

Product Summary

BV_{DSS}	$R_{DS(ON)}$ Max	I_D Max $T_A = +25^\circ C$
-30V	7.0m Ω @ $V_{GS} = -10V$	-18.5A
	10.0m Ω @ $V_{GS} = -4.5V$	-15.5A

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.

- Backlighting
- Power Management Functions
- DC-DC Converters

Features

- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- **ESD Protected Gate**
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

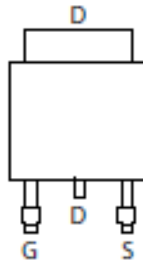
Mechanical Data

- 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 Finish - Matte Tin Annealed over Copper Lead Frame. Solderable per MIL-STD-202, Method 208 $\text{\textcircled{3}}$
- Weight: 0.315 grams (Approximate)

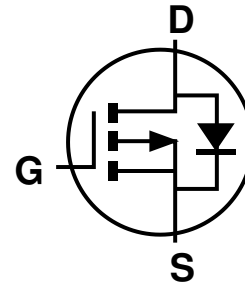


Top View

TO252 (DPAK)



Pin Out Top View



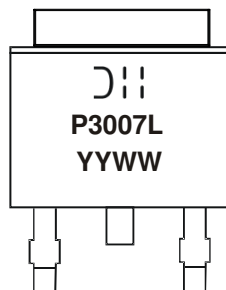
Equivalent Circuit

Ordering Information (Note 4)

Part Number	Case	Packaging
DMP3007LK3-13	TO252 (DPAK)	2,500/Tape & Reel

- Notes:
1. EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied.
 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



$\text{D}||$ = Manufacturer's Marking
 P3007L = 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}	-30	V
Gate-Source Voltage	V _{GSS}	±25	V
Continuous Drain Current, V _{GS} = -10V (Note 6)	I _D	T _A = +25°C	-18.5
Steady State		T _A = +70°C	-15
Maximum Continuous Body Diode Forward Current (Note 6)	I _S	-4.5	A
Pulsed Drain Current (380µs Pulse, Duty Cycle = 1%)	I _{DM}	-250	A
Pulsed Body Diode Forward Current (380µs Pulse, Duty Cycle = 1%)	I _{SM}	-250	A
Avalanche Current, L = 1mH (Note 7)	I _{AS}	-16	A
Avalanche Energy, L = 1mH (Note 7)	E _{AS}	130	mJ

