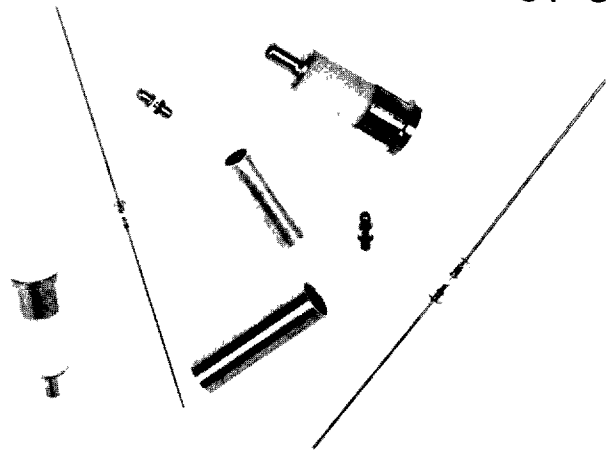


# Silicon Point Contact Mixer Diodes

T-37-07

## Features

- High Burnout Resistance
- Low Noise Figure, even in the Starved L.O. Mode
- Hermetically Sealed



## Description

Alpha's point contact mixer diodes are designed for applications through Ka-band (40 GHz). These diodes employ epitaxial silicon optimized for low noise figure and uniformity. Since they are point contact devices, they can be used in mixers operating in the low, or starved, local oscillator condition as well as in the normal mode, where the local oscillator level is nominally one milliwatt.

They are available in a variety of packages which make them suitable for use in waveguide, coaxial and stripline applications.

For those applications requiring guaranteed power handling capability, Alpha has diodes that are screened 100% using narrow RF pulses ( / 5 nanoseconds). This screening insures reliable operation at power levels up to the screened value. These diodes are particularly useful in applications where the mixer follows a TRL or solid state limiter. Diodes in packages other than those shown are also available.

## Applications

These diodes are categorized by noise figure at frequencies up through 40 GHz.

Matched pairs of mixer diodes are used in conjunction with a hybrid or magic-tee primarily for suppressing noise originating in the local oscillator arm from the signal arm, thus minimizing radiation and absorption of signal power. Other uses are for specific reflection of signals through the hybrid and for balanced modulators and discriminators.

The matching criteria for mixer diodes are as follows:

- a) Conversion loss (within 0.3 dB of each other)
- b) IF impedance (within 25 ohms of each other)
- c) The VSWR of individual diodes, when not otherwise restricted ( such as 1.3 on premium units), is limited to 1.6 Max.

These specifications allow the noise figure of the receiver to deteriorate no greater than 0.1 dB due to local oscillator noise. The VSWR limit allows a maximum of 5% leakage. In practice, this leakage is generally less than 2%.

Matched diodes are supplied in either forward pairs (M) or forward/reverse pairs (MR). The forward/reverse pair allows for a simpler IF circuit design.

Figure 1 is a plot of a typical X-band point contact diode's E-I characteristic.

Figure 2 shows the behavior of a typical X-band single diode's noise figure versus local oscillator drive level. Because of the point contact diode's low turn-on as seen in Figure 1, it can operate efficiently as a mixer at local oscillator drive levels as low as 0.1 milliwatts, as can be seen in Figure 2.

Figure 3 depicts the circuit configuration of a balanced mixer using two diodes of the same polarity for L.O. noise suppression. In order to attain local oscillator noise suppression, the IF outputs of the two diodes must differ by 180°. In this circuit the phase reversal is accomplished in the IF combining network as shown.

A much easier method of obtaining the 180° phase reversal is to use one forward and one reverse diode as shown in Figure 4. This substantially simplifies the mixer-IF amplifier interface design.

