Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)}$ max	I_D T_A = +25°C
-30V	77mΩ@ V_{GS} = -10V	-3.5A
	95mΩ@ V_{GS} = -4.5V	-3.0A
	150mΩ@ V_{GS} = -2.5V	-2.4A

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)**

Description and Applications

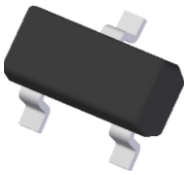
This MOSFET has been designed to meet the stringent requirements of Automotive applications. It is qualified to AECQ101, supported by a PPAP and is ideal for use in:

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

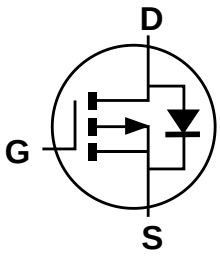
Mechanical Data

- 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 e3
- Terminal Connections: See Diagram
- Weight: 0.009 grams (Approximate)

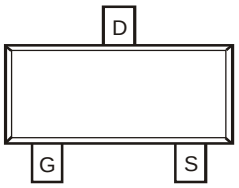
SOT23



Top View



Equivalent Circuit



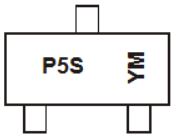
Top View

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 $\overline{Y}$M = Date Code Marking
Y or $\overline{Y}$ = Year (ex: D = 2016)
M = Month (ex: 9 = September)

Date Code Key

Year	2016	2017	2018	2019	2020	2021	2022	2023
Code	D	E	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	O	N	D

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Maximum Ratings (@T_A = +25°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) V_{GS} = -4.5V	Steady State	T_A = +25°C T_A = +70°C	I_D	-3.5 -2.6	A
	t<10s	T_A = +25°C T_A = +70°C	I_D	-4.1 -3.2	A
Maximum Continuous Body Diode Forward Current (Note 6)			I_S	-1.6	A
Pulsed Drain Current (10µs pulse, duty cycle = 1%)			I_{DM}	-20	A

Thermal Characteristics

Characteristic		Symbol	Value	Units
Total Power Dissipation (Note 6)	T_A = +25°C	P_D	0.7	W
	T_A = +70°C		0.4	
Thermal Resistance, Junction to Ambient (Note 6)	Steady State	$R_{\theta JA}$	184	°C/W
	t<10s		115	
Total Power Dissipation (Note 7)	T_A = +25°C	P_D	1.3	W
	T_A = +70°C		0.8	
Thermal Resistance, Junction to Ambient (Note 7)	Steady State	$R_{\theta JA}$	94	°C/W
	t<10s		61	
Thermal Resistance, Junction to Case		$R_{\theta JC}$	25	
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}	-30	—	—	V	V_{GS} = 0V, I_D = -250µA
Zero Gate Voltage Drain Current	I_{DSS}	—	—	-1	µA	V_{DS} = -30V, V_{GS} = 0V
Gate-Body Leakage	I_{GSS}	—	—	±100	nA	V_{GS} = ±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 = -250µA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	59	77	mΩ	V_{GS} = -10V, I_D = -4.2A
		—	73	95		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	C_{iss}	—	432	864	pF	V_{DS} = -15V, V_{GS} = 0V f = 1.0MHz
Output Capacitance	C_{oss}	—	87	174	pF	
Reverse Transfer Capacitance	C_{rss}	—	62	124	pF	
Gate Resistance	R_G	—	4.04	—	Ω	V_{DS} = 0V, V_{GS} = 0V, f = 1.0MHz
SWITCHING CHARACTERISTICS (Note 9)						
Total Gate Charge	Q_G	—	5.9	11.8	nC	V_{DS} = -15V, V_{GS} = -4.5V, I_D = -4.0A
		—	12	24		V_{DS} = -15V, V_{GS} = -10V, I_D = -4.0A
Gate-Source Charge	Q_{GS}	—	1.0	2.0		V_{DS} = -15V, V_{GS} = -4.5V, I_D = -4.0A
Gate-Drain Charge	Q_{GD}	—	3.1	6.2		
Turn-On Delay Time	$t_{D(ON)}$	—	4.6	9.2	ns	V_{DS} = -15V, V_{GS} = -10V, I_D = -1A, R_G = 6.0Ω
Rise Time	t_R	—	6.5	13.0		
Turn-Off Delay Time	$t_{D(OFF)}$	—	27.8	55.6		
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