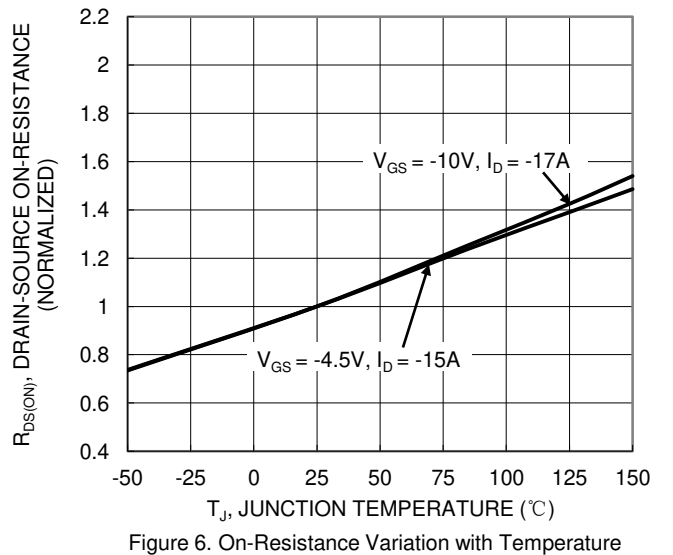
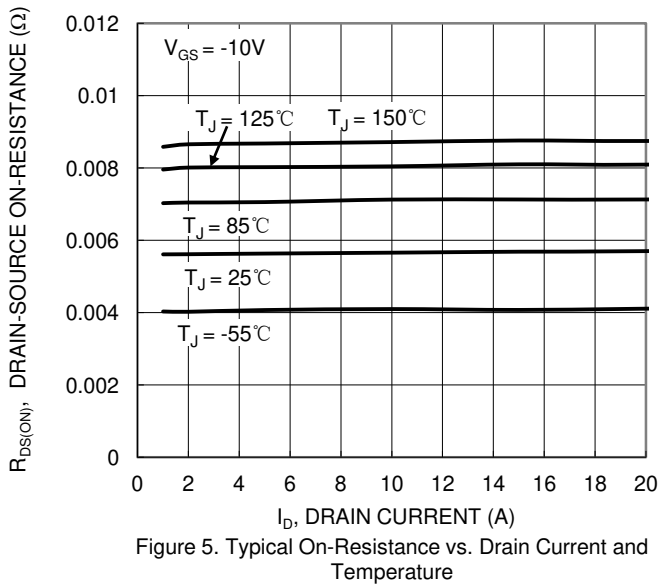
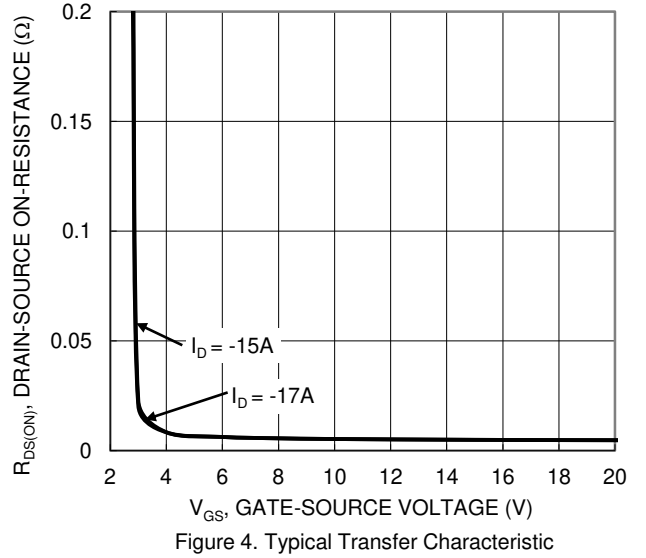
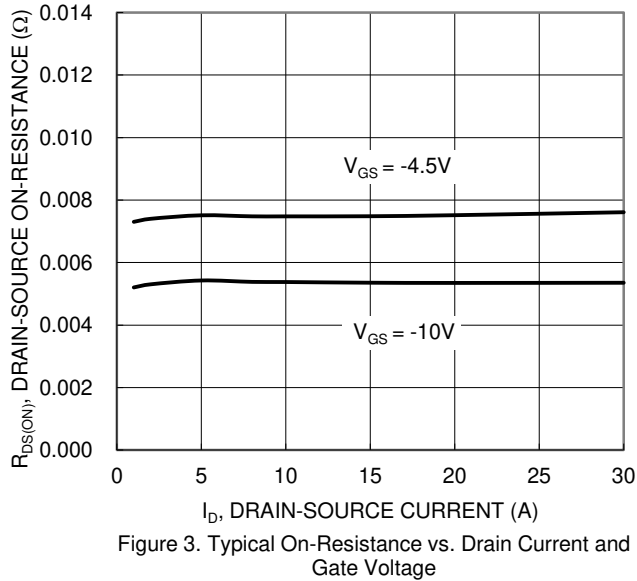
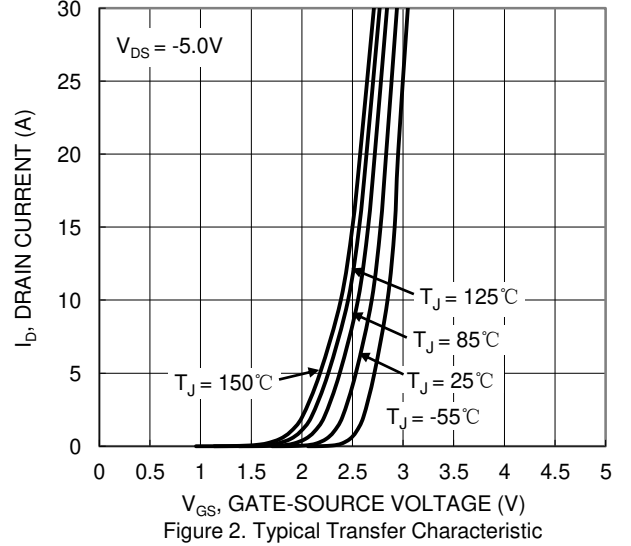
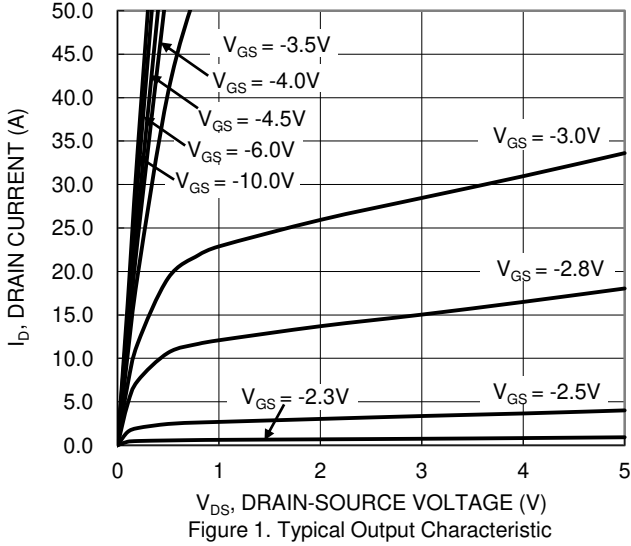
Thermal Characteristics

