A Product Line of
Diodes Incorporated

Lead-free Green

DXTP560BP5

500V PNP SILICON PLANAR HIGH VOLTAGE TRANSISTOR POWERDI®5

Features and Benefits

- BV_{CEO} > -500V
- I_C = -150mA Continuous Collector Current
- 47% smaller than SOT223; 60% smaller than TO252 (D-PAK)
- Profile height just 1.1mm for thin application
- $R_{\theta JA}$ efficient giving high P_D rating up to 2.8W
- **"Lead Free", RoHS Compliant (Note 1)**
- **Halogen and Antimony Free, "Green" Device (Note 2)**
- **Qualified to AEC-Q101 Standards for High Reliability**

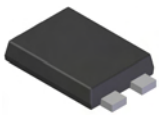
Mechanical Data

- 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)

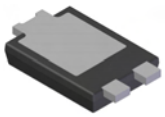
Applications

- Gate driver
- Startup switch in offline lighting
- Motor Control

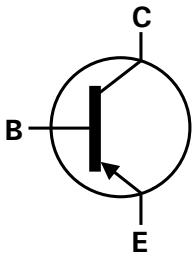
PowerDI®5



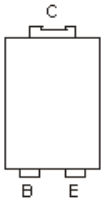
Top View



Bottom View



Device Schematic



Top View
Pin-Out

Ordering Information (Note 3)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
DXTP560BP5-13	DXTP560B	13	16	5,000

Notes:
1. No purposefully added lead.
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

Marking Information

DXTP560B = Product Type Marking Code
= Manufacturers' Code Marking
K = Factory Designator
YYWW = Date Code Marking
YY = Last Two Digits of Year (ex: 10 for 2010)
WW = Week code (01 - 53)

Maximum Ratings @T_A = 25°C unless otherwise specified

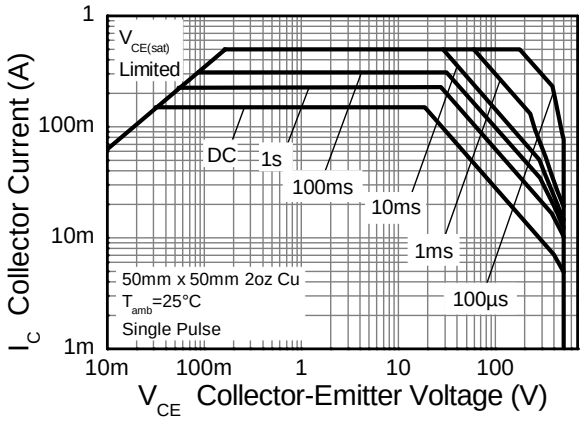
Characteristic		Symbol	Limit	Unit
Collector-Base Voltage		V_{CBO}	-500	V
Collector-Emitter Voltage		V_{CEO}	-500	
Emitter-Base Voltage		V_{EBO}	-7	
Continuous Collector Current	(Note 4)	I_C	-150	mA
Peak Pulse Current		I_{CM}	-500	

Thermal Characteristics @T_A = 25°C unless otherwise specified

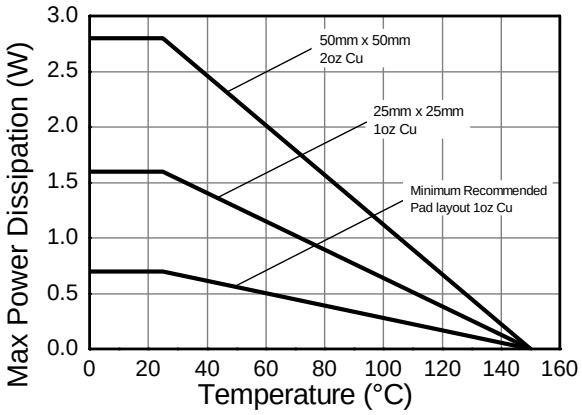
Characteristic		Symbol	Value	Unit
Power Dissipation Linear Derating Factor	(Note 4)	P_D	2.8 22.4	W mW/°C
	(Note 5)		1.3 10.4	
	(Note 6)		0.7 5.6	
Thermal Resistance, Junction to Ambient	(Note 4)	$R_{\theta JA}$	45	°C/W
	(Note 5)		96	
	(Note 6)		179	
Thermal Resistance, Junction to Lead	(Note 7)	$R_{\theta JL}$	14	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

Notes:
4. For a device surface mounted on 50mm x 50mm x 1.6mm FR4 PCB with high coverage of single sided 2oz copper, in still air conditions; the device is measured when operating in a steady-state condition. The entire exposed collector pad is attached to the heatsink.
5. Same as note (4), except the device is mounted on 25mm x 25mm 1oz copper.
6. Same as note (4), except the device is mounted on a minimum recommended pad layout of 1oz copper.
7. Thermal resistance from junction to solder-point (at the end of the collector lead).

