

SK 35 GB 12T4



SEMITOP® 2

IGBT module

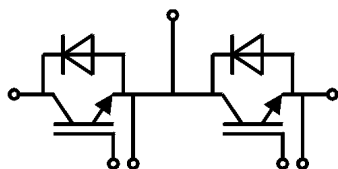
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Features

- 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
- UL recognized, file no. E 63 532

Typical Applications*

- Inverter
- Motor drive



GB

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	44	A
		T _s = 70 °C	35	A
I _{Cnom}			35	A
I _{CRM}	I _{CRM} = 3 x I _{Cnom}		105	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	40	A
		T _s = 70 °C	30	A
I _{Fnom}			35	A
I _{FRM}	I _{FRM} = 3 x I _{Fnom}		105	A
I _{FSM}	10 ms, sin 180°, T _j = 150 °C		170	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					
$V_{CE(sat)}$	$I_C = 35\text{ A}$ $V_{GE} = 15\text{ V}$ chipelevel	$T_j = 25\text{ °C}$	1.85	2.10	V
		$T_j = 150\text{ °C}$	2.25	2.45	V
V_{CE0}	chipelevel	$T_j = 25\text{ °C}$	0.8	0.9	V
		$T_j = 150\text{ °C}$	0.7	0.8	V
r_{CE}	$V_{GE} = 15\text{ V}$ chipelevel	$T_j = 25\text{ °C}$	30.0	34.3	m Ω
		$T_j = 150\text{ °C}$	44.3	47.1	m Ω
$V_{GE(th)}$	$V_{GE} = V_{CE}, I_C = 1.2\text{ mA}$	5	5.8	6.5	V
I_{CES}	$V_{GE} = 0\text{ V}$ $V_{CE} = 1200\text{ V}$	$T_j = 25\text{ °C}$		0.062	mA
		$T_j = 150\text{ °C}$			mA
C_{ies}	$V_{CE} = 25\text{ V}$ $V_{GE} = 0\text{ V}$	$f = 1\text{ MHz}$	1.95		nF
C_{oes}		$f = 1\text{ MHz}$	0.155		nF
C_{res}		$f = 1\text{ MHz}$	0.115		nF
Q_G	- 8 V...+ 15 V		189		nC
R_{Gint}	$T_j = 25\text{ °C}$				Ω
$t_{d(on)}$	$V_{CC} = 600\text{ V}$	$T_j = 150\text{ °C}$	28		ns
t_r	$I_C = 35\text{ A}$	$T_j = 150\text{ °C}$	25		ns
E_{on}	$R_{G on} = 22\text{ }\Omega$	$T_j = 150\text{ °C}$	3.27		mJ
$t_{d(off)}$	$R_{G off} = 22\text{ }\Omega$	$T_j = 150\text{ °C}$	303		ns
t_f	$di/dt_{on} = 2900\text{ A}/\mu\text{s}$	$T_j = 150\text{ °C}$	70		ns
E_{off}	$di/dt_{off} = 2900\text{ A}/\mu\text{s}$	$T_j = 150\text{ °C}$	3.3		mJ
$R_{th(j-s)}$	per IGBT		1.21		K/W

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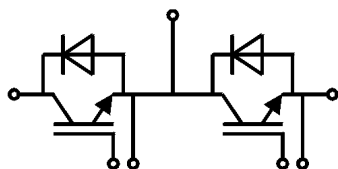
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Typical Applications*

- Inverter
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Characteristics						
Symbol	Conditions		min.	typ.	max.	Unit
Inverse - Diode						
V _F = V _{EC}	I _F = 35 A	T _j = 25 °C		2.30	2.62	V
	V _{GE} = 15 V chipllevel	T _j = 150 °C		2.29	2.62	V
V _{F0}	chipllevel	T _j = 25 °C		1.3	1.5	V
		T _j = 150 °C		0.9	1.1	V
r _F	chipllevel	T _j = 25 °C		28.6	32.0	mΩ
		T _j = 150 °C		39.7	43.4	mΩ
I _{RRM}	I _F = 35 A	T _j = 150 °C		30		A
Q _{rr}	di/dt _{off} = 2900 A/μs	T _j = 150 °C		2		μC
E _{rr}	V _{GE} = -7 V	T _j = 150 °C		1.46		mJ
	V _{CC} = 600 V					
R _{th(j-s)}				1.55		K/W
Module						
M _s	Mounting torque to heatsink		1.8		2	Nm
w				19		g
Temperature Sensor						
R ₁₀₀						Ω
R(T)	, ,		(T)			



