

SKM 300GA123D



SEMITRANS® 4

IGBT Modules

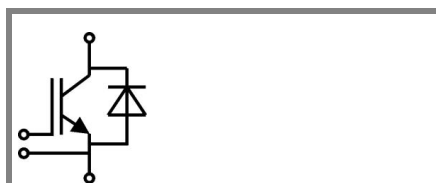
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Features

- MOS input (voltage controlled)
- N channel, Homogeneous Si
- Low inductance case
- Very low tail current with low temperature dependence
- High short circuit capability, self limiting to $6 \times I_{Cnom}$
- Latch-up free
- Fast & soft inverse CAL diodes
- Isolated copper baseplate using DCB Direct Copper Bonding Technology
- Large clearance (12 mm) and creepage distances (20 mm)

Typical Applications

- Switching (not for linear use)



GA

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	$T_j = 150^\circ\text{C}$	$T_{case} = 25^\circ\text{C}$		300	A
		$T_{case} = 80^\circ\text{C}$		220	A
I_{CRM}	$I_{CRM} = 2 \times I_{Cnom}$			400	A
V_{GES}				± 20	V
t_{psc}	$V_{CC} = 600\text{ V}; V_{GE} \leq 20\text{ V}; T_j = 125^\circ\text{C}$ $V_{CES} < 1200\text{ V}$			10	μs
Inverse Diode					
I_F	$T_j = 150^\circ\text{C}$	$T_{case} = 25^\circ\text{C}$		300	A
		$T_{case} = 80^\circ\text{C}$		200	A
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$			400	A
I_{FSM}	$t_p = 10\text{ ms; sin.}$	$T_j = 150^\circ\text{C}$		2200	A
Module					
$I_{t(RMS)}$				500	A
T_{vj}				- 40 ... + 150 (125)	$^\circ\text{C}$
T_{stg}				- 40...+ 125	$^\circ\text{C}$
V_{isol}	AC, 1 min.			2500	V

Characteristics			T _c = 25 °C, unless otherwise specified			
Symbol	Conditions		min.	typ.	max.	Units
IGBT						
V _{GE(th)}	V _{GE} = V _{CE} , I _C = 8 mA		4,5	5,5	6,5	V
I _{CES}	V _{GE} = 0 V, V _{CE} = V _{CES}	T _j = 25 °C		0,1	0,3	mA
V _{CE0}		T _j = 25 °C		1,4	1,6	V
		T _j = 125 °C		1,6	1,8	V
r _{CE}	V _{GE} = 15 V	T _j = 25°C		5,5	7	mΩ
		T _j = 125°C		7,5	9,5	mΩ
V _{CE(sat)}	I _{Cnom} = 200 A, V _{GE} = 15 V	T _j = °C _{chiplev.}		2,5	3	V
C _{ies}	V _{CE} = 25, V _{GE} = 0 V	f = 1 MHz		15	19	nF
C _{oes}				2	2,6	nF
C _{res}				1	1,3	nF
Q _G	V _{GE} = -8V - +20V			2000		nC
R _{Gint}	T _j = °C			1,25		Ω
t _{d(on)}	R _{Gon} = 4,7 Ω	V _{CC} = 600V I _{Cnom} = 200A T _j = 125 °C		250	400	ns
t _r				90	160	ns
E _{on}				26		mJ
t _{d(off)}	R _{Goff} = 4,7 Ω			550	700	ns
t _f				70	100	ns
E _{off}				22		mJ
R _{th(j-c)}	per IGBT			0,075		K/W

