

**100V NPN LOW SAT MEDIUM POWER TRANSISTOR
POWERDI[®]5**


Features

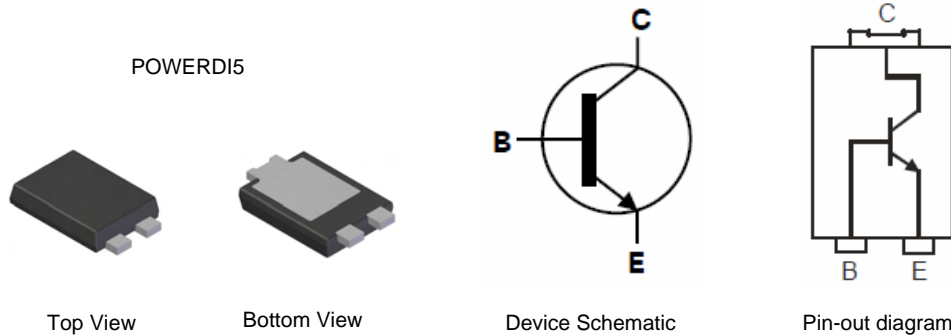
- 43% smaller than SOT223; 60% smaller than TO252
- Maximum height just 1.1mm
- Rated up to 3.2W
- $BV_{CEO} > 100V$
- Maximum continuous current $I_C = 6A$
- Low Saturation voltage
- **Totally Lead-Free & Fully RoHS compliant (Note 1)**
- **Halogen and Antimony Free. "Green" Device (Note 2)**

Applications

- Motor Drive
- Regulator circuit

Mechanical Data

- Case: POWERDI5
- 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 
- Weight: 0.093 grams (approximate)

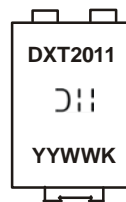



Ordering Information (Note 3)

Part Number	Case	Packaging
DXT2011P5-13	POWERDI5	5000/Tape & Reel

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
 2. Halogen and Antimony free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
 3. For packaging details, go to our website at <http://www.diodes.com>.

Marking Information



DXT2011 = 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

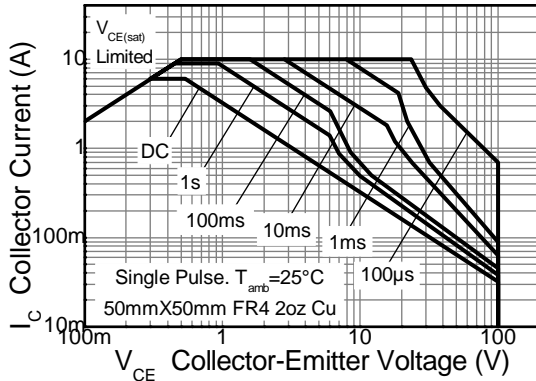
Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	200	V
Collector-Emitter Voltage	V_{CEO}	100	V
Emitter-Base Voltage	V_{EBO}	7	V
Continuous Collector Current	I_C	6	A
Peak Pulse Current	I_{CM}	10	A

Thermal Characteristics @ $T_A = 25^\circ\text{C}$ unless otherwise specified

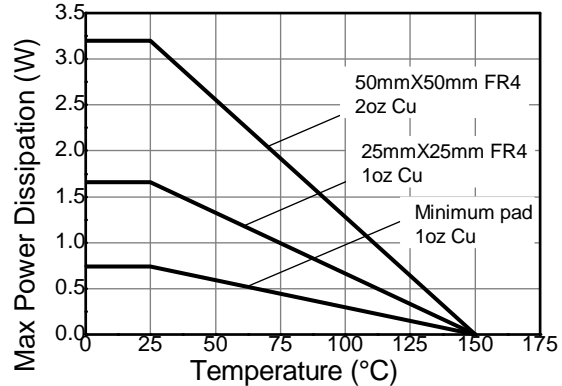
Characteristic	Symbol	Value	Unit
Power Dissipation	P_D	3.2	W
		1.7	
		0.74	
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	39	$^\circ\text{C/W}$
		75	
		169	
Thermal Resistance, Junction to Collector Terminal	$R_{\theta JT}$	5.6	$^\circ\text{C/W}$
Operating and Storage Temperature Range	T_J,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

