

Product Summary

BV _{DSS}	R _{DS(ON)} Max	I _D Max T _C = +25°C
30V	4mΩ @V _{GS} = 10V	75A
	7mΩ @V _{GS} = 4.5V	75A

Features

- Rated to +175°C – Ideal for High Ambient Temperature Environments
- High Conversion Efficiency
- Low R_{DS(ON)} – Minimizes On-State Losses
- Low Input Capacitance
- **Lead-Free Finish; 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)**

Description and Applications

This MOSFET is designed to meet the stringent requirements of automotive applications. It is qualified to AECQ101, supported by a PPAP and is ideal for use in:

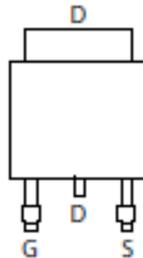
- Power Management Functions
- DC-DC Converters
- BLDC Motor control
- Reverse Polarity Protection

Mechanical Data

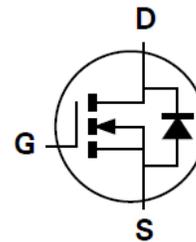
- Case: TO252 (DPAK)
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram
- Terminals: Matte Tin Finish. Solderable per MIL-STD-202, Method 208 Ⓔ3
- Weight: 0.315 grams (Approximate)



Top View



Pin Out Top View



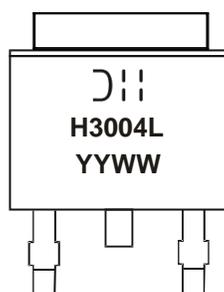
Equivalent Circuit

Ordering Information (Note 5)

Part Number	Case	Packaging
DMTH3004LK3Q-13	TO252 (DPAK)	2,500/Tape & Reel

- Notes:
1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
 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. 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



D = Manufacturer's Marking
 H3004L = Product Type Marking Code
 YYWW = Date Code Marking
 YY = Last Two Digits of Year (ex: 16 = 2016)
 WW = Week Code (01 to 53)

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

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V _{DSS}	30	V
Gate-Source Voltage			V _{GSS}	+20 -16	V
Continuous Drain Current V _{GS} = 10V	Steady State (Note 7)	T _C = +25°C T _C = +100°C	I _D	75 75	A
	Steady State (Note 6)	T _A = +25°C T _A = +100°C	I _D	21 15	A
Pulsed Drain Current (10μs Pulse, Duty Cycle=1%)			I _{DM}	105	A
Maximum Continuous Body Diode Forward Current			I _S	75	A
Avalanche Current L=5mH			I _{AS}	10.7	A
Avalanche Energy L=5mH			E _{AS}	287	mJ

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

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 7)	P _D	107	W
Thermal Resistance, Junction to Ambient (Note 6)	R _{θJA}	50	°C/W
Thermal Resistance, Junction to Case (Note 7)	R _{θJC}	1.4	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +175	°C

