

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
- $V_{CEO} = 400V$
- $I_C = 300mA$; $I_{CM} = 1A$
- **Lead, Halogen and Antimony Free, RoHS Compliant (Note 1)**
- **“Green” Device (Note 2)**

Applications

- PSU start up switch
- Telecom switch

Mechanical Data

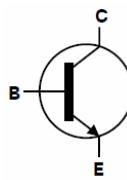
- Case: PowerDI®5
- Case Material: Molded Plastic, “Green” Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208 (3)
- Weight: 0.093 grams (approximate)



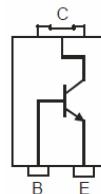
Top View



Bottom View



Device Schematic



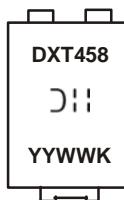
Pin-out diagram

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
DII = 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 @ $T_A = 25^\circ\text{C}$ unless otherwise specified

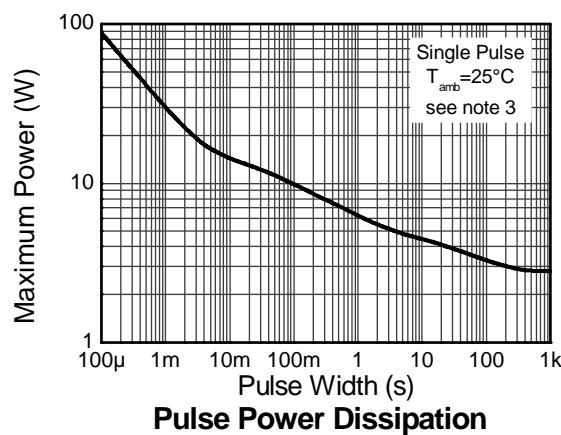
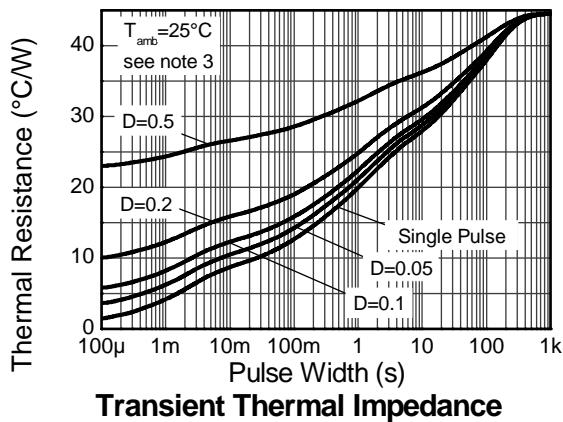
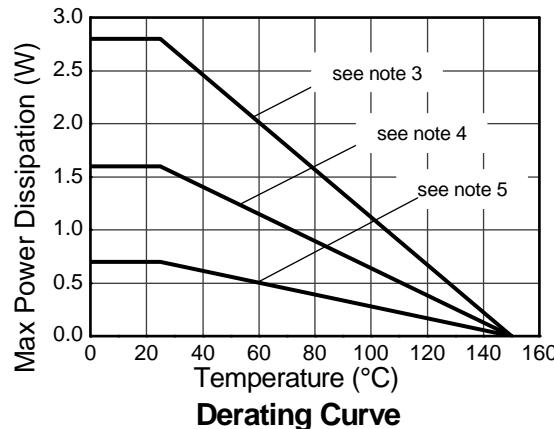
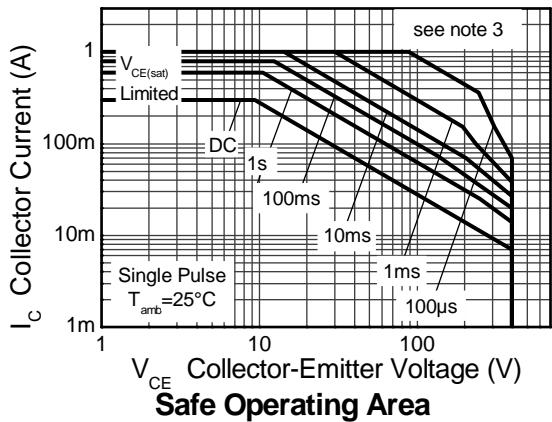
Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	400	V
Collector-Emitter Voltage	V_{CEO}	400	V
Emitter-Base Voltage	V_{EBO}	5	V
Continuous Collector Current	I_C	300	mA
Base Current	I_B	200	mA
Peak Pulse Current	I_{CM}	1	A

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation @ $T_A = 25^\circ\text{C}$ (Note 4)	P_D	2.8	W
Thermal Resistance, Junction to Ambient Air (Note 4) @ $T_A = 25^\circ\text{C}$	$R_{\theta JA}$	45	°C/W
Power Dissipation @ $T_A = 25^\circ\text{C}$ (Note 5)	P_D	1.3	W
Thermal Resistance, Junction to Ambient Air (Note 5) @ $T_A = 25^\circ\text{C}$	$R_{\theta JA}$	96	°C/W
Power Dissipation @ $T_A = 25^\circ\text{C}$ (Note 6)	P_D	0.7	W
Thermal Resistance, Junction to Ambient Air (Note 6) @ $T_A = 25^\circ\text{C}$	$R_{\theta JA}$	179	°C/W
Thermal Resistance, Junction to Collector Terminal	$R_{\theta JT}$	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.



