

HSMS-282Z

RF Schottky Barrier Diodes In Surface Mount SOD-323 Package



Data Sheet

Description/Applications

Avago Technologies's HSMS-282Z is a RF Schottky Barrier Diode, featuring low series resistance, low forward voltage at all current levels and good RF characteristics.

It is housed in a low cost, industrial standard surface mount package - SOD-323. This package offers customer who already use SOT-23 and SOT-323 packages, a logical transition to a smaller package outline to accommodate end product design with limited board space.

The HSMS-282Z is specially designed for both analog and digital applications. The typical applications are mixing, detecting, switching, sampling, clamping and wave shaping.

Table 1. Absolute Maximum Ratings ^[1] at Tc = +25°C

Symbol	Parameter	Unit	Max Rating
I _f	Forward Current (1 μ s Pulse)	Amp	1
P _{IV}	Peak Inverse Voltage	V	15
T _j	Junction Temperature	°C	150
T _{stg}	Storage Temperature	°C	-60 to 150
θ_{jc}	Thermal Resistance ^[2]	°C/W	135

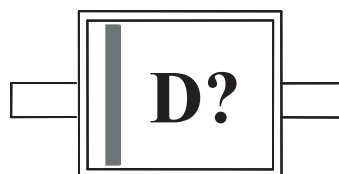
Notes:

1. Operation in excess of any one of these conditions may result in permanent damage to the device.
2. Thermal Resistance is measured from junction to board using IR method.

Features

- 2 Leads Surface Mount Package
- Low Turn-On Voltage
- Low Series Resistance
- Microwave Frequency Operation
- Tape and Reel Options Available
- Low Failure in Time (FIT) Rate
- MSL1 & Lead Free

Package Marking and Pin Connections



Note: Package marking provides orientation and identification

"D" = Device Code

"?" = Month code indicates the month of manufacture

Table 2. Electrical Specifications at Tc = +25°C

	Minimum Breakdown Voltage V _{BR} (V)	Maximum Forward Voltage V _F (mV)	Maximum Forward Voltage V _F (V)	Maximum Reverse Leakage I _R (nA)	Minimum Capacitance C _T (pF)	Typical Dynamic Resistance R _D (Ohm)
	15	340	0.5	100	1.0	12
Test Conditions	V _R = V _{BR} Measure I _R ≤ 100uA	I _F = 1mA	I _F = 10mA	V _R = 1V	V _R = 0 V f = 1 MHz	I _F = 5mA

