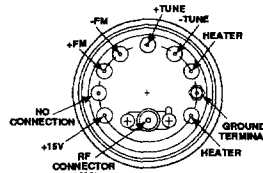
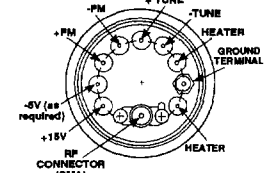


**FEATURES**

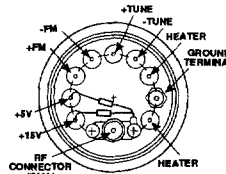
- 2 to 18 GHz Frequency Coverage
- Designed to MIL-E1-5400 and -16400
- Rugged Hermetic Thin-Film Construction
- $\pm 0.05\%$  to  $+0.2\%$  Tuning Linearity
- High Rate FM and Phase-Lock Capability
- Frequency Stable Under Severe Vibration
- $-54^\circ$  to  $+85^\circ\text{C}$  Temperature Range



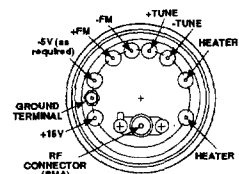
M1-45, p. 16-23



M4-45, p. 16-24



M4-38, p. 16-23



M3-45, M3-60, p. 16-24

**DESCRIPTION**

The Avantek® AV Series Extended Temperature Range fundamental oscillators are extremely compact and lightweight, yet are designed and manufactured to offer excellent performance and high MTBFs over the  $-54^\circ$  to  $+85^\circ\text{C}$  temperature range. They meet the environmental conditions of MIL-E-5400 and MIL-E-16400.

This family of truly ruggedized YTOs offers complete 2 to 18 GHz frequency coverage. They are ideal for systems requiring signal sources with moderate power levels, excellent tuning linearity, low spurious outputs and a flat power out vs. frequency characteristic.

**Greater Than 70,000 Hours MTBF Under Missile Launch Conditions**

As an indication of the inherent reliability of the Avantek family of these YTOs, the MTBF of the AV-7246 (2 to 6 GHz) is calculated at 73,900 hours at  $71^\circ\text{C}$  under the most severe

condition of MIL-HDBK-217B ( $M_L$ —missile launch). Even at temperatures which exceed the normal guaranteed operating range, the MTBF still remains high. For example, under the same  $M_L$  conditions, the MTBF of the AV-7246 is 46,600 hours at  $100^\circ\text{C}$ .

**Resistant To Shock and Vibration**

Under the conditions of MIL-STD-810C (method 516.2, procedure 4, figure 516.2-2), with a shock of 50G for 11 ms or 300G for 3 ms, there is no degradation, before and after, of the performance of the AV-7246. The incidental frequency stability of the AV-7246 is equal to or better than 200 kHz with a vibration of 10-2500 Hz at 45G, MIL-STD-202, method 204, test condition E. Note that the mounting and cabling of the oscillator during the vibration test is critical—consult the Avantek factory for information on the procedures for duplicating this test.

# YIG-Tuned Oscillators Extended Temperature Range Multi-Octave Band

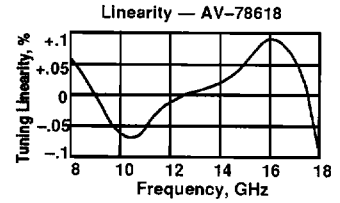
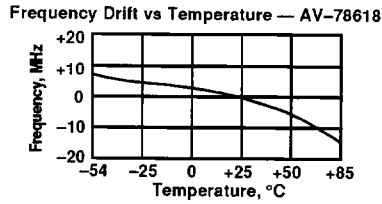
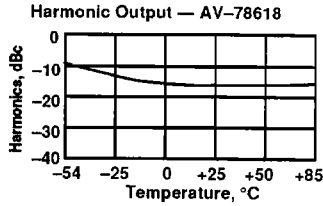
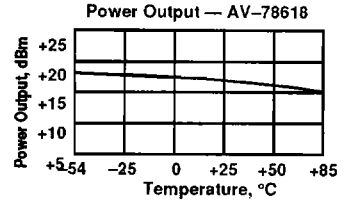
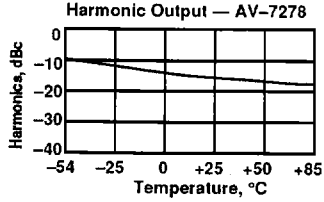
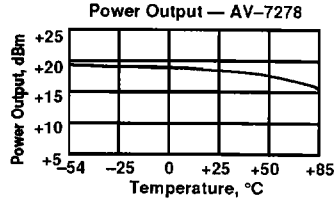
## ELECTRICAL AND PERFORMANCE SPECIFICATIONS

Guaranteed Specifications at -54° to +85°C Case Temperature (Unless Otherwise Noted)

