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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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 Continuous Collector Current
- I$_{CM}$ = -3A Peak Pulse Current
- Low Saturation Voltage V$_{CE(sat)}$ < -320mV @ -1A
- Complementary NPN Type: NK-DXTN22040DFGQ
- Rated to +175°C – Ideal For High Temperature Environment
- Wettable Flank For Improved Optical Inspection

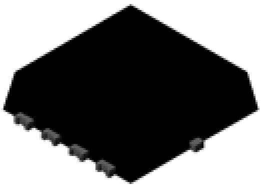
Mechanical Data

- 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 Plated Leads Solderable per MIL-STD-202, Method 208 ⓔ3
- Weight: 0.03 grams (Approximate)

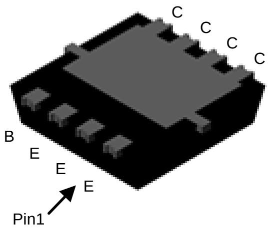
Applications

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

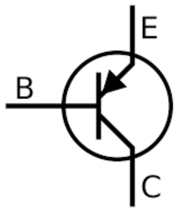
PowerDI3333-8 (SWP) (Type UX)



Top View



Bottom View



Device Symbol

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	-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°C, unless otherwise specified.)

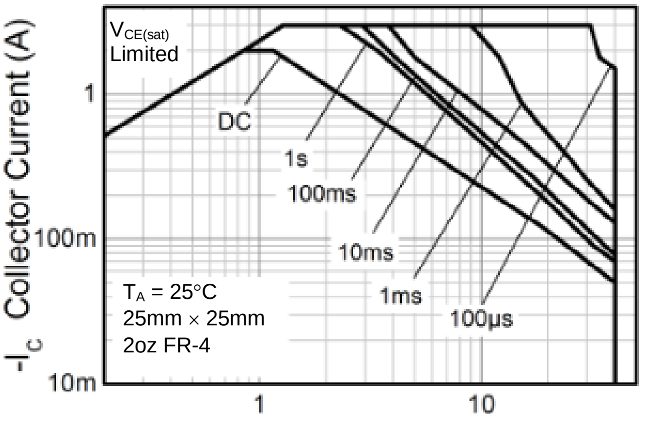
Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 5)	P_D	1.07	W
	(Note 6)		2.3	W
	(Note 7)		3.4	W
Thermal Resistance, Junction to Ambient	(Note 5)	$R_{\theta JA}$	140	°C/W
	(Note 6)		65	°C/W
	(Note 7)		44	°C/W
Thermal Resistance, Junction to Leads (Note 8)		$R_{\theta JL}$	11	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +175	°C

ESD Ratings (Note 9)

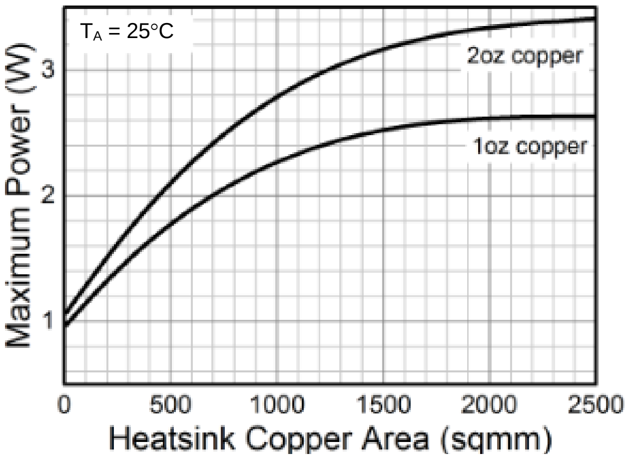
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge – Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge – Machine Model	ESD MM	400	V	C

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.

