

Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)}$ Max	I_D $T_A = +25^\circ C$
20V	24m Ω @ $V_{GS} = 4.5V$	7A
	28m Ω @ $V_{GS} = 2.5V$	5A

Description

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

Applications

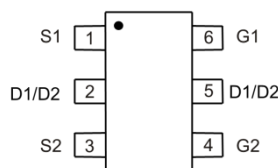
- Backlighting
- DC-DC Converters
- Power Management Functions



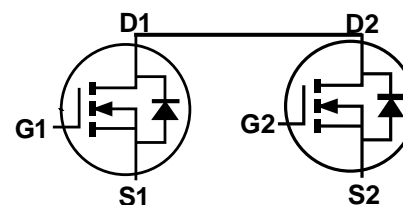
ESD Protected Gate



TSOT26



Top View



Equivalent Circuit

Features and Benefits

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

Mechanical Data

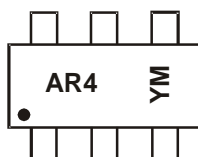
- Case: TSOT26
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals Connections: See Diagram
- Terminals: Finish—Matte Tin Annealed Over Copper Leadframe. Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.013 grams (Approximate)

Ordering Information (Note 4)

Part Number	Case	Packaging
DMN2024UVT-7	TSOT26	3000/Tape & Reel
DMN2024UVT-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, refer to <http://www.diodes.com/products/packages.html>.

Marking Information



AR4 = 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
Code	F	G	H	I	J	K	L	M

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	Units
Drain-Source Voltage			V _{DSS}	20	V
Gate-Source Voltage			V _{GSS}	±10	V
Continuous Drain Current (Note 6) V _{GS} = 4.5V	Steady State	T _A = +25°C	I _D	7.0	A
		T _A = +70°C		5.0	
Maximum Continuous Body Diode Forward Current (Note 6)			I _S	2.3	A
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)			I _{DM}	35	A

