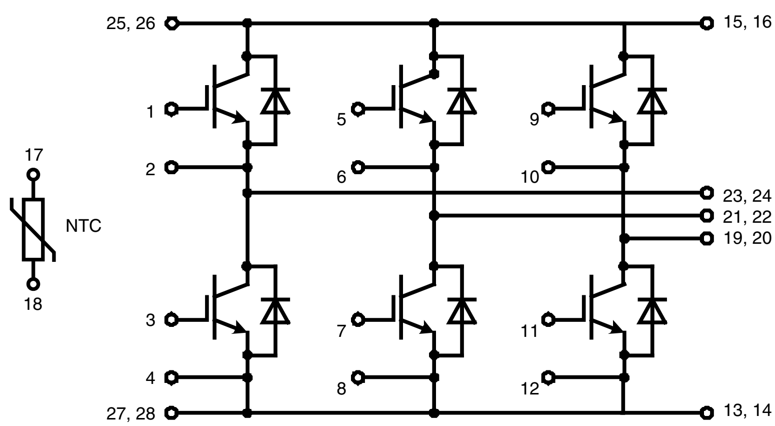
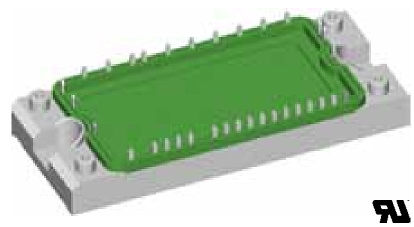
Six-Pack
XPT IGBT

V_{CES} = 1200 V
I_{C25} = 43 A
$V_{CE(sat)}$ = 1.8 V

Part name (Marking on product)

MIXA30W1200TED





E 72873

Pin configuration see outlines.

Features:

- Easy paralleling due to the positive temperature coefficient of the on-state voltage
- Rugged XPT design (Xtreme light Punch Through) results in:
  - short circuit rated for 10 µsec.
  - very low gate charge
  - square RBSOA @ 3x I_C
  - low EMI
- Thin wafer technology combined with the XPT design results in a competitive low $V_{CE(sat)}$
- SONIC™ diode
  - fast and soft reverse recovery
  - low operating forward voltage

Application:

- AC motor drives
- Solar inverter
- Medical equipment
- Uninterruptible power supply
- Air-conditioning systems
- Welding equipment
- Switched-mode and resonant-mode power supplies

Package:

- "E2-Pack" standard outline
- Insulated copper base plate
- Soldering pins for PCB mounting
- Temperature sense included

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

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Ouput Inverter T1 - T6

Symbol	Definitions	Conditions		min.	typ.	max.	Unit
V_{CES}	*collector emitter voltage*		T_{VJ} = 25°C			1200	V
V_{GES} V_{GEM}	*max. DC gate voltage* *max. transient collector gate voltage*	continuous transient				±20 ±30	V V
I_{C25} I_{C80}	*collector current*		T_C = 25°C T_C = 80°C			43 30	A A
P_{tot}	*total power dissipation*		T_C = 25°C			150	W
$V_{CE(sat)}$	*collector emitter saturation voltage*	I_C = 25 A; V_{GE} = 15 V	T_{VJ} = 25°C T_{VJ} = 125°C		1.8 2.1	2.1	V V
$V_{GE(th)}$	*gate emitter threshold voltage*	I_C = 1 mA; V_{GE} = V_{CE}	T_{VJ} = 25°C	5.4	6.0	6.5	V
I_{CES}	*collector emitter leakage current*	V_{CE} = V_{CES}; V_{GE} = 0 V	T_{VJ} = 25°C T_{VJ} = 125°C		0.01 0.2	2.1	mA mA
I_{GES}	*gate emitter leakage current*	V_{GE} = ±20 V				500	nA
$Q_{G(on)}$	*total gate charge*	V_{CE} = 600 V; V_{GE} = 15 V; I_C = 25 A			76		nC
$t_{d(on)}$ t_r $t_{d(off)}$ t_f E_{on} E_{off}	*turn-on delay time* *current rise time* *turn-off delay time* *current fall time* *turn-on energy per pulse* *turn-off energy per pulse*	inductive load V_{CE} = 600 V; I_C = 25 A V_{GE} = ±15 V; R_G = 39 Ω	T_{VJ} = 125°C		70 40 250 100 2.5 3.0		ns ns ns ns mJ mJ
RBSOA	*reverse bias safe operating area*	V_{GE} = ±15 V; R_G = 39 Ω;	T_{VJ} = 125°C V_{CEK} = 1200 V			75	A
SCSOA t_{SC} I_{SC}	*short circuit safe operating area* *short circuit duration* *short circuit current*	V_{CE} = 900 V; V_{GE} = ±15 V; R_G = 39 Ω; non-repetitive	T_{VJ} = 125°C		 100	10	µs A
R_{thJC}	*thermal resistance junction to case*	(per IGBT)				0.84	K/W

