



100V 175°C N-CHANNEL ENHANCEMENT MODE MOSFET PowerDI5060-8

Product Summary

BV _{DSS}	R _{DS(ON)} Max	I _D Max T _C = +25°C
100V	8mΩ @ V _G S = 10V	91A
	12.5mΩ @ V _{GS} = 4.5V	73A

Description

This MOSFET is designed to meet the stringent requirements of automotive applications. It is qualified to AEC-Q101, supported by a PPAP and is ideal for use in:

- Motor Control
- DC-DC Converters
- Power Management

Features

- Rated to +175°C Ideal for High Ambient Temperature Environments
- 100% Unclamped Inductive Switching (UIS) Test in Production Ensures More Reliable and Robust End Application
- Thermally Efficient Package-Cooler Running Applications
- High Conversion Efficiency
- Low R_{DS(ON)} Minimizes On-State Losses
- Low Input Capacitance
- Fast Switching Speed
- <1.1mm Package Profile Ideal for Thin Applications (PowerDI[®])
- Lead-Free Finish; RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)
- The DMTH10H009LPSQ is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.

https://www.diodes.com/quality/product-definitions/

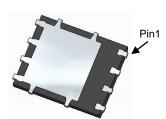
Mechanical Data

- Case: PowerDI5060-8
- Case Material: Molded Plastic, "Green" Molding Compound.
 UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram Below
- Terminal Finish Matte Tin Annealed over Copper Leadframe.
 Solderable per MIL-STD-202, Method 208 (3)
- Weight: 0.097 grams (Approximate)

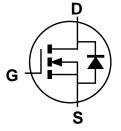
PowerDI5060-8



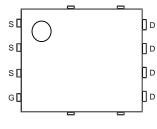




Bottom View



Internal Schematic



Top View Pin Configuration

Ordering Information (Note 4)

Part Number	Case	Packaging
DMTH10H009LPSQ-13	PowerDI5060-8	2,500 / 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/.

PowerDI is a registered trademark of Diodes Incorporated.



Marking Information



TH1009LSQ = Product Type Marking Code
YYWW = Date Code Marking
YY = Last Two Digits of Year (ex: 20 = 2020)
WW = Week Code (01 to 53)

Characteristic	Symbol	Value	Unit		
Drain-Source Voltage	VDSS	100	V		
Gate-Source Voltage	Vgss	±20	V		
Continuous Drain Current V _{GS} = 10V (Note 5)	Steady State	T _A = +25°C T _A = +100°C	lσ	15 11	А
Continuous Drain Current V _{GS} = 10V (Note 6)	Steady State	T _C = +25°C T _C = +100°C	lσ	91 64	А
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)			Ірм	360	Α
Maximum Continuous Body Diode Forward Current			Is	85	Α
Pulsed Body Diode Current (10µs Pulse, Duty Cycle = 1%)			Ism	360	Α
Avalanche Current (Note 8), L=0.3mH			las	21	Α
Avalanche Energy (Note 8), L=0.3mH			Eas	66	mJ
V _{DS} Spike, L=0.1mH t=10μs			VSPIKE	110	V

Thermal Characteristics

Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 5)	T _A = +25°C	PD	1.5	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	RθJA	99	°C/W
Total Power Dissipation (Note 6)	T _A = +25°C	PD	3.1	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady State	RθJA	49	°C/W
Total Power Dissipation (Note 7)	Tc = +25°C	PD	100	W
Thermal Resistance, Junction to Case (Note 7)		R _θ JC	1.5	°C/W
Operating and Storage Temperature Range		TJ, TSTG	-55 to +175	°C

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 1inch square copper plate.
- 7. Thermal resistance from junction to soldering point (on the exposed drain pad).
- 8. I_{AS} and E_{AS} ratings are based on low frequency and duty cycles to keep T_{J} = +25°C.



