Status of FE circuit radioactivity measurements

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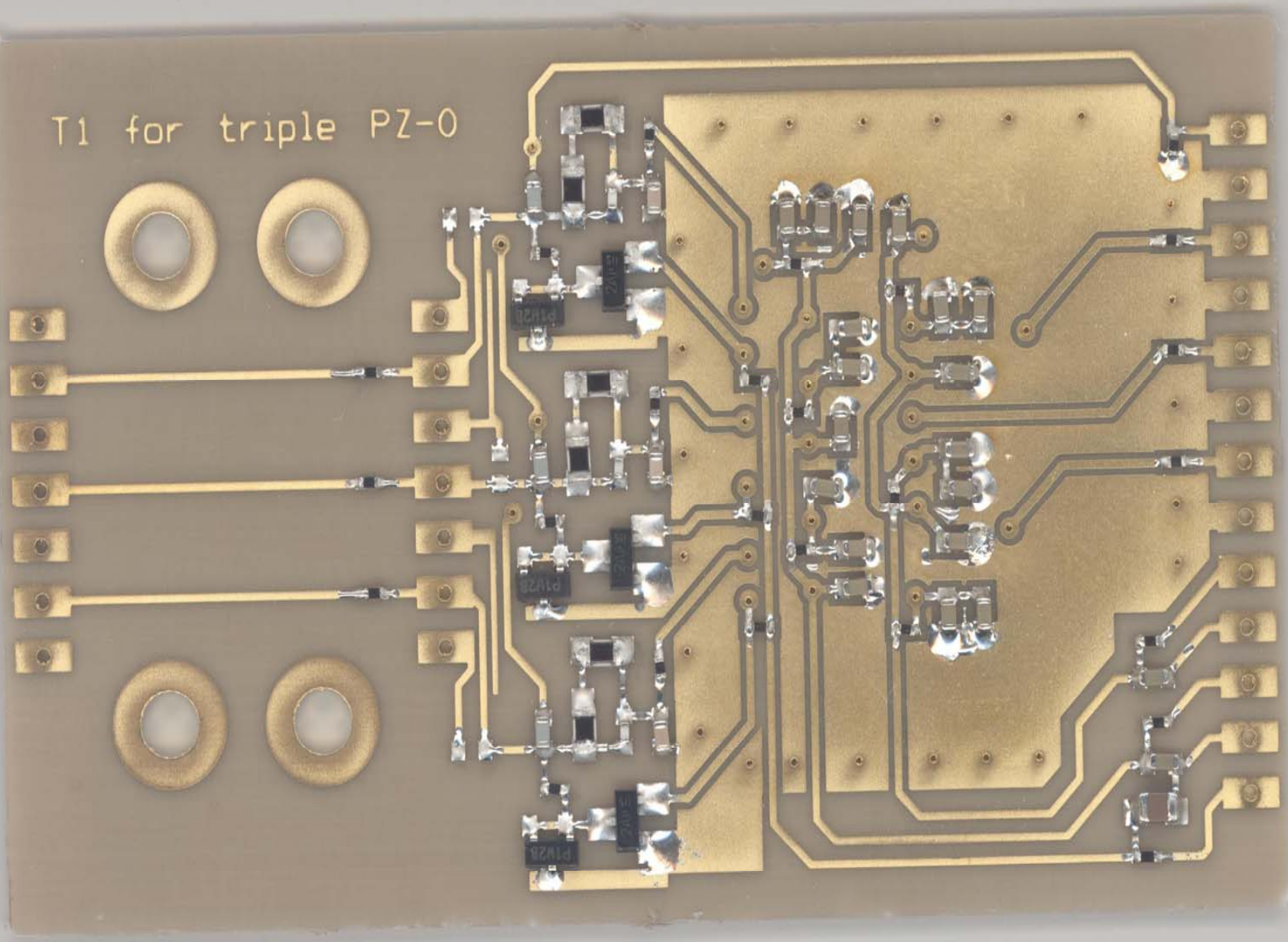
