



For measuring characteristic energies of alpha particles, one BPX61 with a destroyed glass window is needed. Alternatively up to 4 x BPW34F(A) diodes can be populated (like in V1.1). In this case only electrons will be detectable plus few gamma photons as with the BPX61.

The advantages of using 4 x BPW34F(A) diodes are:

- x4 increased sensitivity towards ionizing radiation (x4 sensitive volume)
- less sensitive to disturbing electromagnetic interferences (due to lower signal amplification)
- less sensitive to stray light (due to the black plastic cases of the BPW34F(A) diodes)
- much less susceptible to the microphony effect / mechanical vibrations (due to lower signal amp.)

Following changes are need for the 4-diode variant using BPW34F(A) diodes:

D1 – D4 = BPW34F or BPW34FA, from Osram or Vishay

R3 = 10M

R4 = 1k

R5 = 100k

R8 = 0 (short with a wire)

C4 = 100n

C6 = 10p

C9 = not needed (do not populate)

- MK1 via for coincidence sandwich
- MK2 via for coincidence sandwich
- MK3 via for coincidence sandwich
- MK4 via for coincidence sandwich

Suitable aluminium die-cast enclosures (besides your favourite candy tin box):
Multicomp G102MF (Farnell nr. 1902552), fits precisely including edge mount screws
<http://uk.farnell.com/multicomp/g102mf/box-diecast-90x36x30mm/dp/1902552>
Deltron 480-0010 (Farnell nr. 1774842), no mounting holes inside
<http://uk.farnell.com/deltron-enclosures/480-0010/box-diecast-ip68/dp/1774842>

- MK5 M3 support
- MK6 M3 support
- MK7 M3 support

All hardware & software source files plus detailed instructions on:
www.github.com/ozel/DIY_particle_detector
Details on the physics of the sensors & reference measurements:
www.mdpi.com/1424-8220/19/19/4264
(www.doi.org/10.3390/s19194264)

Low-Cost DIY Particle Detector for Ionising Radiation

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A spectrometer for measuring the energy of alpha particles and electrons.

CERN Open Hardware License (CERN OHL V1.2)

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