Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!


## Contact us

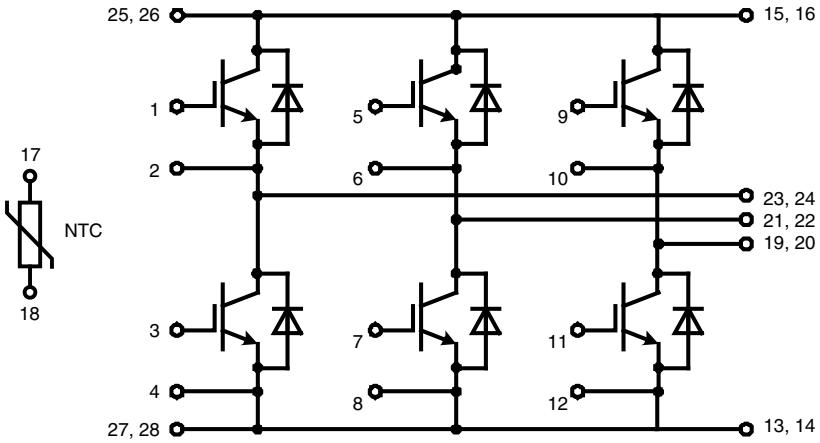
Tel: +86-755-8981 8866 Fax: +86-755-8427 6832
Email & Skype: info@chipsmall.com Web: www.chipsmall.com
Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China

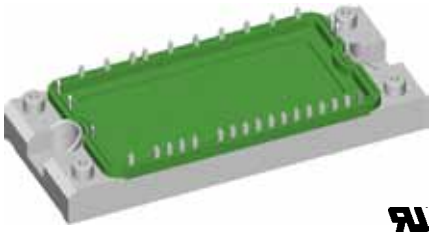
# Six-Pack
XPT IGBT

$V_{CES}$ = 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

## Ouput Inverter T1 - T6

| Symbol | Definitions | Conditions | | Ratings min. | typ. | max. | Unit |
|---|---|---|---|---|---|---|---|
| $V_{CES}$ | *collector emitter voltage* | | $T_{VJ}$ = 25°C | | | 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* | | $T_C$ = 25°C | | | 43 | A |
| $I_{C80}$ | | | $T_C$ = 80°C | | | 30 | 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 | | 1.8 | 2.1 | V |
| | | | $T_{VJ}$ = 125°C | | 2.1 | | 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 | | 0.01 | 2.1 | mA |
| | | | $T_{VJ}$ = 125°C | | 0.2 | | 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 |
| $t_{d(on)}$ | *turn-on delay time* | inductive load<br>$V_{CE}$ = 600 V; $I_C$ = 25 A<br>$V_{GE}$ = ±15 V; $R_G$ = 39 Ω | $T_{VJ}$ = 125°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* | $V_{GE}$ = ±15 V; $R_G$ = 39 Ω; | $T_{VJ}$ = 125°C<br>$V_{CEK}$ = 1200 V | | | 75 | A |
| **SCSOA** | *short circuit safe operating area* | | | | | | |
| $t_{SC}$ | *short circuit duration* | $V_{CE}$ = 900 V; $V_{GE}$ = ±15 V; | $T_{VJ}$ = 125°C | | | 10 | µs |
| $I_{SC}$ | *short circuit current* | $R_G$ = 39 Ω; non-repetitive | | | 100 | | A |
| $R_{thJC}$ | *thermal resistance junction to case* | (per IGBT) | | | | 0.84 | K/W |

