Lead-free Green

DXTN07100BP5

100V NPN MEDIUM POWER LOW SATURATION TRANSISTOR PowerDI®5

Features

- 43% smaller than SOT223; 60% smaller than TO252
- Maximum height just 1.1mm
- Rated up to 3.2W
- V_{CEO} = 100V
- I_C = 2A; I_{CM} = 6A
- Low Saturation, high gain transistor,
- **Lead, Halogen and Antimony Free, RoHS Compliant (Note 1)**
- **"Green" Device (Note 2)**

Features

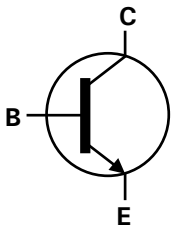
- Regular circuits

Mechanical Data

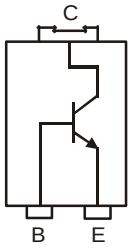
- Case: PowerDI®5
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.093 grams (approximate)

Top View

Bottom View



Device Schematic



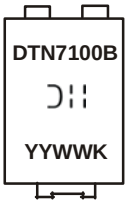
Pin-out diagram

Ordering Information (Note 3)

Part Number	Case	Packaging
DXTN07100BP5-13	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



DTN7100B = 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.

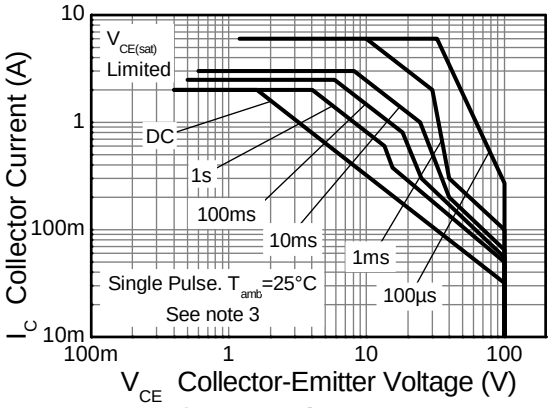
Maximum Ratings @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	120	V
Collector-Emitter Voltage	V_{CEO}	100	V
Emitter-Base Voltage	V_{EBO}	5	V
Continuous Collector Current	I_C	2	A
Peak Pulse Current	I_{CM}	6	A

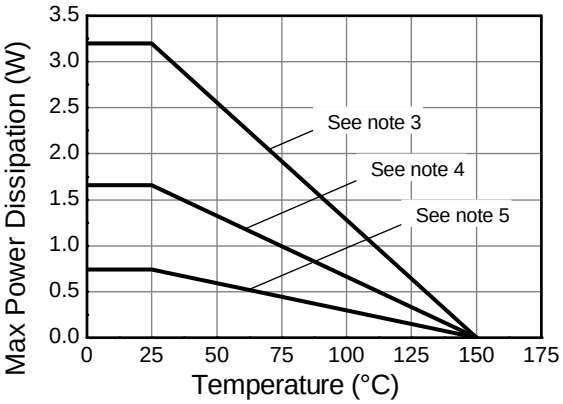
Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation @ T_A = 25°C (Note 4)	P_D	3.2	W
Thermal Resistance, Junction to Ambient Air (Note 4) @T_A = 25°C	$R_{\theta JA}$	39	°C/W
Power Dissipation @ T_A = 25°C (Note 5)	P_D	1.7	W
Thermal Resistance, Junction to Ambient Air (Note 5) @T_A = 25°C	$R_{\theta JA}$	75	°C/W
Power Dissipation @ T_A = 25°C (Note 6)	P_D	0.74	W
Thermal Resistance, Junction to Ambient Air (Note 6) @T_A = 25°C	$R_{\theta JA}$	169	°C/W
Thermal Resistance, Junction to Collector Terminal	$R_{\theta JT}$	8.9	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

