



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

0755-83047638

ysbdt@szyoushang.cn

www.szyoushang.cn



企业微信二维码



企业QQ二维码

Features

- $BV_{CEO} > -40V$
- Small Form Factor Thermally Efficient Package. Enables Higher Density End Products
- $I_C = -3A$ High Continuous Current
- $I_{CM} = -6A$ Peak Pulse Current
- Low Saturation Voltage $V_{CE(sat)} < -400mV @ -1A$
- Minimum $h_{FE} 200 @ I_C = -1A$
- Rated to $+175^\circ C$ —Ideal For High Temperature Environment
- Wettable Flank For Improved Optical Inspection

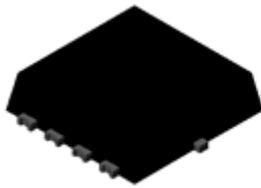
Mechanical Data

- 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 Solderable per MIL-STD-202,
Method 208 
- Weight: 0.03 grams (Approximate)

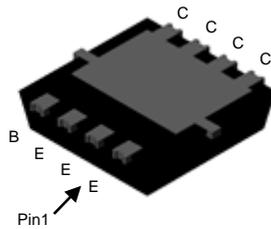
Applications

- High-Side Switch
- Low Drop Out Regulator
- MOSFET or IGBT Gate Driving

PowerDI3333-8 (SWP) (Type UX)

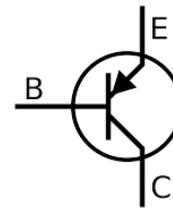


Top View



Bottom View

Equivalent Circuit



Device Symbol

Absolute Maximum Ratings (@ $T_A = +25^{\circ}\text{C}$, 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	-3	A
Peak Pulse Current	I_{CM}	-6	A

