

Features

- $BV_{CEO} > -100V$
- $BV_{EBO} > -8V$
- Continuous Current I_C to $-4A$
- Peak Pulse Current I_{CM} to $-10A$
- Ultra-Low Saturation Voltage $V_{CE(sat)} < -70mV @ -1A$
- High Current $R_{CE(sat)} = 40m\Omega$ Typical
- Small Form Factor Thermally Efficient Package
Enables Higher Density End Products
- Wettable Flank for Improved Optical Inspection
- Rated to $+175^\circ C$ – Ideal for High-Temperature Environments
- Complementary NPN Type: [DXTN80100CFGQ](#)
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- Halogen and Antimony Free. "Green" Device (Note 3)
- The DXTP80100CFGQ is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.

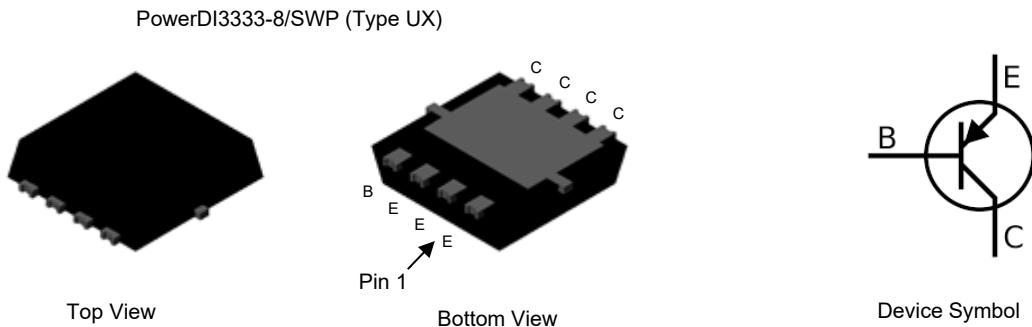
<https://www.diodes.com/quality/product-definitions/>

Mechanical Data

- Package: PowerDI®3333-8
- Package 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 208 
- Weight: 0.03 grams (Approximate)

Applications

- MOSFET & IGBT gate drivers
- Load switches
- Low-voltage regulation
- DC to DC converters
- Motors, solenoids, relays and actuator drivers control



Ordering Information (Note 4)

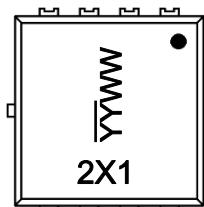
Orderable Part Number	Package	Marking	Reel Size (inches)	Tape Width (mm)	Packing	
					Qty.	Carrier
DXTP80100CFGQ-7	PowerDI3333-8/SWP (Type UX)	2X1	7	12	2,000	Reel

Notes:

1. EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied.
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)



2X1 = Product Type Marking Code
 YYWW = Date Code Marking
 YY = Last Two Digits of Year (ex: 25 = 2025)
 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}	-110	V
Collector-Emitter Voltage	V_{CEO}	-100	V
Emitter-Base Voltage	V_{EBO}	-8	V
Continuous Collector Current (Note 5)	I_C	-2.5	A
Continuous Collector Current (Note 7)	I_C	-4	A
Peak Pulse Current	I_{CM}	-10	A

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

Characteristic	Symbol	Value	Unit
Power Dissipation	P_D	900	mW
		1.6	W
		2.4	W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	140	°C/W
		92	°C/W
		62.5	°C/W
Thermal Resistance, Junction to Case (Note 7)	$R_{\theta JC}$	6.5	°C/W
Thermal Resistance, Junction to Lead (Note 8)	$R_{\theta JL}$	4.2	°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
Electrostatic Discharge - Charged Device Model	ESD CDM	1,000	V	IV

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 15mm x 15mm 2oz copper.

