SKM 800GA125D

SEMITRANS® 4

Ultrafast IGBT Modules

SKM 800GA125D

Features

- Homogeneous Si
- NPT-IGBT
- $V_{CE(sat)}$ with positive temperature coefficient
- High short circuit capability, self limiting to 6 x I_C

Typical Applications*

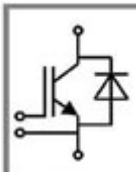
- Resonant inverters up to 100 kHz
- Inductive heating
- Electronic welders at fsw > 20 kHz

Remarks

- $I_{DC} \leq 500$ A limited by terminals
- Take care of over-voltage caused by stray inductances

Absolute Maximum Ratings			T_{case} = 25°C, unless otherwise specified	
Symbol	**Conditions**		**Values**	**Units**
IGBT				
V_{CES}	T_j = 25 °C		1200	V
I_C	T_j = 150 °C	T_{case} = 25 °C	760	A
		T_{case} = 80 °C	530	A
I_{CRM}	I_{CRM}=2xI_{Cnom}		1200	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_{case} = 25 °C	720	A
		T_{case} = 80 °C	500	A
I_{FRM}	I_{FRM}=2xI_{Fnom}		1200	A
I_{FSM}	t_p = 10 ms; sin.	T_j = 150 °C	5700	A
Module				
$I_{t(RMS)}$			500	A
T_{vj}			- 40 ... +150 (125)	°C
T_{stg}			125	°C
V_{isol}	AC, 1 min.		4000	V

Characteristics			T_{case} = 25°C, unless otherwise specified			
Symbol	**Conditions**		**min.**	**typ.**	**max.**	**Units**
IGBT						
$V_{GE(th)}$	V_{GE} = V_{CE}, I_C = 24 mA		4,5	5,5	6,5	V
I_{CES}	V_{GE} = 0 V, V_{CE} = V_{CES}	T_j = 25 °C		0,2	0,6	mA
		T_j = 125 °C				mA
V_{CE0}		T_j = 25 °C		1,5	1,75	V
		T_j = 125 °C		1,7		V
r_{CE}	V_{GE} = 15 V	T_j = 25°C		2,8	3,3	mΩ
		T_j = 125°C		3,8	5,4	mΩ
$V_{CE(sat)}$	I_{Cnom} = 600 A, V_{GE} = 15 V	T_j = 25°C$_{chiplev.}$		3,2	3,75	V
		T_j = 125°C$_{chiplev.}$		4		V
C_{ies}	V_{CE} = 25, V_{GE} = 0 V	f = 1 MHz		37		nF
C_{oes}				5,6		nF
C_{res}				2,8		nF
R_{Gint}	T_j = °C			1,7		Ω
$t_{d(on)}$	R_{Gon} = 0,5 Ω	V_{CC} = 600V				ns
t_r		I_C= 600A				ns
E_{on}		T_j = 125 °C		88		mJ
$t_{d(off)}$	R_{Goff} = 0,5 Ω	V_{GE} = ± 15V				ns
t_f						ns
E_{off}				48		mJ
$R_{th(j-c)}$	per IGBT				0,03	K/W



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Remarks

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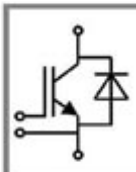
- Take care of over-voltage caused by stray inductances

Characteristics						
Symbol	**Conditions**		**min.**	**typ.**	**max.**	**Units**
$V_F = V_{EC}$	$I_{From} = 600$ A; $V_{GE} = 0$ V	$T_j = 25$ °C$_{chiplev.}$		2,3	2,5	V
		$T_j = 125$ °C$_{chiplev.}$		2,1	2,3	V
V_{F0}		$T_j = 25$ °C		1,1	1,3	V
		$T_j = 125$ °C		0,9	1,05	V
r_F		$T_j = 25$ °C		2	2	mΩ
		$T_j = 125$ °C		2	2,1	mΩ
I_{RRM}	$I_F = 600$ A	$T_j = 25$ °C		370		A
Q_{rr}				83		µC
E_{rr}	$V_{GE} = 0$ V; $V_{CC} = 600$ V			28		mJ
$R_{th(j-c)D}$	per diode				0,07	K/W
Module						
L_{CE}					20	nH
$R_{CC'+EE'}$	res., terminal-chip	$T_{case} = 25$ °C		0,18		mΩ
		$T_{case} = 125$ °C		0,22		mΩ
$R_{th(c-s)}$	per module				0,038	K/W
M_s	to heat sink M6		3		5	Nm
M_t	to terminals M6(M4)		2,5 (1,1)		5 (2)	Nm
w					330	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.



