



40V P-CHANNEL ENHANCEMENT MODE MOSFET POWERDI®

Product Summary

V _{(BR)DSS}	R _{DS(on)} max	I _D max T _A = +25°C (Notes 6)	
-40V	25mΩ @ V_{GS} = -10 V	- 7.2A	
	45mΩ @ V _{GS} = -4.5V	- 5.4A	

Description

This MOSFET has been designed to minimize the on-state resistance and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

Applications

- Motor Control
- Backlighting
- DC-DC Converters
- Printer Equipment

Features

- Low R_{DS(on)} Minimizes conduction losses
- Fast switching speed Minimizes switching losses
- 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

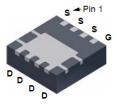
Mechanical Data

- Case: POWERDI3333-8
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals Connections: See diagram below
- Terminals: Finish Matte Tin annealed over Copper lead frame. Solderable per MIL-STD-202, Method 208 (3)
- Weight: 0.0172 grams (approximate)

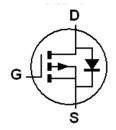
POWERDI3333-8



Top View



Bottom View



Device symbol

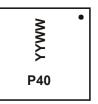
Ordering Information (Note 4)

Product	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
DMP4025SFG-7	P40	7	8	2,000
DMP4025SFG-13	P40	13	8	3,000

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



P40 = Product marking code YYWW = Date Code Marking YY = Year (ex: 12 = 2012) WW = Week (01 - 53)





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

Characteristic			Symbol	Value	Units
Drain-Source Voltage	Drain-Source Voltage			-40	V
Gate-Source Voltage			V _{GSS}	±20	V
		(Notes 6)		-7.2	
Continuous Drain Current	V _{GS} = 10V	$T_A = +70^{\circ}C$ (Notes 6)	I _D	-5.77	۸
		(Notes 5)		-4.65	"
Pulsed Drain Current	V _{GS} = 10V	(Notes 7)	I _{DM}	-26	

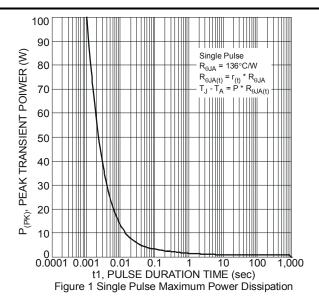
Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

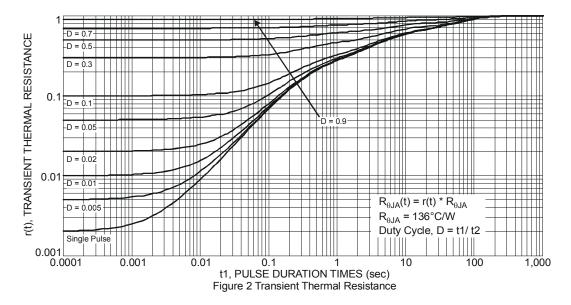
Characteristic	Symbol	Value	Unit	
Power Dissipation	(Note 5)	D	0.81	10/
Linear Derating Factor (Note 6)		PD	1.95	W
Thermal Desigtance Junction to Ambient	(Note 5)	Б	155	°C/W
Thermal Resistance, Junction to Ambient	(Note 6)	R _{0JA}	64	C/VV
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C	

- 5. Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout
- 6. For a device surface mounted on 25mm x 25mm FR4 PCB with 2oz copper, in still air conditions; 7. Same as note (6), except the device is pulsed with D= 0.02 and pulse width 300µs.



Thermal Characteristics









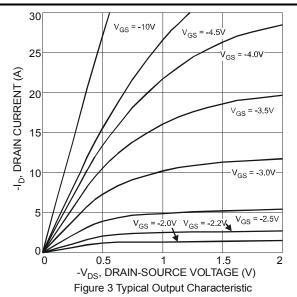
Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

