

HSMS-286Y

Microwave Schottky Detector Diodes In Surface Mount SOD-523 Package



Data Sheet

Description/Applications

The HSMS-286Y of Avago Technologies is a DC biased detector Diode that designed and optimized for use from 915MHz to 5.8GHz. They are ideal for RF/ID and RF Tag applications as well as large signal detection, modulation, RF to DC conversion or voltage doubling.

The device is housed in a miniature low cost surface mount SOD-523 package. This miniature package is particularly useful in the application where board space is the major concern.

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

Symbol	Parameter	Unit	Max Rating
P _{IV}	Peak Inverse Voltage	V	4
T _J	Junction Temperature	°C	150
T _{STG}	Storage Temperature	°C	-65 to 150
T _{OP}	Storage Temperature	°C	-65 to 150
θ _{jb}	Thermal Resistance ^[2]	°C/W	175

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

- Space saving SOD-523 package
- High Detection Sensitivity
 - Up to 50 mW/uW at 915 MHz
 - Up to 35 mW/uW at 2.45 GHz
 - Up to 25 mW/uW at 5.80 GHz
- Tape and Reel Options Available
- MSL 1 & Lead Free

Package Marking and Pin Connections



Note: Package marking provides orientation and identification

"P" = Device Code

"?" = Month code indicates the month of manufacture



Attention: Observe precautions for handling electrostatic sensitive devices.

ESD Machine Model <30V

ESD Human Body Model =50 V

Refer to Avago Technologies Application Note A004R: *Electrostatic Discharge, Damage and Control*.

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

	Forward Voltage V _F (mV)		Typical Capacitance C _T (pF)
		250 Min	350 Max
Test Conditions	I _F = 1.0 mA	I _F = 1.0 mA	V _R = 0V , f = 1MHz

Table 3. RF Electrical Specifications, Tc = +25°C

	Typical Tangential Sensitivity TSS (dBm) @ f =			Typical Voltage Sensitivity (mV/μW) @ f =			Typical Video Resistance R _V (KΩ)
	915 MHz	2.45 GHz	5.8 GHz	915 MHz	2.45 GHz	5.8 GHz	
	-57	-56	-55	50	35	25	5.0
Test Conditions	Video Bandwidth = 2 MHz I _b = 5 μA			Power in = -40 dBm R _L = 100 KΩ, I _b = 5 μA			I _b = 5 μA

Typical Performance Curves at Tc = +25°C

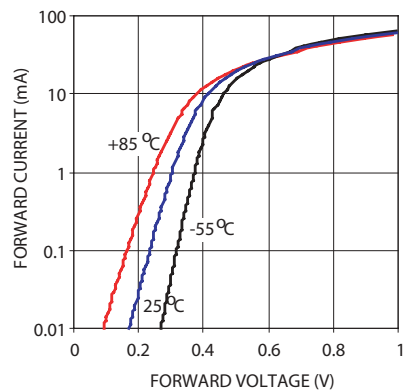


Figure 1. Forward Current vs. Forward Voltage at Temperature

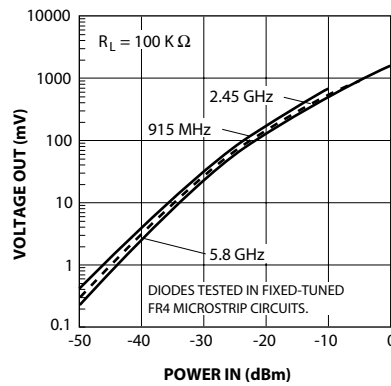


Figure 2. +25°C Output Voltage vs. Input Power, 3uA Bias

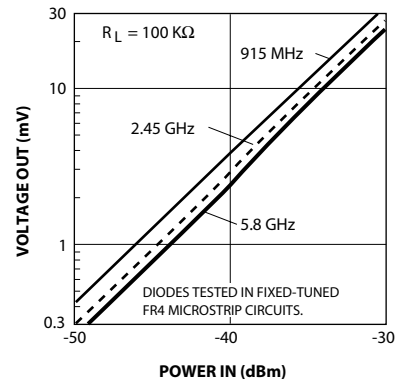


Figure 3. +25°C Expanded Output Voltage vs. Input Power.

