

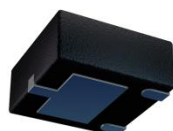
## Features

- $BV_{CEO} > -40V$
- $h_{FE}$  Specified up to -3A for High Current Gain Hold Up
- Low Profile 0.6mm High Package for Thin Applications
- **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-Q100/101/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please refer to the related automotive grade (Q-suffix) part. A listing can be found at**  
<https://www.diodes.com/products/automotive/automotive-products/>.
- **This part is qualified to JEDEC standards (as references in AEC-Q) for High Reliability.**  
<https://www.diodes.com/quality/product-definitions/>

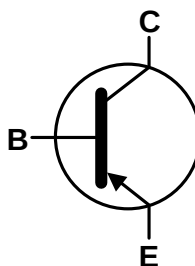
U-DFN2020-3 (Type B)



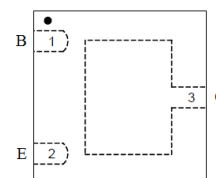
Top View



Bottom View



Device Symbol



Top View  
Pin-Out

## Mechanical Data

- Case: U-DFN2020-3 (Type B)
- Nominal Package Height: 0.6mm
- Case Material: Molded Plastic. "Green" Molding Compound. UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – NiPdAu, Solderable per MIL-STD-202, Method 208 (e4)
- Weight: 0.01 grams (Approximate)

## Applications

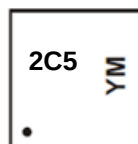
- DC-DC Converters
- Charging Circuits
- Motor Control
- Power Switches

## Ordering Information (Note 4)

| Part Number    | Marking | Reel Size (inches) | Tape Width (mm) | Quantity per Reel |
|----------------|---------|--------------------|-----------------|-------------------|
| DXTP5840CFDB-7 | 2C5     | 7                  | 8               | 3,000             |

- 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



2C5 = Product Type Marking Code  
YM = Date Code Marking  
Y = Year (ex: G = 2019)  
M = Month (ex: 9 = September)

### Date Code Key

| Year | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 |
|------|------|------|------|------|------|------|------|------|
| Code | G    | H    | I    | J    | K    | L    | M    | N    |

| 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<sub>A</sub> = +25°C, unless otherwise specified.)

| Parameter                    | Symbol           | Limit | Unit |
|------------------------------|------------------|-------|------|
| Collector-Base Voltage       | V <sub>CBO</sub> | -40   | V    |
| Collector-Emitter Voltage    | V <sub>CEO</sub> | -40   |      |
| Emitter-Base Voltage         | V <sub>EBO</sub> | -7    |      |
| Peak Pulse Current           | I <sub>CM</sub>  | -8    | A    |
| Continuous Collector Current | I <sub>C</sub>   | -4.8  |      |

