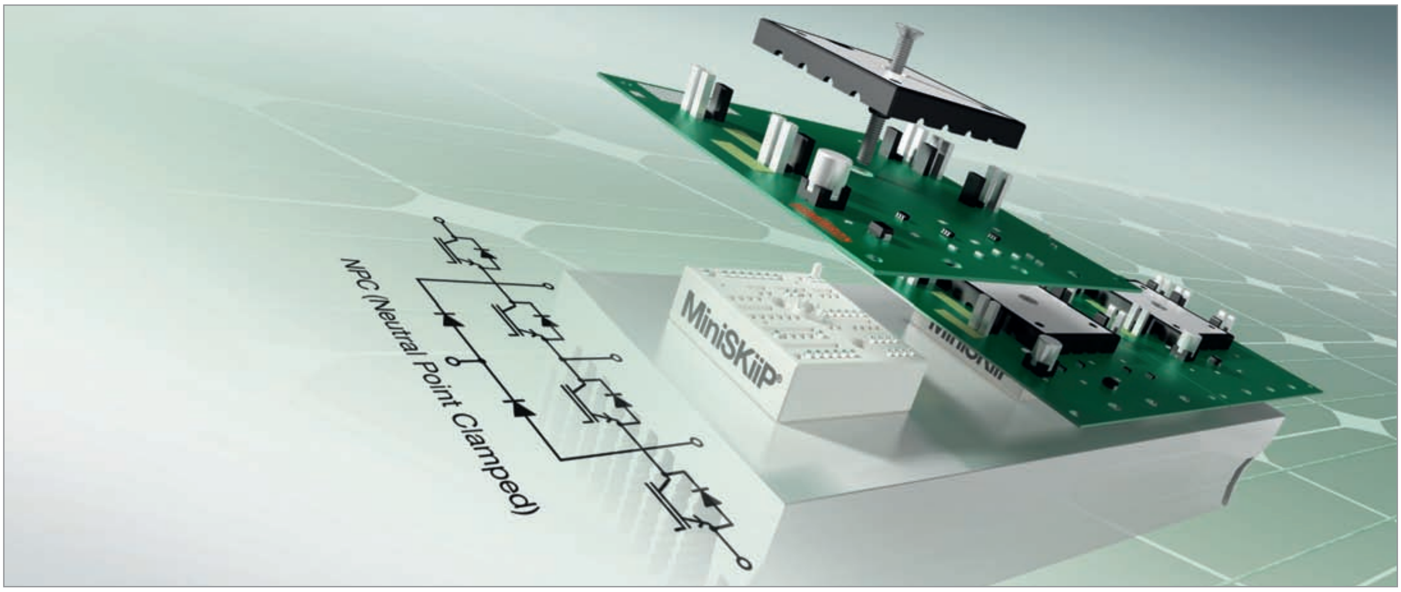
Contents

A new dimension of power density in multilevel applications



Applications

The MiniSKiiP 3-level power modules are most suitable for applications requiring a high level of efficiency and a better output waveform quality, e.g. for uninterruptible power supply systems (UPS) and solar inverters. Especially at switching frequencies above 8 kHz, the 3-level topology provides reduction of overall losses up to 40% compared to a conventional 2-level solution.

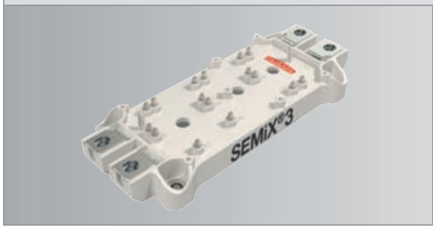
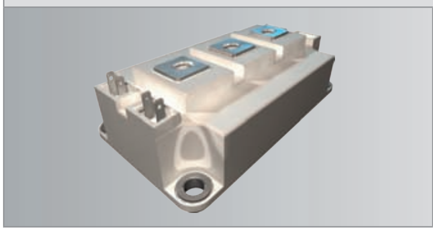
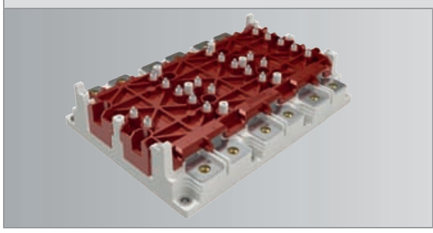
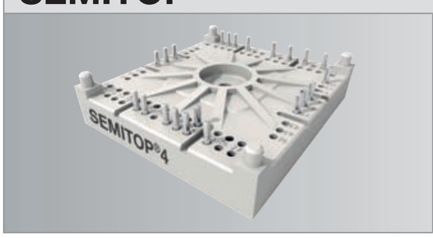
Product range

The MiniSKiiP 3-level power modules are available up to 200A in NPC (Neutral Clamping Point) topology and in the MiniSKiiP housing sizes 2 and 3. All modules are featuring Trench Field Stop IGBT4 with a blocking voltage of 650 V and SEMIKRON CAL I4F diodes.

Benefits

The MiniSKiiP 3-level power modules combine all electrical advantages of 3-level topology with a well-established MiniSKiiP mechanical concept consisting of pressure contact technology for quick and easy solder-free assembly. While a soldered module is assembled in a time consuming production process requiring expensive automatic soldering equipment, MiniSKiiP 3-level power modules will be assembled in one step without costly special equipment.

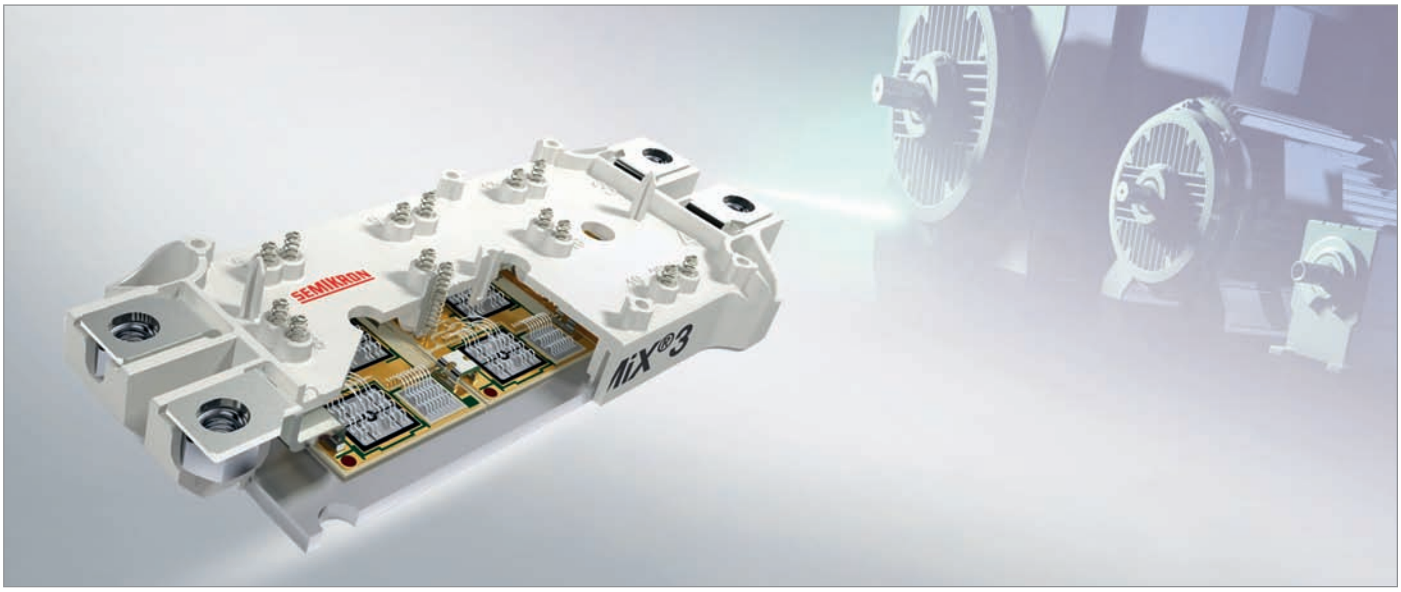
IGBT Modules

Product		Topologies	Voltage	Current range (I_{Cnom})
SEMiX®		half bridge 6-pack chopper	600V/1200V/1700V	75A – 600A
SEMITRANS®		half bridge 6-pack chopper single switch	600V/1200V/1700V	35A – 900A
SKiM® 63/93		6-pack 3-level	600V/1200V/1700V	300A – 900A
SKiM® 4/5		6-pack 3-level	650V/1200V/1700V	200A – 600A
MiniSKiiP®		6-pack 3-level	600V/1200V	8A – 200A
SEMITOP®		half bridge 6-pack 3-level chopper single switch	600V/1200V	10A – 200A

I_{Cnom} [A] 8 10 35 75 200 300 600 900

SEMiX®

IGBT and rectifier module family for solder-free assemblies



Applications

SEMiX is a flexible and application-oriented module. On the basis of a scalable platform concept, modern chip technology is integrated into IGBT and rectifier modules, which are used in a wide variety of applications such as AC motor drives, switching power supplies and current source inverters. Other typical applications are matrix converters, uninterruptible power supplies and electronic welding devices.

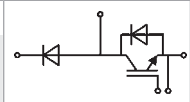
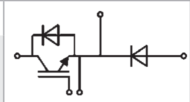
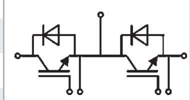
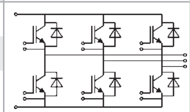
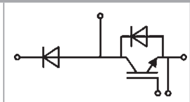
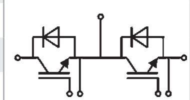
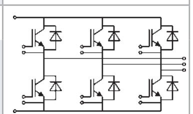
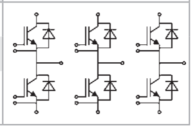
Product range

Six different housing sizes are available in the voltage classes 600 V, 1200 V and 1700 V for IGBT modules. Half-bridge, six-pack and chopper topologies are available for a current range of 75 A to 600 A. Besides IGBT3 and IGBT4 chips, the 1200 V range now also includes a new series with V-IGBT devices. Controlled, half-controlled and uncontrolled rectifier modules with same footprint and 17 mm module height are also available.

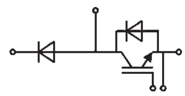
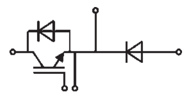
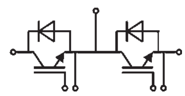
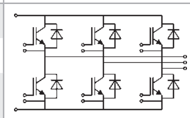
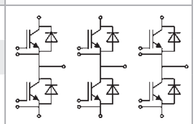
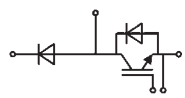
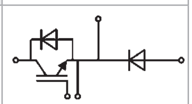
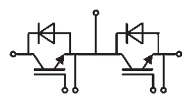
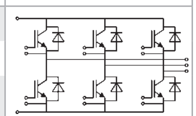
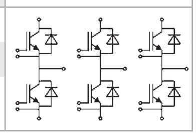
Benefits

- Fast assembly in one direction from above
- Solder-free connection to control unit using reliable spring contacts
- Separation of control unit, AC and DC terminals
- Direct driver assembly
- Same-height (17 mm) IGBT and rectifier modules
- Flat and compact inverter design
- Optimized production at customer site
- Easy servicing

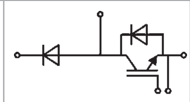
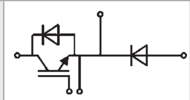
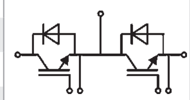
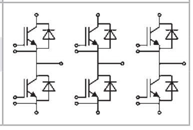
Modules - IGBT - SEMiX

Type	IGBT						Diode				Case		Circuit
	I_C @T_C= 25°C	I_{Cnom}	$V_{CE(sat)}$ @T_j= 25°C typ.	E_{on}	E_{off}	$R_{th(j-c)}$	I_F @T_C= 25°C	V_F @T_j= 25°C typ.	E_{rr}	$R_{th(j-c)}$	Case	$R_{th(c-s)}$	
	A	A	V	mJ	mJ	K/W	A	V	mJ	K/W		K/W	
600 V - IGBT 3 (Trench)													
SEMiX402GAL066HDs	502	400	1.45	22	24	0.12	543	1.4	10	0.15	2s	0.045	
SEMiX603GAL066HDs	720	600	1.45	12	43	0.087	771	1.4	13	0.11	3s	0.04	
SEMiX402GAR066HDs	502	400	1.45	22	24	0.12	543	1.4	10	0.15	2s	0.045	
SEMiX603GAR066HDs	720	600	1.45	12	43	0.087	771	1.4	13	0.11	3s	0.04	
SEMiX202GB066HDs	274	200	1.45	6	8	0.21	291	1.4	6.5	0.27	2s	0.045	
SEMiX302GB066HDs	379	300	1.45	11.5	15	0.16	419	1.4	7.5	0.19	2s	0.045	
SEMiX402GB066HDs	502	400	1.45	22	24	0.12	543	1.4	10	0.15	2s	0.045	
SEMiX603GB066HDs	720	600	1.45	12	43	0.087	771	1.4	13	0.11	3s	0.04	
SEMiX101GD066HDs	139	100	1.45	3	4	0.41	151	1.4	4.5	0.51	13	0.04	
SEMiX151GD066HDs	200	150	1.45	3.8	6.1	0.29	219	1.4	5.8	0.36	13	0.04	
SEMiX201GD066HDs	259	200	1.45	5	8	0.23	284	1.4	7.5	0.28	13	0.04	
1200 V - V-IGBT													
SEMiX151GAL12Vs [1]	231	150	1.75	19.4	17.1	0.19	189	2.1	11.5	0.31	1s	0.075	
SEMiX151GB12Vs	231	150	1.75	19.4	17.1	0.19	189	2.14	11.5	0.31	1s	0.075	
SEMiX202GB12Vs	310	200	1.75	24.9	24.1	0.14	229	2.2	14.5	0.26	2s	0.045	
SEMiX223GB12Vs	323	225	1.85	19.9	27.2	0.14	263	2.2	16.4	0.23	3s	0.04	
SEMiX302GB12Vs	448	300	1.75	37.3	36.1	0.1	356	2.1	21.8	0.17	2s	0.045	
SEMiX303GB12Vs	448	300	1.75	26.5	36.3	0.1	327	2.2	21.4	0.19	3s	0.04	
SEMiX404GB12Vs	596	400	1.75	39.1	52.3	0.075	440	2.2	34.3	0.14	4s	0.03	
SEMiX453GB12Vs	673	450	1.75	39.8	54.4	0.067	516	2.1	32.7	0.12	3s	0.04	
SEMiX603GB12Vs [1]	800	600	1.85	50	83	0.057	516	2.4	40	0.12	3s	0.04	
SEMiX604GB12Vs	880	600	1.75	58.7	78.5	0.051	707	2.1	49.5	0.086	4s	0.03	
SEMiX101GD12Vs	159	100	1.75	12.9	11.4	0.27	121	2.2	7.7	0.48	13	0.04	
SEMiX151GD12Vs	231	150	1.75	19.4	17.1	0.19	189	2.1	11.5	0.31	13	0.04	
SEMiX223GD12Vc	323	225	1.85	19.9	27.2	0.14	263	2.2	16.4	0.23	33c	0.014	
SEMiX303GD12Vc	448	300	1.75	26.5	36.3	0.1	327	2.2	21.4	0.19	33c	0.014	
SEMiX453GD12Vc	673	450	1.75	39.8	54.4	0.067	516	2.1	32.7	0.12	33c	0.014	

Modules - IGBT - SEMiX

Type	IGBT						Diode				Case		Circuit
	I_C @T_c= 25°C	I_{Cnom}	$V_{CE(sat)}$ @T_j= 25°C typ.	E_{on}	E_{off}	$R_{th(j-c)}$	I_F @T_c= 25°C	V_F @T_j= 25°C typ.	E_{rr}	$R_{th(j-c)}$	Case	$R_{th(c-s)}$	
	A	A	V	mJ	mJ	K/W	A	V	mJ	K/W		K/W	
1200 V - IGBT 4 (Trench)													
SEMiX151GAL12E4HDs	232	150	1.8	18	18	0.19	207	1.7	12	0.31	1s	0.075	
SEMiX302GAL12E4HDs	463	300	1.8	33	44	0.096	387	1.7	25	0.17	2s	0.045	
SEMiX453GAL12E4HDs	683	450	1.8	50	67	0.065	592	1.7	36	0.11	3s	0.04	
SEMiX604GAL12E4HDs	916	600	1.8	38	110	0.049	777	1.7	57	0.086	4s	0.03	
SEMiX151GAR12E4HDs	232	150	1.8	18	18	0.19	207	1.7	12	0.31	1s	0.075	
SEMiX302GAR12E4HDs	463	300	1.8	33	44	0.096	387	1.7	25	0.17	2s	0.045	
SEMiX453GAR12E4HDs	683	450	1.8	50	67	0.065	592	1.7	36	0.11	3s	0.04	
SEMiX604GAR12E4HDs	916	600	1.8	38	110	0.049	777	1.7	57	0.086	4s	0.03	
SEMiX151GB12E4HDs	232	150	1.8	18	18	0.19	207	1.7	12	0.31	1s	0.075	
SEMiX202GB12E4HDs	314	200	1.8	24	28	0.14	249	1.8	16	0.26	2s	0.045	
SEMiX302GB12E4HDs	463	300	1.8	33	44	0.096	387	1.7	25	0.17	2s	0.045	
SEMiX303GB12E4HDs	466	300	1.8	33	41	0.095	362	1.8	23	0.18	3s	0.04	
SEMiX404GB12E4HDs	618	400	1.8	30	60	0.072	471	1.8	34	0.14	4s	0.03	
SEMiX453GB12E4HDs	683	450	1.8	50	67	0.065	592	1.7	36	0.11	3s	0.04	
SEMiX604GB12E4HDs	916	600	1.8	38	110	0.049	777	1.7	57	0.086	4s	0.03	
SEMiX71GD12E4HDs	115	75	1.85	8.5	9	0.38	107	1.7	7	0.58	13	0.04	
SEMiX101GD12E4HDs	160	100	1.8	12	13	0.27	130	1.8	8	0.48	13	0.04	
SEMiX151GD12E4HDs	232	150	1.8	16	19	0.19	207	1.7	16	0.31	13	0.04	
SEMiX223GD12E4HDc	333	225	1.85	24	31	0.135	296	1.7	22	0.22	33c	0.014	
SEMiX303GD12E4HDc	466	300	1.8	33	42	0.095	362	1.8	30	0.18	33c	0.014	
SEMiX453GD12E4HDc	683	450	1.8	57	68	0.065	592	1.7	36	0.11	33c	0.014	
1200 V - IGBT 3 (Trench)													
SEMiX452GAL126HDs	455	300	1.7	35	45	0.083	394	1.6	33	0.15	2s	0.045	
SEMiX703GAL126HDs	642	450	1.7	32	68	0.061	561	1.6	60	0.11	3s	0.04	
SEMiX703GAR126HDs	642	450	1.7	32	68	0.061	561	1.6	60	0.11	3s	0.04	
SEMiX252GB126HDs	242	150	1.7	20	21	0.15	228	1.6	18	0.24	2s	0.045	
SEMiX302GB126HDs	311	200	1.7	30	26	0.12	292	1.6	22.5	0.19	2s	0.045	
SEMiX353GB126HDs	364	225	1.7	26.5	32.5	0.1	329	1.6	29	0.17	3s	0.04	
SEMiX452GB126HDs	455	300	1.7	35	45	0.083	394	1.6	33	0.15	2s	0.045	
SEMiX503GB126HDs	466	300	1.7	28	44	0.08	431	1.6	32.5	0.13	3s	0.04	
SEMiX604GB126HDs	590	400	1.7	36	60	0.065	533	1.6	46	0.11	4s	0.03	
SEMiX703GB126HDs	642	450	1.7	32	68	0.061	561	1.6	60	0.11	3s	0.04	
SEMiX904GB126HDs	821	600	1.7	60	88	0.05	752	1.6	75	0.081	4s	0.03	
SEMiX101GD126HDs	129	75	1.7	10	11	0.27	117	1.6	9	0.46	13	0.04	
SEMiX151GD126HDs	168	100	1.7	12	14	0.21	152	1.6	11.5	0.36	13	0.04	
SEMiX251GD126HDs	242	150	1.7	19	22	0.15	207	1.6	14.5	0.28	13	0.04	
SEMiX353GD126HDc	364	225	1.7	26.5	32.5	0.1	329	1.6	29	0.17	33c	0.014	
SEMiX503GD126HDc	466	300	1.7	28	44	0.08	412	1.6	32.5	0.14	33c	0.014	
SEMiX703GD126HDc	642	450	1.7	32	68	0.061	561	1.6	60	0.11	33c	0.014	

Modules - IGBT - SEMiX

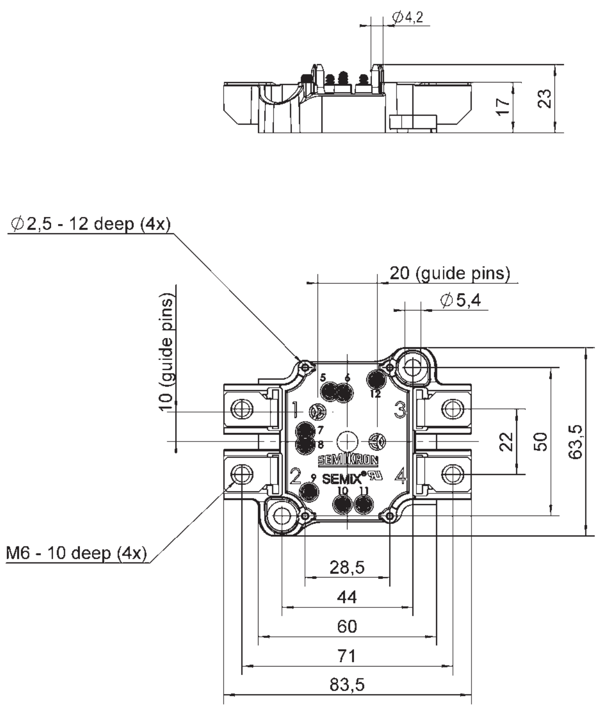
Type	IGBT						Diode				Case		Circuit
	I_C @T_C= 25°C	I_{Cnom}	$V_{CE(sat)}$ @T_j= 25°C typ.	E_{on}	E_{off}	$R_{th(j-c)}$	I_F @T_C= 25°C	V_F @T_j= 25°C typ.	E_{rr}	$R_{th(j-c)}$	Case	$R_{th(c-s)}$	
	A	A	V	mJ	mJ	K/W	A	V	mJ	K/W		K/W	
1700 V - IGBT 3 (Trench)													
SEMiX653GAL176HDs	619	450	2	300	180	0.054	545	1.7	73	0.11	3s	0.04	
SEMiX653GAR176HDs	619	450	2	300	180	0.054	545	1.7	73	0.11	3s	0.04	
SEMiX252GB176HDs	246	150	2	90	55	0.12	288	1.6	32	0.19	2s	0.045	
SEMiX302GB176HDs	308	200	2	130	77	0.1	389	1.5	43	0.15	2s	0.045	
SEMiX353GB176HDs	353	225	2	155	85	0.086	428	1.6	45	0.13	3s	0.04	
SEMiX452GB176HDs	437	300	2	180	110	0.073	389	1.7	46	0.15	2s	0.045	
SEMiX453GB176HDs	444	300	2	215	125	0.071	545	1.5	65	0.11	3s	0.04	
SEMiX604GB176HDs	567	400	2	215	165	0.058	740	1.5	95	0.081	4s	0.03	
SEMiX653GB176HDs	619	450	2	300	180	0.054	545	1.7	73	0.11	3s	0.04	
SEMiX854GB176HDs	779	600	2	300	250	0.045	740	1.7	170	0.081	4s	0.03	
SEMiX353GD176HDc	353	225	2	155	85	0.086	428	1.6	45	0.13	33c	0.014	
SEMiX453GD176HDc	444	300	2	215	125	0.071	545	1.5	65	0.11	33c	0.014	
SEMiX653GD176HDc	619	450	2	300	180	0.054	545	1.7	73	0.11	33c	0.014	

Footnotes

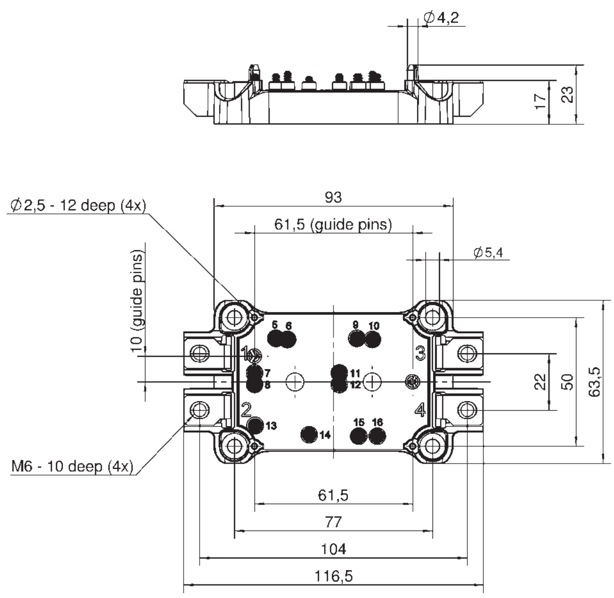
1) New

Cases

SEMiX 1s



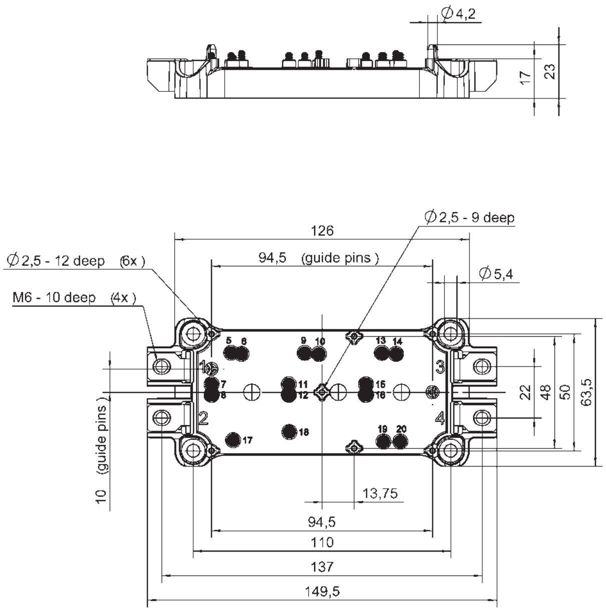
SEMiX 2s



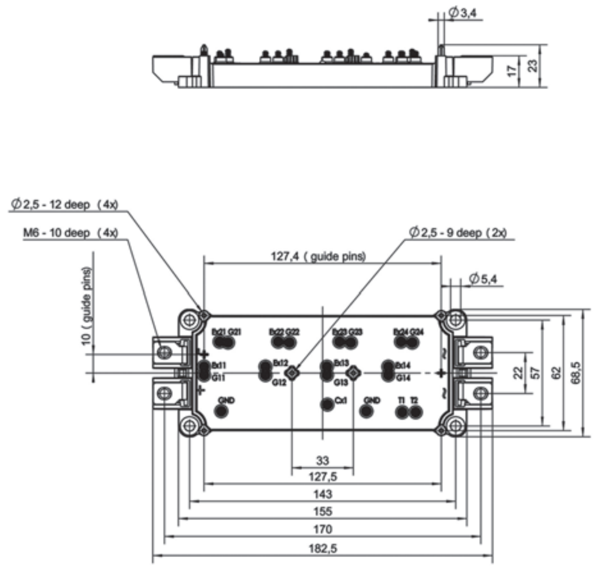
Dimensions in mm

Cases

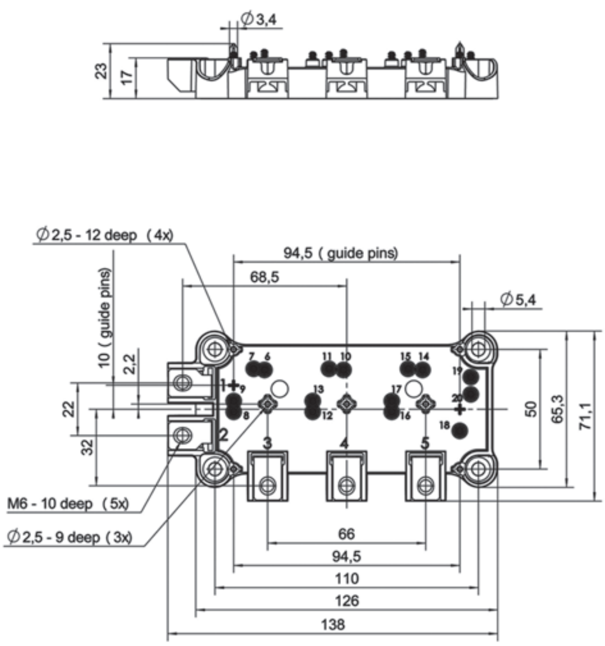
SEMiX 3s



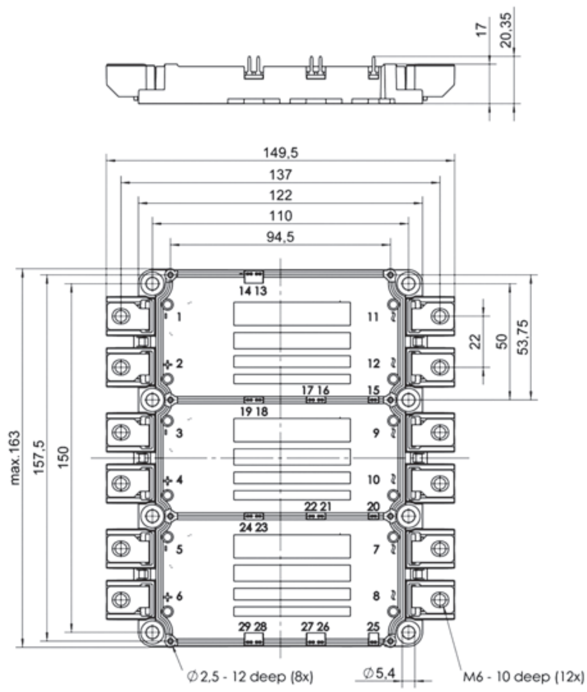
SEMiX 4s



SEMiX 13

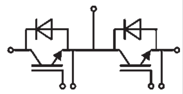
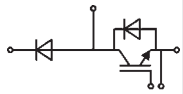
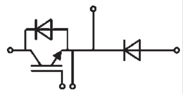
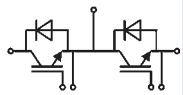
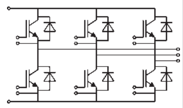
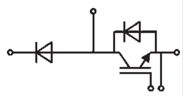
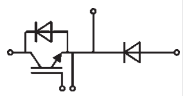
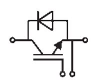
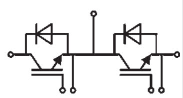


SEMiX 33c

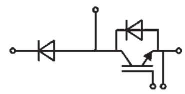
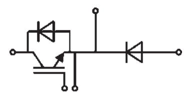
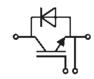
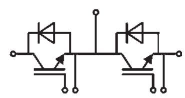
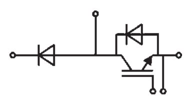
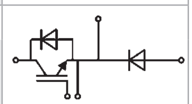
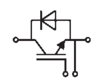
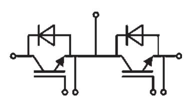
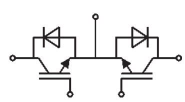
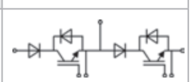


Dimensions in mm

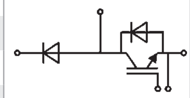
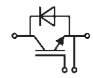
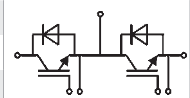
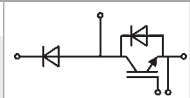
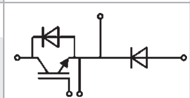
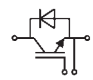
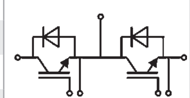
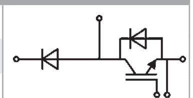
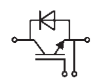
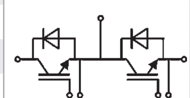
Modules - IGBT - SEMITRANS

Type	IGBT						Diode				Case		Circuit
	I_C @T_C= 25°C	I_{Cnom}	$V_{CE(sat)}$ @T_j= 25°C typ.	E_{on}	E_{off}	$R_{th(j-c)}$	I_F @T_C= 25°C	V_F @T_j= 25°C typ.	E_{rr}	$R_{th(j-c)}$	Case	$R_{th(c-s)}$	
	A	A	V	mJ	mJ	K/W	A	V	mJ	K/W		K/W	
600 V - IGBT 3 (Trench)													
SKM145GB066D	195	150	1.45	8.5	5.5	0.3	150	1.38	3.5	0.5	2	0.05	
SKM195GB066D	265	200	1.45	14	8	0.22	200	1.35	5.6	0.4	2	0.05	
SKM300GB066D	390	300	1.45	7.5	11.5	0.15	350	1.38	10.5	0.25	3	0.038	
SKM400GB066D	500	400	1.45	8	16	0.12	450	1.35	14	0.2	3	0.038	
SKM600GB066D	760	600	1.45	7.5	29.5	0.08	700	1.38	25	0.125	3	0.038	
600 V - NPT IGBT (Standard)													
SKM75GAL063D 1)	100	75	2.1	3	2.5	0.35	75	1.55	0.53	0.72	2	0.05	
SKM300GAL063D 1)	400	300	2.1	14	13	0.09	250	1.65	4	0.25	3	0.038	
SKM75GAR063D 1)	100	75	2.1	3	2.5	0.35	75	1.55	0.53	0.72	2	0.05	
SKM300GAR063D 1)	400	300	2.1	14	13	0.09	250	1.65	4	0.25	3	0.038	
SKM50GB063D 1)	70	50	2.1	2.5	1.8	0.5	75	1.35	0.48	1	2	0.05	
SKM75GB063D 1)	100	75	2.1	3	2.5	0.35	75	1.55	0.53	0.72	2	0.05	
SKM100GB063D 1)	130	100	2.1	4	3	0.27	100	1.55	1.5	0.6	2	0.05	
SKM200GB063D 1)	260	200	2.1	11	7.5	0.14	200	1.55	2.1	0.3	3	0.038	
SKM300GB063D 1)	400	300	2.1	14	13	0.09	250	1.65	4	0.25	3	0.038	
SKM100GD063DL 1)	130	100	2.1	4	3	0.27	100	1.55	1.5	0.6	6	0.05	
1200 V - V-IGBT													
SKM150GAL12V 2)	231	150	1.75	13.5	14.2	0.19	189	2.14	8.9	0.31	2	0.05	
SKM400GAL12V 2)	612	400	1.75	39	42	0.072	440	2.20	26	0.14	3	0.038	
SKM400GAR12V 2)	612	400	1.75	39	42	0.072	440	2.20	26	0.14	3	0.038	
SKM300GA12V 2)	420	300	1.85	23	33	0.11	353	2.17	21	0.17	4	0.038	
SKM400GA12V 2)	612	400	1.75	39	42	0.072	440	2.20	26	0.14	4	0.038	
SKM600GA12V 2)	908	600	1.75	76	76	0.049	707	2.14	43	0.086	4	0.038	
SKM50GB12V 2)	77	50	1.85	5	4	0.53	65	2.22	3.6	0.84	2	0.05	
SKM75GB12V 2)	114	75	1.85	6.7	7.1	0.38	97	2.17	4.2	0.58	2	0.05	
SKM100GB12V 2)	159	100	1.75	10.7	8.7	0.27	121	2.20	5.7	0.48	2	0.05	
SKM150GB12V 2)	231	150	1.75	13.5	14.2	0.19	189	2.14	8.9	0.31	2	0.05	
SKM150GB12VG 2)	222	150	1.85	10	16.5	0.2	187	2.17	11	0.31	3	0.038	
SKM200GB12V 2)	311	200	1.75	14	22	0.14	229	2.20	13	0.26	3	0.038	
SKM300GB12V 2)	420	300	1.85	23	33	0.11	353	2.17	21	0.17	3	0.038	
SKM400GB12V 2)	612	400	1.75	39	42	0.072	440	2.20	26	0.14	3	0.038	

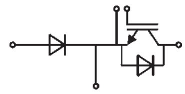
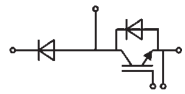
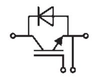
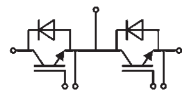
Modules - IGBT - SEMITRANS

Type	IGBT						Diode				Case		Circuit
	I_C @T_c= 25°C	I_{Cnom}	$V_{CE(sat)}$ @T_j= 25°C typ.	E_{on}	E_{off}	$R_{th(j-c)}$	I_F @T_c= 25°C	V_F @T_j= 25°C typ.	E_{rr}	$R_{th(j-c)}$	Case	$R_{th(c-s)}$	
	A	A	V	mJ	mJ	K/W	A	V	mJ	K/W		K/W	
1200 V - IGBT 4 (Trench)													
SKM200GAL12E4HD	313	200	1.8	23	27	0.14	249	1.77	17	0.26	3	0.038	
SKM300GAL12E4HD	422	300	1.85	30	39	0.11	387	1.72	30	0.17	3	0.038	
SKM400GAL12E4HD	616	400	1.8	36	56	0.072	471	1.77	40	0.14	3	0.038	
SKM200GAR12E4HD	313	200	1.8	21	27	0.14	249	1.77	13	0.26	3	0.038	
SKM300GAR12E4HD	422	300	1.85	27	39	0.11	387	1.72	23	0.17	3	0.038	
SKM400GAR12E4HD	616	400	1.8	36	56	0.072	471	1.77	40	0.14	3	0.038	
SKM300GA12E4HD	422	300	1.85	29	35	0.11	387	1.72	29	0.17	4	0.038	
SKM400GA12E4HD	616	400	1.8	31	59	0.072	471	1.77	48	0.14	4	0.038	
SKM600GA12E4HD	913	600	1.8	81	84	0.049	777	1.72	49	0.086	4	0.038	
SKM900GA12E4HD [2)]	1305	900	1.83	88	115	0.035	956	1.84	85	0.07	4	0.038	
SKM200GB12E4HD	313	200	1.8	23	27	0.14	249	1.77	17	0.26	3	0.038	
SKM300GB12E4HD	422	300	1.85	30	39	0.11	387	1.72	30	0.17	3	0.038	
SKM400GB12E4HD	616	400	1.8	36	56	0.072	471	1.77	40	0.14	3	0.038	
SKM450GB12E4HD [2)]	699	450	1.82	39	61	0.062	471	1.84	43	0.14	3	0.038	
1200 V - IGBT 4 Fast (Trench)													
SKM50GAL12T4 [2)]	81	50	1.85	5.5	4.5	0.53	65	2.22	3.6	0.84	2	0.05	
SKM100GAL12T4 [2)]	160	100	1.8	15	10.2	0.27	121	2.20	5.9	0.48	2	0.05	
SKM150GAL12T4	232	150	1.8	19.2	15.8	0.19	189	2.14	13	0.31	2	0.05	
SKM200GAL12T4	313	200	1.8	21	20	0.14	229	2.20	13	0.26	3	0.038	
SKM300GAL12T4	422	300	1.85	27	29	0.11	353	2.17	23	0.17	3	0.038	
SKM400GAL12T4	616	400	1.8	33	42	0.072	440	2.20	30.5	0.14	3	0.038	
SKM150GAR12T4	232	150	1.8	19.2	15.8	0.19	189	2.14	13	0.31	2	0.05	
SKM400GAR12T4	616	400	1.8	33	42	0.072	440	2.20	30.5	0.14	3	0.038	
SKM300GA12T4	422	300	1.85	23.4	26	0.11	353	2.17	22.2	0.17	4	0.038	
SKM400GA12T4	616	400	1.8	28	44	0.072	440	2.20	37	0.14	4	0.038	
SKM600GA12T4	913	600	1.8	74	63	0.049	707	2.14	38	0.086	4	0.038	
SKM50GB12T4	81	50	1.85	5.5	4.5	0.53	65	2.22	3.8	0.84	2	0.05	
SKM75GB12T4	115	75	1.85	11	6.9	0.38	97	2.17	4.7	0.58	2	0.05	
SKM100GB12T4	160	100	1.8	15	10.2	0.27	121	2.20	5.9	0.48	2	0.05	
SKM100GB12T4G	154	100	1.85	16.1	8.6	0.29	118	2.22	6	0.49	3	0.038	
SKM150GB12T4	232	150	1.8	19.2	15.8	0.19	189	2.14	13	0.31	2	0.05	
SKM150GB12T4G	223	150	1.85	18.7	14.1	0.2	183	2.17	9	0.32	3	0.038	
SKM200GB12T4	313	200	1.8	21	20	0.14	229	2.20	13	0.26	3	0.038	
SKM300GB12T4	422	300	1.85	27	29	0.11	353	2.17	23	0.17	3	0.038	
SKM400GB12T4	616	400	1.8	33	42	0.072	440	2.20	30.5	0.14	3	0.038	
SKM150GM12T4G [2)]	229	150	1.85	19.2	15.8	0.19	187	2.17	13	0.31	3	0.038	
SKM200GM12T4 [2)]	313	200	1.8	21	20	0.14	229	2.20	13	0.26	3	0.038	
SKM300GM12T4 [2)]	422	300	1.85	27	29	0.11	353	2.17	23	0.17	3	0.038	
SKM400GM12T4 [2)]	616	400	1.8	33	42	0.072	440	2.20	30.5	0.14	3	0.038	
SKM300GBD12T4 [2)]	422	300	1.85	27	29	0.11	56	2.41	-	0.94	3	0.038	

Modules - IGBT - SEMITRANS

Type	IGBT						Diode				Case		Circuit
	I_C @T_C= 25°C	I_{Cnom}	$V_{CE(sat)}$ @T_j= 25°C typ.	E_{on}	E_{off}	$R_{th(j-c)}$	I_F @T_C= 25°C	V_F @T_j= 25°C typ.	E_{rr}	$R_{th(j-c)}$	Case	$R_{th(c-s)}$	
	A	A	V	mJ	mJ	K/W	A	V	mJ	K/W		K/W	
1200 V - IGBT 3 (Trench)													
SKM195GAL126D	220	150	1.7	16	24.5	0.16	170	2.45	5.8	0.32	2	0.05	
SKM200GAL126D	260	150	1.7	18	24	0.13	200	1.50	18	0.3	3	0.038	
SKM400GAL126D	470	300	1.7	29	48	0.08	400	1.64	27	0.18	3	0.038	
SKM600GAL126D	660	400	1.7	39	64	0.055	490	1.67	41	0.125	3	0.038	
SKM600GA126D	660	400	1.7	39	64	0.055	490	1.67	41	0.125	4	0.038	
SKM800GA126D	960	600	1.7	65	95	0.042	680	1.69	59	0.09	4	0.038	
SKM195GB126D	220	150	1.7	16	24.5	0.16	170	2.45	5.8	0.32	2	0.05	
SKM200GB126D	260	150	1.7	18	24	0.13	200	1.64	18	0.3	3	0.038	
SKM300GB126D	310	200	1.7	21	33	0.12	250	1.67	18	0.25	3	0.038	
SKM400GB126D	470	300	1.7	29	48	0.08	400	1.64	27	0.18	3	0.038	
SKM600GB126D	660	400	1.7	39	64	0.055	490	1.67	41	0.125	3	0.038	
1200 V - NPT IGBT (Ultrafast)													
SKM200GAL125D	200	150	3.3	14	8	0.09	200	2.06	8	0.25	3	0.038	
SKM400GAL125D	400	300	3.3	17	18	0.05	390	2.06	16	0.125	3	0.038	
SKM200GAR125D	200	150	3.3	14	8	0.09	200	2.06	8	0.25	3	0.038	
SKM400GAR125D	400	300	3.3	17	18	0.05	390	2.06	16	0.125	3	0.038	
SKM600GA125D	580	400	3.3	30	22	0.041	500	2.00	24	0.09	4	0.038	
SKM800GA125D	760	600	3.2	88	48	0.03	720	2.3	28	0.07	4	0.038	
SKM100GB125DN	100	75	3.3	9	3.5	0.18	95	2.06	4	0.5	2N	0.05	
SKM200GB125D	200	150	3.3	14	8	0.09	200	2.06	8	0.25	3	0.038	
SKM300GB125D	300	200	3.3	16	11	0.075	260	2.00	13	0.18	3	0.038	
SKM400GB125D	400	300	3.3	17	18	0.05	390	2.06	16	0.125	3	0.038	
1700 V - IGBT 3 (Trench)													
SKM145GAL176D	160	100	2	60	38	0.19	140	1.6	27.5	0.36	2	0.05	
SKM200GAL176D	260	150	2	93	58	0.12	210	1.55	31	0.25	3	0.038	
SKM400GAL176D	432	300	2	170	118	0.075	440	1.55	78	0.125	3	0.038	
SKM600GA176D	660	400	2	255	155	0.044	600	1.6	102	0.09	4	0.038	
SKM800GA176D	830	600	2	335	245	0.04	630	1.6	155	0.07	4	0.038	
SKM75GB176D	80	50	2	25	18	0.38	80	1.50	14.5	0.55	2	0.05	
SKM100GB176D	125	75	2	44	28.5	0.24	100	1.6	21.4	0.45	2	0.05	
SKM145GB176D	160	100	2	60	38	0.19	140	1.6	27.5	0.36	2	0.05	
SKM200GB176D	260	150	2	93	58	0.12	210	1.55	31	0.25	3	0.038	
SKM400GB176D	432	300	2	170	118	0.075	440	1.55	78	0.125	3	0.038	

