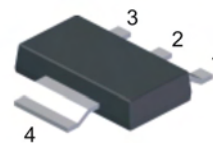


### Features

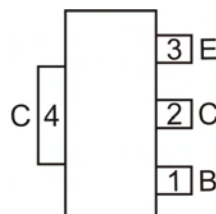
- Epitaxial Planar Die Construction
- Complementary NPN Type Available (DZT853)
- Ideally Suited for Automated Assembly Processes
- Ideal for Medium Power Switching or Amplification Applications
- **Lead Free By Design/RoHS Compliant (Note 1)**
- **"Green" Device (Note 2)**

### Mechanical Data

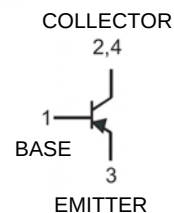
- Case: SOT-223
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020D
- Terminals: Finish — Matte Tin annealed over Copper Leadframe (Lead Free Plating). Solderable per MIL-STD-202, Method 208
- Marking Information: See Page 3
- Ordering Information: See Page 3
- Weight: 0.115 grams (approximate)



SOT-223



TOP VIEW



Schematic and Pin Configuration

### Maximum Ratings @T<sub>A</sub> = 25°C unless otherwise specified

| Characteristic                          | Symbol                            | Value                  | Unit |
|-----------------------------------------|-----------------------------------|------------------------|------|
| Collector-Base Voltage                  | V <sub>CB0</sub>                  | -140                   | V    |
| Collector-Emitter Voltage               | V <sub>CEO</sub>                  | -100                   | V    |
| Emitter-Base Voltage                    | V <sub>EBO</sub>                  | -6                     | V    |
| Continuous Collector Current            | I <sub>C</sub>                    | -5                     | A    |
| Peak Pulse Collector Current            | I <sub>CM</sub>                   | -10                    | A    |
| Power Dissipation                       | P <sub>D</sub>                    | 1(Note 3)<br>3(Note 4) | W    |
| Operating and Storage Temperature Range | T <sub>J</sub> , T <sub>STG</sub> | -55 to +150            | °C   |

- Notes:
1. No purposefully added lead.
  2. Diodes Inc.'s "Green" policy can be found on our website at [http://www.diodes.com/products/lead\\_free/index.php](http://www.diodes.com/products/lead_free/index.php).
  3. Device mounted on FR-4 PCB, pad layout as shown on page 4.
  4. The power which can be dissipated, assuming the device is mounted in a typical manner on a PCB with copper equal to 4 square inch minimum.

