

## Features

- $BV_{CEO} > 60V$
- Small Form Factor Thermally Efficient Package. Enables Higher Density End Products
- $I_C = 6A$  Continuous Collector Current
- $I_{CM} = 20A$  Peak Pulse Current
- Low Saturation Voltage  $V_{CE(sat)} < 60mV @ 1A$
- $h_{FE}$  Specified up to 10A for a High Gain Hold up
- Complementary PNP Type: DXTP03060BFG
- Wettable Flank for Improved Optical Inspection
- **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 [contact us](mailto:contact@diodes.com) or your local Diodes representative. <https://www.diodes.com/quality/product-definitions/>**

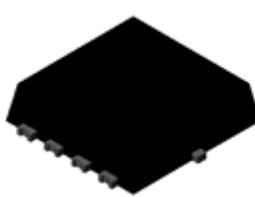
## Mechanical Data

- Case: PowerDI<sup>®</sup>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 <sup>(3)</sup>
- Weight: 0.03 grams (Approximate)

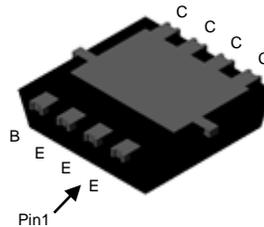
## Applications

- MOSFET & IGBT Gate Drivers
- Solenoid, Relay And Actuator Drivers
- DC to DC Converters
- Motor Control

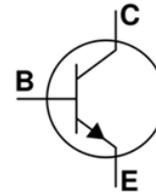
PowerDI3333-8 (SWP) (Type UX)



Top View



Bottom View



Device Symbol

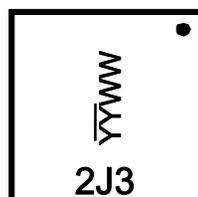
## Ordering Information (Note 4)

Part Number	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity Per Reel
DXTN03060BFG-7	Standard	2J3	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 <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

## Marking Information

PowerDI3333-8 (SWP) (Type UX)



2J3= Product Type Marking Code  
 YYWW = Date Code Marking  
 YY = Last Two Digits of Year (ex: 21 = 2021)  
 WW = Week Code (01 to 53)

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CBO</sub>	100	V
Collector-Emitter Voltage	V <sub>CEO</sub>	60	V
Emitter-Base Voltage	V <sub>EBO</sub>	7	V
Continuous Collector Current	I <sub>C</sub>	6	A
Peak Pulse Current	I <sub>CM</sub>	20	A

