

DMP4025LSD
40V DUAL P-CHANNEL ENHANCEMENT MODE MOSFET
Product Summary

$V_{(BR)DSS}$	$R_{DS(on)}$ max	I_D max (A) $T_A = +25^\circ C$
-40V	25m Ω @ $V_{GS} = -10V$	-7.6
	45m Ω @ $V_{GS} = -4.5V$	-6.0

Description

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.

Applications

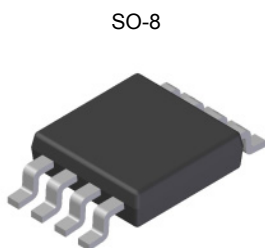
- Motor Control
- Backlighting
- DC-DC Converters
- Printer Equipment

Features and Benefits

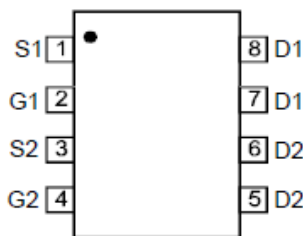
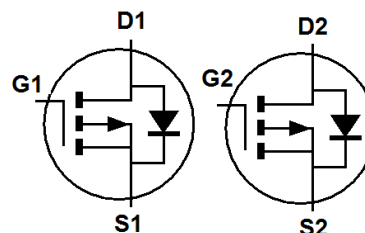
- Low $R_{DS(on)}$ – Minimizes conduction losses
- Fast switching speed – Minimizes switching losses
- **Totally Lead-Free & Fully RoHS compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **PPAP Capable (Note 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 lead frame. Solderable per MIL-STD-202, Method 208E3
- Weight: 0.074 grams (approximate)



Top View

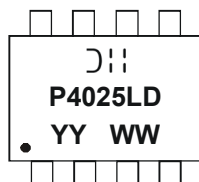

 Top View
Pin-Out


Device symbol

Ordering Information (Notes 4 & 5)

Part Number	Compliance	Case	Packaging
DMP4025LSD-13	Standard	SO-8	2500 / Tape & Reel
DMP4025LSDQ-13	Automotive	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>.
 5. Automotive products are AEC-Q101 qualified and are PPAP capable. Automotive, AEC-Q101 and standard products are electrically and thermally the same, except where specified. For more information, please refer to http://www.diodes.com/quality/product_grade_definitions/.

Marking Information


J11 = 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.)

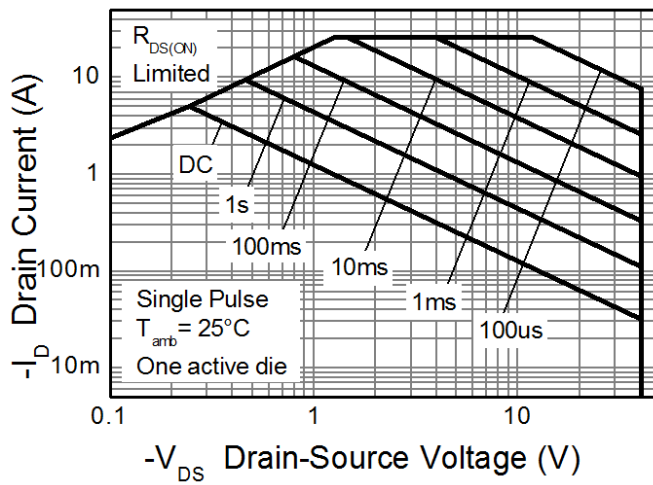
Characteristic			Symbol	Value	Units
Drain-Source Voltage			V _{DSS}	-40	V
Gate-Source Voltage			V _{GSS}	±20	
Continuous Drain Current	V _{GS} = -10V	(Notes 7 & 9)	I _D	-7.6	A
		T _A = +70°C (Notes 7 & 9)		-6.1	
		(Notes 6 & 9)		-5.8	
		(Notes 6 & 10)		-6.9	
Pulsed Drain Current	V _{GS} = -10V	(Notes 8 & 9)	I _{DM}	-28.0	
Continuous Source Current (Body diode)		(Notes 7 & 9)	I _S	-3.0	
Pulsed Source Current (Body diode)		(Notes 8 & 9)	I _{SM}	-28.0	