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 8)						
Drain-Source Breakdown Voltage	BV _{DSS}	30	—	—	V	V _{GS} = 0V, I _D = 1mA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	1	μA	V _{DS} = 24V, V _{GS} = 0V
Zero Gate Voltage Drain Current (Note 9)	I _{DSS}	—	—	10	μA	V _{DS} = 24V, V _{GS} = 0V T _A = +125°C
Gate-Source Leakage	I _{GSS}	—	—	±100	nA	V _{GS} = +20V, V _{DS} = 0V V _{GS} = -16V, V _{DS} = 0V
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	V _{GS(TH)}	1	1.7	3	V	V _{DS} = V _{GS} , I _D = 250μA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	3.3	4	mΩ	V _{GS} = 10V, I _D = 20A
		—	5.5	7		V _{GS} = 4.5V, I _D = 7A
Diode Forward Voltage	V _{SD}	—	0.75	1	V	V _{GS} = 0V, I _S = 1A
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C _{ISS}	—	2,370	—	pF	V _{DS} = 15V, V _{GS} = 0V, f = 1MHz
Output Capacitance	C _{OSS}	—	1,360	—	pF	
Reverse Transfer Capacitance	C _{RSS}	—	240	—	pF	
Gate Resistance	R _G	0.15	0.6	1.5	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1MHz
Total Gate Charge (V _{GS} = 4.5V)	Q _G	—	20	—	nC	V _{DS} = 15V, I _D = 20A
Total Gate Charge (V _{GS} = 10V)	Q _G	—	44	—	nC	
Gate-Source Charge	Q _{GS}	—	7	—	nC	
Gate-Drain Charge	Q _{GD}	—	8	—	nC	
Turn-On Delay Time	t _{D(ON)}	—	6.2	—	ns	V _{DD} = 15V, V _{GS} = 10V, R _L = 0.75Ω, R _G = 3Ω, I _D = 20A
Turn-On Rise Time	t _R	—	4.3	—	ns	
Turn-Off Delay Time	t _{D(OFF)}	—	21	—	ns	
Turn-Off Fall Time	t _F	—	8	—	ns	
Reverse Recovery Time	t _{RR}	—	25	—	ns	I _F = 15A, di/dt = 500A/μs
Reverse Recovery Charge	Q _{RR}	—	37	—	nC	

- Notes:
- Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.
 - Thermal resistance from junction to soldering point (on the exposed drain pad)
 - Short duration pulse test used to minimize self-heating effect.
 - Guaranteed by design. Not subject to product testing.

