

Product Summary

BV _{DSS}	R _{DS(ON)} Max	I _D T _C = +25°C
-450V	4.9Ω @ V _{GS} = -10V	-4.7A

Description and Applications

This MOSFET is designed to minimize the on-state resistance yet maintain superior switching performance, making it ideal for high efficiency power management applications.

- Motor Control
- DC-DC Converters
- Power Management Functions
- Uninterrupted Power Supply

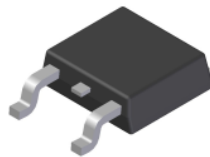
Features

- Low Input Capacitance
- High BV_{DSS} Rating for Power Application
- Low Input/Output Leakage
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please [contact us](mailto:contact@diodes.com) or your local Diodes representative. <https://www.diodes.com/quality/product-definitions/>**

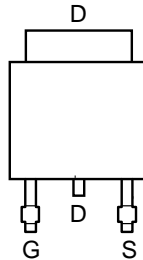
Mechanical Data

- Package: TO252
- Package 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: Finish – Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 (E3)
- Weight: 0.33 grams (Approximate)

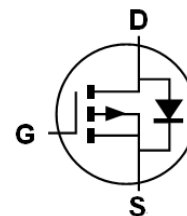
TO252 (DPAK)



Top View



Top View



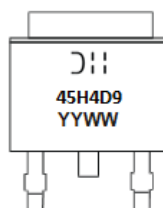
Internal Schematic

Ordering Information (Note 4)

Part Number	Package	Packing	
		Qty.	Carrier
DMP45H4D9HK3-13	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
 45H4D9 = Product Type Marking Code
 YYWW = Date Code Marking
 YY or YY = Last Two Digits of Year (ex: 21 = 2021)
 WW or WW = Week Code (01 to 53)

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

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V _{DSS}	-450	V
Gate-Source Voltage			V _{GSS}	±30	V
Continuous Drain Current (Note 5) V _{GS} = -10V	Steady State	T _C = +25°C	I _D	-4.7	A
		T _C = +100°C		-3.0	
Maximum Body Diode Forward Current (Note 5)			I _S	-1.5	A
Pulsed Drain Current (10μs Pulse, Duty Cycle = 1%)			I _{DM}	-12	A
Avalanche Current, L = 60mH (Note 7)			I _{AS}	-2.5	A
Avalanche Energy, L = 60mH (Note 7)			E _{AS}	187	mJ

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

Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 5)	T _C = +25°C	P _D	104	W
	T _C = +100°C		41	
Thermal Resistance, Junction to Ambient (Note 6)		R _{θJA}	41	°C/W
Thermal Resistance, Junction to Case (Note 5)		R _{θJC}	1.2	
Operating and Storage Temperature Range		T _J , T _{STG}	-55 to +150	°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}	-450	—	—	V	V _{GS} = 0V, I _D = -250μA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	-1	μA	V _{DS} = -450V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±100	nA	V _{GS} = ±30V, V _{DS} = 0V
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	V _{GS(TH)}	-3.0	-4.0	-5.0	V	V _{DS} = V _{GS} , I _D = -250μA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	3.1	4.9	Ω	V _{GS} = -10V, I _D = -1.05A
Diode Forward Voltage	V _{SD}	—	—	-1.4	V	V _{GS} = 0V, I _S = -2.1A
Forward Transconductance	g _{fs}	—	1.4	—	S	V _{DS} = -50.0V, I _b = -1.05A
DYNAMIC CHARACTERISTICS (Note 7)						
Input Capacitance	C _{iss}	—	564	—	pF	V _{DS} = -25V, V _{GS} = 0V, f = 1.0MHz
Output Capacitance	C _{oss}	—	70	—		
Reverse Transfer Capacitance	C _{rss}	—	3.3	—		
Total Gate Charge (V _{GS} = -10V)	Q _g	—	13.7	—	nC	V _{DS} = -360V, I _D = -2.7A, V _{GS} = -10V
Gate-Source Charge	Q _{gs}	—	3.4	—		
Gate-Drain Charge	Q _{gd}	—	6.0	—		
Turn-On Delay Time	t _{D(ON)}	—	21	—	ns	V _{DD} = -225V, R _G = 3.0Ω, I _D = -2.7A
Turn-On Rise Time	t _R	—	54	—		
Turn-Off Delay Time	t _{D(OFF)}	—	34	—		
Turn-Off Fall Time	t _F	—	34	—		
Body Diode Reverse Recovery Time	t _{RR}	—	168	—	ns	V _{GS} = 0V, V _{DD} = -200V, I _S = -2.7A,
Body Diode Reverse Recovery Charge	Q _{RR}	—	1.3	—	μC	dI/dt = 100A/μs

