

## Product Summary

$V_{(BR)DSS}$	$R_{DS(on) \max}$	$I_D$ $T_A = +25^\circ\text{C}$
-30V	45m $\Omega$ @ $V_{GS} = -10\text{V}$	-6.9A
	65m $\Omega$ @ $V_{GS} = -4.5\text{V}$	-5.1A

## 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

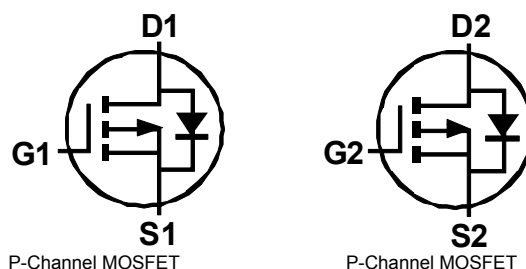
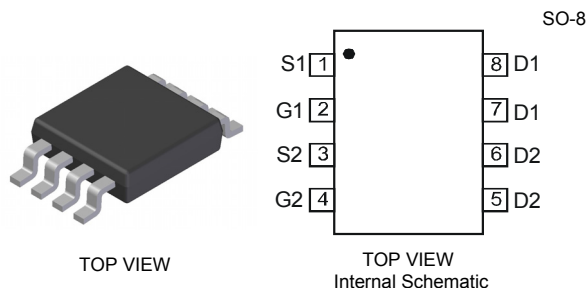
- Power Management Functions
- Backlighting
- DC-DC Converters

## Features

- Dual P-Channel MOSFET
- 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**

## Mechanical Data

- Case: SO-8
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections Indicator: See Diagram
- Terminals: Finish - Matte Tin annealed over Copper lead frame. Solderable per MIL-STD-202, Method 208  $\text{\textcircled{3}}$
- Weight: 0.072g (approximate)

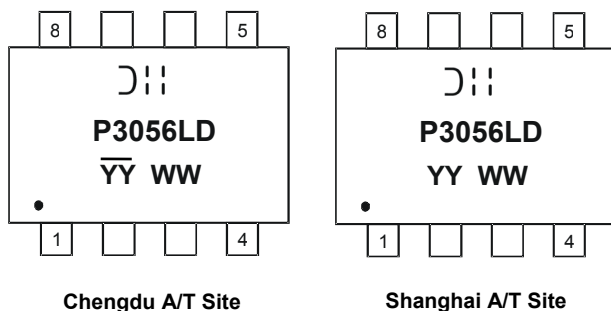


## Ordering Information (Note 4)

Part Number	Case	Packaging
DMP3056LSD-13	SO-8	2,500/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](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>.

## Marking Information



$\text{\textcircled{D}}$  ::= Manufacturer's Marking  
 P3056LD = Product Type Marking Code  
 YYWW = Date Code Marking  
 YY or YY = Year (ex: 14 = 2014)  
 WW = Week (01 - 53)  
 $\overline{\text{YY}}$  = Date Code Marking for SAT (Shanghai Assembly/ Test site)  
 $\overline{\text{YY}}$  = Date Code Marking for CAT (Chengdu Assembly/ Test site)

**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			$V_{GSS}$	$\pm 20$	V
Drain Current (Note 5)	Steady State	$T_A = +25^\circ\text{C}$	$I_D$	-6.9	A
		$T_A = +70^\circ\text{C}$		-5.8	
Pulsed Drain Current (Note 6)			$I_{DM}$	-24	A

**Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	$P_D$	2.5	W
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	50	$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	$^\circ\text{C}$

