



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



企业QQ二维码

Product Summary

BV _{DSS}	R _{DS(ON)} Max	I _D Max T _c = +25°C
100V	66mΩ @ V _{GS} = 10V	12A
	114mΩ @ V _{GS} = 4.5V	9A

Features and Benefits

- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage

Description and Applications

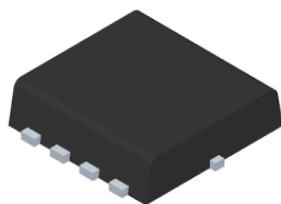
This new generation MOSFET is designed to minimize the on-state resistance (R_{DS(ON)}) yet maintain superior switching performance, making it ideal for high-efficiency power-management applications.

- Power-management functions
- Analog switches

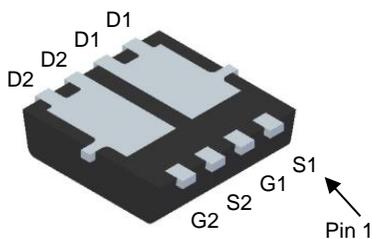
Mechanical Data

- Package: PowerDI[®]3333-8
- Package Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections Indicator: See Diagram
- Terminals: Finish — Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208
- Weight: 0.072 grams (Approximate)

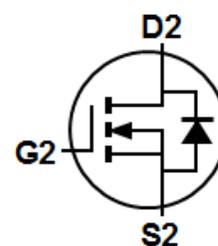
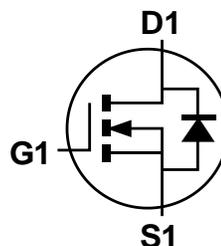
PowerDI3333-8 (Type UXC)



Top View



Bottom View



Equivalent Circuit

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

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V _{DSS}	100	V
Gate-Source Voltage			V _{GSS}	±20	V
Continuous Drain Current, V _{GS} = 10V (Note 6)	Steady State	T _C = +25°C T _C = +70°C	I _D	12 10	A
Maximum Body Diode Forward Current (Note 6)			I _S	12	A
Pulsed Drain Current (10μs Pulse, Duty Cycle = 1%)			I _{DM}	20	A
Pulsed Drain Body Diode Forward Current (10μs Pulse, Duty Cycle = 1%)			I _{SM}	20	A
Avalanche Current (L = 0.1mH) (Note 7)			I _{AS}	6	A
Avalanche Energy (L = 0.1mH) (Note 7)			E _{AS}	1.8	mJ

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

Characteristic			Symbol	Value	Unit
Total Power Dissipation (Note 5)			P _D	1	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady State		R _{θJA}	120	°C/W
Total Power Dissipation (Note 6)			P _D	2.2	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady State		R _{θJA}	57	°C/W
Thermal Resistance, Junction to Case (Note 6)			R _{θJC}	6.7	
Operating and Storage Temperature Range			T _J , T _{STG}	-55 to +150	°C

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 8)						
Drain-Source Breakdown Voltage	BV _{DSS}	100	—	—	V	V _{GS} = 0V, I _D = 250μA
Zero Gate Voltage Drain Current T _J = +25°C	I _{DSS}	—	—	1	μA	V _{DS} = 80V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±100	nA	V _{GS} = ±20V, V _{DS} = 0V
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	V _{GS(TH)}	1	—	3	V	V _{DS} = V _{GS} , I _D = 250μA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	48	66	mΩ	V _{GS} = 10V, I _D = 4.5A
		—	57	84		V _{GS} = 6V, I _D = 4A
		—	73	114	mΩ	V _{GS} = 4.5V, I _D = 2.6A
Diode Forward Voltage	V _{SD}	—	0.8	1	V	V _{GS} = 0V, I _S = 1A
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C _{iss}	—	228	—	pF	V _{DS} = 50V, V _{GS} = 0V, f = 1MHz
Output Capacitance	C _{oss}	—	89.3	—	pF	
Reverse Transfer Capacitance	C _{rss}	—	2.5	—	pF	
Gate Resistance	R _g	—	8.2	—	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1MHz
Total Gate Charge (V _{GS} = 4.5V)	Q _g	—	2.5	—	nC	V _{DS} = 50V, I _D = 4.5A
Total Gate Charge (V _{GS} = 10V)	Q _g	—	4.5	—	nC	
Gate-Source Charge	Q _{gs}	—	0.6	—	nC	
Gate-Drain Charge	Q _{gd}	—	1.3	—	nC	
Turn-On Delay Time	t _{D(ON)}	—	3.0	—	ns	V _{DS} = 50V, R _L = 11Ω V _{GS} = 10V, R _{GEN} = 3Ω
Turn-On Rise Time	t _r	—	3.1	—	ns	
Turn-Off Delay Time	t _{D(OFF)}	—	12.3	—	ns	
Turn-Off Fall Time	t _f	—	4.3	—	ns	I _F = 4.5A, di/dt = 300A/μs
Reverse Recovery Time	t _{RR}	—	22.9	—	ns	
Reverse Recovery Charge	Q _{RR}	—	45.2	—	nC	

