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# HSMS-282Y

## RF Schottky Barrier Diodes In Surface Mount SOD-523 Package



### Data Sheet

#### Description

The HSMS-282Y of Avago Technologies is a RF Schottky Barrier Diode, featuring low series resistance, low forward voltage at all current levels and good RF characteristics. 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. Applications The HSMS-282Y 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 <sub>F</sub>   | Forward Current (1 μs Pulse)      | Amp  | 1          |
| P <sub>IV</sub>  | Peak Inverse Voltage              | V    | 15         |
| T <sub>J</sub>   | Junction Temperature              | °C   | 150        |
| T <sub>STG</sub> | Storage Temperature               | °C   | -65 to 150 |
| θ <sub>jb</sub>  | Thermal Resistance <sup>[2]</sup> | °C/W | 175        |

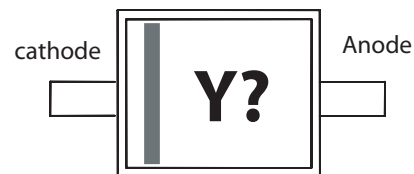
Notes:

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 microscopy method.

#### Features

- Space saving SOD-523 package
- Low Turn-On Voltage
- Low Series Resistance
- Tape and Reel Options Available
- MSL 1 & Lead Free

#### Package Marking and Pin Connections



Note: Package marking provides orientation and identification  
"Y" = Device Code  
"?" = Month code indicates the month of manufacture

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

|                        | Minimum Breakdown Voltage<br>$V_{BR}$ (V)     | Maximum Forward Voltage<br>$V_F$ (mV) | Maximum Forward Voltage<br>$V_F$ (V) | Maximum Reverse Leakage<br>$I_R$ (nA) | Maximum Capacitance<br>$C_T$ (pF) | Typical Dynamic Resistance<br>$R_D$ (Ohm) <sup>[2]</sup> |
|------------------------|---|---------------------------------------|--------------------------------------|---------------------------------------|-----------------------------------|--|
|                        | 15  | 340                                   | 0.5                                  | 100                                   | 1.0                               | 12   |
| <b>Test Conditions</b> | $V_R = V_{BR}$<br>Measure $I_R \leq 100\mu A$ | $I_F = 1mA$                           | $I_F = 10mA$                         | $V_R = 1V$                            | $V_R = 0$<br>$V_f = 1\text{ MHz}$ | $I_F = 5mA$  |

Notes :

1. Effective carrier lifetime( $\tau$ ) for the diode is 100 ps maximum measured with Krakaver method at 5 mA
2.  $R_D = R_s + 5.2\text{ Ohm}$  @ 25 °C and  $I_F = 5\text{ mA}$

