



20V P-CHANNEL ENHANCEMENT MODE MOSFET POWERDI®

Product Summary

V _{(BR)DSS}	R _{DS(ON)} Max	I _D Max T _C = +25°C		
-20V	$6.7 \text{m}\Omega$ @ $V_{GS} = -4.5 \text{V}$	-40A		
-20V	$9.0 \text{m}\Omega$ @ $V_{GS} = -2.5 \text{V}$	-40A		

Description

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.

Applications

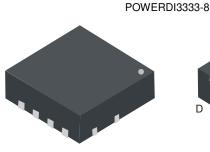
- Load Switch
- Power Management Functions

Features

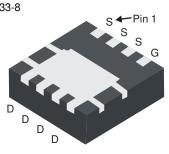
- Low R_{DS(ON)} ensures on state losses are minimized
- Small form factor thermally efficient package enables higher density end products
- Occupies just 33% of the board area occupied by SO-8 enabling smaller end product
- ESD HBM Protected up to 1KV
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)

Mechanical Data

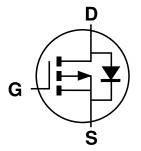
- Case: POWERDI3333-8
- Case Material: Molded Plastic, "Green" Molding Compound.
 UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections Indicator: See Diagram
- Terminals: Finish Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 (23)
- Weight: 0.008 grams (Approximate)







Bottom View



Equivalent Circuit

Ordering Information (Note 4)

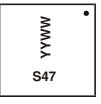
Part Number	Case	Packaging
DMP26M7UFG-7	POWERDI3333-8	2000/Tape & Reel
DMP26M7UFG-13	POWERDI3333-8	3000/Tape & Reel

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/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





S42 or S47= Product Type Marking Code YYWW = Date Code Marking YY = Last Digit of Year (ex: 14 = 2014) WW = Week Code (01 to 53)



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

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V _{DSS}	-20	V
Gate-Source Voltage			V _{GSS}	±10	V
Continuous Drain Current (Note 5) V _{GS} = -4.5V	Steady State	$T_A = +25^{\circ}C$ $T_A = +70^{\circ}C$ $T_C = +25^{\circ}C$	I _D	-18.0 -14.5 -40	А
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)	I _{DM}	-80	Α		
Maximum Continuous Body Diode Forward Current (Note 5)			I _S	-2.2	Α
Avalanche Current (Note 7) L=0.1mH			I _{AS}	-23	Α
Avalanche Energy (Note 7) L=0.1mH			E _{AS}	28	mJ

