

Features

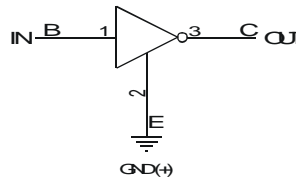
- Epitaxial Planar Die Construction
- Complementary NPN Types Available (DDTC)
- Built-In Biasing Resistors, R1≠R2
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

| Part Number | R1 (NOM) | R2 (NOM) |
|-------------|----------|----------|
| DDTA113ZE | 1kΩ | 10kΩ |
| DDTA123YE | 2.2kΩ | 10kΩ |
| DDTA123JE | 2.2kΩ | 47kΩ |
| DDTA143XE | 4.7kΩ | 10kΩ |
| DDTA143FE | 4.7kΩ | 22kΩ |
| DDTA143ZE | 4.7kΩ | 47kΩ |
| DDTA114YE | 10kΩ | 47kΩ |
| DDTA114WE | 10kΩ | 4.7kΩ |
| DDTA124XE | 22kΩ | 47kΩ |
| DDTA144VE | 47kΩ | 10kΩ |
| DDTA144WE | 47kΩ | 22kΩ |

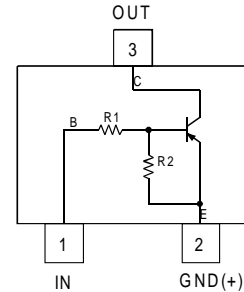
SOT523



Top View



Device Schematic



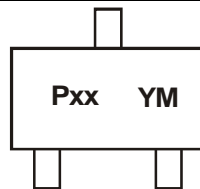
Package Pin Out Configuration

Ordering Information (Note 4)

| Part Number | Compliance | Marking | Reel size (inches) | Tape width (mm) | Quantity per reel |
|---------------|------------|---------|--------------------|-----------------|-------------------|
| DDTA113ZE-7-F | AEC-Q101 | P02 | 7 | 8 | 3,000 |
| DDTA123YE-7-F | AEC-Q101 | P05 | 7 | 8 | 3,000 |
| DDTA123JE-7-F | AEC-Q101 | P06 | 7 | 8 | 3,000 |
| DDTA143XE-7-F | AEC-Q101 | P09 | 7 | 8 | 3,000 |
| DDTA143FE-7-F | AEC-Q101 | P10 | 7 | 8 | 3,000 |
| DDTA143ZE-7-F | AEC-Q101 | P11 | 7 | 8 | 3,000 |
| DDTA114YE-7-F | AEC-Q101 | P14 | 7 | 8 | 3,000 |
| DDTA114WE-7-F | AEC-Q101 | P15 | 7 | 8 | 3,000 |
| DDTA124XE-7-F | AEC-Q101 | P18 | 7 | 8 | 3,000 |
| DDTA144VE-7-F | AEC-Q101 | P21 | 7 | 8 | 3,000 |
| DDTA144WE-7-F | AEC-Q101 | P22 | 7 | 8 | 3,000 |

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
 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. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

Marking Information



Pxx = Product Type Marking Code (See Ordering Information)
 YM = Date Code Marking
 Y or Ȳ = Year (ex: F = 2018)
 M = Month (ex: 9 = September)

Date Code Key

| Year | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 |
|------|------|------|------|------|------|------|------|------|------|------|------|
| Code | F | G | H | I | J | K | L | M | N | O | P |

| 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 |

Absolute 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 (Note 5) | P _D | 150 | mW |
| Thermal Resistance, Junction to Ambient Air (Note 5) | R _{θJA} | 833 | °C/W |
| Operating and Storage Temperature Range | T _J , T _{STG} | -55 to +150 | °C |

Note: 5. Mounted on FR4 PC Board with minimum recommended pad layout.

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 | 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 (Note 6) | | f _T | — | 250 | — | MHz | V _{CE} = -10V, I _E = 5mA, f = 100MHz |