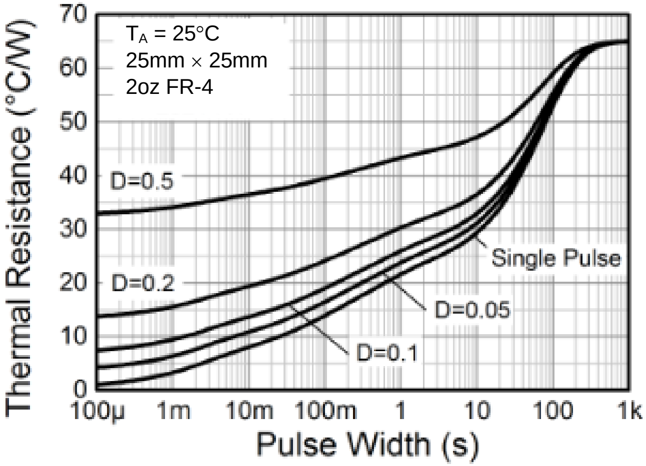
Thermal Characteristics and Derating Information



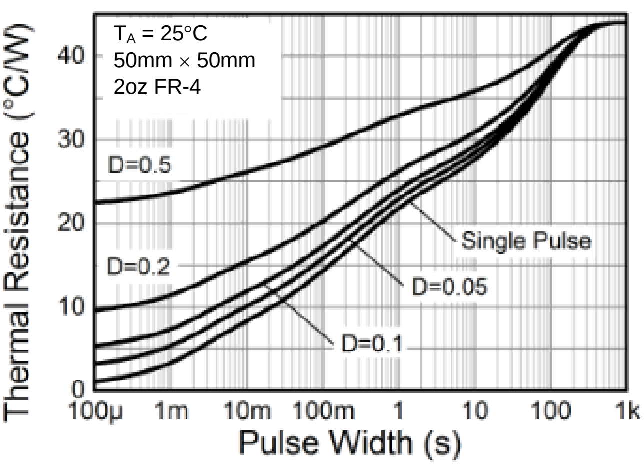
Safe Operating Area



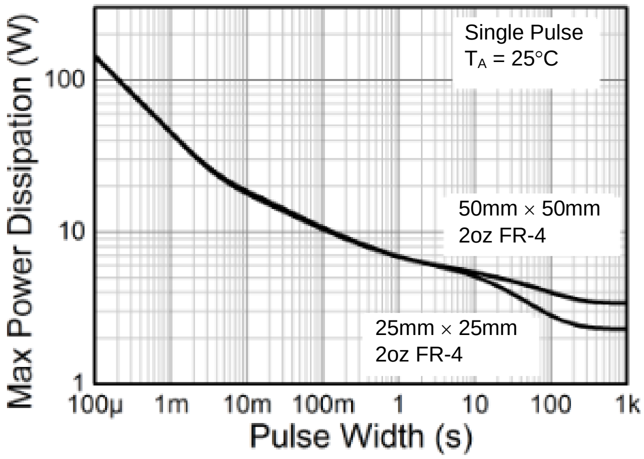
Max Power Dissipation vs Copper Area



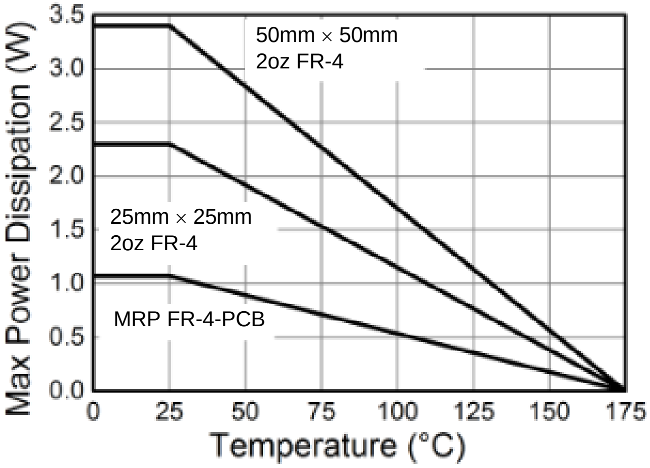
Transient Thermal Impedance



Transient Thermal Impedance



Pulse Power Dissipation



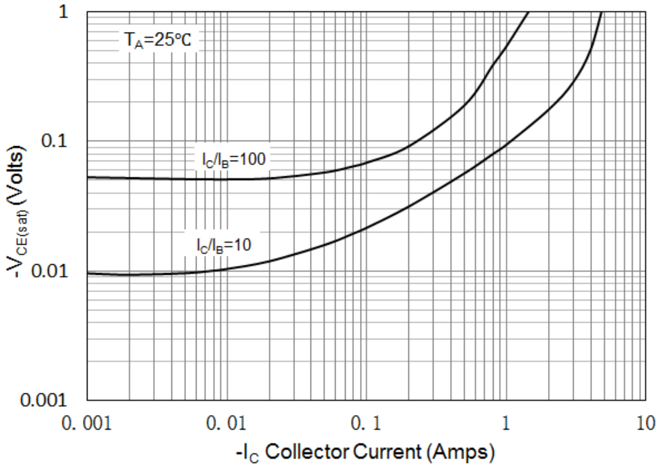
Derating Curve

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

