

**Quartzlock**

**A5**

<10ps/°C  
Phase Stability

# 1...100MHz Distribution Amplifiers

*exhibit low 1/f AM & PM noise*



## DESCRIPTION

The Quartzlock A5 Distribution Amplifier is a precision Amplifier for use with Frequency Standards or other signals where a need for multiple outputs from a single generator is required. Versions are available in 4 output Eurocard (160 x 100mm) or complete instruments with 4, 12, 24 or 32 outputs

## FEATURES

- Bipolar Junction Amplifiers
- 24Vdc or 90 ... 240Vac operation
- High Isolation between inputs and outputs
- Low phase noise
- High Stability
- Low Harmonic Distortion

## BENEFITS

- Hydrogen Maser compatible performance
- Retains original input signal characteristics

## APPLICATIONS

- National Standards Laboratories
- Calibration Laboratories
- Research and Development
- OEM use of 4 output Eurocard
- Production Test

A5-32



A5-12



A5-4



## STANDARD SPECIFICATIONS

<b>No of outputs:</b>	4 to 32 in multiples of 4
<b>No of inputs:</b>	1 to 4 (Note mixed frequencies are permitted in one unit)
<b>Input characteristics:</b>	a) Impedance: 50 Ohm nominal b) Level: 0dBm to +13dBm adjustable, sine wave c) Input SWR: <1.2:1 at 10MHz <1.5:1 at 100MHz
<b>Output Characteristics:</b>	a) Impedance: 50 Ohm nominal b) Level: 13dBm nominal into 50 Ohms (1 volt RMS) c) Output SWR: <1.2:1 d) Maximum Output: 17 dBm at 10MHz typical 15dBm at 100MHz typical
<b>Frequency Response:</b>	2MHz to 100 MHz +/-1.5dB 500kHz to 100MHz +/-3dB
<b>Harmonics:</b>	(at nominal output, 10MHz) (Source harmonics less than -60dBc) Second Harmonic <-50dBc Third Harmonic <-40dBc
<b>Isolation:</b>	a) Output to output: >90dB (adjacent outputs) at 10MHz 130dB at 5MHz (non adjacent outputs) typ. >70dB (adjacent outputs) at 100MHz Typically >110dB at 10MHz and >90dBm at 100MHz b) Output to input: >110dB at 10MHz >90dB at 100 MHz c) Input to input: >90dB at 5MHz >80dB at 10MHz >55dB at 100MHz
<b>Phase Noise:</b>	(10MHz) Offset: 1Hz Phase noise, dBc -140 10Hz -150 >100Hz -165
<b>Spurious Outputs:</b>	<-110dBc (above 1MHz) (typically <-120dBc) (Spurious outputs are exclusively from the switch mode power supply).
<b>Broadband noise:</b>	<-148dBm/Hz
<b>Delay match between outputs:</b>	<2ns (within group of 4 outputs <0.3ns)
<b>Temperature stability of delay:</b>	10ps/deg C
<b>Phase change at output:</b>	due to open or short at any other output (Calculated from isolation): 0.5ps (at 10MHz)
<b>Shot term stability:</b>	(at 10MHz): <10-13 (tau=1sec) <3x10-14 (tau=10sec) <10-14 (tau=100sec)
<b>Output Failure Alarm:</b>	LED on each output + common active low logic output



## MEASUREMENT RESULTS

<b>Input Characteristics:</b>	Impedance: 50 ohm Level: +13dBm, 1V RMS Level max: 1.2VRMS, 5MHz
<b>Output Characteristics:</b>	Impedance: 50 ohm Level: 1V into 50 Ohms (RMS) Maximum: 1.1V into 50 Ohms
<b>Frequency Response:</b>	800 kHz - 100MHz ± 1dB
<b>Harmonics:</b>	5 MHz source harmonics less than -60dBc
<b>Isolation:</b>	Output to output: >110dB 5-60 MHz Non-adjacent o/p typ @ 5MHz: 130dB Output to Input: >70dB 70 - 100 MHz
<b>Stability:</b>	$\sigma(2\tau)1s - 3 \times 10^{-13}$
<b>Phase Noise (5 MHz) Offset:</b>	1Hz - 130dBc, 10Hz - 140dBc, 1kHz - 160dBc
<b>Phase Stability:</b>	10ps/°C (5 MHz)

## OPTION 001 Tuned outputs

Option 001 provides tuned rather than broadband outputs. This option is recommended for distribution of standard frequencies where delay variation between outputs is not important. The specifications of the standard version apply except for the following:

Frequency Response: Equivalent to a single pole bandpass filter centred on the specified frequency and with a 3dB bandwidth of 7%. Centre frequency to be specified between 1 MHz and 100MHz

Harmonics: <-60dBc Broadband noise: Modified by filter, therefore total integrated noise approx 20dB lower than broadband version.

Delay match between outputs TBA, Temperature stability of delay TBA

## OPTION 002 Ground Isolated outputs

Option 002 provides ground isolated outputs. This option may be used if long lengths of cable are used to drive instruments where ground potential differences exist. The specifications are as for the standard version with the addition of the following:

Ground Isolation: DC resistance between output connector ground and local ground: 1 MOhm. Capacitance between output connector ground and local ground: 1 nF.

Maximum common mode voltage: 30 volts DC + peak AC

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