

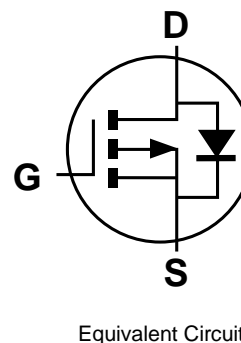
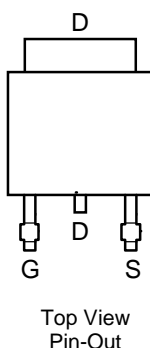
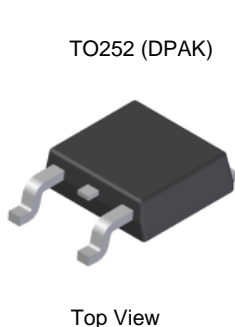
## Product Summary

BV <sub>DSS</sub>	R <sub>DS(ON)</sub> MAX	I <sub>D</sub> MAX T <sub>C</sub> = +25°C
-30V	25mΩ @ V <sub>GS</sub> = -10V	-27A
	38mΩ @ V <sub>GS</sub> = -4.5V	-22A

## Description and Applications

This MOSFET is designed to meet the stringent requirements of Automotive applications. It is qualified to AEC-Q101, supported by a PPAP and is ideal for use in:

- Backlighting
- DC-DC Converters
- Power Management Functions



## Features

- 100% Unclamped Inductive Switch (UIS) Test In Production
- Low On-Resistance
- Fast Switching Speed
- **Totally Lead-Free & Fully RoHS Compliant (Note 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **PPAP Capable (Note 4)**

## Mechanical Data

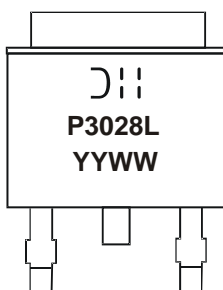
- Case: TO252 (DPAK)
- Case Material: Molded Plastic, "Green" Molding Compound.  
UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish Annealed over Copper Leadframe.  
Solderable per MIL-STD-202, Method 208 **e3**
- Weight: 0.33 grams (Approximate)

## Ordering Information (Note 5)

Product	Case	Packaging
DMP3028LK3Q-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) compliant.
  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. Automotive products are AEC-Q101 qualified and are PPAP capable. Refer to [http://www.diodes.com/product\\_compliance\\_definitions.html](http://www.diodes.com/product_compliance_definitions.html).
  5. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

## Marking Information



Δ = Manufacturer's Marking  
 P3028L = Product Type Marking Code  
 YYWW = Date Code Marking  
 YY = Year (ex: 16 = 2016)  
 WW = Week (01 to 53)

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

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V <sub>DSS</sub>	-30	V
Gate-Source Voltage			V <sub>GSS</sub>	±20	V
Continuous Drain Current (Note 7) V <sub>GS</sub> = -10V	Steady State	T <sub>C</sub> = +25°C T <sub>C</sub> = +70°C	I <sub>D</sub>	-27 -22	A
	t < 10s	T <sub>A</sub> = +25°C T <sub>A</sub> = +70°C	I <sub>D</sub>	-11 -8.6	A
Maximum Body Diode Continuous Current			I <sub>S</sub>	-2.5	A
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)			I <sub>DM</sub>	-40	A
Avalanche Current (Note 8) L = 0.1mH			I <sub>AS</sub>	-22	A
Avalanche Energy (Note 8) L = 0.1mH			E <sub>AS</sub>	24	mJ

