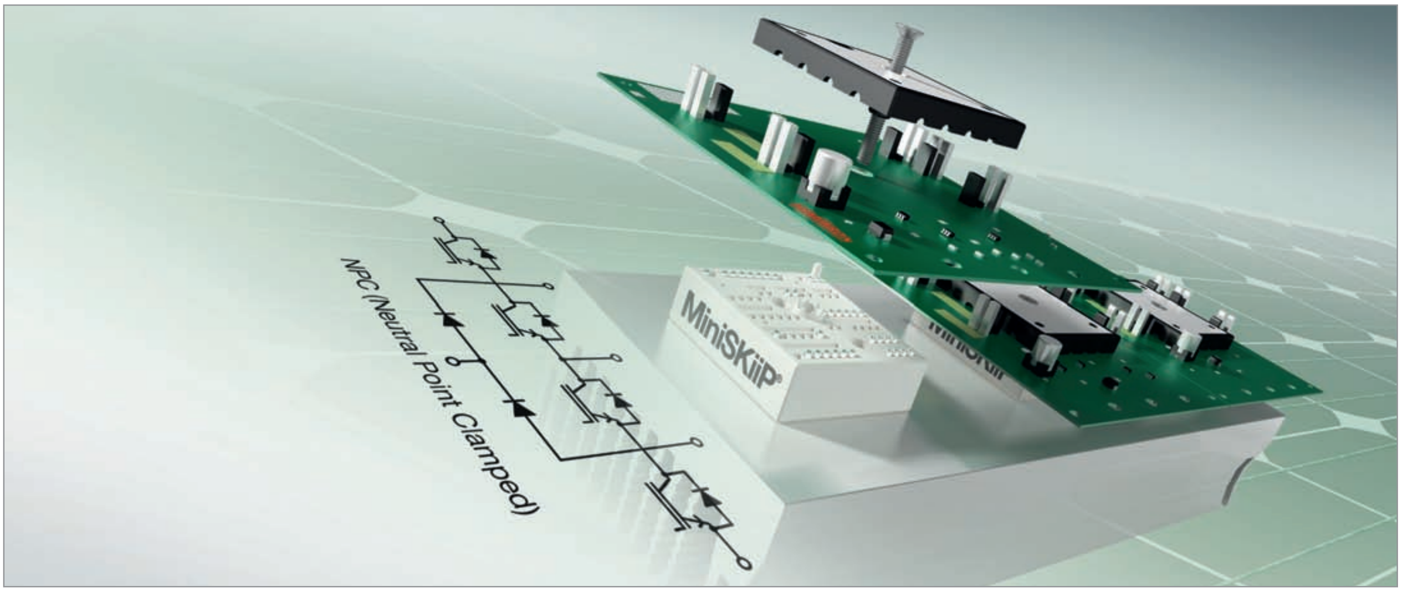
MiniSKiiP® 3-level

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

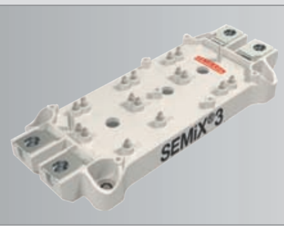
The MiniSKiiP 3-level power modules are available up to 200A in NPC (Neutral Clamping Point) topology and in the MiniSKiiP housing sizes 2 and 3. All modules are featuring Trench Field Stop IGBT4 with a blocking voltage of 650 V and SEMIKRON CAL I4F diodes.

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

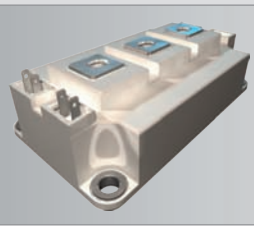
SEMiX®



half bridge
6-pack
chopper

600V/1200V/1700V
75A – 600A

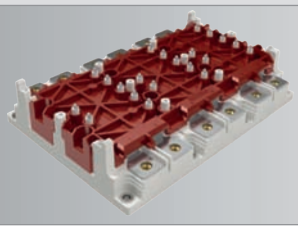
SEMITRANS®



half bridge
6-pack
chopper
single switch

600V/1200V/1700V
35A – 900A

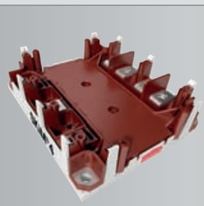
SKiM® 63/93



6-pack
3-level

600V/1200V/1700V
300A – 900A

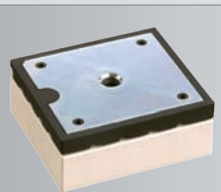
SKiM® 4/5



6-pack
3-level

650V/1200V/1700V
200A – 600A

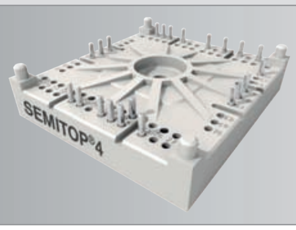
MiniSKiiP®



6-pack
3-level

600V/1200V
8A – 200A

SEMITOP®

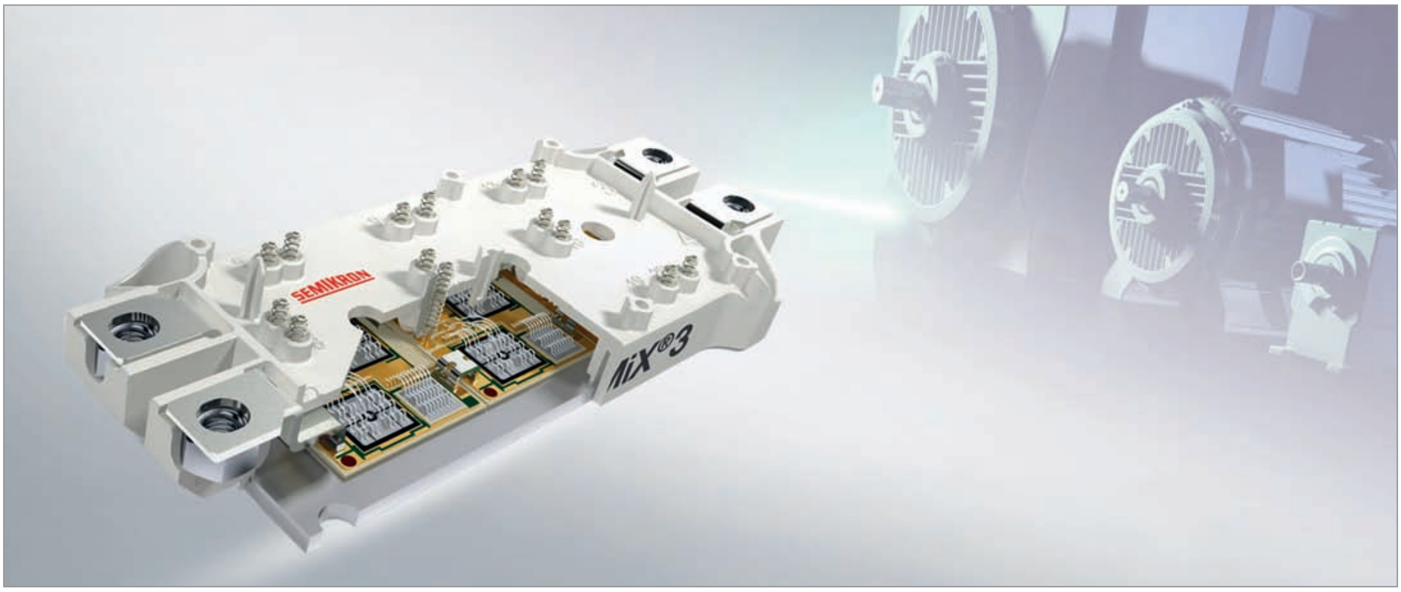


half bridge
6-pack
3-level
chopper
single switch

600V/1200V
10A – 200A

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

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.

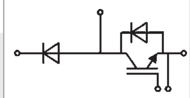
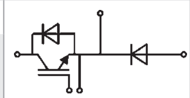
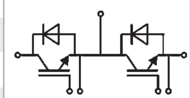
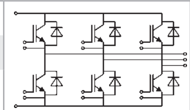
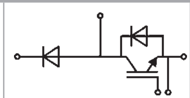
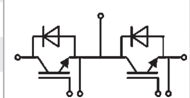
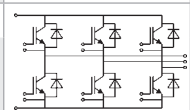
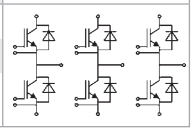
Product range

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.

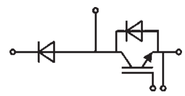
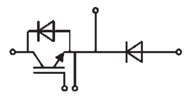
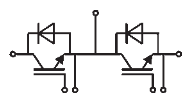
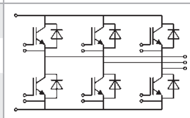
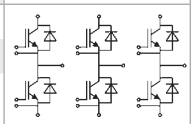
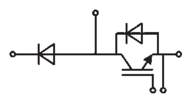
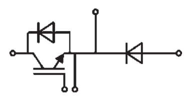
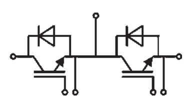
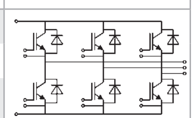
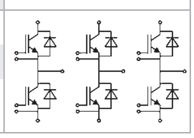
Benefits

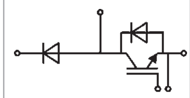
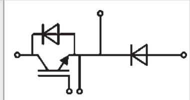
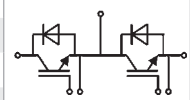
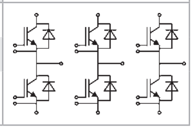
- Fast assembly in one direction from above
- Solder-free connection to control unit using reliable spring contacts
- Separation of control unit, AC and DC terminals
- Direct driver assembly
- Same-height (17 mm) IGBT and rectifier modules
- Flat and compact inverter design
- Optimized production at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

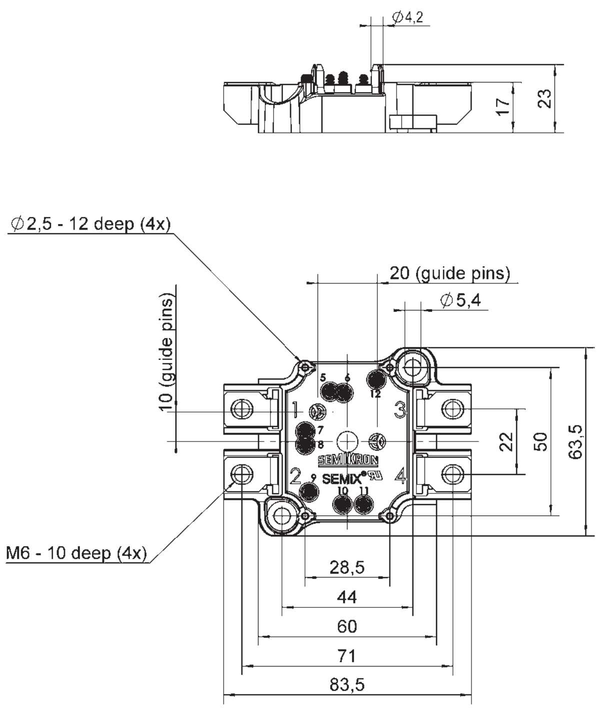
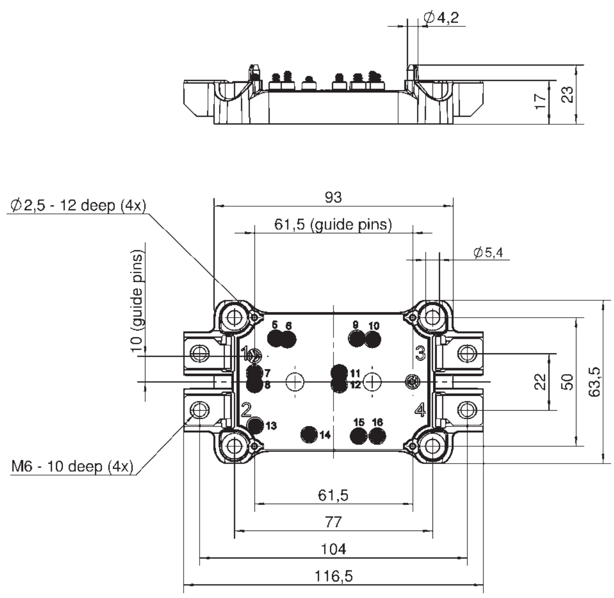
Type	IGBT						Diode				Case		Circuit
	I_C @T_C= 25°C (A)	I_{Cnom} (A)	$V_{CE(sat)}$ @T_j= 25°C typ. (V)	E_{on} (mJ)	E_{off} (mJ)	$R_{th(j-c)}$ (K/W)	I_F @T_C= 25°C (A)	V_F @T_j= 25°C typ. (V)	E_{rr} (mJ)	$R_{th(j-c)}$ (K/W)	Case	$R_{th(c-s)}$ (K/W)	
1200 V - IGBT 4 (Trench)													
SEMiX151GAL12E4HDs	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	

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

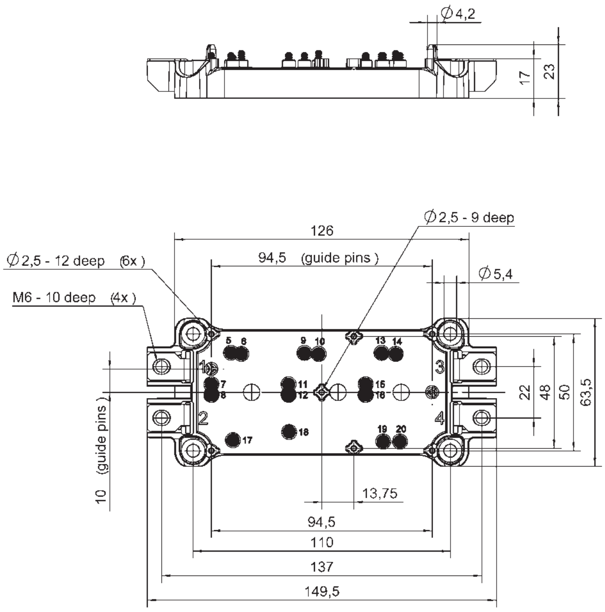
Cases

SEMiX 1s	SEMiX 2s
	

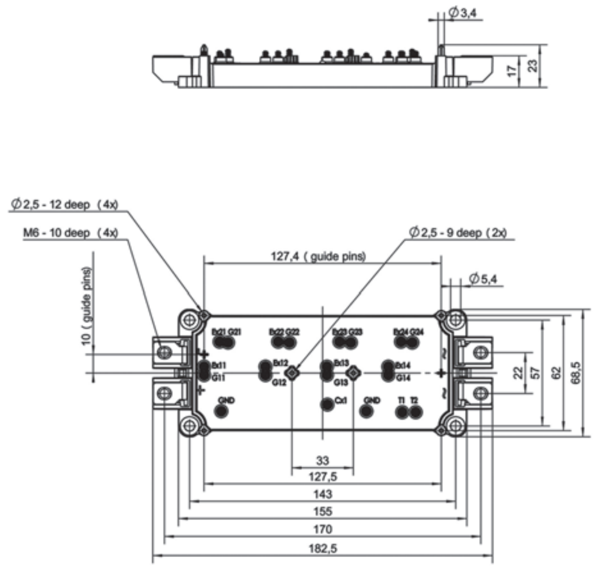
Dimensions in mm

Cases

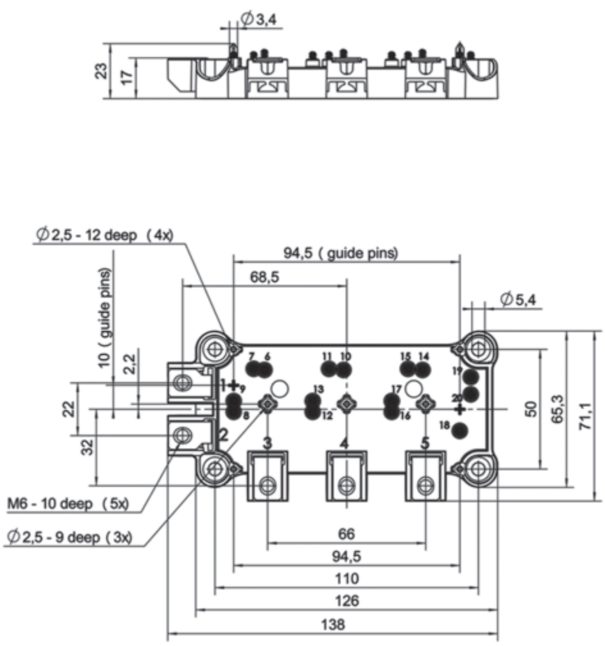
SEMiX 3s



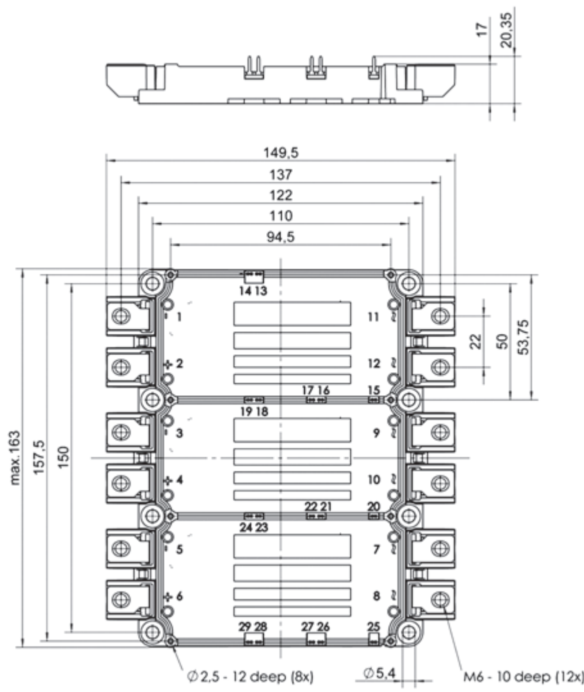
SEMiX 4s



SEMiX 13

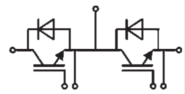
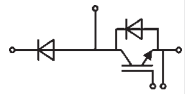
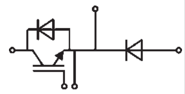
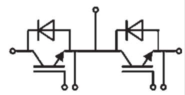
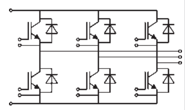
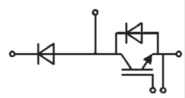
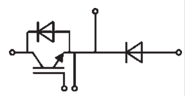
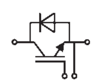
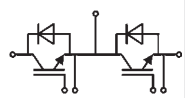


