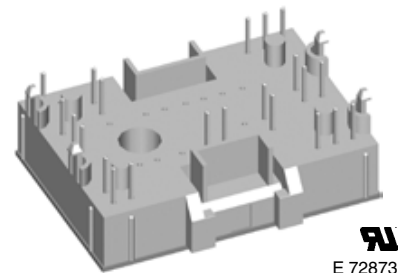
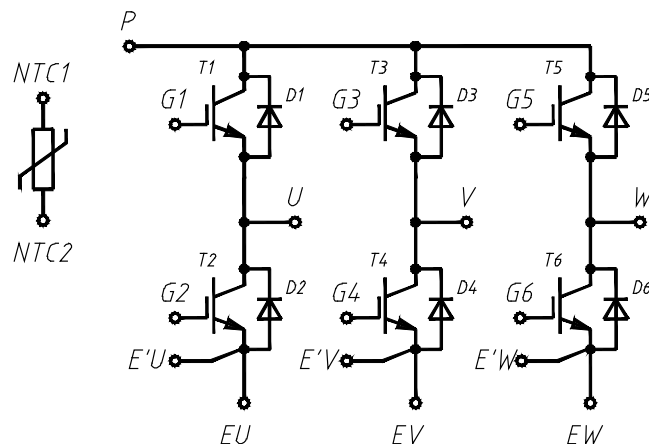


Six-Pack XPT IGBT

$$\begin{aligned} V_{CES} &= 1200 \text{ V} \\ I_{C25} &= 43 \text{ A} \\ V_{CE(sat)} &= 1.8 \text{ V} \end{aligned}$$

Part name (Marking on product)

MIXA30W1200TMH



UL
E 72873

Pin configuration see outlines.

Features:

- High level of integration - only one power semiconductor module required for the whole drive
- Rugged XPT design (Xtreme light Punch Through) results in:
 - short circuit rated for 10 μ sec.
 - very low gate charge
 - square RBSOA @ 3x I_C
 - low EMI
- Thin wafer technology combined with the XPT design results in a competitive low $V_{CE(sat)}$
- Temperature sense included
- SONIC™ diode
 - fast and soft reverse recovery
 - low operating forward voltage

Application:

- AC motor drives
- Pumps, Fans
- Washing machines
- Air-conditioning system
- Inverter and power supplies

Package:

- "Mini" package
- Assembly height is 17 mm
- Insulated base plate
- Pins suitable for wave soldering and PCB mounting
- Assembly clips available
 - IXKU 5-505 screw clamp
 - IXRB 5-506 click clamp
- UL registered E72873

