



P-CHANNEL ENHANCEMENT MODE MOSFET POWERDI®

Product Summary

V _{(BR)DSS}	R _{DS(ON)}	I _D T _A = +25 <i>°</i> C
-30V	$7.5 \text{m}\Omega @ V_{GS} = -10V$	-36A
-307	$10m\Omega$ @ $V_{GS} = -4.5V$	-31A

Description

This new generation 30V P-Channel Enhancement Mode MOSFET is designed to minimize $R_{DS(ON)}$ and yet maintain superior switching performance. This device is ideal for use in notebook battery power management and load switch.

Applications

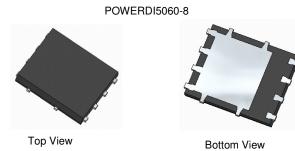
- Notebook Battery Power Management
- DC-DC Converters
- Load Switch

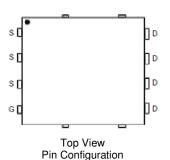
Features

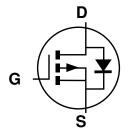
- Thermally Efficient Package Cooler Running Applications
- High Conversion Efficiency
- Low RDS(ON) Minimizes On State Losses
- Low Input Capacitance
- Fast Switching Speed
- <1.1mm Package Profile Ideal for Thin Applications
- ESD HBM Protected up to 1kV
- Lead-Free Finish; RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)
- Qualified to AEC-Q101 Standards for High Reliability
- PPAP Available

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 Connections: See Diagram Below
- Weight: 0.097 grams (Approximate)







Internal Schematic

Ordering Information (Notes 4 & 5)

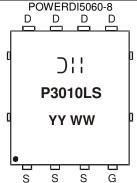
Part Number	Qualification	Case	Packaging
DMP3010LPSQ-13	Automotive	POWERDI®5060-8	2,500 / Tape & Reel

Pin1

Notes:

- 1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
- 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



Oll = Manufacturer's Marking
P3010LS = Product Type Marking Code
YYWW = Date Code Marking
YY = Year (ex: 13 = 2013)
WW = Week (01 - 53)

POWERDI is a registered trademark of Diodes Incorporated.



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

Characteristic	Symbol	Value	Unit		
Drain-Source Voltage	V_{DSS}	-30	V		
Gate-Source Voltage	V_{GSS}	±20	V		
Continuous Drain Current (Note 7) V _{GS} = 10V	Steady State	T _A = +25 °C T _A = +70 °C	I _D	-36 -29	Α
Continuous Drain Current (Note 7) V _{GS} = 4.5V	Steady State	T _A = +25 °C T _A = +70 °C	ID	-31 -25	Α
Continuous Drain Current (Note 6) V _{GS} = 10V	I _D	-14.5 -11.5	Α		
Pulsed Drain Current (Notes 6 & 9)	I _{DM}	-100	А		
Avalanche Current (Notes 10 & 11)	I _{AR}	-17.5	Α		
Repetitive Avalanche Energy (Notes 10 & 11) L = 1r	E _{AR}	153	mJ		

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 6)	P _D	2.18	W
Thermal Resistance, Junction to Ambient @T _A = +25 °C (Note 6)	R _{0JA}	55	°C/W
Power Dissipation (Note 7)	P _D	14.37	W
Thermal Resistance, Junction to Ambient @ $T_A = +25$ °C (Note 7)	$R_{\theta JA}$	8.7	°C/W
Power Dissipation (Notes 7 & 8)	P _D	58.7	W
Thermal Resistance, Junction to Case @T _C = +25 ℃ (Notes 7 & 8)	R _{0JC}	2.13	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	℃

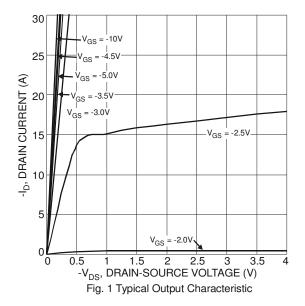
Electrical Characteristics (@T_A = +25 °C, unless otherwise specified.)

