

45V DUAL PNP SMALL SIGNAL SURFACE MOUNT TRANSISTOR
Description

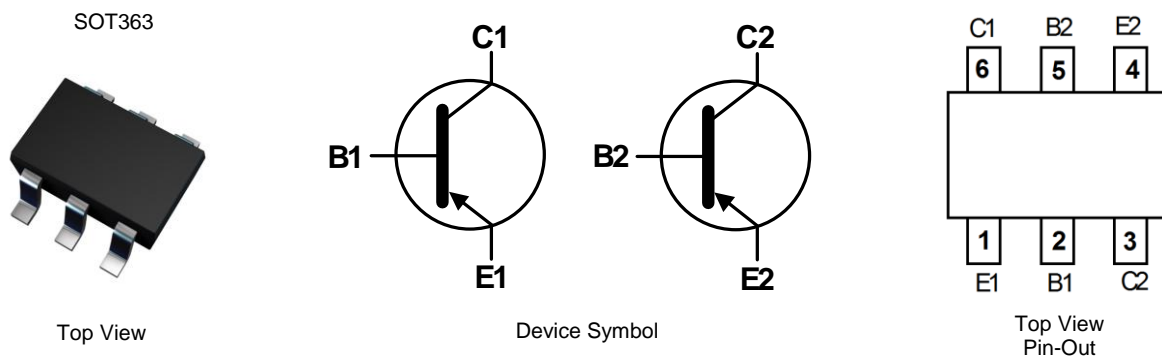
This Bipolar Junction Transistor (BJT) is designed to meet the stringent requirement of Automotive Applications.

Features

- Ultra-Small Surface Mount Package
- Ideally Suited for Automated Insertion
- For Switching and AF Amplifier Application
- **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)**

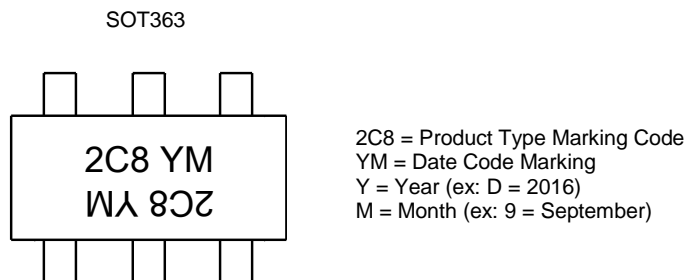
Mechanical Data

- 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 Finish. Solderable per MIL-STD-202, Method 208 ^{e3}
- Weight: 0.006 grams (Approximate)


Ordering Information (Notes 4 & 5)

| Part Number | Compliance | Marking | Reel Size (inches) | Tape Width (mm) | Quantity Per Reel |
|-------------|------------|---------|--------------------|-----------------|-------------------|
| AC857BSQ-7 | Automotive | 2C8 | 7 | 8 | 3,000 |

- 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 http://www.diodes.com/product_compliance_definitions.html.
 5. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

Marking Information

Date Code Key

| Year | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|------|------|------|------|------|------|------|------|------|
| Code | D | E | F | G | H | I | J | K |

| 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 |
|---------------------------|------------------|-------|------|
| Collector-Base Voltage | V _{CB0} | -50 | V |
| Collector-Emitter Voltage | V _{CEO} | -45 | V |
| Emitter-Base Voltage | V _{EBO} | -5.0 | V |
| Collector Current | I _C | -100 | mA |
| Peak Collector Current | I _{CM} | -200 | mA |
| Peak Base Current | I _{BM} | -200 | mA |

