



**ZXTN10150DZ**

**150V NPN LED DRIVING TRANSISTOR IN SOT89**

**Features**

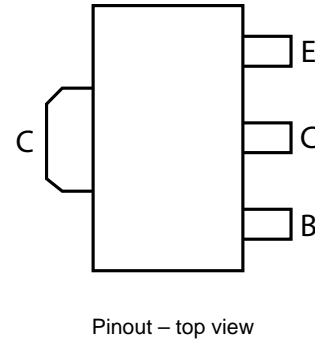
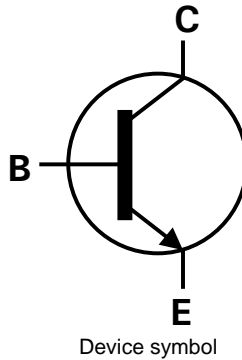
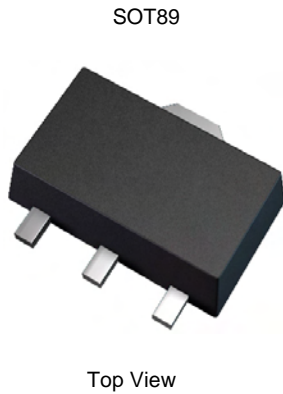
- $BV_{CEO} > 150V$
- $h_{FE} > 100$  for  $I_C = 150mA$ ,  $V_{CE} = 0.25V$
- $I_C (cont) = 1A$
- **Lead Free, RoHS Compliant (Note 1)**
- **Halogen and Antimony Free "Green" Device (Note 2)**
- **Qualified to AEC-Q101 Standards for High Reliability**

**Mechanical Data**

- Case: SOT-89
- Case Material: Molded Plastic. "Green" Molding Compound.
- UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish
- Weight: 0.008 grams (Approximate)

**Applications**

- LED TV backlight

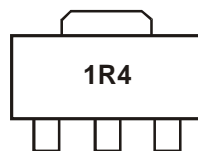


**Ordering Information**

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTN10150DZTA	1R4	7	12	1000

- Notes:
1. No purposefully added lead.
  2. "Green" devices, Halogen and Antimony Free, Diodes Inc's "Green" Policy can be found on our website at <http://www.diodes.com>

**Marking Information**



1R4 - Product Type Marking Code

**Maximum Ratings** @ $T_A = 25^\circ\text{C}$  unless otherwise specified

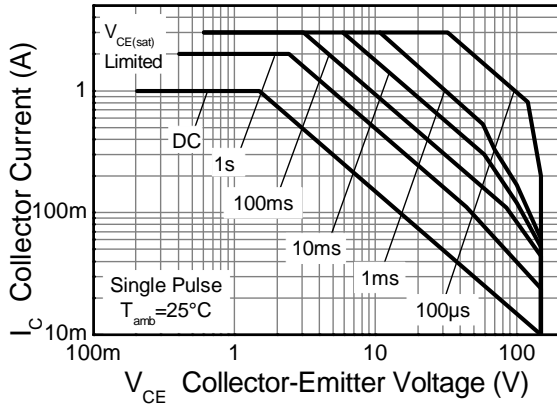
Characteristic	Symbol	Value	Unit
Collector-Base Voltage	$V_{CBO}$	150	V
Collector-Emitter Voltage	$V_{CEO}$	150	V
Emitter-Base Voltage	$V_{EBO}$	7	V
Continuous Collector Current	$I_C$	1	A
Peak Pulse Current (Note 4)	$I_{CM}$	3	A
Base Current	$I_B$	500	mA

