

45V NPN MEDIUM POWER HIGH GAIN TRANSISTOR IN PowerDI3333-8
Features

- $BV_{CEO} > 45V$
- Small Form Factor Thermally Efficient Package. Enables Higher Density End Products
- $I_C = 3A$ High Continuous Current
- High Gain $h_{FE} > 400 @ 1A$
- Low Saturation Voltage $V_{CE(SAT)} < 300mV @ 1A$
- 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)**

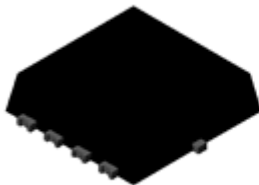
Mechanical Data

- 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 208③
- Weight: 0.03 grams (Approximate)

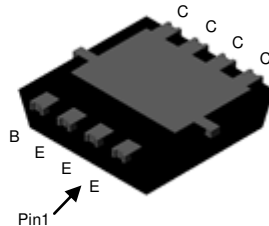
Applications

- Load Switch
- Linear Regulator
- MOSFET or IGBT Gate Driving

PowerDI3333-8 (SWP) (Type UX)

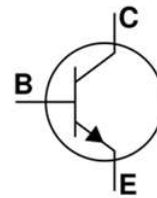


Top View



Bottom View

Equivalent Circuit



Device Symbol

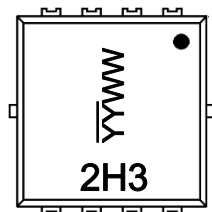
Ordering Information (Note 4)

Part Number	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
DXTN07045DFG-7	2H3	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/design/support/packaging/diodes-packaging/>.

Marking Information

PowerDI3333-8 (SWP) (Type UX)



2H3 = 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_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V _{CBO}	45	V
Collector-Emitter Voltage	V _{CEO}	45	V
Emitter-Base Voltage	V _{EBO}	7	V
Continuous Collector Current	I _C	3	A
Peak Pulse Current	I _{CM}	6	A

