

Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from Europe, America and south Asia, supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of "Quality Parts, Customers Priority, Honest Operation, and Considerate Service", our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip, ALPS, ROHM, Xilinx, Pulse, ON, Everlight and Freescale. Main products comprise IC, Modules, Potentiometer, IC Socket, Relay, Connector. Our parts cover such applications as commercial, industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



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Features

- $BV_{CEO} > 45V$
- $BV_{CBO} > 45V$
- $I_C = 3.0A$ High Continuous Current
- $hFE > 400$ @ 1A and Low Saturation Voltage
- $R_{CE(SAT)} = 125m\Omega$ @ 2A for Low Equivalent On-Resistance
- Very Low-Saturation Voltage
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- Halogen and Antimony Free. "Green" Device (Note 3)
- Qualified to AEC-Q101 Standards for High Reliability
- PPAP Capable (Note 4)

Mechanical Data

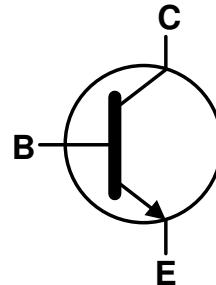
- Case: SOT223
- Case Material: Molded Plastic, "Green" Molding Compound; UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Plated Leads; Solderable per MIL-STD-202, Method 208 (e3)
- Weight: 0.112 grams (Approximate)

Applications

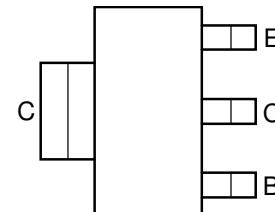
- Darlington Replacement
- Flash-Gun Convertors and Battery-Powered Circuits
- Siren Drivers, DC-DC Converters



Top View



Device Symbol



Top View
Pin-Out

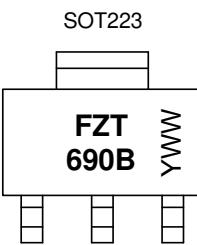
Ordering Information (Notes 4 & 5)

| Product | Compliance | Marking | Reel size (inches) | Tape width (mm) | Quantity per reel |
|------------|------------|---------|--------------------|-----------------|-------------------|
| FZT690BTA | AEC-Q101 | FZT690B | 7 | 12 | 1,000 |
| FZT690BQTA | Automotive | FZT690B | 7 | 12 | 1,000 |

Notes:

1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
2. See http://www.diodes.com/quality/lead_free.html for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
4. Automotive products are AEC-Q101 qualified and are PPAP capable. Automotive, AEC-Q101 and standard products are electrically and thermally the same, except where specified. For more information, please refer to http://www.diodes.com/quality/product_compliance_definitions/.
5. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

Marking Information



SOT223

FZT 690B = Product Type Marking Code
 YWW = Date Code Marking
 Y or \bar{Y} = Last Digit of Year (ex: 5= 2015)
 WW or \bar{WW} = Week Code (01~53)

Absolute Maximum Ratings (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

| Characteristic | Symbol | Value | Unit |
|------------------------------|-----------|-------|------|
| Collector-Base Voltage | V_{CBO} | 45 | V |
| Collector-Emitter Voltage | V_{CEO} | 45 | V |
| Emitter-Base Voltage | V_{EBO} | 7 | V |
| Continuous Collector Current | I_C | 3 | A |
| Peak Pulse Current | I_{CM} | 6 | A |

Thermal Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

| Characteristic | Symbol | Value | Unit |
|---|-----------------|-------------|------|
| Power Dissipation | P_D | 3.0 | W |
| | | 2.0 | |
| | | 1.6 | |
| | | 1.2 | |
| Thermal Resistance, Junction to Ambient | $R_{\theta JA}$ | 41.7 | °C/W |
| | | 62.5 | |
| | | 78.1 | |
| | | 104 | |
| Thermal Resistance Junction to Lead | $R_{\theta JL}$ | 12.9 | °C |
| Operating and Storage Temperature Range | T_J, T_{STG} | -55 to +150 | |

