

**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)
- 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**

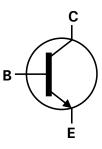
# **Mechanical Data**

- Case: E-Line (TO-92 Compatible)
- Case Material: molded plastic, "Green" Molding Compound
- UL Flammability Classification Rating 94V-0
- Terminals: Finish Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 @3
- Weight: 0.159 grams (approximate)

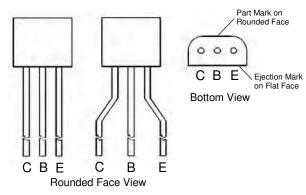


E-Line





Device Symbol



Pin-Out Configuration

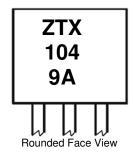
# Ordering Information (Note 4)

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

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"
- 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**



ZTX1049A = Product type Marking Code





ZTX1049A

# **Maximum Ratings** (@ $T_A = +25^{\circ}C$ , unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	$V_{CBO}$	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	Α
Peak Pulse Current	I <sub>CM</sub>	20	Α
Base Current	Ι <sub>Β</sub>	500	mA

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

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P <sub>D</sub>	1.5	W
Power Dissipation (Note 6)	P <sub>D</sub>	1	W
Thermal Resistance Junction to Ambient (Note 5)	$R_{\theta JA}$	116	°C/W
Thermal Resistance Junction to Ambient (Note 6)	$R_{ heta JA}$	175	°C/W
Thermal Resistance Junction to Lead (Note 7)	$R_{ heta JL}$	63.75	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +200	°C

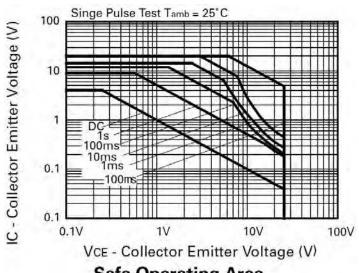
### **ESD Ratings** (Note 8)

Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	≥ 4,000	٧	3A
Electrostatic Discharge - Machine Model	ESD MM	≥ 400	V	С

Notes:

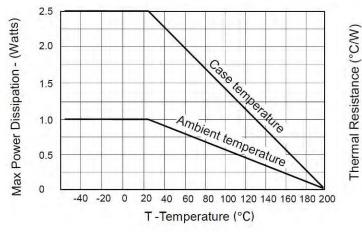
- 5. For a through-hole device mounted at the seating plane (2.5mm lead length) with the collector lead on 25mm X 25mm 1oz weight copper that is on a single-sided FR4 PCB; device is measured under still air conditions whilst operating in a steady-state.
- 6. Same as note (5), except the device is mounted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

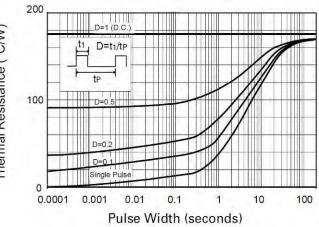
# Thermal Characteristics and Derating Information





**ZTX1049A** 





**Derating curve** 

Maximum transient thermal impedance

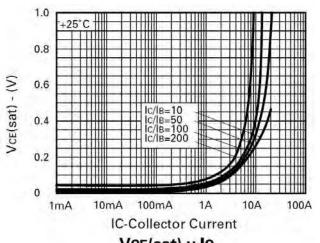
# **Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

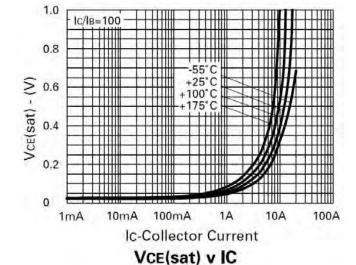
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV <sub>CBO</sub>	80	120	_	V	$I_{C} = 100 \mu A$
Collector-Emitter Breakdown Voltage	BV <sub>CES</sub>	80	120	_	V	$I_{C} = 100 \mu A$
Collector-Emitter Breakdown Voltage (Note 9)	BV <sub>CEO</sub>	25	30	_	V	I <sub>C</sub> = 10mA
Collector-Emitter Breakdown Voltage	BV <sub>CEV</sub>	80	120	_	V	$I_C = 100 \mu A, V_{EB} = 1 V$
Emitter-Base Breakdown Voltage	BV <sub>EBO</sub>	5	8.75	_	V	$I_E = 100\mu A$
Collector Cut-off Current	I <sub>CBO</sub>	_	0.3	10	nA	V <sub>CB</sub> = 50V
Collector Emitter Cut-off Current	I <sub>CES</sub>	_	0.3	10	nA	V <sub>CES</sub> = 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	$I_C = 500$ mA, $I_B = 10$ mA $I_C = 1$ A, $I_B = 10$ mA $I_C = 2$ A, $I_B = 10$ mA $I_C = 4$ A, $I_B = 50$ mA
Base-Emitter Saturation Voltage (Note 9)	V <sub>BE(sat)</sub>	_	890	950	mV	I <sub>C</sub> =4A, I <sub>B</sub> = 50mA
Base-Emitter Turn-On Voltage (Note 9)	V <sub>BE(on)</sub>	_	820	900	mV	I <sub>C</sub> = 4A, V <sub>CE</sub> = 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⊤	_	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	$I_C = 4A$ , $I_B = 40mA$ , $V_{CC} = 10V$
Turn-Off Times	t <sub>off</sub>	_	380	_	ns	$I_C = 4A$ , $I_B = 40mA$ , $V_{CC} = 10V$

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

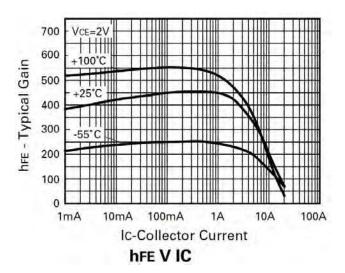


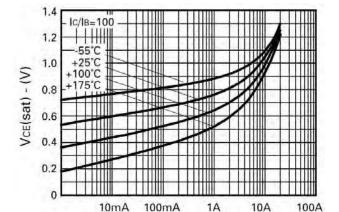
# Typical Electrical Characteristics (@TA = +25°C, unless otherwise specified.)





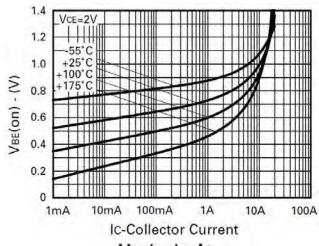
# VCE(sat) v IC





VBE(sat) v IC

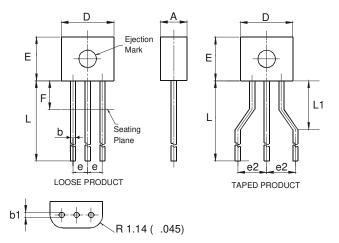
**IC-Collector Current** 





# **Package Outline Dimensions**

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



	E-Line					
Dim	Min	Max	Тур			
Α	2.16	2.41	1			
b	0.41	0.495	_			
b1	0.41	0.495	1			
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	All Dimensions in mm					





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