Output Inverter D1 - D6

Symbol	Definitions	Conditions		min.	typ.	max.	Unit
V_{RRM}	*max. repetitve reverse voltage*		T_{VJ} = 25°C			1200	V
I_{F25} I_{F80}	*forward current*		T_C = 25°C T_C = 80°C			44 29	A A
V_F	*forward voltage*	I_F = 30 A; V_{GE} = 0 V	T_{VJ} = 25°C T_{VJ} = 125°C		1.95 1.95	2.2	V V
Q_{rr} 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 = -600 A/µs I_F = 30 A; V_{GE} = 0 V	T_{VJ} = 125°C		3.5 30 350 0.9		µC A ns mJ
R_{thJC}	*thermal resistance junction to case*	(per diode)				1.2	K/W

T_C = 25°C unless otherwise stated

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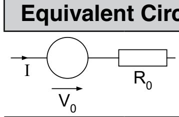
Temperature Sensor NTC

Symbol	Definitions	Conditions	min.	typ.	max.	Unit
				Ratings		
R_{25}	*resistance*	T_C = 25°C	4.75	5.0	5.25	kΩ
$B_{25/50}$				3375		K

Module

Symbol	Definitions	Conditions	min.	typ.	max.	Unit
				Ratings		
T_{VJ}	*operating temperature*		-40		125	°C
T_{VJM}	*max. virtual junction temperature*				150	°C
T_{stg}	*storage temperature*		-40		125	°C
V_{ISOL}	*isolation voltage*	$I_{ISOL} \leq$ 1 mA; 50/60 Hz			2500	V~
CTI	*comparative tracking index*				-	
M_d	*mounting torque (M5)*		3		6	Nm
d_S	*creep distance on surface*		10			mm
d_A	*strike distance through air*		7.5			mm
$R_{pin\text{-}chip}$	*resistance pin to chip*			2.5		mΩ
R_{thCH}	*thermal resistance case to heatsink*	with heatsink compound		0.02		K/W
Weight				180		g

Equivalent Circuits for Simulation



Symbol	Definitions	Conditions		min.	typ.	max.	Unit
					Ratings		
V_0	*IGBT*	T1 - T6	T_{VJ} = 150°C			1.1	V
R_0						55	mΩ
V_0	*free wheeling diode*	D1 - D6	T_{VJ} = 150°C			1.2	V
R_0						27	mΩ

