

Product Summary

BV_{DSS}	$R_{DS(ON)}$	I_D $T_A = +25^\circ C$
-30V	122m Ω @ $V_{GS} = -10V$	-2.7A
	190m Ω @ $V_{GS} = -4.5V$	-2.0A

Description

This new generation MOSFET is designed to minimize the on-state resistance ($R_{DS(ON)}$) yet maintain superior switching performance, making it ideal for high efficiency power management applications.

Applications

- DC-DC Converters
- Power Management Functions

Features

- 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)
- The DMP3160LQ is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.

<https://www.diodes.com/quality/product-definitions/>

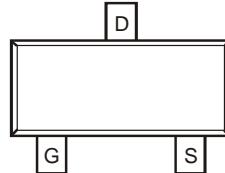
Mechanical Data

- 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: 0.008 grams (Approximate)

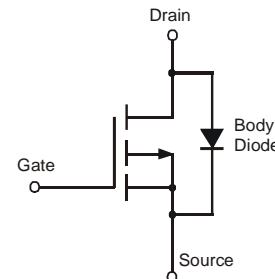
SOT23



Top View



Top View



Equivalent Circuit

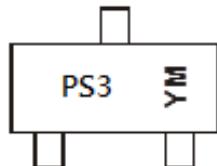
Ordering Information (Note 4)

Part Number	Compliance	Case	Packaging
DMP3160L-7	Standard	SOT23	3000/Tape & Reel
DMP3160LQ-7	Automotive	SOT23	3000/Tape & Reel

Notes:

- No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
- 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.
- Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
- For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information



PS3 = Product Type Marking Code
 YM = Date Code Marking
 Y or \bar{Y} = Year (ex: H = 2020)
 M = Month (ex: 9 = September)

Date Code Key

Year	2007	...	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Code	U	...	H	I	J	K	L	M	N	O	P	R
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

Maximum Ratings (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V_{DSS}	-30	V
Gate-Source Voltage			V_{GSS}	± 20	V
Drain Current (Note 5) $V_{GS} = -10\text{V}$	Steady State	$T_A = +25^\circ\text{C}$	I_D	-2.7 -2	A
Pulsed Drain Current (Note 6)			I_{DM}	-8	A

