优尚

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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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 VCE(sat) < -400mV @ -1A
- Minimum h_{FE} 200 @ I_C=-1A
- Rated to +175°C—Ideal For High Temperature Environment

Mechanical Data

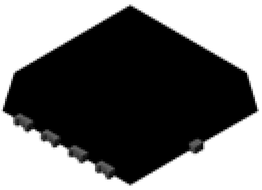
- Case: PowerDI®3333-8
- Case Material: Molded Plastic. “Green” Molding Compound UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish—Matte Tin Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.03 grams (Approximate)

Applications

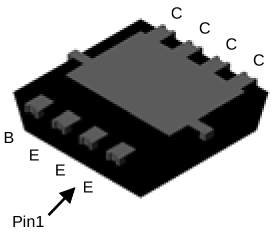
- High Side Switch
- Low Drop Out Regulator
- MOSFET or IGBT Gate Driving

PowerDI3333-8 (SWP) (Type UX)

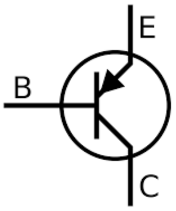
Equivalent Circuit



Top View



Bottom View



Device Symbol

Absolute Maximum Ratings (@T_A = +25°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	-3	A
Peak Pulse Current	I_{CM}	-6	A

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

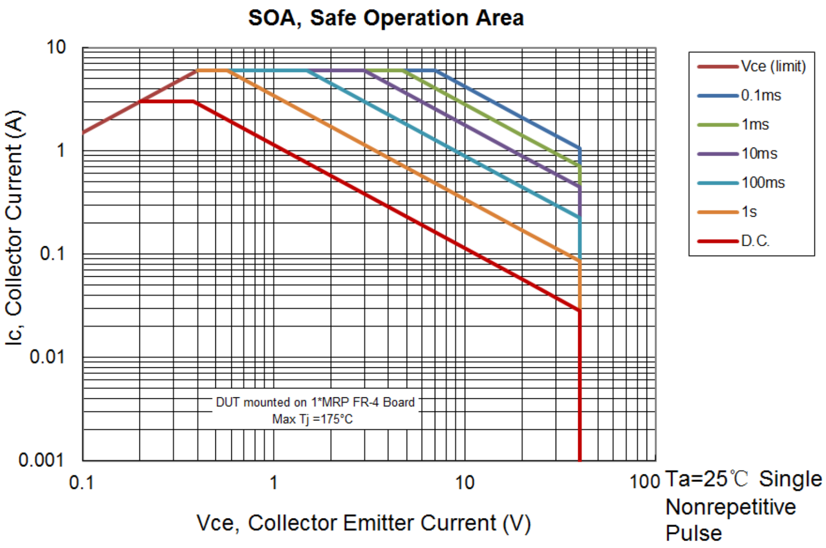
Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 5)	P_D	0.9	W
	(Note 6)		2.1	W
	(Note 7)		3.1	W
Thermal Resistance, Junction to Ambient	(Note 5)	$R_{\Theta JA}$	140	°C/W
	(Note 6)		65	°C/W
	(Note 7)		44	°C/W
Thermal Resistance, Junction to Leads (Note 8)		$R_{\Theta JL}$	8.5	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +175	°C

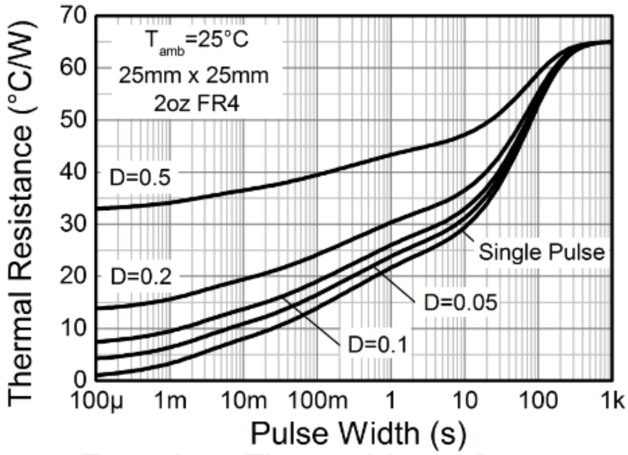
ESD Ratings (Note 9)

