

## 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

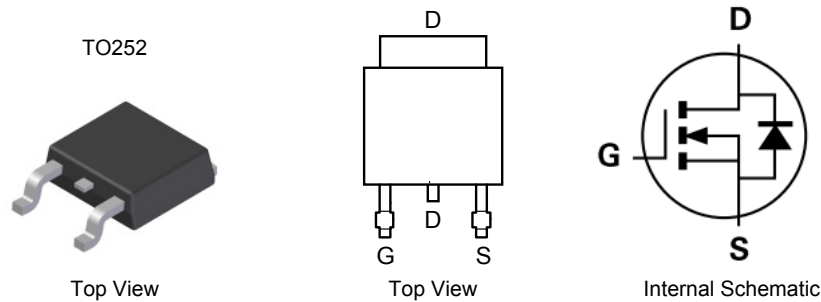
- Power Management Functions
- DC-DC Converters

## 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 **(e3)**
- Weight: 0.33 grams (approximate)

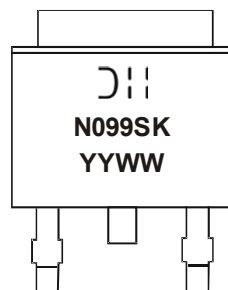


## Ordering Information (Note 4)

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



= 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<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Units
Drain-Source Voltage	V <sub>DSS</sub>	100	V
Gate-Source Voltage	V <sub>GSS</sub>	±20	V
Continuous Drain Current (Note 5) V <sub>GS</sub> = 10V	I <sub>D</sub>	T <sub>C</sub> = +25°C	17
		T <sub>C</sub> = +70°C	13
Pulsed Drain Current (10µs pulse, duty cycle = 1%)	I <sub>DM</sub>	20	A
Avalanche Current, L = 1mH	I <sub>AS</sub>	7.5	A
Avalanche Energy, L = 1mH	E <sub>AS</sub>	28.5	mJ

**Thermal Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Units
Total Power Dissipation (Note 5)	P <sub>D</sub>	T <sub>C</sub> = +25°C	34
		T <sub>C</sub> = +70°C	22
Thermal Resistance, Junction to Ambient (Note 5)	R <sub>θJA</sub>	51	°C/W
Thermal Resistance, Junction to Case (Note 5)	R <sub>θJC</sub>	3.6	
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 7)</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	100	—	—	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250µA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	—	—	1	µA	V <sub>DS</sub> = 80V, V <sub>GS</sub> = 0V
Gate-Source Leakage	I <sub>GSS</sub>	—	—	±100	nA	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS (Note 7)</b>						
Gate Threshold Voltage	V <sub>GS(th)</sub>	1.5	2	3	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250µA
Static Drain-Source On-Resistance	R <sub>DS(on)</sub>	—	67	80	mΩ	V <sub>GS</sub> = 10V, I <sub>D</sub> = 3.3A
		—	69	99		V <sub>GS</sub> = 6V, I <sub>D</sub> = 3A
Diode Forward Voltage	V <sub>SD</sub>	—	0.77	—	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = 3.2A
<b>DYNAMIC CHARACTERISTICS (Note 6)</b>						
Input Capacitance	C <sub>iss</sub>	—	1172	—	pF	V <sub>DS</sub> = 50V, V <sub>GS</sub> = 0V, f = 1MHz
Output Capacitance	C <sub>OSS</sub>	—	40.8	—		
Reverse Transfer Capacitance	C <sub>rss</sub>	—	31.3	—		
Gate Resistance	R <sub>G</sub>	—	1.6	—	Ω	V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1MHz
Total Gate Charge (V <sub>GS</sub> = 10V)	Q <sub>g</sub>	—	25.2	—	nC	V <sub>DS</sub> = 50V, I <sub>D</sub> = 3.3A
Total Gate Charge (V <sub>GS</sub> = 4.5V)	Q <sub>g</sub>	—	12.2	—		
Gate-Source Charge	Q <sub>gs</sub>	—	5.3	—		
Gate-Drain Charge	Q <sub>gd</sub>	—	5.9	—		
Turn-On Delay Time	t <sub>D(on)</sub>	—	5.4	—	ns	V <sub>DD</sub> = 50V, R <sub>G</sub> = 6.0Ω, I <sub>D</sub> = 3.3A
Turn-On Rise Time	t <sub>r</sub>	—	5.9	—		
Turn-Off Delay Time	t <sub>D(off)</sub>	—	20	—		
Turn-Off Fall Time	t <sub>f</sub>	—	7.3	—		
Body Diode Reverse Recovery Time	t <sub>rr</sub>	—	19.7	—	ns	I <sub>F</sub> = 3.3A, dI/dt = 100A/µs
Body Diode Reverse Recovery Charge	Q <sub>rr</sub>	—	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.

