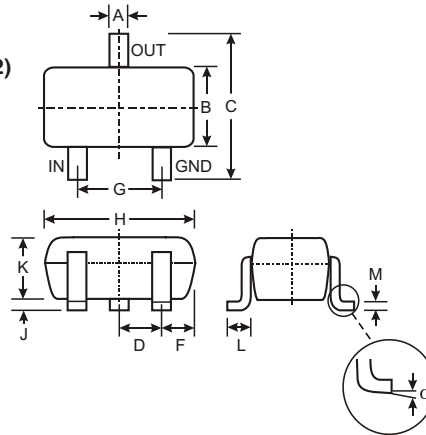


Features

- Epitaxial Planar Die Construction
- Complementary PNP Types Available (DDTA)
- Built-In Biasing Resistors, R1≠R2
- Available in Lead Free/RoHS Compliant Version (Note 2)

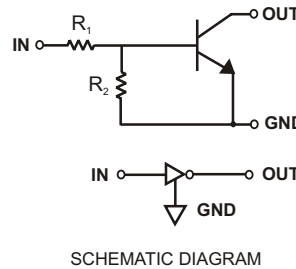
Mechanical Data

- Case: SOT-323
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020C
- Terminal Connections: See Diagram
- Terminals: Solderable per MIL-STD-202, Method 208
- Also Available in Lead Free Plating (Matte Tin Finish annealed over Alloy 42 leadframe). Please see Ordering Information, Note 4, on Page 2
- Marking: Date Code and Type Code, See Page 2
- Type Code: See Table Below
- Ordering Information (See Page 2)
- Weight: 0.006 grams (approximate)



| SOT-323 | | |
|----------------------|--------------|------|
| Dim | Min | Max |
| A | 0.25 | 0.40 |
| B | 1.15 | 1.35 |
| C | 2.00 | 2.20 |
| D | 0.65 Nominal | |
| E | 0.30 | 0.40 |
| G | 1.20 | 1.40 |
| H | 1.80 | 2.20 |
| J | 0.0 | 0.10 |
| K | 0.90 | 1.00 |
| L | 0.25 | 0.40 |
| M | 0.10 | 0.18 |
| α | 0° | 8° |
| All Dimensions in mm | | |

| P/N | R1 (NOM) | R2 (NOM) | Type Code |
|------------|---------------|---------------|-----------|
| DDTC113ZUA | 1K Ω | 10K Ω | N02 |
| DDTC123YUA | 2.2K Ω | 10K Ω | N05 |
| DDTC123JUA | 2.2K Ω | 47K Ω | N06 |
| DDTC143XUA | 4.7K Ω | 10K Ω | N09 |
| DDTC143FUA | 4.7K Ω | 22K Ω | N10 |
| DDTC143ZUA | 4.7K Ω | 47K Ω | N11 |
| DDTC114YUA | 10K Ω | 47K Ω | N14 |
| DDTC114WUA | 10K Ω | 4.7K Ω | N15 |
| DDTC124XUA | 22K Ω | 47K Ω | N18 |
| DDTC144VUA | 47K Ω | 10K Ω | N21 |
| DDTC144WUA | 47K Ω | 22K Ω | N22 |



Maximum Ratings @ T_A = 25°C unless otherwise specified

| Characteristic | Symbol | Value | Unit |
|--|-----------------------------------|---|------|
| Supply Voltage, (3) to (1) | V _{CC} | 50 | V |
| Input Voltage, (2) to (1) | V _{IN} | -5 to +10 -5 to +12 -5 to +12 -7 to +20 -6 to +30 -5 to +30 -6 to +40 -10 to +30 -10 to +40 -15 to +40 -10 to +40 | V |
| Output Current | I _O | 100 100 100 100 100 100 70 100 50 30 30 | mA |
| Output Current | I _C (Max) | 100 | mA |
| Power Dissipation | P _d | 200 | mW |
| Thermal Resistance, Junction to Ambient Air (Note 1) | R _{θJA} | 625 | °C/W |
| Operating and Storage and Temperature Range | T _j , T _{STG} | -55 to +150 | °C |

Note: 1. Mounted on FR4 PC Board with recommended pad layout at <http://www.diodes.com/datasheets/ap02001.pdf>.
2. No purposefully added lead.

