



YOUSHANG SEMICONDUCTOR

设计研发新型功率器件

各类小信号开关

中低压及高压大电流等场效应管

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企业微信二维码



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Features

- $BV_{CEO} > 40V$
- Small Form Factor Thermally Efficient Package. Enables Higher Density End Products
- $I_C = 2A$ High Continuous Collector Current
- $I_{CM} = 3A$ Peak Pulse Current
- Low Saturation Voltage $V_{CE(sat)} < 320mV @ 1A$
- Complementary PNP Type: NK-DXTP22040DFGQ
- Wettable Flank for Improved Optical Inspection

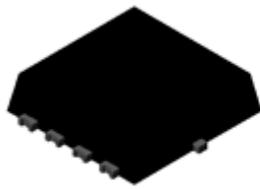
Mechanical Data

- 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 
- Weight: 0.03 grams (Approximate)

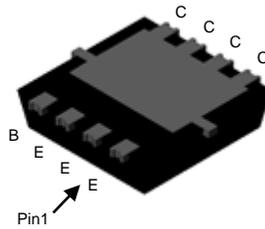
Applications

- DC to DC Conversion
- Supply Line Switching
- Low Drop Out Regulation
- LCD Backlighting

PowerDI3333-8 (SWP) (Type UX)

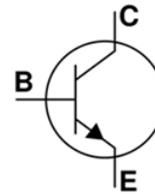


Top View



Bottom View

Equivalent Circuit



Device Symbol

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V _{CB0}	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	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.)