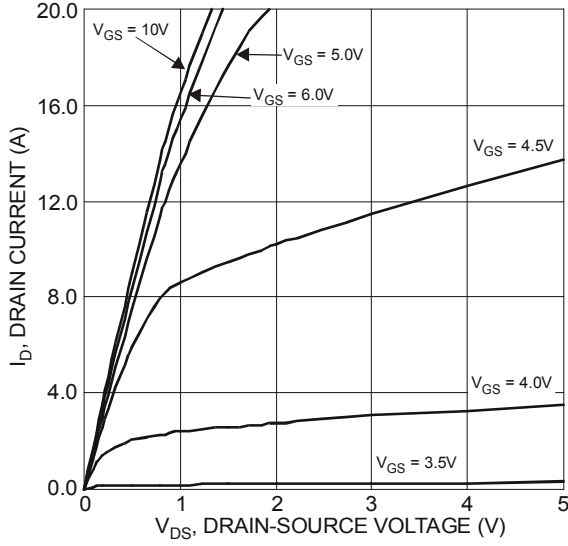


Figure 1 Typical Output Characteristics

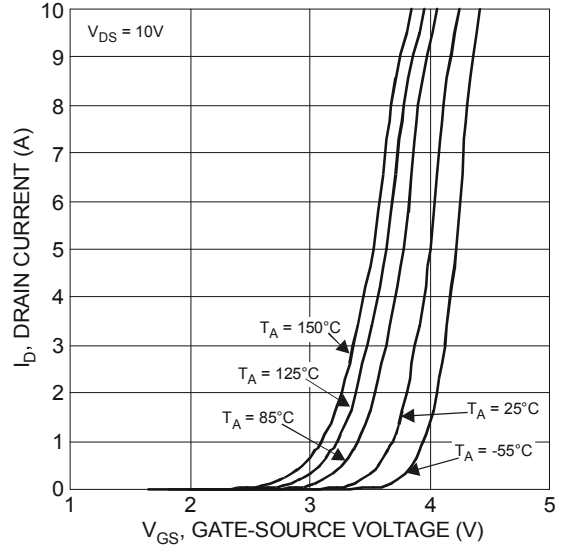


Figure 2 Typical Transfer Characteristics

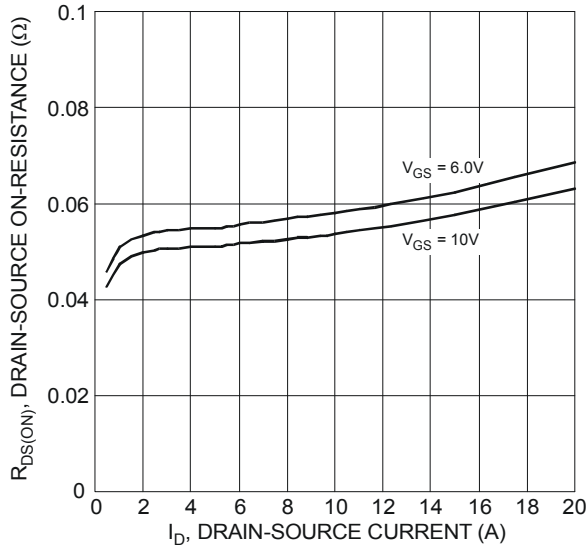


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

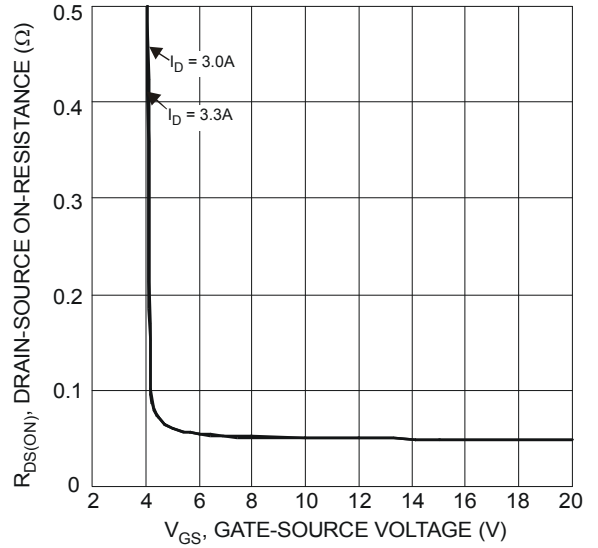


Figure 4 Typical Transfer Characteristics

