

SKM 800GA126D



SEMITRANS® 4

Trench IGBT Modules

SKM 800GA126D

Preliminary Data

Features

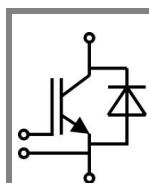
- Trench = Trenchgate technology
- V_{CEsat} with positive temperature coefficient
- High short circuit capability, self limiting to $6 \times I_C$

Typical Applications

- AC inverter drives
- UPS
- Electronic welders

Remarks

- $I_{DC} \leq 500A$ limited by terminals



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Absolute Maximum Ratings		$T_c = 25^\circ\text{C}$, unless otherwise specified		
Symbol	Conditions	Values	Units	
IGBT				
V_{CES}	$T_j = 25^\circ\text{C}$	1200	V	
I_C	$T_j = 150^\circ\text{C}$	$T_{case} = 25^\circ\text{C}$	960	A
		$T_{case} = 80^\circ\text{C}$	620	A
I_{CRM}	$I_{CRM} = 2 \times I_{Cnom}$	1200	A	
V_{GES}		± 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	μs	
Inverse Diode				
I_F	$T_j = 150^\circ\text{C}$	$T_{case} = 25^\circ\text{C}$	680	A
		$T_{case} = 125^\circ\text{C}$	470	A
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$	1200	A	
I_{FSM}	$t_p = 10\text{ ms}; \text{sin.}$	$T_j = 150^\circ\text{C}$	3600	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		$T_c = 25^\circ\text{C}$, unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
IGBT					
$V_{GE(th)}$	$V_{GE} = V_{CE}, I_C = 16\text{ mA}$	5	5,8	6,5	V
I_{CES}	$V_{GE} = 0\text{ V}, V_{CE} = V_{CES}$	$T_j = 25^\circ\text{C}$	0,2	0,6	mA
		$T_j = 125^\circ\text{C}$			mA
V_{CE0}		$T_j = 25^\circ\text{C}$	1	1,15	V
		$T_j = 125^\circ\text{C}$	0,9		V
r_{CE}	$V_{GE} = 15\text{ V}$	$T_j = 25^\circ\text{C}$	1,2	1,7	$\text{m}\Omega$
		$T_j = 125^\circ\text{C}$	1,8		$\text{m}\Omega$
$V_{CE(sat)}$	$I_{Cnom} = 600\text{ A}, V_{GE} = 15\text{ V}$	$T_j = 25^\circ\text{C}_{chiplev.}$	1,7	2,15	V
		$T_j = 125^\circ\text{C}_{chiplev.}$	2		V
C_{ies}	$V_{CE} = 25, V_{GE} = 0\text{ V}$	$f = 1\text{ MHz}$	42		nF
C_{oes}			3,3		nF
C_{res}			3,1		nF
Q_G	$V_{GE} = -8\text{ V} - +20\text{ V}$		5200		nC
R_{Gint}	$T_j = ^\circ\text{C}$		1,25		Ω
$t_{d(on)}$	$R_{Gon} = 3\ \Omega$	$V_{CC} = 600\text{ V}$ $I_{Cnom} = 600\text{ A}$	220		ns
t_r			100		ns
E_{on}			65		mJ
$t_{d(off)}$	$R_{Goff} = 3\ \Omega$	$T_j = 125^\circ\text{C}$ $V_{GE} = \pm 15\text{ V}$	860		ns
t_f			135		ns
E_{off}			95		mJ
$R_{th(j-c)}$	per IGBT			0,042	K/W



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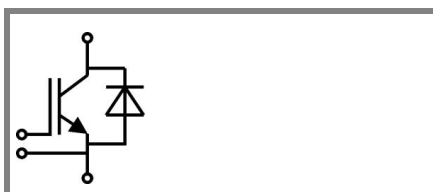
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Characteristics

