HEWLETT PACKARD

Avantek Products

YIG-Tuned Oscillators For Industrial Applications

Technical Data

AV Series

Features

- **Full 0.5 to 50 GHz Coverage**
- **Rugged Hermetic Packaging**
- **Reliable Thin-Film Construction**
- **±0.05% to ±0.2% Tuning Linearity**
- **0° to +65°C Temperature Range**

Applications

- **Test and Measurement Equipment**
- **Instrumentation**
- **Signal Sources**
- **Wideband Receivers**

Description

HP YIG-tuned fundamental transistor oscillators are compact and lightweight and are cost-effective for commercial instrument applications. They are built using the same HP thin-film construction and hermetic packaging that has proven itself ultimately reliable under severe military and aerospace environmental conditions.

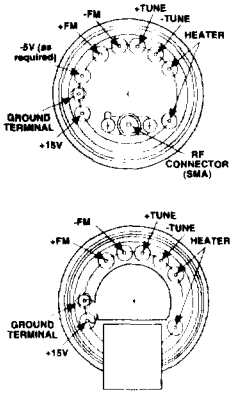
This family of oscillators is designed for wideband applications in receivers and instruments where tuning linearity and spectral purity are crucial. They make ideal local oscillators for wideband receivers and spectrum analyzers, and are excellent as signal sources for microwave sweep generators and synthesizers.

The tuning curves (I_{tuning} vs. f_{out}) for this series of YTOs are linear, and will deviate from the ideal straight line only ±0.05% to ±0.2% (typically). The power output remains flat within ±1.5 to ±3.0 dB over the entire tuning range.

All oscillators have a low inductance FM tuning coil in addition to the main tuning coil. This coil is in close proximity to the YIG sphere and is used to fine-tune the oscillator frequency, to phase lock the YTO or to frequency modulate the output signal. The sensitivity of this port is much less than that of the main tuning coil, but it has a much wider 3 dB bandwidth and permits input modulation or control signals to deviate the output frequency by as much as 15 to 100 MHz at a rate up to 1 MHz.

Pin Configuration

See Individual Specification for Case Style



(See Section 5 for detailed case drawings.)

Electrical and Performance Specifications

Guaranteed Specifications at 0° to +65°C Case Temperature into a 50-ohm Load (Unless Otherwise Noted)

Model No.	AV-70502	AV-7104	AV-7104-9	AV-7124
Frequency Range, Min.	0.5–2 GHz	1–2.2 GHz	1–2.2 GHz	1–4 GHz
Power Output Into 50-ohm Load, Min. at 25°C	30 mW/+14.8 dBm	40 mW/+16 dBm	40 mW/+16 dBm	30 mW/+14.8 dBm
Power Output Variation vs. Frequency, Max.	6.0 dB	3.0 dB	3.0 dB	6.0 dB
Operating Case Temperature Range	0° to +65°C	0° to +65°C	0° to +65°C	0° to +65°C
Frequency Drift Over Operating Temperature, Max.	10 MHz	10 MHz	10 MHz	10 MHz
Pulling Figure (12 dB Return Loss), Typ.	0.5 MHz	0.01 MHz	0.01 MHz	0.5 MHz
Pushing Figure, +15 VDC Supply, Typ.	0.5 MHz/V	0.5 MHz/V	0.5 MHz/V	0.5 MHz/V
–5 VDC Supply, Typ.	N/A	N/A	N/A	1.5 MHz/V
Magnetic Susceptibility @ 60 Hz, Typ.	50 kHz/Gauss	70 kHz/Gauss	70 kHz/Gauss	70 kHz/Gauss
2nd Harmonic, @ 25°C, Min.	–10 dBc	–15 dBc	–20 dBc	–12 dBc
3rd Harmonic, @ 25°C, Min.	–10 dBc	–20 dBc	–20 dBc	–12 dBc
Spurious Output, Min.	–60 dBc	–60 dBc	–60 dBc	–60 dBc
Main Tuning Port Characteristics				
Sensitivity	15±.08 MHz/mA	20±1 MHz/mA	20±1 MHz/mA	20±1 MHz/mA
3 dB Bandwidth, Typ.	5 kHz	5 kHz	5 kHz	5 kHz
Linearity, Typ	±0.2%	±0.1%	±0.1%	±0.15%
Hysteresis, Typ.	2 MHz	1.7 MHz	1.7 MHz	3 MHz
Input Impedance@1 kHz and 25°C Typ.	10 ohms in series with 42 mH	10 ohms in series with 95 mH	10 ohms in series with 95 mH	10 ohms in series with 95 mH
FM Port Characteristics				
Sensitivity, Typ.	310 kHz/mA	310 kHz/mA	310 kHz/mA	310 kHz/mA
3 dB Bandwidth, Typ.	400 kHz	800 kHz	800 kHz	800 kHz
Deviation at 3 dB Bandwidth, Max.	15 MHz	15 MHz	15 MHz	15 MHz
Input Impedance @ 1 MHz and 25°C Typ.	1 ohm in series with 1.25 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	200 mA	150 mA	150 mA	150 mA
–5±0.1V	N/A	N/A	N/A	50 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 @ 0°C, Max.	2.0 watts	2.0 watts	2.0 watts	2.0 watts
Weight,Max.	8 oz.	10 oz.	10 oz.	10 oz.
Case Style	M1–45	A–45	A–45	C–45