SEMiX 33c

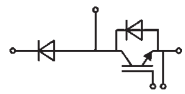
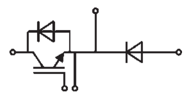
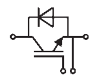
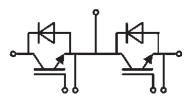
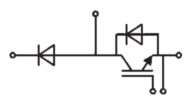
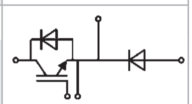
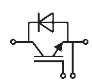
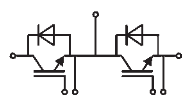
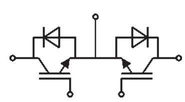
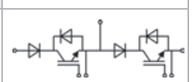


Dimensions in mm

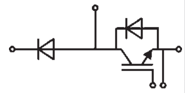
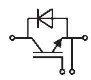
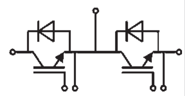
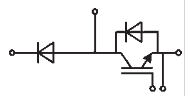
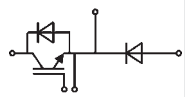
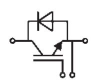
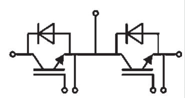
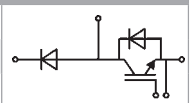
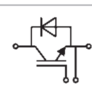
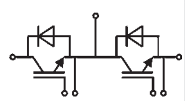
Modules - IGBT - SEMITRANS

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	

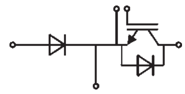
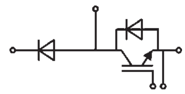
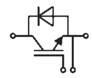
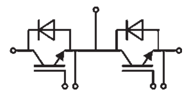
Modules - IGBT - SEMITRANS

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	

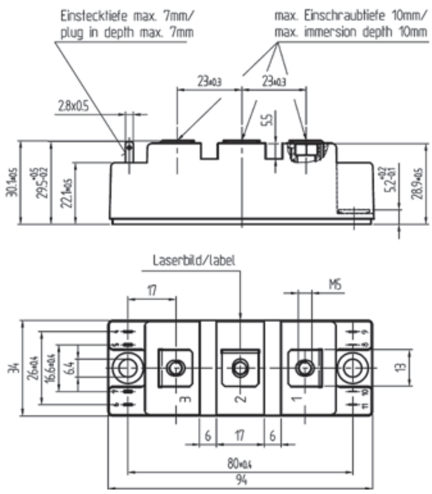
Footnotes

1) Not for New Design

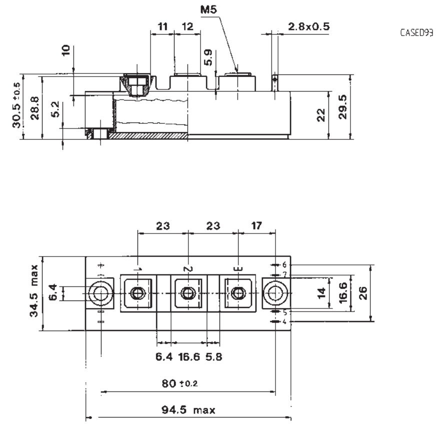
2) New

Cases

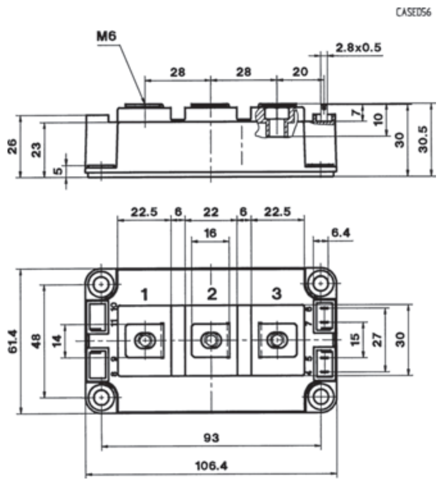
SEMITRANS 2



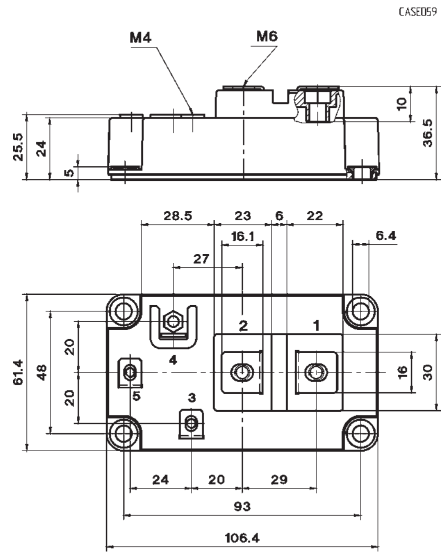
SEMITRANS 2N



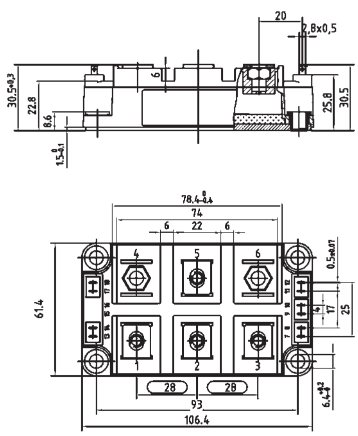
SEMITRANS 3



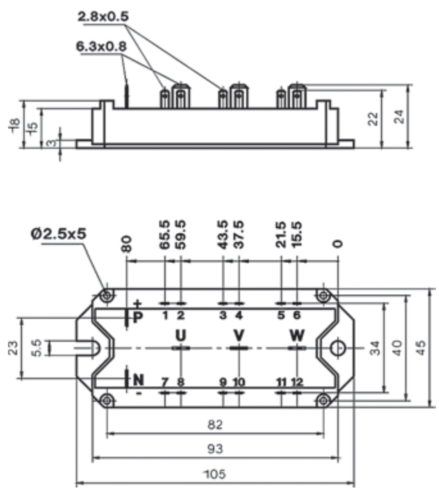
SEMITRANS 4



SEMITRANS 5



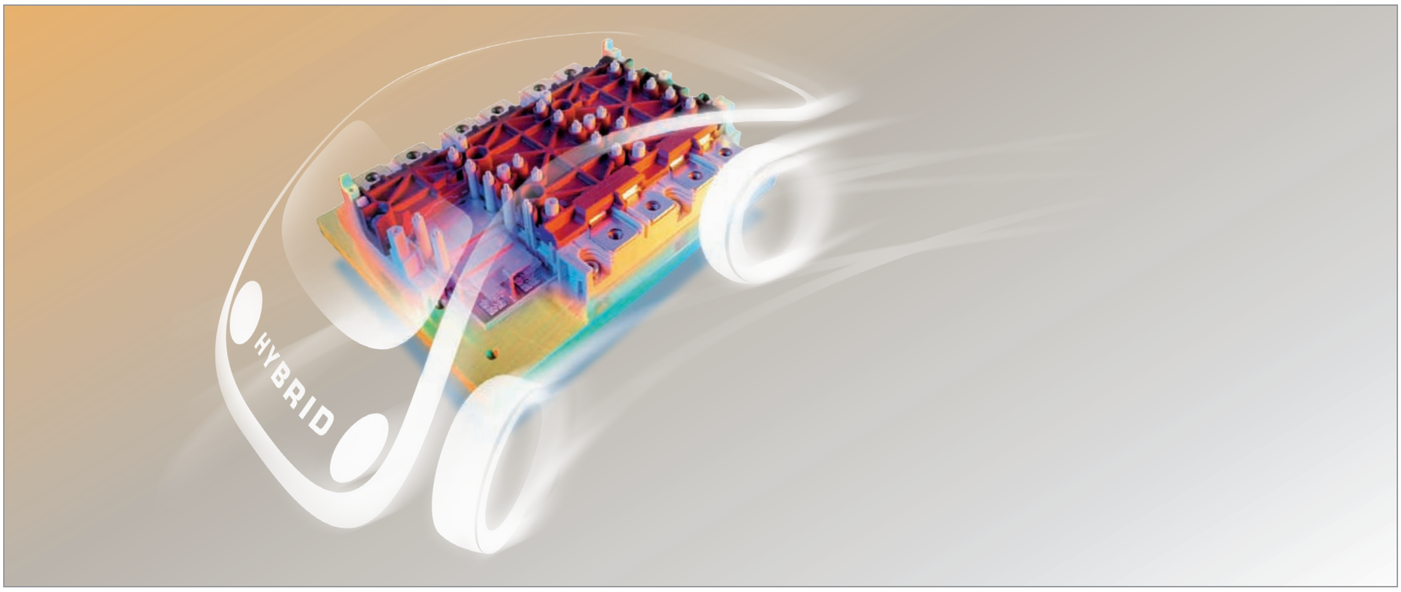
SEMITRANS 6



Dimensions in mm

SKiM® 63 / 93

100 % solder-free ensures durability



Applications

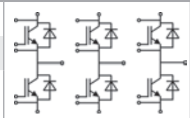
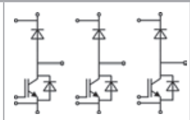
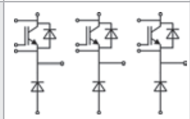
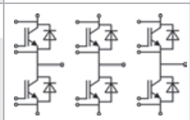
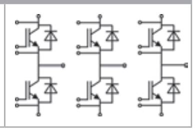
SKiM 63/93, sintered modules with no base plate, offer a number of possibilities for boosting the reliability of inverters. The SKiM 63/93 is used in many different applications such as electric powertrains in electric vehicles, hybrid cars and utility vehicles, heavy-duty construction machinery, or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

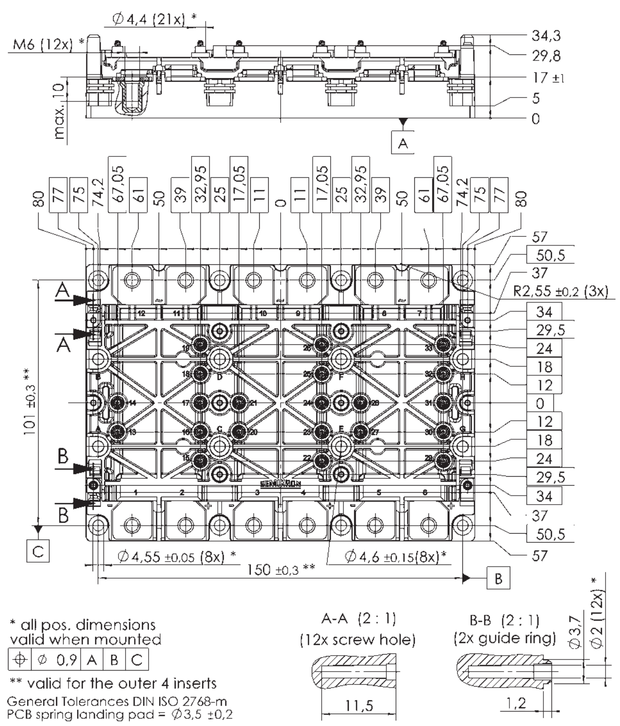
Benefits

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.

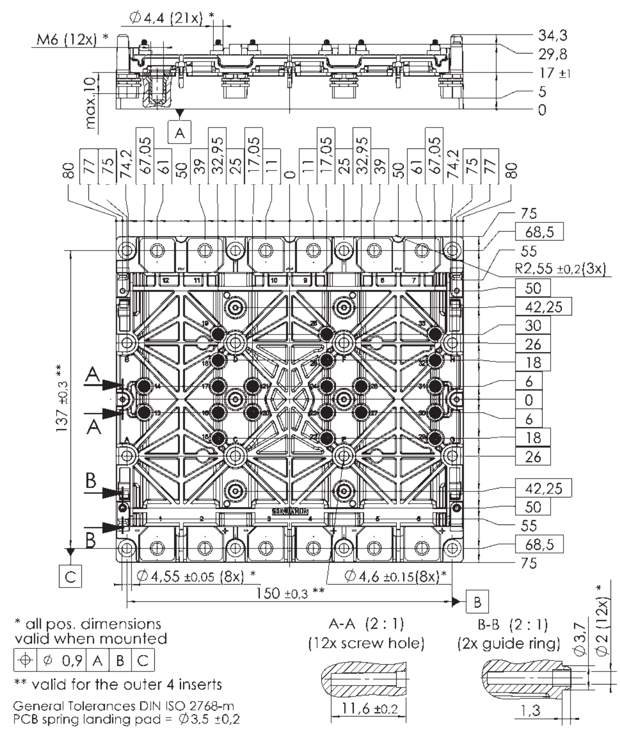
Type	IGBT						Diode				Case	Circuit
	I_C @T_s= 25°C	I_{Cnom}	$V_{CE(sat)}$ @T_j= 25°C typ.	E_{on}	E_{off}	$R_{th(j-s)}$	I_F @T_s= 25°C	V_F @T_j= 25°C typ.	E_{rr}	$R_{th(j-s)}$		
	A	A	V	mJ	mJ	K/W	A	V	mJ	K/W		
600 V - IGBT 3 (Trench)												
SKiM406GD066HD	468	400	1.45	8	25	0.135	360	1.5	12	0.243	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

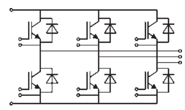
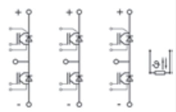
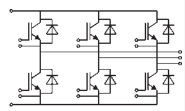
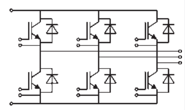
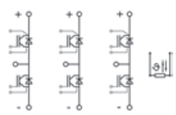


SKiM 93



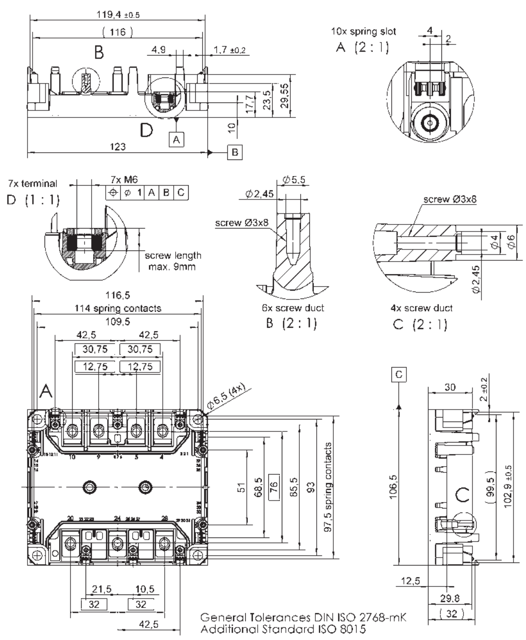
Dimensions in mm

Modules - IGBT - SKiM 4 / 5

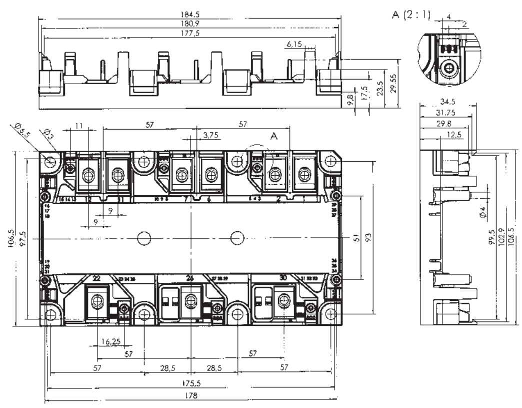
Type	IGBT						Diode				Case	Circuit
	I_C @T_s= 25°C	I_{Cnom}	$V_{CE(sat)}$ @T_j= 25°C typ.	E_{on}	E_{off}	$R_{th(j-s)}$	I_F @T_s= 25°C	V_F @T_j= 25°C typ.	E_{rr}	$R_{th(j-s)}$		
	A	A	V	mJ	mJ	K/W	A	V	mJ	K/W		
1200 V - IGBT 3 (Trench)												
SKiM200GD126D	-	200	1.65	15	25	-	152	2.4	-	0.35	4	
SKiM 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

