



**THE DATASHEET OF  
DXT2010P5-13**





**DXT2010P5**

**60V NPN MEDIUM POWER TRANSISTOR**  
**PowerDI<sup>®</sup>5**

**Features**

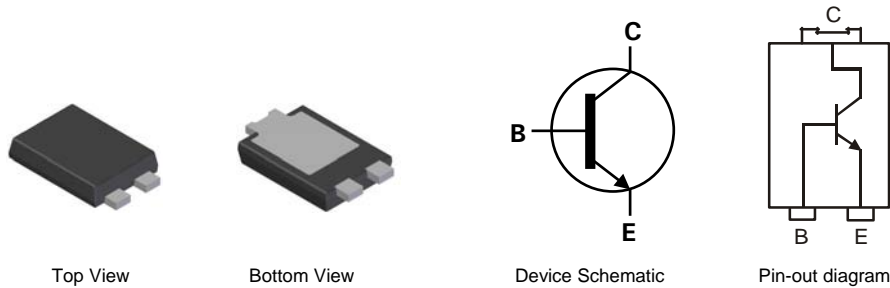
- 43% smaller than SOT223; 60% smaller than TO252
- Maximum height just 1.1mm
- Rated up to 3.2W
- $V_{CE0} = 60V$
- $I_C = 6A$ ;  $I_{CM} = 20A$
- Low Saturation voltage
- **Lead, Halogen and Antimony Free, RoHS Compliant (Note 1)**
- **“Green” Device (Note 2)**

**Applications**

- Motor driver
- Regulator circuit

**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 <sup>Ⓒ</sup>3
- Weight: 0.093 grams (approximate)



**Ordering Information (Note 3)**

Part Number	Case	Packaging
DXT2010P5-13	PowerDI <sup>®</sup> 5	5000/Tape & Reel

- Notes:
1. No purposefully added lead. Halogen and Antimony Free.
  2. Diodes Inc's “Green” Policy can be found on our website at <http://www.diodes.com>
  3. For packaging details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

**Marking Information**



DXT2010 = Product Type Marking Code  
 ⓂⓂ = 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)

