

ZX5T1951G

60V PNP MEDIUM POWER TRANSISTOR IN SOT223

Features and Benefits

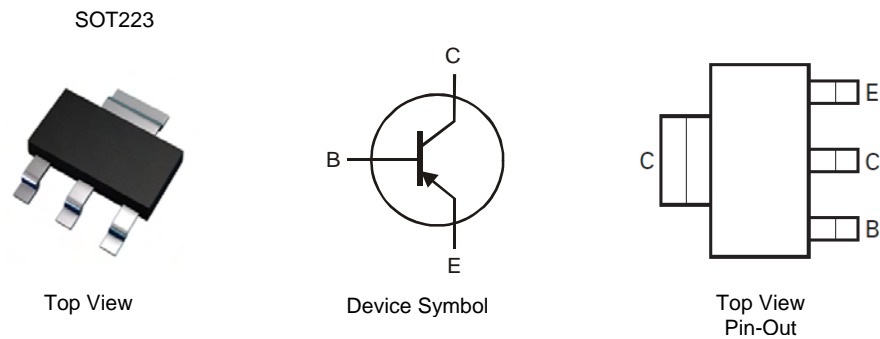
- $BV_{CEO} > -60V$
- $I_C = -6A$ Continuous Collector Current
- Low Saturation Voltage (-95mV max @ -1A)
- $R_{SAT} = 40m\Omega$ for a low equivalent On-Resistance
- h_{FE} specified up to -10A for a high gain hold up
- **RoHS Compliant**
- **Halogen and Antimony Free. "Green" Device (Note 1)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

- Case: SOT223
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish annealed over Copper Leadframe
- Weight: 0.112 grams (Approximate)

Applications

- Motor driving
- DC-DC modules
- Backlight inverters
- Actuator, relay, and solenoid drivers

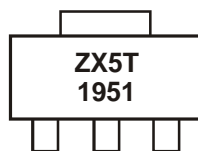


Ordering Information (Note 2)

| Product | Marking | Reel size (inches) | Tape width (mm) | Quantity per reel |
|-------------|----------|--------------------|-----------------|-------------------|
| ZX5T1951GTA | ZX5T1951 | 7 | 12 | 1,000 |

- Notes:
1. Diodes Inc's "Green" Policy can be found on our website at <http://www.diodes.com>
 2. For Packaging Details, go to our website at <http://www.diodes.com>.

