DXT2012P5

60V 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} = 60V
- I_C = -5.5A; I_{CM} = 15A
- Low Saturation voltage
- **Lead, Halogen, and Antimony Free/RoHS Compliant (Note 1)**
- **"Green" Device (Note 2)**

Mechanical Data

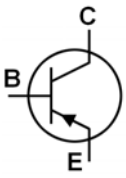
- Case: PowerDI®5
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.093 grams (approximate)

Applications

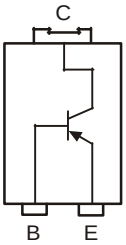
- Motor driver
- Regulator circuit

Top View

Bottom View



Device Schematic



Pin-out diagram

Ordering Information (Note 3)

Part Number	Case	Packaging
DXT2012P5-13	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

DXT2012 = 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

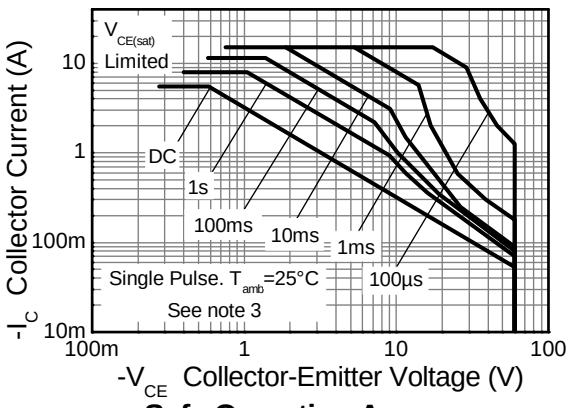
Maximum Ratings @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	-100	V
Collector-Emitter Voltage	V_{CEO}	-60	V
Emitter-Base Voltage	V_{EBO}	-7	V
Continuous Collector Current	I_C	-5.5	A
Peak Pulse Current	I_{CM}	-15	A

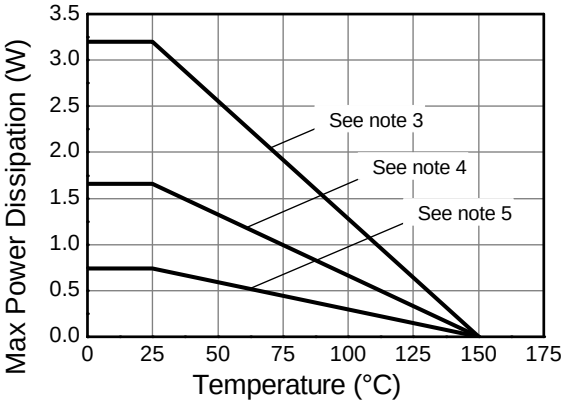
Thermal Characteristics

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

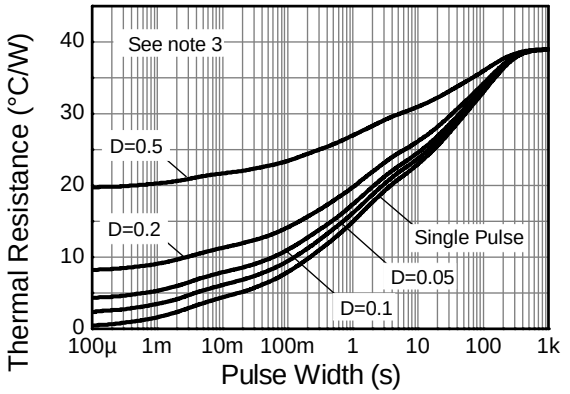
Notes: 4. Device mounted on FR-4 PCB, single sided 2 oz. copper, collector pad dimensions 50mm x 50mm.
5. Device mounted on FR-4 PCB, single sided 1 oz. copper, collector pad dimensions 25mm x 25mm.
6. Device mounted on FR-4 PCB, 2 single sided 1oz. copper, minimum recommended pad layout.



