

## 490 Series Waveguide Mixers

The 490 Series Tektronix Waveguide Mixers cover from 18 to 140 GHz with at least  $-75$  dBm sensitivity. They are designed specifically for use with the TEKTRONIX 492 and 7L18 Spectrum Analyzers.

The two microwave mixers cover ranges 18 to 26.5 GHz and 26.8 to 40 GHz. They have field replaceable diodes and frequency response of  $\pm 3$  dB when used with the spectrum analyzers indicated above.

The three millimeter wave mixers cover ranges 40 to 60 GHz (also specified at  $\pm 3$  dB frequency response), 60 to 90 GHz and 90 to 140 GHz.

The units are all gold plated brass, conforming to MIL-G-45204 Class 1, Type 1 specifications and will withstand harsh environments. Each set comes complete with a container for spare diodes, a 28 inch cable, a 32 page instruction manual and a wood storage box with foam cutout storage locations for all five mixers.

### PERFORMANCE CHARACTERISTICS

**For All Waveguide Mixers** — Max cw RF input level:  $+10$  dBm (10 mW).

**Maximum PULSED RF Input Level** — 1 W peak with 0.001 max duty factor and 1  $\mu$ s max pulse width.

**L.O. Requirement** —  $+7$  dBm min,  $+15$  dBm max,  $+10$  dBm typical.

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

**For the 18 to 60 GHz Waveguide Mixers** — 3 dB compression point (saturation):  $-10$  dBm (typical).

**Conversion Loss** — 30 dB typical (when used in the proper spectrum analyzer frequency band).

### ORDERING INFORMATION

When ordering, please use the nomenclature given below:

18 to 26.5 GHz: WM 490 K .....	\$975
26.5 to 40 GHz: WM 490 A .....	\$975
40 to 60 GHz: WM 490 U .....	\$1250
60 to 90 GHz: WM 490 E .....	\$2400
90 to 140 GHz: WM 490 F .....	\$2600
18 to 40 GHz set (items 1,2): WM 490-2 .....	\$2010
18 to 60 GHz set (items 1,3): WM 490-3 .....	\$3260
18 to 90 GHz set (items 1,4): WM 490-4 .....	\$5660
18 to 140 GHz set (items 1,5): WM 490-5 .....	\$8260

ELECTRICAL CHARACTERISTICS			
Frequency Range	Sensitivity <sup>1</sup> (dBm)	Frequency Response <sup>2</sup>	Amplitude Accuracy <sup>3</sup>
18-26.5 GHz	$-100$	$\pm 3$ dB	$\pm 6$ dB
26.5-40 GHz	$-95$	$\pm 3$ dB	$\pm 6$ dB
40-60 GHz	$-95$	$\pm 3$ dB	$\pm 6$ dB
<sup>1</sup> Equivalent average noise level at 1 kHz bandwidth.			
<sup>2</sup> Maximum amplitude variation across each waveguide mixer band (with peaking control optimized) in response to a $-30$ dBm CW input signal to the waveguide mixer.			
<sup>3</sup> Maximum reference level error with respect to the internal calibrator. Amplitude accuracy can be improved 3 dB by measuring amplitude responses in each band with respect to a known external waveguide signal source level.			
Frequency Range	Typical Sensitivity <sup>4</sup> (dBm)	Typical Frequency Response <sup>5</sup>	3 dB Compression Point (Saturation)
60-90 GHz	$-95$ @ 60 GHz $-85$ @ 90 GHz	$\pm 3$ dB	$-15$ dBm @ 60 GHz $-5$ dBm @ 90 GHz
90-140 GHz	$-85$ @ 90 GHz $-75$ @ 140 GHz	$\pm 3$ dB	$-5$ dBm @ 90 GHz 0 dBm @ 140 GHz

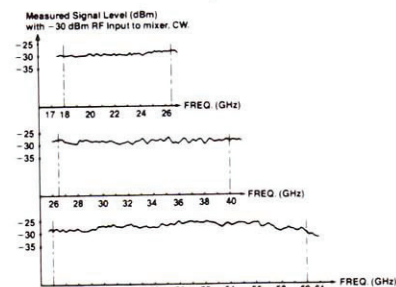
<sup>4</sup>Equivalent average noise level at 1 kHz bandwidth. <sup>5</sup>Over any 5 GHz bandwidth.

