SK60GAL128

SEMITOP® 2

IGBT Module

SK60GAL128
SK60GAR128

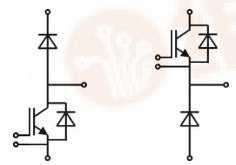
Preliminary Data

Features

- Compact design
- One screw mounting
- Heat transfer and isolation through direct copper bonded aluminium oxide ceramic (DCB
- High short circuit capabilit
- SPT= Soft-Punch-Through technology
- $V_{ce,sat}$ with positive coefficient

Typical Applications

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



GAL GAR

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	63	A
		T_s = 80 °C	44	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; V_{CES} < 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			0,1	mA
		T_j = 125 °C		0,2		mA
I_{GES}	V_{CE} = 0 V, V_{GE} = 20 V	T_j = 25 °C			200	nA
		T_j = 125 °C				nA
V_{CE0}		T_j = 25 °C		1,1	1,3	V
		T_j = 125 °C		1	1,2	V
r_{CE}	V_{GE} = 15 V	T_j = 25°C		16		mΩ
		T_j = 125°C		18		mΩ
$V_{CE(sat)}$	I_{Cnom} = 50 A, V_{GE} = 15 V	T_j = 25°C$_{chiplev.}$	1,7	1,9	2,3	V
		T_j = 125°C$_{chiplev.}$		1,9	2,3	V
C_{ies}	V_{CE} = 25, V_{GE} = 0 V	f = 1 MHz		4,46		nF
C_{oes}				0,33		nF
C_{res}				0,21		nF
$t_{d(on)}$	R_{Gon} = 15 Ω	V_{CC} = 600V		80		ns
t_r		I_{Cnom}= 50A		50		ns
E_{on}		T_j = 125 °C		5,8		mJ
$t_{d(off)}$	R_{Goff} = 15 Ω	V_{GE}=±15V		420		ns
t_f				40		ns
E_{off}				4,8		mJ
$R_{th(j-s)}$	per IGBT				0,6	K/W

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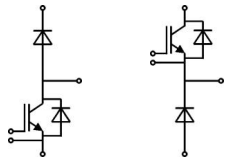

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Characteristics

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		1,2		V
r_F		T_j = 125 °C		62,7		mΩ
I_{RRM}	I_{Fnom} = 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 °$C_{chiplev.}$		2		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_{Fnom} = 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.

This technical information specifies semiconductor devices but promises no characteristics. No warranty or guarantee expressed or implied is made regarding delivery, performance or suitability.

