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[DXT458P5-13](#)

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**DXT458P5**

**NPN SILICON PLANAR HIGH VOLTAGE TRANSISTOR  
PowerDI<sup>®</sup>5**

**Features**

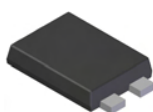
- 43% smaller than SOT223; 60% smaller than TO252
- Maximum height just 1.1mm
- Rated up to 2.8W
- $V_{CE0} = 400V$
- $I_C = 300mA$ ;  $I_{CM} = 1A$
- **Lead, Halogen and Antimony Free, RoHS Compliant (Note 1)**
- **“Green” Device (Note 2)**

**Applications**

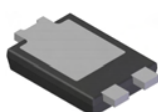
- PSU start up switch
- Telecom switch

**Mechanical Data**

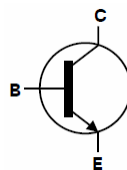
- Case: PowerDI<sup>®</sup>5
- Case Material: Molded Plastic, “Green” Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208 <sup>Ⓔ</sup>
- Weight: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



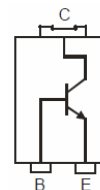
Top View



Bottom View



Device Schematic



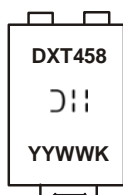
Pin-out diagram

**Ordering Information** (Note 3)

Part Number	Case	Packaging
DXT458P5-13	PowerDI <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**



- 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)

PowerDI is a registered trademark of Diodes Incorporated.

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Document number: DS32067 Rev. 1 - 2

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March 2010  
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**Maximum Ratings** @T<sub>A</sub> = 25°C unless otherwise specified

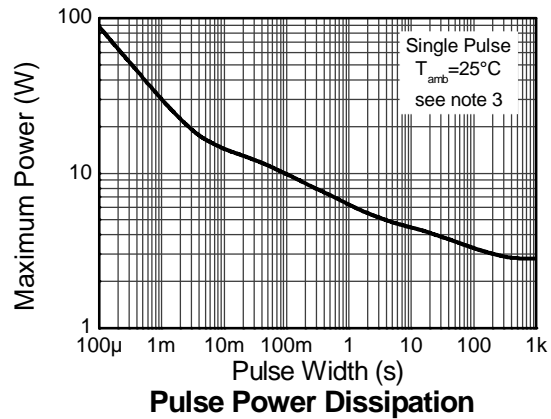
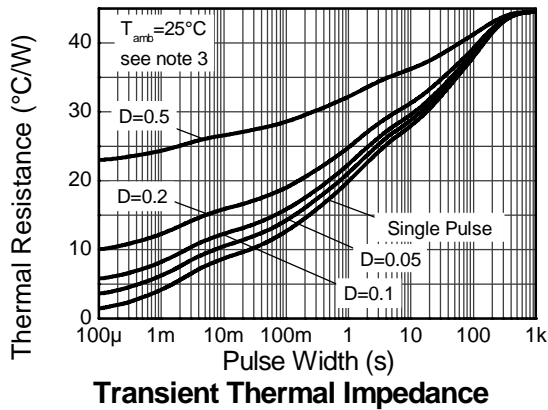
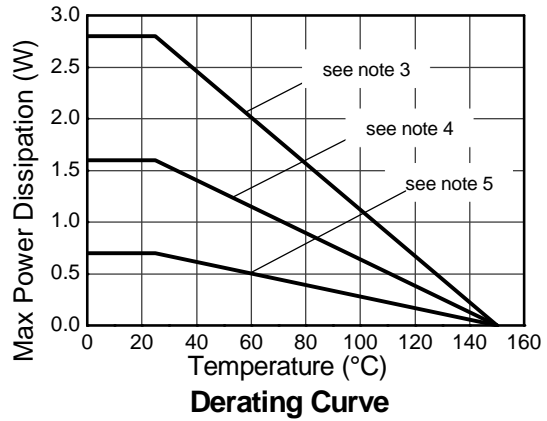
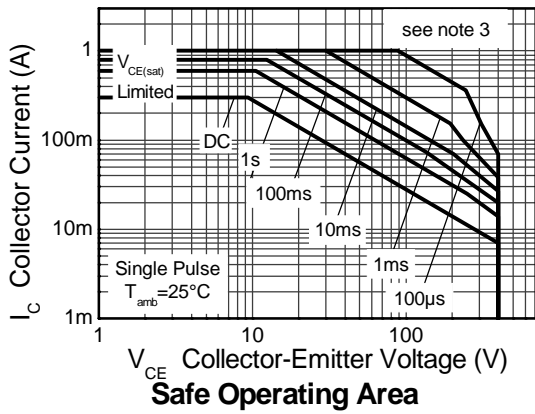
Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CB0</sub>	400	V
Collector-Emitter Voltage	V <sub>CEO</sub>	400	V
Emitter-Base Voltage	V <sub>EBO</sub>	5	V
Continuous Collector Current	I <sub>C</sub>	300	mA
Base Current	I <sub>B</sub>	200	mA
Peak Pulse Current	I <sub>CM</sub>	1	A