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

Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 6)	T <sub>A</sub> = +25°C	P <sub>D</sub>	1.6	W
	T <sub>A</sub> = +70°C		1.0	
Thermal Resistance, Junction to Ambient (Note 6)	Steady state	R <sub>θJA</sub>	77	°C/W
	t < 10s		34	
Total Power Dissipation (Note 7)	T <sub>A</sub> = +25°C	P <sub>D</sub>	2.8	W
	T <sub>A</sub> = +70°C		1.8	
Thermal Resistance, Junction to Ambient (Note 7)	Steady state	R <sub>θJA</sub>	45	°C/W
	t < 10s		29	
Thermal Resistance, Junction to Case (Note 7)		R <sub>θJC</sub>	4.5	
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</b> (Note 9)						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	-30	—	—	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = -250µA
Zero Gate Voltage Drain Current T <sub>J</sub> = +25°C	I <sub>DSS</sub>	—	—	-1	µA	V <sub>DS</sub> = -30V, 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</b> (Note 9)						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	-1	—	-2.4	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250µA
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	—	20	25	mΩ	V <sub>GS</sub> = -10V, I <sub>D</sub> = -7A
			29	38		V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -6.2A
Diode Forward Voltage	V <sub>SD</sub>	—	-0.7	-1.2	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = -2.1A
<b>DYNAMIC CHARACTERISTICS</b> (Note 10)						
Input Capacitance	C <sub>iss</sub>	—	1241	—	pF	V <sub>DS</sub> = -15V, V <sub>GS</sub> = 0V f = 1.0MHz
Output Capacitance	C <sub>oss</sub>	—	147	—	pF	
Reverse Transfer Capacitance	C <sub>rss</sub>	—	110	—	pF	
Gate Resistance	R <sub>G</sub>	—	15	—	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>	—	22	—	nC	V <sub>DS</sub> = -15V, I <sub>D</sub> = -7A
Total Gate Charge (V <sub>GS</sub> = -4.5V)	Q <sub>g</sub>	—	11	—	nC	
Gate-Source Charge	Q <sub>gs</sub>	—	3.5	—	nC	
Gate-Drain Charge	Q <sub>gd</sub>	—	4.7	—	nC	
Turn-On Delay Time	t <sub>D(ON)</sub>	—	9.7	—	ns	V <sub>GS</sub> = -10V, V <sub>DD</sub> = -15V, R <sub>GEN</sub> = 6Ω I <sub>D</sub> = -7A
Turn-On Rise Time	t <sub>R</sub>	—	17.1	—	ns	
Turn-Off Delay Time	t <sub>D(OFF)</sub>	—	60.5	—	ns	
Turn-Off Fall Time	t <sub>F</sub>	—	40.4	—	ns	

- Notes: 6. Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.  
7. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.  
8. I<sub>AS</sub> and E<sub>AS</sub> ratings are based on low frequency and duty cycles to keep T<sub>J</sub> = +25°C.  
9. Short duration pulse test used to minimize self-heating effect.  
10. Guaranteed by design. Not subject to product testing.

