

# 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 <sup>[1]</sup> at Tc = +25°C**

| Symbol           | Parameter                         | Unit | Max Rating |
|------------------|-----------------------------------|------|------------|
| I <sub>F</sub>   | Forward Current (1 $\mu$ s 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 |
| $\theta_{jb}$    | Thermal Resistance <sup>[2]</sup> | °C/W | 175        |

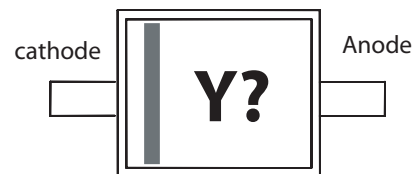
Notes:

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

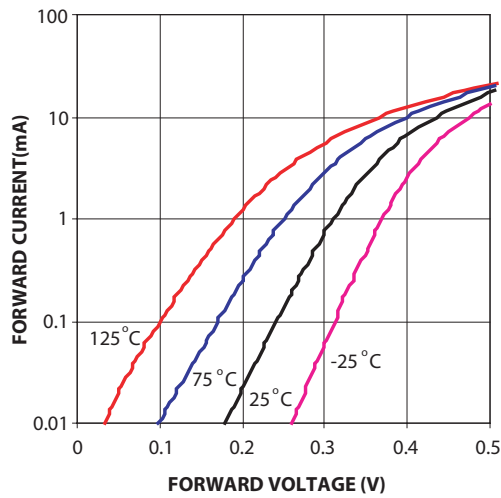
**Table 2. Electrical Specifications at  $T_c = +25^\circ\text{C}$**

|                        | Minimum<br>Breakdown Voltage<br>$V_{BR}$ (V)        | Maximum<br>Forward Voltage<br>$V_F$ (mV) | Maximum<br>Forward Voltage<br>$V_F$ (V) | Maximum<br>Reverse Leakage<br>$I_R$ (nA) | Maximum<br>Capacitance<br>$C_T$ (pF) | Typical Dynamic<br>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 $I_R \leq 100\mu\text{A}$ | $I_F = 1\text{mA}$                       | $I_F = 10\text{mA}$                     | $V_R = 1\text{V}$                        | $V_R = 0$<br>$V_f = 1\text{MHz}$     | $I_F = 5\text{mA}$                                          |

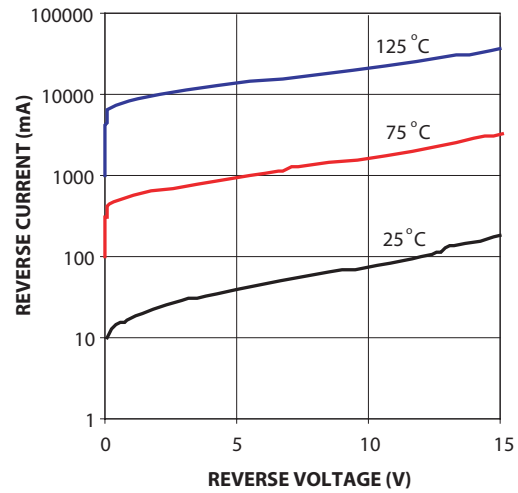
Notes :

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

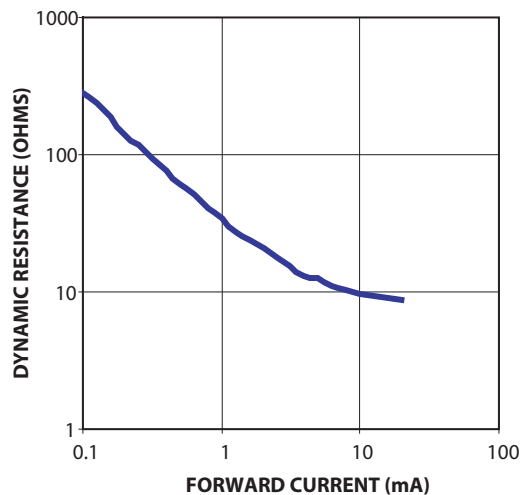
**Typical Performance Curves at  $T_c = +25^\circ\text{C}$**



