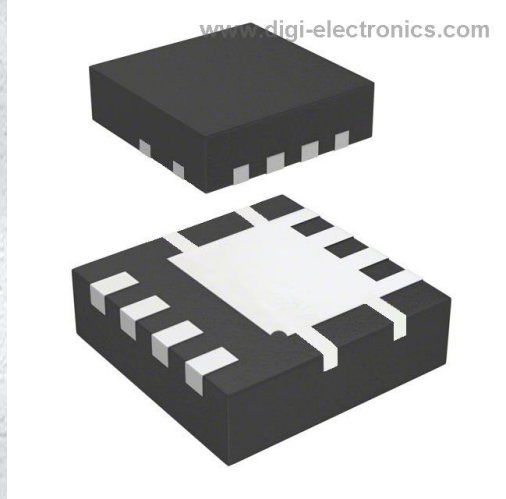
DMTH43M8LFG-7 Datasheet



https://www.DiGi-Electronics.com

DiGi Electronics Part Number	DMTH43M8LFG-7-DG
Manufacturer	Diodes Incorporated
Manufacturer Product Number	DMTH43M8LFG-7
Description	MOSFET N-CH 40V PWRDI3333
Detailed Description	N-Channel 40 V 24A (Ta), 100A (Tc) 2.62W (Ta), 65.2W (Tc) Surface Mount POWERDI3333-8

Tel: +00 852-30501935

RFQ Email: Info@DiGi-Electronics.com

Purchase and inquiry

Manufacturer Product Number:	Manufacturer:
DMTH43M8LFG-7	Diodes Incorporated
Series:	Product Status:
-	Active
FET Type:	Technology:
N-Channel	MOSFET (Metal Oxide)
Drain to Source Voltage (Vdss):	Current - Continuous Drain (Id) @ 25°C:
40 V	24A (Ta), 100A (Tc)
Drive Voltage (Max Rds On, Min Rds On):	Rds On (Max) @ Id, Vgs:
5V, 10V	3mOhm @ 20A, 10V
Vgs(th) (Max) @ Id:	Gate Charge (Qg) (Max) @ Vgs:
2.5V @ 250µA	40.1 nC @ 10 V
Vgs (Max):	Input Capacitance (Ciss) (Max) @ Vds:
±20V	2798 pF @ 20 V
FET Feature:	Power Dissipation (Max):
-	2.62W (Ta), 65.2W (Tc)
Operating Temperature:	Mounting Type:
-55°C ~ 175°C (TJ)	Surface Mount
Supplier Device Package:	Package / Case:
PowerDI3333-8	8-PowerVDFN
Base Product Number:	
DMTH43	

Environmental & Export classification

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

DMTH43M8LFG

40V 175°C N-CHANNEL ENHANCEMENT MODE MOSFET
PowerDI3333-8

Product Summary

BV_{DSS}	$R_{DS(ON)}$ Max	I_D Max (Note 9) T_C = +25°C
40V	3.0mΩ @ V_{GS} = 10V	100A
	5.0mΩ @ V_{GS} = 5V	93A

Features and Benefits

- Rated to +175°C — Ideal for High Ambient Temperature Environments
- 100% Unclamped Inductive Switching, Test in Production — Ensures More Reliable and Robust End Application
- Low $R_{DS(ON)}$ — Ensures On-State Losses are Minimized
- Excellent Q_{GD} × $R_{DS(ON)}$ Product (FOM)
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **An Automotive-Compliant Part is Available Under Separate Datasheet (DMTH43M8LFGQ)**

Description and Applications

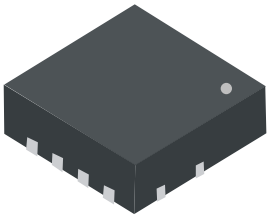
This MOSFET is designed to minimize the on-state resistance ($R_{DS(ON)}$) yet maintain superior switching performance, making it ideal for high-efficiency power management applications.

