



SEMITRANS® 2

Trench IGBT Modules

SKM 195GB126D

SKM 195GAL126D

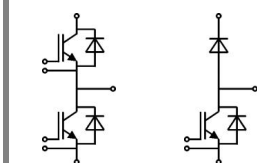
Preliminary Data

Features

- 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



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Absolute Maximum Ratings		T _{case} = 25°C, unless otherwise specified		
Symbol	Conditions		Values	Units
IGBT				
V _{CES}	T _j = 25 °C		1200	V
I _C	T _j = 150 °C	T _c = 25 °C	220	A
		T _c = 80 °C	160	A
I _{CRM}	I _{CRM} =2xI _{Cnom}		300	A
V _{GES}			± 20	V
t _{psc}	V _{CC} = 600 V; V _{GE} ≤ 20 V; T _j = 125 °C V _{CES} < 1200 V		10	μs
Inverse Diode				
I _F	T _j = 150 °C	T _c = 25 °C	170	A
		T _c = 80 °C	115	A
I _{FRM}	I _{FRM} =2xI _{Fnom}		200	A
I _{FSM}	t _p = 10 ms; sin. T _j = 150 °C		900	A
Freewheeling Diode				
I _F	T _j = 150 °C	T _c = 25 °C	170	A
		T _c = 80 °C	115	A
I _{FRM}	I _{FRM} =2xI _{Fnom}		200	A
I _{FSM}	t _p = 10 ms; sin. T _j = 150 °C		900	A
Module				
I _{t(RMS)}			200	A
T _{vj}			-40 ... +150	°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 = 6 mA		5	5,8	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	1,2	V
		T _j = 125 °C		0,9	1,1	V
r _{CE}	V _{GE} = 0 V	T _j = 25°C		4,7	6,3	mΩ
		T _j = 125°C		7,3	9	mΩ
V _{CE(sat)}	I _{Cnom} = 150 A, V _{GE} = 15 V	T _j = 25°C _{chiplev.}		1,7	2,15	V
		T _j = 125°C _{chiplev.}		2	2,45	V
C _{ies}	V _{CE} = 25, V _{GE} = 0 V	f = 1 MHz		10,5		nF
C _{oes}				0,9		nF
C _{res}				0,8		nF
Q _G	V _{GE} = -8V ...+20V			1380		nC
R _{Gint}	T _j = °C			5		Ω
t _{d(on)}	R _{Gon} = 2 Ω	V _{CC} = 600V I _{Cnom} = 150A T _j = 125 °C V _{GE} = ± 15V		280		ns
t _r				50		ns
E _{on}			16		mJ	
t _{d(off)}	R _{Goff} = 2 Ω			560		ns
t _f				70		ns
E _{off}			24,5		mJ	
R _{th(j-c)}	per IGBT				0,16	K/W



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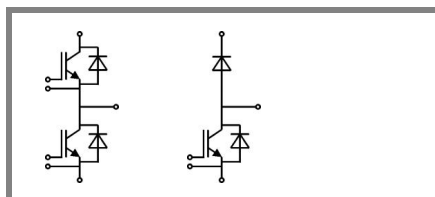
Typical Applications

