ZXTN4004K

150V NPN LED DRIVING TRANSISTOR IN TO252

Features

- BV_{CEO} > 150V
- h_{FE} > 100 for I_C = 150mA, V_{CE} = 0.25V
- $I_{C\ (cont)}$ = 1A
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **PPAP Capable (Note 4)**

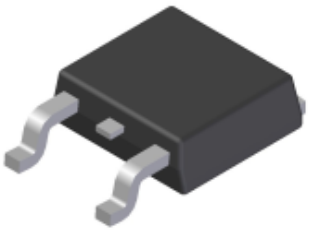
Mechanical Data

- Case: TO252 (DPAK)
- Case Material: Molded Plastic, "Green" Molding Compound; UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Plated Leads. Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.34 grams (Approximate)

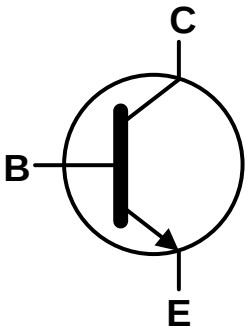
Applications

- LED TV Backlight

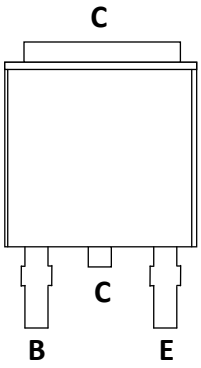
TO252



Top View



Device symbol



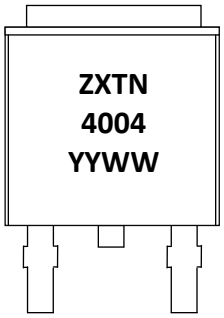
Top View
Pin Out

Ordering Information (Notes 4 & 5)

Product	Compliance	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTN4004KTC	AEC-Q101	ZXTN4004	13	16	2,500
ZXTN4004KQTC	Automotive	ZXTN4004	13	16	2,500

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" 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. Automotive products are AEC-Q101 qualified and are PPAP capable. Automotive, AEC-Q101 and standard products are electrically and thermally the same, except where specified. For more information, please refer to http://www.diodes.com/quality/product_compliance_definitions/.
5. For packaging details, go to our website at http://www.diodes.com/products/packages.html.

Marking Information



ZXTN4004 = Product Marking Code
YYWW = Date Code Marking
YY = Last Digit of Year (ex: 10 = 2010)
WW = Week Code (01 – 53)

Absolute Maximum Ratings (@T_A = +25°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	I_{CM}	3	A
Base Current	I_B	500	mA

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

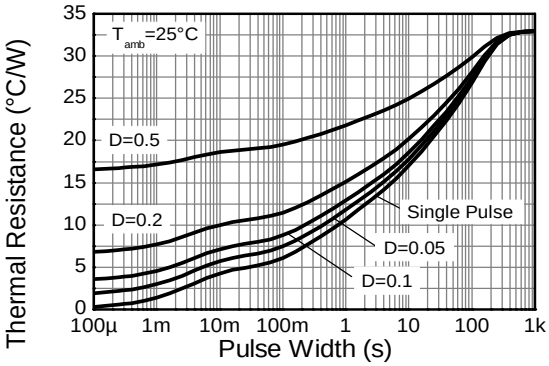
Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 6)	P_D	3.8	W
Thermal Resistance, Junction to Ambient	(Note 6)	$R_{\theta JA}$	33	°C/W
Thermal Resistance, Junction to Leads	(Note 7)	$R_{\theta JL}$	12	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

ESD Ratings (Note 8)

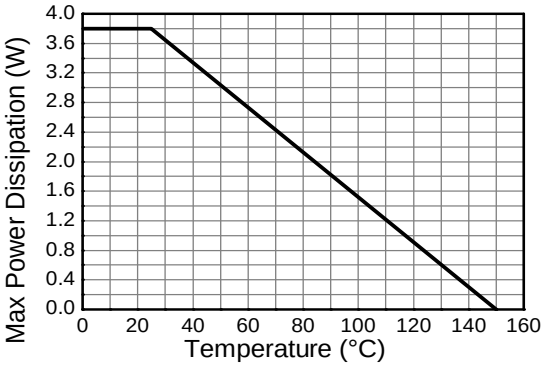
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

Notes:
6. For a device mounted with the exposed collector pad on 50mm x 50mm, 2oz copper that is on a single-sided 1.6mm FR4 PCB; device is measured under still air conditions whilst operating in a steady-state.
7. Thermal resistance from junction to solder-point (on the exposed collector pad).
8. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

