



### N-CHANNEL ENHANCEMENT MODE MOSFET

### **Product Summary**

V <sub>(BR)DSS</sub>	R <sub>DS(ON)</sub> max	I <sub>D</sub> max T <sub>C</sub> = +25°C
80V	16mΩ @ V <sub>GS</sub> = 10V	35A
80 V	22mΩ @ V <sub>GS</sub> = 6V	30A

### **Description and Applications**

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.

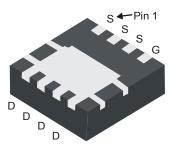
- Synchronous Rectifier
- Backlighting
- Power Management Functions
- DC-DC Converters

### **Features and Benefits**

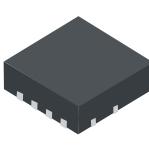
- Low R<sub>DS(ON)</sub> ensures on state losses are minimized
- Excellent Q<sub>gd x</sub> R<sub>DS(ON)</sub> Product (FOM)
- Advanced Technology for DC/DC converts
- Small form factor thermally efficient package enables higher density end products
- Occupies just 33% of the board area occupied by SO-8 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

### **Mechanical Data**

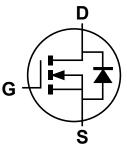
- Case: POWERDI<sup>®</sup>3333-8
- Case Material: Molded Plastic, "Green" Molding Compound.
  UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections Indicator: See diagram
- Terminals: Finish Matte Tin annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208 (3)
- Weight: 0.008 grams (approximate)



Bottom View



Top View



Equivalent Circuit

### Ordering Information (Note 4)

Part Number	Case	Packaging
DMT8012LFG-7	POWERDI3333-8	2,000/Tape & Reel
DMT8012LFG-13	POWERDI3333-8	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**



SG8 = Product Type Marking Code YYWW = Date Code Marking YY = Last digit of year (ex: 13 = 2013) WW = Week code (01 ~ 53)



# Maximum Ratings (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Units	
Drain-Source Voltage		V <sub>DSS</sub>	80	V
Gate-Source Voltage	V <sub>GSS</sub>	±20	V	
Continuous Drain Current (Note $E(X) = 40V$	T <sub>A</sub> = +25°C T <sub>A</sub> = +70°C	ID	9.5 7.6	А
Continuous Drain Current (Note 5) V <sub>GS</sub> = 10V	T <sub>C</sub> = +25°C T <sub>C</sub> = +70°C	ID	35 28	А
Maximum Continuous Body Diode Forward Current (Note 5)		IS	2	А
Pulsed Drain Current (10µs pulse, duty cycle = 1%)	I <sub>DM</sub>	80	А	

# Thermal Characteristics (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic		Symbol	Value	Units	
Total Dower Dissinction (Note 5)	T <sub>A</sub> = +25°C	D	2.2	W	
Total Power Dissipation (Note 5)	T <sub>C</sub> = +25°C	PD	30		
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	Devi	57		
	t<10s	R <sub>0JA</sub>	35	°C/W	
Thermal Resistance, Junction to Case (Note 5)	$R_{\theta JC}$	4.2			
Operating and Storage Temperature Range		T <sub>J,</sub> T <sub>STG</sub>	-55 to 150	°C	