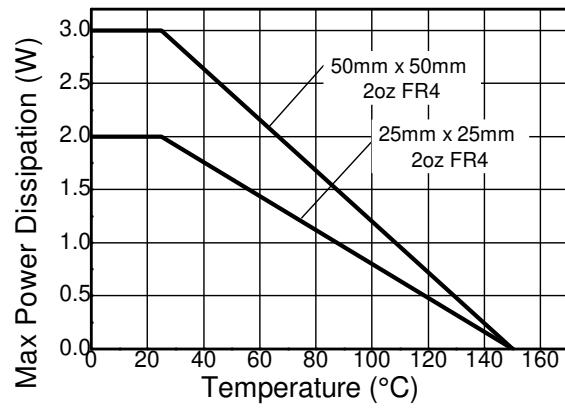
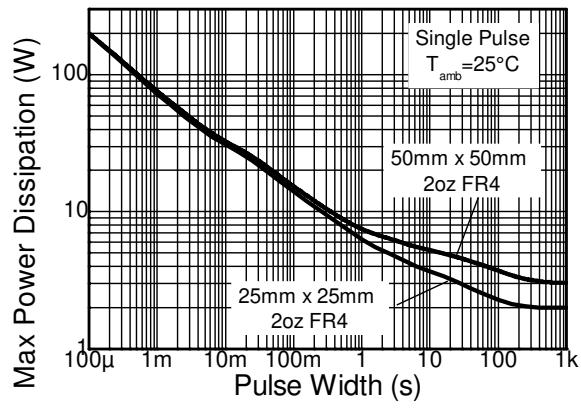
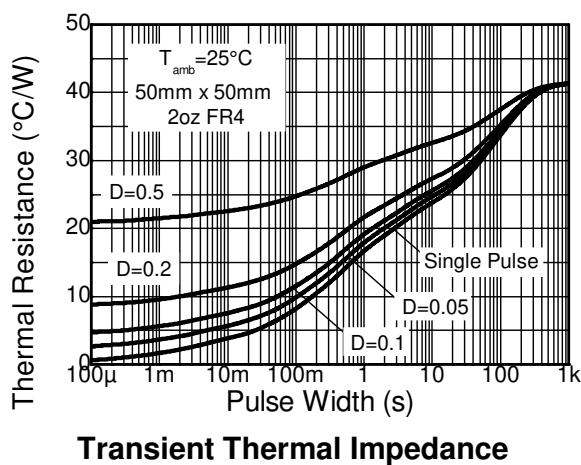
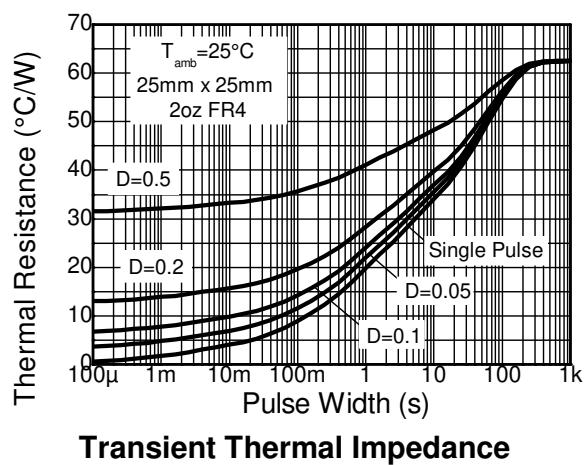
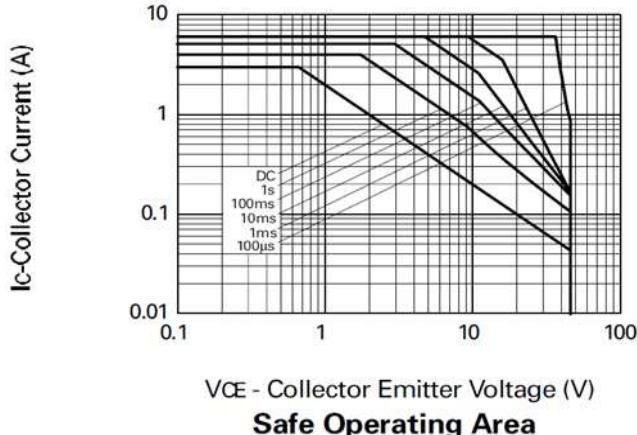
ESD Ratings (Note 11)

| Characteristic | Symbol | Value | Unit | JEDEC Class |
|--|---------|-------|------|-------------|
| Electrostatic Discharge - Human Body Model | ESD HBM | 4,000 | V | 3A |
| Electrostatic Discharge - Machine Model | ESD MM | 400 | V | C |

