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

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Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)}$ **Max**	I_D $T_A = +25°C$
60V	44mΩ @ V_{GS} = 10V	5.0A
	60mΩ @ V_{GS} = 4.5V	4.3A

Features and Benefits

- 100% Unclamped Inductive Switch (UIS) Test in Production
- Low Input Capacitance
- Low On-Resistance
- Fast Switching Speed

Description and Applications

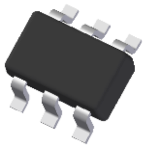
This new generation MOSFET is designed to minimize the on-state resistance ($R_{DS(ON)}$), yet maintain superior switching performance, making it ideal for high efficiency power management applications.

- DC-DC Converters
- Power Management Functions
- Backlighting

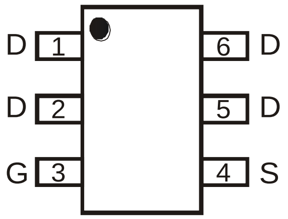
Mechanical Data

- Case: TSOT26
- 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 – Tin Finish Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.013 grams (Approximate)

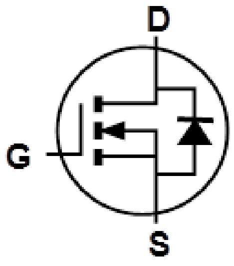
TSOT26



Top View



Top View
Pin Configuration



Equivalent Circuit

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

Characteristic			Symbol	Value	Units
Drain-Source Voltage			V_{DSS}	60	V
Gate-Source Voltage			V_{GSS}	±20	V
Continuous Drain Current (Note 7) V_{GS} = 10V	Steady State	T_A = +25°C	I_D	5.0	A
		T_A = +70°C		4.0	
	t<10s	T_A = +25°C	I_D	6.3	A
		T_A = +70°C		5.0	
Continuous Drain Current (Note 7) V_{GS} = 5V	Steady State	T_A = +25°C	I_D	4.3	A
		T_A = +70°C		3.4	
	t<10s	T_A = +25°C	I_D	5.4	A
		T_A = +70°C		4.3	
Maximum Body Diode Forward Current (Note 7)			I_S	2.1	A
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)			I_{DM}	30	A
Avalanche Current (Note 8) L = 0.1mH			I_{AR}	14.2	A
Avalanche Energy (Note 8) L = 0.1mH			E_{AR}	10	mJ

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

Characteristic		Symbol	Value	Units
Total Power Dissipation (Note 6)	T_A = +25°C	P_D	1.2	W
	T_A = +70°C		0.75	
Thermal Resistance, Junction to Ambient (Note 6)	Steady State	$R_{\theta JA}$	106	°C/W
	t<10s		69	°C/W
Total Power Dissipation (Note 7)	T_A = +25°C	P_D	1.8	W
	T_A = +70°C		1.1	
Thermal Resistance, Junction to Ambient (Note 7)	Steady State	$R_{\theta JA}$	68	°C/W
	t<10s		44	°C/W
Thermal Resistance, Junction to Case (Note 7)		$R_{\theta JC}$	20	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

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_{AR} and E_{AR} rating are based on low frequency and duty cycles to keep T_J = +25°C.

