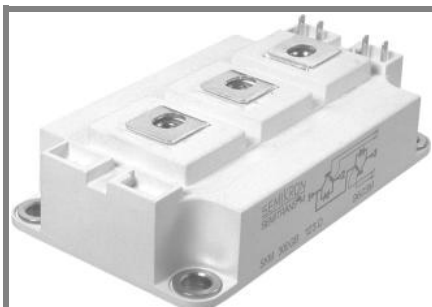


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SEMITRANS® 3

SPT IGBT Module

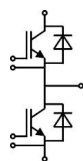
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Features

- Homogeneous Si
- SPT = Soft-Punch-Through technology
- V_{CEsat} with positive temperature coefficient
- High short circuit capability, self limiting to $6 \times I_C$

Typical Applications

- AC inverter drives
- UPS
- Electronic welders f_{sw} up to 20kHz

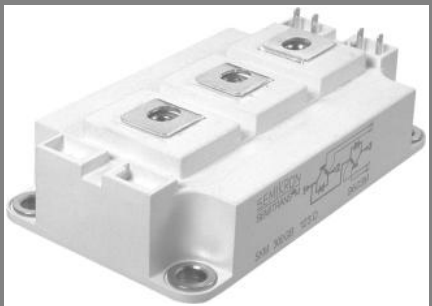


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Absolute Maximum Ratings			$T_c = 25\text{ }^{\circ}\text{C}$, unless otherwise specified	
Symbol	Conditions		Values	Units
IGBT				
V_{CES}	$T_j = 150\text{ }^{\circ}\text{C}$		1200	V
I_C	$T_j = 150\text{ }^{\circ}\text{C}$	$T_c = 25\text{ }^{\circ}\text{C}$	300	A
		$T_c = 80\text{ }^{\circ}\text{C}$	220	A
I_{CRM}	$I_{CRM} = 2 \times I_{Cnom}$		300	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	$T_j = 150\text{ }^{\circ}\text{C}$	$T_{case} = 25\text{ }^{\circ}\text{C}$	190	A
		$T_{case} = 80\text{ }^{\circ}\text{C}$	130	A
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$		300	A
I_{FSM}	$t_p = 10\text{ ms}; \sin.$	$T_j = 150\text{ }^{\circ}\text{C}$	1440	A
Module				
$I_{t(RMS)}$			500	A
T_{vj}			- 40... + 150	$^{\circ}\text{C}$
T_{stg}			- 40... + 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 = 6 mA		4,5	5,5	6,45	V
I _{CES}	V _{GE} = 0 V, V _{CE} = V _{CES} T _j = 25 °C			0,2	0,6	mA
V _{CE0}			T _j = 25 °C	1	1,15	V
			T _j = 125 °C	0,9	1,05	V
r _{CE}	V _{GE} = 15 V		T _j = 25°C	6	8	mΩ
			T _j = 125°C	8	10	mΩ
V _{CE(sat)}	I _{Cnom} = 150 A, V _{GE} = 15 V		T _j = 25°C _{chiplev.}	1,9	2,35	V
			T _j = 125°C _{chiplev.}	2,1	2,55	V
C _{ies}	V _{CE} = 25, V _{GE} = 0 V f = 1 MHz			13		nF
C _{oes}				2		nF
C _{res}				2		nF
Q _G	V _{GE} = -8V- +20V			1700		nC
R _{Gint}	T _j = 25 °C			2,5		Ω
t _{d(on)}	R _{Gon} = 7 Ω di/dt = 4800 A/μs		V _{CC} = 600V I _C = 150A T _j = 125 °C V _{GE} = ±15V L _s = 20 nH	125		ns
t _r				50		ns
E _{on}				18		mJ
t _{d(off)}	R _{Goff} = 7 Ω			620		ns
t _f				55		ns
E _{off}				15		mJ
R _{th(j-c)}	per IGBT				0,095	K/W