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

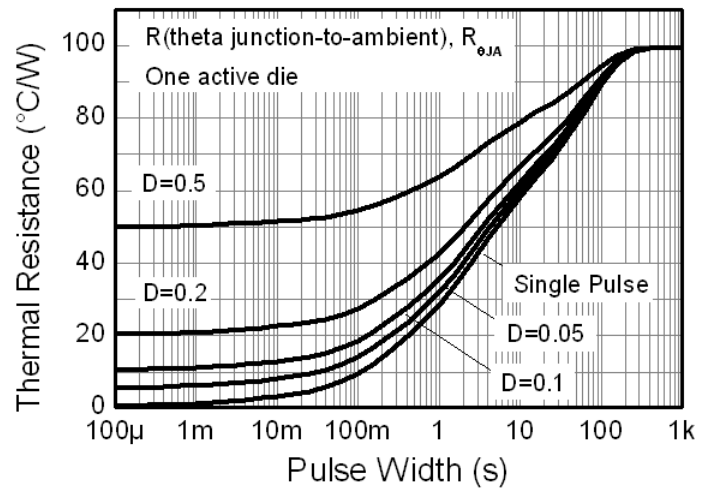
Characteristic		Symbol	Value	Unit
Power Dissipation Linear Derating Factor	(Notes 6 & 9)	P _D	1.25 10	W mW/°C
	(Notes 6 & 10)		1.8 14.3	
	(Notes 7 & 9)		2.14 17.2	
	(Notes 6 & 9)		100	
Thermal Resistance, Junction to Ambient	(Notes 6 & 10)	R _{θJA}	70	°C/W
	(Notes 7 & 9)		58	
	(Notes 9 & 11)		51	
Thermal Resistance, Junction to Lead		R _{θJL}	51	°C
Operating and Storage Temperature Range		T _J , T _{STG}	-55 to +150	

- Notes:
6. 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.
 7. Same as note (2), except the device is measured at t ≤ 10 sec.
 8. Same as note (2), except the device is pulsed with D = 0.02 and pulse width 300μs.
 9. For a dual device with one active die.
 10. For a device with two active die running at equal power.
 11. Thermal resistance from junction to solder-point (at the end of the drain lead).