Output Inverter T1 - T6

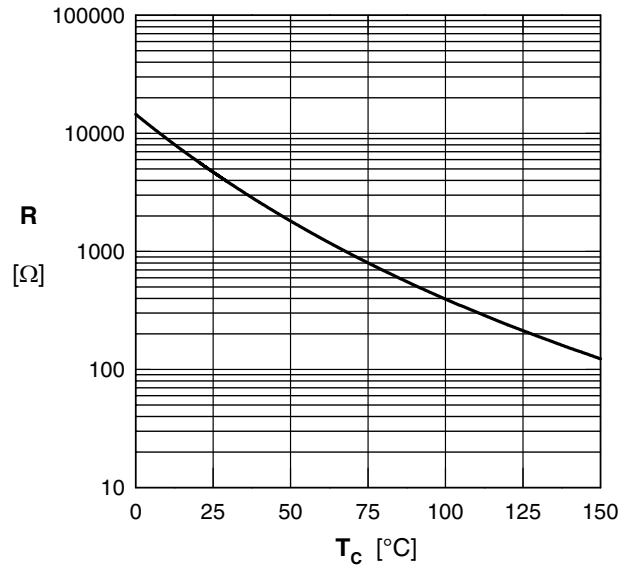
| Symbol | Definitions | Conditions | Ratings | | | Unit |
|--|---------------------------------------|---|------------------------------|------|------|------|
| | | | min. | typ. | max. | |
| V_{CES} | collector emitter voltage | | | | 1200 | V |
| V_{GES} | max. DC gate voltage | continuous | | | ±20 | V |
| V_{GEM} | max. transient collector gate voltage | transient | | | ±30 | V |
| I_{C25} | collector current | | | | 43 | A |
| I_{C80} | | | | | 30 | A |
| P_{tot} | total power dissipation | | | | 150 | W |
| $V_{CE(sat)}$ | collector emitter saturation voltage | $I_C = 25 \text{ A}; V_{GE} = 15 \text{ V}$ | | 1.8 | 2.1 | V |
| | | | | 2.1 | | V |
| $V_{GE(th)}$ | gate emitter threshold voltage | $I_C = 1 \text{ mA}; V_{GE} = V_{CE}$ | 5.4 | 5.9 | 6.5 | V |
| I_{CES} | collector emitter leakage current | $V_{CE} = V_{CES}; V_{GE} = 0 \text{ V}$ | | 0.02 | 0.15 | mA |
| | | | | 0.3 | | mA |
| I_{GES} | gate emitter leakage current | $V_{GE} = \pm 20 \text{ V}$ | | | 500 | nA |
| $Q_{G(on)}$ | total gate charge | $V_{CE} = 600 \text{ V}; V_{GE} = 15 \text{ V}; I_C = 25 \text{ A}$ | | 76 | | nC |
| $t_{d(on)}$ | turn-on delay time | inductive load $V_{CE} = 600 \text{ V}; I_C = 25 \text{ A}$ $V_{GE} = \pm 15 \text{ V}; R_G = 39 \Omega$ | $T_{VJ} = 125^\circ\text{C}$ | 70 | | ns |
| t_r | current rise time | | | 40 | | ns |
| $t_{d(off)}$ | turn-off delay time | | | 250 | | ns |
| t_f | current fall time | | | 100 | | ns |
| E_{on} | turn-on energy per pulse | | | 2.5 | | mJ |
| E_{off} | turn-off energy per pulse | | | 3.0 | | mJ |
| RBSOA | reverse bias safe operating area | $V_{GE} = \pm 15 \text{ V}; R_G = 39 \Omega; V_{CEK} = 1200 \text{ V}$ | | | 75 | A |
| | | $T_{VJ} = 125^\circ\text{C}$ | | | | |
| I_{SC} (SCSOA) | short circuit safe operating area | $V_{CE} = 900 \text{ V}; V_{GE} = \pm 15 \text{ V};$ $R_G = 39 \Omega; t_p = 10 \mu\text{s};$ non-repetitive | | 100 | | A |
| R_{thJC} | thermal resistance junction to case | (per IGBT) | | | 0.84 | K/W |
| R_{thCH} | thermal resistance case to heatsink | | | 0.24 | | K/W |

Output Inverter D1 - D6

| Symbol | Definitions | Conditions | Ratings | | | Unit |
|------------|-------------------------------------|---|------------------------------|------|------|---------------|
| | | | min. | typ. | max. | |
| V_{RRM} | max. repetitive reverse voltage | | | | 1200 | V |
| I_{F25} | forward current | | | | 44 | A |
| I_{F80} | | | | | 29 | A |
| V_F | forward voltage | $I_F = 30 \text{ A}; V_{GE} = 0 \text{ V}$ | | 1.95 | 2.2 | V |
| | | | | 1.95 | | V |
| Q_{rr} | reverse recovery charge | $V_R = 600 \text{ V}$ $di_F/dt = -600 \text{ A}/\mu\text{s}$ $I_F = 30 \text{ A}; V_{GE} = 0 \text{ V}$ | $T_{VJ} = 125^\circ\text{C}$ | 3.5 | | μC |
| I_{RM} | max. reverse recovery current | | | 30 | | A |
| t_{rr} | reverse recovery time | | | 350 | | ns |
| E_{rec} | reverse recovery energy | | | 0.9 | | mJ |
| R_{thJC} | thermal resistance junction to case | (per diode) | | | 1.2 | K/W |
| R_{thCH} | thermal resistance case to heatsink | | | 0.4 | | K/W |

Temperature Sensor NTC

| Symbol | Definitions | Conditions | Ratings | | | Unit |
|-------------|-------------|--------------------------|---------|------|------|------------|
| | | | min. | typ. | max. | |
| R_{25} | resistance | $T_C = 25^\circ\text{C}$ | 4.75 | 5.0 | 5.25 | k Ω |
| $B_{25/50}$ | | | | 3375 | | K |



