

100V N-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

BV _{DSS}	R _{DS(ON)} max	I _D T _C = +25°C
100V	80mΩ @ V _{GS} = 10V	18A
	100mΩ @ V _{GS} = 4.5V	16A

Description

This new generation MOSFET features low on-resistance and fast switching, making it ideal for high efficiency power management applications.

Applications

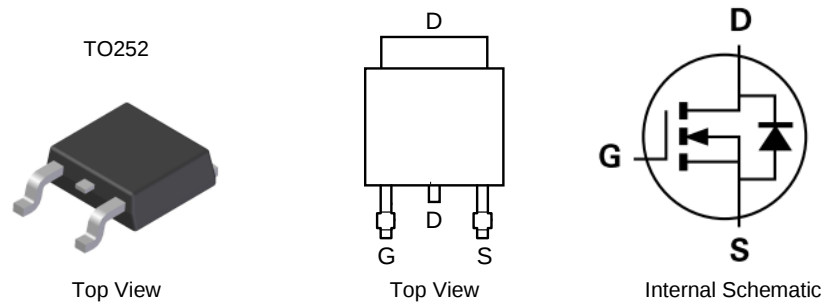
- Power Management Functions
- DC-DC Converters

Features

- Low R_{DS(ON)} – ensures on state losses are minimized
- Small form factor thermally efficient package enables higher density end products
- **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 208^③
- Weight: 0.33 grams (Approximate)

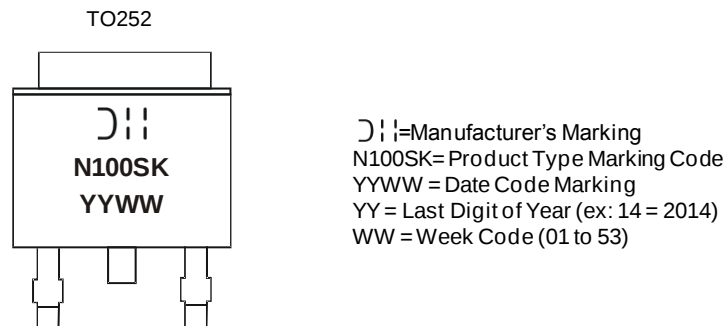


Ordering Information (Note 4)

Part Number	Case	Packaging
DMN10H100SK3-13	TO252	2,500/Tape & Reel

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
 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. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

Marking Information



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

Characteristic	Symbol	Value	Units
Drain-Source Voltage	V _{DSS}	100	V
Gate-Source Voltage	V _{GSS}	±20	V
Continuous Drain Current (Note 6) V _{GS} = 10V	I _D	18 14	A
Pulsed Drain Current (380μs Pulse, Duty Cycle = 1%)	I _{DM}	16	A
Avalanche Current, L = 1mH (Note 7)	I _{AS}	8	A
Avalanche Energy, L = 1mH (Note 7)	E _{AS}	32.6	mJ

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

Characteristic	Symbol	Value	Units
Total Power Dissipation (Note 6)	P _D	37 24	W
Thermal Resistance, Junction to Ambient (Note 5)	R _{θJA}	46	°C/W
Thermal Resistance, Junction to Case (Note 6)	R _{θJC}	3.3	°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} = 80V, 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)}	1.0	2.0	3.0	V	V _{DS} = V _{GS} , I _D = 250μA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	65 70	80 100	mΩ	V _{GS} = 10V, I _D = 3.3A V _{GS} = 4.5V, I _D = 2A
Diode Forward Voltage	V _{SD}	—	0.77	—	V	V _{GS} = 0V, I _S = 3.2A
DYNAMIC CHARACTERISTICS (Note 7)						
Input Capacitance	C _{iss}	—	1172	—	pF	V _{DS} = 50V, V _{GS} = 0V, f = 1MHz
Output Capacitance	C _{oss}	—	40.8	—		
Reverse Transfer Capacitance	C _{rss}	—	31.3	—		
Gate Resistance	R _G	—	1.6	—	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1MHz
Total Gate Charge (V _{GS} = 10V)	Q _g	—	25.2	—	nC	V _{DS} = 50V, I _D = 3.3A
Total Gate Charge (V _{GS} = 4.5V)	Q _g	—	12.2	—		
Gate-Source Charge	Q _{gs}	—	5.3	—		
Gate-Drain Charge	Q _{gd}	—	5.9	—		
Turn-On Delay Time	t _{D(ON)}	—	5.4	—	ns	V _{DD} = 50V, R _G = 6.0Ω, I _D = 3.3A
Turn-On Rise Time	t _r	—	5.9	—		
Turn-Off Delay Time	t _{D(OFF)}	—	20	—		
Turn-Off Fall Time	t _f	—	7.3	—		
Body Diode Reverse Recovery Time	t _{RR}	—	19.7	—	ns	I _F = 3.3A, dI/dt = 100A/μs
Body Diode Reverse Recovery Charge	Q _{rr}	—	15.9	—	nC	

