

SK 35 GB 12T4



SEMITOP® 2

IGBT module

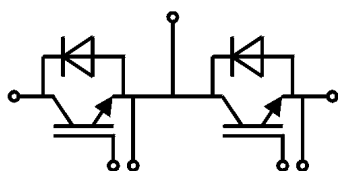
SK 35 GB 12T4

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
- UL recognized, file no. E 63 532

Typical Applications*

- Inverter
- Motor drive



GB

Absolute Maximum Ratings

Symbol	Conditions	Values	Unit
Inverter - IGBT			
V_{CES}	$T_j = 25\text{ °C}$	1200	V
I_C	$T_j = 175\text{ °C}$	$T_s = 25\text{ °C}$	44
		$T_s = 70\text{ °C}$	35
I_{Cnom}		35	A
I_{CRM}	$I_{CRM} = 3 \times I_{Cnom}$	105	A
V_{GES}		-20 ... 20	V
t_{psc}	$V_{CC} = 800\text{ V}$ $V_{GE} \leq 15\text{ V}$ $V_{CES} \leq 1200\text{ V}$	$T_j = 150\text{ °C}$	10
T_j		-40 ... 175	°C
Inverse - Diode			
I_F	$T_j = 175\text{ °C}$	$T_s = 25\text{ °C}$	40
		$T_s = 70\text{ °C}$	30
I_{Fnom}		35	A
I_{FRM}	$I_{FRM} = 3 \times I_{Fnom}$	105	A
I_{FSM}	10 ms, sin 180°, $T_j = 150\text{ °C}$	170	A
T_j		-40 ... 175	°C
Module			
$I_{t(RMS)}$	,		A
T_{stg}		-40 ... 125	°C
V_{isol}	AC, sinusoidal, $t = 1\text{ min}$	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
			$T_j = 150\text{ °C}$	2.25	2.45
V_{CE0}	chipelevel		$T_j = 25\text{ °C}$	0.8	0.9
			$T_j = 150\text{ °C}$	0.7	0.8
r_{CE}	$V_{GE} = 15\text{ V}$ chipelevel		$T_j = 25\text{ °C}$	30.0	34.3
			$T_j = 150\text{ °C}$	44.3	47.1
$V_{GE(th)}$	$V_{GE} = V_{CE}, I_C = 1.2\text{ mA}$	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}	$R_{G on} = 22\text{ Ω}$	$T_j = 150\text{ °C}$	3.27		mJ
$t_{d(off)}$	$R_{G off} = 22\text{ Ω}$	$T_j = 150\text{ °C}$	303		ns
t_f	$di/dt_{on} = 2900\text{ A/μs}$	$T_j = 150\text{ °C}$	70		ns
E_{off}	$di/dt_{off} = 2900\text{ A/μs}$	$T_j = 150\text{ °C}$	3.3		mJ
$R_{th(j-s)}$	per IGBT		1.21		K/W

SK 35 GB 12T4



SEMITOP® 2

IGBT module

SK 35 GB 12T4

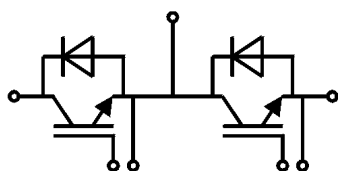
Features

- 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
- UL recognized, file no. E 63 532

Typical Applications*

- Inverter
- Motor drive

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	T _j = 150 °C		2.29	2.62	V
	chiplevel					
V _{F0}		T _j = 25 °C		1.3	1.5	V
	chiplevel	T _j = 150 °C		0.9	1.1	V
r _F		T _j = 25 °C		28.6	32.0	mΩ
	chiplevel	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)	, ,					