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 7)</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	-30	—	—	V	$V_{GS} = 0\text{V}, I_D = -250\mu\text{A}$
Zero Gate Voltage Drain Current	$I_{DSS}$	—	—	-1	$\mu\text{A}$	$V_{DS} = -30\text{V}, V_{GS} = 0\text{V}$
Gate-Source Leakage	$I_{GSS}$	—	—	$\pm 100$ $\pm 800$	nA	$V_{GS} = \pm 20\text{V}, V_{DS} = 0\text{V}$ $V_{GS} = \pm 25\text{V}, V_{DS} = 0\text{V}$
<b>ON CHARACTERISTICS (Note 7)</b>						
Gate Threshold Voltage	$V_{GS(th)}$	-1	-1.7	-2.1	V	$V_{DS} = V_{GS}, I_D = -250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	—	45	m $\Omega$	$V_{GS} = -10\text{V}, I_D = -6.0\text{A}$
		—	—	65		$V_{GS} = -4.5\text{V}, I_D = -5.0\text{A}$
Forward Transconductance	$g_{fs}$	—	8	—	S	$V_{DS} = -10\text{V}, I_D = -5.3\text{A}$
Diode Forward Voltage (Note 7)	$V_{SD}$	-0.5	—	-1.2	V	$V_{GS} = 0\text{V}, I_S = -1.7\text{A}$
<b>DYNAMIC CHARACTERISTICS</b>						
Input Capacitance	$C_{iss}$	—	722	—	pF	$V_{DS} = -25\text{V}, V_{GS} = 0\text{V}$ $f = 1.0\text{MHz}$
Output Capacitance	$C_{oss}$	—	114	—	pF	
Reverse Transfer Capacitance	$C_{rss}$	—	92	—	pF	
Gate Resistance	$R_G$	—	3.3	—	$\Omega$	$V_{DS} = 0\text{V}, V_{GS} = 0\text{V}$ $f = 1.0\text{MHz}$
<b>SWITCHING CHARACTERISTICS</b>						
Total Gate Charge	$Q_G$	—	6.8	—	nC	$V_{DS} = -15\text{V}, V_{GS} = -4.5\text{V},$ $I_D = -6\text{A}$
	$Q_G$	—	13.7	—		
Gate-Source Charge	$Q_{GS}$	—	1.6	—	nC	$V_{DS} = -15\text{V}, V_{GS} = -10\text{V},$ $I_D = -6\text{A}$
Gate-Drain Charge	$Q_{GD}$	—	4.2	—		
Turn-On Delay Time	$t_{d(on)}$	—	6.4	—	ns	$V_{DS} = -15\text{V}, V_{GS} = -10\text{V},$ $I_D = -1\text{A}, R_G = 6.0\Omega$
Rise Time	$t_r$	—	5.3	—		
Turn-Off Delay Time	$t_{d(off)}$	—	26.5	—		
Fall Time	$t_f$	—	14.7	—		

- Notes:
- Device mounted on 2 oz. 1" x 1" Copper pads on 2" x 2" FR-4 PCB.
  - Pulse width  $\leq 10\mu\text{s}$ , Duty Cycle  $\leq 1\%$ .
  - Short duration pulse test used to minimize self-heating effect.