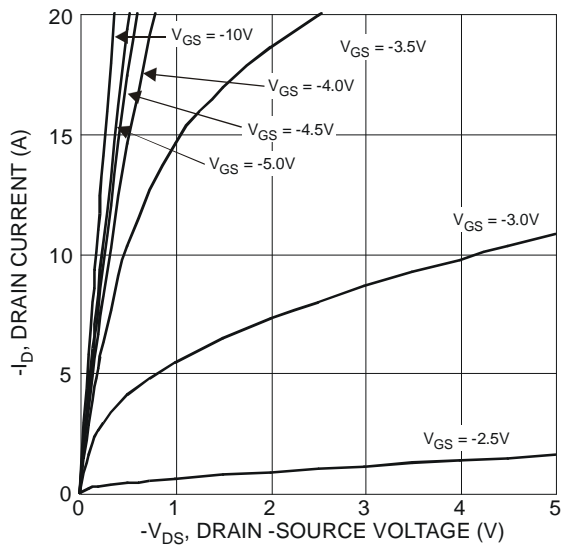


Figure 1 Typical Output Characteristics

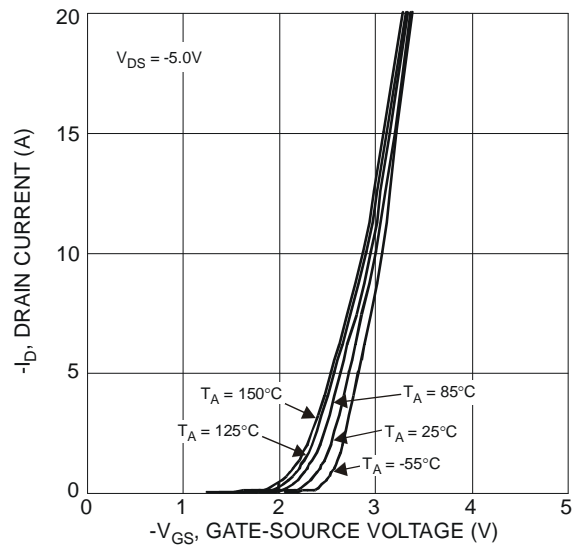


Figure 2 Typical Transfer Characteristics

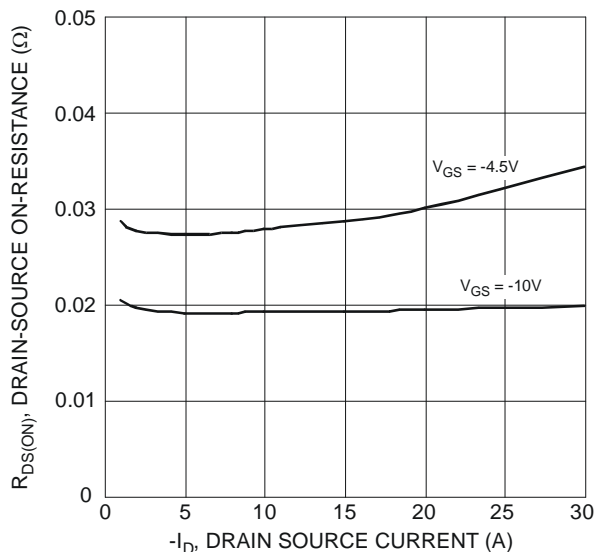


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

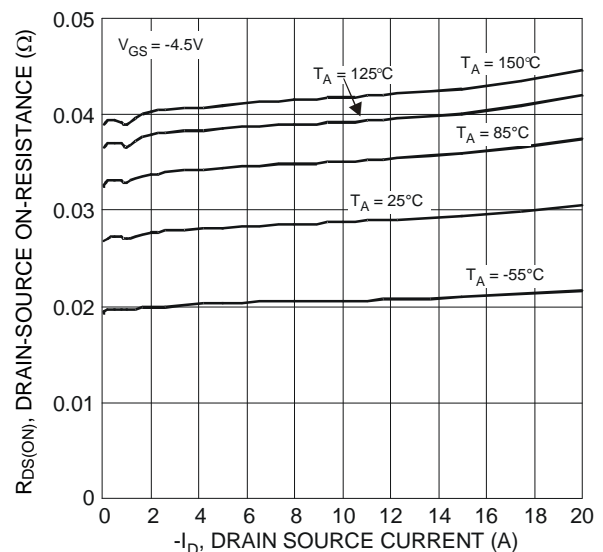


Figure 4 Typical On-Resistance vs. Drain Current and Temperature

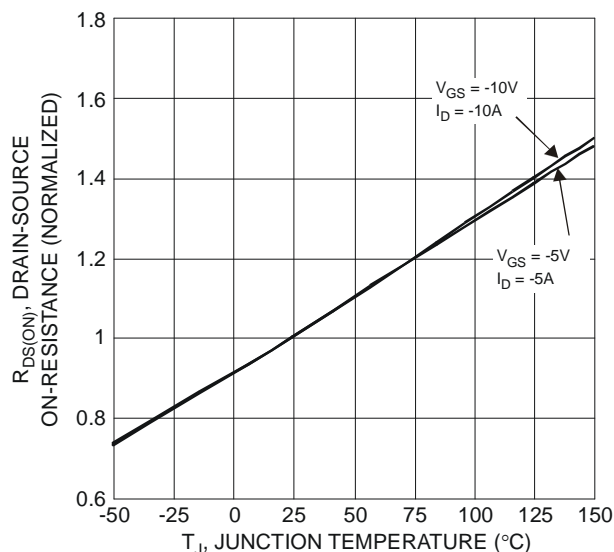


