

Product Summary

BV _{DSS}	R _{D(on)}	I _D T _A = +25°C
40V	30mΩ @V _{GS} = 10V	9.6A
	50mΩ @V _{GS} = 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

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.

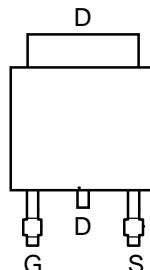
<https://www.diodes.com/quality/product-definitions/>

Mechanical Data

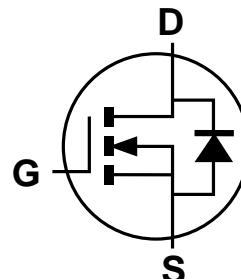
- Case: TO252
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 (e3)
- Weight: 0.33 grams (Approximate)



Top View



Top View
Pin-Out



Equivalent Circuit

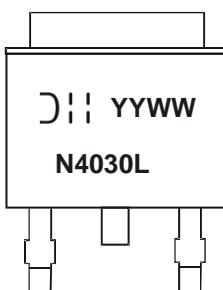
Ordering Information (Note 4)

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



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

Maximum Ratings (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V_{DSS}	40	V
Gate-Source Voltage			V_{GSS}	± 20	V
Continuous Drain Current (Note 5) $V_{GS} = 10\text{V}$	Steady State	$T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$	I_D	9.6 7.7	A
Maximum Body Diode Continuous Current (Note 5)			I_S	9.6	A
Pulsed Drain Current (10 μs Pulse, Duty Cycle = 1%) (Note 6)			I_{DM}	37.7	A
Pulsed Source Current (10 μs Pulse, Duty Cycle = 1%) (Note 6)			I_{SM}	37.7	A