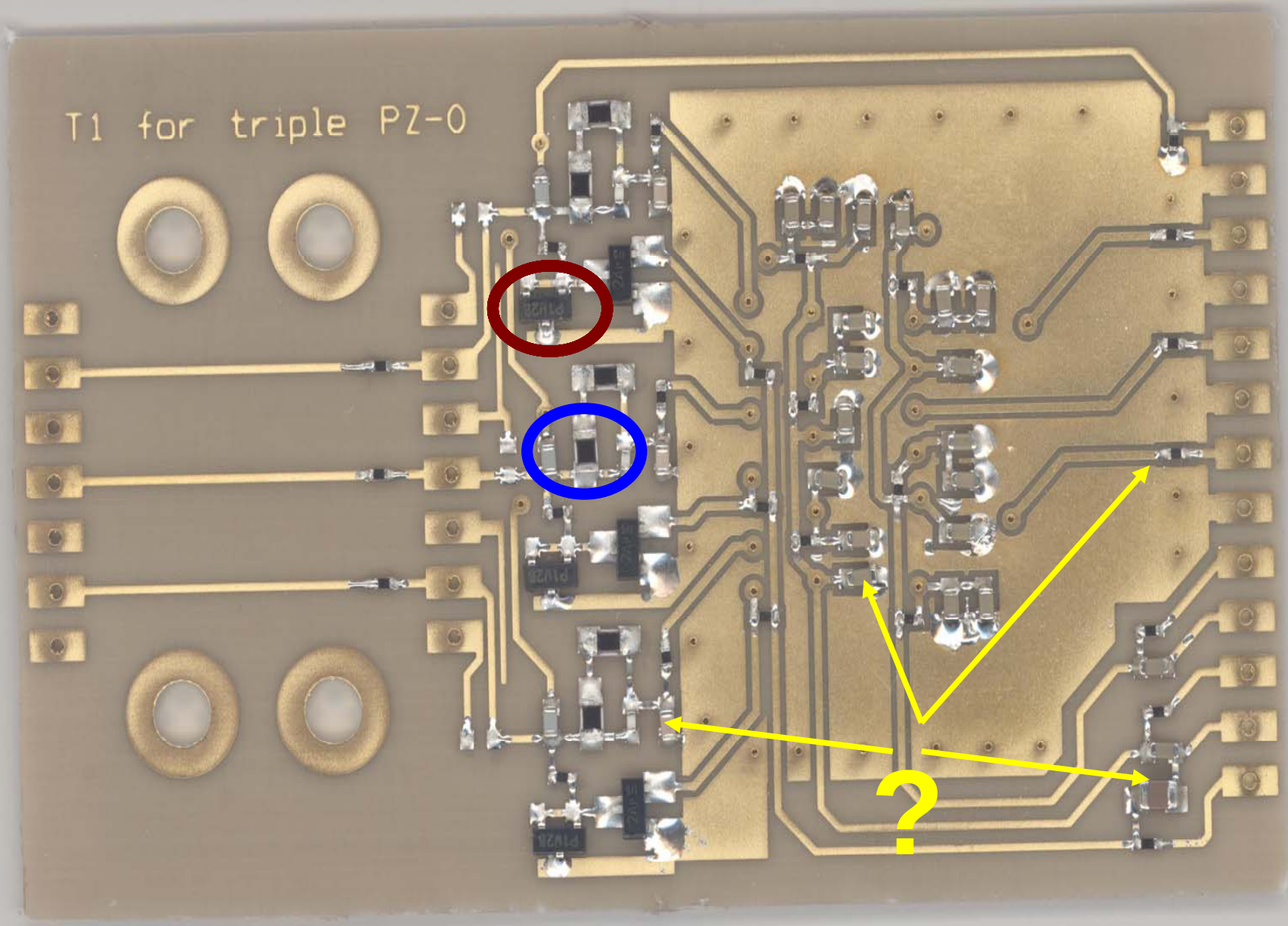
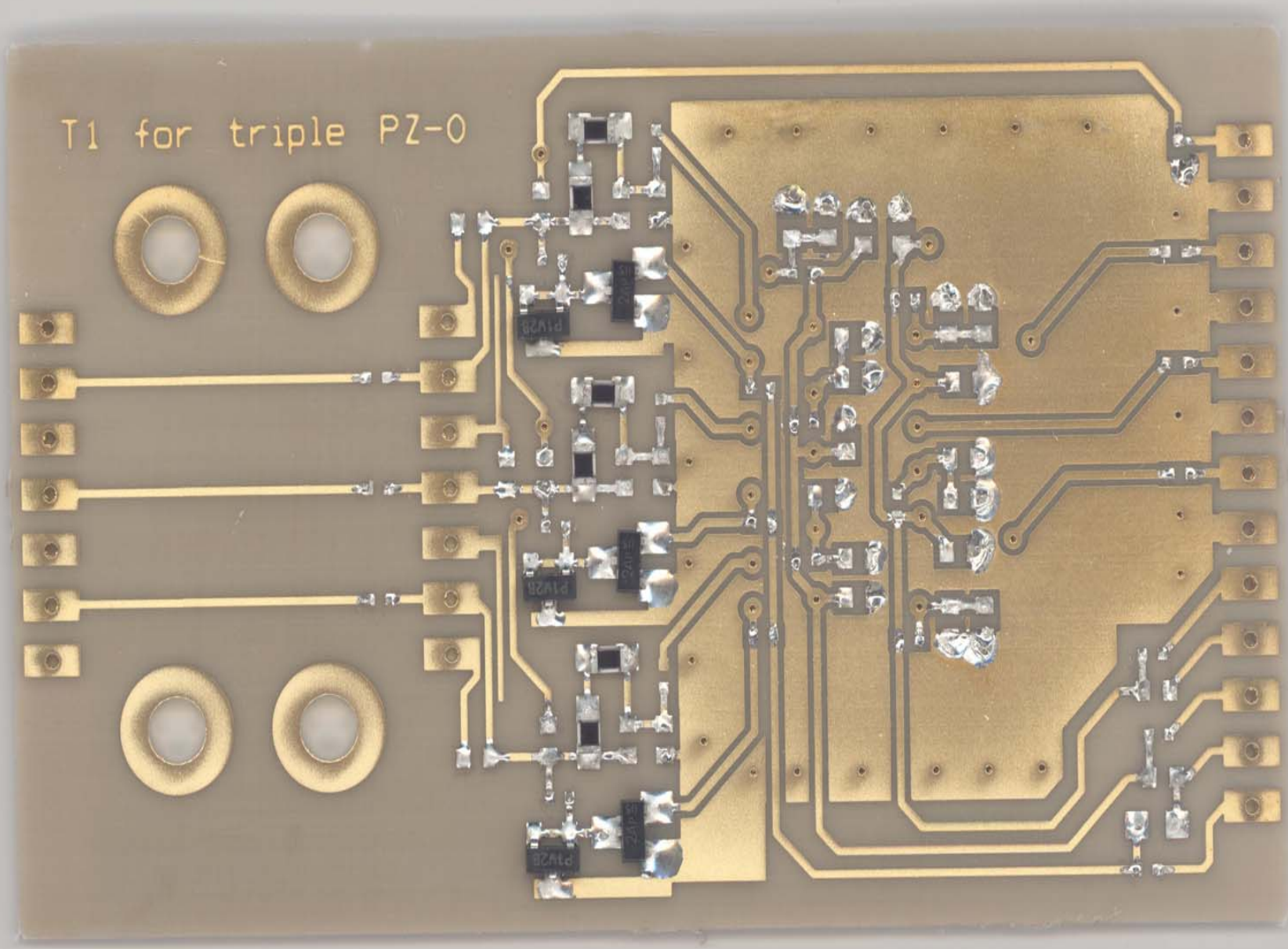

