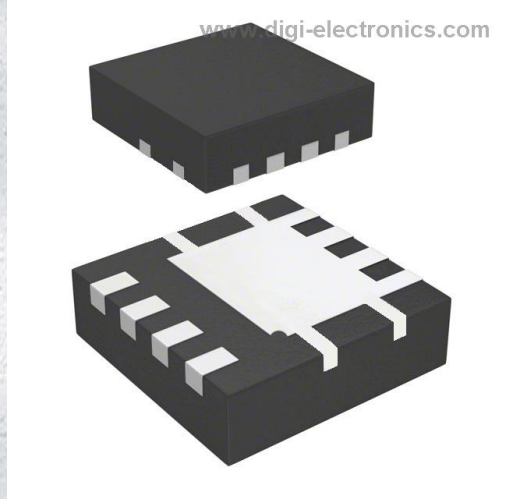
DMP1011LFV-7 Datasheet



https://www.DiGi-Electronics.com

DiGi Electronics Part Number	DMP1011LFV-7-DG
Manufacturer	Diodes Incorporated
Manufacturer Product Number	DMP1011LFV-7
Description	MOSFET P-CH 12V 19A POWERDI3333
Detailed Description	P-Channel 12 V 19A (Tc) 2.16W Surface Mount PowerDI3333-8

Tel: +00 852-30501935

RFQ Email: Info@DiGi-Electronics.com

Purchase and inquiry

Manufacturer Product Number:	Manufacturer:
DMP1011LFV-7	Diodes Incorporated
Series:	Product Status:
-	Active
FET Type:	Technology:
P-Channel	MOSFET (Metal Oxide)
Drain to Source Voltage (Vdss):	Current - Continuous Drain (Id) @ 25°C:
12 V	19A (Tc)
Drive Voltage (Max Rds On, Min Rds On):	Rds On (Max) @ Id, Vgs:
2.5V, 4.5V	11.7mOhm @ 12A, 4.5V
Vgs(th) (Max) @ Id:	Gate Charge (Qg) (Max) @ Vgs:
1.2V @ 250µA	9.5 nC @ 6 V
Vgs (Max):	Input Capacitance (Ciss) (Max) @ Vds:
-6V	913 pF @ 6 V
FET Feature:	Power Dissipation (Max):
-	2.16W
Operating Temperature:	Mounting Type:
-55°C ~ 150°C (TJ)	Surface Mount
Supplier Device Package:	Package / Case:
PowerDI3333-8	8-PowerVDFN
Base Product Number:	
DMP1011	

Environmental & Export classification

RoHS Status:	Moisture Sensitivity Level (MSL):
ROHS3 Compliant	1 (Unlimited)
REACH Status:	ECCN:
REACH Unaffected	EAR99
HTSUS:	
8541.29.0095	

Lead-free Green

DMP1011LFV

P-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

BV_{DSS}	$R_{DS(ON)}$ Max	I_D Max T_C = +25°C
-12V	11.7mΩ @ V_{GS} = -4.5V	-19A
	18.6mΩ @ V_{GS} = -2.5V	-15A

Description

This 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.

Applications

- Backlighting
- Power Management Functions
- DC-DC Converters

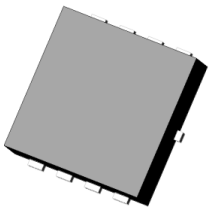
Features and Benefits

- Low $R_{DS(ON)}$ – Ensures On-State Losses are Minimized
- Small Form Factor Thermally Efficient Package Enables Higher Density End Products (PowerDI®)
- Occupies just 33% of the Board Area Occupied by SO-8 Enabling Smaller End Product
- ESD Protected Up To 3kV
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

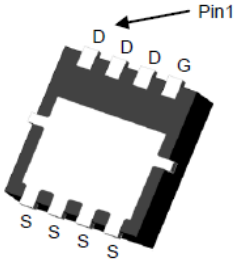
Mechanical Data

- Case: PowerDI3333-8 (Type UX)
- Case 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 e3
- Weight: 0.072grams (Approximate)

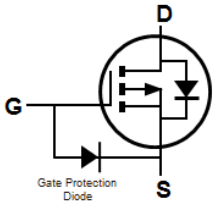
PowerDI3333-8 (Type UX)



Top View



Bottom View
Pin Configuration



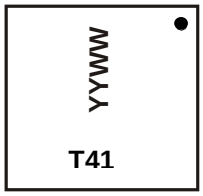
Equivalent Circuit

Ordering Information (Note 4)

Part Number	Case	Packaging
DMP1011LFV-7	PowerDI3333-8 (Type UX)	2,000/Tape & Reel
DMP1011LFV-13	PowerDI3333-8 (Type UX)	3,000/Tape & Reel

Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
2. See http://www.diodes.com/quality/lead_free.html for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
4. For packaging details, go to our website at http://www.diodes.com/products/packages.html.

