

SKM 600GA125D



SEMITRANS® 4

Ultra Fast IGBT Modules

SKM 600GA125D

Preliminary Data

Features

- NPT-IGBT with positive temperature coefficient of V_{CEsat}
- Short circuit self limiting to $6 \times I_C$
- Corresponds to standards: IEC 60721-3-3 (humidity) class 3K3/IEC 68T.1 climate 40/125/56

Typical Applications

- Resonant inverters upto 100 kHz
- Inductive heating
- Electronic welders at $f_{SW} > 20$ kHz

Remarks

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



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Absolute Maximum Ratings			$T_c = 25\text{ }^{\circ}\text{C}$, unless otherwise specified	
Symbol	Conditions		Values	Units
IGBT				
V_{CES}	$T_j = 25\text{ }^{\circ}\text{C}$		1200	V
I_C	$T_j = 150\text{ }^{\circ}\text{C}$	$T_{case} = 25\text{ }^{\circ}\text{C}$	580	A
		$T_{case} = 80\text{ }^{\circ}\text{C}$	400	A
I_{CRM}	$I_{CRM}=2 \times I_{Cnom}$		800	A
V_{GES}			± 20	V
t_{psc}	$V_{CC} = 600\text{ V}; V_{GE} \leq 20\text{ V}; T_j = 125\text{ }^{\circ}\text{C}$ $V_{CES} < 1200\text{ V}$		10	μs
Inverse Diode				
I_F	$T_j = 150\text{ }^{\circ}\text{C}$	$T_{case} = 25\text{ }^{\circ}\text{C}$	500	A
		$T_{case} = 80\text{ }^{\circ}\text{C}$	350	A
I_{FRM}	$I_{FRM}=2 \times I_{Fnom}$		800	A
I_{FSM}	$t_p = 10\text{ ms}; \sin.$	$T_j = 150\text{ }^{\circ}\text{C}$	3600	A
Module				
$I_{t(RMS)}$			500	A
T_{vj}			- 40 ... + 150 (125)	$^{\circ}\text{C}$
T_{stg}			125	$^{\circ}\text{C}$
V_{isol}	AC, 1 min.		4000	V

Characteristics			T _c = 25 °C, unless otherwise specified			
Symbol	Conditions		min.	typ.	max.	Units
IGBT						
V _{GE(th)}	V _{GE} = V _{CE} , I _C = 16 mA		4,5	5,5	6,5	V
I _{CES}	V _{GE} = 0 V, V _{CE} = V _{CES} T _j = 25 °C			0,15	0,45	mA
V _{CE0}				T _j = 25 °C	1,5	V
				T _j = 125 °C	1,7	V
r _{CE}	V _{GE} = 15 V			T _j = 25°C	4,5	mΩ
				T _j = 125°C	6	mΩ
V _{CE(sat)}	I _{Cnom} = 400 A, V _{GE} = 15 V			T _j = 25°C _{chiplev.}	3,3	V
				T _j = 125°C _{chiplev.}	4	V
C _{ies}	V _{CE} = 25, V _{GE} = 0 V f = 1 MHz				36	nF
C _{oes}					3,8	nF
C _{res}					3,5	nF
Q _G	V _{GE} = -8V - +20V				4400	nC
R _{Gint}	T _j = °C				1,25	Ω
t _{d(on)}	R _{Gon} = 2,5 Ω		V _{CC} = 600V I _{Cnom} = 400A		80	ns
t _r					70	ns
E _{on}					30	mJ
t _{d(off)}	R _{Goff} = 2,5 Ω		T _j = 125 °C V _{GE} = ± 15V		570	ns
t _f					60	ns
E _{off}						mJ
R _{th(j-c)}	per IGBT				0,041	K/W

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Characteristics						
Symbol	Conditions		min.	typ.	max.	Units
Inverse Diode						
V _F = V _{EC}	I _{Fnom} = 400 A; V _{GE} = 0 V	T _j = 25 °C _{chiplev.} T _j = 125 °C _{chiplev.}		2 1,8	2,5	V V
V _{F0}		T _j = 25 °C T _j = 125 °C		1,1	1,2	V V
r _F		T _j = 25 °C T _j = 125 °C		2,3	3,3	mΩ mΩ
I _{RRM} Q _{rr} E _{rr}	I _{Fnom} = 400 A V _{GE} = 0 V; V _{CC} = 600 V	T _j = 125 °C		460 65		A μC mJ
R _{th(j-c)D}	per diode				0,09	K/W
Module						
L _{CE}				15	20	nH
R _{CC'+EE'}	res., terminal-chip	T _{case} = °C		0,18		mΩ
R _{th(c-s)}	per module				0,038	K/W
M _s	to heat sink			3	5	Nm
M _t	to terminals			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.