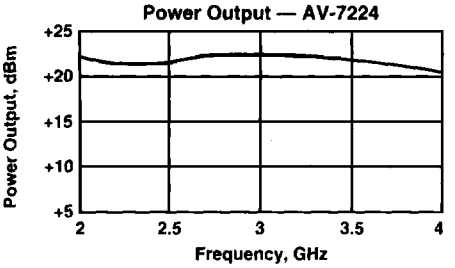
Electrical and Performance Specifications

Guaranteed Specifications at 0 to +65°C Case Temperature into a 50-ohm Load (Unless Otherwise Noted)

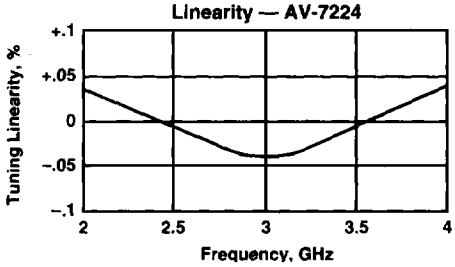
Model No.	AV-7203	AV-7224	AV-7224-9	AV-7298
Frequency Range, Min.	2–4 GHz	2–4 GHz	2–4 GHz	2–8 GHz
Power Output into 50–ohm Load, Min. at 25°C	25 mW/+14 dBm	100 mW/+20 dBm	100 mW/+20 dBm	30 mW/+14.8 dBm
Power Output Variation vs. Frequency, Max.	3.0 dB	3.0 dB	3.0 dB	6.0 dB
Operating Case Temperature Range	0° to +65°C	0° to +65°C	0° to +65°C	0° to +65°C
Frequency Drift Over Operating Temperature, Max.	10 MHz	10 MHz	10 MHz	20 MHz
Pulling Figure (12 dB Return Loss), Typ.	0.5 MHz	0.5 MHz	0.5 MHZ	0.1 MHz
Pushing Figure, +15 VDC Supply, Typ.	0.5 MHz/V	0.1 MHz/V	0.1 MHz/V	0.1 MHz/V
–5 VDC Supply, Typ.	N/A	1.5 MHz/V	1.5 MHz/V	1.0 MHz/V
Magnetic Susceptibility @ 60 Hz, Typ.	70 kHz/Gauss	70 kHz/Gauss	70 kHz Gauss	70 kHz/Gauss
2nd Harmonic, @ 25°C, Min.	–12 dBc	–12 dBc	–20 dBc	–12 dBc
3rd Harmonic, @ 25°C, Min.	–20 dBc	–12 dBc	–20 dBc	–12 dBc
Spurious Output, Min.	–60 dBc	–60 dBc	–60 dBc	–60 dBc
Single Sideband Phase Noise				
@ 10 kHz Offset, Typ.	N/A	N/A	N/A	-105 dBc/ Hz
@ 100 kHz Offset, Typ.	N/A	N/A	N/A	-130 dBc/ Hz
Main Tuning Port Characteristics				
Sensitivity	20±1 MHz/mA	20±1 MHz/mA	20±1 MHz/mA	20±1 MHz/mA
3 dB Bandwidth, Typ.	5 kHz	5 kHz	5 kHz	5 kHz
Linearity, Typ.	±.05%	±.05%	±.05%	± 0.1%
Hysteresis, Typ.	3 MHz	3 MHz	3 MHz	6 MHz
Input Impedence @ 1 kHz and 25°C, Typ.	10 ohms in series with 95 mH	10 ohms in series with 95 mH	10 ohms in series with 95 mH	10 ohms in series with 95 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.	20 MHz	20 MHz	20 MHz	40 MHz
Input Impedance @ 1 MHz and 25°C, 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	100 mA	150 mA	150 mA	200 mA
–5.0±.0.1 V	N/A	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 @ 0°C, Max.	2.0 watts	2.0 watts	2.0 watts	2.0 watts
Weight, Max.	10 oz.	10 oz.	10 oz.	10 oz.
Case Style	A–45	C–45	C–45	C–45

Typical Performance

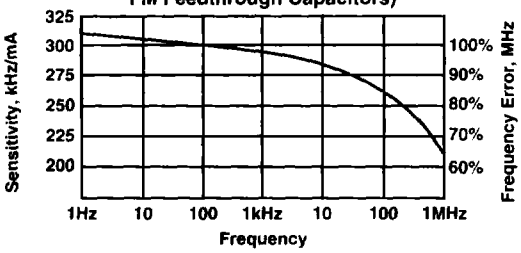
Power Output — AV-7224



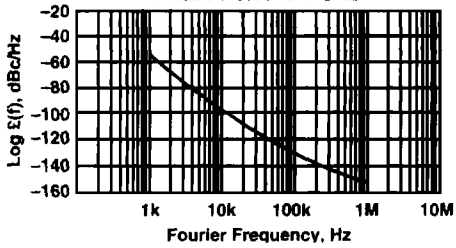
Linearity — AV-7224



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



Typical Single Sideband
Phase Noise @ 4 GHz



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Electrical and Performance Specifications

Guaranteed Specifications at 0 to +65°C Case Temperature into a 50-ohm Load (Unless Otherwise Noted)

