

NPN SILICON PLANAR HIGH VOLTAGE TRANSISTOR
PowerDI®5

Features

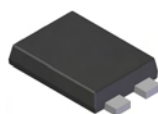
- 43% smaller than SOT223; 60% smaller than TO252
- Maximum height just 1.1mm
- Rated up to 2.8W
- $V_{CE0} = 400V$
- $I_C = 300mA$; $I_{CM} = 1A$
- **Lead, Halogen and Antimony Free, RoHS Compliant (Note 1)**
- **"Green" Device (Note 2)**

Applications

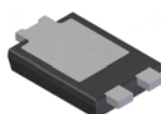
- PSU start up switch
- Telecom switch

Mechanical Data

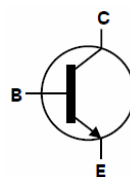
- Case: PowerDI®5
- Case Material: Molded Plastic, "Green" Molding Compound.
UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin annealed over Copper leadframe.
Solderable per MIL-STD-202, Method 208 
- Weight: 0.093 grams (approximate)



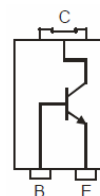
Top View



Bottom View



Device Schematic



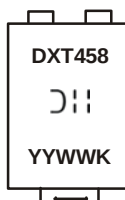
Pin-out diagram

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)

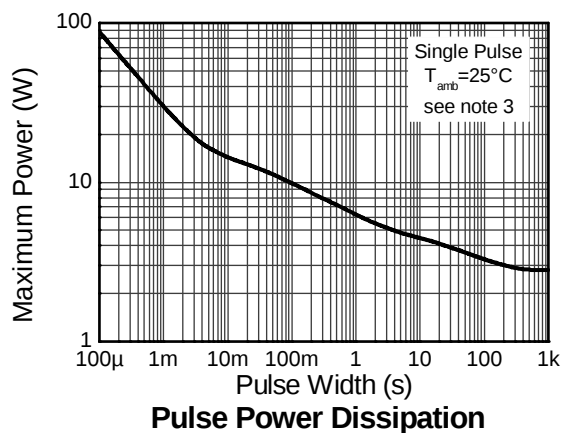
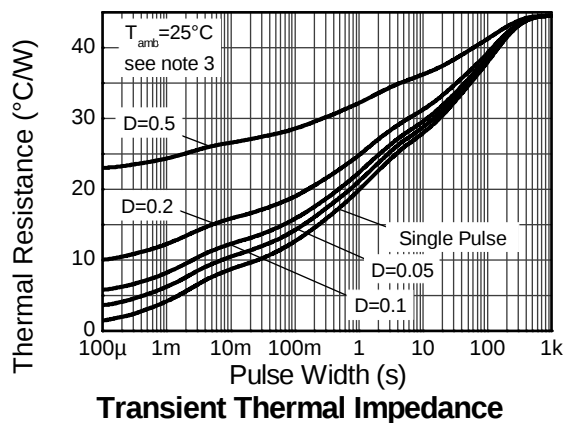
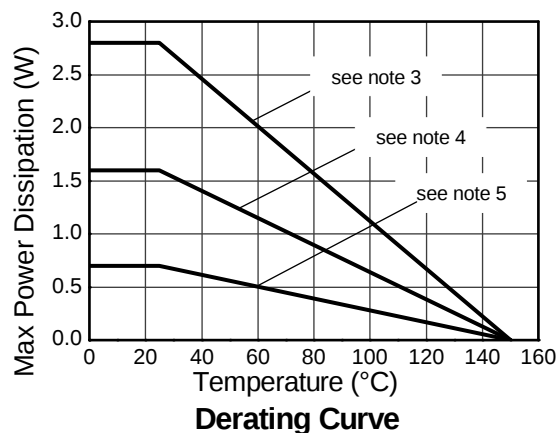
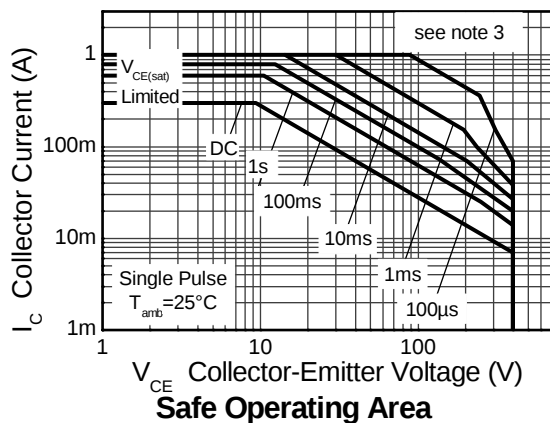
Maximum Ratings @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V _{CBO}	400	V
Collector-Emitter Voltage	V _{CEO}	400	V
Emitter-Base Voltage	V _{EBO}	5	V
Continuous Collector Current	I _C	300	mA
Base Current	I _B	200	mA
Peak Pulse Current	I _{CM}	1	A

