



# SILICON POINT CONTACT MIXER DIODES

ASI Point Contact Mixer Diodes are designed for applications from UHF through 26 GHz.

The overall noise figure is expressed by the following relationship:

$NF_o = L_c(NR_o + NF_{IF} - 1)$   
 $NF_o$  = overall receiver noise figure  
 $NR_o$  = output noise temperature ratio of the mixer diode  
 $NF_{IF}$  = noise figure of the I.F. amplifier (1.5dB)  
 $L_c$  = conversion loss of the mixer diode

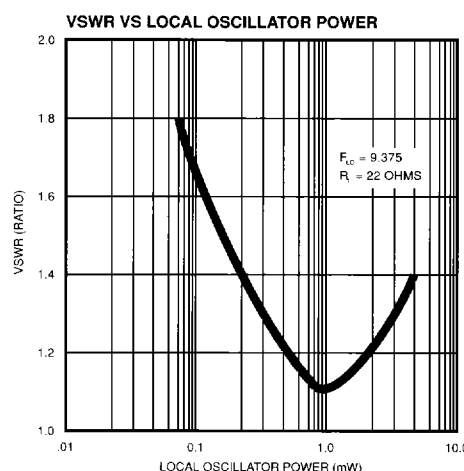
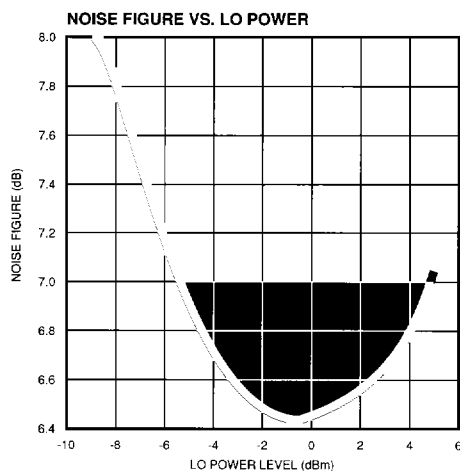
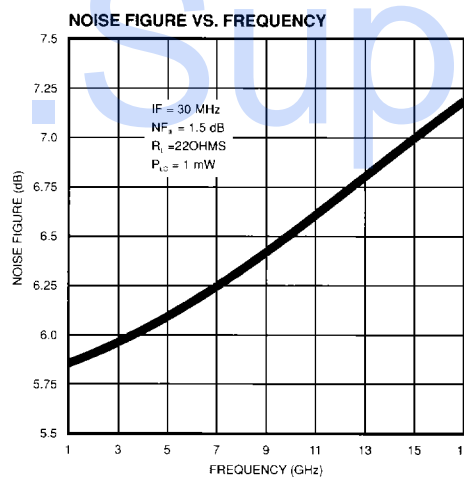
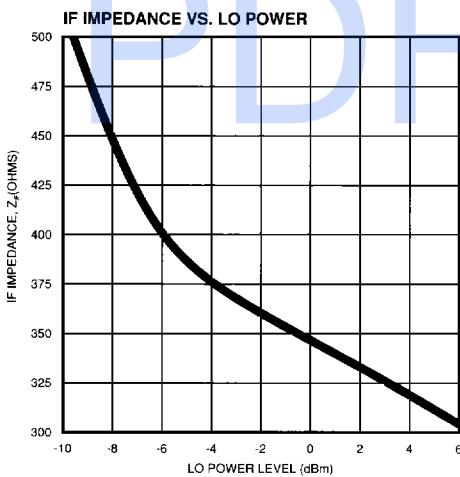
They feature high burnout resistance, low noise figure and are hermetically sealed. They are available in DO-7, DO-22, DO-23 and DO-37 package styles which make them suitable for use in Coaxial, Waveguide and Stripline applications.

These diodes are available as matched pairs and are supplied in either forward pairs (M) or forward/reverse pairs (MR). The matching criteria for these mixer diodes is:

1. Conversion Loss- $\Delta L_c = 0.3\text{dB}$  maximum
2. IF Impedance- $\Delta Z_{IF} = 25\text{ OHMS}$  maximum

These mixer diodes are categorized by noise figure at the designated test frequencies from UHF to 26GHz.