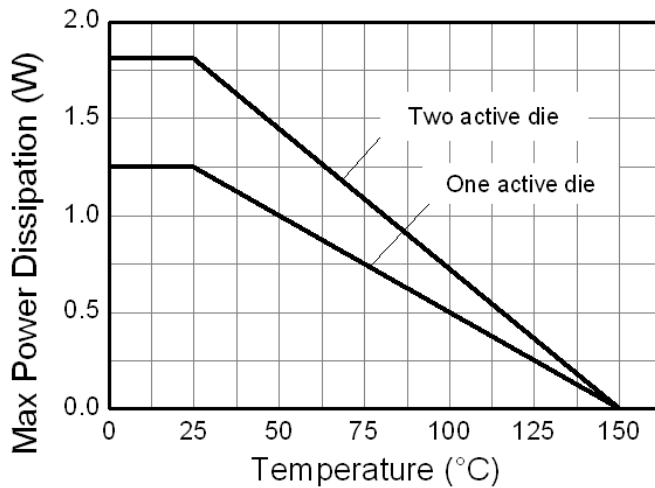
Thermal Characteristics



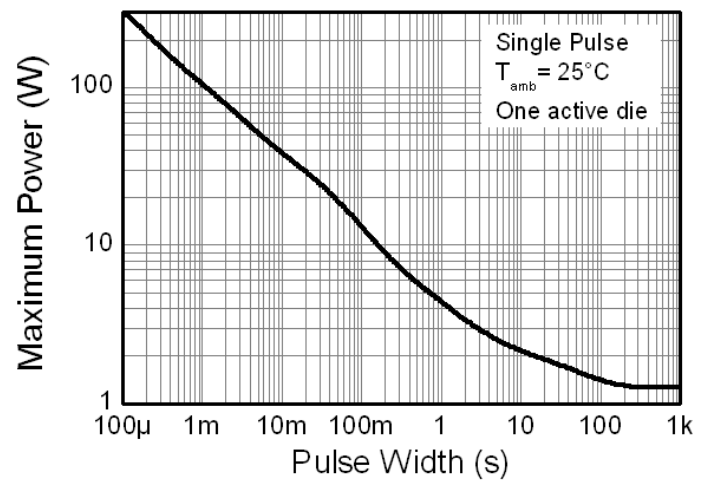
P-channel Safe Operating Area



Transient Thermal Impedance



Derating Curve



Pulse Power Dissipation

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
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						
Gate Threshold Voltage	V _{GS(th)}	-0.8	-1.3	-1.8	V	I _D = -250 μA, V _{DS} = V _{GS}
Static Drain-Source On-Resistance (Note 12)	R _{DS(on)}	—	18	25	mΩ	V _{GS} = -10V, I _D = -3A
			30	45		V _{GS} = -4.5V, I _D = -3A
Forward Transconductance (Notes 12 & 13)	g _{fs}	—	16.6	—	S	V _{DS} = -5V, I _D = -3A
Diode Forward Voltage (Note 12)	V _{SD}	—	-0.7	-1.0	V	I _S = -1A, V _{GS} = 0V
DYNAMIC CHARACTERISTICS (Note 13)						
Input Capacitance	C _{iss}	—	1640	—	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 (Note 14)	Q _g	—	14.0	—	nC	V _{GS} = -4.5V V _{DS} = -20V I _D = -3A
Total Gate Charge (Note 14)	Q _g	—	33.7	—		
Gate-Source Charge (Note 14)	Q _{gs}	—	5.5	—		
Gate-Drain Charge (Note 14)	Q _{gd}	—	7.3	—		
Turn-On Delay Time (Note 14)	t _{D(on)}	—	6.9	—	ns	V _{DD} = -20V, V _{GS} = -10V I _D = -3A
Turn-On Rise Time (Note 14)	t _r	—	14.7	—		
Turn-Off Delay Time (Note 14)	t _{D(off)}	—	53.7	—		
Turn-Off Fall Time (Note 14)	t _f	—	30.9	—		

Notes: 12. Measured under pulsed conditions. Pulse width ≤ 300μs; duty cycle ≤ 2%
13. For design aid only, not subject to production testing.
14. Switching characteristics are independent of operating junction temperatures.