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

| Characteristic | Symbol | Value | Unit |
|--|-----------------------------------|-------------|------|
| Power Dissipation (Note 6) | P _D | 200 | mW |
| Thermal Resistance, Junction to Ambient Air (Note 6) | R _{θJA} | 625 | °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 (Note 7) | Symbol | Min | Typ | Max | Unit | Test Condition |
|--------------------------------------|----------------------|------|------|--------------|----------|---|
| Collector-Base Breakdown Voltage | BV _{CB0} | -50 | — | — | V | I _C = -100μA, I _B = 0 |
| Collector-Emitter Breakdown Voltage | BV _{CEO} | -45 | — | — | V | I _C = -10mA, I _B = 0 |
| Emitter-Base Breakdown Voltage | BV _{EBO} | -5 | — | — | V | I _E = -100μA, I _C = 0 |
| DC Current Gain | h _{FE} | 220 | — | 475 | — | V _{CE} = -5.0V, I _C = -2.0mA |
| Collector-Emitter Saturation Voltage | V _{CE(SAT)} | — | — | -100 -400 | mV | I _C = -10mA, I _B = -0.5mA I _C = -100mA, I _B = -5.0mA |
| Base-Emitter Saturation Voltage | V _{BE(SAT)} | — | -700 | — | mV | I _C = -10mA, I _B = -0.5mA |
| Base-Emitter Voltage | V _{BE(ON)} | -580 | -665 | -750 | mV | V _{CE} = -5.0V, I _C = -2.0mA |
| Collector-Cutoff Current | I _{CB0} | — | — | -15 -4.0 | nA μA | V _{CB} = -30V V _{CB} = -30V, T _A = +150°C |
| Emitter Cutoff Current | I _{EBO} | — | — | -100 | nA | V _{EB} = -5.0V, I _C = 0 |
| Gain Bandwidth Product | f _T | 100 | — | — | MHz | V _{CE} = -5.0V, I _C = -10mA, f = 100MHz |
| Collector-Base Capacitance | C _{CB0} | — | 2 | 3 | pF | V _{CB} = -10V, f = 1.0MHz |
| Emitter-Base Capacitance | C _{EBO} | — | 11 | — | pF | V _{EB} = -0.5V, f = 1.0MHz |

- Notes:
6. For the device mounted on minimum recommended pad layout FR-4 PCB with high coverage of single sided 1oz copper, in still air conditions; the device is measured when operating in a steady-state condition.
 7. Short duration pulse test used to minimize self-heating effect.

