



30V N-CHANNEL ENHANCEMENT MODE MOSFET POWERDI®

Product Summary

V _{(BR)DSS}	R _{DS(ON)} max	I _D max T _A = 25°C
	$23\text{m}\Omega$ @ V _{GS} = 10V	7.0A
30V	$33m\Omega$ @ $V_{GS} = 4.5V$	6.0A

Features and Benefits

- 100% Unclamped Inductive Switch (UIS) test in production
- Low R_{DS(ON)} ensures on state losses are minimized
- 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
- 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 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.

- Backlighting
- Power Management Functions
- DC-DC Converters

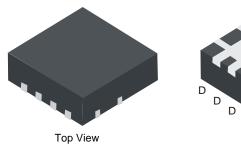
Mechanical Data

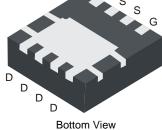
Case: POWERDI3333-8

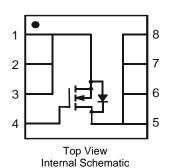
Pin 1

- 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 63
- Weight: 0.008 grams (approximate)









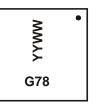
Ordering Information (Note 4)

Part Number	Case	Packaging		
DMG7408SFG-7	POWERDI3333-8	2000/Tape & Reel		
DMG7408SFG-13	POWERDI3333-8	3000/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 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.

Marking Information



G78 = Product Type Marking Code YYWW = Date Code Marking YY = Last digit of year (ex: 11 = 2011) WW = Week code (01 ~ 53)



N34 = Product Type Marking Code YYWW = Date Code Marking YY = Last digit of year (ex: 11 = 2011) WW = Week code (01 ~ 53)



Maximum Ratings @TA = 25°C unless otherwise specified

Characteristic	Symbol	Value	Units		
Drain-Source Voltage	V_{DSS}	30	V		
Gate-Source Voltage	V_{GSS}	±20	V		
Continuous Drain Current (Note 6) V 40V	Steady State	$T_A = 25$ °C $T_A = 70$ °C	I _D	7.0 5.5	Α
Continuous Drain Current (Note 6) V _{GS} = 10V	t<10s	$T_A = 25$ °C $T_A = 70$ °C	I _D	9.5 7.5	Α
Continuous Drain Current (Note 6) V 4.5V	Steady State	$T_A = 25$ °C $T_A = 70$ °C	Ι _D	6.0 5.7	Α
Continuous Drain Current (Note 6) V _{GS} = 4.5V	t<10s	$T_A = 25$ °C $T_A = 70$ °C	I _D	8.0 6.3	А
Pulsed Drain Current (10µs pulse, duty cycle = 1%)	I _{DM}	66	Α		
Maximum Continuous Body Diode Forward Current (I _S	3.0	Α		
Avalanche Current (Note 7)			I _{AS}	9	Α
Avalanche Energy (Note 7)	E _{AS}	12	mJ		

Thermal Characteristics @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Value	Units	
Total Power Dissipation (Note 5)		P_{D}	1	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady state	C	131	°C/W
termal Resistance, Junction to Ambient (Note 5)		$R_{\theta JA}$	72	°C/W
Total Power Dissipation (Note 6)		P_{D}	2.1	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady state	6	63	°C/W
Thermal Resistance, Junction to Ambient (Note 6)	t<10s	$R_{\theta JA}$	35	°C/W
Thermal Resistance, Junction to Case (Note 6)		$R_{ heta JC}$	7.1	°C/W
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}	30	-	-	V	$V_{GS} = 0V, I_D = 250\mu A$	
Zero Gate Voltage Drain Current	I _{DSS}	-	-	1	μΑ	$V_{DS} = 30V, V_{GS} = 0V$	
Gate-Source Leakage	I _{GSS}	-	-	±100	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$	
ON CHARACTERISTICS (Note 8)	ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	V _{GS(th)}	1.0	1.45	2.4	V	$V_{DS} = V_{GS}, I_{D} = 250 \mu A$	
Static Drain-Source On-Resistance	D		15 25	23 33	mΩ	$V_{GS} = 10V, I_D = 10A$	
Static Drain-Source On-Resistance	R _{DS} (ON)	-			111 2 2	$V_{GS} = 4.5V, I_D = 7.5A$	
Forward Transfer Admittance	Y _{fs}	1	11	1	S	$V_{DS} = 5V, I_{D} = 10A$	
Diode Forward Voltage	V_{SD}	-	0.72	1	V	$V_{GS} = 0V, I_{S} = 1A$	
DYNAMIC CHARACTERISTICS (Note 9)							
Input Capacitance	C _{iss}	-	478.9	-	pF		
Output Capacitance	Coss	-	96.7	-	pF	$V_{DS} = 15V, V_{GS} = 0V,$ f = 1.0MHz	
Reverse Transfer Capacitance	C _{rss}	-	61.4	-	pF	1 = 1.000112	
Gate Resistance	R_g	0.4	1.1	1.6	Ω	$V_{DS} = 0V$, $V_{GS} = 0V$, $f = 1MHz$	
Total Gate Charge (V _{GS} = 4.5V)	Qg	-	5.0	8	nC		
Total Gate Charge (V _{GS} = 10V)	Qg	-	10.5	17	nc	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	
Gate-Source Charge	Q _{gs}	-	1.8	-	nC	$V_{DS} = 15V, I_{D} = 10A$	
Gate-Drain Charge	Q_{gd}	-	1.6	-	nC	1	
Turn-On Delay Time	t _{D(on)}	-	2.9	-	ns	V _{GS} = 10V, V _{DS} = 15V,	
Turn-On Rise Time	t _r	ı	7.9	-	ns		
Turn-Off Delay Time	t _{D(off)}	1	14.6	-	ns	$R_G = 3\Omega$, $R_L = 1.5\Omega$	
Turn-Off Fall Time	t _f	-	3.1	-	ns		