## Output Inverter D1 - D6

| Symbol | Definitions | Conditions | | Ratings min. | typ. | max. | Unit |
|---|---|---|---|---|---|---|---|
| $V_{RRM}$ | *max. repetitve reverse voltage* | | $T_{VJ}$ = 25°C | | | 1200 | V |
| $I_{F25}$ | *forward current* | | $T_C$ = 25°C | | | 44 | A |
| $I_{F80}$ | | | $T_C$ = 80°C | | | 29 | A |
| $V_F$ | *forward voltage* | $I_F$ = 30 A; $V_{GE}$ = 0 V | $T_{VJ}$ = 25°C | | 1.95 | 2.2 | V |
| | | | $T_{VJ}$ = 125°C | | 1.95 | | V |
| $Q_{rr}$ | *reverse recovery charge* | $V_R$ = 600 V<br>$di_F/dt$ = -600 A/µs<br>$I_F$ = 30 A; $V_{GE}$ = 0 V | $T_{VJ}$ = 125°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 |

$T_C$ = 25°C unless otherwise stated

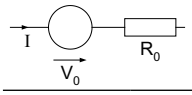
## Temperature Sensor NTC

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

## Module

| Symbol | Definitions | Conditions | | Ratings min. | typ. | max. | Unit |
|---|---|---|---|---|---|---|---|
| $T_{VJ}$ | *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 |

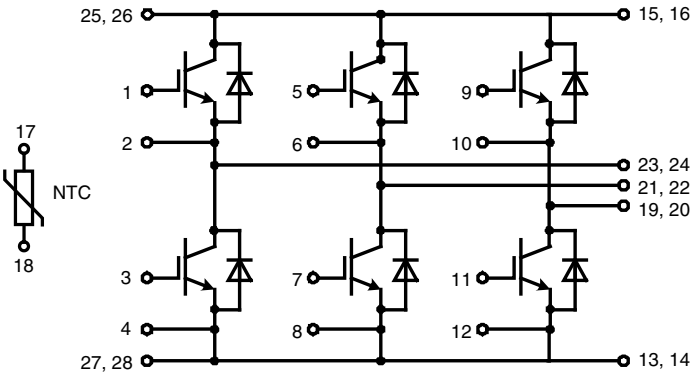
## Equivalent Circuits for Simulation




| Symbol | Definitions | Conditions | | Ratings min. | typ. | max. | Unit |
|---|---|---|---|---|---|---|---|
| $V_0$ | *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 |

