

Product Summary

BV _{DSS}	R _{DS(ON)} Max	I _D Max T _A = +25°C
-20V	80mΩ @ V _{GS} = -4.5V	-3.7A
	110mΩ @ V _{GS} = -2.5V	-3.1A

Description

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.

Applications

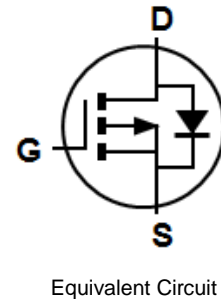
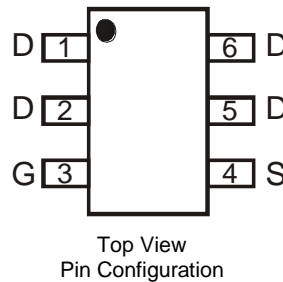
- General Purpose Interfacing Switch
- Power Management Functions

Features and Benefits

- Low On-Resistance
- Low Gate Threshold Voltage
- Low Input Capacitance
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

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)

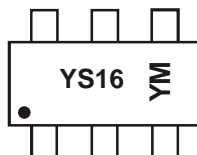


Ordering Information (Note 4)

Part Number	Case	Packaging
DMP2109UVT-7	TSOT26	3000/Tape & Reel
DMP2109UVT-13	TSOT26	10,000/Tape & Reel

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
 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



YS16 = Product Type Marking Code
 YM = Date Code Marking
 Y or \bar{Y} = Year (ex: F = 2018)
 M = Month (ex: 9 = September)

Date Code Key

Year	2018	2019	2020	2021	2022	2023	2024	2025	2026
Code	F	G	H	I	J	K	L	M	N

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

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

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V _{DSS}	-20	V
Gate-Source Voltage	V _{GSS}	±10	V
Continuous Drain Current (Note 6) V _{GS} = -4.5V	I _D	T _A = +25°C -3.7	A
		T _A = +70°C -2.9	
Continuous Drain Current (Note 6) V _{GS} = -2.5V	I _D	T _A = +25°C -3.1	A
		T _A = +70°C -2.5	
Maximum Continuous Body Diode Forward Current (Note 6)	I _S	-1.2	A
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)	I _{DM}	-20	A

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

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	P _D	1.2	W
Thermal Resistance, Junction to Ambient (Note 5)	R _{θJA}	105	°C/W
Total Power Dissipation (Note 6)	P _D	1.0	W
Thermal Resistance, Junction to Ambient (Note 6)	R _{θJA}	77	°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 7)						
Drain-Source Breakdown Voltage	BV _{DSS}	-20	—	—	V	V _{GS} = 0V, I _D = -250µA
Zero Gate Voltage Drain Current T _J = +25°C	I _{DSS}	—	—	-1.0	µA	V _{DS} = -16V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±100	nA	V _{GS} = ±8V, V _{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	V _{GS(TH)}	-0.45	—	-1.0	V	V _{DS} = V _{GS} , I _D = -250µA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	54	80	mΩ	V _{GS} = -4.5V, I _D = -2.8A
			70	110		V _{GS} = -2.5V, I _D = -2.0A
Diode Forward Voltage	V _{SD}	—	-0.7	-1.0	V	V _{GS} = 0V, I _S = -1A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C _{ISS}	—	443	—	pF	V _{DS} = -10V, V _{GS} = 0V f = 1.0MHz
Output Capacitance	C _{OSS}	—	59	—	pF	
Reverse Transfer Capacitance	C _{RSS}	—	47	—	pF	
Gate Resistance	R _G	—	8.5	—	Ω	V _{GS} = 0V, V _{DS} = 0V, f = 1.0MHz
Total Gate Charge	Q _g	—	6.0	—	nC	V _{GS} = -4.5V, V _{DS} = -10V, I _D = -3A
Gate-Source Charge	Q _{gs}	—	0.6	—	nC	
Gate-Drain Charge	Q _{gd}	—	1.8	—	nC	
Turn-On Delay Time	t _{D(ON)}	—	4.0	—	ns	
Turn-On Rise Time	t _R	—	3.7	—	ns	V _{DS} = -10V, V _{GS} = -4.5V, R _L = 10Ω, R _G = 1.0Ω, I _D = -1A
Turn-Off Delay Time	t _{D(OFF)}	—	24.5	—	ns	
Turn-Off Fall Time	t _F	—	9.5	—	ns	
Reverse Recovery Time	t _{RR}	—	8.3	—	ns	I _F = -1.0A, di/dt = 100A/µs
Reverse Recovery Charge	Q _{RR}	—	2.0	—	nC	I _F = -1.0A, di/dt = 100A/µs

