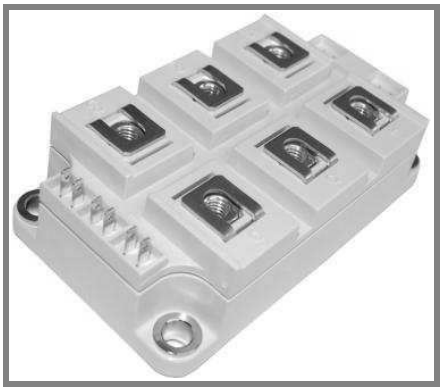
SKM300MLI066TAT



SEMITRANS® 5

Trench IGBT Modules

SKM300MLI066TAT

Features

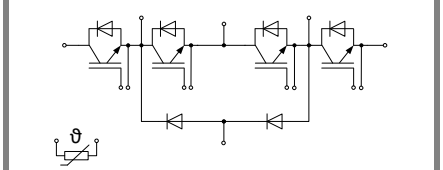
- Homogeneous Si
- Trench = Trenchgate technology
- $V_{CE(sat)}$ with positive temperature coefficient
- Integrated NTC temperature sensor

Typical Applications*

- UPS
- 3 Level Inverter

Remarks

- Case temperature limited to T_c =125°C max
- Recommended T_{op} = -40..+150°C for IGBT; T_{op}=-40..+125°C for diode
- T_{vj} is intended as absolute maximum rating, limited by diode
- Fig.2 is referred to IGBT current capability

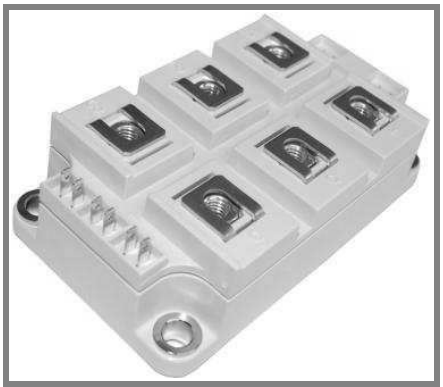


MLI-TAT

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	400	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; $V_{GE} \leq$ 15 V; V_{CES} < 600 V	T_j = 150 °C	6	µs
Inverse Diode				
I_F	T_j = 150 °C	T_c = 25 °C	324	A
		T_c = 80 °C	211	A
I_{FRM}	I_{FRM}=2xI_{Fnom}		420	A
I_{FSM}	t_p = 10 ms; half sine wave	T_j = 150 °C	2100	A
Freewheeling Diode				
I_F	T_j = 150 °C	T_c = 25 °C	324	A
		T_c = 80 °C	211	A
I_{FRM}	I_{FRM}=2xI_{Fnom}		420	A
I_{FSM}	t_p = 10 ms; half sine wave	T_j = 150 °C	2100	A
Module				
$I_{t(RMS)}$			500	A
T_{vj}			- 40 ... + 150	°C
T_{stg}			- 40 ... + 125	°C
V_{isol}	AC, 1 min.		2500	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			0,5	mA
I_{GES}	V_{CE} = 0 V, V_{GE} = 20 V	T_j = 25 °C			1200	nA
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		18,4		nF
C_{oes}				1,14		nF
C_{res}				0,54		nF
Q_G	V_{GE} = -15V...+15V			3900		nC
R_{Gint}	T_j = °C			1		Ω
$t_{d(on)}$	R_{Gon} = 2,2 Ω	V_{CC} = 300V		140		ns
t_r	di/dt = 3400 A/µs	I_C= 300A		89		ns
E_{on}		T_j = 125 °C		3,5		mJ
$t_{d(off)}$	R_{Goff} = 2,2 Ω	V_{GE} = --15V/+15V		433		ns
t_f	di/dt = 3400 A/µs			116		ns
E_{off}				10,1		mJ
$R_{th(j-c)}$	per IGBT			0,15		K/W