- AC inverter drives
- UPS
- Electronic welders

Characteristics					
Symbol	Conditions	min.	typ.	max.	Units
Inverse Diode					
$V_F = V_{EC}$	$I_{Fnom} = 100 \text{ A}; V_{GE} = 0 \text{ V}$				
	$T_j = 25 \text{ }^\circ\text{C}_{chiplev.}$		2	2,5	V
	$T_j = 125 \text{ }^\circ\text{C}_{chiplev.}$		1,8		V
V_{F0}					
	$T_j = 25 \text{ }^\circ\text{C}$		1,1	1,2	V
	$T_j = 125 \text{ }^\circ\text{C}$				V
r_F					
	$T_j = 25 \text{ }^\circ\text{C}$		9	13	mΩ
	$T_j = 125 \text{ }^\circ\text{C}$				mΩ
I_{RRM}	$I_{Fnom} = 150 \text{ A}$		86		A
Q_{rr}	$di/dt = 2200 \text{ A}/\mu\text{s}$		17		μC
E_{rr}	$V_{GE} = -15 \text{ V}; V_{CC} = 600 \text{ V}$		5,8		mJ
$R_{th(j-c)D}$	per diode			0,32	K/W
Freewheeling diode					
$V_F = V_{EC}$	$I_{Fnom} = 100 \text{ A}; V_{GE} = 0 \text{ V}$				
	$T_j = 25 \text{ }^\circ\text{C}_{chiplev.}$		2	2,5	V
	$T_j = 125 \text{ }^\circ\text{C}_{chiplev.}$		1,8		V
V_{F0}					
	$T_j = 25 \text{ }^\circ\text{C}$		1,1	1,2	V
	$T_j = 125 \text{ }^\circ\text{C}$				V
r_F					
	$T_j = 25 \text{ }^\circ\text{C}$		9	13	V
	$T_j = 125 \text{ }^\circ\text{C}$				V
I_{RRM}	$I_{Fnom} = 150 \text{ A}$		86		A
Q_{rr}	$di/dt = 2200 \text{ A}/\mu\text{s}$		17		μC
E_{rr}	$V_{GE} = -15 \text{ V}; V_{CC} = 600 \text{ V}$		5,8		mJ
$R_{th(j-c)FD}$	per diode			0,32	K/W
Module					
L_{CE}				30	nH
$R_{CC'+EE'}$	res., terminal-chip				
	$T_{case} = 25 \text{ }^\circ\text{C}$		0,75		mΩ
	$T_{case} = 125 \text{ }^\circ\text{C}$		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				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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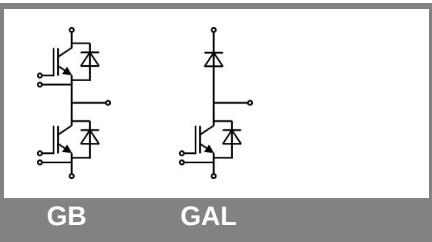
Features