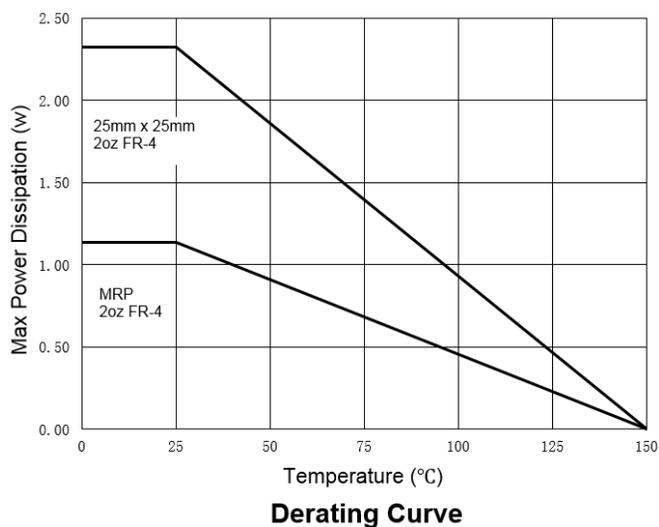
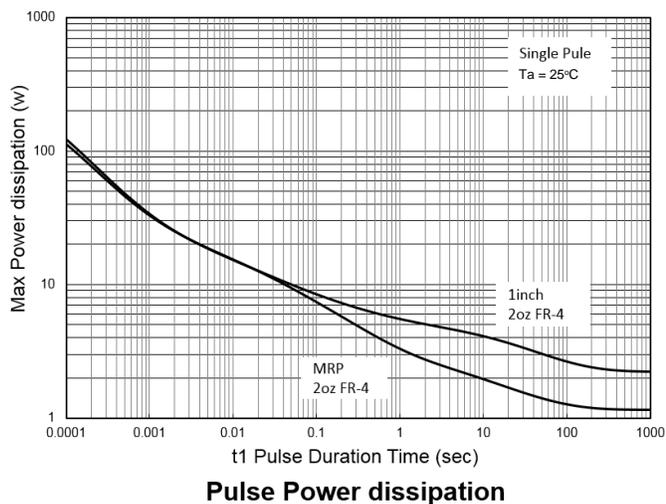
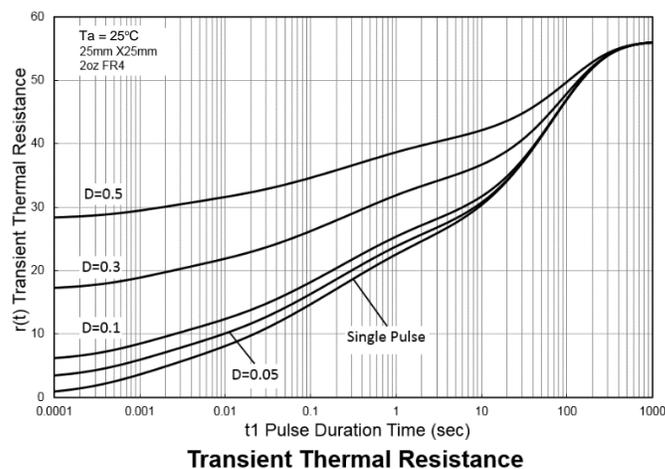
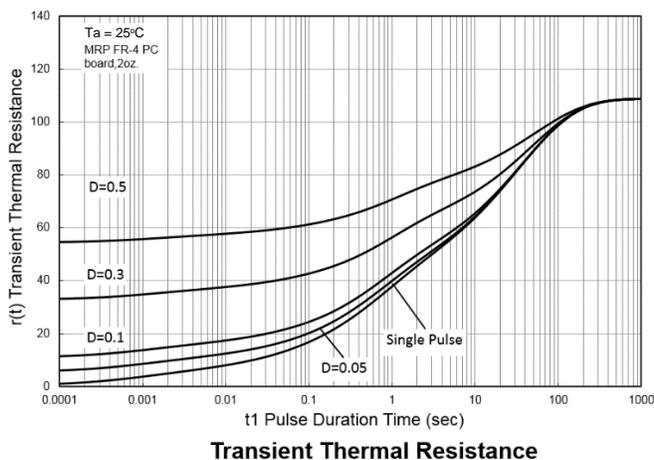
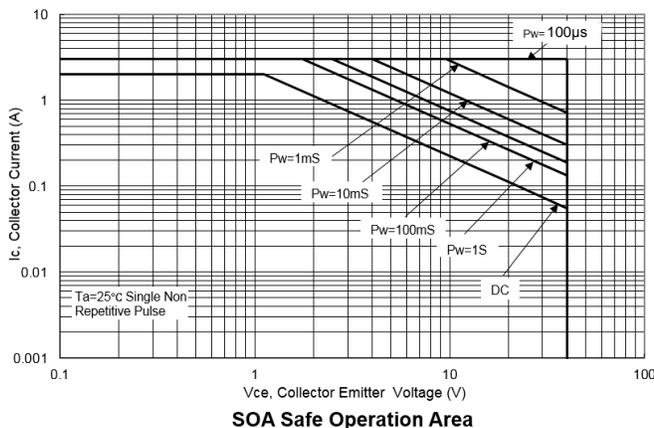
Characteristic	Symbol	Value	Unit	
Power Dissipation	P _D	(Note 5)	1.1	W
		(Note 6)	2.3	W
Thermal Resistance, Junction to Ambient	R _{θJA}	(Note 5)	113	°C/W
		(Note 6)	55	°C/W
Thermal Resistance, Junction to Leads (Note 7)	R _{θJL}	7.4	°C/W	
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C	

ESD Ratings (Note 8)

Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge – Human Body Model	ESD HBM	4,000	V	3A
Charge Device Model	CDM	1,000	V	C5

- 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. Thermal resistance from junction to solder-point (at the collector tab).
 8. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

