



**SEMITRANS® 3**

## Trench IGBT Modules

**SKM 200GB126D**

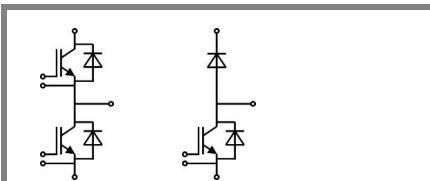
**SKM 200GAL126D**

### Features

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

### Typical Applications\*

- Electronic welders
- AC inverter drives
- UPS

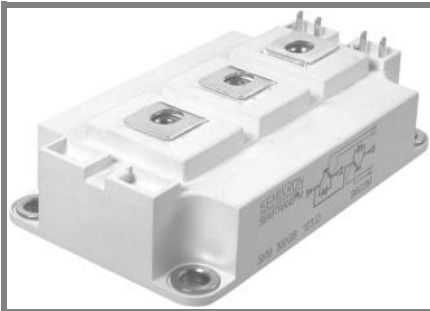


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Absolute Maximum Ratings		$T_{case} = 25^\circ\text{C}$ , unless otherwise specified		
Symbol	Conditions	Values		Units
<b>IGBT</b>				
$V_{CES}$	$T_j = 25^\circ\text{C}$	1200		V
$I_C$	$T_j = 150^\circ\text{C}$	$T_c = 25^\circ\text{C}$	260	A
		$T_c = 80^\circ\text{C}$	190	A
$I_{CRM}$	$I_{CRM} = 2 \times I_{Cnom}$	300		A
$V_{GES}$		$\pm 20$		V
$t_{psc}$	$V_{CC} = 600\text{ V}; V_{GE} \leq 20\text{ V}; T_j = 125^\circ\text{C}$ $V_{CES} < 1200\text{ V}$	10		$\mu\text{s}$
<b>Inverse Diode</b>				
$I_F$	$T_j = 150^\circ\text{C}$	$T_c = 25^\circ\text{C}$	200	A
		$T_c = 80^\circ\text{C}$	140	A
$I_{FRM}$	$I_{FRM} = 2 \times I_{Fnom}$	300		A
$I_{FSM}$	$t_p = 10\text{ ms}; \sin.$	$T_j = 150^\circ\text{C}$	1100	A
<b>Freewheeling Diode</b>				
$I_F$	$T_j = 150^\circ\text{C}$	$T_c = 25^\circ\text{C}$	200	A
		$T_c = 80^\circ\text{C}$	140	A
$I_{FRM}$	$I_{FRM} = 2 \times I_{Fnom}$	300		A
$I_{FSM}$	$t_p = 10\text{ ms}; \sin.$	$T_j = 150^\circ\text{C}$	1100	A
<b>Module</b>				
$I_{t(RMS)}$		500		A
$T_{vj}$		- 40 ... + 150		$^\circ\text{C}$
$T_{stg}$		- 40 ... + 125		$^\circ\text{C}$
$V_{isol}$	AC, 1 min.	4000		V