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



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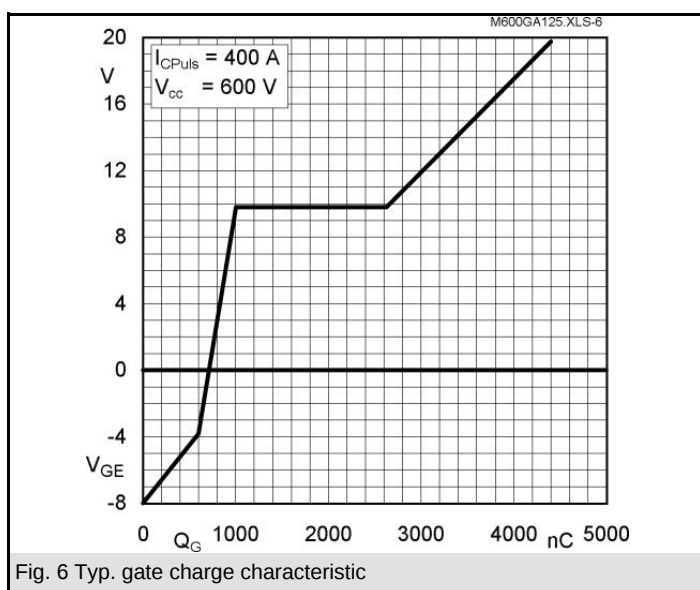
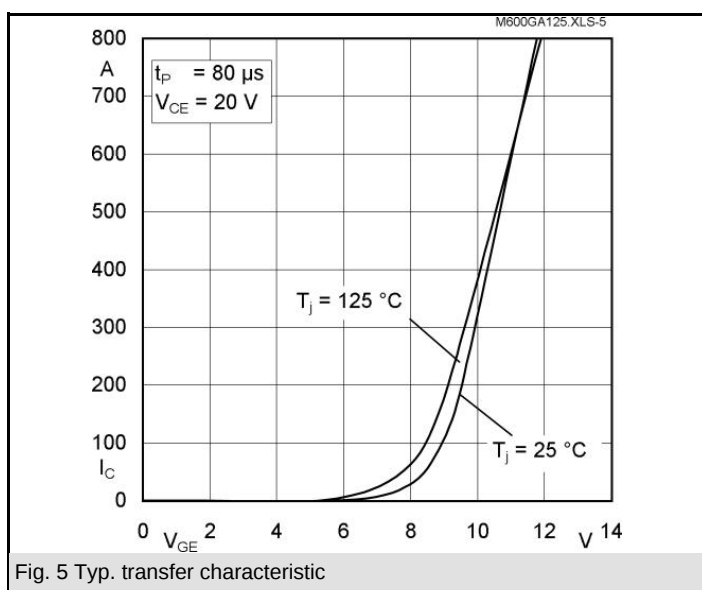
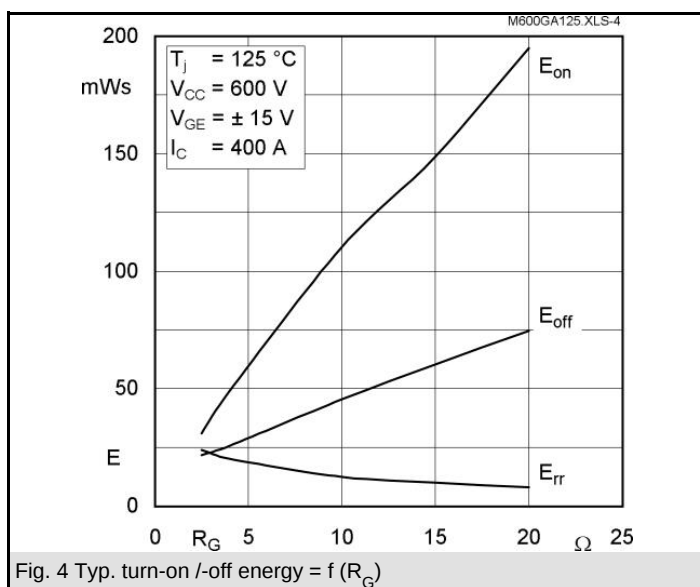
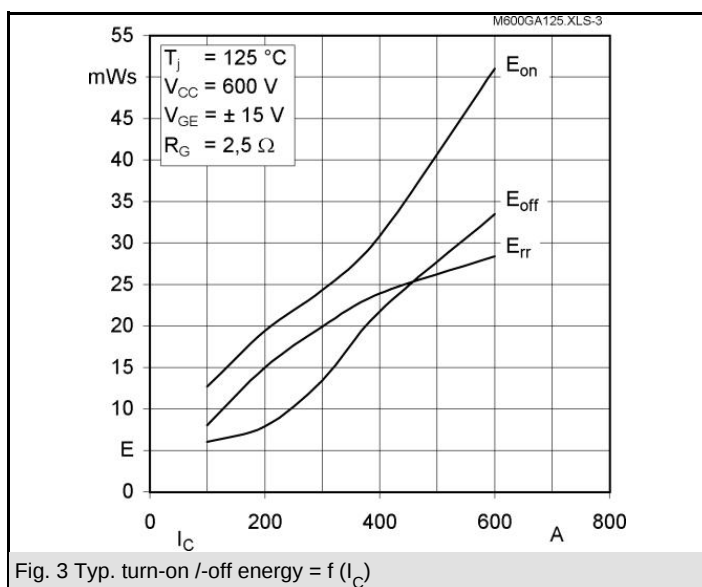
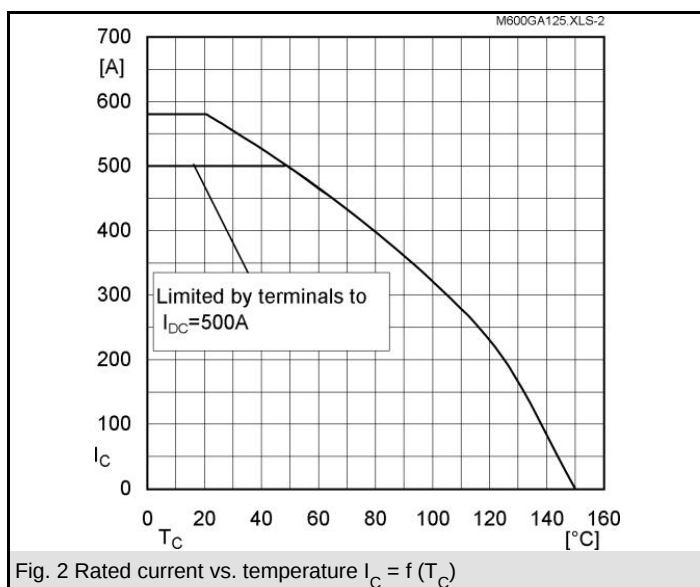
