



40V DUAL P-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

V _{(BR)DSS}	R _{DS(on)}	I _D T _A = +25°C
-40V	45mΩ @ V _{GS} = -10V	-6.5A
	55mΩ @ V _{GS} = -4.5V	-5.9A

Description

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

Applications

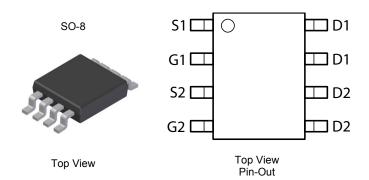
- Backlighting
- DC-DC Converters
- Power Management Functions

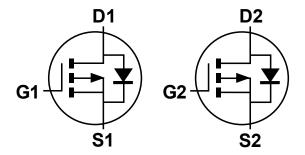
Features

- 100% Unclamped Inductive Switch (UIS) test in production
- Low on-resistance
- Fast switching speed
- Totally Lead-Free & Fully RoHS compliant (Note 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)
- Qualified to AEC-Q101 Standards for High Reliability

Mechanical Data

- Case: SO-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
- Terminals: Finish Tin Finish annealed over Copper leadframe.
 Solderable per MIL-STD-202, Method 208_(€3)
- Weight: 0.074 grams (approximate)





Equivalent Circuit

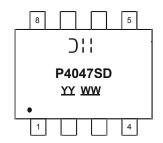
Ordering Information (Note 4 & 5)

Part Number	Compliance	Case	Packaging
DMP4047SSD-13	Standard	SO-8	2,500/Tape & Reel
DMP4047SSDQ-13	Automotive	SO-8	2,500/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. Automotive products are AEC-Q101 qualified and are PPAP capable. Automotive, AEC-Q101 and standard products are electrically and thermally the same, except where specified. For more information, please refer to http://www.diodes.com/quality/product_grade_definitions/.
- 5. For packaging details, go to our website at http://www.diodes.com/products/packages.html.

Marking Information



☐ Manufacturer's Marking
☐ P4047SD = Product Type Marking Code
☐ YYWW = Date Code Marking
☐ YY = Year (ex: 09 = 2009)
☐ WW = Week (01 - 53)



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

Characteristic			Symbol	Value	Units
Drain-Source Voltage			V_{DSS}	-40	V
Gate-Source Voltage			V _{GSS}	±20	V
Continuous Drain Current (Note 7) V = 40V	Steady State	T _A = +25°C T _A = +70°C	l _D	-5.1 -4.1	А
Continuous Drain Current (Note 7) V _{GS} = -10V t < 10s		T _A = +25°C T _A = +70°C	I _D	-6.5 -5.2	А
		I _D	-4.6 -3.7	А	
Continuous Drain Current (Note 7) V _{GS} = -4.5V	t < 10s	$T_A = +25^{\circ}C$ $T_A = +70^{\circ}C$	I _D	-5.9 -4.7	А
Maximum Body Diode Continuous Current			Is	-2.5	Α
Pulsed Drain Current (10µs pulse, duty cycle = 1%)			I _{DM}	-40	А

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

Characteristic		Symbol	Value	Units	
Total Dawer Dissination (Note 6)	T _A = +25°C	D	1.3	10/	
Total Power Dissipation (Note 6)	T _A = +70°C	P_{D}	0.8	W	
Thermal Resistance, Junction to Ambient (Note 6)	Steady state	D	98	°C/W	
	t < 10s	$R_{\theta JA}$	59		
Total Davier Dissipation (Note 7)	T _A = +25°C	П	1.8	W	
Total Power Dissipation (Note 7)	T _A = +70°C	P_{D}	1.1		
Thermal Desistance Junction to Ambient (Note 7)	Steady state	D	71	°C/W	
Thermal Resistance, Junction to Ambient (Note 7)	t < 10s	$R_{\theta JA}$	43		
Thermal Resistance, Junction to Case (Note 7)		$R_{\theta JC}$	11.8		
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	Тур	Max	Unit	Test Condition	
OFF CHARACTERISTICS (Note 8)							
Drain-Source Breakdown Voltage	BV _{DSS}	-40	_	-	V	$V_{GS} = 0V$, $I_D = -250\mu A$	
Zero Gate Voltage Drain Current T _J = +25°C	I _{DSS}	-	-	-1	μΑ	$V_{DS} = -40V, V_{GS} = 0V$	
Gate-Source Leakage	I _{GSS}	_	_	±100	nA	V _{GS} = ±20V, V _{DS} = 0V	
ON CHARACTERISTICS (Note 8)							
Gate Threshold Voltage	$V_{GS(th)}$	-1.0	ī	-3.0	٧	$V_{DS} = V_{GS}, I_{D} = -250 \mu A$	
Static Drain-Source On-Resistance			33	45	0	$V_{GS} = -10V, I_D = -4.4A$	
Static Drain-Source On-Resistance	R _{DS} (ON)	_	40	55	mΩ	$V_{GS} = -4.5V, I_D = -3.7A$	
Diode Forward Voltage	V_{SD}	_	-0.75	-1.2	V	V _{GS} = 0V, I _S = -3.9A	
DYNAMIC CHARACTERISTICS (Note 9)		•					
Input Capacitance	Ciss	-	1154	-	pF		
Output Capacitance	Coss	-	84	-	pF	V _{DS} = -20V, V _{GS} = 0V, -f = 1.0MHz	
Reverse Transfer Capacitance	Crss	-	66	-	pF	T = 1.0MH2	
Gate Resistance	RG	-	12.6	-	Ω	$V_{DS} = 0V$, $V_{GS} = 0V$, $f = 1MHz$	
Total Gate Charge (V _{GS} = -4.5V)	Qg	_	10.6	-	nC		
Total Gate Charge (V _{GS} = -10V)	Qg	-	21.5	-	nC	\\ - 20\\ \ - 4.04	
Gate-Source Charge	Qgs	_	2.2	_	nC	$V_{DS} = -20V$, $I_{D} = -4.9A$	
Gate-Drain Charge	Qgd	-	3.3	_	nC		
Turn-On Delay Time	tD(on)	-	8.7	-	ns		
Turn-On Rise Time	tr	-	19.6	-	ns	$V_{DS} = -20V, I_{D} = -3.9A$	
Turn-Off Delay Time	tD(off)	_	34.9	-	ns	$V_{GS} = 4.5V, R_{G} = 1\Omega$	
Turn-Off Fall Time	tf	_	25.5	_	ns		
Body Diode Reverse Recovery Time	trr	-	9.61	-	ns	L = 2.04 di/dt = 1004/ug	
Body Diode Reverse Recovery Charge	Qrr	_	3.3	_	nC	$I_F = -3.9A$, di/dt = 100A/ μ s	