Thermal Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

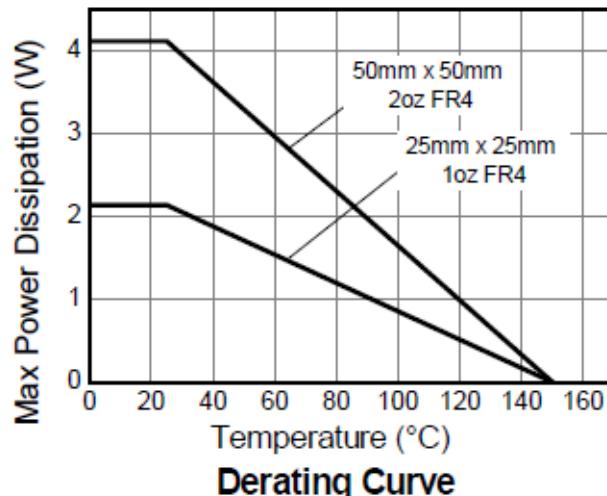
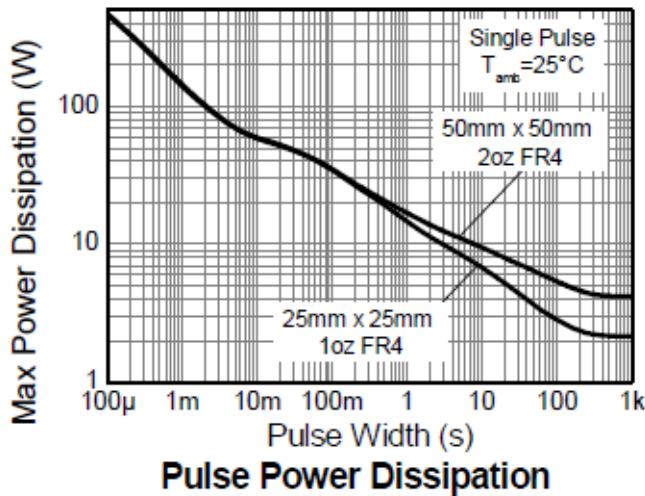
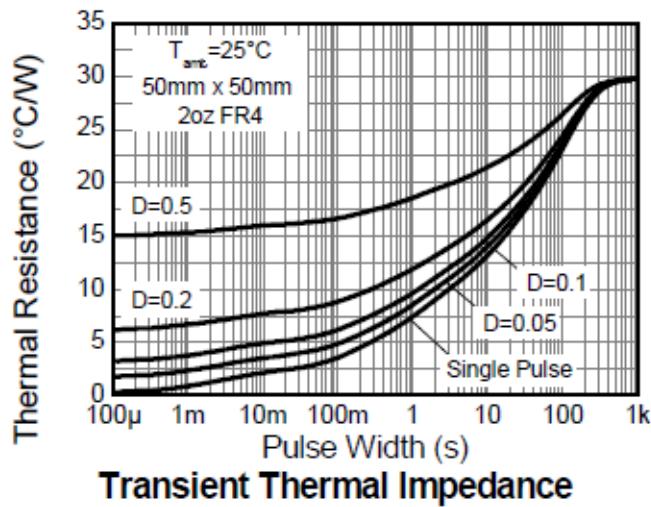
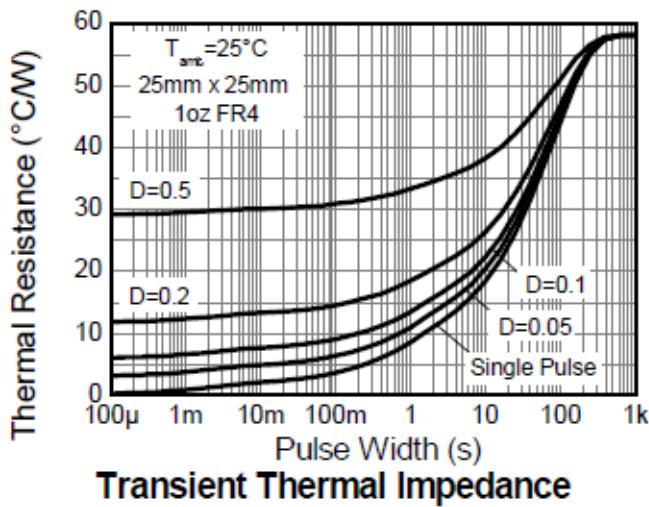
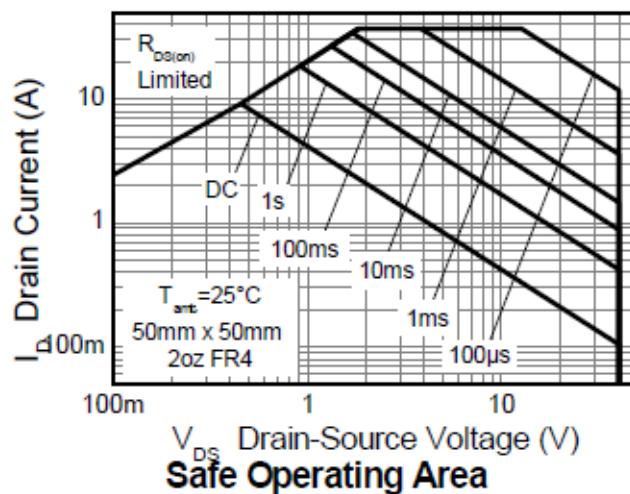
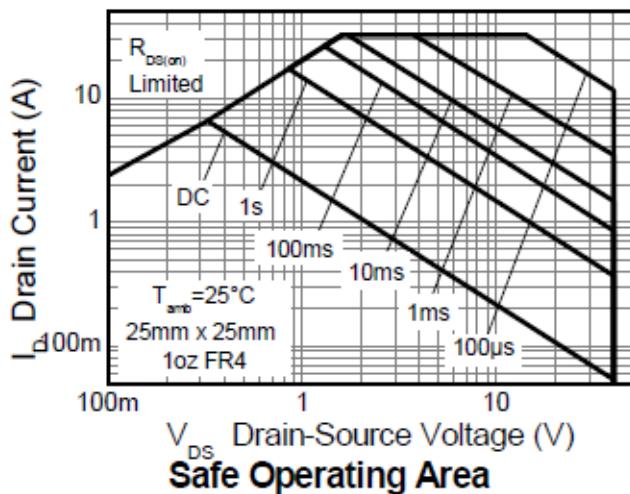
Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 5)	$T_A = +25^\circ\text{C}$	P_D	4.18	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	$R_{\theta JA}$	29.9	$^\circ\text{C}/\text{W}$
Total Power Dissipation (Note 7)	$T_A = +25^\circ\text{C}$	P_D	2.14	W
Thermal Resistance, Junction to Ambient (Note 7)	Steady State	$R_{\theta JA}$	58.4	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction to Case (Note 8)		$R_{\theta JC}$	2.46	$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