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

8. Thermal resistance from junction to solder-point (at the collector tab).

9. Refer to JEDEC specifications JESD22-A114, JESD22-A115 and JESD22-C101.

Thermal Characteristics and Derating Information

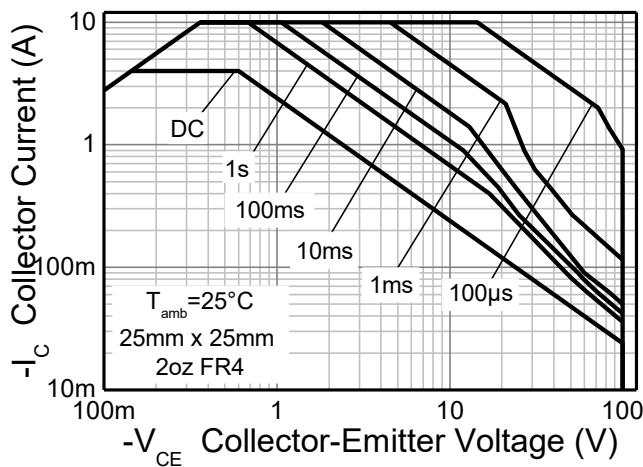


Fig 1. Safe Operating Area

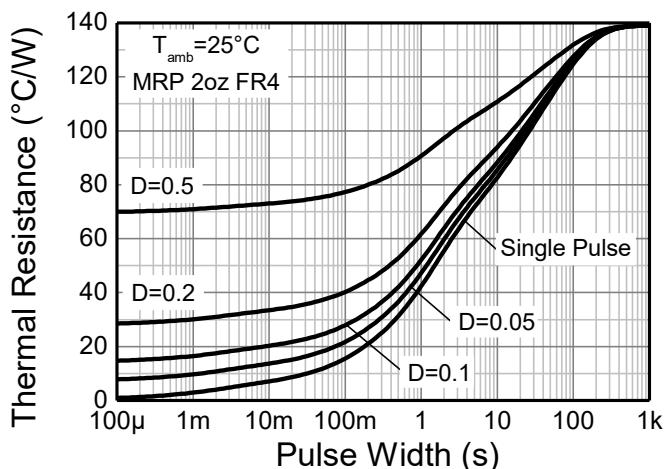


Fig 2. Transient Thermal Impedance

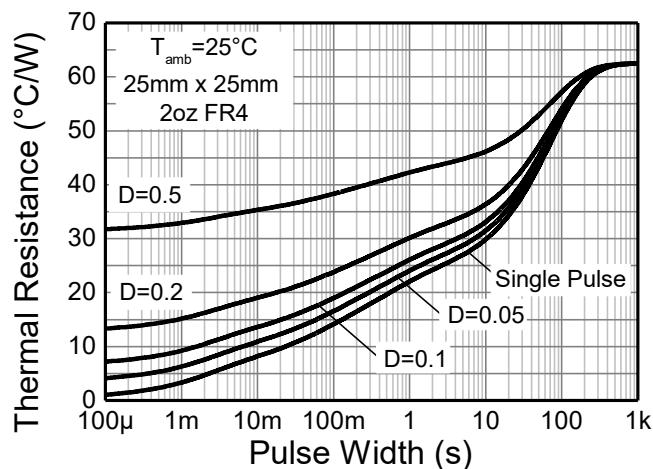


Fig 3. Transient Thermal Impedance

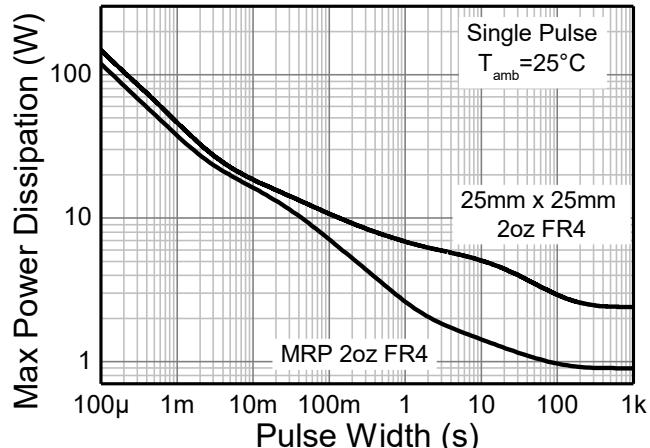


Fig 4. Pulse Power Dissipation

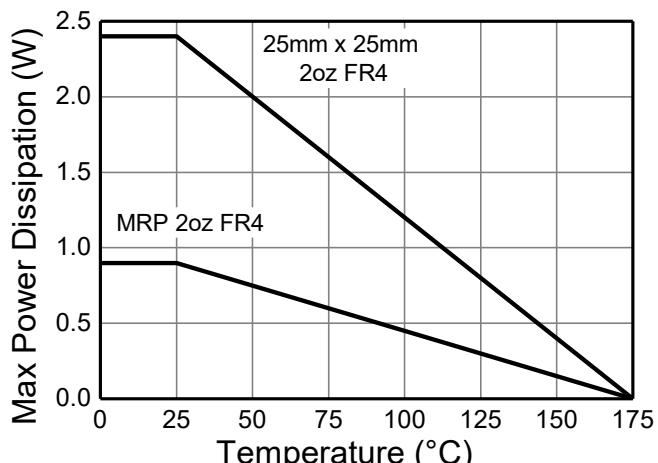
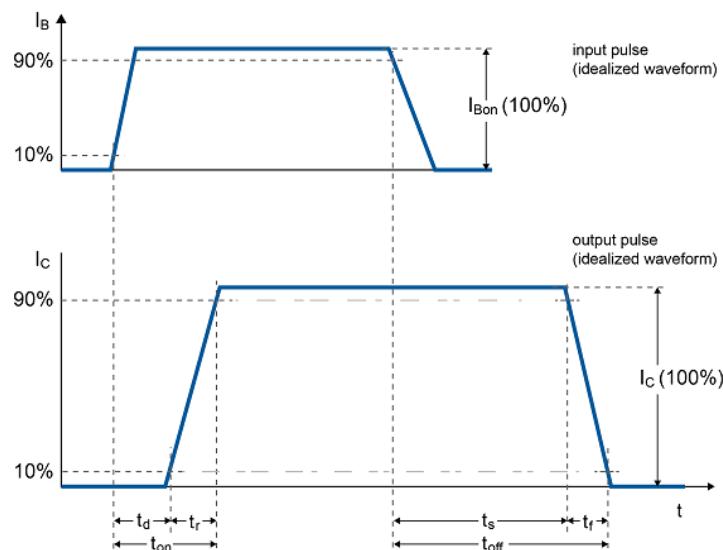


