

Product Summary

BV _{DSS}	R _{DS(ON)} Max	I _D Max T _A = +25°C (Note 6)
-40V	25mΩ @ V _{GS} = -10V	-8.6A
	45mΩ @ V _{GS} = -4.5V	-7.0A

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

- Low On-Resistance
- Fast Switching Speed
- Low Input/Output Leakage
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **The DMP4025LK3Q is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.**

<https://www.diodes.com/quality/product-definitions/>

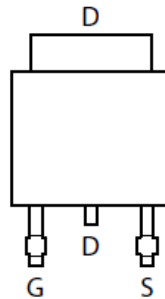
Mechanical Data

- Case: TO252
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals Connections: See Diagram Below
- Terminals: Finish - Matte Tin Annealed over Copper Lead Frame. Solderable per MIL-STD-202, Method 208 
- Weight: 0.315 grams (Approximate)

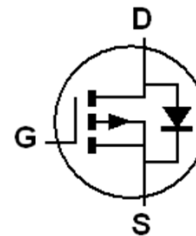
TO252 (DPAK)



Top View



Top View
Pin Out



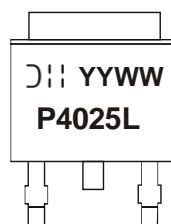
Device symbol

Ordering Information (Note 4)

Part Number	Case	Packaging
DMP4025LK3Q-13	TO252 (DPAK)	2,500/Tape & Reel

- Notes:
1. EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied.
 2. See <https://www.diodes.com/quality/lead-free/> 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 <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information



DII = Manufacturer's Marking
 P4025L = Product Type Marking Code
 YYWW = Date Code Marking
 YY = Year (ex: 20 = 2020)
 WW = Week (01 to 53)

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

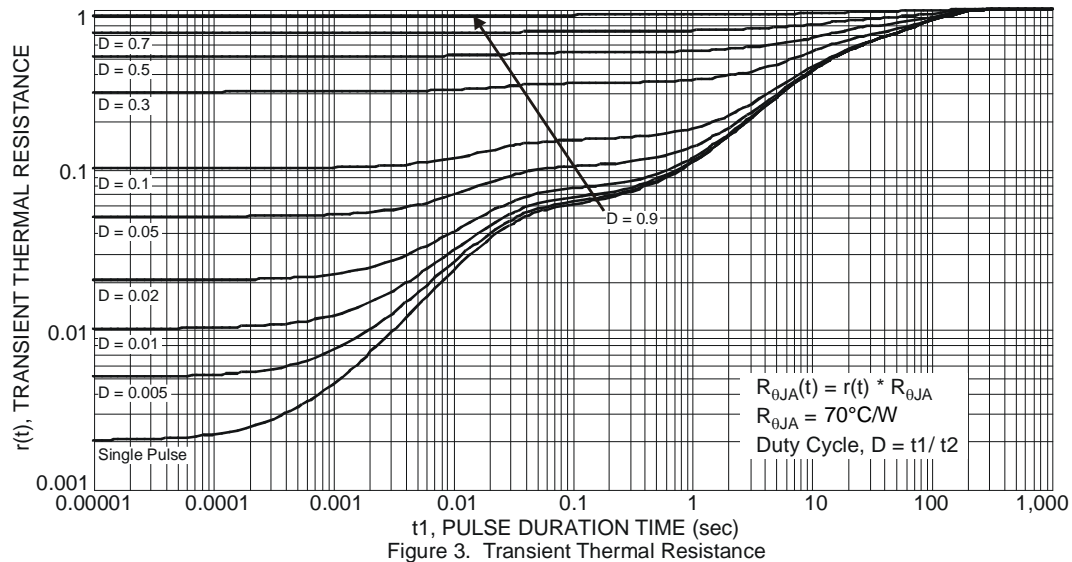
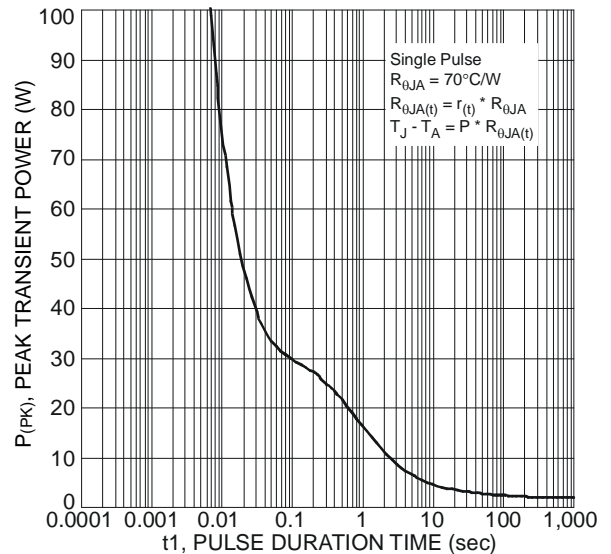
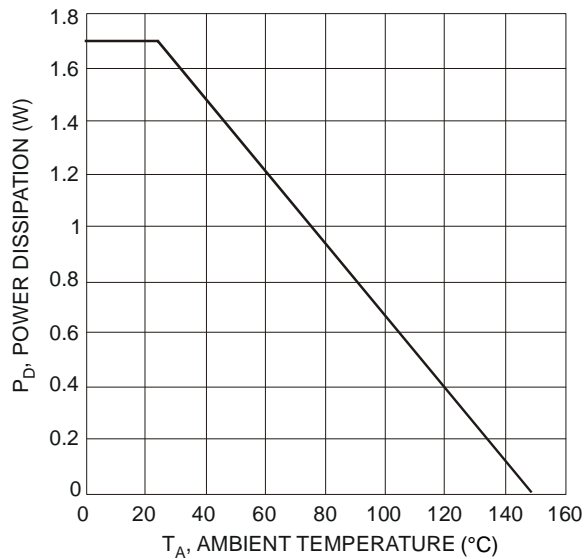
Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V _{DSS}	-40	V
Gate-Source Voltage			V _{GSS}	±20	
Continuous Drain Current	V _{GS} = -10V	(Note 6)	I _D	-8.6	A
		T _A = +70°C (Note 6)		-6.9	
		(Note 5)		-6.7	
Pulsed Drain Current	V _{GS} = -10V	(Note 7)	I _{DM}	-40	
Continuous Source Current (Body Diode)		(Note 7)	I _S	-8.6	
Pulsed Source Current (Body Diode)		(Note 7)	I _{SM}	-40	