T1 for triple PZ-O

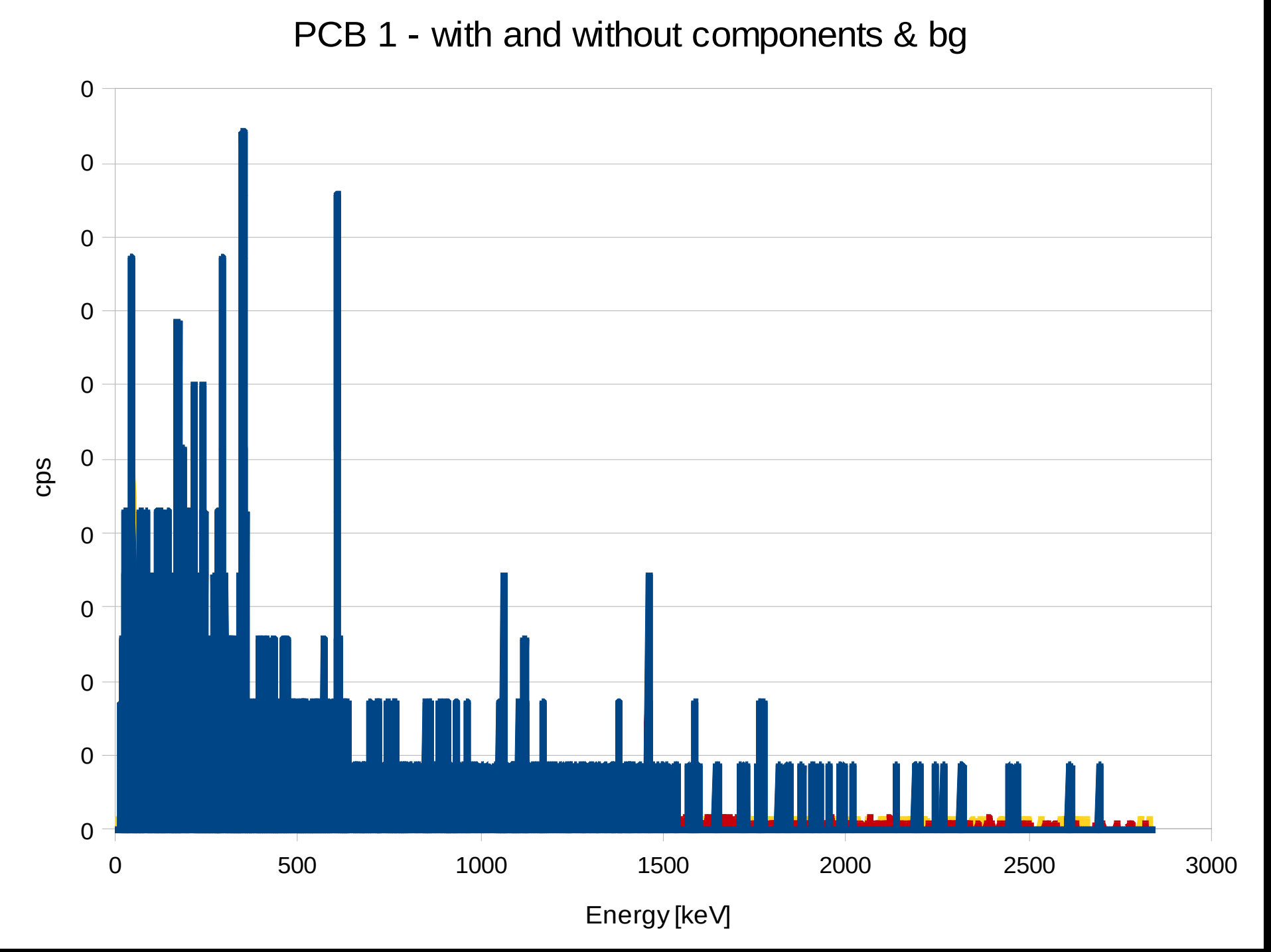
Radionuclide concentrations per PCB

item	mass	^{226}Ra	^{228}Ra	^{228}Th	^{40}K
PCB	6.5 g	6.3 ± 0.5	0.21 ± 0.13	0.19 ± 0.08	2.2 ± 0.7
Cuflon	4.4 g	< 3.5 E-3	< 12 E-3	< 7.9 E-3	0.19 ± 0.06
solder	~2 g	< 9.6 E-3	< 9.2 E-3	< 13 E-3	< 0.10
FET	0.05 g	31 ± 8 E-3	< 26 E-3	33 ± 8 E-3	< 0.12
Big res.	0.03 g	< 22 E-3	< 20 E-3	< 20 E-3	< 0.21

