

## Product Summary

BV <sub>DSS</sub>	R <sub>DS(ON)</sub>	I <sub>D</sub> T <sub>A</sub> = +25°C
40V	30mΩ @V <sub>GS</sub> = 10V	9.6A
	50mΩ @V <sub>GS</sub> = 4.5V	7.4A

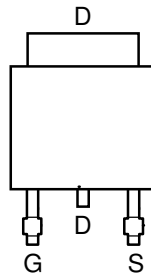
## Description and Applications

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:

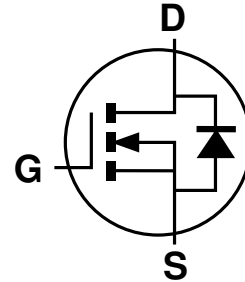
- Backlighting
- DC-DC Converters
- Power Management Functions



Top View



Top View  
Pin-Out



Equivalent Circuit

## Features and Benefits

- Low On-Resistance
- Fast Switching Speed
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **The DMN4030LK3Q 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

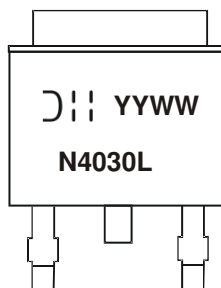
- Case: TO252
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208
- Weight: 0.33 grams (Approximate)

## Ordering Information (Note 4)

Part Number	Case	Packaging
DMN4030LK3Q-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



= Manufacturer's Marking  
 N4030L = Product Type Marking Code  
 YYWW = Date Code Marking  
 YY = Year (ex: 21 = 2021)  
 WW = Week (01 to 53)

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

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V <sub>DSS</sub>	40	V
Gate-Source Voltage			V <sub>GSS</sub>	±20	V
Continuous Drain Current (Note 5) V <sub>GS</sub> = 10V	Steady State	T <sub>A</sub> = +25°C	I <sub>D</sub>	9.6	A
		T <sub>A</sub> = +70°C		7.7	
Maximum Body Diode Continuous Current (Note 5)			I <sub>S</sub>	9.6	A
Pulsed Drain Current (10μs Pulse, Duty Cycle = 1%) (Note 6)			I <sub>DM</sub>	37.7	A
Pulsed Source Current (10μs Pulse, Duty Cycle = 1%) (Note 6)			I <sub>SM</sub>	37.7	A