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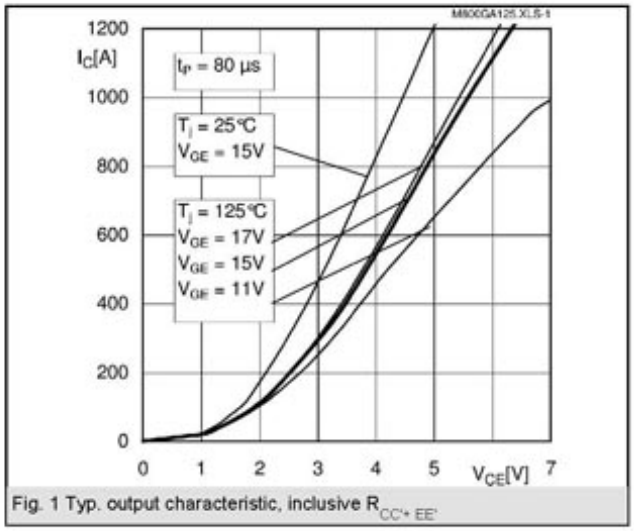

Fig. 1 Typ. output characteristic, inclusive $R_{CC'+EE'}$

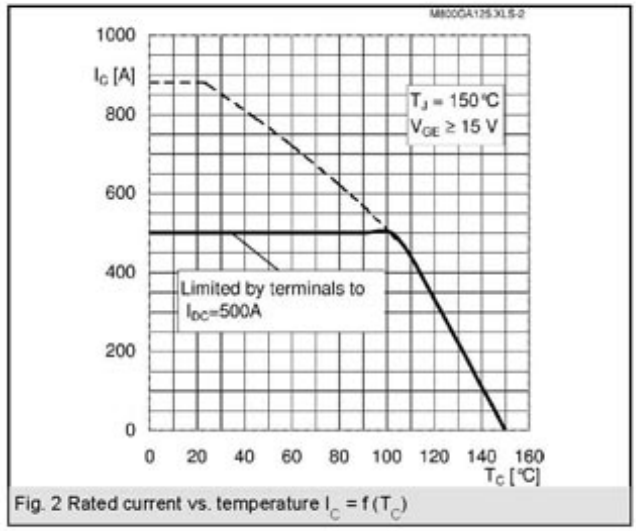

Fig. 2 Rated current vs. temperature $I_C = f(T_C)$

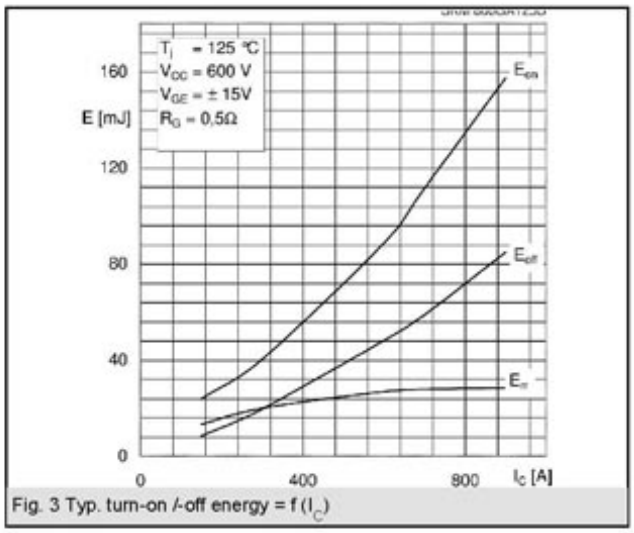

Fig. 3 Typ. turn-on /-off energy = f (I_C)