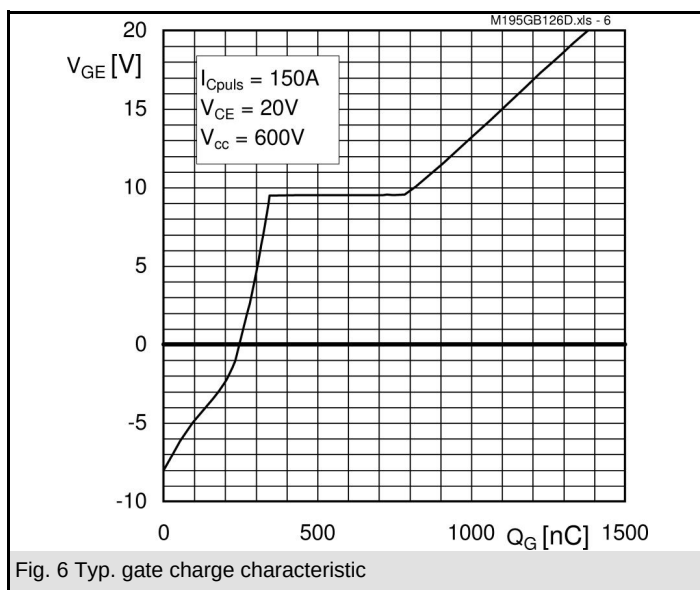
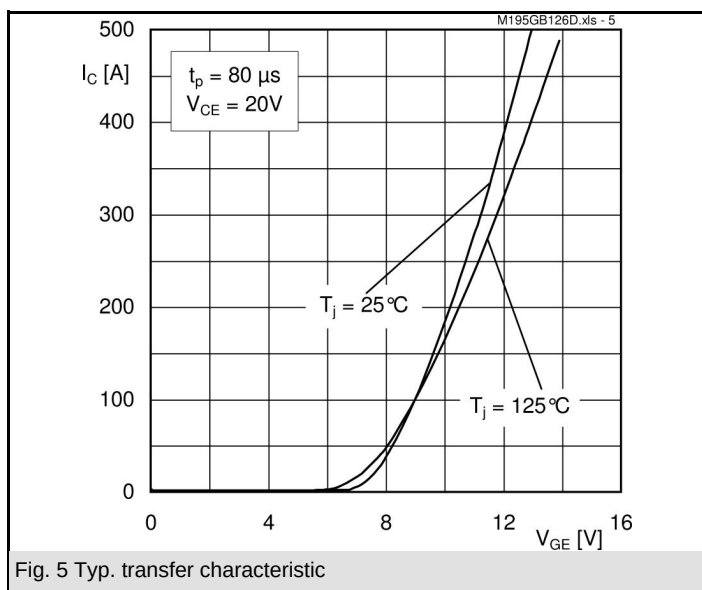
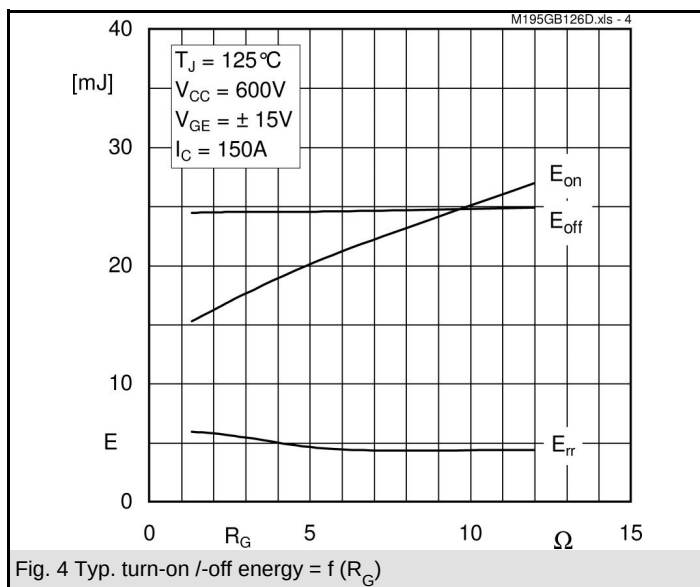
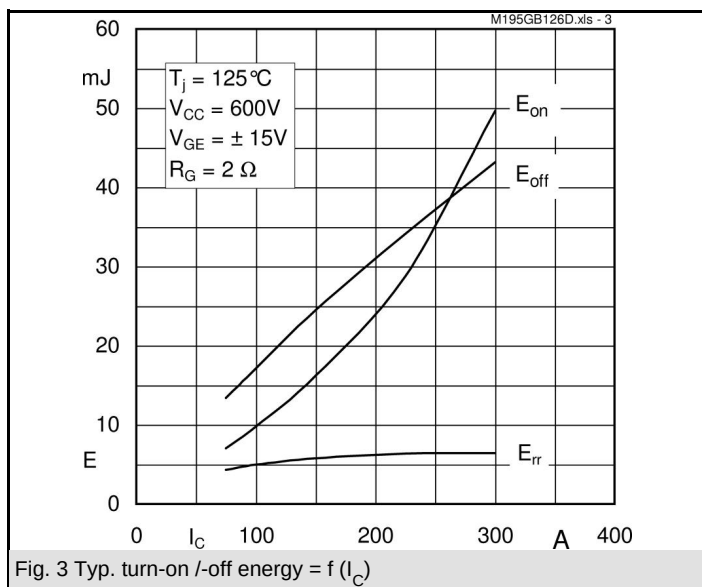
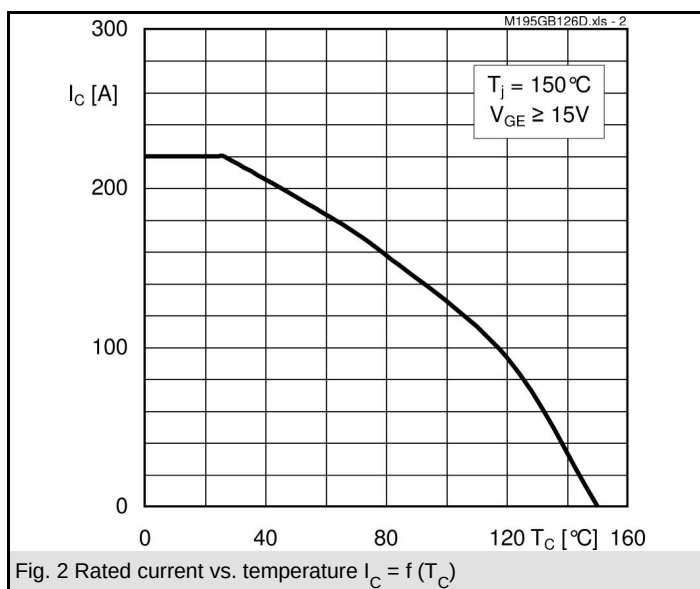