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

Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition	
OFF CHARACTERISTICS (Note 9)							
Drain-Source Breakdown Voltage	BV _{DSS}	100	_	_	V	$V_{GS} = 0V$, $I_D = 1mA$	
Zero Gate Voltage Drain Current	IDSS	_	_	1	μΑ	V _{DS} = 80V, V _{GS} = 0V	
Gate-Source Leakage	Igss	_	_	±100	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$	
ON CHARACTERISTICS (Note 9)	•					·	
Gate Threshold Voltage	VGS(TH)	1.2	_	2.5	V	$V_{DS} = V_{GS}$, $I_D = 250\mu A$	
Static Drain-Source On-Resistance	D	_	6	8	mΩ	$V_{GS} = 10V, I_D = 20A$	
Static Drain-Source On-Resistance	RDS(ON)	_	9	12.5	11177	V _G S = 4.5V, I _D = 5A	
Diode Forward Voltage	V _{SD}	_	0.8	1.2	V	V _{GS} = 0V, I _S = 13A	
DYNAMIC CHARACTERISTICS (Note 10)	•					·	
Input Capacitance	Ciss	_	2309			V _{DS} = 50V, V _{GS} = 0V f = 1MHz	
Output Capacitance	Coss	_	536	_	pF		
Reverse Transfer Capacitance	Crss	_	13.7	_			
Gate Resistance	Rg	_	1.9	_	Ω	$V_{DS} = 0V$, $V_{GS} = 0V$, $f = 1MHz$	
Total Gate Charge (V _{GS} = 10V)	Qg	_	40.2	_			
Total Gate Charge (V _{GS} = 4.5V)	Qg	_	20.2	_	nC	$V_{DD} = 50V, I_{D} = 20A$	
Gate-Source Charge	Qgs	_	7.0	_	nc nc		
Gate-Drain Charge	Qgd	_	8.5	_			
Turn-On Delay Time	t _{D(ON)}	_	5.4	_		V _{DD} = 50V, V _{GS} = 10V,	
Turn-On Rise Time	t _R	_	10.6	_			
Turn-Off Delay Time	tD(OFF)	_	28.3	_	ns	$I_D=20A,\ R_g=3\Omega$	
Turn-Off Fall Time	t _F	_	14.9	_			
Reverse Recovery Time	trr	_	44.3	_	ns	1 004 41/44 4004/	
Reverse Recovery Charge	Q _{RR}	_	65.5	_	nC	I _F = 20A, di/dt = 100A/μs	

Notes:

Short duration pulse test used to minimize self-heating effect.
 Guaranteed by design. Not subject to product testing.



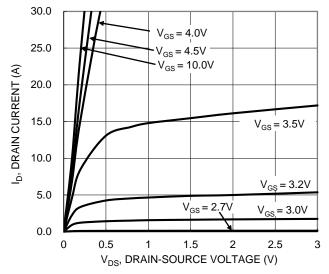


Figure 1. Typical Output Characteristic

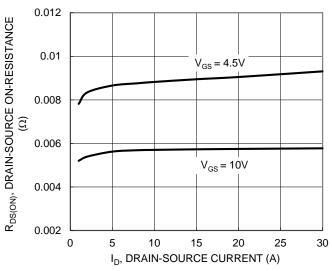


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

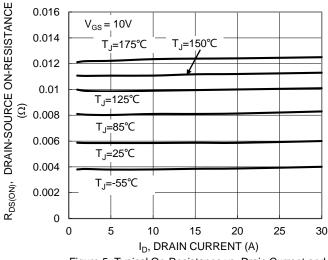


Figure 5. Typical On-Resistance vs. Drain Current and Junction Temperature

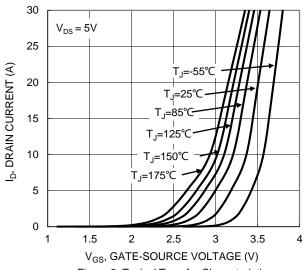


Figure 2. Typical Transfer Characteristic

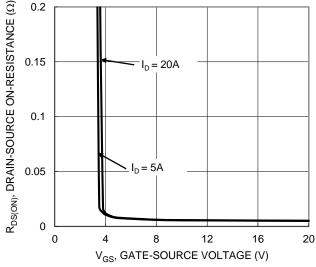


Figure 4. Typical Transfer Characteristic

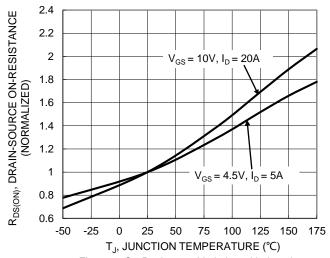


Figure 6. On-Resistance Variation with Junction Temperature



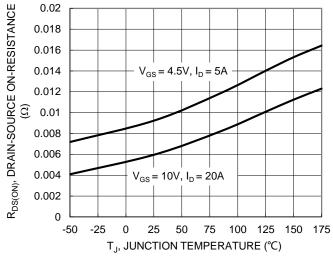
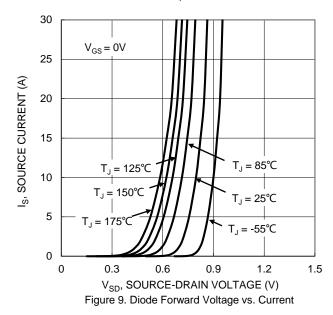