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	P _D	1.5	W
Thermal Resistance, Junction to Ambient (Note 5)	R _{θJA}	81	°C/W
Total Power Dissipation (Note 6)	P _D	3.0	W
Thermal Resistance, Junction to Ambient (Note 6)	R _{θJA}	42	°C/W
Thermal Resistance, Junction to Case (Note 6)	R _{θJC}	1.5	°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}	-30	—	—	V	V _{GS} = 0V, I _D = -250µA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	-1	µA	V _{DS} = -24V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±10	µA	V _{GS} = ±20V, V _{DS} = 0V
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	V _{GS(TH)}	-1.0	—	-2.8	V	V _{DS} = V _{GS} , I _D = -250µA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	5.8	7	mΩ	V _{GS} = -10V, I _D = -17A
		—	8.2	10		V _{GS} = -4.5V, I _D = -15A
Diode Forward Voltage	V _{SD}	—	-0.7	-1.2	V	V _{GS} = 0V, I _S = -1A
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C _{iSS}	—	2826	—	pF	V _{DS} = -15V, V _{GS} = 0V, f = 1.0MHz
Output Capacitance	C _{oss}	—	606	—	pF	
Reverse Transfer Capacitance	C _{rSS}	—	305	—	pF	
Gate Resistance	R _g	—	22.8	—	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1.0MHz
Total Gate Charge (V _{GS} = -4.5V)	Q _g	—	31.2	—	nC	V _{DS} = -15V, I _D = -11.5A
Total Gate Charge (V _{GS} = -10V)	Q _g	—	64.2	—	nC	
Gate-Source Charge	Q _{gs}	—	10.6	—	nC	
Gate-Drain Charge	Q _{gd}	—	11.6	—	nC	
Turn-On Delay Time	t _{D(ON)}	—	4.8	—	ns	V _{DD} = -15V, V _{GS} = -10V, R _g = 6Ω, I _D = -11.5A
Turn-On Rise Time	t _R	—	4.3	—	ns	
Turn-Off Delay Time	t _{D(OFF)}	—	306	—	ns	
Turn-Off Fall Time	t _F	—	125	—	ns	
Reverse Recovery Time	t _{RR}	—	19	—	ns	
Reverse Recovery Charge	Q _{RR}	—	9.8	—	nC	I _S = -11.5A, dI/dt = 100A/µs

- Notes:
- Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.
 - Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1inch square copper plate.
 - I_{AS} and E_{AS} ratings are based on low frequency and duty cycles to keep T_J = +25°C.
 - Short duration pulse test used to minimize self-heating effect.
 - Guaranteed by design. Not subject to product testing.



