

SKM 75GB176D



SEMITRANS® 2

Trench IGBT Modules

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Features

- Homogeneous Si
- 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 mains 575 - 750 V AC
- Public transport (auxiliary syst.)



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Absolute Maximum Ratings		$T_{case} = 25^\circ\text{C}$, unless otherwise specified			
Symbol	Conditions	Values			Units
IGBT					
V_{CES}	$T_j = 25^\circ\text{C}$	1700			V
I_C	$T_j = 150^\circ\text{C}$	$T_c = 25^\circ\text{C}$	80		A
		$T_c = 80^\circ\text{C}$	55		A
I_{CRM}	$I_{CRM} = 2 \times I_{Cnom}$	100			A
V_{GES}		± 20			V
t_{psc}	$V_{CC} = 1200\text{ V}; V_{GE} \leq 20\text{ V}; T_j = 125^\circ\text{C}$ $V_{CES} < 1700\text{ V}$	10			μs
Inverse Diode					
I_F	$T_j = 150^\circ\text{C}$	$T_c = 25^\circ\text{C}$	80		A
		$T_c = 80^\circ\text{C}$	55		A
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$	100			A
I_{FSM}	$t_p = 10\text{ ms; sin.}$	$T_j = 150^\circ\text{C}$	550		A
Module					
$I_{t(RMS)}$		200			A
T_{vj}		-40 ... +150			$^\circ\text{C}$
T_{stg}		-40 ... +125			$^\circ\text{C}$
V_{isol}	AC, 1 min.	4000			V

Characteristics		$T_{case} = 25^\circ\text{C}$, unless otherwise specified				
Symbol	Conditions	min.	typ.	max.	Units	
IGBT						
$V_{GE(th)}$	$V_{GE} = V_{CE}, I_C = 2\text{ mA}$	5,2	5,8	6,4	V	
I_{CES}	$V_{GE} = 0\text{ V}, V_{CE} = V_{CES}$			3	mA	
V_{CE0}		$T_j = 25^\circ\text{C}$	1		1,2	V
		$T_j = 125^\circ\text{C}$	0,9		1,1	V
r_{CE}	$V_{GE} = 15\text{ V}$	$T_j = 25^\circ\text{C}$	20		25	m Ω
		$T_j = 125^\circ\text{C}$	31		36	m Ω