- Notes:
- Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.
 - Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.
 - I_{AS} and E_{AS} ratings are based on low frequency and duty cycles to keep T_J = +25°C.
 - Short duration pulse test used to minimize self-heating effect.
 - Guaranteed by design. Not subject to product testing.

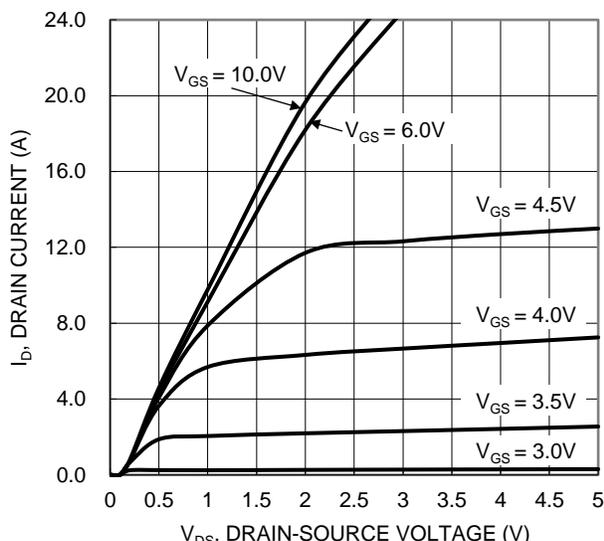


Figure 1. Typical Output Characteristic

