

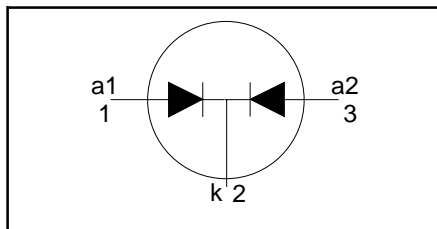
Rectifier diode ultrafast, low switching loss

BYC10-600CT

FEATURES

- Dual diode
- Extremely fast switching
- Low reverse recovery current
- Low thermal resistance
- Reduces switching losses in associated MOSFET

SYMBOL



QUICK REFERENCE DATA

| |
|-------------------------------|
| $V_R = 600\text{ V}$ |
| $V_F \leq 1.75\text{ V}$ |
| $I_{O(AV)} = 10\text{ A}$ |
| $t_{rr} = 19\text{ ns (typ)}$ |

APPLICATIONS

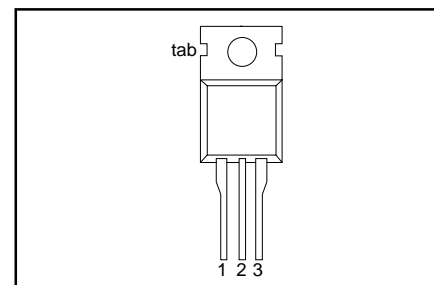
- Active power factor correction
- Half-bridge lighting ballasts
- Half-bridge/ full-bridge switched mode power supplies.

The BYC10-600CT is supplied in the SOT78 (TO220AB) conventional leaded package.

PINNING

| PIN | DESCRIPTION |
|-----|-------------|
| 1 | anode 1 |
| 2 | cathode |
| 3 | anode 2 |
| tab | cathode |

SOT78 (TO220AB)



LIMITING VALUES

Limiting values in accordance with the Absolute Maximum System (IEC 134).

| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|-------------|---|--|------|------|------------------|
| V_{RRM} | Peak repetitive reverse voltage | | - | 600 | V |
| V_{RWM} | Crest working reverse voltage | | - | 600 | V |
| V_R | Continuous reverse voltage | $T_{mb} \leq 110\text{ }^\circ\text{C}$ | - | 500 | V |
| $I_{O(AV)}$ | Average output current (both diodes conducting) | $\delta = 0.5$; with reapplied $V_{RRM(max)}$; $T_{mb} \leq 50\text{ }^\circ\text{C}^1$ | - | 10 | A |
| I_{FRM} | Repetitive peak forward current per diode | $\delta = 0.5$; with reapplied $V_{RRM(max)}$; $T_{mb} \leq 50\text{ }^\circ\text{C}^1$ | - | 10 | A |
| I_{FSM} | Non-repetitive peak forward current per diode | $t = 10\text{ ms}$ | - | 40 | A |
| | | $t = 8.3\text{ ms}$ | - | 44 | A |
| | | sinusoidal; $T_j = 150\text{ }^\circ\text{C}$ prior to surge with reapplied $V_{RWM(max)}$ | | | |
| T_{stg} | Storage temperature | | -40 | 150 | $^\circ\text{C}$ |
| T_j | Operating junction temperature | | - | 150 | $^\circ\text{C}$ |

THERMAL RESISTANCES

| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|----------------|--|--------------|------|------|------|------|
| $R_{th\ j-mb}$ | Thermal resistance junction to mounting base | per diode | - | - | 2.5 | K/W |
| | | both diodes | - | - | 2.2 | K/W |
| $R_{th\ j-a}$ | Thermal resistance junction to ambient | in free air. | - | 60 | - | K/W |

