

Features

- $BV_{CEO} > 530V$
- $BV_{CES} > 900V$
- $BV_{EBO} > 10V$
- $I_C = 1.5A$ high Continuous Collector Current
- High Switching Speed
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

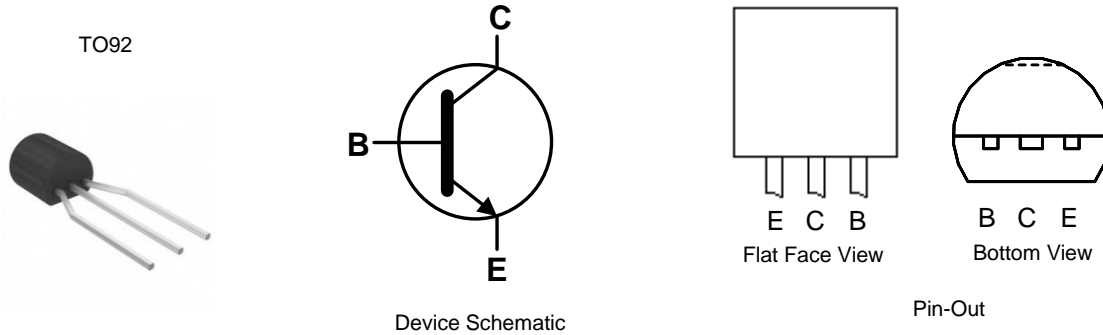
Applications

Low Power AC-DC SMPS for:

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

Mechanical Data

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

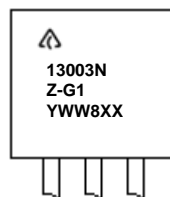


Ordering Information (Note 4)

| Product | Package | Marking | Quantity |
|-----------------|---------------------|------------|---------------------------|
| APT13003NZTR-G1 | TO92 (Joggled Legs) | 13003NZ-G1 | 2,000 Taped, per Ammo Box |

- Notes:
1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
 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



Flat Face View

- = Manufacturers' Code Marking
 13003NZ-G1 = Product Type Marking ID
 YWW = Date Code Marking
 e.g. 512 = Year 2015, Week 12.
 8 = Assembly Site Code
 XX = Batch Number

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

| Characteristic | Symbol | Value | Unit |
|--|------------------|-------|------|
| Collector-Emitter Voltage (V _{BE} = 0V) | V _{CES} | 900 | V |
| Collector-Emitter Voltage | V _{CEO} | 530 | V |
| Emitter-Base Voltage | V _{EBO} | 10 | V |
| Continuous Collector Current | I _C | 1.5 | A |
| Peak Pulse Collector Current | I _{CM} | 3 | A |
| Continuous Base Current | I _B | 0.75 | A |
| Peak Pulse Base Current | I _{BM} | 1.5 | A |

