



60V +175°C N-CHANNEL ENHANCEMENT MODE MOSFET POWERDI

Product Summary

BV _{DSS}	R _{DS(ON)} Max	I _D T _C = +25°C
60V	$10m\Omega$ @ $V_{GS} = 10V$	89.5A
607	$12m\Omega$ @ $V_{GS} = 4.5V$	81.7A

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
- Low R_{DS(ON)}—Minimizes Power Losses
- Low Q_G—Minimizes Switching Losses
- Lead-Free Finish; RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)
- Qualified to AEC-Q101 Standards for High Reliability
- PPAP Capable (Note 4)

Description and Applications

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

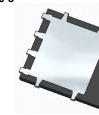
- High-Frequency Switching
- Synchronous Rectification
- DC-DC Converters

Mechanical Data

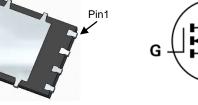
- Case: PowerDI[®]5060-8
- Case Material: Molded Plastic, "Green" Molding Compound.
 UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Finish—Matte Tin Annealed over Copper Leadframe,
 Solderable per MIL-STD-202, Method 208 (§3)
- Weight: 0.097 grams (Approximate)

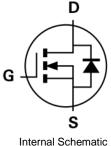


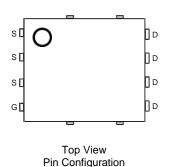
Top View



Bottom View







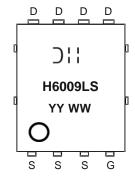
Ordering Information (Note 5)

Part Number	Case	Packaging
DMTH6009LPSQ-13	PowerDI5060-8	2500/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. Automotive products are AEC-Q101 qualified and are PPAP capable. Refer to http://www.diodes.com/product_compliance_definitions.html.
- 5. See http://www.diodes.com/products/packages.html for packaging details.

Marking Information



⊃¦¦ = Manufacturer's Marking H6009LS = Product Type Marking Code YYWW = Date Code Marking YY = Year (ex: 18 = 2018) WW = Week (01 - 53)



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

Characteristic	Symbol	Value	Units	
Drain-Source Voltage		V_{DSS}	60	V
Gate-Source Voltage		V_{GSS}	±16	V
Continuous Drain Current (Note 6)	$T_A = +25$ °C $T_A = +100$ °C	Ι _D	11.76 8.3	А
Continuous Drain Current (Note 7)	$T_{C} = +25^{\circ}C$ $T_{C} = +100^{\circ}C$	Ι _D	89.5 63.3	А
Maximum Continuous Body Diode Forward Current (Note 7)		Is	89	Α
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)		I _{DM}	350	Α
Pulsed Body Diode Forward Current (380µs Pulse, Duty Cycle = 1%)		I _{SM}	350	Α
Avalanche Current, L=0.1mH		I _{AS}	20.3	Α
Avalanche Energy, L=0.1mH		E _{AS}	20.6	mJ

Thermal Characteristics

Characteristic		Symbol	Value	Units
Total Power Dissipation (Note 6)	$T_A = +25$ °C	P_{D}	2.8	W
Thermal Resistance, Junction to Ambient (Note 6)		$R_{\Theta JA}$	53	°C/W
Total Power Dissipation (Note 7)	$T_C = +25^{\circ}C$	P _D	136	W
Thermal Resistance, Junction to Case (Note 7)		R _{OJC}	1.1	°C/W
Operating and Storage Temperature Range		T _{J,} T _{STG}	-55 to +175	°C

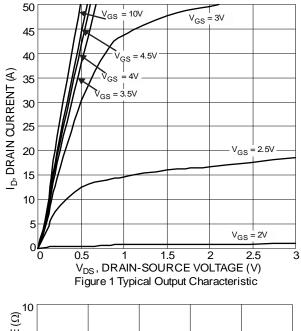
Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