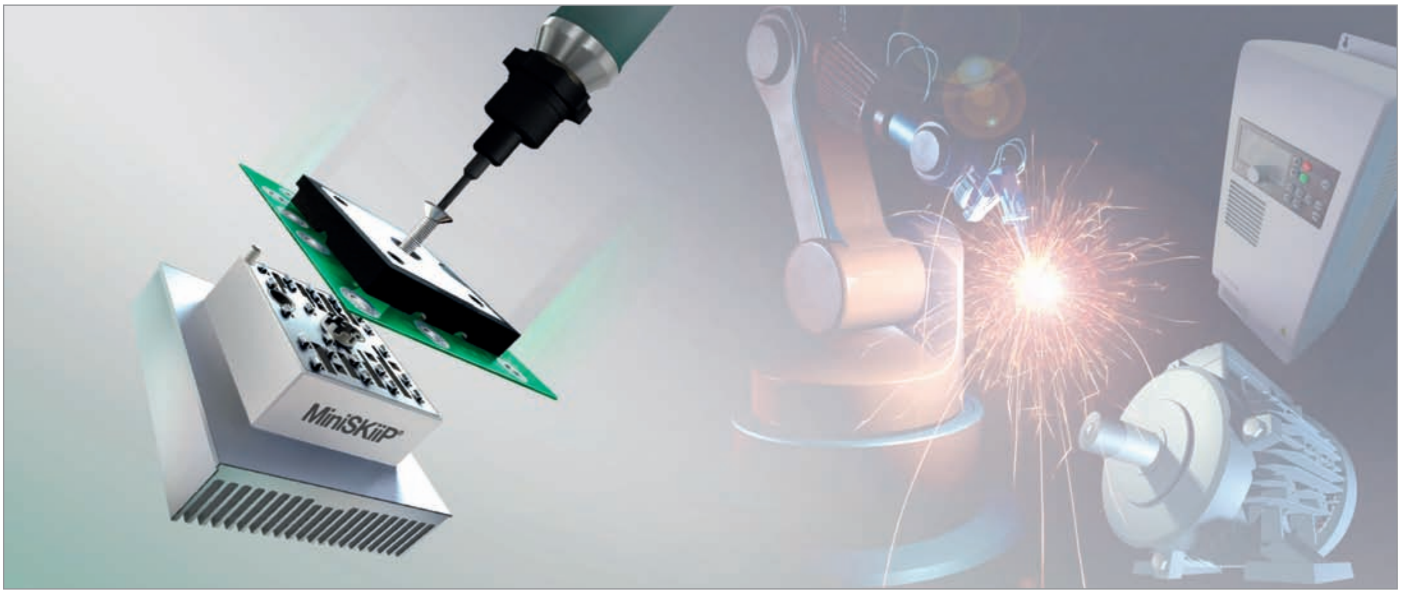


SKiM 5



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

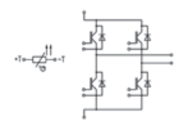
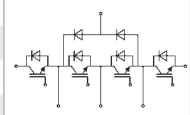
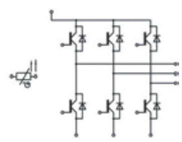
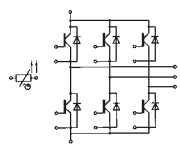
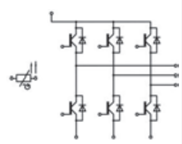
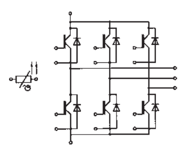
MiniSKiiP modules are designed for 600 V and 1200 V chip off-state voltages with 4-150 A nominal chip currents and feature Trench IGBT technology in combination with SEMIKRON CAL diode. In the 1200 V range, the latest Trench IGBT4 technology is used in combination with the CAL I4 diode. These chips may 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						Diode				Case	Circuit
	I_C @T_s= 25°C A	I_{Cnom} A	$V_{CE(sat)}$ @T_j= 25°C typ. V	E_{on} mJ	E_{off} mJ	$R_{th(j-s)}$ K/W	I_F @T_s= 25°C A	V_F @T_j= 25°C typ. V	E_{rr} mJ	$R_{th(j-s)}$ 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	

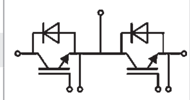
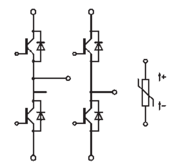
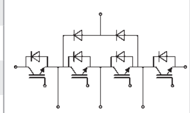
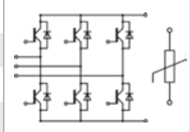
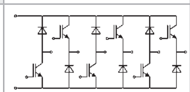
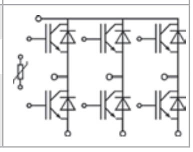
For detailed case drawings please see page 38

Footnotes

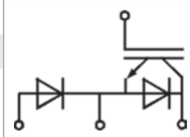
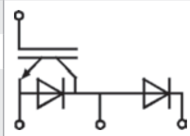
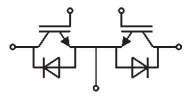
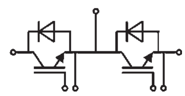
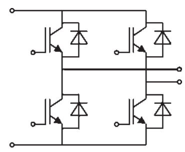
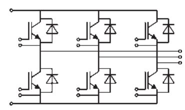
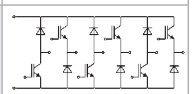
1) New

2) Not for New Design

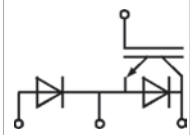
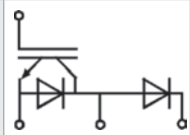
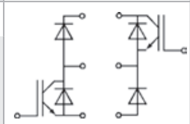
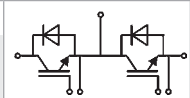
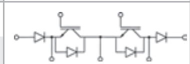
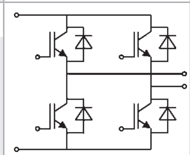
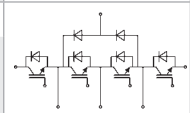
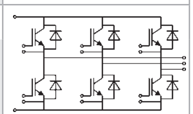
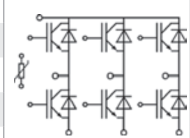
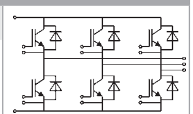
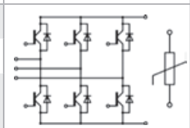
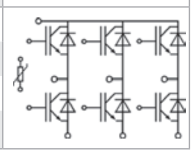
Modules - IGBT - SEMITOP

Type	IGBT						Diode				Case	Circuit
	I_C @T_s= 25°C A	I_{Cnom} A	$V_{CE(sat)}$ @T_j= 25°C typ. V	E_{on} mJ	E_{off} mJ	$R_{th(j-s)}$ K/W	I_F @T_s= 25°C A	V_F @T_j= 25°C typ. V	E_{rr} mJ	$R_{th(j-s)}$ 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	

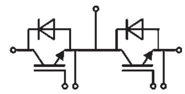
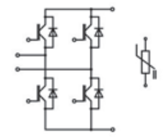
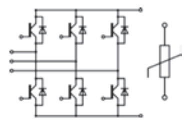
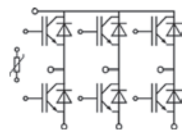
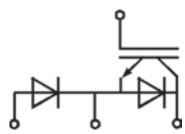
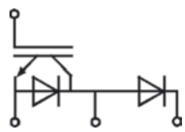
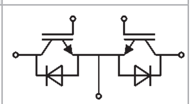
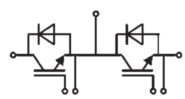
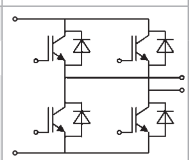
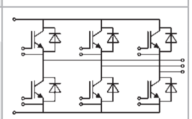
Modules - IGBT - SEMITOP

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	

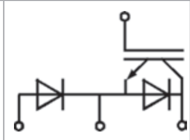
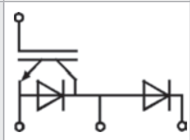
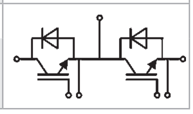
Modules - IGBT - SEMITOP

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

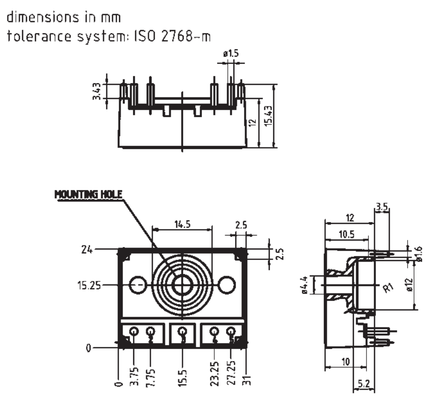
Type	IGBT						Diode				Case	Circuit
	I_C @T_S= 25°C	I_{Cnom}	$V_{CE(sat)}$ @T_j= 25°C typ.	E_{on}	E_{off}	$R_{th(j-s)}$	I_F @T_S= 25°C	V_F @T_j= 25°C typ.	E_{rr}	$R_{th(j-s)}$		
	A	A	V	mJ	mJ	K/W	A	V	mJ	K/W		
1200 V - NPT IGBT (Ultrafast)												
SK 60 GAR 125	51	50	3.2	8.36	3.32	0.6	43	2.00	2	1.16	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

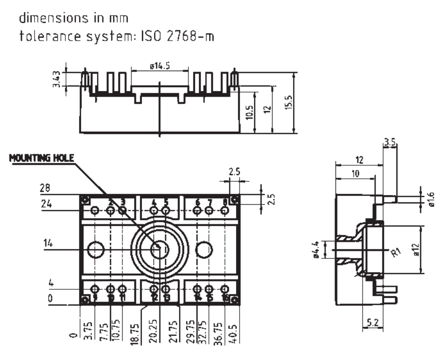
1) Not for New Design

Cases

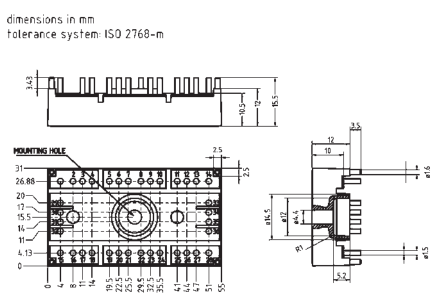
SEMITOP 1



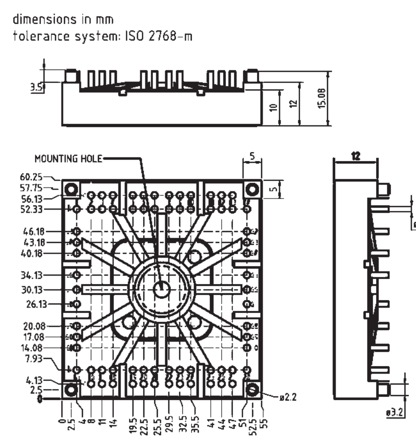
SEMITOP 2



SEMITOP 3



SEMITOP 4



Dimensions in mm

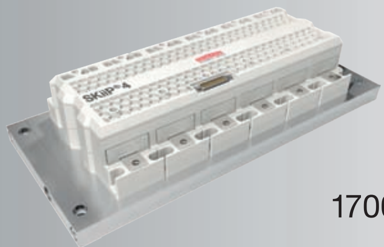
IPM Intelligent Power Modules

MiniSKiiP® IPM

600V
CIB

1200V
6-pack

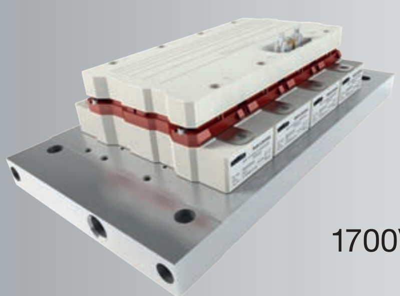
SKiiP® 4



1200V
half bridge
1800A 3600A

1700V
half bridge
1800A 3600A

SKiiP® 3



1200V
6-pack
1200A half bridge 2400A

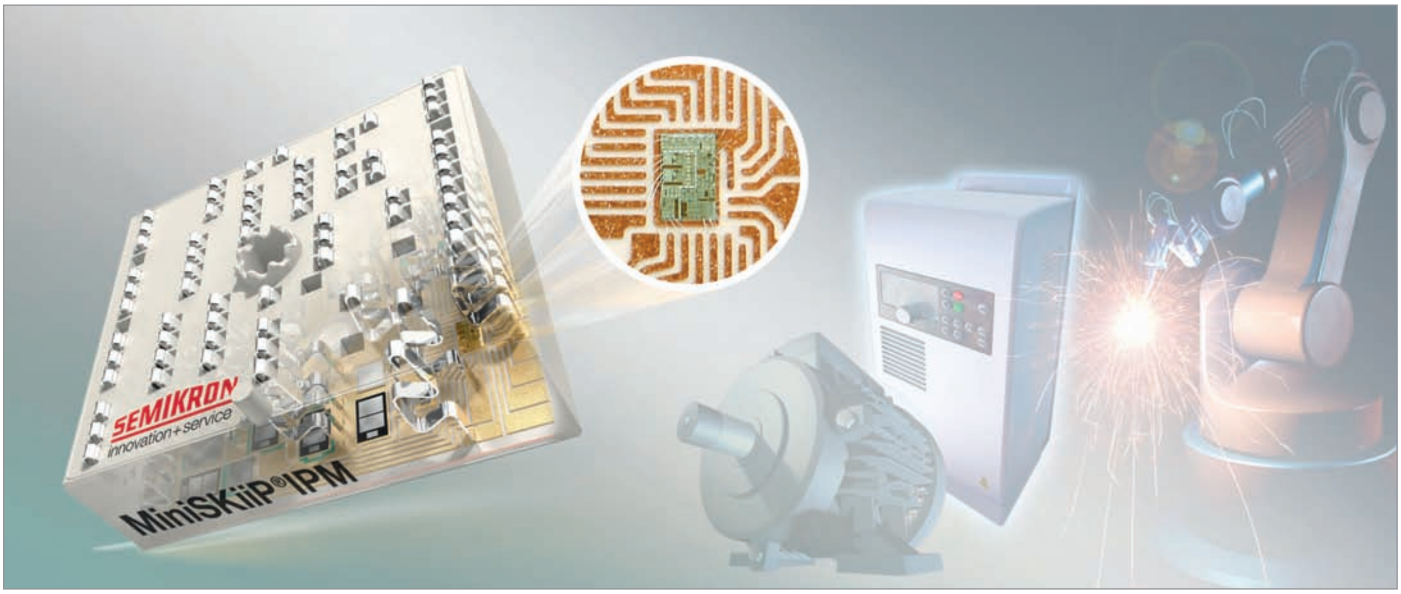
1700V
6-pack
1000A half bridge 2400A

I_c@ 25°C [A]
I_c@ 70°C SKiiP®4

42 59 61 600 1000 1200 1800 2400 3600

MiniSKiiP® IPM

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.

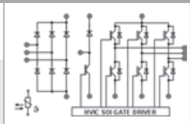
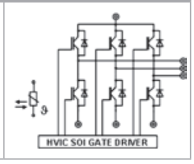
Product range

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

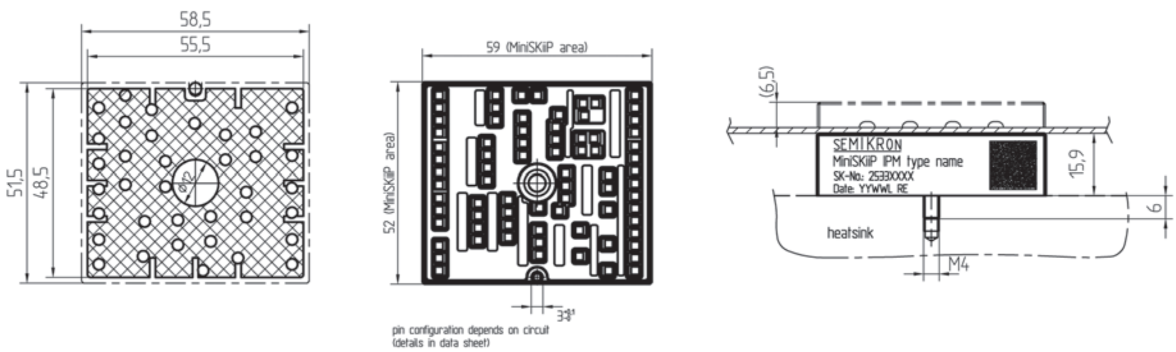
The IPM combines a base plate free package with the established pressure contact technology for quick and easy solder-free assembly. All power, control and auxiliary contacts are connected directly to the printed circuit board via springs resulting in more reliable electrical connections under stronger 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.

