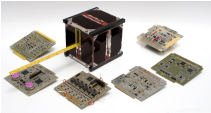
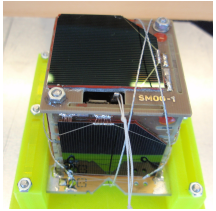
Műegyetemi kis műholdak jelene és jövője

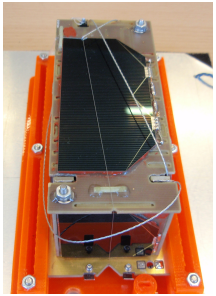
Dudás Levente, Gschwindt András



Masat-1
2012.02.13
1062 nap



SMOG-P
2019.12.06
298 nap



ATL-1
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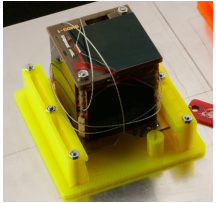
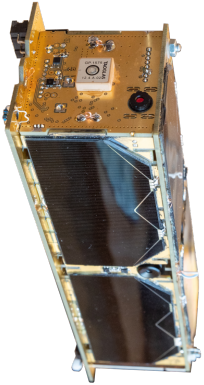
312 nap

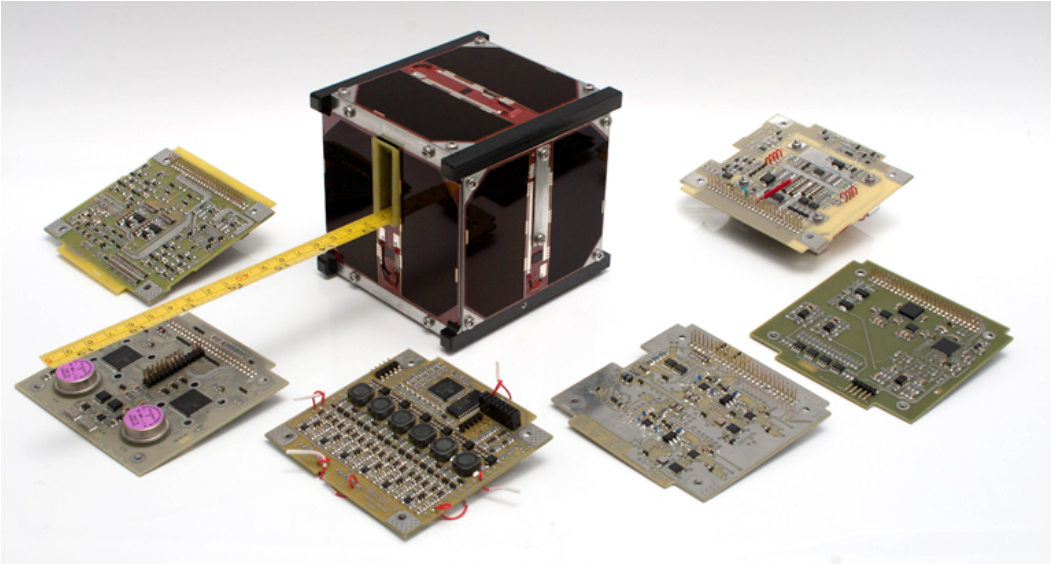


SMOG-1
2021.03.22
még ad
életjelet...



MRC-100
2023.06.08+
?

Az első magyar műhold: Masat-1



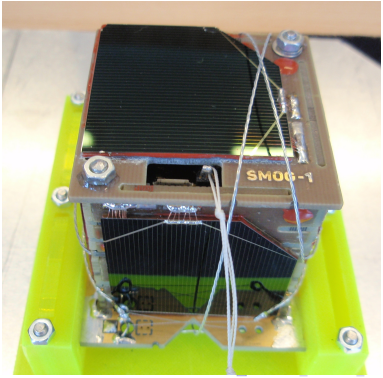
SMOG-1 & SMOG-P

1. DVB-T sávú spektrum monitor.
2. Totál ionizáló dózismérő rendszer.
3. Passzív pályaélettartam csökkentő eljárás mágneses elven.

Egy-pont meghibásodásra méretezett, hidegtartalékolt alrendszerek elosztott intelligenciával.

