

## Features

- $BV_{CEO} > -300V$
- $I_C = -500mA$  High Collector Current
- 2W Power Dissipation
- Low Saturation Voltage  $V_{CE(sat)} < -500mV @ -20mA$
- Complementary NPN Type: DZTA42
- **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-Q100/101/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please [contact us](mailto:contact@diodes.com) or your local Diodes representative. <https://www.diodes.com/quality/product-definitions/>**

## Mechanical Data

- Package: SOT223
- Package 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
- Weight: 0.112 grams (Approximate)

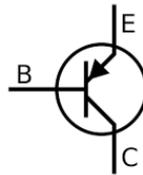
## Applications

- Medium power switching & amplification
- Switch-mode power supplies (SMPS)
- Video output stages
- Motor drivers

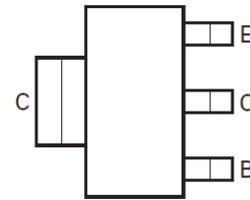
SOT223



Top View



Device Symbol



Top View  
Pin-Out

## Ordering Information (Note 4)

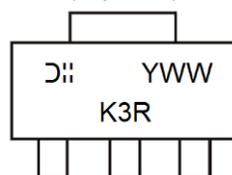
Orderable Part Number	Marking	Reel Size (inches)	Tape Width (mm)	Package	Packing	
					Quantity	Carrier
DZTA92-13	K3R	13	12	SOT223	2,500	Reel

- 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/>.

## Marking Information

SOT223

(Top View)



K3R = Product Type Marking Code  
 YWW = Date Code Marking  
 Y = Last Digit of Year (ex: 1 = 2021)  
 WW = Week Code (01 to 52)

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	$V_{CB0}$	-300	V
Collector-Emitter Voltage	$V_{CEO}$	-300	V
Emitter-Base Voltage	$V_{EBO}$	-6	V
Collector Current	$I_C$	-500	mA
Base Current	$I_B$	-100	mA

**Thermal Characteristics** (@  $T_A = +25^{\circ}\text{C}$ , unless otherwise specified.)

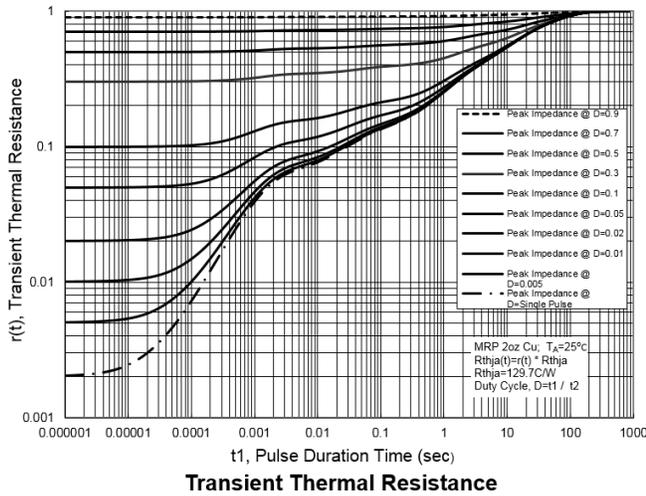
Characteristic	Symbol	Value	Unit
Power Dissipation	$P_D$	1.86	W
		0.97	
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	67.7	$^{\circ}\text{C/W}$
		129.7	
Thermal Resistance, Junction to Case (Note 7)	$R_{\theta JC}$	13	$^{\circ}\text{C/W}$
		17.9	
Thermal Resistance, Junction to Leads (Note 8)	$R_{\theta JL}$	41	$^{\circ}\text{C/W}$
		26.2	
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	$^{\circ}\text{C}$

**ESD Ratings** (Note 9)

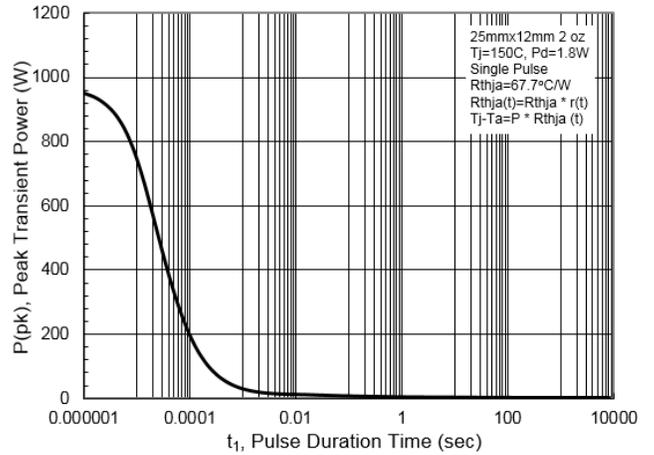
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

