



P-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

V _{(BR)DSS}	RDS(ON) max	I _D T _A = +25°C
	$77m\Omega@V_{GS} = -10V$	-3.5A
-30V	$95m\Omega@V_{GS} = -4.5V$	-3.0A
	$150 \text{m} \Omega @ V_{GS} = -2.5 \text{V}$	-2.4A

Description and Applications

This MOSFET has been designed to meet the stringent requirements of Automotive applications. It is qualified to AECQ101, supported by a PPAP and is ideal for use in:

- DC-DC Converters
- Power Management Functions
- Analog Switch

Features and Benefits

- Low On-Resistance
- Low Gate Threshold Voltage
- Low Input Capacitance
- · Fast Switching Speed
- Low Input/Output Leakage
- 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)

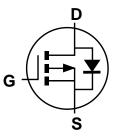
Mechanical Data

- 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 (£3)
- Terminal Connections: See Diagram
- Weight: 0.009 grams (Approximate)

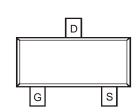
SOT23







Equivalent Circuit



Top View

Ordering Information (Note 5)

Part Number	Case	Packaging
DMP3130LQ-7	SOT23	3000/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. Automotive products are AEC-Q101 qualified and are PPAP capable. Refer to http://www.diodes.com/product_compliance_definitions.html
- 5. For packaging details, go to our website at http://www.diodes.com/products/packages.html

Marking Information



P5S = Product Type Marking Code YM or YM = Date Code Marking Y or Y = Year (ex: D = 2016) M = Month (ex: 9 = September)

Date Code Key

2410 0040 110	7											
Year	2016		2017	2018		2019	2020		2021	2022		2023
Code	D		Е	F	F G		H I		J		K	
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 (@ $T_A = +25^{\circ}C$, unless otherwise specified.)

Characteristic		Symbol	Value	Units	
Drain-Source Voltage		V_{DSS}	-30	V	
Gate-Source Voltage		V_{GSS}	±12	V	
Continuous Drain Current (Note 6) 1/ 451/	Steady State	$T_A = +25^{\circ}C$ $T_A = +70^{\circ}C$	l _D	-3.5 -2.6	А
Continuous Drain Current (Note 6) V _{GS} = -4.5V	t<10s	$T_A = +25^{\circ}C$ $T_A = +70^{\circ}C$	I _D	-4.1 -3.2	А
Maximum Continuous Body Diode Forward Current	(Note 6)	Is	-1.6	А	
Pulsed Drain Current (10µs pulse, duty cycle = 1%)		I _{DM}	-20	А	

Thermal Characteristics

Characteristic		Symbol	Value	Units
Total Power Dissipation (Note 6)	T _A = +25°C	р	0.7	W
Total Power Dissipation (Note 6)	$T_A = +70^{\circ}C$	P_{D}	0.4	VV
Thermal Resistance, Junction to Ambient (Note 6)	Steady State	D	184	°C/W
Thermal Resistance, Junction to Ambient (Note 0)	t<10s	$R_{\theta JA}$	115	C/VV
Total Power Dissipation (Note 7)	$T_A = +25^{\circ}C$	D-	1.3	W
Total Power Dissipation (Note 7)	$T_A = +70^{\circ}C$	P_D	0.8	VV
Thermal Resistance, Junction to Ambient (Note 7)	Steady State	р	94	
Thermal Resistance, Junction to Ambient (Note 7)	t<10s	$R_{\theta JA}$	61	°C/W
Thermal Resistance, Junction to Case		$R_{ hetaJC}$	25	
Operating and Storage Temperature Range		$T_{J_1}T_{STG}$	-55 to +150	°C

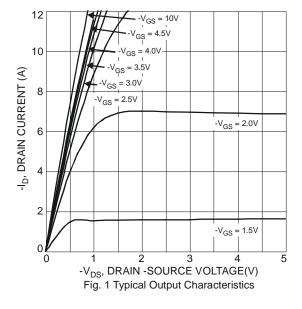
Electrical Characteristics (@ $T_A = \pm 25$ °C, unless otherwise specified.)

