


## Features

- $BV_{CEO} > -40V$
- Small Form Factor Thermally Efficient Package. Enables Higher Density End Products
- $I_C = -3A$  High Continuous Current
- $I_{CM} = -6A$  Peak Pulse Current
- Low Saturation Voltage  $V_{CE(sat)} < -400mV @ -1A$
- Minimum  $h_{FE} 200 @ I_C = -1A$
- Rated to  $+175^\circ C$ —Ideal For High Temperature Environment
- Wettable Flank For Improved Optical Inspection
- **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**

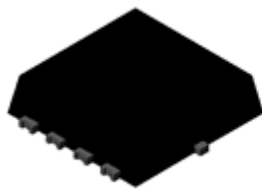
## Mechanical Data

- Case: PowerDI@3333-8
- Case Material: Molded Plastic. "Green" Molding Compound UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish—Matte Tin Solderable per MIL-STD-202, Method 208 
- Weight: 0.03 grams (Approximate)

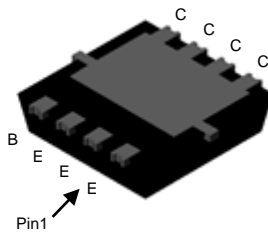
## Applications

- High Side Switch
- Low Drop Out Regulator
- MOSFET or IGBT Gate Driving

PowerDI3333-8 (SWP) (Type UX)

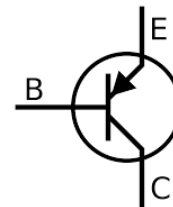


Top View



Bottom View

Equivalent Circuit



Device Symbol

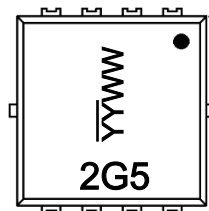
## Ordering Information (Note 4)

| Part Number    | Compliance | Marking | Reel Size (inches) | Tape Width (mm) | Quantity per Reel |
|----------------|------------|---------|--------------------|-----------------|-------------------|
| DXTP07040CFG-7 | AEC-Q101   | 2G5     | 7                  | 12              | 2,000             |

- 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 <http://www.diodes.com/products/packages.html>.

## Marking Information

PowerDI3333-8 (SWP) (Type UX)



2G5= Product Type Marking Code  
 YYWW = Date Code Marking  
 YY = Last Two Digits of Year (ex: 18 = 2018)  
 WW = Week Code (01 to 53)

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

| Characteristic               | Symbol           | Value | Unit |
|------------------------------|------------------|-------|------|
| Collector-Base Voltage       | V <sub>CB0</sub> | -50   | V    |
| Collector-Emitter Voltage    | V <sub>CEO</sub> | -40   | V    |
| Emitter-Base Voltage         | V <sub>EBO</sub> | -7    | V    |
| Continuous Collector Current | I <sub>C</sub>   | -3    | A    |
| Peak Pulse Current           | I <sub>CM</sub>  | -6    | A    |

