

# ANTREX Electronics

Electronic Components Sourcing Information

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## Product Reference Information

**Part Number:** ACX143ZUQ-13R  
**Manufacturer:** Diodes Incorporated  
**Package:** 6-TSSOP, SC-88, SOT-363  
**Availability:** Please confirm with sales

### Product Page:

<https://antrexco.com/product/details/diodes-incorporated/acx143zuq-13r.html>

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## Contact Information

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## Quality & Trust

New & Original Components

Supplier verification and packaging condition review

CoC / RoHS / REACH documents available on request

Secure sourcing support for OEM / EMS projects

### Note:

This PDF includes an ANTREX product reference cover page.

The original manufacturer datasheet follows from the next page.

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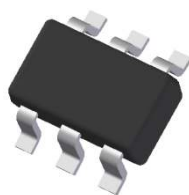
**SMALL SIGNAL COMPLEMENTARY PRE-BIASED DUAL TRANSISTOR**

## 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   | 47kΩ    |

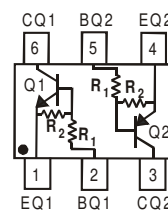
SOT363



Top View

## Mechanical Data

- Case: SOT363
- 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)



Device Schematic

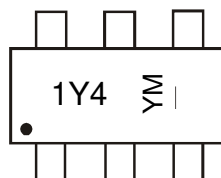
## Ordering Information (Note 5)

| Product       | Compliance | Marking | Reel Size (inches) | Tape Width (mm) | Quantity per Reel |
|---------------|------------|---------|--------------------|-----------------|-------------------|
| ACX143ZUQ-7R  | Automotive | 1Y4     | 7                  | 8               | 3,000             |
| ACX143ZUQ-13R | Automotive | 1Y4     | 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](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. -7R /-13R are parts rotated in the pocket tape by +180°.
- For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

## Marking Information

SOT363



1Y4 = Product Type Marking Code  
YM = Date Code Marking  
Y = Year (ex: E = 2017)  
M = Month (ex: 9 = September)

Date Code Key

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 - NPN Section** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Characteristic                   | Symbol               | Value      | Unit |
|----------------------------------|----------------------|------------|------|
| Supply Voltage <Pin: (6) to (1)> | V <sub>CC</sub>      | 50         | V    |
| Input Voltage <Pin: (2) to (1)>  | V <sub>IN</sub>      | -10 to +30 | V    |
| Output Current                   | I <sub>O</sub>       | 100        | mA   |
| Output Current                   | I <sub>C</sub> (Max) | 100        | mA   |

**Absolute Maximum Ratings - PNP Section** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

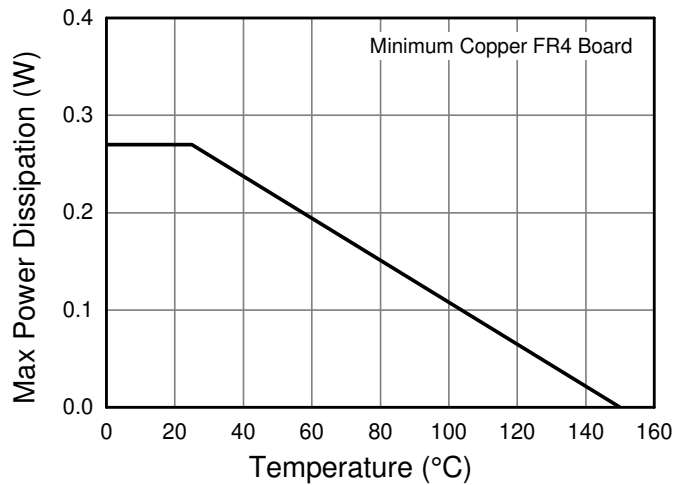
| Characteristic                   | Symbol               | Value     | Unit |
|----------------------------------|----------------------|-----------|------|
| Supply Voltage <Pin: (4) to (3)> | V <sub>CC</sub>      | -50       | V    |
| Input Voltage <Pin: (5) to (4)>  | V <sub>IN</sub>      | +5 to -30 | V    |
| Output Current                   | I <sub>O</sub>       | -100      | mA   |
| Output Current                   | I <sub>C</sub> (Max) | -100      | mA   |