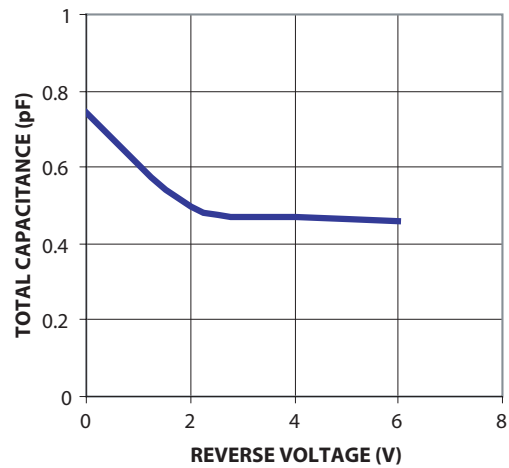
**Figure 1. Forward Current vs. Forward Voltage at temperature**



**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**

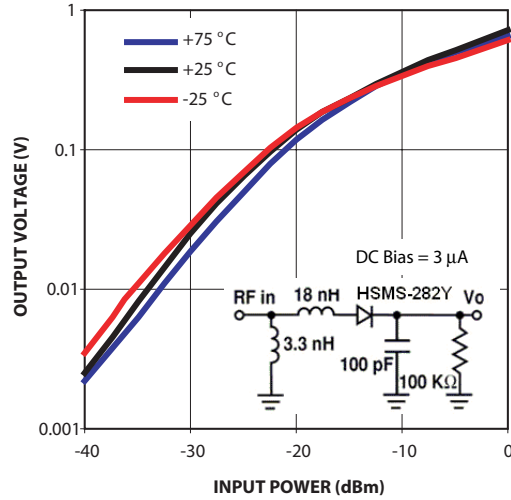


Figure 5. Typical Output Voltage vs. Input Power, Small Signal Detector Operating at 850 MHz.

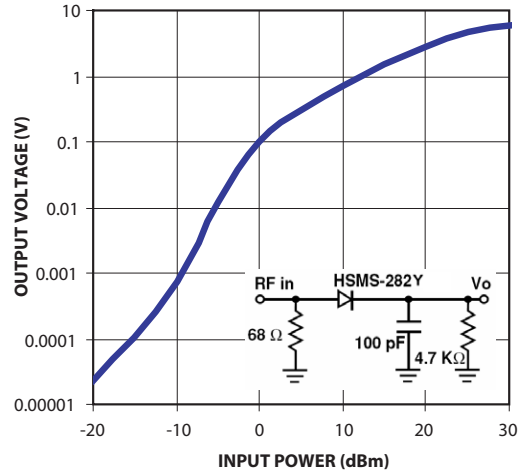
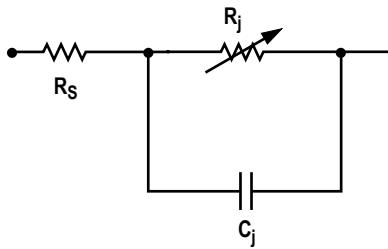


Figure 6. Typical Output Voltage vs. Input Power, Large Signal Detector Operating at 915 MHz.

### 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)

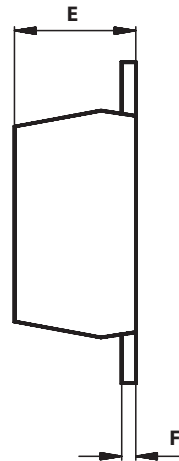
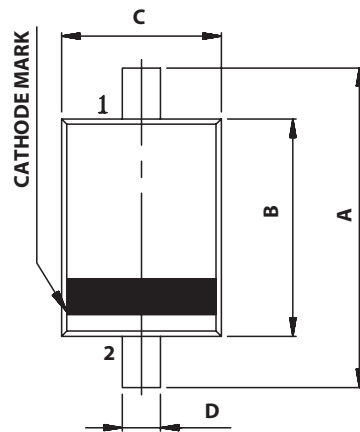
Note:

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

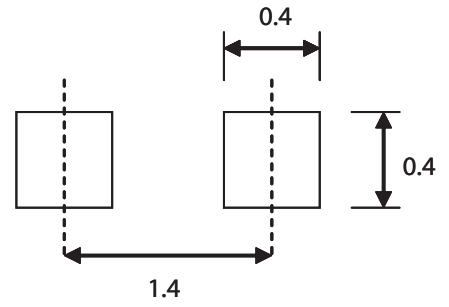
### SPICE Parameters

| 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       |

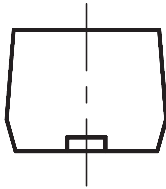
## Package Outline and Dimension



## PCB Footprint

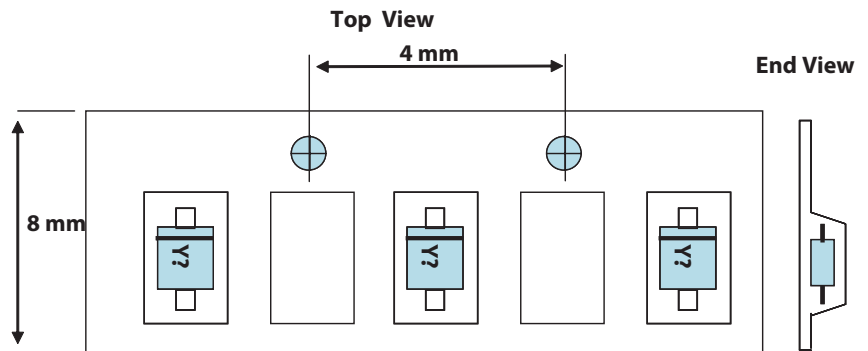
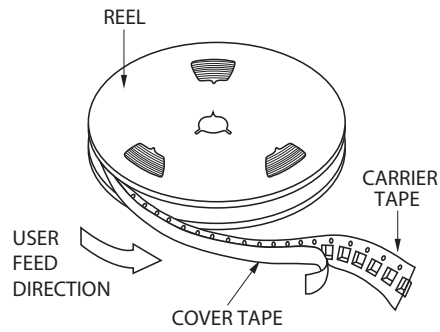


Unit : mm

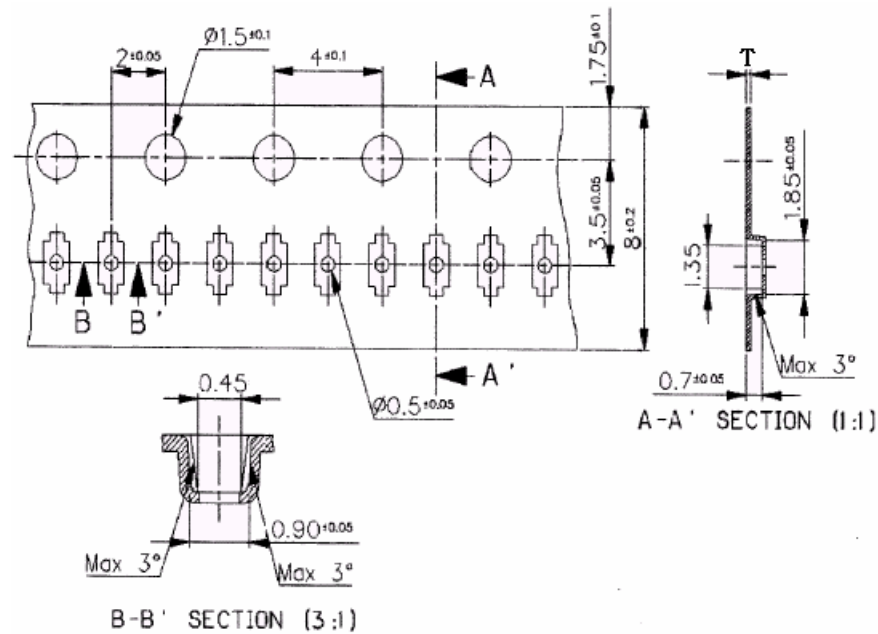


| DIM | MILLIMETERS     |
|-----|-----------------|
| A   | $1.60 \pm 0.10$ |
| B   | $1.20 \pm 0.10$ |
| C   | $0.80 \pm 0.10$ |
| D   | $0.30 \pm 0.05$ |
| E   | $0.60 \pm 0.10$ |
| F   | $0.13 \pm 0.05$ |

## 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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