SKM300MLI066TAT



SEMITRANS® 5

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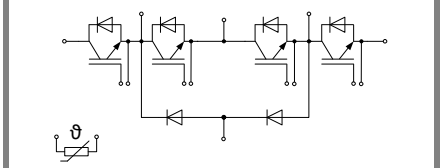


MLI-TAT

Characteristics						
Symbol	**Conditions**		**min.**	**typ.**	**max.**	**Units**
Inverse Diode						
$V_F = V_{EC}$	I_{Fnom} = 245 A; V_{GE} = 0 V	T_j = 25 °C$_{chiplev.}$		1,35	1,6	V
		T_j = 125 °C$_{chiplev.}$		1,35	1,6	V
V_{F0}		T_j = 25 °C		1	1,1	V
		T_j = 125 °C		0,9	1	V
r_F		T_j = 25 °C		1,42	2	mΩ
		T_j = 125 °C		1,8	2,4	mΩ
I_{RRM}	I_F = 245 A	T_j = 125 °C				A
Q_{rr}						µC
E_{rr}	V_{GE} = -8 V; V_{CC} = 300 V					mJ
$R_{th(j-c)D}$	per diode			0,28		K/W
Free-wheeling diode (Neutral Clamp Diode)						
$V_F = V_{EC}$	I_{Fnom} = 245 A; V_{GE} = 0 V	T_j = 25 °C$_{chiplev.}$		1,35	1,6	V
		T_j = 125 °C$_{chiplev.}$		1,35	1,6	V
V_{F0}		T_j = 25 °C		1	1,1	V
		T_j = 125 °C		0,9	1	V
r_F		T_j = 25 °C		1,42	2	V
		T_j = 125 °C		1,8	2,4	V
I_{RRM}	I_F = 300 A	T_j = 125 °C		194		A
Q_{rr}	di/dt = 3400 A/µs			13		µC
E_{rr}	V_{GE} = 0 V; V_{CC} = 300 V			4		mJ
$R_{th(j-c)FD}$	per diode			0,28		K/W
$R_{th(c-s)}$	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					310	g
Temperature sensor						
R_{100}	T_s=100°C (R_{25}=5kΩ)			493±5%		Ω
						K

IMPORTANT INFORMATION AND WARNINGS

This is an electrostatic discharge sensitive device (ESDS) according to international standard IEC 61340.*The specifications of Semikron Danfoss products may not be considered as any guarantee or assurance of product characteristics ("Beschaffenheitsgarantie"). The specifications of Semikron Danfoss products describe only the usual characteristics of Semikron Danfoss products to be expected in typical applications, which may still vary depending on the specific application. Therefore, products must be tested for the respective application in advance. Resulting from this, application adjustments of any kind may be necessary. Any user of Semikron Danfoss products is responsible for the safety of their applications embedding Semikron Danfoss products and must take adequate safety measures to prevent the applications from causing any physical injury, fire or other problem, also if any Semikron Danfoss product becomes faulty. Any user is responsible for making sure that the application design and realization are compliant with all laws, regulations, norms and standards applicable to the scope of application. Unless otherwise explicitly approved by Semikron Danfoss in a written document signed by authorized representatives of Semikron Danfoss, Semikron Danfoss products may not be used in any applications where a failure of the product or any consequences of the use thereof can reasonably be expected to result in personal injury. No representation or warranty is given and no liability is assumed with respect to the accuracy, completeness and/or use of any information herein, including without limitation, warranties of non-infringement of intellectual property rights of any third party. Semikron Danfoss does not convey any license under its or a third party's patent rights, copyrights, trade secrets or other intellectual property rights, neither does it make any representation or warranty of non-infringement of intellectual property rights of any third party which may arise from a user's applications.