**Thermal Characteristics** @ $T_A = 25^\circ\text{C}$  unless otherwise specified

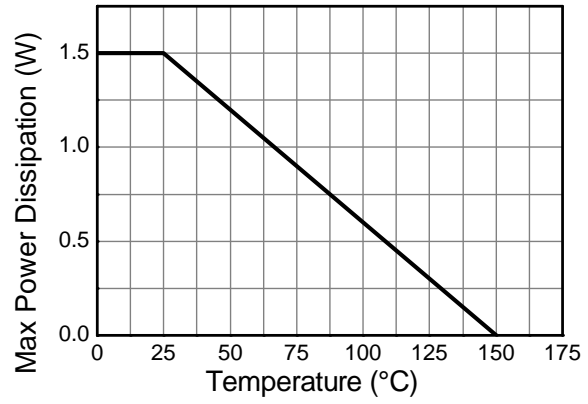
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 3)	$P_D$	1.5	W
Thermal Resistance, Junction to Ambient (Note 3)	$R_{\theta JA}$	83	$^\circ\text{C/W}$
Thermal Resistance, Junction to Leads	$R_{\theta JL}$	6.36	$^\circ\text{C/W}$
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	$^\circ\text{C}$

- Notes:
3. For a device surface mounted on 25mm X 25mm FR4 PCB with high coverage of single sided 1 oz copper, in still air conditions.
  4. Measured under pulsed conditions. Pulse width = 300 $\mu\text{s}$ . Duty cycle  $\leq 2\%$ .

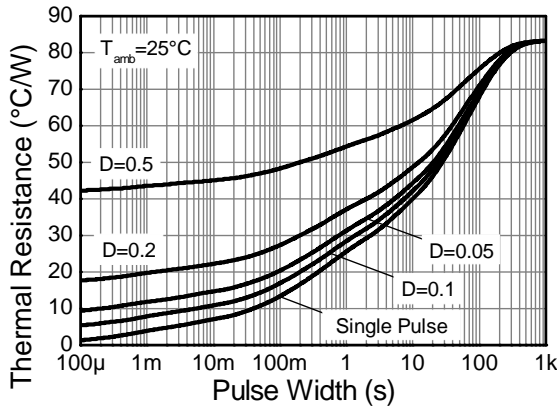
**Thermal Characteristics and Derating information**