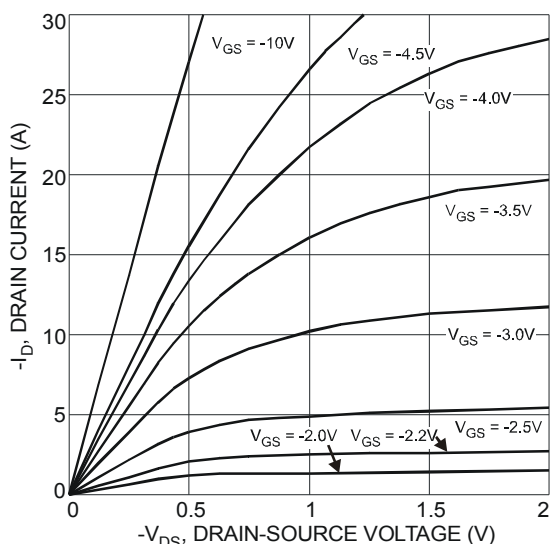
Typical Characteristics


Fig. 1 Typical Output Characteristic

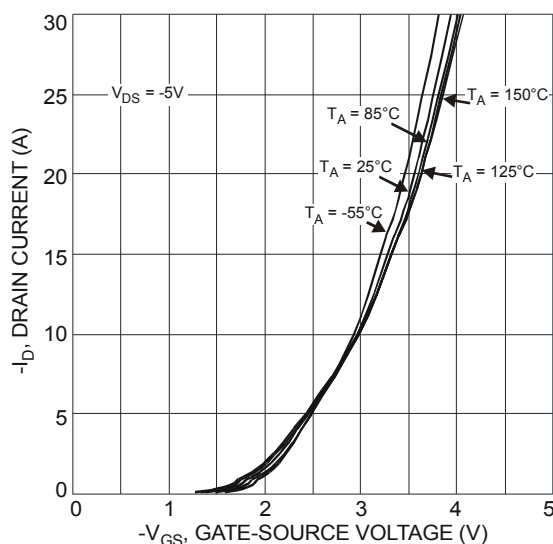


Fig. 2 Typical Transfer Characteristic

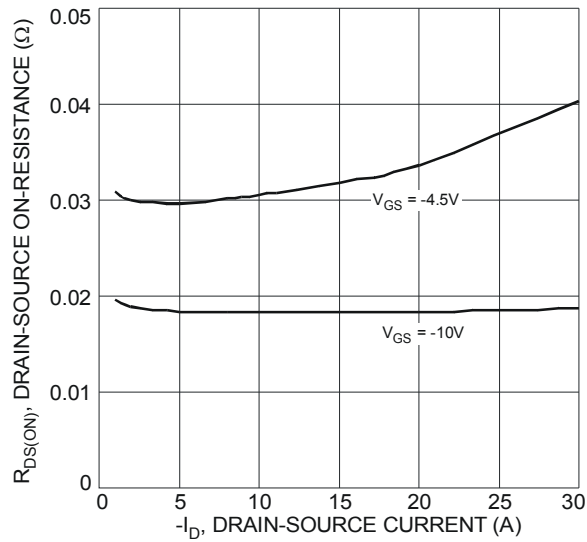


Fig. 3 Typical On-Resistance
vs. Drain Current and Gate Voltage

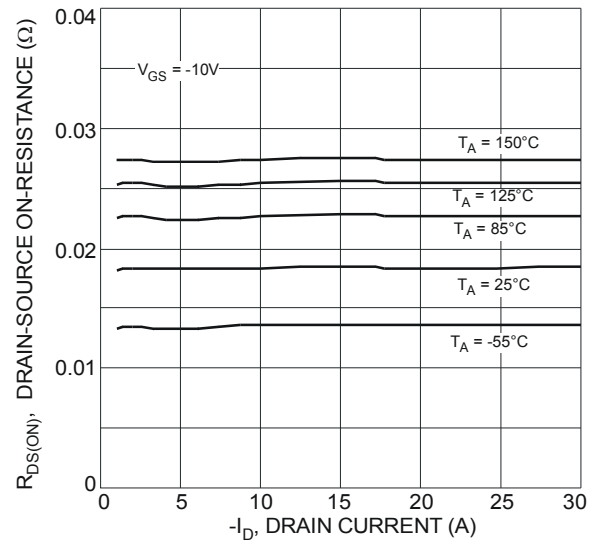


Fig. 4 Typical On-Resistance
vs. Drain Current and Temperature