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

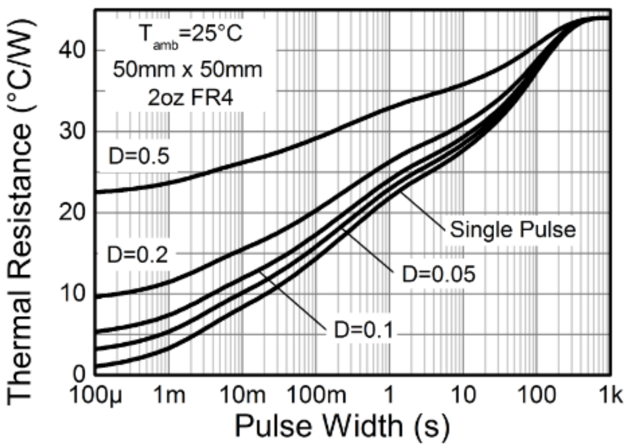
Notes:
5. For a device mounted with the collector tab on MRP FR4-PCB; device is measured under still air conditions whilst operating in a steady-state.
6. Same as Note 5, except the device is mounted on 25mm × 25mm 2oz copper.
7. Same as Note 5, except the device is mounted on 50mm × 50mm 2oz copper.
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

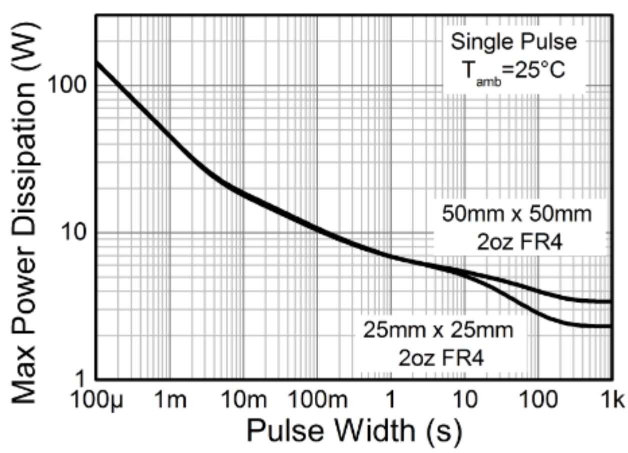




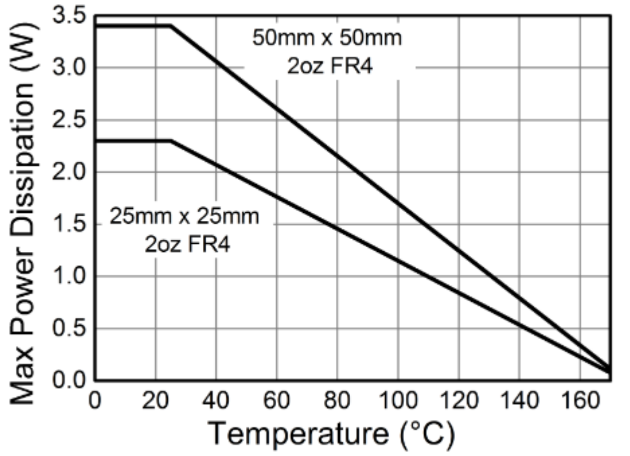
Transient Thermal Impedance



Transient Thermal Impedance



Pulse Power Dissipation