Modules - IGBT - SEMITRANS

Type	IGBT						Diode				Case		Circuit
	I_C @T_C= 25°C	I_{Cnom}	$V_{CE(sat)}$ @T_j= 25°C typ.	E_{on}	E_{off}	$R_{th(j-c)}$	I_F @T_C= 25°C	V_F @T_j= 25°C typ.	E_{rr}	$R_{th(j-c)}$	Case	$R_{th(c-s)}$	
	A	A	V	mJ	mJ	K/W	A	V	mJ	K/W		K/W	
1700 V - NPT IGBT (Standard)													
SKM200GAR173D [1]	220	150	3.4	95	45	0.1	150	2.2	21	0.32	3	0.038	
SKM200GAL173D [1]	220	150	3.4	95	45	0.1	150	2.2	21	0.32	3	0.038	
SKM400GA173D [1]	440	300	3	180	10	0.05	300	2.2	46	0.17	4	0.038	
SKM75GB173D [1]	75	50	3.4	18	13	0.25	60	2.2	10.5	0.75	2	0.05	
SKM100GB173D [1]	110	75	3.4	35	21	0.2	80	2.2	11.5	0.63	2	0.05	
SKM150GB173D [1]	150	100	3.4	60	32	0.125	125	2.2	14	0.4	3	0.038	
SKM200GB173D [1]	220	150	3.4	95	45	0.1	150	2.2	21	0.32	3	0.038	

Footnotes

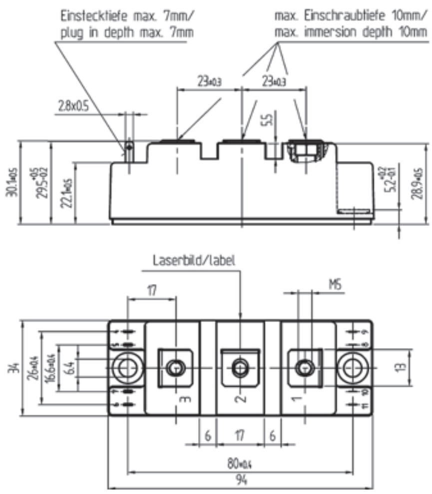
1) Not for New Design

2) New

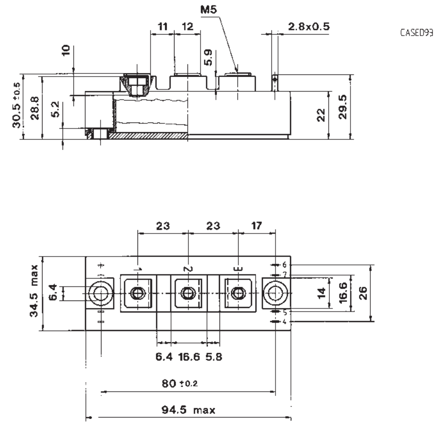
Modules - IGBT - SEMITRANS

Cases

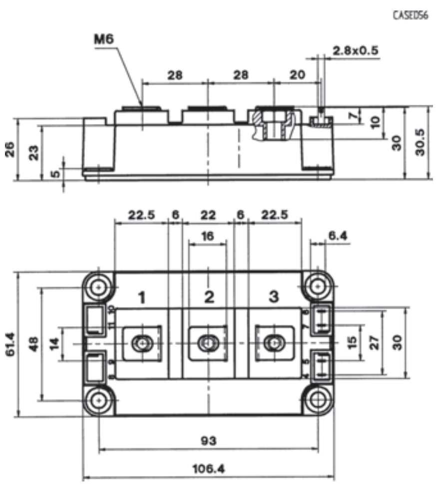
SEMITRANS 2



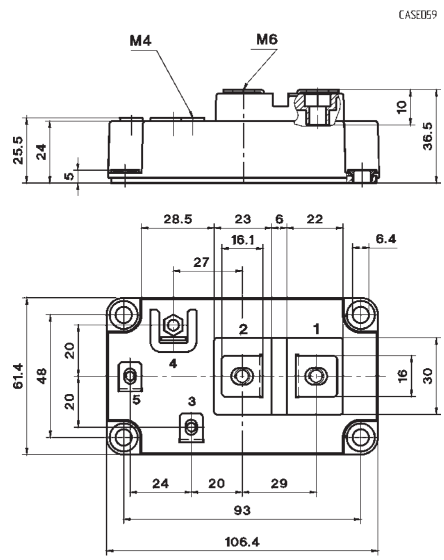
SEMITRANS 2N



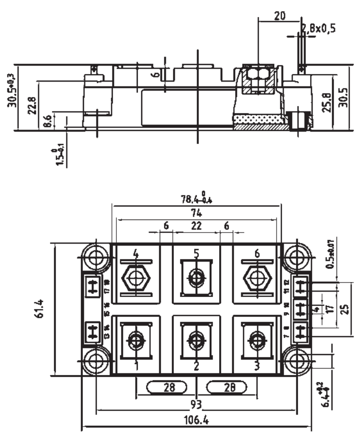
SEMITRANS 3



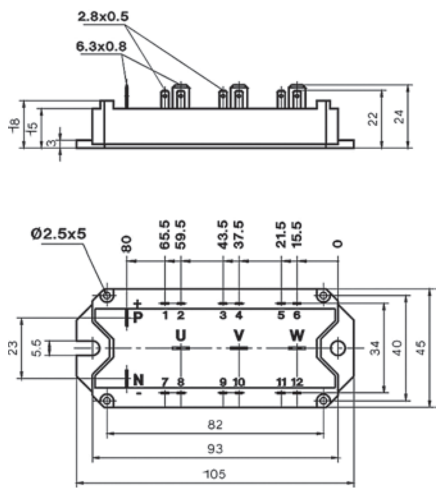
SEMITRANS 4



SEMITRANS 5



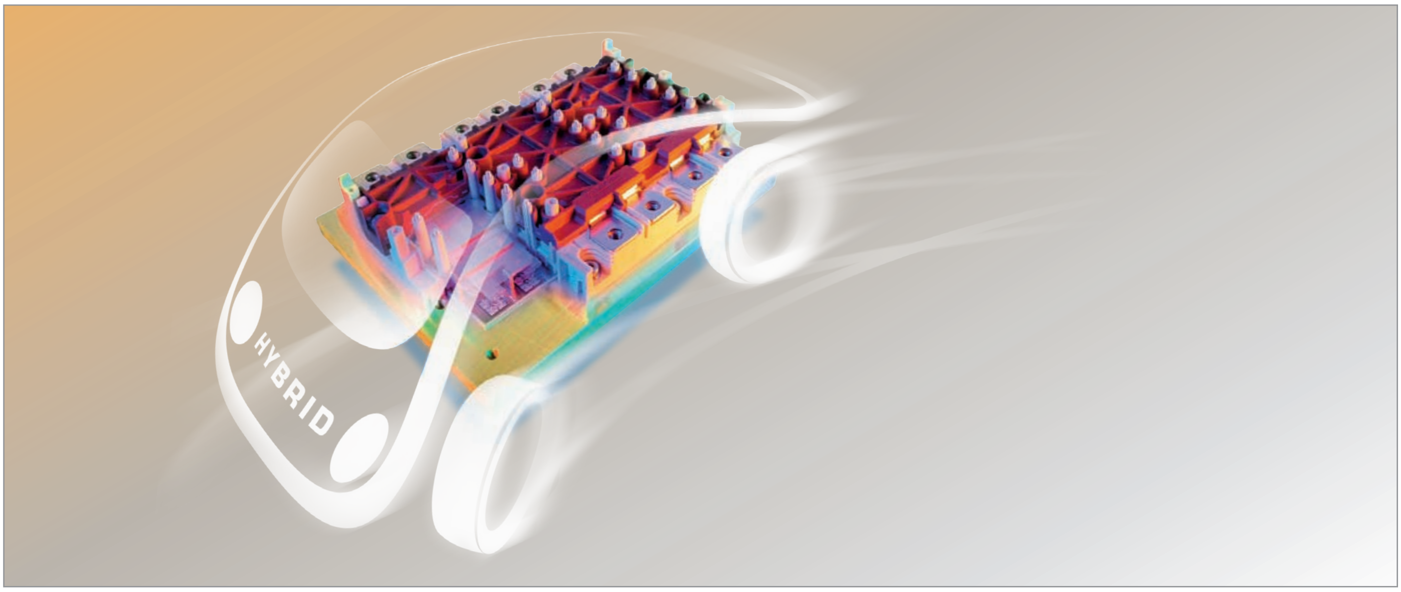
SEMITRANS 6



Dimensions in mm

SKiM® 63 / 93

100 % solder-free ensures durability



Applications

SKiM 63/93, sintered modules with no base plate, offer a number of possibilities for boosting the reliability of inverters. The SKiM 63/93 is used in many different applications such as electric powertrains in electric vehicles, hybrid cars and utility vehicles, heavy-duty construction machinery, or even to provide leading-edge performance in race cars.

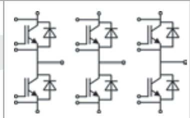
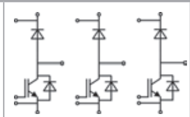
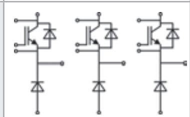
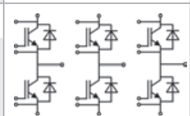
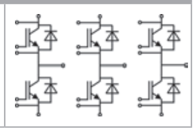
Product range

The SKiM 63/93 modules combine 3-phase inverter topology with temperature control for all 3 phases in 600 V, 650 V, 1200 V, 1700 V voltage. Power ranges from 20 kW - 180 kW, nominal currents range from 300 A - 900 A. A 600 V / 650 V driver board and an optimized water cooler are available for fast and customer-friendly evaluation.

Benefits

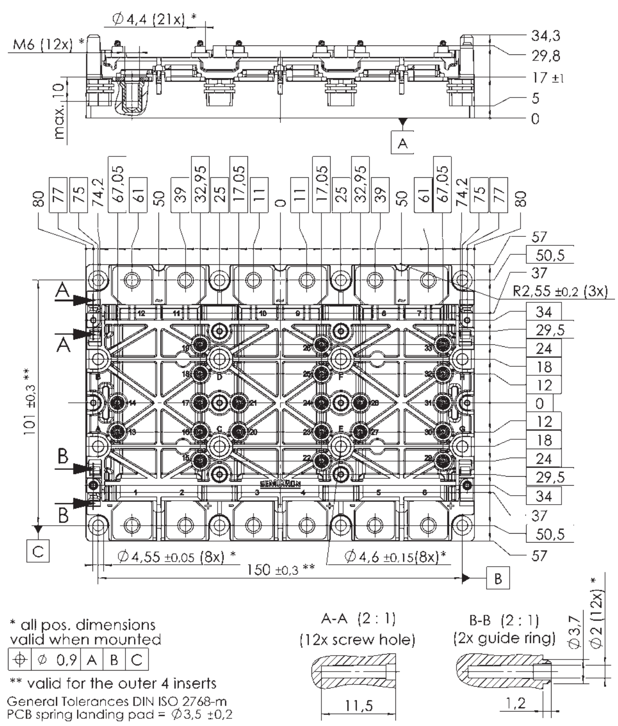
SKiM solder-free technology completely eliminates solder connections, which can be detrimental to service life. The reliability of the inverter, even under substantial active and passive temperature swings, can be increased by several factors. Testimony to this is best-in-class results in power cycle and temperature cycle tests. Thanks to the baseplate-less design, the thickness of the thermal paste layer can be reduced by a factor of 4 compared to conventional modules. Hand in hand with the optimized thermal layout, operating temperatures are reduced significantly. Temperatures are largely homogenous in the 3 phases of the inverter. All SKiM modules come with pre-applied thermal paste. No solder steps are required for SKiM driver board and heat sink mounting, making assembly easy and cost-efficient.

Modules - IGBT - SKiM 63 / 93

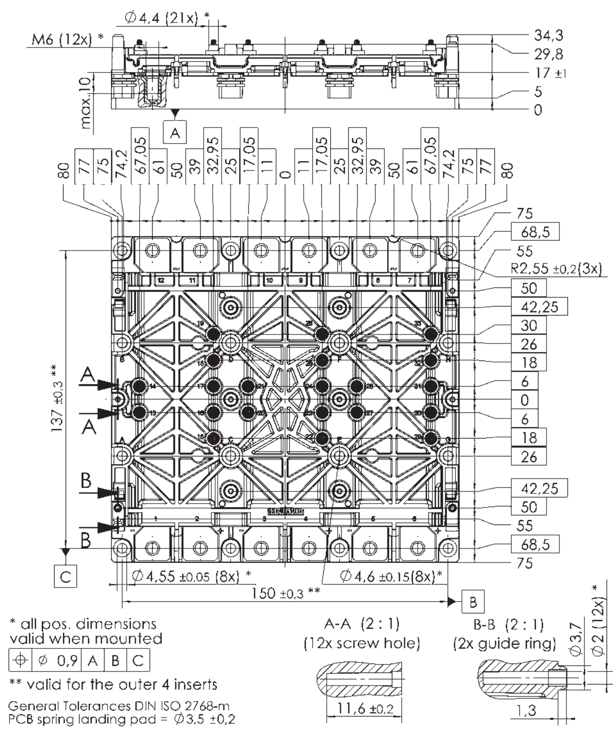
Type	IGBT						Diode				Case	Circuit
	I_C @T_s= 25°C	I_{Cnom}	$V_{CE(sat)}$ @T_j= 25°C typ.	E_{on}	E_{off}	$R_{th(j-s)}$	I_F @T_s= 25°C	V_F @T_j= 25°C typ.	E_{rr}	$R_{th(j-s)}$		
	A	A	V	mJ	mJ	K/W	A	V	mJ	K/W		
600 V - IGBT 3 (Trench)												
SKiM406GD066HD	468	400	1.45	8	25	0.135	360	1.5	12	0.243	63	
SKiM606GD066HD	641	600	1.45	16	53	0.105	453	1.6	21	0.201	63	
SKiM909GD066HD	899	900	1.45	36	88	0.078	712	1.5	29	0.135	93	
1200 V - IGBT 4 (Trench)												
SKiM609GAL12E4	748	600	1.85	136	83	0.068	1397	1.7	39	0.048	93	
SKiM609GAR12E4	748	600	1.85	136	83	0.068	1397	1.7	39	0.048	93	
SKiM306GD12E4	410	300	1.85	19	39	0.116	302	2.1	21	0.218	63	
SKiM459GD12E4	554	450	1.85	22	57	0.092	438	2.1	40	0.155	93	
1700 V - IGBT 4 (Trench)												
SKiM429GD17E4HD	595	420	1.9	245	180	0.079	413	1.7	99	0.169	93	

Cases

SKiM 63

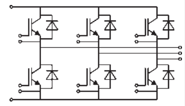
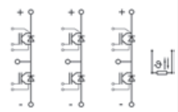
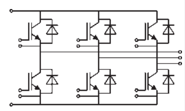
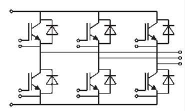
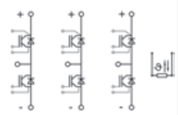


SKiM 93



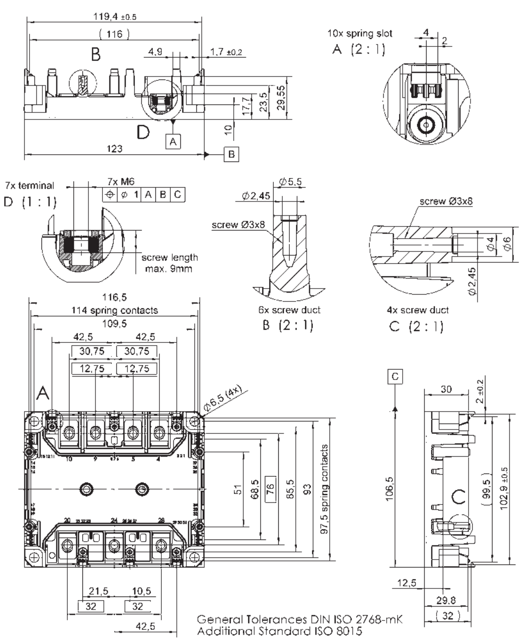
Dimensions in mm

Modules - IGBT - SKiM 4 / 5

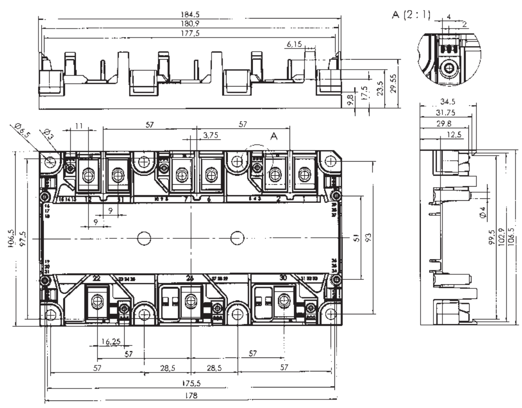
Type	IGBT						Diode				Case	Circuit
	I_C @T_S= 25°C	I_{Cnom}	$V_{CE(sat)}$ @T_j= 25°C typ.	E_{on}	E_{off}	$R_{th(j-s)}$	I_F @T_S= 25°C	V_F @T_j= 25°C typ.	E_{rr}	$R_{th(j-s)}$		
	A	A	V	mJ	mJ	K/W	A	V	mJ	K/W		
1200 V - IGBT 3 (Trench)												
SKiM200GD126D	-	200	1.65	15	25	-	152	2.4	-	0.35	4	
SKiM 300GD126D	265	300	1.7	28	47	0.2	260	1.9	-	0.285	4	
SKiM 400GD126DM	330	300	1.7	29	46	0.134	300	1.9	-	0.19	4	
SKiM300GD126DL	265	300	1.65	28	47	0.2	260	1.9	-	0.285	4	
SKiM400GD126DLM	330	300	1.65	29	46	0.134	300	1.9	-	0.19	4	
SKiM 450GD126D	390	450	1.7	42	70	0.13	345	1.9	-	0.19	5	
SKiM 601GD126DM	480	450	1.7	42	70	0.09	450	1.9	-	0.125	5	
SKiM450GD126DL	390	450	1.65	42	70	0.13	345	1.9	-	0.19	5	
SKiM455GD12T4D1	390	450	1.8	42	70	0.13	345	1.9	-	0.19	5	
SKiM455GD12T4DM1	390	450	1.8	42	70	0.13	345	1.9	-	0.19	5	
SKiM600GD126DLM	480	450	1.65	42	70	0.09	450	1.9	-	0.125	5	
1200 V - IGBT 4 (Trench)												
SKiM304GD12T4D	312	300	1.8	-	-	0.19	221	2.3	-	0.25	4	
1700 V - IGBT 3 (Trench)												
SKiM 120GD176D	110	125	2	72	46	0.4	105	1.6	22	0.56	4	
SKiM 220GD176DH4	220	250	2	145	100	0.21	220	1.7	65	0.26	4	
SKiM 270GD176D	260	300	2	170	120	0.175	215	1.7	-	0.29	5	

Cases

SKiM 4

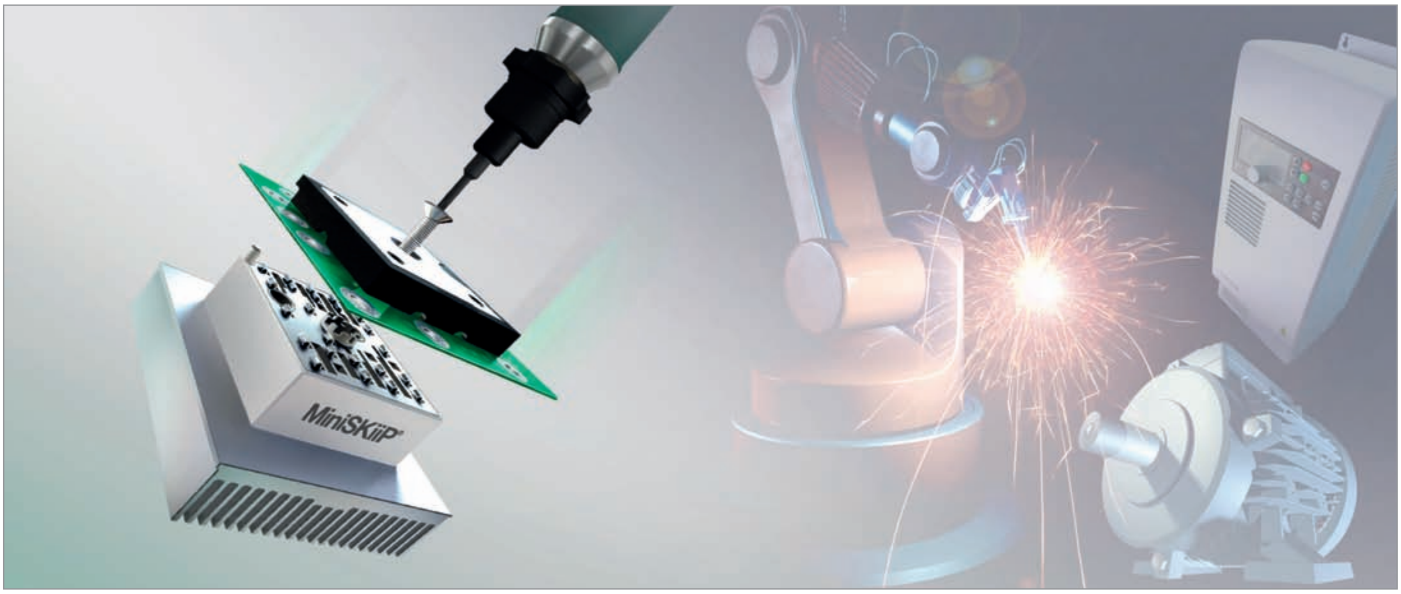


SKiM 5



Dimensions in mm

Fast, cost efficient and reliable one screw mounting



Applications

Thanks to the use of spring contact technology, MiniSKiiP modules enable fast single-screw or double-screw assembly, facilitating quick and reliable inverter manufacture. With more than 14 years of field experience and more than 15 million modules in the field, this module platform has proven successful in every standard application. The main applications are all kinds of frequency inverters, like standard drives, stand alone drives, servo drives, system drives, solar inverters, UPS systems and welding machines. Thanks to the reliability of spring contacts applications like agricultural vehicles or pitch motors of windmills benefit from the MiniSKiiP technology.

Product range

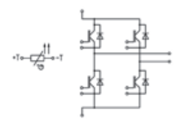
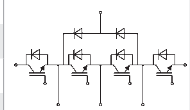
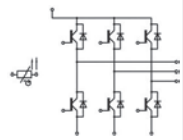
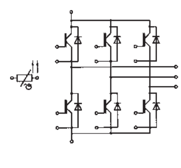
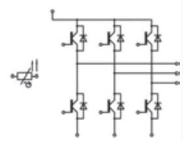
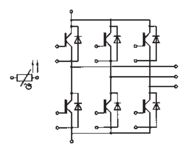
MiniSKiiP modules are designed for 600 V and 1200 V chip off-state voltages with 4-150 A nominal chip currents and feature Trench IGBT technology in combination with SEMIKRON CAL diode. In the 1200 V range, the latest Trench IGBT4 technology is used in combination with the CAL I4 diode. These chips may be used for a junction temperature of up to 175°C. In addition to the CIB configuration and 6-pack modules, non-controlled rectifiers with brake chopper, as well as half-controlled rectifiers with brake chopper are also available.

Modules for 3-level inverters with output powers of 30-80 kVA and a maximum blocking voltage of 650 V, as well as SiC devices are also available.

Benefits

An important mechanical feature in this module is the easy-assembly and service-friendly spring-contact for load and gate terminals. Compared to conventional soldered modules, where expensive automaticn soldering equipment is needed in time-consuming soldering processes, no special tools are needed to assemble MiniSKiiP modules - instead, a single-screw connection is used. The printed circuit board (PCB), power module and heat sink are firmly joined via the pressure lid.
This connection technology has a number of other advantages: the customer's PCB can be more flexible in design, as the power circuit board does not have to include holes for solder pins. The springs provide a flexible connection between the PCB and the power circuitry that is far superior to a soldered joint, especially under thermal or mechanical load conditions which can affect lifetime. Thanks to the good contact force provided by the springs, an air-tight, reliable electrical connection is ensured.

Modules - IGBT - MiniSKiiP

Type	IGBT I_C @T_s= 25°C	I_{Cnom}	$V_{CE(sat)}$ @T_j= 25°C typ.	E_{on}	E_{off}	$R_{th(j-s)}$	Diode I_F @T_s= 25°C	V_F @T_j= 25°C typ.	E_{rr}	$R_{th(j-s)}$	Case	Circuit
	A	A	V	mJ	mJ	K/W	A	V	mJ	K/W		
600 V - IGBT 3 (Trench)												
SKiiP 16GH066V1	65	50	1.45	1.7	1.7	0.95	56	1.50	1.3	1.6	II 1	
SKiiP 27GH066V1	88	75	1.45	2.7	3	0.75	77	1.50	1.8	1.2	II 2	
SKiiP 28GH066V1	112	100	1.45	3.4	3.5	0.6	112	1.30	3.3	0.8	II 2	
650 V - IGBT 3 (Trench)												
SKiiP 26MLI07E3V1 [1]	-	75	1.45	-	-	-	-	1.5	-	-	II 2	
SKiiP 27MLI07E3V1 [1]	-	100	1.45	-	-	-	-	1.4	-	-	II 2	
SKiiP 28MLI07E3V1 [1]	-	150	1.33	-	-	-	-	1.4	-	-	II 2	
SKiiP 39MLI07E3V1 [1]	-	200	1.45	-	-	-	-	1.4	-	-	II 3	
1200 V - IGBT 3 (Trench)												
SKiiP 11AC126V1 [2]	16	8	1.7	0.9	1	1.5	14	1.90	0.9	2.5	II 1	
SKiiP 12AC126V1 [2]	28	15	1.7	1.7	1.9	1.15	26	1.60	1.2	1.95	II 1	
SKiiP 13AC126V1 [2]	41	25	1.7	4.1	3.1	0.9	30	1.80	2.2	1.7	II 1	
SKiiP 23AC126V1 [2]	41	25	1.7	3.7	3.1	0.9	30	1.80	2.6	1.7	II 2	
SKiiP 24AC126V1 [2]	52	35	1.7	4.2	4.4	0.75	38	1.80	3.5	1.5	II 2	
SKiiP 25AC126V1 [2]	73	50	1.7	5.8	6.5	0.55	62	1.60	5.1	1	II 2	
SKiiP 26AC126V1 [2]	88	70	1.7	9	7.7	0.5	91	1.50	7.5	0.7	II 2	
SKiiP 37AC126V2 [2]	97	75	1.7	9.6	8.7	0.45	90	1.60	9.6	0.7	II 3	
SKiiP 38AC126V2 [2]	118	105	1.7	13.1	13	0.4	118	1.60	11.2	0.55	II 3	
SKiiP 39AC126V2 [2]	157	140	1.7	19.9	17.2	0.3	167	1.50	16.2	0.4	II 3	
1200 V - IGBT 4 (Trench)												
SKiiP 11AC12T4V1	12	8	1.85	0.87	0.75	1.84	15	2.3	0.53	2.53	II 1	
SKiiP 12AC12T4V1	18	15	1.85	1.65	1.5	1.3	23	2.4	0.79	1.92	II 1	
SKiiP 13AC12T4V1	41	25	1.85	3.7	2.4	1	32	2.4	1.64	1.52	II 1	
SKiiP 23AC12T4V1	41	25	1.85	3.7	2.4	1	32	2.4	1.64	1.52	II 2	
SKiiP 24AC12T4V1	52	35	1.85	3.7	3	0.85	44	2.3	2.3	1.2	II 2	
SKiiP 25AC12T4V1	69	50	1.85	6	4.5	0.71	60	2.2	3.2	0.95	II 2	
SKiiP 26AC12T4V1	90	70	1.85	9.5	7.1	0.55	83	2.2	5.6	0.75	II 2	
SKiiP 37AC12T4V1	90	75	1.85	11.5	6.8	0.58	83	2.2	5.5	0.75	II 3	
SKiiP 38AC12T4V1	115	100	1.8	13.7	9.7	0.48	100	2.2	6.5	0.66	II 3	
SKiiP 39AC12T4V1	167	150	1.85	22.5	14	0.33	136	2.1	11.4	0.52	II 3	

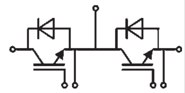
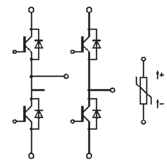
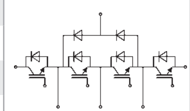
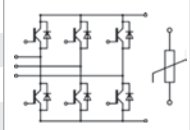
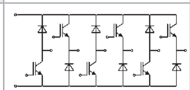
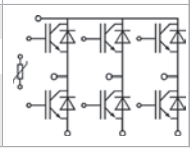
For detailed case drawings please see page 38

Footnotes

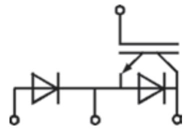
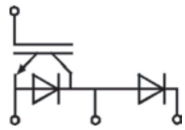
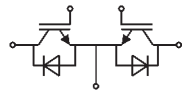
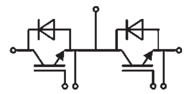
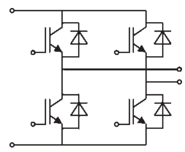
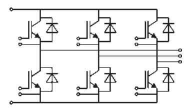
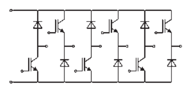
1) New

2) Not for New Design

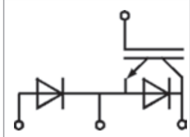
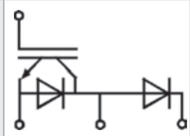
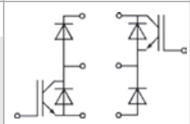
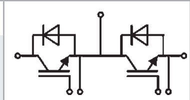
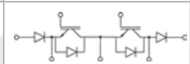
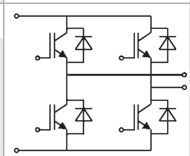
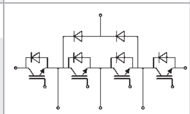
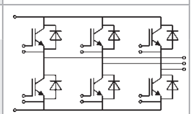
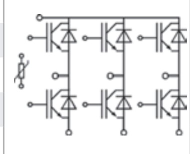
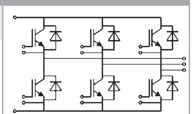
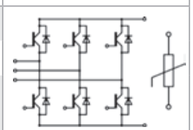
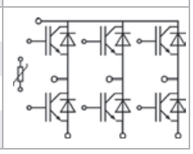
Modules - IGBT - SEMITOP

Type	IGBT						Diode				Case	Circuit
	I_C @T_s= 25°C	I_{Cnom}	$V_{CE(sat)}$ @T_j= 25°C typ.	E_{on}	E_{off}	$R_{th(j-s)}$	I_F @T_s= 25°C	V_F @T_j= 25°C typ.	E_{rr}	$R_{th(j-s)}$		
	A	A	V	mJ	mJ	K/W	A	V	mJ	K/W		
600 V - IGBT 3 (Trench)												
SK 75 GB 066 T	77	75	1.45	3.1	2.8	0.94	62	1.35	0.85	1.55	3	
SK 100 GB 066 T	96	100	1.45	7	6	0.78	108	1.35	1.7	0.91	3	
SK 150 GB 066 T	124	150	1.45	6.25	5.7	0.55	135	1.35	1.7	0.73	3	
SK 30 GBB 066 T	40	30	1.45	0.97	1.77	1.65	36	1.45	0.26	2.1	3	
SK 50 GBB 066 T	60	50	1.45	2.2	1.73	1.11	56	1.50	0.72	1.7	3	
SK 75 GBB 066 T	77	75	1.45	3.1	2.8	0.94	77	1.35	0.85	1.55	3	
SK 20 MLI 066	30	20	1.45	0.4	1.07	1.95	30	1.60	0.2	2.46	3	
SK 30 MLI 066	40	30	1.45	0.97	1.77	1.65	37	1.50	0.26	2.3	3	
SK 50 MLI 066	60	50	1.45	1.46	2.02	1.11	56	1.50	1.07	1.7	3	
SK 75 MLI 066 T	83	75	1.45	1.7	2.8	0.75	92	1.50	1.1	1.2	4	
SK 100 MLI 066 T	105	100	1.45	2.5	4.2	0.65	110	1.35	1.9	0.9	4	
SK 150 MLI 066 T	151	150	1.45	2.7	5.9	0.55	115	1.50	2.6	0.72	4	
SK 75 GD 066 T	83	75	1.45	3.1	2.8	0.75	92	1.35	0.85	1.2	4	
SK 100 GD 066 T	105	100	1.45	7	6	0.65	99	1.30	1.7	0.8	4	
SK 150 GD 066 T	151	150	1.45	6.25	5.7	0.55	198	1.30	1.7	0.54	4	
SK 200 GD 066 T	174	200	1.45	13.9	12	0.45	99	1.30	3.4	0.8	4	
SK 30 GAD 066 T [1]	38	30	1.45	1.24	1.48	1.8	65	1.30	0.44	1.2	3	
SK 20 GD 066 ET	30	20	1.45	0.34	0.63	1.95	31	1.45	0.2	2.46	3	
SK 30 GD 066 ET	40	30	1.45	0.97	1.77	1.65	36	1.45	0.26	2.1	3	
SK 50 GD 066 ET	60	50	1.45	2.2	1.73	1.11	56	1.50	0.72	1.7	3	

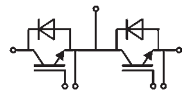
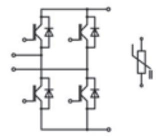
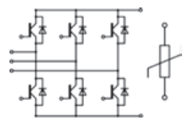
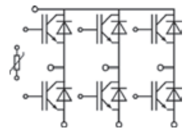
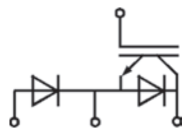
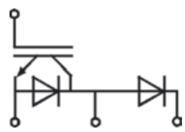
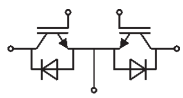
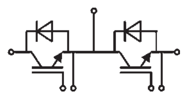
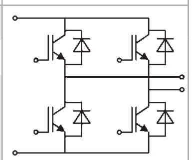
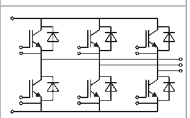
Modules - IGBT - SEMITOP

Type	IGBT						Diode				Case	Circuit
	I_C @T_s= 25°C	I_{Cnom}	$V_{CE(sat)}$ @T_j= 25°C typ.	E_{on}	E_{off}	$R_{th(j-s)}$	I_F @T_s= 25°C	V_F @T_j= 25°C typ.	E_{rr}	$R_{th(j-s)}$		
	A	A	V	mJ	mJ	K/W	A	V	mJ	K/W		
600 V - NPT IGBT (Standard)												
SK 25 GAR 063 [1]	30	30	-	1.25	0.9	1.4	38	1.45	-	1.7	1	
SK 45 GAR 063 [1]	45	50	2.1	1.4	1.2	1	57	1.45	0.25	1.2	2	
SK 70 GAR 063 [1]	81	100	2.1	4	3	0.6	22	1.45	0.1	2.3	2	
SK 25 GAL 063 [1]	30	30	-	1.25	0.9	1.4	38	1.45	-	1.7	1	
SK 45 GAL 063 [1]	45	50	2.1	1.4	1.2	1	57	1.45	0.25	1.2	2	
SK 70 GAL 063 [1]	81	100	2.1	4	3	0.6	22	1.45	0.1	2.3	2	
SK 80 GM 063 [1]	81	100	2	3	2.3	0.6	105	1.30	0.2	1.2	2	
SK 45 GB 063 [1]	45	50	2.1	1.4	1.2	1	57	1.45	0.25	1.2	2	
SK 80 GB 063 [1]	81	100	2.1	4	3	0.6	79	1.40	1.2	0.9	3	
SK 15 GH 063 [1]	20	15	2	0.71	0.4	1.9	20	1.45	0.45	1.2	2	
SK 25 GH 063 [1]	30	30	2.1	1.1	0.8	1.4	36	1.45	0.25	1.7	2	
SK 45 GH 063 [1]	45	50	2.1	1.4	1.2	1	57	1.30	0.9	1.2	3	
SK 13 GD 063 [1]	18	10	2.1	0.6	0.4	2	22	1.45	0.1	2.3	3	
SK 25 GD 063 [1]	30	30	2.1	1.3	0.9	1.4	36	1.45	0.25	1.7	3	
SK 45 GD 063 [1]	45	50	2.1	1.4	1.2	1	36	1.45	0.25	1.7	3	
SK 25 GAD 063 T [1]	30	30	2.1	1.3	0.9	1.4	36	1.45	0.25	1.7	3	

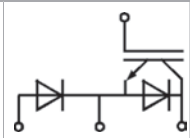
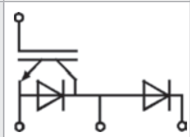
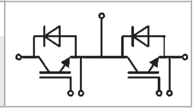
Modules - IGBT - SEMITOP

Type	IGBT						Diode				Case	Circuit
	I_C @T_s= 25°C	I_{Cnom}	$V_{CE(sat)}$ @T_j= 25°C typ.	E_{on}	E_{off}	$R_{th(j-s)}$	I_F @T_s= 25°C	V_F @T_j= 25°C typ.	E_{rr}	$R_{th(j-s)}$		
	A	A	V	mJ	mJ	K/W	A	V	mJ	K/W		
600 V - NPT IGBT (Ultrafast)												
SK 50 GAR 065	54	60	2	1.1	0.7	0.85	57	1.30	0.2	1.2	2	
SK 50 GAL 065	54	60	2	1.1	0.7	0.85	57	1.30	0.2	1.2	2	
SK 55 GARL 065 E	54	60	1.7	1.1	0.76	0.85	36	1.45	0.9	1.7	3	
SK 75 GARL 065 E	80	90	1.7	2.71	2.75	0.6	57	1.30	0.2	1.2	3	
SK 25 GB 065 [1]	30	30	1.8	0.75	0.6	1.4	36	1.45	0.25	1.7	1	
SK 50 GB 065	54	60	2	1.1	0.7	0.85	64	1.45	0.55	1.1	2	
SK 50 GARL 065 F	54	60	1.7	1.03	0.8	0.85	82	1.70	-	2.3	2	
SK 50 GARL 065 USA	54	60	1.7	1.07	0.76	0.85	64	1.40	-	2.3	2	
SK 20 GH 065 [1]	24	20	2	0.6	0.4	1.7	25	1.60	-	1.7	2	
SK 50 GH 065 F	54	60	2	1.07	1.76	0.85	82	1.10	0.42	1.1	3	
SK 25 MLI 065 [1]	30	30	1.8	0.75	0.6	1.4	36	1.45	0.32	1.7	3	
SK 50 MLI 065 [1]	54	60	1.8	1.07	0.76	0.85	36	1.45	-	1.1	3	
SK 9 GD 065 [1]	11	6	2	0.22	0.12	2.6	22	1.40	0.31	2.3	2	
SK 20 GD 065 [1]	24	20	2	0.7	0.4	1.7	22	1.60	0.4	2.3	2	
SK 10 GD 065 ET [1]	17	10	2	0.18	0.13	2	22	1.30	0.18	2.3	3	
SK 15 GD 065 ET [1]	20	15	2	0.3	0.22	1.9	22	1.40	0.24	2.3	3	
SK 20 GD 065 ET [1]	26	15	2	0.6	0.44	1.7	27	1.60	-	1.9	3	
SK 25 GD 065 ET [1]	30	30	2	0.8	0.55	1.4	36	1.45	-	1.7	3	
SK 35 GD 065 ET	45	50	2	1.3	0.6	1	36	1.90	0.9	1.7	3	
1200 V - IGBT 3 (Trench)												
SK 8 GD 126 [1]	15	8	1.7	0.78	0.96	2	13	1.90	20.6	2.8	2	
SK 15 GD 126 [1]	22	15	1.7	2	1.56	1.6	25	1.60	1.4	2.1	2	
SK 50 GD 126 T	68	50	1.7	4.6	6.3	0.6	62	1.35	3.6	1	4	
SK 75 GD 126 T	88	75	1.7	11.3	10	0.5	91	1.46	6	0.7	4	
SK 100 GD 126 T	114	100	1.7	9.8	11.7	0.4	118	1.50	7.3	0.55	4	
SK 10 GD 126 ET	15	8	1.7	1	1	2	25	1.90	1.4	2.1	3	
SK 15 GD 126 ET	22	15	1.7	2	1.8	1.6	25	1.60	1.4	2.1	3	
SK 25 GD 126 ET	32	25	1.7	3.3	3.1	1.2	28	1.80	2.1	1.9	3	
SK 35 GD 126 ET	40	35	1.7	4.6	4.3	1.05	34	1.80	2.9	1.7	3	

Modules - IGBT - SEMITOP

Type	IGBT						Diode				Case	Circuit
	I_C @T_s= 25°C	I_{Cnom}	$V_{CE(sat)}$ @T_j= 25°C typ.	E_{on}	E_{off}	$R_{th(j-s)}$	I_F @T_s= 25°C	V_F @T_j= 25°C typ.	E_{rr}	$R_{th(j-s)}$		
	A	A	V	mJ	mJ	K/W	A	V	mJ	K/W		
1200 V - IGBT 4 (Trench)												
SK 25 GB 12T4	37	25	1.85	2.27	2.7	1.31	30	2.40	1.28	1.91	2	
SK 35 GB 12T4	44	35	1.85	3.27	3.3	1.21	40	2.30	1.46	1.55	2	
SK 50 GB 12T4 T	71	50	1.85	8.3	5	0.9	50	2.20	2.15	1.24	3	
SK 75 GB 12T4 T	80	75	1.85	13.6	8.2	0.74	70	2.10	3.39	0.97	3	
SK 100 GB 12T4 T	100	100	1.85	16.6	10	0.6	85	2.25	5.2	0.87	3	
SK 50 GH 12T4 T	75	50	1.8	8.3	5	0.65	56	2.20	2.15	1.05	4	
SK 100 GH 12T4 T	126	100	1.8	16.6	10	0.43	102	2.20	5.2	0.62	4	
SK 50 GD 12T4 T	75	50	1.85	8.3	5	0.65	60	2.20	2.15	0.97	4	
SK 75 GD 12T4 T	102	75	1.85	13.6	8.2	0.51	83	2.20	3.38	0.75	4	
SK 100 GD 12T4 T	126	100	1.85	16.6	10	0.43	102	2.25	5.2	0.62	4	
SK 10 GD 12T4 ET	17	8	1.85	0.41	0.76	2.2	15	2.38	0.41	2.7	3	
SK 15 GD 12T4 ET	27	15	1.85	0.83	1.52	1.65	21	2.38	0.82	2.34	3	
SK 25 GD 12T4 ET	37	25	1.85	2.27	2.7	1.31	30	2.40	1.28	1.91	3	
SK 35 GD 12T4 ET	44	35	1.85	3.27	3.3	1.21	40	2.30	1.46	1.55	3	
1200 V - NPT IGBT (Standard)												
SK 30 GAR 123 [1]	33	25	2.5	3.5	2.6	1	37	2.00	1	1.2	2	
SK 60 GAR 123 [1]	58	50	2.5	9.9	5.3	0.6	33	2.00	0.4	2.1	2	
SK 30 GAL 123 [1]	33	25	2.5	3.5	2.6	1	37	2.00	1	1.2	2	
SK 60 GAL 123 [1]	58	50	2.5	9.9	5.3	0.6	33	2.00	0.4	2.1	2	
SK 60 GM 123 USA [1]	60	50	2.5	7	5.2	0.6	60	2.00	2.4	0.7	2	
SK 20 GB 123 [1]	23	15	2.5	2	1.8	1.4	24	2.00	0.6	1.7	2	
SK 30 GB 123 [1]	33	25	2.5	3.5	2.6	1	37	2.00	1	1	2	
SK 40 GB 123 [1]	40	30	2.5	3.2	3.6	0.85	48	2.00	1	2	2	
SK 60 GB 123 [1]	58	50	2.5	7.6	5.1	0.6	57	2.00	2	0.9	3	
SK 10 GH 123 [1]	16	10	2.7	1.3	1	1.8	18	2.00	0.4	2.1	2	
SK 20 GH 123 [1]	23	15	2.5	2	1.8	1.4	24	2.00	0.6	1.7	2	
SK 30 GH 123 [1]	33	25	2.5	3.5	2.5	1	37	2.00	1	1.2	3	
SK 20 GD 123 [1]	23	15	2.5	2	1.8	1.4	24	2.00	0.6	1.7	3	
SK 30 GD 123 [1]	33	25	2.5	3.5	2.5	1	24	2.00	0.6	1.7	3	