- DC-DC Converters
- Power Management

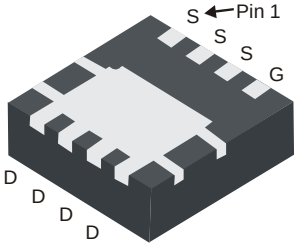
Mechanical Data

- Case: PowerDI®3333-8
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Finish — Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.008 grams (Approximate)

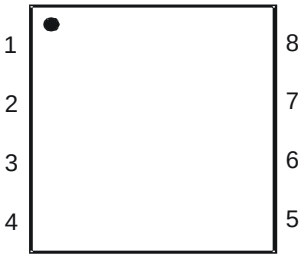
PowerDI3333-8



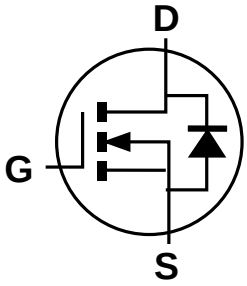
Top View



Bottom View



Top View



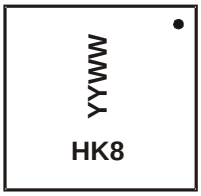
Equivalent Circuit

Ordering Information (Note 4)

Part Number	Case	Packaging
DMTH43M8LFG-7	PowerDI3333-8	2000/Tape & Reel
DMTH43M8LFG-13	PowerDI3333-8	3000/Tape & Reel

Notes:
1. EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied.
2. See https://www.diodes.com/quality/lead-free/ 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 https://www.diodes.com/design/support/packaging/diodes-packaging/.

Marking Information



HK8 = Product Type Marking Code
YYWW = Date Code Marking
YY = Last Two Digits of Year (ex: 19 = 2019)
WW = Week Code (01 to 53)

PowerDI is a registered trademark of Diodes Incorporated.

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

Characteristic		Symbol	Value	Unit
Drain-Source Voltage		V_{DSS}	40	V
Gate-Source Voltage		V_{GSS}	±20	V
Continuous Drain Current (Notes 6 & 9) V_{GS} = 10V	T_C = +25°C T_C = +100°C	I_D	100 85	A
Continuous Drain Current (Note 5) V_{GS} = 10V	T_A = +25°C T_A = +100°C	I_D	24.0 16.9	A
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)		I_{DM}	400	A
Maximum Continuous Body Diode Forward Current (Note 6)		I_S	3.05	A
Pulsed Body Diode Forward Current (10µs Pulse, Duty Cycle = 1%)		I_{SM}	400	A
Avalanche Current, L = 1mH		I_{AS}	18.2	A
Avalanche Energy, L = 1mH		E_{AS}	165	mJ

Thermal Characteristics

Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 5)	T_A = +25°C	P_D	2.62	W
Thermal Resistance, Junction to Ambient (Note 5)		$R_{\theta JA}$	57.8	°C/W
Total Power Dissipation (Note 6)	T_C = +25°C	P_D	65.2	W
Thermal Resistance, Junction to Case (Note 6)		$R_{\theta JC}$	2.3	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +175	°C

