300V NPN HIGH VOLTAGE TRANSISTOR IN SOT223

Features

- BV_{CEO} > 300V
- I_C = 500mA high Collector Current
- 2W Power Dissipation
- Low Saturation Voltage $V_{CE(sat)}$ < 500mV @ 20mA
- Complementary PNP Type: DZTA92
- **Totally Lead-Free & Fully RoHS compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

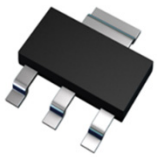
Mechanical Data

- Case: SOT223
- 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: 0.112 grams (approximate)

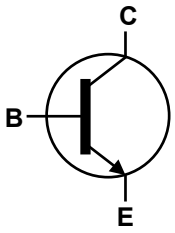
Applications

- Switch-Mode Power Supplies (SMPS)
- Video output stages
- Motor driver

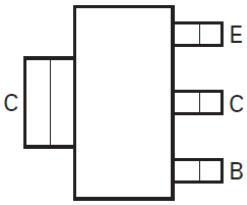
SOT223



Top View



Device Symbol



Top View
Pin-Out

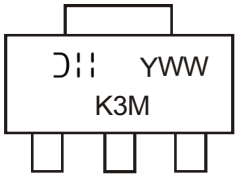
Ordering Information (Note 4)

Product	Compliance	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
DZTA42-13	AEC-Q101	K3M	13	12	2,500

Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
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. For packaging details, go to our website at http://www.diodes.com/products/packages.html

Marking Information

(Top View)



K3M = Product Type Marking Code
YWW = Date Code Marking
Y = Last digit of year ex: 4 = 2014
WW = Week code 01 - 52

Absolute Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	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°C, unless otherwise specified.)

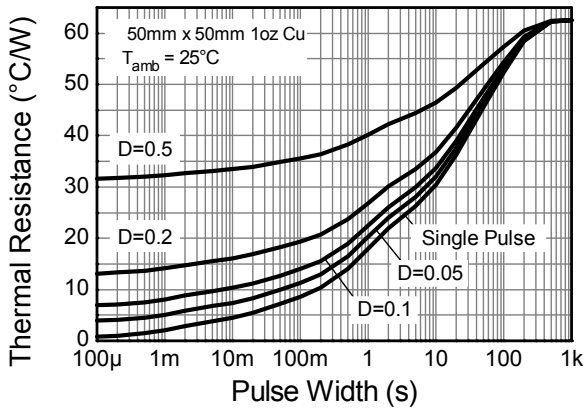
Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 5)	P_D	2	W
	(Note 6)		1	
Thermal Resistance, Junction to Ambient	(Note 5)	$R_{\theta JA}$	62	°C/W
	(Note 6)		125	
Thermal Resistance, Junction to Leads	(Note 7)	$R_{\theta JL}$	19.4	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	-65 to +150	°C

ESD Ratings (Note 8)

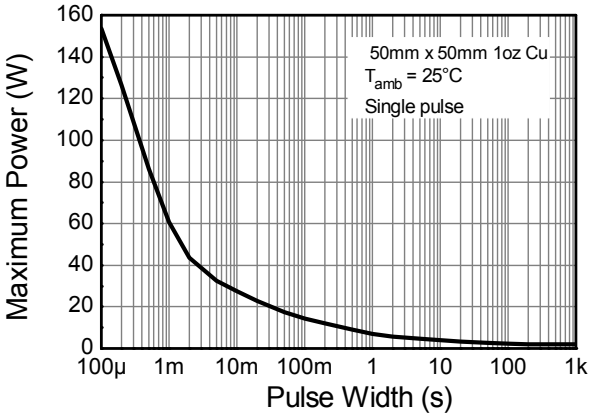
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

Notes:
5. For a device mounted with the collector lead on 50mm x 50mm 1oz copper that is on a single-sided 1.6mm FR4 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 solder-point (at the end of the collector lead).
8. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