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

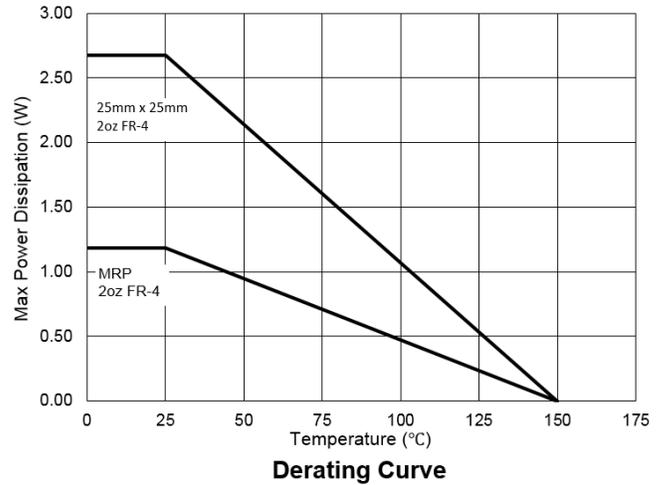
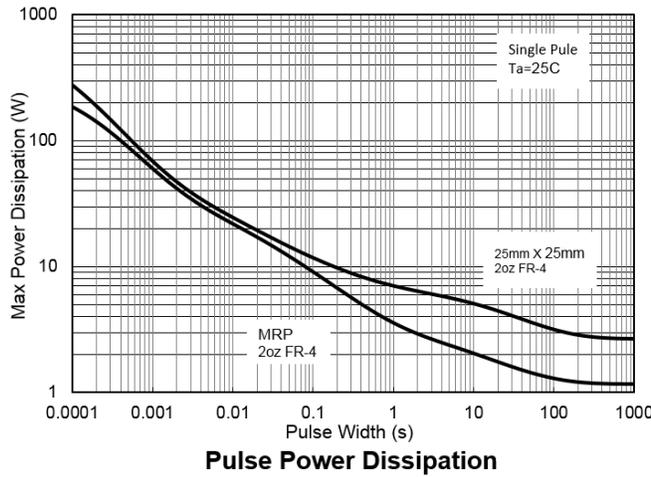
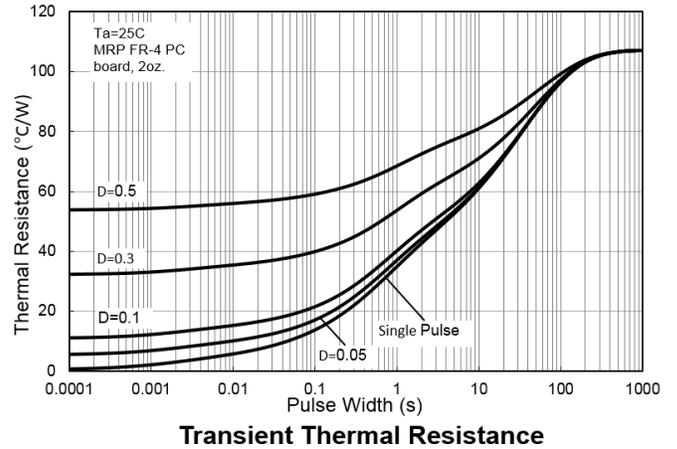
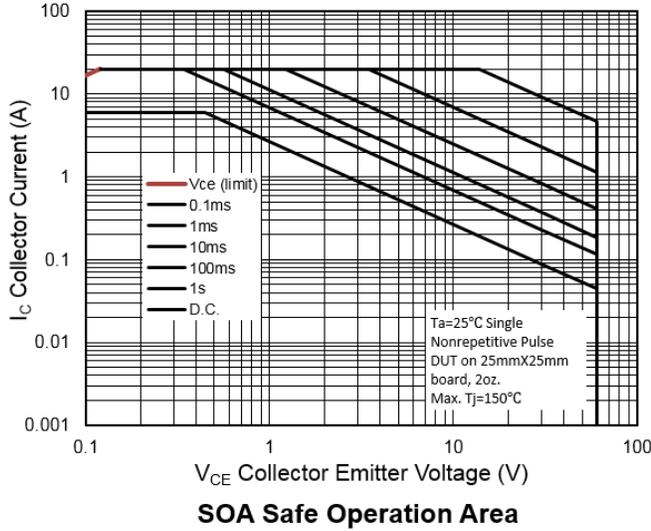
Characteristic	Symbol	Value	Unit
Power Dissipation	P <sub>D</sub>	(Note 5) 1.2	W
		(Note 6) 2.7	W
Thermal Resistance, Junction to Ambient	R <sub>θJA</sub>	(Note 5) 107	°C/W
		(Note 6) 48	°C/W
Thermal Resistance, Junction to Leads (Note 7)	R <sub>θJL</sub>	8.5	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

**ESD Ratings** (Note 8)

Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Charge Device Model	CDM	1,000	V	C5

- 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 x 25mm 2oz copper.
  7. Thermal resistance from junction to solder-point (at the collector tab).
  8. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

