

Product Summary

BV_{DSS}	$R_{DS(ON)}$ Max	I_D $T_C = +25^\circ C$
100V	220m Ω @ $V_{GS} = 10V$	7.5A

Description and Applications

This MOSFET is designed to minimize the on-state resistance ($R_{DS(ON)}$) and yet maintain superior switching performance, making it ideal for high-efficiency power management applications.

- Load Switch

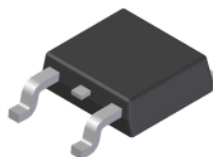
Features and Benefits

- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

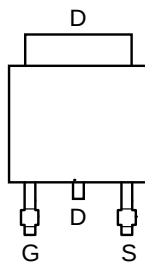
Mechanical Data

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

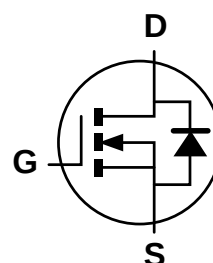
TO252 (DPAK)



Top View



Top View
Pin Out



Internal Schematic

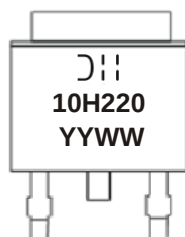
Ordering Information (Note 4)

Part Number	Case	Packaging
DMN10H220LK3-13	TO252 (DPAK)	2,500/Tape & Reel

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
 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

TO252 (DPAK)



 = Manufacturer's Marking
 10H220 = Product Type Marking Code
 YYWW = Date Code Marking
 YY = Last Two Digits of Year (ex: 19 = 2019)
 WW = Week Code (01 to 53)

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

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V _{DSS}	100	V
Gate-Source Voltage	V _{GSS}	±20	V
Continuous Drain Current (Note 5) V _{GS} = 10V	I _D	T _C = +25°C 7.5 T _C = +100°C 4.7	A
Maximum Body Diode Forward Current (Note 6)	I _S	1.5	A
Pulsed Drain Current (10μs Pulse, Duty Cycle = 1%)	I _{DM}	30	A
Pulsed Source Current (10μs Pulse, Duty Cycle = 1%)	I _{SM}	30	A
Avalanche Current	I _{AS}	L = 0.1mH 4.7	A
Avalanche Energy	E _{AS}	L = 0.1mH 1.1	mJ

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

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	P _D	T _C = +25°C 18.7 T _C = +100°C 7.5	W
Thermal Resistance, Junction to Ambient (Note 6)	R _{θJA}	92	°C/W
Thermal Resistance, Junction to Case (Note 5)	R _{θJC}	6.7	°C/W
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}	100	—	—	V	V _{GS} = 0V, I _D = 250μA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	1	μA	V _{DS} = 100V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	100	nA	V _{GS} = ±20V, V _{DS} = 0V
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	V _{GS(TH)}	1	1.5	2.5	V	V _{DS} = V _{GS} , I _D = 250μA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	179	220	mΩ	V _{GS} = 10V, I _D = 2A
		—	228	250	mΩ	V _{GS} = 4.5V, I _D = 1A
Diode Forward Voltage	V _{SD}	—	0.8	1.3	V	V _{GS} = 0V, I _S = 2A
DYNAMIC CHARACTERISTICS (Note 7)						
Input Capacitance	C _{iss}	—	384	—	pF	V _{DS} = 25V, f = 1MHz, V _{GS} = 0V
Output Capacitance	C _{oss}	—	23	—		
Reverse Transfer Capacitance	C _{rss}	—	17	—		
Gate Resistance	R _G	—	2.4	—	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1MHz
Total Gate Charge (V _{GS} = 4.5V)	Q _g	—	3.7	—	nC	V _{DD} = 50V, I _D = 1.6A
Total Gate Charge (V _{GS} = 10V)	Q _g	—	6.7	—		
Gate-Source Charge	Q _{gs}	—	1.3	—		
Gate-Drain Charge	Q _{gd}	—	2	—		
Turn-On Delay Time	t _{D(ON)}	—	6.2	—	ns	V _{DD} = 50V, V _{GS} = 4.5V, R _G = 6.8Ω, I _D = 1.0A
Turn-On Rise Time	t _R	—	8.7	—		
Turn-Off Delay Time	t _{D(OFF)}	—	7.4	—		
Turn-Off Fall Time	t _F	—	4.2	—		
Body Diode Reverse Recovery Time	t _{RR}	—	20	—	ns	I _S = 1.1A, dI/dt = 100A/μs
Body Diode Reverse Recovery Charge	Q _{RR}	—	11	—	nC	

