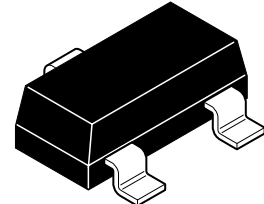


ZXTN25012EFL

12V, SOT23, NPN low power transistor

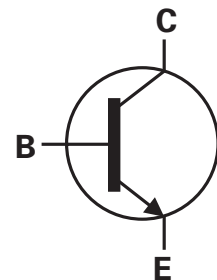
Summary

$BV_{CEO} > 12V$
 $BV_{ECO} > 4.5V$
 $h_{FE} > 500$
 $I_{C(cont)} = 2A$
 $V_{CE(sat)} < 65\text{ mV @ } 1A$
 $R_{CE(sat)} = 46\text{ m}\Omega$
 $P_D = 350mW$



Description

Advanced process capability has been used to achieve high current gain hold up making this device ideal for applications requiring high pulse currents.

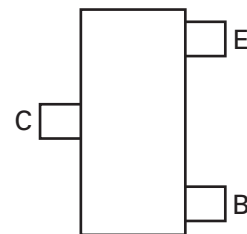


Features

- High peak current
- Low saturation voltage
- 6V reverse blocking voltage

Applications

- MOSFET and IGBT gate driving
- DC-DC conversion
- LED driving
- Interface between low voltage IC's and load



Pinout - top view

Ordering information

| Device | Reel size (inches) | Tape width (mm) | Quantity per reel |
|----------------|--------------------|-----------------|-------------------|
| ZXTN25012EFLTA | 7 | 8 | 3000 |

Device marking

1B6

ZXTN25012EFL

Absolute maximum ratings

| Parameter | Symbol | Limit | Unit |
|---|----------------|-------------|-----------------|
| Collector-base voltage | V_{CBO} | 20 | V |
| Collector-emitter voltage | V_{CEO} | 12 | V |
| Emitter-collector voltage | V_{ECO} | 4.5 | V |
| Emitter-base voltage | V_{EBO} | 7 | V |
| Continuous collector current ^(a) | I_C | 2 | A |
| Base current | I_B | 500 | mA |
| Peak pulse current | I_{CM} | 15 | A |
| Power dissipation @ $T_{amb} = 25^{\circ}C^{(a)}$ | P_D | 350 | mW |
| Linear derating factor | | 2.8 | mW/ $^{\circ}C$ |
| Operating and storage temperature range | T_j, T_{stg} | - 55 to 150 | $^{\circ}C$ |