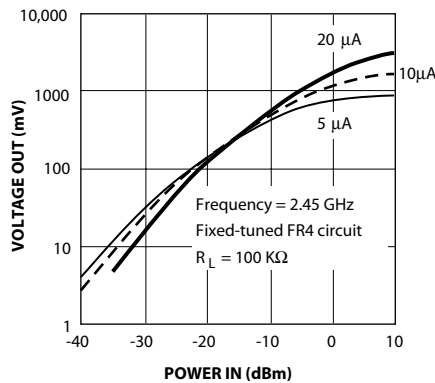


Figure 4. Dynamic Transfer Characteristic as a function of DC Bias

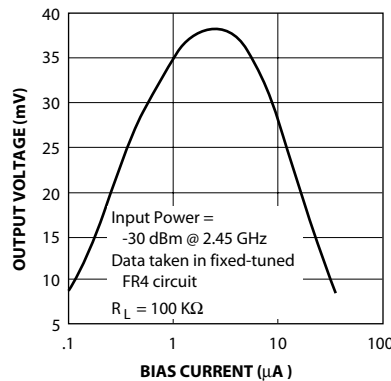
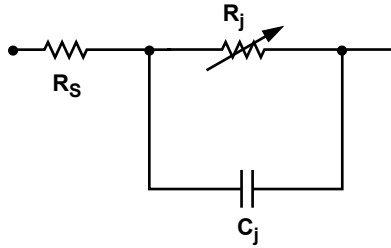


Figure 5. Voltage Sensitivity as a Function of DC Bias Current

Equivalent Linear 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)

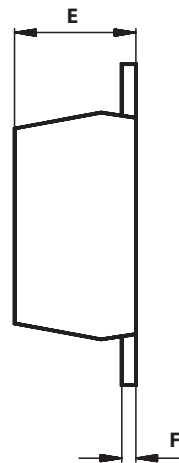
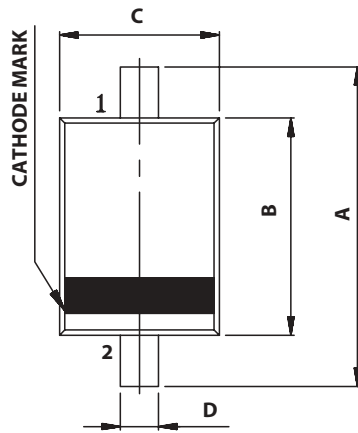
Note:

To effectively model the packaged HSMS-286x product, please refer to Application Note AN1124.

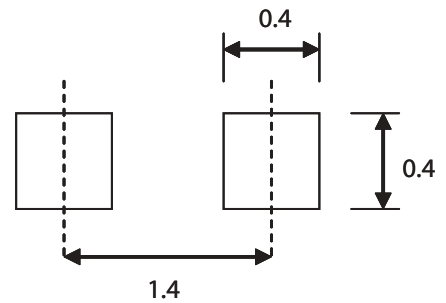
SPICE Parameters

Parameter	Units	Value
B_V	V	7.0
C_{J0}	pF	0.18
E_G	eV	0.69
I_{BV}	A	1E - 5
I_S	A	5E - 8
N		1.08
R_S	Ω	6.0
P_B (VJ)	V	0.65
P_T (XTI)		2
M		0.5