- 50 x 50 x 50 mm
- 183 g tömeg
- $-40 \ldots +80C$
- $20g$ gyorsulás

- 2019-12-06, Electron - SMOG-P
- 2021-03-22, Soyuz - SMOG-1

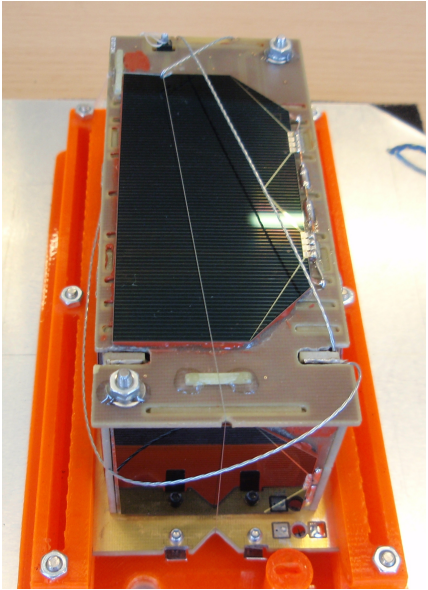


ATL-1 2 PQ - az első magyar magánműhold

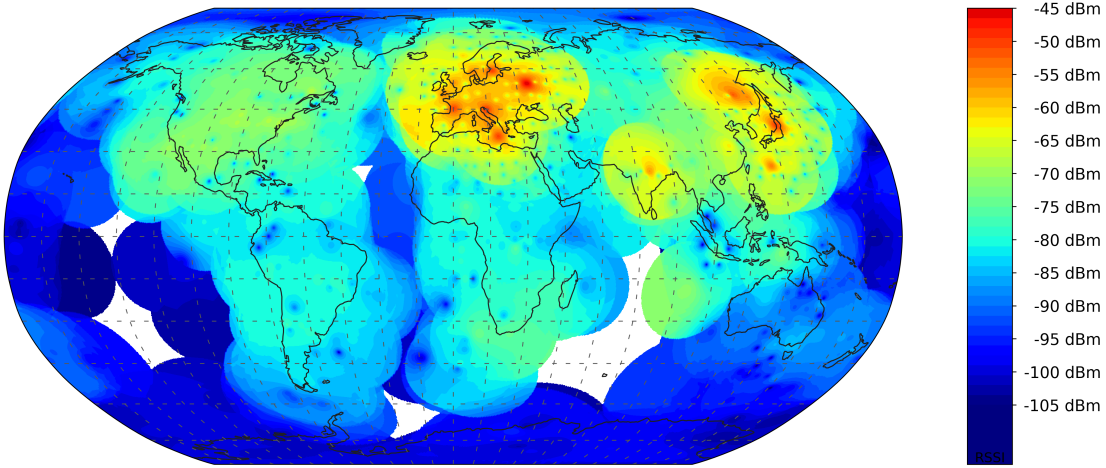
- 5 x 5 x 10 cm
- 336 g tömeg
- avg. 500 mW DC, 1 W csúcs

- 4 akkumulátor
- 3 különleges hőszigetelő anyag

- 2019-12-06, Electron



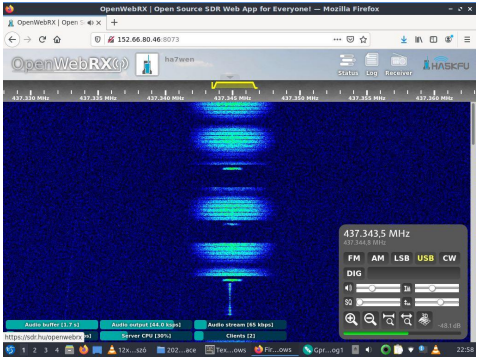
Globális TV sávú szennyezettségi térkép



Takács Donát, Markotics Boldizsár - BME VIK TDK 2020

SMOG-1 - Soyuz start 22.03.2021

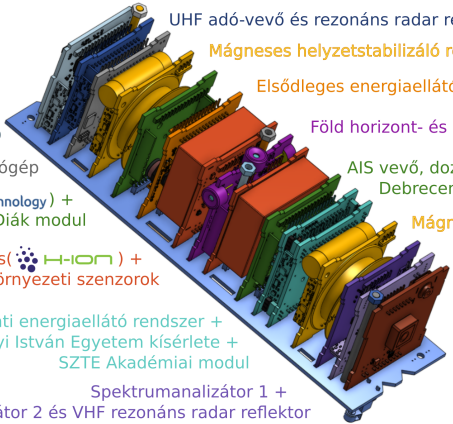
SMOG-1 első jelei 2021-03-25 0:46



AZ MRC-100 POCKETQUBE MŰHOLD

MŰEGYETEM 1782

BME VILLAMOSMÉRNÖKI ÉS INFORMATIKAI KAR



UHF adó-vevő és rezonáns radar reflektor

Mágneses helyzetstabilizáló rendszer

Elsődleges energiaellátó rendszer

Föld horizont- és Nap szenzor

S sávú adó

Fedélzeti számítógép

AIS vevő, doziméter (27G-Technology) +
SZE Diák modul

AIS vevő, doziméter (27G) +
Debreceni Egyetem kísérlete

Mágneses helyzetstabilizáló rendszer

Akkumulátorvédelem és szigetelés(H-ION) +
környezeti szenzorok

Optikai szenzor és GPS vevő

Központi energiaellátó rendszer +
Széchenyi István Egyetem kísérlete +
SZTE Akadémiai modul

