



N-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

V _{(BR)DSS}	R _{DS(ON)} max	I _D max T _C = +25°C
	7.5 m Ω @ V _{GS} = 10V	30A
60V	11.5mΩ @ V _{GS} = 4.5V	25A

Features and Benefits

- Low R_{DS(ON)} ensures on state losses are minimized.
- Excellent Q_{gd x} R_{DS (ON)} Product (FOM)
- Advanced Technology for DC-DC Converters
- Small form factor thermally efficient package enables higher density end products.
- Occupies just 33% of the board area occupied by SO-8, enabling smaller end product.
- 100% UIS (Avalanche) Rated
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)
- Qualified to AEC-Q101 Standards for High Reliability

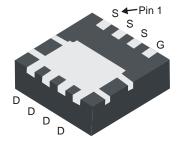
Description and Applications

This MOSFET is 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.

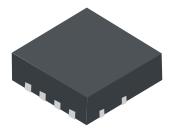
- Synchronous Rectifier
- Backlighting
- Power Management Functions
- DC-DC Converters

Mechanical Data

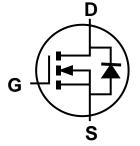
- Case: POWERDI®3333-8
- Case Material: Molded Plastic, "Green" Molding Compound;
 UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections Indicator: See Diagram
- Terminal Finish Matte Tin Annealed over Copper Leadframe;
 Solderable per MIL-STD-202, Method 208
- Weight: 0.008 grams (Approximate) (3)







Top View



Equivalent Circuit

Ordering Information (Note 4)

Part Number	Case	Packaging
DMT6010LFG-7	POWERDI [®] 3333-8	2,000/Tape & Reel
DMT6010LFG-13	POWERDI®3333-8	3,000/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. For packaging details, go to our website at http://www.diodes.com/products/packages.html.

Marking Information



SG6 = Product Type Marking Code YYWW = Date Code Marking YY = Last digit of year (ex: 13 = 2013) WW = Week code (01 ~ 53)

February 2015

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Maximum Ratings $(@T_A = +25^{\circ}C, \text{ unless otherwise specified.})$

Characteristic	Symbol	Value	Units	
Drain-Source Voltage		V_{DSS}	60	V
Gate-Source Voltage		V_{GSS}	±20	V
Continuous Dusis Coursest (Note 5) V	$T_A = +25$ °C $T_A = +70$ °C	I _D	13 11	А
Continuous Drain Current (Note 5) V _{GS} = 10V	$T_C = +25$ °C $T_C = +70$ °C	I _D	30 24	А
Maximum Continuous Body Diode Forward Current (Note 5)	Is	3	Α	
Pulsed Drain Current (10µs pulse, duty cycle = 1%)	I _{DM}	80	Α	
Avalanche Current, L=0.1mH		I _{AS}	20	A
Avalanche Energy, L=0.1mH	E _{AS}	64	mJ	

Thermal Characteristics ($@T_A = +25^{\circ}C$, unless otherwise specified.)

Characteristic	Symbol	Value	Units		
Total Power Dissipation (Note 5)	$T_A = +25^{\circ}C$	Б	2.2	- W	
Total Fower Dissipation (Note 3)	$T_C = +25^{\circ}C$	P_{D}	41		
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	D	55		
Thermal Resistance, Junction to Ambient (Note 5)	t<10s	$R_{\theta JA}$	35	°C/W	
Thermal Resistance, Junction to Case (Note 5)	$R_{ heta JC}$	3			
Operating and Storage Temperature Range	$T_{J_i} T_{STG}$	-55 to +150	°C		

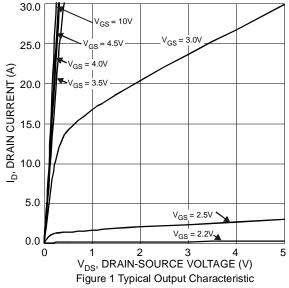
Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

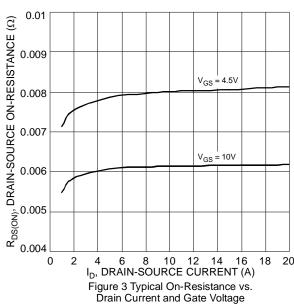
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 6)						
Drain-Source Breakdown Voltage	BV _{DSS}	60	_	_	V	$V_{GS} = 0V$, $I_D = 250\mu A$
Zero Gate Voltage Drain Current	I _{DSS}	-		1	μΑ	$V_{DS} = 48V, V_{GS} = 0V$
Gate-Source Leakage	I _{GSS}	1	1	±100	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$
ON CHARACTERISTICS (Note 6)						
Gate Threshold Voltage	V _{GS(th)}	8.0	_	2	V	$V_{DS} = V_{GS}, I_{D} = 250 \mu A$
Static Drain-Source On-Resistance	B- a (a)	_	6	7.5	mΩ	$V_{GS} = 10V, I_D = 20A$
Static Drain-Source On-Resistance	R _{DS} (ON)	_	7.8	11.5		$V_{GS} = 4.5V, I_D = 20A$
Diode Forward Voltage	V _{SD}	_	0.9	1.2	V	$V_{GS} = 0V, I_{S} = 20A$
DYNAMIC CHARACTERISTICS (Note 7)						
Input Capacitance	C _{iss}	1	2090	_		V _{DS} = 30V, V _{GS} = 0V, f = 1.0MHz
Output Capacitance	Coss	_	746	_	pF	
Reverse Transfer Capacitance	C _{rss}	_	38.5	_		
Gate resistance	Rg	_	0.59		Ω	$V_{DS} = 0V, V_{GS} = 0V, f = 1.0MHz$
Total Gate Charge (V _{GS} = 4.5V)	Qg	_	19.3			V _{DS} = 30V, I _D = 20A
Total Gate Charge (V _{GS} = 10V)	Qg	_	41.3		nC	
Gate-Source Charge	Qgs	_	6.0	_	IIC	
Gate-Drain Charge	Q_{gd}	_	8.8	_		
Turn-On Delay Time	t _{D(on)}	_	5.7	_		
Turn-On Rise Time	t _r	_	4.3	_	nS	$V_{DD} = 30V, V_{GS} = 10V,$
Turn-Off Delay Time	t _{D(off)}	_	23.4	_	115	$I_D = 20A, R_G = 3\Omega,$
Turn-Off Fall Time	t _f	_	9.7	_		

