

Features

- $BV_{CEO} > 80V$
- $I_C = 1A$ High Continuous Collector Current
- $I_{CM} = 2A$ Peak Pulse Current
- 520mW Power Dissipation
- Low Saturation Voltage $V_{CE(sat)} < 500mV$ @ 0.5A
- Complementary PNP Type: BC53-16PA
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- Qualified to AEC-Q101 Standards for High Reliability

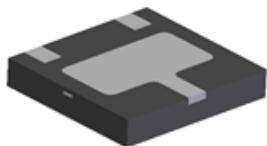
Mechanical Data

- Case: U-DFN2020-3 (Type B)
- Case Material: Molded Plastic. "Green" Molding Compound.
- UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Plated Leads.
- Solderable per MIL-STD-202, Method 208 (Note 3)
- Weight: 0.01 grams (Approximate)

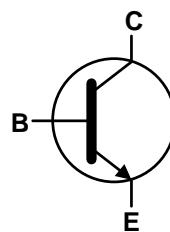
Applications

- Medium Power Switching or Amplification Applications
- AF Driver and Output Stages

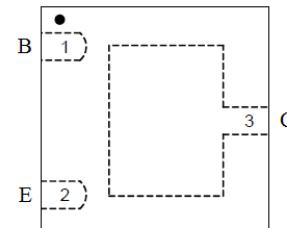
U-DFN2020-3 (Type B)



Bottom View



Device Symbol



Top View
Pin-Out

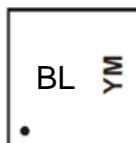
Ordering Information (Note 4)

| Product | Compliance | Marking | Reel size (inches) | Tape width (mm) | Quantity per reel |
|-------------|------------|---------|--------------------|-----------------|-------------------|
| BC56-16PA-7 | AEC-Q101 | BL | 7 | 12 | 3,000 |

Notes:

1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
2. See http://www.diodes.com/quality/lead_free.html 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 <http://www.diodes.com/products/packages.html>.

Marking Information



BL = Product Type Marking Code
YM = Date Code Marking
Y = Year (ex: C = 2015)
M = Month (ex: 9 = September)

Date Code Key

| Year | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | | | | |
|-------|------|------|------|------|------|------|------|------|-----|-----|-----|-----|
| Code | C | D | E | F | G | H | I | J | | | | |
| Month | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
| Code | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | O | N | D |

Absolute Maximum Ratings (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

| Characteristic | Symbol | Value | Unit |
|------------------------------|-----------|-------|------|
| Collector-Base Voltage | V_{CBO} | 100 | V |
| Collector-Emitter Voltage | V_{CEO} | 80 | V |
| Emitter-Base Voltage | V_{EBO} | 7 | V |
| Continuous Collector Current | I_C | 1 | A |
| Peak Pulse Collector Current | I_{CM} | 2 | |
| Continuous Base Current | I_B | 100 | |
| Peak Pulse Base Current | I_{BM} | 200 | mA |

Thermal Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

| Characteristic | Symbol | Value | Unit |
|---|----------------|-----------------|-------|
| Power Dissipation | (Note 5) | P_D | mW |
| Thermal Resistance, Junction to Ambient | (Note 5) | $R_{\theta JA}$ | °C /W |
| Thermal Resistance, Junction to Leads | (Note 6) | $R_{\theta JL}$ | °C/W |
| Operating and Storage Temperature Range | T_J, T_{STG} | -65 to +150 | °C |