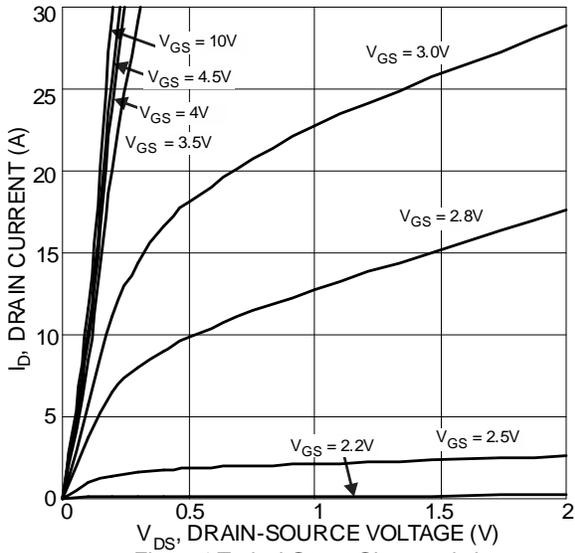


Figure 1 Typical Output Characteristic

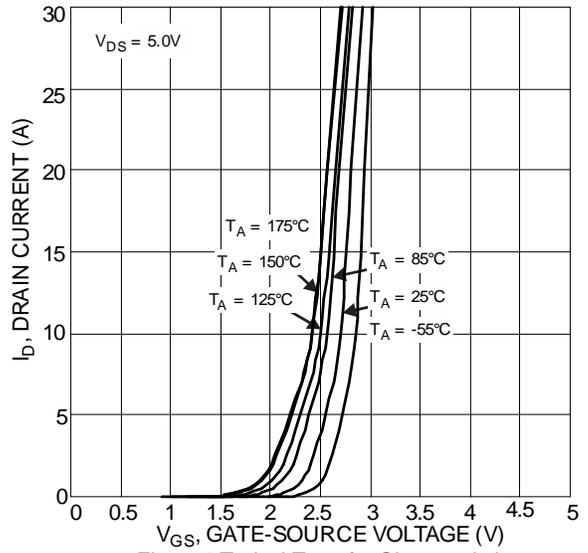


Figure 2 Typical Transfer Characteristics

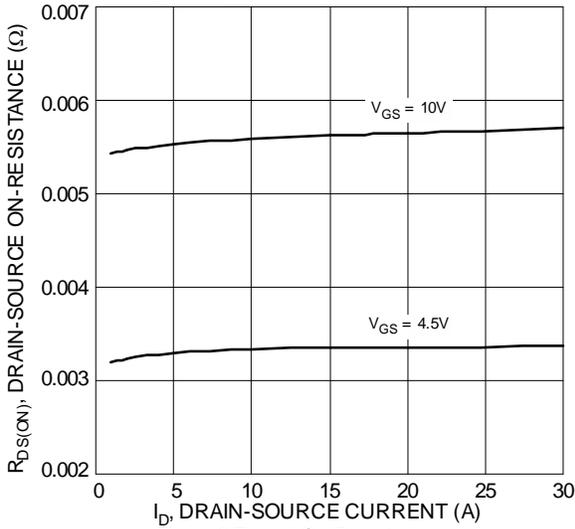


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

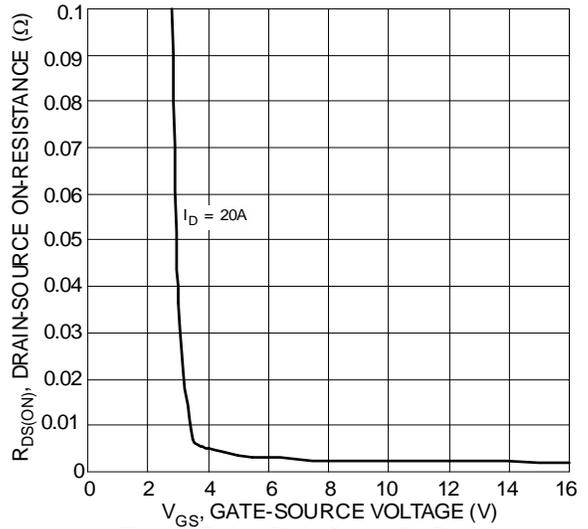


Figure 4 Typical Drain-Source On-Resistance vs. Gate-Source Voltage