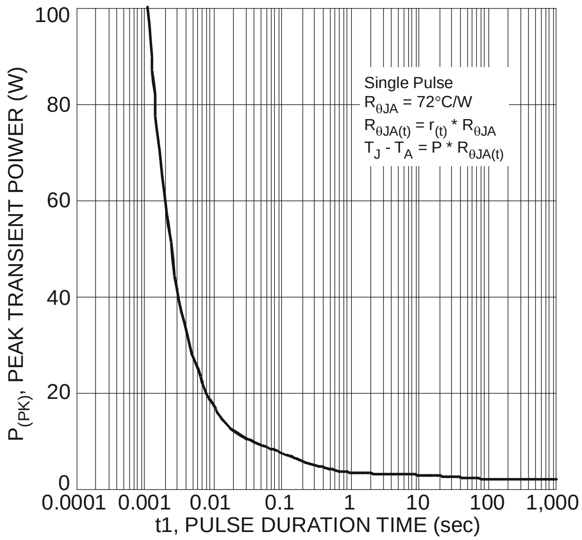


Fig. 1 Single Pulse Maximum Power Dissipation

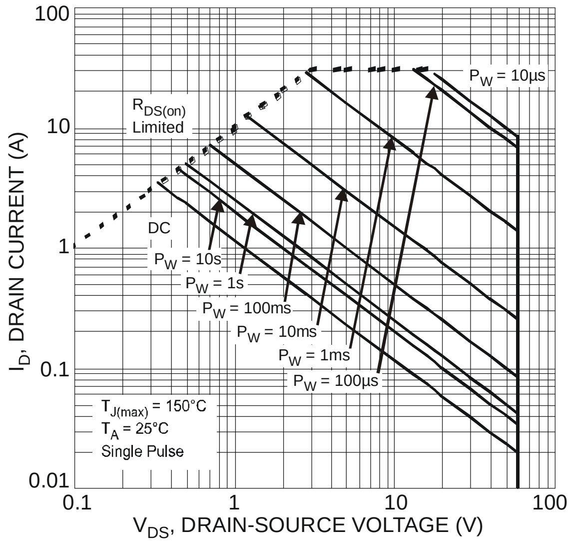


Fig. 2 SOA, Safe Operation Area

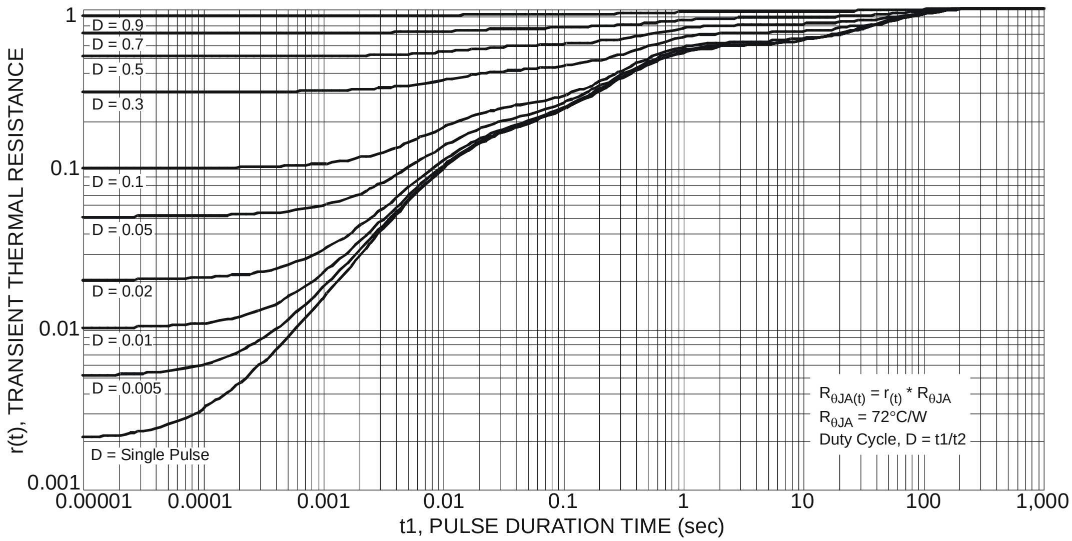


Fig. 3 Transient Thermal Resistance

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}	60	—	—	V	V_{GS} = 0V, I_D = 250µA
Zero Gate Voltage Drain Current	I_{DSS}	—	—	100	nA	V_{DS} = 60V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	—	—	±100	nA	V_{GS} = ±20V, V_{DS} = 0V
ON CHARACTERISTICS (Note 9)						
Gate Threshold Voltage	$V_{GS(TH)}$	1	—	3	V	V_{DS} = V_{GS}, I_D = 250µA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	30	44	mΩ	V_{GS} = 10V, I_D = 4.3A
		—	35	60		V_{GS} = 4.5V, I_D = 4A
Forward Transfer Admittance	$\|Y_{FS}\|$	—	4.5	—	S	V_{DS} = 10V, I_D = 4.3A
Diode Forward Voltage	V_{SD}	—	0.7	1.2	V	V_{GS} = 0V, I_S = 1A
DYNAMIC CHARACTERISTICS (Note 10)						
Input Capacitance	C_{ISS}	—	1,287	—	pF	V_{DS} = 25V, V_{GS} = 0V f = 1.0MHz
Output Capacitance	C_{OSS}	—	57	—		
Reverse Transfer Capacitance	C_{RSS}	—	44	—		
Gate Resistance	R_G	—	1.2	—	Ω	V_{DS} = 0V, V_{GS} = 0V, f = 1.0MHz
Total Gate Charge (V_{GS} = 10V)	Q_G	—	22.4	—	nC	V_{DS} = 30V, I_D = 4.3A
Total Gate Charge (V_{GS} = 4.5V)	Q_G	—	10.4	—		
Gate-Source Charge	Q_{GS}	—	4.9	—		
Gate-Drain Charge	Q_{GD}	—	3.0	—		
Turn-On Delay Time	$t_{D(ON)}$	—	6.6	—	ns	V_{GS} = 10V, V_{DD} = 30V, R_G = 6Ω, I_D = 4.3A
Turn-On Rise Time	t_R	—	8.1	—		
Turn-Off Delay Time	$t_{D(OFF)}$	—	20.1	—		
Turn-Off Fall Time	t_F	—	4.0	—		
Body Diode Reverse Recovery Time	t_{RR}	—	18	—	ns	I_S = 4.3A, dI/dt = 100A/µs
Body Diode Reverse Recovery Charge	Q_{RR}	—	11.9	—	nC	I_S = 4.3A, dI/dt = 100A/µs

