

Features

- $BV_{CEO} > -60V$
- Small Form Factor Thermally Efficient Package. Enables Higher Density End Products
- $I_C = -5.5A$ Continuous Collector Current
- $I_{CM} = -15A$ Peak Pulse Current
- Low Saturation Voltage $V_{CE(sat)} < 90mV @ -1A$
- h_{FE} Specified Up to -10A for a High Gain Hold Up
- Complementary NPN Type: DXTN03060CFG
- Rated to +175°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)**

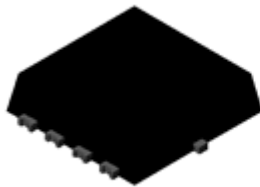
Mechanical Data

- 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 Plated Leads Solderable per MIL-STD-202, Method 208 (E3)
- Weight: 0.03 grams (Approximate)

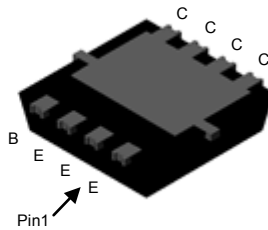
Applications

- Motor Driving
- Line Switching
- High Side Switches

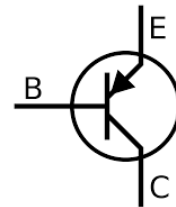
PowerDI3333-8 (SWP) (Type UX)



Top View



Bottom View



Device Symbol

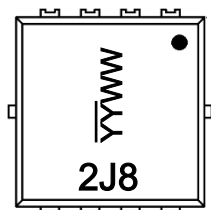
Ordering Information (Note 4)

Part Number	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
DXTP03060CFG-7	2J8	7	12	2000

- 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/products/packages.html>.

Marking Information

PowerDI3333-8 (SWP) (Type UX)



- 2J8= Product Type Marking Code
 YYWW = Date Code Marking
 YY = Last Two Digits of Year (ex: 19 = 2019)
 WW = Week Code (01 to 53)

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	-70	V
Collector-Emitter Voltage	V_{CEO}	-60	V
Emitter-Base Voltage	V_{EBO}	-7	V
Continuous Collector Current	I_C	-5.5	A
Peak Pulse Current	I_{CM}	-15	A