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

Characteristic	Symbol	Value	Unit	
Total Power Dissination (Note 5)	$T_A = +25^{\circ}C$	В	2.3	w
Total Power Dissipation (Note 5)	$T_C = +25^{\circ}C$		41] vv
Thermal Resistance, Junction to Ambient	(Note 5)	D	56	°C/W
Thermal nesistance, Junction to Ambient	(Note 6)	$R_{\theta JA}$	124	
Thermal Resistance, Junction to Case	$R_{ heta JC}$	6.8		
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}	-20	_	_	V	$V_{GS} = 0V, I_{D} = -250\mu A$	
Zero Gate Voltage Drain Current	I _{DSS}	_	_	-1	μΑ	$V_{DS} = -16V, V_{GS} = 0V$	
Gate-Source Leakage	I _{GSS}	_		±100	nA	$V_{GS} = \pm 8V$, $V_{DS} = 0V$	
ON CHARACTERISTICS (Note 8)							
Gate Threshold Voltage	$V_{GS(TH)}$	-0.4	-	-1.0	V	$V_{DS} = V_{GS}, I_{D} = -250 \mu A$	
			4.2	6.7		$V_{GS} = -4.5V$, $I_{D} = -15A$	
Static Drain-Source On-Resistance	R _{DS(ON)}		5.4	9.0	mΩ	$V_{GS} = -2.5V, I_D = -10A$	
		-	7	_		$V_{GS} = -1.8V, I_{D} = -1A$	
Diode Forward Voltage	V_{SD}	_	-0.7	-1.2	V	$V_{GS} = 0V, I_{S} = -10A$	
DYNAMIC CHARACTERISTICS (Note 9)	•						
Input Capacitance	C _{iss}	_	5940	_		$V_{DS} = -10V, V_{GS} = 0V$ f = 1.0MHz	
Output Capacitance	Coss	_	835	_	pF		
Reverse Transfer Capacitance	C_{rss}	_	728	_			
Gate Resistance	Rg	_	3.0	_	Ω	$V_{DS} = 0V, V_{GS} = 0V, f = 1.0MHz$	
Total Gate Charge (V _{GS} = -4.5V)	Q_g	_	75	_		$V_{DD} = -10V, I_D = -20A$	
Total Gate Charge (V _{GS} = -10V)	Qg	_	156	_	nC		
Gate-Source Charge	Q _{gs}	_	8.8	_	IIC		
Gate-Drain Charge	Q _{qd}	_	22	_			
Turn-On Delay Time	t _{D(ON)}	_	10.7	_		$V_{GS} = -4.5V, V_{DD} = -10V,$ $R_{G} = 1\Omega, I_{D} = -10A$	
Turn-On Rise Time	t _R	_	23	_			
Turn-Off Delay Time	t _{D(OFF)}	_	121	_	ns		
Turn-Off Fall Time	t _F	-	109	_	1		
Reverse Recovery Time	t _{RR}	_	60	_	ns	I _F = -10A, di/dt = 100A/μs	
Reverse Recovery Charge	Q _{RR}	_	47	_	nC	$I_F = -10A$, $di/dt = 100A/\mu s$	

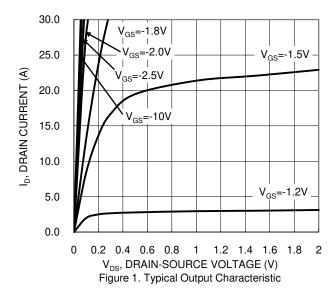
Notes:

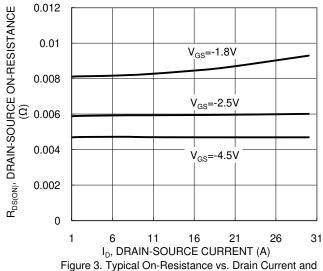
5. R_{BJA} is determined with the device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate. R_{BJC} is guaranteed by design while $R_{\theta JA}$ is determined by the user's board design.

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- 6. Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.
- 7 .UIS in production with L =0.1mH, T_J = +25°C
- 8. Short duration pulse test used to minimize self-heating effect.
- 9. Guaranteed by design. Not subject to product testing.







Gate Voltage

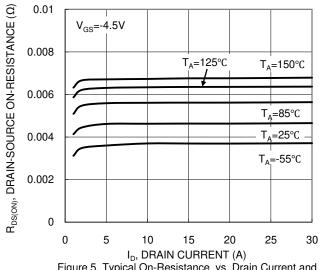
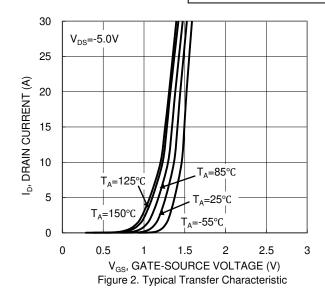
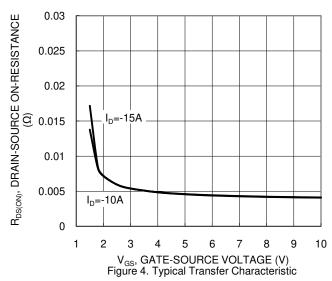