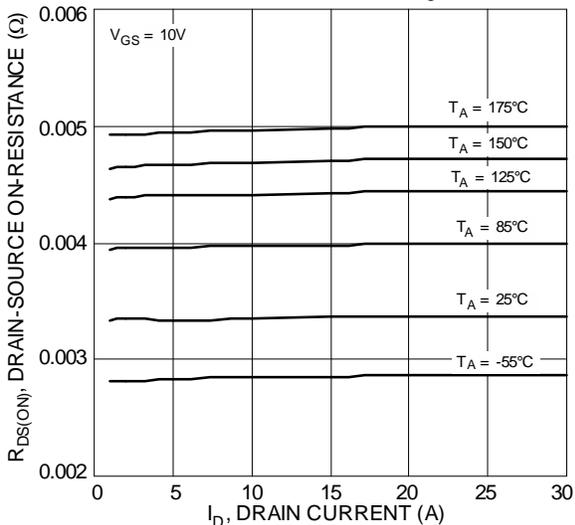


Figure 5 Typical On-Resistance vs. Drain Current and Temperature

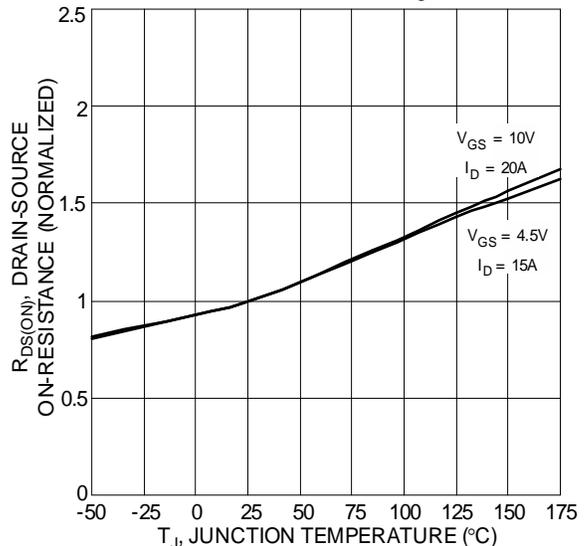


Figure 6 On-Resistance Variation with Temperature

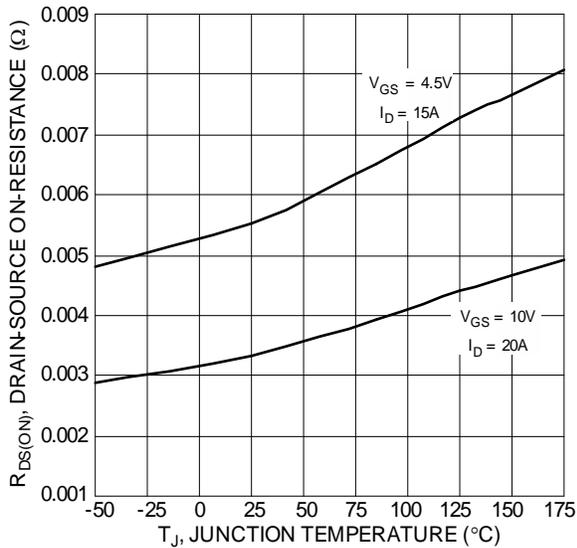


Figure 7 On-Resistance Variation with Temperature

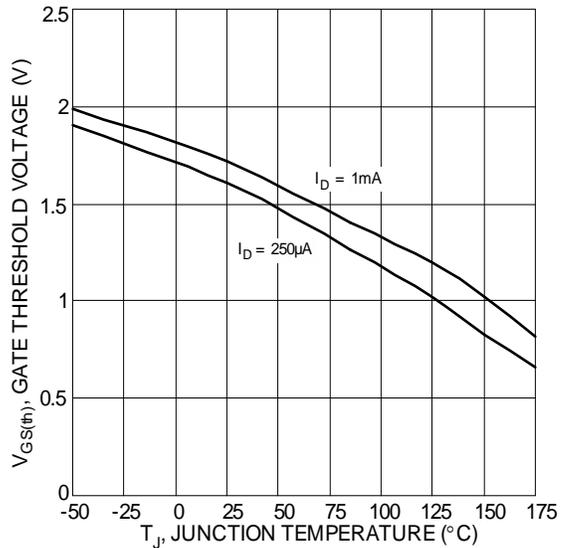