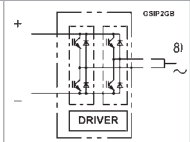
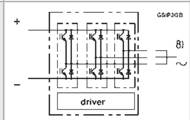
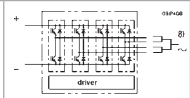
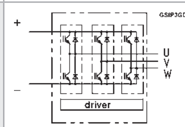
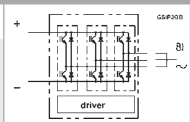
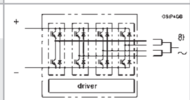
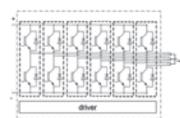
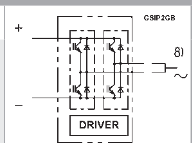
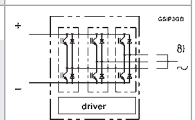
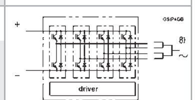
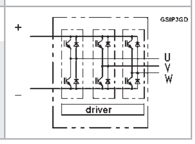
Product range

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.

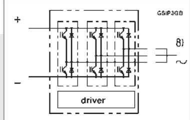
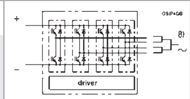
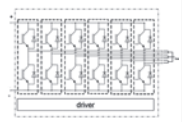
Benefits

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

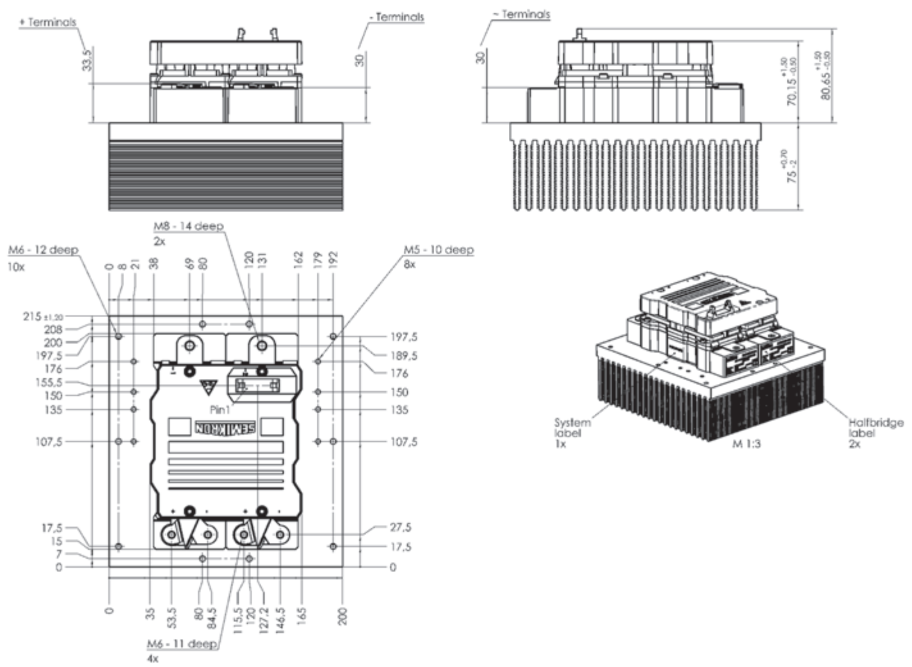
Type	IGBT				Diode			Case		Circuit
	I_C @T_s= 25°C	I_{Cnom}	$V_{CE(sat)}$ @T_j= 25°C typ.	E_{on} + E_{off}	I_F @T_s= 25°C	V_F @T_j= 25°C typ.	E_{rr}	Case	Options	
	A	A	V	mJ	A	V	mJ			
1200 V - IGBT 3 (Trench) - SKiiP 3										
SKiiP 1213 GB123-2DL V3	1200	1200	1.7	390	930	1.50	56	S23	W,L,F	
SKiiP 1813 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

