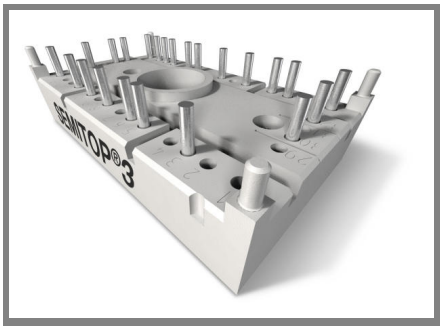


SEMITOP® 3

IGBT Module

SK20GD123

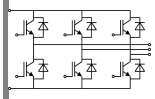
Preliminary Data

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
- Low tail current with low temperature dependence
- UL recognized, file no. E63532

Typical Applications*

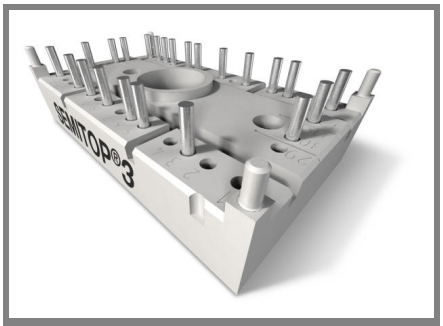
- Switching (not for linear use)
- Inverter
- Switched mode power supplies
- UPS



GD

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	23	A
		T_s = 80 °C	15	A
I_{CRM}	I_{CRM}= 2 x I_{Cnom}		30	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	24	A
		T_s = 80 °C	17	A
I_{FRM}	I_{FRM}= 2 x I_{Fnom}			A
I_{FSM}	t_p = 10 ms; half sine wave	T_j = 150 °C	180	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 = 0,6 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				mA
I_{GES}	V_{CE} = 0 V, V_{GE} = 30 V	T_j = 25 °C			480	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		86		mΩ
		T_j = 125°C		126		mΩ
$V_{CE(sat)}$	I_{Cnom} = 15 A, V_{GE} = 15 V	T_j = 25°$C_{chiplev.}$	2	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		1		nF
C_{oes}				0,15		nF
C_{res}				0,07		nF
Q_G	V_{GE}=0 ... 20 V			90		nC
$t_{d(on)}$	R_{Gon} = 40 Ω	V_{CC} = 600V		35		ns
t_r		I_C= 15A		45		ns
E_{on}		T_j = 125 °C		2		mJ
$t_{d(off)}$	R_{Goff} = 40 Ω	V_{GE}=±15V		250		ns
t_f				70		ns
E_{off}				1,8		mJ
$R_{th(j-s)}$	per IGBT				1,4	K/W



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SK20GD123

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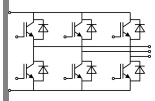


GD

Characteristics						
Symbol	**Conditions**		**min.**	**typ.**	**max.**	**Units**
Inverse Diode						
$V_F = V_{EC}$	I_{Fnom} = 15 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		53	73	mΩ
I_{RRM}	I_F = 15 A	T_j = 125 °C		16		A
Q_{rr}	di/dt = -200 A/µs			2,7		µC
E_{rr}	V_{CC}= 600V			0,6		mJ
$R_{th(j-s)D}$	per diode				1,7	K/W
M_s	to heat sink M1		2,25		2,5	Nm
w				30		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.

