NPN SILICON PLANAR MEDIUM-POWER TRANSISTORS

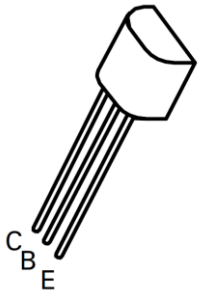
Features

- 60 Volt V_{CEO}
- 1 Amp Continuous Current
- P_{tot} = 1 Watt
- **Totally Lead-Free & Fully 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: E-Line
- Package Material: Molded Plastic, UL Flammability Rating 94V-0
- Terminals: Finish – Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.159 grams (Approximate)

E-Line (TO92 Compatible)



Ordering Information (Note 4)

Orderable Part Number	Status (Note 5)	Marking	Package	Reel Size (inches)	Tape Width (mm)	Packing	
						Qty.	Carrier
ZTX450	Active	ZTX450	E-Line	7	8	4,000	Reel
ZTX450STZ	NRND	ZTX450	E-Line	7	8	2,000	Reel
ZTX450Q	Obsolete	ZTX450	E-Line	N/A	N/A	N/A	N/A
ZTX451	NRND	ZTX451	E-Line	7	8	4,000	Reel
ZTX451STZ	NRND	ZTX451	E-Line	7	8	2,000	Reel

Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
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/.
5. NRND = Not Recommended for New Designs.

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Absolute Maximum Ratings

Parameter	Symbol	ZTX450	ZTX451	Unit
Collector-Base Voltage	V_{CBO}	60	80	V
Collector-Emitter Voltage	V_{CEO}	45	60	V
Emitter-Base Voltage	V_{EBO}	5		V
Peak Pulse Current	I_{CM}	2		A
Continuous Collector Current	I_C	1		A
Power Dissipation at T_{amb} = 25°C	P_{tot}	1		W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to 200		°C

Electrical Characteristics (@ T_{amb} = +25°C)

Parameter	Symbol	ZTX450		ZTX451		Unit	Conditions
		Min	Max	Min	Max		
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	60	—	80	—	V	I_C = 100µA
Collector-Emitter Sustaining Voltage	$V_{CEO(sus)}$	45	—	60	—	V	I_C = 10mA (Note 6)
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	5	—	5	—	V	I_E = 100µA
Collector Cutoff Current	I_{CBO}	— —	0.1 —	— —	— 0.1	µA	V_{CB} = 45V V_{CB} = 60V
Emitter Cutoff Current	I_{EBO}	—	0.1	—	0.1	µA	V_{EB} = 4V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	—	0.25	—	0.35	V	I_C = 150mA, I_B = 15mA (Note 6)
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	—	1.1	—	1.1	V	I_C = 150mA, I_B = 15mA (Note 6)
Static Forward Current Transfer Ratio	h_{FE}	100 15	300 —	50 10	150 —	—	I_C = 150mA, V_{CE} = 10V (Note 6) I_C = 1A, V_{CE} = 10V (Note 6)
Transition Frequency	f_T	150	—	150	—	MHz	I_C = 50mA, V_{CE} = 10V, f = 100MHz
Output Capacitance	C_{obo}	—	15	—	15	pF	V_{CB} = 10V, f = 1MHz