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

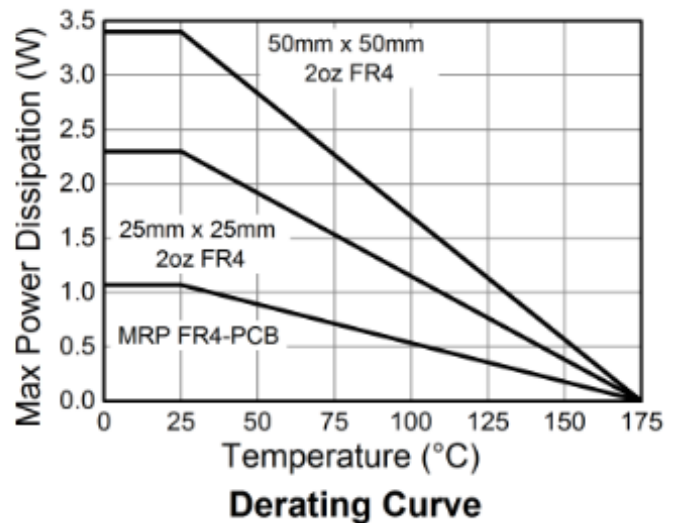
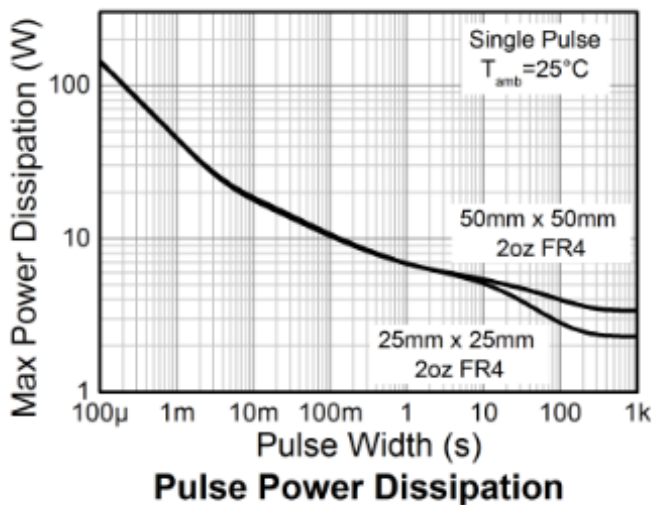
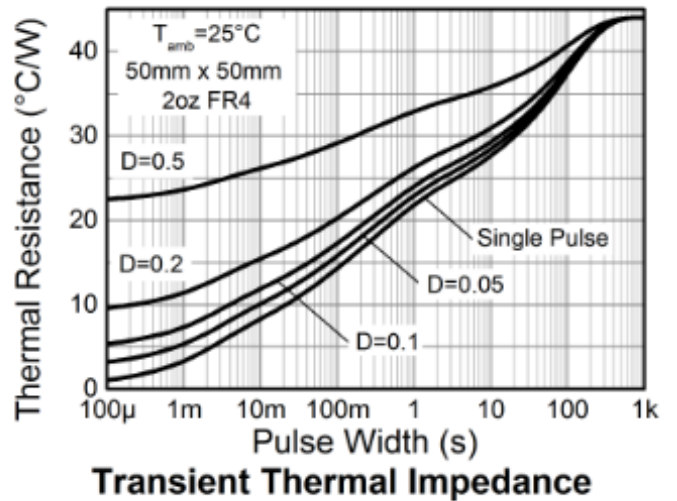
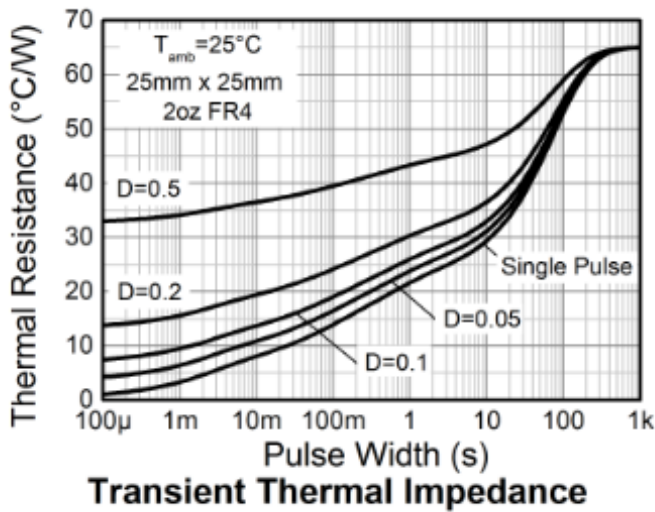
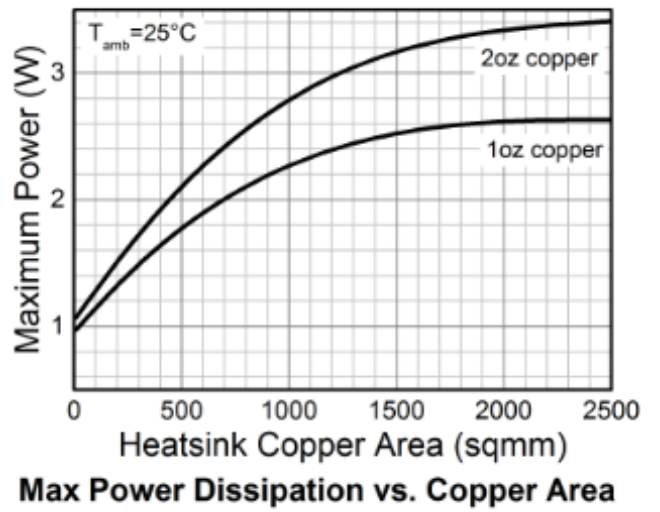
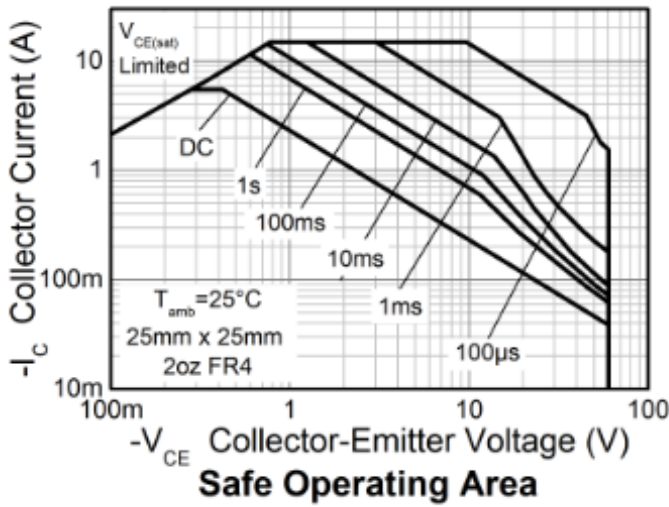
Characteristic	Symbol	Value	Unit
Power Dissipation	P_D	1.07	W
		2.3	W
		3.4	W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	140	$^\circ\text{C/W}$
		65	$^\circ\text{C/W}$
		44	$^\circ\text{C/W}$
Thermal Resistance, Junction to Leads (Note 8)	$R_{\theta JL}$	6	$^\circ\text{C/W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +175	$^\circ\text{C}$