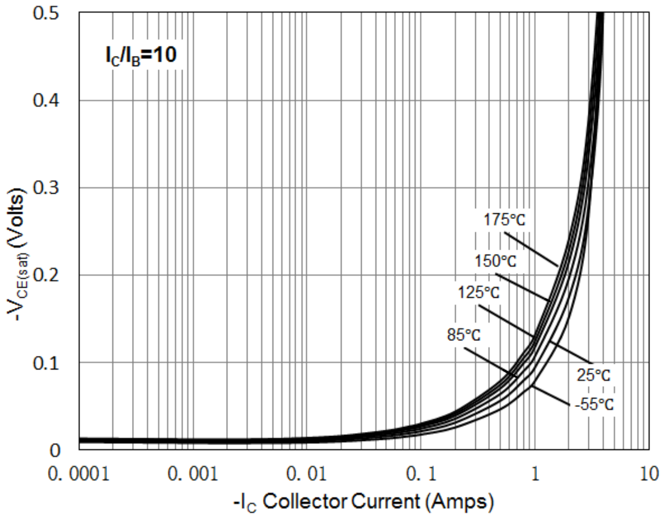
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	-50	-71	—	V	I_C = -100µA
Collector-Emitter Breakdown Voltage (Note 10)	BV_{CEO}	-40	-58	—	V	I_C = -10mA
Emitter-Base Breakdown Voltage	BV_{EBO}	-7	-8.5	—	V	I_E = -100µA
Collector-Base Cut-Off Current	I_{CBO}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

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

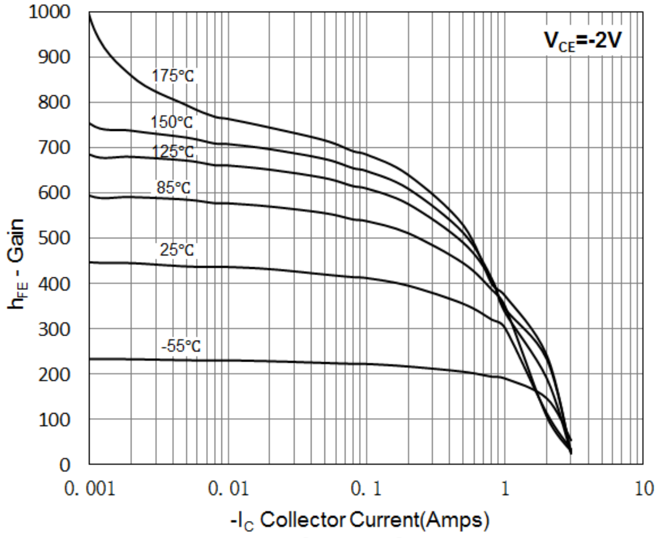
Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)



