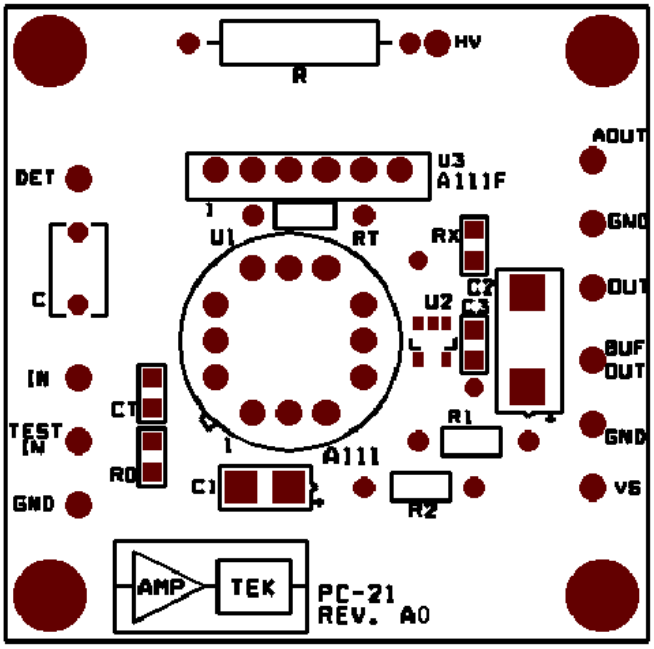
PC21 Test Board
for the A111 and A111F

The PC-21 is a printed circuit board designed to facilitate testing of the A-111 or the A-111F. In addition to testing circuitry, it provides component locations for use with detectors. Ground plane construction minimizes external pick-up.



Dimensions: 1.75 x 1.75 x 1.0 in. (4.45 x 4.45 x 2.54 cm)

INPUTS

IN:	Detector input; A111/PIN 12; A111F/PIN 1. Should be AC coupled with a high voltage capacitor (500 pF - 1000 pF).
DET:	Provides post to connect the detector and input capacitor.
TEST IN:	Input to test circuit as described in specifications.
V_S:	A111/PIN 2; A111F/PIN 5; supply voltage (+4 to +10 VDC).
HV:	Provides post to connect the detector to the high voltage supply through a resistor.

OUTPUTS

OUT:	Positive, TTL type output from A111/PIN 5; A111F/PIN 6.
A OUT:	Positive, Analog ouput from A111/PIN 7; A111F/PIN 4.
BUF OUT:	Positive output through a Buffer/Line Drive IC from A111/PIN 5; A111F/PIN 6.

COMPONENTS

C_1, C_2, C_3:	Filter capacitor (1 uF, 4.7 uF, 0.1 uF).
C_T:	Test capacitor (2 pF).
R_O:	Test pulse termination (50 ohm).
R_X:	External load resistor (see specifications).
R_T:	Threshold adjustment resistor.
R:	Detector bias resistor (user supplied).
C:	Detector coupling capacitor (HV) (user supplied).
U_2:	Line Driver TPS2829.