Spektrumanalizátor 1 +
Spektrumanalizátor 2 és VHF rezonáns radar reflektor

Támogatóink

NMH

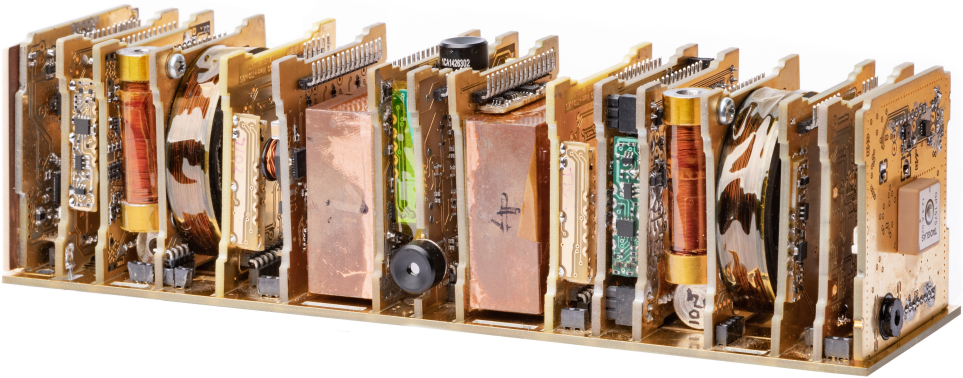
hvt

KÜLGAZDASÁGI ÉS KÜLÜGYMINISZTÉRIUM

Radar Research Group

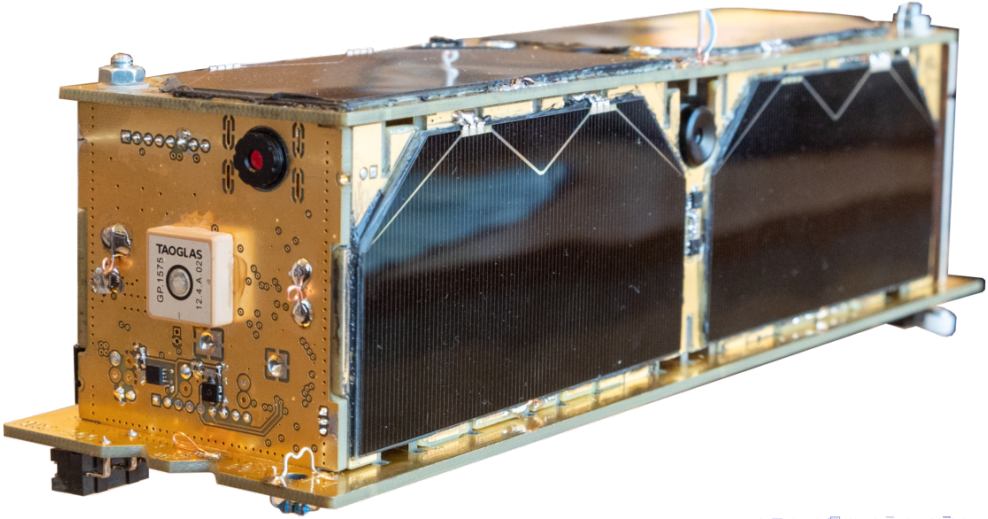
HA4TI

MRC-100 - 3 PQ

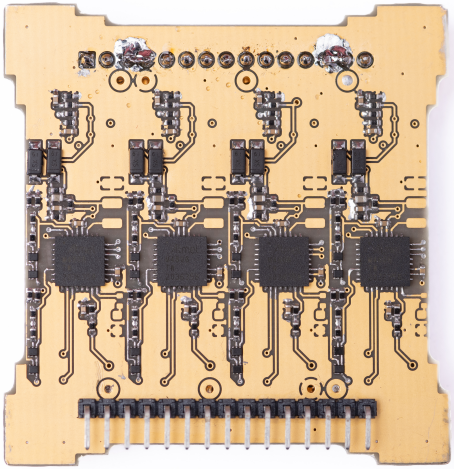


