YIG Tuned Oscillators
2 - 20 GHz

MLYO 0000 Series

V3.00

Features

- Multioctave Tuning Ranges
- Miniature and Cube Packages
- High Linearity
- High Stability
- Low Phase Noise

Description

The YIG Tuned Oscillator (YTO) is a type of tuned oscillator where the frequency determining element is a sphere of YIG (Yttrium Iron Garnet) ferrite material. A property of YIG material is that its resonant frequency is directly proportional to the strength of an applied magnetic field. This enables it to be used as an electronically tuned cavity, sustaining oscillation in an active circuit. This active circuit, a negative resistance generator, is either a silicon bipolar transistor or a GaAs FET device in a negative feedback circuit. The oscillator output is then amplified by a buffer amplifier stage. Careful design and manufacture of the YTO produces a highly linear oscillator capable of octave and multioctave tuning bandwidths with high stability and low phase noise.

M/A-COM YTOs are constructed using discrete chip devices integrated into a conventional alumina MIC. This MIC, together with the YIG sphere and tuning coils is packaged in either a standard, miniature or cube package which is hermetically sealed by laser welding. This compact, rugged construction makes these VCOs suitable for a wide range of environmental conditions encountered in military, commercial and hi-rel applications.

YTOs have a wide range of applications where oscillators with very wide tuning bandwidth and high linearity are required. YTOs provide an attractive solution for wideband receiver local oscillators in ESM and ECM equipment and low noise synthesizers or sweep oscillators for spectrum analyzers and signal generators. In addition to the main tuning coil the YTO has a low inductance FM tuning coil placed in close proximity to the YIG sphere. This coil allows fine tuning of the oscillator frequency to either phase lock the YTO or frequency modulate the output signal.

As well as the standard YTOs described M/A-COM also manufactures a wide range of custom designs to meet specific system specifications. Please contact the factory to discuss your requirements in detail.

North America: Tel. (800) 366-2266 Fax (800) 618-8883 ■ Asia/Pacific: Tel. +81 (03) 3226-1671 Fax +81 (03) 3226-1451 ■ Europe: Tel. +44 (1344) 869 595 Fax +44 (1344) 300 020

SPECIFICATIONS (guaranteed -0°C to +65°C)

Frequency Range (GHz) Min.	Output Power (dBm) Min.	Output Power Variation (dB) Max.	Main Tune Linearity (%) Max.	Frequency Drift (MHz) Max.	Phase Noise @100KHz (dBc/Hz) Max.	Harmonic Outputs (dBc) Max.	Power Supplies Hysteresis (MHz) Max.	@+15V (mA) Max.	@-5V (mA) Max.	Package Style	Part Number
2.0 - 4.0	+12	±2.5	±0.05	30	-115	-12	4	110	30	YTOA	MLYO-0204C
							5	150	30	YTOB	MLYOM-0204C
							5	110	30	YTOC	MLYOC-0204C
2.0 - 6.0	+12	±2.5	±0.05	30	-112	-12	5	110	30	YTOA	MLYO-0206C
							6	150	30	YTOB	MLYOM-0206C
							6	110	30	YTOC	MLYOC-0206C
2.0 - 8.0	+10	±2.5	±0.05	30	-110	-12	9	110	30	YTOA	MLYO-0208C
							10	150	30	YTOB	MLYOM-0208C
							10	110	30	YTOC	MLYOC-0208C
4.0 - 8.0	+12	±2.5	±0.05	30	-110	-12	6	110	30	YTOA	MLYO-0408C
							7	150	30	YTOB	MLYOM-0408C
							7	110	30	YTOC	MLYOC-0408C
6.0 - 12.0	+12	±3.0	±0.1	40	-98	-12	12	110	N/A	YTOA	MLYO-0612C
							14	150	N/A	YTOB	MLYOM-0612C
							13	110	N/A	YTOD	MLYOC-0612C
8.0 - 12.0	+12	±3.0	±0.15	40	-98	-12	6	110	N/A	YTOA	MLYO-0812C
							8	150	N/A	YTOB	MLYOM-0812C
							7	110	N/A	YTOD	MLYOC-0812C
8.0 - 16.0	+12	±3.0	±0.15	40	-95	-10	9	110	N/A	YTOA	MLYO-0816C
							10	110	N/A	YTOD	MLYOC-0816C
8.0 - 18.0	+10	±3.0	±0.15	40	-95	-10	15	110	N/A	YTOA	MLYO-0818C
							16	110	N/A	YTOD	MLYOC-0818C
12.0 - 18.0	+12	±3.0	±0.15	40	-95	-10	9	110	N/A	YTOA	MLYO-1218C
							10	110	N/A	YTOD	MLYOC-1218C
12.0 - 20.0	+10	±3.0	±0.15	40	-95	-10	12	110	N/A	YTOA	MLYO-1220C
							13	110	N/A	YTOD	MLYOC-1220C

