

## 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**
- **PPAP Capable (Note 4)**

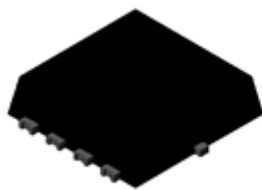
## Mechanical Data

- 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 (E3)
- Weight: 0.03 grams (Approximate)

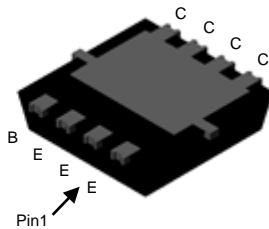
## Applications

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

PowerDI3333-8 (SWP) (Type UX)

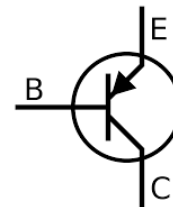


Top View



Bottom View

Equivalent Circuit



Device Symbol

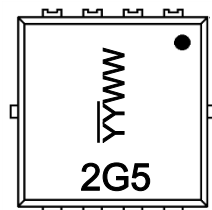
## Ordering Information (Note 5)

Part Number	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
DXTP07040CFGQ-7	Automotive	2G5	7	12	2000

- 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> 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. Automotive products are AEC-Q101 qualified and are PPAP capable. Refer to <https://www.diodes.com/quality/>.
  5. 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>CBO</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.)