Typical Performance Curves at Tc = +25°C

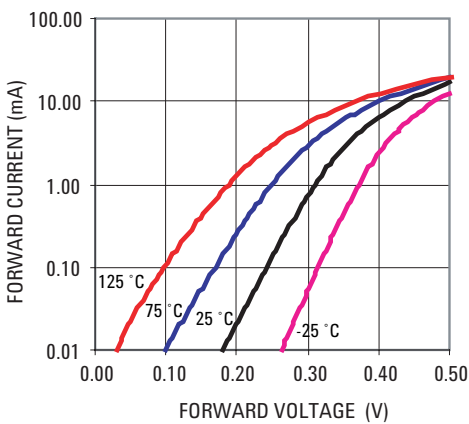


Figure 1. Forward Current vs. Forward Voltage

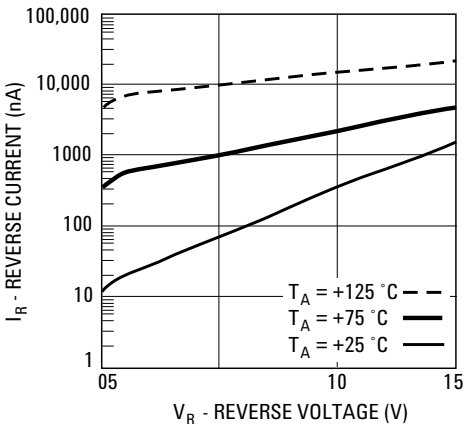


Figure 2. Reverse Current vs. Reverse Voltage

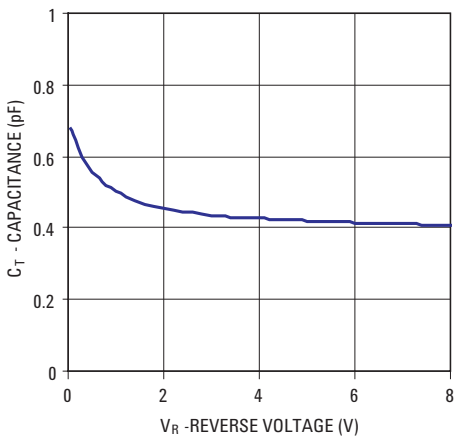


Figure 3. Total Capacitance vs. Reverse Bias

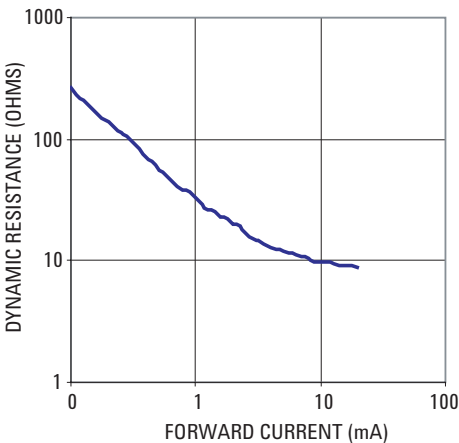


Figure 4. Dynamic Resistance vs. Forward Current

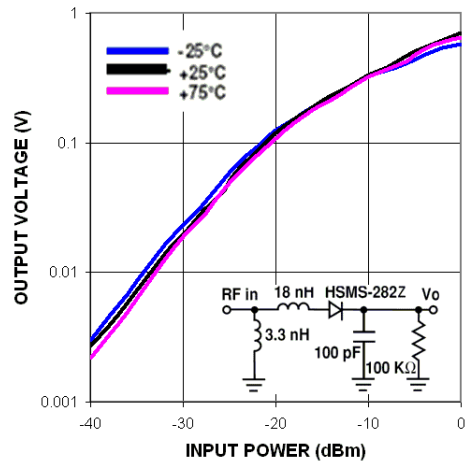


Figure 5. Typical Output Voltage vs. Input Power, Small Signal Detector operating at 850 MHz

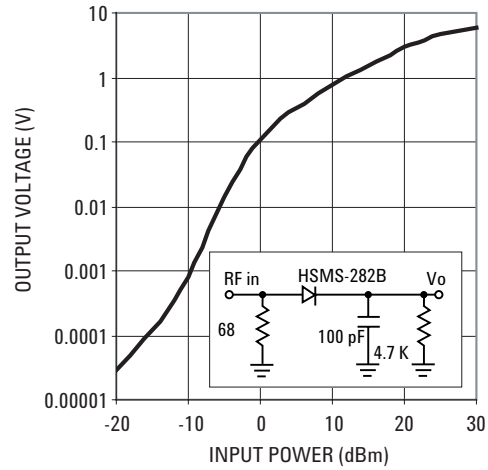
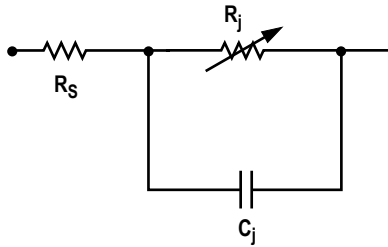


Figure 6. Typical Output Voltage vs. Input Power, Large Signal Detector Operating at 915 MHz.

Linear Equivalent Circuit Model Diode Chip



R_S = series resistance (see Table of SPICE parameters)

C_j = junction capacitance (see Table of SPICE parameters)

$$R_j = \frac{8.33 \times 10^{-5} \text{ nT}}{I_b + I_s}$$

where

I_b = externally applied bias current in amps

I_s = saturation current (see table of SPICE parameters)

T = temperature, K

n = ideality factor (see table of SPICE parameters)

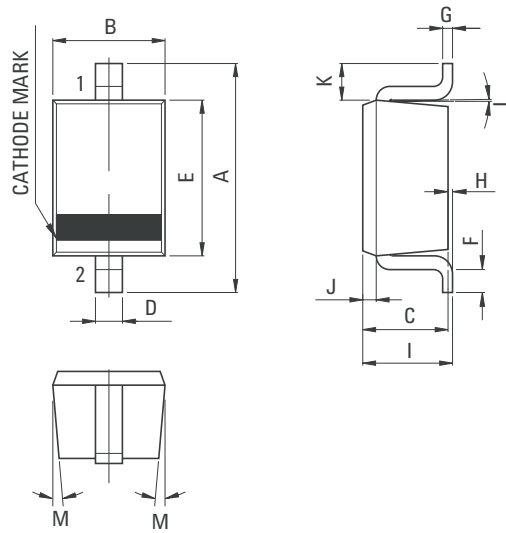
Note:

To effectively model the packaged HSMS-282x product, please refer to Application Note AN1124.

