

WM780 AND WM490 SERIES

WAVEGUIDE MIXERS

The Tektronix WM780 Series and WM490 Series Waveguide Mixers cover a frequency range of 18 to 325 GHz with optimum flatness. Although designed specifically for use with the Tektronix 2750 and 490 Series Spectrum Analyzers, they are also compatible with most other spectrum analyzers. They can serve a wide variety of general-purpose uses, such as down-conversion for noise figure and network analysis measurements.

WM780 Series Waveguide Mixers feature individual frequency characterization curves attached to the housing, for improved measurement accuracy. Custom characterization for system use is also available upon request.

For the WM490 Series WGMs two microwave mixers with field-replaceable diodes cover the 18-26.5 GHz and 26.5-40 GHz ranges. When used with 2750 and 490 Series, the frequency response of both the WM490 and WM780 Series WGMs is ± 2 dB. Eight millimeter-wave mixers cover the 33-220 GHz range in the standard Mil-Spec band ranges. A special tapered flange transition converts the G-band mixers to cover the 220-325 GHz J band.

ELECTRICAL CHARACTERISTICS

(Shown for WM780 Series; characteristics and model number suffixes (K, A, Q, U, V, E, W, F, D, G, and G Opt. 1) are the same for WM490 Series.)

Frequency Range (GHz)	Tektronix Model No.	Band Desig.	Sensitivity ¹ (dBm)	Frequency ² Response (dB)	Conversion ³ Loss, Typical (dB)	Low-Pass ⁷ Cutoff Frequency
18-26.5	WM780K	K	-100	± 2	-30	12 GHz
26.5-40	WM780A	A	-95	± 2	-30	16 GHz
33-50	WM780Q	Q	-95	± 2	-30	21 GHz
40-60	WM780U	U	-95	± 2.5	-30	16 GHz
50-75	WM780V	V	-95 @ 50 GHz -90 @ 75 GHz typ	± 3 ⁴ typical	-30 @ 50 GHz -35 @ 75 GHz	28 GHz
60-90	WM780E	E	-95 @ 60 GHz -85 @ 90 GHz typ	± 3 ⁴ typical	-30 @ 60 GHz -40 @ 90 GHz	28 GHz
75-110	WM780W	W	-90 @ 75 GHz -80 @ 110 GHz typ	± 3 ⁴ typical	-35 @ 75 GHz -45 @ 110 GHz	30 GHz
90-140	WM780F	F	-85 @ 90 GHz -75 @ 140 GHz typ	± 3 ⁴ typical	-40 @ 90 GHz -50 @ 140 GHz	32 GHz
110-170	WM780D	D	-80 @ 110 GHz -70 @ 170 GHz typ	± 3 ⁴ typical	-45 @ 110 GHz -55 @ 170 GHz	40 GHz
140-220	WM780G	G	-75 @ 140 GHz -65 @ 220 GHz typ	± 3 ⁴ typical	-50 @ 140 GHz -60 @ 220 GHz	40 GHz
220-325	WM780G w/Opt. 1 ⁶	J	-65 @ 220 GHz, ⁵ -50 @ 325 GHz typ	± 3 ⁴ typical	-60 @ 220 GHz -70 @ 325 GHz	-

¹ Equivalent average noise level (using a 2750 Series or 490 Series Spectrum Analyzer in 1 kHz resolution bandwidth).

² Maximum amplitude variation across each waveguide mixer band (using a 2750 Series or 490 Series Spectrum Analyzer with peaking control optimized at each frequency in response to a -30 dBm CW input signal to the mixer).

³ LO drive ± 10 dBm peaking control optimized.

⁴ Over any 5 GHz bandwidth for millimeter wave mixers above 60 GHz.

⁵ Value estimated at 325 GHz.

⁶ Option 1 adds a tapered waveguide transition allowing WM780G/WM490G to cover this range.

⁷ These low-pass filters are in LO/IF connector.

All mixers are gold-plated brass, conforming to MIL-G-45204 Class I, Type 1 specifications, and will withstand harsh environments. Mixer sets come complete with a 28-inch cable, an instruction manual, and a wood storage box with foam cutout storage locations for five mixers.