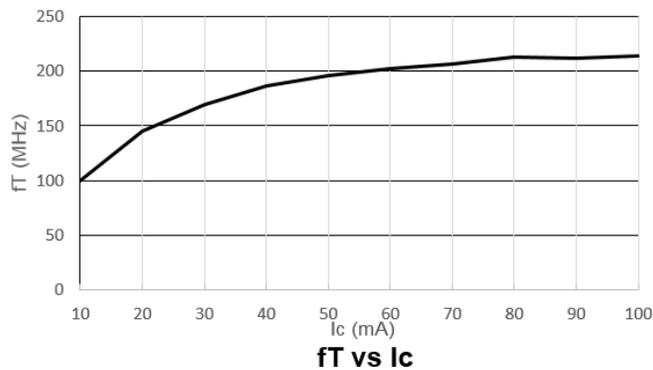
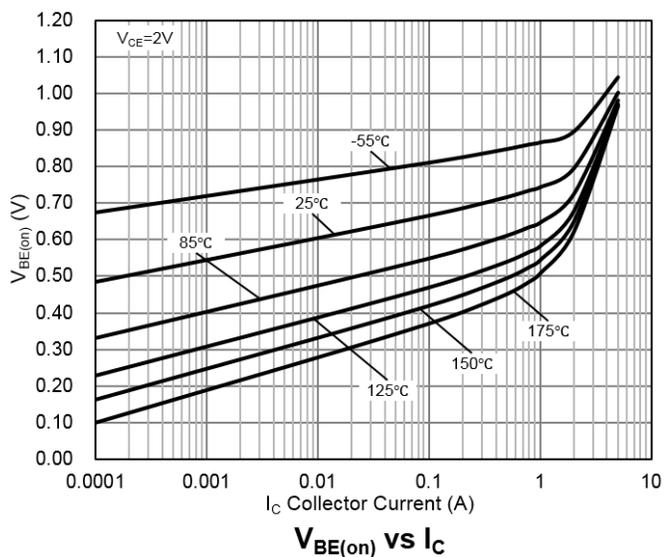
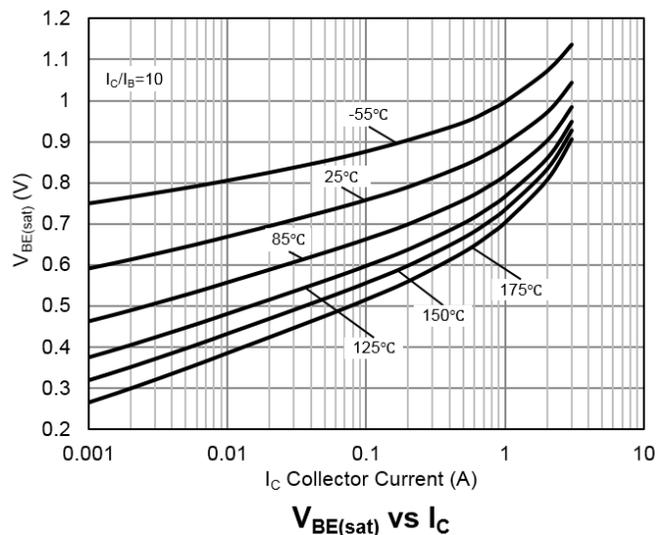
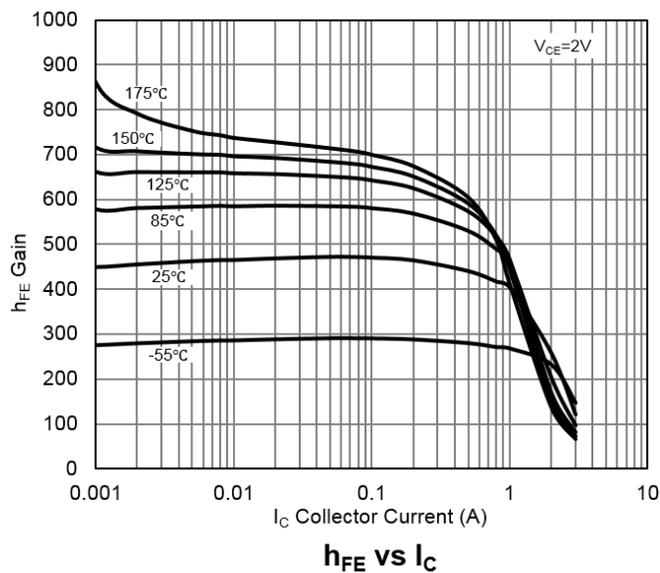
