



SEMITRANS® 4

IGBT4 Modules

SKM900GA12E4

Target Data

Features

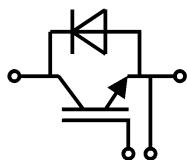
- IGBT4 = 4. generation medium fast trench IGBT (Infineon)
- CAL4 = Soft switching 4. generation CAL-diode
- Isolated copper baseplate using DBC technology (Direct Bonded Copper)
- Increased power cycling capability
- With integrated gate resistor
- For higher switching frequencies up to 12kHz
- UL recognized, file no. E63532

Typical Applications*

- AC inverter drives
- UPS
- Switched reluctance motor

Remarks

- Case temperature limited to $T_c = 125^\circ\text{C}$ max.
- Recommended $T_{op} = -40 \dots +150^\circ\text{C}$
- Product reliability results valid for $T_j = 150^\circ\text{C}$



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Absolute Maximum Ratings				
Symbol	Conditions		Values	Unit
IGBT				
V _{CES}	T _j = 25 °C		1200	V
I _C	T _j = 175 °C	T _c = 25 °C	1305	A
		T _c = 80 °C	1003	A
I _{Cnom}			900	A
I _{CRM}	I _{CRM} = 3xI _{Cnom}		2700	A
V _{GES}			-20 ... 20	V
t _{psc}	V _{CC} = 800 V V _{GE} ≤ 15 V V _{CES} ≤ 1200 V	T _j = 150 °C	10	μs
T _j			-40 ... 175	°C
Inverse diode				
I _F	T _j = 175 °C	T _c = 25 °C	871	A
		T _c = 80 °C	651	A
I _{Fnom}			800	A
I _{FRM}	I _{FRM} = 3xI _{Fnom}		2400	A
I _{FSM}	t _p = 10 ms, sin 180°, T _j = 25 °C		3520	A
T _j			-40 ... 175	°C
Module				
I _{t(RMS)}	T _{terminal} = 80 °C		500	A
T _{stg}			-40 ... 125	°C
V _{isol}	AC sinus 50 Hz, t = 1 min		4000	V

Characteristics						
Symbol	Conditions		min.	typ.	max.	Unit
IGBT						
V _{CE(sat)}	I _C = 900 A	T _j = 25 °C		1.83	2.08	V
	V _{GE} = 15 V chipelevel	T _j = 150 °C		2.23	2.44	V
V _{CE0}	chipelevel	T _j = 25 °C		0.8	0.9	V
		T _j = 150 °C		0.7	0.8	V
r _{CE}	V _{GE} = 15 V chipelevel	T _j = 25 °C		1.14	1.31	mΩ
		T _j = 150 °C		1.70	1.82	mΩ
V _{GE(th)}	V _{GE} =V _{CE} , I _C = 32.8 mA		5	5.8	6.5	V
I _{CES}	V _{GE} = 0 V	T _j = 25 °C			5	mA
	V _{CE} = 1200 V	T _j = 150 °C				mA
C _{ies}	V _{CE} = 25 V V _{GE} = 0 V	f = 1 MHz		54.4		nF
C _{oes}		f = 1 MHz		3.52		nF
C _{res}		f = 1 MHz		3		nF
Q _G	V _{GE} = - 8 V...+ 15 V					nC
R _{Gint}	T _j = 25 °C			0.9		Ω
t _{d(on)}	V _{CC} = 600 V	T _j = 150 °C		378		ns
t _r	I _C = 900 A	T _j = 150 °C		112		ns
E _{on}	V _{GE} = ±15 V	T _j = 150 °C		130		mJ
t _{d(off)}	R _{G on} = 1 Ω	T _j = 150 °C		650		ns
t _f	di/dt _{on} = 6900 A/μs	T _j = 150 °C		138		ns
E _{off}	di/dt _{off} = 5600 A/μs	T _j = 150 °C		126		mJ
R _{th(j-c)}	per IGBT				0.035	K/W



