



SEMITRANS® 4

Trench IGBT Modules

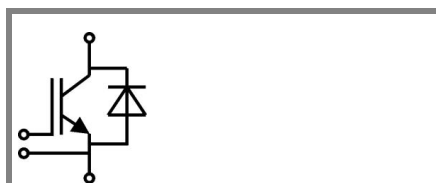
SKM 600GA126D

Features

- Trench = Trenchgate technology
- $V_{CE(sat)}$ with positive temperature coefficient
- High short circuit capability, self limiting to $6 \times I_C$

Typical Applications*

- AC inverter drives
- UPS
- Electronic welders



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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 _c = 25 °C	660	A
		T _c = 80 °C	460	A
I _{CRM}	I _{CRM} =2xI _{Cnom}		800	A
V _{GES}			± 20	V
t _{psc}	V _{CC} = 600 V; V _{GE} ≤ 20 V; T _j = 125 °C V _{CES} < 1200 V		10	µs
Inverse Diode				
I _F	T _j = 150 °C	T _c = 25 °C	490	A
		T _c = 80 °C	340	A
I _{FRM}	I _{FRM} =2xI _{Fnom}		800	A
I _{FSM}	t _p = 10 ms; sin. T _j = 150 °C		2900	A
Module				
I _{t(RMS)}			500	A
T _{vj}			-40 ... + 150	°C
T _{stg}			-40 ... + 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 = 16 mA	5	5,8	6,5	V
I _{CES}	V _{GE} = 0 V, V _{CE} = V _{CES} T _j = 25 °C T _j = 125 °C		0,2	0,6	mA mA
V _{CE0}	T _j = 25 °C T _j = 125 °C		1 0,9	1,2 1,1	V V
r _{CE}	V _{GE} = 15 V T _j = 25°C T _j = 125°C		1,8 2,8	2,4 3,4	mΩ mΩ
V _{CE(sat)}	I _{Cnom} = 400 A, V _{GE} = 15 V T _j = 25°C _{chiplev.} T _j = 125°C _{chiplev.}		1,7 2	2,15 2,45	V V
C _{ies} C _{oes} C _{res}	V _{CE} = 25, V _{GE} = 0 V f = 1 MHz		29 1,5 1,3		nF nF nF
Q _G	V _{GE} = -8V - +20V		3600		nC
R _{Gint}	T _j = °C		1,88		Ω
t _{d(on)} t _r E _{on}	R _{Gon} = 2 Ω	V _{CC} = 600V I _C = 400A	330 65 39		ns ns mJ
t _{d(off)} t _f E _{off}	R _{Goff} = 2 Ω	T _j = 125 °C V _{GE} = ± 15V	630 130 64		ns ns mJ
R _{th(j-c)}	per IGBT			0,055	K/W