## Maximum Ratings

Operating Temperature .....	-55°C to +150°C
Storage Temperature .....	-65°C to +150°C
Power Dissipation DC .....	100 mW <sup>(1)</sup>

1. Derate linearly above 25°C at 8 mW/°C

# Silicon Point Contact Mixer Diodes

## S-Band

Type Number					NF <sub>s</sub> dB Max.	Package Outline	Electrical Characteristics			
Polarity			Matched Pairs				Proof Burnout Ergs	Z <sub>0</sub>		VSWR Max.
Forward	Reverse	Reversible	Two Forward- Polarity Diodes	One Forward- One Reverse- Polarity Diodes				OHMS		
								Min.	Max.	
1N21G	1N21GR		1N21GM	1N21GMR	5.5	005-802	5.0	350	450	1.3
		1N21WG <sup>1</sup>	1N21WGM <sup>1</sup>	1N21WGMR <sup>1</sup>	5.5	005-801	5.0	350	450	1.3
		1N416G	1N46GM	1N416GMR	5.5	005-801	5.0	350	450	1.3
1N21F	1N21FR		1N21FM	1N21FMR	6.0	005-802	5.0	350	450	1.3
		1N416F	1N416FM	1N416FMR	6.0	005-801	5.0	350	450	1.3
		1N3655B	1N3655BM	1N3655BMR	6.0	005-801	10.0	350	450	1.3
		1N831C	1N831CM		6.0	062-001	5.0	300 <sup>2</sup>	500 <sup>2</sup>	---
		1N831B	1N831BM		6.5	062-001	5.0	300 <sup>2</sup>	500 <sup>2</sup>	---
1N21E	1N21ER		1N21EM	1N21EMR	7.0	005-802	5.0	350	450	1.3
		1N21WE <sup>1</sup>	1N21WEM <sup>1</sup>	1N21WEMR <sup>1</sup>	7.0	005-801	5.0	350	450	1.3
		1N416E	1N416EM	1N416EMR	7.0	005-801	5.0	350	450	1.3
		1N831A	1N831AM		7.0	062-001	5.0	300 <sup>2</sup>	500 <sup>2</sup>	---
		1N3655A <sup>1</sup>	1N3655AM <sup>1</sup>	1N3655AMR <sup>1</sup>	7.0	005-001	10.0	350	450	1.3
1N21D	1N21DR		1N21DM	1N21DMR	7.3	005-802	5.0	325	425	1.5
		1N416D	1N416DM	1N416DMR	7.3	005-801	5.0	325	475	1.5
1N21C	1N21CR		1N21CM	1N21CMR	8.3	005-802	5.0	300 <sup>2</sup>	500 <sup>2</sup>	---
		1N416C	1N416CM	1N416CMR	8.3	005-801	5.0	300 <sup>2</sup>	500 <sup>2</sup>	---
		1N831	1N831M		8.3	062-001	5.0	300 <sup>2</sup>	500 <sup>2</sup>	---
		1N3655	1N3655M	1N3655MR	8.3	005-801	10.0	300 <sup>2</sup>	500 <sup>2</sup>	---

		DMA5221-042	DMA5221-043		5.5	013-001	5.0	300	600	1.6
		DMA4148-042	DMA4148-043	DMA4148-044	5.5	005-801	10.0	350	450	1.3
		DMA5221-036	DMA5221-037		6.0	013-001	5.0	300	600	1.6
		DMA5091-006	DMA5091-007		6.5	075-001	5.0	300 <sup>2</sup>	500 <sup>2</sup>	---
		DMA5091-000	DMA5091-001		7.0	075-001	5.0	300 <sup>2</sup>	500 <sup>2</sup>	---
		DMA5221-030	DMA5221-031		7.0	013-001	5.0	300	600	1.8
		DMA5221-018	DMA5221-019		8.3	013-001	5.0	300	600	2.3

### Notes:

- Available as JAN or single service types which meet all applicable requirements of MIL-S-19500.
- Nominal range.
- N<sub>s</sub> = 1.5 dB
- Broadband device.
- For stripline applications, all diodes in the 062-001 and 075-001 packages are available with flattened leads.
- These diodes are designed for those applications requiring guaranteed RF burnout resistance. They are direct replacements for the 1N23/1N415 and 1N78 families. They are 100% screened under the following conditions and at the RF burnout level shown in the table.  
 t<sub>p</sub> = 3 ns min.  
 Exposure = 15,000 pulses min.  
 R<sub>L</sub> = 22 ohms
- Maximum operating temperature = 150°C.
- Calculated noise figure.