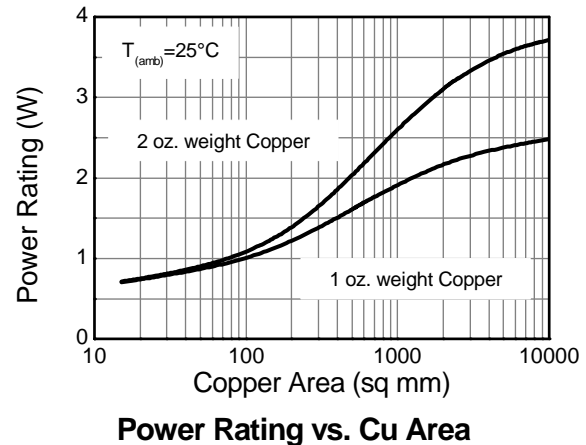
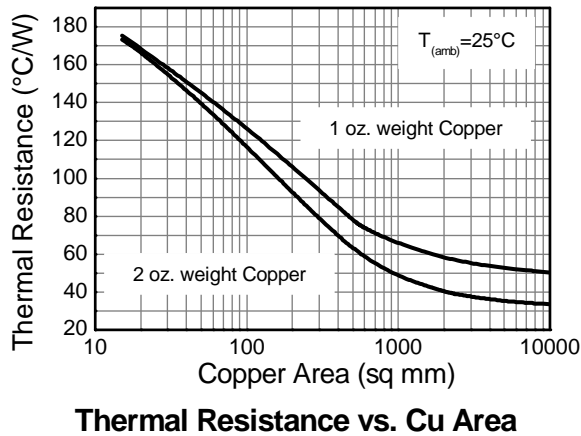
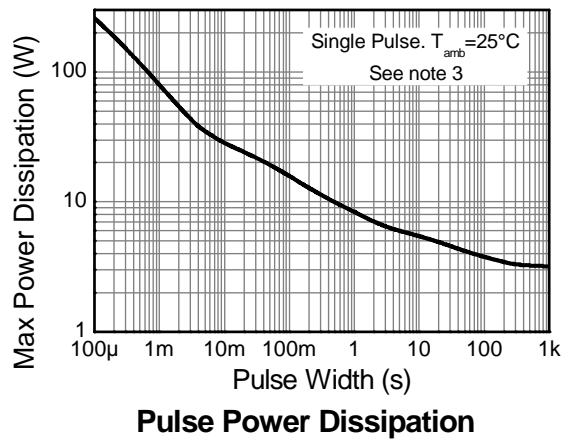
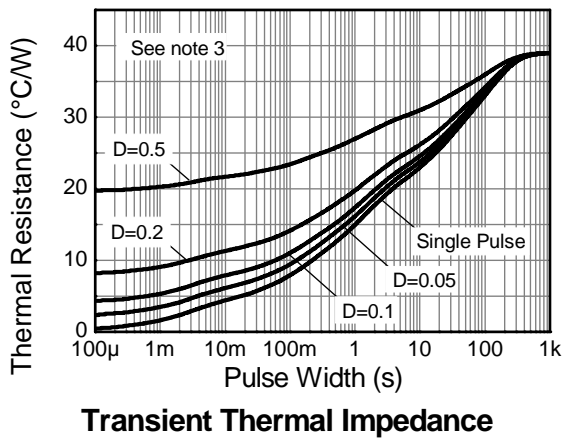
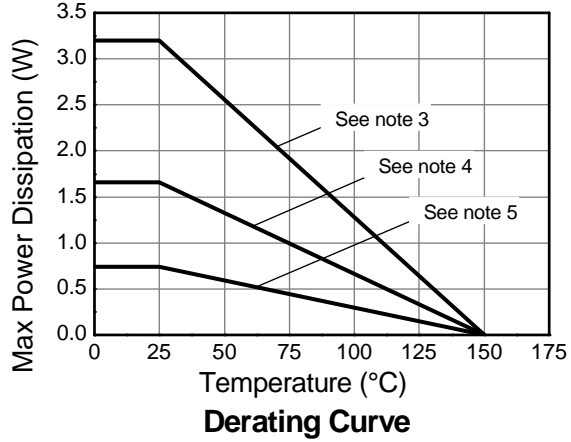
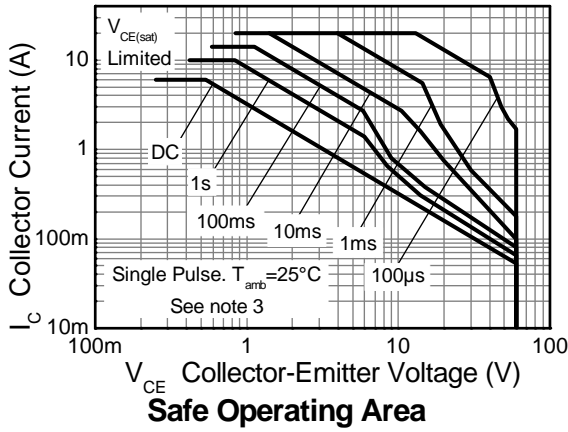
**Maximum Ratings** @ $T_A = 25^\circ\text{C}$  unless otherwise specified

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	$V_{CBO}$	150	V
Collector-Emitter Voltage	$V_{CEO}$	60	V
Emitter-Base Voltage	$V_{EBO}$	7	V
Continuous Collector Current	$I_C$	6	A
Peak Pulse Current	$I_{CM}$	20	A

**Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Power Dissipation @ $T_A = 25^\circ\text{C}$ (Note 4)	$P_D$	3.2	W
Thermal Resistance, Junction to Ambient Air (Note 4) @ $T_A = 25^\circ\text{C}$	$R_{\theta JA}$	39	$^\circ\text{C/W}$
Power Dissipation @ $T_A = 25^\circ\text{C}$ (Note 5)	$P_D$	1.7	W
Thermal Resistance, Junction to Ambient Air (Note 5) @ $T_A = 25^\circ\text{C}$	$R_{\theta JA}$	75	$^\circ\text{C/W}$
Power Dissipation @ $T_A = 25^\circ\text{C}$ (Note 6)	$P_D$	0.74	W
Thermal Resistance, Junction to Ambient Air (Note 6) @ $T_A = 25^\circ\text{C}$	$R_{\theta JA}$	169	$^\circ\text{C/W}$
Thermal Resistance, Junction to Collector Terminal	$R_{\theta JT}$	5.6	$^\circ\text{C/W}$
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	$^\circ\text{C}$

- Notes:
4. Device mounted on FR-4 PCB, single sided 2 oz. copper, collector pad dimensions 25mm x 25mm.
  5. Device mounted on FR-4 PCB, single sided 1 oz. copper, collector pad dimensions 50mm x 50mm.
  6. Device mounted on FR-4 PCB, single sided 1 oz. copper, minimum recommended pad layout.

