

Surface Mount Microwave Schottky Mixer Diodes

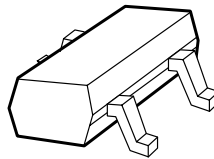
Technical Data

HSMS-8101 Single
HSMS-8202 Pair
HSMS-8205 Pair
HSMS-8207 Quad

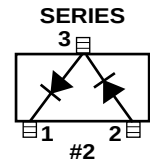
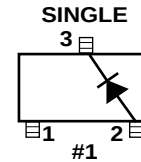
Features

- Optimized for use at
10-14 GHz
- Low Capacitance
- Low Conversion Loss
- Low RD
- Low Cost Surface Mount
Plastic Package

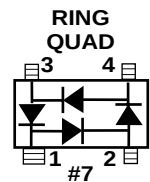
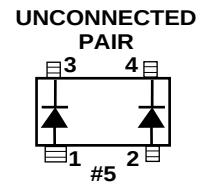
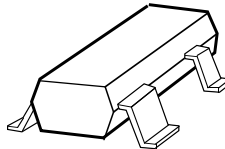
Plastic SOT-23 Package



Package Lead Code Identification (Top View)



Plastic SOT-143 Package



Description/Applications

These low cost microwave Schottky diodes are specifically designed for use at X/Ku-bands and are ideal for DBS and VSAT downconverter applications. They are available in SOT-23 and SOT-143 standard package configurations.

Absolute Maximum Ratings^[1], $T_A = +25^\circ\text{C}$

Symbol	Parameter	Unit	Min.	Max.
P_T	Total Device Dissipation ^[2]	mW	—	75
P_{IV}	Peak Inverse Voltage	V	—	4
T_J	Junction Temperature	$^\circ\text{C}$	—	+150
T_{STG}, T_{op}	Storage and Operating Temperature	$^\circ\text{C}$	-65	+150

Notes:

1. Operation in excess of any one of these conditions may result in permanent damage to the device.
2. Measured in an infinite heat sink at $T_{CASE} = 25^\circ\text{C}$. Derate linearly to zero at 150°C per diode.

DC Electrical Specifications, $T_A = 25^\circ\text{C}$

Symbol	Parameters and Test Conditions	Units	HSMS-8101		HSMS-8202		HSMS-8205		HSMS-8207	
			Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
V_{BR}	Breakdown Voltage $I_R = 10\ \mu\text{A}$	V	4		4		4		4	
C_T	Total Capacitance $V_R = 0\ \text{V}, f = 1\ \text{MHz}$	pF		0.26		0.26		0.26		0.26
ΔC_T	Capacitance Difference $V_R = 0\ \text{V}, f = 1\ \text{MHz}$	pF		—		0.04		0.04		0.04
R_D	Dynamic Resistance $I_F = 5\ \text{mA}$	Ω		14		14		14		14
ΔR_D	Dynamic Resistance Difference $I_F = 5\ \text{mA}$	Ω		—		2		2		2
V_F	Forward Voltage $I_F = 1\ \text{mA}$	mV	250	350	250	350	250	350	250	350
ΔV_F	Forward Voltage Difference $I_F = 1\ \text{mA}$	mV		—		20		20		20
Lead Code			1		2		5		7	
Package Marking Code in White			R1		2R		R5		R7	

RF Electrical Parameters, $T_A = 25^\circ\text{C}$

Symbol	Parameter	Units	Typical
L_c	Conversion Loss at 12 GHz	dB	6.3
Z_{IF}	IF Impedance	Ω	150
SWR	SWR at 12 GHz		1.2

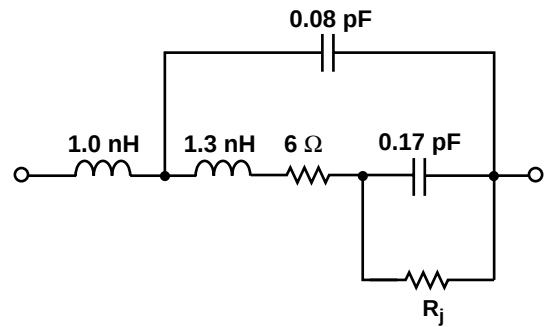
Note:

DC Load Resistance = $0\ \Omega$; LO Power = 1 mW.

SPICE Parameters

$I_S = 4.6\ \text{E-}8$	$E_G = 0.69$	$TT = 0$
$R_S = 6$	$C_{JO} = 0.18\ \text{E-}12$	
$N = 1.09$	$P_B(V_J) = 0.5$	
$B_V = 7.3$	$M = 0.5$	
$I_{BV} = 10\ \text{E-}5$	$FC = 0.5$	

Linear Equivalent Circuit



Self Bias

	1 mA	2.5 mA
R_j	263	142

Typical Performance, $T_C = 25^\circ\text{C}$

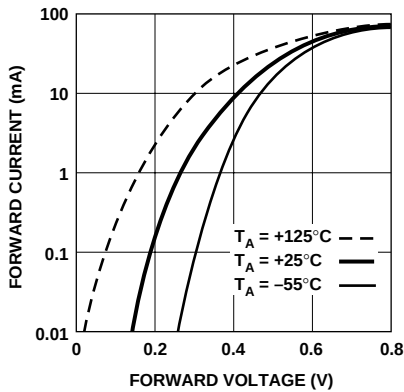


Figure 1. Typical Forward Current vs. Forward Voltage at Three Temperatures.

