Active probes have high input resistance and low input capacitance without loss of signal. The dynamic range and measurement capability are substantially increased through the voltage offset control.

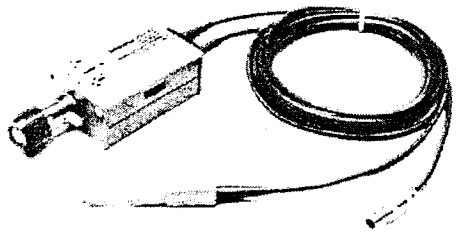
Since active probes have a selectable 50 Ω output impedance, the distance from the probe tip to the instrument is only limited by the bandwidth limit of the 50 Ω coaxial cables between the probe and instrument. Active probes are used in measurements where high input resistance and low input capacitance is needed and where frequencies above 250 MHz are encountered.

ACTIVE PROBES SELECTION GUIDE

Type	Attn	Nominal Length	Loading		Risetime	Input Limits: Maximum Dc + Pk Ac	Input Limits: Linear Dynamic Range	Input Limits: Dc Offset Range	Read-Out	Page
P6046 Diff/Amp	1X 10X	6 ft	1 MΩ 10 MΩ	10 pF 3 pF	3.5 ns	±25 V ±250 V	±5 V ±50 V		NO	439
P6201 FET	1X 10X 100X	6 ft	100 kΩ 1 MΩ 1 MΩ	3 pF 1.5 pF 1.5 pF	0.4 ns	±100 V ±200 V ±200 V	±0.6 V ±6 V ±60 V	±5.6 V ±56 V ±200 V	YES	435
P6202A FET	10X 100X	2 m	10 MΩ 10 MΩ	2 pF 2 pF	0.7 ns 0.7 ns	±200 V ±200 V	±6 V ±60 V	±55 V ±200 V	YES NO	435
P6230 Bias/Offset	10X	1.5 m	450 Ω	1.3 pF	230 ps	±30 V	±5 V	±5 V	YES	434

P6230

Dc to 1.5 GHz, 10X Bias/Offset



For 50 Ω or 1 MΩ Inputs

Bias/Offset from −5 V to +5 V

Internal/External 50 Ω Termination Switch—Use on Scopes with 50 Ω or 1 MΩ Input

Low Impedance

Adjustable Tip "Nulling" Voltage

Fully Compatible with Tek Subminiature Probe Accessories

UL Listed

The P6230 is a 1.5 GHz, low-impedance, subminiature, 10X active probe for use with broad-band oscilloscopes. The P6230 is equipped with an internal/external 50 Ω termination switch which allows the probe to be used on scopes having an input resistance of either 50 Ω or 1 MΩ. A coding pin on the BNC connector activates the Volts/Division reading by 10X, on oscilloscopes equipped with this feature, so that the correct deflection factor at the probe tip is indicated.

The compensation box houses an active circuit which provides a variable voltage at the probe tip. This voltage is used to minimize probe-loading effects. The voltage available at the tip spans the range from minus five volts to plus five volts, allowing the probe to minimize loading effects on most logic families that are in use today.

The P6230 acts as a standard 500 Ω passive voltage probe with the additional capability of having an adjustable tip "nulling voltage." This feature reduces the dc-loading effects of the probe when it is used to measure signals whose mid-voltage value is other than zero volts, or in circuits where the termination impedance is returned to other than ground level. The Input Bias/Offset Voltage may be adjusted so that at a particular test-signal voltage both ends of the probe input-resistor are at equal potentials and no current is flowing through the resistor.

ECL logic is most commonly operated from a −5.2 V supply with Vcc connected to ground. The output of an ECL gate is the emitter of an NPN emitter follower stage. The output is pulled down to a negative supply (about −2 V) with an external resistor (50 Ω to 100 Ω). Since speed is a major consideration in ECL designs, the interconnections between gates are often transmission lines, and the pull-down resistor doubles as a line termination.

If a standard 500 Ω, 10X probe without the Input Bias/Offset feature were used to examine an ECL output, the probe's 500 Ω resistance to ground would form a voltage divider with the gate's output-termination resistor. This divider can cause distortion of the output signal levels, shift the dc-operation point of the output transistor, and reduce the gate's noise margin.

The dc-load nulling capability of the P6230 helps to solve this problem. By adjusting the Input Bias/Offset Voltage to the ECL low level or to the termination voltage, the only effect of the probe resistance will be a small decrease in the ECL output-termination resistance. The effect of the probe on output voltage levels is negligible.

The probe derives its power from the probe power jack on many Tek scopes, a 1101 or 1101A Power Supply (see next page).

CHARACTERISTICS

ELECTRICAL CHARACTERISTICS

Attenuation — 10X ±3%

Loading — 1.3 pF/450 Ω.

Bandwidth — 1.5 GHz

Dc Offset Range — −5 V to +5 V.

Dc Maximum — 10 V.

ENVIRONMENTAL CHARACTERISTICS

Temperature Range — Operating: 0°C to +50°C (+32°F to +122°F). Nonoperating: −55°C to +75°C (−67°F to +167°F).

Humidity — Five cycles (120 hrs) 95% to 97% at 30°C to 60°C. MIL-E-16400F, Class 4.

Altitude — Operating: 4600 m (15,000 ft). Nonoperating: 15 000 m (50,000 ft).

ORDERING INFORMATION

P6230 10X, Bias/Offset Probe
1.5 m Cable. Order 010-6230-01

Includes: Alligator ground lead (195-1870-00); microhook ground lead (195-4104-00); low inductance ground lead (195-4240-00); two white marker bands (334-2794-01); two gray marker bands (334-2794-03); protective pouch (016-0708-00); retractable hook tip (013-0208-00); two red marker bands (334-2794-06), two green marker bands (334-2794-07); probe connector (131-2766-03), probe holder (352-0687-00), instruction manual (070-4211-00).

OPTIONAL ACCESSORIES

Probe to BNC Adaptor — Order 013-0195-00

50 Ω Probe to GR Adaptor —
Order 017-0520-00

100 ECB Test Connectors — Outer Shell.
Order 131-2766-01

100 ECB Test Connectors — Center.
Order 136-0352-02

Subminiature to Miniature Adaptor —
Order 013-0202-00

THE FOLLOWING ARE USED WITH 013-0202-00

Miniature to BNC Adaptor —
Order 013-0084-01

50 Ω Miniature to GR Adaptor —
Order 017-0088-00

Miniature to Square Pin Adaptor —
Order 015-0325-00

Microcircuit Pincer Tip —
Order 206-0222-00