



SEMITRANS® 2N

Ultra Fast IGBT Module

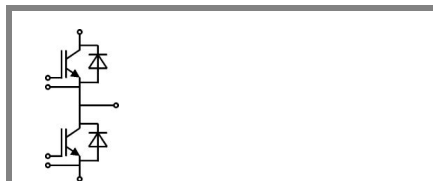
SKM 100GB125DN

Features

- N channel, homogeneous Si
- Low inductance case
- Short tail current with low temperature dependence
- High short circuit capability, self limiting to $6 \times I_{Cnom}$
- Fast & soft inverse CAL diodes
- Isolated copper baseplate using DCB Direct Copper Bonding Technology
- Large clearance (10 mm) and creepage distances (20 mm)

Typical Applications

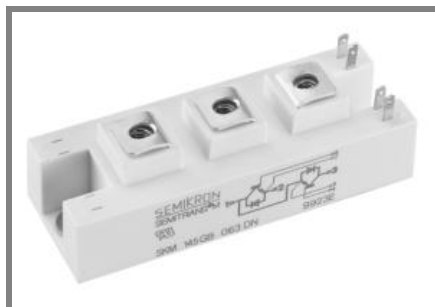
- Switched mode power supplies at $f_{sw} > 20$ kHz
- Resonant inverters up to 100 kHz
- Inductive heating
- Electronic welders at $f_{sw} > 20$ kHz



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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	$T_j = 150^\circ\text{C}$	$T_{case} = 25^\circ\text{C}$		100	A
		$T_{case} = 85^\circ\text{C}$		80	A
I_{CRM}	$I_{CRM} = 2 \times I_{Cnom}$			150	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	$T_j = 150^\circ\text{C}$	$T_{case} = 25^\circ\text{C}$		95	A
		$T_{case} = 80^\circ\text{C}$		65	A
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$			150	A
I_{FSM}	$t_p = 10\text{ ms}; \sin.$	$T_j = 150^\circ\text{C}$		720	A
Module					
$I_{t(RMS)}$				200	A
T_{vj}				- 40 ... + 150	$^\circ\text{C}$
T_{stg}				125	$^\circ\text{C}$
V_{isol}	AC, 1 min.			4000	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 = 2 mA		4,5	5,5	6,5	V
I _{CES}	V _{GE} = 0 V, V _{CE} = V _{CES}	T _j = 25 °C T _j = 125 °C		0,15	0,45	mA mA
V _{CE0}		T _j = 25 °C T _j = 125 °C				V V
r _{CE}	V _{GE} = 15 V	T _j = 25°C T _j = 125°C				mΩ mΩ
V _{CE(sat)}	I _{Cnom} = 75 A, V _{GE} = 15 V	T _j = °C _{chiplev.}		3,3	3,85	V
C _{ies}	V _{CE} = 25, V _{GE} = 0 V	f = 1 MHz		5	6,6	nF
C _{oes}				0,72	0,9	nF
C _{res}				0,38	0,5	nF
Q _G	V _{GE} = 0 - +20V			650		nC
R _{Gint}	T _j = °C			5		Ω
t _{d(on)}	R _{Gon} = 8 Ω	V _{CC} = 600V I _C = 75A T _j = 125 °C V _{GE} = ± 15V		80		ns
t _r				40		ns
E _{on}			9		mJ	
t _{d(off)}	R _{Goff} = 8 Ω			360		ns
t _f				20		ns
E _{off}				3,5		mJ
R _{th(j-c)}	per IGBT				0,18	K/W