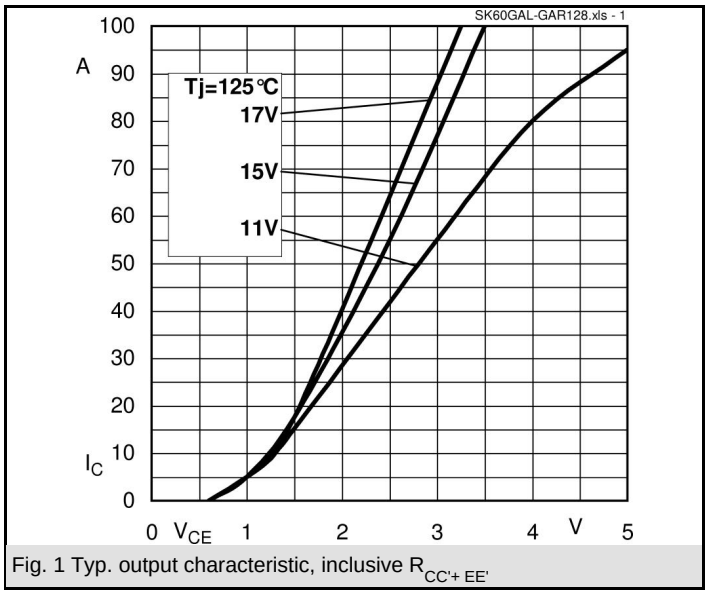

Fig. 1 Typ. output characteristic, inclusive $R_{CC'+EE'}$

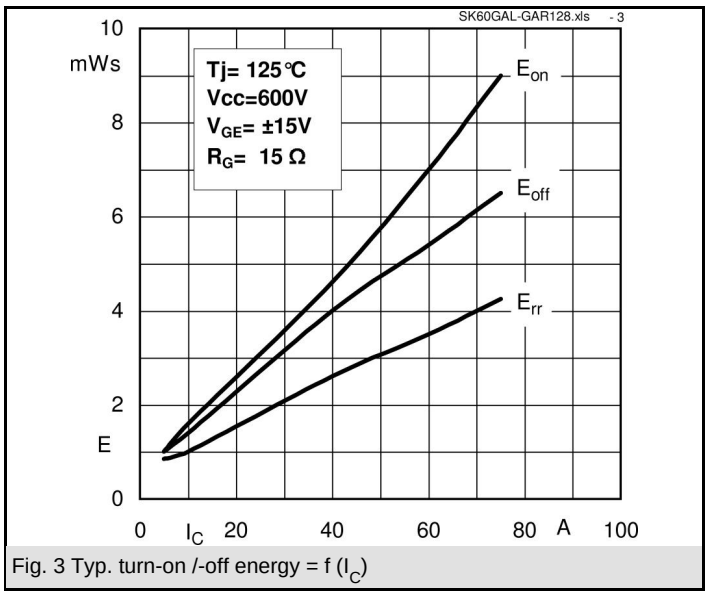

Fig. 3 Typ. turn-on /-off energy = f (I_C)

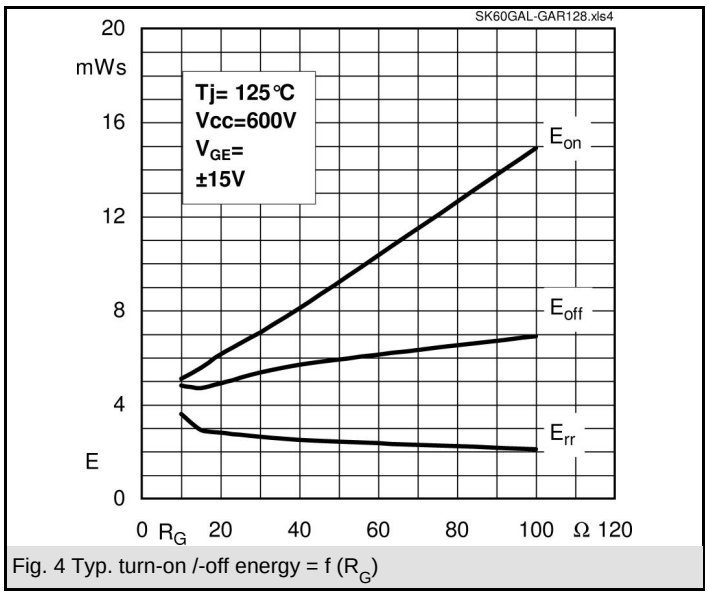

Fig. 4 Typ. turn-on /-off energy = f (R_G)