**Thermal Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

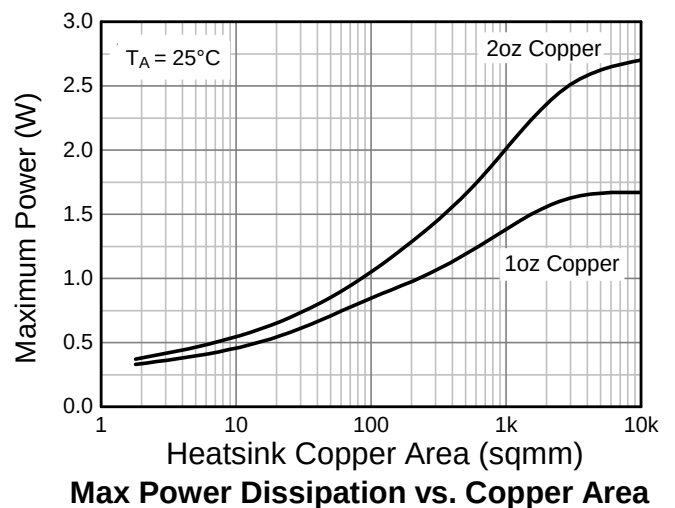
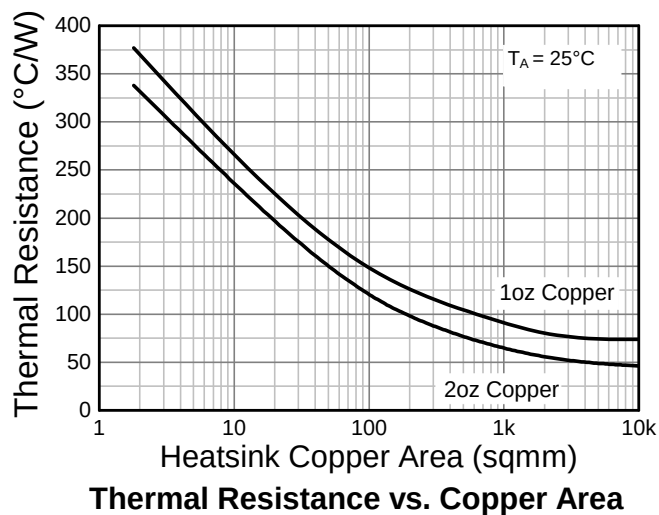
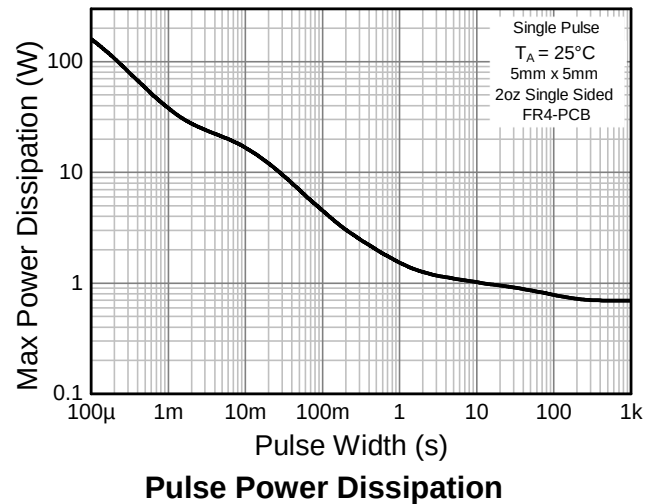
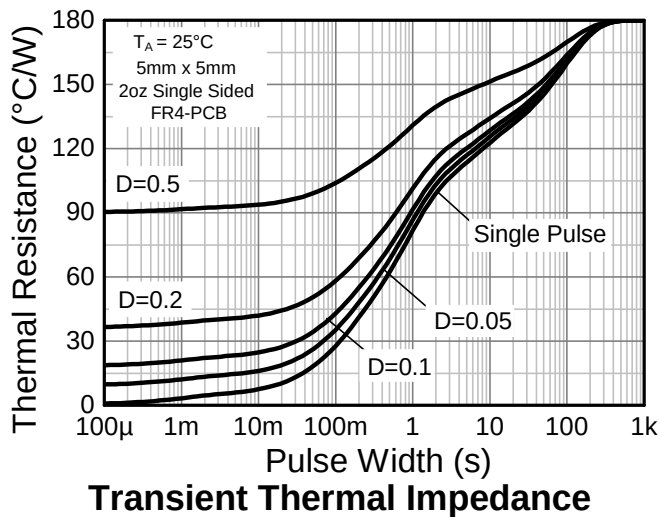
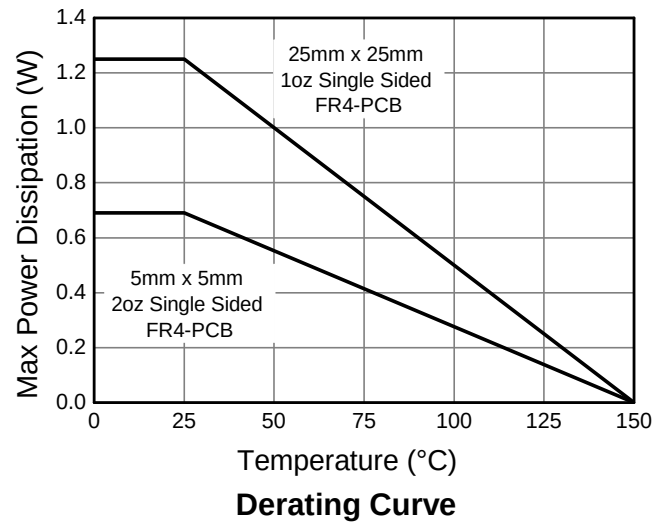
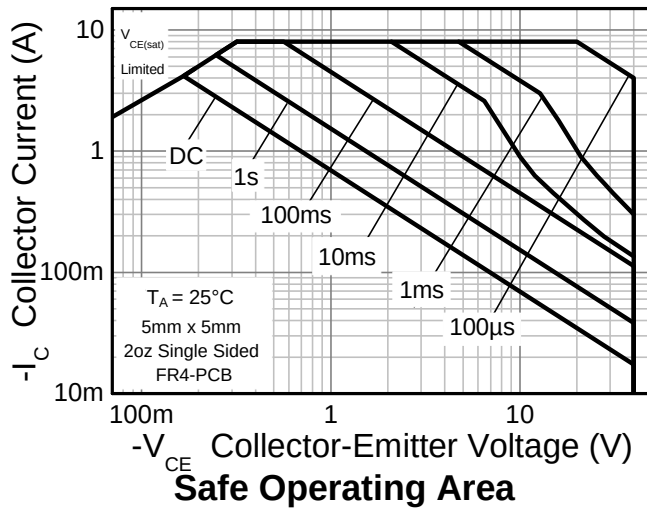
| Characteristic                          | Symbol                            | Value       | Unit |
|-----------------------------------------|-----------------------------------|-------------|------|
| Power Dissipation                       | P <sub>D</sub>                    | 0.69        | W    |
|                                         |                                   | 1.25        |      |
| Thermal Resistance, Junction to Ambient | R <sub>θJA</sub>                  | 180         | °C/W |
|                                         |                                   | 100         |      |
| Operating and Storage Temperature Range | T <sub>J</sub> , T <sub>STG</sub> | -55 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 with the exposed collector on 5mm x 5mm 2oz copper on single sided FR4 PCB; device is measured under still air conditions whilst operating in the steady state.
  6. Same as Note (5) except the exposed collector pad is mounted on 25mm x 25mm 1oz copper.
  7. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