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

Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 5)	P _D	1.7	W
	(Note 6)		2.78	
Thermal Resistance, Junction to Ambient	(Note 5)	R _{θJA}	74	°C/W
	(Note 6)		45	
Thermal Resistance, Junction to Case	(Note 6)	R _{θJC}	7.1	
Thermal Resistance, Junction to Lead	(Note 8)	R _{θJL}	1.43	
Operating and Storage Temperature Range		T _J , T _{STG}	-55 to +150	°C

- Notes:
5. 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.
 6. Same as note (5), except the device is surface mounted on 25mm X 25mm X 1.6mm FR4 PCB.
 7. Repetitive rating on 25mm X 25mm FR4 PCB, D=0.02, pulse width 300μs – pulse width by maximum junction temperature.
 8. Thermal resistance from junction to solder-point (at the end of the drain lead).

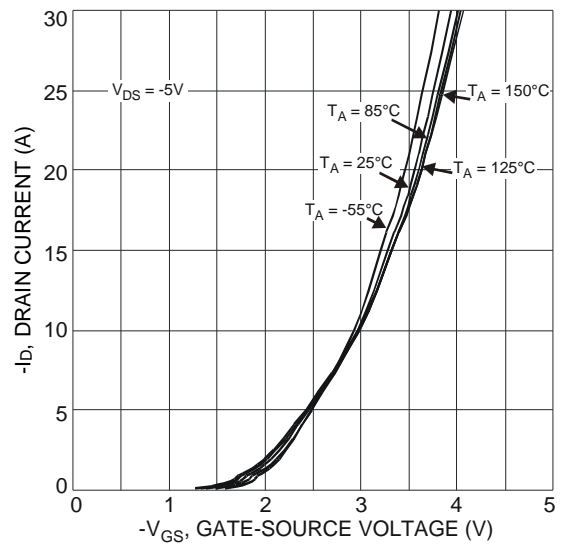
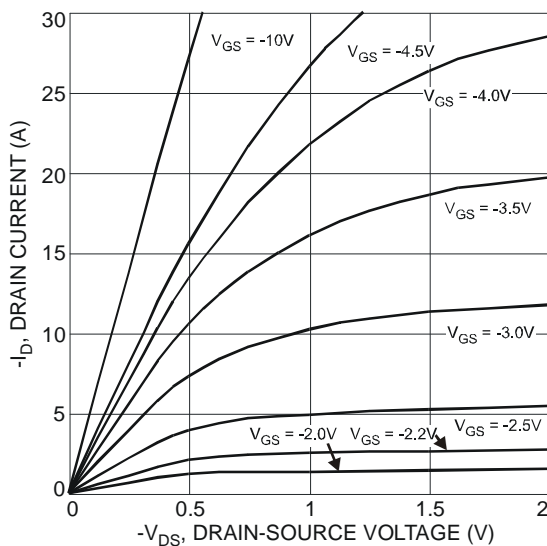
Thermal Characteristics