NOTES

1) Frequency pushing — +15V Supply 0.5MHz/V maximum; -5V Supply 1.5MHz/V maximum
2) Frequency pulling — 2MHz maximum into a 1.5:1 VSWR load all phases
3) Spurious outputs — -70dBc maximum
4) Main Tune Port — Sensitivity: 20MHz/mA ±5%; Input Impedance: 8 ohm, 100mH maximum MLYO Series; 12 ohm, 120mH maximum MLYOM Series; 10 ohm, 50mH maximum MLYOC Series
5) FM Port — Sensitivity: 300KHz/mA ±10%; 3dB Bandwith: 300KHz minimum; Input Impedance: 1ohm, 1.8µH maximum
6) Heater Power Supply — +28V @ 30mA maximum, MLYO and MLYOC Series
7) Storage Temperature Range — -54°C to +100°C

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SPECIFICATIONS (guaranteed -54°C to +85°C)

Frequency Range (GHz) Min.	Output Power (dBm) Min.	Output Power Variation (dB) Max.	Main Tune Linearity (%) Max.	Frequency Drift (MHz) Max.	Phase Noise @100KHz (dBc/Hz) Max.	Harmonic Outputs (dBc) Max.	Power Supplies Hysteresis (MHz) Max.	@+15V (mA) Max.	@-5V (mA) Max.	Package Style	Part Number
2.0 - 4.0	+12	±3.0	±0.05	40	-115	-10	4	110	30	YTOA	MLYO-0204M
							5	150	30	YTOB	MLYOM-0204M
							5	110	30	YTOC	MLYOC-0204M
2.0 - 6.0	+12	±3.0	±0.05	40	-112	-10	5	110	30	YTOA	MLYO-0206M
							6	150	30	YTOB	MLYOM-0206M
							6	110	30	YTOC	MLYOC-0206M
2.0 - 8.0	+10	±3.0	±0.05	40	-110	-10	9	110	30	YTOA	MLYO-0208M
							10	150	30	YTOB	MLYOM-0208M
							10	110	30	YTOC	MLYOC-0208M
4.0 - 8.0	+12	±3.0	±0.05	40	-110	-10	6	110	30	YTOA	MLYO-0408M
							7	150	30	YTOB	MLYOM-0408M
							7	110	30	YTOC	MLYOC-0408M
6.0 - 12.0	+12	±4.0	±0.10	50	-98	-10	12	110	N/A	YTOA	MLYO-0612M
							14	150	N/A	YTOB	MLYOM-0612M
							13	110	N/A	YTOD	MLYOC-0612M
8.0 - 12.0	+12	±4.0	±0.15	50	-98	-10	6	110	N/A	YTOA	MLYO-0812M
							8	150	N/A	YTOB	MLYOM-0812M
							7	110	N/A	YTOD	MLYOC-0812M
8.0 - 16.0	+12	±4.0	±0.15	50	-95	-10	9	110	N/A	YTOA	MLYO-0816M
							10	110	N/A	YTOD	MLYOC-0816M
8.0 - 18.0	+10	±4.0	±0.15	50	-95	-10	15	110	N/A	YTOA	MLYO-0818MK
							16	110	N/A	YTOD	MLYOC-0818M
12.0 - 18.0	+12	±4.0	±0.15	50	-95	-10	9	110	N/A	YTOA	MLYO-1218M
							10	110	N/A	YTOD	MLYOC-1218M
12.0 - 20.0	+10	±4.0	±0.15	50	-95	-10	12	110	N/A	YTOA	MLYO-1220M
							13	110	N/A	YTOD	MLYOC-1220M