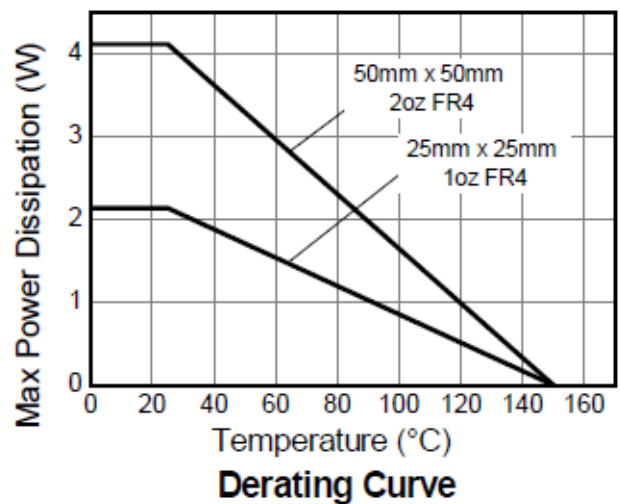
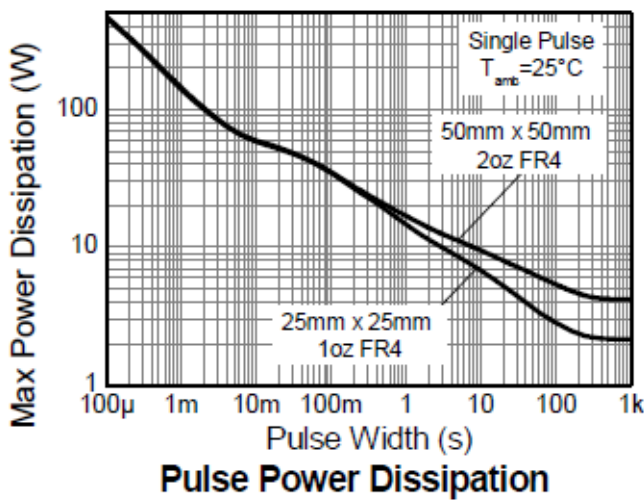
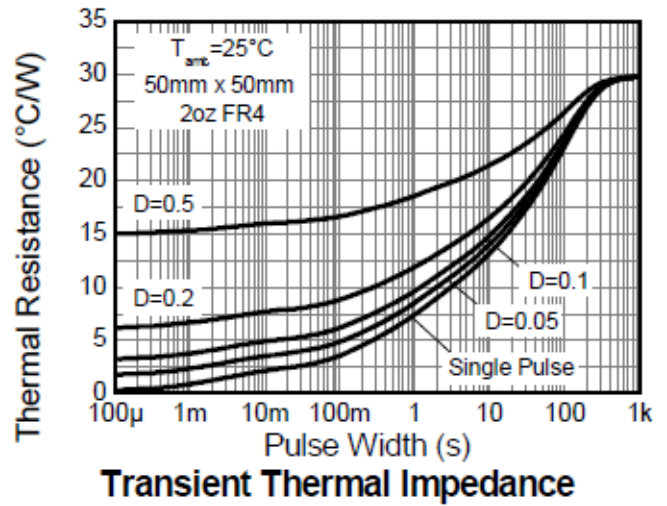
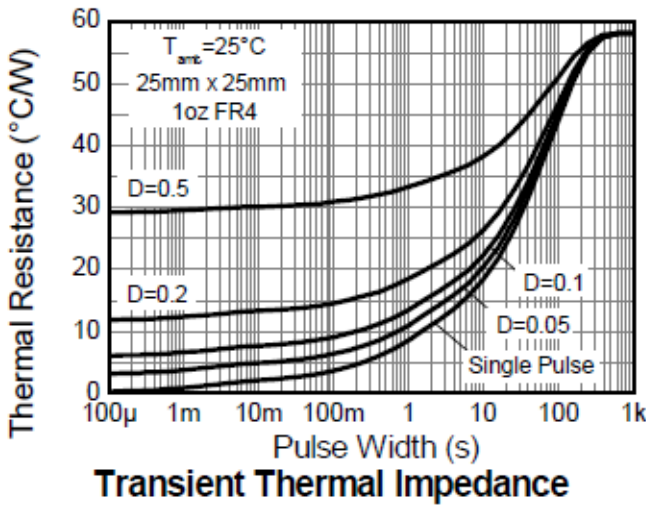
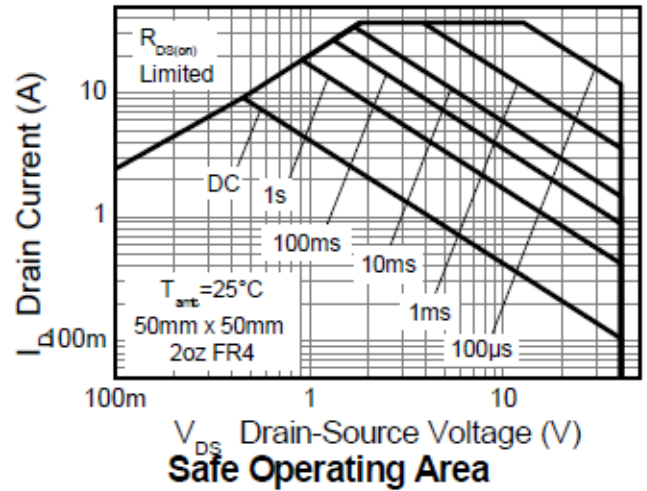
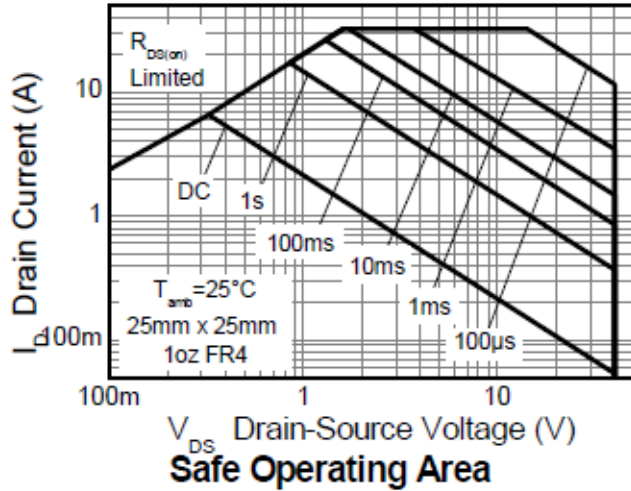
**Thermal Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