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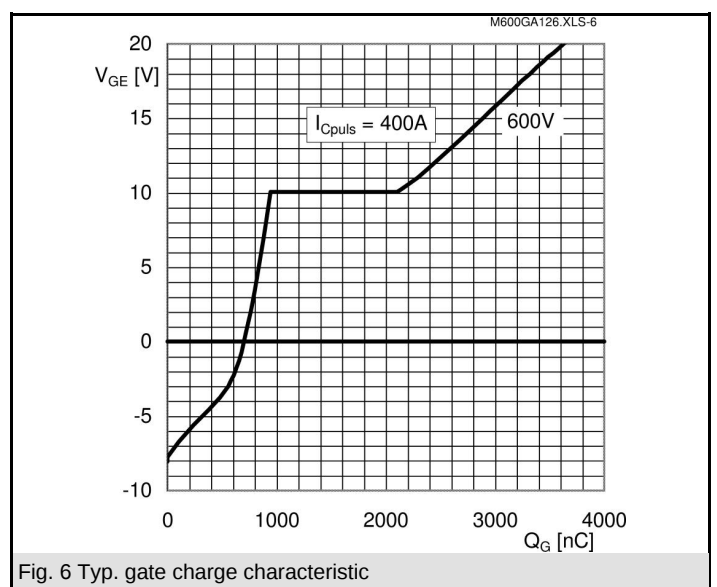
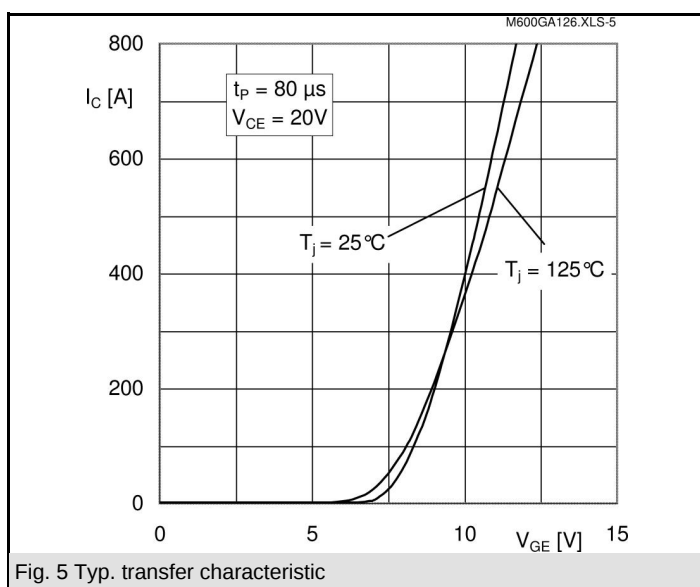
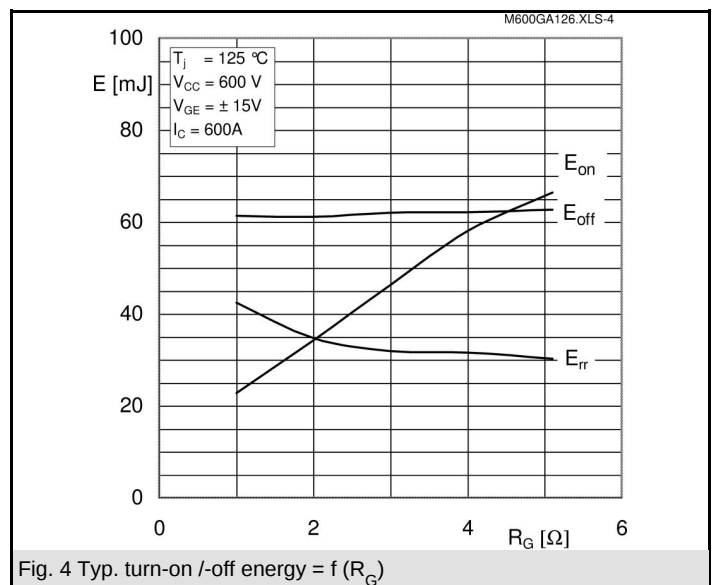
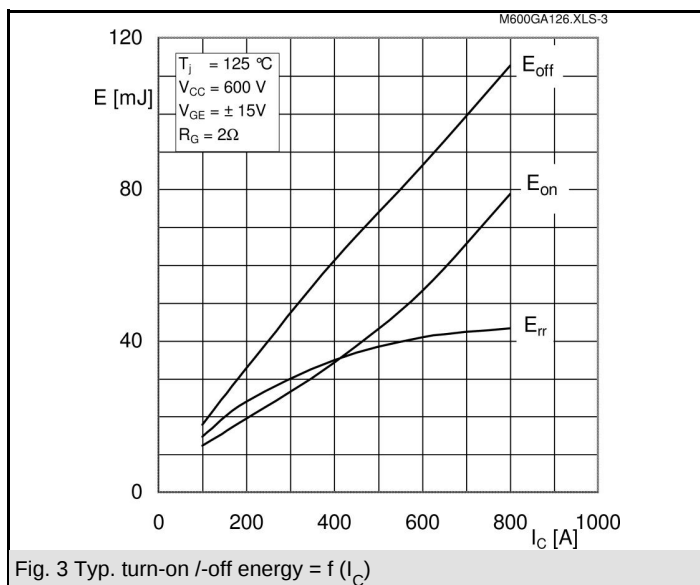
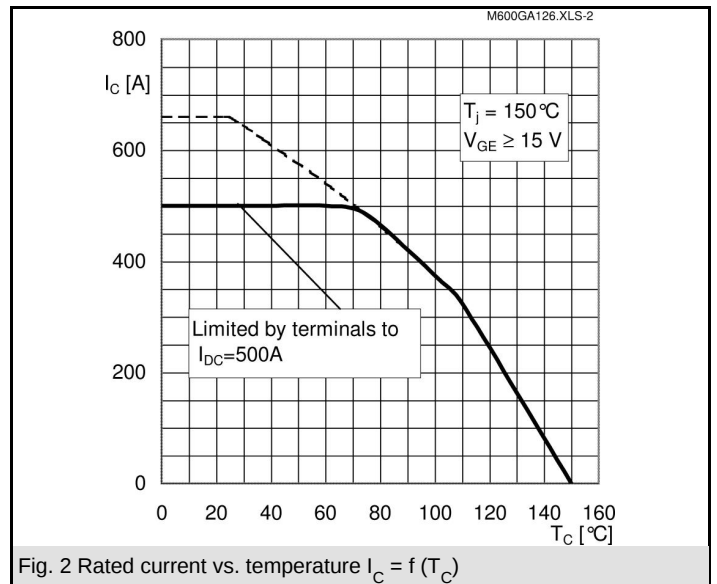
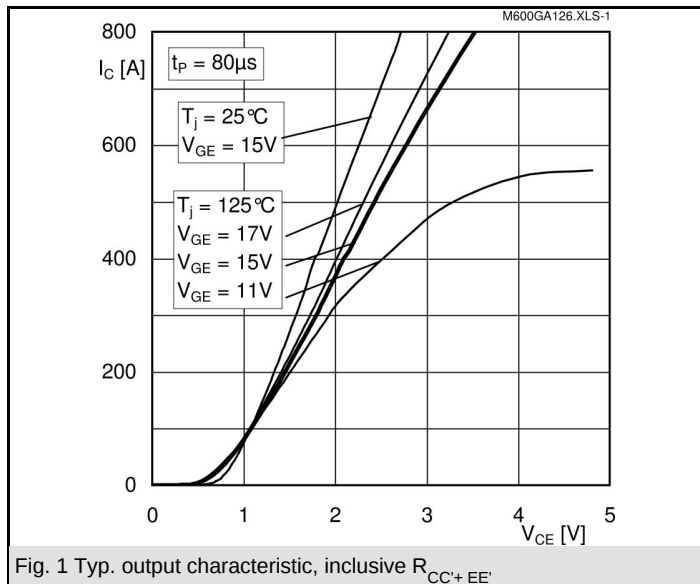
Characteristics					
Symbol	Conditions	min.	typ.	max.	Units
Inverse diode					
$V_F = V_{EC}$	$I_{Fnom} = 400\text{ A}; V_{GE} = 0\text{ V}$				
	$T_j = 25\text{ }^{\circ}\text{C}_{chiplev.}$		1,6	1,8	V
	$T_j = 125\text{ }^{\circ}\text{C}_{chiplev.}$		1,6	1,8	V
V_{F0}					
	$T_j = 25\text{ }^{\circ}\text{C}$		1	1,1	V
	$T_j = 125\text{ }^{\circ}\text{C}$		0,8	0,9	V
r_F					
	$T_j = 25\text{ }^{\circ}\text{C}$		1,5	1,8	mΩ
	$T_j = 125\text{ }^{\circ}\text{C}$		2	2,3	mΩ
I_{RRM}	$I_F = 400\text{ A}$		350		A
Q_{rr}	$di/dt = 5800\text{ A}/\mu\text{s}$		87		μC
E_{rr}	$V_{GE} = -15\text{ V}; V_{CC} = 600\text{ V}$				mJ
$R_{th(j-c)D}$	per diode			0,125	K/W
Module					
L_{CE}			15	20	nH
$R_{CC'+EE'}$	res., terminal-chip				
	$T_{case} = 25\text{ }^{\circ}\text{C}$		0,18		mΩ
	$T_{case} = 125\text{ }^{\circ}\text{C}$		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