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

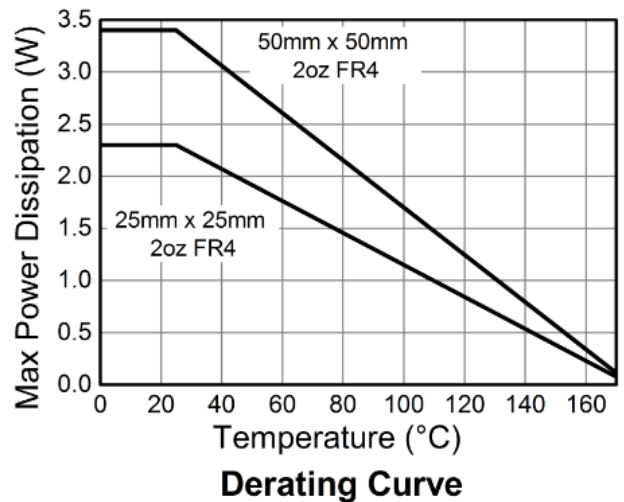
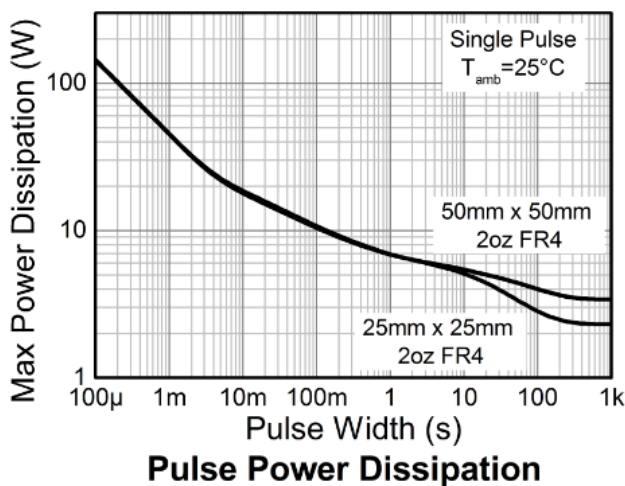
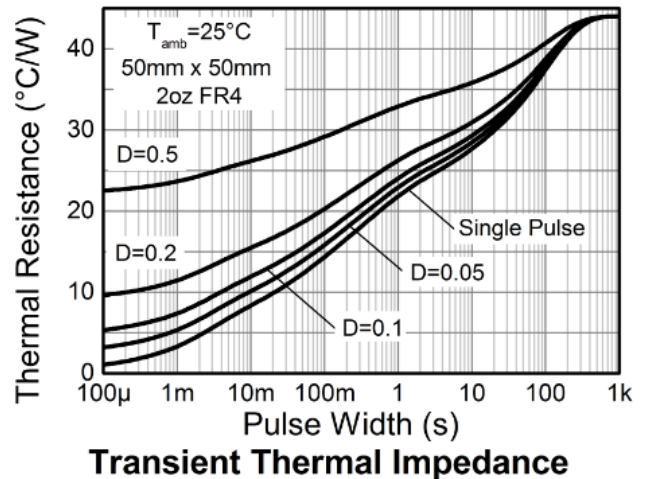
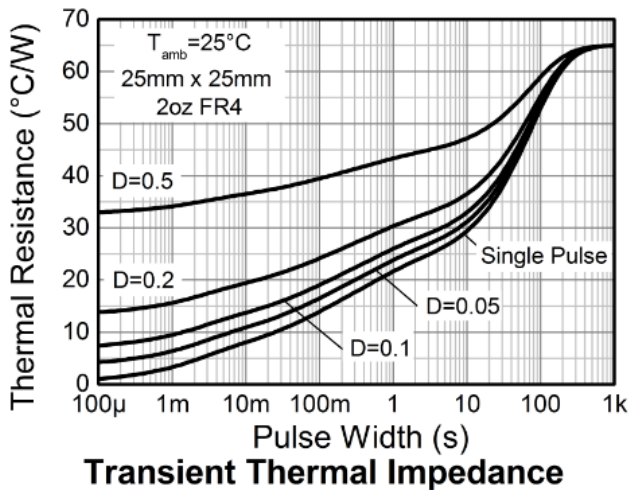
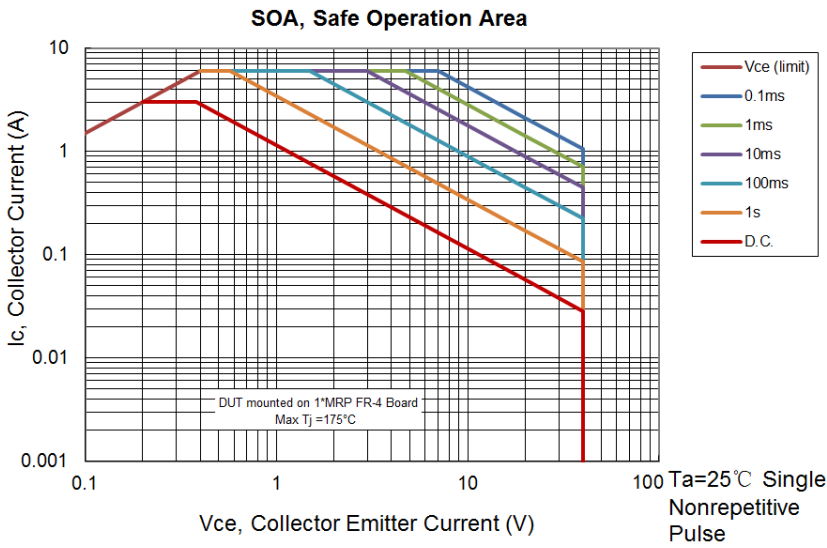
| Characteristic                                 | Symbol                            | Value       | Unit |
|--|-----------------------------------|-------------|------|
| Power Dissipation                              | P <sub>D</sub>                    | 0.9         | W    |
|  |                                   | 2.1         | W    |
|  |                                   | 3.1         | W    |
| Thermal Resistance, Junction to Ambient        | R <sub>θJA</sub>                  | 140         | °C/W |
|  |                                   | 65          | °C/W |
|  |                                   | 44          | °C/W |
| Thermal Resistance, Junction to Leads (Note 8) | R <sub>θJL</sub>                  | 8.5         | °C/W |
| Operating and Storage Temperature Range        | T <sub>J</sub> , T <sub>STG</sub> | -55 to +175 | °C   |