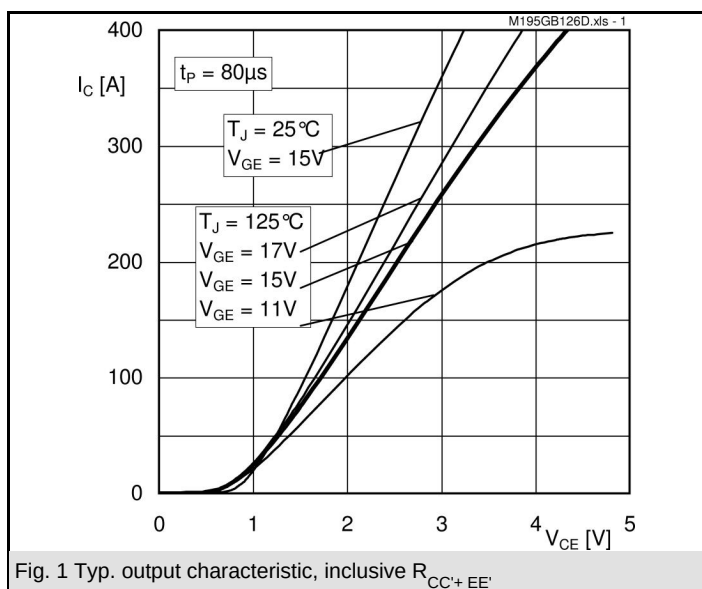
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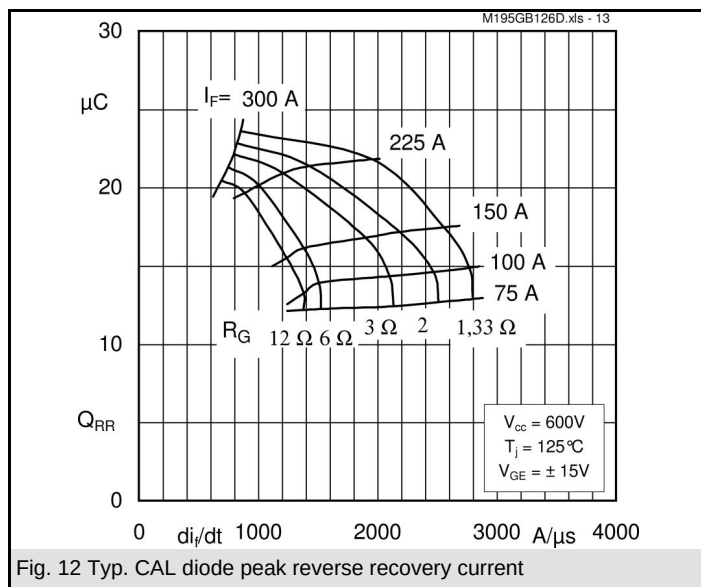
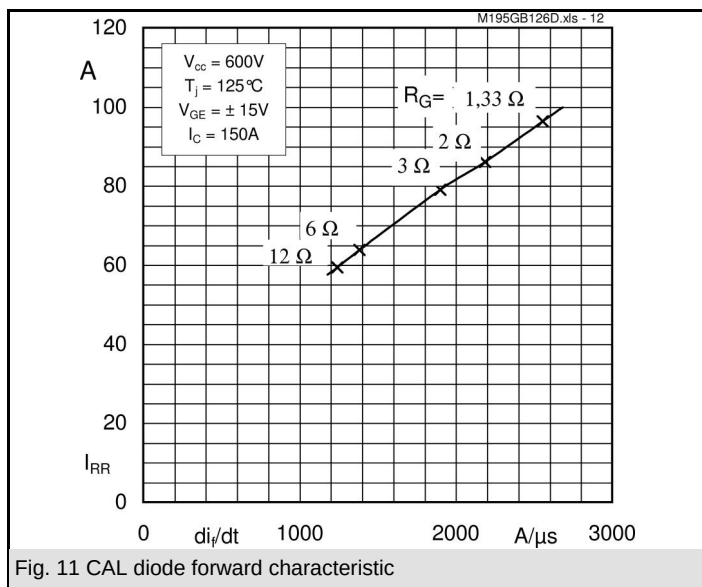
