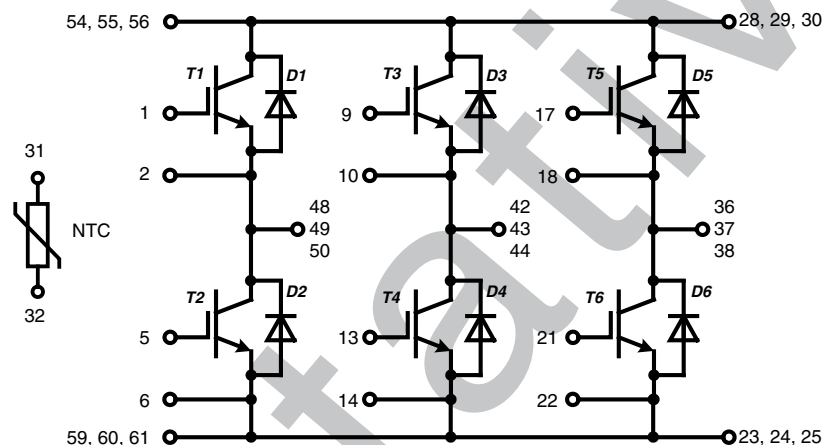
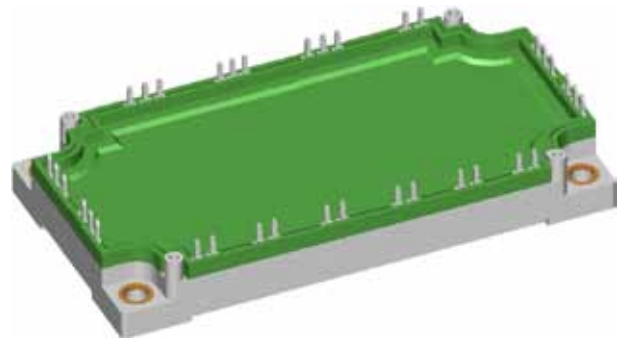


tentative

X2PT IGBT Module

 $V_{CES} = 1200 \text{ V}$
 $I_{C25} = 186 \text{ A}$
 $V_{CE(sat)} = 1.7 \text{ V}$

6-Pack + NTC

Part number
 MIXG120W1200TEH


E72873

Features / Advantages:

- X2PT - 2nd generation Xtreme light Punch Through
- $T_{vjm} = 175^{\circ}\text{C}$
- 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 I_c
- Low $V_{CE(sat)}$ and low thermal resistance
- SONIC™ 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.

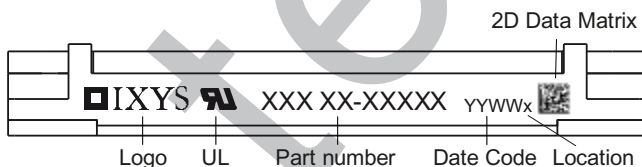
IXYS reserves the right to change limits, test conditions and dimensions.

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Inverter IGBT				Ratings		
Symbol	Definitions	Conditions	min.	typ.	max.	
V_{CES}	collector emitter voltage	$T_{VJ} = 25^{\circ}\text{C}$			1200	V
V_{GES}	max. DC gate voltage		-20		+20	V
V_{GEM}	max. transient gate emitter voltage		-30		+30	V
I_{C25}	collector current	$T_C = 25^{\circ}\text{C}$			186	A
I_{C80}		$T_C = 80^{\circ}\text{C}$			140	A
I_{C100}		$T_C = 100^{\circ}\text{C}$			120	A
P_{tot}	total power dissipation	$T_C = 25^{\circ}\text{C}$			625	W
$V_{CE(sat)}$	collector emitter saturation voltage	$I_C = 100\text{ A}; V_{GE} = 15\text{ V}$		1.7 2.0	2.0	V V
$V_{GE(th)}$	gate emitter threshold voltage	$I_C = 4\text{ mA}; V_{GE} = V_{GE}$		6	7	V
I_{CES}	collector emitter leakage current	$V_{CE} = V_{CES}; V_{GE} = 0\text{ V}$		2		mA mA
I_{GES}	gate emitter leakage current	$V_{GE} = \pm 20\text{ V}$			500	nA
R_G	internal gate resistance			3.9		Ω
C_{iss}	input capacitance	$V_{CE} = 100\text{ V}; V_{GS} = 0\text{ V}; f = 1\text{ MHz}$				nF
C_{oss}	output capacitance					pF
C_{rss}	reverse transfer (Miller) capacitance					pF
Q_g	total gate charge	$V_{CE} = 600\text{ V}; V_{GE} = 15\text{ V}; I_C = 100\text{ A}$				nC
Q_{gs}	gate source charge					nC
Q_{gd}	gate drain (Miller) charge					nC
$t_{d(on)}$	turn-on delay time	Inductive switching $V_{CE} = 600\text{ V}; I_C = 100\text{ A}$ $V_{GE} = \pm 15\text{ V}; R_G = 6.8\ \Omega$ (external)	$T_{VJ} = 25^{\circ}\text{C}$		80	ns
t_r	current rise time				40	ns
$t_{d(off)}$	turn-off delay time				250	ns
t_f	current fall time				80	ns
E_{on}	turn-on energy per pulse				6	mJ
E_{off}	turn-off energy per pulse				5.8	mJ
$E_{rec(off)}$	reverse recovery losses at turn-off					mJ
$t_{d(on)}$	turn-on delay time	Inductive switching $V_{CE} = 600\text{ V}; I_C = 100\text{ A}$ $V_{GE} = \pm 15\text{ V}; R_G = 6.8\ \Omega$ (external)	$T_{VJ} = 150^{\circ}\text{C}$		100	ns
t_r	current rise time				50	ns
$t_{d(off)}$	turn-off delay time				300	ns
t_f	current fall time				100	ns
E_{on}	turn-on energy per pulse				10.5	mJ
E_{off}	turn-off energy per pulse				8.2	mJ
$E_{rec(off)}$	reverse recovery losses at turn-off					mJ
RBSOA	reverse bias safe operating area	$V_{GE} = \pm 15\text{ V}; R_G = 6.8\ \Omega$	$T_{VJ} = 150^{\circ}\text{C}$			
I_{CM}		$V_{CEmax} = 1200\text{ V}$			200	A
SCSOA	short circuit safe operating area	$V_{CEmax} = 1200\text{ V}$	$T_{VJ} = 150^{\circ}\text{C}$			
t_{SC}	short circuit duration	$V_{CE} = 900\text{ V}; V_{GE} = \pm 15\text{ V}$			10	μs
I_{SC}	short circuit current	non-repetitive		600		A
R_{thJC}	thermal resistance junction to case	with heatsink compound; IXYS test setup			0.24	K/W
R_{thJH}	thermal resistance junction to heatsink			0.38		K/W

