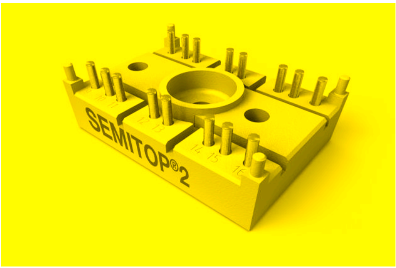
SK45GB063



SEMITOP® 2

IGBT Module

SK45GB063

SK45GAL063

SK45GAR063

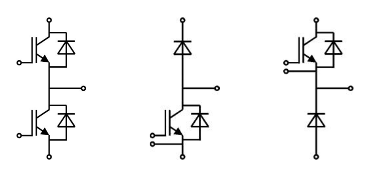
Preliminary Data

Features

- Compact design
- One screw mounting
- Heat transfer and isolation through direct copper bonded aluminium oxide ceramic (DCB)
- N channel, homogeneous Silicon structure (NPT-Non punchtrough IGBT)
- High short circuit capability
- Low tail current with low temperature dependence
- UL recognized, file no. E63532

Typical Applications*

- Switching (not for linear use)
- Inverter
- Switched mode power supplies
- UPS

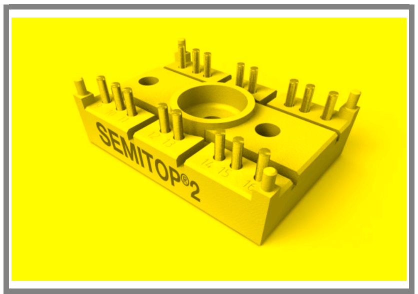


Absolute Maximum Ratings T_s = 25 °C, unless otherwise specified

Symbol	Conditions		Values	Units
IGBT				
V_{CES}	T_j = 25 °C		600	V
I_C	T_j = 125 °C	T_s = 25 °C	45	A
		T_s = 80 °C	30	A
I_{CRM}	I_{CRM} = 2 x I_{Cnom}		100	A
V_{GES}			± 20	V
t_{psc}	V_{CC} = 300 V; $V_{GE} \leq$ 20 V; VCES < 600 V	T_j = 125 °C	10	µs
Inverse Diode				
I_F	T_j = 150 °C	T_s = 25 °C	57	A
		T_s = 80 °C	38	A
I_{FRM}				A
I_{FSM}	t_p = 10 ms; half sine wave	T_j = 150 °C	440	A
Freewheeling Diode				
I_F	T_j = 150 °C	T_s = 25 °C	57	A
		T_s = 80 °C	38	A
I_{FRM}				A
I_{FSM}	t_p = 150 ms;	T_j = °C	440	A
Module				
$I_{t(RMS)}$				A
T_{vj}			-40 ... +150	°C
T_{stg}			-40 ... +125	°C
V_{isol}	AC, 1 min.		2500	V

Characteristics T_s = 25 °C, unless otherwise specified

Symbol	Conditions		min.	typ.	max.	Units
IGBT						
$V_{GE(th)}$	$V_{GE} = V_{CE}$, I_C = 1 mA		4,5	5,5	6,5	V
I_{CES}	V_{GE} = 0 V, $V_{CE} = V_{CES}$	T_j = 25 °C			0,15	mA
		T_j = 125 °C				mA
I_{GES}	V_{CE} = 0 V, V_{GE} = 30 V	T_j = 25 °C			120	nA
		T_j = 125 °C				nA
V_{CE0}		T_j = 25 °C		1		V
		T_j = 125 °C		1,1		V
r_{CE}	V_{GE} = 15 V	T_j = 25°C		20		mΩ
		T_j = 125°C				mΩ
$V_{CE(sat)}$	I_{Cnom} = 50 A, V_{GE} = 15 V	T_j = 25°C$_{chiplev.}$		2,1	2,5	V
		T_j = 125°C$_{chiplev.}$				V
C_{ies}				2,2		nF
C_{oes}	V_{CE} = 25, V_{GE} = 0 V	f = 1 MHz				nF
C_{res}				0,2		nF
Q_G	V_{GE} = 0 ... 20 V			155		nC
$t_{d(on)}$				45		ns
t_r	R_{Gon} = 22 Ω	V_{CC} = 300V		35		ns
E_{on}		I_C= 30A		1,4		mJ
$t_{d(off)}$	R_{Goff} = 22 Ω	T_j = 125 °C		250		ns
t_f		V_{GE} = ±15V		25		ns
E_{off}				1,2		mJ
$R_{th(j-s)}$	per IGBT				1	K/W



