



#### P-CHANNEL ENHANCEMENT MODE MOSFET

## **Product Summary**

V <sub>(BR)DSS</sub>	R <sub>DS(on) max</sub>	I <sub>D</sub> T <sub>C</sub> = +25°C
-30V	$32m\Omega$ @ $V_{GS} = -10V$	-5.8A
	$50m\Omega$ @ $V_{GS} = -4.5V$	-4.6A

### **Description**

This new generation MOSFET has been designed to minimize the onstate 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
- Backlighting

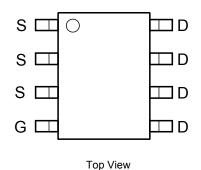
#### **Features**

- Low On-Resistance
- 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

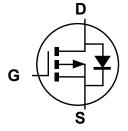
### **Mechanical Data**

- 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: See Diagram Below
- Weight: 0.072 grams (approximate)





Pin-Out



Equivalent Circuit

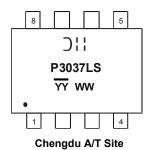
### Ordering Information (Note 4)

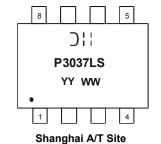
Part Number	Case	Packaging
DMP3037LSS-13	SO-8	2500 / Tape & Reel

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





);; = Manufacturer's Marking
P3037LS = Product Type Marking Code
YYWW = Date Code Marking
YY or YY = Year (ex: 13 = 2013)
WW = Week (01 - 53)

 $\frac{YY}{YY}$  = Date Code Marking for SAT (Shanghai Assembly/ Test site)  $\frac{YY}{YY}$  = Date Code Marking for CAT (Chengdu Assembly/ Test site)



# **Maximum Ratings** (@ $T_A = +25$ °C, unless otherwise specified.)

Characteristic		Symbol	Value	Unit
Drain-Source Voltage		$V_{DSS}$	-30	V
Gate-Source Voltage		$V_{GSS}$	±20	V
Continuous Drain Current (Note 6) V <sub>GS</sub> = -10V	T <sub>A</sub> = +25°C T <sub>A</sub> = +70°C	ID	-5.8 -4.6	Α
Pulsed Drain Current (10µs pulse, duty cycle = 1%)		I <sub>DM</sub>	-40	Α
Avalanche Current (Notes 7) L = 0.1mH		las	-17	Α
Avalanche Energy (Notes 7) L = 0.1mH		E <sub>AS</sub>	15	mJ

## **Thermal Characteristics**

Characteristic		Symbol	Value	Units
Total Dayyar Dissination (Note 5)	T <sub>A</sub> = +25°C	D	1.2	W
Total Power Dissipation (Note 5)	T <sub>A</sub> = +70°C	$P_{D}$	0.8	
Thermal Resistance, Junction to Ambient (Note 5)	Steady state	D	100	°C/W
Thermal Resistance, Junction to Ambient (Note 5)	t<10s	$R_{\theta JA}$	58	
Total Power Dissipation (Note 6)	$T_A = +25^{\circ}C$	Б	1.6	W
Total Power Dissipation (Note 6)	T <sub>A</sub> = +70°C	$P_{D}$	1.0	
Thermal Pagistanes, Jungtion to Ambient (Note 6)	Steady state	Ъ	77	°C/W
Thermal Resistance, Junction to Ambient (Note 6)	t<10s	$R_{\theta JA}$	45	
Thermal Resistance, Junction to Case (Note 6)		$R_{ heta JC}$	10	
Operating and Storage Temperature Range		T <sub>J,</sub> T <sub>STG</sub>	-55 to +150	°C