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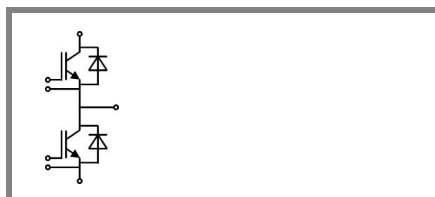
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Characteristics					
Symbol	Conditions	min.	typ.	max.	Units
Inverse Diode					
$V_F = V_{EC}$	$I_{F\text{nom}} = 75 \text{ A}; V_{GE} = 0 \text{ V}$				
	$T_j = 25 \text{ }^\circ\text{C}_{\text{chiplev.}}$		2	2,5	V
	$T_j = 125 \text{ }^\circ\text{C}_{\text{chiplev.}}$		1,8		V
V_{F0}	$T_j = \text{ }^\circ\text{C}$		1,1	1,2	V
r_F	$T_j = \text{ }^\circ\text{C}$		12	17,3	mΩ
I_{RRM}	$I_F = 75 \text{ A}$		50		A
Q_{rr}	$di/dt = 800 \text{ A}/\mu\text{s}$		11,5		μC
E_{rr}	$V_{GE} = 0 \text{ V}; V_{CC} = 600 \text{ V}$				mJ
$R_{th(j-c)D}$	per diode			0,5	K/W
Module					
L_{CE}			20	25	nH
$R_{CC'+EE'}$	res., terminal-chip		0,75		mΩ
	$T_{\text{case}} = 25 \text{ }^\circ\text{C}$		1		mΩ
