

# SKM 300GB126D



**SEMITRANS® 3**

## Trench IGBT Module

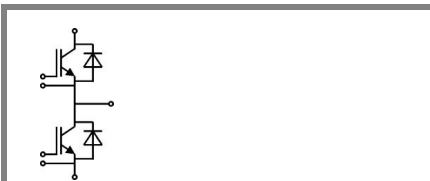
**SKM 300GB126D**

### Features

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

### Typical Applications\*

- Electronic welders
- AC inverter drives
- UPS



**GB**

Absolute Maximum Ratings		$T_c = 25\text{ °C}$ , unless otherwise specified			
Symbol	Conditions	Values			Units
<b>IGBT</b>					
$V_{CES}$	$T_j = 25\text{ °C}$	1200			V
$I_C$	$T_j = 150\text{ °C}$	$T_{case} = 25\text{ °C}$	310		A
		$T_{case} = 80\text{ °C}$	200		A
$I_{CRM}$	$I_{CRM} = 2 \times I_{Cnom}$	400			A
$V_{GES}$		± 20			V
$t_{psc}$	$V_{CC} = 600\text{ V}; V_{GE} \leq 20\text{ V}; T_j = 125\text{ °C}$ $V_{CES} < 1200\text{ V}$	10			µs
<b>Inverse Diode</b>					
$I_F$	$T_j = 150\text{ °C}$	$T_{case} = 25\text{ °C}$	250		A
		$T_{case} = 80\text{ °C}$	170		A
$I_{FRM}$	$I_{FRM} = 2 \times I_{Fnom}$	400			A
<b>Module</b>					
$I_{t(RMS)}$		500			A
$T_{vj}$		- 40 ... + 150			°C
$T_{stg}$		-40...+125			°C
$V_{isol}$	AC, 1 min.	4000			V

Characteristics		$T_c = 25\text{ °C}$ , unless otherwise specified				
Symbol	Conditions	min.	typ.	max.	Units	
<b>IGBT</b>						
$V_{GE(th)}$	$V_{GE} = V_{CE}, I_C = 8\text{ mA}$	5	5,8	6,5	V	
$I_{CES}$	$V_{GE} = 0\text{ V}, V_{CE} = V_{CES}$	$T_j = 25\text{ °C}$		0,1	0,3	mA
$V_{CE0}$		$T_j = 25\text{ °C}$		1	1,2	V
		$T_j = 125\text{ °C}$		0,9	1,1	V
$r_{CE}$	$V_{GE} = 15\text{ V}$	$T_j = 25\text{ °C}$		3,5	4,7	mΩ
		$T_j = 125\text{ °C}$		5,5	6,8	mΩ
$V_{CE(sat)}$	$I_{Cnom} = 200\text{ A}, V_{GE} = 15\text{ V}$	$T_j = 25\text{ °C}_{chiplev.}$		1,7	2,15	V
		$T_j = 125\text{ °C}_{chiplev.}$		2	2,45	V
$C_{ies}$	$V_{CE} = 25, V_{GE} = 0\text{ V}$	$f = 1\text{ MHz}$		15		nF
$C_{oes}$				1,2		nF
$C_{res}$				1,1		nF
$Q_G$	$V_{GE} = -8\text{ V} - +20\text{ V}$	1800			nC	
$R_{Gint}$	$T_j = 25\text{ °C}$	3,8			Ω	
$t_{d(on)}$	$R_{Gon} = 1,5\text{ Ω}$	$V_{CC} = 600\text{ V}$ $I_C = 200\text{ A}$	$T_j = 25\text{ °C}$		280	ns
$t_r$			$T_j = 125\text{ °C}$		37	ns
$E_{on}$			$V_{GE} = \pm 15\text{ V}$		21	mJ
$t_{d(off)}$	$R_{Goff} = 1,5\text{ Ω}$	$V_{GE} = \pm 15\text{ V}$	$T_j = 25\text{ °C}$		560	ns
$t_f$			$T_j = 125\text{ °C}$		100	ns
$E_{off}$					33	mJ
$R_{th(j-c)}$	per IGBT	0,12			K/W	