Notes:

6. For a device mounted with the collector lead on 50mm x 50mm 2oz copper that is on a single-sided 1.6mm FR4 PCB; device is measured under still air conditions whilst operating in a steady-state.
7. Same as Note 6, except the device is mounted on 25mm x 25mm 2oz copper.
8. Same as Note 6, except the device is mounted on 25mm x 25mm 1oz copper.
9. Same as Note 6, except the device is mounted on minimum recommended pad layout.
10. Thermal resistance from junction to solder-point (at the end of the collector lead).
11. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

Thermal Characteristics and Derating Information

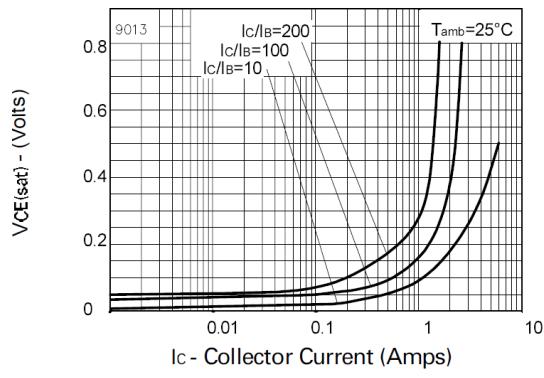


Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

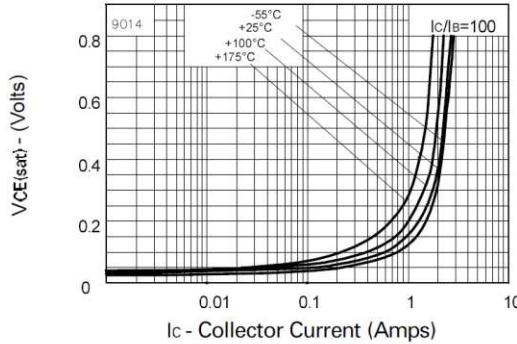
| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|--|-----------------------------|-------------------------|------------------|------------------|---------------|--|
| Collector-Base Breakdown Voltage | BV_{CBO} | 45 | — | — | V | $I_C = 100\mu\text{A}$ |
| Collector-Emitter Breakdown Voltage (Note 12) | BV_{CEO} | 45 | — | — | V | $I_C = 10\text{mA}$ |
| Emitter-Base Breakdown Voltage | BV_{EBO} | 7 | — | — | V | $I_E = 100\mu\text{A}$ |
| Collector-Base Cut-Off Current | I_{CBO} | — | — | 0.1 | μA | $V_{\text{CB}} = 35\text{V}$ |
| Emitter Cut-Off Current | I_{EBO} | — | — | 0.1 | μA | $V_{\text{EB}} = 4\text{V}$ |
| DC Current Gain (Note 12) | h_{FE} | 500 400 150 50 | — — — — | — — — — | — | $I_C = 0.1\text{A}, V_{\text{CE}} = 2\text{V}$ $I_C = 1\text{A}, V_{\text{CE}} = 2\text{V}$ $I_C = 2\text{A}, V_{\text{CE}} = 2\text{V}$ $I_C = 3\text{A}, V_{\text{CE}} = 2\text{V}$ |
| Collector-Emitter Saturation Voltage (Note 12) | $V_{\text{CE}(\text{sat})}$ | — — | — — | 0.10 0.50 | V | $I_C = 0.1\text{A}, I_B = 0.5\text{mA}$ $I_C = 1\text{A}, I_B = 5\text{mA}$ |
| Base-Emitter Saturation Voltage (Note 12) | $V_{\text{BE}(\text{sat})}$ | — | — | 0.9 | V | $I_C = 1\text{A}, I_B = 10\text{mA}$ |
| Base-Emitter Turn-On Voltage (Note 12) | $V_{\text{BE}(\text{on})}$ | — | — | 0.9 | V | $I_C = 1\text{A}, V_{\text{CE}} = 2\text{V}$ |
| Input Capacitance | C_{ib0} | — | 200 | — | pF | $V_{\text{EB}} = 0.5\text{V}, f = 1\text{MHz}$ |
| Output Capacitance | C_{ob0} | — | 16 | — | pF | $V_{\text{CB}} = 10\text{V}, f = 1\text{MHz}$ |
| Current Gain-Bandwidth Product | f_T | 150 | — | — | MHz | $V_{\text{CE}} = 5\text{V}, I_C = 50\text{mA}, f = 50\text{MHz}$ |
| Turn-On Time | t_{on} | — | 33 | — | ns | $V_{\text{CC}} = 10\text{V}, I_C = 500\text{mA}$ |
| Turn-Off Time | t_{off} | — | 1,300 | — | ns | $I_{B1} = -I_{B2} = 50\text{mA}$ |