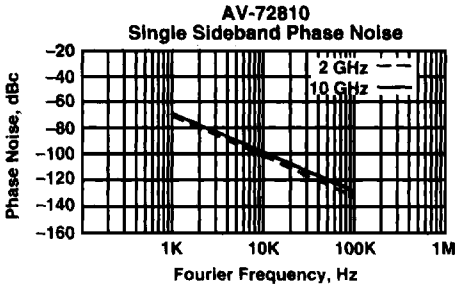
Model No.	AV-7288	AV-72B8	AV-72810	AV-72012
Frequency Range, Min.	2–8 GHz	2–8 GHz	2–10 GHz	2–12.4 GHz
Power Output into 50-ohm Load, Min. at 25°C	100 mW/+20 dBm	200 mW/+23 dBm	25 mW/+14.0 dBm	40 mW/+16 dBm
Power Output Variation vs. Frequency, Max.	6.0 dB	6.0 dB	6.0 dB	6.0 dB
Operating Case Temperature Range	0° to +65°C	0° to +65°C	0° to +65°C	0° to +65°C
Frequency Drift Over Operating Temperature, Max.	20 MHz	20 MHz	20 MHz	25 MHz
Pulling Figure (12 dB Return Loss), Typ.	0.2 MHz	0.2 MHz	0.1 MHz	0.5 MHz
Pushing Figure, +15 VDC Supply, Typ.	0.1 MHz/V	0.1 MHz/V	0.1 MHz/V	0.1 MHz/V
–5 VDC Supply, Typ.	2.0 MHz/V	N/A	1.0 MHz/V	1.5 MHz/V
Magnetic Susceptibility @ 60 Hz, Typ.	70 kHz/Gauss	70 kHz/Gauss	70 kHz/Gauss	50 kHz/Gauss
2nd Harmonic, @ 25°C, Min.	–8 dBc	–10 dBc	–12 dBc	–10 dBc
3rd Harmonic, @ 25°C, Min.	–8 dBc	–10 dBc	–12 dBc	–10 dBc
Spurious Output, Min.	–60 dBc	–60 dBc	–60 dBc	–60 dBc/Hz
Single Sideband Phase Noise				
@ 10 kHz Offset, Typ.	N/A	N/A	N/A	–100 dBc/ Hz
@ 100 kHz Offset, Typ.	N/A	N/A	N/A	–130 dBc/ Hz
Main Tuning Port Characteristics				
Sensitivity	20±1 MHz/mA	20±1 MHz/mA	20±1 MHz/mA	20±1 MHz/mA
3 dB Bandwidth, Typ.	5 kHz	5 kHz	5 kHz	5 kHz
Linearity, Typ.	±0.1%	±.1%	±0.1%	± 0.1%
Hysteresis, Typ.	9 MHz	8 MHz	8 MHz	10 MHz
Input Impedence @1 kHz and 25°C, Typ.	10 ohms in series with 95 mH	10 ohms in series with 95 mH	10 ohms in series with 95 mH	9 ohms in series with 60 mH
FM Port Characteristics				
Sensitivity, Typ.	310 kHz/mA	310 kHz/mA	310 kHz/mA	450 kHz/mA
3 dB Bandwidth, Typ.	800 kHz	400 kHz	800 kHz	200 kHz
Deviation at 3 dB Bandwidth, Max.	40 MHz	40 MHz	40 MHz	40 MHz
Input Impedance @ 1 MHz and 25°C, Typ.	1 ohm in series with 1.7 µH	1 ohm in series with 1.25 µH	1 ohm in series with 1.7 µH	0.5 ohm in series with 2.0 µH
DC Circuit Power, Max.				
+15±0.5V	250 mA	350 mA	200 mA	175 mA
–5.0±.0.1 V	60 mA	60 mA	25 mA	25 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 @ 0°C, Max.	2.0 watts	2.0 watts	2.0 watts	2.0 watts
Weight, Max.	10 oz.	10 oz.	10 oz.	12 oz.
Case Style	C–45	C–60	C–45	M4–45

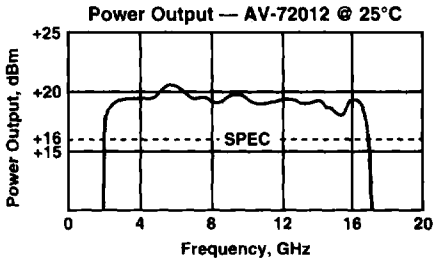
Electrical and Performance Specifications

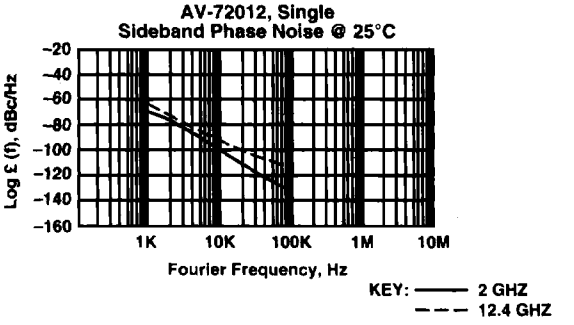
Guaranteed Specifications at 0 to +65°C Case Temperature into a 50-ohm Load (Unless Otherwise Noted)

