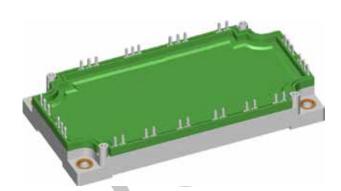
# LIXYS

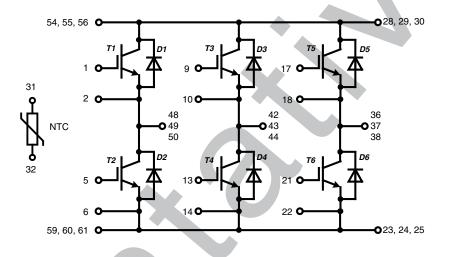
**MIXG180W1200TEH** 

#### tentative X2PT IGBT Module = 1200 V V<sub>CES</sub> 280 A C25 = V<sub>CE(sat)</sub> 1.7 V

6-Pack + NTC

Part number MIXG180W1200TEH





**E**72873

### Features / Advantages:

- X2PT 2nd generation Xtreme light **Punch Through**
- Tvjm = 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  $V_{CE(sat)}$  and low thermal resistance SONIC<sup>TM</sup> 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;

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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.



### tentative

inverter l	nverter IGBT				Ratings		
Symbol	Definitions	Conditions		min.	typ.	max.	
V <sub>CES</sub>	collector emitter voltage		$T_{VJ} = 25^{\circ}C$			1200	
V <sub>GES</sub>	max. DC gate voltage			-20		+20	
V <sub>GEM</sub>	max. transient gate emitter voltage			-30		+30	
I <sub>C25</sub>	collector current		$T_c = 25^{\circ}C$			280	
I <sub>C80</sub>			$T_c = 80^{\circ}C$ $T_c = 100^{\circ}C$			210 180	
I <sub>C100</sub>	total power dissipation						1
P <sub>tot</sub>			$T_c = 25^{\circ}C$		47	935	
V <sub>CE(sat)</sub>	collector emitter saturation voltage	$I_{\rm C} = 150 \text{ A}; V_{\rm GE} = 15 \text{ V}$	$\begin{array}{rcl} T_{VJ} = & 25^{\circ}C \\ T_{VJ} = & 150^{\circ}C \end{array}$		1.7 2	2	
$V_{GE(th)}$	gate emitter threshold voltage	$I_c = 6 \text{ mA}; V_{GE} = V_{GE}$	$T_{VJ} = 25^{\circ}C$	5.5		7	
I <sub>CES</sub>	collector emitter leakage current	$V_{\text{CE}} = V_{\text{CES}} \text{ ; } V_{\text{GE}} = 0 \text{ V}$	$\begin{array}{l} T_{VJ} = & 25^{\circ}C \\ T_{VJ} = & 150^{\circ}C \end{array}$		12	0.5	m m
I <sub>GES</sub>	gate emitter leakage current	$V_{GE} = \pm 20 \text{ V}$				500	n
R <sub>G</sub>	internal gate resistance				2.5		
C <sub>iss</sub>	input capacitance				8.5		n
C <sub>oss</sub>	output capacitance	$V_{CE} = 100 \text{ V}; V_{GS} = 0 \text{ V}; \text{ f} = 1 \text{ MHz}$					р
C <sub>rss</sub>	reverse transfer (Miller) capacitance	<u></u>					р
Q <sub>g</sub>	total gate charge				520		n
$\mathbf{Q}_{gs}$ $\mathbf{Q}_{gd}$	gate source charge gate drain (Miller) charge	$V_{CE} = 600 \text{ V}; \text{ V}_{GE} = 15 \text{ V}; \text{ I}_{C} = 150 \text{ A}$					n n
<u>∽gd</u> t <sub>d(on)</sub>	urn-on delay time	)			90		r
•d(on) <b>t</b> r	current rise time				60		r
t <sub>d(off)</sub>	turn-off delay time	Inductive switching			280		r
t <sub>f</sub>	current fall time	$V_{CE} = 600 \text{ V}; \text{ I}_{C} = 150 \text{ A}$	$T_{VJ} = 25^{\circ}C$		80		r
E <sub>on</sub>	turn-on energy per pulse	$V_{GE} = \pm 15 \text{ V}; \text{ R}_{G} = 4.7 \Omega \text{ (external)}$			11		n
E <sub>off</sub>	turn-off energy per pulse				12		n
E <sub>rec(off)</sub>	reverse recovery losses at turn-off						m
t <sub>d(on)</sub>	turn-on delay time				100		r
t,	current rise time	la destriction de la la comp			75		r
t <sub>d(off)</sub> ⁺	turn-off delay time current fall time	Inductive switching $V_{CE} = 600 \text{ V}; I_C = 150 \text{ A}$	T _ 150°C		340 100		r
t <sub>f</sub> E <sub>on</sub>	turn-on energy per pulse	$V_{GE} = 600 \text{ V}, \text{ I}_{C} = 150 \text{ A}$ $V_{GE} = \pm 15 \text{ V}; \text{ R}_{G} = 4.7 \Omega \text{ (external)}$	$T_{VJ} = 150^{\circ}C$		100		r m
∟ <sub>on</sub> E <sub>off</sub>	turn-off energy per pulse	$v_{GE} = \pm 13 v, H_G = 4.7 \Omega (external)$			16		'n
⊏ <sub>off</sub> E <sub>rec(off)</sub>	reverse recovery losses at turn-off				10		'n
RBSOA	reverse bias safe operating area	$V_{GE} = \pm 15$ V; R <sub>G</sub> = 4.7 Ω	T <sub>vJ</sub> = 150°C				
I <sub>CM</sub>		$\int V_{CEmax} = 1200 \text{ V}$	1 <sub>0</sub> j = 100 0			400	
SCSOA	short circuit safe operating area	V <sub>CEmax</sub> = 1200 V					
t <sub>sc</sub>	short circuit duration	$V_{CE} = 900 \text{ V}; V_{GE} = \pm 15 \text{ V}$	$T_{vJ} = 150^{\circ}C$			10	ł
I <sub>sc</sub>	short circuit duration	J non-repetitive			600		
R <sub>thJC</sub>	thermal resistance junction to case					0.16	K/\
R <sub>thJH</sub>	thermal resistance junction to heatsin	k with heatsink compound; IXYS test	setup		0.26		K/\