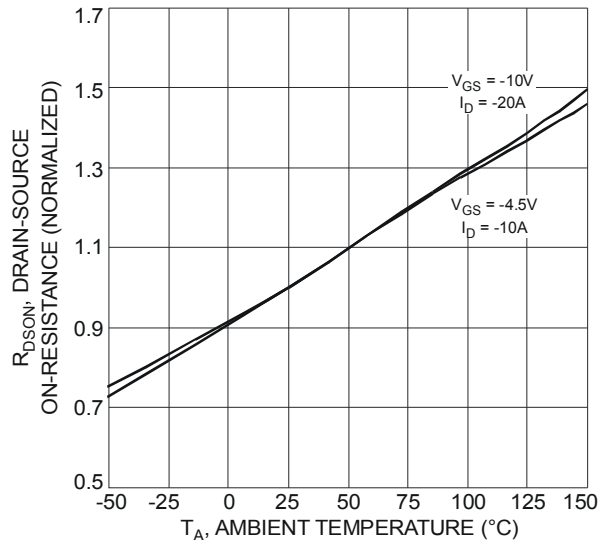


Fig. 5 On-Resistance Variation with Temperature

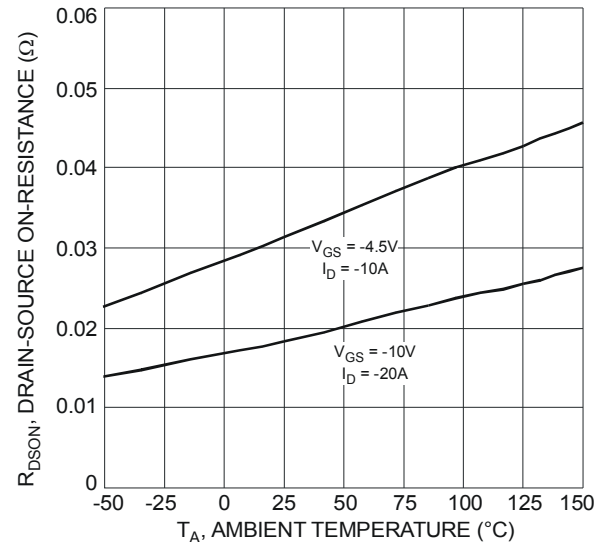


Fig. 6 On-Resistance Variation with Temperature

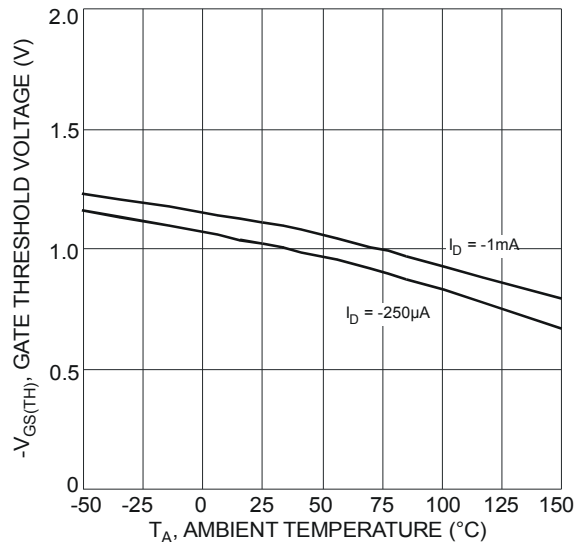


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

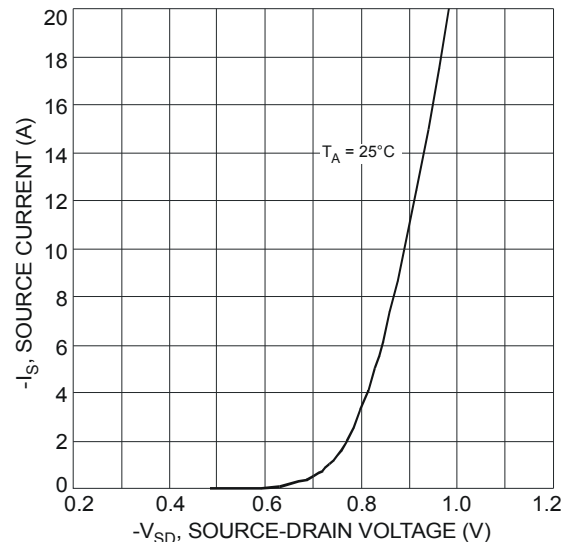
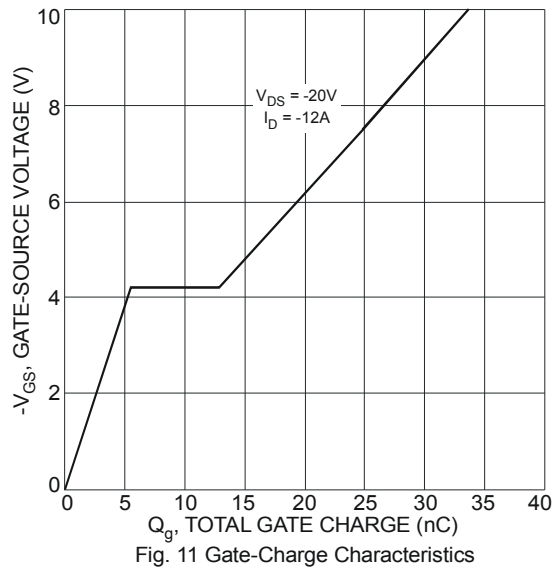
