



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

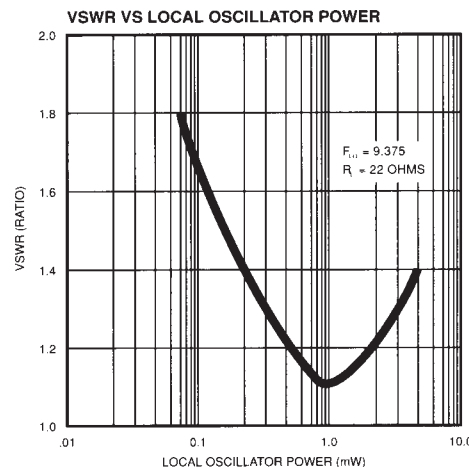
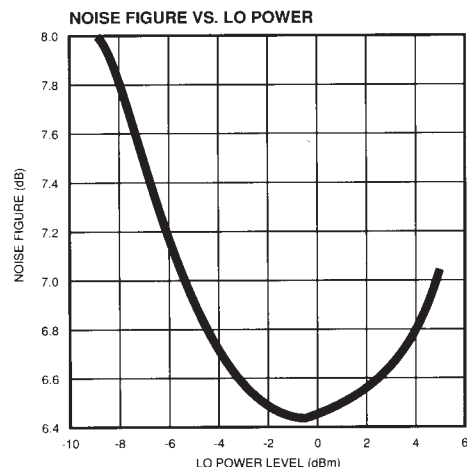
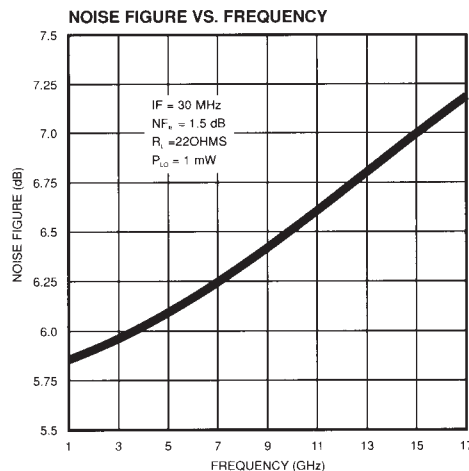
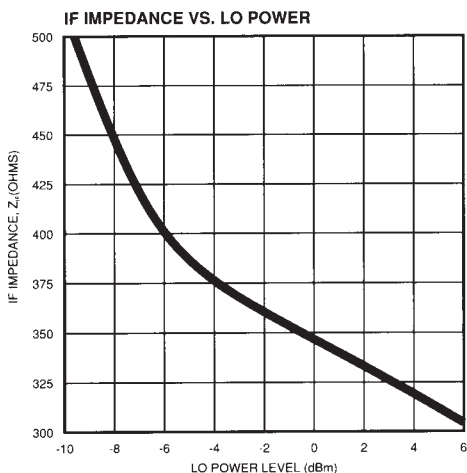
They feature high burnout resistance, low noise figure and are hermetically sealed. They are available in DO-7, DO-22, DO-23 and DO-37 package styles which make them suitable for use in Coaxial, Waveguide and Stripline applications.

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 μ | 12.4 to 18.0 |
| K | 18.0 to 26.5 |

