优尚

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

0755-83047638
ysbdt@szyoushang.cn
www.szyoushang.cn

企业微信二维码

企业QQ二维码

Product Summary

BV_{DSS}	$R_{DS(ON)}$ Max	I_D $T_C = +25°C$
120V	8.9mΩ @ V_{GS} = 10V	86A

Description and Applications

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

- Power management functions
- DC-DC converters
- Backlighting

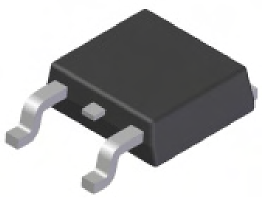
Features and Benefits

- Rated to +175°C – Ideal for High Ambient Temperature Environments
- 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

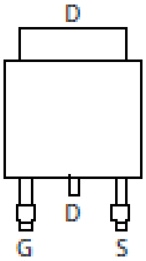
Mechanical Data

- 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)

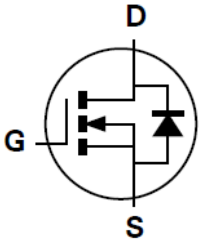
TO252 (DPAK)



Top View



Pin Out Top View



Equivalent Circuit

Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic		Symbol	Value	Unit
Drain-Source Voltage		V_{DSS}	120	V
Gate-Source Voltage		V_{GSS}	±20	V
Continuous Drain Current, V_{GS} = 10V (Note 5)	T_C = +25°C T_C = +100°C	I_D	86 61	A
Pulsed Drain Current (10µs Pulse, T_C = +25°C, Package Limited)		I_{DM}	344	A
Maximum Continuous Body Diode Forward Current (Note 5)		I_S	86	A
Pulsed Body Diode Forward Current (10µs Pulse, T_C = +25°C, Package Limited)		I_{SM}	344	A
Avalanche Current, L = 3mH (Note 6)		I_{AS}	15.5	A
Avalanche Energy, L = 3mH (Note 6)		E_{AS}	360.4	mJ
V_{DS} Spike, L = 0.1mH	t = 10µs	V_{SPIKE}	130	V

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 7)		P_D	2	W
Thermal Resistance, Junction to Ambient (Note 7)	Steady State	$R_{\theta JA}$	75	°C/W
Total Power Dissipation (Note 8)		P_D	3.3	W
Thermal Resistance, Junction to Ambient (Note 8)	Steady State	$R_{\theta JA}$	45	°C/W
Thermal Resistance, Junction to Case (Note 5)		$R_{\theta JC}$	1.1	
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +175	°C

Notes:
5. Thermal resistance from junction to soldering point (on the exposed drain pad).
6. I_{AS} and E_{AS} ratings are based on low frequency and duty cycles to keep T_J = +25°C.
7. Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.
8. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 9)						
Drain-Source Breakdown Voltage	BV_{DSS}	120	—	—	V	V_{GS} = 0V, I_D = 10mA
Zero Gate Voltage Drain Current	I_{DSS}	—	—	1	µA	V_{DS} = 96V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	—	—	±100	nA	V_{GS} = ±20V, V_{DS} = 0V
ON CHARACTERISTICS (Note 9)						
Gate Threshold Voltage	$V_{GS(TH)}$	2	—	4	V	V_{DS} = V_{GS}, I_D = 250µA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	7.5	8.9	mΩ	V_{GS} = 10V, I_D = 30A
Diode Forward Voltage	V_{SD}	—	0.8	1.2	V	V_{GS} = 0V, I_S = 30A
DYNAMIC CHARACTERISTICS (Note 10)						
Input Capacitance	C_{iss}	—	3142	—	pF	V_{DS} = 60V, V_{GS} = 0V f = 1MHz
Output Capacitance	C_{oss}	—	665	—		
Reverse Transfer Capacitance	C_{rss}	—	29	—		
Gate Resistance	R_g	—	1.9	—	Ω	V_{DS} = 0V, V_{GS} = 0V, f = 1MHz
Total Gate Charge	Q_g	—	44	—	nC	V_{DD} = 60V, I_D = 25A V_{GS} = 10V
Gate-Source Charge	Q_{gs}	—	15	—		
Gate-Drain Charge	Q_{gd}	—	9	—		
Turn-On Delay Time	$t_{D(ON)}$	—	12.5	—	ns	V_{DD} = 60V, V_{GS} = 10V I_D = 25A, R_g = 2.7Ω
Turn-On Rise Time	t_R	—	13.7	—		
Turn-Off Delay Time	$t_{D(OFF)}$	—	24.4	—		
Turn-Off Fall Time	t_F	—	10.9	—		
Reverse Recovery Time	t_{RR}	—	55	—	ns	I_F = 25A, dI/dt = 100A/µs
Reverse Recovery Charge	Q_{RR}	—	105	—	nC	

