SK60GAL125

SEMITOP® 2

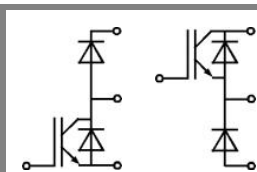IGBT Module

SK60GAL125
SK60GAR125

Target Data

Features

- Compact design
- One screw mounting
- Heat transfer and isolation through direct copper bonded aluminium oxide ceramic (DCB)
- High short circuit capability
- Ultra Fast NPT IGBT 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 $\quad$ T_s = 25 °C	51	A
	T_s = 80 °C	35	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; T_j = 125 °C V_{CES} < 600 V	10	µs
Inverse Diode			
I_F	T_j = 150 °C $\quad$ T_s = 25 °C	43	A
	T_s = 80 °C	29	A
I_{FRM}	I_{FRM}= 2 x I_{Fnom}		A
I_{FSM}	t_p = 10 ms; half sine wave $\quad$ T_j = 25 °C	110	A
Freewheeling Diode			
I_F	T_j = 150 °C $\quad$ T_s = 25 °C	57	A
	T_s = 80 °C	38	A
I_{FRM}			A
I_{FSM}	t_p = 10 ms; half sine wave $\quad$ 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} $\quad$ T_j = 25 °C			0,006	mA
I_{GES}	V_{CE} = 0 V, V_{GE} = 20 V $\quad$ T_j = 25 °C			300	nA
V_{CE0}	T_j = 25 °C		1,4	1,9	V
	T_j = 125 °C		1,7	2,2	V
r_{CE}	V_{GE} = 15 V $\quad$ T_j = 25°C		36		mΩ
	T_j = 125°C		43		mΩ
$V_{CE(sat)}$	I_{Cnom} = 50 A, V_{GE} = 15 V $\quad$ T_j = 25°C$_{chiplev.}$		3,2	3,7	V
	T_j = 125°C$_{chiplev.}$		3,85		V
C_{ies}			3,3		nF
C_{oes}	V_{CE} = 25, V_{GE} = 0 V $\quad$ f = 1 MHz		0,5		nF
C_{res}			0,22		nF
$t_{d(on)}$					ns
t_r	R_{Gon} = 33 Ω	V_{CC} = 600V I_C= 45A			ns
E_{on}			8,36		mJ
$t_{d(off)}$	R_{Goff} = 33 Ω	T_j = 125 °C V_{GE}=±15V			ns
t_f					ns
E_{off}			3,32		mJ
$R_{th(j-s)}$	per IGBT			0,6	K/W

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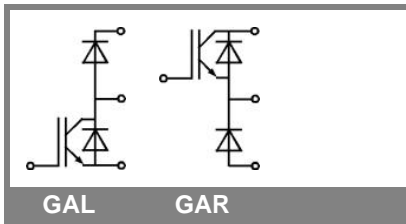- $V_{ce,sat}$ with positive coefficient

Typical Applications*

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- Inverter
- Switched mode power supplies
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Characteristics

