



YOUSHANG SEMICONDUCTOR

**设计研发新型功率器件**

**各类小信号开关**

**中低压及高压大电流等场效应管**

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## Product Summary

$BV_{DSS}$	$R_{DS(on)}$ Max	$I_D$ Max $T_C = +25^\circ C$
80V	7.0m $\Omega$ @ $V_{GS} = 10V$	95A
	11m $\Omega$ @ $V_{GS} = 4.5V$	75A

## Description

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

## Applications

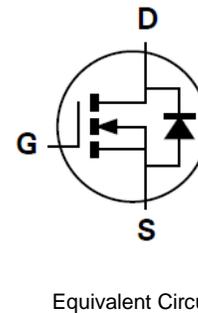
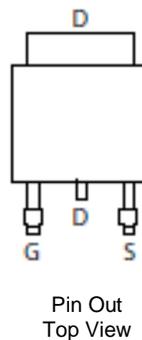
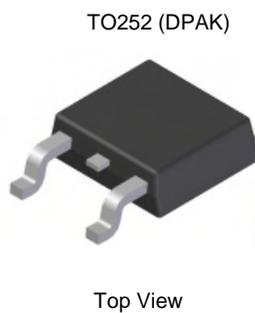
- Power Management Functions
- DC-DC Converters
- Backlighting

## Features

- 100% Unclamped Inductive Switching (UIS) Test in Production – Ensures More Reliable and Robust End Application
- Low  $R_{DS(on)}$  – Minimizes Power Losses
- Low  $Q_g$  – Minimizes Switching Losses

## Mechanical Data

- Package: TO252
- Package Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 3 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)



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

Characteristic		Symbol	Value	Unit
Drain-Source Voltage		$V_{DSS}$	80	V
Gate-Source Voltage		$V_{GSS}$	$\pm 20$	V
Continuous Drain Current, $V_{GS} = 10\text{V}$	$T_C = +25^\circ\text{C}$	$I_D$	95	A
	$T_C = +70^\circ\text{C}$		76	
Pulsed Drain Current (10 $\mu\text{s}$ Pulse, Duty Cycle = 1%)		$I_{DM}$	380	A
Maximum Continuous Body Diode Forward Current (Note 6)		$I_S$	95	A
Pulsed Body Diode Forward Current (10 $\mu\text{s}$ Pulse, Duty Cycle = 1%)		$I_{SM}$	380	A
Avalanche Current, $L = 0.1\text{mH}$		$I_{AS}$	23	A
Avalanche Energy, $L = 0.1\text{mH}$		$E_{AS}$	26.5	mJ

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

Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 5)		$P_D$	1.7	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	$R_{\theta JA}$	71	$^\circ\text{C/W}$
Total Power Dissipation (Note 6)		$P_D$	3	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady State	$R_{\theta JA}$	45	$^\circ\text{C/W}$
Thermal Resistance, Junction to Case		$R_{\theta JC}$	1.1	
Operating and Storage Temperature Range		$T_J, T_{STG}$	-55 to +150	$^\circ\text{C}$

Notes: 5. Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.  
 6. Device mounted on FR-4 substrate PC board, 2oz copper, with 1-inch square copper plate.