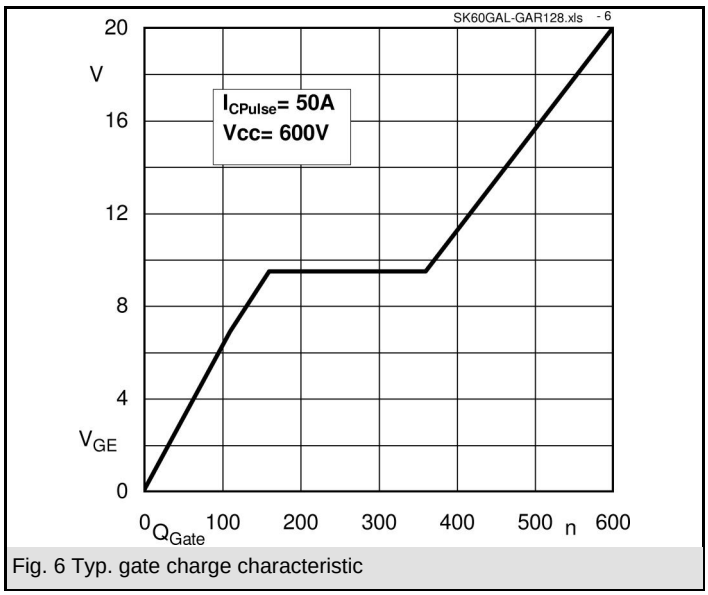

Fig. 6 Typ. gate charge characteristic

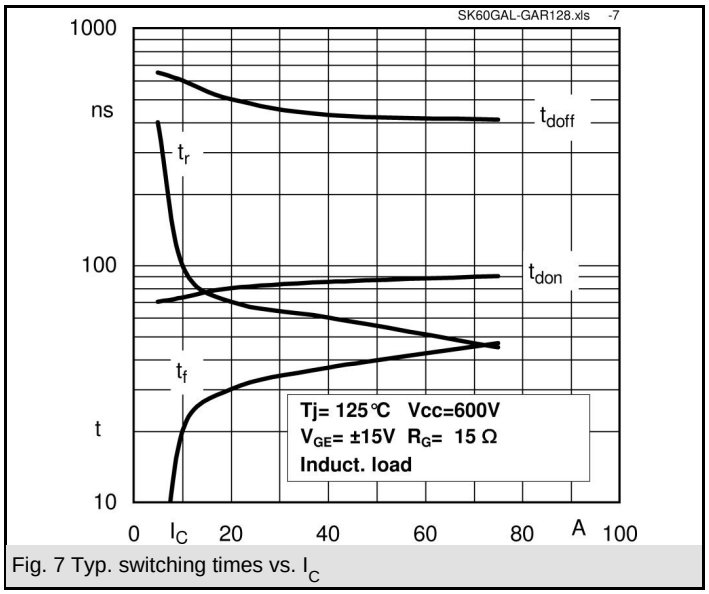

Fig. 7 Typ. switching times vs. I_C

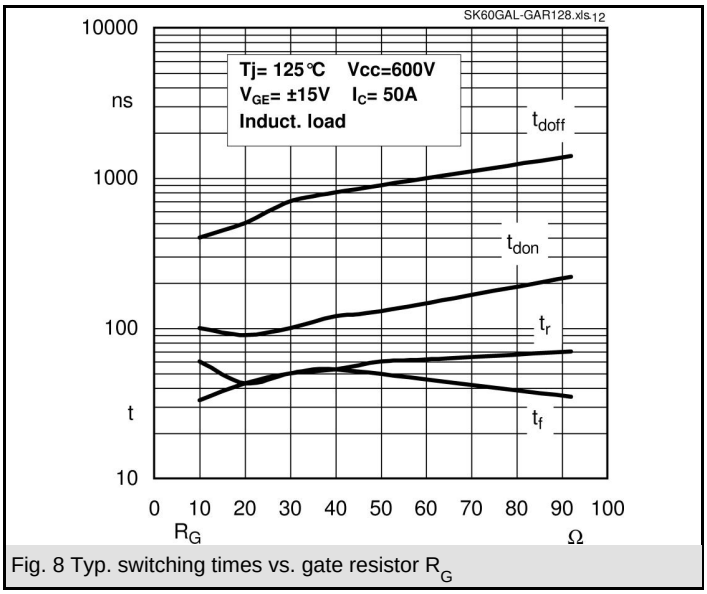

Fig. 8 Typ. switching times vs. gate resistor R_G

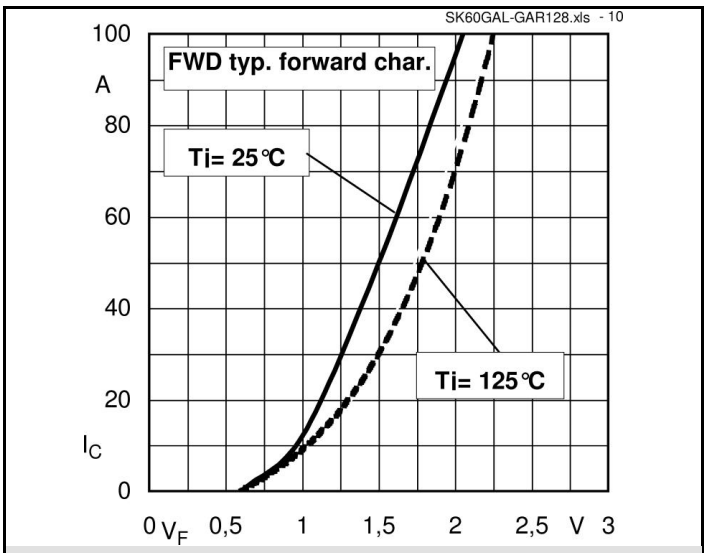