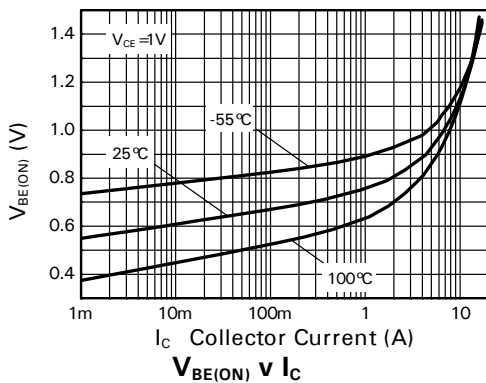
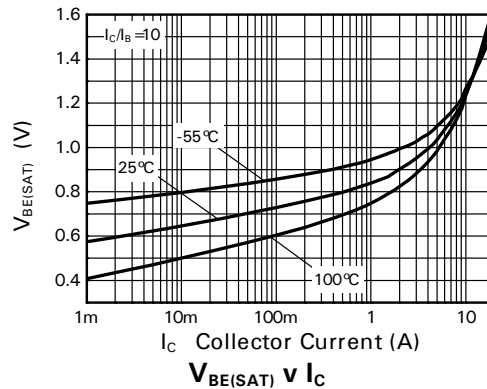
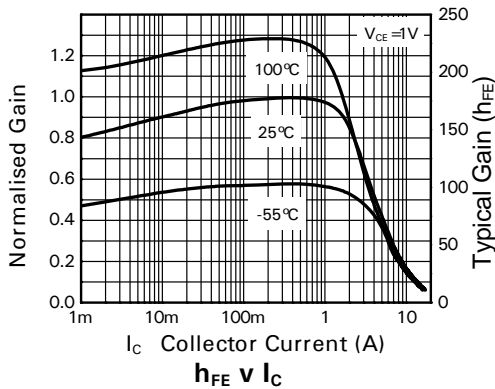
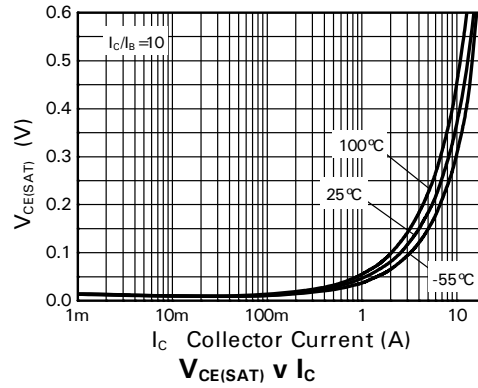
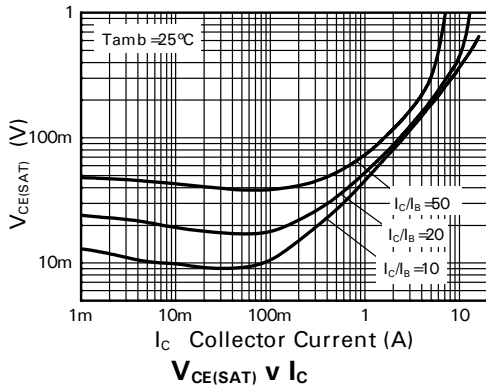