T_C = 25°C unless otherwise stated

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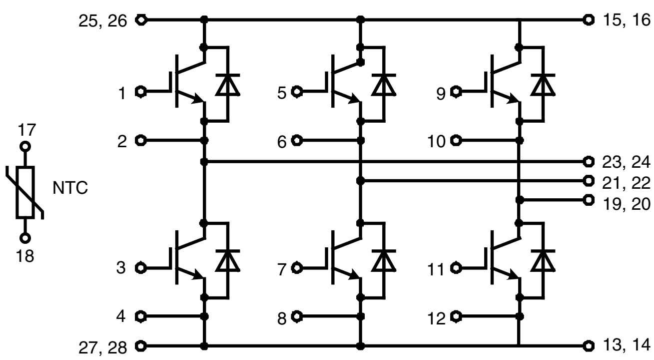
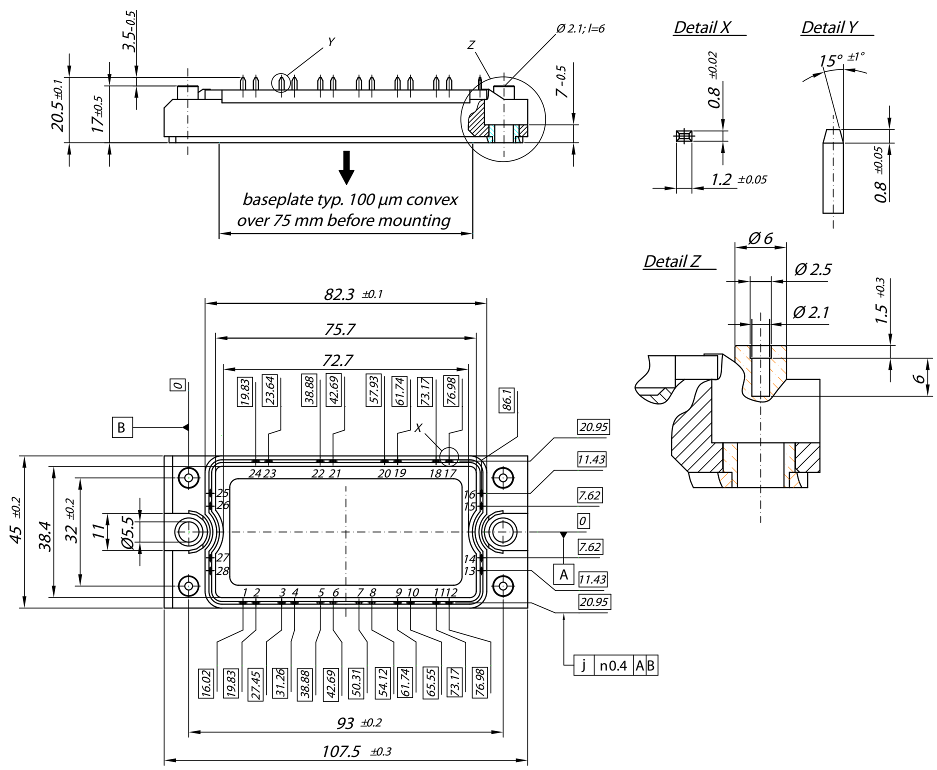
Circuit Diagram

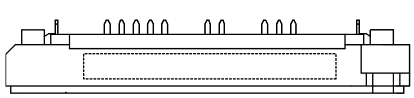


Outline Drawing

Dimensions in mm (1 mm = 0.0394")



Product Marking



Part number

M = Module
I = IGBT
X = XPT
A = Standard
30 = Current Rating [A]
W = Six-Pack
1200 = Reverse Voltage [V]
T = NTC
ED = E2-Pack

Ordering	Part Name	Marking on Product	Delivering Mode	Base Qty	Ordering Code
Standard	MIXA30W1200 TED	MIXA30W1200TED	Box	6	508635