Marking Information



ZX5T1951 = Product type Marking Code

Maximum Ratings @ $T_A = 25^\circ\text{C}$ unless otherwise specified

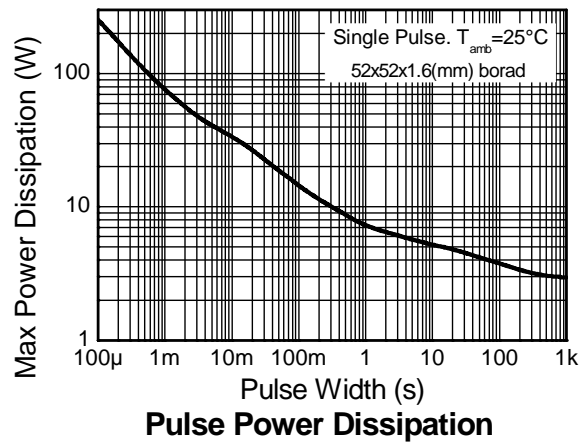
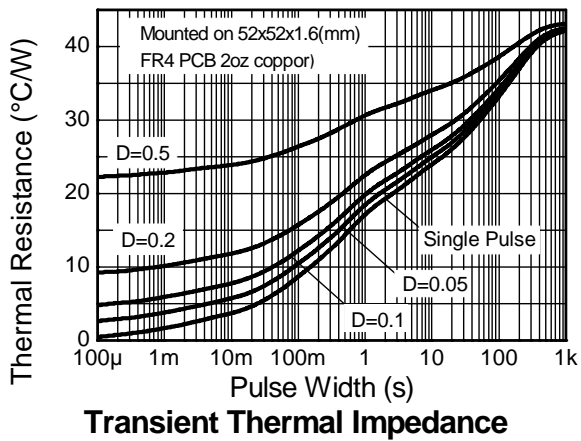
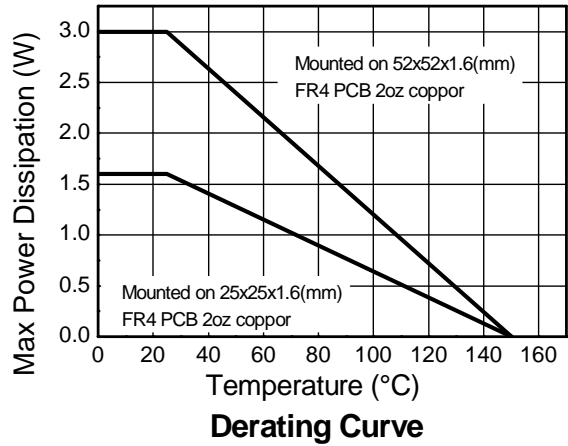
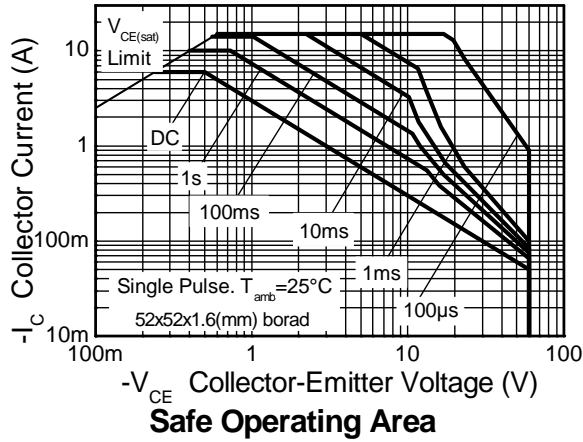
| Characteristic | Symbol | Value | Unit |
|---------------------------------------|-----------|-------|------|
| Collector-Base Voltage | V_{CBO} | -90 | V |
| Collector-Emitter Voltage | V_{CES} | -90 | V |
| Collector-Emitter Voltage | V_{CEO} | -60 | V |
| Emitter-Base Voltage | V_{EBO} | -7 | V |
| Continuous Collector Current (Note 3) | I_C | -6 | A |
| Peak Pulse Current | I_{CM} | -15 | A |
| Base Current | I_B | -1 | A |

Thermal Characteristics @ $T_A = 25^\circ\text{C}$ unless otherwise specified

| Characteristic | Symbol | Value | Unit |
|---|-----------------|-------------|---------------------------|
| Power Dissipation Linear derating factor | P_D | 3.0 | W mW/ $^\circ\text{C}$ |
| | | 24 | |
| | | 1.6 | |
| Thermal Resistance, Junction to Ambient | $R_{\theta JA}$ | 12.8 | $^\circ\text{C}/\text{W}$ |
| | | 42 | |
| Thermal Resistance Junction to Lead | $R_{\theta JL}$ | 78 | $^\circ\text{C}/\text{W}$ |
| | | 12.3 | |
| Operating and Storage Temperature Range | T_J, T_{STG} | -55 to +150 | $^\circ\text{C}$ |

- Notes:
3. For a device surface mounted on 52mm x 52mm x 1.6mm FR4 PCB with high coverage of single sided 2oz copper, in still air conditions; the device is measured when operating in a steady-state condition.
 4. Same as note (3), except the device is surface mounted on 25mm x 25mm with 1oz copper.
 5. Thermal resistance from junction to solder-point (at the end of the collector lead).