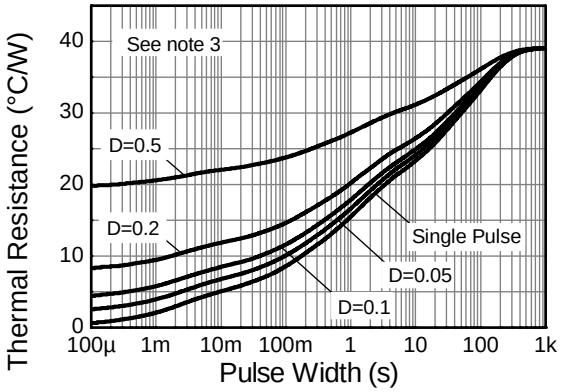
Notes: 4. Device mounted on FR-4 PCB, single sided 2 oz. copper, collector pad dimensions 50mm x 50mm.
5. Device mounted on FR-4 PCB, single sided 1 oz. copper, collector pad dimensions 50mm x 50mm.
6. Device mounted on FR-4 PCB, single sided 1 oz. copper, minimum recommended pad layout.



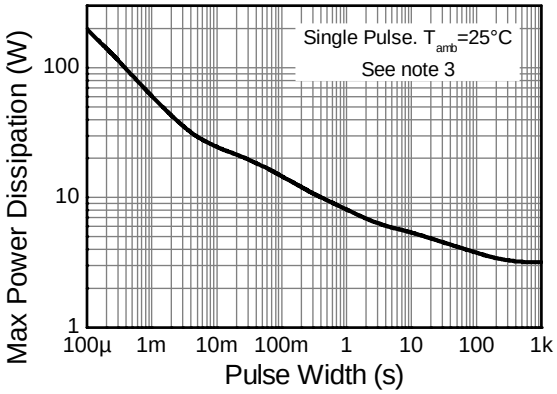
Safe Operating Area



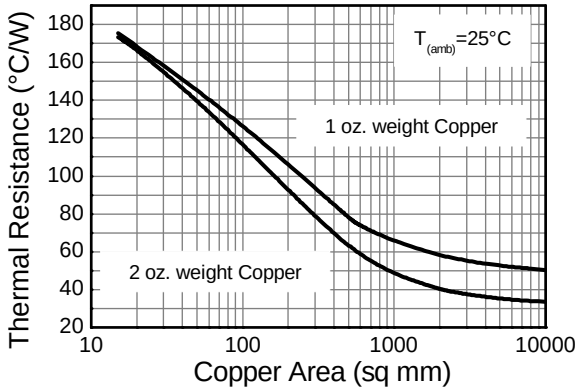
Derating Curve



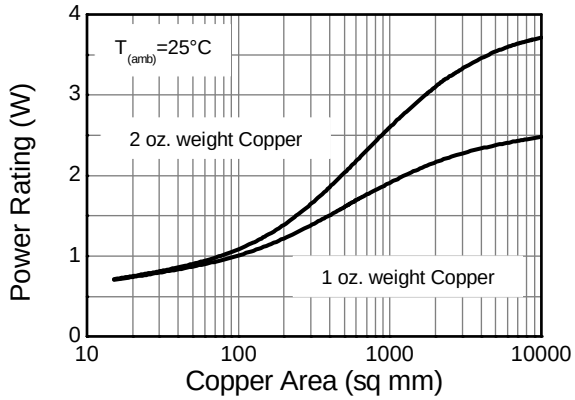
Transient Thermal Impedance



Pulse Power Dissipation



Thermal Resistance vs. Cu Area



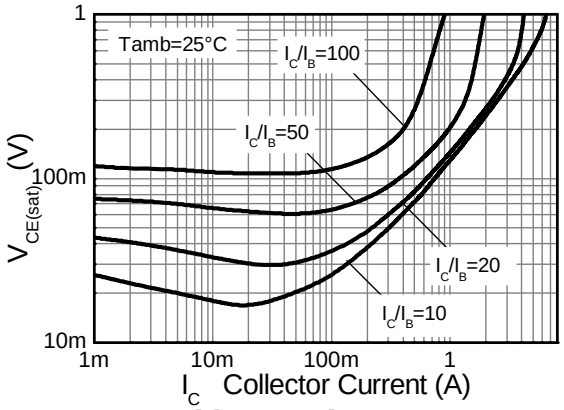
Power Rating vs. Cu Area

Electrical Characteristics @T_A = 25°C unless otherwise specified

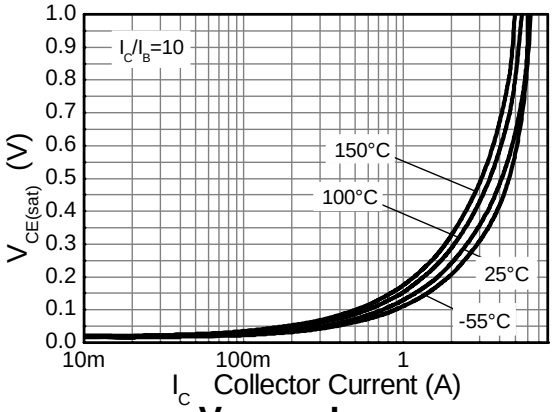
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	120	—	—	V	I_C = 100μA
Collector-Emitter Breakdown Voltage (Note 7)	$V_{(BR)CEO}$	100	—	—	V	I_C = 10mA