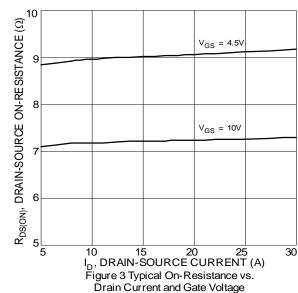
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 8)						•
Drain-Source Breakdown Voltage	BV _{DSS}	60			V	$V_{GS} = 0V$, $I_D = 1mA$
Zero Gate Voltage Drain Current	I _{DSS}	_	_	1	μA	$V_{DS} = 48V, V_{GS} = 0V$
Gate-Source Leakage	I _{GSS}	_	_	±100	nA	$V_{GS} = \pm 16V$, $V_{DS} = 0V$
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	V _{GS(TH)}	0.7	_	2	V	$V_{DS} = V_{GS}, I_{D} = 250 \mu A$
Static Drain-Source On-Resistance		_	7.2	10	mΩ	$V_{GS} = 10V, I_D = 20A$
Static Drain-Source On-Resistance	R _{DS(ON)}	_	8.9	12	11177	$V_{GS} = 4.5V, I_D = 15A$
Diode Forward Voltage	V _{SD}	_	0.9	1.2	V	V _{GS} = 0V, I _S = 20A
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C _{ISS}	_	1,925	_		201111 011
Output Capacitance	Coss	_	438	_	pF	$V_{DS} = 30V, V_{GS} = 0V,$ f = 1MHz
Reverse Transfer Capacitance	C _{RSS}	_	41			
Gate Resistance	R _G	_	1.7	_	Ω	$V_{DS} = 0V$, $V_{GS} = 0V$, $f = 1MHz$
Total Gate Charge (V _{GS} = 10V)	Q _G	_	33.5			
Total Gate Charge (V _{GS} = 4.5V)	Q_G	_	15.6	_	nC	V 20V I 12.5A
Gate-Source Charge	Q _{GS}		4.7		110	$V_{DS} = 30V, I_{D} = 13.5A$
Gate-Drain Charge	Q_GD	_	5.3		<u></u>	
Turn-On Delay Time	t _{D(ON)}	_	4.5			
Turn-On Rise Time	t _R	_	8.6	_	20	$V_{DD} = 30V, V_{GS} = 10V,$
Turn-Off Delay Time	t _{D(OFF)}	_	35.9	_	ns	$R_G = 6\Omega$, $I_D = 13.5A$
Turn-Off Fall Time	t _F	_	15.7	_		
Body Diode Reverse Recovery Time	t _{RR}	_	18.2	_	ns	
Body Diode Reverse Recovery Charge	Q _{RR}	_	33.1	_	nC	$I_F = 13.5A$, di/dt = 400A/ μ s

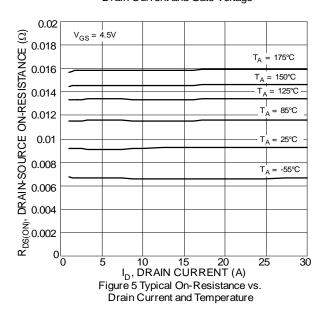
Notes:

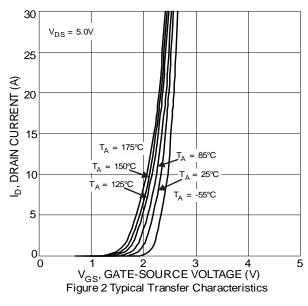
- 6. Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1-inch square copper plate.
- $\label{eq:continuous} \textbf{7. Thermal resistance from junction to soldering point (on the exposed drain pad)}.$
- 8. Short duration pulse test used to minimize self-heating effect.
- 9. Guaranteed by design. Not subject to product testing.