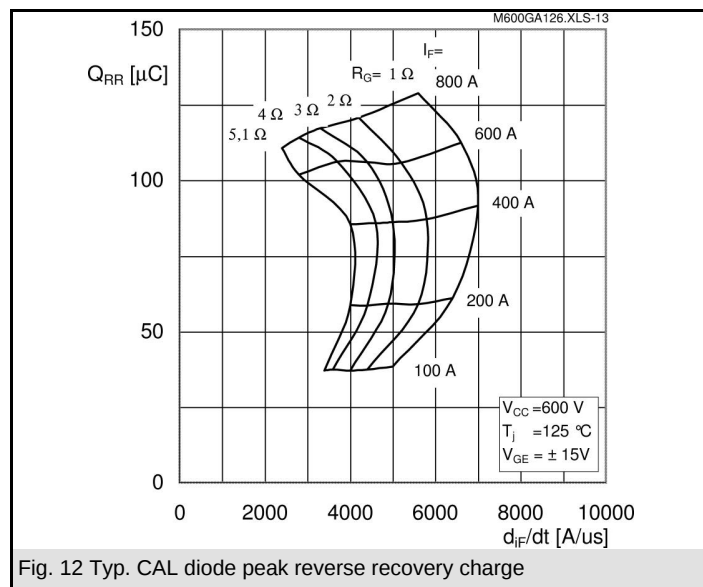
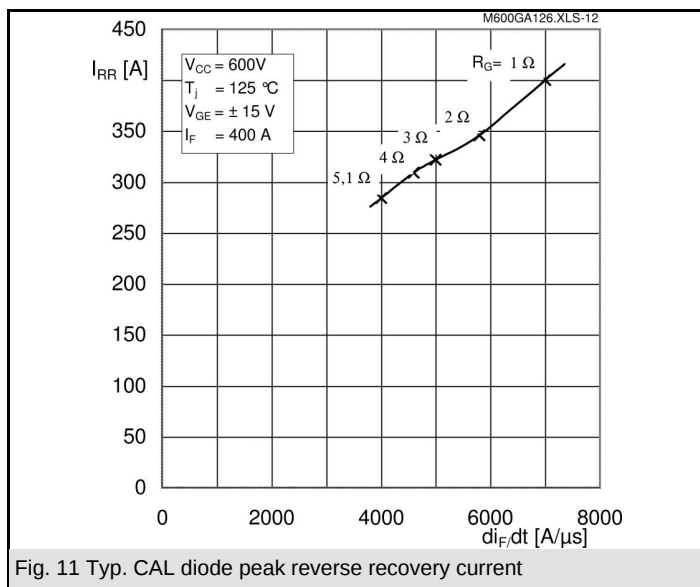
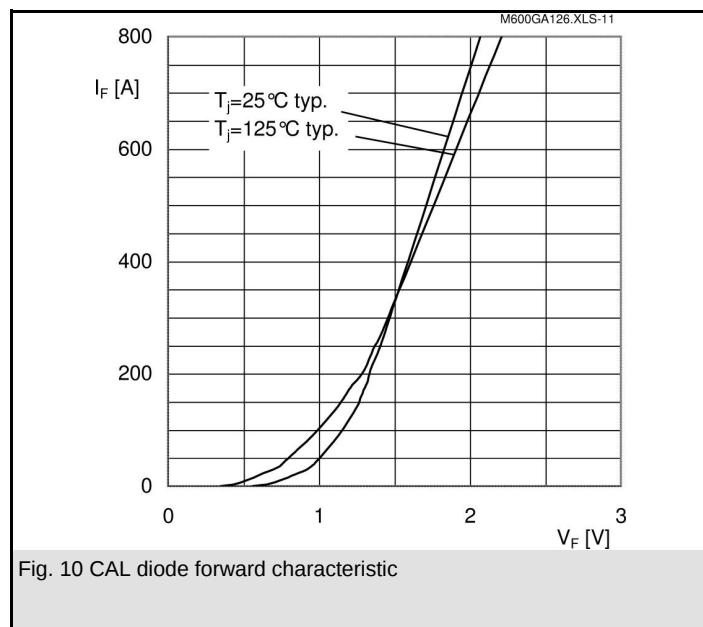
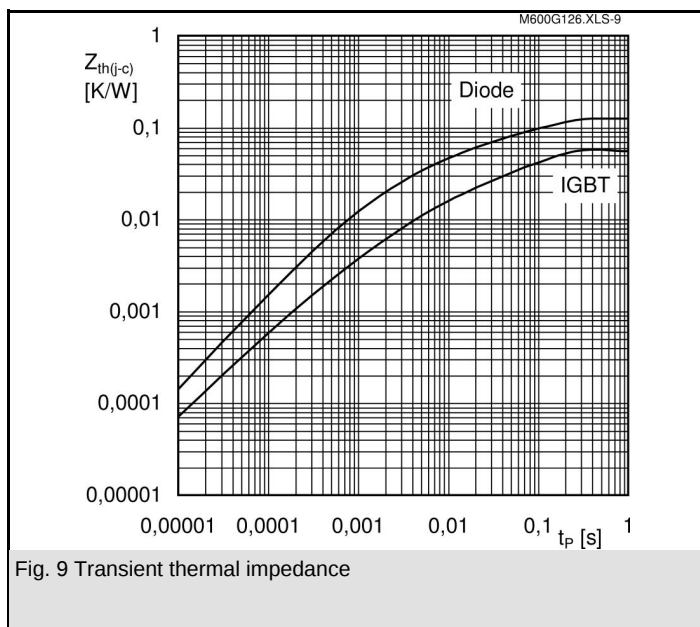
