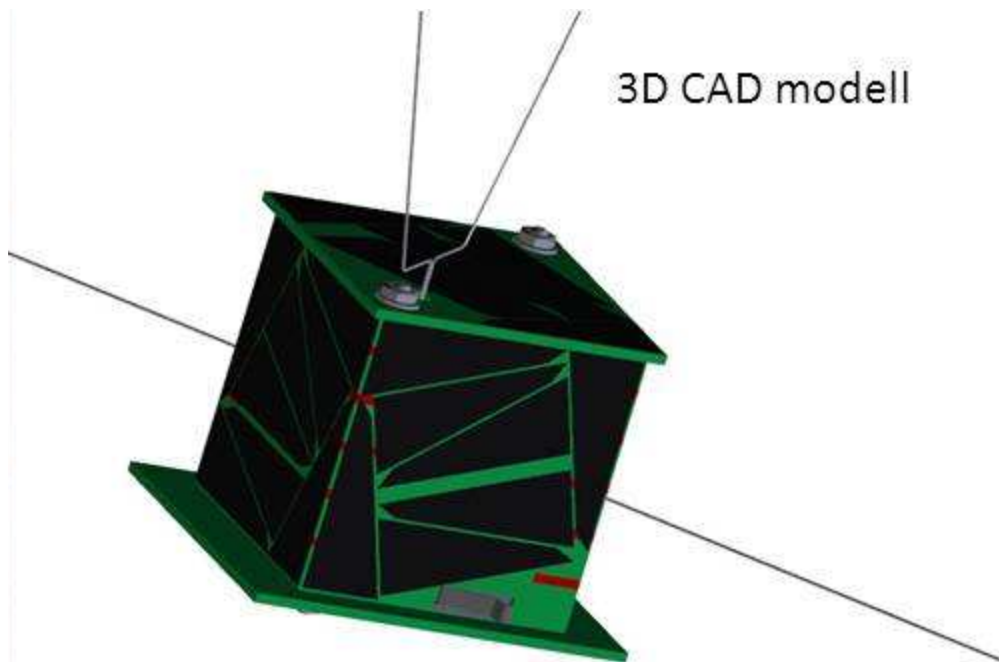


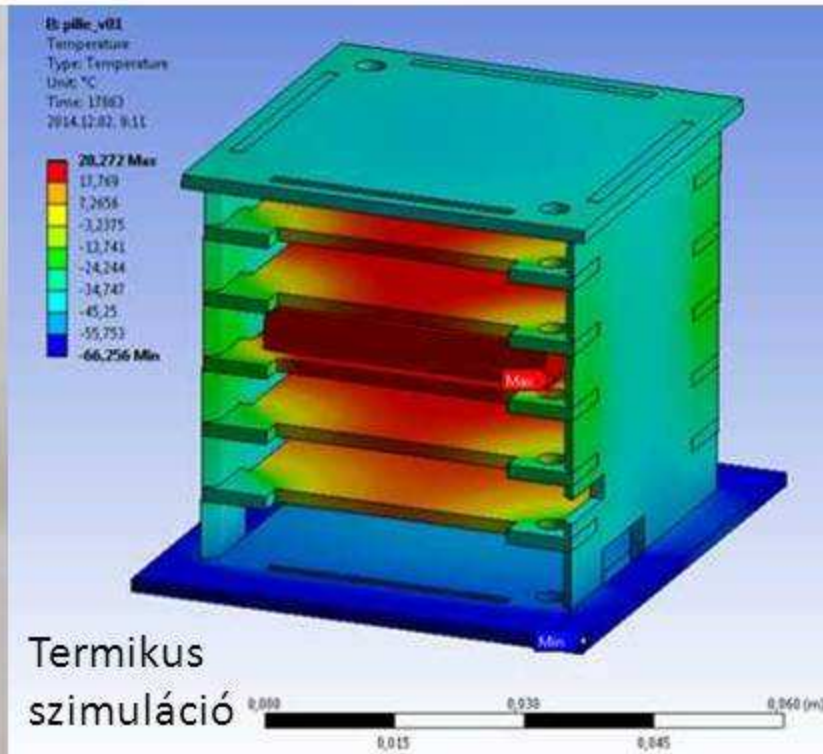


SMOG-1

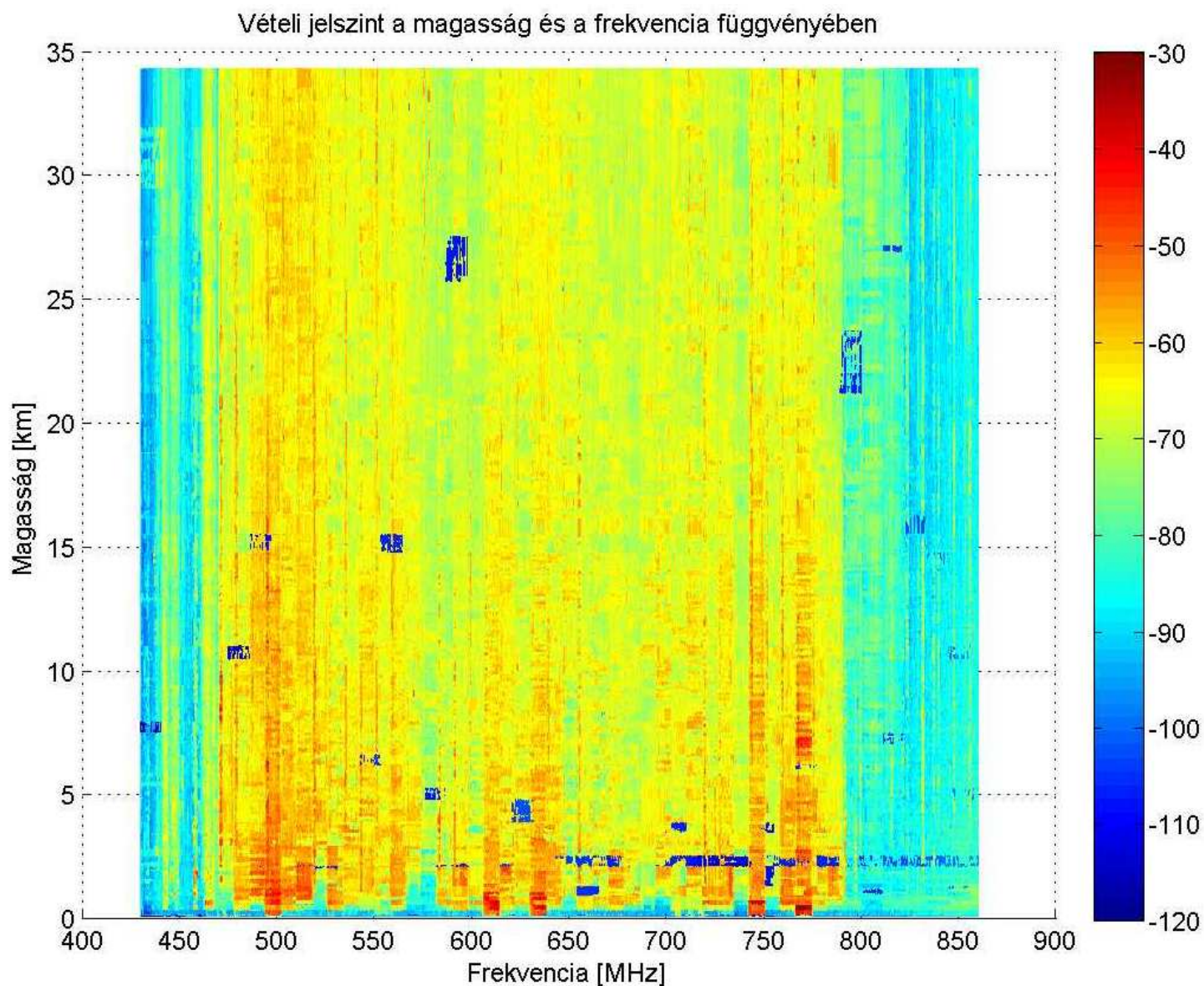