**Thermal Characteristics and Derating Information**

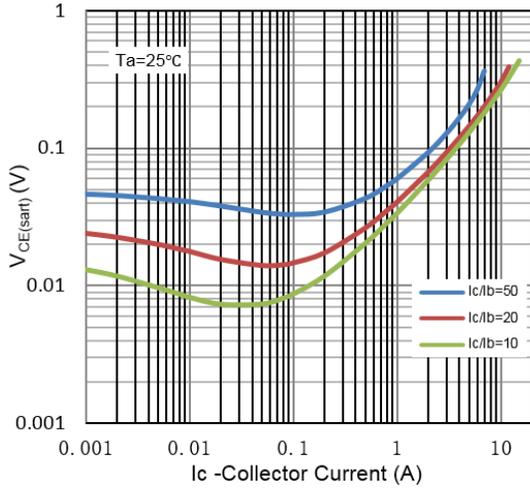


**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

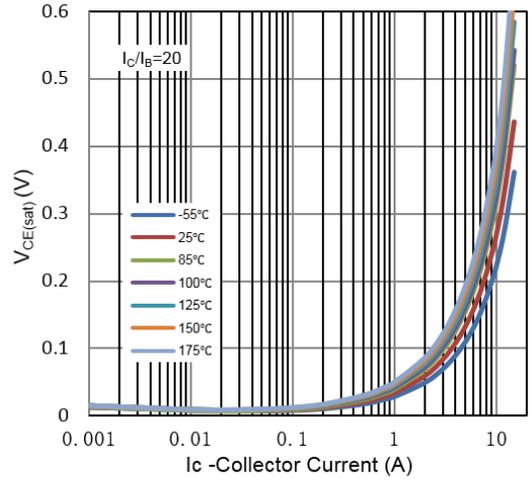
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV <sub>CBO</sub>	100	198	—	V	I <sub>C</sub> = 100μA
Collector-Emitter Breakdown Voltage (Note 9)	BV <sub>CEO</sub>	60	79	—	V	I <sub>C</sub> = 10mA
Emitter-Base Breakdown Voltage	BV <sub>EBO</sub>	7	8.4	—	V	I <sub>E</sub> = 100μA
Collector Cut-off Current	I <sub>CBO</sub>	—	2	50	nA	V <sub>CB</sub> = 100V
		—	0.05	10	μA	V <sub>CB</sub> = 100V, T <sub>A</sub> = +125°C
Collector Cut-off Current	I <sub>CER</sub> R <sub>B</sub> ≤ 1kΩ	—	5	100	nA	V <sub>CB</sub> = 60V
		—	0.2	10	μA	V <sub>CB</sub> = 60V, T <sub>A</sub> = +125°C
Emitter Cut-off Current	I <sub>EBO</sub>	—	1	20	nA	V <sub>EB</sub> = 6V
DC Current Gain (Note 9)	h <sub>FE</sub>	100	197	—	—	I <sub>C</sub> = 10mA, V <sub>CE</sub> = 2V
		100	195	400	—	I <sub>C</sub> = 1A, V <sub>CE</sub> = 2V
		100	194	300	—	I <sub>C</sub> = 2A, V <sub>CE</sub> = 2V
		55	117	—	—	I <sub>C</sub> = 5A, V <sub>CE</sub> = 2V
		20	50	—	—	I <sub>C</sub> = 10A, V <sub>CE</sub> = 2V
Collector-Emitter Saturation Voltage (Note 9)	V <sub>CE(sat)</sub>	—	15	30	mV	I <sub>C</sub> = 100mA, I <sub>B</sub> = 5mA
		—	35	60	mV	I <sub>C</sub> = 1A, I <sub>B</sub> = 100mA
		—	42	70	mV	I <sub>C</sub> = 1A, I <sub>B</sub> = 50mA
		—	86	135	mV	I <sub>C</sub> = 2A, I <sub>B</sub> = 50mA
		—	176	260	mV	I <sub>C</sub> = 6A, I <sub>B</sub> = 300mA
Base-Emitter Saturation Voltage (Note 9)	V <sub>BE(sat)</sub>	—	986	1100	mV	I <sub>C</sub> = 6A, I <sub>B</sub> = 300mA
Base-Emitter Turn-On Voltage (Note 9)	V <sub>BE(on)</sub>	—	916	1000	mV	I <sub>C</sub> = 6A, V <sub>CE</sub> = 1V
Input Capacitance	C <sub>ibo</sub>	—	563	—	pF	V <sub>EB</sub> = 0.5V, f = 1MHz
Output Capacitance	C <sub>obo</sub>	—	26	—	pF	V <sub>CB</sub> = 10V, f = 1MHz
Current Gain-Bandwidth Product	f <sub>T</sub>	—	140	—	MHz	V <sub>CE</sub> = 5V, I <sub>C</sub> = 100mA, f = 100MHz
Switching Time	t <sub>delay</sub>	—	17.9	—	ns	I <sub>C</sub> = 1A, V <sub>CC</sub> = 10V, I <sub>B1</sub> = -I <sub>B2</sub> = 100mA
	t <sub>rise</sub>	—	6.1	—	ns	
	t <sub>storage</sub>	—	1256	—	ns	
	t <sub>fall</sub>	—	27.6	—	ns	