**Thermal Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

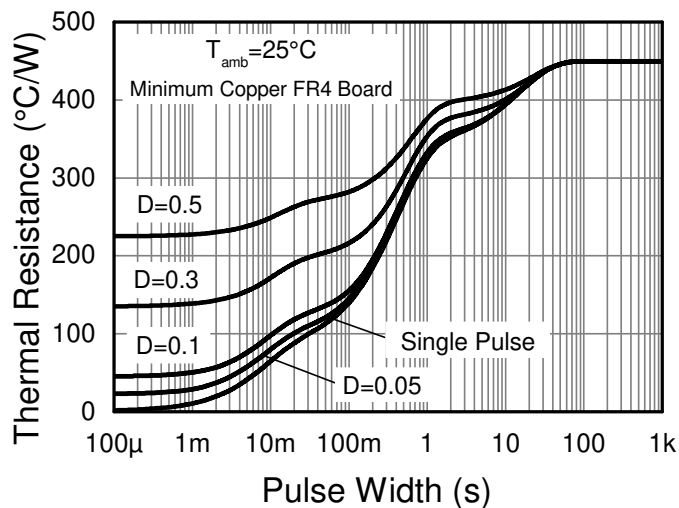
| Characteristic                                       | Symbol                            | Value       | Unit |
|------------------------------------------------------|-----------------------------------|-------------|------|
| Power Dissipation (Notes 6 & 7)                      | P <sub>D</sub>                    | 270         | mW   |
| Thermal Resistance, Junction to Ambient Air (Note 6) | R <sub>θJA</sub>                  | 450         | °C/W |
| Operating and Storage Temperature Range              | T <sub>J</sub> , T <sub>STG</sub> | -55 to +150 | °C   |

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

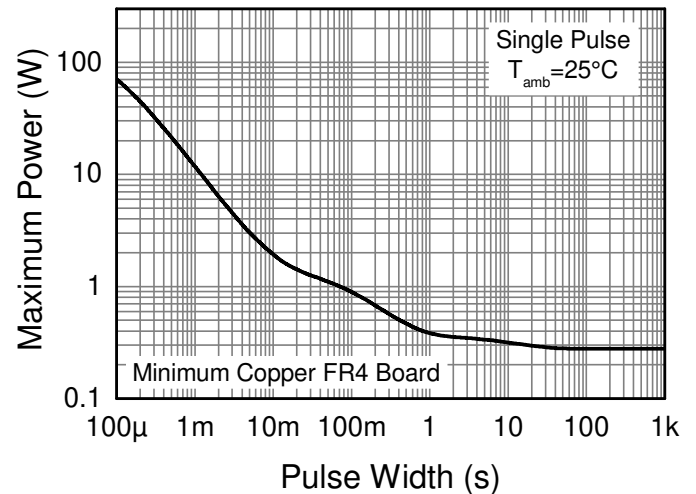
## Thermal Characteristics and Derating Information



**Derating Curve**



**Transient Thermal Impedance**



**Pulse Power Dissipation**

## Electrical Characteristics - NPN Section (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Characteristic                             | Symbol                          | Min | Typ | Max | Unit | Test Condition                                          |
|--------------------------------------------|---------------------------------|-----|-----|-----|------|---------------------------------------------------------|
| Input Voltage                              | V <sub>I(OFF)</sub> (Note 8)    | 0.5 | —   | —   | V    | V <sub>CC</sub> = 5V, I <sub>O</sub> = 100μA            |
|                                            | V <sub>I(ON)</sub> (Note 9)     | —   | —   | 1.3 |      | V <sub>O</sub> = 0.3V, I <sub>O</sub> = 5mA             |
| Output Voltage                             | V <sub>O(ON)</sub>              | —   | 0.1 | 0.3 | V    | I <sub>O</sub> /I <sub>I</sub> = 5mA / 0.25mA           |
| Input Current                              | I <sub>I</sub>                  | —   | —   | 1.8 | mA   | V <sub>I</sub> = 5V                                     |
| Output Current                             | I <sub>O(OFF)</sub>             | —   | —   | 0.5 | μA   | V <sub>CC</sub> = 50V, V <sub>I</sub> = 0V              |
| DC Current Gain                            | G <sub>I</sub>                  | 80  | —   | —   | —    | V <sub>O</sub> = 5V, I <sub>O</sub> = 10mA              |
| Input Resistor (R <sub>1</sub> ) Tolerance | ΔR <sub>1</sub>                 | -30 | —   | +30 | %    | —                                                       |
| Resistance Ratio Tolerance                 | ΔR <sub>2</sub> /R <sub>1</sub> | -20 | —   | +20 | %    | —                                                       |
| Gain-Bandwidth Product (Note 10)           | f <sub>T</sub>                  | —   | 250 | —   | MHz  | V <sub>CE</sub> = 10V, I <sub>E</sub> = 5mA, f = 100MHz |

