

480V NPN HIGH VOLTAGE POWER TRANSISTOR

Features

- $BV_{CEO} > 480V$
- $BV_{CES} > 700V$
- $BV_{EBO} > 10V$
- $I_C = 50mA$ High Collector Current
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

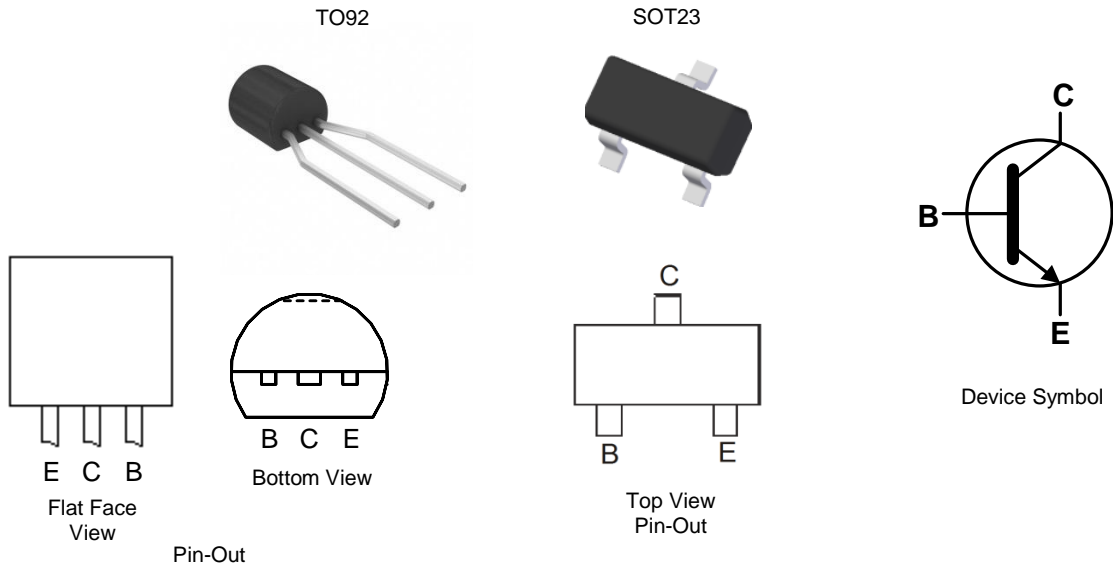
Application

Low Power AC-DC SMPS for:

- Battery Chargers for Mobile Phone / Tablets / Smartphones
- Power Supply for DVD / STB LED Lighting

Mechanical Data

- Case: TO92 or SOT23
- Case Material: Molded Plastic, "Green" Molding Compound; UL Flammability Classification Rating 94V-0
- Terminals: Matte Tin Finish; Solderable per MIL-STD-202, Method 208^{e3}
- Weight: TO92: 200mg (Approximate)
SOT23: 8mg (Approximate)

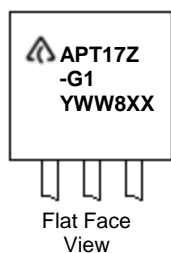


Ordering Information (Note 4)

| Product | Package | Marking | Quantity |
|-------------|---------------------|-----------|---------------------------|
| APT17ZTR-G1 | TO92 (Joggled Legs) | APT17Z-G1 | 2,000 Taped, per Ammo Box |
| APT17NTR-G1 | SOT23 | GD8 | 3,000 Taped, per 7" reel |

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

Marking Information



= Manufacturers' code marking
 APT17Z-G1 = Product Type Marking ID
 YWW = Date Code Marking
 e.g. 312 = Year 2013, Week 12
 8 = Assembly site code
 XX = Batch Number



= Manufacturers' code marking
 GD8 = Product Type Marking ID

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

| Characteristic | Symbol | Value | Unit |
|--|------------------|-------|------|
| Collector-Emitter Voltage (V _{BE} = 0V) | V _{CES} | 700 | V |
| Collector-Emitter Voltage | V _{CEO} | 480 | V |
| Emitter-Base Voltage | V _{EBO} | 10 | V |
| Continuous Collector Current | I _C | 50 | mA |
| Peak Pulse Collector Current | I _{CM} | 100 | mA |
| Continuous Base Current | I _B | 25 | mA |
| Peak Pulse Base Current | I _{BM} | 50 | mA |

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

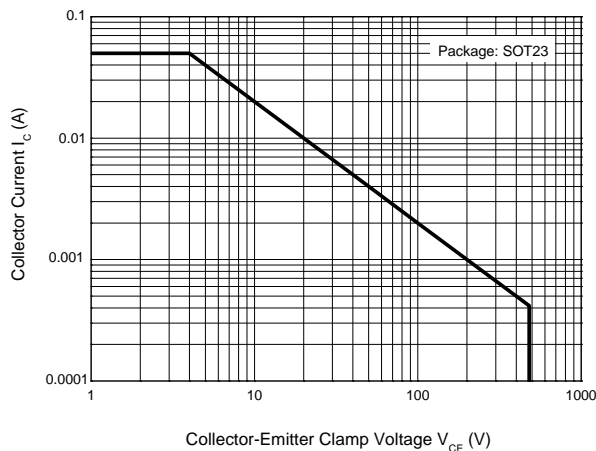
| Characteristic | Symbol | Value | Unit |
|---|-----------------------------------|-------------|------|
| Power Dissipation | P _D | For TO92 | 0.5 |
| | | For SOT23 | 0.2 |
| Thermal Resistance, Junction to Ambient Air | R _{θJA} | For TO92 | 250 |
| | | For SOT23 | 625 |
| Operating and Storage Temperature Range | T _J , T _{STG} | -55 to +150 | °C |