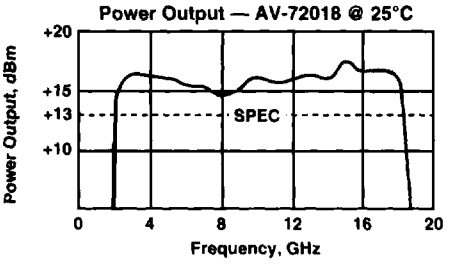
Model No.	AV-72018	AV-7453	AV-7453-9	AV-7443
Frequency Range, Min.	2–18 GHz	4–8 GHz	4–8 GHz	4–8 GHz
Power Output into 50-ohm Load, Min. at 25°C	20 mW/+13 dBm	50 mW/+17 dBm	40 mW/+16 dBm	100 mW/+20 dBm
Power Output Variation vs. Frequency, Max.	6.0 dB	6.0 dB	6.0 dB	6.0 dB
Operating Case Temperature Range	0° to +65°C	0° to +65°C	0° to +65°C	0° to +65°C
Frequency Drift Over Operating Temperature, Max.	40 MHz	20 MHz	20 MHz	20 MHz
Pulling Figure (12 dB Return Loss), Typ.	0.1 MHz	0.5 MHz	0.5 MHZ	0.2 MHz
Pushing Figure, +15 VDC Supply, Typ.	0.1 MHz/V	0.1 MHz/V	0.1 MHz/V	0.1 MHz/V
–5 VDC Supply, Typ.	5.0 MHz/V	1.5 MHz/V	1.5 MHz/V	2.0 MHz/V
Magnetic Susceptibility @ 60 Hz, Typ.	50 kHz/Gauss	70 kHz/Gauss	70 kHz/Gauss	70 kHz/Gauss
2nd Harmonic, @ 25°C, Min.	–8 dBc	–12 dBc	–20 dBc	–12 dBc
3rd Harmonic, @ 25°C, Min.	–10 dBc	–20 dBc	–20 dBc	–20 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	20±1 MHz/mA	20±1 MHz/mA
3 dB Bandwidth, Typ.	5 kHz	5 kHz	5 kHz	5 kHz
Linearity, Typ.	±0.1%	±.05%	±.05%	± .05%
Hysteresis, Typ.	16 MHz	6 MHz	6 MHz	6 MHz
Input Impedence @1 kHz and 25°C, Typ.	6 ohms in series with 73 mH	10 ohms in series with 95 mH	10 ohms in series with 95 mH	10 ohms in series with 95 mH
FM Port Characteristics				
Sensitivity, Typ.	450 kHz/mA	310 kHz/mA	310 kHz/mA	310 kHz/mA
3 dB Bandwidth, Typ.	200 kHz	800 kHz	800 kHz	800 kHz
Deviation at 3 dB Bandwidth, Max.	70 MHz	40 MHz	40 MHz	40 MHz
Input Impedance @ 1 MHz and 25°C, Typ.	0.5 ohm in series with 2.0 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	350 mA	150 mA	150 mA	200 mA
–5.0±.0.1 V	30 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 @ 0°C, Max.	2.0 watts	2.0 watts	2.0 watts	2.0 watts
Weight, Max.	17 oz.	10 oz.	10 oz.	10 oz.
Case Style	M3–60	C–38	C–38	C–45

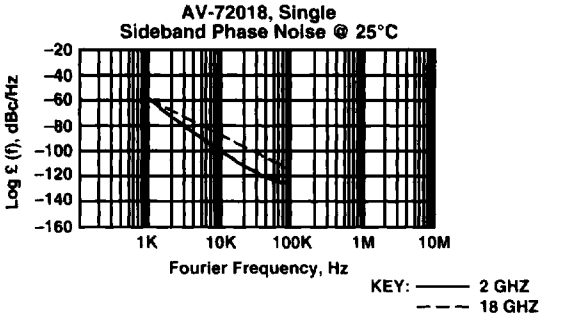
Typical Performance

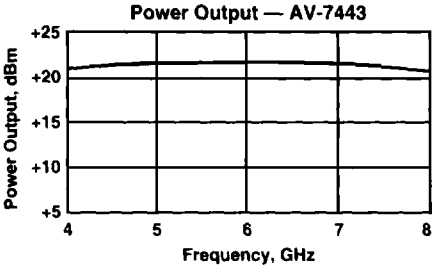


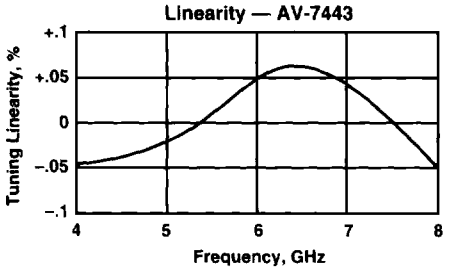












Electrical and Performance Specifications

Guaranteed Specifications at 0 to +65°C Case Temperature into a 50-ohm Load (Unless Otherwise Noted)

