

Features

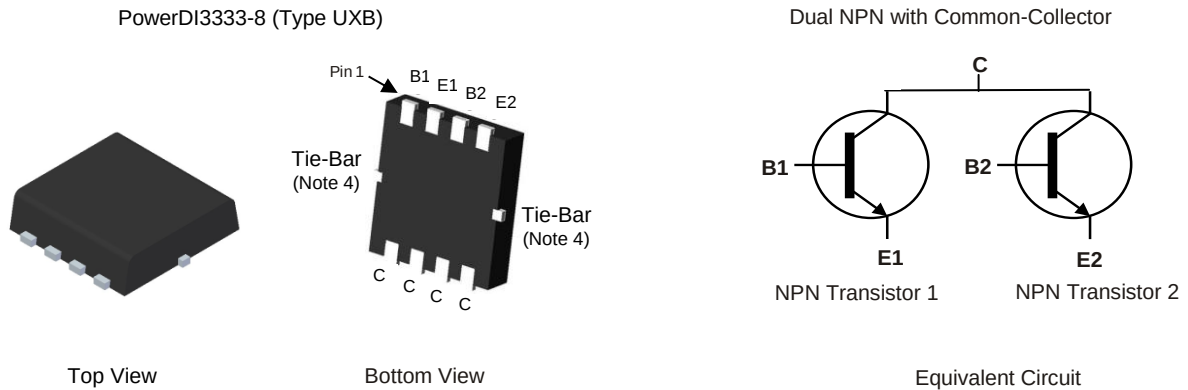
- Dual NPN with Common-Collector
- $BV_{CEO} > 400V$
- $I_C = 0.5A$ Continuous Collector Current
- Configurable as NPN Darlington Pair
- Low Saturation Voltage $V_{CE(SAT)} < 175mV @ 500mA$
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

Mechanical Data

- Case: PowerDI[®] 3333-8
- Case Material: Molded Plastic, "Green" Molding Compound.
UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish — Matte Tin Plated Leads. Solderable per
MIL-STD-202, Method 208 
- Weight: 0.072 grams (Approximate)

Applications

- Power Management
- High Voltage Start-Up Switch
- DC-DC Converters

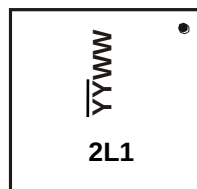


Ordering Information (Note 5)

Part Number	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
ZXTN08400BNS-7	Standard	2L1	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. Tie-bars are internally connected to the Common-Collector. They do not need to be externally connected.
 5. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information



2L1 = Product Type Marking Code
 YYWW = Date Code Marking
 YY = Last Two Digits of Year (ex: 19 for 2019)
 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}	450	V
Collector-Emitter Voltage (Forward Blocking)	V _{CEX}	450	V
Collector-Emitter Voltage	V _{CEO}	400	V
Emitter-Collector Voltage (Reverse Blocking)	V _{ECO}	6	V
Emitter-Base Voltage	V _{EBO}	7	V
Continuous Collector Current	I _C	0.5	A
Peak Pulse Current	I _{CM}	1	A
Base Current	I _B	0.2	A