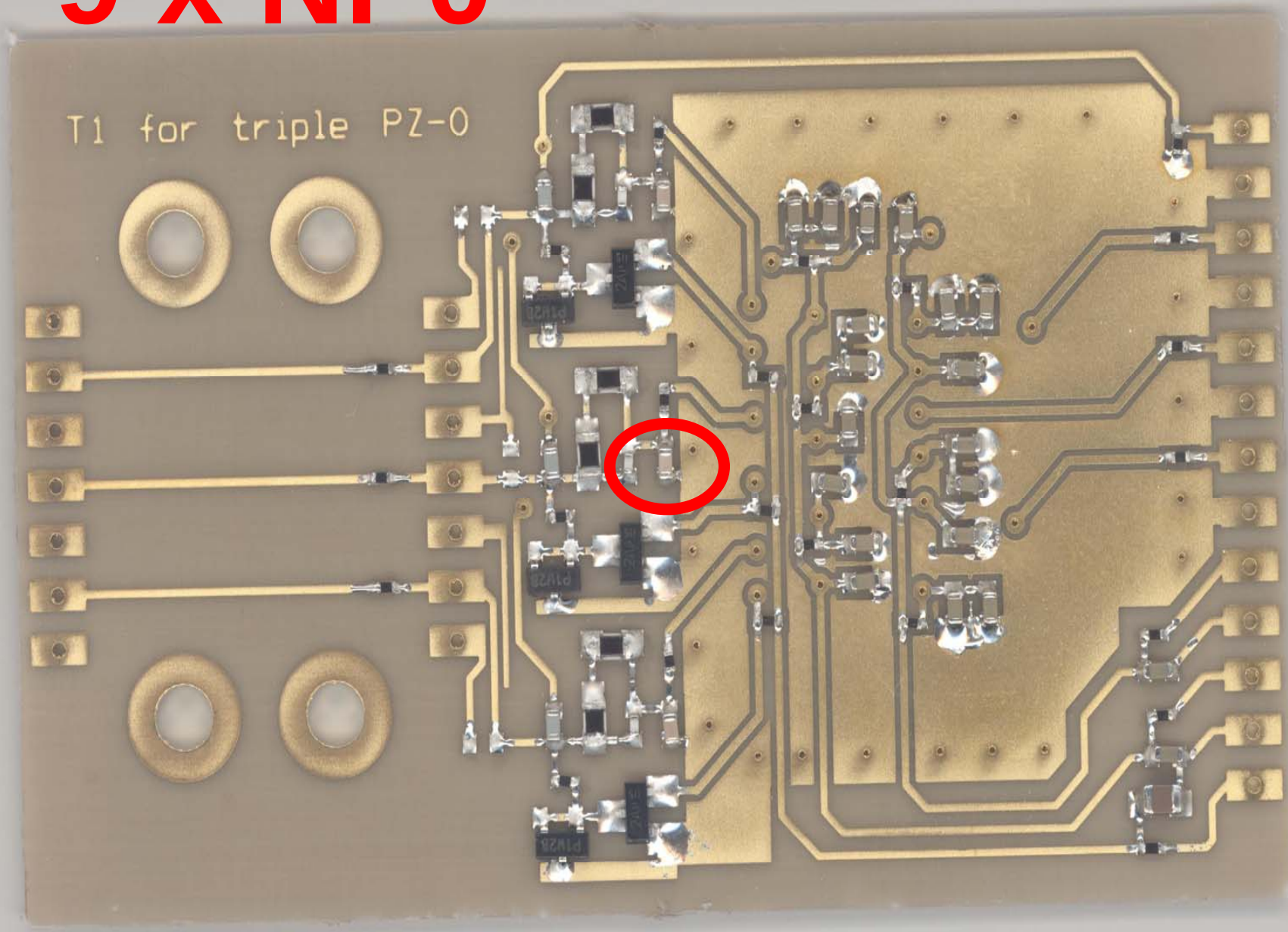
unit in mBq