Note: 9. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

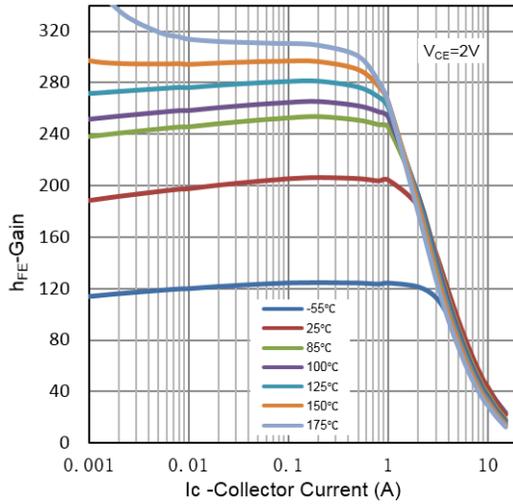
**Typical Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)



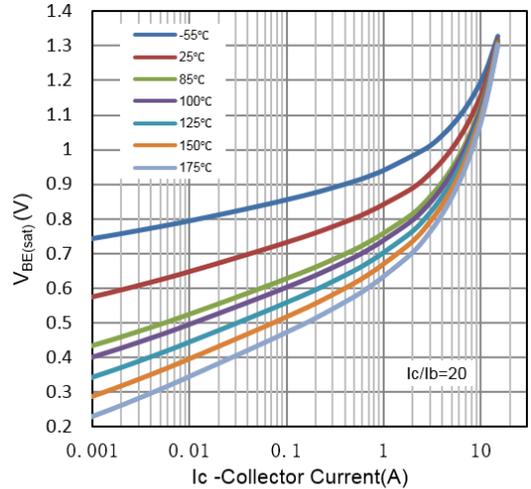
**$V_{CE(sat)}$  vs  $I_C$**



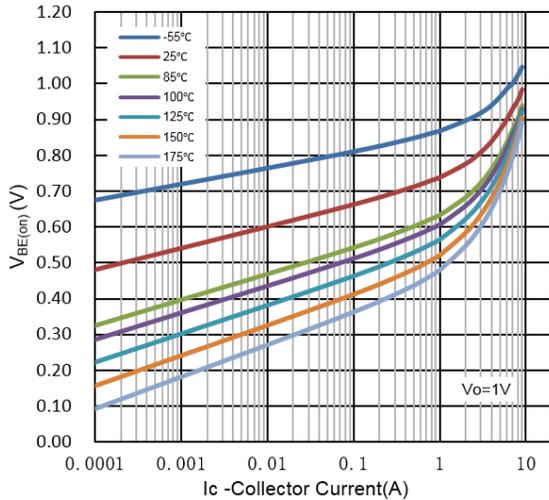
**$V_{CE(sat)}$  vs  $I_C$**



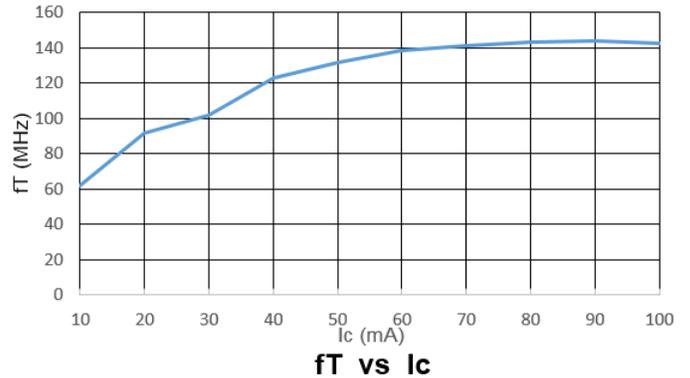
**$h_{FE}$  vs  $I_C$**



**$V_{BE(sat)}$  vs  $I_C$**



**$V_{BE(on)}$  vs  $I_C$**

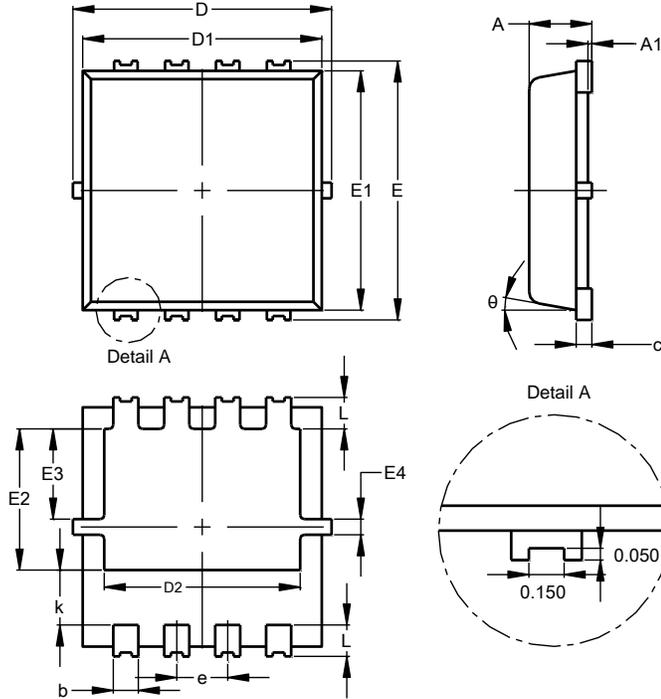


**$f_T$  vs  $I_C$**

## Package Outline Dimensions

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

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