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

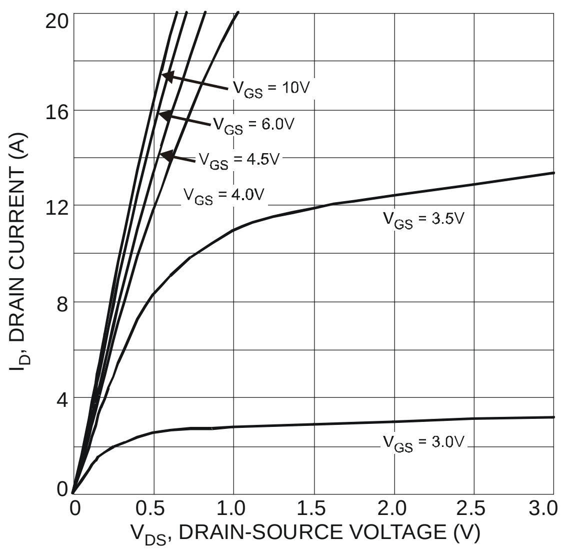


Fig. 4 Typical Output Characteristic

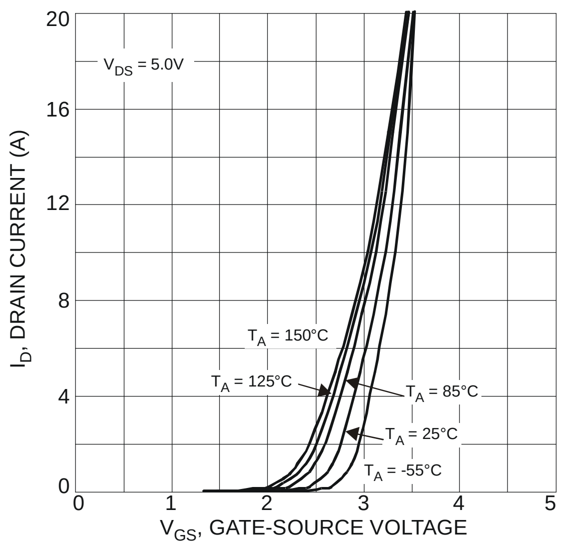


Fig. 5 Typical Transfer Characteristics

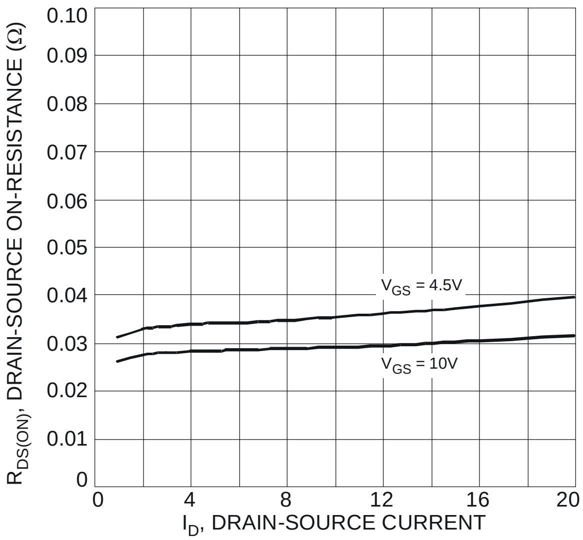


Fig. 6 Typical On-Resistance vs.
Drain Current and Gate Voltage

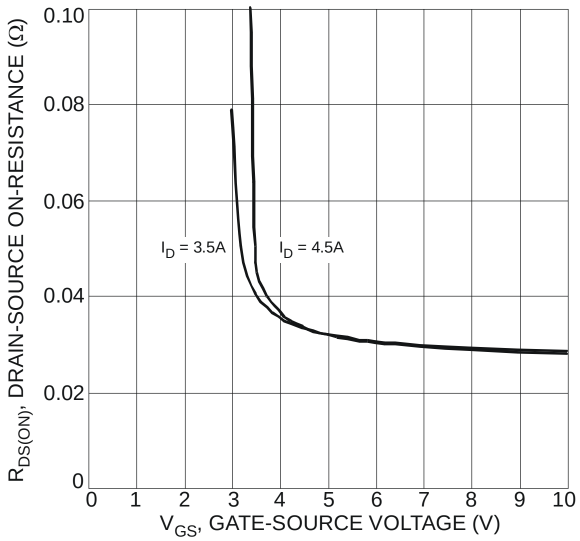


