

Features

- $BV_{CEO} > -40V$
- Small Form Factor Thermally Efficient Package. Enables Higher Density End Products
- $I_C = -2A$ Continuous Collector Current
- $I_{CM} = -3A$ Peak Pulse Current
- Low Saturation Voltage $V_{CE(sat)} < -320mV @ -1A$
- Complementary NPN Type: DXTN22040DFGQ
- 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)**
- **The DXTP22040DFGQ is suitable for automotive applications requiring specific change control and is AEC-Q101 qualified, is PPAP capable, and is manufactured in IATF16949:2016 certified facilities.**

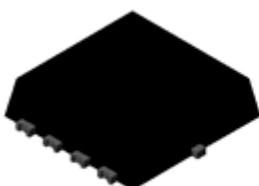
Mechanical Data

- 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)

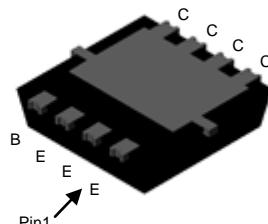
Applications

- High-Side Switch
- Supply Line Switching
- Motor Driving

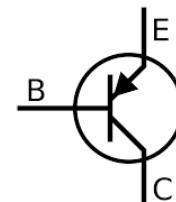
PowerDI3333-8 (SWP) (Type UX)



Top View



Bottom View



Device Symbol

Ordering Information (Note 4)

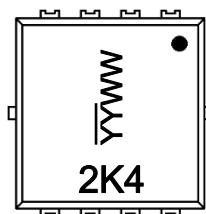
Part Number	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity Per Reel
DXTP22040DFGQ-7	Automotive	2K4	7	12	2,000

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)



2K4 = Product Type Marking Code
 YYWW = Date Code Marking
 YY = Last Two Digits of Year (ex: 19 = 2019)
 WW = Week Code (01 to 53)

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	-50	V
Collector-Emitter Voltage	V_{CEO}	-40	V
Emitter-Base Voltage	V_{EBO}	-7	V
Continuous Collector Current	I_C	-2	A
Peak Pulse Collector Current	I_{CM}	-3	
Continuous Base Current	I_B	-100	mA
Peak Pulse Base Current	I_{BM}	-200	

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	°C/W
		65	°C/W
		44	°C/W
Thermal Resistance, Junction to Leads (Note 8)	$R_{\theta JL}$	11	°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.