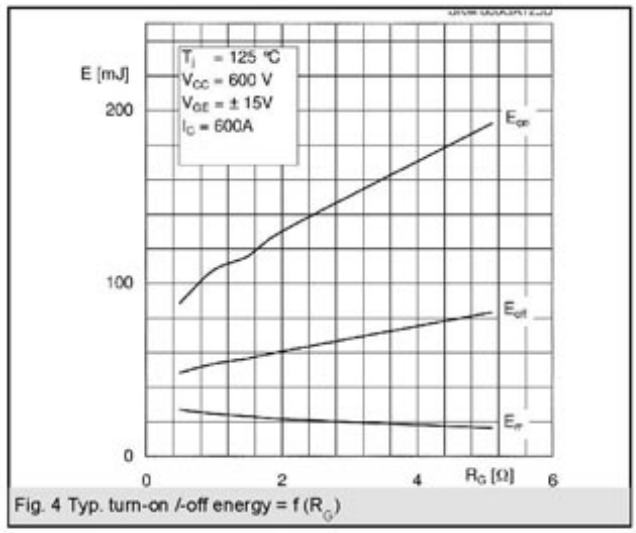

Fig. 4 Typ. turn-on /-off energy = f (R_G)

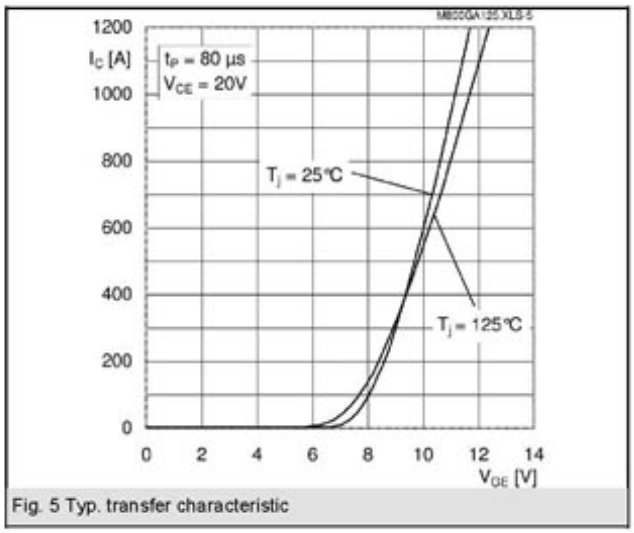

Fig. 5 Typ. transfer characteristic

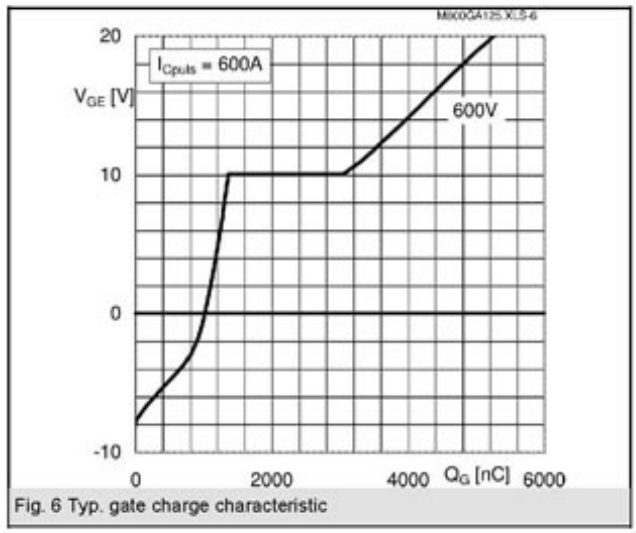

Fig. 6 Typ. gate charge characteristic

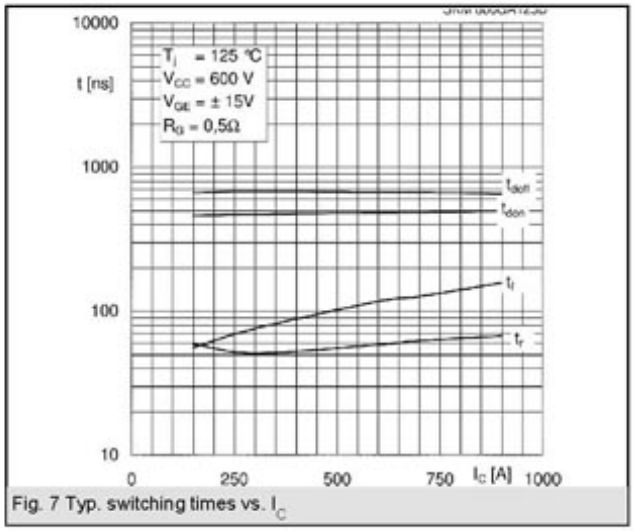

Fig. 7 Typ. switching times vs. I_C