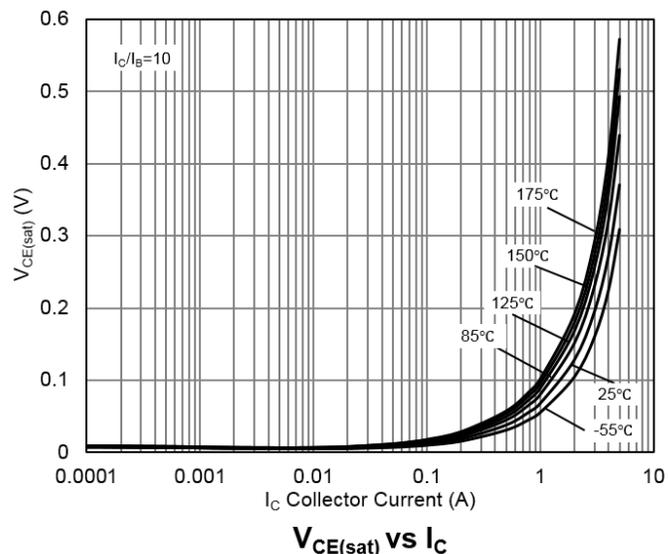
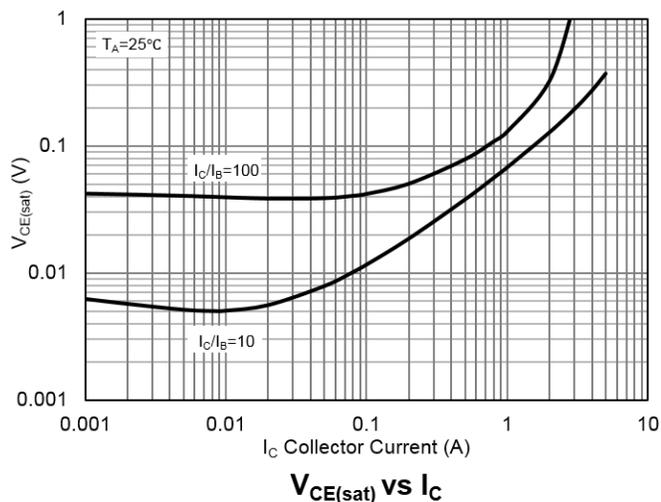
Thermal Characteristics and Derating Information