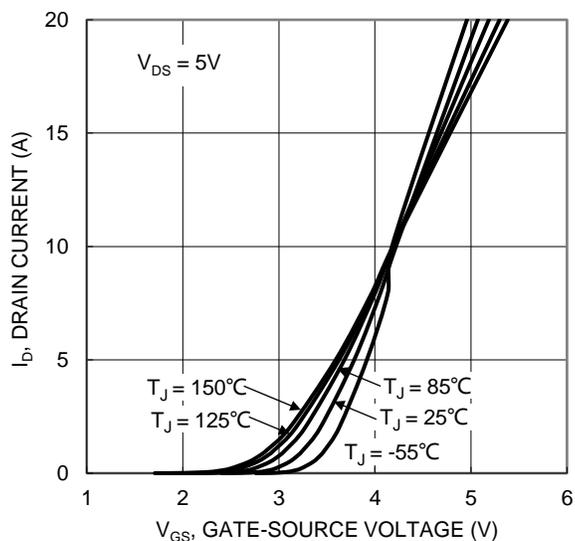


Figure 2. Typical Transfer Characteristic

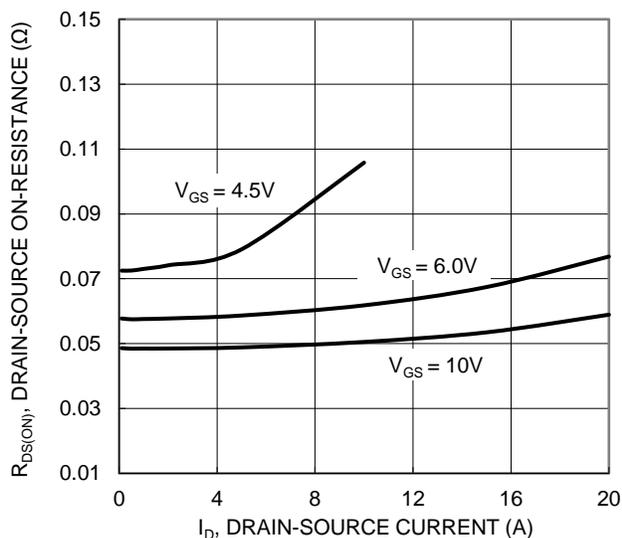


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

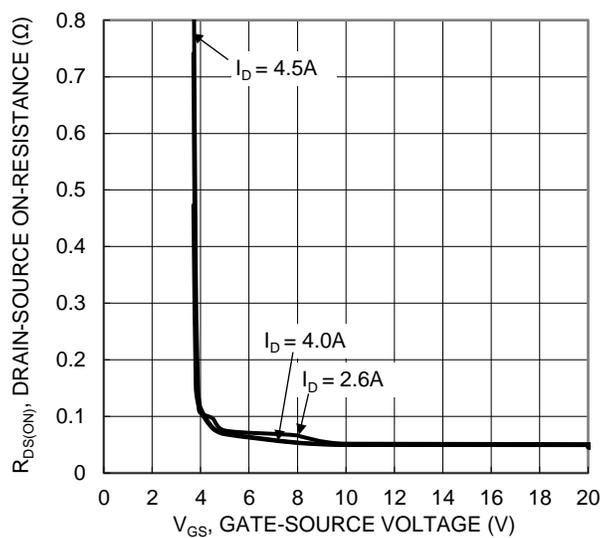


Figure 4. Typical Transfer Characteristic

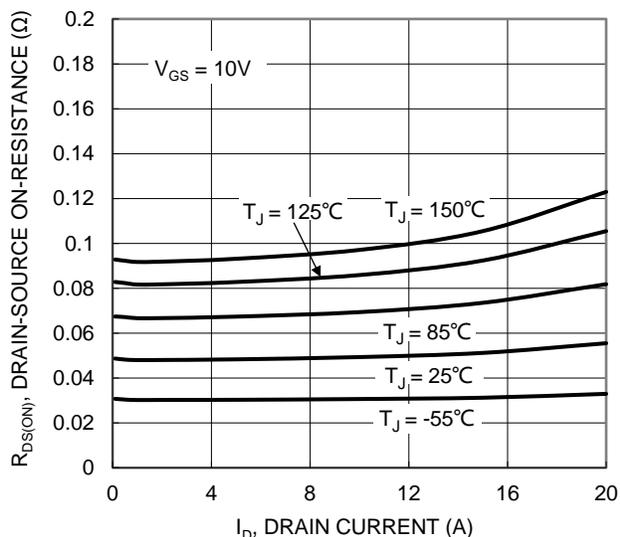


Figure 5. Typical On-Resistance vs. Drain Current and Junction Temperature

