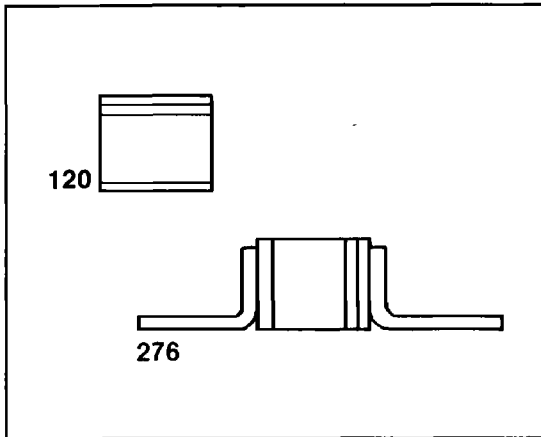


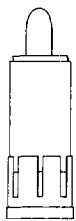
Silicon Schottky Detector Diodes



Description

This family of low capacitance Schottky diodes is designed to give superior performance in video detectors and power monitors from 100 MHz through 40 GHz. They have low junction capacitance and repeatable video impedance. These diodes are available in a wide range of ceramic, stripline and axial lead packages and as bondable chips. Both P and N type diodes are offered.

Case Styles



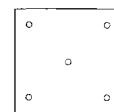
3



54

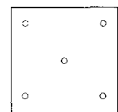


119



ANODE
CATHODE

135



CATHODE
ANODE

135A

Features

- WIDE SELECTION OF PACKAGES FOR STRIPLINE, COAXIAL AND WAVEGUIDE DETECTORS
- CHIP DIODES AVAILABLE
- BOTH P AND N TYPE DIODES
- EXCELLENT SENSITIVITY THROUGH Ka-BAND
- LOW 1/f NOISE

Applications

Detectors and power monitors in stripline, coaxial and waveguide circuits through 40 GHz.

Packaged N Type Silicon Schottky Detector Diodes

These low barrier packaged detector diodes are suitable for use in stripline, waveguide and coaxial detectors. They feature high sensitivity and low I/f noise. These diodes are

listed by increasing test frequency, grouped by packaged style and decreasing Tss. Other case styles than those specified are available upon request.

Specifications @ $T_A = 25^\circ\text{C}$

Model Number ¹	Case Style	Test Frequency (GHz)	Minimum ² Tang. Sig. Sens. Tss (dBm)	Video Impedance ³ Range Min./Max. (K Ohms)
MA40041	3	3.0	-55	1-2
MA40040	3	3.0	-50	1-2
MA40053	54	3.0	-55	1-2
MA40052	54	3.0	-50	1-2
MA40064	119	3.0	-55	1-2
MA40063	119	3.0	-50	1-2
MA40043	3	10.0	-52	1-2
MA40042	3	10.0	-50	1-2
MA40202	54	10.0	-55	1-2
MA40204	54	10.0	-52	1-2
MA40072	54	10.0	-50	1-2
MA40201	119	10.0	-55	1-2
MA40203	119	10.0	-52	1-2
MA40065	119	10.0	-50	1-2
MA40207	120	10.0	-55	1-2
MA40208	120	10.0	-52	1-2
MA40205	119	16.0	-52	1-2
MA40206	119	16.0	-50	1-2
MA40215	120	16.0	-52	1-2
MA40216	120	16.0	-50	1-2
MA40267	119	36.0	-49	1-2
MA40268	120	36.0	-49	1-2

NOTES

1. Schottky barrier junction diodes are thermocompression bonded in case style 119 and 120. Case styles 3 and 54 use pressure contacts. The standard case style is given for each model number. Other case styles are available upon request. For additional information, contact the factory.

2. The video amplifier bandwidth is 2 MHz and the nominal amplifier noise figure is 3 dB. DC impedance is 10 K ohms. The dc bias is 20 μA .

3. RF Power = -30 dBm. The dc forward bias is +20 μA .

4. Measured at the indicated test frequency and at -30 dBm RF power with $R_L = 10\text{ K ohms}$ and DC forward bias = 20 μA .

MAXIMUM RATINGS

TEMPERATURE RATINGS

Storage Operating Temperature -65°C to +150°C

POWER RATINGS at 25°C

Maximum Peak Incident RF Power S-X Band 1 Watt-1 microsecond maximum pulse length
Ku-K Band .5W-1 microsecond maximum pulse length

Maximum CW RF Power S-X Band 150 mW (maximum)
Ku-K band 100 mW (maximum)

Derate Linearly to Zero at 150°C

SOLDER TEMPERATURE RATINGS

For case styles 54, 276, 186 230°C for 5 seconds, 1 mm from package

For case style 120 200°C for 5 seconds

Packaged P Type Silicon Schottky Detector Diodes

This series of low barrier P type detector diodes is suitable for use in waveguide, coaxial and stripline circuits. Each diode in this family features high sensitivity and lower 1/f

noise than N type diodes. They are listed by test frequency, case style and descending T_{SS}. These diodes are most appropriate for detectors with low video amplifier frequency.