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Characteristics					
Symbol	Conditions	min.	typ.	max.	Units
Inverse Diode					
$V_F = V_{EC}$	$I_{Fnom} = 200\text{ A}; V_{GE} = 0\text{ V}$ $T_j = 25\text{ }^{\circ}\text{C}_{chiplev.}$ $T_j = 125\text{ }^{\circ}\text{C}_{chiplev.}$		2 1,8	2,5	V V
V_{F0}	$T_j = 25\text{ }^{\circ}\text{C}$ $T_j = 125\text{ }^{\circ}\text{C}$				V V
r_F	$T_j = 25\text{ }^{\circ}\text{C}$ $T_j = 125\text{ }^{\circ}\text{C}$				mΩ mΩ
I_{RRM} Q_{rr} E_{rr}	$I_{Fnom} = 200\text{ A}$ $V_{GE} = 0\text{ V}; V_{CC} = 600\text{ V}$ $T_j = 25\text{ }^{\circ}\text{C}$		80 11		A μC mJ
$R_{th(j-c)D}$	per diode			0,15	K/W
Module					
L_{CE}			15	20	nH
$R_{CC'+EE'}$	res., terminal-chip $T_{case} = 25\text{ }^{\circ}\text{C}$ $T_{case} = 125\text{ }^{\circ}\text{C}$		0,18 0,22		mΩ 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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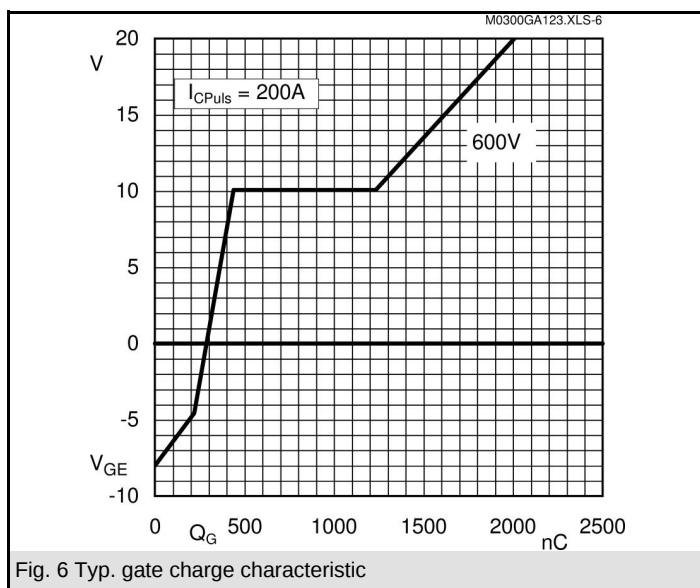
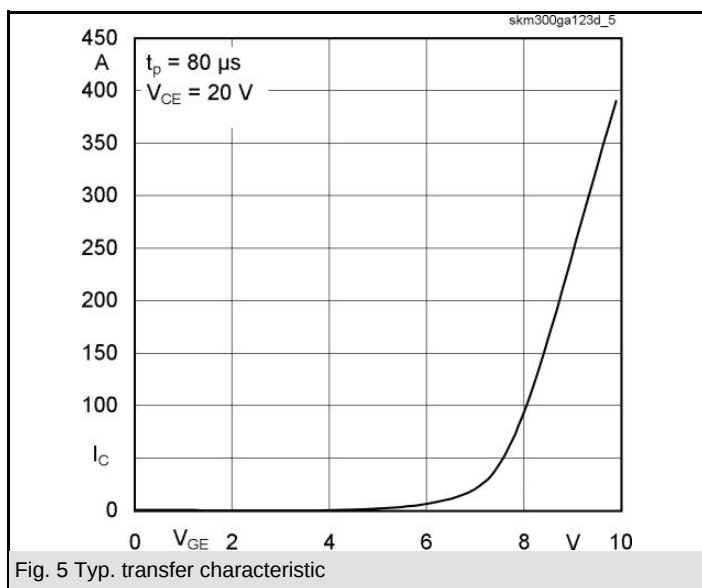
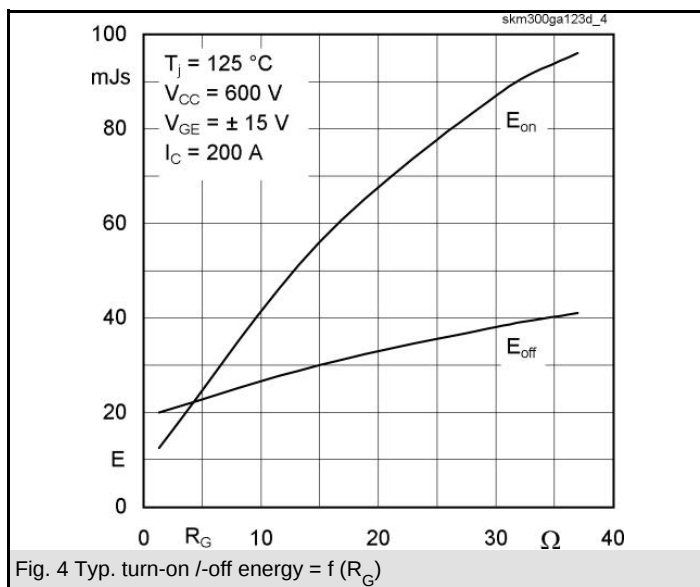
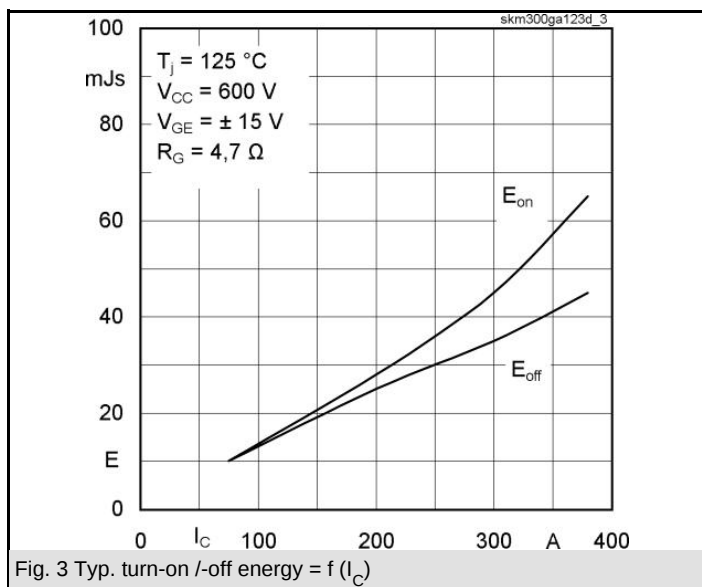
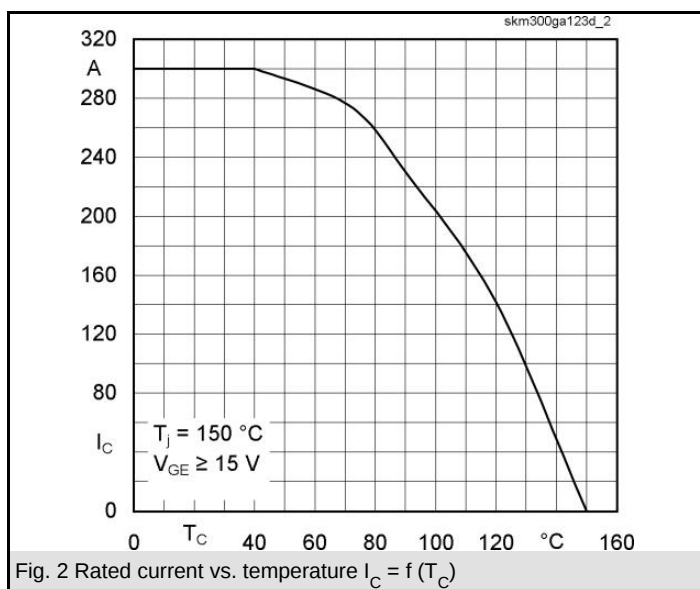
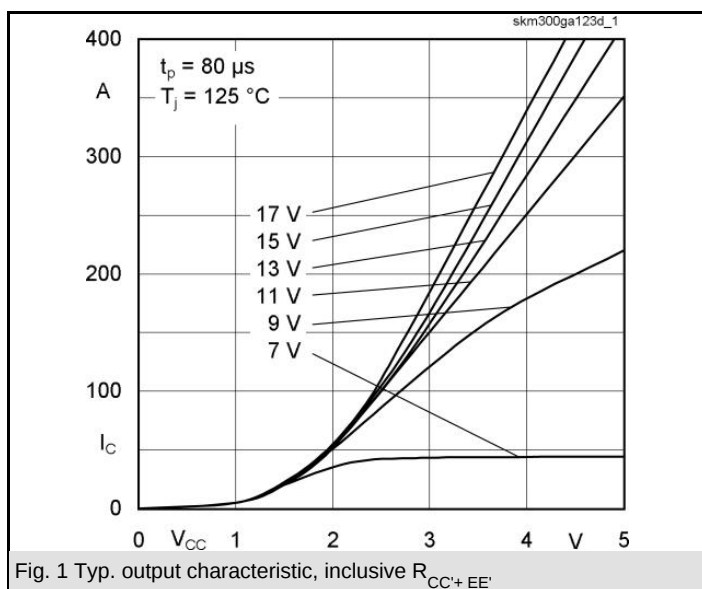
Typical Applications

