

PNP PRE-BIASED SMALL SIGNAL SURFACE MOUNT TRANSISTOR

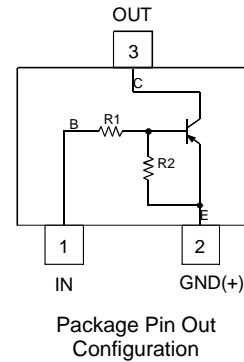
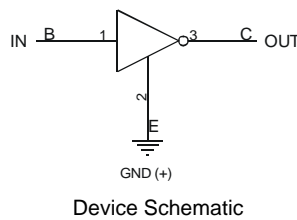
Features

- Epitaxial Planar Die Construction
- Complementary NPN Types Available (DDTC)
- Built-In Biasing Resistors, R1≠R2
- “Lead Free”, RoHS Compliant (Note 1)
- Halogen and Antimony Free “Green” Device (Note 2)
- Qualified to AEC-Q101 Standards for High Reliability

Mechanical Data

- Case: SOT523
- Case Material: Molded Plastic, “Green” Molding Compound, Note 3. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish annealed over Alloy 42 leadframe (Lead Free Plating) Solderable per MIL-STD-202, Method 208
- Weight: 0.002 grams (approximate)

| Part Number | R1 (NOM) | R2 (NOM) | Marking |
|-------------|----------|----------|---------|
| DDTA113ZE | 1KΩ | 10KΩ | P02 |
| DDTA123YE | 2.2KΩ | 10KΩ | P05 |
| DDTA123JE | 2.2KΩ | 47KΩ | P06 |
| DDTA143XE | 4.7KΩ | 10KΩ | P09 |
| DDTA143FE | 4.7KΩ | 22KΩ | P10 |
| DDTA143ZE | 4.7KΩ | 47KΩ | P11 |
| DDTA114YE | 10KΩ | 47KΩ | P14 |
| DDTA114WE | 10KΩ | 4.7KΩ | P15 |
| DDTA124XE | 22KΩ | 47KΩ | P18 |
| DDTA144VE | 47KΩ | 10KΩ | P21 |
| DDTA144WE | 47KΩ | 22KΩ | P22 |

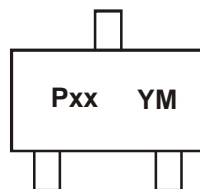


Ordering Information (Note 3)

| Part Number | Case | Packaging |
|---------------|--------|------------------|
| DDTA113ZE-7-F | SOT523 | 3000/Tape & Reel |
| DDTA123YE-7-F | SOT523 | 3000/Tape & Reel |
| DDTA123JE-7-F | SOT523 | 3000/Tape & Reel |
| DDTA143XE-7-F | SOT523 | 3000/Tape & Reel |
| DDTA143FE-7-F | SOT523 | 3000/Tape & Reel |
| DDTA143ZE-7-F | SOT523 | 3000/Tape & Reel |
| DDTA114YE-7-F | SOT523 | 3000/Tape & Reel |
| DDTA114WE-7-F | SOT523 | 3000/Tape & Reel |
| DDTA124XE-7-F | SOT523 | 3000/Tape & Reel |
| DDTA144VE-7-F | SOT523 | 3000/Tape & Reel |
| DDTA144WE-7-F | SOT523 | 3000/Tape & Reel |

- Notes:
1. No purposefully added lead.
 2. Diodes Inc.'s "Green" policy can be found on our website at <http://www.diodes.com>.
 3. For packaging details, go to our website at <http://www.diodes.com>.

Marking Information



Pxx = Product Type Marking Code (See Features Table)
 YM = Date Code Marking
 Y = Year (ex: T = 2006)
 M = Month (ex: 9 = September)