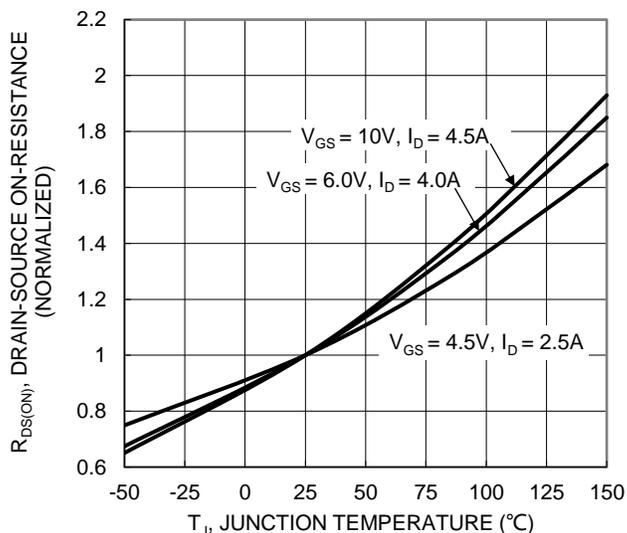


Figure 6. On-Resistance Variation with Junction Temperature

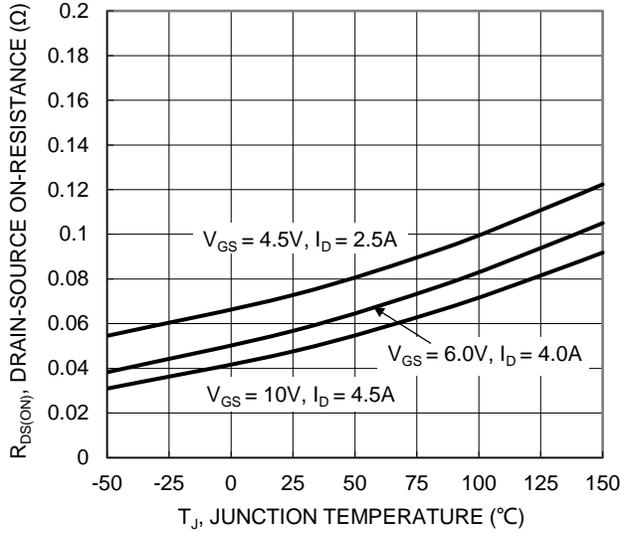


Figure 7. On-Resistance Variation with Junction Temperature

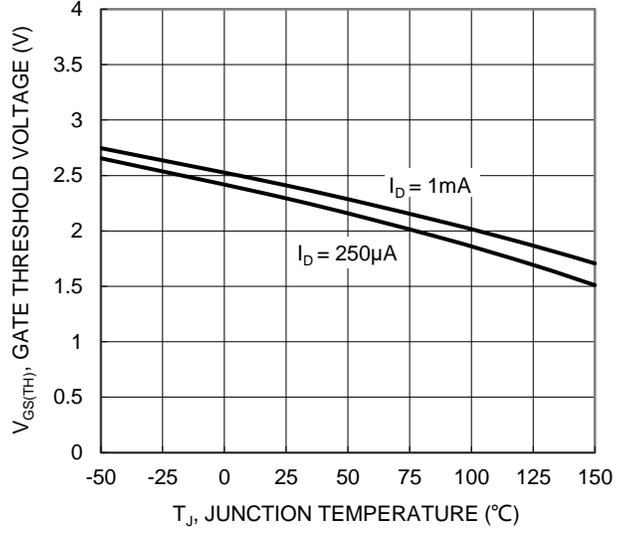


Figure 8. Gate Threshold Variation vs. Junction Temperature

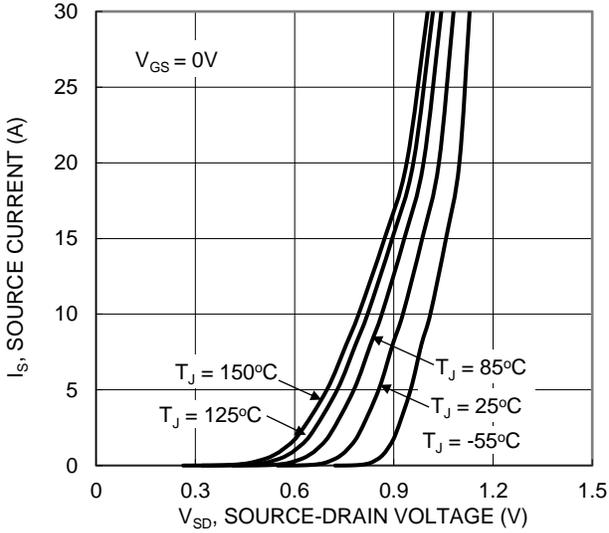


Figure 9. Diode Forward Voltage vs. Current

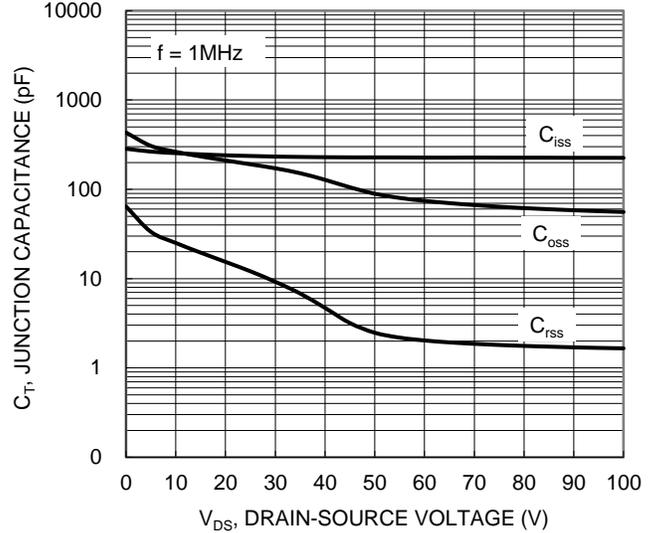