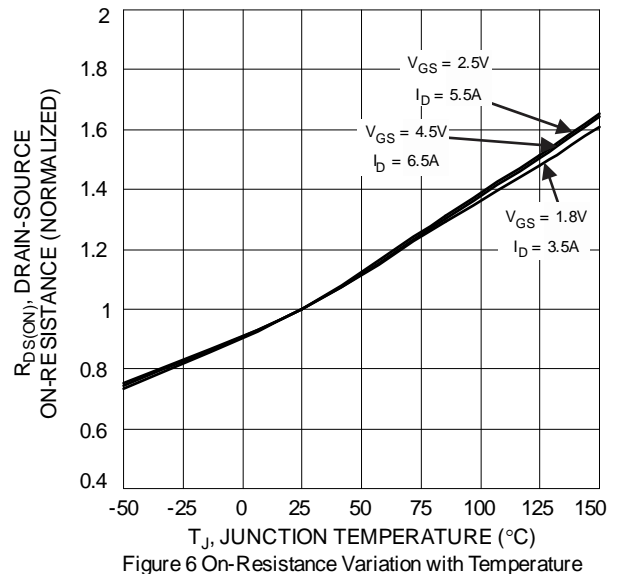
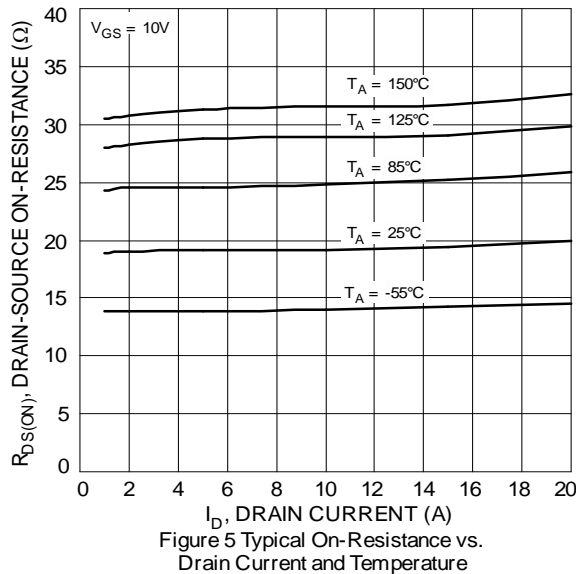
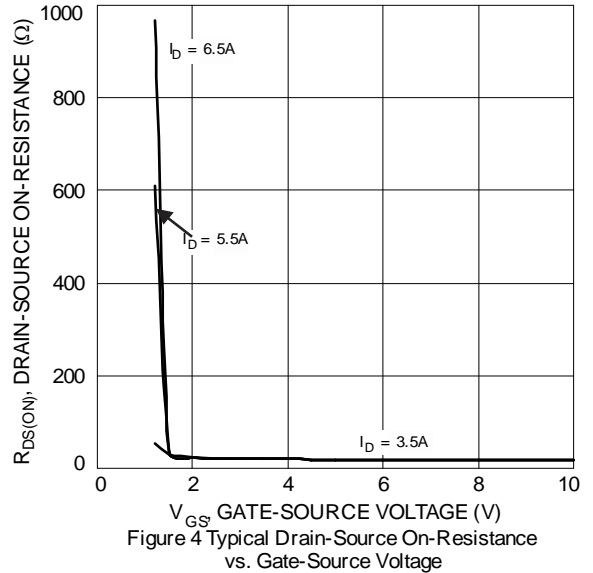
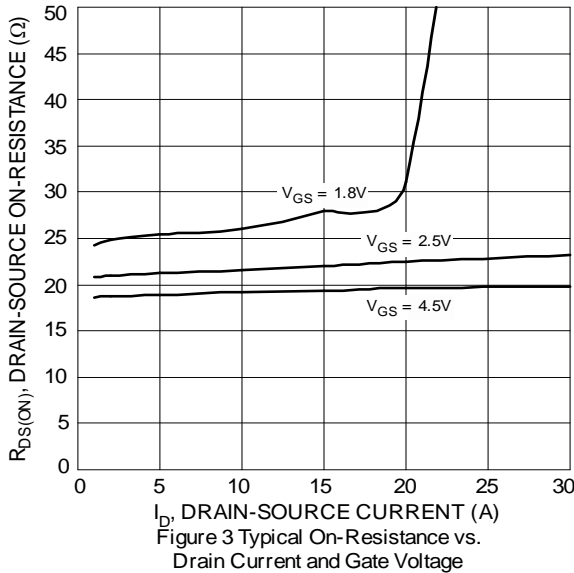
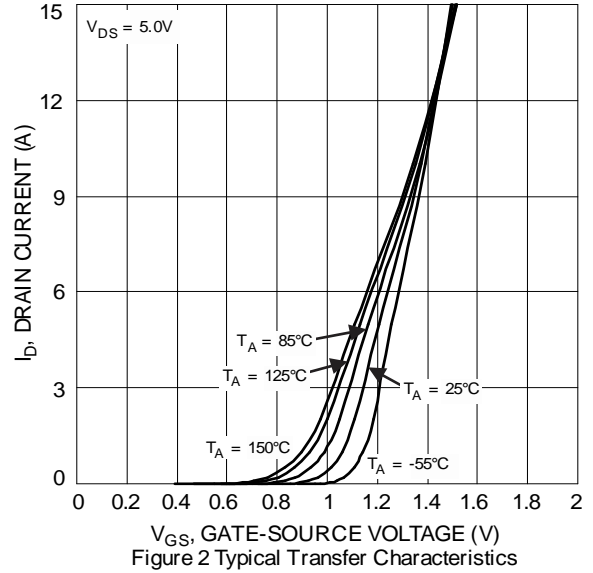
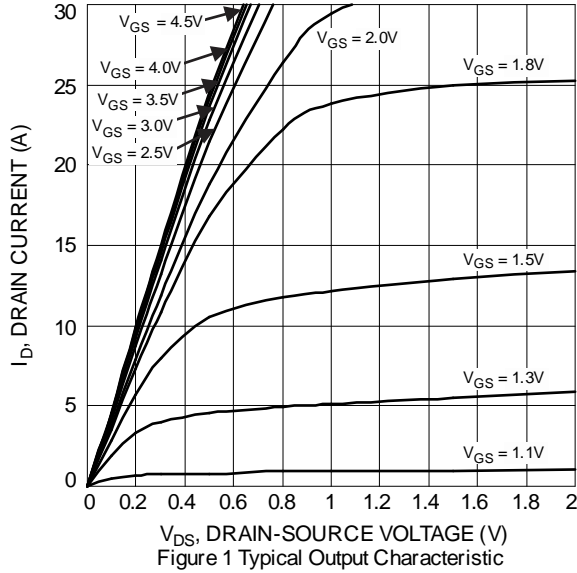
Thermal Characteristics