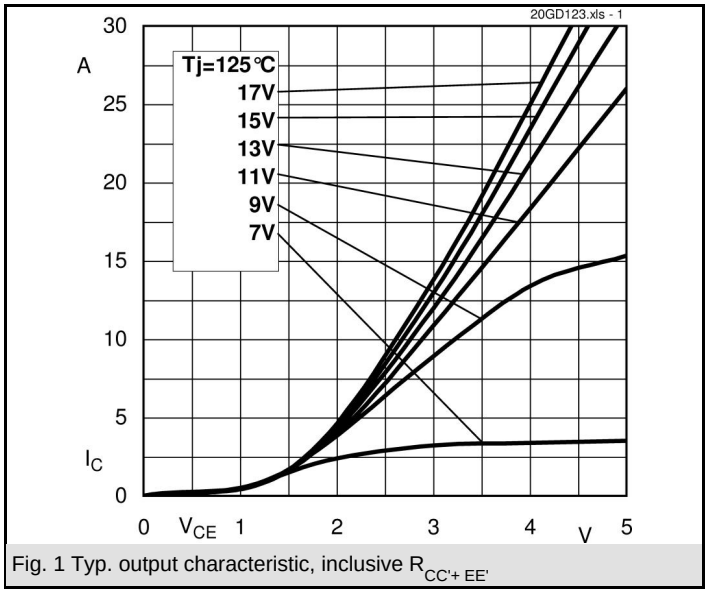


Fig. 1 Typ. output characteristic, inclusive $R_{CC'+EE'}$

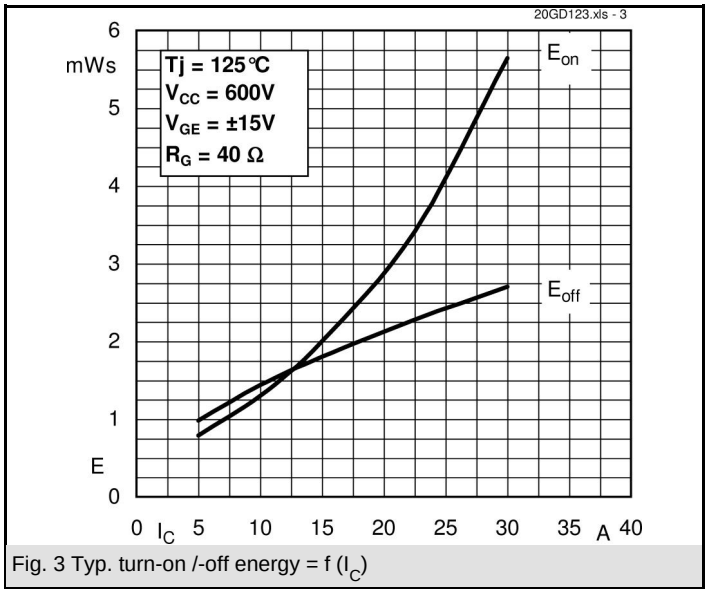


Fig. 3 Typ. turn-on /-off energy = f (I_C)

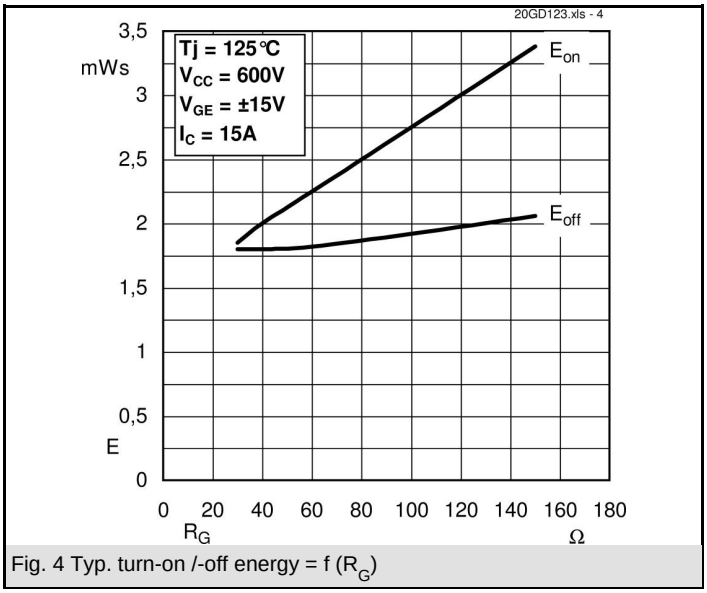


Fig. 4 Typ. turn-on /-off energy = f (R_G)