Electrical Characteristics @ T_A = 25°C unless otherwise specified

| Characteristic | | Symbol | Min | Typ | Max | Unit | Test Condition |
|----------------------------|--|---------------------------------|---|-----|--|------|---|
| Input Voltage | DDTC113ZUA DDTC123YUA DDTC123JUA DDTC143XUA DDTC143FUA DDTC143ZUA DDTC114YUA DDTC114WUA DDTC124XUA DDTC144VUA DDTC144WUA | V _{I(off)} | 0.3 0.3 0.5 0.3 0.3 0.5 0.3 0.8 0.4 1.0 0.8 | — | — | V | V _{CC} = 5V, I _O = 100μA |
| | DDTC113ZUA DDTC123YUA DDTC123JUA DDTC143XUA DDTC143FUA DDTC143ZUA DDTC114YUA DDTC114WUA DDTC124XUA DDTC144VUA DDTC144WUA | | V _{I(on)} | — | — | | |
| Output Voltage | | V _{O(on)} | — | 0.1 | 0.3 | V | I _O /I _I = 5mA/0.25mA DDCT123JUA I _O /I _I = 5mA/0.25mA DDCT143ZUA I _O /I _I = 5mA/0.25mA DDCT114YUA I _O /I _I = 10mA/0.5mA All Others |
| Input Current | DDTC113ZUA DDTC123YUA DDTC123JUA DDTC143XUA DDTC143FUA DDTC143ZUA DDTC114YUA DDTC114WUA DDTC124XUA DDTC144VUA DDTC144WUA | I _I | — | — | 7.2 3.8 3.6 1.8 1.8 1.8 0.88 0.88 0.36 0.16 0.16 | mA | V _I = 5V |
| Output Current | | I _{O(off)} | — | — | 0.5 | μA | V _{CC} = 50V, V _I = 0V |
| DC Current Gain | DDTC113ZUA DDTC123YUA DDTC123JUA DDTC143XUA DDTC143FUA DDTC143ZUA DDTC114YUA DDTC114WUA DDTC124XUA DDTC144VUA DDTC144WUA | G _I | 33 33 80 30 68 80 68 24 68 33 56 | — | — | — | V _O = 5V, I _O = 5mA V _O = 5V, I _O = 10mA V _O = 5V, I _O = 10mA V _O = 5V, I _O = 10mA V _O = 5V, I _O = 10mA V _O = 5V, I _O = 10mA V _O = 5V, I _O = 5mA V _O = 5V, I _O = 10mA V _O = 5V, I _O = 5mA V _O = 5V, I _O = 5mA V _O = 5V, I _O = 5mA |
| Input Resistor Tolerance | | ΔR ₁ | -30 | — | +30 | % | — |
| Resistance Ratio Tolerance | | ΔR ₂ /R ₁ | -20 | — | +20 | % | — |
| Gain-Bandwidth Product* | | f _T | — | 250 | — | MHz | V _{CE} = 10V, I _E = 5mA, f = 100MHz |

* Transistor - For Reference Only

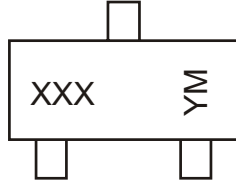
Ordering Information (Note 3)

| Device | Packaging | Shipping |
|--------------|-----------|------------------|
| DDTC113ZUA-7 | SOT-323 | 3000/Tape & Reel |
| DDTC123YUA-7 | SOT-323 | 3000/Tape & Reel |
| DDTC123JUA-7 | SOT-323 | 3000/Tape & Reel |
| DDTC143XUA-7 | SOT-323 | 3000/Tape & Reel |
| DDTC143FUA-7 | SOT-323 | 3000/Tape & Reel |
| DDTC143ZUA-7 | SOT-323 | 3000/Tape & Reel |
| DDTC114YUA-7 | SOT-323 | 3000/Tape & Reel |
| DDTC114WUA-7 | SOT-323 | 3000/Tape & Reel |
| DDTC124XUA-7 | SOT-323 | 3000/Tape & Reel |
| DDTC144VUA-7 | SOT-323 | 3000/Tape & Reel |
| DDTC144WUA-7 | SOT-323 | 3000/Tape & Reel |

Notes: 3. For Packaging Details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

4. For Lead Free/RoHS Compliant version part number, please add "-F" suffix to the part number above. Example: DDTC144WUA-7-F.