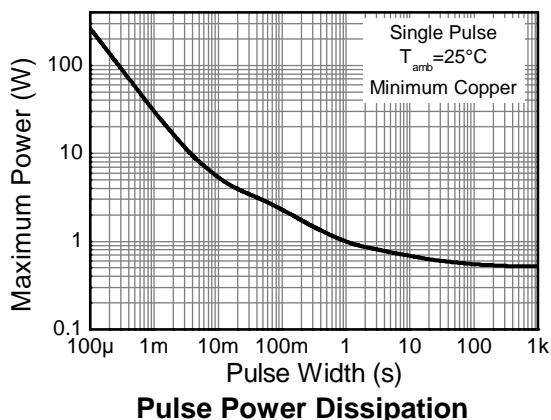
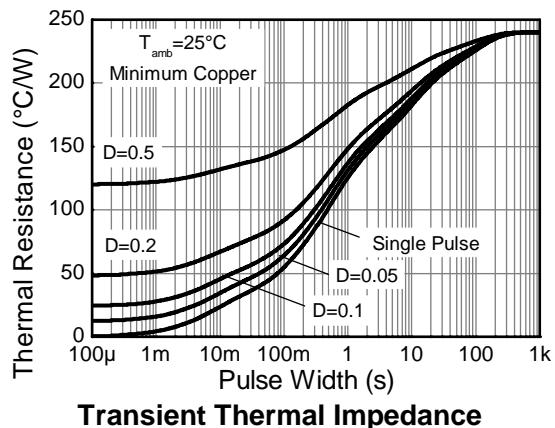
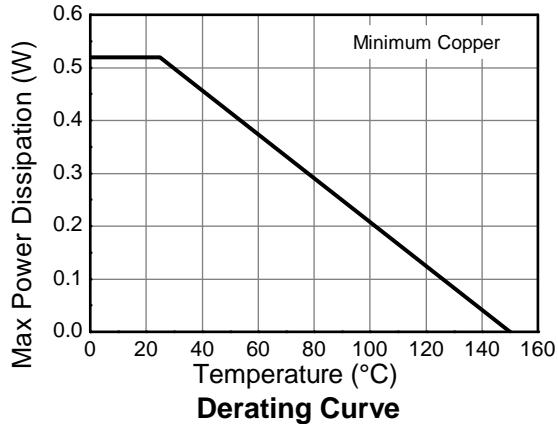
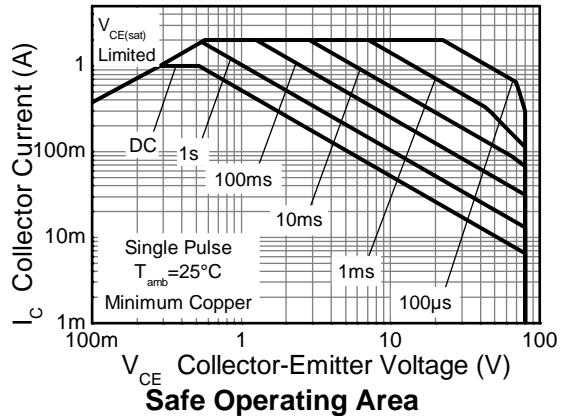
ESD Ratings (Note 7)

| Characteristic | Symbol | Value | Unit | JEDEC Class |
|--|---------|-------|------|-------------|
| Electrostatic Discharge - Human Body Model | ESD HBM | 4,000 | V | 3A |
| Electrostatic Discharge - Machine Model | ESD MM | 400 | V | C |

Notes:

- 5. For a device mounted on minimum recommended pad layout FR4 PCB single sided 1oz copper; device is measured under still air conditions while operating at a steady-state.
- 6. Thermal resistance from junction to solder-point (at the end of the collector lead).
- 7. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

Thermal Characteristics and Derating Information



Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|--|-----------------------------|-----------------|-------------|-----------|---------------|---|
| Collector-Base Breakdown Voltage | BV_{CBO} | 100 | - | - | V | $I_C = 100\mu\text{A}$ |
| Collector-Emitter Breakdown Voltage (Note 8) | BV_{CEO} | 80 | - | - | V | $I_C = 10\text{mA}$ |
| Emitter-Base Breakdown Voltage | BV_{EBO} | 7 | - | - | V | $I_E = 100\mu\text{A}$ |
| Collector Cut-off Current | I_{CBO} | - | - | 0.1 20 | μA | $V_{\text{CB}} = 30\text{V}$ $V_{\text{CB}} = 30\text{V}, T_A = +150^\circ\text{C}$ |
| Emitter Cut-off Current | I_{EBO} | - | - | 20 | nA | $V_{\text{EB}} = 4\text{V}$ |
| Static Forward Current Transfer Ratio (Note 8) | h_{FE} | 25 100 25 | - - - | 250 | - | $I_C = 5\text{mA}, V_{\text{CE}} = 2\text{V}$ $I_C = 150\text{mA}, V_{\text{CE}} = 2\text{V}$ $I_C = 500\text{mA}, V_{\text{CE}} = 2\text{V}$ |
| Collector-Emitter Saturation Voltage (Note 8) | $V_{\text{CE}(\text{sat})}$ | - | - | 0.5 | V | $I_C = 500\text{mA}, I_B = 50\text{mA}$ |
| Base-Emitter Turn-On Voltage (Note 8) | $V_{\text{BE}(\text{on})}$ | - | - | 1.0 | V | $I_C = 500\text{mA}, V_{\text{CE}} = 2\text{V}$ |
| Transition Frequency | f_T | - | 125 | - | MHz | $I_C = 50\text{mA}, V_{\text{CE}} = 10\text{V}$ $f = 100\text{MHz}$ |
| Output Capacitance | C_{obo} | - | - | 25 | pF | $V_{\text{CB}} = 10\text{V}, f = 1\text{MHz}$ |

Note: 8. Measured under pulsed conditions. Pulse width $\leq 300\mu\text{s}$. Duty cycle $\leq 2\%$.

