

## Features

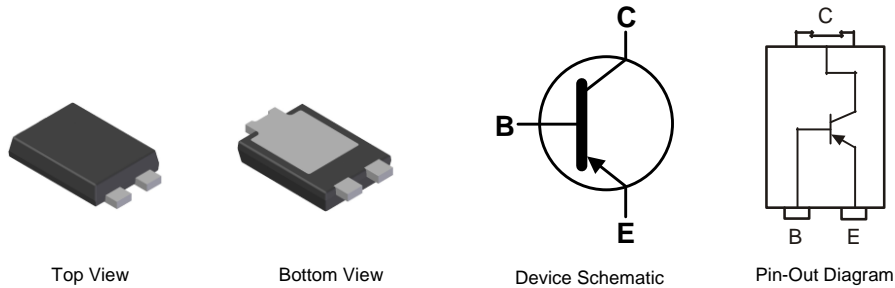
- $BV_{CEO} = -200V$
- $I_C = -2A$  High Continuous Collector Current
- $I_{CM} = -5A$  Peak Collector Current
- $P_D$  up to 3.2W
- 43% smaller than SOT223; 60% smaller than TO252 (DPAK)
- Maximum height just 1.1mm
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

## Application

- DC – DC Conversion
- Telecoms
- Power Management

## Mechanical Data

- Case: PowerDI<sup>®</sup>5
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 (e3)
- Weight: 0.093 grams (Approximate)

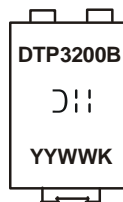


## Ordering Information (Note 4)

Product	Compliance	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
DXTP03200BP5-13	AEC-Q101	DTP3200B	13	16	5,000

- 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](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



DTP3200B = Product Type Marking Code  
 DII = Manufacturers' Code Marking  
 K = Factory Designator  
 YYWW = Date Code Marking  
 YY = Last Two Digits of Year (ex: 09 for 2009)  
 WW = Week Code (01 to 53)

### Absolute Maximum Ratings (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CBO</sub>	-220	V
Collector-Emitter Voltage	V <sub>CEO</sub>	-200	V
Emitter-Base Voltage	V <sub>EBO</sub>	-7	V
Continuous Collector Current	I <sub>C</sub>	-2	A
Base Current	I <sub>B</sub>	-1	A
Peak Pulse Current	I <sub>CM</sub>	-5	A

