30V 175°C N-CHANNEL ENHANCEMENT MODE MOSFET

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

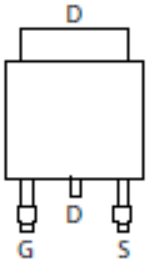
This MOSFET is designed to meet the stringent requirements of automotive applications. It is qualified to AECQ101, supported by a PPAP and is ideal for use in:

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

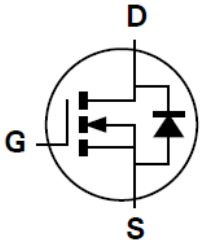
Mechanical Data

- 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 e3
- Weight: 0.315 grams (Approximate)

Top View



Pin Out Top View



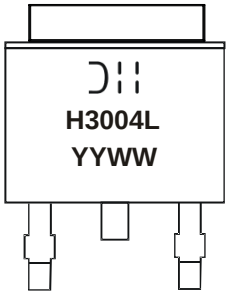
Equivalent Circuit

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



=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)	$R_{\theta JA}$	50	°C/W
Thermal Resistance, Junction to Case (Note 7)	$R_{\theta JC}$	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: 6. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.
7. Thermal resistance from junction to soldering point (on the exposed drain pad)
8. Short duration pulse test used to minimize self-heating effect.
9. Guaranteed by design. Not subject to product testing.