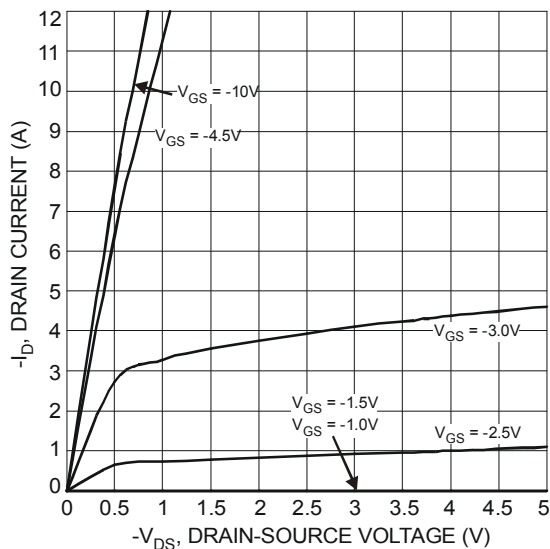


Fig. 1 Typical Output Characteristics

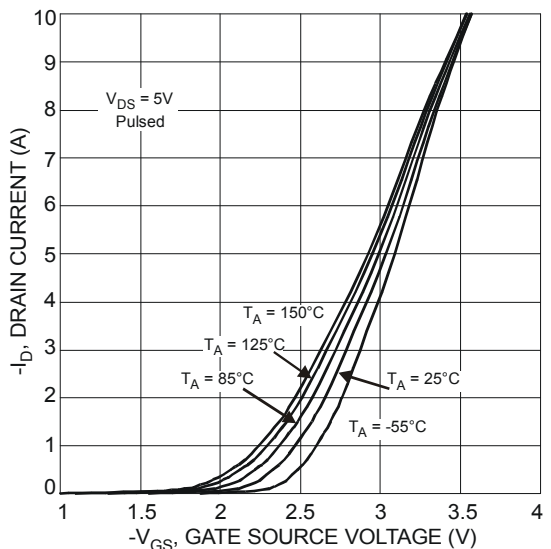


Fig. 2 Typical Transfer Characteristics

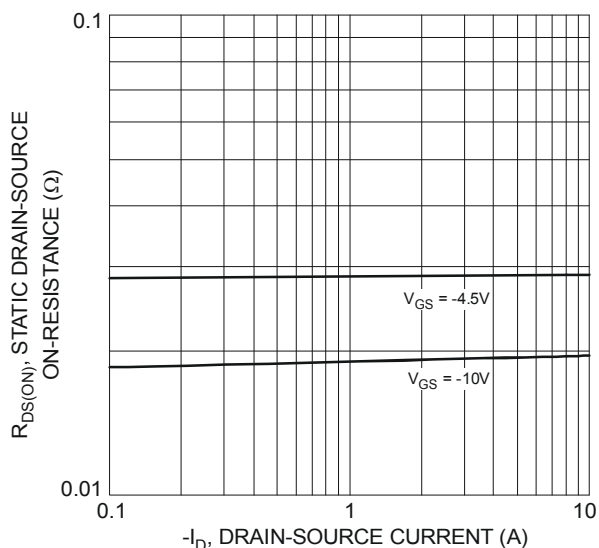


Fig. 3 On-Resistance vs. Drain Current & Gate Voltage

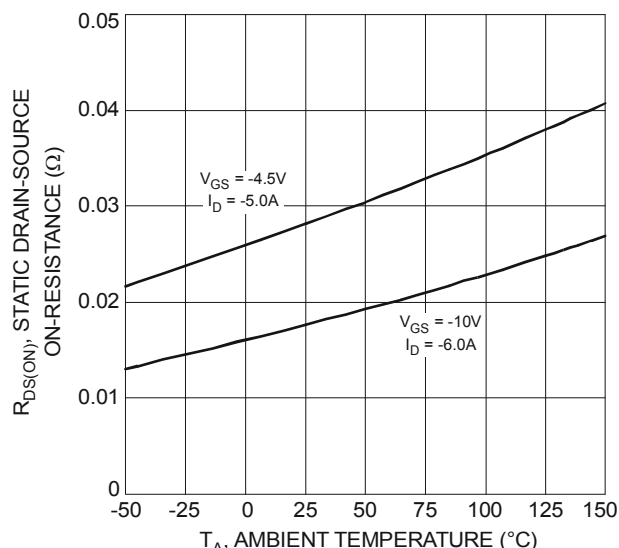


Fig. 4 Static Drain-Source On-Resistance vs. Ambient Temperature

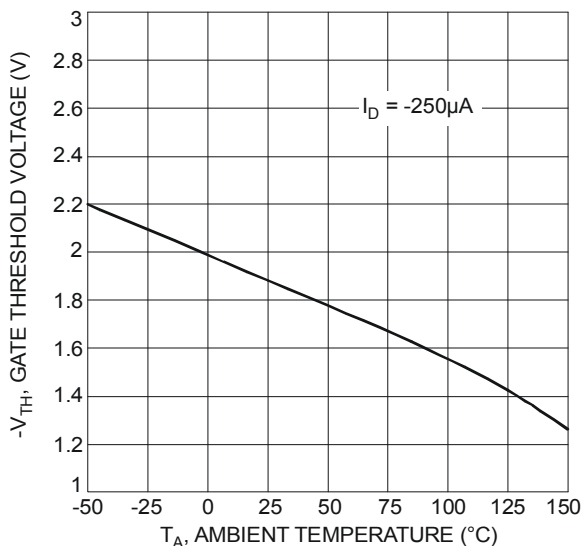


Fig. 5 Gate Threshold Variation vs. Ambient Temperature

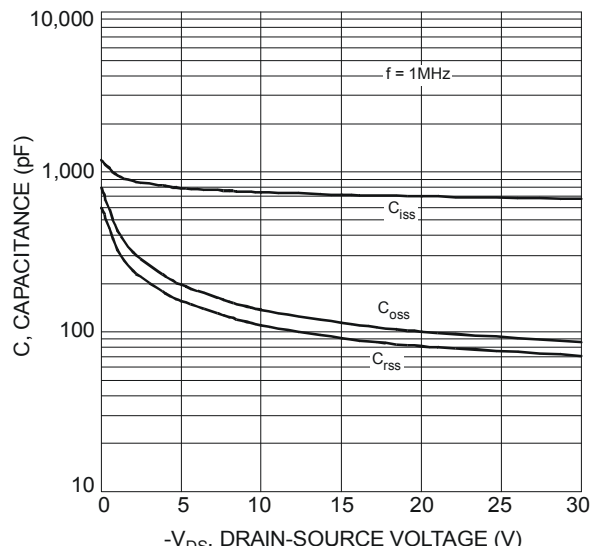


Fig. 6 Typical Total Capacitance

