



N-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

BV _{DSS}	R _{DS(ON)} Max	I _D Max T _C = +25°C
	6mΩ @ V _{GS} = 10V	80A
60V	$8.5 \text{m}\Omega$ @ $V_{GS} = 4.5 \text{V}$	70A

Description

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

Applications

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

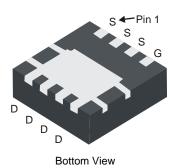
Features and Benefits

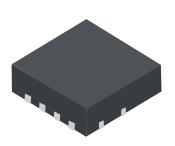
- Low R_{DS(ON)} Ensures On-State Losses are Minimized
- Excellent Q_{gd} x R_{DS(ON)} Product (FOM)
- Advanced Technology for DC-DC Converters
- Small form factor thermally efficient package enables higher density end products
- Occupies just 33% of the board area by enabling smaller end products
- 100% UIS (Avalanche) Rated
- Lead-Free Finish; RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)
- Qualified to AEC-Q101 Standards for High Reliability

Mechanical Data

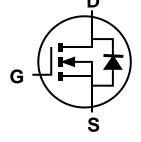
- Case: POWERDI[®]3333-8
- Case Material: Molded Plastic, "Green" Molding Compound.
 UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections Indicator: See Diagram
- Terminal Finish Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 (3)
- Weight: 0.008 grams (Approximate)

POWERDI®3333-8





Top View



Equivalent Circuit

Ordering Information (Note 4)

Part Number	Case	Packaging	
DMT6007LFG-7	POWERDI®3333-8	2,000/Tape & Reel	
DMT6007LFG-13	POWERDI [®] 3333-8	3,000/Tape & Reel	

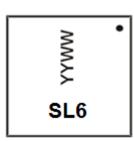
Notes:

- 1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
- 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

POWERDI®3333-8



SL6 = Product Type Marking Code YYWW = Date Code Marking YY = Last Digit of Year (ex: 14 = 2014) 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}	±20	V	
Continuous Pusin Courset (Note 5) // 40 //	$T_A = +25$ °C $T_A = +70$ °C	I _D	15 12	А
Continuous Drain Current (Note 5) V _{GS} = 10V	$T_C = +25$ °C $T_C = +70$ °C	I _D	80 65	А
Maximum Continuous Body Diode Forward Current (Note 6	I _S	80	Α	
Pulsed Drain Current (10µs pulse, duty cycle = 1%)	I _{DM}	80	Α	
Avalanche Current, L=0.1mH	I _{AS}	20	А	
Avalanche Energy, L=0.1mH	E _{AS}	20	mJ	

Thermal Characteristics

Characteristic		Symbol	Value	Units
Total Power Dissipation (Note 5) $T_A = +25^{\circ}C$		P_{D}	2.2	W
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	55	°C/W	
Total Power Dissipation (Note 6) $T_C = +25^{\circ}C$		P_{D}	62.5	W
Thermal Resistance, Junction to Case (Note 6)		R ₀ JC	2	°C/W
Operating and Storage Temperature Range		$T_{J_i}T_{STG}$	-55 to +150	°C

Notes:

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

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

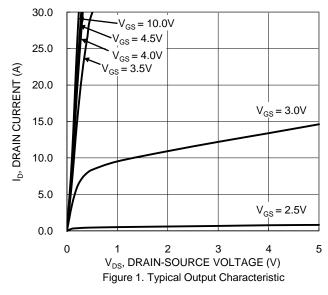


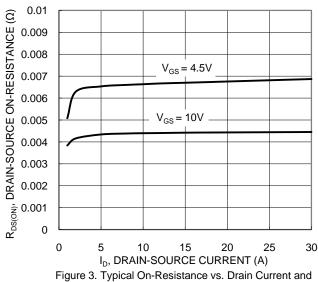
Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition	
OFF CHARACTERISTICS (Note 6)							
Drain-Source Breakdown Voltage	BV _{DSS}	60	_	_	V	$V_{GS} = 0V, I_D = 250\mu A$	
Zero Gate Voltage Drain Current	I _{DSS}	_	_	1	μΑ	$V_{DS} = 48V, V_{GS} = 0V$	
Gate-Source Leakage	I _{GSS}	_	_	±100	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$	
ON CHARACTERISTICS (Note 6)							
Gate Threshold Voltage	V _{GS(TH)}	0.8	_	2	V	$V_{DS} = V_{GS}$, $I_D = 250\mu A$	
Static Drain-Source On-Resistance		_	4.5	6	mΩ	$V_{GS} = 10V, I_D = 20A$	
Static Drain-Source On-Resistance	R _{DS(ON)}	_	6.5	8.5	11122	$V_{GS} = 4.5V, I_D = 15A$	
Forward Transconductance	G _{FS}	_	100	_	S	$V_{DS} = 5V, I_{D} = 20A$	
Diode Forward Voltage	V _{SD}	_	0.9	1.2	V	V _{GS} = 0V, I _S = 20A	
DYNAMIC CHARACTERISTICS (Note 7)							
Input Capacitance	C _{iss}	_	2090	_		V _{DS} = 30V, V _{GS} = 0V, f = 1MHz	
Output Capacitance	Coss	_	746	_	pF		
Reverse Transfer Capacitance	Crss	_	38.5	_			
Gate Resistance	Rq	_	0.59	_	Ω	$V_{DS} = 0V$, $V_{GS} = 0V$, $f = 1MHz$	
Total Gate Charge (V _{GS} = 4.5V)	Qg	_	19.3	_		V _{DS} = 30V, I _D = 20A	
Total Gate Charge (V _{GS} = 10V)	Qq	_	41.3	_			
Gate-Source Charge	Qgs	_	6.0	_	nC		
Gate-Drain Charge	Q _{gd}	_	8.8	_			
Turn-On Delay Time	t _{D(ON)}	_	5.7	_		$V_{DD} = 30V, V_{GS} = 10V,$ $I_{D} = 20A, R_{G} = 3\Omega$	
Turn-On Rise Time	t _R	_	4.3	_			
Turn-Off Delay Time	t _{D(OFF)}	_	23.4	_	ns		
Turn-Off Fall Time	t _F	_	9.7	_			
Body Diode Reverse Recovery Time	t _{RR}	_	35.4	_	ns	1 000 11/11 4000/	
Body Diode Reverse Recovery Charge	Q_{RR}	_	38.2	_	nC	I _F = 20A, di/dt = 100A/μs	

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







Gate Voltage

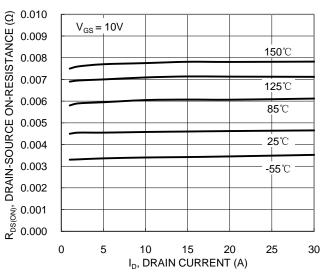
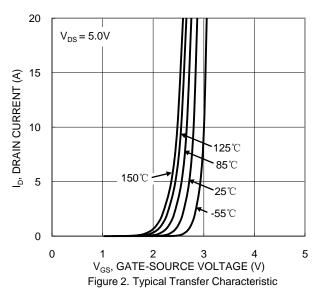
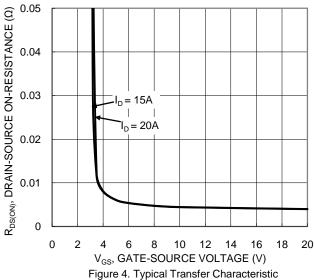