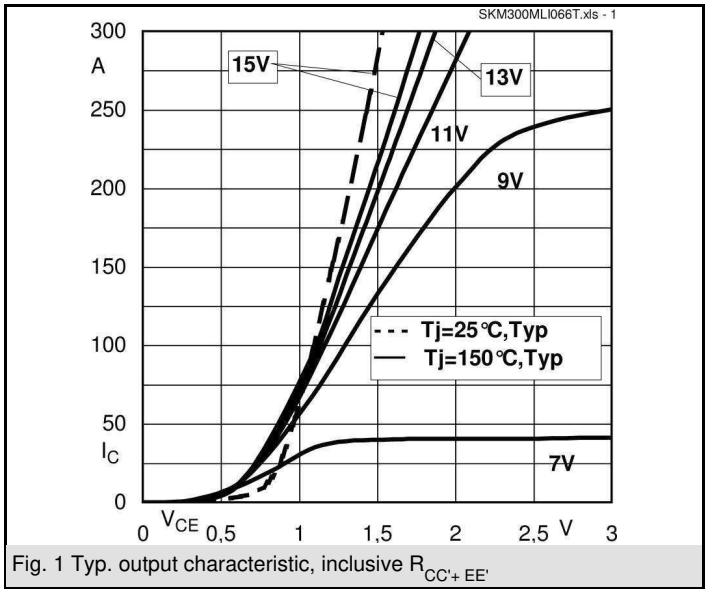


Fig. 1 Typ. output characteristic, inclusive $R_{CC'+EE'}$

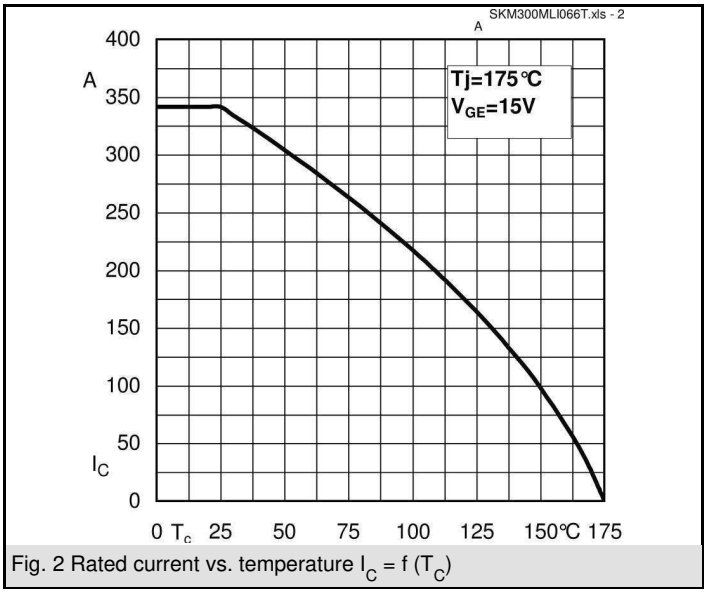


Fig. 2 Rated current vs. temperature $I_C = f(T_C)$

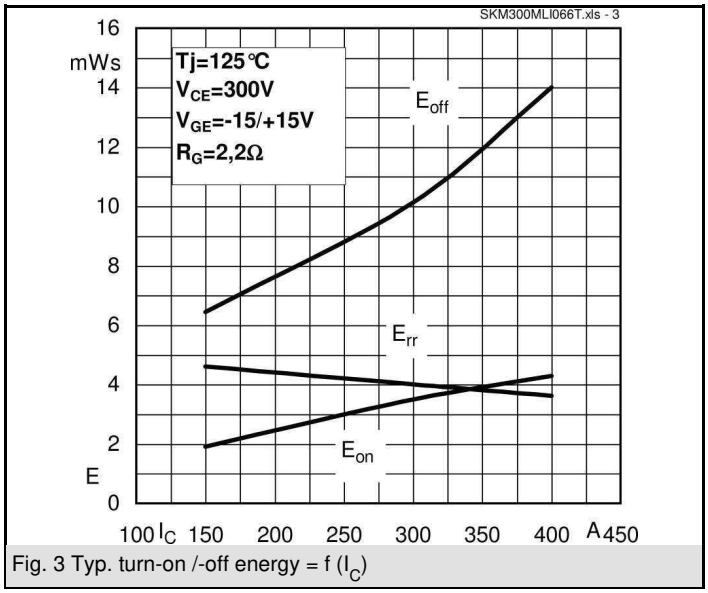


Fig. 3 Typ. turn-on /-off energy = f (I_C)