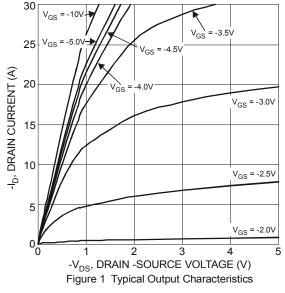
6. Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.

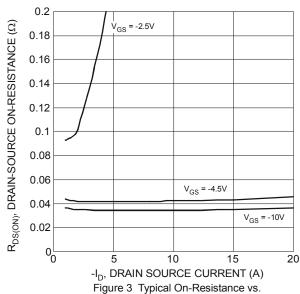
7. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

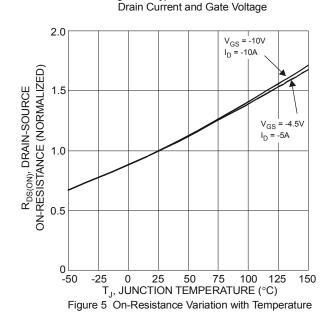
8. Short duration pulse test used to minimize self-heating effect.

9. Guaranteed by design. Not subject to product testing. Notes:







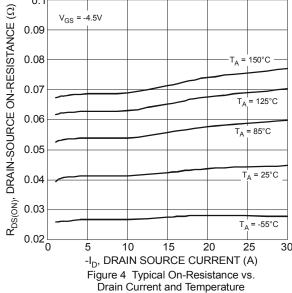


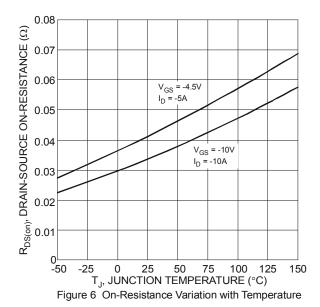
-I_D, DRAIN CURRENT (A) 20 15 10 T_A = 85°C 5 = 25°C -55°C 0 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 -V_{GS}, GATE-SOURCE VOLTAGE (V) 0 0.5 Figure 2 Typical Transfer Characteristics 0.1 V_{GS} = -4.5V 0.09 0.08

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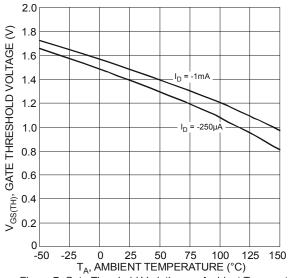
 $V_{DS} = -5.0V$

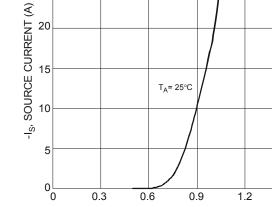




1.5







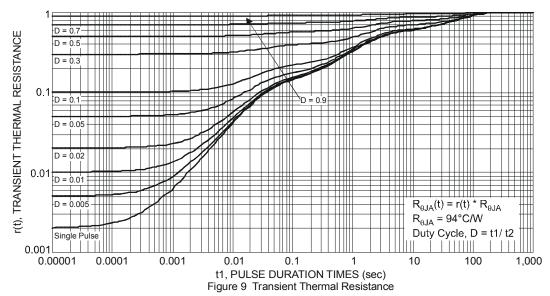
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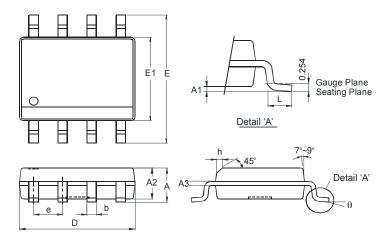
Figure 7 Gate Threshold Variation vs. Ambient Temperature





Package Outline Dimensions

Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.

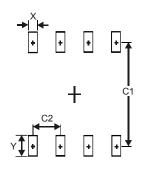


SO-8				
Dim	Min	Max		
Α	-	1.75		
A1	0.10	0.20		
A2	1.30	1.50		
A3	0.15	0.25		
b	0.3	0.5		
D	4.85	4.95		
Е	5.90	6.10		
E1	3.85	3.95		
е	e 1.27 Typ			
h	ı	0.35		
L	0.62	0.82		
θ	0°	8°		
All Dimensions in mm				



Suggested Pad Layout

Please see AP02001 at http://www.diodes.com/datasheets/ap02001.pdf for the latest version.



Dimensions	Value (in mm)
Х	0.60
Υ	1.55
C1	5.4
C2	1.27

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