ESD Ratings (Note 9)

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:
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 \times 25mm 2oz copper.
 7. Same as Note 5, except the device is mounted on 50mm \times 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

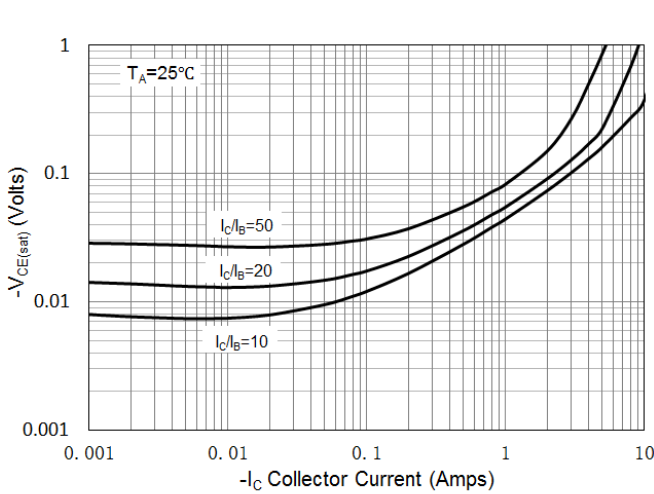


Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

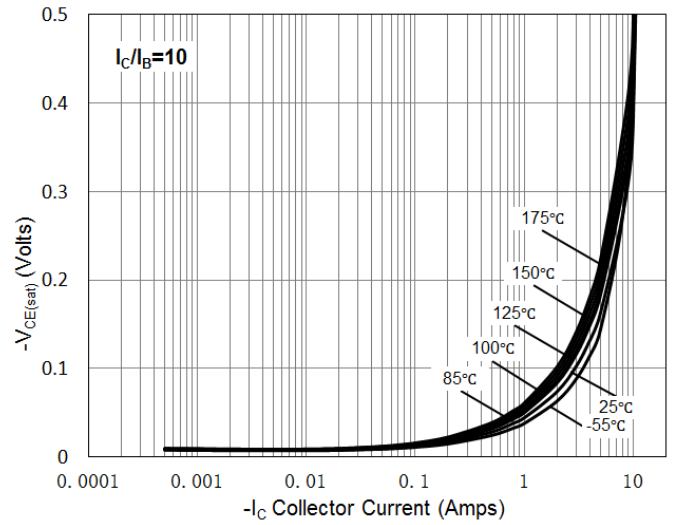
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	-70	-102	—	V	$I_C = -100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Note 10)	BV_{CEO}	-60	-79	—	V	$I_C = -10\text{mA}$
Emitter-Base Breakdown Voltage	BV_{EBO}	-7	-8.6	—	V	$I_E = -100\mu\text{A}$
Collector-Base Cutoff Current	I_{CBO}	—	-1	-50	nA	$V_{CB} = -70\text{V}$
		—	-0.06	-10	μA	$V_{CB} = -70\text{V}$, $T_A = +125^\circ\text{C}$
Collector-Emitter Cutoff Current	I_{CER} $R \leq 1\text{k}\Omega$	—	-1	-50	nA	$V_{CB} = -60\text{V}$
		—	-1	-10	μA	$V_{CB} = -60\text{V}$, $T_A = +125^\circ\text{C}$
Emitter Cutoff Current	I_{EBO}	—	-1	-20	nA	$V_{EB} = -6\text{V}$
Static Forward Current Transfer Ratio (Note 10)	h_{FE}	240	362	—	—	$I_C = -10\text{mA}$, $V_{CE} = -2\text{V}$
		200	308	800	—	$I_C = -1\text{A}$, $V_{CE} = -2\text{V}$
		180	271	—	—	$I_C = -2\text{A}$, $V_{CE} = -2\text{V}$
		45	130	—	—	$I_C = -5\text{A}$, $V_{CE} = -2\text{V}$
Collector-Emitter Saturation Voltage (Note 10)	$V_{CE(sat)}$	—	-12	-30	mV	$I_C = -100\text{mA}$, $I_B = -10\text{mA}$
		—	-44	-90	mV	$I_C = -1\text{A}$, $I_B = -100\text{mA}$
		—	-74	-150	mV	$I_C = -2\text{A}$, $I_B = -200\text{mA}$
		—	-161	-300	mV	$I_C = -5\text{A}$, $I_B = -500\text{mA}$
Base-Emitter Saturation Voltage (Note 10)	$V_{BE(sat)}$	—	-995	-1.1	V	$I_C = -5\text{A}$, $I_B = -500\text{mA}$
Base-Emitter Turn-On Voltage (Note 10)	$V_{BE(on)}$	—	-891	-1	V	$I_C = -5\text{A}$, $V_{CE} = -1\text{V}$
Output Capacitance	C_{obo}	—	48	—	pF	$V_{CB} = -10\text{V}$, $f = 1\text{MHz}$
Transition Frequency	f_T	—	120	—	MHz	$V_{CE} = -10\text{V}$, $I_C = -100\text{mA}$ $f = 50\text{MHz}$
Switching Characteristics	t_{delay}	—	5	—	ns	$V_{CC} = -10\text{V}$, $I_C = -1\text{A}$ $I_{B1} = -I_{B2} = -100\text{mA}$
	t_{rise}	—	300	—	ns	
	$t_{storage}$	—	1486	—	ns	
	t_{fall}	—	191	—	ns	