### Electrical Characteristics (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition	
OFF CHARACTERISTICS (Note 6)							
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	80	—	—	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250µA	
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	_	_	1	μA	$V_{DS} = 64V, V_{GS} = 0V$	
Gate-Source Leakage	I <sub>GSS</sub>	_	—	±100	nA	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V	
ON CHARACTERISTICS (Note 6)						-	
Gate Threshold Voltage	V <sub>GS(th)</sub>	1	1.5	3	V	$V_{DS} = V_{GS}$ , $I_D = 250 \mu A$	
Static Drain-Source On-Resistance	P	_	13	16		V <sub>GS</sub> = 10V, I <sub>D</sub> = 12A	
	R <sub>DS(ON)</sub>	_	14	22	mΩ	$V_{GS} = 6V, I_D = 6A$	
Diode Forward Voltage	V <sub>SD</sub>	_	0.9	1.2	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = 12A	
DYNAMIC CHARACTERISTICS (Note 7)							
Input Capacitance	C <sub>iss</sub>	_	1949	—	pF	V <sub>DS</sub> = 40V, V <sub>GS</sub> = 0V, f = 1MHz	
Output Capacitance	Coss	_	177	_			
Reverse Transfer Capacitance	C <sub>rss</sub>	_	10	_			
Gate resistance	Rg	_	0.7	—	Ω	$V_{DS}$ = 0V, $V_{GS}$ = 0V, f = 1MHz	
Total Gate Charge (V <sub>GS</sub> = 4.5V)	Qg	_	15	—		V <sub>DS</sub> = 40V, I <sub>D</sub> = 12A	
Total Gate Charge (V <sub>GS</sub> = 10V)	Qg	_	34	—			
Gate-Source Charge	Q <sub>gs</sub>	_	6	—	nC		
Gate-Drain Charge	Q <sub>gd</sub>	_	4.5	_			
Turn-On Delay Time	t <sub>D(on)</sub>	_	4.9	_		V <sub>DD</sub> = 40V, V <sub>GS</sub> = 10V, I <sub>D</sub> = 12A, R <sub>G</sub> = 1.6Ω,	
Turn-On Rise Time	tr	_	3.8	_			
Turn-Off Delay Time	t <sub>D(off)</sub>	_	16.5	_	nS		
Turn-Off Fall Time	t <sub>f</sub>	_	3.5	—	1		
Body Diode Reverse Recovery Time	t <sub>rr</sub>	_	30.2	_	nS	1 100 IV/II 1000/	
Body Diode Reverse Recovery Charge	Qrr	_	34.6	_	nC	—I <sub>F</sub> = 12A, di/dt = 100A/μs	

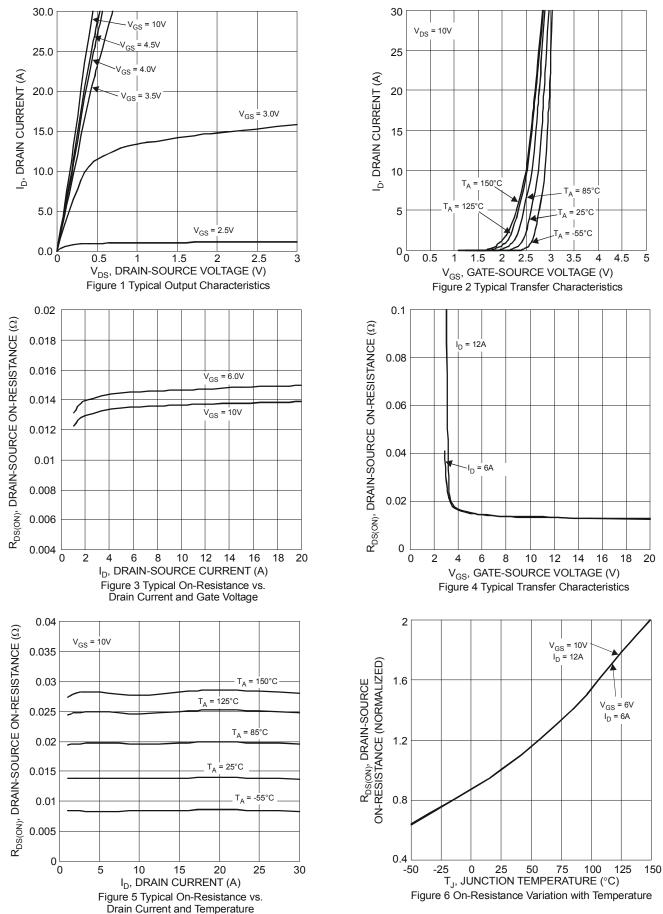
Notes: 5. R<sub>0JA</sub> is determined with the device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate. R<sub>0JC</sub> is guaranteed by design while R<sub>0JA</sub> is determined by the user's board design.