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation @ T _A = 25°C (Note 4)	P _D	2.8	W
Thermal Resistance, Junction to Ambient Air (Note 4) @T _A = 25°C	R _{θJA}	45	°C/W
Power Dissipation @ T _A = 25°C (Note 5)	P _D	1.3	W
Thermal Resistance, Junction to Ambient Air (Note 5) @T _A = 25°C	R _{θJA}	96	°C/W
Power Dissipation @ T _A = 25°C (Note 6)	P _D	0.7	W
Thermal Resistance, Junction to Ambient Air (Note 6) @T _A = 25°C	R _{θJA}	179	°C/W
Thermal Resistance, Junction to Collector Terminal	R _{θJT}	14	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-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.

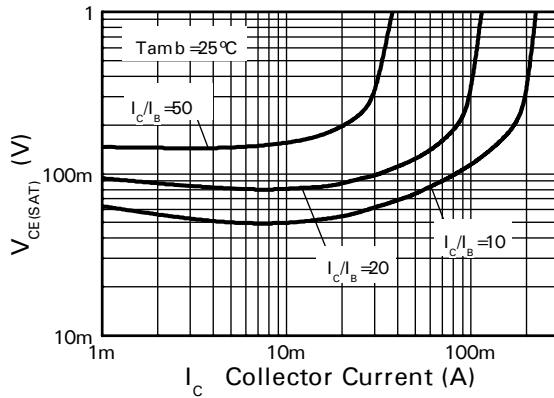


Electrical Characteristics @T_A = 25°C unless otherwise specified

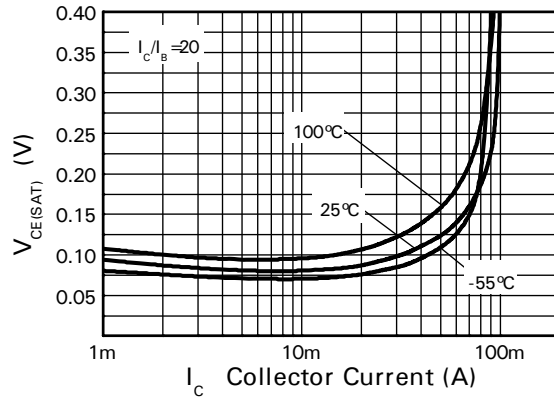
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	V _{(BR)CBO}	400	—	—	V	I _C = 100μA
Collector-Emitter Breakdown Voltage (Note 7)	V _{CEO(sus)}	400	—	—	V	I _C = 10mA
Emitter-Base Breakdown Voltage	V _{(BR)EBO}	5	—	—	V	I _E = 100μA
Collector Cutoff Current	I _{CBO}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

