

DATASHEET

SEMIKRON

SKM100GB128D

OTHER SYMBOLS:

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SPÓŁKA JAWNA**

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SEMITRANS[®] 2

SPT IGBT Module

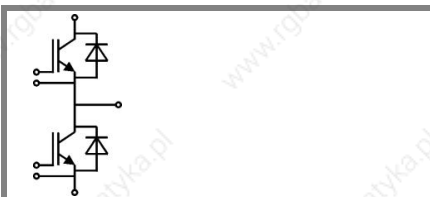
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Features

- SPT = Soft-Punch-Through technology
- V_{CEsat} with positive temperature coefficient
- High short circuit capability, self limiting to $6 \times I_C$

Typical Applications

- AC inverter drives
- UPS
- Electronic welders at f_{sw} up to 20 kHz



GB

Absolute Maximum Ratings		$T_c = 25\text{ }^\circ\text{C}$, unless otherwise specified	
Symbol	Conditions	Values	Units
IGBT			
V_{CES}	$T_j = 25\text{ }^\circ\text{C}$	1200	V
I_C	$T_j = 150\text{ }^\circ\text{C}$	$T_c = 25\text{ }^\circ\text{C}$	145
		$T_c = 80\text{ }^\circ\text{C}$	105
I_{CRM}	$I_{CRM} = 2 \times I_{Cnom}$	150	A
V_{GES}		± 20	V
t_{psc}	$V_{CC} = 600\text{ V}; V_{GE} \leq 20\text{ V}; T_j = 125\text{ }^\circ\text{C}$ $V_{CES} < 1200\text{ V}$	10	μs
Inverse Diode			
I_F	$T_j = 150\text{ }^\circ\text{C}$	$T_{case} = 25\text{ }^\circ\text{C}$	95
		$T_{case} = 80\text{ }^\circ\text{C}$	65
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$	150	A
I_{FSM}	$t_p = 10\text{ ms}; \text{sin.}$	$T_j = 150\text{ }^\circ\text{C}$	720
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.	4000	V

Characteristics		$T_c = 25\text{ }^\circ\text{C}$, unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
IGBT					
$V_{GE(th)}$	$V_{GE} = V_{CE}, I_C = 3\text{ mA}$	4,5	5,5	6,45	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	1,15	V
		$T_j = 125\text{ }^\circ\text{C}$	0,9	1,05	V
r_{CE}	$V_{GE} = 15\text{ V}$	$T_j = 25\text{ }^\circ\text{C}$	13	16	$\text{m}\Omega$
		$T_j = 125\text{ }^\circ\text{C}$	16	20	$\text{m}\Omega$
$V_{CE(sat)}$	$I_{Cnom} = 75\text{ A}, V_{GE} = 15\text{ V}$	$T_j = 25\text{ }^\circ\text{C}_{chiplev.}$	1,9	2,35	V
		$T_j = 125\text{ }^\circ\text{C}_{chiplev.}$	2,1	2,55	V
C_{res}	$V_{CE} = 25, V_{GE} = 0\text{ V}$	$f = 1\text{ MHz}$	6,2		nF
C_{oes}			0,74		nF
C_{res}			0,71		nF
Q_G	$V_{GE} = -8\text{ V} - +20\text{ V}$		860		nC
R_{Gint}	$T_j = 25\text{ }^\circ\text{C}$		5		Ω
$t_{d(on)}$	$R_{Gon} = 4,7\ \Omega$	$V_{CC} = 600\text{ V}$ $I_{Cnom} = 75\text{ A}$	175		ns
t_r			38		ns
E_{on}			9		mJ
$t_{d(off)}$	$R_{Goff} = 4,7\ \Omega$	$T_j = 125\text{ }^\circ\text{C}$ $V_{GE} = \pm 15\text{ V}$	370		ns
t_f			65		ns
E_{off}			7,5		mJ
$R_{th(j-c)}$	per IGBT			0,21	K/W

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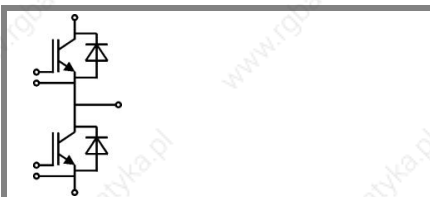
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Typical Applications

