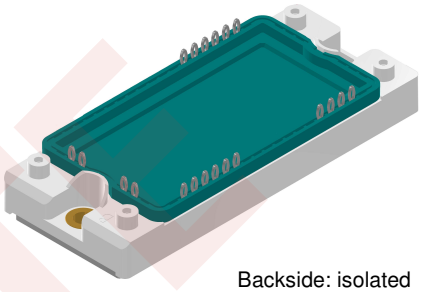
IGBT Trench Module

V_{CES} = 1700 V
I_{C25} = 400 A
$V_{CE(sat)}$ = 2 V

Boost/Brake Chopper + free wheeling Diode + NTC

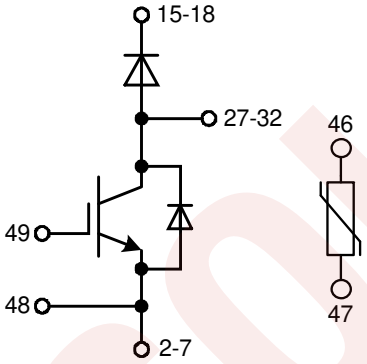
Part number

MITA300RF1700PTED



Backside: isolated

E72873



Features / Advantages:

- Brake with Infineon IGBT³

Applications:

- AC motor drives
- Solar inverter
- Medical equipment
- Uninterruptible power supply
- Air-conditioning systems
- Welding equipment
- Switched-mode and resonant-mode power supplies
- Inductive heating, cookers
- Pumps, Fans

Package: E2-Pack

- Isolation Voltage: 3600 V~
- Industry standard outline
- RoHS compliant
- PressFit-Pins for PCB mounting
- Height: 17 mm
- Base plate: Copper internally DCB isolated
- Advanced power cycling
- Phase Change Material available

Terms and Conditions of Usage

The data contained in this product data sheet is exclusively intended for technically trained staff. The user will have to evaluate the suitability of the product for the intended application and the completeness of the product data with respect to his application. The specifications of our components may not be considered as an assurance of component characteristics. The information in the valid application- and assembly notes must be considered. Should you require product information in excess of the data given in this product data sheet or which concerns the specific application of your product, please contact your local sales office.
Due to technical requirements our product may contain dangerous substances. For information on the types in question please contact your local sales office.
Should you intend to use the product in aviation, in health or life endangering or life support applications, please notify. For any such application we urgently recommend
- to perform joint risk and quality assessments;
- the conclusion of quality agreements;
- to establish joint measures of an ongoing product survey, and that we may make delivery dependent on the realization of any such measures.

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Free Wheeling Diode FWD				Ratings			
Symbol	**Definition**	**Conditions**		**min.**	**typ.**	**max.**	**Unit**
V_{RSM}	*max. non-repetitive reverse blocking voltage*		T_{VJ} = 25°C			1700	V
V_{RRM}	*max. repetitive reverse blocking voltage*		T_{VJ} = 25°C			1700	V
I_R	*reverse current, drain current*	V_R = 1700 V	T_{VJ} = 25°C			100	µA
	* not applicable, see Ices at IGBT	V_R = 1700 V	T_{VJ} = 125°C			0.8	mA
V_F	*forward voltage drop*	I_F = 40 A	T_{VJ} = 25°C			2.20	V
		I_F = 80 A				2.75	V
		I_F = 40 A	T_{VJ} = 125°C			2.30	V
		I_F = 80 A				3.15	V
I_{FAV}	*average forward current*	T_C = 80°C	T_{VJ} = 150°C			40	A
		rectangular d = 0.5					
V_{F0}	*threshold voltage* } *for power loss calculation only*		T_{VJ} = 150°C			1.35	V
r_F	*slope resistance* }					23	mΩ
R_{thJC}	*thermal resistance junction to case*					1	K/W
R_{thCH}	*thermal resistance case to heatsink*				0.30		K/W
P_{tot}	*total power dissipation*		T_C = 25°C			125	W
I_{FSM}	*max. forward surge current*	t = 10 ms; (50 Hz), sine; V_R = 0 V	T_{VJ} = 45°C			300	A
C_J	*junction capacitance*	V_R = 900 V f = 1 MHz	T_{VJ} = 25°C		14		pF