Thermal Characteristics

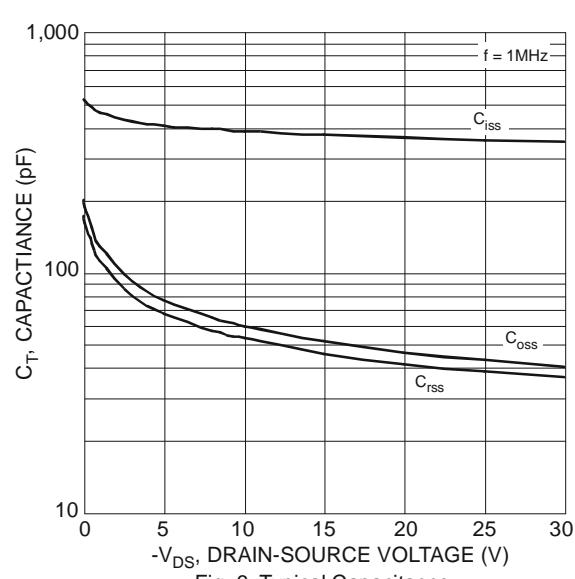
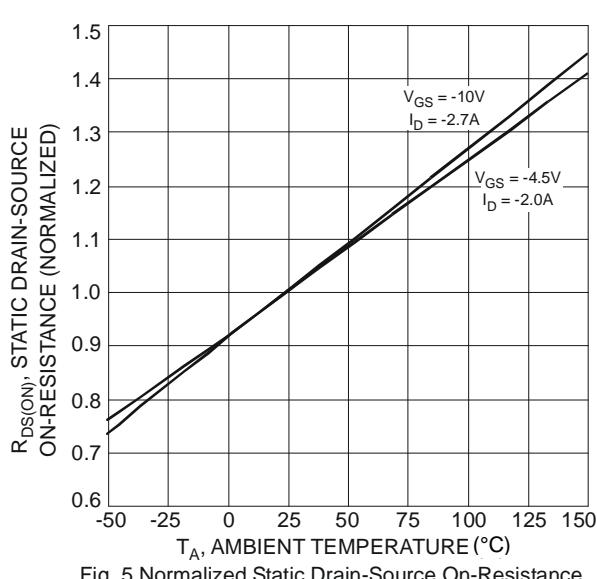
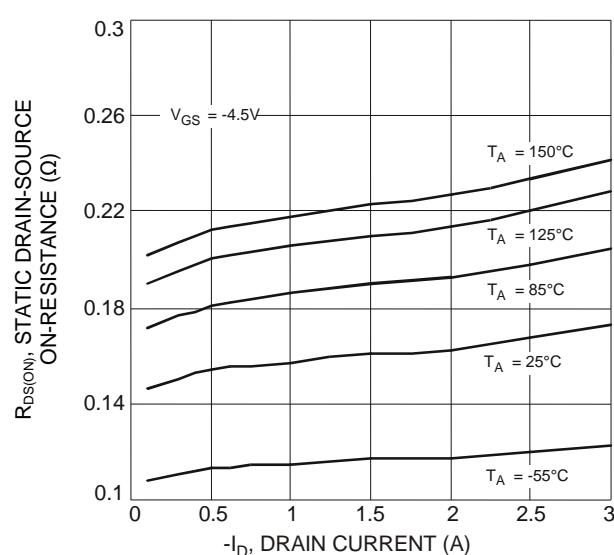
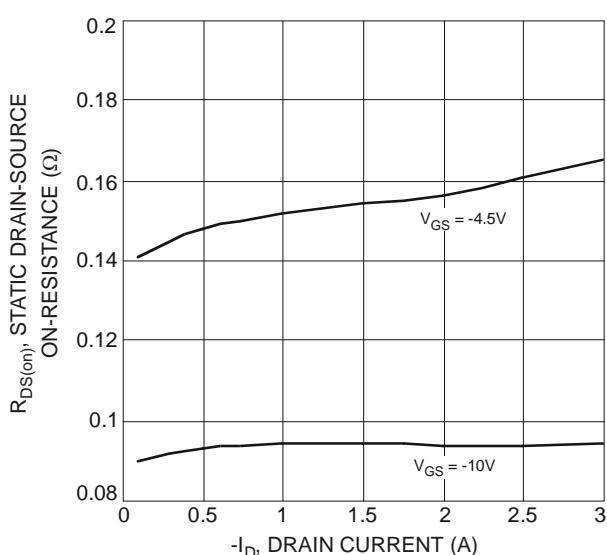
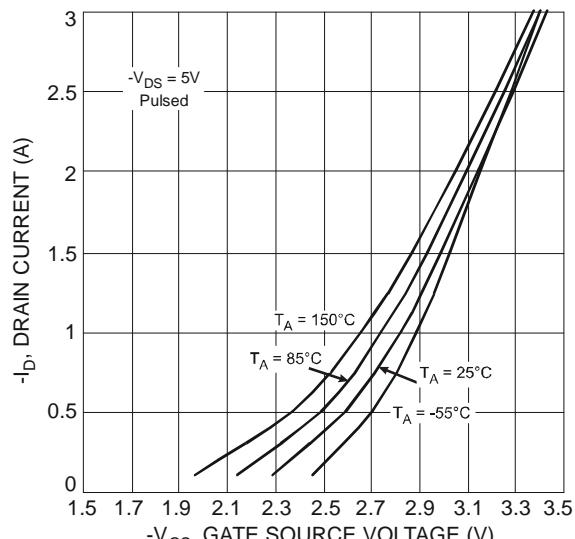
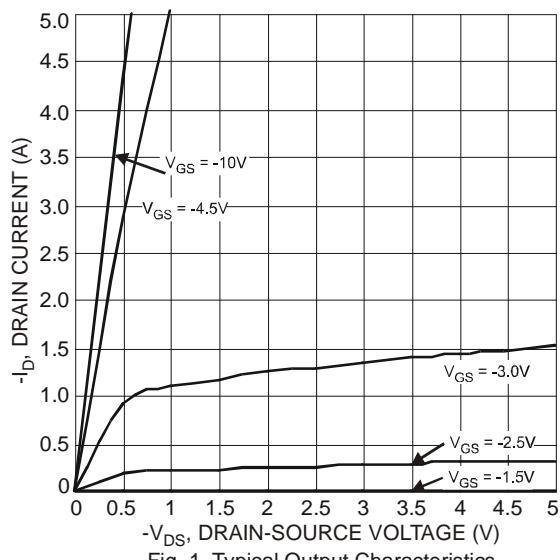
Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	P_D	1.08	W
Thermal Resistance, Junction to Ambient @ $T_A = +25^\circ\text{C}$ (Note 5)	$R_{\theta JA}$	115	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)						
Drain-Source Breakdown Voltage	BV_{DSS}	-30	—	—	V	$V_{GS} = 0\text{V}$, $I_D = -250\mu\text{A}$
Zero Gate Voltage Drain Current	I_{DSS}	—	—	-800	nA	$V_{DS} = -30\text{V}$, $V_{GS} = 0\text{V}$
Gate-Source Leakage	I_{GS}	—	—	± 80 ± 800	nA	$V_{GS} = \pm 12\text{V}$, $V_{DS} = 0\text{V}$ $V_{GS} = \pm 15\text{V}$, $V_{DS} = 0\text{V}$
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(TH)}$	-1.3	-1.8	-2.1	V	$V_{DS} = V_{GS}$, $I_D = -250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	97 165	122 190	$\text{m}\Omega$	$V_{GS} = -10\text{V}$, $I_D = -2.7\text{A}$ $V_{GS} = -4.5\text{V}$, $I_D = -2.0\text{A}$