**Electrical Characteristics** @T<sub>A</sub> = 25°C unless otherwise specified

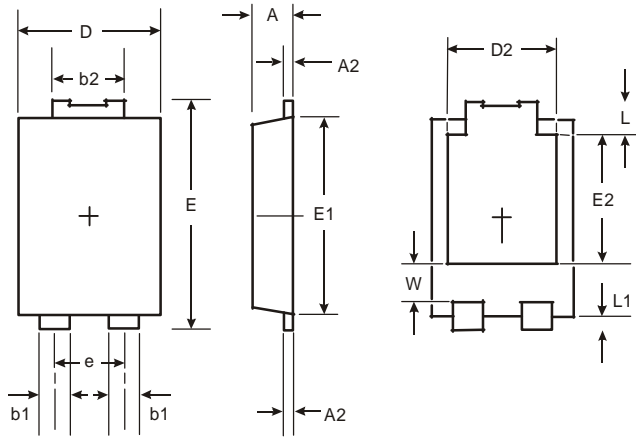
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	V <sub>(BR)CBO</sub>	150	190	—	V	I <sub>C</sub> = 100μA
Collector-Emitter Breakdown Voltage (Note 7)	V <sub>(BR)CEO</sub>	60	80	—	V	I <sub>C</sub> = 10mA
Emitter-Base Breakdown Voltage	V <sub>(BR)EBO</sub>	7.0	8.1	—	V	I <sub>E</sub> = 100μA
Collector Cutoff Current	I <sub>CBO</sub>	—	—	20 0.5	nA μA	V <sub>CB</sub> = 120V V <sub>CB</sub> = 120V, T <sub>amb</sub> = 100 °C
Collector Cutoff Current	I <sub>CER</sub> R ≤ 1kΩ	—	—	20 0.5	nA μA	V <sub>CB</sub> = 120V V <sub>CB</sub> = 120V, T <sub>amb</sub> = 100 °C
Emitter Cutoff Current	I <sub>EBO</sub>	—	—	10	nA	V <sub>EB</sub> = 6V
Collector-Emitter Saturation Voltage (Note 7)	V <sub>CE(sat)</sub>	—	20 45 50 100 210	30 60 70 135 260	mV	I <sub>C</sub> = 100mA, I <sub>B</sub> = 5mA I <sub>C</sub> = 1A, I <sub>B</sub> = 100mA I <sub>C</sub> = 1A, I <sub>B</sub> = 50mA I <sub>C</sub> = 2A, I <sub>B</sub> = 50mA I <sub>C</sub> = 6A, I <sub>B</sub> = 300mA
Base-Emitter Saturation Voltage (Note 7)	V <sub>BE(sat)</sub>	—	1000	1100	mV	I <sub>C</sub> = 6A, I <sub>B</sub> = 300mA
Base-Emitter Turn-On Voltage (Note 7)	V <sub>BE(on)</sub>	—	940	1050	mV	V <sub>CE</sub> = 1V, I <sub>C</sub> = 6A
DC Current Gain (Note 6)	h <sub>FE</sub>	100 100 55 20	200 200 105 40	— 300 — —	—	I <sub>C</sub> = 10mA, V <sub>CE</sub> = 1V I <sub>C</sub> = 2A, V <sub>CE</sub> = 1V I <sub>C</sub> = 5A, V <sub>CE</sub> = 1V I <sub>C</sub> = 10A, V <sub>CE</sub> = 1V
Transition Frequency	f <sub>T</sub>	—	130	—	MHz	I <sub>C</sub> = 100mA, V <sub>CE</sub> = 10V f = 50MHz
Output Capacitance (Note 7)	C <sub>obo</sub>	—	31	—	pF	V <sub>CB</sub> = -10A, f = 1MHz
Switching Times	t <sub>on</sub> t <sub>off</sub>	— —	42 760	— —	ns ns	I <sub>C</sub> = 1A, V <sub>CC</sub> = 10V, I <sub>B1</sub> = I <sub>B2</sub> = 100mA

Notes: 7. Pulse Test: Pulse width ≤ 300μs. Duty cycle ≤ 2.0%.

**Typical Characteristic**

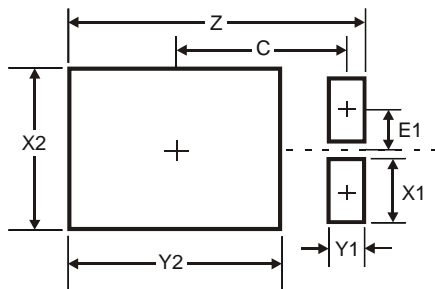


**Package Outline Dimensions**



PowerDI <sup>®5</sup>		
Dim	Min	Max
A	1.05	1.15
A2	0.33	0.43
b1	0.80	0.99
b2	1.70	1.88
D	3.90	4.05
D2	3.054 Typ	
E	6.40	6.60
e	1.84 Typ	
E1	5.30	5.45
E2	3.549 Typ	
L	0.75	0.95
L1	0.50	0.65
W	1.10	1.41
All Dimensions in mm		

**Suggested Pad Layout**



Dimensions	Value (in mm)
Z	6.6
X1	1.4
X2	3.6
Y1	0.8
Y2	4.7
C	3.87
E1	0.9

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