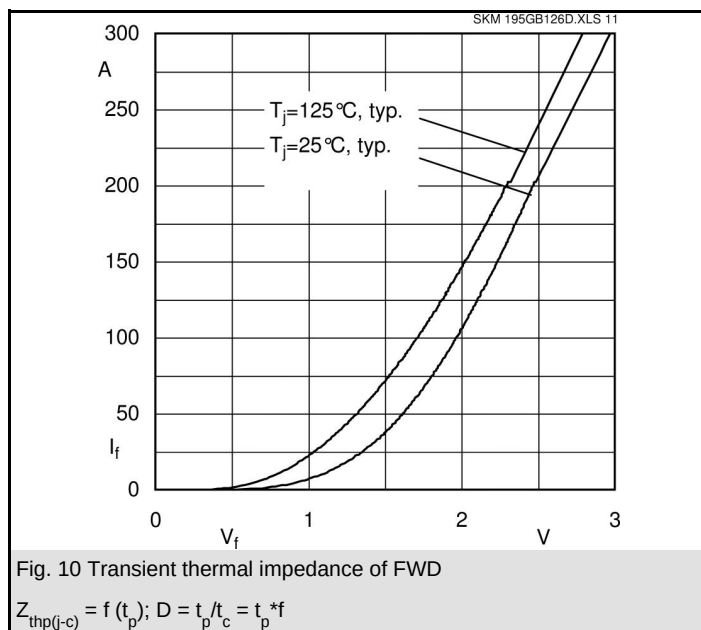
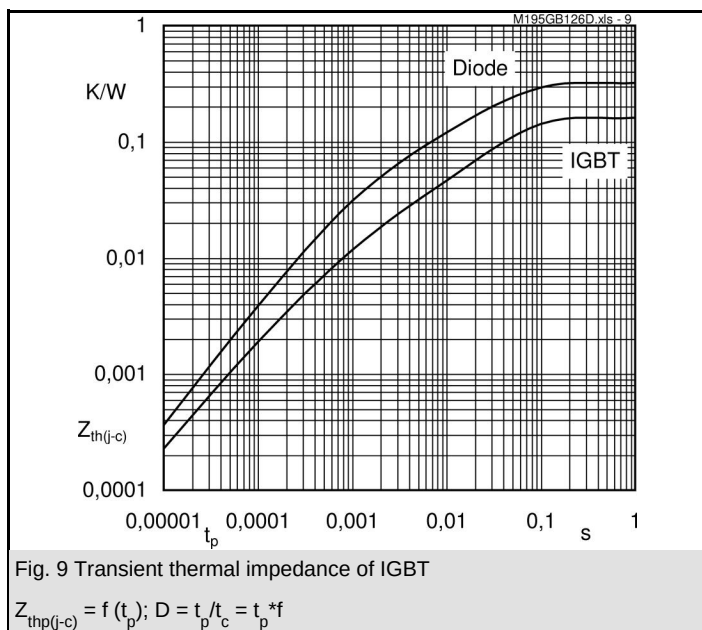
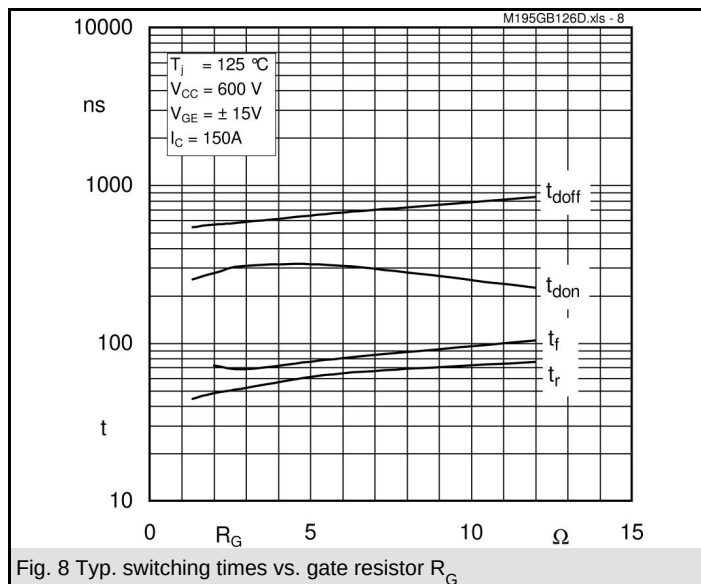
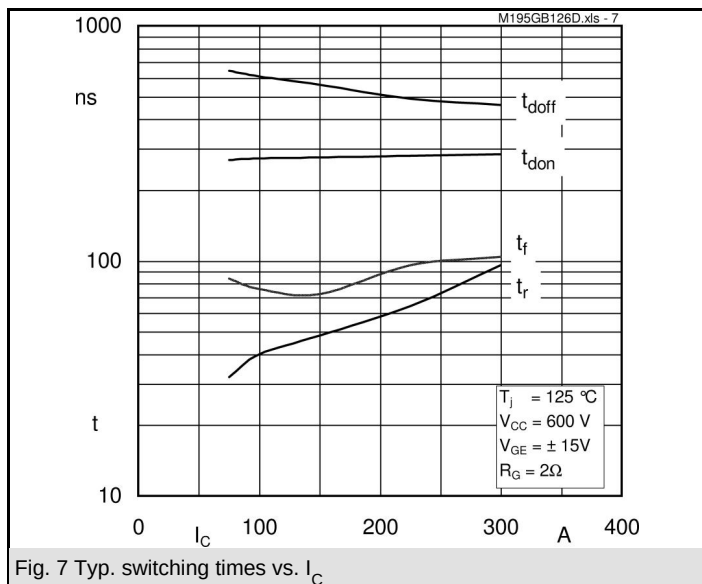
Typical Applications