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	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 = -250μA, V _{DS} = V _{GS}
Static Drain-Source On-Resistance (Note 9)	R _{DS(ON)}	—	18	25	mΩ	V _{GS} = -10V, I _D = -3A
			30	45		V _{GS} = -4.5V, I _D = -3A
Forward Transconductance (Notes 9 & 10)	g _{fs}	—	16.6	—	S	V _{DS} = -5V, I _D = -3A
Diode Forward Voltage (Note 9)	V _{SD}	—	-0.7	-1	V	I _S = -1A, V _{GS} = 0V
DYNAMIC CHARACTERISTICS (Note 10)						
Input Capacitance	C _{iss}	—	1643	—	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 11)	Q _g	—	14	—	nC	V _{GS} = -4.5V V _{DS} = -20V I _D = -3A
Total Gate Charge (Note 11)	Q _g	—	33.7	—		
Gate-Source Charge (Note 11)	Q _{gs}	—	5.5	—		
Gate-Drain Charge (Note 11)	Q _{gd}	—	7.3	—		
Turn-On Delay Time (Note 11)	t _{D(ON)}	—	6.9	—	ns	V _{DD} = -20V, V _{GS} = -10V I _D = -3A
Turn-On Rise Time (Note 11)	t _R	—	14.7	—		
Turn-Off Delay Time (Note 11)	t _{D(OFF)}	—	53.7	—		
Turn-Off Fall Time (Note 11)	t _F	—	30.9	—		

Notes: 9. Measured under pulsed conditions. Pulse width ≤ 300μs; duty cycle ≤ 2%.
 10. For design aid only, not subject to production testing.
 11. Switching characteristics are independent of operating junction temperatures.