Note: 6. Transistor – For Reference Only

Typical Curves – DDTA123JE

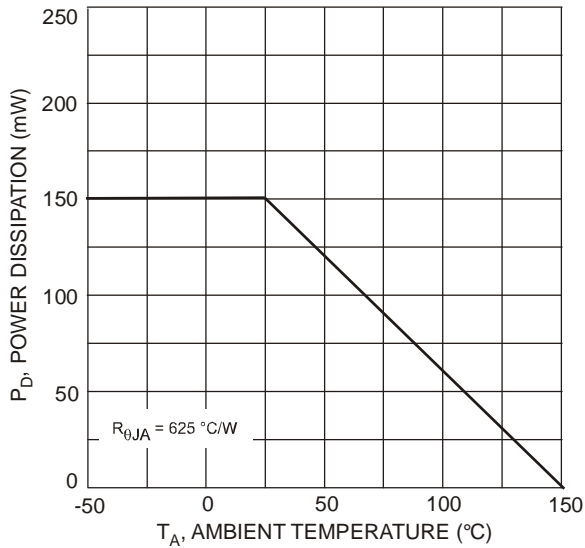


Fig. 1 Power Dissipation vs. Ambient Temperature

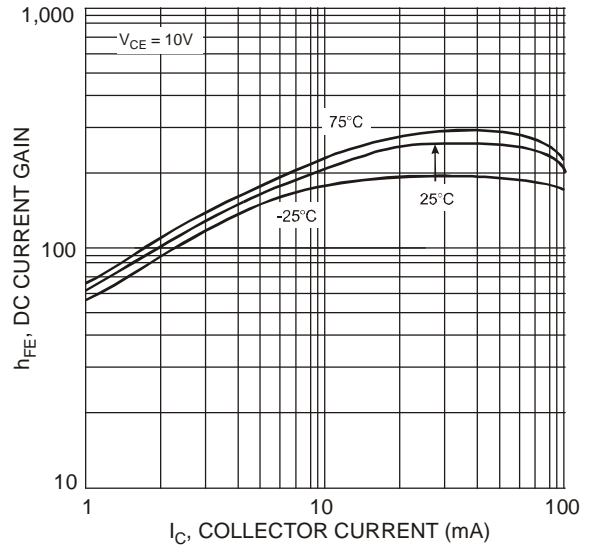


Fig. 2 Typical DC Current Gain vs. Collector Current

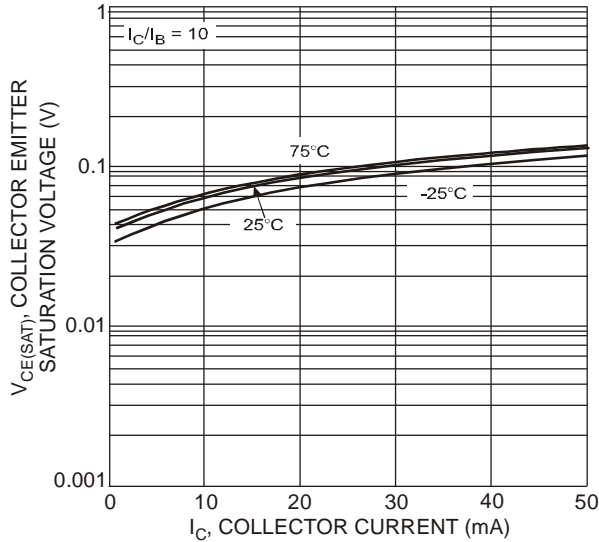


Fig. 3 Collector Emitter Saturation Voltage vs. Collector Current

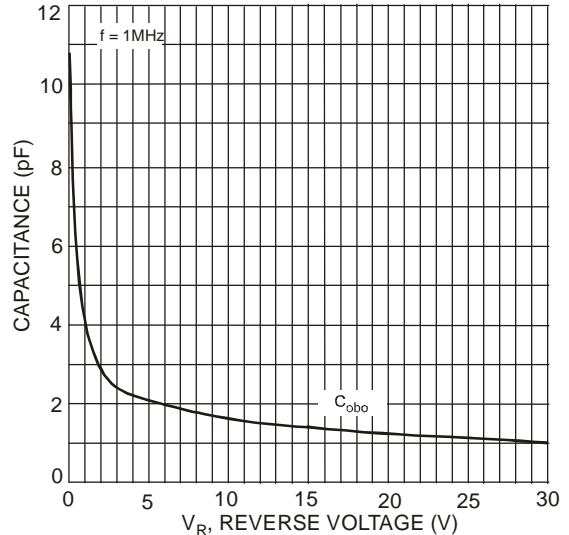


Fig. 4 Typical Capacitance Characteristics

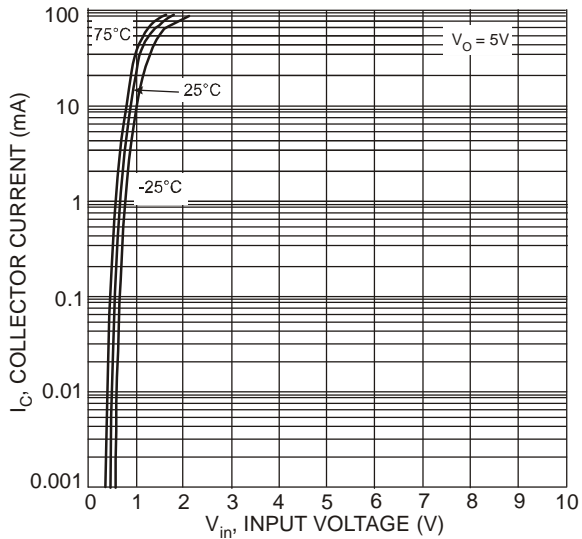


Fig. 5 Collector Current vs. Input Voltage

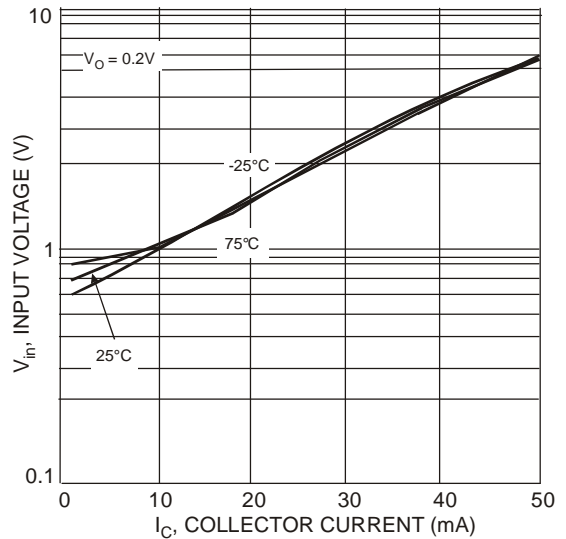
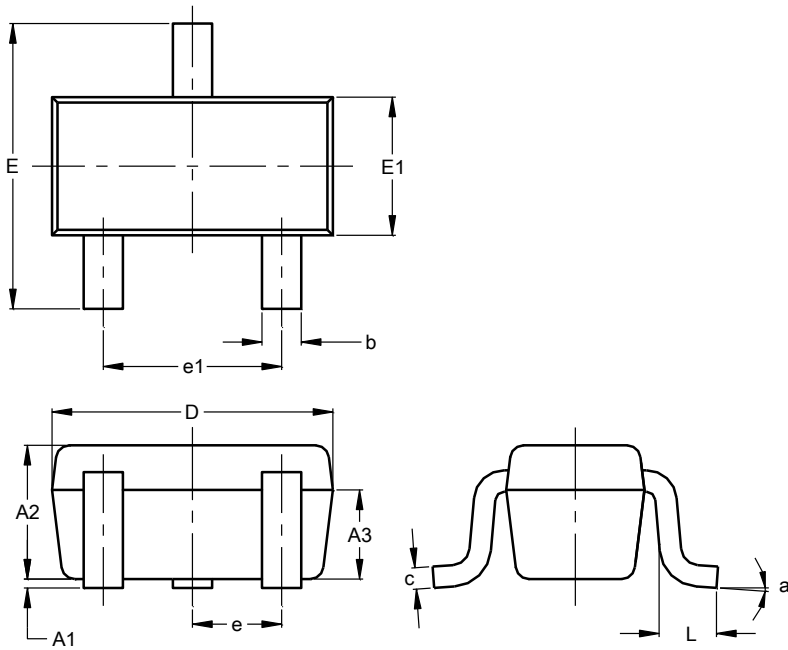


Fig. 6 Input Voltage vs. Collector Current

Package Outline Dimensions

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