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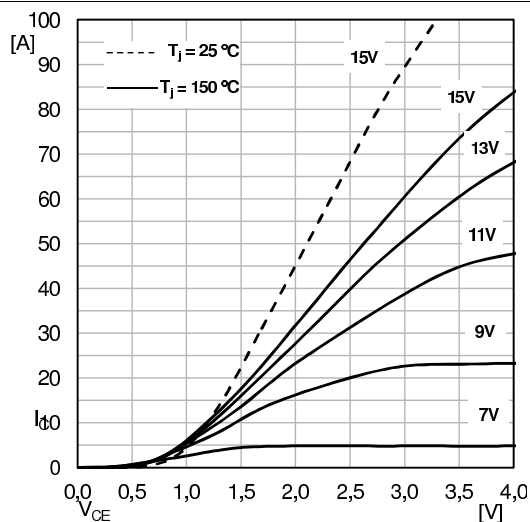


Fig. 1: Typical IGBT output characteristics

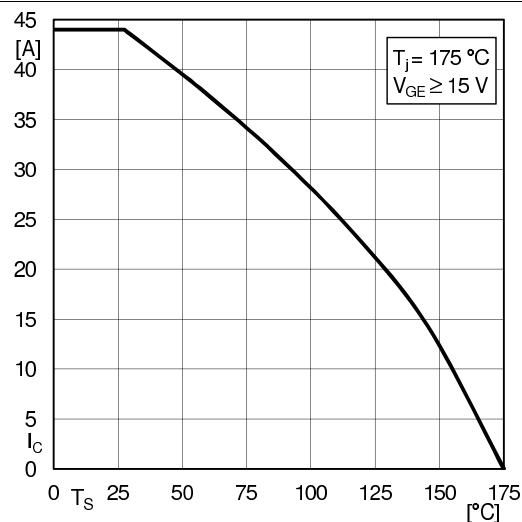


Fig. 2: Rated current vs. temperature $I_C = f(T_S)$

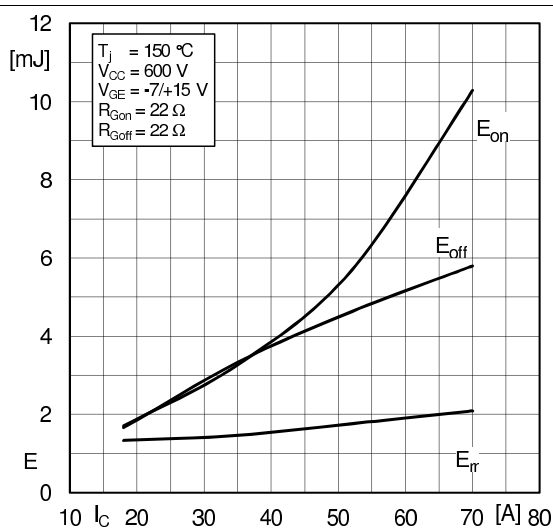


Fig. 3: Typ. turn-on /-off energy $= f(I_C)$

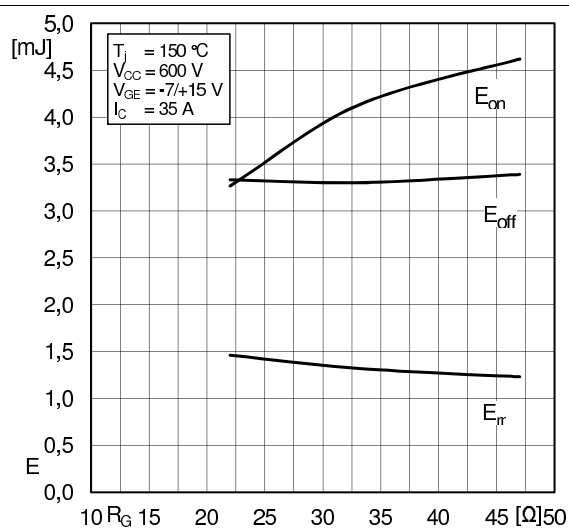


Fig. 4: Typ. turn-on /-off energy $= f(R_G)$

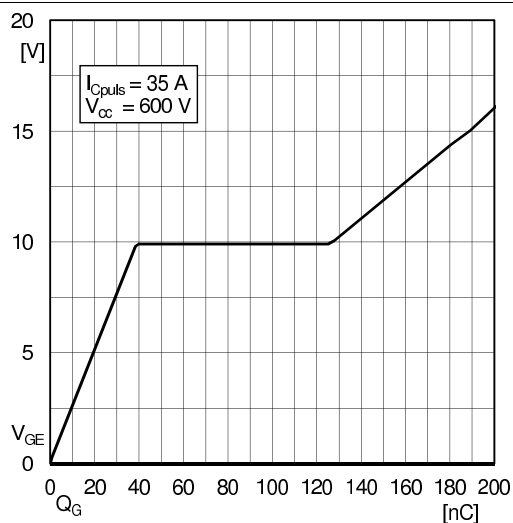


