

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)}$	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 has been 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.

Applications

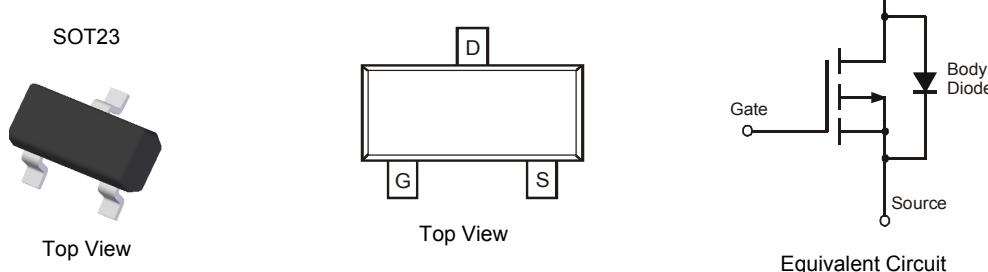
- DC-DC Converters
- Power Management Functions

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)
- 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 (e3)
- Terminal Connections: See Diagram
- Weight: 0.008 grams (approximate)



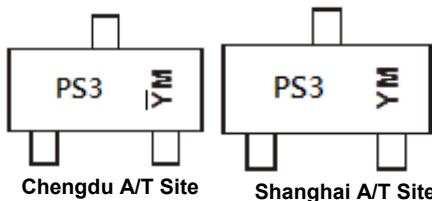
Ordering Information (Note 4 & 5)

Part Number	Compliance	Case	Packaging
DMP3160L-7	Standard	SOT23	3000/Tape & Reel
DMP3160LQ-7	Automotive	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. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.
5. Automotive products are AEC-Q101 qualified and are PPAP capable. Automotive, AEC-Q101 and standard products are electrically and thermally the same, except where specified. For more information, please refer to http://www.diodes.com/quality/product_grade_definitions/.

Marking Information



PS3 = Product Type Marking Code

YM = Date Code Marking for SAT (Shanghai Assembly/ Test site)

YM = Date Code Marking for CAT (Chengdu Assembly/ Test site)

Y or YM = Year (ex: A = 2013)

M = Month (ex: 9 = September)

Date Code Key

Year	2007	2008	2009	2010	2011	2012	2013	2014	2015			
Code	U	V	W	X	Y	Z	A	B	C			
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

DMP3160L

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

Characteristic			Symbol	Value	Units
Drain-Source Voltage			V_{DSS}	-30	V
Gate-Source Voltage			V_{GSS}	± 20	V
Drain Current (Note 6) $V_{GS} = -10\text{V}$	Steady State	$T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$	I_D	-2.7 -2	A
Pulsed Drain Current (Note 7)			I_{DM}	-8	A