Thermal resistance

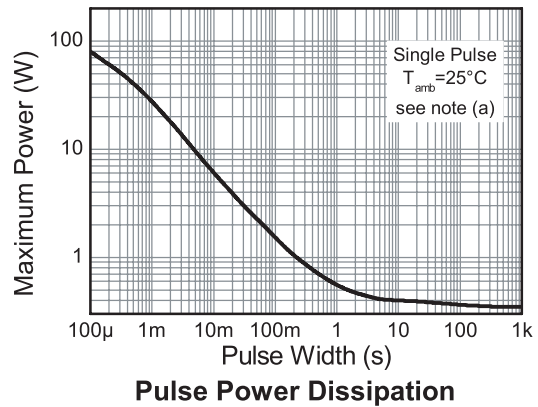
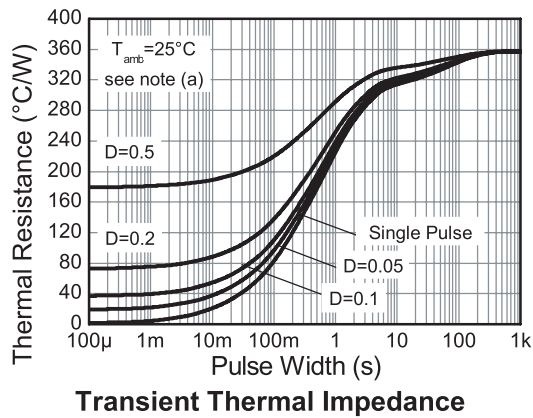
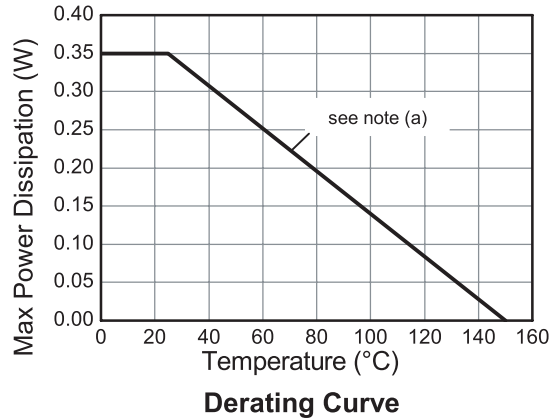
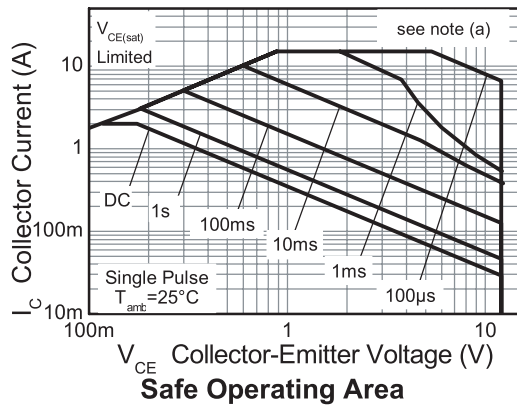
| Parameter | Symbol | Limit | Unit |
|------------------------------------|-----------------|-------|---------------|
| Junction to ambient ^(a) | $R_{\theta JA}$ | 357 | $^{\circ}C/W$ |

NOTES:

(a) For a device surface mounted on 25mm x 25mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.

ZXTN25012EFL

Characteristics



ZXTN25012EFL

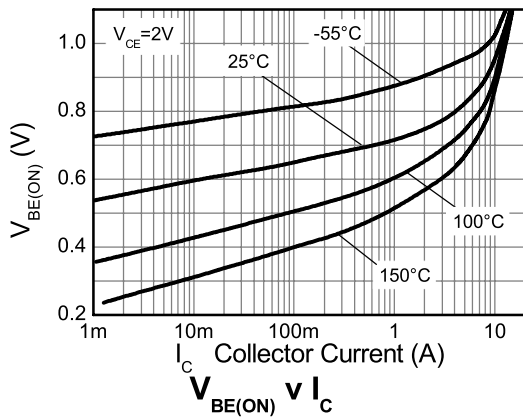
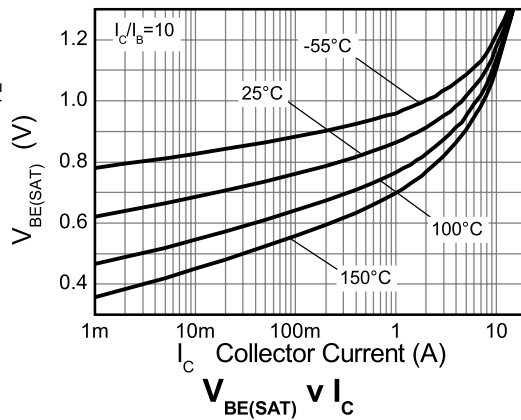
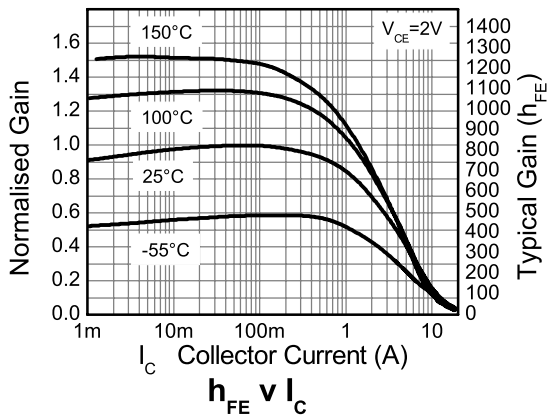
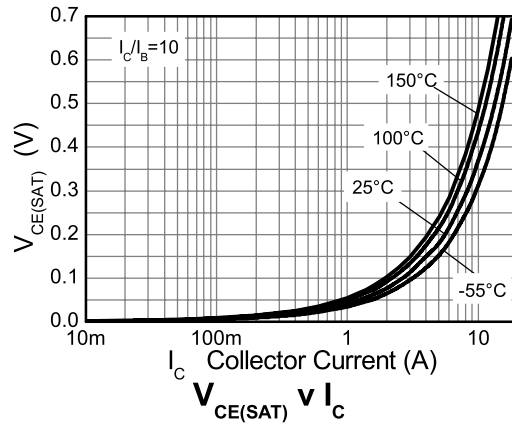
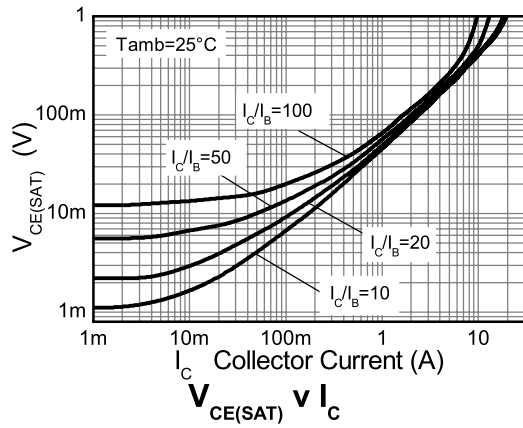
Electrical characteristics (at $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated)