SOT523

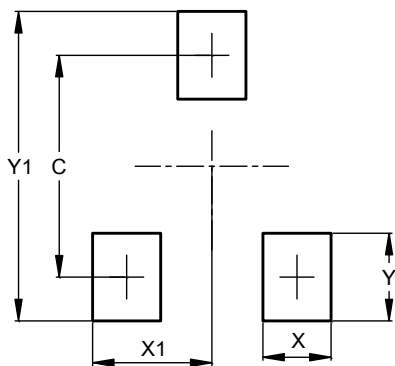


| SOT523 | | | |
|----------------------|----------|------|------|
| Dim | Min | Max | Typ |
| A1 | 0.00 | 0.10 | 0.05 |
| A2 | 0.60 | 0.80 | 0.75 |
| A3 | 0.45 | 0.65 | 0.50 |
| b | 0.15 | 0.30 | 0.22 |
| c | 0.10 | 0.20 | 0.12 |
| D | 1.50 | 1.70 | 1.60 |
| E | 1.45 | 1.75 | 1.60 |
| E1 | 0.75 | 0.85 | 0.80 |
| e | 0.50 BSC | | |
| e1 | 0.90 | 1.10 | 1.00 |
| L | 0.20 | 0.40 | 0.33 |
| a | 0° | -- | 8° |
| All Dimensions in mm | | | |

Suggested Pad Layout

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

SOT523



| Dimensions | Value |
|------------|-------|
| C | 1.29 |
| X | 0.40 |
| X1 | 0.70 |
| Y | 0.51 |
| Y1 | 1.80 |

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