

DATA SHEET

BTA216B series B Triacs high commutation

Product specification

August 2018



WeEn

WeEn Semiconductors

Triacs high commutation

BTA216B series B

GENERAL DESCRIPTION

Glass passivated high commutation triacs in a plastic envelope suitable for surface mounting, intended for use in circuits where high static and dynamic dV/dt and high dI/dt can occur. These devices will commute the full rated rms current at the maximum rated junction temperature, without the aid of a snubber.

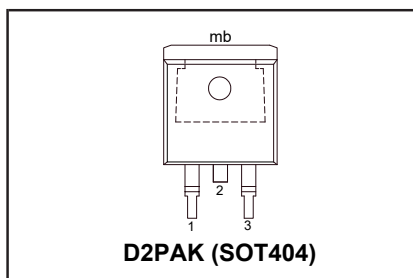
QUICK REFERENCE DATA

| SYMBOL | PARAMETER | MAX. | MAX. | MAX. | UNIT |
|--------------|---|--------------------|--------------------|--------------------|------|
| V_{DRM} | BTA216B- Repetitive peak off-state voltages | 500B 500 | 600B 600 | 800B 800 | V |
| $I_{T(RMS)}$ | RMS on-state current | 16 | 16 | 16 | A |
| I_{TSM} | Non-repetitive peak on-state current | 140 | 140 | 140 | A |

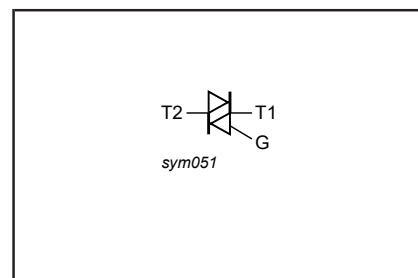
PINNING - SOT404

| PIN | DESCRIPTION |
|-----|-----------------|
| 1 | main terminal 1 |
| 2 | main terminal 2 |
| 3 | gate |
| mb | main terminal 2 |

PIN CONFIGURATION



SYMBOL



LIMITING VALUES

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

| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | | | UNIT |
|--------------|--|---|------|--------------------------|--------------------------|-------------|------------------------|
| | | | | -500 500 ¹ | -600 600 ¹ | -800 800 | |
| V_{DRM} | Repetitive peak off-state voltages | | - | | | | V |
| $I_{T(RMS)}$ | RMS on-state current | full sine wave; $T_{mb} \leq 99\text{ }^\circ\text{C}$ | - | 16 | | | A |
| I_{TSM} | Non-repetitive peak on-state current | full sine wave; $T_j = 25\text{ }^\circ\text{C}$ prior to surge | - | 140 | | | A |
| | | $t = 20\text{ ms}$ | - | 150 | | | A |
| | | $t = 16.7\text{ ms}$ | - | 98 | | | A^2s |
| I^2t | I^2t for fusing | $t = 10\text{ ms}$ | - | 100 | | | $\text{A}/\mu\text{s}$ |
| di_T/dt | Repetitive rate of rise of on-state current after triggering | $I_M = 20\text{ A}; I_G = 0.2\text{ A}; di_G/dt = 0.2\text{ A}/\mu\text{s}$ | - | | | | |
| I_{GM} | Peak gate current | | - | 2 | | | A |
| V_{GM} | Peak gate voltage | | - | 5 | | | V |
| P_{GM} | Peak gate power | | - | 5 | | | W |
| $P_{G(AV)}$ | Average gate power | over any 20 ms period | - | 0.5 | | | W |
| T_{stg} | Storage temperature | | -40 | 150 | | | $^\circ\text{C}$ |
| T_j | Operating junction temperature | | - | 125 | | | $^\circ\text{C}$ |

¹ Although not recommended, off-state voltages up to 800V may be applied without damage, but the triac may switch to the on-state. The rate of rise of current should not exceed 15 A/ μs .

