

LOW IF/LOW LO DRIVE SCHOTTKY MIXER DIODES

These low level silicon Doppler mixer diodes are suitable for use in waveguide, coaxial and stripline applications and are specifically designed for starved LO conditions (-10 dBm). They exhibit minimum noise figure without dc bias. Special diodes in stripline packages are available.

MODEL NUMBER ^{1,2}	CASE STYLE ²	TEST FREQ. (GHz)	MAX. NOISE FIGURE ³ (dB)	TYP. Z_{IF} ⁴ (OHMS)	PACK. DESC.
MA-40194	3	9.375	12	250	Ceramic Cartridge
MA-40192	54	9.375	12	250	Glass Axial Lead
MA-40191	119	9.375	12	250	Ceramic MQM
MA-40190	120	9.375	12	250	Ceramic Pill
MA-40193	135	9.375	12	250	Chip
MA-40195	158	9.375	12	250	Ceramic Pronged
MA-40183	119	16.0	12	250	Ceramic MQM
MA-40182	120	16.0	12	250	Ceramic Pill
MA-40184	135	16.0	12	250	Chip

NOTES:

- These diodes are available as matched pairs by adding the suffix "M" to the basic model number.
- These diodes are thermocompression bonded in all case styles except in case styles 3, 54 and 135. The maximum solder temperature for all cases except 120 is 230°C for 5 seconds. For case style 120 maximum solder temperature is 200°C for 5 seconds.
- Test conditions: $P_{LO} = -10$ dBm; $IF = 10$ kHz; $R_L = 22$ ohms; $NF_{IF} = 1.5$ dB.
- IF impedance is measured by modulating the specified test frequency with a 1000 Hz signal, $R_L = 22$ ohms. Low and medium barrier diodes are tested at an incident power level of 1.0 mW. High barrier diodes are tested at an incident power level of 2.0 mW.

ZERO IF SCHOTTKY MIXER DIODES

The MA-40054 is a low noise mixer diode for zero IF systems. This Schottky mixer diode is designed specifically for high burn-out resistance and high sensitivity in zero IF systems such as CW Doppler radars, police radars, braking systems, intrusion alarms and other motion detecting systems. This diode is available as a high volume, low cost product.

MODEL NUMBER	CASE STYLE	TEST FREQ. ¹ (GHz)	TYP. CONV. LOSS, L_c ² (dB)	MAX. VSWR ² (RATIO)	MAX. AM NOISE ³ 5-300 Hz (RMS VOLTS)	MAX. AM NOISE ³ 300-5000 Hz (RMS mV)	PACK DESC.
MA-40054	3	10.525	5.0	2.0	0.22	0.22	Ceramic Cartridge

See notes on page 6.

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NOTES:

1. The frequency tolerance is ± 250 MHz.
2. Test conditions: $P_{LO} = 1.0$ mW, $R_L = 100$ ohms. The holder is a modified JAN-105.
3. For system applications, the absolute noise in terms of dB below the carrier in a given bandwidth is of little value. Hence, using a Gunn diode

source, the AM noise is specified in terms of the RMS voltage output of an amplifier with a voltage gain of 100,000 across the band 5 Hz — 300 Hz (with a band reject filter at 120 Hz) or, as the RMS voltage output of an amplifier with a voltage gain of 1000 across the band 300 Hz — 5000 Hz. Incident RF power on MA-40054 is 0.5 mW and sensitivity is approximately 800 mV/mW.

PACKAGED GaAs SCHOTTKY BARRIER MIXER DIODES

These devices are specially suited for high frequency and millimeter wave applications. They have low junction capacitance and low series resistance, allowing them to be used up to and beyond 100 GHz. They are listed by increasing frequency and noise figure and grouped by package style. Other packages and specifications are available upon request.

MODEL NUMBER ¹	CASE STYLE ²	TEST FREQ. (GHz)	MAX. NOISE FIGURE ³ (dB)	TYP. JUNC. CAP., C_J ⁴ (pF)	SERIES RESIST. RANGE, R_S ⁵ (OHMS)	PACK. DESC.
MA-40414	119	9.375	5.5	0.10	4—6	Ceramic MQM
MA-40419	120	9.375	5.5	0.10	4—6	Ceramic Pill
MA-40422	119	16.0	6.0	0.07	4—8	Ceramic MQM
MA-40424	120	16.0	6.0	0.07	4—8	Ceramic Pill
MA-40402	100	36.0	8.0	0.05	4—8	Glass MQM
MA-40406	119	36.0	8.0	0.05	4—8	Ceramic MQM
MA-40403	120	36.0	8.0	0.05	4—8	Ceramic Pill
MA-40415	155	36.0	8.0	0.05	4—8	Ceramic Miniature
MA-40417 ⁶	155	60.0	9.0	0.04	5—10	Ceramic Miniature

NOTES:

1. Matched pairs are available by adding the suffix "M" to the model number. Matching criteria: $\Delta L_C = 0.3$ dB maximum, $\Delta Z_{IF} = 25$ ohms maximum.
2. Other case styles are available upon request.
3. An external bias voltage is required for optimum performance.
4. Capacitance is measured at 0 volts bias and 1 MHz.
5. Series resistance is the slope resistance measured at 10 mA.
6. Experimental device.