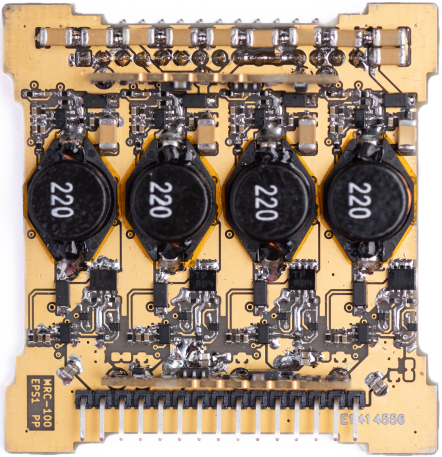
MRC-100 - 3 PQ

578 g - 5 x 5 x 15 cm - 800 mW DC



MRC-100 EPS1





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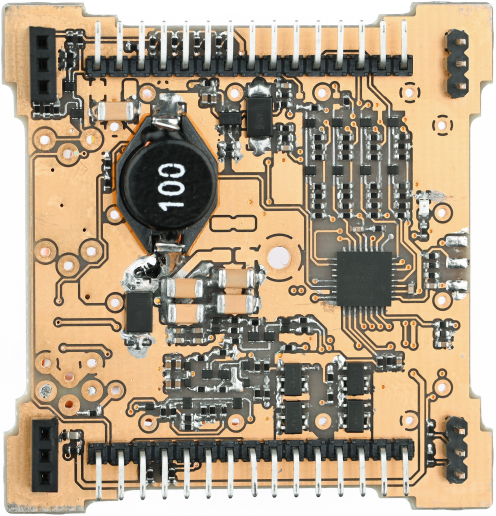
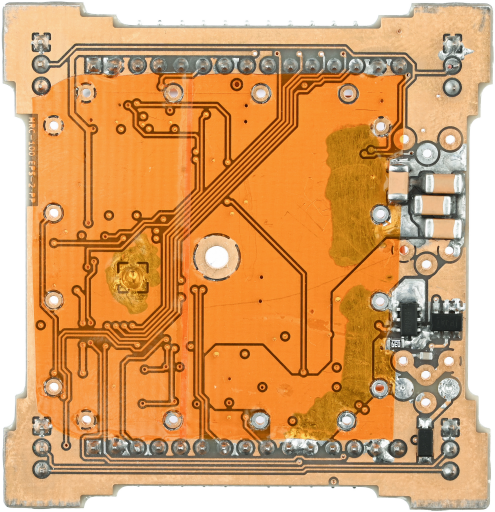
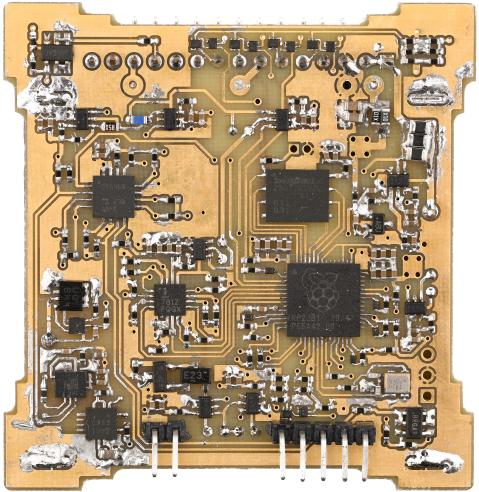
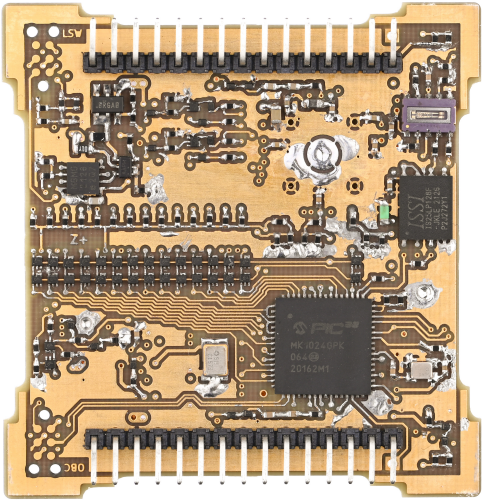