**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>	80	—	—	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = 1mA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	—	—	1	μA	V <sub>DS</sub> = 64V, 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>	1.3	—	2.8	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA
Static Drain-Source On-Resistance	R <sub>DS(on)</sub>	—	5.6	7.0	mΩ	V <sub>GS</sub> = 10V, I <sub>D</sub> = 14A
		—	7.9	11		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 12A
Diode Forward Voltage	V <sub>SD</sub>	—	0.8	1.2	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = 20A
<b>DYNAMIC CHARACTERISTICS (Note 8)</b>						
Input Capacitance	C <sub>iss</sub>	—	2345	—	pF	V <sub>DS</sub> = 40V, V <sub>GS</sub> = 0V, f = 1MHz
Output Capacitance	C <sub>oss</sub>	—	842	—		
Reverse Transfer Capacitance	C <sub>rss</sub>	—	52	—		
Gate Resistance	R <sub>g</sub>	—	1.7	—	Ω	V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1MHz
Total Gate Charge (V <sub>GS</sub> = 4.5V)	Q <sub>g</sub>	—	21.7	—	nC	V <sub>DD</sub> = 40V, I <sub>D</sub> = 2A
Total Gate Charge (V <sub>GS</sub> = 10V)	Q <sub>g</sub>	—	41.2	—		
Gate-Source Charge	Q <sub>gs</sub>	—	5.0	—		
Gate-Drain Charge	Q <sub>gd</sub>	—	10.6	—		
Turn-On Delay Time	t <sub>D(on)</sub>	—	5.8	—	ns	V <sub>DD</sub> = 40V, V <sub>GS</sub> = 10V, I <sub>D</sub> = 2A, R <sub>G</sub> = 1.6Ω
Turn-On Rise Time	t <sub>R</sub>	—	5.4	—		
Turn-Off Delay Time	t <sub>D(off)</sub>	—	24.5	—		
Turn-Off Fall Time	t <sub>F</sub>	—	43.2	—		
Body Diode Reverse Recovery Time	t <sub>RR</sub>	—	61	—	ns	I <sub>F</sub> = 2A, di/dt = 100A/μs
Body Diode Reverse Recovery Charge	Q <sub>RR</sub>	—	181	—	nC	

Notes: 7. Short duration pulse test used to minimize self-heating effect.  
 8. Guaranteed by design. Not subject to product testing.