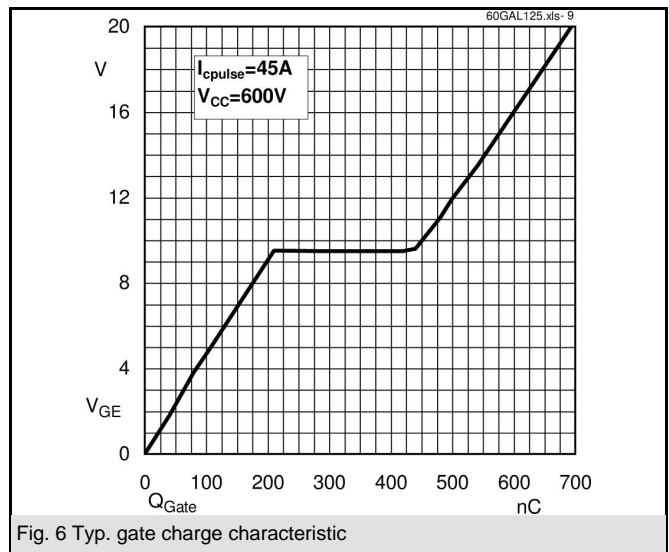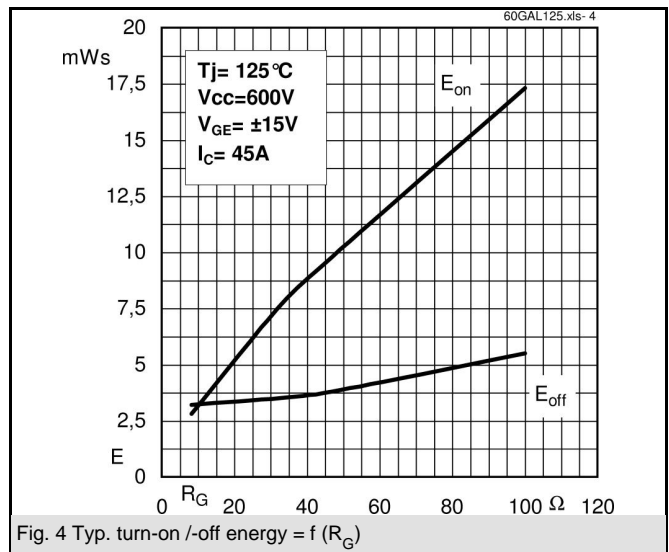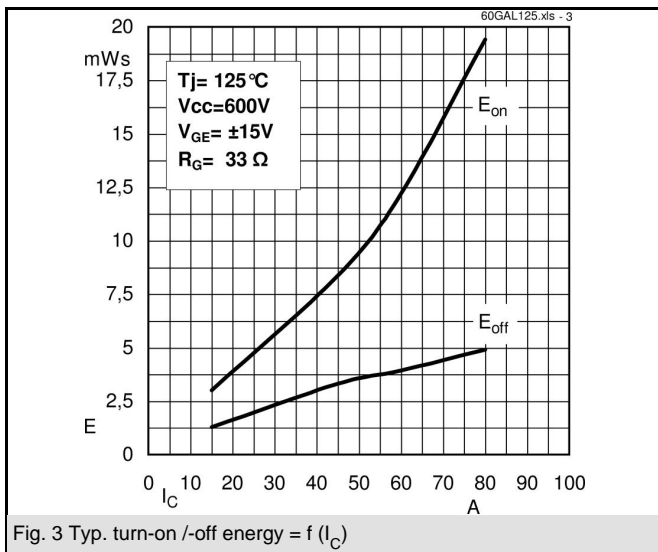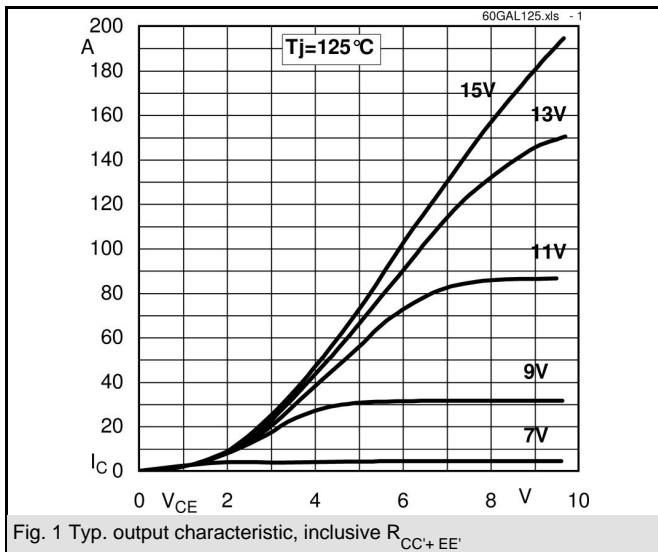| Symbol	Conditions		min.	typ.	max.	Units
Inverse Diode						
$V_F = V_{EC}$	I_{Fnom} = 10 A; V_{GE} = 0 V	T_j = 25 °C$_{chiplev.}$		2	2,5	V
		T_j = 150 °C$_{chiplev.}$		1,79	2,3	V
V_{F0}		T_j = 25 °C				V
		T_j = 125 °C		1,18		V
r_F		T_j = 25 °C				mΩ
		T_j = 125 °C		31,5		mΩ
I_{RRM}	I_F = 30 A	T_j = 125 °C				A
Q_{rr}	di/dt = -100 A/µs					µC
E_{rr}	V_{CC}= 400V					mJ
$R_{th(j-s)D}$	per diode				1,16	K/W
Freewheeling Diode						
$V_F = V_{EC}$	I_{Fnom} = 50 A; V_{GE} = 0 V	T_j = 25 °C$_{chiplev.}$		2	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		16	22	V
I_{RRM}	I_F = 50 A	T_j = 125 °C				A
Q_{rr}	di/dt = -800 A/µs					µC
E_{rr}	V_R=600V					mJ
$R_{th(j-s)FD}$	per diode				0,9	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.
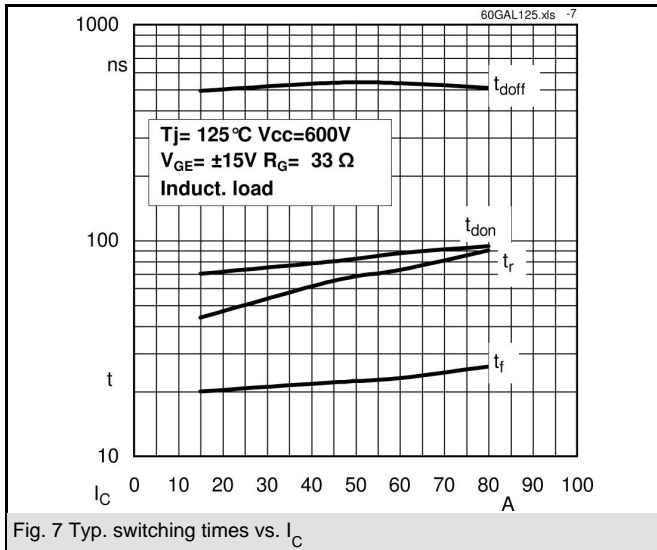
GAL   **GAR**