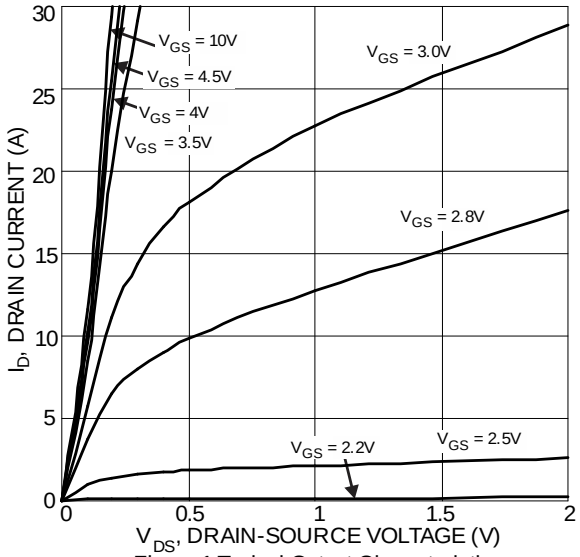


Figure 1 Typical Output Characteristic

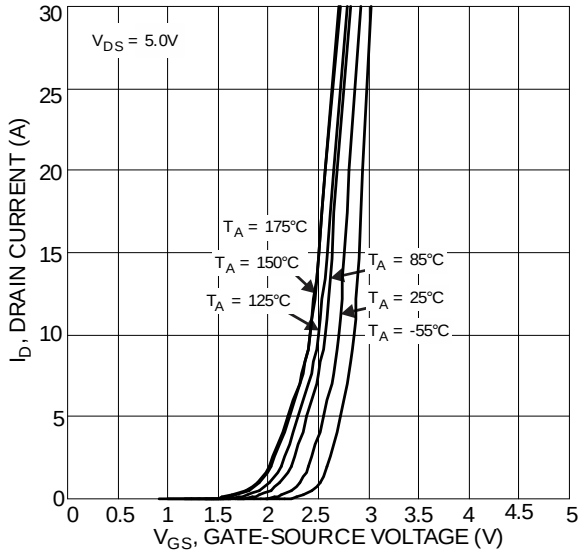


Figure 2 Typical Transfer Characteristics

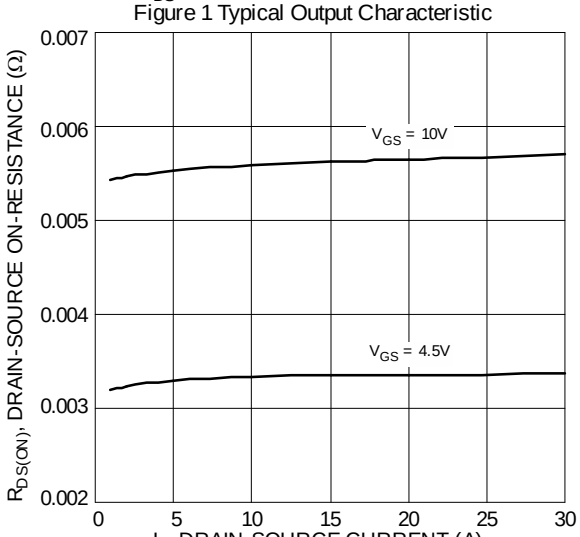


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

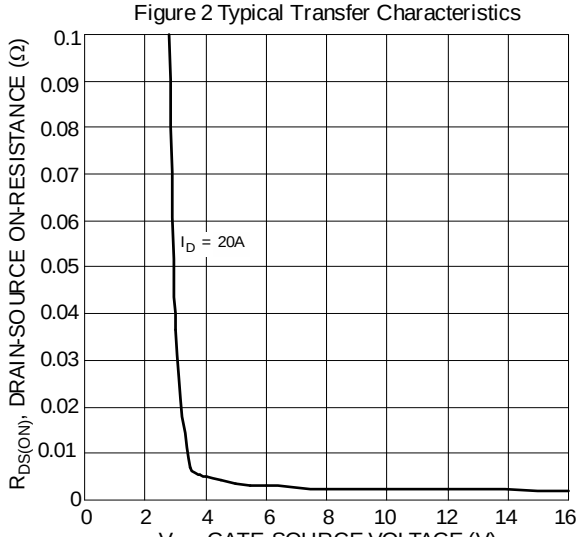


Figure 4 Typical Drain-Source On-Resistance vs. Gate-Source Voltage

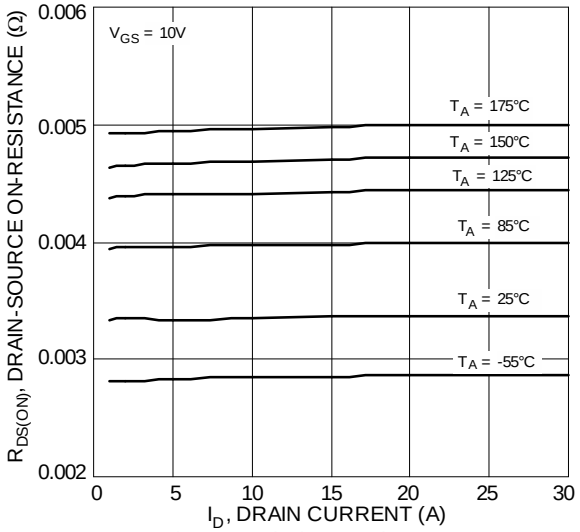


Figure 5 Typical On-Resistance vs. Drain Current and Temperature