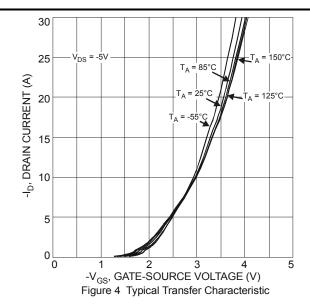
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition	
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage	BV_{DSS}	-40	_	_	V	$I_D = -250 \mu A, V_{GS} = 0 V$	
Zero Gate Voltage Drain Current	I _{DSS}	_	_	-1.0	μΑ	$V_{DS} = -40V, V_{GS} = 0V$	
Gate-Source Leakage	I _{GSS}	_	_	±100	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$	
ON CHARACTERISTICS							
Gate Threshold Voltage	$V_{GS(th)}$	-0.8	-1.3	-1.8	V	$I_D = -250 \mu A$, $V_{DS} = V_{GS}$	
Static Drain Source On Resistance (Note 9)	D		18	25	mΩ	$V_{GS} = -10V, I_D = -3A$	
Static Drain-Source On-Resistance (Note 8)	R _{DS (ON)}	_	30	45		V _{GS} = -4.5V, I _D = -3A	
Forward Transconductance (Notes 8 & 9)	g _{fs}	_	16.6	_	S	$V_{DS} = -5V, I_{D} = -3A$	
Diode Forward Voltage (Note 8)	V_{SD}	_	-0.7	-1.0	V	I _S = -1A, V _{GS} = 0V	
DYNAMIC CHARACTERISTICS (Note 9)							
Input Capacitance	Ciss	_	1643			.,	
Output Capacitance	Coss	_	179	_	pF	$V_{DS} = -20V$, $V_{GS} = 0V$ f = 1MHz	
Reverse Transfer Capacitance	Crss	_	128	_		1 - 11011 12	
Gate Resistance	R_g	_	6.43	_	Ω	$V_{DS} = 0V$, $V_{GS} = 0V$, $f = 1MHz$	
Total Gate Charge (Note 10)	Q_g	_	14.0	_		V _{GS} = -4.5V	
Total Gate Charge (Note 10)	Qg	_	33.7	_	nC	V _{DS} = -20V	
Gate-Source Charge (Note 10)	Q_{gs}	_	5.5	_	nC	$V_{GS} = -10V$ $I_D = -3A$	
Gate-Drain Charge (Note 10)	Q_{gd}	_	7.3	_			
Turn-On Delay Time (Note 10)	t _{D(on)}	_	6.9	_		<u>'</u>	
Turn-On Rise Time (Note 10)	t _r	_	14.7	_		V _{DD} = -20V, V _{GS} = -10V	
Turn-Off Delay Time (Note 10)	$t_{D(off)}$	_	53.7	_	ns	$I_D = -3A$	
Turn-Off Fall Time (Note 10)	t _f	_	30.9	_			

Notes:

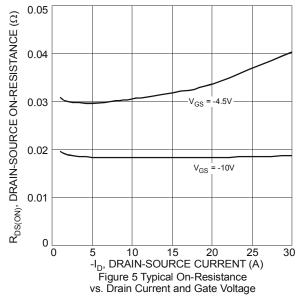
- 8. Measured under pulsed conditions. Pulse width $\leq 300 \mu s;$ duty cycle $\leq 2\%$
- 9. For design aid only, not subject to production testing.
- 10. Switching characteristics are independent of operating junction temperatures.

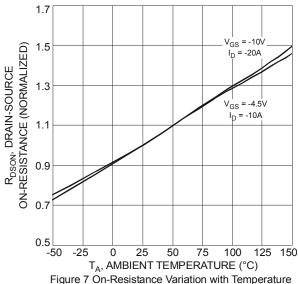
Typical Characteristics











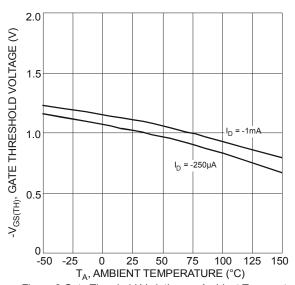
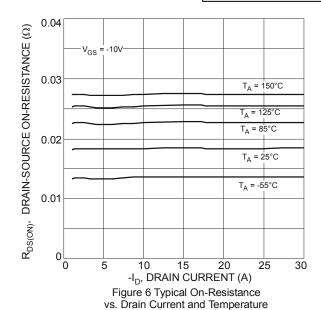


Figure 9 Gate Threshold Variation vs. Ambient Temperature POWERDI is a registered trademark of Diodes Incorporated.



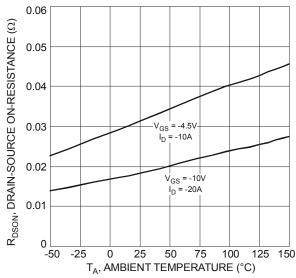


Figure 8 On-Resistance Variation with Temperature

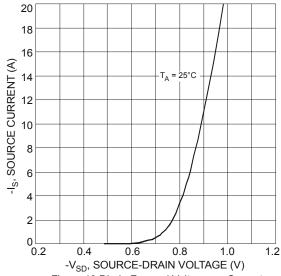
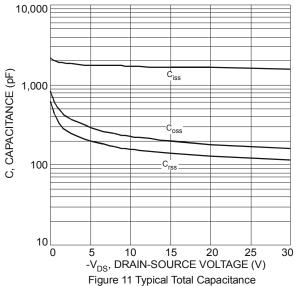


Figure 10 Diode Forward Voltage vs. Current





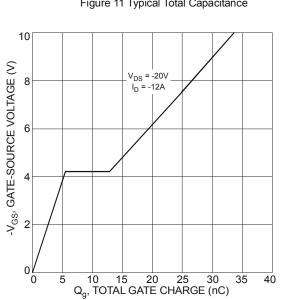
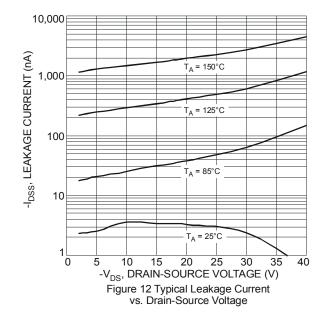


Figure 13 Gate-Charge Characteristics

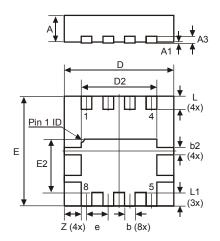






Package Outline Dimensions

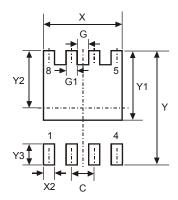
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for latest version.



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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