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

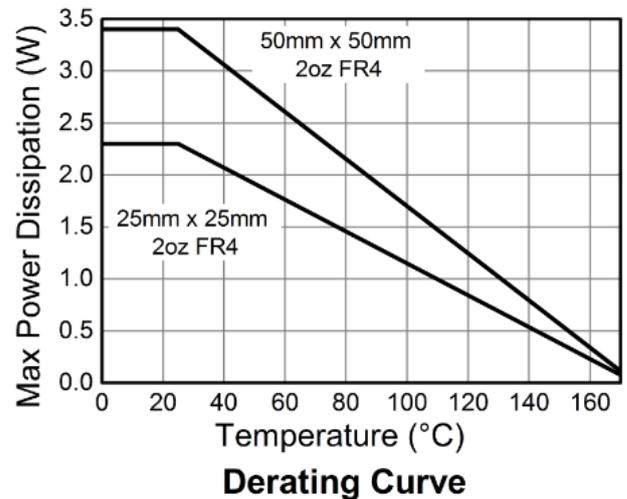
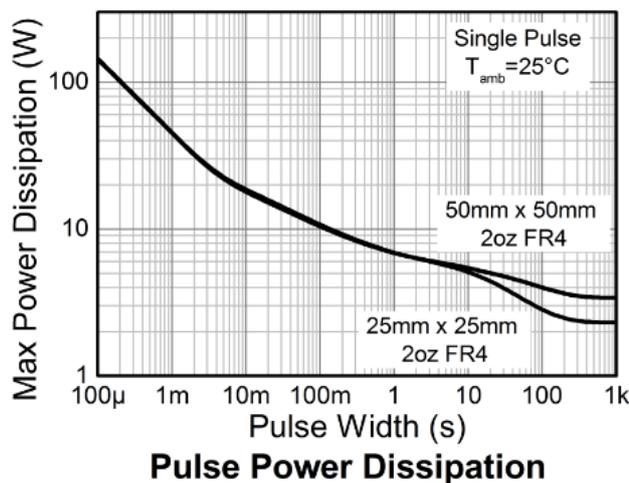
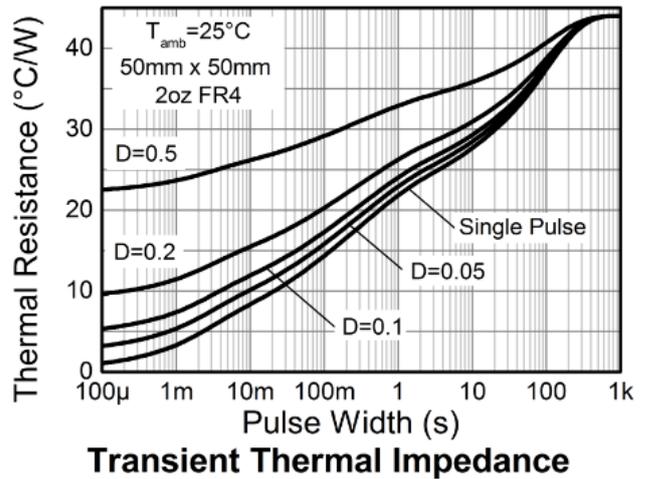
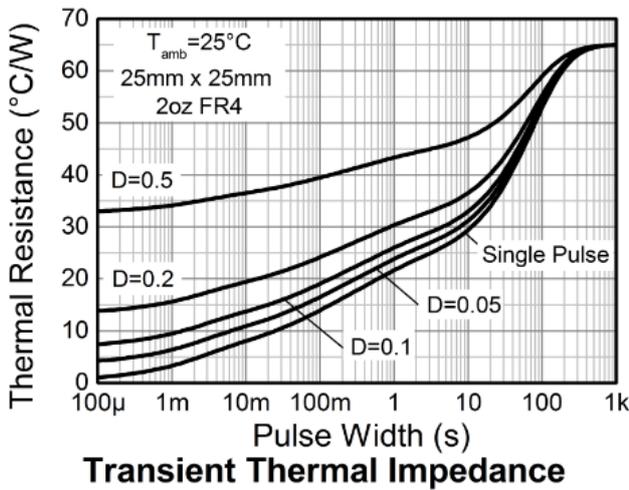
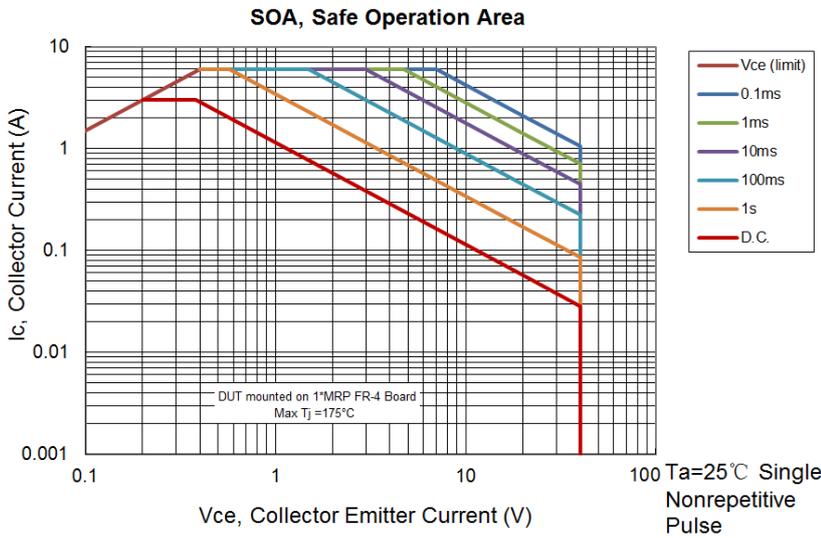
Characteristic	Symbol	Value	Unit	
Power Dissipation	P_D	(Note 6)	0.9	W
		(Note 7)	2.1	W
		(Note 8)	3.1	W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	(Note 6)	140	$^{\circ}\text{C/W}$
		(Note 7)	65	$^{\circ}\text{C/W}$
		(Note 8)	44	$^{\circ}\text{C/W}$
Thermal Resistance, Junction to Leads (Note 9)	$R_{\theta JL}$	8.5	$^{\circ}\text{C/W}$	
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +175	$^{\circ}\text{C}$	

ESD Ratings (Note 10)

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:
6. 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.
 7. Same as Note 5, except the device is mounted on 25mm x 25mm 2oz copper.
 8. Same as Note 5, except the device is mounted on 50mm x 50mm 2oz copper.
 9. Thermal resistance from junction to solder-point (at the collector tab).
 10. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

