

PNP PRE-BIASED SMALL SIGNAL SURFACE MOUNT TRANSISTOR
Features

- Epitaxial Planar Die Construction
- Built-In Biasing Resistors
- Surface Mount Package Suited for Automated Assembly
- **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**
- **PPAP Capable (Note 4)**

| R1(NOM) | R2(NOM) |
|---------|---------|
| 4.7kΩ | 10kΩ |

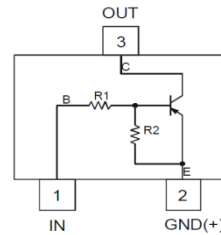
Mechanical Data

- Case: SOT323
- 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 (E3)
- Weight: 0.006 grams (Approximate)

SOT323



Top View



Device Schematic

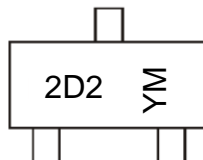
Ordering Information (Note 5)

| Part Number | Compliance | Marking | Reel Size (inches) | Tape Width (mm) | Quantity per Reel |
|----------------|------------|---------|--------------------|-----------------|-------------------|
| ADTA143XUAQ-7 | Automotive | 2D2 | 7 | 8 | 3,000 |
| ADTA143XUAQ-13 | Automotive | 2D2 | 13 | 8 | 10,000 |

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) 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. Automotive products are AEC-Q101 qualified and are PPAP capable. Refer to <https://www.diodes.com/quality/product-compliance-definitions/>.
 5. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information

SOT323



2D2 = Product Type Marking Code
 YM = Date Code Marking
 Y = Year (ex: E = 2017)
 M = Month (ex: 9 = September)

Date Code Key

| Year | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | |
|-------|------|------|------|------|------|------|------|------|------|------|------|-----|
| Code | E | F | G | H | I | J | K | L | M | N | O | |
| 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.)

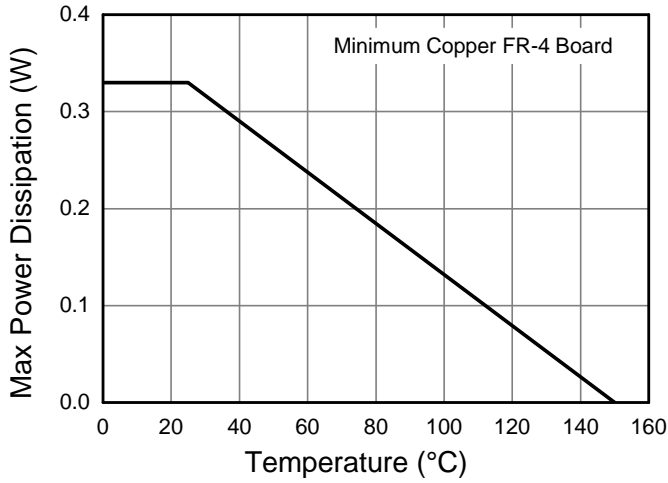
| Characteristic | Symbol | Value | Unit |
|----------------------------------|----------------------|-----------|------|
| Supply Voltage <Pin: (3) to (2)> | V _{CC} | -50 | V |
| Input Voltage <Pin: (1) to (2)> | V _{IN} | +7 to -20 | V |
| Output Current | I _O | -100 | mA |
| Output Current | I _C (Max) | -100 | mA |

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

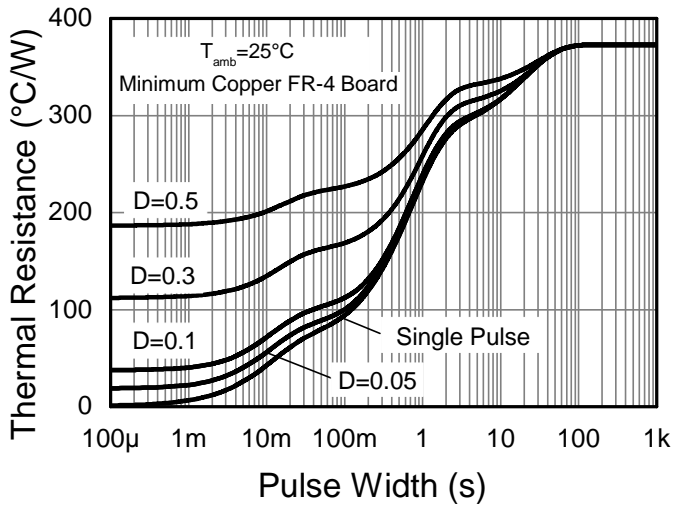
| Characteristic | Symbol | Value | Unit |
|--|-----------------------------------|-------------|------|
| Power Dissipation (Note 6) | P _D | 330 | mW |
| Thermal Resistance, Junction to Ambient Air (Note 6) | R _{θJA} | 375 | °C/W |
| Operating and Storage Temperature Range | T _J , T _{STG} | -55 to +150 | °C |