Typical Characteristics


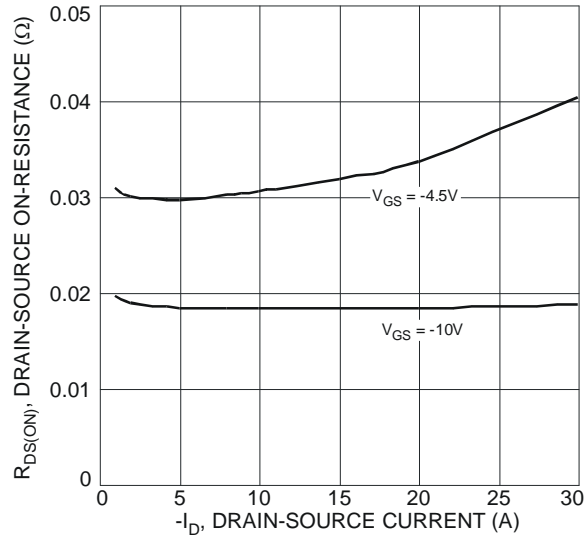


Figure 6. Typical On-Resistance vs. Drain Current and Gate Voltage

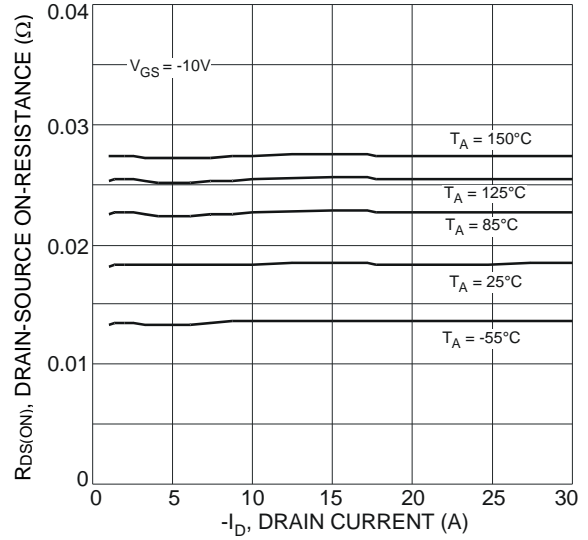


Figure 7. Typical On-Resistance vs. Drain Current and Temperature

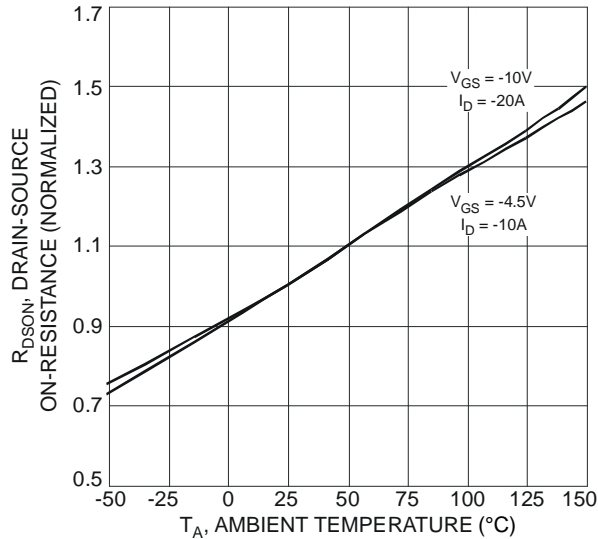


Figure 8. On-Resistance Variation with Temperature

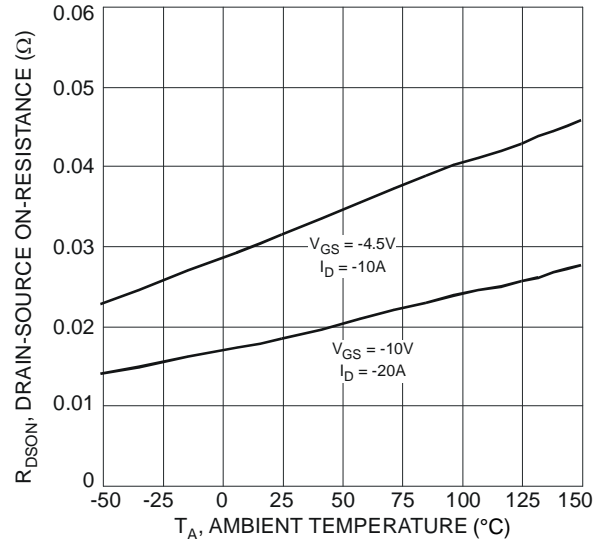


