



SEMITRANS[®] 2

Superfast NPT-IGBT Module

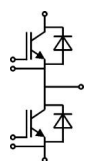
SKM 100GB063D

Features

- N channel, homogeneous Silicon structure (NPT- Non punch through IGBT)
- Low tail current with low temperature dependence
- High short circuit capability, self limiting if term. G is clamped to E
- Pos. temp.-coeff. of V_{CEsat}
- Very low C_{ies} , C_{oes} , C_{res}
- Latch-up free
- Fast & soft inverse CAL diodes
- Isolated copper Bonding Technology without hard mould
- Large clearance (10 mm) and creepage distances (20 mm)

Typical Applications

- Switching (not for linear use)
- Switched mode power supplies
- UPS
- Three phase inverters for servo / AC motor speed control
- Pulse frequencies also above 10 kHz



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Absolute Maximum Ratings		$T_c = 25\text{ }^\circ\text{C}$, unless otherwise specified			
Symbol	Conditions	Values			Units
IGBT					
V_{CES}	$T_j = 25\text{ }^\circ\text{C}$	600			V
I_C	$T_j = 150\text{ }^\circ\text{C}$	$T_{case} = 25\text{ }^\circ\text{C}$	130		A
		$T_{case} = 70\text{ }^\circ\text{C}$	100		A
I_{CRM}	$I_{CRM} = 2 \times I_{Cnom}$	200			A
V_{GES}		± 20			V
t_{psc}	$V_{CC} = 300\text{ V}$; $V_{GE} \leq 20\text{ V}$; $T_j = 125\text{ }^\circ\text{C}$ $V_{CES} < 600\text{ V}$	10			μs
Inverse Diode					
I_F	$T_j = 150\text{ }^\circ\text{C}$	$T_{case} = 25\text{ }^\circ\text{C}$	100		A
		$T_{case} = 80\text{ }^\circ\text{C}$	75		A
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$	200			A
I_{FSM}	$t_p = 10\text{ ms}$; sin.	$T_j = 150\text{ }^\circ\text{C}$	720		A
Module					
$I_{t(RMS)}$		200			A
T_{vj}		- 40 ... + 150			$^\circ\text{C}$
T_{stg}		- 40 ... + 125			$^\circ\text{C}$
V_{isol}	AC, 1 min.	2500			V

Characteristics		$T_c = 25\text{ }^\circ\text{C}$, unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
IGBT					
$V_{GE(th)}$	$V_{GE} = V_{CE}$, $I_C = 2\text{ mA}$	4,5	5,5	6,5	V
I_{CES}	$V_{GE} = 0\text{ V}$, $V_{CE} = V_{CES}$		0,1	0,3	mA
V_{CE0}		$T_j = 25\text{ }^\circ\text{C}$	1,05		V
		$T_j = 125\text{ }^\circ\text{C}$	1		V
r_{CE}	$V_{GE} = 15\text{ V}$	$T_j = 25\text{ }^\circ\text{C}$	10,5		m Ω
		$T_j = 125\text{ }^\circ\text{C}$	14		m Ω
$V_{CE(sat)}$	$I_{Cnom} = 100\text{ A}$, $V_{GE} = 15\text{ V}$	$T_j = 25\text{ }^\circ\text{C}_{chiplev.}$	2,1	2,5	V
		$T_j = 125\text{ }^\circ\text{C}_{chiplev.}$	2,4	2,8	V
C_{res}	$V_{CE} = 25$, $V_{GE} = 0\text{ V}$	$f = 1\text{ MHz}$	5,6		nF
C_{oes}			0,6		nF
C_{res}			0,4		nF
Q_G	$V_{GE} = 0\text{ V} - +15\text{ V}$		240		nC
R_{Gint}	$T_j = \text{ }^\circ\text{C}$		0		Ω
$t_{d(on)}$	$R_{Gon} = 10\text{ }^\circ\Omega$	$V_{CC} = 300\text{ V}$ $I_{Cnom} = 100\text{ A}$	50		ns
t_r			40		ns
E_{on}	$R_{Goff} = 10\text{ }^\circ\Omega$	$T_j = 125\text{ }^\circ\text{C}$ $V_{GE} = \pm 15\text{ V}$	4		mJ
$t_{d(off)}$			300		ns
t_f			35		ns
E_{off}			3		mJ
$R_{th(j-c)}$	per IGBT			0,27	K/W