Symbol	Conditions	min.	typ.	max.	Units
Inverse Diode					
$V_F = V_{EC}$	$I_{Fnom} = 600 A; V_{GE} = 0 V$	$T_j = 25 ^\circ C_{chiplev.}$	1,6	1,8	V
		$T_j = 125 ^\circ C_{chiplev.}$	1,6	1,8	V
V_{F0}		$T_j = 25 ^\circ C$	1	1,1	V
		$T_j = 125 ^\circ C$	0,8	0,9	V
r_F		$T_j = 25 ^\circ C$	1	1,2	mΩ
		$T_j = 125 ^\circ C$	1,3	1,5	mΩ
I_{RRM}	$I_{Fnom} = 600 A$	$T_j = 125 ^\circ C$	540		A
Q_{rr}	$di/dt = 6000 A/\mu s$		125		μC
E_{rr}	$V_{GE} = -15 V; V_{CC} = 600 V$		59		mJ
$R_{th(j-c)D}$	per diode			0,09	K/W
Module					
L_{CE}			15	20	nH
$R_{CC'+EE'}$	res., terminal-chip	$T_{case} = 25 ^\circ C$	0,18		mΩ
		$T_{case} = 125 ^\circ C$	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.

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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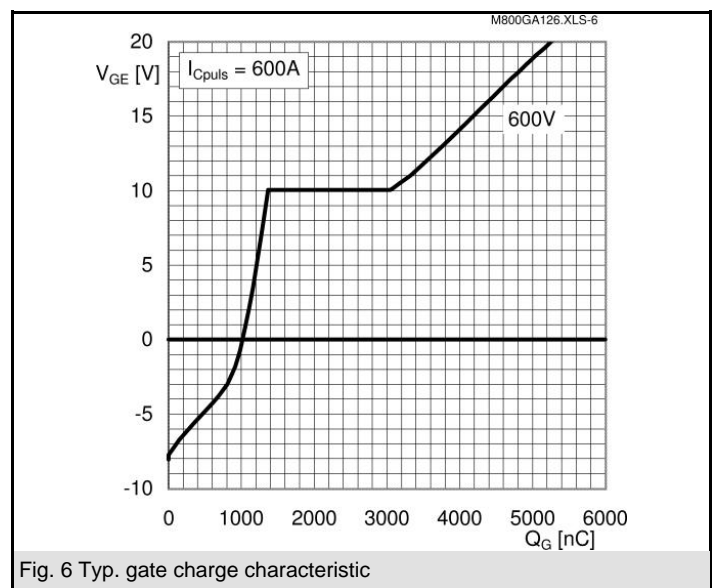
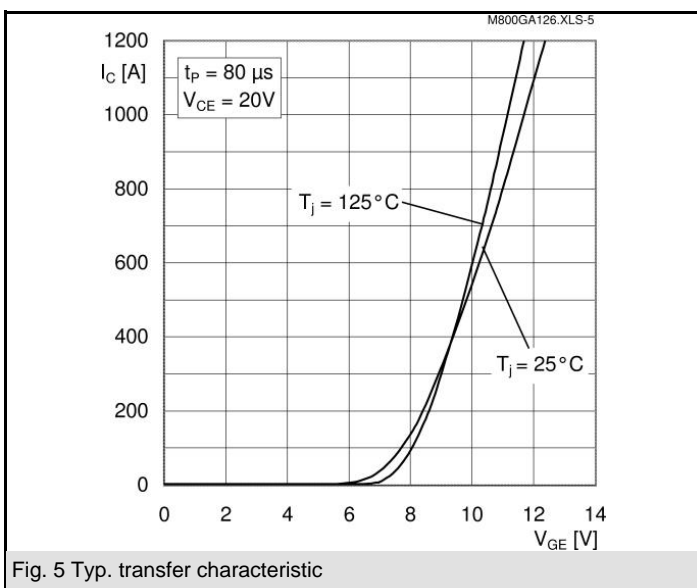
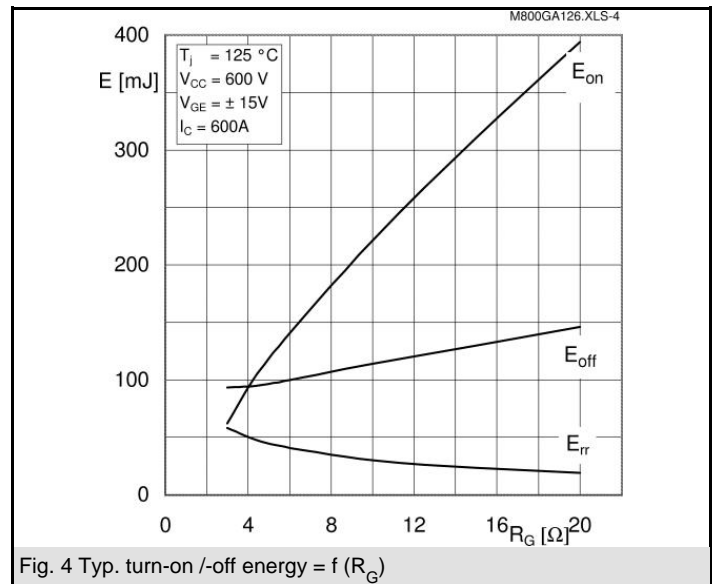