Thermal Characteristics

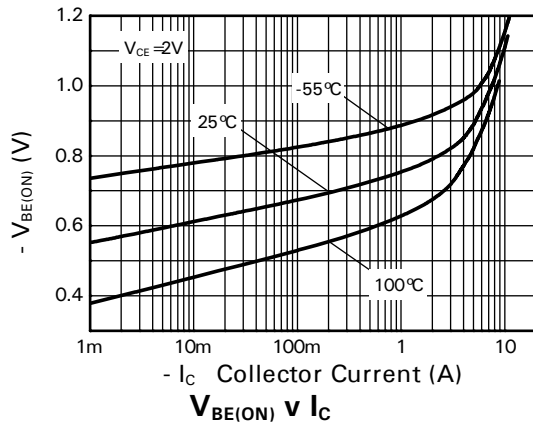
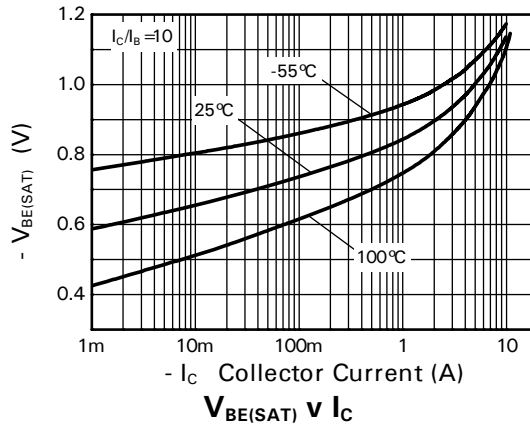
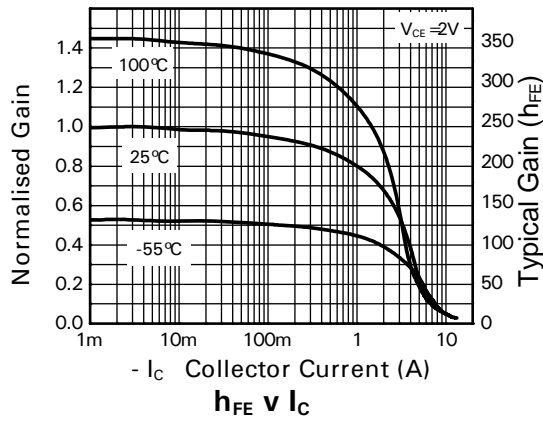
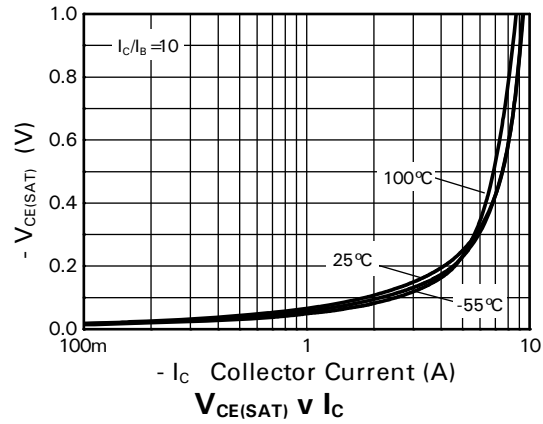
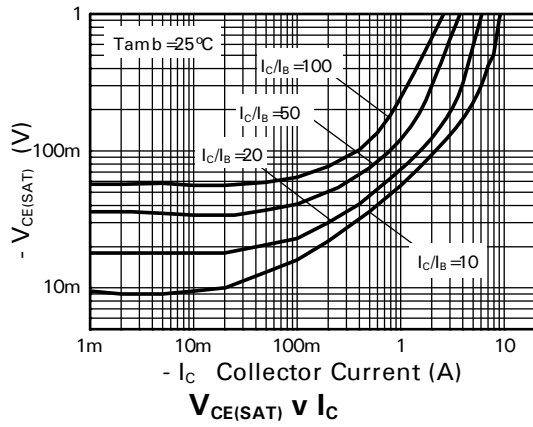


