

Products > RF ICs/Discretes > Schottky Diodes > Demonstration Circuit Boards > DEMO-HSMS285-0

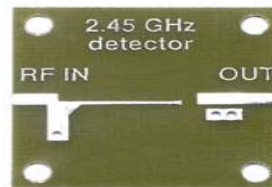
DEMO-HSMS285-0

Demonstration circuit board for HSMS-2850, HSMS-2852 and HSMS-2855

Description



Lifecycle status: **Active**



Features

- 2.45 GHz TAG circuit using the HSMS-2850 zero bias Schottky diode
- Fits package: SOT-23 (pkg 33), SOT-143 (pkg 11)
- Use with: HSMS-2850, HSMS-2852 and HSMS-2855

Data Sheet

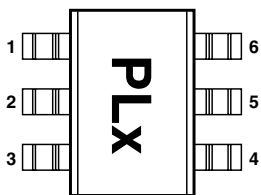
Description

Avago's HSMS-285x family of zero bias Schottky detector diodes has been designed and optimized for use in small signal (Pin < -20 dBm) applications at frequencies below 1.5 GHz. They are ideal for RF/ID and RF Tag applications where primary (DC bias) power is not available.

Important Note: For detector applications with input power levels greater than -20 dBm, use the HSMS-282x series at frequencies below 4.0 GHz, and the HSMS-286x series at frequencies above 4.0 GHz. The HSMS-285x series IS NOT RECOMMENDED for these higher power level applications.

Available in various package configurations, these detector diodes provide low cost solutions to a wide variety of design problems. Avago's manufacturing techniques assure that when two diodes are mounted into a single package, they are taken from adjacent sites on the wafer, assuring the highest possible degree of match.

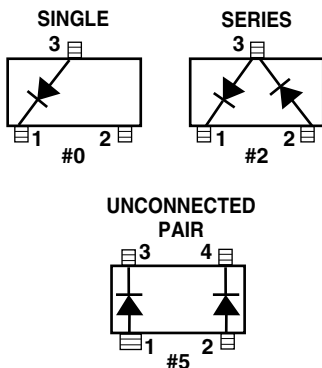
Pin Connections and Package Marking



Notes:

1. Package marking provides orientation and identification.
2. See "Electrical Specifications" for appropriate package marking.

SOT-23/SOT-143 Package Lead Code Identification (top view)



Features

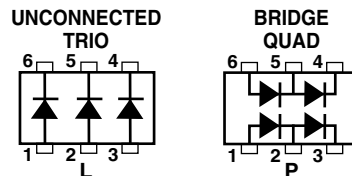
- Surface Mount SOT-23/SOT-143 Packages
- Miniature SOT-323 and SOT-363 Packages
- High Detection Sensitivity:
up to 50 mV/μW at 915 MHz
- Low Flicker Noise:
-162 dBV/Hz at 100 Hz
- Low FIT (Failure in Time) Rate*
- Tape and Reel Options Available
- Matched Diodes for Consistent Performance
- Better Thermal Conductivity for Higher Power Dissipation
- Lead-free Option Available

* For more information see the Surface Mount Schottky Reliability Data Sheet.

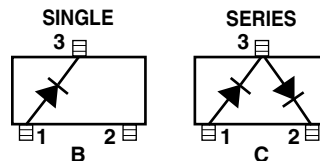


Attention: Observe precautions for handling electrostatic sensitive devices.
ESD Machine Model (Class A)
ESD Human Body Model (Class 0)
Refer to Avago Application Note A004R:
Electrostatic Discharge Damage and Control.