SEMITOP® 2

IGBT Module

SK45GB063

SK45GAL063

SK45GAR063

Preliminary Data

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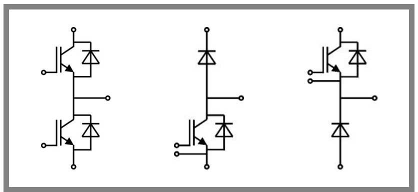


Characteristics

Symbol	Conditions		min.	typ.	max.	Units
Inverse Diode						
$V_F = V_{EC}$	I_{Fnom} = 30 A; V_{GE} = 0 V	T_j = 25 °$C_{chiplev.}$		1,45	1,7	V
		T_j = 125 °$C_{chiplev.}$		1,4	1,75	V
V_{F0}		T_j = 125 °C		0,85	0,9	V
r_F		T_j = 125 °C		9	16	mΩ
I_{RRM}	I_F = 30 A	T_j = 125 °C		16		A
Q_{rr}	di/dt = -500 A/µs			2		µC
E_{rr}	V_{CC}=300V			0,25		mJ
$R_{th(j-s)D}$	per diode				1,2	K/W
Freewheeling Diode						
$V_F = V_{EC}$	I_{Fnom} = 30 A; V_{GE} = 0 V	T_j = 25 °$C_{chiplev.}$		1,45	1,7	V
		T_j = 125 °$C_{chiplev.}$		1,4	1,75	V
V_{F0}		T_j = 125 °C		0,85	0,9	V
r_F		T_j = 125 °C		9	16	V
I_{RRM}	I_F = 30 A	T_j = 125 °C		16		A
Q_{rr}	di/dt = -500 A/µs			2		µC
E_{rr}	V_{CC}=300V			0,25		mJ
$R_{th(j-s)FD}$	per diode				1,2	K/W
M_s	to heat sink				2	Nm
w				19		g

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 personal.

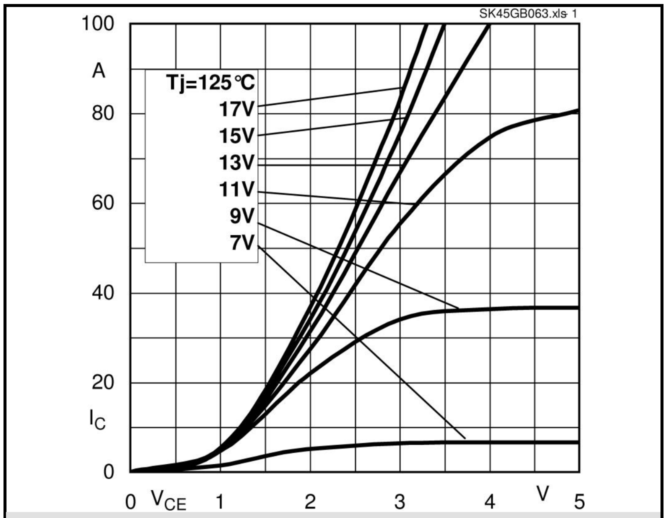


Fig. 1 Typ. output characteristic, inclusive $R_{CC'+ EE'}$

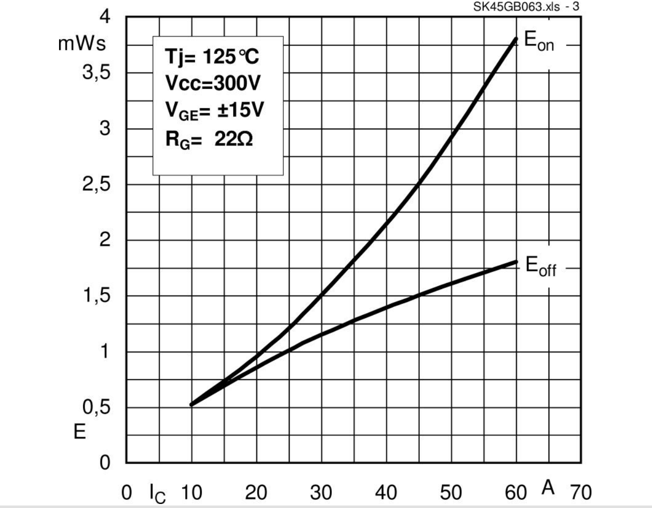


Fig. 3 Typ. turn-on /-off energy = f (I_C)