Modules - IGBT - SEMITOP

Type	IGBT						Diode				Case	Circuit
	I_C @T_S= 25°C	I_{Cnom}	$V_{CE(sat)}$ @T_j= 25°C typ.	E_{on}	E_{off}	$R_{th(j-s)}$	I_F @T_S= 25°C	V_F @T_j= 25°C typ.	E_{rr}	$R_{th(j-s)}$		
	A	A	V	mJ	mJ	K/W	A	V	mJ	K/W		
1200 V - NPT IGBT (Ultrafast)												
SK 60 GAR 125	51	50	3.2	8.36	3.32	0.6	43	2.00	2	1.16	2	
SK 60 GAL 125	51	50	3.2	8.36	3.32	0.6	43	2.00	2	1.16	2	
SK 60 GB 125	51	50	3.2	8.36	3.32	0.6	57	-	2	0.9	3	
SK 80 GB 125 T	85	75	3.2	9.9	5	0.32	90	2.00	1	0.65	3	

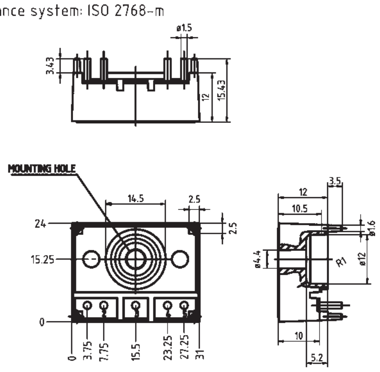
Footnotes

1) Not for New Design

Cases

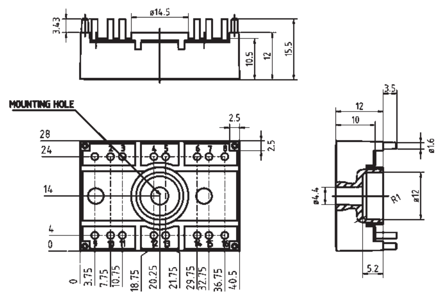
SEMITOP 1

dimensions in mm
tolerance system: ISO 2768-m



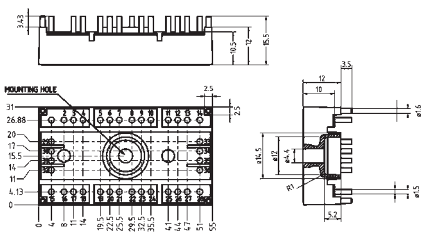
SEMITOP 2

dimensions in mm
tolerance system: ISO 2768-m



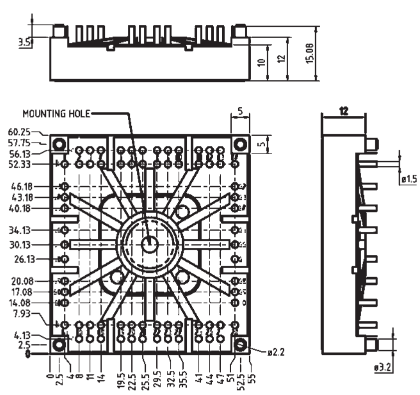
SEMITOP 3

dimensions in mm
tolerance system: ISO 2768-m



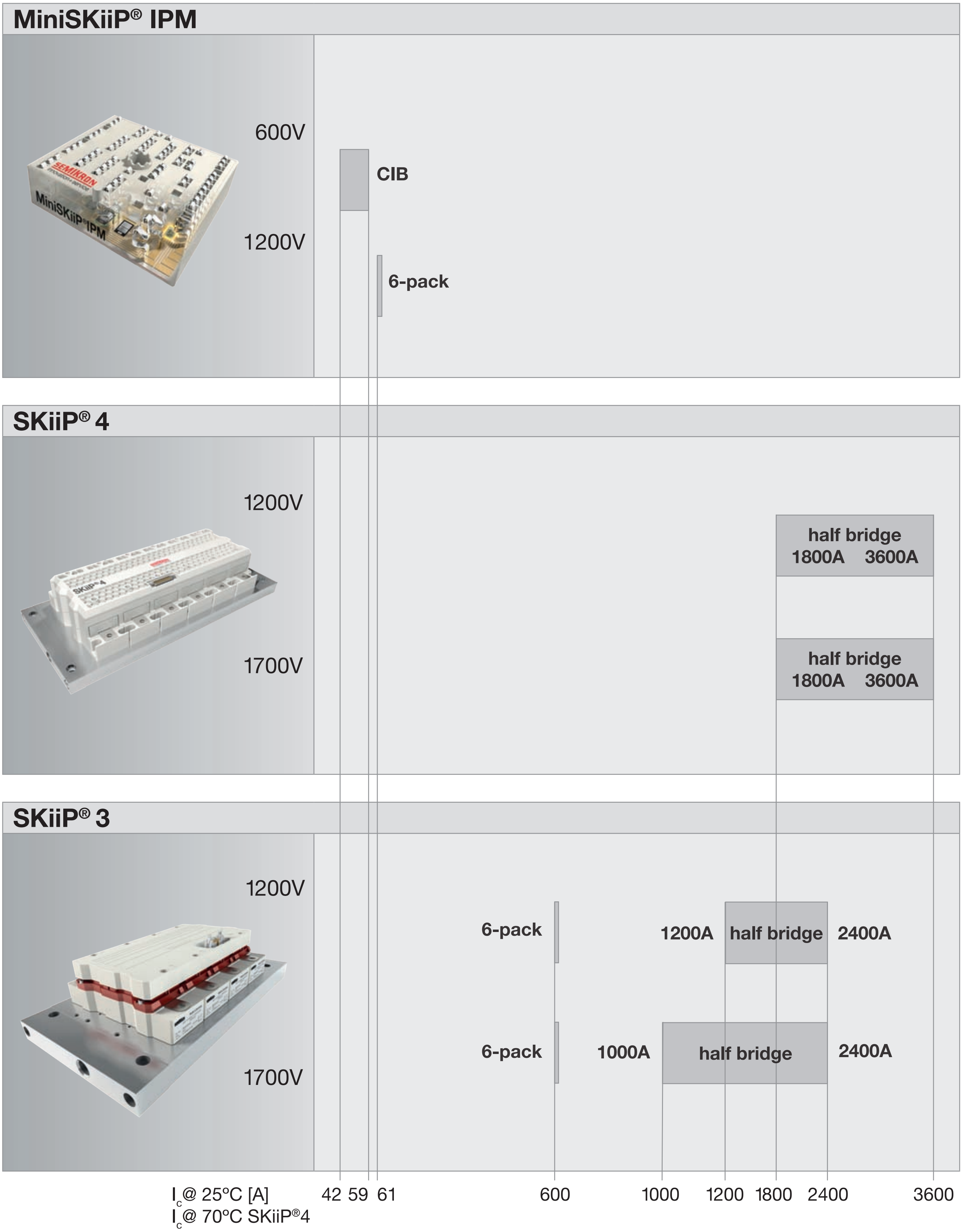
SEMITOP 4

dimensions in mm
tolerance system: ISO 2768-m

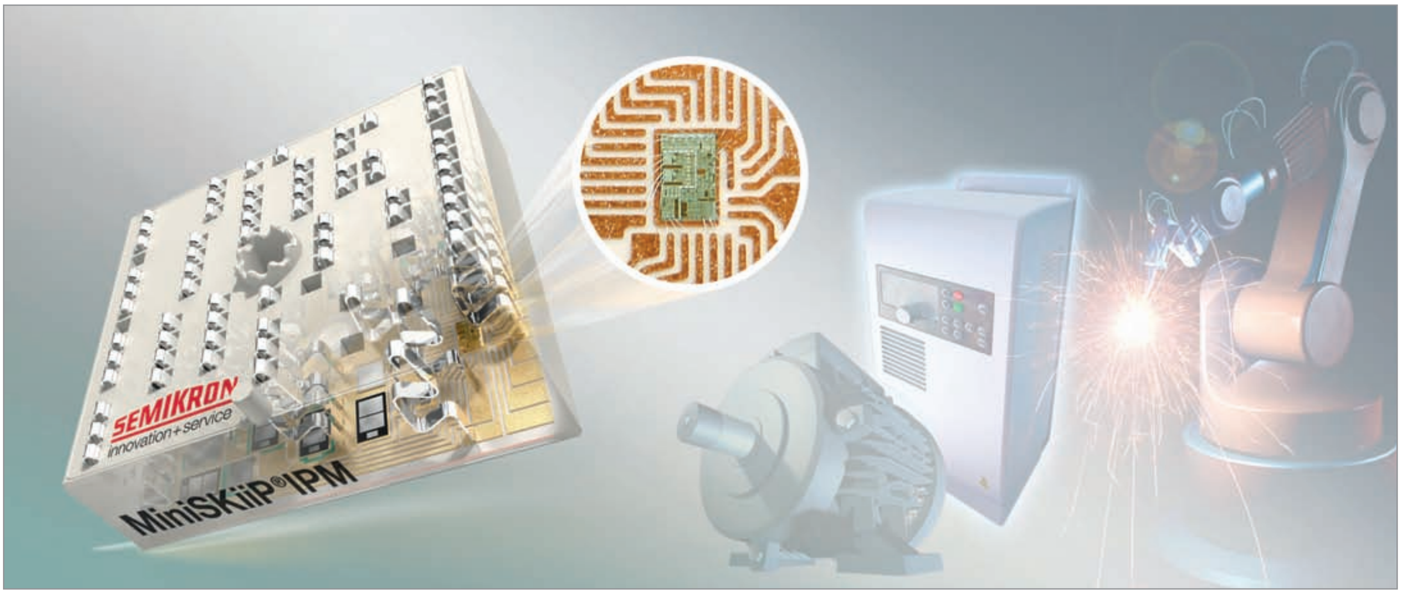


Dimensions in mm

IPM Intelligent Power Modules



Compact 3-phase inverter design through high power density



Applications

MiniSKiiP IPM is SEMIKRON's new intelligent power module family for medium power applications. Each IPM incorporates a latch-up free HVIC SOI gate driver with advanced level shifter concept. The gate driver has a 3.3 V / 5 V / 15 V compatible input signal interface and provides short-circuit current detection using external shunt resistor, integrated under-voltage lockout for all channels and interlock logic with dead time setting for cross conduction protection. A built-in temperature sensor with NTC characteristic enables monitoring of the intelligent power module temperature continuously by the external µC.

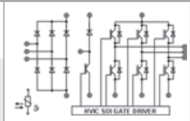
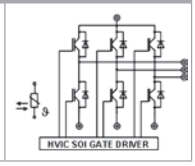
Product range

MiniSKiiP IPM is suitable for industrial and consumer drives up to 15 kW as well as process control and solar applications. Using state-of the-art Trench-Field-Stop IGBTs, the IPMs are available in 600 V as CIB and 1200 V as 6-pack. The modules are RoHS-compliant.

Benefits

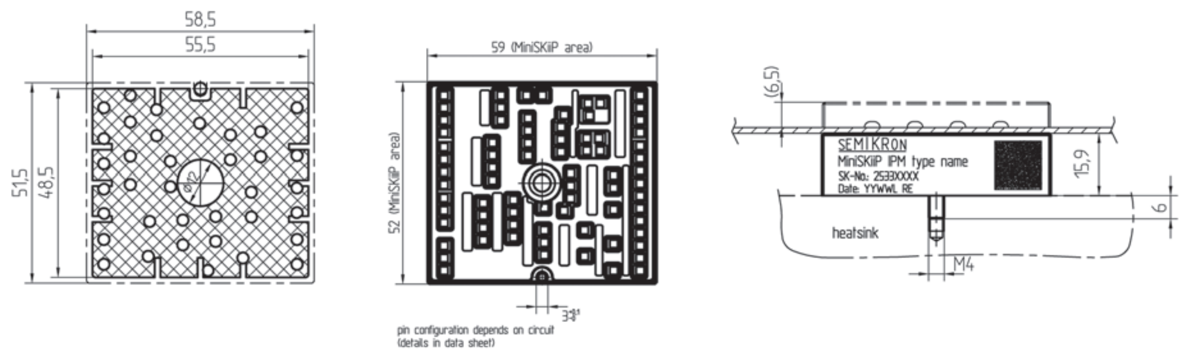
The IPM combines a base plate free package with the established pressure contact technology for quick and easy solder-free assembly. All power, control and auxiliary contacts are connected directly to the printed circuit board via springs resulting in more reliable electrical connections under stronger vibration and shock conditions. The simple one-step mounting of module, printed circuit board and heat sink with one standard screw reduces assembly steps and costs.

Modules - IPM - MiniSKiiP

Type	IGBT						Diode				Rectifier		Case	Circuit
	I_C @T_s= 25°C	I_{Cnom}	$V_{CE(sat)}$ @T_j= 25°C typ.	E_{on}	E_{off}	$R_{th(j-s)}$	I_F @T_s= 25°C	V_F @T_j= 25°C typ.	E_{rr}	$R_{th(j-s)}$	I_{FSM} @T_s= 25°C	$R_{th(j-s)}$		
	A	A	V	mJ	mJ	K/W	A	V	mJ	K/W	A	K/W		
600 V - IGBT 3 (Trench)														
SKiiP 25NABI066V3 [1)]	41	30	1.5	1.3	1	1.4	37	1.6	0.6	1.8	370	1.7	IPM 2	
SKiiP 26NABI066V3 [1)]	59	50	1.45	3	2	1.1	51	1.5	1	1.6	370	1.7	IPM 2	
1200 V - IGBT 4 (Trench)														
SKiiP 25ACI12T4V2 [1)]	62	50	1.85	7.2	5.6	0.84	59	2.25	3	0.99	-	-	IPM 2	

Cases

MiniSKiiP IPM 2



Dimensions in mm

Footnotes

1) New

SKiiP® 4th generation

Sintered chips – for high operating temperatures

Applications

The success story of the SKiiP family has progressed hand in hand with the advancement of the wind power market. The 4th-generation SKiiP modules are a further improvement of the powerful SKiiP series. The mainstay of SKiiP4 modules is the wind power sector, with approximately 57 GW of the 122 GW of wind power installed worldwide (at the end of 2009) featuring SEMIKRON solutions, in many cases SKiiP technology. Besides wind power applications, SKiiP modules can also be found in elevators, solar power and railway applications - in fact in any area where powerful, safe and reliable IGBT IPMs are a must.

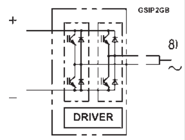
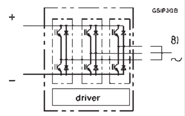
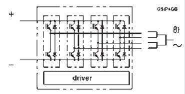
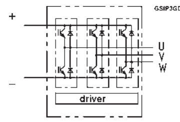
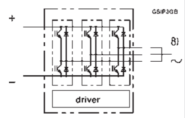
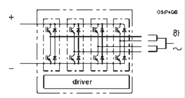
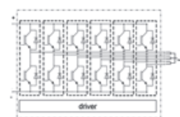
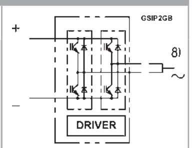
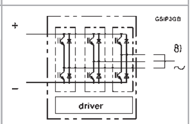
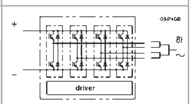
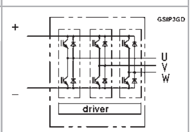
Product range

SKiiP4 is available for 1200 V and 1700 V. In both of these voltage classes, SKiiP4 modules come in the topologies 3GB 1800 A, 4GB 2400 A and - new to the SKiiP family - 6GB 3600 A.

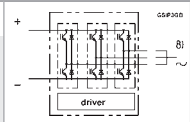
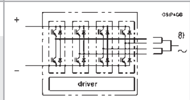
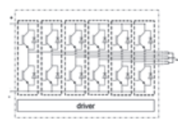
Benefits

SKiiP4 is the most powerful IPM on the market. SKiiP4 modules enable the production of converter units with outputs of up to 2.1 MW. The power semiconductors used in SKiiP4 modules can be operated at a junction temperature of up to 175°C. To make sure these components can be reliably used at these temperatures, the power circuitry is 100% solder-free. Instead, sinter technology is used to create a sintered silver layer in place of the solder layer that can limit the service life of power modules. Reliability during active and passive thermal cycling is greatly improved. A further benefit is the better load cycling capability as compared with solder-based modules. The integrated gate driver in the SKiiP4 sets new standards on the reliability and functionality fronts. The digital driver guarantees safe isolation between the primary and secondary side for both switching signals and all measurement parameters, such as temperature and DC link voltage. This means the user no longer has to introduce complex and costly circuit components to provide safe isolation. For the first time, the SKiiP driver features a CANopen diagnosis channel for the integration of additional functions.

Modules - IPM - SKiiP 3 / 4

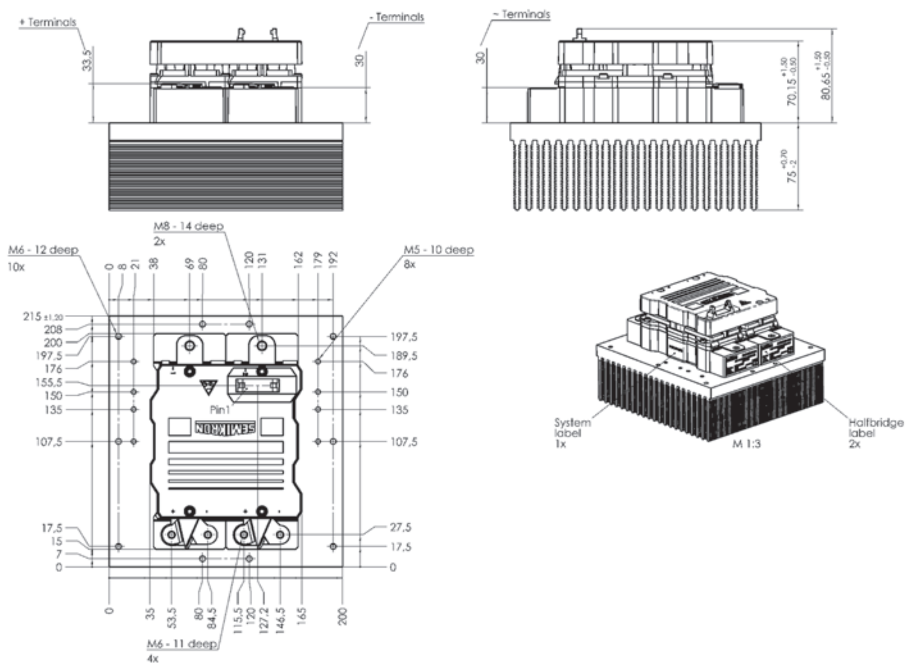
Type	IGBT				Diode			Case		Circuit
	I_C @T_s= 25°C	I_{Cnom}	$V_{CE(sat)}$ @T_j= 25°C typ.	$E_{on} + E_{off}$	I_F @T_s= 25°C	V_F @T_j= 25°C typ.	E_{rr}	Case	Options	
	A	A	V	mJ	A	V	mJ			
1200 V - IGBT 3 (Trench) - SKiiP 3										
SKiiP 1213 GB123-2DL V3	1200	1200	1.7	390	930	1.50	56	S23	W,L,F	
SKiiP 1813 GB123-3DL V3	1800	1800	1.7	585	1410	1.50	84	S33	W,L,F,U	
SKiiP 2413 GB123-4DL V3	2400	2400	1.7	780	1860	1.50	112	S43	W,L,F,U	
SKiiP 613 GD123-3DUL V3	600	600	1.7	195	470	1.50	28	S33	L,W	
1200 V - IGBT 4 (Trench) - SKiiP 4										
SKiiP 1814 GB12E4-3DUL	2345	1800	2.01	1260	1776	2.33	150	S34	F,S	
SKiiP 1814 GB12E4-3DUW	2345	1800	2.01	1260	1776	2.33	150	S34	F,S	
SKiiP 2414 GB12E4-4DUL	3109	2400	2.01	1680	2369	2.33	200	S44	F,S	
SKiiP 2414 GB12E4-4DUW	3109	2400	2.01	1680	2369	2.33	200	S44	F,S	
SKiiP 3614 GB12E4-6DUL	4664	3600	2.01	2520	3558	2.33	300	S64	F,S	
SKiiP 3614 GB12E4-6DUW	4664	3600	2.01	2520	3558	2.33	300	S64	F,S	
1700 V - IGBT 3 (Trench) - SKiiP 3										
SKiiP 1013 GB172-2DL V3	1000	1000	1.9	575	830	2.00	86	S23	W,L,F	
SKiiP 1203 GB172-2DW V3	1200	1200	1.9	575	900	2.00	86	S23	W,L,F	
SKiiP 1513 GB172-3DL V3	1500	1500	1.9	863	1250	2.00	128	S33	W,L,F,U	
SKiiP 1803 GB172-3DW V3	1800	1800	1.9	863	1400	2.00	128	S33	W,L,F	
SKiiP 2013 GB172-4DL V3	2000	2000	1.9	1150	1650	2.00	171	S43	W,L,F,U	
SKiiP 2403 GB172-4DW V3	2400	2400	1.9	1150	1800	2.00	171	S43	W,L,F,U	
SKiiP 513 GD172-3DUL V3	500	500	1.9	288	400	1.90	43	S33	W,L	
SKiiP 603 GD172-3DUW V3	570	600	1.9	288	450	1.90	43	S33	W,L	

Modules - IPM - SKiiP 3 / 4

Type	IGBT				Diode			Case		Circuit
	I_C @T_s= 25°C	I_{Cnom}	$V_{CE(sat)}$ @T_j= 25°C typ.	E_{on} + E_{off}	I_F @T_s= 25°C	V_F @T_j= 25°C typ.	E_{rr}	Case	Options	
	A	A	V	mJ	A	V	mJ			
1700 V - IGBT 4 (Trench) - SKiiP 4										
SKiiP 1814 GB17E4-3DUL	2547	1800	2.12	2130	1771	2.02	342	S34	F,S	
SKiiP 1814 GB17E4-3DUW	2547	1800	2.12	2130	1771	2.02	342	S34	F,S	
SKiiP 2414 GB17E4-4DUL	3385	2400	2.12	2840	2362	2.02	456	S44	F,S	
SKiiP 2414 GB17E4-4DUW	3385	2400	2.12	2840	2362	2.02	456	S44	F,S	
SKiiP 3614 GB17E4-6DUL	5078	3600	2.12	6840	3547	2.02	684	S64	F,S	
SKiiP 3614 GB17E4-6DUW	5078	3600	2.12	6840	3547	2.02	684	S64	F,S	

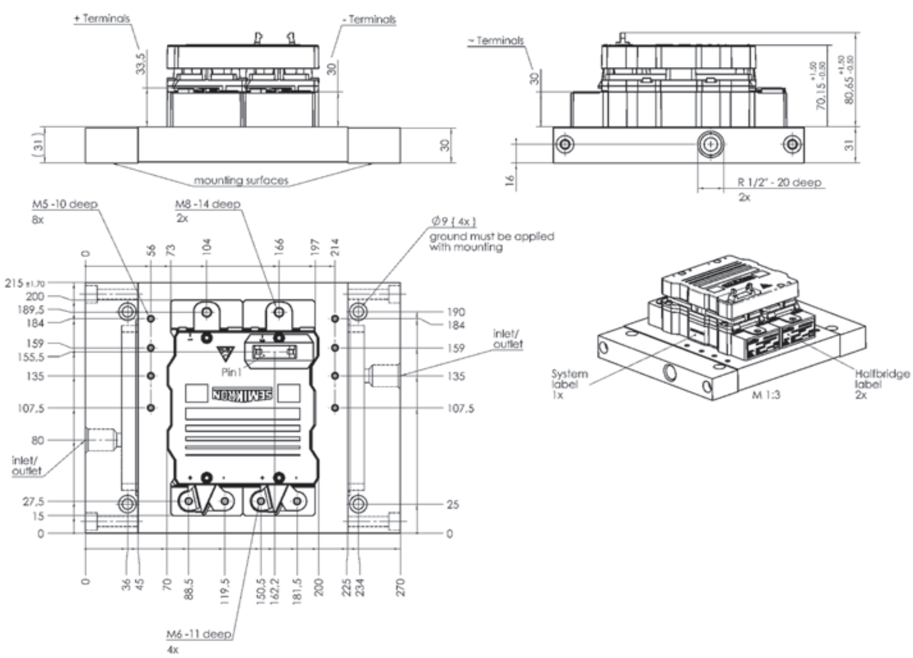
Cases SKiiP 3

Case S 23 mounted on P3016 heat sink



weight without heat sink:	**1,7 kg**
P3016:	**4,4 kg**

Case S 23 mounted on liquid cooled heat sink NWK 40



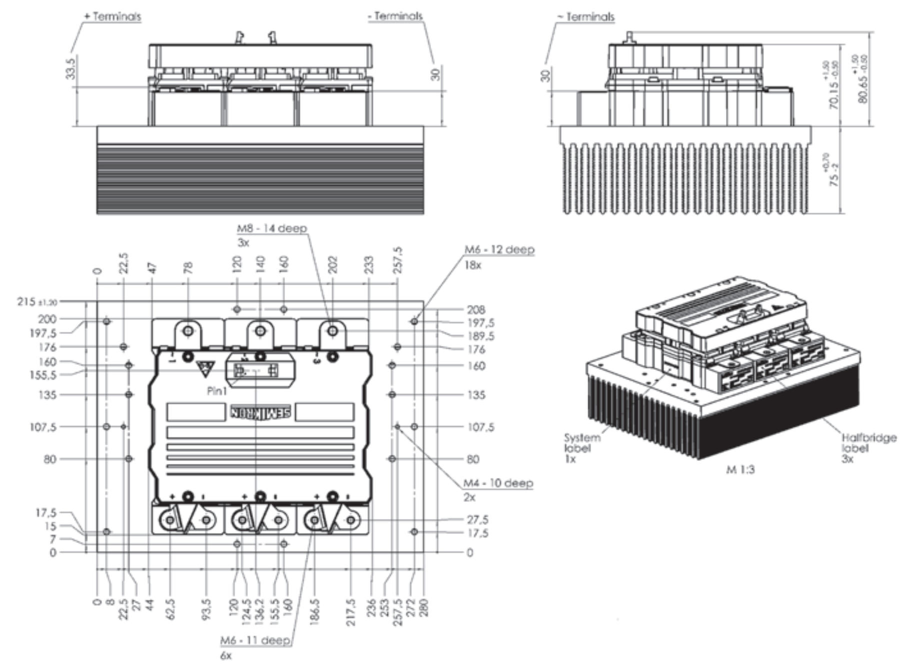
NWK 40:	**2,8 kg**

Dimensions in mm

Modules - IPM - SKiiP 3 / 4

Cases SKiiP 3

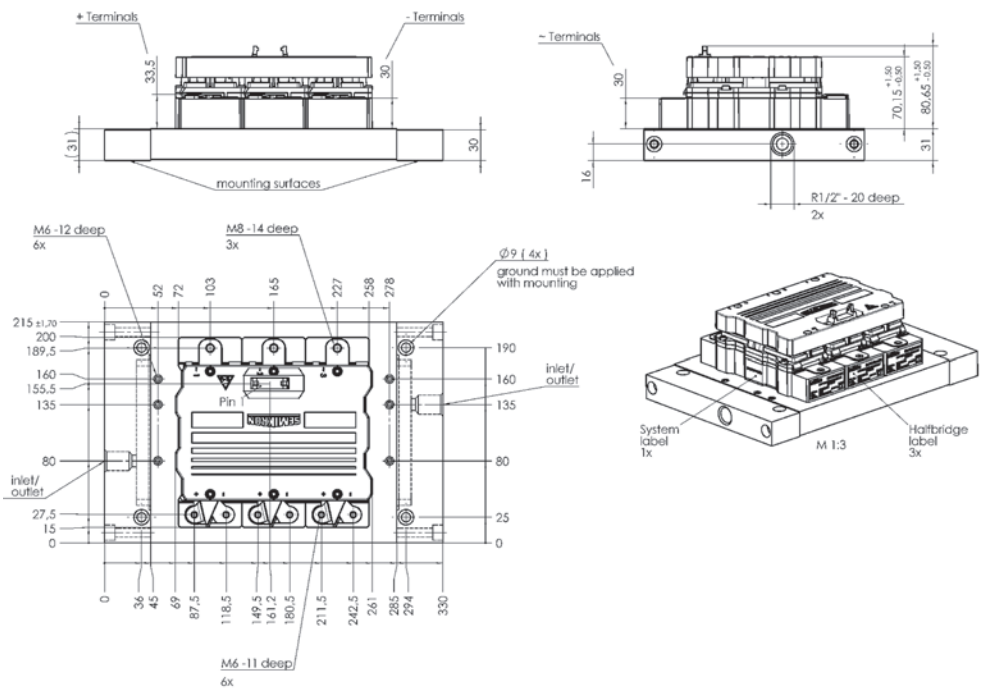
Case S 33 mounted on P3016 heat sink



weight without heat sink: **2,4 kg**

P3016: **6,2 kg**

Case S 33 mounted on liquid cooled heat sink NWK 40



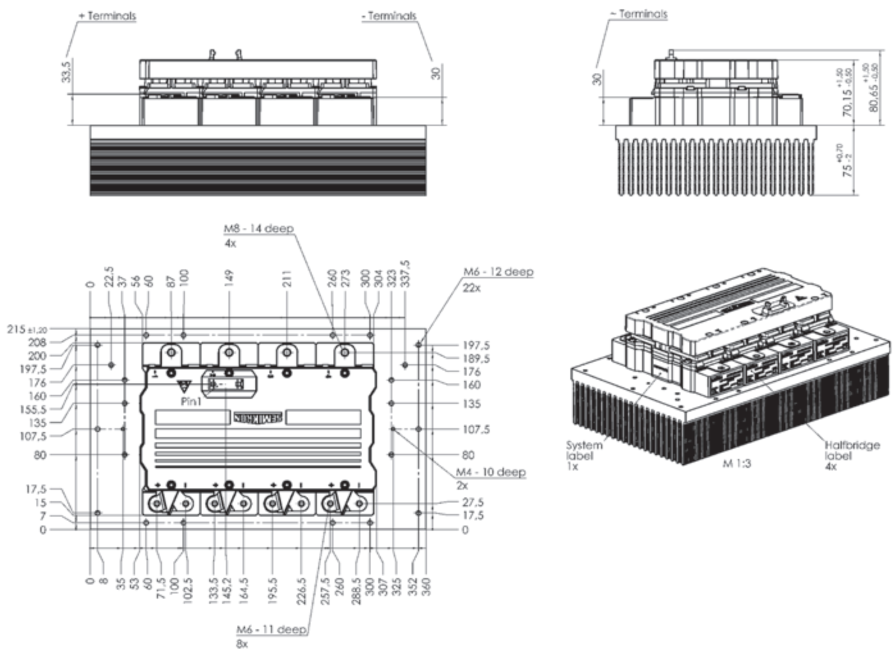
NWK 40: **5,2 kg**

Dimensions in mm

Modules - IPM - SKiiP 3 / 4

Cases SKiiP 3

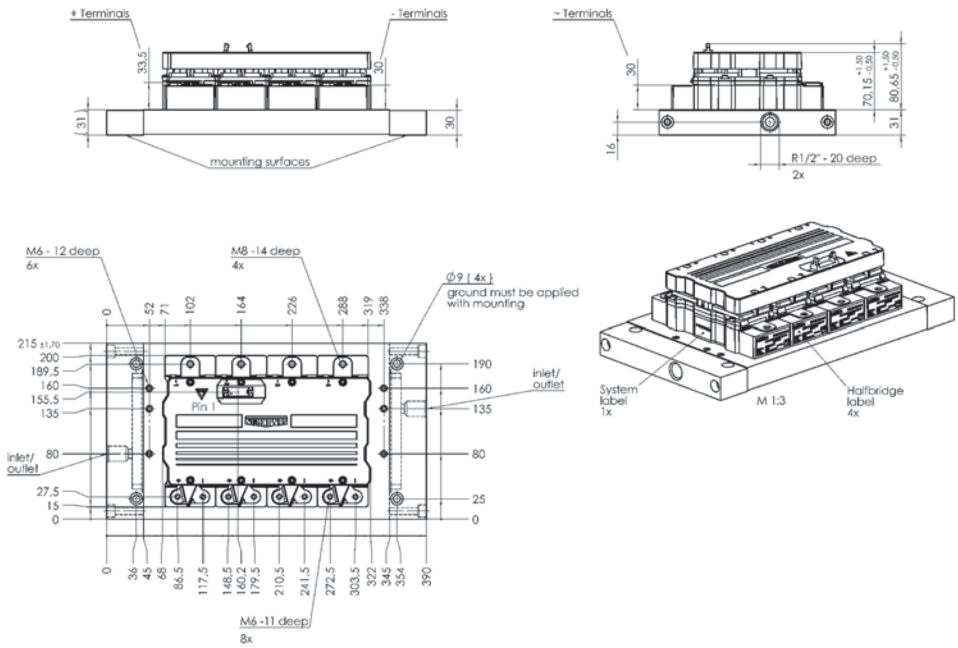
Case S 43 mounted on P3016 heat sink



weight without heat sink: 3,1 kg

P3016: 8,0 kg

Case S 43 mounted on liquid cooled heat sink NWK 40

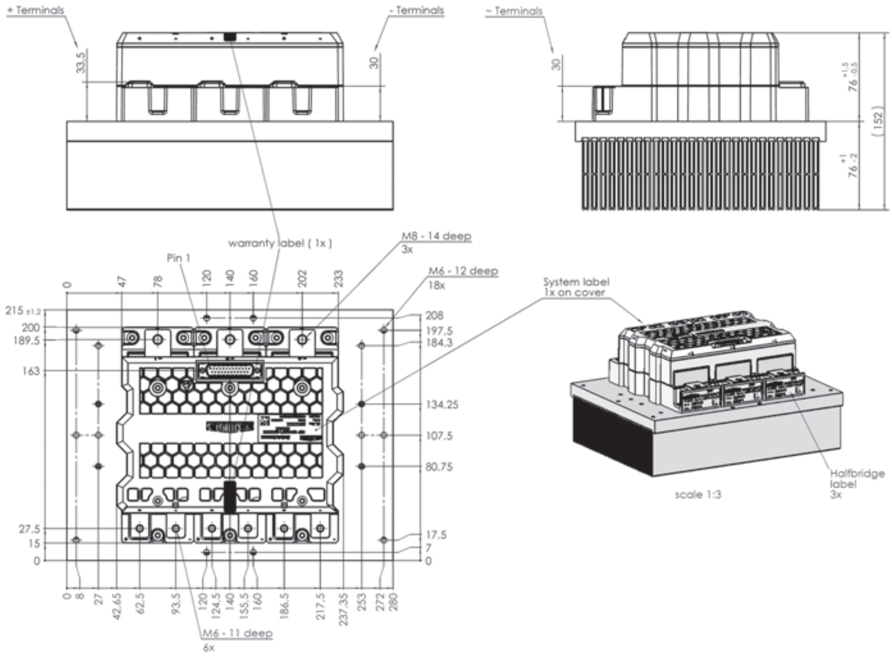


NWK 40: 6,2 kg

Dimensions in mm

Cases SKiiP 4

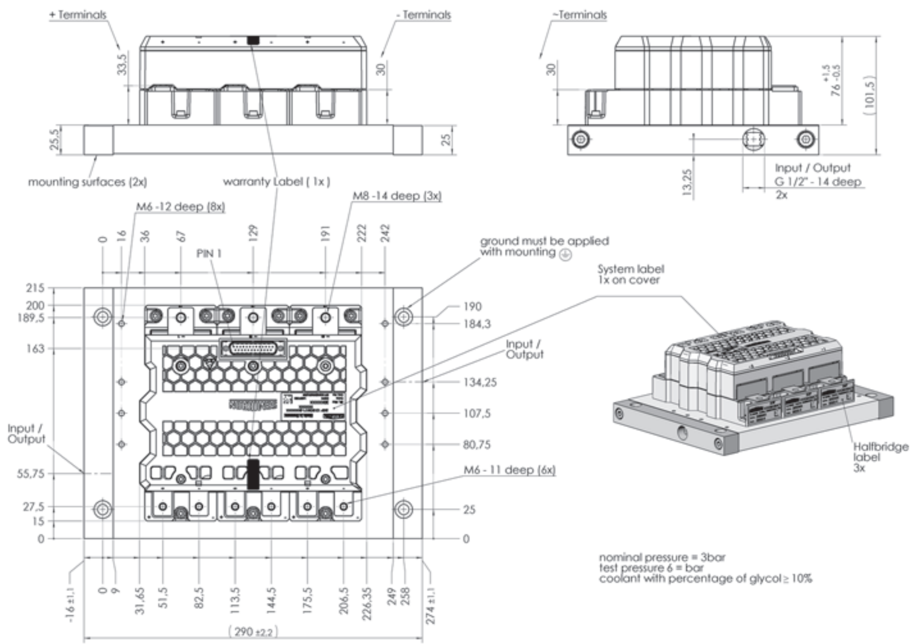
Case S 34 mounted on P4016 heat sink



weight without heat sink: 2,48 kg

P4016: 5,9 kg

Case S 34 mounted on liquid cooled heat sink NHC

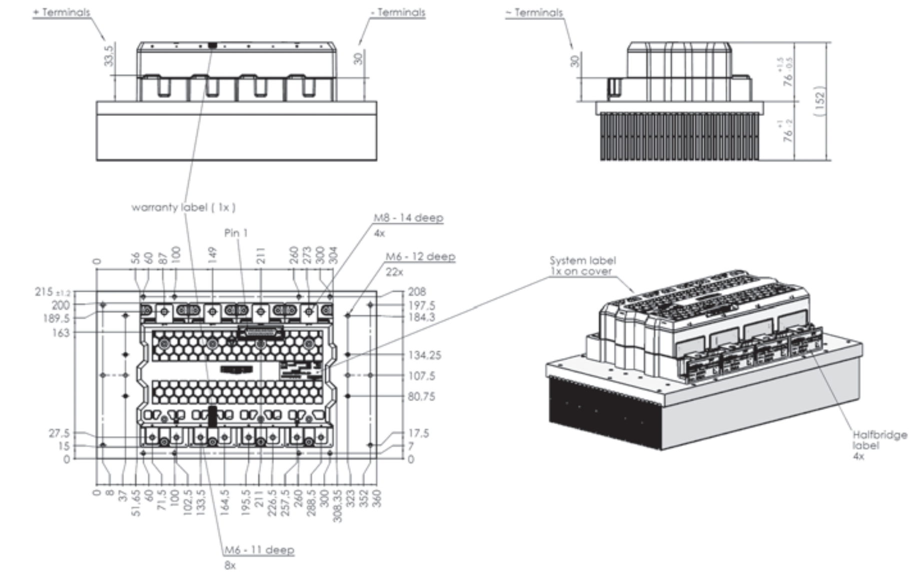


NHC: 3,49 kg

Dimensions in mm

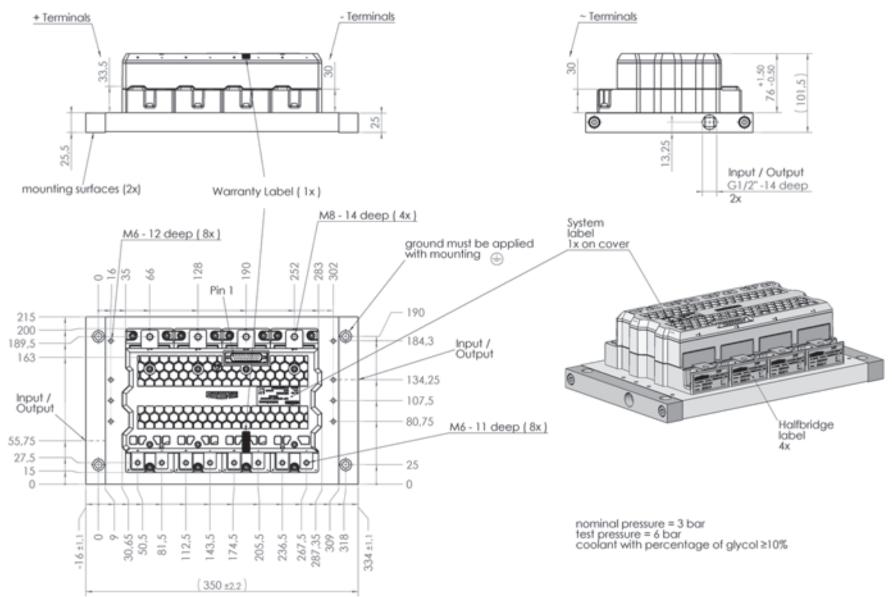
Cases SKiiP 4

Case S 44 mounted on P4016 heat sink



weight without heat sink:	**3,22 kg**
P4016:	**7,55 kg**

Case S 44 mounted on liquid cooled heat sink NHC

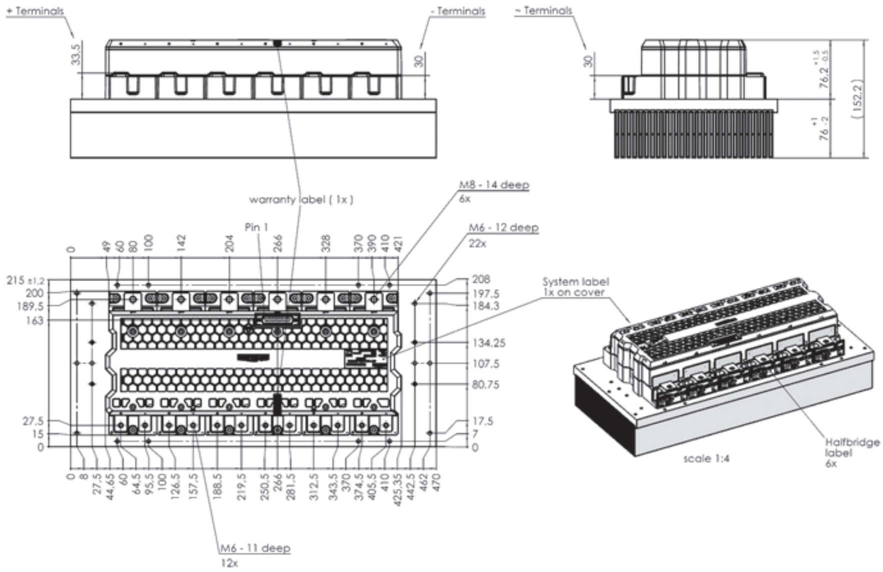


NHC:	**4,25 kg**

Dimensions in mm

Cases SKiiP 4

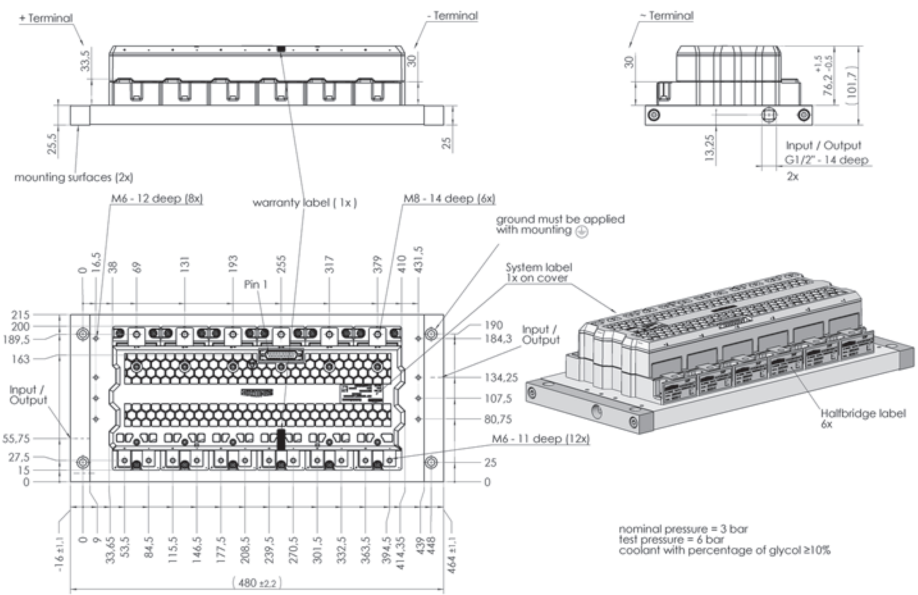
Case S 64 mounted on P4016 heat sink



weight without heat sink: **4,84 kg**

P4016: **9,9 kg**

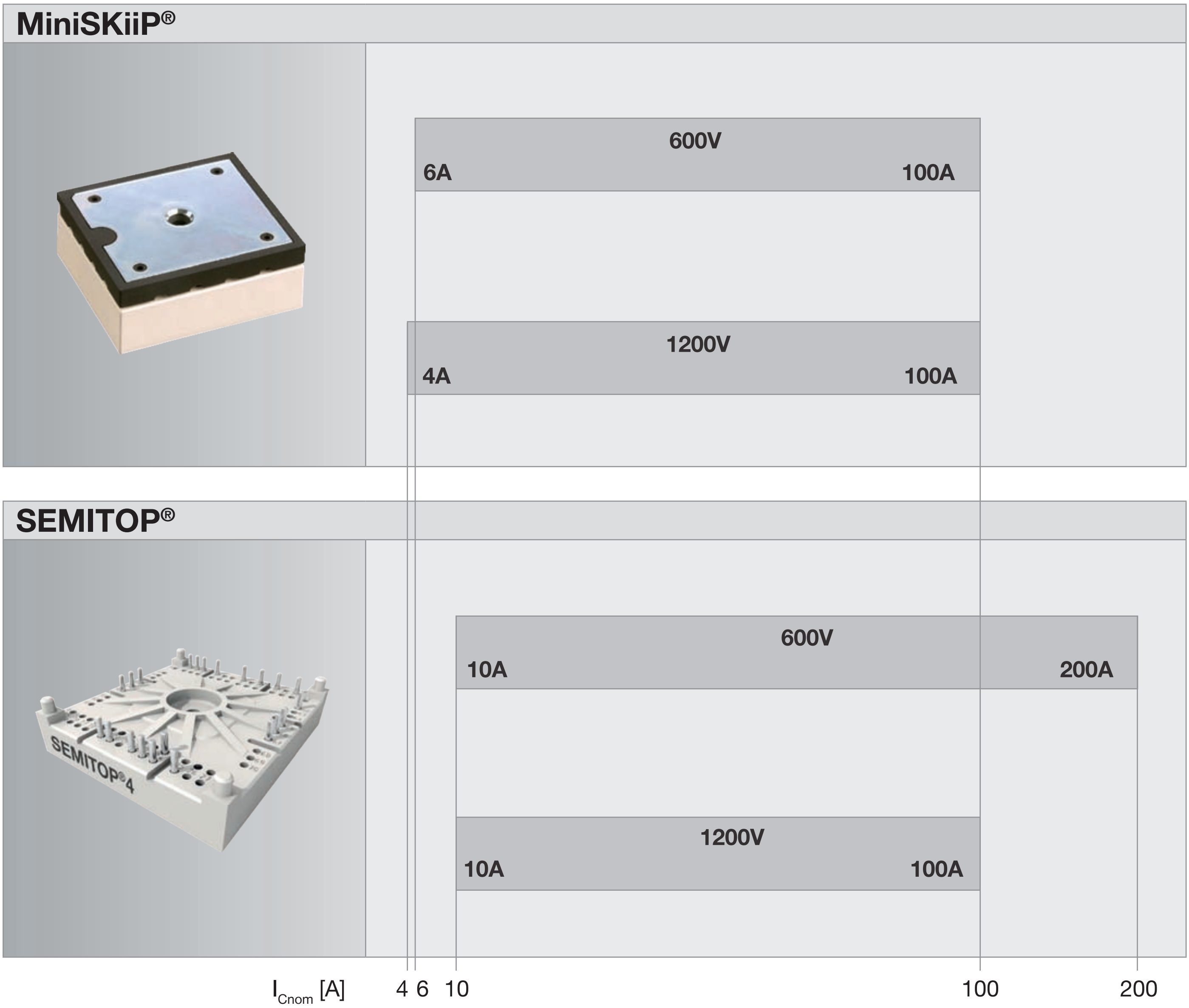
Case S 64 mounted on liquid cooled heat sink NHC



