

Trench-based Schottky Diode, 500 mA, 20 V

NSR05201MX4

These Trench Schottky diodes are optimized for low forward voltage drop and low leakage current that offers the most optimal power dissipation in applications. They are housed in space saving micro-packaging ideal for space constrained applications.

Features

- Smallest Package Available (01005); 0.445 x 0.24mm
- 500 mA of Continuous Forward Current
- Low Forward Voltage Drop – 350 mV (Typical) @ $I_F = 100$ mA
- Low Reverse Current – 40 μ A (Typical) @ $V_R = 20$ V
- Very Low Reverse Recovery Time – 8 ns Maximum
- Low Capacitance – 20 pF Typical

Typical Applications

- Mobile and Wearable Devices
- Battery Chargers
- Buck and Boost dc-dc Converters
- Reverse Voltage and Current Protection
- Clamping & Protection

MAXIMUM RATINGS

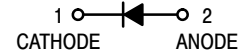
Rating	Symbol	Value	Unit
Forward Current (DC)	I_F	500	mA
Reverse Voltage	V_R	20	V
Repetitive Peak Forward Current (Pulse Wave = 1 sec, Duty Cycle = 66%)	I_{FRM}	1.0	A
ESD Rating: Human Body Model Machine Model	ESD	>8.0 >400	kV V

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.



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MARKING DIAGRAM



X4DFN2 (01005)
CASE 718AA



T = Specific Device Code
M = Date Code

ORDERING INFORMATION

Device	Package	Shipping†
NSR05201MX4T5G	X4DFN2 (Pb-Free)	10000 / Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance Junction-to-Ambient (Note 1) Total Power Dissipation @ $T_A = 25^\circ\text{C}$	$R_{\theta JA}$ P_D	614.9 203	$^\circ\text{C/W}$ mW
Thermal Resistance Junction-to-Ambient (Note 2) Total Power Dissipation @ $T_A = 25^\circ\text{C}$	$R_{\theta JA}$ P_D	239.4 522	$^\circ\text{C/W}$ mW
Junction Temperature Range	T_J	-55 to +125	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55 to +150	$^\circ\text{C}$
Lead Solder Temperature - Maximum (10 seconds)	T_L	260	$^\circ\text{C}$

1. Mounted onto a 4 in² FR-4 board 10 mm² 1 oz. Cu 0.06" thick single-sided. Operating to steady state.
2. Mounted onto a 4 in² FR-4 board 2 cm² 1 oz. Cu 0.06" thick single-sided. Operating to steady state.

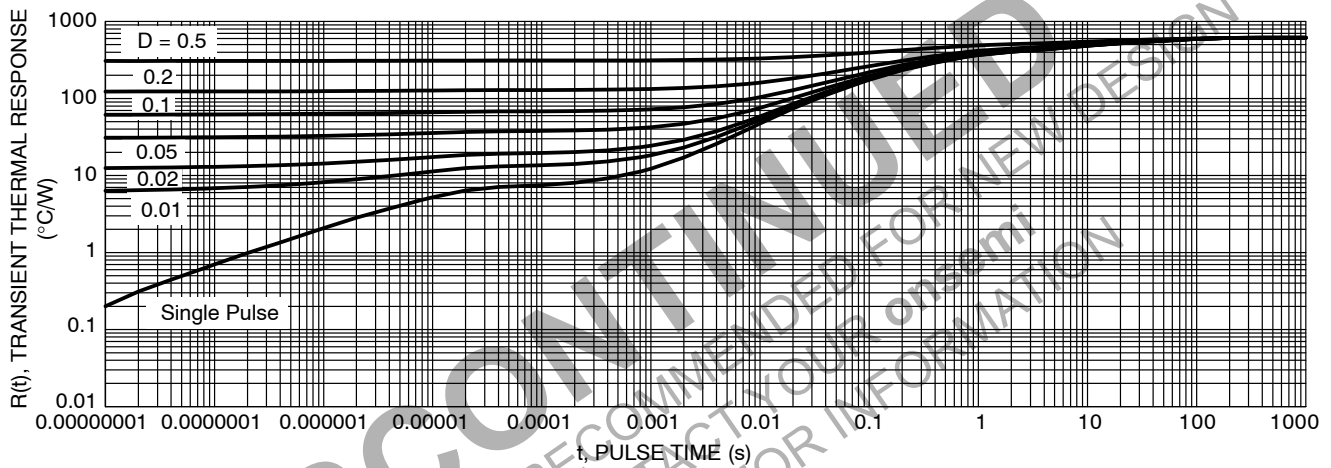


Figure 1. Thermal Response (Note 1)