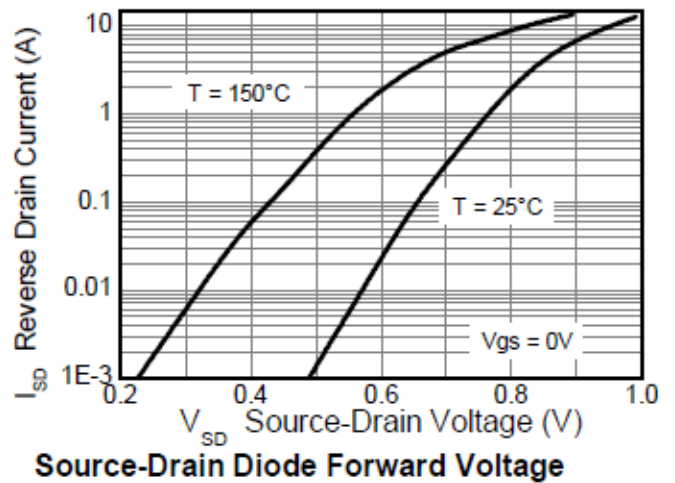
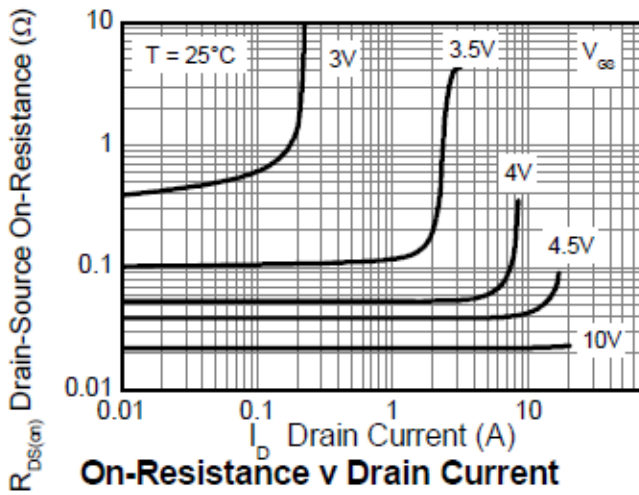
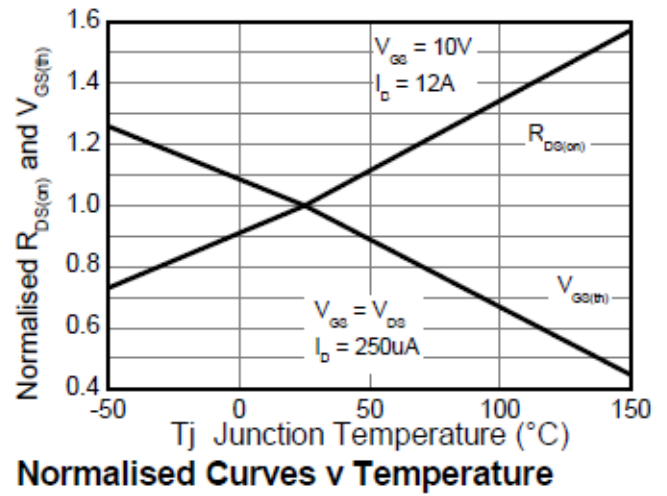
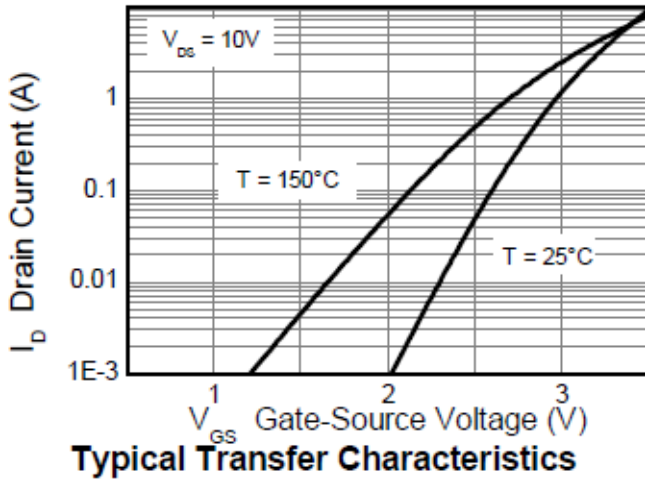
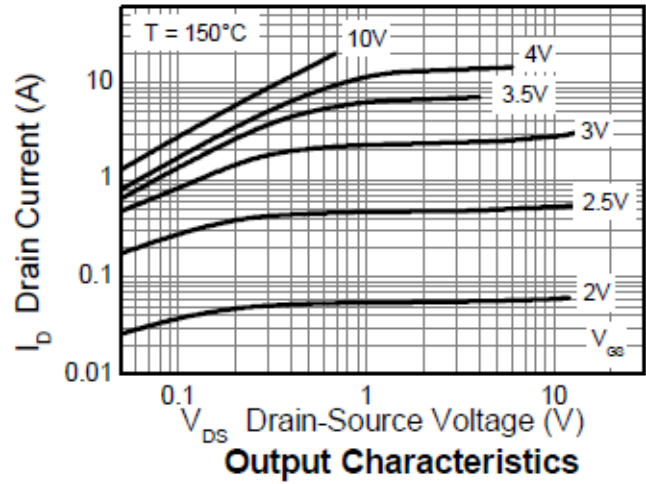
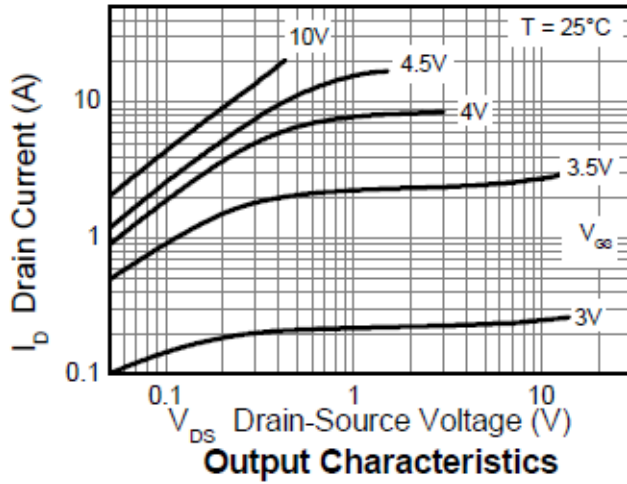
Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 5)	T <sub>A</sub> = +25°C	P <sub>D</sub>	4.18	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	R <sub>θJA</sub>	29.9	°C/W
Total Power Dissipation (Note 7)	T <sub>A</sub> = +25°C	P <sub>D</sub>	2.14	W
Thermal Resistance, Junction to Ambient (Note 7)	Steady State	R <sub>θJA</sub>	58.4	°C/W
Thermal Resistance, Junction to Case (Note 8)		R <sub>θJC</sub>	2.46	°C/W
Operating and Storage Temperature Range		T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