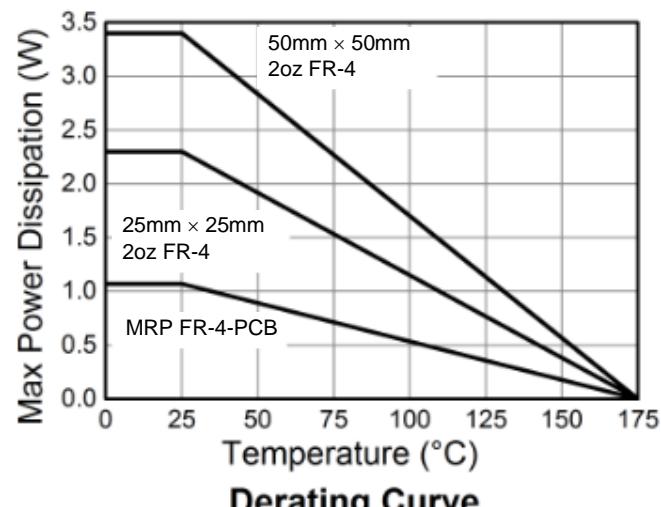
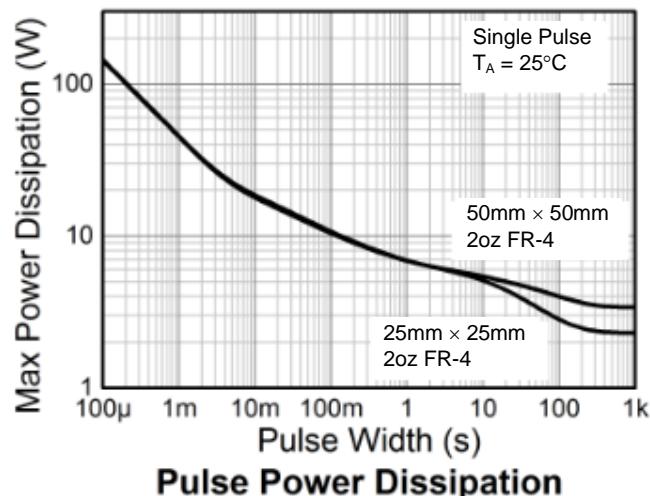
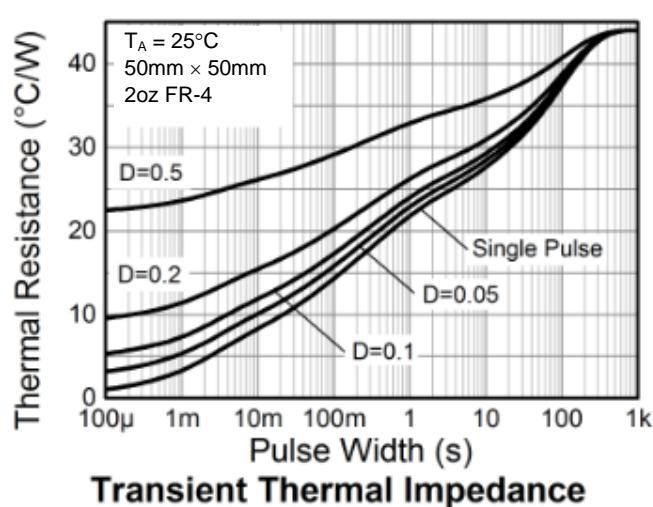
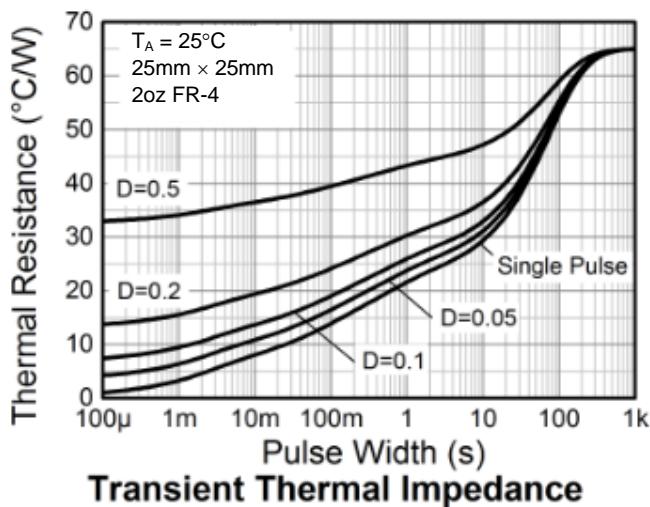
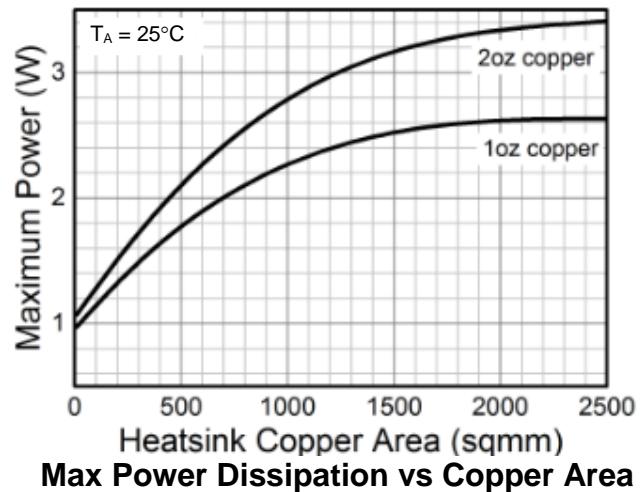
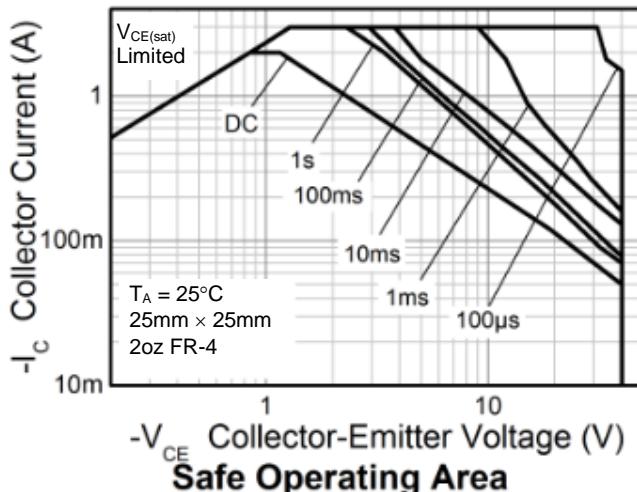
- 6. Same as Note 5, except the device is mounted on 25mm × 25mm 2oz copper.