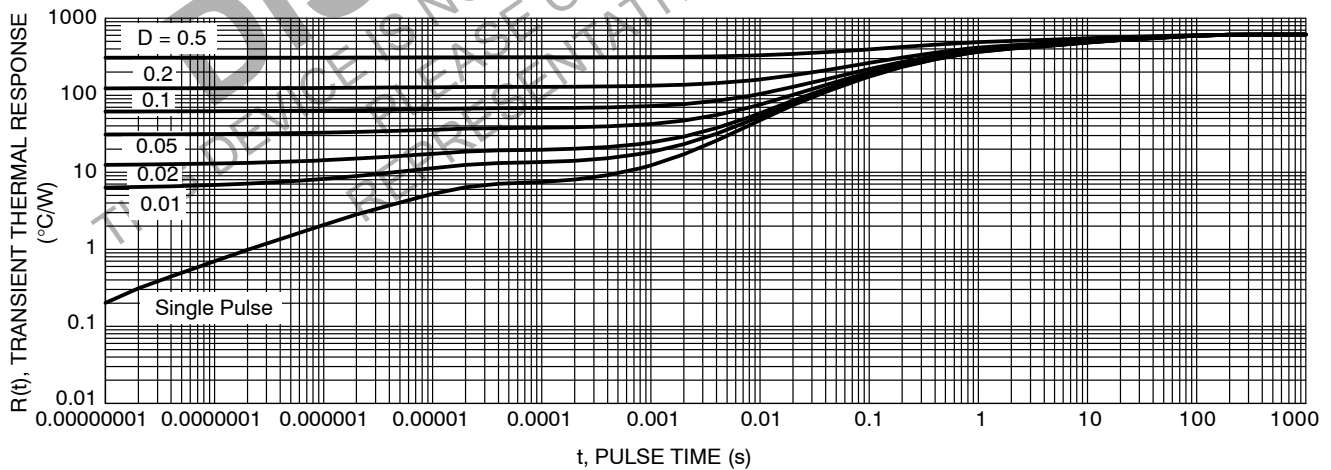


Figure 2. Thermal Response (Note 2)

NSR05201MX4

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
Reverse Leakage (V _R = 7 V) (V _R = 20 V)	I _R		5.0 40	60 110	μA
Forward Voltage (I _F = 100 mA) (I _F = 200 mA) (I _F = 500 mA)	V _F		350 400 450	480 530 600	mV
Total Capacitance (V _R = 5.0 V, f = 1 MHz)	C _T		20		pF
Reverse Recovery Time (I _F = I _R = 10 mA, I _{R(REC)} = 1.0 mA)	t _{rr}			8.0	ns