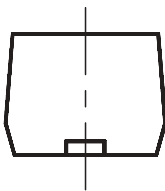
Package Outline and Dimension



PCB Footprint

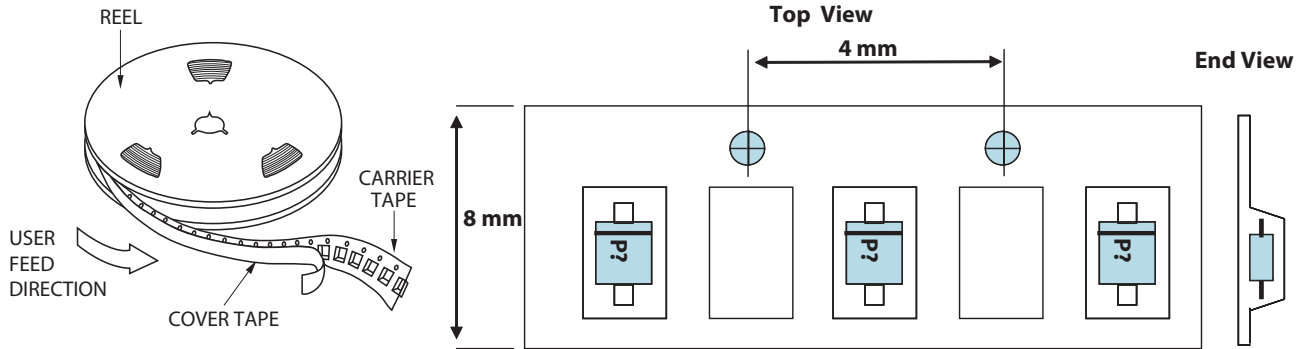


Unit : mm

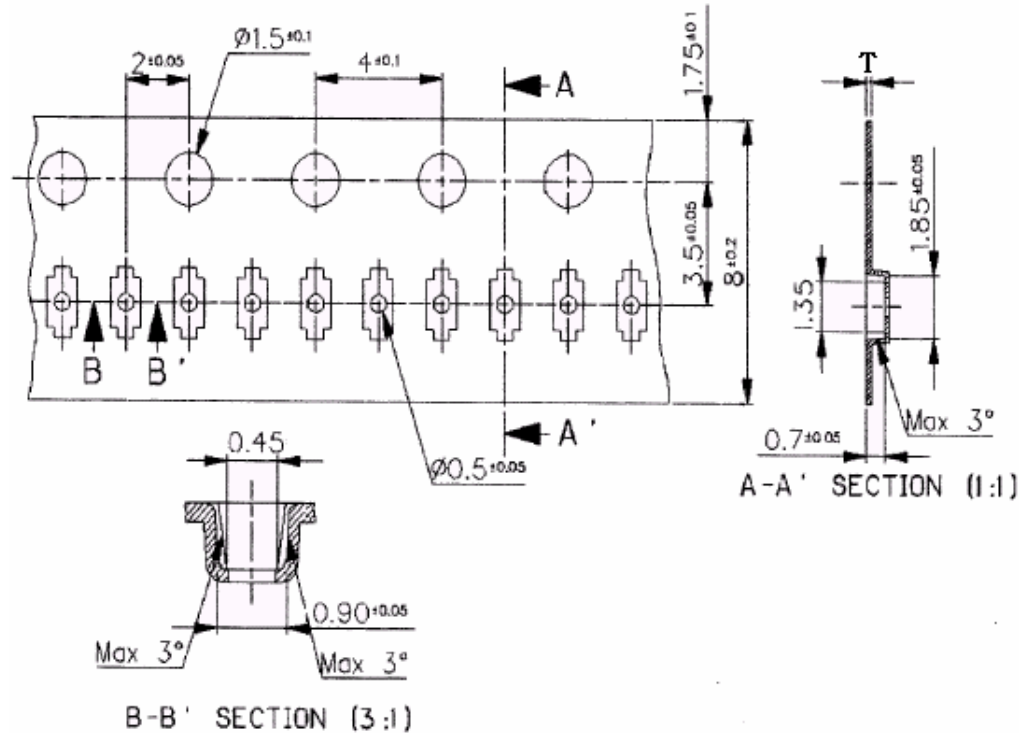


DIM	MILLIMETERS
A	1.60 ± 0.10
B	1.20 ± 0.10
C	0.80 ± 0.10
D	0.30 ± 0.05
E	0.60 ± 0.10
F	0.13 ± 0.05

Device Orientation



Tape Dimension



Specification < Unit : mm >

hole pitch : 50 Pitch Tolerance : 200 ± 0.3

General Tolerance : ± 0.1

Surface resistance : $104 \sim 108 \text{ W/cm}^3$

Part Number Ordering Information

Part number	No. of Units	Container
HSMS-286Y-BLKG	100	Anti-static bag
HSMS-286Y-TR1G	3000	7" reel

For product information and a complete list of distributors, please go to our web site: www.avagotech.com

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