Millimeter Wave Single Diode Unbalanced Harmonic Mixers

OML is pleased to quote this full waveguide bandwidth harmonic mixer product line covering 18 to 325 GHz. These mixers are typically equivalent in performance to Tek WM780/490 series mixers. External diplexers are not needed for use with: Keysight PXA (N9030A), Advantest R3271A, 3272, 3273, Anritsu MS2830A, MS2668C, MS2667C, 2802, 710, and Rohde & Schwarz FSV, FSEx, FSIQ. External diplexers are required for use with: Keysight PSA (E444xA), 71209A, 8566B, 856x, E4407B, and IFR/Marconi 9xx, 18xx, 239x, 684x. Tektronix # 015-0385-00 external diplexer is required for use with Tektronix 279x, 275x, 49x series analyzers. The mixers can be used with other manufacturer's equipment, consult the equipment's operation manual. **These products are subject to U.S. Government. Export Regulations and Licensing.**

Figure 1- Single Diode Unbalanced Harmonic Mixer Family

Specifications:	Model Number	Frequency GHz	Sensitivity dBm (2)	Waveguide Flange (3)	Dimensions (in) A-B-C-D max.
WR-42	M42HWD	18-26.5	-105	68-001KM	3.0x 1.6x 1.0x 0.9
WR-28	M28HWD	26.5-40	-100	68-001AM	2.9x 1.2x 0.9x 0.8
WR-22	M22HWD	33-50	-100	67B-006	2.9x 1.3x 0.9x 1.2
WR-19	M19HWD	40-60	-100	67B-007	2.9x 1.3x 0.9x 1.2
WR-15	M15HWD	50-75	-95	67B-008	2.9x 0.9x 0.9x 0.8
WR-12	M12HWD	60-90	-95	67B-009	2.9x 0.9x 0.9x 0.8
WR-10	M10HWD	75-110	-90	67B-010	2.9x 0.9x 0.9x 0.8
WR-08	M08HWD	90-140	-80	67B-M08	2.9x 0.9x 0.9x 0.8
WR-06	M06HWD	110-170	(Note 4)	67B-M06	2.9x 0.9x 0.9x 0.8
WR-05	M05HWD	140-220	(Note 4)	67B-M05	2.9x 0.9x 0.9x 0.8
WR-04	M04HWD	170-260	(Note 4)	67B-M04	2.9x 0.9x 0.9x 0.8
WR-03	M03HWD	220-325	(Note 4)	67B-M03	2.9x 0.9x 0.9x 0.8

LO/IF Diplexer   Includes a diplexer, a 1 m. mixer to diplexer cable, and necessary interface adapters. Diplexers available for Anritsu, Keysight, IFR, Marconi, etc. Specify manufacturer / model. Tektronix diplexer not available.

LO Freq.:   Up to 18.6 GHz (M42HW, K Band, up to 13.25 GHz).

LO Level: +12 to +15 dBm nom. at the mixer (useable +6 to +18 dBm with degraded conversion loss).

Mixer Bias: 0 to 10 mA typical, 20 mA max. Typically provided by the spectrum analyzer. An adjustable DC current supplied thru a 1 kW resistor and a bias T will allow optimization of conversion loss for given LO power and frequency conditions. If bias is not available in the user's application, the mixer can utilize self bias if a DC return path is provided. Optimization of the DC return resistance may be required for best performance. A 1 dB pad in the IF path can serve as a DC return with possible degraded conversion loss.

Notes:	1)	Maximum power = 100 mW (RF + LO power).
	2)	Equivalent average noise level typical with a full spec. Tek. 2750 or 490 series Spectrum Analyzer using a 1 KHz RBW, with peaking optimized.
	3)	Mixers are compatible with the MIL.-F-3922/xx spec. flange. Insert the listed number for /xx.
	4)	Measured conversion loss data are not available above 110 GHz as there are no recognized reference standards available.
	5)	Because these mixers are passive components, receiving only LO power from customer-owned equipment, CE testing is not required.

All mixers tested for proper operation and delivered with a "Certificate of Conformance." Measured conversion loss data are included with all mixers up to 110 GHz using spectrum analyzer emulation data supplied by the analyzer manufacturer; see the list below for available emulations. Measured conversion loss data are not available above 110 GHz as there are no recognized power standards above 110 GHz for reference. The spectrum analyzer make and model must be identified on purchase order. OML can not specify conversion loss as it is not possible to duplicate each type of spectrum analyzer. Conversion loss can vary with each individual spectrum analyzer. Mixer conversion loss data is available only for the following spectrum analyzers. The manufacturers of these analyzers have provided OML with emulation data for use with our millimeter wave harmonic mixer test set (reference OML pn 42-021219).

Advantest	R3271/ A R3272 R3273 R3172 R3182	Internal diplexer
Anritsu	MS2830A 710C/D 2702/ 2802 2667C 2668C	Internal diplexer
Keysight (Agilent/ HP)	PXA(N9030A) PSA(E444xA) 71209A 8566B 856x E4407B	Internal diplexer External diplexer required
IFR	930/ 940 1800 239xA 684x	External diplexer required
Marconi	2393	External diplexer required
R & S	FSV FSEK/ M FSIQ ESMI	Internal diplexer, external diplexer possible
Tektronix	49x/ 27xx 2782/ 84	Requires Tektronix external diplexer P/N 015-0385-00 Internal diplexer

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The OML harmonic mixers are useable with other instruments (older spectrum analyzers not listed, EIP counters, some surveillance receivers, etc). The mixers are also useable in scientific applications such as radio astronomy, as phase locking mixers, etc. OML cannot provide conversion loss data for these applications. There is not a "delete" price option for the conversion loss data. Customers with these "non listed applications" can chose an analyzer from the above list that will have performance parameters similar to their application or OML will suggest a suitable test emulation if the customer will provide L.O. and I.F. data for his application.

Scientific Atlanta (S.A) receivers are specifically not included in the available test emulations. S.A. utilized harmonic mixers in a very unusual manner. S.A. utilized the mixer diode self-generated bias current as a signal for their L.O. leveling loop. S.A. did not provide mixer conversion loss data when it sold mixers for this system. OML has no method for testing to this system design. Many users have reported excellent results using OML mixers in S.A. systems following the system's standard set-up and calibration procedure.