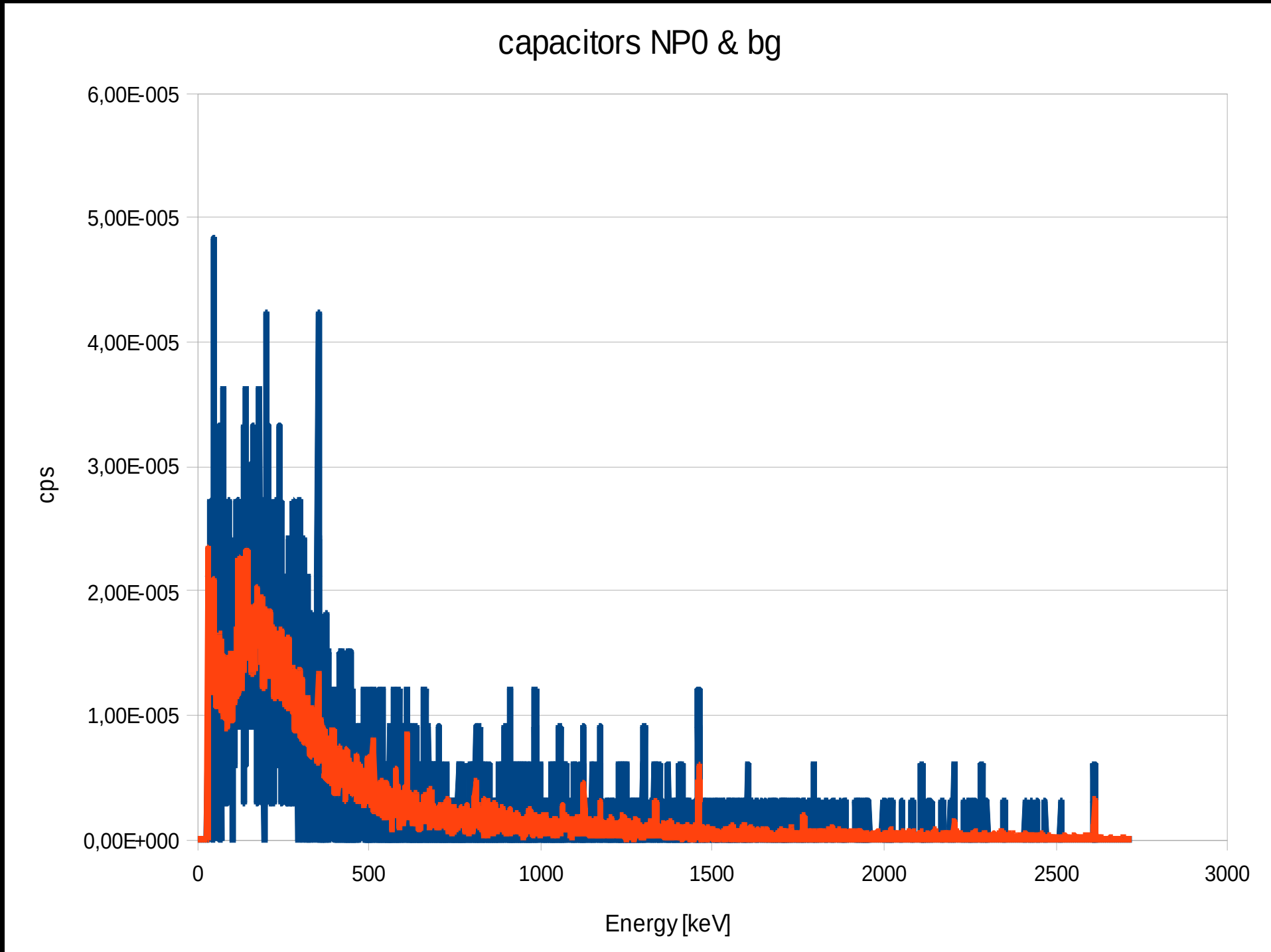

T1 for triple PZ-0
?