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	5	—	—	V	I_E = 100μA
Collector Cutoff Current	I_{CBO}	—	—	0.1 10	μA	V_{CB} = 100V V_{CB} = 100V, T_{amb} = 100 °C
Emitter Cutoff Current	I_{EBO}	—	—	0.1	μA	V_{EB} = 4V
Collector-Emitter Saturation Voltage (Note 7)	$V_{CE(sat)}$	—	0.13 0.23	0.3 0.5	V	I_C = 1A, I_B = 100mA I_C = 2A, I_B = 200mA
Base-Emitter Saturation Voltage (Note 7)	$V_{BE(sat)}$	—	0.9	1.25	V	I_C = 1A, I_B = 100mA
Base-Emitter Turn-On Voltage (Note 7)	$V_{BE(on)}$	—	0.8	1.00	V	I_C = 1A, V_{CE} = 2V
DC Current Gain (Note 7)	h_{FE}	70 100 55 25	200 200 110 55	— 300 — —	—	I_C = 50mA, V_{CE} = 2V I_C = 500mA, V_{CE} = 2V I_C = 1A, V_{CE} = 2V I_C = 2A, V_{CE} = 2V
Transition Frequency	f_T	140	175	—	MHz	I_C = 100mA, V_{CE} = 5V f = 100MHz
Output Capacitance	C_{obo}	—	—	30	pF	V_{CB} = 10A, f = 1MHz
Switching Times	t_{on} t_{off}	— —	80 1200	— —	ns ns	I_C = 500mA, V_{CC} = 10V, I_{B1} = I_{B2} = 50mA

