

## Product Summary

$V_{(BR)DSS}$	$R_{DS(on) \max}$	$I_D$ $T_C = +25^\circ C$
100V	80m $\Omega$ @ $V_{GS} = 10V$	17A
	99m $\Omega$ @ $V_{GS} = 6V$	15A

## Description

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

## Applications

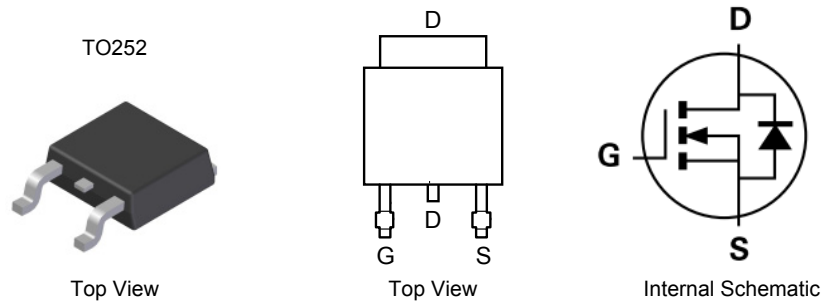
- Power Management Functions
- DC-DC Converters

## Features

- Low  $R_{DS(ON)}$  – ensures on state losses are minimized
- Small form factor thermally efficient package enables higher density end products
- **Lead-Free Finish; RoHS compliant (Note 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

## 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: Finish – Matte Tin annealed over Copper leadframe  
Solderable per MIL-STD-202, Method 208  $\text{\textcircled{E}}$
- Weight: 0.33 grams (approximate)

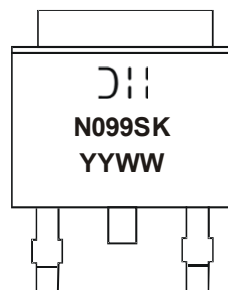


## Ordering Information (Note 4)

Part Number	Case	Packaging
DMN10H099SK3-13	TO252	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](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



$\text{\textcircled{D}}$  = Manufacturer's Marking  
 N099SK = Product Type Marking Code  
 YYWW = Date Code Marking  
 YY = Last Digit of Year (ex: 14 = 2014)  
 WW = Week Code (01 to 53)

**Maximum Ratings** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Characteristic	Symbol	Value	Units	
Drain-Source Voltage	$V_{DSS}$	100	V	
Gate-Source Voltage	$V_{GSS}$	$\pm 20$	V	
Continuous Drain Current (Note 5) $V_{GS} = 10\text{V}$		$T_C = +25^\circ\text{C}$	17	A
		$T_C = +70^\circ\text{C}$	13	A
Pulsed Drain Current (10 $\mu\text{s}$ pulse, duty cycle = 1%)	$I_{DM}$	20	A	
Avalanche Current, L = 1mH	$I_{AS}$	7.5	A	
Avalanche Energy, L = 1mH	$E_{AS}$	28.5	mJ	

**Thermal Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Characteristic	Symbol	Value	Units	
Total Power Dissipation (Note 5)	$P_D$	$T_C = +25^\circ\text{C}$	34	W
		$T_C = +70^\circ\text{C}$	22	
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	51	$^\circ\text{C/W}$	
Thermal Resistance, Junction to Case (Note 5)	$R_{\theta JC}$	3.6		
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	$^\circ\text{C}$	

**Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 7)</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	100	—	—	V	$V_{GS} = 0\text{V}, I_D = 250\mu\text{A}$
Zero Gate Voltage Drain Current	$I_{DSS}$	—	—	1	$\mu\text{A}$	$V_{DS} = 80\text{V}, V_{GS} = 0\text{V}$
Gate-Source Leakage	$I_{GSS}$	—	—	$\pm 100$	nA	$V_{GS} = \pm 20\text{V}, V_{DS} = 0\text{V}$
<b>ON CHARACTERISTICS (Note 7)</b>						
Gate Threshold Voltage	$V_{GS(th)}$	1.5	2	3	V	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{DS(on)}$	—	67	80	m $\Omega$	$V_{GS} = 10\text{V}, I_D = 3.3\text{A}$
		—	69	99		$V_{GS} = 6\text{V}, I_D = 3\text{A}$
Diode Forward Voltage	$V_{SD}$	—	0.77	—	V	$V_{GS} = 0\text{V}, I_S = 3.2\text{A}$
<b>DYNAMIC CHARACTERISTICS (Note 6)</b>						
Input Capacitance	$C_{iss}$	—	1172	—	pF	$V_{DS} = 50\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$
Output Capacitance	$C_{oss}$	—	40.8	—		
Reverse Transfer Capacitance	$C_{rss}$	—	31.3	—		
Gate Resistance	$R_G$	—	1.6	—	$\Omega$	$V_{DS} = 0\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$
Total Gate Charge ( $V_{GS} = 10\text{V}$ )	$Q_g$	—	25.2	—	nC	$V_{DS} = 50\text{V}, I_D = 3.3\text{A}$
Total Gate Charge ( $V_{GS} = 4.5\text{V}$ )	$Q_g$	—	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	$V_{DD} = 50\text{V}, R_G = 6.0\Omega, I_D = 3.3\text{A}$
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	$I_F = 3.3\text{A}, dI/dt = 100\text{A}/\mu\text{s}$
Body Diode Reverse Recovery Charge	$Q_{rr}$	—	15.9	—	nC	