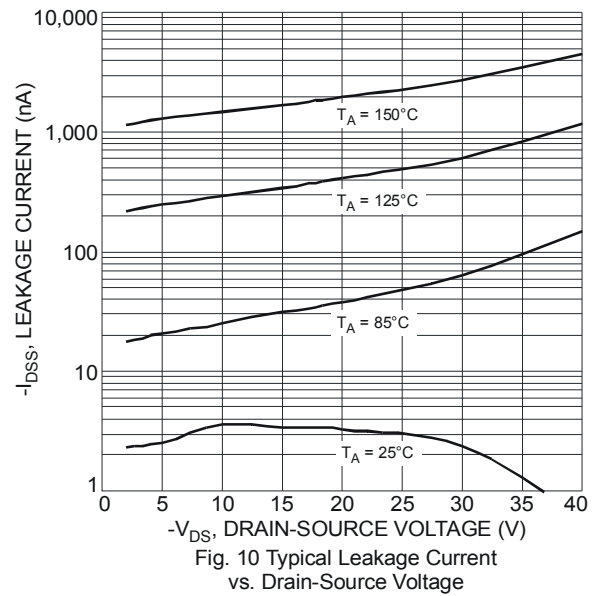
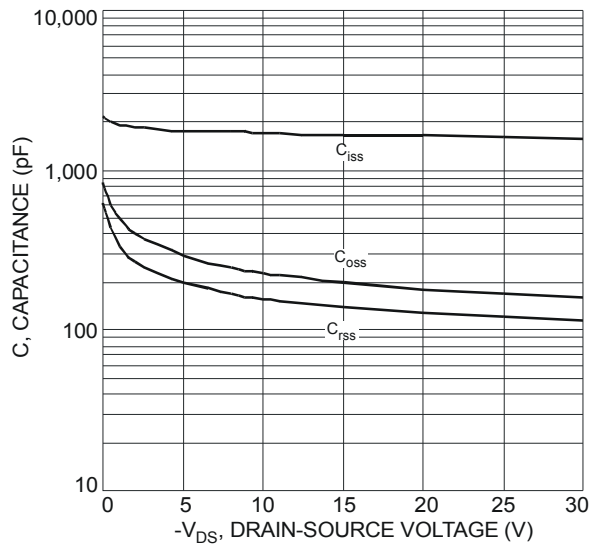
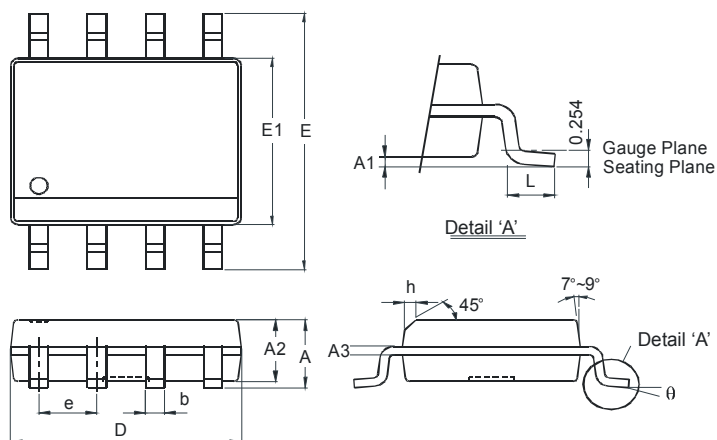


Fig. 8 Diode Forward Voltage vs. Current



Package Outline Dimensions

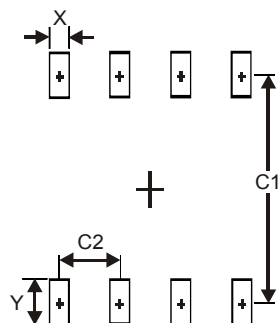
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



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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