Characteristic			Symbol	Value	Units
Total Power Dissipation (Note 5)			P _D	1.0	W
Thermal Resistance, Junction to Ambient (Note 5)		Steady State	R _{θJA}	124	°C/W
Total Power Dissipation (Note 6)			P _D	1.6	W
Thermal Resistance, Junction to Ambient (Note 6)		Steady State	R _{θJA}	78	°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	I _{DSS}	—	—	1.0	µA	T _J = +25°C, V _{DS} = 20V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±10	µA	V _{GS} = ±8V, V _{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	V _{GS(TH)}	0.5	—	0.9	V	V _{DS} = V _{GS} , I _D = 250µA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	19	24	mΩ	V _{GS} = 4.5V, I _D = 6.5A
			22	28		V _{GS} = 2.5V, I _D = 5.5A
			25	34		V _{GS} = 1.8V, I _D = 3.5A
Diode Forward Voltage	V _{SD}	—	0.9	1.2	V	V _{GS} = 0V, I _D = 5A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C _{ISS}	—	647	—	pF	V _{DS} = 10V, V _{GS} = 0V f = 1.0MHz
Output Capacitance	C _{OSS}	—	78	—	pF	
Reverse Transfer Capacitance	C _{RSS}	—	38	—	pF	
Gate Resistance	R _g	—	628	—	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1MHz
Total Gate Charge	Q _g	—	7.1	—	nC	V _{GS} = 4.5V, V _{DS} = 10V, I _D = 6.5A
Gate-Source Charge	Q _{gs}	—	0.9	—	nC	
Gate-Drain Charge	Q _{gd}	—	0.7	—	nC	
Turn-On Delay Time	t _{D(ON)}	—	98	—	ns	V _{DS} = 10V, V _{GS} = 4.5V, R _L = 10Ω, R _G = 6Ω, I _D = 1A
Turn-On Rise Time	t _R	—	140	—	ns	
Turn-Off Delay Time	t _{D(OFF)}	—	1024	—	ns	
Turn-Off Fall Time	t _F	—	434	—	ns	
Reverse Recovery Time	t _{RR}	—	245	—	ns	I _F = 1.0A, di/dt = 100A/µs
Reverse Recovery Charge	Q _{RR}	—	149	—	nC	I _F = 1.0A, di/dt = 100A/µs