Marking Information

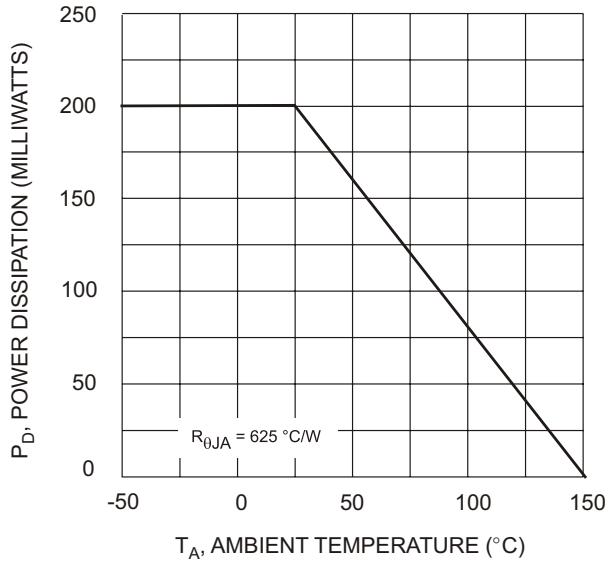


XXX = Product Type Marking Code
 See Sheet 1 Diagrams
 YM = Date Code Marking
 Y = Year ex: N = 2002
 M = Month ex: 9 = September

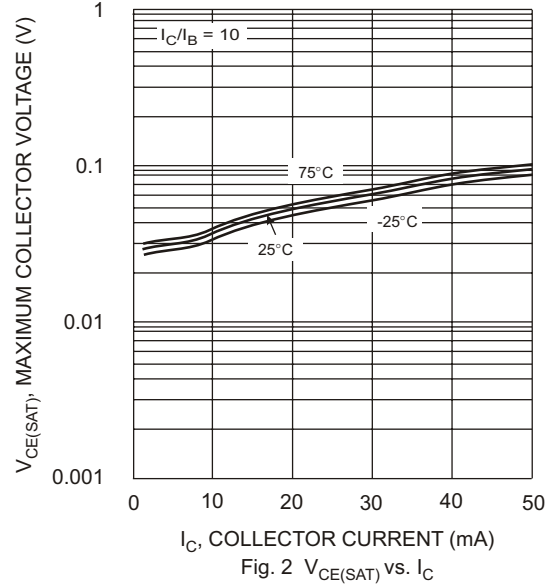
Date Code Key

| | | | | | | | | |
|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Year | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
| Code | N | P | R | S | T | U | V | W |

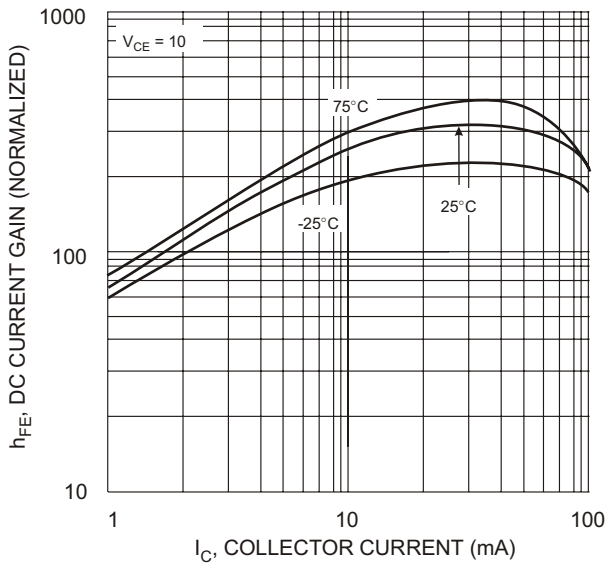
| | | | | | | | | | | | | |
|--------------|------------|------------|--------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| Month | Jan | Feb | March | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
| Code | 1 | 2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