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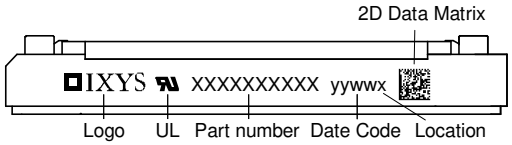
Boost IGBT				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
V_{CES}	*collector emitter voltage*		T_{VJ} = 25°C			1700	V
V_{GES}	*max. DC gate voltage*					±20	V
V_{GEM}	*max. transient gate emitter voltage*					±30	V
I_{C25}	*collector current*		T_C = 25°C			400	A
I_{C80}			T_C = 80°C			280	A
P_{tot}	*total power dissipation*		T_C = 25°C			1390	W
$V_{CE(sat)}$	*collector emitter saturation voltage*	I_C = 300 A; V_{GE} = 15 V	T_{VJ} = 25°C		2	2.45	V
			T_{VJ} = 125°C		2.4		V
$V_{GE(th)}$	*gate emitter threshold voltage*	I_C = 12 mA; V_{GE} = V_{CE}	T_{VJ} = 25°C	5.2	5.8	6.4	V
I_{CES}	*collector emitter leakage current*	V_{CE} = V_{CES}; V_{GE} = 0 V	T_{VJ} = 25°C			1.2	mA
			T_{VJ} = 125°C		1.4		mA
I_{GES}	*gate emitter leakage current*	V_{GE} = ±20 V				800	nA
$Q_{G(on)}$	*total gate charge*	V_{CE} = 900 V; V_{GE} = 15 V; I_C = 300 A			3400		nC
$t_{d(on)}$	*turn-on delay time*	inductive load V_{CE} = 900 V; I_C = 300 A V_{GE} = ±15 V; R_G = 4.7 Ω	T_{VJ} = 125°C		340		ns
t_r	*current rise time*				90		ns
$t_{d(off)}$	*turn-off delay time*				800		ns
t_f	*current fall time*				400		ns
E_{on}	*turn-on energy per pulse*				100		mJ
E_{off}	*turn-off energy per pulse*				75		mJ
RBSOA	*reverse bias safe operating area*	V_{GE} = ±15 V; R_G = 4.7 Ω	T_{VJ} = 125°C				
I_{CM}		V_{CEmax} = 1700 V				600	A
SCSOA	*short circuit safe operating area*	V_{CEmax} = 1700 V					
t_{SC}	*short circuit duration*	V_{CE} = 900 V; V_{GE} = ±15 V	T_{VJ} = 125°C			10	µs
I_{SC}	*short circuit current*	R_G = 4.7 Ω; non-repetitive			1600		A
R_{thJC}	*thermal resistance junction to case*					0.09	K/W
R_{thCH}	*thermal resistance case to heatsink*				0.03		K/W

Boost Diode BD							
V_{RRM}	*max. repetitive reverse voltage*		T_{VJ} = 25°C			1700	V
I_{F25}	*forward current*		T_C = 25°C			400	A
I_{F80}			T_C = 80°C			300	A
V_F	*forward voltage*	I_F = 300 A	T_{VJ} = 25°C			2.20	V
			T_{VJ} = 125°C		2.00		V
I_R	*reverse current*	V_R = V_{RRM}	T_{VJ} = 25°C			1.2	mA
			T_{VJ} = 125°C		1.2		mA
Q_{rr}	*reverse recovery charge*	V_R = 900 V -di_F/dt = 3000 A/µs I_F = 300 A; V_{GE} = 0 V	T_{VJ} = 125°C		80		µC
I_{RM}	*max. reverse recovery current*				300		A
t_{rr}	*reverse recovery time*				950		ns
E_{rec}	*reverse recovery energy*				40		mJ
R_{thJC}	*thermal resistance junction to case*					0.14	K/W
R_{thCH}	*thermal resistance case to heatsink*				0.05		K/W

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Package E2-Pack				Ratings			
Symbol	**Definition**	**Conditions**		**min.**	**typ.**	**max.**	**Unit**
I_{RMS}	*RMS current*	per terminal				30	A
T_{VJ}	*virtual junction temperature*			-40		150	°C
T_{op}	*operation temperature*			-40		125	°C
T_{stg}	*storage temperature*			-40		125	°C
Weight					176		g
M_D	*mounting torque*			3		6	Nm
$d_{Spp/App}$	*creepage distance on surface | striking distance through air*		*terminal to terminal*	6.0			mm
$d_{Spb/Apb}$			*terminal to backside*	12.0			mm
V_{ISOL}	*isolation voltage*	t = 1 second	50/60 Hz, RMS; I_{ISOL} ≤ 1 mA	3600			V
		t = 1 minute		3000			V
$R_{pin-chip}$	*resistance pin to chip*	$V = V_{CEsat} + 2 \cdot R \cdot I_C$ resp. $V = V_F + 2 \cdot R \cdot I_F$			2.5		mΩ