Thermal Characteristics

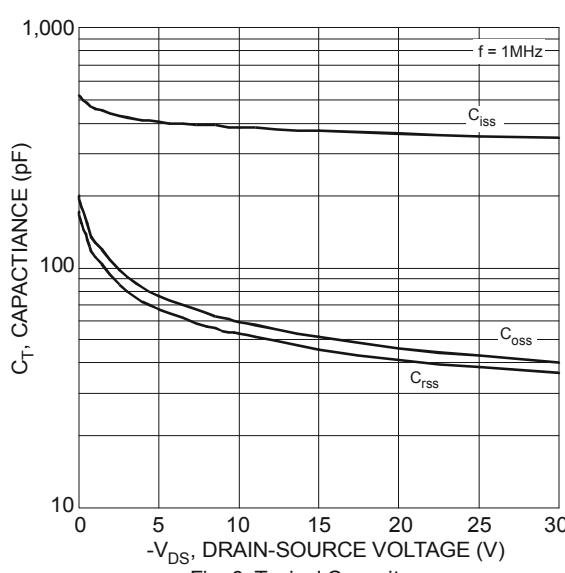
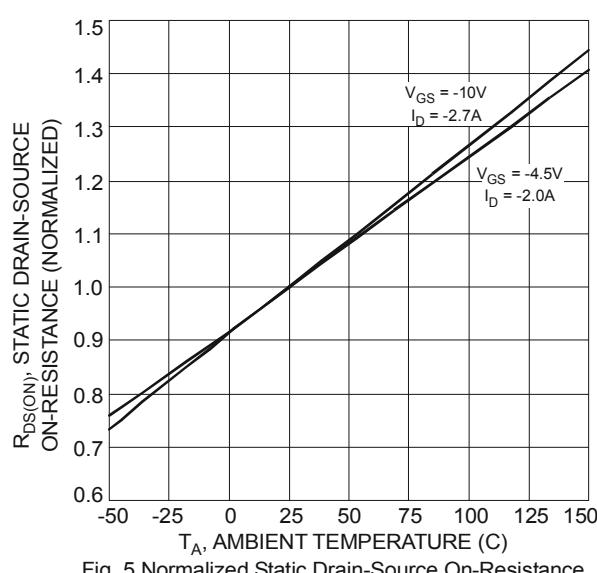
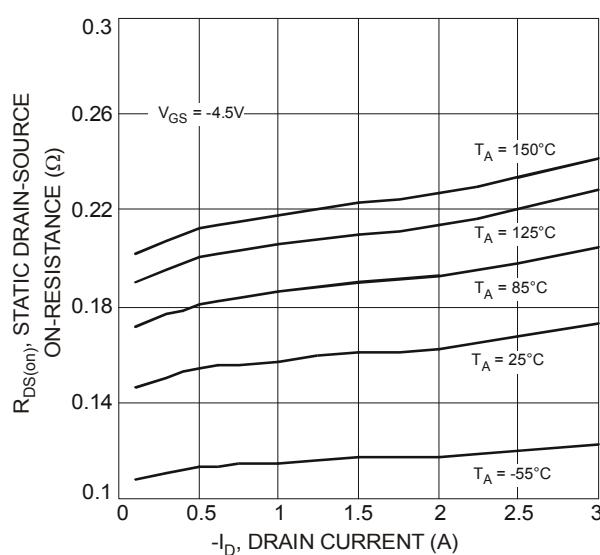
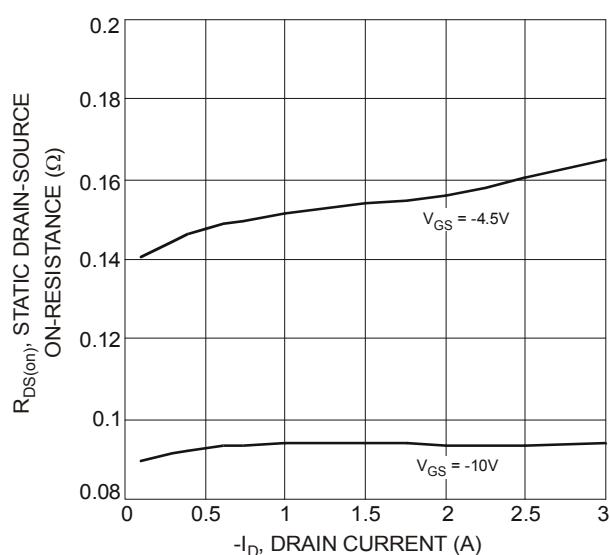
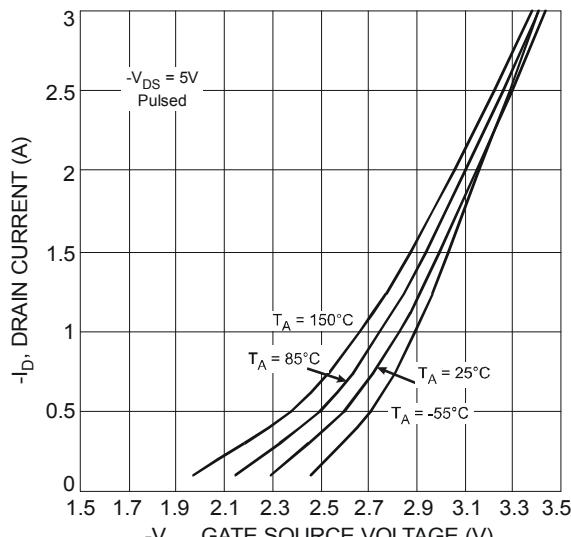
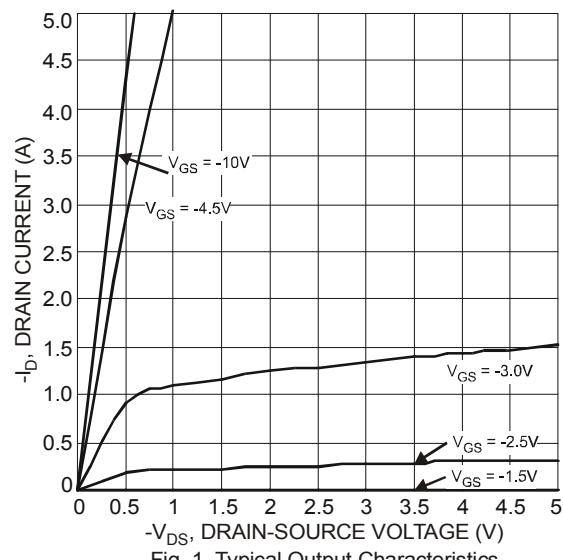
Characteristic	Symbol	Value	Units
Total Power Dissipation (Note 6)	P_D	1.08	W
Thermal Resistance, Junction to Ambient @ $T_A = +25^\circ\text{C}$ (Note 6)	$R_{\theta JA}$	115	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 8)						
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 8)						
Gate Threshold Voltage	$V_{GS(\text{th})}$	-1.3	-1.8	-2.1	V	$V_{DS} = V_{GS}, I_D = -250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{DS(\text{ON})}$	—	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 8)	V_{SD}	—	—	-1.26	V	$V_{GS} = 0\text{V}, I_S = -2.7\text{A}$
DYNAMIC CHARACTERISTICS (Note 9)						
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	
Gate Resistance	R_G	—	17.1	—	Ω	$V_{GS} = 0\text{V}, V_{DS} = 0\text{V},$ $f = 1.0\text{MHz}$
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	$t_{D(\text{on})}$	—	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	$t_{D(\text{off})}$	—	22.5	—	ns	
Turn-Off Fall Time	t_f	—	13.4	—	ns	

