

## Product Summary

$V_{(BR)DSS}$	$R_{DS(on) \text{ max}}$	$I_D$ $T_A = 25^\circ\text{C}$
-30V	45m $\Omega$ @ $V_{GS} = -10\text{V}$	-5A
	65m $\Omega$ @ $V_{GS} = -4.5\text{V}$	-4A

## Features

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.

- General Purpose Interfacing Switch
- Power Management Functions
- Analog Switch

## Features and Benefits

- Low Gate Threshold Voltage
- Low On-Resistance
- "Lead Free", RoHS Compliant (Note 1)
- "Green" Device (Note 2)
- Qualified to AEC-Q101 Standards for High Reliability

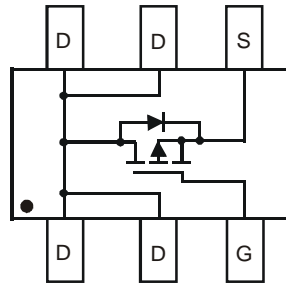
## Mechanical Data

- Case: SOT26
- Case Material – Molded Plastic, "Green" Molding Compound. UL Flammability 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
- Terminal Connections: See Diagram
- Weight: 0.008 grams (approximate)

SOT26



Top View



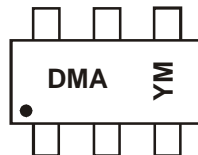
Top View  
Internal Schematic

## Ordering Information (Note 3)

Part Number	Qualification	Case	Packaging
DMP3056LDM-7	Commercial	SOT26	3000/Tape & Reel
DMP3056LDMQ-7	Automotive	SOT26	3000/Tape & Reel

- Notes:
1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. No purposely added lead. Halogen and Antimony free
  2. Diodes Inc.'s "Green" policy can be found on our website at <http://www.diodes.com>.
  3. For packaging details, go to our website at <http://www.diodes.com>.

## Marking Information



DMA = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: V = 2008)  
 M = Month (ex: 9 = September)

### Date Code Key

Year	2008	2009	2010	2011	2012	2013	2014	2015
Code	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

**Maximum Ratings** @T<sub>A</sub> = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V <sub>DSS</sub>	-30	V
Gate-Source Voltage	V <sub>GSS</sub>	±20	V
Continuous Drain Current (Note 4) (V <sub>GS</sub> = -10V)	I <sub>D</sub>	T <sub>A</sub> = 25°C	-5
		T <sub>A</sub> = 70°C	-4.2
Pulsed Drain Current (10µs pulse, duty cycle = 1%)	I <sub>DM</sub>	-13	A

**Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 4)	P <sub>D</sub>	1.25	W
Thermal Resistance, Junction to Ambient (Note 4); Steady-State	R <sub>θJA</sub>	100	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

**Electrical Characteristics** @T<sub>A</sub> = 25°C unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>STATIC PARAMETERS (Note 5)</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	-30	—	—	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = -250µA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	—	—	-1	µA	T <sub>J</sub> = 25°C, V <sub>GS</sub> = 0V, V <sub>DS</sub> = -30V
Gate-Body Leakage Current	I <sub>GSS</sub>	—	—	±100 ±800	nA	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V V <sub>GS</sub> = ±25V, V <sub>DS</sub> = 0V
Gate Threshold Voltage	V <sub>GS(th)</sub>	-1.0	—	-2.1	V	V <sub>GS</sub> = V <sub>DS</sub> , I <sub>D</sub> = -250µA
Static Drain-Source On-Resistance	R <sub>DS(on)</sub>	—	—	45 65	mΩ	V <sub>GS</sub> = -10V, I <sub>D</sub> = -5A V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -4.2A
Forward Transconductance	g <sub>FS</sub>	—	8	—	S	V <sub>DS</sub> = -10V, I <sub>D</sub> = -4.3A
Diode Forward Voltage	V <sub>SD</sub>	—	—	-1.2	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = -1.7A
<b>DYNAMIC PARAMETERS (Note 6)</b>						
Input Capacitance	C <sub>iss</sub>	—	948	—	pF	V <sub>GS</sub> = 0V, V <sub>DS</sub> = -25V, f = 1.0MHz
Output Capacitance	C <sub>oss</sub>	—	105	—	pF	
Reverse Transfer Capacitance	C <sub>rss</sub>	—	100	—	pF	
<b>SWITCHING CHARACTERISTICS (Note 6)</b>						
Total Gate Charge	Q <sub>G</sub>	—	10.1	—	nC	V <sub>DS</sub> = -15V, V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -6A
	Q <sub>G</sub>	—	21.1	—	nC	
Gate-Source Charge	Q <sub>GS</sub>	—	2.8	—	nC	V <sub>DS</sub> = -15V, V <sub>GS</sub> = -10V, I <sub>D</sub> = -6A
Gate-Drain Charge	Q <sub>GD</sub>	—	3.2	—	nC	
Gate Resistance	R <sub>g</sub>	—	13.15	—	Ω	V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1MHz
Turn-On Delay Time	t <sub>d(on)</sub>	—	10.2	—	ns	V <sub>DS</sub> = -15V, V <sub>GS</sub> = -10V, I <sub>D</sub> = -1A, R <sub>G</sub> = 6.0Ω
Rise Time	t <sub>r</sub>	—	6.6	—		
Turn-Off Delay Time	t <sub>d(off)</sub>	—	50.1	—		
Fall Time	t <sub>f</sub>	—	22.3	—		