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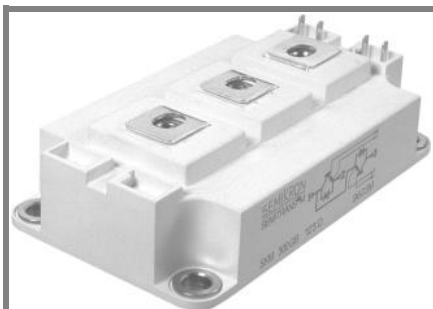
**GB**

Characteristics				min.	typ.	max.	Units
Symbol	Conditions						
<b>Inverse diode</b>							
$V_F = V_{EC}$	$I_{Fnom} = 200 \text{ A}; V_{GE} = 0 \text{ V}$	$T_j = 25 \text{ }^\circ\text{C}_{chiplev.}$		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
$r_F$		$T_j = 25 \text{ }^\circ\text{C}$		3		3,5	mΩ
		$T_j = 125 \text{ }^\circ\text{C}$		4		4,5	mΩ
$I_{RRM}$	$I_F = 200 \text{ A}$	$T_j = 125 \text{ }^\circ\text{C}$		290			A
$Q_{rr}$	$di/dt = 6200 \text{ A}/\mu\text{s}$			44			μC
$E_{rr}$	$V_{GE} = -15 \text{ V}; V_{CC} = 600 \text{ V}$			18			mJ
$R_{th(j-c)D}$	per diode					0,25	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 M6			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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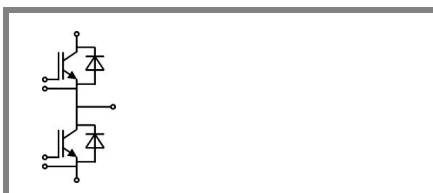
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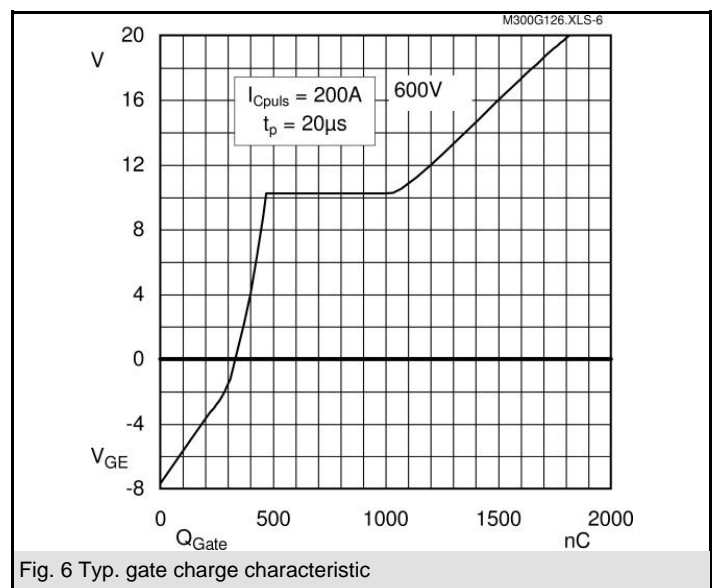
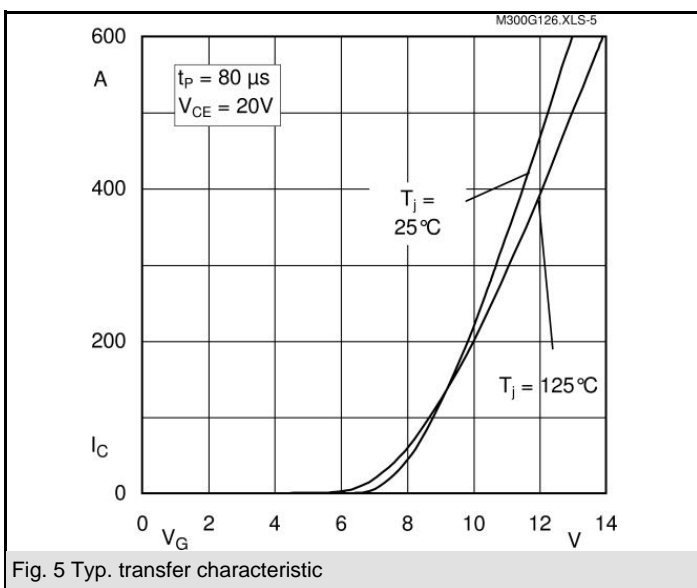
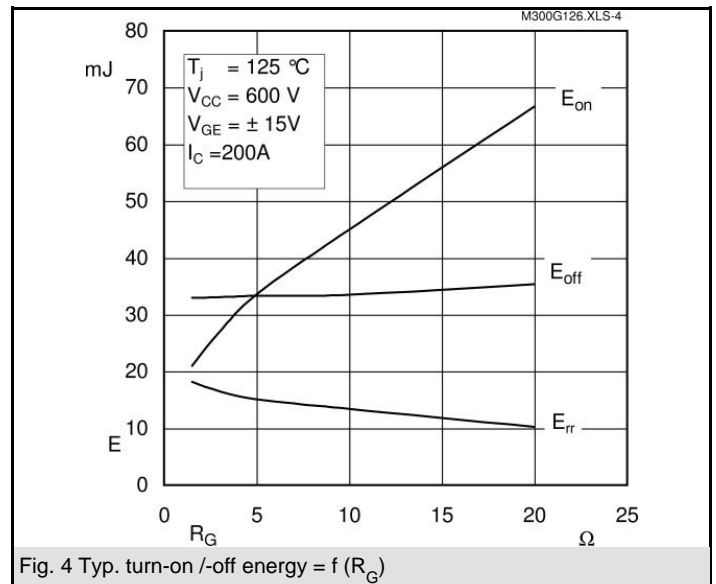
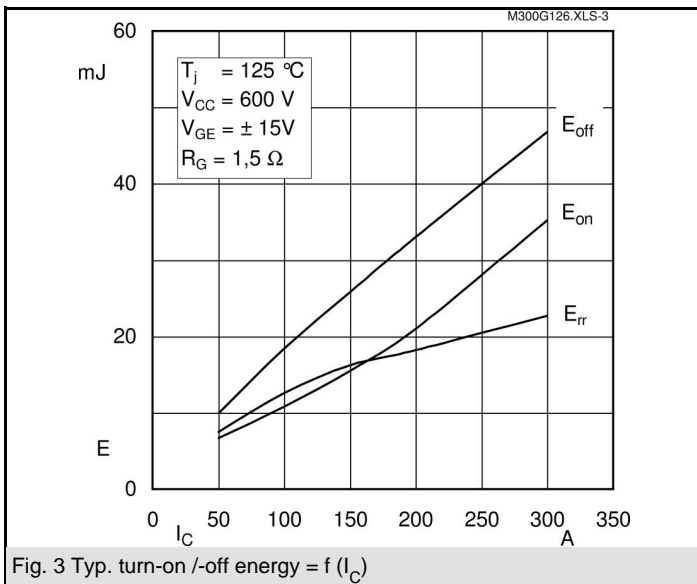
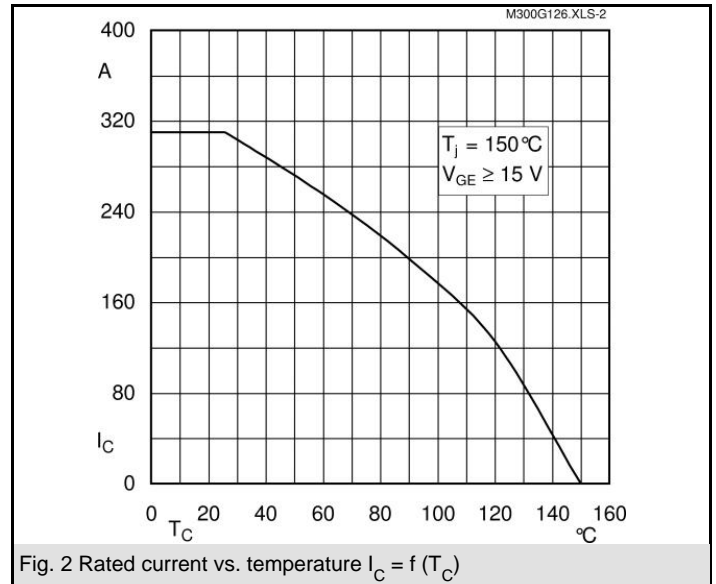
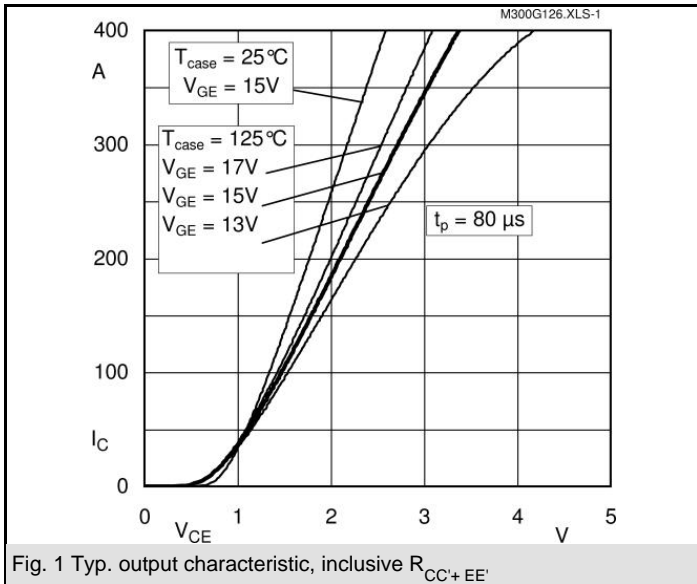
### Typical Applications\*