Figure 7. On-Resistance Variation with Junction Temperature



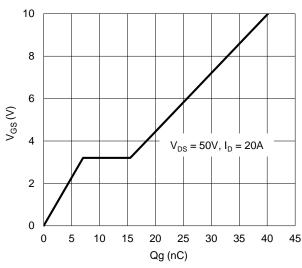


Figure 11. Gate Charge

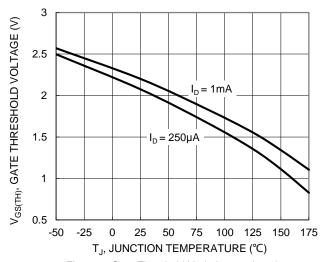


Figure 8. Gate Threshold Variation vs. Junction Temperature

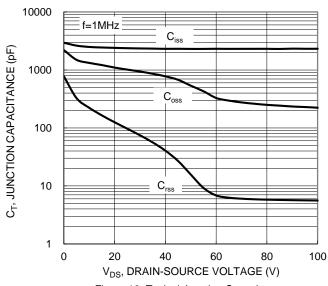
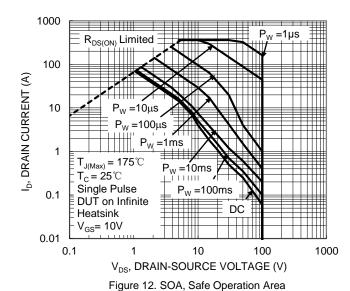


Figure 10. Typical Junction Capacitance



DMTH10H009LPSQ



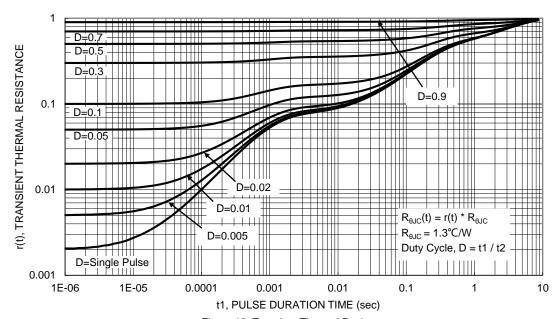


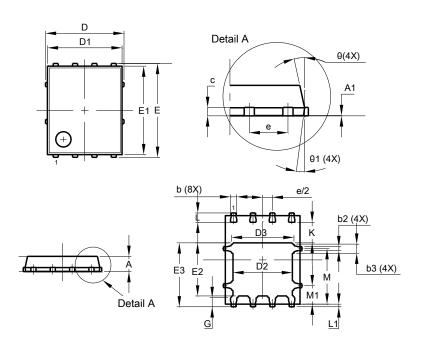
Figure 13. Transient Thermal Resistance



Package Outline Dimensions

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

PowerDI5060-8

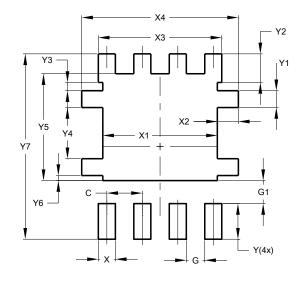


PowerDI5060-8						
Dim	Min	Max	Тур			
Α	0.90	1.10	1.00			
A1	0.00	0.05	-			
b	0.33	0.51	0.41			
b2	0.200	0.350	0.273			
b3	0.40	0.80	0.60			
С	0.230	0.330	0.277			
D	ļ	5.15 BSC				
D1	4.70	5.10	4.90			
D2	3.70	4.10	3.90			
D3	3.90	4.30	4.10			
Е	6.15 BSC					
E1	5.60	6.00	5.80			
E2	3.28	3.68	3.48			
E3	3.99	4.39	4.19			
е	1.27 BSC					
G	0.51	0.71	0.61			
K	0.51	_	_			
L	0.51	0.71	0.61			
L1	0.100	0.200	0.175			
М	3.235	4.035	3.635			
M1	1.00	1.40	1.21			
Θ	10°	12º	11º			
Θ1	6º	8º	7º			
All Dimensions in mm						

Suggested Pad Layout

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

PowerDI5060-8



C 1.270 G 0.660 G1 0.820	
	_
G1 0.820	
0.020	
X 0.610	
X1 4.100	
X2 0.755	
X3 4.420	
X4 5.610	
Y 1.270	
Y1 0.600	
Y2 1.020	
Y3 0.295	
Y4 1.825	
Y5 3.810	
Y6 0.180	
Y7 6.610	



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.

Copyright © 2020, Diodes Incorporated

www.diodes.com

单击下面可查看定价,库存,交付和生命周期等信息

>>Diodes Incorporated(达迩科技(美台))