BAND	FREQUENCY (GHz)
UHF	Up to 1
L	1 to 2
S	2 to 4
C	4 to 8
X	8 to 12.4
K $\mu$	12.4 to 18.0
K	18.0 to 26.5



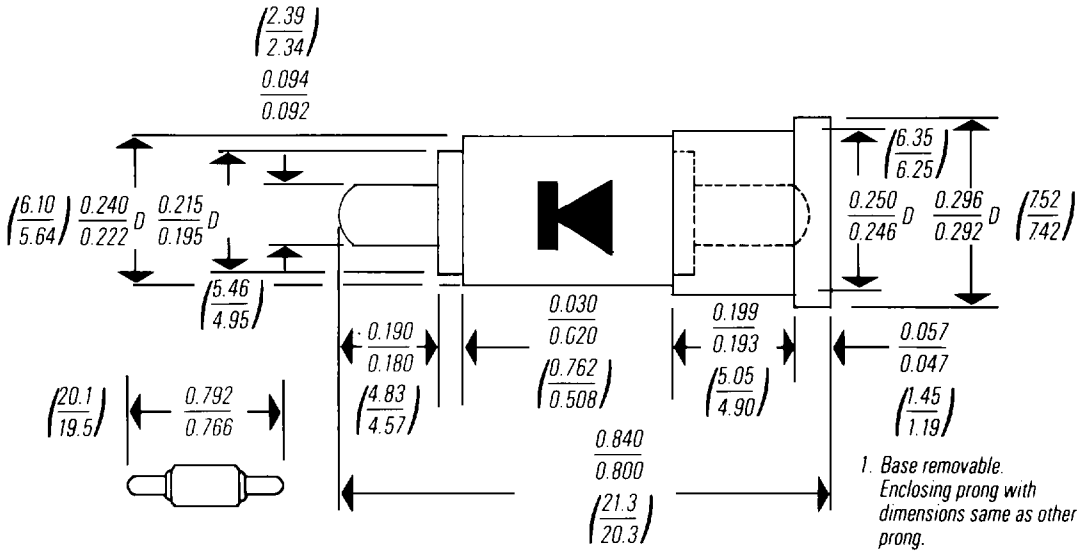
All of the point contact mixer diodes meet or exceed the military environmental specifications of MIL-S-19500, MIL-STD-202 and methods from MIL-STD-750 that specify mechanical, electrical, thermal and environmental tests.

ADVANCED SEMICONDUCTOR, INC.

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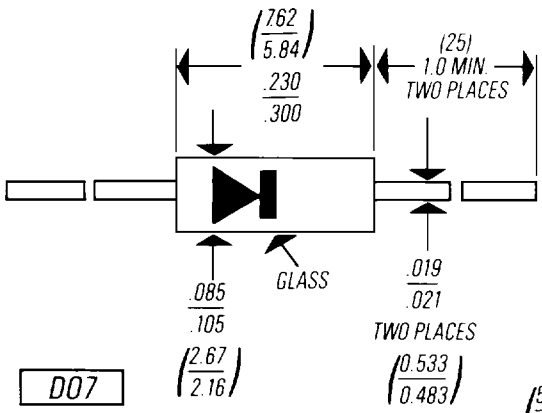
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# PACKAGE STYLES