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**GB**

$Z_{th}$		Conditions	Values	Units
<b>Symbol</b>				
$Z_{th(j-c)I}$				
$R_{\theta j-c}$		$i = 1$	80	mk/W
$R_{\theta j-c}$		$i = 2$	30	mk/W
$R_{\theta j-c}$		$i = 3$	8,5	mk/W
$R_{\theta j-c}$		$i = 4$	1,5	mk/W
$\tau_{th(j-c)I}$		$i = 1$	0,0576	s
$\tau_{th(j-c)I}$		$i = 2$	0,01	s
$\tau_{th(j-c)I}$		$i = 3$	0,002	s
$\tau_{th(j-c)I}$		$i = 4$	0,0002	s
$Z_{th(j-c)D}$				
$R_{\theta j-c}$		$i = 1$	150	mk/W
$R_{\theta j-c}$		$i = 2$	75	mk/W
$R_{\theta j-c}$		$i = 3$	22	mk/W
$R_{\theta j-c}$		$i = 4$	3	mk/W
$\tau_{th(j-c)D}$		$i = 1$	0,0331	s
$\tau_{th(j-c)D}$		$i = 2$	0,0113	s
$\tau_{th(j-c)D}$		$i = 3$	0,0012	s
$\tau_{th(j-c)D}$		$i = 4$	0,001	s