- 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

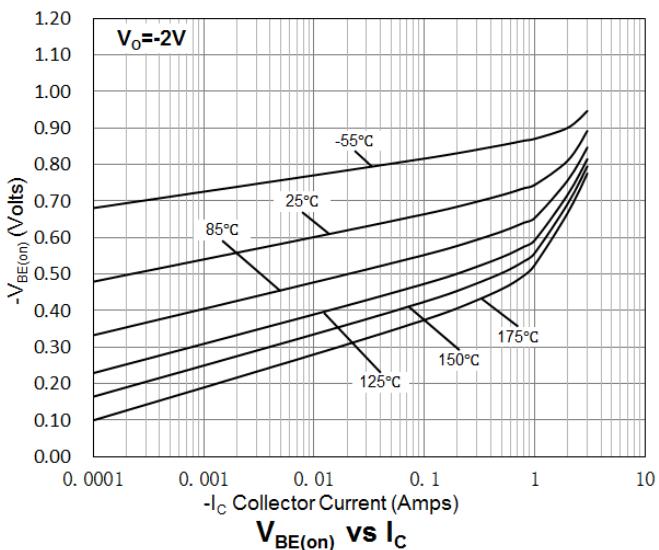
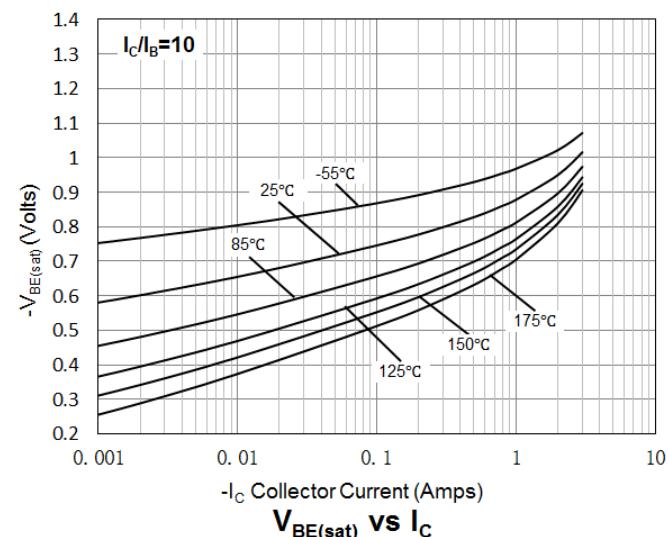
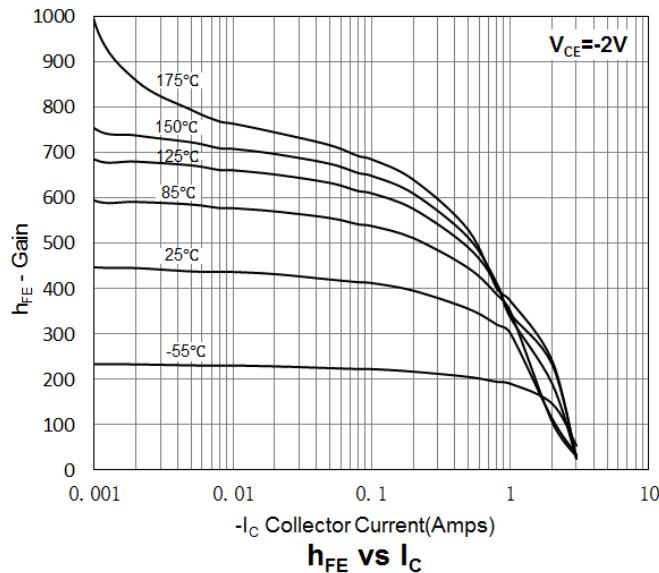
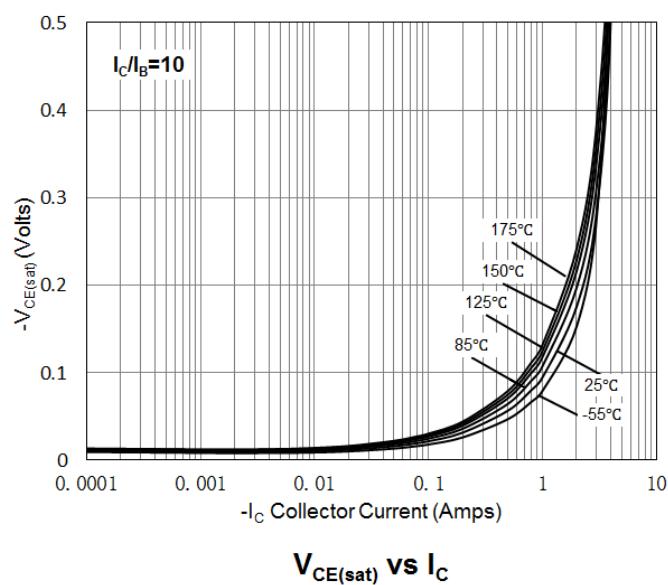
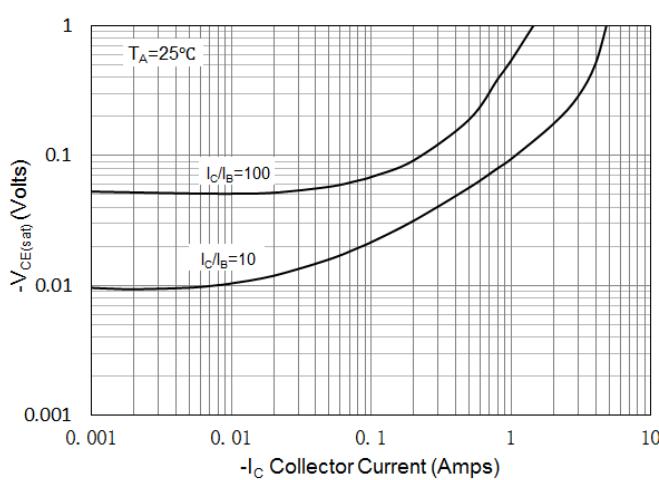


Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	-50	-71	—	V	$I_C = -100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Note 10)	BV_{CEO}	-40	-58	—	V	$I_C = -10\text{mA}$
Emitter-Base Breakdown Voltage	BV_{EBO}	-7	-8.5	—	V	$I_E = -100\mu\text{A}$
Collector-Base Cut-Off Current	I_{CBO}	—	-1 -0.1	-0.1 -20	μA	$V_{\text{CB}} = -50\text{V}$ $V_{\text{CB}} = -50\text{V}, T_A = +150^\circ\text{C}$
Emitter-Base Cut-Off Current	I_{EBO}	—	-1	-20	nA	$V_{\text{EB}} = -6\text{V}$
Collector-Emitter Cut-Off Current	I_{CES}	—	-1	-20	nA	$V_{\text{CE}} = -40\text{V}, V_{\text{BE}} = 0\text{V}$
Static Forward Current Transfer Ratio (Note 10)	h_{FE}	340 300 200 120	410 354 303 203	— 900 — —	—	$I_C = -100\text{mA}, V_{\text{CE}} = -2\text{V}$ $I_C = -500\text{mA}, V_{\text{CE}} = -2\text{V}$ $I_C = -1\text{A}, V_{\text{CE}} = -2\text{V}$ $I_C = -2\text{A}, V_{\text{CE}} = -2\text{V}$
Collector-Emitter Saturation Voltage (Note 10)	$V_{\text{CE}(\text{sat})}$	—	-56 -48 -81 -146 -218	-140 -170 -320 -400 -600	mV	$I_C = -100\text{mA}, I_B = -1\text{mA}$ $I_C = -500\text{mA}, I_B = -50\text{mA}$ $I_C = -1\text{A}, I_B = -100\text{mA}$ $I_C = -2\text{A}, I_B = -200\text{mA}$ $I_C = -3\text{A}, I_B = -300\text{mA}$
Collector-Emitter Saturation Resistance (Note 10)	$R_{\text{CE}(\text{sat})}$	—	—	320	$\text{m}\Omega$	$I_C = -1\text{A}, I_B = -100\text{mA}$
Base-Emitter Saturation Voltage (Note 10)	$V_{\text{BE}(\text{sat})}$	—	-0.88	-1	V	$I_C = -1\text{A}, I_B = -100\text{mA}$
Base-Emitter Turn-On Voltage (Note 10)	$V_{\text{BE}(\text{on})}$	—	-0.76	-0.9	V	$I_C = -1\text{A}, V_{\text{CE}} = -2\text{V}$
Transition Frequency	f_T	—	120	—	MHz	$I_C = -50\text{mA}, V_{\text{CE}} = -10\text{V}$ $f = 100\text{MHz}$
Output Capacitance	C_{obo}	—	12	—	pF	$V_{\text{CB}} = -10\text{V}, f = 1\text{MHz}$
Switching Characteristics	t_{delay}	—	10	—	ns	$V_{\text{CC}} = -10\text{V}, I_C = -500\text{mA}$ $I_{B1} = -I_{B2} = -50\text{mA}$
	t_{rise}	—	144	—	ns	
	t_{storage}	—	704	—	ns	
	t_{fall}	—	48.5	—	ns	