SOT-363 Package Lead Code Identification (top view)



SOT-323 Package Lead Code Identification (top view)



SOT-23/SOT-143 DC Electrical Specifications, $T_c = +25^\circ\text{C}$, Single Diode

Part Number HSMS-	Package Marking Code	Lead Code	Configuration	Maximum Forward Voltage		Maximum Reverse Leakage,	Typical Capacitance C_T (pF)
				V_F (mV)		I_R (μA)	
2850	P0	0	Single	150	250	175	0.30
2852	P2	2	Series Pair ^[1,2]				
2855	P5	5	Unconnected Pair ^[1,2]				
Test Conditions				$I_F = 0.1 \text{ mA}$	$I_F = 1.0 \text{ mA}$	$V_R = 2\text{V}$	$V_R = -0.5 \text{ V to } -1.0\text{V}$ $f = 1 \text{ MHz}$

Notes:

1. ΔV_F for diodes in pairs is 15.0 mV maximum at 1.0 mA.
2. ΔC_T for diodes in pairs is 0.05 pF maximum at -0.5V .

SOT-323/SOT-363 DC Electrical Specifications, $T_c = +25^\circ\text{C}$, Single Diode

Part Number HSMS-	Package Marking Code	Lead Code	Configuration	Maximum Forward Voltage		Maximum Reverse Leakage,	Typical Capacitance C_T (pF)
				V_F (mV)		I_R (μA)	
285B	P0	B	Single	150	250	175.	0.30
285C	P2	C	Series Pair				
285L	PL	L	Unconnected Trio				
285P	PP	P	Bridge Quad				
Test Conditions				$I_F = 0.1 \text{ mA}$	$I_F = 1.0 \text{ mA}$	$V_R = 2\text{V}$	$V_R = 0.5 \text{ V to } -1.0\text{V}$ $f = 1 \text{ MHz}$

Notes:

1. ΔV_F for diodes in pairs is 15.0 mV maximum at 1.0 mA.
2. ΔC_T for diodes in pairs is 0.05 pF maximum at -0.5V .

RF Electrical Specifications, $T_c = +25^\circ\text{C}$, Single Diode

Part Number HSMS-	Typical Tangential Sensitivity TSS (dBm) @ $f = 915 \text{ MHz}$	Typical Voltage Sensitivity g (mV/ μW) @ $f = 915 \text{ MHz}$	Typical Video Resistance R_V (K Ω)
2850	-57	40	8.0
2852			
2855			
285B			
285C			
285L			
285P			
Test Conditions	Video Bandwidth = 2 MHz Zero Bias	Power in = -40 dBm $R_L = 100 \text{ K}\Omega$, Zero Bias	Zero Bias

Absolute Maximum Ratings, $T_C = +25^\circ\text{C}$, Single Diode

Symbol	Parameter	Unit	Absolute Maximum ^[1]	
			SOT-23/143	SOT-323/363
P_{IV}	Peak Inverse Voltage	V	2.0	2.0
T_J	Junction Temperature	$^\circ\text{C}$	150	150
T_{STG}	Storage Temperature	$^\circ\text{C}$	-65 to 150	-65 to 150
T_{OP}	Operating Temperature	$^\circ\text{C}$	-65 to 150	-65 to 150
θ_{jc}	Thermal Resistance ^[2]	$^\circ\text{C}/\text{W}$	500	150

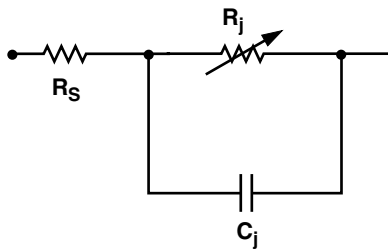
ESD WARNING:
Handling Precautions Should Be Taken
To Avoid Static Discharge.

Notes:

1. Operation in excess of any one of these conditions may result in permanent damage to the device.
2. $T_C = +25^\circ\text{C}$, where T_C is defined to be the temperature at the package pins where contact is made to the circuit board.

Equivalent Linear Circuit Model

HSMS-285x chip



R_S = series resistance (see Table of SPICE parameters)

C_j = junction capacitance (see Table of SPICE parameters)

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

where

I_b = externally applied bias current in amps

I_s = saturation current (see table of SPICE parameters)

T = temperature, $^\circ\text{K}$

n = ideality factor (see table of SPICE parameters)

Note:

To effectively model the packaged HSMS-285x product, please refer to Application Note AN1124.