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

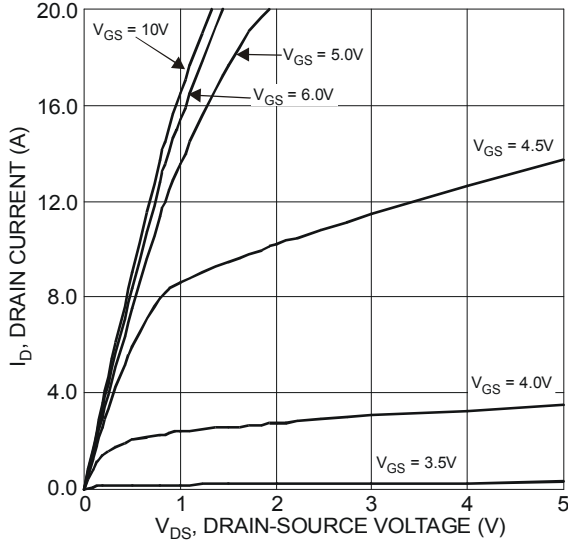


Figure 1 Typical Output Characteristics

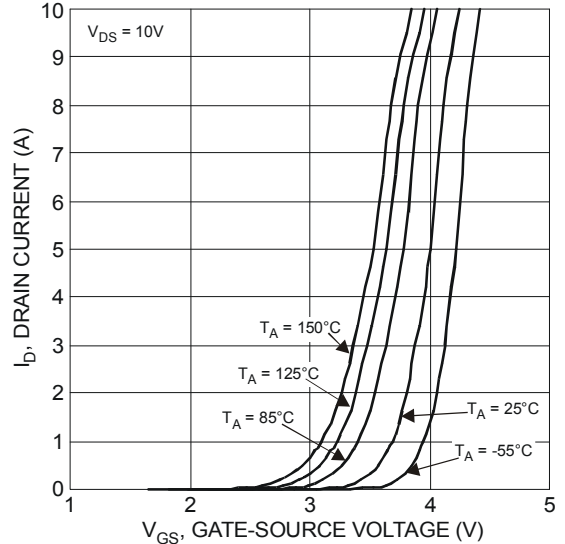


Figure 2 Typical Transfer Characteristics

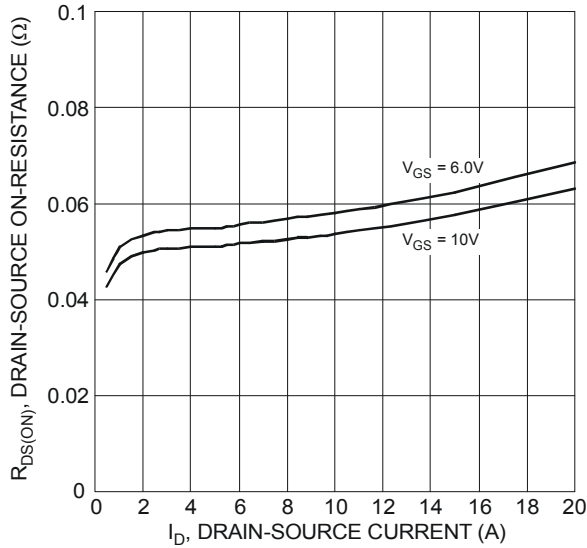


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

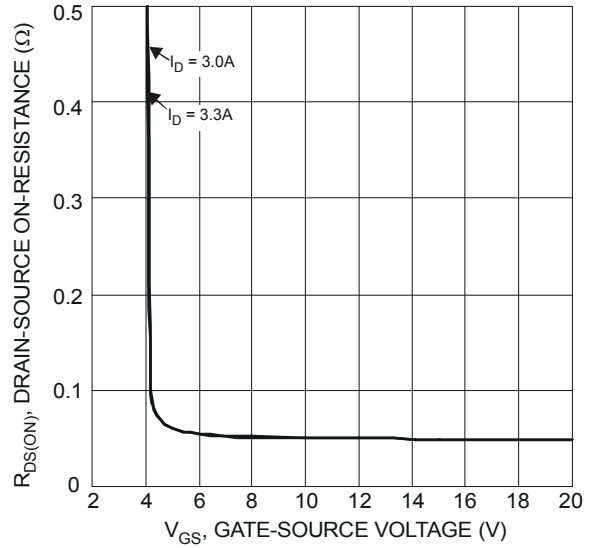


Figure 4 Typical Transfer Characteristics

