

# DATA SHEET

## **BYC10B-600**

Rectifier diode

ultrafast, low switching loss

Product specification

August 2018



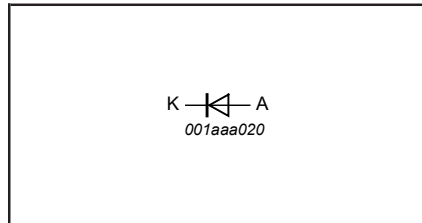
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# Rectifier diode ultrafast, low switching loss

**BYC10B-600****FEATURES**

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

**SYMBOL****QUICK REFERENCE DATA**

|                               |
|-------------------------------|
| $V_R = 600\text{ V}$          |
| $V_F \leq 1.8\text{ V}$       |
| $I_{F(AV)} = 10\text{ A}$     |
| $t_{rr} = 19\text{ ns (typ)}$ |

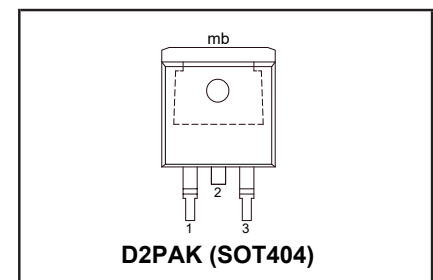
**APPLICATIONS**

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

The BYC10B-600 is supplied in the SOT404 surface mounting package.

**PINNING**

| PIN | DESCRIPTION          |
|-----|----------------------|
| 1   | no connection        |
| 2   | cathode <sup>1</sup> |
| 3   | anode                |
| tab | cathode              |

**SOT404****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           |                                                                                                                                                               | -    | 500  | V    |
| $I_{F(AV)}$ | Average forward current              | $T_{mb} \leq 114\text{ °C}$<br>$\delta = 0.5$ ; with reappplied $V_{RRM(max)}$ ;                                                                              | -    | 10   | A    |
| $I_{FRM}$   | Repetitive peak forward current      | $T_{mb} \leq 78\text{ °C}$<br>$\delta = 0.5$ ; with reappplied $V_{RRM(max)}$ ;                                                                               | -    | 20   | A    |
| $I_{FSM}$   | Non-repetitive peak forward current. | $T_{mb} \leq 78\text{ °C}$<br>$t = 10\text{ ms}$<br>$t = 8.3\text{ ms}$<br>sinusoidal; $T_j = 150\text{ °C}$ prior to surge<br>with reappplied $V_{RWM(max)}$ | -    | 65   | A    |
| $T_{stg}$   | Storage temperature                  |                                                                                                                                                               | -40  | 150  | °C   |
| $T_j$       | Operating junction temperature       |                                                                                                                                                               | -    | 150  | °C   |

**THERMAL RESISTANCES**

| SYMBOL         | PARAMETER                                    | CONDITIONS                   | MIN. | TYP. | MAX. | UNIT |
|----------------|----------------------------------------------|------------------------------|------|------|------|------|
| $R_{th\ j-mb}$ | Thermal resistance junction to mounting base |                              | -    | -    | 2    | K/W  |
| $R_{th\ j-a}$  | Thermal resistance junction to ambient       | minimum footprint, FR4 board | -    | 50   | -    | K/W  |

<sup>1</sup> it is not possible to make connection to pin 2 of the SOT404 package