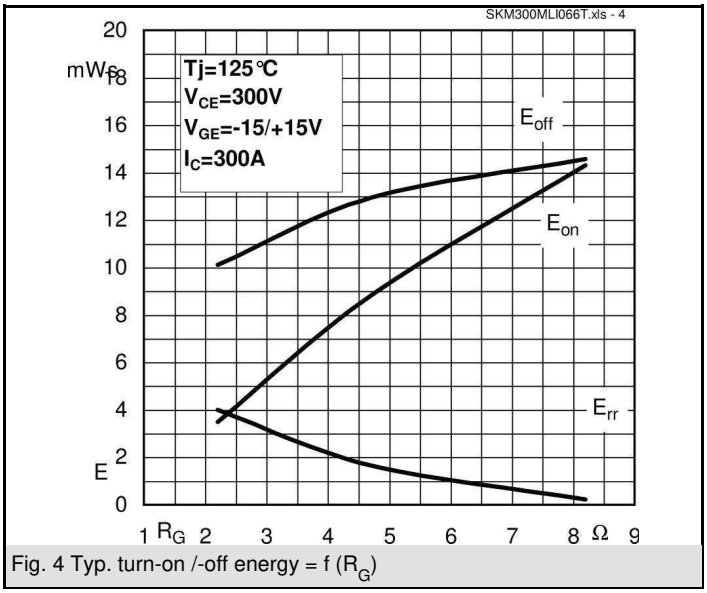


Fig. 4 Typ. turn-on /-off energy = f (R_G)