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

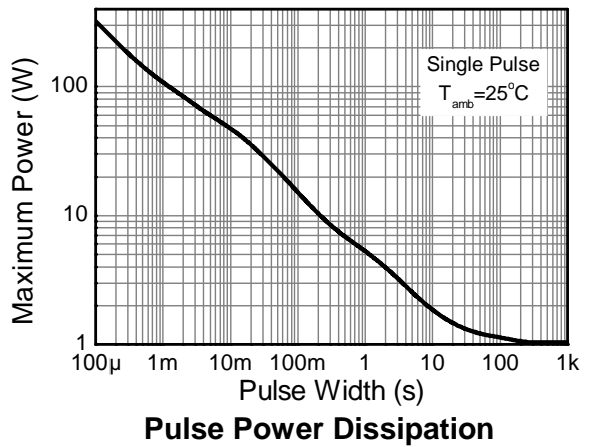
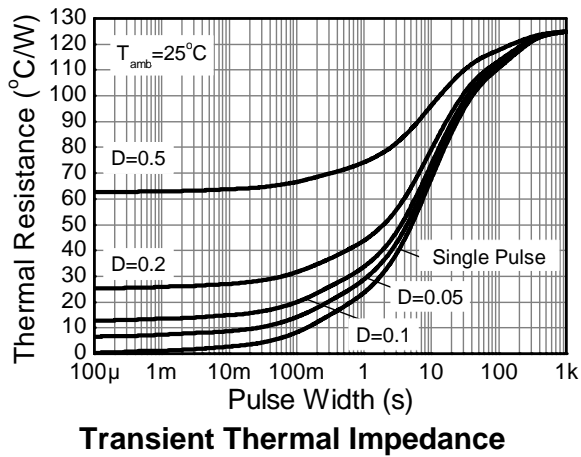
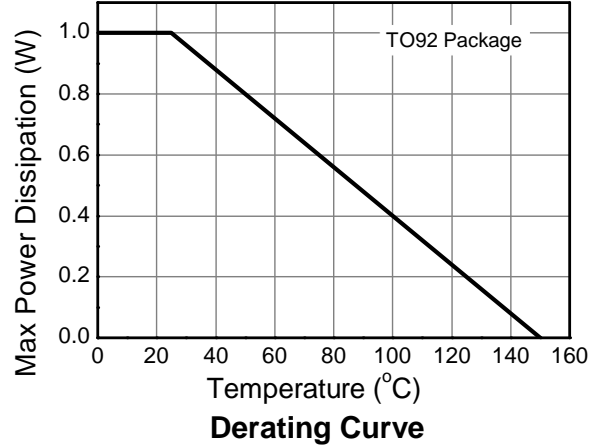
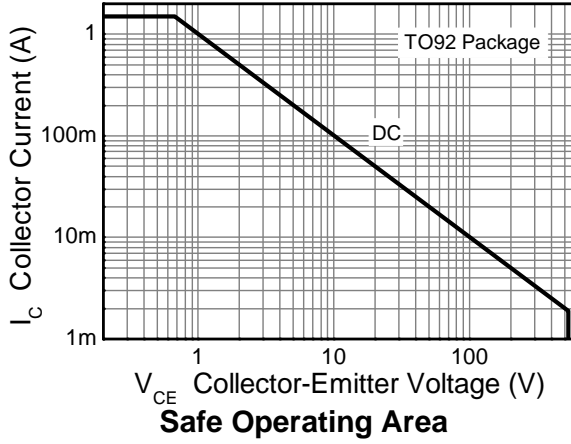
| Characteristic | Symbol | Value | Unit |
|---|-----------------------------------|-------------|------|
| Power Dissipation | P _D | 1.0 | W |
| Thermal Resistance, Junction to Ambient Air | R _{θJA} | 125 | °C/W |
| Thermal Resistance, Junction to Case | R _{θJC} | 83.3 | °C/W |
| Operating and Storage 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.

Thermal Characteristics and Derating Information (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