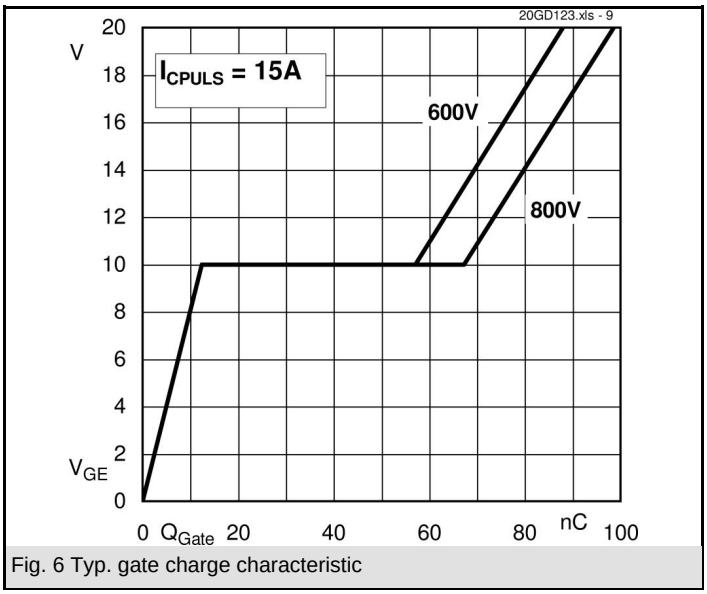


Fig. 6 Typ. gate charge characteristic

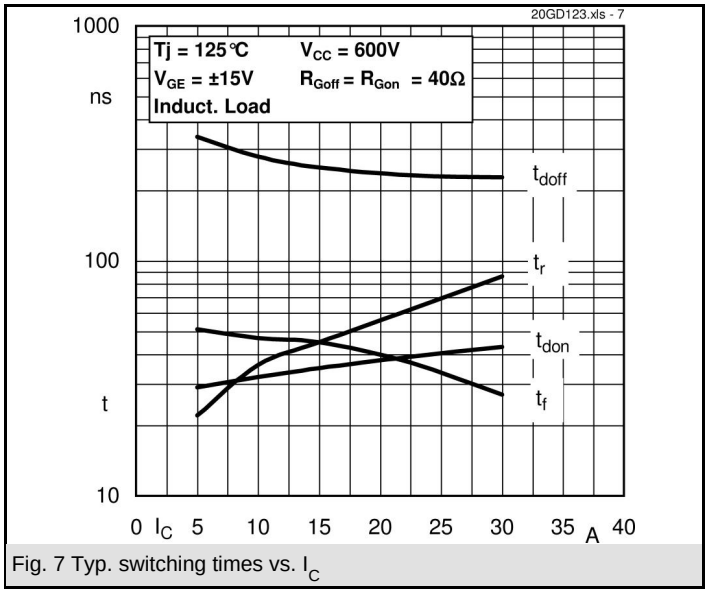


Fig. 7 Typ. switching times vs. I_C

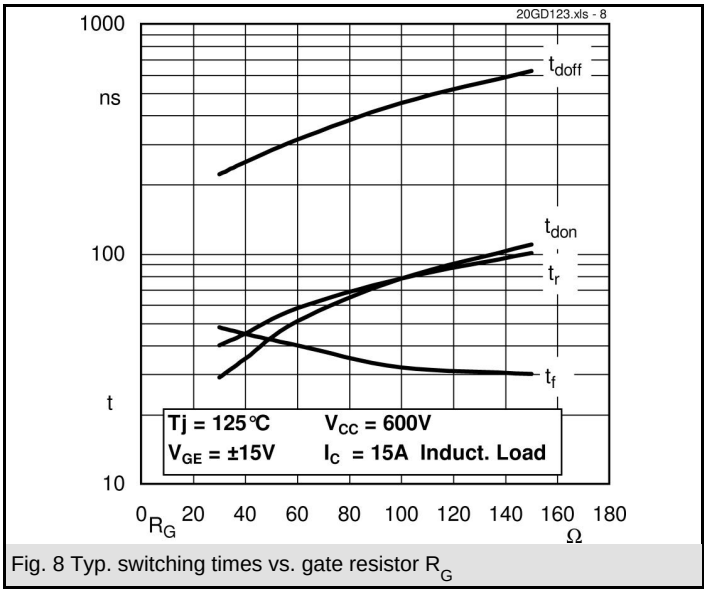


Fig. 8 Typ. switching times vs. gate resistor R_G

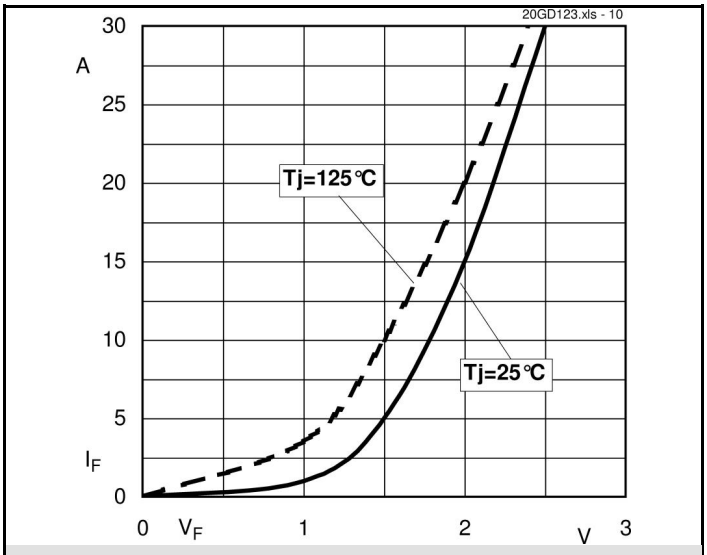
