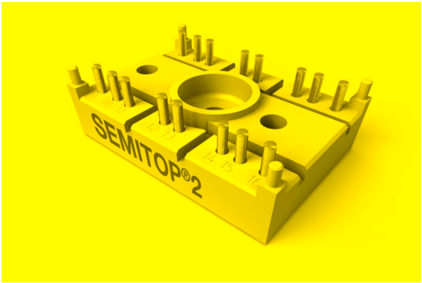


SEMITOP® 2

IGBT Module

SK60GAL123

SK60GAR123

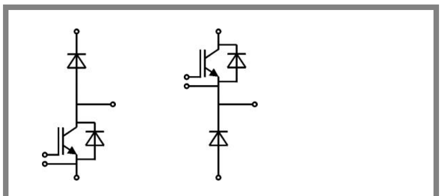
Preliminary Data

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 punch-through IGBT)
- High short circuit capability
- $V_{ce,sat}$ with positive coefficient
- Low tail current with low temperature dependence

Typical Applications*

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

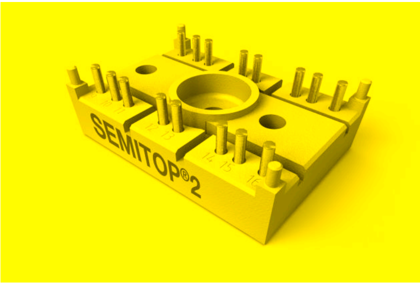


Absolute Maximum Ratings — T_s = 25 °C, unless otherwise specified

Symbol	Conditions		Values	Units
IGBT				
V_{CES}	T_j = 25 °C		1200	V
I_C	T_j = 125 °C	T_s = 25 °C	58	A
		T_s = 80 °C	40	A
I_{CRM}	I_{CRM}= 2 x I_{Cnom}		100	A
V_{GES}			± 20	V
t_{psc}	V_{CC} = 600 V; $V_{GE} \leq$ 20 V; VCES < 1200 V	T_j = 125 °C	10	µs
Inverse Diode				
I_F	T_j = 150 °C	T_s = 25 °C	33	A
		T_s = 80 °C	23	A
I_{FRM}	I_{FRM}= 2 x I_{Fnom}			A
I_{FSM}	t_p = 10 ms; half sine wave	T_j = 150 °C	110	A
Freewheeling Diode				
I_F	T_j = 150 °C	T_{case} = 25 °C	57	A
		T_{case} = 80 °C	38	A
I_{FRM}				A
I_{FSM}	t_p = 10 ms; half sine wave	T_j = 150 °C	550	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 = 2 mA		4,5	5,5	6,5	V
I_{CES}	V_{GE} = 0 V, $V_{CE} = V_{CES}$	T_j = 25 °C			0,3	mA
		T_j = 125 °C				mA
I_{GES}	V_{CE} = 0 V, V_{GE} = 30 V	T_j = 25 °C			300	nA
		T_j = 125 °C				nA
V_{CE0}		T_j = 25 °C		1,2		V
		T_j = 125 °C		1,2		V
r_{CE}	V_{GE} = 15 V	T_j = 25°C		26		mΩ
		T_j = 125°C		38		mΩ
$V_{CE(sat)}$	I_{Cnom} = 50 A, V_{GE} = 15 V	T_j = 25°C$_{chiplev.}$		2,5	3	V
		T_j = 125°C$_{chiplev.}$		3,1	3,7	V
C_{ies}	V_{CE} = 25, V_{GE} = 0 V	f = 1 MHz		3,3		nF
C_{oes}				0,5		nF
C_{res}				0,22		nF
Q_G	V_{GE}=0 ... 20 V			285		nC
$t_{d(on)}$	R_{Gon} = 22 Ω	V_{CC} = 600V, I_C= 50A, T_j = 125 °C, V_{GE}=±15V		70		ns
t_r				90		ns
E_{on}				9,9		mJ
$t_{d(off)}$	R_{Goff} = 22 Ω			460		ns
t_f				30		ns
E_{off}				5,3		mJ
$R_{th(j-s)}$	per IGBT				0,6	K/W



