A Product Line of
Diodes Incorporated

Lead-free Green

DXTP19020DP5

20V PNP HIGH GAIN TRANSISTOR
PowerDI®5

Features

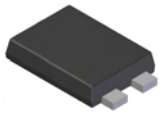
- 43% smaller than SOT223; 60% smaller than TO252
- Maximum height just 1.1mm
- Rated up to 1.3W
- V_{CEO} = -20V
- I_C = -8A; I_{CM} = -15A
- Low Saturation voltage, high gain transistor
- **Lead, Halogen and Antimony Free, RoHS Compliant (Note 1)**
- **"Green" Device (Note 2)**

Mechanical Data

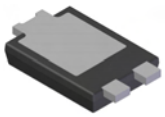
- Case: PowerDI®5
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.093 grams (approximate)

Applications

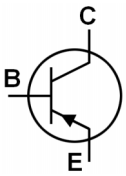
- Load disconnect switch
- Battery charging



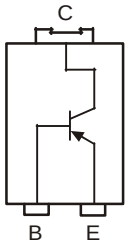
Top View



Bottom View



Device Schematic



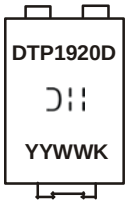
Pin-out diagram

Ordering Information (Note 3)

Part Number	Case	Packaging
DXTP19020DP5-13	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



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_A = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	-25	V
Collector-Emitter Voltage	V_{CEO}	-20	V
Emitter-Collector Voltage (Reverse Blocking)	V_{ECO}	-4	V
Emitter-Base Voltage	V_{EBO}	-7	V
Continuous Collector Current	I_C	-8	A
Base Current	I_B	-1	A
Peak Pulse Current	I_{CM}	-15	A

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation @ T_A = 25°C (Note 4)	P_D	1.3	W
Thermal Resistance, Junction to Ambient Air (Note 4) @T_A = 25°C	$R_{\theta JA}$	96.1	°C/W
Power Dissipation @ T_A = 25°C (Note 5)	P_D	3	W
Thermal Resistance, Junction to Ambient Air (Note 5) @T_A = 25°C	$R_{\theta JA}$	41.7	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-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^2.

Electrical Characteristics @T_A = 25°C unless otherwise specified

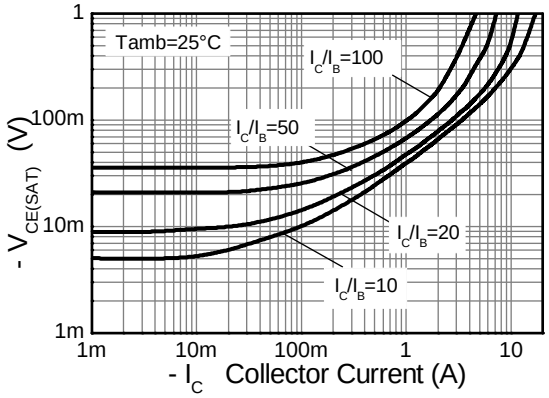
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	-25	-55	—	V	I_C = -100μA
Collector-Emitter Breakdown Voltage (Note 6)	$V_{(BR)CEO}$	-20	-50	—	V	I_C = -10mA
Emitter-Collector Breakdown Voltage (Reverse Blocking)	$V_{(BR)ECX}$	-4	-8.6	—	V	I_E = -100μA, R_{BC} < 1kΩ or 0.25V > V_{CB} > -0.25V
Emitter-Base Breakdown Voltage (Reverse Blocking)	$V_{(BR)ECO}$	-4	-8.6	—	V	I_E = -100μA
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	-7	-8.2	—	V	I_E = -100μA
Collector Cutoff Current	I_{CBO}	—	<1 —	50 0.5	nA μA	V_{CB} = -25V V_{CB} = -25V, T_{amb} = 100 °C
Emitter Cutoff Current	I_{EBO}	—	<1	-50	nA	V_{EB} = -5.6V
Collector-Emitter Saturation Voltage (Note 6)	$V_{CE(sat)}$	—	-40 -97 -115 -220	-47 -130 -145 -275	mV	I_C = -1A, I_B = -100mA I_C = -1A, I_B = -10mA I_C = -2A, I_B = -40mA I_C = -8A, I_B = -800mA
Base-Emitter Saturation Voltage (Note 6)	$V_{BE(sat)}$	—	-1050	-1150	mV	I_C = -8A, I_B = -800mA
Base-Emitter Turn-On Voltage (Note 6)	$V_{BE(on)}$	—	-930	-1000	mV	I_C = -8A, V_{CE} = -2V
DC Current Gain (Note 6)	h_{FE}	300 200 45 —	450 290 70 25	900 — — —	—	I_C = -100mA, V_{CE} = -2V I_C = -2A, V_{CE} = -2V I_C = -8A, V_{CE} = -2V I_C = -15A, V_{CE} = -2V
Transition Frequency	f_T	—	176	—	MHz	I_C = -50mA, V_{CE} = -10V, f = 50MHz
Input Capacitance (Note 6)	C_{ibo}	—	—	400	pF	V_{EB} = -0.5V, f = 1MHz
Output Capacitance (Note 6)	C_{obo}	—	36	45	pF	V_{CB} = -10V, f = 1MHz
Delay Time	t_d	—	23	—	ns	I_C = -1A, V_{CC} = -10V, I_{B1} = -I_{B2} = -50mA
Rise Time	t_r	—	18.4	—		
Storage Time	t_s	—	266	—		
Fall Time	t_f	—	49.6	—		

