



N-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

V _{(BR)DSS}	R _{DS(ON)} max	I _D max T _C = +25°C
60)/	7.5mΩ @ V _{GS} = 10V	60A
60V	11.5mΩ @ V _{GS} = 4.5V	49A

Description

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

Applications

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

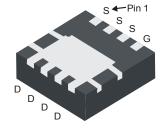
Features and Benefits

- Low R_{DS(ON)} Ensures on State Losses Are Minimized
- Excellent Q_{gd} x R_{DS (ON)} Product (FOM)
- Advanced Technology for DC/DC 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
- ESD Protected Gate
- 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[®]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)

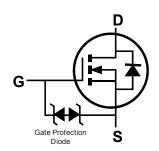




Bottom View



Top View Internal Schematic



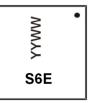
Ordering Information (Note 4)

Part Number	Case	Packaging
DMT6008LFG-7	POWERDI3333-8	2,000/Tape & Reel
DMT6008LFG-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



S6E = Product Type Marking Code YYWW = Date Code Marking YY = Last digit of year (ex: 13 = 2013) WW = Week code (01 ~ 53)



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

Characteristic	Symbol	Value	Units	
Drain-Source Voltage	V _{DSS}	60	V	
Gate-Source Voltage		V _{GSS}	±12	V
Continuous Drain Current (Note EVV - 40V	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	60 48	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 (Note 6)		I _{AS}	13	Α
Avalanche Energy (Note 6)	E _{AS}	25	mJ	

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

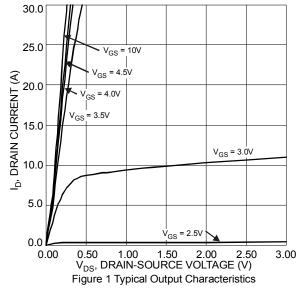
Characteristic	Symbol	Value	Units		
Total Power Dissipation (Note 5)	T _A = +25°C	D-	2.2	- W	
Total Fower Dissipation (Note 3)	T _C = +25°C	P_D	41		
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	Ъ	58		
Thermal Resistance, Junction to Ambient (Note 5)	t<10s	$R_{\theta JA}$	35	°C/W	
Thermal Resistance, Junction to Case (Note 5)	$R_{ heta JC}$	3			
Operating and Storage Temperature Range	T _{J,} T _{STG}	-55 to +150	°C		

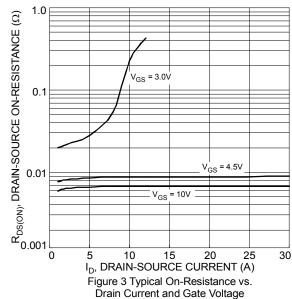
Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

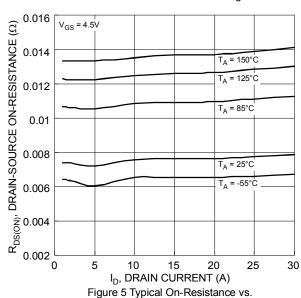
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition	
OFF CHARACTERISTICS (Note 7)	- Jimber		. , , ,	mux	0	Tool Commune	
Drain-Source Breakdown Voltage	BV _{DSS}	60	_	<u> </u>	V	V _{GS} = 0V, I _D = 1mA	
Zero Gate Voltage Drain Current	I _{DSS}	_	_	1	μA	V _{DS} = 48V, V _{GS} = 0V	
Gate-Source Leakage		_	_	±10	μΑ	V _{GS} = ±10V, V _{DS} = 0V	
ON CHARACTERISTICS (Note 7)			•				
Gate Threshold Voltage	V _{GS(th)}	0.7	_	2.0	V	$V_{DS} = V_{GS}, I_{D} = 250 \mu A$	
		_	5.0	7.5	mΩ	V _{GS} = 10V, I _D = 20A	
Static Drain-Source On-Resistance	R _{DS(ON)}	_	6.5	11.5		$V_{GS} = 4.5V, I_D = 20A$	
		_	19	_		$V_{GS} = 3V$, $I_D = 3A$	
Diode Forward Voltage	V _{SD}	_	0.9	1.2	V	V _{GS} = 0V, I _S = 20A	
DYNAMIC CHARACTERISTICS (Note 8)	1			•	•		
Input Capacitance	C _{iss}	_	2713	_			
Output Capacitance	Coss	_	822	_	pF	$V_{DS} = 30V$, $V_{GS} = 0V$, $f = 1.0MHz$	
Reverse Transfer Capacitance	C _{rss}	_	57	_			
Gate Resistance	R _g	_	0.54	_	Ω	$V_{DS} = 0V, V_{GS} = 0V, f = 1.0MHz$	
Total Gate Charge (V _{GS} = 4.5V)	Qg	_	22.4	_			
Total Gate Charge (V _{GS} = 10V)	Qg	_	50.4	_	1		
Gate-Source Charge	Q _{gs}	_	9.6	_	nC	$V_{DS} = 30V, I_{D} = 20A$	
Gate-Drain Charge	Q_{gd}	_	7.8	_			
Turn-On Delay Time	t _{D(on)}	_	7.0	_			
Turn-On Rise Time	t _r	_	4.4	_	V _{DD} = 30V, V _{GS} = 10V,		
Turn-Off Delay Time	t _{D(off)}	_	24.4	_	nS	$I_D = 20A, R_G = 3\Omega,$	
Turn-Off Fall Time	t _f	_	7.0	_	1		