Figure 9. On-Resistance Variation with Temperature

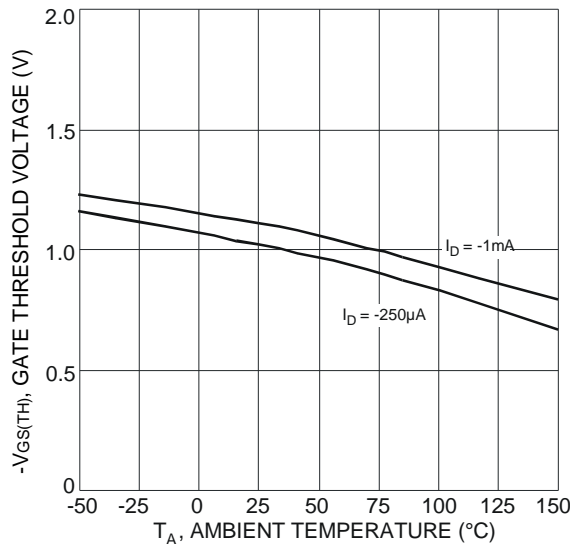


Figure 10. Gate Threshold Variation vs. Ambient Temperature

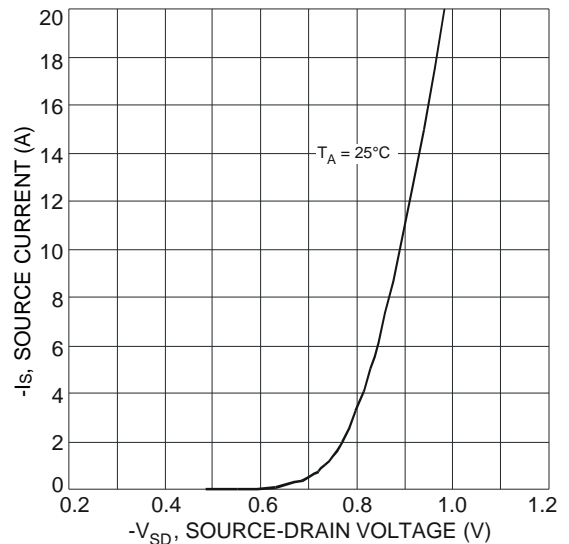
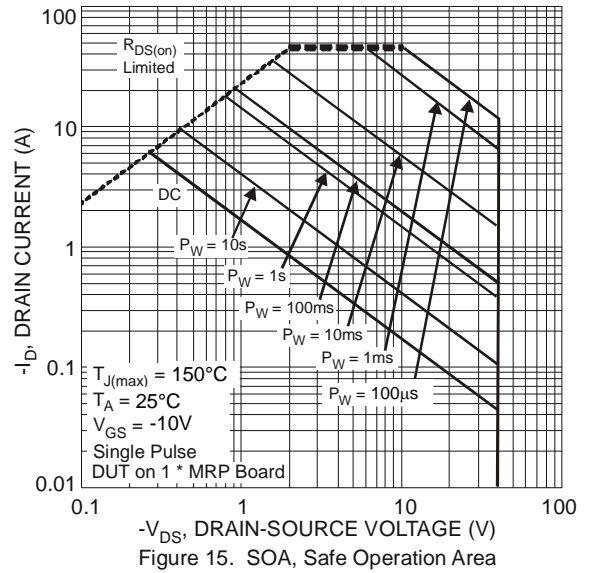
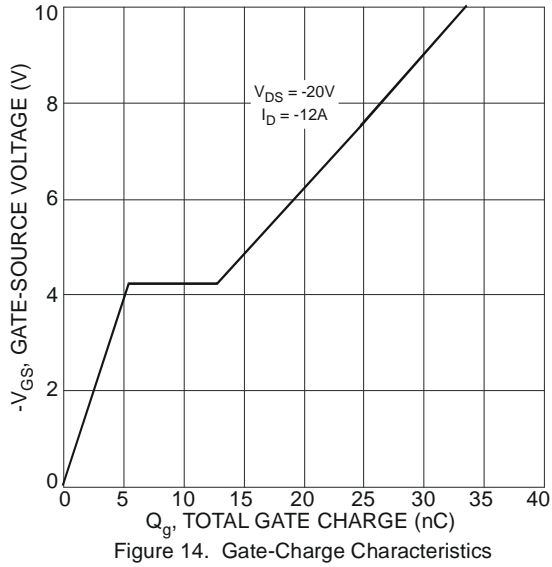
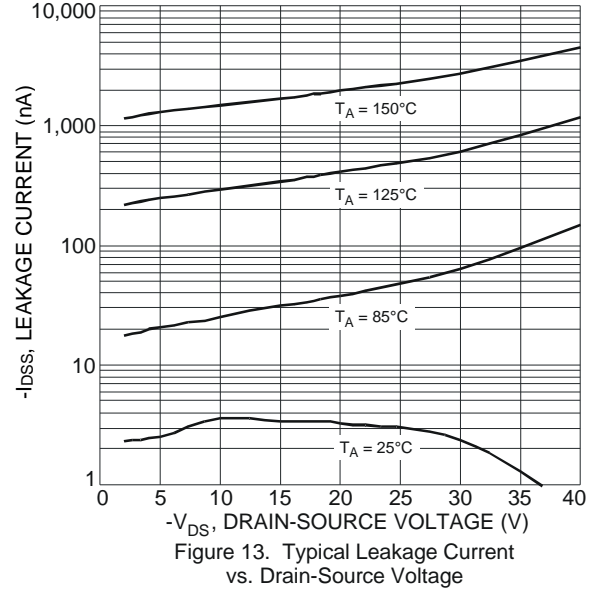
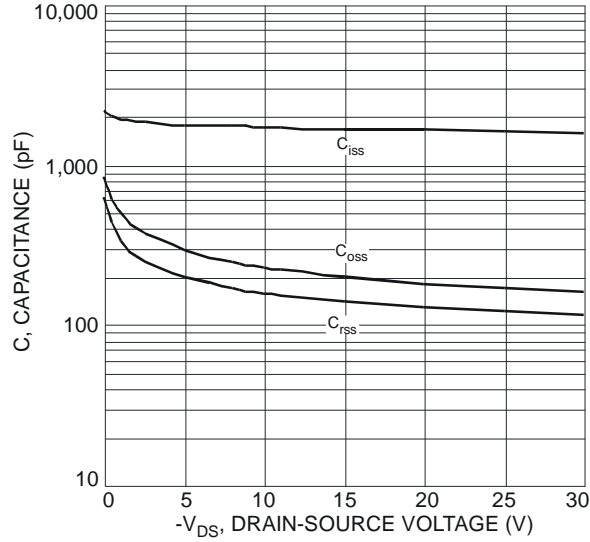