3D CAD modell

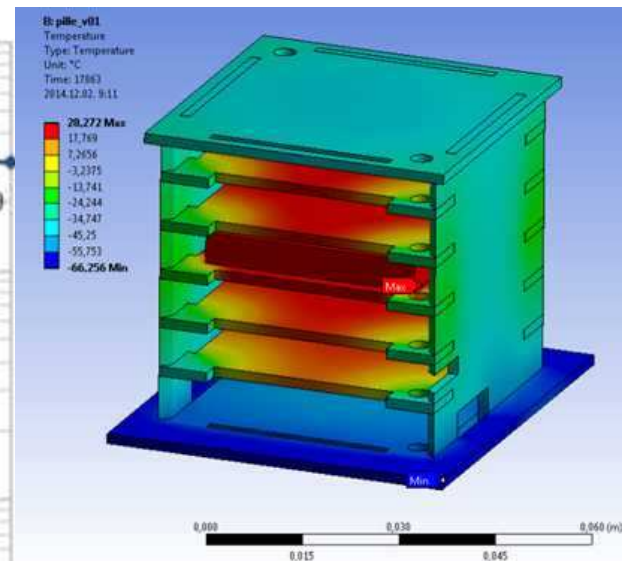
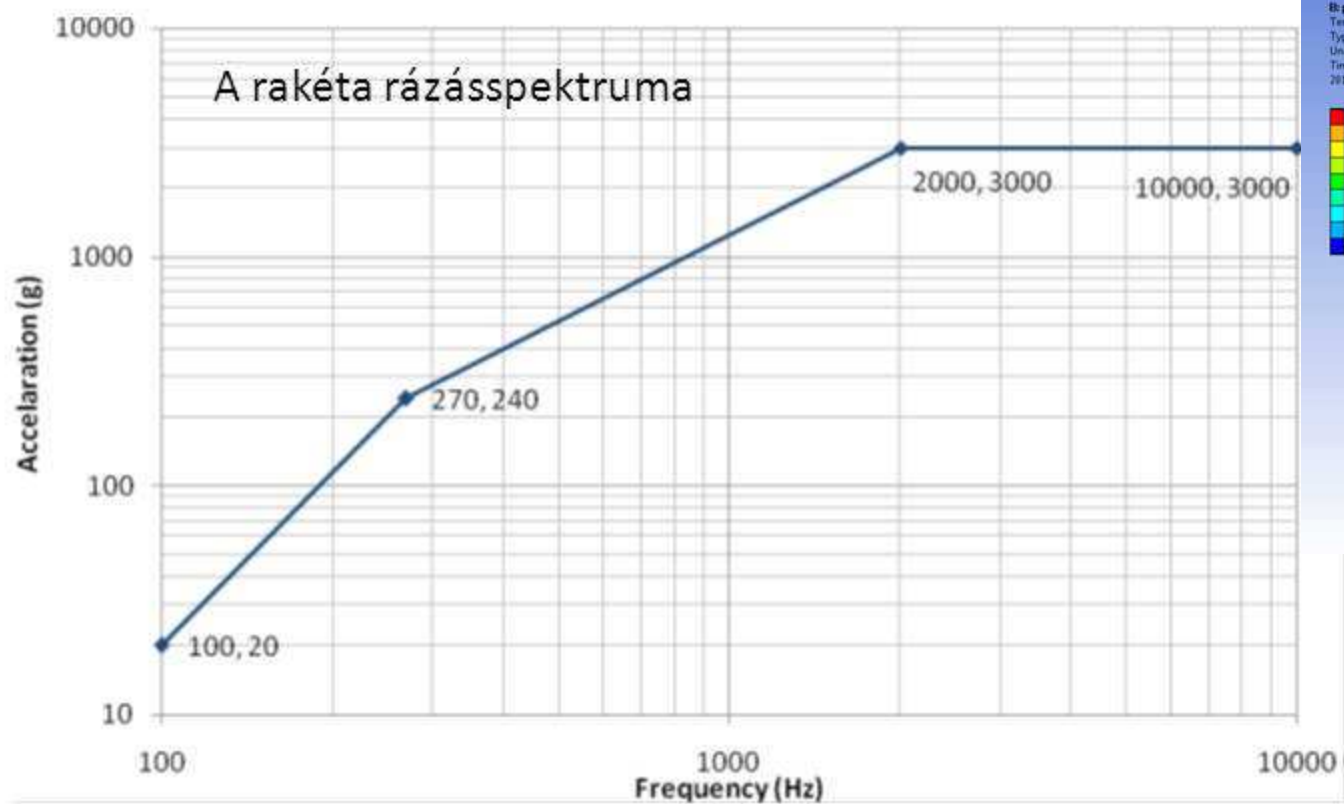