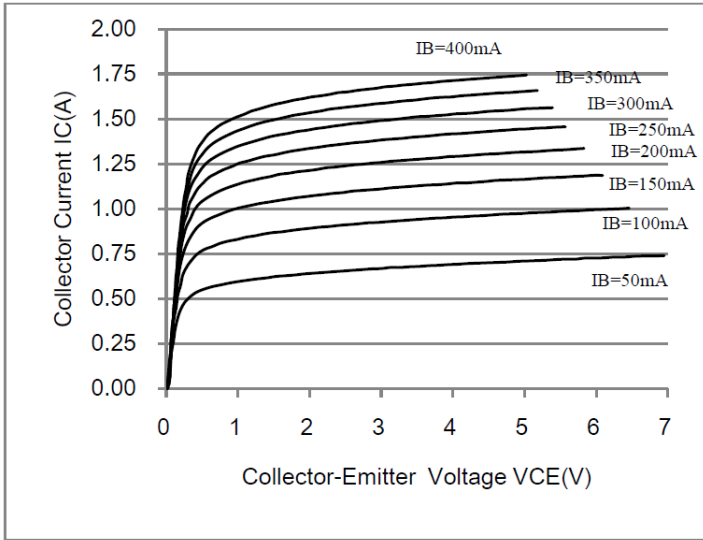


Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

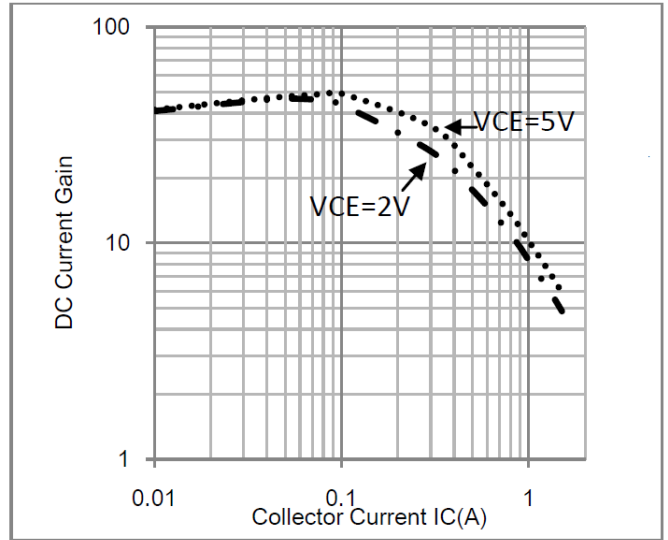
| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|---|----------------------|---------|--------------|------------|--------|--|
| Collector-Emitter Breakdown Voltage | BV _{CES} | 900 | — | — | V | I _C = 100μA, V _{BE} = 0V |
| Collector-Emitter Breakdown Voltage | BV _{CEO} | 530 | — | — | V | I _C = 100μA |
| Emitter-Base Breakdown Voltage | BV _{EBO} | 10 | — | — | V | I _E = 100μA |
| Collector Cutoff Current | I _{CEV} | — | — | 10 | μA | V _{CE} = 900V |
| DC Current Transfer Static Ratio (Note 6) | h _{FE} | 15 5 | 17 — | 30 25 | — — | I _C = 0.5A, V _{CE} = 2V I _C = 1.0A, V _{CE} = 2V |
| Collector-Emitter Saturation Voltage (Note 6) | V _{CE(SAT)} | — — | 0.17 0.30 | 0.3 0.4 | V | I _C = 0.5A, I _B = 0.1A I _C = 1A, I _B = 0.25A |
| Base-Emitter Saturation Voltage (Note 6) | V _{BE(SAT)} | — — | — — | 1.0 1.2 | V | I _C = 0.5A, I _B = 0.1A I _C = 1A, I _B = 0.25A |
| Transition Frequency | f _T | 4 | — | — | MHz | I _C = 0.1A, V _{CE} = 10V |
| Turn-on Time with Resistive Load | t _{ON} | — | — | 1 | μs | I _C = 1A, V _{CC} = 125V, I _{B1} = 0.2A, I _{B2} = -0.2A, t _p = 25μs |
| Storage Time with Resistive Load | t _S | — | — | 3.5 | | |
| Fall Time with Resistive Load | t _F | — | — | 0.65 | | |

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

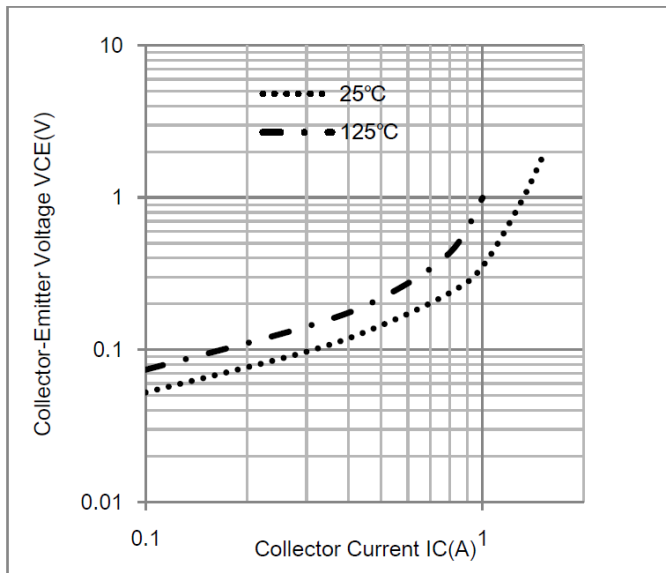
Typical Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)