**ESD Ratings** (Note 9)

| 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 collector tab on MRP FR4-PCB; device is measured under still air conditions whilst operating in a steady-state.
  6. Same as Note 5, except the device is mounted on 25mm × 25mm 2oz copper.
  7. Same as Note 5, except the device is mounted on 50mm × 50mm 2oz copper.
  8. Thermal resistance from junction to solder-point (at the collector tab).
  9. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

**Thermal Characteristics and Derating Information**

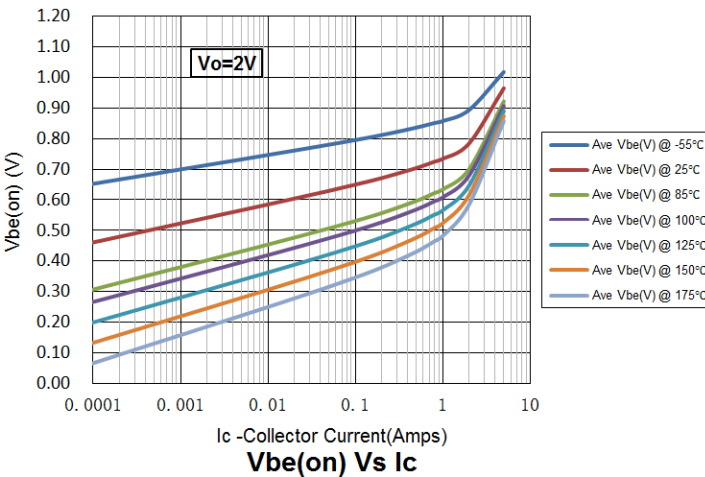
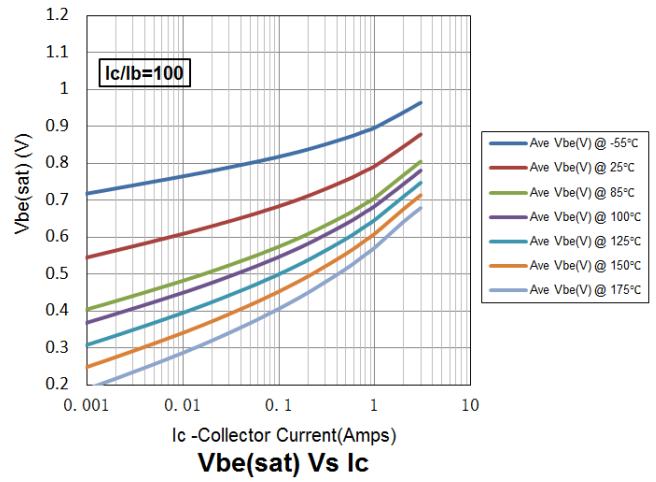
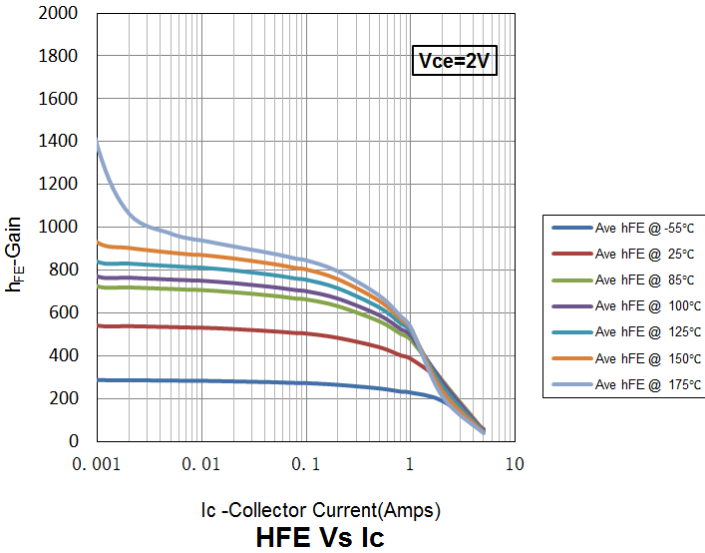
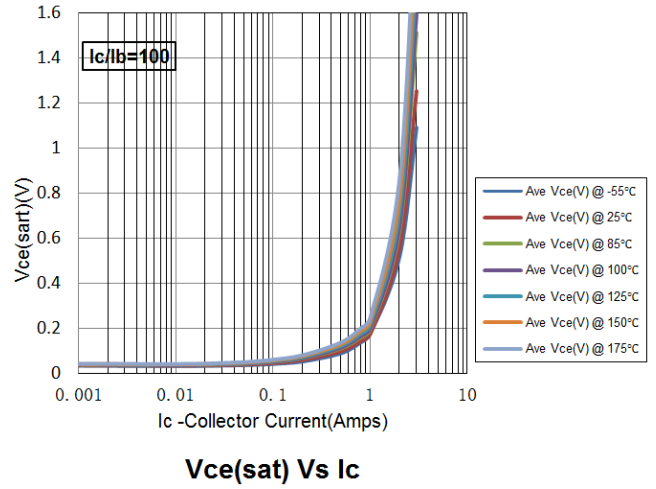
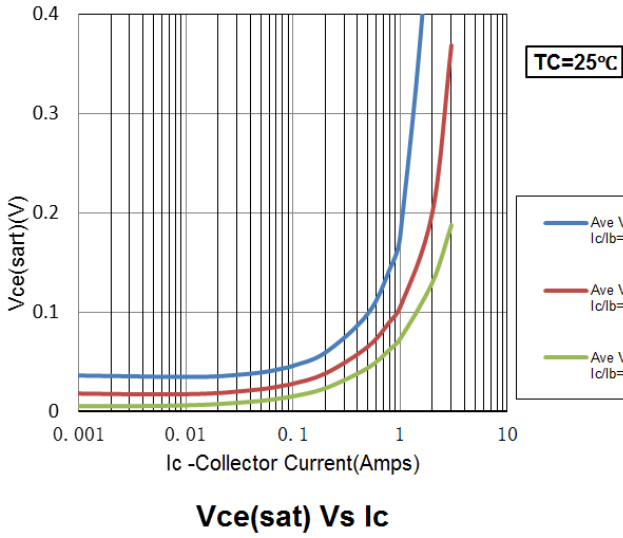