¹ $T_{mb(max)}$ limited by thermal runaway

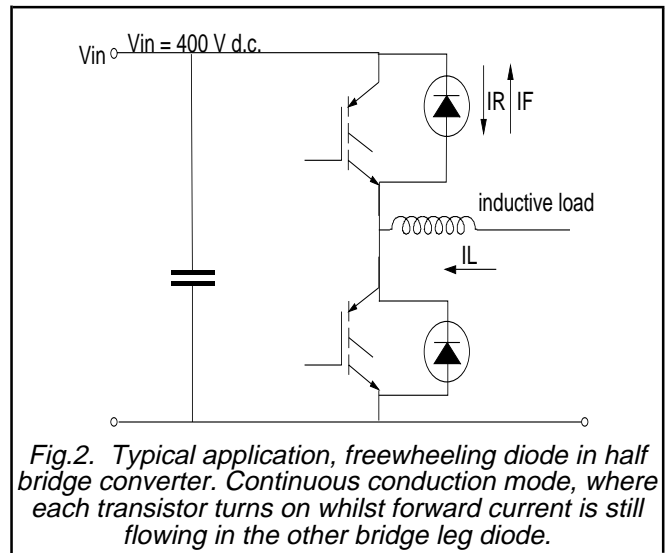
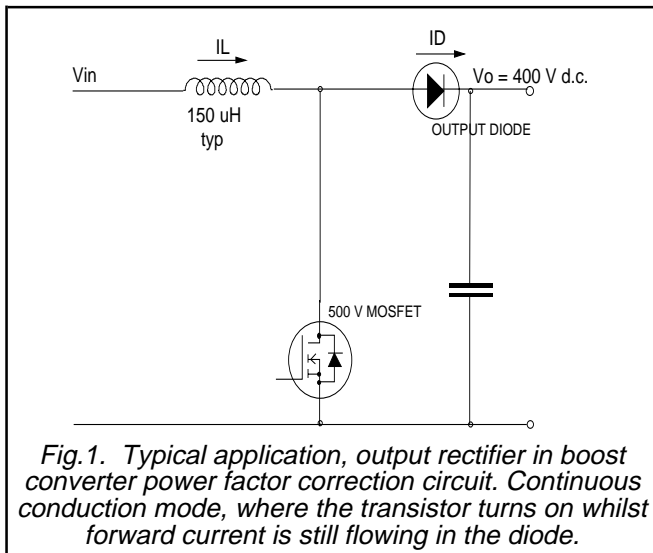
**Rectifier diode
ultrafast, low switching loss**