Note: 6. Mounted on FR-4 PC Board with minimum recommended pad layout.

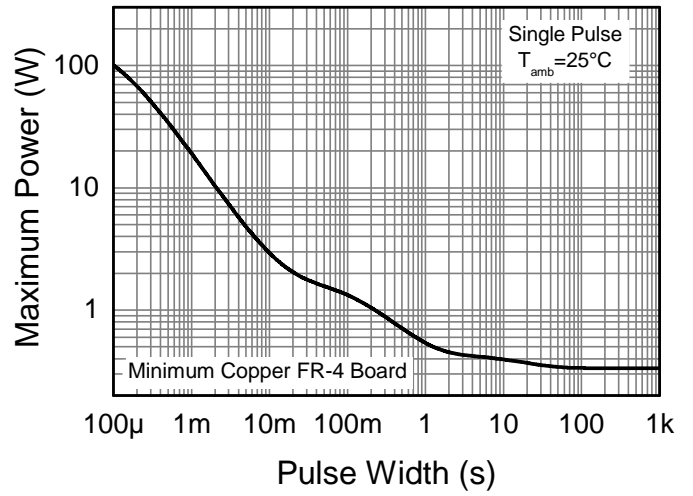
Thermal Characteristics and Derating Information



Derating Curve



Transient Thermal Impedance



