

Product Summary

BV _{DSS}	R _{DS(ON)} Max	I _D Max (A) T _A = +25°C
-40V	25mΩ @ V _{GS} = -10V	-8.0A
	45mΩ @ V _{GS} = -4.5V	-6.0A

Description and Applications

This MOSFET is designed to meet the stringent requirements of Automotive applications. It is qualified to AEC-Q101, supported by a PPAP and is ideal for use in:

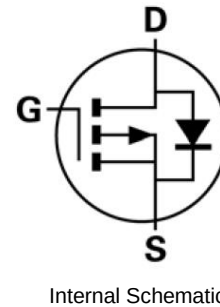
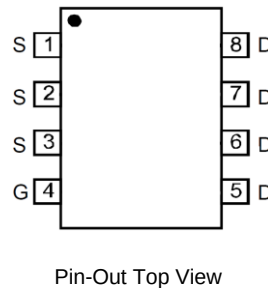
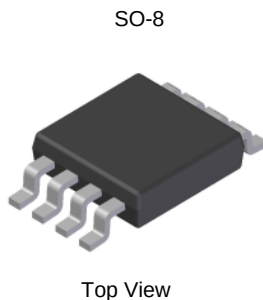
- Motor Control
- Backlighting
- DC-DC Converters
- Printer Equipment

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**
- **PPAP Capable (Note 4)**

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 Leadframe. Solderable per MIL-STD-202, Method 208 @3
- Weight: 0.074 grams (Approximate)

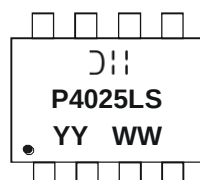


Ordering Information (Note 5)

Part Number	Case	Packaging
DMP4025LSSQ-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> 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. Automotive products are AEC-Q101 qualified and are PPAP capable. Refer to http://www.diodes.com/product_compliance_definitions.html
 5. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

Marking Information



DII = Manufacturer's Marking
 P4025LS = Product Type Marking Code
 YYWW = Date Code Marking
 YY = Year (ex: 16 = 2016)
 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	
Continuous Drain Current	V _{GS} = -10V	(Note 7)	I _D	-8.0	A
		T _A = +70°C (Note 7)		-6.9	
		(Note 6)		-6.0	
		(Note 8)		-30	
Pulsed Drain Current	V _{GS} = -10V	(Note 8)	I _{DM}	-30	
Continuous Source Current (Body Diode)			I _S	-8.0	
Pulsed Source Current (Body Diode)			I _{SM}	-30	

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 6)	P _D	1.52	W
	(Note 7)		2.4	
Thermal Resistance, Junction to Ambient	(Note 6)	R _{θJA}	82	°C/W
	(Note 7)		52	
Thermal Resistance, Junction to Lead	(Note 9)	R _{θJL}	48.85	°C
Operating and Storage Temperature Range		T _J , T _{STG}	-55 to +150	

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 10)						
Drain-Source Breakdown Voltage	BV _{DSS}	-40	—	—	V	I _D = -250μA, V _{GS} = 0V
Zero Gate Voltage Drain Current	I _{DSS}	—	—	-1.0	μA	V _{DS} = -40V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±100	nA	V _{GS} = ±20V, V _{DS} = 0V
ON CHARACTERISTICS (Note 10)						
Gate Threshold Voltage	V _{GS(TH)}	-0.8	-1.3	-1.8	V	I _D = -250μA, V _{DS} = V _{GS}
Static Drain-Source On-Resistance	R _{DS(ON)}	—	18	25	mΩ	V _{GS} = -10V, I _D = -3A
			30	45		V _{GS} = -4.5V, I _D = -3A
Forward Transconductance	g _{FS}	—	16.6	—	S	V _{DS} = -5V, I _D = -3A
Diode Forward Voltage	V _{SD}	—	-0.7	-1.0	V	I _S = -1A, V _{GS} = 0V
DYNAMIC CHARACTERISTICS (Note 11)						
Input Capacitance	C _{ISS}	—	1,640	—	pF	V _{DS} = -20V, V _{GS} = 0V f = 1MHz
Output Capacitance	C _{OSS}	—	179	—		
Reverse Transfer Capacitance	C _{RSS}	—	128	—		
Gate Resistance	R _G	—	6.43	—	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1MHz
Total Gate Charge	Q _G	—	14.0	—	nC	V _{DS} = -20V I _D = -3A
Total Gate Charge	Q _G	—	33.7	—		
Gate-Source Charge	Q _{GS}	—	5.5	—		
Gate-Drain Charge	Q _{GD}	—	7.3	—		
Turn-On Delay Time	t _{D(ON)}	—	6.9	—	ns	V _{DD} = -20V, V _{GS} = -10V I _D = -3A
Turn-On Rise Time	t _R	—	14.7	—		
Turn-Off Delay Time	t _{D(OFF)}	—	53.7	—		
Turn-Off Fall Time	t _F	—	30.9	—		