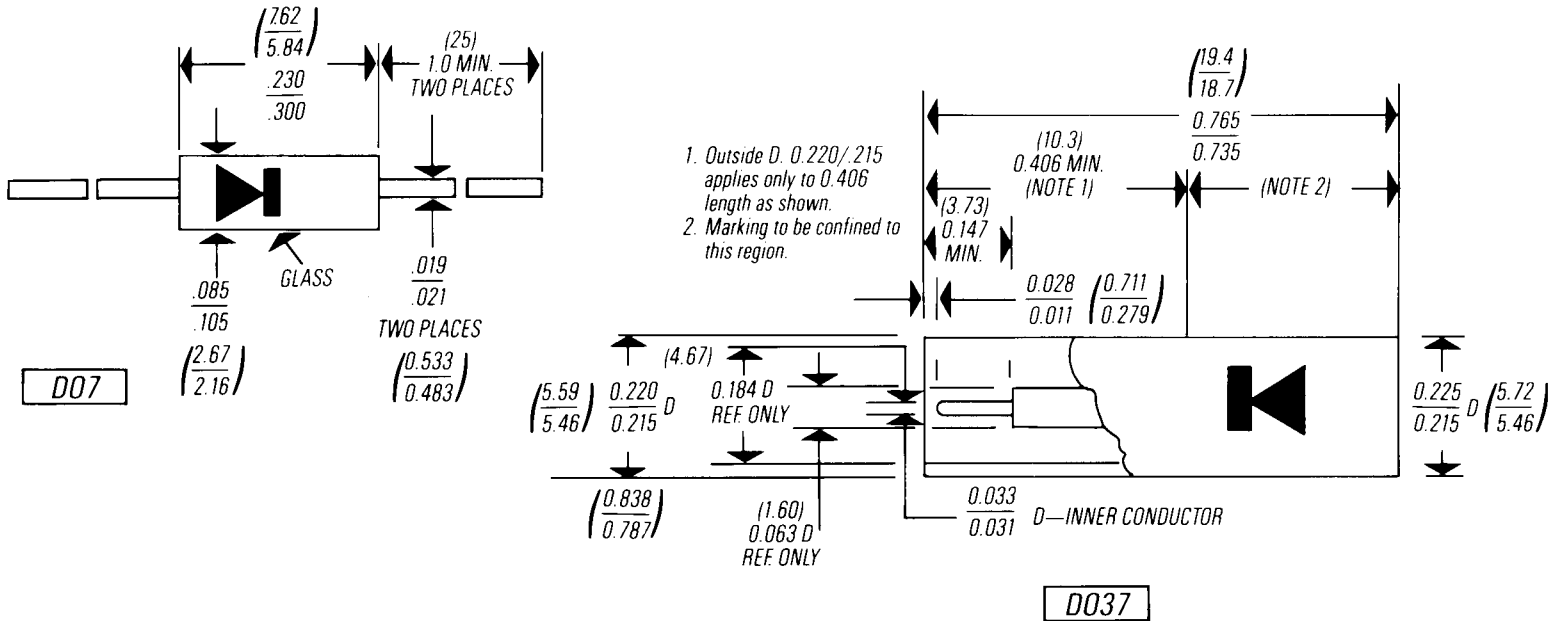
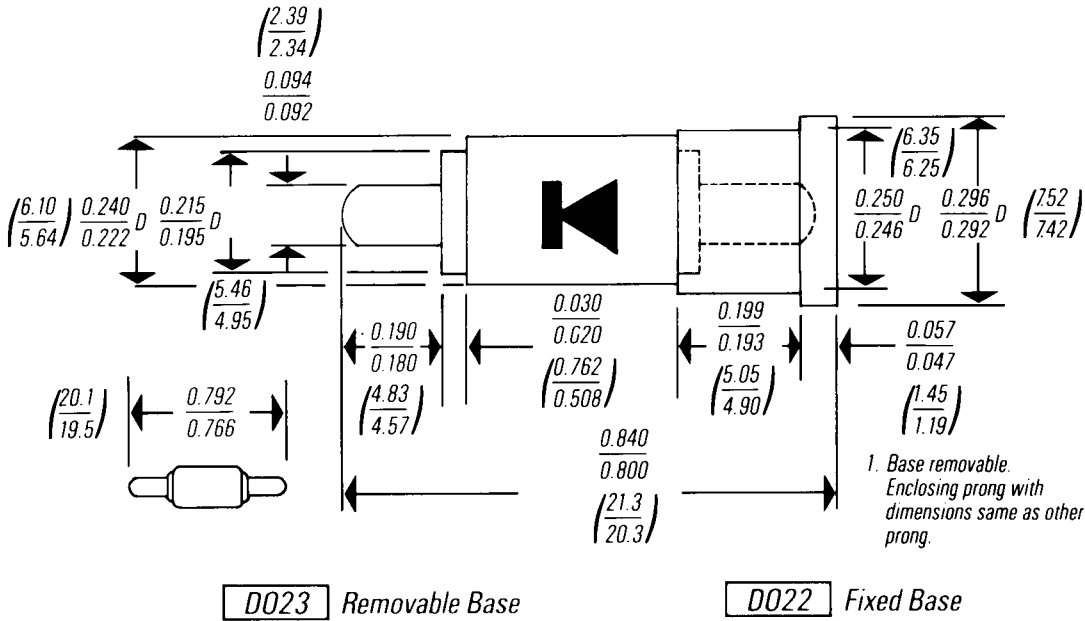


