Harmonic Generator

Description

The harmonic generator takes the main modulation frequency and produces the 5th harmonic which serves as the second modulation frequency. It also generates the second and the tenth harmonic for measuring the power in the RF sidebands. It generates the sum and difference of the two modulation frequencies at the forth and sixth harmonic. Locking the interferometer also requires both third harmonics at the third and fifteenth harmonic. The harmonic generator should preserve the phase noise of the original oscillator. The degradation in phase noise is typically linear in the harmonic order.

Specifications

Frequency range:

- 8.6 MHz - 9.1 MHz minimum (input)
- Highest output frequency is 15 times input

Input:

- 10 dBm
- N female
- 9.096279 MHz / 8.68628 MHz nominal

Outputs:

- Order of harmonics: 2, 3, 4, 5, 6, 10, and 15 (n-th harmonic is n times fundamental)
- 10 dBm each
- N female (7x)

Phase noise (input):

Frequency	Phase noise spec
10 Hz	-120 dBc/Hz
100 Hz	-155 dBc/Hz
1 kHz	-165 dBc/Hz
10 kHz	-165 dBc/Hz

Phase noise (output):

- < 20 Log (Harmonic order) + 3 dB (5th harmonic)
- < 20 Log (Harmonic order) + ~6 dB (all others, best effort)

Harmonic distortion (output):

- \> 60 dBc for all spurious lines
- \> 60 dBc for all other multiples of the input frequency

Amplitude noise (input & output):

Frequency	AM noise spec
10 Hz	-140 dBc/Hz
100 Hz	-150 dBc/Hz
1 kHz	-150 dBc/Hz
10 kHz	-150 dBc/Hz

Physical:

- 19" rack mount
- 1U or 2U

Power:

- +15V and/or +24V
- Negative voltages optional