Figure 8 Gate Threshold Variation vs. Ambient Temperature

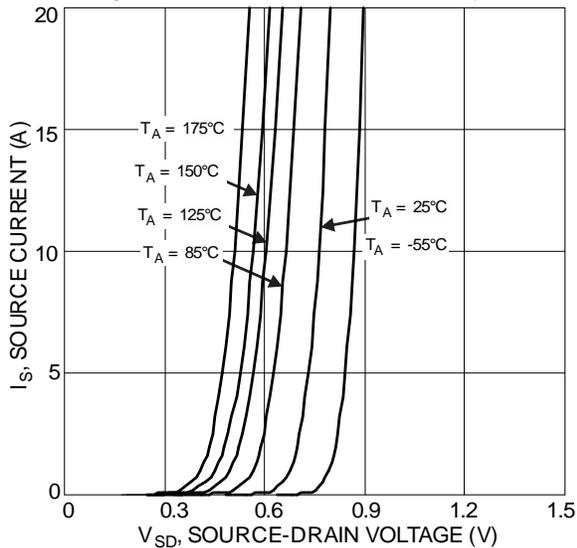


Figure 9 Diode Forward Voltage vs. Current

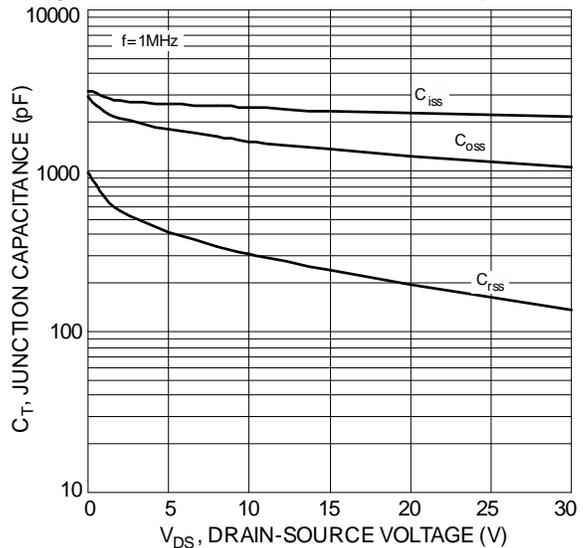


Figure 10 Typical Junction Capacitance

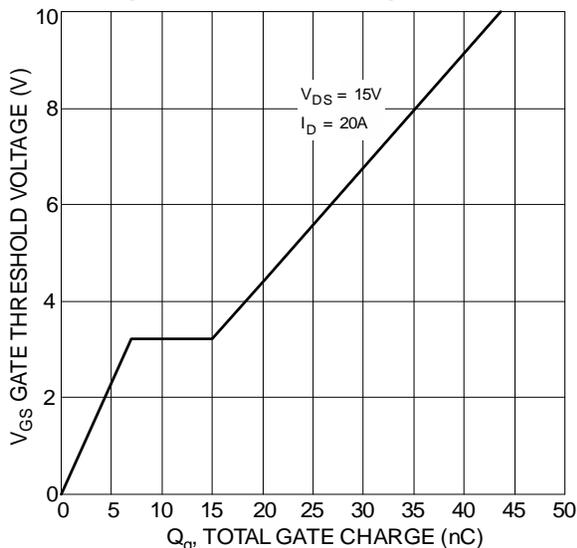


Figure 11 Gate Charge

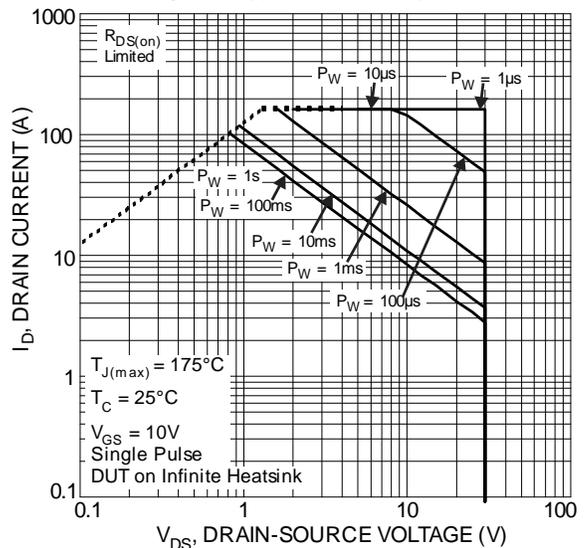
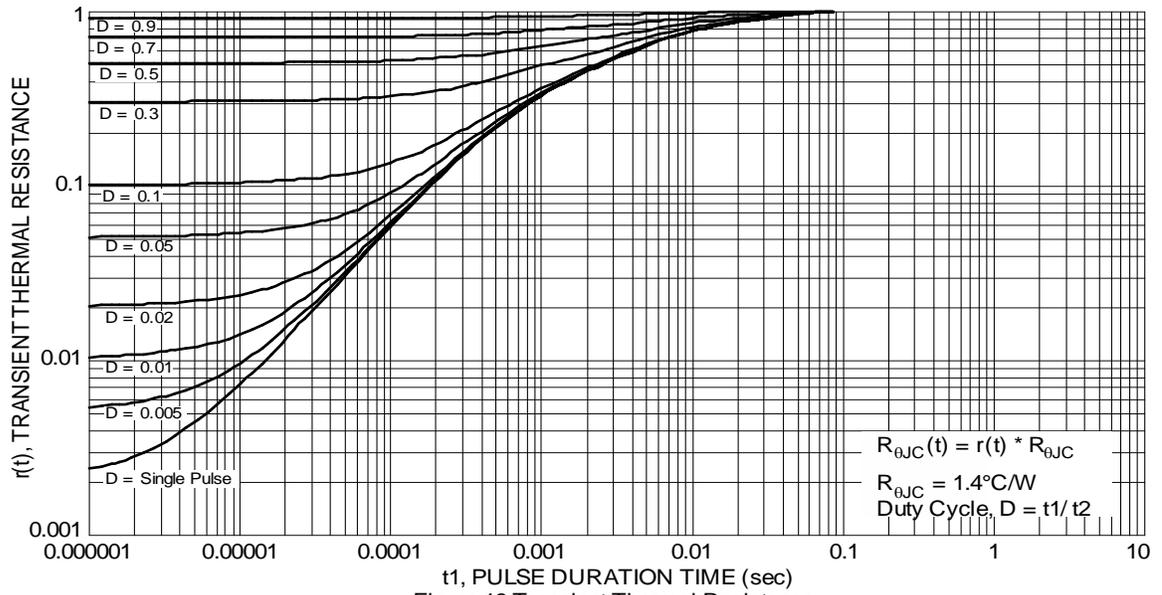