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

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Typical Characteristics

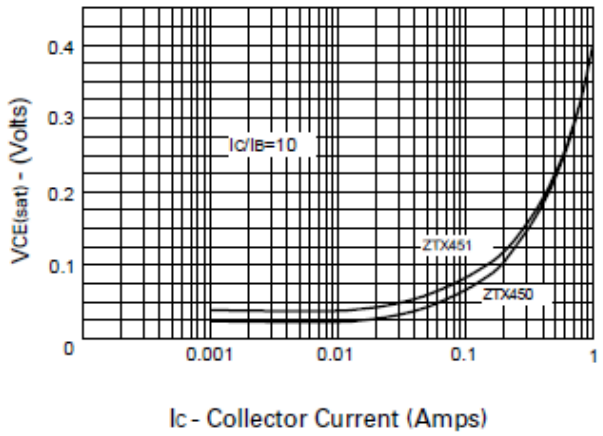


Figure 1. $V_{CE(sat)}$ vs. I_C

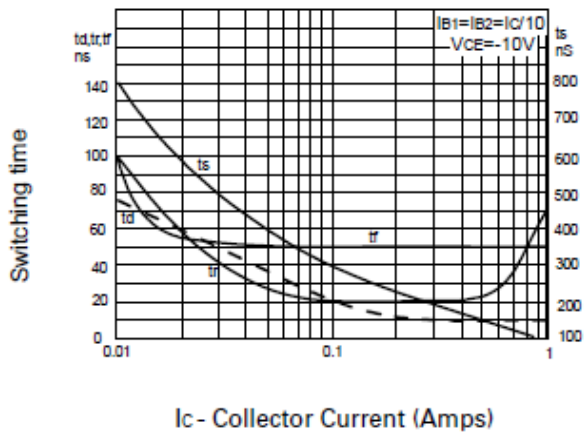


Figure 2. Typical Switching Speeds

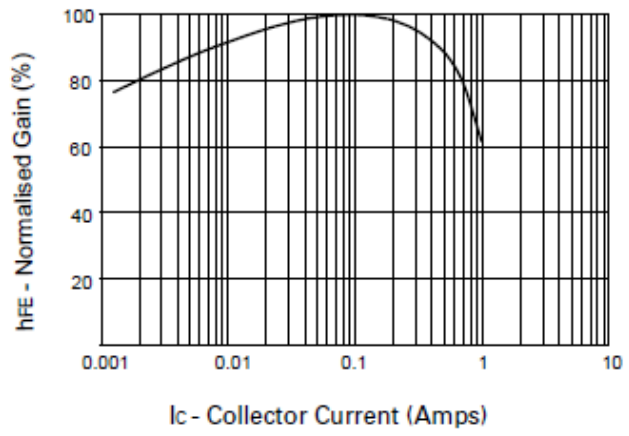


Figure 3. h_{FE} vs. I_C

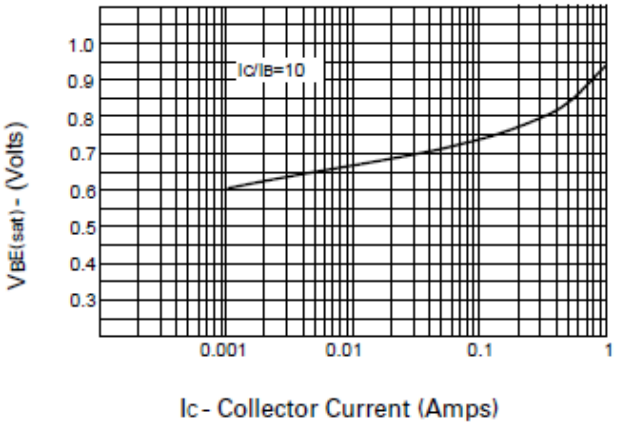


Figure 4. $V_{BE(sat)}$ vs. I_C

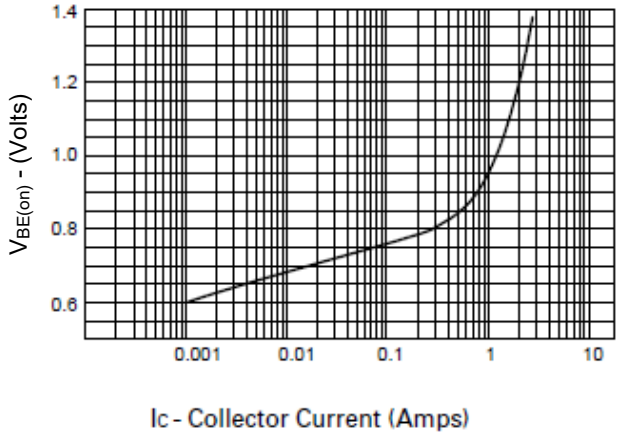


Figure 5. $V_{BE(on)}$ vs. I_C

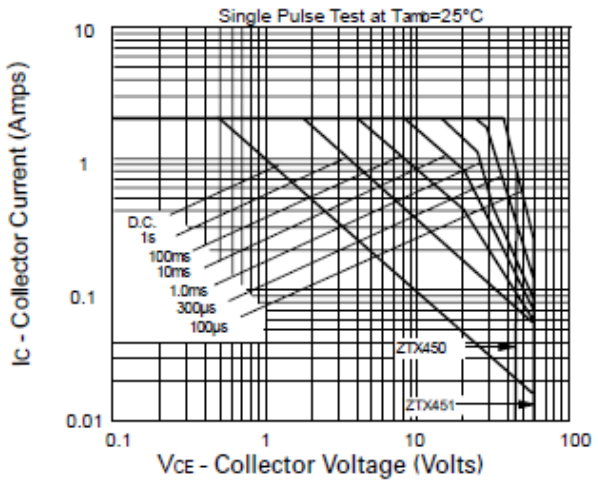


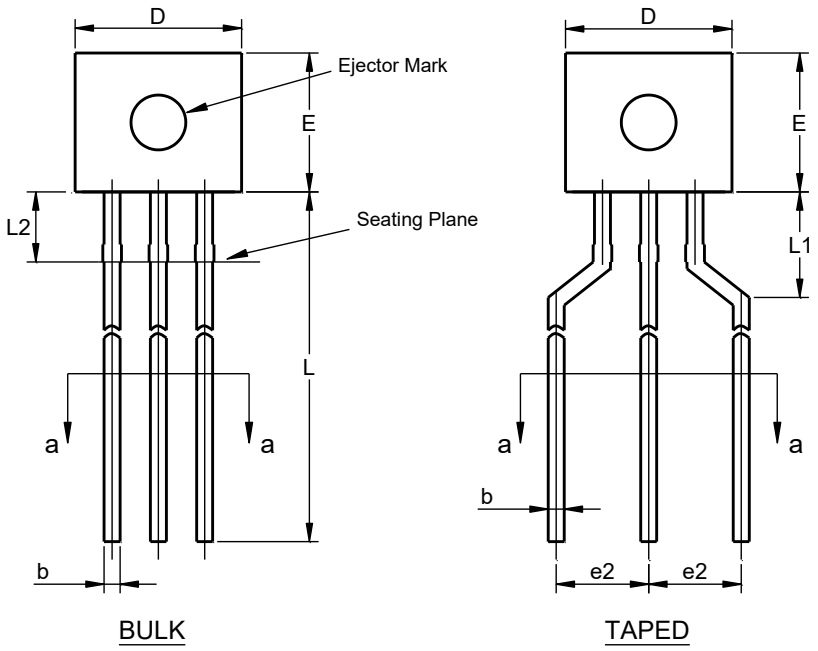
Figure 6. Safe Operating Area