GB

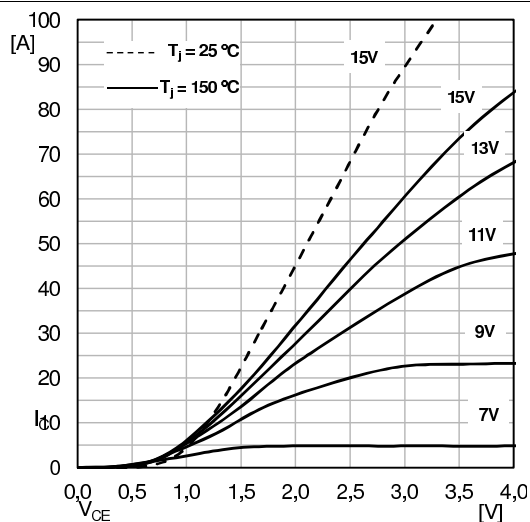


Fig. 1: Typical IGBT output characteristics

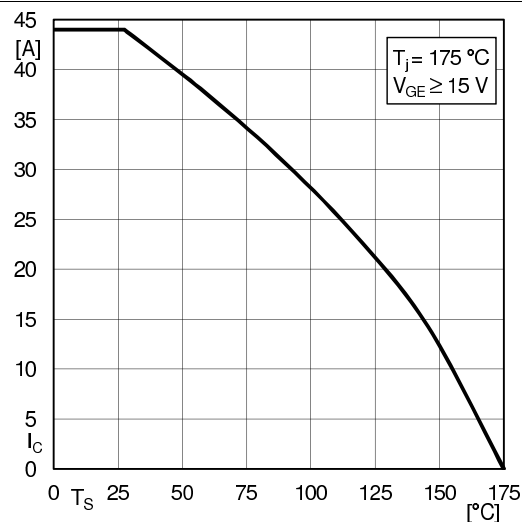


Fig. 2: Rated current vs. temperature $I_C = f(T_S)$

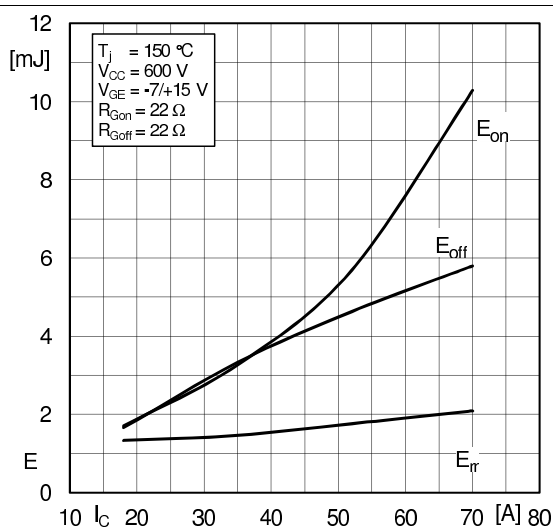


Fig. 3: Typ. turn-on /-off energy $= f(I_C)$

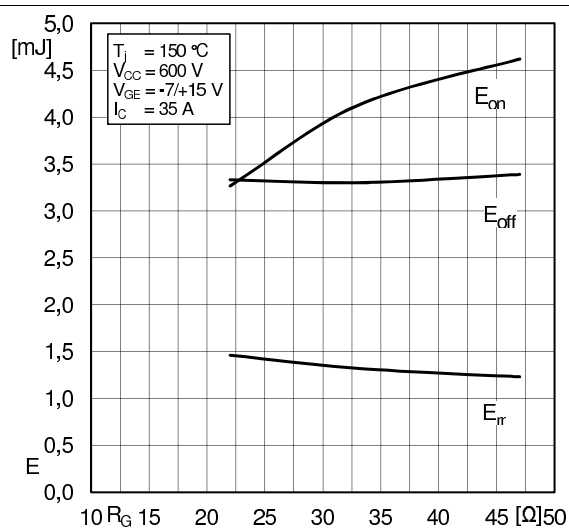


Fig. 4: Typ. turn-on /-off energy $= f(R_G)$

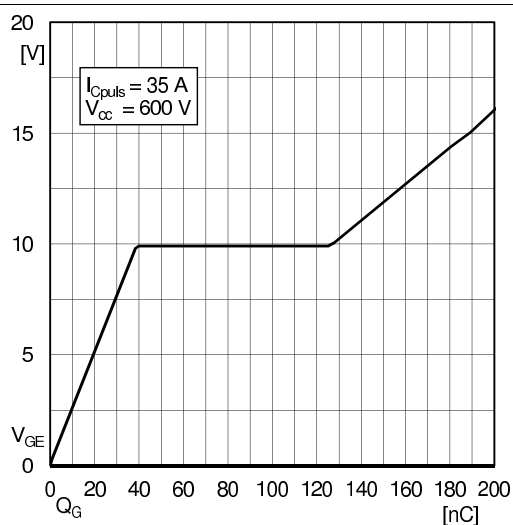


Fig. 6: Typ. gate charge characteristic

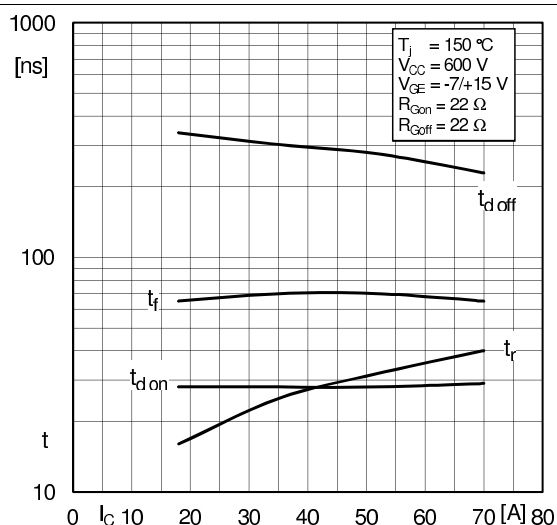


Fig. 7: Typ. switching times vs. I_C

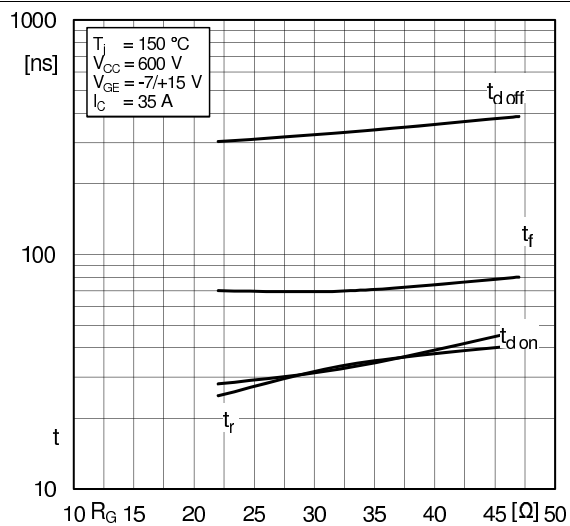