$V_{CE(sat)}$	$I_{Cnom} = 50\text{ A}, V_{GE} = 15\text{ V}$	$T_j = 25^\circ\text{C}_{chiplev.}$	2		2,45	V
		$T_j = 125^\circ\text{C}_{chiplev.}$	2,45		2,9	V
C_{res}	$V_{CE} = 25, V_{GE} = 0\text{ V}$	$f = 1\text{ MHz}$	4,3		nF	
C_{oes}			0,18		nF	
C_{res}			0,15		nF	
Q_G	$V_{GE} = -8\text{V}...+15\text{V}$		410		nC	
R_{Gint}	$T_j = 25^\circ\text{C}$		9,5		Ω	
$t_{d(on)}$	$R_{Gon} = 6,2\ \Omega$ $di/dt = 1680\text{ A}/\mu\text{s}$	$V_{CC} = 1200\text{V}$ $I_C = 50\text{A}$	210		ns	
t_r			30		ns	
E_{on}			25		mJ	
$t_{d(off)}$	$R_{Goff} = 6,2\ \Omega$ $di/dt = 320\text{ A}/\mu\text{s}$	$T_j = 125^\circ\text{C}$ $V_{GE} = \pm 15\text{V}$	590		ns	
t_f			135		ns	
E_{off}			18		mJ	
$R_{th(j-c)}$	per IGBT		0,38		K/W	

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Characteristics			min.	typ.	max.	Units