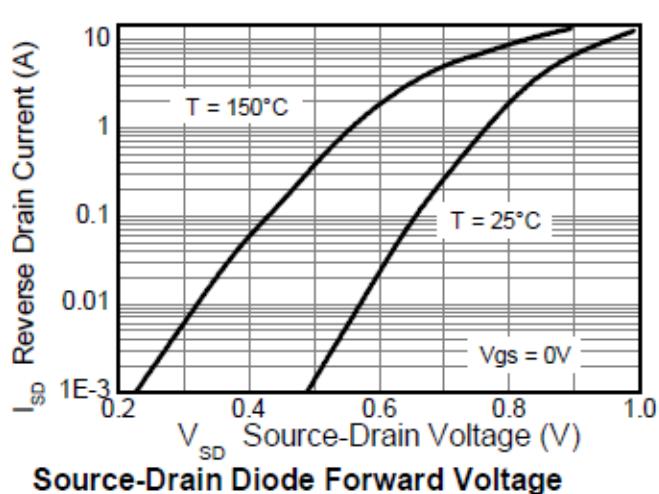
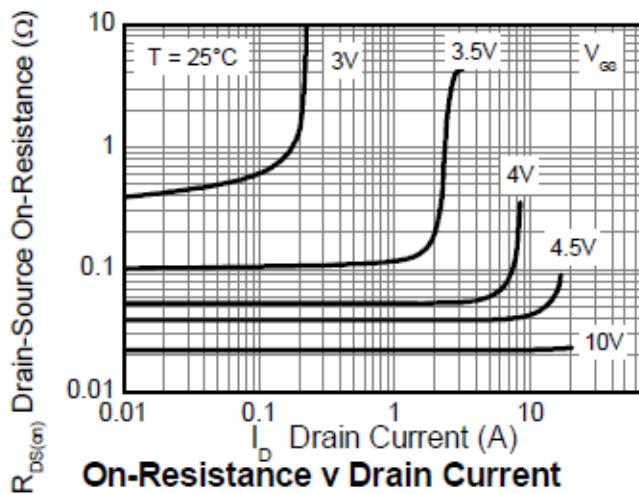
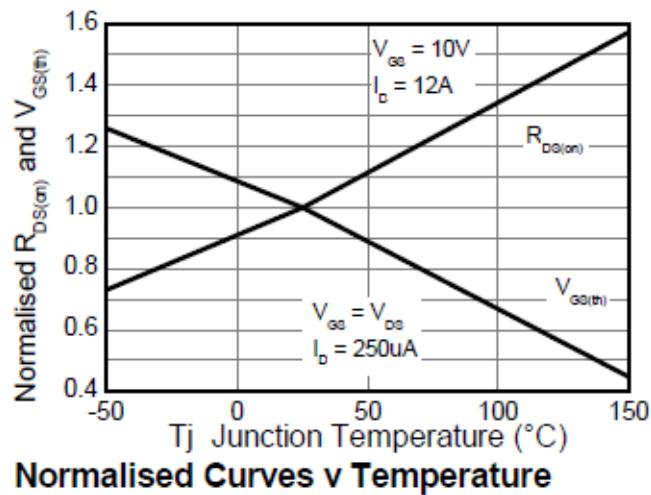
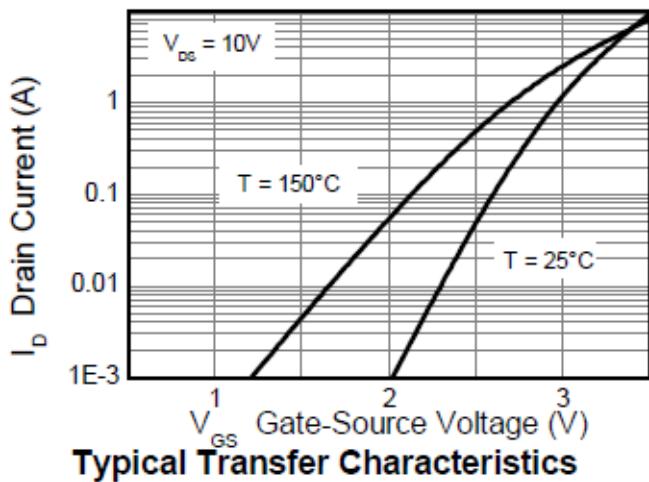
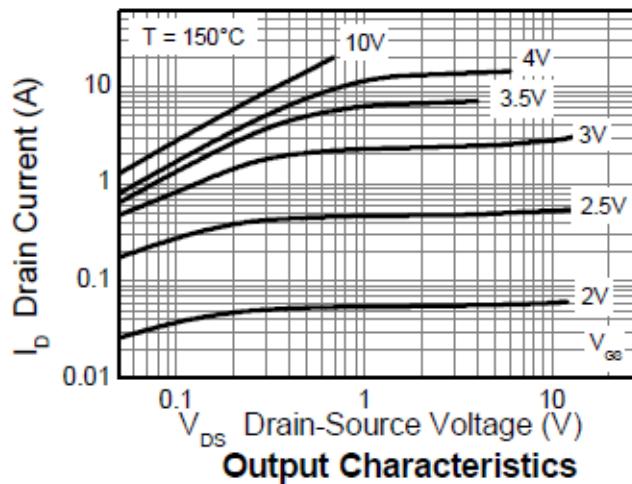
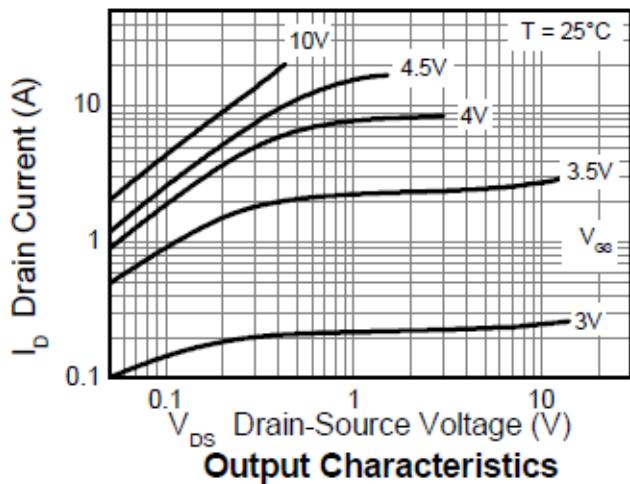
Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