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THERMAL RESISTANCES

| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|----------------|--|--|------|------|------|------|
| $R_{th\ j-mb}$ | Thermal resistance junction to mounting base | full cycle | - | - | 1.2 | K/W |
| $R_{th\ j-a}$ | Thermal resistance junction to ambient | half cycle minimum footprint, FR4 board | - | 55 | 1.7 | K/W |
| | | | - | | - | K/W |

STATIC CHARACTERISTICS

$T_j = 25\text{ °C}$ unless otherwise stated

| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|----------|-----------------------------------|--|------|------|------|------|
| I_{GT} | Gate trigger current ² | $V_D = 12\text{ V}; I_T = 0.1\text{ A}$ | | | | |
| | | T2+ G+ | 2 | 18 | 50 | mA |
| | | T2+ G- | 2 | 21 | 50 | mA |
| | | T2- G- | 2 | 34 | 50 | mA |
| I_L | Latching current | $V_D = 12\text{ V}; I_{GT} = 0.1\text{ A}$ | | | | |
| | | T2+ G+ | - | 31 | 60 | mA |
| | | T2+ G- | - | 34 | 90 | mA |
| | | T2- G- | - | 30 | 60 | mA |
| I_H | Holding current | $V_D = 12\text{ V}; I_{GT} = 0.1\text{ A}$ | - | 31 | 60 | mA |
| V_T | On-state voltage | $I_T = 20\text{ A}$ | - | 1.2 | 1.5 | V |
| V_{GT} | Gate trigger voltage | $V_D = 12\text{ V}; I_T = 0.1\text{ A}$ | - | 0.7 | 1.5 | V |
| I_D | Off-state leakage current | $V_D = 400\text{ V}; I_T = 0.1\text{ A}; T_j = 125\text{ °C}$ $V_D = V_{DRM(max)}; T_j = 125\text{ °C}$ | 0.25 | 0.4 | - | V |
| | | | - | 0.1 | 0.5 | mA |