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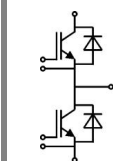
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Characteristics

Symbol	Conditions	min.	typ.	max.	Units
Inverse Diode					
$V_F = V_{EC}$	$I_{Fnom} = 100 \text{ A}; V_{GE} = 0 \text{ V}$		1,55	1,9	V
			1,55		V
V_{F0}				0,9	V
r_F			8	10	mΩ
I_{RRM}	$I_{Fnom} = 100 \text{ A}$		44		A
Q_{rr}			6		μC
E_{rr}	$V_{GE} = -15 \text{ V}; V_{CC} = 300 \text{ V}$				mJ
$R_{th(j-c)D}$	per diode			0,6	K/W
Module					
L_{CE}				30	nH
R_{CC+EE}	res., terminal-chip	$T_{case} = 25 \text{ °C}$	0,75		mΩ
		$T_{case} = 125 \text{ °C}$	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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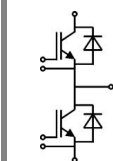
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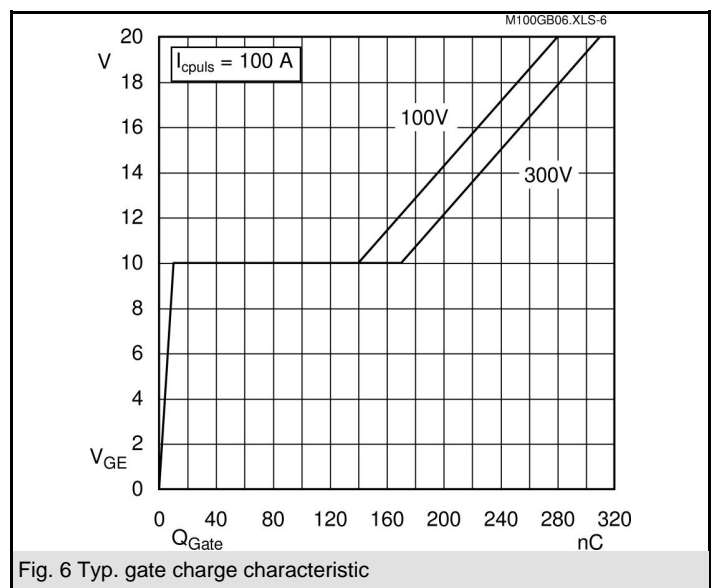
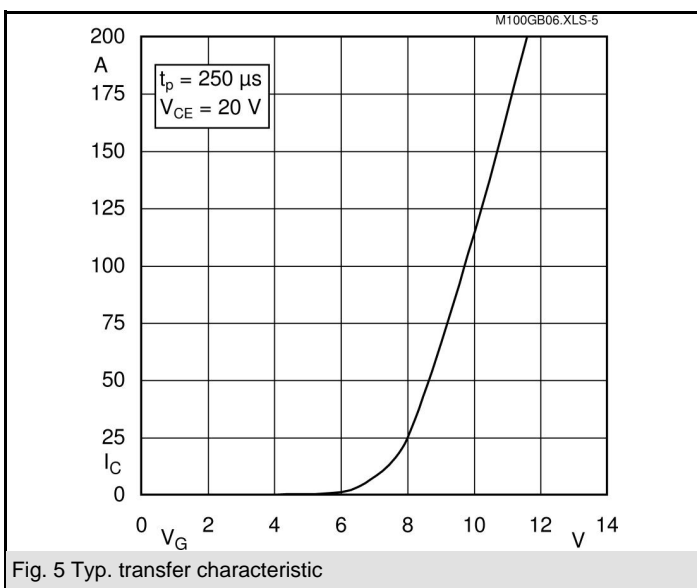
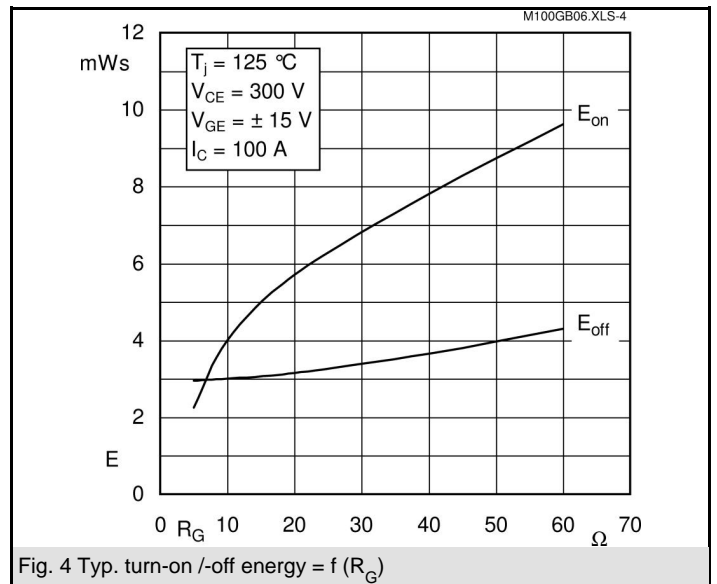
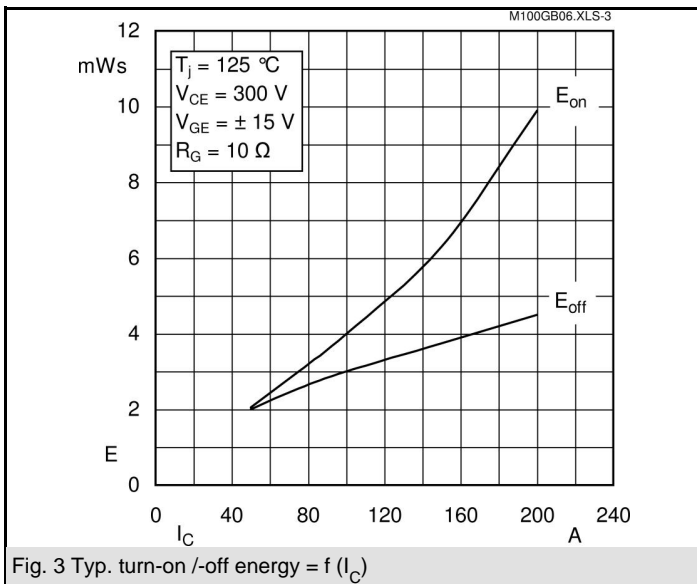
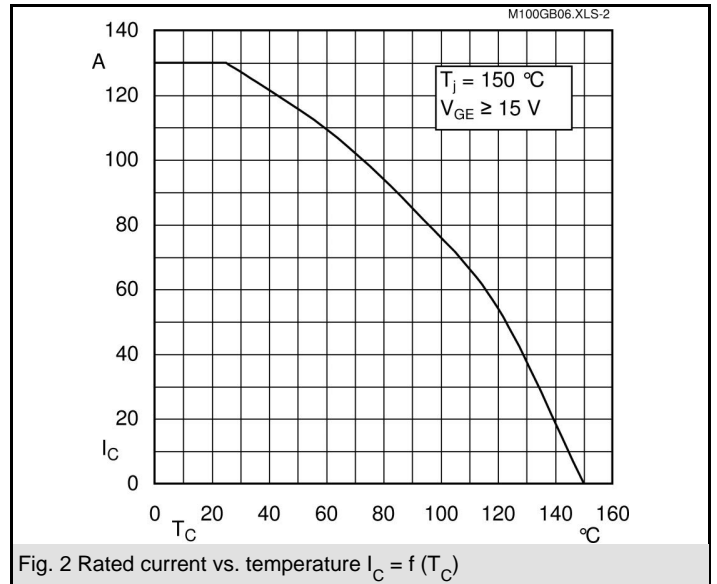