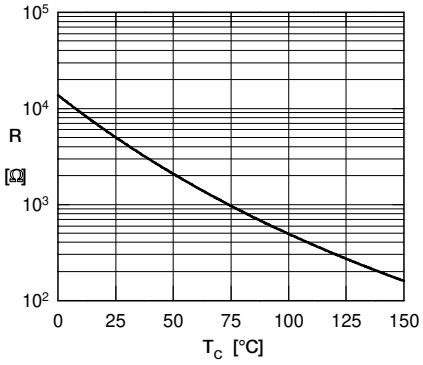
Part description

M = Module
I = IGBT
T = IGBT Trench
A = Gen 3 / std
300 = Current Rating [A]
RF = Boost/Brake Chopper + free wheeling Diode
1700 = Reverse Voltage [V]
PT = PressFit-Pin, Thermistor
ED = E2-Pack
- = Hyphen
PC = Phase Change Material

Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	MITA300RF1700PTED	MITA300RF1700PTED	Blister	28	516670
Alternative	MITA300RF1700PTED-PC	MITA300RF1700PTED	Blister	28	515402

Temperature Sensor NTC

Symbol	**Definition**	**Conditions**	**min.**	**typ.**	**max.**	**Unit**
R_{25}	*resistance*	T_{VJ} = 25°	4.85	5	5.15	kΩ
$B_{25/50}$	*temperature coefficient*			3375		K

