



SEMITOP® 3

IGBT module

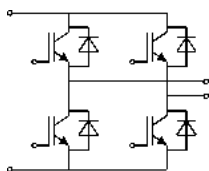
SK 25 GH 12T4

Features

- Compact design
- One screw mounting
- Heat transfer and isolation through direct copper bonded aluminium oxide ceramic (DCB)
- High short circuit capability
- Trench4 IGBT technology
- CAL4F diode technology
- $V_{CE,sat}$ with positive coefficient

Typical Applications*

- Inverter
- Motor drive



GH

Absolute Maximum Ratings				
Symbol	Conditions		Values	Unit
Inverter - IGBT				
V _{CES}	T _j = 25 °C		1200	V
I _C	T _j = 175 °C	T _s = 25 °C	35	A
		T _s = 70 °C	29	A
I _{Cnom}			25	A
I _{CRM}	I _{CRM} = 3 x I _{Cnom}		75	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 _s = 25 °C	28	A
		T _s = 70 °C	22	A
I _{Fnom}			25	A
I _{FRM}	I _{FRM} = 3 x I _{Fnom}		75	A
I _{FSM}	10 ms, sin 180°, T _j = 150 °C		100	A
T _j			-40 ... 175	°C
Module				
I _{t(RMS)}	,			A
T _{stg}			-40 ... 125	°C
V _{isol}	AC, sinusoidal, t = 1 min		2500	V

Characteristics						
Symbol	Conditions		min.	typ.	max.	Unit
Inverter - IGBT						
V _{CE(sat)}	I _C = 25 A	T _J = 25 °C		1.85	2.10	V
	V _{GE} = 15 V chiplevel	T _J = 150 °C		2.25	2.45	V
V _{CE0}	chiplevel	T _J = 25 °C		0.8	0.9	V
		T _J = 150 °C		0.7	0.8	V
r _{CE}	V _{GE} = 15 V	T _J = 25 °C		42.0	48.0	mΩ
		T _J = 150 °C		62.0	66.0	mΩ
V _{GE(th)}	V _{GE} = V _{CE} , I _C = 0.85 mA		5	5.8	6.5	V
I _{CES}	V _{GE} = 0 V	T _J = 25 °C				mA
	V _{CE} = 1200 V					mA
C _{ies}	V _{CE} = 25 V V _{GE} = 0 V	f = 1 MHz		1.43		nF
C _{oes}		f = 1 MHz		0.115		nF
C _{res}		f = 1 MHz		0.085		nF
Q _G	- 8 V...+ 15 V			142		nC
R _{Gint}	T _J = 25 °C			0.00		Ω
t _{d(on)}	V _{CC} = 600 V	T _J = 150 °C		22		ns
t _r	I _C = 25 A	T _J = 150 °C		19.5		ns
E _{on}	R _{G on} = 19 Ω	T _J = 150 °C		2.27		mJ
t _{d(off)}	R _{G off} = 19 Ω	T _J = 150 °C		288		ns
t _f	di/dt _{on} = 2825 A/μs	T _J = 150 °C		77.5		ns
E _{off}	di/dt _{off} = 2825 A/μs	T _J = 150 °C		2.7		mJ
R _{th(j-s)}	per IGBT			1.31		K/W

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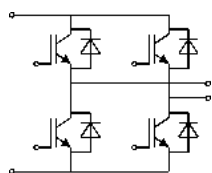
Features

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Typical Applications*

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Characteristics						
Symbol	Conditions		min.	typ.	max.	Unit
Inverse - Diode						
V _F = V _{EC}	I _F = 25 A	T _j = 25 °C		2.41	2.74	V
	chiplevel	T _j = 150 °C		2.45	2.79	V
V _{F0}		T _j = 25 °C	1.1	1.3	1.5	V
		T _j = 150 °C	0.7	0.9	1.1	V
r _F		T _j = 25 °C	36.0	44.4	49.6	mΩ
		T _j = 150 °C		62.0	67.6	mΩ
I _{RRM}	I _F = 25 A	T _j = 150 °C		31.5		A
Q _{rr}	di/dt _{off} = 2825 A/μs	T _j = 150 °C		1.15		μC
E _{rr}	V _{GE} = -7 V	T _j = 150 °C		1.28		mJ
	V _{CC} = 600 V					
R _{th(j-s)}	per diode			1.91		K/W
Module						
M _s	Mounting torque		2.3		2.5	Nm
w				29		g
Temperatur Sensor						
R ₁₀₀						Ω
R(T)	, ,					