- Notes:
- Device mounted on infinite heatsink.
 - Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper pad layout.
 - Guaranteed by design. Not subject to production testing.
 - Short duration pulse test used to minimize self-heating effect.

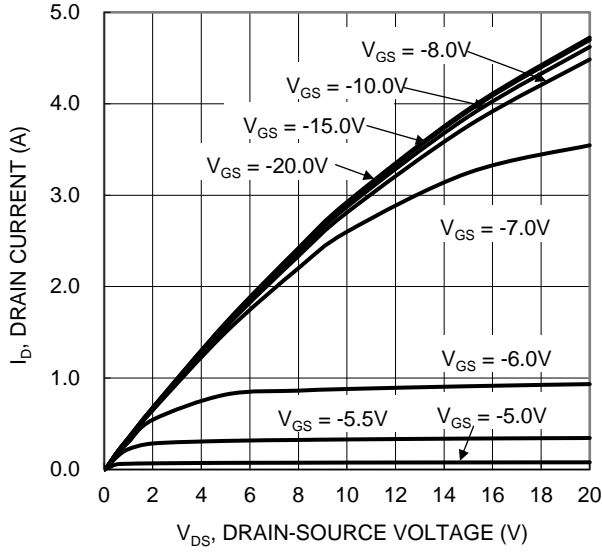


Figure 1. Typical Output Characteristic

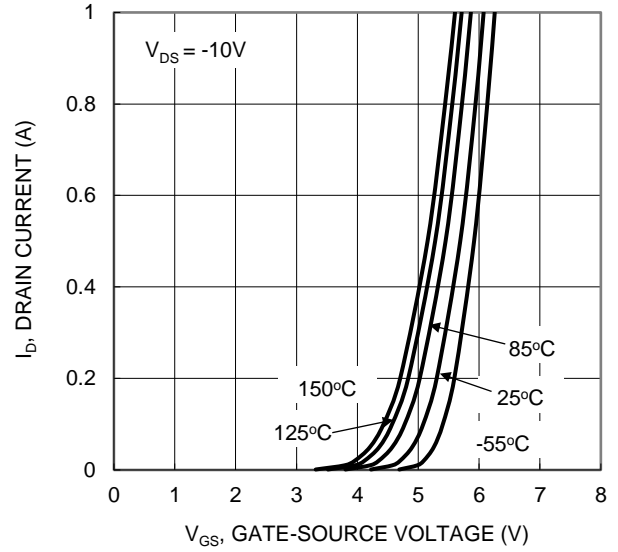