Characteristics		$T_{case} = 25^\circ\text{C}$ , unless otherwise specified				
Symbol	Conditions	min.	typ.	max.	Units	
<b>IGBT</b>						
$V_{GE(th)}$	$V_{GE} = V_{CE}, I_C = 6\text{ mA}$	5	5,8	6,5	V	
$I_{CES}$	$V_{GE} = 0\text{ V}, V_{CE} = V_{CES}$	$T_j = 25^\circ\text{C}$	0,1		0,3	mA
		$T_j = 125^\circ\text{C}$				mA
$V_{CE0}$		$T_j = 25^\circ\text{C}$	1		1,2	V
		$T_j = 125^\circ\text{C}$	0,9		1,1	V
$r_{CE}$	$V_{GE} = 15\text{ V}$	$T_j = 25^\circ\text{C}$	4,7		6,3	$\text{m}\Omega$
		$T_j = 125^\circ\text{C}$	7,3		9	$\text{m}\Omega$
$V_{CE(sat)}$	$I_{Cnom} = 150\text{ A}, V_{GE} = 15\text{ V}$	$T_j = 25^\circ\text{C}_{chiplev.}$	1,7		2,15	V
		$T_j = 125^\circ\text{C}_{chiplev.}$	2		2,45	V
$C_{ies}$	$V_{CE} = 25, V_{GE} = 0\text{ V}$	$f = 1\text{ MHz}$	10,8		nF	
$C_{oes}$			0,9		nF	
$C_{res}$			0,9		nF	
$Q_G$	$V_{GE} = -8\text{ V} - +20\text{ V}$	1530		nC		
$R_{Gint}$	$T_j = 25^\circ\text{C}$	5		$\Omega$		
$t_{d(on)}$	$R_{Gon} = 1,5\ \Omega$	$V_{CC} = 600\text{ V}$ $I_C = 150\text{ A}$	260		ns	
			$T_j = 125^\circ\text{C}$	40		ns
$t_r$	$R_{Goff} = 1,5\ \Omega$	$V_{GE} = \pm 15\text{ V}$	18		mJ	
$E_{on}$			540		ns	
$t_{d(off)}$			110		ns	
$t_f$					mJ	
$E_{off}$					mJ	
$R_{th(j-c)}$	per IGBT	0,13		K/W		



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**SKM 200GAL126D**

### Features

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

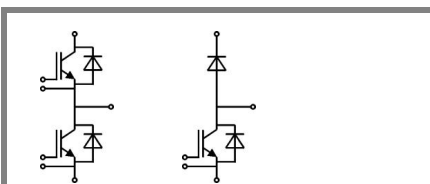
### Typical Applications\*

- Electronic welders
- AC inverter drives
- UPS

Characteristics					
Symbol	Conditions	min.	typ.	max.	Units
<b>Inverse diode</b>					
$V_F = V_{EC}$	$I_{Fnom} = 150 \text{ A}; V_{GE} = 0 \text{ V}$	$T_j = 25 \text{ }^\circ\text{C}_{chiplev.}$	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
$r_F$		$T_j = 25 \text{ }^\circ\text{C}$	4	4,7	mΩ
		$T_j = 125 \text{ }^\circ\text{C}$	5,3	6	mΩ
$I_{RRM}$	$I_F = 150 \text{ A}$	$T_j = 125 \text{ }^\circ\text{C}$	240		A
$Q_{rr}$	$di/dt = 5000 \text{ A}/\mu\text{s}$		42		μC
$E_{rr}$	$V_{GE} = -15 \text{ V}; V_{CC} = 600 \text{ V}$				mJ
$R_{th(j-c)D}$	per diode			0,3	K/W
<b>FWD</b>					
$V_F = V_{EC}$	$I_{Fnom} = 150 \text{ A}; V_{GE} = 0 \text{ V}$	$T_j = 25 \text{ }^\circ\text{C}_{chiplev.}$	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
$r_F$		$T_j = 25 \text{ }^\circ\text{C}$	4	4,7	V
		$T_j = 125 \text{ }^\circ\text{C}$	5,3	6	V
$I_{RRM}$	$I_F = 150 \text{ A}$	$T_j = 125 \text{ }^\circ\text{C}$	240		A
$Q_{rr}$	$di/dt = 5000 \text{ A}/\mu\text{s}$		42		μC
$E_{rr}$	$V_{GE} = -15 \text{ V}; V_{CC} = 600 \text{ V}$				mJ
$R_{th(j-c)FD}$	per diode			0,3	K/W
<b>Module</b>					
$L_{CE}$			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 M5		2,5	5	Nm
w				325	g

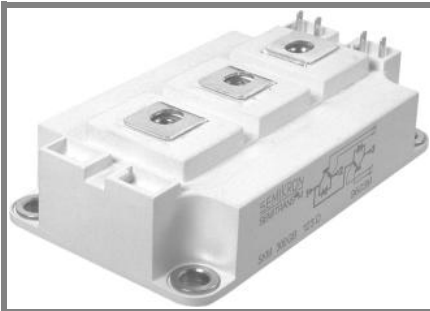
This is an electrostatic discharge sensitive device (ESDS), international standard IEC 60747-1, Chapter IX.