T1 for triple PZ-0

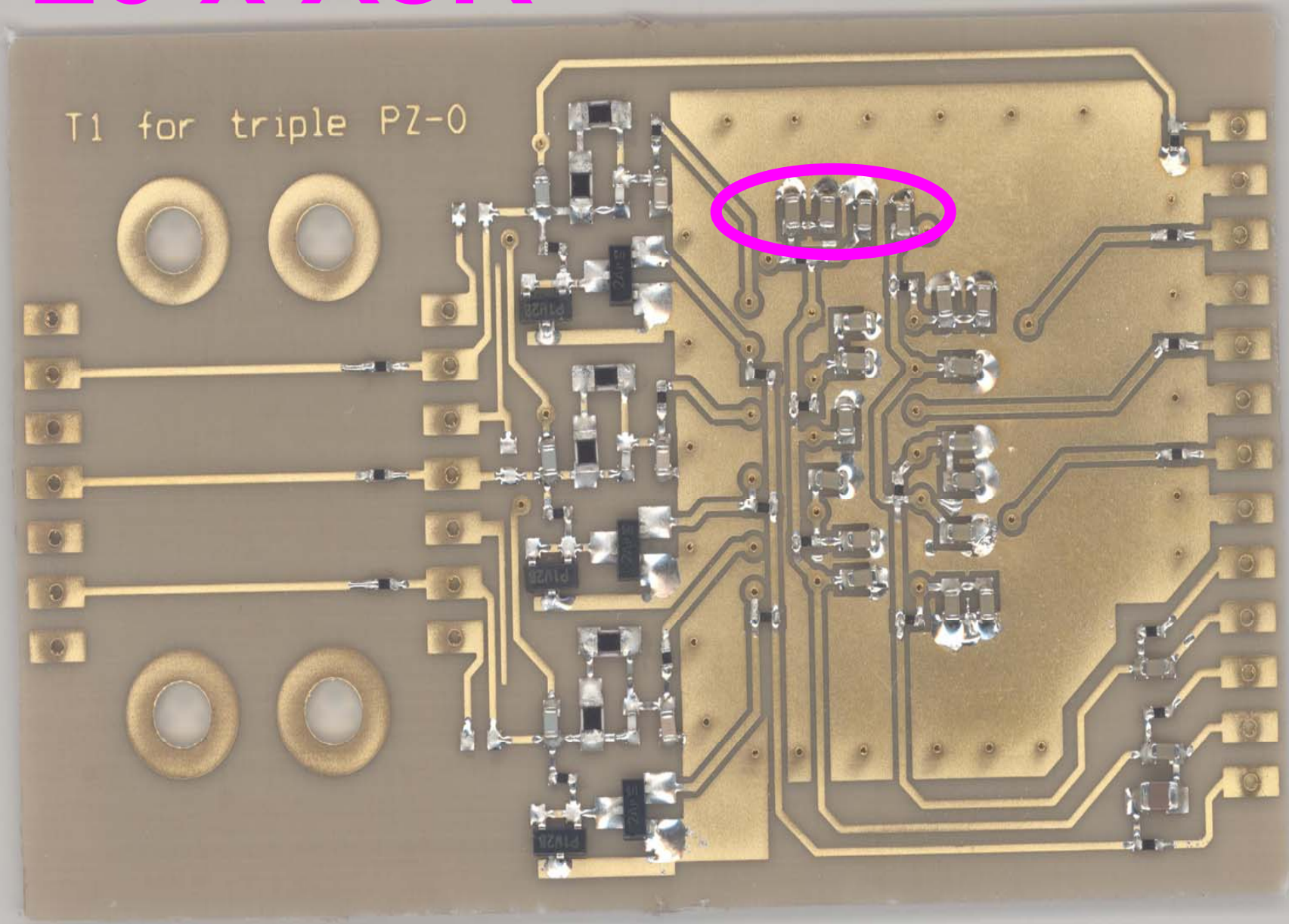

PCB 1 - with and without components & bg
cps
0
0
0
0
0
0
0
0
0
0
0
500
1000
1500
2000
2500
3000
Energy [keV]

