530V NPN HIGH VOLTAGE POWER TRANSISTOR IN TO92

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)**
- **For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/104/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please contact us or your local Diodes representative. https://www.diodes.com/quality/product-definitions/**

Mechanical Data

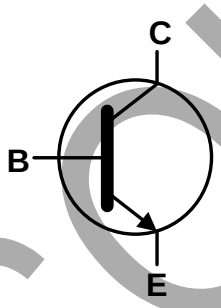
- Package: TO92
- Package Material: Molded Plastic, "Green" Molding Compound; UL Flammability Classification Rating 94V-0
- Terminals: Matte Tin Finish; Solderable per MIL-STD-202, Method 208 e3
- Weight: 200mg (Approximate)

Applications

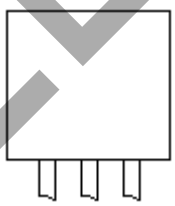
Low Power AC-DC SMPS for:

- Battery chargers for mobile phones / tablets / smartphones
- Power supplies for DVD / STB
- LED Lighting

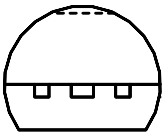
TO92



Device Schematic



Flat Face View



Bottom View

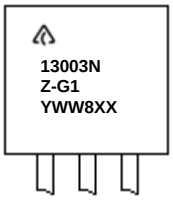
Pin-Out

Ordering Information (Note 4)

Part Number	Package	Marking	Packing	
			Qty.	Carrier
APT13003NZTR-G1	TO92 (Joggled Legs)	13003NZ-G1	2,000	Tape, per Ammo Box

Notes:
1. EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied.
2. See https://www.diodes.com/quality/lead-free/ 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 https://www.diodes.com/design/support/packaging/diodes-packaging/.

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.)

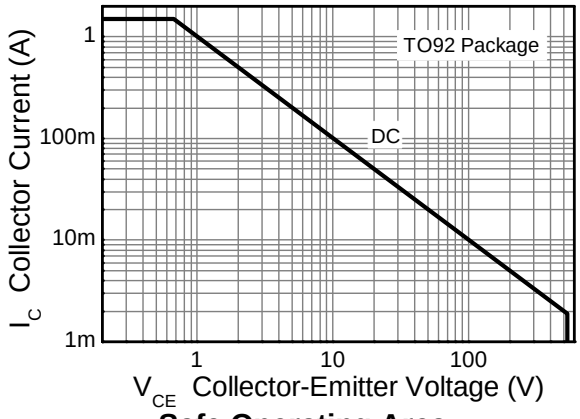
Characteristic	Symbol	Value	Unit
Power Dissipation	P_D	1.0	W
Thermal Resistance, Junction to Ambient Air	$R_{\theta JA}$	125	°C/W
Thermal Resistance, Junction to Case	$R_{\theta JC}$	83.3	°C/W
Operating and Storage Temperature Range	T_J,T_{STG}	-55 to +150	°C

ESD Ratings (Note 5)

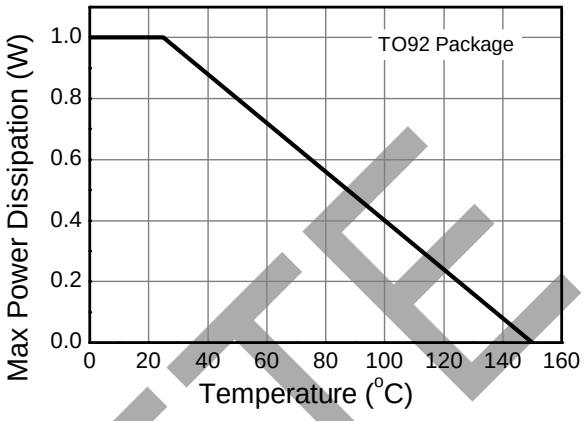
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	8,000	V	3B
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

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

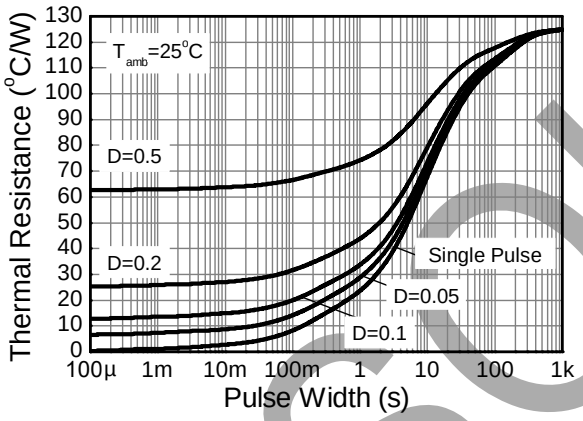
Thermal Characteristics and Derating Information (@T_A = +25°C, unless otherwise specified.)