Figure 2. Typical Transfer Characteristic

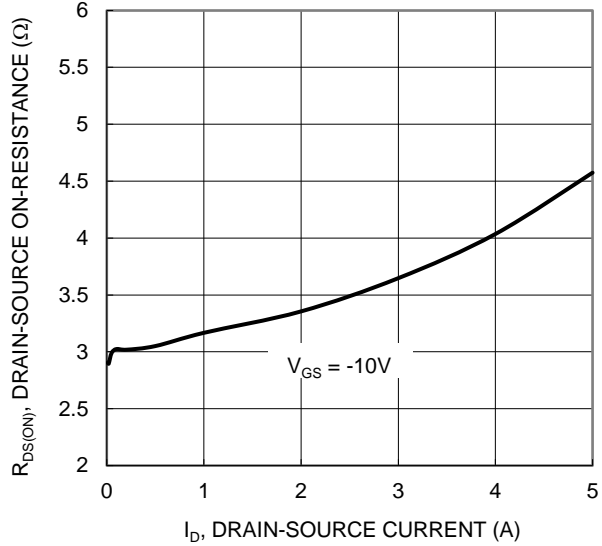


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

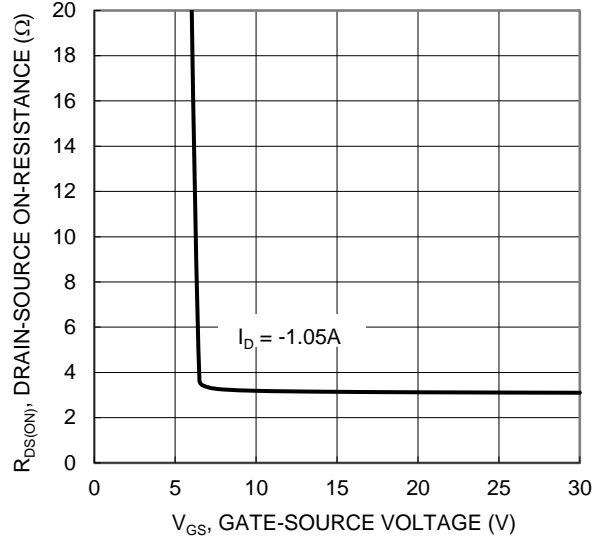


Figure 4. Typical Transfer Characteristic

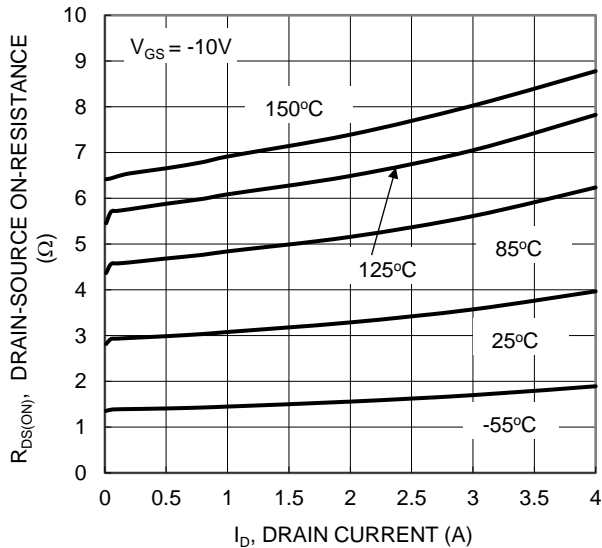


Figure 5. Typical On-Resistance vs. Drain Current and Temperature

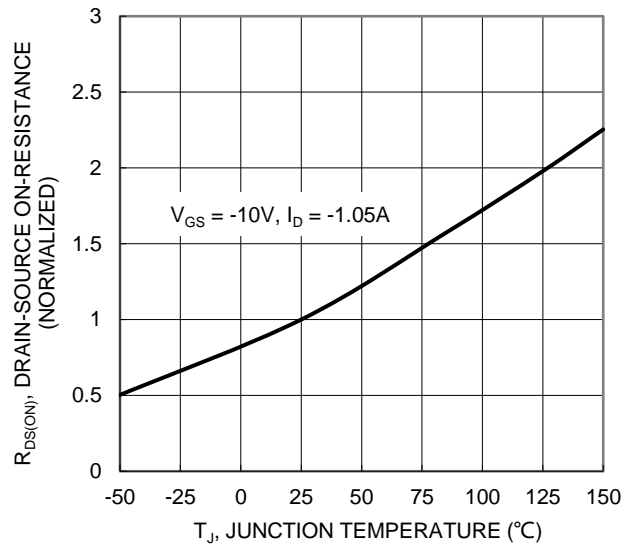


