MIXG120W1200TEH

tentative

71 E72873

= 1200 VV_{CES}

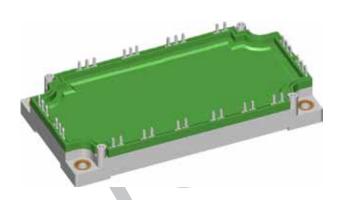
186 A C25

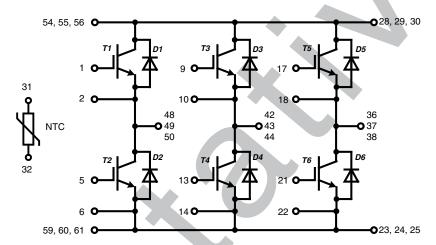
1.7 V

X2PT IGBT Module

6-Pack + NTC

Part number MIXG120W1200TEH





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;

- 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.

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

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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	٧
V _{GES}	max. DC gate voltage			-20		+20	V
V_{GEM}	max. transient gate emitter voltage			-30		+30	V
l _{C25}	collector current		$T_C = 25^{\circ}C$			186	A
C80			$T_{\rm C} = 80^{\circ}{\rm C}$ $T_{\rm C} = 100^{\circ}{\rm C}$			140 120	A A
I _{C100}	total power dissipation		$T_{\rm C} = 100 \rm C$ $T_{\rm C} = 25 \rm ^{\circ}C$			625	
P _{tot}		1 100 4.1/ 15 //			17		
V _{CE(sat)}	collector emitter saturation voltage	$I_C = 100 \text{ A}; V_{GE} = 15 \text{ V}$	$T_{VJ} = 25^{\circ}C$ $T_{VJ} = 150^{\circ}C$		1.7 2.0	2.0	V V
$V_{\text{GE(th)}}$	gate emitter threshold voltage	$I_C = 4 \text{ mA}; V_{GE} = V_{GE}$	$T_{VJ} = 25^{\circ}C$	6		7	V
I _{CES}	collector emitter leakage current	$V_{CE} = V_{CES}$; $V_{GE} = 0 \text{ V}$	$T_{VJ} = 25^{\circ}C$ $T_{VJ} = 150^{\circ}C$		2		mA mA
I _{GES}	gate emitter leakage current	V _{GE} = ±20 V	- W		_	500	nA
R _G	internal gate resistance				3.9		Ω
C _{iss}	input capacitance						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						pF
Q_g	total gate charge gate source charge	$V_{CE} = 600 \text{ V}; V_{GE} = 15 \text{ V}; I_{C} = 100 \text{ A}$					nC nC
\mathbf{Q}_{gs} \mathbf{Q}_{gd}	gate drain (Miller) charge	$\begin{cases} v_{CE} = 000 \text{ V}, v_{GE} = 15 \text{ V}, I_{C} = 100 \text{ A} \end{cases}$					nC
t _{d(on)}	urn-on delay time		¥		80		ns
t _r	current rise time				40		ns
t _{d(off)}	turn-off delay time	Inductive switching	T 0500		250		ns
t _f	current fall time	$V_{CE} = 600 \text{ V}; I_{C} = 100 \text{ A}$	$T_{VJ} = 25^{\circ}C$		80		ns
E _{on}	turn-on energy per pulse turn-off energy per pulse	$V_{GE} = \pm 15 \text{ V}; R_G = 6.8 \Omega \text{ (external)}$			5.8		mJ mJ
E _{off} E _{rec(off)}	reverse recovery losses at turn-off				3.0		mJ
t _{d(on)}	turn-on delay time	1			100		ns
t _r	current rise time				50		ns
$\mathbf{t}_{d(off)}$	turn-off delay time	Inductive switching			300		ns
<u>t_f</u>	current fall time	$V_{CE} = 600 \text{ V}; I_{C} = 100 \text{ A}$	$T_{VJ} = 150^{\circ}C$		100		ns
E _{on}	turn-on energy per pulse	$V_{GE} = \pm 15 \text{ V}; R_G = 6.8 \Omega \text{ (external)}$			10.5		mJ
E _{off}	turn-off energy per pulse reverse recovery losses at turn-off				8.2		mJ mJ
RBSOA	reverse bias safe operating area	V -+15 V: B -680	T _{v.j} = 150°C				1110
I _{CM}	Tovorse bias sale operating area	$V_{GE} = \pm 15 \text{ V}; R_G = 6.8 \Omega$ $V_{CEmax} = 1200 \text{ V}$	1 _{VJ} = 150 C			200	Α
SCSOA	short circuit safe operating area	V _{CEmax} = 1200 V					
t _{sc}	short circuit duration	$V_{CE} = 900 \text{ V}; V_{GE} = \pm 15 \text{ V}$	$T_{VJ} = 150^{\circ}C$		000	10	μs
I _{sc}	short circuit duration				600		A
R _{thJC}	thermal resistance junction to case	with heataink asmasund, IVVC test	aatun		0.00	0.24	K/W
R _{thJH}	thermal resistance junction to heatsink	with heatsink compound; IXYS test	setup		0.38		K/W