Band	Frequency Range	TEST CONDITIONS	
		Frequency	L.O. Power
	GHz	GHz	mW
S	2 to 4	3.1	0.5
S-X	2 to 12	3 & 12	1.0
X	8 to 12	9.4	1.0
ku	12 to 18	16.0	1.0
k	18 to 26	24.0	1.0
ka	26 to 40	35.0	1.0

# Silicon Point Contact Mixer Diodes

## S-X Band

Type Number					NF <sup>3</sup> dB Max.	Package Outline	Electrical Characteristics			
Polarity			Matched Pairs				Proof Burnout Ergs	Z <sub>n</sub>		VSWR Max.
Forward	Reverse	Reversible	Two Forward- Polarity Diodes	One Forward- One Reverse- Polarity Diodes				OHMS		
					Min.	Max.				
1N1132 <sup>1,4</sup>	1N1132R <sup>1,4</sup>		1N1132M	1N1132MR	9.5	007-001	1.0	100	200	2.0
DMA5632-006 <sup>4</sup>	DMA5632-009 <sup>4</sup>		DMA5632-007	DMA5632-008	8.0	007-001	1.0	100	200	2.0
DMA5632-000 <sup>4</sup>	DMA5632-003 <sup>4</sup>		DMA5632-001	DMA5632-002	9.0	007-001	1.0	100	200	2.0

## X-Band

Type Number					NF <sup>3</sup> dB Max.	Package Outline	RF <sup>5</sup> Burnout Level W Min.	Electrical Characteristics			
Polarity			Matched Pairs					Proof Burnout Ergs	Z <sub>n</sub>		VSWR Max.
Forward	Reverse	Reversible	Two Forward- Polarity Diodes	One Forward- One Reverse- Polarity Diodes					Min.	Max.	
1N23H	1N23HR		1N23HM	1N23HMR	6.0	005-802	---	2.0	335	465	1.3
		1N415H	1N415HM	1N415HMR	6.0	005-801	---	2.0	335	465	1.3
1N23G	1N23GR		1N23GM	1N23GMR	6.5	005-802	---	2.0	335	465	1.3
		1N23WG	1N23WGM	1N23WGMR	6.5	005-801	---	2.0	335	465	1.3
		1N23WG <sup>1</sup>	1N23WGM <sup>1</sup>	1N23WGMR <sup>1</sup>	6.5	005-801	20	---	335	465	1.3
		1N415G	1N415GM	1N415GMR	6.5	005-801	---	2.0	335	465	1.3
		1N832C	1N832CM		6.5	062-001	---	2.0	250 <sup>2</sup>	550 <sup>2</sup>	---
1N23F	1N23FR		1N23FM	1N23FMR	7.0	005-802	---	2.0	335	465	1.3
		1N415F	1N415FM	1N415FMR	7.0	005-801	---	2.0	335	465	1.3
		1N832B	1N832BM		7.0	062-001	---	2.0	250 <sup>2</sup>	550 <sup>2</sup>	---
1N23E	1N23ER		1N23EM	1N23EMR	7.5	005-802	---	2.0	335	475	1.3
		1N23WE	1N23WEM	1N23WEMR	7.5	005-801	---	2.0	335	465	1.3
		1N23WE <sup>1</sup>	1N23WEM <sup>1</sup>	1N23WEMR <sup>1</sup>	7.5	005-801	20	---	335	465	1.3
		1N415E	1N415EM	1N415EMR	7.5	005-801	---	2.0	335	465	1.3
		1N832A	1N832AM		7.5	062-001	---	2.0	250 <sup>2</sup>	550 <sup>2</sup>	---
		1N3747	1N3747M	1N3747MR	7.5	005-801	---	5.0	335	465	1.3
1N23D	1N23DR		1N23DM	1N23DMR	7.8	005-802	---	2.0	350	450	1.3

