





P-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

BV _{DSS}	R _{DS(ON)} Max	Package	I _D T _A = +25°C
-20V	$52m\Omega @V_{GS} = -4.5V$	SOT23	-5.0A
-200	100mΩ @V _{GS} = -2.5V	30123	-3.6A

Features

- 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)
- Qualified to AEC-Q101 Standards for High Reliability
- PPAP Capable (Note 4)

Description and Applications

This MOSFET is designed to meet the stringent requirements of Automotive applications. It is qualified to AEC-Q101, supported by a PPAP and is ideal for use in:

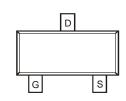
- Backlighting
- Power Management Functions
- DC-DC Converters
- Motor Control

Mechanical Data

- Case: SOT23
- Case Material: Molded Plastic, "Green" Molding Compound.
 UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020D
- Terminals: Finish Matte Tin Annealed over Copper Leadframe.
 Solderable per MIL-STD-202, Method 208 (§3)
- Terminals Connections: See Diagram Below
- Weight: 0.009 grams (Approximate)







Top View

Internal Schematic

Top View

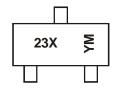
Ordering Information (Note 5)

Part Number	Compliance	Case	Packaging
DMG2305UXQ-7	Automotive	SOT23	3,000/Tape & Reel
DMG2305UXQ-13	Automotive	SOT23	10,000/Tape & Reel

Notes:

- 1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
- 2. See https://www.diodes.com/quality/lead-free/ 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. Automotive products are AEC-Q101 qualified and are PPAP capable. Refer to https://www.diodes.com/quality/.
- 5. For packaging details, go to our website at https://www.diodes.com/design/support/packaging/diodes-packaging/.

Marking Information



23X = Product Type Marking Code YM = Date Code Marking Y = Year (ex: F = 2018) M = Month (ex: 9 = September)

Date Code Key

Year	200	9	~		2016	20)17	2018		2019	2	2020
Code	W		~		D		Ē			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	Unit	
Drain-Source Voltage			V_{DSS}	-20	V
Gate-Source Voltage		V_{GSS}	±8	V	
Continuous Dusin Comment (Nata C) \/	Steady State	$T_A = +25^{\circ}C$ $T_A = +70^{\circ}C$		-4.2 -3.3	А
Continuous Drain Current (Note 6) V _{GS} = -4.5V	t<10s	$T_A = +25^{\circ}C$ $T_A = +70^{\circ}C$	I _D	-5.0 -4.0	А
Pulsed Drain Current (Note 7)		I _{DM}	-15	А	

Thermal Characteristics

Characteristic	Symbol	Value	Unit	
Power Dissipation (Note 6)	P_{D}	1.4	W	
Thermal Resistance, Junction to Ambient (Note 6)	Steady State	D	90	°C/W
Thermal Resistance, Junction to Ambient (Note 6)	t<10s	$R_{\theta JA}$	64	°C/W
Thermal Resistance, Junction to Case (Note 8)	$R_{ heta JC}$	33	°C/W	
Operating and Storage Temperature Range	$T_{J_i}T_{STG}$	-55 to +150	°C	

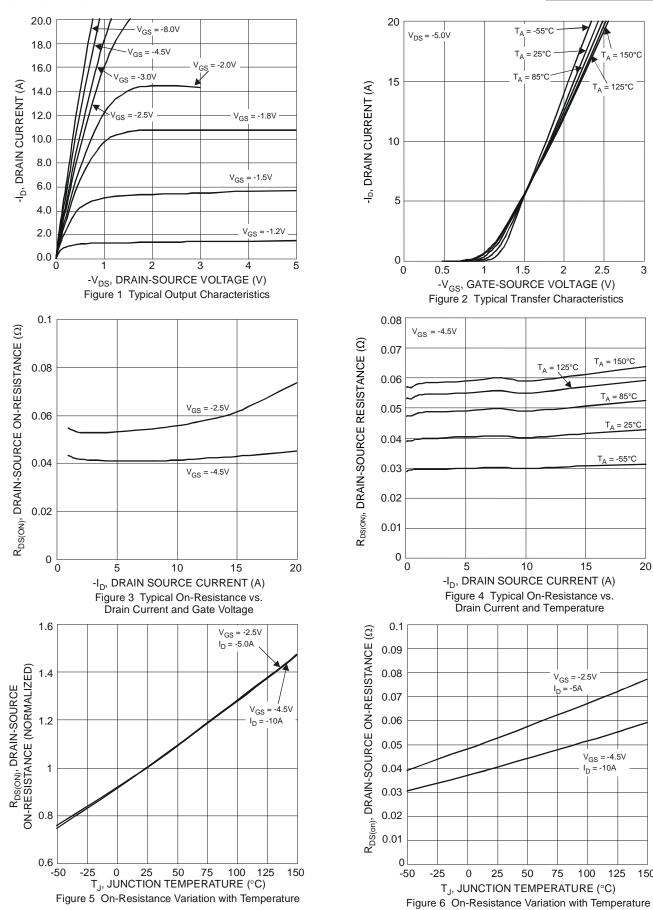
Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