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Conditions |
|--|---------------|------|------|------|---------------|---|
| Collector-base breakdown voltage | BV_{CBO} | 20 | 40 | | V | $I_C = 100\mu\text{A}$ |
| Collector-emitter breakdown voltage | BV_{CEO} | 12 | 17 | | V | $I_C = 10\text{mA}^{(*)}$ |
| Emitter-base breakdown voltage | BV_{EBO} | 7 | 8.3 | | V | $I_E = 100\mu\text{A}$ |
| Emitter-collector breakdown voltage (reverse blocking) | BV_{ECX} | 6 | 8 | | V | $I_E = 100\mu\text{A}$, $R_{BC} \leq 1\text{k}\Omega$ or $0.25\text{V} > V_{BC} > -0.25\text{V}$ |
| Emitter-collector breakdown voltage (base open) | BV_{ECO} | 4.5 | 5.5 | | V | $I_E = 100\mu\text{A}$, |
| Collector cut-off current | I_{CBO} | | <1 | 50 | nA | $V_{CB} = 16\text{V}$ |
| | | | | 20 | μA | $V_{CB} = 16\text{V}$, $T_{amb} = 100^{\circ}\text{C}$ |
| Emitter-base cut-off current | I_{EBO} | | <1 | 50 | nA | $V_{EB} = 5.6\text{V}$ |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | | 50 | 65 | mV | $I_C = 1\text{A}$, $I_B = 100\text{mA}^{(*)}$ |
| | | | 70 | 85 | mV | $I_C = 1\text{A}$, $I_B = 10\text{mA}^{(*)}$ |
| | | | 105 | 130 | mV | $I_C = 2\text{A}$, $I_B = 40\text{mA}^{(*)}$ |
| | | | 235 | 300 | mV | $I_C = 5\text{A}$, $I_B = 100\text{mA}^{(*)}$ |
| Base-emitter saturation voltage | $V_{BE(sat)}$ | | 830 | 950 | mV | $I_C = 2\text{A}$, $I_B = 40\text{mA}^{(*)}$ |
| Base-emitter turn-on voltage | $V_{BE(on)}$ | | 745 | 850 | mV | $I_C = 2\text{A}$, $V_{CE} = 2\text{V}^{(*)}$ |
| Static forward current transfer ratio | h_{FE} | 500 | 800 | 1500 | | $I_C = 10\text{mA}$, $V_{CE} = 2\text{V}^{(*)}$ |
| | | 500 | 700 | | | $I_C = 1\text{A}$, $V_{CE} = 2\text{V}^{(*)}$ |
| | | 370 | 575 | | | $I_C = 2\text{A}$, $V_{CE} = 2\text{V}^{(*)}$ |
| | | 210 | 335 | | | $I_C = 5\text{A}$, $V_{CE} = 2\text{V}^{(*)}$ |
| | | 30 | 55 | | | $I_C = 15\text{A}$, $V_{CE} = 2\text{V}^{(*)}$ |
| Transition frequency | f_T | | 260 | | MHz | $I_C = 50\text{mA}$, $V_{CE} = 10\text{V}$ $f = 100\text{MHz}$ |
| Output capacitance | C_{obo} | | 25 | 35 | pF | $V_{CB} = 10\text{V}$, $f = 1\text{MHz}^{(*)}$ |
| Delay time | $t_{(d)}$ | | 71 | | ns | $V_{CC} = 10\text{V}$ |
| Rise time | $t_{(r)}$ | | 70 | | ns | $I_C = 1\text{A}$, $I_{B1} = I_{B2} = 10\text{mA}$ |
| Storage time | $t_{(s)}$ | | 233 | | ns | |
| Fall time | $t_{(f)}$ | | 72 | | ns | |