- Notes:
6. For a device surface mounted on minimum recommended 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.
 7. Same as Note (6), except the device is surface mounted on 25mm x 25mm x 1.6mm FR4 PCB.
 8. Repetitive rating on 25mm X 25mm FR4 PCB, D=0.02, pulse width 300μs – pulse width by maximum junction temperature.
 9. Thermal resistance from junction to solder-point (at the end of the drain lead).
 10. Short duration pulse test used to minimize self-heating effect.
 11. Guaranteed by design. Not subject to production testing.

Thermal Characteristics

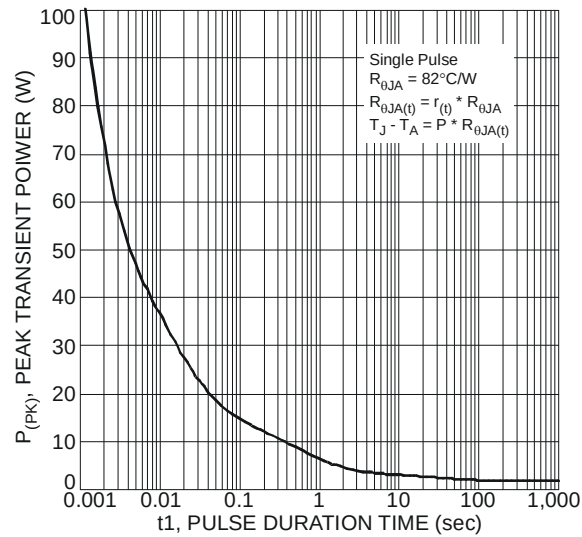


Fig. 1 Single Pulse Maximum Power Dissipation

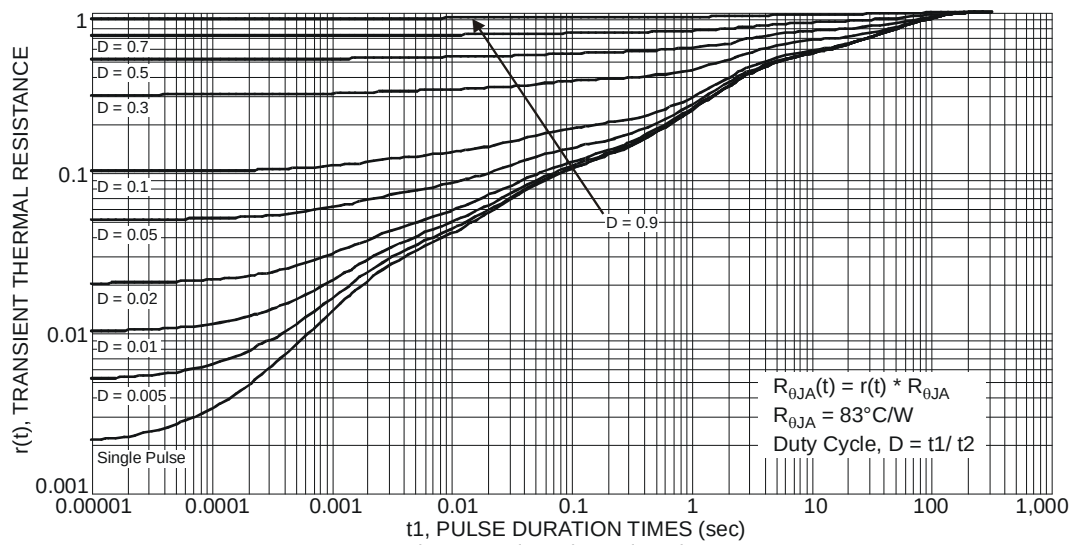


Fig. 2 Transient Thermal Resistance

Typical Characteristics

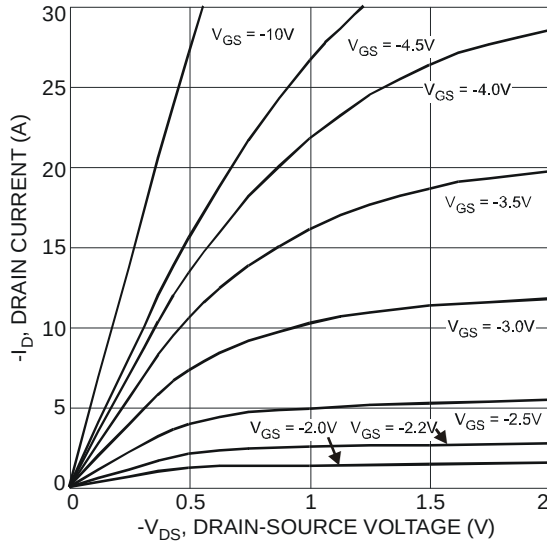


Fig. 3 Typical Output Characteristic

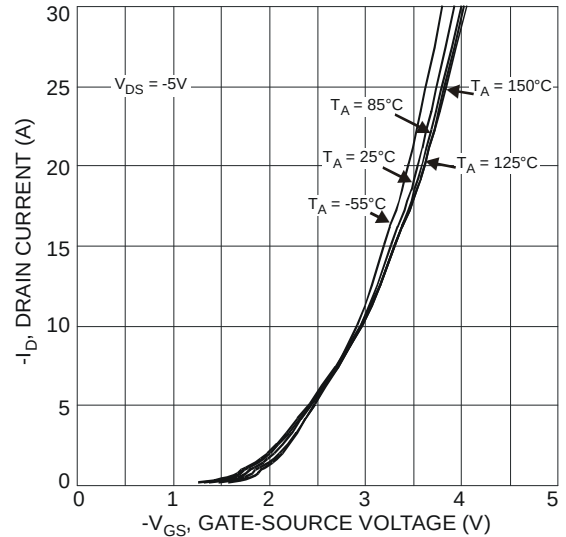


Fig. 4 Typical Transfer Characteristic

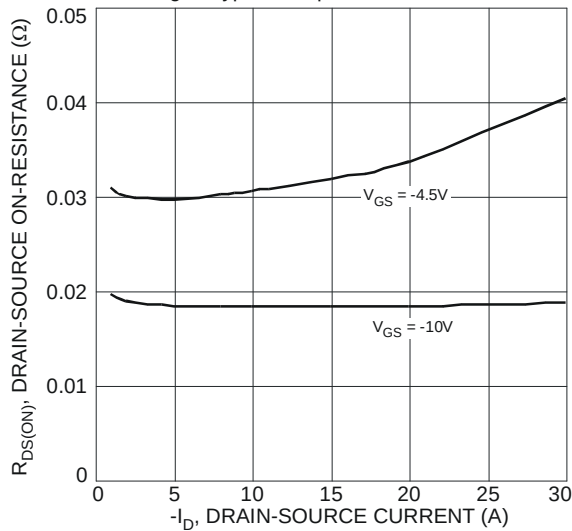


Fig. 5 Typical On-Resistance vs. Drain Current and Gate Voltage

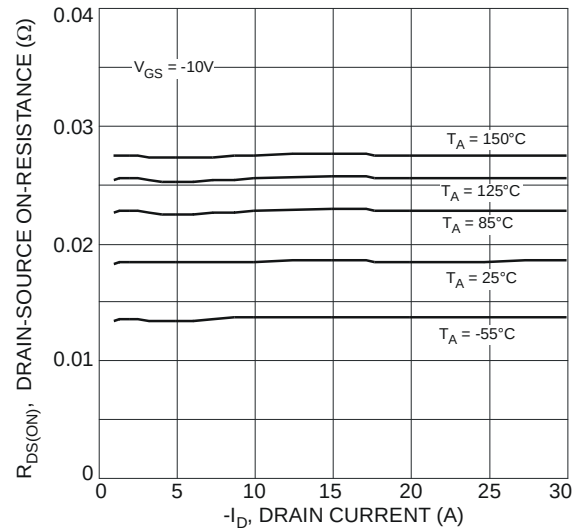


Fig. 6 Typical On-Resistance vs. Drain Current and Temperature