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Inverter T1 - T6

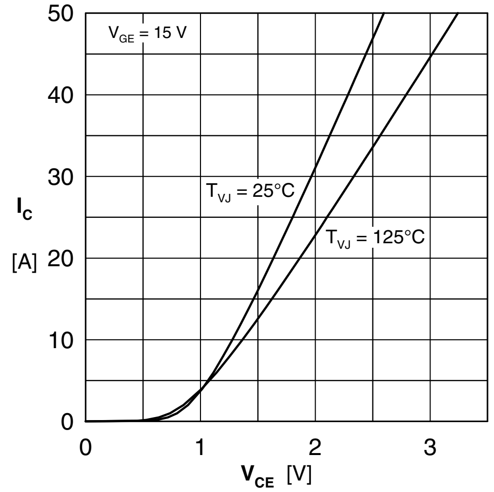

Fig. 1 Typ. output characteristics

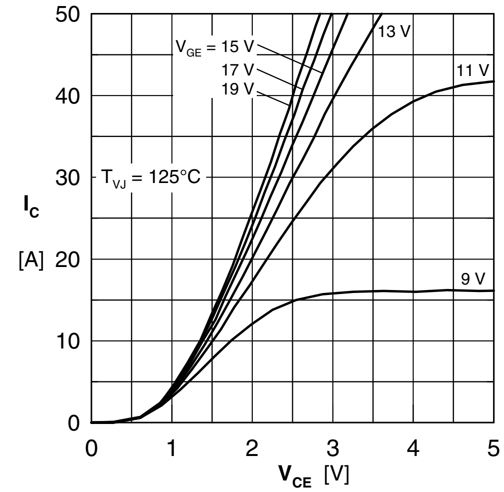

Fig. 2 Typ. output characteristics

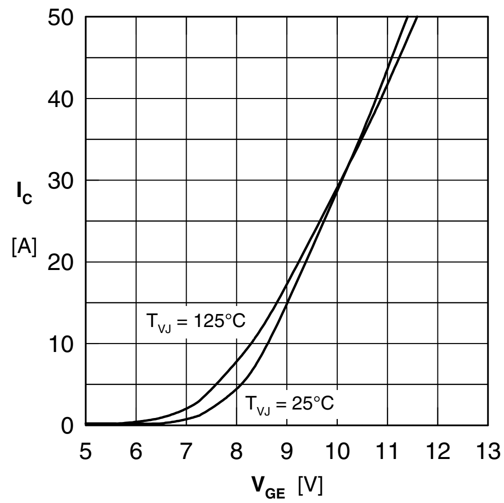

Fig. 3 Typ. tranfer characteristics

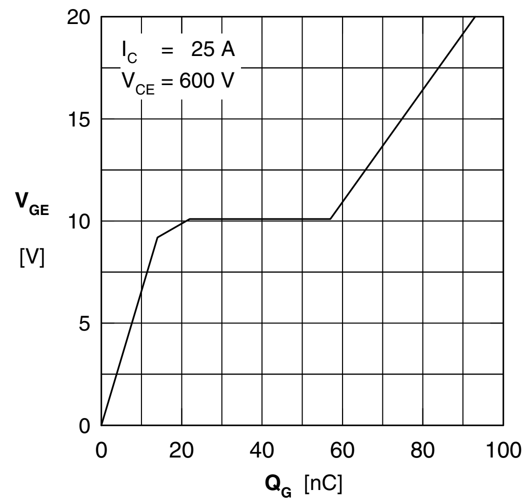

Fig. 4 Typ. turn-on gate charge

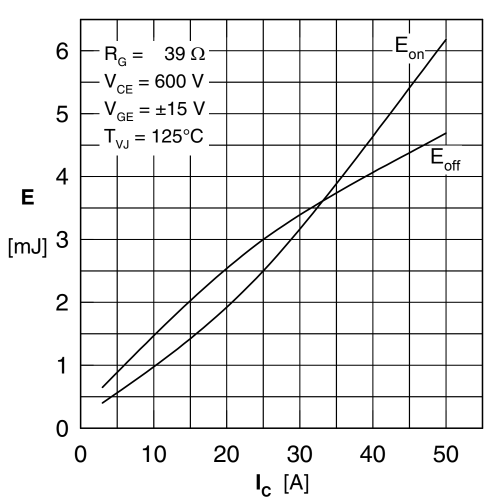

Fig. 5 Typ. switching energy vs. collector current

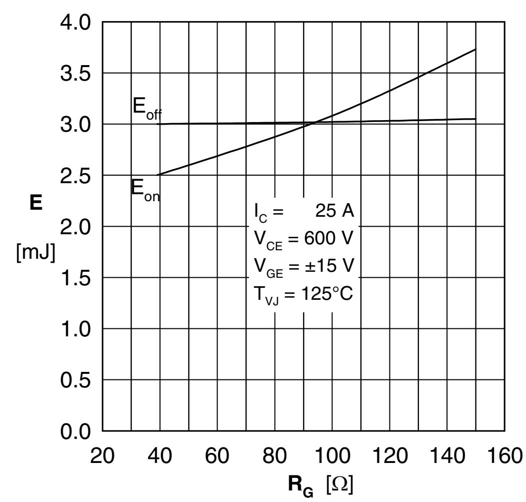

Fig. 6 Typ. switching energy vs. gate resistance