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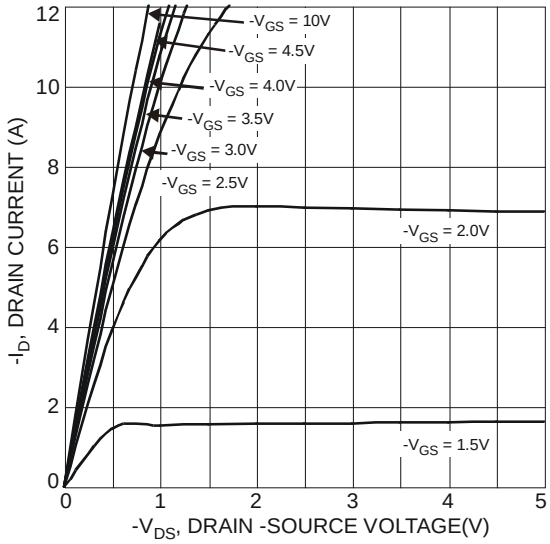


Fig. 1 Typical Output Characteristics

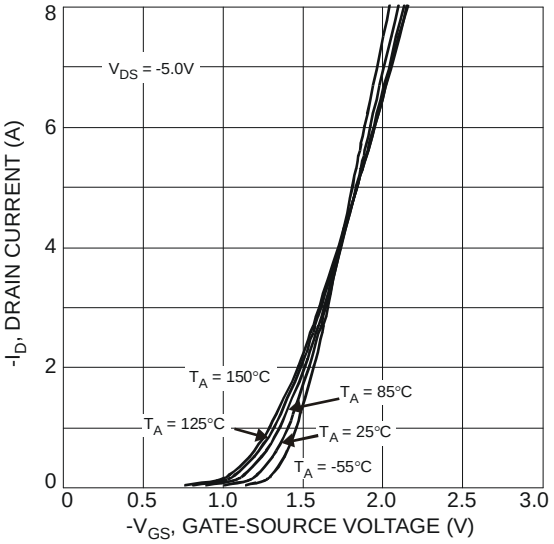


Fig. 2 Typical Transfer Characteristics

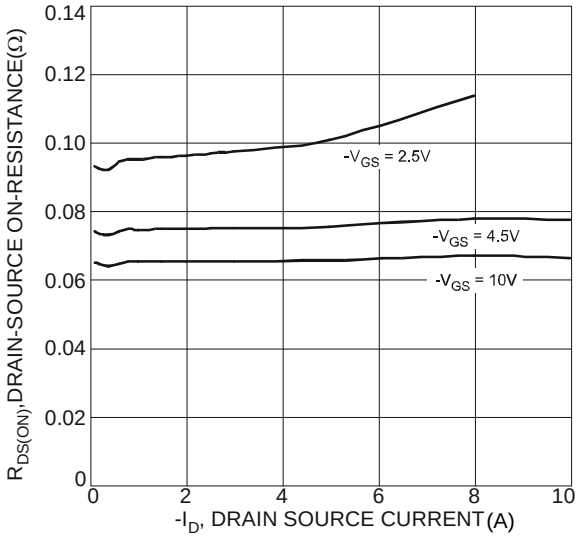


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

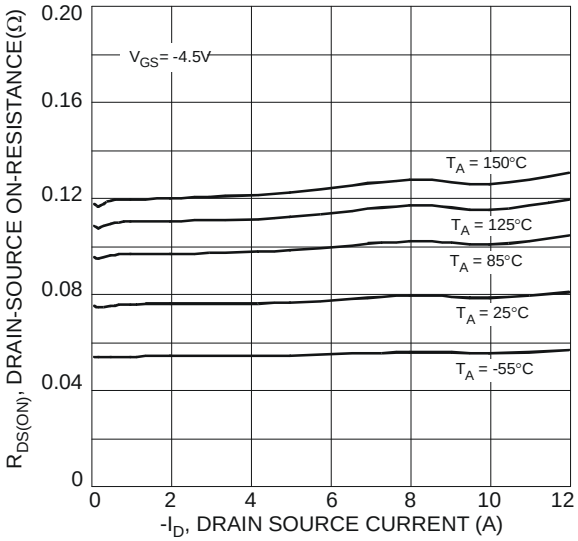