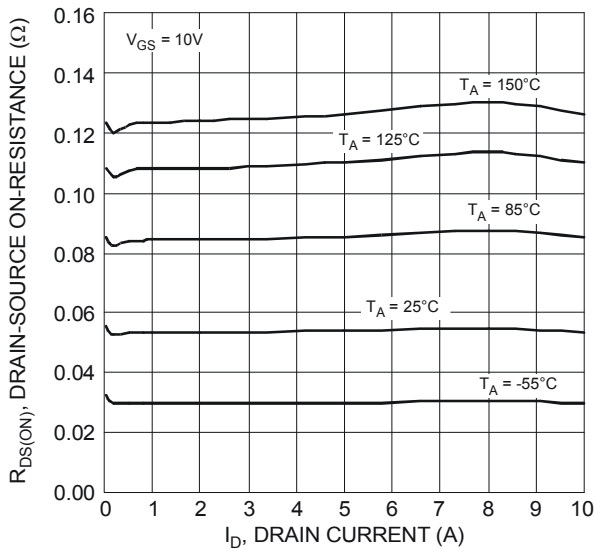


Figure 5 Typical On-Resistance vs. Drain Current and Temperature

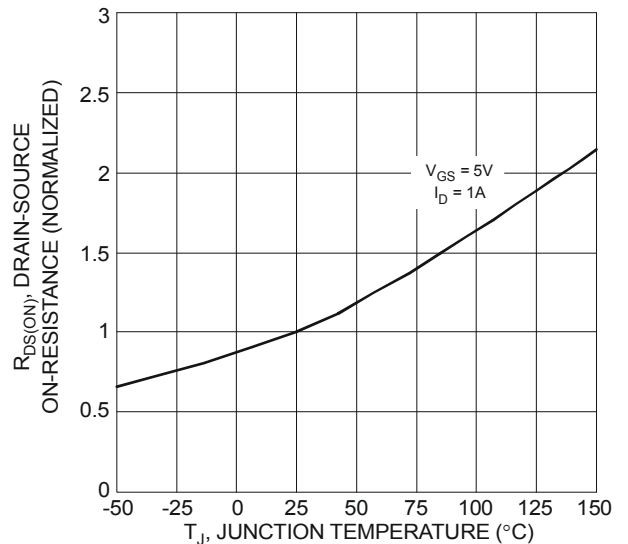


Figure 6 On-Resistance Variation with Temperature

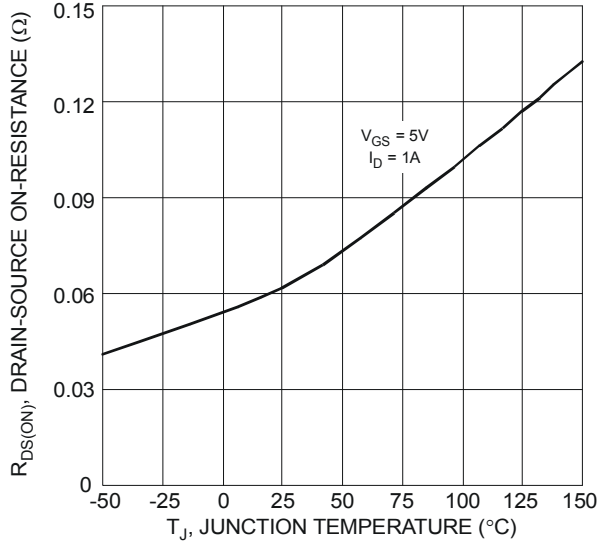


Figure 7 On-Resistance Variation with Temperature

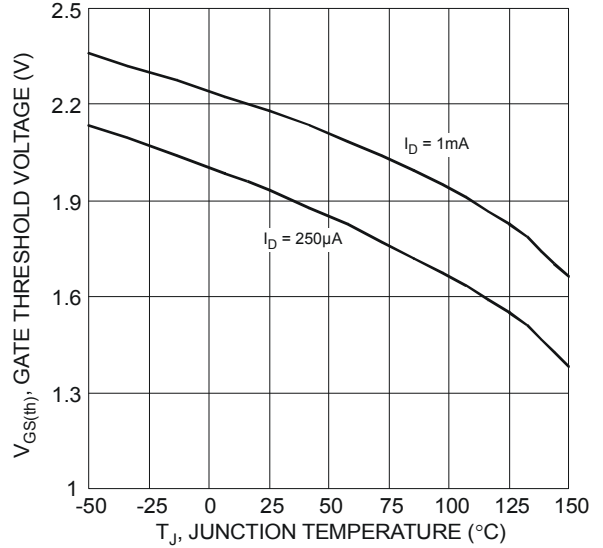


Figure 8 Gate Threshold Variation vs. Ambient Temperature