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

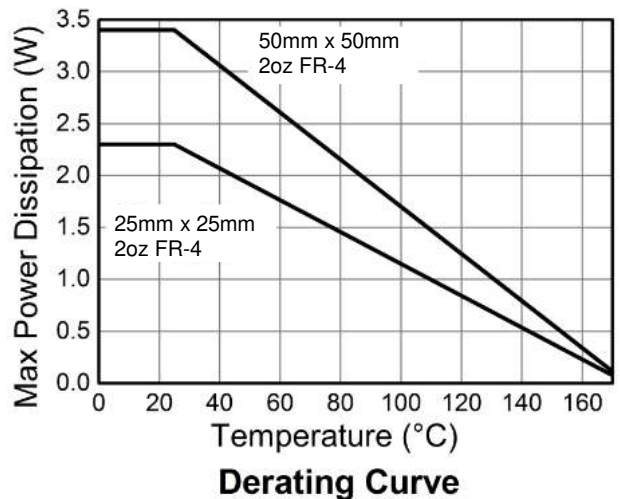
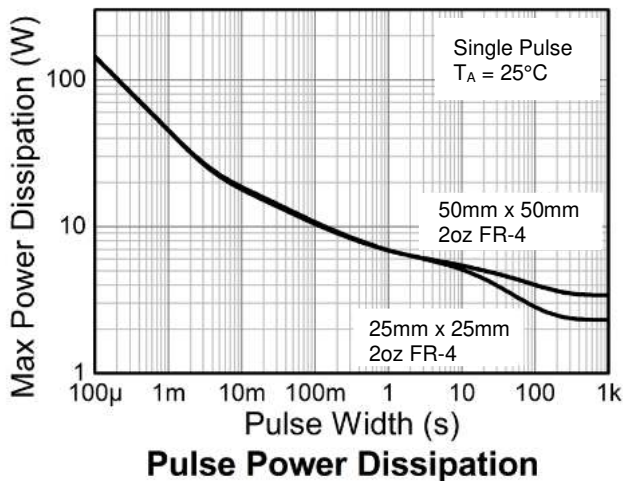
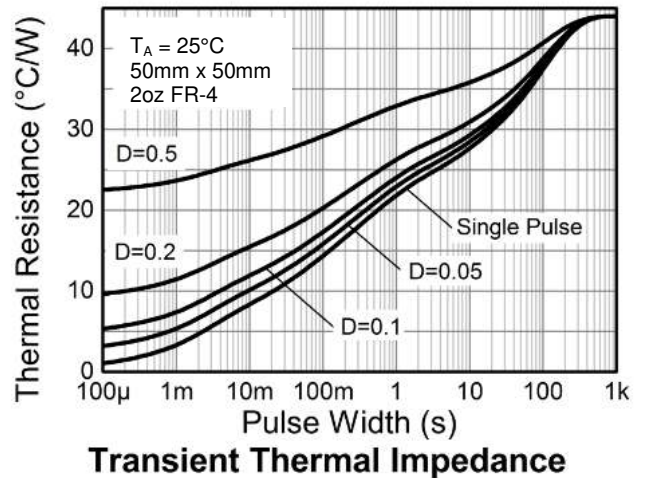
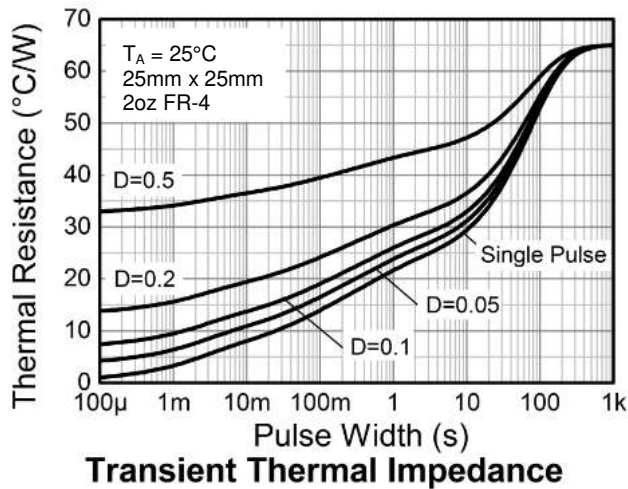
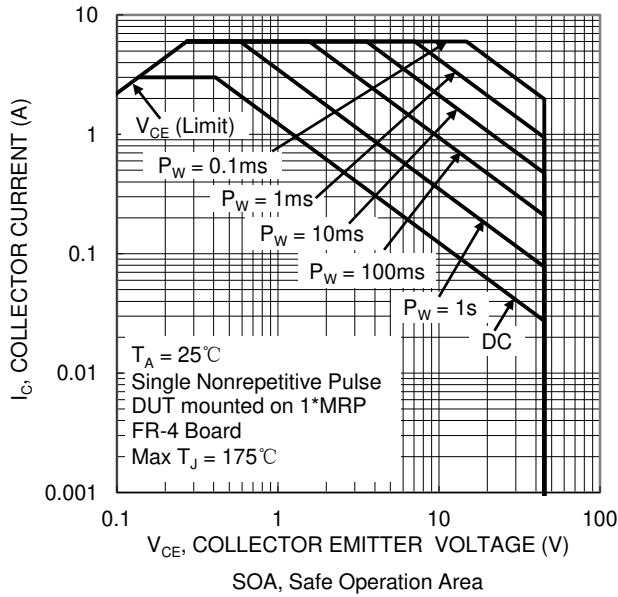
Characteristic	Symbol	Value	Unit	
Power Dissipation	P _D	(Note 5)	0.9	W
		(Note 6)	2.1	W
		(Note 7)	3.1	W
Thermal Resistance, Junction to Ambient	R _{θJA}	(Note 5)	140	°C/W
		(Note 6)	65	°C/W
		(Note 7)	44	°C/W
Thermal Resistance, Junction to Leads (Note 8)	R _{θJL}	8.5	°C/W	
Operating and Storage Temperature 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	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 × 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