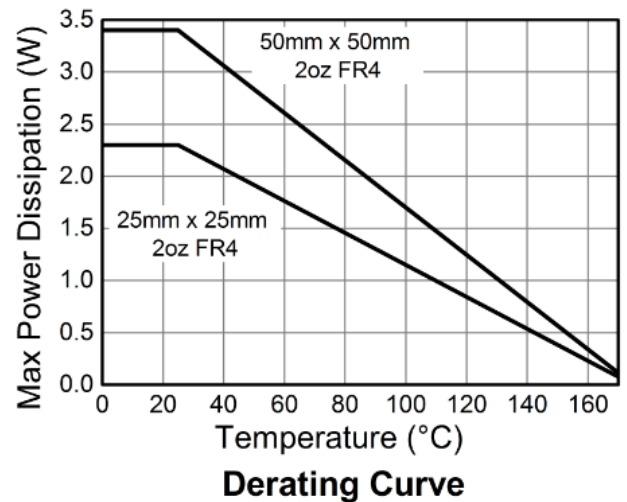
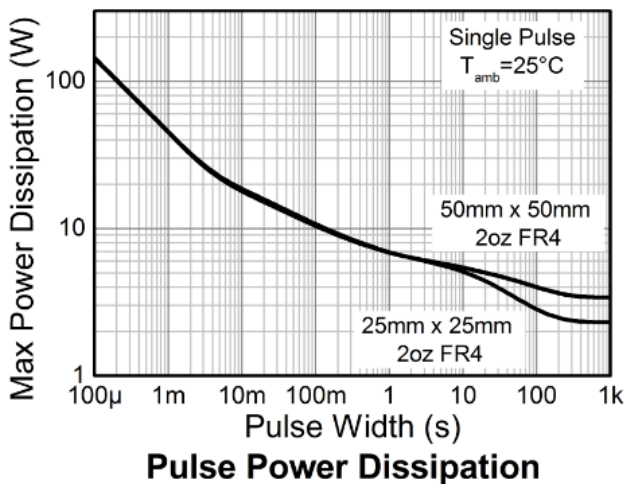
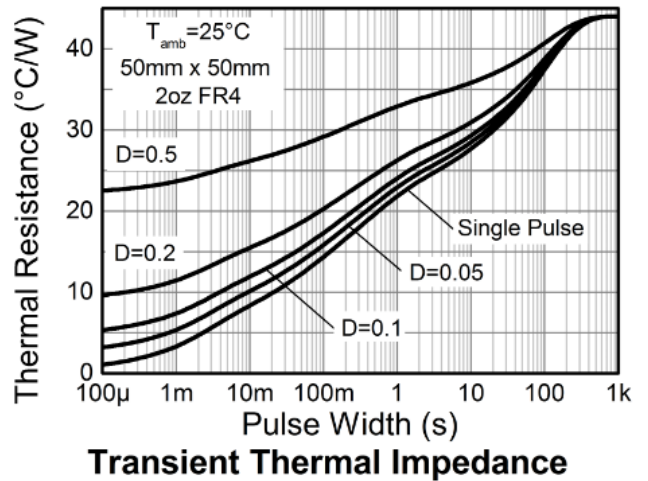
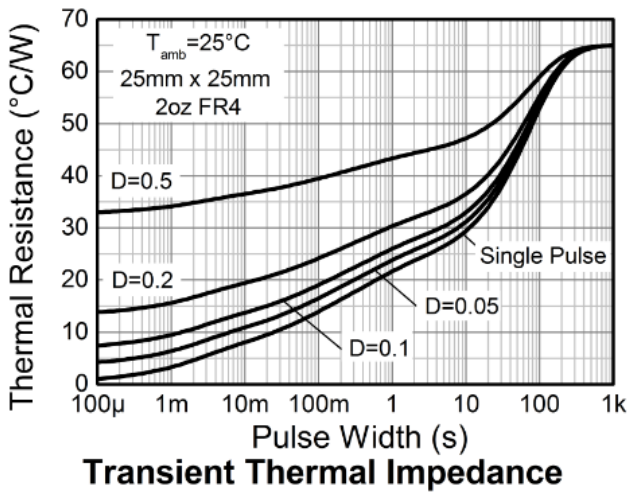
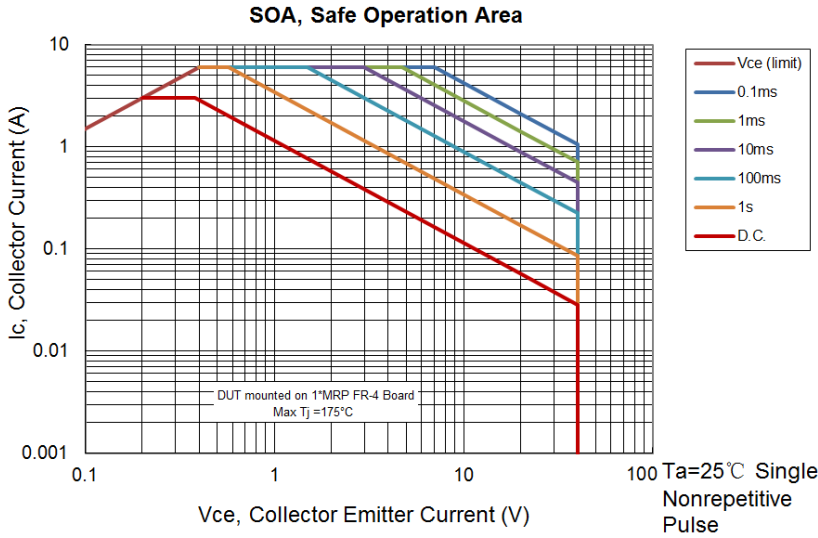
Characteristic	Symbol	Value	Unit	
Power Dissipation	P <sub>D</sub>	(Note 6)	0.9	W
		(Note 7)	2.1	W
		(Note 8)	3.1	W
Thermal Resistance, Junction to Ambient	R <sub>θJA</sub>	(Note 6)	140	°C/W
		(Note 7)	65	°C/W
		(Note 8)	44	°C/W
Thermal Resistance, Junction to Leads (Note 9)	R <sub>θJL</sub>	8.5	°C/W	
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +175	°C	

**ESD Ratings** (Note 10)

Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge—Human Body Model	ESD HBM	4000	V	3A
Electrostatic Discharge—Machine Model	ESD MM	400	V	C

- Notes:
6. 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.
  7. Same as Note 5, except the device is mounted on 25mm × 25mm 2oz copper.
  8. Same as Note 5, except the device is mounted on 50mm × 50mm 2oz copper.
  9. Thermal resistance from junction to solder-point (at the collector tab).
  10. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