Figure 6. On-Resistance Variation with Temperature

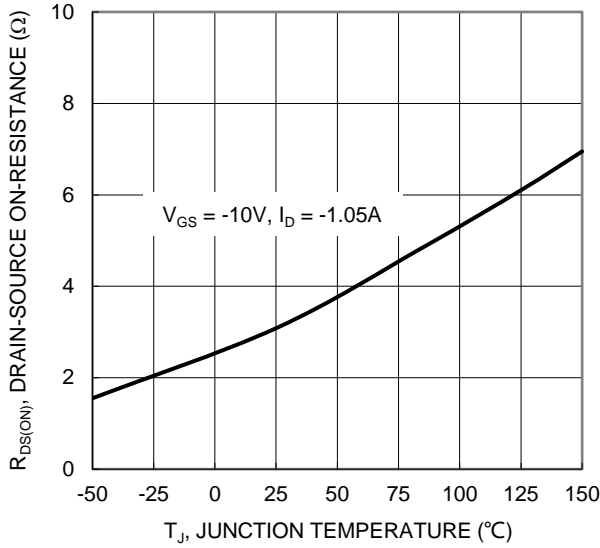


Figure 7. On-Resistance Variation with Temperature

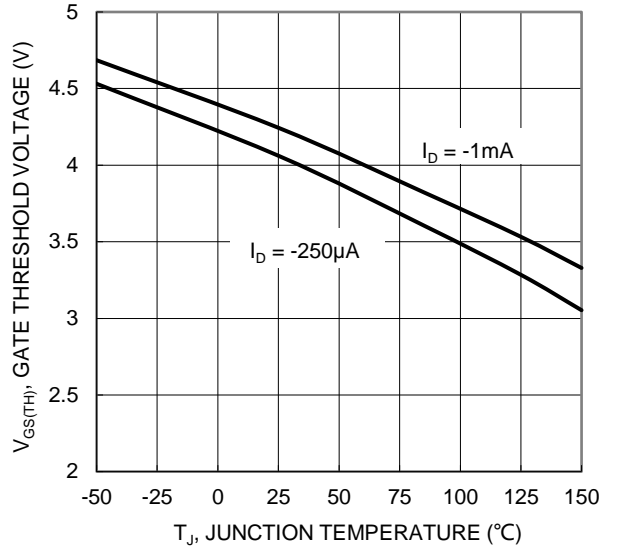


Figure 8. Gate Threshold Variation vs. Junction Temperature

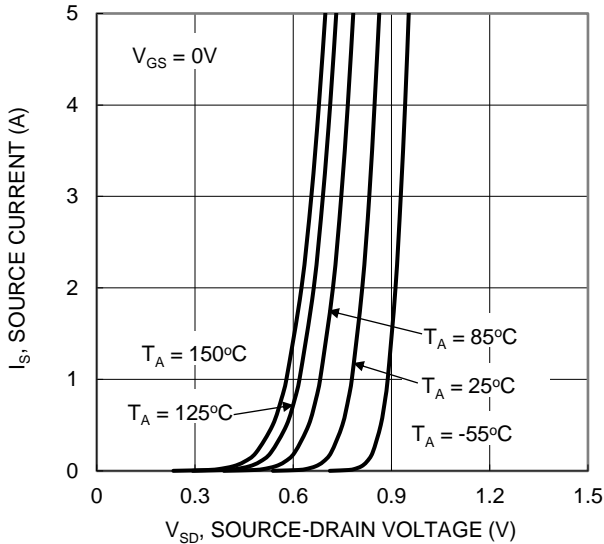


Figure 9. Diode Forward Voltage vs. Current

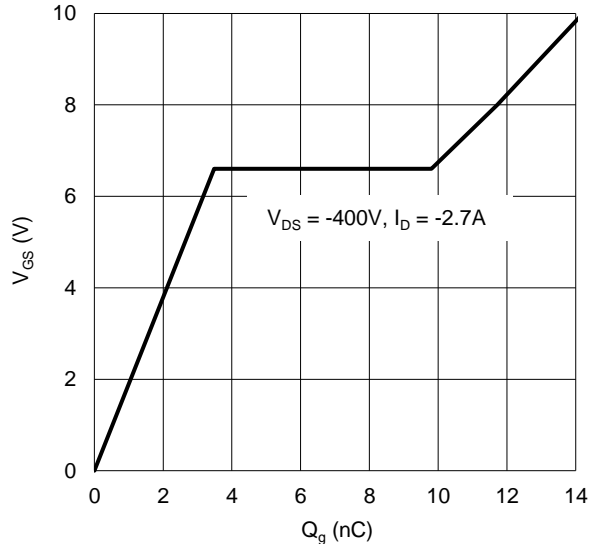


