80V PNP MEDIUM POWER TRANSISTOR IN PowerDI3333-8

Features

- BV_{CEO} > -80V
- Small Form Factor Thermally Efficient Package. Enables Higher Density End Products
- I_C = -1A Continuous Collector Current
- I_{CM} = -2A Peak Pulse Current
- Low Saturation Voltage $V_{CE(sat)}$ < -280mV @ -0.5A
- 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)**
- **The DXTP06080BFGQ is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.**
  https://www.diodes.com/quality/product-definitions/

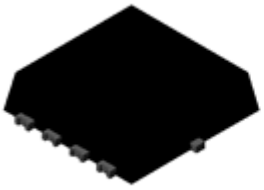
Mechanical Data

- 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)

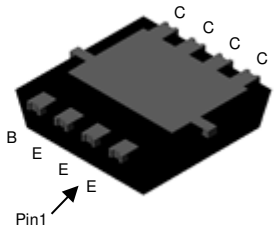
Applications

- Medium Power Switching
- Power Amplification
- AF Driver and Output Stages

PowerDI3333-8 (SWP) (Type UX)

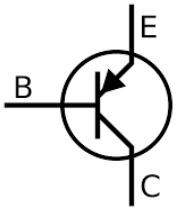


Top View



Bottom View

Equivalent Circuit



Device Symbol

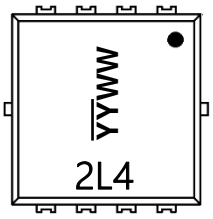
Ordering Information (Note 4)

Part Number	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
DXTP06080BFGQ-7	Automotive	2L4	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)



2L4= Product Type Marking Code
YYWW = Date Code Marking
YY = Last Two Digits of Year (ex: 21 = 2021)
WW = Week Code (01 to 53)

PowerDI is a registered trademark of Diodes Incorporated.

Absolute Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	-100	V
Collector-Emitter Voltage	V_{CEO}	-80	V
Emitter-Base Voltage	V_{EBO}	-7	V
Continuous Collector Current	I_C	-1	A
Peak Pulse Collector Current	I_{CM}	-2	A
Continuous Base Current	I_B	-100	mA
Peak Pulse Base Current	I_{BM}	-200	mA

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

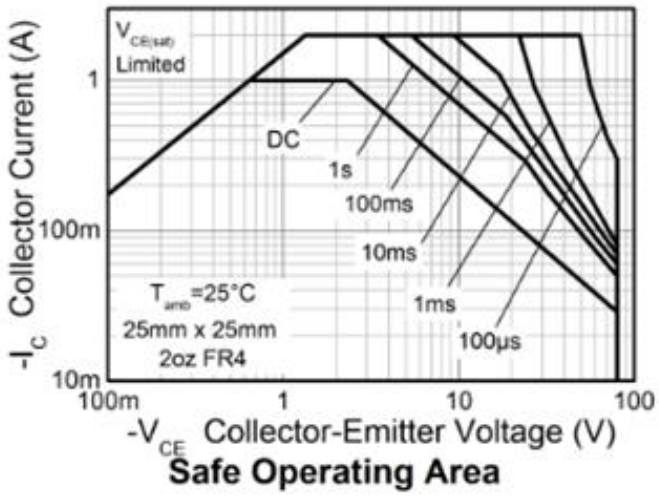
Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 5)	P_D	1.07	W
	(Note 6)		2.3	W
	(Note 7)		3.4	W
Thermal Resistance, Junction to Ambient	(Note 5)	$R_{\theta JA}$	140	°C/W
	(Note 6)		65	°C/W
	(Note 7)		44	°C/W
Thermal Resistance, Junction to Leads (Note 8)		$R_{\theta JL}$	11.3	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +175	°C

ESD Ratings (Note 9)