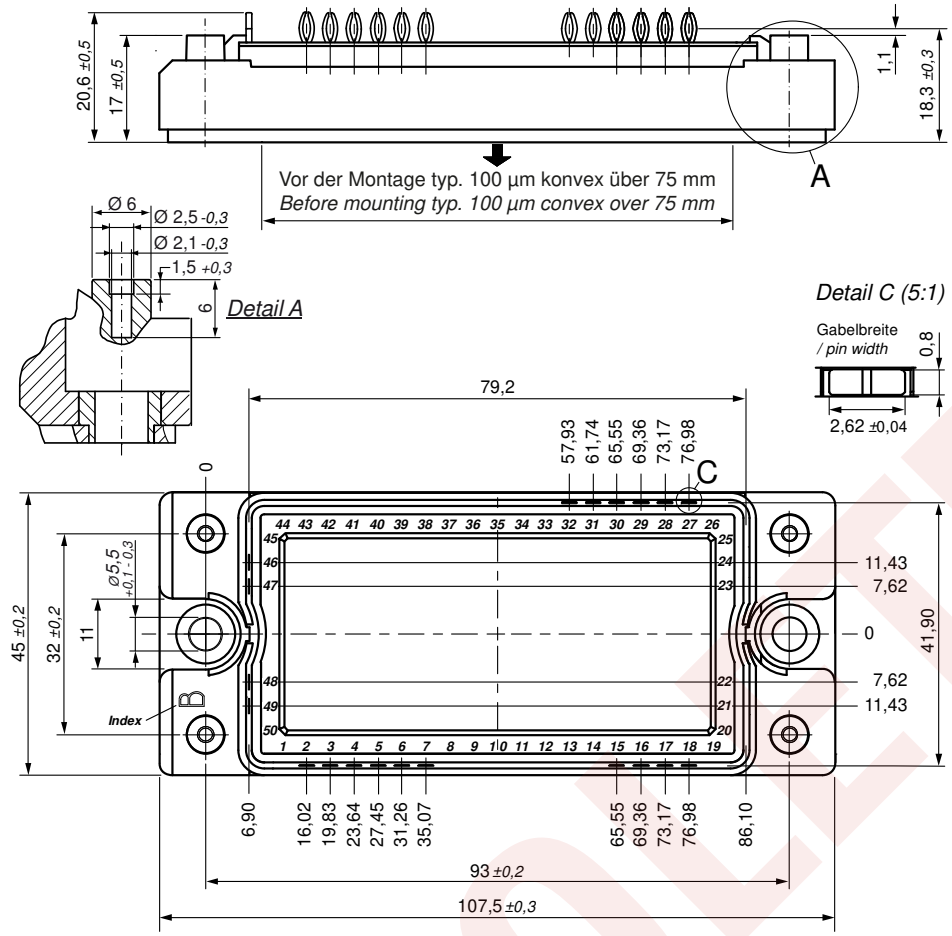


Typ. NTC resistance vs. temperature

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Outlines E2-Pack

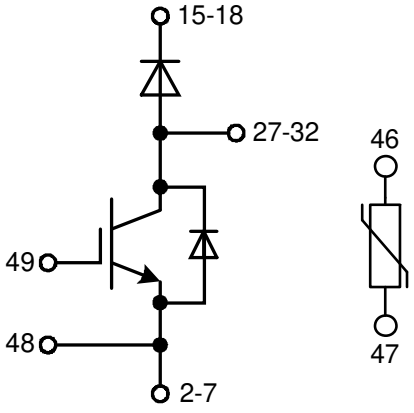


Bemerkung / ***Note:***

- Nicht tolerierte Maße nach / *Measure without tolerances according DIN ISO 2768-T1-m*
- PCB-Lochmuster / *PCB hole pattern:* **see pin position**
- Toleranz Pin-Position und PCB-Lochmuster / *Tolerance of pin position and PCB hole pattern:* ⌖ **0.1**
- Bohrlochdurchmesser / *Diameter of drill:* **Ø 2.35 mm**
- Endlochdurchmesser / *Diameter of plated holes:* **Ø 2.14 - 2.29 mm** (Cu thickness in via typ. 50 µm)
- Beschichtung / *Plating:* **chem. Sn max. 15 µm**
- Einpresskraft / *Insert Force:* per terminal with a typ. insert speed of 7 mm/s: **typ. 90 N**
- Weitere Angaben / *Further information:* www.ixys.com **Application note IXAN0077**
- Montageanleitung / *Mounting instruction:* www.ixys.com **Application note IXAN0024**

***Detail A*:** PCB-Montage / *Mounting on PCB*

- Empfohlene, selbstschneidende Schraube / *Recommended, self-tapping screw:* **EJOT PT®** (Größe / *size:* **K25**)
- Max. Schraubenlänge / *Max. screw length:* **PCB-Dicke** / **thickness + 6 mm** (max. Lochtiefe / *hole depth*)
- Empfohlenes Drehmoment / *Recommended mounting torque:* **1.5 Nm**



