

**NPN SILICON PLANAR HIGH VOLTAGE TRANSISTOR**  
**PowerDI®5**


## Features

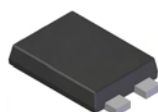
- 43% smaller than SOT223; 60% smaller than TO252
- Maximum height just 1.1mm
- Rated up to 2.8W
- $V_{CE0} = 400V$
- $I_C = 300mA$ ;  $I_{CM} = 1A$
- **Lead, Halogen and Antimony Free, RoHS Compliant (Note 1)**
- **"Green" Device (Note 2)**

## Applications

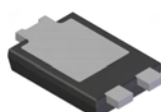
- PSU start up switch
- Telecom switch

## Mechanical Data

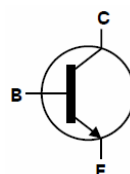
- Case: PowerDI®5
- Case Material: Molded Plastic, "Green" Molding Compound.  
UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin annealed over Copper leadframe.  
Solderable per MIL-STD-202, Method 208 
- Weight: 0.093 grams (approximate)



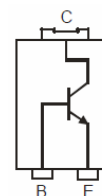
Top View



Bottom View



Device Schematic



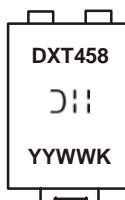
Pin-out diagram


## Ordering Information (Note 3)

Part Number	Case	Packaging
DXT458P5-13	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



DXT458 = 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)

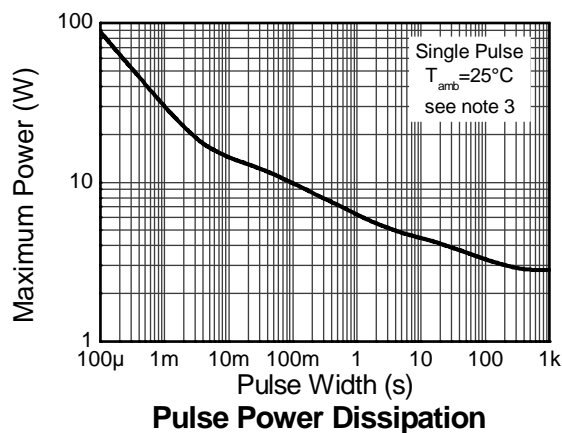
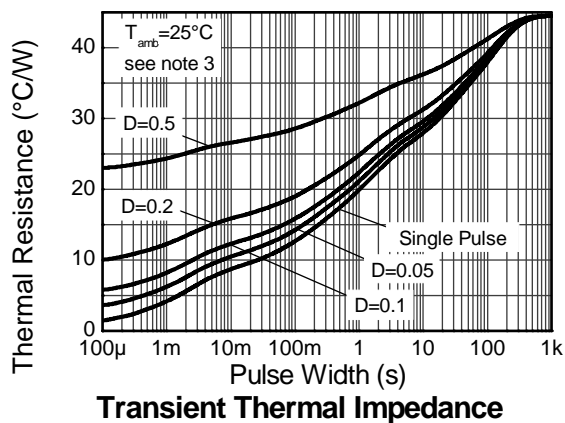
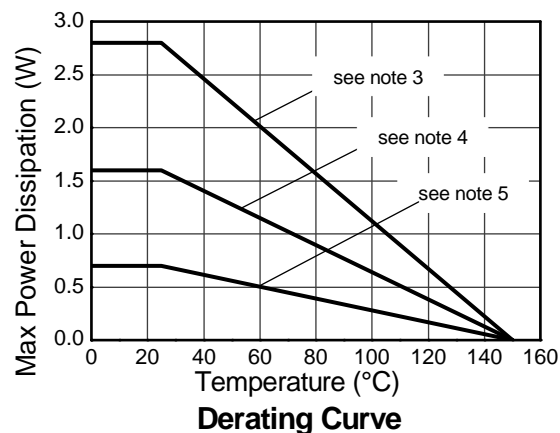
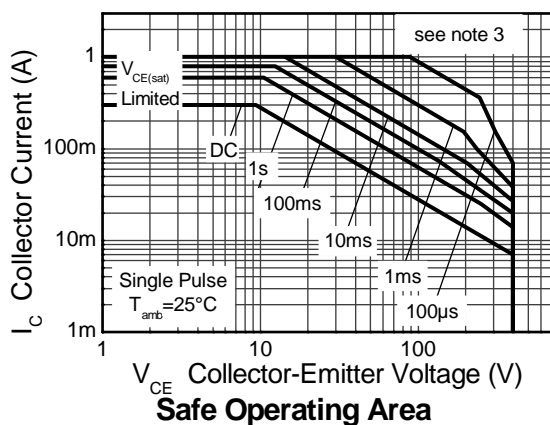
## Maximum Ratings @T<sub>A</sub> = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CBO</sub>	400	V
Collector-Emitter Voltage	V <sub>CEO</sub>	400	V
Emitter-Base Voltage	V <sub>EBO</sub>	5	V
Continuous Collector Current	I <sub>C</sub>	300	mA
Base Current	I <sub>B</sub>	200	mA
Peak Pulse Current	I <sub>CM</sub>	1	A

## Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation @ T <sub>A</sub> = 25°C (Note 4)	P <sub>D</sub>	2.8	W
Thermal Resistance, Junction to Ambient Air (Note 4) @T <sub>A</sub> = 25°C	R <sub>θJA</sub>	45	°C/W
Power Dissipation @ T <sub>A</sub> = 25°C (Note 5)	P <sub>D</sub>	1.3	W
Thermal Resistance, Junction to Ambient Air (Note 5) @T <sub>A</sub> = 25°C	R <sub>θJA</sub>	96	°C/W
Power Dissipation @ T <sub>A</sub> = 25°C (Note 6)	P <sub>D</sub>	0.7	W
Thermal Resistance, Junction to Ambient Air (Note 6) @T <sub>A</sub> = 25°C	R <sub>θJA</sub>	179	°C/W
Thermal Resistance, Junction to Collector Terminal	R <sub>θJT</sub>	14	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

Notes: 4. Device mounted on 1.6mm FR-4 PCB, single sided 2 oz. copper, collector pad dimensions 50mm x 50mm.  
5. Device mounted on 1.6mm FR-4 PCB, single sided 1 oz. copper, collector pad dimensions 25mm x 25mm.  
6. Device mounted on 1.6mm FR-4 PCB, single sided 1 oz. copper, minimum recommended pad layout.



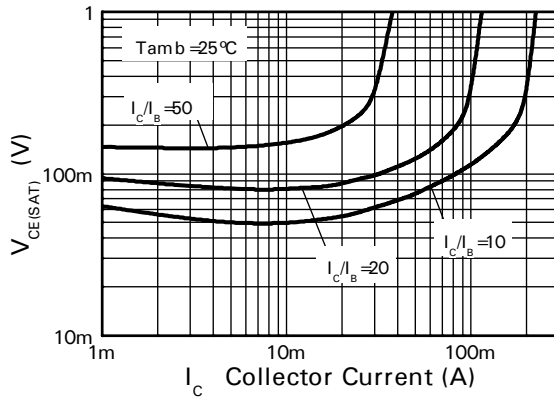
## Electrical Characteristics

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

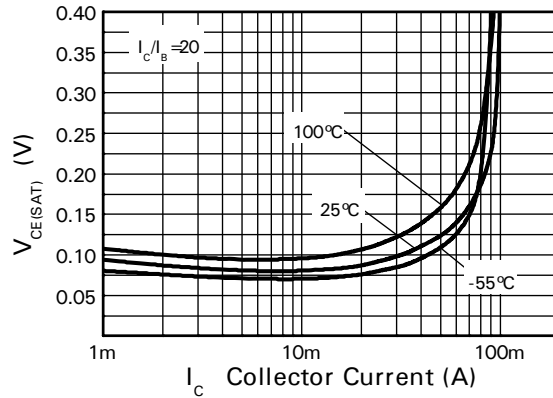
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	V <sub>(BR)CBO</sub>	400	—	—	V	I <sub>C</sub> = 100μA
Collector-Emitter Breakdown Voltage (Note 7)	V <sub>CEO(sus)</sub>	400	—	—	V	I <sub>C</sub> = 10mA
Emitter-Base Breakdown Voltage	V <sub>(BR)EBO</sub>	5	—	—	V	I <sub>E</sub> = 100μA
Collector Cutoff Current	I <sub>CBO</sub>	—	—	100	nA	V <sub>CB</sub> = 320V
Collector Cutoff Current	I <sub>CES</sub>	—	—	100	nA	V <sub>CB</sub> = 320V
Emitter Cutoff Current	I <sub>EBO</sub>	—	—	100	nA	V <sub>EB</sub> = 4V
Collector-Emitter Saturation Voltage (Note 7)	V <sub>CE(sat)</sub>	—	—	200 500	mV	I <sub>C</sub> = 20mA, I <sub>B</sub> = 2mA I <sub>C</sub> = 50mA, I <sub>B</sub> = 6mA
Base-Emitter Saturation Voltage (Note 7)	V <sub>BE(sat)</sub>	—	—	900	mV	I <sub>C</sub> = 50mA, I <sub>B</sub> = 5mA
Base-Emitter Turn-On Voltage (Note 7)	V <sub>BE(on)</sub>	—	—	900	mV	V <sub>CE</sub> = 10V, I <sub>C</sub> = 50mA
DC Current Gain (Note 7)	h <sub>FE</sub>	100 100 15	— — —	— 300 —	—	V <sub>CE</sub> = 10V, I <sub>C</sub> = 1mA V <sub>CE</sub> = 10V, I <sub>C</sub> = 50mA V <sub>CE</sub> = 10V, I <sub>C</sub> = 100mA
Transition Frequency	f <sub>T</sub>	50	—	—	MHz	V <sub>CE</sub> = 20V, I <sub>C</sub> = 10mA, f = 20MHz
Output Capacitance	C <sub>obo</sub>	—	—	5	pF	V <sub>CB</sub> = 20V, f = 1MHz
Switching Times	t <sub>on</sub> t <sub>off</sub>	— —	135 2260	— —	ns	V <sub>CC</sub> = 100V, I <sub>C</sub> = 50mA, I <sub>B1</sub> = 5mA, I <sub>B2</sub> = 10mA