ESD Ratings (Note 5)

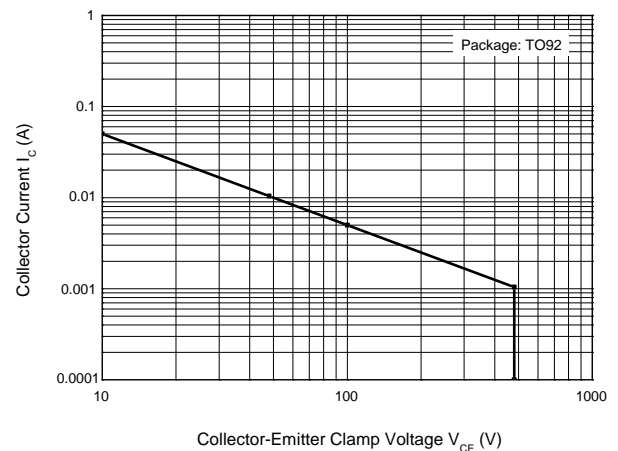
| Characteristic | Symbol | Value | Unit | JEDEC Class |
|--|---------|-------|------|-------------|
| Electrostatic Discharge - Human Body Model | ESD HBM | 8,000 | V | 3B |
| Electrostatic Discharge - Machine Model | ESD MM | 400 | V | C |

Note: 5. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

Safe Operating Area (@T_A = +25°C, unless otherwise specified.)



Safe Operating Areas



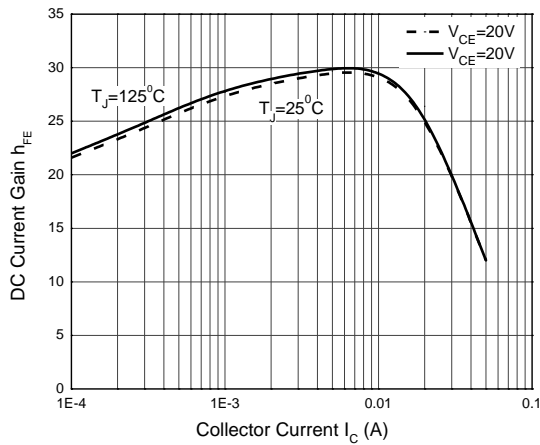
Safe Operating Areas

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

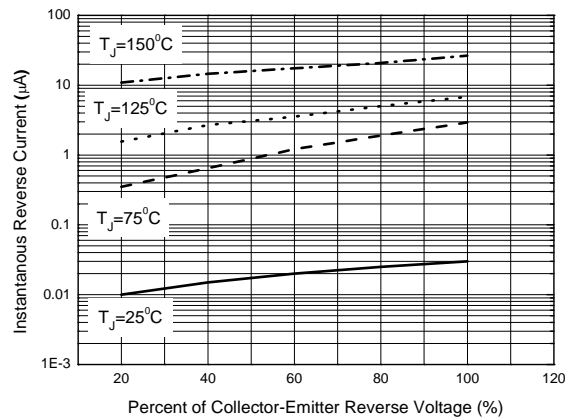
| Characteristic | Symbol | Min | Max | Unit | Test Condition |
|---|-------------------|------|------|------|---|
| Collector-Emitter Breakdown Voltage | BV _{CES} | 700 | — | V | I _C = 100μA, V _{BE} = 0V |
| Collector-Emitter Breakdown Voltage | BV _{CEO} | 480 | — | V | I _C = 300μA |
| Emitter-Base Breakdown Voltage | BV _{EBO} | 10 | — | V | I _E = 100μA |
| Collector Cutoff Current | I _{CEV} | — | 10 | μA | V _{CE} = 700V, V _{BE} = -1.5V |
| DC Current Transfer Static Ratio (Note 6) | h _{FE} | 21 | 36.5 | — | I _C = 100μA, V _{CE} = 20V |
| | | 24.5 | 35.5 | — | I _C = 500μA, V _{CE} = 20V |
| | | 20 | 45.5 | — | I _C = 10mA, V _{CE} = 20V |