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 (T _J = +25°C)	I _{DSS}	_	_	-1.0	μA	V _{DS} = -20V, 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)}	-0.5	_	-0.9	V	$V_{DS} = V_{GS}, I_{D} = -250 \mu A$	
			40	52		$V_{GS} = -4.5V$, $I_{D} = -4.2A$	
Static Drain-Source On-Resistance	R _{DS(ON)}	_	52	100	mΩ	$V_{GS} = -2.5V, I_{D} = -3.4A$	
			68	200		$V_{GS} = -1.8V, I_{D} = -2A$	
Forward Transfer Admittance	Y _{FS}	_	9	_	S	$V_{DS} = -5V, I_{D} = -4A$	
DYNAMIC CHARACTERISTICS (Note 9)						•	
Input Capacitance	C _{iss}	_	808		рF	151/11/ 01/	
Output Capacitance	Coss	_	85	_	pF	$V_{DS} = -15V, V_{GS} = 0V$ - $f = 1.0MHz$	
Reverse Transfer Capacitance	Crss	_	77	_	pF	1 - 1.000112	
Gate Resistance	R_{G}	_	15.2	_	Ω	$V_{GS} = 0V, V_{DS} = 0V, f = 1.0MHz$	
SWITCHING CHARACTERISTICS (Note 9)							
Total Gate Charge	Q_{G}	_	10.2	_	nC	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	
Gate-Source Charge	Q_{GS}	_	1.3	_	nC	$V_{GS} = -4.5V, V_{DS} = -4V,$ $I_{D} = -3.5A$	
Gate-Drain Charge	Q_{GD}	_	2.2	_	nC	ID = -3.5A	
Turn-On Delay Time	t _{D(ON)}	_	10.8		ns		
Turn-On Rise Time	t _R	_	13.7	_	ns	$V_{DS} = -4V, V_{GS} = -4.5V,$	
Turn-Off Delay Time	t _{D(OFF)}	_	79.3	_	ns	$R_G = 6\Omega$, $I_D = -1A$	
Turn-Off Fall Time	t _F	_	34.7	_	ns	1	

Notes:

- 6. Device mounted on FR-4 substrate PC board, 2oz copper, with 1-inch square copper plate.
- 7. Repetitive rating, pulse width limited by junction temperature. 8. Short duration pulse test used to minimize self-heating effect.
- 9. Guaranteed by design. Not subject to product testing.







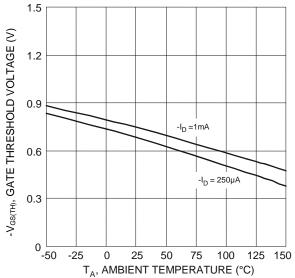
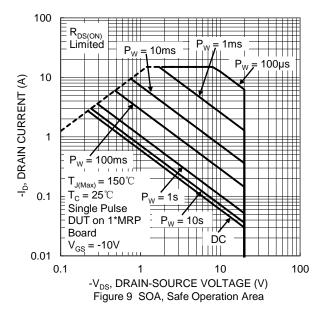
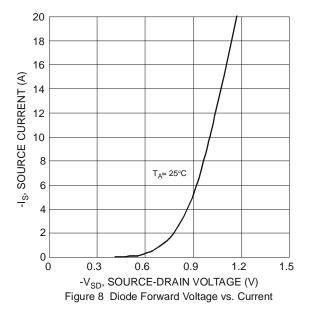


Figure 7 Gate Threshold Variation vs. Ambient Temperature



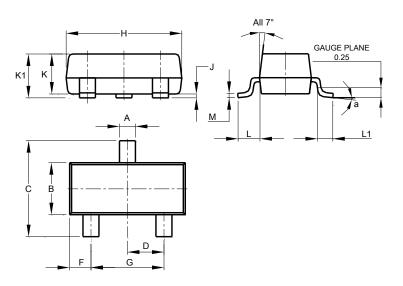




Package Outline Dimensions

Please see http://www.diodes.com/package-outlines.html for the latest version.

SOT23

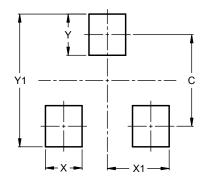


SOT23							
Dim	Min	Max	Тур				
Α	0.37	0.51	0.40				
В	1.20	1.40	1.30				
С	2.30	2.50	2.40				
D	0.89	1.03	0.915				
F	0.45	0.60	0.535				
G	1.78	2.05	1.83				
Н	2.80	3.00	2.90				
J	0.013	0.10	0.05				
K	0.890	1.00	0.975				
K1	0.903	1.10	1.025				
L	0.45	0.61	0.55				
L1	0.25	0.55	0.40				
М	0.085	0.150	0.110				
а	0°	8°					
All Dimensions in mm							

Suggested Pad Layout

Please see http://www.diodes.com/package-outlines.html for the latest version.

SOT23



Dimensions	Value (in mm)
C	2.0
Х	0.8
X1	1.35
Y	0.9
Y1	2.9



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