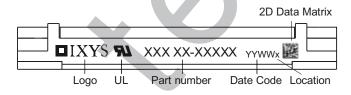


### **MIXG180W1200TEH**

### tentative

Inverter Diode				Ratings			
Symbol	Definitions	Conditions		min.	typ.	max.	
V <sub>RRM</sub>	max. repetitive reverse voltage		$T_{VJ} = 25^{\circ}C$			1200	V
<sub>F25</sub>   <sub>F80</sub>   <sub>F100</sub>	forward current		$\begin{array}{rcl} T_{\rm c} = & 25^{\circ}{\rm C} \\ T_{\rm c} = & 80^{\circ}{\rm C} \\ T_{\rm c} = & 100^{\circ}{\rm C} \end{array}$			230 170 145	A A
V <sub>F</sub>	forward voltage	I <sub>F</sub> = 150 A	$\begin{array}{l} T_{vJ} = & 25^{\circ}C \\ T_{vJ} = & 150^{\circ}C \end{array}$		1.9	2.2	V V
I <sub>R</sub>	<i>reverse current</i> * not applicable, see Ices at IGBT	$V_{R} = V_{RRM}$	$\begin{array}{l} T_{\rm VJ} = & 25^{\circ}{\rm C} \\ T_{\rm VJ} = & 150^{\circ}{\rm C} \end{array}$		*	*	mA mA
Q <sub>RM</sub> I <sub>RM</sub> t <sub>rr</sub> E <sub>rec</sub>	reverse recovery charge max. reverse recovery current reverse recovery time reverse recovery energy	V <sub>R</sub> = 600 V ≻ -di <sub>F</sub> /dt = 2500 A/µs I <sub>F</sub> = 150 A	$T_{v_J} = 25^{\circ}C$				μC A ns mJ
Q <sub>RM</sub> I <sub>RM</sub> t <sub>rr</sub> E <sub>rec</sub>	reverse recovery charge max. reverse recovery current reverse recovery time reverse recovery energy	V <sub>R</sub> = 600 V ≻ -di <sub>F</sub> /dt = 2500 A/µs I <sub>F</sub> = 150 A	T <sub>vJ</sub> = 150°C		20 175 350 10		μC A ns mJ
R <sub>thJC</sub> R <sub>thJH</sub>	thermal resistance junction to case thermal resistance junction to heatsink	with heatsink compound; IXY	S test setup		0.40	0.25	K/W K/W