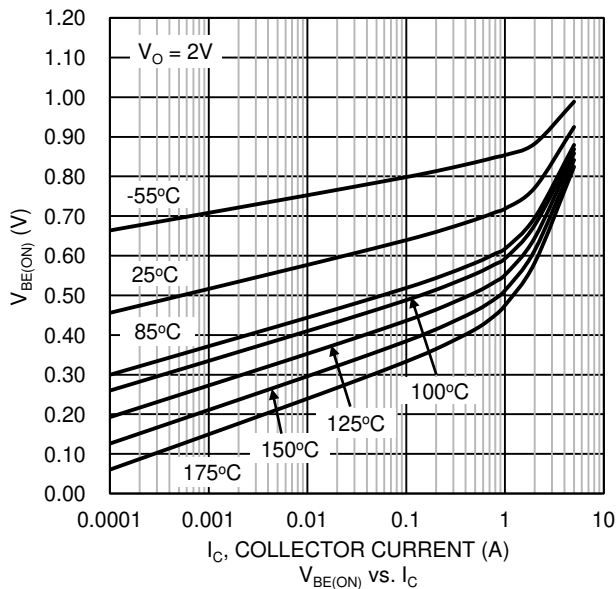
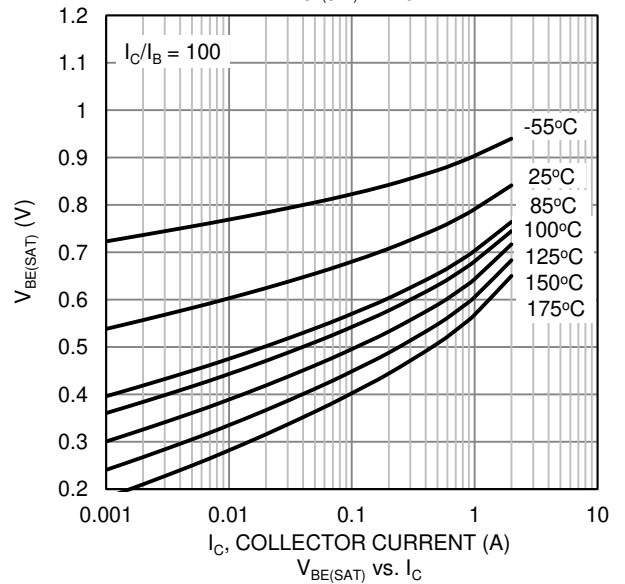
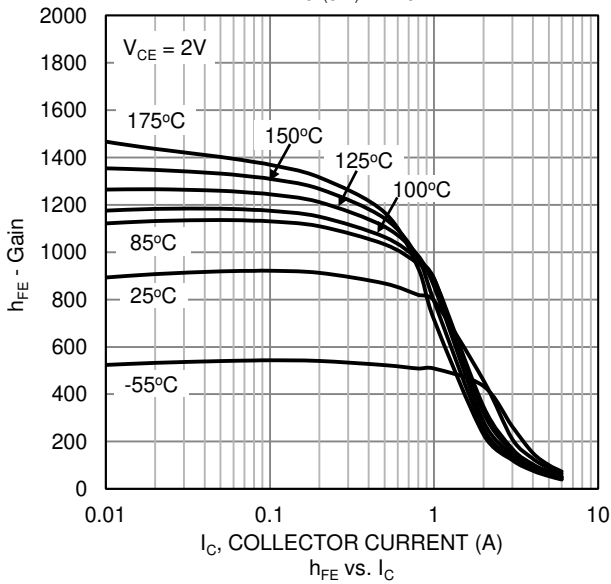
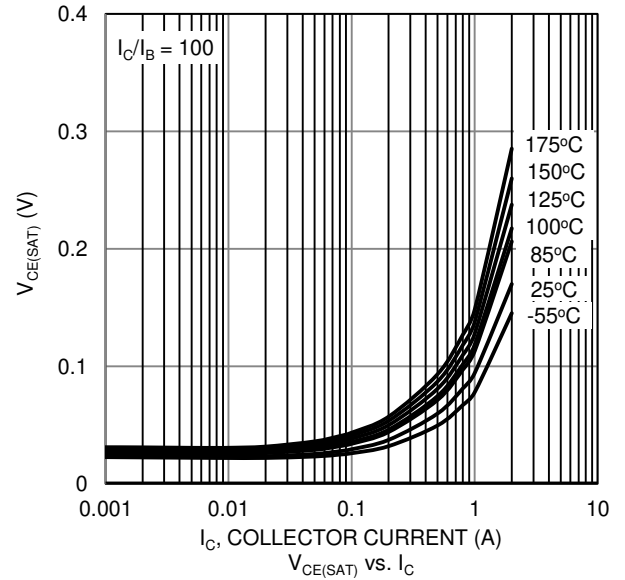
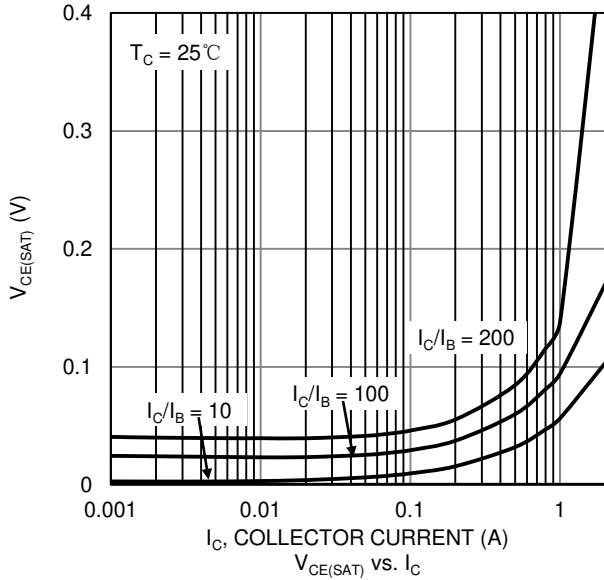


Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV _{CBO}	50	143	—	V	I _C = 100μA
Collector-Emitter Breakdown Voltage (Note 10)	BV _{CEO}	45	58	—	V	I _C = 10mA
Emitter-Base Breakdown Voltage	BV _{EBO}	7	8.3	—	V	I _E = 100μA
Collector-Base Cut-Off Current	I _{CBO}	—	—	20	nA	V _{CB} = 45V
		—	—	10	μA	V _{CB} = 45V, T _A = +125°C
Emitter Cut-Off Current	I _{EBO}	—	—	20	nA	V _{EB} = 6V
DC Current Gain (Note 10)	h _{FE}	500	—	—	—	I _C = 0.1A, V _{CE} = 2V
		400	780	—	—	I _C = 1A, V _{CE} = 2V
		150	470	—	—	I _C = 2A, V _{CE} = 2V
		50	223	—	—	I _C = 3A, V _{CE} = 2V
Collector-Emitter Saturation Voltage (Note 10)	V _{CE(SAT)}	—	46	100	mV	I _C = 0.1A, I _B = 0.5mA
		—	140	300	mV	I _C = 1A, I _B = 5mA
Base-Emitter Saturation Voltage (Note 10)	V _{BE(SAT)}	—	0.79	1	V	I _C = 1A, I _B = 10mA
Base-Emitter Turn-On Voltage (Note 10)	V _{BE(ON)}	—	0.73	0.9	V	I _C = 1A, V _{CE} = 2V
Input Capacitance	C _{I(B)}	—	200	—	pF	V _{EB} = 0.5V, f = 1MHz
Output Capacitance	C _{O(B)}	—	16	—	pF	V _{CB} = 10V, f = 1MHz
Current Gain-Bandwidth Product	f _T	150	—	—	MHz	V _{CE} = 5V, I _C = 50mA, f = 50MHz
Turn-On Time	t _{ON}	—	33	—	ns	V _{CC} = 10V, I _C = 500mA
Turn-Off Time	t _{OFF}	—	1,300	—	ns	I _{B1} = -I _{B2} = 50mA

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

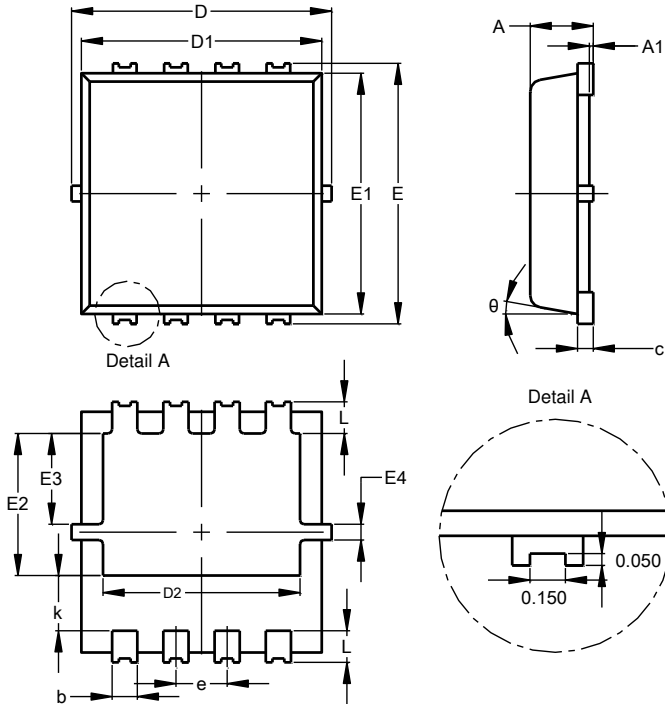
Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)



Package Outline Dimensions

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

PowerDI3333-8 (SWP) (Type UX)

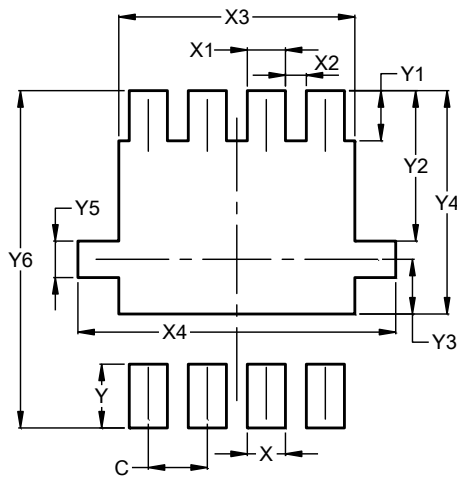


PowerDI3333-8 (SWP) (Type UX)			
Dim	Min	Max	Typ
A	0.75	0.85	0.80
A1	0.00	0.05	--
b	0.25	0.40	0.32
c	0.10	0.25	0.15
D	3.20	3.40	3.30
D1	2.95	3.15	3.05
D2	2.30	2.70	2.50
E	3.20	3.40	3.30
E1	2.95	3.15	3.05
E2	1.60	2.00	1.80
E3	0.95	1.35	1.15
E4	0.10	0.30	0.20
e	--	--	0.65
k	0.50	0.90	0.70
L	0.30	0.50	0.40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