**Thermal Characteristics and Derating Information**

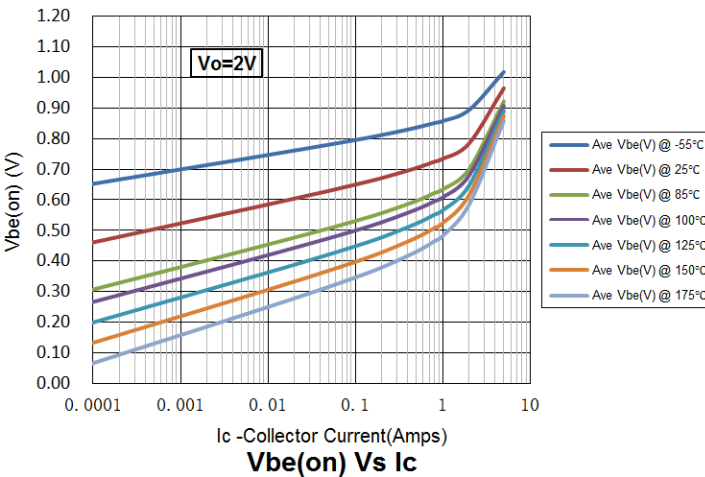
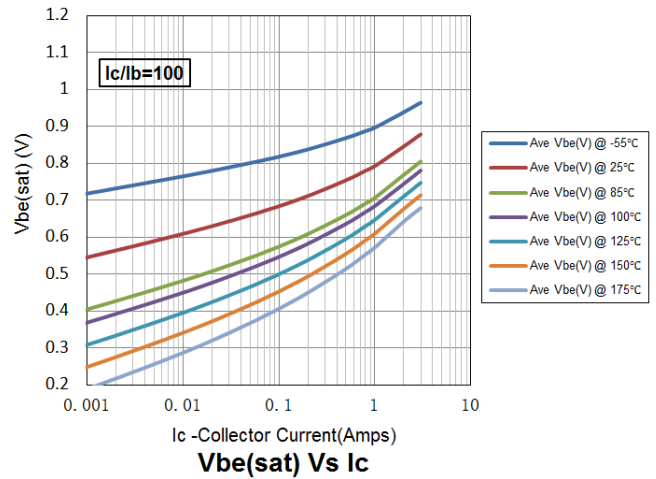
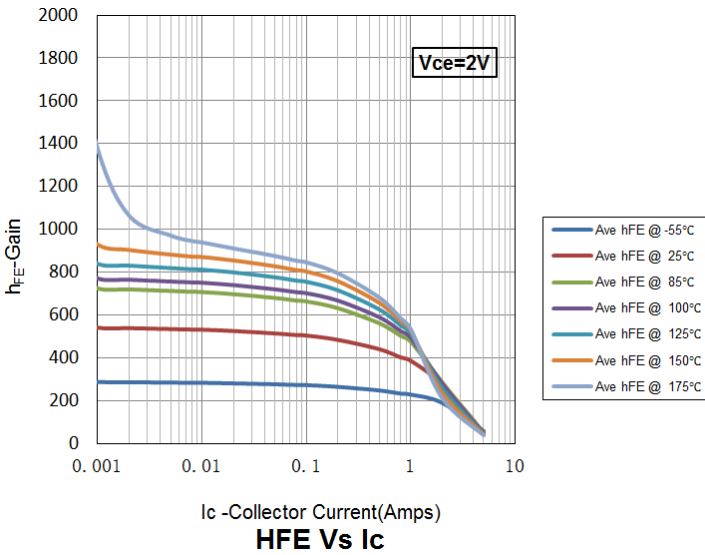
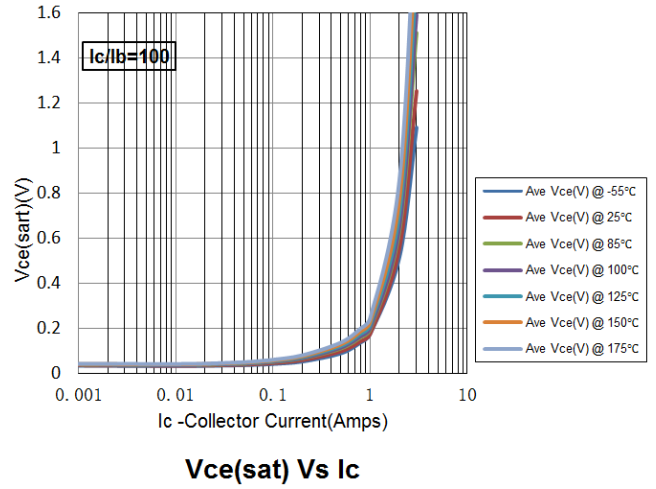
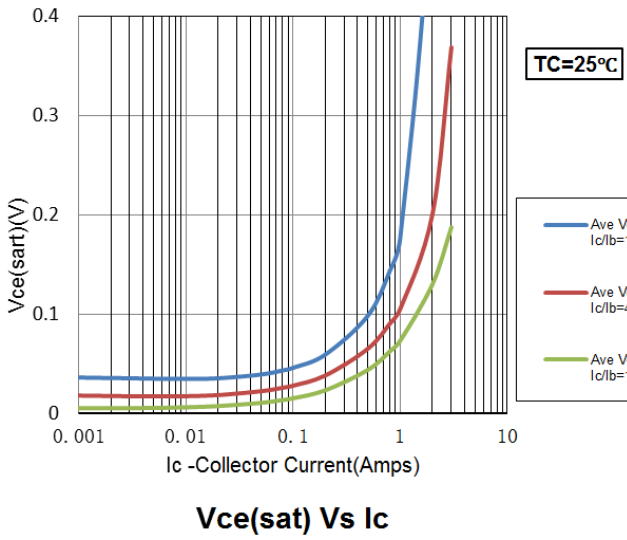