SMOG-1
vázszerkezet

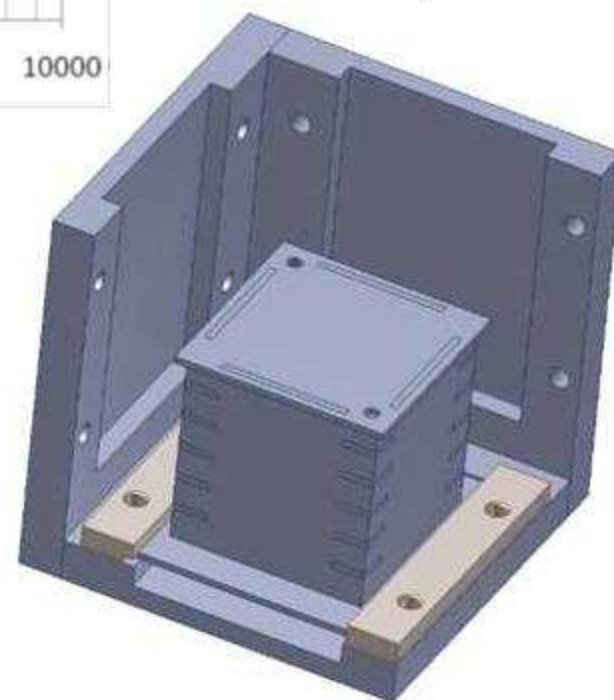


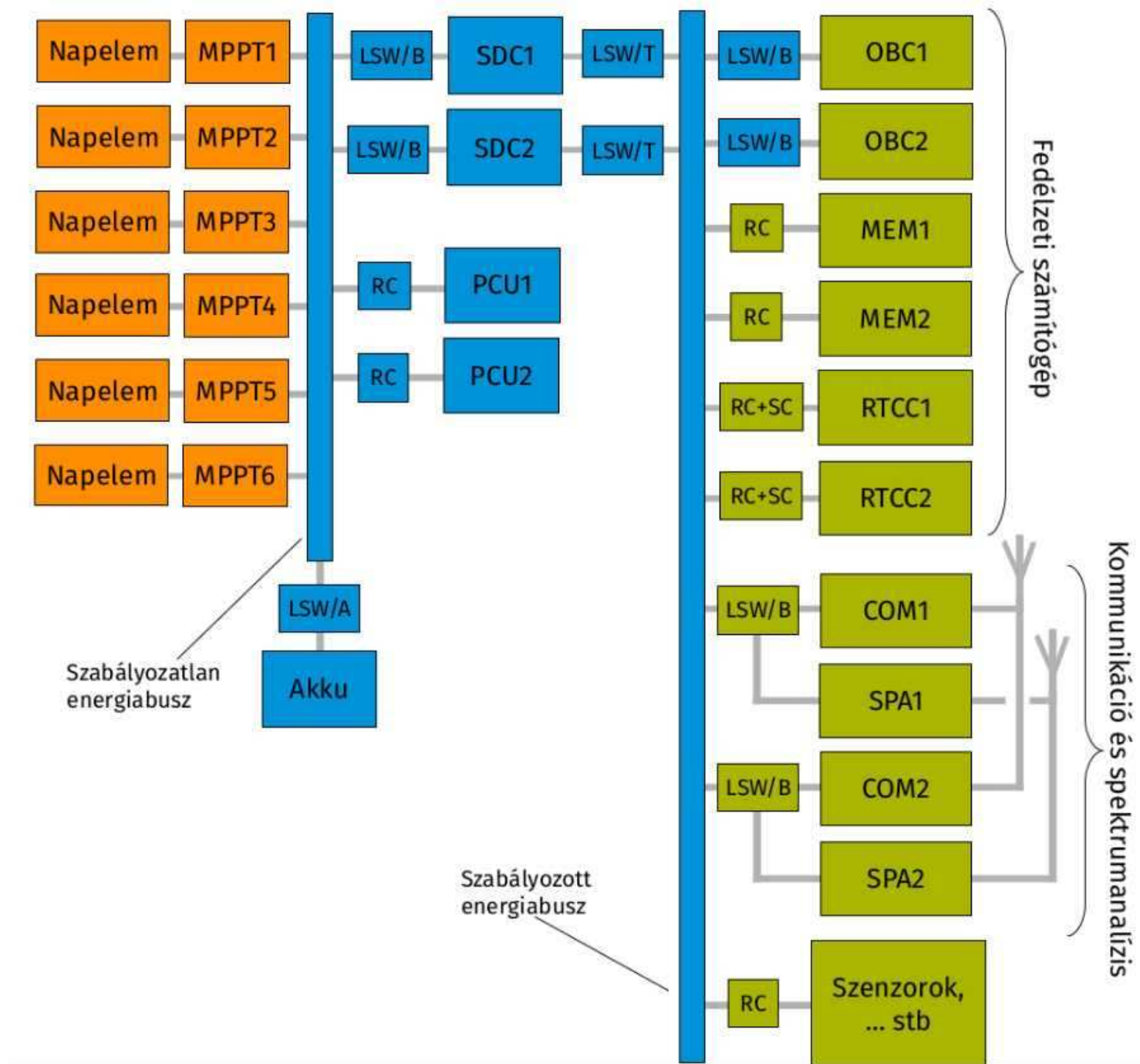
A SMOG-1 küldetés elsődleges célja



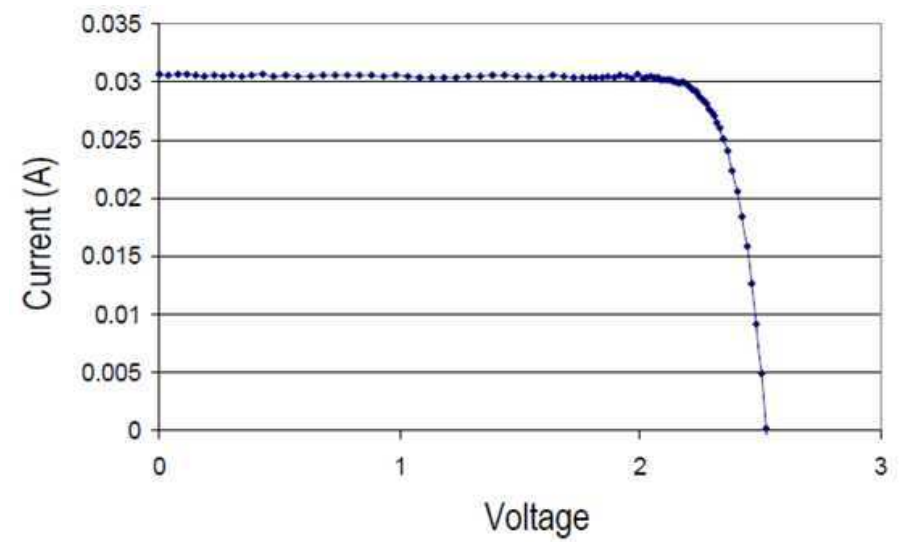
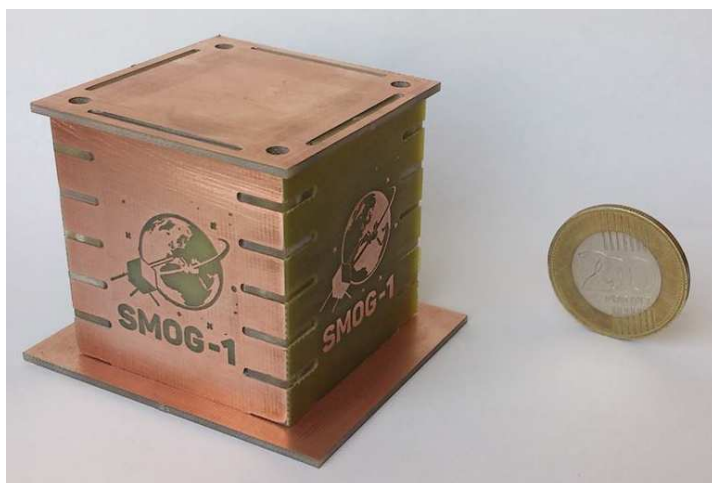
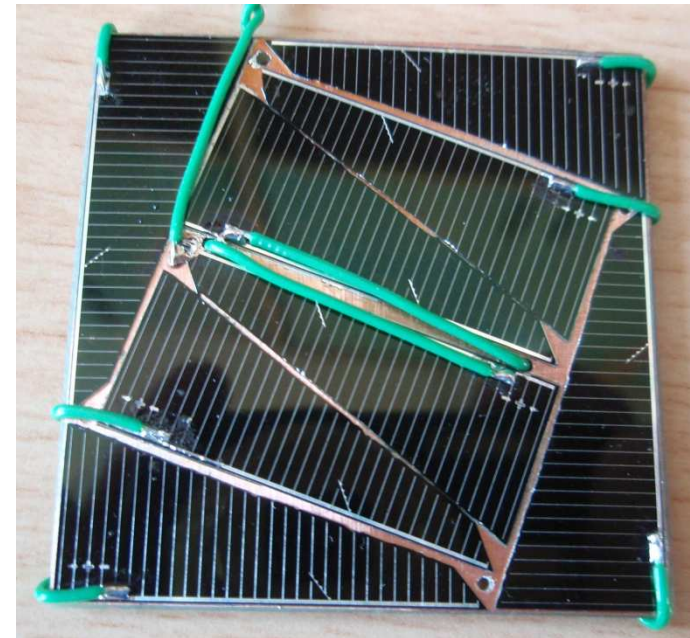
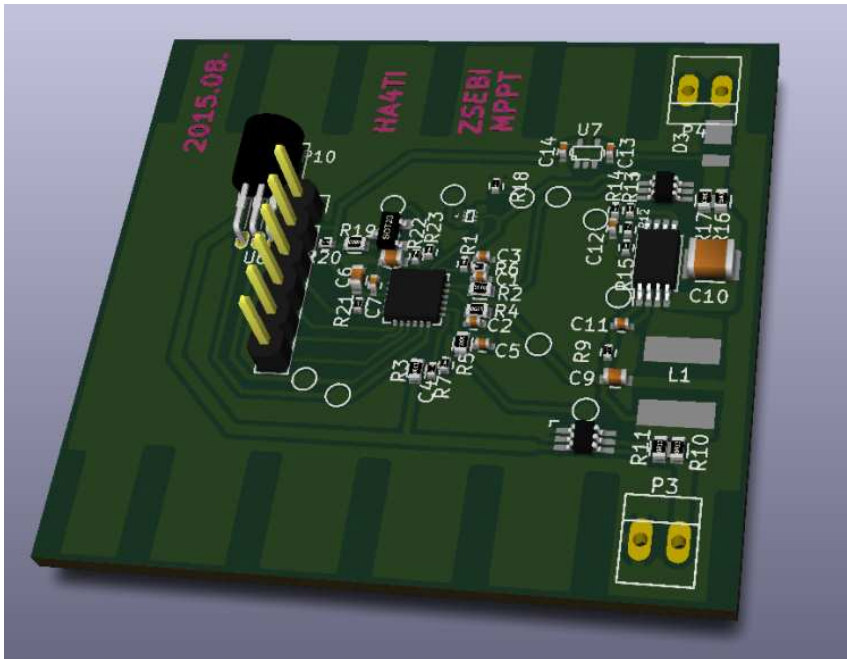