- Notes:
5. Device mounted on FR-4 substrate PCB, 2oz copper, with minimum recommended pad layout.
 6. Device mounted on FR-4 substrate PCB, 2oz copper, with 1inch square copper plate.
 7. Short duration pulse test used to minimize self-heating effect.
 8. Guaranteed by design. Not subject to product testing.

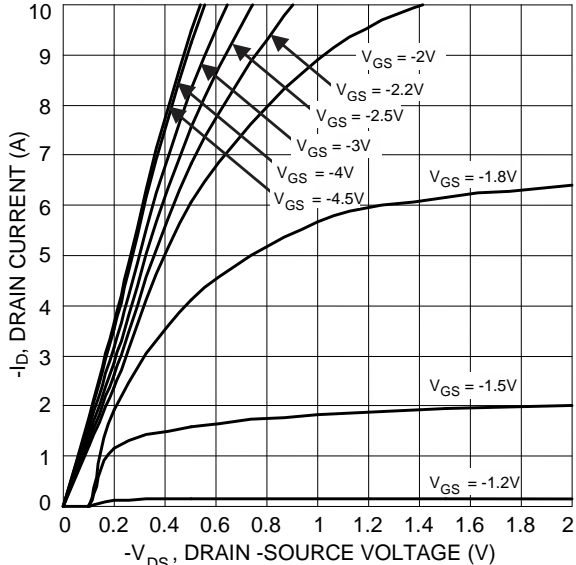


Figure 1 Typical Output Characteristics

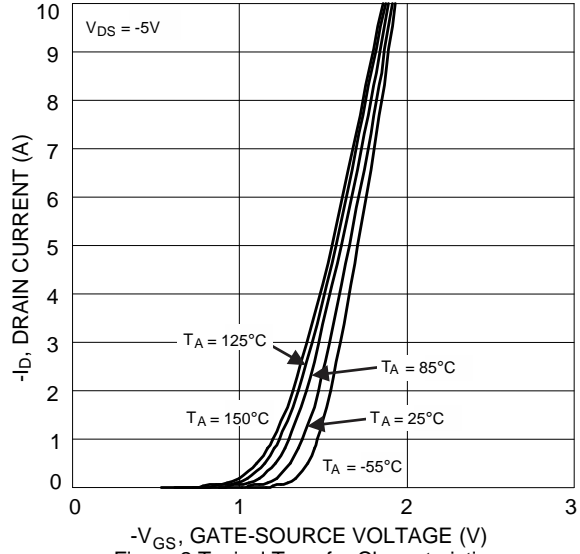