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

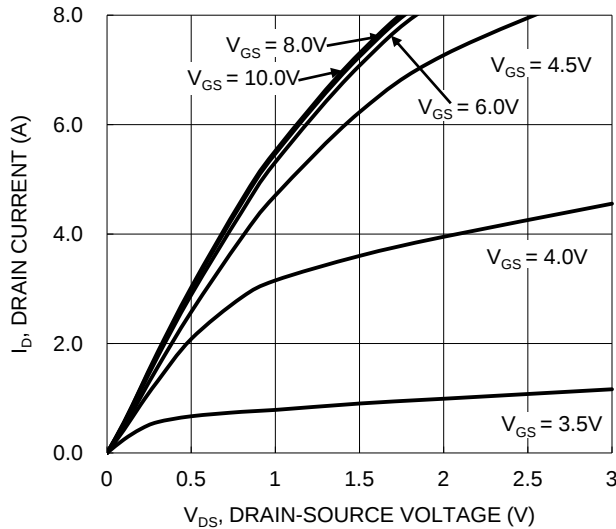


Figure 1. Typical Output Characteristic

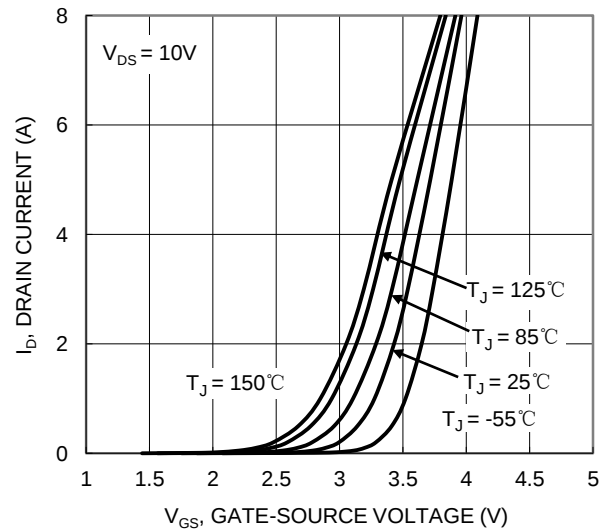


Figure 2. Typical Transfer Characteristic

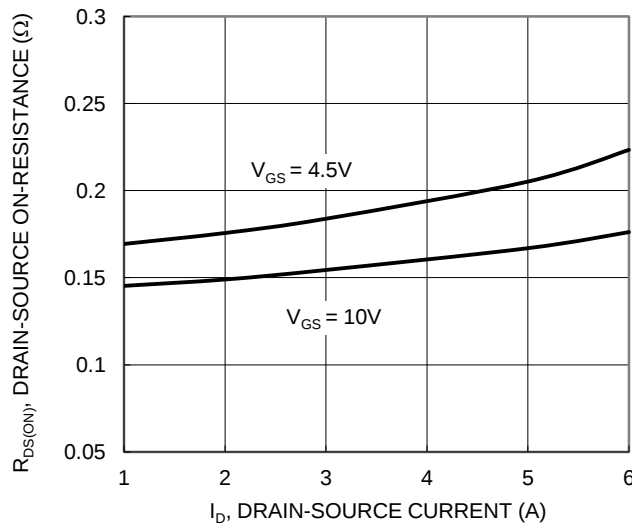


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

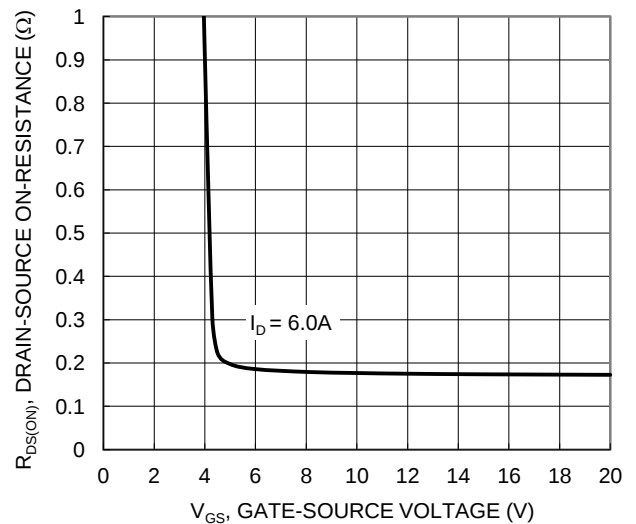