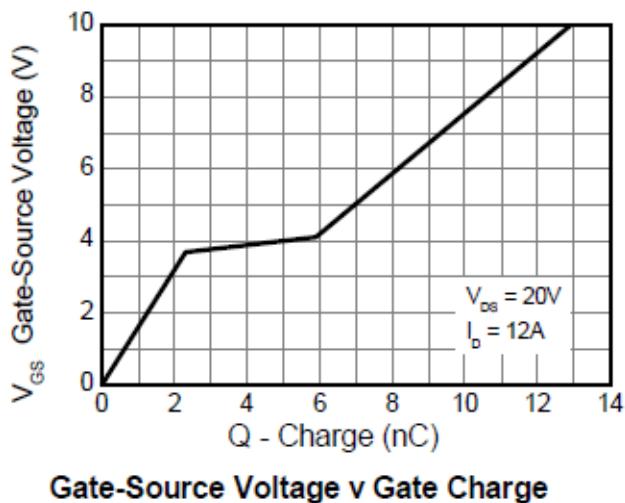
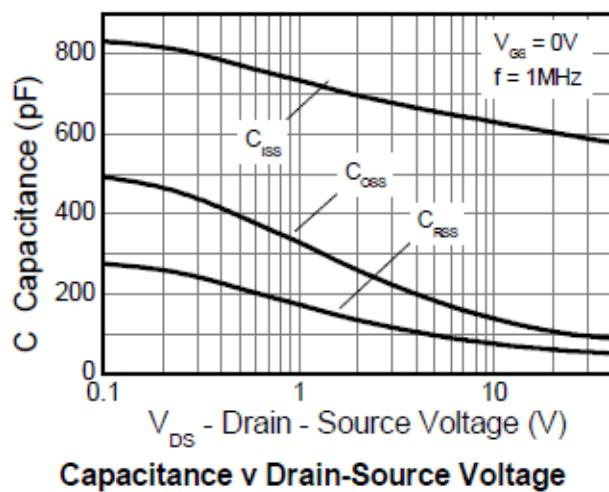
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 9)						
Drain-Source Breakdown Voltage	BV_{DSS}	40	—	—	V	$V_{GS} = 0\text{V}, I_D = 250\mu\text{A}$
Zero Gate Voltage Drain Current	I_{DSS}	—	—	1	μA	$V_{DS} = 40\text{V}, V_{GS} = 0\text{V}$
Gate-Source Leakage	I_{GSS}	—	—	± 100	nA	$V_{GS} = \pm 20\text{V}, V_{DS} = 0\text{V}$
ON CHARACTERISTICS (Note 9)						
Gate Threshold Voltage	$V_{GS(TH)}$	1	—	3	V	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	21	30	$\text{m}\Omega$	$V_{GS} = 10\text{V}, I_D = 12\text{A}$
		—	37	50		$V_{GS} = 4.5\text{V}, I_D = 6\text{A}$
Diode Forward Voltage	V_{SD}	—	0.95	1.1	V	$V_{GS} = 0\text{V}, I_S = 12\text{A}$
DYNAMIC CHARACTERISTICS (Note 10)						
Input Capacitance	C_{iss}	—	604	—	pF	$V_{DS} = 20\text{V}, V_{GS} = 0\text{V}, f = 1.0\text{MHz}$
Output Capacitance	C_{oss}	—	106	—		
Reverse Transfer Capacitance	C_{rss}	—	59.6	—		
Total Gate Charge ($V_{GS} = 4.5\text{V}$)	Q_g	—	6.5	—	nC	$V_{DS} = 20\text{V}, I_D = 12\text{A}$
Total Gate Charge ($V_{GS} = 10\text{V}$)	Q_g	—	12.9	—		
Gate-Source Charge	Q_{gs}	—	2.3	—		
Gate-Drain Charge	Q_{gd}	—	3.6	—	ns	$V_{DD} = 20\text{V}, I_D = 12\text{A}$ $V_{GS} = 10\text{V}, R_G = 6\Omega$
Turn-On Delay Time	$t_{D(ON)}$	—	4.2	—		
Turn-On Rise Time	t_R	—	12.4	—		
Turn-Off Delay Time	$t_{D(OFF)}$	—	13.8	—	ns	$V_{GS} = 10\text{V}, R_G = 6\Omega$
Turn-Off Fall Time	t_F	—	10.7	—		
Body Diode Reverse Recovery Time	t_{RR}	—	135	—		
Body Diode Reverse Recovery Charge	Q_{RR}	—	799	—	nC	$I_F = 12\text{A}, di/dt = 100\text{A}/\mu\text{s}$