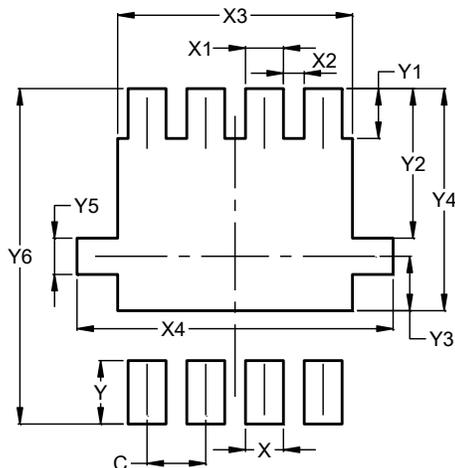


PowerDI3333-8 (SWP) (Type UX)			
Dim	Min	Max	Typ
A	0.75	0.85	0.80
A1	0.00	0.05	--
b	0.25	0.40	0.32
c	0.10	0.25	0.15
D	3.20	3.40	3.30
D1	2.95	3.15	3.05
D2	2.30	2.70	2.50
E	3.20	3.40	3.30
E1	2.95	3.15	3.05
E2	1.60	2.00	1.80
E3	0.95	1.35	1.15
E4	0.10	0.30	0.20
e	--	--	0.65
k	0.50	0.90	0.70
L	0.30	0.50	0.40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

## Suggested Pad Layout

Please see <https://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

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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