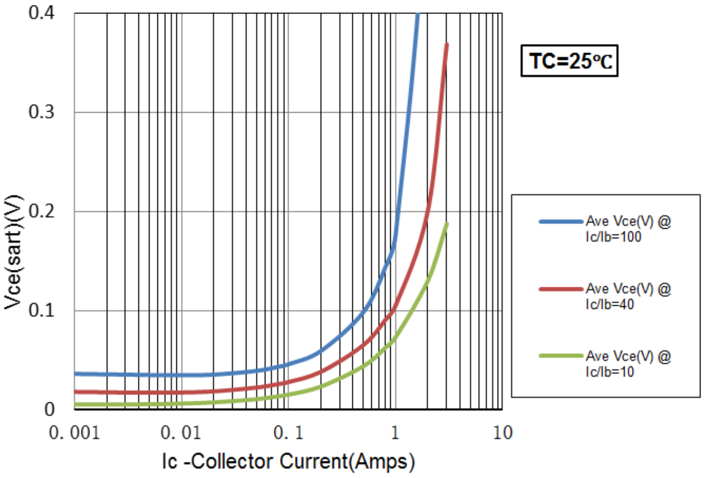
Derating Curve

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

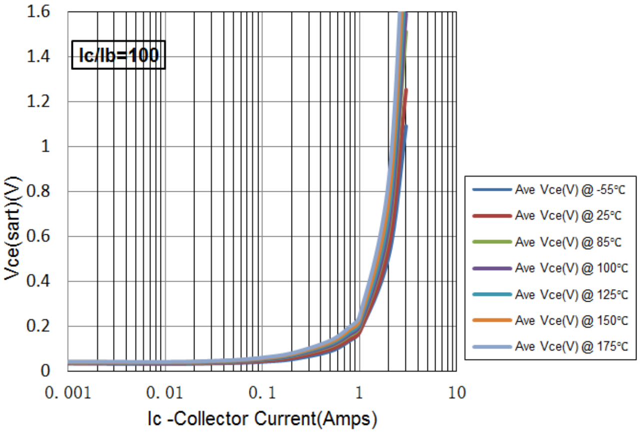
Characteristic	Symbol	Min	Typ.	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	-50	-65	—	V	$I_C = -100\mu A$
Collector-Emitter Breakdown Voltage (Note 10)	BV_{CEO}	-40	-57	—	V	$I_C = -10mA$
Emitter-Base Breakdown Voltage	BV_{EBO}	-7	-8.8	—	V	$I_E = -100\mu A$
Collector Cut-Off Current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

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

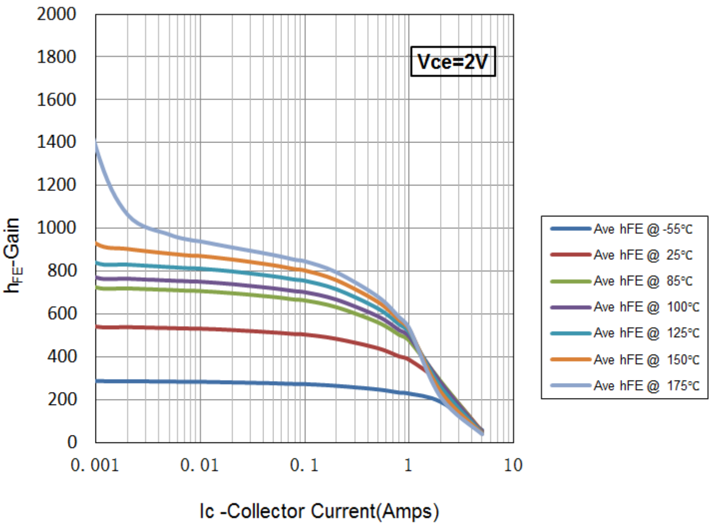
Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)