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ELECTRICAL CHARACTERISTICS

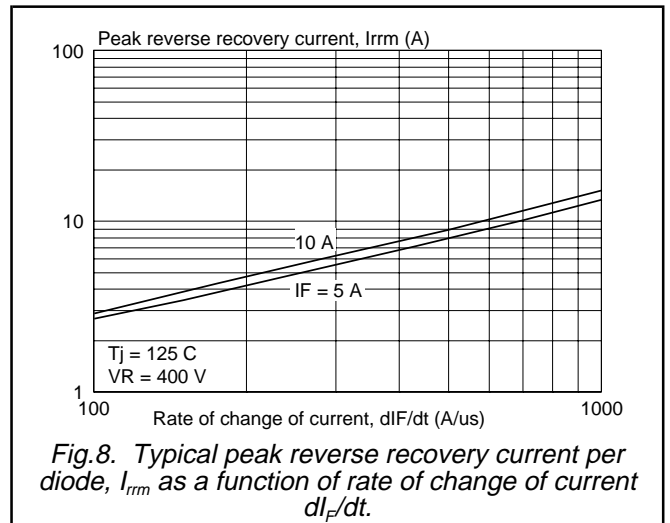
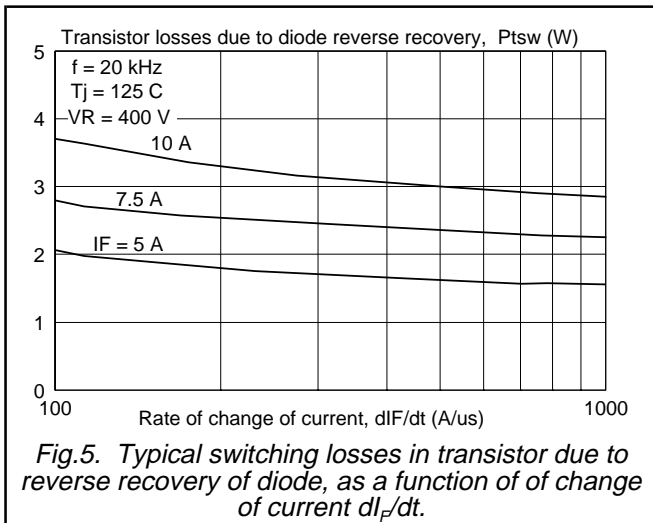
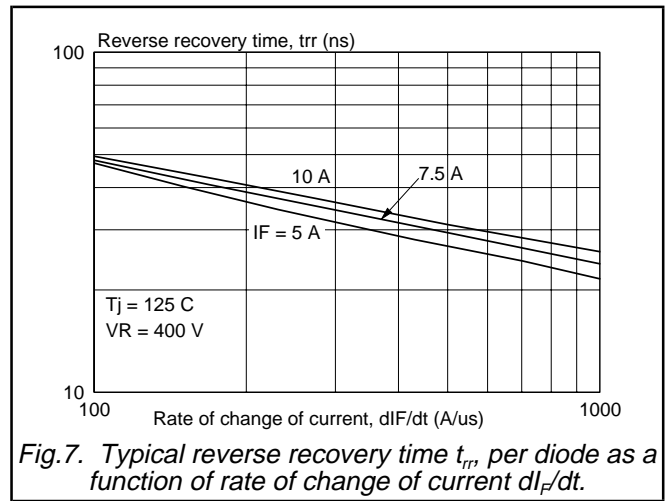
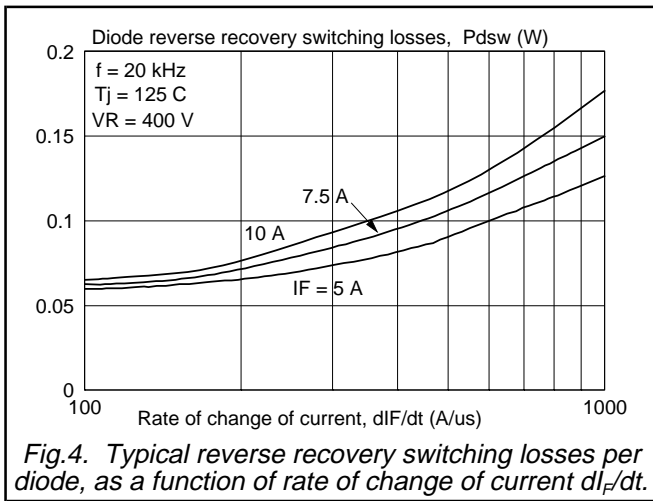
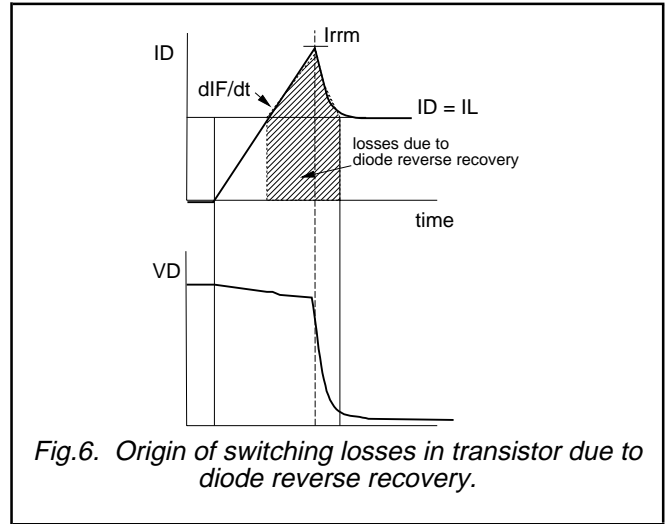
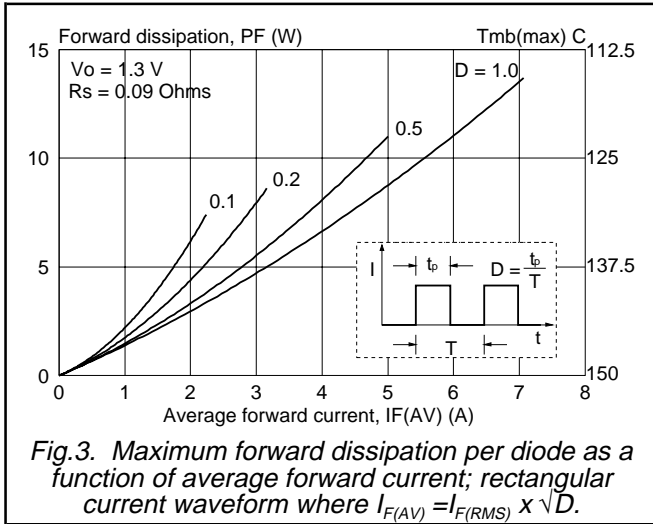
$T_j = 25\text{ }^\circ\text{C}$, per diode unless otherwise stated

| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|-----------|-------------------------------|--|------|-----------------|-------------------|--------------------------|
| V_F | Forward voltage | $I_F = 5\text{ A}; T_j = 150\text{ }^\circ\text{C}$ $I_F = 10\text{ A}; T_j = 150\text{ }^\circ\text{C}$ | - | 1.4 1.75 | 1.75 2.2 | V V |
| I_R | Reverse current | $I_F = 5\text{ A};$ $V_R = 600\text{ V}$ $V_R = 500\text{ V}; T_j = 100\text{ }^\circ\text{C}$ | - | 2.0 9 0.9 | 2.8 100 3.0 | V μA mA |
| t_{rr} | Reverse recovery time | $I_F = 1\text{ A}; V_R = 30\text{ V}; dI_F/dt = 50\text{ A}/\mu\text{s}$ | - | 30 | 50 | ns |
| t_{rr} | Reverse recovery time | $I_F = 5\text{ A}; V_R = 400\text{ V};$ $dI_F/dt = 500\text{ A}/\mu\text{s}$ | - | 19 | - | ns |
| t_{rr} | Reverse recovery time | $I_F = 5\text{ A}; V_R = 400\text{ V};$ $dI_F/dt = 500\text{ A}/\mu\text{s}; T_j = 125\text{ }^\circ\text{C}$ | - | 25 | 30 | ns |
| I_{rrm} | Peak reverse recovery current | $I_F = 5\text{ A}; V_R = 400\text{ V};$ $dI_F/dt = 50\text{ A}/\mu\text{s}; T_j = 125\text{ }^\circ\text{C}$ | - | 0.7 | 3 | A |
| I_{rrm} | Peak reverse recovery current | $I_F = 5\text{ A}; V_R = 400\text{ V};$ $dI_F/dt = 500\text{ A}/\mu\text{s}; T_j = 125\text{ }^\circ\text{C}$ | - | 8 | 11 | A |
| V_{fr} | Forward recovery voltage | $I_F = 10\text{ A}; dI_F/dt = 100\text{ A}/\mu\text{s}$ | - | 9 | 11 | V |