DYNAMIC CHARACTERISTICS

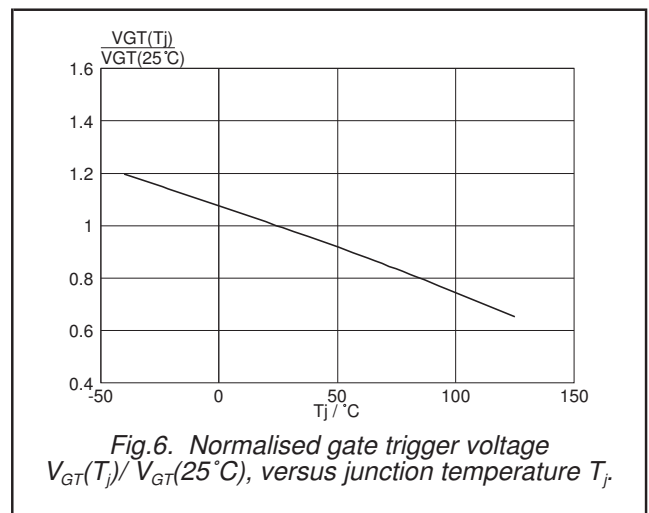
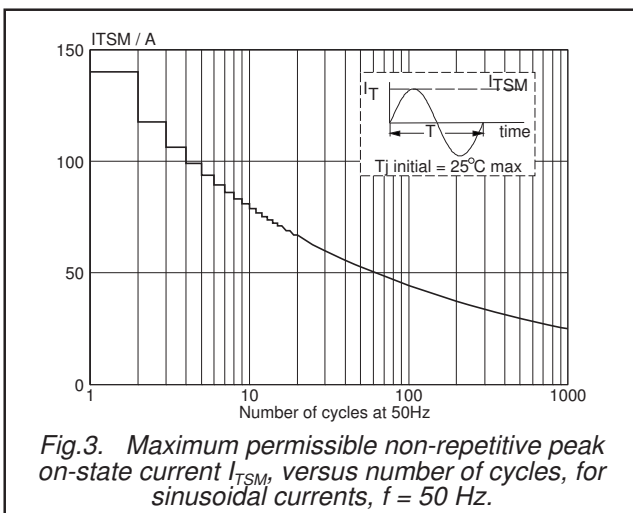
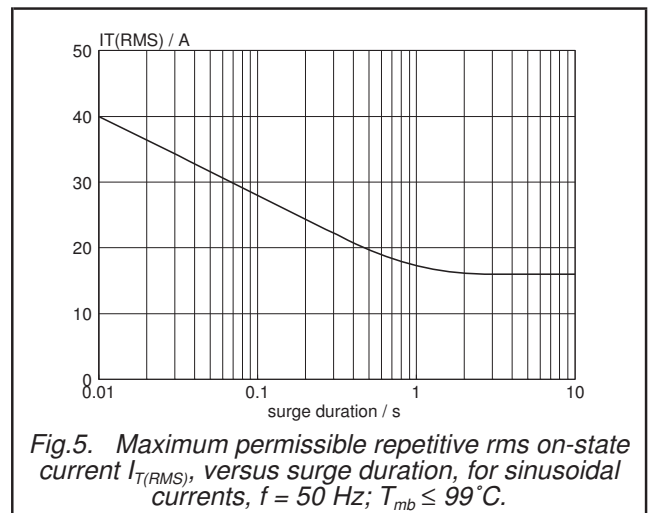
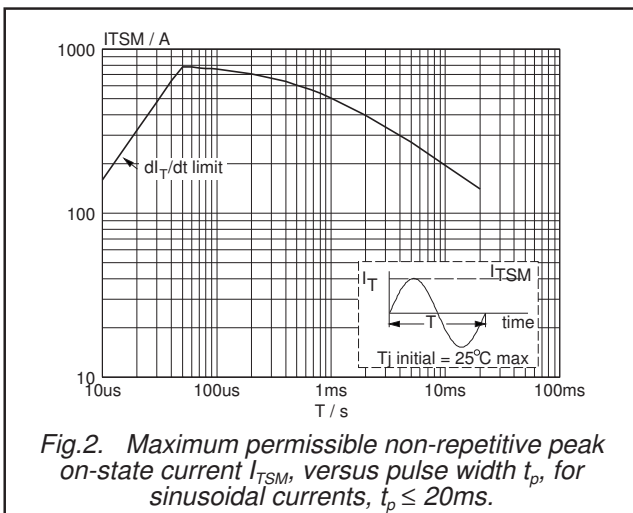
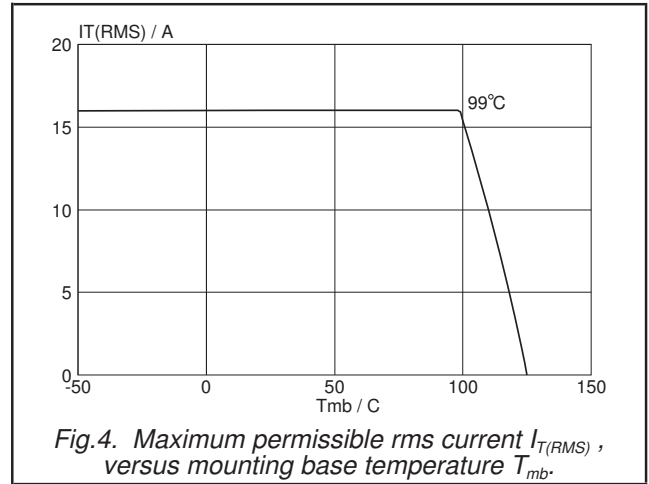
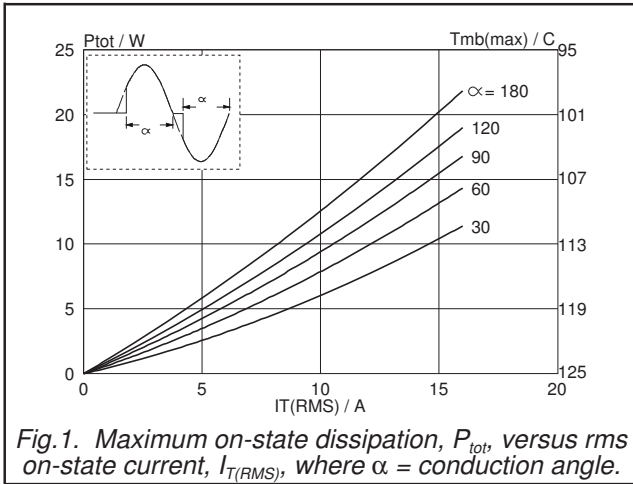
$T_j = 25\text{ °C}$ unless otherwise stated

| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|---------------|--|---|------|------|------|------------|
| dV_D/dt | Critical rate of rise of off-state voltage | $V_{DM} = 67\% V_{DRM(max)}; T_j = 125\text{ °C};$ exponential waveform; gate open circuit | 1000 | 4000 | - | V/ μ s |
| dI_{com}/dt | Critical rate of change of commutating current | $V_{DM} = 400\text{ V}; T_j = 125\text{ °C}; I_{T(RMS)} = 16\text{ A};$ without snubber; gate open circuit | - | 28 | - | A/ms |
| t_{gt} | Gate controlled turn-on time | $I_{TM} = 20\text{ A}; V_D = V_{DRM(max)}; I_G = 0.1\text{ A};$ $dI_G/dt = 5\text{ A}/\mu$ s | - | 2 | - | μ s |

² Device does not trigger in the T2-, G+ quadrant.

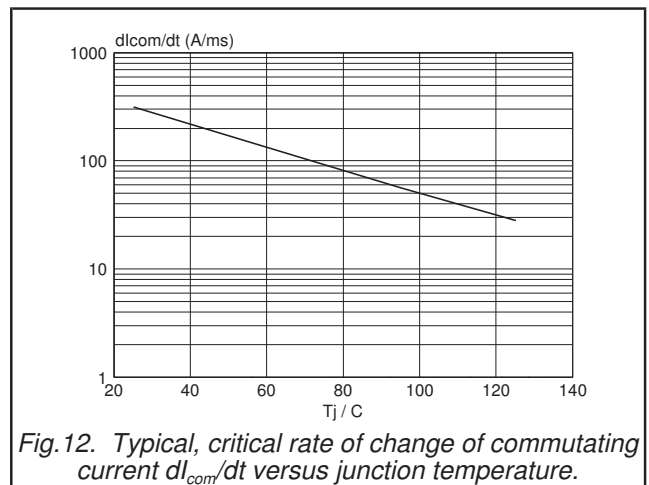
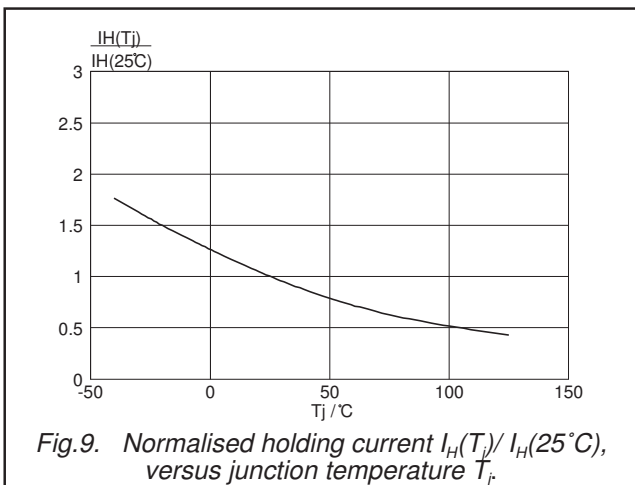
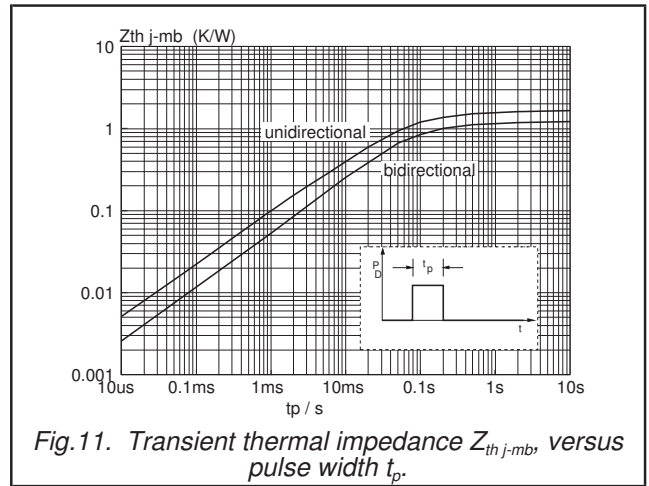
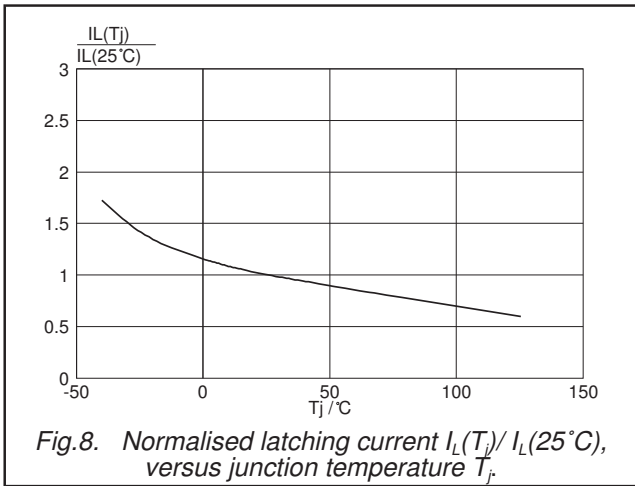
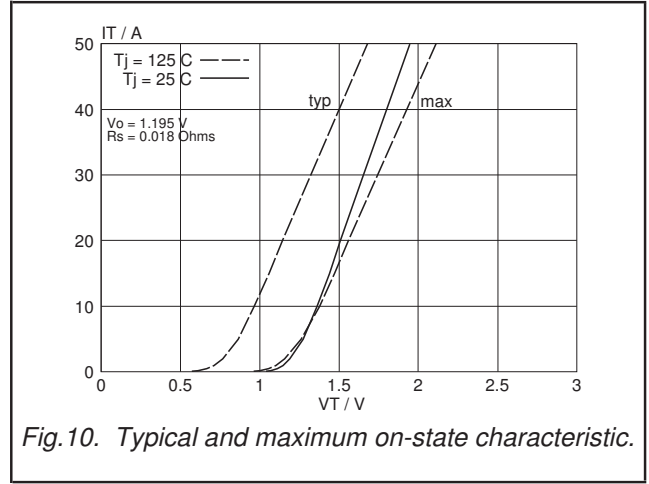
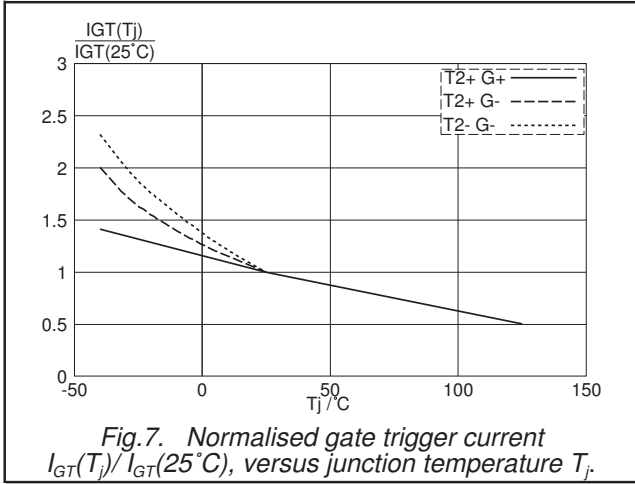
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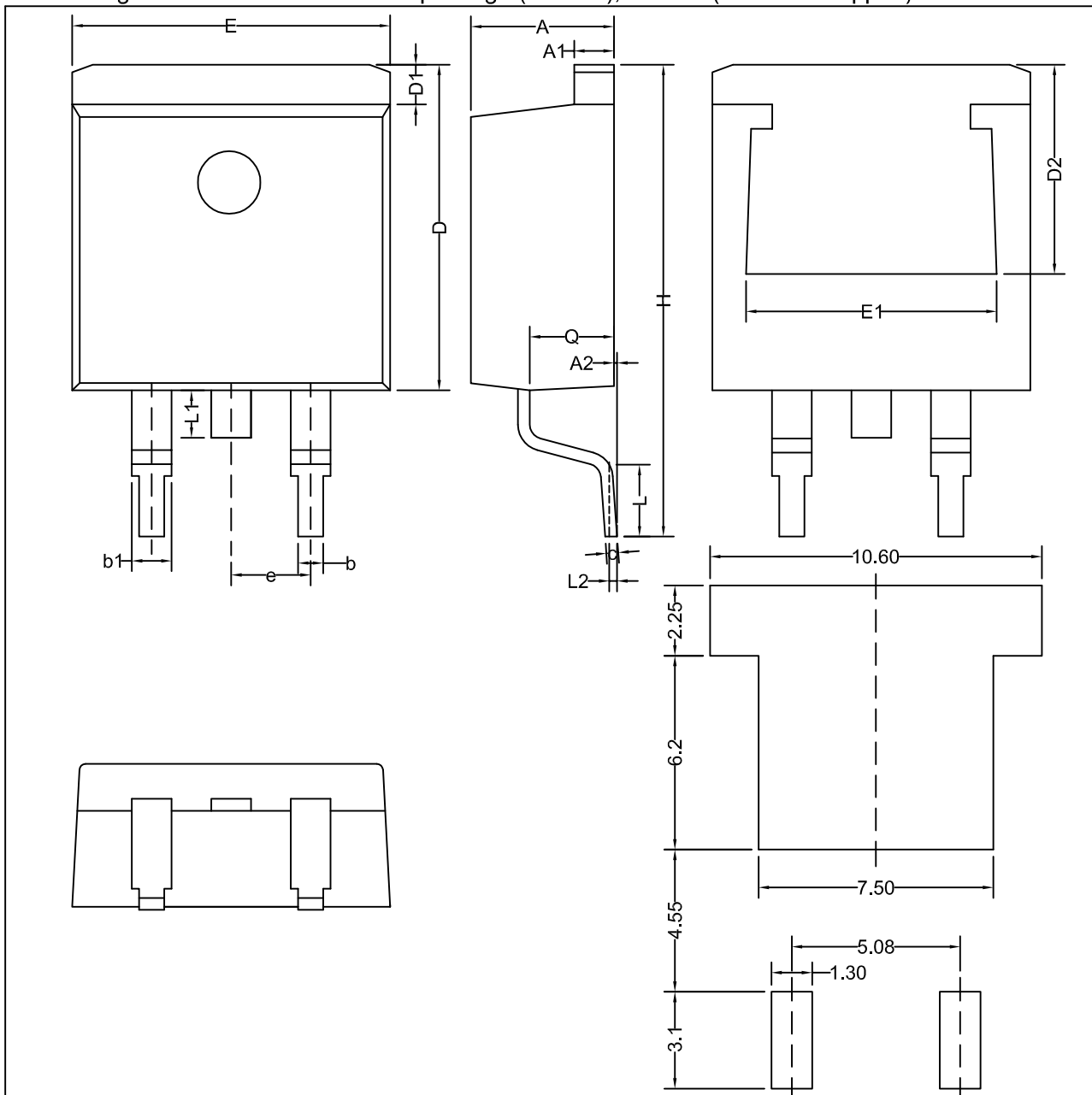
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MECHANICAL DATA