Befogó szerkezet
rázópadra

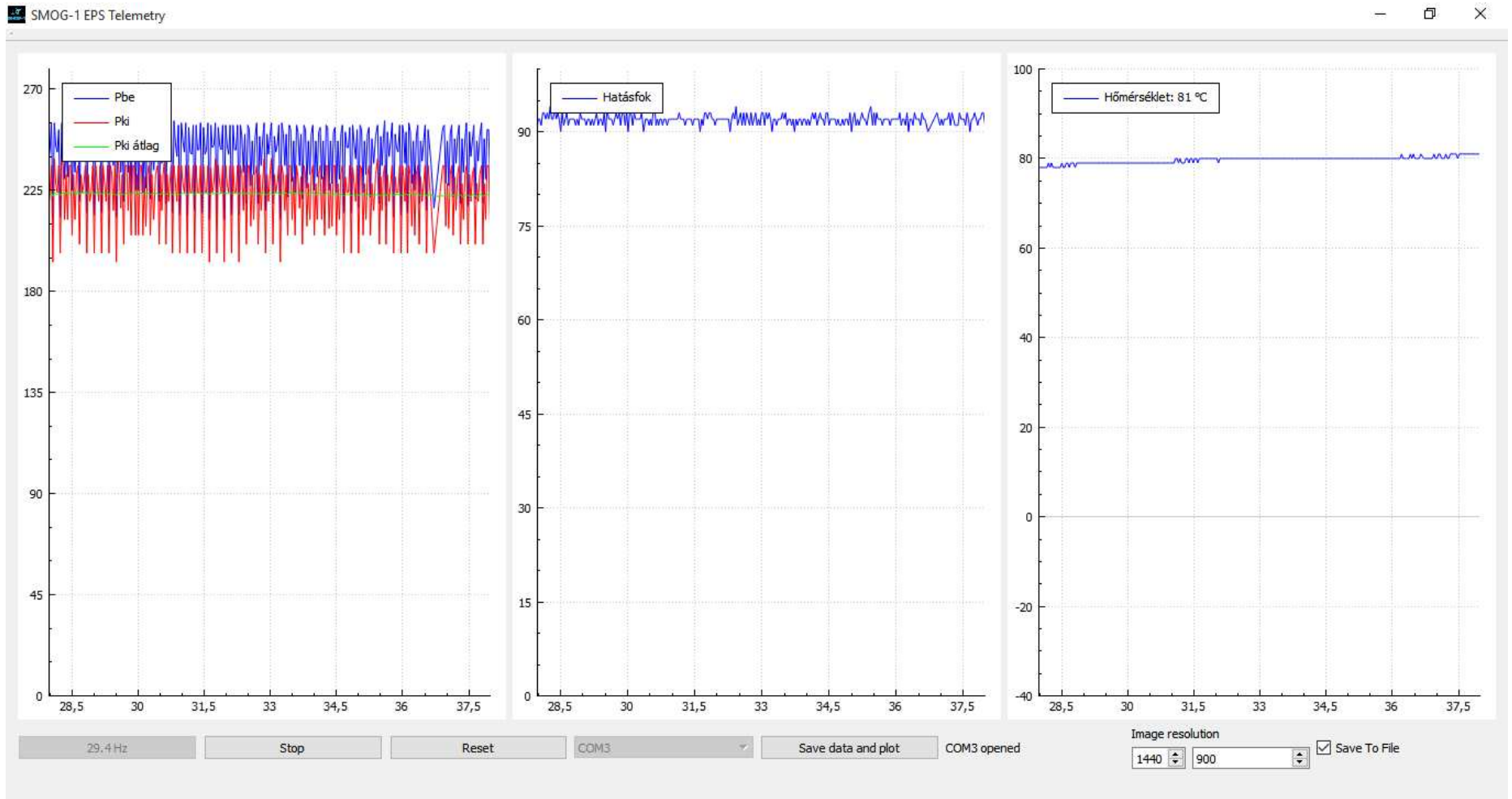




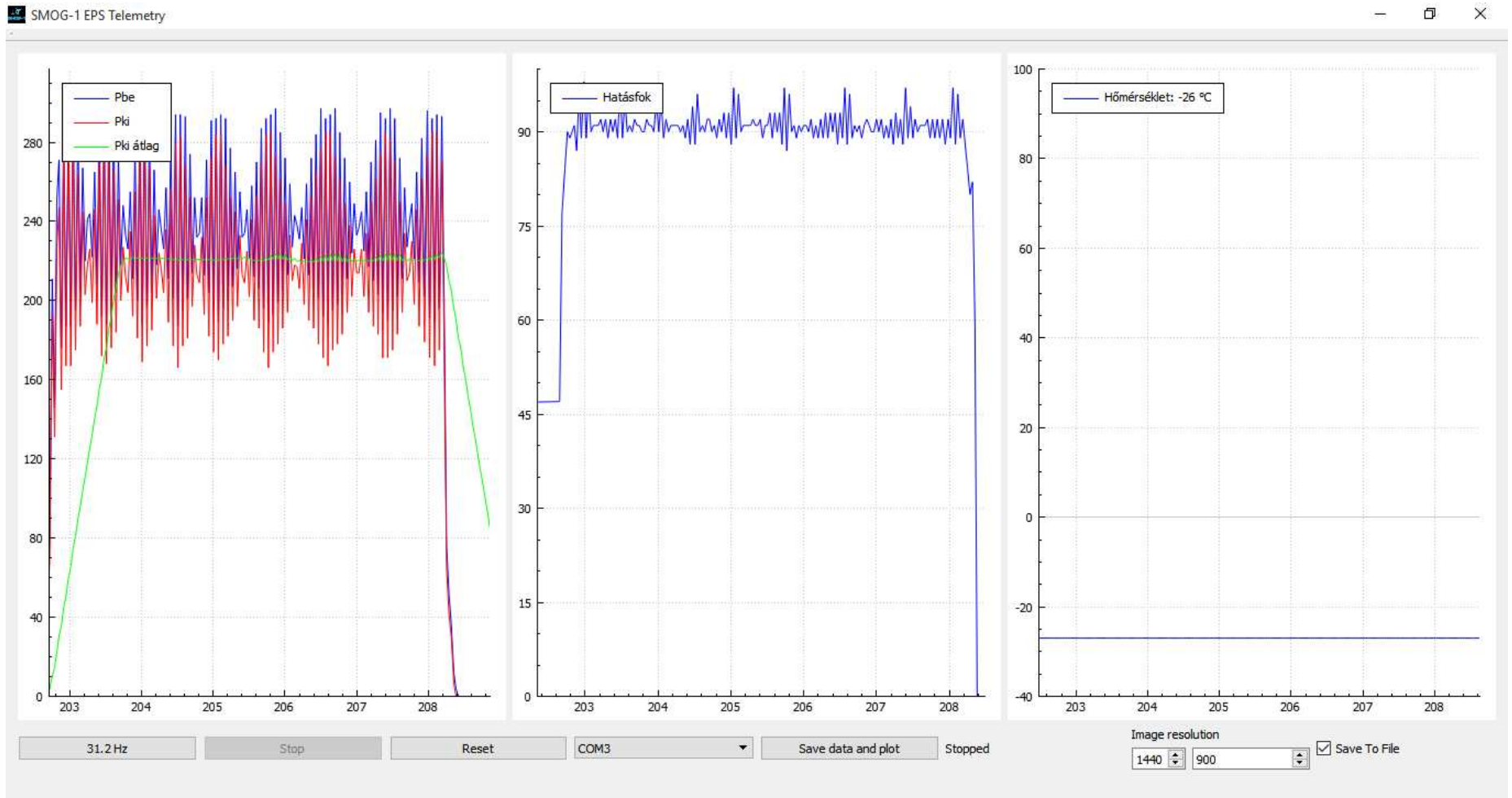
EPS 1



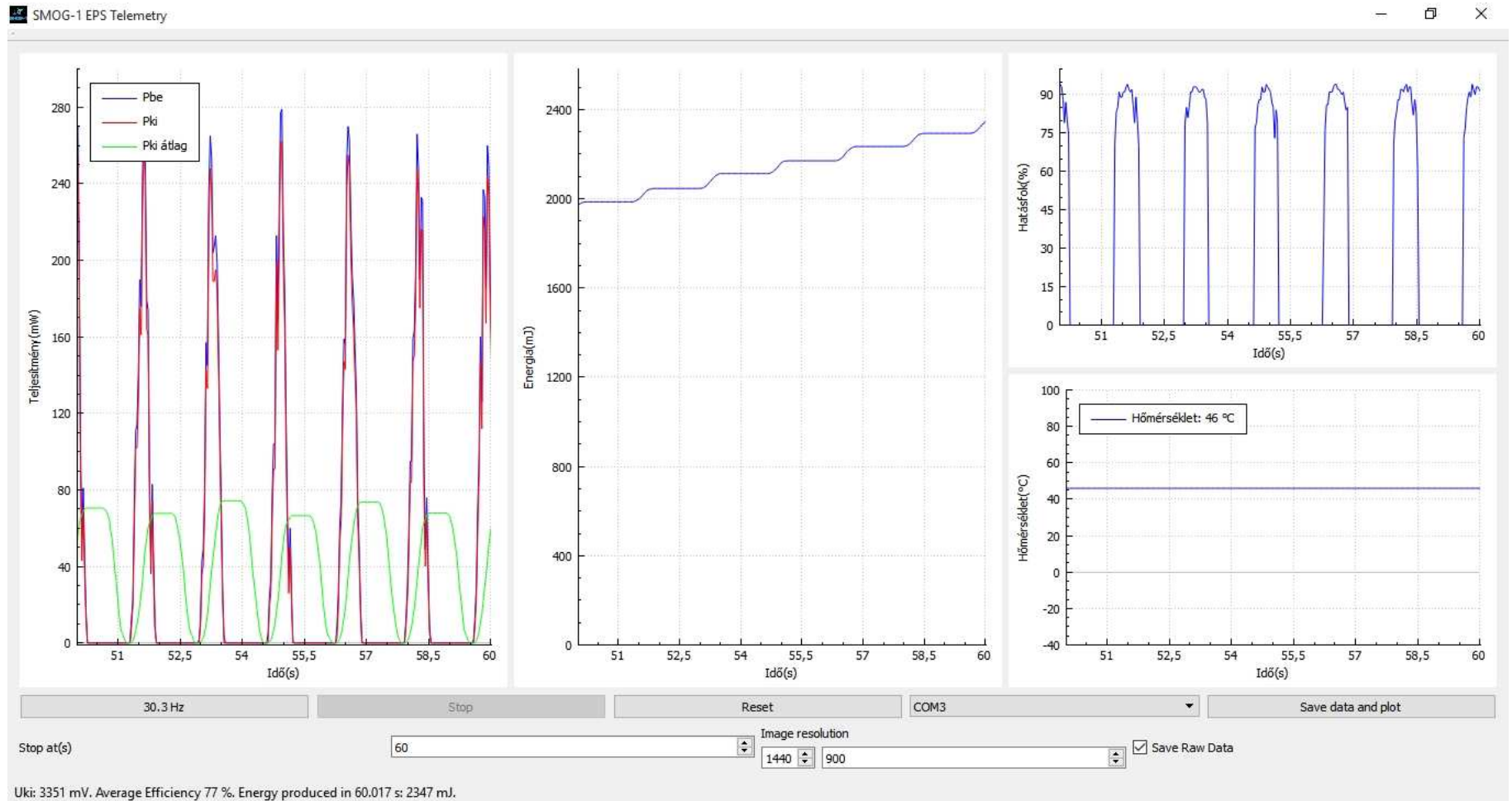
EPS 1: 80 °C