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)						
Drain-Source Breakdown Voltage	BV_{DSS}	40	—	—	V	V_{GS} = 0V, I_D = 1mA
Zero Gate Voltage Drain Current	I_{DSS}	—	—	1	µA	V_{DS} = 32V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	—	—	±100	nA	V_{GS} = ±20V, V_{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(TH)}$	1	1.5	2.5	V	V_{DS} = V_{GS}, I_D = 250µA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	2.3	3.0	mΩ	V_{GS} = 10V, I_D = 20A
		—	3.4	5.0		V_{GS} = 5V, I_D = 15A
Static Drain-Source On-Resistance (T_J = +175°C) (Note 8)	$R_{DS(ON)}$	—	—	6.0		V_{GS} = 10V, I_D = 20A
		—	—	9.0		V_{GS} = 5V, I_D = 15A
Diode Forward Voltage	V_{SD}	—	0.8	1.0	V	V_{GS} = 0V, I_S = 20A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	—	2798	—	pF	V_{DS} = 20V, V_{GS} = 0V, f = 1MHz
Output Capacitance	C_{oss}	—	904	—		
Reverse Transfer Capacitance	C_{rss}	—	88	—		
Gate Resistance	R_G	—	2.44	—	Ω	V_{DS} = 0V, V_{GS} = 0V, f = 1MHz
Total Gate Charge (V_{GS} = 10V)	Q_G	—	40.1	—	nC	V_{DS} = 20V, I_D = 20A, V_{GS} = 10V
Gate-Source Charge	Q_{GS}	—	5.2	—		
Gate-Drain Charge	Q_{GD}	—	8.8	—		
Turn-On Delay Time	$t_{D(ON)}$	—	5.16	—	ns	V_{DD} = 20V, V_{GS} = 10V, R_G = 1.6Ω, I_D = 20A
Turn-On Rise Time	t_R	—	10.7	—		
Turn-Off Delay Time	$t_{D(OFF)}$	—	24.6	—		
Turn-Off Fall Time	t_F	—	12.4	—		
Body Diode Reverse Recovery Time	t_{RR}	—	32.6	—	ns	I_F = 15A, di/dt = 100A/µs
Body Diode Reverse Recovery Charge	Q_{RR}	—	26.6	—	nC	

Notes:
5. Device mounted on FR-4 substrate PCB, 2oz copper, with thermal bias to bottom layer 1-inch square copper plate.
6. Thermal resistance from junction to soldering point (on the exposed drain pad).
7. Short duration pulse test used to minimize self-heating effect.
8. Guaranteed by design. Not subject to product testing.
9. Package limit.

