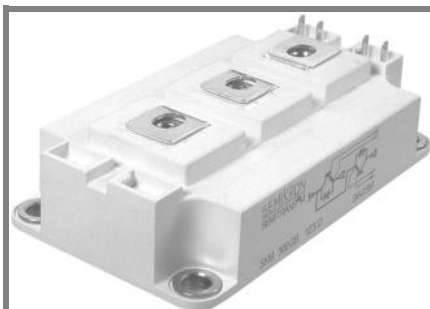




SEMITRANS® 3

Trench IGBT Modules

SKM 300GB066D

Preliminary Data

Features

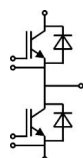
- Homogeneous Si
- Trench = Trenchgate technology
- $V_{CE(sat)}$ with positive temperature coefficient
- High short circuit capability, self limiting to $6 \times I_C$

Typical Applications

- AC inverter drives
- UPS
- Electronic welders

Remarks

- Case temperature limited to $T_C = 125^\circ\text{C}$ max, recommended $T_{op} = -40 \dots +150^\circ\text{C}$
- Product reliability results are valid for $T_j \leq 150^\circ\text{C}$
- Short circuit data: $t_p \leq 6\mu\text{s}$; $V_{GE} \leq 15\text{V}$; $T_j = 150^\circ\text{C}$; $V_{CC} \leq 360\text{V}$, use of soft R_G necessary !
- Take care of over-voltage caused by stray inductances

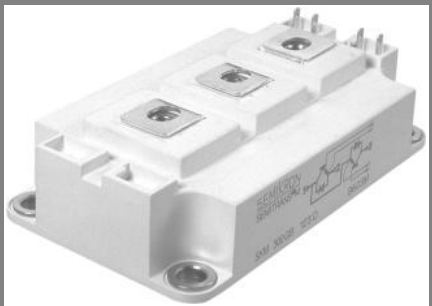


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Absolute Maximum Ratings		T _{case} = 25°C, unless otherwise specified		
Symbol	Conditions		Values	Units
IGBT				
V _{CES}	T _j = 25 °C		600	V
I _C	T _j = 175 °C	T _c = 25 °C	390	A
		T _c = 80 °C	300	A
I _{CRM}	I _{CRM} =2xI _{Cnom}		600	A
V _{GES}			± 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	350	A
		T _c = 80 °C	250	A
I _{FRM}	I _{FRM} =2xI _{Fnom}		600	A
I _{FSM}	t _p = 10 ms; sin. T _j = 175 °C		1760	A
Module				
I _{t(RMS)}			500	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 = 4,8 mA	5	5,8	6,5	V	
I _{CES}	V _{GE} = 0 V, V _{CE} = V _{CES} T _j = 25 °C		0,15	0,45	mA	
V _{CE0}			T _j = 25 °C	0,9	1	V
			T _j = 150 °C	0,85	0,9	V
r _{CE}	V _{GE} = 15 V		T _j = 25°C	1,8	3	mΩ
			T _j = 150°C	2,7	3,8	mΩ
V _{CE(sat)}	I _{Cnom} = 300 A, V _{GE} = 15 V		T _j = 25°C _{chiplev.}	1,45	1,9	V
			T _j = 150°C _{chiplev.}	1,7	2,1	V
C _{ies}	V _{CE} = 25, V _{GE} = 0 V f = 1 MHz		18,5		nF	
C _{oes}			1,2		nF	
C _{res}			0,55		nF	
Q _G	V _{GE} = -8V...+15V		2400		nC	
R _{Gint}	T _j = °C		1		Ω	
t _{d(on)}	R _{Gon} = 2,4 Ω	V _{CC} = 300V I _C = 300A T _j = 150 °C V _{GE} = -8V/+15V	150		ns	
t _r			48		ns	
E _{on}	7,5			mJ		
t _{d(off)}	R _{Goff} = 2,4 Ω		540		ns	
t _f			53		ns	
E _{off}			11,5		mJ	
R _{th(j-c)}	per IGBT			0,15	K/W	