Note: 12. Measured under pulsed conditions. Pulse width $\leq 300\ \mu\text{s}$. Duty cycle $\leq 2\%$.

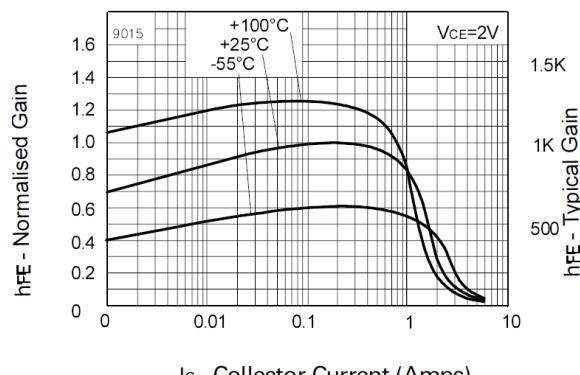
Typical Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)



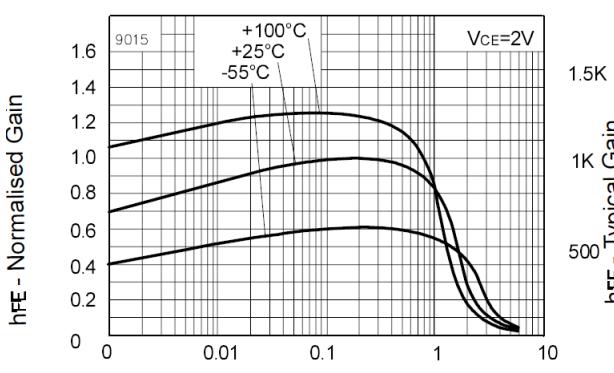
$V_{CE(sat)}$ v I_C



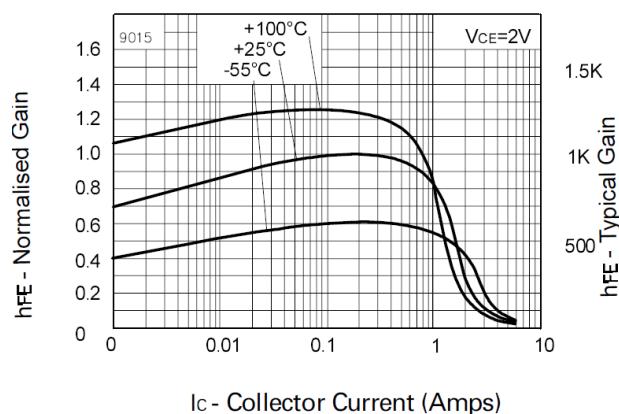
$V_{CE(sat)}$ v I_C