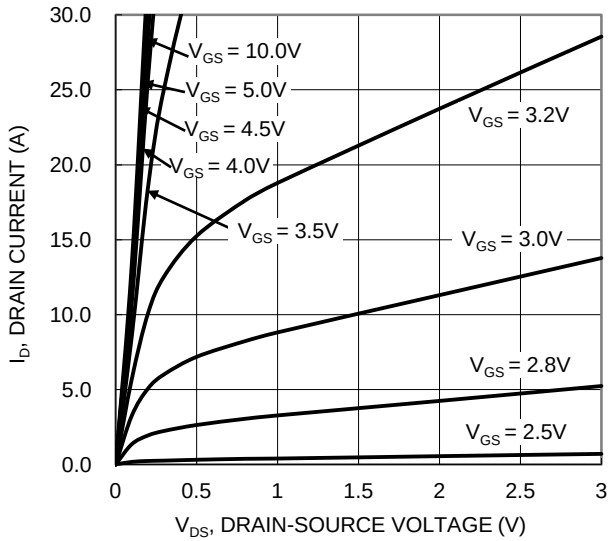


Figure 1.Typical Output Characteristic

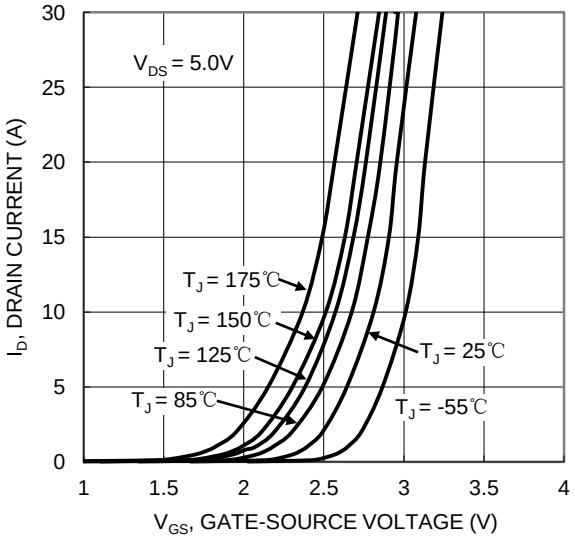


Figure 2. Typical Transfer Characteristic

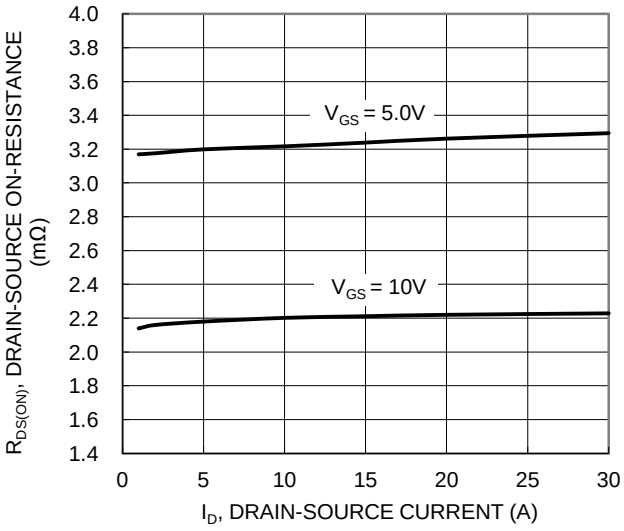


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

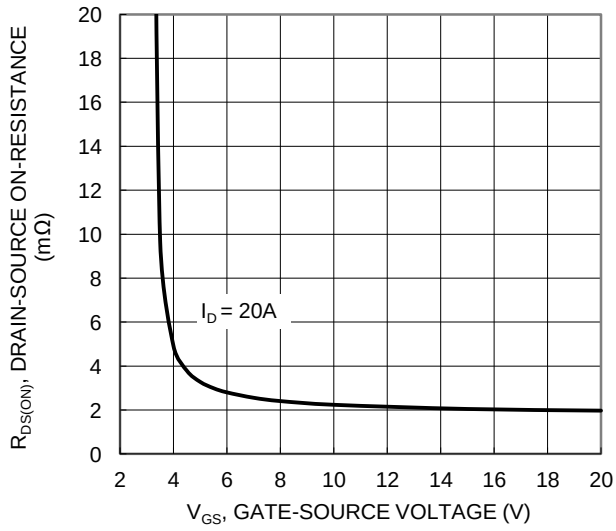


Figure 4. Typical Transfer Characteristic

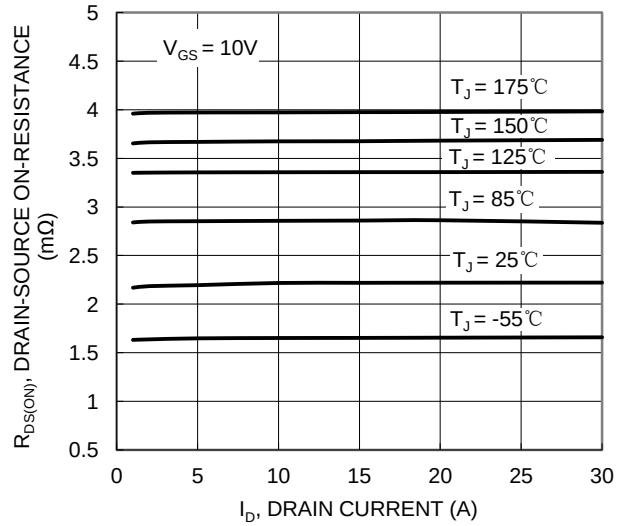


Figure 5. Typical On-Resistance vs. Drain Current and Temperature

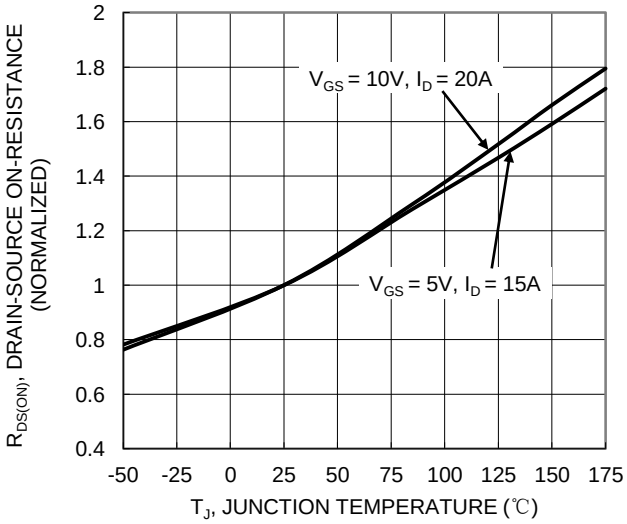