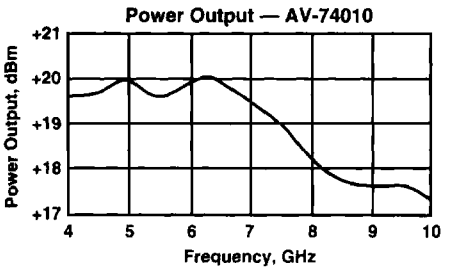
Model No.	AV-7443-9	AV-74010	AV-74018	AV-76318
Frequency Range, Min.	4–8 GHz	4–10 GHz	4–18 GHz	6–18 GHz
Power Output into 50-ohm Load, Min. at 25°C	60 mW/+17.8 dBm	40 mW/+16 dBm	50 mW/+17 dBm	40 mW/+16 dBm
Power Output Variation vs. Frequency, Max.	6.0 dB	6.0 dB	6.0 dB	6.0 dB
Operating Case Temperature Range	0° to +65°C	0° to +65°C	0° to +65°C	0° to +65°C
Frequency Drift Over Operating Temperature, Max.	20 MHz	20 MHz	40 MHz	40 MHz
Pulling Figure (12 dB Return Loss), Typ.	0.2 MHz	0.1 MHz	0.1 MHz	0.1 MHz
Pushing Figure, +15 VDC Supply, Typ.	0.1 MHz/V	0.1 MHz/V	0.1 MHz/V	0.1 MHz/V
−5 VDC Supply, Typ.	2.0 MHz/V	1.5 MHz/V	2.0 MHz/V	1.5 MHz/V
Magnetic Susceptibility @ 60 Hz, Typ.	70 kHz/Gauss	70 kHz/Gauss	50 kHz/Gauss	50 kHz/Gauss
2nd Harmonic, @ 25°C, Min.	−20 dBc	−12 dBc	−10 dBc	−10 dBc
3rd Harmonic, @ 25°C, Min.	−20 dBc	−15 dBc	−20 dBc	−12 dBc
Spurious Output, Min.	−60 dBc	−60 dBc	−60 dBc	−60 dBc
Single Sideband Phase Noise				
@ 10 kHz Offset, Typ.	N/A	N/A	N/A	−95 dBc/ Hz
@ 100 kHz Offset, Typ.	N/A	N/A	N/A	−120 dBc/ Hz
Main Tuning Port Characteristics				
Sensitivity	20±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.	±0.1%	±0.1%	±0.1%	± 0.1%
Hysteresis, Typ.	6 MHz	9 MHz	16 MHz	12 MHz
Input Impedence @1 kHz and 25°C, Typ.	10 ohms in series with 95 mH	10 ohms in series with 95 mH	6 ohms in series with 73 mH	6 ohms in series with 73 mH
FM Port Characteristics				
Sensitivity, Typ.	310 kHz/mA	310 kHz/mA	450 kHz/mA	425 kHz/mA
3 dB Bandwidth, Typ.	800 kHz	800 kHz	200 kHz	1 MHz
Deviation at 3 dB Bandwidth, Max.	40 MHz	40 MHz	70 MHz	90 MHz
Input Impedance @ 1 MHz and 25°C, Typ.	1 ohm in series with 1.7 µH	1 ohm in series with 2.3 µH	0.5 ohm in series with 2.0 µH	0.5 ohm in series with 2.3 µH
DC Circuit Power, Max.				
+15±0.5V	200 mA	200 mA	350 mA	350 mA
−5.0±.0.1 V	60 mA	60 mA	30 mA	30 mA
YIG Heater Power				
Input Voltage Range	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	—
Power @ 0°C, Max.	2.0 watts	2.0 watts	2.0 watts	—
Weight, Max.	10 oz.	10 oz.	17 oz.	17 oz.
Case Style	C–45	C–45	M3–60	M3–60

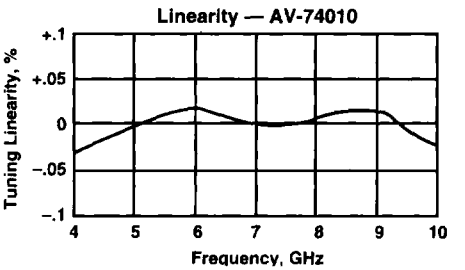
Electrical and Performance Specifications

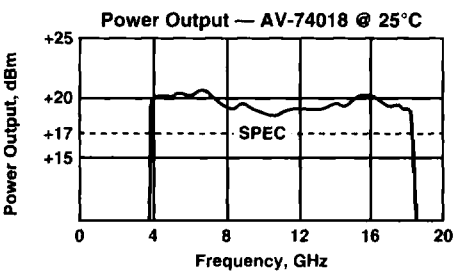
Guaranteed Specifications at 0 to +65°C Case Temperature into a 50-ohm Load (Unless Otherwise Noted)