	$T_{\text{case}} = 125 \text{ }^\circ\text{C}$				
$R_{th(c-s)}$	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				160	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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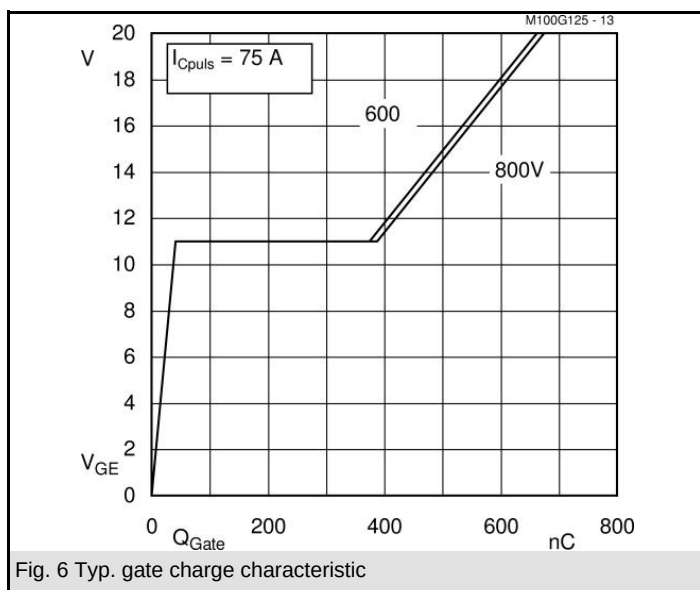
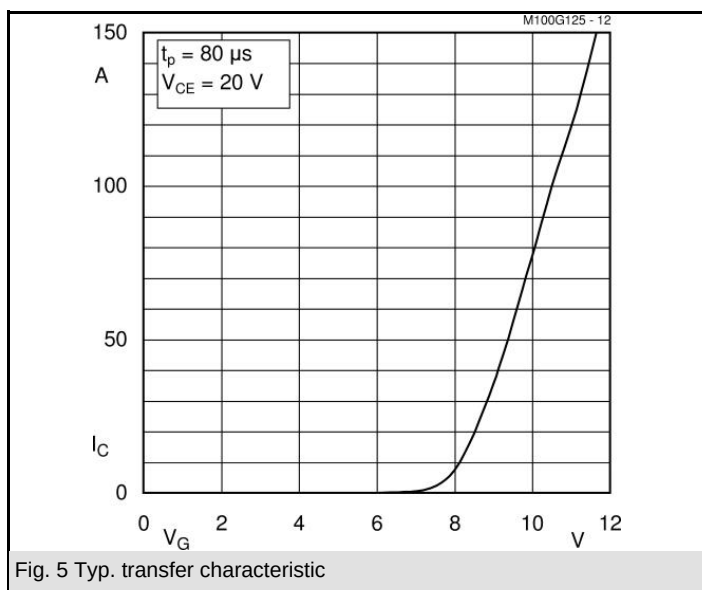
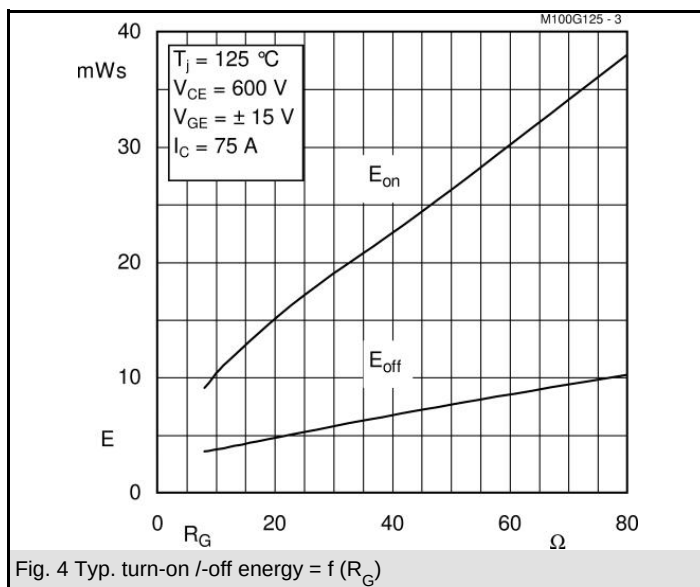
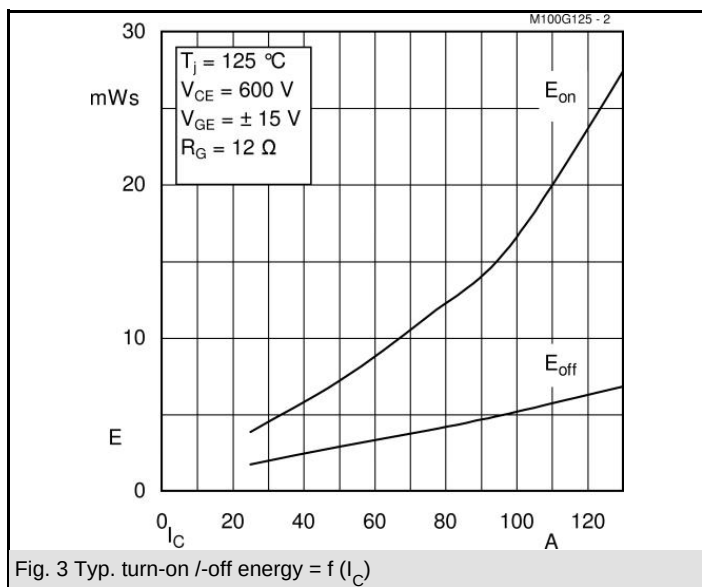
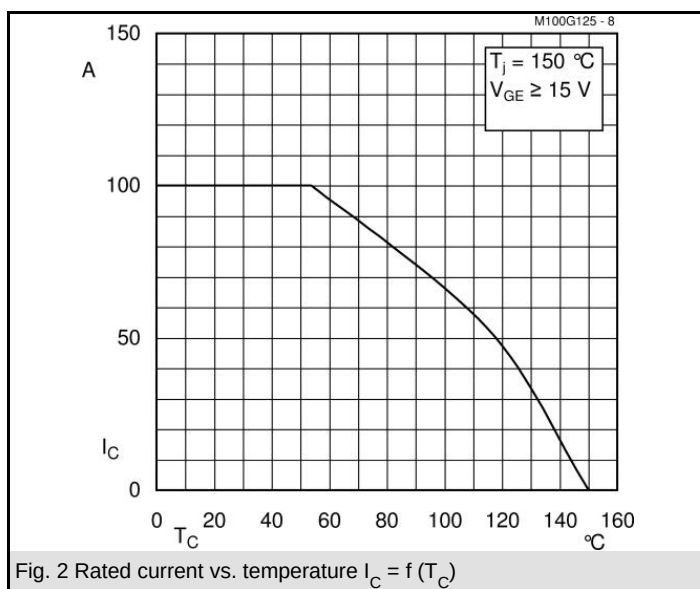