- Notes: 4. Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.  
5. Short duration pulse test used to minimize self-heating effect.  
6. Guaranteed by design. Not subject to product testing.

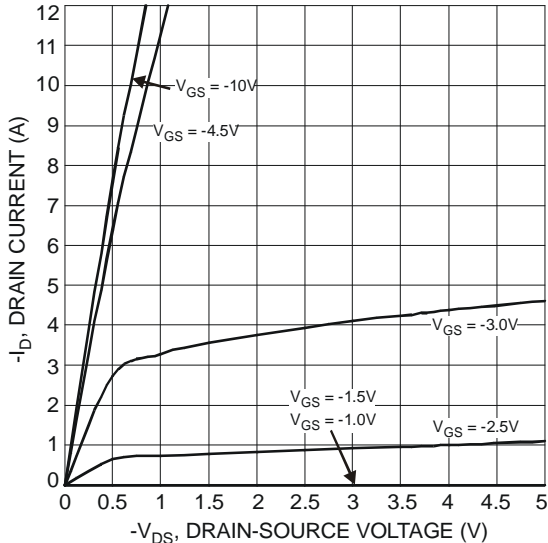


Fig. 1 Typical Output Characteristics

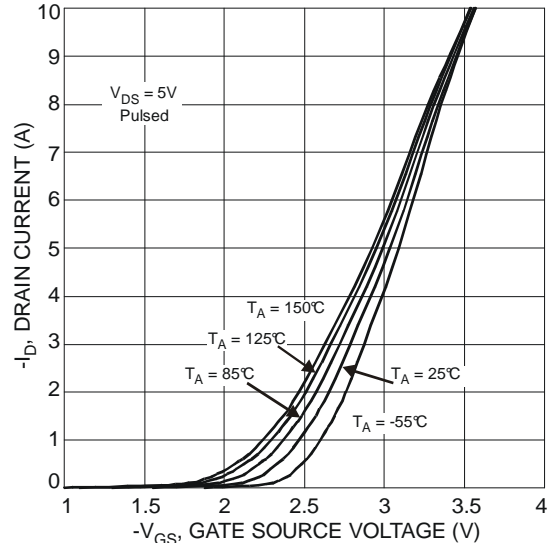


Fig. 2 Typical Transfer Characteristics

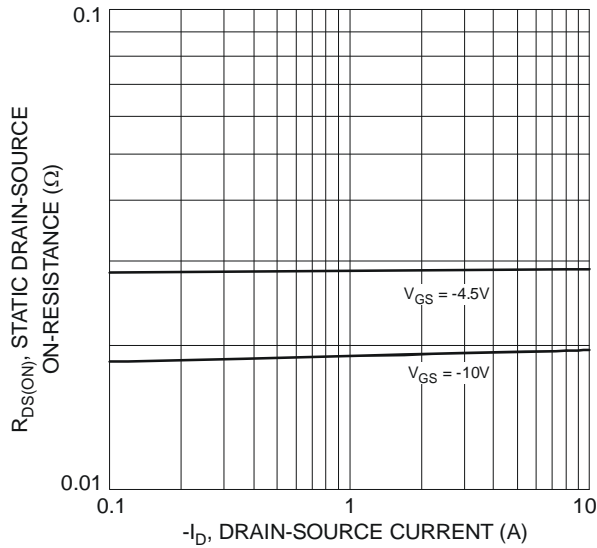


Fig. 3 On-Resistance vs. Drain Current & Gate Voltage

