

Product Summary

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

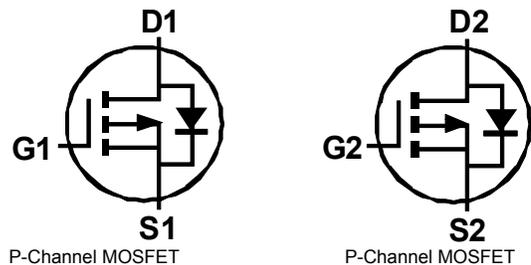
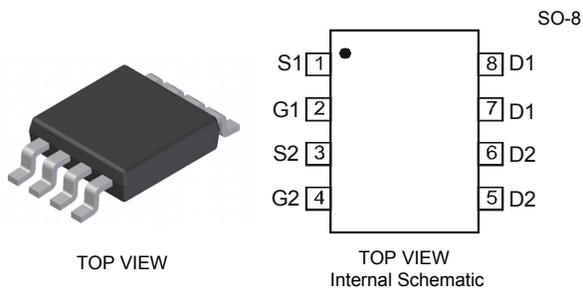
- Power Management Functions
- Backlighting
- DC-DC Converters

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)

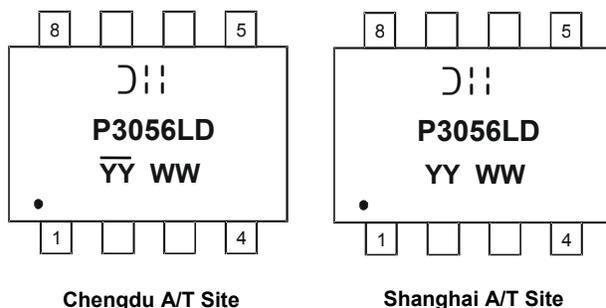


Ordering Information (Note 4)

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 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°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 5)	Steady State	T _A = +25°C	I _D	-6.9	A
		T _A = +70°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 _{θJA}	50	°C/W
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 7)						
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-Source Leakage	I _{GSS}	—	—	±100 ±800	nA	V _{GS} = ±20V, V _{DS} = 0V V _{GS} = ±25V, V _{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	V _{GS(th)}	-1	-1.7	-2.1	V	V _{DS} = V _{GS} , I _D = -250μA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	—	45	mΩ	V _{GS} = -10V, I _D = -6.0A V _{GS} = -4.5V, I _D = -5.0A
		—	—	65		
Forward Transconductance	g _{fs}	—	8	—	S	V _{DS} = -10V, I _D = -5.3A
Diode Forward Voltage (Note 7)	V _{SD}	-0.5	—	-1.2	V	V _{GS} = 0V, I _S = -1.7A
DYNAMIC CHARACTERISTICS						
Input Capacitance	C _{iss}	—	722	—	pF	V _{DS} = -25V, V _{GS} = 0V f = 1.0MHz
Output Capacitance	C _{oss}	—	114	—	pF	
Reverse Transfer Capacitance	C _{rss}	—	92	—	pF	
Gate Resistance	R _G	—	3.3	—	Ω	V _{DS} = 0V, V _{GS} = 0V f = 1.0MHz
SWITCHING CHARACTERISTICS						
Total Gate Charge	Q _G	—	6.8	—	nC	V _{DS} = -15V, V _{GS} = -4.5V, I _D = -6A
	Q _G	—	13.7	—		
Gate-Source Charge	Q _{GS}	—	1.6	—	nC	V _{DS} = -15V, V _{GS} = -10V, I _D = -6A
Gate-Drain Charge	Q _{GD}	—	4.2	—		
Turn-On Delay Time	t _{d(on)}	—	6.4	—	ns	V _{DS} = -15V, V _{GS} = -10V, I _D = -1A, R _G = 6.0Ω
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 ≤10μs, Duty Cycle ≤1%.
 - Short duration pulse test used to minimize self-heating effect.