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

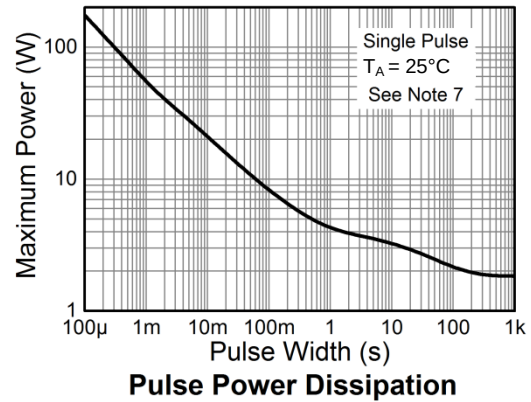
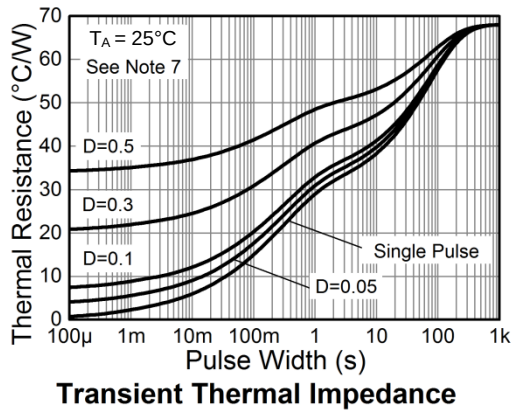
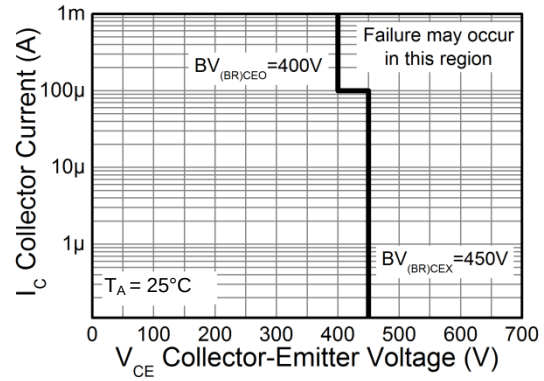
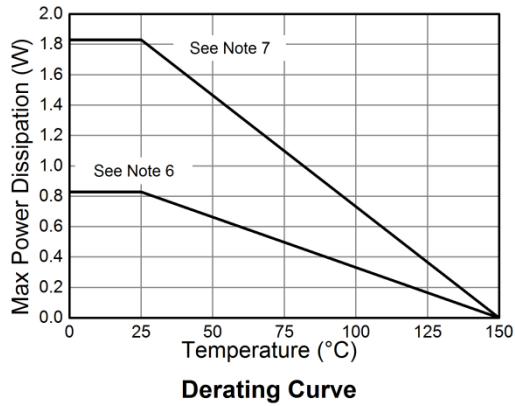
Characteristic	Symbol	Value	Units
Total Power Dissipation (Note 6)	P _D	0.83	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady State R _{θJA}	150	°C/W
Total Power Dissipation (Note 7)	P _D	1.83	W
Thermal Resistance, Junction to Ambient (Note 7)	Steady State R _{θJA}	68	°C/W
Thermal Resistance, Junction to Lead (Note 8)	R _{θJL}	19	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°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:
6. Device mounted on FR-4 PCB board, with minimum recommended pad layout, single sided.
 7. Device mounted on FR-4 substrate PCB board, 2oz copper, with thermal bias to bottom layer 1-inch square copper plate.
 8. Thermal resistance from junction to soldering point (on the collector pads).
 9. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