### Thermal Characteristics (@T<sub>A</sub> = +25°C, unless otherwise specified.)

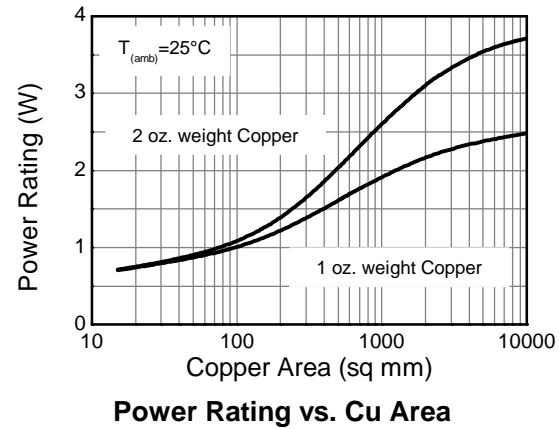
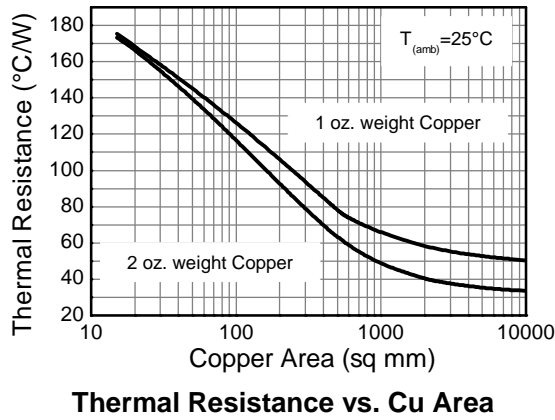
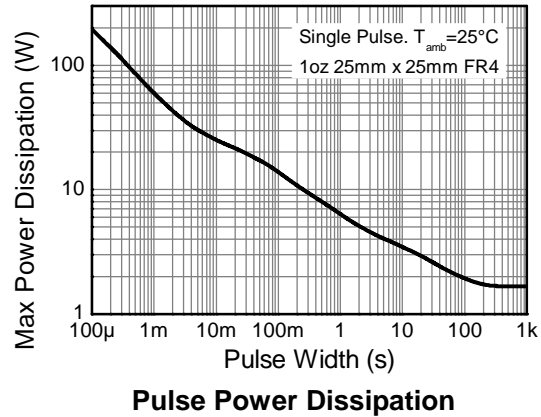
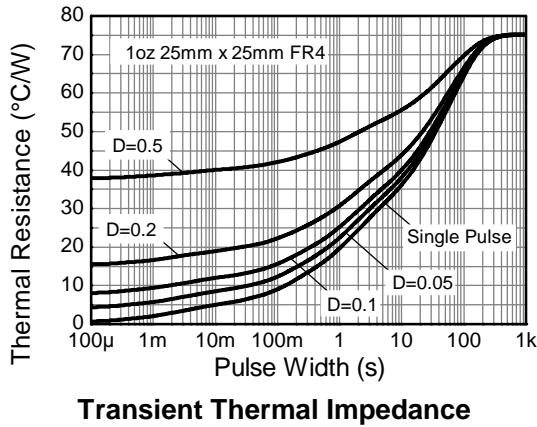
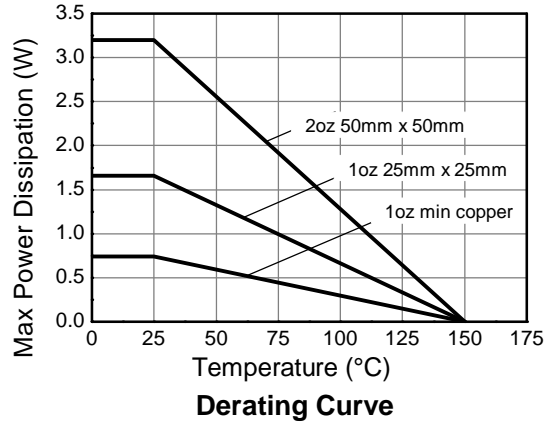
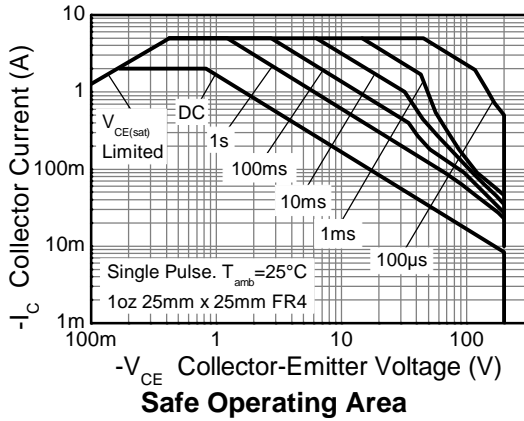
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P <sub>D</sub>	3.2	W
Thermal Resistance, Junction to Ambient Air (Note 5)	R <sub>θJA</sub>	39	°C/W
Power Dissipation (Note 6)	P <sub>D</sub>	1.7	W
Thermal Resistance, Junction to Ambient Air (Note 6)	R <sub>θJA</sub>	75	°C/W
Power Dissipation (Note 7)	P <sub>D</sub>	0.74	W
Thermal Resistance, Junction to Ambient Air (Note 7)	R <sub>θJA</sub>	169	°C/W
Thermal Resistance, Junction to Lead (Note 8)	R <sub>θJL</sub>	5.6	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°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. Device mounted on FR-4 PCB, single sided 2 oz. copper, collector pad dimensions 50mm x 50mm.
  6. Device mounted on FR-4 PCB, single sided 1 oz. copper, collector pad dimensions 25mm x 25mm.
  7. Device mounted on FR-4 PCB, single sided 1 oz. copper, minimum recommended pad layout.
  - 8 Thermal resistance from junction to solder-point (on the exposed collector pad).
  9. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