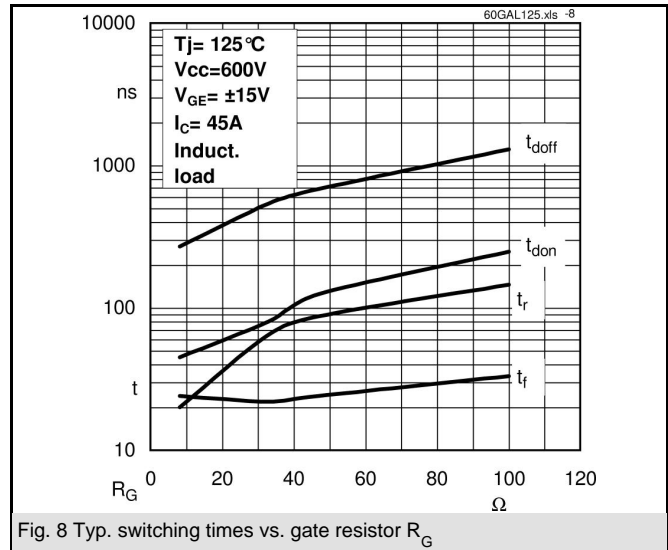Fig. 1 Typ. output characteristic, inclusive $R_{CC'+EE'}$

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

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Fig. 7 Typ. switching times vs. I_C