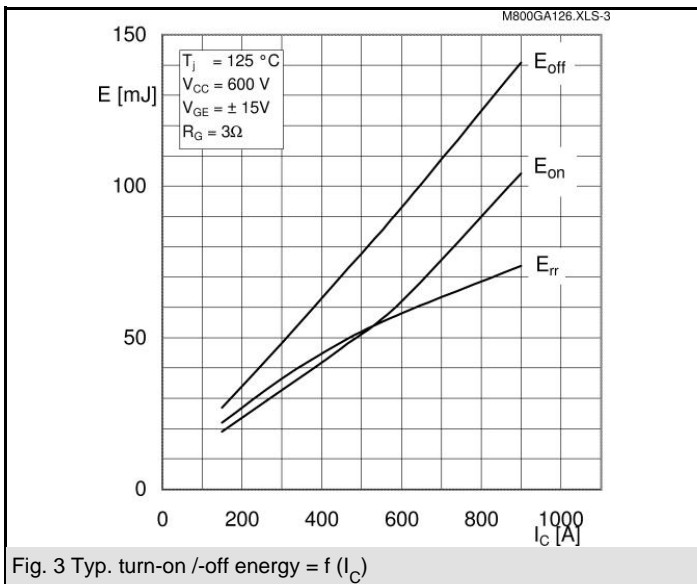
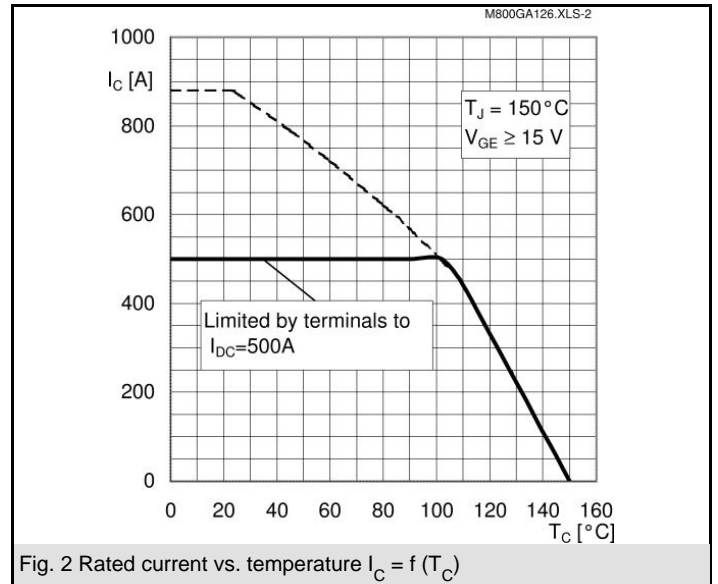
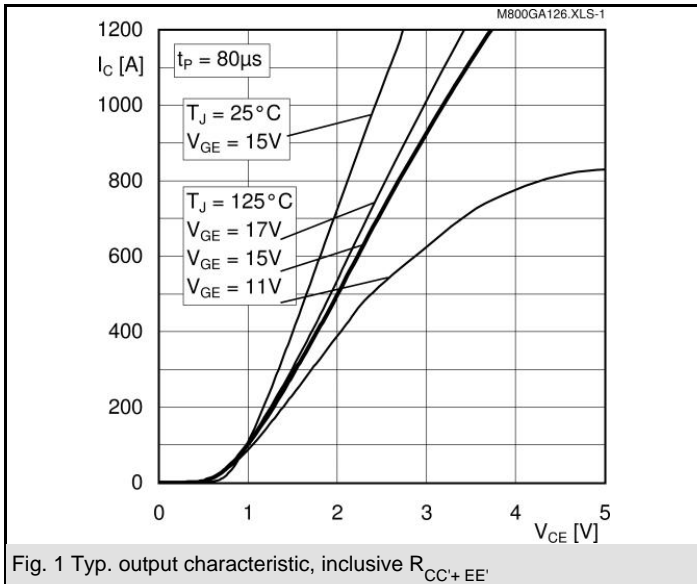
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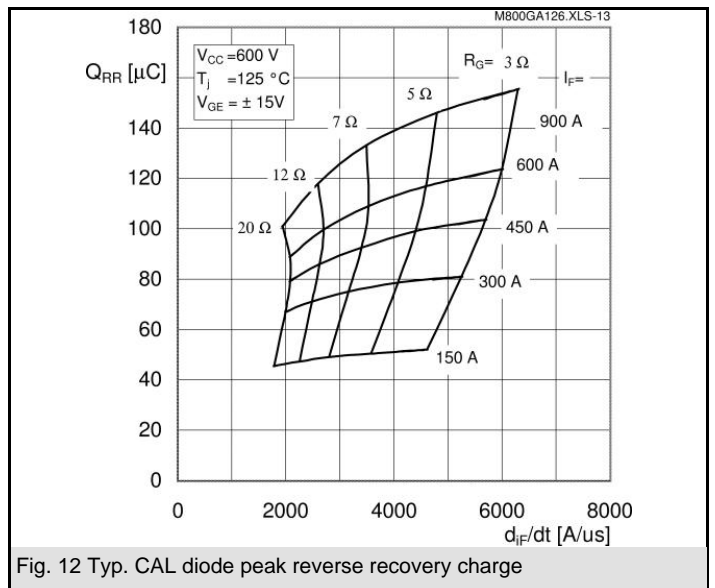
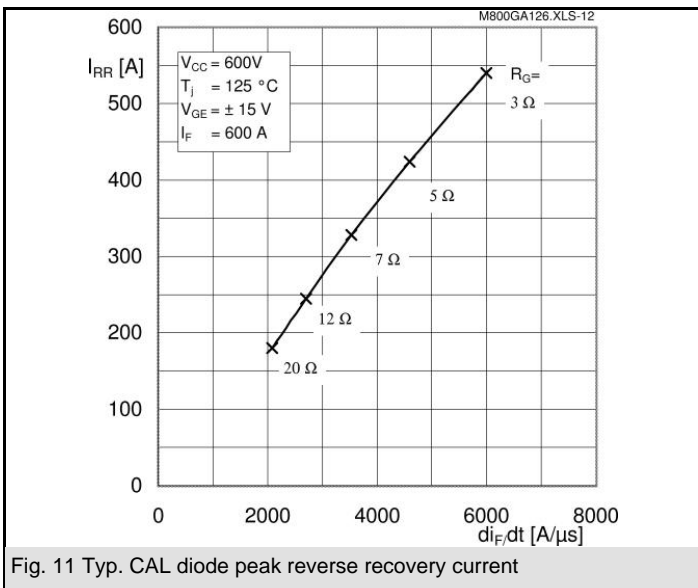
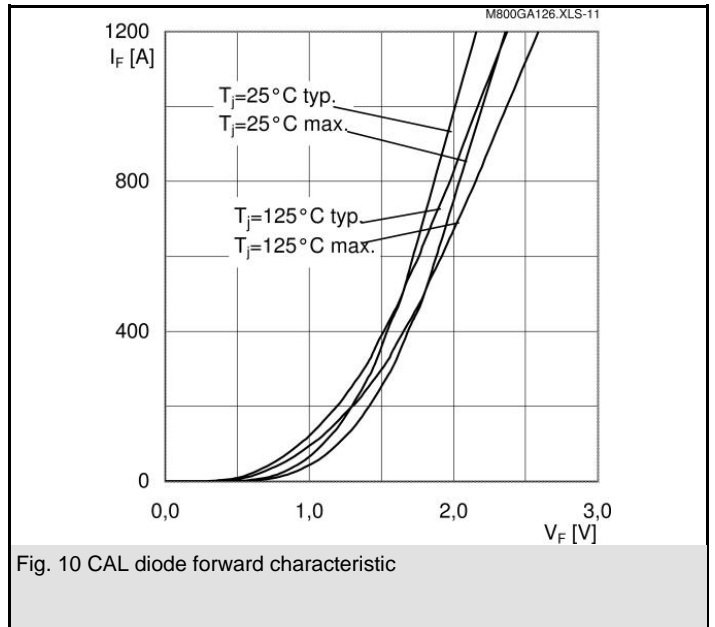
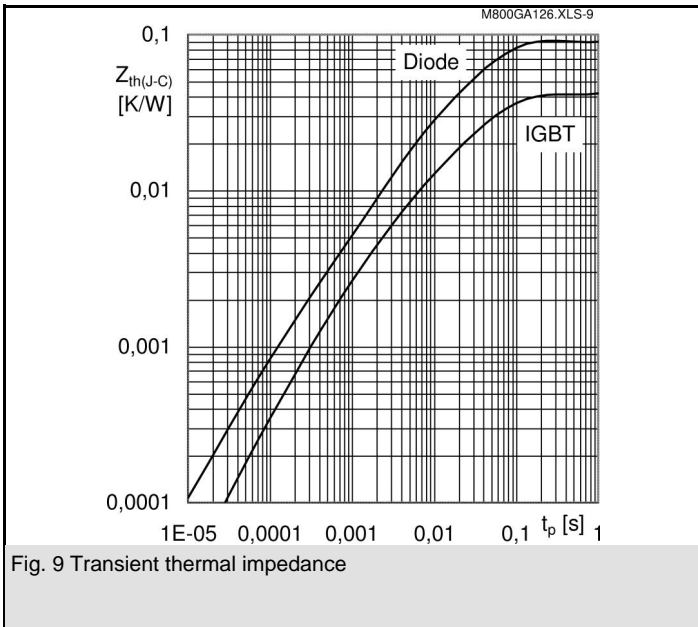
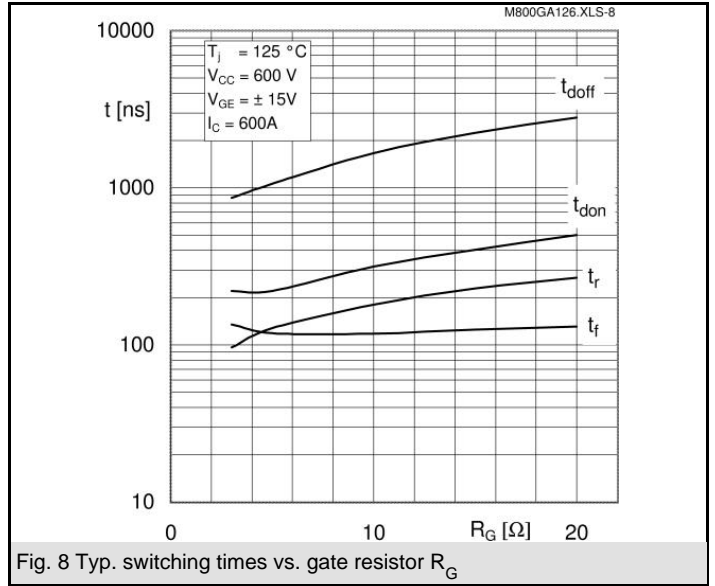
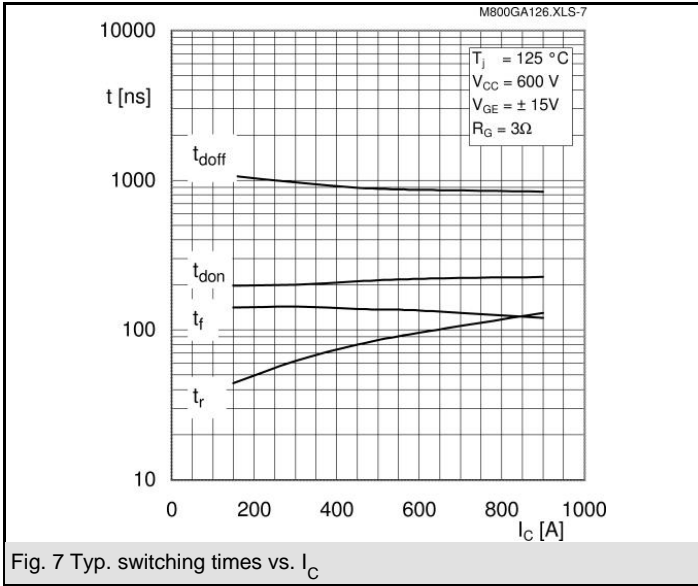