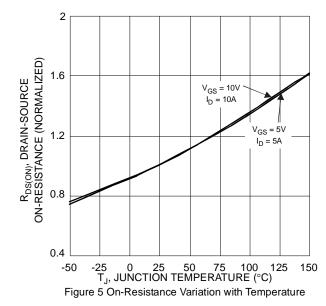
Notes:

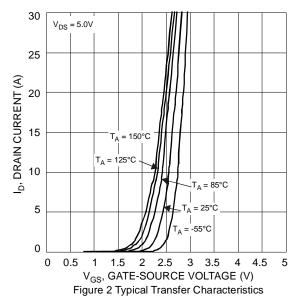
- 5. R_{BJA} is determined with the device mounted on FR-4 substrate PC board, 2oz copper, with 1-inch square copper plate. R_{BJC} is guaranteed by design while R_{BJA} is determined by the user's board design.
- 6. Short duration pulse test used to minimize self-heating effect.
- 7. Guaranteed by design. Not subject to product testing.

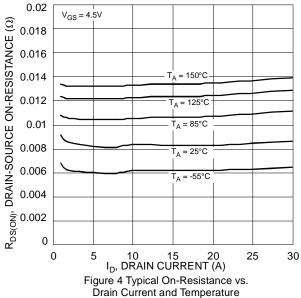


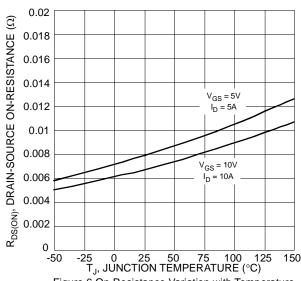














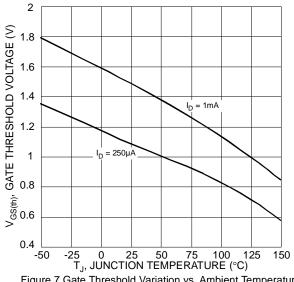
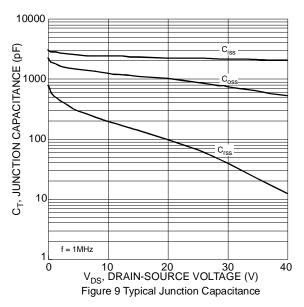
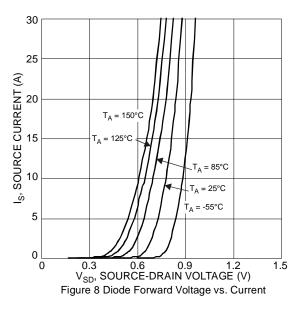
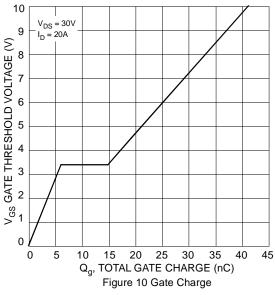
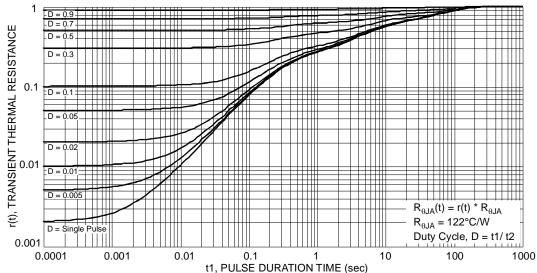


Figure 7 Gate Threshold Variation vs. Ambient Temperature





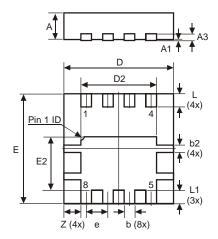






Package Outline Dimensions

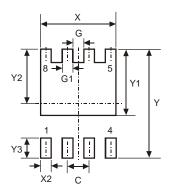
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.



POWERDI®3333-8					
Dim	Min	Max	Тур		
D	3.25	3.35	3.30		
Е	3.25	3.35	3.30		
D2	2.22	2.32	2.27		
E2	1.56	1.66	1.61		
Α	0.75	0.85	0.80		
A1	0	0.05	0.02		
A3	_	_	0.203		
b	0.27	0.37	0.32		
b2	_	_	0.20		
L	0.35	0.45	0.40		
L1	_	_	0.39		
е	_	_	0.65		
Z	_	_	0.515		
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	0.650
G	0.230
G1	0.420
Υ	3.700
Y1	2.250
Y2	1.850
Y3	0.700
X	2.370
X2	0.420



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Офис по работе с юридическими лицами:

105318, г. Москва, ул. Щербаковская д. 3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: info@moschip.ru

Skype отдела продаж:

moschip.ru moschip.ru_6 moschip.ru 4 moschip.ru 9