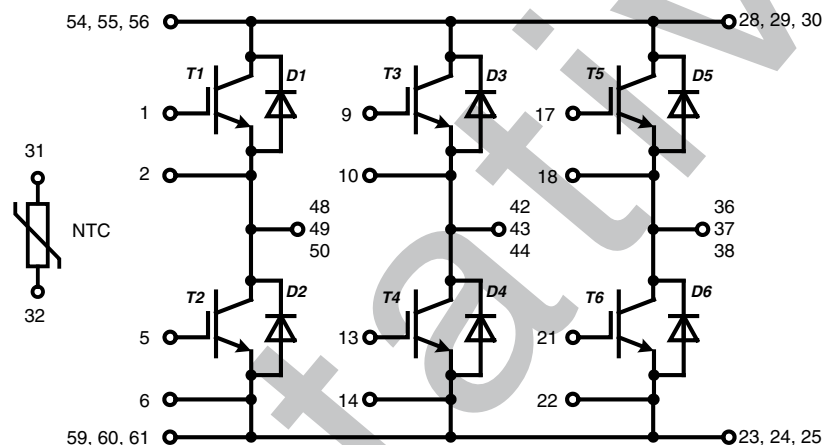
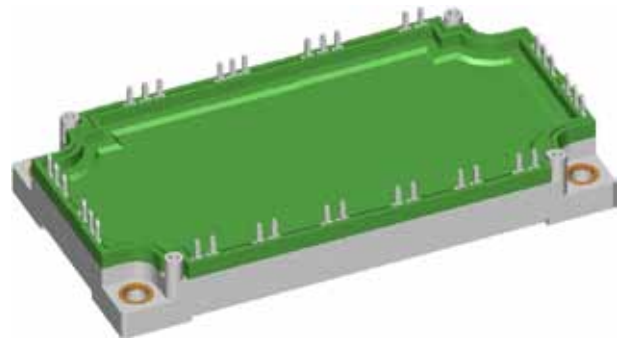


tentative

X2PT IGBT Module

 $V_{CES} = 1200 \text{ V}$
 $I_{C25} = 370 \text{ A}$
 $V_{CE(sat)} = 1.7 \text{ V}$

6-Pack + NTC

Part number
 MIXG240W1200TEH


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.

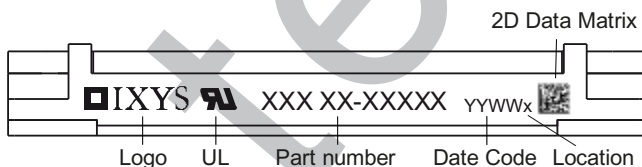
IXYS reserves the right to change limits, test conditions and dimensions.