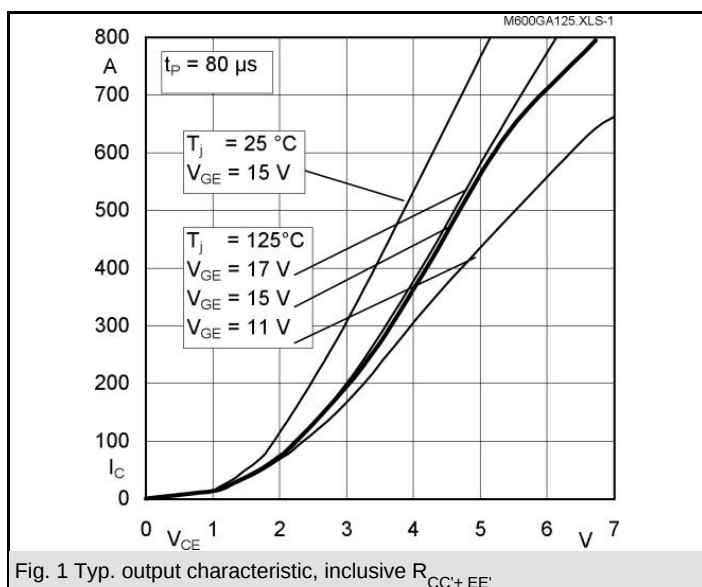
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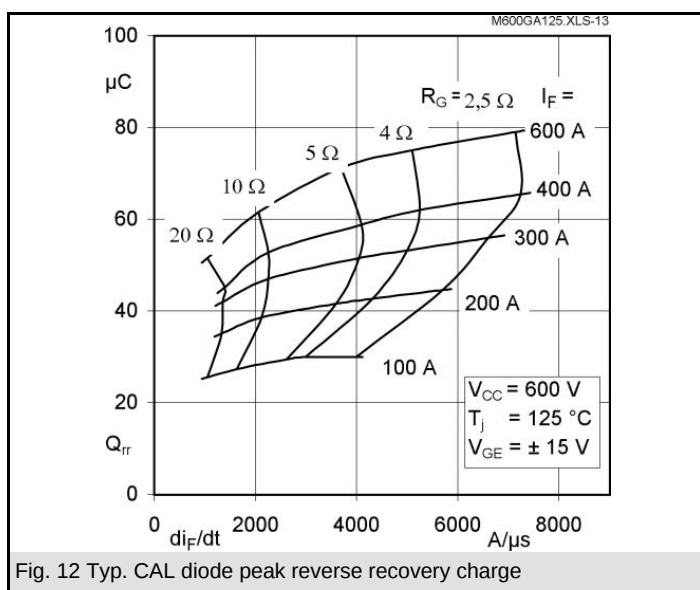
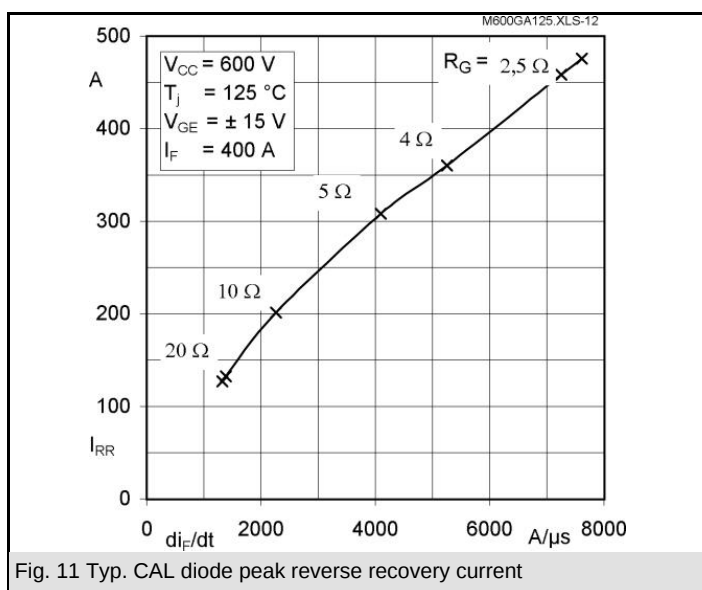
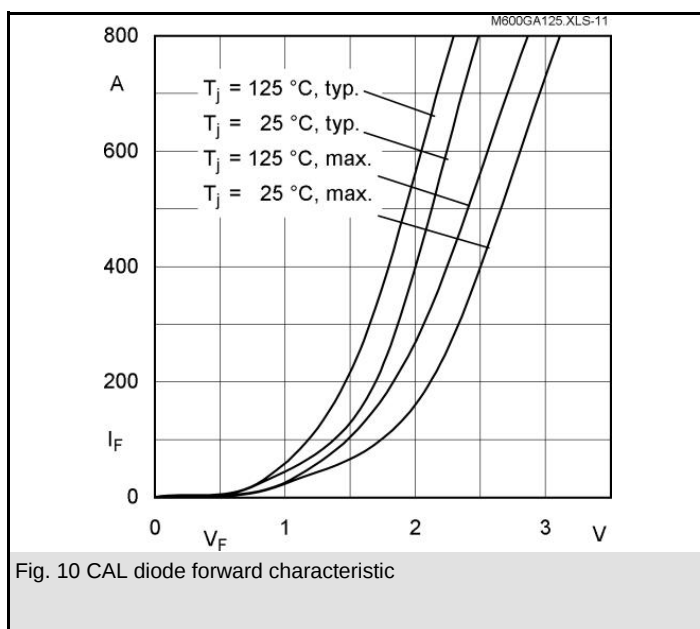
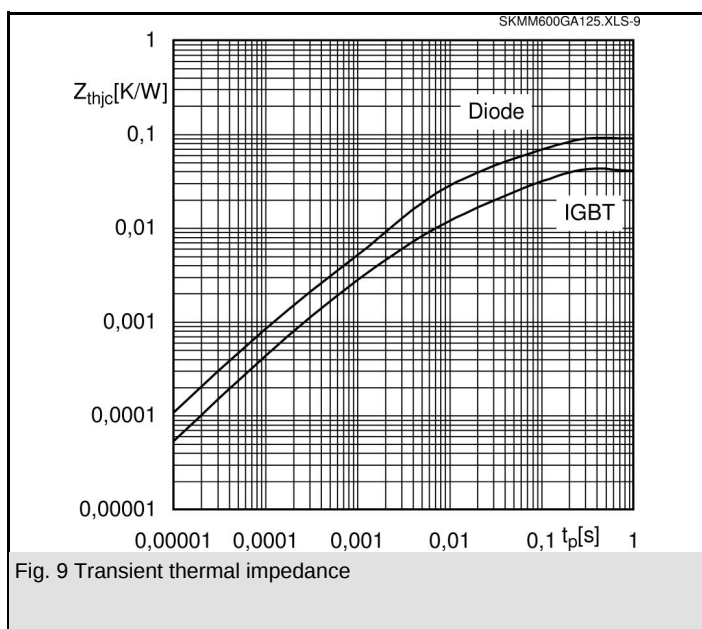
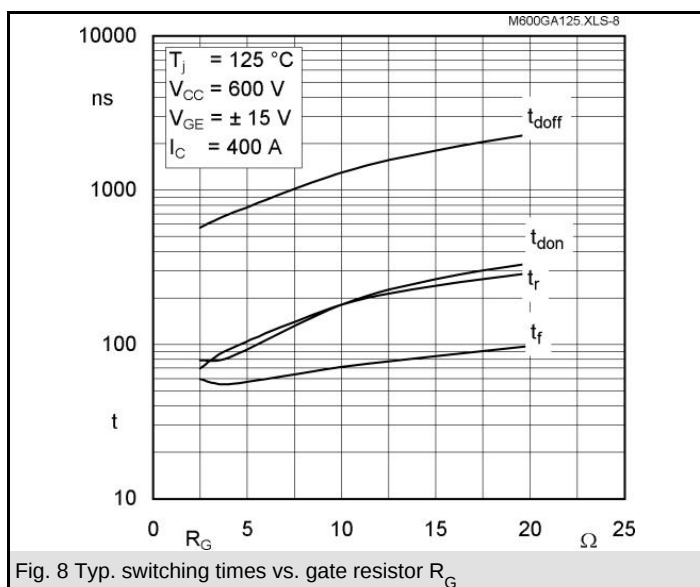