Marking Information



T41 = Product Marking Code
YYWW = Date Code Marking
YY = Last Two Digits of Year (ex: 17 for 2017)
WW = Week Code (01 to 53)

PowerDI is a registered trademark of Diodes Incorporated.

DMP1011LFV

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

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V_{DSS}	-12	V
Gate-Source Voltage			V_{GSS}	- 6	V
Continuous Drain Current (Note 6) V_{GS} = 4.5V	t<10s	T_A = +25°C T_A = +70°C	I_D	-13 -10	A
	Steady State	T_C = +25°C T_C = +70°C	I_D	-19 -15	A
Maximum Continuous Body Diode Forward Current (Note 6)			I_S	3	A
Pulsed Drain Current (380µs Pulse, Duty Cycle = 1%)			I_{DM}	70	A
Avalanche Current (Note 7) L = 0.3mH			I_{AS}	24	A
Avalanche Energy (Note 7) L = 0.3mH			E_{AS}	86	mJ

Thermal Characteristics

Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 5)		P_D	1.05	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	$R_{\theta JA}$	118	°C/W
	t<10s		83.5	
Total Power Dissipation (Note 6)		P_D	2.16	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady State	$R_{\theta JA}$	57	°C/W
	t<10s		40.3	
Thermal Resistance, Junction to Case (Note 6)		$R_{\theta JC}$	11.7	
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}	-12	—	—	V	V_{GS} = 0V, I_D = -250µA
Zero Gate Voltage Drain Current (T_J = +25°C)	I_{DSS}	—	—	-1	µA	V_{DS} = -9.6V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	—	—	-100	nA	V_{GS} = -6V, V_{DS} = 0V
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	$V_{GS(TH)}$	-0.6	—	-1.2	V	V_{DS} = V_{GS}, I_D = -250µA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	9.8	11.7	mΩ	V_{GS} = -4.5V, I_D = -12A
		—	14.6	18.6		V_{GS} = -2.5V, I_D = -9A
Diode Forward Voltage	V_{SD}	—	-0.8	-1.0	V	V_{GS} = 0V, I_S = -16A
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C_{iss}	—	913	—	pF	V_{DS} = -6V, V_{GS} = 0V, f = 1.0MHz
Output Capacitance	C_{oss}	—	458	—		
Reverse Transfer Capacitance	C_{rss}	—	53	—		
Gate Resistance	R_g	—	1.85	—	Ω	V_{DS} = 0V, V_{GS} = 0V, f = 1.0MHz
Total Gate Charge (V_{GS} = -6V)	Q_g	—	9.5	—	nC	V_{DS} = -6V, I_D = -12A
Total Gate Charge (V_{GS} = -4.5V)	Q_g	—	7.1	—		
Gate-Source Charge	Q_{gs}	—	1.4	—		
Gate-Drain Charge	Q_{gd}	—	1.1	—		
Turn-On Delay Time	$t_{D(ON)}$	—	6.3	—	ns	V_{DS} = -6V, V_{GS} = -4.5V, R_L = 1Ω, R_g = 4.7Ω, I_D =-12A
Turn-On Rise Time	t_R	—	2.6	—		
Turn-Off Delay Time	$t_{D(OFF)}$	—	14.4	—		
Turn-Off Fall Time	t_F	—	3.9	—		
Body Diode Reverse Recovery Time	t_{RR}	—	13.5	—	ns	I_F = -12A, dI/dt = 100A/µs
Body Diode Reverse Recovery Charge	Q_{RR}	—	2.5	—	nC	I_F = -12A, dI/dt = 100A/µs

Notes: 5. Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.
6. Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1-inch square copper plate.
7. I_{AS} and E_{AS} ratings are based on low frequency and duty cycles to keep T_J = +25°C.
8. Short duration pulse test used to minimize self-heating effect.
9. Guaranteed by design. Not subject to production testing.