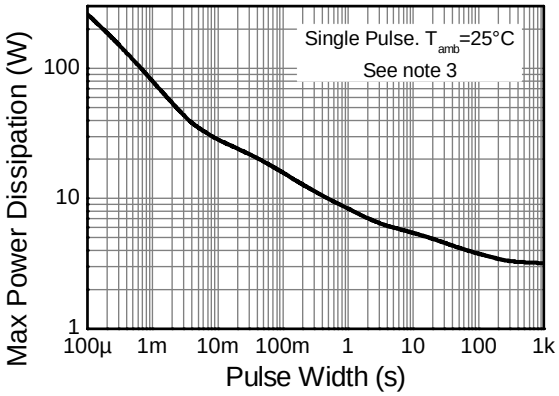
Safe Operating Area



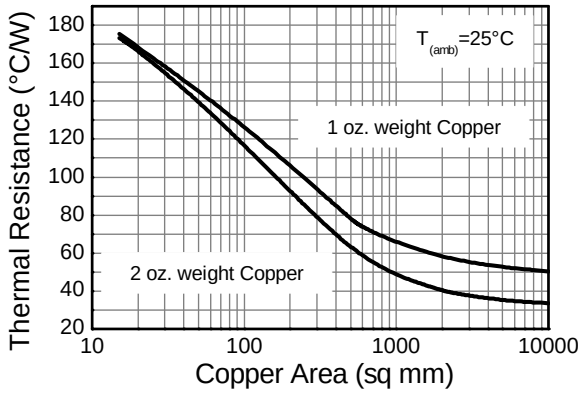
Derating Curve



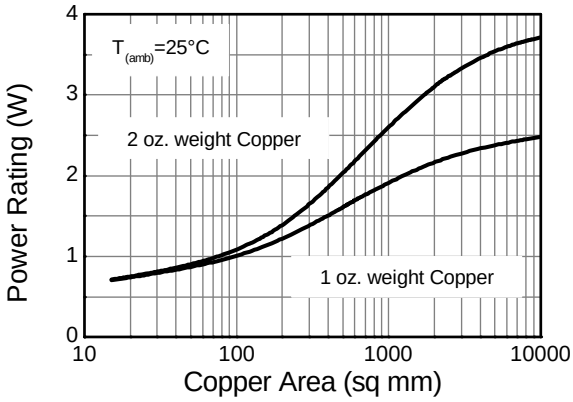
Transient Thermal Impedance



Pulse Power Dissipation



Thermal Resistance vs. Cu Area



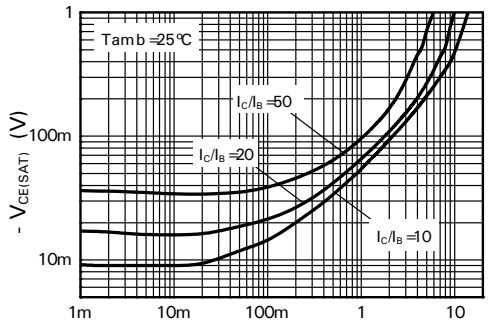
Power Rating vs. Cu Area

Electrical Characteristics @T_A = 25°C unless otherwise specified

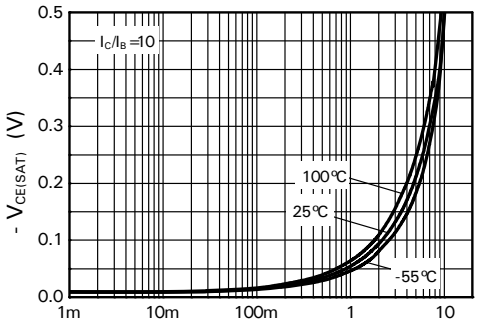
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	-100	-120	–	V	I_C = -100μA
Collector-Emitter Breakdown Voltage (Note 7)	$V_{(BR)CEO}$	-60	-80	–	V	I_C = -10mA
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	-7	-8.1	–	V	I_E = -100μA
Collector Cutoff Current	I_{CBO}	–	<1 –	-20 -0.5	nA μA	V_{CB} = -80V V_{CB} = -80V, T_{amb} = 100 °C
Collector Cutoff Current	I_{CER} R≤1kΩ	–	<1 –	-20 -0.5	nA μA	V_{CB} = -80V V_{CB} = -80V, T_{amb} = 100 °C
Emitter Cutoff Current	I_{EBO}	–	<1	-10	nA	V_{EB} = -6V
Collector-Emitter Saturation Voltage (Note 7)	$V_{CE(sat)}$	– – – –	-15 -55 -90 -195	-25 -70 -120 -250	mV	I_C = -0.1A, I_B = -10mA I_C = -1A, I_B = -100mA I_C = -2A, I_B = -200mA I_C = -5A, I_B = -500mA
Base-Emitter Saturation Voltage (Note 7)	$V_{BE(sat)}$	–	-1030	-1150	mV	I_C = -5A, I_B = -500mA
Base-Emitter Turn-On Voltage (Note 7)	$V_{BE(on)}$	–	-920	-1020	mV	V_{CE} = -1V, I_C = -5A
DC Current Gain (Note 7)	h_{FE}	100 100 45 10	250 200 90 25	– 300 – –	–	V_{CE} = -1V, I_C = -10mA V_{CE} = -1V, I_C = -2A V_{CE} = -1V, I_C = -5A V_{CE} = -1V, I_C = -10A
Transition Frequency	f_T	–	120	–	MHz	V_{CE} = -10V, I_C = -100mA, f = 50MHz
Output Capacitance	C_{obo}	–	48	–	pF	V_{CB} = -10V, f = 1MHz
Switching Times	t_{on} t_{off}	– –	39 370	– –	ns	V_{CC} = 10V, I_C = 1A, I_{B1} = I_{B2} = -100mA