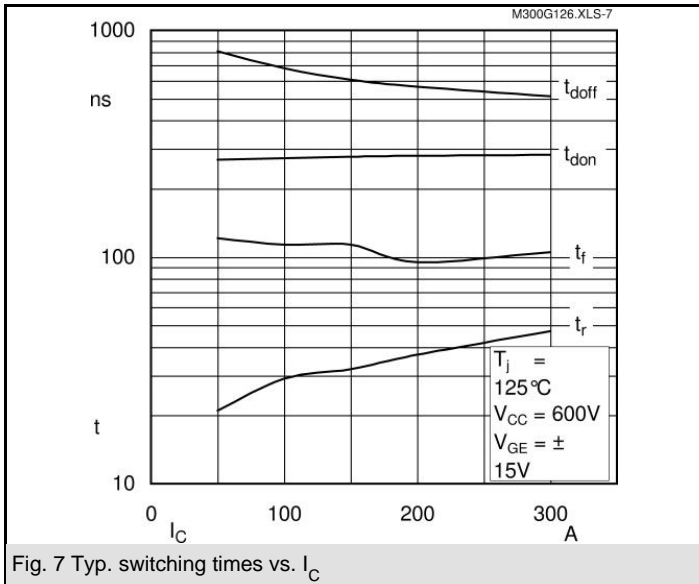


Fig. 7 Typ. switching times vs.  $I_C$

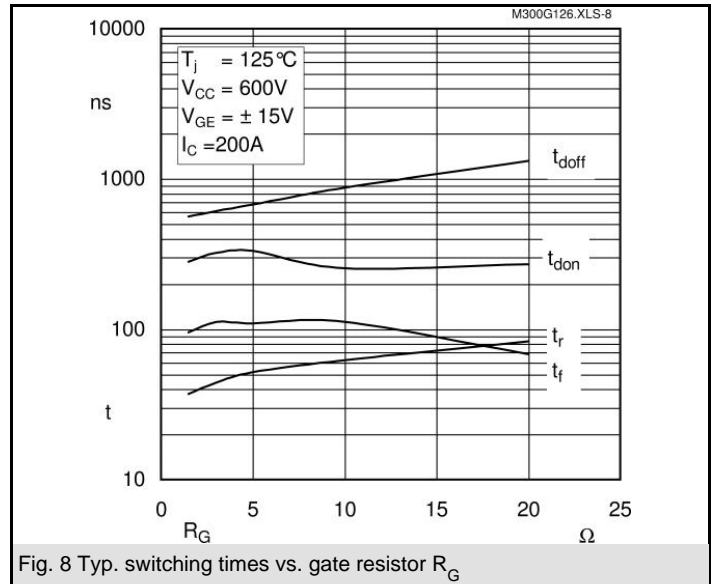


Fig. 8 Typ. switching times vs. gate resistor  $R_G$

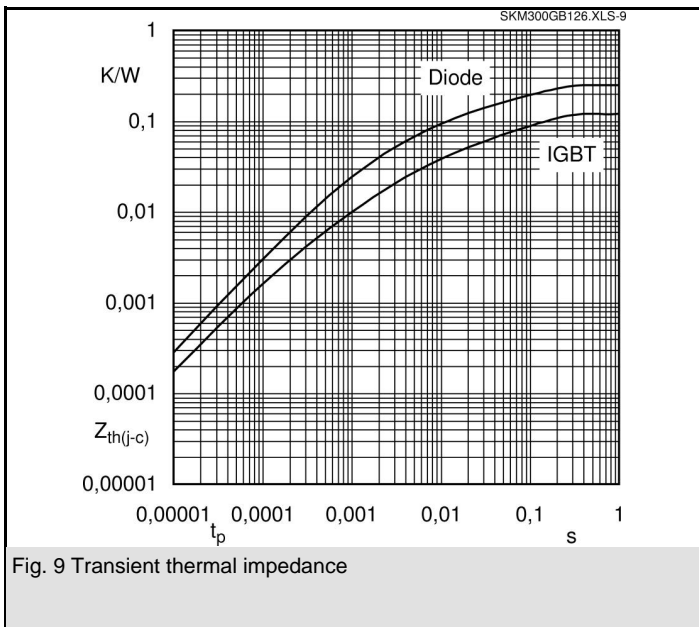


Fig. 9 Transient thermal impedance

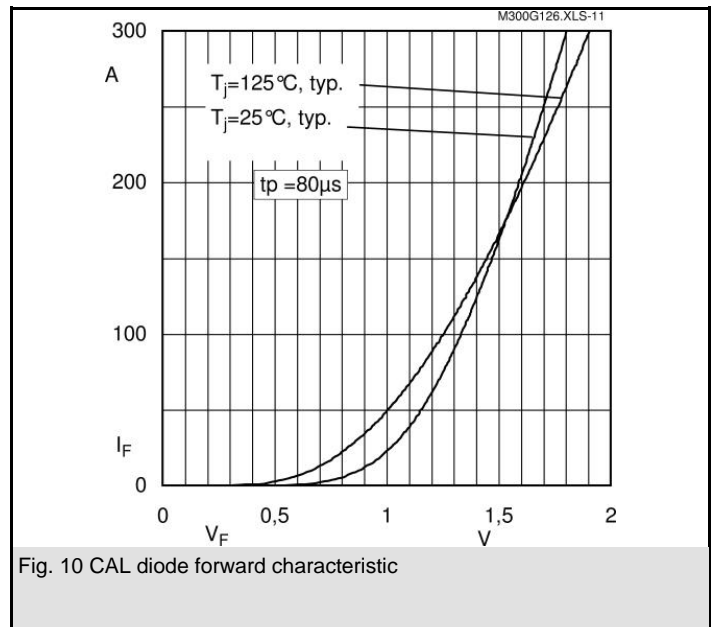


Fig. 10 CAL diode forward characteristic