**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.

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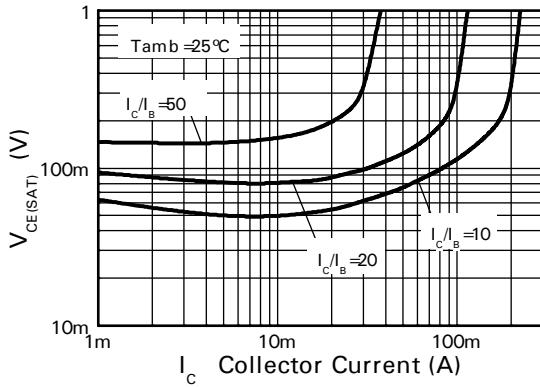
**Electrical Characteristics** @ $T_A = 25^\circ\text{C}$  unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	400	–	–	V	$I_C = 100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Note 7)	$V_{CEO(sus)}$	400	–	–	V	$I_C = 10\text{mA}$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	5	–	–	V	$I_E = 100\mu\text{A}$
Collector Cutoff Current	$I_{CBO}$	–	–	100	nA	$V_{CB} = 320\text{V}$
Collector Cutoff Current	$I_{CES}$	–	–	100	nA	$V_{CB} = 320\text{V}$
Emitter Cutoff Current	$I_{EBO}$	–	–	100	nA	$V_{EB} = 4\text{V}$
Collector-Emitter Saturation Voltage (Note 7)	$V_{CE(sat)}$	–	–	200 500	mV	$I_C = 20\text{mA}, I_B = 2\text{mA}$ $I_C = 50\text{mA}, I_B = 6\text{mA}$
Base-Emitter Saturation Voltage (Note 7)	$V_{BE(sat)}$	–	–	900	mV	$I_C = 50\text{mA}, I_B = 5\text{mA}$
Base-Emitter Turn-On Voltage (Note 7)	$V_{BE(on)}$	–	–	900	mV	$V_{CE} = 10\text{V}, I_C = 50\text{mA}$
DC Current Gain (Note 7)	$h_{FE}$	100 100 15	– – –	– 300 –	–	$V_{CE} = 10\text{V}, I_C = 1\text{mA}$ $V_{CE} = 10\text{V}, I_C = 50\text{mA}$ $V_{CE} = 10\text{V}, I_C = 100\text{mA}$
Transition Frequency	$f_T$	50	–	–	MHz	$V_{CE} = 20\text{V}, I_C = 10\text{mA}, f = 20\text{MHz}$
Output Capacitance	$C_{obo}$	–	–	5	pF	$V_{CB} = 20\text{V}, f = 1\text{MHz}$
Switching Times	$t_{on}$ $t_{off}$	– –	135 2260	– –	ns	$V_{CC} = 100\text{V}, I_C = 50\text{mA}, I_{B1} = 5\text{mA}, I_{B2} = 10\text{mA}$

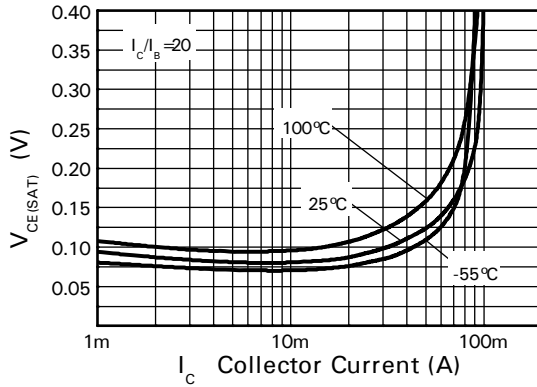
Notes: 7. Pulse Test: Pulse width  $\leq 300\mu\text{s}$ . Duty cycle  $\leq 2.0\%$ .