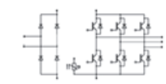
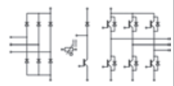
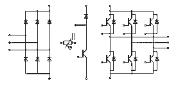
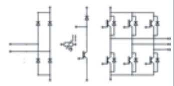
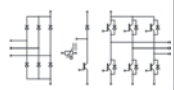
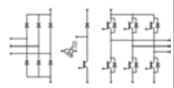
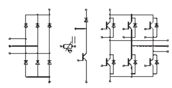
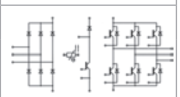
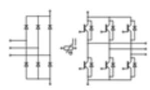
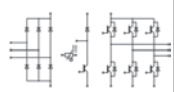
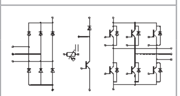
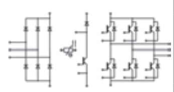
NHC: **5,77 kg**

Dimensions in mm

CIB Converter Inverter Brake Modules



Modules - CIB - MiniSKiiP

Type	IGBT I_C @T_s= 25°C (A)	IGBT I_{Cnom} (A)	IGBT $V_{CE(sat)}$ @T_j= 25°C typ. (V)	IGBT E_{on} (mJ)	IGBT E_{off} (mJ)	IGBT $R_{th(j-s)}$ (K/W)	Diode I_F @T_s= 25°C (A)	Diode V_F @T_j= 25°C typ. (V)	Diode E_{rr} (mJ)	Diode $R_{th(j-s)}$ (K/W)	Rectifier I_{FSM} @T_s= 25°C (A)	Rectifier $R_{th(j-s)}$ (K/W)	Case	Circuit
600 V - IGBT 3 (Trench)														
SKiiP 01NEC066V3	12	6	1.45	0.3	0.2	2.4	12	1.30	0.2	3	220	1.5	II 0	
SKiiP 02NEC066V3	20	10	1.45	0.5	0.3	2	20	1.30	0.5	2.5	220	1.5	II 0	
SKiiP 03NEC066V3	27	15	1.45	0.6	0.5	1.8	28	1.40	0.5	2.5	220	1.5	II 0	
SKiiP 12NAB066V1	20	10	1.45	0.5	0.3	2	20	1.30	0.5	2.5	220	1.5	II 1	
SKiiP 13NAB066V1	27	15	1.45	0.6	0.5	1.8	28	1.40	0.5	2.5	220	1.5	II 1	
SKiiP 14NAB066V1	33	20	1.45	0.75	0.7	1.6	31	1.60	0.55	2.5	220	1.5	II 1	
SKiiP 25NAB066V1	43	30	1.45	0.9	1.2	1.35	39	1.50	1.1	2.1	370	1.5	II 2	
SKiiP 26NAB066V1	65	50	1.45	1.6	1.6	0.95	56	1.50	1.3	1.6	370	1.5	II 2	
SKiiP 25NEB066V1	43	30	1.45	0.9	1.2	1.35	39	1.50	1.1	2.1	370	1.5	II 2	
600 V - NPT IGBT (Ultrafast)														
SKiiP 11NAB065V1 [1]	12	6	2	0.3	0.2	1.9	12	1.30	0.2	2.5	220	1.5	II 1	
SKiiP 12NAB065V1 [1]	20	10	2	0.3	0.3	1.5	20	1.40	0.2	2.5	220	1.5	II 1	
SKiiP 13NAB065V1 [1]	24	15	2	0.6	0.3	1.4	26	1.40	0.4	2.2	220	1.5	II 1	
SKiiP 14NAB065V1 [1]	29	20	2	0.7	0.4	1.25	26	1.60	0.4	2.2	370	1.25	II 1	
1200 V - IGBT 3 (Trench)														
SKiiP 11NAB126V1 [1]	16	8	1.7	0.8	1	1.5	14	1.90	0.9	2.5	220	1.5	II 1	
SKiiP 12NAB126V1 [1]	28	15	1.7	2	1.9	1.15	26	1.60	1.3	1.95	220	1.5	II 1	
SKiiP 23NAB126V1 [1]	41	25	1.7	3.5	3	0.9	30	1.80	2.5	1.7	370	1.25	II 2	
SKiiP 23NAB126V10 [1]	41	25	1.7	3.5	3	0.9	30	1.80	2.5	1.7	635	0.9	II 2	
SKiiP 24NAB126V1 [1]	52	35	1.7	4.6	4	0.75	38	1.80	3.3	1.5	370	1.25	II 2	
SKiiP 24NAB126V10 [1]	52	35	1.7	4.6	4	0.75	38	1.80	3.3	1.5	635	0.9	II 2	
SKiiP 35NAB126V1 [1]	73	50	1.7	6.5	6.1	0.55	62	1.60	4.7	1	700	0.9	II 3	
SKiiP 36NAB126V1 [1]	88	70	1.7	9	7.7	0.5	91	1.50	7.5	0.7	700	0.9	II 3	
1200 V - IGBT 4 (Trench)														
SKiiP 02NAC12T4V1	6	4	1.85	0.66	0.37	2.49	7.5	1.8	0.34	2.53	220	1.5	II 0	
SKiiP 03NAC12T4V1	7.5	8	1.85	0.9	0.7	1.84	9	2.3	0.5	2.53	220	1.5	II 0	
SKiiP 10NAB12T4V1	6	4	1.85	0.66	0.37	2.49	7.5	1.8	0.34	2.53	220	1.5	II 1	
SKiiP 11NAB12T4V1	12	8	1.85	0.87	0.74	1.84	15	2.3	0.57	2.53	220	1.5	II 1	
SKiiP 12NAB12T4V1	18	15	1.85	1.4	1.3	1.3	23	2.40	1.1	1.92	220	1.5	II 1	
SKiiP 23NAB12T4V1	37	25	1.85	2.65	2.3	1.2	32	2.40	1.6	1.52	370	1.25	II 2	
SKiiP 24NAB12T4V1	48	35	1.85	4.3	3.25	1	44	2.3	2.4	1.2	370	1.25	II 2	
SKiiP 34NAB12T4V1	52	35	1.85	4.3	3.3	0.85	44	2.3	2.4	1.2	370	1.25	II 3	
SKiiP 35NAB12T4V1	69	50	1.85	6	4.7	0.71	60	2.25	3.4	0.95	700	0.9	II 3	
SKiiP 37NAB12T4V1	90	75	1.85	9.7	6.8	0.58	83	2.2	4.9	0.75	700	0.9	II 3	
SKiiP 38NAB12T4V1	115	100	1.8	11.2	10	0.48	99	2.2	6.5	0.66	1000	0.7	II 3	

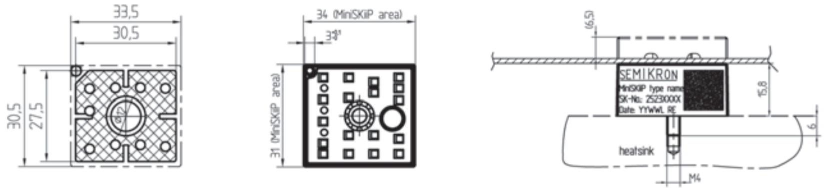
Footnotes

[1] Not for New Design

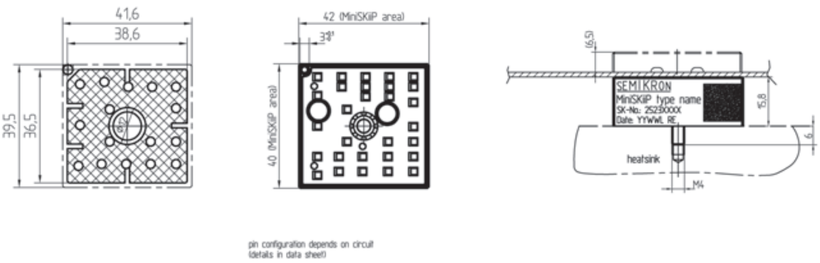
Modules - CIB - MiniSKiiP

Cases

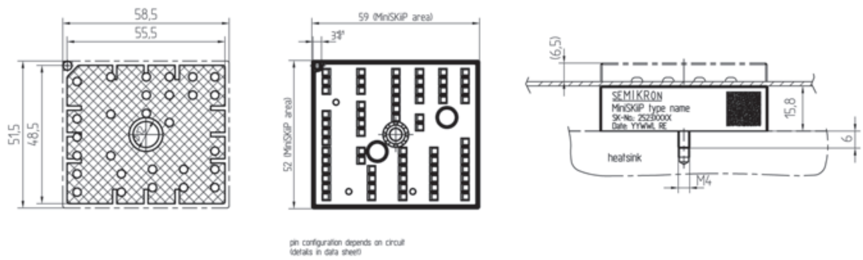
MiniSKiiP II 0



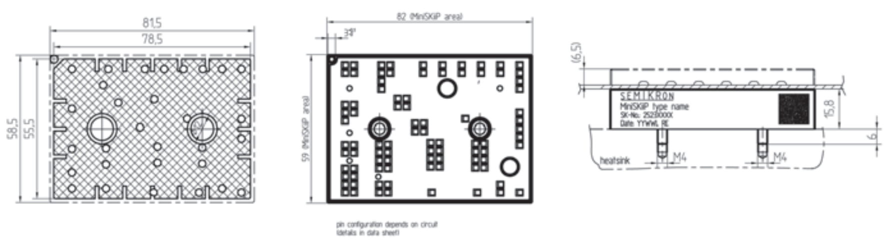
MiniSKiiP II 1



MiniSKiiP II 2

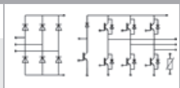
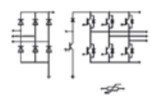
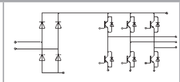
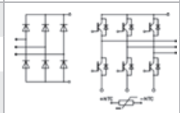
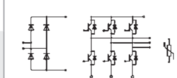
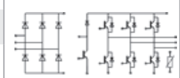
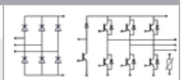
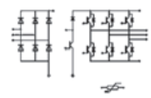
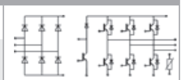
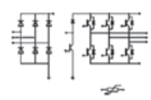


MiniSKiiP II 3



Dimensions in mm

Modules - CIB - SEMITOP

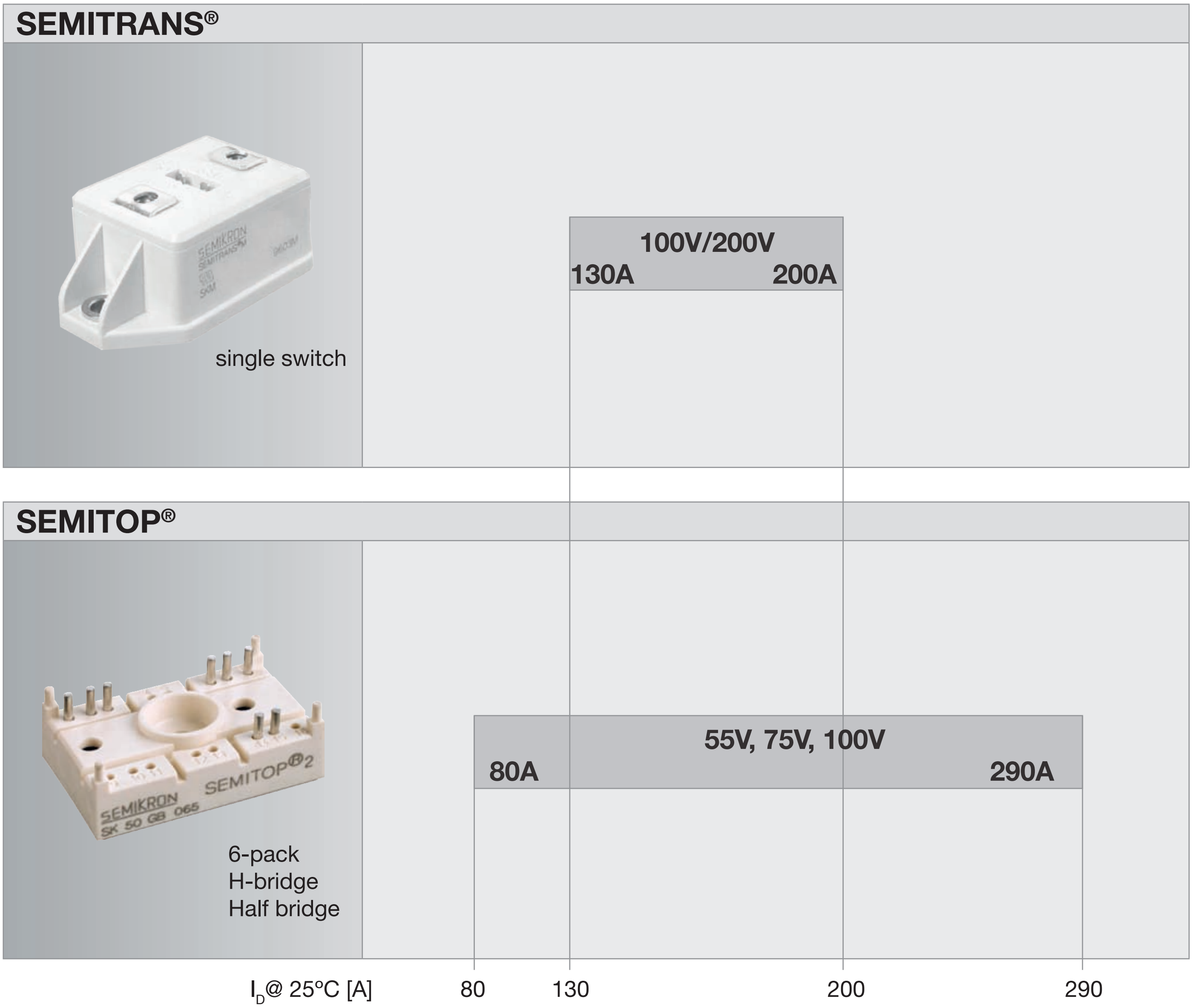
Type	IGBT						Diode				Rectifier		Case	Circuit
	I_C @T_S= 25°C	I_{Cnom}	$V_{CE(sat)}$ @T_j= 25°C typ.	E_{on}	E_{off}	$R_{th(j-s)}$	I_F @T_S= 25°C	V_F @T_j= 25°C typ.	E_{rr}	$R_{th(j-s)}$	I_{FSM} @T_S= 25°C	$R_{th(j-s)}$		
	A	A	V	mJ	mJ	K/W	A	V	mJ	K/W	A	K/W		
600 V - IGBT 3 (Trench)														
SK 20 DGDL 066 ET	30	20	1.45	0.3	0.6	1.95	27	1.40	0.2	2.46	220	2.15	3	
SK 30 DGDL 066 ET	40	30	1.45	0.55	1.15	1.65	36	1.50	0.53	2.3	370	1.7	3	
SK 50 DGDL 066 T	69	50	1.45	2.2	1.74	0.95	54	1.35	0.73	1.6	370	1.5	4	
SK 75 DGDL 066 T	81	75	1.45	3.1	2.8	0.75	64	1.35	0.9	1.2	700	0.9	4	
SK 100 DGDL 066 T	106	100	1.45	4.4	3.5	0.65	99	1.10	1.45	0.8	700	0.9	4	
600 V - NPT IGBT (Ultrafast)														
SK 8 BGD 065 E 1)	12	6	2	0.22	0.12	2.6	13	1.35	-	2.7	220	2.15	2	
SK 9 DGD 065 ET	12	6	2	0.22	0.12	2.6	20	1.35	0.31	2.7	220	2.15	3	
SK 20 DGD 065 ET	26	20	2	0.66	0.4	1.7	25	1.60	-	1.7	370	1.7	3	
SK 25 DGD 065 ET 1)	30	20	1.8	0.8	0.55	1.4	36	1.45	-	1.7	370	1.7	3	
SK 9 BGD 065 ET	12	6	2	0.22	0.12	2.6	20	1.35	0.31	2.7	220	2.15	3	
SK 10 BGD 065 ET	17	6	2	0.18	0.13	2	22	1.30	0.18	2.3	220	2.7	3	
SK 8 DGDL 065 ET 1)	12	6	2	0.22	0.12	2.6	13	1.35	-	2.7	-	2.8	3	
SK 10 DGDL 065 ET	17	6	2	0.18	0.13	2	22	1.30	0.18	2.3	220	2.7	3	
SK 15 DGDL 065 ET 1)	19	10	2	0.3	0.22	1.9	22	1.40	0.24	2.3	220	2.7	3	
SK 20 DGDL 065 ET	24	20	2	0.69	0.39	1.7	25	1.60	-	1.7	220	2	3	
1200 V - IGBT 3 (Trench)														
SK 10 DGDL 126 ET	15	8	1.7	1	1	2	25	1.90	1.4	2.1	220	2.7	3	
SK 15 DGDL 126 ET	22	15	1.7	2	1.8	1.6	25	1.60	1.1	2.1	220	2	3	
SK 25 DGDL 126 T	41	25	1.7	2.8	3.1	0.9	30	1.50	2	1.7	370	1.5	4	
SK 35 DGDL 126 T	52	35	1.7	3.7	4.8	0.75	38	1.50	3	1.5	370	1.25	4	
SK 50 DGDL 126 T	68	50	1.7	4.6	6.3	0.6	62	1.35	3.6	1	700	0.9	4	
1200 V - IGBT 4 (Trench)														
SK 10 DGDL 12T4 ET	17	8	1.85	0.41	0.75	2.2	15	2.38	0.41	2.7	220	2	3	
SK 15 DGDL 12T4 ET	27	15	1.85	0.82	1.52	1.65	21	2.38	0.82	2.34	220	2	3	
SK 25 DGDL 12T4 T	45	25	1.85	2.27	2.7	0.96	30	2.40	-	1.7	370	1.25	4	
SK 35 DGDL 12T4 T	58	35	1.85	3.27	3.3	0.8	46	2.30	1.46	1.37	370	1.25	4	
SK 50 DGDL 12T4 T	75	50	1.85	8.3	5	0.65	60	2.22	2.15	0.97	700	0.9	4	

For detailed case drawings please see page 23

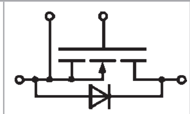
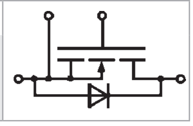
Footnotes

1) Not for New Design

MOSFET Modules

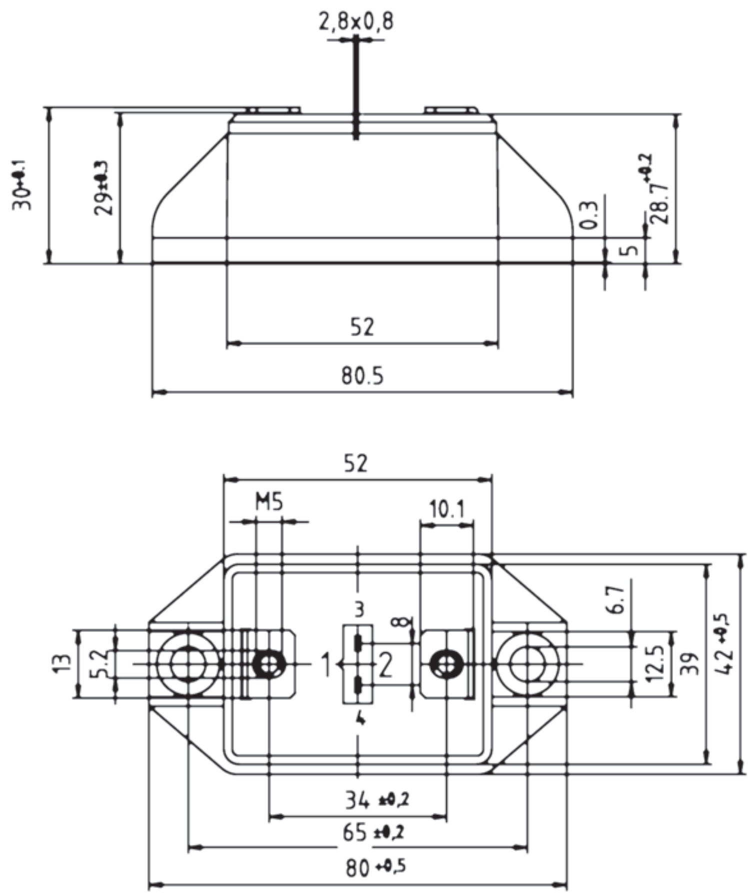


Modules - MOSFET - SEMITRANS

Type	V_{DS} V	I_D @T_C= 25°C A	$R_{DS(on)}$ @T_j= 25°C typ. mΩ	$R_{th(j-c)}$ K/W	Case	Circuit
100 V						
SKM 111 AR	100	200	7	0.18	M1	
200 V						
SKM 121 AR [1]	200	130	18	0.18	M1	
SKM 180 A020	200	180	9	0.18	M1	

Cases

SEMITRANS M1

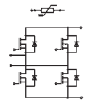
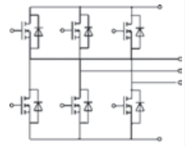
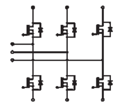
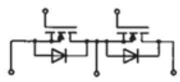
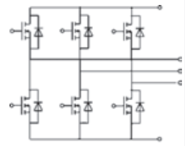
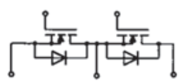
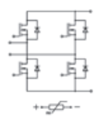
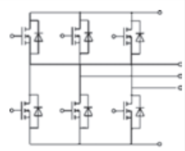


Dimensions in mm

Footnotes

1) Not for New Design

Modules - MOSFET - SEMITOP

Type	V_{DS} V	I_D @T_C= 25°C A	$R_{DS(on)}$ @T_j= 25°C typ. mΩ	$R_{th(j-s)}$ K/W	Case	Circuit
55 V						
SK 150 MHK 055 T [1]	55	240	1.1	0.8	3	
SK 80 MD 055 [1]	55	117	2.2	1.1	2	
SK 80 MBBB 055	55	117	2.2	1.1	3	
75 V						
SK 300 MB 075	75	290	-	0.45	3	
SK 70 MD 075 [1]	75	100	6.2	1.1	2	
100 V						
SK 260 MB 10	100	230	-	0.45	3	
SK 85 MH 10 T	100	80	-	1.1	2	
SK 115 MD 10 [1]	100	80	-	1.1	3	
SK 60 MD 10 [1]	100	80	-	1.1	2	

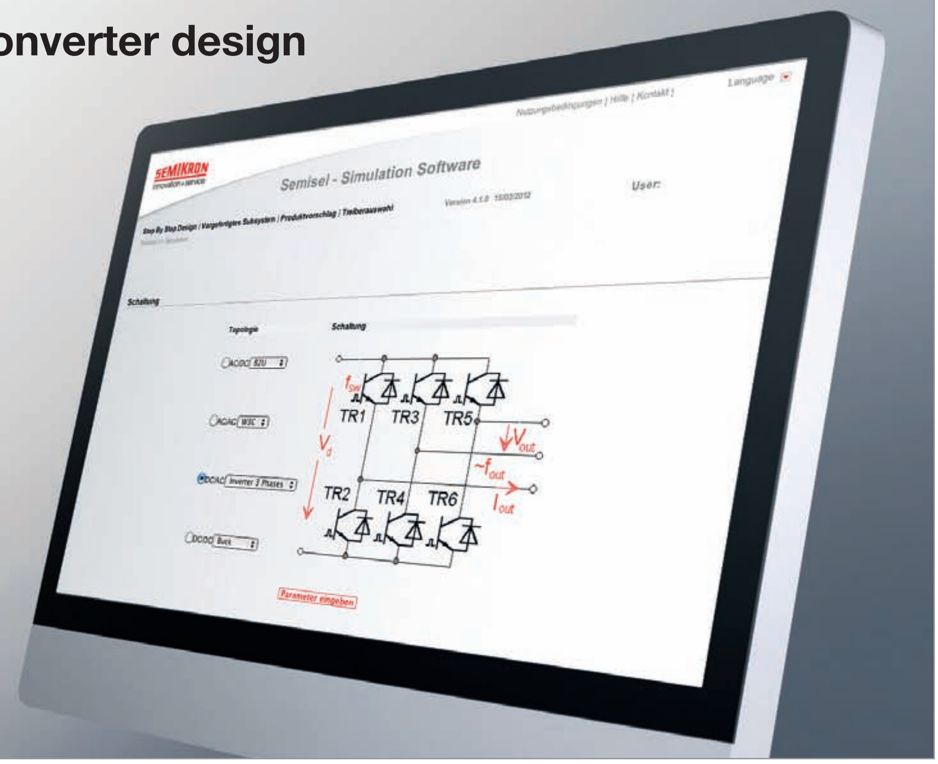
For detailed case drawings please see page 23

Footnotes

1) Not for New Design

SemiSel

Free help with your converter design



Applications

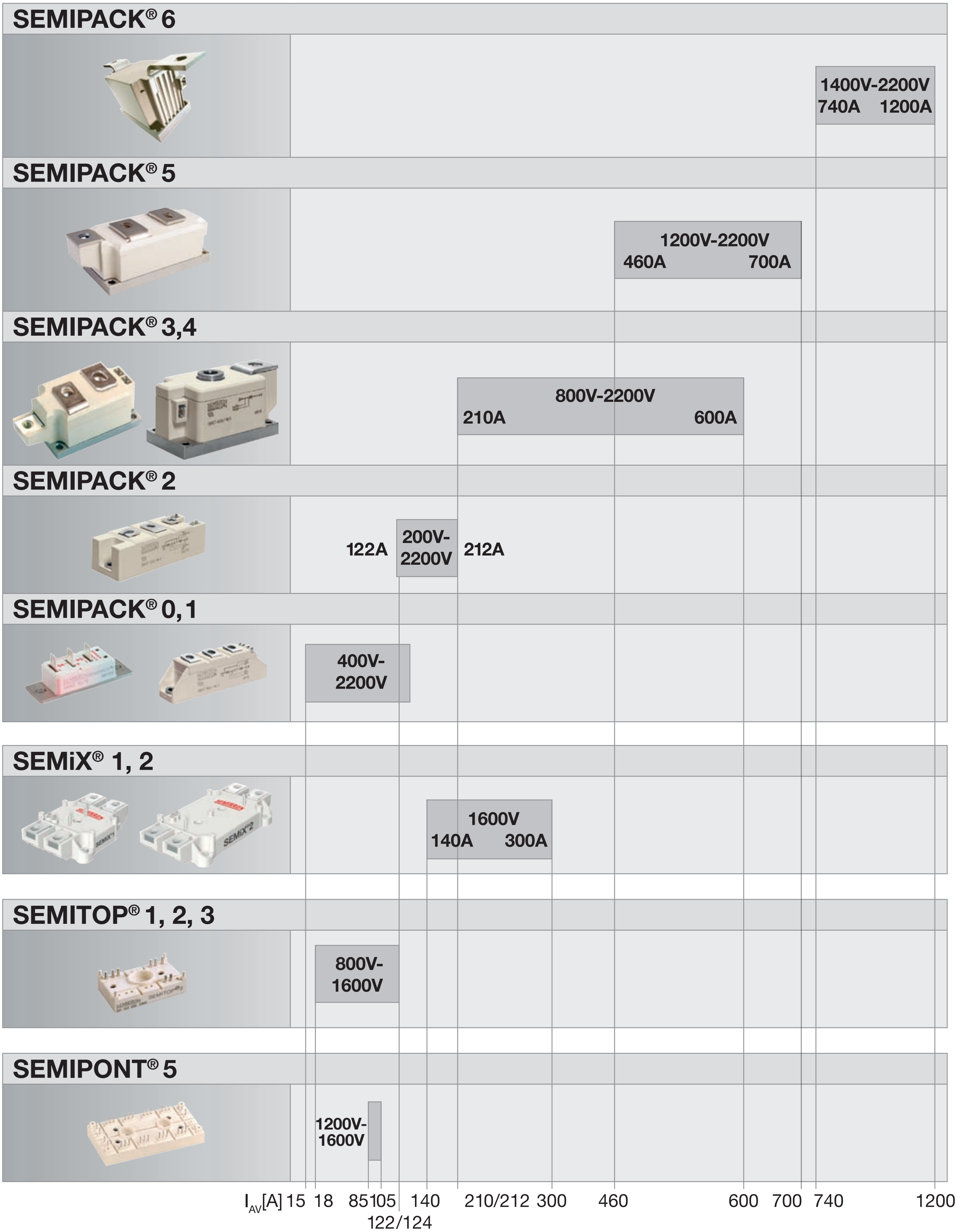
SemiSel is the SEMIKRON online calculation and simulation tool for losses, temperatures and optimum choice of power electronic components (www.semikron.com). Due to ever-present cost pressure, the optimum choice of power conductor components is a must. The days when a module was purchased solely on the basis of its nominal current are over. Today, increased product diversity in the field of power semiconductors calls for comparisons over and above the information contained in data sheets. Only a comparison under application-oriented conditions such as voltage level, switching frequency or cooling conditions can demonstrate differences in the performance of the devices available. Miniaturisation coupled with higher power densities makes it essential to have the right thermal design for heat dissipation.

http://semisel.semikron.com

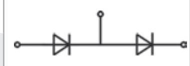
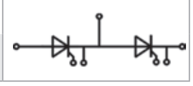
Benefits

The risk arising from variations in both component and electrical circuit parameters should be considered in proper circuit design. These facts are only a few of the many points that have to be considered when developing a power electronic system. And this is where efficient support is provided by SemiSel to enable developers to make the right decisions. Many manufacturers of power semiconductors offer tools for device selection but SemiSel is still the most comprehensive free tool of this kind which can be used to investigate different power electronic circuits under different operating conditions. This program has been available online since 2001 and has been continually improved and expanded since its introduction. It provides a good compromise of user-friendliness, application fields and speed. The calculation functions range from product proposal for nominal operating conditions to drivers and heat sink specifications to product selections for specific overload conditions and complex calculations such as complete load cycles that factor in temperature cycling problems.

Thyristor / Diode Modules

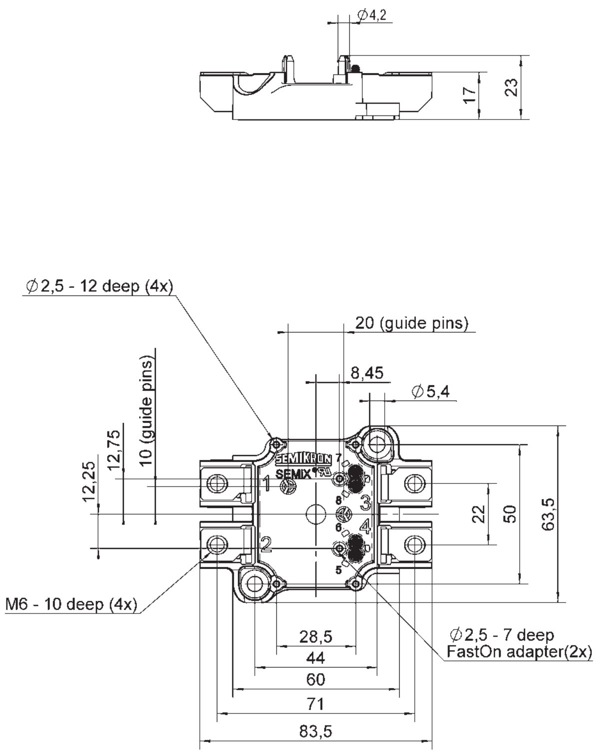


Modules - Thyristor / Diode - SEMiX

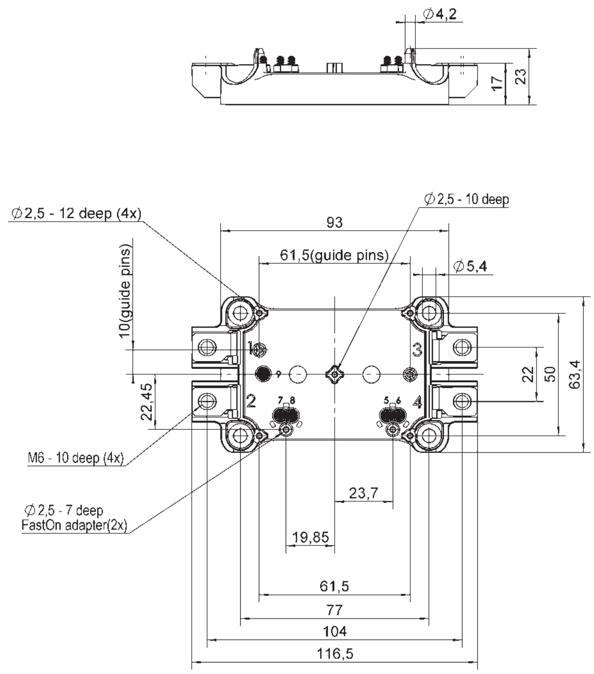
Type	V_{RRM} V_{DRM}	I_{TAV} I_{FAV} @T_C	T_C	I_{TSM} I_{FSM} @T_{jmax}	$V_{T(TO)}$ @T_{jmax}	r_T @T_{jmax}	$R_{th(j-c)}$ per chip	$R_{th(c-s)}$ per mo-dule	T_j	Case	Circuit
	V	A	°C	A	V	mΩ	K/W	K/W	°C		
SEMiX191KD16s	1600	190	85	5000	0.85	0.95	0.18	0.075	-40 ... +130	1s	
SEMiX302KD16s	1600	300	85	7500	0.85	1.1	0.091	0.045	-40 ... +130	2s	
SEMiX171KH16s	1600	170	85	4800	0.85	1.5	0.18	0.075	-40 ... +130	1s	
SEMiX302KH16s	1600	300	85	8000	0.85	1.1	0.091	0.045	-40 ... +130	2s	
SEMiX141KT16s	1600	140	85	3000	0.85	2.1	0.21	0.075	-40 ... +130	1s	
SEMiX302KT16s	1600	300	85	8000	0.85	1.7	0.091	0.045	-40 ... +130	2s	

Cases

SEMiX 1s

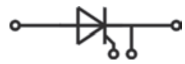
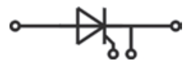
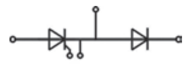
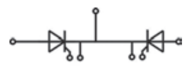
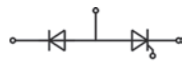
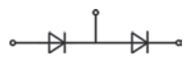


SEMiX 2s

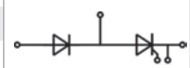


Dimensions in mm

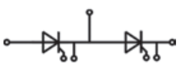
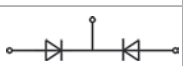
Modules - Thyristor / Diode - SEMIPACK

Type	V_{RRM} V_{DRM} V	I_{TAV} I_{FAV} @T_C A	T_C °C	I_{TSM} I_{FSM} @T_{jmax} A	$V_{T(TO)}$ @T_{jmax} V	r_T @T_{jmax} mΩ	$R_{th(j-c)}$ cont. per chip K/W	$R_{th(c-s)}$ per chip K/W	T_j °C	Case	Circuit
SKET 330	800-2200	295	85	8000	1.2	0.55	0.09	0.02	-40 ... +130	4	
SKET 400	800-1800	392	85	12000	0.92	0.3	0.09	0.02	-40 ... +130	4	
SKKE 15	600-1600	14	85	280	0.85	15	2	0.2	-40 ... +125	0	
SKKE 81	400-2200	82	85	1750	0.85	1.8	0.4	0.2	-40 ... +125	1	
SKKE 162	800-1800	195	85	5000	0.85	1.2	0.17	0.1	-40 ... +135	2	
SKKE 380	1200-1600	380	100	10000	0.8	0.35	0.11	0.04	-40 ... +150	3	
SKKE 600	1200-2200	600	100	18000	0.75	0.25	0.07	0.02	-40 ... +150	4	
SKKE 1200	1800-2200	1180	85	40000	0.72	0.19	0.0385	0.01	-40 ... +125	6	
SKET 740	1800-2200	700	85	31000	0.88	0.28	0.0405	0.01	-40 ... +125	6	
SKET 800	1400-1800	805	85	32000	0.83	0.25	0.0405	0.01	-40 ... +130	6	
SKKL 92	800-1800	95	85	1750	0.9	2	0.28	0.2	-40 ... +125	1	
SKMT 92	800-1800	95	85	1750	0.9	2	0.28	0.2	-40 ... +125	1	
SKNH 56	1200-1800	50	85	1250	0.9	3.5	0.57	0.2	-40 ... +125	1	
SKNH 91	1200-1800	95	85	1750	0.9	2	0.28	0.2	-40 ... +125	1	
SKKD 15	600-1600	14	85	280	0.85	15.5	2	0.2	-40 ... +125	0	
SKKD 26	1200-1600	31	85	480	0.85	6	1	0.2	-40 ... +125	1	
SKKD 46	400-1800	47	85	600	0.85	5	0.6	0.2	-40 ... +125	1	
SKKD 81	400-1800	82	85	1750	0.85	1.8	0.4	0.2	-40 ... +125	1	
SKKD 81 H4	2000-2200	82	85	1750	0.85	1.8	0.4	0.2	-40 ... +125	1	
SKKD 100	400-1800	100	85	2000	0.85	1.3	0.35	0.2	-40 ... +125	1	
SKKD 101/16 [1]	1600	115	85	2000	0.87	2.45	0.19	0.22	-40 ... +130	1	
SKKD 162	800-2200	195	85	5000	0.85	1.2	0.17	0.1	-40 ... +135	2	
SKKD 212	1200-1800	212	85	5500	0.75	1.05	0.18	0.1	-40 ... +135	2	
SKKD 260	800-2200	260	100	10000	0.9	0.37	0.14	0.04	-40 ... +130	3	
SKKD 380	800-2200	380	100	10000	0.8	0.35	0.11	0.04	-40 ... +150	3	
SKKD 701	1200-2200	701	100	22500	0.7	0.28	0.069	0.02	-40 ... +160	5	

Modules - Thyristor / Diode - SEMIPACK

Type	V_{RRM} V_{DRM} V	I_{TAV} I_{FAV} @T_C A	T_C °C	I_{TSM} I_{FSM} @T_{jmax} A	$V_{T(TO)}$ @T_{jmax} V	r_T @T_{jmax} mΩ	$R_{th(j-c)}$ cont. per chip K/W	$R_{th(c-s)}$ per chip K/W	T_j °C	Case	Circuit
SKKH 15	600-1600	13.5	85	280	1.1	20	1.6	0.2	-40 ... +125	0	
SKKH 27	800-1800	25	85	480	0.9	12	0.9	0.2	-40 ... +125	1	
SKKH 42	800-1800	40	85	850	1	4.5	0.65	0.2	-40 ... +125	1	
SKKH 58/16 E [1]	1600	55	85	1200	1	4.8	0.47	0.22	-40 ... +130	1	
SKKH 57	800-1800	50	85	1250	0.9	3.5	0.57	0.2	-40 ... +125	1	
SKKH 57 H4	2000-2200	50	85	1250	0.9	3.5	0.57	0.2	-40 ... +125	1	
SKKH 72	800-1800	70	85	1450	0.9	3.5	0.35	0.2	-40 ... +125	1	
SKKH 72 H4	2000-2200	70	85	1450	0.9	3.5	0.35	0.2	-40 ... +125	1	
SKKH 92	800-1800	95	85	1750	0.9	2	0.28	0.2	-40 ... +125	1	
SKKH 106	800-1800	106	85	1900	0.9	2	0.28	0.2	-40 ... +130	1	
SKKH 107/16 E [1]	1600	119	85	1900	0.9	3.35	0.19	0.22	-40 ... +130	1	
SKKH 122	800-1800	129	85	3200	0.85	2	0.2	0.1	-40 ... +125	2	
SKKH 132	800-1800	137	85	4000	1	1.6	0.18	0.1	-40 ... +125	2	
SKKH 132 H4	2000-2200	128	85	4000	1.1	2	0.17	0.1	-40 ... +125	2	
SKKH 162	800-1800	156	85	5000	0.85	1.5	0.17	0.1	-40 ... +125	2	
SKKH 162 H4	2000-2200	143	85	5000	0.95	2	0.16	0.1	-40 ... +125	2	
SKKH 172	1400-1800	175	85	5000	0.83	1.3	0.155	0.1	-40 ... +125	2	
SKKH 280	2000-2200	252	85	7500	0.9	0.75	0.11	0.04	-40 ... +125	3	
SKKH 250	1200-1800	250	85	8000	0.925	0.45	0.14	0.04	-40 ... +130	3	
SKKH 273	1200-1800	273	85	8000	0.9	0.92	0.104	0.08	-40 ... +130	3	
SKKH 330	800-1800	305	85	8000	0.8	0.6	0.11	0.04	-40 ... +130	3	
SKKH 323	1200-1600	320	85	8200	0.81	0.85	0.091	0.08	-40 ... +130	3	
SKKH 460	1600-2200	460	85	15500	0.88	0.45	0.072	0.02	-40 ... +130	5	
SKKH 570	1200-1800	570	85	15500	0.78	0.32	0.069	0.02	-40 ... +135	5	