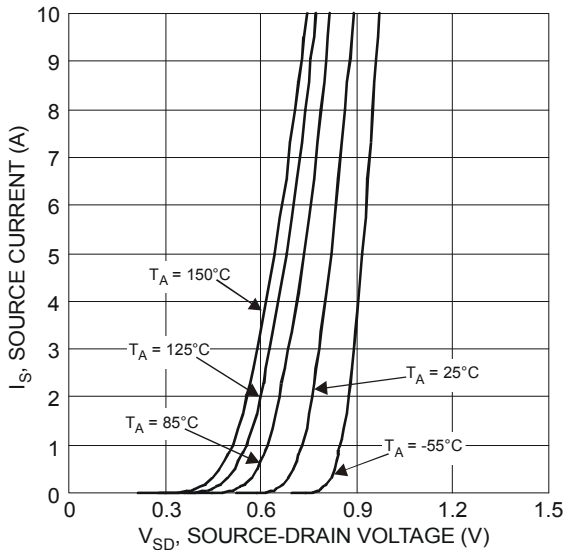


Figure 9 Diode Forward Voltage vs. Current

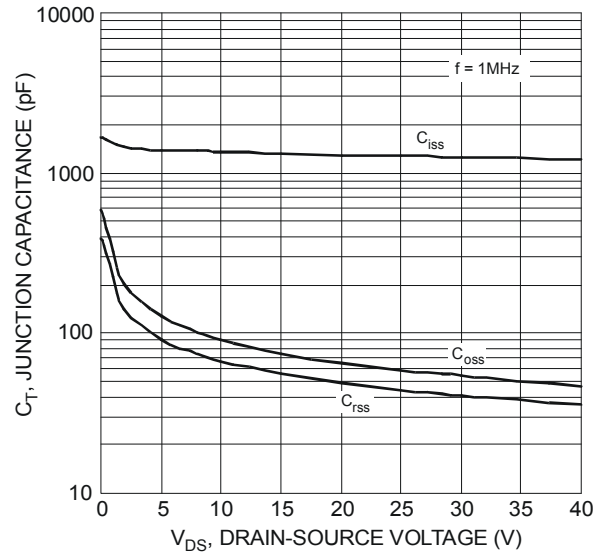


Figure 10 Typical Junction Capacitance

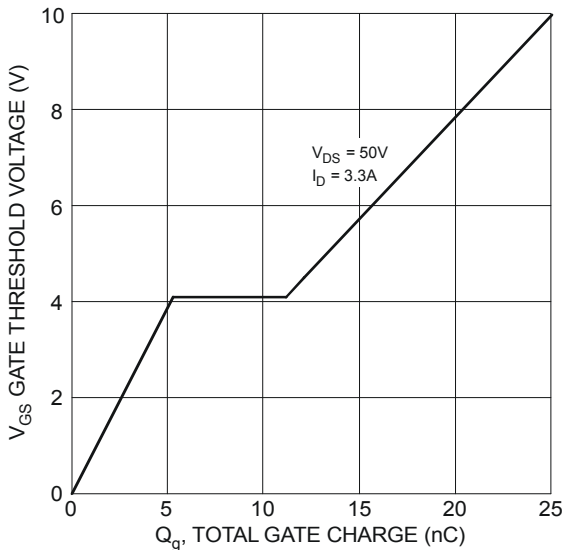


Figure 11 Gate Charge

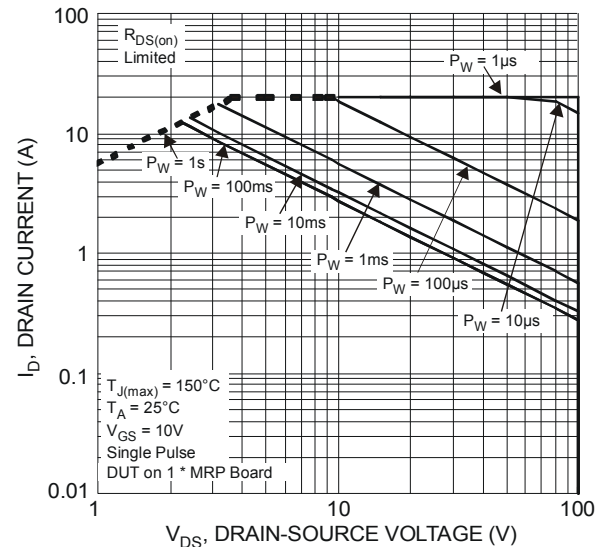
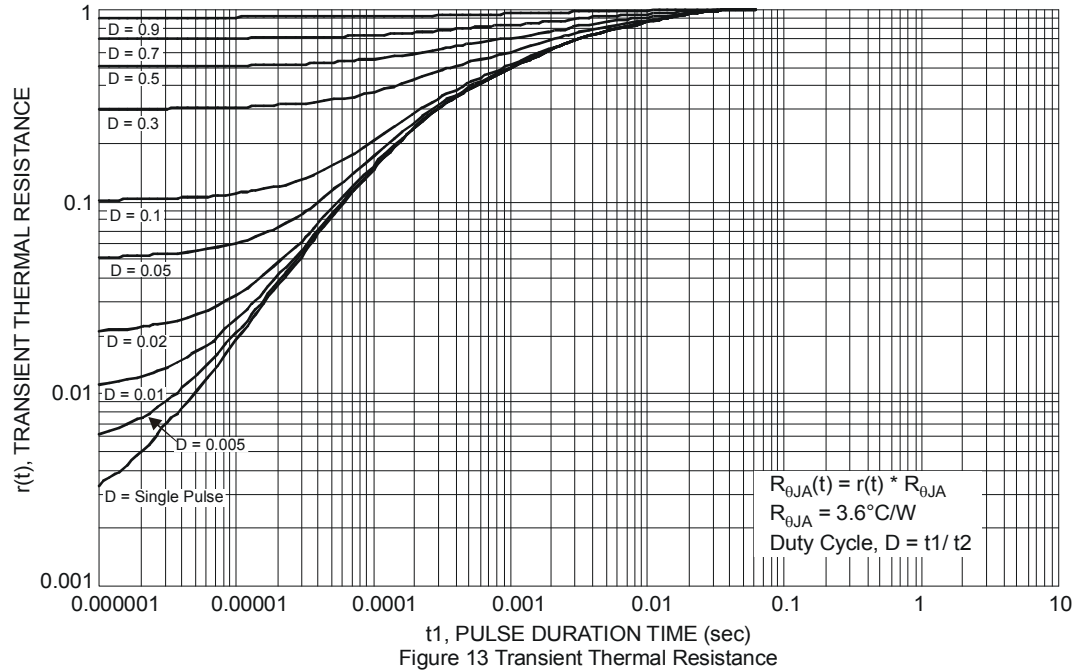
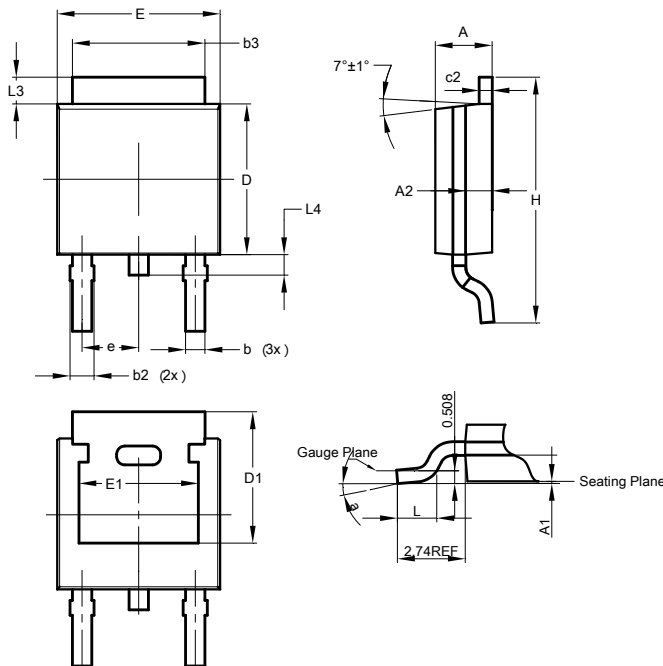


Figure 12 SOA, Safe Operation Area



**Package Outline Dimensions**

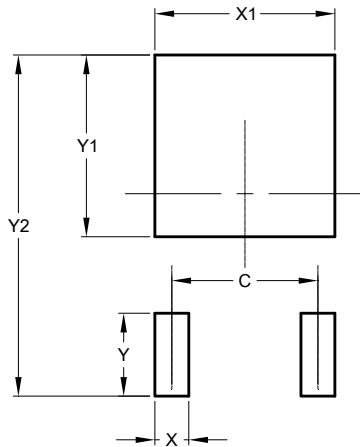
Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for latest version.



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)
<b>C</b>	4.572
<b>X</b>	1.060
<b>X1</b>	5.632
<b>Y</b>	2.600
<b>Y1</b>	5.700
<b>Y2</b>	10.700

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