



**Mechanical Data** 

Case: E-Line (TO-92 Compatible)

MIL-STD-202, Method 208 @3

Weight: 0.159 grams (approximate)

UL Flammability Classification Rating 94V-0

A Product Line of Diodes Incorporated

Case Material: molded plastic, "Green" Molding Compound

Terminals: Finish - Matte Tin Plated Leads, Solderable per



**ZTX1049A** 

#### 25V NPN MEDIUM POWER TRANSISTOR IN E-LINE

#### Features

- BV<sub>CEO</sub> > 25V
- I<sub>C</sub> = 4A High Continuous Collector Current
- I<sub>CM</sub> = 20A Peak Pulse Current
- T<sub>J</sub> up to 200°C for High Temperature Operation
- Low Saturation Voltage < 75mV @ 1A
- P<sub>D</sub> = 1W Power dissipation
- Lead-Free Finish; RoHS compliant (Note 1 & 2)

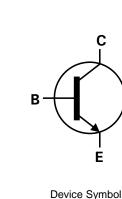
E-Line

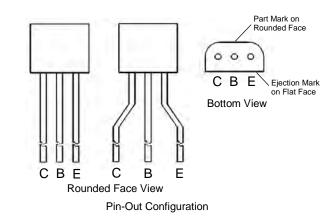
(TO-92 Compatible)

- Halogen and Antimony Free. "Green" Device (Note 3)
- Qualified to AEC-Q101 Standards for High Reliability

## **Applications**

- LCD Backlight Converters
- Emergency Lighting
- DC-DC Converters





#### Ordering Information (Note 4)

Flat Face View

Part Number	Marking	Case	Leads	Quantity
ZTX1049ASTZ	ZTX1049A	E-Line	Joggled	2,000 taped per Ammo Box
ZTX1049A	ZTX1049A	E-Line	Straight	4,000 loose in a Box

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

 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.

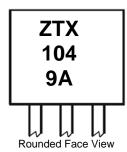
3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.

ZTX1049A = Product type Marking Code

4. For packaging details, go to our website at http://www.diodes.com/products/packages.html.

# **Marking Information**

Notes:



ZTX1049A Document number: DS33327 Rev. 5 - 2





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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CBO</sub>	80	V
Collector-Emitter Voltage	V <sub>CEO</sub>	25	V
Emitter-Base Voltage	V <sub>EBO</sub>	5	V
Continuous Collector Current	Ic	4	A
Peak Pulse Current	I <sub>CM</sub>	20	A
Base Current	IB	500	mA

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

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	PD	1.5	W
Power Dissipation (Note 6)	PD	1	W
Thermal Resistance Junction to Ambient (Note 5)	$R_{ ext{ heta}JA}$	116	°C/W
Thermal Resistance Junction to Ambient (Note 6)	R <sub>0JA</sub>	175	°C/W
Thermal Resistance Junction to Lead (Note 7)	R <sub>0JL</sub>	63.75	°C/W
Operating and Storage Temperature Range	TJ, TSTG	-55 to +200	°C

#### ESD Ratings (Note 8)

				•
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	≥ 4,000	V	ЗA
Electrostatic Discharge - Machine Model	ESD MM	≥ 400	V	С

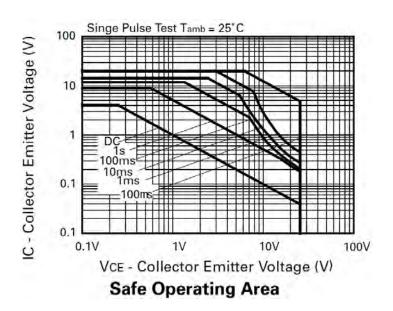
Notes: 5. For a through-hole device mounted at the seating plane (2.5mm lead length) with the collector lead on 25mm X 25mm 1oz weight copper that is on a single-sided FR4 PCB; device is measured under still air conditions whilst operating in a steady-state.

6. Same as note (5), except the device is mounted on minimum recommended pad layout with 12mm lead length from the bottom of package to the board.

7. Thermal resistance from junction to solder-point at the seating plane (2.5mm from the bottom of package along the collector lead).

8. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

## **Thermal Characteristics and Derating Information**

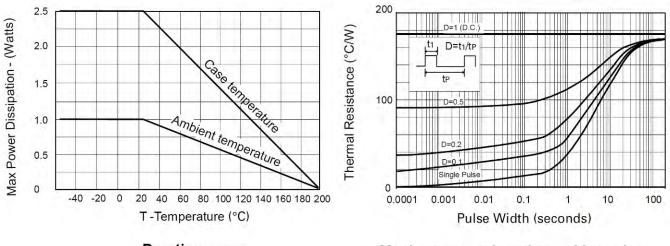




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**Derating curve** 

Maximum transient thermal impedance

Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV <sub>CBO</sub>	80	120	—	V	I <sub>C</sub> = 100μA
Collector-Emitter Breakdown Voltage	BV <sub>CES</sub>	80	120	—	V	I <sub>C</sub> = 100µA
Collector-Emitter Breakdown Voltage (Note 9)	BV <sub>CEO</sub>	25	30	—	V	$I_{\rm C} = 10 {\rm mA}$
Collector-Emitter Breakdown Voltage	BVCEV	80	120	—	V	$I_{C} = 100 \mu A, V_{EB} = 1 V$
Emitter-Base Breakdown Voltage	BV <sub>EBO</sub>	5	8.75	—	V	I <sub>E</sub> = 100μA
Collector Cut-off Current	I <sub>СВО</sub>	—	0.3	10	nA	$V_{CB} = 50V$
Collector Emitter Cut-off Current	ICES	—	0.3	10	nA	$V_{CES} = 50V$
Emitter Cut-off Current	I <sub>EBO</sub>	—	0.3	10	nA	$V_{EB} = 4V$
Collector-Emitter Saturation Voltage (Note 9)	V <sub>CE(sat)</sub>	_	30 60 125 155	45 80 180 220	mV	$\begin{split} I_{C} &= 500\text{mA}, \ I_{B} = 10\text{mA} \\ I_{C} &= 1\text{A}, \ I_{B} = 10\text{mA} \\ I_{C} &= 2\text{A}, \ I_{B} = 10\text{mA} \\ I_{C} &= 4\text{A}, \ I_{B} = 50\text{mA} \end{split}$
Base-Emitter Saturation Voltage (Note 9)	V <sub>BE(sat)</sub>	—	890	950	mV	$I_{\rm C} = 4$ A, $I_{\rm B} = 50$ mA
Base-Emitter Turn-On Voltage (Note 9)	V <sub>BE(on)</sub>	—	820	900	mV	$I_{C} = 4A, V_{CE} = 2V$
DC Current Gain (Note 9)	h <sub>FE</sub>	250 300 300 200 35	430 450 450 350 70	 1200 	_	$\begin{split} I_{C} &= 10 \text{mA}, \ V_{CE} = 2 \text{V} \\ I_{C} &= 0.5 \text{A}, \ V_{CE} = 2 \text{V} \\ I_{C} &= 1 \text{A}, \ V_{CE} = 2 \text{V} \\ I_{C} &= 4 \text{A}, \ V_{CE} = 2 \text{V} \\ I_{C} &= 20 \text{A}, \ V_{CE} = 2 \text{V} \end{split}$
Current Gain-Bandwidth Product (Note 9)	f <sub>T</sub>	_	180	_	MHz	$V_{CE} = 10V, I_C = 50mA$ f = 50MHz
Output Capacitance (Note 9)	C <sub>obo</sub>	_	45	60	pF	V <sub>CB</sub> = 10V. f = 1MHz
Turn-On Times	t <sub>on</sub>	—	125	—	ns	$I_{C} = 4A, I_{B} = 40mA, V_{CC} = 1$
Turn-Off Times	toff		380	_	ns	$I_{C} = 4A, I_{B} = 40mA, V_{CC} = 1$

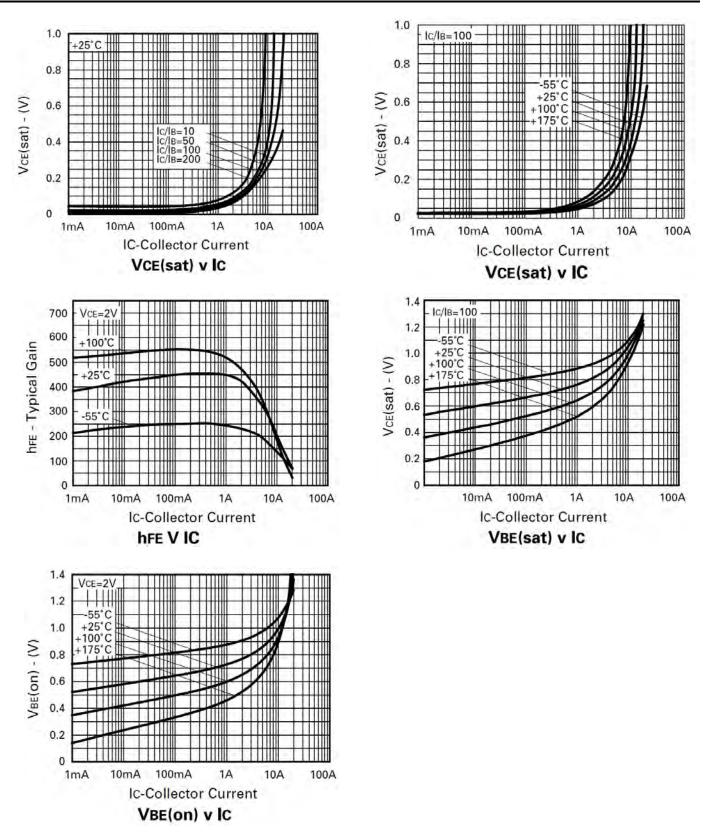
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9. Measured under pulsed conditions. Pulse width  $\leq$  300  $\mu s.$  Duty cycle  $\leq$  2% Notes:





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

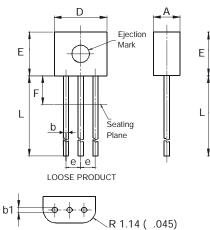


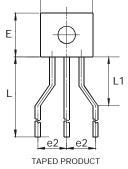




# **Package Outline Dimensions**

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





D

E-Line						
Dim	Min	Max	Тур			
Α	2.16	2.41	-			
b	0.41	0.495	-			
b1	0.41	0.495	-			
D	4.37	4.77	-			
Е	3.61	4.01	-			
е	-	-	1.27			
e2	-	-	2.54			
F	-	2.50	-			
L	13.00	13.97	-			
L1	2.50	3.50	-			
All Dimensions in mm						





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