



## THE DIELECTRIC RESONATOR OSCILLATOR

A HIGHLY STABLE CLASS OF MICROWAVE SIGNAL SOURCES

### FEATURES

- DIELECTRIC RESONATOR
- INTERNAL VOLTAGE REGULATOR
- 150 MHz BANDWIDTH
- LOW PHASE NOISE
- MIC FABRICATION
- LOW MICROPHONICS
- LOW POWER CONSUMPTION
- UP TO +25 dBm OUTPUT POWER
- AVAILABLE FROM 2 - 26 GHz
- OPERATING RANGE -40° TO +85°C

### APPLICATION

- SATELLITE COMMUNICATIONS
- CABLE TV LINKS (CATV)
- LOCAL AREA NETWORKS (LAN)
- GLOBAL POSITIONING SYSTEMS (GPS)
- TEST EQUIPMENT
- UP / DOWN CONVERTERS
- LMDS
- TRANSMITTER & RECEIVERS
- DIGITAL RADIOS
- MISSILE GUIDANCE

### DESCRIPTION

**DRO-1000** series Dielectric Resonator Oscillator (DRO) utilizes state of the art MIC to provide a highly stable, reliable and efficient signal source at microwave frequencies up to 26 GHz. The low profile and rugged construction provide excellent durability against harsh environmental conditions.

**DRO-1000** series oscillator is designed using GaAs FET or BJT amplifier with series feedback at source and Dielectric Resonator at the gate. High gain, low-noise GaAs FETs/BJTs are biased positively or negatively at the gate to ensure minimum phase-noise. The device is carefully matched for maximum power, minimum phase-noise and Voltage Standing Wave Ratio (VSWR). The oscillator is matched for maximum temperature stability and optimum negative resistance.

**DRO-1000** series oscillator is buffered by cascaded low-noise driver and power amplifiers for minimum load pulling, maximum isolation and power. GaAs FET/BJT devices are directly attached to gold plated Kovar carriers to minimize shear effect and maximize heat sinking. Kovar carriers are mounted to the chassis to provide an efficient thermal junction and a stable structure for reduction of microphonics. To ensure oscillator stability over the full temperature range, high-Q low dielectric constant resonators are chosen with proper temperature coefficient to compensate for frequency drift. Where extreme stability is required, a miniature heater can be provided to ensure constant temperature and minimum drift.

**DRO-1000** series provide several advantages over other microwave signal sources, such as Gunn Cavity Oscillators and Crystal Multiplier Chains. Table 1 offers a brief summary comparison of the other sources.

**DRO-1000** series is internally voltage regulated to avoid reverse bias, frequency pushing, bias modulation and voltage transients. Mechanical frequency adjustment is provided for desired frequency setting within the bandwidth.

CHARACTERISTIC	CRYSTAL MULTIPLIER CHAIN	GUNN CAVITY OSCILLATOR	DRO-1000 SERIES
Reliability	GOOD	FAIR	EXCELLENT
Efficiency	LOW	LOW	HIGH
Temperature Range	GOOD	POOR	EXCELLENT
Power Variation	HIGH	HIGH	LOW
FM Noise	VERY GOOD	EXCELLENT	EXCELLENT
Frequency Stability	EXCELLENT	GOOD	VERY GOOD
Environmental Stability	FAIR	FAIR	EXCELLENT
Size	LARGE	MEDIUM	SMALL

Table 1

# SPECIFICATIONS

Model Number	DRO-1000-XX.XX (Where XX.XX is freq. In Ghz)
Single Frequency	2.00 to 26.00 Ghz
Mechanical Tuning Range	100 Mhz
Electrical Tuning	Optional
Power Output	+13 dBm, up to +25 dBm Optional
Load VSWR, Maximum	2.0 : 1.0
Power Requirements	+15, +12, +10 VDC, 90mA
Power Variation	+/- 0.5 dBm
Pushing	10 ppm/V Max.
Pulling (12dB Return Loss)	+/- 90 ppm Max.
Frequency Stability	4 ppm / °C
Phase Noise	See Phase Noise Envelope (Fig. A)
Spurious	-85 dBc
Harmonics	-25 dBc
Operating Temperature	-55° to +95°C Optional
Storage Temperature	-55° to +125°C
Connectors	SMA Female
Size	2.25" x .93" x .67"
Finish	Nickel

## PHASE NOISE ENVELOPE

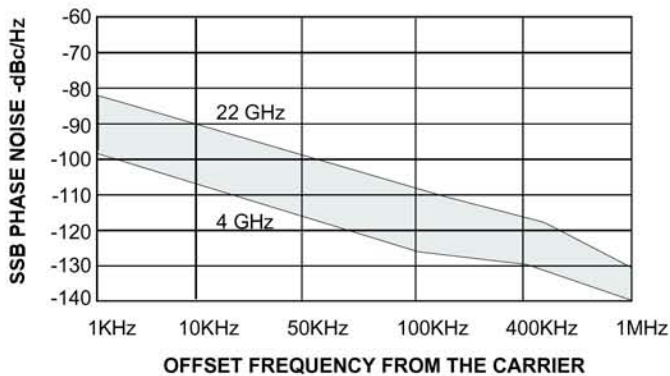
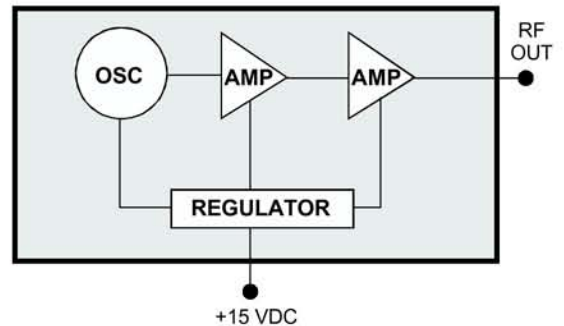
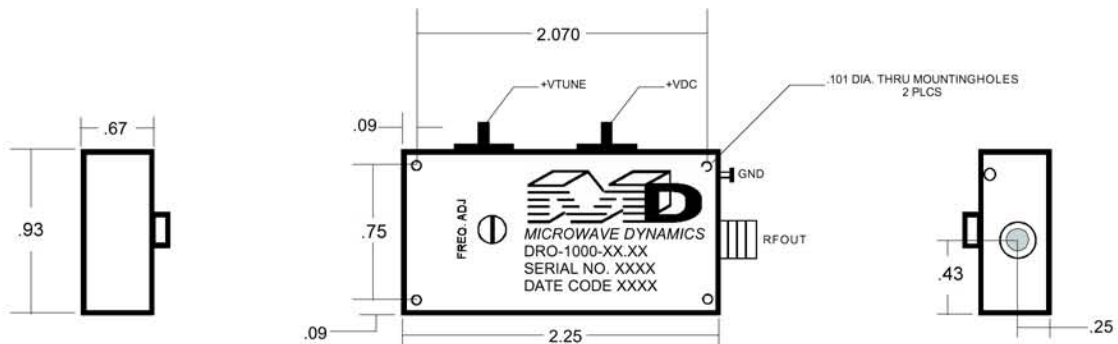


FIGURE A

## BLOCK DIAGRAM



## OUTLINE DRAWING



NOTE: Drawing not to scale

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