

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**

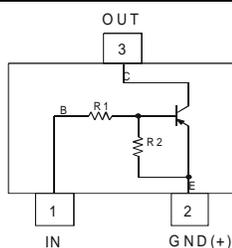
Mechanical Data

- Case: SOT523
- Case Material: Molded Plastic, "Green" Molding Compound
- UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 Ⓜ
- Weight: 0.002 grams (Approximate)

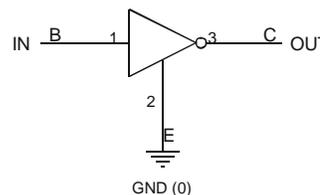
| Part Number | R1, R2 (NOM) |
|-------------|--------------|
| DDTA123EE | 2.2kΩ |
| DDTA143EE | 4.7kΩ |
| DDTA114EE | 10kΩ |
| DDTA124EE | 22kΩ |
| DDTA144EE | 47kΩ |
| DDTA115EE | 100kΩ |



Top View



Device Schematic



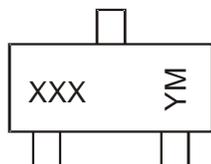
Equivalent Inverter Circuit

Ordering Information (Note 4)

| Product | Compliance | Marking | Reel Size (inches) | Tape Width (mm) | Quantity per Reel |
|---------------|------------|---------|--------------------|-----------------|-------------------|
| DDTA123EE-7-F | AEC-Q101 | P04 | 7 | 8 | 3,000 |
| DDTA143EE-7-F | AEC-Q101 | P08 | 7 | 8 | 3,000 |
| DDTA114EE-7-F | AEC-Q101 | P13 | 7 | 8 | 3,000 |
| DDTA124EE-7-F | AEC-Q101 | P17 | 7 | 8 | 3,000 |
| DDTA144EE-7-F | AEC-Q101 | P20 | 7 | 8 | 3,000 |
| DDTA115EE-7-F | AEC-Q101 | P24 | 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 <https://www.diodes.com/quality/lead-free/> 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 <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information



XXX = Product Type Marking Code, See Table Above
 YM = Date Code Marking
 Y or Y = 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 |

Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

| Characteristic | | Symbol | Value | Unit |
|------------------------------------|----------------------|-----------------|------------|------|
| Supply Voltage <Pin: (3) to (2)> | | V _{CC} | 50 | V |
| Input Voltage <Pin: (1) to (2)> | DDTA123EE | V _{IN} | +10 to -12 | V |
| | DDTA143EE | | +10 to -30 | |
| | DDTA114EE | | +10 to -40 | |
| | DDTA124EE | | +10 to -40 | |
| | DDTA144EE | | +10 to -40 | |
| | DDTA115EE | | +10 to -40 | |
| Output Current | DDTA123EE | I _O | -100 | mA |
| | DDTA143EE | | -100 | |
| | DDTA114EE | | -50 | |
| | DDTA124EE | | -30 | |
| | DDTA144EE | | -30 | |
| | DDTA115EE | | -20 | |
| Output Current | I _C (Max) | -100 | mA | |

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

| Characteristic | Symbol | Value | Unit |
|--|-----------------------------------|-------------|------|
| Power Dissipation (Note 5 & 6) | 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 |

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

| Characteristic | | Symbol | Min | Typ | Max | Unit | Test Condition |
|---------------------------------|--|---------------------------------|--|------|--|------|---|
| Input Voltage | | V _{I(OFF)} | -0.5 | -1.1 | — | V | V _{CC} = -5V, I _O = -100μA |
| | | V _{I(ON)} | — | -1.9 | -3 | | V _O = -0.3V, I _O = -20mA, DDTA123EE V _O = -0.3V, I _O = -20mA, DDTA143EE V _O = -0.3V, I _O = -10mA, DDTA114EE V _O = -0.3V, I _O = -5mA, DDTA124EE V _O = -0.3V, I _O = -2mA, DDTA144EE V _O = -0.3V, I _O = -1mA, DDTA115EE |
| Output Voltage | | V _{O(ON)} | — | -0.1 | -0.3 | V | I _O /I _I = -10mA/-0.5mA DDTA123EE I _O /I _I = -10mA/-0.5mA DDTA143EE I _O /I _I = -10mA/-0.5mA DDTA114EE I _O /I _I = -10mA/-0.5mA DDTA124EE I _O /I _I = -10mA/-0.5mA DDTA144EE I _O /I _I = -5mA/-0.25mA DDTA115EE |
| Input Current | DDTA123EE DDTA143EE DDTA114EE DDTA124EE DDTA144EE DDTA115EE | I _I | — | — | -3.8 -1.8 -0.88 -0.36 -0.18 -0.15 | mA | V _I = -5V |
| Output Current | | I _{O(OFF)} | — | — | -0.5 | μA | V _{CC} = -50V, V _I = 0V |
| DC Current Gain | DDTA123EE DDTA143EE DDTA114EE DDTA124EE DDTA144EE DDTA115EE | G _I | -20 -20 -30 -56 -68 -82 | — | — | — | V _O = -5V, I _O = -20mA 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 | 0.8 | 1 | 1.2 | % | — |
| Gain-Bandwidth Product (Note 7) | | f _T | — | 250 | — | MHz | V _{CE} = -10V, I _E = 5mA, f = 100MHz |

Notes:
 5. Mounted on FR-4 PC Board with minimum recommended pad layout.
 6. 150mW per element must not be exceeded.
 7. Transistor only.