Modules - Thyristor / Diode - SEMIPACK

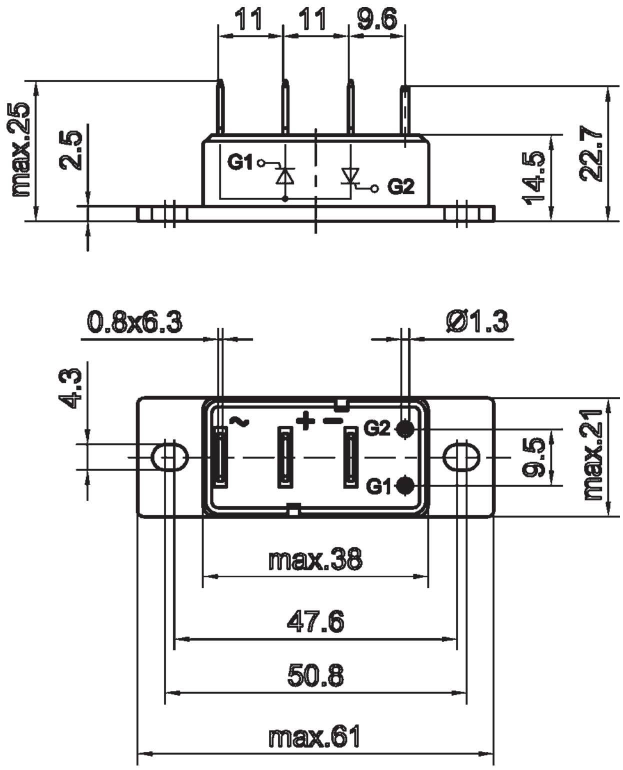
Type	V_{RRM} V_{DRM}	I_{TAV} I_{FAV} @T_C	T_C	I_{TSM} I_{FSM} @T_{jmax}	$V_{T(TO)}$ @T_{jmax}	r_T @T_{jmax}	$R_{th(j-c)}$ cont. per chip	$R_{th(c-s)}$ per chip	T_j	Case	Circuit
	V	A	°C	A	V	mΩ	K/W	K/W	°C		
SKKT 15	600-1600	13.5	85	280	1.1	20	1.6	0.2	-40 ... +125	0	
SKKT 20	800-1600	18	85	280	1	16	1.2	0.2	-40 ... +125	1	
SKKT 20B	800-1600	18	85	280	1	16	1.2	0.2	-40 ... +125	1	
SKKT 27	800-1600	25	85	480	0.9	12	0.9	0.2	-40 ... +125	1	
SKKT 27B	800-1800	25	85	480	0.9	12	0.9	0.2	-40 ... +125	1	
SKKT 42	800-1800	40	85	850	1	4.5	0.65	0.2	-40 ... +125	1	
SKKT 42B	800-1800	40	85	850	1	4.5	0.65	0.2	-40 ... +125	1	
SKKT 58/16 E [1]	1600	55	85	1200	1	4.8	0.47	0.22	-40 ... +130	1	
SKKT 58B16 E [1]	1600	55	85	1200	1	4.8	0.47	0.22	-40 ... +130	1	
SKKT 57	800-1800	50	85	1250	0.9	3.5	0.57	0.2	-40 ... +125	1	
SKKT 57 H4	2000-2200	50	85	1250	0.9	3.5	0.57	0.2	-40 ... +125	1	
SKKT 57B	800-1800	50	85	1250	0.9	3.5	0.57	0.2	-40 ... +125	1	
SKKT 72	800-1800	70	85	1450	0.9	3.5	0.35	0.2	-40 ... +125	1	
SKKT 72 H4	2000-2200	70	85	1450	0.9	3.5	0.35	0.2	-40 ... +125	1	
SKKT 72B	800-1800	70	85	1450	0.9	3.5	0.35	0.2	-40 ... +125	1	
SKKT 92	800-1800	95	85	1750	0.9	2	0.28	0.2	-40 ... +125	1	
SKKT 92B	800-1800	95	85	1750	0.9	2	0.28	0.2	-40 ... +125	1	
SKKT 106	800-1800	106	85	1900	0.9	2	0.28	0.2	-40 ... +130	1	
SKKT 106B	800-1800	106	85	1900	0.9	2	0.28	0.2	-40 ... +130	1	
SKKT 107/16 E [1]	1600	119	85	1900	0.9	3.35	0.19	0.22	-40 ... +130	1	
SKKT 107B16 E [1]	1600	119	85	1900	0.9	3.35	0.19	0.22	-40 ... +130	1	
SKKT 122	800-1800	129	85	3200	0.85	2	0.2	0.1	-40 ... +125	2	
SKKT 132 H4	2000-2200	128	85	3800	1.1	2	0.18	0.1	-40 ... +125	2	
SKKT 132	800-1800	137	85	4000	1	1.6	0.18	0.1	-40 ... +125	2	
SKKT 162	800-1800	156	85	5000	0.85	1.5	0.17	0.1	-40 ... +125	2	
SKKT 162 H4	2000-2200	143	85	5000	0.95	2	0.16	0.1	-40 ... +125	2	
SKKT 172	1400-1800	175	85	5000	0.83	1.3	0.155	0.1	-40 ... +125	2	
SKKT 280	2000-2200	252	85	7500	0.9	0.75	0.11	0.04	-40 ... +125	3	
SKKT 250	800-1800	250	85	8000	0.925	0.45	0.14	0.04	-40 ... +130	3	
SKKT 273	1200-1800	273	85	8000	0.9	0.92	0.104	0.08	-40 ... +130	3	
SKKT 330	800-1800	305	85	8000	0.8	0.6	0.11	0.04	-40 ... +130	3	
SKKT 323	1200-1600	320	85	8200	0.81	0.85	0.091	0.08	-40 ... +130	3	
SKKT 460	1600-2200	460	85	15500	0.88	0.45	0.072	0.02	-40 ... +130	5	
SKKT 460 H4	2000-2200	460	85	15500	0.88	0.45	0.072	0.02	-40 ... +130	5	
SKKT 570	1200-1800	570	85	15500	0.78	0.32	0.069	0.02	-40 ... +135	5	
SKMD 100	400-1600	100	85	2000	0.85	1.3	0.35	0.2	-40 ... +125	1	

Footnotes

[1] New

Cases

SEMIPACK 0



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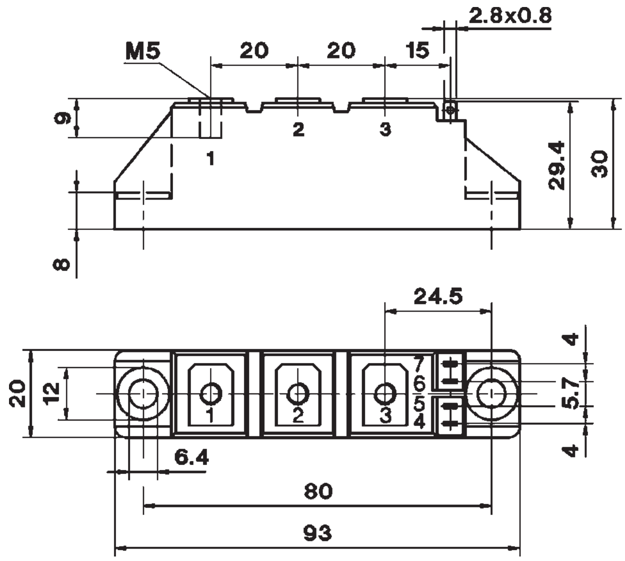

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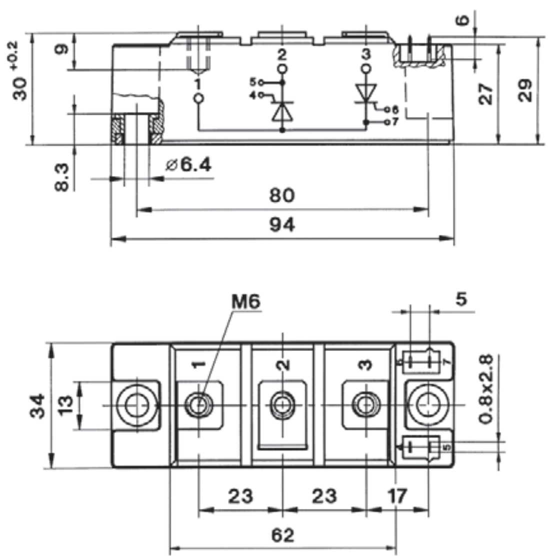
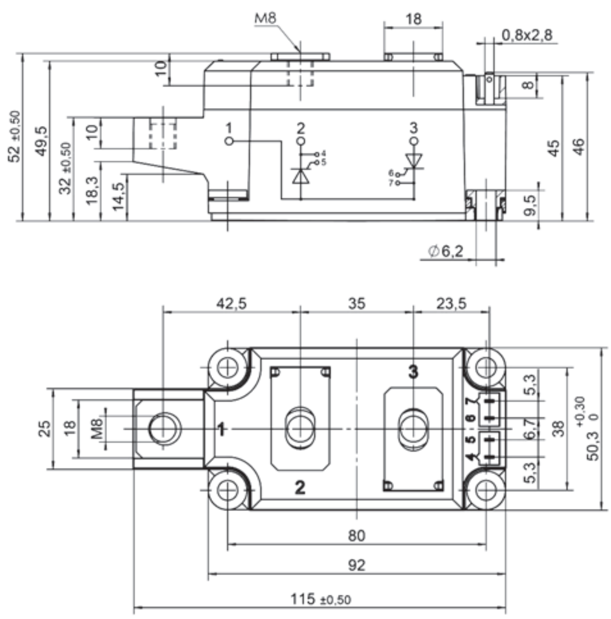


SEMIPACK 3

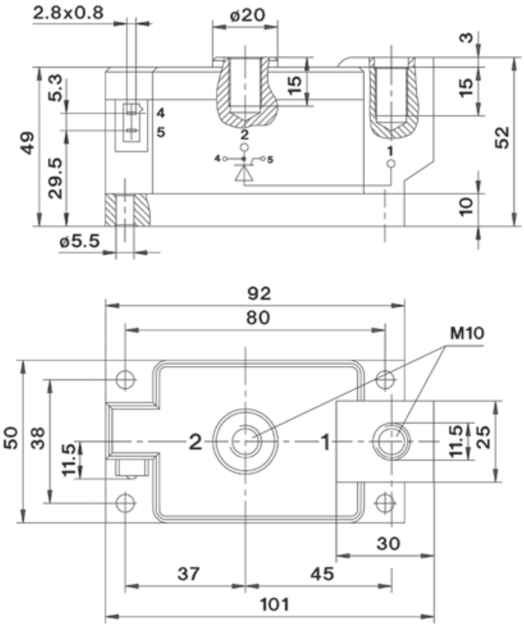


Dimensions in mm

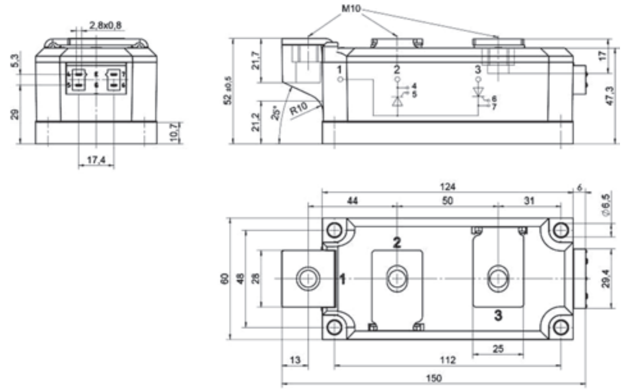
Modules - Thyristor / Diode - SEMIPACK

Cases

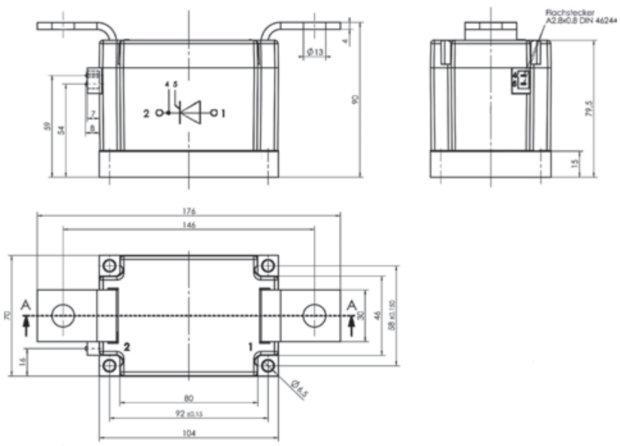
SEMIPACK 4



SEMIPACK 5

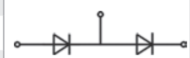
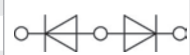


SEMIPACK 6



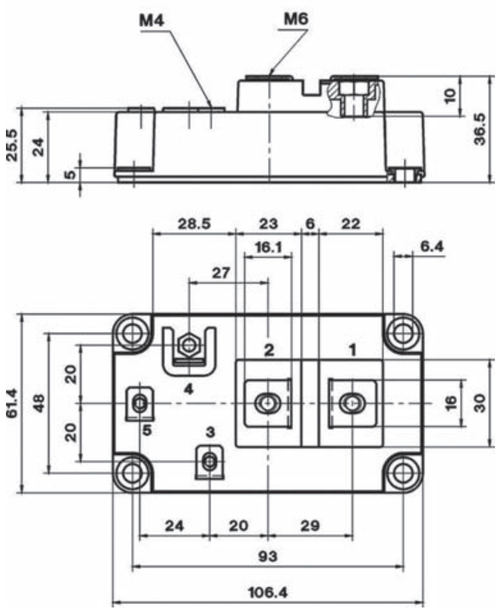
Dimensions in mm

Modules - Thyristor / Diode - SEMIPACK Fast

Type	V_{RRM} V_{DRM} V	I_{TAV} I_{FAV} @T_C A	T_C °C	I_{FSM} @T_{jmax} A	$V_{T(TO)}$ @T_{jmax} V	r_T @T_{jmax} mΩ	$R_{th(j-c)}$ per chip K/W	$R_{th(c-s)}$ per chip K/W	T_j °C	Case	Circuit
SKKE 120F	1700	120	82	1800	1.5	4.5	0.2	0.05	-40 ... +150	2	
SKKE 290F	600	290	109	6000	0.9	1.2	0.08	0.05	-40 ... +150	2	
SKKE 301F	1200	300	43	3600	1.2	2.75	0.11	0.05	-40 ... +150	2	
SKKE 310F	1200	310	84	5500	1.2	1.9	0.08	0.05	-40 ... +150	2	
SKKE 330F [1]	1700	330	70	5200	1.5	1.9	0.079	0.038	-40 ... +150	4	
SKKE 600F [1]	1200	600	85	5800	1.2	1.9	0.062	0.038	-40 ... +150	4	
SKKD 40F	400-1000	40	80	940	1.2	4	0.7	0.2	-40 ... +125	1	
SKKD 42F	1000-1500	42	85	1100	1	5	0.7	0.2	-40 ... +130	1	
SKKD 60F	1700	60	83	900	1.5	9	0.4	0.1	-40 ... +150	2	
SKKD 75F12	1200	75	55	900	1.2	11	0.4	0.1	-40 ... +150	2	
SKKD 105F	800-1600	105	83	2100	1.2	2.5	0.24	0.2	-40 ... +130	1	
SKKD 115F	1200-1400	115	83	2100	1.1	2	0.24	0.2	-40 ... +130	1	
SKKD 150F	1200	150	54	1800	1.2	5.5	0.2	0.1	-40 ... +150	2	
SKKD 170F	1200	170	85	2300	1.2	3.5	0.14	0.1	-40 ... +150	2	
SKKD 205F	600	205	87	3000	0.9	2	0.16	0.1	-40 ... +150	2	
SKMD 40F	400-1000	40	80	940	1.2	4	0.7	0.2	-40 ... +125	1	
SKMD 42F	1000-1500	42	85	1100	1	5	0.7	0.2	-40 ... +130	1	
SKMD 105F	800-1600	105	83	2100	1.2	2.5	0.24	0.2	-40 ... +130	1	
SKMD 150F12	1200	150	54	1800	1.2	5.5	0.2	0.1	-40 ... +150	2	
SKMD 202E	200-300	202	87	2800	0.8	1.5	0.2	0.1	-40 ... +150	2	
SKND 42F	1000-1500	42	85	1100	1	5	0.7	0.2	-40 ... +130	1	
SKND 105F	800-1600	105	83	2100	1.2	2.5	0.24	0.2	-40 ... +130	1	
SKND 150F	1200	150	54	1800	1.2	5.5	0.2	0.1	-40 ... +150	2	
SKND 202E	200-300	202	87	2800	0.8	1.5	0.2	0.1	-40 ... +150	2	
SKND 205F	600	205	87	3000	0.9	2	0.16	0.1	-40 ... +150	2	

Cases

SEMIPACK Fast in SEMITRANS 4

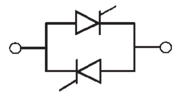
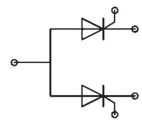
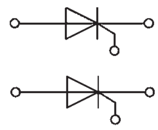
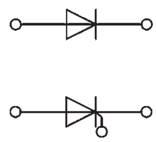
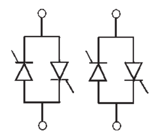
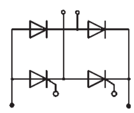
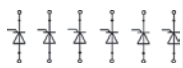
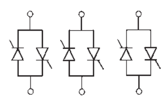
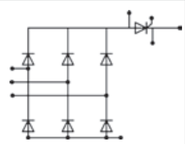


Dimensions in mm

Footnotes

[1] SEMIPACK Fast in SEMITRANS 4 case

Modules - Thyristor / Diode - SEMITOP

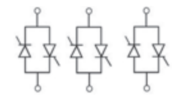
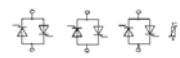
Type	V_{RRM} V_{DRM}	I_{TAV} I_{FAV} @T_C	T_C	I_{TSM} I_{FSM} @T_{jmax}	$V_{T(TO)}$ @T_{jmax}	r_T @T_{jmax}	$R_{th(j-s)}$ cont. per chip	T_j	Case	Circuit
	V	A	°C	A	V	mΩ	K/W	°C		
SK 25 KQ	800-1600	29	85	280	1.1	20	1.7	-40 ... +125	1	
SK 45 KQ	800-1600	47	85	380	1	10	1.2	-40 ... +125	1	
SK 70 KQ	800-1600	72	85	900	1	6	0.8	-40 ... +125	1	
SK 100 KQ	800-1600	101	85	1350	0.9	4.5	0.6	-40 ... +125	2	
SK 120 KQ	800-1600	134	85	1800	0.9	3.5	0.45	-40 ... +125	2	
SK 35 NT [1]	800-1600	33	85	900	1	6	0.8	-40 ... +125	1	
SK 35 TAA	800-1600	35	80	380	0.85	9.1	1.2	-40 ... +130	2	
SK 55 TAA	800-1600	55	80	900	0.85	5.7	0.8	-40 ... +130	2	
SK 75 TAA	800-1600	75	80	1500	0.9	4.5	0.6	-40 ... +130	2	
SK 100 TAA	800-1600	100	80	2000	0.9	3.5	0.45	-40 ... +130	2	
SK 75 TAE 12	1200	75	80	1250	0.85	4.4	0.6	-40 ... +130	2	
SK 25 WT	800-1600	29	85	280	1.1	20	1.7	-40 ... +125	2	
SK 45 WT	800-1600	47	85	380	1	10	1.2	-40 ... +125	2	
SK 70 WT	800-1600	72	85	900	1	6	0.8	-40 ... +125	3	
SK 100 WT	800-1600	101	85	1350	0.9	4.5	0.6	-40 ... +125	3	
SK 35 BZ	800-1600	35	80	270	0.85	14	1.7	-40 ... +125	2	
SK 45 STA	800-1600	47	75	380	1	10	1.2	-40 ... +125	3	
SK 25 UT	800-1600	29	85	280	1.1	20	1.7	-40 ... +125	3	
SK 45 UT	800-1600	47	85	380	1	10	1.2	-40 ... +125	2	
SK 30 DTA	800-1600	25	80	900	1	6	1.7	-40 ... +150	3	
SK 60 DTA	800-1600	61	80	1350	0.9	0.6	0.6	-40 ... +125	3	
SK 80 DTA	800-1600	65	80	1800	0.9	3.5	1	-40 ... +150	3	

For detailed case drawings please see page 23

Footnotes

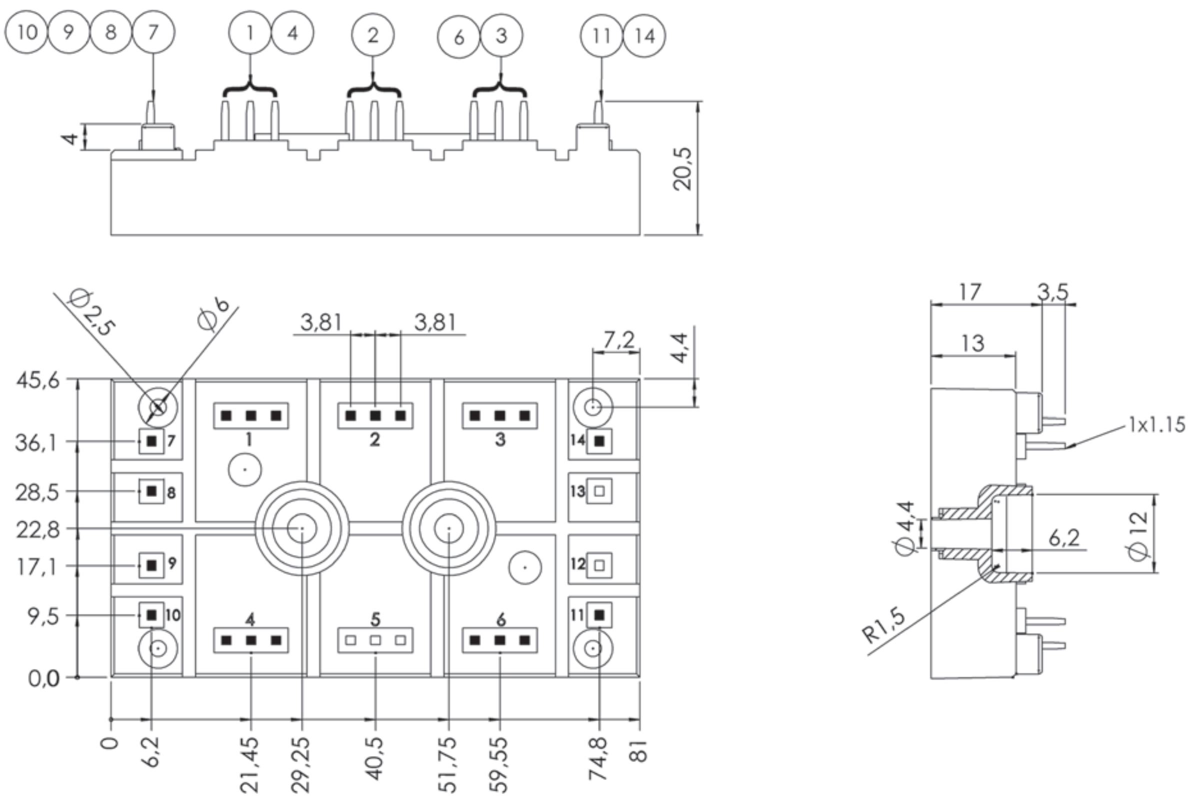
1) Not for New Design

Modules - Thyristor / Diode - SEMIPONT

Type	V_{RRM} V_{DRM}	I_{RMS} @T_C	T_C	I_{TSM} I_{FSM} @T_{jmax}	$V_{T(TO)}$ @T_{jmax}	r_T @T_{jmax}	$R_{th(j-s)}$ cont. per chip	T_j	Case	Circuit
	V	A	°C	A	V	mΩ	K/W	°C		
SKUT 85	1200-1600	85	85	1050	1.1	6	0.85	-40 ... +125	5	
SKUT 115	1200-1600	105	85	1250	0.9	5	0.63	-40 ... +125	5	
SKUT 85 T	1200-1600	85	85	1050	1.1	6	0.85	-40 ... +125	5	
SKUT 115 T	1200-1600	105	85	1250	0.9	5	0.63	-40 ... +125	5	

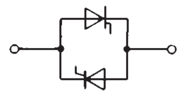
Cases

SEMIPONT 5



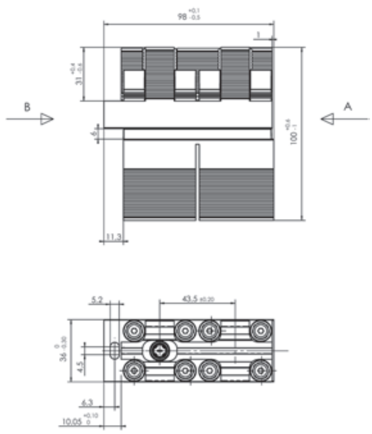
Dimensions in mm

Modules - Thyristors - SEMiSTART

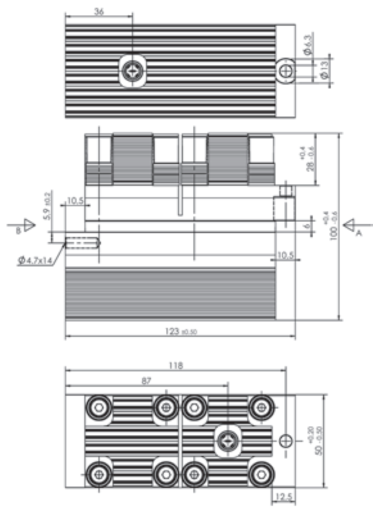
Type	V_{RRM} V_{DRM} V	$I_{overload}$ W1C (for 20s) A	T_C °C	I_{TSM} @T_j= 125°C A	$V_{T(TO)}$ @T_j= 125°C V	r_T @T_j= 125°C mΩ	$R_{th(j-s)}$ cont. per chip K/W	T_j (for 20s) °C	Case	Circuit
SKKQ 560	1400-1800	560	150	5200	0.9	0.9	0.106	150	1	
SKKQ 800	1400-1800	800	150	5200	0.9	0.8	0.106	150	2	
SKKQ 1200	1400-1800	1225	150	8000	0.9	0.5	0.066	150	2	
SKKQ 1500	1400-1800	1500	150	15000	0.85	0.3	0.037	150	2	
SKKQ 3000	1400-1800	3080	150	25500	0.95	0.18	0.026	150	3	

Cases

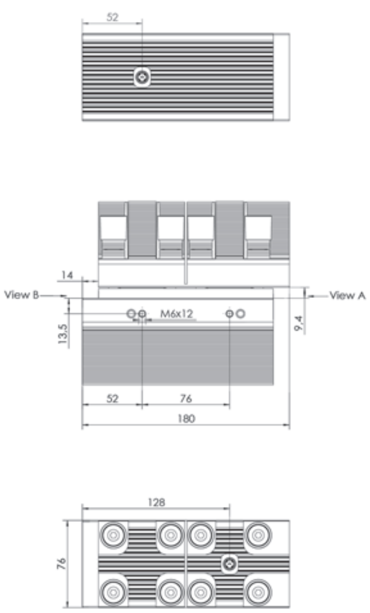
SEMiSTART 1



SEMiSTART 2

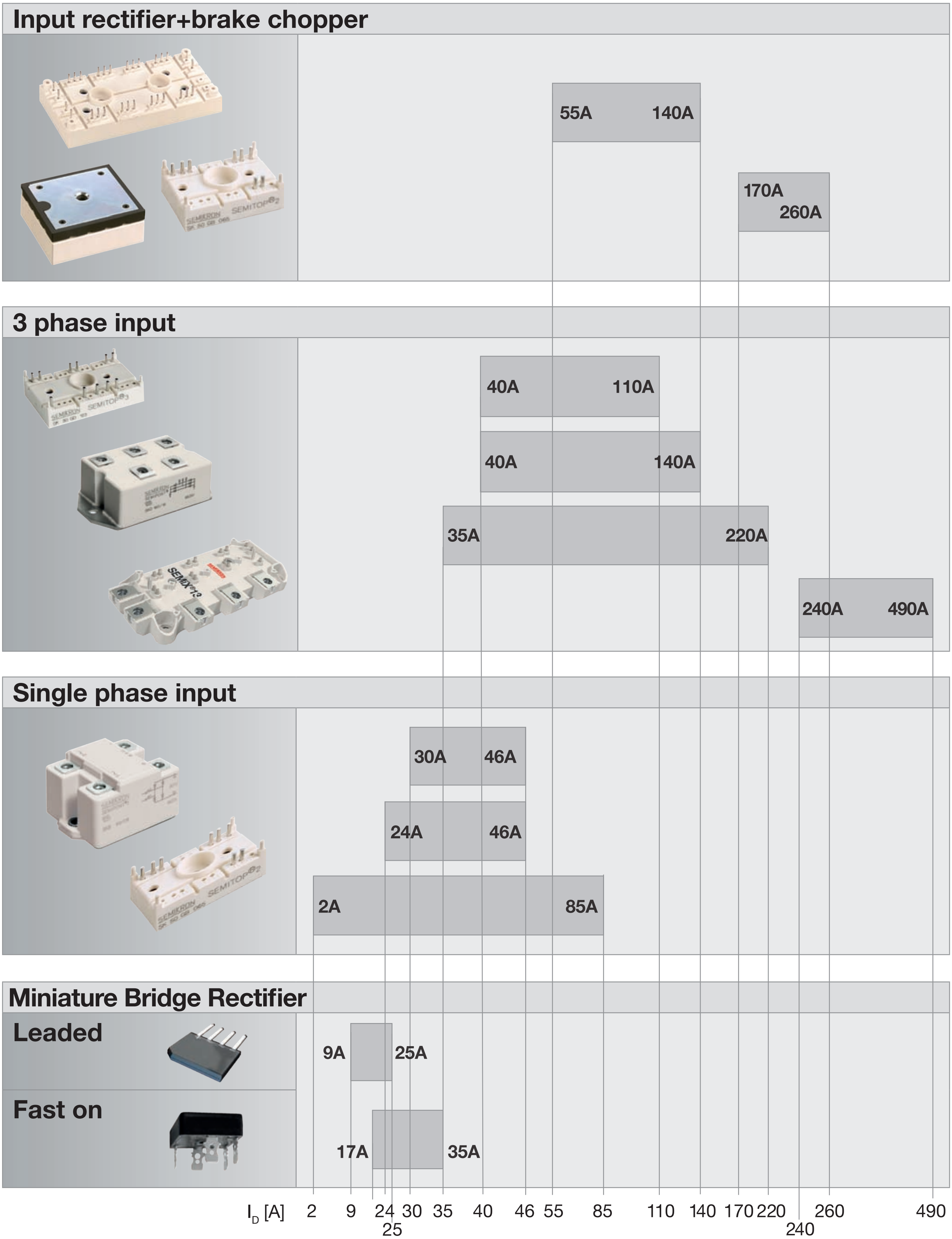


SEMiSTART 3

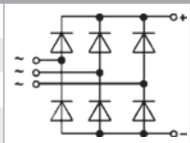
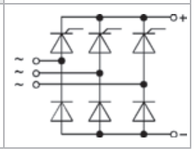


Dimensions in mm

Bridge Rectifier

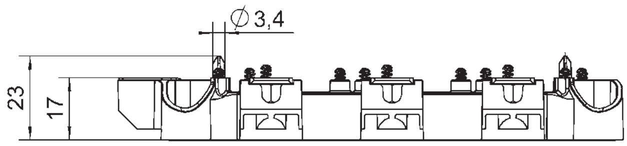


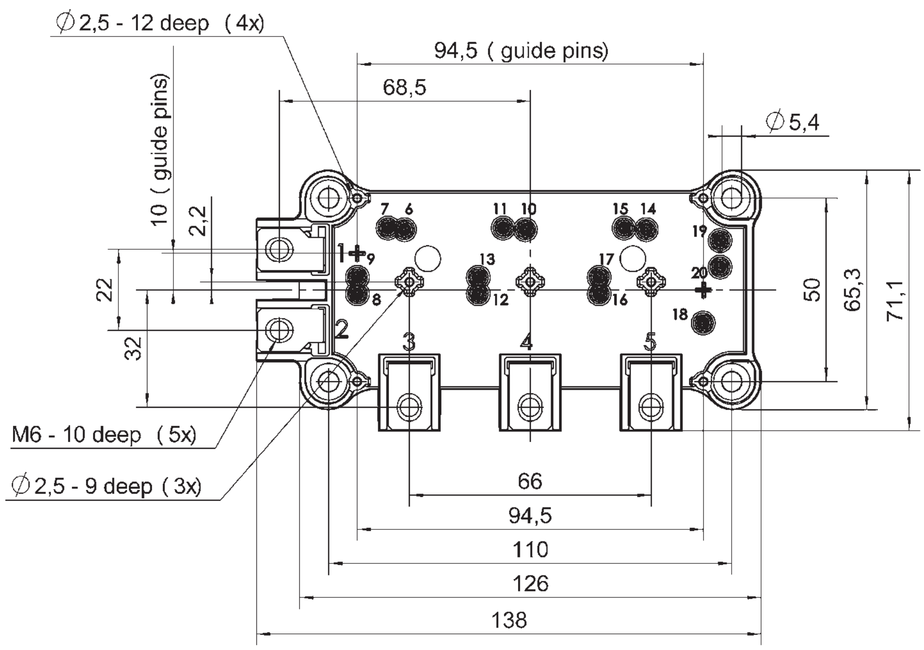
Modules - Bridge - SEMiX

Type	V_{RRM} V_{DRM}	I_D @T_C	T_C	I_{TSM} I_{FSM} @T_{jmax}	$V_{T(TO)}$ @T_{jmax}	r_T @T_{jmax}	$R_{th(j-c)}$ per chip	$R_{th(c-s)}$ per module	T_j	Case	Circuit
	V	A	°C	A	V	mΩ	K/W	K/W	°C		
SEMiX251D12Fs	1200	250	85	1330	1.2	7	0.26	0.04	-40 ... +150	13	
SEMiX291D16s [1]	1600	290	85	1380	0.83	4.6	0.45	0.04	-40 ... +130	13	
SEMiX341D16s	1600	340	85	2000	0.9	2.7	0.22	0.04	-40 ... +130	13	
SEMiX501D17Fs [1]	1700	489	85	2140	1.1	2.7	0.165	0.04	-40 ... +150	13	
SEMiX241DH16s	1600	240	85	1900	0.85	4	0.32	0.04	-40 ... +130	13	

Cases

SEMiX 13



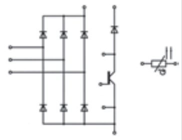
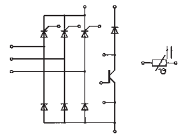


Dimensions in mm

Footnotes

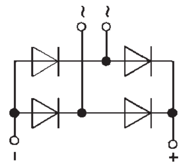
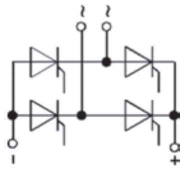
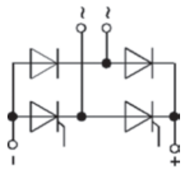
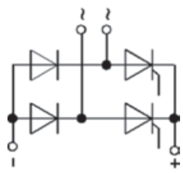
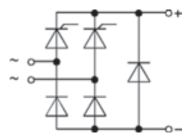
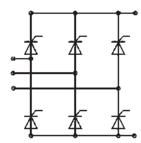
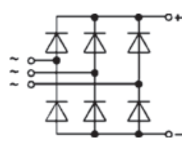
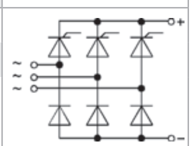
1) New

Modules - Bridge - MiniSKiiP

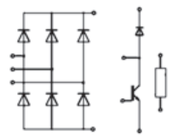
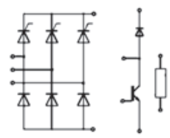
Type	IGBT						Diode				Case	Circuit
	I_C @T_S= 25°C	I_{Cnom}	$V_{CE(sat)}$ @T_j= 25°C typ.	E_{on}	E_{off}	$R_{th(j-s)}$	I_F @T_S= 25°C	V_F @T_j= 25°C typ.	E_{rr}	$R_{th(j-s)}$		
	A	A	V	mJ	mJ	K/W	A	V	mJ	K/W		
1200 V - IGBT 3 (Trench)												
SKiiP 28ANB16V1	118	105	1.7	13.1	13	0.4	118	1.60	11.2	0.55	II 2	
SKiiP 39ANB16V1	157	140	1.7	19.9	17.2	0.3	167	1.50	16.2	0.4	II 3	
SKiiP 28AHB16V1	118	105	1.7	14.4	13.3	0.4	118	1.60	10.8	0.55	II 2	
SKiiP 39AHB16V1	157	140	1.7	19.9	17.3	0.3	167	1.50	16.2	0.4	II 3	

For detailed case drawings please see page 38

Modules - Bridge - SEMIPONT

Type	V_{RRM} V_{DRM}	I_D @T_C	T_C	I_{TSM} I_{FSM} @T_{jmax}	$V_{T(TO)}$ @T_{jmax}	r_T @T_{jmax}	$R_{th(j-c)}$ cont. per chip	T_j	Case	Circuit
	V	A	°C	A	V	mΩ	K/W	°C		
1 and 3 phase										
SKB 52	400-1800	50	99	425	0.85	8	1.5	-40 ... +150	3	
SKB 60	400-1600	60	88	850	0.85	5	1	-40 ... +125	2	
SKB 72	400-1800	70	101	640	0.85	5	1.1	-40 ... +150	3	
SKBT 28	600-1400	28	89	280	1	16	1.8	-40 ... +125	1	
SKBT 40	800-1400	46	92	400	1	16	1	-40 ... +125	2	
SKBZ 28	400-1400	28	89	280	1	16	1.8	-40 ... +125	1	
SKBH 28	600-1400	28	89	280	1	16	1.8	-40 ... +125	1	
SKCH 28	400-1400	28	89	280	1	16	1.8	-40 ... +125	1	
SKCH 40	400-1600	40	92	400	1	16	1	-40 ... +125	2	
SKDT 60	400-1400	60	86	400	1	16	1	-40 ... +125	2	
SKDT 115	1200-1600	110	80	950	1.1	6	0.84	-40 ... +125	5	
SKDT 145	1200-1600	140	80	1250	0.9	5	0.6	-40 ... +125	5	
SKD 31	200-1600	31	100	320	0.85	12	2	-40 ... +125	1	
SKD 60	400-1600	60	102	850	0.85	5	1	-40 ... +125	2	
SKD 62	400-1800	60	110	425	0.85	8	1.5	-40 ... +150	3	
SKD 82	400-1800	80	110	640	0.85	5	1.1	-40 ... +150	3	
SKD 100	400-1600	100	93	1000	0.85	5	0.85	-40 ... +125	2	
SKD 110	800-1800	110	100	1000	0.85	4	0.9	-40 ... +150	4	
SKD 115	1200-1800	110	85	1150	0.8	7	1	-40 ... +150	5	
SKD 145	1200-1800	140	85	1700	0.8	4	0.8	-40 ... +150	5	
SKD 160	800-1800	205	100	1500	0.85	3	0.65	-40 ... +150	4	
SKD 210	900-1800	207	99	1600	0.85	3	0.5	-40 ... +150	4	
SKDH 100	800-1400	100	84	850	1	4.5	0.85	-40 ... +125	2	
SKDH 115	1200-1600	110	80	950	1.1	6	0.84	-40 ... +125	5	
SKDH 145	1200-1600	110	80	1250	0.9	5	0.63	-40 ... +125	5	

Modules - Bridge - SEMIPONT

Type	V_{RRM} V_{DRM} V	I_D @T_C A	T_C °C	I_{TSM} I_{FSM} @T_{jmax} A	$V_{T(TO)}$ @T_{jmax} V	r_T @T_{jmax} mΩ	$R_{th(j-c)}$ cont. per chip K/W	T_j °C	Case	Circuit
3 phase with brake chopper										
SKD 116/..-L100 [1]	1200-1600	110	85	950	0.8	7	0.3	-40 ... +125	6	
SKD 116/..-L105	1200-1600	110	85	1050	0.8	7	1	-40 ... +125	6	
SKD 116/..-L140	1200-1600	110	85	1050	0.8	7	1	-40 ... +125	6	
SKD 116/..-L75 [1]	1200-1600	110	85	1050	0.8	7	0.4	-40 ... +125	6	
SKD 146/..-L100 [1]	1200-1600	140	85	1250	0.8	4	0.8	-40 ... +125	6	
SKD 146/..-L105	1200-1600	140	85	1250	0.8	4	0.8	-40 ... +125	6	
SKD 146/..-L75 [1]	1200-1600	140	85	1250	0.8	4	0.4	-40 ... +125	6	
SKD146/..-L140T4	1200-1600	140	85	1250	0.8	4	0.8	-40 ... +125	6	
SKDH 116/..-L100 [1]	1200-1600	110	80	950	1.1	6	0.85	-40 ... +125	6	
SKDH 116/..-L75 [1]	1200-1600	110	80	950	1.1	6	0.84	-40 ... +125	6	
SKDH116/..L105	1200-1600	110	85	1050	0.8	7	1	-40 ... +125	6	
SKDH116/..L140	1200-1600	110	85	1050	0.8	7	1	-40 ... +125	6	
SKDH146/..-L105	1200-1600	110	85	1250	0.8	4	0.8	-40 ... +125	6	
SKDH146/..-L140	1200-1600	110	85	1250	0.8	4	0.8	-40 ... +125	6	
SKDH 146/..-L100 [1]	1200-1600	140	80	1250	0.8	4	0.3	-40 ... +125	6	
SKDH 146/..-L75 [1]	1200-1600	140	80	1250	0.8	4	0.4	-40 ... +150	6	
SKDH 146/08-L200	800	140	80	1250	0.85	3	0.6	-40 ... +125	6	

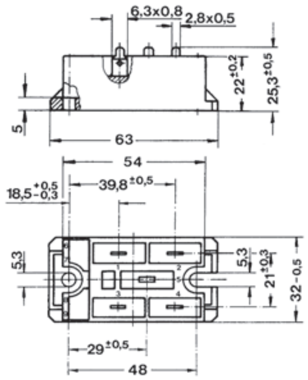
Footnotes

1) Not for New Design

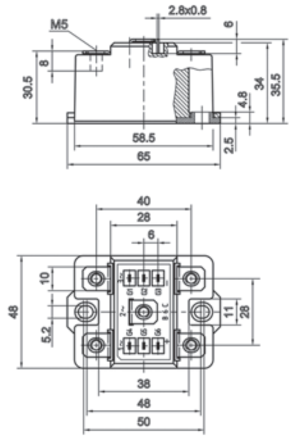
Modules - Bridge - SEMIPONT

Cases

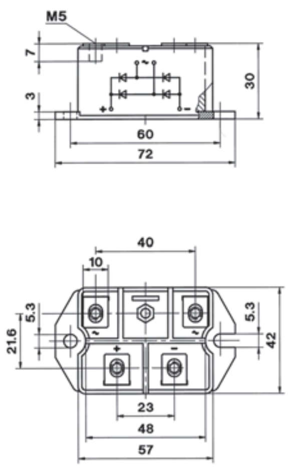
SEMIPONT 1



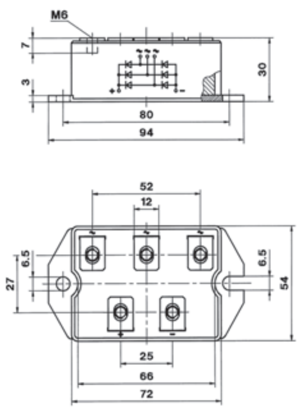
SEMIPONT 2



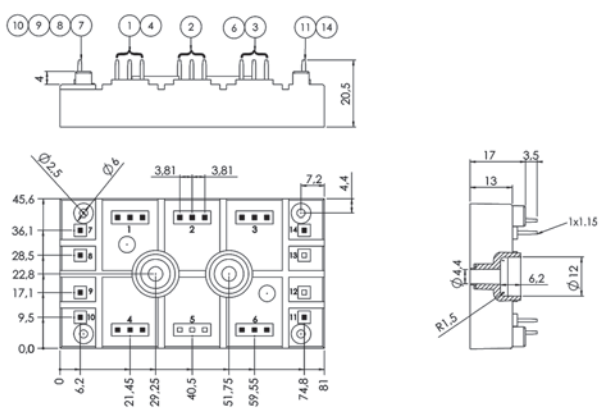
SEMIPONT 3



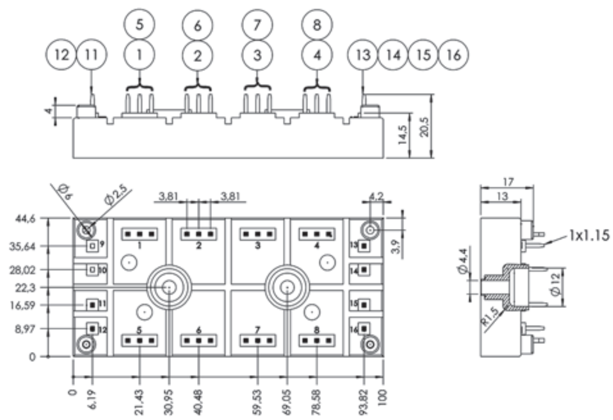
SEMIPONT 4



SEMIPONT 5

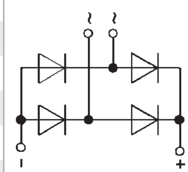
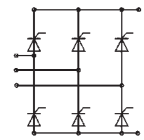
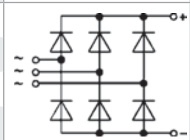
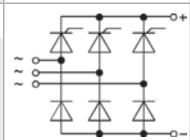
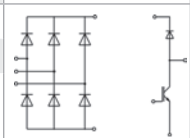
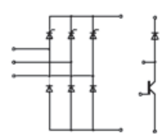