Figure 2 Typical Transfer Characteristics

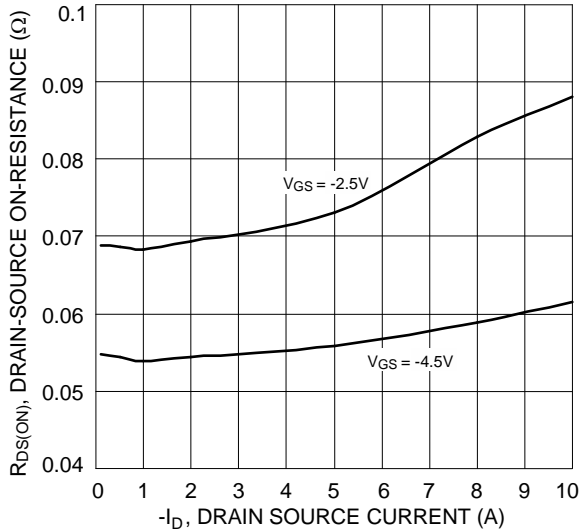


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

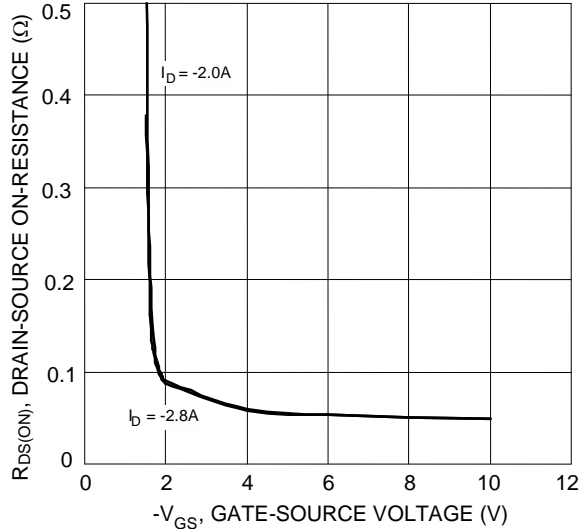


Figure 4 Typical Drain-Source On-Resistance vs. Gate-Source Voltage

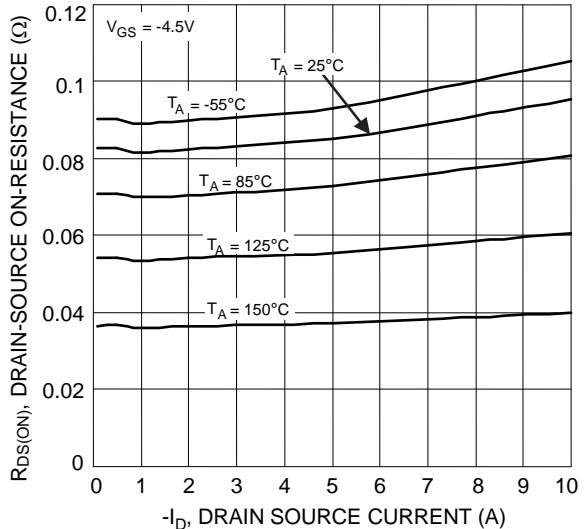


Figure 5 Typical On-Resistance vs. Drain Current and Temperature

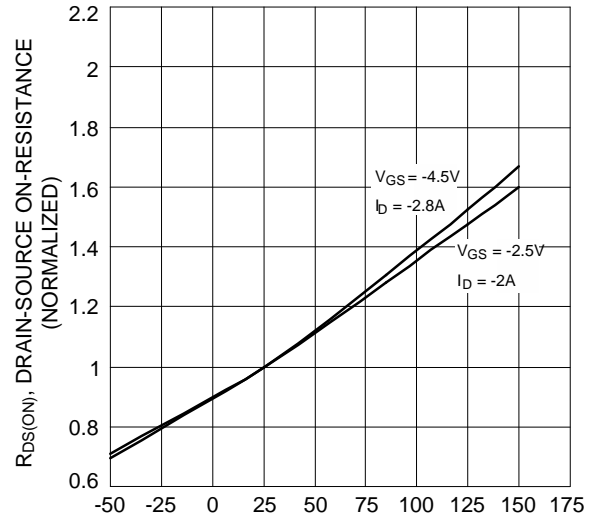