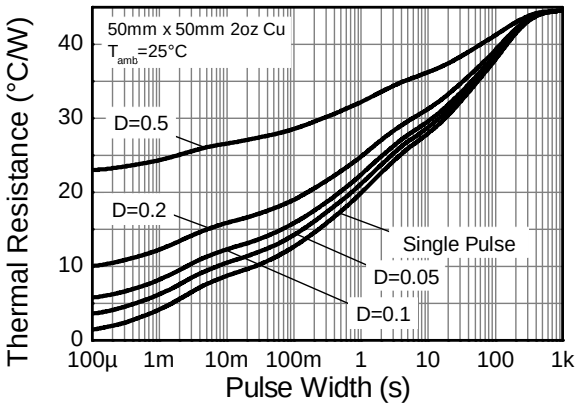
Thermal Characteristics



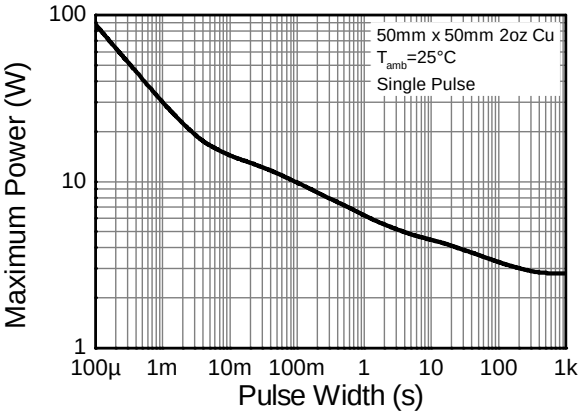
Safe Operating Area



Derating Curve



Transient Thermal Impedance



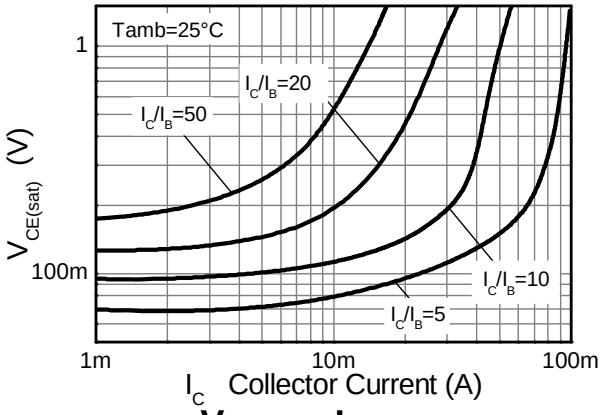
Pulse Power Dissipation

Electrical Characteristics @T_A = 25°C unless otherwise specified

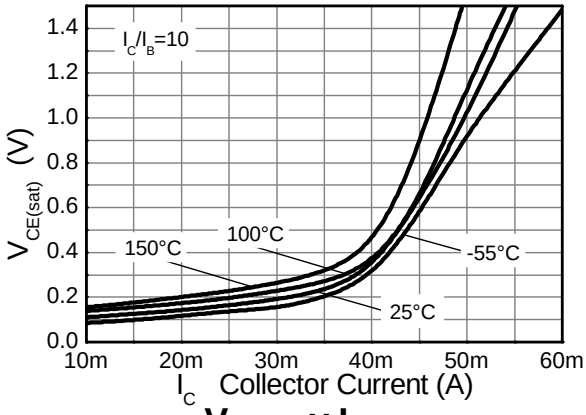
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	-500	—	—	V	I_C = -100μA
Collector-Emitter Breakdown Voltage (Note 8)	BV_{CEO}	-500	—	—	V	I_C = -10mA
Emitter-Base Breakdown Voltage	BV_{EBO}	-7	—	—	V	I_E = -100μA
Collector Cutoff Current	I_{CBO}	—	—	-100	nA	V_{CB} = -500V
Collector Cutoff Current	I_{CES}	—	—	-100	nA	V_{CE} = -500V
Emitter Cutoff Current	I_{EBO}	—	—	-100	nA	V_{EB} = -5.6V
Collector-Emitter Saturation Voltage (Note 8)	$V_{CE(sat)}$	— —	— —	-200 -500	mV	I_C = -20mA, I_B = -2mA I_C = -50mA, I_B = -10mA
Base-Emitter Saturation Voltage (Note 8)	$V_{BE(sat)}$	—	—	-900	mV	I_C = -50mA, I_B = -10mA
Base-Emitter Turn-On Voltage (Note 8)	$V_{BE(on)}$	—	—	-900	mV	V_{CE} = -10V, I_C = -50mA
DC Current Gain (Note 8)	h_{FE}	100 80 —	— — 15	300 300 —	—	V_{CE} = -10V, I_C = -1mA V_{CE} = -10V, I_C = -50mA V_{CE} = -10V, I_C = -100mA
Transition Frequency	f_T	60	—	—	MHz	V_{CE} = -20V, I_C = -10mA, f = 50MHz
Output Capacitance	C_{obo}	—	—	8	pF	V_{CB} = -20V, f = 1MHz
Switching Times	t_{on} t_{off}	— —	110 1500	— —	ns	V_{CC} = -100V, I_C = -50mA, I_{B1} = 5mA, I_{B2} = -10mA

