DUAL N-CHANNEL ENHANCEMENT MODE MOSFET
POWERDI®

Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)}$ max	I_D max T_A = +25°C
20V	20mΩ @ V_{GS} = 10V	6.8A
	22mΩ @ V_{GS} = 4.5V	6.5A
	26mΩ @ V_{GS} = 2.5V	6.1A
	36mΩ @ V_{GS} = 1.8V	5.2A

Features

- Low On-Resistance
- Low Input Capacitance
- **ESD Protected Up To 2kV**
- **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

This new generation 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.

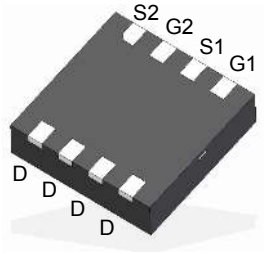
Mechanical Data

- Case: POWERDI3030-8
- Case Material: Molded Plastic, "Green" Molding Compound.
- UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram
- Weight: 0.0072 grams (approximate)

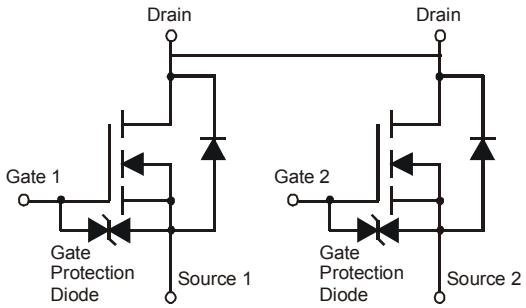
Applications

- Power management functions
- Load Switch

POWERDI3030-8



Bottom View



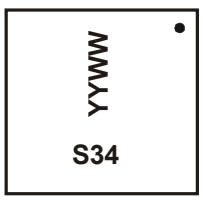
Internal Schematic

Ordering Information (Note 4)

Part Number	Case	Packaging
DMN2028UFDH-7	POWERDI3030-8	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 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



S34 = Product Type Marking Code
YYWW = Date Code Marking
YY = Last Digit of Year (ex: 13 = 2013)
WW = Week Code (01 to 53)

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

Characteristic			Symbol	Value	Units
Drain-Source Voltage			V_{DSS}	20	V
Gate-Source Voltage (Note 5)			V_{GSS}	±12	V
Continuous Drain Current (Note 7) V_{GS} = 10V	Steady State	T_A = +25°C T_A = +70°C	I_D	6.8 5.8	A
	t<10s	T_A = +25°C T_A = +70°C	I_D	8.8 7.0	A
Maximum Body Diode Forward Current (Note 7)			I_S	2	A
Pulsed Drain Current (10µs pulse, Duty cycle = 1%)			I_{DM}	40	A

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

Characteristic		Symbol	Value	Units
Total Power Dissipation (Note 6)		P_D	1.1	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady state	$R_{\theta JA}$	118	°C/W
	t<10s		72	
Total Power Dissipation (Note 7)		P_D	1.5	W
Thermal Resistance, Junction to Ambient (Note 7)	Steady state	$R_{\theta JA}$	82	°C/W
	t<10s		50	
Thermal Resistance, Junction to Case (Note 7)		$R_{\theta JC}$	14	
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	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 8)						
Drain-Source Breakdown Voltage	BV_{DSS}	20	—	—	V	V_{GS} = 0V, I_D = 250µA
Zero Gate Voltage Drain Current T_J = +25°C	I_{DSS}	—	—	1	µA	V_{DS} = 20V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	—	—	±10	µA	V_{GS} = ±10V, V_{DS} = 0V
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	$V_{GS(th)}$	0.5	—	1	V	V_{DS} = V_{GS}, I_D = 250µA
Static Drain-Source On-Resistance	$R_{DS\ (ON)}$	—	16	20	mΩ	V_{GS} = 10V, I_D = 4A
			17	22		V_{GS} = 4.5V, I_D = 4A
			19	26		V_{GS} = 2.5V, I_D = 4A
			24	36		V_{GS} = 1.8V, I_D = 4A
Forward Transfer Admittance	$\|Y_{fs}\|$	—	8	—	S	V_{DS} = 5V, I_D = 12A
Diode Forward Voltage	V_{SD}	—	0.7	1.0	V	V_{GS} = 0V, I_S = 5A
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C_{iss}	—	151	—	pF	V_{DS} = 10V, V_{GS} = 0V, f = 1.0MHz
Output Capacitance	C_{oss}	—	91	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	32	—	pF	
Gate Resistance	R_g	—	200	—	Ω	V_{DS} = 0V, V_{GS} = 0V, f = 1MHz
Total Gate Charge	Q_g	—	8.5	—	nC	V_{GS} = 4.5V, V_{DS} = 10V, I_D = 6.5A
Gate-Source Charge	Q_{gs}	—	1.6	—	nC	
Gate-Drain Charge	Q_{gd}	—	2.8	—	nC	
Turn-On Delay Time	$t_{D(on)}$	—	53	—	ns	V_{GS} = 10V, V_{DS} = 4.5V, R_G = 6Ω, R_L = 1.0 Ω, I_D = 1A
Turn-On Rise Time	t_r	—	77	—	ns	
Turn-Off Delay Time	$t_{D(off)}$	—	561	—	ns	
Turn-Off Fall Time	t_f	—	234	—	ns	