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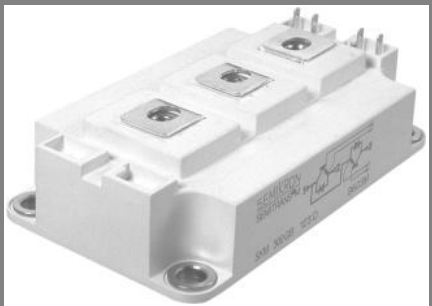
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Characteristics						
Symbol	Conditions		min.	typ.	max.	Units
Inverse Diode						
V _F = V _{EC}	I _{Fnom} = 300 A; V _{GE} = 0 V	T _j = 25 °C _{chiplev.}		1,4	1,6	V
V _{F0}		T _j = 25 °C		0,95	1	V
r _F		T _j = 25 °C		1,5	2	mΩ
I _{RRM}	I _F = 300 A	T _j = 150 °C		340		A
Q _{rr}	di/dt = 7000 A/μs			47		μC
E _{rr}	V _{GE} = -8 V; V _{CC} = 300 V			10,5		mJ
R _{th(j-c)D}	per diode				0,25	K/W
Module						
L _{CE}				15	20	nH
R _{CC'+EE'}	res., terminal-chip	T _{case} = 25 °C		0,35		mΩ
		T _{case} = 125 °C		0,5		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		2,5		5	Nm
w					325	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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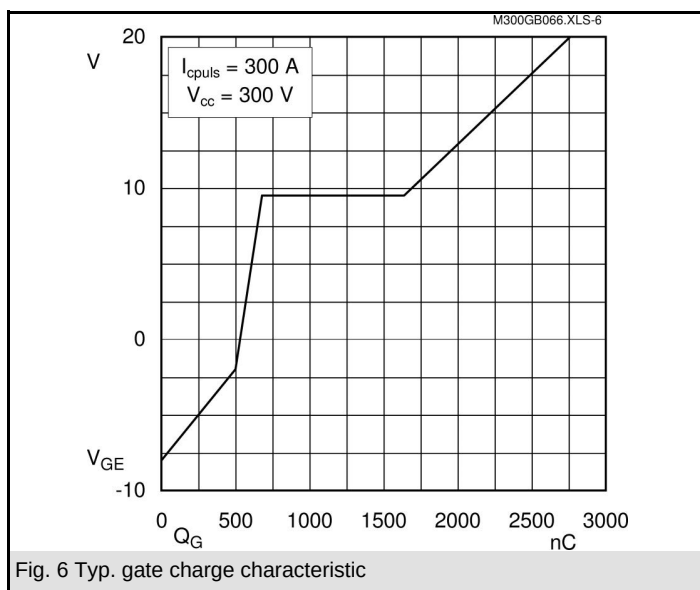
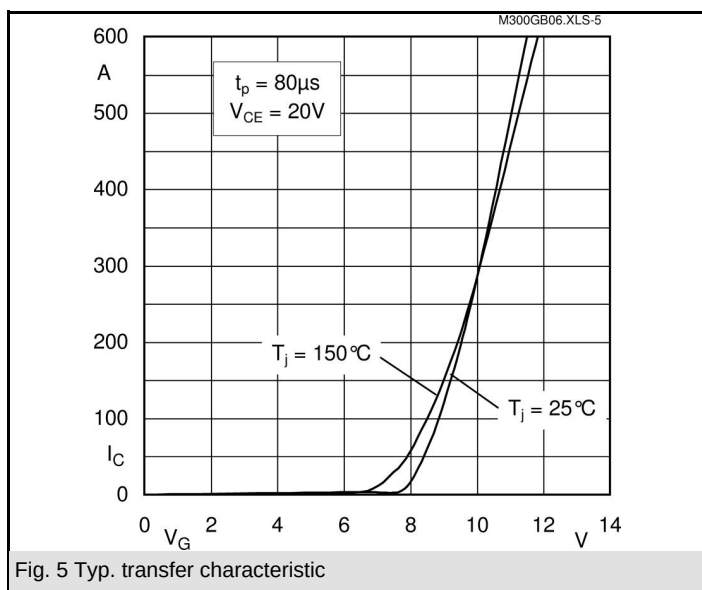
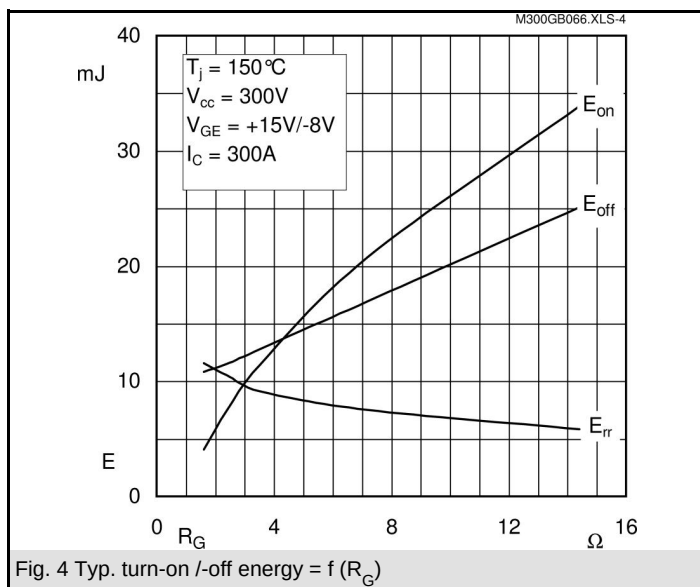
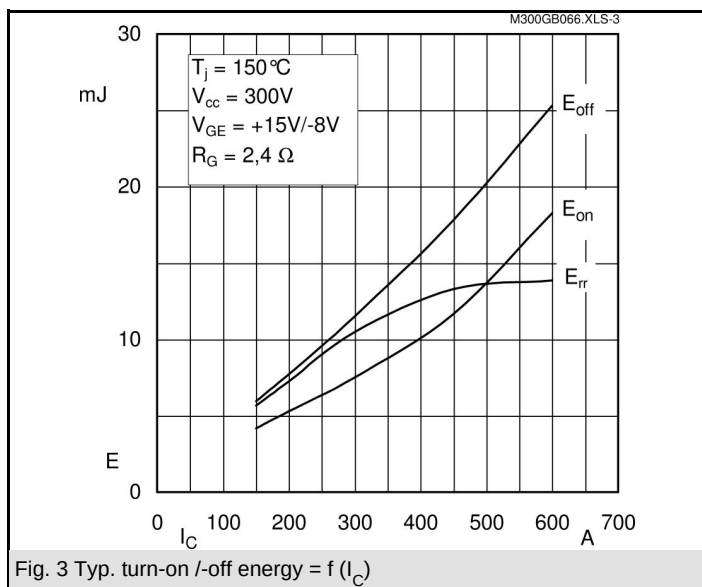
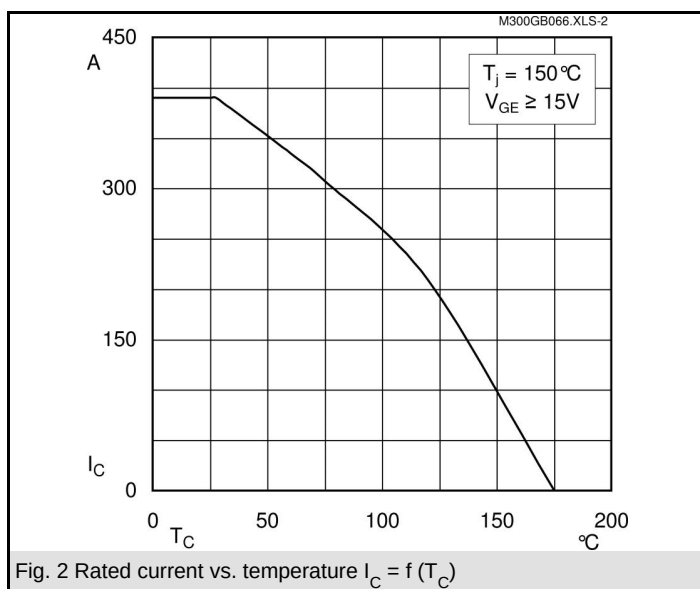
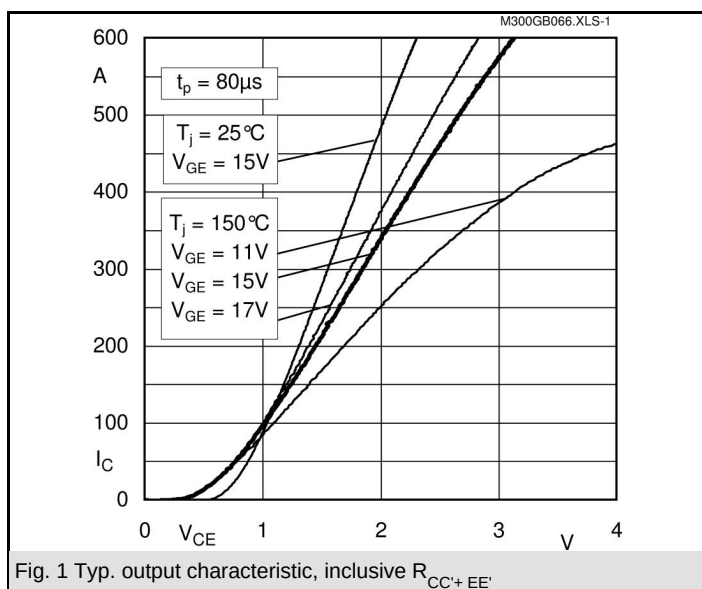
Remarks