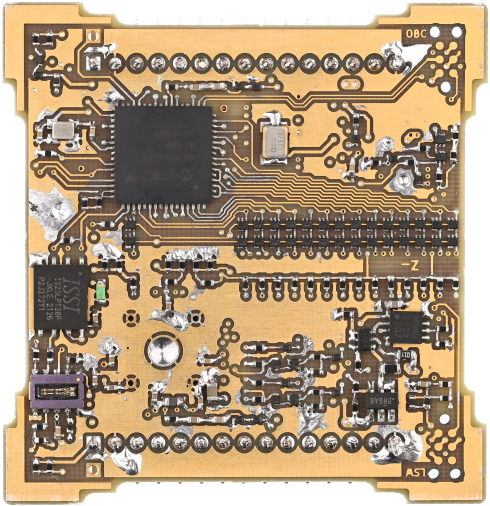


MRC-100 Battery

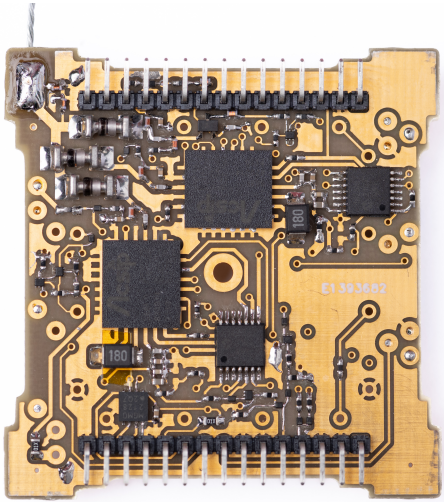


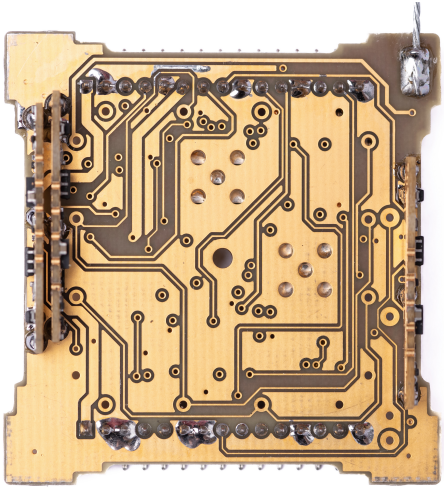
MRC-100 OBC



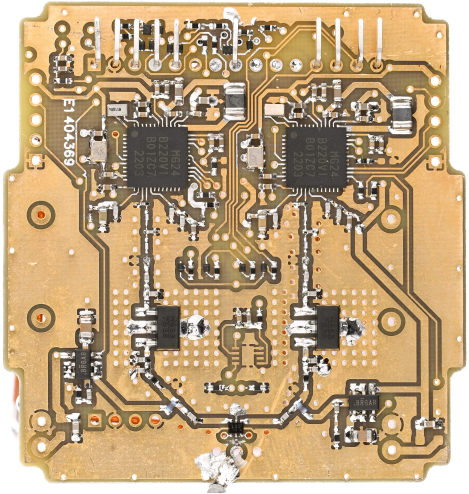


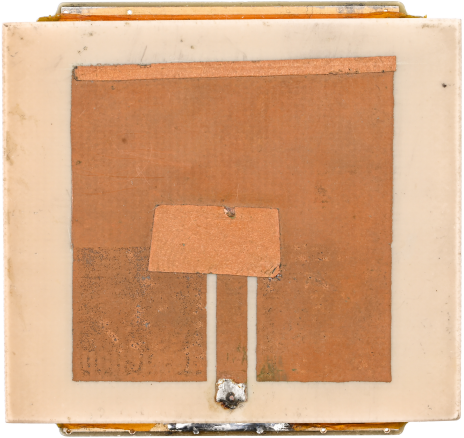
MRC-100 UHF COM



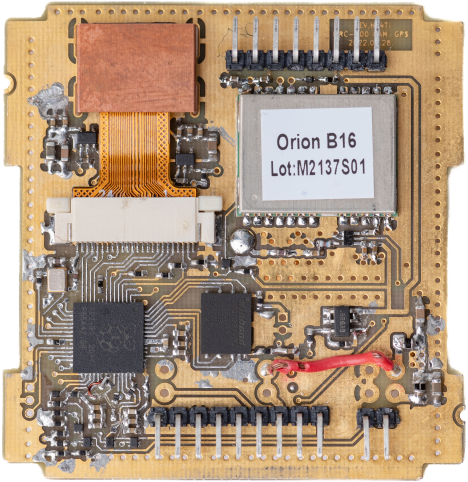


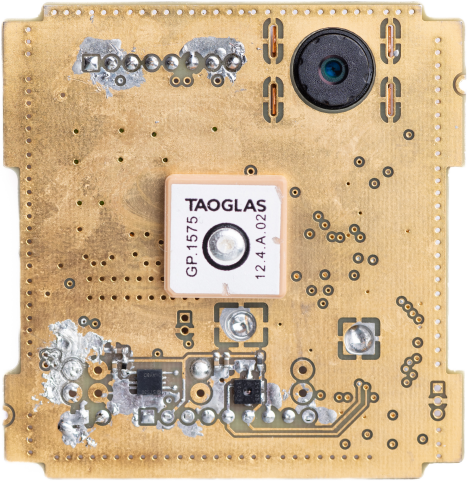
MRC-100 S-band TX



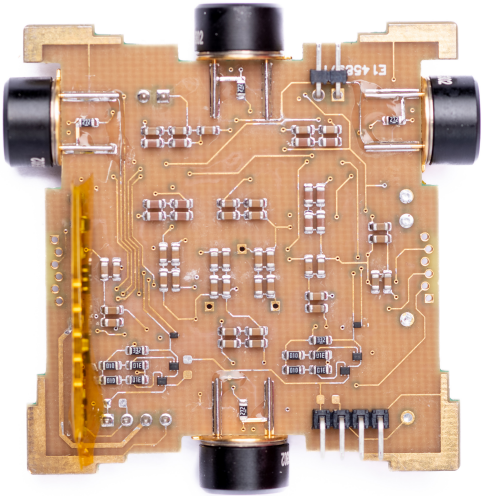