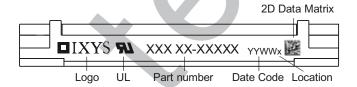


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Inverter Diode				Ratings			
Symbol	Definitions	Conditions		min.	typ.	max.	
V _{RRM}	max. repetitive reverse voltage		$T_{VJ} = 25^{\circ}C$			1200	V
_{F25} _{F80} _{F100}	forward current		$T_{c} = 25^{\circ}C$ $T_{c} = 80^{\circ}C$ $T_{c} = 100^{\circ}C$			180 135 115	A A
V _F	forward voltage	I _F = 120 A	$T_{VJ} = 25$ °C $T_{VJ} = 150$ °C		1.9	2.2	V V
I _R	reverse current * not applicable, see Ices at IGBT	$V_{R} = V_{RRM}$	$T_{VJ} = 25$ °C $T_{VJ} = 150$ °C		*	*	mA mA
Q _{RM} I _{RM} t _{rr} E _{rec}	reverse recovery charge max. reverse recovery current reverse recovery time reverse recovery energy	$V_{R} = 600 \text{ V}$ - $di_{F}/dt = 2400 \text{ A/}\mu\text{s}$ $I_{F} = 120 \text{ A}$	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 V -di _F /dt = 2400 A/μs I _F = 120 A	T _{VJ} = 150°C		16 120 350 5		μC A ns mJ
R _{thJC}	thermal resistance junction to case thermal resistance junction to heatsink	with heatsink compound;	IXYS test setup		0.45	0.30	K/W K/W

Package	E3-Pack		Ratings				
Symbol	Definitions	Conditions		min.	typ.	max.	Unit
I _{RMS}	RMS current	per terminal				300	Α
T _{stg} T _{op} T _{VJ}	storage temperature operation temperature virtual junction temperature			-40 -40 -40		125 150 175	ე° ℃
Weight	Tintual junioner temperature			10	270	170	g
M _D	mounting torque			3		6	Nm
d _{Spp}	creepage distance on surface		terminal to terminal terminal to backside	6 12			mm mm
d _{App}	striking distance through air		terminal to terminal terminal to backside	6 12			mm mm
V _{ISOL}	isolation voltage	t = 1 second t = 1 minute	50 / 60 Hz, RMS; $I_{ISOL} \le 1 \text{ mA}$	4300 3600			V
R _{pin-chip}	resistance pin to chip	$V = V_{CEsat} + 2 \cdot F$	$R \cdot I_C \text{ resp. } V = V_F + 2 \cdot R \cdot I_F$		2.5		mΩ
C _P	coupling capacity per switch	between shorted	pins of switch and back side metallization				pF



Part number

M = Module

I = IGBT

X = XPT IGBT

G = Gen 2 / std120 = 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	MIXG120W1200TEH	MIXG120W1200TEH	Box	5	518143
with Phase Change Material	MIXG120W1200TEH -PC	MIXG120W1200TEH	Blister	12	