## Thermal Characteristics and Derating Information

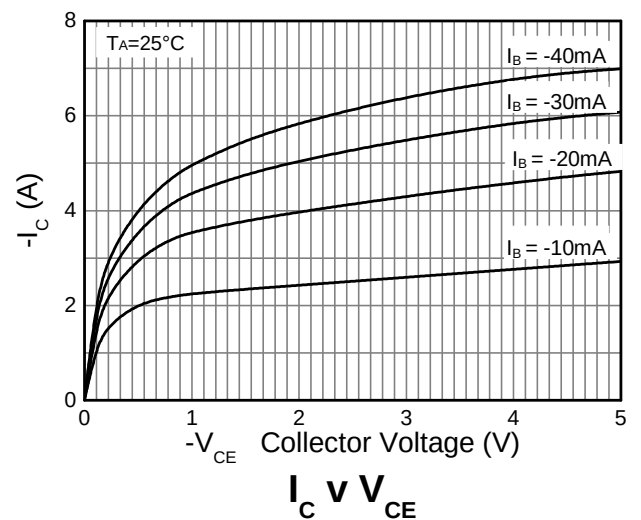
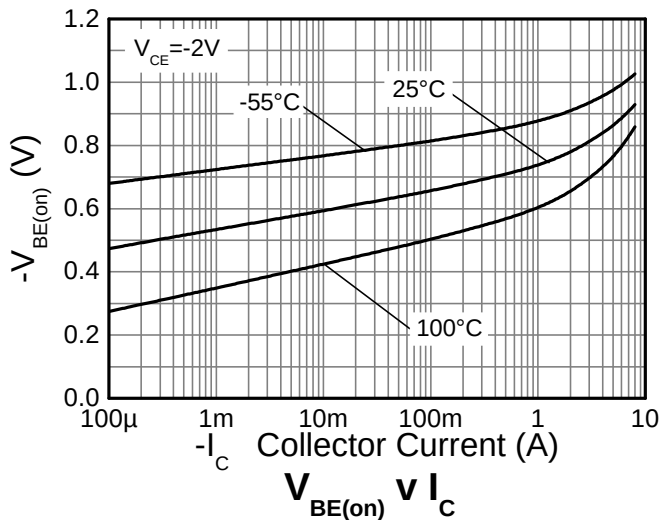
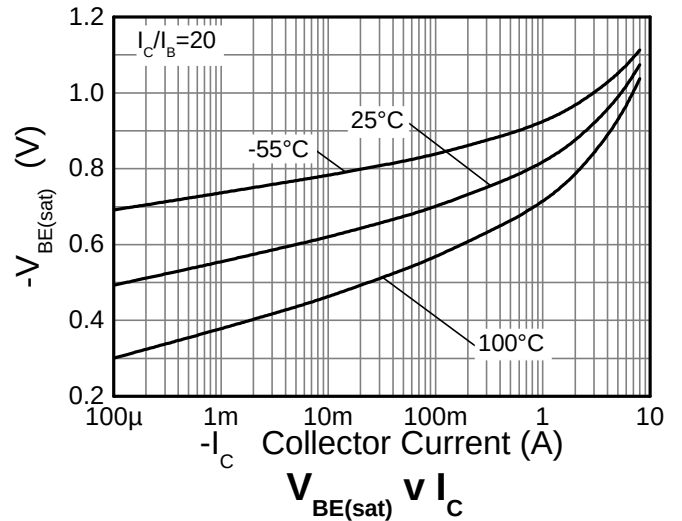
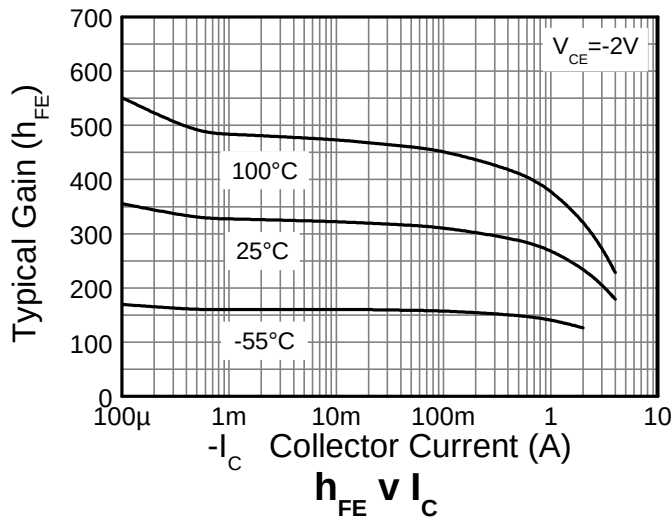
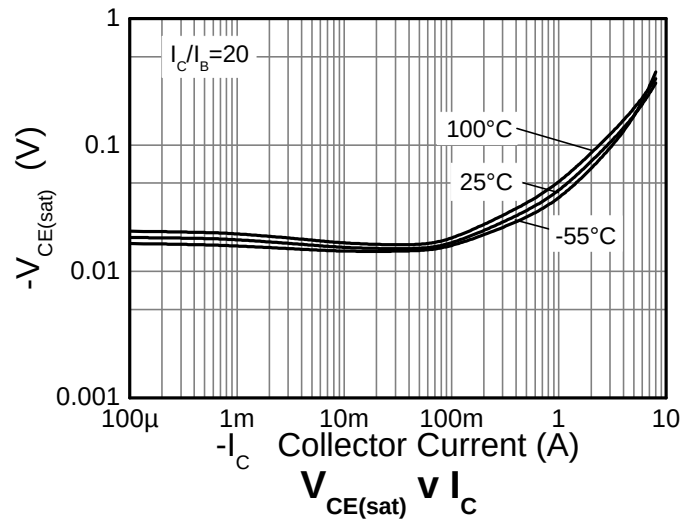
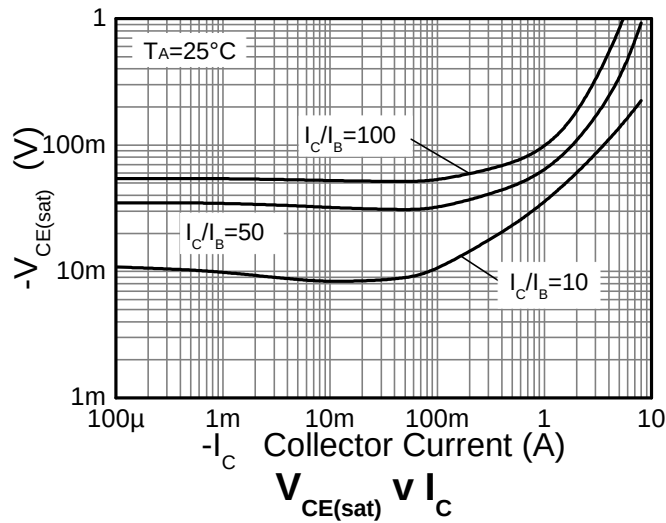