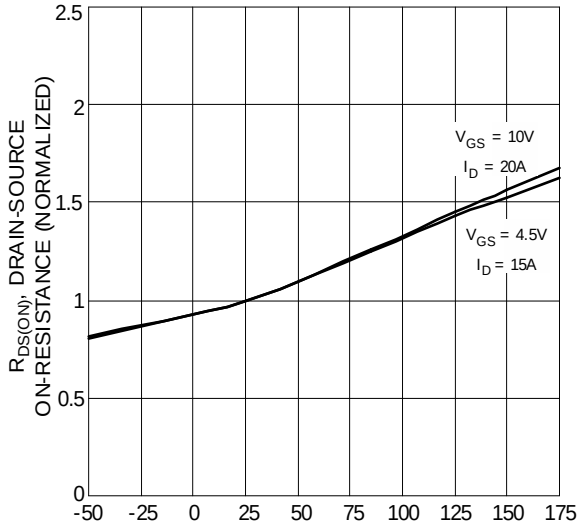


Figure 6 On-Resistance Variation with Temperature

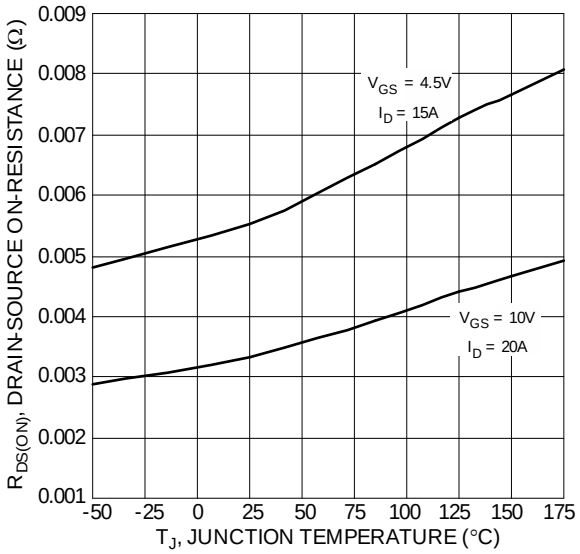


Figure 7 On-Resistance Variation with Temperature

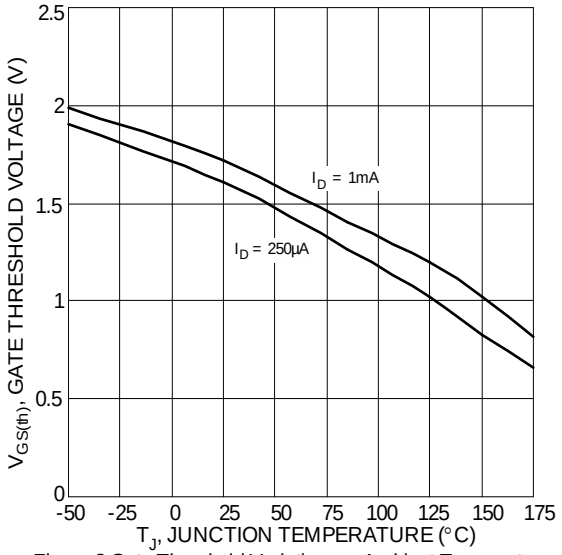


Figure 8 Gate Threshold Variation vs. Ambient Temperature

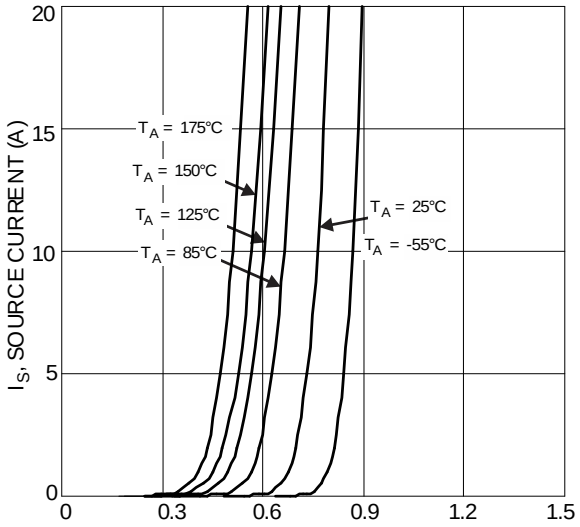


Figure 9 Diode Forward Voltage vs. Current

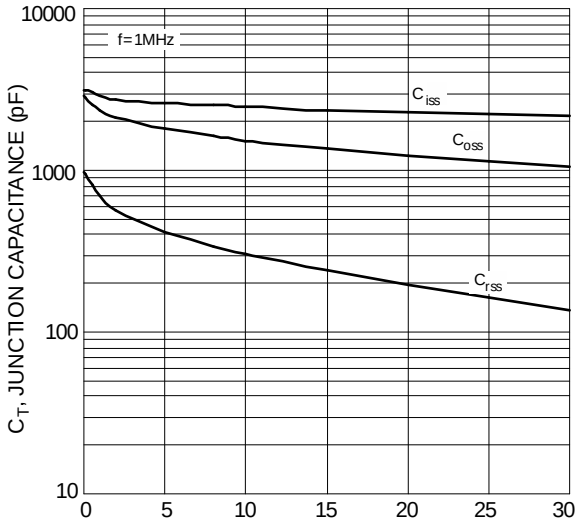


Figure 10 Typical Junction Capacitance

