General Description
ORU
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1. SCOPE

This document establishes the general description for the functional performance of the frequency stability and control, spurious suppression and power control requirements for the Outdoor Receiver Unit (ORU).

2. DESCRIPTION

2.1 Frequency stability and control. The Local Oscillator (LO) frequency exhibits a stability/accuracy of less than ± 8 parts per million (ppm) as a result of initial setting inaccuracy, temperature drift and aging over 10 years. The stability is achieved by phase-locking the LO to a stable 100 MHz reference oscillator that is internal to the ORU. The 100 MHz reference is an Ovenized Crystal Oscillator (OCXO) and the stability requirements guaranteed by the OCXO manufacturer.

Adjustment of the frequency of the crystal oscillator can be performed in one of two ways.

a) Some oscillators employ a mechanical tuning adjustment that allows the frequency to be controlled within ± 4 ppm from the initial setting. The mechanical tuning does not allow for frequency control after the unit has been sealed.

b) Some oscillators employ a voltage controlled frequency adjustment that allows the frequency to be controlled within ± 3 ppm from the initial setting over a voltage range of 0 to 5 VDC. The voltage control enables the frequency to be adjusted externally via the RS-422 interface.

2.2 Spurious suppression. Radiated spurious emissions from the ORU, at the RF input port, are suppressed by the use of pre–select filtering. A standard WR-28 waveguide filter is employed which rejects signals > 125 MHz from either band edge by >25 dB.

The cutoff characteristics of WR-28 waveguide and the length of the pre-select filter, reject signals DC – 20 GHz by > 90 dB.

The fundamental LO leakage, LO harmonics and sub-harmonics at the RF input port are < 30 dBm. The use of the pre-select filter and the reverse isolation of the internal mixer and input amplifier achieve this.

2.3 Power Control. The ORU is a receiver and therefor there are no signals transmitted at the RF input port beyond the spurious emissions stated in section 2.2.