Figure 10. Typical Junction Capacitance

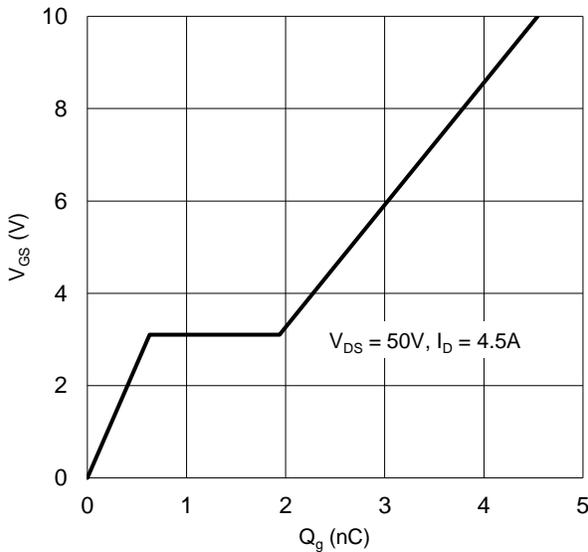


Figure 11. Gate Charge

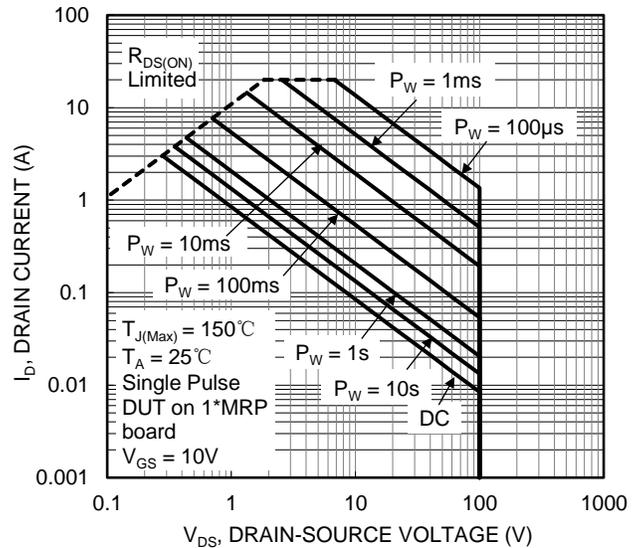


Figure 12. SOA, Safe Operation Area

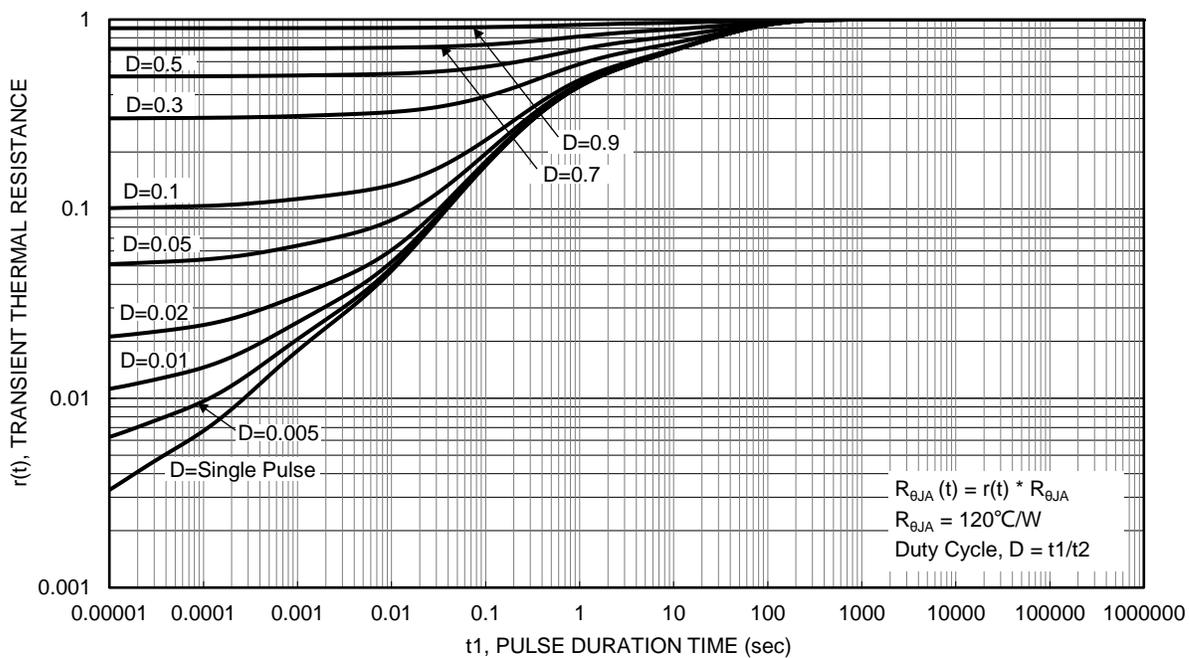
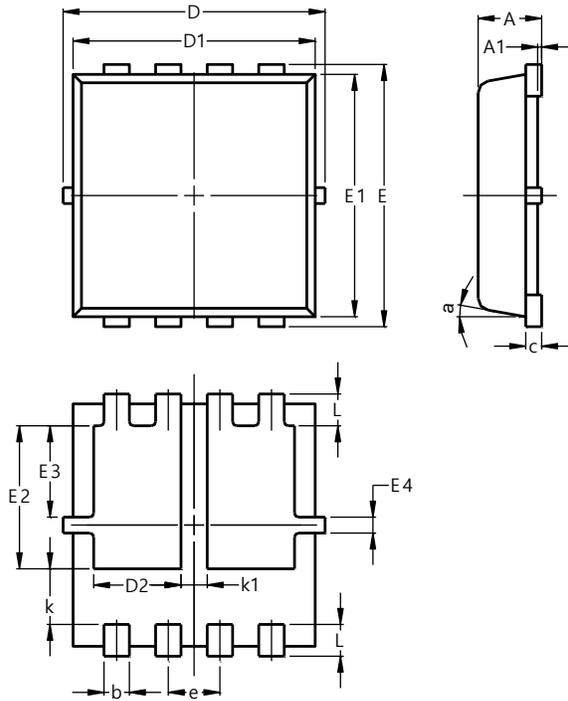


Figure 13. Transient Thermal Resistance

Package Outline Dimensions

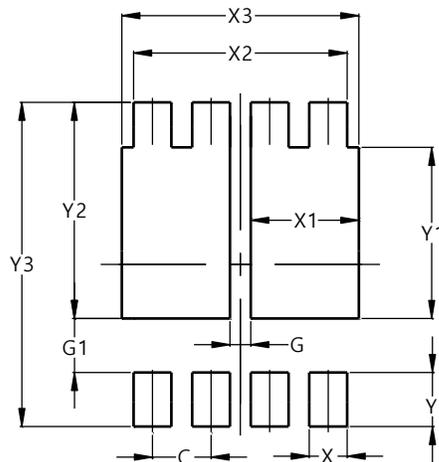
PowerDI3333-8 (Type UXC)



PowerDI3333-8 (Type UXC)			
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	0.90	1.30	1.10
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
L	0.30	0.50	0.40
k	0.50	0.90	0.70
k1	0.13	0.53	0.33
a	0°	12°	10°
All Dimensions in mm			

Suggested Pad Layout

PowerDI3333-8 (Type UXC)



Dimensions	Value (in mm)
C	0.650
G	0.230
G1	0.600
X	0.420
X1	1.200
X2	2.370
X3	2.630
Y	0.600
Y1	1.900
Y2	2.400
Y3	3.600