Typical Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

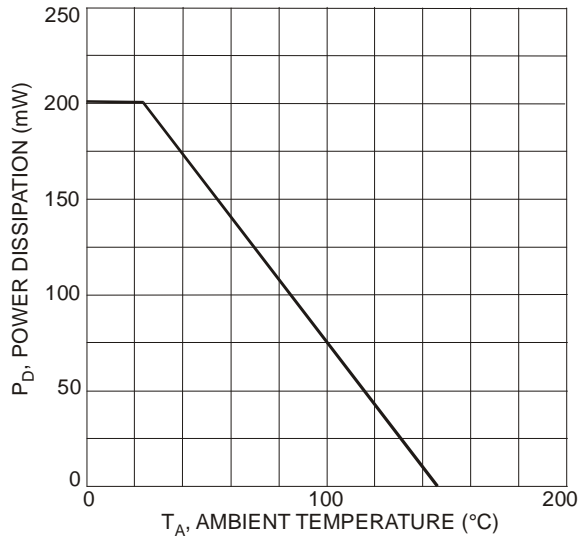


Fig. 1 Power Dissipation vs. Ambient Temperature

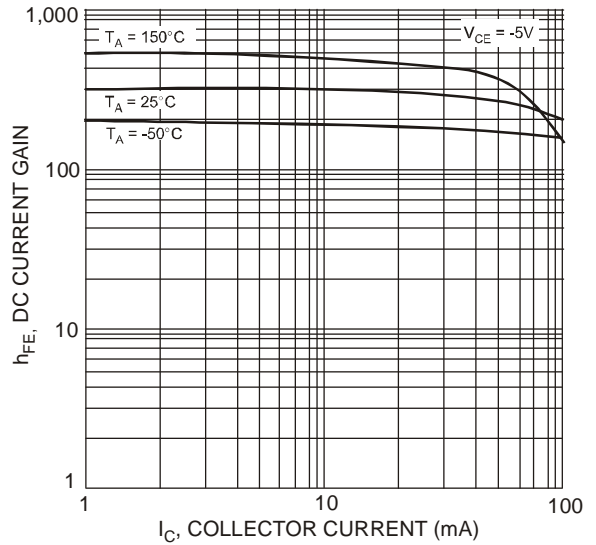


Fig. 2 Typical DC Current Gain vs. Collector Current

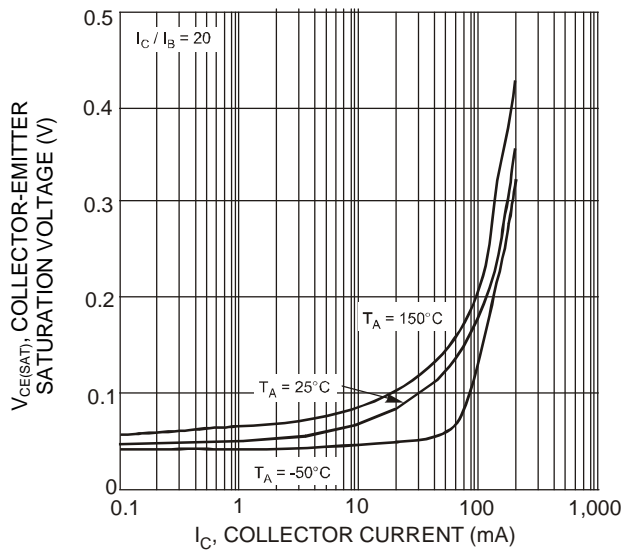


Fig. 3 Typical Collector-Emitter Saturation Voltage vs. Collector Current

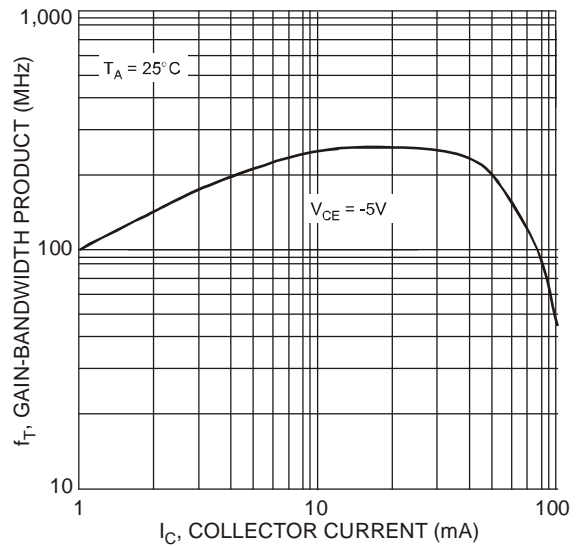
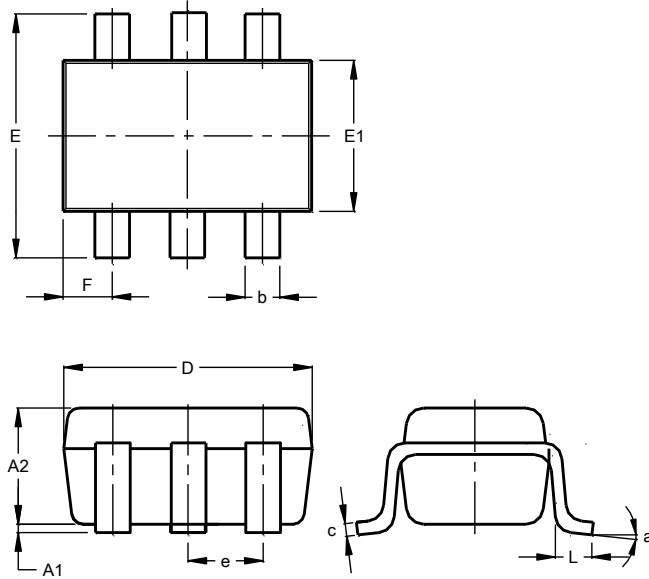


Fig. 4 Typical Gain-Bandwidth Product vs. Collector Current

Package Outline Dimensions

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

SOT363

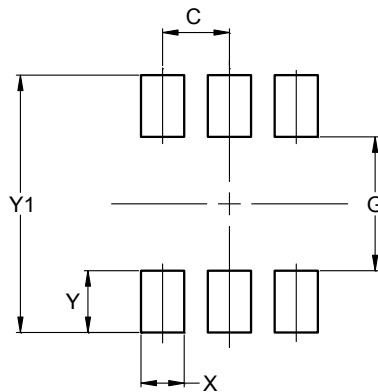


| SOT363 | | | |
|----------------------|-----------|------|-------|
| Dim | Min | Max | Typ |
| A1 | 0.00 | 0.10 | 0.05 |
| A2 | 0.90 | 1.00 | 1.00 |
| b | 0.10 | 0.30 | 0.25 |
| c | 0.10 | 0.22 | 0.11 |
| D | 1.80 | 2.20 | 2.15 |
| E | 2.00 | 2.20 | 2.10 |
| E1 | 1.15 | 1.35 | 1.30 |
| e | 0.650 BSC | | |
| 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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