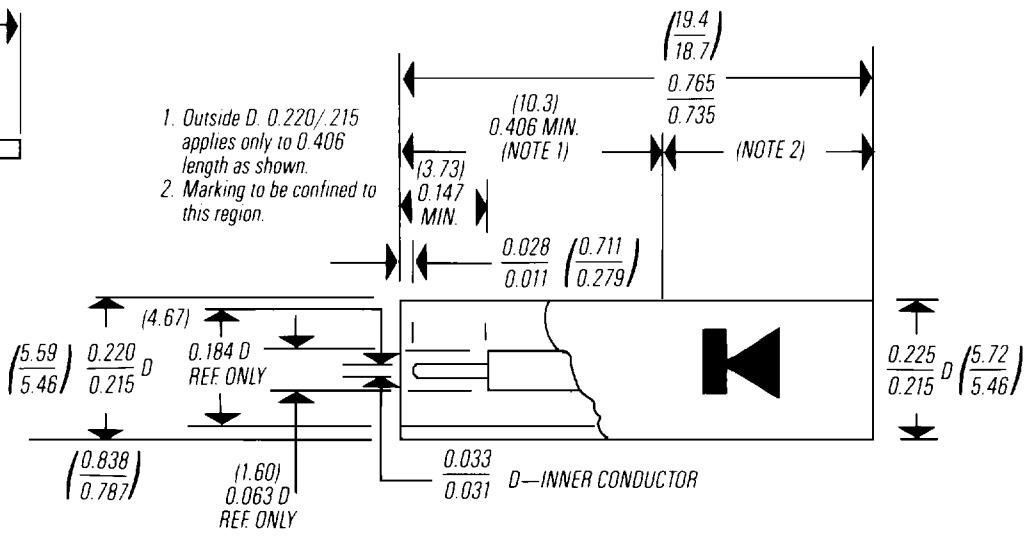


**D023** Removable Base

**D022** Fixed Base



**D07**



**D037**

1. Outside D. 0.220/.215 applies only to 0.406 length as shown.
2. Marking to be confined to this region.

**POINT CONTACT MIXER DIODES**

**X BAND (CONTINUED)**

FREQUENCY BAND	TYPE NUMBER				ELECTRICAL CHARACTERISTICS				TEST CONDITIONS				PACKAGE OUTLINE			
	POLARITY		MATCHED PAIRS		NOISE RATIO MAX.	NOISE <sup>1</sup> FIGURE NF, dB MAX.	BURNOUT ERGS	Z <sub>IF</sub> <sup>2</sup> OHMS		VSWR MAX.	CONVERSION LOSS MAX., dB	FREQUENCY MHz		LO POWER mW	BASIC TYPE	
	FORWARD	REVERSE	REVERSIBLE	TWO FORWARD POLARITY DIODES				ONE FORWARD ONE REVERSE POLARITY DIODES	MIN.							MAX.
X			1N415D	1N415DM	1N415DMR	1.7	7.8	2.0	350	450	1.3	5.0	9375	1.0	1N415D	DO-23
X	1N23E	1N23ER		1N23EM	1N23EMR	-	7.5	2.0	335	465	1.3	-	9375	1.0	1N23E	DO-22
X			1N23WE	1N23WEM	1N23WEMR	-	7.5	2.0	335	465	1.3	-	9375	1.0	1N23WE	DO-23
X			1N415E	1N415EM	1N415EMR	-	7.5	2.0	335	465	1.3	-	9375	1.0	1N415E	DO-23
X			1N832A	1N832AM		-	7.5	2.0	250	550	-	-	9375	1.0	1N832A	DO-7
X			1N3747W	1N3747WM	1N3747WMR	-	7.5	5.0	335	465	1.3	-	9375	1.0	1N3747W	DO-23
X	1N23F	1N23FR		1N23FM	1N23FMR	-	7.0	2.0	335	465	1.3	-	9375	1.0	1N23F	DO-22
X			1N23WF	1N23WFM	1N23WFMR	-	7.0	2.0	335	465	1.3	-	9375	1.0	1N23WF	DO-23
X			1N415F	1N415FM	1N415FMR	-	7.0	2.0	335	465	1.3	-	9375	1.0	1N415F	DO-23
X			1N832B	1N832BM		-	7.0	2.0	250	550	-	-	9375	1.0	1N832B	DO-7
X	1N23G	1N23GR		1N23GM	1N23GMR	-	6.5	2.0	335	465	1.3	-	9375	1.0	1N23G	DO-22
X			1N23WG	1N23WGM	1N23WGMR	-	6.5	2.0	335	465	1.3	-	9375	1.0	1N23WG	DO-23
X			1N415G	1N415GM	1N415GMR	-	6.5	2.0	335	465	1.3	-	9375	1.0	1N415G	DO-23
X			1N832C	1N832CM		-	6.5	2.0	250	550	-	-	9375	1.0	1N832C	DO-7
X	1N23H	1N23HR		1N23HM	1N23HMR	-	6.0	2.0	335	465	1.3	-	9375	1.0	1N23H	DO-22
X			1N415H	1N415HM	1N415HMR	-	6.0	2.0	335	465	1.3	-	9375	1.0	1N415H	DO-23

