MIXG180W1200TEH

tentative

71 E72873

= 1200 VV_{CES}

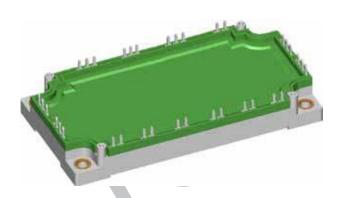
280 A C25

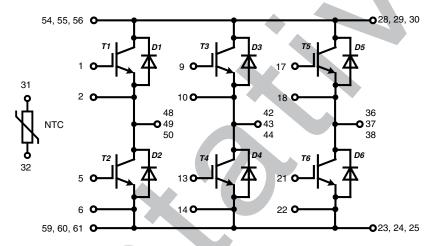
1.7 V

X2PT IGBT Module

6-Pack + NTC

Part number MIXG180W1200TEH





Features / Advantages:

- X2PT 2nd generation Xtreme light **Punch Through**
- Tvim = 175°C
- Easy paralleling due to the positive temperature coefficient of the on-state voltage
- Rugged X2PT design results in:
- short circuit rated for 10 µsec.
- very low gate charge
- low EMI
- square RBSOA @ 2x lc
- Low $V_{\text{CE(sat)}}$ and low thermal resistance • SONICTM diode
- fast and soft reverse recovery
- low operating forward voltage

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: E3-Pack

- Isolation Voltage: 4300 V~
- Industry standard outline
- RoHS compliant
- · Base plate: Copper internally DCB isolated
- Advanced power cycling

Option:

• Phase Change Material printed on base plate

Terms & 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 the sales office, which is responsible for you. Due to technical requirements our product may contain dangerous substances. For information on the types in question please contact the sales office, which is responsible for you. Should you intend to use the product in aviation, in health or live endangering or life support applications, please notify. For any such application we urgently recommend - to perform joint risk and quality assessments;

IXYS reserves the right to change limits, test conditions and dimensions.

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⁻ 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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Inverter I	GBT				Rating	S	
Symbol	Definitions	Conditions		min.	typ.	max.	
V _{CES}	collector emitter voltage		$T_{VJ} = 25^{\circ}C$			1200	١
V _{GES}	max. DC gate voltage			-20		+20	٧
V _{GEM}	max. transient gate emitter voltage			-30		+30	V
I _{C25}	collector current		$T_C = 25^{\circ}C$			280	Α
I _{C80}			$T_{\rm C} = 80^{\circ}{\rm C}$			210	Α
I _{C100}			$T_C = 100^{\circ}C$			180	A
P _{tot}	total power dissipation		$T_C = 25^{\circ}C$			935	W
$V_{\text{CE(sat)}}$	collector emitter saturation voltage	$I_C = 150 \text{ A}; V_{GE} = 15 \text{ V}$	$T_{VJ} = 25^{\circ}C$ $T_{VJ} = 150^{\circ}C$		1.7 2	2	V V
$V_{\text{GE(th)}}$	gate emitter threshold voltage	$I_C = 6 \text{ mA}; V_{GE} = V_{GE}$	$T_{VJ} = 25^{\circ}C$	5.5		7	V
I _{CES}	collector emitter leakage current	$V_{CE} = V_{CES}$; $V_{GE} = 0 \text{ V}$	$T_{VJ} = 25^{\circ}C$ $T_{VJ} = 150^{\circ}C$		12	0.5	mA mA
I _{GES}	gate emitter leakage current	V _{GE} = ±20 V	*			500	nA
R _G	internal gate resistance				2.5		Ω
C _{iss}	input capacitance				8.5		nF
Coss	output capacitance	$V_{CE} = 100 \text{ V}; V_{GS} = 0 \text{ V}; f = 1 \text{ MHz}$					pF
C _{rss}	reverse transfer (Miller) capacitance	J					pF
\mathbf{Q}_{g}	total gate charge				520		nC
Q _{gs}	gate source charge	$V_{CE} = 600 \text{ V}; V_{GE} = 15 \text{ V}; I_{C} = 150 \text{ A}$					nC
Q _{gd}	gate drain (Miller) charge						nC
t _{d(on)}	urn-on delay time current rise time				90 60		ns ns
t _r t _{d(off)}	turn-off delay time	Inductive switching			280		ns
t _f	current fall time	V _{CE} = 600 V; I _C = 150 A	$T_{V,J} = 25^{\circ}C$		80		ns
Ė _{on}	turn-on energy per pulse	$V_{GE} = \pm 15 \text{ V}; R_G = 4.7 \Omega \text{ (external)}$	V3		11		mJ
E _{off}	turn-off energy per pulse				12		mJ
E _{rec(off)}	reverse recovery losses at turn-off						mJ
$\mathbf{t}_{d(on)}$	turn-on delay time				100		ns
t _r	current rise time				75		ns
t _{d(off)}	turn-off delay time	Inductive switching	T 45000		340		ns
t _f	current fall time	$V_{CE} = 600 \text{ V}; I_{C} = 150 \text{ A}$	$T_{VJ} = 150^{\circ}C$		100		ns
E _{on}	turn-on energy per pulse turn-off energy per pulse	$V_{GE} = \pm 15 \text{ V}; R_G = 4.7 \Omega \text{ (external)}$			16 16		mJ mJ
E _{off} E _{rec(off)}	reverse recovery losses at turn-off				10		mJ
RBSOA	reverse bias safe operating area	$V_{GE} = \pm 15 \text{ V}; R_{G} = 4.7 \Omega$	T _{v,j} = 150°C				0
I _{CM}	TITIOS SIAS SAIS SPORMING ANDA	$V_{\text{CEmax}} = 1200 \text{ V}$	1 _{VJ} = 100 0			400	Α
SCSOA	short circuit safe operating area	V _{CEmax} = 1200 V					
t _{sc}	short circuit duration	$V_{CE} = 900 \text{ V}; V_{GE} = \pm 15 \text{ V}$	$T_{VJ} = 150^{\circ}C$			10	μs
I _{sc}	short circuit duration	non-repetitive			600		Α
R_{thJC}	thermal resistance junction to case				0.00	0.16	K/W
R_{thJH}	thermal resistance junction to heatsin	with heatsink compound; IXYS test	setup		0.26		K/W