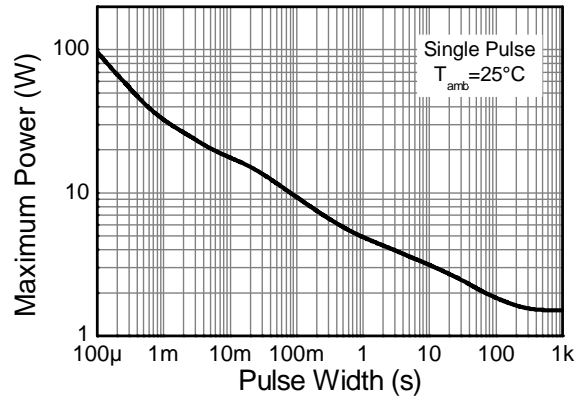
**Safe Operating Area**



**Derating Curve**



**Transient Thermal Impedance**



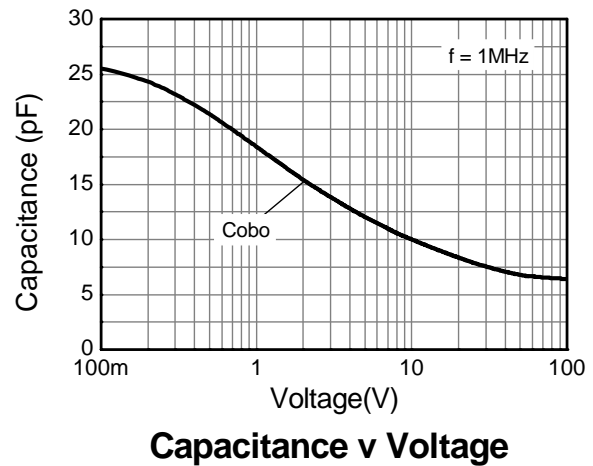
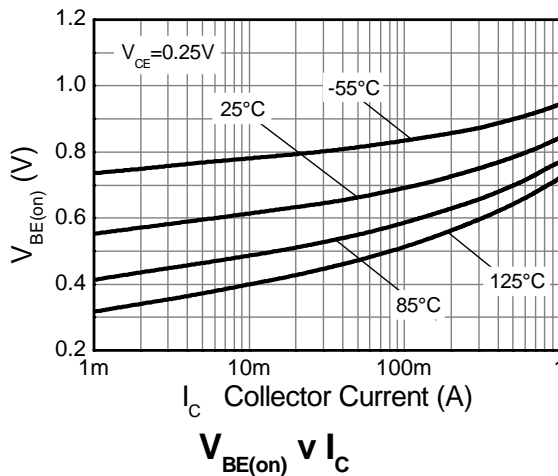
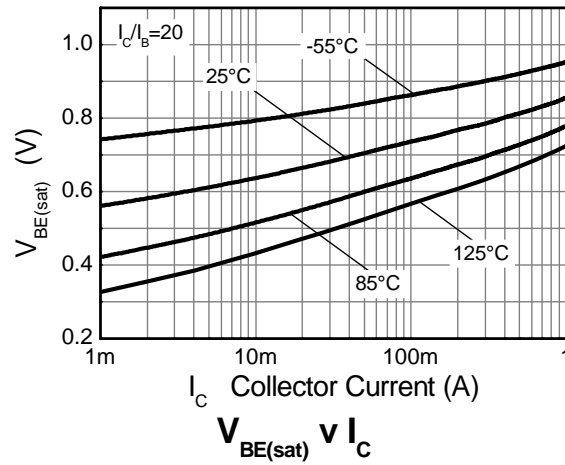
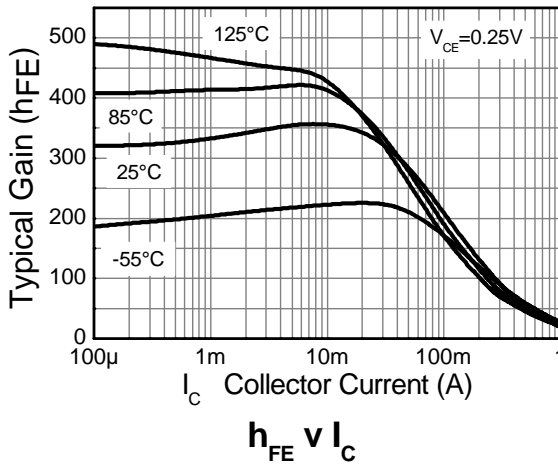
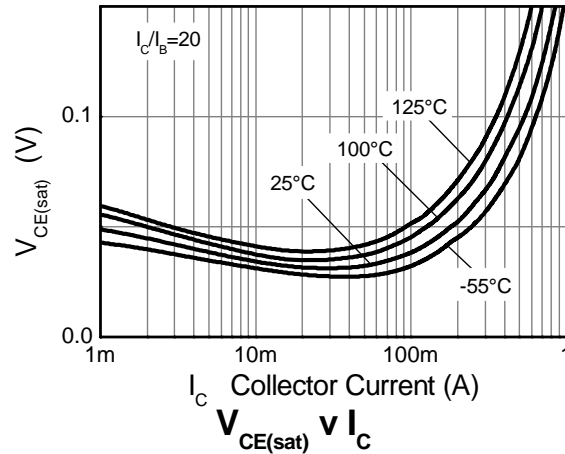
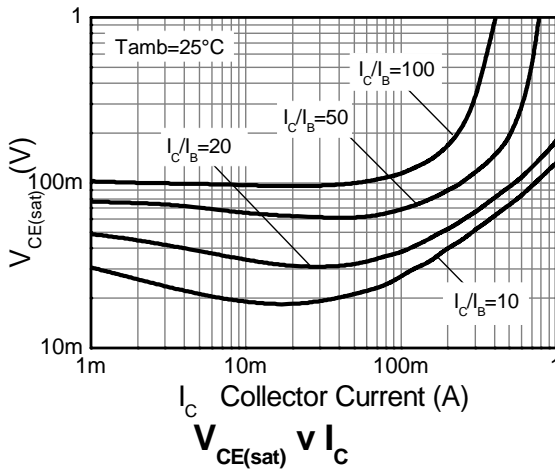
**Pulse Power Dissipation**

