



SEMITRANS® 2

Trench IGBT Modules

SKM195GB066D

SKM 195GAL066D

Preliminary Data

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

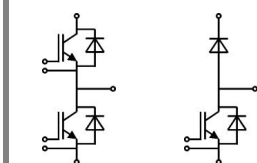
- AC inverter drives
- UPS
- Electronic welders

Remarks

- Case temperature limited to $T_c = 125^\circ\text{C}$ max., product rel. results valid for $T_j \leq 150^\circ\text{C}$
- SC data: Use of soft R_G necessary!
- Take care of over-voltage caused by stray induct.

Absolute Maximum Ratings		T _{case} = 25°C, unless otherwise specified		
Symbol	Conditions		Values	Units
IGBT				
V _{CES}	T _j = 25 °C		600	V
I _C	T _j = 175 °C	T _c = 25 °C	265	A
		T _c = 80 °C	200	A
I _{CRM}	I _{CRM} =2xI _{Cnom}		400	A
V _{GES}			± 20	V
t _{psc}	V _{CC} = 360 V; V _{GE} ≤ 15 V; T _j = 150 °C V _{CES} < 600 V		6	µs
Inverse Diode				
I _F	T _j = 175 °C	T _c = 25 °C	200	A
		T _c = 80 °C	130	A
I _{FRM}	I _{FRM} =2xI _{Fnom}		400	A
I _{FSM}	t _p = 10 ms; sin.	T _j = 175 °C	1400	A
Module				
I _{t(RMS)}			200	A
T _{vj}			- 40 ... + 175	°C
T _{stg}			- 40 ... + 125	°C
V _{isol}	AC, 1 min.		4000	V

Characteristics		T _{case} = 25°C, unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
IGBT					
V _{GE(th)}	V _{GE} = V _{CE} , I _C = 3,2 mA	5	5,8	6,5	V
I _{CES}	V _{GE} = 0 V, V _{CE} = V _{CES} T _j = 25 °C		0,13	0,38	mA
V _{CE0}	T _j = 25 °C T _j = 150 °C		0,9	1	V
			0,85	0,9	V
r _{CE}	V _{GE} = 15 V T _j = 25°C T _j = 150°C		2,8	4,5	mΩ
			4,3	6	mΩ
V _{CE(sat)}	I _{Cnom} = 200 A, V _{GE} = 15 V T _j = 25°C _{chiplev.} T _j = 150°C _{chiplev.}		1,45	1,9	V
			1,7	2,1	V
C _{ies}	V _{CE} = 25, V _{GE} = 0 V f = 1 MHz		12,3		nF
C _{oes}			0,77		nF
C _{res}			0,37		nF
Q _G	V _{GE} = -8V...+15V		1500		nC
R _{Gint}	T _j = °C		2		Ω
t _{d(on)}	R _{Gon} = 3 Ω	V _{CC} = 300V I _{Cnom} = 200A T _j = 150 °C V _{GE} = -8V/+15V	160		ns
t _r			68		ns
E _{on}	14			mJ	
t _{d(off)}	520			ns	
t _f	49			ns	
E _{off}			8		mJ
R _{th(i-c)}	per IGBT			0,22	K/W



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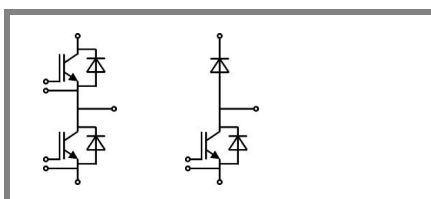
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Characteristics					
Symbol	Conditions	min.	typ.	max.	Units
Inverse Diode					
$V_F = V_{EC}$	$I_{Fnom} = 200 \text{ A}; V_{GE} = 0 \text{ V}; T_j = 25^\circ\text{C}_{chiplev.}$		1,4	1,6	V
V_{F0}	$T_j = 25^\circ\text{C}$		0,95	1	V
r_F	$T_j = 25^\circ\text{C}$		2,3	3	mΩ
I_{RRM}	$I_{Fnom} = 200 \text{ A}; T_j = 150^\circ\text{C}$		100		A
Q_{rr}	$di/dt = 2000 \text{ A}/\mu\text{s}$		30		μC
E_{rr}	$V_{GE} = -8 \text{ V}; V_{CC} = 300 \text{ V}$		5,6		mJ
$R_{th(j-c)D}$	per diode			0,4	K/W
Module					
L_{CE}				30	nH
$R_{CC'+EE'}$	res., terminal-chip	$T_{case} = 25^\circ\text{C}$	0,75		mΩ
		$T_{case} = 125^\circ\text{C}$	1		mΩ
$R_{th(c-s)}$	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				150	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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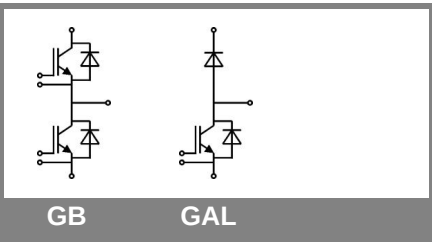
Typical Applications