**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified)

| Characteristic                                 | Symbol               | Min | Typ   | Max  | Unit | Test Condition                                                                                |
|------------------------------------------------|----------------------|-----|-------|------|------|-----------------------------------------------------------------------------------------------|
| Collector-Base Breakdown Voltage               | BV <sub>CBO</sub>    | -40 | —     | —    | V    | I <sub>C</sub> = -100μA                                                                       |
| Collector-Emitter Breakdown Voltage (Note 8)   | BV <sub>CEO</sub>    | -40 | —     | —    | V    | I <sub>C</sub> = -10mA                                                                        |
| Emitter-Base Breakdown Voltage                 | BV <sub>EBO</sub>    | -7  | —     | —    | V    | I <sub>E</sub> = -100μA                                                                       |
| Collector Cutoff Current                       | I <sub>CBO</sub>     | —   | —     | -100 | nA   | V <sub>CB</sub> = -32V                                                                        |
| Emitter Cutoff Current                         | I <sub>EBO</sub>     | —   | —     | -100 | nA   | V <sub>EB</sub> = -7V                                                                         |
| Collector Emitter Cutoff Current               | I <sub>CES</sub>     | —   | —     | -100 | nA   | V <sub>CES</sub> = -32V                                                                       |
| Static Forward Current Transfer Ratio (Note 8) | h <sub>FE</sub>      | 250 | 400   | —    | —    | I <sub>C</sub> = -10mA, V <sub>CE</sub> = -2V                                                 |
|                                                |                      | 240 | 350   | —    |      | I <sub>C</sub> = -500mA, V <sub>CE</sub> = -2V                                                |
|                                                |                      | 220 | 330   | —    |      | I <sub>C</sub> = -1A, V <sub>CE</sub> = -2V                                                   |
|                                                |                      | 180 | 280   | —    |      | I <sub>C</sub> = -2A, V <sub>CE</sub> = -2V                                                   |
|                                                |                      | 150 | 240   | —    |      | I <sub>C</sub> = -3A, V <sub>CE</sub> = -2V                                                   |
| Collector-Emitter Saturation Voltage (Note 8)  | V <sub>CE(sat)</sub> | —   | -10   | -15  | mV   | I <sub>C</sub> = -0.1A, I <sub>B</sub> = -10mA                                                |
|                                                |                      | —   | -37   | -80  |      | I <sub>C</sub> = -1A, I <sub>B</sub> = -100mA                                                 |
|                                                |                      | —   | -100  | -130 |      | I <sub>C</sub> = -1A, I <sub>B</sub> = -10mA                                                  |
|                                                |                      | —   | -190  | -230 |      | I <sub>C</sub> = -2A, I <sub>B</sub> = -20mA                                                  |
|                                                |                      | —   | -310  | -370 |      | I <sub>C</sub> = -3A, I <sub>B</sub> = -30mA                                                  |
|                                                |                      | —   | -115  | -260 |      | I <sub>C</sub> = -4A, I <sub>B</sub> = -400mA                                                 |
| Base-Emitter Turn-On Voltage (Note 8)          | V <sub>BE(on)</sub>  | —   | -0.8  | -0.9 | V    | I <sub>C</sub> = -2A, V <sub>CE</sub> = -2V                                                   |
| Base-Emitter Saturation Voltage (Note 8)       | V <sub>BE(sat)</sub> | —   | -0.76 | -0.9 | V    | I <sub>C</sub> = -1A, I <sub>B</sub> = -10mA                                                  |
| Output Capacitance                             | C <sub>obo</sub>     | —   | 65    | —    | pF   | V <sub>CB</sub> = -3V, f = 1MHz                                                               |
| Transition Frequency                           | f <sub>T</sub>       | —   | 135   | —    | MHz  | V <sub>CE</sub> = -5V, I <sub>C</sub> = -100mA, f = 100MHz                                    |
| Delay Time                                     | t <sub>d</sub>       | —   | 105   | —    | ns   | V <sub>CC</sub> = -30V, I <sub>C</sub> = -750mA<br>I <sub>B1</sub> = -I <sub>B2</sub> = -15mA |
| Rise Time                                      | t <sub>r</sub>       | —   | 125   | —    |      |                                                                                               |
| Turn-On Time                                   | t <sub>on</sub>      | —   | 230   | —    |      |                                                                                               |
| Storage Time                                   | t <sub>s</sub>       | —   | 265   | —    |      |                                                                                               |
| Fall Time                                      | t <sub>f</sub>       | —   | 95    | —    |      |                                                                                               |
| Turn-Off Time                                  | t <sub>off</sub>     | —   | 360   | —    |      |                                                                                               |