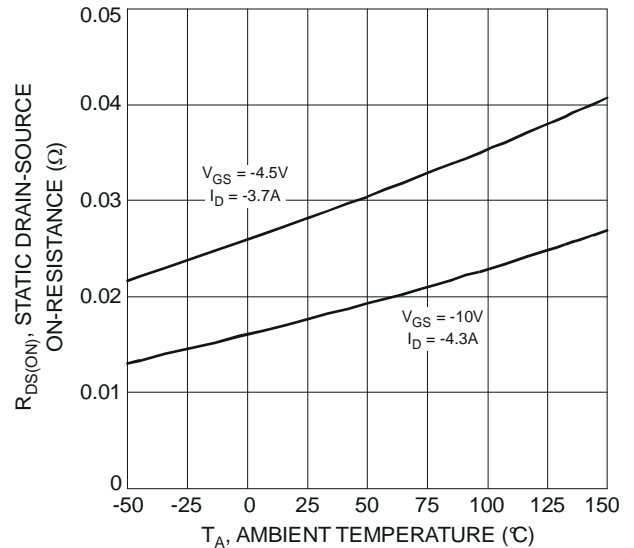


Fig. 4 Static Drain-Source On-Resistance vs. Ambient Temperature

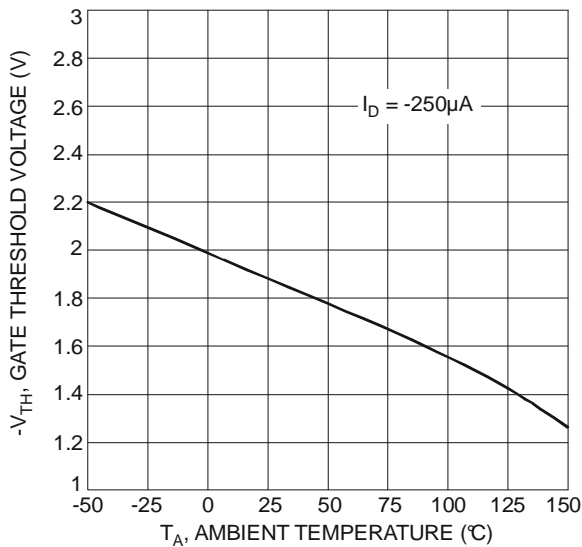


Fig. 5 Gate Threshold Variation vs. Ambient Temperature

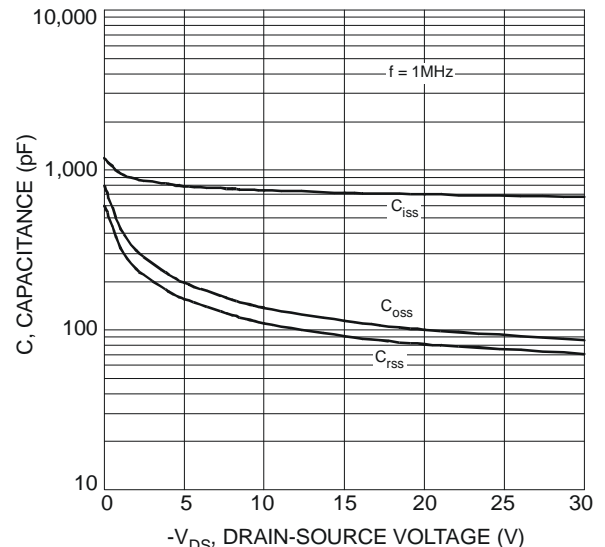


Fig. 6 Typical Total Capacitance

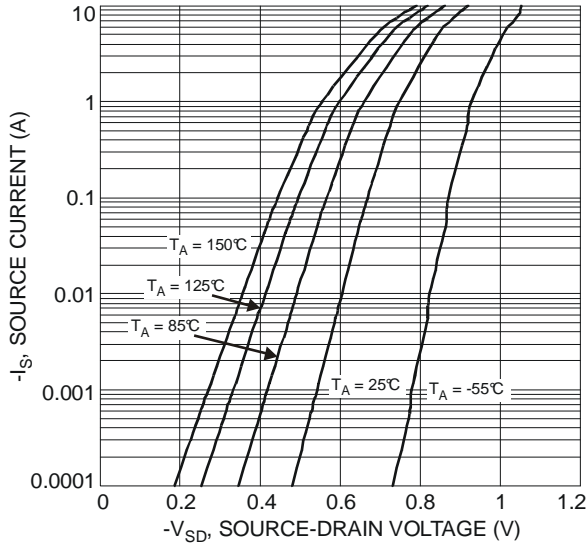


Fig. 7 Reverse Drain Current vs. Source-Drain Voltage

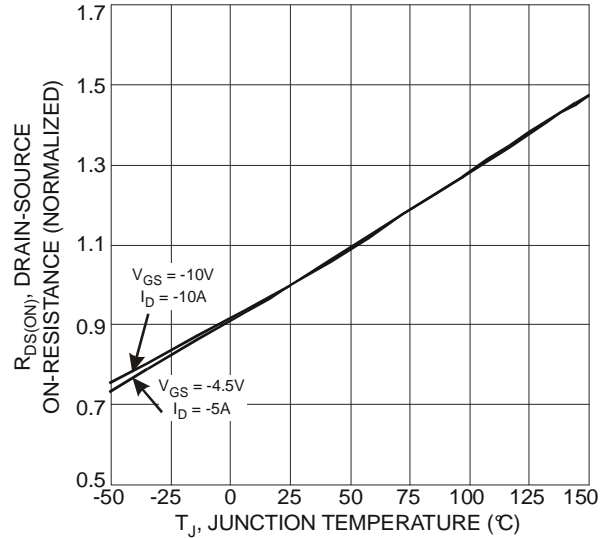