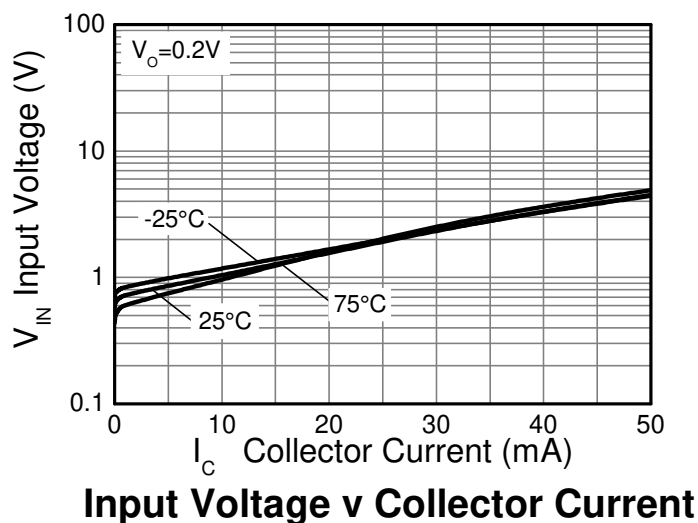
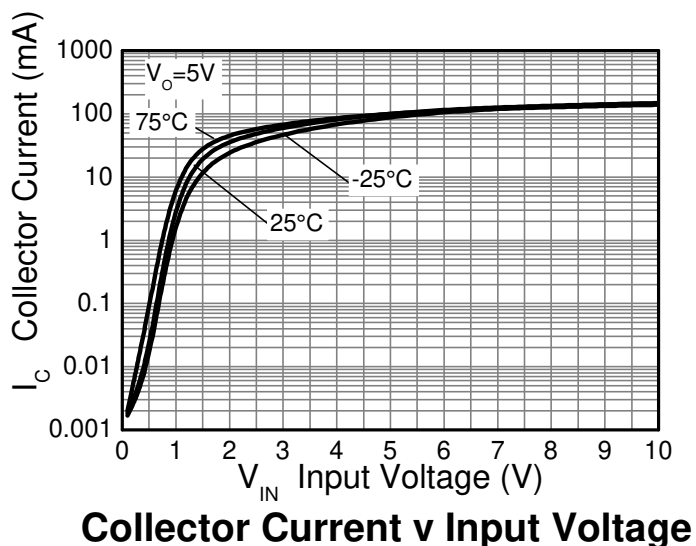
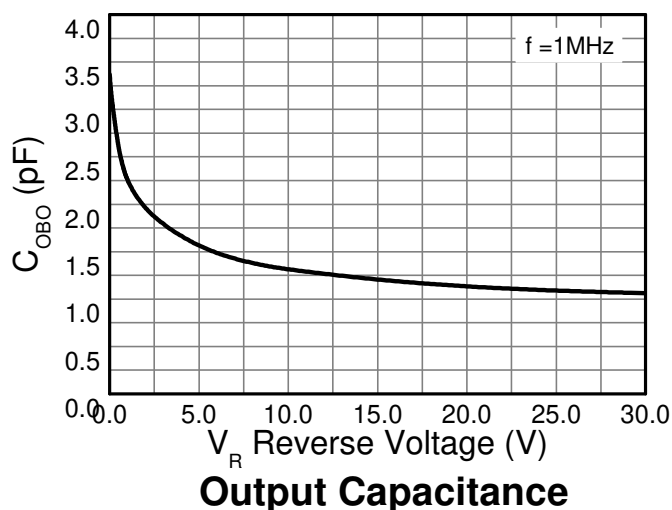
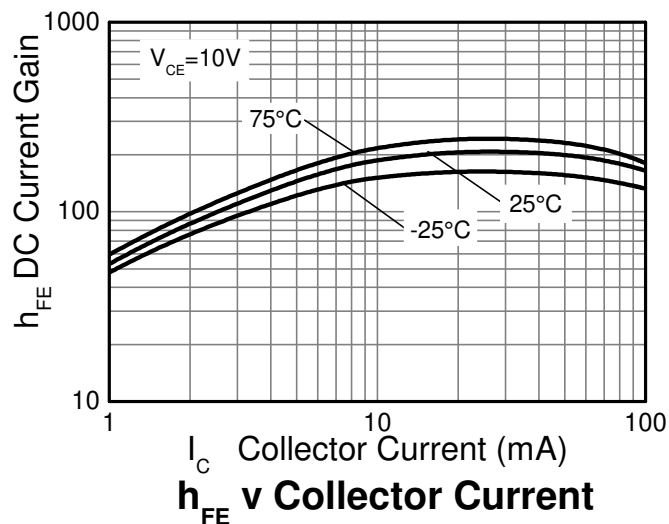
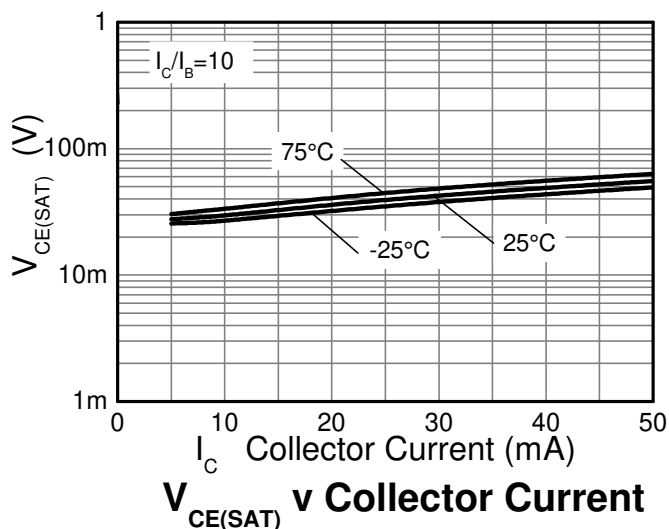
Notes: 8. Guarantees that the device will be switched OFF if the Input Voltage is less than 0.5V.  
9. Guarantees that the device will be switched ON if the Input Voltage is more than 1.3V.  
10. Transistor - For Reference Only.