Typical Electrical Characteristics – DDTA143EE

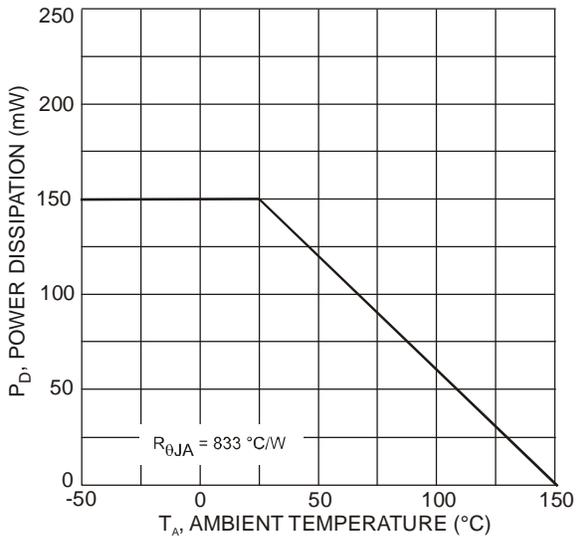


Figure 1 Power Dissipation vs. Ambient Temperature

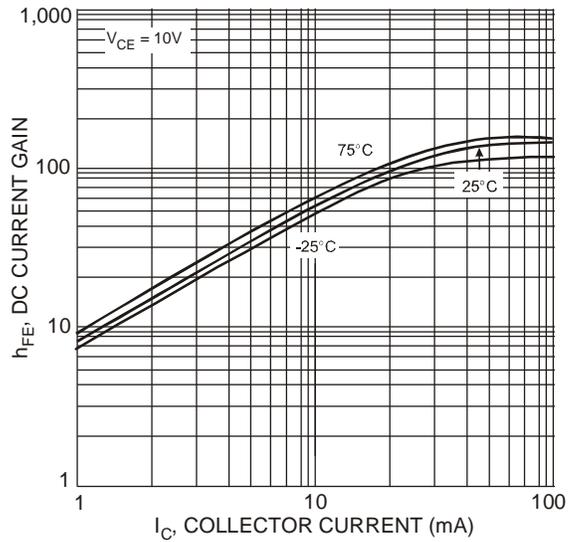


Figure 2 Typical DC Current Gain vs. Collector Current

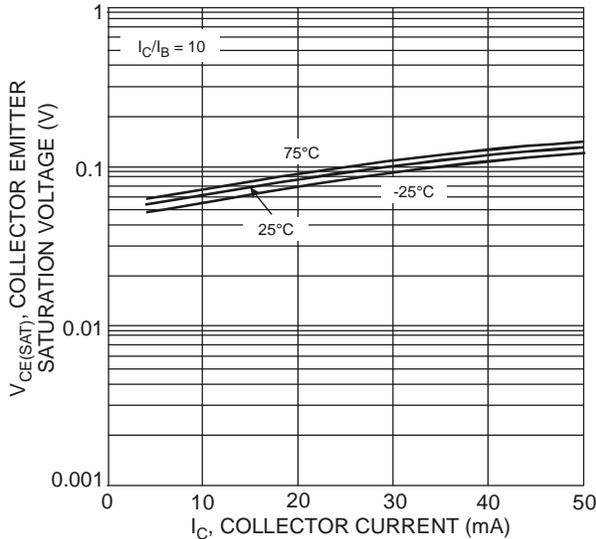


Figure 3 Typical Collector Emitter Saturation Voltage vs. Collector Current

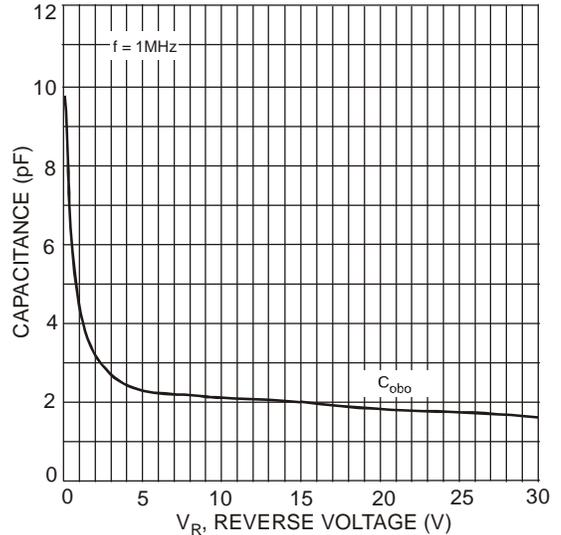


Figure 4 Typical Capacitance Characteristics

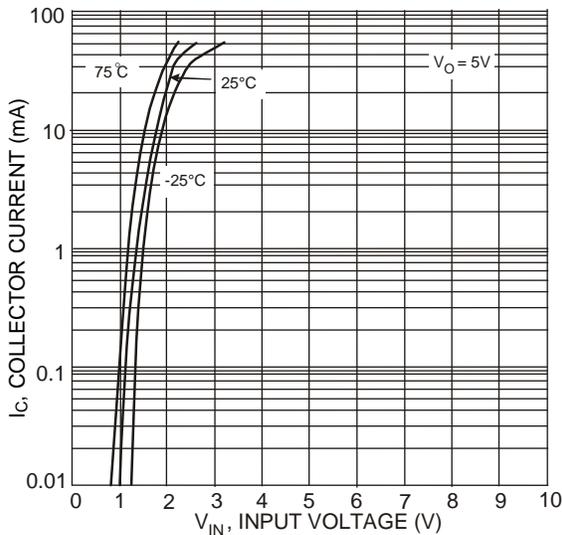


Figure 5 Collector Current vs. Input Voltage

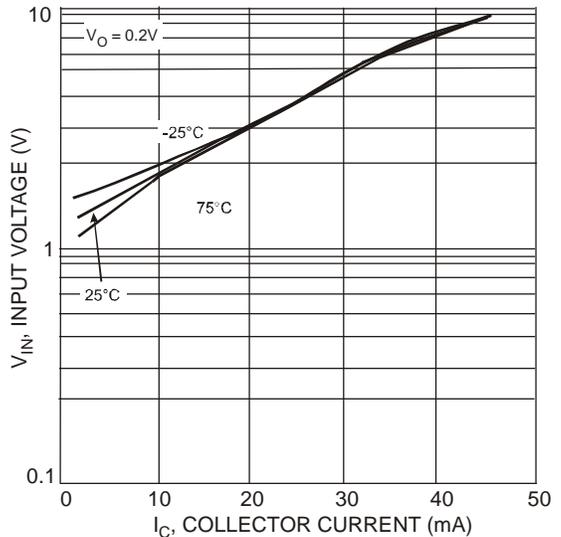
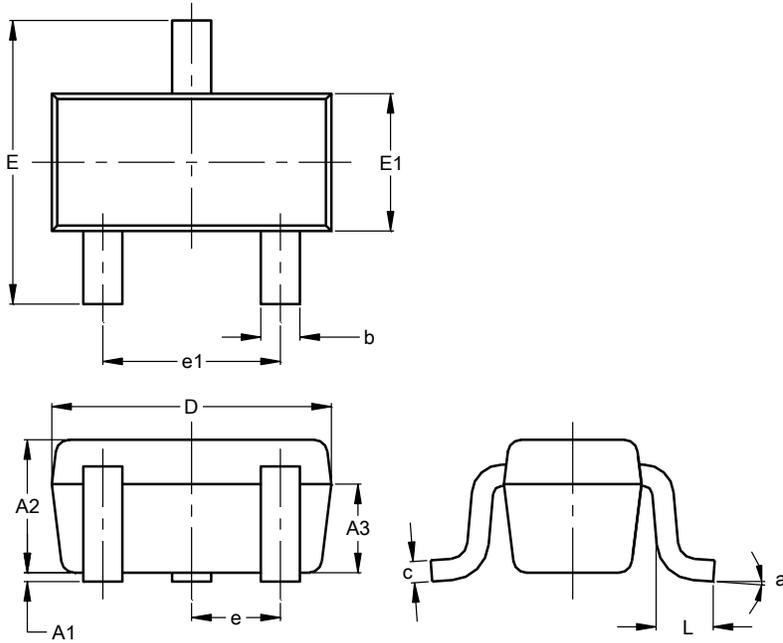


Figure 6 Input Voltage vs. Collector Current

Package Outline Dimensions

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

SOT523

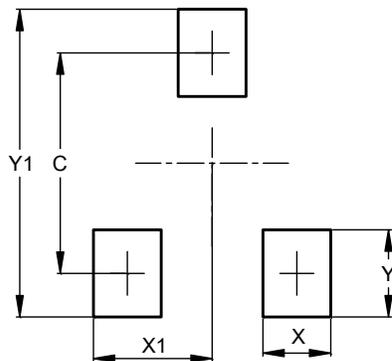


| SOT523 | | | |
|----------------------|----------|------|------|
| Dim | Min | Max | Typ |
| A1 | 0.00 | 0.10 | 0.05 |
| A2 | 0.60 | 0.80 | 0.75 |
| A3 | 0.45 | 0.65 | 0.50 |
| b | 0.15 | 0.30 | 0.22 |
| c | 0.10 | 0.20 | 0.12 |
| D | 1.50 | 1.70 | 1.60 |
| E | 1.45 | 1.75 | 1.60 |
| E1 | 0.75 | 0.85 | 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 (in mm) |
|------------|---------------|
| C | 1.29 |
| X | 0.40 |
| X1 | 0.70 |
| Y | 0.51 |
| Y1 | 1.80 |

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