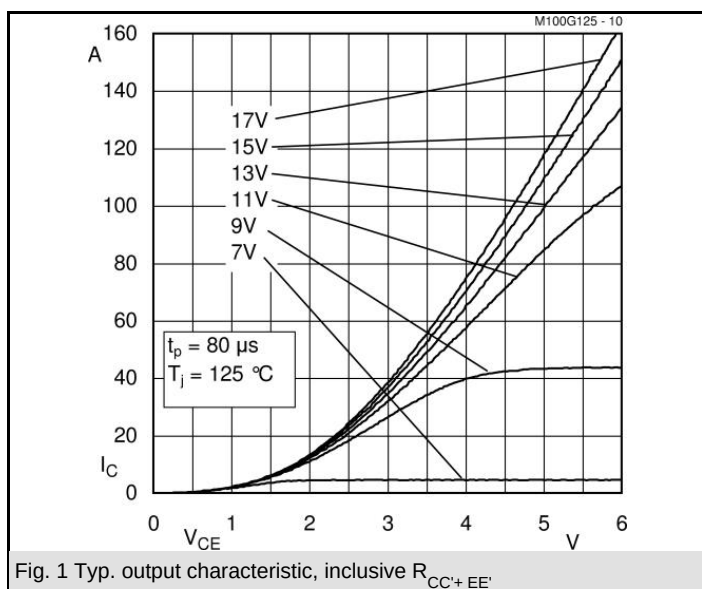
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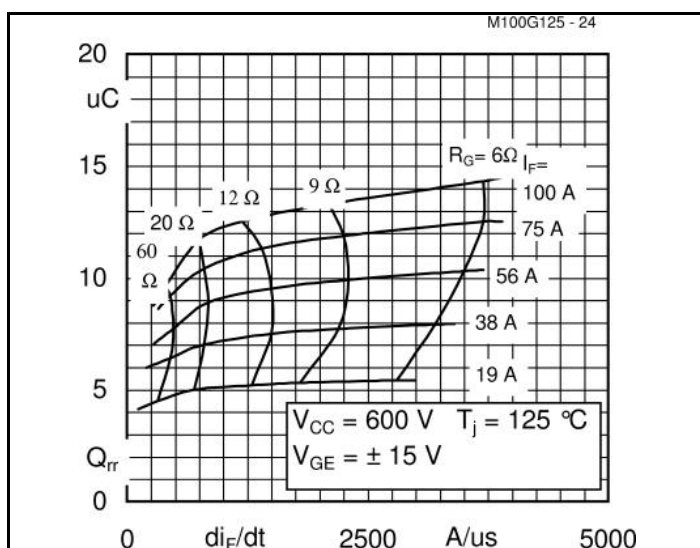
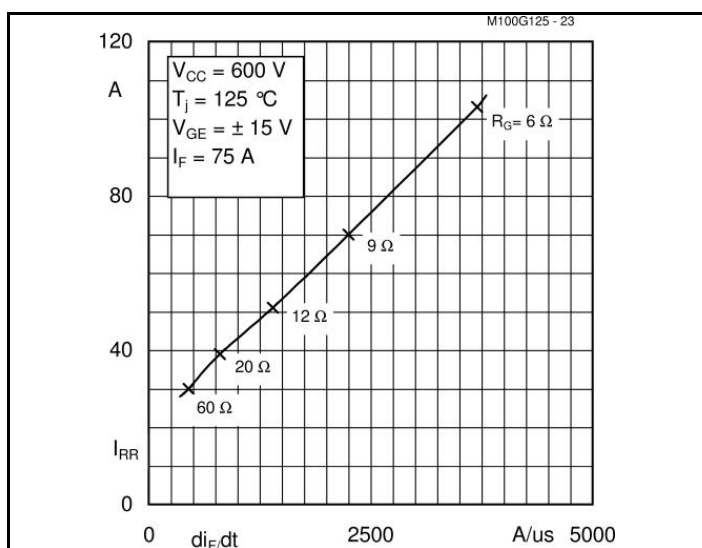
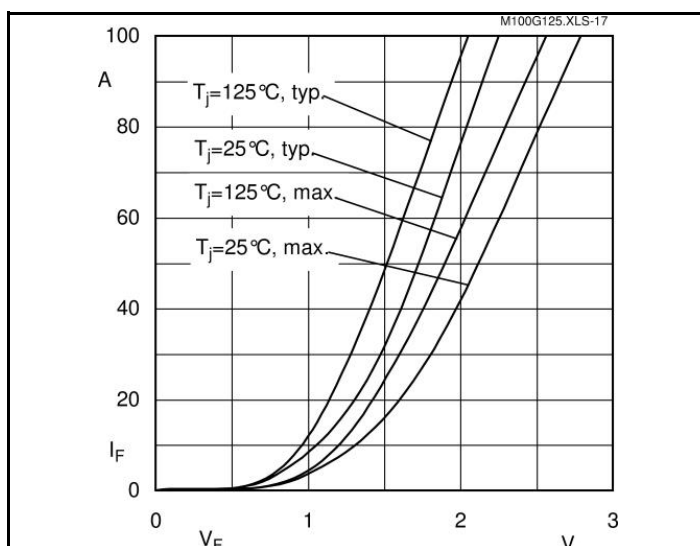
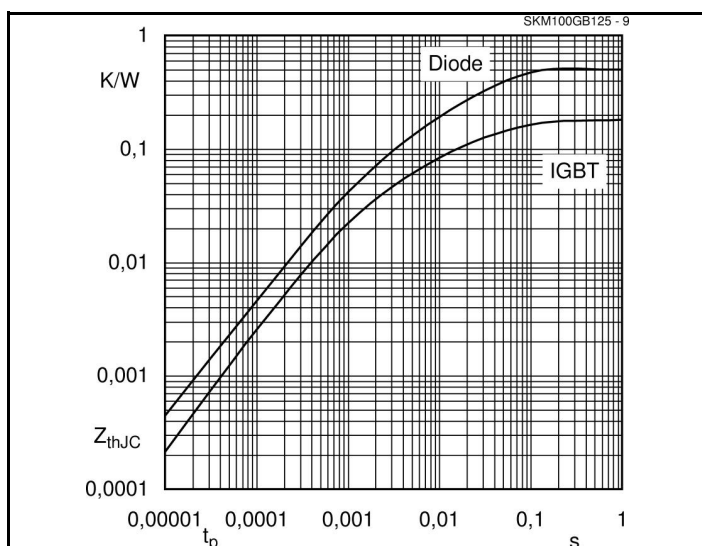
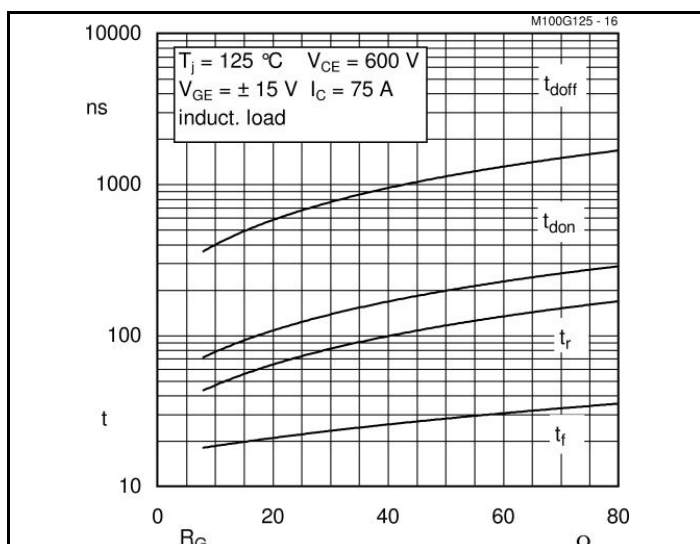
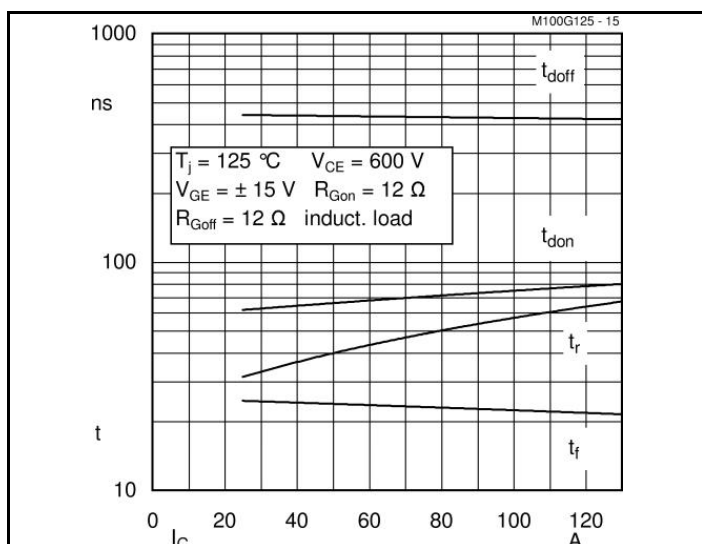
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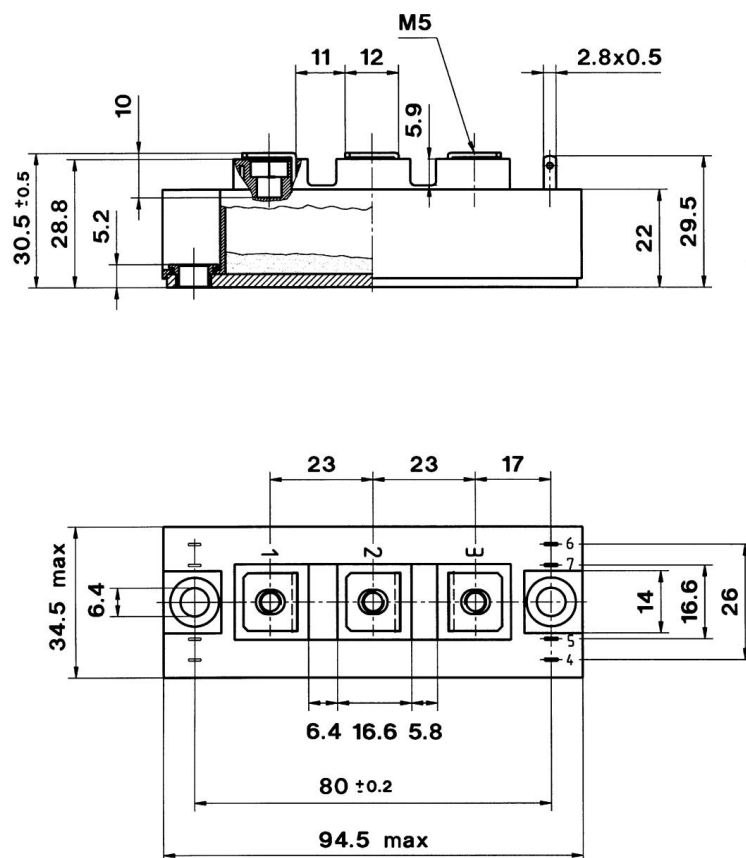