SEMITOP® 2

IGBT Module

SK60GAL123

SK60GAR123

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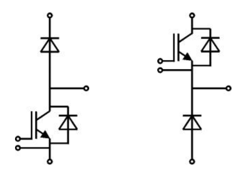


GAL GAR

Characteristics						
Symbol	**Conditions**		**min.**	**typ.**	**max.**	**Units**
Inverse Diode						
$V_F = V_{EC}$	I_{Fnom} = 10 A; V_{GE} = 0 V	T_j = 25 °$C_{chiplev.}$		2	2,5	V
		T_j = 125 °$C_{chiplev.}$		1,8	2,3	V
V_{F0}		T_j = 125 °C		1	1,2	V
r_F		T_j = 125 °C		80		mΩ
I_{RRM}	I_F = 10 A	T_j = 125 °C		12		A
Q_{rr}	di/dt = -300 A/µs			1,8		µC
E_{rr}	V_{CC}= 600V			0,4		mJ
$R_{th(j-s)D}$	per diode				2,1	K/W
Freewheeling Diode						
$V_F = V_{EC}$	I_{Fnom} = 50 A; V_{GE} = 0 V	T_j = 25 °$C_{chiplev.}$		1	2,5	V
		T_j = 125 °$C_{chiplev.}$		1,8		V
V_{F0}		T_j = 125 °C		1	1,2	V
r_F		T_j = 125 °C		18	22	V
I_{RRM}	I_F = 50 A	T_j = 125 °C		40		A
Q_{rr}	di/dt = -800 A/µs			8		µC
E_{rr}	V_R=600V			2,3		mJ
$R_{th(j-s)FD}$	per diode				0,9	K/W
M_s	to heat sink M1				2	Nm
w				21		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.

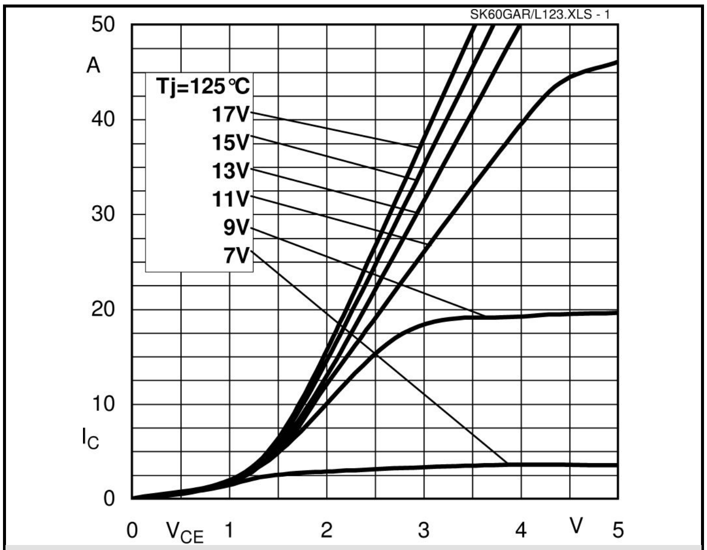


Fig. 1 Typ. output characteristic, inclusive $R_{CC'+ EE'}$

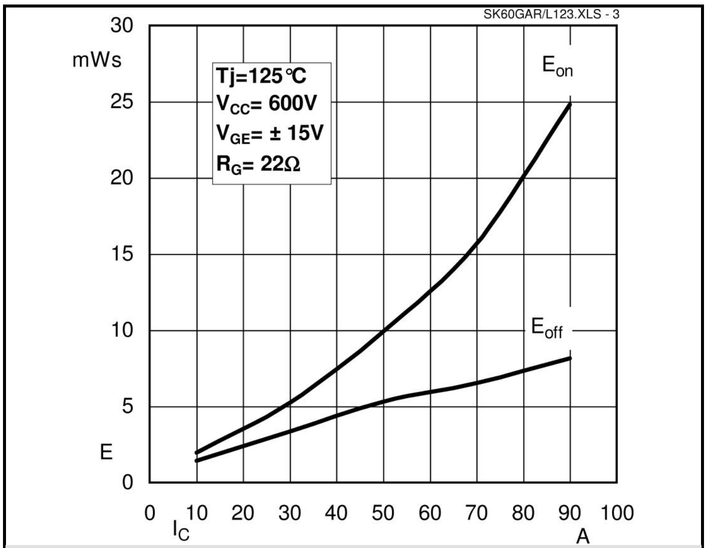


Fig. 3 Typ. turn-on /-off energy = f (I_C)

