A Product Line of
Diodes Incorporated

DXT2013P5

Lead-free Green

100V PNP MEDIUM POWER TRANSISTOR
PowerDI®5

Features

- 43% smaller than SOT223; 60% smaller than TO252
- Maximum height just 1.1mm
- Rated up to 3.2W
- V_{CEO} = -100V
- I_C = -5A; I_{CM} = -10A
- Low Saturation voltage
- **Lead, Halogen and Antimony Free, RoHS Compliant (Note 1)**
- **"Green" Device (Note 2)**

Mechanical Data

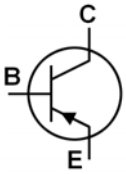
- Case: PowerDI®5
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.093 grams (approximate)

Applications

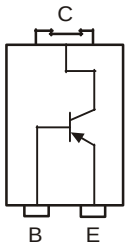
- SLIC DC-DC Converter

Top View

Bottom View



Device Schematic



Pin-out diagram

Ordering Information (Note 3)

Part Number	Case	Packaging
DXT2013P5-13	PowerDI®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

DXT2013 = 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)

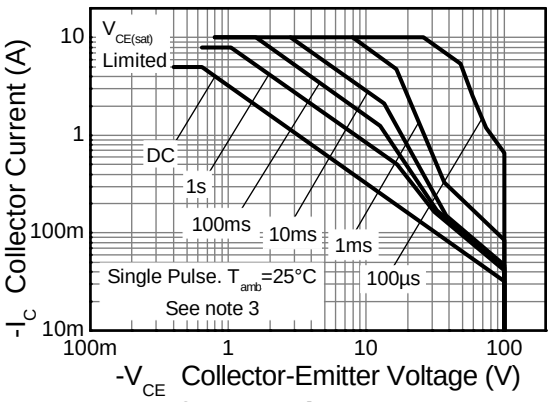
Maximum Ratings @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	-140	V
Collector-Emitter Voltage	V_{CEO}	-100	V
Emitter-Base Voltage	V_{EBO}	-7	V
Continuous Collector Current	I_C	-5	A
Peak Pulse Current	I_{CM}	-10	A

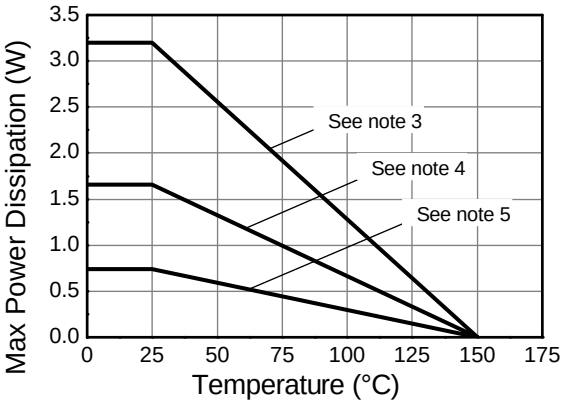
Thermal Characteristics

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

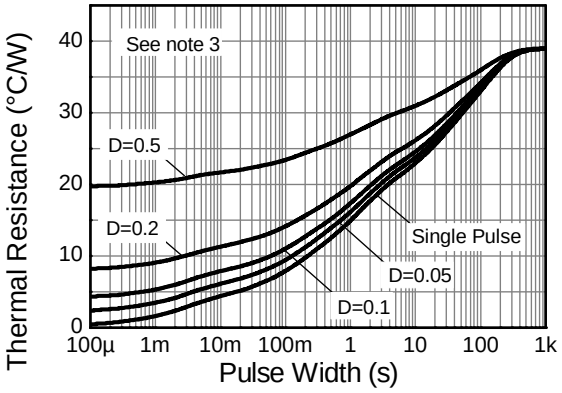
Notes: 4. Device mounted on FR-4 PCB, single sided 2 oz. copper, collector pad dimensions 50mm x 50mm.
5. Device mounted on FR-4 PCB, single sided 1 oz. copper, collector pad dimensions 25mm x 25mm.
6. Device mounted on FR-4 PCB, single sided 1 oz. copper, minimum recommended pad layout.