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SPT IGBT Module

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Characteristics					
Symbol	Conditions	min.	typ.	max.	Units
Inverse Diode					
$V_F = V_{EC}$	$I_{Fnom} = 150\text{ A}; V_{GE} = 0\text{ V}$		$T_j = 25\text{ }^{\circ}\text{C}_{chiplev.}$	2	V
			$T_j = 125\text{ }^{\circ}\text{C}_{chiplev.}$	1,8	V
V_{F0}	$T_j = 25\text{ }^{\circ}\text{C}$		1,1	1,2	V
r_F	$T_j = 25\text{ }^{\circ}\text{C}$		6	7,8	mΩ
I_{RRM}	$I_F = 150\text{ A}$ $di/dt = 4800\text{ A}/\mu\text{s}$ $V_{GE} = -15\text{ V}; V_{CC} = 600\text{ V}$		$T_j = 125\text{ }^{\circ}\text{C}$	190	A
Q_{rr}				24	μC
E_{rr}				8	mJ
$R_{th(j-c)D}$	per diode			0,25	K/W
Module					
L_{CE}			15	20	nH
$R_{CC'+EE'}$	res., terminal-chip		$T_{case} = 25\text{ }^{\circ}\text{C}$	0,35	mΩ
			$T_{case} = 125\text{ }^{\circ}\text{C}$	0,5	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	2,5		5	Nm
w				325	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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SPT IGBT Module