Date Code Key

| Year | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|------|------|------|------|------|------|------|------|------|------|------|------|
| Code | S | T | U | V | W | X | Y | Z | A | B | C |

| 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 |

Maximum Ratings @T_A = 25°C unless otherwise specified

| Characteristic | Symbol | Value | Unit | |
|----------------------------|-----------------|---------------------|------------|----|
| Supply Voltage, (2) to (3) | V _{CC} | -50 | V | |
| Input Voltage, (1) to (2) | V _{IN} | DDTA113ZE | +5 to -10 | |
| | | DDTA123YE | +5 to -12 | |
| | | DDTA123JE | +5 to -12 | |
| | | DDTA143XE | +7 to -20 | |
| | | DDTA143FE | +6 to -30 | |
| | | DDTA143ZE | +5 to -30 | |
| | | DDTA114YE | +6 to -40 | |
| | | DDTA114WE | +10 to -30 | |
| | | DDTA124XE | +10 to -40 | |
| | | DDTA144VE | +15 to -40 | |
| | | DDTA144WE | +10 to -40 | |
| Output Current | I _O | DDTA113ZE | -100 | |
| | | DDTA123YE | -100 | |
| | | DDTA123JE | -100 | |
| | | DDTA143XE | -100 | |
| | | DDTA143FE | -100 | |
| | | DDTA143ZE | -100 | |
| | | DDTA114YE | -70 | |
| | | DDTA114WE | -100 | |
| | | DDTA124XE | -50 | |
| | | DDTA144VE | -30 | |
| DDTA144WE | -30 | | | |
| Output Current | All | I _{C(MAX)} | -100 | mA |

Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|--|-----------------------------------|-------------|------|
| Power Dissipation | P _D | 150 | mW |
| Thermal Resistance, Junction to Ambient Air (Note 4) | R _{θJA} | 833 | °C/W |
| Operating and Storage Temperature Range | T _J , T _{STG} | -55 to +150 | °C |

Electrical Characteristics @_{T_A} = 25°C unless otherwise specified

| Characteristic | | Symbol | Min | Typ | Max | Unit | Test Condition |
|----------------------------|---|---------------------------------|--|------|---|--|--|
| Input Voltage | DDTA113ZE DDTA123YE DDTA123JE DDTA143XE DDTA143FE DDTA143ZE DDTA114YE DDTA114WE DDTA124XE DDTA144VE DDTA144WE | 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 |
| | DDTA113ZE DDTA123YE DDTA123JE DDTA143XE DDTA143FE DDTA143ZE DDTA114YE DDTA114WE DDTA124XE DDTA144VE DDTA144WE | | V _{I(ON)} | — | — | -3.0 -3.0 -1.1 -2.5 -1.3 -1.3 -1.4 -3.0 -2.5 -5.0 -4.0 | V _O = -0.3V, I _O = -20mA V _O = -0.3V, I _O = -20mA V _O = -0.3V, I _O = -5mA V _O = -0.3V, I _O = -20mA V _O = -0.3V, I _O = -3mA V _O = -0.3V, I _O = -5mA V _O = -0.3V, I _O = -1mA V _O = -0.3V, I _O = -2mA V _O = -0.3V, I _O = -2mA V _O = -0.3V, I _O = -2mA V _O = -0.3V, I _O = -2mA |
| Output Voltage | | V _{O(ON)} | — | -0.1 | -0.3 | V | I _O /I _I = -5mA/-0.25mA DDTA123E I _O /I _I = -5mA/-0.25mA DDTA143E I _O /I _I = -5mA/-0.25mA DDTA114E I _O /I _I = -10mA/-0.5mA All Others |
| Input Current | DDTA113ZE DDTA123YE DDTA123JE DDTA143XE DDTA143FE DDTA143ZE DDTA114YE DDTA114WE DDTA124XE DDTA144VE DDTA144WE | 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 | DDTA113ZE DDTA123YE DDTA123JE DDTA143XE DDTA143FE DDTA143ZE DDTA114YE DDTA114WE DDTA124XE DDTA144VE DDTA144WE | G _I | 33 33 80 30 68 80 68 24 68 33 56 | — | — | — | V _O = -5V, I _O = -10mA |
| 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

Notes: 4. Mounted on FR4 PC Board with recommended pad layout at <http://www.diodes.com>.