SPICE Parameters

Parameter	Units	HSMS-285x
B_V	V	3.8
C_{J0}	pF	0.18
E_G	eV	0.69
I_{BV}	A	3 E-4
I_s	A	3 E-6
N		1.06
R_S	Ω	25
$P_B (V_J)$	V	0.35
$P_T (XTI)$		2
M		0.5

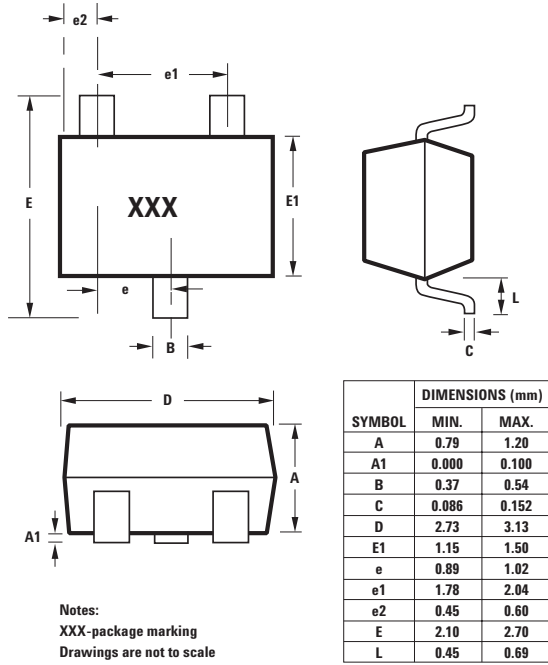
Part Number Ordering Information

Part Number	No. of Devices	Container
HSMS-285x-TR2G	10000	13" Reel
HSMS-285x-TR1G	3000	7" Reel
HSMS-285x-BLK G	100	antistatic bag

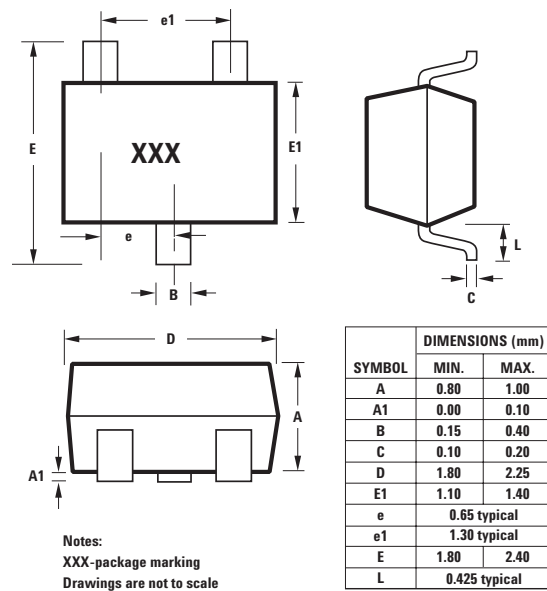
where x = 0, 2, 5, B, C, L and P for HSMS-285x.

Package Dimensions

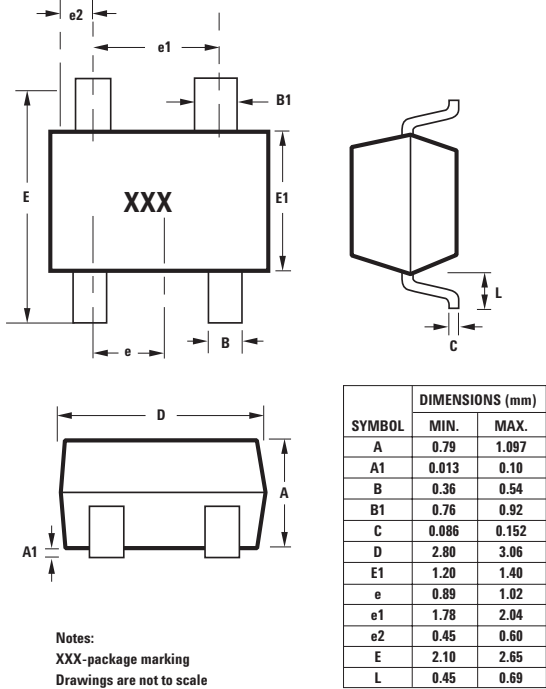
Outline 23 (SOT-23)



