

40V DUAL P-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

V _{(BR)DSS}	R _{DS(on)} max	I _D max (A) T _A = 25°C (Notes 6 & 8)
-40V	$25m\Omega @ V_{GS} = -10V$	-7.6
- 4 0V	45mΩ @ V _{GS} = -4.5V	-6.0

Description and Applications

This MOSFET has been designed to minimize the on-state resistance and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

- Motor control
- Backlighting
- DC-DC Converters
- Printer equipment

Features and Benefits

- Low R_{DS(on)} Minimizes conduction losses
- Fast switching speed Minimizes switching losses
- 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

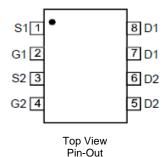
Mechanical Data

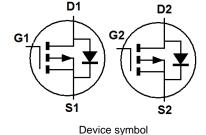
- Case: SO-8
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0 (Note 1)
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish Matte Tin annealed over Copper lead frame.
 Solderable per MIL-STD-202, Method 208 (3)
- Weight: 0.074 grams (approximate)



SO-8







Ordering Information (Note 4)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
DMP4025LSD-13	P4025LD	13	12	2,500

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 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

Marking Information



Oll = Manufacturer's Marking P4025LD = Product Type Marking Code YYWW = Date Code Marking YY = Year (ex: 10 = 2010) WW = Week (01 - 53)





Maximum Ratings @T_A = 25°C unless otherwise specified

Characteristic			Symbol	Value	Units
Drain-Source Voltage		V_{DSS}	-40	V	
Gate-Source Voltage			V_{GSS}	±20	7 v
		(Notes 6 & 8)		-7.6	
Continuous Drain Current V _{GS} = -10V	\/ 10\/	T _A = 70°C (Notes 6 & 8)	I-	-6.1	ļ
	(Notes 5 & 8)	ID	-5.8	•	
		(Notes 5 & 9)		-6.9	Α
Pulsed Drain Current	$V_{GS} = -10V$	(Notes 7 & 8)	I _{DM}	-28.0	
Continuous Source Current	(Body diode)	(Notes 6 & 8)	Is	-3.0	
Pulsed Source Current (Body diode) (Notes 7 & 8)		I _{SM}	-28.0		

Thermal Characteristics @TA = 25°C unless otherwise specified

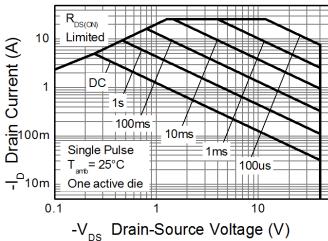
Characteristic		Symbol	Value	Unit
Decree Disciplination	(Notes 5 & 8)		1.25 10	
Power Dissipation Linear Derating Factor	(Notes 5 & 9)	P _D	1.8 14.3	W mW/°C
	(Notes 6 & 8)		2.14 17.2	
	(Notes 5 & 8)		100	
Thermal Resistance, Junction to Ambient	(Notes 5 & 9)	R _{θJA}	70	00.004
	(Notes 6 & 8)		58	°C/W
Thermal Resistance, Junction to Lead	(Notes 8 & 10)	R _{0JL}	51	
Operating and Storage Temperature Range		T _J , T _{STG}	-55 to +150	°C

Notes:

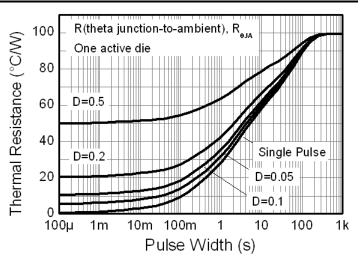
- 5. For a device surface mounted on 25mm x 25mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions; the device is measured when operating in a steady-state condition.
- 6. Same as note (2), except the device is measured at $t \le 10$ sec.
- Same as note (2), except the device is pulsed with D = 0.02 and pulse width 300μs.
 For a dual device with one active die.
- 9. For a device with two active die running at equal power.
- 10. Thermal resistance from junction to solder-point (at the end of the drain lead).