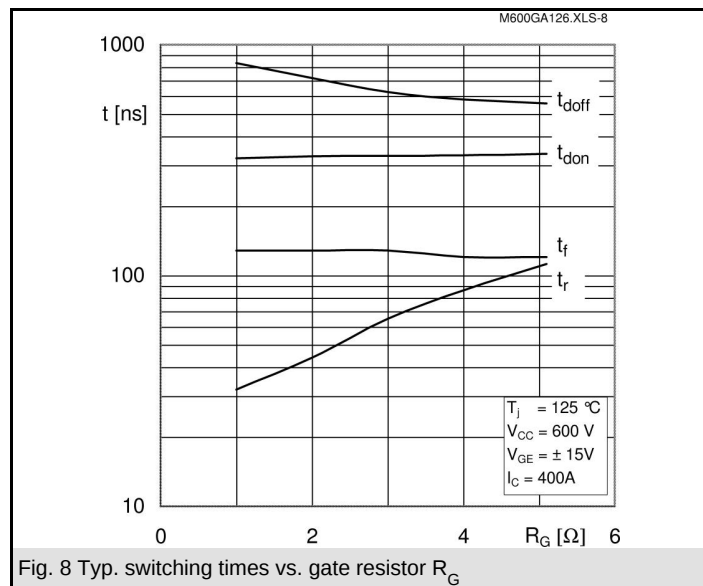
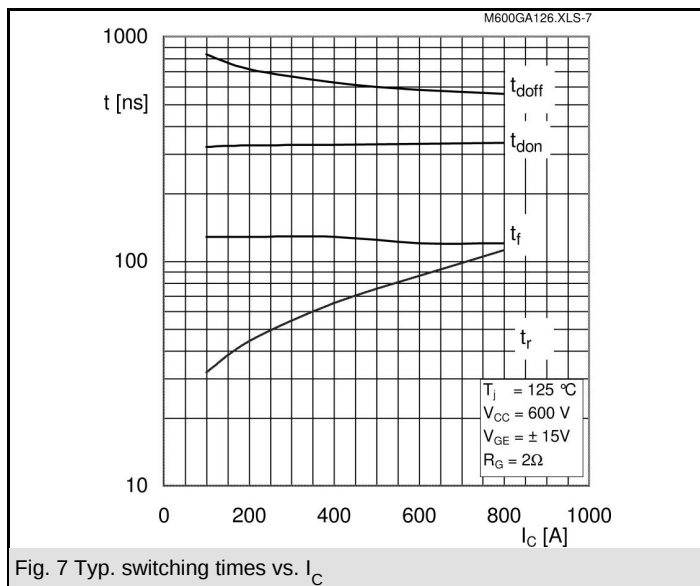
This is an electrostatic discharge sensitive device (ESDS), international standard IEC 60747-1, Chapter IX.