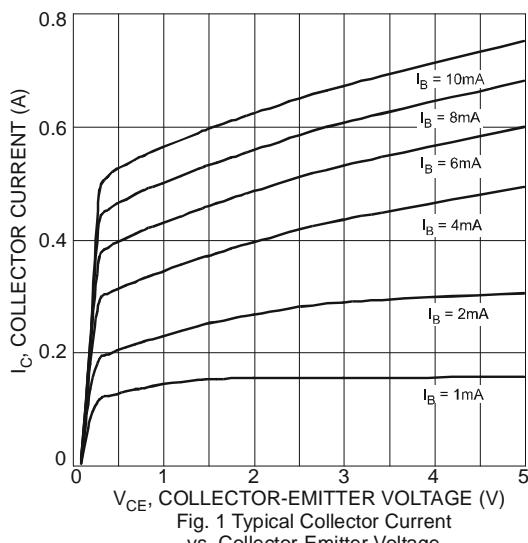
Typical Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)


Fig. 1 Typical Collector Current
vs. Collector-Emitter Voltage

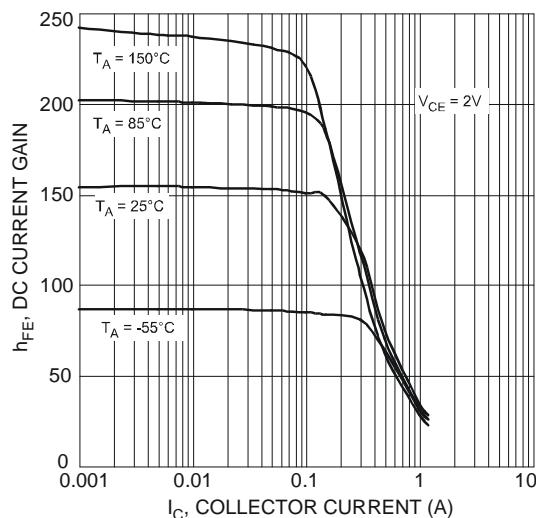
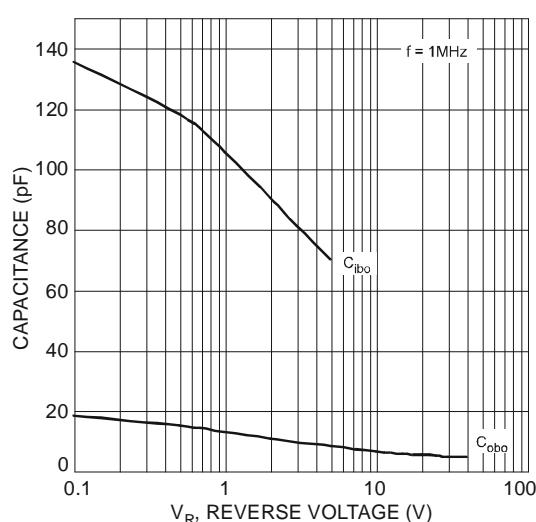
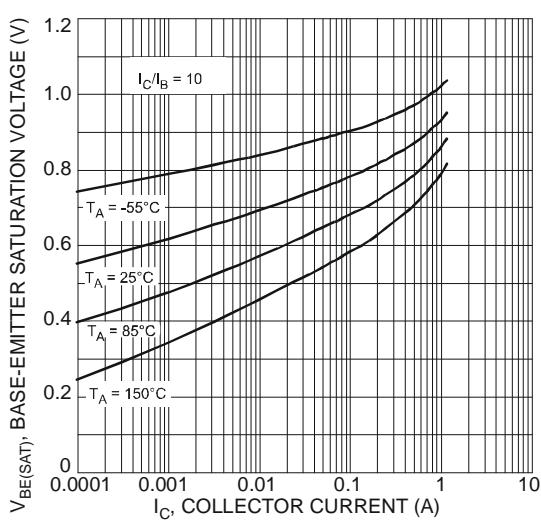
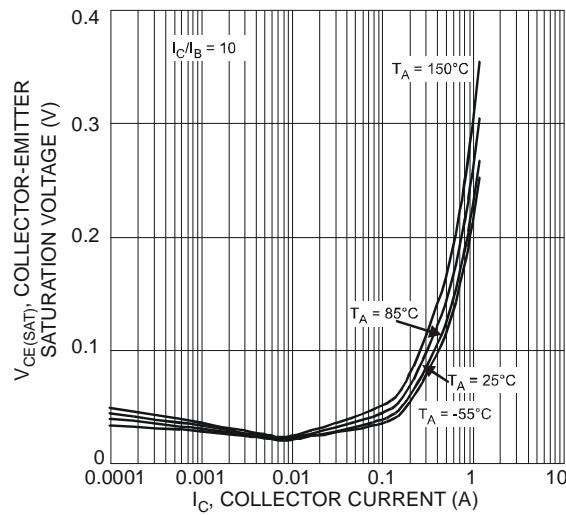
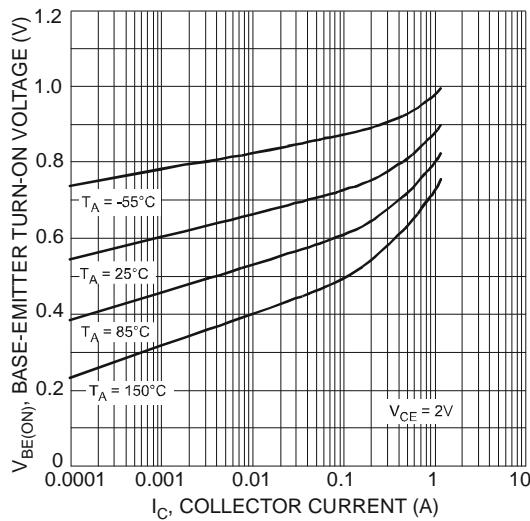


