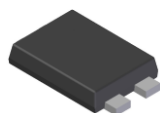


Features

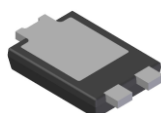
- 43% smaller than SOT223; 60% smaller than TO252
- Maximum height just 1.1mm
- Rated up to 1.3W
- $V_{CE0} = -20V$
- $I_C = -8A$; $I_{CM} = -15A$
- Low saturation voltage, high gain transistor
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/104/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please [contact us](mailto:contact@diodes.com) or your local Diodes representative. <https://www.diodes.com/quality/product-definitions/>**

Features

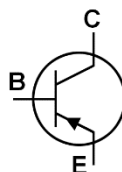
- Load disconnect switches
- Battery charging



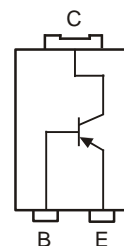
Top View



Bottom View



Device Schematic



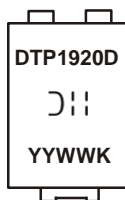
Pin-out diagram

Ordering Information (Note 4)

| Orderable Part Number | Package | Marking | Reel Size (inches) | Tape Width (mm) | Packing | |
|-----------------------|----------|----------|--------------------|-----------------|----------|---------|
| | | | | | Quantity | Carrier |
| DXTP19020DP5-13 | PowerDI5 | DTP1920D | 13 | 12 | 5,000 | Reel |

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
 2. See <https://www.diodes.com/quality/lead-free/> for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
 3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
 4. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information



- DTP1920D = Product Type Marking Code
- ⌋|| = Manufacturers' Code Marking
- K = Factory Designator
- YYWW = Date Code Marking
- YY = Last Digit of Year (ex: 23 = 2023)
- WW = Week code (01 to 53)

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 (@T_A = +25°C, unless otherwise specified.)

| Characteristic | Symbol | Value | Unit |
|--|-----------------------------------|-------------|------|
| Power Dissipation (Note 5) | P _D | 1,3 | W |
| Power Dissipation (Note 6) | P _D | 3 | W |
| Thermal Resistance, Junction to Ambient Air (Note 5) | R _{θJA} | 96.1 | °C/W |
| Thermal Resistance, Junction to Ambient Air (Note 6) | R _{θJA} | 41.7 | °C/W |
| Operating and Storage Temperature Range | T _J , T _{STG} | -55 to +150 | °C |