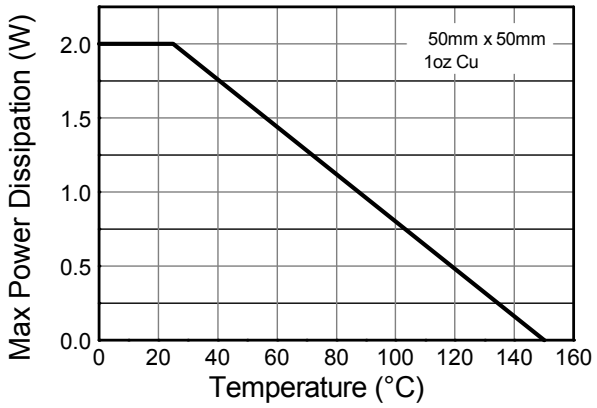
Thermal Characteristics and Derating Information



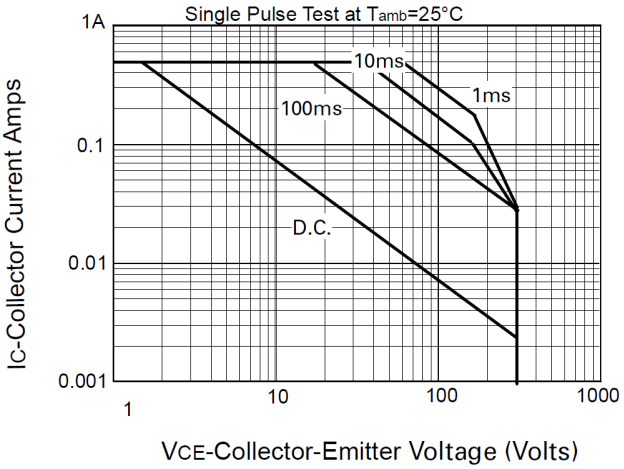
Transient Thermal Impedance



Pulse Power Dissipation



Derating Curve



Safe operating area

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Collector-Base Breakdown Voltage	BV_{CBO}	300	—	—	V	I_C = 100μA, I_E = 0
Collector-Emitter Breakdown Voltage (Note 9)	BV_{CBO}	300	—	—	V	I_C = 1mA, I_B = 0
Emitter-Base Breakdown Voltage	BV_{EBO}	6	—	—	V	I_E = 100μA, I_C = 0
Collector-Base Cut-off Current	I_{CBO}	—	—	0.1	μA	V_{CB} = 200V, I_E = 0
Emitter-Base Cut-off Current	I_{EBO}	—	—	0.1	μA	V_{EB} = 6V, I_C = 0
ON CHARACTERISTICS (Note 9)						
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	—	—	0.5	V	I_C = 20mA, I_B = 2mA
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	—	—	0.9	V	I_C = 20mA, I_B = 2mA
Static Forward Current Transfer Ratio	h_{FE}	25	—	—		I_C = 1mA, V_{CE} = 10V
		40	—	—		I_C = 10mA, V_{CE} = 10V
		40	—	—		I_C = 30mA, V_{CE} = 10V
SMALL SIGNAL CHARACTERISTICS						
Transition Frequency	fT	50	—	—	MHz	I_C = 10mA, V_{CE} = 20V f = 100MHz
Output Capacitance	Cobo	—	—	3	pF	V_{CB} = 20V, f = 1MHz