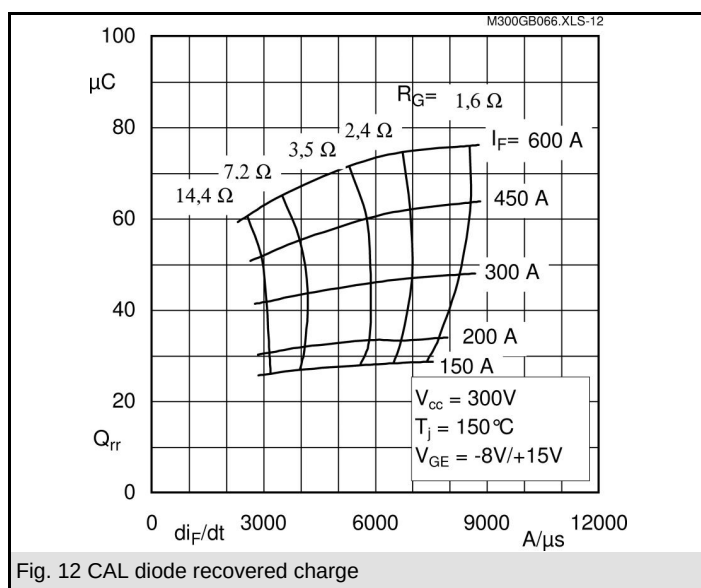
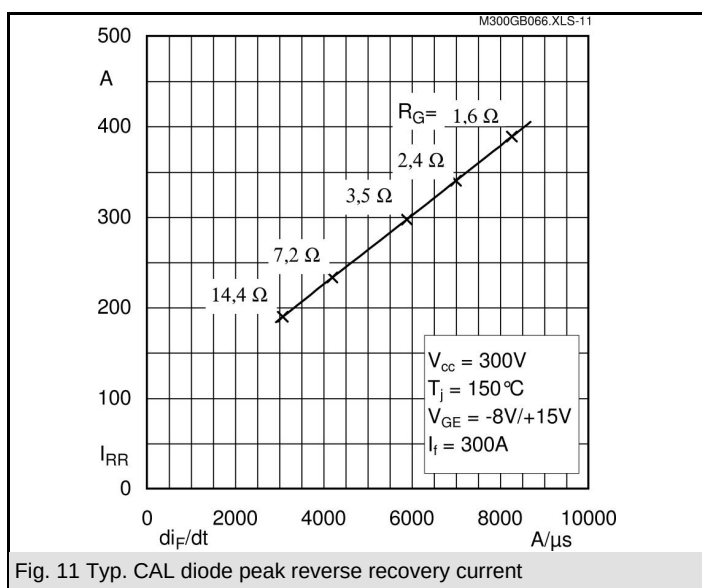
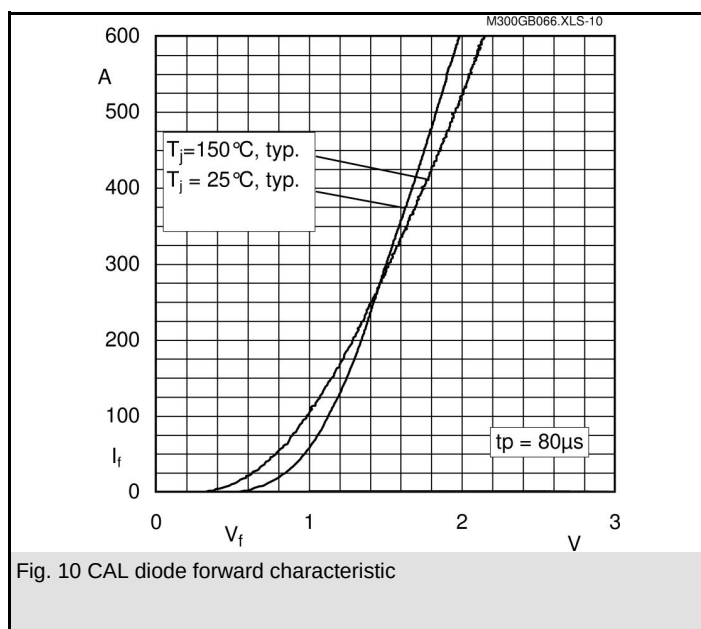
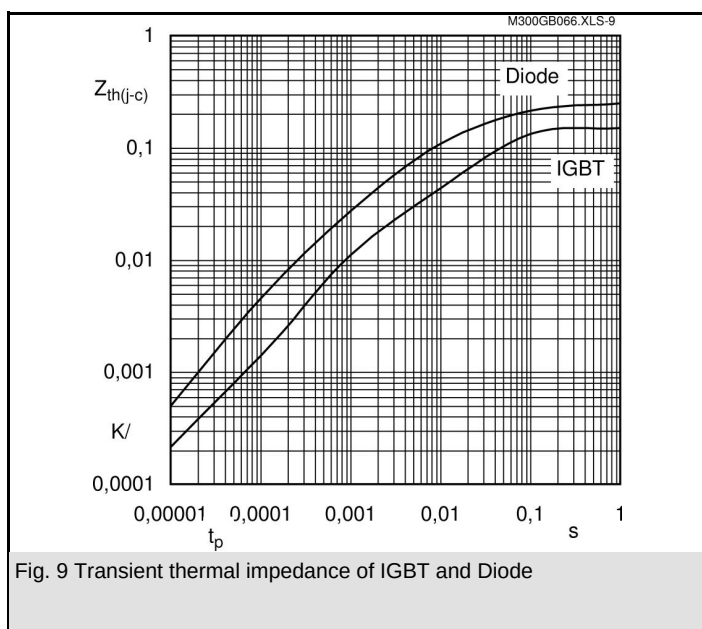
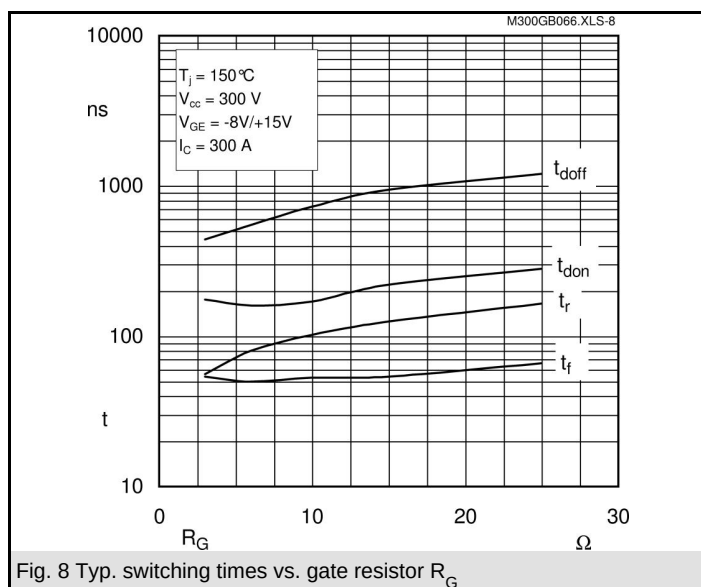
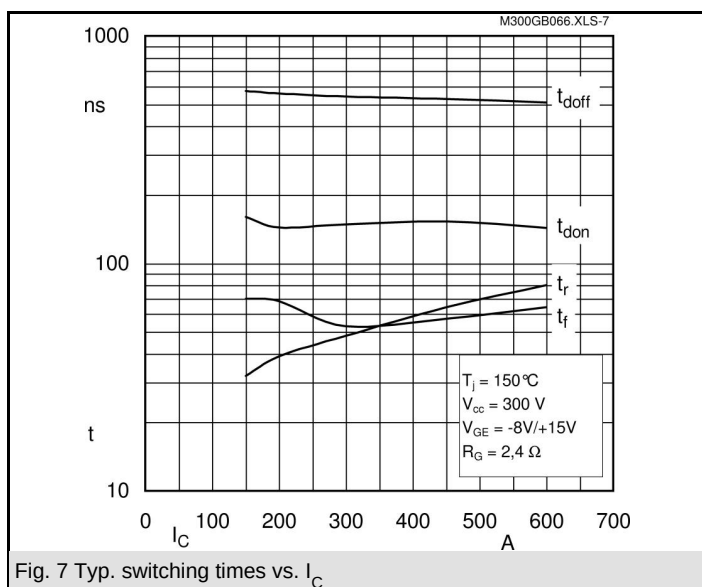
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Z_{th}			
Symbol	Conditions	Values	Units
$Z_{th(j-c)I}$			
R_i	$i = 1$	107	mk/W
R_i	$i = 2$	30	mk/W
R_i	$i = 3$	11,6	mk/W
R_i	$i = 4$	1,4	mk/W
τ_{u_i}	$i = 1$	0,054	s
τ_{u_i}	$i = 2$	0,0144	s
τ_{u_i}	$i = 3$	0,0007	s
τ_{u_i}	$i = 4$	0,0004	s
$Z_{th(j-c)D}$			
R_i	$i = 1$	140	mk/W
R_i	$i = 2$	82	mk/W
R_i	$i = 3$	23,5	mk/W
R_i	$i = 4$	4,5	mk/W
τ_{u_i}	$i = 1$	0,054	s
τ_{u_i}	$i = 2$	0,01	s
τ_{u_i}	$i = 3$	0,0015	s
τ_{u_i}	$i = 4$	0,0002	s