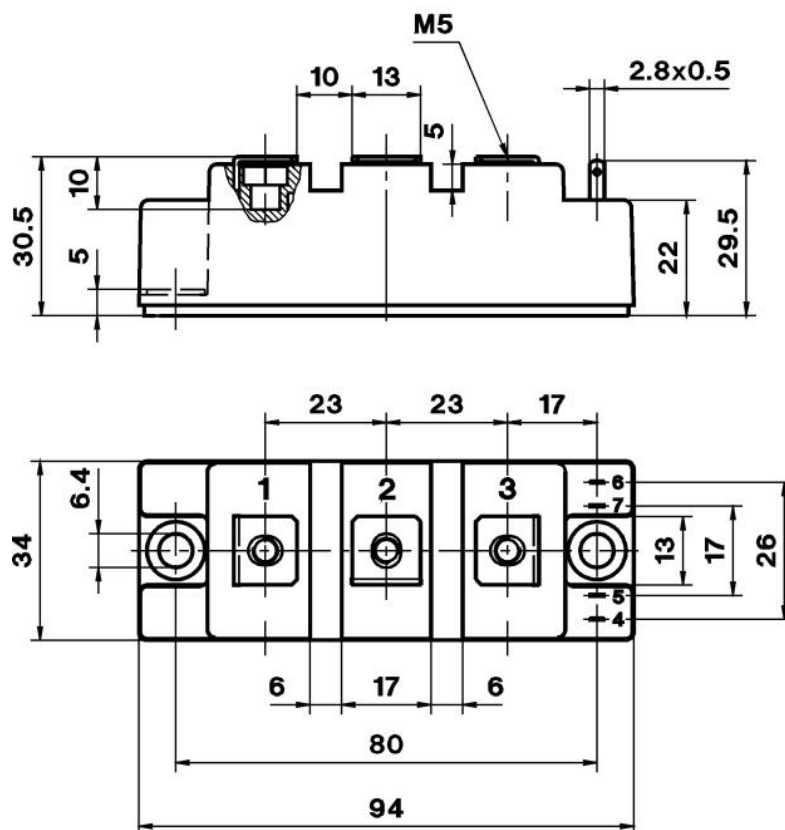
- AC inverter drives
- UPS
- Electronic welders