## Electrical Characteristics @T<sub>A</sub> = 25°C unless otherwise specified

| Characteristic                       | Symbol                              | Min                         | Typ                           | Max                         | Unit     | Test Condition                                                                                                                                                                                                                                  |
|--------------------------------------|-------------------------------------|-----------------------------|-------------------------------|-----------------------------|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| OFF CHARACTERISTICS                  |                                     |                             |                               |                             |          |                                                                                                                                                                                                                                                 |
| Collector-Base Breakdown Voltage     | V <sub>(BR)CBO</sub>                | -140                        | -165                          | —                           | V        | I <sub>C</sub> = -100μA, I <sub>E</sub> = 0                                                                                                                                                                                                     |
| Collector-Emitter Breakdown Voltage  | V <sub>(BR)CEO</sub>                | -100                        | -120                          | —                           | V        | I <sub>C</sub> = -10mA*, I <sub>B</sub> = 0                                                                                                                                                                                                     |
| Emitter-Base Breakdown Voltage       | V <sub>(BR)EBO</sub>                | -6                          | -9                            | —                           | V        | I <sub>E</sub> = -100μA, I <sub>C</sub> = 0                                                                                                                                                                                                     |
| Collector Cutoff Current             | I <sub>CBO</sub>                    | —                           | —                             | -50<br>-1                   | nA<br>μA | V <sub>CB</sub> = -100V, I <sub>E</sub> = 0<br>V <sub>CB</sub> = -100V, I <sub>E</sub> = 0, T <sub>A</sub> = 100°C                                                                                                                              |
| Emitter Cutoff Current               | I <sub>EBO</sub>                    | —                           | —                             | -10                         | nA       | V <sub>EB</sub> = - 6V, I <sub>C</sub> = 0                                                                                                                                                                                                      |
| ON CHARACTERISTICS                   |                                     |                             |                               |                             |          |                                                                                                                                                                                                                                                 |
| Collector-Emitter Saturation Voltage | V <sub>CE(SAT)</sub>                | —<br>—<br>—<br>—            | -18<br>-70<br>-125<br>-260    | -50<br>-115<br>-220<br>-420 | mV       | I <sub>C</sub> = -100mA, I <sub>B</sub> = -10mA*<br>I <sub>C</sub> = -1A, I <sub>B</sub> = -100mA*<br>I <sub>C</sub> = -2A, I <sub>B</sub> = -200mA*<br>I <sub>C</sub> = -4A, I <sub>B</sub> = -400mA*                                          |
| Base-Emitter Saturation Voltage      | V <sub>BE(SAT)</sub>                | —                           | -960                          | -1170                       | mV       | I <sub>C</sub> = -4A, I <sub>B</sub> = -400mA*                                                                                                                                                                                                  |
| Base-Emitter Turn-On Voltage         | V <sub>BE(ON)</sub>                 | —                           | -880                          | -1160                       | mV       | I <sub>CE</sub> = -4A, V <sub>CE</sub> = -1V*                                                                                                                                                                                                   |
| DC Current Gain                      | h <sub>FE</sub>                     | 100<br>100<br>50<br>30<br>— | 220<br>200<br>100<br>70<br>15 | —<br>300<br>—<br>—<br>—     | —        | I <sub>C</sub> = -10mA, V <sub>CE</sub> = -1V*<br>I <sub>C</sub> = -1A, V <sub>CE</sub> = -1V*<br>I <sub>C</sub> = -3A, V <sub>CE</sub> = -1V*<br>I <sub>C</sub> = -4A, V <sub>CE</sub> = -1V*<br>I <sub>C</sub> = -10A, V <sub>CE</sub> = -1V* |
| SMALL SIGNAL CHARACTERISTICS         |                                     |                             |                               |                             |          |                                                                                                                                                                                                                                                 |
| Current Gain-Bandwidth Product       | f <sub>T</sub>                      | —                           | 125                           | —                           | MHz      | I <sub>C</sub> = -100mA, V <sub>CE</sub> = -10V,<br>f = 50MHz                                                                                                                                                                                   |
| Output Capacitance                   | C <sub>obo</sub>                    | —                           | 65                            | —                           | pF       | V <sub>CB</sub> = -10V, f = 1MHz                                                                                                                                                                                                                |
| SWITCHING CHARACTERISTICS            |                                     |                             |                               |                             |          |                                                                                                                                                                                                                                                 |
| Switching Times                      | t <sub>on</sub><br>t <sub>off</sub> | —                           | 65<br>100                     | —                           | ns       | I <sub>C</sub> = -2A, I <sub>B1</sub> = -200mA<br>I <sub>B2</sub> = 200mA, V <sub>CC</sub> = -10V                                                                                                                                               |

\*Measured under pulsed conditions. Pulse width = 300μs. Duty cycle ≤2%

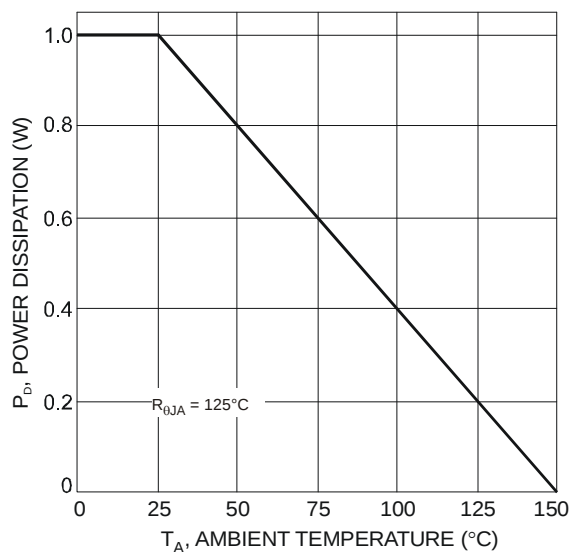


Fig. 1 Power Dissipation vs. Ambient Temperature (Note 3)