Inverse Diode						
$V_F = V_{EC}$	$I_{Fnom} = 50 \text{ A}; V_{GE} = 0 \text{ V}$	$T_j = 25 \text{ }^\circ\text{C}_{chiplev.}$		1,7	1,9	V
		$T_j = 125 \text{ }^\circ\text{C}_{chiplev.}$		1,8	2	V
V_{F0}		$T_j = 25 \text{ }^\circ\text{C}$		1,1	1,3	V
		$T_j = 125 \text{ }^\circ\text{C}$		0,9	1,1	V
r_F		$T_j = 25 \text{ }^\circ\text{C}$		12	12	m Ω
		$T_j = 125 \text{ }^\circ\text{C}$		18	18	m Ω
I_{RRM}	$I_F = 50 \text{ A}$	$T_j = 125 \text{ }^\circ\text{C}$		52		A
Q_{rr}	$di/dt = 1320 \text{ A}/\mu\text{s}$			20		μC
E_{rr}	$V_{GE} = -15 \text{ V}; V_{CC} = 1200 \text{ V}$			14,5		mJ
$R_{th(j-c)D}$	per diode				0,55	K/W
Module						
L_{CE}					30	nH
$R_{CC'+EE'}$	res., terminal-chip	$T_{case} = 25 \text{ }^\circ\text{C}$		0,75		m Ω
		$T_{case} = 125 \text{ }^\circ\text{C}$		1		m Ω