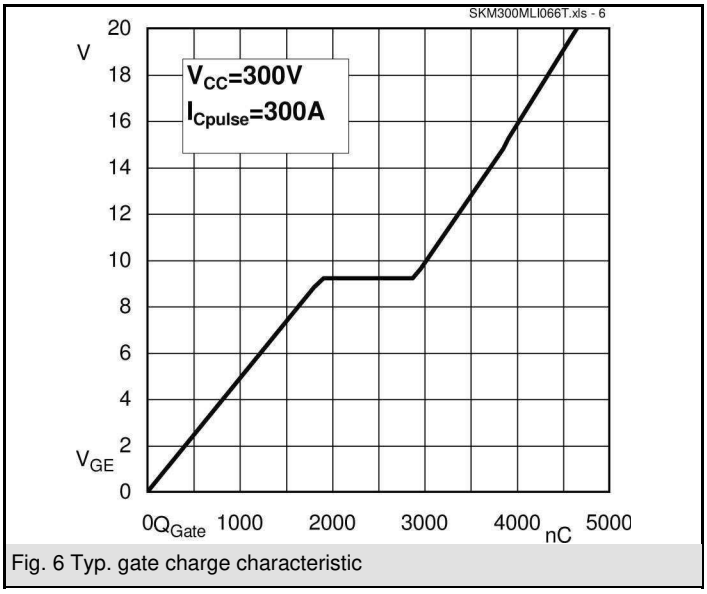


Fig. 6 Typ. gate charge characteristic

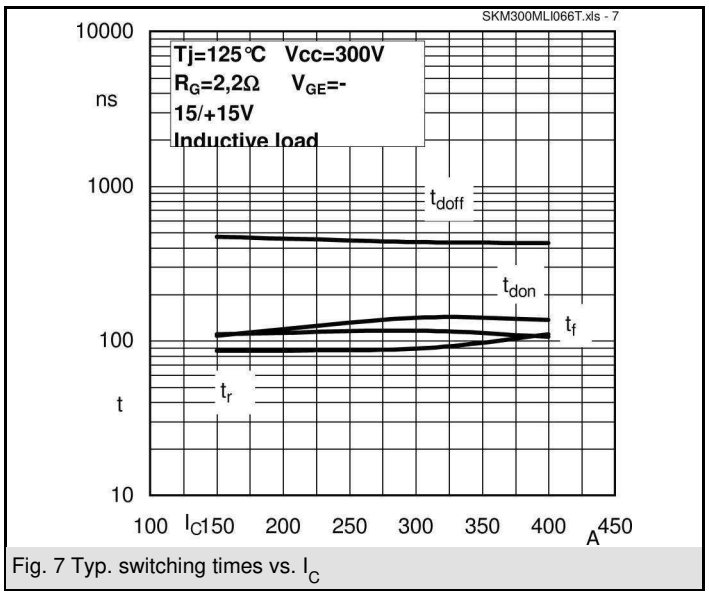


Fig. 7 Typ. switching times vs. I_C

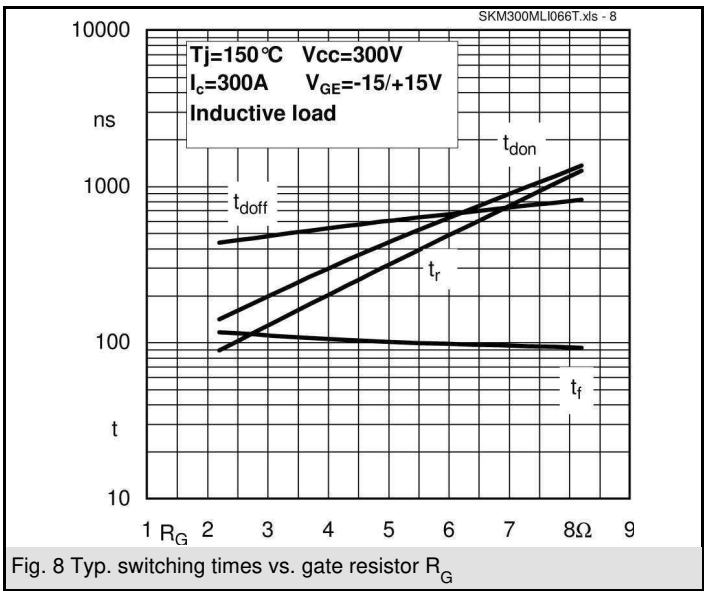


Fig. 8 Typ. switching times vs. gate resistor R_G

