



**DXTP19020DP5**

**20V PNP HIGH GAIN TRANSISTOR**  
**PowerDI<sup>®</sup>5**

## Features

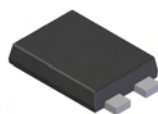
- 43% smaller than SOT223; 60% smaller than TO252
- Maximum height just 1.1mm
- Rated up to 1.3W
- $V_{CE0} = -20V$
- $I_C = -8A$ ;  $I_{CM} = -15A$
- Low Saturation voltage, high gain transistor
- **Lead, Halogen and Antimony Free, RoHS Compliant (Note 1)**
- **“Green” Device (Note 2)**

## Applications

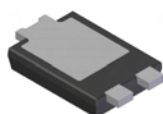
- Load disconnect switch
- Battery charging

## Mechanical Data

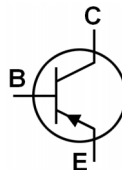
- Case: PowerDI<sup>®</sup>5
- Case Material: Molded Plastic, “Green” Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208 <sup>Ⓒ3</sup>
- Weight: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



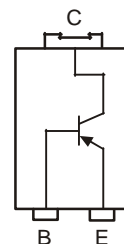
Top View



Bottom View



Device Schematic



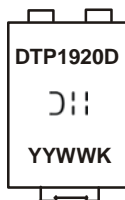
Pin-out diagram

## Ordering Information (Note 3)

Part Number	Case	Packaging
DXTP19020DP5-13	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



DTP1920D = 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)

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CBO</sub>	-25	V
Collector-Emitter Voltage	V <sub>CEO</sub>	-20	V
Emitter-Collector Voltage (Reverse Blocking)	V <sub>ECO</sub>	-4	V
Emitter-Base Voltage	V <sub>EBO</sub>	-7	V
Continuous Collector Current	I <sub>C</sub>	-8	A
Base Current	I <sub>B</sub>	-1	A
Peak Pulse Current	I <sub>CM</sub>	-15	A

**Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Power Dissipation @ T <sub>A</sub> = 25°C (Note 4)	P <sub>D</sub>	1.3	W
Thermal Resistance, Junction to Ambient Air (Note 4) @T <sub>A</sub> = 25°C	R <sub>θJA</sub>	96.1	°C/W
Power Dissipation @ T <sub>A</sub> = 25°C (Note 5)	P <sub>D</sub>	3	W
Thermal Resistance, Junction to Ambient Air (Note 5) @T <sub>A</sub> = 25°C	R <sub>θJA</sub>	41.7	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

Notes: 4. Device mounted on FR-4 PCB, 2 oz. copper, minimum recommended pad layout.  
5. Device mounted on FR-4 PCB, 2 oz. copper, collector pad dimensions 0.42inch<sup>2</sup>.