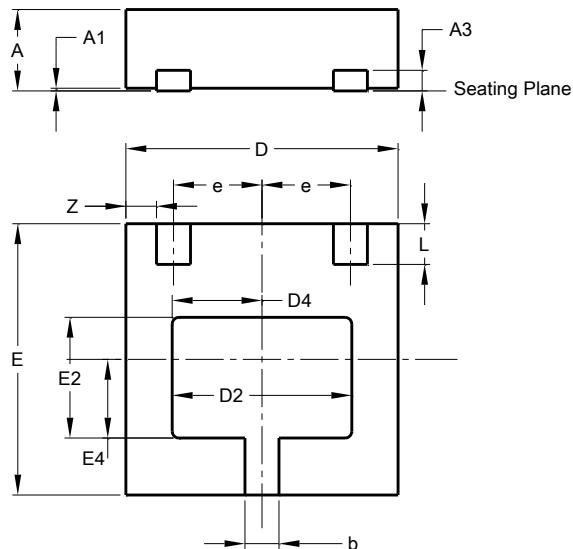
Fig. 2 Typical DC Current Gain vs. Collector Current

Typical Electrical Characteristics (continued)



Package Outline Dimensions

Please see AP02001 at http://www.diodes.com/_files/datasheets/ap02001.pdf for the latest version.

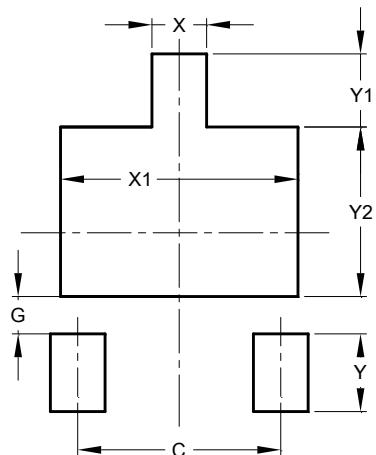


| U-DFN2020-3 (Type B) | | | |
|-------------------------|-------|-------|-------|
| Dim | Min | Max | Typ |
| A | 0.57 | 0.63 | 0.60 |
| A1 | 0.00 | 0.05 | 0.02 |
| A3 | — | — | 0.152 |
| b | 0.20 | 0.30 | 0.25 |
| D | 1.950 | 2.075 | 2.00 |
| D2 | 1.22 | 1.42 | 1.32 |
| D4 | 0.56 | 0.76 | 0.66 |
| E | 1.950 | 2.075 | 2.00 |
| E2 | 0.79 | 0.99 | 0.89 |
| E4 | 0.48 | 0.68 | 0.58 |
| e | — | — | 0.65 |
| L | 0.25 | 0.35 | 0.30 |
| Z | — | — | 0.225 |

All Dimensions in mm

Suggested Pad Layout

Please see AP02001 at http://www.diodes.com/_files/datasheets/ap02001.pdf for the latest version.



| Dimensions | Value (in mm) |
|------------|------------------|
| C | 1.300 |
| G | 0.240 |
| X | 0.350 |
| X1 | 1.520 |
| X2 | 1.700 |
| Y | 0.500 |
| Y1 | 0.470 |
| Y2 | 1.090 |

Note: For high voltage applications, the appropriate industry sector guidelines should be considered with regards to creepage and clearance distances between device Terminals and PCB tracking.

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