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

7. Guaranteed by design. Not subject to product testing.



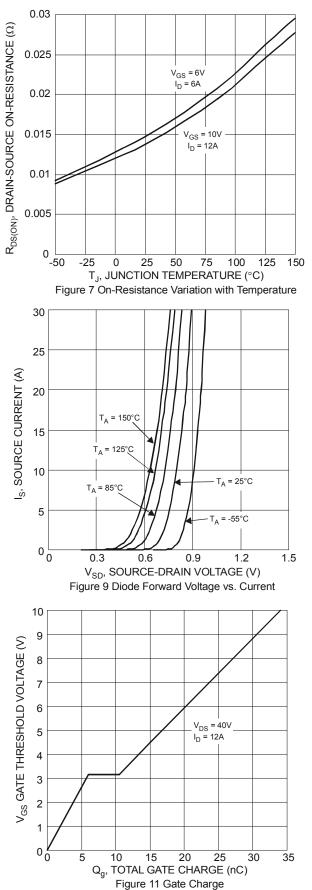
### DMT8012LFG

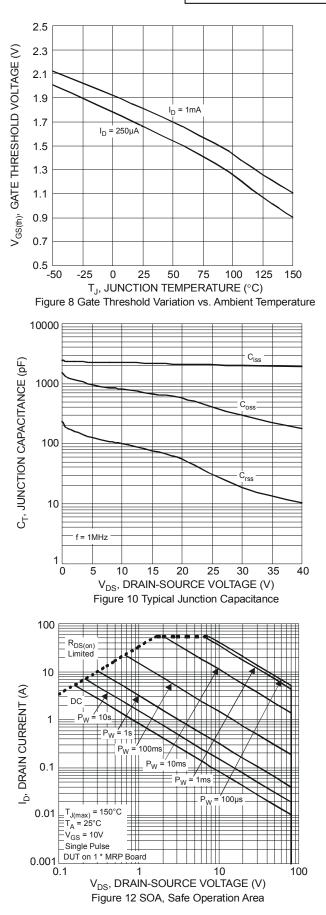


NEW PRODUCT

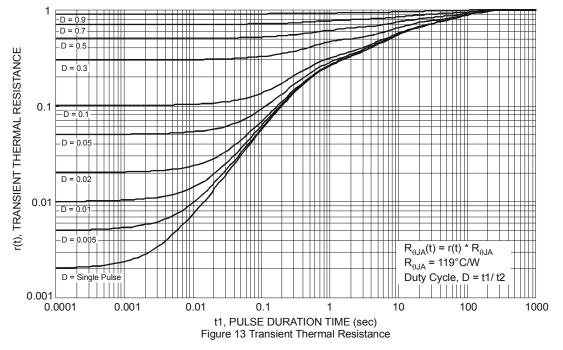
DMT8012LFG Document number: DS36606 Rev. 3 - 2





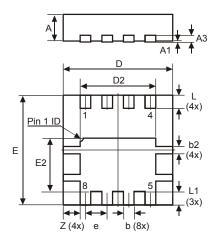






## Package Outline Dimensions

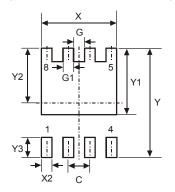
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for latest version.



POWERDI <sup>®</sup> 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		
Ζ	_	_	0.515		
All Dimensions in mm					

## **Suggested Pad Layout**

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



Dimensions	Value (in mm)			
С	0.650			
G	0.230			
G1	0.420			
Y	3.700			
Y1	2.250			
Y2	1.850			
Y3	0.700			
Х	2.370			
X2	0.420			

DMT8012LFG Document number: DS36606 Rev. 3 - 2



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