### Notes:

- Available as JAN or single service types which meet all applicable requirements of MIL-S-19500.
- Nominal range.
- N<sub>f</sub> = 1.5 dB
- Broadband device.
- For stripline applications, all diodes in the 062-001 and 075-001 packages are available with flattened leads.
- These diodes are designed for those applications requiring guaranteed RF burnout resistance. They are direct replacements for the 1N23/1N415 and 1N78 families. They are 100% screened under the following conditions and at the RF burnout level shown in the table.  
 t<sub>p</sub> = 3 ns min.  
 Exposure = 15,000 pulses min.  
 R<sub>L</sub> = 22 ohms
- Maximum operating temperature = 150°C.
- Calculated noise figure.

Band	Frequency Range	TEST CONDITIONS	
		Frequency	L.O. Power
	GHz	GHz	mW
S	2 to 4	3.1	0.5
S-X	2 to 12	3 & 12	1.0
X	8 to 12	9.4	1.0
ku	12 to 18	16.0	1.0
k	18 to 26	24.0	1.0
ka	26 to 40	35.0	1.0

# Silicon Point Contact Mixer Diodes

## X Band

Type Number					NF <sup>3</sup> dB Max.	Package Outline	RF <sup>4</sup> Burnout Level W Min.	Electrical Characteristics			
Polarity			Matched Pairs					Proof Burnout Ergs	Z <sub>n</sub>		VSWR Max.
Forward	Reverse	Reversible	Two Forward- Polarity Diodes	One Forward- One Reverse- Polarity Diodes					OHMS		
					Min.	Max.					
		1N415D	1N415DM	1N415DMR	7.8	005-801	---	2.0	350	450	1.3
1N149	1N149R		1N149M	1N149MR	8.3	005-802	---	2.0	325	475	---
		1N3746	1N3746M	1N3746MR	8.5	005-801	---	5.0	335	465	1.3
1N23C	1N23CR		1N23CM	1N23CMR	9.5	005-802	---	2.0	325	475	1.5
		1N415C	1N415CM	1N415CMR	9.5	005-801	---	2.0	325	475	1.5
		1N832	1N832M		9.5	062-001	---	2.0	250 <sup>2</sup>	550 <sup>2</sup>	---
1N2510	1N2510R		1N2510M	1N2510MR	9.5	002-001	---	2.0	300 <sup>2</sup>	500 <sup>2</sup>	---
		1N3745	1N3745M	1N3745MR	9.5	005-801	---	5.0	325	475	1.5

DMA6497-018	DMA6497-021		DMA6497-019	DMA6497-020	6.0	005-802	20	---	335	465	1.3
		DMA6498-018	DMA6498-019	DMA6498-020	6.0	005-801	20	---	335	465	1.3
DMA6497-012	DMA6497-015		DMA6497-013	DMA6497-014	6.5	005-802	20	---	335	465	1.3
		DMA5092-018	DMA5092-019		6.5	075-001	---	2.0	250 <sup>2</sup>	550 <sup>2</sup>	---
		DMA5223-042	DMA5223-043		6.5	013-001	---	2.0	250	500	1.5
DMA6497-006	DMA6497-009		DMA6497-007	DMA6497-008	7.0	005-802	20	---	335	465	1.3
		DMA6498-006	DMA6498-007	DMA6498-008	7.0	005-801	20	---	335	465	1.3
		DMA5092-012	DMA5092-013		7.0	075-001	---	2.0	250 <sup>2</sup>	550 <sup>2</sup>	---
		DMA5223-036	DMA5223-037		7.0	013-001	---	2.0	250	500	1.6
DMA5392-012 <sup>4</sup>	DMA5392-015 <sup>4</sup>		DMA5392-013	DMA5392-014	7.0	002-001	---	2.0	200	350	1.7
DMA6497-000	DMA6497-003		DMA6497-001	DMA6497-002	7.5	005-802	20	---	335	465	1.3
		DMA5092-006	DMA5092-007		7.5	075-001	---	2.0	250 <sup>2</sup>	550 <sup>2</sup>	---
		DMA5223-030	DMA5223-031		7.5	013-001	---	2.0	250	500	1.8
DMA5392-006 <sup>4</sup>	DMA5392-009 <sup>4</sup>		DMA5392-007	DMA5392-008	7.5	002-001	---	2.0	200	350	1.8
DMA5392-000 <sup>4</sup>	DMA5392-003 <sup>4</sup>			DMA5392-002	8.5	002-001	---	2.0	200	350	---
		DMA5092-000	DMA5092-001		9.5	075-001	---	2.0	250 <sup>2</sup>	550 <sup>2</sup>	---
		DMA5223-018	DMA5223-019		9.5	013-001	---	2.0	250	500	2.3