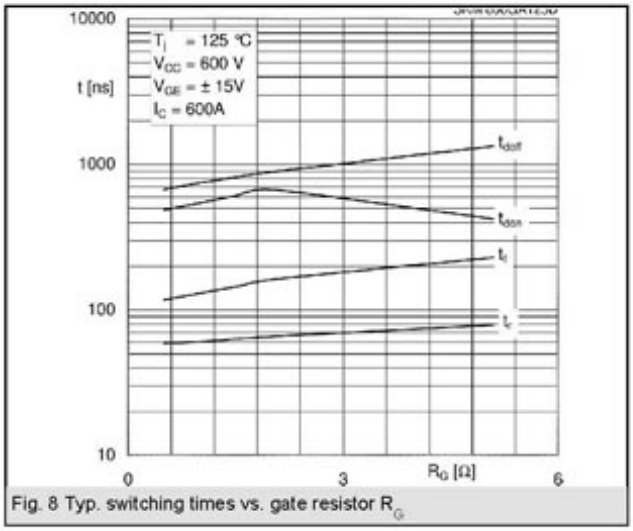

Fig. 8 Typ. switching times vs. gate resistor R_G

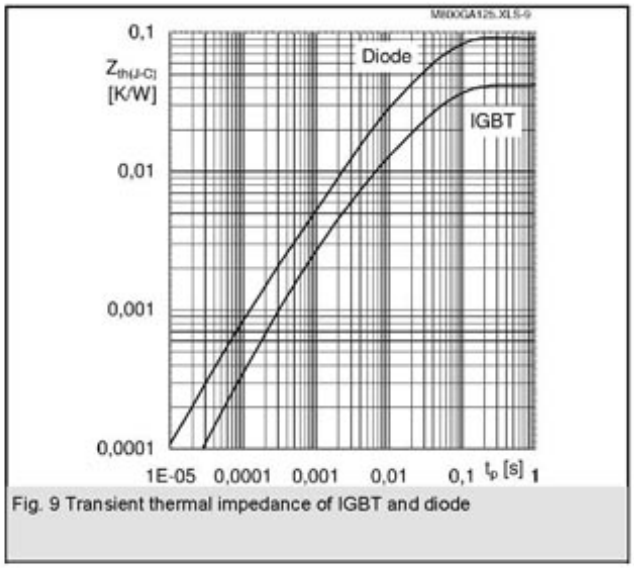

Fig. 9 Transient thermal impedance of IGBT and diode

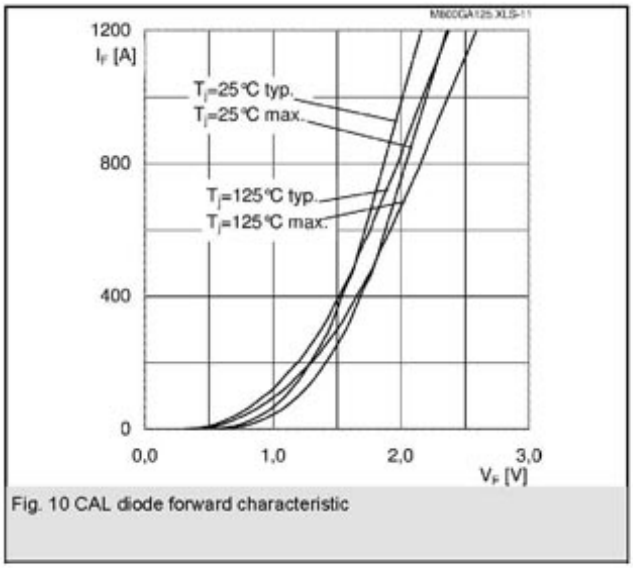

Fig. 10 CAL diode forward characteristic

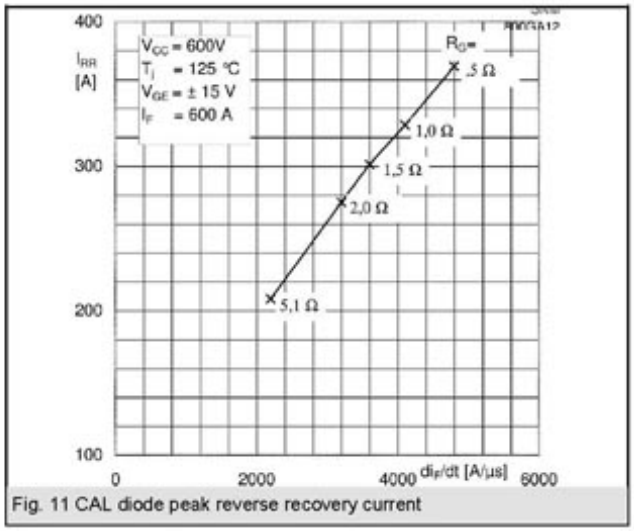