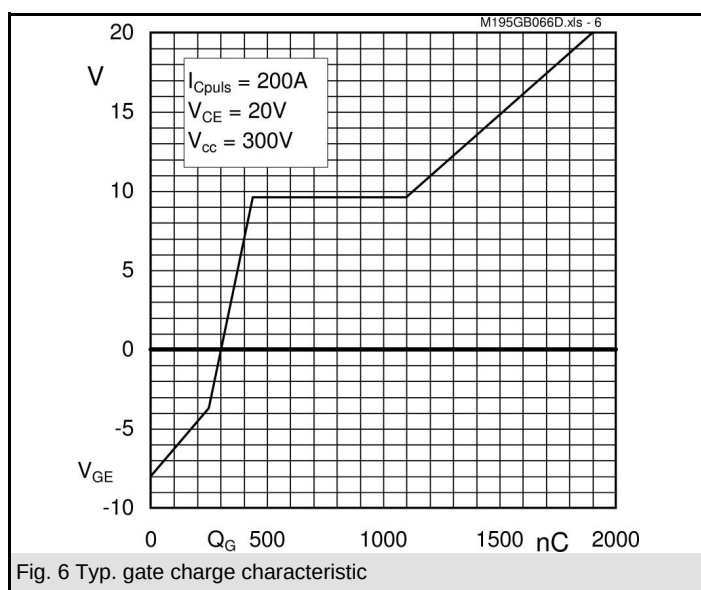
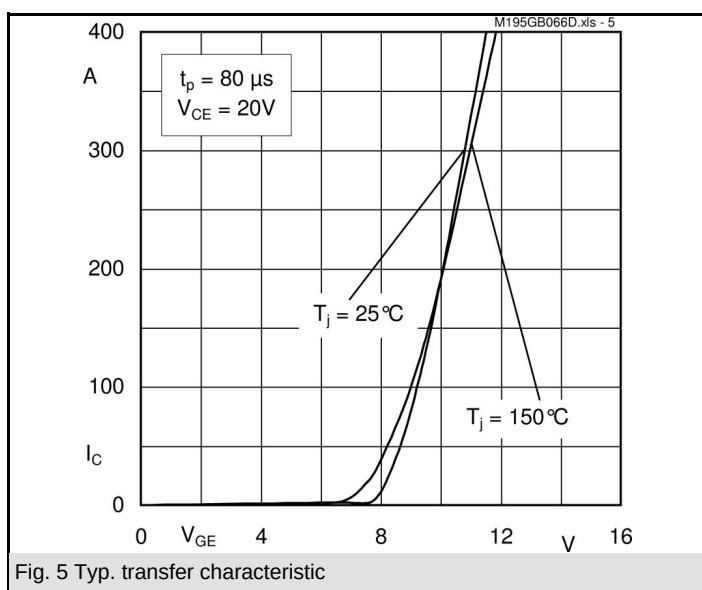
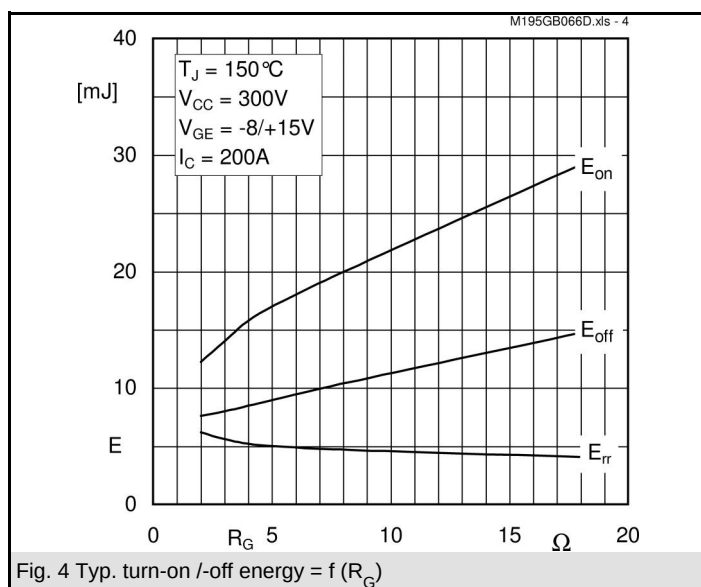
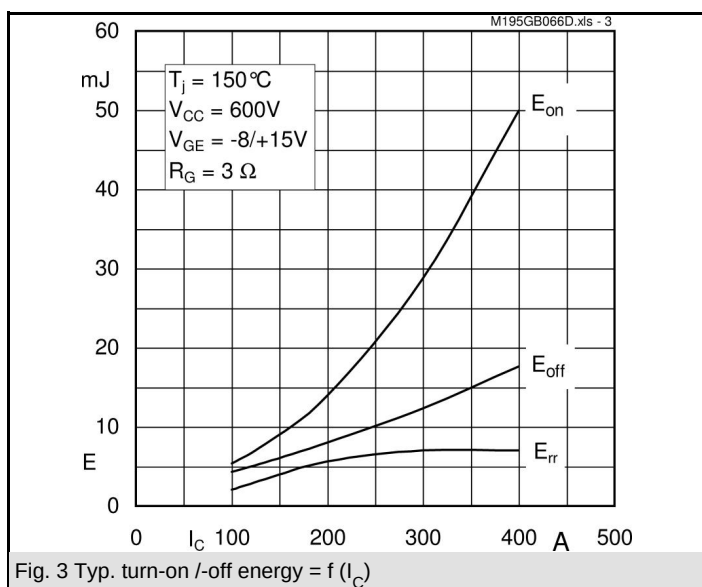
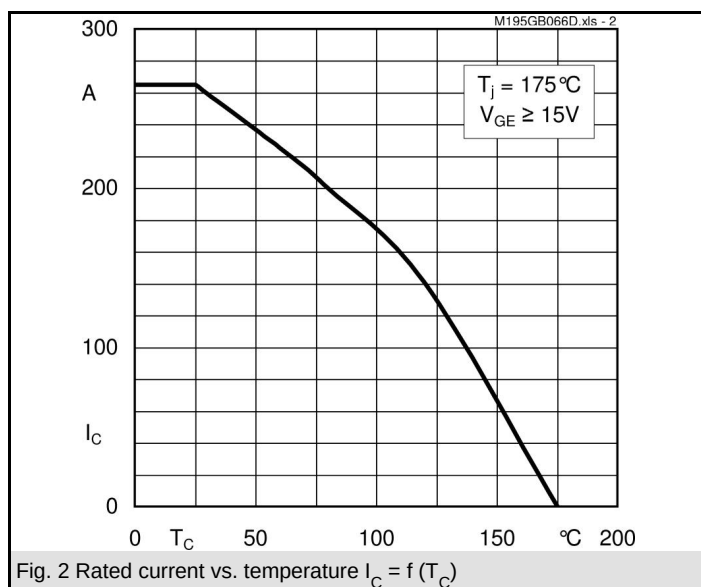
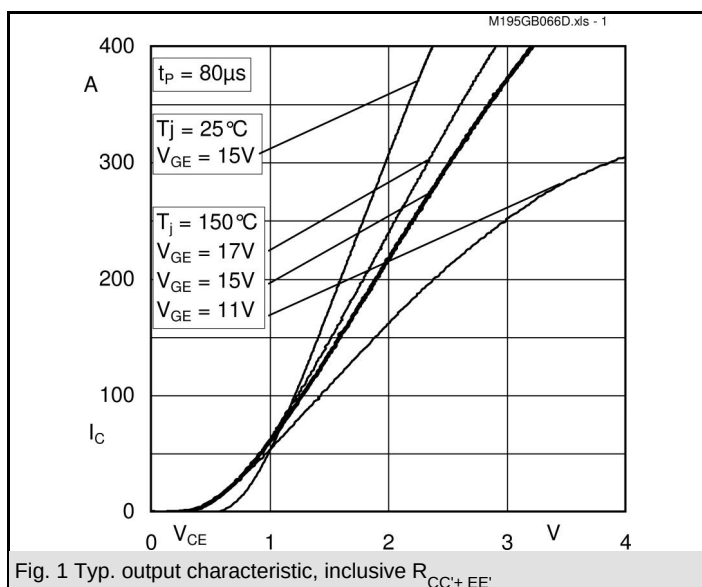