\* 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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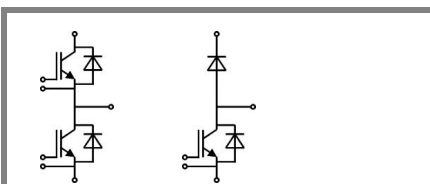
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### Typical Applications\*

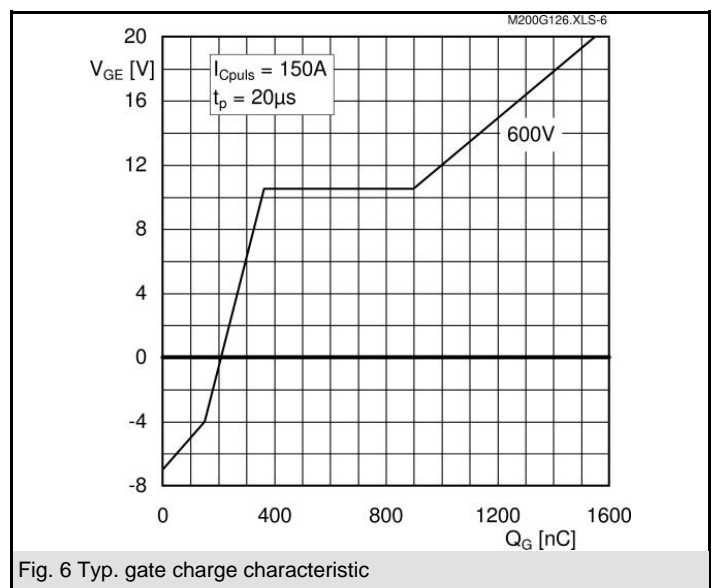
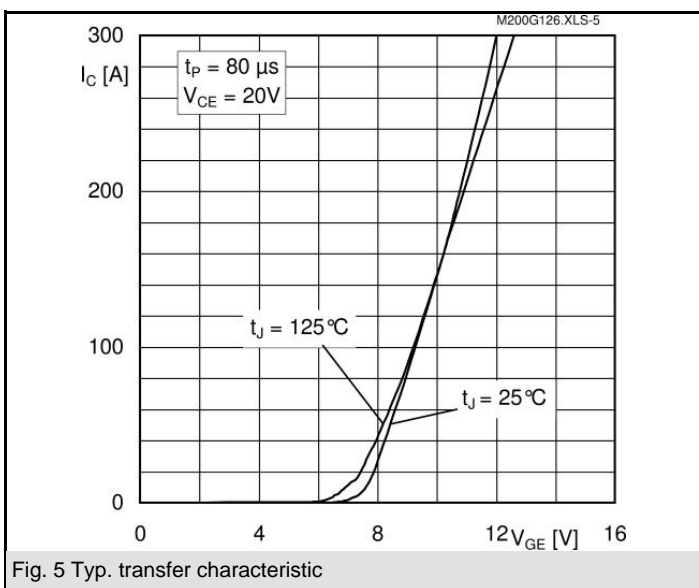
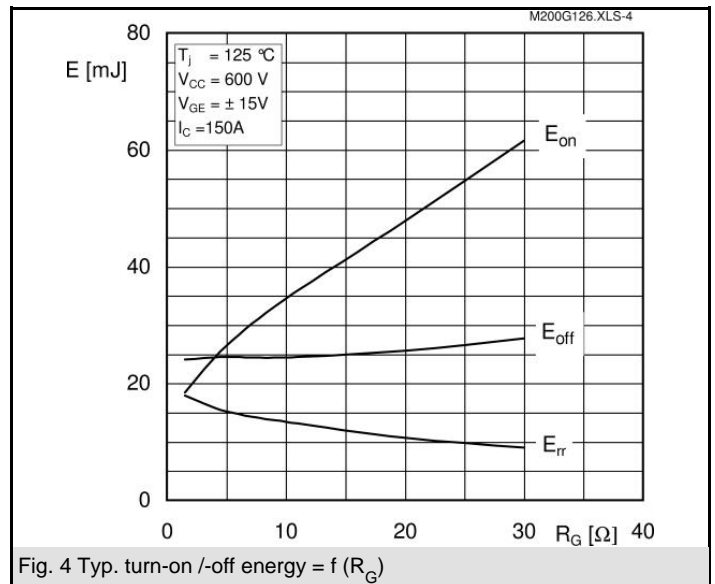