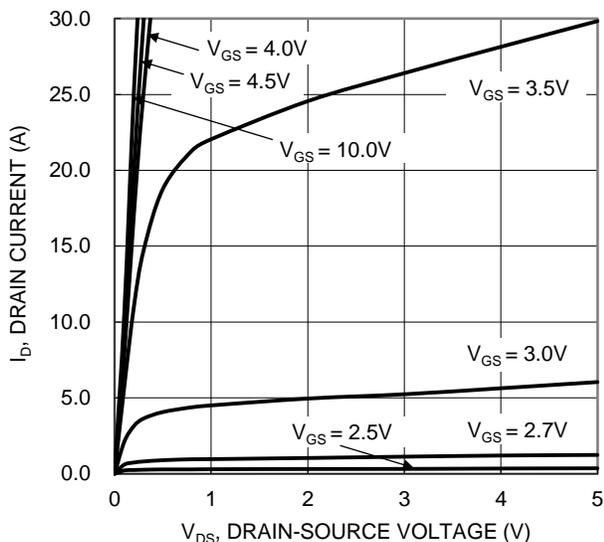


Figure 1. Typical Output Characteristic

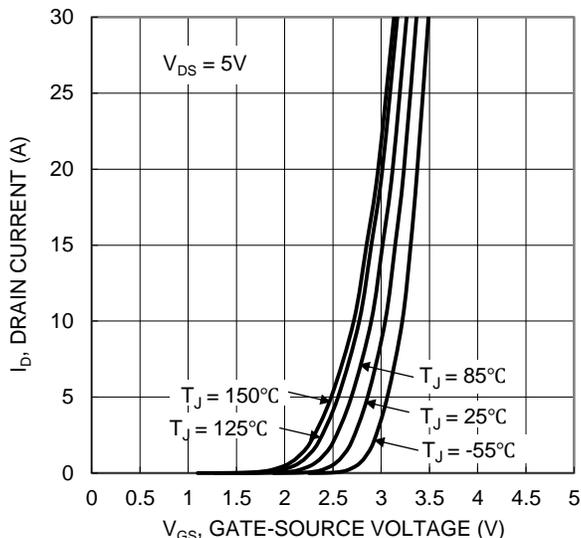


Figure 2. Typical Transfer Characteristic

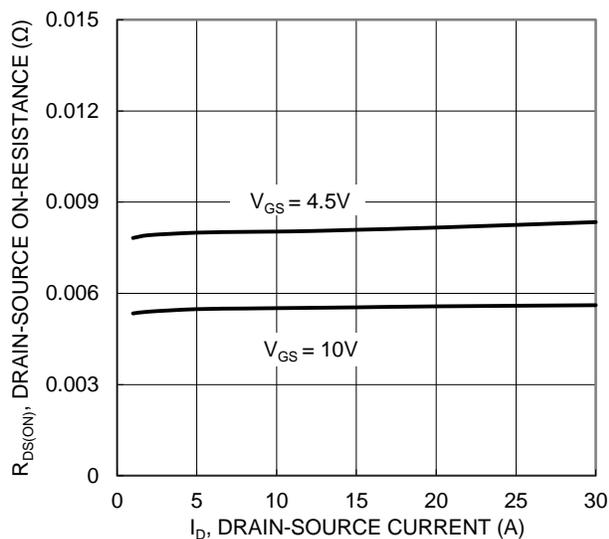


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

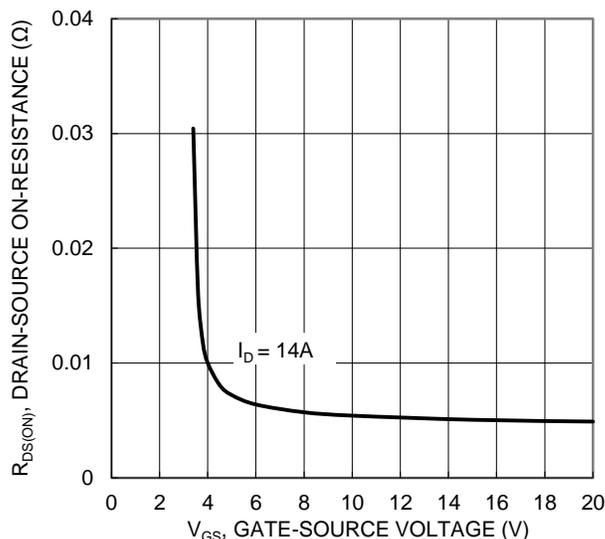


Figure 4. Typical Transfer Characteristic

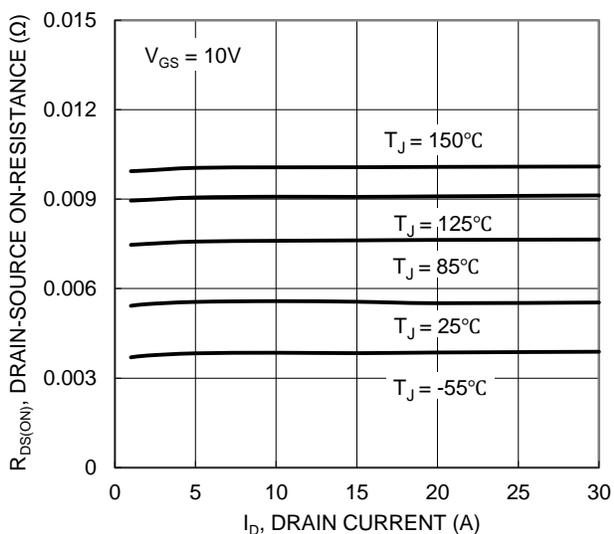