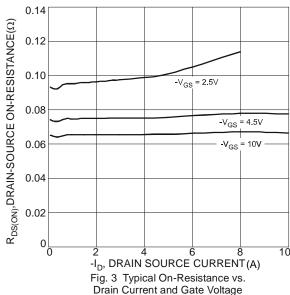
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 8)						
Drain-Source Breakdown Voltage	BV _{DSS}	-30	_	_	V	$V_{GS} = 0V, I_D = -250\mu A$
Zero Gate Voltage Drain Current	I _{DSS}	_	_	-1	μA	$V_{DS} = -30V, V_{GS} = 0V$
Gate-Body Leakage	I _{GSS}	_	_	±100	nA	$V_{GS} = \pm 12V, V_{DS} = 0V$
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	V _{GS(TH)}	-0.6	_	-1.3	V	$V_{DS} = V_{GS}, I_{D} = -250 \mu A$
		_	59	77		$V_{GS} = -10V, I_D = -4.2A$
Static Drain-Source On-Resistance	R _{DS(ON)}	_	73	95	mΩ	$V_{GS} = -4.5V, I_D = -4A$
		_	115	150		$V_{GS} = -2.5V, I_D = -3A$
Forward Transconductance	g _{fs}	_	8	_	S	$V_{DS} = -5V, I_{D} = -4A$
Source-Drain Diode Forward Voltage	V_{SD}	_	-0.8	-1.25	V	$V_{GS} = 0V, I_S = -3.0A$
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	Ciss	_	432	864	pF	45)/)/ 6)/
Output Capacitance	Coss		87	174	рF	V _{DS} = -15V, V _{GS} = 0V f = 1.0MHz
Reverse Transfer Capacitance	Crss	_	62	124	pF	1 = 1.0ivii iz
Gate Resistance	Rg	_	4.04	_	Ω	$V_{DS} = 0V, V_{GS} = 0V, f = 1.0MHz$
SWITCHING CHARACTERISTICS (Note 9)						
Total Gate Charge	QG		5.9	11.8		$V_{DS} = -15V$, $V_{GS} = -4.5V$, $I_{D} = -4.0A$
Total Gate Charge	Q G		12	24	nC	$V_{DS} = -15V$, $V_{GS} = -10V$, $I_{D} = -4.0A$
Gate-Source Charge	Q_{GS}	_	1.0	2.0	IIC	V 45V V 45V L 40A
Gate-Drain Charge	Q_{GD}	_	3.1	6.2		$V_{DS} = -15V$, $V_{GS} = -4.5V$, $I_{D} = -4.0A$
Turn-On Delay Time	t _{D(ON)}	_	4.6	9.2		
Rise Time	t _R	_	6.5	13.0		$V_{DS} = -15V, V_{GS} = -10V,$
Turn-Off Delay Time	t _{D(OFF)}	_	27.8	55.6	ns	$I_D = -1A, R_G = 6.0\Omega$
Fall Time	t _F	_	15.0	30.0		

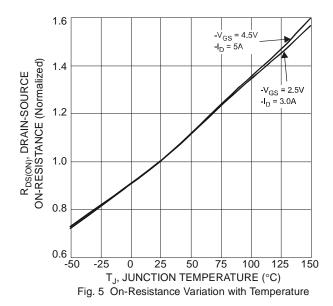
Notes:

- 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 vias 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