Fig 5. Derating Curve

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}	-110	—	—	V	$I_C = -100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Note 10)	BV_{CEO}	-100	—	—	V	$I_C = -10\text{mA}$
Emitter-Collector Breakdown Voltage	BV_{ECO}	-5	—	—	V	$I_E = -100\mu\text{A}$
Emitter-Base Breakdown Voltage	BV_{EBO}	-8	—	—	V	$I_E = -100\mu\text{A}$
Collector Cutoff Current	I_{CBO}	—	—	-100	nA	$V_{\text{CB}} = -110\text{V}$
		—	—	1	μA	$V_{\text{CB}} = -110\text{V}, T_A = +125^\circ\text{C}$
Collector Cutoff Current	I_{CES}	—	—	-300	nA	$V_{\text{CE}} = -80\text{V}$
Emitter Cutoff Current	I_{EBO}	—	—	-50	nA	$V_{\text{EB}} = -7\text{V}$
		—	-80	—	mV	$I_C = -100\text{mA}, I_B = -1\text{mA}$
		—	-150	-200	mV	$I_C = -1\text{A}, I_B = -20\text{mA}$
Collector-Emitter Saturation Voltage (Note 10)	$V_{\text{CE}(\text{sat})}$	—	-50	-70	mV	$I_C = -1\text{A}, I_B = -100\text{mA}$
		—	-180	-300	mV	$I_C = -2.5\text{A}, I_B = -125\text{mA}$
		—	-170	-300	mV	$I_C = -4\text{A}, I_B = -400\text{mA}$
Base-Emitter Saturation Voltage (Note 10)	$V_{\text{BE}(\text{sat})}$	—	-840	-950	mV	$I_C = -2.5\text{A}, I_B = -125\text{mA}$
		—	-930	-1,050	mV	$I_C = -4\text{A}, I_B = -400\text{mA}$
Base-Emitter Turn-On Voltage (Note 10)	$V_{\text{BE}(\text{on})}$	—	-750	-850	mV	$I_C = -2.5\text{A}, V_{\text{CE}} = -2\text{V}$
		—	-820	-900	mV	$I_C = -4\text{A}, V_{\text{CE}} = -2\text{V}$
DC Current Gain (Note 10)	h_{FE}	200	335	—	—	$I_C = -10\text{mA}, V_{\text{CE}} = -2\text{V}$
		250	325	420	—	$I_C = -100\text{mA}, V_{\text{CE}} = -2\text{V}$
		200	290	—	—	$I_C = -1\text{A}, V_{\text{CE}} = -2\text{V}$
		150	230	—	—	$I_C = -2\text{A}, V_{\text{CE}} = -2\text{V}$
		75	140	—	—	$I_C = -2.5\text{A}, V_{\text{CE}} = -2\text{V}$
		25	40	—	—	$I_C = -4\text{A}, V_{\text{CE}} = -2\text{V}$
Input Capacitance	C_{ib}	—	560	—	pF	$V_{\text{EB}} = 0.5\text{V}, f = 1\text{MHz}$
Output Capacitance	C_{ob}	—	37	—	pF	$V_{\text{CB}} = 10\text{V}, f = 1\text{MHz}$
Current Gain-Bandwidth Product	f_T	100	160	—	MHz	$V_{\text{CE}} = -10\text{V}, I_C = -100\text{mA}$ $f = 50\text{MHz}$
Turn-On Time	t_d	—	15	—	ns	$V_{\text{CC}} = -10\text{V}, I_C = -2.5\text{A}$ $I_{\text{B1}} = -I_{\text{B2}} = -250\text{mA}$
Turn-Off Time	t_r	—	100	—	ns	
	t_s	—	265	—	ns	
	t_f	—	45	—	ns	
	t_{on}	—	—	—	—	
	t_{off}	—	—	—	—	