- Notes: 5. Device mounted on FR-4 substrate PC board, 2oz copper, with 1-inch square copper plate.
6. Device mounted on infinite heatsink.
7. Guaranteed by design. Not subject to product testing.
8. Short duration pulse test used to minimize self-heating effect.

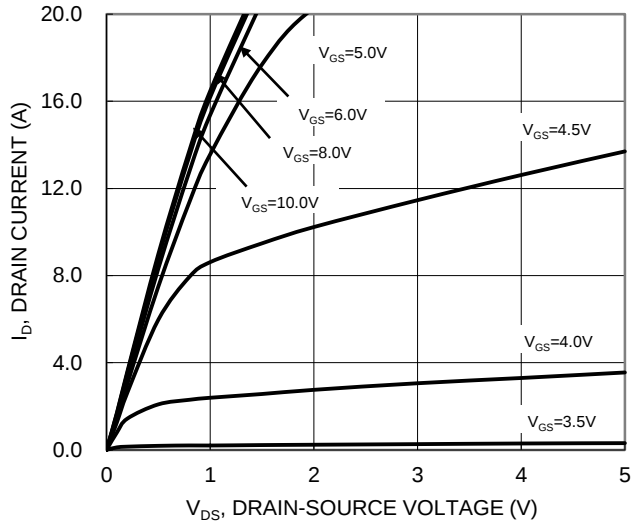


Figure 1. Typical Output Characteristic

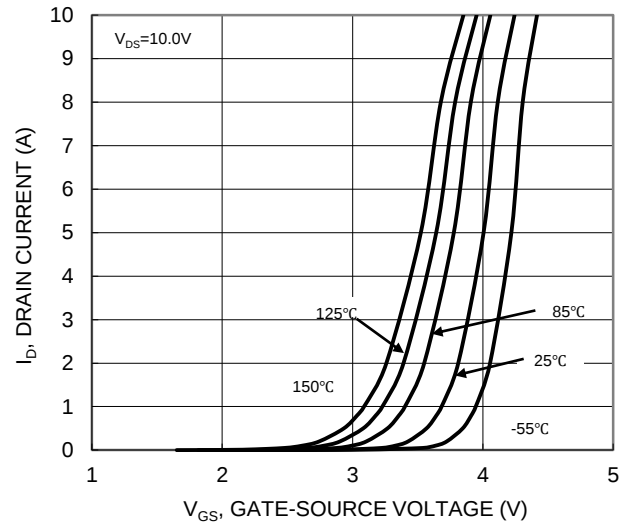


Figure 2. Typical Transfer Characteristic

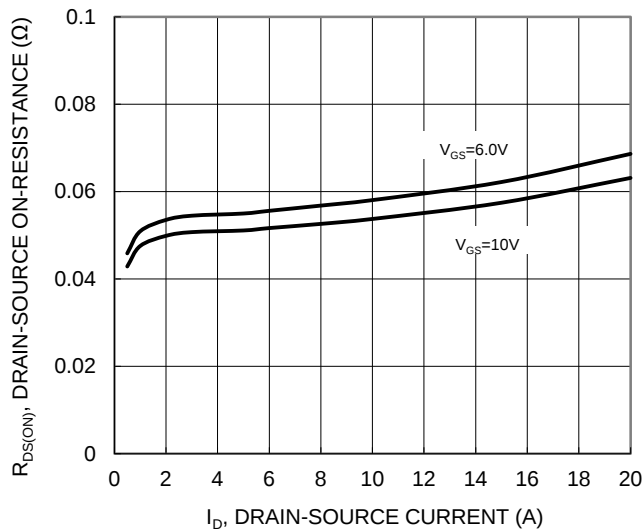


Figure 3. Typical On-Resistance vs Drain Current and Gate Voltage