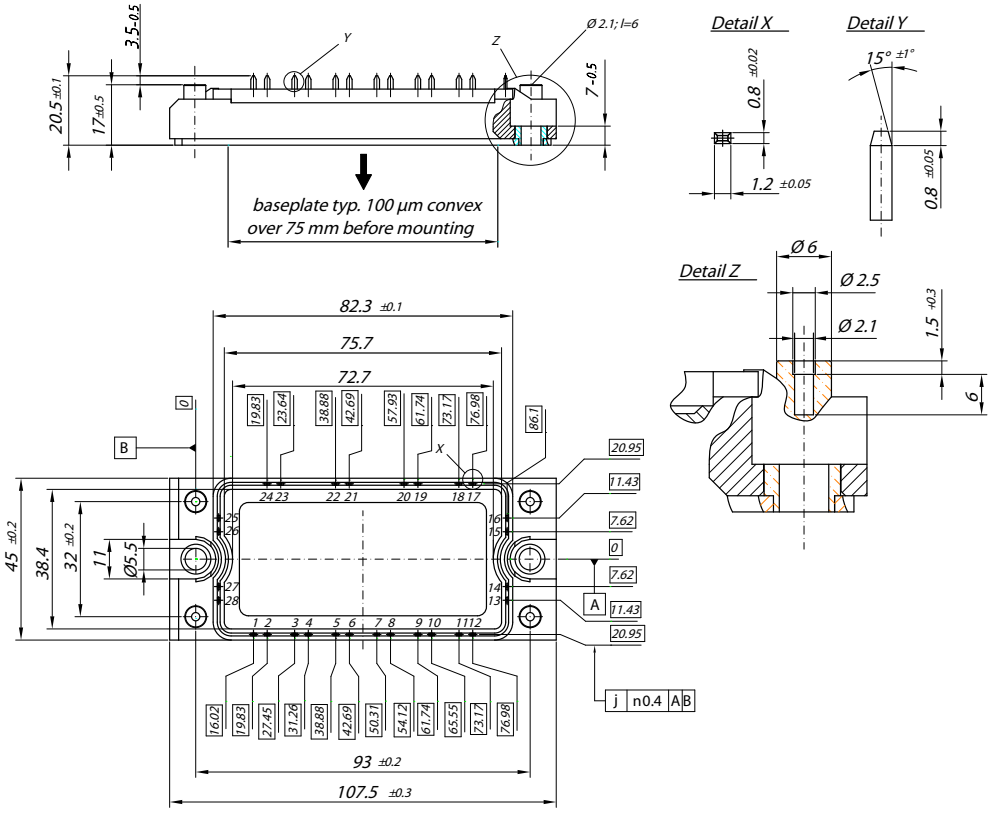
$T_C$ = 25°C unless otherwise stated

## 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 |

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

20100622b

## Inverter T1 - T6

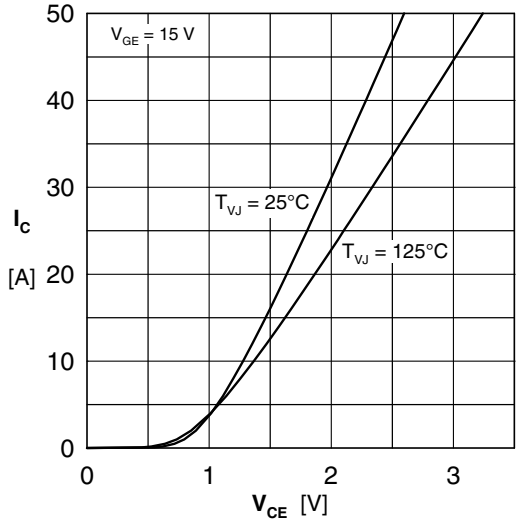



Fig. 1 Typ. output characteristics

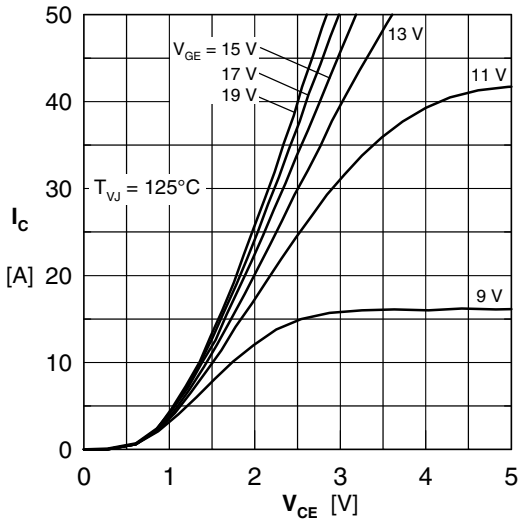



Fig. 2 Typ. output characteristics

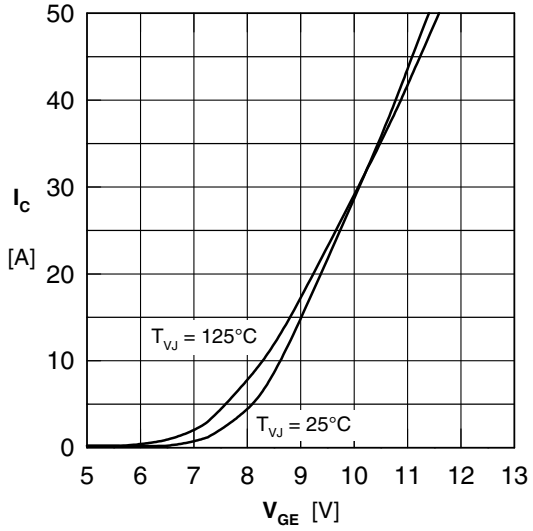