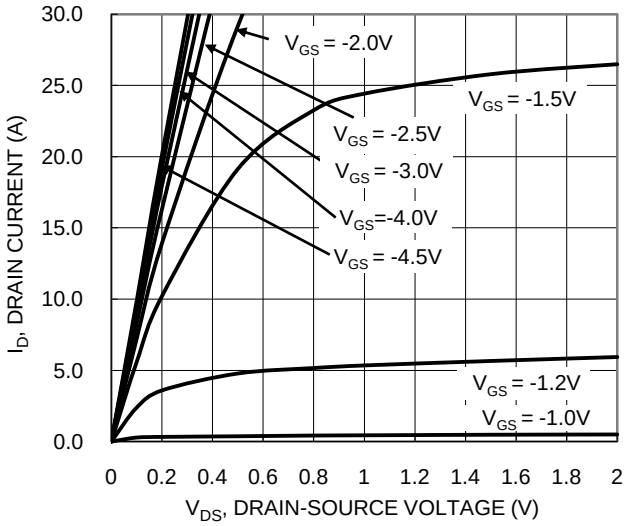


Figure 1. Typical Output Characteristic

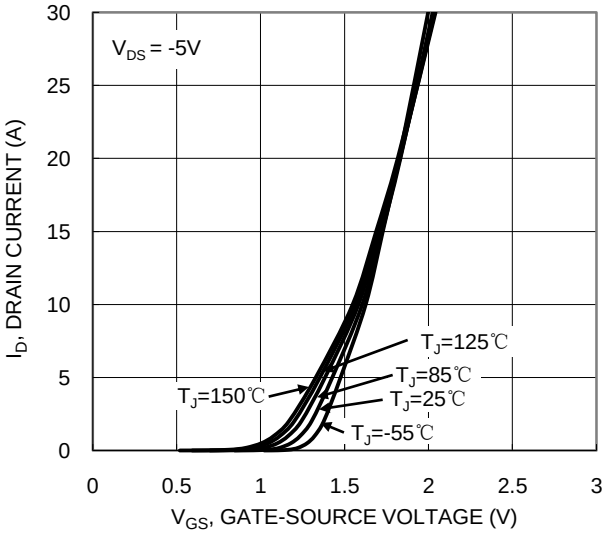


Figure 2. Typical Transfer Characteristic

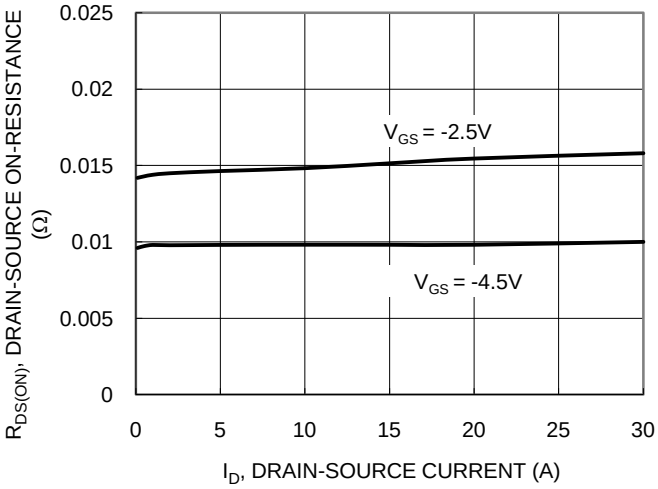


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

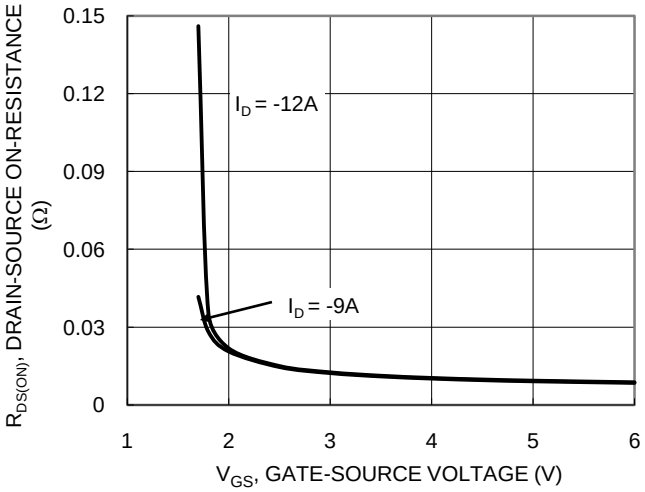


Figure 4. Typical Transfer Characteristic