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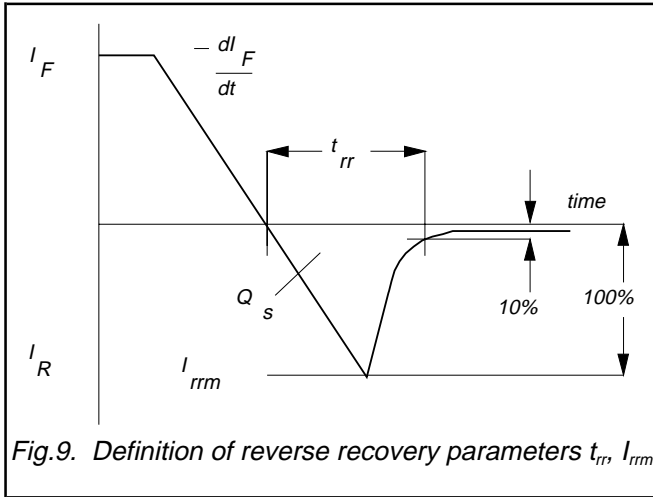


Fig.9. Definition of reverse recovery parameters t_{rr} , I_{rrm}

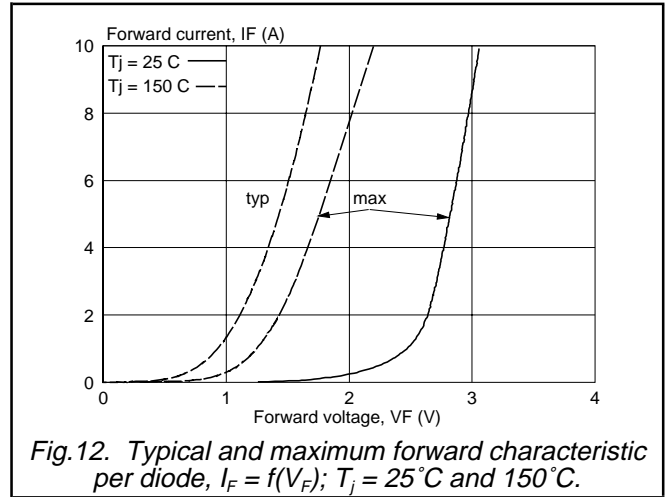


Fig.12. Typical and maximum forward characteristic per diode, $I_F = f(V_F)$; $T_j = 25^\circ\text{C}$ and 150°C .

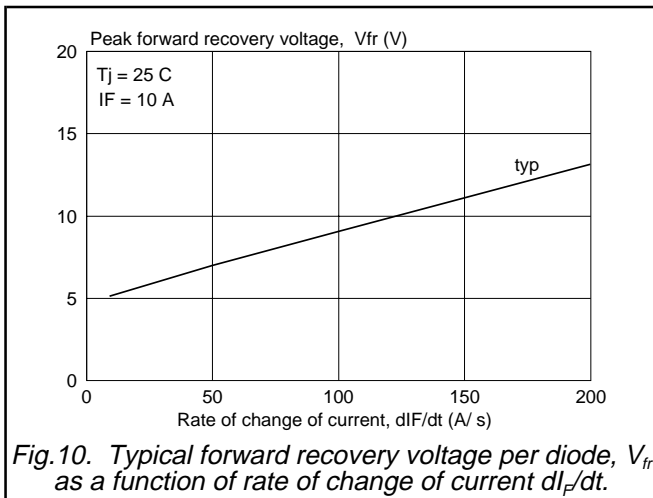


Fig.10. Typical forward recovery voltage per diode, V_{fr} as a function of rate of change of current dl_F/dt .