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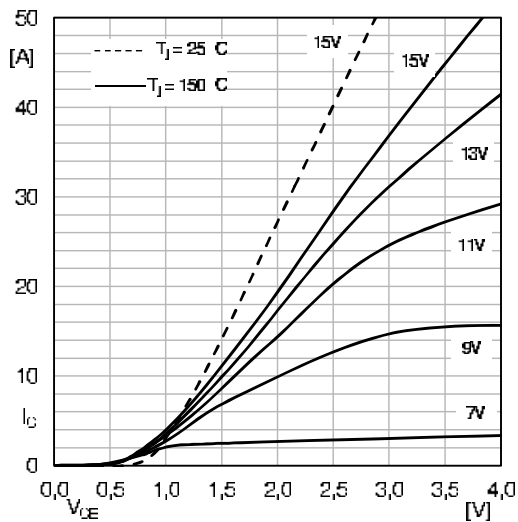


Fig. 1: Typical IGBT output characteristic

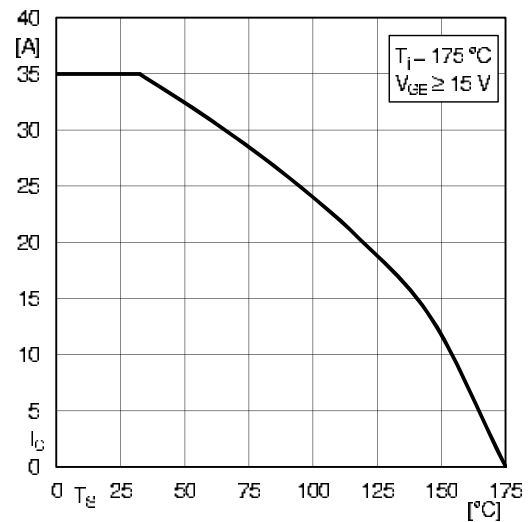


Fig. 2: Rated current vs. temperature $I_C = f(T_S)$

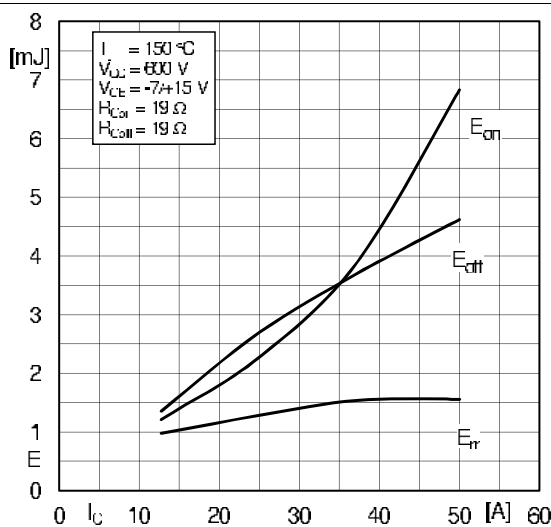


Fig. 3: Typ. turn-on /-off energy $= f(I_C)$

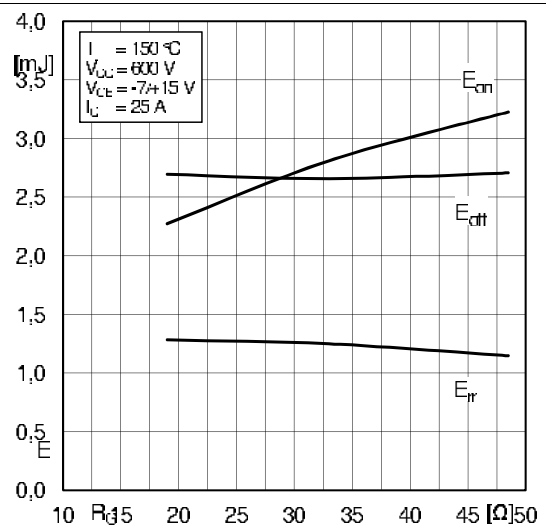


Fig. 4: Typ. turn-on /-off energy $= f(R_G)$

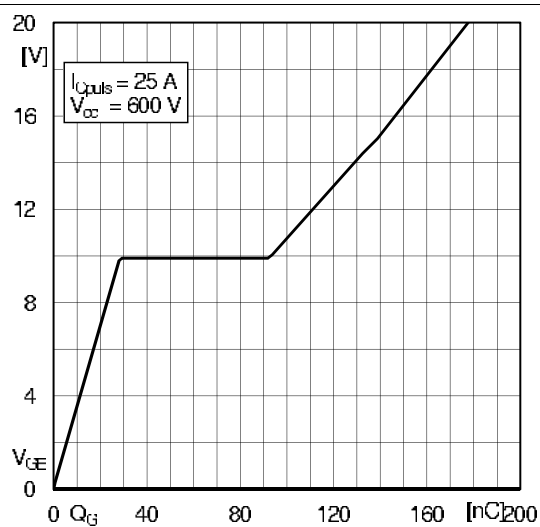


Fig. 6: Typ. gate charge characteristic

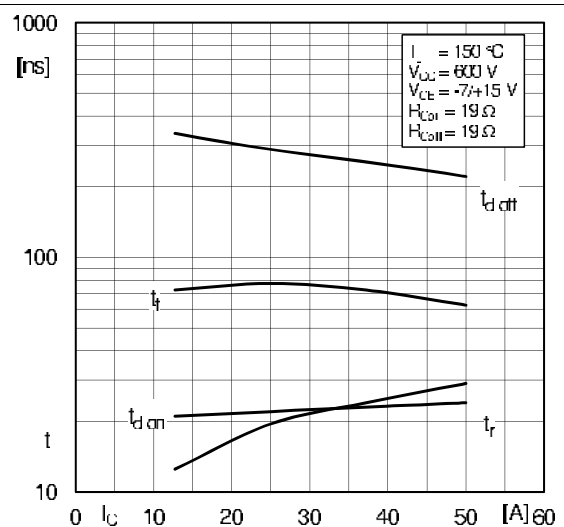


Fig. 7: Typ. switching times vs. I_C