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

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

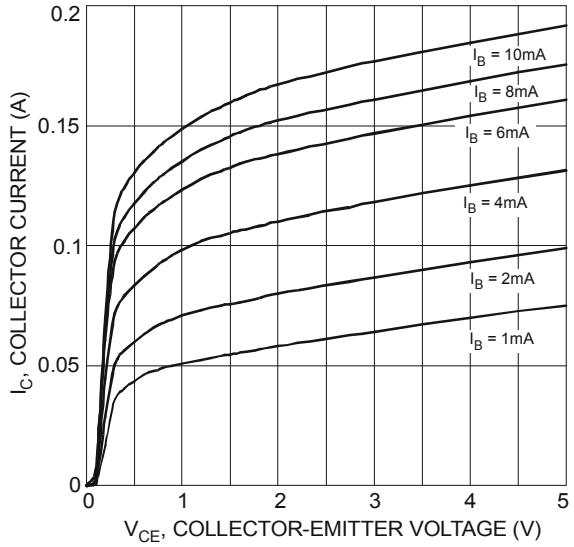


Figure 1 Typical Collector Current vs. Collector-Emitter Voltage

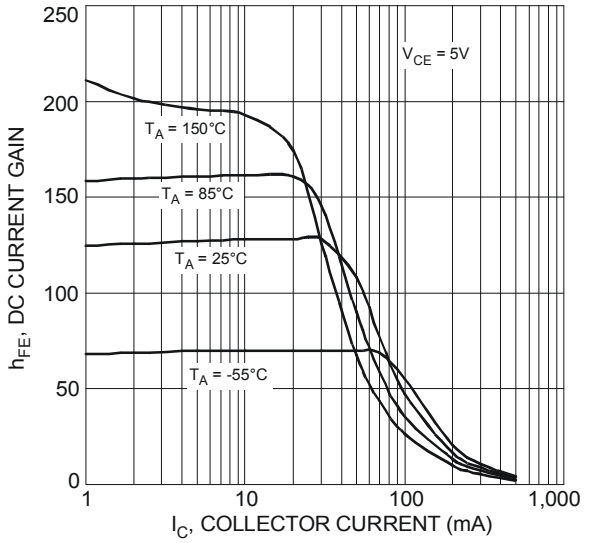


Figure 2 Typical DC Current Gain vs. Collector Current

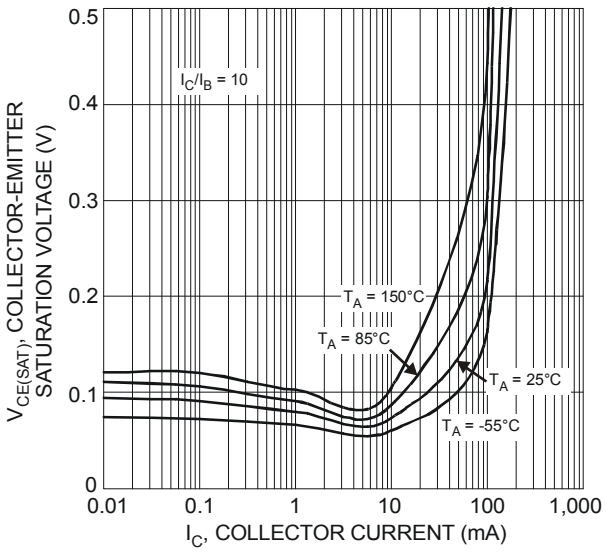


Figure 3 Typical Collector-Emitter Saturation Voltage vs. Collector Current

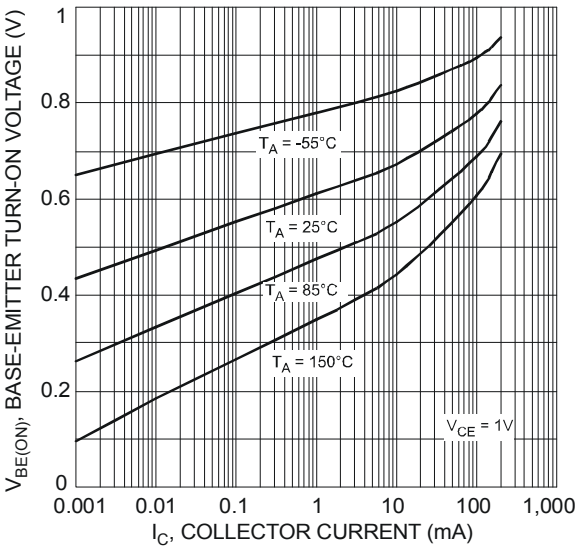


Figure 4 Typical Base-Emitter Turn-On Voltage vs. Collector Current

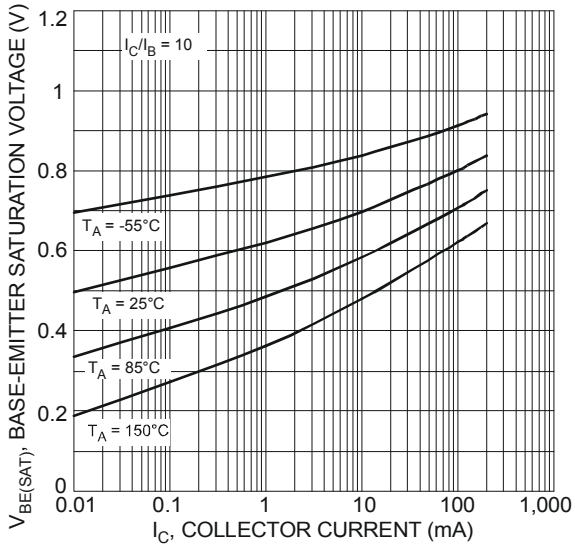


Figure 5 Typical Base-Emitter Saturation Voltage vs. Collector Current

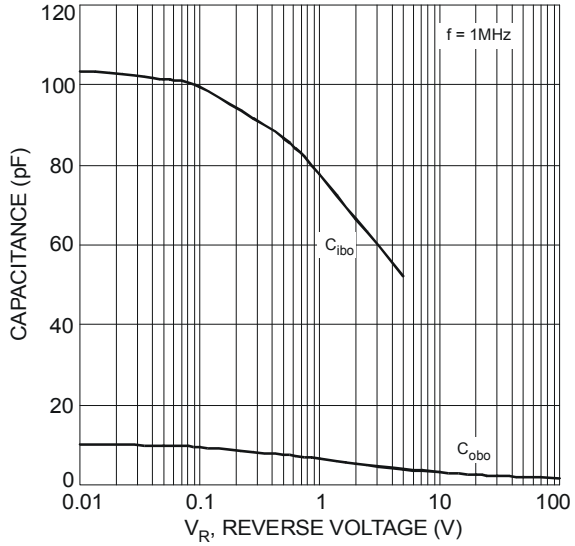


Figure 6 Typical Capacitance Characteristics

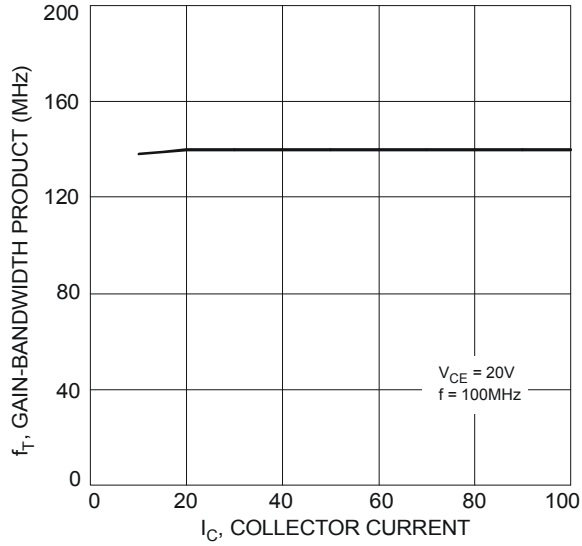