NOTES

1) Frequency pushing — +15V Supply 0.5MHz/V maximum; -5V Supply 1.5MHz/V maximum
2) Frequency pulling — 2MHz maximum into a 1.5:1 VSWR load all phases
3) Spurious outputs — -70dBc maximum
4) Main Tune Port — Sensitivity: 20MHz/mA ±5%; Input Impedance: 8 ohm, 100mH maximum MLYO Series; 12 ohm, 120mH maximum MLYOM Series; 10 ohm, 50mH maximum MLYOC Series
5) FM Port — Sensitivity: 300KHz/mA ±10%; 3dB Bandwith: 300KHz minimum; Input Impedance: 1ohm, 1.8µH maximum
6) Heater Power Supply — +28V @ 30mA maximum, MLYO and MLYOC Series
7) Storage Temperature Range — -54°C to +100°C

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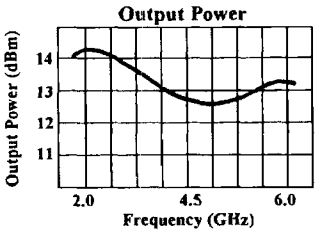
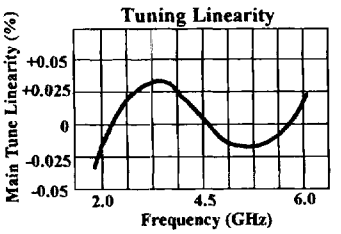
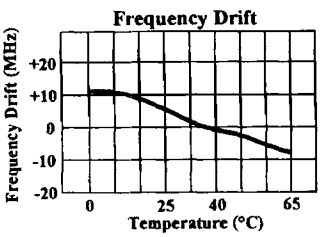
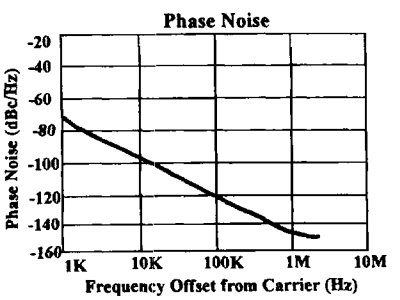
TYPICAL PERFORMANCE

PART NO. MLYO-0206C









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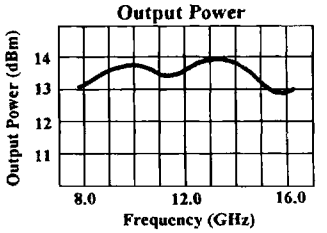

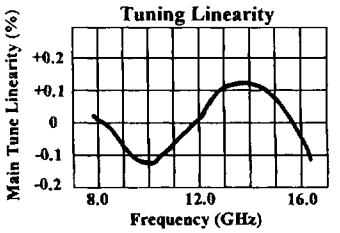

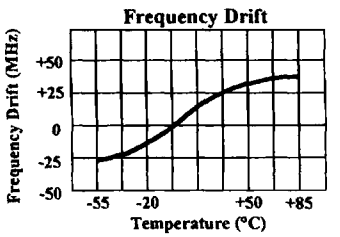

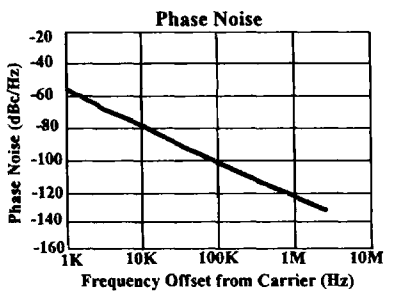

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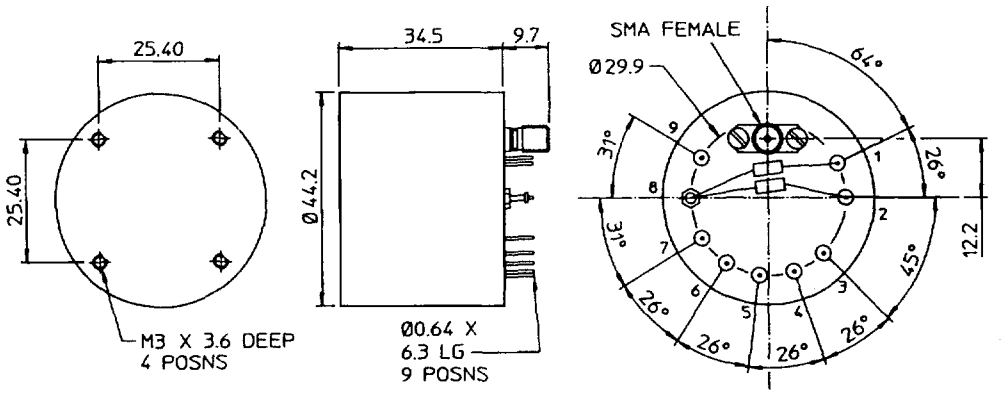
OUTLINE DRAWINGS