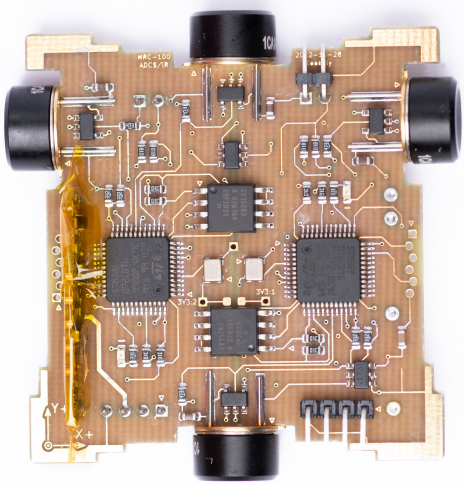
MRC-100 GPS + CAM





MRC-100 SUN





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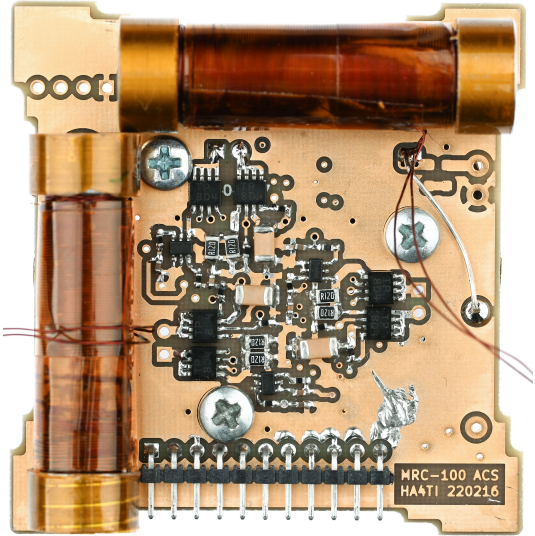

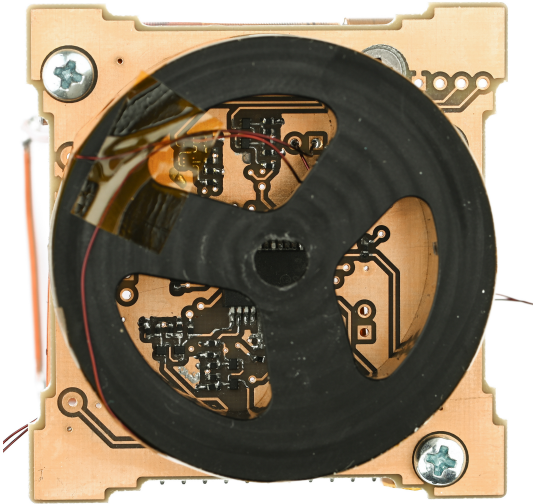

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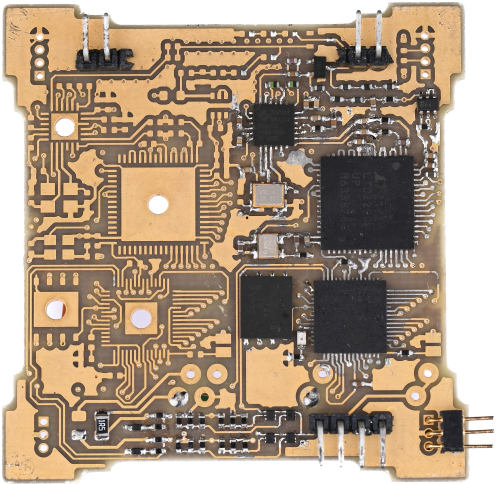
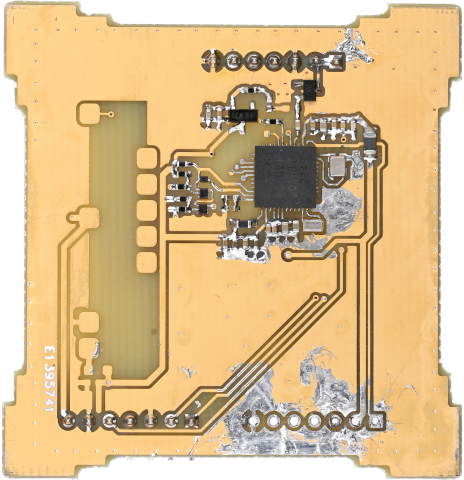
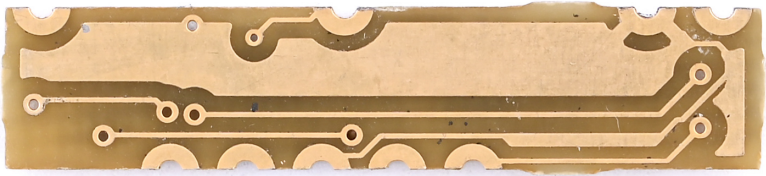
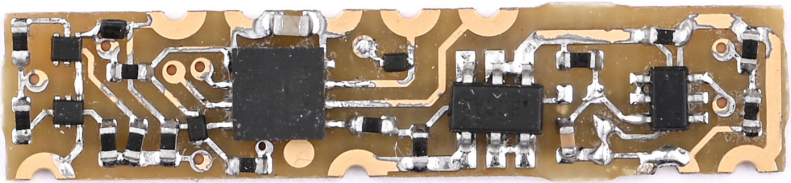