Plastic single-ended surface-mounted package (D2PAK); 3 leads (one lead cropped)

TO263



Recommended Footprint

| | A | A1 | A2 | b | b1 | c | D | D1 | D2 | e | E | E1 | H | L | L1 | L2 | Q |
|-----|------|------|------|------|------|------|-------|------|------|---------------|-------|------|-------|------|------|---------------|------|
| min | 4.10 | 1.22 | 0.00 | 0.60 | 1.05 | 0.34 | --- | 1.20 | 6.60 | 2.54 (BSC) | 9.70 | 7.80 | 14.80 | 2.10 | --- | 0.25 (BSC) | 2.20 |
| max | 4.70 | 1.40 | 0.25 | 0.90 | 1.45 | 0.64 | 11.00 | 1.60 | --- | --- | 10.30 | --- | 15.80 | 2.90 | 1.75 | --- | 2.79 |

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|--------------------------------|--------------------|---|
| Objective [short] data sheet | Development | This document contains data from the objective specification for product development. |
| Preliminary [short] data sheet | Qualification | This document contains data from the preliminary specification. |
| Product [short] data sheet | Production | This document contains the product specification. |

- [1] Please consult the most recently issued document before initiating or completing a design.
- [2] The term 'short data sheet' is explained in section "Definitions".
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