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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	$T_C = 25^{\circ}\text{C}$			370	A
I_{C80}		$T_C = 80^{\circ}\text{C}$			280	A
I_{C100}		$T_C = 100^{\circ}\text{C}$			240	A
P_{tot}	total power dissipation	$T_C = 25^{\circ}\text{C}$			1250	W
$V_{CE(sat)}$	collector emitter saturation voltage	$I_C = 200\text{ A}; V_{GE} = 15\text{ V}$		1.7	2	V
				2		V
$V_{GE(th)}$	gate emitter threshold voltage	$I_C = 8\text{ mA}; V_{GE} = V_{GE}$	5.5		7	V
I_{CES}	collector emitter leakage current	$V_{CE} = V_{CES}; V_{GE} = 0\text{ V}$		2	0.2	mA
						mA
I_{GES}	gate emitter leakage current	$V_{GE} = \pm 20\text{ V}$			500	nA
R_G	internal gate resistance			2.0		Ω
C_{iss}	input capacitance	$V_{CE} = 100\text{ V}; V_{GS} = 0\text{ V}; f = 1\text{ MHz}$		10.6		nF
C_{oss}	output capacitance					pF
C_{rss}	reverse transfer (Miller) capacitance					pF
Q_g	total gate charge	$V_{CE} = 600\text{ V}; V_{GE} = 15\text{ V}; I_C = 200\text{ A}$		630		nC
Q_{gs}	gate source charge					nC
Q_{gd}	gate drain (Miller) charge					nC
$t_{d(on)}$	turn-on delay time	Inductive switching $V_{CE} = 600\text{ V}; I_C = 200\text{ A}$ $V_{GE} = \pm 15\text{ V}; R_G = 3.9\ \Omega$ (external)	$T_{VJ} = 25^{\circ}\text{C}$			ns
t_r	current rise time					ns
$t_{d(off)}$	turn-off delay time					ns
t_f	current fall time					ns
E_{on}	turn-on energy per pulse					mJ
E_{off}	turn-off energy per pulse					mJ
$E_{rec(off)}$	reverse recovery losses at turn-off			mJ		
$t_{d(on)}$	turn-on delay time	Inductive switching $V_{CE} = 600\text{ V}; I_C = 200\text{ A}$ $V_{GE} = \pm 15\text{ V}; R_G = 3.9\ \Omega$ (external)	$T_{VJ} = 150^{\circ}\text{C}$		100	ns
t_r	current rise time				75	ns
$t_{d(off)}$	turn-off delay time				340	ns
t_f	current fall time				100	ns
E_{on}	turn-on energy per pulse				22	mJ
E_{off}	turn-off energy per pulse				21	mJ
$E_{rec(off)}$	reverse recovery losses at turn-off			mJ		
RBSOA	reverse bias safe operating area	$V_{GE} = \pm 15\text{ V}; R_G = 3.9\ \Omega$	$T_{VJ} = 150^{\circ}\text{C}$			
I_{CM}		$V_{CEmax} = 1200\text{ V}$			400	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		900		A
R_{thJC}	thermal resistance junction to case	with heatsink compound; IXYS test setup		0.18	0.12	K/W
R_{thJH}	thermal resistance junction to heatsink					K/W

Inverter Diode				Ratings		
Symbol	Definitions	Conditions	min.	typ.	max.	
V_{RRM}	max. repetitive reverse voltage				1200	V
I_{F25}	forward current				275	A
I_{F80}					205	A
I_{F100}					175	A
V_F	forward voltage	$I_F = 200$ A			2.2	V
				1.9		V
I_R	reverse current * not applicable, see Ices at IGBT	$V_R = V_{RRM}$			*	mA
				*		mA
Q_{RRM}	reverse recovery charge	$V_R = 600$ V $-di_F/dt = 3000$ A/ μ s $I_F = 200$ 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 $-di_F/dt = 3000$ A/ μ s $I_F = 200$ A			24	μ C
I_{RRM}	max. reverse recovery current				210	A
t_{rr}	reverse recovery time				350	ns
E_{rec}	reverse recovery energy				12	mJ
R_{thJC}	thermal resistance junction to case				0.21	K/W
R_{thJH}	thermal resistance junction to heatsink	with heatsink compound; IXYS test setup		0.33		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. $V = V_F + 2 \cdot R \cdot I_F$				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
 240 = Current Rating [A]
 W = 6-pack
 1200 = Reverse Voltage [V]
 T = Thermistor
 EH = E3-Pack

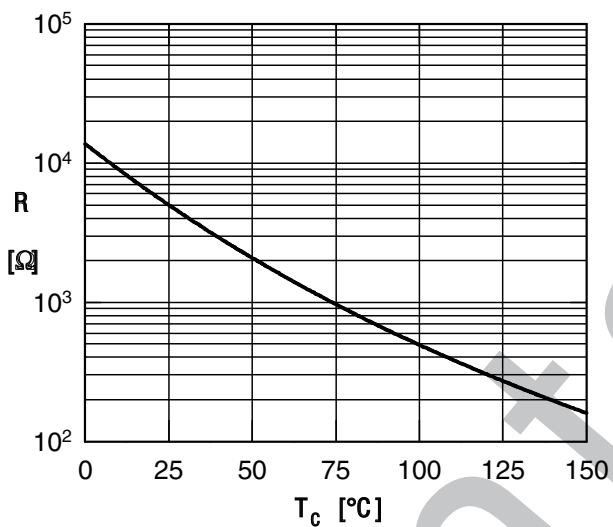
Ordering	Part Name	Marking on Product	Delivering Mode	Base Qty	Ordering Code
Standard	MIXG240W1200TEH	MIXG240W1200TEH	Box	5	517094
with Phase Change Material	MIXG240W1200TEH -PC	MIXG240W1200TEH	Blister	12	

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 *		6.4	5.0	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