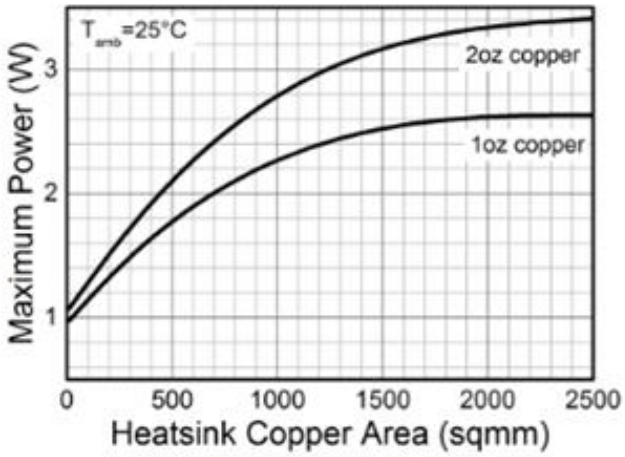
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

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

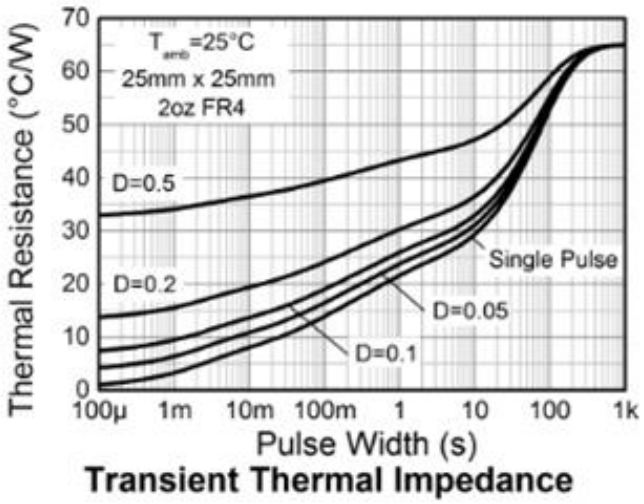
Thermal Characteristics and Derating Information