### Notes:

- Available as JAN or single service types which meet all applicable requirements of MIL-S-19500.
- Nominal range.
- N<sub>f</sub> = 1.5 dB
- Broadband device.
- For stripline applications, all diodes in the 062-001 and 075-001 packages are available with flattened leads.
- These diodes are designed for those applications requiring guaranteed RF burnout resistance. They are direct replacements for the 1N23/1N415 and 1N78 families. They are 100% screened under the following conditions and at the RF burnout level shown in the table.  
 t<sub>i</sub> = 3 ns min.  
 Exposure = 15,000 pulses min.  
 R<sub>i</sub> = 22 ohms
- Maximum operating temperature = 150°C.
- Calculated noise figure.

Band	Frequency Range	TEST CONDITIONS	
		Frequency	L.O. Power
	GHz	GHz	mW
S	2 to 4	3.1	0.5
S-X	2 to 12	3 & 12	1.0
X	8 to 12	9.4	1.0
ku	12 to 18	16.0	1.0
k	18 to 26	24.0	1.0
ka	26 to 40	35.0	1.0

# Silicon Point Contact Mixer Diodes

## Ku- Band

Type Number					NF <sup>3</sup> dB Max.	Package Outline	RF <sup>5</sup> Burnout Level W Min.	Electrical Characteristics			
Polarity			Matched Pairs					Proof Burnout Ergs	Z <sub>i</sub>		VSWR Max.
Forward	Reverse	Reversible	Two Forward- Polarity Diodes	One Forward- One Reverse- Polarity Diodes					OHMS		
					Min.	Max.					
1N78G	1N78GR		1N78GM	1N78GMR	7.0	002-001	---	1.0	400	565	1.5
1N78F	1N78FR		1N78FM	1N78FMR	7.5	002-001	---	1.0	400	565	1.5
1N78F <sup>1</sup>	1N78FR <sup>1</sup>		1N78FM <sup>1</sup>	1N78FMR <sup>1</sup>	7.5	002-001	10	---	400	565	1.5
1N78E	1N78ER		1N78EM	1N78EMR	8.0	002-001	---	1.0	400	565	1.5
1N4605 <sup>4</sup>	1N4605R <sup>4</sup>		1N4605M	1N4605MR	8.0	002-001	---	1.0	400	565	1.5
1N78D	1N78DR		1N78DM	1N78DMR	8.8	002-001	---	1.0	400	565	1.5
1N4604 <sup>4</sup>	1N4604R <sup>4</sup>		1N4604M	1N4604MR	8.8	002-001	---	1.0	400	565	1.5
1N78C	1N78CR		1N78CM	1N78CMR	9.5	002-001	---	1.0	400	565	1.5
1N78C <sup>1</sup>	1N78CR <sup>1</sup>		1N78CM <sup>1</sup>	1N78CMR <sup>1</sup>	9.5	002-001	10	---	400	565	1.5
1N4603 <sup>4</sup>	1N4603R <sup>4</sup>		1N4603M	1N4603MR	9.5	002-001	---	1.0	365	565	1.5
1N3205	1N3205R		1N3205M	1N3205MR	9.8	002-001	---	1.0	365	565	1.6
1N78B	1N78BR		1N78BM	1N78BMR	10.0	002-001	---	1.0	365	565	1.6