Typical Curves – DDTA123JE

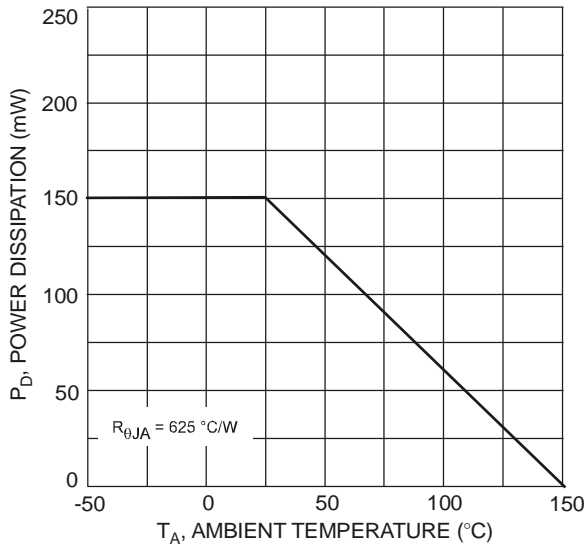


Fig. 1 Power Dissipation vs. Ambient Temperature

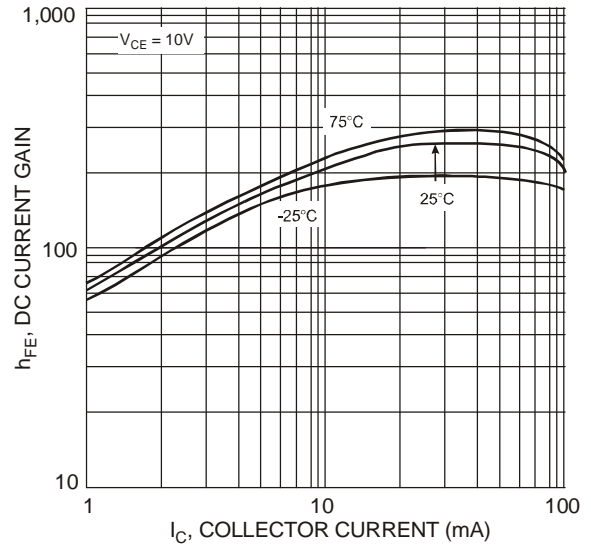


Fig. 2 Typical DC Current Gain vs. Collector Current

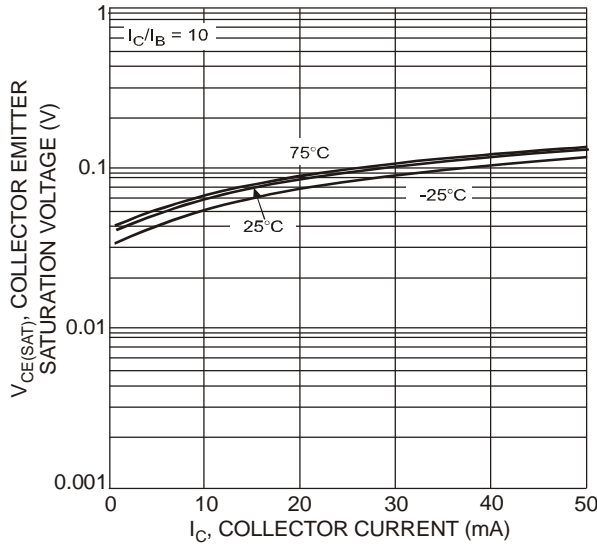


Fig. 3 Collector Emitter Saturation Voltage vs. Collector Current

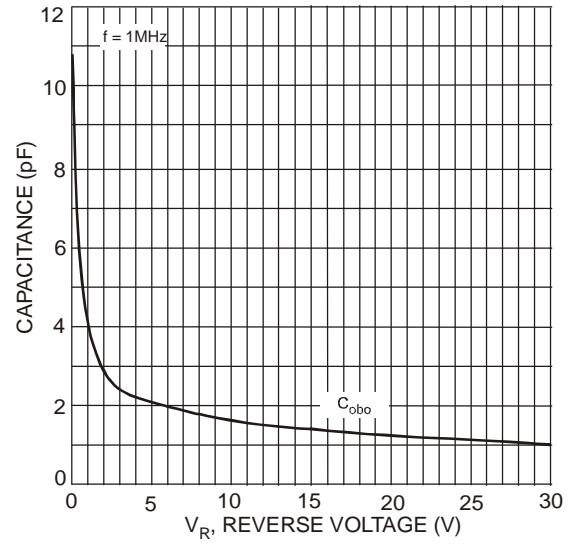


Fig. 4 Typical Capacitance Characteristics

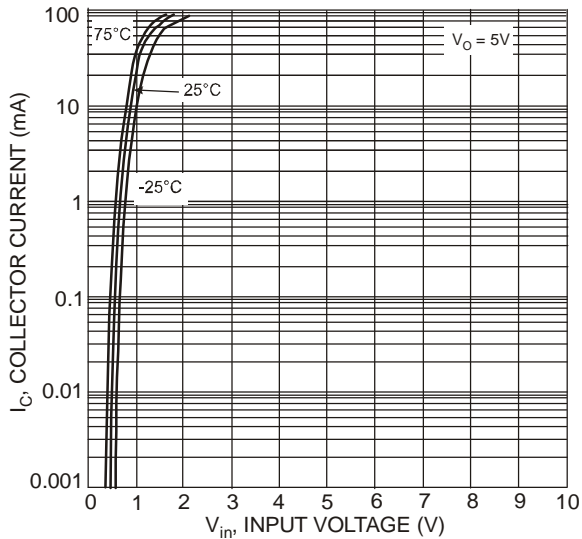


Fig. 5 Collector Current vs. Input Voltage

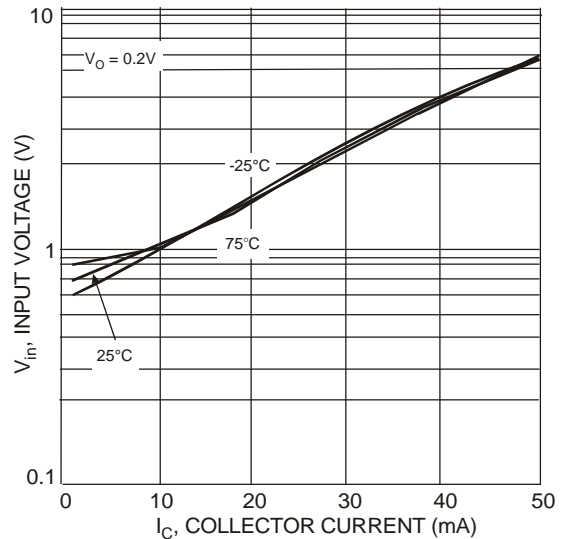
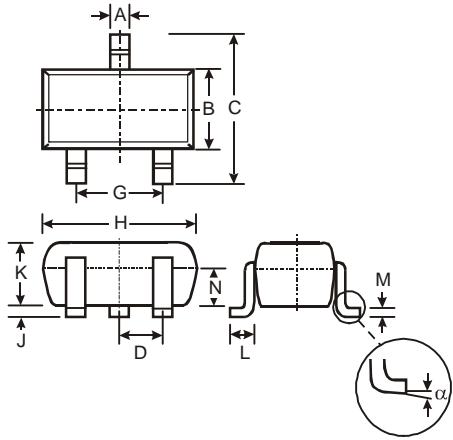


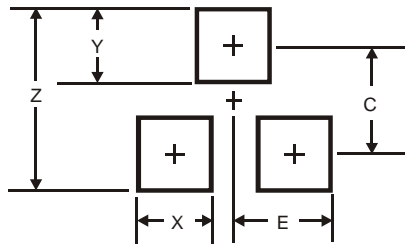
Fig. 6 Input Voltage vs. Collector Current

Package Outline Dimensions



| SOT523 | | | |
|----------------------|------|------|------|
| Dim | Min | Max | Typ |
| A | 0.15 | 0.30 | 0.22 |
| B | 0.75 | 0.85 | 0.80 |
| C | 1.45 | 1.75 | 1.60 |
| D | — | — | 0.50 |
| G | 0.90 | 1.10 | 1.00 |
| H | 1.50 | 1.70 | 1.60 |
| J | 0.00 | 0.10 | 0.05 |
| K | 0.60 | 0.80 | 0.75 |
| L | 0.10 | 0.30 | 0.22 |
| M | 0.10 | 0.20 | 0.12 |
| N | 0.45 | 0.65 | 0.50 |
| α | 0° | 8° | — |
| All Dimensions in mm | | | |

Suggested Pad Layout



| Dimensions | Value (in mm) |
|------------|---------------|
| Z | 1.8 |
| X | 0.4 |
| Y | 0.51 |
| C | 1.3 |
| E | 0.7 |

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