



P-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

V _{(BR)DSS}	R _{DS(ON)} max	I _D max T _A = +25°C
	120mΩ @ V _{GS} = -4.5V	
-20V	150mΩ @ V _{GS} = -2.5V	-3A

Features and Benefits

- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)

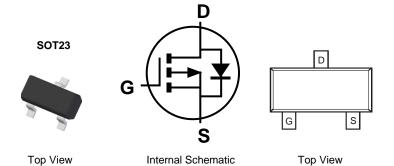
Description and Applications

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.

- Backlighting
- Power Management Functions
- DC-DC Converters
- Motor Control

Mechanical Data

- Case: SOT23
- Case Material: Molded Plastic, "Green" Molding Compound.
 UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 <a> © 3
- Terminals Connections: See Diagram Below
- Weight: 0.008 grams (Approximate)



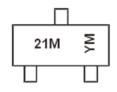
Ordering Information (Note 4)

Part Number	Case	Packaging
DMG2301L-7	SOT23	3,000/Tape & Reel
DMG2301L-13	SOT23	10.000/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



21M = Product Type Marking Code YM = Date Code Marking Y or \overline{\text{Y}} = Year (ex: C = 2015) M = Month (ex: 9 = September)

Date Code Key

Year	201	4	2015		2016	20	17	2018		2019	2	020
Code	В		С		D	[F		G		Н
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	0	N	D



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

Characteristic		Symbol	Value	Units	
Drain-Source Voltage		V_{DSS}	-20	V	
Gate-Source Voltage			V _{GSS}	±8	V
Continuous Drain Current (Note 5) V _{GS} = -4.5V	I _D	-3 -1	А		
Pulsed Drain Current (Note 6)		I _{DM}	-10	Α	
Drain-Source Diode Forward Current (t < 5 sec)		Is	-0.75	Α	

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P_{D}	1.5	W
Thermal Resistance, Junction to Ambient @T _A = +25°C (Note 5)	$R_{ heta JA}$	83	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

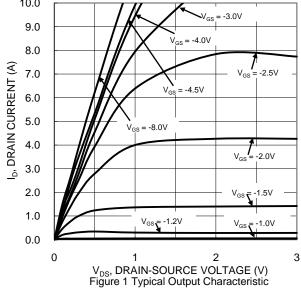
Electrical Characteristics (@T_A = +25°C, unless otherwise specified)

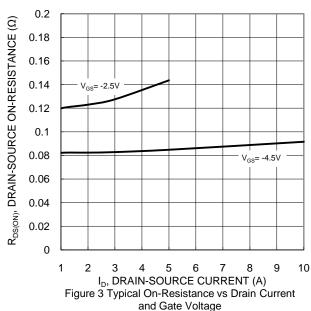
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition	
OFF CHARACTERISTICS (Note 7)							
Drain-Source Breakdown Voltage	BV _{DSS}	-20	_	_	V	$V_{GS} = 0V, I_{D} = -250\mu A$	
Zero Gate Voltage Drain Current T _J = +25°C	I _{DSS}	_	_	-1.0	μA	$V_{DS} = -16V, V_{GS} = 0V$	
Gate-Source Leakage	I _{GSS}	_	_	±100	nA	$V_{GS} = \pm 6V, V_{DS} = 0V$	
ON CHARACTERISTICS (Note 7)							
Gate Threshold Voltage	$V_{GS(TH)}$	-0.4	_	-1.2	V	$V_{DS} = V_{GS}, I_{D} = -250 \mu A$	
Static Drain-Source On-Resistance	В			120	mΩ	$V_{GS} = -4.5V$, $I_{D} = -2.8A$	
Static Drain-Source On-Resistance	R _{DS(ON)}		_	150	11122	$V_{GS} = -2.5V$, $I_{D} = -2.0A$	
Diode Forward Voltage	V_{SD}	_	_	-1.2	V	$V_{GS} = 0V, I_{S} = -0.75A$	
DYNAMIC CHARACTERISTICS (Note 8)							
Input Capacitance	C _{iss}	_	476	_	pF	101111 011	
Output Capacitance	Coss	_	53	_	pF	$V_{DS} = -10V, V_{GS} = 0V$ - f = 1.0MHz	
Reverse Transfer Capacitance	Crss	_	45	_	pF	I = 1.0WII IZ	
Total Gate Charge	Q_g	_	5.5	_	nC		
Gate-Source Charge	Q_gs	_	0.9		nC	$V_{GS} = -4.5V$, $V_{DS} = -6V$, $I_{D} = -2.8A$	
Gate-Drain Charge	Q_{gd}	_	1.8	_	nC		
Turn-On Delay Time	t _{D(ON)}	_	5	_	ns		
Turn-On Rise Time	t _R	_	10	_	ns	$V_{DS} = -6V, V_{GS} = -4.5V,$	
Turn-Off Delay Time	t _{D(OFF)}	_	30	_	ns	$R_{GEN} = 6\Omega$, $I_D = -1A$	
Turn-Off Fall Time	t _F	_	20	_	ns		