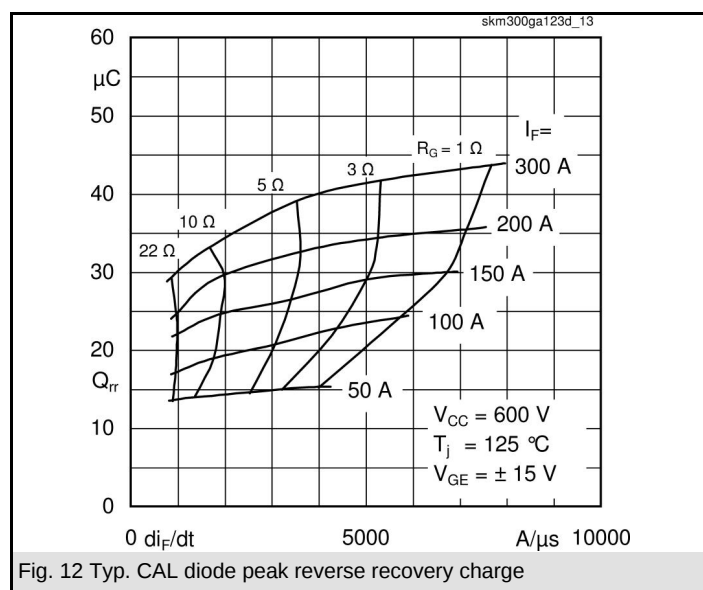
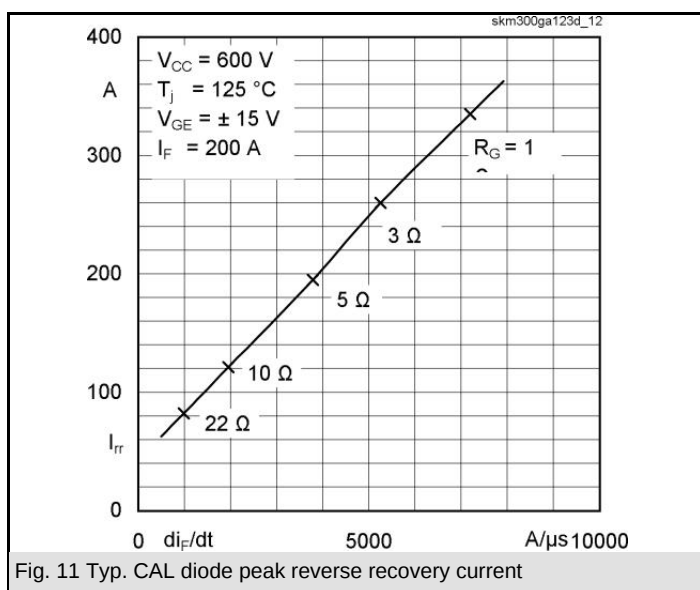
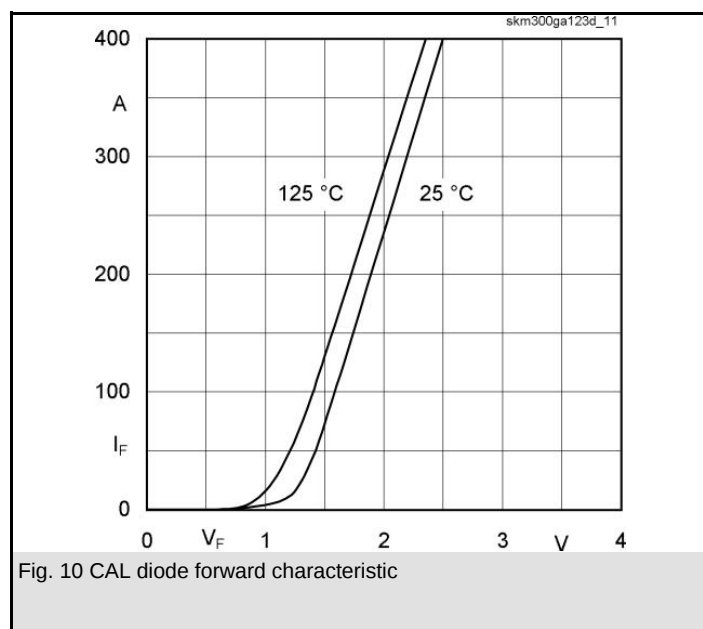
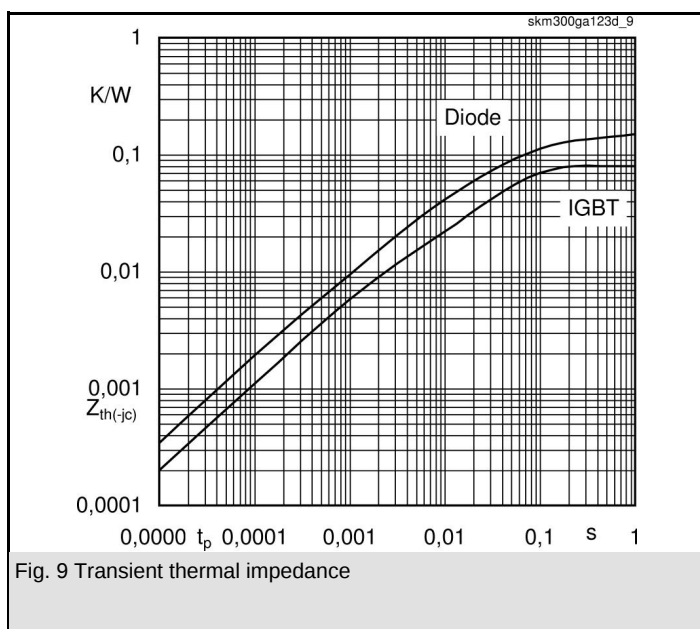
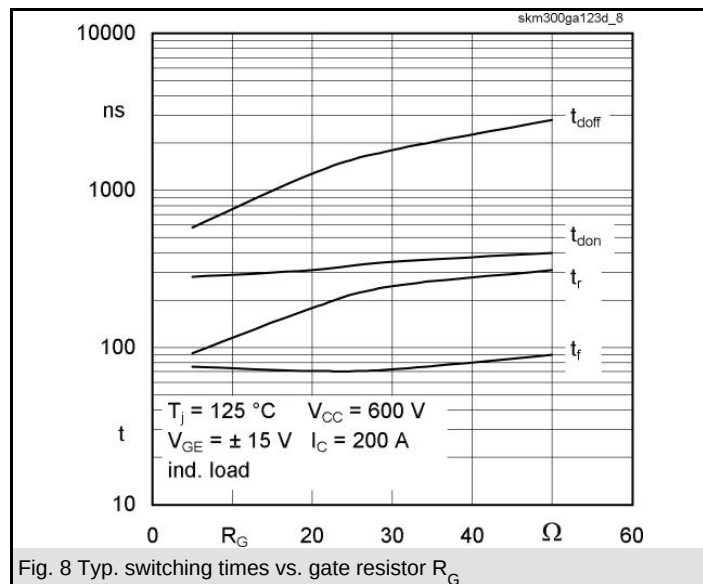
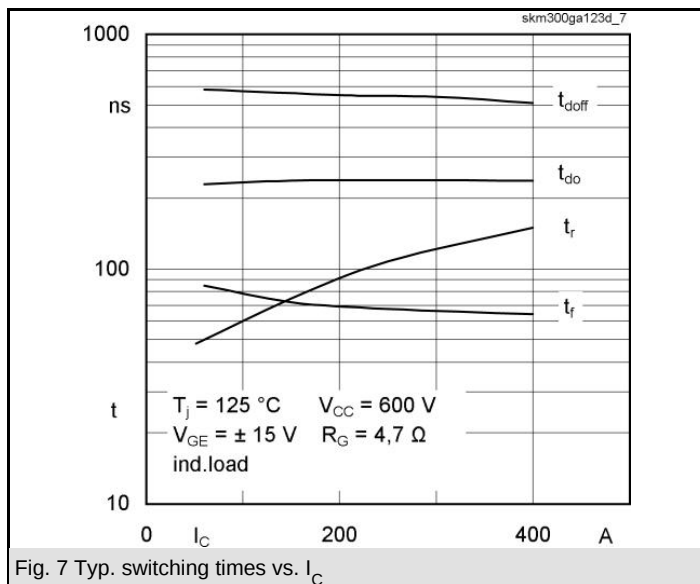
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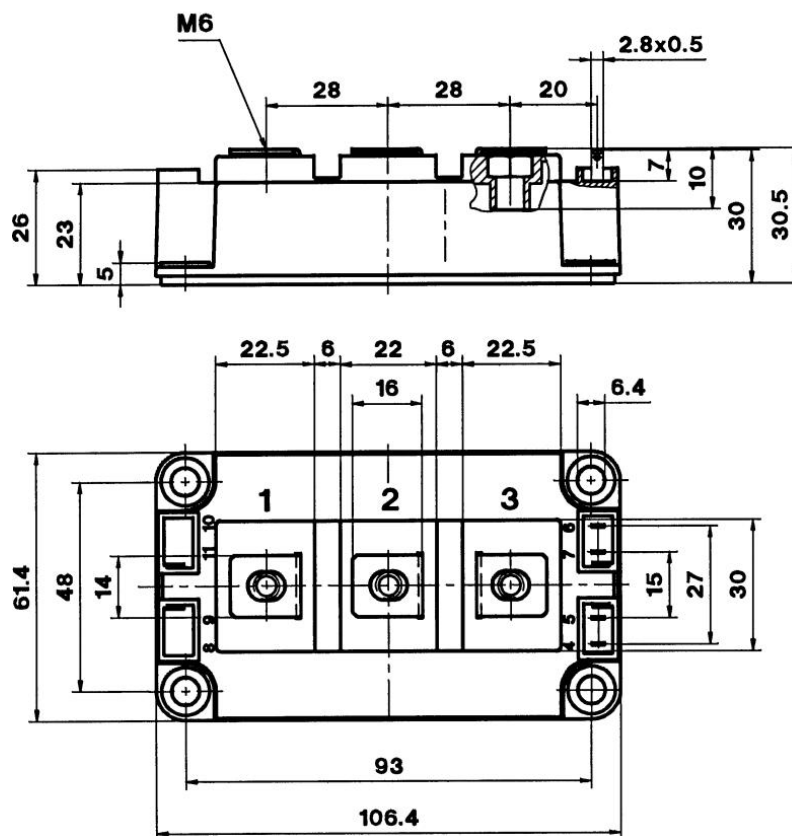