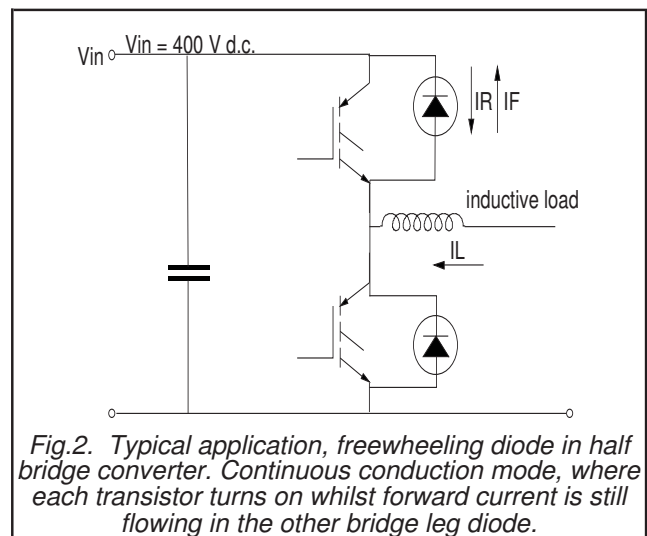
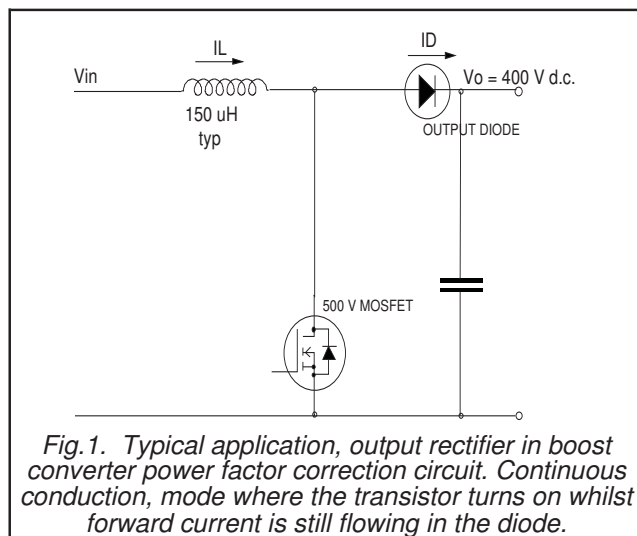
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## ELECTRICAL CHARACTERISTICS