Forward Transfer Admittance	$ Y_{fs} $	—	5.9	—	S	$V_{DS} = -5\text{V}$, $I_D = -2.7\text{A}$
Diode Forward Voltage (Note 7)	V_{SD}	—	—	-1.26	V	$V_{GS} = 0\text{V}$, $I_S = -2.7\text{A}$
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	—	384.4	—	pF	$V_{DS} = -10\text{V}$, $V_{GS} = 0\text{V}$ $f = 1.0\text{MHz}$
Output Capacitance	C_{oss}	—	59.4	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	52.8	—	pF	$V_{GS} = 0\text{V}$, $V_{DS} = 0\text{V}$, $f = 1.0\text{MHz}$
Gate Resistance	R_G	—	17.1	—	Ω	
Total Gate Charge ($V_{GS} = -4.5\text{V}$)	Q_g	—	4.0	—	nC	$V_{GS} = -10\text{V}/-4.5\text{V}$, $V_{DS} = -15\text{V}$, $I_D = -3\text{A}$
Total Gate Charge ($V_{GS} = -10\text{V}$)	Q_g	—	8.2	—	nC	
Gate-Source Charge	Q_{gs}	—	0.9	—	nC	
Gate-Drain Charge	Q_{gd}	—	1.2	—	nC	
Turn-On Delay Time	$t_{D(ON)}$	—	4.8	—	ns	$V_{DS} = -15\text{V}$, $V_{GS} = -10\text{V}$, $R_G = 6\Omega$, $I_D = -1\text{A}$
Turn-On Rise Time	t_R	—	7.3	—	ns	
Turn-Off Delay Time	$t_{D(OFF)}$	—	22.5	—	ns	
Turn-Off Fall Time	t_F	—	13.4	—	ns	