Specifications @ T_A = 25°C

Model Number	Case Style	Test Frequency (GHz)	Minimum ¹ Tang. Sig. Sens. T _{SS} (dBm)	Video Impedance ² Range Min./Max. (Ohms)	Minimum ³ Sensitivity (mV/mW)
MA40252	54	10.0	-55	1.2-1.8	5000
MA40254	54	10.0	-52	1.2-1.8	3500
MA40251	119	10.0	-55	1.2-1.8	5000
MA40253	119	10.0	-52	1.2-1.8	3500
MA40257	120	10.0	-55	1.2-1.8	5000
MA40258	120	10.0	-52	1.2-1.8	3500
MA40257-276	276	10.0	-55	1.2-1.8	5000
MA40258-276	276	10.0	-52	1.2-1.8	3500
MA40255	119	16.0	-52	1.2-1.8	3500
MA40256	119	16.0	-50	1.2-1.8	3000
MA40265	120	16.0	-52	1.2-1.8	3500
MA40266	120	16.0	-50	1.2-1.8	3000
MA40265-276	276	16.0	-52	1.2-1.8	3500
MA40266-276	276	16.0	-50	1.2-1.8	3000

P Type Silicon Schottky Chip Detector Diodes

These low barrier P type chip detector diodes are suitable for use in microstrip or stripline circuits. These diodes are listed by increasing test frequency.

Specifications @ T_A = 25°C

Model Number	Case Style	Test Frequency (GHz)	Voltage ² Breakdown V _b (Volts)	Nominal ¹ T _{SS} (dBm)	Nominal ³ Forward Voltage (Volts)	Nominal ⁴ Total Capacitance (pF)
MA40270	135A	10.0	4.0	-52	0.4	0.12
MA40272	135A	16.0	4.0	-52	0.4	0.09

NOTES:

1. The video amplifier bandwidth is 2 MHz and the noise figure is 3 dB. Impedance is 10 Kiloohms and dc bias is +20 μ A.
2. Breakdown voltage is measured at 10 μ A reverse bias current.
3. Forward voltage is measured at a forward current of 1 mA.
4. Capacitance is measured at 0 volts and 1 MHz.
5. RF power = -30 dBm. The DC forward bias is +20 μ A.
6. Measured at the indicated test frequency and at -30 dBm RF power with R_L = 10 K ohms and DC forward bias +20 μ A.

N Type Silicon Schottky Detector Diodes

These low barrier packaged detector diodes are suitable for use in stripline applications. They feature high sensitivity, and low 1/f noise. These diodes are listed by increasing

frequency, and grouped by package style and Tss. Case styles other than those specified are available on request for a nominal charge. For additional information, contact the factory.

Model Number ¹	Case Style	Test Frequency (GHz)	Minimum ² Tang. Sig. Sens. Tss (dBm)	Video Impedance ³ Range Min./Max. (K Ohms)
MA40069	137	3.0	-55	1-2
MA40067	137	3.0	-50	1-2
MA40261	186	3.0	-55	1-2
MA40260	186	3.0	-50	1-2
MA40144	213	3.0	-55	1-2
MA40143	213	3.0	-50	1-2
MA40114	137	10.0	-55	1-2
MA40108	137	10.0	-52	1-2
MA40070	137	10.0	-50	1-2
MA40264	186	10.0	-55	1-2
MA40263	186	10.0	-52	1-2
MA40262	186	10.0	-50	1-2
MA40147	213	10.0	-55	1-2
MA40146	213	10.0	-52	1-2
MA40145	213	10.0	-50	1-2
MA40207-276	276	10.0	-55	1-2
MA40208-276	276	10.0	-52	1-2
MA40118	137	16.0	-48	1-2
MA40149	213	16.0	-50	1-2
MA40148	213	16.0	-48	1-2
MA40215-276	276	16.0	-52	1-2
MA40216-276	276	16.0	-50	1-2

NOTES

1. This series of Schottky barrier junction diodes are thermocompression bonded.
2. The video amplifier bandwidth is 2 MHz and the noise figure is 3 dB.

- The input impedance is 10 Kohms and dc bias is 20 μ A.
 3. Pinc = -30 dBm. The dc forward bias is +20 μ A.

N Type Silicon Schottky Chip Detector Diodes

These low barrier N type detector diodes are suitable for use in stripline applications. They feature sensitivity, and low 1/f noise. These diodes are listed by increasing

frequency, and grouped according to case style and Tss. Other case styles are available upon request at a nominal charge. For additional information, contact the factory.