Package	E3-Pack				Ratings			
Symbol	Definitions	Conditions		min.	typ.	max.	Unit	
I <sub>RMS</sub>	RMS current	per terminal				300	A	
T <sub>stg</sub>	storage temperature			-40		125	°C	
T <sub>op</sub>	operation temperature			-40		150	°C	
T <sub>vj</sub>	virtual junction temperature			-40		175	°C	
Weight					270		g	
M <sub>D</sub>	mounting torque			3		6	Nm	
d <sub>Spp</sub>			terminal to terminal	6			mm	
d <sub>Spp</sub> d <sub>Spb</sub>	creepage distance on surface		terminal to backside	12			mm	
d <sub>App</sub>			terminal to terminal	6			mm	
d <sub>Apb</sub>	striking distance through air		terminal to backside	12			mm	
VISOL	isolation voltage	t = 1 second		4300			V	
		t = 1 minute	50 / 60 Hz, RMS; $I_{ISOL} \le 1 \text{ mA}$	3600			V	
$\mathbf{R}_{pin-chip}$	resistance pin to chip	$V = V_{CEsat} + 2 \cdot F$	$R \cdot I_{c}$ resp. V = V <sub>F</sub> + 2·R·I <sub>F</sub>		2.5		mΩ	
C <sub>P</sub>	coupling capacity per switch	between shorted p	pins 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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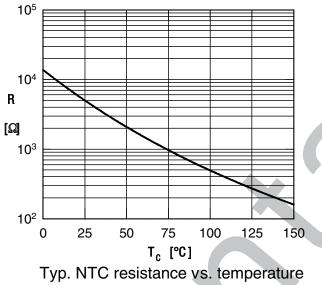


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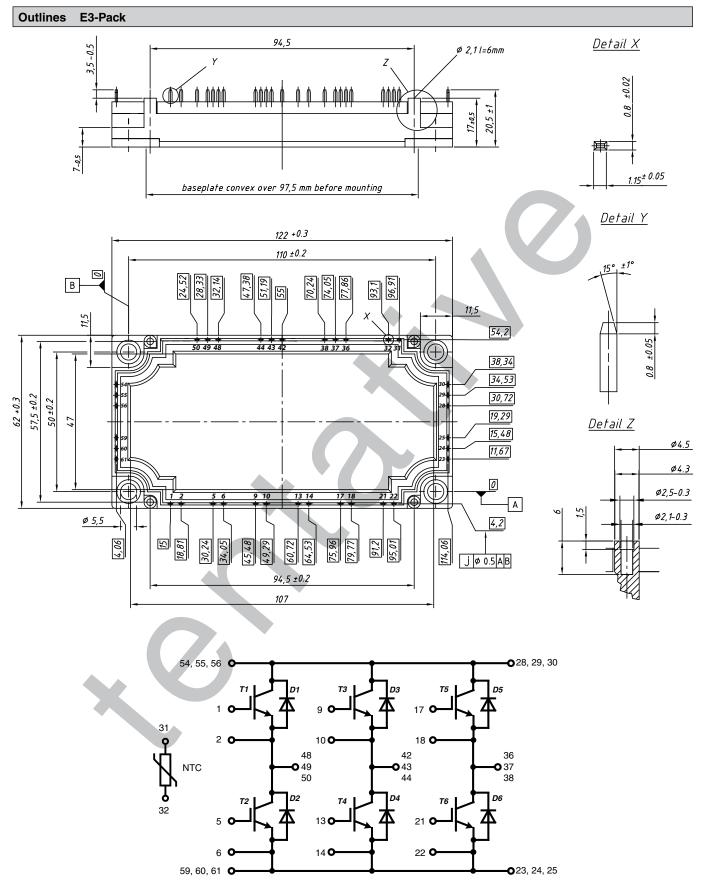
Equivalent Circuits for Simulation *on die level					
	$-R_0$		IGBT	FW Diode	
V <sub>0 max</sub> R <sub>0 max</sub>	threshold voltage slope resistance *	T <sub>vJ</sub> = 125°C			V mΩ
V <sub>0 max</sub> R <sub>0 max</sub>	threshold voltage slope resistance *	T <sub>vJ</sub> = 175°C	1.2 7.7	1.2 6.0	V mΩ

Temperature Sensor NTC									
Symbol	Definitions	Conditions	min.	typ.	max.	Unit			
<b>R</b> <sub>25</sub>	resistance	$T_{vJ} = 25^{\circ}C$	4.75	5.0	5.25	kΩ			
<b>B</b> <sub>25/50</sub>	temperature coefficient			3375		К			



## MIXG180W1200TEH

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