**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

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 11)	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 11)	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 11)	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 11)	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 11)	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: 11. Measured under pulsed conditions. Pulse width ≤ 300 μs. Duty cycle ≤ 2%.

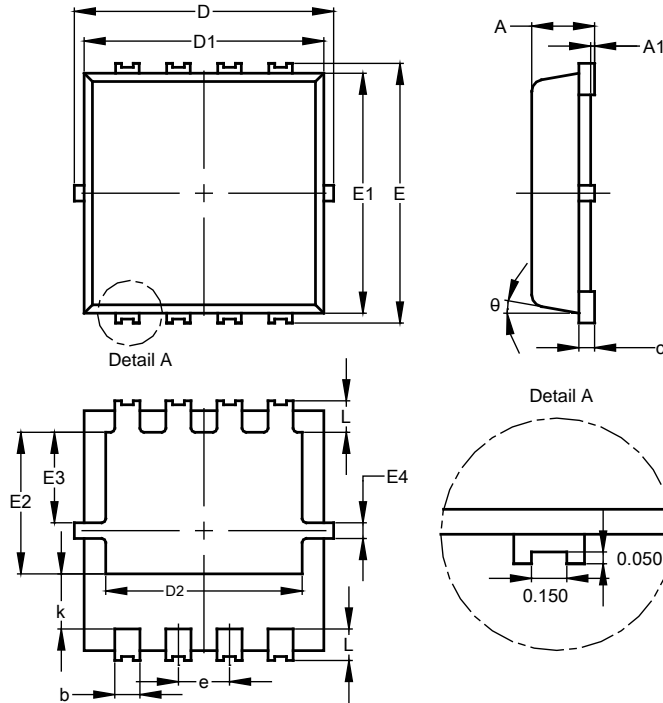
**Typical Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)



**Package Outline Dimensions**

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

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

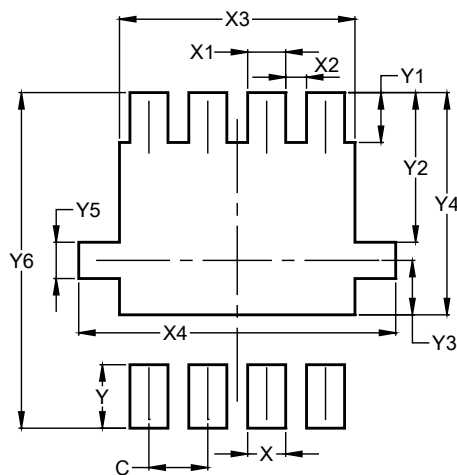


PowerDI3333-8 (SWP) (Type UX)			
Dim	Min	Max	Typ
A	0.75	0.85	0.80
A1	0.00	0.05	—
b	0.25	0.40	0.32
c	0.10	0.25	0.15
D	3.20	3.40	3.30
D1	2.95	3.15	3.05
D2	2.30	2.70	2.50
E	3.20	3.40	3.30
E1	2.95	3.15	3.05
E2	1.60	2.00	1.80
E3	0.95	1.35	1.15
E4	0.10	0.30	0.20
e	—	—	0.65
k	0.50	0.90	0.70
L	0.30	0.50	0.40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

**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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