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

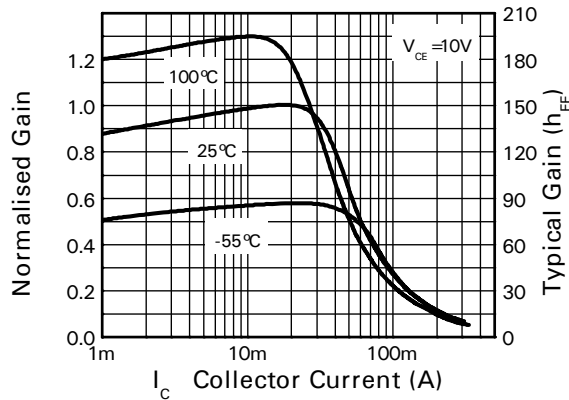
Typical Characteristic



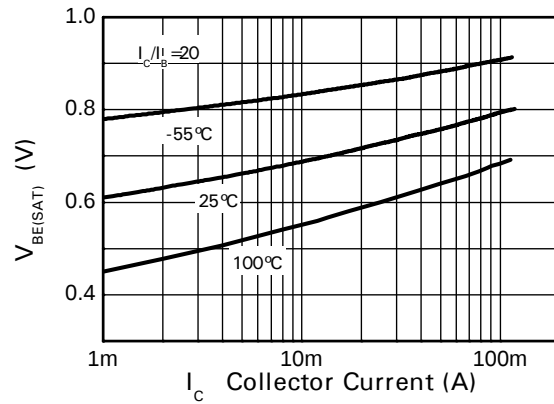
$V_{CE(SAT)} \propto I_C$



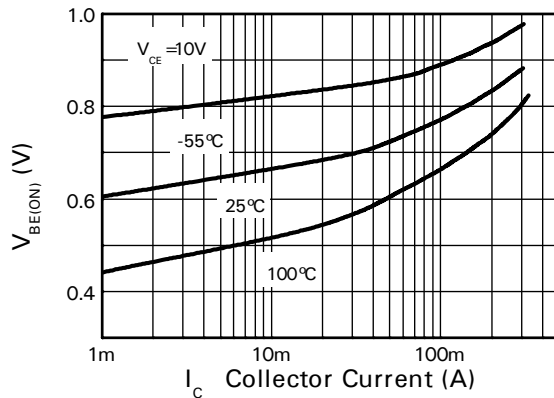
$V_{CE(SAT)} \propto I_C$



$h_{FE} \propto I_C$

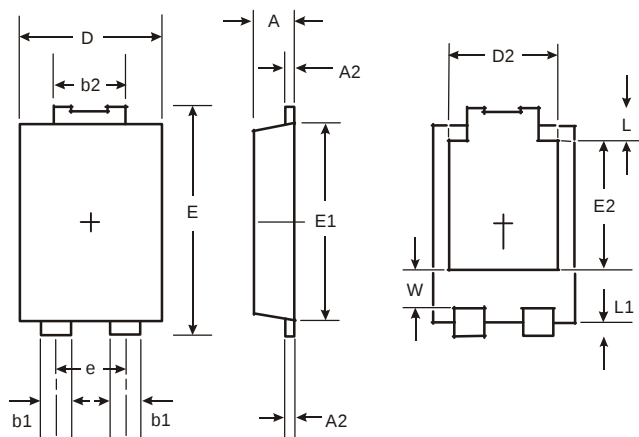


$V_{BE(SAT)} \propto I_C$



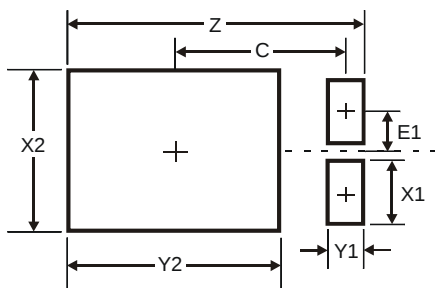
$V_{BE(ON)} \propto I_C$

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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