**Typical Performance Curves at Tc = +25°C**

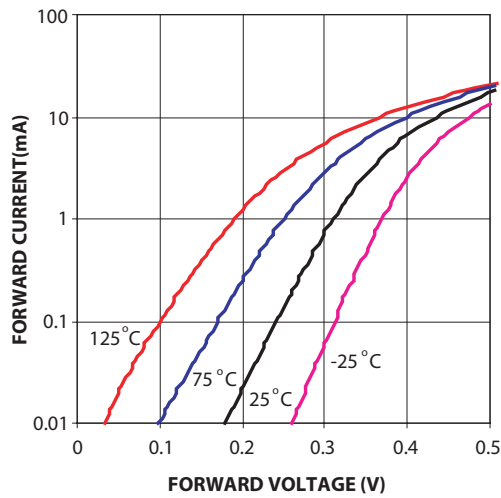


Figure 1. Forward Current vs. Forward Voltage at temperature

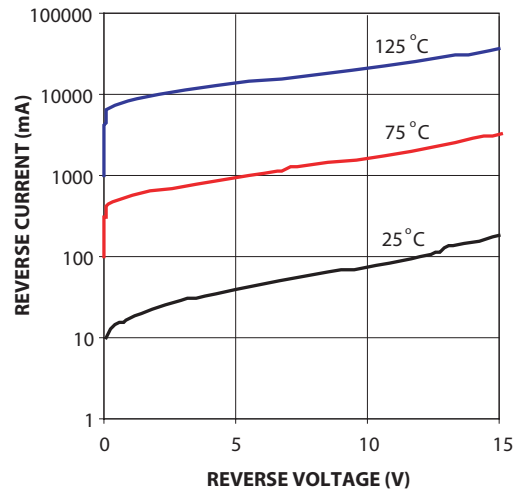


Figure 2. Reverse Current vs. Reverse Voltage at temperature

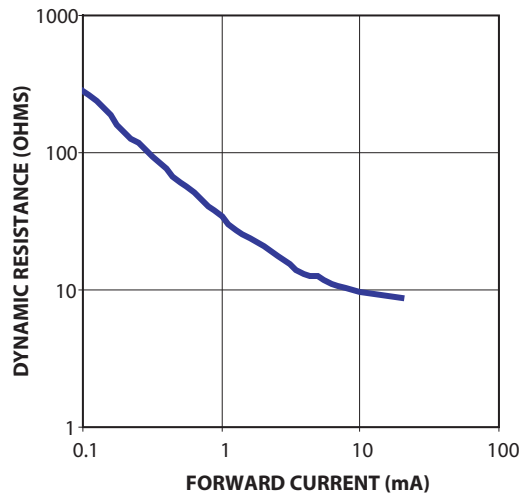


Figure 3. Dynamic Resistance vs. Forward Current

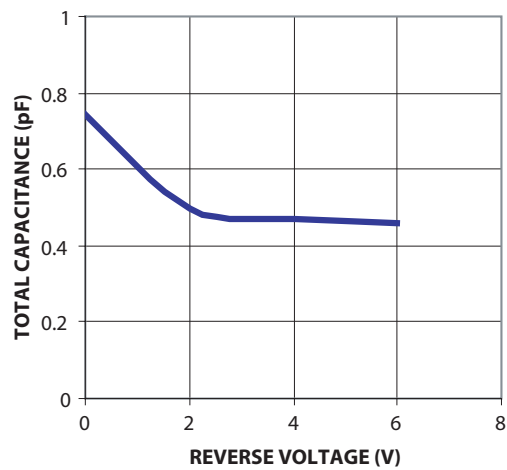


Figure 4. Total Capacitance vs. Reverse Bias at 1MHz

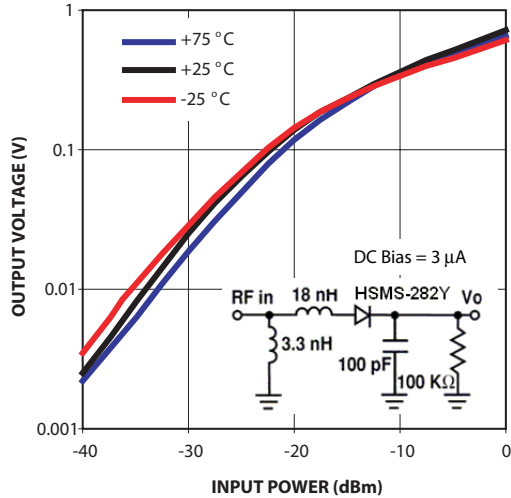


Figure 5. Typical Output Voltage vs. Input Power, Small Signal Detector Operating at 850 MHz.

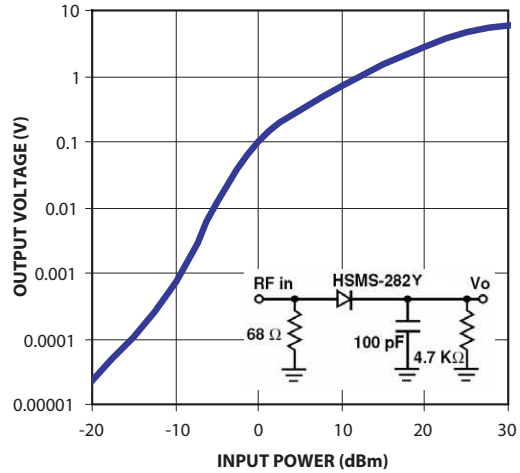
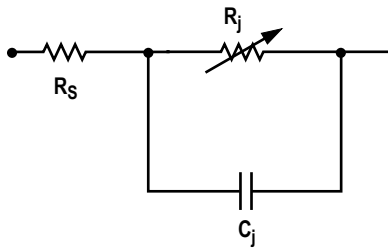


Figure 6. Typical Output Voltage vs. Input Power, Large Signal Detector Operating at 915 MHz.

### 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)

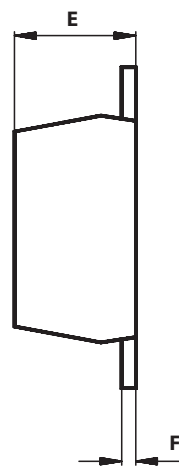
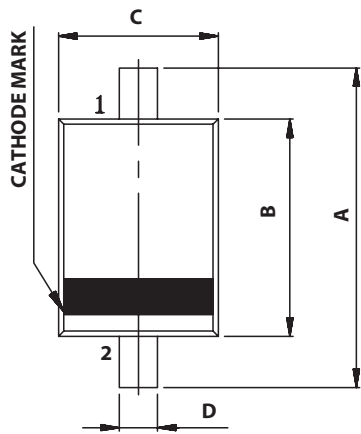
Note:

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

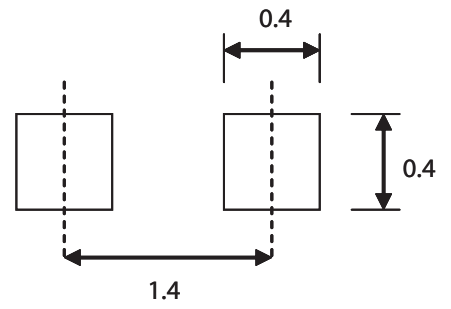
### SPICE Parameters

| Parameter | Units    | HSMS-282Y |
|-----------|----------|-----------|
| $B_V$     | 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      |
| $R_S$     | $\Omega$ | 6.0       |
| $P_B$     | V        | 0.65      |
| $P_T$     |          | 2         |
| $M$       |          | 0.5       |

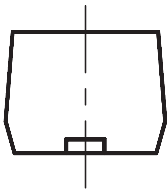
### Package Outline and Dimension



### PCB Footprint

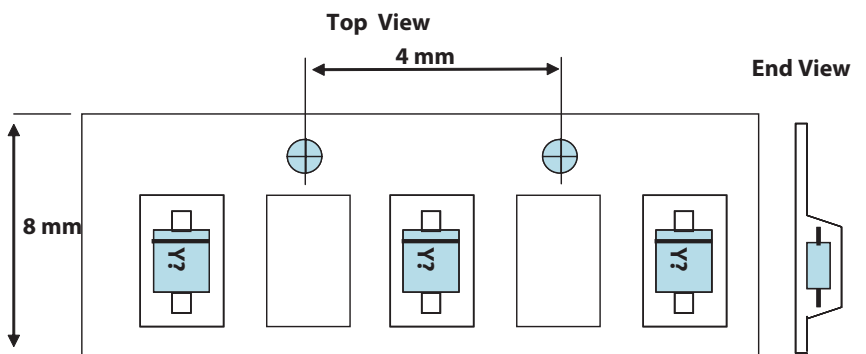
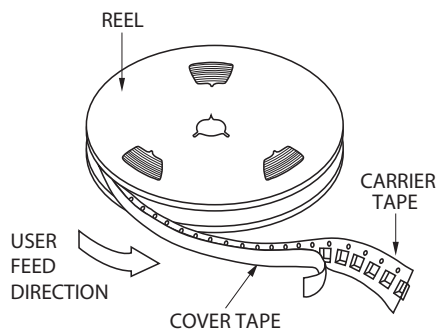


Unit : mm

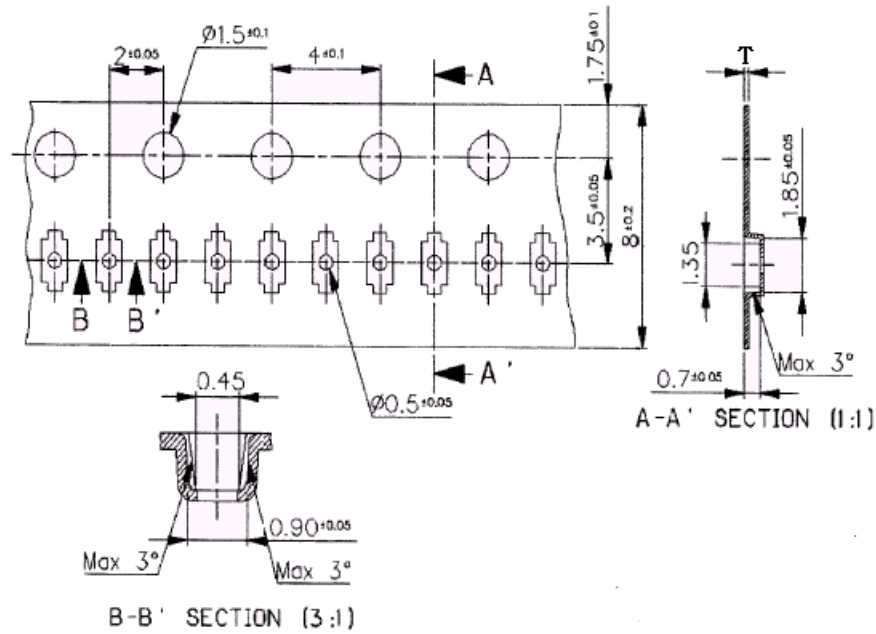


| DIM | MILLIMETERS |
|-----|-------------|
| A   | 1.60 ± 0.10 |
| B   | 1.20 ± 0.10 |
| C   | 0.80 ± 0.10 |
| D   | 0.30 ± 0.05 |
| E   | 0.60 ± 0.10 |
| F   | 0.13 ± 0.05 |

### Device Orientation



## Tape Dimension



Specification < Unit : mm >

hole pitch : 50 Pitch Tolerance :  $200 \pm 0.3$

General Tolerance :  $\pm 0.1$

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

## Part Number Ordering Information

| Part number    | No. of Units | Container       |
|----------------|--------------|-----------------|
| HSMS-282Y-BLKG | 100          | Anti-static bag |
| HSMS-282Y-TR1G | 3000         | 7" reel         |

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

[www.avagotech.com](http://www.avagotech.com)

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