Typ. NTC resistance vs. temperature

Module

| Symbol | Definitions | Conditions | Ratings | | | Unit |
|---------------|-----------------------------------|--|---------|------|------|------------------|
| | | | min. | typ. | max. | |
| T_{VJ} | operating temperature | | -40 | | 125 | $^\circ\text{C}$ |
| T_{VJM} | max. virtual junction temperature | | | | 150 | $^\circ\text{C}$ |
| T_{stg} | storage temperature | | -40 | | 125 | $^\circ\text{C}$ |
| V_{ISOL} | isolation voltage | $I_{ISOL} \leq 1 \text{ mA}; 50/60 \text{ Hz}$ | | | 2500 | V~ |
| CTI | comparative tracking index | | | | - | |
| F_C | mounting force | | 40 | | 80 | N |
| d_S | creep distance on surface | | 12.7 | | | mm |
| d_A | strike distance through air | | 12 | | | mm |
| Weight | | | | 35 | | g |

IGBT T1 - T6

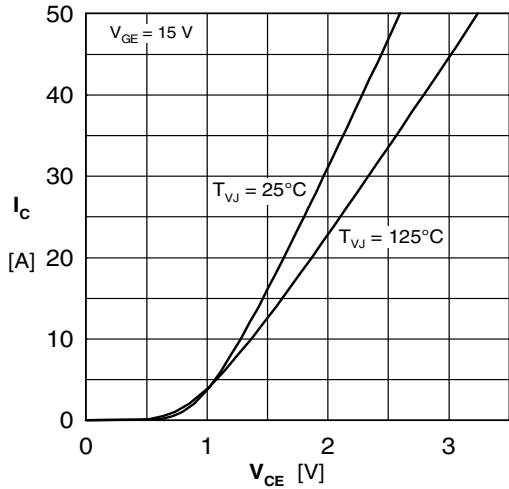


Fig. 1 Typ. output characteristics

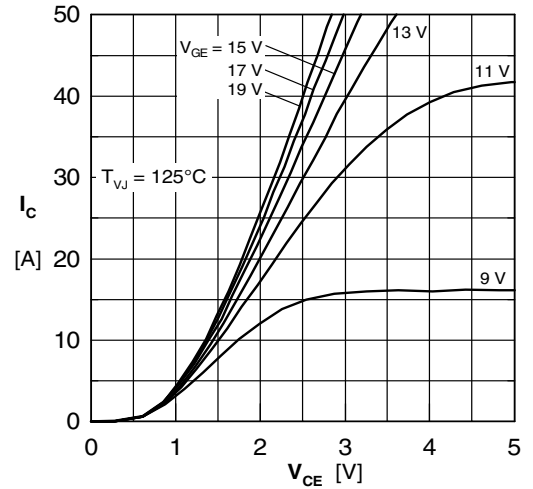


Fig. 2 Typ. output characteristics

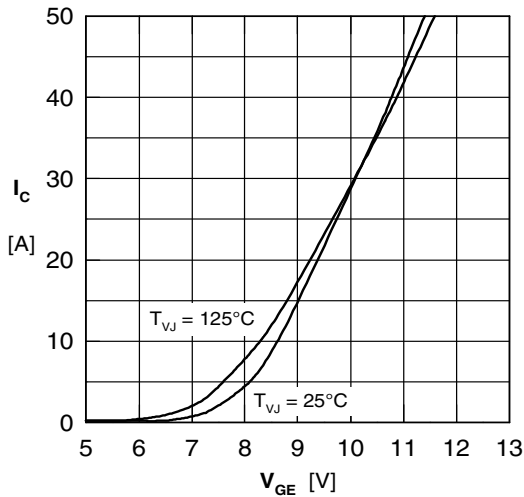


Fig. 3 Typ. transfer characteristics

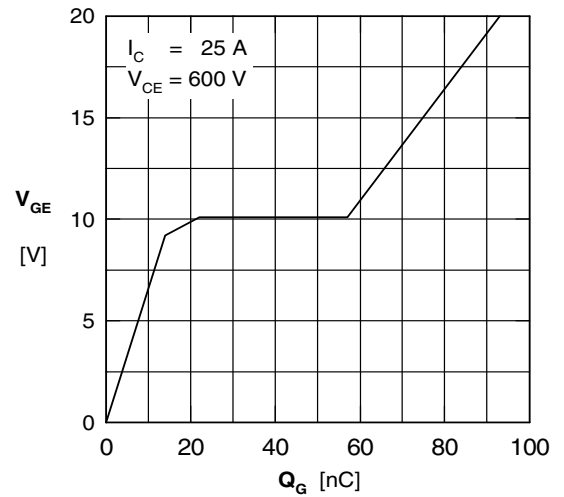


Fig. 4 Typ. turn-on gate charge

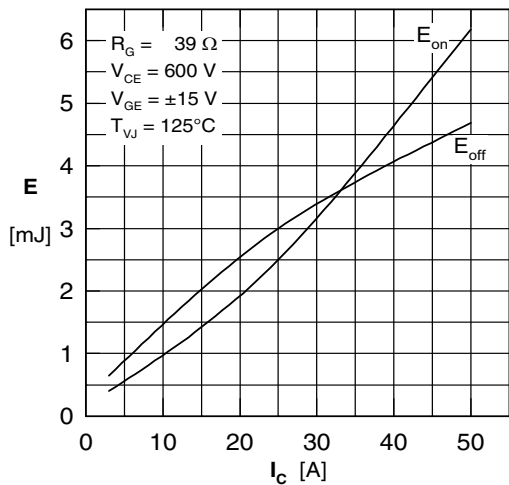


Fig. 5 Typ. switching energy vs. collector current

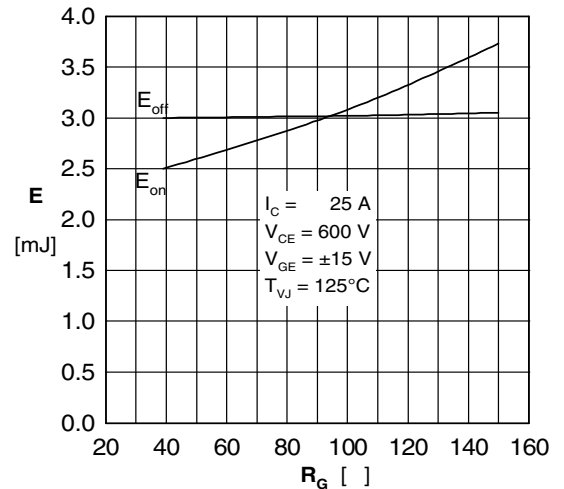


Fig. 6 Typ. switching energy vs. gate resistance