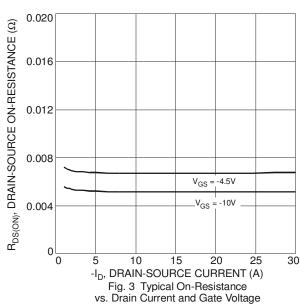
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition	
OFF CHARACTERISTICS (Note 11)							
Drain-Source Breakdown Voltage	BV_{DSS}	-30		_	V	$V_{GS} = 0V, I_D = -250\mu A$	
Zero Gate Voltage Drain Current	I _{DSS}	_	_	-1	μA	$V_{DS} = -30V, V_{GS} = 0V$	
Gate-Source Leakage	I _{GSS}		_	±100	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$	
ON CHARACTERISTICS (Note 11)							
Gate Threshold Voltage	$V_{GS(th)}$	-1.1	-1.6	-2.1	V	$V_{DS} = V_{GS}$, $I_D = -250\mu A$	
Static Drain-Source On-Resistance			5.7	7.5	mΩ	$V_{GS} = -10V, I_D = -10A$	
Static Drain-Source Off-Nesistance	R _{DS(ON)}	_	7.2	10	11122	$V_{GS} = -4.5V, I_D = -10A$	
Forward Transfer Admittance	Y _{fs}		30	_	S	$V_{DS} = -15V, I_{D} = -10A$	
Diode Forward Voltage	V_{SD}		-0.65	-1	V	$V_{GS} = 0V, I_{S} = -1A$	
DYNAMIC CHARACTERISTICS (Note 12)							
Input Capacitance	Ciss	l	6,234	_	pF	V _{DS} = 15V, V _{GS} = 0V, f = 1MHz	
Output Capacitance	Coss	_	1,500	_	pF		
Reverse Transfer Capacitance	Crss	l	774	_	pF	1 – 11011 12	
Gate Resistance	R_g	_	1.28	_	Ω	$V_{DS} = 0V$, $V_{GS} = 0V$, $f = 1MHz$	
Total Gate Charge (V _{GS} = -10V)	Q_g		126.2	_	nC	$V_{DS} = -15V, I_{D} = -10A$	
Total Gate Charge (V _{GS} = -4.5V)	Q_g	ı	59.2	_	nC	\\ 15\\ \\ 15\\ \\ \\ 15\\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\	
Gate-Source Charge	Qgs		16.1	_	nC	$V_{DS} = -15V$, $V_{GS} = -4.5V$, $I_{D} = -10A$	
Gate-Drain Charge	Q _{gd}	_	15.7	_	nC		
Turn-On Delay Time	t _{D(on)}		11.4	_	ns	$V_{DS} = -15V, V_{GEN} = -10V,$ $R_G = 6\Omega, I_D = -1A$	
Turn-On Rise Time	tr		9.4	_	ns		
Turn-Off Delay Time	$t_{D(off)}$	_	260.7	_	ns		
Turn-Off Fall Time	t _f	_	99.3	_	ns		

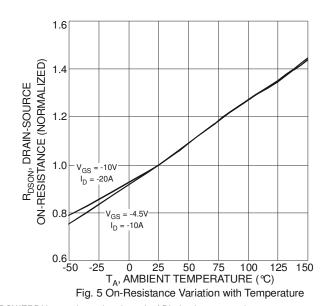
Notes:

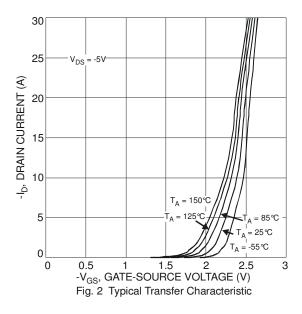
- 6. Device mounted on FR-4 PCB with 1-inch square 2 oz. Copper, single sided.
- 7. Device mounted on FR-4 PCB with infinite heatsink.
- 8. $R_{\theta JC}$ is guaranteed by design while $R_{\theta CA}$ is determined by the user's board design.
- 9. Repetitive rating, pulse width limited by junction temperature, $10\mu s$ pulse, duty cycle = 1%.
- 10. I_{AR} and E_{AR} rating are based on low frequency and duty cycles to keep $T_J = +25$ °C.
- 11. Short duration pulse test used to minimize self-heating effect.
- 12. Guaranteed by design. Not subject to production testing.