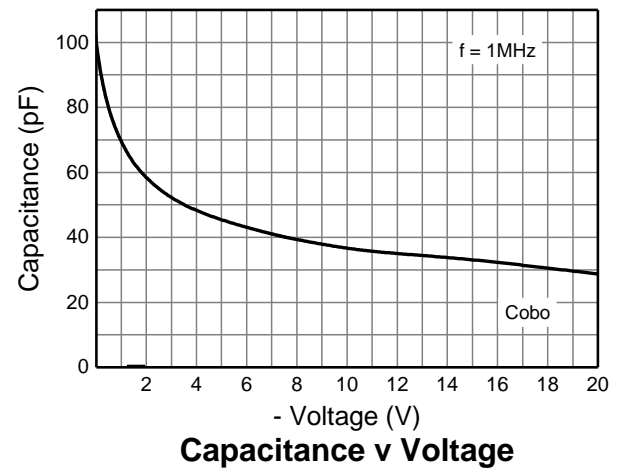
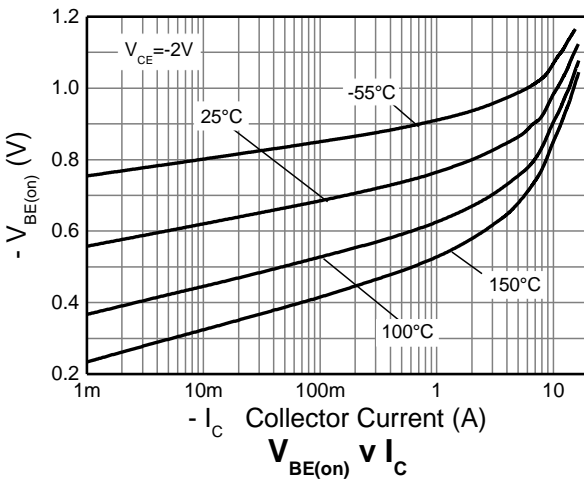
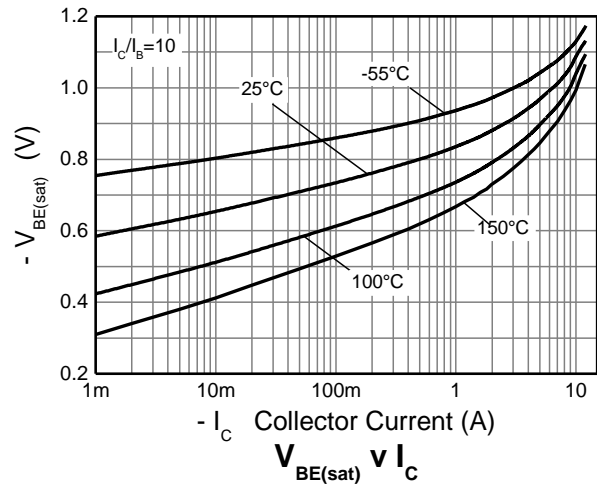
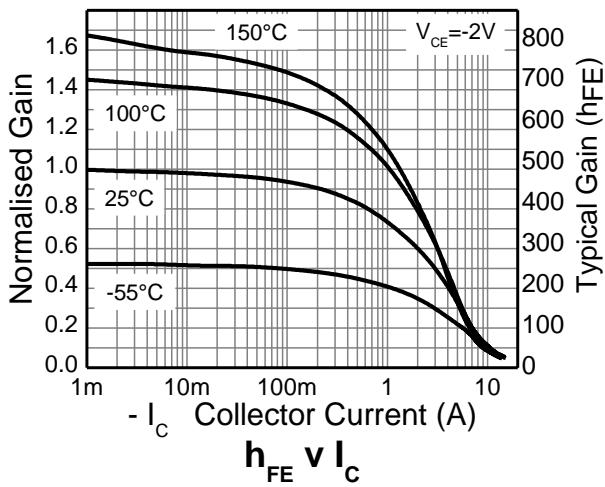
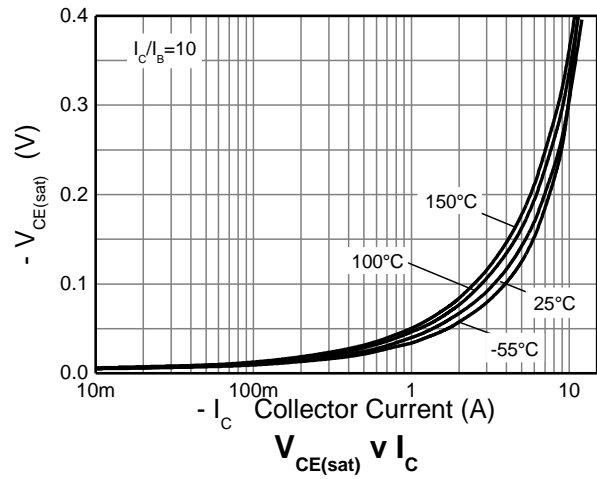
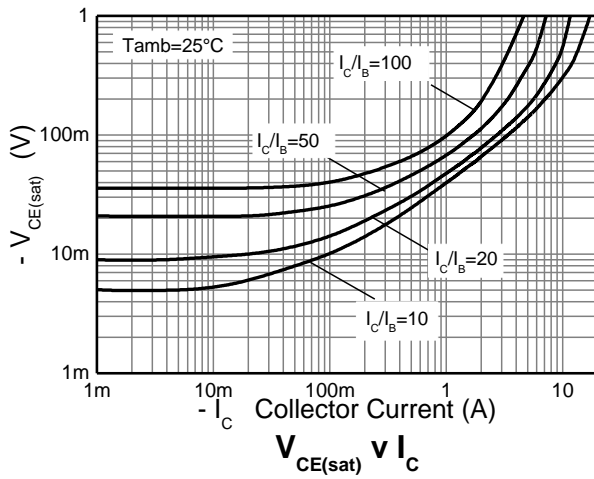
Notes: 5. Device mounted on FR-4 PCB, 2 oz. copper, minimum recommended pad layout.
6. Device mounted on FR-4 PCB, 2 oz. copper, collector pad dimensions 0.42inch².