## Electrical Characteristics - PNP Section (@T<sub>A</sub> = +25°C, unless otherwise specified.)

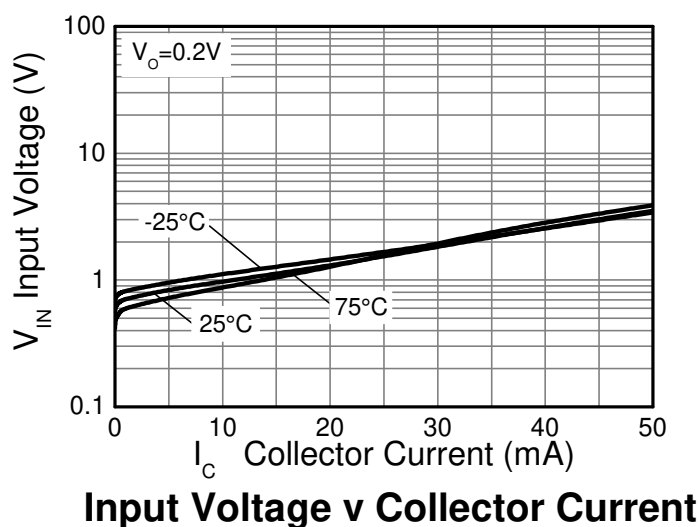
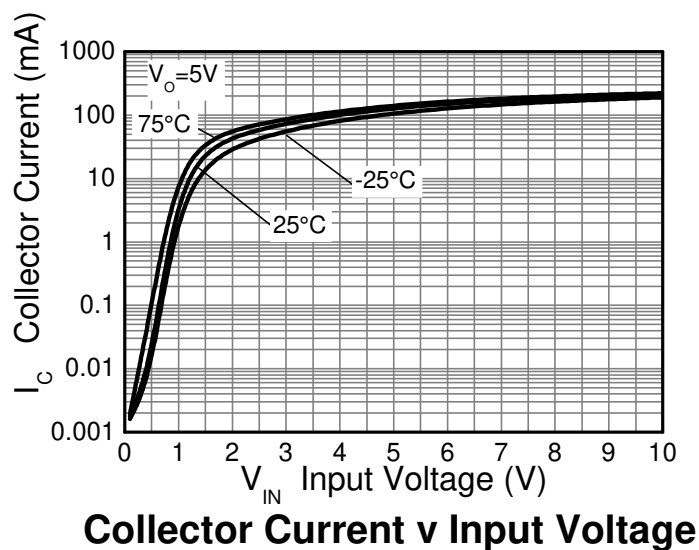
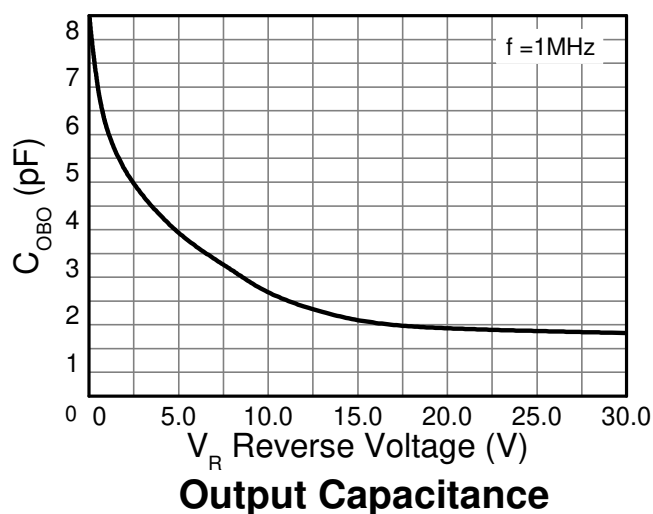
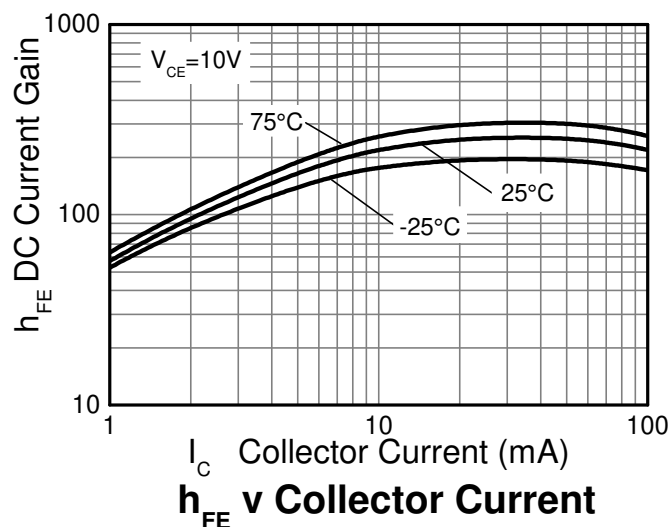
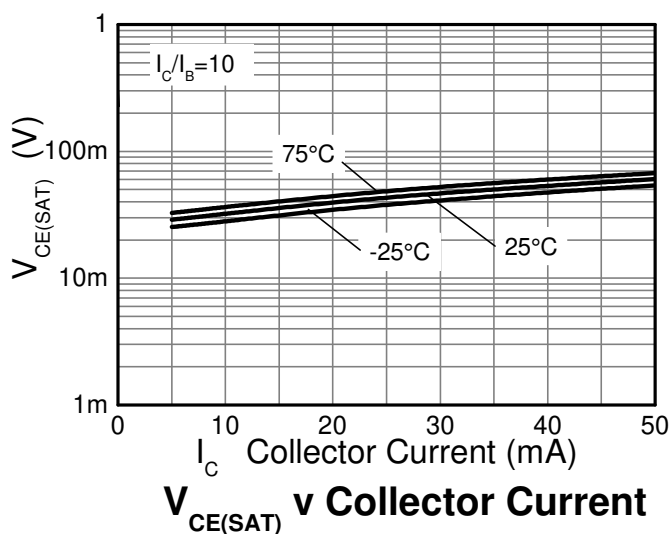
| Characteristic                             | Symbol                          | Min  | Typ  | Max  | Unit | Test Condition                                            |
|--------------------------------------------|---------------------------------|------|------|------|------|-----------------------------------------------------------|
| Input Voltage                              | V <sub>I(OFF)</sub> (Note 11)   | -0.5 | —    | —    | V    | V <sub>CC</sub> = -5V, I <sub>O</sub> = -100μA            |
|                                            | V <sub>I(ON)</sub> (Note 12)    | —    | —    | -1.3 |      | V <sub>O</sub> = -0.3V, I <sub>O</sub> = -5mA             |
| Output Voltage                             | V <sub>O(ON)</sub>              | —    | -0.1 | -0.3 | V    | I <sub>O</sub> /I <sub>I</sub> = -5mA / -0.25mA           |
| Input Current                              | I <sub>I</sub>                  | —    | —    | -1.8 | mA   | V <sub>I</sub> = -5V                                      |
| Output Current                             | I <sub>O(OFF)</sub>             | —    | —    | -0.5 | μA   | V <sub>CC</sub> = 50V, V <sub>I</sub> = 0V                |
| DC Current Gain                            | G <sub>I</sub>                  | 80   | —    | —    | —    | V <sub>O</sub> = -5V, I <sub>O</sub> = -10mA              |
| Input Resistor (R <sub>1</sub> ) Tolerance | ΔR <sub>1</sub>                 | -30  | —    | +30  | %    | —                                                         |
| Resistance Ratio Tolerance                 | ΔR <sub>2</sub> /R <sub>1</sub> | -20  | —    | +20  | %    | —                                                         |
| Gain-Bandwidth Product (Note 10)           | f <sub>T</sub>                  | —    | 250  | —    | MHz  | V <sub>CE</sub> = -10V, I <sub>E</sub> = -5mA, f = 100MHz |