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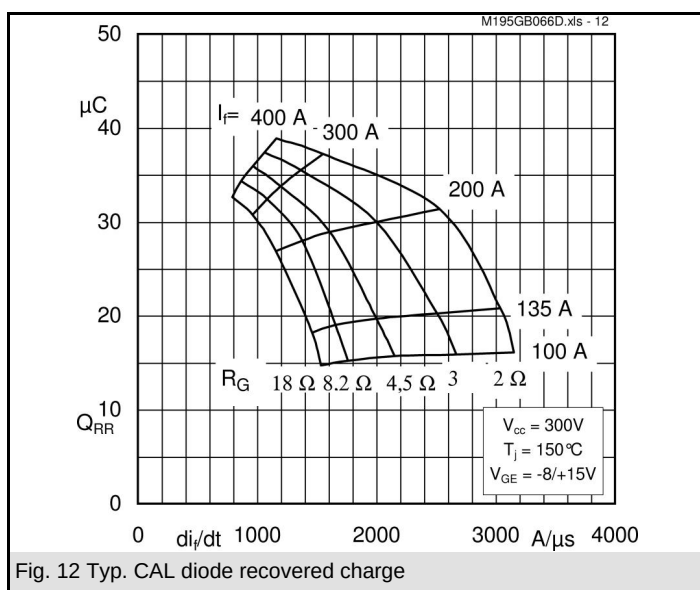
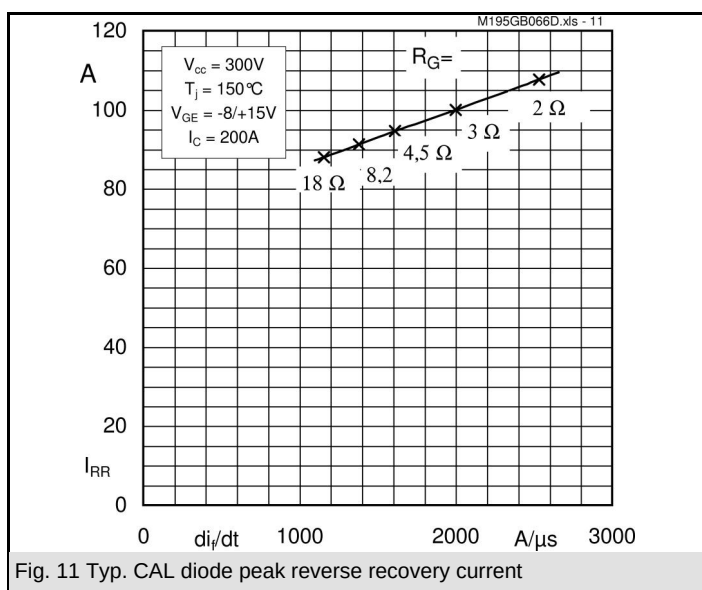
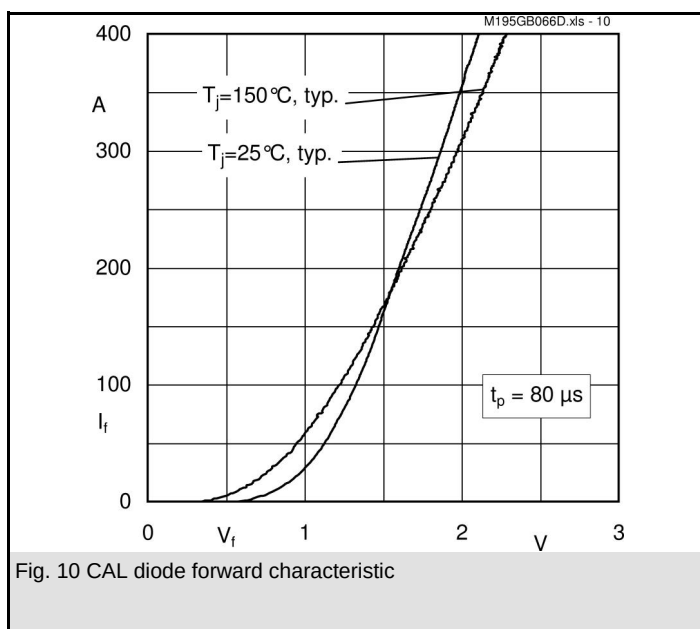
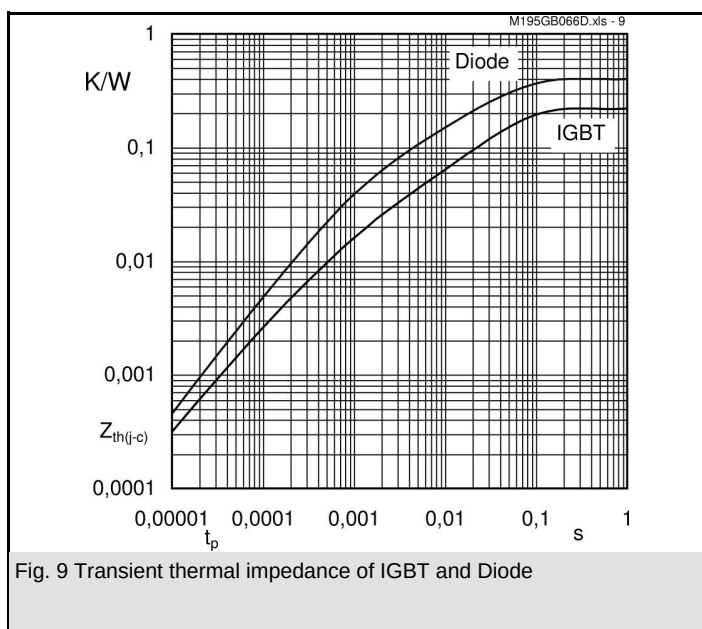
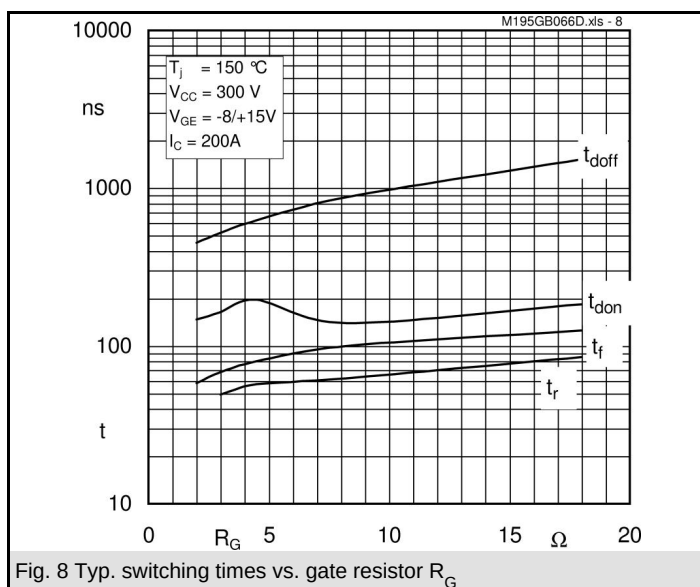
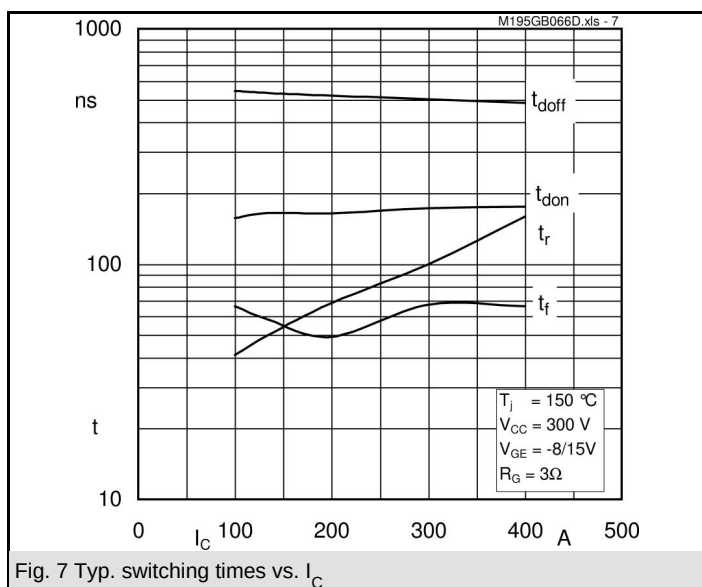