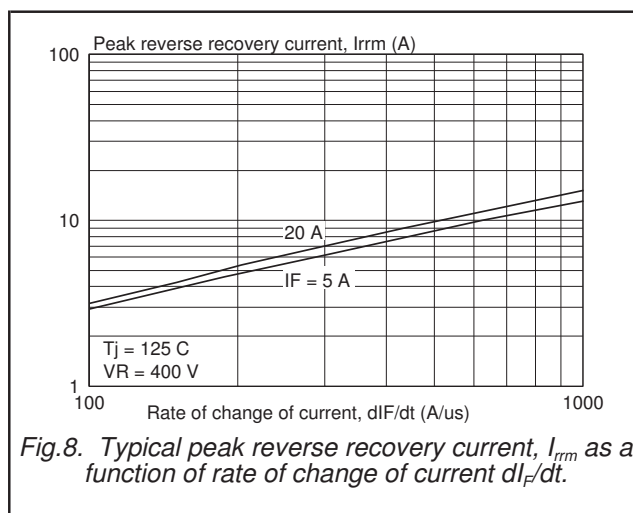
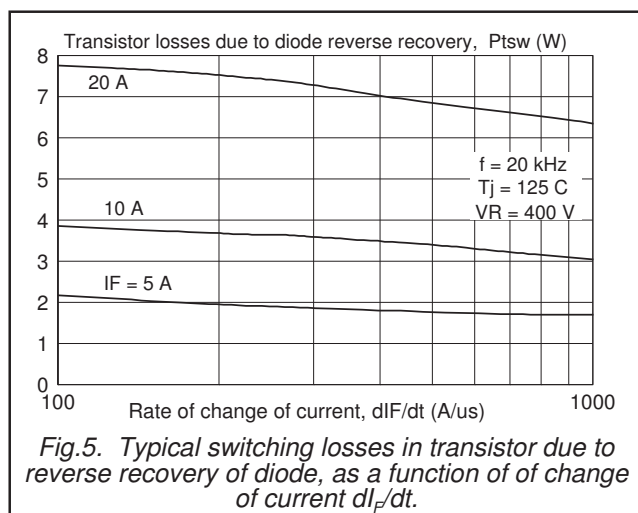
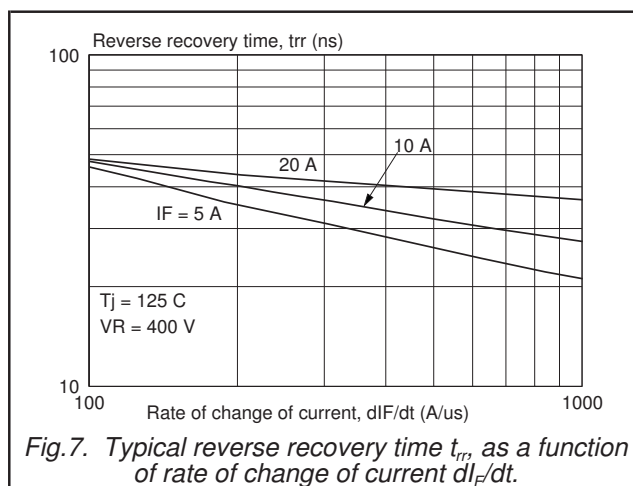
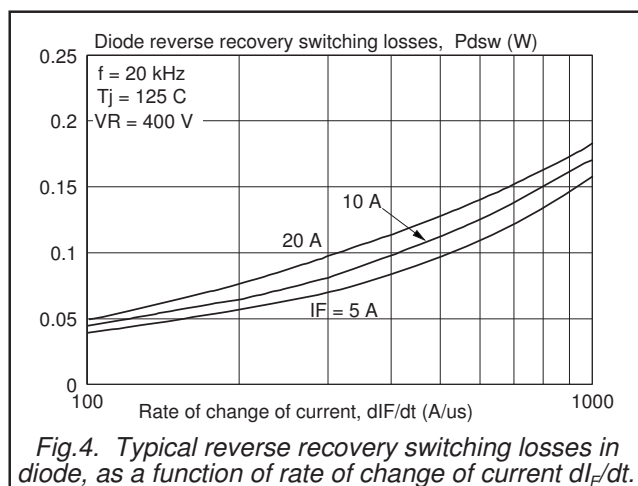
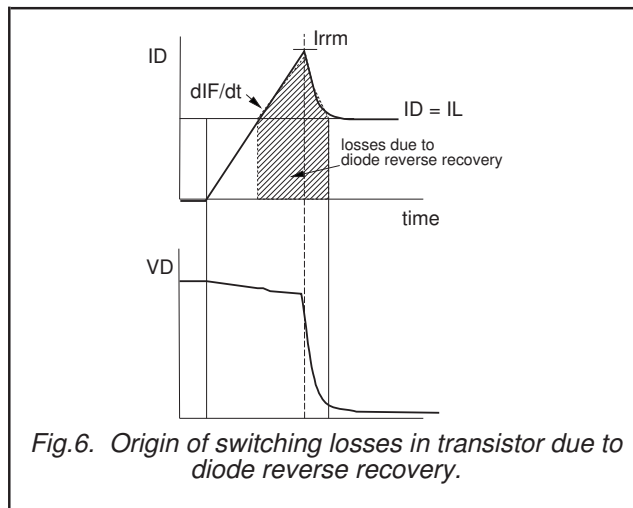
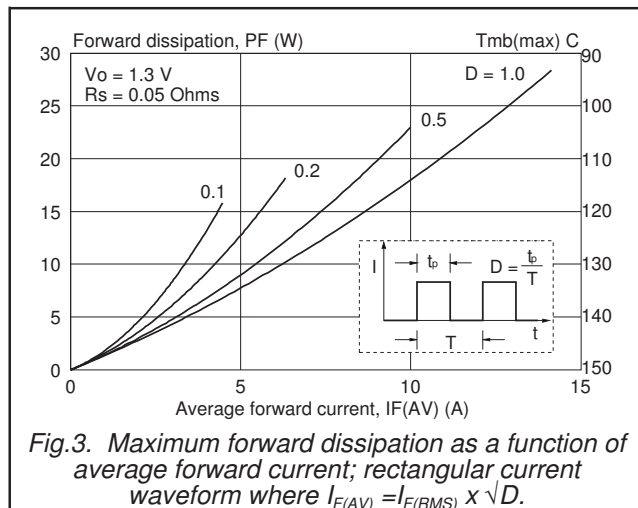
 $T_j = 25\text{ }^{\circ}\text{C}$  unless otherwise stated