All of the point contact mixer diodes meet or exceed the military environmental specifications of MIL-S-19500, MIL-STD-202 and methods from MIL-STD-750 that specify mechanical, electrical, thermal and environmental tests.

ADVANCED SEMICONDUCTOR, INC.

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PACKAGE STYLES



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 ¹ 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 | TWO FORWARD POLARITY DIODES | ONE FORWARD ONE REVERSE POLARITY DIODES | | | | MIN. | MAX. | | | | | | |
| L | 1N25 | 1N25R | | 1N25M | 1N25MR | 2.0 | 12.6 | 6.5 ¹ | 100 | 400 | | 8.0 | 1000 | 1.25 | 1N25 | DO-22 |
| L | 1N25A | 1N25AR | | 1N25AM | 1N25AMR | 2.0 | 10.3 | 6.5 ¹ | 100 | 300 | | 6.5 | 1000 | 1.25 | 1N25A | DO-22 |
| L | 1N25B | 1N25BR | | 1N25BM | 1N25BMR | 1.5 | 8.3 | 6.5 ¹ | 100 | 300 | | 5.5 | 1000 | 1.25 | 1N25B | DO-22 |
| S | 1N21C | 1N21CR | | 1N21CM | 1N21CMR | 1.5 | 8.3 | 2.0 | 300 | 500 | | 5.5 | 3060 | 0.5 | 1N21C | DO-22 |
| S | 1N4294 | 1N4294R | | 1N4294M | 1N4294MR | | | | | | | 5.5 | 3060 | 0.5 | 1N4294 | DO-22 |
| S | | | 1N416C | 1N416CM | 1N416CMR | 1.5 | 8.3 | 2.0 | 300 | 500 | | 5.5 | 3060 | 0.5 | 1N416C | DO-23 |
| S | | | 1N831 | 1N831M | | 1.5 | 8.3 | 2.0 | 300 | 500 | - | 5.5 | 3060 | 0.5 | 1N831 | DO-7 |
| S | | | 1N3655 | 1N3655M | | 1.5 | 8.3 | 10.0 | 300 | 500 | - | 5.5 | 3060 | 0.5 | 1N3655 | DO-23 |
| S | 1N21D | 1N21DR | | 1N21DM | 1N21DMR | 1.3 | 7.3 | 2.0 | 325 | 475 | 1.5 | 5.0 | 3060 | 0.5 | 1N21D | DO-22 |
| S | | | 1N416D | 1N416DM | 1N416DMR | 1.3 | 7.3 | 2.0 | 325 | 475 | 1.5 | 5.0 | 3060 | 0.5 | 1N416D | DO-23 |
| S | 1N21E | 1N21ER | | 1N21EM | 1N21EMR | | 7.0 | 5.0 | 350 | 450 | 1.3 | - | 3060 | 0.5 | 1N21E | DO-22 |
| S | | | 1N416E | 1N416EM | 1N416EMR | | 7.0 | 5.0 | 350 | 450 | 1.3 | - | 3060 | 0.5 | 1N416E | DO-23 |
| S | | | 1N21WE | 1N21WEM | 1N21WEMR | | 7.0 | 5.0 | 350 | 450 | 1.3 | - | 3060 | 0.5 | 1N21WF | DO-23 |
| S | | | 1N831A | 1N831AM | | | 7.0 | | 300 | 500 | - | - | 3060 | 0.5 | 1N831 | DO-7 |
| S | | | 1N3655A | 1N3655AM | 1N3655AMR | 1.5 | 7.0 | 10.0 | 350 | 450 | 1.3 | 5.5 | 3060 | 0.5 | 1N3655A | DO-23 |
| S | 1N21F | 1N21FR | | 1N21FM | 1N21FMR | | 6.0 | 5.0 | 350 | 450 | 1.3 | - | 3060 | 0.5 | 1N21F | DO-22 |
| S | | | 1N416F | 1N416FM | 1N416FMR | | 6.0 | 5.0 | 350 | 450 | 1.3 | - | 3060 | 0.5 | 1N416F | DO-23 |
| S | | | 1N3655B | 1N3655BM | 1N3655BMR | 1.5 | 6.0 | 10.0 | 350 | 450 | 1.3 | 5.5 | 3060 | 0.5 | 1N3655B | DO-23 |
| S | | | 1N831B | 1N831BM | | | 6.5 | 5.0 | 300 | 500 | - | - | 3060 | 0.5 | 1N831B | DO-7 |
| S | | | 1N831C | 1N831CM | | | 6.0 | 5.0 | 300 | 500 | - | - | 3060 | 0.5 | 1N831C | DO-7 |
| S | 1N21G | 1N21GR | | 1N21GM | 1N21GMR | | 5.5 | 5.0 | 350 | 450 | 1.3 | - | 3060 | 0.5 | 1N21G | DO-22 |
| S | | | 1N416G | 1N416GM | 1N416GMR | | 5.5 | 5.0 | 350 | 450 | 1.3 | - | 3060 | 0.5 | 1N416G | DO-23 |
| S | | | 1N21WG | 1N21WGM | 1N21WGMR | | 5.5 | 5.0 | 350 | 450 | 1.3 | - | 3060 | 0.5 | 1N21WG | DO-23 |
| S | 1N21H | 1N21HR | | 1N21HM | 1N21HMR | | 5.0 | 5.0 | 350 | 450 | 1.3 | - | 3060 | 0.5 | 1N21H | DO-22 |
| S | | | 1N416H | 1N416HM | 1N416HMR | | 5.0 | 5.0 | 350 | 450 | 1.3 | - | 3060 | 0.5 | 1N416H | DO-23 |
| C | 1N150 | 1N150R | | 1N150M | 1N150MR | 2.0 | 9.8 | 1.0 | 200 | 500 | 1.5 | 6.0 | 6750 | 1.0 | 1N150 | DO-22 |
| C | 1N160 | 1N160R | | 1N160M | 1N160MR | 2.7 | 11.4 | 1.0 | 200 | 500 | | 6.5 | 6750 | 1.0 | 1N160 | DO-22 |