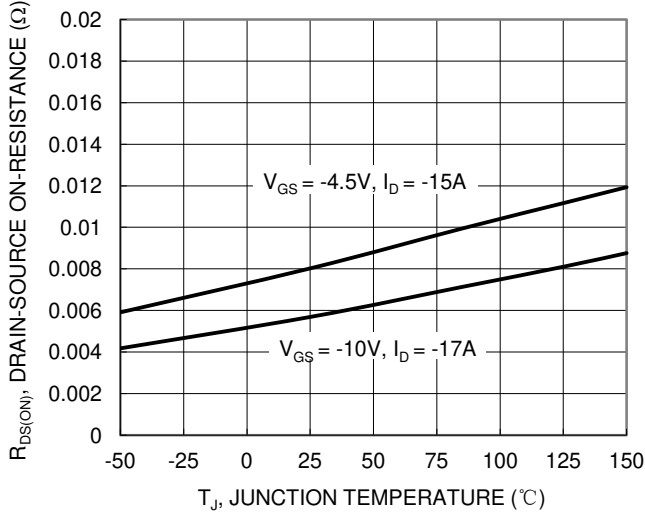


Figure 7. On-Resistance Variation with Temperature

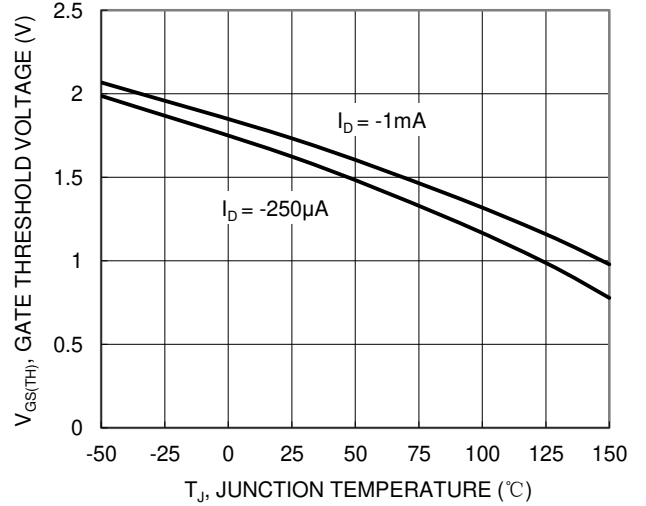


Figure 8. Gate Threshold Variation vs. Junction Temperature

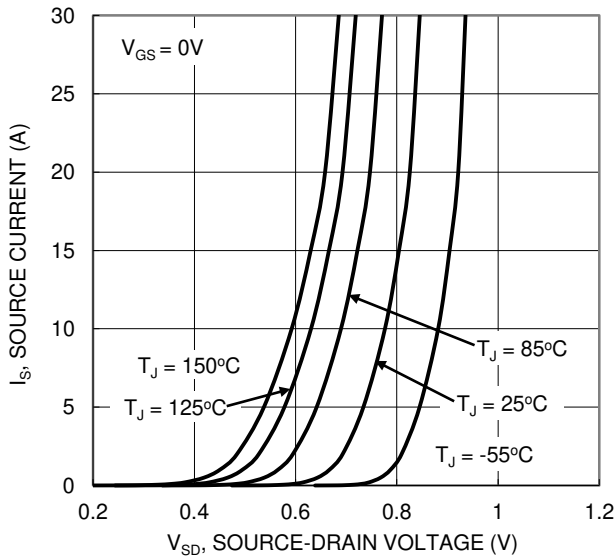


Figure 9. Diode Forward Voltage vs. Current

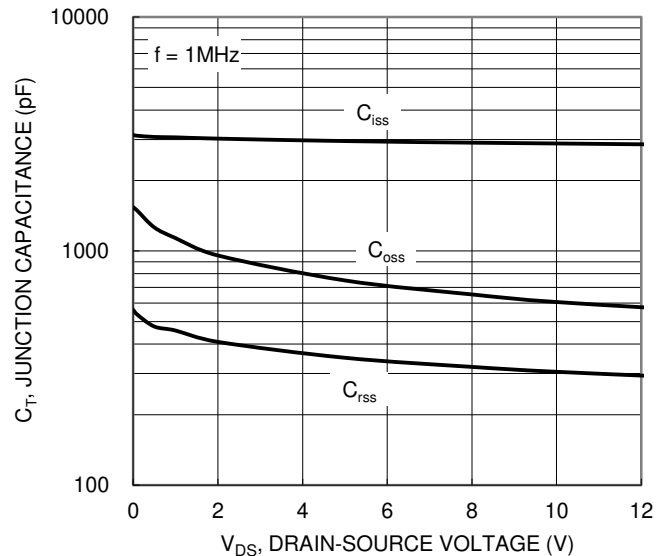


Figure 10. Typical Junction Capacitance