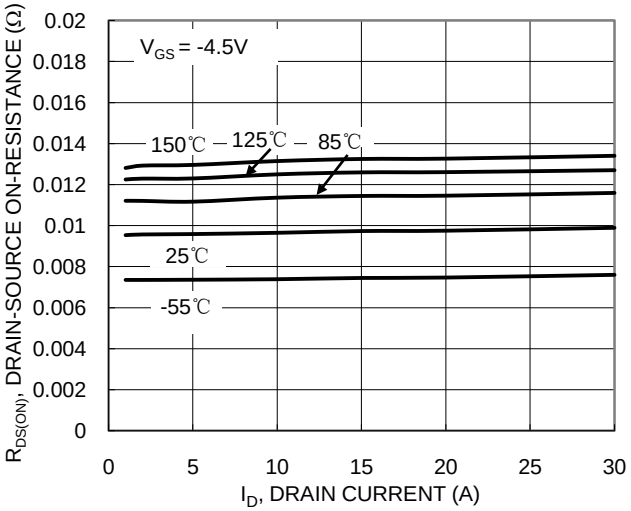


Figure 5. Typical On-Resistance vs. Drain Current and Temperature

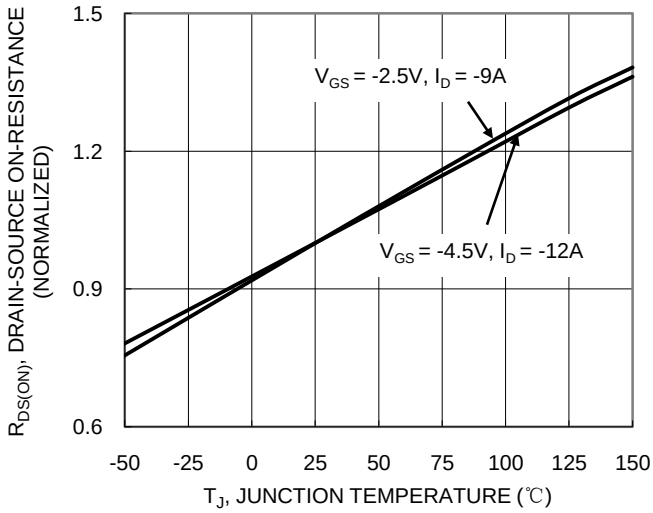


Figure 6. On-Resistance Variation with Temperature

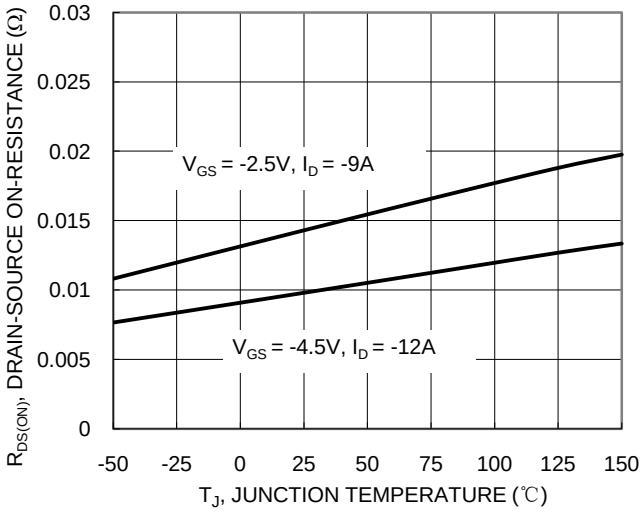


Figure 7. On-Resistance Variation with Temperature

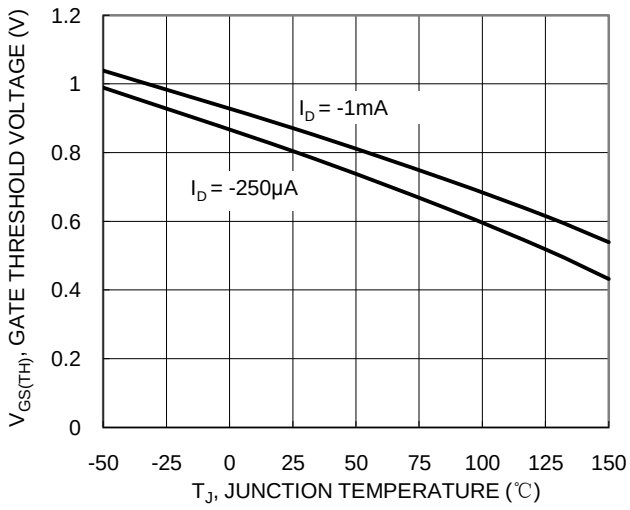