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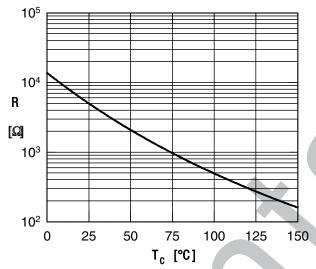




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Equival	ent Circuits for Simulation	*on die level			
$I \rightarrow V_0$	R_0		IGBT	FW Diode	
V _{0 max}	threshold voltage slope resistance *	T _{VJ} = 125°C			V mΩ
V _{0 max}	threshold voltage slope resistance *	T _{vJ} = 175°C	1.2 11.6	1.2 7.5	V mΩ

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		K		

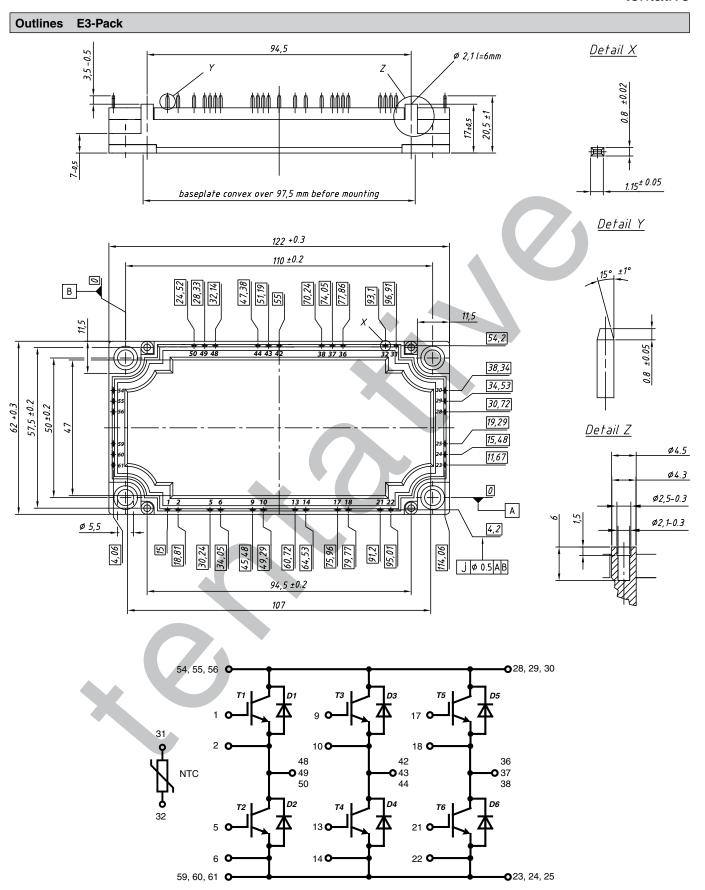


Typ. NTC resistance vs. temperature





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F3L400R07ME4_B22 FB20R06W1E3_B11 FD300R12KS4_B5 FD400R33KF2C-K FF200R06YE3 FF600R12IP4V FF900R12IE4V FP06R12W1T4_B3 FP10R06W1E3_B11 FP15R12W2T4 FP20R06W1E3 FP40R12KT3G FP75R07N2E4_B11 FS10R12YE3 FS150R07PE4 FS150R12PT4 FS15R12VT3 FS200R12KT4R FS20R06W1E3_B11 FS50R06KE3 FS50R07N2E4 FS50R07N2E4_B11 FZ1600R17HP4_B2 DD250S65K3 DF1000R17IE4 APTGT100A60T1G APTGT75DA60T1G BSM300GB120DLC BSM75GB120DN2_E3223c-Se F3L200R07PE4 F3L200R12W2H3_B11 F3L300R12ME4_B22 F3L75R07W2E3_B11 F4-50R12KS4_B11 F475R07W1H3B11ABOMA1 FD1400R12IP4D FD400R12KE3_B5 FD800R33KF2C-K FF1200R17KP4_B2 FF150R12ME3G FF150R17ME3G FF225R12MS4 FF300R17KE3_S4 FF300R17ME4_B11 FF600R12IE4 FF650R17IE4D_B2 FF900R12IP4D FF900R12IP4DV FP10R12W1T4_B3 FP30R06W1E3_B11