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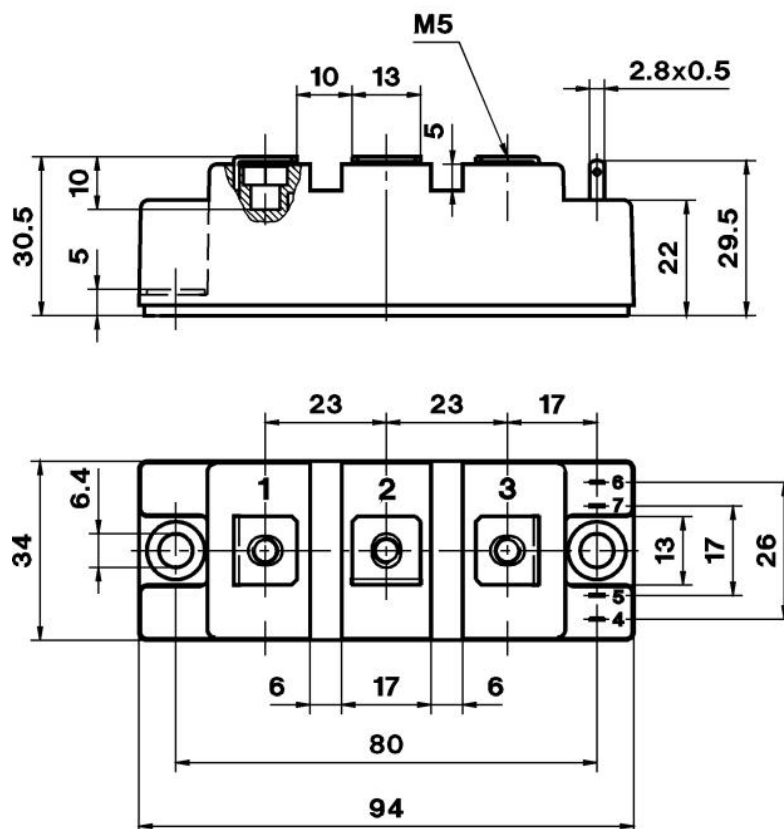
Z_{th}			
Symbol	Conditions	Values	Units
$Z_{th(j-c)I}$			
R_i	$i = 1$	160	mk/W
R_i	$i = 2$	41	mk/W
R_i	$i = 3$	16	mk/W
R_i	$i = 4$	3	mk/W
τ_{u_i}	$i = 1$	0,0276	s