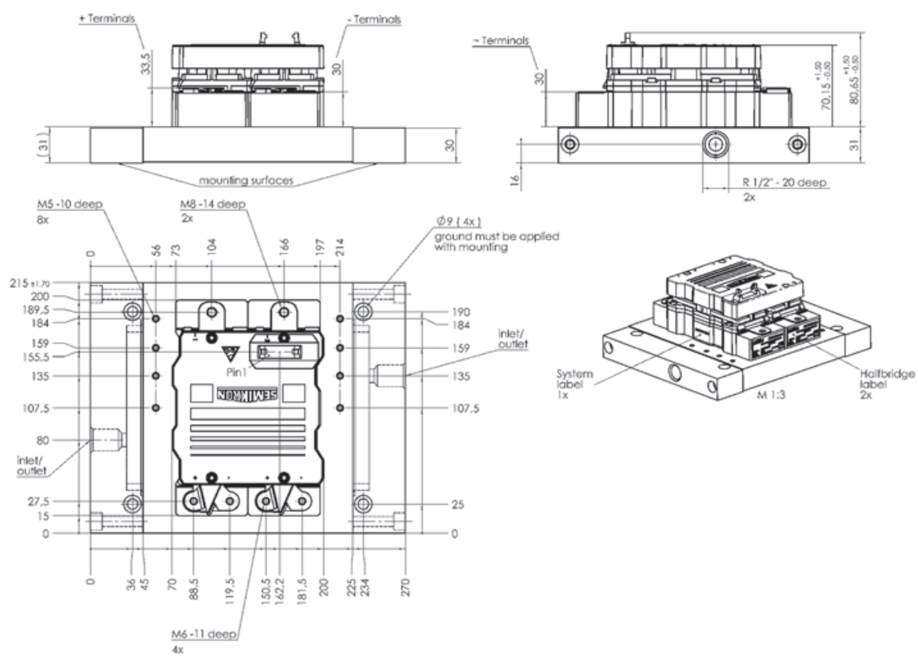
Case S 23 mounted on P3016 heat sink



weight without heat sink: 1,7 kg

P3016: 4,4 kg

Case S 23 mounted on liquid cooled heat sink NWK 40

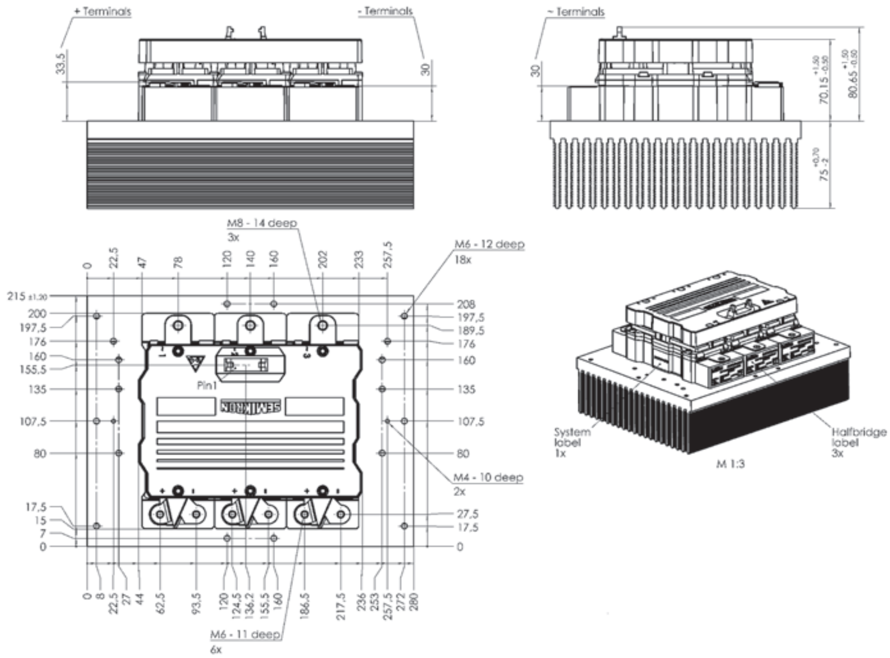


NWK 40: 2,8 kg

Dimensions in mm

Cases SKiiP 3

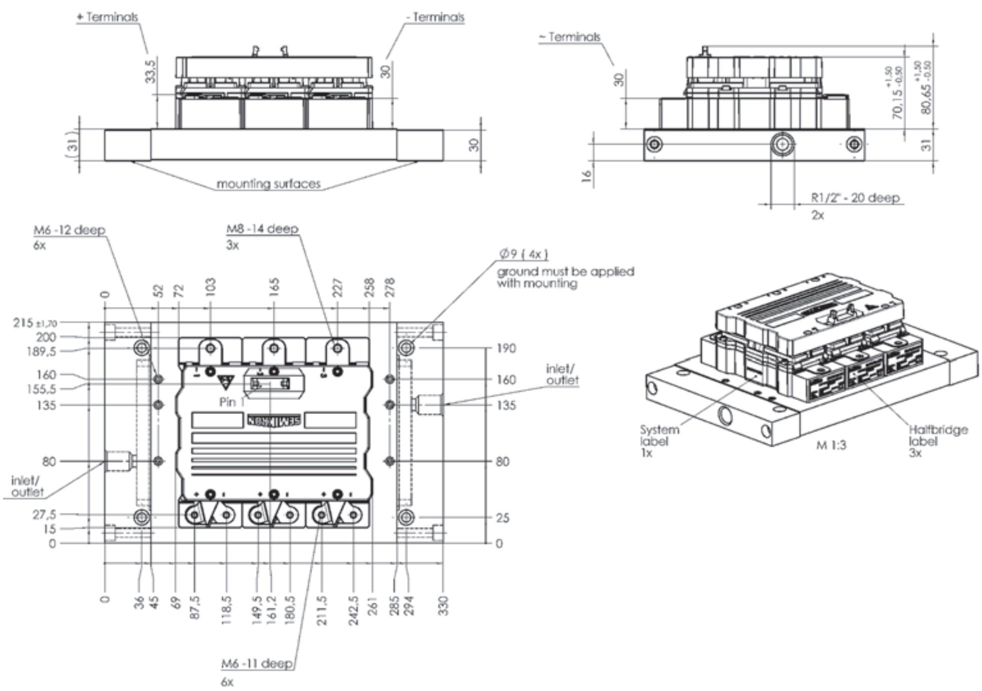
Case S 33 mounted on P3016 heat sink



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

P3016: **6,2 kg**

Case S 33 mounted on liquid cooled heat sink NWK 40

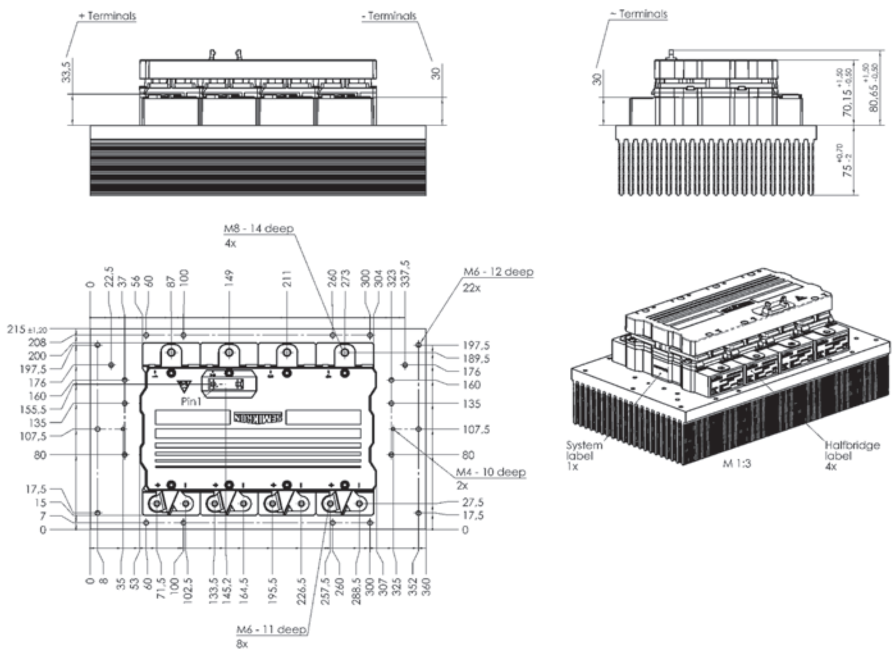


NWK 40: **5,2 kg**

Dimensions in mm

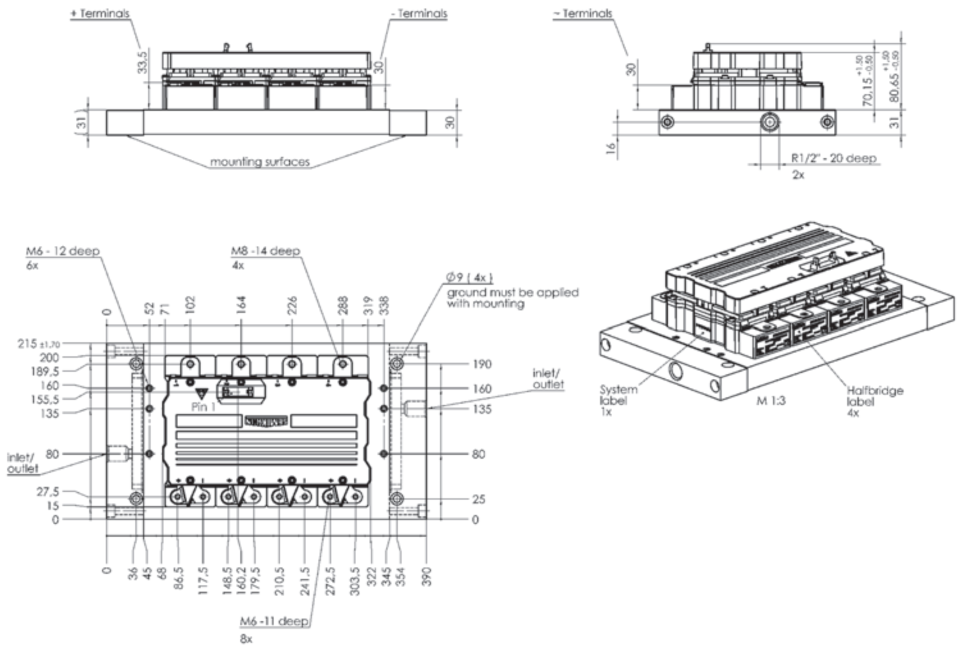
Cases SKiiP 3

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

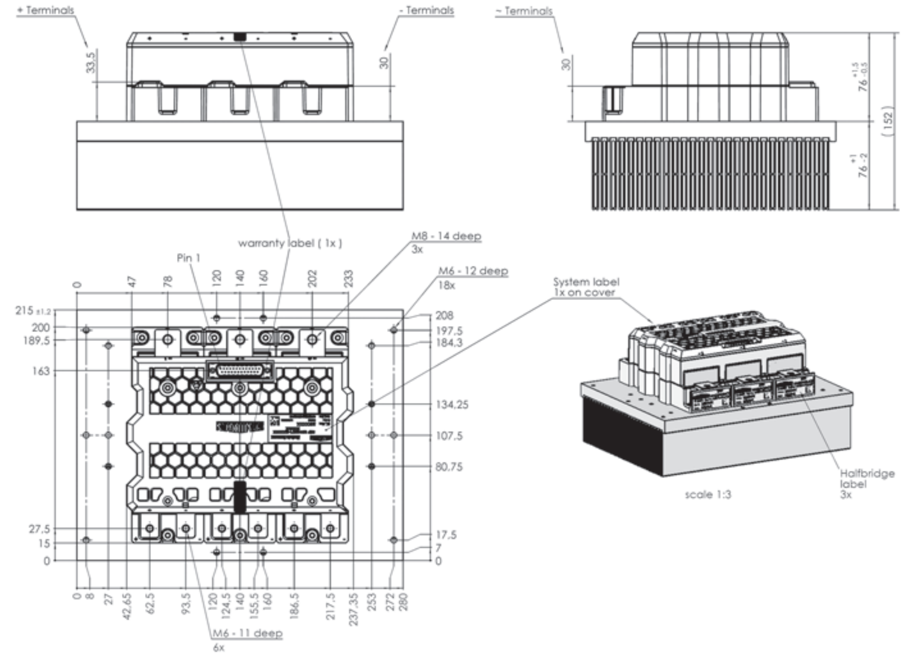


NWK 40:	**6,2 kg**

Dimensions in mm

Cases SKiiP 4

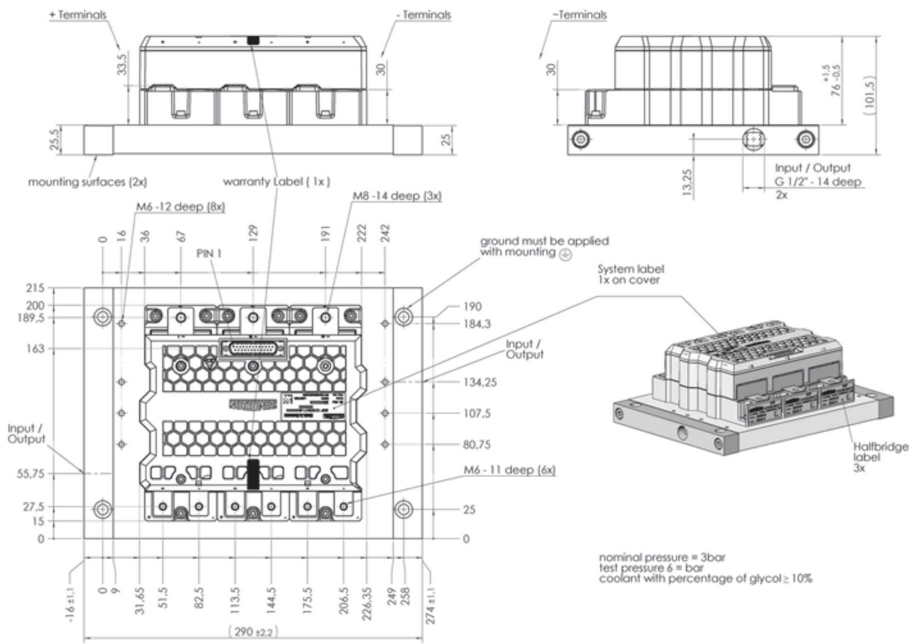
Case S 34 mounted on P4016 heat sink



weight without heat sink: 2,48 kg

P4016: 5,9 kg

Case S 34 mounted on liquid cooled heat sink NHC

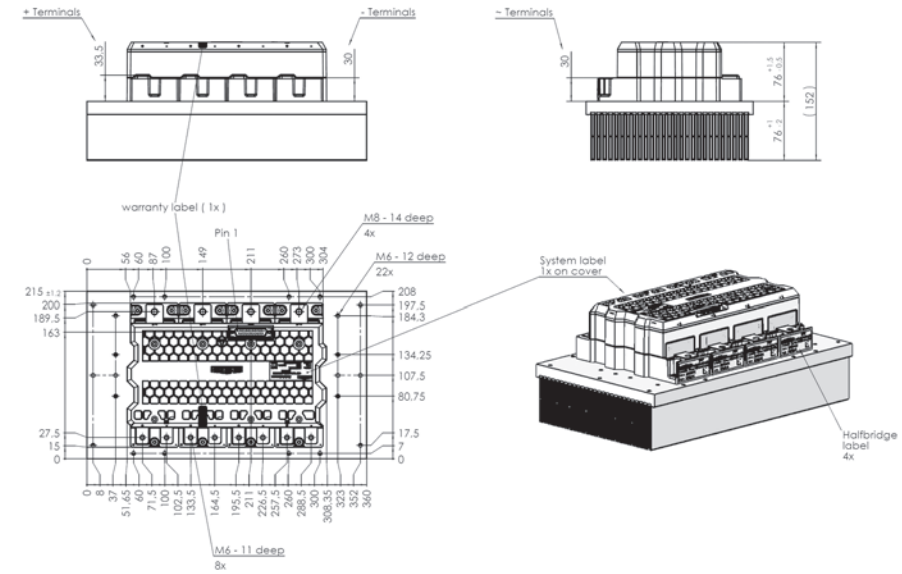


NHC: 3,49 kg

Dimensions in mm

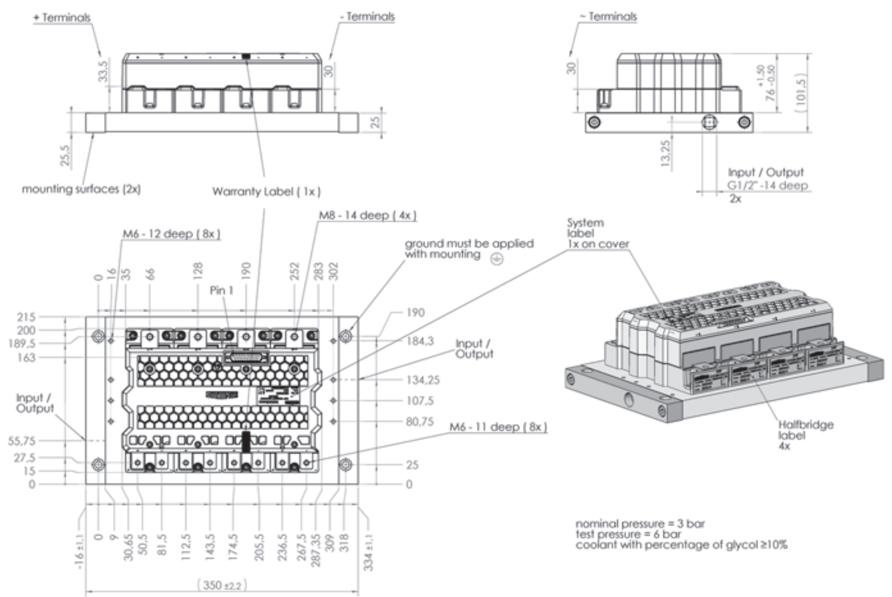
Cases SKiiP 4

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

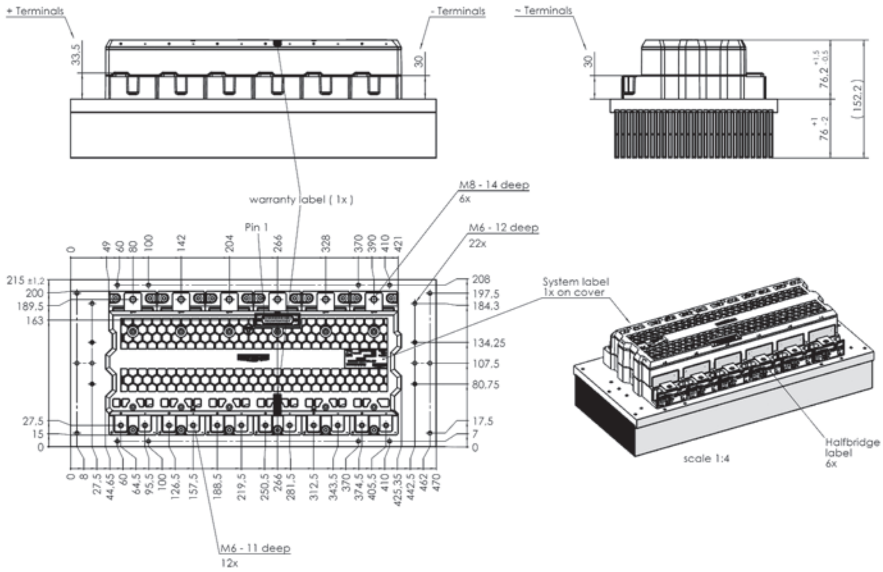


NHC:	**4,25 kg**

Dimensions in mm

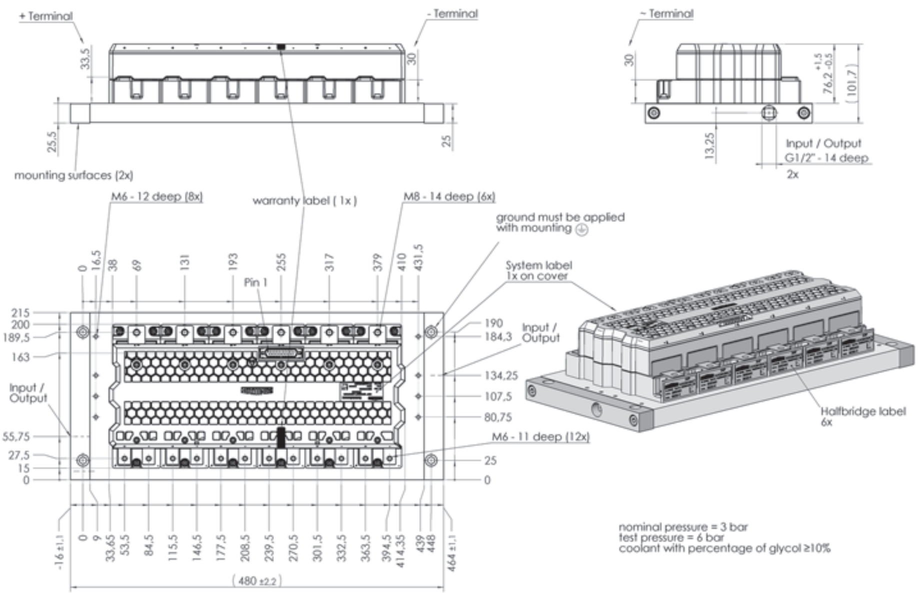
Cases SKiiP 4

Case S 64 mounted on P4016 heat sink



weight without heat sink:	**4,84 kg**
P4016:	**9,9 kg**

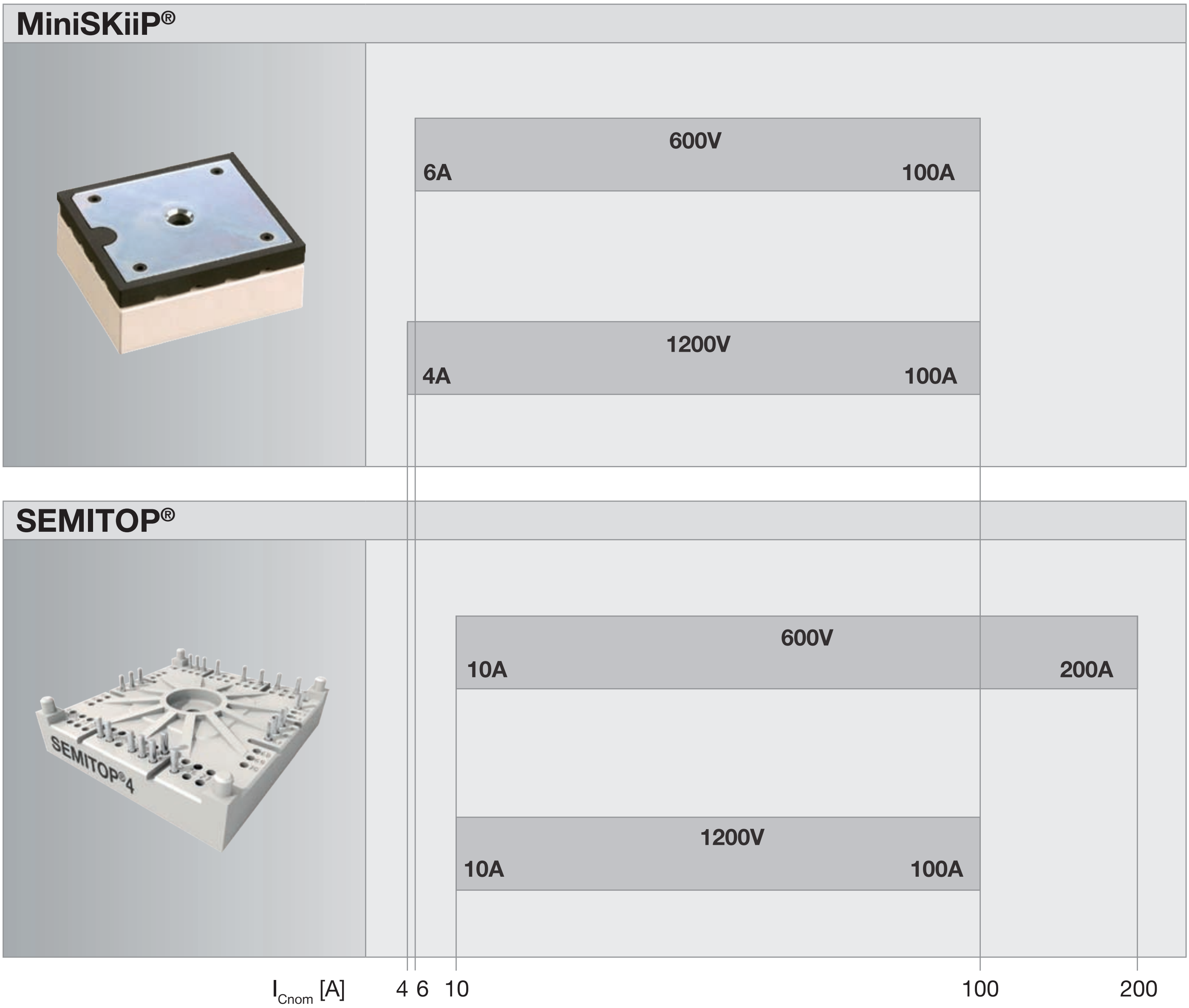
Case S 64 mounted on liquid cooled heat sink NHC



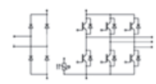
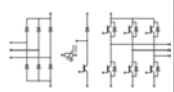
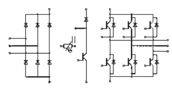
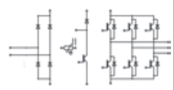
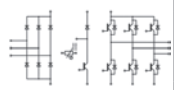
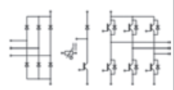
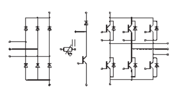
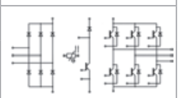
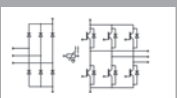
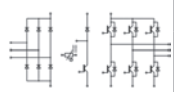
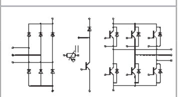
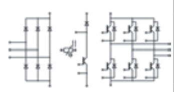
NHC:	**5,77 kg**

Dimensions in mm

CIB Converter Inverter Brake Modules



Modules - CIB - MiniSKiiP

Type	IGBT						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 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	

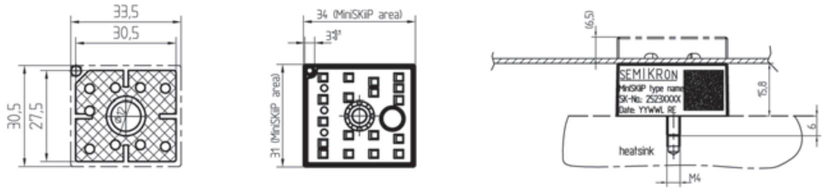
Footnotes

[1] Not for New Design

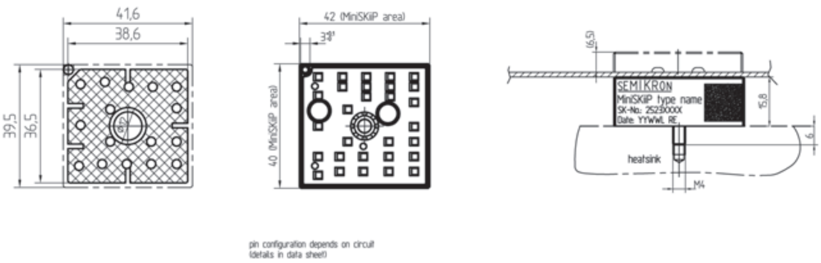
Modules - CIB - MiniSKiiP

Cases

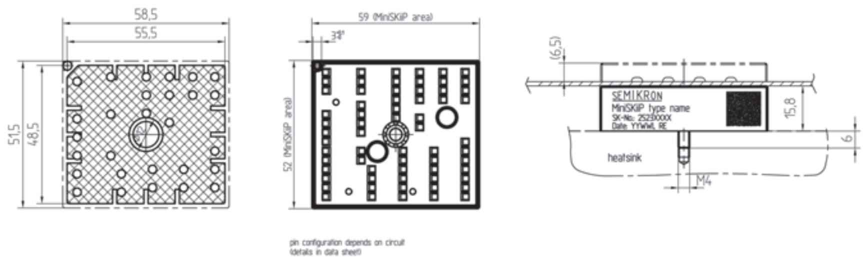
MiniSKiiP II 0



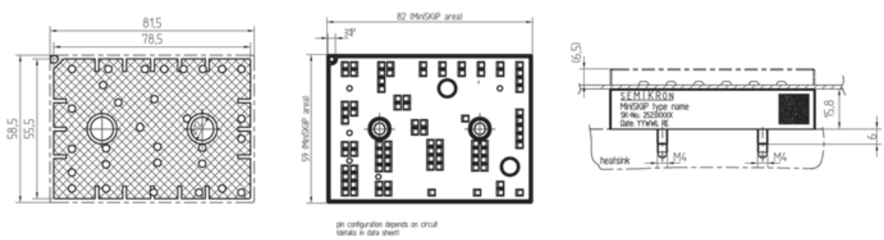
MiniSKiiP II 1



MiniSKiiP II 2

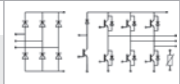
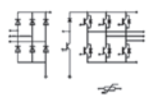
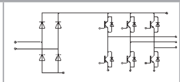
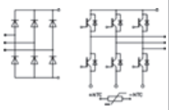
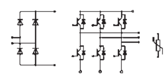
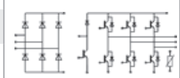
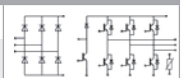
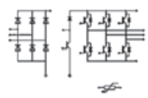
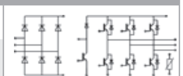
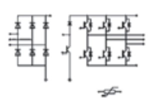