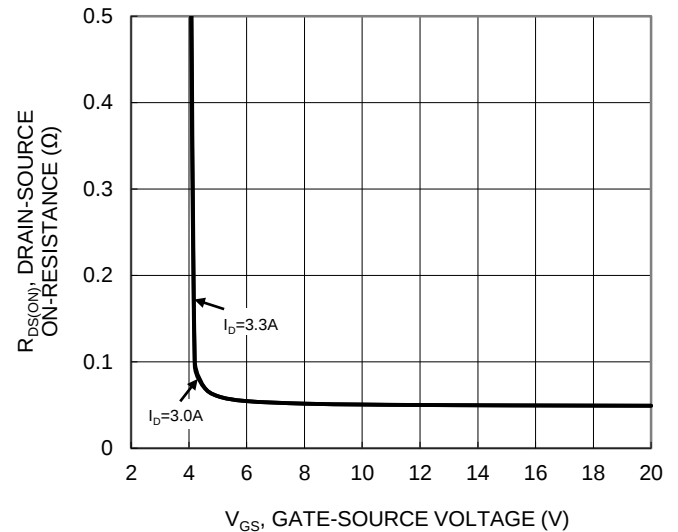


Figure 4. Typical Transfer Characteristic

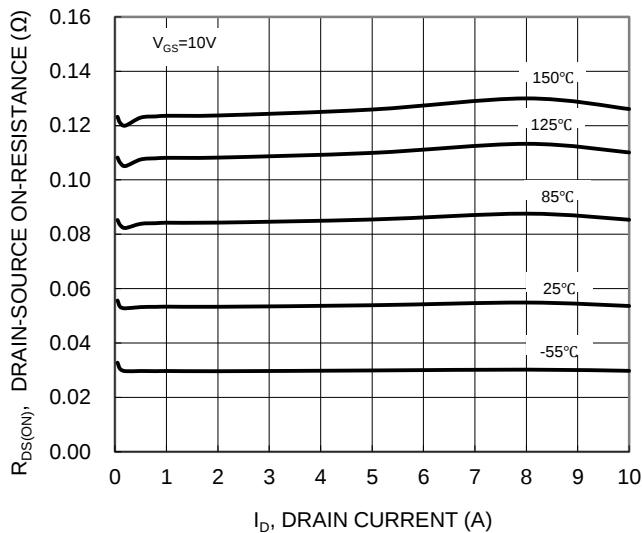


Figure 5. Typical On-Resistance vs Drain Current and Temperature

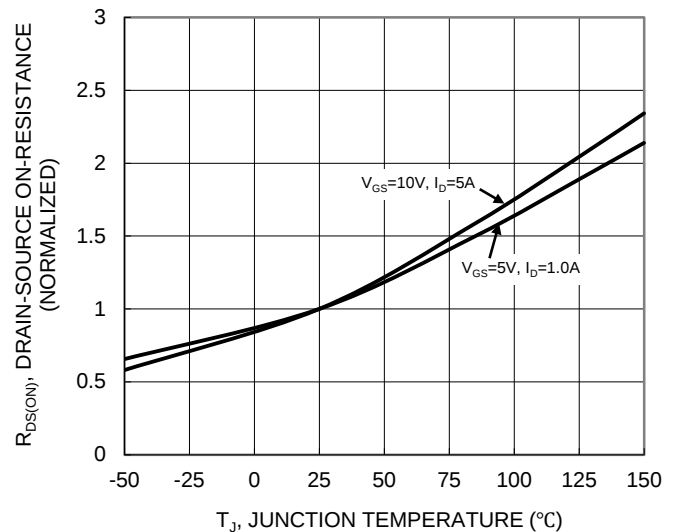