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


Fig 6. Timing Waveform

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

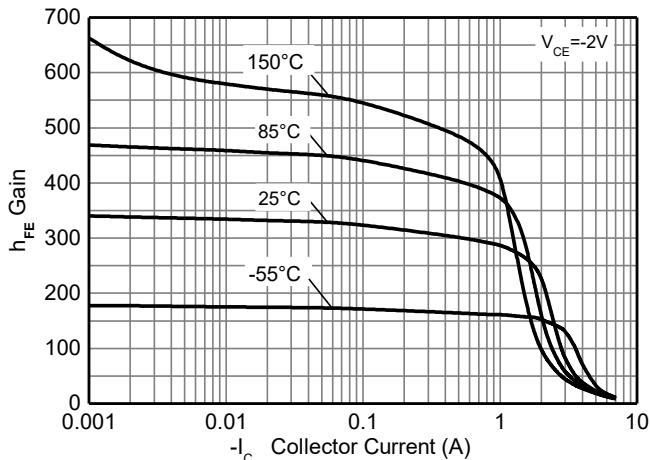


Fig. 7 h_{FE} v I_c

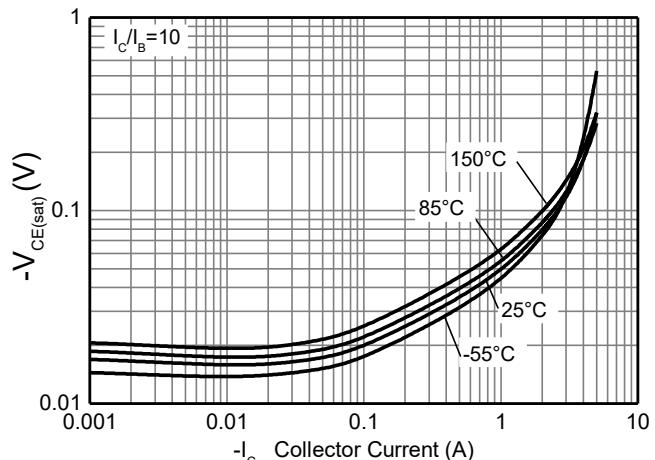


Fig. 8 $V_{CE(sat)}$ v I_c

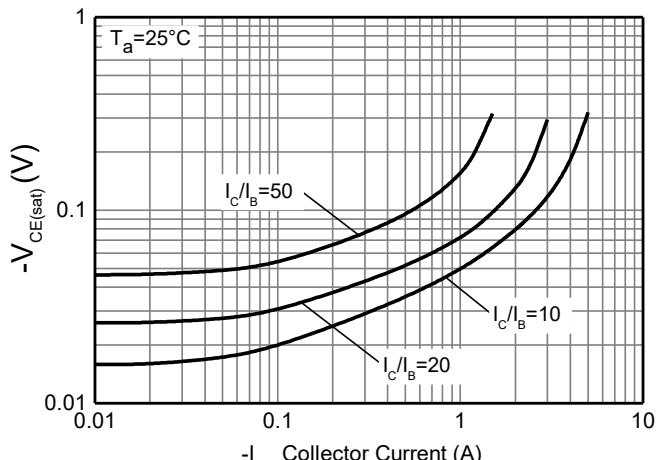


Fig. 9 $V_{CE(sat)}$ v I_c

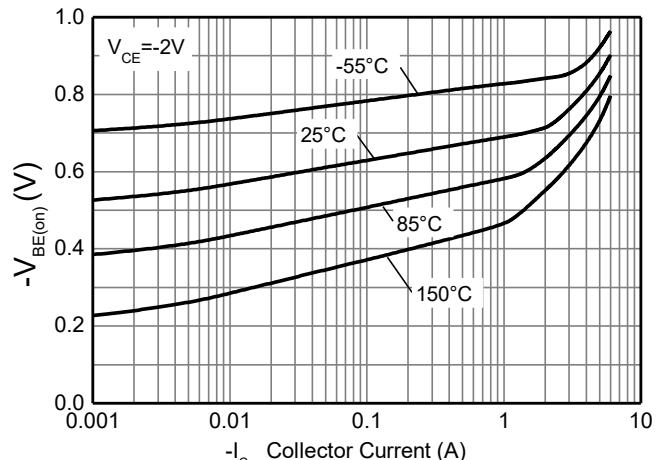


Fig. 10 $V_{BE(on)}$ v I_c

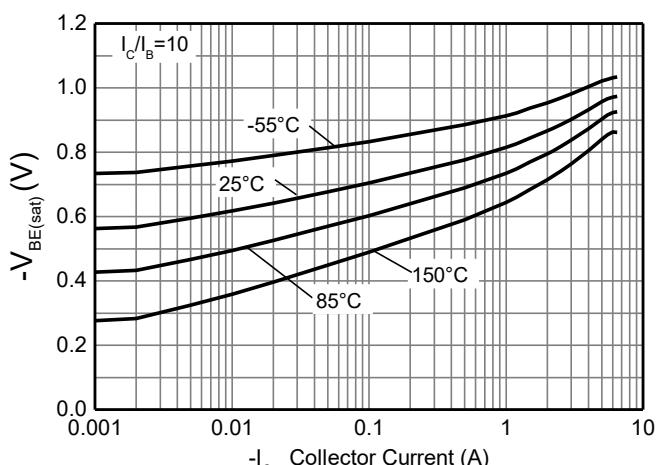