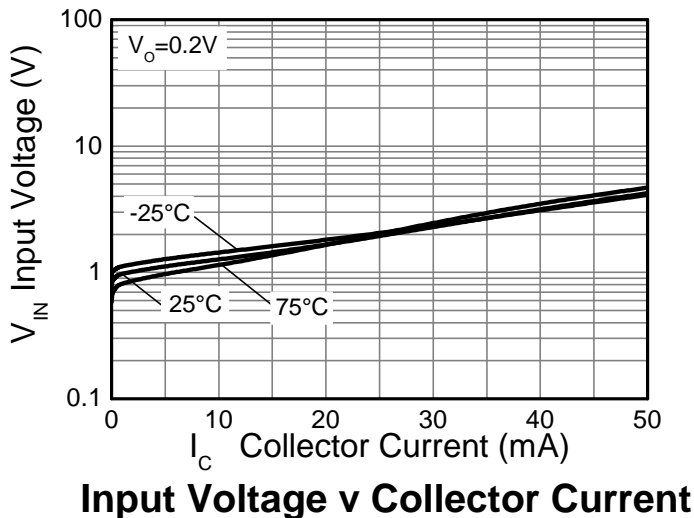
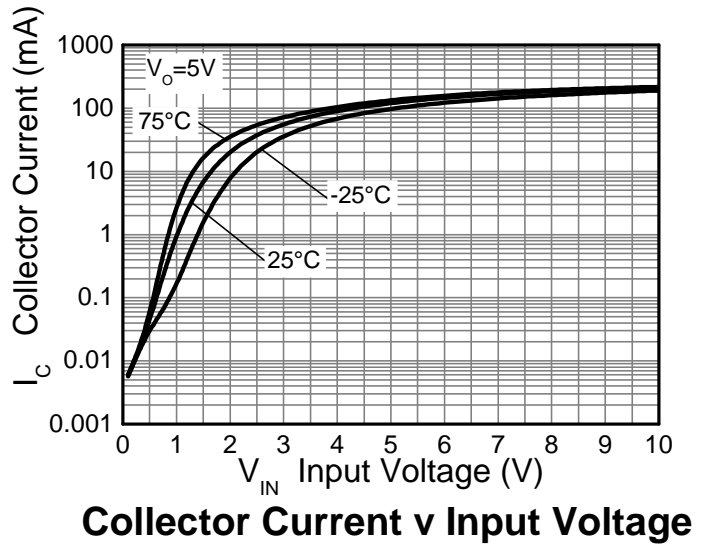
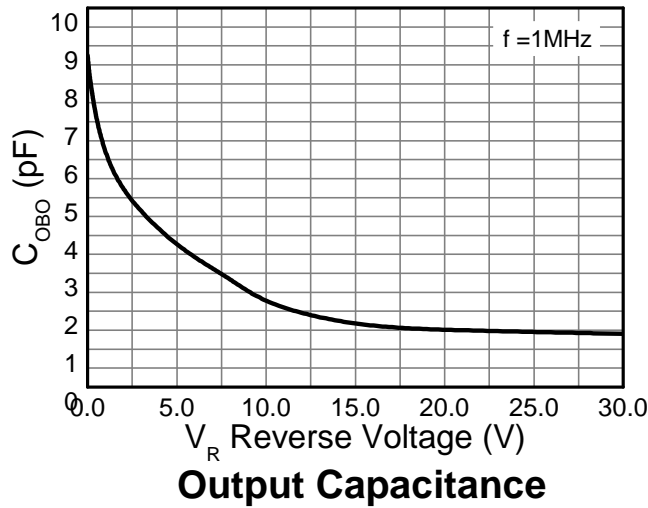
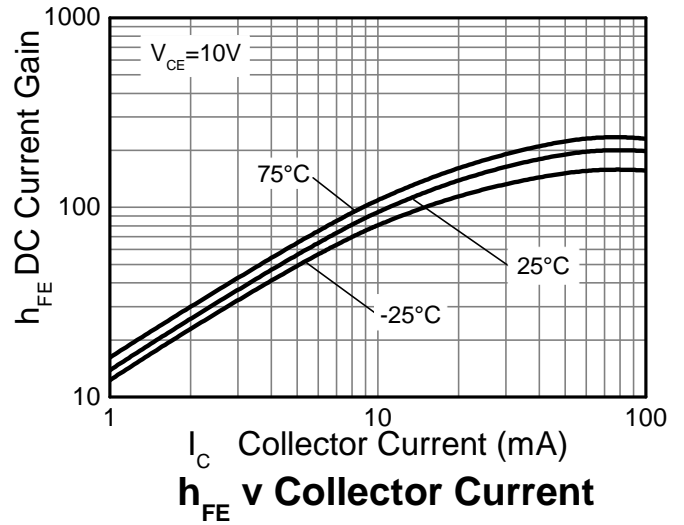
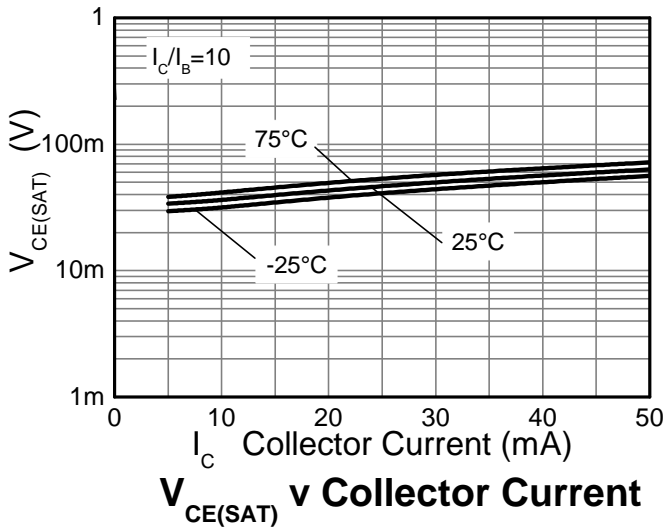
Pulse Power Dissipation