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



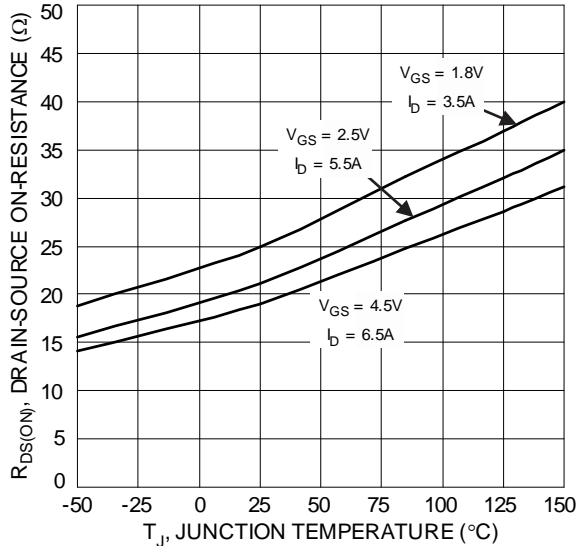


Figure 7 On-Resistance Variation with Temperature

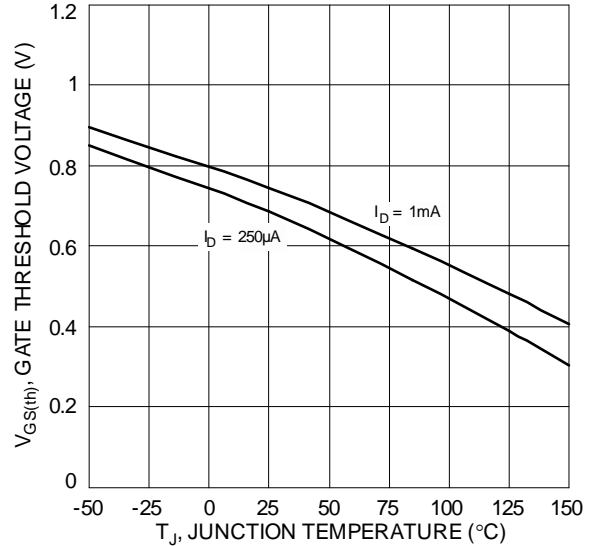


Figure 8 Gate Threshold Variation vs. Ambient Temperature

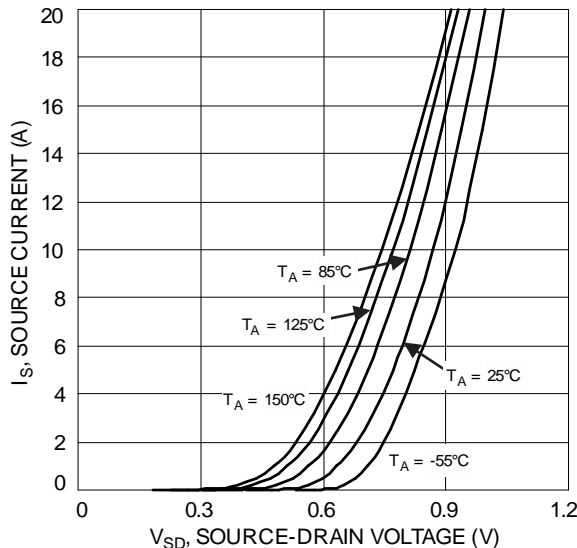


Figure 9 Diode Forward Voltage vs. Current

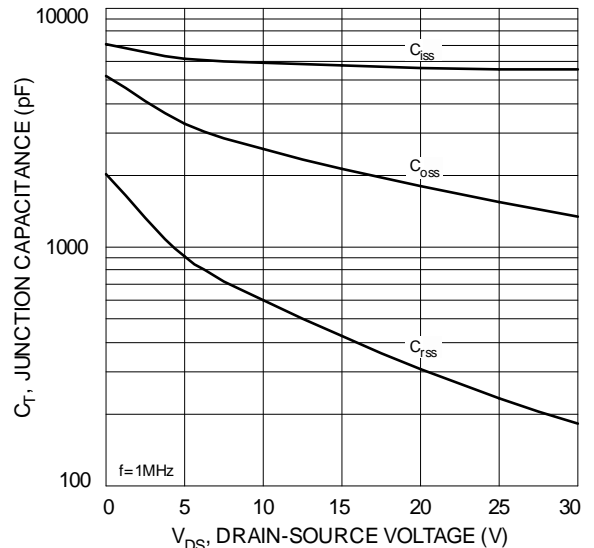


Figure 10 Typical Junction Capacitance

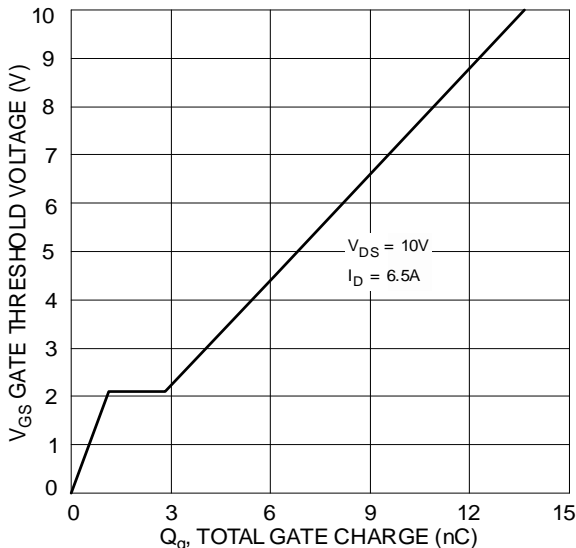


Figure 11 Gate Charge

