

Differential Comparator Amplifier

## 7A13

Dc to 105 MHz Bandwidth (7900 Family)

1 mV/div to 5 V/div

Calibrated Deflection Factors

20,000: 1 Cmr

10,000 cm Effective Screen Height

1 MΩ Input

The 7A13 is a differential comparator amplifier. It incorporates a number of features which make it particularly versatile, especially in multitrace combination with other 7000 Series vertical plug-ins.

The 7A13 has constant bandwidth over the 1 mV/div to 5 V/div deflection factor range. The bandwidth is selectable to FULL or 5 MHz for best displayed noise conditions for low-frequency applications.

As a differential amplifier the 7A13 provides a balanced (+ and -) input for applications requiring rejection of a common-mode signal. The cmr is 20,000:1 from dc to 100 kHz, derating to 200:1 at 20 MHz. The unit can reject up to 10 V of common-mode signal at a deflection factor setting of 1 mV/div, increasing to 100 V rejection potential at 10 mV/div (X10 Vc pulled) and 500 V at 0.1 V/div.

As a comparator amplifier the 7A13 loses its differential capability, but provides an accurate (0.1%) positive or negative internal offsetting voltage covering the common-mode signal range of the unit. A signal of up to  $\pm 10$  V may be applied to an input (+ or -) at a deflection factor setting of 1 mV/div and, with an opposing Vc (offset voltage), viewed in 10,000 segments of 1 mV. The offset voltage is also available as an output for external monitoring.

## High Cmr Probes for Differential Amplifiers

We recommend the P6055 high cmr adjustable 10X probes for use with Tektronix differential amplifiers.

When used in pairs, these probes increase the differential input impedance to 20 MΩ and allow adjustment for maximum common-mode rejection ratio (cmr).

See page 336 for P6055 characteristics.

**Input R and C** — 1 MΩ within 0.15%,  $\approx 20$  pF. R in  $\infty$ , is available in the 1 mV to 50 mV/div range, selectable by an internal switch.

**Deflection Factor** — 1 mV/div to 5 V/div in 12 calibrated steps (1-2-5 sequence). Accuracy is within 1.5% with gain adjusted at 1 mV/div. Uncalibrated VARIABLE is continuous between steps to at least 12.5 V/div.

Single Range —

Deflection Factor Settings	1 mV to 50 mV/div	10 mV to 50 mV/div (X10 Vc out) and 0.1 V to 0.5 V/div	0.1 V to 0.5 V/div (X10 Vc out) and 1 V to 5 V/div
Common-mode Signal Range	$\pm 10$ V	$\pm 100$ V	$\pm 500$ V
Max Dc-coupled Input (dc + Peak Ac at 1 kHz or less)	$\pm 40$ V	$\pm 400$ V	$\pm 500$ V
Max Ac-coupled Input (dc voltage)		$\pm 500$ V	

**Max Input Gate Current** — 0.2 nA or less from 0°C to +35°C; 2 nA or less at +85°C to +55°C.

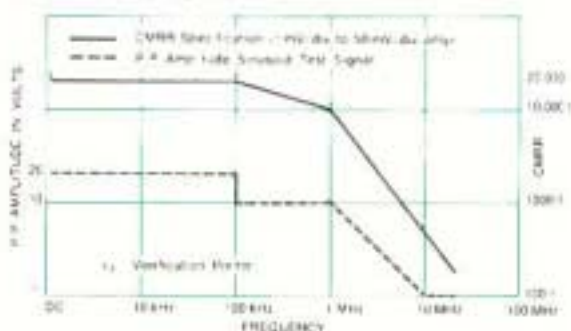
**Dc Stability** — Drift with time (constant ambient temperature and line voltage): short term, 1 mV p-p or 0.1 div, or less (whichever is greater) over any 1-minute interval after 20 minute warm-up. Long term, 1 mV p-p or 0.1 div or less (whichever is greater) during any 1 hour interval after 20 minute warm-up. Drift with ambient temperature (constant line voltage), 2 mV/10°C to 0.2 div/10°C or less, whichever is greater.

**Displayed Noise (Tangentially measured)** — With X10 Vc in, 400  $\mu$ V (200  $\mu$ V RMS) or less at 1 mV/div; 0.2 div or less at 2 mV/div to 5 mV/div; 0.05 div or less at 10 mV/div to 5 V/div. With X10 Vc out, 0.4 div or less at 10 mV/div to 0.5 V/div.

**Overdrive Recovery** — 1  $\mu$ s to recover to within 2 mV and 0.1 ms to recover to within 1 mV after a pulse of  $\pm 10$  V or less at 1 mV/div only regardless of pulse duration.

**Internal Comparison Voltage** — Range, 0 V to  $\pm 10$  V; accuracy,  $\pm 0.1\%$  of setting  $\pm 3$  mV; Vc output R,  $\approx 15$  kΩ.

**Common-Mode Rejection Ratio —**



At least 2000:1, 10 mV/div to 50 mV (X10 Vc out) and 0.1 V/div to 5 V/div. Ac-coupled input at least 500:1 at 60 Hz.

Order 7A13 Amplifier