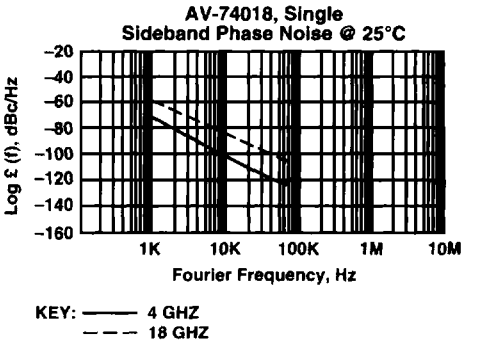
Model No.	AV-7871	AV-7871-9	AV-78012	AV-7873
Frequency Range, Min.	8–12.4 GHz	8–12.4 GHz	8–12.4 GHz	8–12.4 GHz
Power Output into 50-ohm Load, Min. at 25°C	30 mW/+14.8 dBm	30 mW/+14.8 dBm	60 mW/+17.8 dBm	100 mW/+20 dBm
Power Output Variation vs. Frequency, Max.	6.0 dB	6.0 dB	6.0 dB	6.0 dB
Operating Case Temperature Range	0° to +65°C	0° to +65°C	0° to +65°C	0° to +65°C
Frequency Drift Over Operating Temperature, Max.	25 MHz	25 MHz	20 MHz	25 MHz
Pulling Figure (12 dB Return Loss), Typ.	5.0 MHz	5.0 MHz	0.5 MHz	1 MHz
Pushing Figure, +15 VDC Supply, Typ.	0.1 MHz/V	0.1 MHz/V	0.1 MHz/V	0.1 MHz/V
–5 VDC Supply, Typ.	N/A	N/A	1.5 MHz/V	N/A
Magnetic Susceptibility @ 60 Hz, Typ.	50 kHz/Gauss	50 kHz/Gauss	50 kHz Gauss	50 kHz/Gauss
2nd Harmonic, @ 25°C, Min.	–12 dBc	–20 dBc	–12 dBc	–12 dBc
3rd Harmonic, @ 25°C, Min.	–20 dBc	–20 dBc	–20 dBc	–20 dBc
Spurious Output, Min.	–60 dBc	–60 dBc	–60 dBc	–60 dBc
Single Sideband Phase Noise				
@ 10 kHz Offset, Typ.	N/A	N/A	–105 dBc/ Hz	N/A
@ 100 kHz Offset, Typ.	N/A	N/A	–135 dBc/ Hz	N/A
Main Tuning Port Characteristics				
Sensitivity	20±1 MHz/mA	20±1 MHz/mA	20±1 MHz/mA	20±1 MHz/mA
3 dB Bandwidth, Typ.	5 kHz	5 kHz	5 kHz	5 kHz
Linearity, Typ.	±0.01%	±0.1%	±0.05%	±0.1%
Hysteresis, Typ.	6 MHz	6 MHz	5 MHz	6 MHz
Input Impedence @1 kHz and 25°C, Typ.	9 ohms in series with 60 mH	9 ohms in series with 60 mH	9 ohms in series with 60 mH	9 ohms in series with 60 mH
FM Port Characteristics				
Sensitivity, Typ.	450 kHz/mA	450 kHz/mA	450 kHz/mA	450 kHz/mA
3 dB Bandwidth, Typ.	400 kHz	400 kHz	400 kHz	400 kHz
Deviation at 3 dB Bandwidth, Max.	40 MHz	40 MHz	40 MHz	40 MHz
Input Impedance @ 1 MHz and 25°C, Typ.	0.5 ohm in series with 2.0 µH	0.5 ohm in series with 1.7 µH	0.5 ohm in series with 2.0 µH	0.5 ohm in series with 2.0 µH
DC Circuit Power, Max.				
+15±0.5V	125 mA	125 mA	250 mA	250 mA
–5.0±.0.1 V	—	—	40 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 @ 0°C, Max.	2.0 watts	2.0 watts	2.0 watts	2.0 watts
Weight, Max.	12 oz.	12 oz.	12 oz.	12 oz.
Case Style	M4–45	M4–45	M4–45	M4–45

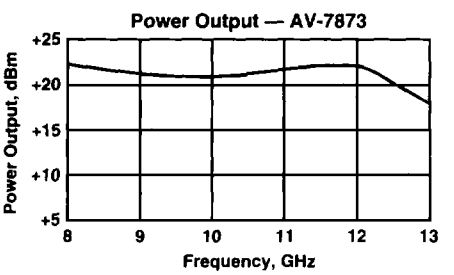
Typical Performance

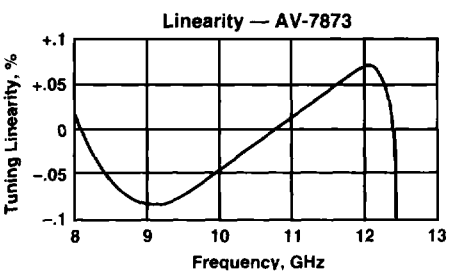


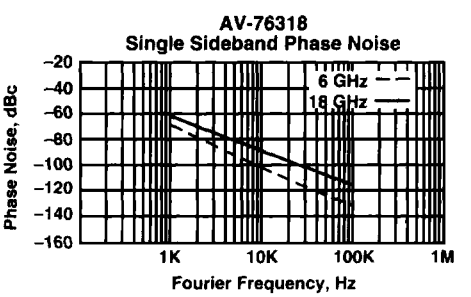












Electrical and Performance Specifications

Guaranteed Specifications at 0 to +65°C Case Temperature into a 50-ohm Load (Unless Otherwise Noted)

Model No.	AV-7873-9	AV-78218	AV-78518	AV-78020
Frequency Range, Min.	8–12.4 GHz	8–18 GHz	6–18 GHz	8–20 GHz
Power Output into 50-ohm Load, Min. at 25°C	100 mW/+20 dBm	30 mW/+14.8 dBm	60 mW/+17.8 dBm	20 mW/+13 dBm
Power Output Variation vs. Frequency, Max.	6.0 dB	6.0 dB	6.0 dB	8.0 dB
Operating Case Temperature Range	0° to +65°C	0° to +65°C	0° to +65°C	0° to +65°C
Frequency Drift Over Operating Temperature, Max.	25 MHz	40 MHz	40 MHz	40 MHz
Pulling Figure (12 dB Return Loss), Typ.	1.0 MHz	0.5 MHz	1 MHz	1 MHz
Pushing Figure, +15 VDC Supply, Typ.	0.1 MHz/V	0.1 MHz/V	0.1 MHz/V	0.1 MHz/V
−5 VDC Supply, Typ.	N/A	N/A	N/A	N/A
Magnetic Susceptibility @ 60 Hz, Typ.	50 kHz/Gauss	50 kHz/Gauss	50 kHz Gauss	50 kHz/Gauss
2nd Harmonic, @ 25°C, Min.	−20 dBc	−12 dBc	−12 dBc	−12 dBc
3rd Harmonic, @ 25°C, Min.	−20 dBc	—	—	—
Spurious Output, Min.	−60 dBc	−60 dBc	−60 dBc	−60 dBc
Main Tuning Port Characteristics				
Sensitivity	20±1 MHz/mA	18±1 MHz/mA	18±1 MHz/mA	20±1 MHz/mA
3 dB Bandwidth, Typ.	5 kHz	5 kHz	5 kHz	5 kHz
Linearity, Typ.	±0.1%	±0.1%	±0.1%	± 0.1%
Hysteresis, Typ.	6 MHz	15 MHz	18 MHz	18 MHz
Input Impedence @1 kHz and 25°C, Typ.	9 ohms in series with 60 mH	6 ohms in series with 73 mH	6 ohms in series with 51 mH	7 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.	400 kHz	1 MHz	1 MHz	1 MHz
Deviation at 3 dB Bandwidth, Max.	40 MHz	90 MHz	90 MHz	90 MHz
Input Impedance @ 1 MHz and 25°C, Typ.	0.5 ohm in series with 2.0 µH	0.5 ohm in series with 2.3 µH	0.5 ohm in series with 2.3 µH	0.5 ohm in series with 2.3 µH
DC Circuit Power, Max.				
+15+0.5,−3.5V	250 mA	175 mA	275 mA	275 mA
−5.0±.0.1V	—	—	—	—
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 @ 0°C, Max.	2.0 watts	2.0 watts	2.0 watts	2.0 watts
Weight, Max.	10 oz.	17 oz.	17 oz.	17 oz.
Case Style	M4–45	M3–45	M3–60	M3–60