τ_{u_i}	$i = 2$	0,0406	s
τ_{u_i}	$i = 3$	0,001	s
τ_{u_i}	$i = 4$	0,0011	s
$Z_{th(j-c)D}$			
R_i	$i = 1$	250	mk/W
R_i	$i = 2$	110	mk/W
R_i	$i = 3$	35	mk/W
R_i	$i = 4$	5	mk/W
τ_{u_i}	$i = 1$	0,054	s
τ_{u_i}	$i = 2$	0,012	s
τ_{u_i}	$i = 3$	0,0015	s
τ_{u_i}	$i = 4$	0,0007	s



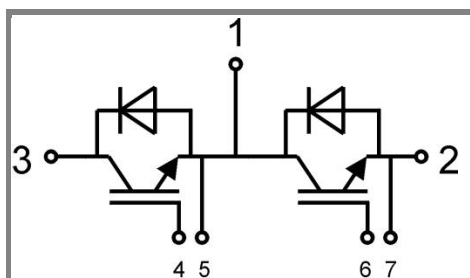




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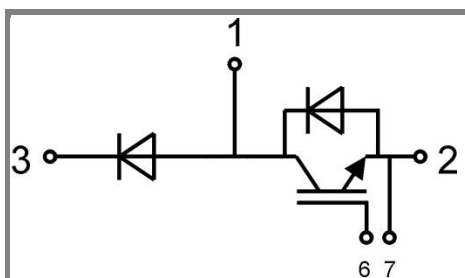


Case D 61



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Case D 61



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Case D 62