| SYMBOL    | PARAMETER                     | CONDITIONS                                                                                                          | MIN. | TYP. | MAX. | UNIT          |
|-----------|-------------------------------|---------------------------------------------------------------------------------------------------------------------|------|------|------|---------------|
| $V_F$     | Forward voltage               | $I_F = 10\text{ A}; T_j = 150\text{ }^{\circ}\text{C}$                                                              | -    | 1.4  | 1.8  | V             |
|           |                               | $I_F = 20\text{ A}; T_j = 150\text{ }^{\circ}\text{C}$                                                              | -    | 1.7  | 2.3  | V             |
| $I_R$     | Reverse current               | $I_F = 10\text{ A};$<br>$V_R = 600\text{ V}$                                                                        | -    | 2.0  | 2.9  | V             |
|           |                               | $V_R = 500\text{ V}; T_j = 100\text{ }^{\circ}\text{C}$                                                             | -    | 9    | 200  | $\mu\text{A}$ |
|           |                               |                                                                                                                     | -    | 1.1  | 3.0  | mA            |
| $t_{rr}$  | Reverse recovery time         | $I_F = 1\text{ A}; V_R = 30\text{ V}; dI_F/dt = 50\text{ A}/\mu\text{s}$                                            | -    | 35   | 55   | ns            |
| $t_{rr}$  | Reverse recovery time         | $I_F = 10\text{ A}; V_R = 400\text{ V};$<br>$dI_F/dt = 500\text{ A}/\mu\text{s}$                                    | -    | 19   | -    | ns            |
| $t_{rr}$  | Reverse recovery time         | $I_F = 10\text{ A}; V_R = 400\text{ V};$<br>$dI_F/dt = 500\text{ A}/\mu\text{s}; T_j = 100\text{ }^{\circ}\text{C}$ | -    | 32   | 40   | ns            |
| $I_{rrm}$ | Peak reverse recovery current | $I_F = 10\text{ A}; V_R = 400\text{ V};$<br>$dI_F/dt = 100\text{ A}/\mu\text{s}; T_j = 125\text{ }^{\circ}\text{C}$ | -    | 3    | 7.5  | A             |
| $I_{rrm}$ | Peak reverse recovery current | $I_F = 10\text{ A}; V_R = 400\text{ V};$<br>$dI_F/dt = 500\text{ A}/\mu\text{s}; T_j = 125\text{ }^{\circ}\text{C}$ | -    | 9.5  | 12   | A             |
| $V_{fr}$  | Forward recovery voltage      | $I_F = 10\text{ A}; dI_F/dt = 100\text{ A}/\mu\text{s}$                                                             | -    | 8    | 11   | V             |