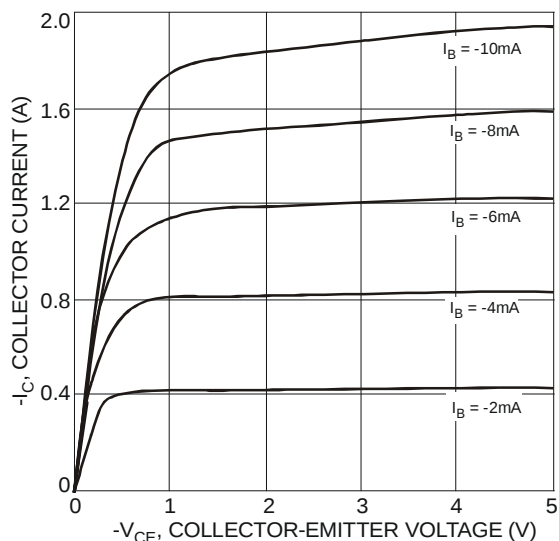


Fig 2. Collector Current vs. Collector Emitter Voltage

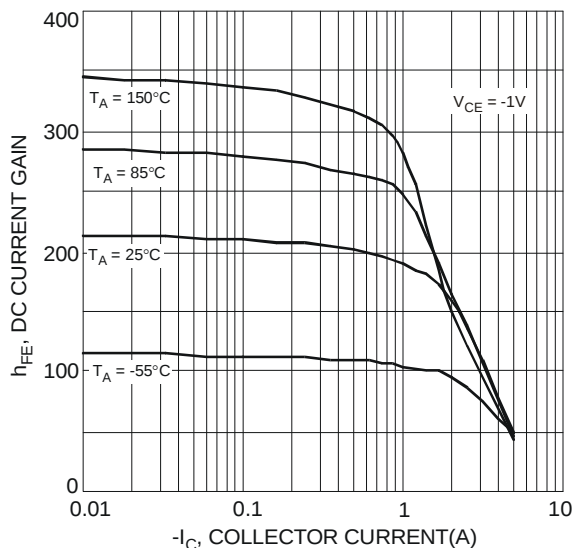


Fig. 3 Typical DC Current Gain vs. Collector Current

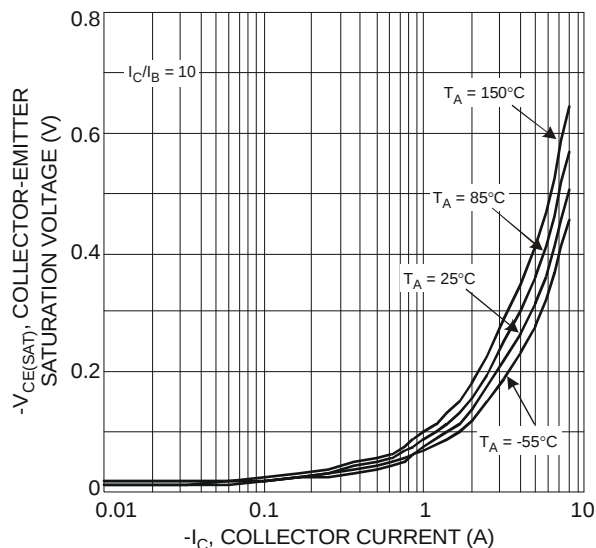


Fig. 4 Collector-Emitter Saturation Voltage vs. Collector Current

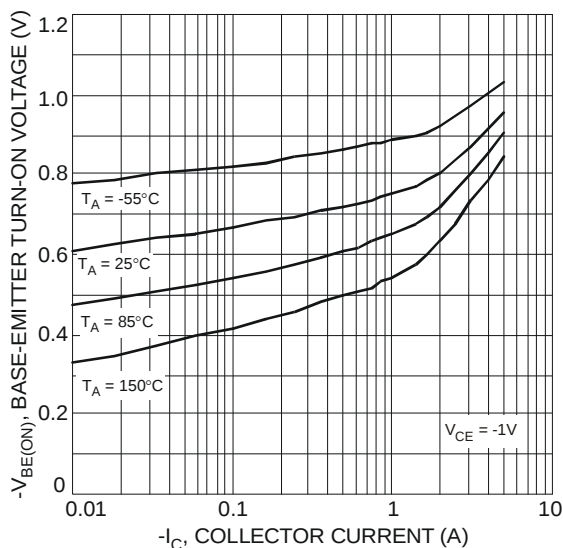


Fig. 5 Base-Emitter Turn-On Voltage vs. Collector Current

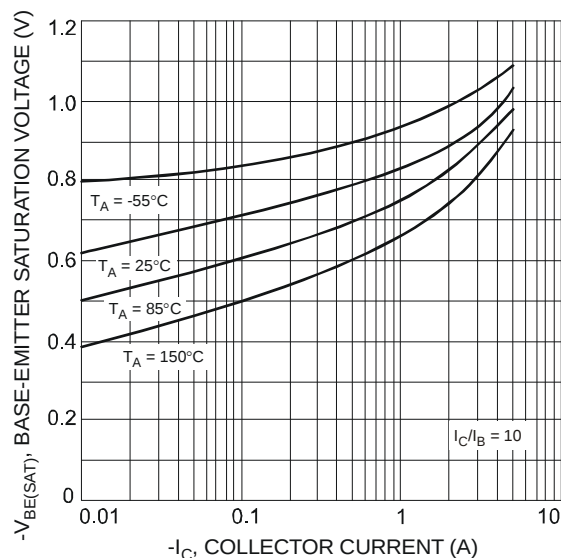


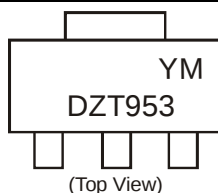
Fig. 6 Base-Emitter Saturation Voltage vs. Collector Current

## Ordering Information (Note 5)

| Device    | Valid Marking Codes | Packaging | Shipping         |
|-----------|---------------------|-----------|------------------|
| DZT953-13 | DZT953              | SOT-223   | 2500/Tape & Reel |
| DZT953-13 | PT06                | SOT-223   | 2500/Tape & Reel |