Fig. 8 Typ. switching times vs. gate resistor R_G
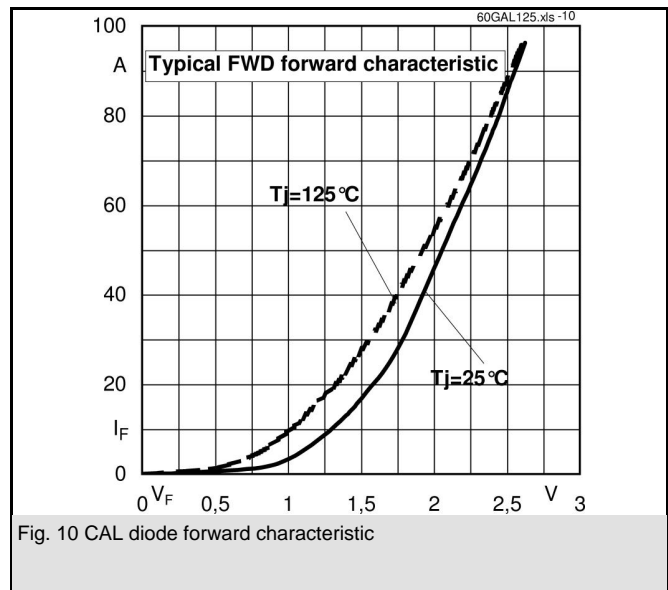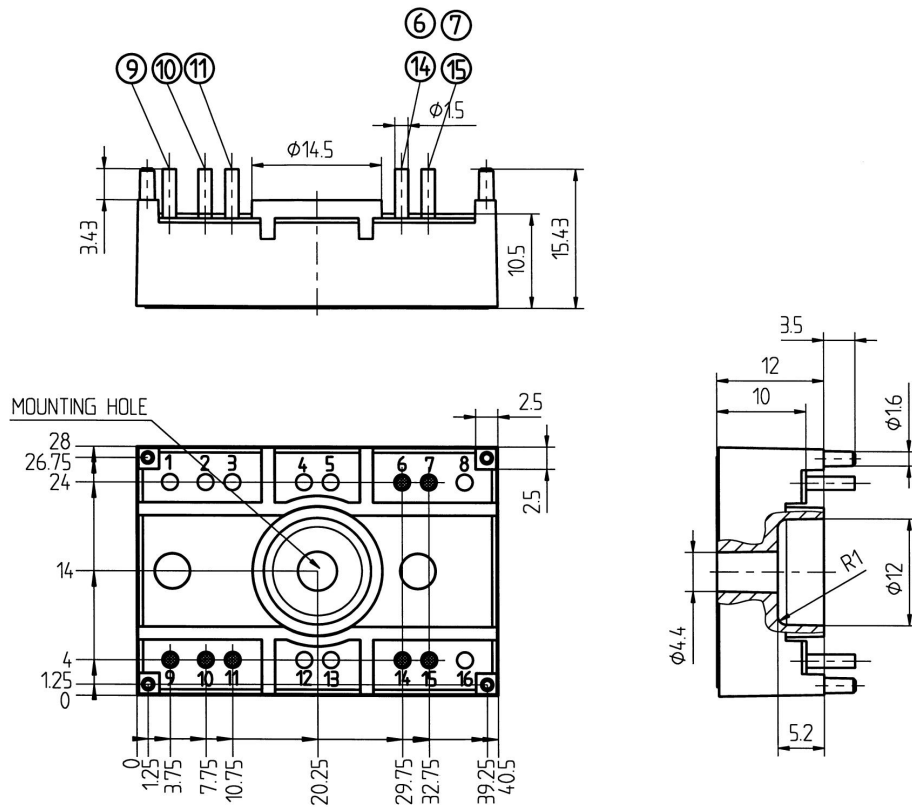
Fig. 10 CAL diode forward characteristic

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

Case T 18   GAL

Case T 18   GAR

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