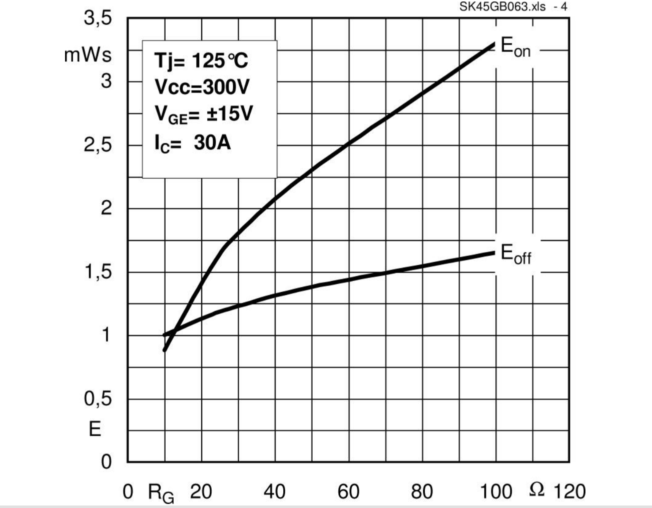


Fig. 4 Typ. turn-on /-off energy = f (R_G)

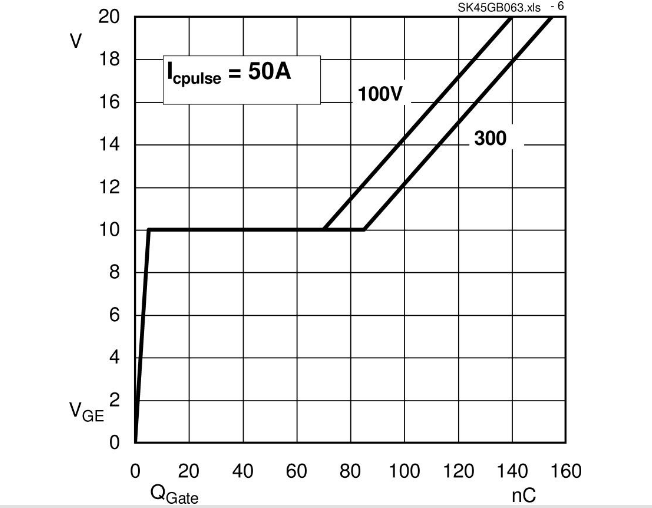


Fig. 6 Typ. gate charge characteristic

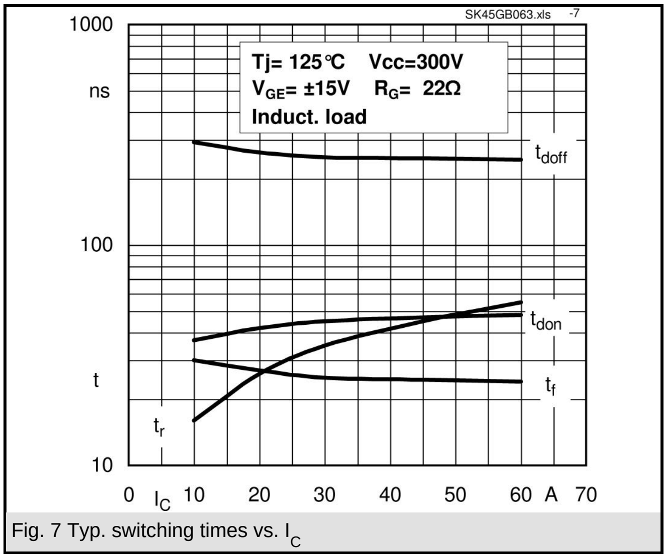