Figure 4. Typical Transfer Characteristic

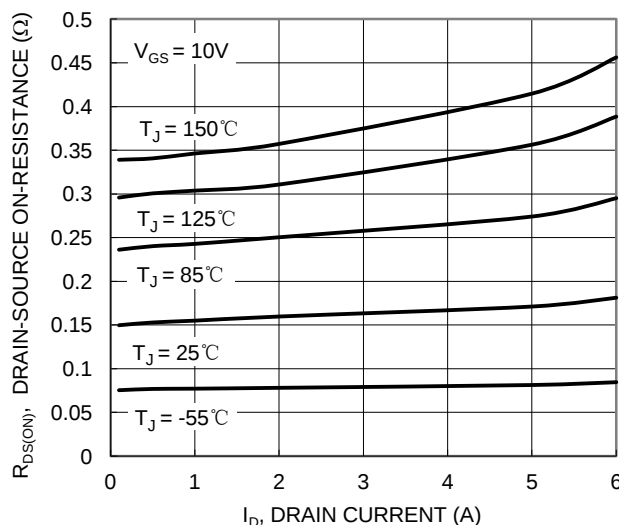


Figure 5. Typical On-Resistance vs. Drain Current and Junction Temperature

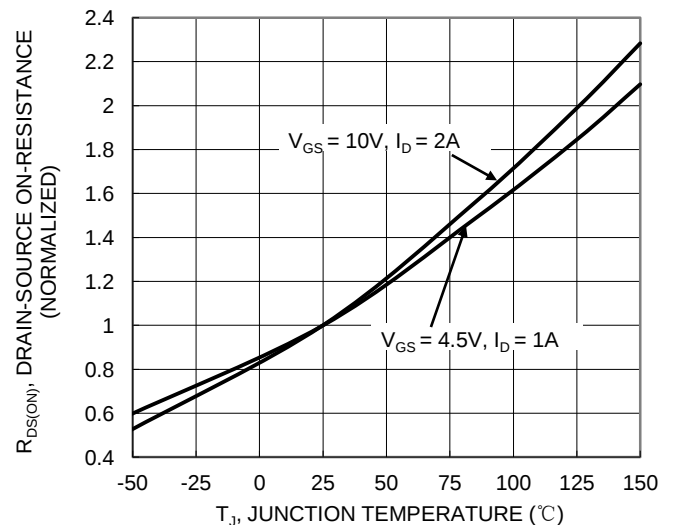


Figure 6. On-Resistance Variation with Junction Temperature

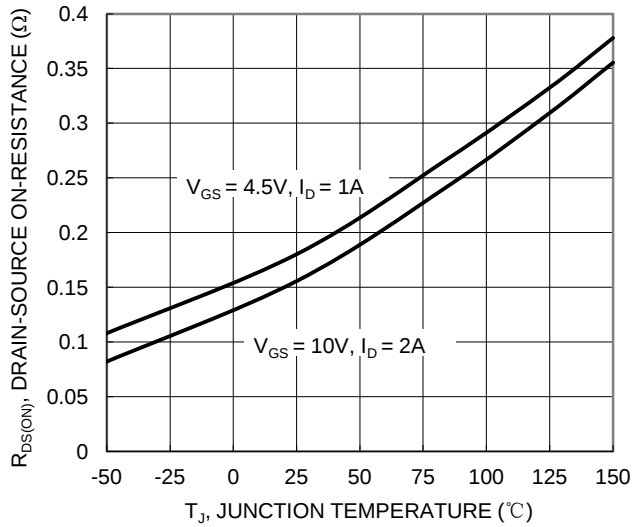


Figure 7. On-Resistance Variation with Junction Temperature