Notes: 11. Guarantees that the device will be switched OFF if the Input Voltage is less than -0.5V.  
12. Guarantees that the device will be switched ON if the Input Voltage is more than -1.3V.

**Typical Electrical Characteristics – NPN Section** (@T<sub>A</sub> = +25°C, unless otherwise specified.)



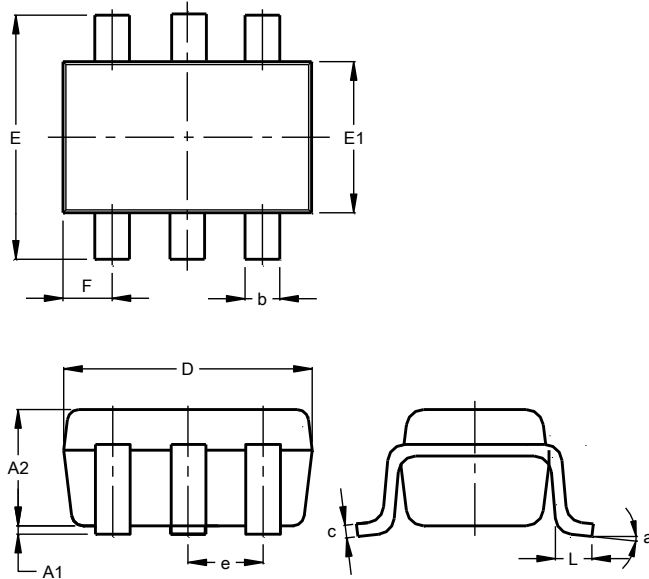
**Typical Electrical Characteristics – PNP Section** (@T<sub>A</sub> = +25°C, unless otherwise specified.)



## Package Outline Dimensions

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

### SOT363

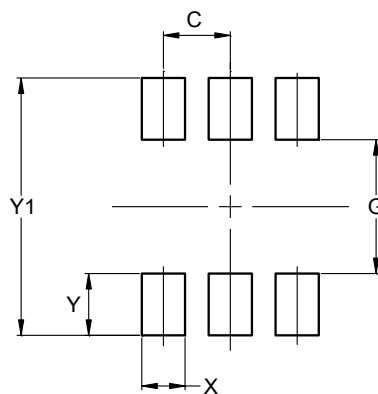


| SOT363               |           |      |       |
|----------------------|-----------|------|-------|
| Dim                  | Min       | Max  | Typ   |
| A1                   | 0.00      | 0.10 | 0.05  |
| A2                   | 0.90      | 1.00 | 1.00  |
| b                    | 0.10      | 0.30 | 0.25  |
| c                    | 0.10      | 0.22 | 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 |      |       |
| F                    | 0.40      | 0.45 | 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.

### SOT363



| Dimensions | Value (in mm) |
|------------|---------------|
| C          | 0.650         |
| G          | 1.300         |
| X          | 0.420         |
| Y          | 0.600         |
| Y1         | 2.500         |

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