Fig. 8: Typ. switching times vs. gate resistor R_G

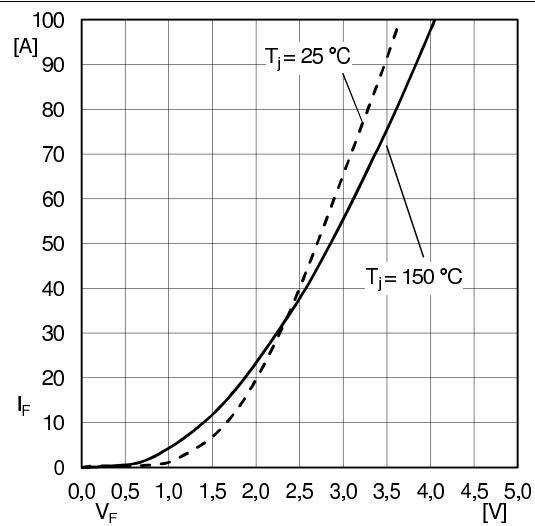
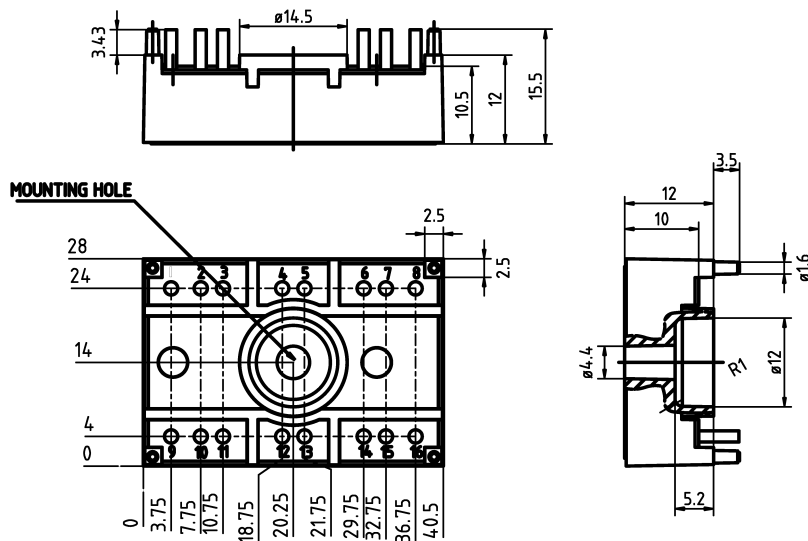


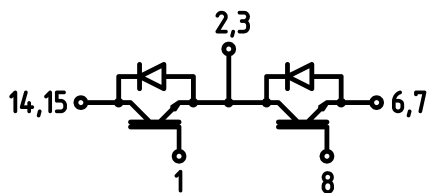
Fig. 10: CAL diode forward characteristic

dimensions in mm
tolerance system: ISO 2768-m



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

These documents are SEMIKRON properties. SEMIKRON reserves all copyrights.
All copying and transmitting of this information requires written permission.
For the case of industrial property rights, SEMIKRON reserves all rights



GB

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.