Fig. 11 CAL diode peak reverse recovery current

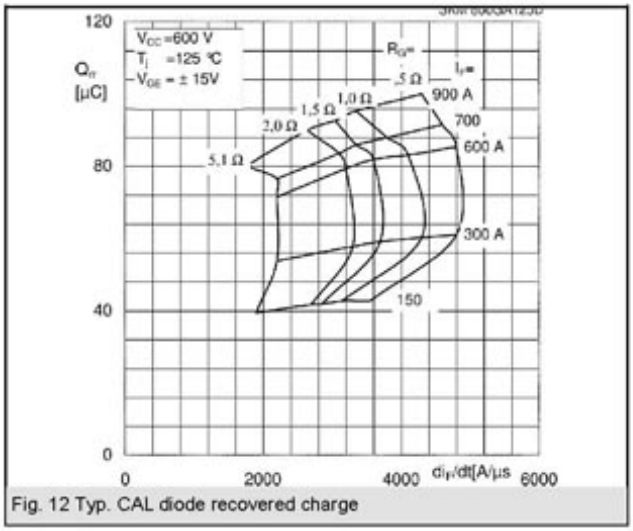

Fig. 12 Typ. CAL diode recovered charge

UL Recognized

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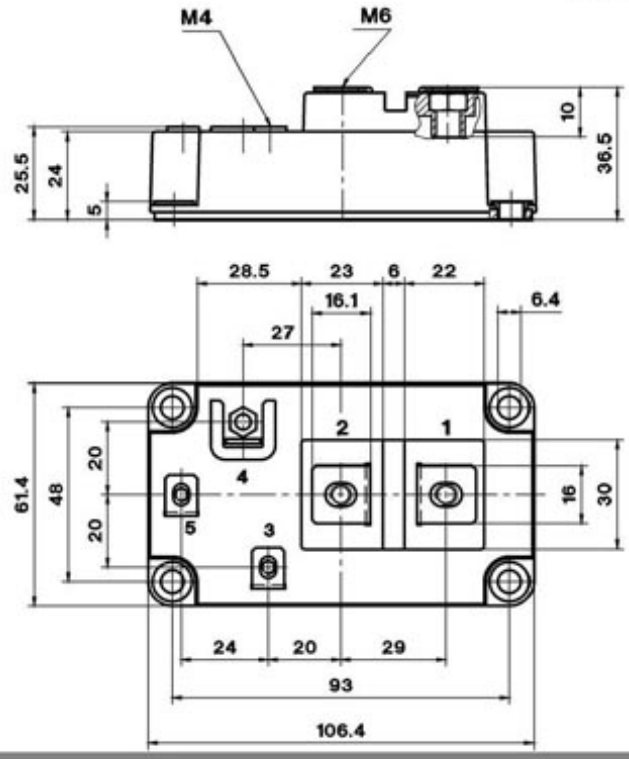
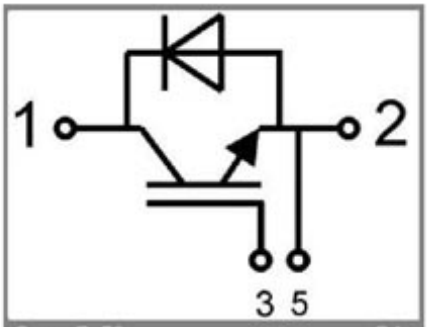


Case D 59



Case D 59 GA