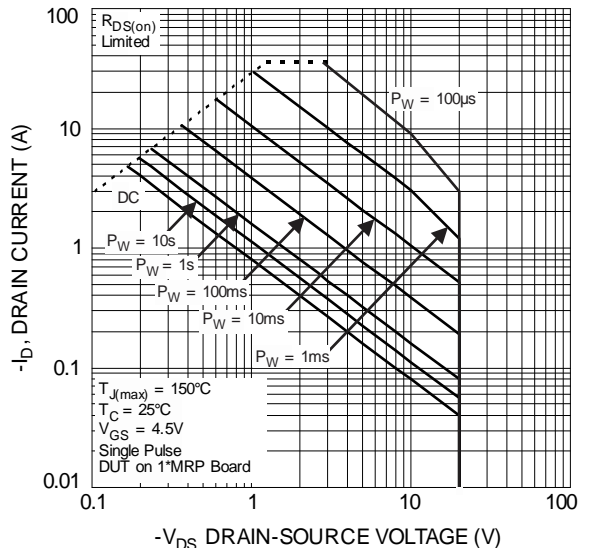


Figure 12 SOA, Safe Operation Area

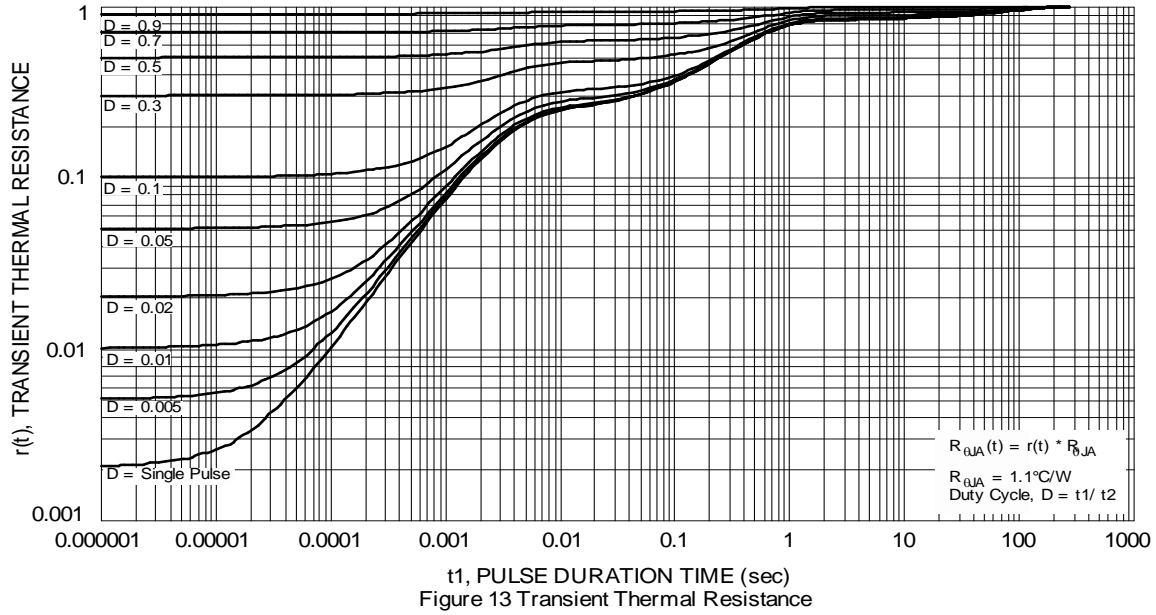
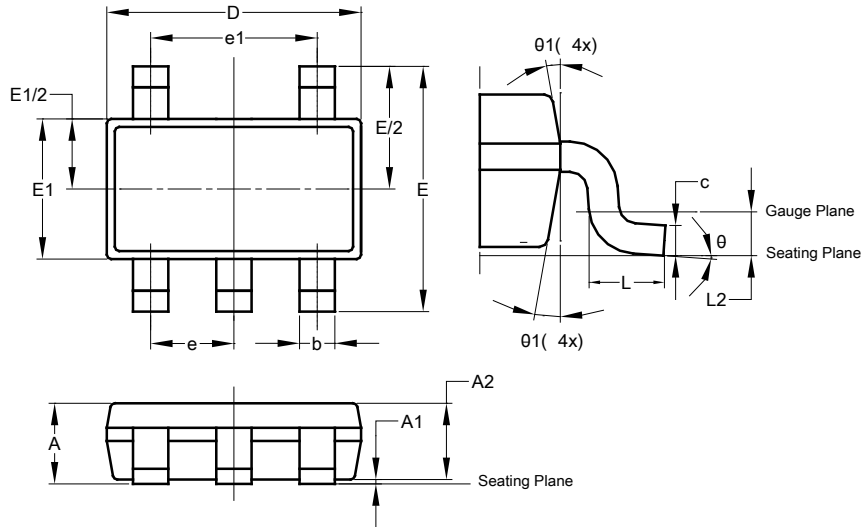


Figure 13 Transient Thermal Resistance

Package Outline Dimensions

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

TSOT25

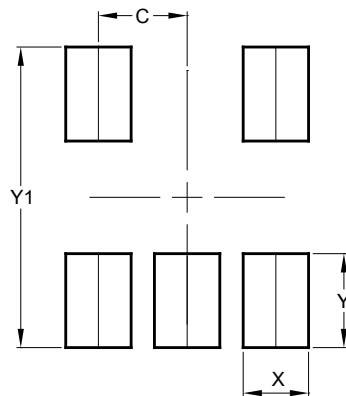


TSOT25			
Dim	Min	Max	Typ
A	—	1.00	—
A1	0.01	0.10	—
A2	0.84	0.90	—
b	0.30	0.45	—
c	0.12	0.20	—
D	—	—	2.90
E	—	—	2.80
E1	—	—	1.60
e	0.95 BSC		
e1	1.90 BSC		
L	0.30	0.50	—
L2	0.25 BSC		
θ	0°	8°	4°
$\theta 1$	4°	12°	—
All Dimensions in mm			

Suggested Pad Layout

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

TSOT25



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

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Телефон: 8 (812) 309-75-97 (многоканальный)

Факс: 8 (812) 320-03-32

Электронная почта: ocean@oceanchips.ru

Web: <http://oceanchips.ru/>

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, д. 2, корп. 4, лит. А