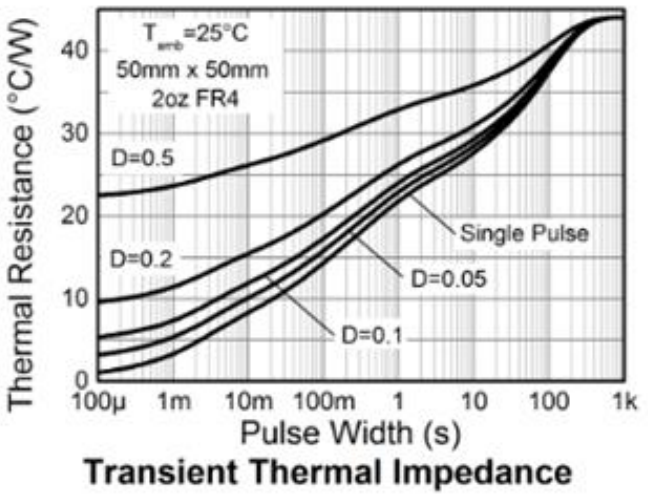
Safe Operating Area



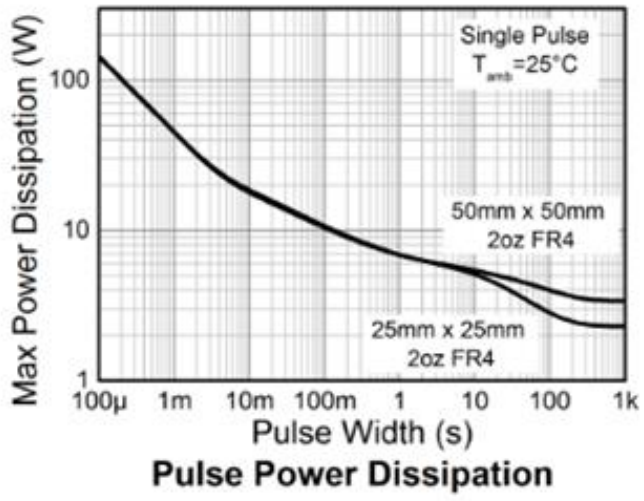
Pd vs Cu Area



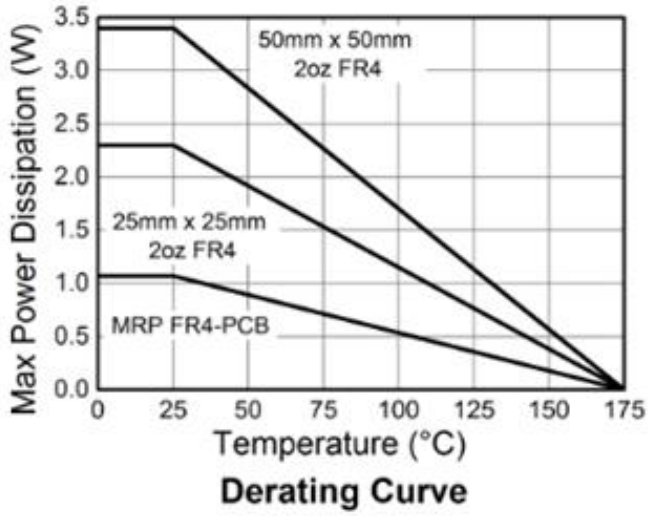
Transient Thermal Impedance



Transient Thermal Impedance



Pulse Power Dissipation



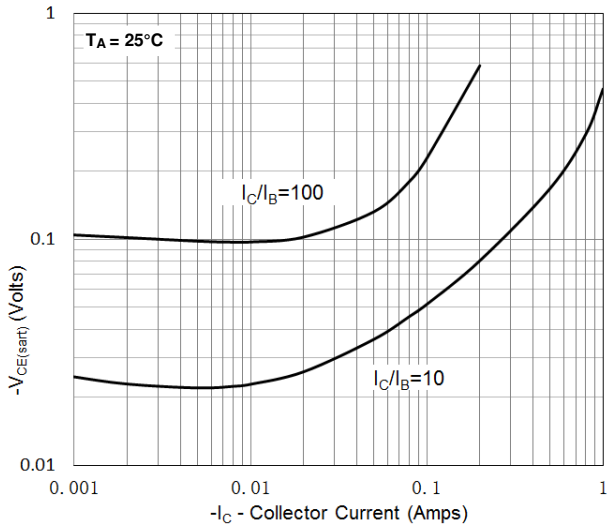
Derating Curve

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

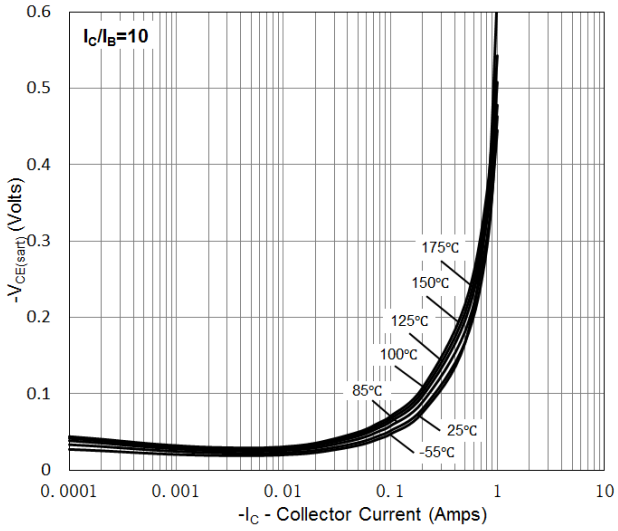
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	-100	-183	—	V	I_C = -100µA
Collector-Emitter Breakdown Voltage (Note 10)	BV_{CEO}	-80	-132	—	V	I_C = -10mA
Emitter-Base Breakdown Voltage	BV_{EBO}	-7	-8.4	—	V	I_E = -100µA
Collector-Base Cut-Off Current	I_{CBO}	— —	-1 -0.13	-50 -10	nA µA	V_{CB} = -100V V_{CB} = -80V, T_A = +150°C
Collector-Emitter Cut-Off Current	I_{CES}	—	-1	-20	nA	V_{CE} = -80V