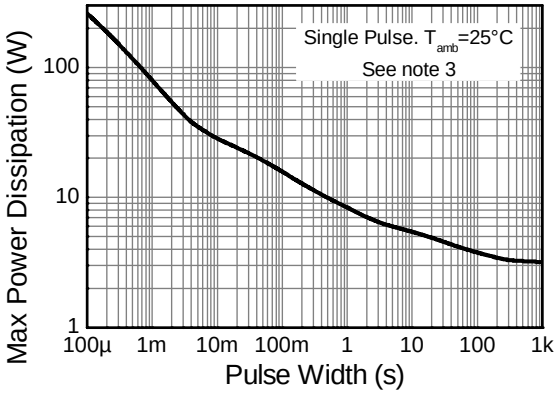
Safe Operating Area



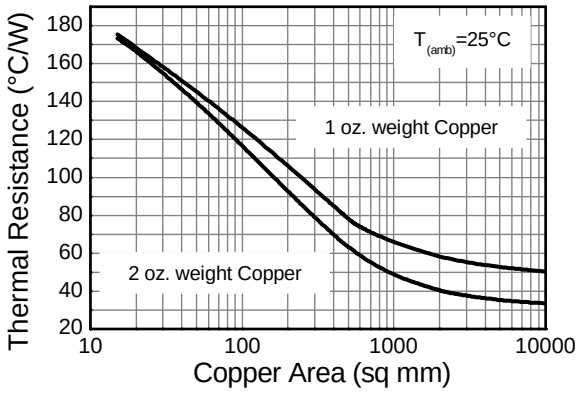
Derating Curve



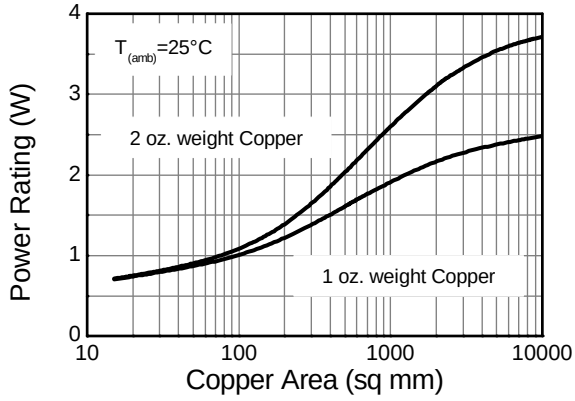
Transient Thermal Impedance



Pulse Power Dissipation



Thermal Resistance vs. Cu Area



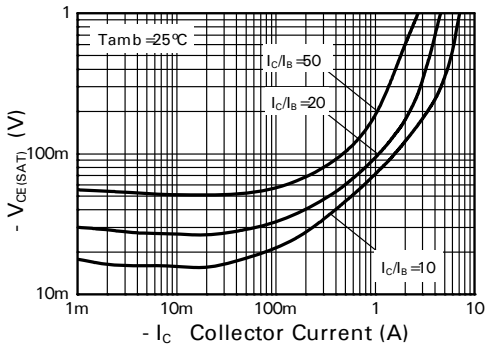
Power Rating vs. Cu Area

Electrical Characteristics @T_A = 25°C unless otherwise specified

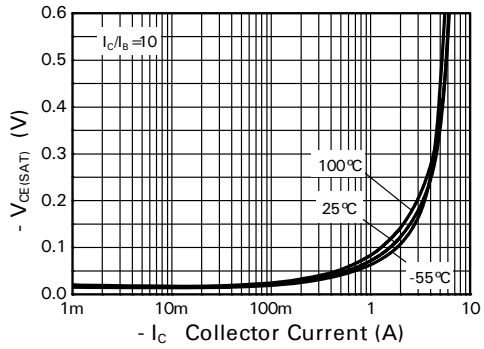
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	-140	-160	—	V	I_C = -100μA
Collector-Emitter Breakdown Voltage (Note 7)	$V_{(BR)CEO}$	-100	-115	—	V	I_C = -10mA
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	-7.0	-8.1	—	V	I_E = -100μA
Collector Cutoff Current	I_{CBO}	—	<1 —	-20 -0.5	nA μA	V_{CB} = -100V V_{CB} = -100V, T_{amb} = 100 °C
Collector Cutoff Current	I_{CER} R≤1kΩ	—	<1 —	-20 -0.5	nA μA	V_{CB} = -100V V_{CB} = -100V, T_{amb} = 100 °C
Emitter Cutoff Current	I_{EBO}	—	<1	-10	nA	V_{EB} = -6V
Collector-Emitter Saturation Voltage (Note 7)	$V_{CE(sat)}$	—	-20 -70 -120 -240	-30 -90 -150 -340	mV	I_C = -0.1A, I_B = -10mA I_C = -1A, I_B = -100mA I_C = -2A, I_B = -200mA I_C = -4A, I_B = -400mA
Base-Emitter Saturation Voltage (Note 7)	$V_{BE(sat)}$	—	-985	-1100	mV	I_C = -4A, I_B = -400mA
Base-Emitter Turn-On Voltage (Note 7)	$V_{BE(on)}$	—	-920	-1050	mV	V_{CE} = -4V, I_C = -2A
DC Current Gain (Note 7)	h_{FE}	100 100 25 15 —	250 200 50 30 5	— 300 — — —	—	I_C = -10mA, V_{CE} = -1V I_C = -1A, V_{CE} = -1V I_C = -3A, V_{CE} = -1V I_C = -4A, V_{CE} = -1V I_C = -10A, V_{CE} = -1V
Transition Frequency	f_T	—	125	—	MHz	I_C = -100mA, V_{CE} = -10V, f = 50MHz
Output Capacitance	C_{obo}	—	42	—	pF	V_{CB} = -10V, f = 1MHz
Switching Times	t_{on} t_{off}	— —	42 540	— —	ns ns	I_C = -1A, V_{CC} = -10V, I_{B1} = I_{B2} = -100mA