Notes:

5. 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.
6. Same as note 5, except the device is pulsed with $D = 0.02$ and pulse width 300 μs . The pulse current is limited by the maximum junction temperature.
7. 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.
8. Thermal resistance from junction to solder-point (at the end of the drain lead).
9. Short duration pulse test used to minimize self-heating effect.
10. Guaranteed by design. Not subject to product testing.

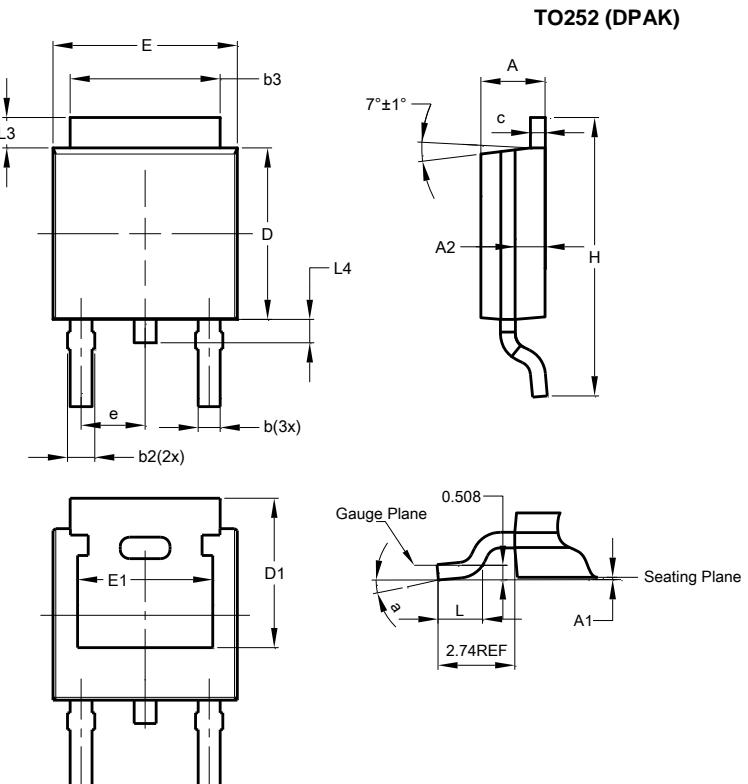






Package Outline Dimensions

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

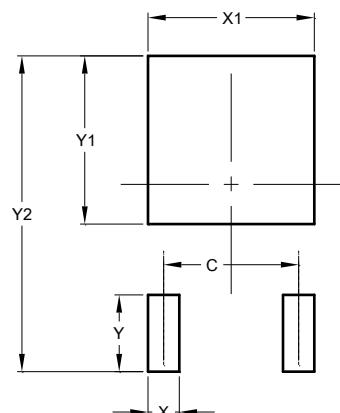


TO252 (DPAK)			
Dim	Min	Max	Typ
A	2.19	2.39	2.29
A1	0.00	0.13	0.08
A2	0.97	1.17	1.07
b	0.64	0.88	0.783
b2	0.76	1.14	0.95
b3	5.21	5.46	5.33
c	0.45	0.58	0.531
D	6.00	6.20	6.10
D1	5.21	-	-
e	-	-	2.286
E	6.45	6.70	6.58
E1	4.32	-	-
H	9.40	10.41	9.91
L	1.40	1.78	1.59
L3	0.88	1.27	1.08
L4	0.64	1.02	0.83
a	0°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