X BAND

| | | | | | | | | | | | | | | | | |
|---|--------|---------|--------|---------|----------|-----|-----|-----|-----|-----|-----|-----|------|-----|--------|-------|
| X | 1N23C | 1N23CR | | 1N23CM | 1N23CMR | 2.0 | 9.5 | 2.0 | 325 | 475 | 1.5 | 6.0 | 9375 | 1.0 | 1N23C | DO-22 |
| X | | | 1N415C | 1N415CM | 1N415CMR | 2.0 | 9.5 | 2.0 | 325 | 475 | 1.5 | 6.0 | 9375 | 1.0 | 1N415C | DO-23 |
| X | | | 1N832 | 1N832M | | 2.0 | 9.5 | 2.0 | 250 | 550 | - | 6.0 | 9375 | 1.0 | 1N832 | DO-7 |
| X | 1N2510 | 1N2510R | | 1N2510M | 1N2510MR | 2.0 | 9.5 | 2.0 | 300 | 500 | - | 6.0 | 9375 | 1.0 | 1N2510 | DO-37 |
| X | | | 1N3745 | 1N3745M | 1N3745MR | - | 9.5 | 2.0 | 325 | 475 | 1.5 | - | 9375 | 1.0 | 1N3745 | DO-23 |
| X | | | 1N3746 | 1N3746M | 1N3746MR | - | 8.5 | 5.0 | 335 | 465 | 1.3 | - | 9375 | 1.0 | 1N3746 | DO-23 |
| X | 1N149 | 1N149R | | 1N149M | 1N149MR | 1.5 | 8.3 | 2.0 | 325 | 475 | - | 5.5 | 9375 | 1.0 | 1N149 | DO-22 |
| X | 1N23D | 1N23DR | | 1N23DM | 1N23DMR | 1.7 | 7.8 | 2.0 | 350 | 450 | 1.3 | 5.0 | 9375 | 1.0 | 1N23D | DO-22 |