Fig. 11 $V_{BE(sat)}$ v I_c

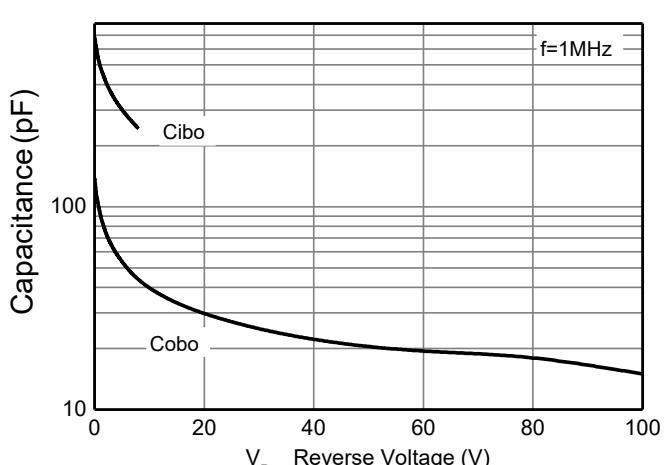


Fig. 12 **Typical Junction Capacitance**

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

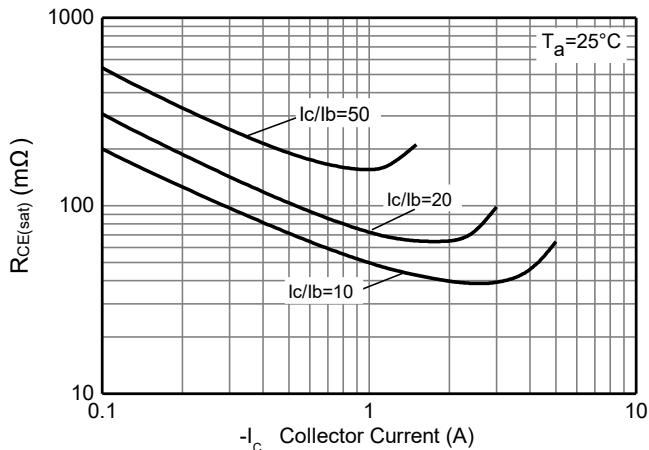


Fig. 13 $R_{CE(\text{sat})}$ v I_C

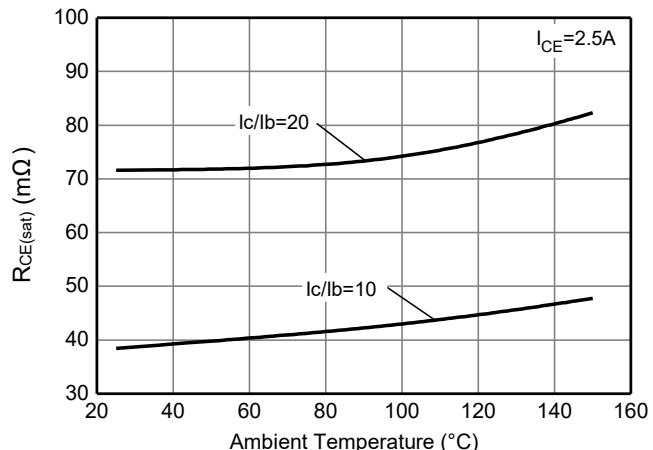


Fig. 14 $R_{CE(\text{sat})}$ v T_{amb}

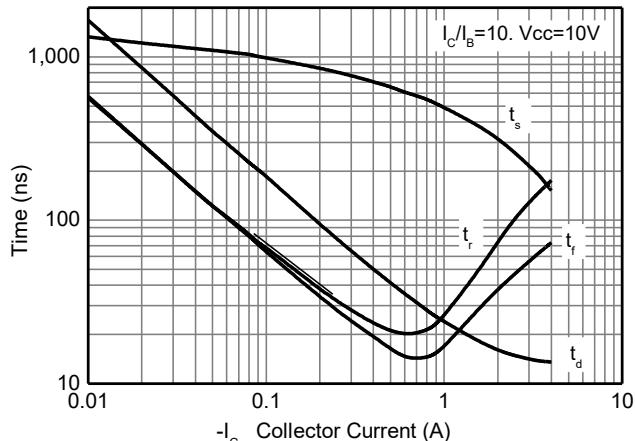
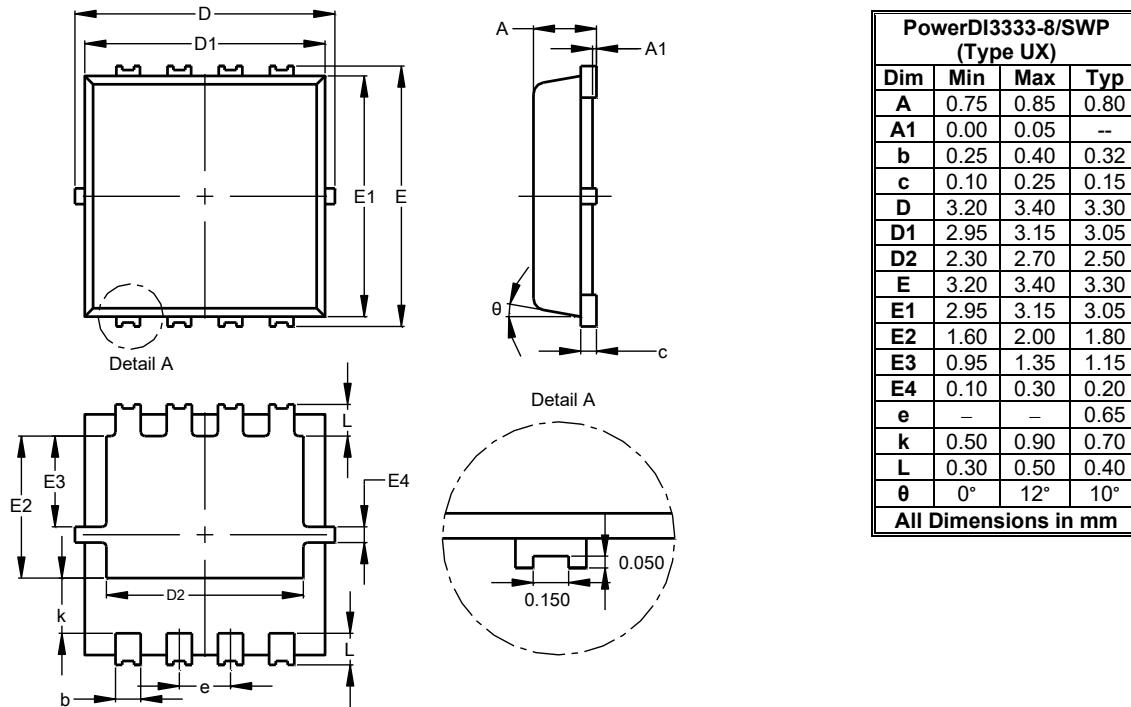


Fig. 15 Switching Performance