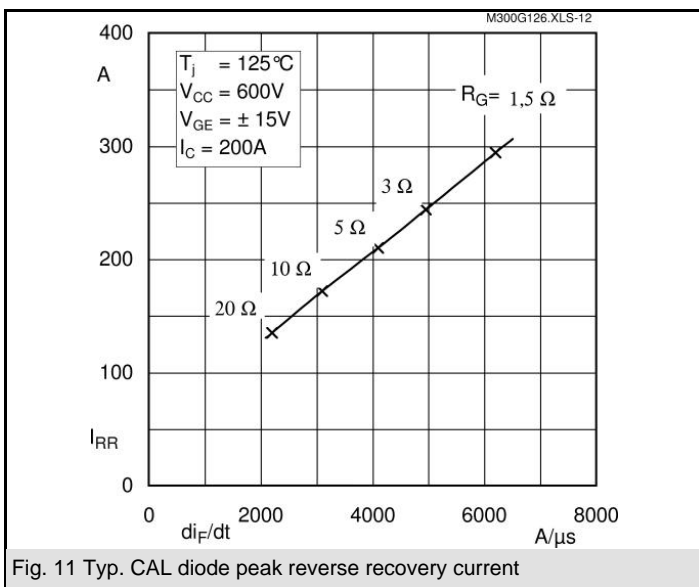


Fig. 11 Typ. CAL diode peak reverse recovery current

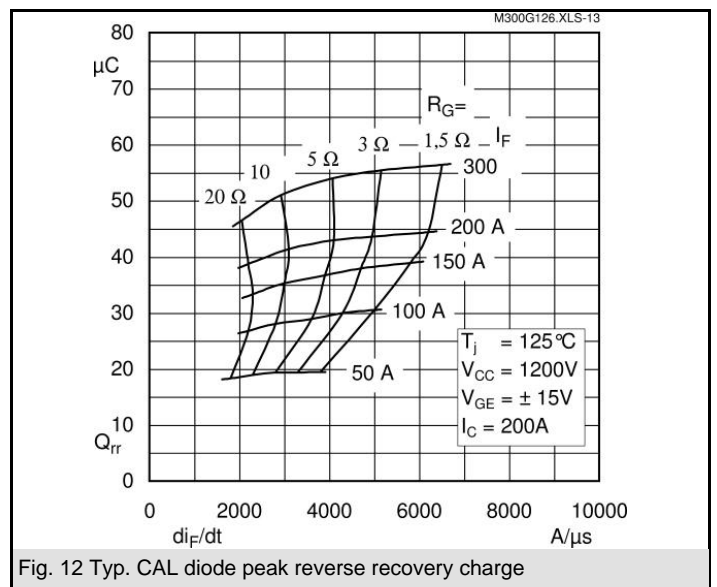


Fig. 12 Typ. CAL diode peak reverse recovery charge

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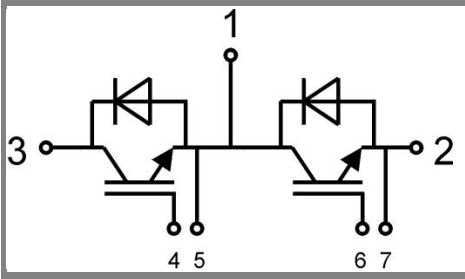
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