

#### 530V NPN HIGH VOLTAGE POWER TRANSISTOR IN TO92

### **Features**

- BV<sub>CEO</sub> > 530V
- BV<sub>CES</sub> > 900V
- BV<sub>EBO</sub> > 10V
- I<sub>C</sub> = 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)

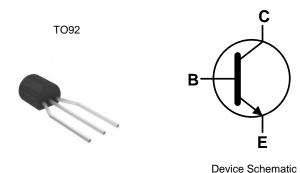
## **Applications**

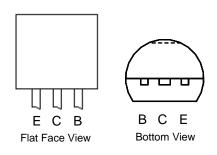
Low Power AC-DC SMPS for:

- 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 <sup>3</sup>
- Weight: 200mg (Approximate)





Pin-Out

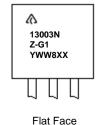
## **Ordering Information** (Note 4)

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**



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<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Emitter Voltage (V <sub>BE</sub> = 0V)	V <sub>CES</sub>	900	V
Collector-Emitter Voltage	V <sub>CEO</sub>	530	V
Emitter-Base Voltage	V <sub>EBO</sub>	10	V
Continuous Collector Current	Ic	1.5	Α
Peak Pulse Collector Current	I <sub>CM</sub>	3	Α
Continuous Base Current	I <sub>B</sub>	0.75	А
Peak Pulse Base Current	I <sub>BM</sub>	1.5	А

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

Characteristic	Symbol	Value	Unit
Power Dissipation	P <sub>D</sub>	1.0	W
Thermal Resistance, Junction to Ambient Air	R <sub>0JA</sub>	125	°C/W
Thermal Resistance, Junction to Case	Rejc	83.3	°C/W
Operating and Storage Temperature Range	$T_{J,}T_{STG}$	-55 to +150	°C

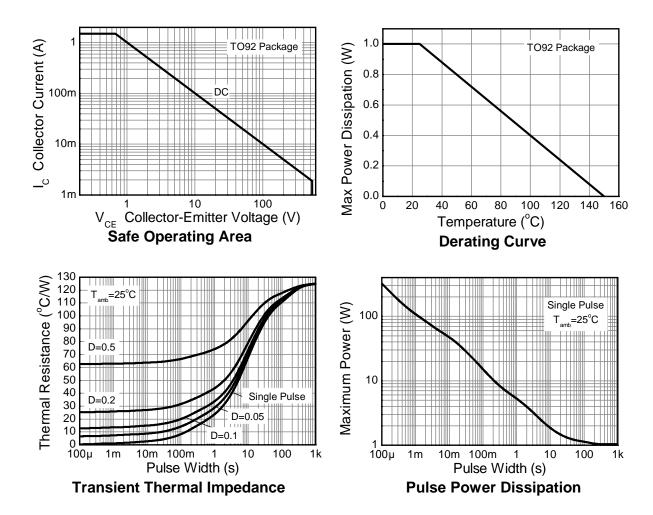
# ESD Ratings (Note 5)