Notes: 9. Short duration pulse test used to minimize self-heating effect.
10. Guaranteed by design. Not subject to product testing.

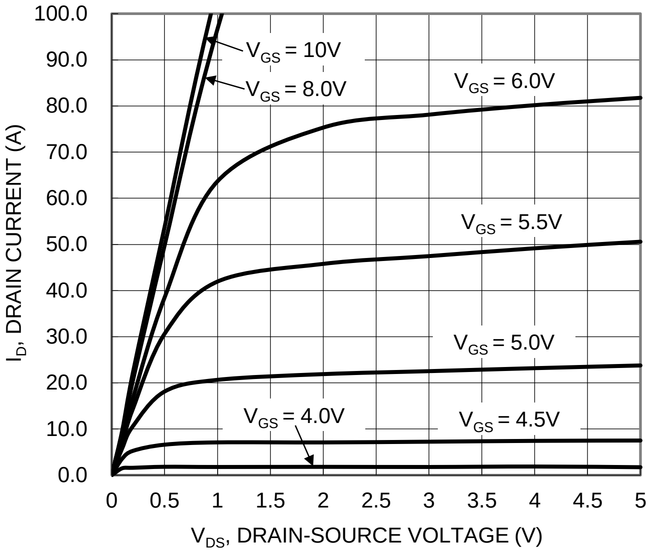


Figure 1. Typical Output Characteristic

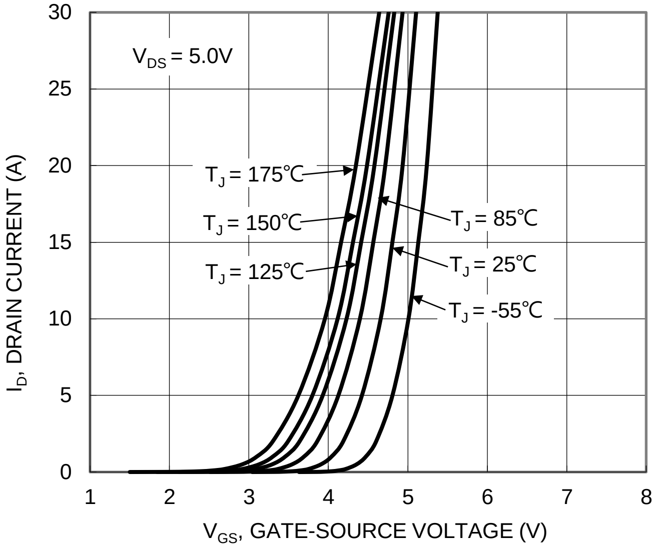


Figure 2. Typical Transfer Characteristic

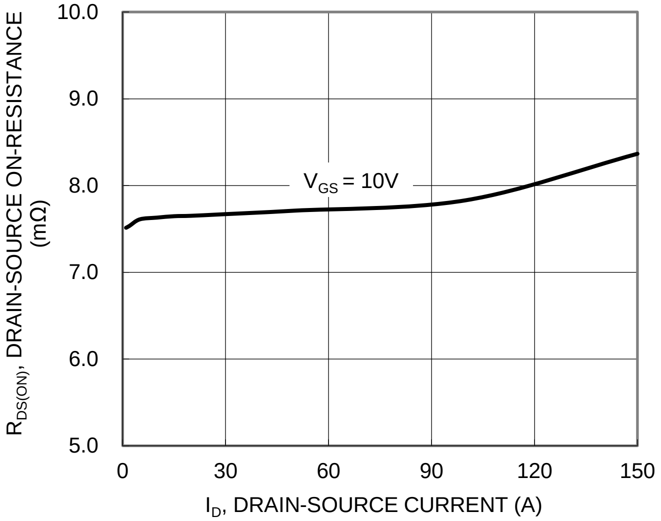