Note: 10. Measured under pulsed conditions. Pulse width $\leq 300\mu\text{s}$. Duty cycle $\leq 2\%$.

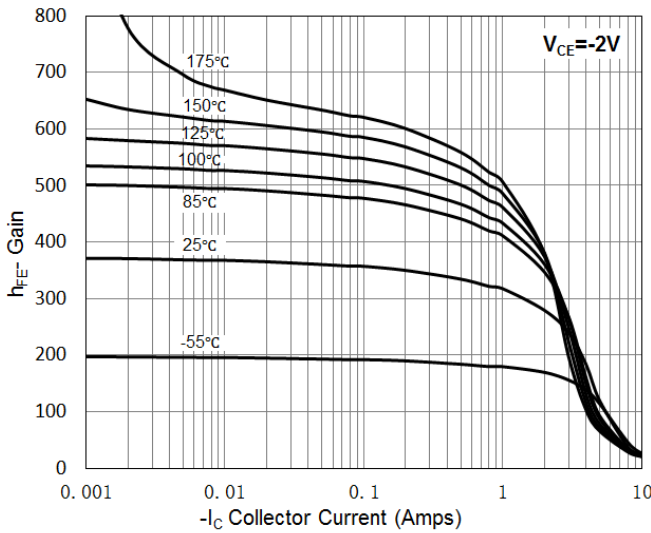
Typical Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)