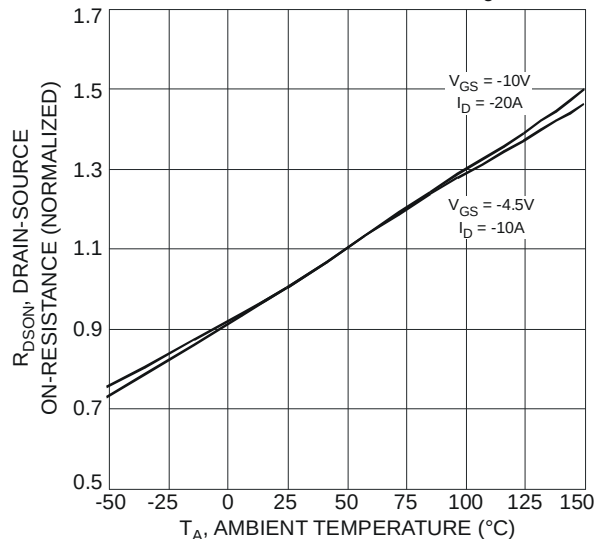


Fig. 7 On-Resistance Variation with Temperature

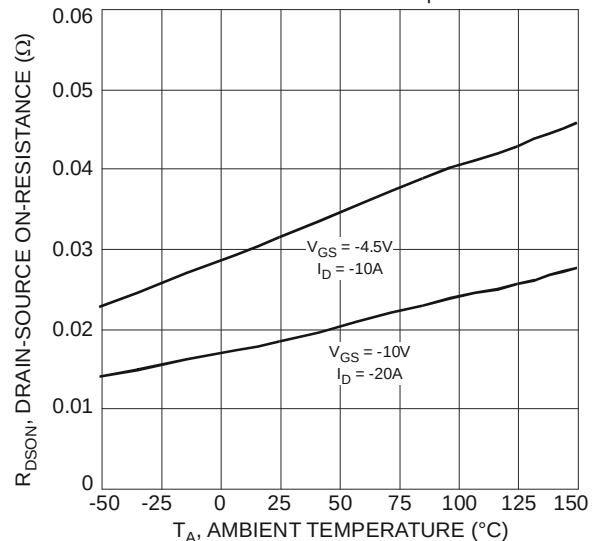


Fig. 8 On-Resistance Variation with Temperature

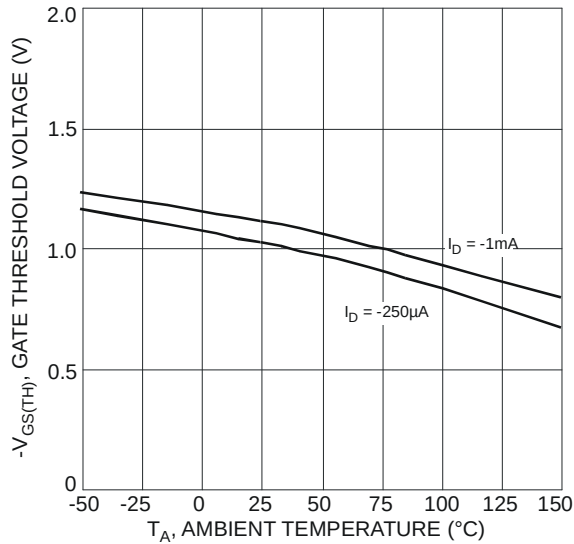


Fig. 9 Gate Threshold Variation vs. Ambient Temperature

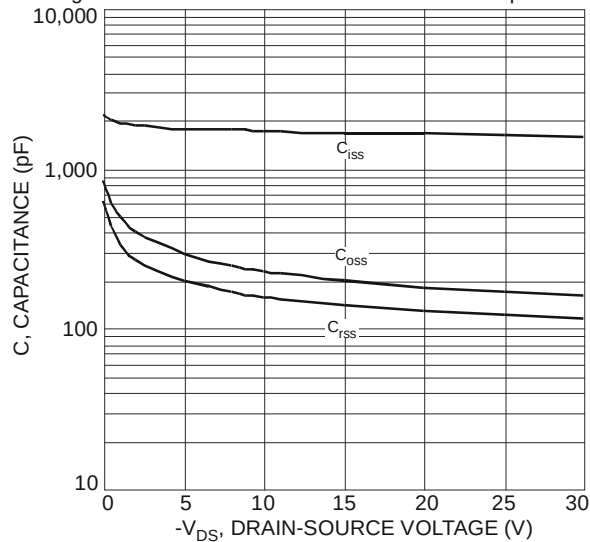


Fig. 11 Typical Total Capacitance

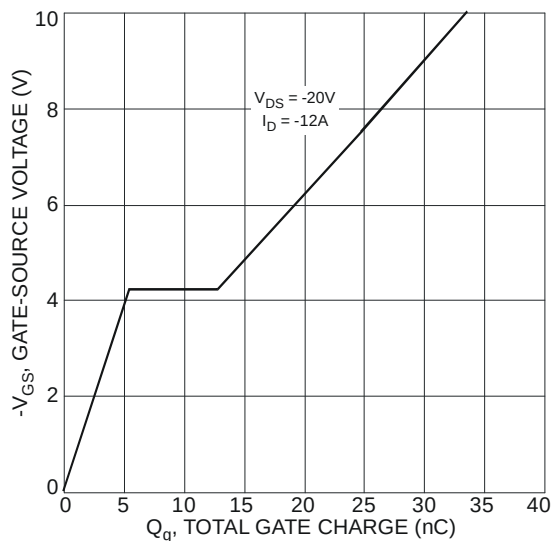


Fig. 13 Gate-Charge Characteristics

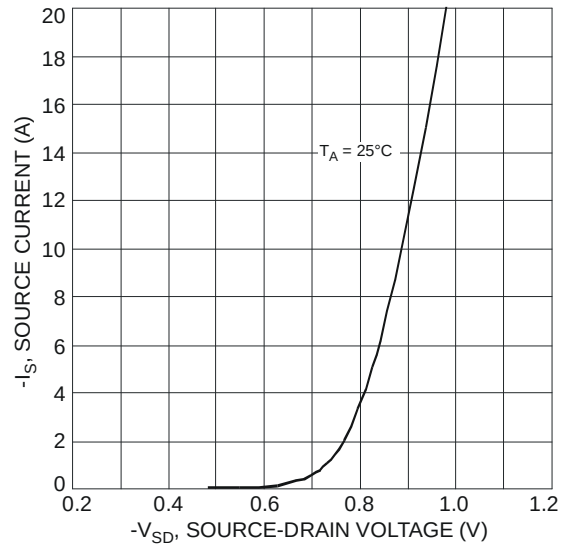


Fig. 10 Diode Forward Voltage vs. Current

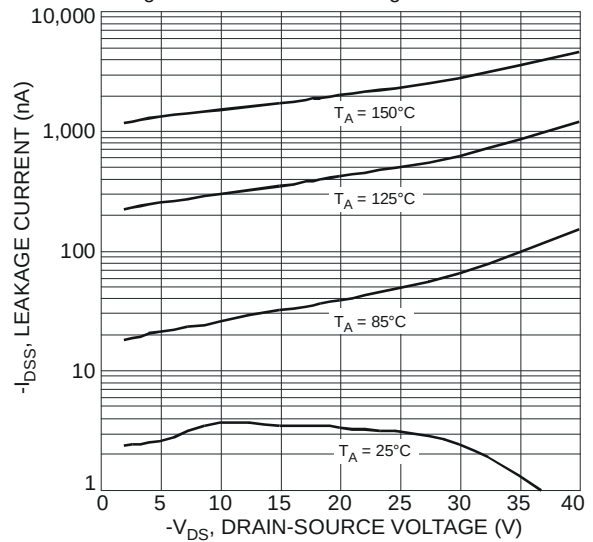
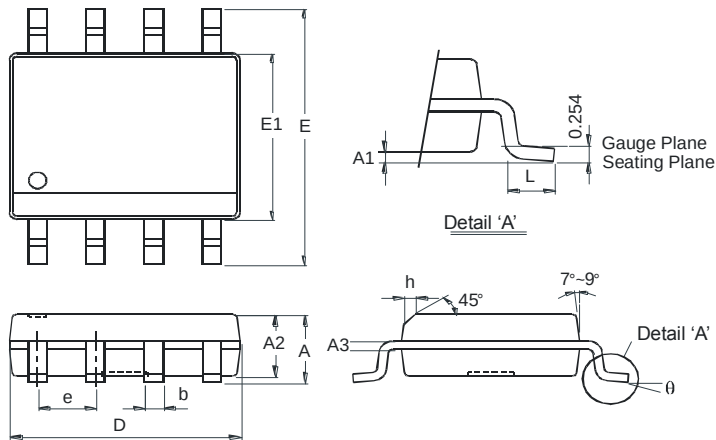


Fig. 12 Typical Leakage Current vs. Drain-Source Voltage

Package Outline Dimensions

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

SO-8

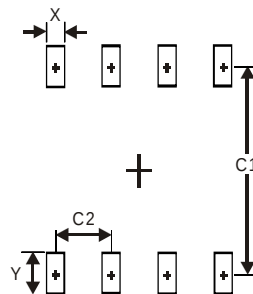


SO-8		
Dim	Min	Max
A	–	1.75
A1	0.10	0.20
A2	1.30	1.50
A3	0.15	0.25
b	0.3	0.5
D	4.85	4.95
E	5.90	6.10
E1	3.85	3.95
e	1.27 Typ	
h	–	0.35
L	0.62	0.82
θ	0°	8°
All Dimensions in mm		

Suggested Pad Layout

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

SO-8



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

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