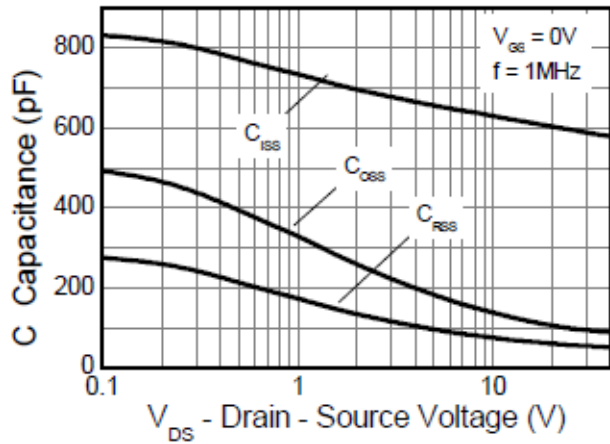
**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 9)</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	40	—	—	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	—	—	1	μA	V <sub>DS</sub> = 40V, V <sub>GS</sub> = 0V
Gate-Source Leakage	I <sub>GSS</sub>	—	—	±100	nA	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS (Note 9)</b>						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	1	—	3	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	—	21	30	mΩ	V <sub>GS</sub> = 10V, I <sub>D</sub> = 12A
		—	37	50		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 6A
Diode Forward Voltage	V <sub>SD</sub>	—	0.95	1.1	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = 12A
<b>DYNAMIC CHARACTERISTICS (Note 10)</b>						
Input Capacitance	C <sub>iss</sub>	—	604	—	pF	V <sub>DS</sub> = 20V, V <sub>GS</sub> = 0V, f = 1.0MHz
Output Capacitance	C <sub>oss</sub>	—	106	—		
Reverse Transfer Capacitance	C <sub>rss</sub>	—	59.6	—		
Total Gate Charge (V <sub>GS</sub> = 4.5V)	Q <sub>g</sub>	—	6.5	—	nC	V <sub>DS</sub> = 20V, I <sub>D</sub> = 12A
Total Gate Charge (V <sub>GS</sub> = 10V)	Q <sub>g</sub>	—	12.9	—		
Gate-Source Charge	Q <sub>gs</sub>	—	2.3	—		
Gate-Drain Charge	Q <sub>gd</sub>	—	3.6	—		
Turn-On Delay Time	t <sub>D(ON)</sub>	—	4.2	—	ns	V <sub>DD</sub> = 20V, I <sub>D</sub> = 12A V <sub>GS</sub> = 10V, R <sub>G</sub> = 6Ω
Turn-On Rise Time	t <sub>R</sub>	—	12.4	—		
Turn-Off Delay Time	t <sub>D(OFF)</sub>	—	13.8	—		
Turn-Off Fall Time	t <sub>F</sub>	—	10.7	—		
Body Diode Reverse Recovery Time	t <sub>RR</sub>	—	135	—	ns	I <sub>F</sub> = 12A, di/dt = 100A/μs
Body Diode Reverse Recovery Charge	Q <sub>RR</sub>	—	799	—	nC	I <sub>F</sub> = 12A, di/dt = 100A/μs