$R_{th(c-s)}$	per module				0,05	K/W
M_s	to heat sink M6			3	5	Nm
M_t	to terminals M5			2,5	5	Nm
w					160	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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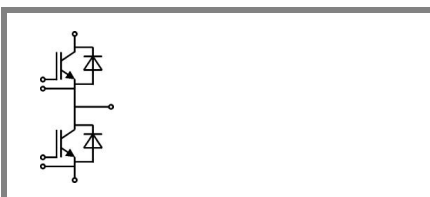
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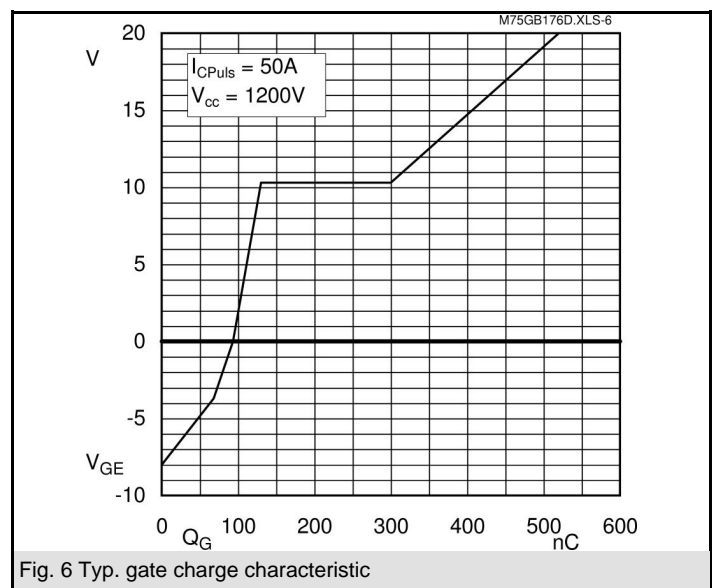
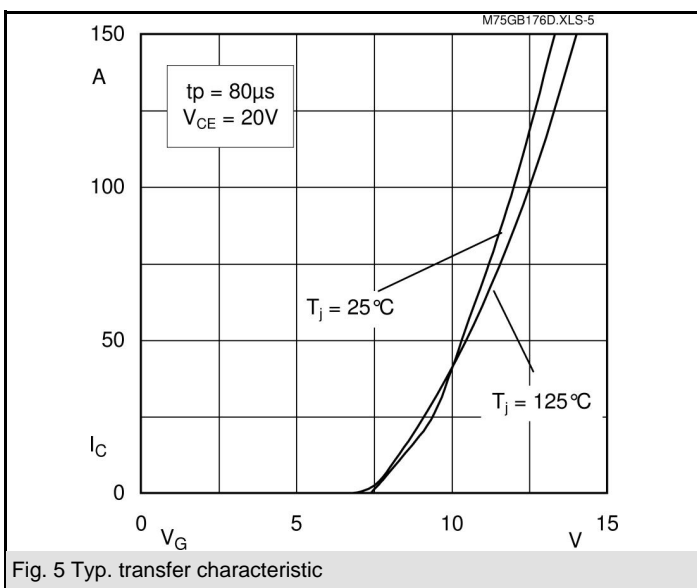
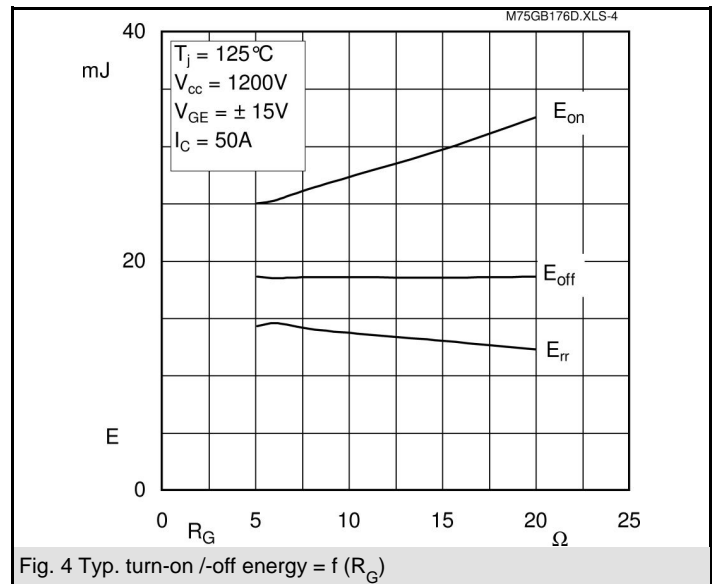
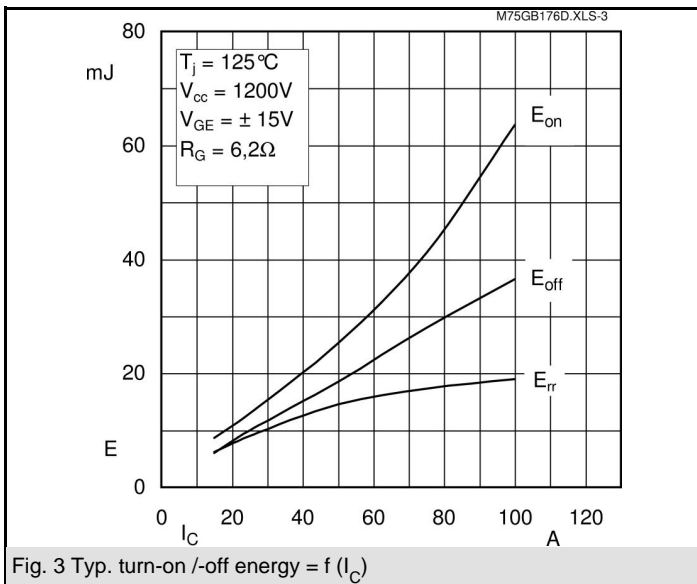
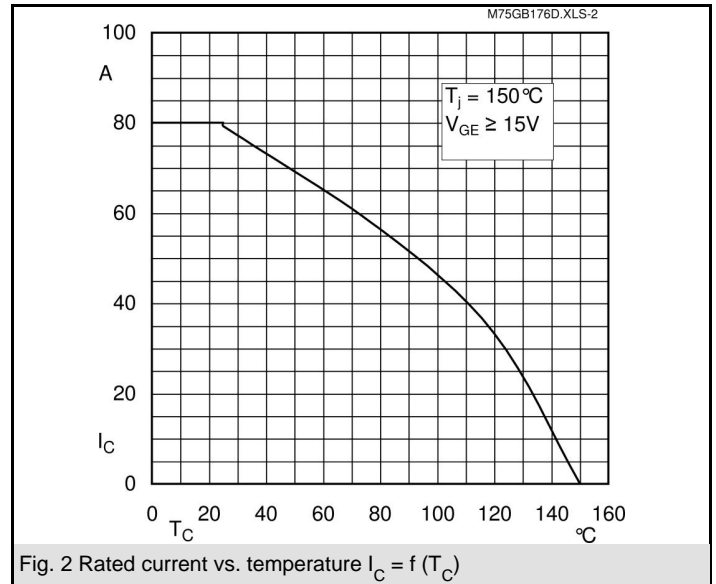
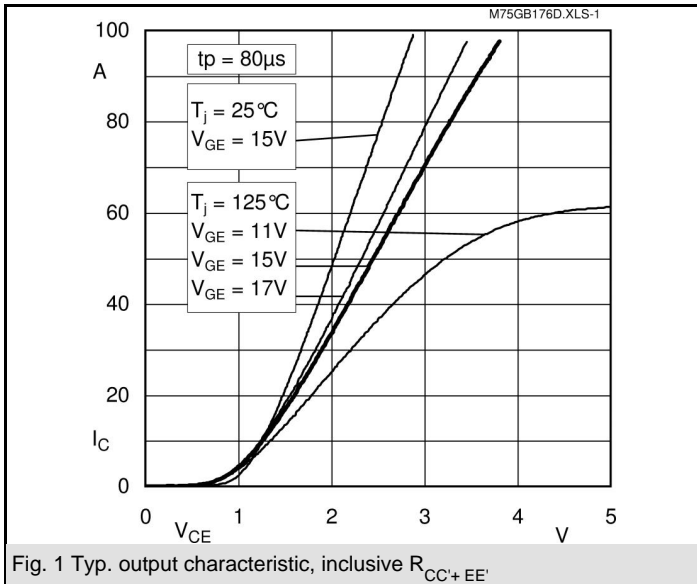
Typical Applications*

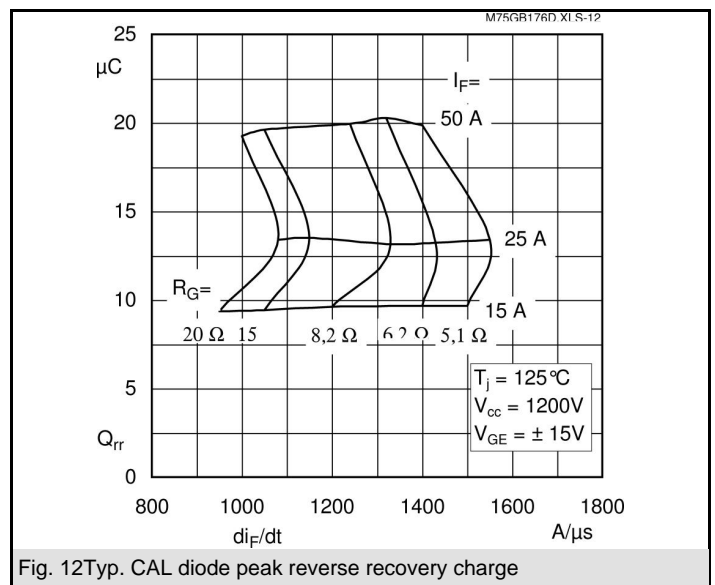
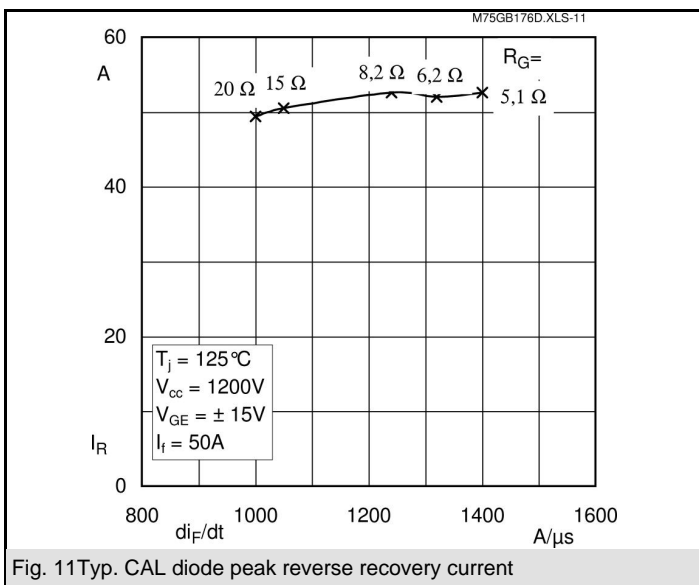
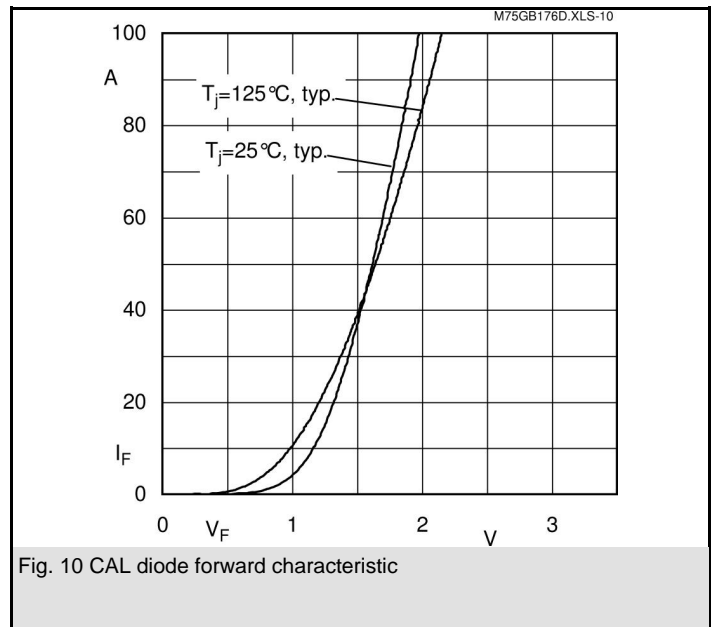
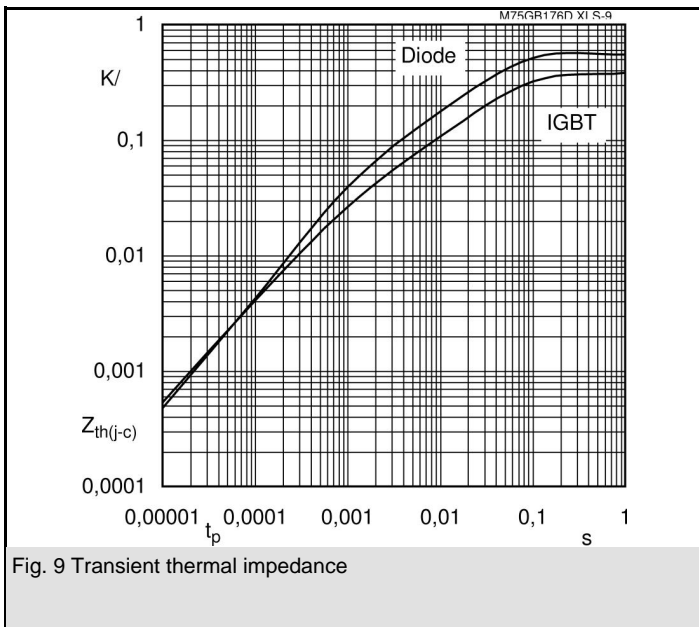
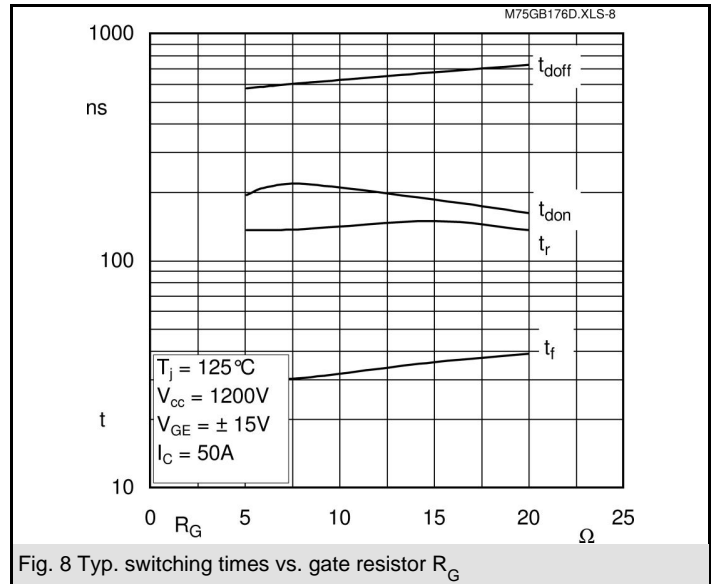