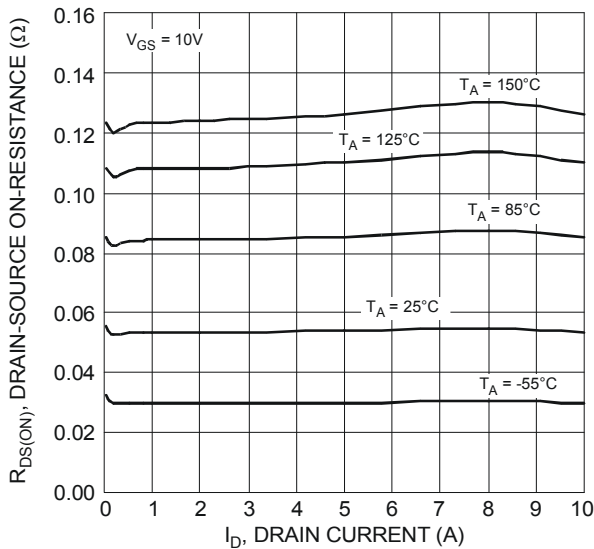


Figure 5 Typical On-Resistance vs. Drain Current and Temperature

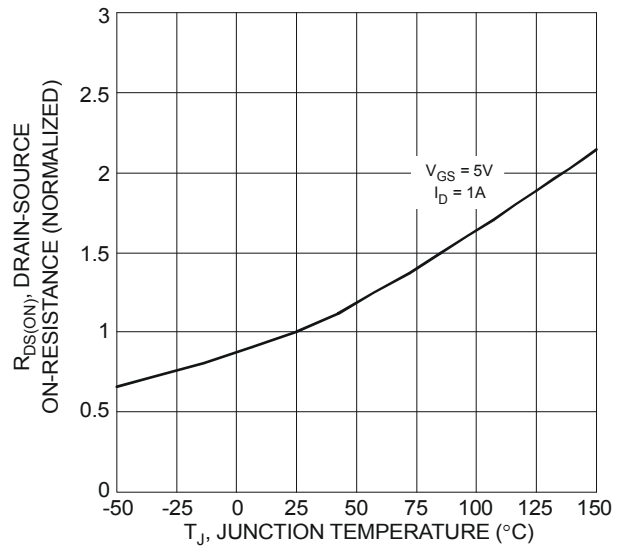


Figure 6 On-Resistance Variation with Temperature

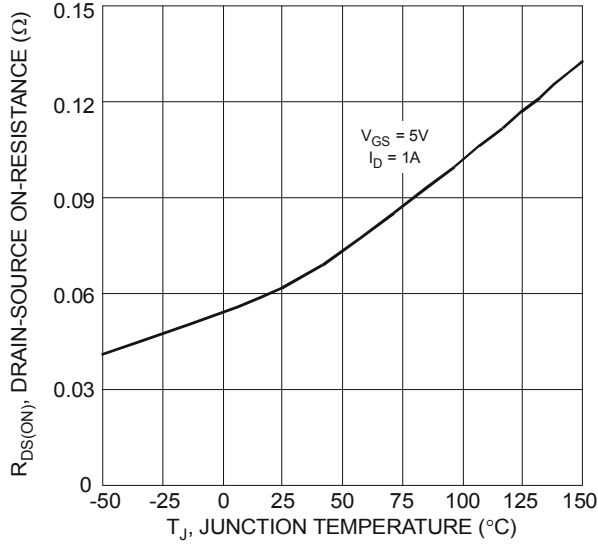


Figure 7 On-Resistance Variation with Temperature

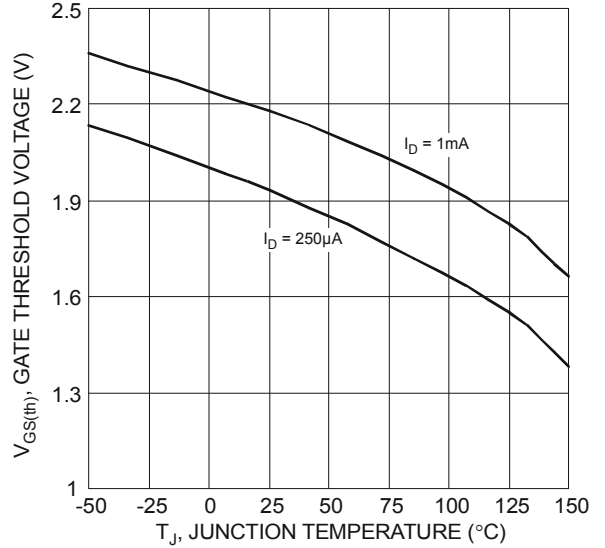


Figure 8 Gate Threshold Variation vs. Ambient Temperature