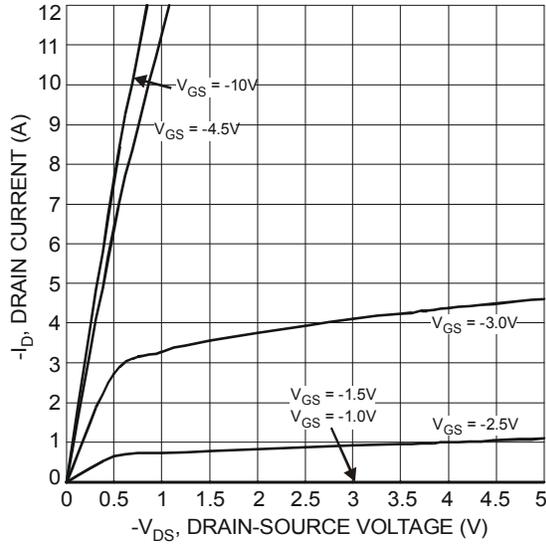


Fig. 1 Typical Output Characteristics

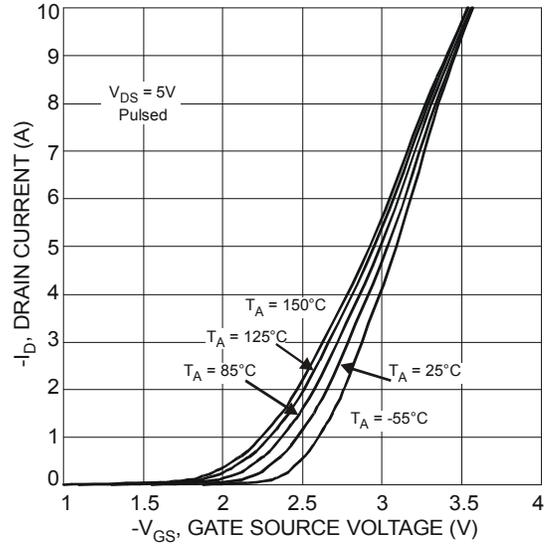


Fig. 2 Typical Transfer Characteristics

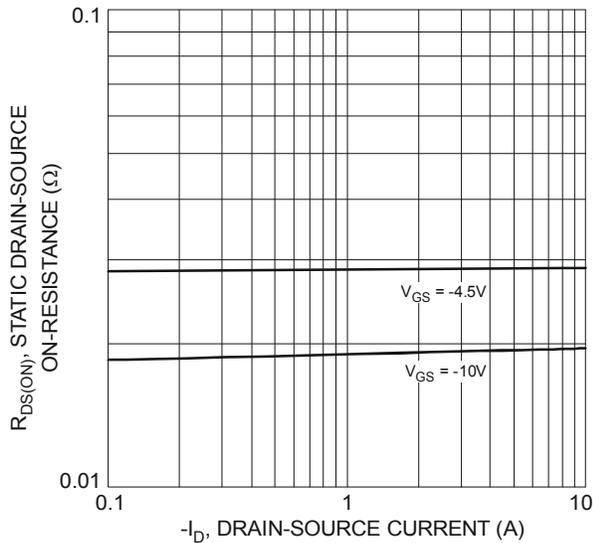


Fig. 3 On-Resistance vs. Drain Current & Gate Voltage

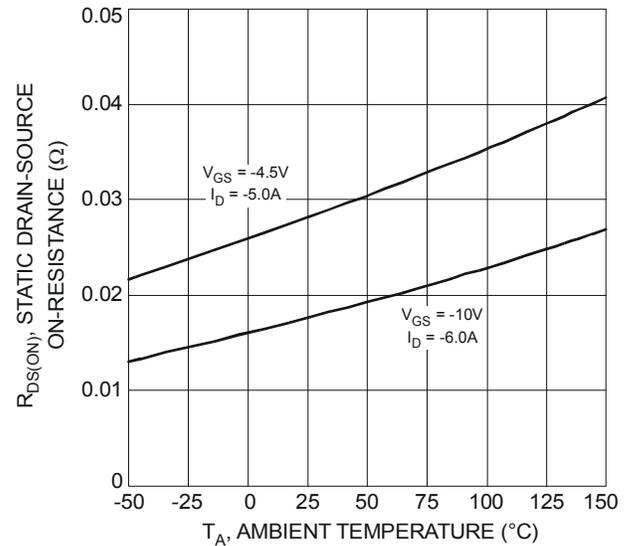


Fig. 4 Static Drain-Source On-Resistance vs. Ambient Temperature

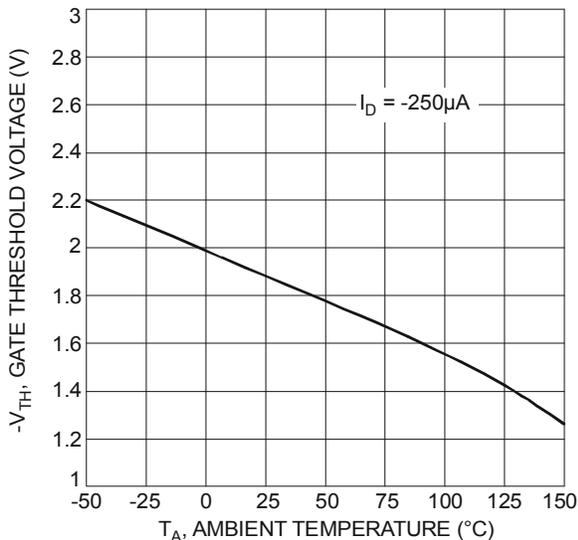


Fig. 5 Gate Threshold Variation vs. Ambient Temperature