MiniSKiiP II 3



Dimensions in mm

Modules - CIB - SEMITOP

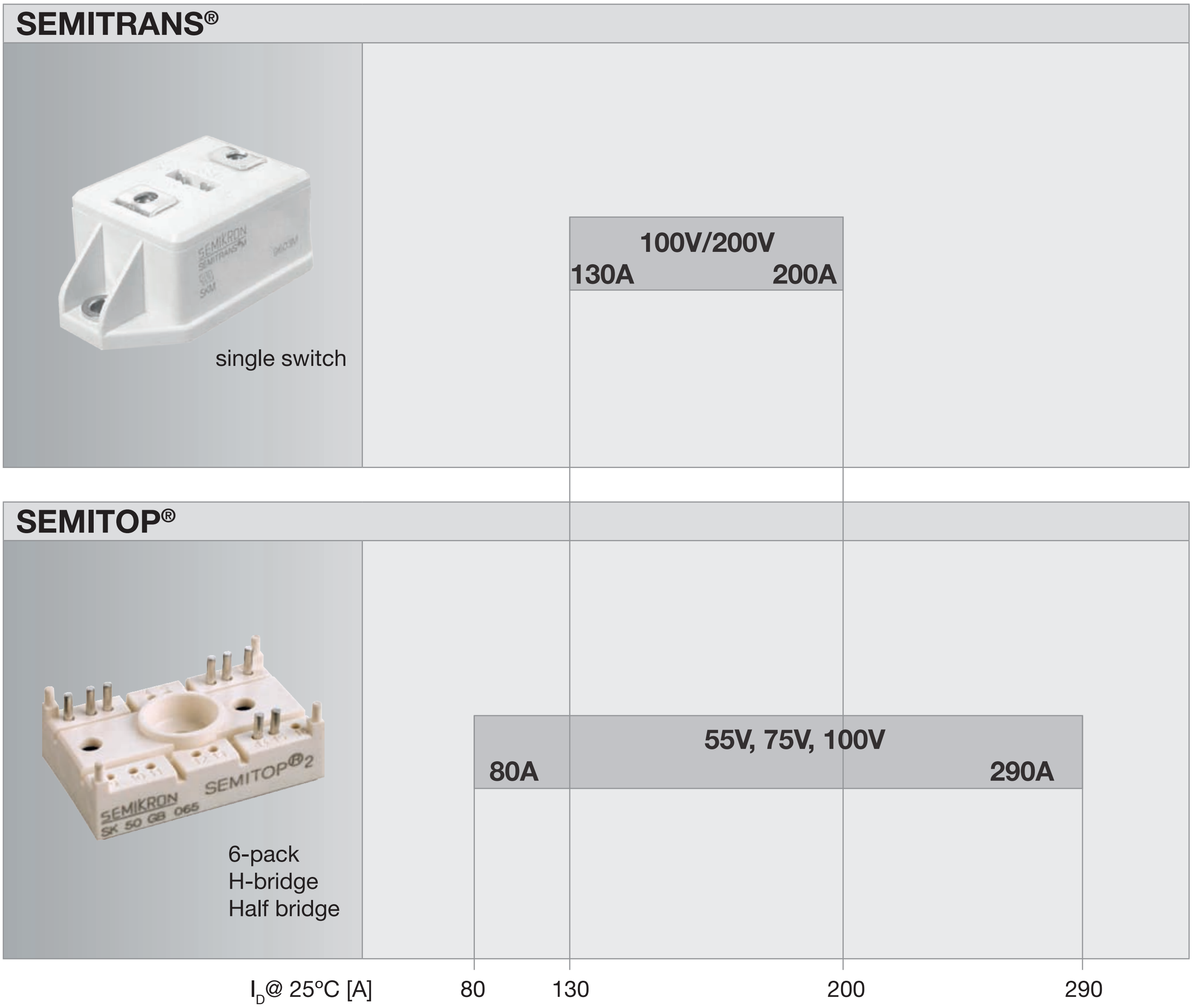
Type	IGBT						Diode				Rectifier		Case	Circuit
	I_C @T_S= 25°C	I_{Cnom}	$V_{CE(sat)}$ @T_j= 25°C typ.	E_{on}	E_{off}	$R_{th(j-s)}$	I_F @T_S= 25°C	V_F @T_j= 25°C typ.	E_{rr}	$R_{th(j-s)}$	I_{FSM} @T_S= 25°C	$R_{th(j-s)}$		
	A	A	V	mJ	mJ	K/W	A	V	mJ	K/W	A	K/W		
600 V - IGBT 3 (Trench)														
SK 20 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

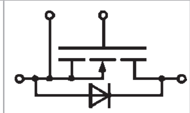
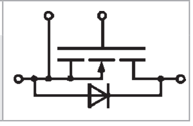
Footnotes

1) Not for New Design

MOSFET Modules

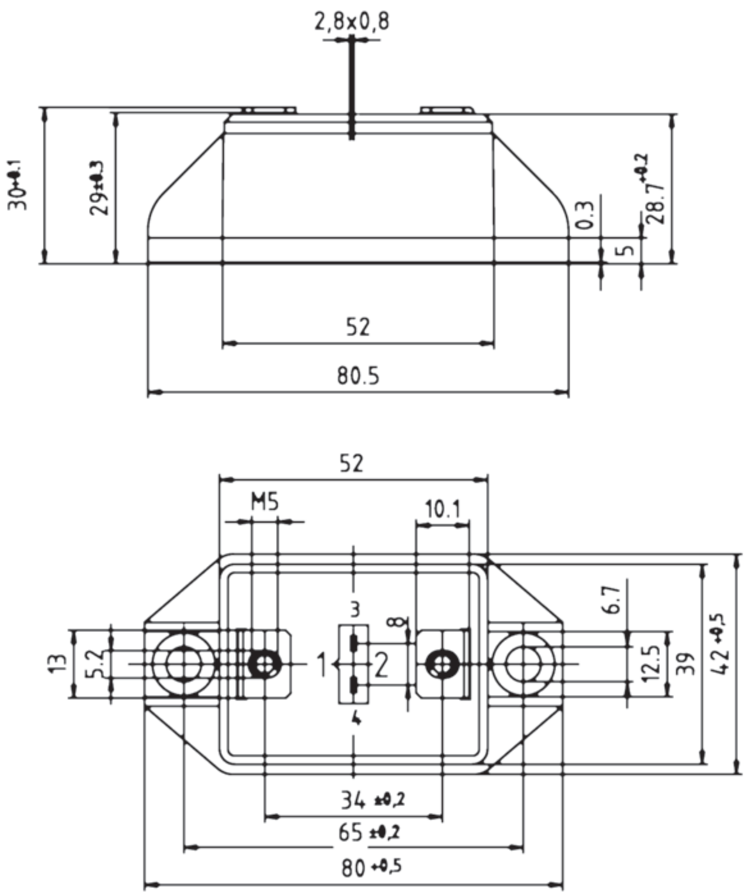


Modules - MOSFET - SEMITRANS

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

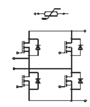
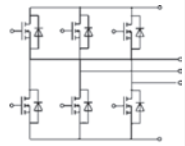
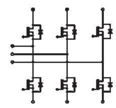
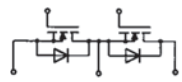
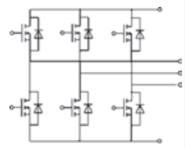
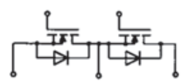
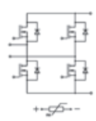
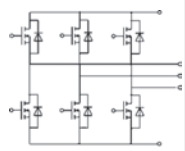


Dimensions in mm

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	

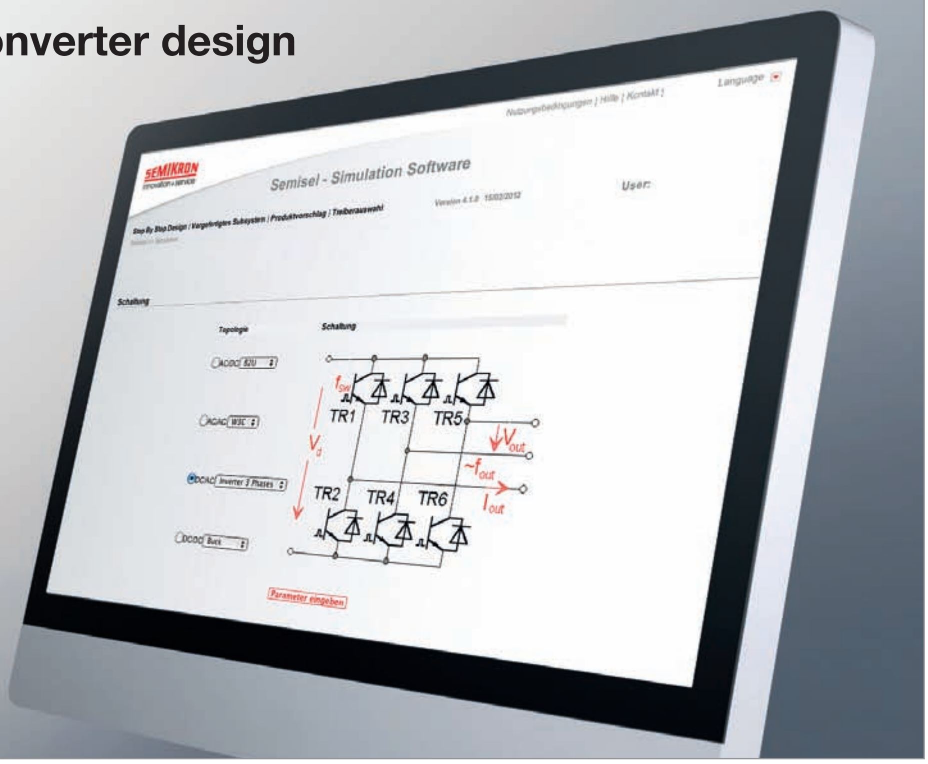
For detailed case drawings please see page 23

Footnotes

1) Not for New Design

SemiSel

Free help with your converter design



Applications

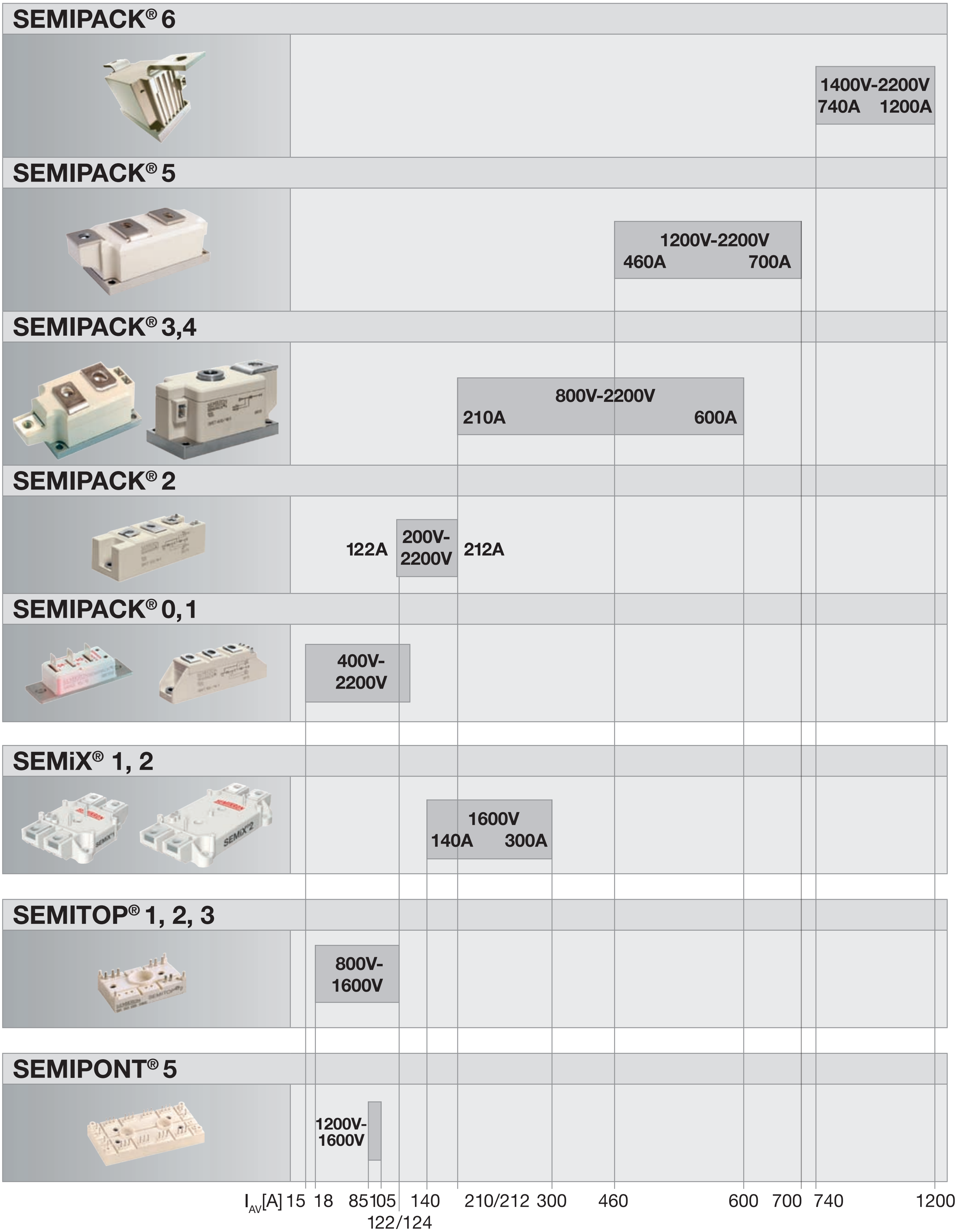
SemiSel is the SEMIKRON online calculation and simulation tool for losses, temperatures and optimum choice of power electronic components (www.semikron.com). Due to ever-present cost pressure, the optimum choice of power conductor components is a must. The days when a module was purchased solely on the 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

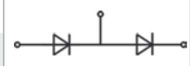
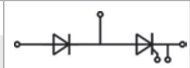
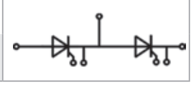
Benefits

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

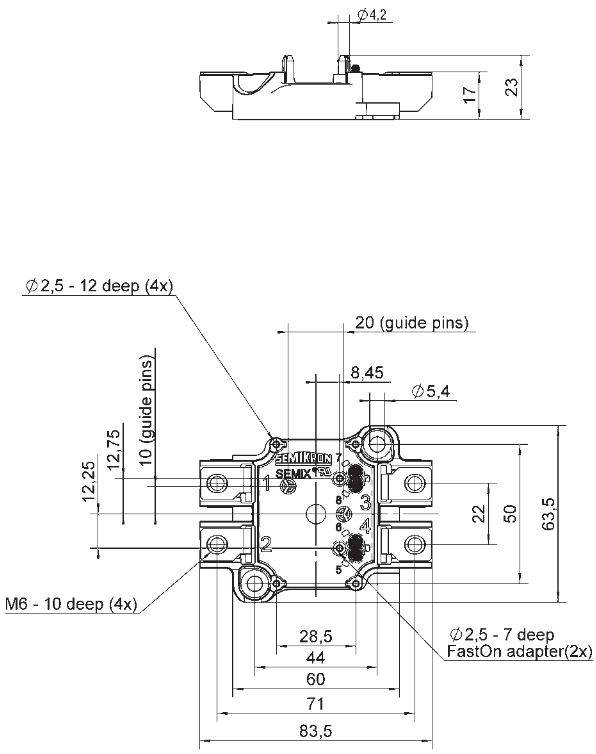


Modules - Thyristor / Diode - SEMiX

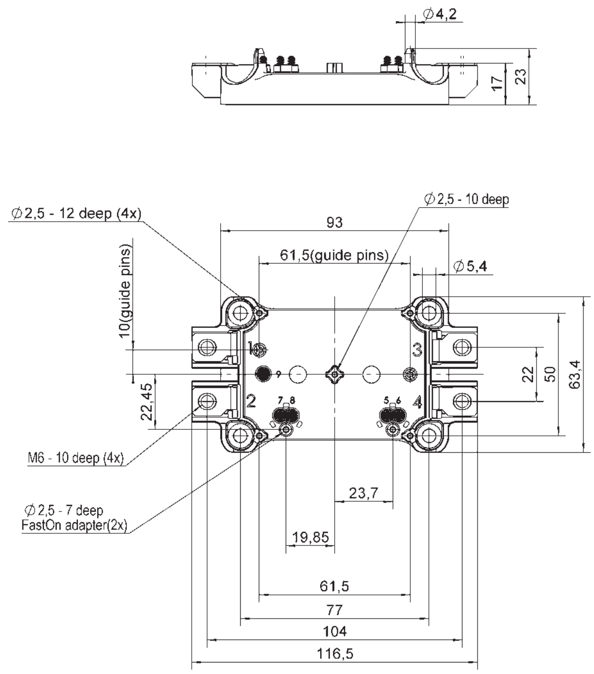
Type	V_{RRM} V_{DRM}	I_{TAV} I_{FAV} @T_C	T_C	I_{TSM} I_{FSM} @T_{jmax}	$V_{T(TO)}$ @T_{jmax}	r_T @T_{jmax}	$R_{th(j-c)}$ per chip	$R_{th(c-s)}$ per mo-dule	T_j	Case	Circuit
	V	A	°C	A	V	mΩ	K/W	K/W	°C		
SEMiX191KD16s	1600	190	85	5000	0.85	0.95	0.18	0.075	-40 ... +130	1s	
SEMiX302KD16s	1600	300	85	7500	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