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

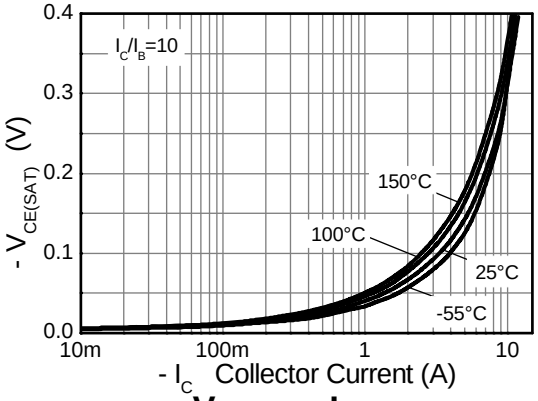
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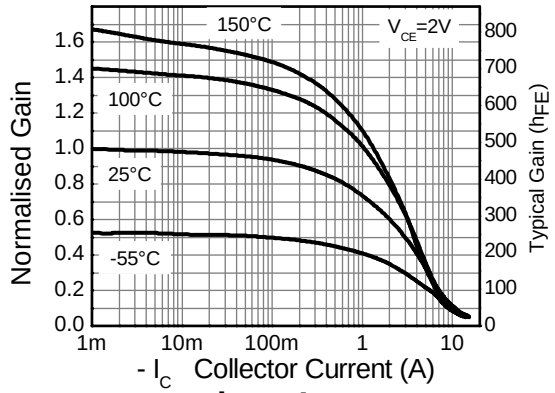
Typical Characteristic



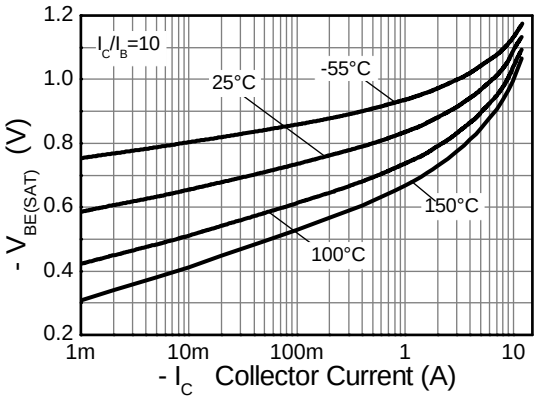
$V_{CE(SAT)}$ v I_C



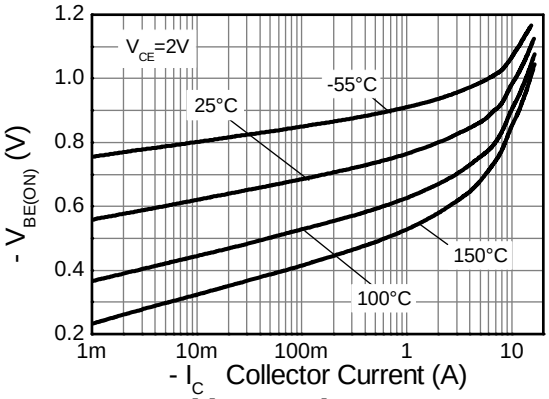
$V_{CE(SAT)}$ v I_C



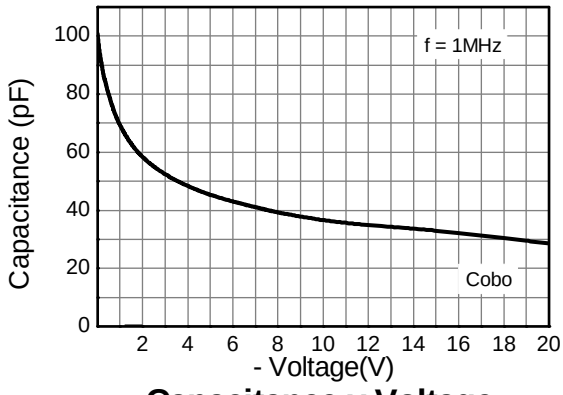
h_{FE} v I_C



$V_{BE(SAT)}$ v I_C



$V_{BE(ON)}$ v I_C

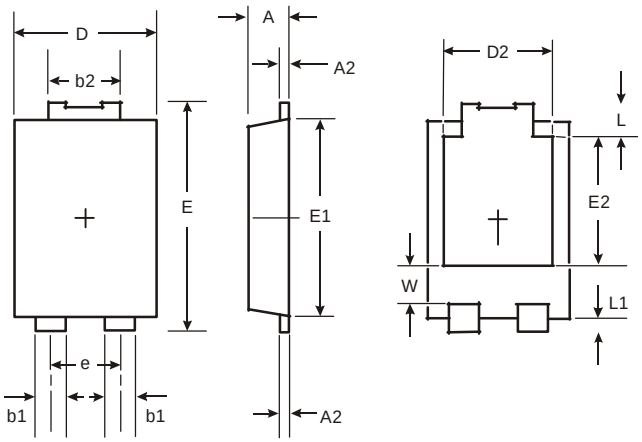


Capacitance v Voltage

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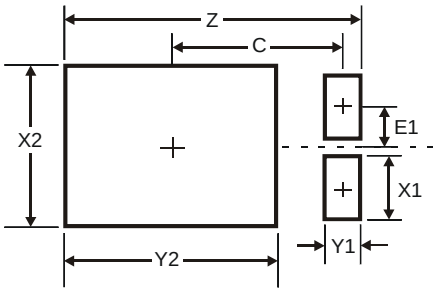
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Package Outline Dimensions



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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