Fig. 7 Typ. switching times vs. I_C

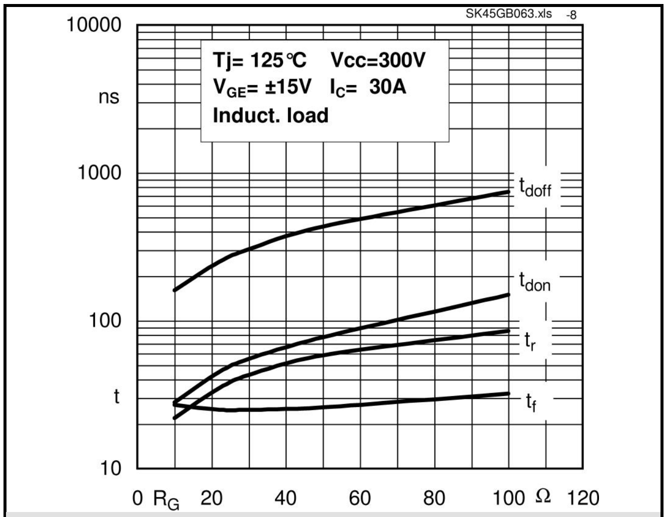


Fig. 8 Typ. switching times vs. gate resistor R_G

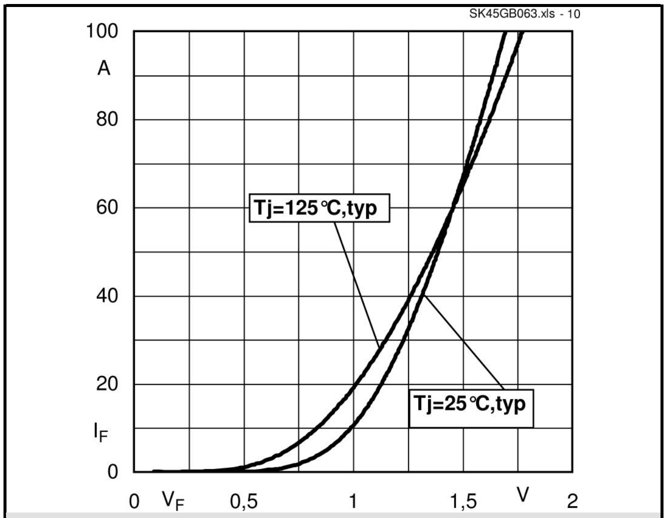
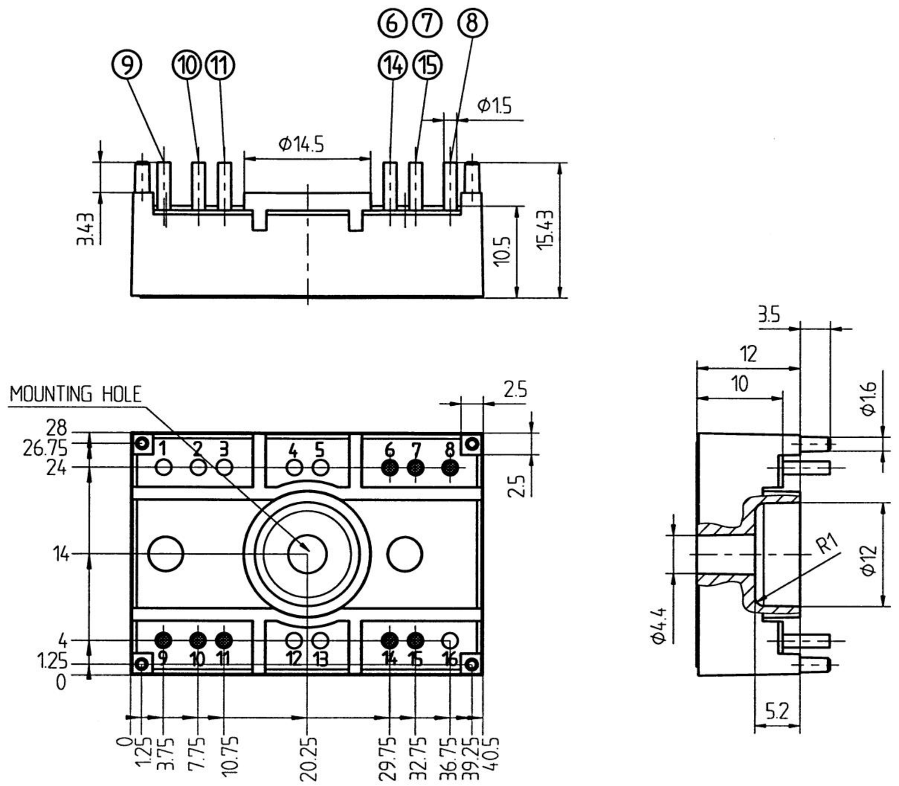