POINT CONTACT MIXER DIODES**X BAND (CONTINUED)**

| FREQUENCY BAND | TYPE NUMBER | | | | | NOISE | | ELECTRICAL CHARACTERISTICS | | | | TEST CONDITIONS | | | PACKAGE OUTLINE | |
|----------------|-------------|---------|------------|-----------------------------|---|------------------|--------------------------------------|----------------------------|-----------------------------------|------|-----------|--------------------------|---------------|-------------|-----------------|------------|
| | POLARITY | | | MATCHED PAIRS | | NOISE RATIO MAX. | NOISE ¹ 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 | 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_μ, K-BAND

| | | | | | | | | | | | | | | | | |
|----------------|---------------------|----------------------|--|---------|----------|-----|------|-----|-----|-----|-----|-----|-------|-----|--------|-------|
| K _μ | 1N78 | 1N78R | | 1N78M | 1N78MR | 2.5 | - | 1.0 | 325 | 625 | - | 7.5 | 16000 | 1.0 | 1N78 | DO-37 |
| K _μ | 1N78A | 1N78AR | | 1N78AM | 1N78AMR | 1.5 | - | 1.0 | 365 | 565 | 1.6 | 7.0 | 16000 | 1.0 | 1N78A | DO-37 |
| K _μ | 1N78B | 1N78BR | | 1N78BM | 1N78BMR | 1.3 | 10.0 | 1.0 | 365 | 565 | 1.6 | 6.5 | 16000 | 1.0 | 1N78B | DO-37 |
| K _μ | 1N3205 | 1N3205R | | 1N3205M | 1N3205MR | 1.4 | 9.8 | 1.0 | 365 | 565 | 1.6 | 6.3 | 16000 | 1.0 | 1N3205 | DO-37 |
| K _μ | 1N78C | 1N78CR | | 1N78CM | 1N78CMR | - | 9.5 | 1.0 | 400 | 565 | 1.5 | 6.0 | 16000 | 1.0 | 1N78C | DO-37 |
| K _μ | 1N4603 ³ | 1N4603R ³ | | 1N4603M | 1N4603MR | - | 9.5 | 1.0 | 365 | 565 | 1.5 | - | 16000 | 1.0 | 1N4603 | DO-37 |
| K _μ | 1N78D | 1N78DR | | 1N78DM | 1N78DMR | - | 8.8 | 1.0 | 400 | 565 | 1.5 | 5.7 | 16000 | 1.0 | 1N78D | DO-37 |
| K _μ | 1N4604 ³ | 1N4604R ³ | | 1N4604M | 1N4604MR | - | 8.8 | 1.0 | 400 | 565 | 1.5 | - | 16000 | 1.0 | 1N4604 | DO-37 |
| K _μ | 1N78E | 1N78ER | | 1N78EM | 1N78EMR | - | 8.0 | 1.0 | 400 | 565 | 1.5 | 5.7 | 16000 | 1.0 | 1N78E | DO-37 |
| K _μ | 1N4605 ³ | 1N4605R ³ | | 1N4605M | 1N4605MR | - | 8.0 | 1.0 | 400 | 565 | 1.5 | - | 16000 | 1.0 | 1N4605 | DO-37 |
| K _μ | 1N78F | 1N78FR | | 1N78FM | 1N78FMR | - | 7.5 | 1.0 | 400 | 565 | 1.5 | 5.7 | 16000 | 1.0 | 1N78F | DO-37 |
| K _μ | 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_F=1.5dB, I_F=30 MHz, R_L=100 Ohms.2. IF impedance is measured by modulating the specified test frequency with a 1000Hz signal, R_L=22 Ohms, at the specified incident power level.

3. Broadband Device