Notes:
5. AEC-Q101 V_{GS} maximum is ±9.6V.
6. Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.
7. Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1inch square copper plate.
8. Short duration pulse test used to minimize self-heating effect.
9. Guaranteed by design. Not subject to production testing.

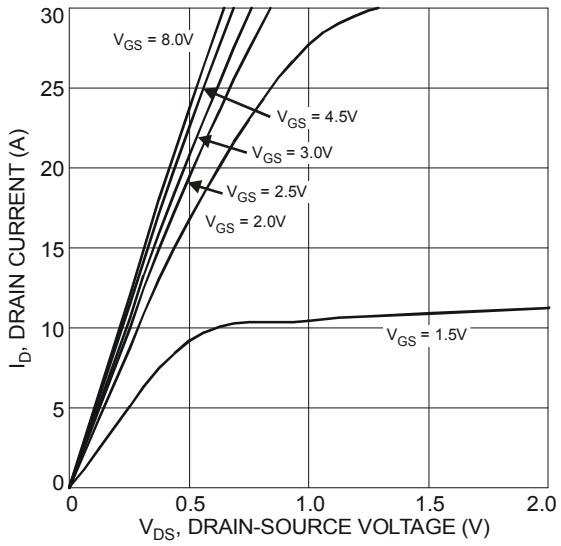


Figure 1 Typical Output Characteristic

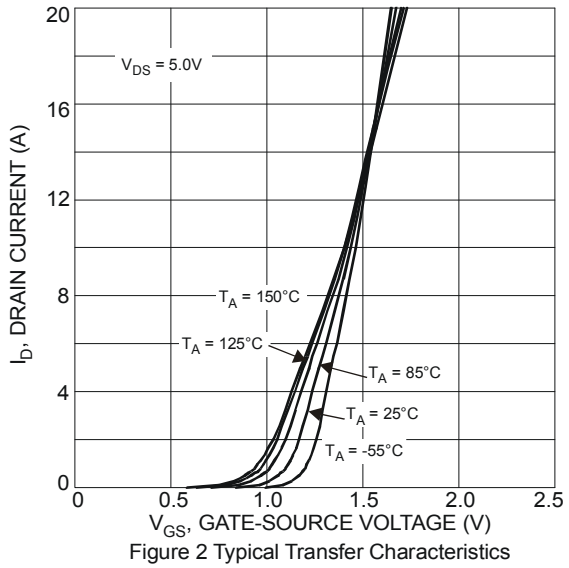