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

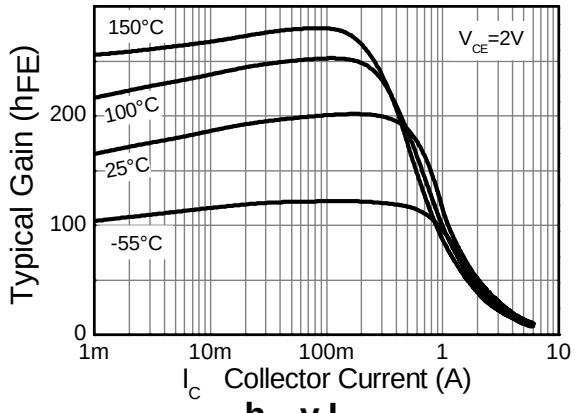
Typical Characteristic



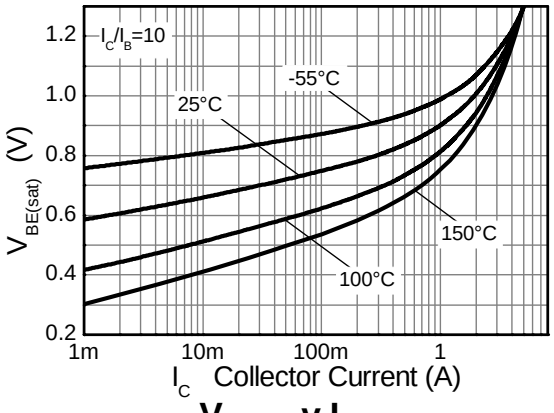
$V_{CE(sat)}$ v I_C



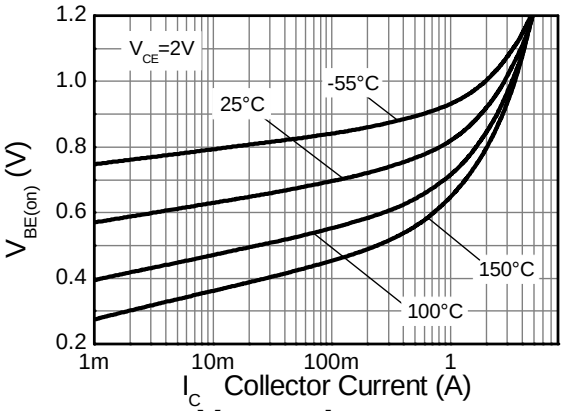
$V_{CE(sat)}$ v I_C



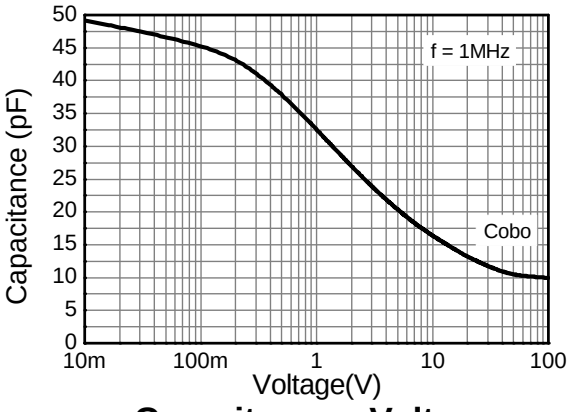
h_{FE} v I_C



$V_{BE(sat)}$ v I_C

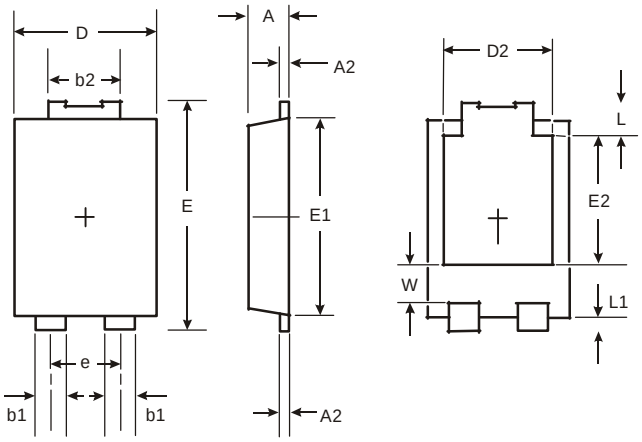


$V_{BE(on)}$ v I_C



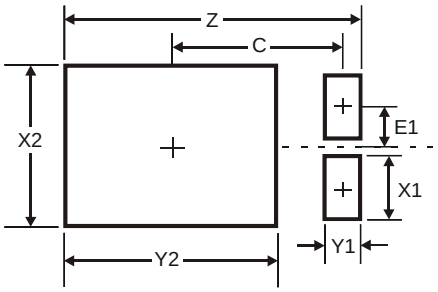
Capacitance v Voltage

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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