Figure 5. Typical On-Resistance vs. Drain Current and Temperature

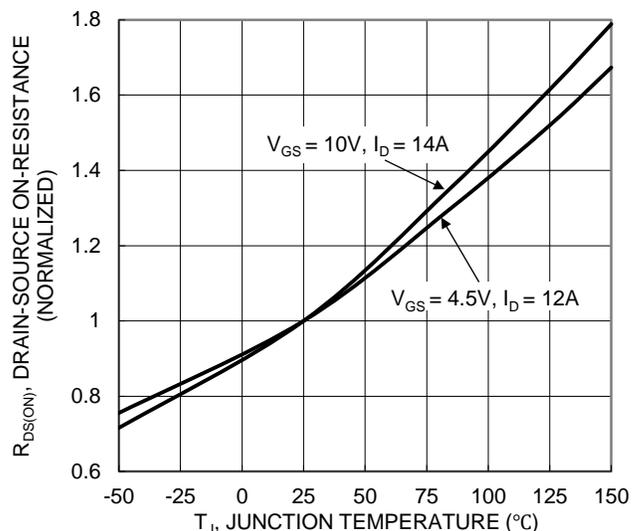


Figure 6. On-Resistance Variation with Junction Temperature

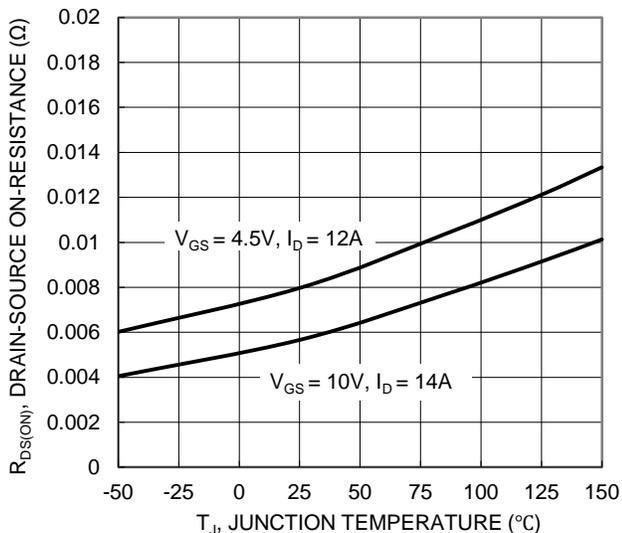


Figure 7. On-Resistance Variation with Temperature

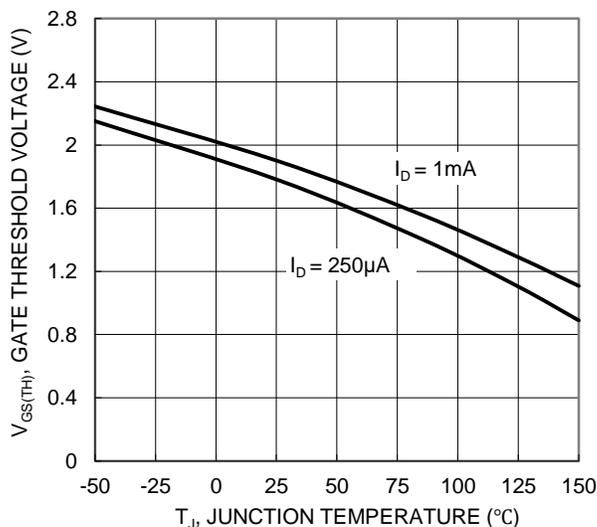


Figure 8. Gate Threshold Variation vs. Temperature