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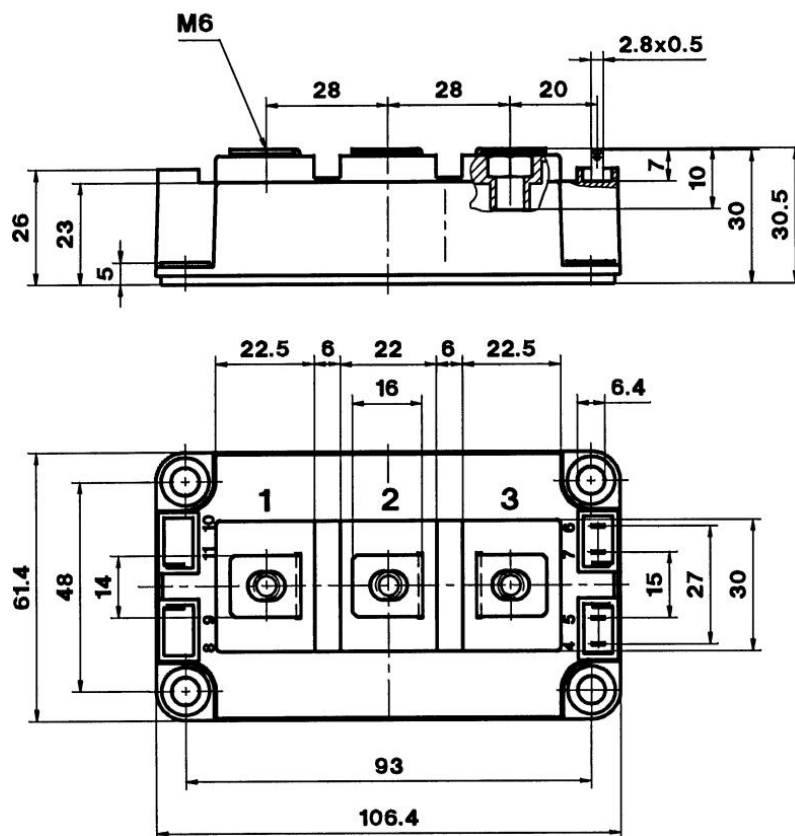




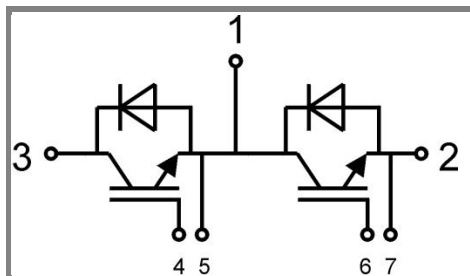
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Case D 56



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Case D56