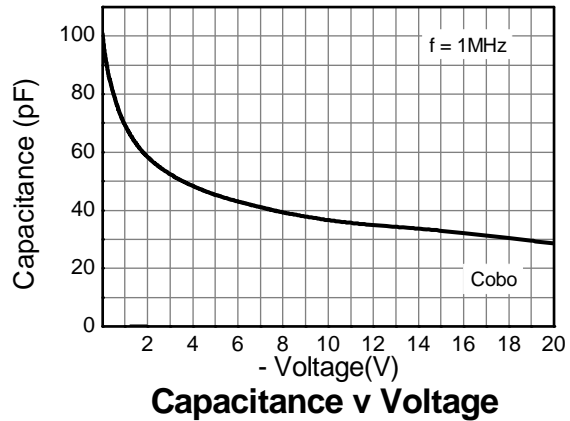
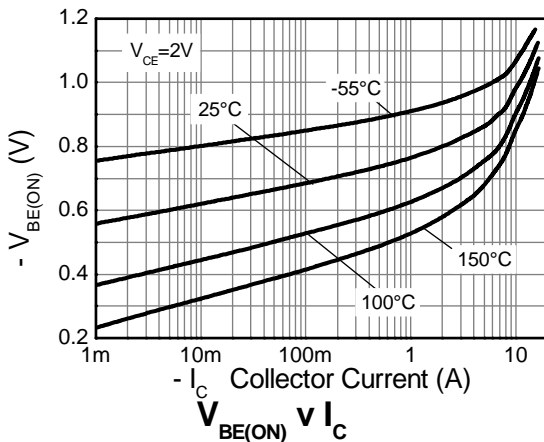
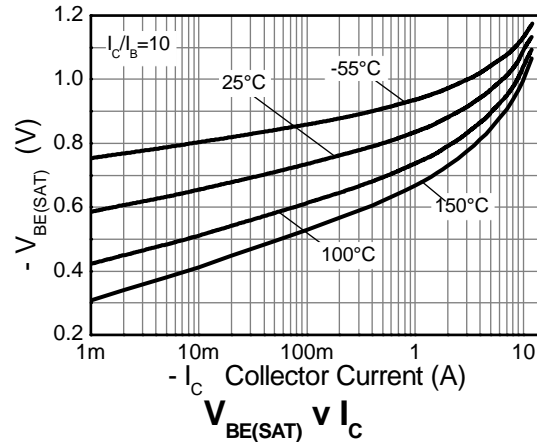
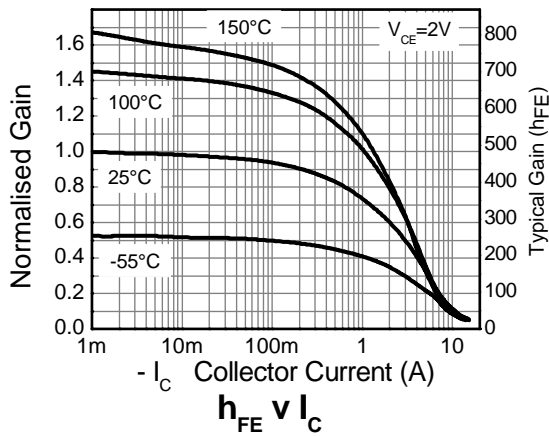
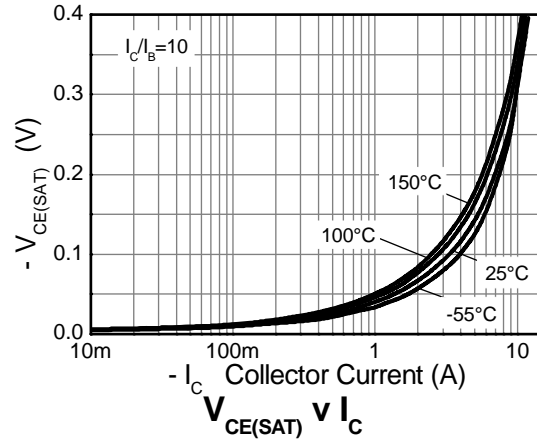
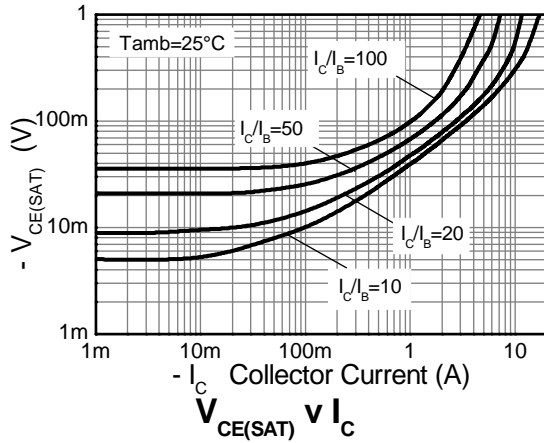
**Electrical Characteristics** @T<sub>A</sub> = 25°C unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	V <sub>(BR)CBO</sub>	-25	-55	—	V	I <sub>C</sub> = -100μA
Collector-Emitter Breakdown Voltage (Note 6)	V <sub>(BR)CEO</sub>	-20	-50	—	V	I <sub>C</sub> = -10mA
Emitter-Collector Breakdown Voltage (Reverse Blocking)	V <sub>(BR)ECX</sub>	-4	-8.6	—	V	I <sub>E</sub> = -100μA, R <sub>BC</sub> < 1kΩ or 0.25V > V <sub>CB</sub> > -0.25V
Emitter-Base Breakdown Voltage (Reverse Blocking)	V <sub>(BR)ECO</sub>	-4	-8.6	—	V	I <sub>E</sub> = -100μA
Emitter-Base Breakdown Voltage	V <sub>(BR)EBO</sub>	-7	-8.2	—	V	I <sub>E</sub> = -100μA
Collector Cutoff Current	I <sub>CBO</sub>	—	<1	50	nA	V <sub>CB</sub> = -25V
Emitter Cutoff Current	I <sub>EBO</sub>	—	<1	-50	nA	V <sub>CB</sub> = -25V, T <sub>amb</sub> = 100 °C
Collector-Emitter Saturation Voltage (Note 6)	V <sub>CE(sat)</sub>	—	-40 -97 -115 -145 -220	-47 -130 -145 -275	mV	I <sub>C</sub> = -1A, I <sub>B</sub> = -100mA I <sub>C</sub> = -1A, I <sub>B</sub> = -10mA I <sub>C</sub> = -2A, I <sub>B</sub> = -40mA I <sub>C</sub> = -8A, I <sub>B</sub> = -800mA
Base-Emitter Saturation Voltage (Note 6)	V <sub>BE(sat)</sub>	—	-1050	-1150	mV	I <sub>C</sub> = -8A, I <sub>B</sub> = -800mA
Base-Emitter Turn-On Voltage (Note 6)	V <sub>BE(on)</sub>	—	-930	-1000	mV	I <sub>C</sub> = -8A, V <sub>CE</sub> = -2V
DC Current Gain (Note 6)	h <sub>FE</sub>	300 200 45 —	450 290 70 25	900 — — —	—	I <sub>C</sub> = -100mA, V <sub>CE</sub> = -2V I <sub>C</sub> = -2A, V <sub>CE</sub> = -2V I <sub>C</sub> = -8A, V <sub>CE</sub> = -2V I <sub>C</sub> = -15A, V <sub>CE</sub> = -2V
Transition Frequency	f <sub>T</sub>	—	176	—	MHz	I <sub>C</sub> = -50mA, V <sub>CE</sub> = -10V, f = 50MHz
Input Capacitance (Note 6)	C <sub>ibo</sub>	—	—	400	pF	V <sub>EB</sub> = -0.5V, f = 1MHz
Output Capacitance (Note 6)	C <sub>obo</sub>	—	36	45	pF	V <sub>CB</sub> = -10V, f = 1MHz
Delay Time	t <sub>d</sub>	—	23	—	ns	I <sub>C</sub> = -1A, V <sub>CC</sub> = -10V, I <sub>B1</sub> = -I <sub>B2</sub> = -50mA
Rise Time	t <sub>r</sub>	—	18.4	—		
Storage Time	t <sub>s</sub>	—	266	—		
Fall Time	t <sub>f</sub>	—	49.6	—		