Figure 2 Typical Transfer Characteristics

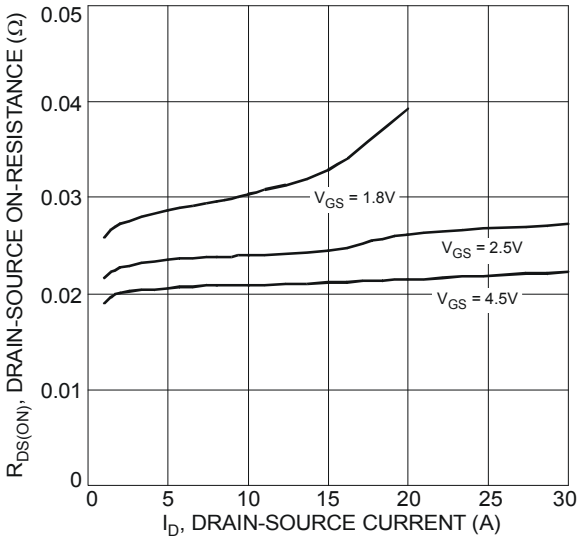


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

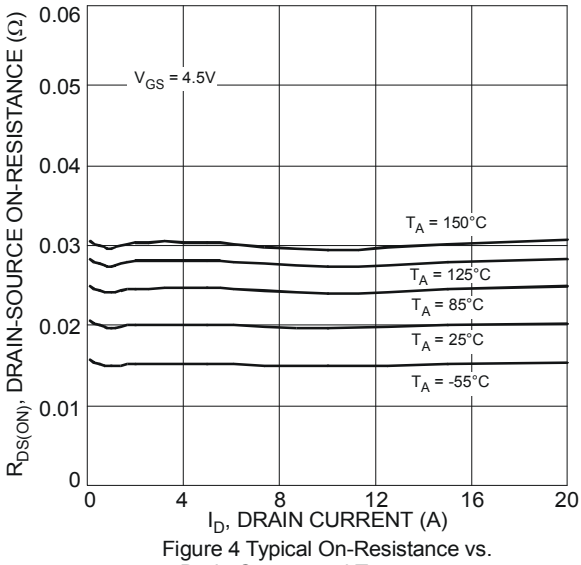


Figure 4 Typical On-Resistance vs. Drain Current and Temperature

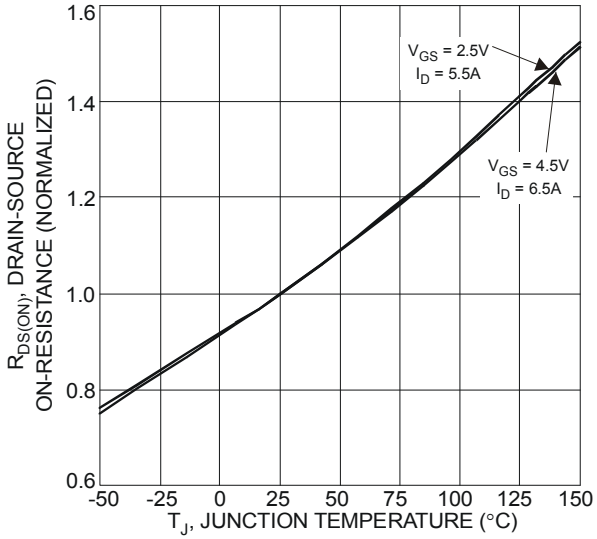


Figure 5 On-Resistance Variation with Temperature

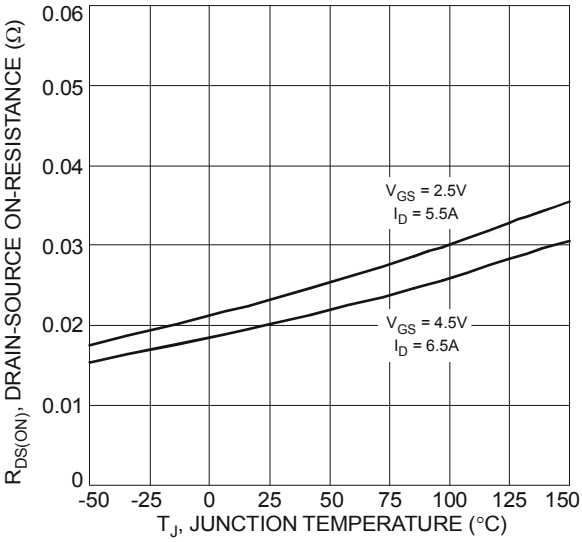


Figure 6 On-Resistance Variation with Temperature

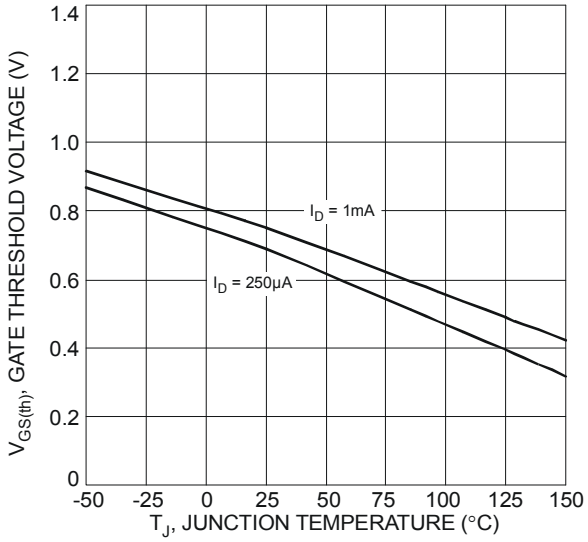