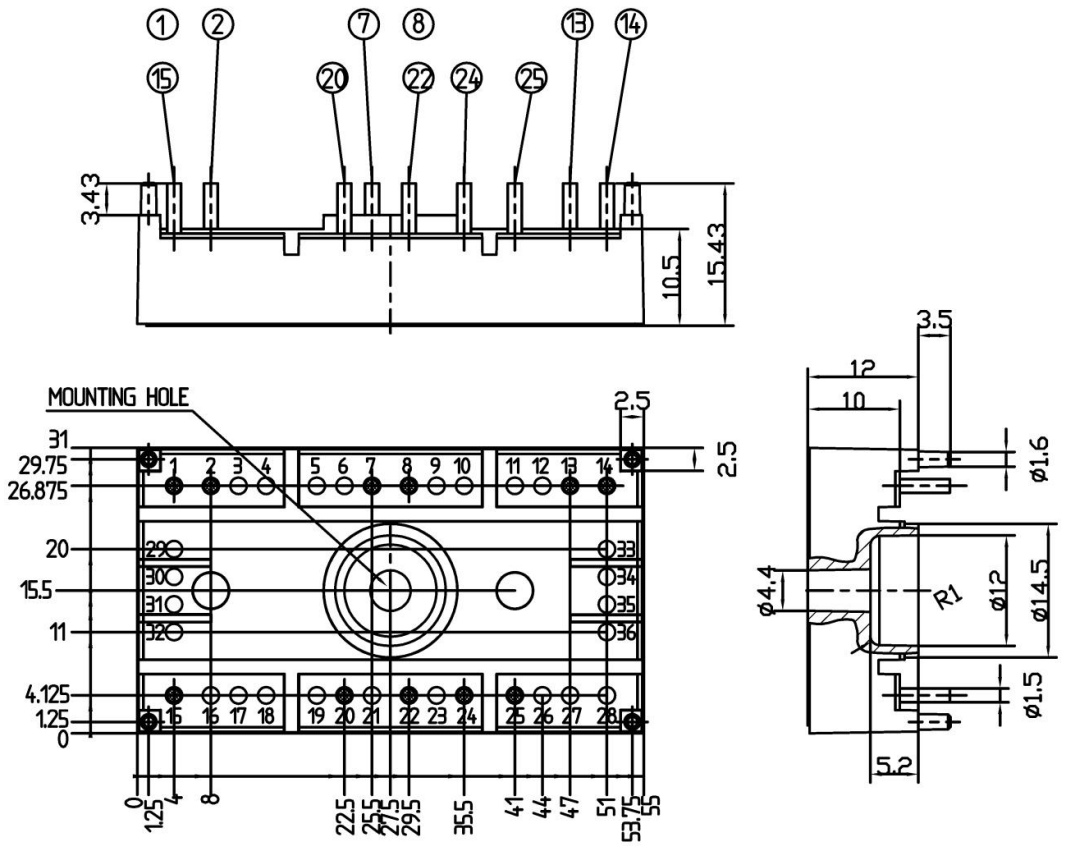
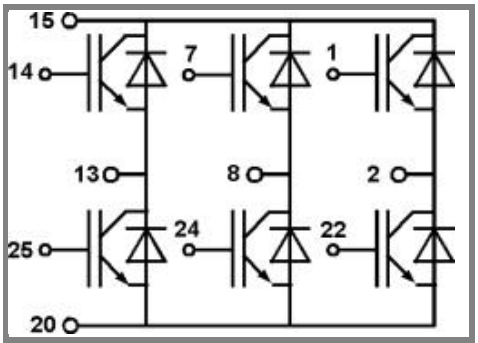


Fig. 10 CAL diode forward characteristic

UL recognized file no. E 63 532



Case T12 (Suggested hole diameter, in the PCB, for solder pins and plastic mounting pins: 2mm)



Case T12 GD