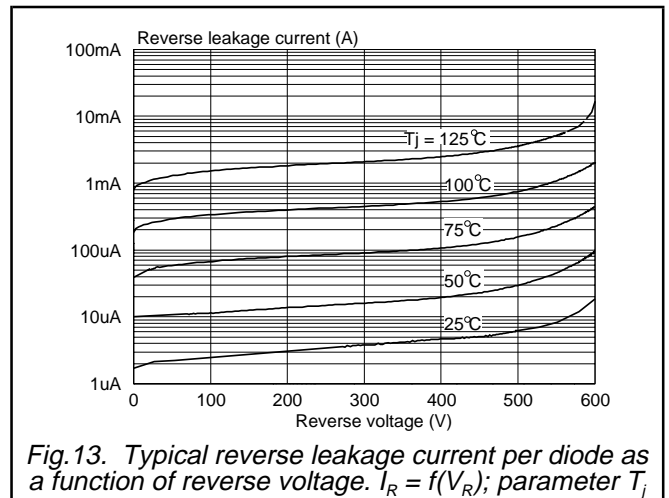


Fig.13. Typical reverse leakage current per diode as a function of reverse voltage. $I_R = f(V_R)$; parameter T_j

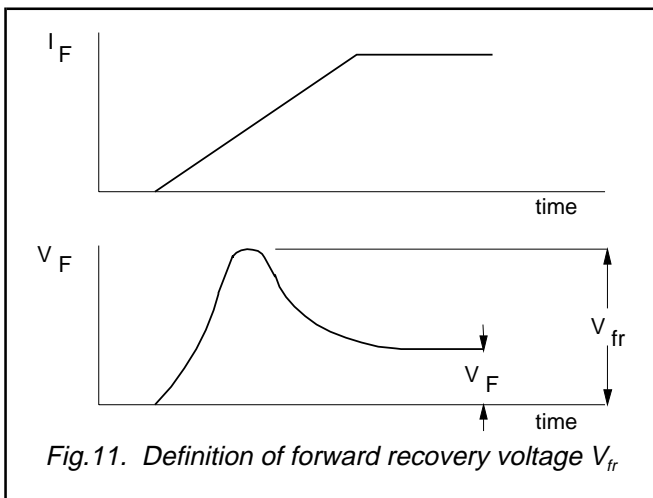


Fig.11. Definition of forward recovery voltage V_{fr}

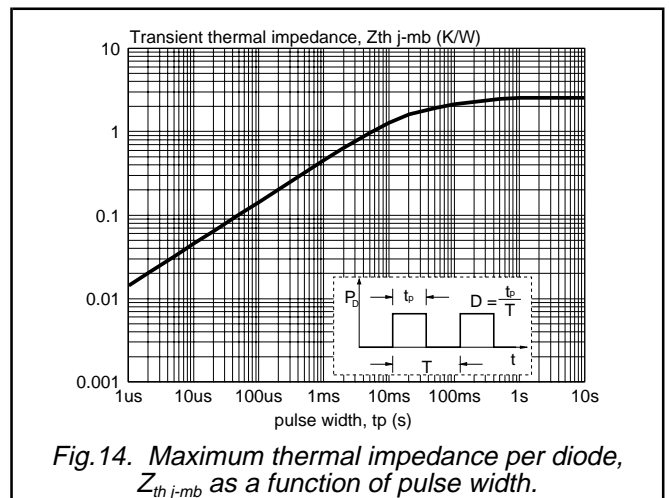
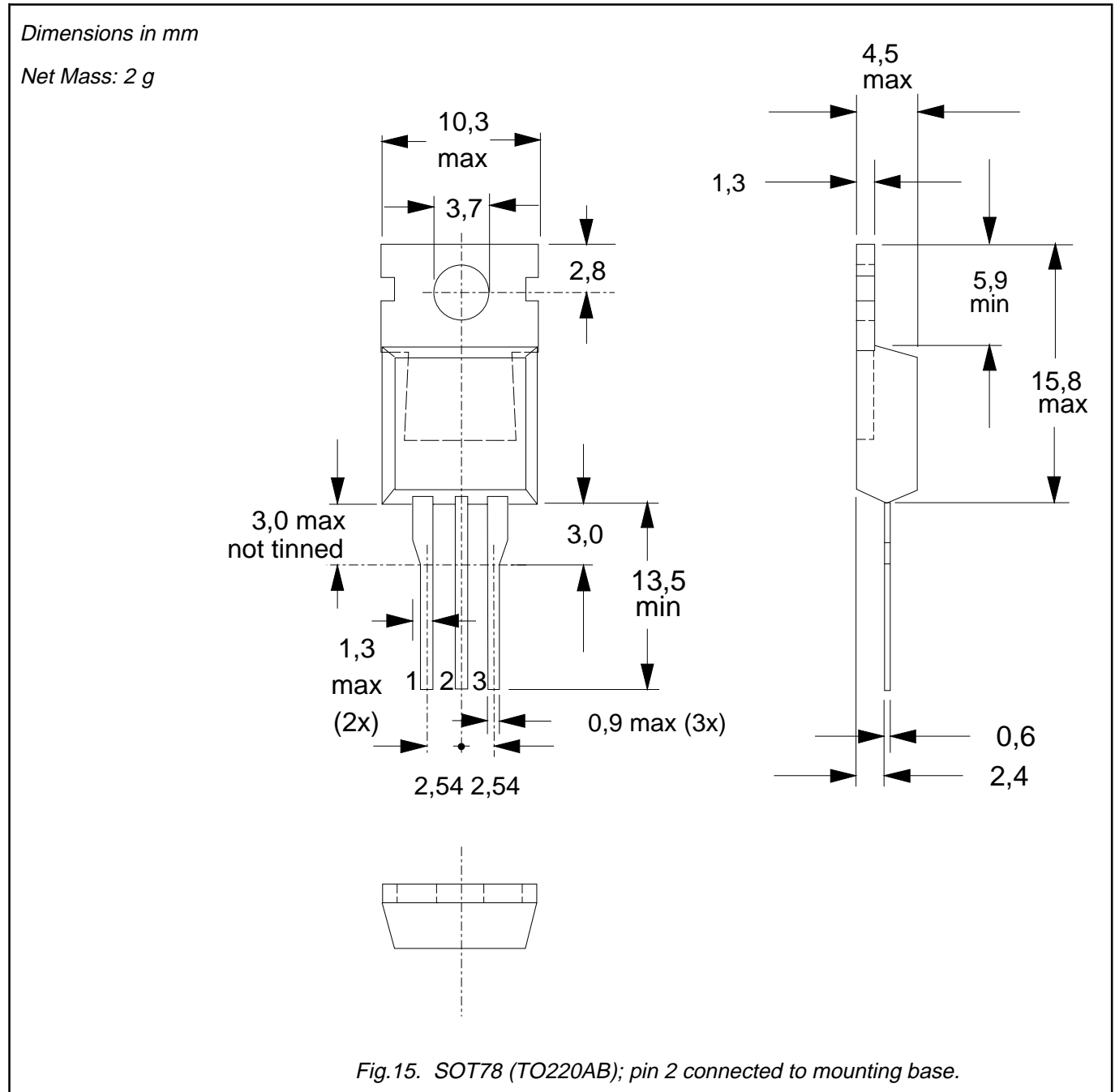


Fig.14. Maximum thermal impedance per diode, $Z_{th\ j-mb}$ as a function of pulse width.

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MECHANICAL DATA



Notes

1. Refer to mounting instructions for SOT78 (TO220) envelopes.
2. Epoxy meets UL94 V0 at 1/8".

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DEFINITIONS

| | |
|--|---|
| Data sheet status | |
| Objective specification | This data sheet contains target or goal specifications for product development. |
| Preliminary specification | This data sheet contains preliminary data; supplementary data may be published later. |
| Product specification | This data sheet contains final product specifications. |
| Limiting values | |
| Limiting values are given in accordance with the Absolute Maximum Rating System (IEC 134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of this specification is not implied. Exposure to limiting values for extended periods may affect device reliability. | |
| Application information | |
| Where application information is given, it is advisory and does not form part of the specification. | |
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