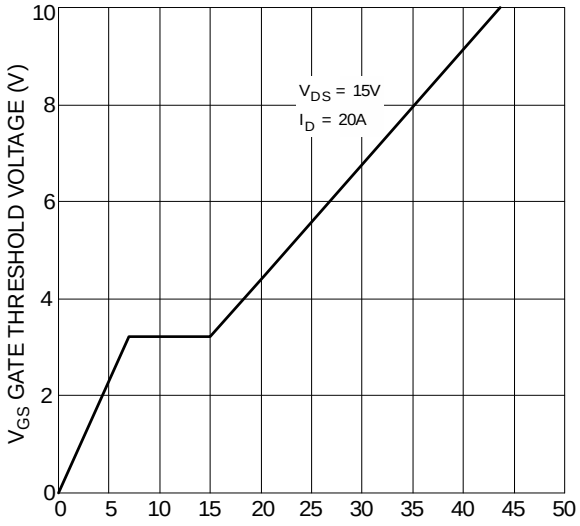


Figure 11 Gate Charge

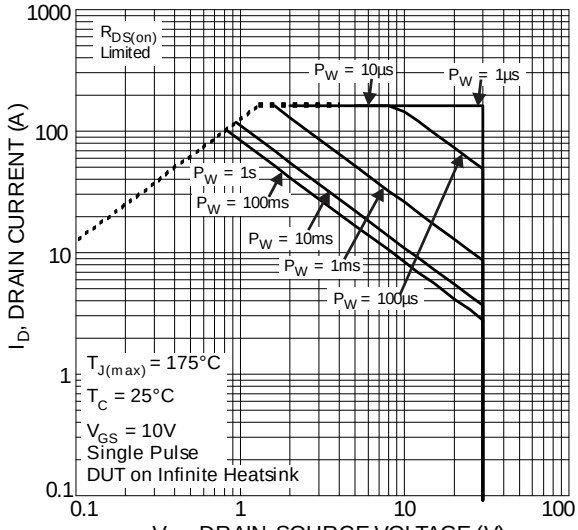


Figure 12 SOA, Safe Operation Area

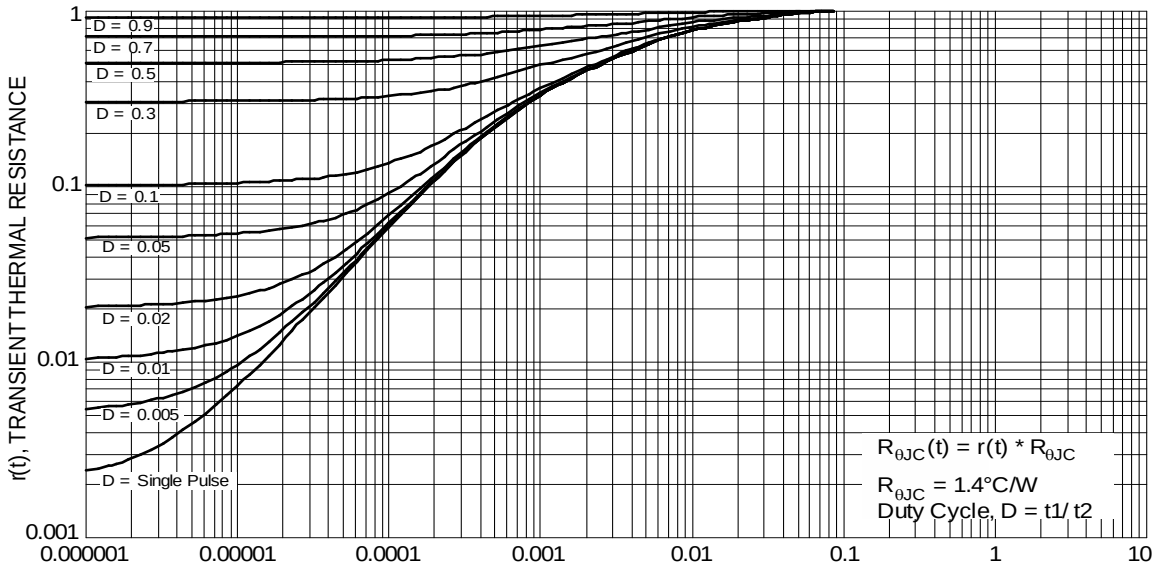


Figure 13 Transient Thermal Resistance

Package Outline Dimensions

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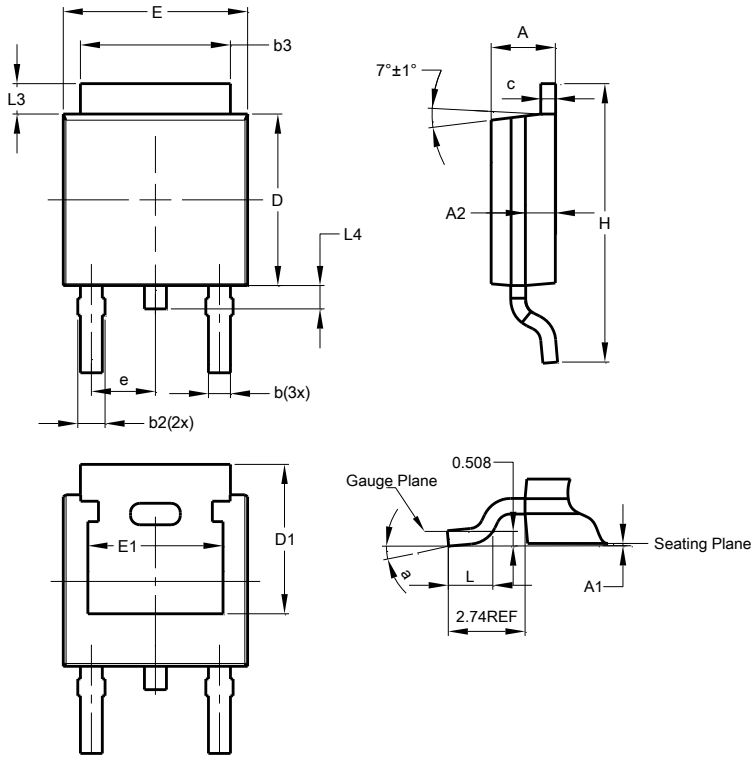
TO252 (DPAK)

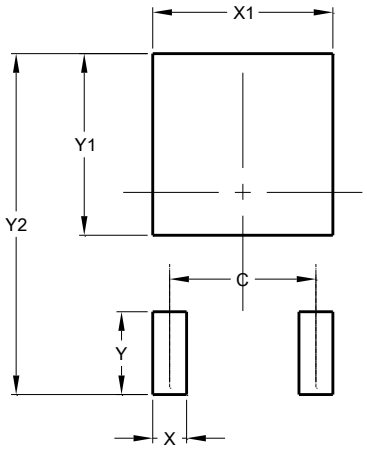


TO252 (DPAK)			
Dim	**Min**	**Max**	**Typ**
A	2.19	2.39	2.29
A1	0.00	0.13	0.08
A2	0.97	1.17	1.07
b	0.64	0.88	0.783
b2	0.76	1.14	0.95
b3	5.21	5.46	5.33
c	0.45	0.58	0.531
D	6.00	6.20	6.10
D1	5.21	-	-
e	-	-	2.286
E	6.45	6.70	6.58
E1	4.32	-	-
H	9.40	10.41	9.91
L	1.40	1.78	1.59
L3	0.88	1.27	1.08
L4	0.64	1.02	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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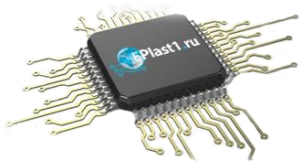
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



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