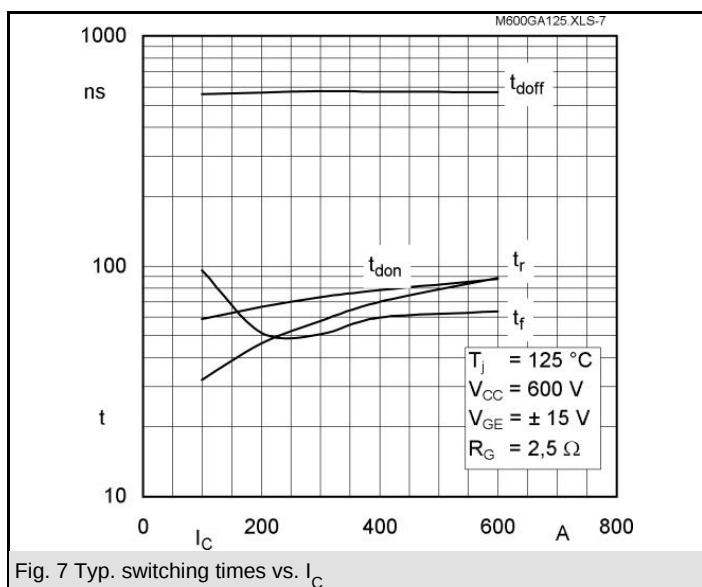
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Z_{th}			
Symbol	Conditions	Values	Units
$Z_{th(j-c)I}$			
R_i	$i = 1$	29	mk/W
R_i	$i = 2$	9	mk/W
R_i	$i = 3$	2,6	mk/W
R_i	$i = 4$	0,4	mk/W
τ_{ui}	$i = 1$	0,1043	s
τ_{ui}	$i = 2$	0,009	s
τ_{ui}	$i = 3$	0,001	s
τ_{ui}	$i = 4$	0,0002	s
$Z_{th(j-c)D}$			
R_i	$i = 1$	62	mk/W
R_i	$i = 2$	23	mk/W
R_i	$i = 3$	4,2	mk/W
R_i	$i = 4$	0,8	mk/W
τ_{ui}	$i = 1$	0,0566	s
τ_{ui}	$i = 2$	0,0166	s
τ_{ui}	$i = 3$	0,0015	s
τ_{ui}	$i = 4$	0,0002	s



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