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

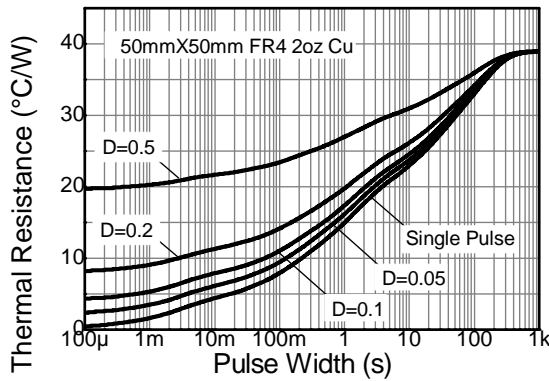
Thermal Characteristics



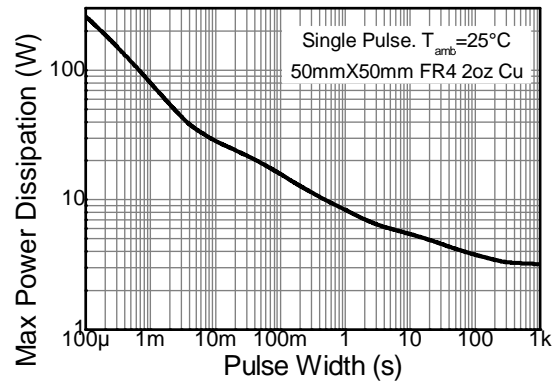
Safe Operating Area



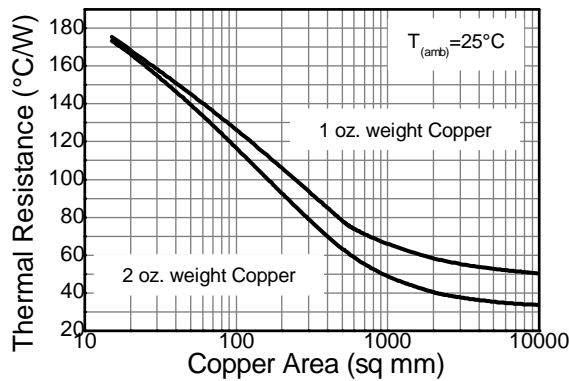
Derating Curve



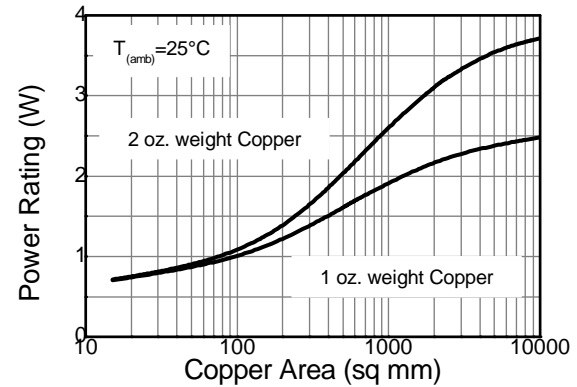
Transient Thermal Impedance



Pulse Power Dissipation



Thermal Resistance vs. Cu Area



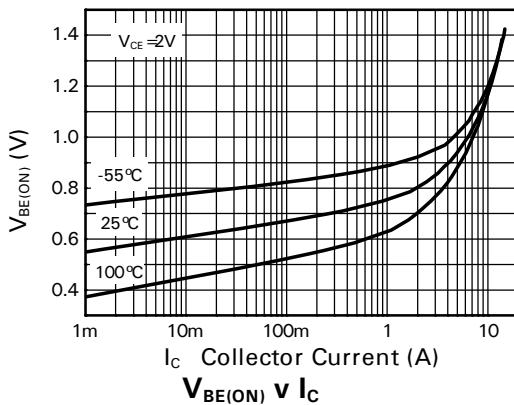
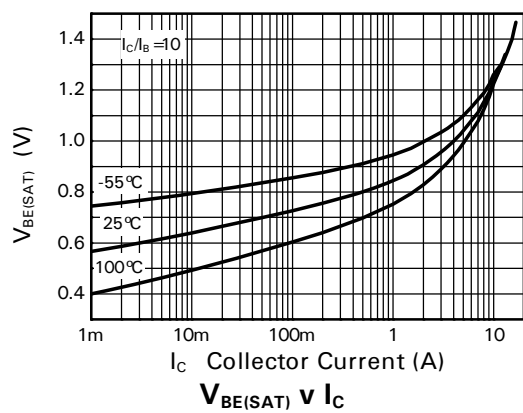
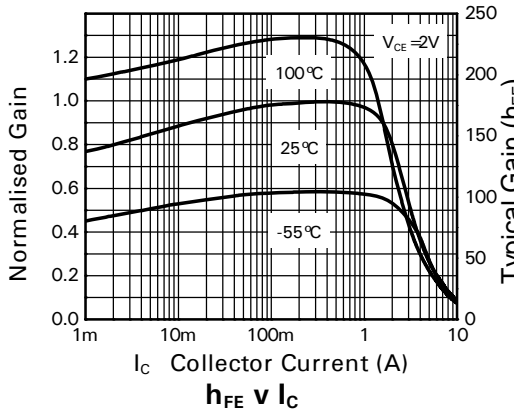
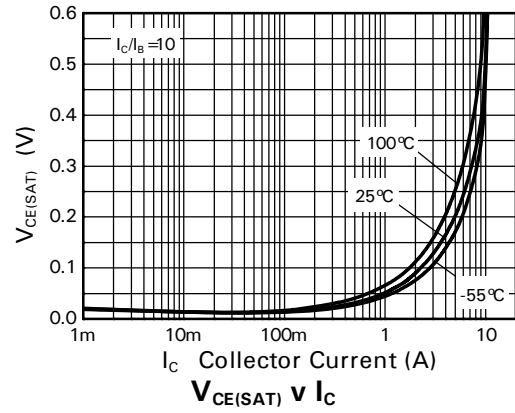
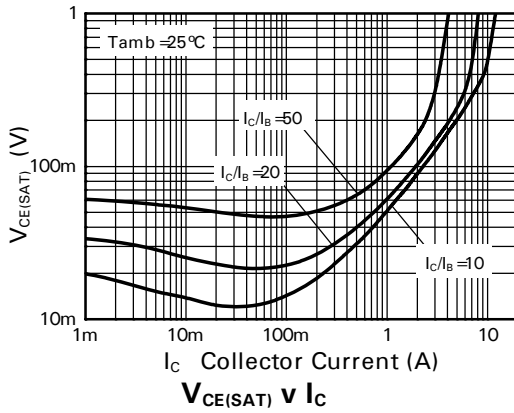
Power Rating vs. Cu Area

