

**450V NPN HIGH VOLTAGE POWER TRANSISTOR**

**Features**

- $BV_{CEO} > 450V$
- $BV_{CES} > 700V$
- $BV_{EBO} > 9V$
- $I_C = 0.8A$  high Continuous Collector Current
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

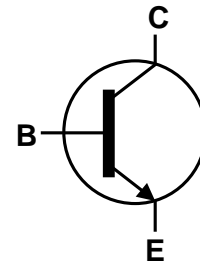
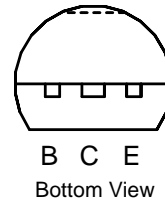
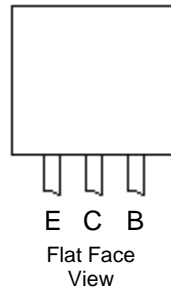
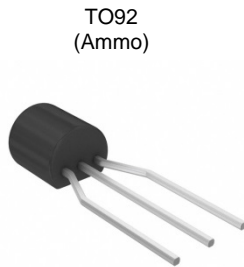
**Applications**

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: TO92: 200mg (Approximate)



Pin-Out

**Ordering Information** (Note 4)

Product	Package	Marking	Quantity
APT13003LZTR-G1	TO92 (Joggled Legs)	13003LZ-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](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
- 13003LZ-G1 = Product Type Marking ID
- YWW = Date Code Marking  
e.g. 312 = Year 2013, Week 12
- 8 = Assembly site code
- XX = Batch Number

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

Characteristic	Symbol	Value	Unit
Collector-Emitter Voltage (V <sub>BE</sub> = 0V)	V <sub>CES</sub>	700	V
Collector-Emitter Voltage	V <sub>CEO</sub>	450	V
Emitter-Base Voltage	V <sub>EBO</sub>	9	V
Continuous Collector Current	I <sub>C</sub>	0.8	A
Peak Pulse Collector Current	I <sub>CM</sub>	1.6	A
Continuous Base Current	I <sub>B</sub>	0.4	A
Peak Pulse Base Current	I <sub>BM</sub>	0.8	A

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

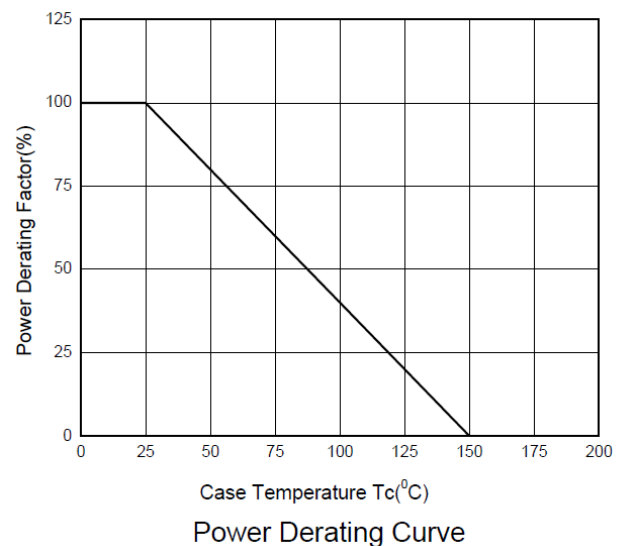
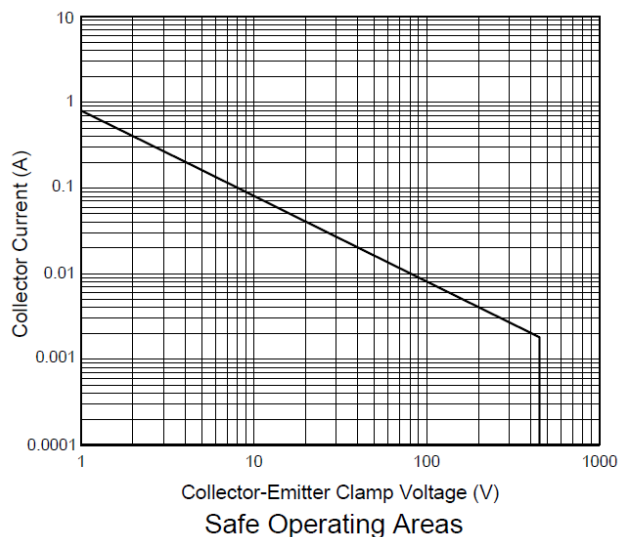
Characteristic	Symbol	Value	Unit
Power Dissipation	P <sub>D</sub>	0.8	W
Thermal Resistance, Junction to Ambient Air	R <sub>θJA</sub>	156.25	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