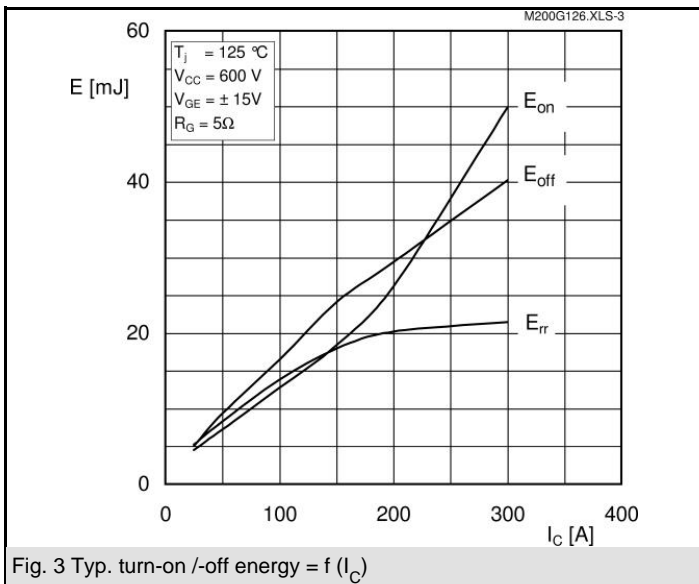
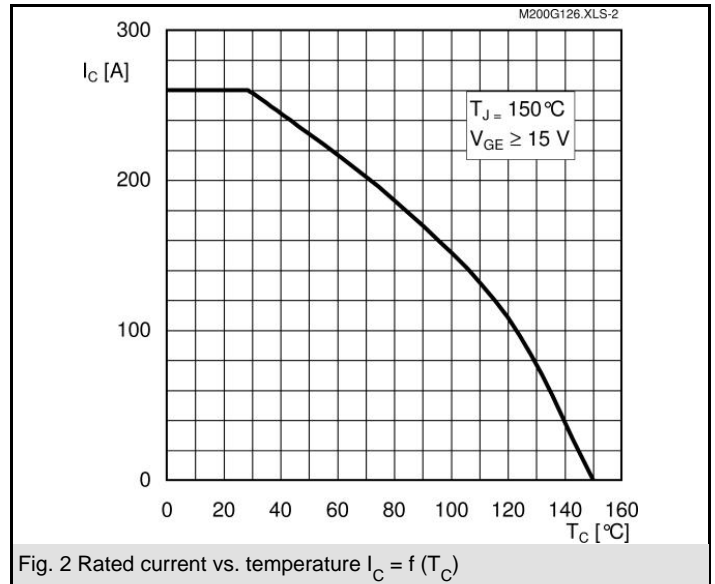
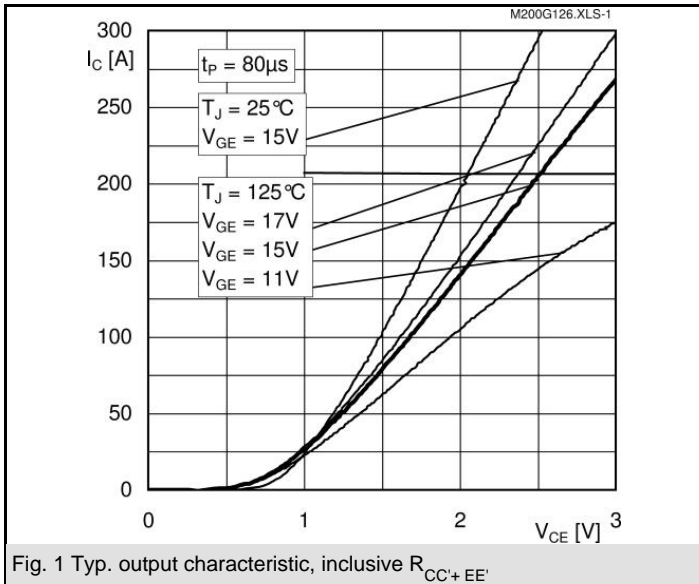
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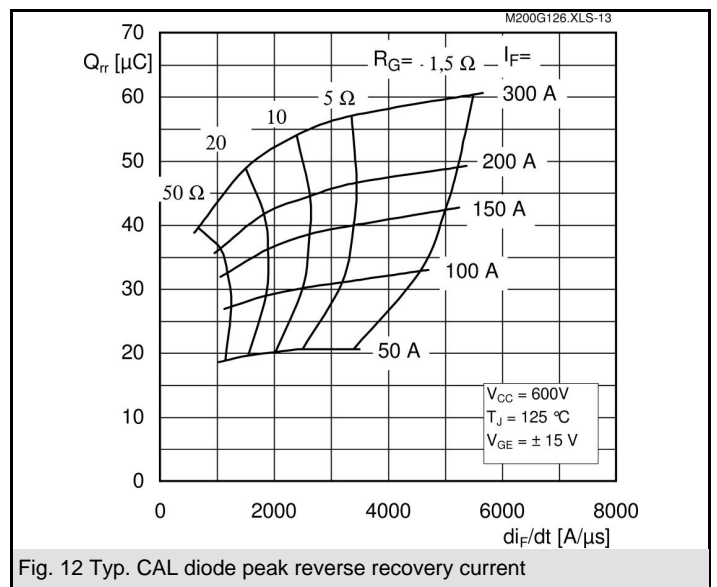
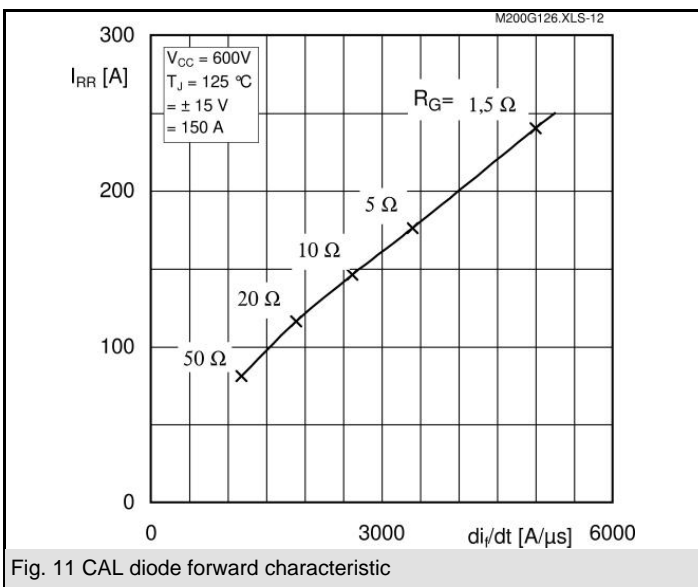
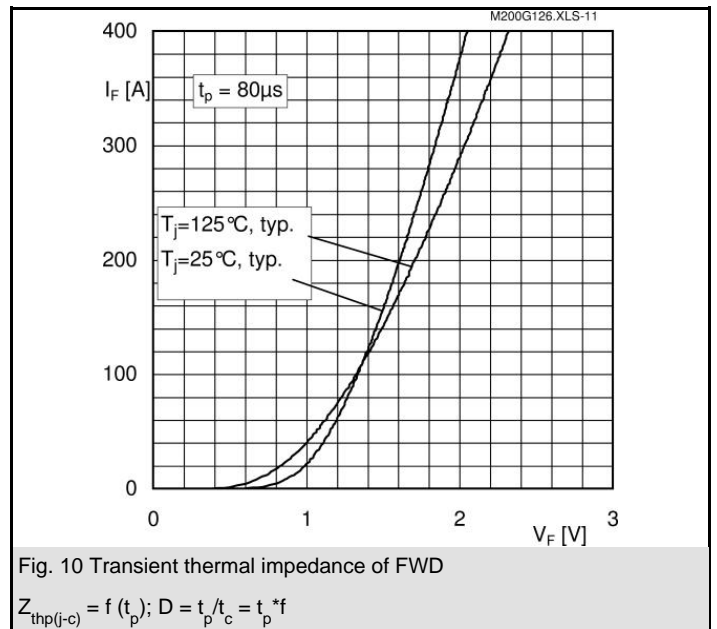
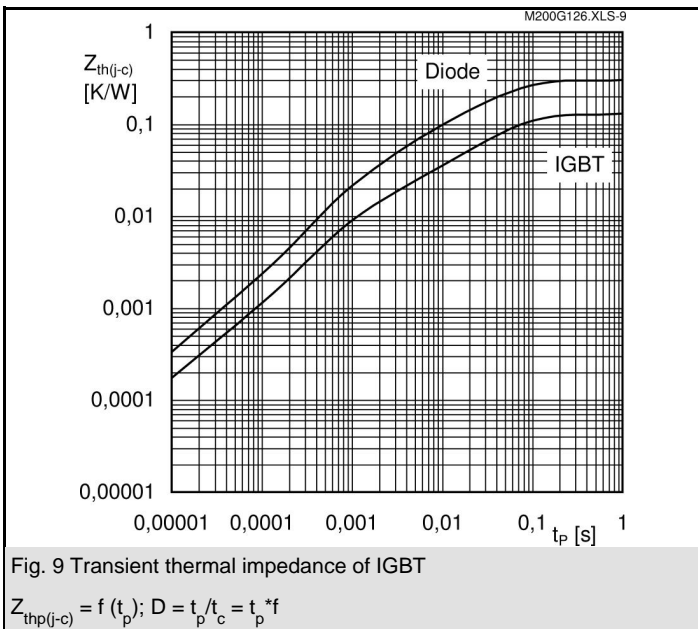