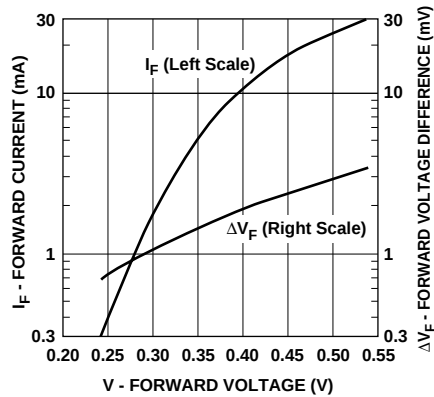


Figure 2. Typical VF Match, HSMS-820X Pairs and Quads.

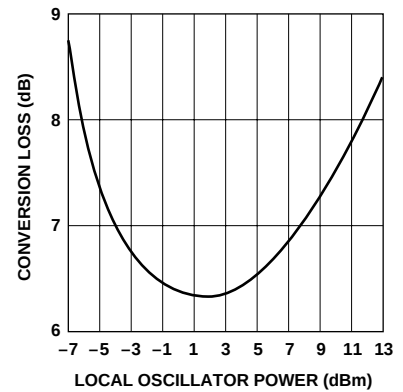


Figure 3. Typical Conversion Loss vs. Local Oscillator Power.

Ordering Information

Specify part number followed by option. For example:

H SMS-8101 #X XX

_____ Bulk or Tape and Reel Option

_____ Profile: Low = L

_____ Part Number

_____ Surface Mount Schottky

_____ Hewlett-Packard

Profile Option Descriptions

#L30 = Bulk

#L31 = 3K pc. Tape and Reel,
Device Orientation
Figures 4, 5

Tape and Reeling conforms to
Electronic Industries RS-481,
“Taping of Surface Mounted
Components for Automated
Placement.”

Device Orientation

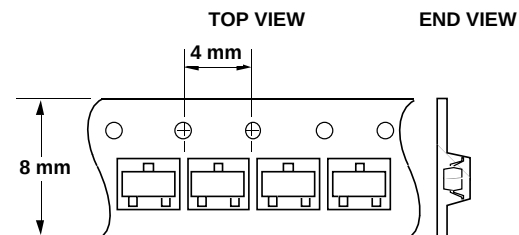
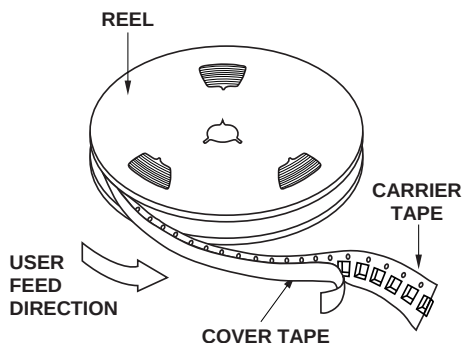


Figure 4. Option L31 for SOT-23 Packages.

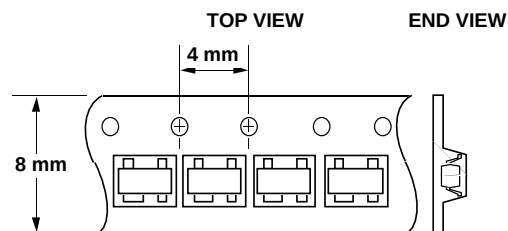
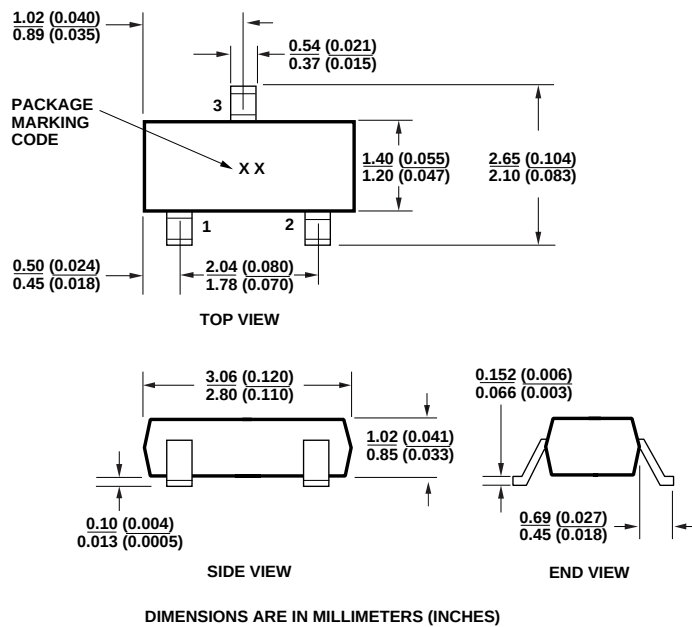


Figure 5. Option L31 for SOT-143 Packages.

Package Characteristics

Lead Material Alloy 42
Lead Finish Tin-Lead 85-15%
Maximum Soldering Temperature 260°C for 5 seconds
Minimum Lead Strength 2 pounds pull
Typical Package Inductance 2 nH
Typical Package Capacitance 0.08 pF (opposite leads)

Package Dimensions Outline 23 (SOT-23)



Outline 143 (SOT-143)