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

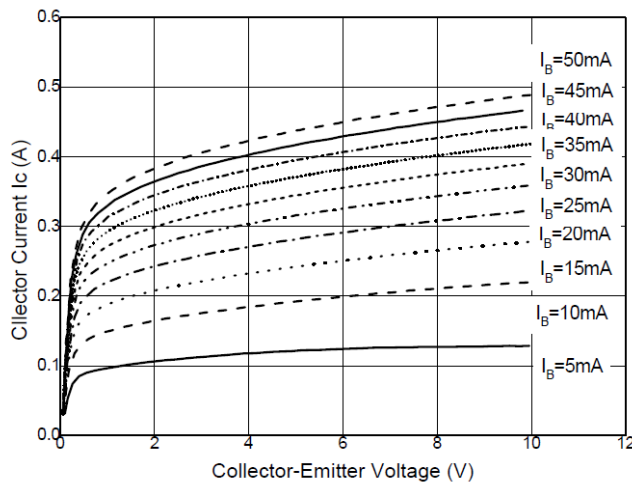


**Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

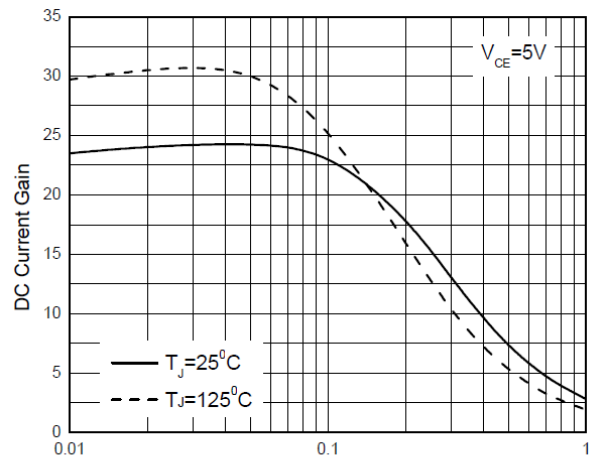
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Emitter Voltage	$V_{CEs}$	700	—	—	V	$I_C = 100\mu\text{A}$ , $V_{BE} = 0\text{V}$
Collector-Emitter Breakdown Voltage	$V_{CEO}$	450	—	—	V	$I_C = 100\mu\text{A}$
Emitter-Base Breakdown Voltage	$V_{EBO}$	9	—	—	V	$I_E = 100\mu\text{A}$
Collector Cutoff Current	$I_{CEV}$	—	—	10	$\mu\text{A}$	$V_{CE} = 700\text{V}$ , $V_{BE} = -1.5\text{V}$
DC current transfer Static ratio (Note 6)	$h_{FE}$	15	23	40	—	$I_C = 100\text{mA}$ , $V_{CE} = 10\text{V}$
		6	15	30	—	$I_C = 300\text{mA}$ , $V_{CE} = 10\text{V}$
Collector-Emitter Saturation Voltage (Note 6)	$V_{CE(sat)}$	—	—	0.5	V	$I_C = 200\text{mA}$ , $I_B = 40\text{mA}$

Note: 6. Measured under pulsed conditions. Pulse width  $\leq 300\mu\text{s}$ . Duty cycle  $\leq 2\%$ .

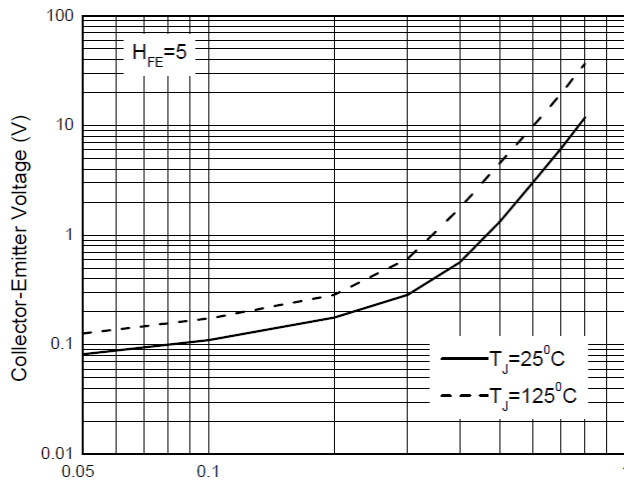
**Typical Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)