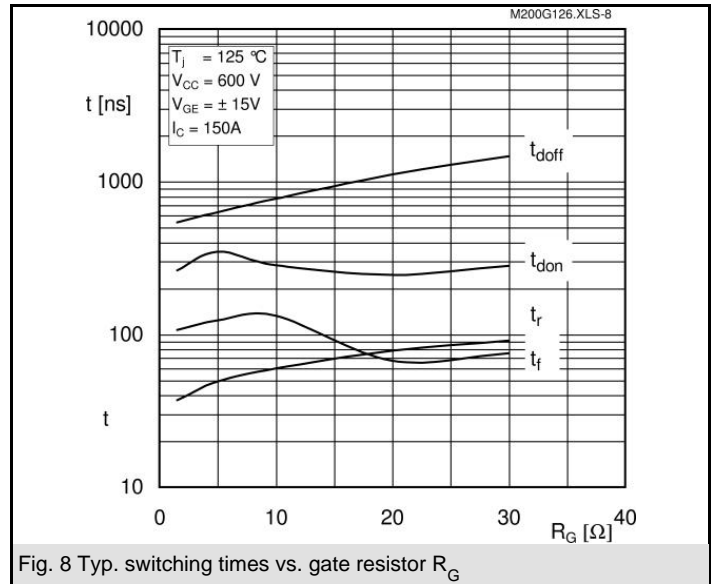
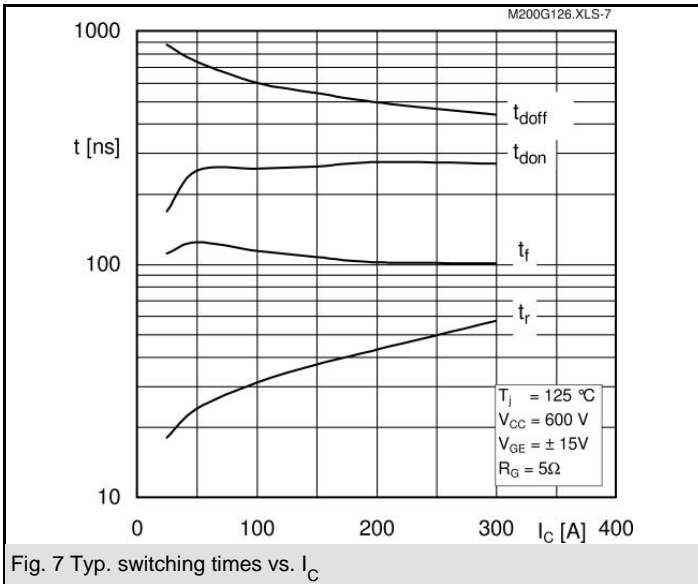
$Z_{th}$		Conditions	Values	Units
<b><math>Z_{th(j-c)I}</math></b>				
$R_{\theta j-c}$		$i = 1$	95	mk/W
$R_{\theta j-c}$		$i = 2$	27	mk/W
$R_{\theta j-c}$		$i = 3$	6,7	mk/W
$R_{\theta j-c}$		$i = 4$	1,3	mk/W
$\tau_{th(j-c)}$		$i = 1$	0,0744	s
$\tau_{th(j-c)}$		$i = 2$	0,0087	s