**Electrical Characteristics** @T<sub>A</sub> = 25°C unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV <sub>CB0</sub>	150	300	-	V	I <sub>C</sub> = 100μA
Collector-Emitter Breakdown Voltage (Note 5)	BV <sub>CEO</sub>	150	175	-	V	I <sub>C</sub> = 10mA
Emitter-Base Breakdown Voltage	BV <sub>EBO</sub>	7	8.3	-	V	I <sub>E</sub> = 100μA
Collector Cut-off Current	I <sub>CB0</sub>	-	-	50	nA	V <sub>CB</sub> = 150V
Emitter Cut-off Current	I <sub>EBO</sub>	-	-	50	nA	V <sub>EB</sub> = 7V
Static Forward Current Transfer Ratio (Note 5)	h <sub>FE</sub>	200 60 100	450 180 150	- - -	-	I <sub>C</sub> = 30mA, V <sub>CE</sub> = 5V I <sub>C</sub> = 85mA, V <sub>CE</sub> = 0.20V I <sub>C</sub> = 150mA, V <sub>CE</sub> = 0.25V
Base-Emitter Turn-On Voltage (Note 5)	V <sub>BE(on)</sub>	-	0.701	0.95	V	I <sub>C</sub> = 150mA, V <sub>CE</sub> = 0.25V
Output Capacitance	C <sub>OBO</sub>	-	10	-	pF	V <sub>CB</sub> = 10V, f = 1MHz
Current Gain-Bandwidth Product	f <sub>t</sub>	-	135	-	MHz	V <sub>CB</sub> = 10V, I <sub>C</sub> = 10mA, f = 100MHz
Delay Time	t <sub>(d)</sub>	-	625	-	ns	V <sub>CC</sub> = 110V, I <sub>C</sub> = 150mA, -I <sub>B2</sub> = 1.5mA, V <sub>CE(ON)</sub> = 0.25V
Rise Time	t <sub>(r)</sub>	-	562	-	ns	
Storage Time	t <sub>(s)</sub>	-	2465	-	ns	
Fall Time	t <sub>(f)</sub>	-	289	-	ns	
Storage Time	t <sub>(s)</sub>	-	461	-	ns	
Fall Time	t <sub>(f)</sub>	-	52	-	ns	V <sub>CC</sub> = 110V, I <sub>C</sub> = 150mA, -I <sub>B2</sub> = 1.5mA, V <sub>CE(ON)</sub> = 4V

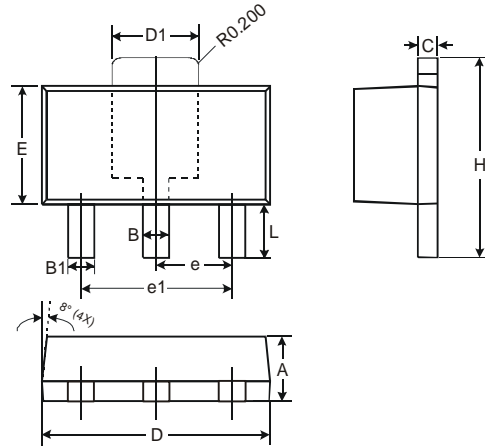
Notes: 5. Measured under pulsed conditions. Pulse width = 300μs. Duty cycle ≤ 2%

**Typical Characteristics**



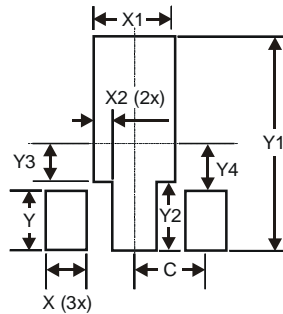
**ZXTN10150DZ**

**Package Outline Dimensions**



SOT89-3L		
Dim	Min	Max
A	1.40	1.60
B	0.44	0.62
B1	0.35	0.54
C	0.35	0.43
D	4.40	4.60
D1	1.52	1.83
E	2.29	2.60
e	1.50 Typ	
e1	3.00 Typ	
H	3.94	4.25
L	0.89	1.20
All Dimensions in mm		

**Suggested Pad Layout**



Dimensions	Value (in mm)
X	0.900
X1	1.733
X2	0.416
Y	1.300
Y1	4.600
Y2	1.475
Y3	0.950
Y4	1.125
C	1.500

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