Notes: 5. Packaging Details as shown on page 4, or go to our website at <http://www.diodes.com/ap2007.pdf>.

## Marking Information



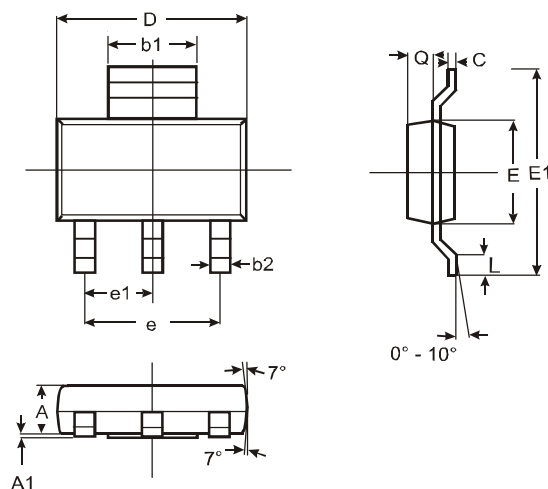
DZT953 or PT06= Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year ex: T = 2006  
 M = Month ex: 9 = September

Date Code Key

| Year | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|------|------|------|------|------|------|------|------|
| Code | T    | U    | V    | W    | X    | Y    | Z    |

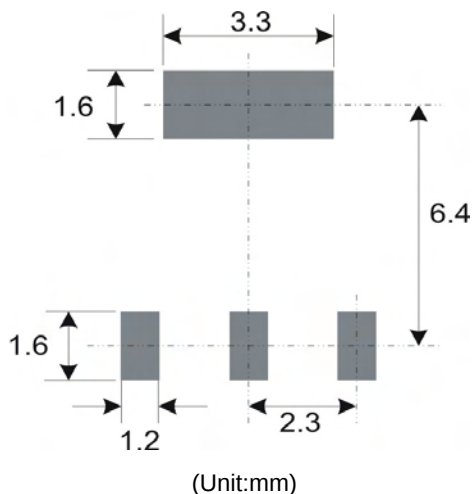
| Month | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Code  | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | O   | N   | D   |

## Package Outline Dimensions



| SOT-223              |       |      |      |
|----------------------|-------|------|------|
| 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:



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