8
V_{DS} = -5.0V

V_{DS} = -5.0V

4

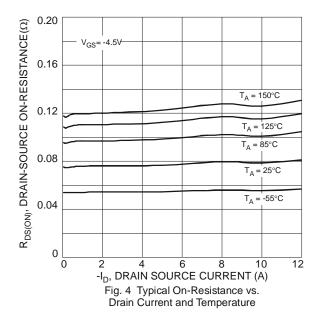
T_A = 150°C

T_A = 150°C

T_A = 25°C

O
O
O
S
T_A = -55°C

O
O
O
S
S
GATE-SOURCE VOLTAGE (V)
Fig. 2 Typical Transfer Characteristics



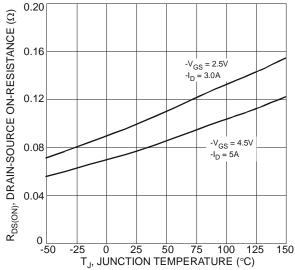


Fig. 6 On-Resistance Variation with Temperature



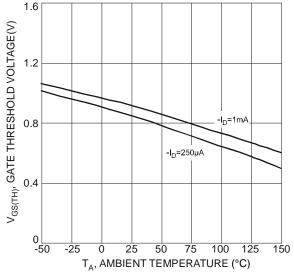
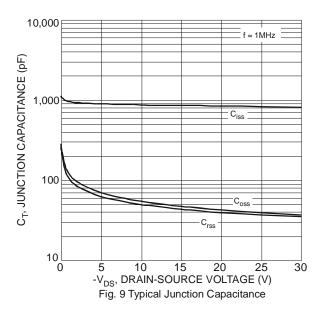
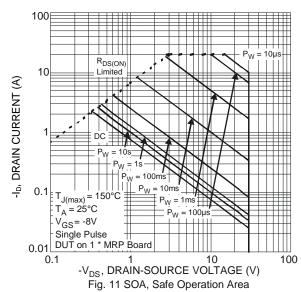
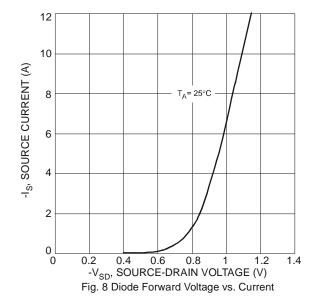
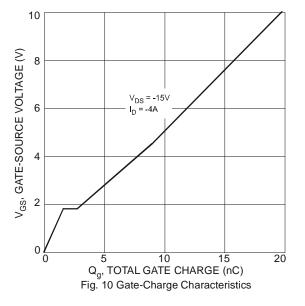


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

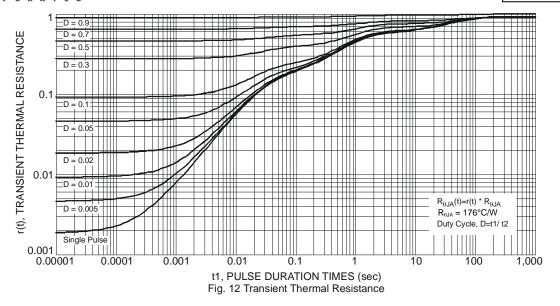








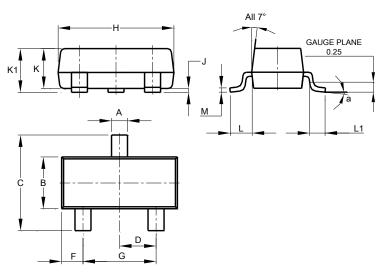




Package Outline Dimensions

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

SOT23

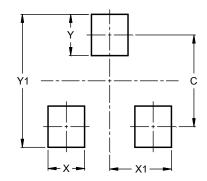


SOT23								
Dim	Min	Max	Тур					
Α	0.37	0.51	0.40					
В	1.20	1.40	1.30					
С	2.30	2.50	2.40					
D	0.89	1.03	0.915					
F	0.45	0.60	0.535					
G	1.78	2.05	1.83					
Н	2.80	3.00	2.90					
J	0.013	0.10	0.05					
K	0.890	1.00	0.975					
K1	0.903	1.10	1.025					
L	0.45	0.61	0.55					
L1	0.25	0.55	0.40					
M	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)
С	2.0
Х	0.8
X1	1.35
Y	0.9
Y1	29

March 2016



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