NOTE:

A diplexer assembly and diplexer interconnecting cable, such as Tektronix part numbers 015-0385-00 and 012-0649-00, respectively, are required for waveguide mixers used with the 2750 and 490 Series Spectrum Analyzers. The 015-0385-00 Diplexer Assembly includes a TNC-to-SMA adaptor and an SMA semi-rigid coax.

CHARACTERISTICS

Maximum CW RF Input Level - +20 dBm (100 mW)

Maximum PULSED RF Input Level - 1 W peak with 0.001 maximum duty factor and 1 μ s maximum pulse width.

LO Requirement - +7 dBm minimum, +15 dBm maximum, +10 dBm typical.

Bias Requirement - -2.0 V to +0.5 V with respect to the mixer body through a current-limiting resistor, to provide 0 mA to 20 mA of bias current.

1 dB Compression Point - +13 dBm typical (at system level). -10 dBm typical when used with the 2750 Series and 490 Series Spectrum Analyzers.

ORDERING INFORMATION

WM780 WAVEGUIDE MIXERS & SETS	
18-26.5 GHz - Order WM780K	\$1,575
26.5-40 GHz - Order WM780A	\$1,575
33-50 GHz - Order WM780Q	\$1,825
40-60 GHz - Order WM780U	\$2,170
50-75 GHz - Order WM780V	\$2,455
60-90 GHz - Order WM780E	\$2,670
75-110 GHz - Order WM780W	\$2,740
90-140 GHz - Order WM780F	\$2,935
110-170 GHz - Order WM780D	\$4,095
140-220 GHz - Order WM780G	\$4,190
220-325 GHz - Order WM780G Opt. 01 (adds tapered transition)	+\$1,275
18 to 40 GHz Set - Includes WM780K, WM780A, Order WM7802	"1
18 to 60 GHz Set - Includes WM780K, WM780A, WM780U, Order WM7803	"1
26.5 to 60 GHz Set - Includes WM780A, WM780U, Order WM7806	\$3,745
26.5 to 90 GHz Set - Includes WM780A, WM780U, WM780E, Order WM7807	\$6,415
26.5 to 140 GHz Set - Includes WM780A, WM780U, WM780E, WM780F, Order WM7808	\$9,350
26.5 to 220 GHz Set - Includes WM780A, WM780U, WM780E, WM780F, Order WM7809	\$13,540
33 TO 50 GHz Set - Includes WM780Q, WM780V, Order WM78010	\$4,280
33 to 110 GHz Set - Includes WM780Q, WM780V, WM780W, Order WM78011	\$7,020
33 to 170 GHz Set - Includes WM780Q, WM780V, WM780W, WM780D, Order WM78012	\$11,115
WM490 WAVEGUIDE MIXERS & SETS	
18-26.5 GHz - Order WM490K	\$1,375
26.5-40 GHz - Order WM490A	\$1,375
33-50 GHz - Order WM490Q	\$1,595
40-60 GHz - Order WM490U	\$1,895
50-75 GHz - Order WM490V	\$2,150
60-90 GHz - Order WM490E	\$2,335
75-110 GHz - Order WM490W	\$2,395
90-140 GHz - Order WM490F	\$2,570
110-170 GHz - Order WM490D	\$3,580
140-220 GHz - Order WM490G	\$3,665
220-325 GHz - Order WM490G, Opt. 01 - (adds tapered transition)	+\$1,325
18 to 40 GHz Set - Includes WM490K, WM490A, Order WM4902	\$2,810
18 to 60 GHz Set - Includes WM4902 plus WM490U, Order WM4903	\$4,740
18 to 90 GHz Set - Includes WM4903 plus WM490E, Order WM4904	\$7,075
18 to 140 GHz Set - Includes WM4904 plus WM490, Order WM4905	\$9,650
WM780 & WM490 ACCESSORIES	
Diplexer Assembly - (required for 2750/490 Series), Order 015-0385-00	\$290
Diplexer to Waveguide Mixer Interconnecting Cable Assembly - (required for 2750/490 Series) 50-ohm, SMA-to-SMA, Order 012-0649-00	\$37
Tapered Transition - Extends WM780G/WM490G frequency coverage to 220-325 GHz, Order 119-1728-00	\$1,865
Case - Order 016-0465-01	\$30
¹ Contact your local sales representative	