Fig. 7 Typical On-Resistance vs.
Drain Current and Gate Voltage

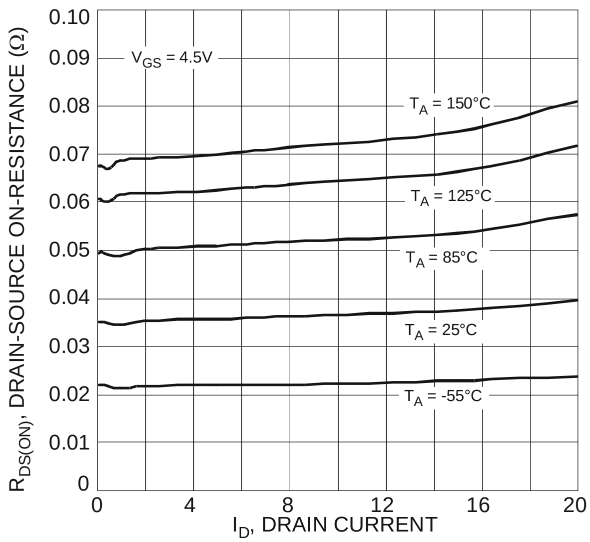


Fig. 8 Typical On-Resistance vs.
Drain Current and Temperature

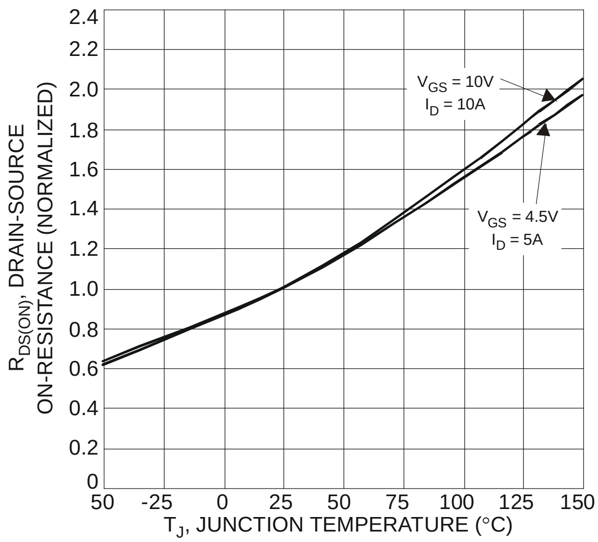


Fig. 9 On-Resistance Variation with Temperature

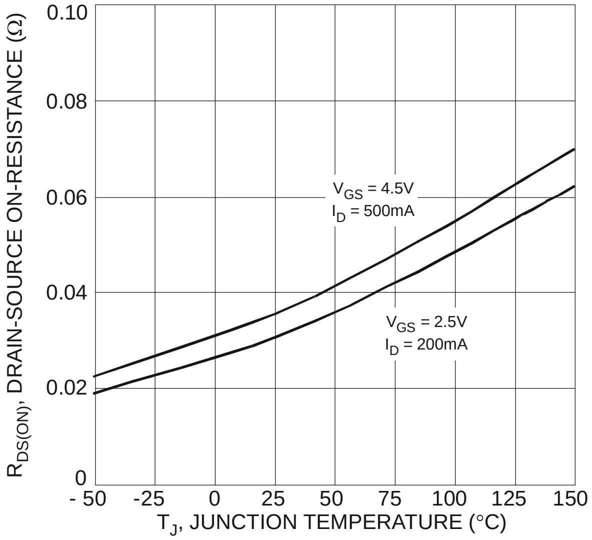


Fig. 10 On-Resistance Variation with Temperature

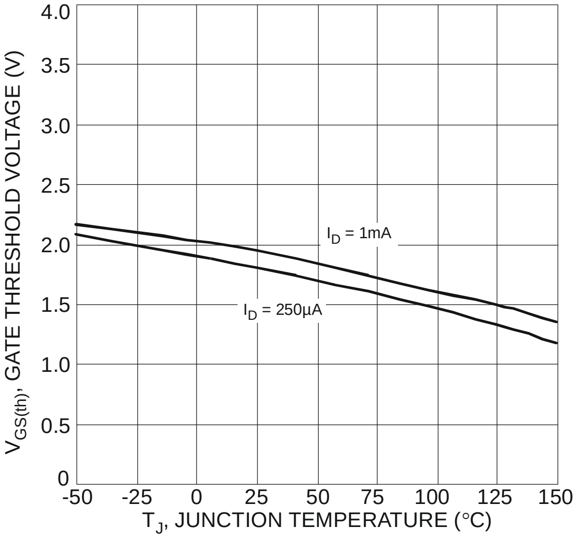