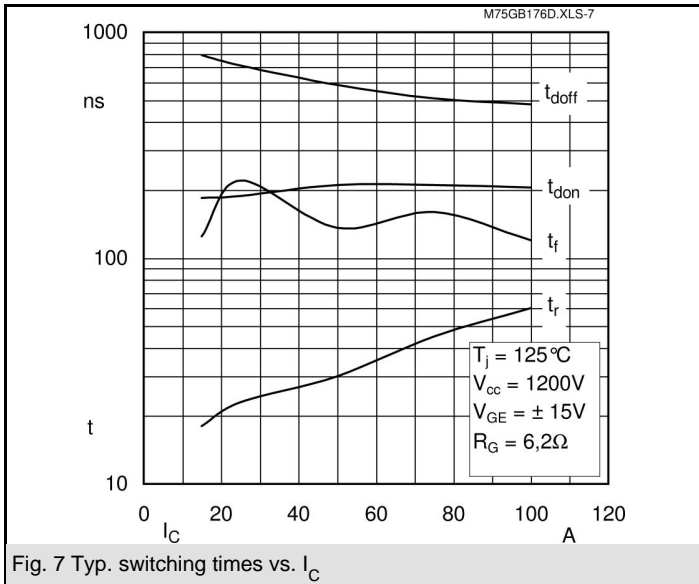
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Z_{th}		Conditions	Values	Units
Symbol				
$Z_{th(j-c)I}$				
$R_{\theta j-c}$	$i = 1$		270	mk/W
$R_{\theta j-c}$	$i = 2$		85	mk/W
$R_{\theta j-c}$	$i = 3$		21	mk/W
$R_{\theta j-c}$	$i = 4$		4	mk/W
$\tau_{th j-c}$	$i = 1$		0,0393	s
$\tau_{th j-c}$	$i = 2$		0,0786	s
$\tau_{th j-c}$	$i = 3$		0,0014	s
$\tau_{th j-c}$	$i = 4$		0,0002	s
Symbol				
$Z_{th(j-c)D}$				
$R_{\theta j-c}$	$i = 1$		360	mk/W
$R_{\theta j-c}$	$i = 2$		150	mk/W
$R_{\theta j-c}$	$i = 3$		36	mk/W
$R_{\theta j-c}$	$i = 4$		4	mk/W
$\tau_{th j-c}$	$i = 1$		0,0262	s
$\tau_{th j-c}$	$i = 2$		0,0417	s
$\tau_{th j-c}$	$i = 3$		0,0012	s
$\tau_{th j-c}$	$i = 4$		0,001	s



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