Thermal Characteristics and Derating Information

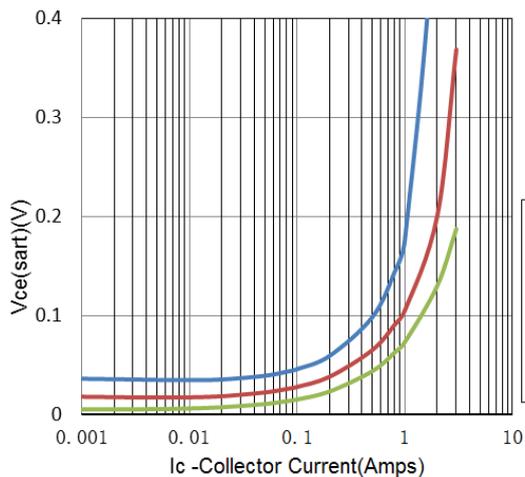


Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

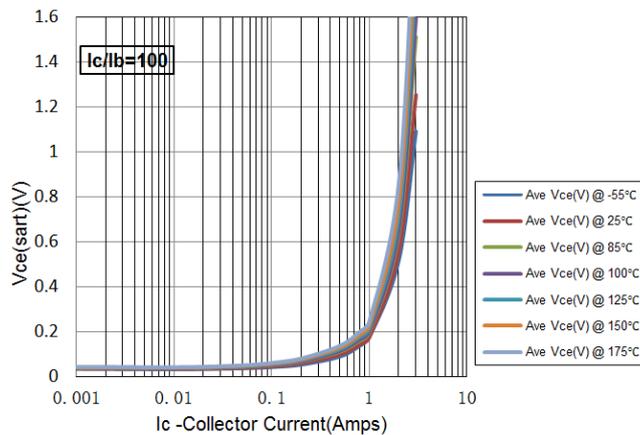
Characteristic	Symbol	Min	Typ.	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	-50	-65	—	V	$I_C = -100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Note 11)	BV_{CEO}	-40	-57	—	V	$I_C = -10\text{mA}$
Emitter-Base Breakdown Voltage	BV_{EBO}	-7	-8.8	—	V	$I_E = -100\mu\text{A}$
Collector Cut-Off Current	I_{CBO}	—	—	-20	nA	$V_{CB} = -40\text{V}$
		—	—	-10	μA	$V_{CB} = -40\text{V}, T_A = +125^\circ\text{C}$
Emitter Cut-Off Current	I_{EBO}	—	—	-20	nA	$V_{EB} = -6\text{V}$
DC Current Transfer Static Ratio (Note 11)	h_{FE}	300	527	800	—	$I_C = -10\text{mA}, V_{CE} = -2\text{V}$
		250	432	—	—	$I_C = -500\text{mA}, V_{CE} = -2\text{V}$
		200	377	—	—	$I_C = -1\text{A}, V_{CE} = -2\text{V}$
		150	273	—	—	$I_C = -2\text{A}, V_{CE} = -2\text{V}$
Collector-Emitter Saturation Voltage (Note 11)	$V_{CE(sat)}$	—	-99	-200	mV	$I_C = -500\text{mA}, I_B = -5\text{mA}$
		—	-177	-400	mV	$I_C = -1\text{A}, I_B = -10\text{mA}$
		—	-200	-500	mV	$I_C = -2\text{A}, I_B = -50\text{mA}$
Base-Emitter Saturation Voltage (Note 11)	$V_{BE(sat)}$	—	-0.8	-1	V	$I_C = -1\text{A}, I_B = -10\text{mA}$
Base-Emitter Turn-On Voltage (Note 11)	$V_{BE(on)}$	—	-0.75	0.9	V	$I_C = -1\text{A}, V_{CE} = -2\text{V}$
Transitional Frequency	f_T	100	—	—	MHz	$I_C = -50\text{mA}, V_{CE} = -5\text{V}, f = 50\text{MHz}$
Output Capacitance	C_{obo}	—	24	—	pF	$V_{CB} = -10\text{V}, f = 1\text{MHz}$
Switching Time	t_{ON}	—	35	—	ns	$V_{CC} = -10\text{V}, I_C = -500\text{mA}, I_{B1} = -I_{B2} = -50\text{mA}$
	t_{OFF}	—	600	—	ns	

Note: 11. Measured under pulsed conditions. Pulse width $\leq 300 \mu\text{s}$. Duty cycle $\leq 2\%$.

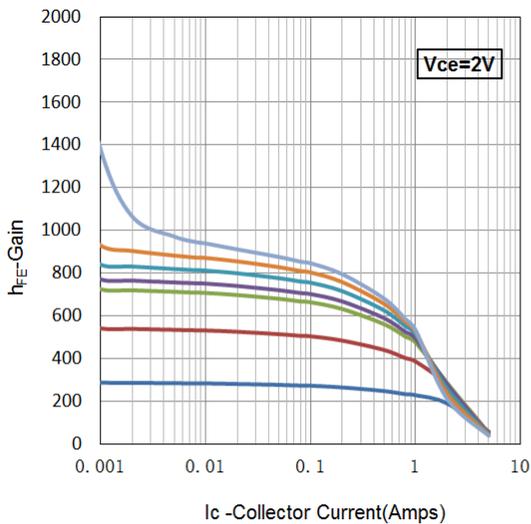
Typical Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)



