

# PHASE LOCKED OSCILLATOR

## MODEL MDR5100-14000 (14 GHz)



### Features

- Low Phase Noise: -113 dBc/Hz @ 100 kHz
- Low Spurious: -80 dBc Typical
- Internal Reference Design
- Environmental Screening Available

### Specifications<sup>1</sup>

| CHARACTERISTIC                                      | TYPICAL<br>Ta = 25 °C  | MIN/MAX<br>Ta = -20 °C to +65 °C |
|---|--|----------------------------------|
| Frequency (GHz) <sup>2</sup>                        | 14   | 14                               |
| Mechanical Tuning                                   |  |                                  |
| Bandwidth (MHz) <sup>3</sup>                        | +/- 20   | +/- 20 Min.                      |
| Output Power (dBm) <sup>4</sup>                     | +13  | +12                              |
| Variation Over Temperature (dBm)                    | +/- 0.75   | +/- 1                            |
| Spurious (dBc)                                      | -80  | -70                              |
| Phase Noise (dB) <sup>5</sup>                       | -92 dBc/Hz @ 1 KHz<br>-107 dBc/Hz @ 10 KHz<br>-113 dBc/Hz @ 100 KHz<br>-127 dBc/Hz @ 1 MHz                           |                                  |
| VSWR  | 1.5  | 2.0                              |
| Harmonics (dBc)                                     | -20  | -15                              |
| Lock Indicator                                      | TTL (High=Locked)  | TTL (Low=Unlocked)               |
| Supply Power DC <sup>6</sup><br>mA                  | +12<br>265   | +12<br>275                       |
| Phase Voltage<br>Set to (nom.)<br>Lock Range (min.) | +5.0 VDC<br>+2 to +9 VDC   |                                  |
| Phase-Lock Alarm<br>Locked<br>Unlocked <sup>7</sup> | Transistor Collector (NPN)<br>Open Vc = 30 VDC max.<br>Saturated to Ground<br>Vce = +0.5 VDC max.<br>Ic = 50 mA max. |                                  |

### Description

Spectrum Microwave's Series MDR5100 Phase Locked Oscillators use a Dielectric Resonator in the resonant circuit. The circuit is lightly loaded to obtain the lowest phase noise possible.

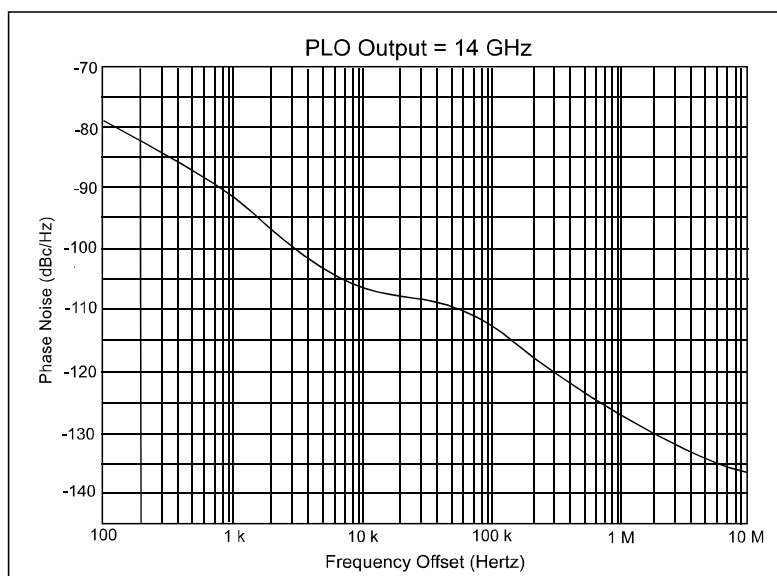
The resonator is epoxied to a printed circuit board and well grounded to minimize modulation sidebands during shock and vibration.

Buffer amplifiers are used to provide isolation from load VSWRs; Regulators filter noise on the DC input voltage.

External reference models are also available. A lock indicator circuit is provided to signal an out-of-lock condition.

#### Notes:

1. Specifications labeled "min." or "max." are guaranteed in a 50 Ohm system over the specified temperature range.
2. Output frequency must be specified, and it is an integer multiple of the internal crystal reference frequency.
3. Mechanical tuning of PLO in unlocked mode.
4. Higher output power is available.
5. Phase Noise at offsets <100 kHz is dependent on external reference and can be approximated as follows:  $Phase\ Noise\ (dB) = 20\log(N) + 3\ dB\ above\ the\ external\ reference\ phase\ noise,$  where  $N = multiple\ of\ reference.$
6. Other input voltages are available.
7. Actual or impending loss of lock.
8. Package must be verified by Spectrum Microwave.



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### Outline Drawing