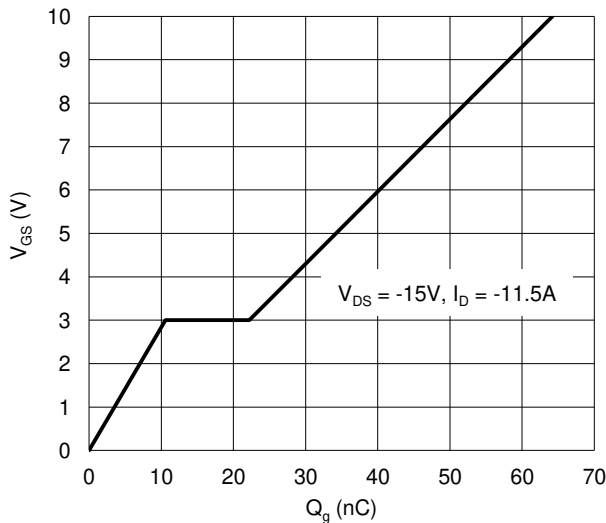


Figure 11. Gate Charge

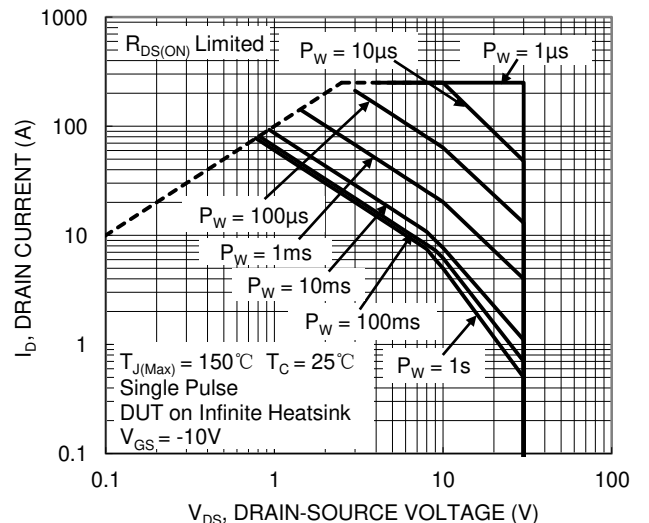


Figure 12. SOA, Safe Operation Area

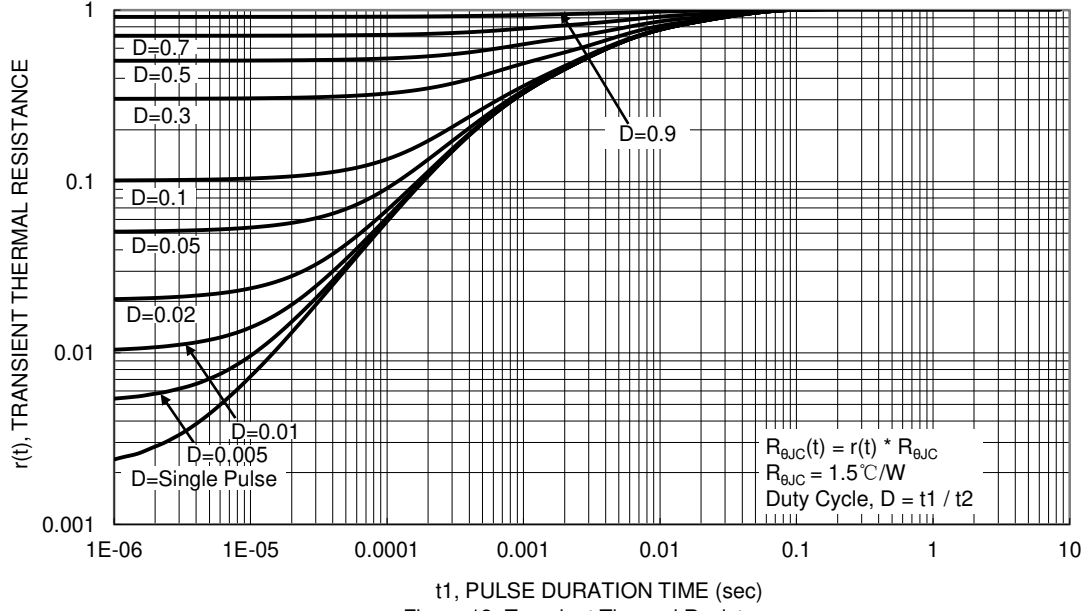
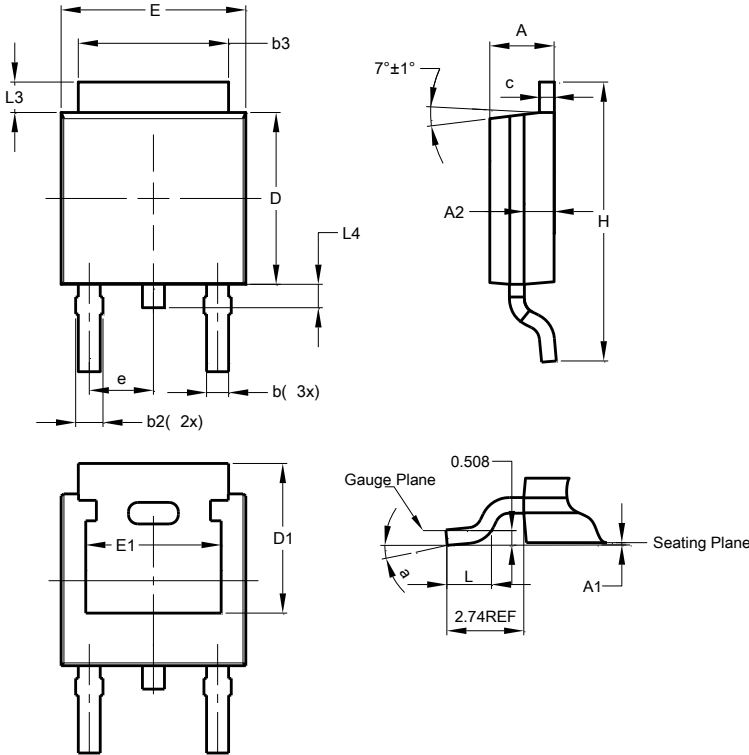


Figure 13. Transient Thermal Resistance

Package Outline Dimensions

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

TO252 (DPAK)

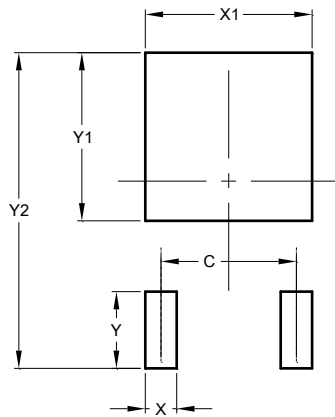


TO252 (DPAK)			
Dim	Min	Max	Typ
A	2.19	2.39	2.29
A1	0.00	0.13	0.08
A2	0.97	1.17	1.07
b	0.64	0.88	0.783
b2	0.76	1.14	0.95
b3	5.21	5.46	5.33
c	0.45	0.58	0.531
D	6.00	6.20	6.10
D1	5.21	-	-
e	-	-	2.286
E	6.45	6.70	6.58
E1	4.32	-	-
H	9.40	10.41	9.91
L	1.40	1.78	1.59
L3	0.88	1.27	1.08
L4	0.64	1.02	0.83
a	0°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