Fig. 10 CAL diode forward characteristic

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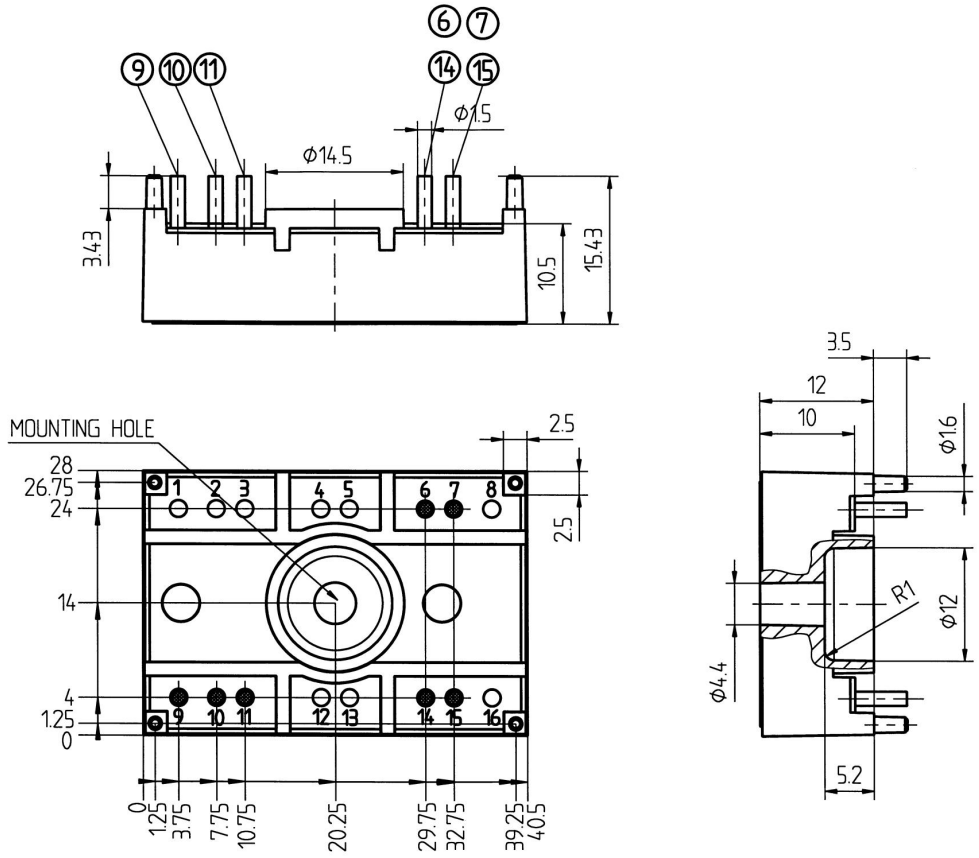
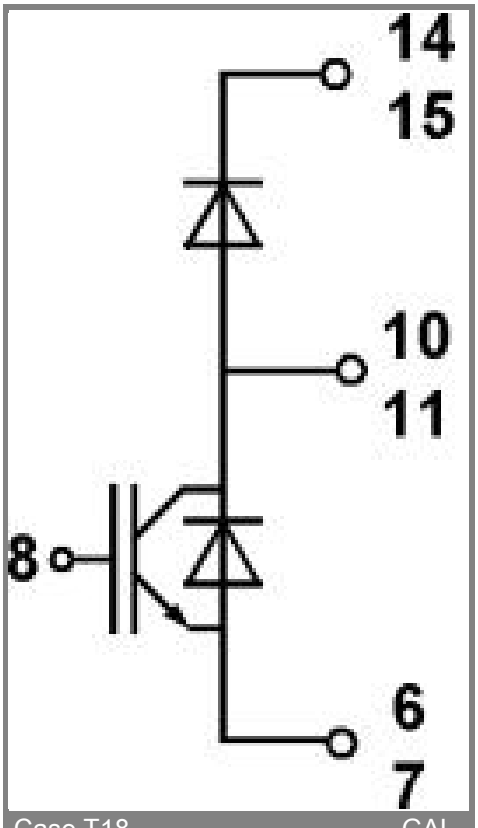
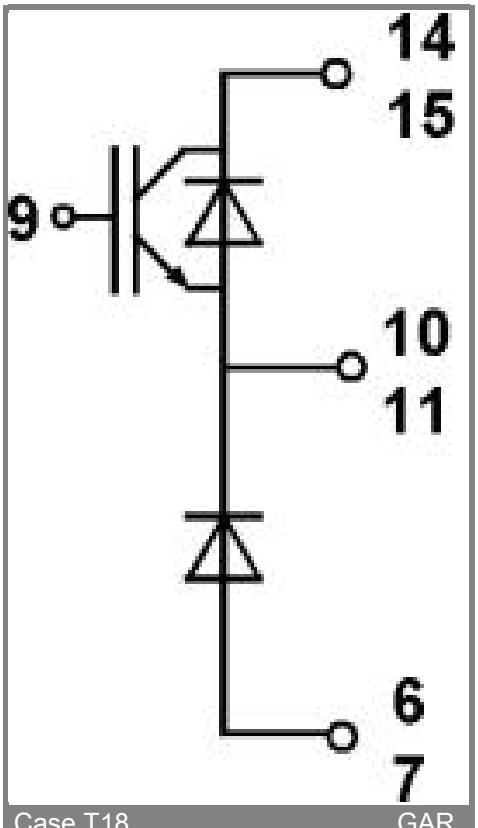
UL recognized file no. E 63 532



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



Case T18 GAL



Case T18 GAR