Notes: 8. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

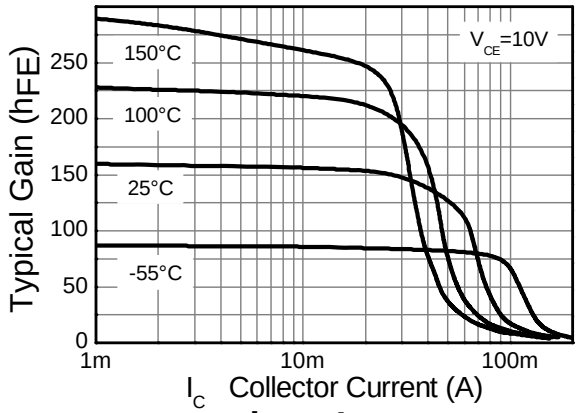
Typical Electrical Characteristics



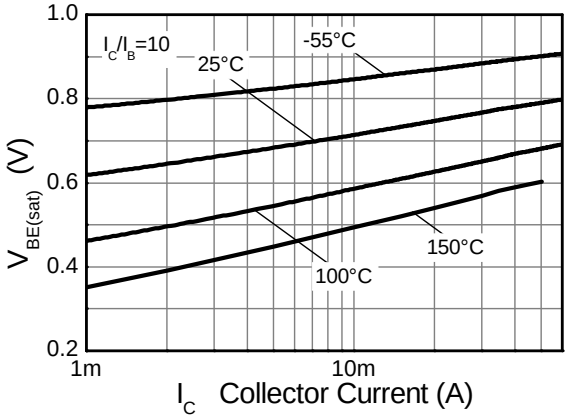
$V_{CE(sat)}$ v I_C



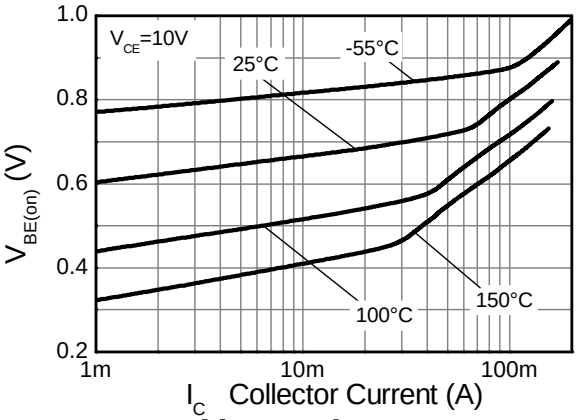
$V_{CE(sat)}$ v I_C



h_{FE} v I_C

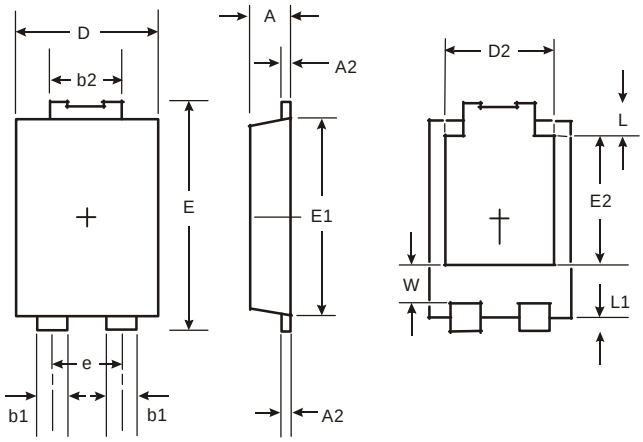


$V_{BE(sat)}$ v I_C



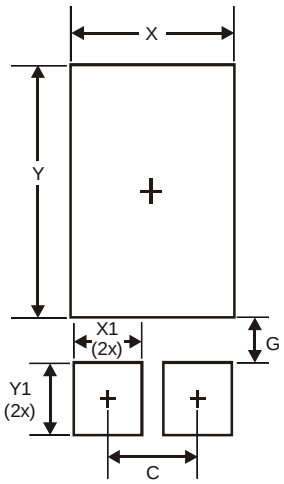
$V_{BE(on)}$ v I_C

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)
C	1.840
G	0.852
X	3.360
X1	1.390
Y	4.860
Y1	1.400

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