Fig. 4 Typical On-Resistance vs. Drain Current and Temperature

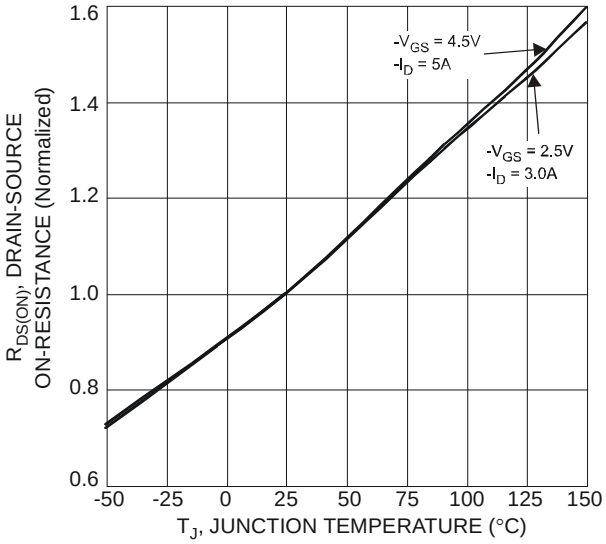


Fig. 5 On-Resistance Variation with Temperature

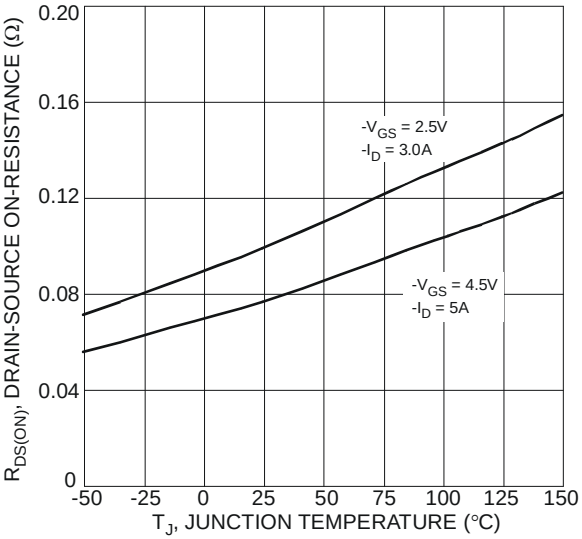


Fig. 6 On-Resistance Variation with Temperature

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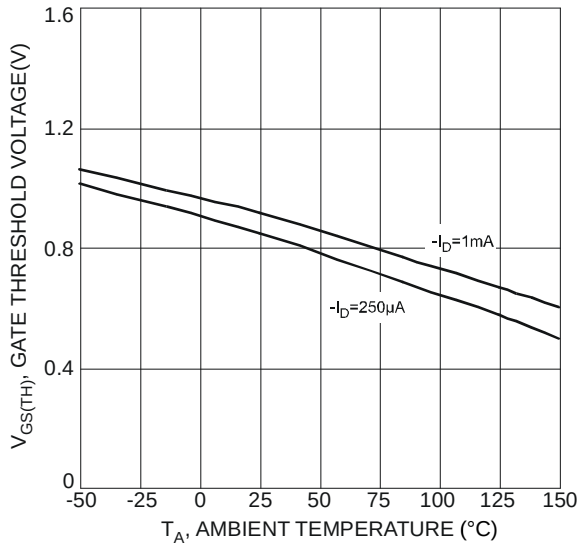