Electrical Characteristics @T_A = 25°C unless otherwise specified

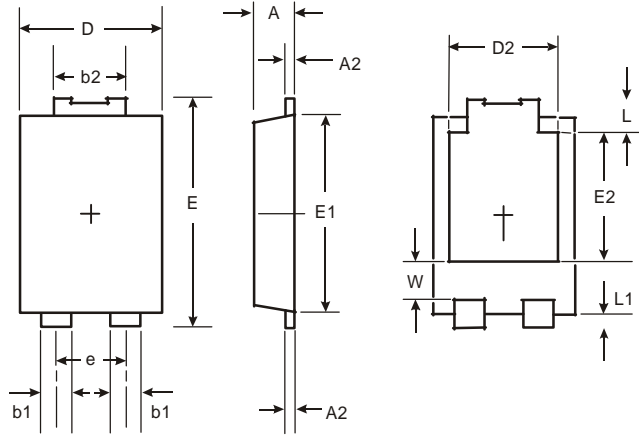
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV _{CBO}	200	235	—	V	I _C = 100μA
Collector-Emitter Breakdown Voltage (Note 7)	BV _{CEO}	100	115	—	V	I _C = 10mA
Emitter-Base Breakdown Voltage	BV _{EBO}	7	8.1	—	V	I _E = 100μA
Collector Cutoff Current	I _{CBO}	—	—	20	nA	V _{CB} = 150V
		—	—	0.5	μA	V _{CB} = 150V, T _{amb} = 100 °C
Collector Cutoff Current	I _{CER}	—	—	20	nA	V _{CB} = 150V
	R ≤ 1kΩ	—	—	0.5	μA	V _{CB} = 150V, T _{amb} = 100 °C
Emitter Cutoff Current	I _{EBO}	—	—	10	nA	V _{EB} = 6V
Collector-Emitter Saturation Voltage (Note 7)	V _{CE(sat)}	—	21	35	mV	I _C = 0.1A, I _B = -5mA
		—	50	65		I _C = 1A, I _B = 100mA
		—	95	125		I _C = 2A, I _B = 100mA
		—	180	220		I _C = 5A, I _B = 500mA
Base-Emitter Saturation Voltage (Note 7)	V _{BE(sat)}	—	1020	1120	mV	I _C = 5A, I _B = 500mA
Base-Emitter Turn-On Voltage (Note 7)	V _{BE(on)}	—	920	1000	mV	V _{CE} = 2V, I _C = 5A
DC Current Gain (Note 7)	h _{FE}	100	—	—	—	V _{CE} = 2V, I _C = 10mA
		100	—	300	—	V _{CE} = 2V, I _C = 2A
		30	—	—	—	V _{CE} = 2V, I _C = 5A
		10	—	—	—	V _{CE} = 2V, I _C = 10A
Transition Frequency	f _T	—	130	—	MHz	V _{CE} = 10V, I _C = 100mA, f = 50MHz
Output Capacitance	C _{obo}	—	26	—	pF	V _{CB} = 10V, f = 1MHz
Switching Times	t _{on}	—	41	—	ns	V _{CC} = 10V, I _C = 1A,
	t _{off}	—	1010	—		I _{B1} = I _{B2} = 100mA

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

Typical Characteristic

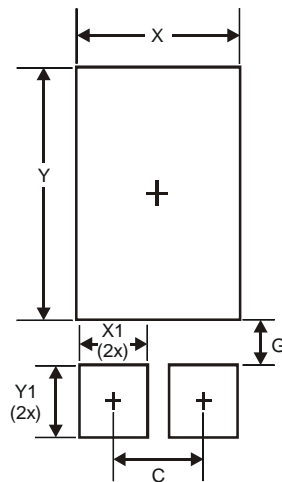


Package Outline Dimensions



POWERDI5		
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)
C	1.840
G	0.852
X	3.360
X1	1.390
Y	4.860
Y1	1.400

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