Figure 6 On-Resistance Variation with Temperature

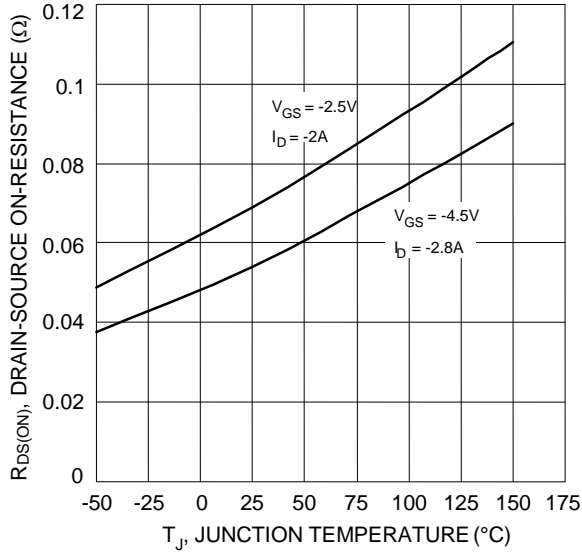


Figure 7 On-Resistance Variation with Temperature

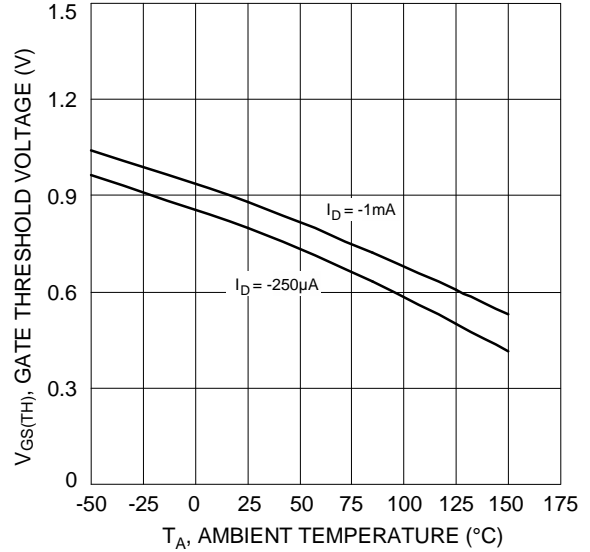


Figure 8 Gate Threshold Variation vs. Ambient Temperature

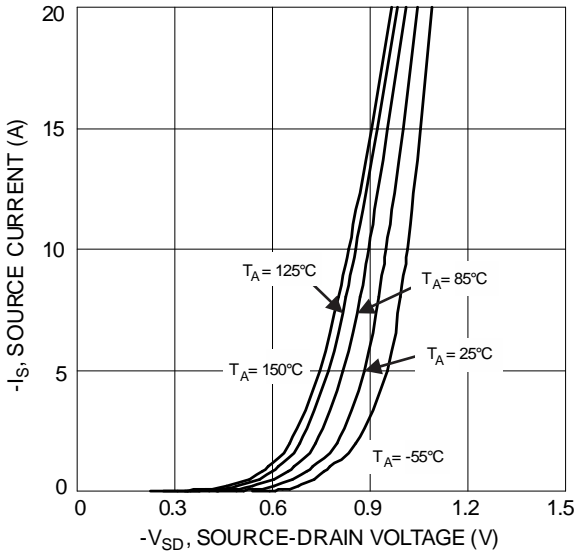


Figure 9 Diode Forward Voltage vs. Current

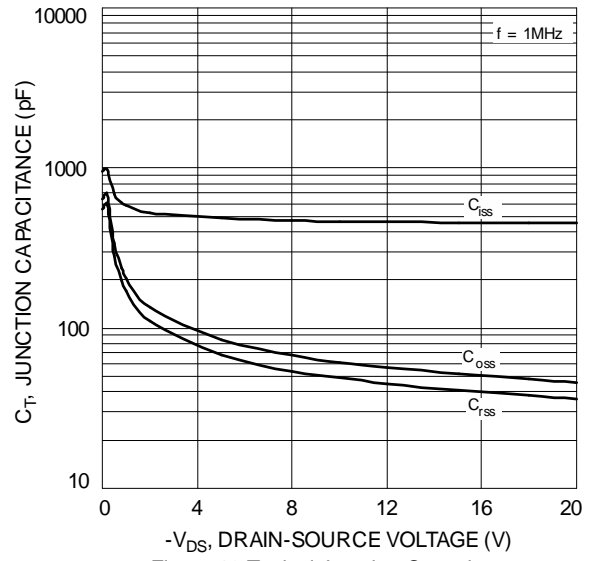


Figure 10 Typical Junction Capacitance