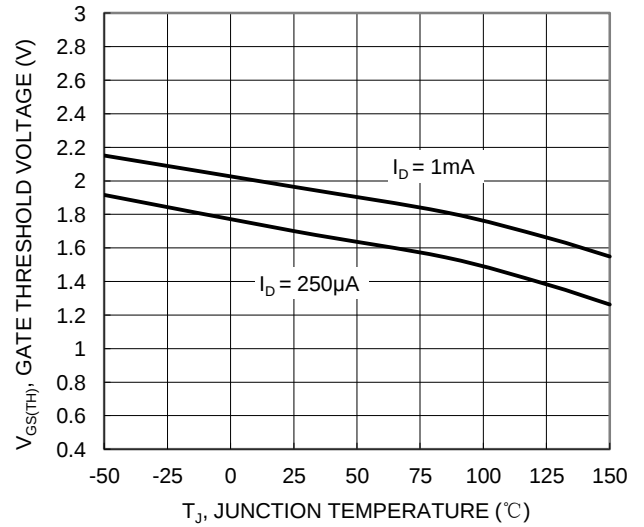


Figure 8. Gate Threshold Variation vs. Junction Temperature

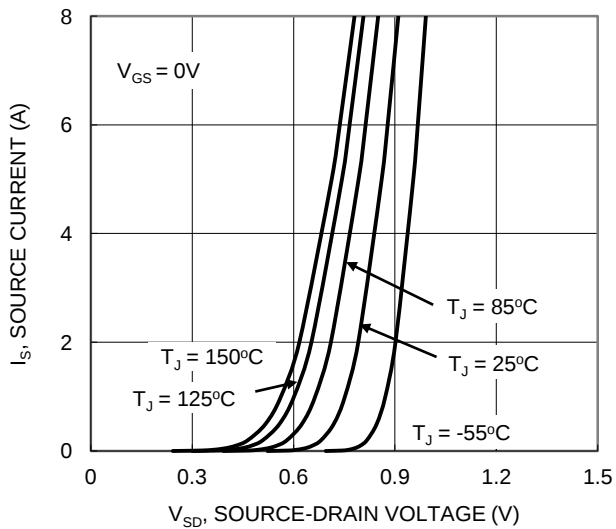


Figure 9. Diode Forward Voltage vs. Current

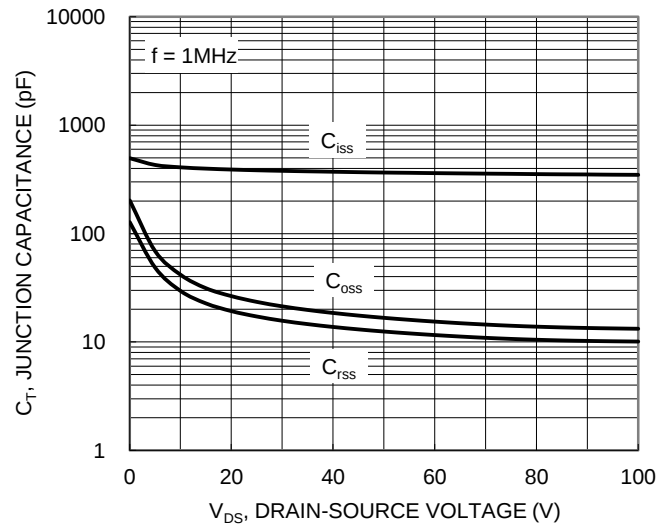


Figure 10. Typical Junction Capacitance

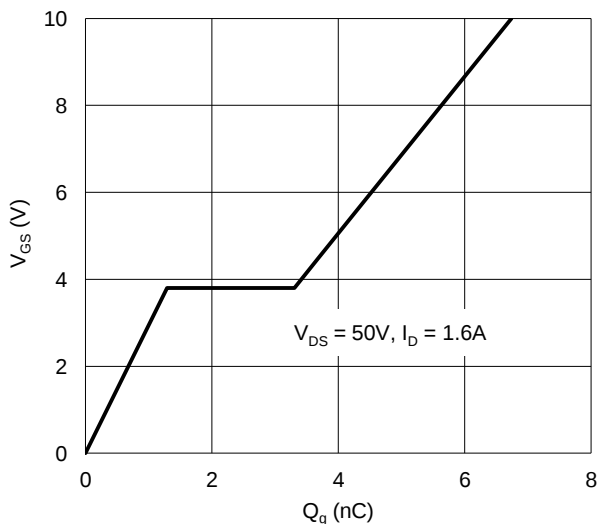


Figure 11. Gate Charge

