PicoAmp

Distribution Amplifier Module
Model PA1

Hamilton Technical Services
650 Distant Island Drive
Beaufort, SC 29907 USA
843-525-6495
bill@wriley.com

The new PicoAmp Module is a small and inexpensive USB-powered 4-channel 10 MHz RF distribution amplifier to supply reference signals to four PicoPak clock measurement modules.

The PicoAmp Model PA1 is a quad RF distribution amplifier module intended to supply isolated 10 MHz reference signals to one to four PicoPak clock measurement modules. Like the PicoPak, it is USB-powered and has the same extruded aluminum case and SMA RF connectors. One PicoAmp can therefore support up to four PicoPak modules from a single 10 MHz reference source, which a single PC can easily support. The PicoAmp has unity gain with excellent channel-to-channel isolation and low temperature sensitivity, and adds negligible noise to a PicoPak time domain stability measurement.

Preliminary Specifications

Parameter		Specification
Channels	# I/Os	1 input, 4 coherent isolated outputs
RF Input	Frequency	10 MHz (can be used at lower RF frequencies)
	Waveform	Sinusoidal
	Level	0 to +10 dBm (+7 dBm nominal)
	Impedance	50 ohms nominal
	VSWR	≤ 1.5:1 between 5 to 15 MHz
RF Outputs	Frequency	10 MHz
	Waveform	Sinusoidal
	Level	0 to +10 dBm (nominally same as input)
	Impedance	50 ohms
	VSWR	≤ 1.5:1 at 10 MHz
Isolation	Output-to-Output	$\geq$ 70 dB (78 dB typical) at 10 MHz with 50 Ω terminations
	Output-to-Input	$\geq$ 65 dB (74 dB typical) at 10 MHz with 50 Ω terminations
Noise	Time Domain $\geq$ 1 s	Negligible for PicoPak measurement
	Frequency Domain	-120 dBc/Hz near carrier, -160 dBc/Hz floor (typical with PC power)
Harmonics	x2 and higher	≤ -50 dBc, (- 60 dBc typical, x2 largest)
Spurious Components	Non-harmonics	≤ -80 dBc (and generally much lower, depending on power supply)
Temperature Coefficient	Phase versus Temperature	≤ ±5 ps/°C (-3 ps/°C typical)
Power	Voltage	+5 VDC from USB
	Current	≤ 0.75 mA (0.65 mA typical)
Connectors	USB	Type B Male on rear panel
	RF Input	SMA Female on rear panel
	RF Outputs	4 SMA Females on front panel
Indicators	Power	Red LED on front panel
	RF Input	Red LED on front panel
Physical	Size (LxWxH)	3.28"x2.25"x1.03" (excluding connectors, feet and trim)
	Weight	≤ 5 oz (extruded aluminum case)
Accessories (Included)	Cable	5' USB Type A plug to Type B plug with ferrite choke
	Documentation	Paper describing PicoAmp design & use