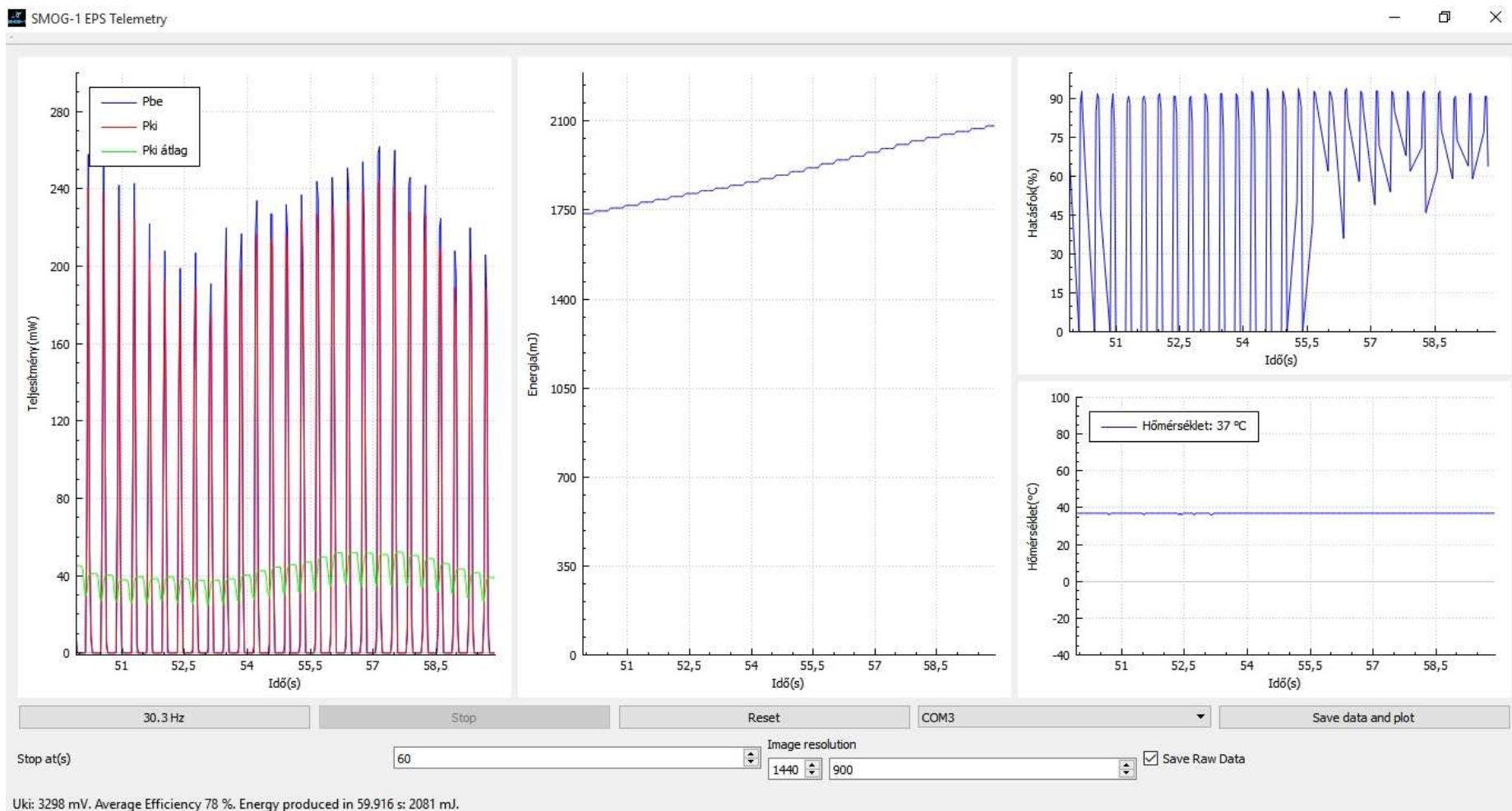
EPS 1: - 40 °C



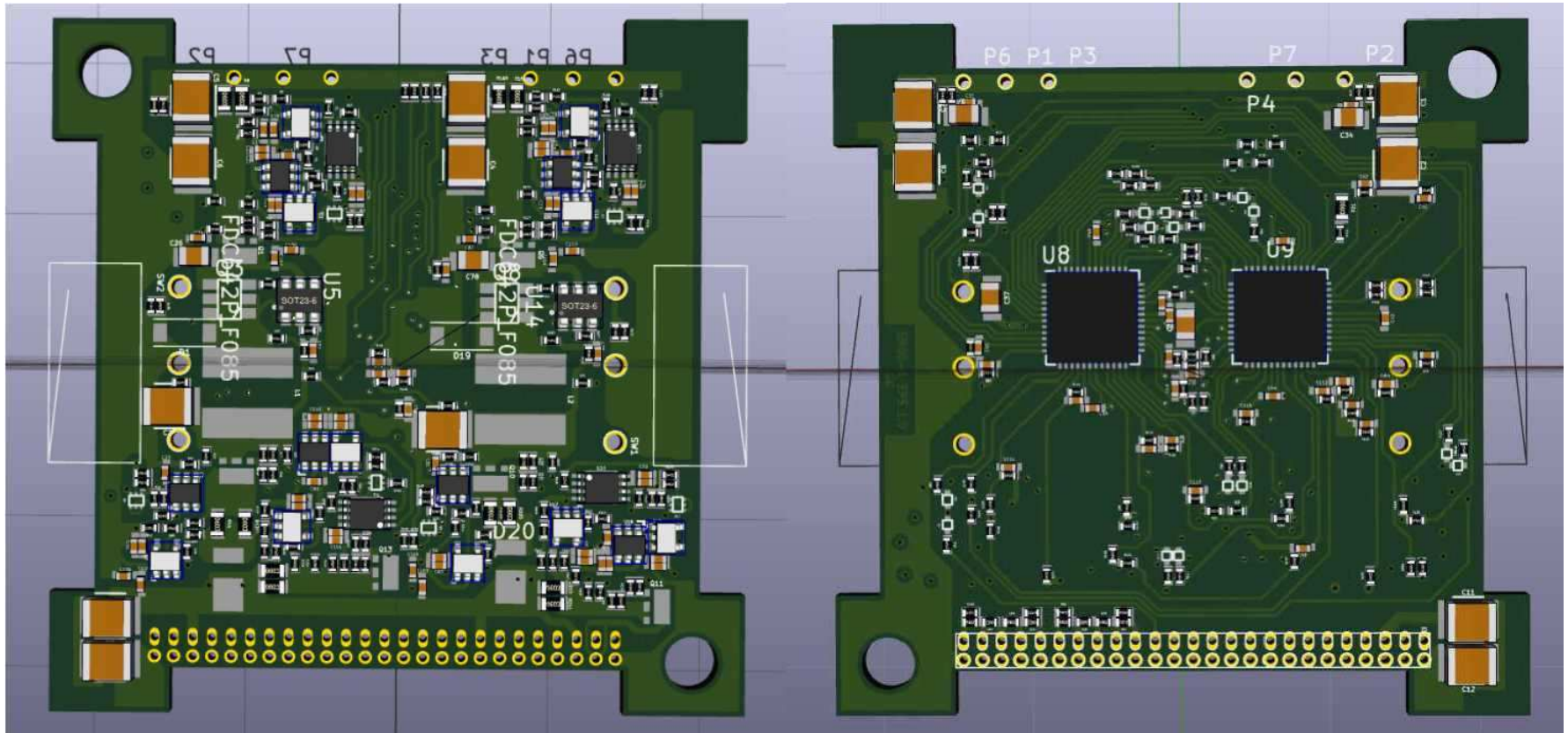
EPS 1: 36 rpm



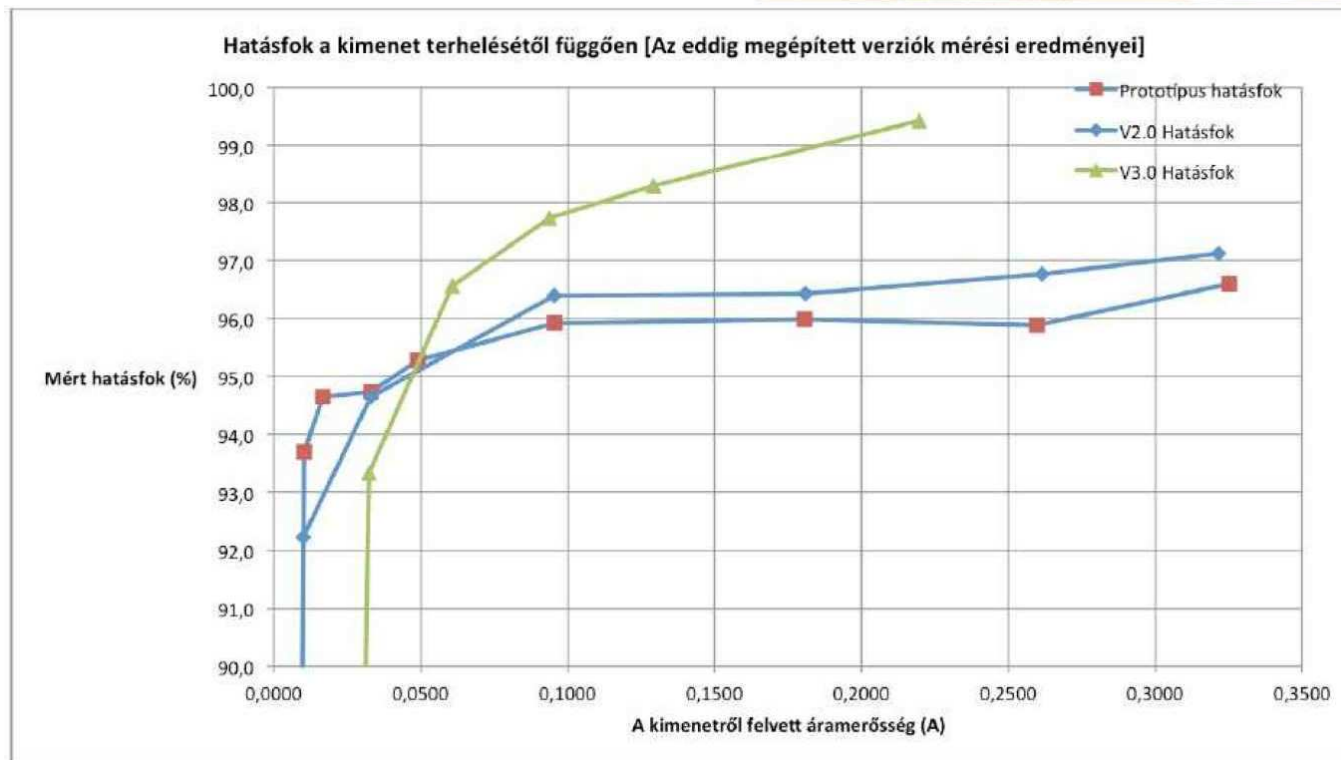