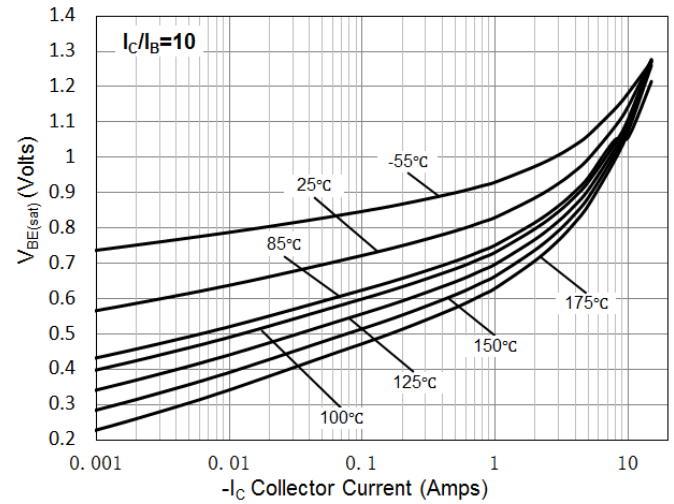
$V_{CE(sat)}$ vs I_C



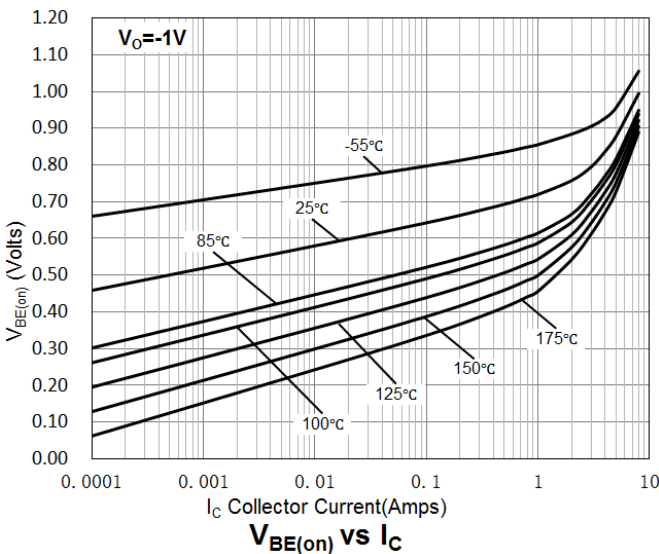
$V_{CE(sat)}$ vs I_C



h_{FE} vs I_C



$V_{BE(sat)}$ vs I_C

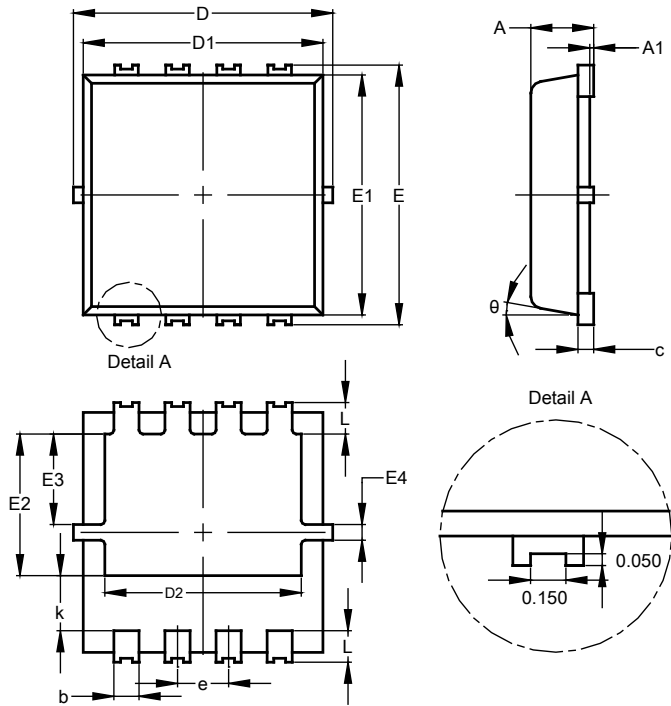


$V_{BE(on)}$ vs I_C

Package Outline Dimensions

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

PowerDI3333-8 (SWP) (Type UX)

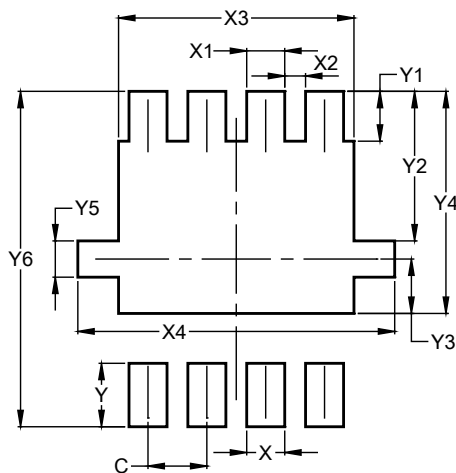


PowerDI3333-8 (SWP) (Type UX)			
Dim	Min	Max	Typ
A	0.75	0.85	0.80
A1	0.00	0.05	—
b	0.25	0.40	0.32
c	0.10	0.25	0.15
D	3.20	3.40	3.30
D1	2.95	3.15	3.05
D2	2.30	2.70	2.50
E	3.20	3.40	3.30
E1	2.95	3.15	3.05
E2	1.60	2.00	1.80
E3	0.95	1.35	1.15
E4	0.10	0.30	0.20
e	—	—	0.65
k	0.50	0.90	0.70
L	0.30	0.50	0.40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