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

20101102b

Diode D1 - D6

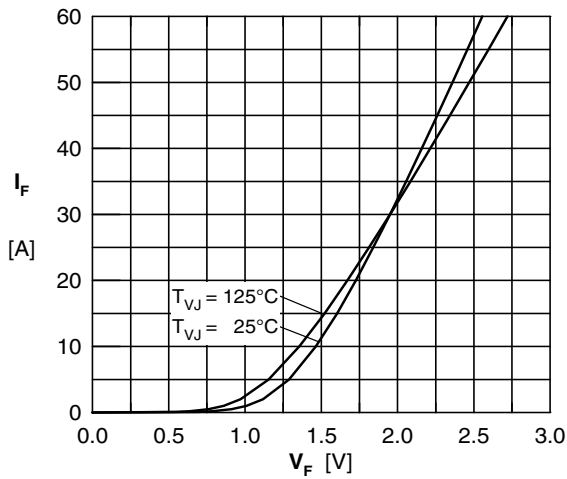


Fig. 7 Typ. Forward current versus V_F

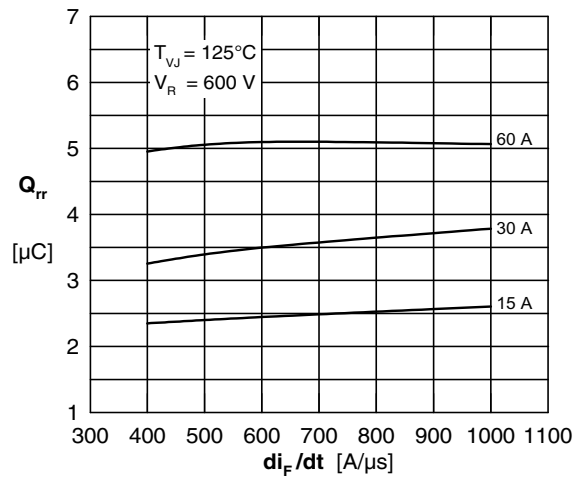


Fig. 8 Typ. reverse recov.charge Q_{rr} vs. di/dt

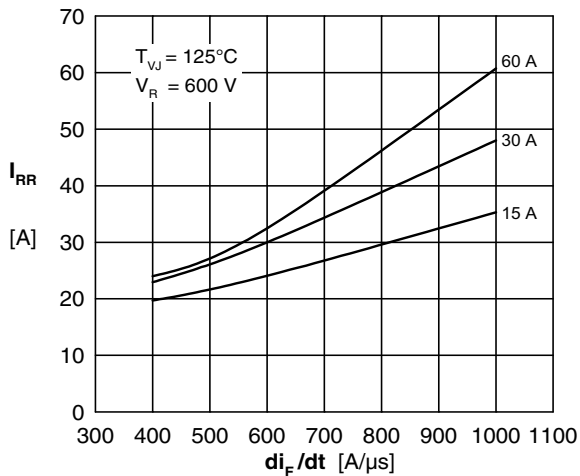


Fig. 9 Typ. peak reverse current I_{RM} vs. di/dt

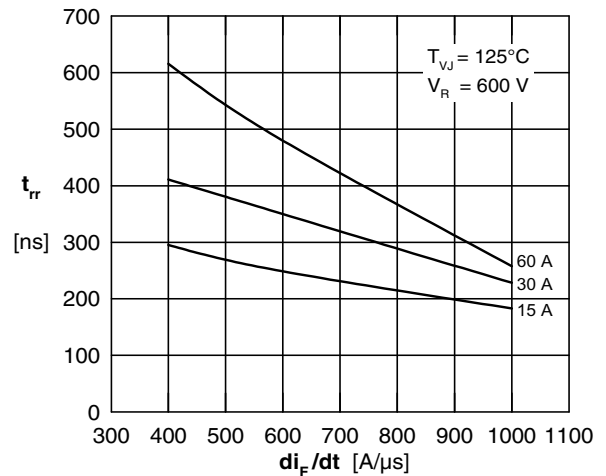


Fig. 10 Typ. recovery time t_{rr} versus di/dt

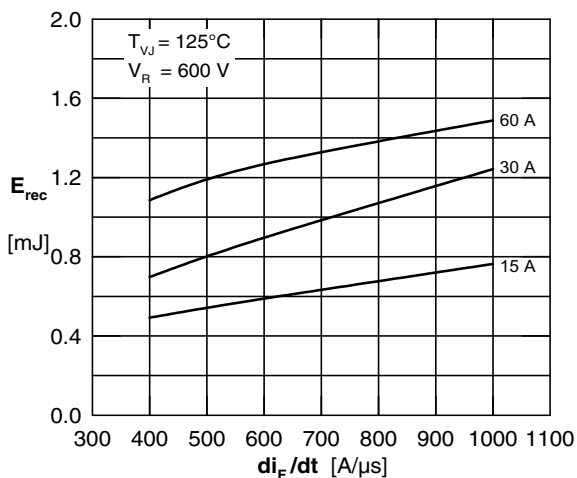


Fig. 11 Typ. recovery energy E_{rec} versus di/dt

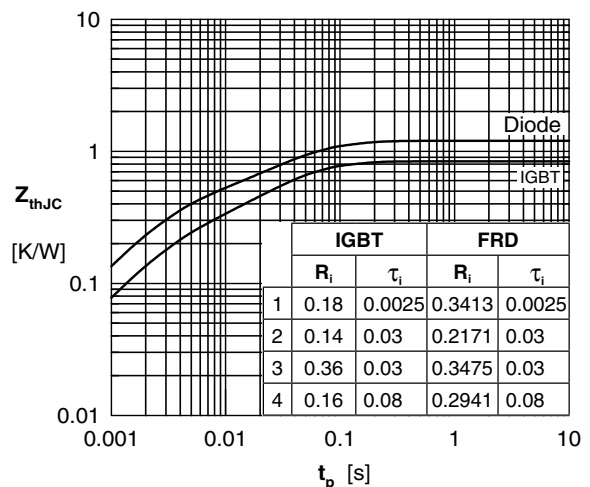


Fig. 12 Typ. transient thermal impedance