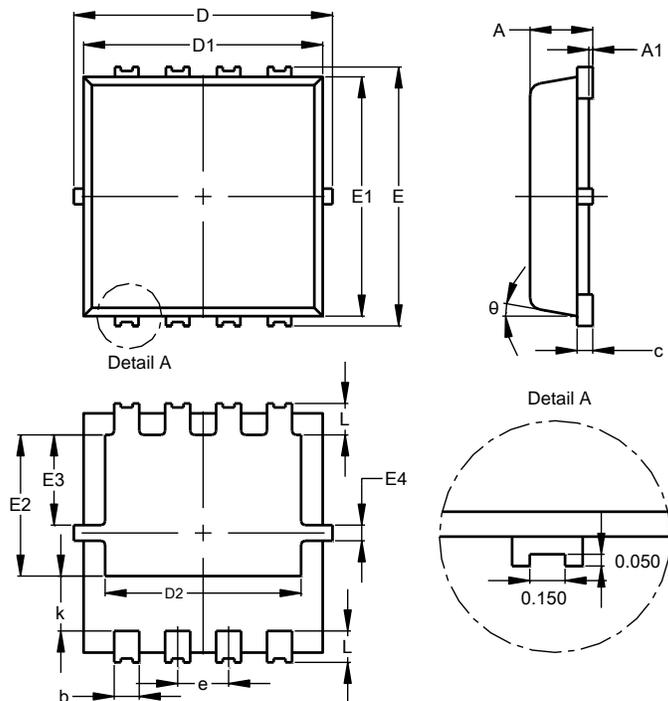
Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	50	171	—	V	$I_C = 100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Note 9)	BV_{CEO}	40	54	—	V	$I_C = 10\text{mA}$
Emitter-Base Breakdown Voltage	BV_{EBO}	7	8.1	—	V	$I_E = 100\mu\text{A}$
Collector-Base Cut-Off Current	I_{CBO}	—	1 0.01	50 10	nA μA	$V_{CB} = 40\text{V}$ $V_{CB} = 40\text{V}, T_A = +150^\circ\text{C}$
Emitter-Base Cut-Off Current	I_{EBO}	—	1	20	nA	$V_{EB} = 6\text{V}$
Collector-Emitter Cut-Off Current	I_{CES}	—	1	50	nA	$V_{CE} = 40\text{V}, V_{BE} = 0\text{V}$
Static Forward Current Transfer Ratio (Note 9)	h_{FE}	300 300 200 140	464 468 445 377	— 900 — —	—	$I_C = 1\text{mA}, V_{CE} = 2\text{V}$ $I_C = 500\text{mA}, V_{CE} = 2\text{V}$ $I_C = 1\text{A}, V_{CE} = 2\text{V}$ $I_C = 2\text{A}, V_{CE} = 2\text{V}$
Collector-Emitter Saturation Voltage (Note 9)	$V_{CE(sat)}$	—	43 38 68 126 187	80 120 220 350 600	mV	$I_C = 100\text{mA}, I_B = 1\text{mA}$ $I_C = 500\text{mA}, I_B = 50\text{mA}$ $I_C = 1\text{A}, I_B = 100\text{mA}$ $I_C = 2\text{A}, I_B = 200\text{mA}$ $I_C = 3\text{A}, I_B = 300\text{mA}$
Base-Emitter Saturation Voltage (Note 9)	$V_{BE(sat)}$	—	0.9	1.1	V	$I_C = 1\text{A}, I_B = 100\text{mA}$
Base-Emitter Turn-On Voltage (Note 9)	$V_{BE(on)}$	—	0.74	1	V	$I_C = 1\text{A}, V_{CE} = 5\text{V}$
Input Capacitance	C_{ibo}	—	161	—	pF	$V_{EB} = 0.5\text{V}, f = 1\text{MHz}$
Output Capacitance	C_{obo}	—	11	—	pF	$V_{CB} = 10\text{V}, f = 1\text{MHz}$
Transition Frequency	f_T	—	198	—	MHz	$I_C = 50\text{mA}, V_{CE} = 10\text{V}$ $f = 100\text{MHz}$
Switching Time	t_{delay}	—	7.9	—	ns	$I_C = 1\text{A}, V_{CC} = 10\text{V},$ $I_{B1} = -I_{B2} = 100\text{mA}$
	t_{rise}	—	2.9	—	ns	
	$t_{storage}$	—	673	—	ns	
	t_{fall}	—	26.8	—	ns	

 Note: 9. Measured under pulsed conditions. Pulse width $\leq 300\mu\text{s}$. Duty cycle $\leq 2\%$.

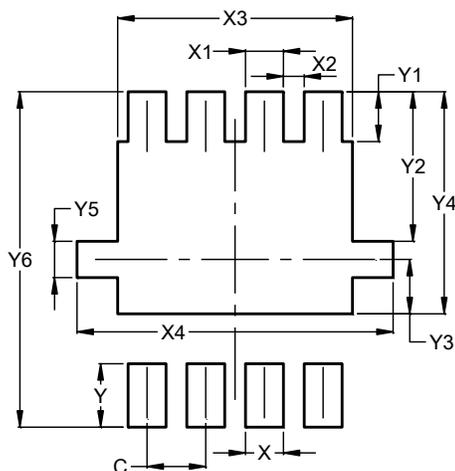


Package Outline Dimensions

PowerDI3333-8 (SWP) (Type UX)


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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

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