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

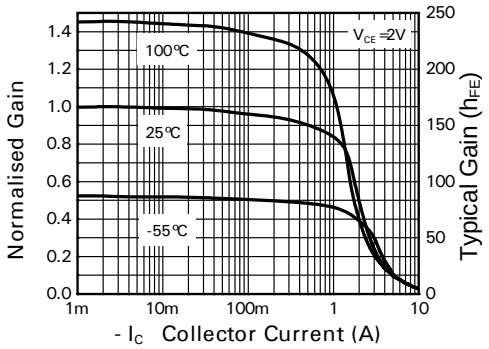
Typical Characteristic



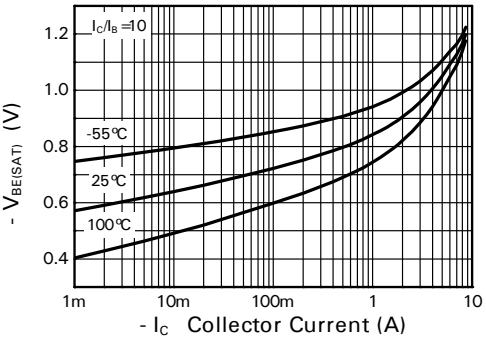
$V_{CE(SAT)}$ v I_C



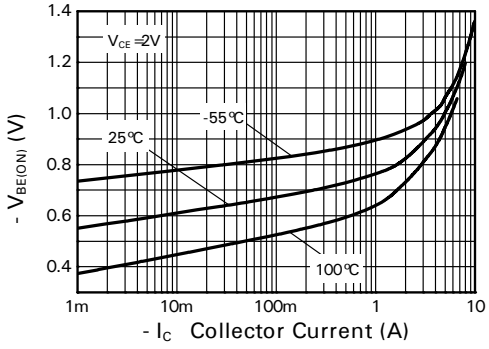
$V_{CE(SAT)}$ v I_C



h_{FE} v I_C

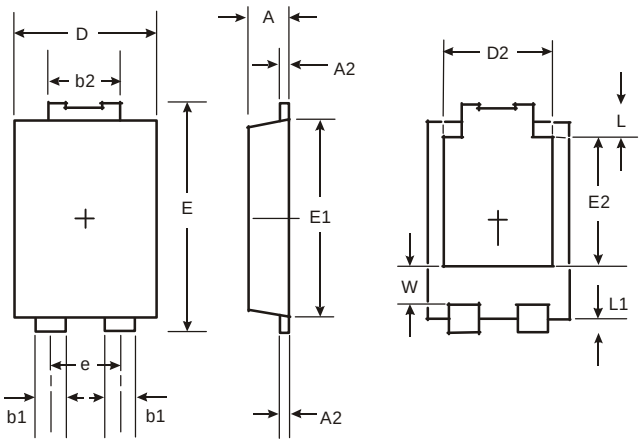


$V_{BE(SAT)}$ v I_C



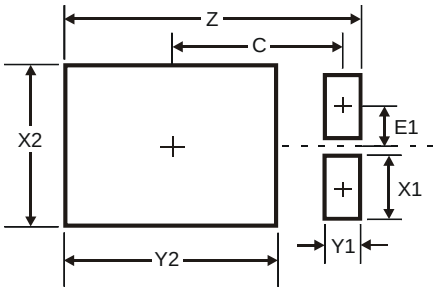
$V_{BE(ON)}$ v I_C

Package Outline Dimensions



PowerDI®5		
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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