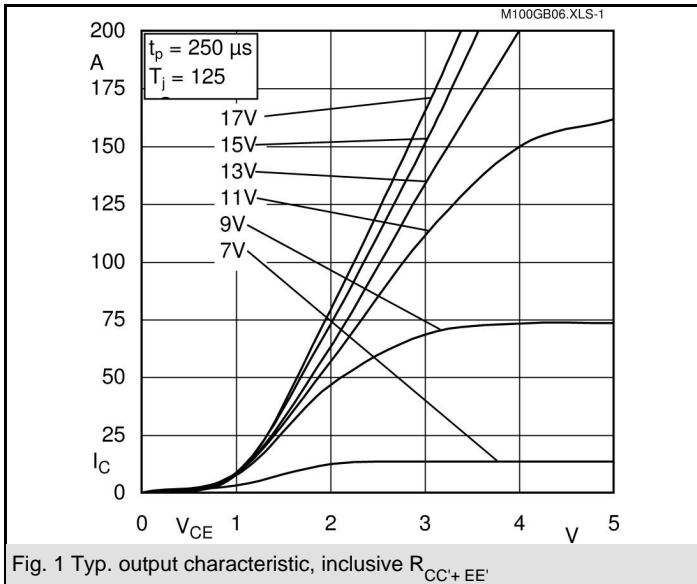
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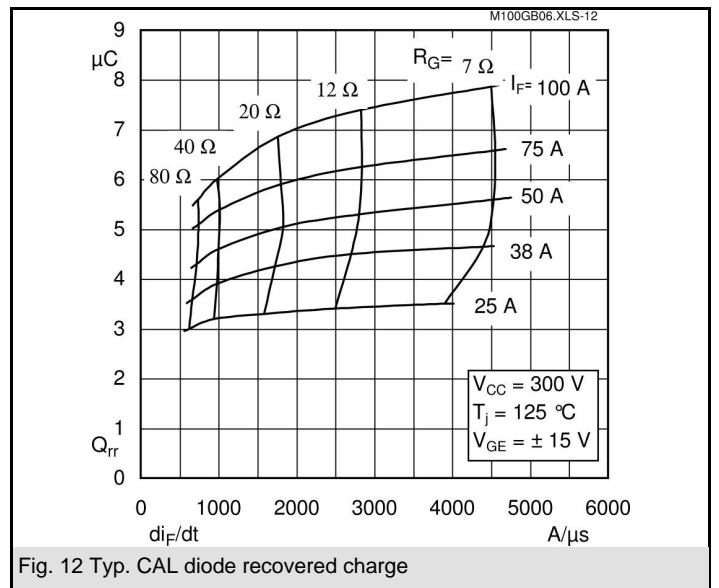
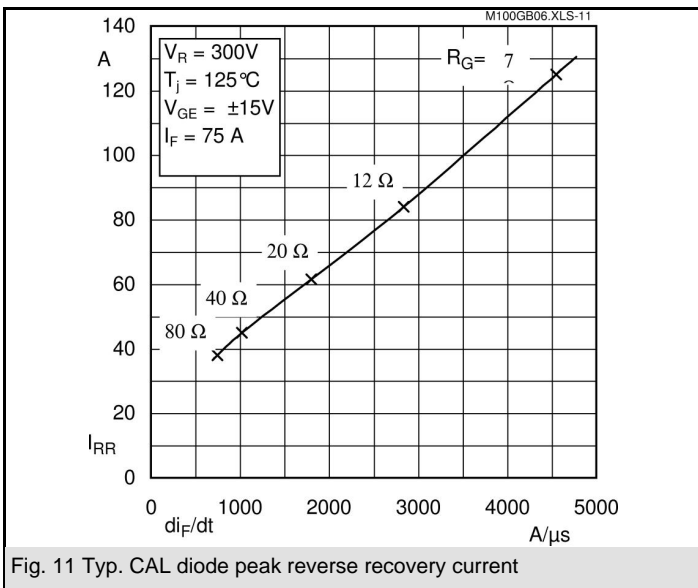
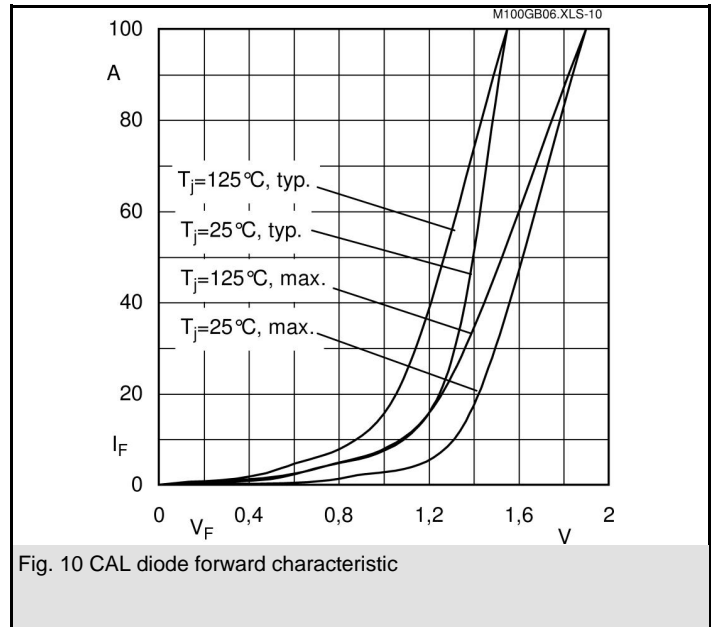
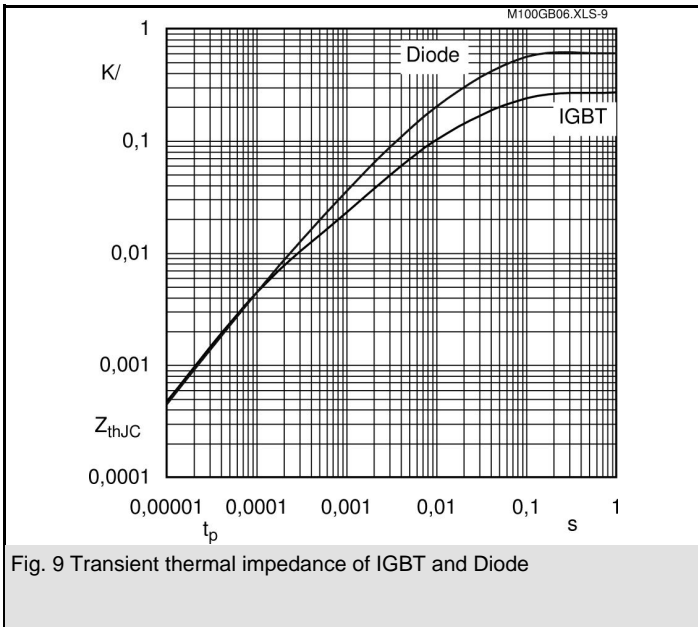
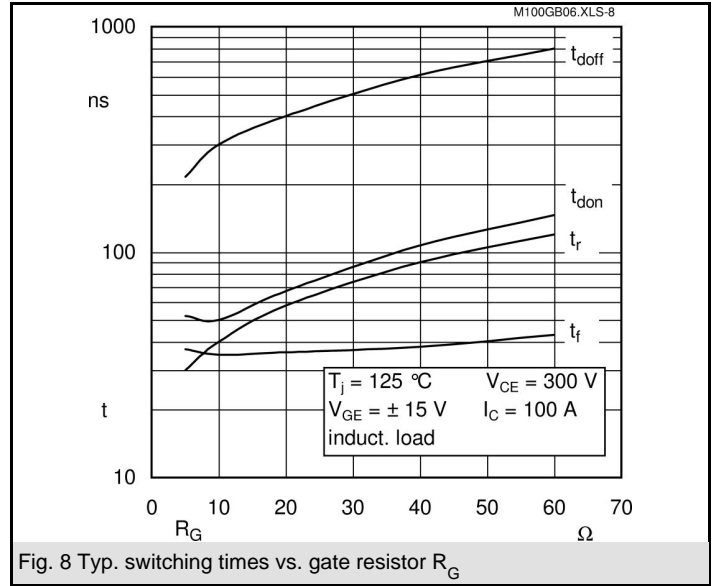
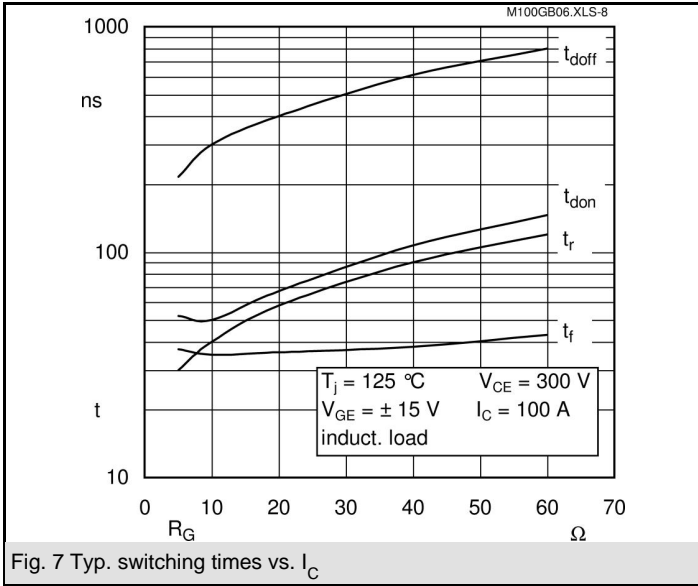
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Z_{th}			
Symbol	Conditions	Values	Units
$Z_{th(j-c)I}$			
$R_{\theta i}$	$i = 1$	160	mk/W
$R_{\theta i}$	$i = 2$	88	mk/W
$R_{\theta i}$	$i = 3$	18	mk/W
$R_{\theta i}$	$i = 4$	4	mk/W
$\tau_{\theta i}$	$i = 1$	0,0447	s
$\tau_{\theta i}$	$i = 2$	0,0087	s
$\tau_{\theta i}$	$i = 3$	0,0015	s
$\tau_{\theta i}$	$i = 4$	0,0002	s
$Z_{th(j-c)D}$			
$R_{\theta i}$	$i = 1$	400	mk/W
$R_{\theta i}$	$i = 2$	165	mk/W
$R_{\theta i}$	$i = 3$	30,5	mk/W
$R_{\theta i}$	$i = 4$	4,5	mk/W
$\tau_{\theta i}$	$i = 1$	0,0613	s
$\tau_{\theta i}$	$i = 2$	0,0085	s
$\tau_{\theta i}$	$i = 3$	0,0045	s
$\tau_{\theta i}$	$i = 4$	0,0003	s