Fig. 3 Typ. tranfer characteristics

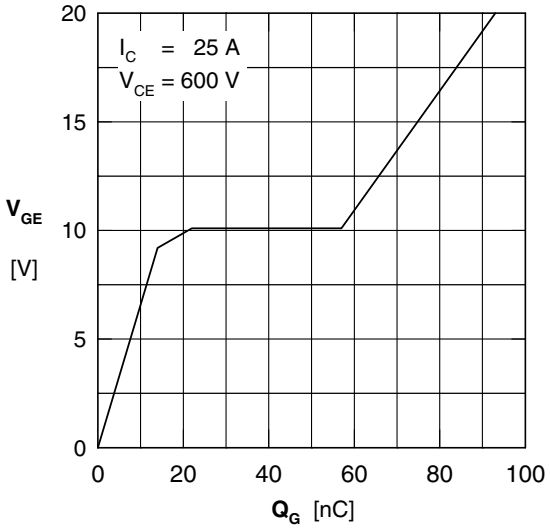



Fig. 4 Typ. turn-on gate charge

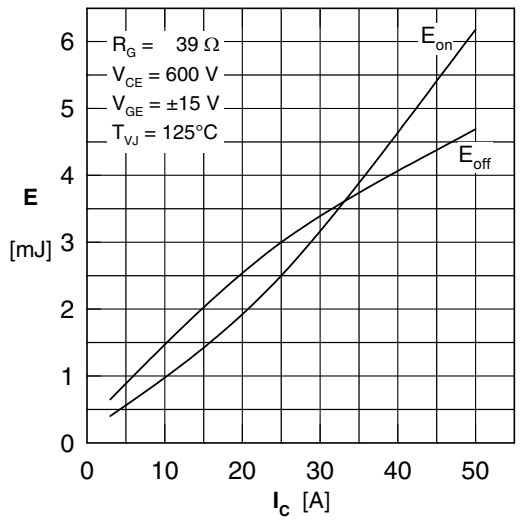



Fig. 5 Typ. switching energy vs. collector current

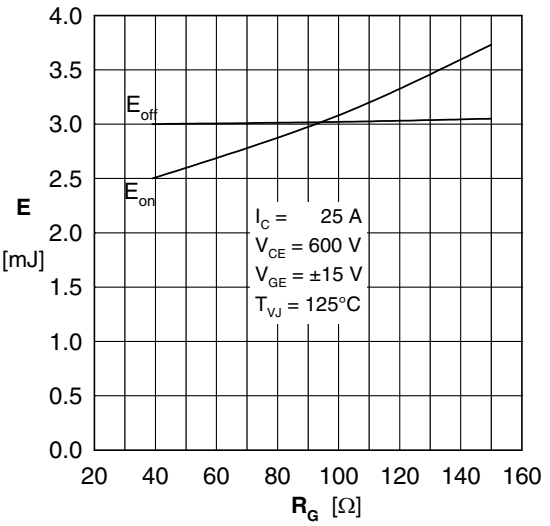



Fig. 6 Typ. switching energy vs. gate resistance

## Inverter D1 - D6

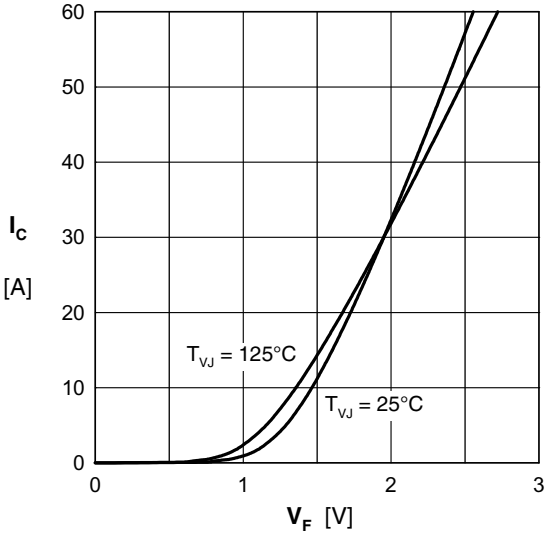



Fig. 7 Typ. forward characteristic