- Notes:
5. For a device mounted with the collector lead on 25mm x 12mm 2oz copper that is on a single-sided 1.6mm FR-4 PCB; device is measured under still air conditions whilst operating in a steady-state.
  6. Same as note (5), except mounted on minimum recommended pad (MRP) layout.
  7. Thermal resistance from junction to top of the package.
  8. Thermal resistance from junction to solder-point (at the end of the collector lead).
  9. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

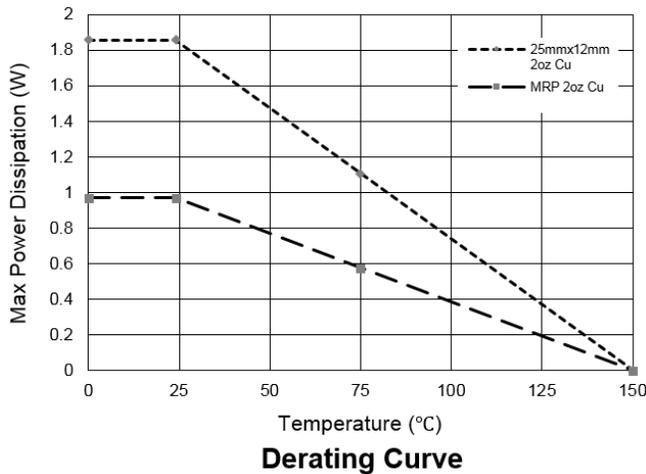
**Thermal Characteristics and Derating Information**



