Lead-free Green

DXT13003DG

450V NPN HIGH VOLTAGE POWER TRANSISTOR IN SOT223

Features

- BV_{CEO} > 450V
- BV_{CES} > 700V
- BV_{EBO} > 9V
- I_C = 1.5A high Continuous Collector Current
- Integrated Collector-Emitter Diode to act as free-wheeling diode
- **Totally Lead-Free & Fully RoHS compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

Mechanical Data

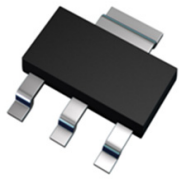
- Case: SOT223
- Case Material: Molded Plastic. "Green" Molding Compound UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.112 grams (approximate)

Applications

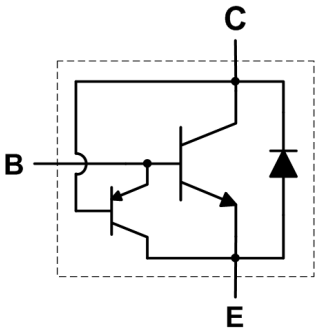
Low power AC-DC SMPS for:

- Battery Chargers for Mobile Phone / Tablets / Smartphones
- Power Supply for DVD / STB
- LED Lighting

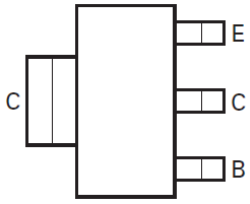
SOT223



Top View



Device Schematic



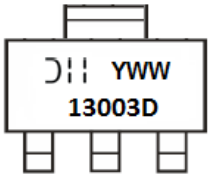
Top View
Pin-Out

Ordering Information (Note 4)

Product	Package	Marking	Tape Width (mm)	Quantity
DXT13003DG-13	SOT223	DXT13003D	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



13003D = Product Type Marking Code
YWW = Date Code Marking
Y = Last Digit of the Year (ex: 3 =2013)
WW = Week Code 01-52

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

Characteristic	Symbol	Value	Unit
Collector-Emitter Voltage (V_{BE} = 0V)	V_{CES}	700	V
Collector-Emitter Voltage	V_{CEO}	450	V
Emitter-Base Voltage	V_{EBO}	9	V
Continuous Collector Current	I_C	1.3	A
Peak Pulse Collector Current	I_{CM}	3	A
Continuous Base Current	I_B	0.75	A
Peak Pulse Base Current	I_{BM}	1.5	A

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

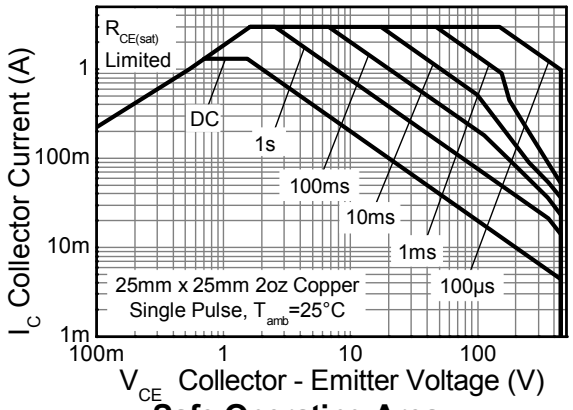
Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 5)	P_D	3	W
	(Note 6)		2	
	(Note 7)		0.7	
Thermal Resistance, Junction to Ambient	(Note 5)	$R_{\theta JA}$	42	°C/W
	(Note 6)	$R_{\theta JA}$	62.5	
	(Note 7)	$R_{\theta JA}$	178	
Thermal Resistance Junction to Lead	(Note 8)	$R_{\theta JL}$	17	
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

ESD Ratings (Note 9)

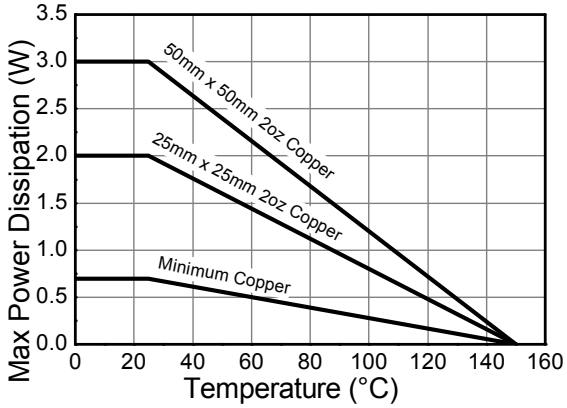
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	8,000	V	3B
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

Notes:
5. For a device mounted with the collector lead 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.
6. Same as note (5), except the device is mounted on 25mm x 25mm 2oz copper.
7. Same as note (5), except the device is mounted on minimum recommended pad layout.
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.