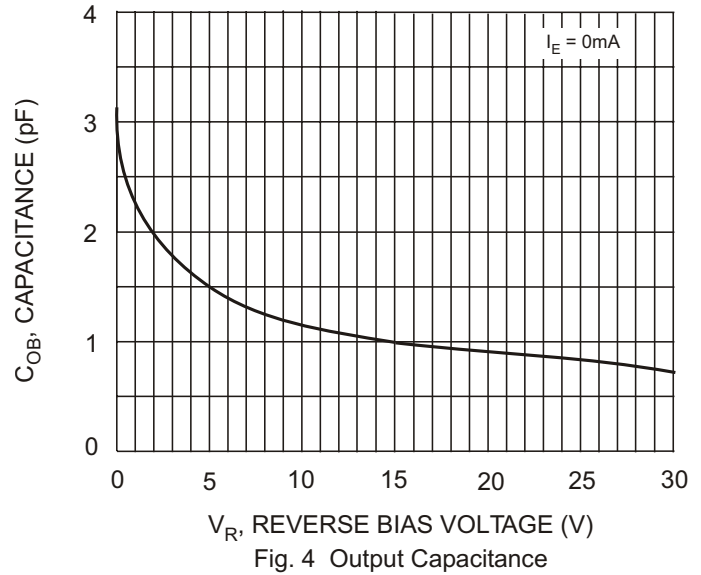
T_A , AMBIENT TEMPERATURE ($^\circ\text{C}$)
Fig. 1 Derating Curve



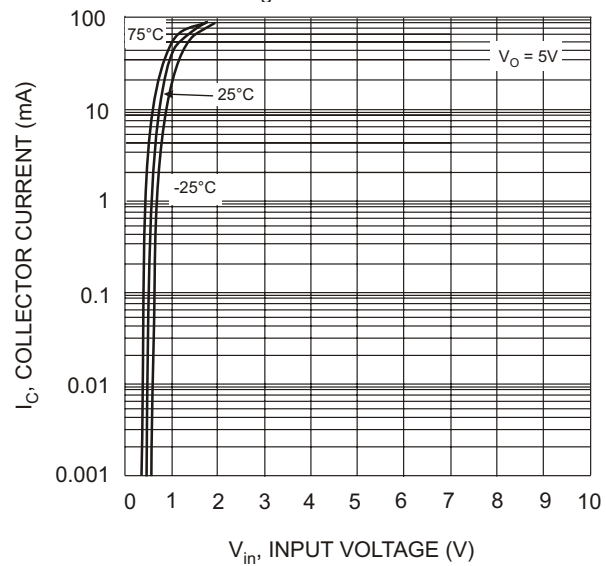
$V_{CE(SAT)}$, MAXIMUM COLLECTOR VOLTAGE (V)
 I_C , COLLECTOR CURRENT (mA)
Fig. 2 $V_{CE(SAT)}$ vs. I_C



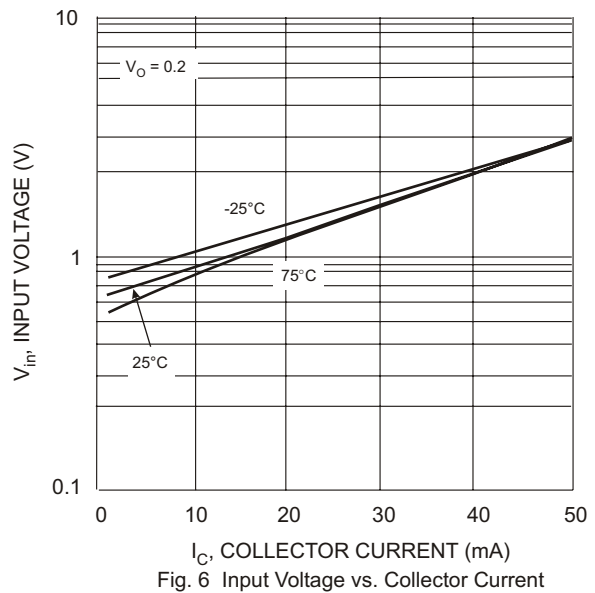
h_{FE} , DC CURRENT GAIN (NORMALIZED)
 I_C , COLLECTOR CURRENT (mA)
Fig. 3 DC Current Gain



C_{OB} , CAPACITANCE (pF)
 V_R , REVERSE BIAS VOLTAGE (V)
Fig. 4 Output Capacitance



I_C , COLLECTOR CURRENT (mA)
 V_{in} , INPUT VOLTAGE (V)
Fig. 5 Collector Current Vs. Input Voltage



V_{in} , INPUT VOLTAGE (V)
 I_C , COLLECTOR CURRENT (mA)
Fig. 6 Input Voltage vs. Collector Current