Notes: 6. Pulse Test: Pulse width ≤300μs. Duty cycle ≤2.0%.

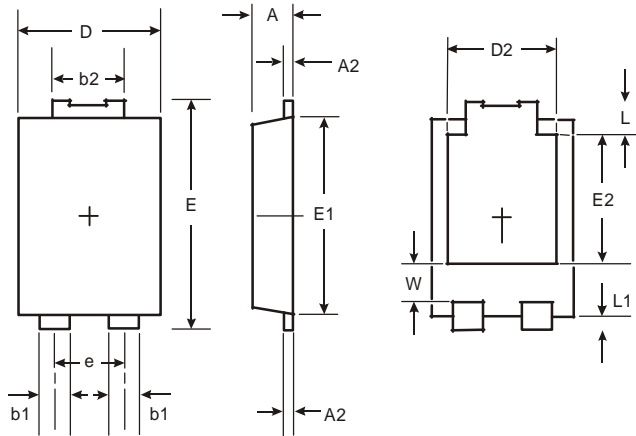
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**Typical Characteristic**



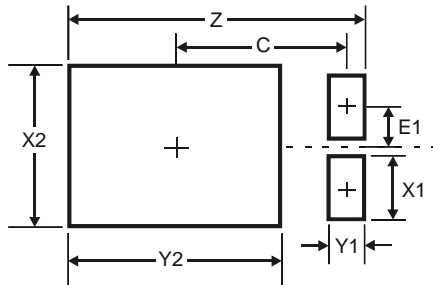
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**Package Outline Dimensions**



PowerDI <sup>®5</sup>		
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
<b>All Dimensions in mm</b>		

**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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