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Z_{th}			
Symbol	Conditions	Values	Units
$Z_{th(j-c)I}$			
R_i	$i = 1$	95	mk/W
R_i	$i = 2$	65	mk/W
R_i	$i = 3$	17,5	mk/W
R_i	$i = 4$	2,5	mk/W
τ_{ui}	$i = 1$	0,0327	s
τ_{ui}	$i = 2$	0,008	s
τ_{ui}	$i = 3$	0,0017	s
τ_{ui}	$i = 4$	0,008	s
$Z_{th(j-c)D}$			
R_i	$i = 1$	300	mk/W
R_i	$i = 2$	160	mk/W
R_i	$i = 3$	36	mk/W
R_i	$i = 4$	4	mk/W
τ_{ui}	$i = 1$	0,054	s
τ_{ui}	$i = 2$	0,001	s
τ_{ui}	$i = 3$	0,0015	s
τ_{ui}	$i = 4$	0,1	s

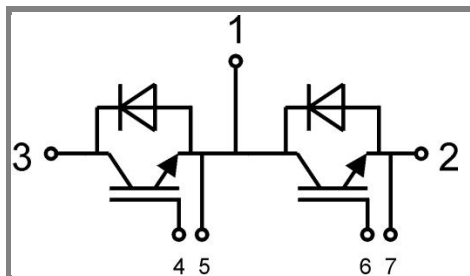






CASED93

Case D 93



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Case D 93