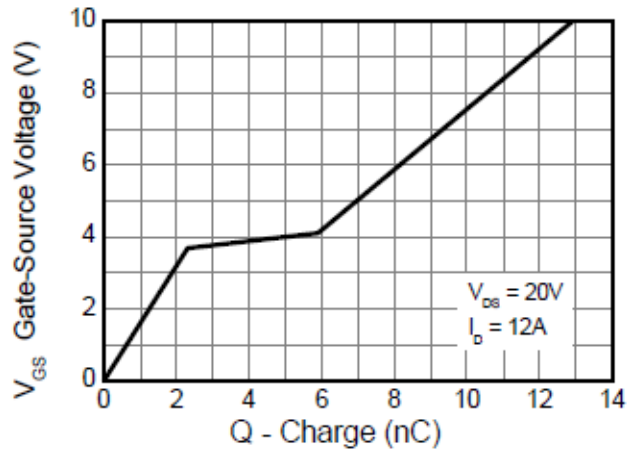
- Notes:
- For a device surface mounted on 50mm x 50mm x 1.6mm FR-4 PCB with high coverage of single sided 2oz copper, in still air conditions; the device is measured when operating in a steady-state condition.
  - Same as note 5, except the device is pulsed with D = 0.02 and pulse width 300μs. The pulse current is limited by the maximum junction temperature.
  - For a device surface mounted on 25mm x 25mm x 1.6mm FR-4 PCB with high coverage of single sided 1oz copper, in still air conditions; the device is measured when operating in a steady-state condition.
  - Thermal resistance from junction to solder-point (at the end of the drain lead).
  - Short duration pulse test used to minimize self-heating effect.
  - Guaranteed by design. Not subject to product testing.