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Inverter D1 - D6

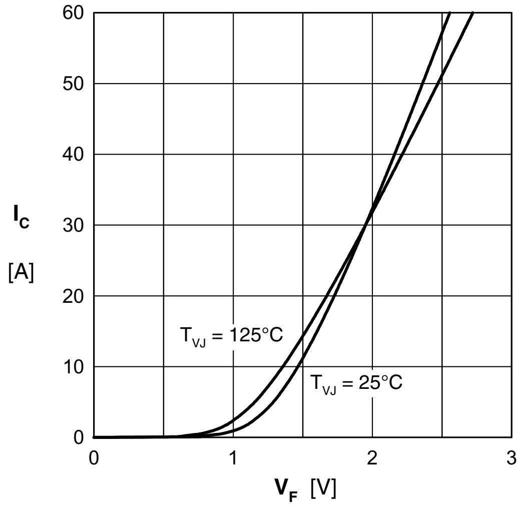

Fig. 7 Typ. forward characteristic

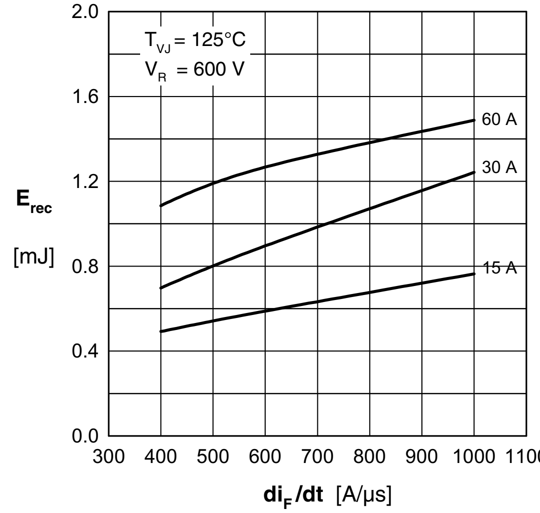

Fig. 8 Typ. recovery energy E_{rec} versus di/dt

NTC

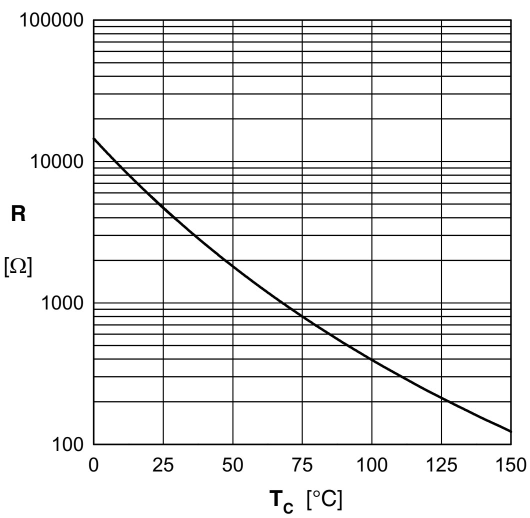

Fig. 9 Typ. NTC resistance versus temperature

	IGBT		FRD	
	R_i	τ_i	R_i	τ_i
1	0.18	0.0025	0.3413	0.0025
2	0.14	0.03	0.2171	0.03
3	0.36	0.03	0.3475	0.03
4	0.16	0.08	0.2941	0.08

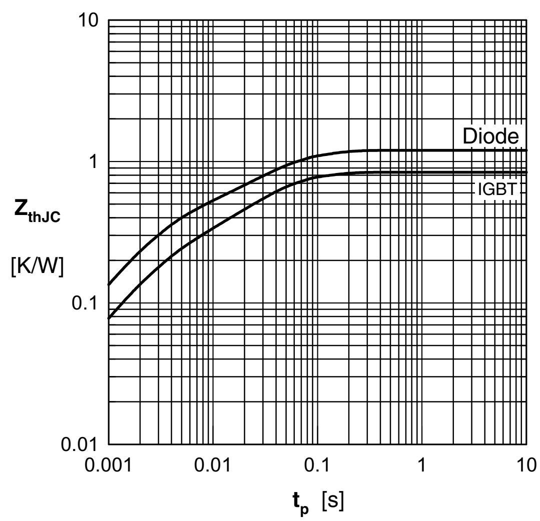

Fig. 10 Typ. transient thermal impedance

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