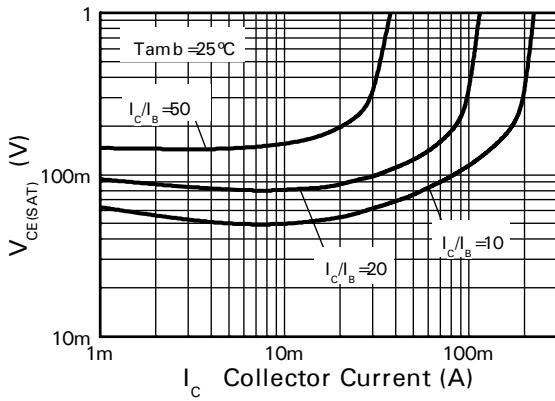
Electrical Characteristics

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

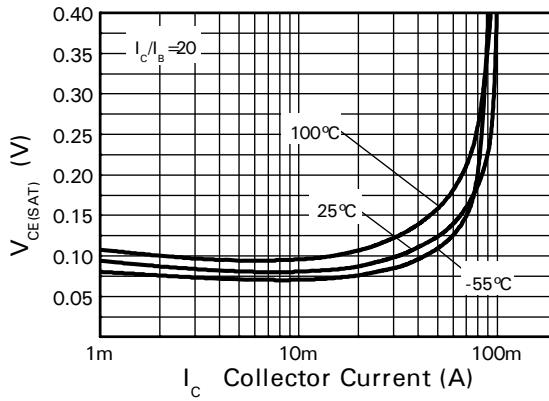
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	$V_{(\text{BR})\text{CBO}}$	400	—	—	V	$I_C = 100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Note 7)	$V_{\text{CEO}(\text{sus})}$	400	—	—	V	$I_C = 10\text{mA}$
Emitter-Base Breakdown Voltage	$V_{(\text{BR})\text{EBO}}$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

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

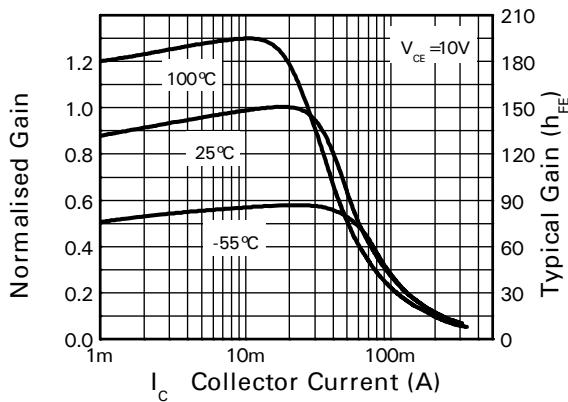
Typical Characteristic



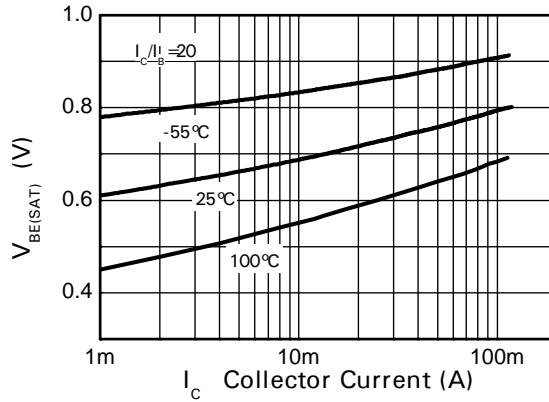
$V_{CE(SAT)} \text{ v } I_c$



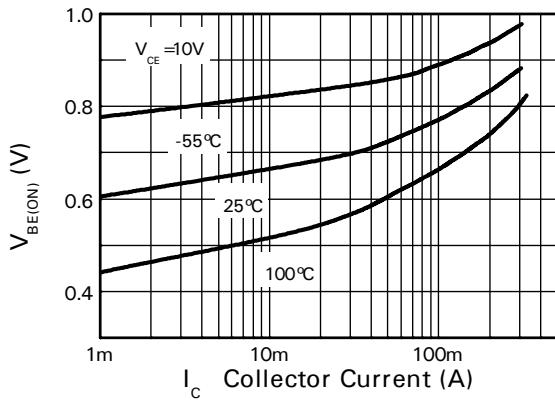
$V_{CE(SAT)} \text{ v } I_c$



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

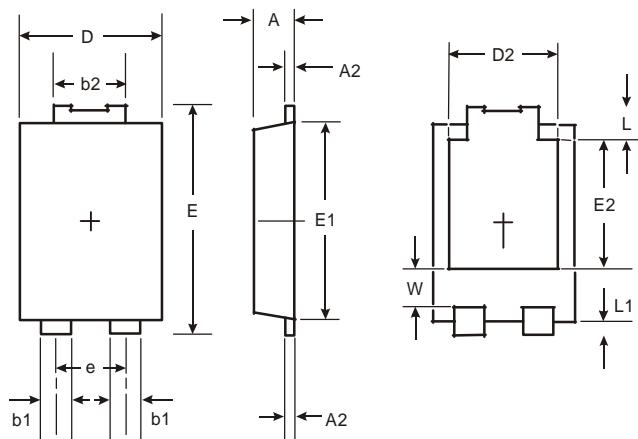


$V_{BE(SAT)} \text{ v } I_c$



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

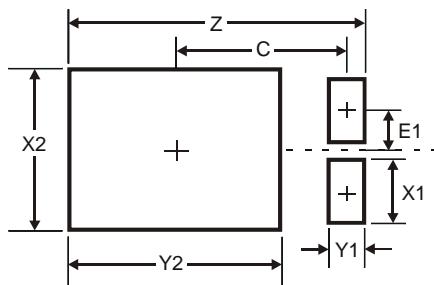
Package Outline Dimensions



PowerDI®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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