Figure 5. Typical On-Resistance vs. Drain Current and Temperature





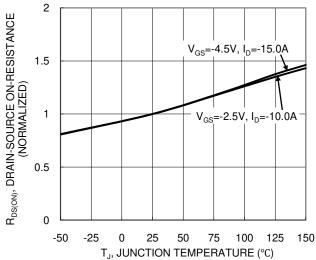
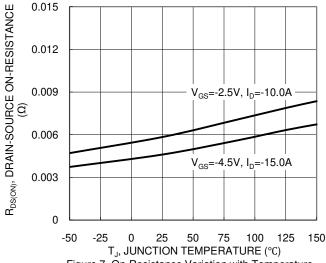
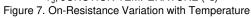
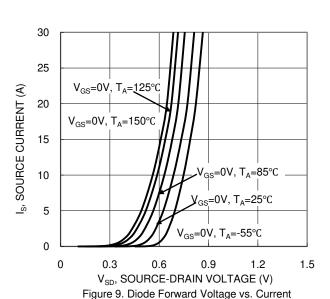


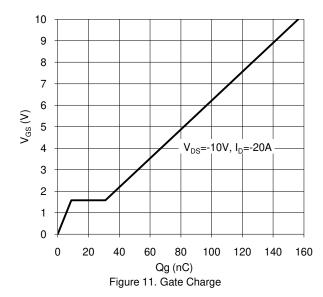
Figure 6. On-Resistance Variation with Temperature

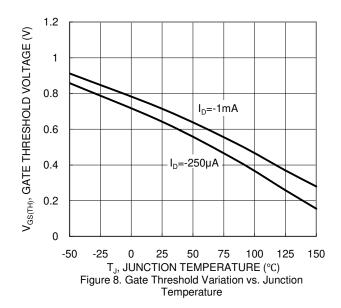


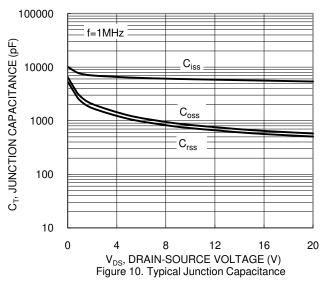


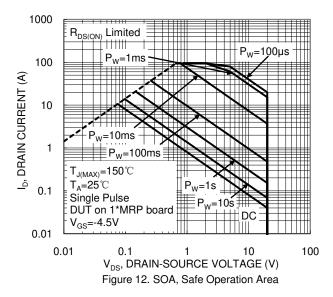




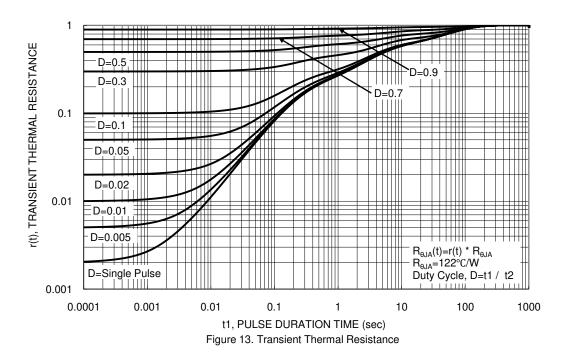






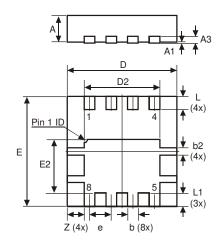






Package Outline Dimensions

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

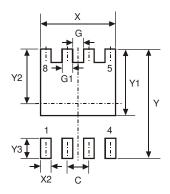


POWERDI3333-8					
Dim	Min	Max	Тур		
D	3.25	3.35	3.30		
Е	3.25	3.35	3.30		
D2	2.22	2.32	2.27		
E2	1.56	1.66	1.61		
Α	0.75	0.85	0.80		
A1	0	0.05	0.02		
А3	-	-	0.203		
b	0.27	0.37	0.32		
b2	_	_	0.20		
L	0.35	0.45	0.40		
L1	_	_	0.39		
е	_	_	0.65		
Z	_	_	0.515		
All Dimensions in mm					



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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