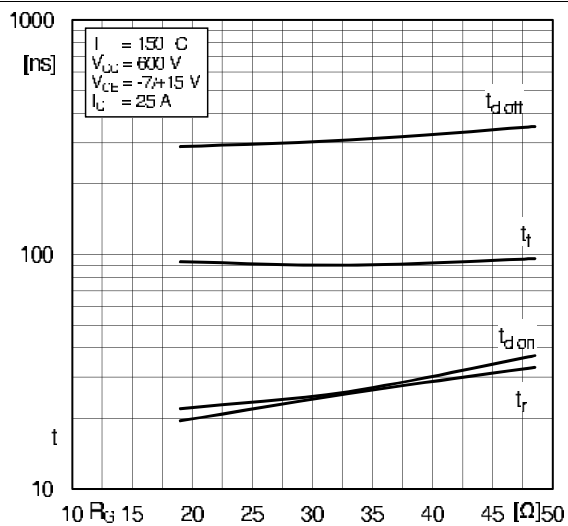


Fig. 8: Typ. switching times vs. gate resistor R_G

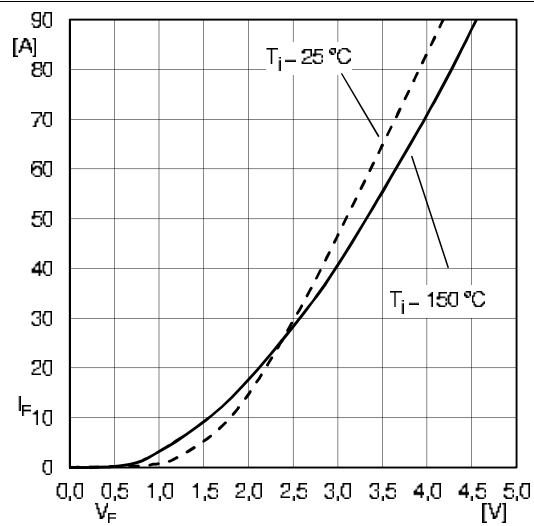
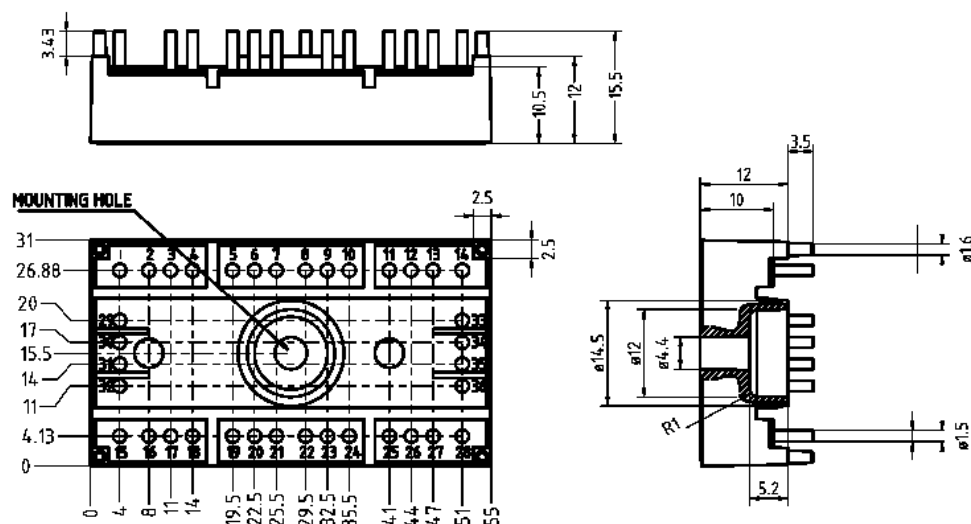


Fig. 10: CAL diode forward characteristic

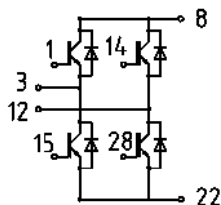
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dimensions in mm
tolerance system: ISO 2768-m



Suggested hole diameter, in the PCB, for solder pins and mounting plastic pins: 2mm

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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.