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Boost IGBT

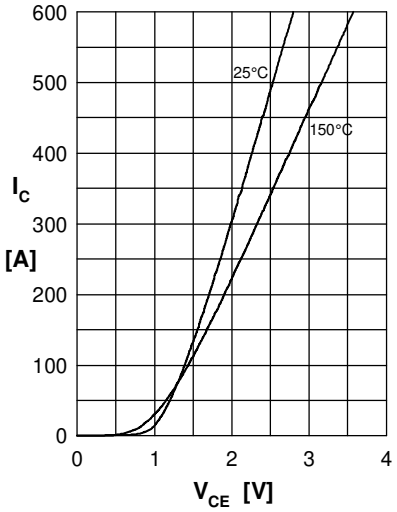


Fig.1 Typ. output characteristics IGBT

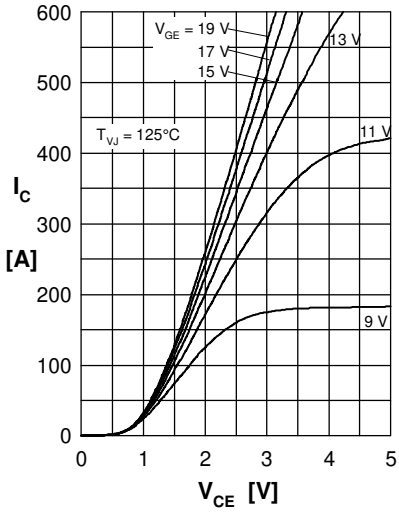


Fig.2 Typ. output characteristics IGBT

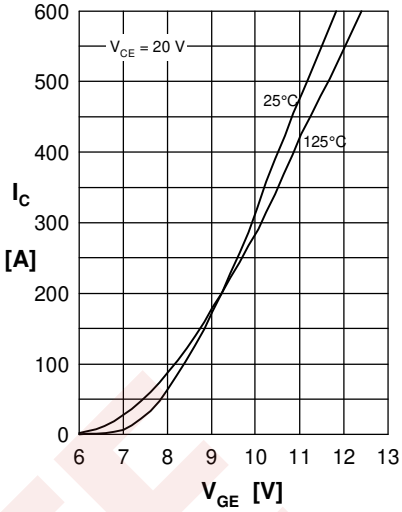


Fig. 3 Typ. transfer charact. IGBT

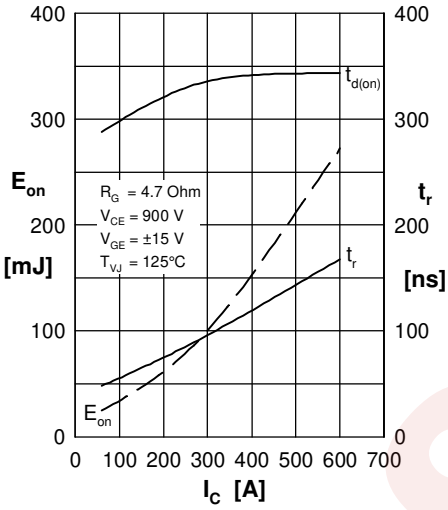


Fig. 4 Typ. turn-on energy & switch. times vs. collector current

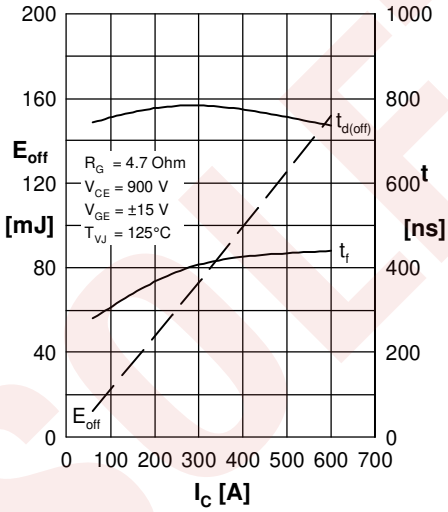


Fig. 5 Typ. turn-off energy & switch. times vs. collector current

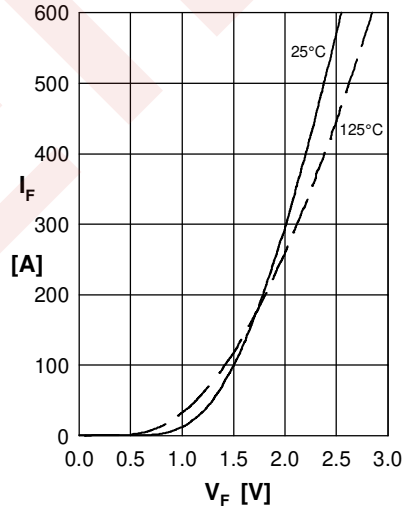


Fig. 6 Typ. forward characteristics Diode

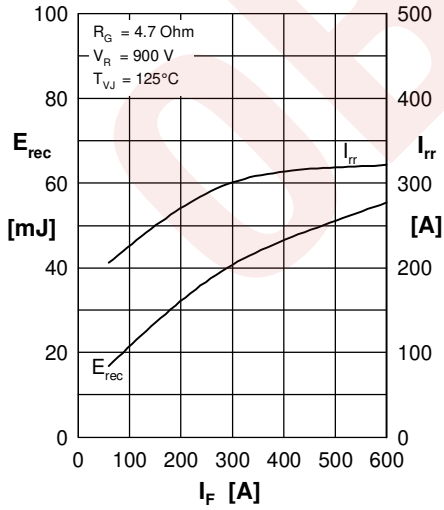


Fig. 7 Typ. reverse recovery characteristics Diode

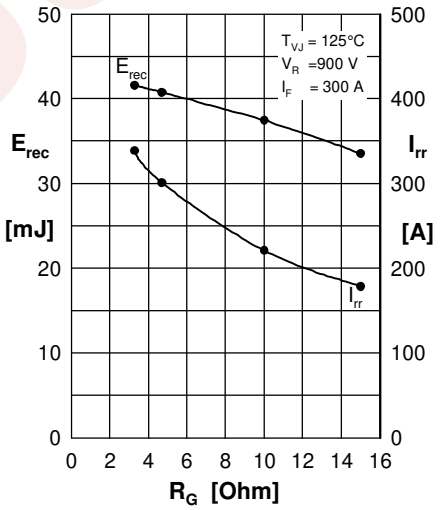


Fig. 8 Typ. reverse recovery characteristics Diode

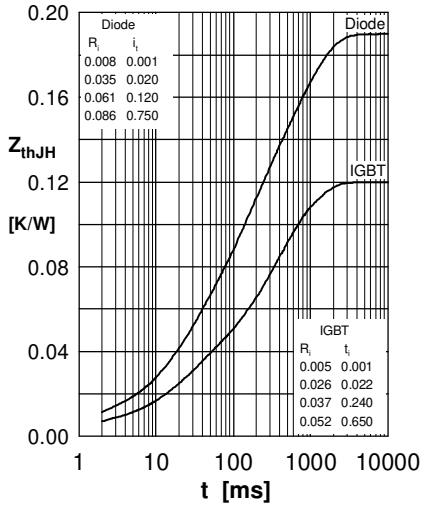


Fig. 9 Typ. transient thermal resistance juntion to heatsink

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