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

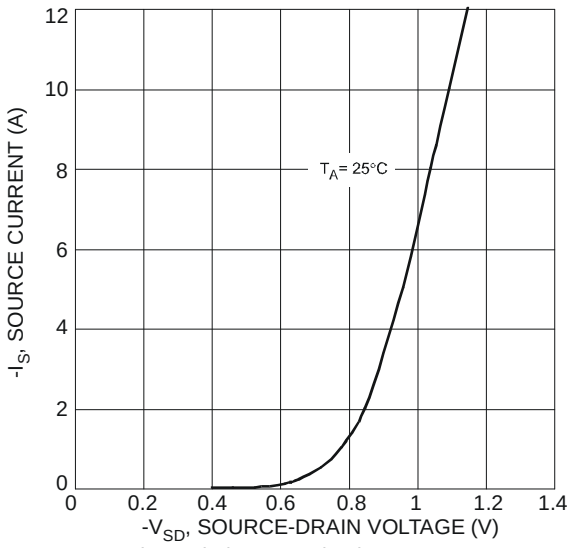


Fig. 8 Diode Forward Voltage vs. Current

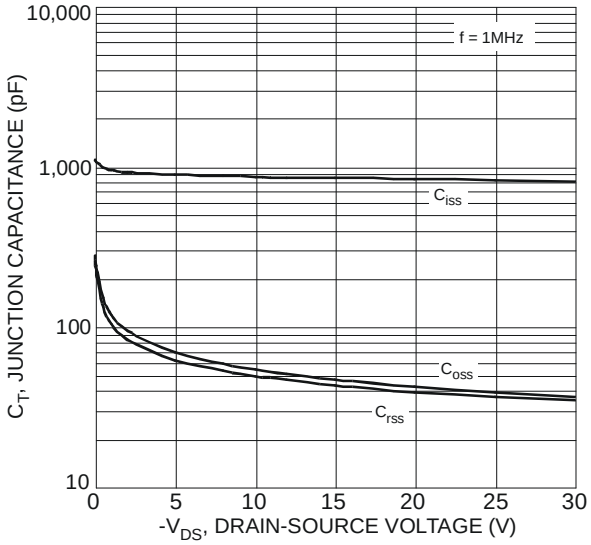


Fig. 9 Typical Junction Capacitance

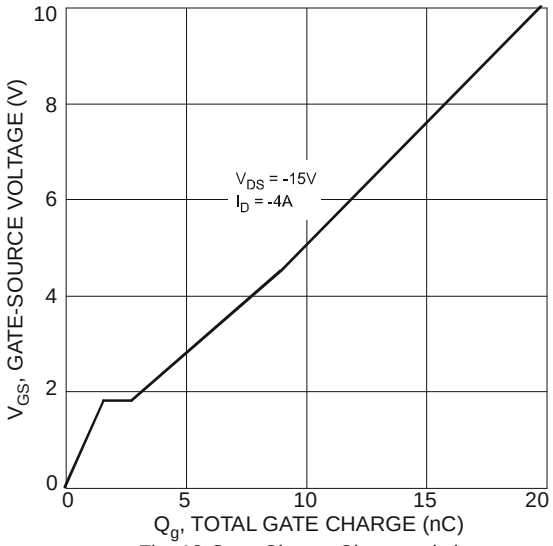


Fig. 10 Gate-Charge Characteristics

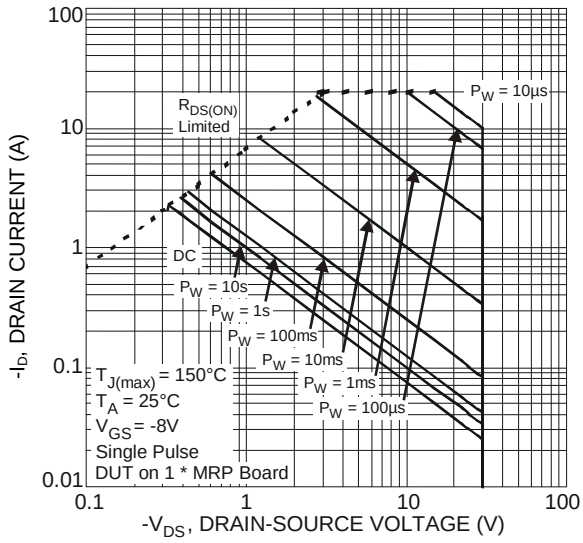


Fig. 11 SOA, Safe Operation Area

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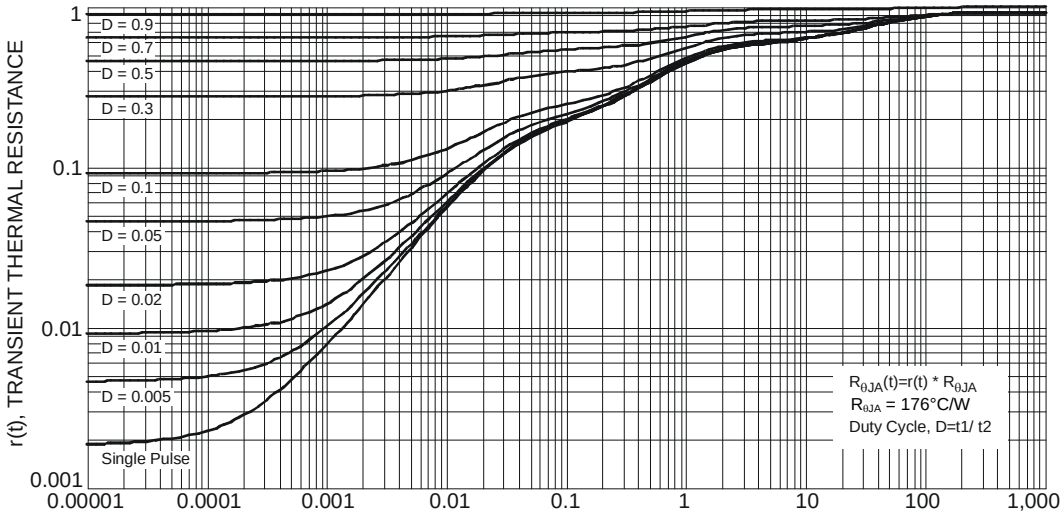
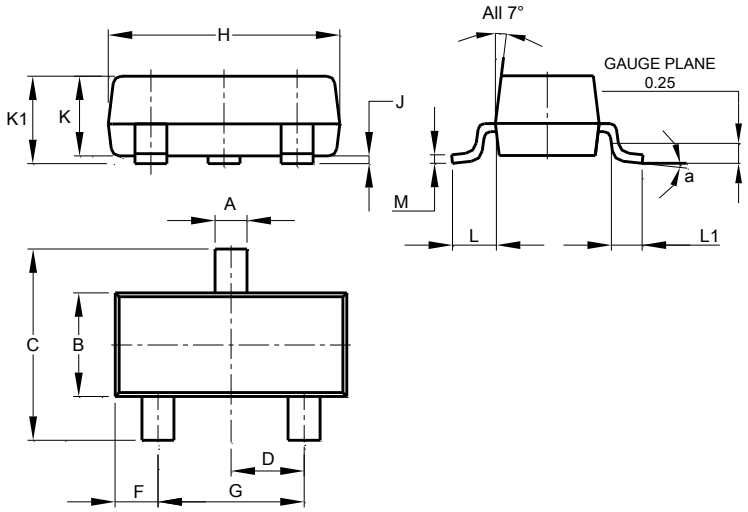


Fig. 12 Transient Thermal Resistance

Package Outline Dimensions

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

SOT23

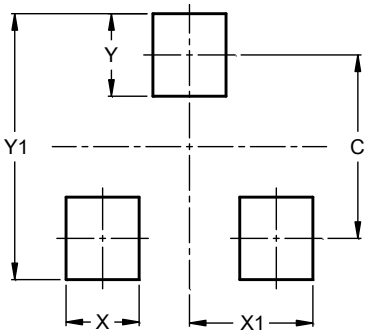


SOT23			
Dim	**Min**	**Max**	**Typ**
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	0°	8°	--
All Dimensions in mm			

Suggested Pad Layout

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

SOT23



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

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