Figure 8. Gate Threshold Variation vs. Junciton Temperature

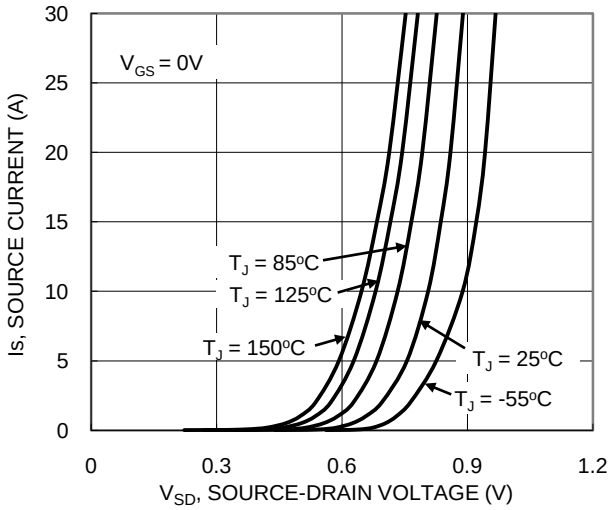


Figure 9. Diode Forward Voltage vs. Current

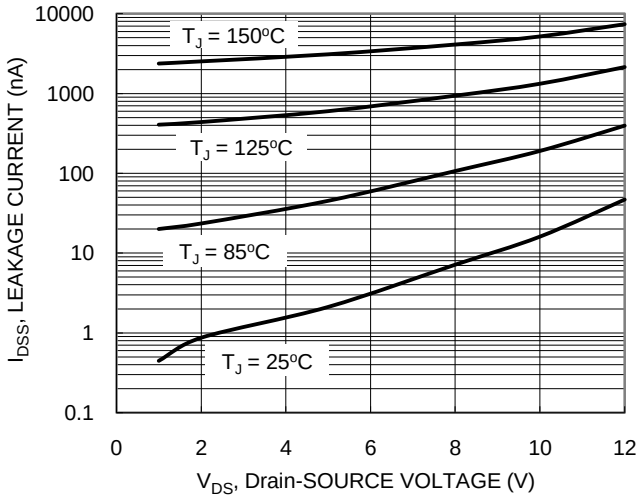


Figure 10. Typical Drain-Source Leakge Current vs. Voltage

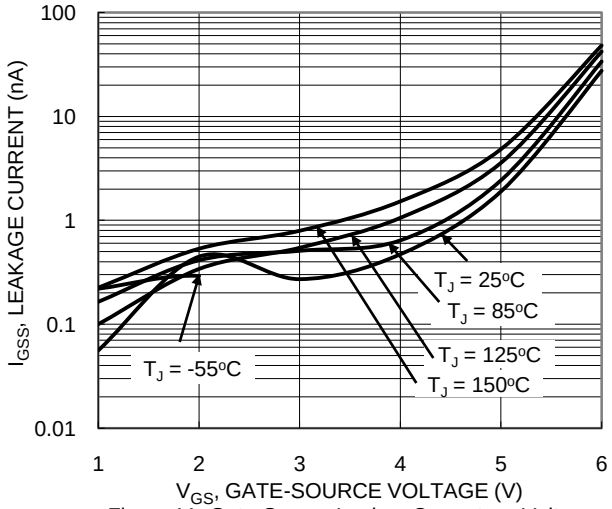


Figure 11. Gate-Source Leakge Current vs. Voltage

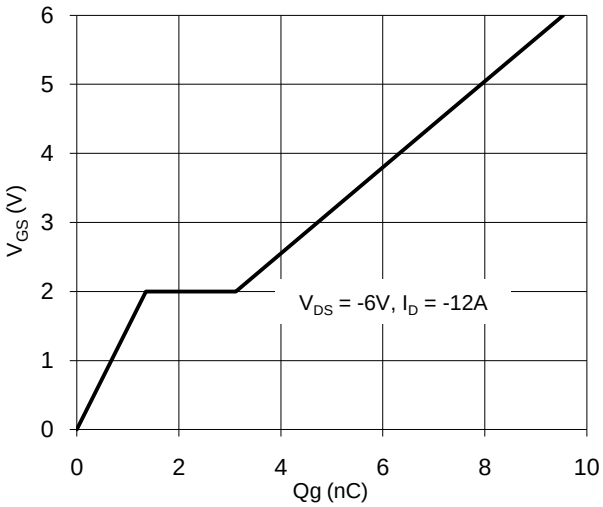