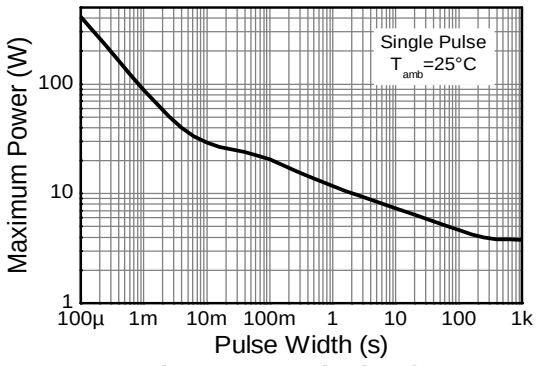
Thermal Characteristics and Derating Information



Transient Thermal Impedance



Derating Curve



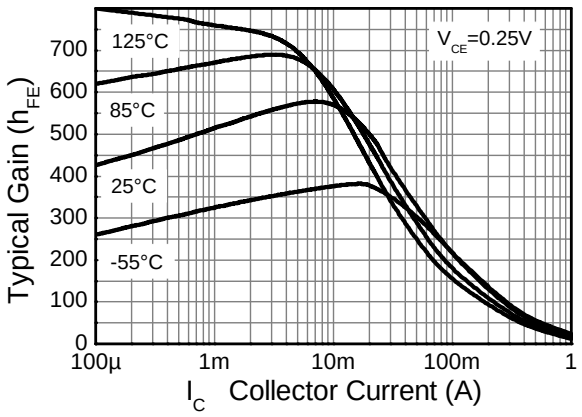
Pulse Power Dissipation

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

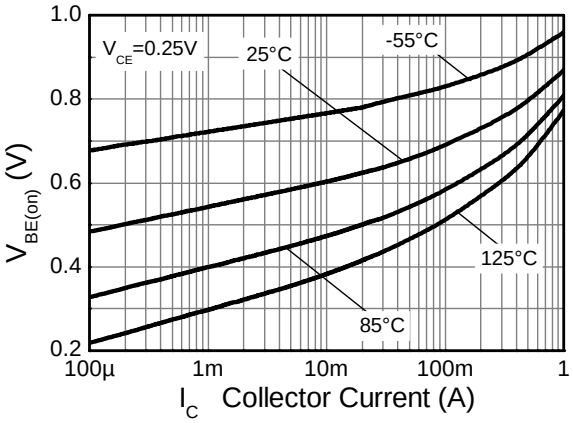
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage (Note 9)	BV_{CBO}	150	-	-	V	I_C = 0.1mA
Collector-Emitter Breakdown Voltage (Note 9)	BV_{CEO}	150	175	-	V	I_C = 10mA
Emitter-Base Breakdown Voltage (Note 9)	BV_{EBO}	7	-	-	V	I_E = 0.1mA
Collector – Emitter Cut-off Current	I_{CES}	-	-	50	nA	V_{CE} = 150V
Collector Cut-off Current	I_{CBO}	-	-	50	nA	V_{CB} = 150V
Emitter Cut-off Current	I_{EBO}	-	-	50	nA	V_{EB} = 7V
Static Forward Current Transfer Ratio (Note 9)	h_{FE}	60 100	- -	- -	-	I_C = 85mA, V_{CE} = 0.20V I_C = 150mA, V_{CE} = 0.25V
Collector-Emitter Saturation Voltage (Note 9)	$V_{CE(sat)}$	-	-	0.25	V	I_C = 100mA, I_B = 5mA
Base-Emitter Saturation Voltage (Note 9)	$V_{BE(sat)}$	-	-	0.95	V	I_C = 100mA, I_B = 5mA
Base-Emitter Turn-On Voltage (Note 9)	$V_{BE(on)}$	-	0.71	0.95	V	I_C = 150mA, V_{CE} = 0.25V
Delay Time	$t_{(d)}$	-	512	-	ns	V_{CC} = 120V, I_C = 150mA, $-I_{B2}$ = 1.5mA, $V_{CE(ON)}$ = 0.25V
Rise Time	$t_{(r)}$	-	426	-	ns	
Storage Time	$t_{(s)}$	-	3413	-	ns	
Fall Time	$t_{(f)}$	-	321	-	ns	
Storage Time	$t_{(s)}$	-	65	-	ns	V_{CC} = 120V, I_C = 150mA, $-I_{B2}$ = 1.5mA, $V_{CE(ON)}$ = 4V
Fall Time	$t_{(f)}$	-	294	-	ns	

Note: 9. Measured under pulsed conditions. Pulse width = 300µs. Duty cycle ≤ 2%.