Notes:

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



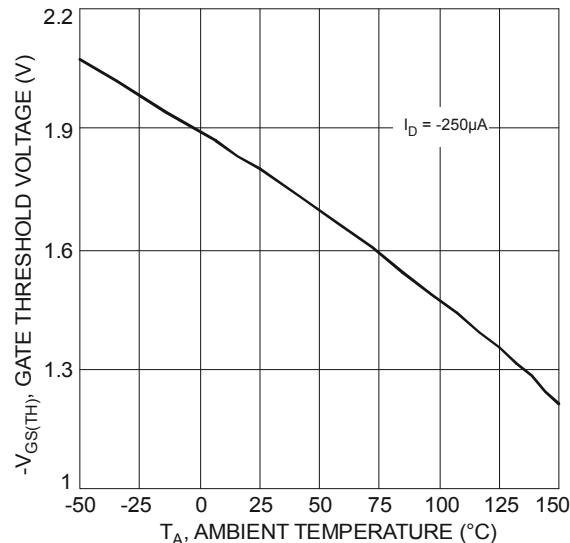


Fig. 7 Gate Threshold Voltage vs. Ambient Temperature

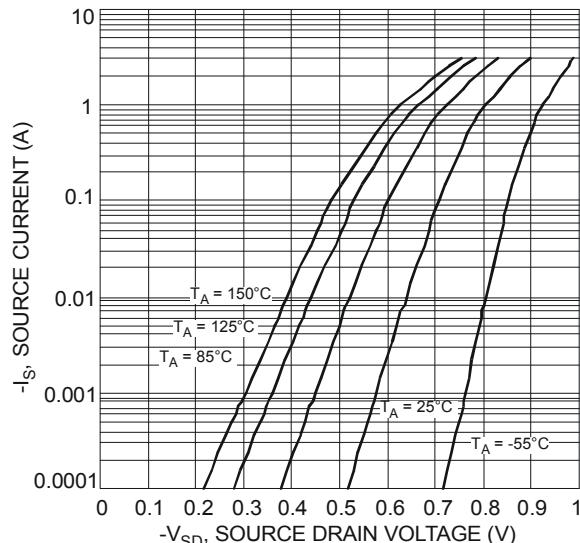


Fig. 8 Reverse Drain Current vs. Source-Drain Voltage

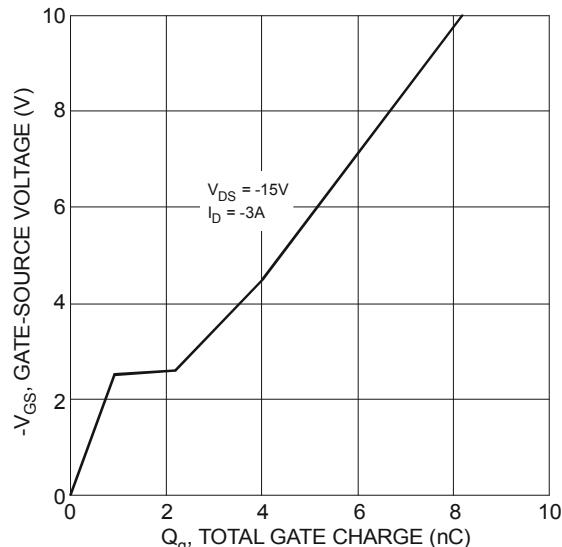
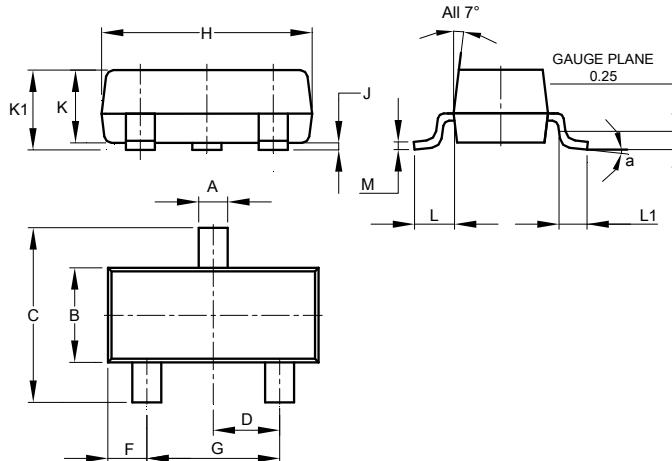


Figure 9 Gate-Charge Characteristics

Package Outline Dimensions

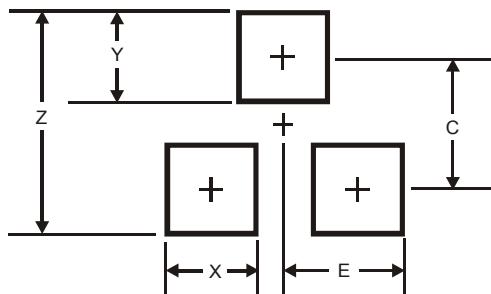
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



SOT23			
Dim	M _{Min}	M _{Max}	T _{Typ}
A	0.977	0.951	0.940
B	1.260	1.140	1.330
C	2.300	2.550	2.460
D	0.989	1.093	0.993
F	0.455	0.660	0.535
G	1.188	2.005	1.883
H	2.260	3.000	2.990
J	0.033	0.050	0.05
K	0.990	1.000	0.975
K1	0.993	1.100	1.023
L	0.455	0.651	0.655
L1	0.285	0.655	0.440
M	0.988	0.9530	0.9100
α	88°		
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
X	0.8
Y	0.9
C	2.0
E	1.35

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