Figure 7 Gate Threshold Variation vs. Ambient Temperature

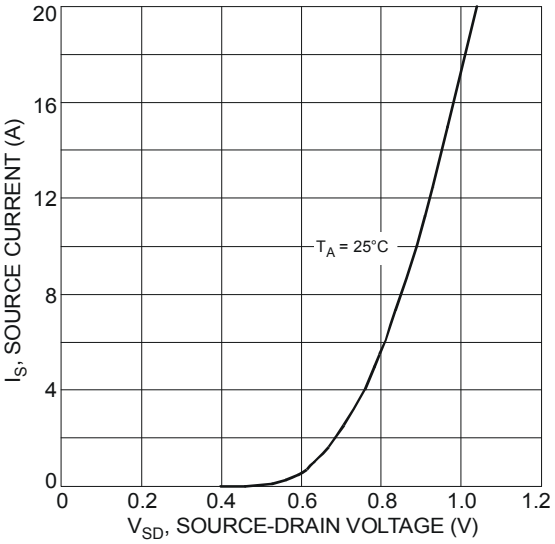


Figure 8 Diode Forward Voltage vs. Current

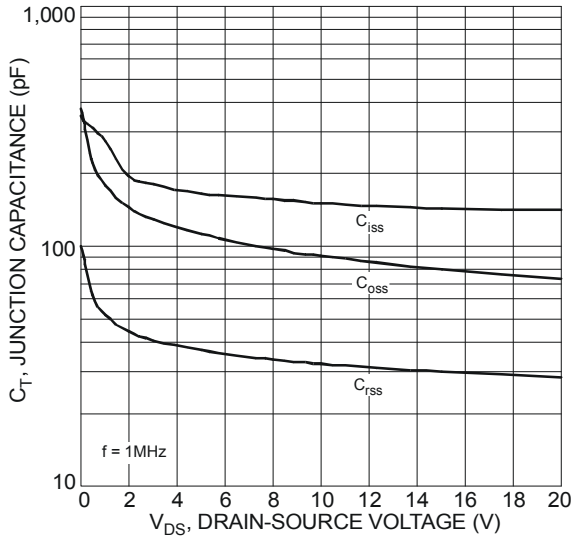


Figure 9 Typical Junction Capacitance

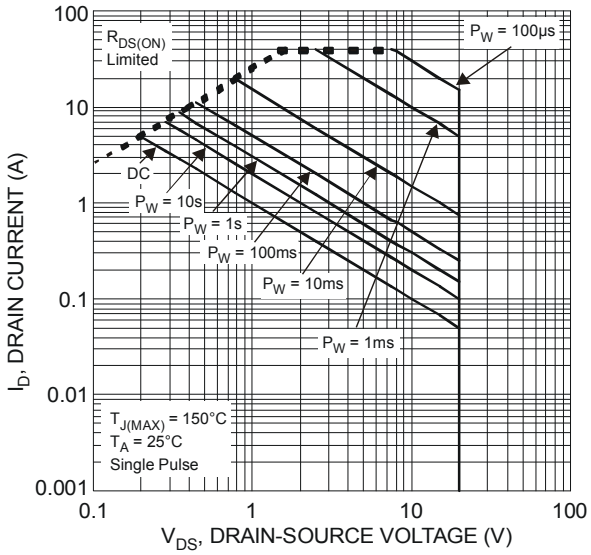


Figure 10 SOA, Safe Operation Area

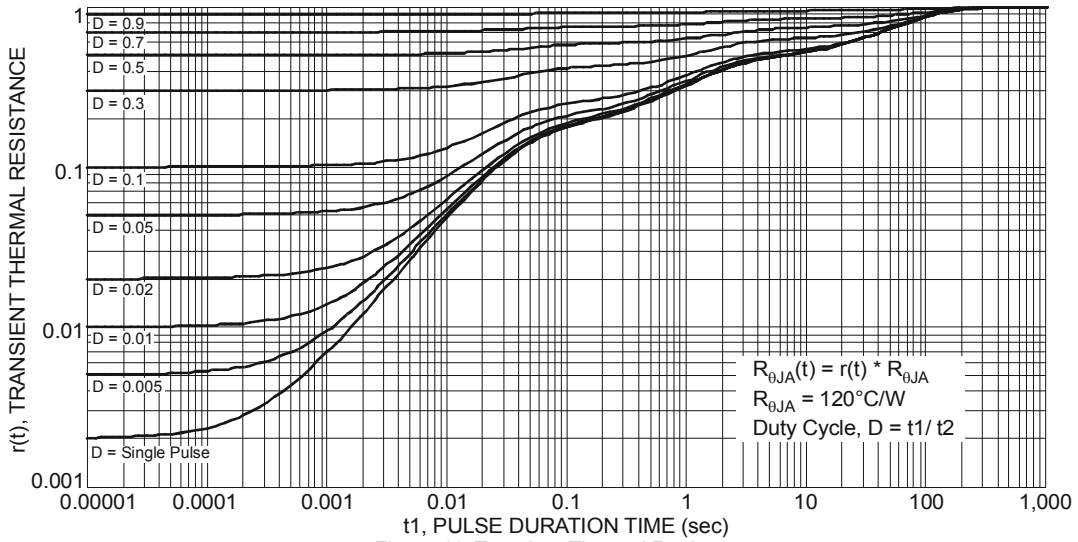
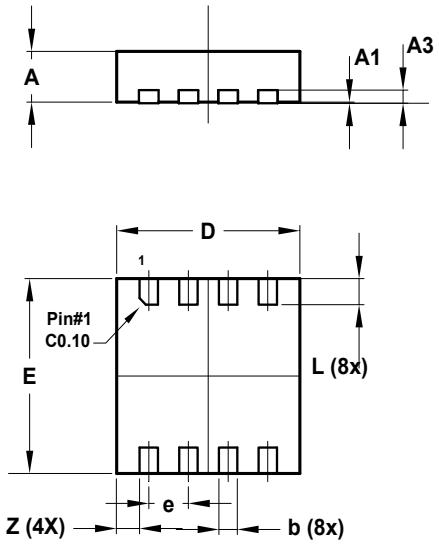


Figure 11 Transient Thermal Resistance

Package Outline Dimensions

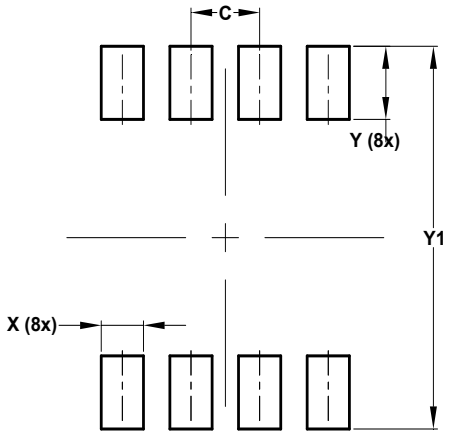
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for latest version.



POWERDI3030-8			
Dim	Min	Max	Typ
A	0.75	0.85	0.80
A1	0	0.05	0.02
A3	–	–	0.203
b	0.25	0.35	0.30
D	2.95	3.05	3.00
E	2.95	3.05	3.00
e	–	–	0.65
L	0.55	0.65	0.60
Z	–	–	0.375
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)
C	0.650
X	0.400
Y	0.850
Y1	3.400

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