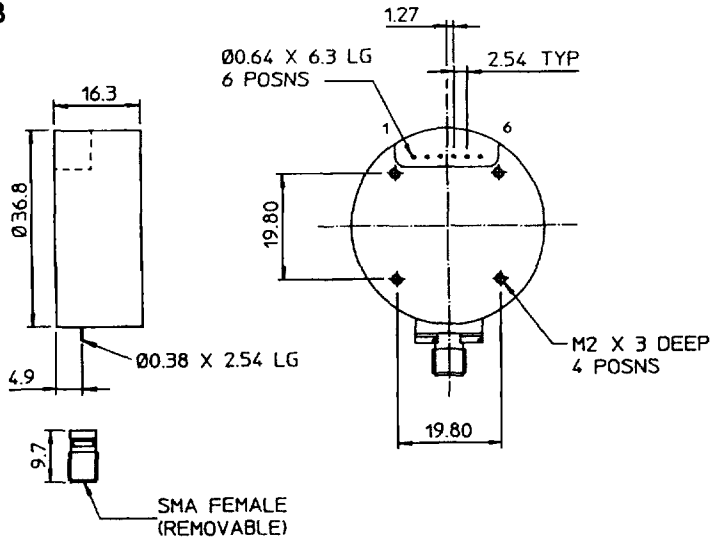
Package Style YTO A



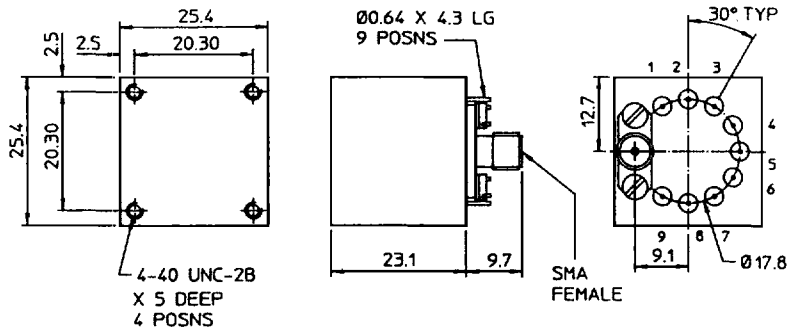
Pin No	Connection	Pin No	Connection
1	+15V	6	-Main Tune
2	-5V	7	-Heater
3	+FM	8	Gnd
4	-FM	9	+Heater
5	+Main Tune		

Package Style YTO B

Pin No	Connection
1	+15V
2	-5V
3	+Main Tune
4	-Main Tune
5	+FM
6	-FM

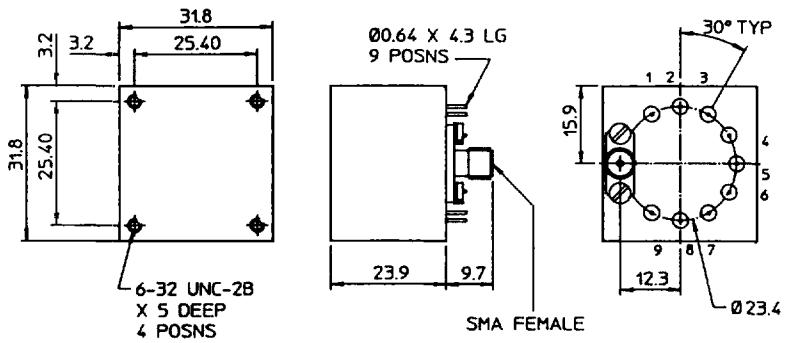


Package Style YTO C



Pin No	Connection	Pin No	Connection
1	+15V	6	-FM
2	-5V	7	Heater
3	+Tune	8	Gnd
4	-Tune	9	Heater
5	+FM		

Package Style YTO D



Pin No	Connection	Pin No	Connection
1	+15V	6	-FM
2	-5V	7	Heater
3	+Tune	8	Gnd
4	-Tune	9	Heater
5	+FM		

DRAWING NOTES

Third Angle Projection
All dimensions in mm
Tolerances x.xx = ±0.5mm
x.xx = ±0.2mm

Standard Finish: Stainless Steel

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