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

TYPICAL CHARACTERISTICS

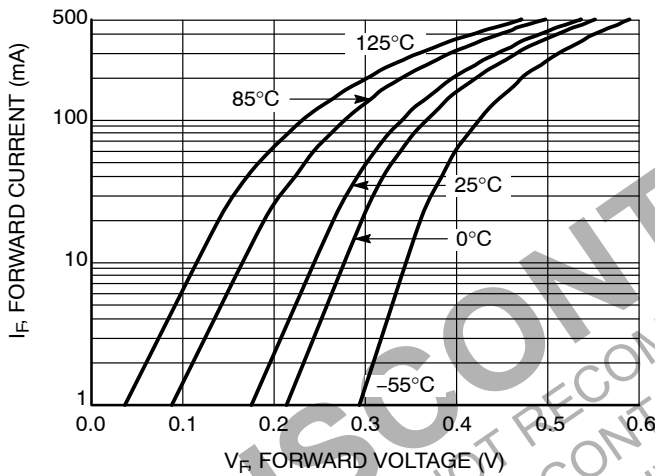


Figure 3. Forward Voltage

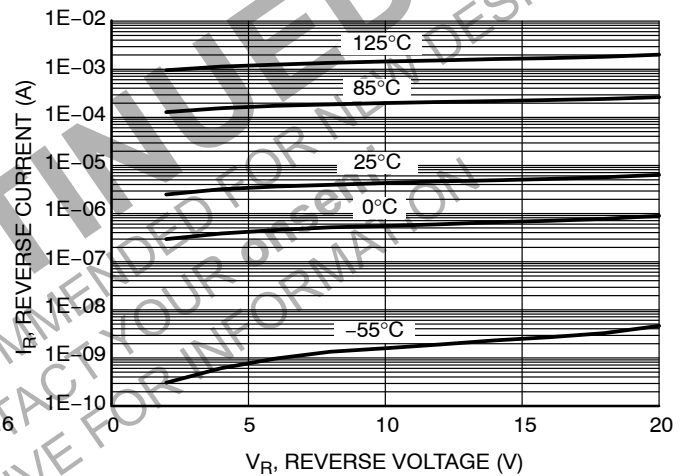


Figure 4. Leakage Current

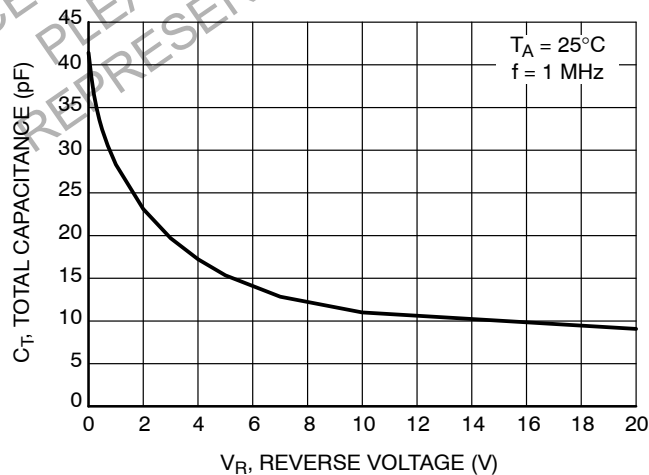
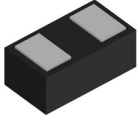
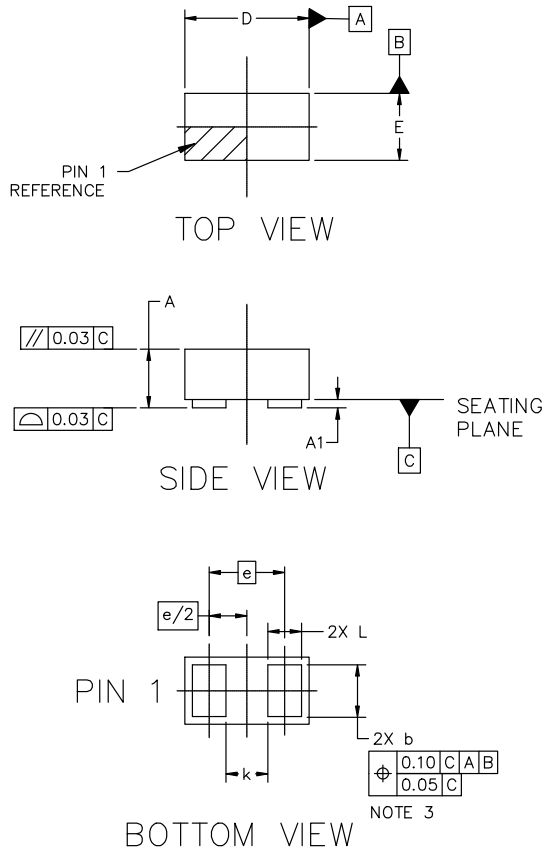


Figure 5. Total Capacitance



X4DFN2, 0.44x0.24x0.18, 0.27P
CASE 718AA
ISSUE B

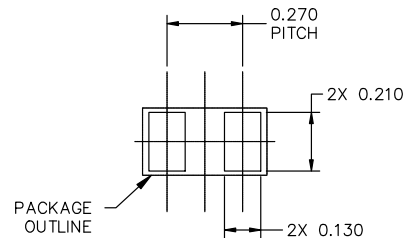
DATE 05 MAR 2025



NOTES:

1. DIMENSIONING AND TOLERANCING AS PER ASME Y14.5M, 2018.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. EXPOSED COPPER ALLOWED AS SHOWN.

MILLIMETERS			
DIM	MIN	NOM	MAX
A	0.150	0.180	0.210
A1	---	---	0.030
b	0.170	0.185	0.200
D	0.415	0.445	0.475
E	0.210	0.240	0.270
e	0.270 BSC		
k	0.125	---	---
L	0.105	0.120	0.135



RECOMMENDED MOUNTING FOOTPRINT

- * For additional information on our Pb-Free strategy and soldering details, please download the onsemi Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

**GENERIC
MARKING DIAGRAMS***



X = Specific Device Code

*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "▪", may or may not be present. Some products may not follow the Generic Marking.

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DESCRIPTION:	X4DFN2, 0.44x0.24x0.18, 0.27P	PAGE 1 OF 1

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