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

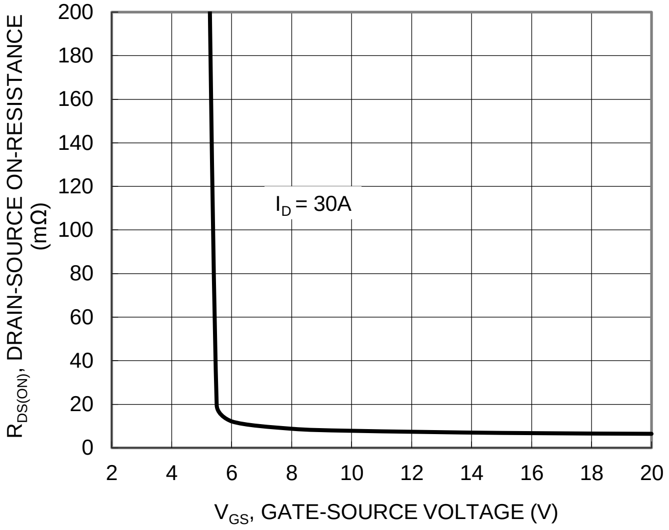


Figure 4. Typical Transfer Characteristic

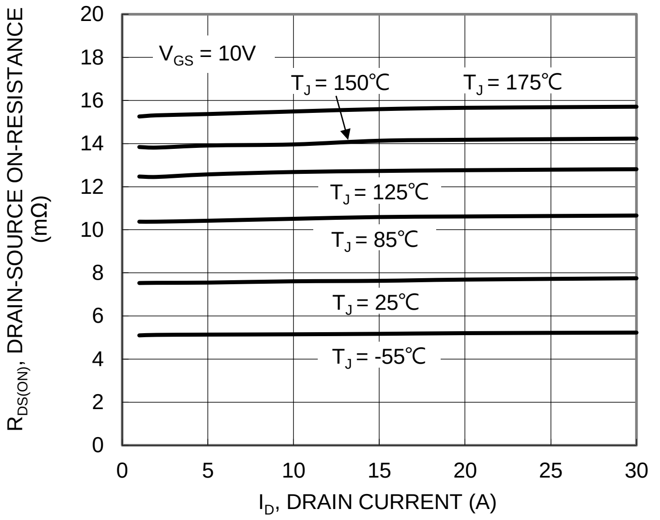


Figure 5. Typical On-Resistance vs. Drain Current and Temperature

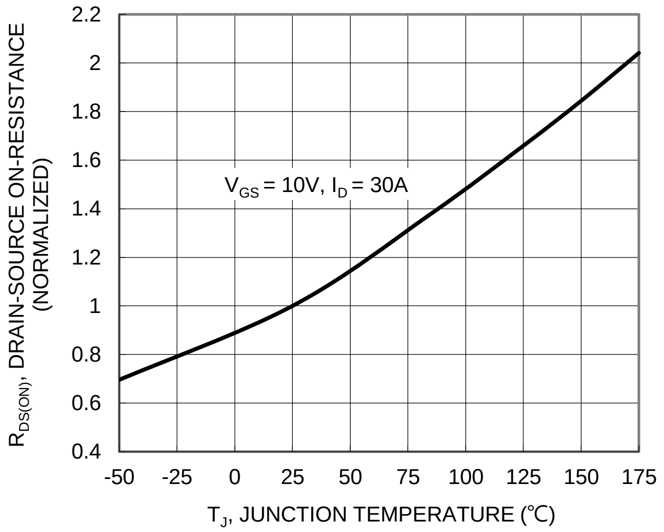


Figure 6. On-Resistance Variation with Temperature