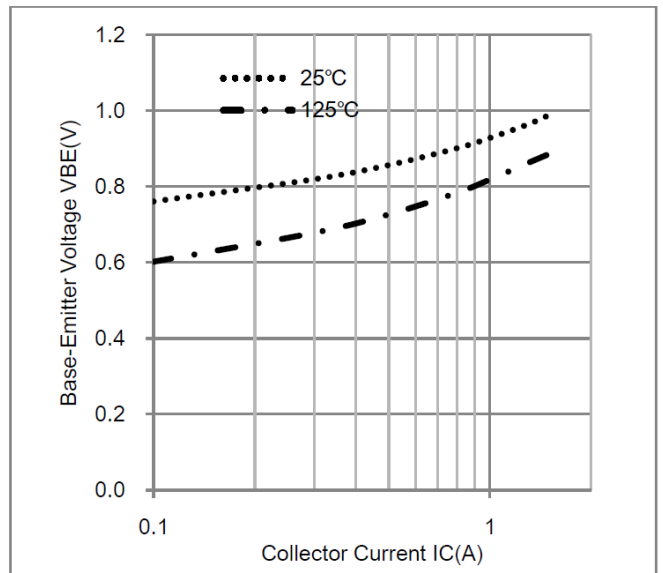
Static Characteristics



DC Current Gain



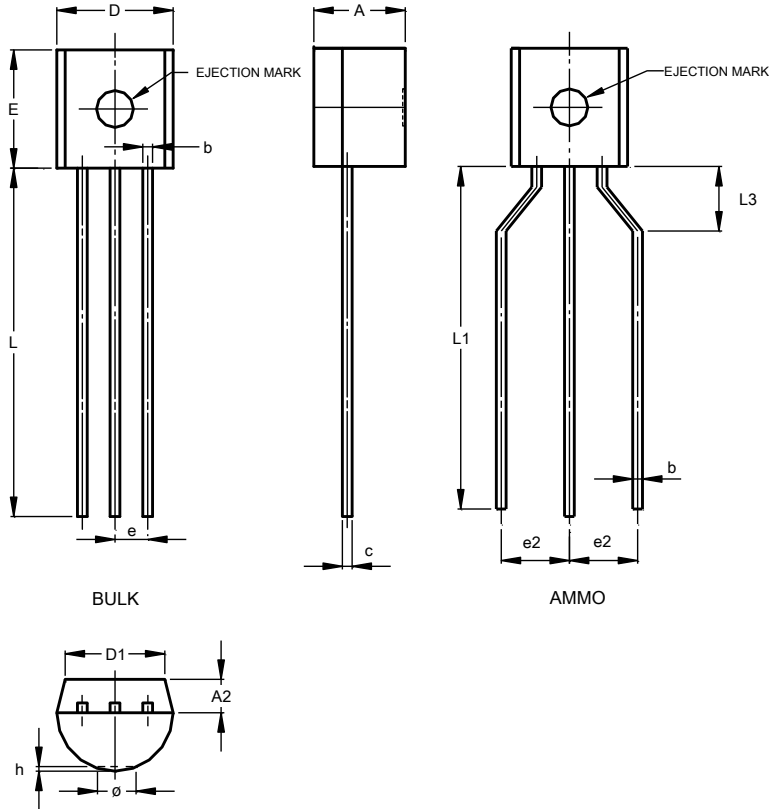
Collector-Emitter Saturation Region



Base-Emitter Saturation Voltage

Package Outline Dimensions

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



| TO92 Type C | | | |
|----------------------|-------|-------|------|
| Dim | Min | Max | Typ |
| A | 3.30 | 3.70 | - |
| A2 | 1.00 | 1.40 | - |
| b | 0.36 | 0.76 | - |
| c | 0.32 | 0.51 | - |
| D | 4.40 | 4.80 | - |
| D1 | 3.430 | - | - |
| E | 4.30 | 4.70 | - |
| e | - | - | 1.27 |
| e2 | - | - | 2.54 |
| h | 0.00 | 0.38 | - |
| L | 12.50 | 15.50 | - |
| L1 | 12.50 | 14.50 | - |
| L3 | 2.50 | 4.00 | - |
| ø | - | 1.60 | - |
| All Dimensions in mm | | | |

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

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