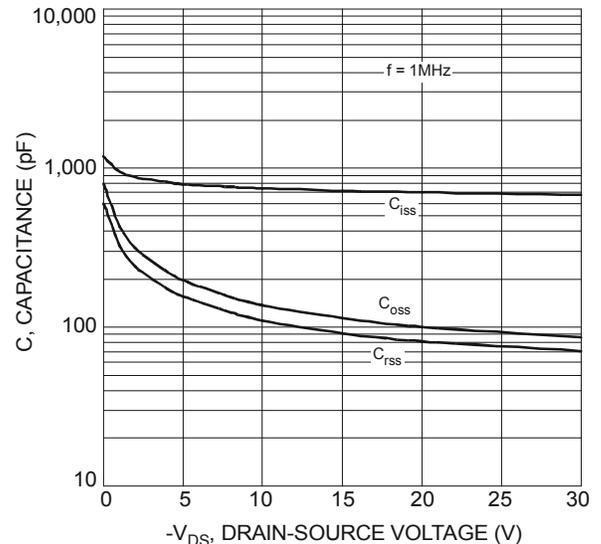


Fig. 6 Typical Total Capacitance

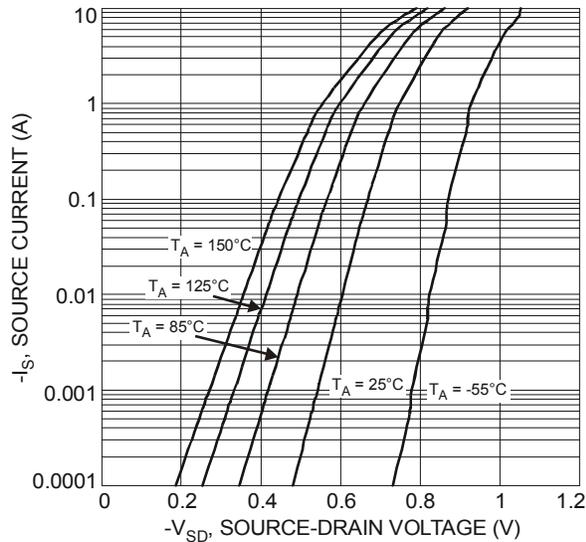
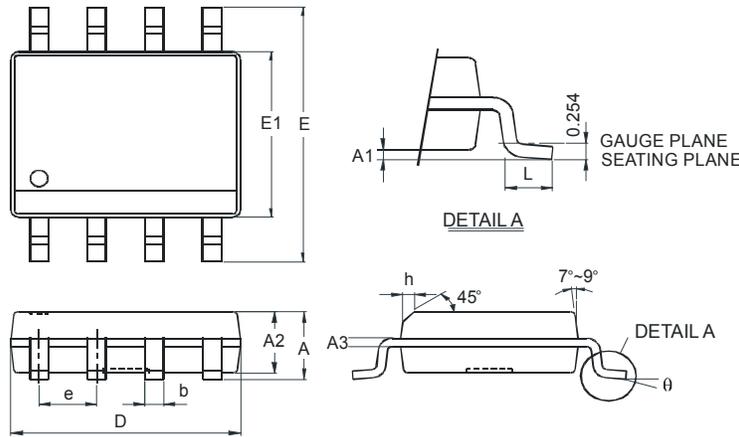


Fig. 7 Reverse Drain Current vs. Source-Drain Voltage

Package Outline Dimensions

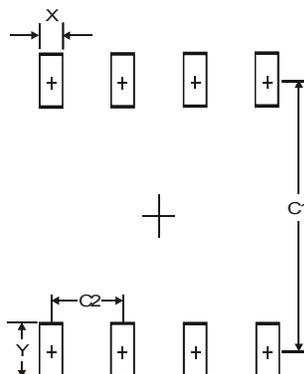
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



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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