Pancake and Mica End Window GM Detectors

Test Circuits

Use HV+, Ra and R1 from the chart.



Plateau Calculations

Plateau slope calculations for CANBERRA data sheets are based upon IEC recommended formulae, as prescribed in the ISO affiliated publication #151-25 part 25, "Methods of measurement of Geiger Mueller counter tubes".



Alpha Particle Detection

The table below shows the initial energy required to penetrate a given mica window thickness. This assumes a negligible air gap between the source and the window. Note the range of alpha particles of various energies in air at atmospheric pressure.

Mica Window	α Energy	lpha Range in Air
1.0 mg/cm ²	1.9 MeV	10 mm
2.0 mg/cm ²	2.6 MeV	15 mm
3.0 mg/cm ²	3.6 MeV	22 mm
4.0 mg/cm ²	4.5 MeV	29 mm

Beta Particle Detection

The chart below shows the effects of mica window thickness (mg/cm²) on beta particle absorption percentage.



Dead Time Correction

GM tubes using conventional counting circuitry all exhibit counting losses due to the Dead Time factor. These factors cited in the CANBERRA tube data tables are based on the recommended operating voltages and test circuits. The chart below enables the user to estimate the counting losses due to the Dead Time factor at high count rates.



m = MEASURED COUNTING RATE (COUNTS PER SECOND)





Δ **CANBERRA**

1.8 to 2.2 mg/cm² Ultra Thin

High alpha and beta efficiency

unmatched quality/cost ratio

Cost effective, easy to use

and very reliable with

Features

diameter

Mica Window

28 or 45 mm effective



Our Warranty: All CANBERRA Geiger Mueller tubes are guaranteed against defects in materials or workmanship for one year following shipment.

All tubes are individually tested, ensuring 100% quality.

> performance required and that all users should expect. Pancake detectors are widely used in nuclear probes and instruments for detecting and measuring alpha or beta surface contamination of clothes, small objects, benches, floors, roads, etc. Such halogen-quenched Geiger Mueller detectors are cost-effective, have an unmatched guality/cost ratio, are easy to use and are very reliable. Their ultra-thin mica window allows for an efficient detection of alpha and low energy beta radiation.

Adherence to stringent design parameters, manufacturing procedures and quality assurance provisions of CANBERRA products has successfully fulfilled commercial and military exacting standards. Our military approved detectors used by the US Army, US Navy and many other military forces worldwide, are able to withstand rigorous shock and vibration testing.

Our 2000-series of GM detectors provides a direct-replacement to most widely used competitive detectors. Other detectors are offered in our Mica End Window selection. Please contact us should you wish to discuss specific requirements or references.

Phone contact information

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Pancake and Mica End Window GM Detectors

Description

Because CANBERRA has been using Geiger Mueller tubes as an end user for 40 years, CANBERRA has successfully bridged the gap between technical conception, detector design and field application to achieve the quality

Pancake and Mica End Window GM Detectors

	Pancake Tubes (Halogen Quenched) For α, β, γ Applications							Mica End Window For α, β, γ Applications				
	6.4/0.2 11 15 3/0.6	5 LH = Low Hysteresis Model HA = High Altitude Model	31.7/1.25 15.6/0.615 (Stop WRE C) NNOGE FIN	LH = Low Hysteresis Model	32.5/1.28	OPTIONS: F = Flying Leads C = Push-on Anode Clip	Mil. Version 2121 M Window 2.8–3.4 mg/cm ²	LEVPE 25.4/1.0 Available with BNC or MHV connector	Probe contains 2131 tube. Available with BNC or MHV connector	Probe contains 2131 tube. Available with BNC or MHV connector		
Tube Type $ ightarrow$ Characteristics \downarrow	T2000/8767 T2000/900 LH T2000/900 HA	T2000/500 T2000/500 LH T2000/500 HA	T2006/900 T2006/900 LH	T2006/500 T2006/500 LH	T2011/900	T2011/500	T2121	TP2121S	TP2131	T2131/4P		
Application	α, β, γ	α, β, γ	α, β, γ	α, β, γ	α, β, γ	α, β, γ	α, β, γ	α, β, γ	α, β, γ	α, β, γ		
Sensitivity* ¹³⁷ Cs cpm at 1 mR/h*	3500	3500	3500	3500	1500	1500	1700	1700	2200	1650		
Window Area Density (mg/cm ²)	1.8– 2.0	1.8– 2.0	1.8– 2.2	1.8– 2.2	1.8–2.0	1.8–2.0	1.8–2.0	1.8–2.0	1.8–2.0	1.8–2.0		
Window Effective Diameter (mm, in.)	44.5, 1.75	44.5, 1.75	44.5, 1.75	44.5, 1.75	28.4, 1.12	28.4, 1.12	19.8–0.78	19.8–0.78	28.4, 1.12	28.4, 1.12		
Recommended Operating Voltage (HV+)	900	500	900	500	900	500	575	900	900	900		
Plateau Length Volts min.	850–1000	450–600	850-1000	450–600	850–1000	450–600	450–700	850–1000	850–1000	850–1000		
Plateau Slope (%100 V max.)	10	10	10	10	7	7	5	5	8	10		
Dead Time (µs max.)	50	50	50	50	40	40	100	100	150	200		
Background (c/m) Shielding 2" Pb + 1/8" Al	30 max.	30 max.	30 max.	30 max.	18 max.	18 max.	30 max.	30 max.	40 max.	40 max.		
Resistor Ra (M Ω)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	1.0	1.0	1.0		
Resistor R1 (MΩ)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		
Operating Temp. (°C)	-40 to +70	-40 to +70	-40 to +70	-40 to +70	-40 to +70	-40 to +70	-51 to +70	-40 to +70	-40 to +70	-20 to +55		
Cathode Material	Cr/Fe	Cr/Fe	Cr/Fe	Cr/Fe	Cr/Fe	Cr/Fe	Cr/Fe	Cr/Fe	Cr/Fe	Cr/Fe		
Max. Overall Length including Pins (mm, in.)			See above drav	wing		·	51.0, 2.0	94.0, 3.7	124, 4.85	124, 4.85		
Max. Overall Diameter (mm, in.)							25.4, 1.0	25.4, 1.0	35–1.38	35–1.38		
Window Recess (mm, in.)	1.6, 0.062	1.6, 0.062	1.6, 0.062	1.6, 0.062	1.3, 0.05	1.3, 0.05	1.6, 0.062	1.6, 0.062	1.3, 0.050	1.3, 0.050		

*At recommended operating voltage.