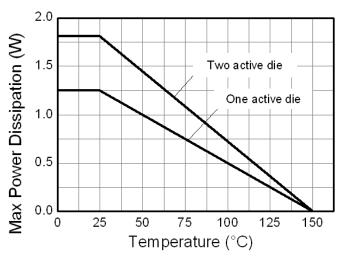
Thermal Characteristics



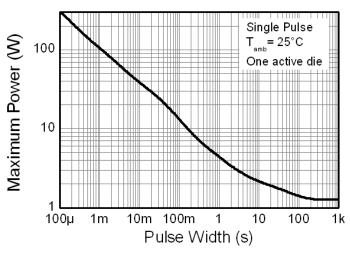
P-channel Safe Operating Area



Transient Thermal Impedance



Derating Curve



Pulse Power Dissipation





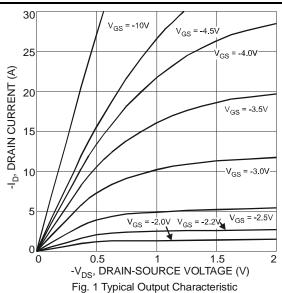
Electrical Characteristics T_A = 25°C unless otherwise specified

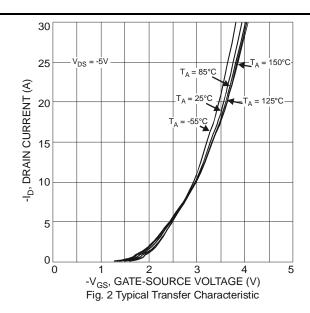
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition	
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage	BV _{DSS}	-40			٧	$I_D = -250 \mu A$, $V_{GS} = 0 V$	
Zero Gate Voltage Drain Current	I _{DSS}	_	_	-1.0	μΑ	$V_{DS} = -40V, V_{GS} = 0V$	
Gate-Source Leakage	I _{GSS}	_	_	±100	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$	
ON CHARACTERISTICS							
Gate Threshold Voltage	$V_{GS(th)}$	-0.8	-1.3	-1.8	V	$I_D = -250 \mu A, V_{DS} = V_{GS}$	
Static Drain-Source On-Resistance (Note 11)	D		18	25	mΩ	$V_{GS} = -10V, I_D = -3A$	
Static Drain-Source On-Resistance (Note 11)	R _{DS (ON)}		30	45	11122	$V_{GS} = -4.5V, I_D = -3A$	
Forward Transconductance (Notes 11 & 12)	g fs	_	16.6		S	$V_{DS} = -5V, I_{D} = -3A$	
Diode Forward Voltage (Note 11)	V_{SD}	_	-0.7	-1.0	V	$I_S = -1A, V_{GS} = 0V$	
DYNAMIC CHARACTERISTICS (Note 12)							
Input Capacitance	Ciss	_	1640	_		V 00V V 0V	
Output Capacitance	Coss	_	179		pF	$V_{DS} = -20V, V_{GS} = 0V$ f = 1MHz	
Reverse Transfer Capacitance	C _{rss}	_	128			1 = 1101112	
Gate Resistance	R_g	_	6.43	_	Ω	$V_{DS} = 0V$, $V_{GS} = 0V$, $f = 1MHz$	
Total Gate Charge (Note 10)	Q_g	_	14.0	_		$V_{GS} = -4.5V$	
Total Gate Charge (Note 10)	Q_g	_	33.7	_	nC V _{DS} = -20V		
Gate-Source Charge (Note 10)	Q_{gs}	_	5.5	_	nc	$V_{GS} = -10V$ $I_D = -3A$	
Gate-Drain Charge (Note 10)	Q_{qd}	_	7.3	_			
Turn-On Delay Time (Note 10)	t _{D(on)}	_	6.9	_			
Turn-On Rise Time (Note 10)	t _r	_	14.7		no	$V_{DD} = -20V, V_{GS} = -10V$	
Turn-Off Delay Time (Note 10)	t _{D(off)}		53.7		ns	$I_D = -3A$	
Turn-Off Fall Time (Note 10)	t _f		30.9	_			

Notes:

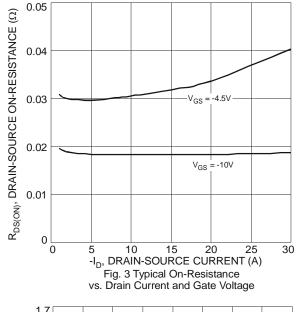
- 11. Measured under pulsed conditions. Pulse width $\leq 300 \mu s$; duty cycle $\leq 2\%$ 12. For design aid only, not subject to production testing. 13. Switching characteristics are independent of operating junction temperatures.