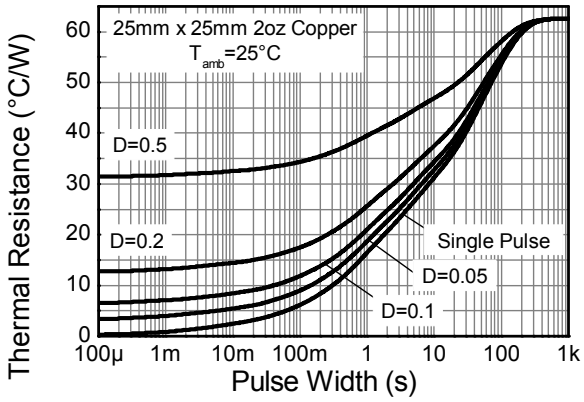
Safe Operating Areas and Derating Information (@T_A = +25°C, unless otherwise specified.)



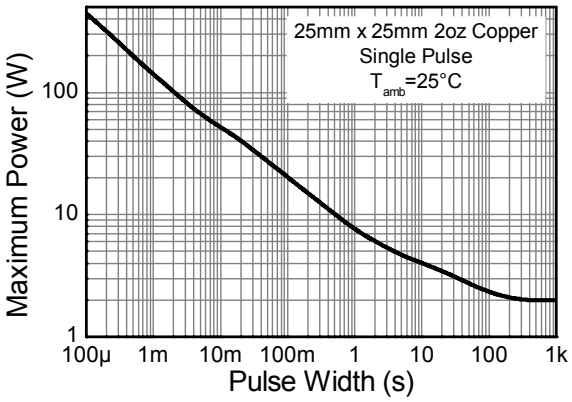
Safe Operating Area



Derating Curve



Transient Thermal Impedance



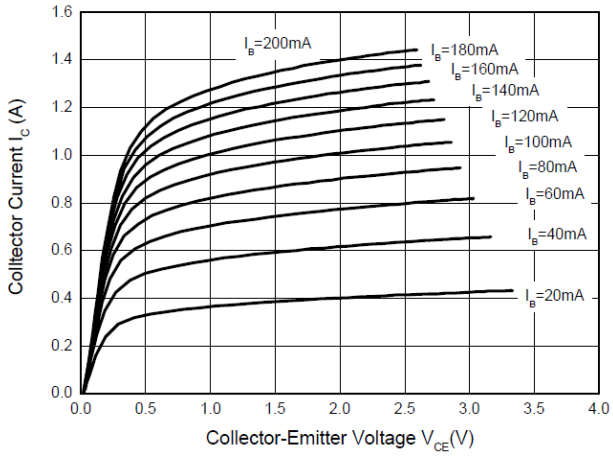
Pulse Power Dissipation

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

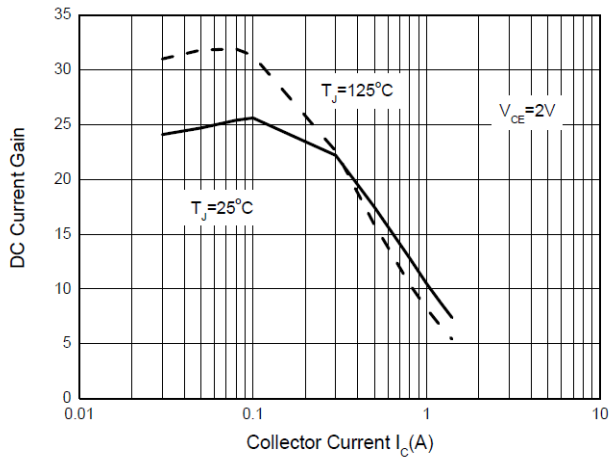
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Emitter Breakdown Voltage	BV_{CES}	700	–	–	V	I_C = 100μA, V_{BE} = 0V
Collector-Emitter Breakdown Voltage	BV_{CEO}	450	–	–	V	I_C = 100μA
Emitter-Base Breakdown Voltage	BV_{EBO}	9	–	–	V	I_E = 100μA
Collector Cutoff Current	I_{CEV}	–	–	10	μA	V_{CE} = 700V, V_{BE} = -1.5V
DC current transfer Static ratio (Note 10)	h_{FE}	20 16 5.0	- – –	40 30 25	–	I_C = 20mA, V_{CE} = 10V I_C = 0.5A, V_{CE} = 2V I_C = 1.0A, V_{CE} = 2V
Collector-Emitter Saturation Voltage (Note 10)	$V_{CE(sat)}$	– –	– –	0.3 0.4	V	I_C = 0.5A, I_B = 0.1A I_C = 1A, I_B = 0.25A
Base-Emitter Saturation Voltage (Note 10)	$V_{BE(sat)}$	– –	– –	1.0 1.2	V	I_C = 0.5A, I_B = 0.1A I_C = 1A, I_B = 0.25A
Output Capacitance	C_{ob}	–	18	–	pF	V_{CB} = 10V, f = 0.1MHz
Transition Frequency	f_T	4	–	–	MHz	I_C = 0.1A, V_{CE} = 10V
Turn-on Time with Resistive Load	t_{on}	–	–	0.7	μs	I_C = 1A,V_{CC} = 125V, I_{B1} = 0.2A, I_{B2} = -0.2A
Storage Time with Resistive Load	t_s	–	–	3.0		
Fall Time with Resistive Load	t_f	–	–	0.35		