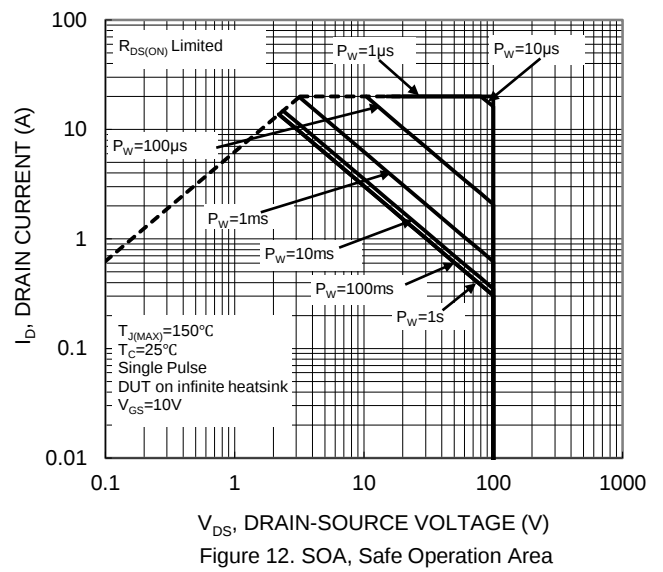
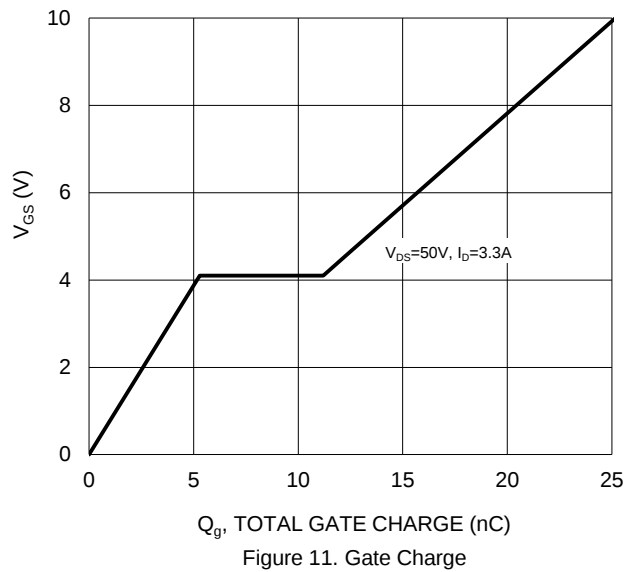
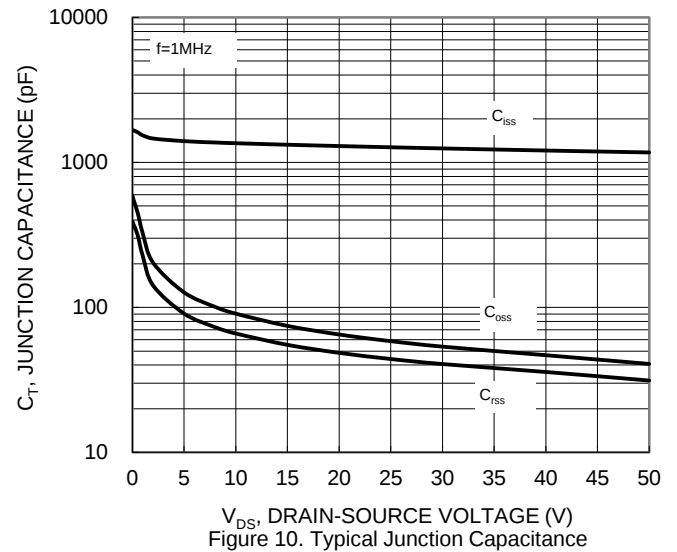
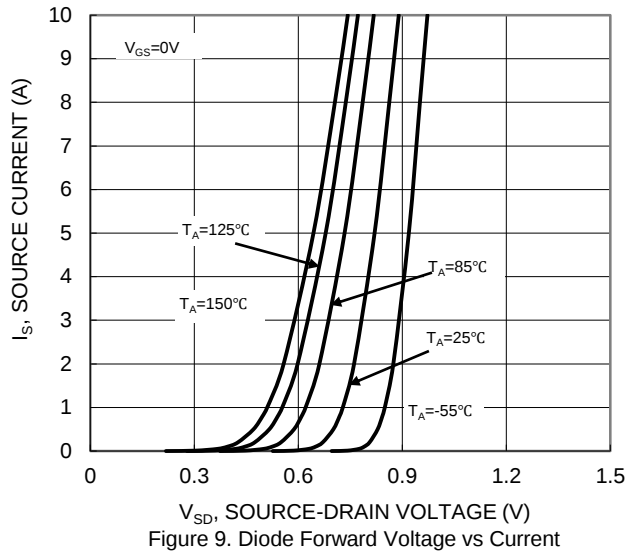
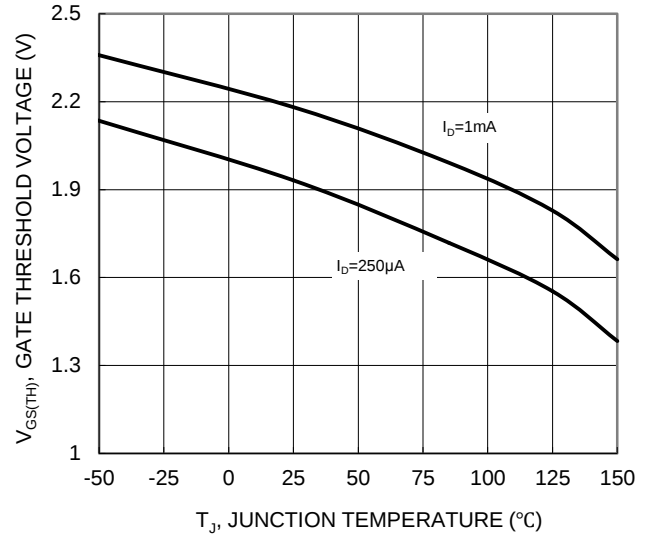
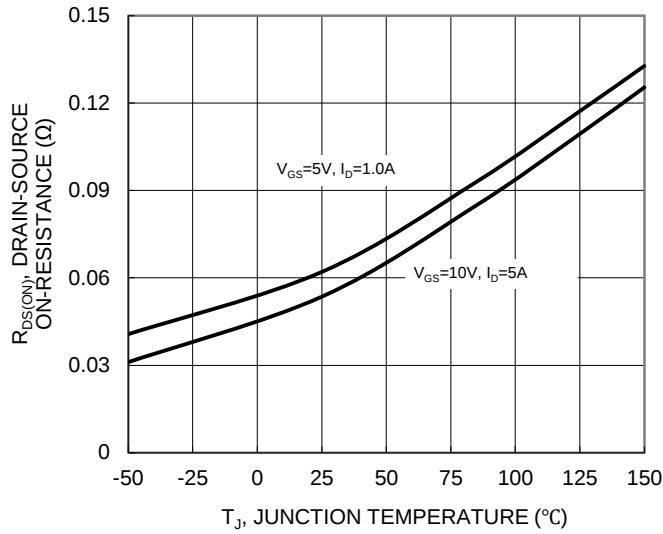