Electrical Characteristics @ $T_A = 25^\circ\text{C}$ unless otherwise specified

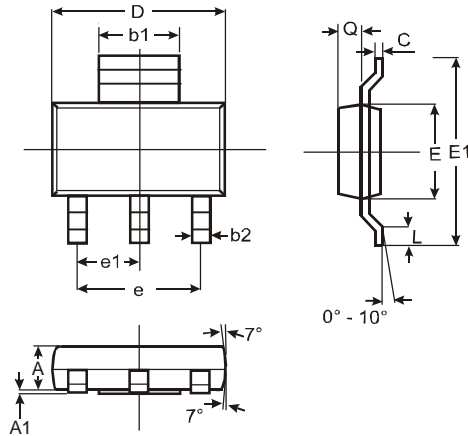
| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|--|---------------|-----|-------|-------|------|--|
| Collector-Base Breakdown Voltage | BV_{CBO} | -90 | -120 | - | V | $I_C = -100\mu\text{A}$ |
| Collector-Emitter Breakdown Voltage | BV_{CES} | -90 | -120 | - | V | $I_C = -100\mu\text{A}$ |
| Collector-Emitter Breakdown Voltage (Note 6) | BV_{CEO} | -60 | -80 | - | V | $I_C = -10\text{mA}$ |
| Emitter-Base Breakdown Voltage | BV_{EBO} | -7 | -8 | - | V | $I_E = -100\mu\text{A}$ |
| Collector-Base Cutoff Current | I_{CBO} | - | <1 | -50 | nA | $V_{CB} = -72\text{V}$ |
| Collector-Emitter Cutoff Current | I_{CES} | - | <1 | -50 | nA | $V_{CB} = -72\text{V}$ |
| Emitter Cutoff Current | I_{EBO} | - | <1 | -10 | nA | $V_{EB} = -6\text{V}$ |
| Static Forward Current Transfer Ratio (Note 6) | h_{FE} | 100 | 240 | - | - | $I_C = -10\text{mA}, V_{CE} = -2\text{V}$ |
| | | 100 | 180 | 300 | | $I_C = -2\text{A}, V_{CE} = -2\text{V}$ |
| | | 40 | 70 | - | | $I_C = -5\text{A}, V_{CE} = -2\text{V}$ |
| | | 5 | 14 | - | | $I_C = -10\text{A}, V_{CE} = -2\text{V}$ |
| Collector-Emitter Saturation Voltage (Note 6) | $V_{CE(sat)}$ | - | -16 | -30 | mV | $I_C = -100\text{mA}, I_B = -10\text{mA}$ |
| | | - | -55 | -95 | | $I_C = -1\text{A}, I_B = -100\text{mA}$ |
| | | - | -85 | -130 | | $I_C = -2\text{A}, I_B = -200\text{mA}$ |
| | | - | -200 | -260 | | $I_C = -5\text{A}, I_B = -500\text{mA}$ |
| Base-Emitter Saturation Voltage (Note 6) | $V_{BE(sat)}$ | - | -1 | -1.15 | V | $I_C = -5\text{A}, I_B = -500\text{mA}$ |
| Base-Emitter Turn-On Voltage (Note 6) | $V_{BE(on)}$ | - | -0.89 | -1.0 | V | $I_C = -5\text{A}, V_{CE} = -2\text{V}$ |
| Output Capacitance (Note 6) | C_{obo} | - | 33 | 70 | pF | $V_{CB} = -10\text{V}, f = 1\text{MHz}$ |
| Transition Frequency | f_T | - | 120 | - | MHz | $V_{CE} = -10\text{V}, I_C = -100\text{mA}$ $f = 50\text{MHz}$ |
| Switching Time | t_{on} | - | 33 | 80 | ns | $V_{CC} = -10\text{V}, I_C = -2\text{A}$ $I_{B1} = -I_{B2} = -200\text{mA}$ |
| | t_{off} | - | 215 | 300 | | |

Notes: 6. Measured under pulsed conditions. Pulse width $\leq 300\mu\text{s}$. Duty cycle $\leq 2\%$

Typical Electrical Characteristics

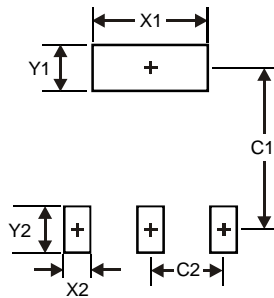


Package Outline Dimensions



| SOT223 | | | |
|----------------------|-------|------|------|
| Dim | Min | Max | Typ |
| A | 1.55 | 1.65 | 1.60 |
| A1 | 0.010 | 0.15 | 0.05 |
| b1 | 2.90 | 3.10 | 3.00 |
| b2 | 0.60 | 0.80 | 0.70 |
| C | 0.20 | 0.30 | 0.25 |
| D | 6.45 | 6.55 | 6.50 |
| E | 3.45 | 3.55 | 3.50 |
| E1 | 6.90 | 7.10 | 7.00 |
| e | — | — | 4.60 |
| e1 | — | — | 2.30 |
| L | 0.85 | 1.05 | 0.95 |
| Q | 0.84 | 0.94 | 0.89 |
| All Dimensions in mm | | | |

Suggested Pad Layout



| Dimensions | Value (in mm) |
|------------|---------------|
| X1 | 3.3 |
| X2 | 1.2 |
| Y1 | 1.6 |
| Y2 | 1.6 |
| C1 | 6.4 |
| C2 | 2.3 |

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Тел: +7 (812) 336 43 04 (многоканальный)

Email: org@lifeelectronics.ru