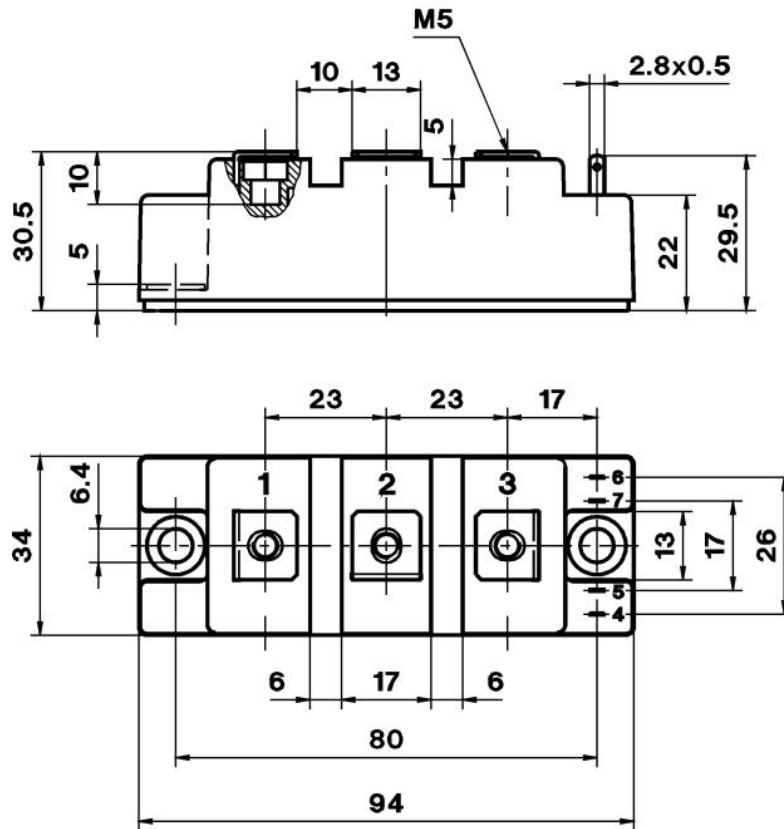


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UL recognized file

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