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Characteristics

Symbol	Conditions	min.	typ.	max.	Units
Inverse Diode					
$V_F = V_{EC}$	$I_{Fnom} = 75 \text{ A}; V_{GE} = 0 \text{ V}$	$T_j = 25 \text{ }^\circ\text{C}_{chiplev.}$	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
r_F		$T_j = 25 \text{ }^\circ\text{C}$	12	17,3	mΩ
I_{RRM}	$I_{Fnom} = 75 \text{ A}$	$T_j = 125 \text{ }^\circ\text{C}$	88		A
Q_{rr}	$di/dt = 2800 \text{ A}/\mu\text{s}$		13		μC
E_{off}	$V_{GE} = -15 \text{ V}; V_{CC} = 600 \text{ V}$		3,9		mJ
$R_{th(j-c)D}$	per diode			0,5	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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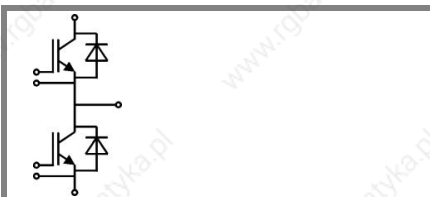
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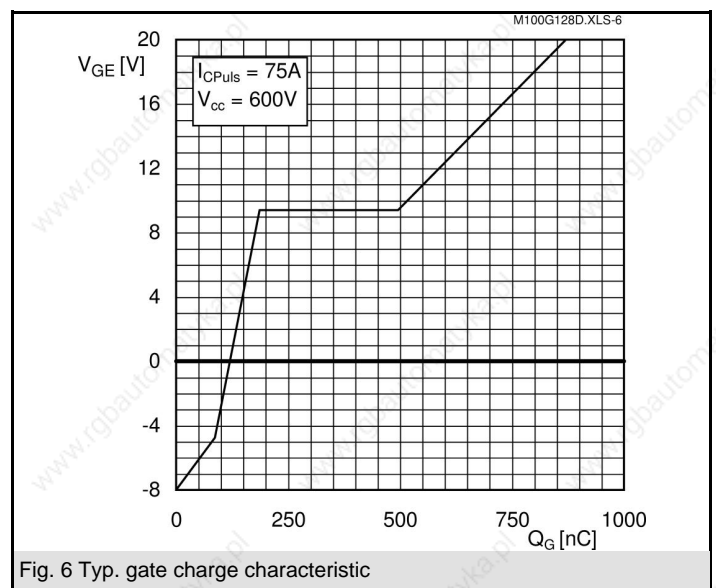
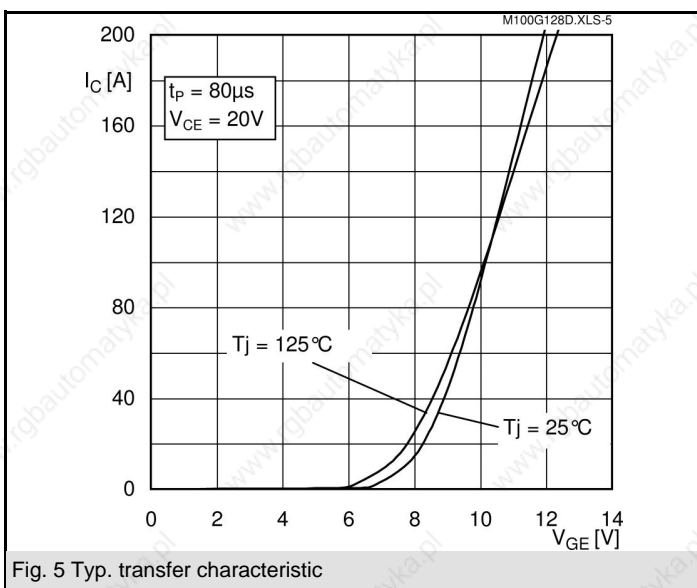
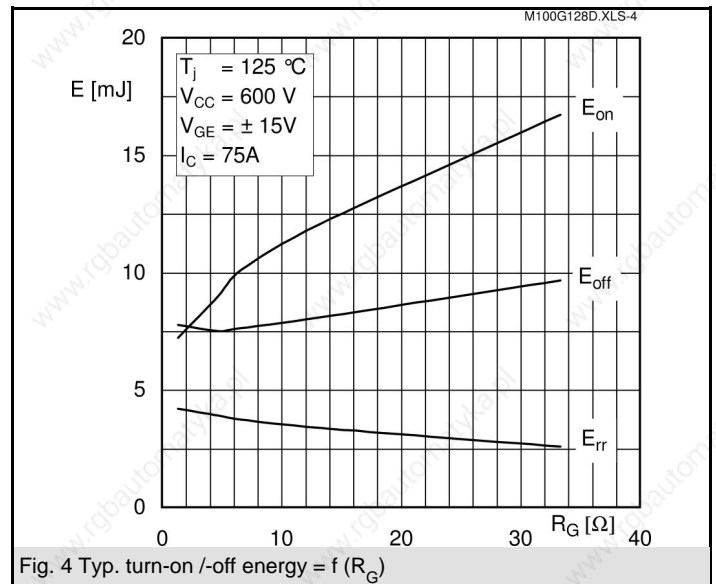
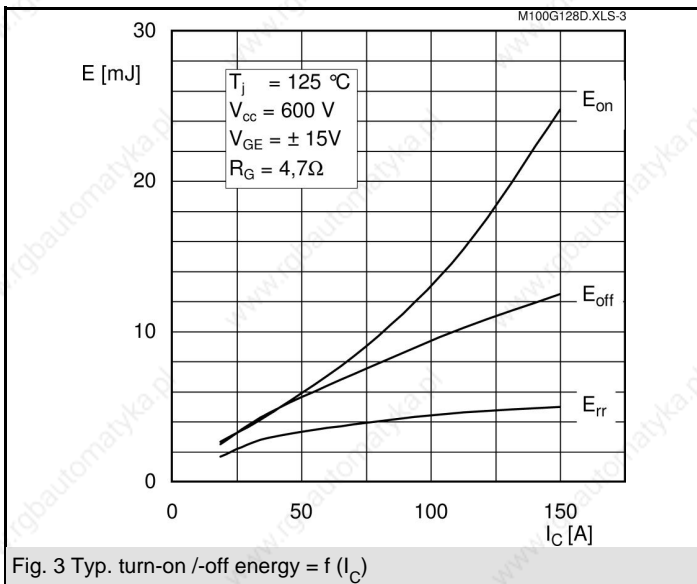
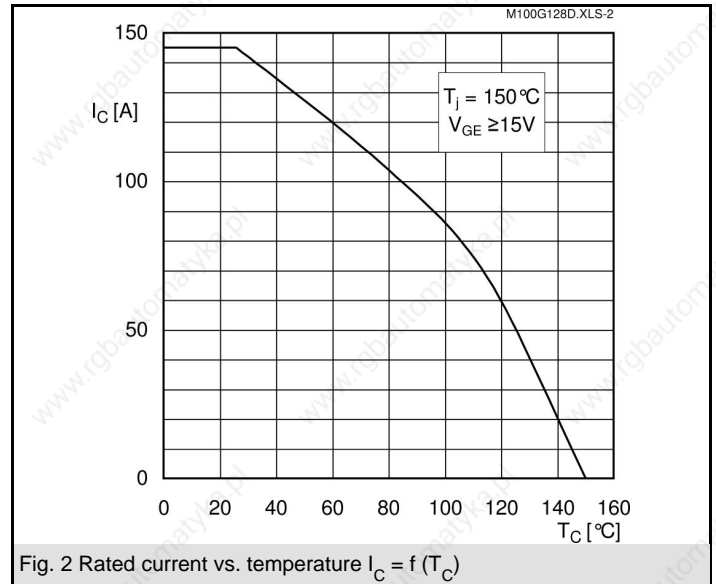
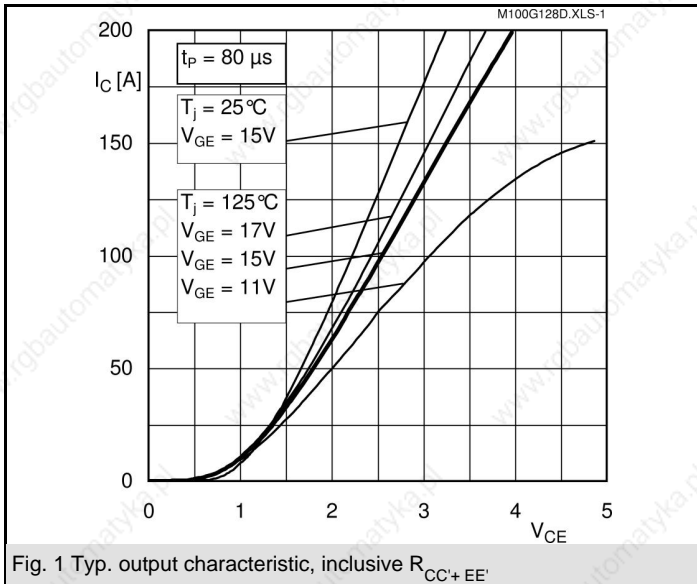