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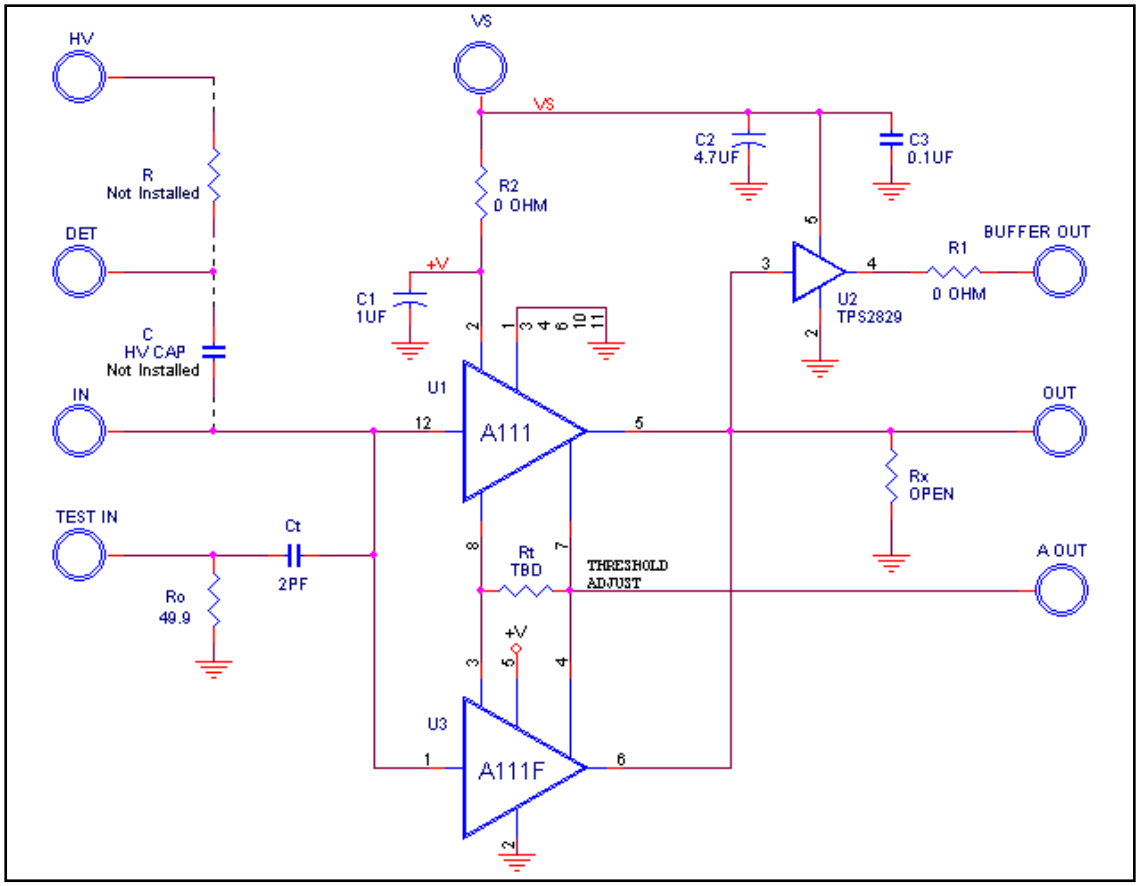
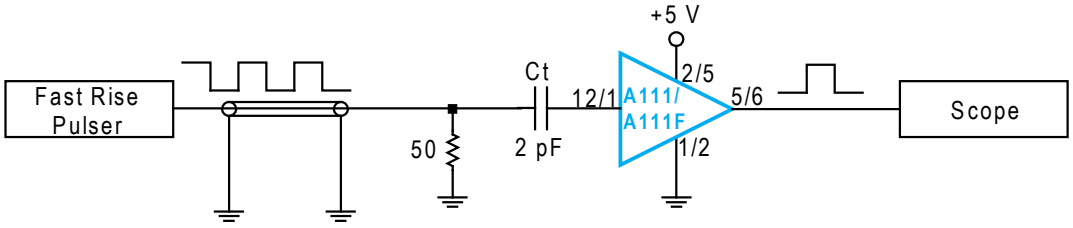
PC21 Wiring Diagram for the A111 or A111F



The A-111 or A111F can be tested with a pulser by using a small 2 pF capacitor to inject a test charge into the input. The unit will trigger on the negative-going edge of the test pulse, which should have a transition time of less than 20 ns. This negative going edge should be followed by a relatively flat part of the waveform so that it appears as a step function. For example, a square wave is a good test waveform. When using a square wave, it should be noted that the unit will respond to the positive-going edge also, at amplitudes above 2x threshold. Alternately, a "sawtooth" waveform or a tail pulse with long fall time (>1 µs) may be used.

Typical test circuit



T_{rise}: <20 ns (negative-going edge).

Amplitude: 500 m/Vpicocoulomb; 4 mV at the nominal threshold.

Charge transfer to the input is according to $Q = C_tV$, where Q = total charge, C_t = value of test capacitor, and V = amplitude of voltage step. Use only the TEST INPUT to test the A111/A111F. DO NOT connect the test pulser to the input directly or through a large capacitor (>100 pF) as this can produce a large current in the input transistor and cause irreversible damage.

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