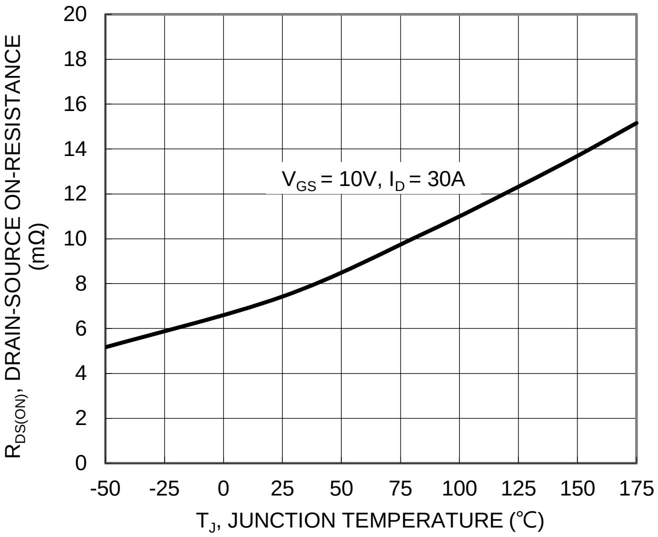


Figure 7. On-Resistance Variation with Temperature

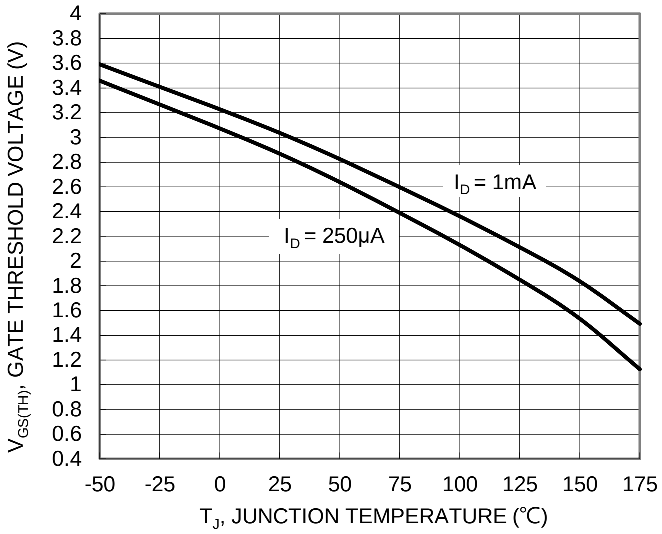


Figure 8. Gate Threshold Variation vs. Junction Temperature

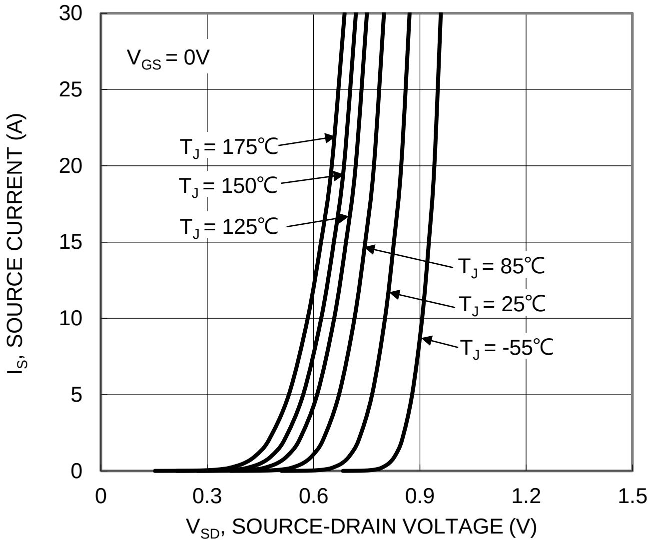


Figure 9. Diode Forward Voltage vs. Current

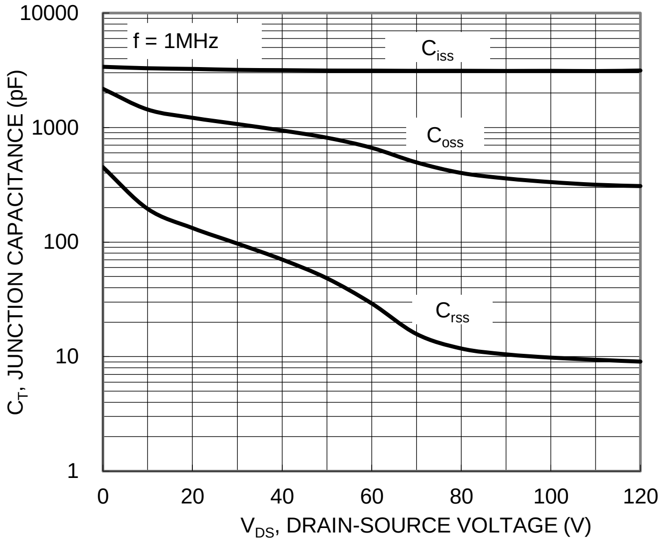