**K<sub>μ</sub>, K-BAND**

K <sub>μ</sub>	1N78	1N78R		1N78M	1N78MR	2.5	-	1.0	325	625	-	7.5	16000	1.0	1N78	DO-37
K <sub>μ</sub>	1N78A	1N78AR		1N78AM	1N78AMR	1.5	-	1.0	365	565	1.6	7.0	16000	1.0	1N78A	DO-37
K <sub>μ</sub>	1N78B	1N78BR		1N78BM	1N78BMR	1.3	10.0	1.0	365	565	1.6	6.5	16000	1.0	1N78B	DO-37
K <sub>μ</sub>	1N3205	1N3205R		1N3205M	1N3205MR	1.4	9.8	1.0	365	565	1.6	6.3	16000	1.0	1N3205	DO-37
K <sub>μ</sub>	1N78C	1N78CR		1N78CM	1N78CMR	-	9.5	1.0	400	565	1.5	6.0	16000	1.0	1N78C	DO-37
K <sub>μ</sub>	1N4603 <sup>3</sup>	1N4603R <sup>3</sup>		1N4603M	1N4603MR	-	9.5	1.0	365	565	1.5	-	16000	1.0	1N4603	DO-37
K <sub>μ</sub>	1N78D	1N78DR		1N78DM	1N78DMR	-	8.8	1.0	400	565	1.5	5.7	16000	1.0	1N78D	DO-37
K <sub>μ</sub>	1N4604 <sup>3</sup>	1N4604R <sup>3</sup>		1N4604M	1N4604MR	-	8.8	1.0	400	565	1.5	-	16000	1.0	1N4604	DO-37
K <sub>μ</sub>	1N78E	1N78ER		1N78EM	1N78EMR	-	8.0	1.0	400	565	1.5	5.7	16000	1.0	1N78E	DO-37
K <sub>μ</sub>	1N4605 <sup>3</sup>	1N4605R <sup>3</sup>		1N4605M	1N4605MR	-	8.0	1.0	400	565	1.5	-	16000	1.0	1N4605	DO-37
K <sub>μ</sub>	1N78F	1N78FR		1N78FM	1N78FMR	-	7.5	1.0	400	565	1.5	5.7	16000	1.0	1N78F	DO-37
K <sub>μ</sub>	1N78G	1N78GR		1N78GM	1N78GMR	-	7.0	1.0	400	565	1.5	-	16000	1.0	1N78G	DO-37
K	1N26	1N26R		1N26M	1N26MR	2.5	13.1	0.3	300	600	-	8.5	23984	1.0	1N26	DO-37
K	1N26A	1N26AR		1N26AM	1N26AMR	2.0	11.3	0.3	300	600	1.6	7.5	23984	1.0	1N26A	DO-37
K	1N26B	1N26BR		1N26BM	1N26BMR	1.5	11.0	0.3	400	600	1.5	7.5	23984	1.0	1N26B	DO-37
K	1N26C	1N26CR		1N26CM	1N26CMR	1.5	9.5	0.3	400	600	1.5	7.5	23984	1.0	1N26C	DO-37

**NOTES:**

1. Test Conditions: NF<sub>IF</sub>=1.5dB, I<sub>F</sub>=30 MHz, R<sub>L</sub>=100 Ohms.
2. IF impedance is measured by modulating the specified test frequency with a 1000Hz signal. R<sub>L</sub>=22 Ohms, at the specified incident power level.
3. Broadband Device