**Thermal Characteristics and Derating Information**

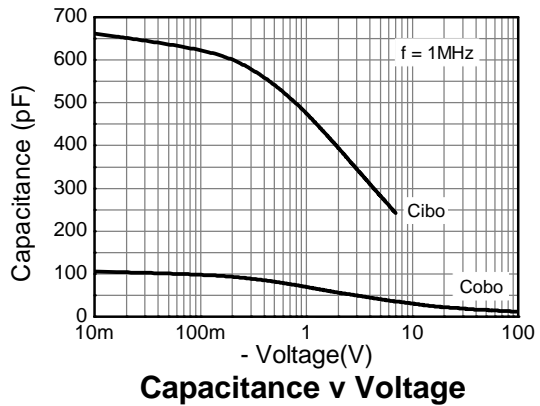
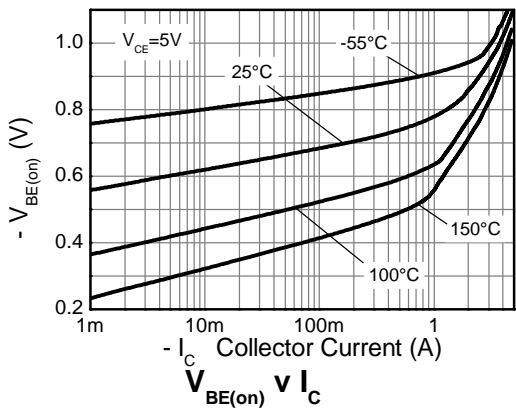
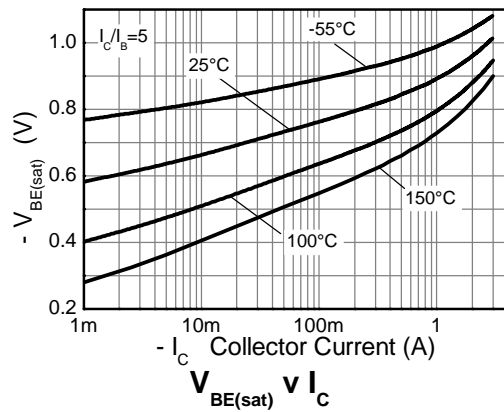
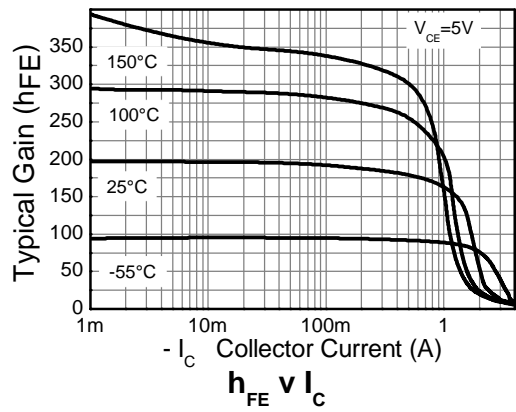
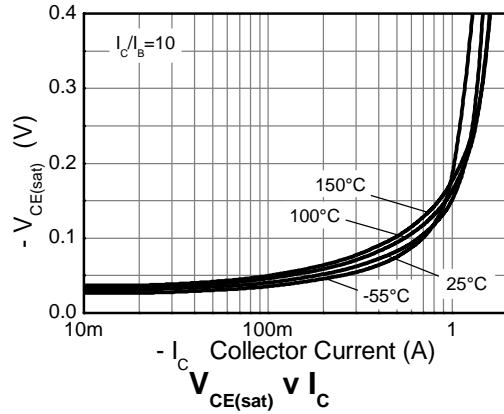
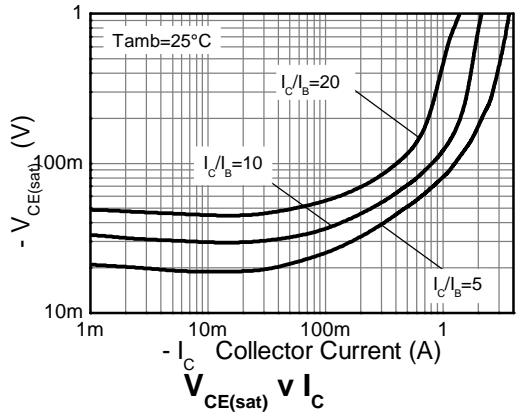