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	С

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



## Thermal Characteristics and Derating Information (@TA = +25°C, unless otherwise specified.)





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

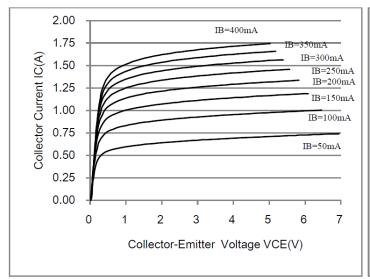
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition
Collector-Emitter Breakdown Voltage	BV <sub>CES</sub>	900	_	_	V	$I_C = 100 \mu A, V_{BE} = 0 V$
Collector-Emitter Breakdown Voltage	$BV_{CEO}$	530	_	_	V	$I_C = 100\mu A$
Emitter-Base Breakdown Voltage	$BV_{EBO}$	10	_	_	V	$I_E = 100\mu A$
Collector Cutoff Current	I <sub>CEV</sub>	_	_	10	μΑ	V <sub>CE</sub> = 900V
DC Current Transfer Static Ratio (Note 6)	h <sub>FE</sub>	15 5	17 —	30 25	1 1	$I_C = 0.5A, V_{CE} = 2V$ $I_C = 1.0A, V_{CE} = 2V$
Collector-Emitter Saturation Voltage (Note 6)	V <sub>CE(SAT)</sub>	-	0.17 0.30	0.3 0.4	٧	$I_C = 0.5A$ , $I_B = 0.1A$ $I_C = 1A$ , $I_B = 0.25A$
Base-Emitter Saturation Voltage (Note 6)	V <sub>BE(SAT)</sub>		_ _	1.0 1.2	V	$I_C = 0.5A, I_B = 0.1A$ $I_C = 1A, I_B = 0.25A$
Transition Frequency	f <sub>T</sub>	4	_	_	MHz	I <sub>C</sub> = 0.1A, V <sub>CE</sub> = 10V
Turn-on Time with Resistive Load	ton	_	_	1		$I_C = 1A, V_{CC} = 125V, I_{B1} = 0.2A,$ $I_{B2} = -0.2A, t_p = 25\mu s$
Storage Time with Resistive Load	ts	_	_	3.5	μs	
Fall Time with Resistive Load	t <sub>F</sub>	_	_	0.65		1820.2Λ, φ - 20μ5

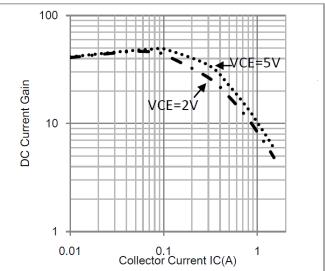
Note:

6. Measured under pulsed conditions. Pulse width  $\leq$  300 $\mu$ s. Duty cycle  $\leq$  2%.



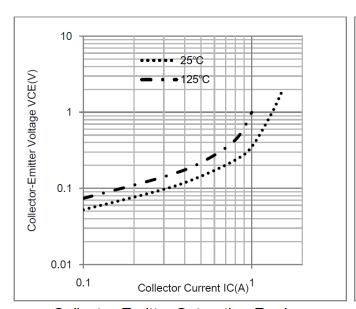
## Typical Electrical Characteristics (@T<sub>A</sub> = +25°C, unless otherwise specified.)

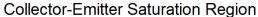


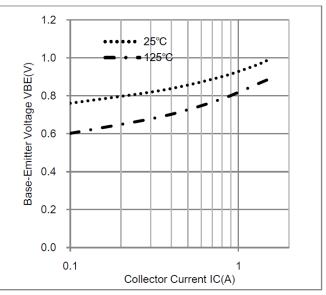


Static Characteristics

DC Current Gain





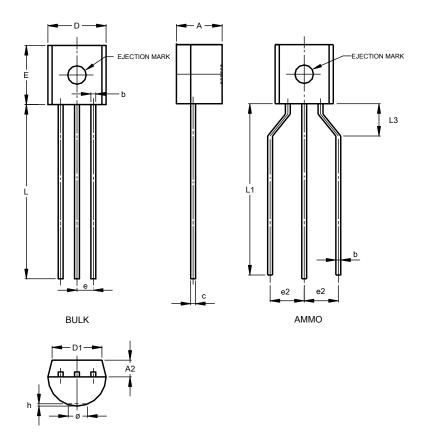


Base-Emitter Saturation Voltage



## **Package Outline Dimensions**

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



TO92 Type C					
Dim	Min	Max	Тур		
Α	3.30	3.70	-		
A2	1.00	1.40	-		
b	0.36	0.76	-		
С	0.32	0.51	-		
D	4.40	4.80	-		
D1	3.430	-	-		
Е	4.30	4.70	-		
е	-	-	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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