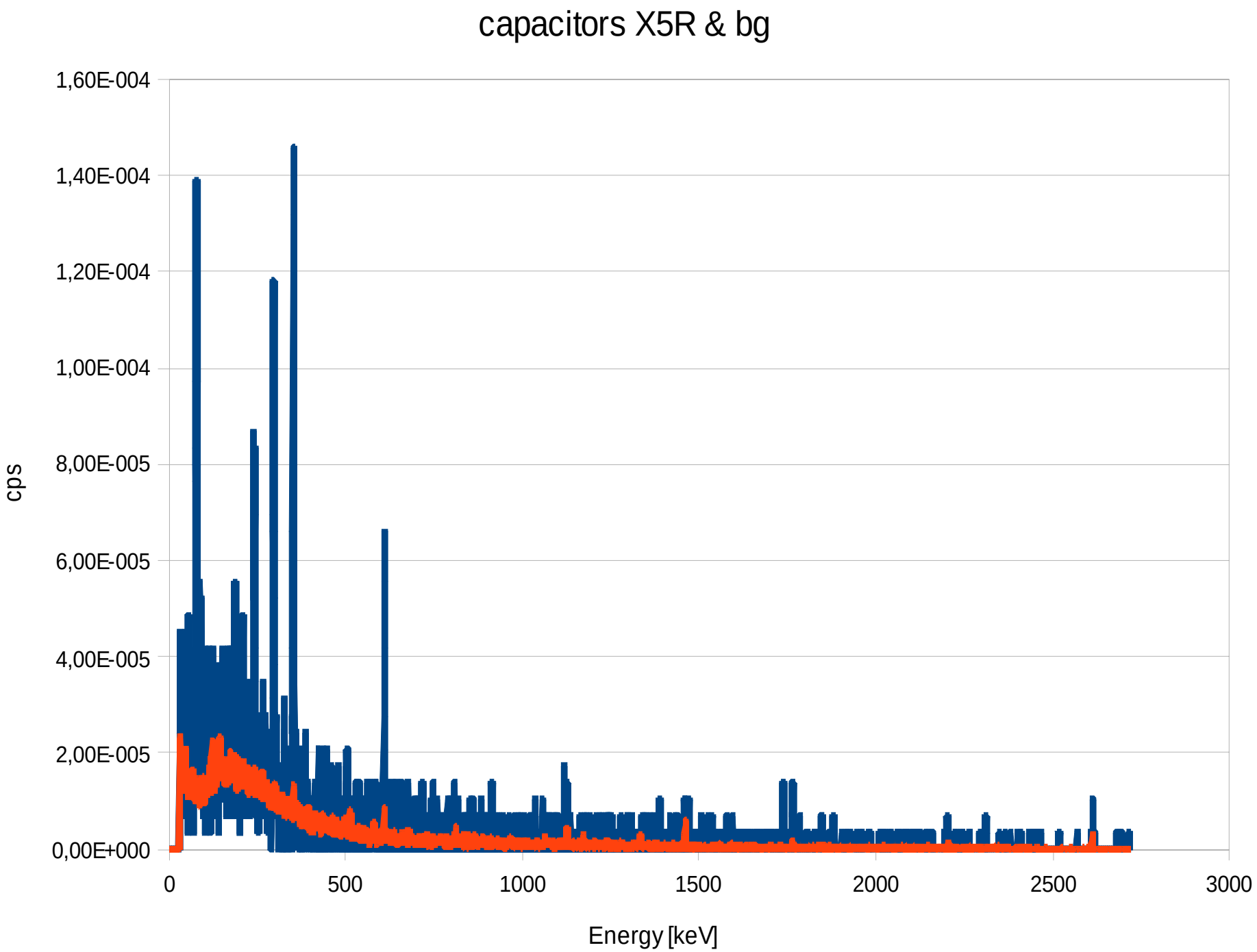
9 x NP0




capacitors NP0 & bg
6,00E-005
5,00E-005
4,00E-005
3,00E-005
2,00E-005
1,00E-005
0,00E+000
cps
0
500
1000
1500
2000
2500
3000
Energy [keV]

20 x X5R




capacitors X5R & bg
1,60E-004
1,40E-004
1,20E-004
1,00E-004
8,00E-005
6,00E-005
4,00E-005
2,00E-005
0,00E+000
cps
0
500
1000
1500
2000
2500
3000
Energy [keV]

1 x X7R

24 x small res.

Ongoing measurements

- in 14 days from now one should have identified ALL components that contribute to the overall activity.
- good news: we do not have to substitute neither the substrate, nor the FET nor the big resistors;
- solder is a problem only for the ^{210}Pb (~ 200 Bq/kg), if any ...
- we have to look out NOW for substitutes for the capacitors, which in fact have never been screened before;

LESSON TO BE LEARNED

- EVERYTHING which goes into the detector or close to it MUST be screened BEFORE in order to avoid bad surprises.
- It is not enough to look out for old measurements thinking that the new material will be the same or at least similar.