Figure 6. On-Resistance Variation with Temperature



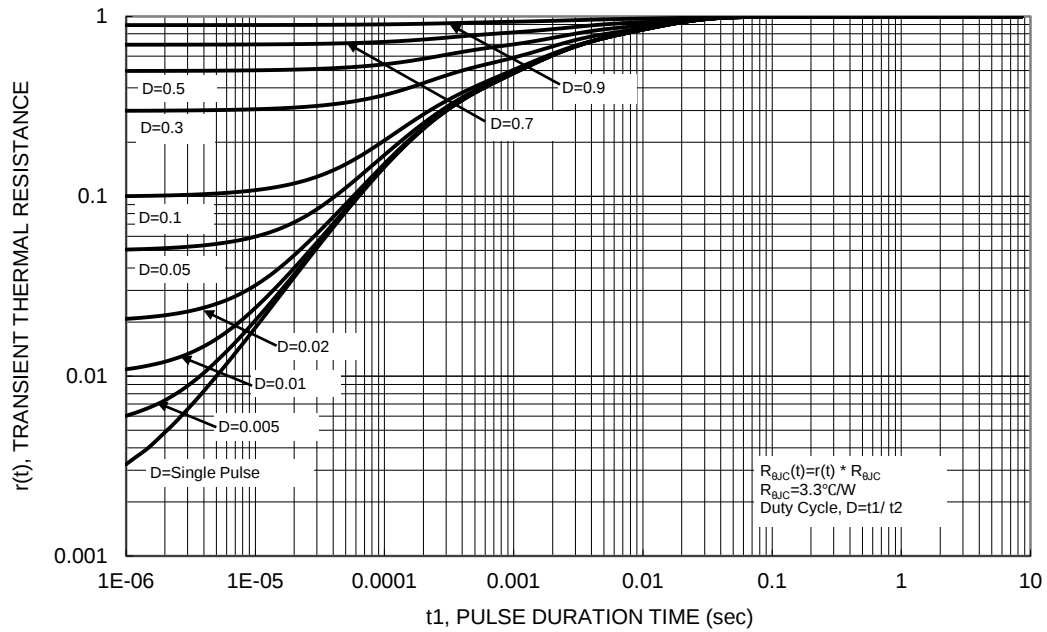
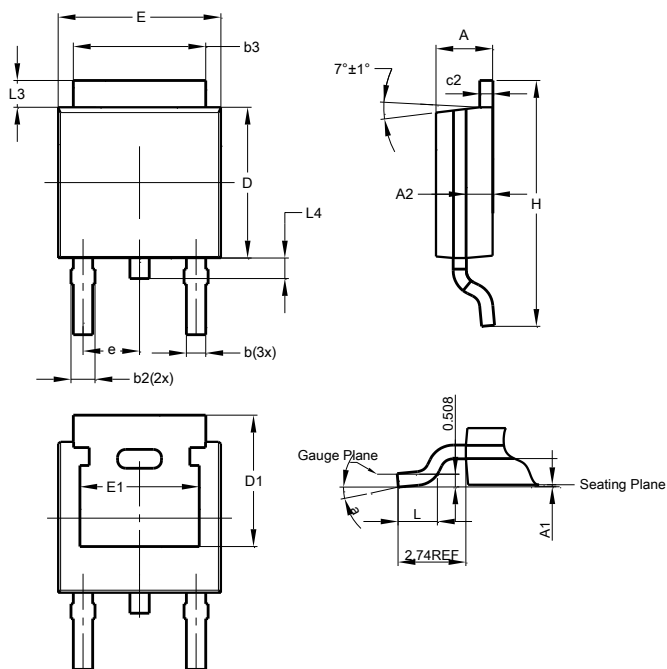


Figure 13. Transient Thermal Resistance

Package Outline Dimensions

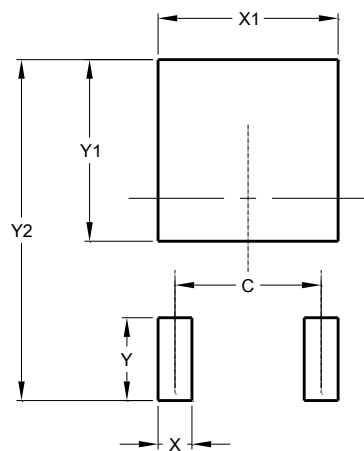
Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.



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
c2	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 AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.



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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