DMA5282-042 <sup>4</sup>	DMA5282-045 <sup>4</sup>		DMA5282-043	DMA5282-044	7.0	002-001	---	1.0	400	565	1.5
DMA6499-012	DMA6499-015		DMA6499-013	DMA6499-014	7.5	002-001	10	---	400	565	1.5
DMA5282-036 <sup>4</sup>	DMA5282-039 <sup>4</sup>		DMA5282-037	DMA5282-038	7.5	002-001	---	1.0	400	565	1.5
		DMA5278-030	DMA5278-031		8.0	013-001	---	1.0	---	---	---
DMA6499-006	DMA6499-009		DMA6499-007	DMA6499-008	8.0	002-001	10	---	400	565	1.5
		DMA5278-024	DMA5278-025		8.8	013-001	---	1.0	---	---	---
DMA6499-000	DMA6499-003		DMA6499-001	DMA6499-002	8.8	002-001	10	---	400	565	1.5
		DMA5278-018	DMA5278-019		9.5	013-001	---	1.0	---	---	---
		DMA5278-012	DMA5278-013		10.0	013-001	---	1.0	---	---	---

### Notes:

- Available as JAN or single service types which meet all applicable requirements of MIL-S-19500.
- Nominal range.
- N<sub>i</sub> = 1.5 dB
- Broadband device.
- For stripline applications, all diodes in the 062-001 and 075-001 packages are available with flattened leads.
- These diodes are designed for those applications requiring guaranteed RF burnout resistance. They are direct replacements for the 1N23/1N415 and 1N78 families. They are 100% screened under the following conditions and at the RF burnout level shown in the table.  
 $t_p = 3$  ns min.  
 Exposure = 15,000 pulses min.  
 $R_L = 22$  ohms
- Maximum operating temperature = 150°C.
- Calculated noise figure.

Band	Frequency Range	TEST CONDITIONS	
		Frequency	L.O. Power
	GHz	GHz	mW
S	2 to 4	3.1	0.5
S-X	2 to 12	3 & 12	1.0
X	8 to 12	9.4	1.0
ku	12 to 18	16.0	1.0
k	18 to 26	24.0	1.0
ka	26 to 40	35.0	1.0

# Silicon Point Contact Mixer Diodes

## K-Band

Type Number					NF <sup>2</sup> dB Max.	Package Outline	RF <sup>2</sup> Burnout Level W Min.	Electrical Characteristics			
Polarity			Matched Pairs					Proof Burnout Ergs	Z <sub>o</sub>		VSWR Max.
Forward	Reverse	Reversible	Two Forward- Polarity Diodes	One Forward- One Reverse- Polarity Diodes					OHMS		
									Min.	Max.	
1N26C	1N26CR		1N26CM	1N26CMR	9.5	002-001	---	0.3	400	600	1.5
1N26B <sup>1</sup>	1N26BR <sup>1</sup>		1N26BM <sup>1</sup>	1N26BMR <sup>1</sup>	11.0	002-001	---	0.3	400	600	1.5
1N26A	1N26AR		1N26AM	1N26AMR	11.3	002-001	---	0.3	300	600	1.6
1N26	1N26R		1N26M	1N26MR	13.1	002-001	---	0.3	300	600	---

DMA5326-012 <sup>4</sup>	DMA5326-015 <sup>4</sup>		DMA5326-013	DMA5326-014	9.0	002-001	---	0.3	400	600	1.5
DMA5326-006 <sup>4</sup>	DMA5326-009 <sup>4</sup>		DMA5326-007	DMA5326-008	10.0	002-001	---	0.3	400	600	1.5
DMA5326-000 <sup>4</sup>	DMA5326-003 <sup>4</sup>		DMA5326-001	DMA5326-002	11.0	002-001	---	0.3	400	600	1.5