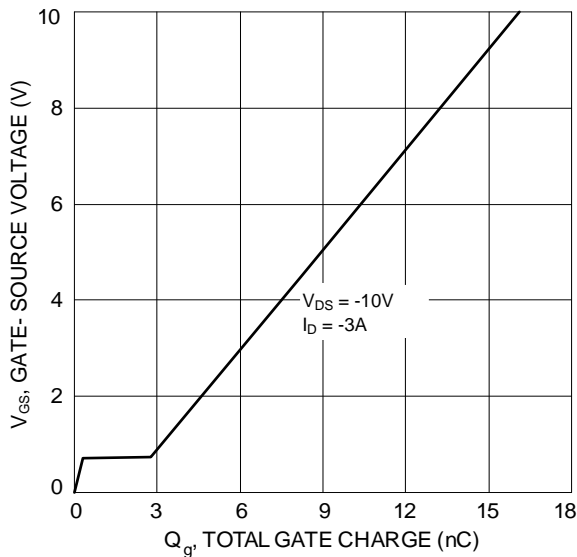


Figure 11 Gate Charge

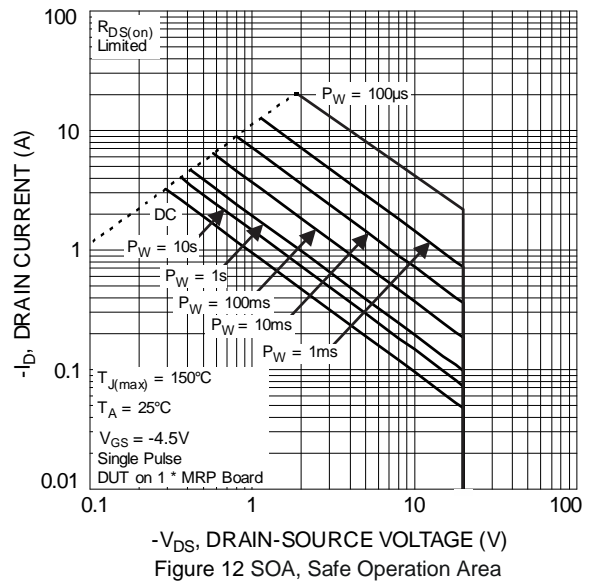


Figure 12 SOA, Safe Operation Area

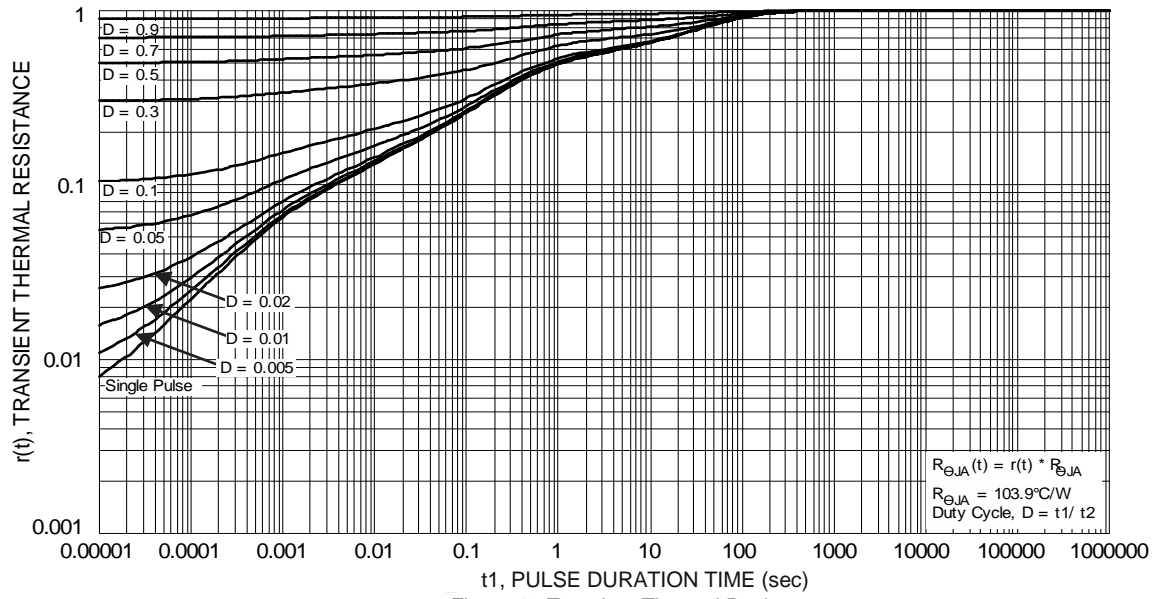
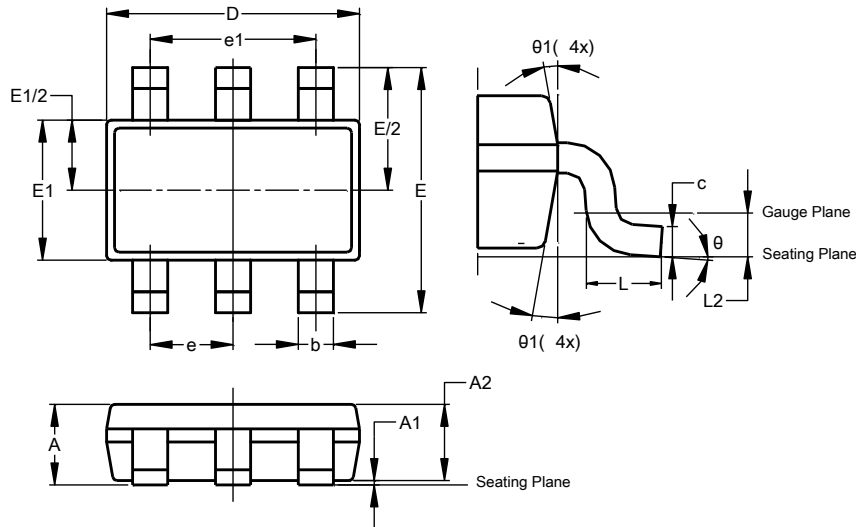


Figure 13 Transient Thermal Resistance

Package Outline Dimensions

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

TSOT26

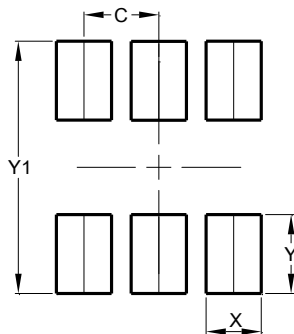


TSOT26			
Dim	Min	Max	Typ
A	—	1.00	—
A1	0.010	0.100	—
A2	0.840	0.900	—
D	2.800	3.000	2.900
E	2.800 BSC		
E1	1.500	1.700	1.600
b	0.300	0.450	—
c	0.120	0.200	—
e	0.950 BSC		
e1	1.900 BSC		
L	0.30	0.50	—
L2	0.250 BSC		
θ	0°	8°	4°
$\theta 1$	4°	12°	—
All Dimensions in mm			

Suggested Pad Layout

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

TSOT26



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

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