Figure 12. Gate Charge

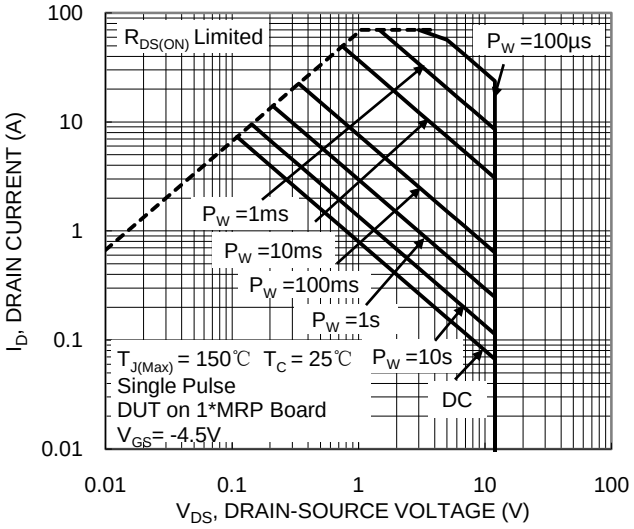


Figure 13. SOA, Safe Operation Area

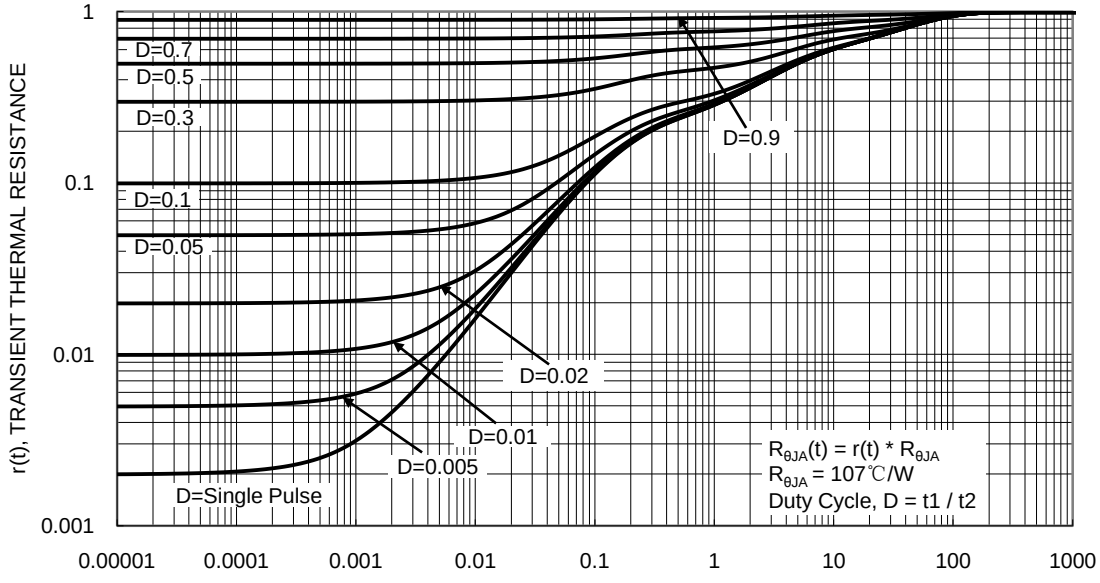
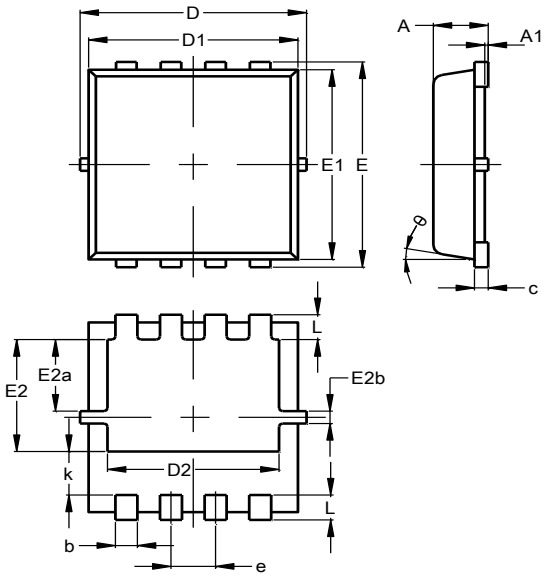


Figure 14.Transient Thermal Resistance

Package Outline Dimensions

Please see http://www.diodes.com/package-outlines.html for the latest version.