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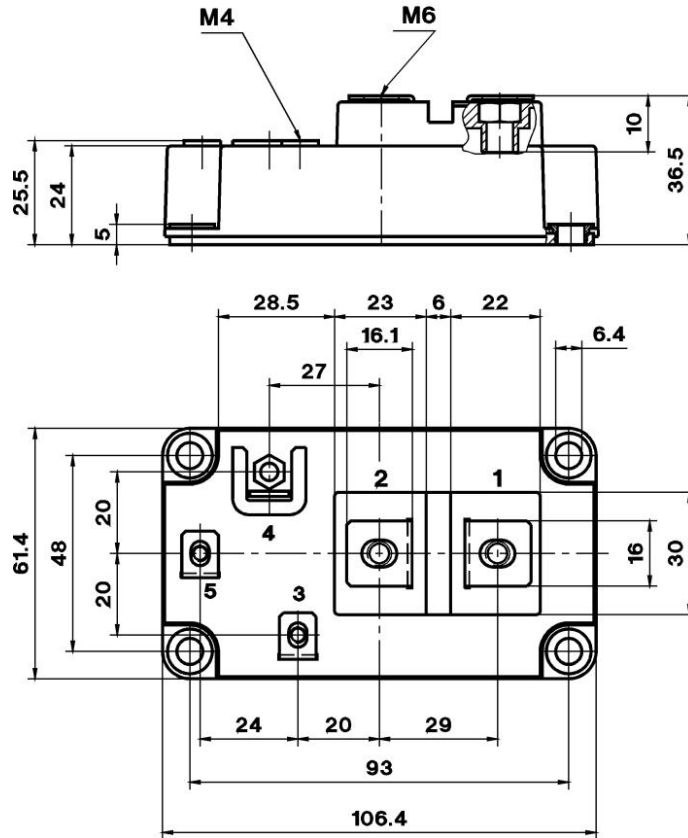
Z_{th}		Conditions	Values	Units
Symbol				
$Z_{th(j-c)I}$				
$R_{\theta j-c}$	$i = 1$		30	mk/W
$R_{\theta j-c}$	$i = 2$		9,5	mk/W
$R_{\theta j-c}$	$i = 3$		2,2	mk/W
$R_{\theta j-c}$	$i = 4$		0,3	mk/W
$\tau_{\theta j-c}$	$i = 1$		0,1043	s
$\tau_{\theta j-c}$	$i = 2$		0,009	s
$\tau_{\theta j-c}$	$i = 3$		0,0015	s
$\tau_{\theta j-c}$	$i = 4$		0,004	s
Symbol				
$Z_{th(j-c)D}$				
$R_{\theta j-c}$	$i = 1$		62	mk/W
$R_{\theta j-c}$	$i = 2$		23	mk/W
$R_{\theta j-c}$	$i = 3$		4,2	mk/W
$R_{\theta j-c}$	$i = 4$		0,8	mk/W
$\tau_{\theta j-c}$	$i = 1$		0,0566	s
$\tau_{\theta j-c}$	$i = 2$		0,0166	s
$\tau_{\theta j-c}$	$i = 3$		0,0015	s
$\tau_{\theta j-c}$	$i = 4$		0,0002	s



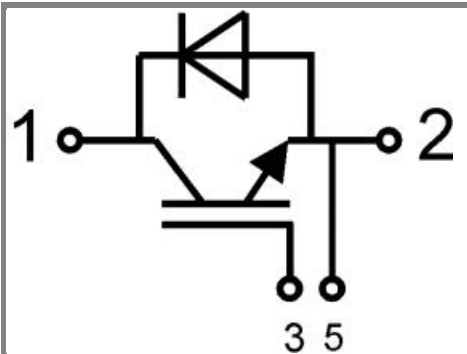
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Case D 59



Case D59

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