Figure 5 On-Resistance Variation with Temperature

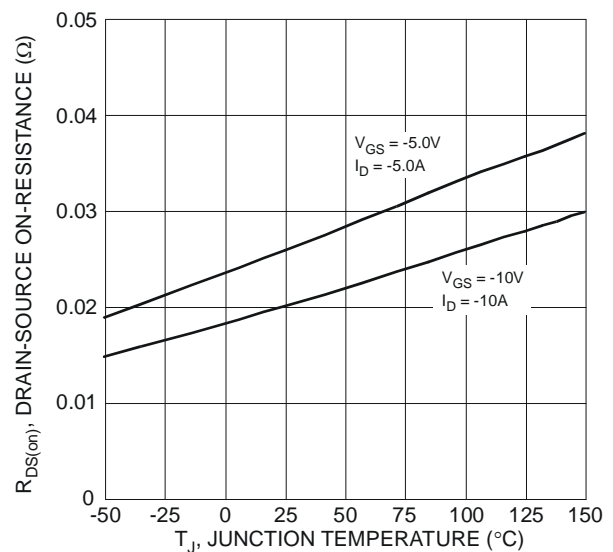


Figure 6 On-Resistance Variation with Temperature

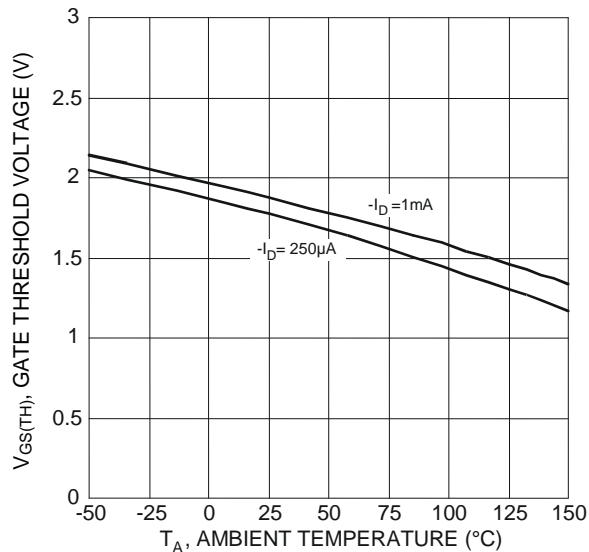


Figure 7 Gate Threshold Variation vs. Ambient Temperature

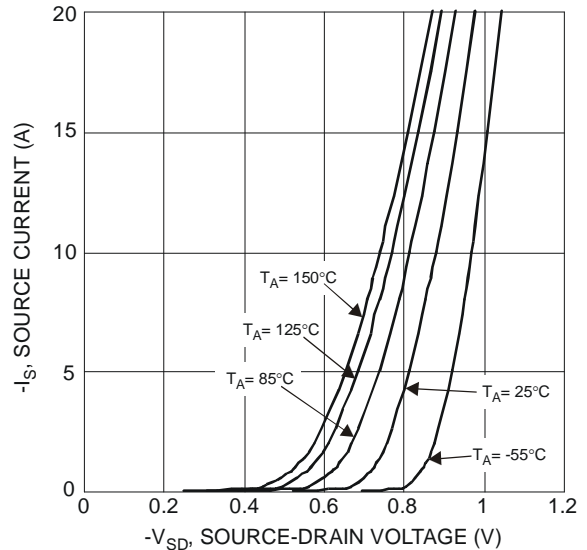


Figure 8 Diode Forward Voltage vs. Current

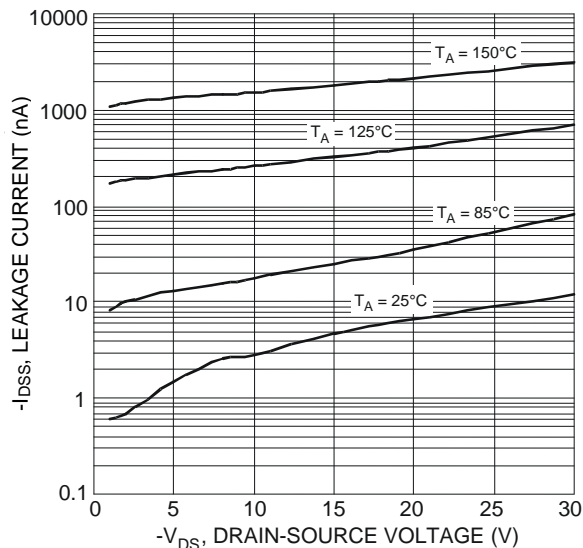


Figure 9 Typical Drain-Source Leakage Current vs. Voltage