- 5. R_{OJA} is determined with the device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate. R_{BJC} is guaranteed by design S. R_{OJA} is determined with the device informed on Fr.4 substrate while R_{OJA} is determined by the user's board design.
 6. UIS in production with L = 0.3mH, T_J = +25°C
 7. Short duration pulse test used to minimize self-heating effect.
 8. Guaranteed by design. Not subject to product testing.

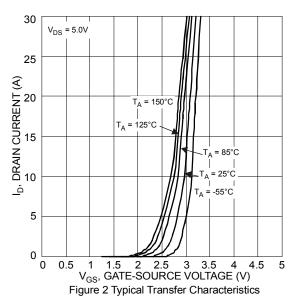


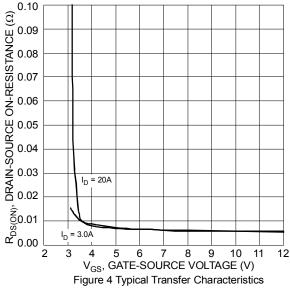






Drain Current and Temperature





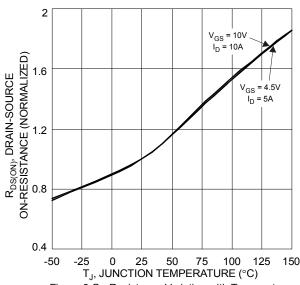


Figure 6 On-Resistance Variation with Temperature



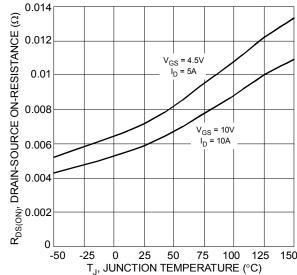
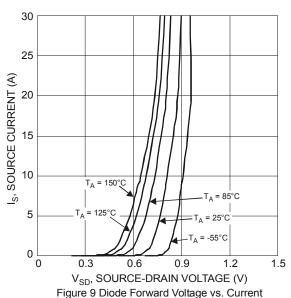
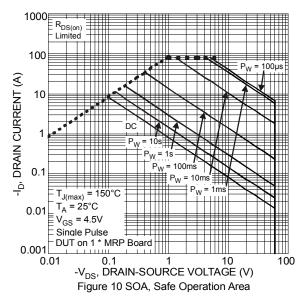


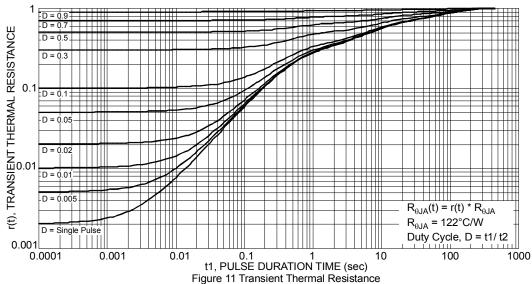
Figure 7 On-Resistance Variation with Temperature



2.4 (Σ) 2.2 BY 1.6 BY 1.6 BY 1.4 E D = 250μA 1_D = 1mA 1_D = 1mB 1

Figure 8 Gate Threshold Variation vs. Ambient Temperature

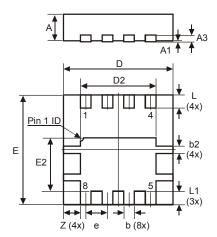






Package Outline Dimensions

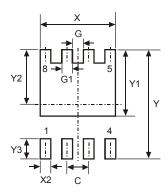
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for latest version.



Р	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		
А3	_	_	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 I	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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