### PHYSICAL CHARACTERISTICS

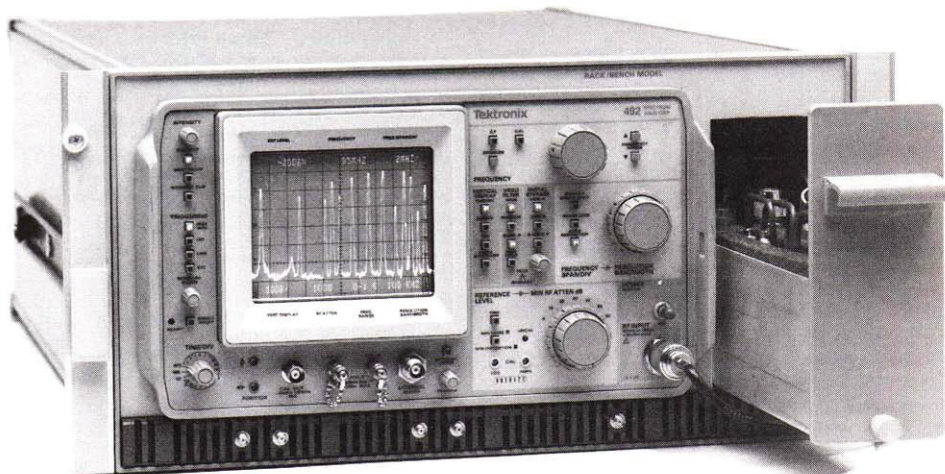
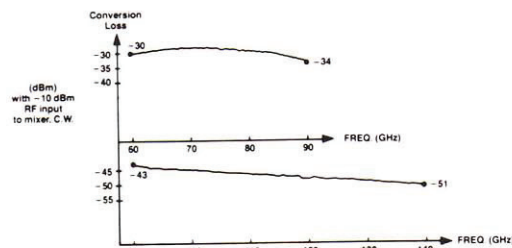
Frequency Range	Length	Width	Height	Weight	Flange
18-26.5 GHz	8.97 cm (3.53 in)	2.22 cm (0.875 in)	3.68 cm (1.45 in)	180 g (6.5 oz)	UG-595/U
26.5-40 GHz	6.93 cm (2.73 in)	1.90 cm (0.75 in)	3.35 cm (1.32 in)	100 g (3.7 oz)	UG-599/U
40-60 GHz	4.52 cm (1.78 in)	1.84 cm (0.725 in) <sup>6</sup>	2.45 cm (0.980 in) <sup>6</sup>	80 g (2.9 oz)	UG-383/U-M
60-90 GHz	4.31 cm (1.70 in)	0.89 cm (0.350 in) <sup>6</sup>	2.29 cm (0.900 in) <sup>6</sup>	40 g (1.5 oz)	UG-387/U
90-140 GHz	4.31 cm (1.70 in)	0.89 cm (0.350 in) <sup>6</sup>	2.29 cm (0.900 in) <sup>6</sup>	40 g (1.5 oz)	UG-387/U-M

<sup>6</sup>Excludes contribution to dimension due to the diameter of the round waveguide flange. Overall length contribution of flange is included.

Typical Frequency Response for 18-60 GHz Waveguide Mixers.



Typical Frequency Response for 60-140 GHz Waveguide Mixers.



## 490 Series Spectrum Analyzers Rack-mount/Benchmount Options

The following options denote mechanical configurations of the 492/492P/496/496P. Option 30 is a rackmount configuration for the 49X with standard front panel input/outputs. Option 31 is a rackmount configuration with rear panel input/output capability. Option 32 is a benchmount configuration that basically adds side covers and trim to an Option 30 or 31 transforming it into a stackable bench top configuration.

The Option 30 and 31 Rackmount is a standard

19 inch rack width and comes with standard rackmount fittings. A spectrum analyzer accessories storage drawer is also included. Dimensions are 22.23 x 42.9 x 63.5 cm (8.75 x 16.89 x 25.00 in). Weight is 54 lb; including the spectrum analyzer.

The Option 32 Benchmount is approximately the same size as the Rackmount but is dressed with side and top panels and carrying handles and feet. The Benchmount provides a convenient surface for stacking other instruments. Dimensions are 23.5 x 45.7 x 63.5 cm (9.25 x 17.9 x 25.00 in). Weight is 57 lb; including the spectrum analyzer. See Ordering Information on page 121 and 124.