PowerDI3333-8 (Type UX)

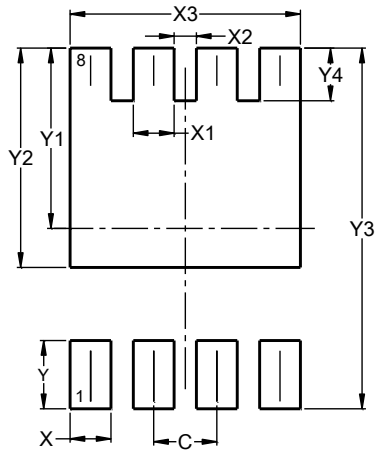


PowerDI3333-8 (Type UX)			
Dim	**Min**	**Max**	**Typ**
A	0.75	0.85	0.80
A1	0.00	0.05	--
b	0.25	0.40	0.32
c	0.10	0.25	0.15
D	3.20	3.40	3.30
D1	2.95	3.15	3.05
D2	2.30	2.70	2.50
E	3.20	3.40	3.30
E1	2.95	3.15	3.05
E2	1.60	2.00	1.80
E2a	0.95	1.35	1.15
E2b	0.10	0.30	0.20
e	0.65 BSC		
k	0.50	0.90	0.70
L	0.30	0.50	0.40
θ	0°	12°	10°
All Dimensions in mm			

Suggested Pad Layout

Please see http://www.diodes.com/package-outlines.html for the latest version.

PowerDI3333-8 (Type UX)



Dimensions	Value (in mm)
C	0.650
X	0.420
X1	0.420
X2	0.230
X3	2.370
Y	0.700
Y1	1.850
Y2	2.250
Y3	3.700
Y4	0.540

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2. support or sustain life and whose failure to perform when properly used in accordance with instructions for use provided in the labeling can be reasonably expected to result in significant injury to the user.

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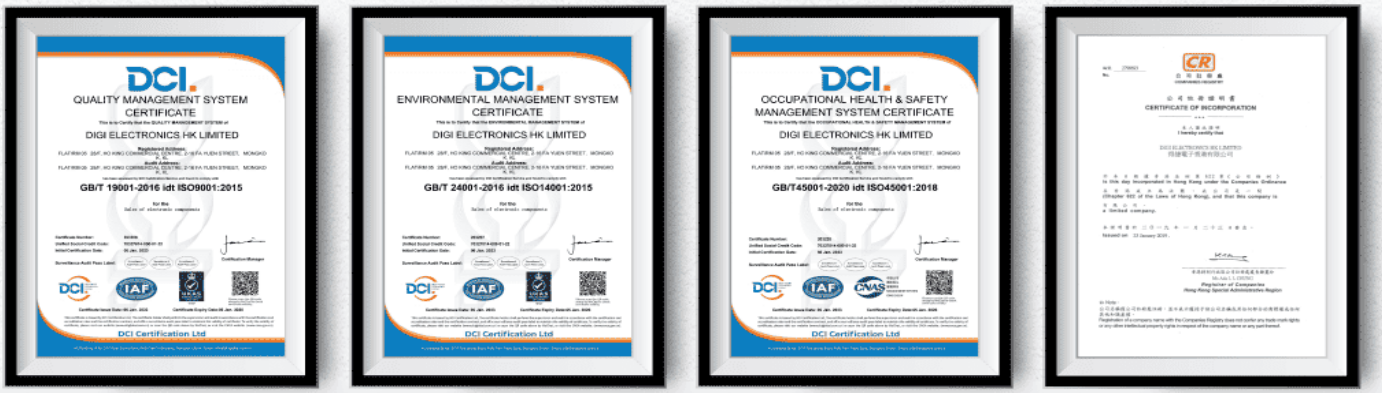

Tel: +00 852-30501935

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