Figure 6. On-Resistance Variation with Temperature

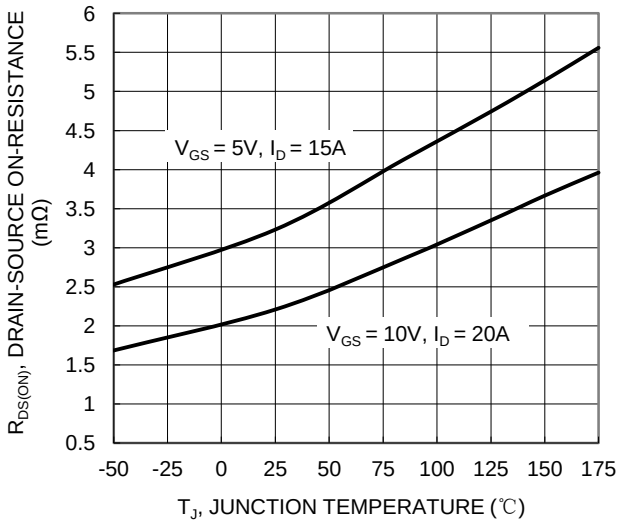


Figure 7. On-Resistance Variation with Temperature

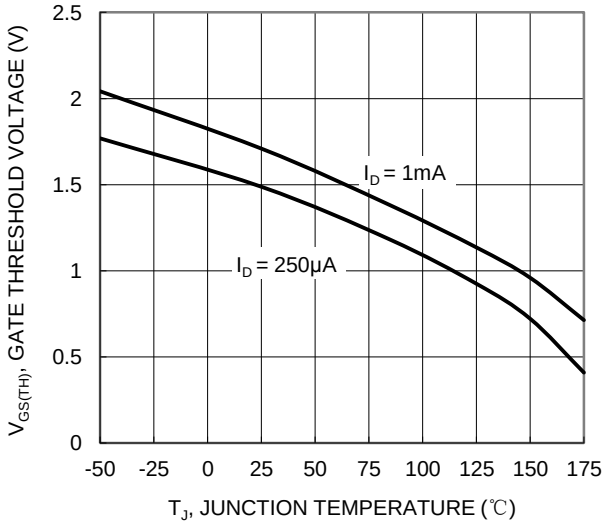


Figure 8. Gate Threshold Variation vs. JunctionTemperature

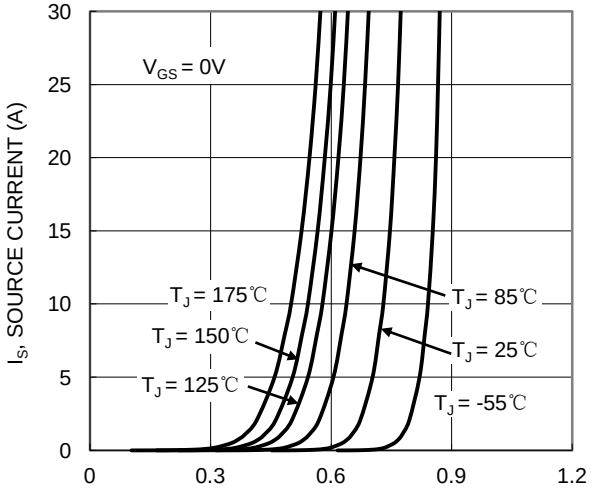


Figure 9. Diode Forward Voltage vs. Current

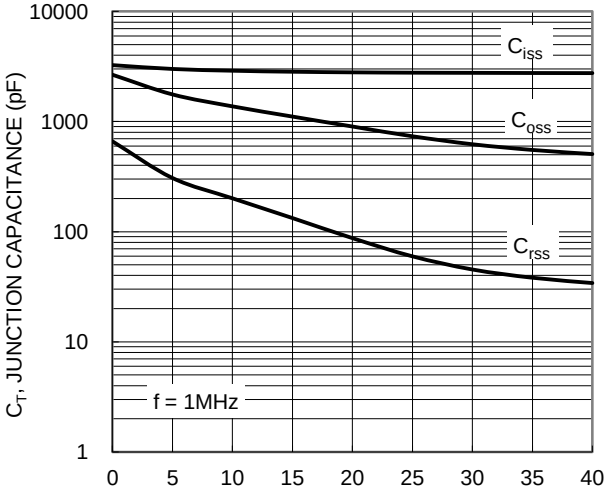


Figure 10. Typical Junction Capacitance

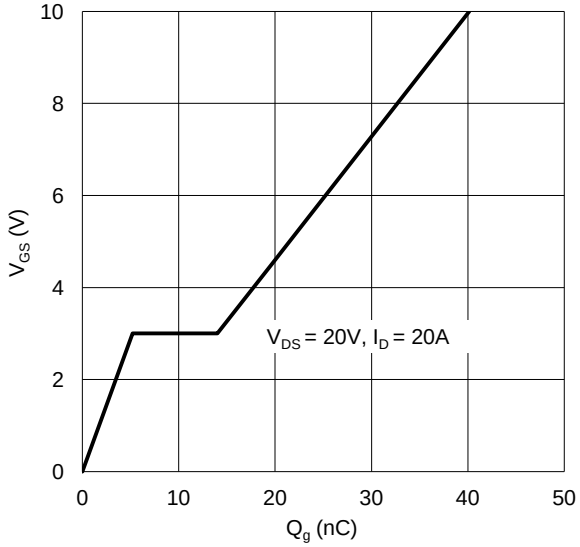


Figure 11. Gate Charge