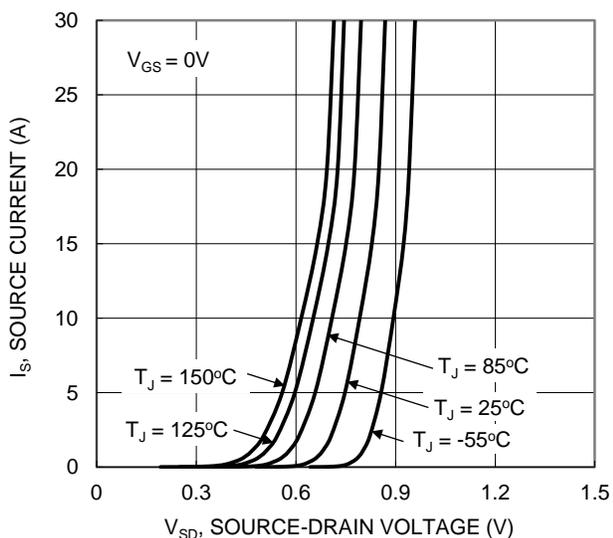


Figure 9. Diode Forward Voltage vs. Current

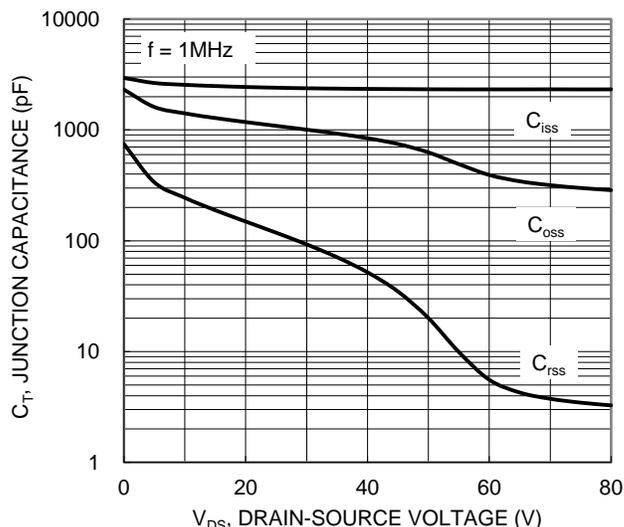


Figure 10. Typical Junction Capacitance

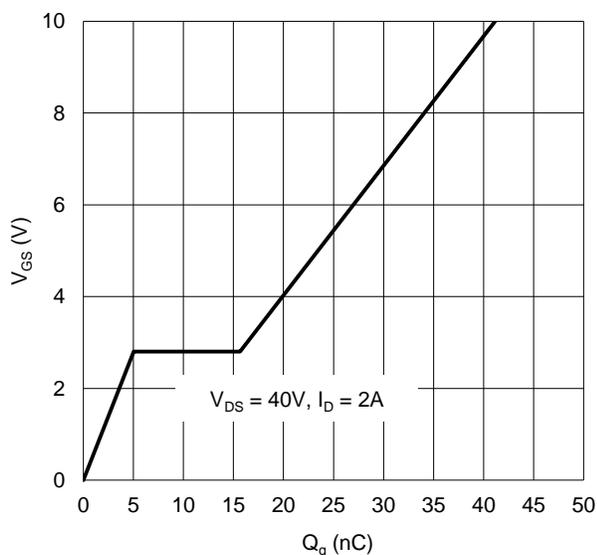


Figure 11. Gate Charge

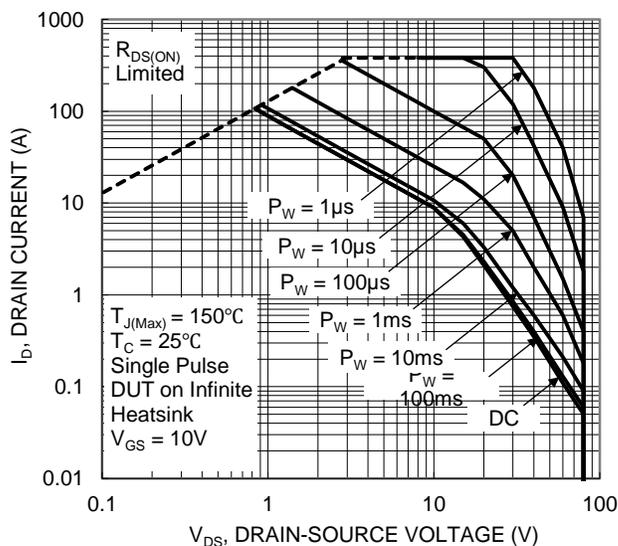


Figure 12. SOA, Safe Operation Area

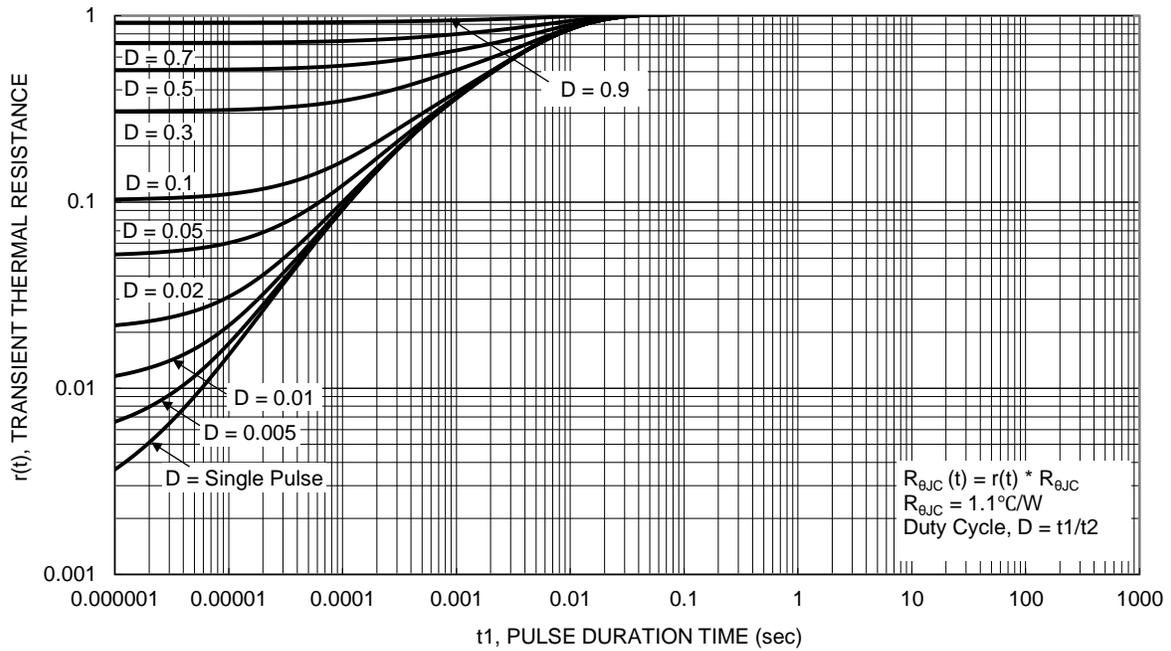