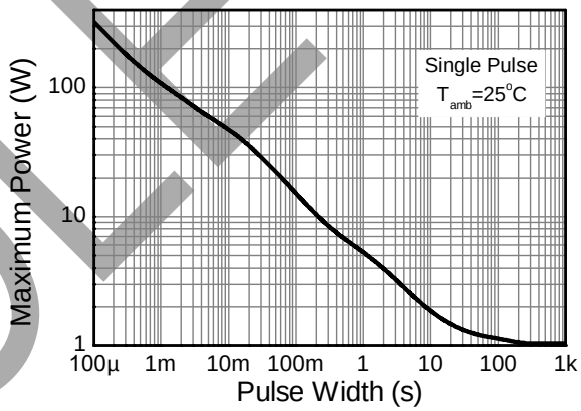
Safe Operating Area



Derating Curve



Transient Thermal Impedance



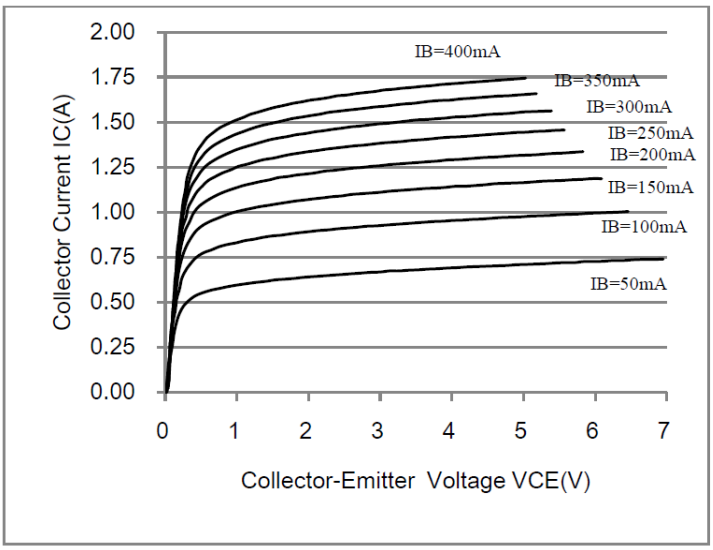
Pulse Power Dissipation

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

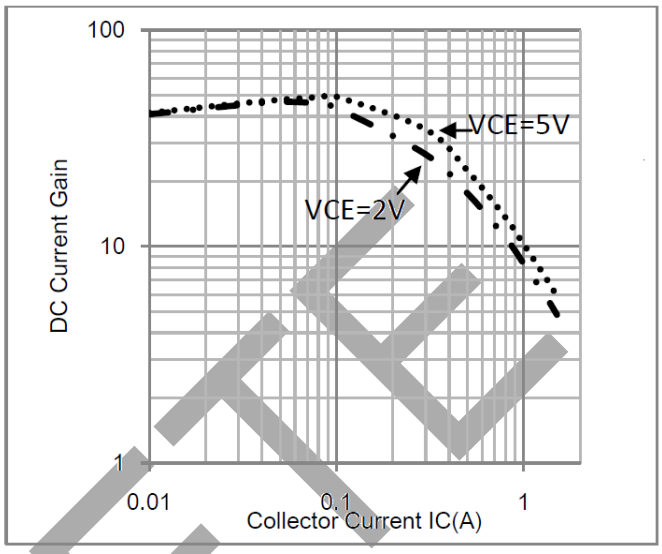
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Emitter Breakdown Voltage	BV_{CES}	900	—	—	V	I_C = 100μA, V_{BE} = 0V
Collector-Emitter Breakdown Voltage	BV_{CEO}	530	—	—	V	I_C = 100μA
Emitter-Base Breakdown Voltage	BV_{EBO}	10	—	—	V	I_E = 100μA
Collector Cutoff Current	I_{CEV}	—	—	10	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%.