Emitter Cut-Off Current	I_{EBO}	—	-1	-20	nA	V_{EB} = -6V
Static Forward Current Transfer Ratio (Note 10)	h_{FE}	50 100 40 —	167 152 76 26	— 250 — —	—	I_C = -5mA, V_{CE} = -2V I_C = -150mA, V_{CE} = -2V I_C = -500mA, V_{CE} = -2V I_C = -800mA, V_{CE} = -2V
Collector-Emitter Saturation Voltage (Note 10)	$V_{CE(sat)}$	— —	-181 -410	-280 —	mV mV	I_C = -500mA, I_B = -50mA I_C = -800mA, I_B = -70mA
Base-Emitter Turn-On Voltage (Note 10)	$V_{BE(on)}$	—	-0.804	-0.9	V	I_C = -500mA, V_{CE} = -2V
Transition Frequency	f_T	150	—	—	MHz	I_C = -50mA, V_{CE} = -10V f = 100MHz
Output Capacitance	C_{obo}	—	—	25	pF	V_{CB} = -10V, f = 1MHz
Switching Characteristics	t_{delay}	—	8.6	—	ns	V_{CC} = -10V, I_C = -500mA I_{B1} = -I_{B2} = -50mA
	t_{rise}	—	3.4	—	ns	
	$t_{storage}$	—	43	—	ns	
	t_{fall}	—	46	—	ns	