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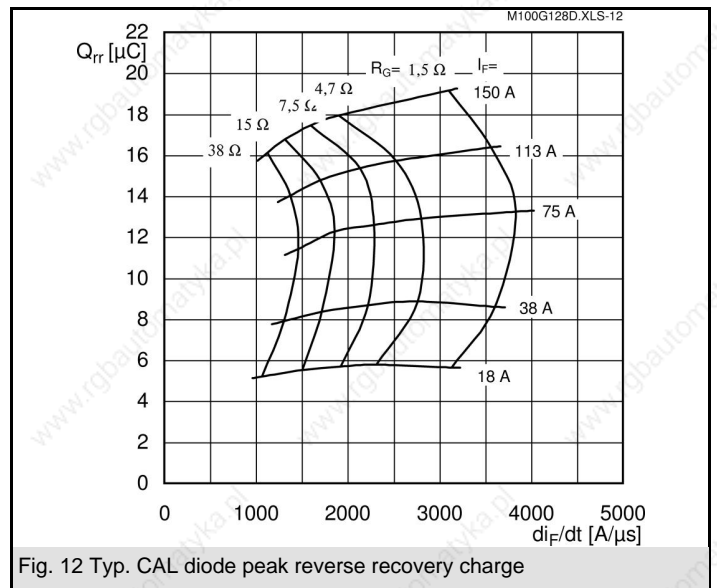
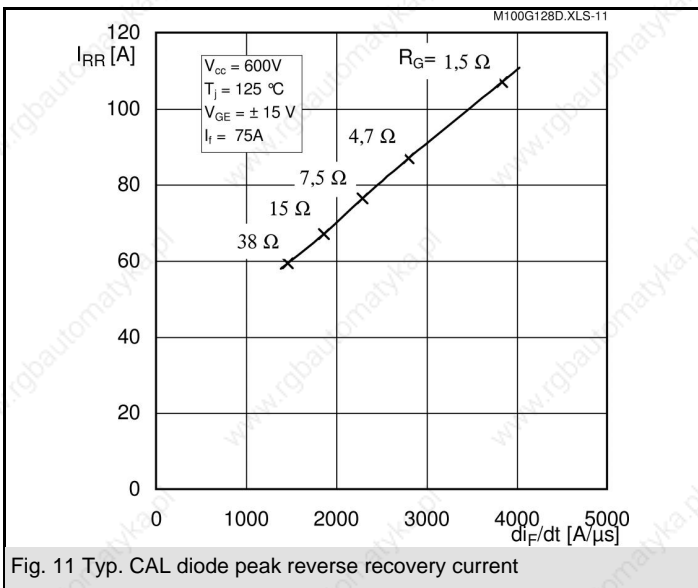
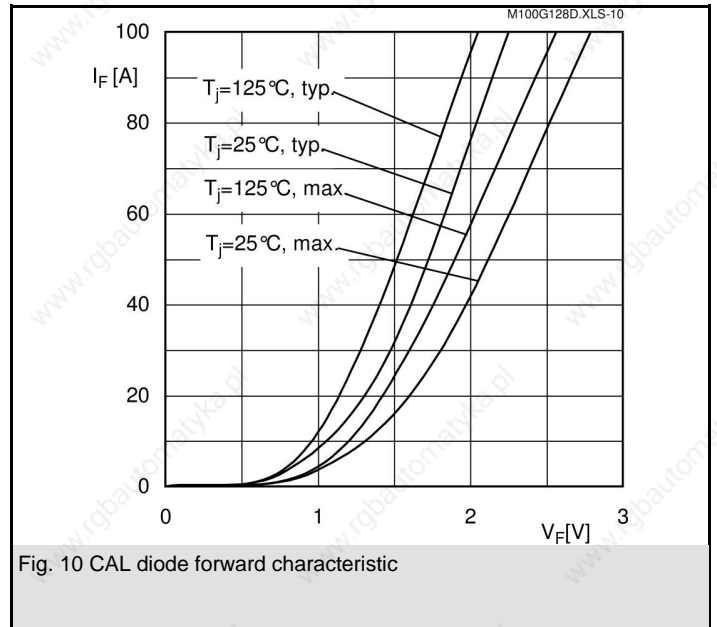
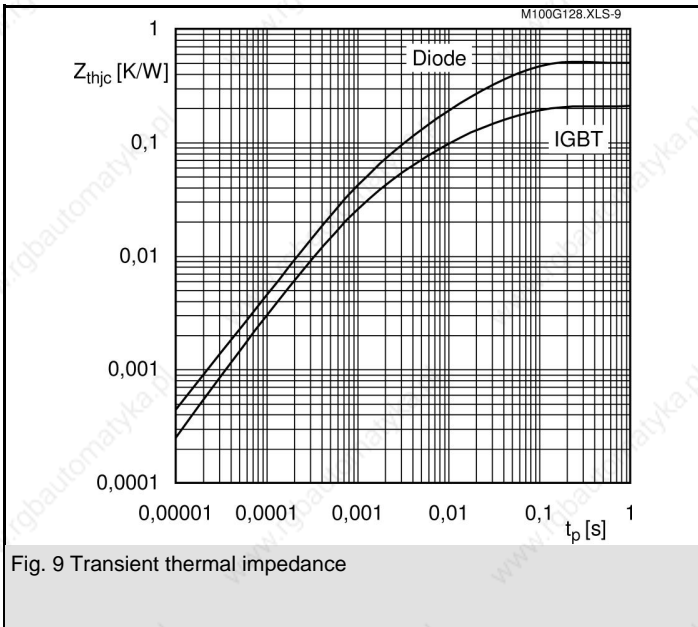
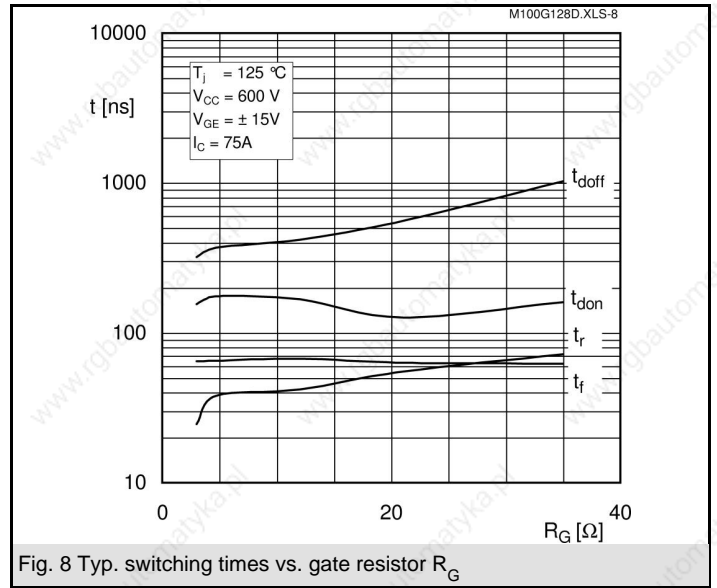
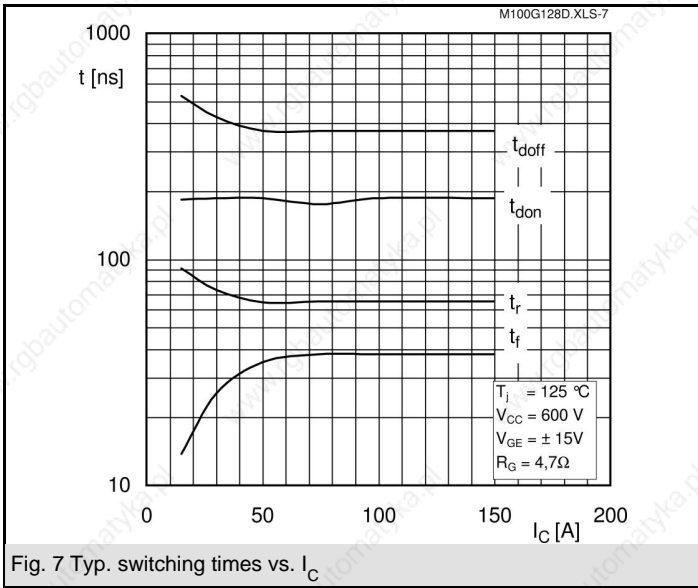
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Z_{th} Symbol	Conditions	Values	Units
$Z_{th(j-c)}$			
$R_{\theta j-c1}$	$i = 1$	114	mk/W
$R_{\theta j-c2}$	$i = 2$	71	mk/W
$R_{\theta j-c3}$	$i = 3$	22	mk/W
$R_{\theta j-c4}$	$i = 4$	3	mk/W
$\tau_{\theta j-c1}$	$i = 1$	0,054	s
$\tau_{\theta j-c2}$	$i = 2$	0,0115	s
$\tau_{\theta j-c3}$	$i = 3$	0,0012	s
$\tau_{\theta j-c4}$	$i = 4$	0,001	s
$Z_{th(j-c)D}$			
$R_{\theta j-cD1}$	$i = 1$	300	mk/W
$R_{\theta j-cD2}$	$i = 2$	160	mk/W
$R_{\theta j-cD3}$	$i = 3$	35,5	mk/W
$R_{\theta j-cD4}$	$i = 4$	4,5	mk/W
$\tau_{\theta j-cD1}$	$i = 1$	0,054	s
$\tau_{\theta j-cD2}$	$i = 2$	0,0071	s
$\tau_{\theta j-cD3}$	$i = 3$	0,0017	s
$\tau_{\theta j-cD4}$	$i = 4$	0,005	s