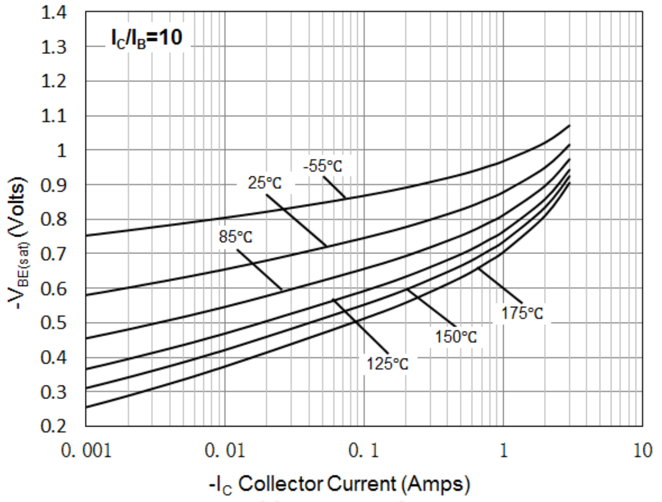
$V_{CE(sat)}$ vs I_C



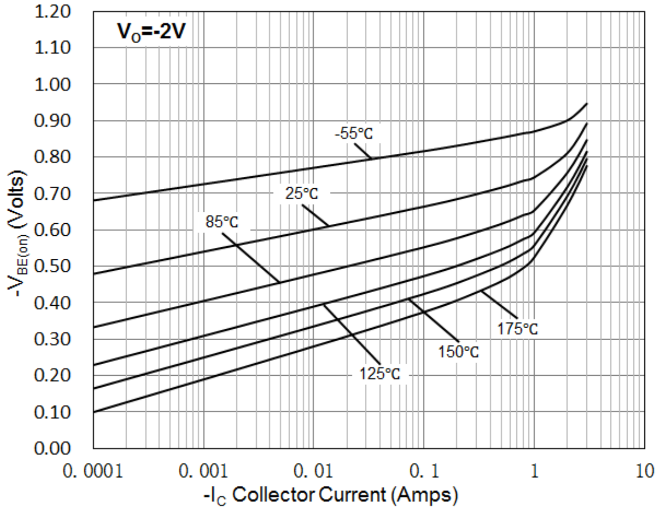
$V_{CE(sat)}$ vs I_C



h_{FE} vs I_C



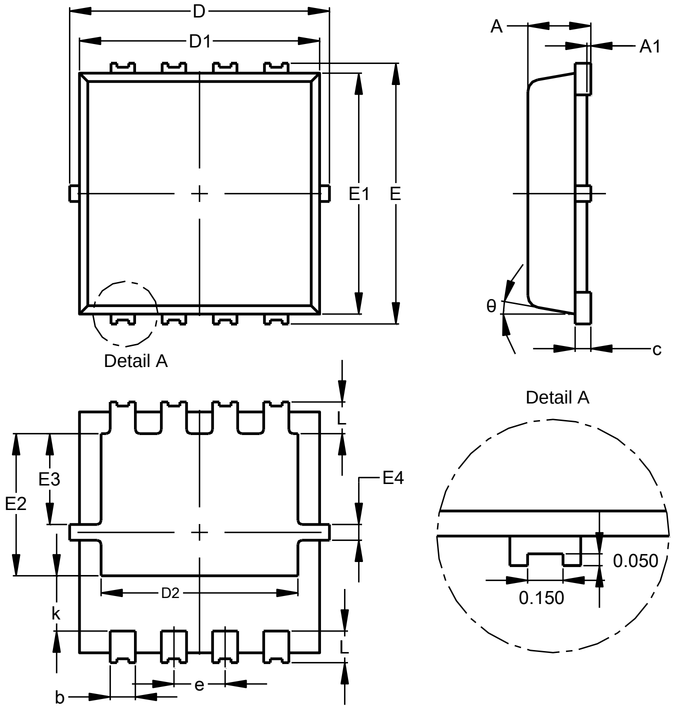
$V_{BE(sat)}$ vs I_C



$V_{BE(on)}$ vs I_C

Package Outline Dimensions

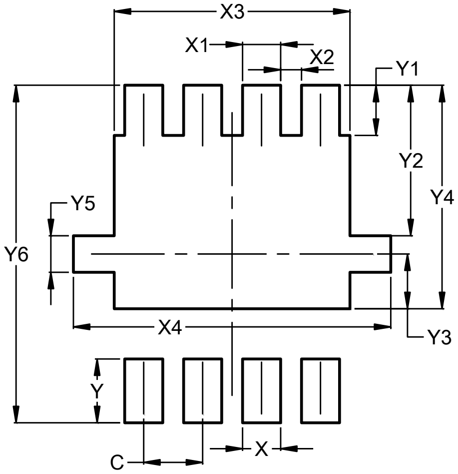
PowerDI3333-8 (SWP) (Type UX)



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