Package Outline Dimensions

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

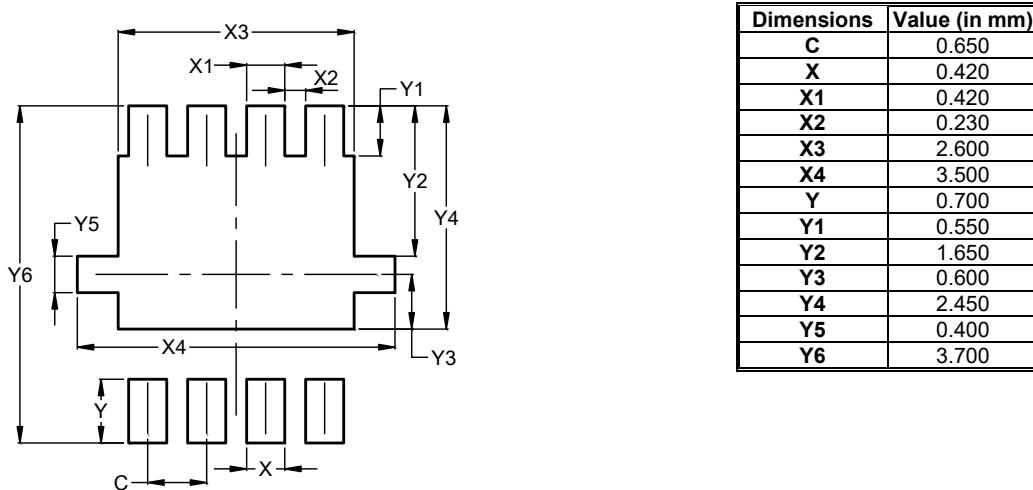
PowerDI3333-8/SWP (Type UX)



Suggested Pad Layout

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

PowerDI3333-8/SWP (Type UX)



Notes:

11. 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.
12. Side wall tin plated package for wettable flanks in AOI.

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