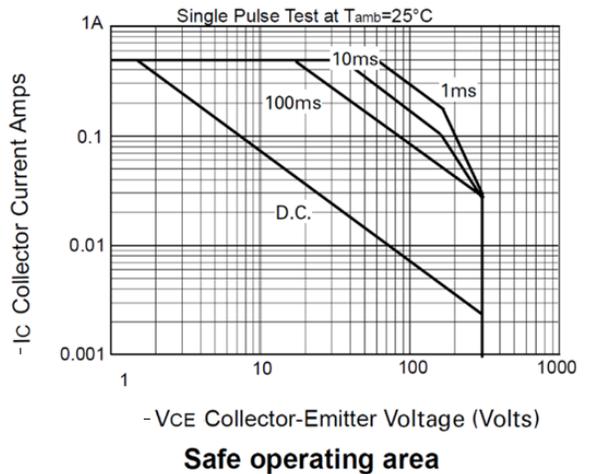
**Transient Thermal Resistance**



**Single Pulse Maximum Power Dissipation**



**Derating Curve**



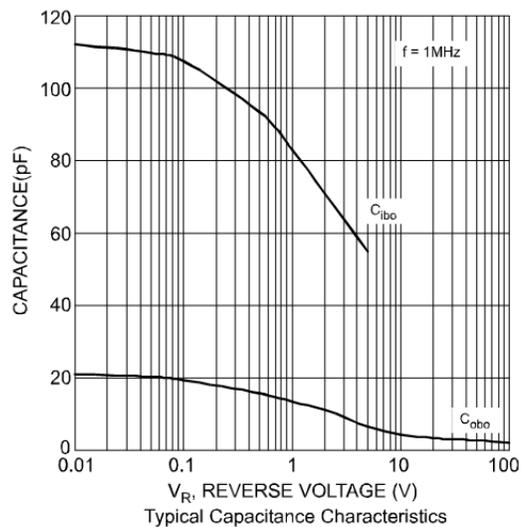
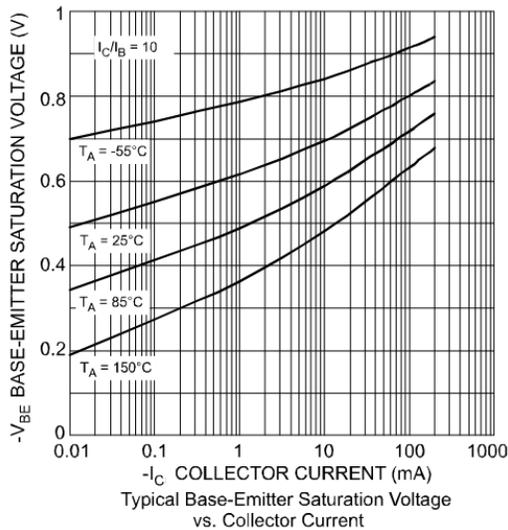
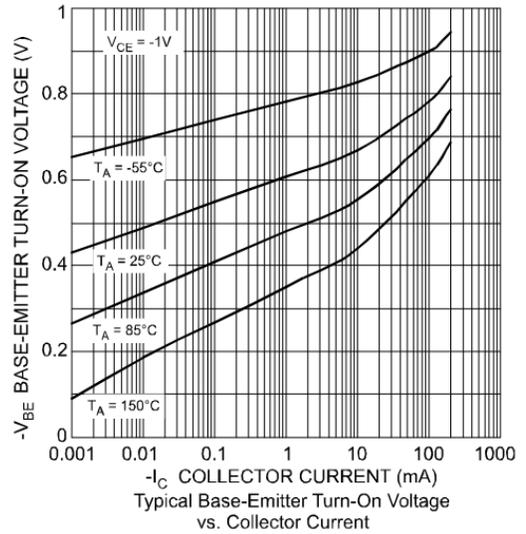
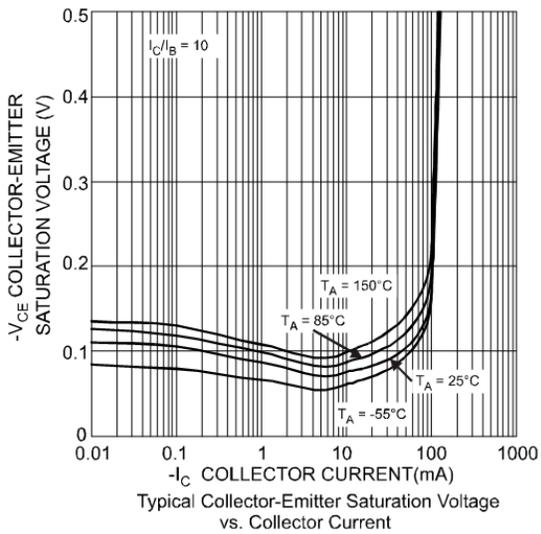
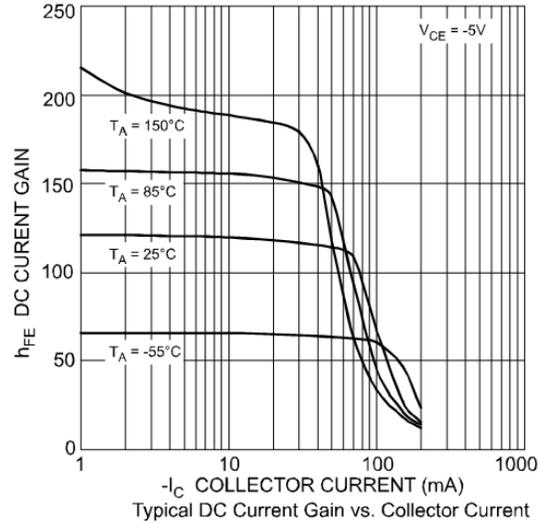
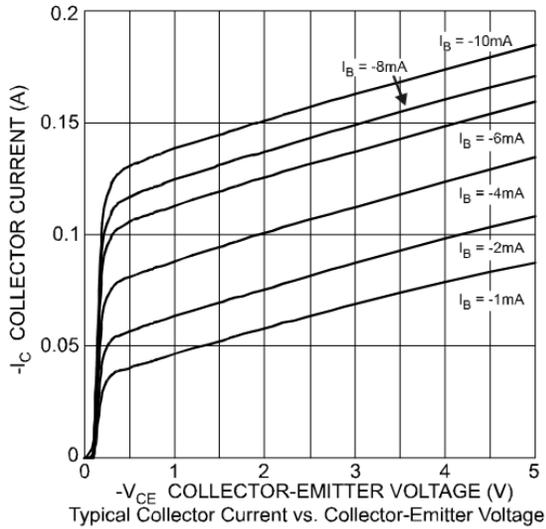
**Safe operating area**