Figure 5. Typical On-Resistance vs. Drain Current and Temperature





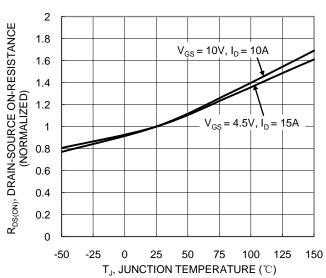


Figure 6. On-Resistance Variation with Temperature



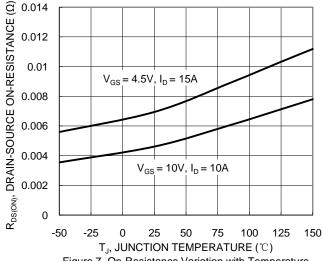


Figure 7. On-Resistance Variation with Temperature

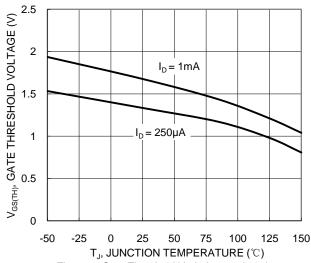
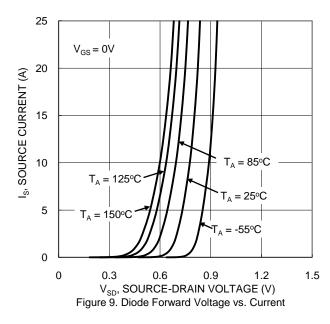
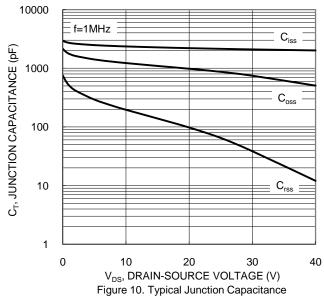
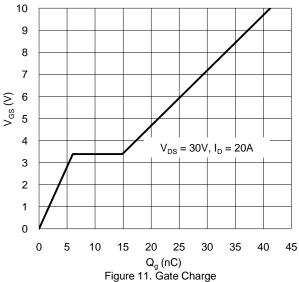


Figure 8. Gate Threshold Variation vs. Junction Temperature







1000 ____ R_{DS(ON)} Limited =100µs 100 DRAIN CURRENT (A) 10 =100ms <u>ث</u> P_W =1s $T_{J(Max)} = 150^{\circ}C$ $T_A = 25^{\circ}C$ 0.1 Single Pulse DUT on 1*MRP Board V_{GS}= 10V 0.01 0.1 10 100 V_{DS}, DRAIN-SOURCE VOLTAGE (V) Figure 12. SOA, Safe Operation Area



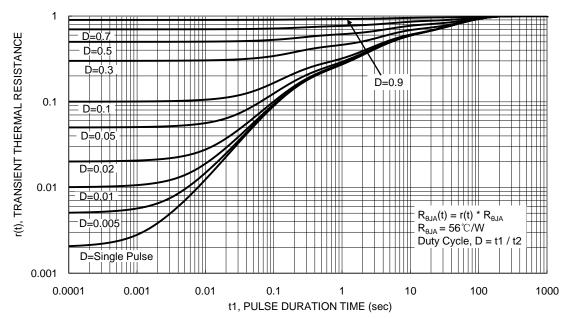


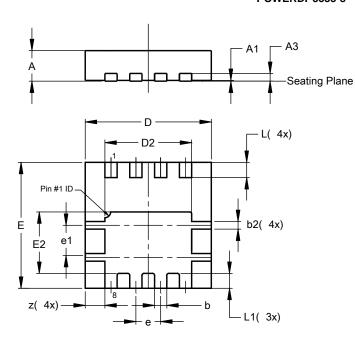
Figure 13. Transient Thermal Resistance



Package Outline Dimensions

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

POWERDI®3333-8

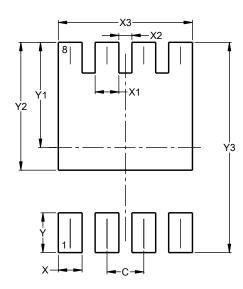


POWERDI®3333-8					
Dim	Min	Max	Тур		
Α	0.75	0.85	0.80		
A1	0.00	0.05	0.02		
A3	-	-	0.203		
b	0.27	0.37	0.32		
b2	_	_	0.20		
D	3.25	3.35	3.30		
D2	2.22	2.32	2.27		
Е	3.25	3.35	3.30		
E2	1.56	1.66	1.61		
е	-	-	0.65		
e1	0.79	0.89	0.84		
L	0.35	0.45	0.40		
L1	_	_	0.39		
Z	_	_	0.515		
All I	All Dimensions in mm				

