

L- to X-Band STALO Unit

General Description

Shown is the NWO5557-17 unit as an example of Nanowave's high reliability, low phase noise, DDS based C-band frequency synthesizers for ground based weather RADAR platforms. The developed C-band unit comprises in-house high reliability HMIC modules and proprietary low phase noise synthesizer and oscillator capabilities.

The unit has been designed to be readily re-banded for operation at S and X bands without change in form factor.

The C-band unit provides +23 dBm over a 150 MHz continuous tuning bandwidth with a frequency step resolution of 1 MHz. DDS frequency control enables frequency step sizes below 1Hz if required.

The source has a phase noise of -120 dBc/Hz at 100 kHz offset and a coherency of less than -60 dBc over an integration bandwidth of 10 Hz to 1 MHz.

An incorporated low-g sensitivity low phase noise internal crystal reference ensures frequency stability over temperature of less than ± 1 ppm. Ultra low phase noise of -140 dBc/Hz at 1 MHz can be provided through inclusion of a proprietary low noise DRO technology option.

Spurious signal levels less than -60 dBc at a 1MHz frequency step are guaranteed through 100 % automated spur test. All performance parameters are achieved over an operational temperature



Fig. 1: C-Band STALO Unit

range of 0 °C to +70 °C. Extended operational temperature ranges are available on request, e.g. -20 °C to +70 °C). The unit is compliant to IP67 and MIL-STD 883.

RS232 digital interface provides frequency control and lock detect monitor through a DB25 connector which is also used to provide the unit with a single +15 V supply rail. Amplitude, frequency and phase of the source can be controlled through the internal DDS. DC power consumption is less than 20 Watts during initial stabilization of the internal reference and falls to a steady state value of less than 18 Watts.

Electrical Parameters

| Parameter | Unit | Min | Typ | Max | Remarks |
|--------------------------------------|-------|-------|--------|-------|------------------|
| Operating Center Frequency Range | GHz | 2.7 | | 9.5 | 1) |
| Operational Bandwidth / Tuning Range | | | 150.0 | | 2) Within C-Band |
| Step Size | Hz | 1.0 | | 1.0 M | |
| Output Power Level | dBm | +23.0 | | | |
| Phase Noise @ 100 kHz offset | dBc/H | | -120.0 | | |

| | | | | | |
|------------------------------------|-------|--|--------|------|------------------|
| | z | | | | |
| Low Phase Noise Option @ 1 MHz off | dBc/H | | -140.0 | | |
| | z | | | | |
| Coherency 10 Hz to 1MHz | dBc | | -60.0 | | |
| Spurious Level | dBc | | -60.0 | | @ 1 MHz step |
| Harmonics Level | dBc | | -50.0 | | |
| | | | | | |
| Frequency Stability | ppm | | ± 1.0 | | Over temperature |
| Frequency Switching Time | µs | | | 50.0 | |
| Output Return Loss | dB | | 15.0 | | |
| | | | | | |

Mechanical and Environmental Parameters

| Parameter | Unit | Min | Typ | Max | Remarks |
|-----------------------------|---------|-------|-------|--------|------------|
| Operating Temperature Range | °C | 0.0 | | +70.0 | |
| Storage Temperature Range | °C | -55.0 | | +100.0 | |
| | | | | | |
| Output Connector | | | SMA-f | | |
| | | | | | |
| Lock Detect | | | TTL | | Logic high |
| | | | | | |
| Size | Length: | cm | 14.48 | | |
| | Width: | cm | 4.83 | | |
| | Height: | cm | 10.16 | | |
| | | | | | |
| Weather Resistant Seal | | | IP67 | | |
| | | | | | |

Measurement Data

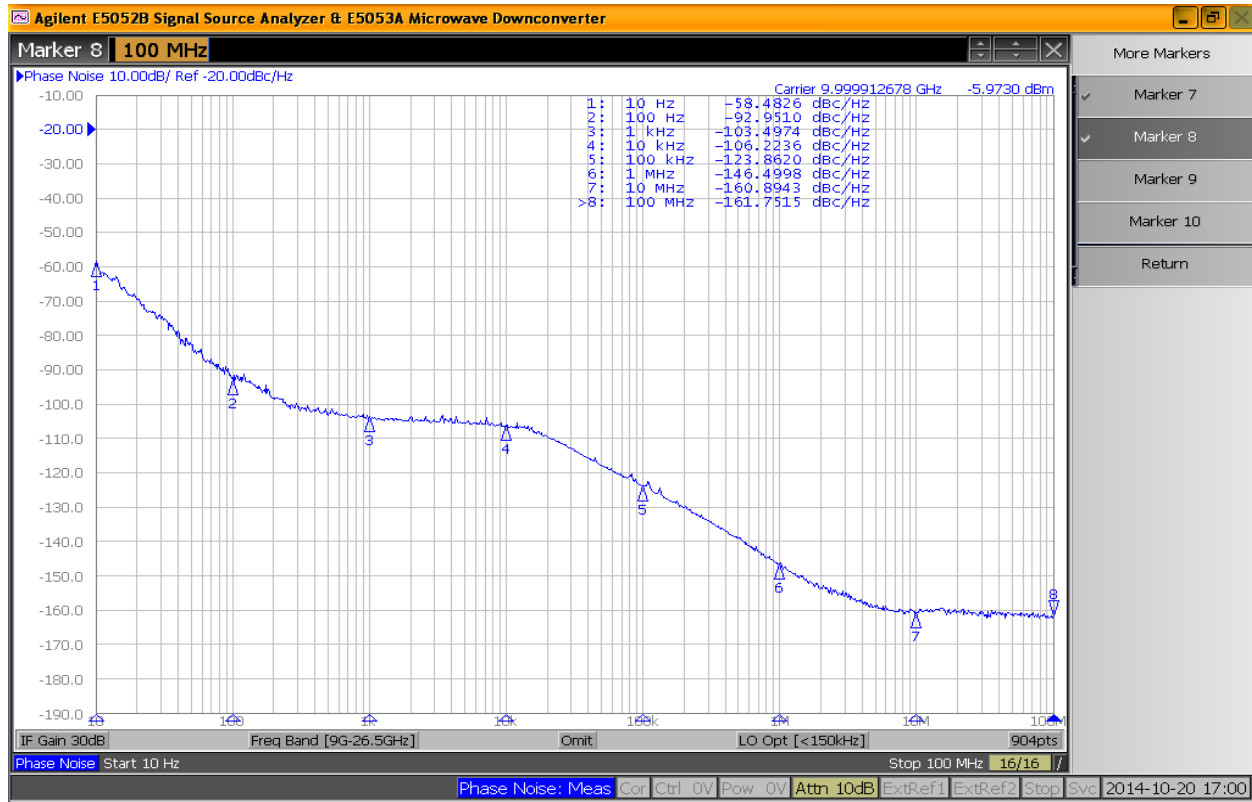


Fig 1: Phase Noise at 10GHz

Additional features:

- All Plating and Panting materials are RoHS compliant.
- Marking: the unit is marked with manufacturer part no., date code, and Serial Number

For further information please contact NANOWAVE Technologies Inc. at sales@nanowavetech.com, or call at (+1) 416-252-5602.