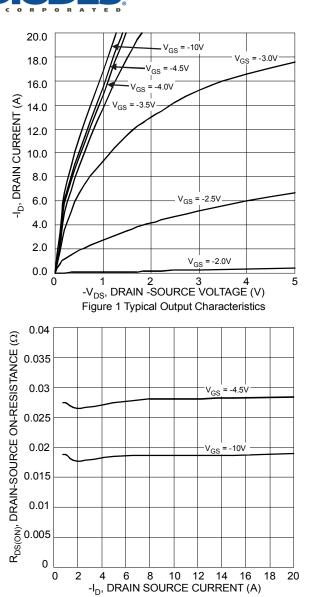
## **Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition	
OFF CHARACTERISTICS (Note 8)							
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	-30	_	_	V	$V_{GS} = 0V, I_D = -250\mu A$	
Zero Gate Voltage Drain Current T <sub>J</sub> = +25°C	I <sub>DSS</sub>		_	-1.0	μΑ	$V_{DS} = -30V, V_{GS} = 0V$	
Gate-Source Leakage	I <sub>GSS</sub>	_	_	±100	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$	
ON CHARACTERISTICS (Note 8)							
Gate Threshold Voltage	$V_{GS(th)}$	-1.0	_	-2.4	V	$V_{DS} = V_{GS}, I_{D} = -250 \mu A$	
Static Drain-Source On-Resistance	D		19	32	mΩ	$V_{GS} = -10V, I_D = -7A$	
Static Drain-Source On-Resistance	R <sub>DS</sub> (ON)	_	28	50	11122	$V_{GS} = -4.5V, I_D = -5A$	
Diode Forward Voltage	$V_{SD}$	_	-0.75	-1.2	V	$V_{GS} = 0V, I_{S} = -1A$	
DYNAMIC CHARACTERISTICS (Note 9)							
Input Capacitance	C <sub>iss</sub>	_	931	_	pF	15), 15), 1	
Output Capacitance	Coss		120	_	pF	V <sub>DS</sub> = -15V, V <sub>GS</sub> = 0V, -f = 1.0MHz	
Reverse Transfer Capacitance	C <sub>rss</sub>		102	_	pF	1 - 1.0WH2	
Gate Resistance	$R_g$	_	23	_	Ω	$V_{DS} = 0V$ , $V_{GS} = 0V$ , $f = 1MHz$	
Total Gate Charge (V <sub>GS</sub> = -10V)	Qg		19.3	_	nC	$V_{DS} = -15V, I_{D} = -7A$	
Total Gate Charge (V <sub>GS</sub> = -4.5V)	Qg	_	9.7	_	nC		
Gate-Source Charge	Q <sub>gs</sub>	_	2.5	_	nC	$V_{DS} = -15V, I_{D} = -7A$	
Gate-Drain Charge	Q <sub>gd</sub>	_	3.6	_	nC		
Turn-On Delay Time	t <sub>D(on)</sub>	_	3.2	_	ns		
Turn-On Rise Time	tr	_	11.5	_	ns	$V_{DS}$ = -15V, $V_{GS}$ = -10V, $R_L$ = 2.15 $\Omega$ , $R_{GEN}$ = 3 $\Omega$ ,	
Turn-Off Delay Time	t <sub>D(off)</sub>	_	55.8	_	ns		
Turn-Off Fall Time	t <sub>f</sub>	_	30.8	_	ns	1	
Body Diode Reverse Recovery Time	trr		13.6	_	nS	IS = -7A, dI/dt = 100A/µs	
Body Diode Reverse Recovery Charge	Qrr	_	3.4	_	nC	IS = -7A, dI/dt = 100A/μs	

Notes:

- 5. Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.
- 6. Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1inch square copper plate
- 7.  $I_{AS}$  and  $E_{AS}$  rating are based on low frequency and duty cycles to keep  $T_J$  = 25°C
- Short duration pulse test used to minimize self-heating effect.
   Guaranteed by design. Not subject to product testing.