**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	V <sub>(BR)CBO</sub>	-220	-245	-	V	I <sub>C</sub> = -100μA
Collector-Emitter Breakdown Voltage (Note 10)	V <sub>(BR)CEO</sub>	-200	-225	-	V	I <sub>C</sub> = -10mA
Emitter-Base Breakdown Voltage	V <sub>(BR)EBO</sub>	-7	-8.4	-	V	I <sub>E</sub> = -100μA
Collector Cutoff Current	I <sub>CBO</sub>	-	<1	-50 -0.5	nA μA	V <sub>CB</sub> = -200V V <sub>CB</sub> = -200V, T <sub>A</sub> = +100°C
Emitter Cutoff Current	I <sub>EBO</sub>	-	<1	-10	nA	V <sub>EB</sub> = -6V
Collector-Emitter Saturation Voltage (Note 10)	V <sub>CE(sat)</sub>	-	-37 -130 -135 -180	-50 -155 -160 -275	mV	I <sub>C</sub> = -0.1A, I <sub>B</sub> = -10mA I <sub>C</sub> = -0.5A, I <sub>B</sub> = -25mA I <sub>C</sub> = -1A, I <sub>B</sub> = -100mA I <sub>C</sub> = -2A, I <sub>B</sub> = -400mA
Base-Emitter Saturation Voltage (Note 10)	V <sub>BE(sat)</sub>	-	-955	-1,100	mV	I <sub>C</sub> = -2A, I <sub>B</sub> = -400mA
Base-Emitter Turn-On Voltage (Note 10)	V <sub>BE(on)</sub>	-	-860	-1,000	mV	V <sub>CE</sub> = -5V, I <sub>C</sub> = -2A
DC Current Gain (Note 10)	h <sub>FE</sub>	100 100 20 -	195 170 50 5	- 300 -	-	V <sub>CE</sub> = -5V, I <sub>C</sub> = -10mA V <sub>CE</sub> = -5V, I <sub>C</sub> = -1A V <sub>CE</sub> = -5V, I <sub>C</sub> = -2A V <sub>CE</sub> = -5V, I <sub>C</sub> = -5A
Transition Frequency	f <sub>T</sub>	-	105	-	MHz	V <sub>CE</sub> = -10V, I <sub>C</sub> = -100mA, f = 50MHz
Output Capacitance	C <sub>obo</sub>	-	31	-	pF	V <sub>CB</sub> = -10V, f = 1MHz
Delay Time	t <sub>d</sub>	-	21	-	ns	V <sub>CC</sub> = -50V, I <sub>C</sub> = -1A, I <sub>B1</sub> = -I <sub>B2</sub> = -100mA
Rise Time	t <sub>r</sub>	-	18	-	ns	
Storage Time	t <sub>s</sub>	-	680	-	ns	
Fall Time	t <sub>f</sub>	-	75	-	ns	

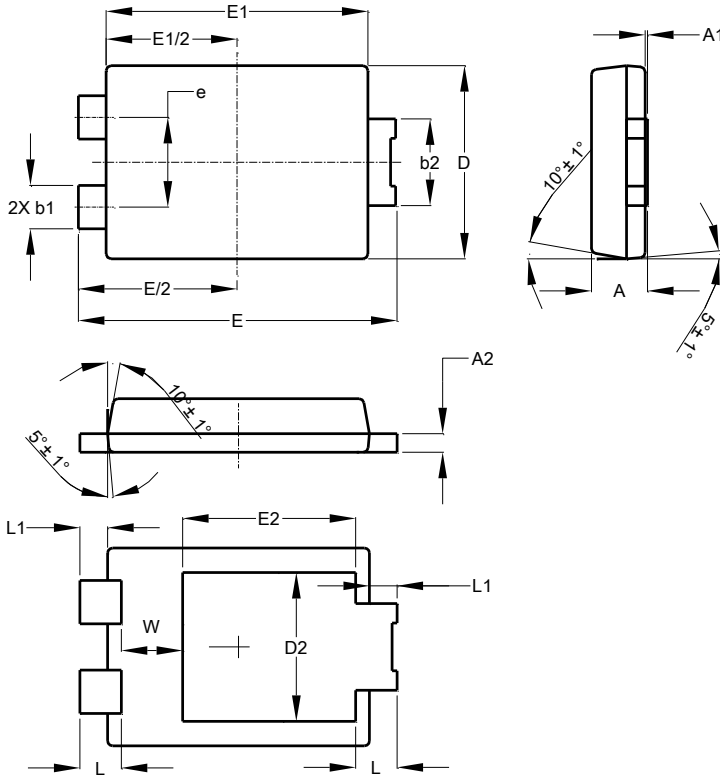
Note: 10. Pulse Test: Pulse width ≤300μs. Duty cycle ≤2.0%.

**Typical Characteristics**



**Package Outline Dimensions**

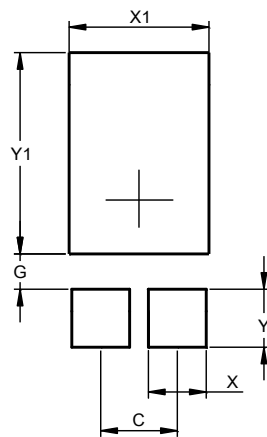
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



POWERDI <sup>®</sup> 5			
Dim	Min	Max	Typ
A	1.05	1.15	1.10
A1	0.00	0.05	--
A2	0.33	0.43	0.381
b1	0.80	0.99	0.89
b2	1.70	1.88	1.78
D	3.90	4.05	3.966
D2	--	--	3.054
E	6.40	6.60	6.504
e	--	--	1.84
E1	5.30	5.45	5.37
E2	--	--	3.549
L	0.75	0.95	0.85
L1	0.50	0.65	0.57
W	1.10	1.41	1.255
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	1.840
G	0.852
X	1.390
X1	3.360
Y	1.400
Y1	4.860

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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