Suggested Pad Layout

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

POWERDI®3333-8



Dimensions	Value (in mm)		
С	0.650		
X	0.420		
X1	0.420		
X2	0.230		
Х3	2.370		
Υ	0.700		
Y1	1.850		
Y2	2.250		
Y3	3.700		



IMPORTANT NOTICE

DIODES INCORPORATED MAKES NO WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, WITH REGARDS TO THIS DOCUMENT, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION).

Diodes Incorporated and its subsidiaries reserve the right to make modifications, enhancements, improvements, corrections or other changes without further notice to this document and any product described herein. Diodes Incorporated does not assume any liability arising out of the application or use of this document or any product described herein; neither does Diodes Incorporated convey any license under its patent or trademark rights, nor the rights of others. Any Customer or user of this document or products described herein in such applications shall assume all risks of such use and will agree to hold Diodes Incorporated and all the companies whose products are represented on Diodes Incorporated website, harmless against all damages.

Diodes Incorporated does not warrant or accept any liability whatsoever in respect of any products purchased through unauthorized sales channel. Should Customers purchase or use Diodes Incorporated products for any unintended or unauthorized application, Customers shall indemnify and hold Diodes Incorporated and its representatives harmless against all claims, damages, expenses, and attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized application.

Products described herein may be covered by one or more United States, international or foreign patents pending. Product names and markings noted herein may also be covered by one or more United States, international or foreign trademarks.

This document is written in English but may be translated into multiple languages for reference. Only the English version of this document is the final and determinative format released by Diodes Incorporated.

LIFE SUPPORT

Diodes Incorporated products are specifically not authorized for use as critical components in life support devices or systems without the express written approval of the Chief Executive Officer of Diodes Incorporated. As used herein:

- A. Life support devices or systems are devices or systems which:
 - 1. are intended to implant into the body, or
 - 2. support or sustain life and whose failure to perform when properly used in accordance with instructions for use provided in the labeling can be reasonably expected to result in significant injury to the user.
- B. A critical component is any component in a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or to affect its safety or effectiveness.

Customers represent that they have all necessary expertise in the safety and regulatory ramifications of their life support devices or systems, and acknowledge and agree that they are solely responsible for all legal, regulatory and safety-related requirements concerning their products and any use of Diodes Incorporated products in such safety-critical, life support devices or systems, notwithstanding any devices- or systems-related information or support that may be provided by Diodes Incorporated. Further, Customers must fully indemnify Diodes Incorporated and its representatives against any damages arising out of the use of Diodes Incorporated products in such safety-critical, life support devices or systems.

Copyright © 2015, Diodes Incorporated

www.diodes.com

ПОСТАВКА ЭЛЕКТРОННЫХ КОМПОНЕНТОВ

Общество с ограниченной ответственностью «МосЧип» ИНН 7719860671 / КПП 771901001 Адрес: 105318, г.Москва, ул.Щербаковская д.3, офис 1107

Данный компонент на территории Российской Федерации Вы можете приобрести в компании MosChip.

Для оперативного оформления запроса Вам необходимо перейти по данной ссылке:

http://moschip.ru/get-element

Вы можете разместить у нас заказ для любого Вашего проекта, будь то серийное производство или разработка единичного прибора.

В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

Офис по работе с юридическими лицами:

105318, г. Москва, ул. Щербаковская д. 3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: info@moschip.ru

Skype отдела продаж:

moschip.ru moschip.ru_6 moschip.ru 4 moschip.ru 9