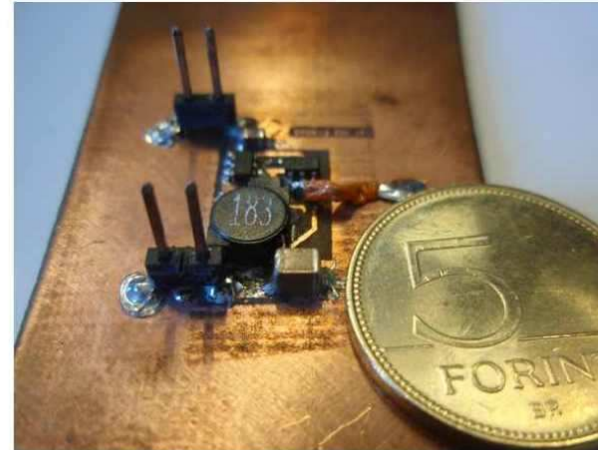
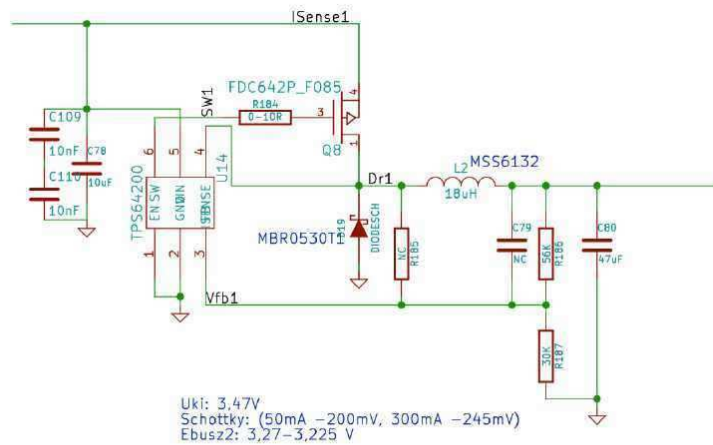
EPS 1: 162 rpm



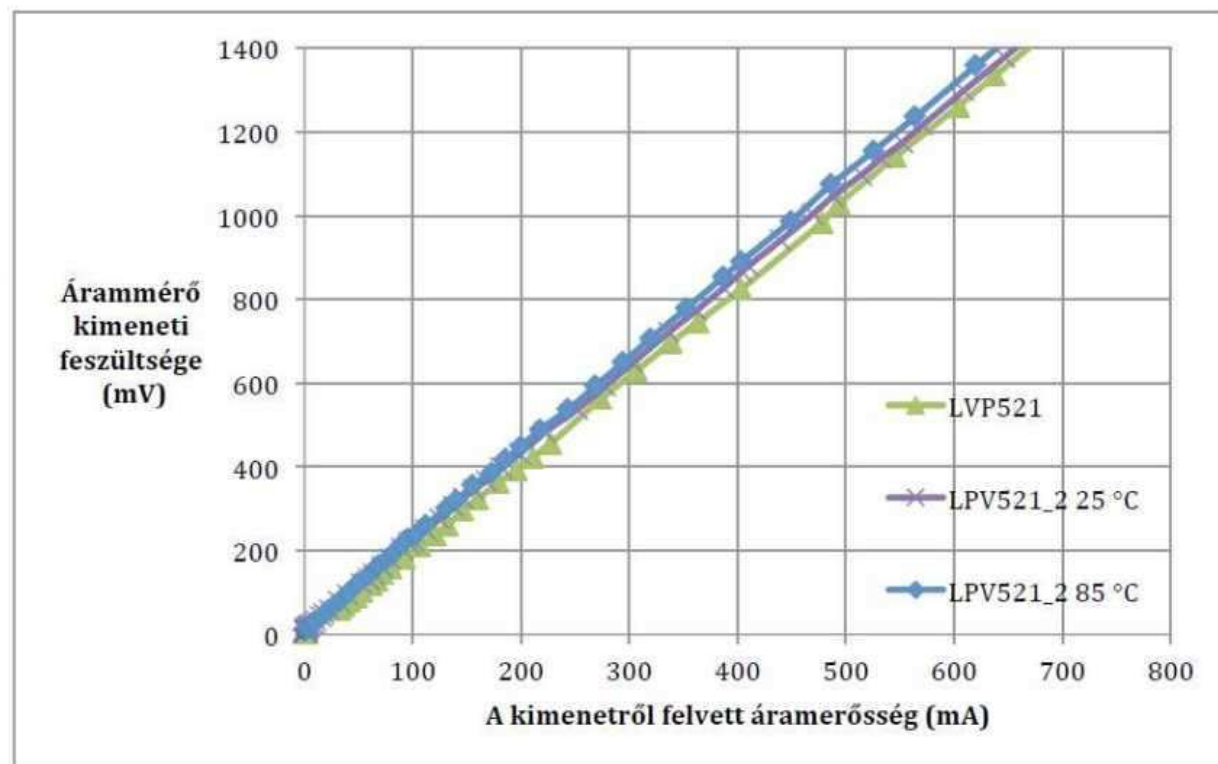
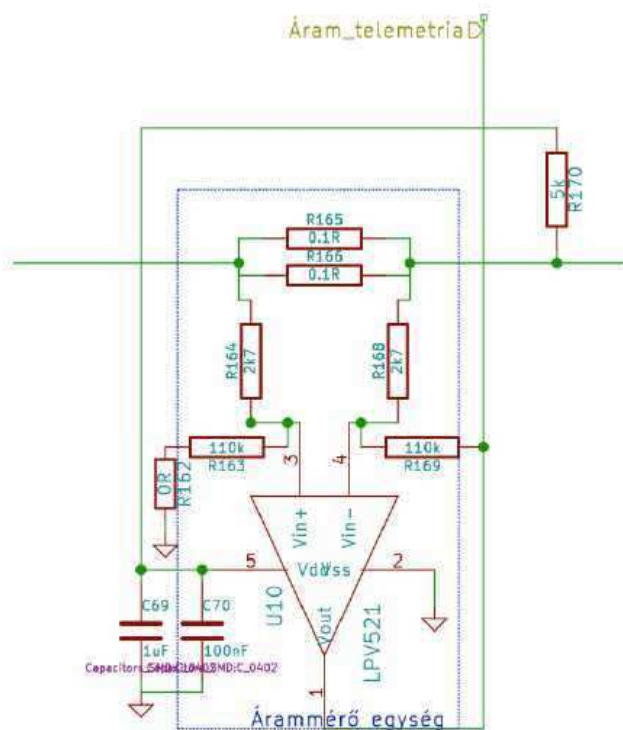
EPS 2