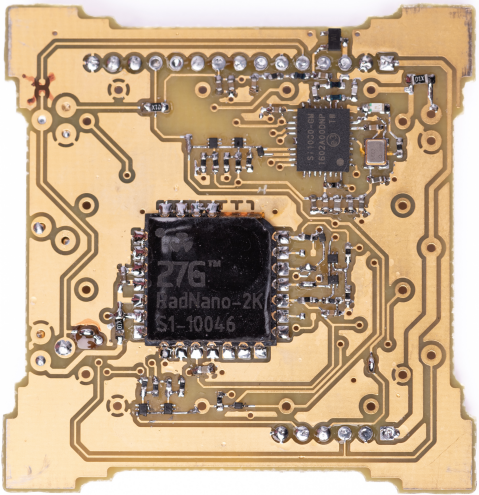
MRC-100 LSW

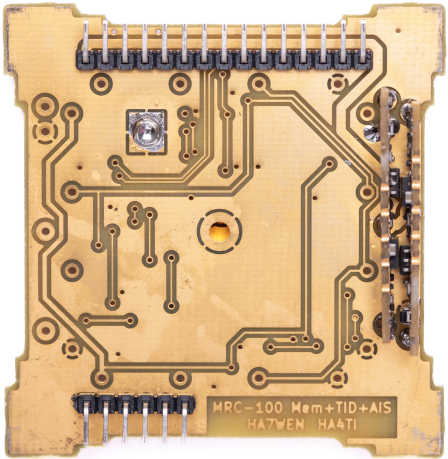


32 db áramhatároló kapcsoló: feszültség és áram mérés, túláram védelem.



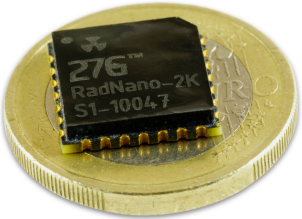
MRC-100 MEM + TID + AIS





MRC-100 TID

27G RadNano doziméterek



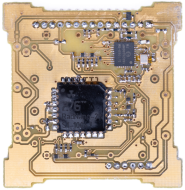
- Ionizáló sugárzási környezet monitorozása a műhold küldetése során
- 2 db. független egység az MRC-100 fedélzetén

Digitálisan előálló mérési eredmények:

- Teljes dózis (TID) mérés szilíciumban
- Precíziós hőmérséklet mérés (+/- 0,5 °C)
- Tápfeszültség mérés
- Precíz időzítés, 30 másodpercenként frissülnek az adatok

Főbb műszaki paraméterek:

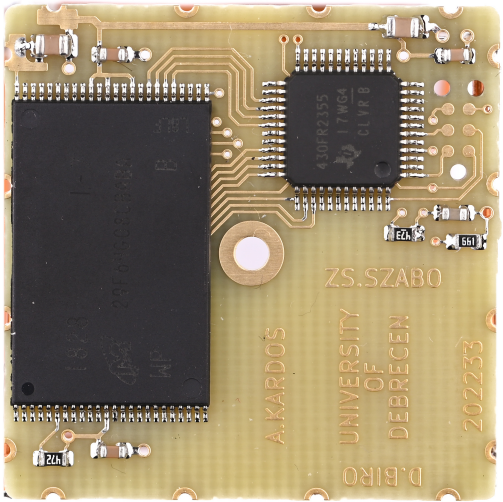
- 1 mGy… 20 Gy (0.1 … 2000 rad) mérési tartomány
- 12.7x12.7x2.5 mm befoglaló méret
- < 10 µW standby fogyasztás, < 10 mW méréskor
- 0.89 g össztömeg



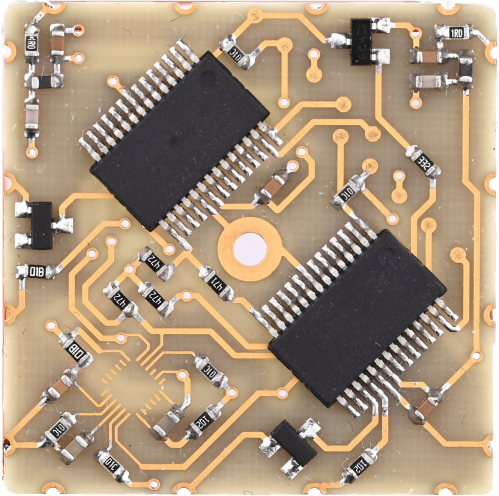
A 27G-Technology (27G) 2020-ban indult a SMOG-P indítása után, a fejlesztő csapat néhány végzett mérnök hallgatója alkotja a startup magját.