SEMIPONT 6



Dimensions in mm

Modules - Bridge - SEMITOP

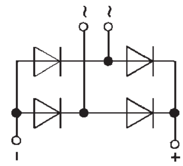
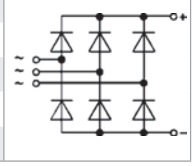
Type	V_{RRM} V_{DRM} V	I_D @T_S A	T_S °C	I_{TSM} I_{FSM} @T_{jmax} A	$V_{T(TO)}$ @T_{jmax} V	r_T @T_{jmax} mΩ	$R_{th(j-s)}$ per chip K/W	T_j °C	Case	Circuit
1 and 3 phase										
SK 50 B 06 UF	600	46	80	400	0.8	11	0.45	-40 ... +150	2	
SK 50 B	800-1600	51	80	270	0.8	13	1.7	-40 ... +150	2	
SK 55 B 06 F	600	54	80	440	0.9	16	1.2	-40 ... +150	2	
SK 55 B 12 F	1200	57	80	550	1.2	22	0.9	-40 ... +150	2	
SK 70 B	800-1600	68	80	560	0.8	11	1.2	-40 ... +150	2	
SK 100 B	800-1600	100	80	890	0.83	3.9	1	-40 ... +150	2	
SK 40 DT	800-1600	42	80	280	1.1	20	1.7	-40 ... +125	3	
SK 70 DT	800-1600	68	80	380	1	10	1.2	-40 ... +125	3	
SK 55 D	800-1600	55	80	200	0.8	13	2.15	-40 ... +150	2	
SK 70 D	800-1600	70	80	270	0.8	13	1.7	-40 ... +150	2	
SK 80 D 12F	1200	80	80	550	1.2	22	0.9	-40 ... +150	3	
SK 95 D	800-1600	95	80	560	0.8	11	1.2	-40 ... +150	2	
SK 40 DH	800-1600	42	80	270	1.1	20	1.7	-40 ... +150	3	
SK 70 DH	800-1600	68	80	270	1	10	1.2	-40 ... +125	3	
SK 55 DGL 126	1200	55	80	370	0.8	13	2	-40 ... +150	3	
SK 74 DGL 063 [1]	600	74	80	370	0.8	13	1.7	-40 ... +150	3	
SK 95 DGL 126	1600	96	80	700	0.8	11	1.2	-40 ... +150	3	
SK 170 DHL 126	1200	170	70	1000	0.8	7	0.51	-40 ... +150	4	
SK 200 DHL 066	600	210	70	1250	0.8	4	0.52	-40 ... +150	4	

For detailed case drawings please see page 23

Footnotes

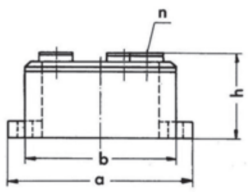
1) Not for New Design

Modules - Bridge - Power Bridge

Type	V_{RRM} V_{DRM} V	I_D @T_C A	T_C °C	I_{FSM} @T_{jmax} A	$V_{T(TO)}$ @T_{jmax} V	r_T @T_{jmax} mΩ	$R_{th(j-s)}$ cont. per chip K/W	T_j °C	Case	Circuit
1 and 3 phase										
SKB 30	200-1600	30	94	320	0.85	12	3.2	-40 ... +150	G12	
SKD 30	200-1600	30	98	320	0.85	12	4.8	-40 ... +150	G13	
SKD 33	400-1800	33	110	240	0.8	18	2.5	-40 ... +150	G55	
SKD 51	400-1800	50	127	700	0.8	8.5	1.1	-40 ... +150	G51	
SKD 53	400-1800	53	100	270	0.8	13	1.9	-40 ... +150	G55	
SKD 83	400-1800	83	95	560	0.8	7.5	1.4	-40 ... +150	G55	

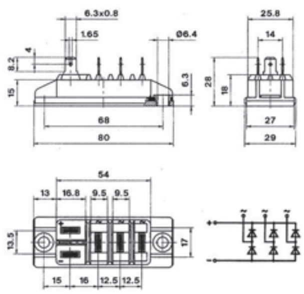
Cases

G 12, G 13

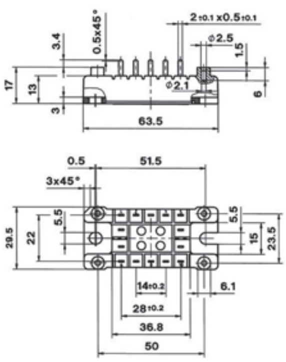


Cases	a	b	h	n
G 12, 13	55	45	24	M 4

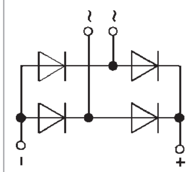
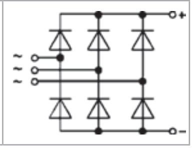
G 51



G 55

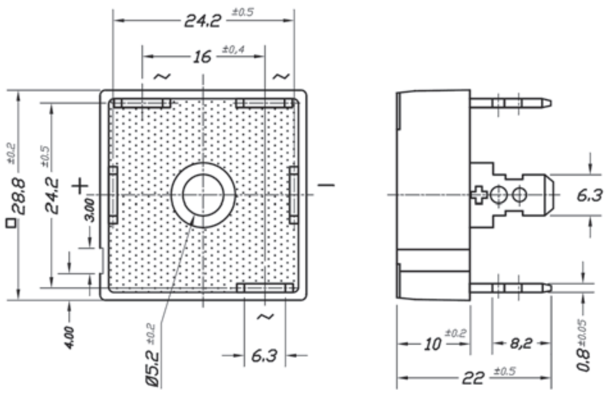


Dimensions in mm

Type	V_{RRM} V_{DRM} V	I_D @T_C A	T_C °C	I_{FSM} @T_j= 25°C A	V_F @ I_F T_j= 25°C V	I_F @T_j= 25°C A	$R_{th(j-s)}$ total K/W	T_j °C	Case	Circuit
Standard recovery - 1 phase										
SKB 25	100-1600	17	75	370	2.2	150	2.15	-40 ... +150	G 10b	
Standard recovery - 3 phase										
SKD 25	200-1600	20	73	370	2.2	150	1.9	-40 ... +150	G 11b	

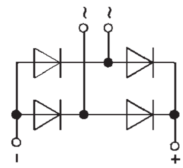
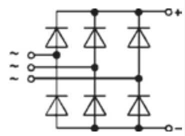
Cases

G 10b, G 11b



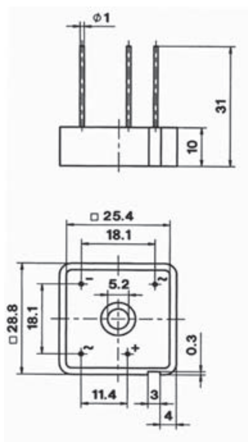
Dimensions in mm

Modules - Miniature Bridge - Leaded

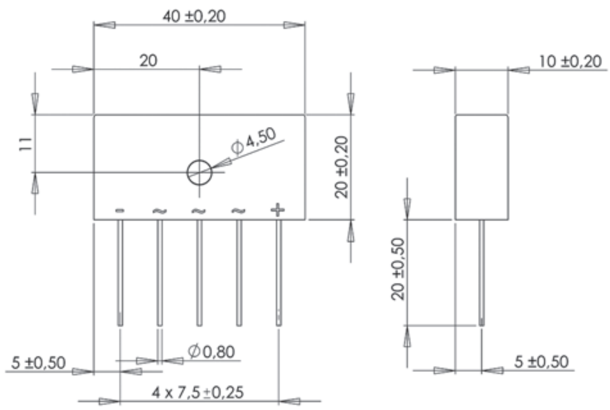
Type	V_{RRM} V_{DRM}	I_D @T_C	T_C	I_{FSM} @T_j= 25°C	V_F @ I_F T_j= 25°C	I_F @T_j= 25°C	$R_{th(j-a)}$ total	T_j	Case	Circuit
	V	A	°C	A	V	A	K/W	°C		
Standard recovery - 1 phase										
SKB 26	200-1600	18	75	370	2.2	150	15	-40 ... +150	G 50a	
Standard recovery - 3 phase										
DBI 6	200-1600	9	90	180	1.2	10	22	-40 ... +150	DBI	
DBI 15	200-1600	15	75	250	1.7	50	21	-40 ... +150	DBI	
DBI 25	200-1600	25	32	370	1.05	12.5	21	-40 ... +150	DBI	

Cases

G 50a



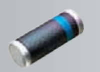
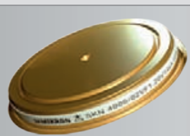
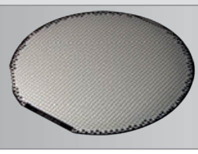
DBI



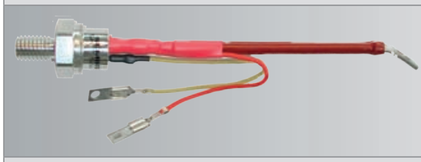
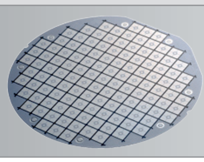
Dimensions in mm

Discretes

Discrete Diode

Package	Picture	Current range [A]
Leaded		1A – 30A
Surface mount		1A – 5A
Stud screw fit		5A – 400A
Capsule		4000A – 6000A
Chip		5A – 6000A

Discrete Thyristor

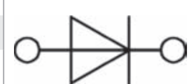
Package	Picture	Current range [A]
Stud screw fit		10A – 300A
Capsule		240A – 2400A
Chip		35A – 1200A

[A] 1 5 10 30 35 240 300 400 1200 2400 4000 6000

Discretes - Diodes - Leaded

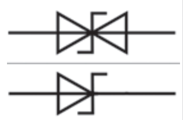
Type	V_{RRM} V	I_{FAV} @T_A A	T_A °C	I_{FSM} @T_A= 25°C A	V_F @ I_F T_j= 25°C V	I_F—V_F A	I_R @T_j= 25°C mA	$R_{th(j-L)}$ K/W	T_j °C	Case	Circuit
Standard recovery											
SK 1	1000-1600	1.45	60	60	1.50	10	0.4	85	-40 ... +150	E33	
SKN 2,5	400-1600	2.5	45	180	1.20	10	1.5	55	-40 ... +180	E5	
SK 3	1000-1600	3.3	85	180	1.20	10	0.6	60	-40 ... +150	E34	
SKN 5	200-1600	5	45	190	1.25	15	2.2	25	-40 ... +180	E6	
P 600 A ... P 600 S	50-1200	6	50	400	1.00	5	0.025	3.5	-50 ... +175	8 x 7,5	
P 1000 A ... P 1000 S	50-1200	10	50	400	0.90	5	0.025	3	-50 ... +175	8 x 7,5	
P 1200 A ... P 1200 S	50-1200	12	50	600	0.84-0.88	5	0.025	2.5	-50 ... +175	8 x 7,5	
P 1500 ATL ... P 1500 STL	50-1200	15	50	600	0.84-0.88	5	0.025	1.8	-50 ... +175	8 x 7,5 TL	
P 2000 A ... P 2000 M	50-1000	20	50	650	0.85-0.87	5	0.025	1	-50 ... +175	8 x 7,5	
P 2500 ATL ... P 2500 MTL	50-1000	25	50	650	0.85-0.87	5	0.025	0.7	-50 ... +175	8 x 7,8 TL	

Type	V_{RRM} V	t_{rr} ns	I_{FAV} @T_A A	T_A °C	I_{FSM} @T_A= 25°C A	V_F @ I_F T_j= 25°C V	I_F—V_F A	I_R @T_j= 25°C mA	$R_{th(j-L)}$ K/W	T_j °C	Case	Circuit
Fast recovery												
MR 820 ... MR 828	50-800	300	5	50	300	1.20	5	0.025	20	-50 ... +150	8 x 7,5	
HE 12FA ... HE 12FG	50-400	200	12	50	650	0.82	5	0.025	2.5	-50 ... +175	8 x 7,5	
HE 15FATL ... HE 15FGTL	50-400	200	15	50	700	0.82-0.84	5	0.025	1.8	-50 ... +175	8 x 7,5 TL	
HE 20FA ... HE 20FG	50-400	200	20	50	700	0.82-0.84	5	0.025	1.5	-50 ... +175	8 x 7,5	
HE 25FATL ... HE 25FGTL	50-400	200	25	50	700	0.82-0.84	5	0.025	1	-50 ... +175	8 x 7,8 TL	
Ultrafast recovery												
UF 600A ... UF 600M	50-1000	75-100	6	50	270	1.0-1.7	5	0.025	20	-50 ... +150	8 x 7,5	

Type	$V_{(BR)min.}$ V	I_{FAV} @T_A A	T_A °C	I_{FSM} @T_A= 25°C A	V_F @ I_F T_j= 25°C V	I_F—V_F A	$R_{th(j-L)}$ K/W	T_j °C	Case	Circuit
Avalanche										
SKa1	1300-1700	1.45	60	60	1.50	10	85	-40 ... +150	E33	
SKNa2	1300-1700	2	45	180	1.20	10	55	-40 ... +150	E5	
SKa3	1300-1700	3.3	90	180	1.20	10	60	-40 ... +150	E34	
SKNa4	1300-1700	3.7	35	190	1.20	10	25	-40 ... +150	E6	

Discretes - Diodes - Leaded

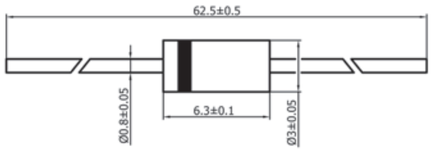
Type	V_{RRM} V	I_{FAV} @T_A A	T_A °C	I_{FSM} @T_A= 25°C A	V_F @ I_F T_j= 25°C V	I_F—V_F A	I_R @T_j= 25°C mA	$R_{th(j-L)}$ K/W	T_j °C	Case	Circuit
Schottky											
1N 5817 ... 1N 5819	20-40	1	50	40	0.75-0.9	3	1	45	-50 ... +150	DO-15	
SB 120 ... SB 1100	20-100	1	50	40	0.5-0.79	1	0.5	45	-50 ... +150	DO-15	
SB 220 ... SB 2100	20-100	2	50	50	0.5-0.79	2	0.5	45	-50 ... +150	DO-15	
1N 5820 ... 1N 5822	20-40	3	50	100	0.85-0.95	9	2	25	-50 ... +150	DO-201	
SB 320 ... SB 3100	20-100	3	50	100	0.5-0.79	3	0.5	25	-50 ... +150	DO-201	
SB 520 ... SB 5100	20-100	5	50	150	0.55-0.79	5	0.5	25	-50 ... +150	DO-201	
SB 820 ... SB 845	20-45	8	50	200	0.49	5	0.4	5	-50 ... +150	5,4 x 7,5	
SB 1220 ... SB 1245	20-45	12	50	280	0.45-0.48	5	0.5	4	-50 ... +150	5,4 x 7,5	
SB 1520 ... SB 1545	20-45	15	50	320	0.43	5	0.5	3	-50 ... +150	8 x 7,5	
SB 1520S ... SB 1540S	20-40	15	50	320	0.43	5	0.5	4	-50 ... +150	5,4 x 7,5	
SB 1520TL ... SB 1540TL	20-40	15	50	350	0.43	5	0.5	1.8	-50 ... +150	8 x 7,5 TL	
SB 2020TL ... SB 2040TL	20-40	20	50	550	0.39	5	0.5	1.8	-50 ... +150	8 x 7,5 TL	
SB2020 ... SB2040	20-40	20	50	550	0.39	5	0.5	2.5	-50 ... +150	8 x 7,5	
SB 2520 ... SB 2540	20-40	25	50	700	0.38	5	0.6	2.5	-50 ... +150	8 x 7,5	
SB 3020 ... SB 3040	20-40	30	50	700	0.37	5	0.6	2.5	-50 ... +150	8 x 7,5	
SB 3020TL ... SB 3040TL	20-40	30	50	700	0.37	5	0.6	1.7	-50 ... +150	8 x 7,5 TL	
High Temperature Schottky											
SBH 820 ... SBH 845	20-45	8	50	180	0.53	5	0.04	5	-50 ... +200	5,4 x 7,5	
SBH 1220 ... SBH 1245	20-45	12	50	280	0.51	5	0.05	4	-50 ... +200	5,4 x 7,5	
SBH 1520 ... SBH 1545	20-45	15	50	350	0.48	5	0.05	3	-50 ... +185	8 x 7,5	
SBH 1520S ... SBH 1545S	20-45	15	50	350	0.48	5	0.05	4	-50 ... +185	5,4 x 7,5	
SBH 2020 ... SBH 2045	20-45	20	75	400	0.45	5	0.065	3.2	-50 ... +185	8 x 7,8	
SBH 2020TL ... SBH 2045TL	20-45	20	50	650	0.45	5	0.065	1.8	-50 ... +185	8 x 7,5 TL	
SBH 2520 ... SBH 2540	20-40	25	50	700	0.45	5	0.1	2.5	-50 ... +175	8 x 7,5	
SBH 3020 ... SBH 3045	20-45	30	50	700	0.43	5	0.15	2.5	-50 ... +175	8 x 7,5	
SBH 3020TL ... SBH 3045TL	20-45	30	50	700	0.43	5	0.15	1.7	-50 ... +175	8 x 7,5 TL	

Type	V_{WM} V	I_D @T_A mA	P_{PPM} @T_A W	T_A °C	I_{FSM} @T_A= 25°C A	V_{BR} @I_T V	I_{T_VBR} mA	$R_{th(j-L)}$ K/W	T_j °C	Case	Circuit
Transient voltage supressor											
1.5 KE6.8 ... 1.5 KE440CA	5,5-376	0.005	1500	25	200	6.12-462	1-10	8	-50 ... +175	5,4 x 7,5	
5 KP6.5 ... 5 KP110CA	6,5-110	0.005	5000	25	400	7.22-140.5	5-50	4	-50 ... +175	8 x 7,5	
BZW 04-5V8 ... BZW 04-376B	5,8-376	0.005	400	25	40	6.45-462	1-10	15	-50 ... +175	DO-15	
BZW 06-5V8 ... BZW 06-376B	5,8-376	0.005	600	25	100	6.45-462	1-10	15	-50 ... +175	DO-15	
P4 KE6,8 ... P4 KE440CA	5.5-376	0.005	400	25	40	6.12-462	1-10	15	-50 ... +175	DO-15	
P6KE6,8...P6KE440CA, P6KE520C	5,5-423	0.005	600	25	100	6.12-570	1-10	15	-50 ... +175	DO-15	

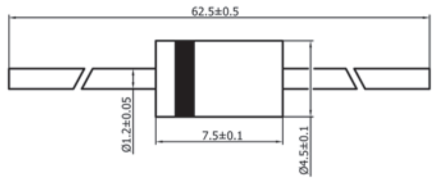
Discretes - Diodes - Leaded

Cases

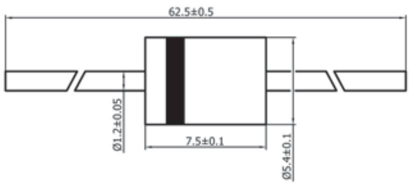
DO-15



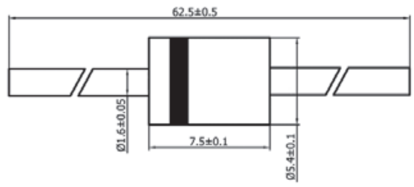
DO-201



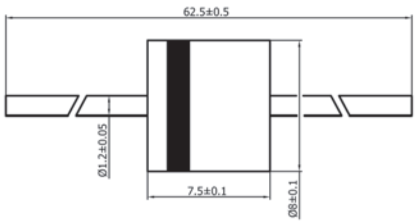
Ø 5,4 x 7,5



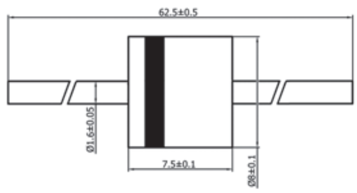
Ø 5,4 x 7,5 TL



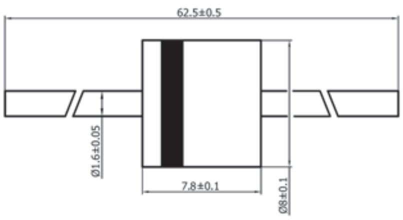
Ø 8 x 7,5



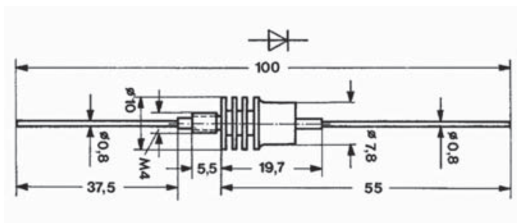
Ø 8 x 7,5 TL



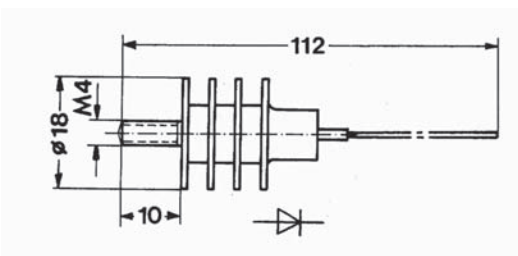
Ø 8 x 7,8 TL



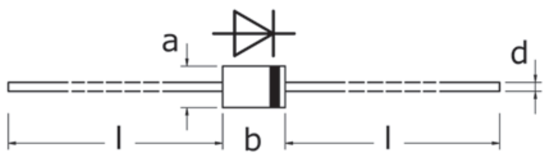
E5



E6



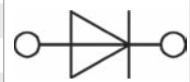
E33 / E34

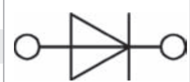


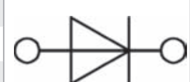
Cases	a	b	l	d
E 33	4,5	7	28	0,75
E 34	6	9	27	1,18

Dimensions in mm

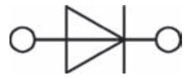
Discretes - Diodes - Surface Mount

Type	V_{RRM}	I_{FAV} @T_T	T_T	I_{FSM} @T_A= 25°C	V_F @ I_F T_j= 25°C	I_F_V_F	I_R @T_j= 25°C	$R_{th(j-a)}$	T_j	Case	Circuit
	V	A	°C	A	V	A	mA	K/W	°C		
Standard recovery											
S1 A ... S1 M	50-1000	1	100	30	1.10	1	0.005	30	-50 ... +150	SMA	
S1 T ... S1 Y	1300-2000	1	100	30	1.10	1	0.005	30	-50 ... +150	SMA	
SM 4001 ... SM 4007	50-1000	1	75	40	1.10	1	0.005	10	-50 ... +175	MELF	
SM 513, SM 516, SM 518, SM 2000	1300-2000	1	75	40	1.10	1	0.005	10	-50 ... +175	MELF	
S2 A ... S2 M	50-1000	2	100	50	1.15	2	0.005	15	-50 ... +150	SMB	
S2 SMA A ... S2 SMA M	50-1000	2	80	50	1.15	2	0.005	30	-50 ... +150	SMA	
S2 T ... S2 Y	1300-2000	2	100	50	1.15	2	0.005	15	-50 ... +150	SMB	
SM 5059 ... SM 5063	200-1000	2	50	50	1.10	2	0.005	10	-50 ... +175	MELF	
S3 A ... S3 M	50-1000	3	100	100	1.15	3	0.005	10	-50 ... +150	SMC	
S3 SMB A ... S3 SMB M	50-1000	3	90	100	1.15	3	0.005	15	-50 ... +150	SMB	
S3 T ... S3 Y	1300-2000	3	100	100	1.15	3	0.005	10	-50 ... +150	SMC	
SM 5400 ... SM 5408	50-1000	3	50	70	1.20	3	0.01	10	-50 ... +175	MELF	
S5 A ... S5 M	50-1000	5	100	225	1.15	5	0.01	15	-50 ... +150	SMC	

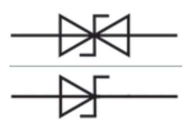
Type	V_{RRM}	t_{rr}	I_{FAV} @T_T	T_T	I_{FSM} @T_A= 25°C	V_F @ I_F T_j= 25°C	I_F_V_F	I_R @T_j= 25°C	$R_{th(j-a)}$	T_j	Case	Circuit
	V	ns	A	°C	A	V	A	mA	K/W	°C		
Fast recovery												
FR 1A ... FR 1M	50-1000	150-500	1	100	30	1.30	1	0.005	30	-50 ... +150	SMA	
FR1T ... FR1Y	1300-2000	500	1	100	20	1.80	1	0.01	30	-50 ... +150	SMA	
SA 154 ... SA 160	50-1000	300	1	100	35	1.30	1	0.005	15	-50 ... +175	MELF	
FR 2A ... FR 2M	50-1000	150-500	2	100	50	1.30	2	0.005	15	-50 ... +150	SMB	
FR2 SMA A...FR2 SMA M	50-1000	150-500	2	65	50	1.30	2	0.005	30	-50 ... +150	SMA	
FR2T ... FR2Y	1300-2000	500	2	100	50	1.80	2	0.01	15	-50 ... +150	SMB	
SA 261 ... SA 265	1200-2000	500	2	100	50	1.80	2	0.005	15	-50 ... +175	MELF	
FR 3 SMB A ... FR 3 SMB M	50-1000	150-500	3	80	100	1.30	3	0.005	15	-50 ... +150	SMB	
FR 3A ... FR 3M	50-1000	150-500	3	100	100	1.30	3	0.005	10	-50 ... +150	SMC	
FR3T ... FR3Y	1300-2000	500	3	100	100	1.80	3	0.01	10	-50 ... +150	SMC	
FR 5A ... FR 5M	50-1000	150-500	5	70	175	1.30	5	0.005	10	-50... +150	SMC	

Type	V_{RRM}	t_{rr}	I_{FAV} @T_T	T_T	I_{FSM} @T_A= 25°C	V_F @ I_F T_j= 25°C	I_F_V_F	I_R @T_j= 25°C	$R_{th(j-a)}$	T_j	Case	Circuit
	V	ns	A	°C	A	V	A	mA	K/W	°C		
Ultrafast recovery												
SUF 4001 ... SUF 4007-1200	50-1200	50-75	1	50	27	1-1.7	1	0.01	10	-50 ... +175	MELF	
US 1A ... US 1S	50-1200	50-75	1	100	30	1-1.7	1	0.01	30	-50 ... +150	SMA	
US 2A ... US 2S	50-1200	50-75	2	100	50	1-1.7	2	0.01	15	-50 ... +150	SMB	
US 2SMA A ... US 2SMA M	50-1000	50-75	2	50	50	1-1.7	2	0.01	30	-50 ... +150	SMA	
US 3SMB A ... US 3SMB M	50-1000	50-75	2.5	70	70	1-1.7	2.5	0.01	15	-50 ... +150	SMB	
US 3A ... US 3S	50-1200	50-75	3	100	100	1-1.7	3	0.01	10	-50 ... +150	SMC	

Discretes - Diodes - Surface Mount

Type	$V_{(BR)min.}$ V	t_{rr} ns	I_{FAV} @T_T A	T_T °C	I_{FSM} @T_A=25°C A	V_F @ I_F T_j=25°C V	I_{F}_V_F A	I_R @T_j=25°C mA	$R_{th(j-a)}$ K/W	T_j °C	Case	Circuit
Avalanche												
FRA 1A ... FRA 1M	50-1000	150-500	1	100	30	1,3	1	0.003	30	-50 ... +150	SMA	
SA 1A ... SA 1M	50-1000	-	1	100	30	1,1	1	0.001	30	-50 ... +150	SMA	
SAA 154 ... SAA 160	50-1000	300	1	100	35	1,3	1	0.015	15	-50 ... +175	MELF	
SAM 4001 ... SAM 4007	50-1000	-	1	75	40	1,1	1	0.015	10	-50 ... +175	MELF	
SUFA4001 ... SUFA4007	50-1000	50-75	1	50	27	1-1,7	1	0.005	10	-50 ... +175	MELF	
USA 1A ... USA 1M	50-1000	50-75	1	90	30	1-1,7	1	0.005	30	-50 ... +150	SMA	
FRA 2A ... FRA 2M	50-1000	150-500	2	100	50	1,3	2	0.003	15	-50 ... +150	SMB	
SA 2A ... SA 2 M	50-1000	-	2	100	50	1,15	2	0.0015	15	-50 ... +150	SMB	
USA 2A ... USA 2M	50-1000	50-75	2	90	50	1-1,7	2	0.01	15	-50 ... +150	SMB	
FRA 3A ... FRA 3M	50-1000	150-500	3	100	100	1,3	3	0.003	10	-50 ... +150	SMC	
SA 3A ... SA 3M	50-1000	-	3	100	100	1,15	3	0.0015	10	-50 ... +150	SMC	
USA 3A ... USA 3M	50-1000	50-75	3	90	100	1-1,7	3	0.01	10	-50 ... +150	SMC	

Type	V_{RRM} V	I_{FAV} @T_T A	T_T °C	I_{FSM} @T_A=25°C A	V_F @ I_F T_j=25°C V	I_{F}_V_F A	I_R @T_j=25°C mA	$R_{th(j-a)}$ K/W	T_j °C	Case	Circuit
Schottky											
SK 12 ... SK 110	20-100	1	100	30	0.5-0.85	1	0.5	30	-50 ... +150	SMA	
SM 5817 ... SM 5819	20-40	1	100	30	0.75-0.9	3	1	10	-50 ... +150	MELF	
SMS 120 ... SMS 1100	20-100	1	100	30	0.5-0.79	1	0.5	10	-50 ... +150	MELF	
SK 22 ... SK 210	20-100	2	100	50	0.5-0.85	2	0.5	15	-50 ... +150	SMB	
SMS 220 ... SMS 2100	20-100	2	100	50	0.5-0.79	2	0.5	10	-50 ... +150	MELF	
SK 32 ... SK 310	20-100	3	100	100	0.5-0.85	3	0.5	10	-50 ... +150	SMC	

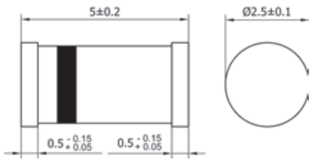
Type	V_{WM} V	I_D @T_A A	P_{PPM} @T_A W	T_A °C	I_{FSM} @T_A=25°C A	V_{BR} @I_T V	I_{T_VBR} mA	$R_{th(j-a)}$ K/W	T_j °C	Case	Circuit
Transient voltage supressor											
1,5 SMCJ 6,5 ... 1,5 SMCJ 180CA	6,5-150	0.000005	1500	25	100	7,2-231	1-10	10	-50 ... +150	SMC	
P4 SMAJ 6,5 ... P4 SMAJ 180CA	6,5-130	0.000005	400	25	40	7,2-231	1-10	30	-50 ... +150	SMA	
P6 SMBJ 6,5 ... P6 SMBJ 180CA	6,5-130	0.000005	600	25	100	7,2-231	1-10	15	-50 ... +150	SMB	
TGL 41-520C	423	0.000005	400	25	40	470-570	1	10	-50 ... +150	MELF	
SDA 2AK, SDA 4AK	0,5-1	0.001	300	25	-	0,8-2	1000	0	-50 ... +150	MELF	
TGL 41-6,8 ... TGL 41-400CA	5,5-342	0.001	400	25	40	6,12-420	1-10	10	-50 ... +150	MELF	

Type	V_Z @I_{ZT} V	I_{ZT} @T_A A	P_{tot} @T_A W	T_A °C	V_R @ I_R T_j=25°C V	I_{R}_V_R µA	$R_{th(j-a)}$ K/W	T_j °C	Case	Circuit
Zener										
ZMY 1 ... ZMY 200 (1,3W)	0,71-212	0.0025	1.3	50	1,5-90	0,5-1	10	-50 ... +150	MELF	
SMZ 1 ... SMZ 200 (2W)	0,71-212	0.005	2	50	1,5-90	1	10	-50 ... +150	MELF	
SZ3C 1 ... SZ3C 200 (3W)	0,71-212	0.005	3	50	1,5-90	1	10	-50 ... +150	MELF	
Z1 SMA 1 ... Z1 SMA 100 (1W)	0,71-106	0.005	1	50	1,5-75	1	30	-50 ... +150	SMA	
Z2 SMB 1 ... Z2 SMB 200 (2W)	0,71-212	0.005	2	50	1,5-90	1	15	-50 ... +150	SMB	
Z3 SMC 1 ... Z3 SMC 200 (3W)	0,71-212	0.005	3	50	1,5-90	1	10	-50 ... +150	SMC	

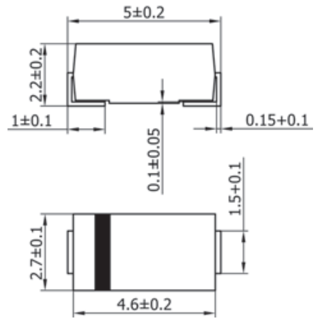
Discretes - Diodes - Surface Mount

Cases

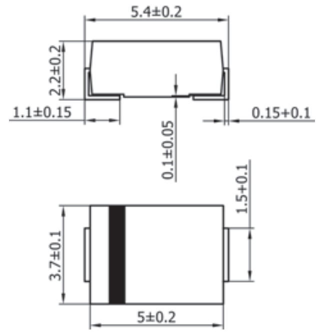
MELF



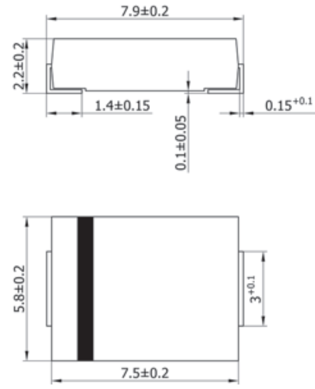
SMA



SMB

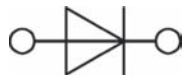
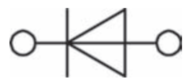


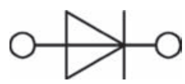
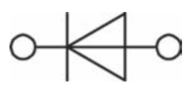
SMC



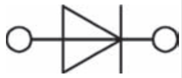
Dimensions in mm

Discretes - Diodes - Stud Screw Fit

Type	V_{RRM} V	I_{FAV} @T_C A	T_C °C	I_{FSM} @T_j= 25°C A	V_F @ I_F T_j= 25°C V	I_F–V_F A	$R_{th(j-c)}$ K/W	T_j °C	also available with UNF-thread	Case	Circuit
Standard recovery											
SKN 20	400-1600	20	125	375	1.55	60	2	-40 ... +180	yes	E9	
SKN 26	400-1600	25	100	375	1.55	60	2	-40 ... +180	yes	E8	
SKN 45	400-1600	45	125	700	1.60	150	0.85	-40 ... +180	yes	E12	
SKN 70	400-1600	70	125	1150	1.50	200	0.55	-40 ... +180	yes	E12	
SKN 71	400-1600	70	125	1150	1.50	200	0.55	-40 ... +180	yes	E11	
SKN 100	400-1800	100	120	1750	1.55	400	0.45	-40 ... +180	yes	E13	
SKN 130	400-1800	130	125	2500	1.50	500	0.35	-40 ... +180	yes	E14	
SKN 240	400-1800	240	125	6000	1.40	750	0.2	-40 ... +180	yes	E15	
SKN 320	400-1600	320	125	9000	1.35	1000	0.16	-40 ... +180	yes	E16	
SKN 400	1800-3000	400	100	9000	1.45	1200	0.11	-40 ... +160	yes	E17	
SKR 20	400-1600	20	125	375	1.55	60	2	-40 ... +180	yes	E9	
SKR 26	400-1600	25	100	375	1.55	60	2	-40 ... +180	yes	E8	
SKR 45	400-1600	45	125	700	1.60	150	0.85	-40 ... +180	yes	E12	
SKR 70	400-1600	70	125	1150	1.50	200	0.55	-40 ... +180	yes	E12	
SKR 71	400-1600	70	125	1150	1.50	200	0.55	-40 ... +180	yes	E11	
SKR 100	400-1800	100	120	1750	1.55	400	0.45	-40 ... +180	yes	E13	
SKR 130	400-1800	130	125	2500	1.50	500	0.35	-40 ... +180	yes	E14	
SKR 240	400-1800	240	125	6000	1.40	750	0.2	-40 ... +180	yes	E15	
SKR 320	400-1600	320	125	9000	1.35	1000	0.16	-40 ... +180	yes	E16	

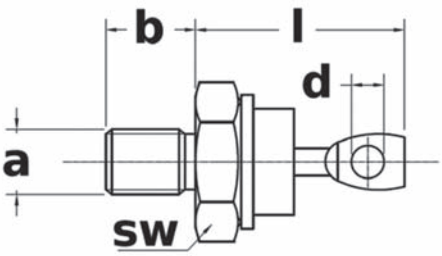
Type	V_{RRM} V	t_{rr} ns	I_{FAV} @T_C A	T_C °C	I_{FSM} @T_j= 25°C A	V_F @ I_F T_j= 25°C V	I_F–V_F A	$R_{th(j-c)}$ K/W	T_j °C	also available with UNF-thread	Case	Circuit
Fast recovery												
SKN 2F17	400-1000	440	17	113	450	2.15	50	1.2	-40 ... +150	yes	E7	
SKN 3F20	800-1200	600	20	104	375	2.15	50	1.2	-40 ... +150	yes	E7	
SKN 2F50	400-1000	600	50	105	1100	1.80	50	0.5	-40 ... +150	yes	E10	
SKN 60F	1200-1700	2100	60	100	1400	1.75	150	0.5	-40 ... +150	yes	E10	
SKN 135F	800-1200	1900	135	100	2500	1.95	300	0.2	-40 ... +150	yes	E14	
SKN 136F	800-1200	1900	135	100	2500	1.95	300	0.2	-40 ... +150	yes	E31	
SKN 140F	1200-1700	2000	140	100	2500	1.80	300	0.2	-40 ... +150	yes	E14	
SKN 141F	1200-1700	2000	140	100	2500	1.80	300	0.2	-40 ... +150	yes	E31	
SKR 2F17	400-1000	440	17	113	450	2.15	50	1.2	-40 ... +150	yes	E7	
SKR 3F20	800-1200	600	20	104	375	2.15	50	1.2	-40 ... +150	yes	E7	
SKR 2F50	400-1000	600	50	95	800	1.80	50	0.65	-40 ... +150	yes	E10	
SKR 60F	1200-1700	2100	60	100	1400	1.75	150	0.5	-40 ... +150	yes	E10	
SKR 135F	800-1200	1900	135	100	2500	1.95	300	0.2	-40 ... +150	yes	E14	
SKR 136F	800-1200	1900	135	100	2500	1.95	300	0.2	-40 ... +150	yes	E31	
SKR 140F	1200-1700	2000	140	100	2500	1.80	300	0.2	-40 ... +150	yes	E14	
SKR 141F	1200-1700	2000	140	100	2500	1.80	300	0.2	-40 ... +150	yes	E31	

Discretes - Diodes - Stud Screw Fit

Type	V_{RRM}	I_{FAV} @T_C	T_C	I_{FSM} @T_j= 25°C	V_F @ I_F T_j= 25°C	I_F—V_F	$R_{th(j-c)}$	T_j	also available with UNF-thread	Case	Circuit
	V	A	°C	A	V	A	K/W	°C			
Avalanche											
SKNa 20	1300-1700	20	93	375	1.55	60	2	-40 ... +150	no	E9	
SKNa 22	3600-5000	25	104	450	1.95	60	1	-40 ... +160	no	E42	
SKNa 47	3600-5000	45	106	700	1.80	100	0.6	-40 ... +160	no	E43	
SKNa 102	3600-5000	125	80	1900	1.90	300	0.3	-40 ... +160	no	E44	
SKNa 202	3600-5000	200	80	3800	1.95	600	0.2	-40 ... +160	no	E45	
SKNa 402	3600-5000	400	88	7800	1.85	1200	0.1	-40 ... +160	no	E46	

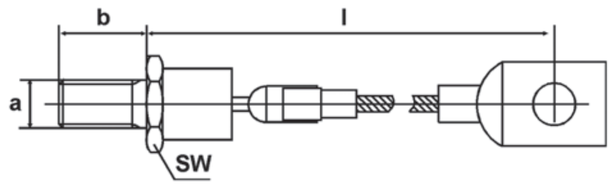
Cases

E7 / E8 / E10 / E11 / E31



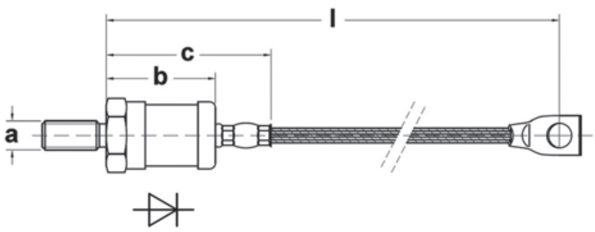
Cases	a	b	d	l	sw
E 7	M 5	11	2,7	22	11
E 8	M 6	11	2,7	21,5	11
E 10	M 6	11	4	25	17
E 11	M 8	11	4	25,5	17
E 31	M 12	18	8,4	55	24

E9 / E12 ... E17



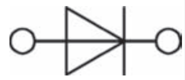
Cases	a	b	l	SW
E 9	M 6	11	130	11
E 12	M 8	11	135	17
E 13	M 12	18	165	24
E 14	M 12	18	165	24
E 15	M 16 x 1,5	20	190	32
E 16, E 17	M 24 x 1,5	20	230	41

E 42 / E 43 / E 44 / E 45 / E 46



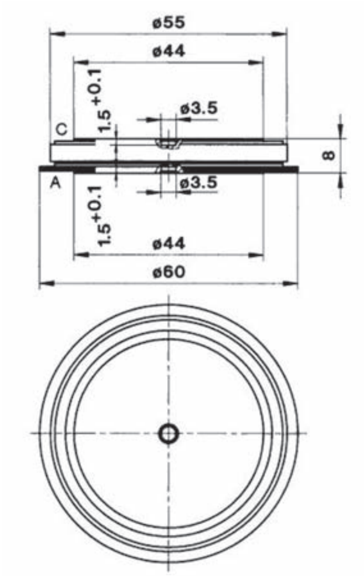
Cases	a	b	c	l
E 42	M 6	28.5	45	150
E 43	M 8	32	54	160
E 44	M 12	38	57	185
E 45	M 16 x 1,5	48	70	205
E 46	M 24 x 1,5	54	82	250

Dimensions in mm

Type	V_{RRM} V	I_{FAV} @T_C A	T_C °C	I_{FSM} @T_j= 25°C A	V_F @ I_F T_j= 25°C V	I_F—V_F A	$R_{th(j-c)}$ per chip K/W	T_j °C	Case	Circuit
SKN 4000	200-600	4000	50	60000	1.30	14000	0.03	-40 ... +180	E35	
SKN 6000	200-600	6000	85	60000	1.30	14000	0.012	-40 ... +180	E35	

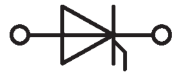
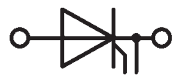
Cases

E35



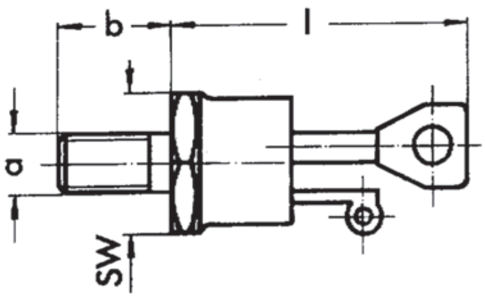
Dimensions in mm

Discretes - Thyristor - Stud Screw Fit

Type	V_{RRM} V_{DRM}	I_{TAV} @T_C	T_C	I_{TSM} @T_j= 25°C	V_T @ I_T T_j= 25°C	$I_{T\_}V_T$	$R_{th(j-c)}$ @sin. 180°	T_j	also available with UNF-thread	Case	Circuit
	V	A	°C	A	V	A	K/W	°C			
SKT 10	600-1200	10	111	250	1.6	30	1.3	-40 ... +130	no	B1	
SKT 16	400-1800	16	104	370	2.4	75	0.9	-40 ... +130	yes	B2	
SKT 24	400-1800	24	95	450	1.9	75	0.9	-40 ... +130	yes	B2	
SKT 40	400-1800	40	80	700	1.95	120	0.66	-40 ... +130	no	B3	
SKT 50	600-1800	50	78	1050	1.8	120	0.6	-40 ... +130	yes	B3	
SKT 55	400-1800	55	92	1300	1.8	200	0.47	-40 ... +130	no	B5	
SKT 80	600-1800	80	85	1700	2.25	300	0.28	-40 ... +130	yes	B5	
SKT 100	400-1800	100	85	2000	1.75	300	0.28	-40 ... +130	yes	B5	
SKT 130	400-1600	130	85	3500	2.25	500	0.18	-40 ... +130	no	B6	
SKT 160	400-1600	160	84	4300	1.75	500	0.18	-40 ... +130	yes	B6	
SKT 250	400-1600	250	85	7000	1.65	800	0.123	-40 ... +130	no	B7	
SKT 300	400-1600	300	93	11000	1.45	800	0.096	-40 ... +130	yes	B7	