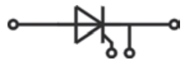
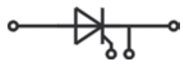
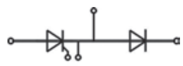
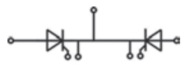
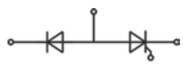
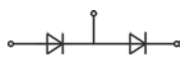


SEMiX 2s

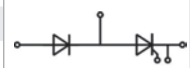


Dimensions in mm

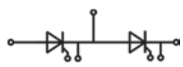
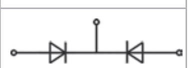
Modules - Thyristor / Diode - SEMIPACK

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	

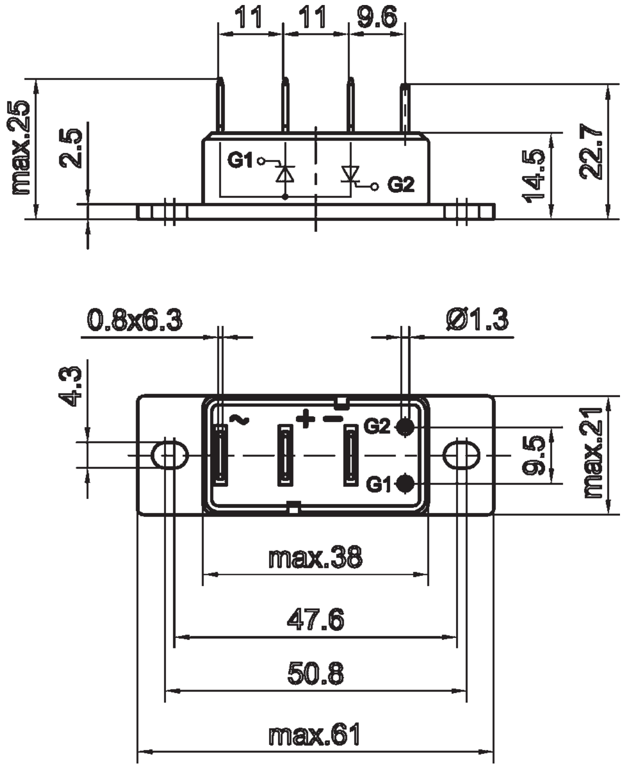
Footnotes

[1] New

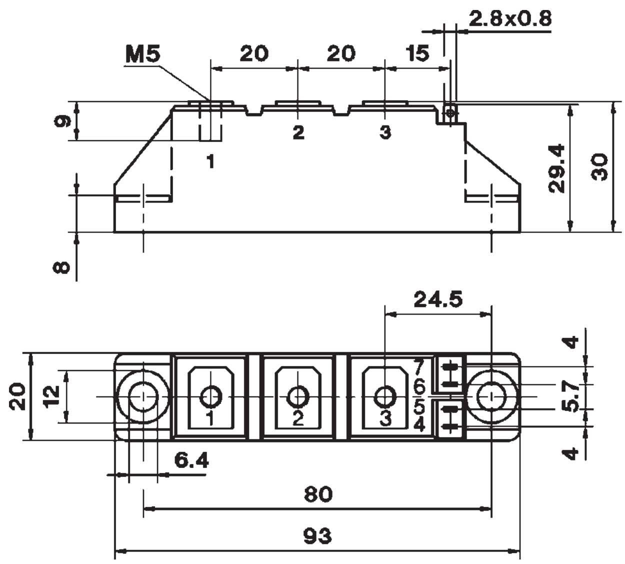
Modules - Thyristor / Diode - SEMIPACK

Cases

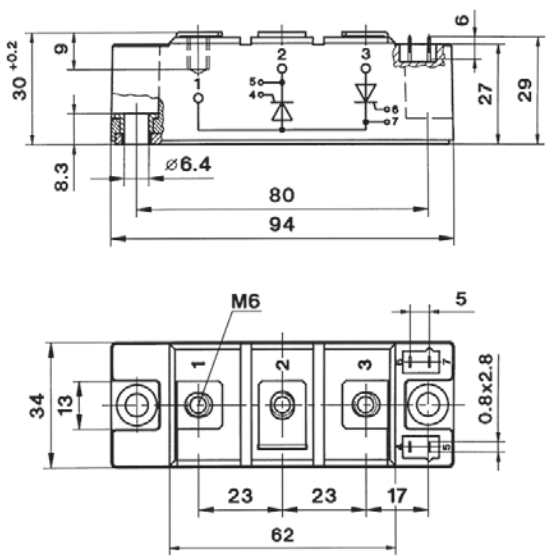
SEMIPACK 0



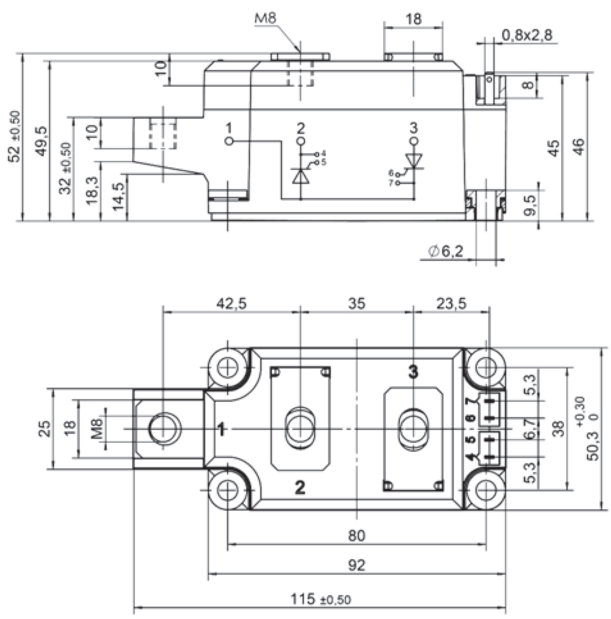
SEMIPACK 1



SEMIPACK 2



SEMIPACK 3

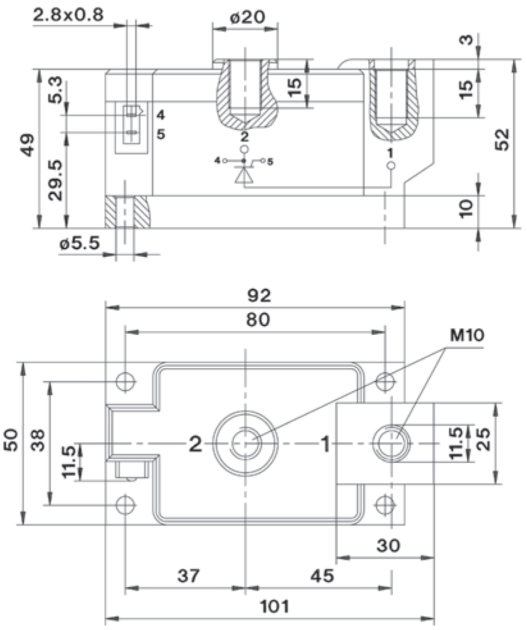


Dimensions in mm

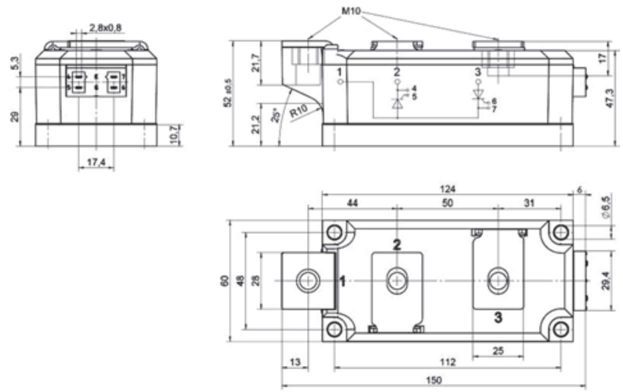
Modules - Thyristor / Diode - SEMIPACK

Cases

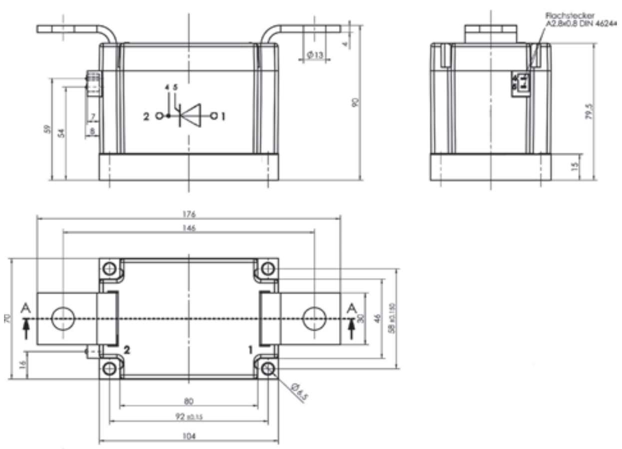
SEMIPACK 4



SEMIPACK 5

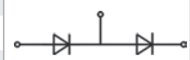
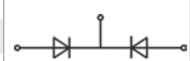
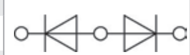


SEMIPACK 6



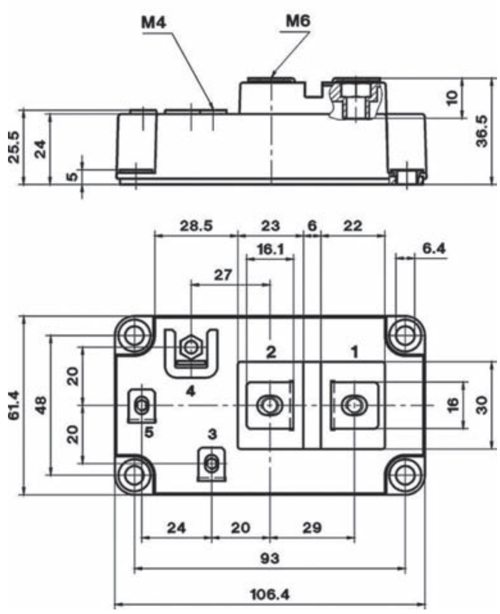
Dimensions in mm

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

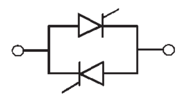
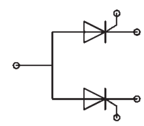
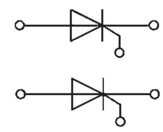
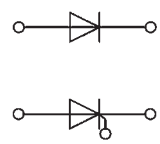
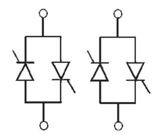
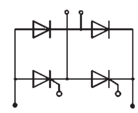
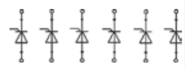
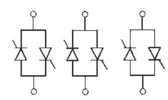
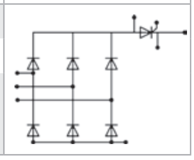


Dimensions in mm

Footnotes

1) SEMIPACK Fast in SEMITRANS 4 case

Modules - Thyristor / Diode - SEMITOP

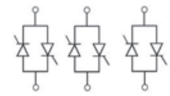
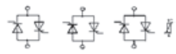
Type	V_{RRM} V_{DRM}	I_{TAV} I_{FAV} @T_C	T_C	I_{TSM} I_{FSM} @T_{jmax}	$V_{T(TO)}$ @T_{jmax}	r_T @T_{jmax}	$R_{th(j-s)}$ cont. per chip	T_j	Case	Circuit
	V	A	°C	A	V	mΩ	K/W	°C		
SK 25 KQ	800-1600	29	85	280	1.1	20	1.7	-40 ... +125	1	
SK 45 KQ	800-1600	47	85	380	1	10	1.2	-40 ... +125	1	
SK 70 KQ	800-1600	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

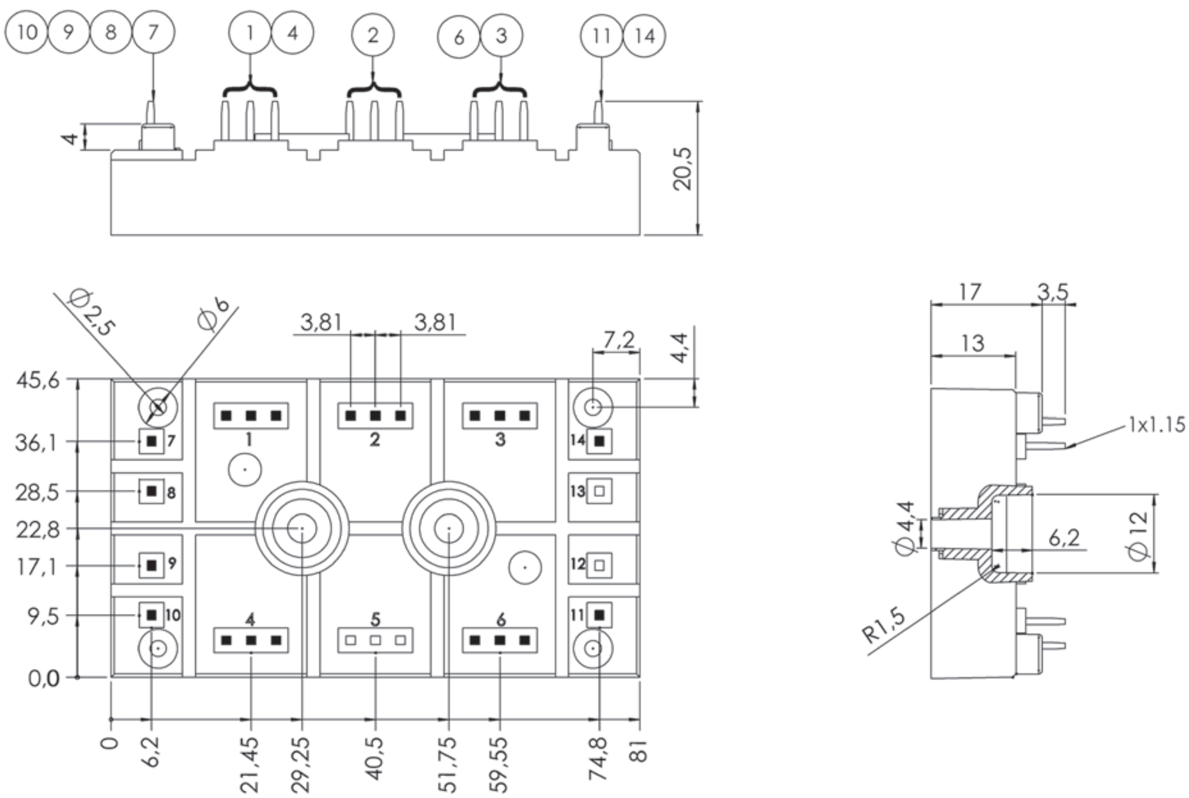
[1] Not for New Design

Modules - Thyristor / Diode - SEMIPONT

Type	V_{RRM} V_{DRM} V	I_{RMS} @T_C A	T_C °C	I_{TSM} I_{FSM} @T_{jmax} A	$V_{T(TO)}$ @T_{jmax} V	r_T @T_{jmax} mΩ	$R_{th(j-s)}$ cont. per chip K/W	T_j °C	Case	Circuit
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	

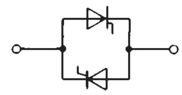
Cases

SEMIPONT 5



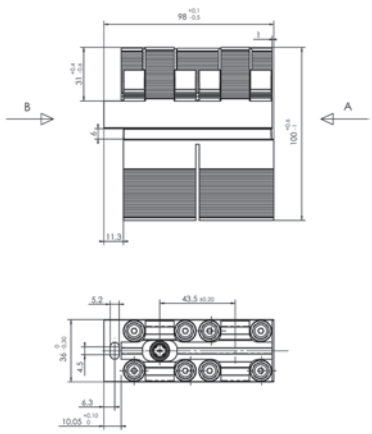
Dimensions in mm

Modules - Thyristors - SEMiSTART

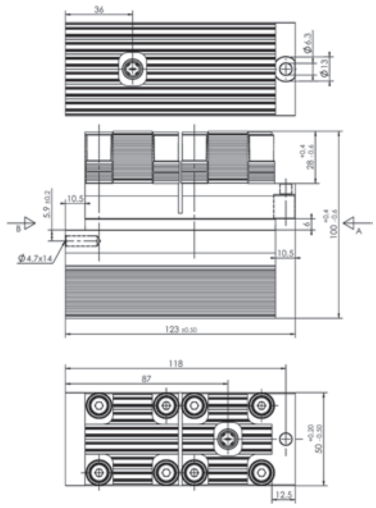
Type	V_{RRM} V_{DRM}	$I_{overload}$ W1C (for 20s)	T_C	I_{TSM} @T_j= 125°C	$V_{T(TO)}$ @T_j= 125°C	r_T @T_j= 125°C	$R_{th(j-s)}$ cont. per chip	T_j (for 20s)	Case	Circuit
	V	A	°C	A	V	mΩ	K/W	°C		
SKKQ 560	1400-1800	560	150	5200	0.9	0.9	0.106	150	1	
SKKQ 800	1400-1800	800	150	5200	0.9	0.8	0.106	150	2	
SKKQ 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