Model No.	AV-7114	AV-7246	AV-7218	AV-7278
Frequency Range, Min.	1-4 GHz	2-6 GHz	2-8 GHz	2-8 GHz
Power Output into 50-ohm Load, Min./Max.	+13 dBm/+21 dBm	+16 dBm/+23 dBm	+5 dBm/+17 dBm	+14.8 dBm/+23 dBm
Frequency Drift Over Operating Temperature, Max.	20 MHz	30 MHz	40 MHz	40 MHz
Pulling Figure (12 dB Return Loss), Typ.	0.5 MHz	0.5 MHz	0.5 MHz	0.5 MHz
Pushing Figure, +15 VDC Supply, Typ.	0.5 MHz/V	0.1 MHz/V	0.5 MHz/V	0.1 MHz/V
-5 VDC Supply, Typ.	1.5 MHz/V	1.5 MHz/V	1.5 MHz/V	1.5 MHz/V
Magnetic Susceptibility @ 60 Hz, Typ.	50 kHz/Gauss	50 kHz/Gauss	50 kHz/Gauss	50 kHz/Gauss
2nd Harmonic, Min.	-12 dBc	-8 dBc	-5 dBc	-8 dBc
3rd Harmonic, Min.	-20 dBc	-12 dBc	-15 dBc	-12 dBc
Spurious Output, Min.	-60 dBc	-60 dBc	-60 dBc	-60 dBc
Main Tuning Port Characteristics				
Sensitivity	+15±0.8 MHz/mA	15±.8 MHz/mA	15±0.8 MHz/mA	15±.8 MHz/mA
3 dB Bandwidth, Typ.	5 kHz	5 kHz	5 kHz	5 kHz
Linearity, Typ.	±.15%	±0.1%	±0.1%	±0.1%
Hysteresis, Typ.	3 MHz	6 MHz	9 MHz	9 MHz
Input Impedance @ 1 kHz, Typ.	10 Ohms in series with 42 mH	7 ohms in series with 51 mH	7 ohms in series with 51 mH	7 ohms in series with 60 mH
FM Port Characteristics				
Sensitivity, Typ.	310 kHz/mA	310 kHz/mA	310 kHz/mA	310 kHz/mA
3 dB Bandwidth, Typ.	800 kHz	800 kHz	800 kHz	800 kHz
Deviation at 3 dB Bandwidth, Max.	50 MHz	60 MHz	60 MHz	60 MHz
Input Impedance @ 1 kHz, Typ.	1 ohm in series with 1.7 µH	1 ohm in series with 1.7 µH	1 ohm in series with 1.7 µH	1 ohm in series with 1.7 µH
DC Circuit Power, Max., +15±0.5V	150 mA	200 mA	120 mA	200 mA
-5±0.1V	50 mA	60 mA	60 mA	60 mA
YIG Heater Power				
Input Voltage Range	20 to 28 VDC	20 to 28 VDC	20 to 28 VDC	20 to 28 VDC
Power @ 25°C, Max.	1.5 watts	1.5 watts	1.5 watts	1.5 watts
Power @ -54°C, Max.	2.5 watts	2.5 watts	2.5 watts	2.5 watts
Weight, Max.	8 oz.	12 oz.	12 oz.	12 oz.
Case Style	M1-45	M4-45	M4-38	M4-45

Model No.	AV-76118	AV-77116	AV-78418	AV-78618
Frequency Range, Min.	6-18 GHz	7-16 GHz	8-18 GHz	8-18 GHz
Power Output into 50-ohm Load, Min./Max.	+13 dBm/+23 dBm	+16 dBm/+24 dBm	+13 dBm/+24 dBm	+16 dBm/+24 dBm
Frequency Drift Over Operating Temperature, Max.	60 MHz	50 MHz	70 MHz	60 MHz
Pulling Figure (12 dB Return Loss), Typ.	1.0 MHz	0.5 MHz	0.5 MHz	1.0 MHz
Pushing Figure, +15 VDC Supply, Typ.	0.1 MHz/V	0.1 MHz/V	0.1 MHz/V	0.1 MHz/V
Magnetic Susceptibility @ 60 Hz, Typ.	50 kHz/Gauss	50 kHz/Gauss	50 kHz/Gauss	50 kHz/Gauss
2nd Harmonic, Min.	-8 dBc	-12 dBc	-10 dBc	-10 dBc
3rd Harmonic, Min.	-8 dBc	-15 dBc	-15 dBc	-15 dBc
Spurious Output, Min.	-60 dBc	-60 dBc	-60 dBc	-60 dBc
Main Tuning Port Characteristics				
Sensitivity	+18±1 MHz/mA	20±1 MHz/mA	18±1 MHz/mA	18±1 MHz/mA
3 dB Bandwidth, Typ.	5 kHz	5 kHz	5 kHz	5 kHz
Linearity, Typ.	±0.25%	±0.1%	±0.1%	±0.1%
Hysteresis, Typ.	18 MHz	13 MHz	15 MHz	15 MHz
Input Impedance @ 1 kHz, Typ.	6 ohms in series with 73 mH	9 ohms in series with 60 mH	6 ohms in series with 73 mH	6 ohms in series with 73 mH
FM Port Characteristics				
Sensitivity, Typ.	450 kHz/mA	450 kHz/mA	450 kHz/mA	450 kHz/mA
3 dB Bandwidth, Typ.	1 MHz	400 kHz	1 MHz	1 MHz
Deviation at 3 dB Bandwidth, Max.	90 MHz	70 MHz	90 MHz	90 MHz
Input Impedance @ 1 kHz, Typ.	.5 ohm in series with 2.3 µH	.5 ohm in series with 2.0 µH	0.5 ohm in series with 2.3 µH	.5 ohm in series with 2.3 µH
DC Circuit Power, Max., +15±0.5/-3.5V	275 mA	300 mA	175 mA	275 mA
YIG Heater Power				
Input Voltage Range	20 to 28 VDC	20 to 28 VDC	20 to 28 VDC	20 to 28 VDC
Power @ 25°C, Max.	1.5 watts	1.5 watts	1.5 watts	1.5 watts
Power @ -54°C, Max.	2.5 watts	2.5 watts	2.5 watts	2.5 watts
Weight, Max.	17 oz.	12 oz.	17 oz.	17 oz.
Case Style	M3-60	M4-45	M3-45	M3-60

**TYPICAL PERFORMANCE @ 25°C Case Temperature**



**FM Port Sensitivity vs. Modulation Frequency**  
(Typical all AV Series Without FM Feedthrough Capacitors)