Electrical and Performance Specifications

Guaranteed Specifications at 0 to +65°C Case Temperature into a 50-ohm Load (Unless Otherwise Noted)

Model No.	AV-78020-9	AV-71251	AV-71251-9	AV-12018
Frequency Range, Min.	8–20 GHz	12–18 GHz	12–18 GHz	12–18 GHz
Power Output into 50–ohm Load, Min. at 25°C	20 mW/+13 dBm	40 mW/+16 dBm	30 mW/+14.8 dBm	50 mW/+17 dBm
Power Output Variation vs. Frequency, Max.	8.0 dB	6.0 dB	6.0 dB	6.0 dB
Operating Case Temperature Range	0° to +65°C	0° to +65°C	0° to +65°C	0° to +65°C
Frequency Drift Over Operating Temperature, Max.	40 MHz	40 MHz	40 MHz	40 MHz
Pulling Figure (12 dB Return Loss), Typ.	1.0 MHz	1 MHz	1.0 MHZ	0.1 MHz
Pushing Figure, +15 VDC Supply, Typ.	0.1 MHz/V	0.1 MHz/V	0.1 MHz/V	0.1 MHz/V
–5 VDC Supply, Typ.	N/A	N/A	N/A	1.5 MHz/V
Magnetic Susceptibility @ 60 Hz, Typ.	50 kHz/Gauss	50 kHz/Gauss	50 kHz Gauss	50 kHz/Gauss
2nd Harmonic, @ 25°C, Min.	–20 dBc	–12 dBc	–20 dBc	–20 dBc
3rd Harmonic, @ 25°C, Min.	–20 dBc	—	–20 dBc	–20 dBc
Spurious Output, Min.	–60 dBc	–60 dBc	–60 dBc	–60 dBc
Single Sideband Phase Noise				
@ 10 kHz Offset, Typ.	N/A	N/A	N/A	–100 dBc/Hz
@ 100 kHz Offset, Typ.	N/A	N/A	N/A	–125 dBc/Hz
Main Tuning Port Characteristics				
Sensitivity	20±1 MHz/mA	18±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.	±0.15%	±0.1%	±0.1%	± 0.1%
Hysteresis, Typ.	18 MHz	9 MHz	9 MHz	6 MHz
Input Impedence @1 kHz and 25°C, Typ.	7 ohms in series with 73 mH	6 ohms in series with 73 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	425 kHz/mA
3 dB Bandwidth, Typ.	1 MHz	1 MHz	1 MHz	1 MHz
Deviation at 3 dB Bandwidth, Max.	90 MHz	70 MHz	70 MHz	90 MHz
Input Impedance @ 1 MHz and 25°C, Typ.	0.5 ohm in series with 2.3 µH	0.5 ohm in series with 2.3 µH	0.5 ohm in series with 2.3 µH	0.5 ohm in series with 2.3 µH
DC Circuit Power, Max.				
+15±0.5V	—	150 mA	—	350 mA
–5.0±.0.1V	—	—	—	30 mA
+15+0.5, –3.5V	275 mA	—	150 mA	—
YIG Heater Power				
Input Voltage Range	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	—
Power @ 0°C, Max.	2.0 watts	2.0 watts	2.0 watts	—
Weight, Max.	17 oz.	17 oz.	17 oz.	17 oz.
Case Style	M3–60	M3–60	M3–60	M3–60

Electrical and Performance Specifications

Guaranteed Specifications at 0 to +65°C Case Temperature into a 50-ohm Load (Unless Otherwise Noted)