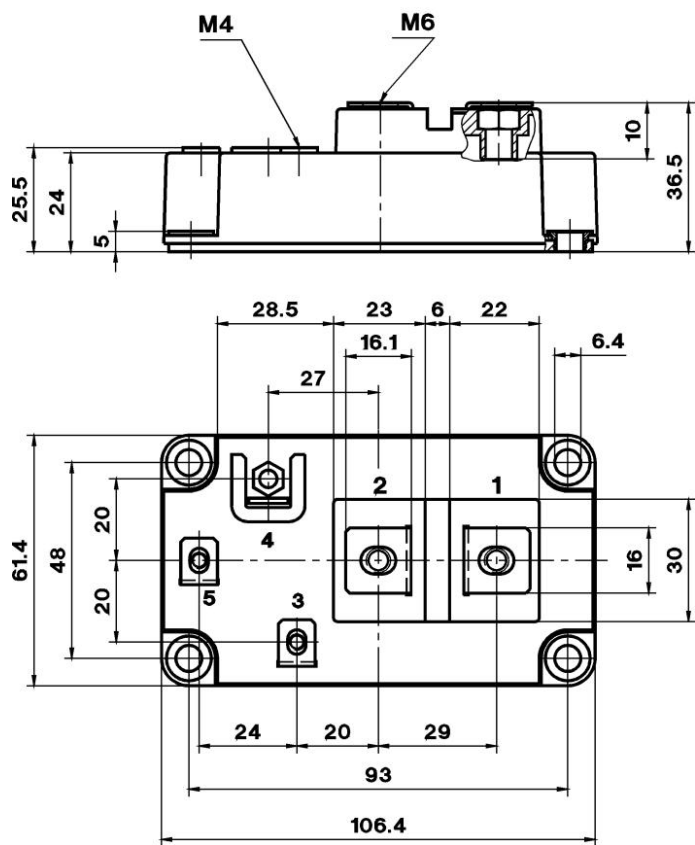
* The specifications of our components may not be considered as an assurance of component characteristics. Components have to be tested for the respective application. Adjustments may be necessary. The use of SEMIKRON products in life support appliances and systems is subject to prior specification and written approval by SEMIKRON. We therefore strongly recommend prior consultation of our personal.



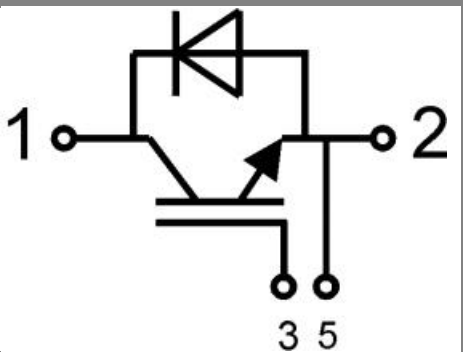
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Case D 59



GA Case D59