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

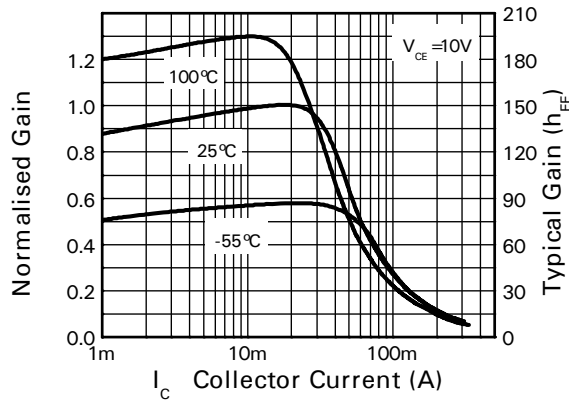
## Typical Characteristic



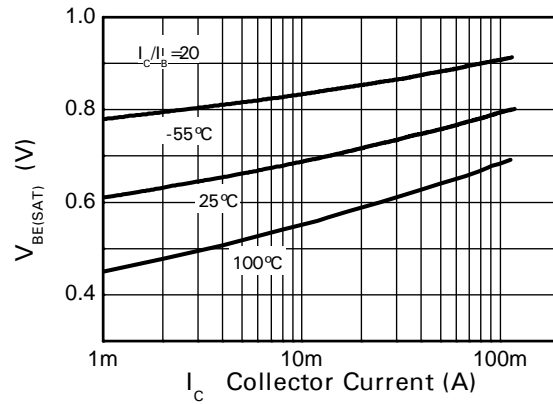
$V_{CE(SAT)} \text{ v } I_C$



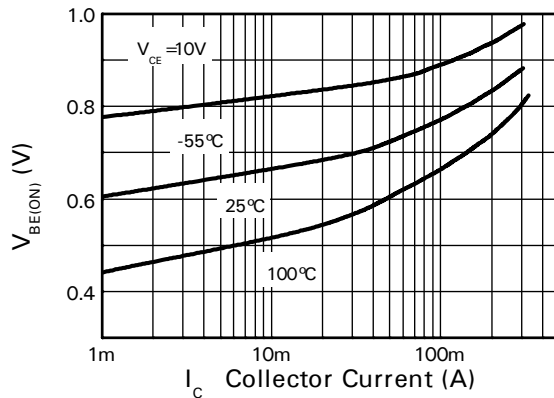
$V_{CE(SAT)} \text{ v } I_C$



$h_{FE} \text{ v } I_C$

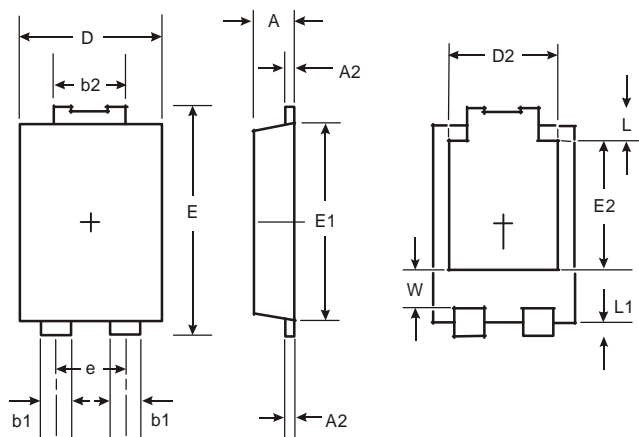


$V_{BE(SAT)} \text{ v } I_C$



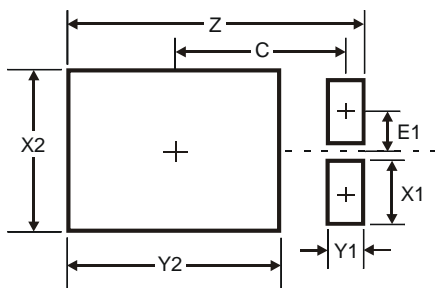
$V_{BE(ON)} \text{ v } I_C$

## Package Outline Dimensions



PowerDI <sup>®</sup> 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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