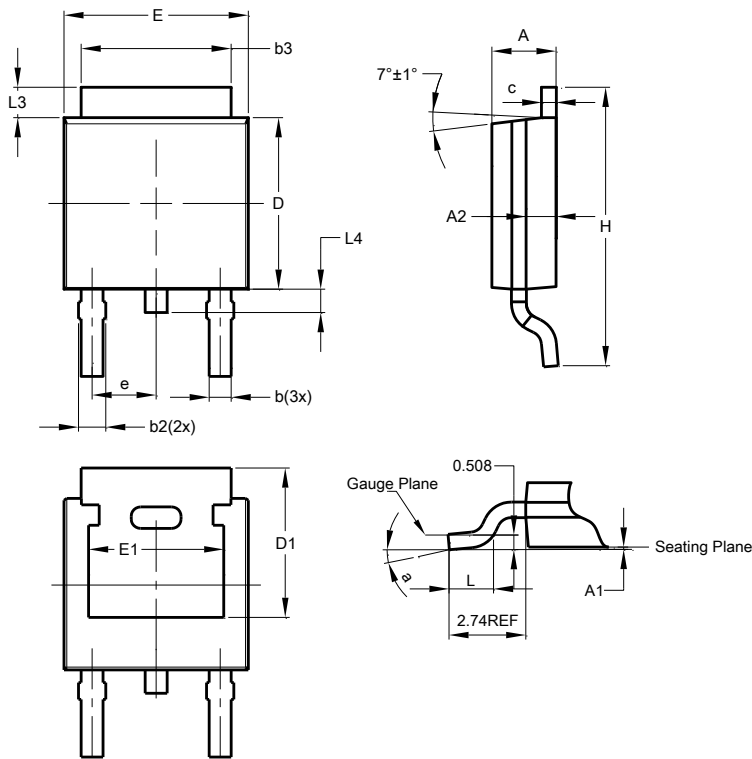
Figure 11. Diode Forward Voltage vs. Current



Package Outline Dimensions

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

TO252 (DPAK)

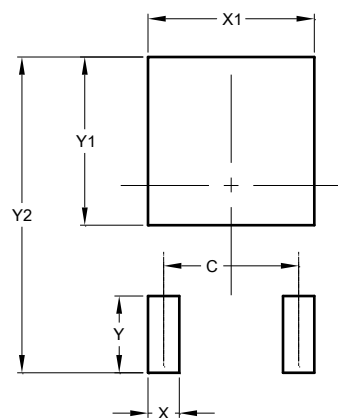


TO252 (DPAK)			
Dim	Min	Max	Typ
A	2.19	2.39	2.29
A1	0.00	0.13	0.08
A2	0.97	1.17	1.07
b	0.64	0.88	0.783
b2	0.76	1.14	0.95
b3	5.21	5.46	5.33
c	0.45	0.58	0.531
D	6.00	6.20	6.10
D1	5.21	-	-
e	-	-	2.286
E	6.45	6.70	6.58
E1	4.32	-	-
H	9.40	10.41	9.91
L	1.40	1.78	1.59
L3	0.88	1.27	1.08
L4	0.64	1.02	0.83
a	0°	10°	-
All Dimensions in mm			

Suggested Pad Layout

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

TO252 (DPAK)



Dimensions	Value (in mm)
C	4.572
X	1.060
X1	5.632
Y	2.600
Y1	5.700
Y2	10.700

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