Model No.	AV-71220	AV-18326	AV-18030	AV-20040
Frequency Range, Min.	12–20 GHz	18–26.5 GHz	18–30 GHz	20–40 GHz
Power Output into 50-ohm Load, Min. at 25°C	40 mW/+16 dBm	60 mW/+17.8 dBm	40 mW/+16 dBm	10 mW/+10 dBm
Power Output Variation vs. Frequency, Max.	6.0 dB	6.0 dB	6.0 dB	6.0 dB
Operating Case Temperature Range	0° to +65°C	0° to +65°C	0° to +65°C	0° to +65°C
Frequency Drift Over Operating Temperature, Max.	40 MHz	40 MHz	60 MHz	60 MHz
Pulling Figure (12 dB Return Loss), Typ.	0.5 MHz	1.0 MHz	1.0 MHZ	0.5 MHz
Pushing Figure, +15 VDC Supply, Typ.	0.1 MHz/V	0.1 MHz/V	0.1 MHz/V	0.1 MHz/V
–5 VDC Supply, Typ.	N/A	N/A	N/A	N/A
Magnetic Susceptibility @ 60 Hz, Typ.	50 kHz/Gauss	50 kHz/Gauss	50 kHz Gauss	50 kHz/Gauss
2nd Harmonic, @ 25°C, Min.	–15 dBc	—	—	—
3rd Harmonic, @ 25°C, Min.	—	—	—	—
Spurious Output, Min.	–60 dBc	–60 dBc	–60 dBc	–60 dBc
Main Tuning Port Characteristics				
Sensitivity	18±1 MHz/mA	30±1.5 MHz/mA	30±1.5 MHz/mA	40±2 MHz/mA
3 dB Bandwidth, Typ.	5 kHz	5 kHz	5 kHz	2 kHz
Linearity, Typ.	±0.15%	±0.05%	±0.1%	± 0.3%
Hysteresis, Typ.	12 MHz	10 MHz	18 MHz	50 MHz
Input Impedence @1 kHz and 25°C, Typ.	6 ohms in series with 73 mH	10 ohms in series with 150 mH	6.5 ohms in series with 95 mH	10.5 ohms in series with 125 mH
FM Port Characteristics				
Sensitivity, Typ.	450 kHz/mA	425 kHz/mA	425 kHz/mA	400 kHz mA
3 dB Bandwidth, Typ.	1 MHz	400 kHz	400 kHz	100 kHz
Deviation at 3 dB Bandwidth, Max.	70 MHz	90 MHz	90 MHz	100 MHz
Input Impedance @ 1 MHz and 25°C, Typ.	0.5 ohm in series with 2.3 µH	0.35 ohm in series with 2.0 µH	0.35 ohm in series with 2.0 µH	0.3 ohm in series with 1 µH
DC Circuit Power, Max.				
+15±0.5V	200 mA	200 mA	200 mA	250 mA
–5.0±.0.1 V	—	—	—	—
YIG Heater Power				
Input Voltage Range	20 to 28 VDC	—	—	—
Power @ 25°C, Max.	1.5 watts	—	—	—
Power @ 0°C, Max.	2.0 watts	—	—	—
Weight, Max.	17 oz.	20 oz.	20 oz.	17 oz.
Case Style	M3–60	M5–60	M5–60	M5–60

Electrical and Performance Specifications

Guaranteed Specifications at 0 to +65°C Case Temperature into a 50-ohm Load (Unless Otherwise Noted)

Model No.	AV-26240M	AV-26240W	AV-33050
Frequency Range, Min.	26.5–40 GHz	26.5–40 GHz	33–50 GHz
Power Output into 50-ohm Load, Min. at 25°C	20 mW/+13 dBm	20 mW/+13 dBm	5 mW/+7 dBm
Power Output Variation vs. Frequency, Max.	4.0 dB	4.0 dB	6.0 dB
Operating Case Temperature Range	0° to +65°C	0° to +65°C	0° to +65°C
Frequency Drift Over Operating Temperature, Max.	60 MHz	60 MHz	60 MHz
Pulling Figure (12 dB Return Loss), Typ.	0.5 MHz	0.5 MHz	0.1 MHz
Pushing Figure, +15 VDC Supply, Typ.	0.1 MHz/V	0.1 MHz/V	0.1 MHz/V
–5 VDC Supply, Typ.	N/A	N/A	N/A
Magnetic Susceptibility @ 60 Hz, Typ.	50 kHz/Gauss	50 kHz/Gauss	50 kHz Gauss
2nd Harmonic, @ 25°C, Min.	—	—	—
3rd Harmonic, @ 25°C, Min.	—	—	—
Spurious Output, Min.	–60 dBc	–60 dBc	–60 dBc
Main Tuning Port Characteristics			
Sensitivity	40±2 MHz/mA	40±2 MHz/mA	50±3 MHz/mA
3 dB Bandwidth, Typ.	2 kHz	2 kHz	2 kHz
Linearity, Typ.	±0.1%	±0.1%	±0.2%
Hysteresis, Typ.	40 MHz	40 MHz	65 MHz
Input Impedence @1 kHz and 25°C, Typ.	6 ohms in series with 90 mH	6 ohms in series with 90 mH	10.5 ohms in series with 130 mH
FM Port Characteristics			
Sensitivity, Typ.	430 kHz/mA	430 kHz/mA	400 kHz/mA
3 dB Bandwidth, Typ.	50 kHz	50 kHz	100 kHz
Deviation at 3 dB Bandwidth, Max.	100 MHz	100 MHz	100 MHz
Input Impedance @ 1 MHz and 25°C, Typ.	0.3 ohm in series with 0.5 µH	0.3 ohm in series with 0.5 µH	0.3 ohm in series with 1 µH
DC Circuit Power, Max.			
+15±0.5V	150 mA	150 mA	150 mA
–5.0±.0.1 V	—	—	—
YIG Heater Power			
Input Voltage Range	—	—	—
Power @ 25°C, Max.	—	—	—
Power @ 0°C, Max.	—	—	—
Weight, Max.	20 oz.	20 oz.	20 oz.
Case Style	M5–60	M5–60WR28	M5–45WR22