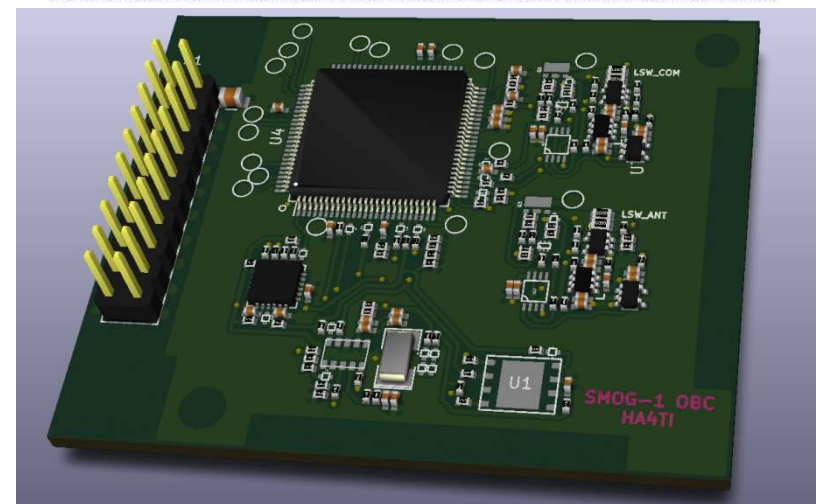
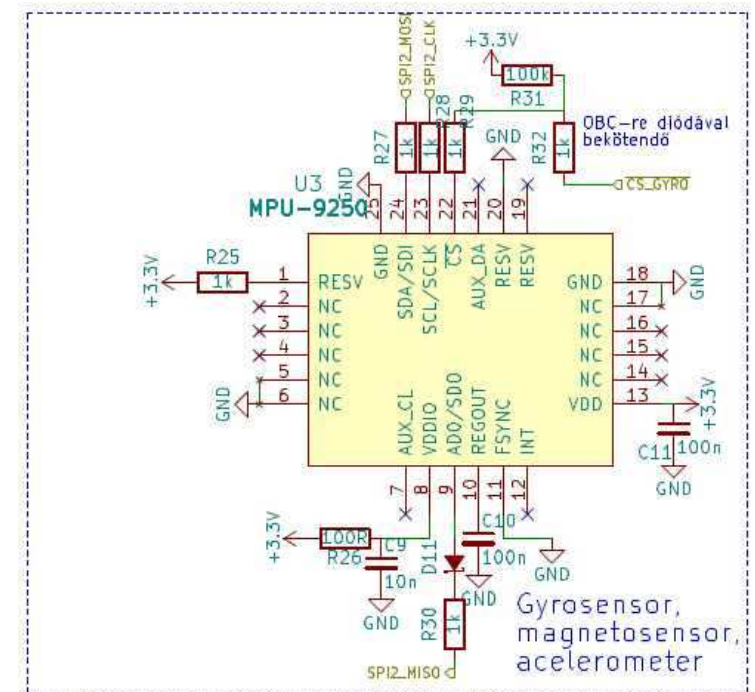
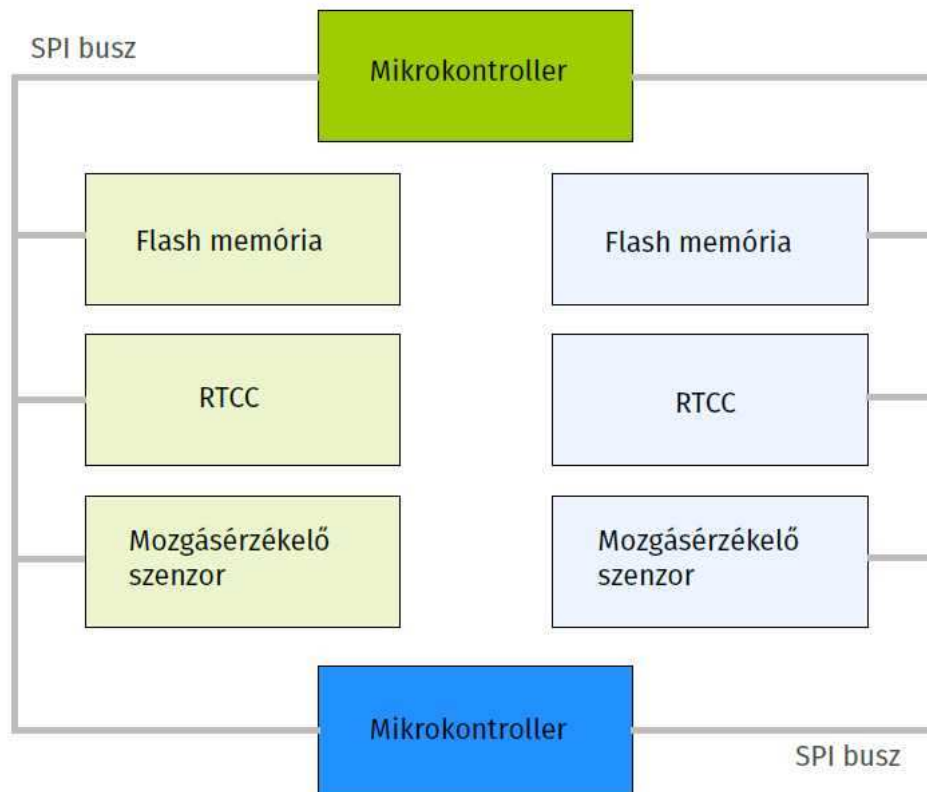
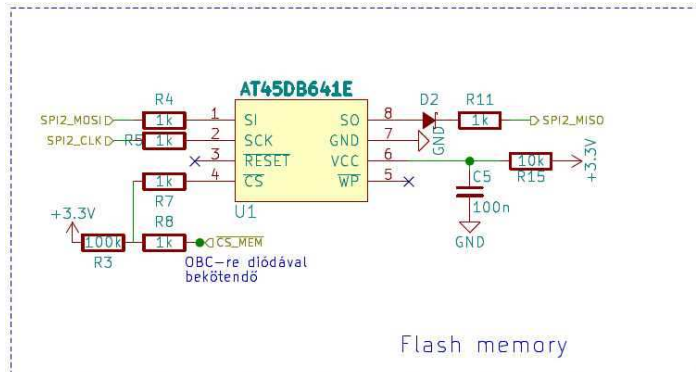
EPS 2



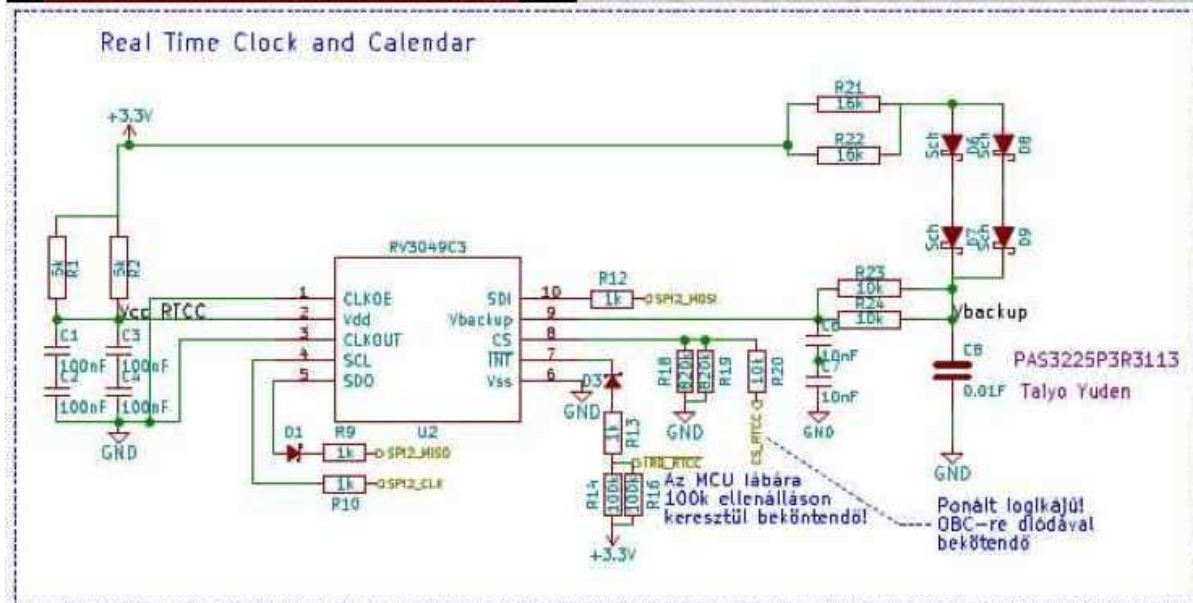
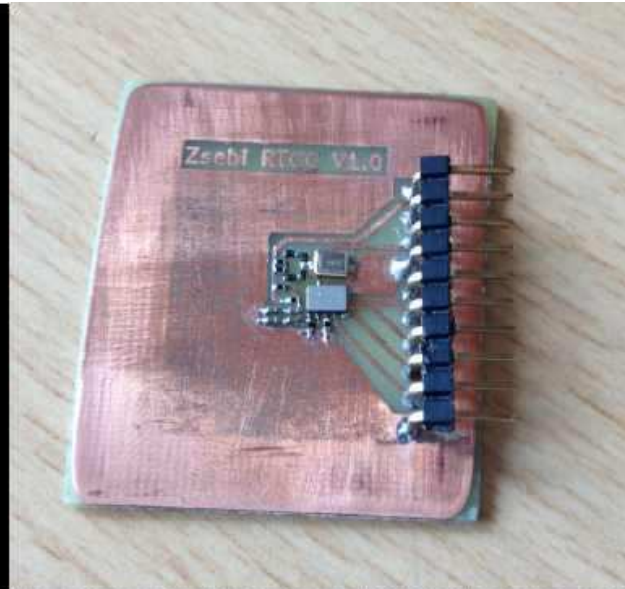
EPS 2: Árammérő híd