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

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|--|---------------------------------|------|------|------|------|---|
| Input Voltage | V _{I(OFF)} (Note 7) | -0.3 | — | — | V | V _{CC} = -5V, I _O = -100μA |
| | V _{I(ON)} (Note 8) | — | — | -2.5 | | V _O = -0.3V, I _O = -20mA |
| Output Voltage | V _{O(ON)} | — | -0.1 | -0.3 | V | I _O /I _I = -10mA / -0.5mA |
| Input Current | I _I | — | — | -1.8 | mA | V _I = -5V |
| Output Current | I _{O(OFF)} | — | — | -0.5 | μA | V _{CC} = -50V, V _I = 0V |
| DC Current Gain | G _I | 30 | — | — | — | V _O = -5V, I _O = -10mA |
| Input Resistor (R ₁) Tolerance | ΔR ₁ | -30 | — | +30 | % | — |
| Resistance Ratio Tolerance | ΔR ₂ /R ₁ | -20 | — | +20 | % | — |
| Gain-Bandwidth Product (Note 9) | f _T | — | 250 | — | MHz | V _{CE} = -10V, I _E = -5mA, f = 100MHz |

- Notes:
7. Guarantees that the device will be switched OFF if the Input Voltage is less than -0.3V.
 8. Guarantees that the device will be switched ON if the Input Voltage is more than -2.5V.
 9. Transistor - For Reference Only.

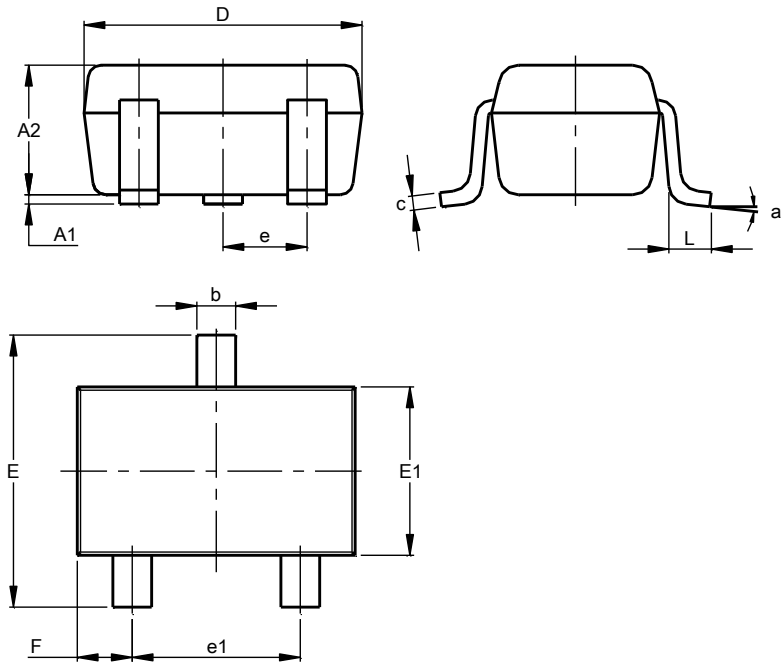
Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)



Package Outline Dimensions

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

SOT323

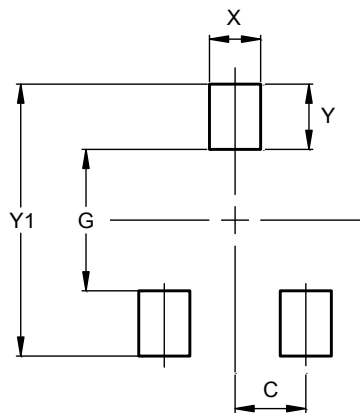


| SOT323 | | | |
|-----------------------------|-----------|-------|-------|
| Dim | Min | Max | Typ |
| A1 | 0.00 | 0.10 | 0.05 |
| A2 | 0.90 | 1.00 | 0.95 |
| b | 0.25 | 0.40 | 0.30 |
| c | 0.10 | 0.18 | 0.11 |
| D | 1.80 | 2.20 | 2.15 |
| E | 2.00 | 2.20 | 2.10 |
| E1 | 1.15 | 1.35 | 1.30 |
| e | 0.650 BSC | | |
| e1 | 1.20 | 1.40 | 1.30 |
| F | 0.375 | 0.475 | 0.425 |
| L | 0.25 | 0.40 | 0.30 |
| a | 0° | 8° | -- |
| All Dimensions in mm | | | |

Suggested Pad Layout

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

SOT323



| Dimensions | Value (in mm) |
|------------|---------------|
| C | 0.650 |
| G | 1.300 |
| X | 0.470 |
| Y | 0.600 |
| Y1 | 2.500 |

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