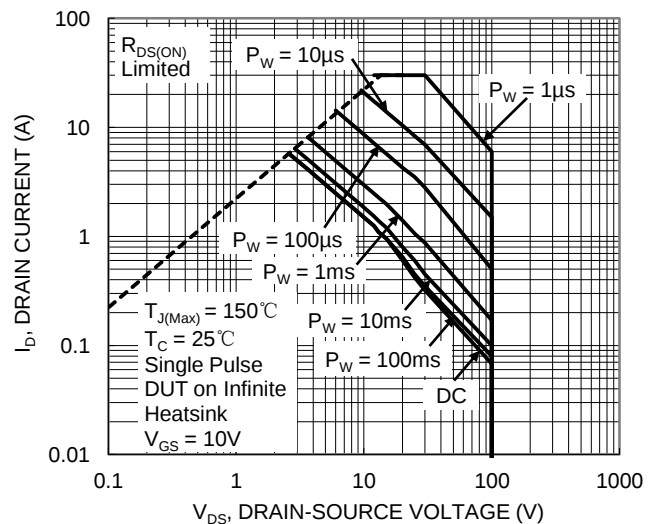


Figure 12. SOA, Safe Operation Area

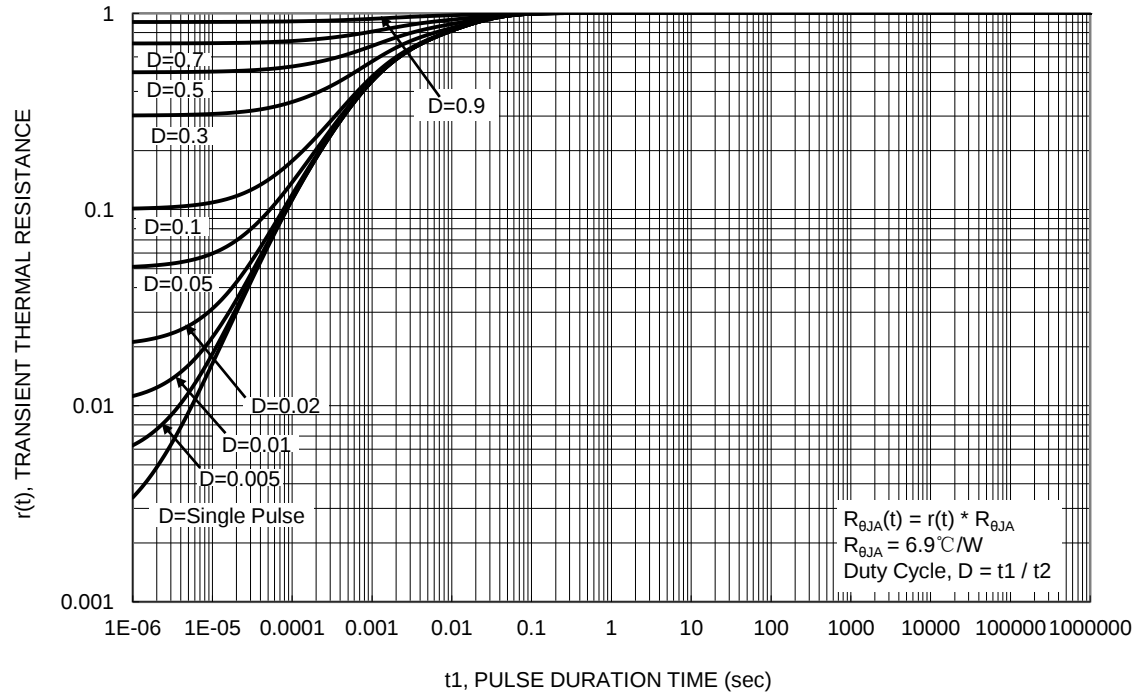
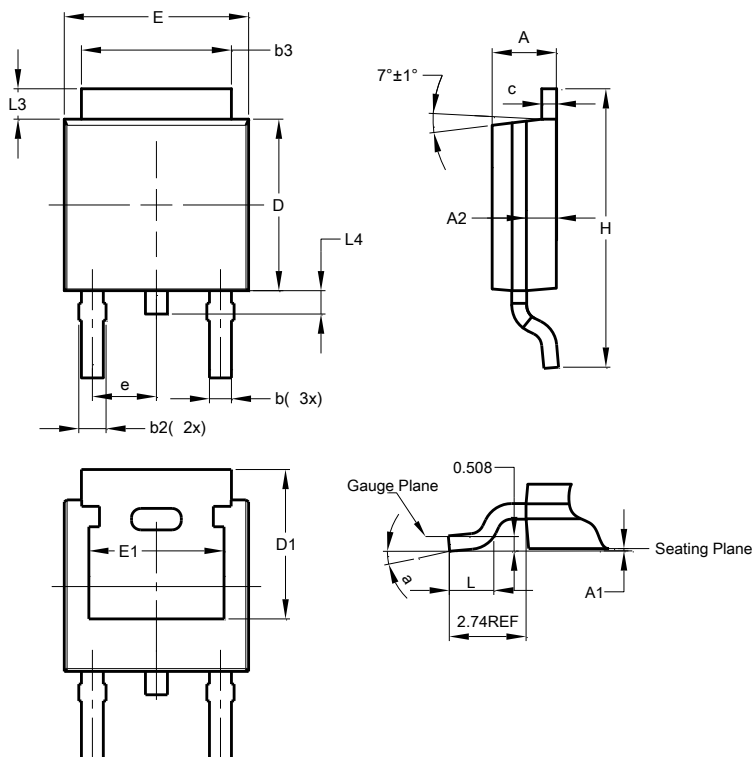


Figure 13. Transient Thermal Resistance

Package Outline Dimensions

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

TO252 (DPAK)

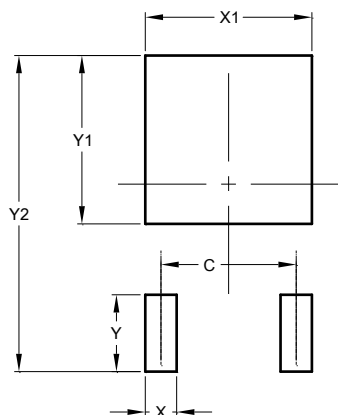


TO252 (DPAK)			
Dim	Min	Max	Typ
A	2.19	2.39	2.29
A1	0.00	0.13	0.08
A2	0.97	1.17	1.07
b	0.64	0.88	0.783
b2	0.76	1.14	0.95
b3	5.21	5.46	5.33
c	0.45	0.58	0.531
D	6.00	6.20	6.10
D1	5.21	-	-
e	-	-	2.286
E	6.45	6.70	6.58
E1	4.32	-	-
H	9.40	10.41	9.91
L	1.40	1.78	1.59
L3	0.88	1.27	1.08
L4	0.64	1.02	0.83
a	0°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