Electrical Characteristics @T_A = 25°C unless otherwise specified

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|--|----------------------|-----------------------|----------------------------|-----------------------------|------|--|
| Collector-Base Breakdown Voltage | BV _{CBO} | -25 | -55 | — | V | I _C = -100μA |
| Collector-Emitter Breakdown Voltage (Note 7) | BV _{CEO} | -20 | -50 | — | V | I _C = -10mA |
| Emitter-Collector Breakdown Voltage (Reverse Blocking) | BV _{ECX} | -4 | -8.6 | — | V | I _E = -100μA, R _{BC} < 1kΩ or 0.25V > V _{CB} > -0.25V |
| Emitter-Base Breakdown Voltage (Reverse Blocking) | BV _{ECO} | -4 | -8.6 | — | V | I _E = -100μA |
| Emitter-Base Breakdown Voltage | BV _{EBO} | -7 | -8.2 | — | V | I _E = -100μA |
| Collector Cutoff Current | I _{CBO} | — | <1 | 50 | nA | V _{CB} = -25V |
| Emitter Cutoff Current | I _{EBO} | — | <1 | -50 | nA | V _{EB} = -5.6V |
| Collector-Emitter Saturation Voltage (Note 7) | 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 7) | V _{BE(sat)} | — | -1050 | -1150 | mV | I _C = -8A, I _B = -800mA |
| Base-Emitter Turn-On Voltage (Note 7) | V _{BE(on)} | — | -930 | -1000 | mV | I _C = -8A, V _{CE} = -2V |
| DC Current Gain (Note 7) | 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 7) | C _{ibo} | — | — | 400 | pF | V _{EB} = -0.5V, f = 1MHz |
| Output Capacitance (Note 7) | 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: 7. Pulse Test: Pulse width ≤300μs. Duty cycle ≤2.0%.

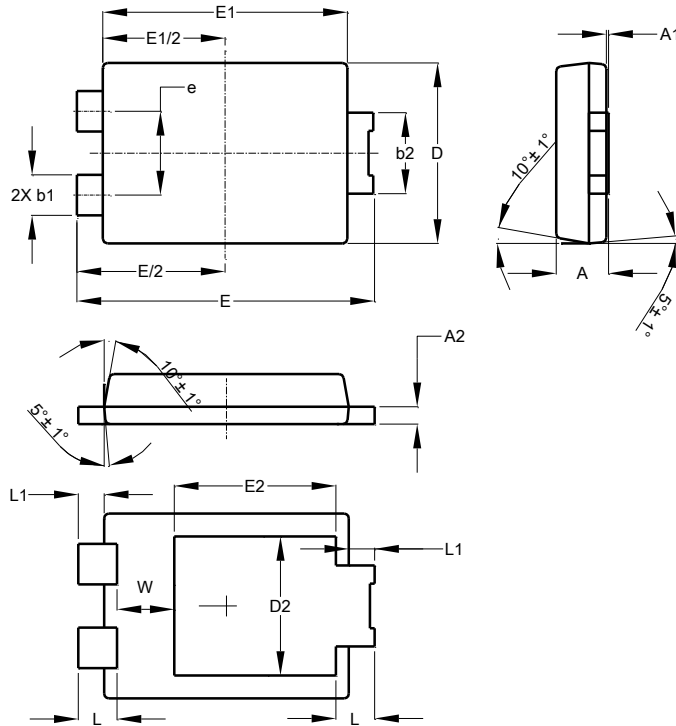
Typical Characteristic



Package Outline Dimensions

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

PowerDI5

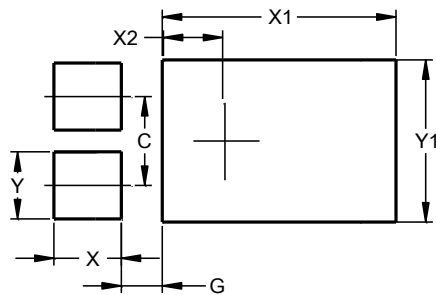


| PowerDI5 | | | |
|----------------------|------|------|-------|
| Dim | Min | Max | Typ |
| A | 1.05 | 1.15 | 1.10 |
| A1 | 0.00 | 0.05 | -- |
| A2 | 0.33 | 0.43 | 0.381 |
| b1 | 0.80 | 0.99 | 0.89 |
| b2 | 1.70 | 1.88 | 1.78 |
| D | 3.90 | 4.05 | 3.966 |
| D2 | -- | -- | 3.054 |
| E | 6.40 | 6.60 | 6.51 |
| e | -- | -- | 1.84 |
| E1 | 5.30 | 5.45 | 5.37 |
| E2 | -- | -- | 3.549 |
| L | 0.75 | 0.95 | 0.85 |
| L1 | 0.50 | 0.65 | 0.57 |
| W | 1.10 | 1.41 | 1.255 |
| All Dimensions in mm | | | |

Suggested Pad Layout

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

PowerDI5



| Dimensions | Value (in mm) |
|------------|---------------|
| C | 1.840 |
| G | 0.852 |
| X | 1.400 |
| X1 | 4.860 |
| X2 | 1.310 |
| Y | 1.390 |
| Y1 | 3.360 |

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