$\tau_{th(j-c)}$		$i = 3$	0,002	s
$\tau_{th(j-c)}$		$i = 4$	0,0001	s
<b><math>Z_{th(j-c)D}</math></b>				
$R_{\theta j-cD}$		$i = 1$	200	mk/W
$R_{\theta j-cD}$		$i = 2$	80	mk/W
$R_{\theta j-cD}$		$i = 3$	17	mk/W
$R_{\theta j-cD}$		$i = 4$	3	mk/W
$\tau_{th(j-c)D}$		$i = 1$	0,0536	s
$\tau_{th(j-c)D}$		$i = 2$	0,0056	s
$\tau_{th(j-c)D}$		$i = 3$	0,09	s
$\tau_{th(j-c)D}$		$i = 4$	0,0002	s



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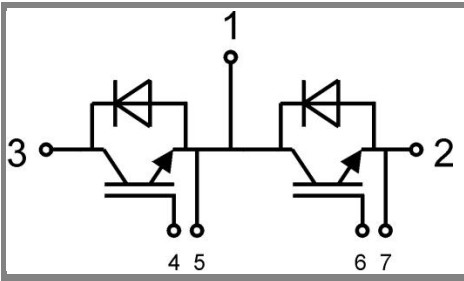
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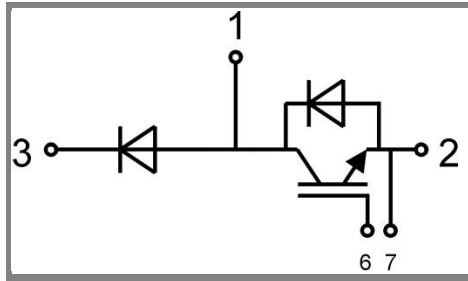


Case D 56



Case D56

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Case D57

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