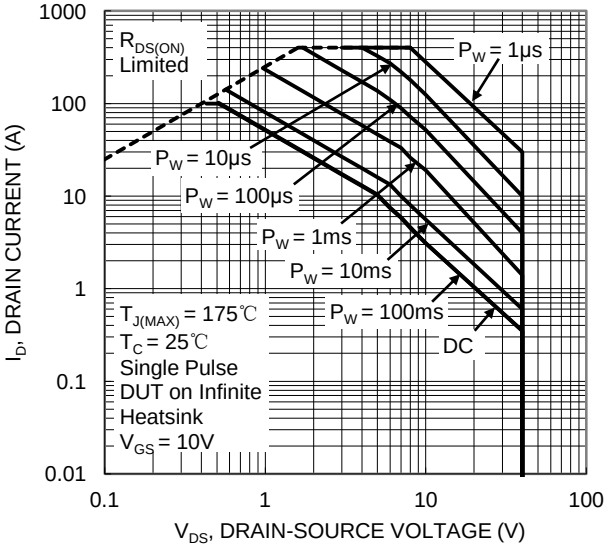


Figure 12. SOA, Safe Operation Area

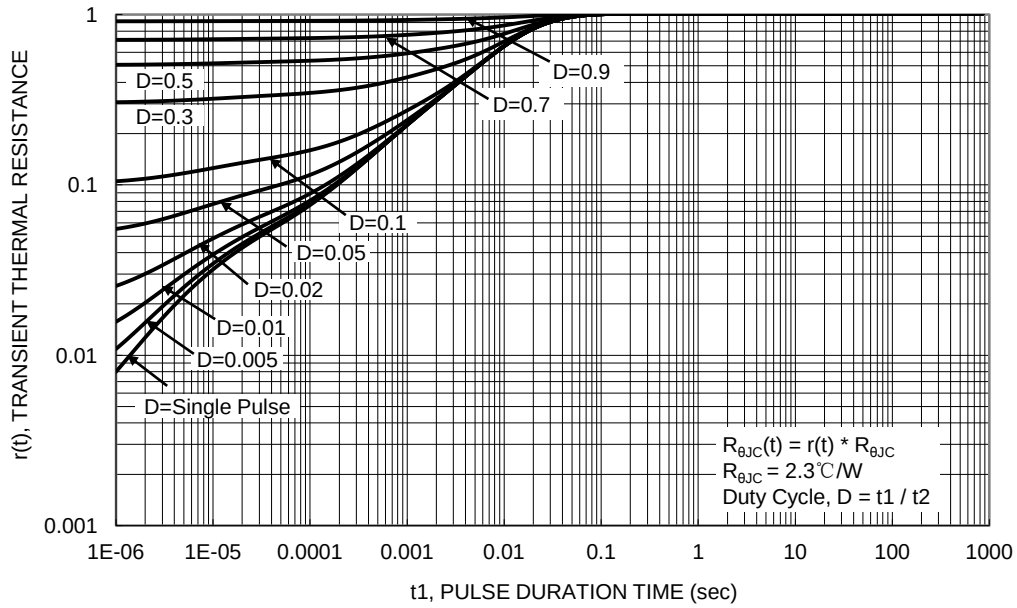
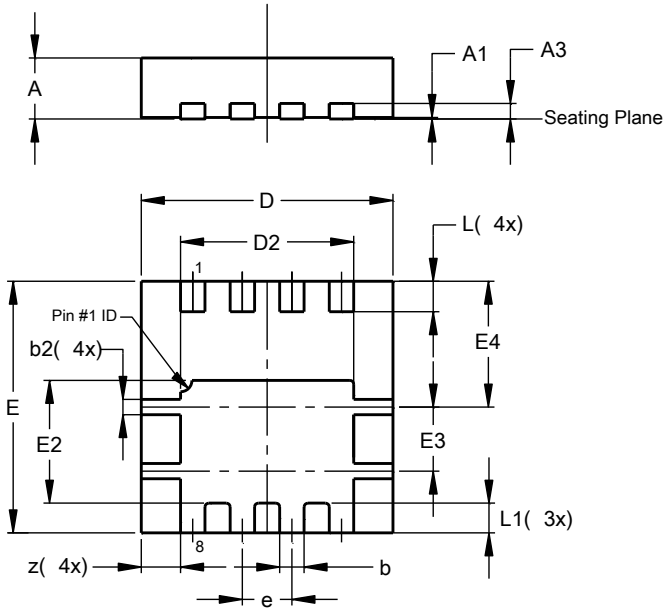


Figure 13. Transient Thermal Resistance

Package Outline Dimensions

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

PowerDI3333-8

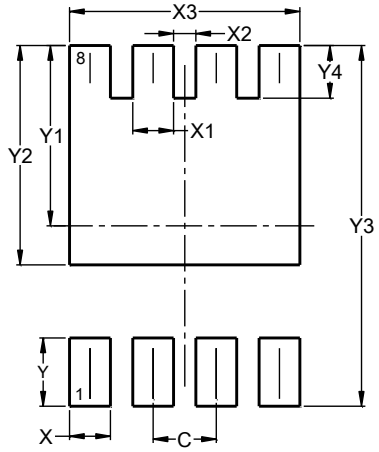


PowerDI3333-8			
Dim	**Min**	**Max**	**Typ**
A	0.75	0.85	0.80
A1	0.00	0.05	0.02
A3	–	–	0.203
b	0.27	0.37	0.32
b2	0.15	0.25	0.20
D	3.25	3.35	3.30
D2	2.22	2.32	2.27
E	3.25	3.35	3.30
E2	1.56	1.66	1.61
E3	0.79	0.89	0.84
E4	1.60	1.70	1.65
e	–	–	0.65
L	0.35	0.45	0.40
L1	–	–	0.39
z	–	–	0.515
All Dimensions in mm			

Suggested Pad Layout

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

PowerDI3333-8



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

IMPORTANT NOTICE

DIODES INCORPORATED MAKES NO WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, WITH REGARDS TO THIS DOCUMENT, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION).