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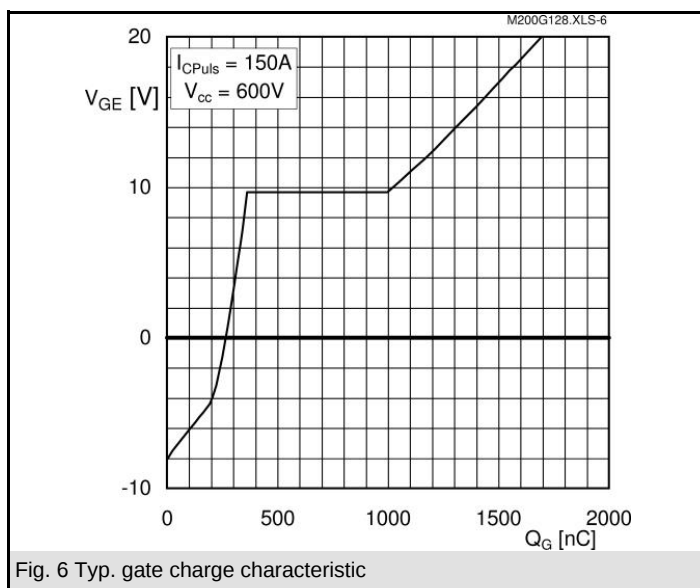
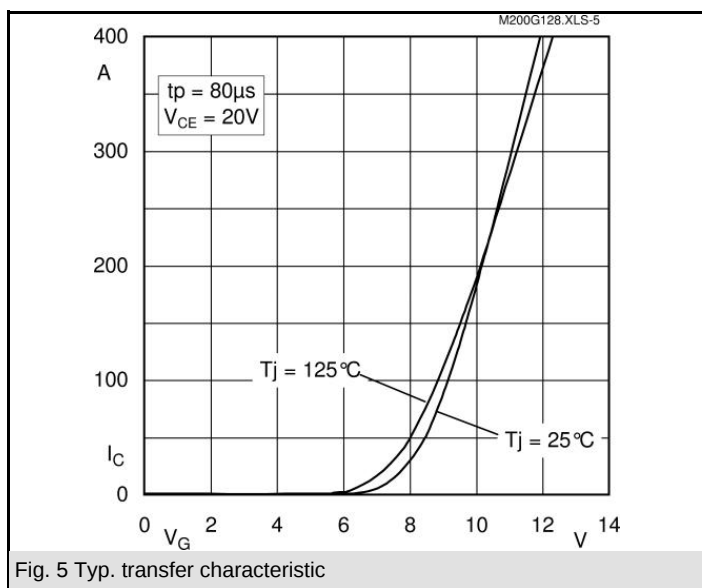
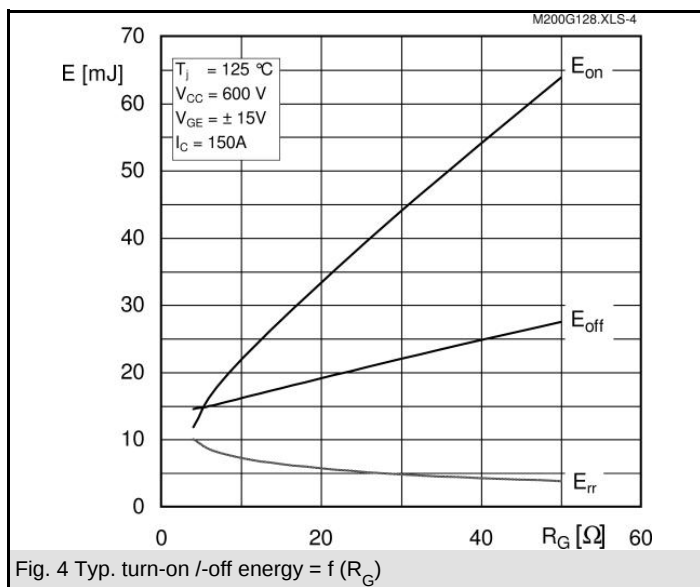
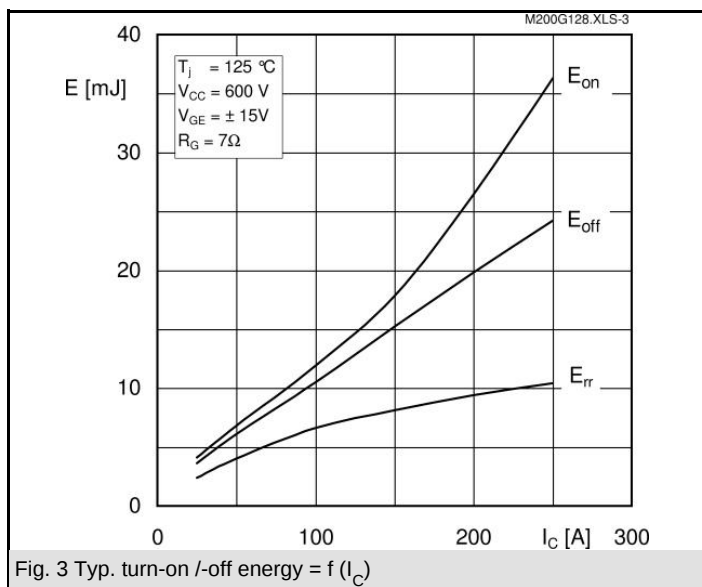
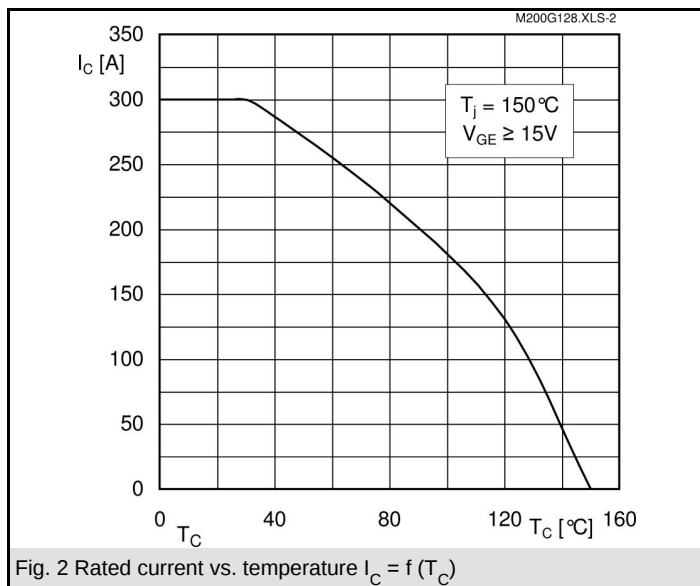
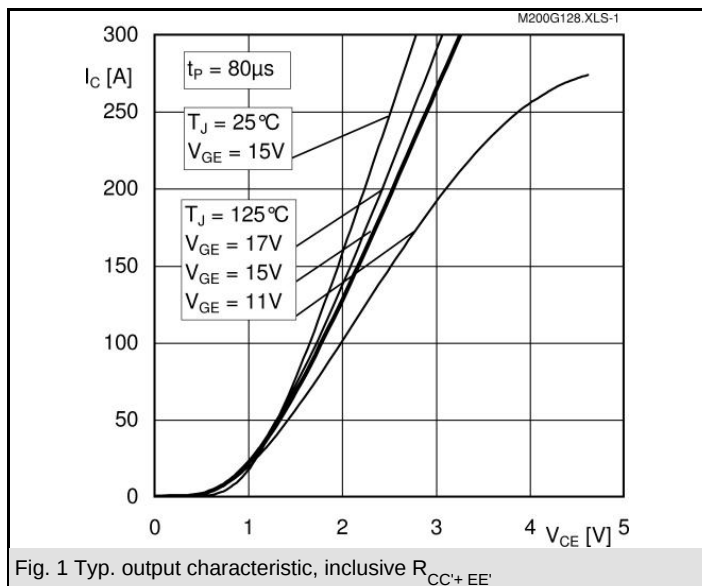
Typical Applications