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

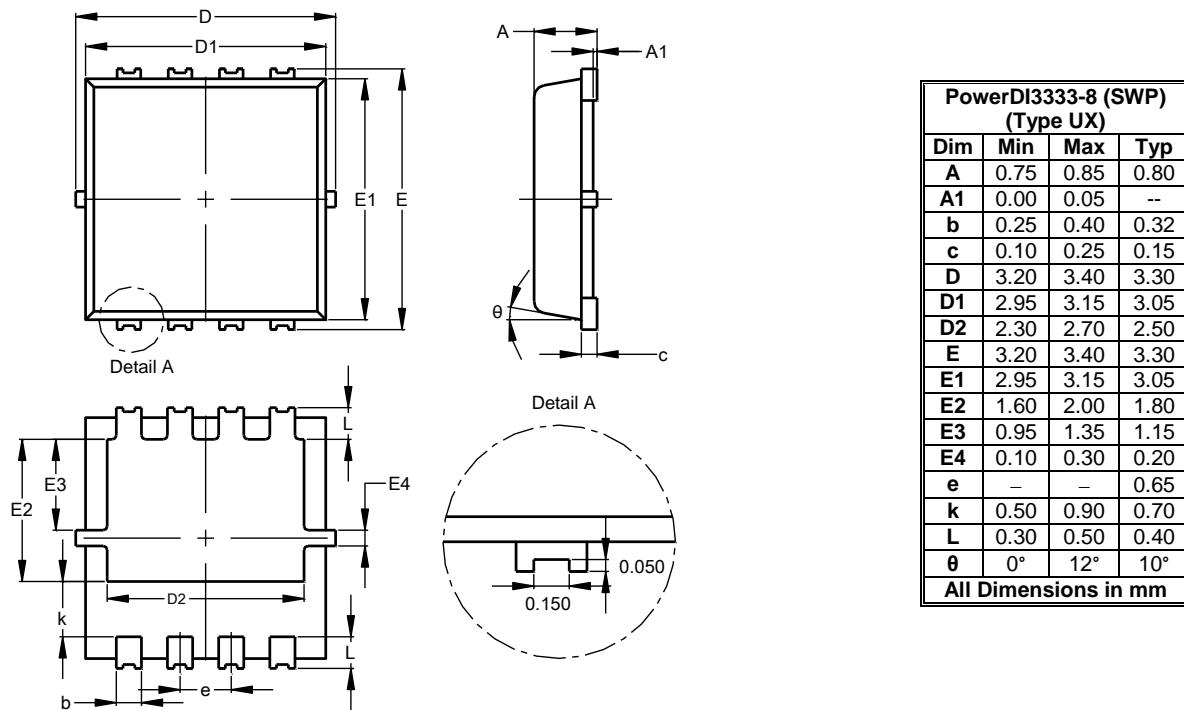
Typical Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)



Package Outline Dimensions

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

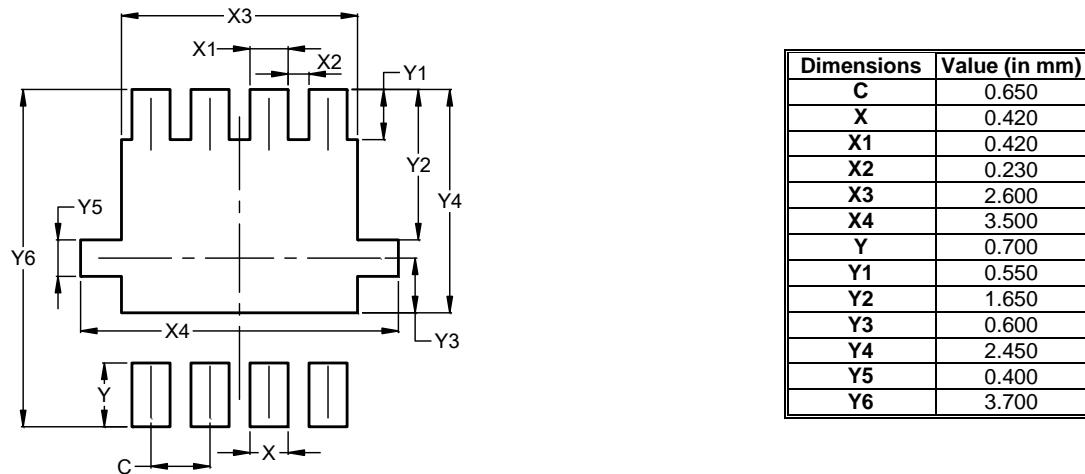
PowerDI3333-8 (SWP) (Type UX)



Suggested Pad Layout

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

PowerDI3333-8 (SWP) (Type UX)



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