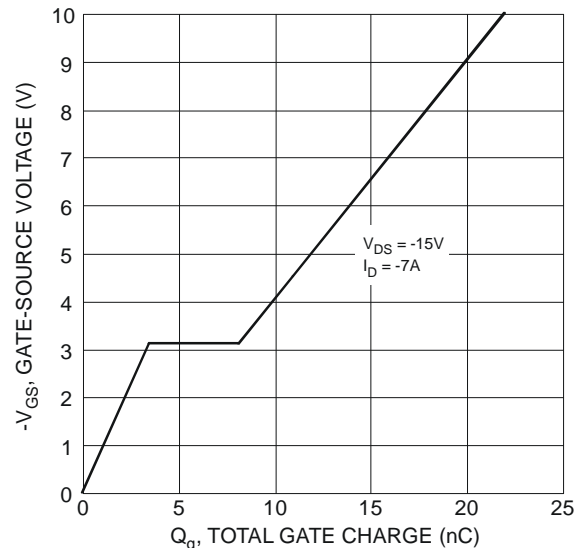


Figure 10 Gate-Charge Characteristics

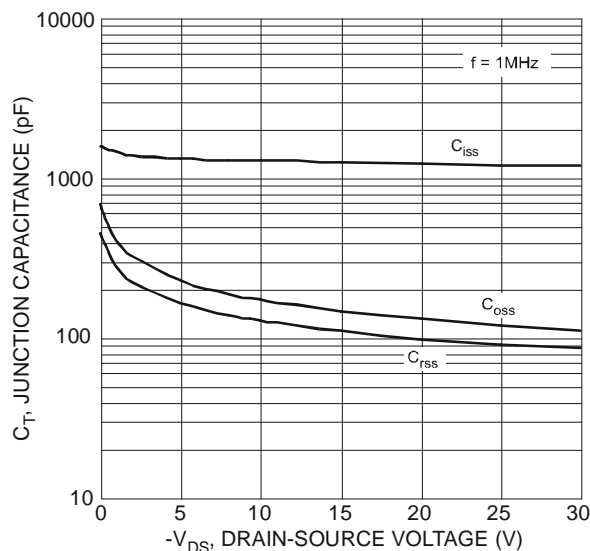


Figure 11 Typical Junction Capacitance

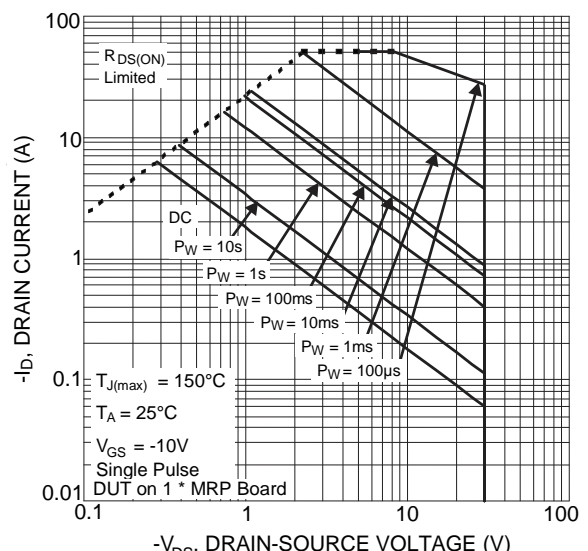


Figure 12 SOA, Safe Operation Area

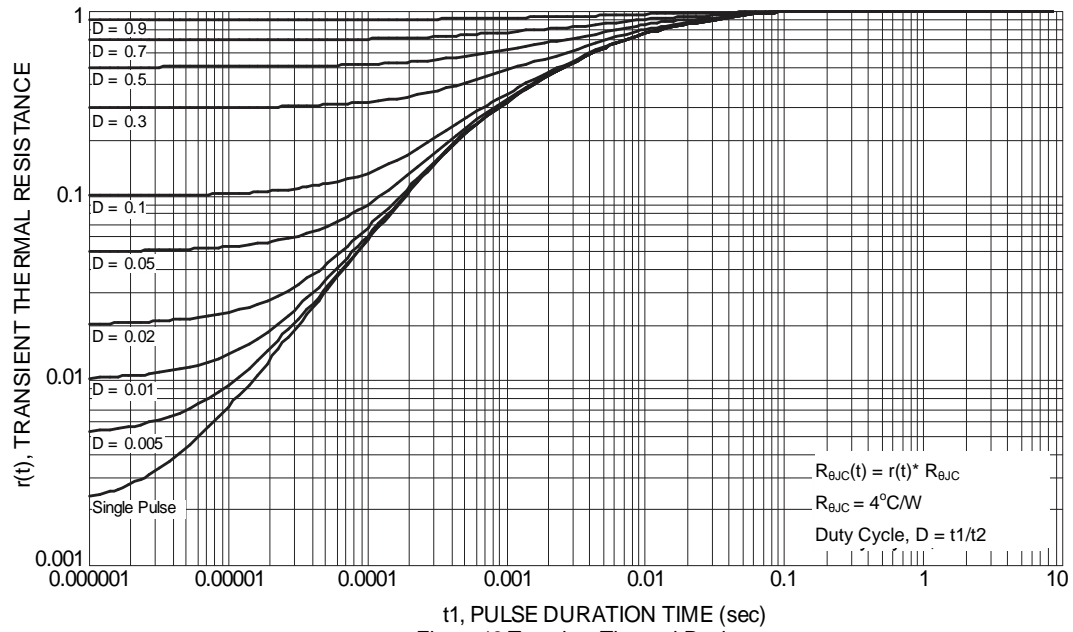
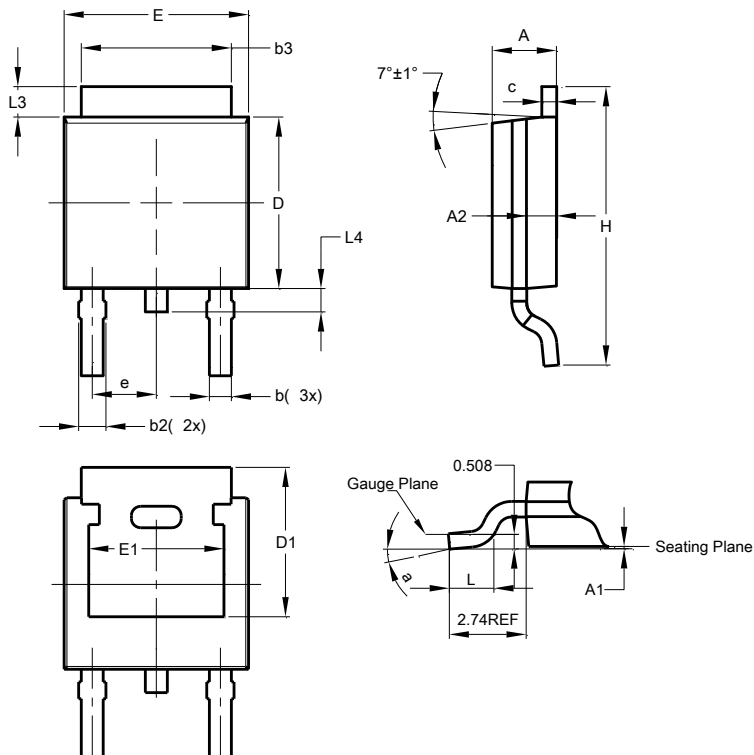


Figure 13 Transient Thermal Resistance

## Package Outline Dimensions

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

### TO252 (DPAK)

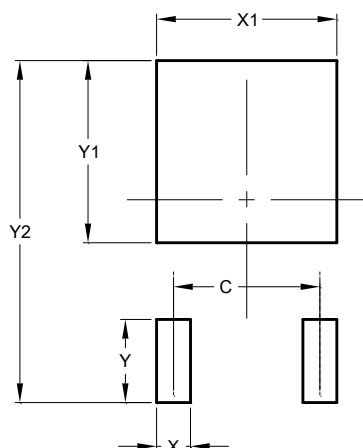


TO252 (DPAK)			
Dim	Min	Max	Typ
A	2.19	2.39	2.29
A1	0.00	0.13	0.08
A2	0.97	1.17	1.07
b	0.64	0.88	0.783
b2	0.76	1.14	0.95
b3	5.21	5.46	5.33
c	0.45	0.58	0.531
D	6.00	6.20	6.10
D1	5.21	-	-
e	-	-	2.286
E	6.45	6.70	6.58
E1	4.32	-	-
H	9.40	10.41	9.91
L	1.40	1.78	1.59
L3	0.88	1.27	1.08
L4	0.64	1.02	0.83
a	0°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