Thermal Characteristics and Derating Information

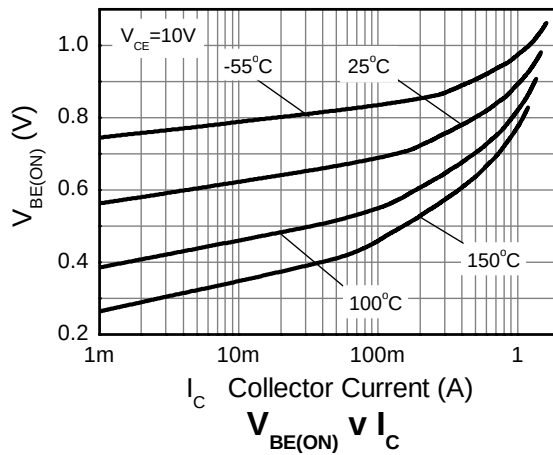
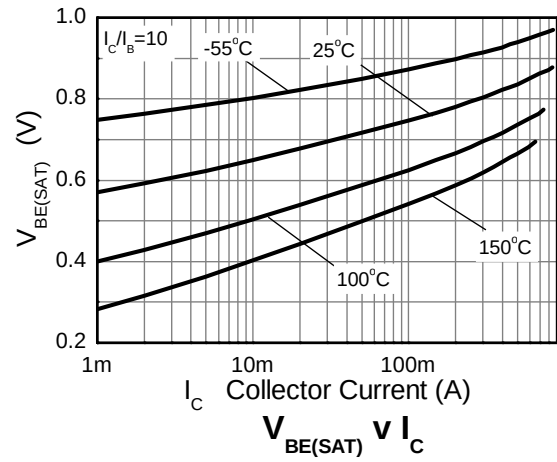
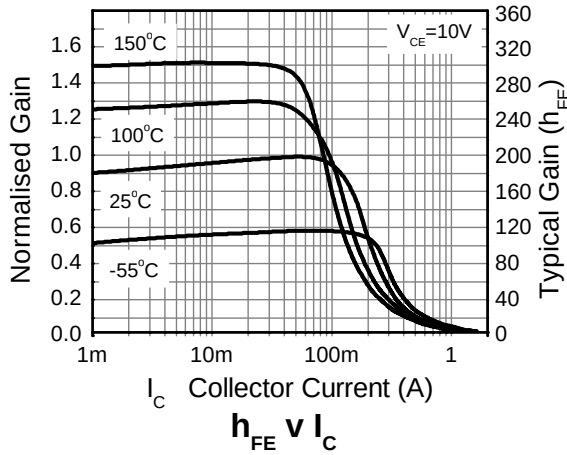
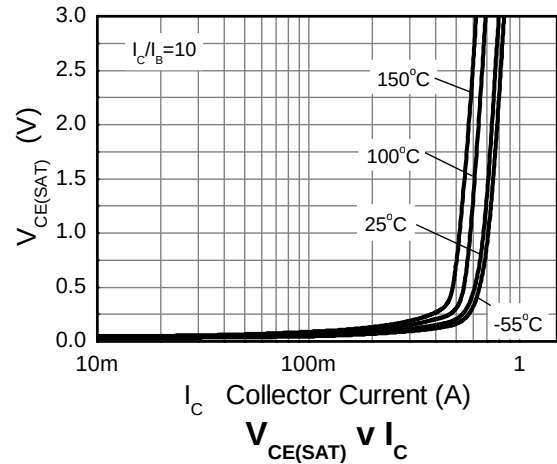
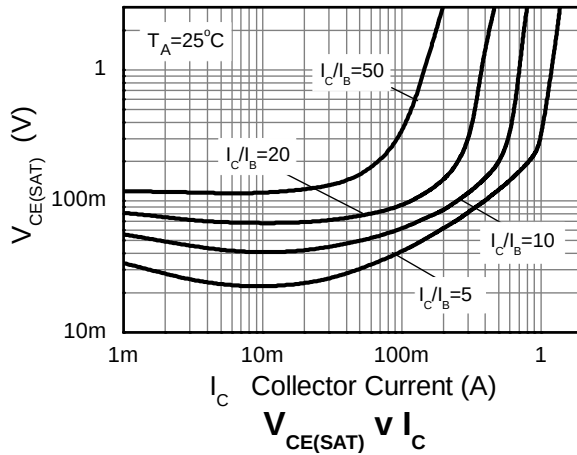


Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Collector-Base Breakdown Voltage	BV _{CBO}	450	550	—	V	I _C = 100μA
Collector-Emitter Breakdown Voltage (Forward Blocking)	BV _{CEX}	450	550	—	V	I _C = 100μA, R _{BE} ≤ 1kΩ or -1V < V _{BE} < 0.25V
Collector-Emitter Breakdown Voltage (Base Open) (Note 10)	BV _{CEO}	400	500	—	V	I _C = 10mA
Emitter-Base Breakdown Voltage	BV _{EBO}	7	8.1	—	V	I _E = 100μA
Emitter-Collector Breakdown Voltage (Reverse Blocking)	BV _{ECX}	6	8	—	V	I _E = 100μA, R _{BC} ≤ 1kΩ or -0.25V < V _{BC} < 0.25V
Emitter-Collector Breakdown Voltage (Base Open)	BV _{ECO}	6	8.5	—	V	I _E = 100μA
Collector-Base Cutoff Current	I _{CBO}	—	<1	50	nA	V _{CB} = 360V
			—	20	μA	V _{CB} = 360V, T _A = +100°C
Collector-Emitter Cutoff Current	I _{CEX}	—	<1	100	nA	V _{CE} = 360V, R _{BE} ≤ 1kΩ -1V < V _{BE} < 0.25V
Emitter-Base Cutoff Current	I _{EBO}	—	<1	50	nA	V _{EB} = 5.6V
ON CHARACTERISTICS (Note 10)						
Static Forward Current Transfer Ratio	h _{FE}	90	165	300	—	I _C = 1mA, V _{CE} = 5V
		100	180			I _C = 50mA, V _{CE} = 5V
		10	20			I _C = 500mA, V _{CE} = 5V
Collector-Emitter Saturation Voltage	V _{CE(SAT)}	—	70	85	mV	I _C = 20mA, I _B = 1mA
			50	70		I _C = 50mA, I _B = 5mA
			120	170		I _C = 300mA, I _B = 30mA
			125	175		I _C = 500mA, I _B = 100mA
Base-Emitter Saturation Voltage	V _{BE(SAT)}	—	865	950	mV	I _C = 500mA, I _B = 100mA
Base-Emitter On Voltage	V _{BE(ON)}	—	800	900	mV	I _C = 500mA, V _{CE} = 10V
SMALL SIGNAL CHARACTERISTICS (Note 10)						
Transition Frequency	f _T	—	40	—	MHz	I _C = 10mA, V _{CE} = 20V, f = 20MHz
Output Capacitance	C _{OBO}	—	8	10	pF	V _{CB} = 20V, f = 1MHz
Delay Time	t _D	—	100	—	ns	V _{CC} = 100V,
Rise Time	t _R	—	52	—	ns	I _C = 100mA,
Storage Time	t _S	—	3122	—	ns	I _{B1} = 10mA
Fall Time	t _F	—	240	—	ns	I _{B2} = -20mA

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

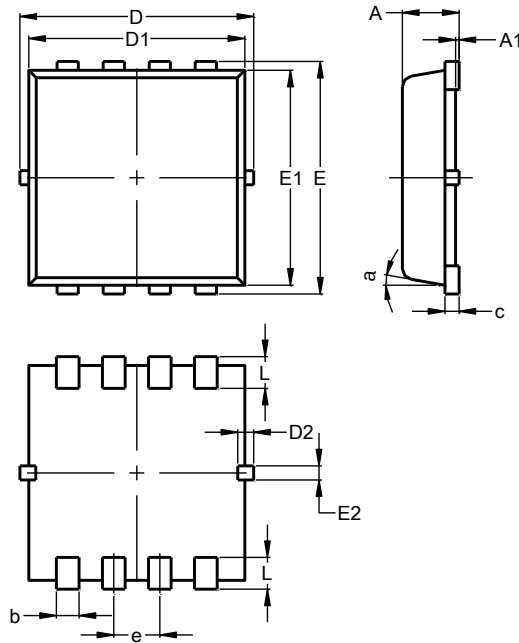
Typical Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)



Package Outline Dimensions

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

PowerDI3333-8 (Type UXB)

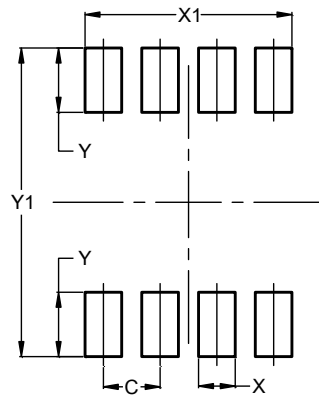


PowerDI3333-8 (Type UXB)			
Dim	Min	Max	Typ
A	0.75	0.85	0.80
A1	0.00	0.05	--
b	0.25	0.40	0.32
c	0.10	0.25	0.15
D	3.20	3.40	3.30
D1	2.95	3.15	3.05
D2	0.10	0.35	0.23
E	3.20	3.40	3.30
E1	2.95	3.15	3.05
E2	0.10	0.30	0.20
e	—	—	0.65
L	0.35	0.55	0.45
a	0°	12°	10°
All Dimensions in mm			

Suggested Pad Layout

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

PowerDI3333-8 (Type UXB)



Dimensions	Value (in mm)
C	0.650
X	0.420
X1	2.370
Y	0.730
Y1	3.500

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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