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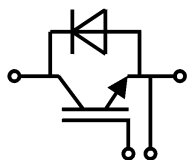
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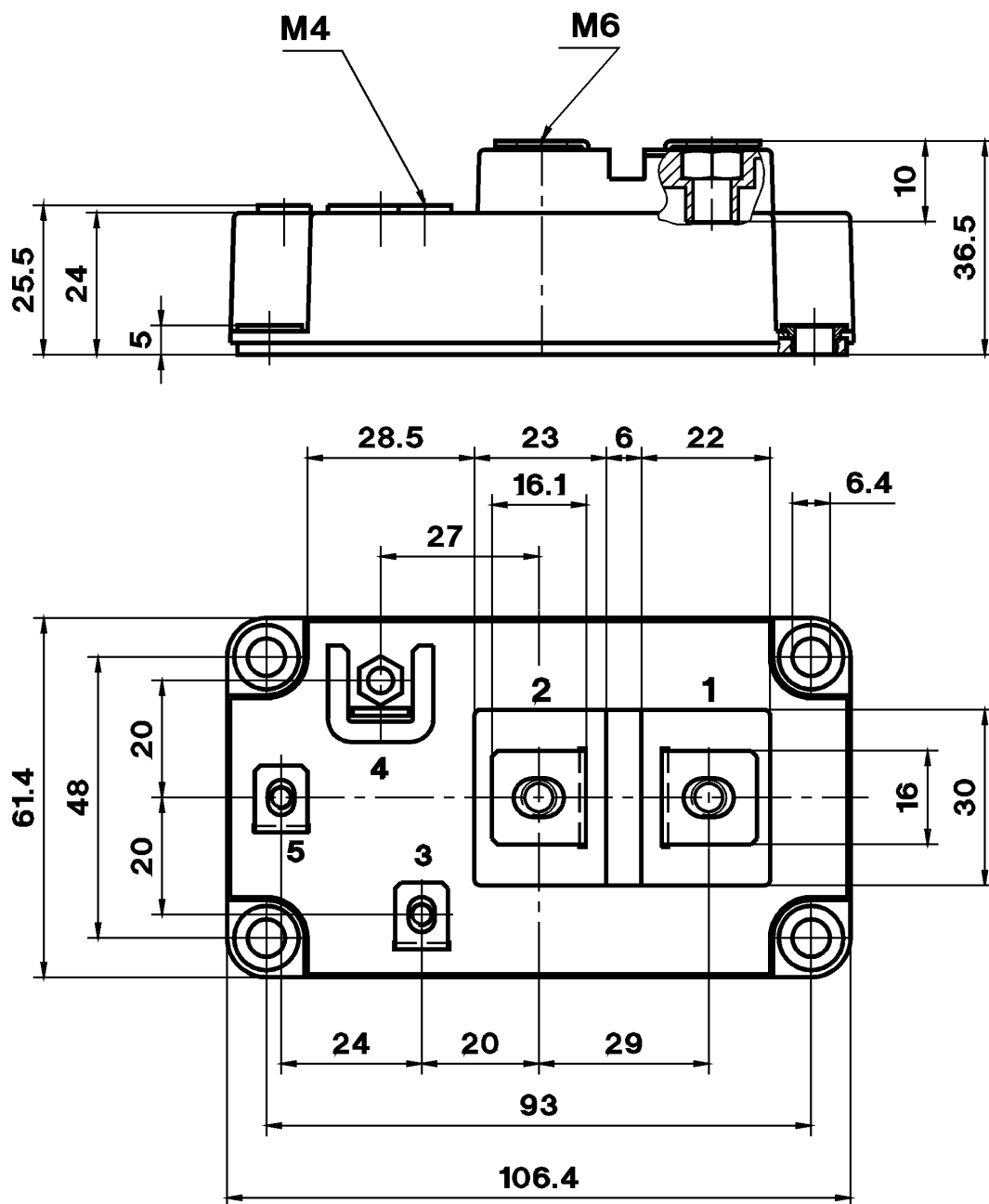
Remarks

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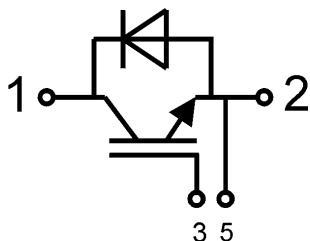
Characteristics						
Symbol	Conditions		min.	typ.	max.	Unit
Inverse diode						
V _F = V _{EC}	I _F = 900 A V _{GE} = 0 V chiplevel	T _j = 25 °C		2.31	2.65	V
		T _j = 150 °C		2.31	2.64	V
V _{F0}	chiplevel	T _j = 25 °C		1.3	1.5	V
		T _j = 150 °C		0.9	1.1	V
r _F	chiplevel	T _j = 25 °C		1.1	1.3	mΩ
		T _j = 150 °C		1.6	1.7	mΩ
I _{RRM}	I _F = 900 A	T _j = 150 °C		576		A
Q _{rr}	di/dt _{off} = 7900 A/μs	T _j = 150 °C		124		μC
E _{rr}	V _{GE} = ±15 V V _{CC} = 600 V	T _j = 150 °C		53		mJ
R _{th(j-c)}	per diode				0.07	K/W
Module						
L _{CE}				15	20	nH
R _{CC'+EE'}	terminal-chip	T _C = 25 °C		0.18		mΩ
		T _C = 125 °C		0.22		mΩ
R _{th(c-s)}	per module			0.02	0.038	K/W
M _s	to heat sink M6		3		5	Nm
M _t	to terminals	M6	2.5		5	Nm
		M4	1.1		2	Nm
w					330	g



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This is an electrostatic discharge sensitive device (ESDS), international standard IEC 60747-1, Chapter IX

* The specifications of our components may not be considered as an assurance of component characteristics. Components have to be tested for the respective application. Adjustments may be necessary. The use of SEMIKRON products in life support appliances and systems is subject to prior specification and written approval by SEMIKRON. We therefore strongly recommend prior consultation of our staff.