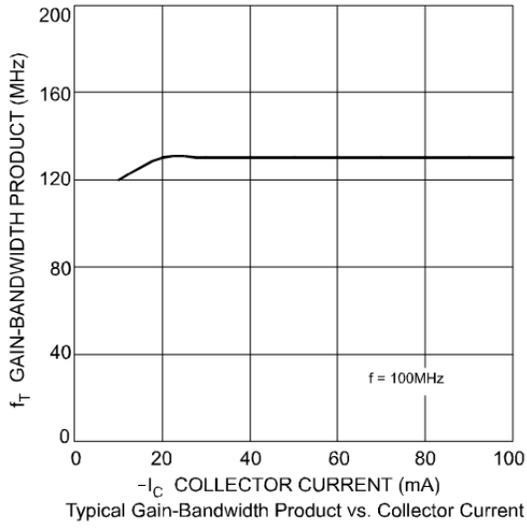
**Electrical Characteristics** (@  $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS</b>						
Collector-Base Breakdown Voltage	$BV_{CBO}$	-300	—	—	V	$I_C = -100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Note 10)	$BV_{CEO}$	-300	—	—	V	$I_C = -1\text{mA}$
Emitter-Base Breakdown Voltage	$BV_{EBO}$	-6	—	—	V	$I_E = -100\mu\text{A}$
Collector-Base Cut-off Current	$I_{CBO}$	—	—	-0.1	$\mu\text{A}$	$V_{CB} = -200\text{V}$
Emitter-Base Cut-off Current	$I_{EBO}$	—	—	-0.1	$\mu\text{A}$	$V_{EB} = -6\text{V}, I_C = 0$
<b>ON CHARACTERISTICS</b> (Note 10)						
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	—	—	-0.5	V	$I_C = -20\text{mA}, I_B = -2\text{mA}$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	—	—	-0.9	V	$I_C = -20\text{mA}, I_B = -2\text{mA}$
Static Forward Current Transfer Ratio	$h_{FE}$	25	—	—	—	$I_C = -1\text{mA}, V_{CE} = -10\text{V}$
		40	—	—		$I_C = -10\text{mA}, V_{CE} = -10\text{V}$
		25	—	—		$I_C = -30\text{mA}, V_{CE} = -10\text{V}$
<b>SMALL SIGNAL CHARACTERISTICS</b>						
Transition Frequency	$f_T$	50	—	—	MHz	$I_C = -10\text{mA}, V_{CE} = -20\text{V}$ $f = 100\text{MHz}$
Output Capacitance	$C_{ob0}$	—	—	6	pF	$V_{CB} = -20\text{V}, f = 1\text{MHz}$

Note: 10. Measured under pulsed conditions. Pulse width  $\leq 300\mu\text{s}$ . Duty cycle  $\leq 2\%$ .

**Typical Electrical Characteristics** (@  $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

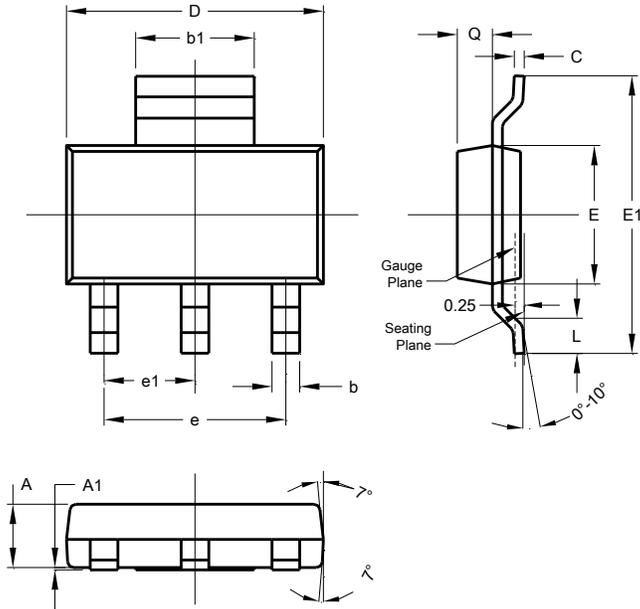




**Package Outline Dimensions**

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

**SOT223**

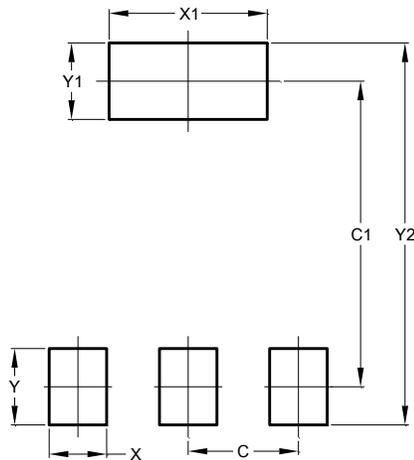


SOT223			
Dim	Min	Max	Typ
A	1.55	1.65	1.60
A1	0.010	0.15	0.05
b	0.60	0.80	0.70
b1	2.90	3.10	3.00
C	0.20	0.30	0.25
D	6.45	6.55	6.50
E	3.45	3.55	3.50
E1	6.90	7.10	7.00
e	-	-	4.60
e1	-	-	2.30
L	0.85	1.05	0.95
Q	0.84	0.94	0.89
<b>All Dimensions in mm</b>			

**Suggested Pad Layout**

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

**SOT223**



Dimensions	Value (in mm)
C	2.30
C1	6.40
X	1.20
X1	3.30
Y	1.60
Y1	1.60
Y2	8.00

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