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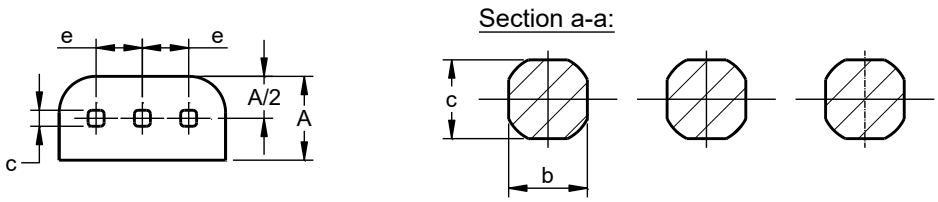
Package Outline Dimensions

Please see http://www.diodes.com/package-outlines.html for the latest version.

E-Line



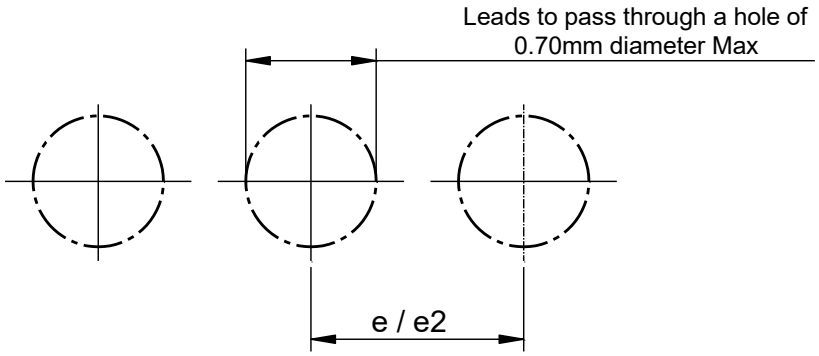
E-Line			
Dim	**Min**	**Max**	**Typ**
A	2.16	2.41	2.28
b	0.41	0.49	0.44
c	0.41	0.49	0.44
D	4.37	4.77	4.57
E	3.61	4.01	3.90
e	1.27 REF		
e2	2.54 REF		
L	13.00	13.97	13.50
L1	2.50	3.50	--
L2	--	--	2.50
All Dimensions in mm			



Suggested Pad Layout

Please see http://www.diodes.com/package-outlines.html for the latest version.

E-Line



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