Fig. 6: Typ. gate charge characteristic

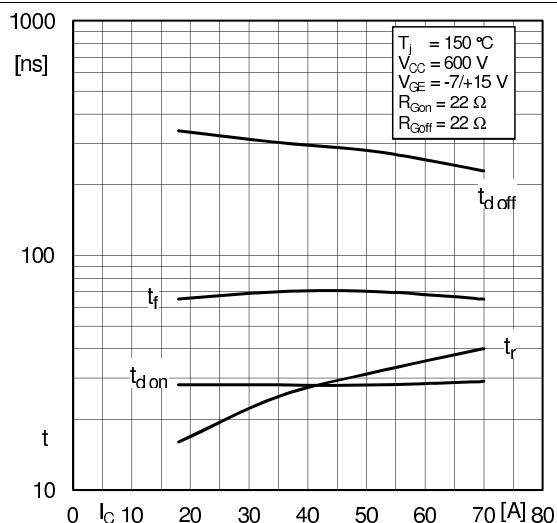


Fig. 7: Typ. switching times vs. I_C

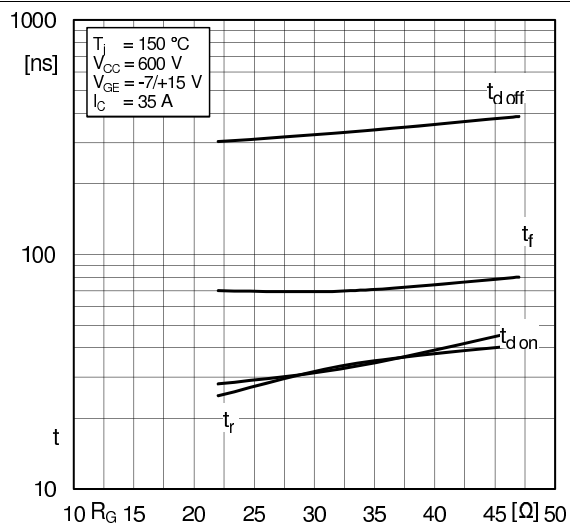


Fig. 8: Typ. switching times vs. gate resistor R_G

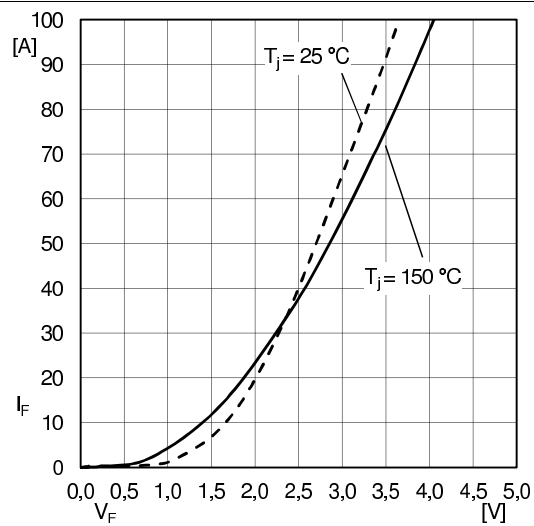
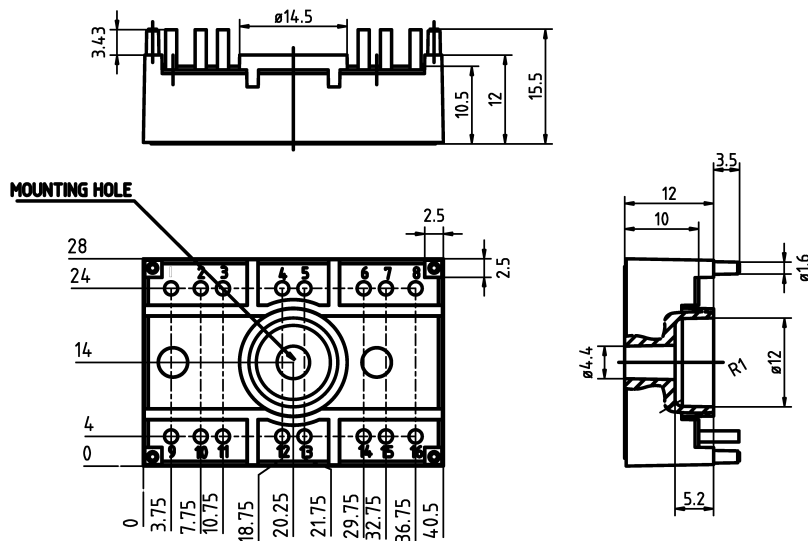


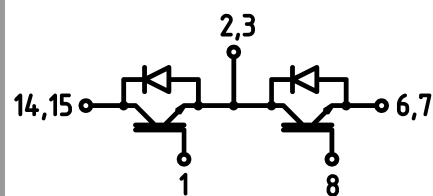
Fig. 10: CAL diode forward characteristic

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

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