**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Characteristic                                 | Symbol               | Min | Typ.  | Max  | Unit | Test Condition   |
|--|----------------------|-----|-------|------|------|--|
| Collector-Base Breakdown Voltage               | BV <sub>CBO</sub>    | -50 | -65   | —    | V    | I <sub>C</sub> = -100μA                                  |
| Collector-Emitter Breakdown Voltage (Note 10)  | BV <sub>CEO</sub>    | -40 | -57   | —    | V    | I <sub>C</sub> = -10mA                                   |
| Emitter-Base Breakdown Voltage                 | BV <sub>EBO</sub>    | -7  | -8.8  | —    | V    | I <sub>E</sub> = -100μA                                  |
| Collector Cut-Off Current                      | I <sub>CBO</sub>     | —   | —     | -20  | nA   | V <sub>CB</sub> = -40V                                   |
|  |                      | —   | —     | -10  | μA   | V <sub>CB</sub> = -40V, T <sub>A</sub> = +125°C          |
| Emitter Cut-Off Current                        | I <sub>EBO</sub>     | —   | —     | -20  | nA   | V <sub>EB</sub> = -6V                                    |
| DC Current Transfer Static Ratio (Note 10)     | h <sub>FE</sub>      | 300 | 527   | 800  | —    | I <sub>C</sub> = -10mA, V <sub>CE</sub> = -2V            |
|  |                      | 250 | 432   | —    | —    | I <sub>C</sub> = -500mA, V <sub>CE</sub> = -2V           |
|  |                      | 200 | 377   | —    | —    | I <sub>C</sub> = -1A, V <sub>CE</sub> = -2V              |
|  |                      | 150 | 273   | —    | —    | I <sub>C</sub> = -2A, V <sub>CE</sub> = -2V              |
| Collector-Emitter Saturation Voltage (Note 10) | V <sub>CE(sat)</sub> | —   | -99   | -200 | mV   | I <sub>C</sub> = -500mA, I <sub>B</sub> = -5mA           |
|  |                      | —   | -177  | -400 | mV   | I <sub>C</sub> = -1A, I <sub>B</sub> = -10mA             |
|  |                      | —   | -200  | -500 | mV   | I <sub>C</sub> = -2A, I <sub>B</sub> = -50mA             |
| Base-Emitter Saturation Voltage (Note 10)      | V <sub>BE(sat)</sub> | —   | -0.8  | -1   | V    | I <sub>C</sub> = -1A, I <sub>B</sub> = -10mA             |
| Base-Emitter Turn-On Voltage (Note 10)         | V <sub>BE(on)</sub>  | —   | -0.75 | 0.9  | V    | I <sub>C</sub> = -1A, V <sub>CE</sub> = -2V              |
| Transitional Frequency                         | f <sub>T</sub>       | 100 | —     | —    | MHz  | I <sub>C</sub> = -50mA, V <sub>CE</sub> = -5V, f = 50MHz |
| Output Capacitance                             | C <sub>obo</sub>     | —   | 24    | —    | pF   | V <sub>CB</sub> = -10V, f = 1MHz                         |
| Switching Time                                 | t <sub>ON</sub>      | —   | 35    | —    | ns   | V <sub>CC</sub> = -10V, I <sub>C</sub> = -500mA,         |
|  | t <sub>OFF</sub>     | —   | 600   | —    | ns   | I <sub>B1</sub> = -I <sub>B2</sub> = -50mA               |

Note: 10. Measured under pulsed conditions. Pulse width ≤ 300 μs. Duty cycle ≤ 2%.