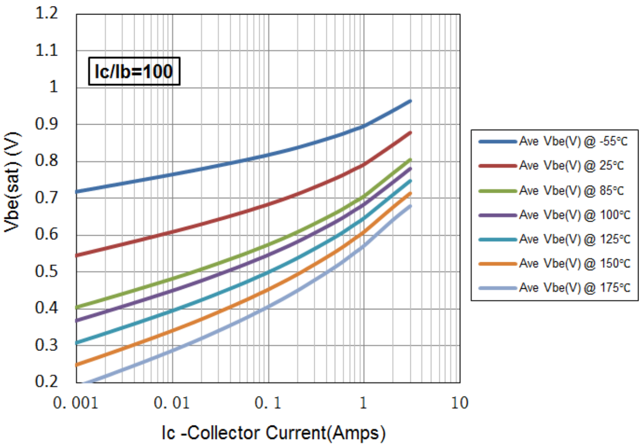
Vce(sat) Vs Ic



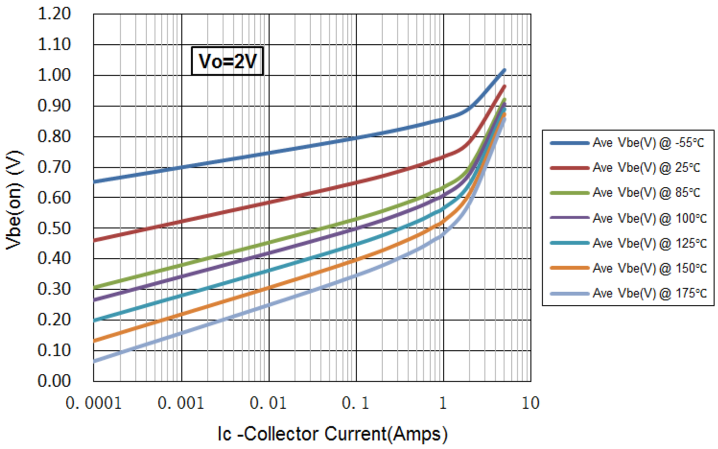
Vce(sat) Vs Ic



HFE Vs Ic



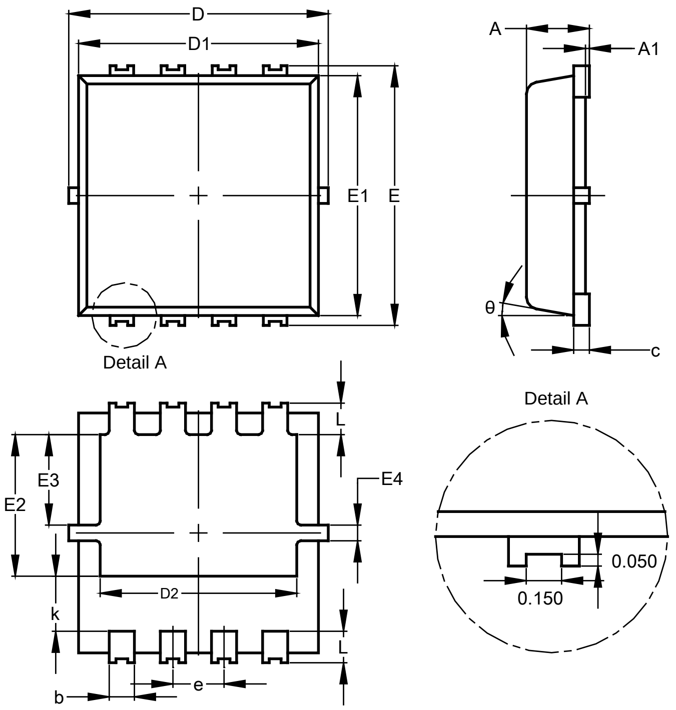
Vbe(sat) Vs Ic



Vbe(on) Vs Ic

Package Outline Dimensions

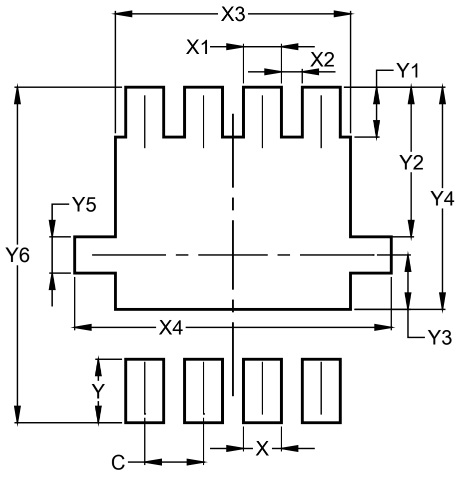
PowerDI3333-8 (SWP) (Type UX)



PowerDI3333-8 (SWP) (Type UX)			
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