Figure 10. Gate Charge

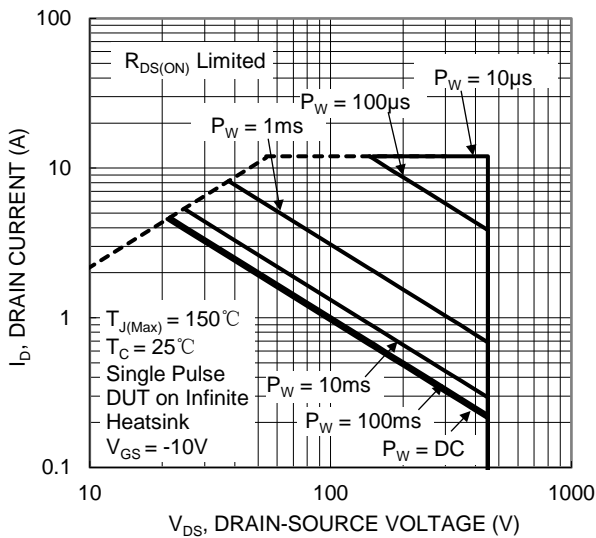


Figure 11. SOA, Safe Operation Area

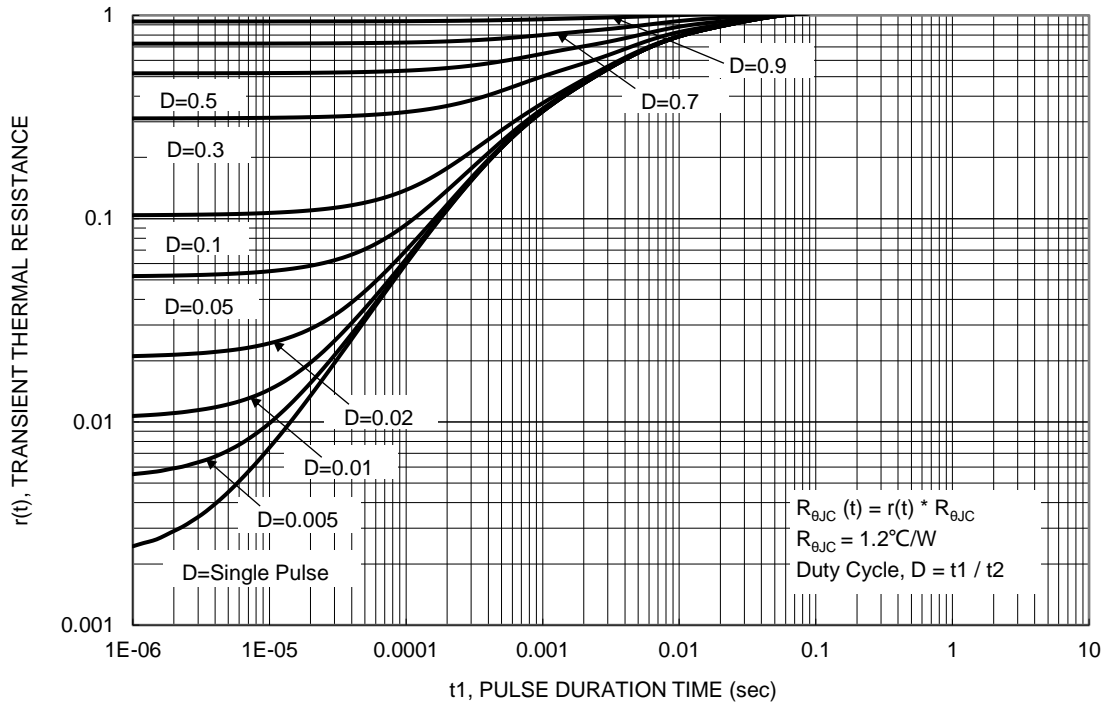
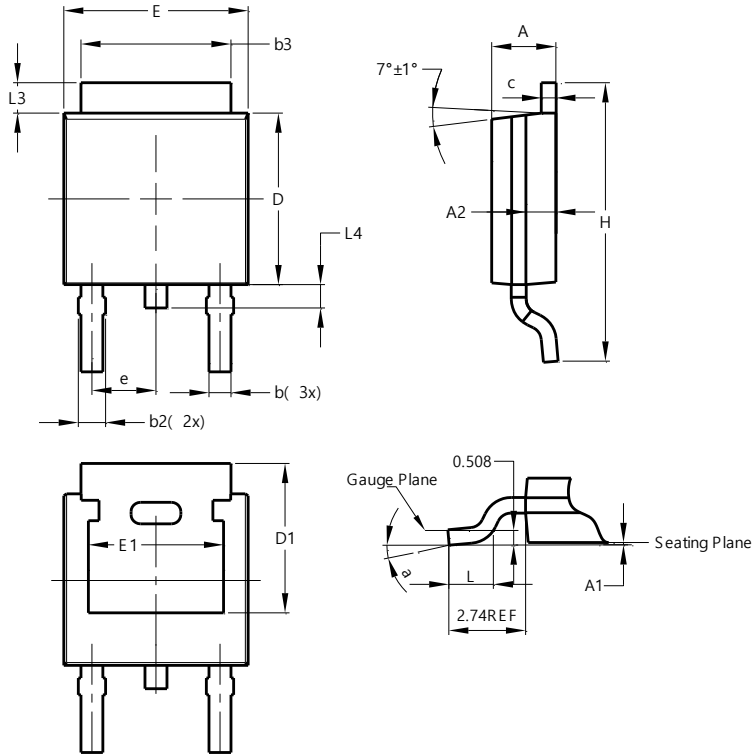


Figure 12. Transient Thermal Resistance

Package Outline Dimensions

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

TO252 (DPAK)

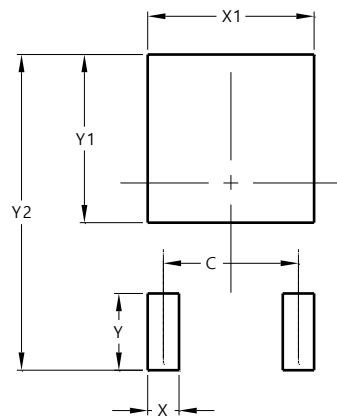


TO252 (DPAK)			
Dim	Min	Max	Typ
A	2.19	2.39	2.29
A1	0.00	0.13	0.08
A2	0.97	1.17	1.07
b	0.64	0.88	0.783
b2	0.76	1.14	0.95
b3	5.21	5.46	5.33
c	0.45	0.58	0.531
D	6.00	6.20	6.10
D1	5.21	-	-
e	-	-	2.286
E	6.45	6.70	6.58
E1	4.32	-	-
H	9.40	10.41	9.91
L	1.40	1.78	1.59
L3	0.88	1.27	1.08
L4	0.64	1.02	0.83
a	0°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