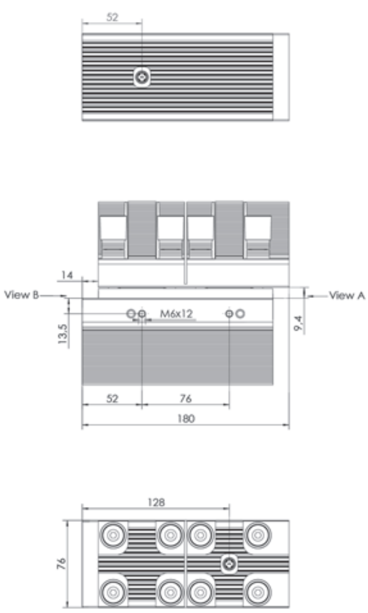
SEMiSTART 1



SEMiSTART 2



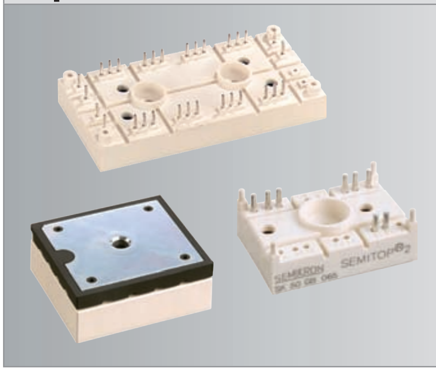
SEMiSTART 3



Dimensions in mm

Bridge Rectifier

Input rectifier+brake chopper

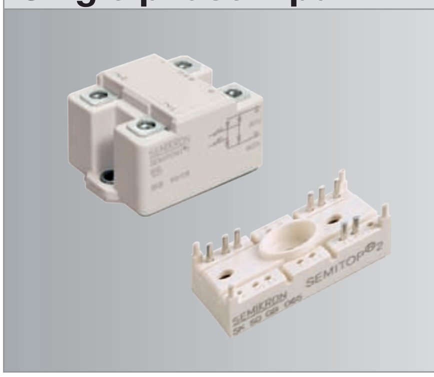


Range	I_D min	I_D max
1	55A	140A
2	170A	260A

3 phase input

Range	I_D min	I_D max
1	40A	110A
2	40A	140A
3	35A	220A
4	240A	490A

Single phase input



Range	I_D min	I_D max
1	30A	46A
2	24A	46A
3	2A	85A

Miniature Bridge Rectifier

Leaded

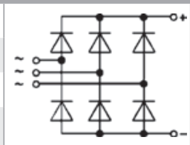
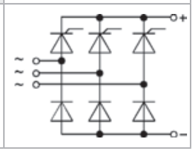
Range	I_D min	I_D max
1	9A	25A

Fast on

Range	I_D min	I_D max
1	17A	35A

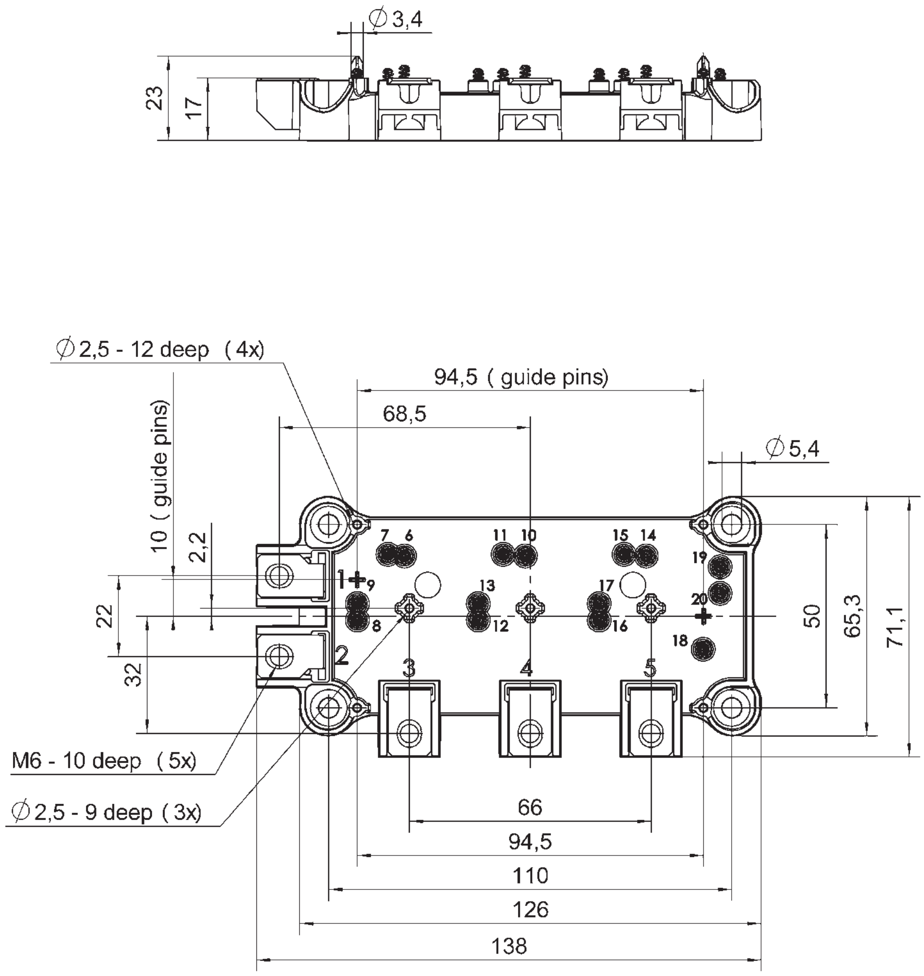
I_D [A]: 2, 9, 24, 25, 30, 35, 40, 46, 55, 85, 110, 140, 170, 220, 240, 260, 490

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 mo-dule	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

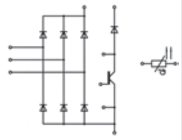
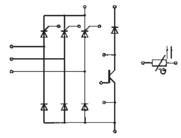


Dimensions in mm

Footnotes

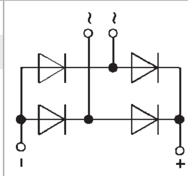
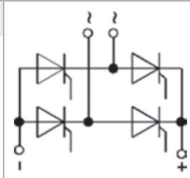
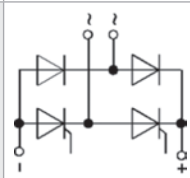
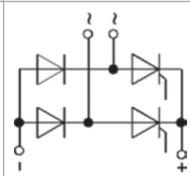
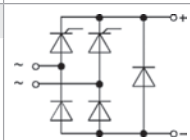
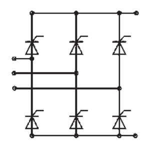
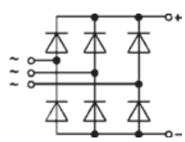
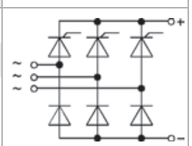
1) New

Modules - Bridge - MiniSKiiP

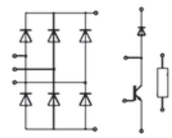
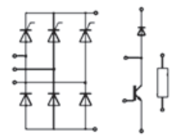
Type	IGBT						Diode				Case	Circuit
	I_C @T_S= 25°C	I_{Cnom}	$V_{CE(sat)}$ @T_j= 25°C typ.	E_{on}	E_{off}	$R_{th(j-s)}$	I_F @T_S= 25°C	V_F @T_j= 25°C typ.	E_{rr}	$R_{th(j-s)}$		
	A	A	V	mJ	mJ	K/W	A	V	mJ	K/W		
1200 V - IGBT 3 (Trench)												
SKiiP 28ANB16V1	118	105	1.7	13.1	13	0.4	118	1.60	11.2	0.55	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} 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
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	

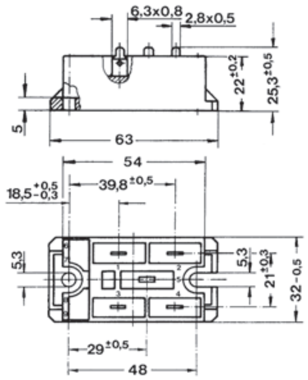
Footnotes

1) Not for New Design

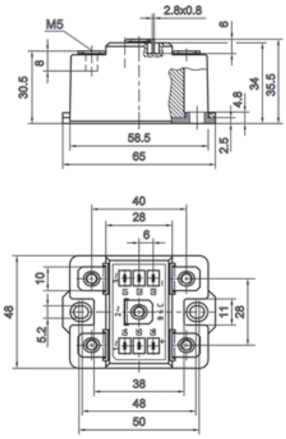
Modules - Bridge - SEMIPONT

Cases

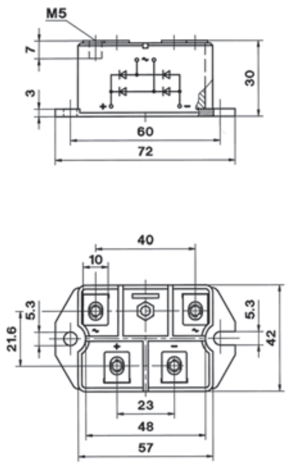
SEMIPONT 1



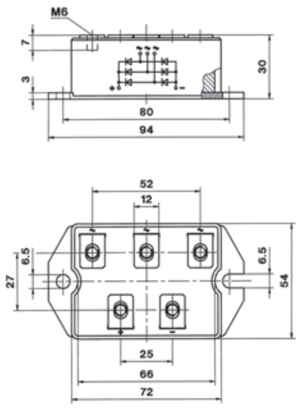
SEMIPONT 2



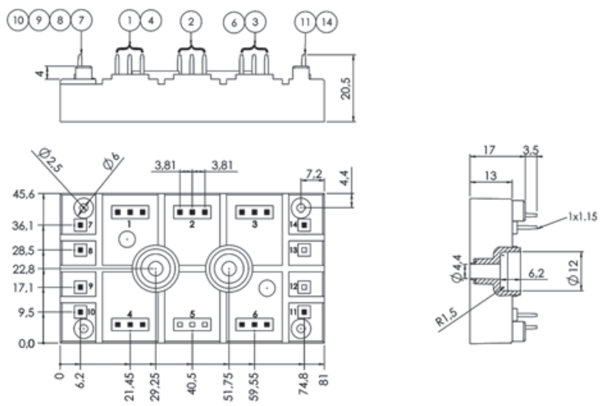
SEMIPONT 3



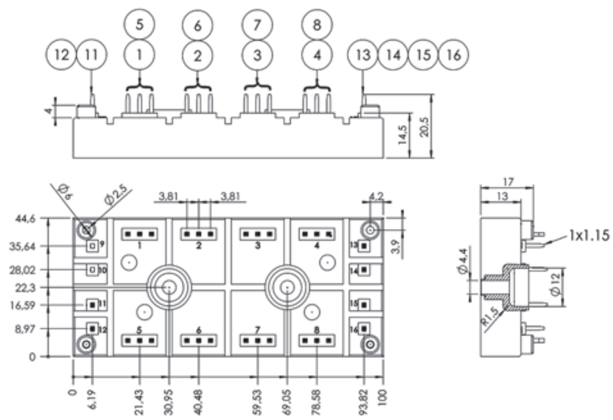
SEMIPONT 4



SEMIPONT 5

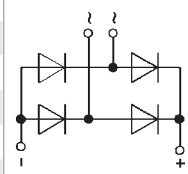
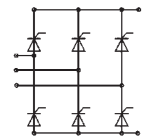
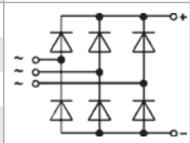
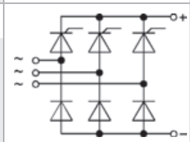
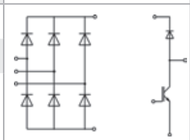
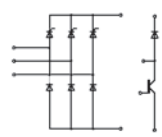


SEMIPONT 6



Dimensions in mm

Modules - Bridge - SEMITOP

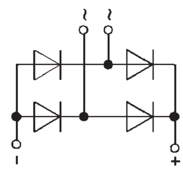
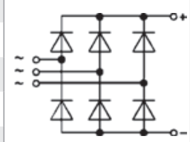
Type	V_{RRM} V_{DRM}	I_D @T_S	T_S	I_{TSM} I_{FSM} @T_{jmax}	$V_{T(TO)}$ @T_{jmax}	r_T @T_{jmax}	$R_{th(j-s)}$ per chip	T_j	Case	Circuit
	V	A	°C	A	V	mΩ	K/W	°C		
1 and 3 phase										
SK 50 B 06 UF	600	46	80	400	0.8	11	0.45	-40 ... +150	2	
SK 50 B	800-1600	51	80	270	0.8	13	1.7	-40 ... +150	2	
SK 55 B 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

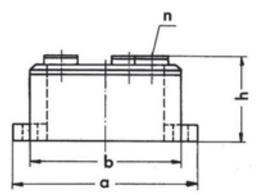
1) Not for New Design

Modules - Bridge - Power Bridge

Type	V_{RRM} V_{DRM}	I_D @T_C	T_C	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		
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	

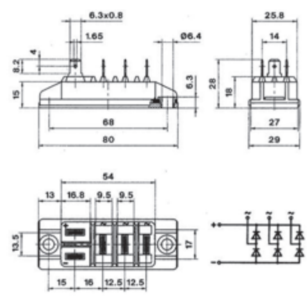
Cases

G 12, G 13

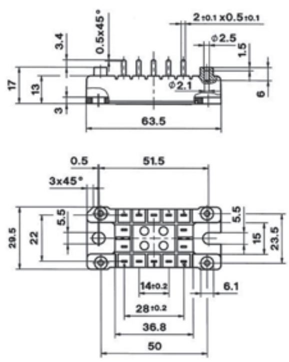


Cases	a	b	h	n
G 12, 13	55	45	24	M 4

G 51

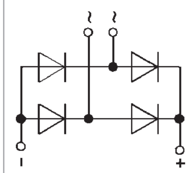
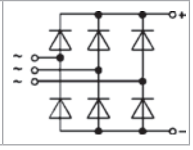


G 55



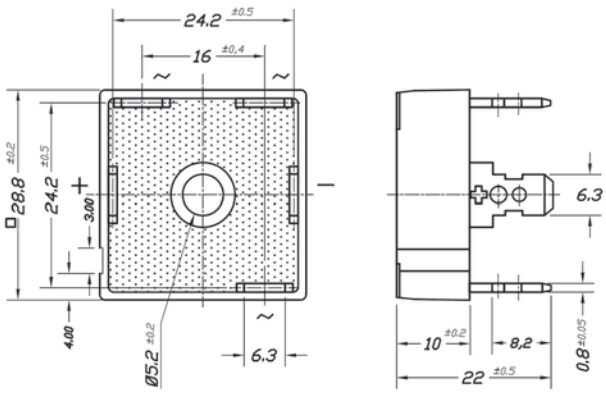
Dimensions in mm

Modules - Miniature Bridge - Fast-on

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	$R_{th(j-s)}$ total	T_j	Case	Circuit
	V	A	°C	A	V	A	K/W	°C		
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	

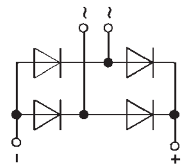
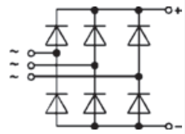
Cases

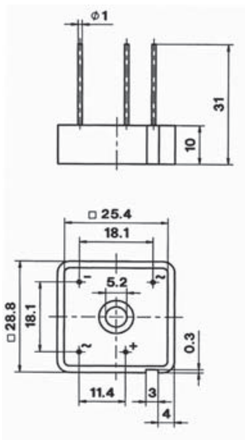
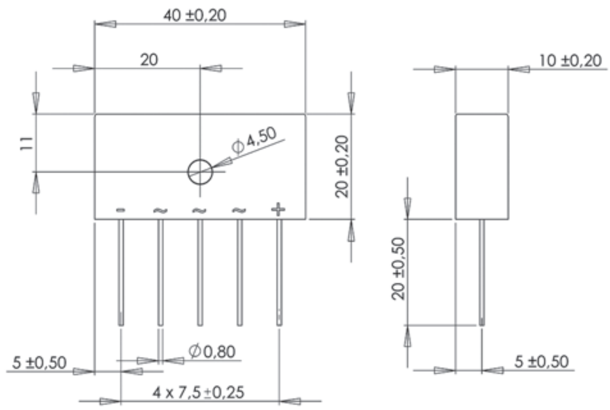
G 10b, G 11b



Dimensions in mm

Modules - Miniature Bridge - Leaded

Type	V_{RRM} V_{DRM} 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	$R_{th(j-a)}$ total K/W	T_j °C	Case	Circuit
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