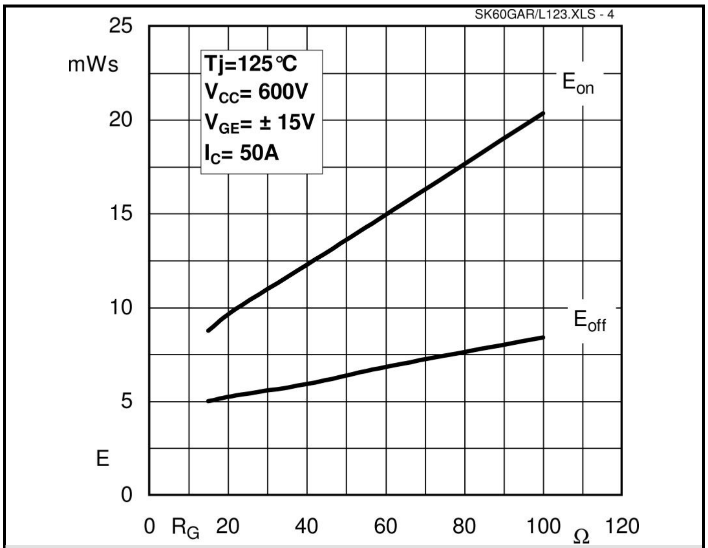


Fig. 4 Typ. turn-on /-off energy = f (R_G)