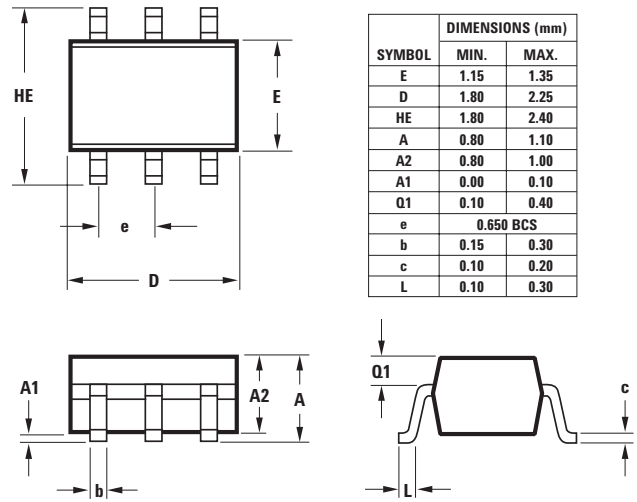
Outline SOT-323 (SC-70 3 Lead)



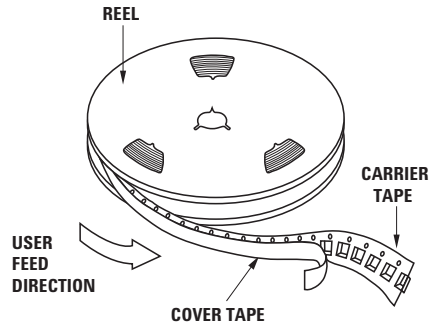
Outline 143 (SOT-143)



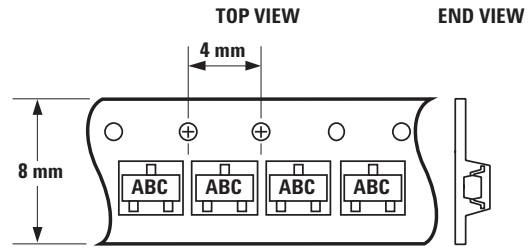
Outline SOT-363 (SC-70 6 Lead)



Device Orientation

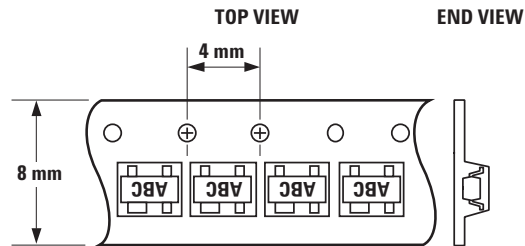


For Outlines SOT-23, -323



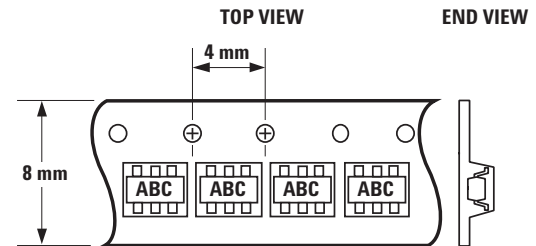
Note: "AB" represents package marking code.
"C" represents date code.

For Outline SOT-143



Note: "AB" represents package marking code.
"C" represents date code.

For Outline SOT-363



Note: "AB" represents package marking code.
"C" represents date code.