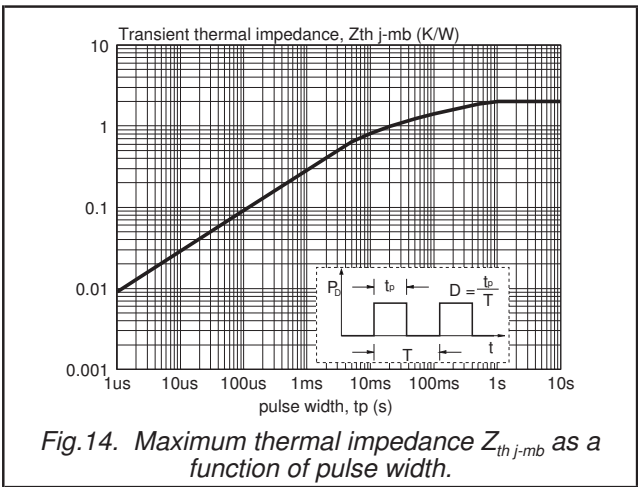
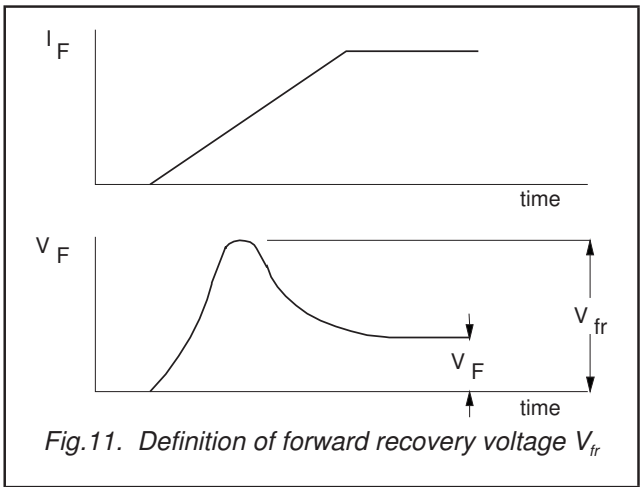
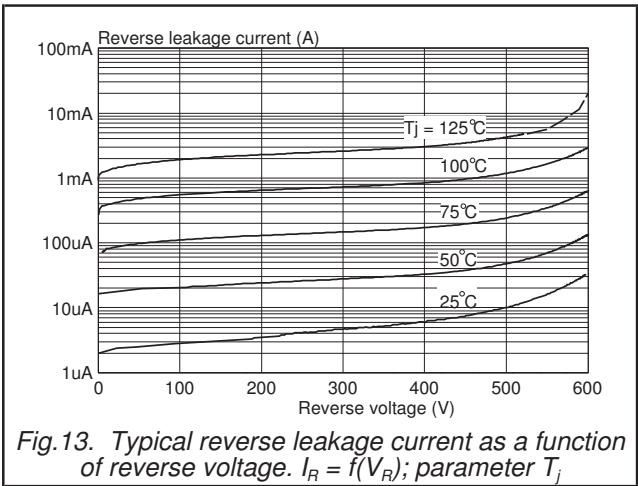
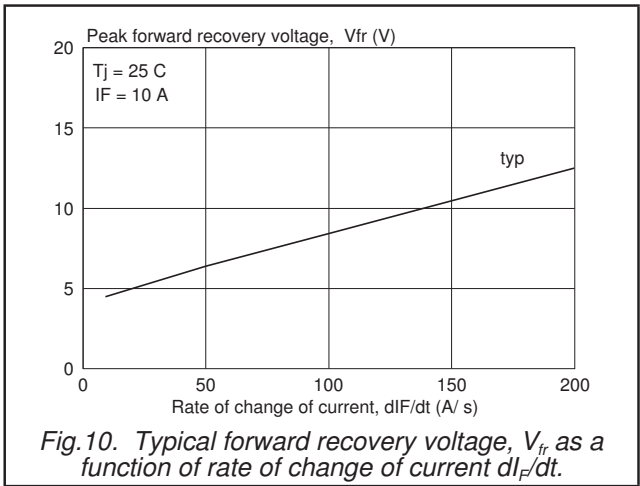
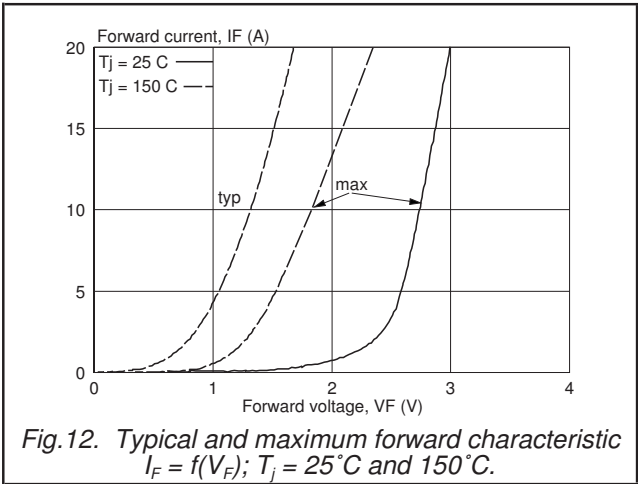
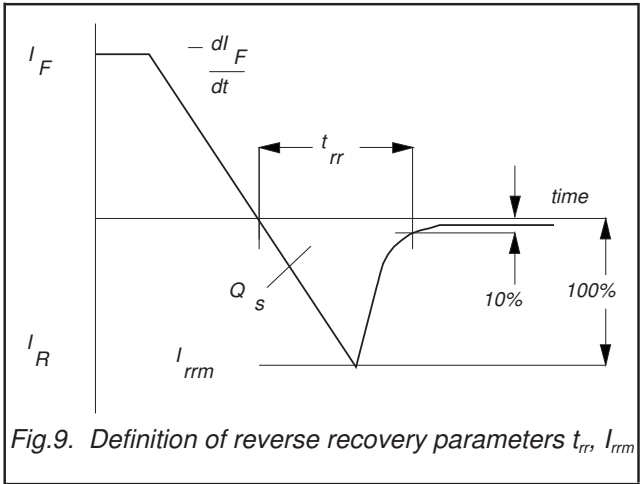
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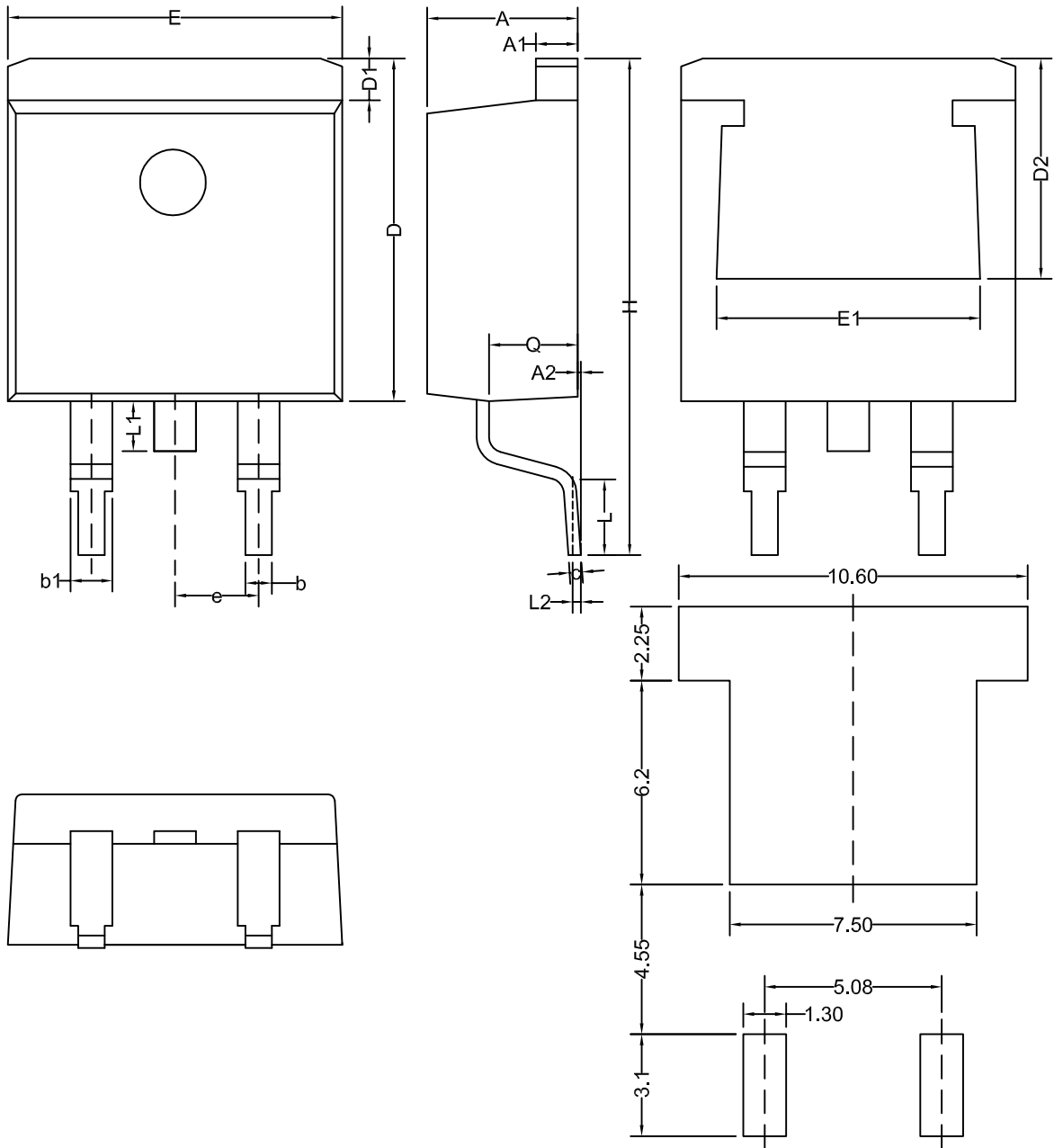
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MECHANICAL DATA

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<br>(BSC) | 9.70  | 7.80 | 14.80 | 2.10 | ---  | 0.25<br>(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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| Document status [1][2]         | Product status [3] | Definition                                                                            |
|--------------------------------|--------------------|---------------------------------------------------------------------------------------|
| Objective [short] data sheet   | Development        | This document contains data from the objective specification for product development. |
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| 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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