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

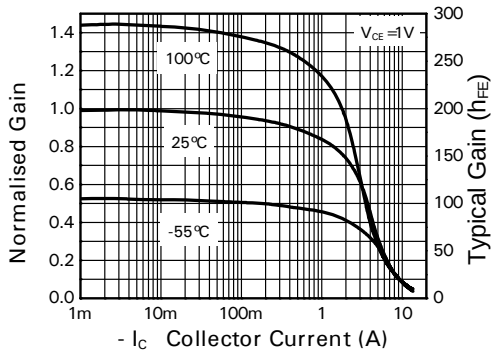
Typical Characteristic



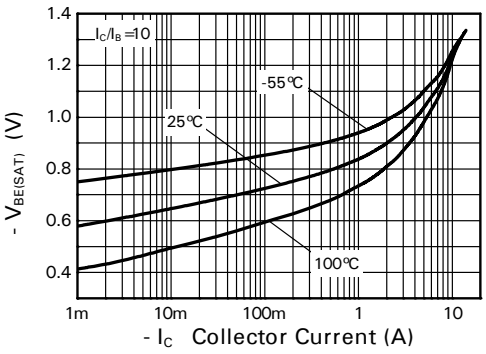
$V_{CE(SAT)}$ v I_C



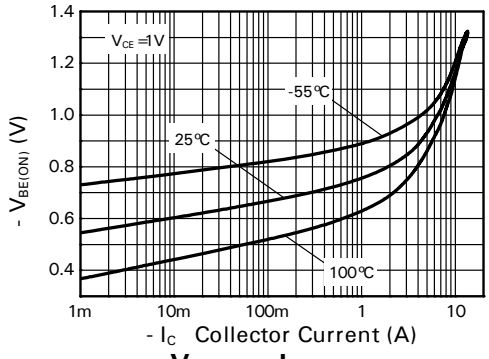
$V_{CE(SAT)}$ v I_C



h_{FE} v I_C

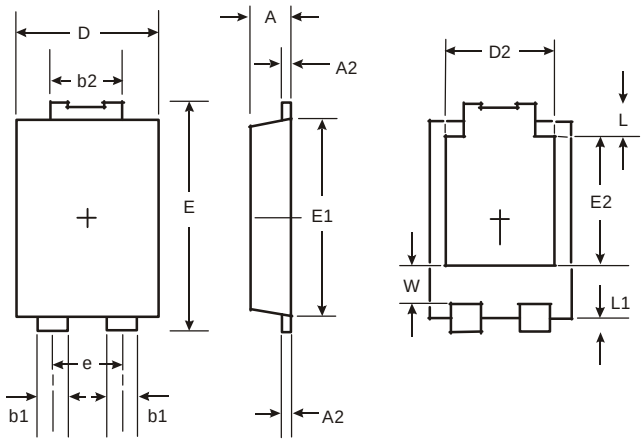


$V_{BE(SAT)}$ v I_C



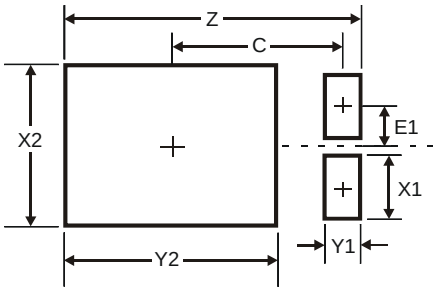
$V_{BE(ON)}$ v I_C

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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