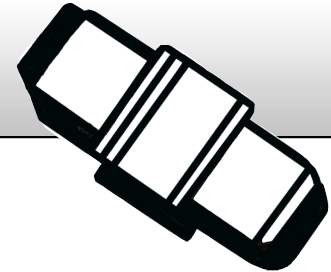


# SCHOTTKY BARRIER MIXER AND DETECTOR DIODES



MBT's Schottky Barrier Mixer and Detector Diodes are manufactured by the deposition of a suitable barrier metal on an epitaxial silicon layer to form a junction. These diodes are designed for applications up to 40 GHz for use in Coaxial, Stripline and Waveguide circuits.

## **Several barrier heights are available which include:**

- LOW BARRIER (N-TYPE) - for applications where the local oscillator drive level is between -10 dBm and +10 dBm.
- MEDIUM BARRIER (N-TYPE) - for applications where the local oscillator drive level is between -5 dBm and +15 dBm.
- HIGH BARRIER (N-TYPE) - for applications where the local oscillator drive level is between 0 dBm and +20 dBm.
- LOW BARRIER (N-TYPE) - for applications where low 1/f noise for use in Doppler Radar and Motion Detectors is required.

The Schottky Barrier Mixer Diodes are characterized by noise figure in four different frequency ranges: S, X, K<sub>μ</sub> and K<sub>a</sub> Bands.

The Schottky Barrier Detector Diodes are characterized by Tangential Signal Sensitivity (TSS) in four different frequency ranges: S, X, K<sub>μ</sub> and K<sub>a</sub> Bands.

In addition to being used in mixer and detector applications these Schottky Barrier Diodes can also be used for modulators, high speed switches and low power limiters.

All of the Schottky Barrier Mixer and Detector Diodes meet or exceed the Military Environmental Specifications of MIL-S-19500 and Methods from MIL-STD-750 and/or customer specifications.

## **ABSOLUTE MAXIMUM RATINGS:**

Storage Temperature: -65°C to +175°C  
Operation Temperature: -65°C to +150°C  
Incident RF CW Power: 100 mW max

# SCHOTTKY BARRIER MIXER DIODES

## LOW BARRIER (N-TYPE)

FREQUENCY	TYPE NUMBER	NF (1) (dB)	Z <sub>IF</sub> (2) (OHMS)		VSWR	TEST FREQUENCY MHz
		MAX	MIN	MAX	MAX	
S	MSL1201	5.5	100	300	1.7	3060
S	MSL1202	6.0	100	300	1.8	3060
S	MSL1203	6.5	100	300	2.0	3060
X	MSL1204	5.5	200	500	1.6	9375
X	MSL1205	6.0	200	500	1.6	9375
X	MSL1206	6.5	200	500	1.6	9375
X	MSL1207	7.0	200	500	1.6	9375
K <sub>μ</sub>	MSL1208	6.0	200	500	1.6	16000
K <sub>μ</sub>	MSL1209	6.5	200	500	1.6	16000
K <sub>μ</sub>	MSL1210	7.0	200	500	1.6	16000
K <sub>μ</sub>	MSL1211	7.5	200	500	1.6	16000
Ka	MSL1212	7.0	300	700	-	34865
Ka	MSL1213	7.5	300	700	-	34865
Ka	MSL1214	8.0	300	700	-	34865
Ka	MSL1215	9.0	300	700	-	34865
Ka	MSL1216	10.0	300	700	-	34865

## MEDIUM BARRIER (N-TYPE)

FREQUENCY	TYPE NUMBER	NF (1) (dB)	Z <sub>IF</sub> (2) (OHMS)		VSWR	TEST FREQUENCY MHz
		MAX	MIN	MAX	MAX	
S	MSM1301	5.5	150	400	1.7	3060
S	MSM1302	6.0	150	400	1.8	3060
S	MSM1303	6.5	150	400	2.0	3060
S	MSM1304	7.0	150	400	2.0	3060
X	MSM1305	6.0	200	450	1.6	9375
X	MSM1306	6.5	200	450	1.6	9375
X	MSM1307	7.0	200	450	1.6	9375
X	MSM1308	7.5	200	450	1.8	9375
X	MSM1309	8.0	200	450	2.0	9375
K <sub>μ</sub>	MSM1310	6.5	250	600	1.6	16000
K <sub>μ</sub>	MSM1311	7.0	250	600	1.8	16000
K <sub>μ</sub>	MSM1312	7.5	250	600	2.0	16000

## HIGH BARRIER (N-TYPE)

FREQUENCY	TYPE NUMBER	NF (1) (dB)	Z <sub>IF</sub> (2) (OHMS)		VSWR	TEST FREQUENCY MHz
		MAX	MIN	MAX	MAX	
S	MSH1401	5.0	250	450	1.6	3060
S	MSH1402	5.5	250	450	1.6	3060
S	MSH1403	6.0	250	450	1.8	3060
S	MSH1404	6.5	250	450	2.0	3060
X	MSH1405	6.0	250	450	1.6	9375
X	MSH1406	6.5	250	450	1.6	9375
X	MSH1407	7.0	250	450	1.8	9375
K <sub>μ</sub>	MSH1408	6.5	250	600	1.6	16000
K <sub>μ</sub>	MSH1409	7.0	250	600	1.8	16000

**NOTES:**

1. NF<sub>IF</sub>=1.5 dB; I<sub>F</sub>=30 MHz; R<sub>L</sub>=100 OHMS; L.O.=1 MW (for low and medium barrier types); L.O.=2.0 MW (for high barrier types); K<sub>a</sub>-Band NF is calculated.
2. I<sub>F</sub> impedance is measured by modulating the specified test frequency with a 1000 Hz signal, R<sub>L</sub> = 22 OHMS, at the specified incident power level.
3. These diodes are available as matched pairs and are supplied in either forward pairs (M) or forward/reverse pairs (MR). The matching criteria is ΔL<sub>C</sub>=0.3 dB max ΔZ<sub>IF</sub>=2.5 OHMS, max.
4. When ordering add package style as a suffix to basic type number to denote desired package style; i.e. MSL1205 is a 6.0 db X-Band Low Barrier Mixer Diode.
5. All of the Schottky Barrier Mixer Diodes are available in chip form.