## Ka-Band

1N53D	1N53DR		1N53DM	1N53DMR	9.0 <sup>6</sup>	003-001	---	0.1	400	800	1.6
1N53B	1N53BR		1N53BM	1N53BMR	10.0 <sup>6</sup>	003-001	---	0.1	400	800	1.6
1N53B <sup>1</sup>	1N53BR <sup>1</sup>		1N53BM <sup>1</sup>	1N53BMR <sup>1</sup>	10.0 <sup>6</sup>	003-001	---	0.1	500	700	1.6
1N53A	1N53AR		1N53AM	1N53AMR	11.1 <sup>6</sup>	003-001	---	0.1	400	800	1.6
1N53	1N53R		1N53M	1N53MR	13.1 <sup>6</sup>	003-001	---	0.1	400	800	1.6

		DMA5252-030	DMA5253-031		7.0 <sup>6</sup>	013-001	---	0.1	---	---	---
DMA5353-036 <sup>4</sup>	DMA5353-039 <sup>4</sup>		DMA5353-037	DMA5353-038	7.0 <sup>6</sup>	003-001	---	0.1	400	800	1.6
DMA5353-030 <sup>4</sup>	DMA5353-033 <sup>4</sup>		DMA5353-031	DMA5353-032	7.5 <sup>6</sup>	003-001	---	0.1	400	800	1.6
DMA5353-024 <sup>4</sup>	DMA5353-027 <sup>4</sup>		DMA5353-025	DMA5353-026	8.0 <sup>6</sup>	003-001	---	0.1	400	800	1.6
		DMA5253-024	DMA5253-025		8.0 <sup>6</sup>	013-001	---	0.1	---	---	---
DMA5353-018 <sup>4</sup>	DMA5353-021 <sup>4</sup>		DMA5353-019	DMA5353-020	9.0 <sup>6</sup>	003-001	---	0.1	400	800	1.6
		DMA5253-018	DMA5253-019		9.0 <sup>6</sup>	013-001	---	0.1	---	---	---
DMA5353-012 <sup>4</sup>	DMA5353-015 <sup>4</sup>		DMA5353-013	DMA5353-014	10.0 <sup>6</sup>	003-001	---	0.1	400	800	1.6
		DMA5253-012	DMA5253-013		10.0 <sup>6</sup>	013-001	---	0.1	---	---	---

### Notes:

- Available as JAN or single service types which meet all applicable requirements of MIL-S-19500.
- Nominal range.
- N<sub>f</sub> = 1.5 dB
- Broadband device.
- For stripline applications, all diodes in the 062-001 and 075-001 packages are available with flattened leads.
- These diodes are designed for those applications requiring guaranteed RF burnout resistance. They are direct replacements for the 1N23/1N415 and 1N78 families. They are 100% screened under the following conditions and at the RF burnout level shown in the table.  
 $t_f = 3$  ns min.  
 Exposure = 15,000 pulses min.  
 $R_L = 22$  ohms
- Maximum operating temperature = 150°C.
- Calculated noise figure.

Band	Frequency Range	TEST CONDITIONS	
		Frequency	L.O. Power
	GHz	GHz	mW
S	2 to 4	3.1	0.5
S-X	2 to 12	3 & 12	1.0
X	8 to 12	9.4	1.0
ku	12 to 18	16.0	1.0
k	18 to 26	24.0	1.0
ka	26 to 40	35.0	1.0