Model Number	Case Style	Test Frequency (GHz)	Minimum ¹ Tss (dBm)	Voltage ² Breakdown V _b (Volts)	Nominal ³ Forward Voltage (Volts)	Nominal ⁴ Total Capacitance (pF)
MA40220	135	10.0	-52	2.0	0.3	0.12
MA40222	135	16.0	-52	2.0	0.3	0.09

NOTES:

1. The video amplifier bandwidth is 2 MHz and the noise figure is 3 dB. Impedance is 10 kilohms and dc bias is +20 μ A. Wafers are evaluated on a sample basis for Tss.
2. Breakdown voltage is measured at 10 μ A reverse bias current.
3. Forward voltage is measured at a forward current of 1 mA.
4. Capacitance is measured at 0 volts and 1 MHz.

Typical Performance Curves

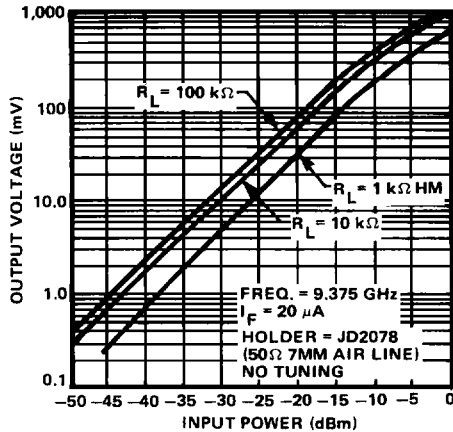


FIGURE 1. MA40250 Series Nominal Output Voltage at X-band (with Forward Bias)

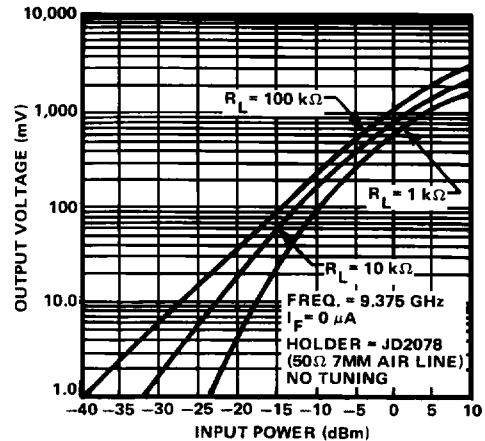


FIGURE 2. MA40250 Series Nominal Output Voltage at X-band (with Zero Bias)

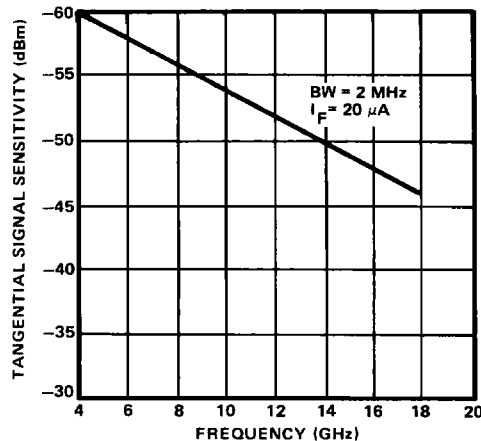


FIGURE 3. MA40250 Series Nominal Tangential Signal Sensitivity vs. Frequency

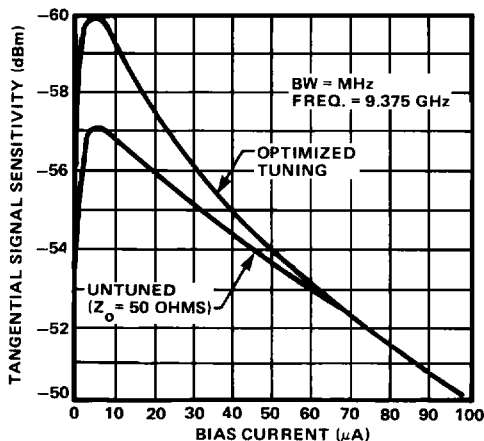


FIGURE 4. MA40250 Series Nominal Tangential Signal Sensitivity vs. Bias Current at X-band

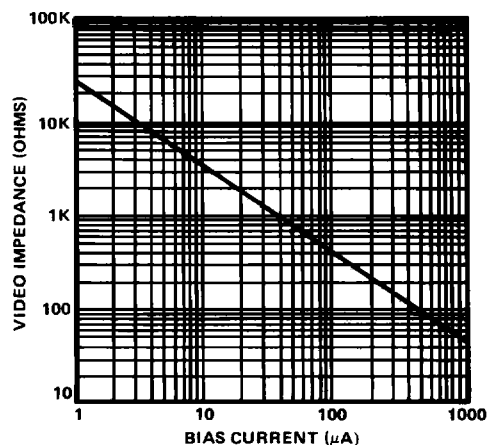


FIGURE 5. MA40250 Nominal Video Impedance vs. Bias Current