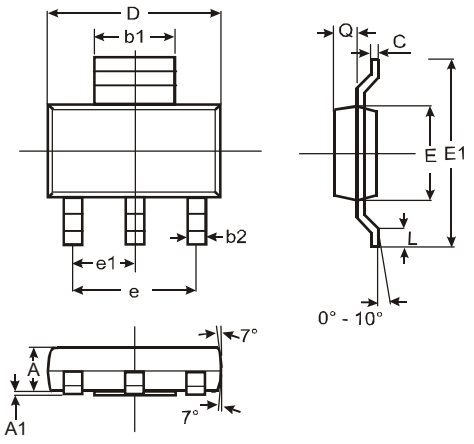


Figure 7 Typical Gain-Bandwidth Product vs. Collector Current

Package Outline Dimensions

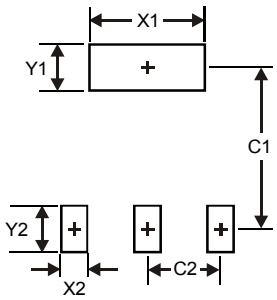
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for latest version.



SOT223			
Dim	**Min**	**Max**	**Typ**
A	1.55	1.65	1.60
A1	0.010	0.15	0.05
b1	2.90	3.10	3.00
b2	0.60	0.80	0.70
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
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)
X1	3.3
X2	1.2
Y1	1.6
Y2	1.6
C1	6.4
C2	2.3

Note: For high voltage applications, the appropriate industry sector guidelines should be considered with regards to creepage and clearance distances between device terminals and PCB tracking.

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