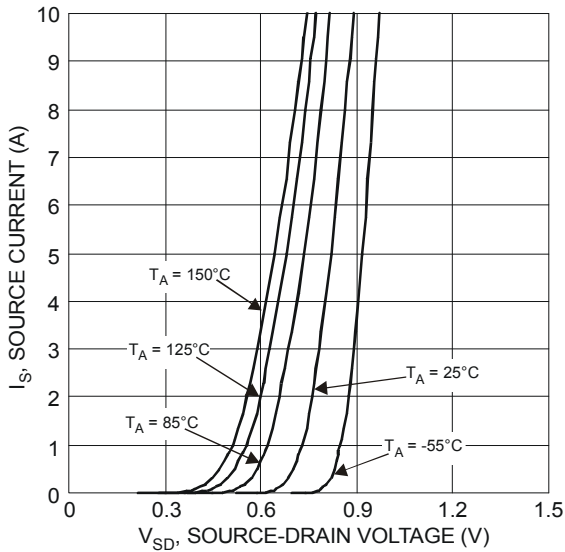


Figure 9 Diode Forward Voltage vs. Current

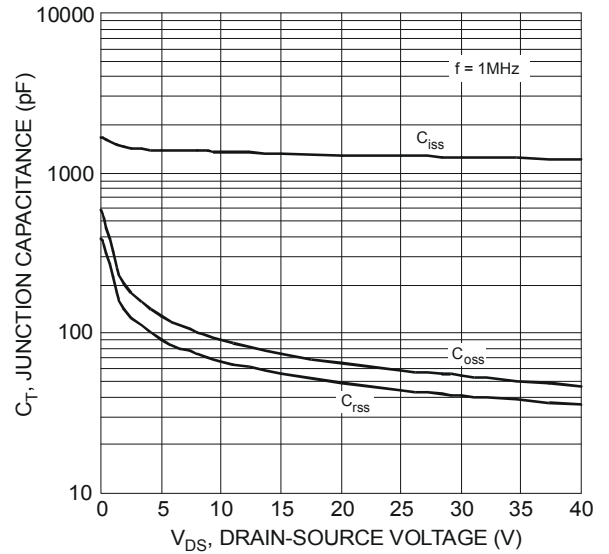


Figure 10 Typical Junction Capacitance

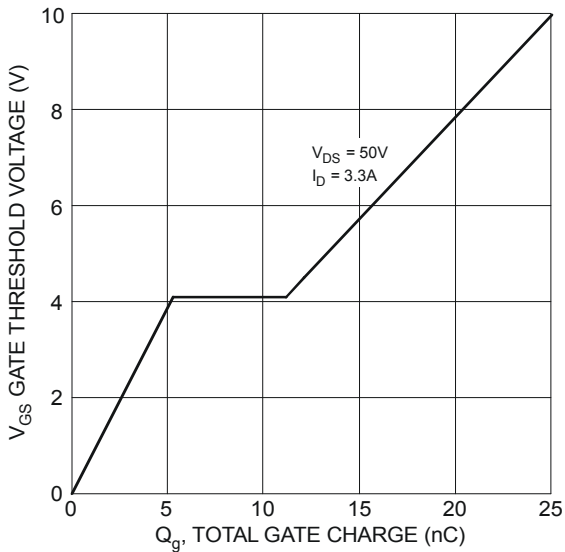


Figure 11 Gate Charge

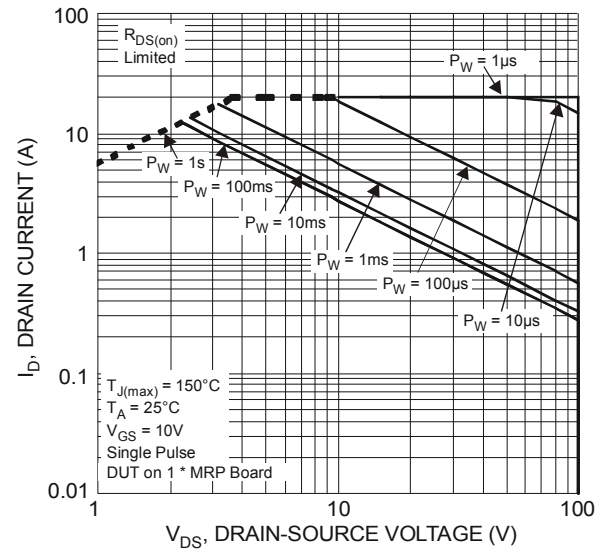
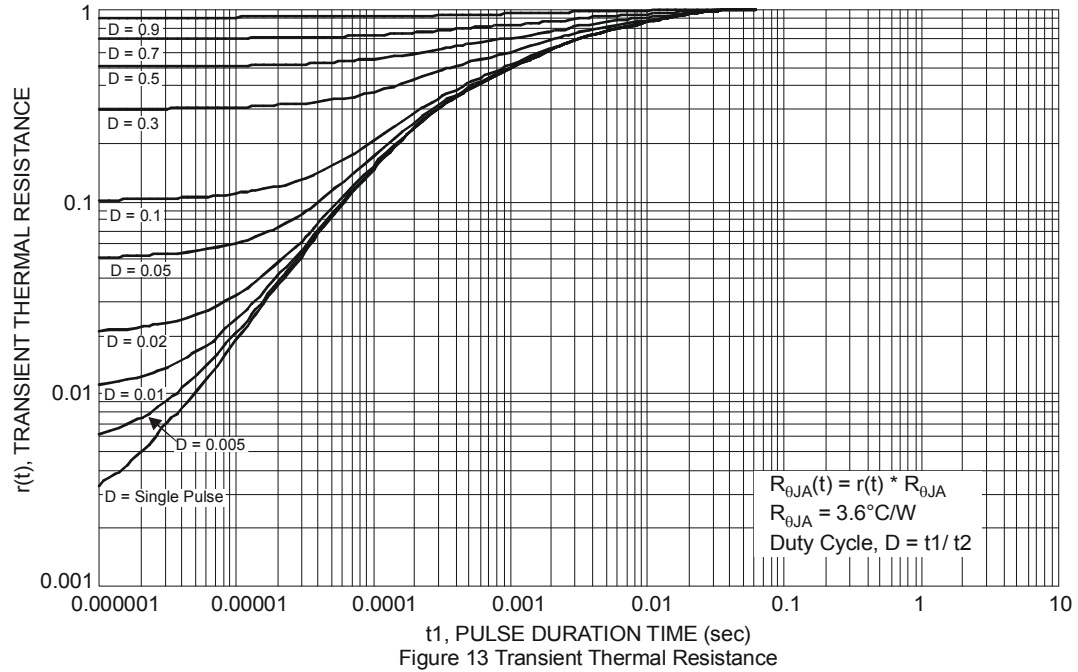
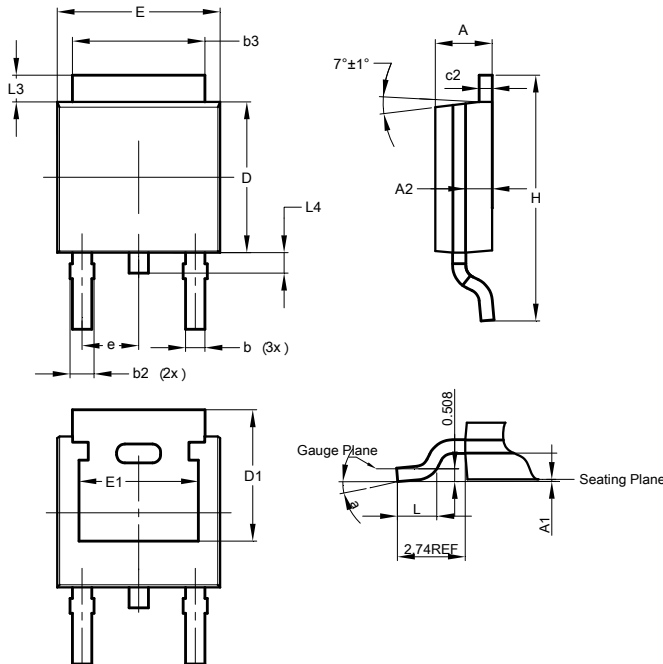


Figure 12 SOA, Safe Operation Area



**Package Outline Dimensions**

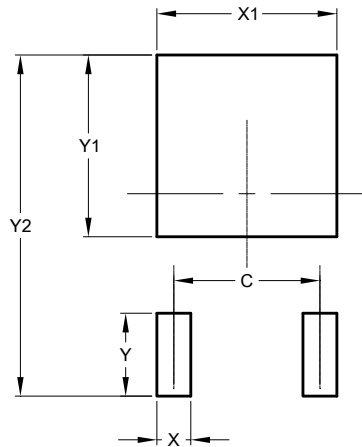
Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for latest version.



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)
C	4.572
X	1.060
X1	5.632
Y	2.600
Y1	5.700
Y2	10.700

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