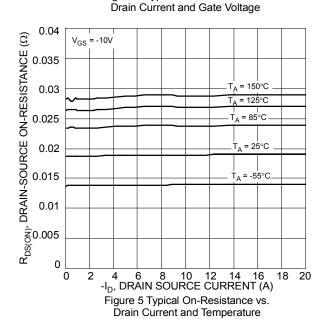
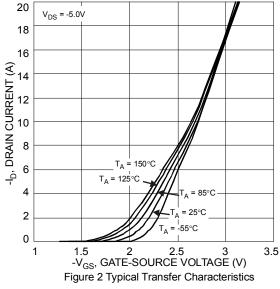
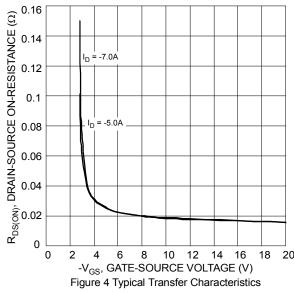
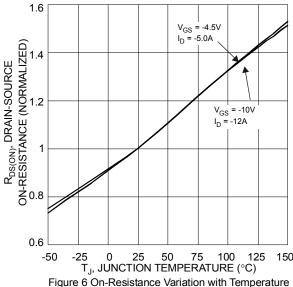


Figure 3 Typical On-Resistance vs.









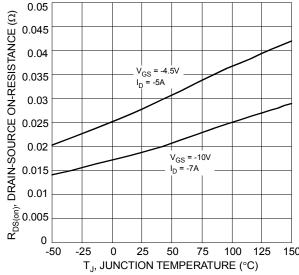
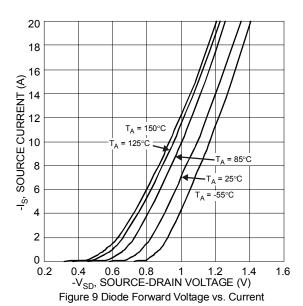
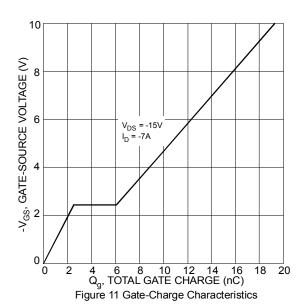


Figure 7 On-Resistance Variation with Temperature





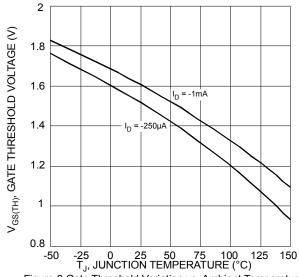
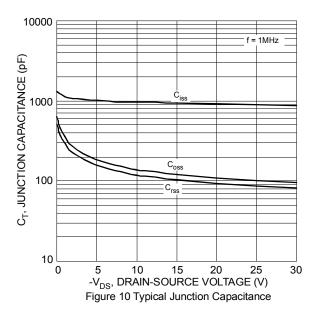
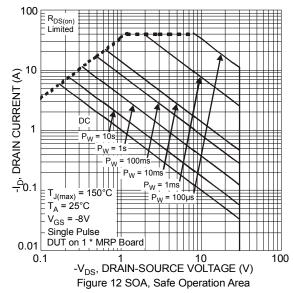
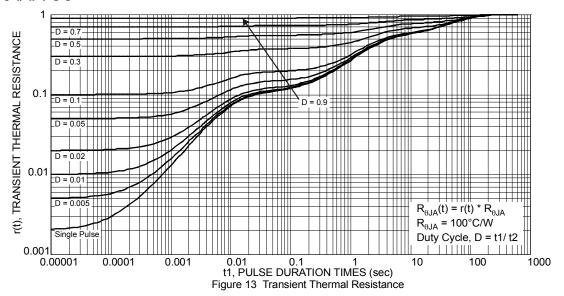


Figure 8 Gate Threshold Variation vs. Ambient Temperature



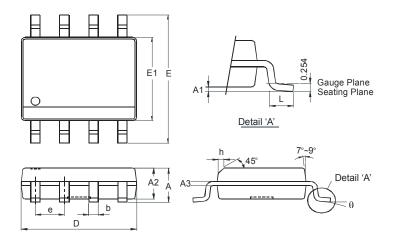






## **Package Outline Dimensions**

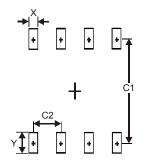
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for latest version.



SO-8					
Dim	Min	Max			
Α	-	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			
е	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
Υ	1.55
C1	5.4
C2	1.27



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