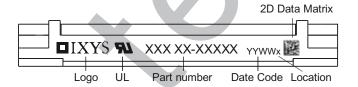


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Inverter Diode				Ratings			
Symbol	Definitions	Conditions		min.	typ.	max.	
V_{RRM}	max. repetitive reverse voltage		$T_{VJ} = 25^{\circ}C$			1200	V
	forward current		$T_{C} = 25^{\circ}C$ $T_{C} = 80^{\circ}C$ $T_{C} = 100^{\circ}C$			230 170 145	A
V _F	forward voltage	I _F = 150 A	$T_{VJ} = 25^{\circ}C$ $T_{VJ} = 150^{\circ}C$		1.9	2.2	V V
I _R	reverse current * not applicable, see Ices at IGBT	$V_{R} = V_{RRM}$	$T_{VJ} = 25^{\circ}C$ $T_{VJ} = 150^{\circ}C$		*	*	mA mA
Q _{RM} I _{RM} t _{rr} E _{rec}	reverse recovery charge max. reverse recovery current reverse recovery time reverse recovery energy	$V_R = 600 \text{ V}$ -di _F /dt = 2500 A/µs $I_F = 150 \text{ A}$	T _{vJ} = 25°C				μC A ns mJ
Q _{RM} I _{RM} t _{rr} E _{rec}	reverse recovery charge max. reverse recovery current reverse recovery time reverse recovery energy	$V_R = 600 \text{ V}$ -di _F /dt = 2500 A/µs $I_F = 150 \text{ A}$	T _{vJ} = 150°C		20 175 350 10		μC A ns mJ
R _{thJC}	thermal resistance junction to case thermal resistance junction to heatsink	with heatsink compound	l; IXYS test setup		0.40	0.25	K/W K/W

Package	E3-Pack	E3-Pack		Ratings			
Symbol	Definitions	Conditions		min.	typ.	max.	Unit
I _{RMS}	RMS current	per terminal				300	Α
T_{stg}	storage temperature			-40		125	°C
T_{op}	operation temperature			-40		150	°C
T _{VJ}	virtual junction temperature			-40		175	°C
Weight					270		g
M_{D}	mounting torque			3		6	Nm
d _{Spp}	creepage distance on surface		terminal to terminal	6			mm
\mathbf{d}_{Spp} \mathbf{d}_{Spb}	creepage distance on surface		terminal to backside	12			mm
d_{App}	atriking diatance through air		terminal to terminal	6			mm
d_{Apb}	striking distance through air		terminal to backside	12			mm
V _{ISOL}	isolation voltage	t = 1 second	50 / 60 Hz DMC: 1 . 1 mA	4300			V
		t = 1 minute	50 / 60 Hz, RMS; I _{ISOL} ≤ 1 mA	3600			V
R _{pin-chip}	resistance pin to chip	$V = V_{CEsat} + 2 \cdot F$	$R \cdot I_C$ resp. $V = V_F + 2 \cdot R \cdot I_F$		2.5		mΩ
C _P	coupling capacity per switch	between shorted p	oins of switch and back side metallization				pF



Part number

M = Module

I = IGBT

X = XPT IGBT

G = Gen 2 / std 180 = Current Rating [A]

W = 6-pack

1200 = Reverse Voltage [V]

T = Thermistor

EH = E3-Pack

Ordering	Part Name	Marking on Product	Delivering Mode	Base Qty	Ordering Code
Standard	MIXG180W1200TEH	MIXG180W1200TEH	Box	5	518150
with Phase Change Material	MIXG180W1200TEH -PC	MIXG180W1200TEH	Blister	12	

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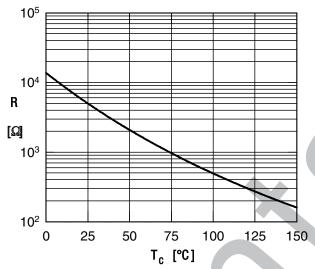




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Equival	ent Circuits for Simulation	*on die level			
$I \rightarrow V_0$	- R _o -		IGBT	FW Diode	
V _{0 max}	threshold voltage slope resistance *	T _{VJ} = 125°C			V mΩ
V _{0 max}	threshold voltage slope resistance *	T _{vJ} = 175°C	1.2 7.7	1.2 6.0	V mΩ

Temperature Sensor NTC								
Symbol	Definitions	Conditions	min.	typ.	max.	Unit		
R ₂₅	resistance	$T_{VJ} = 25^{\circ}C$	4.75	5.0	5.25	kΩ		
B _{25/50}	temperature coefficient			3375		Κ		



Typ. NTC resistance vs. temperature





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