Z_{th}			
Symbol	Conditions	Values	Units
$Z_{th(j-c)I}$			
R_i	$i = 1$	53	mk/W
R_i	$i = 2$	18,5	mk/W
R_i	$i = 3$	3,1	mk/W
R_i	$i = 4$	0,4	mk/W
τ_{u_i}	$i = 1$	0,04	s
τ_{u_i}	$i = 2$	0,0189	s
τ_{u_i}	$i = 3$	0,0017	s
τ_{u_i}	$i = 4$	0,003	s
$Z_{th(j-c)D}$			
R_i	$i = 1$	85	mk/W
R_i	$i = 2$	30	mk/W
R_i	$i = 3$	8,8	mk/W
R_i	$i = 4$	1,2	mk/W
τ_{u_i}	$i = 1$	0,04	s
τ_{u_i}	$i = 2$	0,0044	s
τ_{u_i}	$i = 3$	0,0078	s
τ_{u_i}	$i = 4$	0,005	s



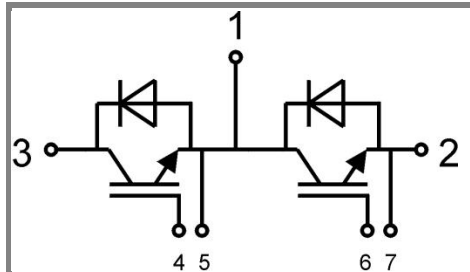
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Case D 59



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Case D 59