Notes:

5. Device mounted on FR-4 PCB. $t \leq 10$ sec.
6. Pulse width $\leq 10\mu\text{S}$, Duty Cycle $\leq 1\%$.
7. Short duration pulse test used to minimize self-heating effect.
8. Guaranteed by design. Not subject to product testing.



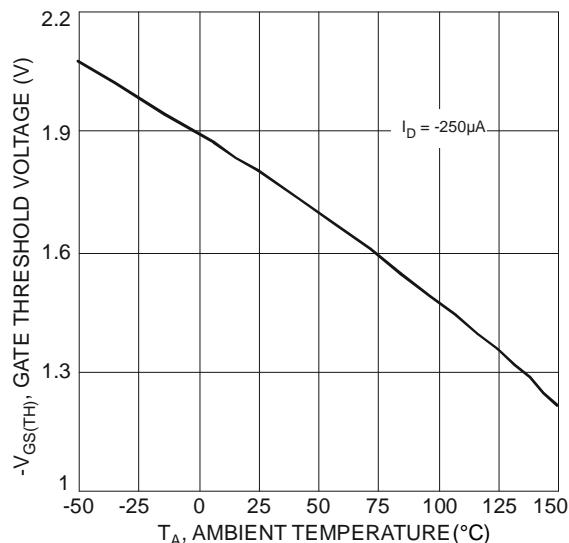


Fig. 7 Gate Threshold Voltage vs. Ambient Temperature

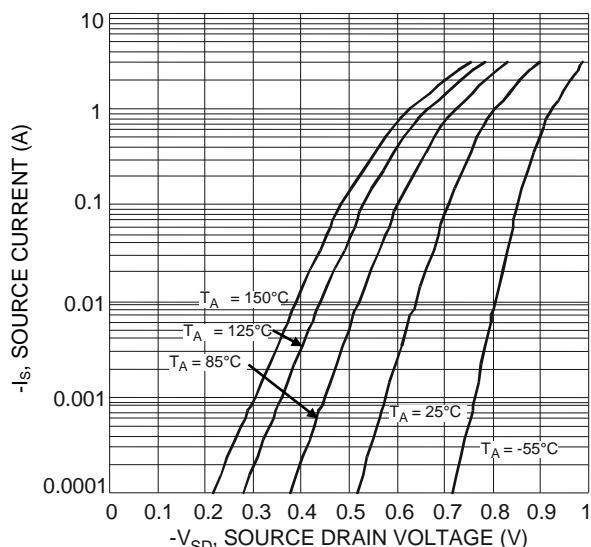


Fig. 8 Reverse Source Current vs. Source-Drain Voltage

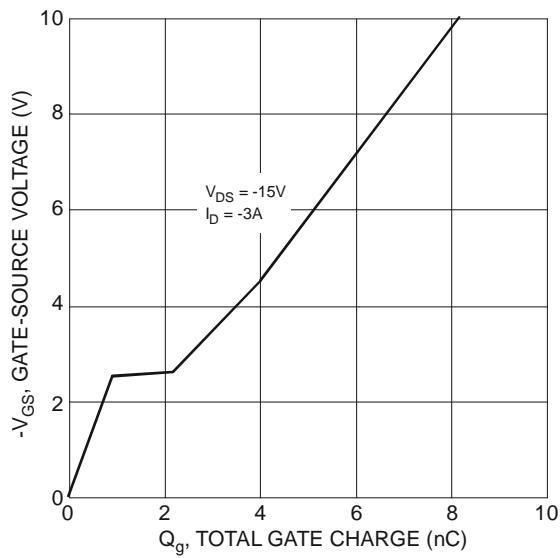
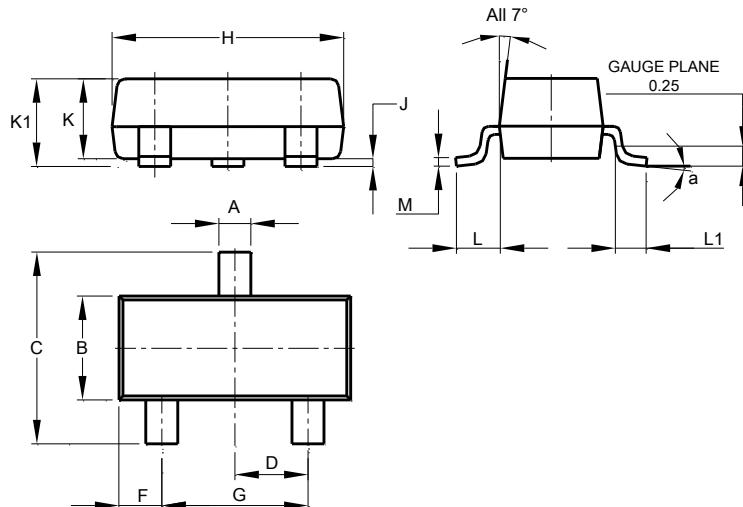


Figure 9 Gate-Charge Characteristics

Package Outline Dimensions

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

SOT23



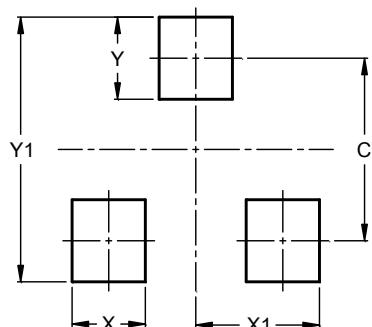
SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	0°	8°	--

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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