Note: 6. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

Typical Electrical Characteristics



DC Current Gain

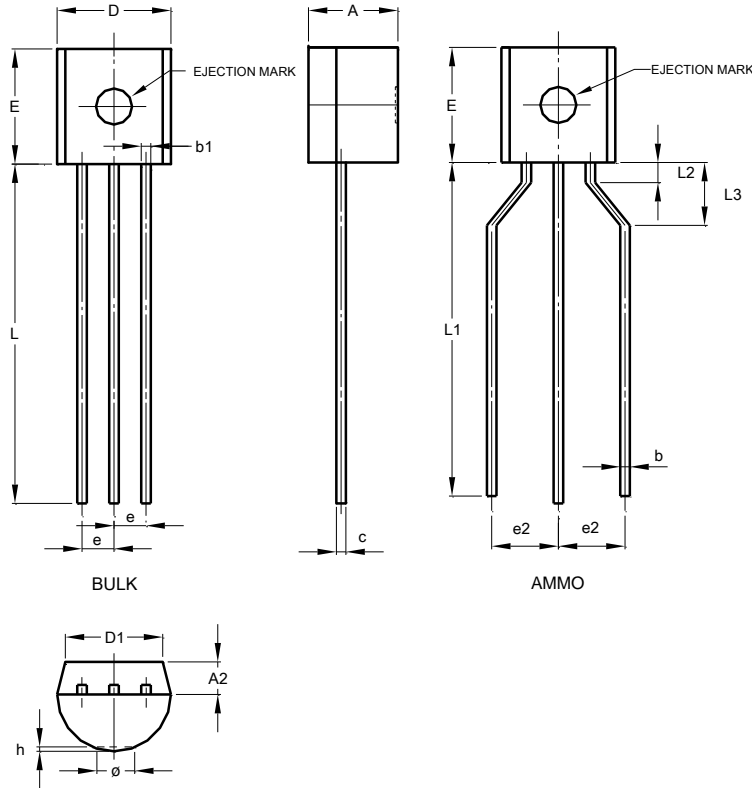


Typical Reverse Characteristics

Package Outline Dimensions

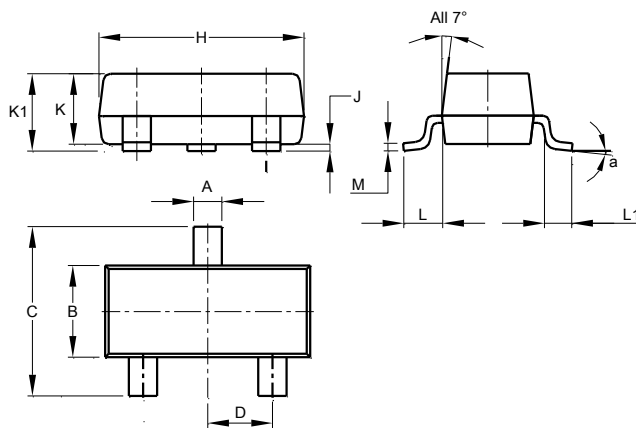
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.

(1) Package Type: TO92 Type C



| TO92 Type C | | | |
|----------------------|-------|-------|------|
| Dim | Min | Max | Typ |
| A | 3.30 | 3.70 | - |
| A ₂ | 1.10 | 1.40 | - |
| b | 0.38 | 0.55 | - |
| c | 0.36 | 0.51 | - |
| D | 4.40 | 4.70 | - |
| D ₁ | 3.430 | - | - |
| E | 4.30 | 4.70 | - |
| e | - | - | 1.27 |
| e ₂ | 2.440 | 2.640 | - |
| h | 0.00 | 0.38 | - |
| L | 14.10 | 14.50 | - |
| L ₁ | 12.50 | 14.50 | - |
| L ₃ | 2.50 | 3.50 | - |
| ø | - | 1.60 | - |
| All Dimensions in mm | | | |

(2) Package Type: SOT23

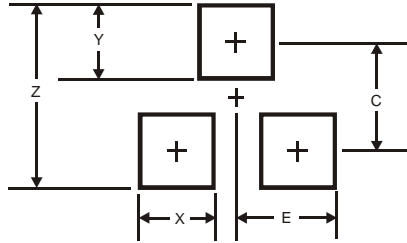


| SOT23 | | | |
|----------------------|-------|-------|-------|
| Dim | Min | Max | Typ |
| A | 0.37 | 0.51 | 0.40 |
| B | 1.20 | 1.40 | 1.30 |
| C | 2.30 | 2.50 | 2.40 |
| D | 0.89 | 1.03 | 0.915 |
| F | 0.45 | 0.60 | 0.535 |
| G | 1.78 | 2.05 | 1.83 |
| H | 2.80 | 3.00 | 2.90 |
| J | 0.013 | 0.10 | 0.05 |
| K | 0.890 | 1.00 | 0.975 |
| K ₁ | 0.903 | 1.10 | 1.025 |
| L | 0.45 | 0.61 | 0.55 |
| L ₁ | 0.25 | 0.55 | 0.40 |
| M | 0.085 | 0.150 | 0.110 |
| a | 8° | | |
| All Dimensions in mm | | | |

Suggested Pad Layout

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.

(1) Package Type: SOT23



| Dimensions | Value (in mm) |
|------------|---------------|
| Z | 2.9 |
| X | 0.8 |
| Y | 0.9 |
| C | 2.0 |
| E | 1.35 |

Note: For high voltage applications, the appropriate industry sector guidelines should be considered with regards to voltage spacing between terminals.

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