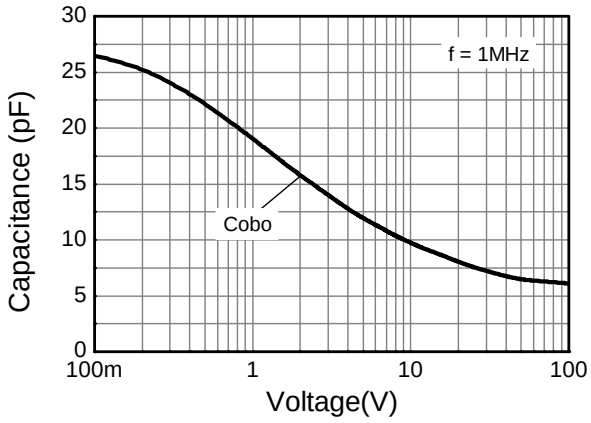
Typical Electrical Characteristics



h_{FE} v I_C



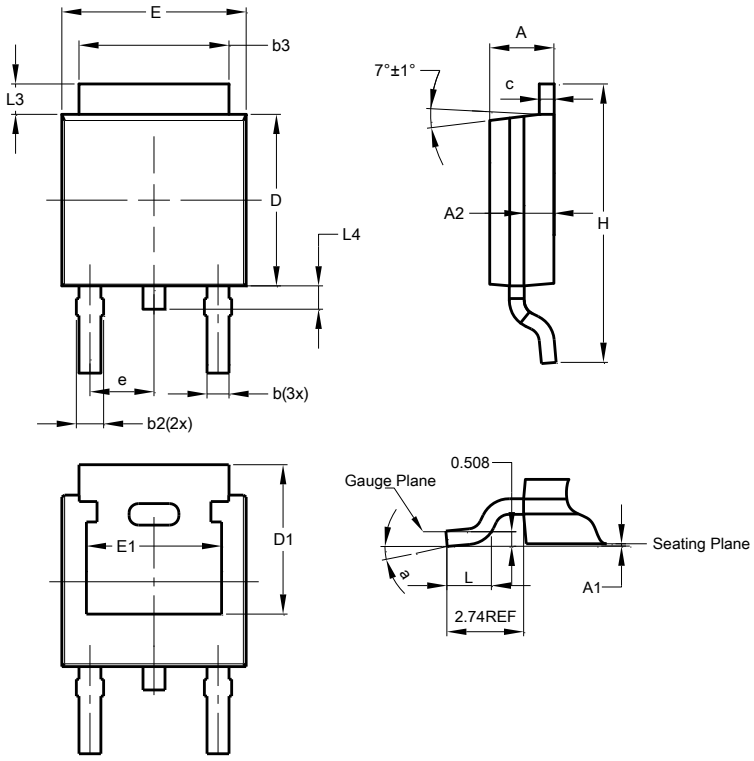
$V_{BE(on)}$ v I_C



Capacitance v Voltage

Package Outline Dimensions

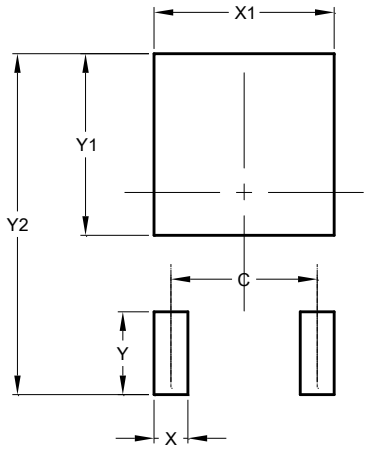
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.



TO252 (DPAK)			
Dim	**Min**	**Max**	**Typ**
A	2.19	2.39	2.29
A1	0.00	0.13	0.08
A2	0.97	1.17	1.07
b	0.64	0.88	0.783
b2	0.76	1.14	0.95
b3	5.21	5.46	5.33
c	0.45	0.58	0.531
D	6.00	6.20	6.10
D1	5.21	-	-
e	-	-	2.286
E	6.45	6.70	6.58
E1	4.32	-	-
H	9.40	10.41	9.91
L	1.40	1.78	1.59
L3	0.88	1.27	1.08
L4	0.64	1.02	0.83
a	0°	10°	-
All Dimensions in mm			

Suggested Pad Layout

Please see AP02001 at http://www.diodes.com/datasheets/ap02001.pdf for the latest version.



Dimensions	Value (in mm)
C	4.572
X	1.060
X1	5.632
Y	2.600
Y1	5.700
Y2	10.700

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