# Silicon Point Contact Mixer Diodes

## Typical X-Band Mixer Diode

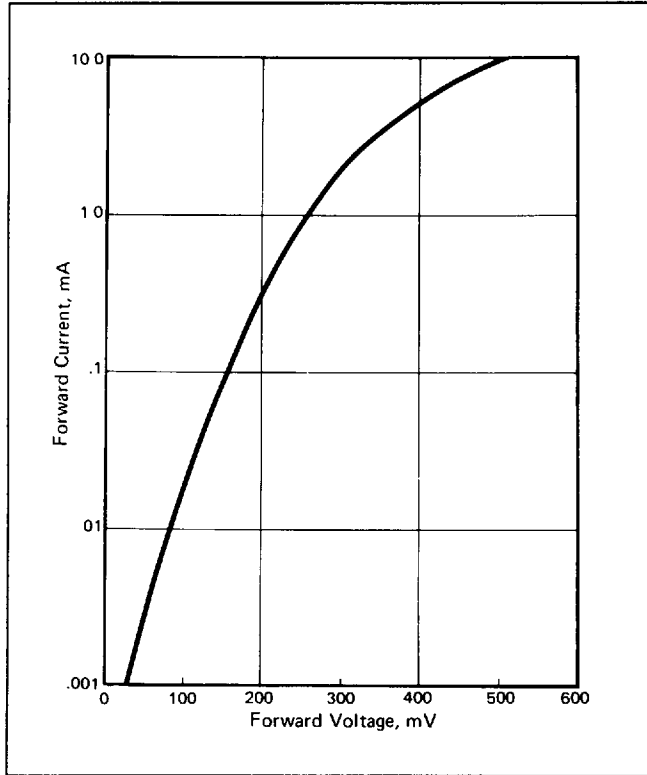


Figure 1. Typical Forward DC Characteristic Curve (Voltage vs. Current)

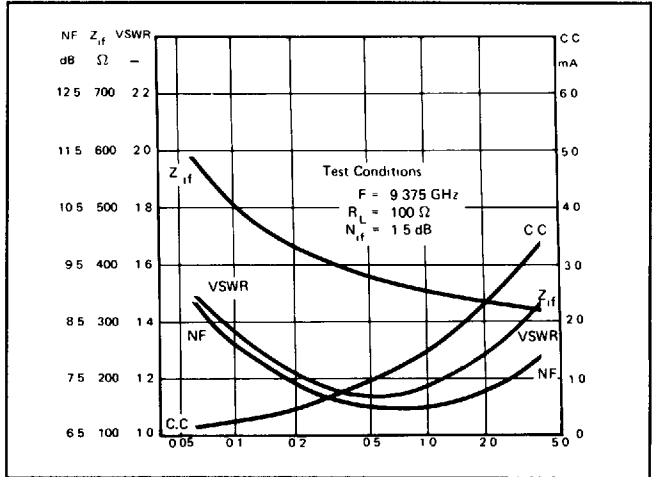


Figure 2. RF Parameters vs. Local Oscillator Drive

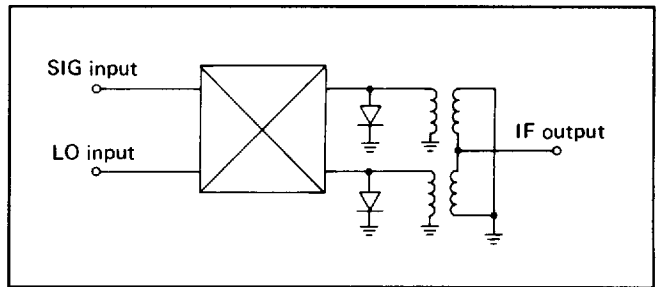


Figure 3. Balanced Mixer Using Diode Pairs With Suffix "M"

### FREQUENCY TABLE

BAND	Frequencies (GHz)
UHF	Up to 1
L	1 to 2
S	2 to 4
C	4 to 8
X	8.2 to 12.4
Ku	12.4 to 18.0
K	18.0 to 26.5
Ka	26.5 to 40.0

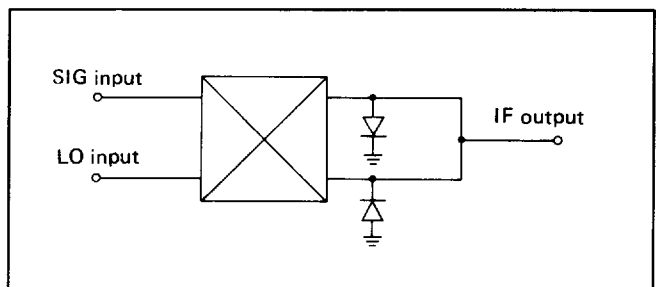


Figure 4. Balanced Mixer Using Diode Pairs With Suffix "MR"