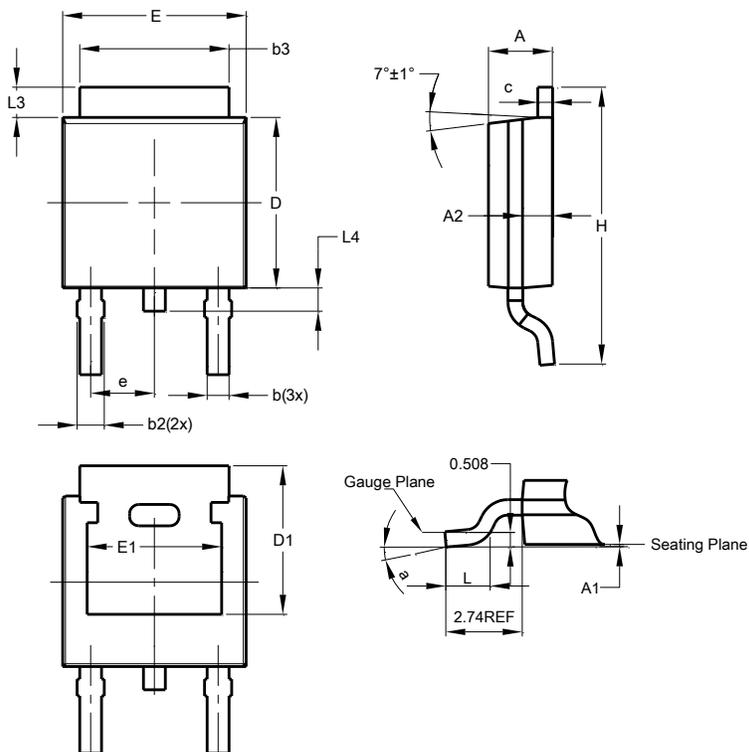


Figure 13. Transient Thermal Resistance

**Package Outline Dimensions**

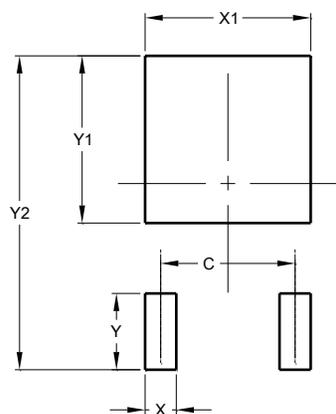
**TO252 (DPAK)**



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°	—
<b>All Dimensions in mm</b>			

**Suggested Pad Layout**

**TO252 (DPAK)**



Dimensions	Value (in mm)
C	4.572
X	1.060
X1	5.632
Y	2.600
Y1	5.700
Y2	10.700