FUNCTIONAL DESCRIPTION

The Model 612A has 12 channels of a fixed 10X gain. Each channel of the Model 612AM, on the other hand, uses two internal amplifiers to achieve a higher but variable gain up to 40X. With the variable gain of the 612AM, simple high voltage distribution may be used where the gains are equalized by the amplifier rather than the high voltage. This technique avoids photomultiplier propagation delay changes resulting from varying the high voltage supply.

The linear range extends from +200 mV to -5 V, directly compatible with LeCroy current integrating ADCs and discriminators.

The 612A offers a 200 MHz bandwidth while the 612AM offers 140 MHz, adapted to handle all but the fastest photomultiplier tubes.

DC-coupling, fast rise times, 1 mV DC stability at the output, 0.1% integral linearity, low overshoot and DC offset temperature coefficient insure faithful reproduction of signal shape after amplification.

Both amplifiers offer a built-in fan-out of two, simplifying simultaneous use of the same photomultiplier signal for multiple purposes.

Both input and output are protected against overload conditions, and recovery rate is swift.

SPECIFICATIONS

INPUT

Impedance: 50 Ω.
Input Protection: ±5% A for 0.5 μsec; ±0.5 A for continuous input voltage; clamps at ±0.6 V.
Reflection Coefficient: Less than 5% over input dynamic range.
Quiescent Voltage: ±0.5 mV.

OUTPUT

Maximum Positive Amplitude (Linear): +200 mV.
Maximum Negative Amplitude (Linear): -2 V with 6 V supply; -5 V with -12 V supply.
Overshoot: Less than ±10% for input rise times ≥ 1.5 nsec and gains > 4X; slightly larger for gains < 4X.
Quiescent Voltage: 0 V ±3 mV.
Output Voltage DC Offset Temperature Coefficient: 612AM, 400 μV/°C maximum; 612A, 100 μV/°C.
Output Voltage Variation: 612AM, < 4 mV for ±1% variation of any supply voltage; 612A, < 1 mV.

GENERAL

Gain: 612AM, 2.5 to 40; 612A, 10 fixed ±5%. Non-inverting, long term stability ±1%.
Linearity: 612AM, 0.2% integral; 612A, 0.01%.
Coupling: Direct.
Rise Time: 612AM, < 3.0 nsec, 10 to 90%; 612A, < 2.0 nsec, 10 to 90%.
Delay: 612AM, approximately 5.5 nsec. 612A, 4 nsec.
Noise: Less than 50 μV R.M.S., referred to input, total.
Interchannel Crosstalk: Output in one channel affects any other channel by no more than -40 dB for the 612AM and -70 dB for the 612A.
Overload Recovery:
a) Operation with -12 V supply: saturated for approximately 15 nsec after 10X overload.
b) Operation with -6 V supply: saturated for approximately 50 nsec after 10X overload. For wide pulses (i.e., > 5 μsec) it is recommended to use -12 V supply for best overload recovery.

Packaging: RF-shielded AEC/NIM #1 width module conforming to specifications outlines in AEC Report TID-20893; Lemo connectors.
Power Requirements: In rear-panel selected 6 V mode: 350 mA at +6 V; 275 mA at -6 V; 10 mA at +12 V; 5 mA at -12 V; 80 mA at -24 V. In 12 V mode: 350 mA at +6 V; 10 mA at +12 V; 275 mA at -12 V; 80 mA at -24 V.