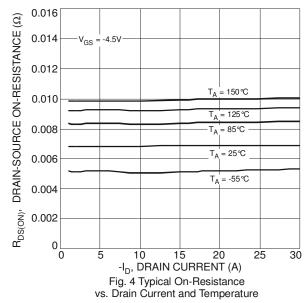












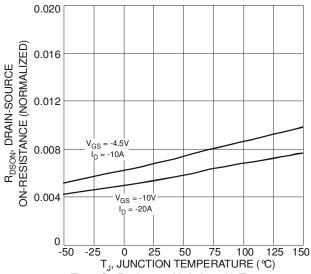


Fig. 6 On-Resistance Variation with Temperature



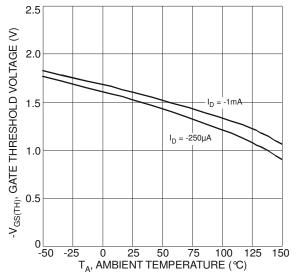
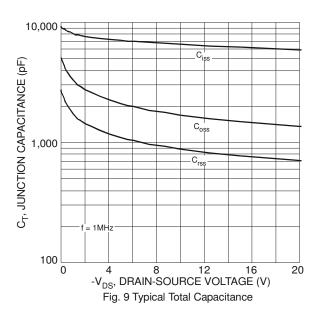
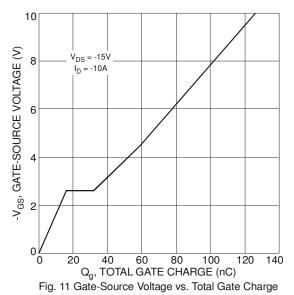
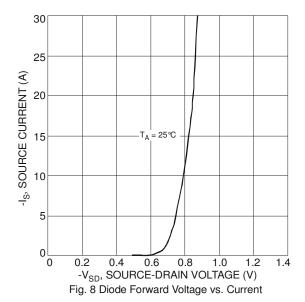


Fig. 7 Gate Threshold Variation vs. Ambient Temperature







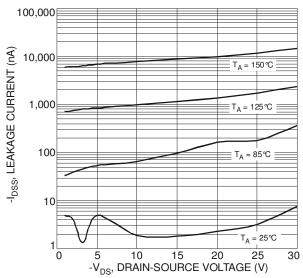
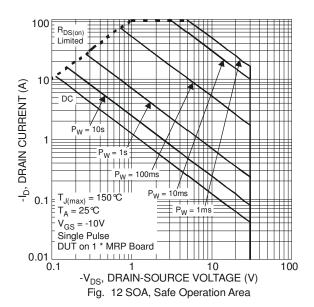
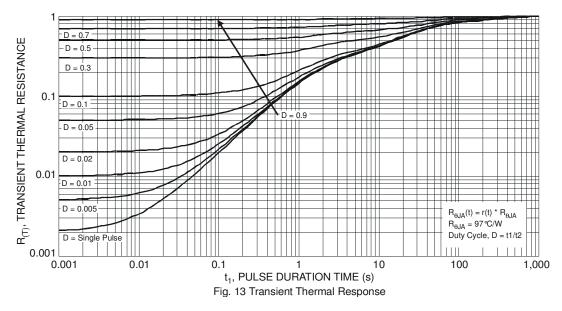


Fig. 10 Typical Leakage Current vs. Drain-Source Voltage



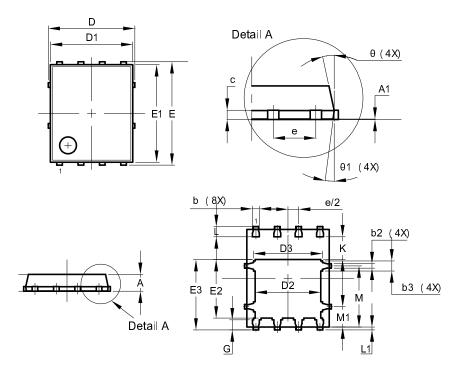




Package Outline Dimensions

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

POWERDI®5060-8

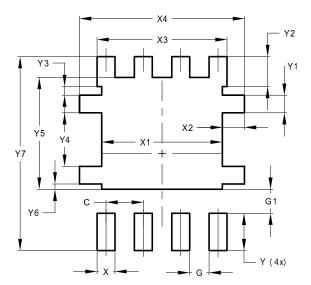


POWERDI®5060-8				
Dim	Min	Max	Тур	
Α	0.90	1.10	1.00	
A 1	0.00	0.05	-	
b	0.33	0.51	0.41	
b2	0.200	0.350	0.273	
b3	0.40	0.80	0.60	
С	0.230	0.330	0.277	
D	5.15 BSC			
D1	4.70	5.10	4.90	
D2	3.70	4.10	3.90	
D3	3.90	4.30	4.10	
Е	•	6.15 BSC	;	
E1	5.60 6.00		5.80	
E2	3.28	3.68	3.48	
E3	3.99	4.39	4.19	
е	1.27 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	
M	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 AP02001 at http://www.diodes.com/datasheets/ap02001.pdf for the latest version.



Dimensions	Value (in mm)
С	1.270
G	0.660
G1	0.820
X	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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многоканальный

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