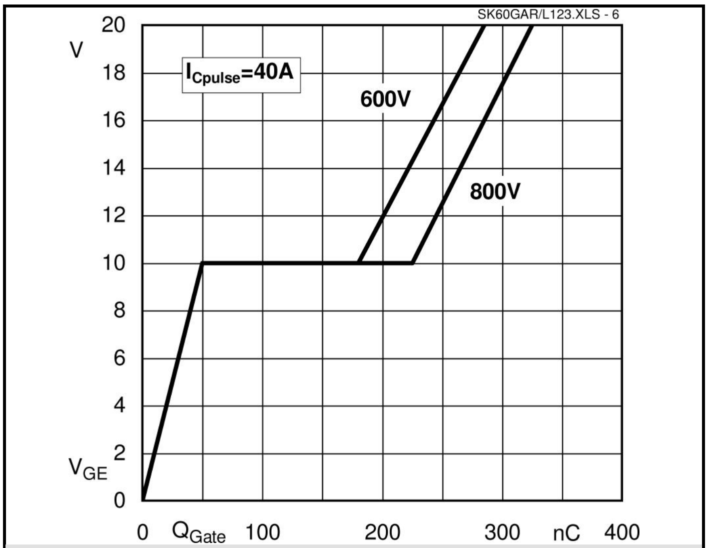


Fig. 6 Typ. gate charge characteristic

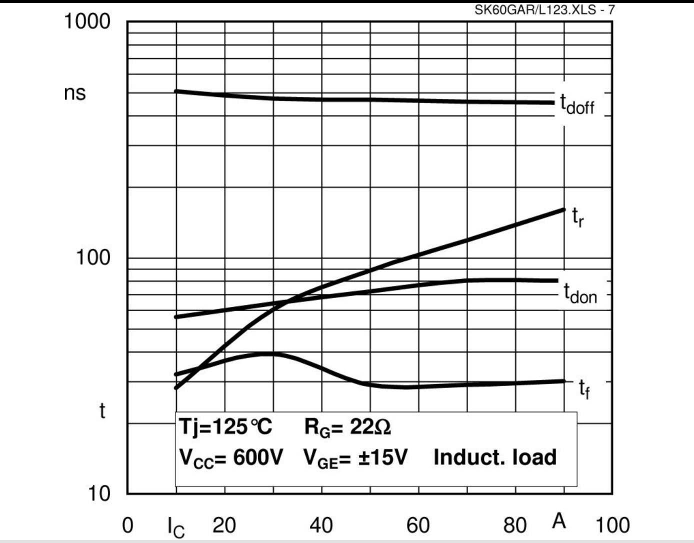


Fig. 7 Typ. switching times vs. I_C

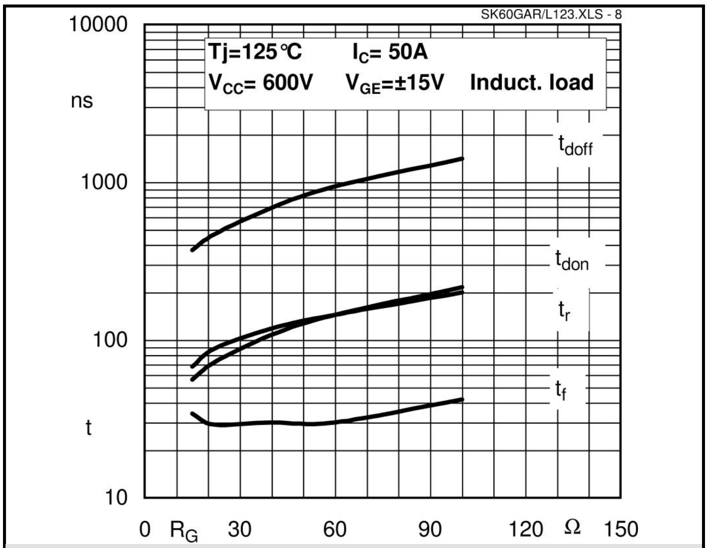


Fig. 8 Typ. switching times vs. gate resistor R_G

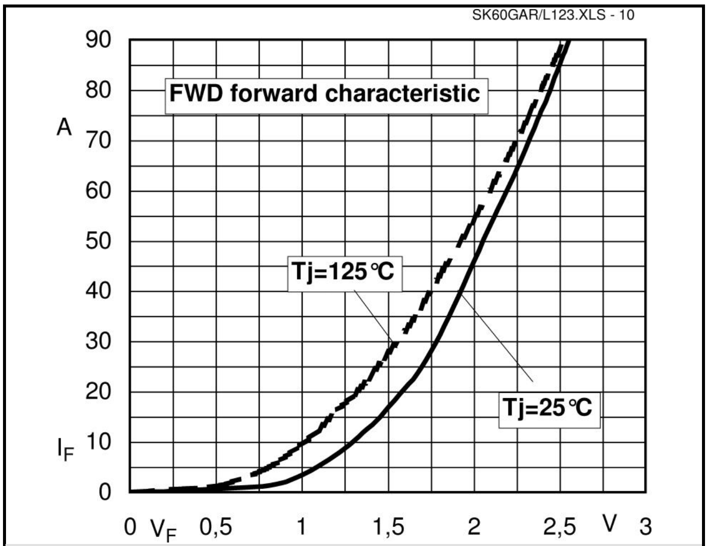
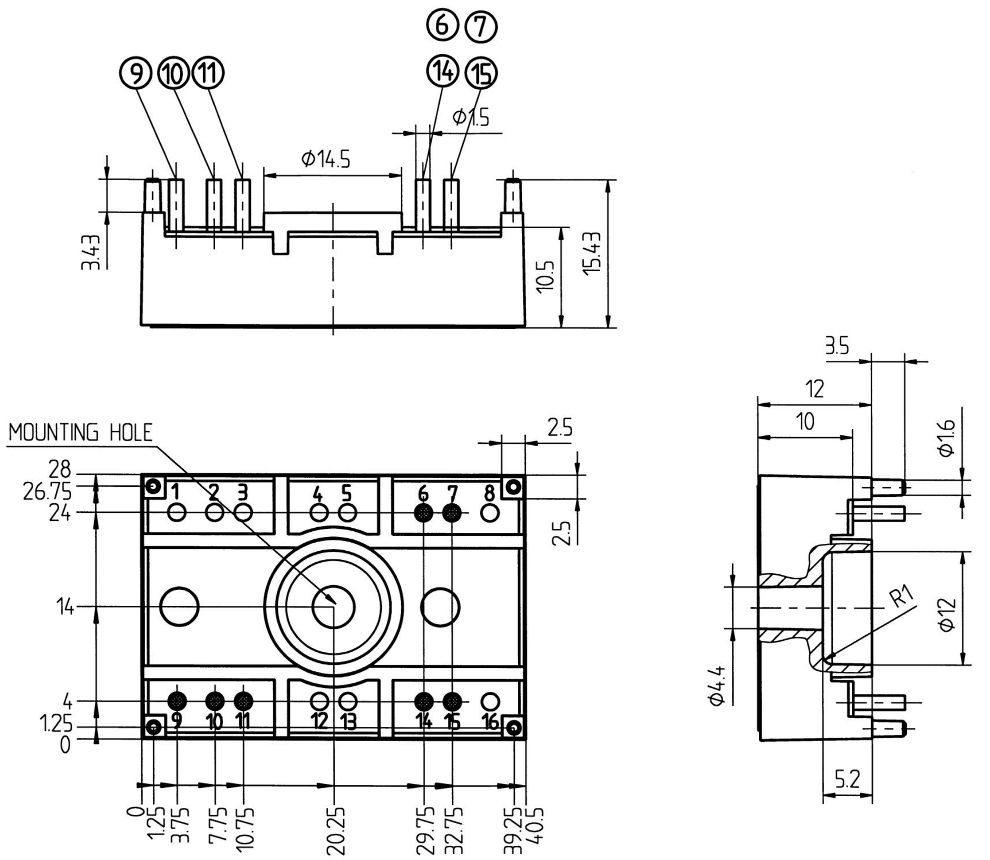
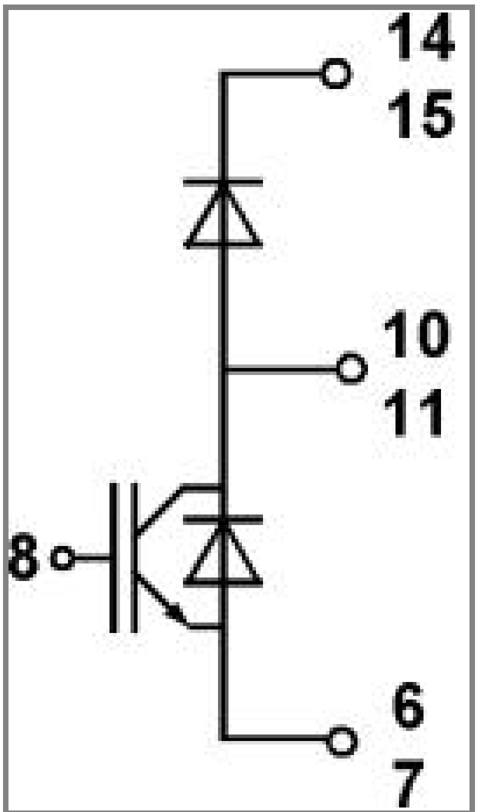