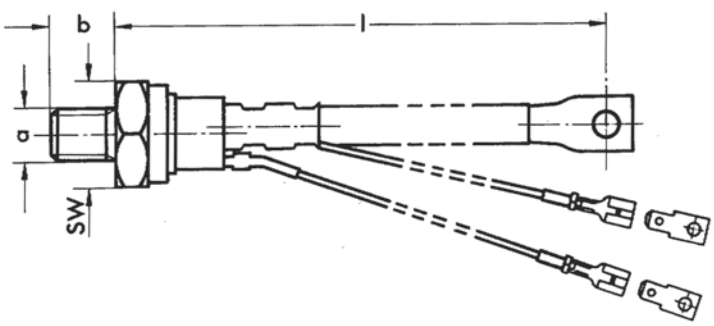
Cases

B1 ... B3



Cases	a	b	l	SW
B 1	M 5	11	20,3	11
B 2	M 6	11	30	14
B 3	M 8	11	33,5	17

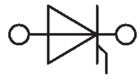
B5 ... B7



Cases	a	b	l	SW
B 5	M 12	18	160	24
B 6	M 16 x 1,5	20	190	32
B 7	M 24 x 1,5	20	230	41

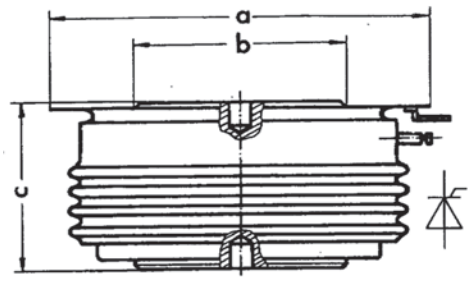
Dimensions in mm

Discretes - Thyristor - Capsule

Type	V_{RRM} V_{DRM} V	I_{TAV} @T_C A	T_C °C	I_{TSM} @T_j= 25°C A	V_T @ I_T T_j= 25°C V	I_T–V_T A	$R_{th(j-c)}$ @sin. 180° K/W	T_j °C	Case	Circuit
SKT 240	400-1800	240	93	5000	2.3	1000	0.072	-40 ... +125	B8	
SKT 340	800-1800	340	82	5700	1.9	1000	0.072	-40 ... +125	B8	
SKT 491	400-1800	490	80	8000	2.1	1500	0.047	-40 ... +125	B11	
SKT 493	400-1800	490	80	8000	2.1	1500	0.047	-40 ... +125	B11a	
SKT 551	800-1800	550	85	9000	1.65	1500	0.047	-40 ... +125	B11	
SKT 553	400-1800	550	85	9000	1.65	1500	0.047	-40 ... +125	B11a	
SKT 600	800-1800	600	86	11500	2	2400	0.04	-40 ... +125	B10	
SKT 760	800-1800	760	80	15000	1.65	2400	0.04	-40 ... +125	B10	
SKT 1000	1200-1600	1000	85	19000	2	3600	0.022	-40 ... +125	B14	
SKT 1200	1200-1800	1200	85	30000	1.65	3600	0.022	-40 ... +125	B14	

Cases

B8 ... B20



Cases	a	b	c
B 8	41	19	14
B 10	57,3	34	26
B 11	41	25	14
B 11a	41	25	14
B 14	73	47	26

Dimensions in mm

Discretes - Chips - SEMICELL

Type	V_{RRM} V	I_F @T_j= 150°C A	I_{FSM} @T_j= 150°C 10ms A	V_F @T_j= 25°C V	I_F @ V_F T_j= 25°C A	Q_{rr} @T_j= 125°C µC
600 V - Freewheeling Diodes CAL I3 Fast						
SKCD 06 C 060 I3	600	15	-	1.35	10	0.7
SKCD 09 C 060 I3	600	20	100	1.35	15	1.2
SKCD 18 C 060 I3	600	30	200	1.35	25	2.5
SKCD 31 C 060 I3	600	50	440	1.35	50	3.3
SKCD 47 C 060 I3	600	80	720	1.35	85	5.5
SKCD 61 C 060 I3	600	100	1000	1.35	110	7
SKCD 81 C 060 I3	600	150	1260	1.35	155	8.5
SKCD 121 C 060 I3	600	210	2100	1.35	245	10.7
1200 V - Freewheeling Diodes CAL I3 Fast						
SKCD 06 C 120 I3	1200	10	-	2.00	5	-
SKCD 11 C 120 I3	1200	15	-	2.00	10	-
SKCD 18 C 120 I3	1200	25	180	2.00	15	2.7
SKCD 23 C 120 I3	1200	30	250	2.00	25	3.7
SKCD 31 C 120 I3	1200	40	350	2.00	35	4.5
SKCD 47 C 120 I3	1200	55	550	2.00	55	8
SKCD 61 C 120 I3	1200	75	720	2.00	70	11
SKCD 81 C 120 I3	1200	100	900	2.00	100	15
SKCD 121 C 120 I3	1200	150	-	2.00	155	-
1700 V - Freewheeling Diodes CAL Fast						
SKCD 47 C 170 I	1700	55	550	2.05	55	15
SKCD 61 C 170 I	1700	75	720	2.05	75	19

Type	V_{RRM} V	I_F @T_j= 175°C A	I_{FSM} @T_j= 150°C 10ms A	V_F @T_j= 25°C V	I_F @ V_F T_j= 25°C A	E_{off} @T_j= 150°C mJ
1200 V - Freewheeling Diodes CAL I4 Fast						
SKCD 08 C 120 I4F	1200	8	36	2.33	8	0.4
SKCD 11 C 120 I4F	1200	15	65	2.38	15	0.6
SKCD 16 C 120 I4F	1200	25	100	2.41	25	1
SKCD 22 C 120 I4F	1200	35	170	2.30	35	1.6
SKCD 31 C 120 I4F	1200	50	270	2.22	50	2.6
SKCD 46 C 120 I4F	1200	75	430	2.17	75	4.2
SKCD 46 C 120 I4F R	1200	75	430	2.17	75	4.2
SKCD 53 C 120 I4F	1200	100	550	2.20	100	5.4
SKCD 81 C 120 I4F	1200	150	900	2.14	150	8.7

Type	V_{RRM} V	I_F @T_j= 175°C A	I_{FSM} @T_j= 150°C 10ms A	V_F @T_j= 25°C V	I_F @ V_F T_j= 25°C A	Q_{rr} @T_j= 150°C µC
600 V - Freewheeling Diodes CAL High Density						
SKCD 04 C 060 I HD	600	10	65	1.35	7	0.89
SKCD 06 C 060 I HD	600	20	95	1.35	12	0.93
SKCD 09 C 060 I HD	600	30	160	1.35	19	1.6
SKCD 16 C 060 I HD	600	50	320	1.35	37	5.64
SKCD 24 C 060 I HD	600	75	395	1.35	60	7.8
SKCD 42 C 060 I HD	600	100	810	1.35	110	14
SKCD 61 C 060 I HD	600	150	1080	1.35	160	22
SKCD 81 C 060 I HD	600	200	1310	1.35	230	32

Type	V_{RRM} V	I_F @T_j= 150°C A	I_{FSM} @T_j= 150°C 10ms A	V_F @T_j= 25°C V	I_F @ V_F T_j= 25°C A	Q_{rr} @T_j= 125°C µC
1200 V - Freewheeling Diodes CAL High Density						
SKCD 06 C 120 I HD	1200	6	55	1.50	5	1.4
SKCD 11 C 120 I HD	1200	15	125	1.50	12	3.3
SKCD 14 C 120 I HD	1200	20	170	1.50	15	4.2
SKCD 18 C 120 I HD	1200	25	200	1.50	20	5
SKCD 31 C 120 I HD	1200	55	480	1.50	45	10
SKCD 47 C 120 I HD	1200	85	640	1.50	70	12
SKCD 61 C 120 I HD	1200	115	900	1.50	90	18
SKCD 81 C 120 I HD	1200	160	1100	1.50	130	23
1700 V - Freewheeling Diodes CAL High Density						
SKCD 47 C 170 I HD	1700	75	650	1.73	75	19
SKCD 61 C 170 I HD	1700	100	710	1.73	100	26
SKCD 81 C 170 I HD	1700	150	1070	1.73	150	44

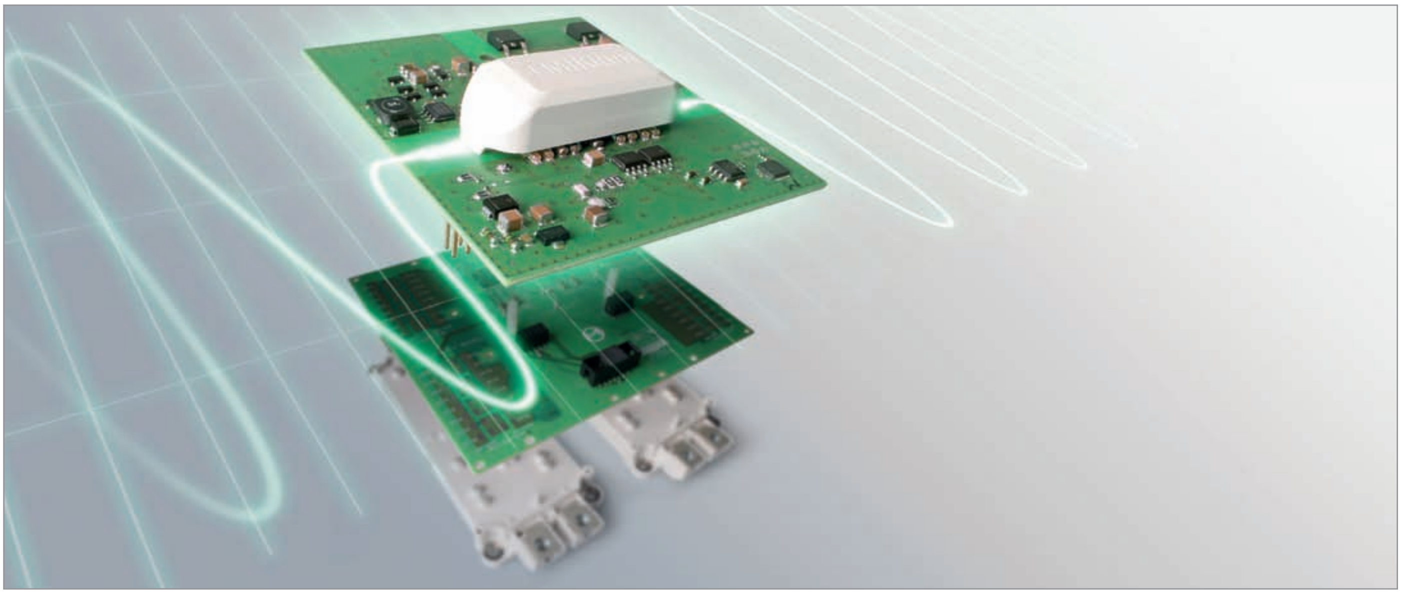
Discretes - Chips - SEMICELL

Type	solderable	V_{RRM}	$I_{F(DC)}$ @T_j= 150°C	I_{FSM} @T_j= 150°C 10ms	V_F @T_j= 25°C	I_F @ V_F T_j= 25°C	t_{rr} @T_j= 25°C 10ms
		V	A	A	V	A	µs
1600 V - Rectifier							
SKR 3,5 Qu bond	on request	1600	25	200	1	8	20
SKR 4,2 Qu bond	on request	1600	35	270	1	13	20
SKR 4,8 Qu bond	yes	1600	45	350	1	18	21
SKR 5,6 Qu bond	on request	1600	50	490	1	25	22
SKR 6,2 Qu bond	yes	1600	65	600	1	33	22
SKR 7,0 Qu bond	on request	1600	75	890	1	45	23
SKR 8,9 Qu bond	yes	1600	140	1380	1	77	26
SKR 10,3 Qu bond	yes	1600	170	1650	1	106	29
SKR 12,4 Qu bond	yes	1600	235	2300	1	160	34
SKR 15,2 Qu bond	on request	1600	330	3800	1	245	42
SKR 16,3 x 18,2 Qu bond	on request	1600	365	5100	1	320	49
SKR 18,2 Qu bond	on request	1600	380	5500	1	360	53
SKR 22,4 Qu bond	on request	1600	770	9450	1	550	72

Type	solderable	V_{RRM} V_{DRM}	$I_{T(DC)}$ @T_c=80°C, T_j=130°C	I_{TSM} @T_j= 130°C 10ms	V_{GT} @T_j= 25°C	I_{GT} @T_j= 25°C	t_q @T_j= 130°C 10ms
		V	A	A	V	A	µs
1600 V - Thyristor Central Gate							
SKT 8,9 Qu ZG bond.	on request	1600	105	1000	1.98	100	150
SKT 10,3 Qu ZG bond.	on request	1600	125	1250	1.98	100	150
SKT 13,5 Qu ZG bond.	on request	1600	185	2300	1.98	100	135
SKT 15,2 Qu ZG bond.	yes	1600	215	3200	1.98	100	150
SKT 18,2 Qu ZG bond.	on request	1600	250	5000	1.98	100	150
SKT 24,3 Qu ZG bond.	on request	1600	480	8200	1.98	150	150
1600 V - Thyristor Corner Gate							
SKT 5,6 Qu RG bond.	on request	1600	60	280	1.98	100	150
SKT 7,0 Qu RG bond.	on request	1600	75	450	1.98	100	150
SKT 8,9 Qu RG bond.	yes	1600	105	1000	1.98	100	150
SKT 10,3 Qu RG bond.	on request	1600	125	1250	1.98	100	150
SKT 12,4 Qu RG bond.	yes	1600	165	1800	1.98	100	150

SKYPER®

Robust IGBT Driver



Applications

SKYPER 32 is solid driving in x-ray devices, industrial drives and process control applications. SKYPER 42 meets the requirements of induction heating/ welding applications that call for high currents, durable solar inverters and variable industrial motor drives between 300 kW to 1.5 MW. The powerful SKYPER 52 is ideal for use in high-power applications such as wind turbines. SKYPER drivers are highly robust two-channel IGBT drivers used to control 50 - 9000 Amp IGBT modules. Boasting a mean time between failures of more than two million hours, the service life of this driver is triple that of standard IGBT drivers. SKYPER 32, 42 and 52 can drive 600 V, 1200 V and 1700 V IGBT modules.

Product range

SKYPER 32 R UL/ 32 PRO R UL/ 32 R/ 32 PRO R:	50 mA/ 15 A	50 kHz
SKYPER42 R:	150 mA/ 30 A	100 kHz
SKYPER 52 R:	300 mA/ 50 A	100 kHz

Benefits

Robust driving technology

- Integrated power and signal transformer provide galvanic insulation
- Internal power supply
- Low coupling capacitance with 100 kV/dt ruggedness
- Steady stabilized gate voltage for safe switching characteristic
- Dynamic short-circuit protection, soft turn-off, dead-time generation and voltage monitoring
- EMC with unique interlayer connection and short-pulse suppression
- SKYPER 52 works as a digital driver, providing differential inputs, digital signal transmission and IntelliOff to rule out voltage spikes

Easy assembly with customized adaptor boards

- Adaptor boards for paralleling SEMiX 3S/ 4S modules, SKiM modules and wire-bonded modules like SEMITRANS
- Decoupled and symmetric gate control to reduce current and voltage peaks
- Assembly service for gate resistors and VCE components for adaptor boards on request

Driver Electronics - SEMIDRIVER

Type	Channels	V_{CE} V	$V_{G(on)}$ V	$V_{G(off)}$ V	$I_{outPEAK}$ A	$Q_{out/pulse}$ µC	f_{max} kHZ	V_{isolIO} kV	dv/dt kV/µs
Driver									
SKHI 10/12 R	1	1200	15	-8	8	9.6	100	2500	75
SKHI 10/17 R	1	1700	15	-8	8	9.6	100	4000	75
SKHI 23/12 R	2	1200	15	-8	8	4.8	100	2500	75
SKHI 23/17 R	2	1700	15	-8	8	4.8	100	4000	75
SKHIT 01 R [1]	3	528	-	-	-	-	10	2500	-
Driver Core									
SKHI 21A R [2]	2	1200	15	0	8	4	50	2500	50
SKHI 22 A/B H4 R	2	1700	15	-7	8	4	50	4000	50
SKHI 22 A/B R	2	1200	15	-7	8	4	50	2500	50
SKHI 24 R	2	1700	15	-8	15	5	50	4000	50
SKYPER 32 PRO R	2	1700	15	-7	15	6.3	50	4000	50
SKYPER 32 PRO R UL	2	1700	15	-7	15	6.3	50	4000	50
SKYPER 32 R	2	1700	15	-7	15	2.5	50	4000	50
SKYPER 32 R UL	2	1700	15	-7	15	2.5	50	4000	50
SKYPER 42 R	2	1700	15	-8	30	50	100	4000	100
SKYPER 52 R	2	1700	15	-15	50	100	100	4000	100
SKHI 61 R	6	900	14.9	-6.5	2	1	50	2500	15
SKHI 71 R	7	900	14.9	-6.5	2	1	50	2500	15
Adaptor Board									
Board 1 SKYPER 32 R	2	1700	15	-7	15	2.5	50	4000	50
Board 1 SKYPER 32PRO R	2	1700	15	-7	15	6.3	50	4000	50
Board 2 // 4S SKYPER 42 R	2	1700	15	-8	30	50	100	4000	100
Board 2 generic SKYPER 42 R	2	1700	15	-8	30	50	100	4000	100
Board 2//3S SKYPER 42 R	2	1700	15	-8	30	50	100	4000	100
Board 2s SKYPER 32 R	2	1700	15	-7	15	2.5	50	4000	50
Board 2s SKYPER 32PRO R	2	1700	15	-7	15	6.3	50	4000	50
Board 3s SKYPER 32 R	2	1700	15	-7	15	2.5	50	4000	50
Board 3s SKYPER 32PRO R	2	1700	15	-7	15	6.3	50	4000	50
Board 4s SKYPER 32 R	2	1700	15	-7	15	2.5	50	4000	50
Board 4s SKYPER 32PRO R	2	1700	15	-7	15	6.3	50	4000	50

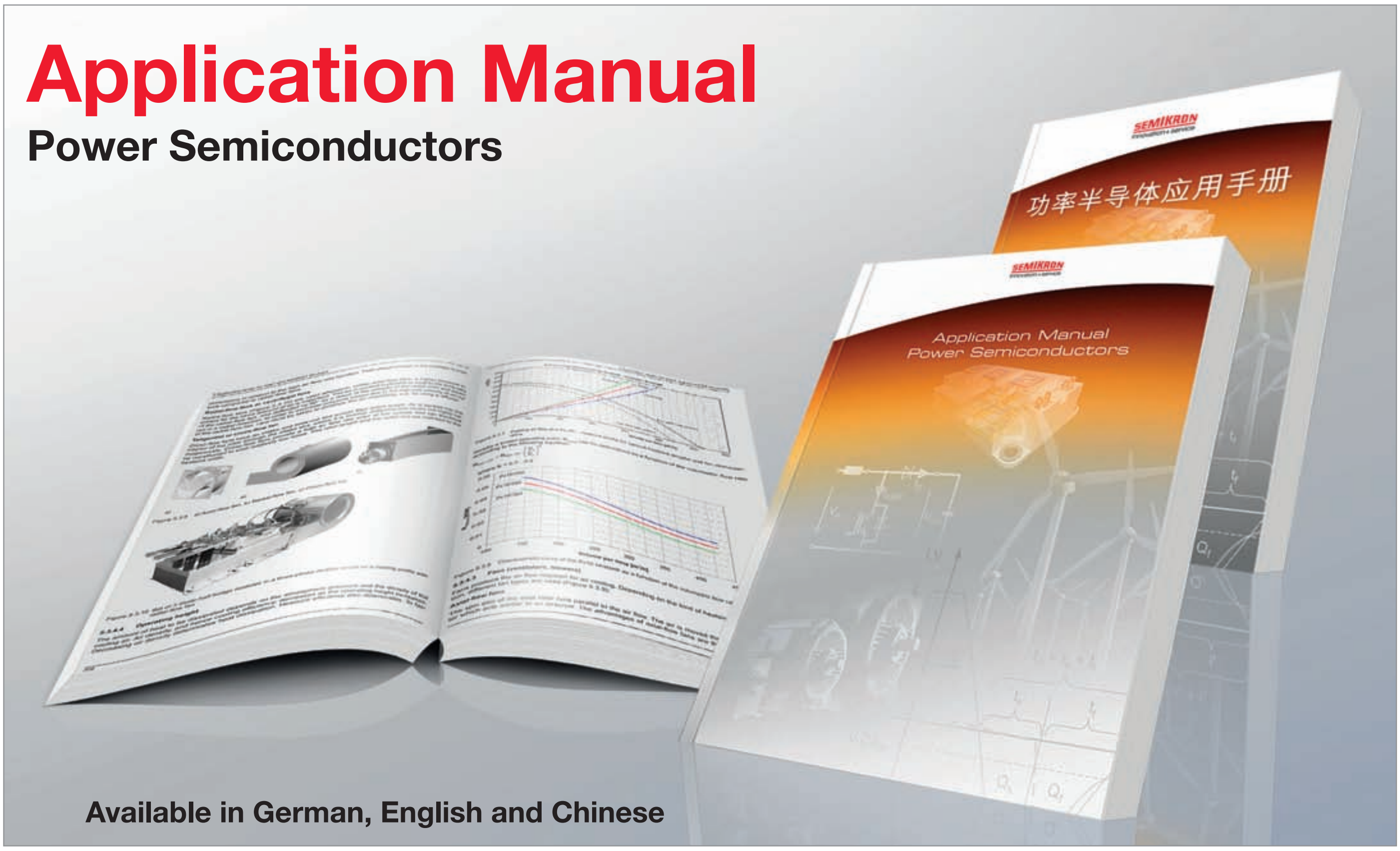
Footnotes

1) Thyristor Driver

2) MOSFET Driver

Application Manual

Power Semiconductors



465 pages of acquired knowledge

IGBT´s and MOSFET´s integrated in power modules are the key components of power electronic circuits today and are continuously finding their way into new fields of application. This goes hand in hand with the ever increasing call for line rectifier diodes and thyristors as a cost-effective way of connecting the circuits to the power grid. The aim of the application manual is to provide users with support in selecting and using such devices. The manual contains basic background knowledge on semiconductors in order to enable a better understanding of application possibilities and limits. More in-depth explanations are given on packaging and assembly technologies, because of the major influence they have on module properties and limitations in field applications. Statements on reliability data, life cycle analyses and key test processes round off the chapter. The application manual also explains the structure of datasheets and provides notes to help users better understand datasheet parameters.

The Application Manual contains detailed application-related information on electrical configuration under important operating conditions, driver and protection elements for semiconductors; thermal dimensioning and cooling, tips on parallel and series connection, assembly tips for optimized power layouts with regard to parasitic elements and the requirements arising from specific ambient conditions.

This book is written for users and provides help with component selection and design-in work. It couples a vast wealth of experience with detailed practical knowledge, the result being a vast pool of information which up till now has been spread across various individual articles or in the minds of experts only.

Can be ordered at
www.sindopower.com

Spring integration
Wire bond-free, solder-free, thermal paste-free

Applications

SEMIKRON has successfully established its SKiN® packaging technology and is now combining it with spring-contact technology for even better results. These two systems are planned mainly in electric vehicle and wind turbine applications.

Benefits

SKiN® technology is a flexible foil used in place of wire bonds. In combination with sinter technology, the SKiN® technology can help double inverter power density to 3 A/cm^2, leading to a 35 % reduction in inverter volume. This high power density requires space-saving and uncomplicated means of connecting the power components with the driver unit. The driver terminals thus use spring contacts affixed to the surface of the flexible foil. SEMIKRON looks back on ten years of experience with spring-contact technology, with more than 500 million SEMIKRON spring contacts in field applications today. The new connection technology also does away with thermal paste, using a sintered layer instead of thermal paste and soldered base plate. Thermal paste is responsible for around 30 % of the overall thermal resistance in an electronic system, which is why it is a key factor in the electric and thermal dimensioning of a power electronics system. With SKiN® technology, the thermal paste layer between the PCB and heat sink is replaced by a silver sinter layer, improving thermal conductivity between chip and heat sink by 35 %.

Systems for e-vehicles

SKAI® 2 IGBT

600V/1200V
300A

SKAI® 2 MOSFET Single

100V/150V/200V
200A – 400A

SKAI® 2 MOSFET Dual

100V/150V/200V
150A – 400A

I_D, I_C [A] 150 200 300 400

SKAI™ 2

3-phase inverter systems up to 250 kVA for electric vehicle applications

Applications

SEMIKRON's SKAI2 product platform is predestined for use in automotive applications. The systems are designed to operate with battery voltages of 24 - 800 V, output power ratings of 10 - 250 kVA, and are developed in line with the latest automotive and system qualification standards. The standard systems are supplied with low-voltage MOSFETs or high-voltage IGBTs in single or dual configuration.

Product range

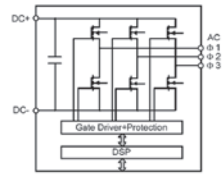
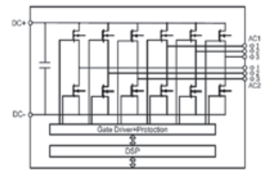
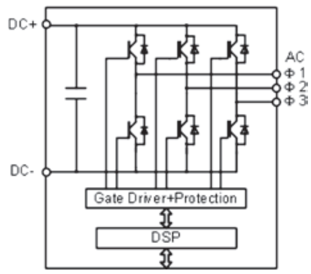
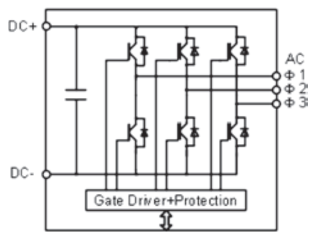
The IGBT-based SKAI2 is available as watercooled 3-phase inverter in voltage classes 600 V or 1200 V, with or without DSP, with an output power of up to 250 kVA. The MOSFET-based SKAI2 is available as forced-air cooled, water-cooled or baseplate type, in voltage classes 100 V, 150 V or 200 V, in single or dual 3-phase inverter topology with an output power of up to 55 kVA.

Benefits

The high-voltage SKAI2 is available as a water-cooled 600 V or 1200 V IGBT-based 3-phase inverter system. It has been optimized for electrification of commercial vehicle drive trains. This system is based on the established, sintered, and 100 % solder-free power semiconductor technology for an output power of up to 250 kVA. It features a polypropylene film DC-link capacitor, driver electronics, a state of the art DSP controller, EMC filters, and sensors for current, voltage and temperature monitoring. All system components will be protected by a waterproof IP67 metal case against environmental impacts. The system can communicate with the vehicle master controller via CANbus.

The low-voltage SKAI2 MOSFET 3-phase inverter systems are available in different configurations regarding cooling, battery voltage and topology. It is mainly used in medium power electric vehicle applications with motor power of up to 55 kVA. They have extremely short bus-bar connections between the MOSFET dice and multicell DC bus capacitor, leading to low inductance in the commutation circuit. This results in a switching behavior with very low voltage overshoot. The utilization of maximum MOSFET drain-source voltage as well as power density is high. The inverter is integrated in a waterproof IP67 enclosure but with the cost-effective solution of leaving the power terminals open. Thermal and electrical contact of SKAI2 systems are based on SKiiP pressure-contact technology. This results in extended service life and high load cycling capability.

Systems - SKAI2

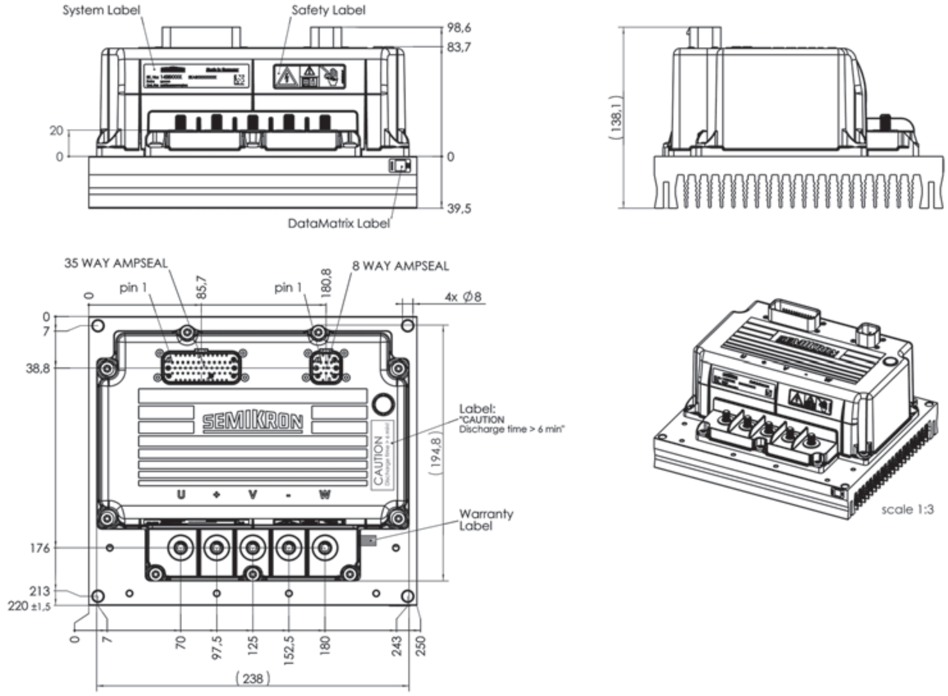
Type	$V_{battery\ (max)}$ V	I_{Cnom} A	Topology	Cooling	DSP	Case	Circuit
MOSFET - Three-phase inverter							
SKAI 60 A2 MD10-L [1)]	72	400	3-Phase	Forced Air	Yes	1	
SKAI 60 A2 MD10-P [1)]	72	400	3-Phase	Baseplate	Yes	3	
SKAI 70 A2 MD15-L [1)]	115	350	3-Phase	Forced Air	Yes	1	
SKAI 70 A2 MD15-W [1)]	115	400	3-Phase	Liquid	Yes	2	
SKAI 50 A2 MD20-L [1)]	160	300	3-Phase	Forced Air	Yes	1	
SKAI 50 A2 MD20-W [1)]	160	350	3-Phase	Liquid	Yes	2	
SKAI 60 A2 MM10-L [1)]	72	250	Dual 3-Phase	Forced Air	Yes	4	
SKAI 70 A2 MM15-L [1)]	115	200	Dual 3-Phase	Forced Air	Yes	4	
SKAI 70 A2 MM15-P [1)]	115	200	Dual 3-Phase	Baseplate	Yes	6	
SKAI 70 A2 MM15-W [1)]	115	300	Dual 3-Phase	Liquid	Yes	5	
SKAI 50 A2 MM20-L [1)]	160	150	Dual 3-Phase	Forced Air	Yes	4	
SKAI 50 A2 MM20-W [1)]	160	250	Dual 3-Phase	Liquid	Yes	5	
IGBT - Three-phase inverter							
SKAI 90 A2 GD06-WCI [1)]	450	300	3-Phase	Liquid	Yes	7	
SKAI 45 A2 GD12-WCI [1)]	800	300	3-Phase	Liquid	Yes	7	
SKAI 90 A2 GD06-WDI [1)]	450	300	3-Phase	Liquid	No	7	
SKAI 45 A2 GD12-WDI [1)]	800	300	3-Phase	Liquid	No	7	

footnotes

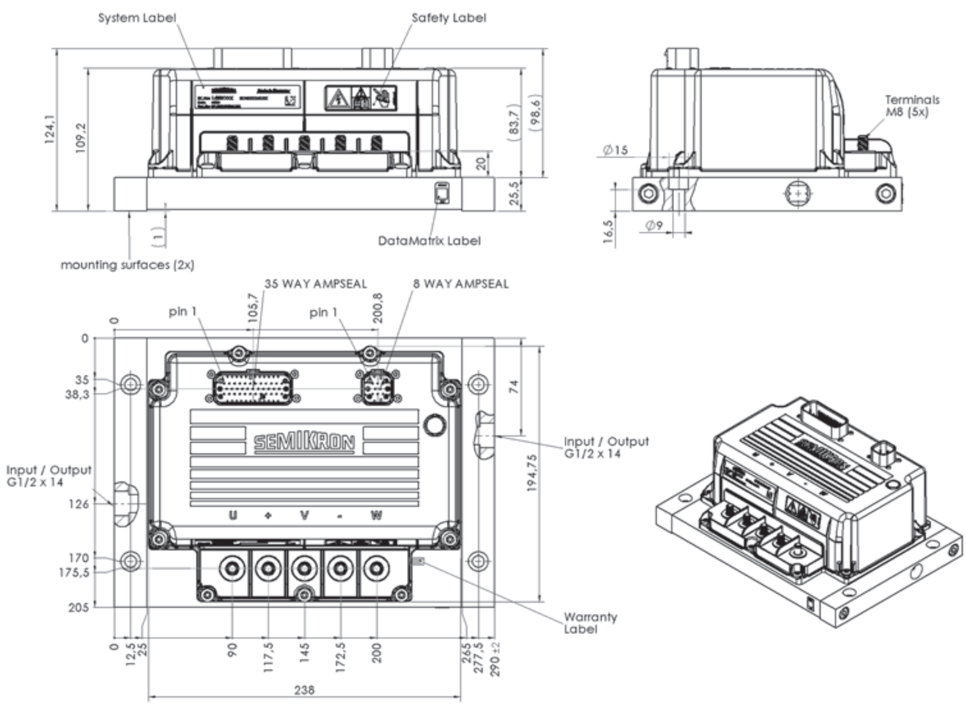
1) New

Cases

Case 1



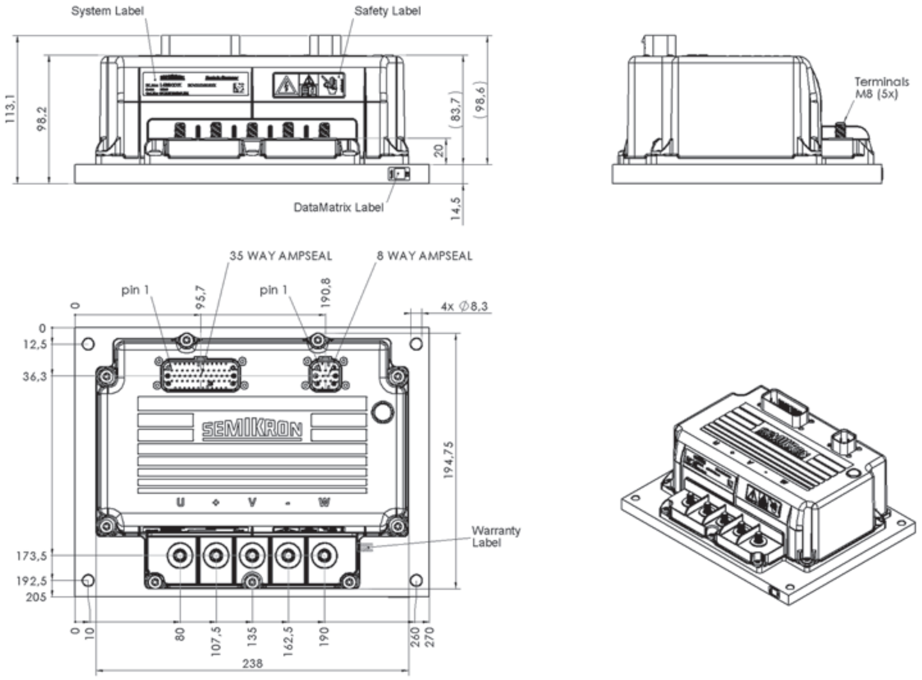
Case 2



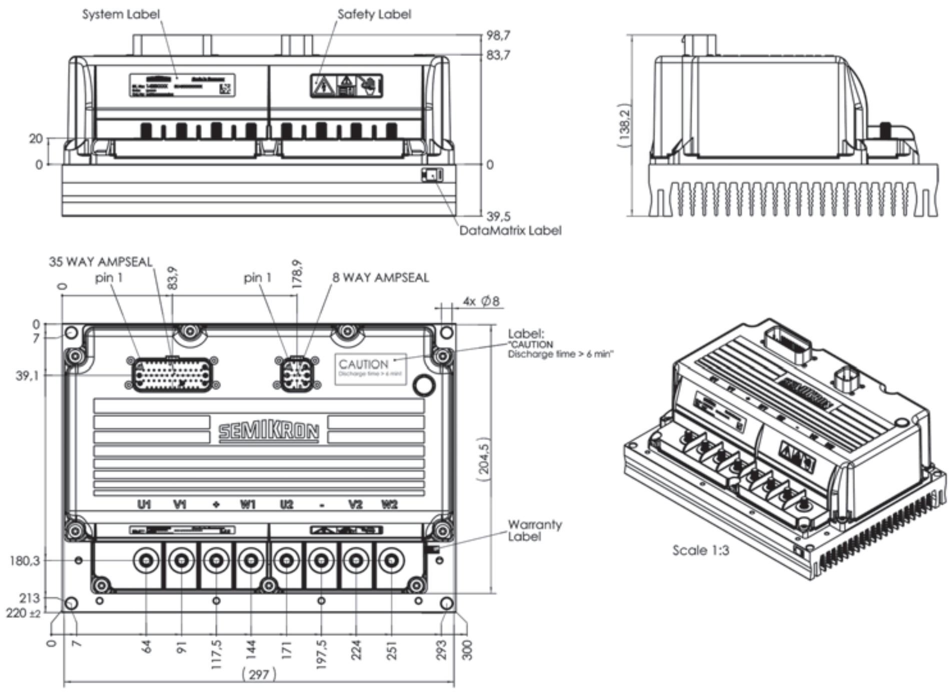
Dimensions in mm

Cases

Case 3



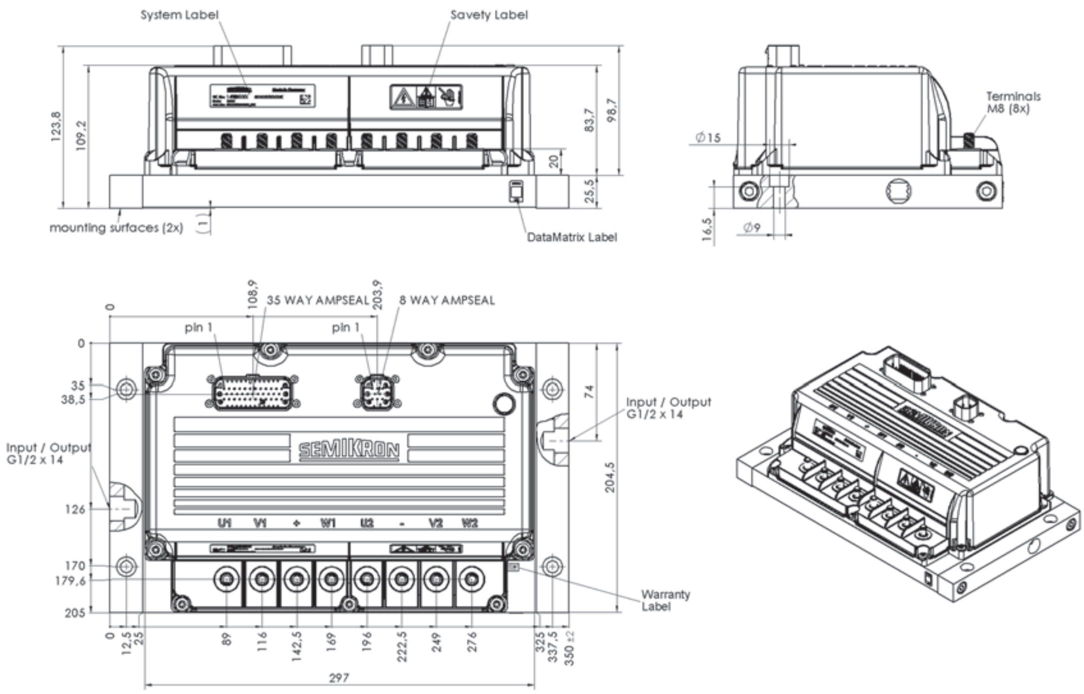
Case 4



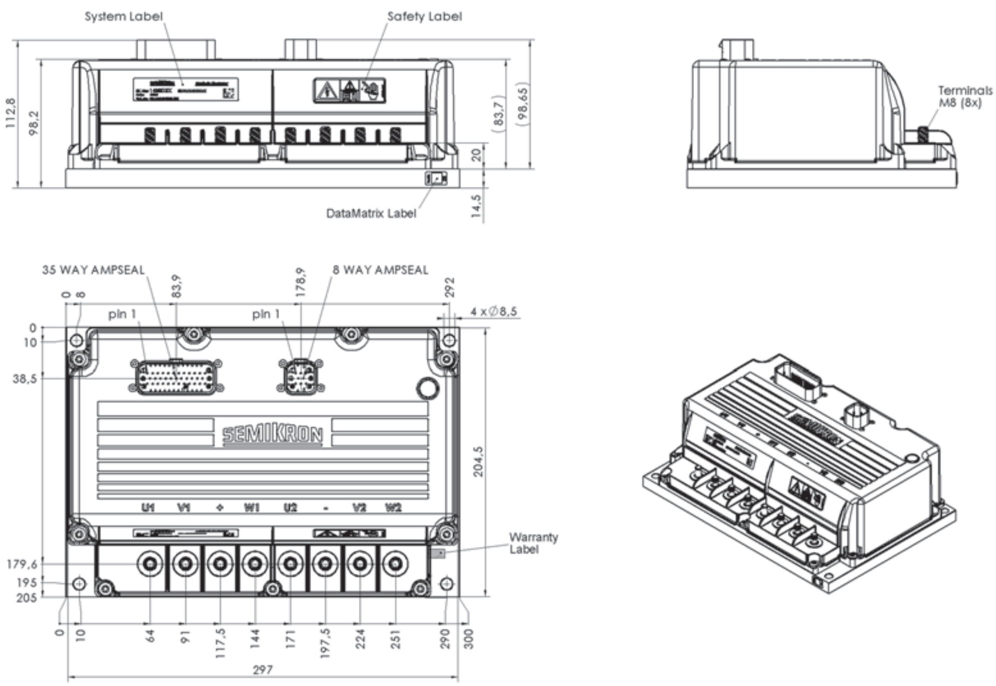
Dimensions in mm

Cases

Case 5



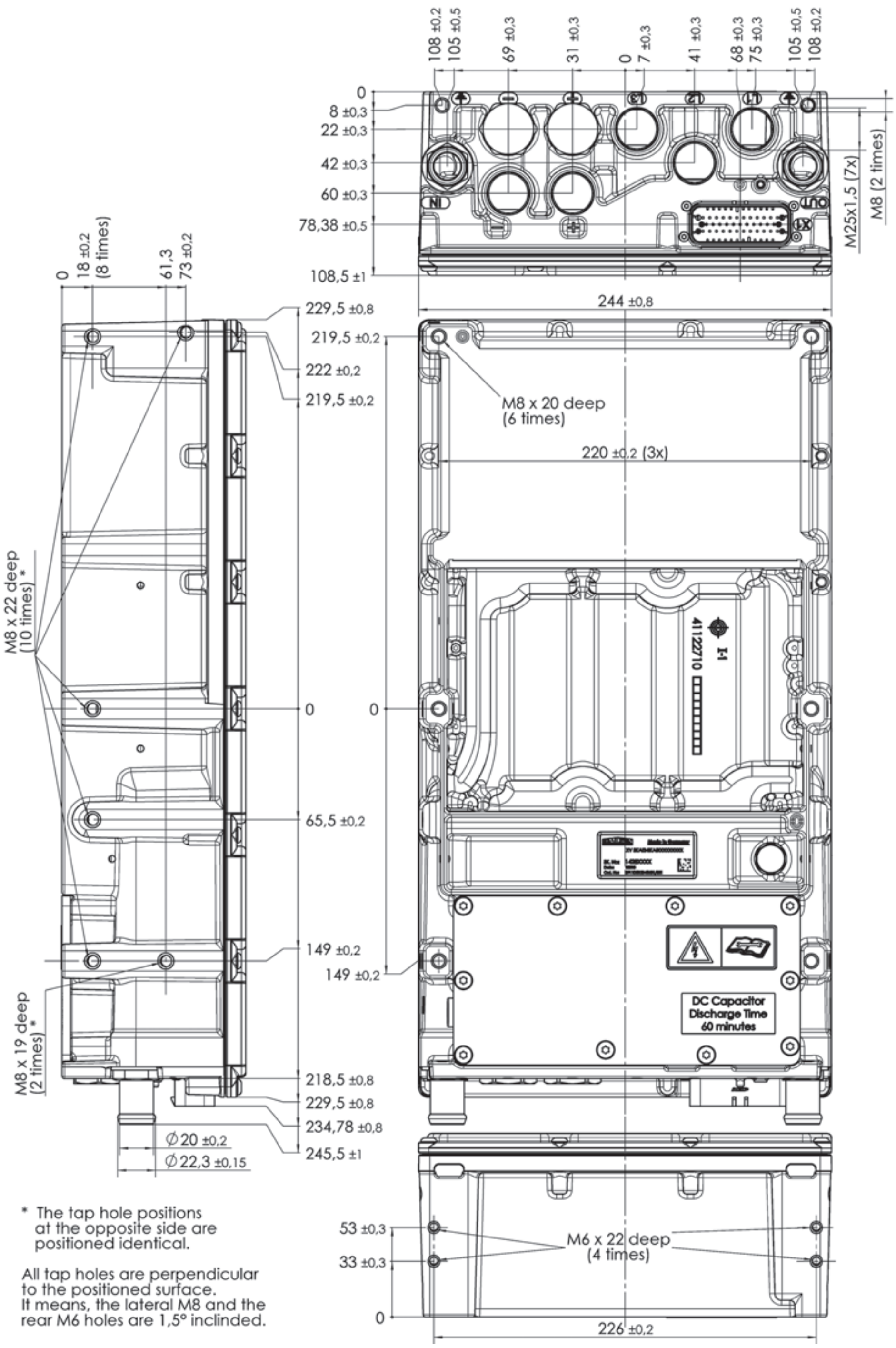
Case 6



Dimensions in mm

Cases

Case 7



Dimensions in mm

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Solutions - IGBT Platforms

SEMISTACK Renewable Energy

Synchronus wind generators
Double-fed wind generators
Solar inverters

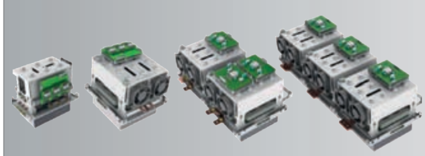
450 kW – 6 MW

SKiiPRACK

Synchronus wind generators
Double-fed wind generators
High power AC drives

450 kW – 5 MW

SEMIKUBE



Solar inverters
Pump & compressor drives

75 kW – 1000 kW

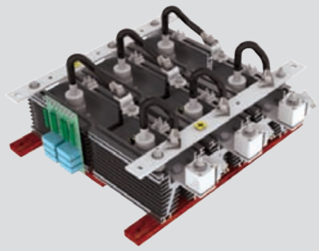
SEMiXBOX

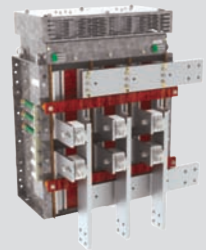
Elevators
Solar inverters
Uninteruptable power supplies