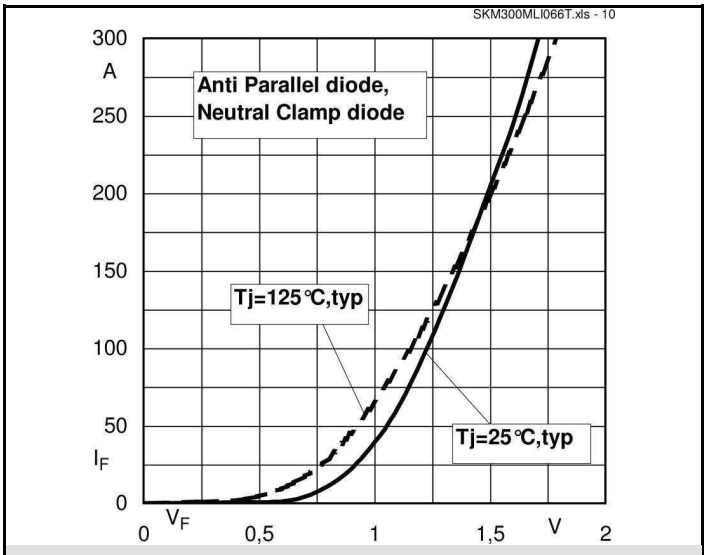
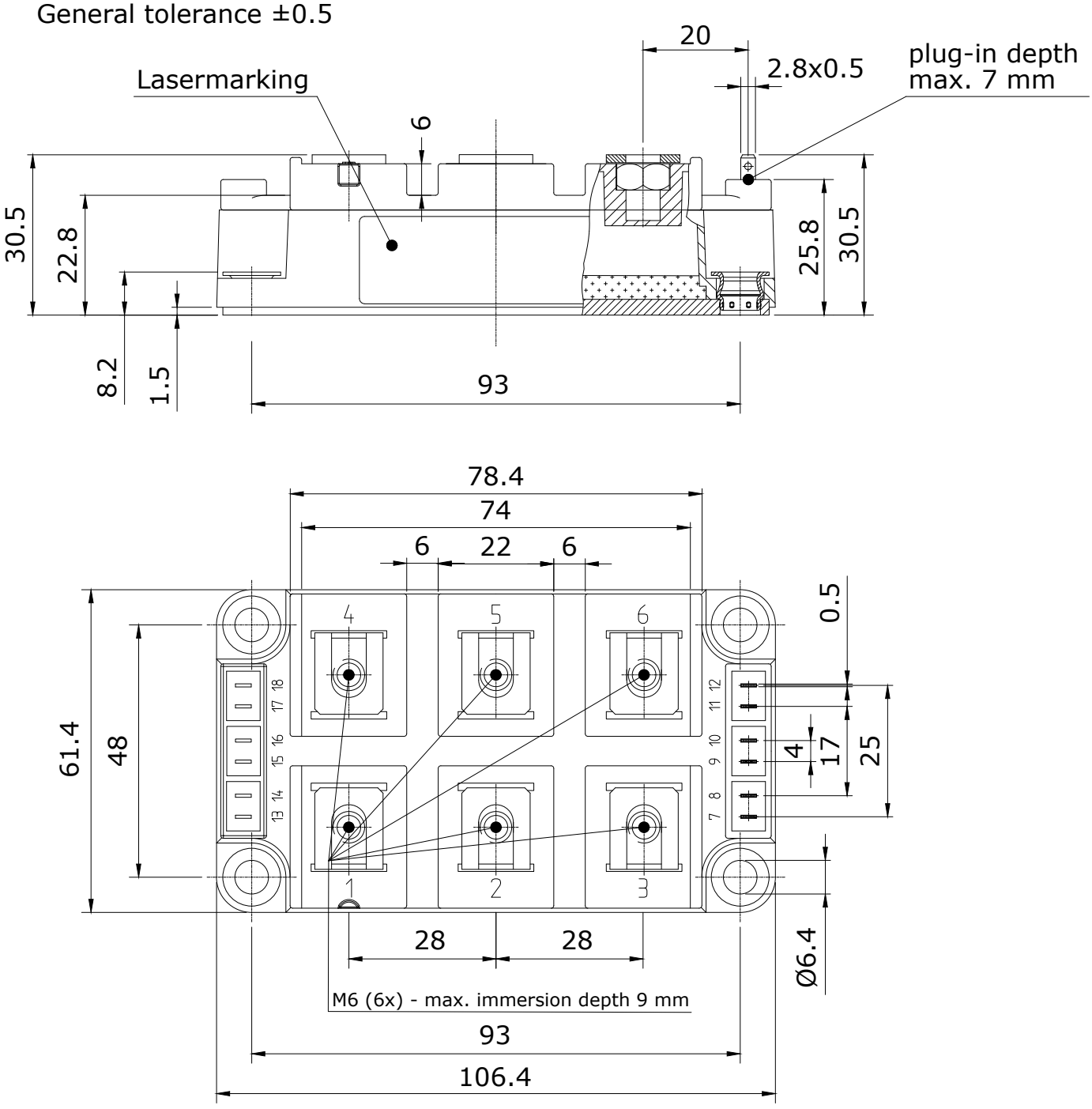


Fig. 10 CAL diode forward characteristic

Dimensions in mm

General tolerance ±0.5



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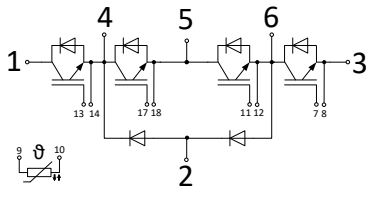

MLI-TAT Case D62