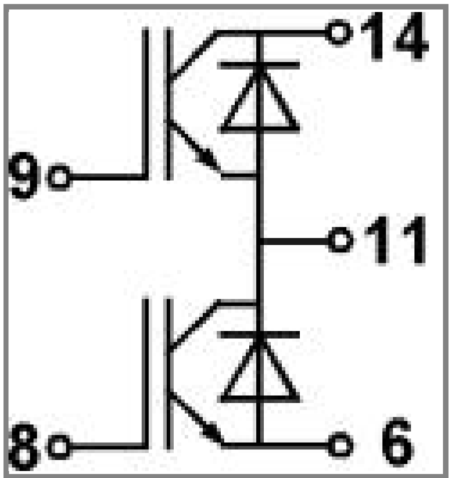
Fig. 10 CAL diode forward characteristic

FWD and APD typical forward characteristic

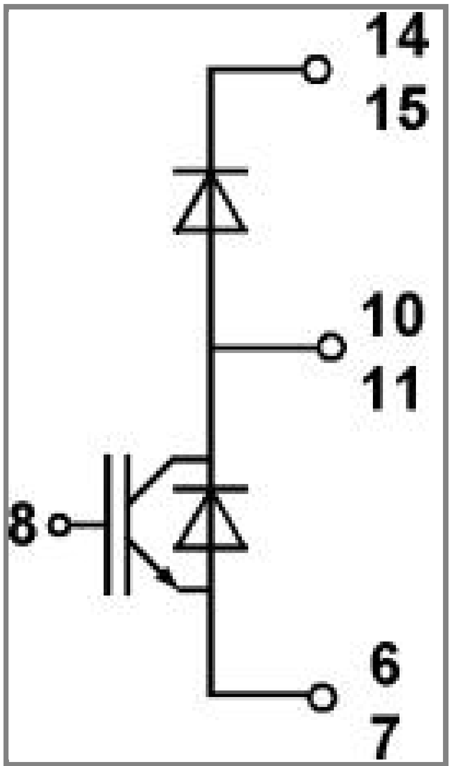
UL recognized file no. E 63 532



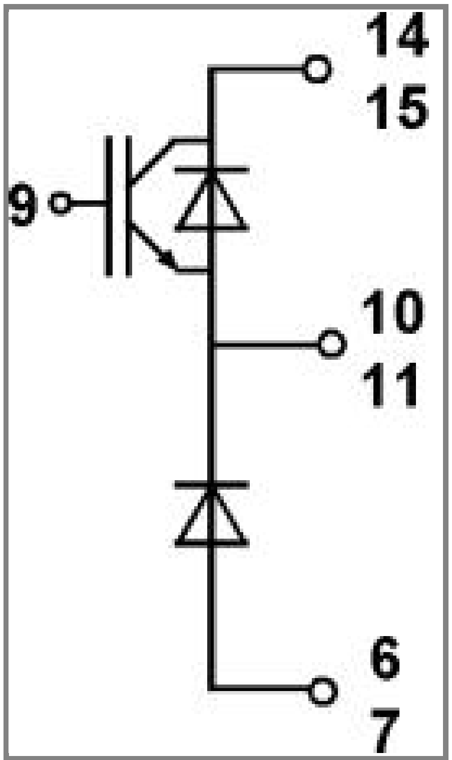
Case T4 (Suggested hole diameter, in the PCB, for solder pins and plastic mounting pins: 2mm)



Case T4 GB



Case T4 GAL



Case T4 GAR