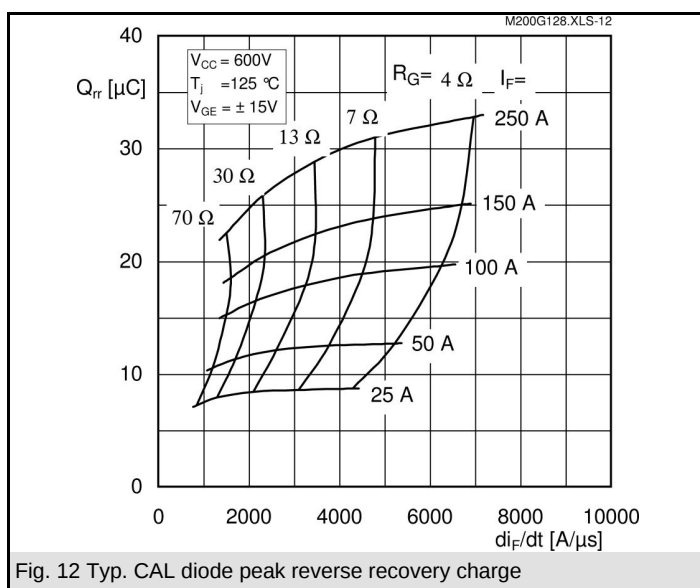
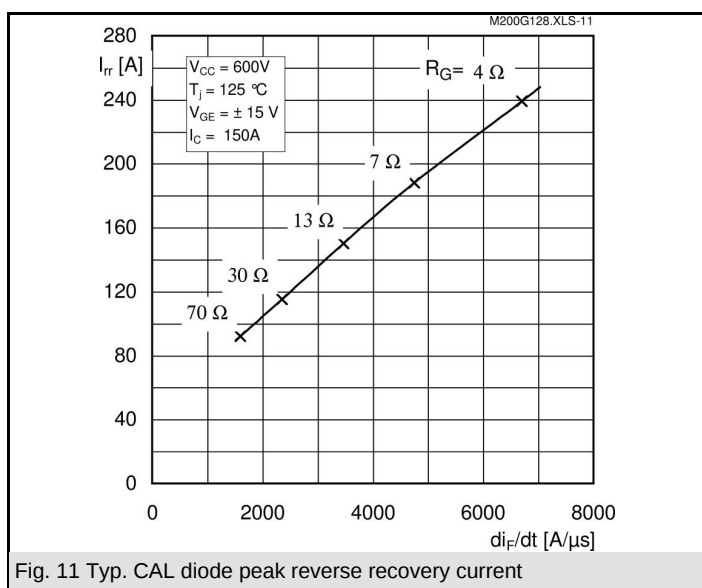
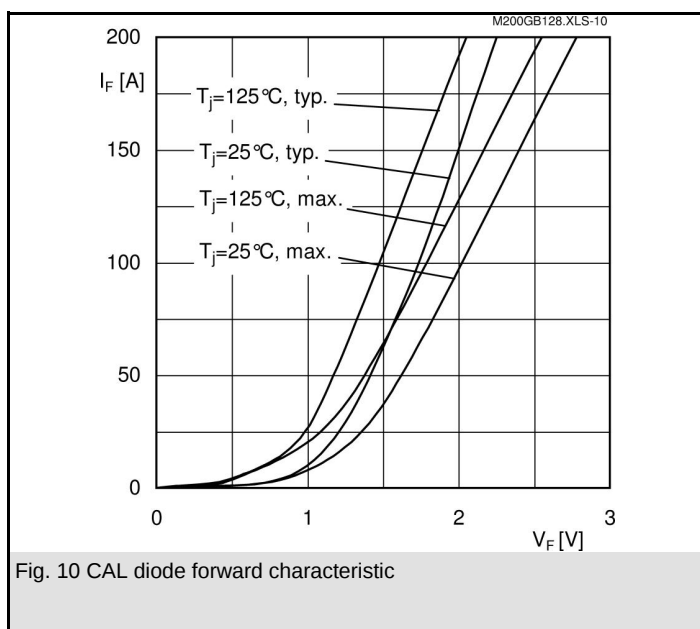
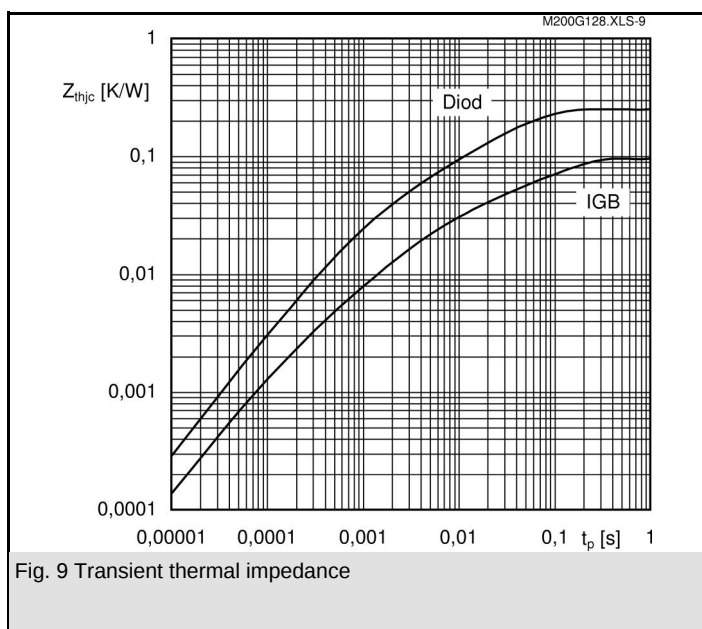
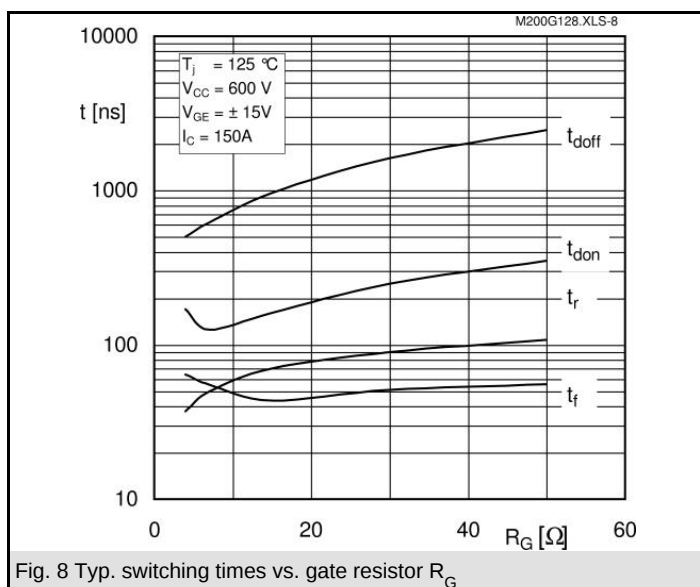
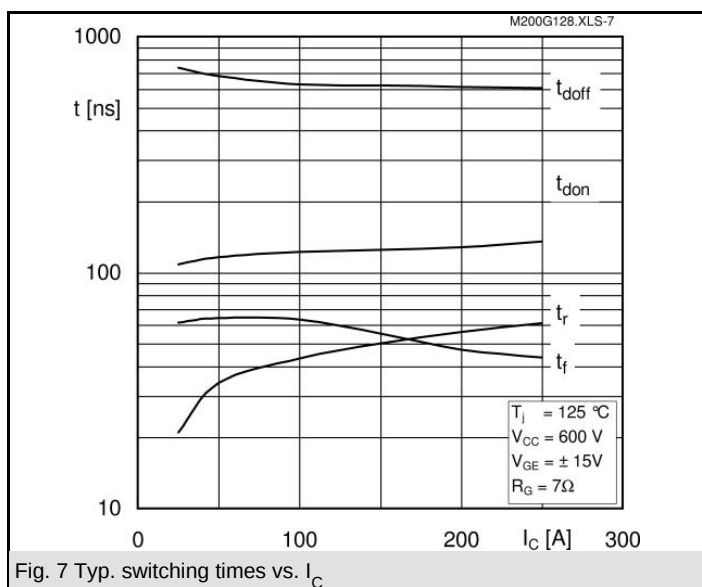
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Z_{th}			
Symbol	Conditions	Values	Units
$Z_{th(j-c)I}$			
R_i	$i = 1$	65	mk/W
R_i	$i = 2$	22	mk/W
R_i	$i = 3$	6,8	mk/W
R_i	$i = 4$	1,2	mk/W
τ_{ui}	$i = 1$	0,0744	s
τ_{ui}	$i = 2$	0,0078	s
τ_{ui}	$i = 3$	0,0016	s
τ_{ui}	$i = 4$	0,0002	s
$Z_{th(j-c)D}$			
R_i	$i = 1$	155	mk/W
R_i	$i = 2$	71	mk/W
R_i	$i = 3$	21	mk/W
R_i	$i = 4$	3	mk/W
τ_{ui}	$i = 1$	0,0716	s
τ_{ui}	$i = 2$	0,0056	s
τ_{ui}	$i = 3$	0,0042	s
τ_{ui}	$i = 4$	0,0002	s





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