**Capacitance v Drain-Source Voltage**

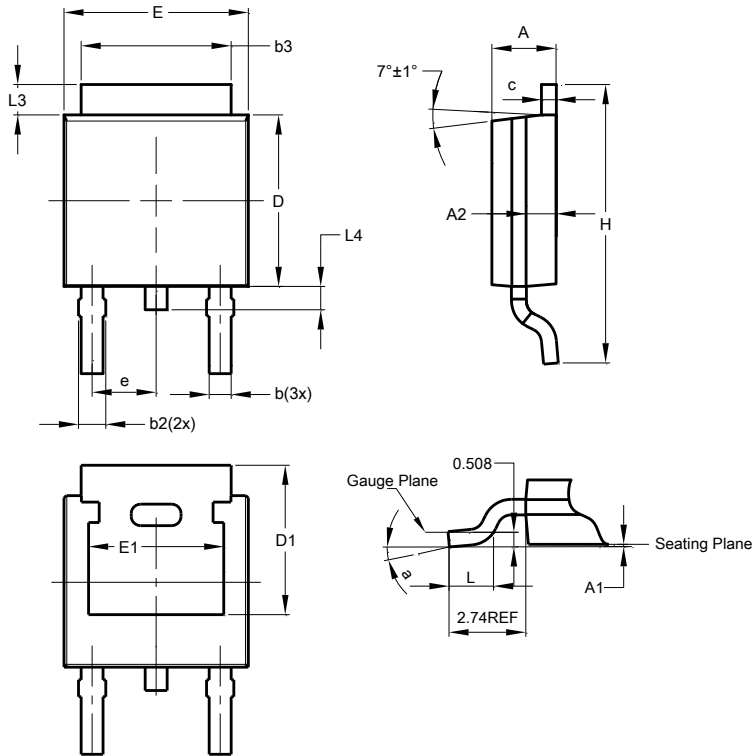


**Gate-Source Voltage v Gate Charge**

## Package Outline Dimensions

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

**TO252 (DPAK)**

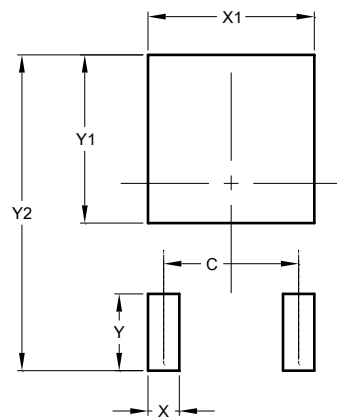


TO252 (DPAK)			
Dim	Min	Max	Typ
A	2.19	2.39	2.29
A1	0.00	0.13	0.08
A2	0.97	1.17	1.07
b	0.64	0.88	0.783
b2	0.76	1.14	0.95
b3	5.21	5.46	5.33
c	0.45	0.58	0.531
D	6.00	6.20	6.10
D1	5.21	-	-
e	-	-	2.286
E	6.45	6.70	6.58
E1	4.32	-	-
H	9.40	10.41	9.91
L	1.40	1.78	1.59
L3	0.88	1.27	1.08
L4	0.64	1.02	0.83
a	0°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

## 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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