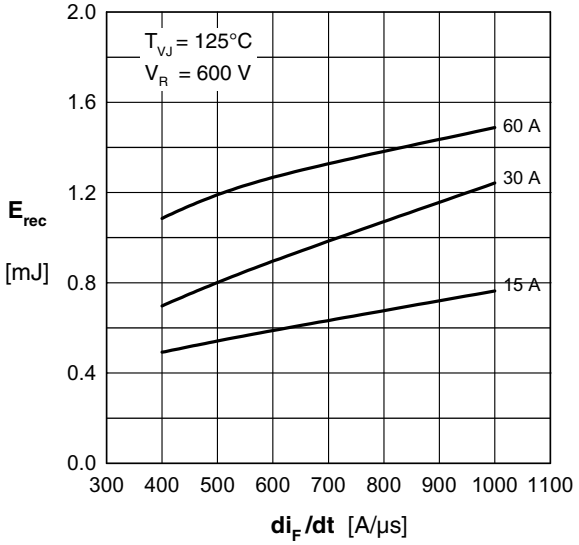



Fig. 8 Typ. recovery energy $E_{rec}$ versus di/dt

| | IGBT | | FRD | |
|---|---|---|---|---|
| | $R_i$ | $\tau_i$ | $R_i$ | $\tau_i$ |
| 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 |

## NTC

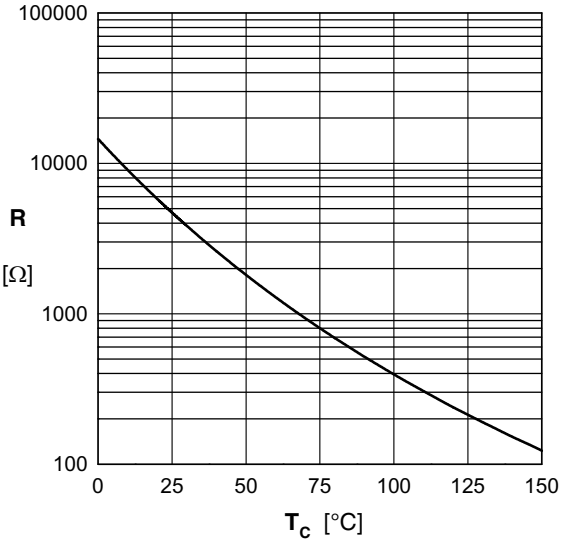



Fig. 9 Typ. NTC resistance versus temperature

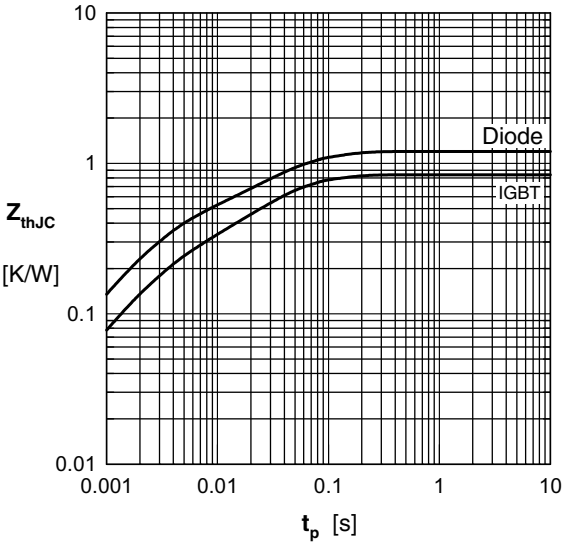



Fig. 10 Typ. transient thermal impedance