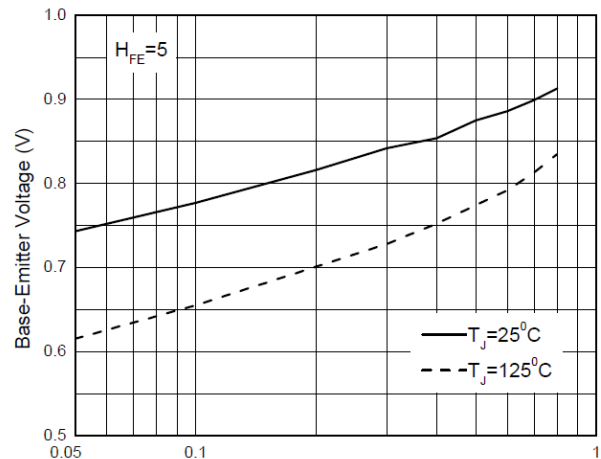
Static Characteristics



DC Current Gain



Collector-Emitter Saturation Region

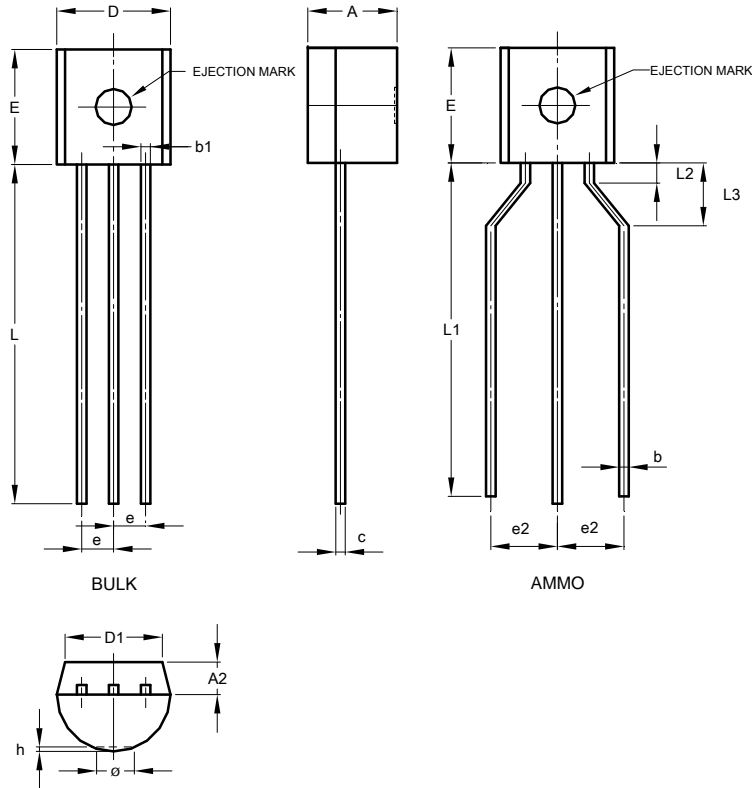


Base-Emitter Saturation Voltage

## Package Outline Dimensions

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

### T092 Type C



T092 Type C			
Dim	Min	Max	Typ
A	3.30	3.70	-
A2	1.10	1.40	-
b	0.38	0.55	-
c	0.36	0.51	-
D	4.40	4.70	-
D1	3.430	-	-
E	4.30	4.70	-
e	-	-	1.27
e2	2.440	2.640	-
h	0.00	0.38	-
L	14.10	14.50	-
L1	12.50	14.50	-
L3	2.50	3.50	-
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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### Наши контакты:

**Телефон:** +7 812 627 14 35

**Электронная почта:** [sales@st-electron.ru](mailto:sales@st-electron.ru)

**Адрес:** 198099, Санкт-Петербург,  
Промышленная ул, дом № 19, литера Н,  
помещение 100-Н Офис 331