Figure 10. Typical Junction Capacitance

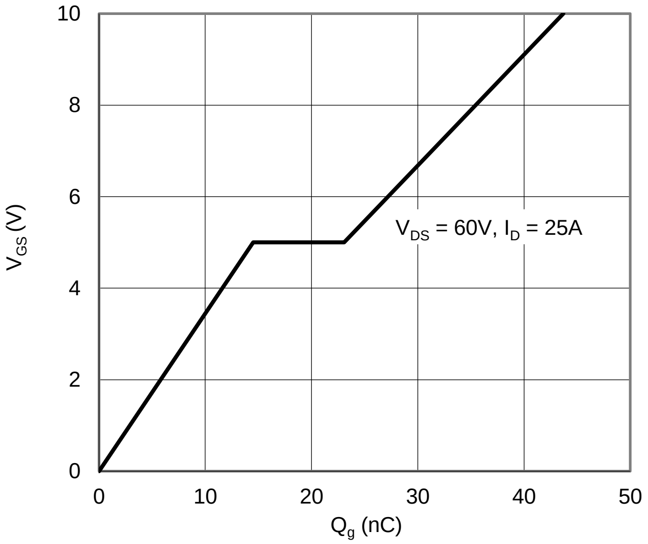


Figure 11. Gate Charge

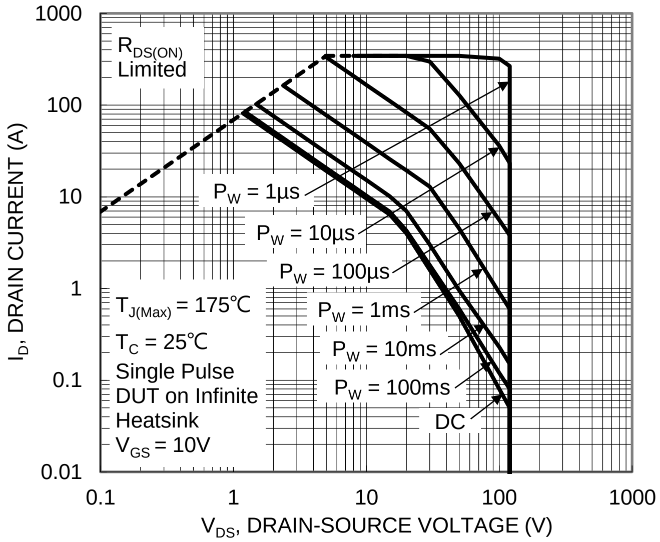


Figure 12. SOA, Safe Operation Area

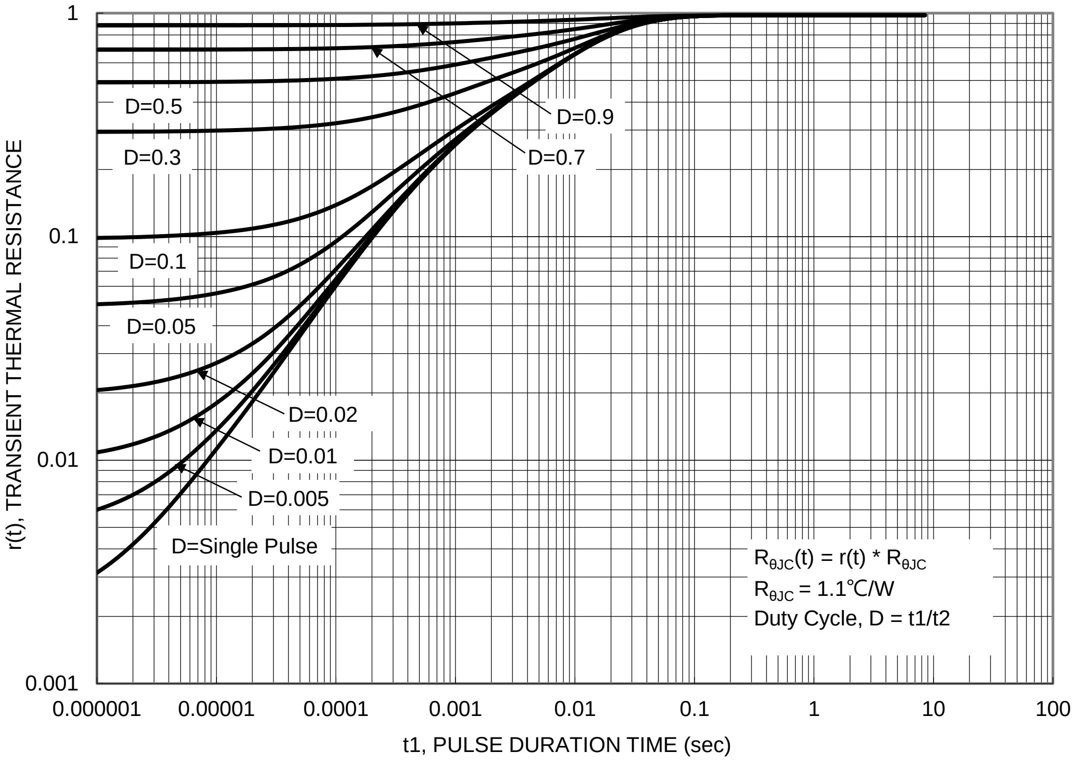
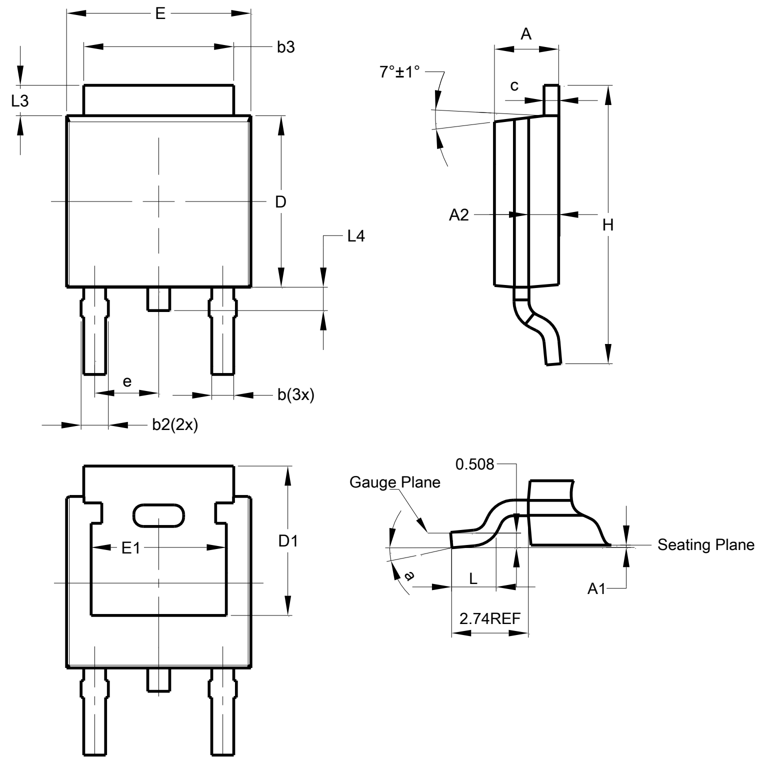


Figure 13. Transient Thermal Resistance

Package Outline Dimensions

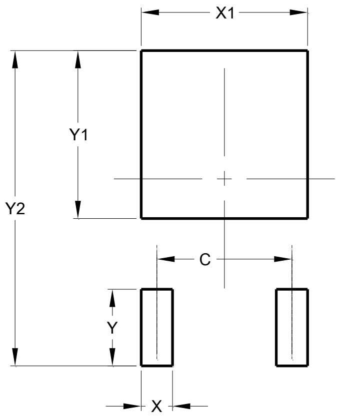
TO252 (DPAK)



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	5.50	5.33
c	0.45	0.58	0.531
D	6.00	6.20	6.10
D1	5.21	--	--
e	2.286 BSC		
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

TO252 (DPAK)



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