Fig. 11 Gate Threshold Variation vs. Ambient Temperature

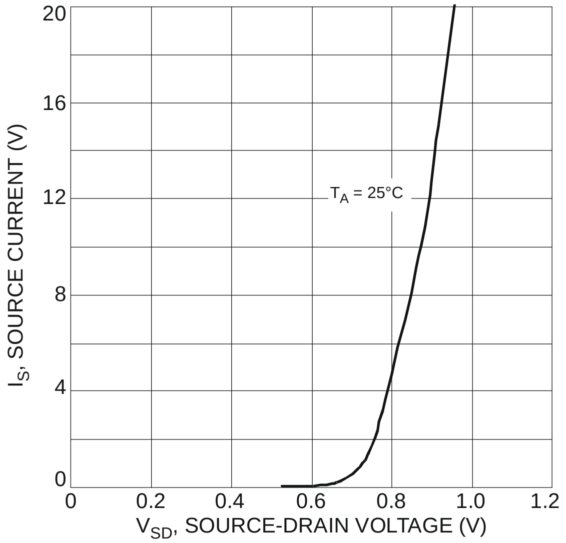


Fig. 12 Diode Forward Voltage vs. Current

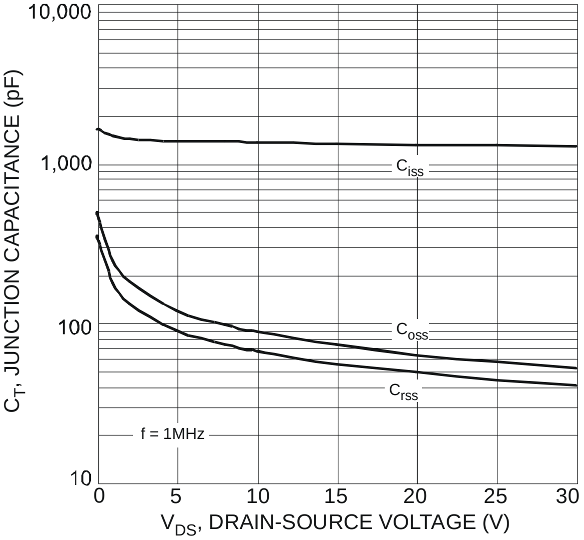


Fig. 13 Typical Junction Capacitance

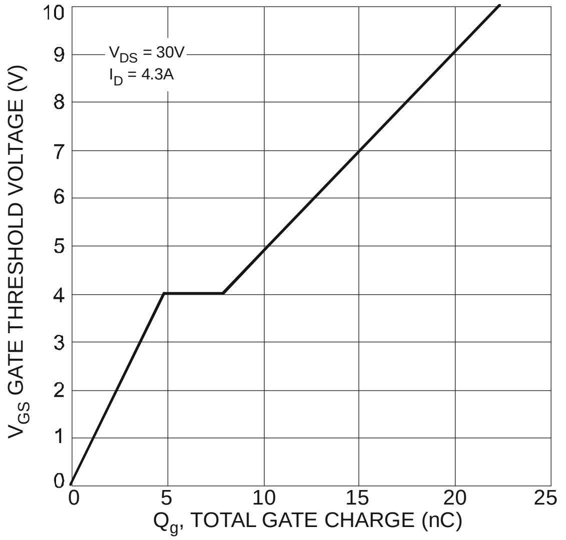
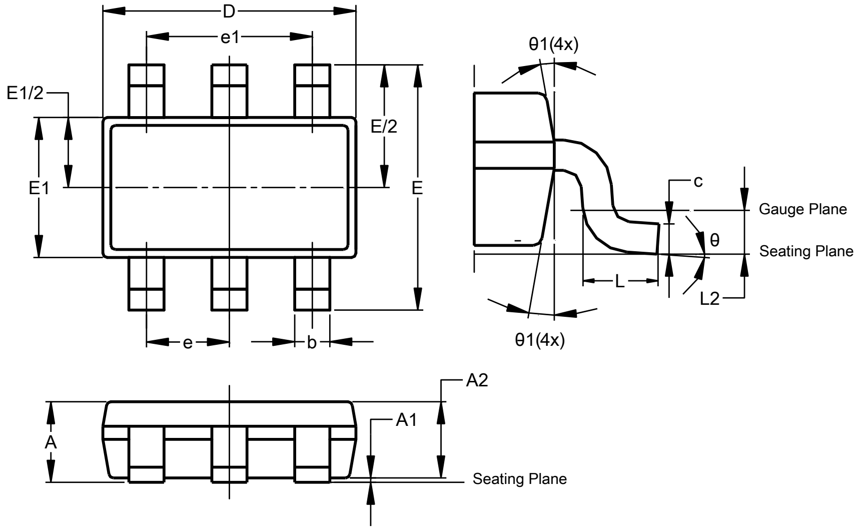


Fig. 14 Gate Charge

Package Outline Dimensions

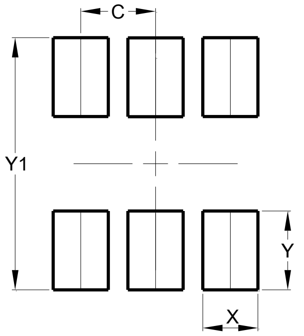
TSOT26



TSOT26			
Dim	**Min**	**Max**	**Typ**
A	–	1.00	–
A1	0.010	0.100	–
A2	0.840	0.900	–
D	2.800	3.000	2.900
E	2.800 BSC		
E1	1.500	1.700	1.600
b	0.300	0.450	–
c	0.120	0.200	–
e	0.950 BSC		
e1	1.900 BSC		
L	0.30	0.50	
L2	0.250 BSC		
θ	0°	8°	4°
θ1	4°	12°	–
All Dimensions in mm			

Suggested Pad Layout

TSOT26



Dimensions	Value (in mm)
C	0.950
X	0.700
Y	1.000
Y1	3.199