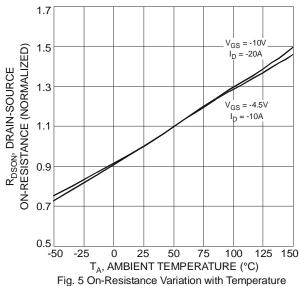
Typical Characteristics











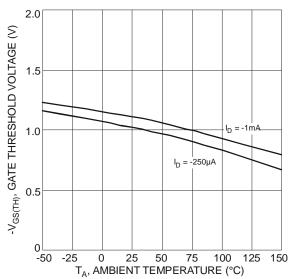
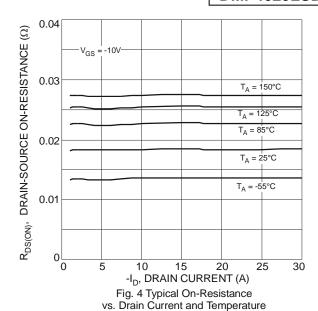


Fig. 7 Gate Threshold Variation vs. Ambient Temperature



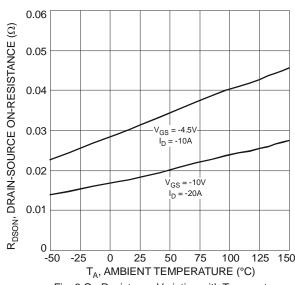


Fig. 6 On-Resistance Variation with Temperature

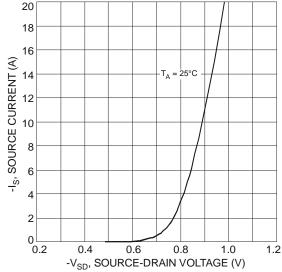
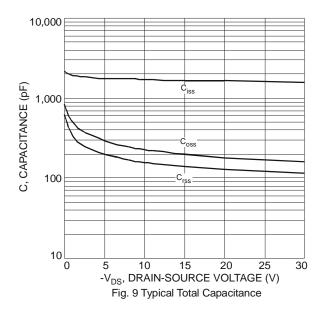
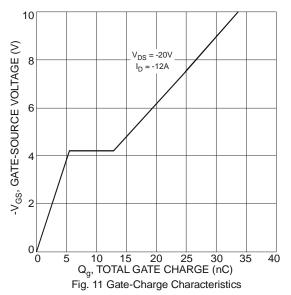
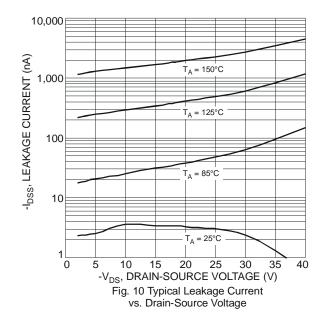


Fig. 8 Diode Forward Voltage vs. Current



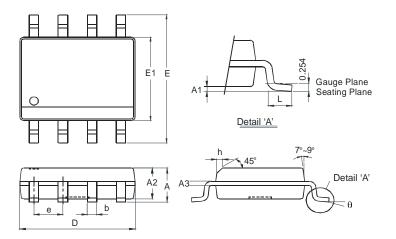






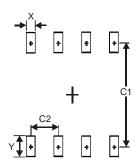


Package Outline Dimensions



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		
Е	5.90	6.10		
E1	3.85 3.95			
е	1.27	Тур		
h	-	0.35		
L	0.62	0.82		
θ	0° 8°			
All Dimensions in mm				

Suggested Pad Layout



Dimensions	Value (in mm)		
X	0.60		
Y	1.55		
C1	5.4		
C2	1.27		





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