Fig. 8 On-Resistance Variation with Temperature

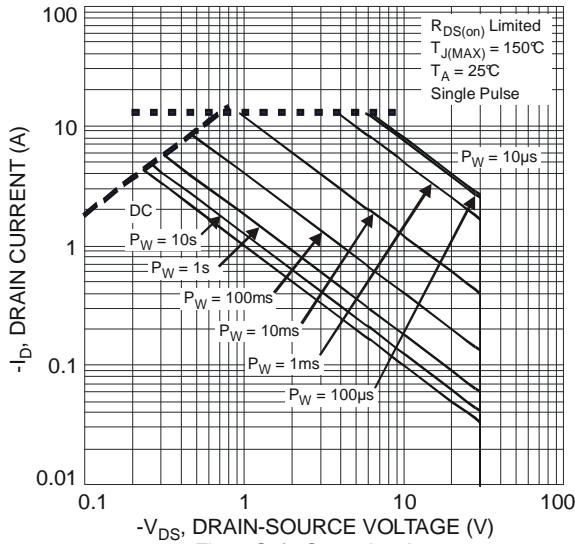


Fig. 9 Safe Operation Area

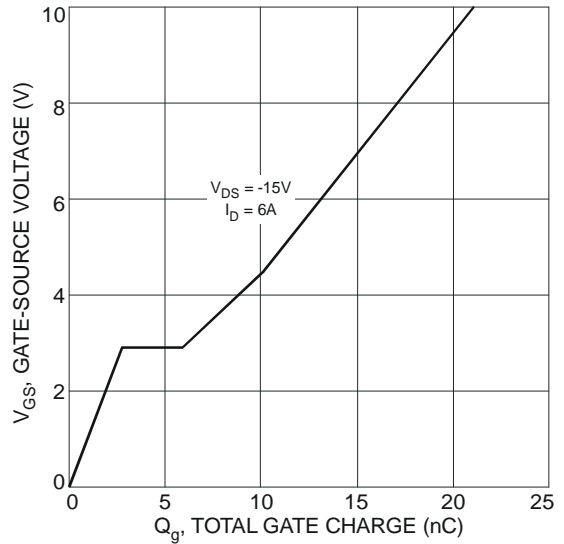


Fig. 10 Gate-Charge Characteristics

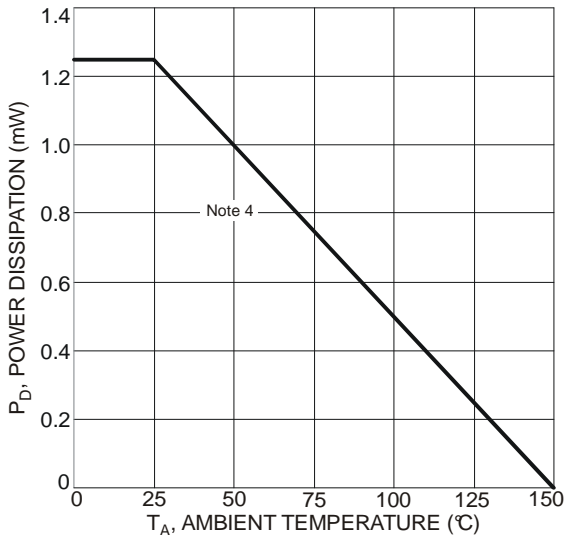


Fig. 11 Power Dissipation vs. Ambient Temperature

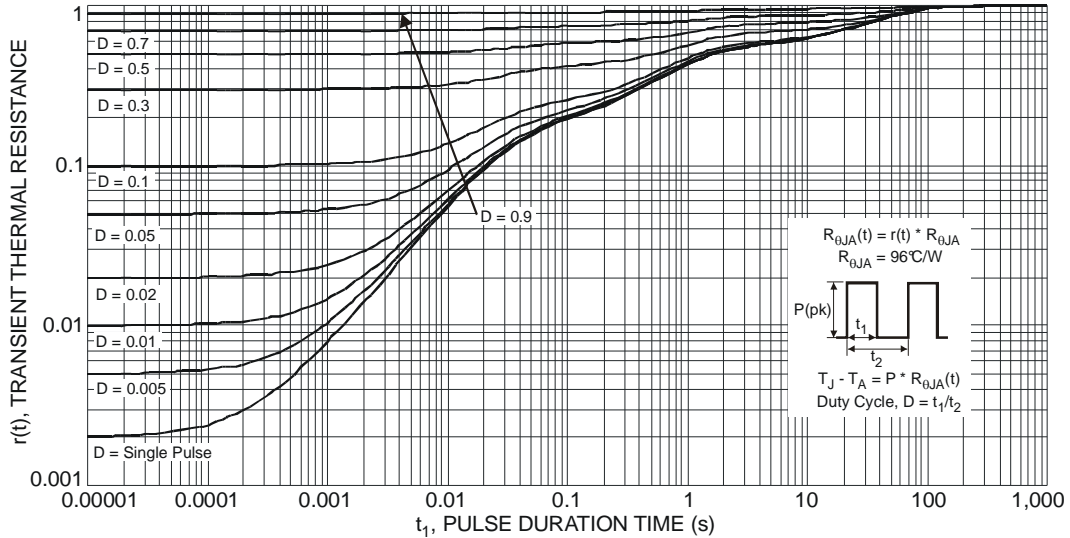
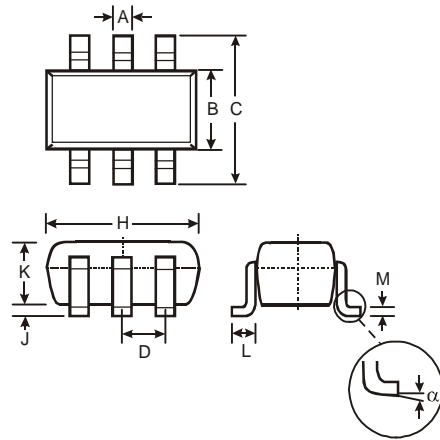


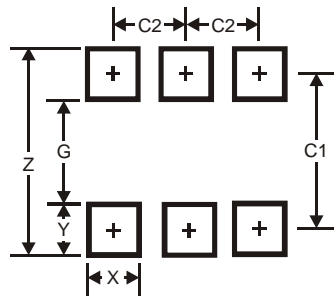
Fig. 12 Transient Thermal Response

**Package Outline Dimensions**



SOT26			
Dim	Min	Max	Typ
A	0.35	0.50	0.38
B	1.50	1.70	1.60
C	2.70	3.00	2.80
D	—	—	0.95
H	2.90	3.10	3.00
J	0.013	0.10	0.05
K	1.00	1.30	1.10
L	0.35	0.55	0.40
M	0.10	0.20	0.15
α	0°	8°	—
All Dimensions in mm			

**Suggested Pad Layout**



Dimensions	Value (in mm)
Z	3.20
G	1.60
X	0.55
Y	0.80
C1	2.40
C2	0.95

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