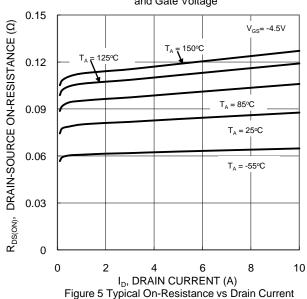
Notes:

- 5. Device mounted on 1" x 1" FR-4 PCB with high coverage 2oz. Copper, single sided.
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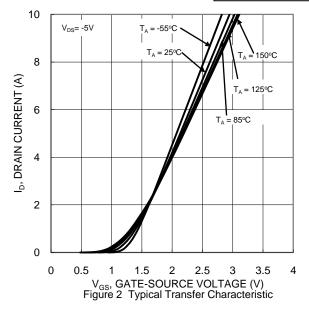


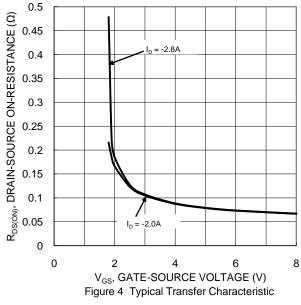


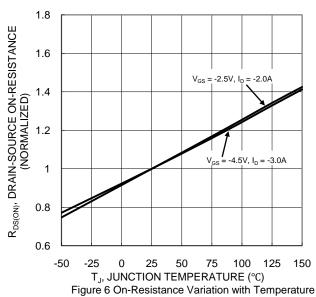




and Temperature







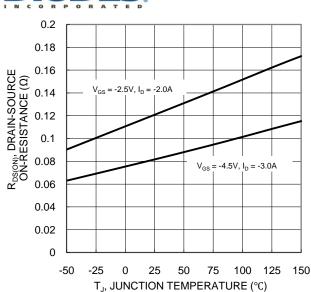


Figure 7 On-Resistance Variation with Temperature

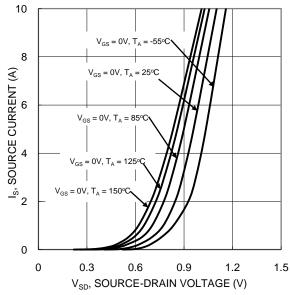
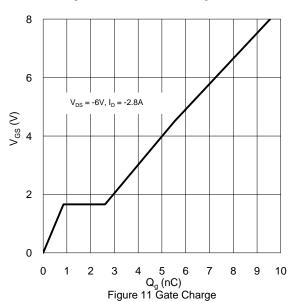


Figure 9 Diode Forward Voltage vs. Current



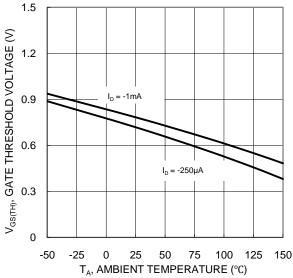
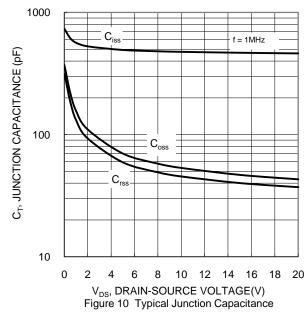
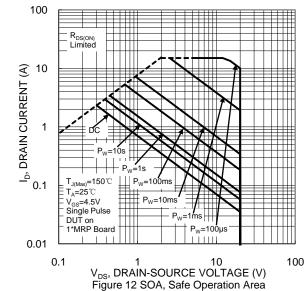
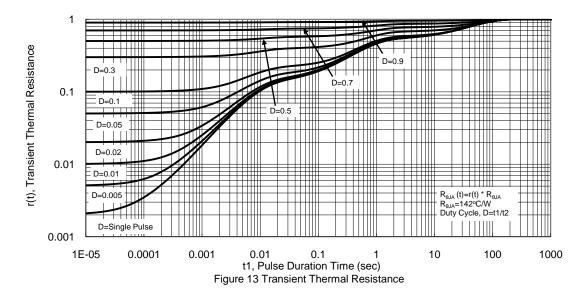


Figure 8 Gate Threshold Variation vs Ambient Temperature



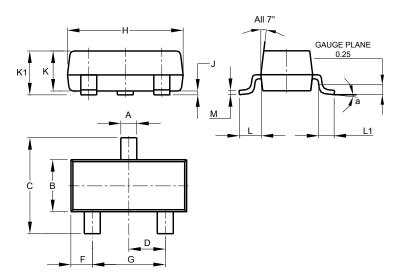






Package Outline Dimensions

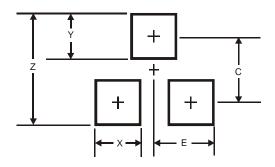
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.



SOT23							
Dim	Min	Max	Тур				
Α	0.37	0.51	0.40				
В	1.20	1.40	1.30				
С	2.30	2.50	2.40				
D	0.89	1.03	0.915				
F	0.45	0.60	0.535				
G	1.78	2.05	1.83				
Н	2.80	3.00	2.90				
J	0.013	0.10	0.05				
K	0.890	1.00	0.975				
K1	0.903	1.10	1.025				
L	0.45	0.61	0.55				
L1	0.25	0.55	0.40				
M	0.085	0.150	0.110				
а	8°						
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)
Z	2.9
Х	0.8
Υ	0.9
С	2.0
E	1.35



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