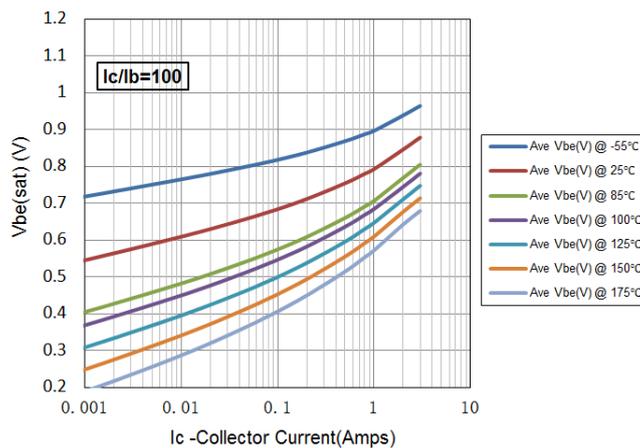
Vce(sat) Vs Ic



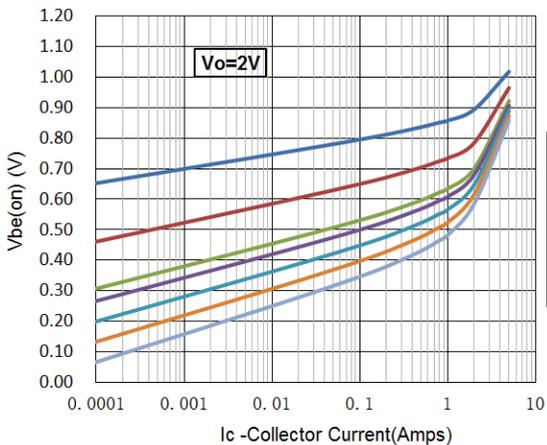
Vce(sat) Vs Ic



HFE Vs Ic



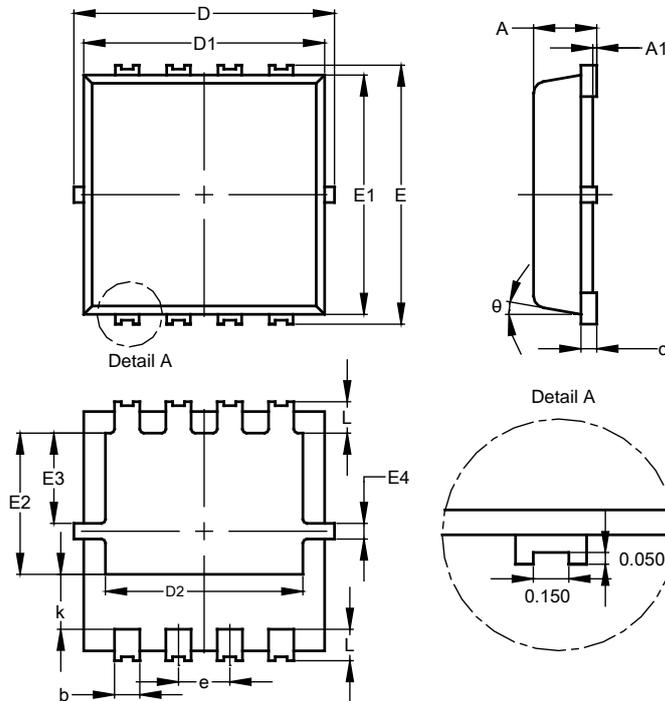
Vbe(sat) Vs Ic



Vbe(on) Vs Ic

Package Outline Dimensions

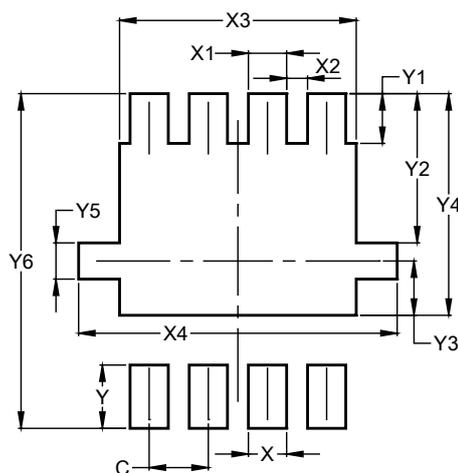
PowerDI3333-8 (SWP) (Type UX)



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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