QUINSTAR
TECHNOLOGY, INC.

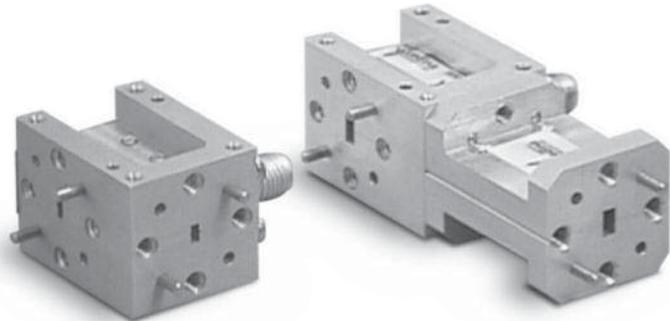## Characteristics

♦ Customized RF Bandwidth

♦ Low Conversion Loss

♦ High Output Power

♦ Integral Filter for SSB

Product Description

QuinStar Technology's **QMU** series **upconverters** cover the frequency range of 18 to 110 GHz in seven waveguide bands.   These upconverters have a balanced mixer configuration for high LO to RF isolation.   They are constructed with a rugged, split-block mechanical design that utilizes GaAs beam-lead Schottky barrier diodes.

The upconverter combines LO and IF signals and produces RF output signals at frequencies of their sum and difference, i.e., LO ± IF. An optional integral waveguide filter is available to produce a single-sideband output signal.   Typical IF bandwidth is a few GHz, but wider bandwidth upconverters are available. The LO and IF drive power levels determine the RF output power level. Typically, a high LO power level (near 17 dBm/50 mw) is needed to produce fully saturated RF output power of

approximately 3 dBm. Conversion loss of the upconverter (defined as the difference between IF and RF output power) varies with LO drive level and iF input power. Generally, the RF output power varies linearly with IF signal below –10 dBm level, and hence conversion loss is nearly constant.

Local oscillator waveguide port may be in either the same waveguide band as RF waveguide port, or in a lower or higher waveguide band (the two adjacent bands), depending on LO frequency. The upconverter can supply several milliwatts of single-sideband output power with the proper input power levels. Upconverters are essential components in radars, communication systems and measurement instruments.

Specifications

FREQUENCY BAND	K	Ka	Q	U	V	E	W
Frequency Range (GHz)	18-26.5	26.5-40	33-50	40-60	50-75	60-90	75-110
Conversion Loss (dB typ)[1]	6-8	6-8	6-8	6-8	7-9	8-10	8-10
RF Output Power (dBm Sat. SSB)	4	4	4	4	4	3	3
Bandwidth (GHz typ)[2]	0.5-8.0	0.5-8.0	0.5-8.0	0.5-8.0	0.5-10.0	0.5-10.0	0.5-10.0
IF for SSB (GHz typ)	1-4	1-4	1-4	1-4	1-5	1-5	1-5
LO Input Power (dBm typ/min)	17/13	17/13	17/13	17/13	17/13	15/11	15/11
Maximum IF input Power (dBm)[3]	17	17	17	17	15	13	13
LO plus IF Power (dBm max)	20	20	20	20	18	16	16
LO to RF Isolation (dB typ)	30	30	0	30	30	30	30
LO to IF Isolation (dB typ)	35	35	35	35	35	35	35

Other waveguide sizes are available.

As specifications are dependent on application-specific configurations, typical ranges are tabulated.

[1] Conversion loss is measured at IF input power of –10 dBm.

[2] Standard product RF/IF bandwidth is typically 2 GHz. Single sideband (SSB) upconverters must have IF band selection consistent with sideband filtering requirements. Contact QuinStar with your exact requirements to obtain an optimal solution.

[3] IF input power range is determined by application requirements, intermod and linearity considerations. Compression and saturation occur at high IF power levels.

Upconverters
QMU

Outline Drawings/Mechanical Specifications
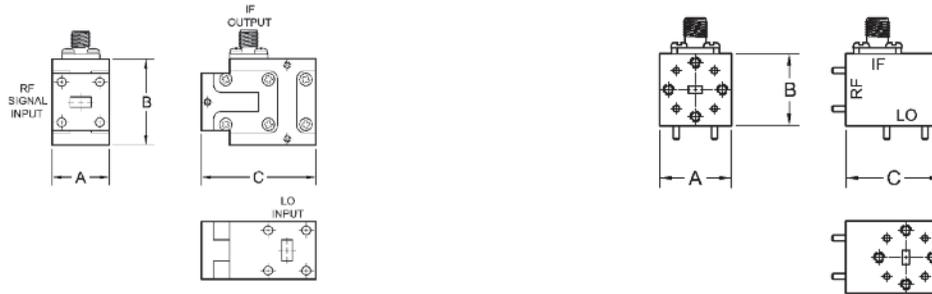
WR-42 and WR-28

WR-22 through WR-10

Double sideband version (without SSB filter)

FREQUENCY BAND	WAVEGUIDE SIZE	FLANGE PATTERN	BIAS INPUT	OUTLINE DIMENSIONS, inches/mm		
				A	B	C
K	WR-42	UG-595/U	SMA JACK	0.88/22.4	1.19/30.2	1.89/48.0
Ka	WR-28	UG-599/U	SMA JACK	0.75/19.1	1.13/28.7	1.50/38.1
Q	WR-22	UG-383/U	SMA JACK	1.13/28.7	1.13/28.7	1.50/38.1
U	WR-19	UG-383/U	SMA JACK	1.13/28.7	1.13/28.7	1.50/38.1
V	WR-15	UG-385/U	SMA JACK	0.75/19.1	0.75/19.1	1.00/25.4
E	WR-12	UG-387/U	SMA JACK	0.75/19.1	0.75/19.1	1.00/25.4
W	WR-10	UG-387/U	SMA JACK	0.75/19.1	0.75/19.1	1.00/25.4

Note: Filter dimensions for single sideband upconverters available upon request. Please see series QFB for approximate size.

Ordering Information

Model Number **QMU -**   **AB CD E F**   ⚠ Please specify exact RF, IF and LO frequencies when ordering.

RF center frequency rounded to nearest GHz
(A0 = 100 GHz, A1 = 101 GHz, B1 = 111 GHz, etc., FB = fullband)

LO frequency rounded to nearest GHz
(A0 = 100 GHz, A1 = 101 GHz, B1 = 111 GHz, etc.)

options
D = double sideband
S = single sideband (filter included please specify exact sideband and LO filtering requirements)
Z = custom

waveguide band designator
K = K-band   V = V-band
A = Ka-band   E = E-band
Q = Q-band   W = W-band
U = U-band