Inverter Diode				Ratings		
Symbol	Definitions	Conditions	min.	typ.	max.	
V_{RRM}	max. repetitive reverse voltage				1200	V
I_{F25}	forward current				180	A
I_{F80}					135	A
I_{F100}					115	A
V_F	forward voltage	$I_F = 120$ A		1.9	2.2	V
I_R	reverse current * not applicable, see Ices at IGBT	$V_R = V_{RRM}$		*	*	mA
Q_{RRM}	reverse recovery charge	$V_R = 600$ V $-di_F/dt = 2400$ A/ μ s $I_F = 120$ A				μ C
I_{RRM}	max. reverse recovery current					A
t_{rr}	reverse recovery time					ns
E_{rec}	reverse recovery energy					mJ
Q_{RRM}	reverse recovery charge	$V_R = 600$ V $-di_F/dt = 2400$ A/ μ s $I_F = 120$ A		16		μ C
I_{RRM}	max. reverse recovery current			120		A
t_{rr}	reverse recovery time			350		ns
E_{rec}	reverse recovery energy			5		mJ
R_{thJC}	thermal resistance junction to case	with heatsink compound; IXYS test setup		0.45	0.30	K/W
R_{thJH}	thermal resistance junction to heatsink					K/W

Package E3-Pack		Ratings				
Symbol	Definitions	Conditions	min.	typ.	max.	Unit
I_{RMS}	RMS current	per terminal			300	A
T_{stg}	storage temperature		-40		125	$^{\circ}$ C
T_{op}	operation temperature		-40		150	$^{\circ}$ C
T_{VJ}	virtual junction temperature		-40		175	$^{\circ}$ C
Weight					270	g
M_D	mounting torque		3		6	Nm
d_{Spp}	creepage distance on surface	terminal to terminal	6			mm
d_{Spb}		terminal to backside	12			mm
d_{App}	striking distance through air	terminal to terminal	6			mm
d_{Apb}		terminal to backside	12			mm
V_{ISOL}	isolation voltage	$t = 1$ second $t = 1$ minute 50 / 60 Hz, RMS; $I_{ISOL} \leq 1$ mA	4300 3600			V 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		m Ω
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 / std
- 120 = Current Rating [A]
- W = 6-pack
- 1200 = Reverse Voltage [V]
- T = Thermistor
- EH = E3-Pack

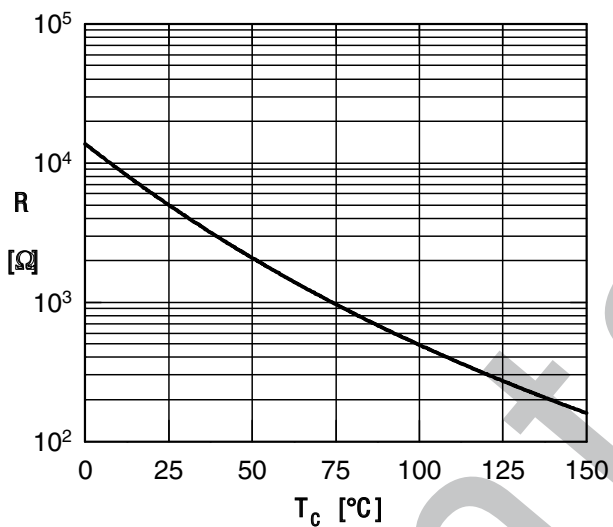
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with Phase Change Material	MIXG120W1200TEH -PC	MIXG120W1200TEH	Blister	12	

Equivalent Circuits for Simulation *on die level

			IGBT	FW Diode	
$V_{0\ max}$	threshold voltage	$T_{VJ} = 125^{\circ}\text{C}$			V
$R_{0\ max}$	slope resistance *				m Ω
$V_{0\ max}$	threshold voltage	$T_{VJ} = 175^{\circ}\text{C}$	1.2	1.2	V
$R_{0\ max}$	slope resistance *		11.6	7.5	m Ω

Temperature Sensor NTC

Symbol	Definitions	Conditions	min.	typ.	max.	Unit
R_{25}	resistance	$T_{VJ} = 25^{\circ}\text{C}$	4.75	5.0	5.25	k Ω
$B_{25/50}$	temperature coefficient			3375		K



Typ. NTC resistance vs. temperature

Outlines E3-Pack