- Bővebb információk a 27G honlapján: www.27g.space

MRC-100 Debrecen



MRC-100 Győr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0R
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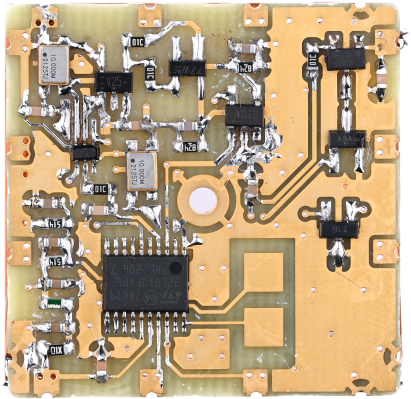
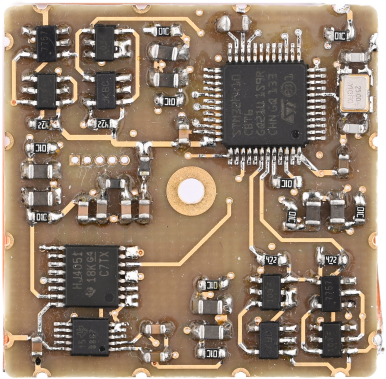
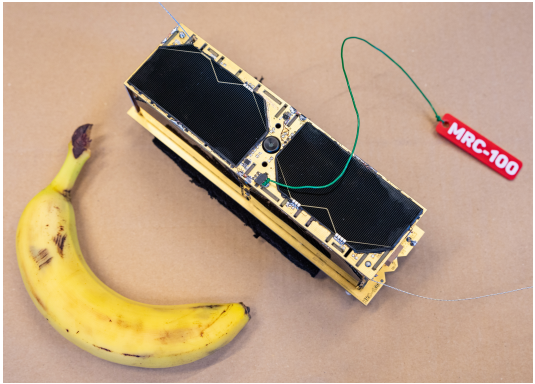
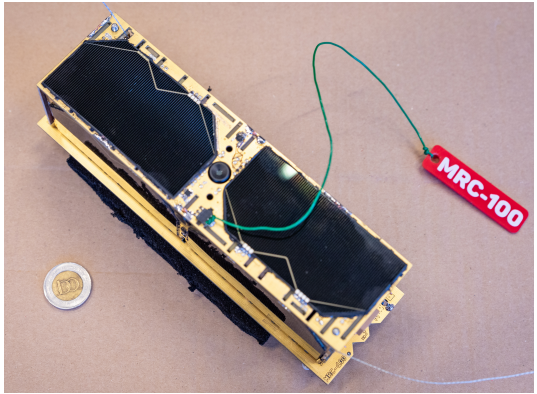
MRC-100 Szeged





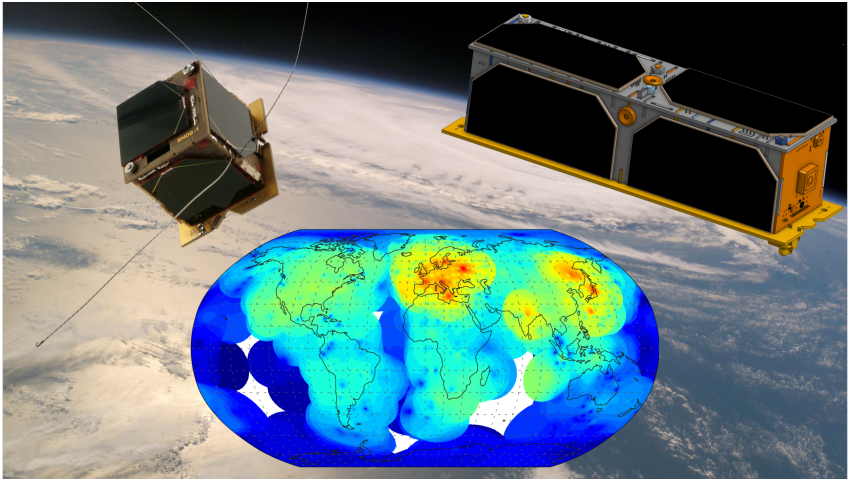
MRC-100 - start 2023. június eleje





A földi állomás készen áll: `https://gnd.bme.hu`

https://gnd.bme.hu/
http://152.66.80.46/smog1
http://152.66.80.46/mrc100dec



dudas.levente@vik.bme.hu