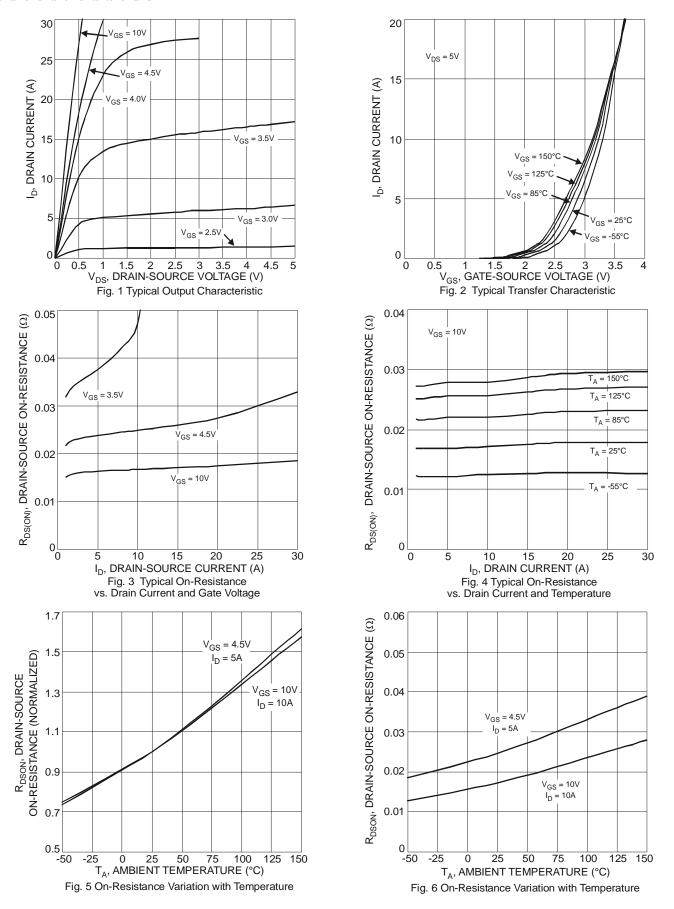
Notes:

- 5. R_{BJA} is determined with the device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate. R 6. Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.

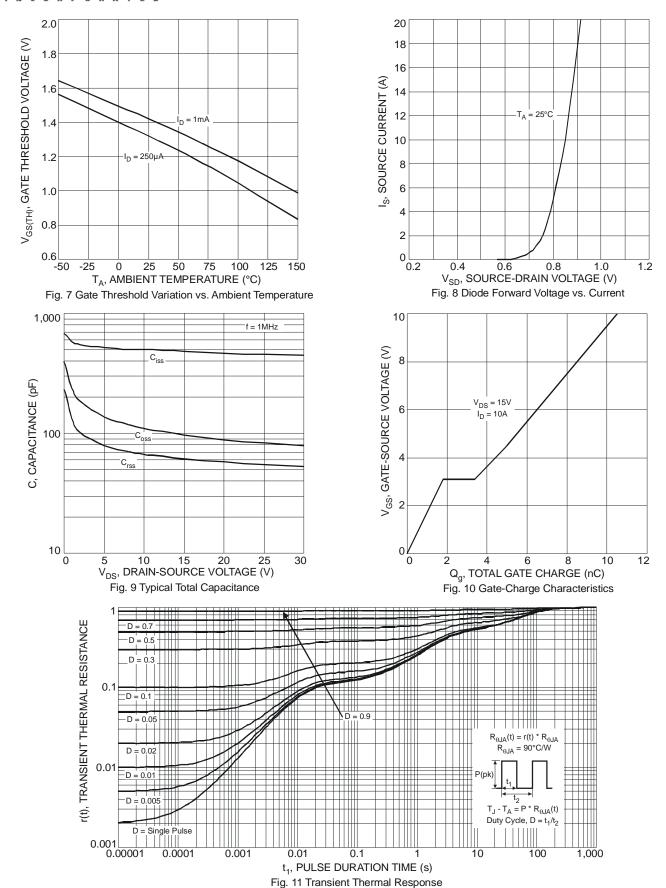
- 7. UIS in production with L = 0.3mH, TJ = 25°C
 8. Short duration pulse test used to minimize self-heating effect.
 9. Guaranteed by design. Not subject to product testing.

Document number: DS35620 Rev. 5 - 2



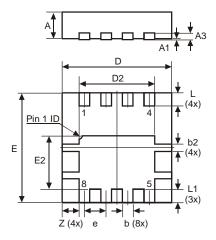






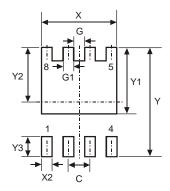


Package Outline Dimensions



P	POWERDI3333-8					
Dim	Min	Max	Тур			
D	3.25	3.35	3.30			
E	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			
А3	_	_	0.203			
b	0.27	0.37	0.32			
b2	1		0.20			
L	0.35	0.45	0.40			
L1	_	_	0.39			
е	-	_	0.65			
Z	_	_	0.515			
All I	All Dimensions in mm					

Suggested Pad Layout



Dimensions	Value (in mm)				
C	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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