Note: 10. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤2%.

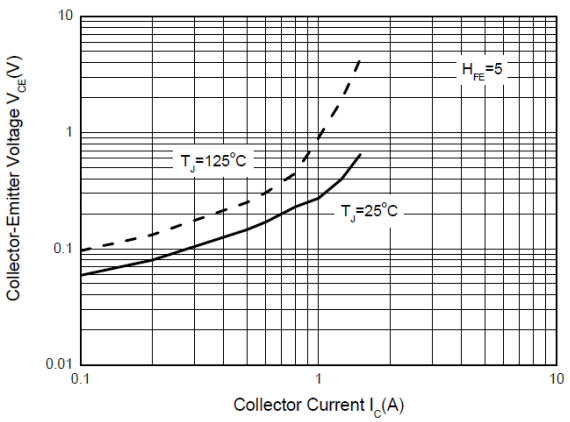
Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)



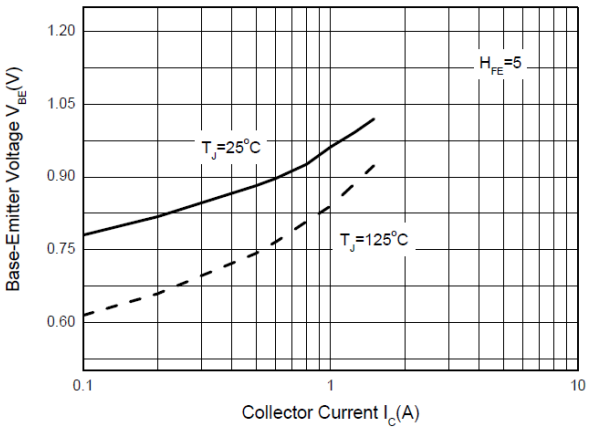
Static Characterstics



DC Current Gain



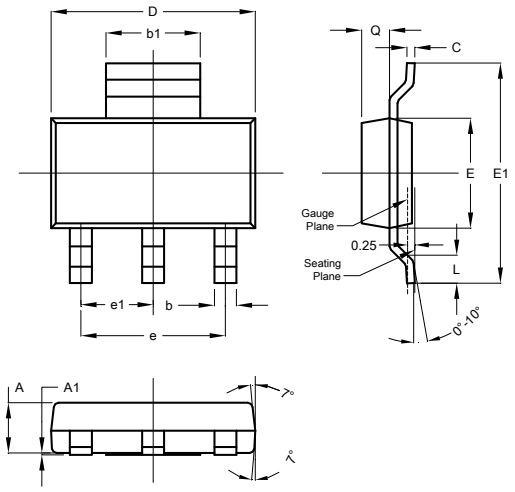
Collector-Emitter Saturation Region



Base-Emitter Saturation Voltage

Package Outline Dimensions

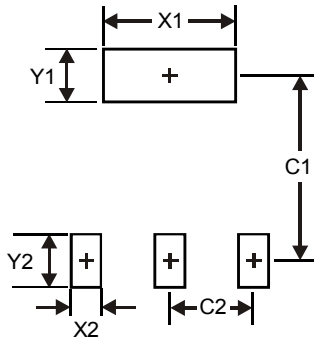
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for latest version.



SOT223			
Dim	**Min**	**Max**	**Typ**
A	1.55	1.65	1.60
A1	0.010	0.15	0.05
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
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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