Diodes Incorporated and its subsidiaries reserve the right to make modifications, enhancements, improvements, corrections or other changes without further notice to this document and any product described herein. Diodes Incorporated does not assume any liability arising out of the application or use of this document or any product described herein; neither does Diodes Incorporated convey any license under its patent or trademark rights, nor the rights of others. Any Customer or user of this document or products described herein in such applications shall assume all risks of such use and will agree to hold Diodes Incorporated and all the companies whose products are represented on Diodes Incorporated website, harmless against all damages.

Diodes Incorporated does not warrant or accept any liability whatsoever in respect of any products purchased through unauthorized sales channel. Should Customers purchase or use Diodes Incorporated products for any unintended or unauthorized application, Customers shall indemnify and hold Diodes Incorporated and its representatives harmless against all claims, damages, expenses, and attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized application.

Products described herein may be covered by one or more United States, international or foreign patents pending. Product names and markings noted herein may also be covered by one or more United States, international or foreign trademarks.

This document is written in English but may be translated into multiple languages for reference. Only the English version of this document is the final and determinative format released by Diodes Incorporated.

LIFE SUPPORT

Diodes Incorporated products are specifically not authorized for use as critical components in life support devices or systems without the express written approval of the Chief Executive Officer of Diodes Incorporated. As used herein:

A. Life support devices or systems are devices or systems which:

1. are intended to implant into the body, or
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.

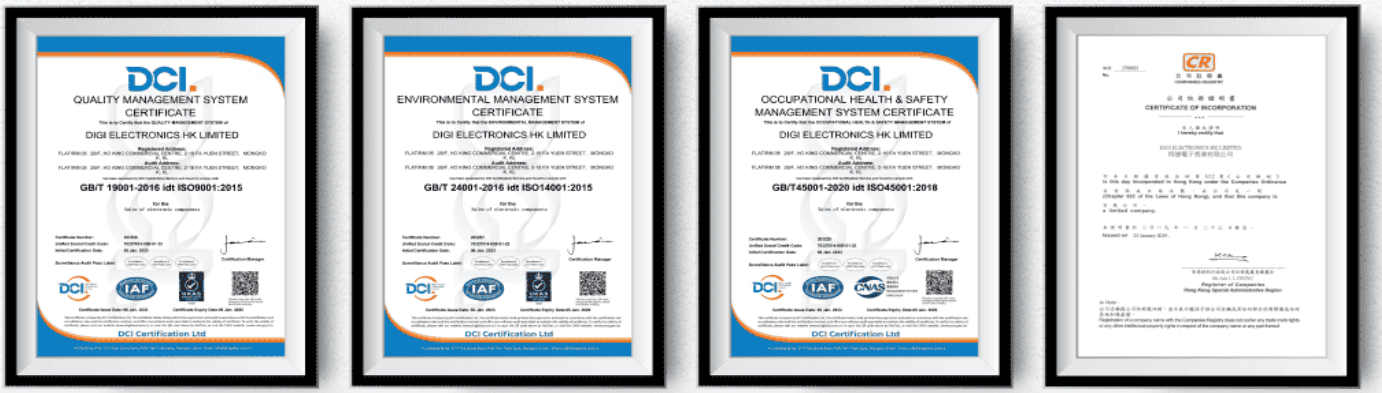
B. A critical component is any component in a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or to affect its safety or effectiveness.

Customers represent that they have all necessary expertise in the safety and regulatory ramifications of their life support devices or systems, and acknowledge and agree that they are solely responsible for all legal, regulatory and safety-related requirements concerning their products and any use of Diodes Incorporated products in such safety-critical, life support devices or systems, notwithstanding any devices- or systems-related information or support that may be provided by Diodes Incorporated. Further, Customers must fully indemnify Diodes Incorporated and its representatives against any damages arising out of the use of Diodes Incorporated products in such safety-critical, life support devices or systems.

www.diodes.com

OUR CERTIFICATE

DiGi provide top-quality products and perfect service for customer worldwide through standardization, technological innovation and continuous improvement. DiGi through third-party certification, we striciy control the quality of products and services. Welcome your RFQ to Email: Info@DiGi-Electronics.com



Tel: +00 852-30501935

RFQ Email: Info@DiGi-Electronics.com

DiGi is a global authorized distributor of electronic components.