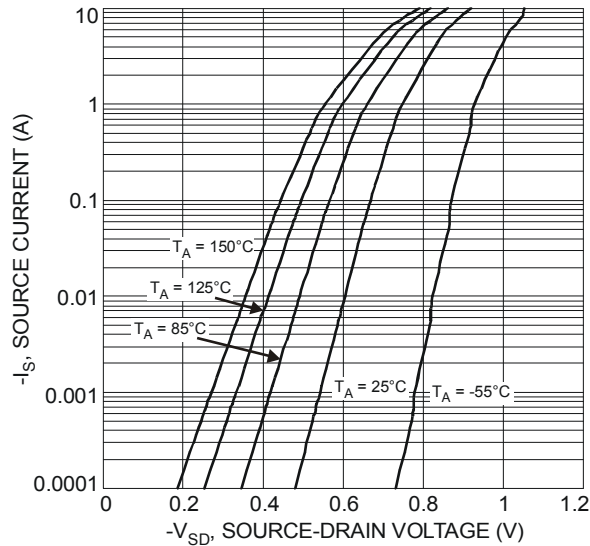
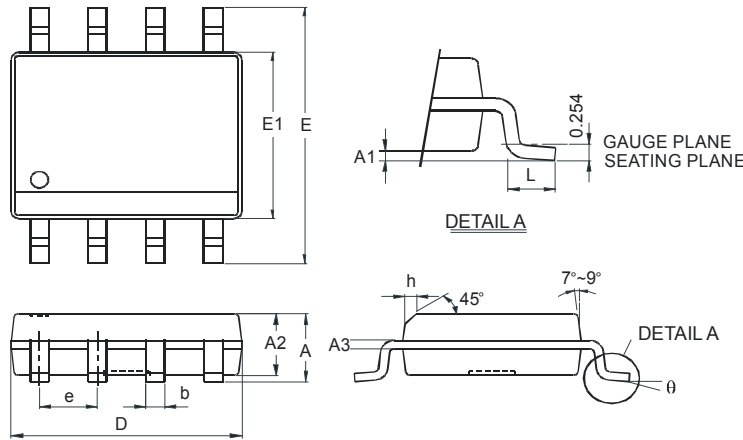


Fig. 7 Reverse Drain Current vs. Source-Drain Voltage

**Package Outline Dimensions**

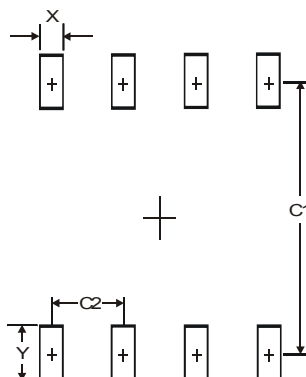
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



SO-8		
Dim	Min	Max
A	-	1.75
A1	0.10	0.20
A2	1.30	1.50
A3	0.15	0.25
b	0.3	0.5
D	4.85	4.95
E	5.90	6.10
E1	3.85	3.95
e	1.27 Typ	
h	-	0.35
L	0.62	0.82
θ	0°	8°
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)
X	0.60
Y	1.55
C1	5.4
C2	1.27

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