Fig. 10 CAL diode forward characteristic

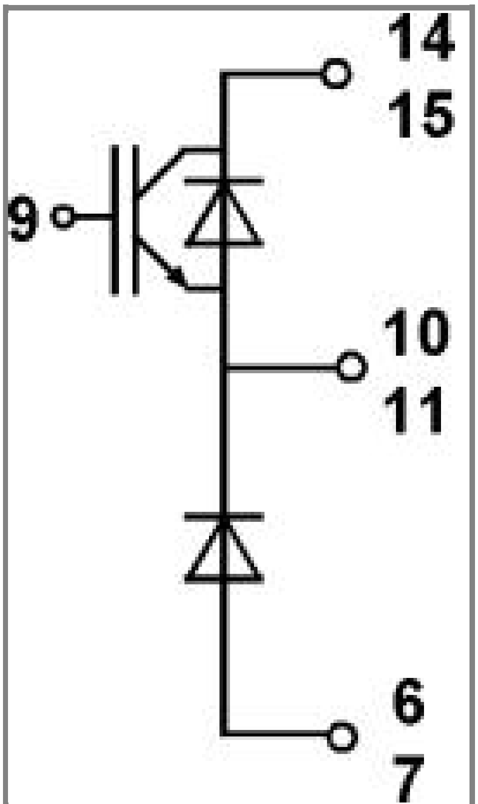
UL recognized file no. E 63 532



Case T18 (Suggested hole diameter, in the PCB, for solder pins and plastic mounting pins: 2mm)



Case T18 GAL



Case T18 GAR