hFE v I_C



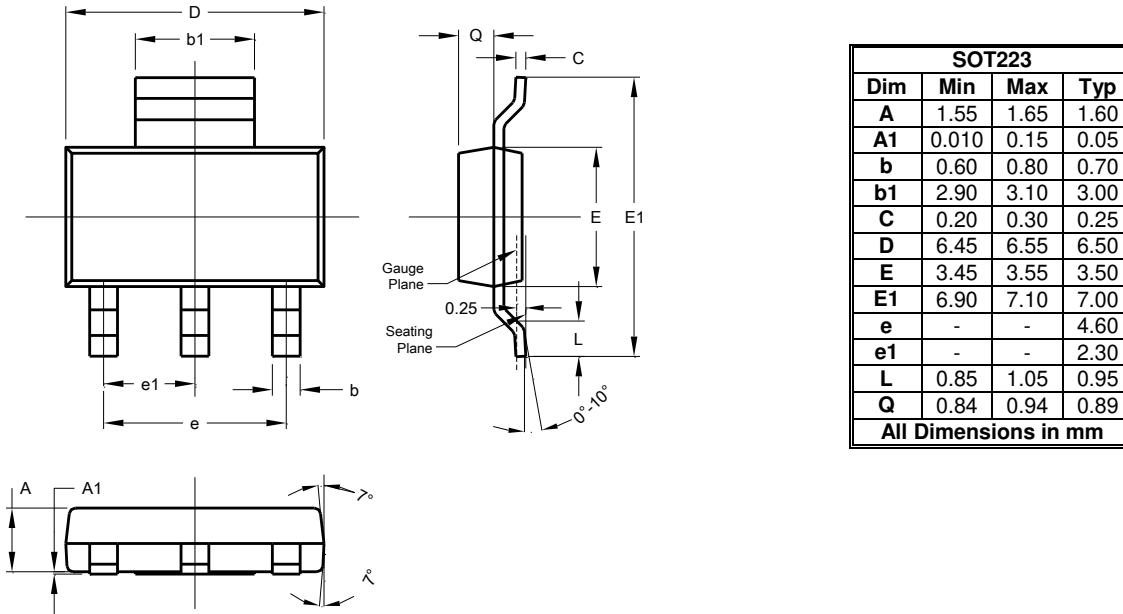
hFE v I_C



hFE v I_C

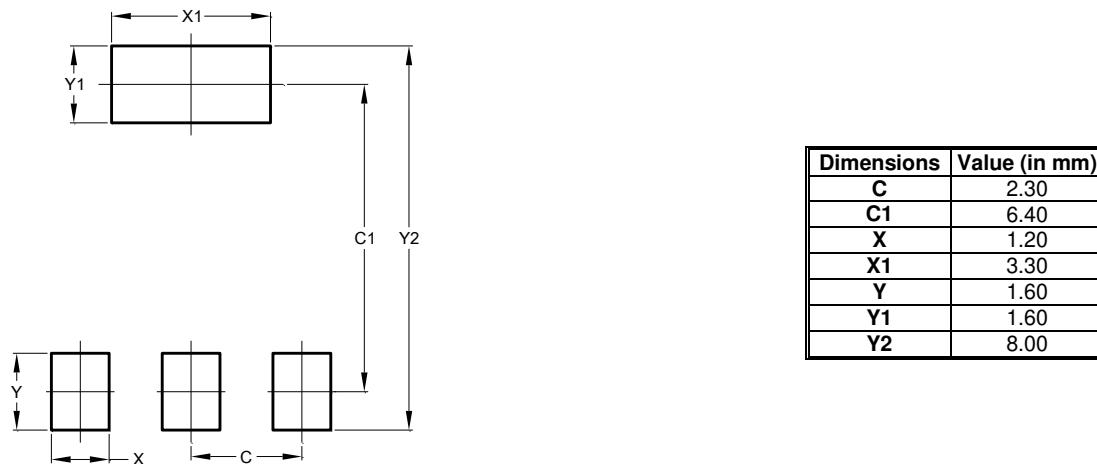
Package Outline Dimensions

Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



Suggested Pad Layout

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.



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