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

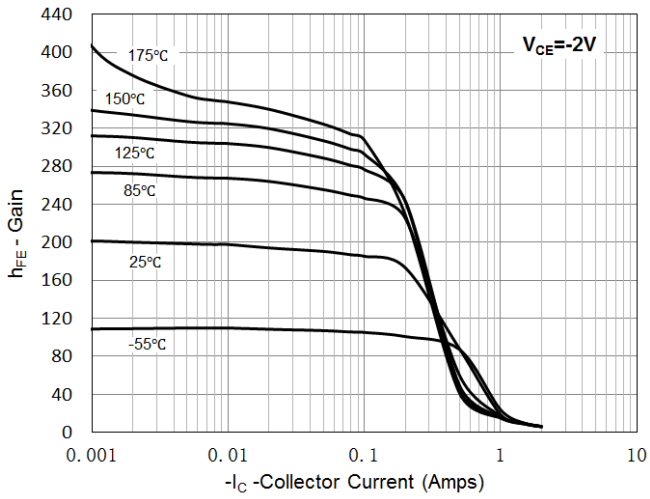
Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)



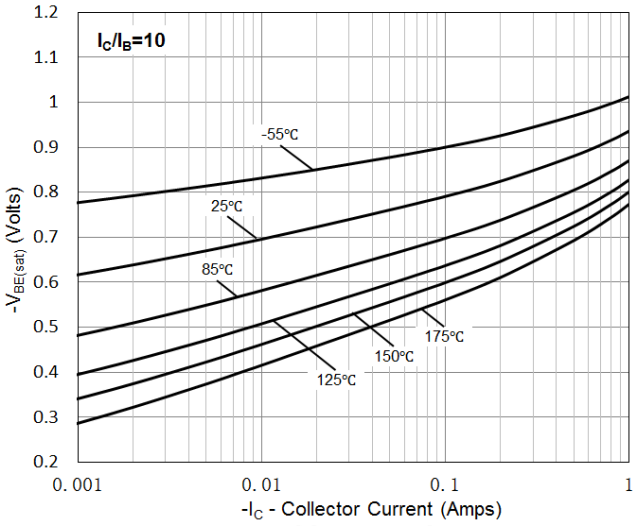
$V_{CE(sat)}$ vs I_C



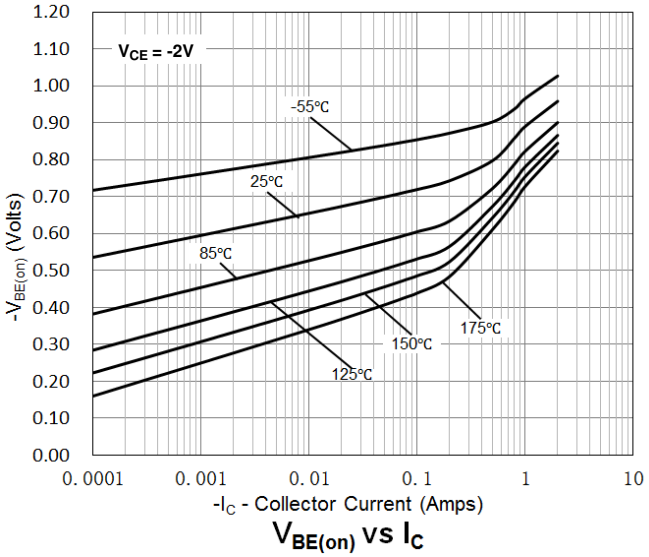
$V_{CE(sat)}$ vs I_C



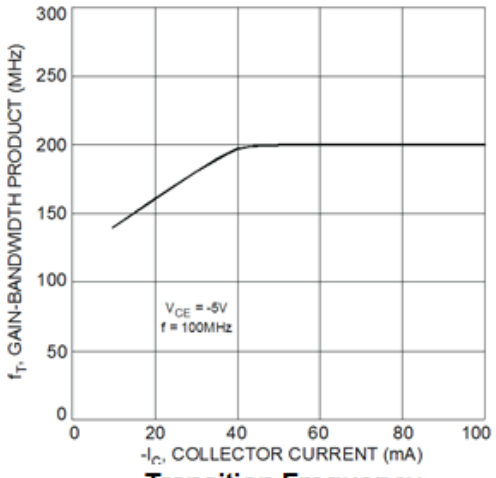
hFE vs I_C



$V_{BE(sat)}$ vs I_C



$V_{BE(on)}$ vs I_C

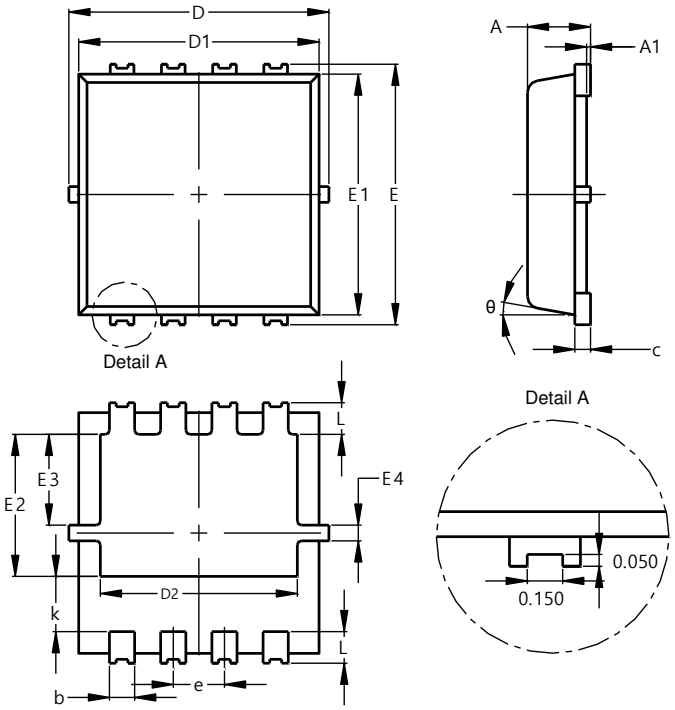


Transition Frequency

Package Outline Dimensions

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

PowerDI3333-8 (SWP) (Type UX)

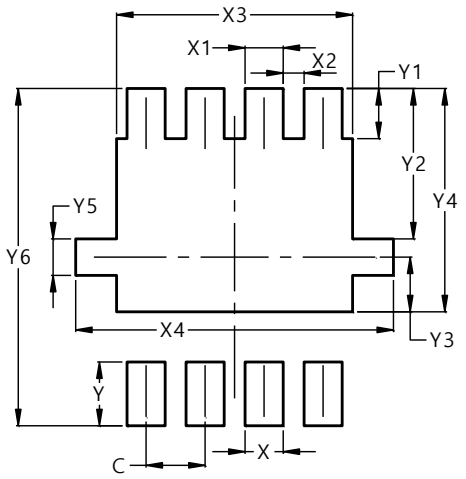


PowerDI3333-8 (SWP) (Type UX)			
Dim	**Min**	**Max**	**Typ**
A	0.75	0.85	0.80
A1	0.00	0.05	--
b	0.25	0.40	0.32
c	0.10	0.25	0.15
D	3.20	3.40	3.30
D1	2.95	3.15	3.05
D2	2.30	2.70	2.50
E	3.20	3.40	3.30
E1	2.95	3.15	3.05
E2	1.60	2.00	1.80
E3	0.95	1.35	1.15
E4	0.10	0.30	0.20
e	–	–	0.65
k	0.50	0.90	0.70
L	0.30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

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