SPICE Parameters

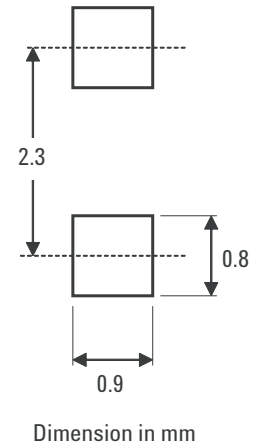
Parameter	Units	HSMS-282Z
B_V	V	15
C_{J0}	pF	0.7
E_G	eV	0.69
I_{BV}	A	1E-4
I_S	A	2.2E-8
N		1.08
R_S	Ω	6.0
P_B	V	0.65
P_T		2
M		0.5

Package Outline and Dimension

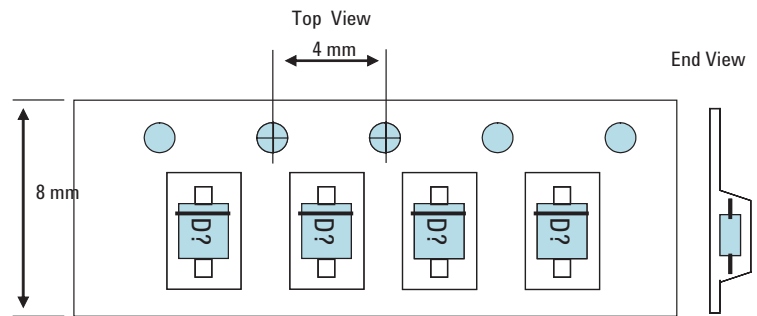
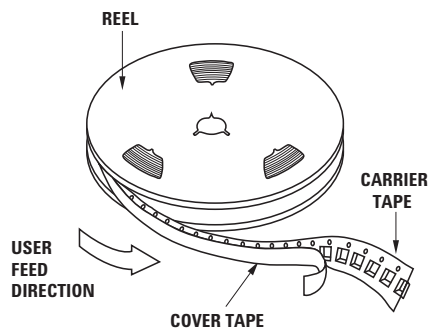


DIM	MILLIMETERS
A	2.50 ± 0.2
B	1.25 ± 0.05
C	0.90 ± 0.05
D	$0.30 + 0.06 / - 0.04$
E	1.70 ± 0.05
F	MIN 0.17
G	0.126 ± 0.03
H	0~0.1
I	1.0 MAX
J	0.15 ± 0.05
K	0.4
L	$2^\circ + 4^\circ / - 2^\circ$
M4	$\sim 6^\circ$

PCB Footprint



Device Orientation



Note: "D" represents package marking code
 "?" represents date code

Technical drawing of a mechanical part, showing a top view and two cross-sections (A-A' and B-B').

Top View Dimensions:

- Overall width: 8.0 ± 0.2
- Overall height: 4.0 ± 0.1
- Distance between centerlines of the two rows of holes: 4.0 ± 0.1
- Radius of the outer semi-circular profile: $R1.5 \pm 0.1$
- Radius of the inner semi-circular profile: $R1.0 \pm 0.1$
- Distance from the centerline to the center of the outer semi-circular profile: 1.75 ± 0.1
- Distance from the centerline to the center of the inner semi-circular profile: 1.25 ± 0.1
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- Distance from the centerline to the center of the inner semi-circular profile: 1.25 ± 0.1

Section A-A' (Right Side View):

- Overall width: 0.25 ± 0.02
- Overall height: 2.7 ± 0.1
- Radius of the outer semi-circular profile: $R1.5 \pm 0.1$
- Radius of the inner semi-circular profile: $R1.0 \pm 0.1$
- Distance from the centerline to the center of the outer semi-circular profile: 1.75 ± 0.1
- Distance from the centerline to the center of the inner semi-circular profile: 1.25 ± 0.1

Section B-B' (Bottom View):

- Overall width: 1.4 ± 0.1
- Overall height: 1.2 ± 0.1
- Radius of the outer semi-circular profile: $R1.5 \pm 0.1$
- Radius of the inner semi-circular profile: $R1.0 \pm 0.1$
- Distance from the centerline to the center of the outer semi-circular profile: 1.75 ± 0.1
- Distance from the centerline to the center of the inner semi-circular profile: 1.25 ± 0.1

A. hole pitch : 50 Pitch Tolerance : 200 ± 0.3

Part Number	No. of Units	Container
HSMS-282Z-BLKG	100	Anti-static bag
HSMS-282Z-TR1G	3000	7" reel