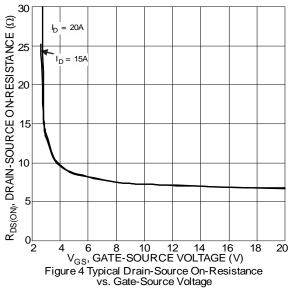


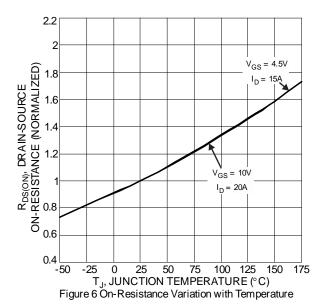




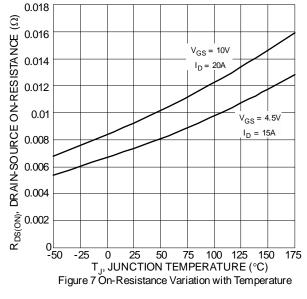


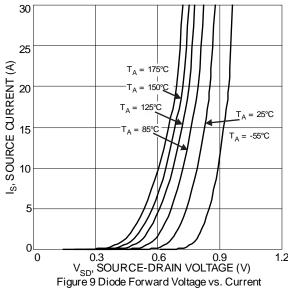


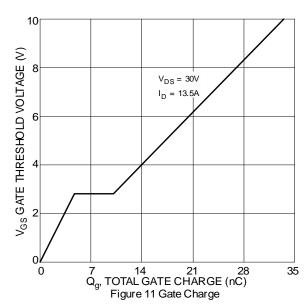












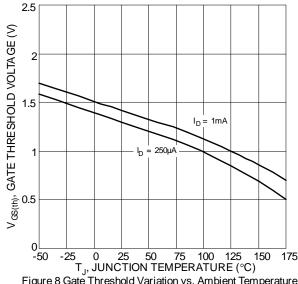
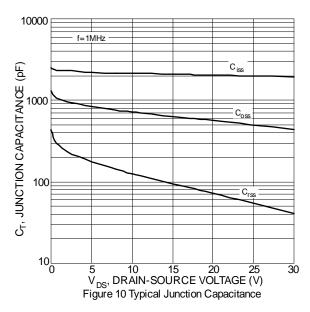
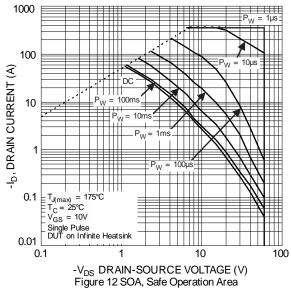
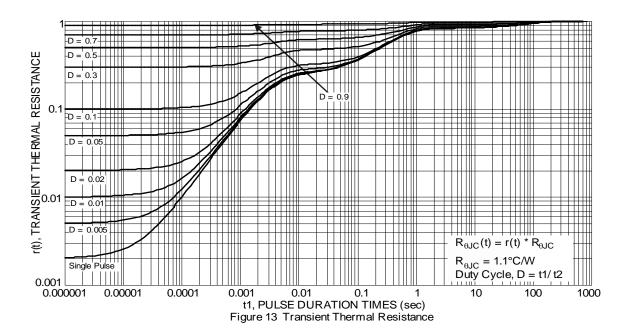


Figure 8 Gate Threshold Variation vs. Ambient Temperature





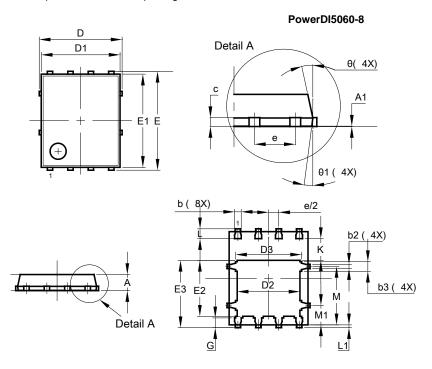






Package Outline Dimensions

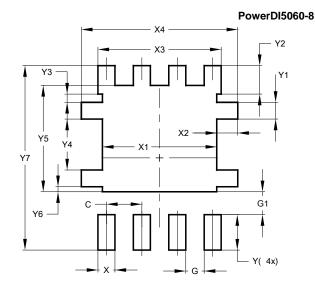
Please see http://www.diodes.com/package-outlines.html for the latest version.



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		
C D	0.230	0.330	0.277		
	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°	12°	11°		
θ1	6°	8°	7°		
All Dimensions in mm					

Suggested Pad Layout

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



Dimensions	Value (in mm)			
С	1.270			
G	0.660			
G1	0.820			
Х	0.610			
X1	4.100			
X2	0.755			
Х3	4.420			
X4	5.610			
Υ	1.270			
Y1	0.600			
Y2	1.020			
Y3	0.295			
Y4	1.825			
Y5	3.810			
Y6	0.180			
Y7	6.610			



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ПОСТАВКА ЭЛЕКТРОННЫХ КОМПОНЕНТОВ

многоканальный

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