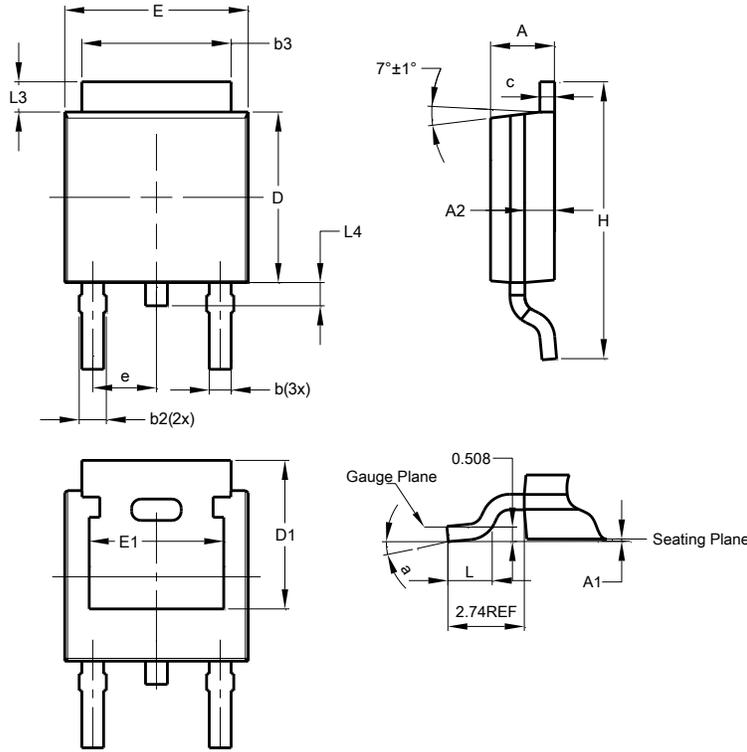
Figure 12 SOA, Safe Operation Area



Package Outline Dimensions

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

TO252 (DPAK)

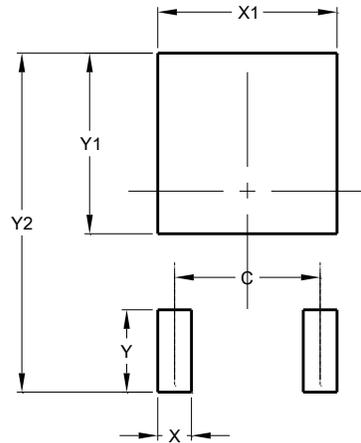


TO252 (DPAK)			
Dim	Min	Max	Typ
A	2.19	2.39	2.29
A1	0.00	0.13	0.08
A2	0.97	1.17	1.07
b	0.64	0.88	0.783
b2	0.76	1.14	0.95
b3	5.21	5.46	5.33
c	0.45	0.58	0.531
D	6.00	6.20	6.10
D1	5.21	-	-
e	-	-	2.286
E	6.45	6.70	6.58
E1	4.32	-	-
H	9.40	10.41	9.91
L	1.40	1.78	1.59
L3	0.88	1.27	1.08
L4	0.64	1.02	0.83
a	0°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