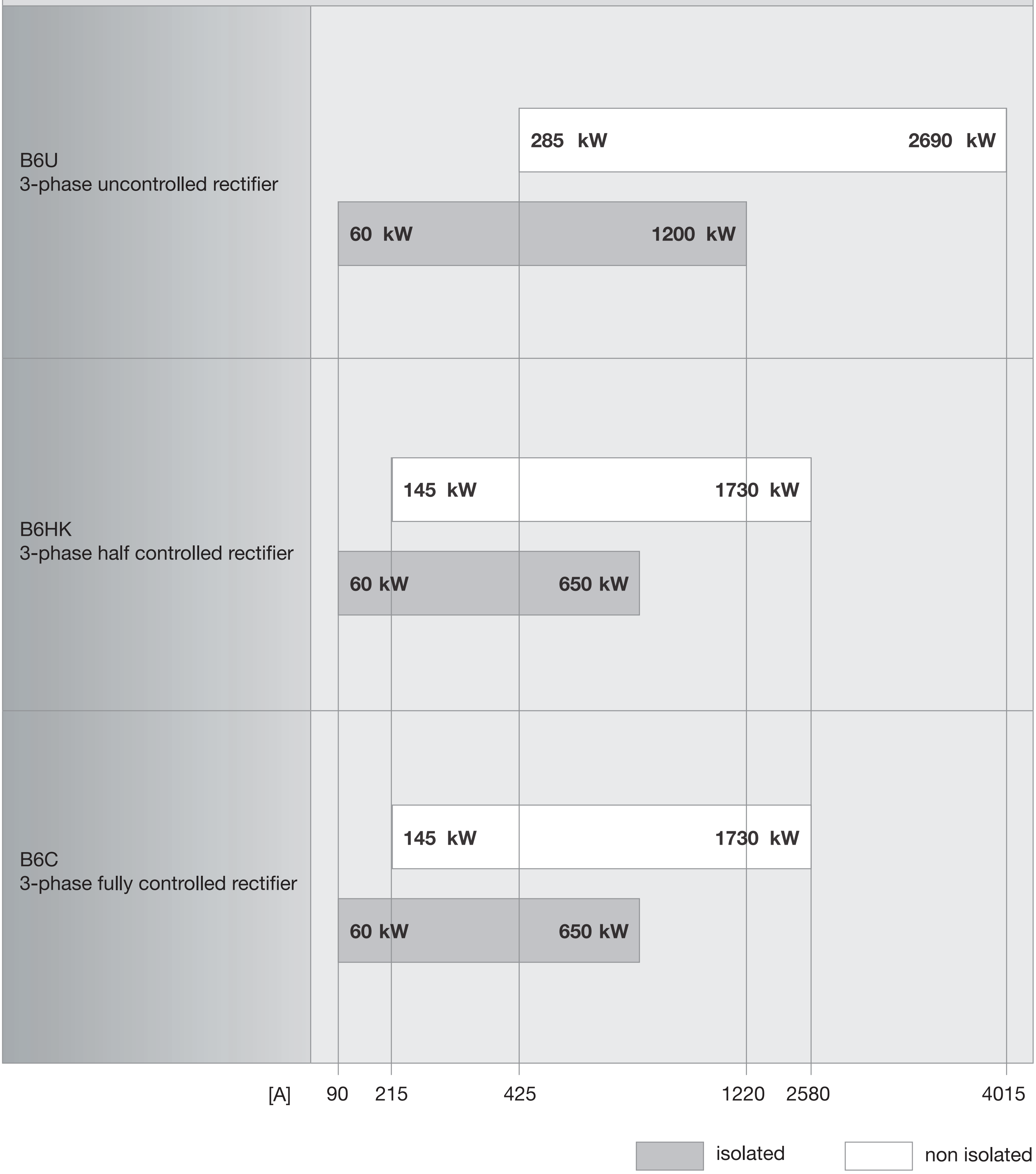
10 kW – 100 kW

Power [kW]: 10, 75, 100, 450, 1000, 5200, 6000

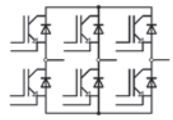
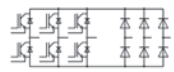
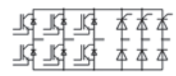
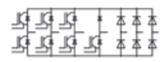
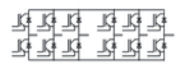
SEMISTACK CLASSICS







Solutions - SEMiXBOX

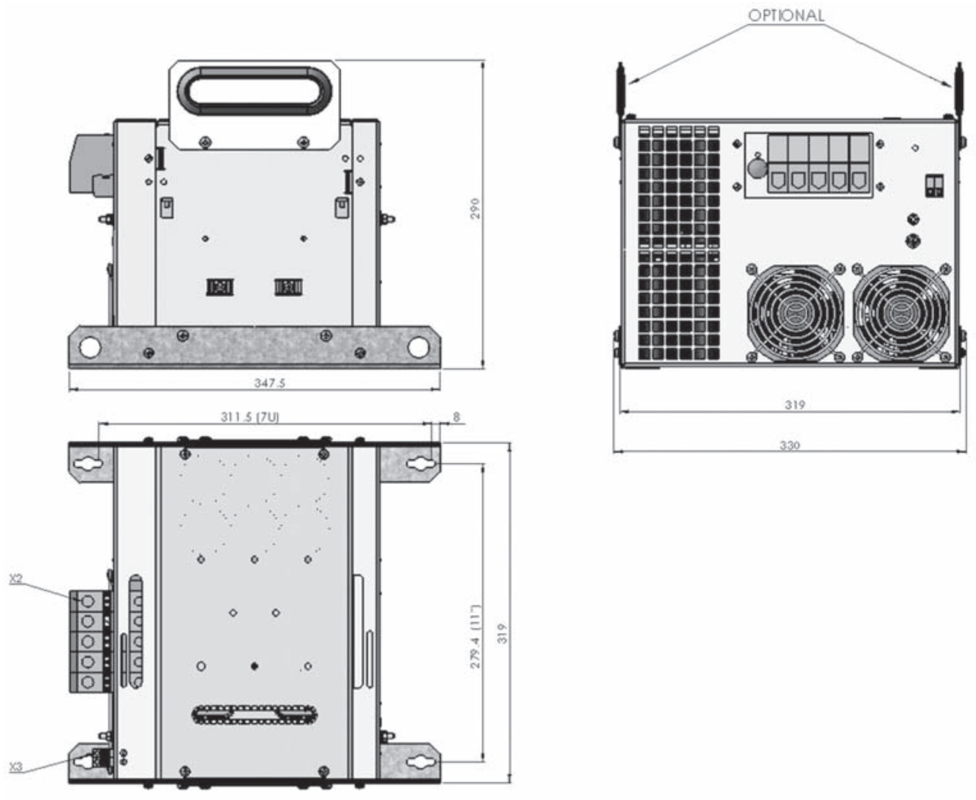
Type	V_{AC} V	V_{DC} V	Current A	Component Family	Cooling	Heatsink profile	Iso-lated	Circuit
Three-phase inverter								
SKS 83F B6CI 58 V12 [1]	500	900	83	SEMiX	Forced-air cooled	Px 17	yes	
SKS 110F B6CI 76 V12 [1]	500	900	110	SEMiX	Forced-air cooled	Px 17	yes	
SKS 118F B6CI 45 V06 [1]	250	450	118	SEMiX	Forced-air cooled	Px 17	yes	
SKS 150F B6CI 104 V12 [1]	500	900	150	SEMiX	Forced-air cooled	Px 17	yes	
SKS 85F B6CI+B6U 59 V12 [1]	500	900	85	SEMiX	Forced-air cooled	Px 17	yes	
SKS 105F B6CI+B6U 72 V12 [1]	500	900	105	SEMiX	Forced-air cooled	Px 17	yes	
SKS 78F B6CI+B6HK 54 V12 [1]	500	900	78	SEMiX	Forced-air cooled	Px 17	yes	
SKS 100F B6CI+B6HK 69 V12 [1]	500	900	100	SEMiX	Forced-air cooled	Px 17	yes	
SKS 80F B6CI+E1CIF+B6U 55 V12 [1]	500	900	80	SEMiX	Forced-air cooled	Px 17	yes	
SKS 88F (B6CI)2P 61 V12 [1]	500	900	88	SEMiX	Forced-air cooled	Px 17	yes	

Footnotes

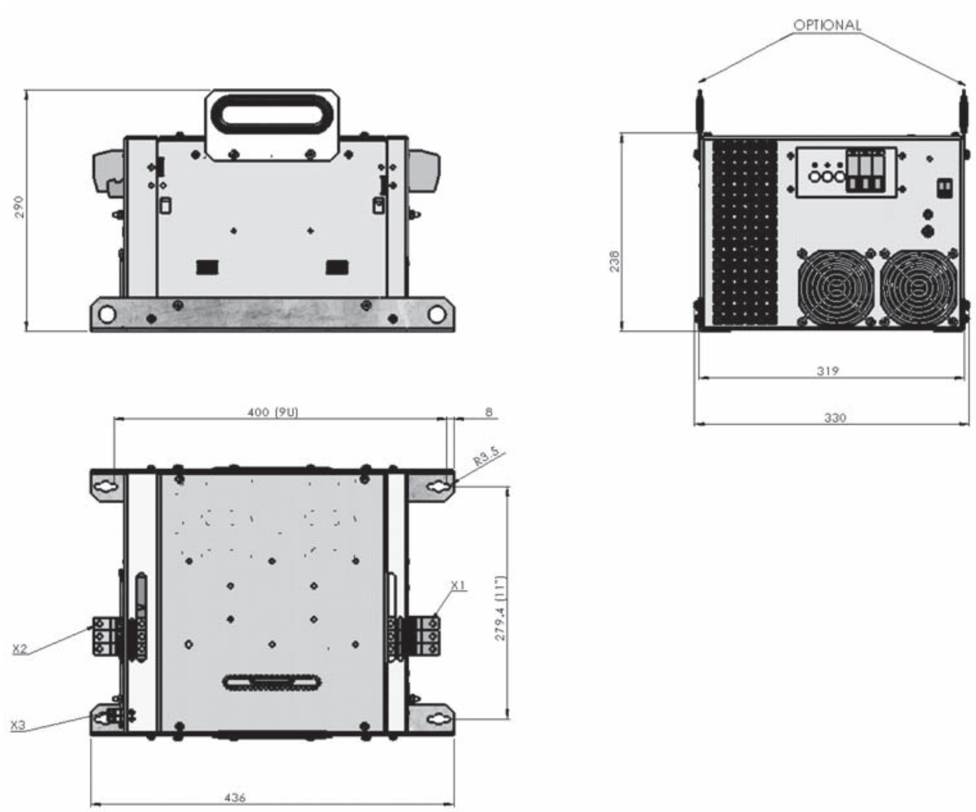
[1] New

Cases

CELL 2

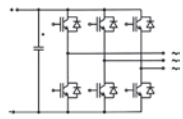
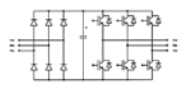


CELL 3



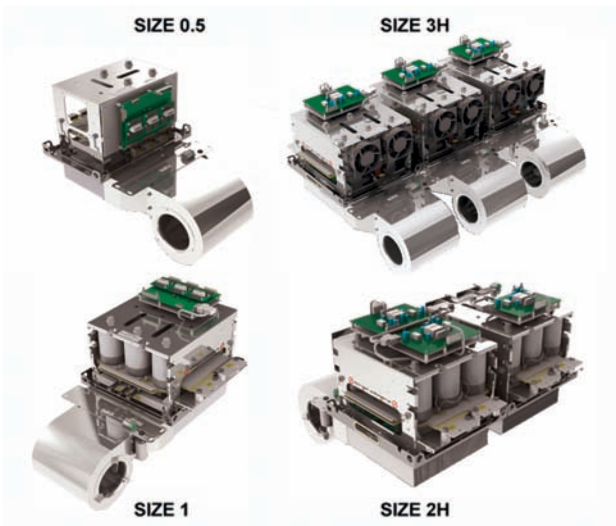
Dimensions in mm

Solutions - SEMIKUBE

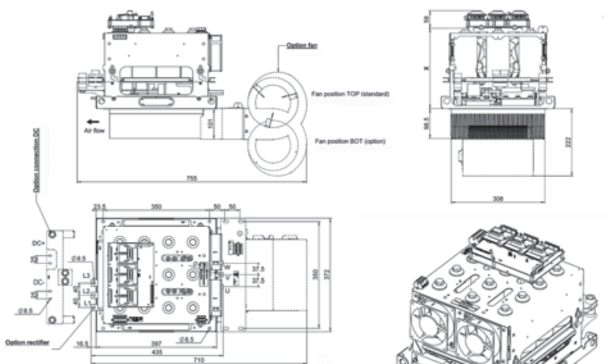
Type	V_{AC} V	V_{DC} V	Current A	Component Family	Cooling	Heatsink profile	Iso-lated	Circuit
Three-phase inverter								
IGD-1-424-P1N4-DL-FA	460	750	200	SEMITRANS	Forced-air cooled	PX 308	yes	
IGD-2-424-P1N6-DH-FA	460	750	350	SEMITRANS	Forced-air cooled	PX 308	yes	
IGD-4-424-P1F7-BL-FA	460	750	750	SEMITRANS	Forced-air cooled	PX 308	yes	
IGD-8-326-E1F12-BH-FA	460	750	1230	SEMITRANS	Forced-air cooled	PX 308	yes	
IGD-8-424-P1F9-BH-FA	460	750	1470	SEMITRANS	Forced-air cooled	PX 308	yes	
IGD-8-426-E1F12-BH-FA	460	750	1470	SEMITRANS	Forced-air cooled	PX 308	yes	
Three-phase rectifier and inverter								
IGDD6-1-326-D1616-E1N6-DL-FA	460	750	150	SEMITRANS/ SEMIPACK	Forced-air cooled	PX 308	yes	
IGDD6-1-426-D1616-E1N6-DL-FA	460	750	180	SEMITRANS/ SEMIPACK	Forced-air cooled	PX 308	yes	
IGDD6-2-326-D1616-E1F12-DH-FA	460	750	280	SEMITRANS/ SEMIPACK	Forced-air cooled	PX 308	yes	
IGDD6-2-426-D1616-E1F12-DH-FA	460	750	330	SEMITRANS/ SEMIPACK	Forced-air cooled	PX 308	yes	
IGDD6-4-326-D3816-E1F12-BL-FA	460	750	570	SEMITRANS/ SEMIPACK	Forced-air cooled	PX 308	yes	
IGDD6-4-426-D3816-E1F12-BL-FA	460	750	680	SEMITRANS/ SEMIPACK	Forced-air cooled	PX 308	yes	

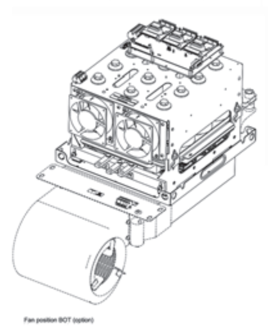
Cases

SEMIKUBE size range



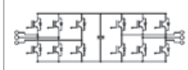
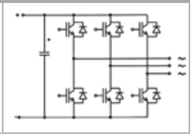
Size 1





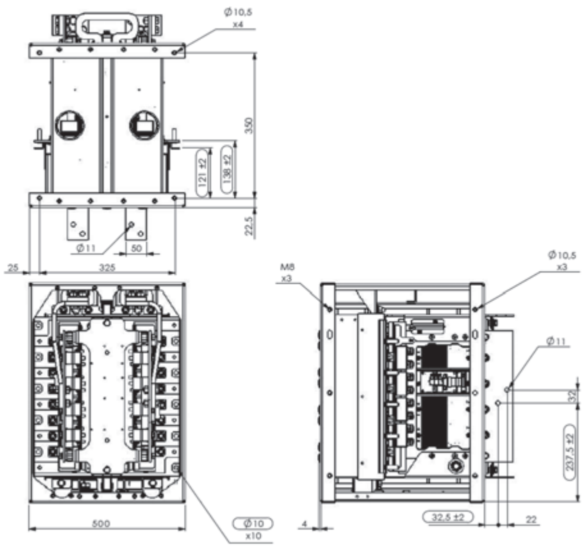
Dimensions in mm

Solutions - SKiiPRACK

Type	V_{AC} V	V_{DC} V	Current A	Component Family	Cooling	Heatsink profile	Iso-lated	Circuit
4-Quadrant converter								
SKS C 120 GDD 69/11 - A2A WA B1B	690	1100	1200	SKiiP 3	Water/ Glycol	-	yes	
Three-phase inverter								
SKS C 120 GD 69/11 - A2A WA B1B	690	1100	1200	SKiiP 3	Water/ Glycol	-	yes	

Cases

SKiiPRACK basic stack element, the CELL



3-Cell vertical integration

Dimensions in mm

SEMISTACK® RE

Optimized converter for solar and wind

Applications

The new SEMISTACK RE is a new high-power converter for use in renewable energy applications such as wind and solar power installations. SEMISTACK RE will typically be applied in synchronous and double-fed induction generators (DFIG) in wind turbines, as well as in central solar PV inverters. Up to four SEMISTACK RE converters can be connected in parallel and support applications of up to 6 MVA.

Benefits

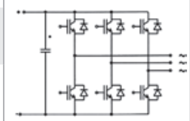
The SEMISTACK RE range features SKiiP 4, the latest generation of SEMIKRON's SKiiP intelligent power module family which integrates power components, driver and heat sink in a single case. SKiiP 4 modules enable to deliver an increase in power over the predecessor generation from 1.4 to 1.7 MVA. While the current carrying capacity of the smaller SEMISTACK RE solution featuring 3-bay SKiiP modules is 900 A, the bigger 4-bay SKiiP version has a current rating of between 1,000 A and 1,400 A, resulting in a power density increase of 17 % greater than in the predecessor version with combined SKiiP 3 modules.

Owing to the very low inductance planar DC busbar of the SEMISTACK RE and the internal construction of the SKiiP 4 nominal DC voltage can now be extended up to 1250 Vdc with the 1700 Vdc modules even when short circuit conditions are considered.

Signal processing on the SKiiP 4 is handled by a newly designed digital driver incorporating the standard control, monitoring and protection functions of the SKiiP 3 plus new additional functions of parameter configuration and diagnostic/fault memory. Further advantages are an improved isolation, a noise immunity inherent in digital control and the functionality and flexibility of the CANopen interface.

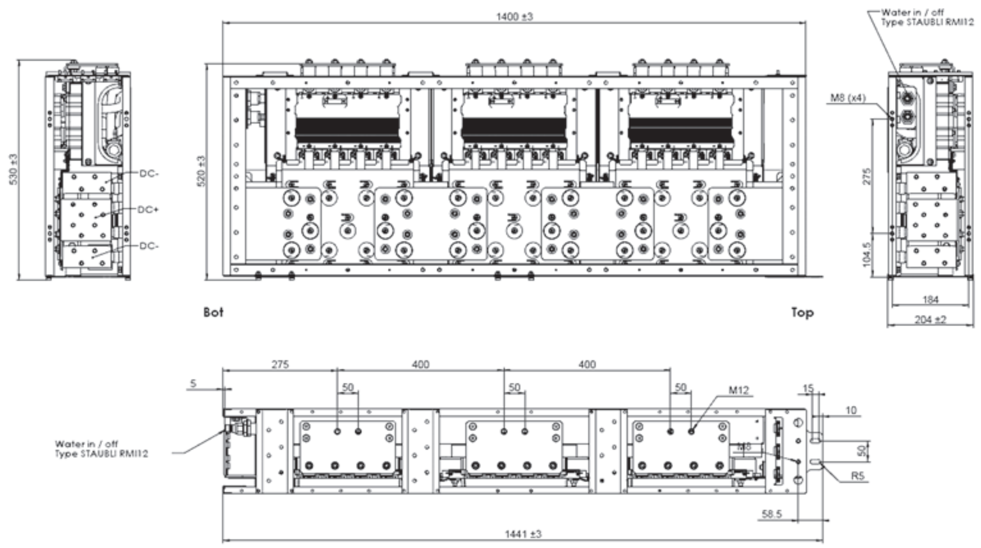
Owing to its 100 % solder free sintering process and innovative pressure contact system the thermal cycling capability of the SKiiP 4 is increased by a factor of 5. These enhancements to the SKiiP 4 are coupled with long lifetime polypropylene capacitors to ensure that the SEMISTACK RE meets the demanding requirements in today's grid connected power generation applications.

Solutions - SEMISTACK Renewable Energy

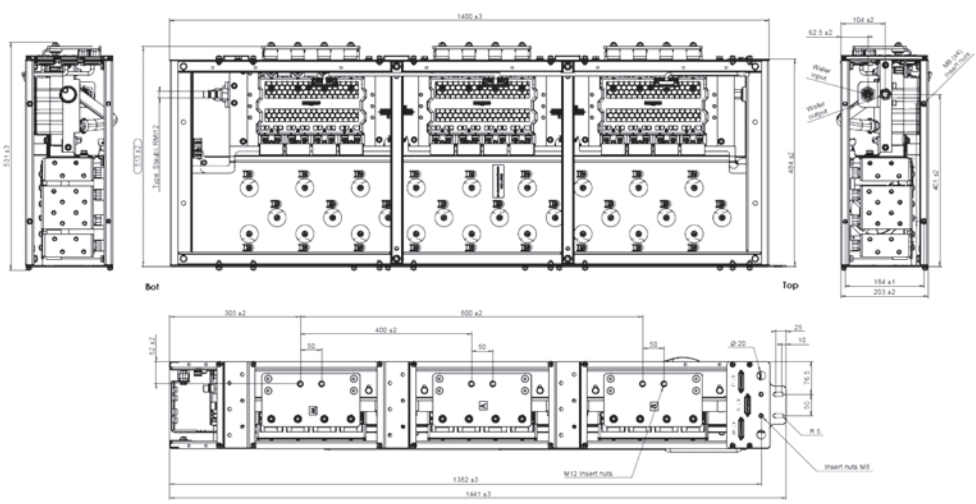
Type	V_{AC} V	V_{DC} V	Current A	Component Family	Cooling	Heatsink profile	Iso-lated	Circuit
Three-phase inverter								
SKS B 085 GD 69/11 - WA PB	690	1100	850	SKiiP 3	Water/ Glycol	-	yes	
SKS B2 100 GD 69/11 - MA PB [1]	690	1100	1000	SKiiP 3	Water/ Glycol	-	yes	
SKS B2 120 GD 69/11 - MA PB [1]	690	1100	1200	SKiiP 3	Water/ Glycol	-	yes	
SKS B2 140 GD 69/12 - MA PB [1]	690	1250	1400	SKiiP 4	Water/ Glycol	-	yes	

Cases

SKS B 085 GD 69/11 - WA PB



SKS B2 100 GD 69/11 - MA PB, SKS B2 120 GD 69/11 - MA PB, and SKS B2 140 GD 69/12 - MA PB

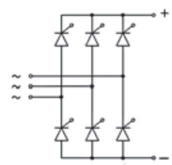


Dimensions in mm

Footnotes

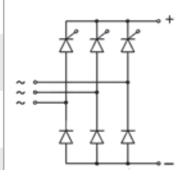
1) New

Solutions - CLASSICS

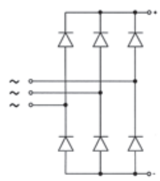
Type	V_{AC} V	V_{DC} V	Current A	Component Family	Cooling	Heatsink profile	Iso-lated	Circuit
Three-phase fully-controlled thyristor bridge rectifier								
SKS 88N B6C 60 V16	500	670	88	SEMIPACK 1	Natural cooled	P3/180	yes	
SKS 88N B6C 60 V16 SU	500	670	88	SEMIPACK 1	Natural cooled	P3/180	yes	
SKS 180F B6C 120 V16	500	670	180	SEMIPACK 1	Forced-air cooled	P3/180	yes	
SKS 180F B6C 120 V16 SU	500	670	180	SEMIPACK 1	Forced-air cooled	P3/180	yes	
SKS 215N B6C 145 V16	500	670	215	Stud devices	Natural cooled	P1/150	no	
SKS 215N B6C 145 V16 SU	500	670	215	Stud devices	Natural cooled	P1/150	no	
SKS 250F B6C 170 V16	500	670	250	SEMIPACK 2	Forced-air cooled	P3/265	yes	
SKS 250F B6C 170 V16 SU	500	670	250	SEMIPACK 2	Forced-air cooled	P3/265	yes	
SKS 355N B6C 240 V16	500	670	355	Stud devices	Natural cooled	P1/200	no	
SKS 355N B6C 240 V16 SU	500	670	355	Stud devices	Natural cooled	P1/200	no	
SKS 365F B6C 245 V16	500	670	365	SEMIPACK 2	Forced-air cooled	P16/200	yes	
SKS 365F B6C 245 V16 SU	500	670	365	SEMIPACK 2	Forced-air cooled	P16/200	yes	
SKS 570F B6C 380 V16	500	670	570	SEMIPACK 3	Forced-air cooled	P16/200	yes	
SKS 570F B6C 380 V16 SU	500	670	570	SEMIPACK 3	Forced-air cooled	P16/200	yes	
SKS 640F B6C 430 V16	500	670	640	SEMIPACK 3	Forced-air cooled	P16/200	yes	
SKS 640F B6C 430 V16 SU	500	670	640	SEMIPACK 3	Forced-air cooled	P16/200	yes	
SKS 700N B6C 470 V16	500	670	700	Presspack	Natural cooled	P11/415	no	
SKS 700N B6C 470 V16 SU	500	670	700	Presspack	Natural cooled	P11/415	no	
SKS 845N B6C 570 V16	500	670	845	Presspack	Natural cooled	U3/515	no	
SKS 845N B6C 570 V16 SU	500	670	845	Presspack	Natural cooled	U3/515	no	
SKS 970F B6C 650 V16	500	670	970	SEMIPACK 5	Forced-air cooled	P16/300	yes	
SKS 970F B6C 650 V16 SU	500	670	970	SEMIPACK 5	Forced-air cooled	P16/300	yes	
SKS 1000N B6C 670 V16	500	670	1000	Presspack	Natural cooled	U3/515	no	
SKS 1000N B6C 670 V16 SU	500	670	1000	Presspack	Natural cooled	U3/515	no	
SKS 1200F B6C 800 V16	500	670	1200	Presspack	Forced-air cooled	P17/130	no	
SKS 1200F B6C 800 V16 SU	500	670	1200	Presspack	Forced-air cooled	P17/130	no	
SKS 1500F B6C 1010 V16	500	670	1500	Presspack	Forced-air cooled	P17/130	no	
SKS 1500F B6C 1010 V16 SU	500	670	1500	Presspack	Forced-air cooled	P17/130	no	
SKS 1890F B6C 1270 V16	500	670	1890	Presspack	Forced-air cooled	P18/180	no	
SKS 1890F B6C 1270 V16 ZU	500	670	1890	Presspack	Forced-air cooled	P18/180	no	
SKS 2580F B6C 1730 V16	500	670	2580	Presspack	Forced-air cooled	N4/250	no	
SKS 2580F B6C 1730 V16 ZU	500	670	2580	Presspack	Forced-air cooled	N4/250	no	

Solutions - CLASSICS

Type	V_{AC} V	V_{DC} V	Current A	Component Family	Cooling	Heatsink profile	Iso-lated	Circuit
Three-phase half-controlled bridge rectifier								
SKS 88N B6HK 60 V16 1)	500	670	88	SEMIPACK 1	Natural cooled	P3/180	yes	
SKS 88N B6HK 60 V16 SU 1)	500	670	88	SEMIPACK 1	Natural cooled	P3/180	yes	
SKS 180F B6HK 120 V16 1)	500	670	180	SEMIPACK 1	Forced-air cooled	P3/180	yes	
SKS 180F B6HK 120 V16 SU 1)	500	670	180	SEMIPACK 1	Forced-air cooled	P3/180	yes	
SKS 215N B6HK 145 V16 1)	500	670	215	Stud devices	Natural cooled	P1/150	no	
SKS 215N B6HK 145 V16 SU 1)	500	670	215	Stud devices	Natural cooled	P1/150	no	
SKS 250F B6HK 170 V16 1)	500	670	250	SEMIPACK 2	Forced-air cooled	P3/265	yes	
SKS 250F B6HK 170 V16 SU 1)	500	670	250	SEMIPACK 2	Forced-air cooled	P3/265	yes	
SKS 355N B6HK 240 V16 1)	500	670	355	Stud devices	Natural cooled	P1/200	no	
SKS 355N B6HK 240 V16 SU 1)	500	670	355	Stud devices	Natural cooled	P1/200	no	
SKS 365F B6HK 245 V16 1)	500	670	365	SEMIPACK 2	Forced-air cooled	P16/200	yes	
SKS 365F B6HK 245 V16 SU 1)	500	670	365	SEMIPACK 2	Forced-air cooled	P16/200	yes	
SKS 570F B6HK 380 V16 1)	500	670	570	SEMIPACK 3	Forced-air cooled	P16/200	yes	
SKS 570F B6HK 380 V16 SU 1)	500	670	570	SEMIPACK 3	Forced-air cooled	P16/200	yes	
SKS 640F B6HK 430 V16 1)	500	670	640	SEMIPACK 3	Forced-air cooled	P16/200	yes	
SKS 640F B6HK 430 V16 SU 1)	500	670	640	SEMIPACK 3	Forced-air cooled	P16/200	yes	
SKS 700N B6HK 470 V16 1)	500	670	700	Presspack	Natural cooled	P11/415	no	
SKS 700N B6HK 470 V16 SU 1)	500	670	700	Presspack	Natural cooled	P11/415	no	
SKS 845N B6HK 570 V16 1)	500	670	845	Presspack	Natural cooled	U3/515	no	
SKS 845N B6HK 570 V16 SU 1)	500	670	845	Presspack	Natural cooled	U3/515	no	
SKS 970F B6HK 650 V16 1)	500	670	970	SEMIPACK 5	Forced-air cooled	P16/300	yes	
SKS 970F B6HK 650 V16 SU 1)	500	670	970	SEMIPACK 5	Forced-air cooled	P16/300	yes	
SKS 1000N B6HK 670 V16 1)	500	670	1000	Presspack	Natural cooled	U3/515	no	
SKS 1000N B6HK 670 V16 SU 1)	500	670	1000	Presspack	Natural cooled	U3/515	no	
SKS 1200F B6HK 800 V16 1)	500	670	1200	Presspack	Forced-air cooled	P17/130	no	
SKS 1200F B6HK 800 V16 SU 1)	500	670	1200	Presspack	Forced-air cooled	P17/130	no	
SKS 1500F B6HK 1010 V16 1)	500	670	1500	Presspack	Forced-air cooled	P17/130	no	
SKS 1500F B6HK 1010 V16 SU 1)	500	670	1500	Presspack	Forced-air cooled	P17/130	no	
SKS 1890F B6HK 1270 V16 1)	500	670	1890	Presspack	Forced-air cooled	P18/180	no	
SKS 1890F B6HK 1270 V16 ZU 1)	500	670	1890	Presspack	Forced-air cooled	P18/180	no	
SKS 2580F B6HK 1730 V16 1)	500	670	2580	Presspack	Forced-air cooled	N4/250	no	
SKS 2580F B6HK 1730 V16 ZU 1)	500	670	2580	Presspack	Forced-air cooled	N4/250	no	



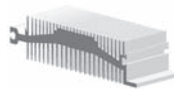
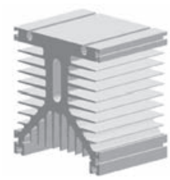
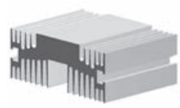
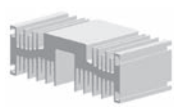
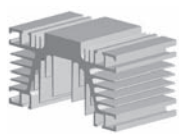
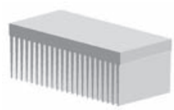
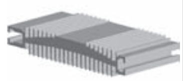
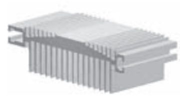
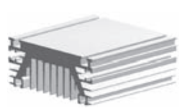
Solutions - CLASSICS

Type	V_{AC} V	V_{DC} V	Current A	Component Family	Cooling	Heatsink profile	Iso-lated	Circuit
Three-phase uncontrolled diode bridge rectifier								
SKS 91N B6U 60 V16 [1]	500	670	91	SEMIPACK 1	Natural cooled	P3/180	yes	
SKS 91N B6U 60 V16 SU [1]	500	670	91	SEMIPACK 1	Natural cooled	P3/180	yes	
SKS 185F B6U 125 V16 [1]	500	670	185	SEMIPACK 1	Forced-air cooled	P3/180	yes	
SKS 185F B6U 125 V16 SU [1]	500	670	185	SEMIPACK 1	Forced-air cooled	P3/180	yes	
SKS 290F B6U 195 V16 [1]	500	670	290	SEMIPACK 2	Forced-air cooled	P3/265	yes	
SKS 290F B6U 195 V16 SU [1]	500	670	290	SEMIPACK 2	Forced-air cooled	P3/265	yes	
SKS 425N B6U 285 V16 [1]	500	670	425	Stud devices	Natural cooled	P1/150	no	
SKS 425N B6U 285 V16 SU [1]	500	670	425	Stud devices	Natural cooled	P1/150	no	
SKS 430F B6U 290 V16 [1]	500	670	430	SEMIPACK 2	Forced-air cooled	P16/200	yes	
SKS 430F B6U 290 V16 SU [1]	500	670	430	SEMIPACK 2	Forced-air cooled	P16/200	yes	
SKS 535N B6U 360 V16 [1]	500	670	535	Stud devices	Natural cooled	P1/200	no	
SKS 535N B6U 360 V16 SU [1]	500	670	535	Stud devices	Natural cooled	P1/200	no	
SKS 660F B6U 440 V16 [1]	500	670	660	SEMIPACK 3	Forced-air cooled	P16/200	yes	
SKS 660F B6U 440 V16 SU [1]	500	670	660	SEMIPACK 3	Forced-air cooled	P16/200	yes	
SKS 850F B6U 570 V16 [1]	500	670	850	SEMIPACK 3	Forced-air cooled	P16/200	yes	
SKS 850F B6U 570 V16 SU [1]	500	670	850	SEMIPACK 3	Forced-air cooled	P16/200	yes	
SKS 1185N B6U 795 V16 [1]	500	670	1185	Presspack	Natural cooled	P11/415	no	
SKS 1185N B6U 795 V16 SU [1]	500	670	1185	Presspack	Natural cooled	P11/415	no	
SKS 1220F B6U 820 V16 [1]	500	670	1220	SEMIPACK 5	Forced-air cooled	P16/300	yes	
SKS 1220F B6U 820 V16 SU [1]	500	670	1220	SEMIPACK 5	Forced-air cooled	P16/300	yes	
SKS 1630N B6U 1090 V16 [1]	500	670	1630	Presspack	Natural cooled	U3/515	no	
SKS 1630N B6U 1090 V16 ZU [1]	500	670	1630	Presspack	Natural cooled	U3/515	no	
SKS 1910N B6U 1280 V16 [1]	500	670	1910	Presspack	Natural cooled	U3/515	no	
SKS 1910N B6U 1280 V16 ZU [1]	500	670	1910	Presspack	Natural cooled	U3/515	no	
SKS 1950F B6U 1305 V16 [1]	500	670	1950	Presspack	Forced-air cooled	P17/130	no	
SKS 1950F B6U 1305 V16 ZU [1]	500	670	1950	Presspack	Forced-air cooled	P17/130	no	
SKS 2300F B6U 1540 V16 [1]	500	670	2300	Presspack	Forced-air cooled	P18/180	no	
SKS 2300F B6U 1540 V16 ZU [1]	500	670	2300	Presspack	Forced-air cooled	P18/180	no	
SKS 4015F B6U 2690 V16 [1]	500	670	4015	Presspack	Forced-air cooled	N4/250	no	

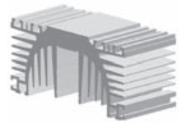
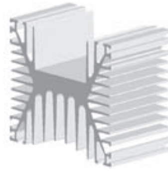
Footnotes

1) New

Accessories - Heatsinks

Type	Suitable for	R_{thsa} natural cooling K/W	R_{thsa} forced air or water cooling K/W	w kg	w kg/m	Picture
Forced-air cooled						
N 4	Capsules	-	0.04	-	25.1	
P 1	Studs or mo-dules	0.7	0.4	-	11.3	
P 3	Isolated base modules	0.45	0.14	-	17.6	
P 8 [1)]	Capsules	0.35	0.07	-	9.6	
P 8,5 [1)]	Capsules	0.3	0.08	-	9.5	
P 9 [1)]	Capsules	0.21	0.06	-	17.8	
P 11	Capsules	0.2	0.05	-	15	
P 16	SKiiP or modules	-	0.06	-	23.5	
P 17	Capsules	0.45	0.12	-	10.6	
P 18	Capsules	0.37	0.08	-	12.2	
P 21 [1)]	Isolated base modules	-	0.02	-	40.8	
Px 308 [1)]	SKiiP or modules	-	0.013	-	12.2	
R 4A	Isolated base modules	1.4	0.38	0.6	-	

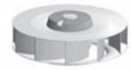
Accessories - Heatsinks

Type	Suitable for	R_{thsa} natural cooling K/W	R_{thsa} forced air or water cooling K/W	w kg	w kg/m	Picture
Forced-air cooled						
U 3	Capsules	0.14	0.06	-	23.7	
Natural cooled						
P 4 [1]	Stud device	0.27	-	-	20.6	

footnotes

[1] Non standard item, available on request only, typical minimum batch quantities of 60 pieces will apply

Accessories - Fans

Type	V_{in} V	f Hz	V_{air} / t m³/h	P_{max} V	T_{Amax} °C	w kg	Noise dB	Picture
Axial Fans								
SKF 3-230-01	230	50	159 / 190	15 / 14	70	0.55	37 / 41	
Centrifugal Fans								
SKF 17 A-230-11	230	50	850 / 930	110 / 120	70	2	74	
SKF N4-230-01	230	50	1500 / 1700	210 / 280	80 / 70	3.1	76 / 78	
Radial Fans								
SKF 16 A-230-01	230	50	615 / 575	135 / 154	50 / 40	3.6	55 / 57	
SKF 16 A-230-11	230	50	615 / 575	135 / 154	50 / 40	3.6	55 / 57	
SKF 16 B-230-01	230	50	610 / 565	170 / 197	40	3.6	58 / 57	

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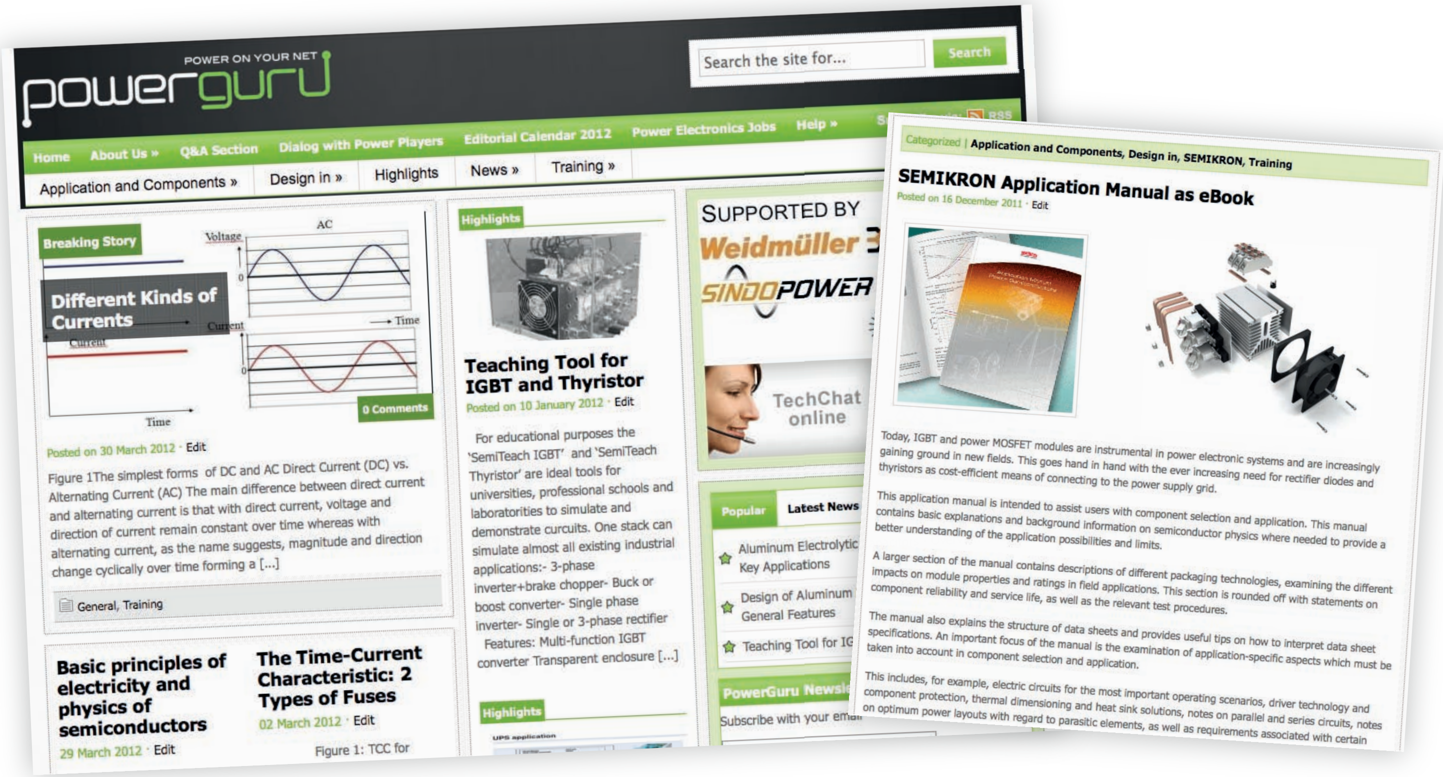

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