Z_{th}			
Symbol	Conditions	Values	Units
$Z_{th(j-c)I}$			
R_i	$i = 1$	115	mk/W
R_i	$i = 2$	34	mk/W
R_i	$i = 3$	9	mk/W
R_i	$i = 4$	2	mk/W
τ_{u_i}	$i = 1$	0,0493	s
τ_{u_i}	$i = 2$	0,0174	s
τ_{u_i}	$i = 3$	0,0012	s
τ_{u_i}	$i = 4$	0,0002	s
$Z_{th(j-c)D}$			
R_i	$i = 1$	200	mk/W
R_i	$i = 2$	90	mk/W
R_i	$i = 3$	26	mk/W
R_i	$i = 4$	4	mk/W
τ_{u_i}	$i = 1$	0,054	s
τ_{u_i}	$i = 2$	0,0089	s
τ_{u_i}	$i = 3$	0,001	s
τ_{u_i}	$i = 4$	0,08	s

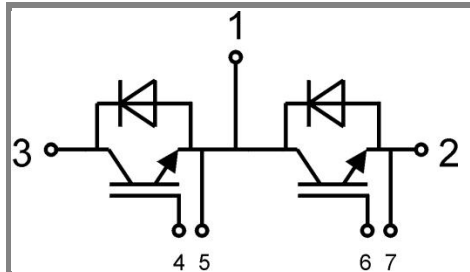






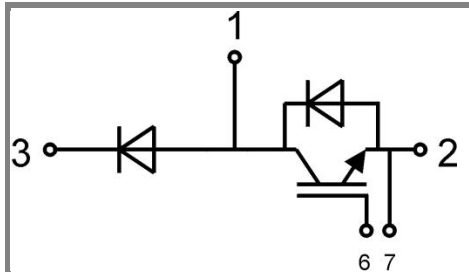


Case D 61



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Case D61



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Case D 62