**POINT CONTACT MIXER DIODES**

**L, S, C-BAND**

FREQUENCY BAND	TYPE NUMBER				NOISE		ELECTRICAL CHARACTERISTICS				TEST CONDITIONS			PACKAGE OUTLINE	
	POLARITY		MATCHED PAIRS		NOISE RATIO MAX.	NOISE <sup>1</sup> FIGURE NF, dB MAX.	BURNOUT ERGS	$Z_{IF}^2$ OHMS		VSWR MAX.	CONVERSION LOSS MAX., dB	FREQUENCY MHz	LO POWER mW		BASIC TYPE
	FORWARD	REVERSE	REVERSIBLE	FORWARD POLARITY DIODES				ONE FORWARD ONE REVERSE POLARITY DIODES	MIN.						
L	1N25	1N25R	1N25M	1N25MR	1N25M	1N25MR	2.0	12.6	6.5 <sup>1</sup>	100	400	1000	1.25	1N25	DO-22
L	1N25A	1N25AR	1N25AM	1N25AMR	1N25AM	1N25AMR	2.0	10.3	6.5 <sup>1</sup>	100	300	1000	1.25	1N25A	DO-22
L	1N25B	1N25BR	1N25BM	1N25BMR	1N25BM	1N25BMR	1.5	8.3	6.5 <sup>1</sup>	100	300	1000	1.25	1N25B	DO-22
S	1N21C	1N21CR	1N21CM	1N21CMR	1N21CM	1N21CMR	1.5	8.3	2.0	300	500	3060	0.5	1N21C	DO-22
S	1N4294	1N4294R	1N4294M	1N4294MR	1N4294M	1N4294MR						3060	0.5	1N4294	DO-22
S		1N416C	1N416CM	1N416CMR	1N416CM	1N416CMR	1.5	8.3	2.0	300	500	3060	0.5	1N416C	DO-23
S		1N831	1N831M		1N831M		1.5	8.3	2.0	300	500	3060	0.5	1N831	DO-7
S		1N3655	1N3655M		1N3655M		1.5	8.3	10.0	300	500	3060	0.5	1N3655	DO-23
S	1N21D	1N21DR	1N21DM	1N21DMR	1N21DM	1N21DMR	1.3	7.3	2.0	325	475	3060	0.5	1N21D	DO-22
S		1N416D	1N416DM	1N416DMR	1N416DM	1N416DMR	1.3	7.3	2.0	325	475	3060	0.5	1N416D	DO-23
S	1N21E	1N21ER	1N21EM	1N21EMR	1N21EM	1N21EMR		7.0	5.0	350	450	3060	0.5	1N21E	DO-22
S		1N416E	1N416EM	1N416EMR	1N416EM	1N416EMR		7.0	5.0	350	450	3060	0.5	1N416E	DO-23
S		1N21WE	1N21WEM	1N21WEMR	1N21WEM	1N21WEMR		7.0	5.0	350	450	3060	0.5	1N21WF	DO-23
S		1N831A	1N831AM		1N831AM			7.0		300	500	3060	0.5	1N831	DO-7
S		1N3655A	1N3655AM	1N3655AMR	1N3655AM	1N3655AMR	1.5	7.0	10.0	350	450	3060	0.5	1N3655A	DO-23
S	1N21F	1N21FR	1N21FM	1N21FMR	1N21FM	1N21FMR		6.0	5.0	350	450	3060	0.5	1N21F	DO-22
S		1N416F	1N416FM	1N416FMR	1N416FM	1N416FMR		6.0	5.0	350	450	3060	0.5	1N416F	DO-23
S		1N3655B	1N3655BM	1N3655BMR	1N3655BM	1N3655BMR	1.5	6.0	10.0	350	450	3060	0.5	1N3655B	DO-23
S		1N831B	1N831BM		1N831BM			6.5	5.0	300	500	3060	0.5	1N831B	DO-7
S		1N831C	1N831CM		1N831CM			6.0	5.0	300	500	3060	0.5	1N831C	DO-7
S	1N21G	1N21GR	1N21GM	1N21GMR	1N21GM	1N21GMR		5.5	5.0	350	450	3060	0.5	1N21G	DO-22
S		1N416G	1N416GM	1N416GMR	1N416GM	1N416GMR		5.5	5.0	350	450	3060	0.5	1N416G	DO-23
S		1N21WG	1N21WGM	1N21WGMR	1N21WGM	1N21WGMR		5.5	5.0	350	450	3060	0.5	1N21WG	DO-23
S	1N21H	1N21HR	1N21HM	1N21HMR	1N21HM	1N21HMR		5.0	5.0	350	450	3060	0.5	1N21H	DO-22
S		1N416H	1N416HM	1N416HMR	1N416HM	1N416HMR		5.0	5.0	350	450	3060	0.5	1N416H	DO-23
C	1N150	1N150R	1N150M	1N150MR	1N150M	1N150MR	2.0	9.8	1.0	200	500	6750	1.0	1N150	DO-22
C	1N160	1N160R	1N160M	1N160MR	1N160M	1N160MR	2.7	11.4	1.0	200	500	6750	1.0	1N160	DO-22

**X BAND**

X	1N23C	1N23CR	1N23CM	1N23CMR	1N23CM	1N23CMR	2.0	9.5	2.0	325	475	9375	1.0	1N23C	DO-22
X		1N415C	1N415CM	1N415CMR	1N415CM	1N415CMR	2.0	9.5	2.0	325	475	9375	1.0	1N415C	DO-23
X		1N832	1N832M		1N832M		2.0	9.5	2.0	250	550	9375	1.0	1N832	DO-7
X	1N2510	1N2510R	1N2510M	1N2510MR	1N2510M	1N2510MR	2.0	9.5	2.0	300	500	9375	1.0	1N2510	DO-37
X		1N3745	1N3745M	1N3745MR	1N3745M	1N3745MR		9.5	2.0	325	475	9375	1.0	1N3745	DO-23
X		1N3746	1N3746M	1N3746MR	1N3746M	1N3746MR		8.5	5.0	335	465	9375	1.0	1N3746	DO-23
X	1N149	1N149R	1N149M	1N149MR	1N149M	1N149MR	1.5	8.3	2.0	325	475	9375	1.0	1N149	DO-22
X	1N23D	1N23DR	1N23DM	1N23DMR	1N23DM	1N23DMR	1.7	7.8	2.0	350	450	9375	1.0	1N23D	DO-22