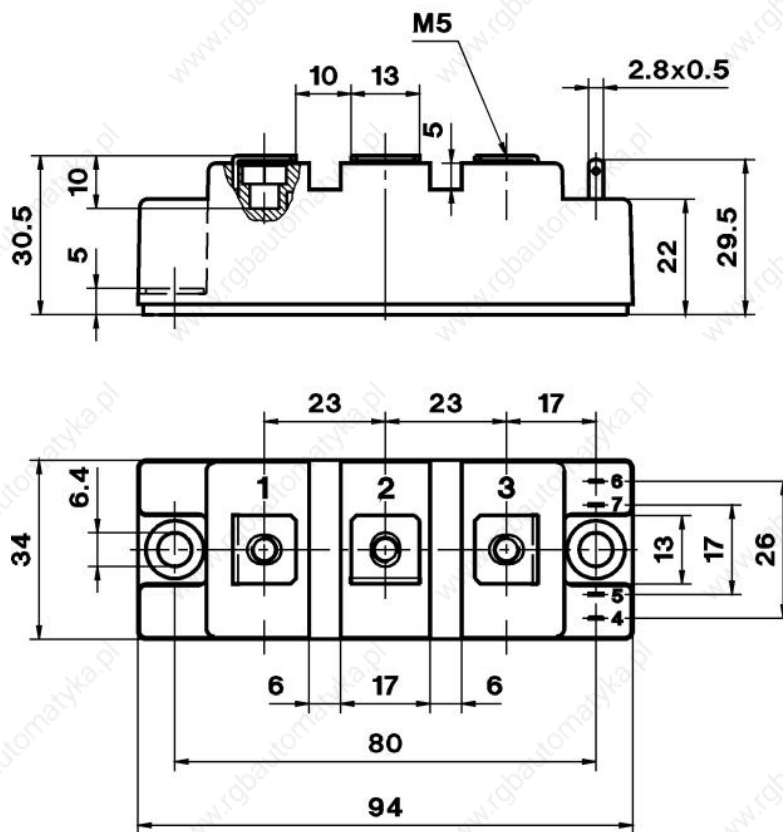


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UL Recognized
File no. E 63 532

Dimensions in mm

CASED61



Case D 61