**Typical Characteristic**

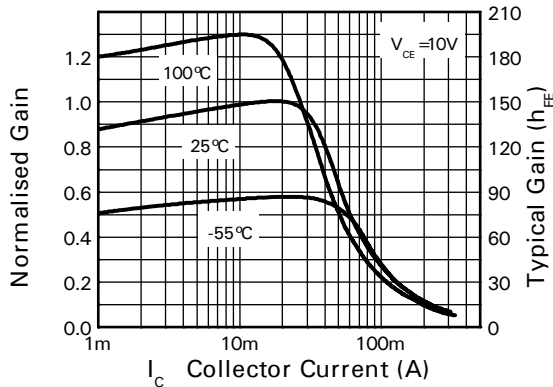
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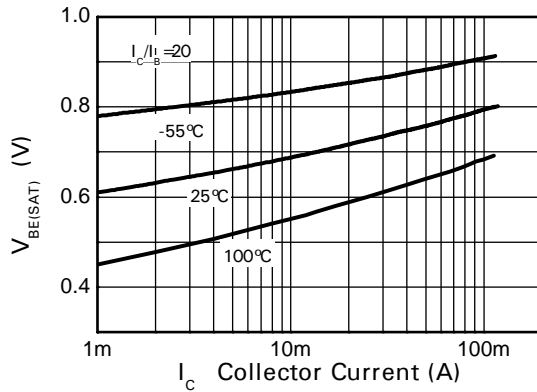
$V_{CE(SAT)} \ v \ I_C$



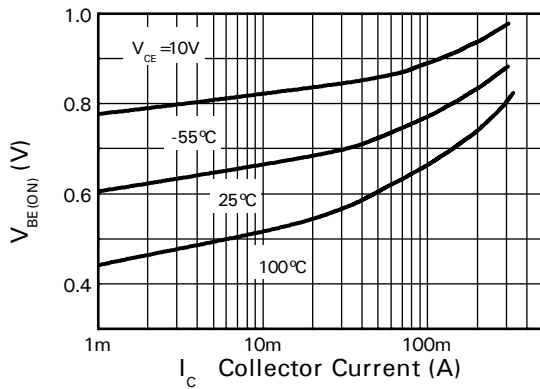
$V_{CE(SAT)} \ v \ I_C$



$h_{FE} \ v \ I_C$

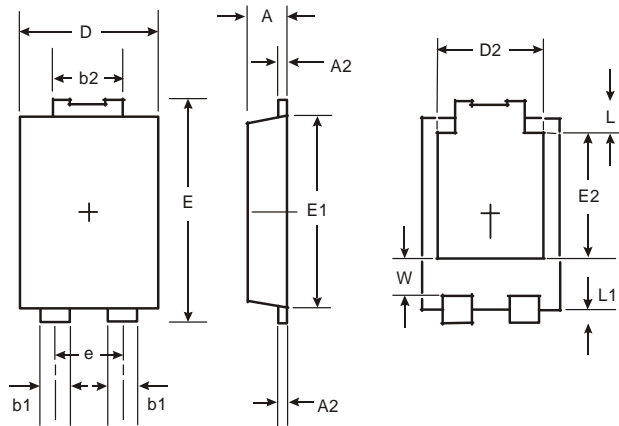


$V_{BE(SAT)} \ v \ I_C$



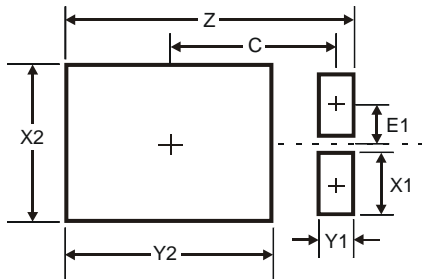
$V_{BE(ON)} \ v \ I_C$

**Package Outline Dimensions**



PowerDI <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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