Note: 8. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

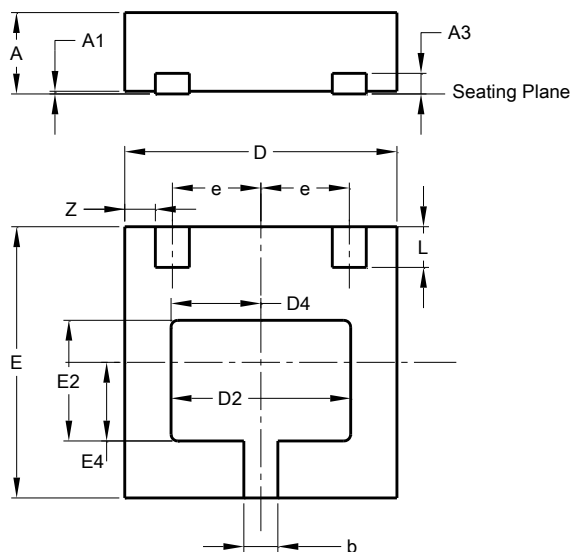
**Typical Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)



## Package Outline Dimensions

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

**U-DFN2020-3 (Type B)**

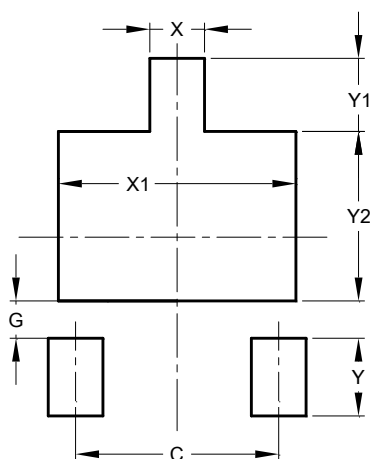


| U-DFN2020-3<br>(Type B) |       |       |       |
|-------------------------|-------|-------|-------|
| Dim                     | Min   | Max   | Typ   |
| A                       | 0.57  | 0.63  | 0.60  |
| A1                      | 0.00  | 0.05  | 0.02  |
| A3                      | —     | —     | 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 <http://www.diodes.com/package-outlines.html> for the latest version.

**U-DFN2020-3 (Type B)**



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

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