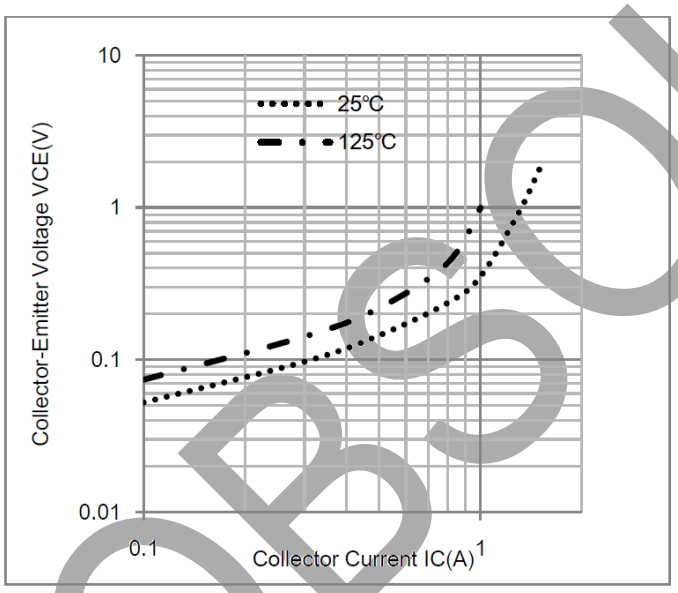
Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)



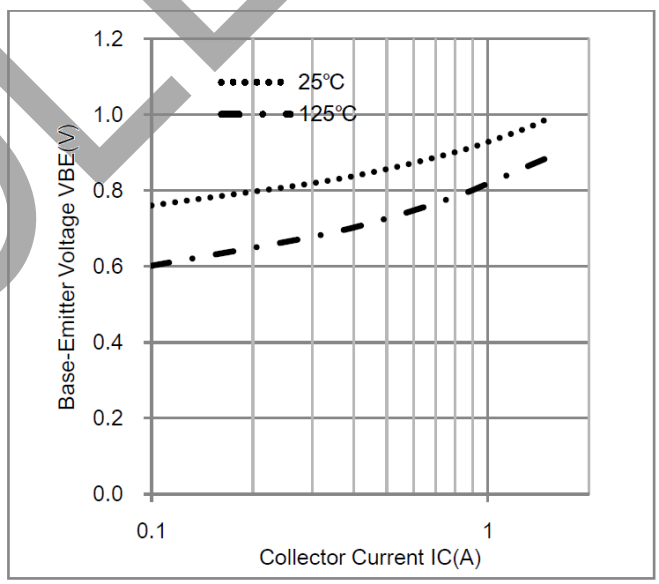
Static Characteristics



DC Current Gain



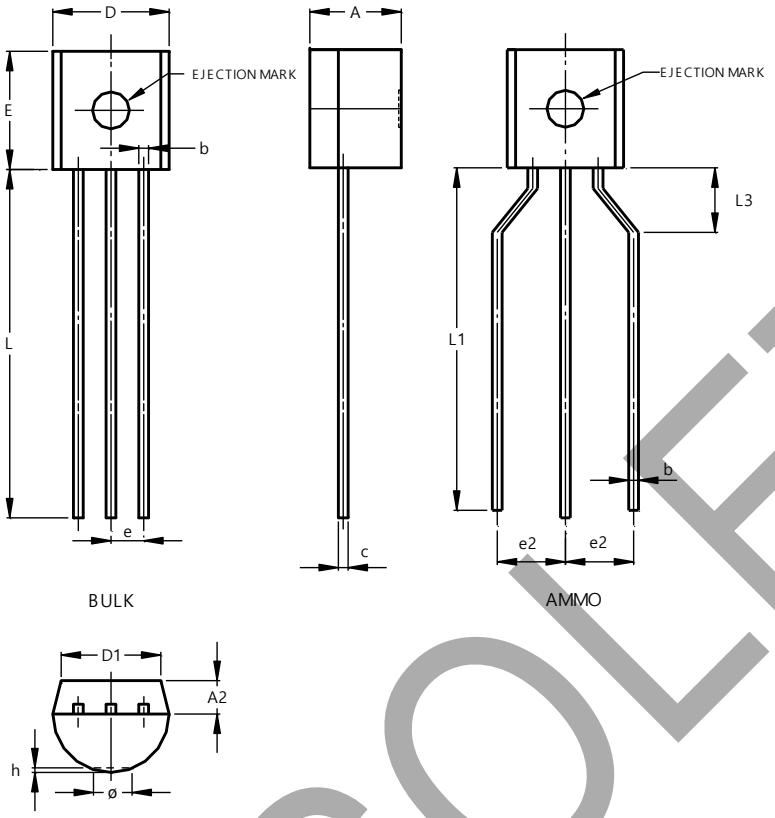
Collector-Emitter Saturation Region



Base-Emitter Saturation Voltage

Package Outline Dimensions

Please see http://www.diodes.com/package-outlines.html 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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