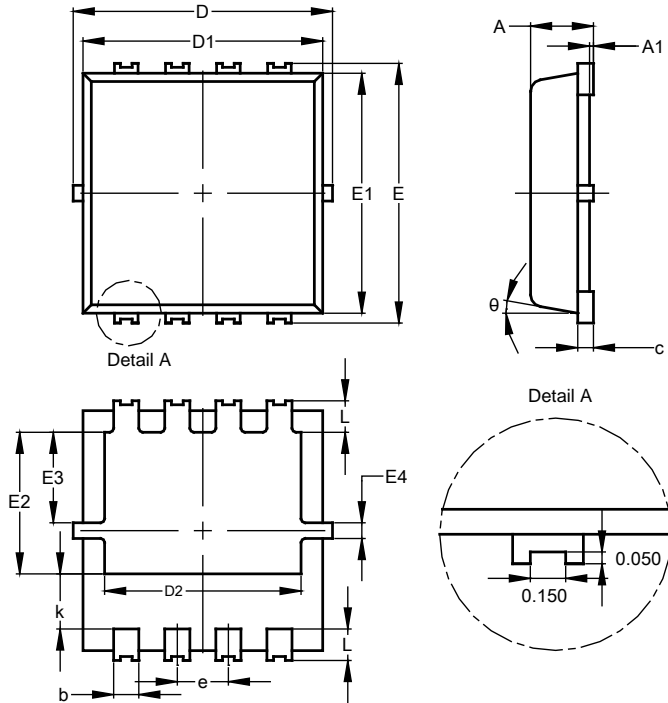
**Typical Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)



**Package Outline Dimensions**

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

**PowerDI3333-8 (SWP) (Type UX)**

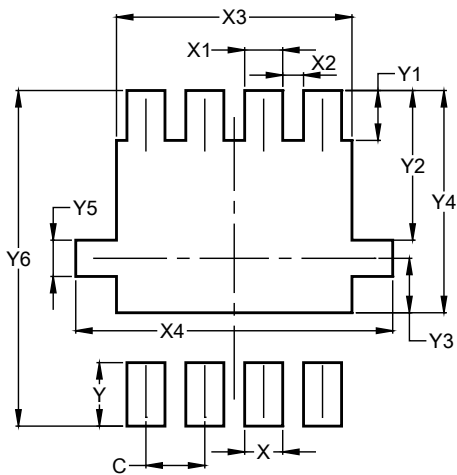


| PowerDI3333-8 (SWP)<br>(Type UX) |      |      |      |
|----------------------------------|------|------|------|
| Dim                              | Min  | Max  | Typ  |
| A                                | 0.75 | 0.85 | 0.80 |
| A1                               | 0.00 | 0.05 | —    |
| b                                | 0.25 | 0.40 | 0.32 |
| c                                | 0.10 | 0.25 | 0.15 |
| D                                | 3.20 | 3.40 | 3.30 |
| D1                               | 2.95 | 3.15 | 3.05 |
| D2                               | 2.30 | 2.70 | 2.50 |
| E                                | 3.20 | 3.40 | 3.30 |
| E1                               | 2.95 | 3.15 | 3.05 |
| E2                               | 1.60 | 2.00 | 1.80 |
| E3                               | 0.95 | 1.35 | 1.15 |
| E4                               | 0.10 | 0.30 | 0.20 |
| e                                | —    | —    | 0.65 |
| k                                | 0.50 | 0.90 | 0.70 |
| L                                | 0.30 | 0.50 | 0.40 |
| θ                                | 0°   | 12°  | 10°  |
| <b>All Dimensions in mm</b>      |      |      |      |

**Suggested Pad Layout**

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

**PowerDI3333-8 (SWP) (Type UX)**



| Dimensions | Value (in mm) |
|------------|---------------|
| C          | 0.650         |
| X          | 0.420         |
| X1         | 0.420         |
| X2         | 0.230         |
| X3         | 2.600         |
| X4         | 3.500         |
| Y          | 0.700         |
| Y1         | 0.550         |
| Y2         | 1.650         |
| Y3         | 0.600         |
| Y4         | 2.450         |
| Y5         | 0.400         |
| Y6         | 3.700         |

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