NOTES:

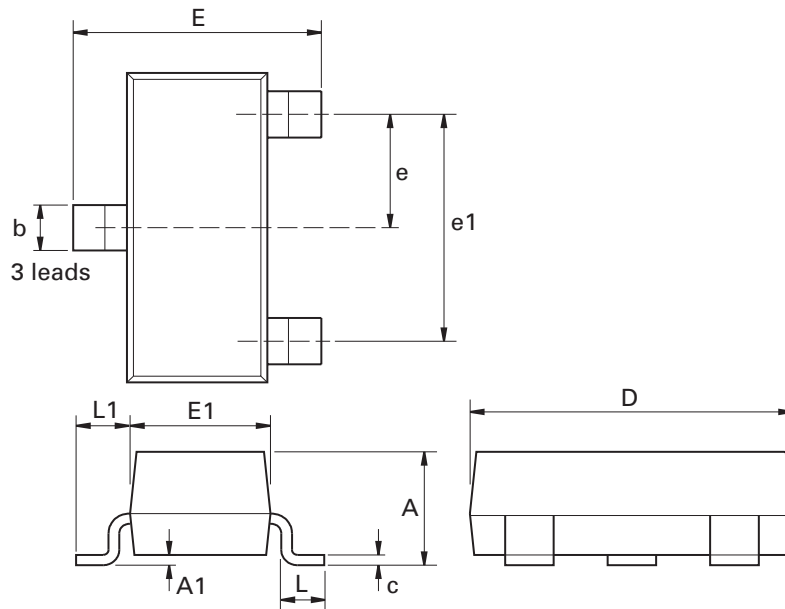
(*) Measured under pulsed conditions. Pulse width $\leq 300\mu\text{s}$; duty cycle $\leq 2\%$.

Typical characteristics



ZXTN25012EFL

Package outline - SOT23



| Dim. | Millimeters | | Inches | | Dim. | Millimeters | | Inches | |
|------|-------------|-------|------------|-------|------|-------------|------|-----------|-------|
| | Min. | Max. | Min. | Max. | | Min. | Max. | Max. | Max. |
| A | - | 1.12 | - | 0.044 | e1 | 1.90 NOM | | 0.075 NOM | |
| A1 | 0.01 | 0.10 | 0.0004 | 0.004 | E | 2.10 | 2.64 | 0.083 | 0.104 |
| b | 0.30 | 0.50 | 0.012 | 0.020 | E1 | 1.20 | 1.40 | 0.047 | 0.055 |
| C | 0.085 | 0.120 | 0.003 | 0.008 | L | 0.25 | 0.62 | 0.018 | 0.024 |
| D | 2.80 | 3.04 | 0.110 | 0.120 | L1 | 0.45 | 0.62 | 0.018 | 0.024 |
| e | 0.95 NOM | | 0.0375 NOM | | - | - | - | - | - |

Note: Controlling dimensions are in millimeters. Approximate dimensions are provided in inches

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| "Not recommended for new designs" | Device is still in production to support existing designs and production |
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| | |
|-----------------------|---|
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