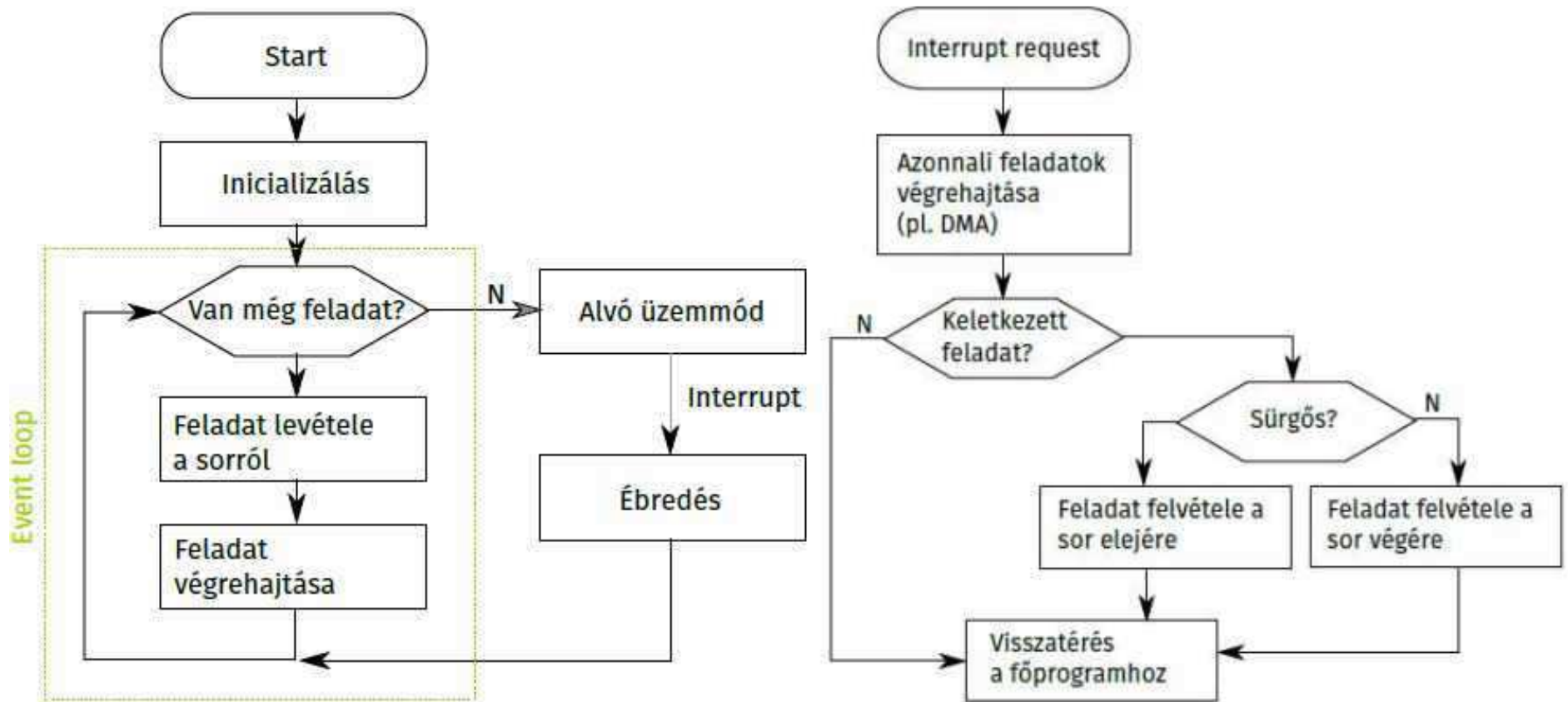
OBC



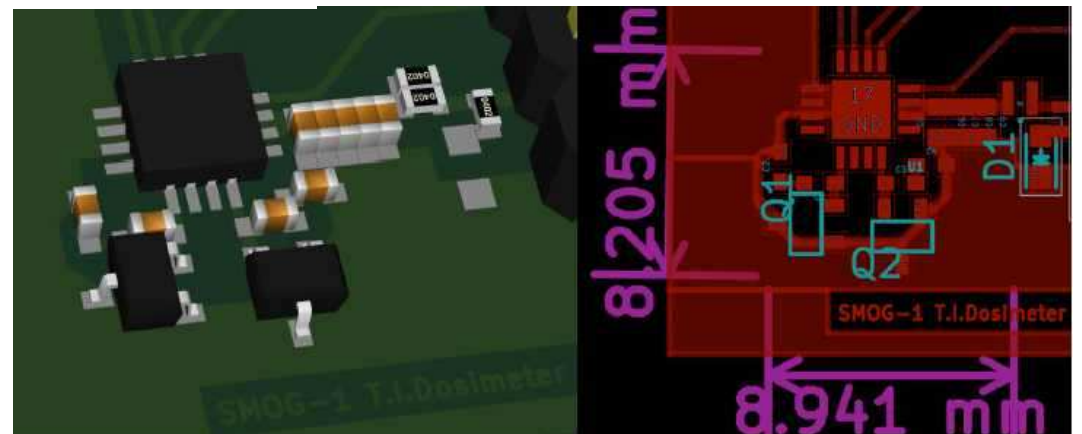
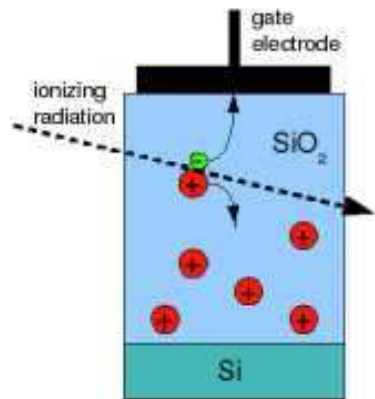
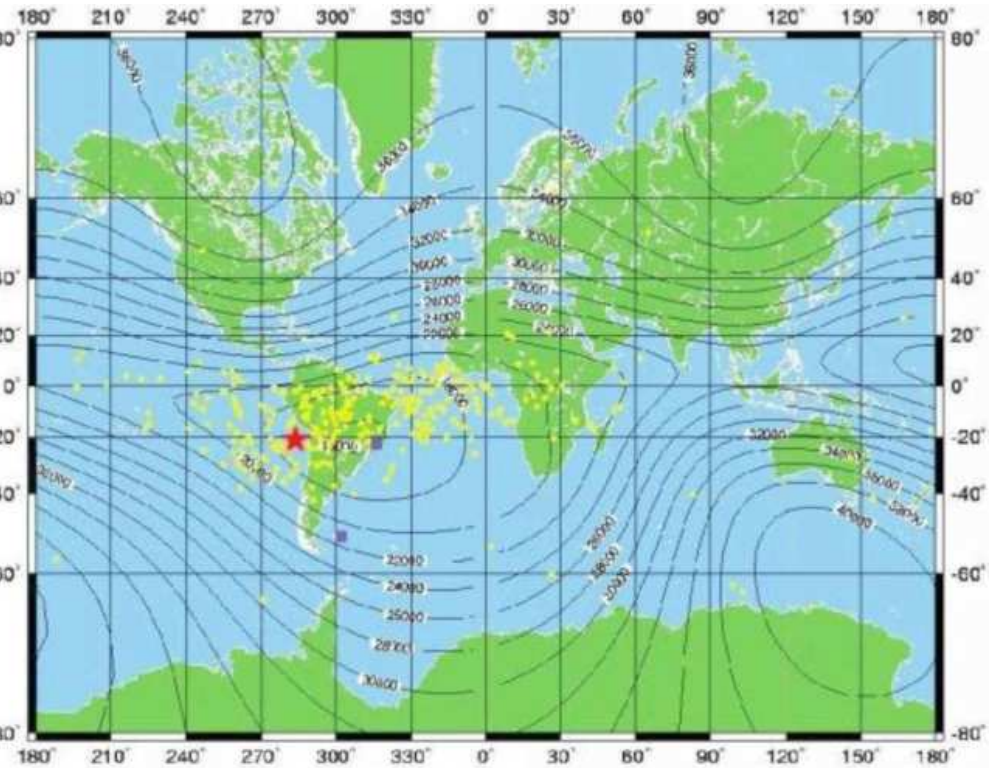
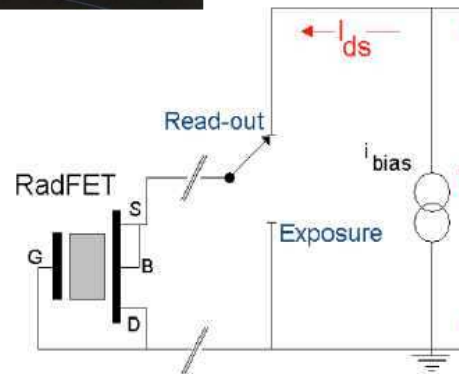
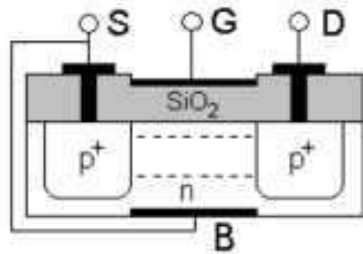
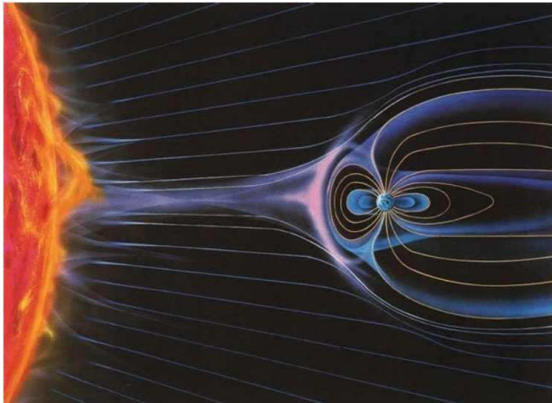
Valós idejű óra + naptár



OBC: Program



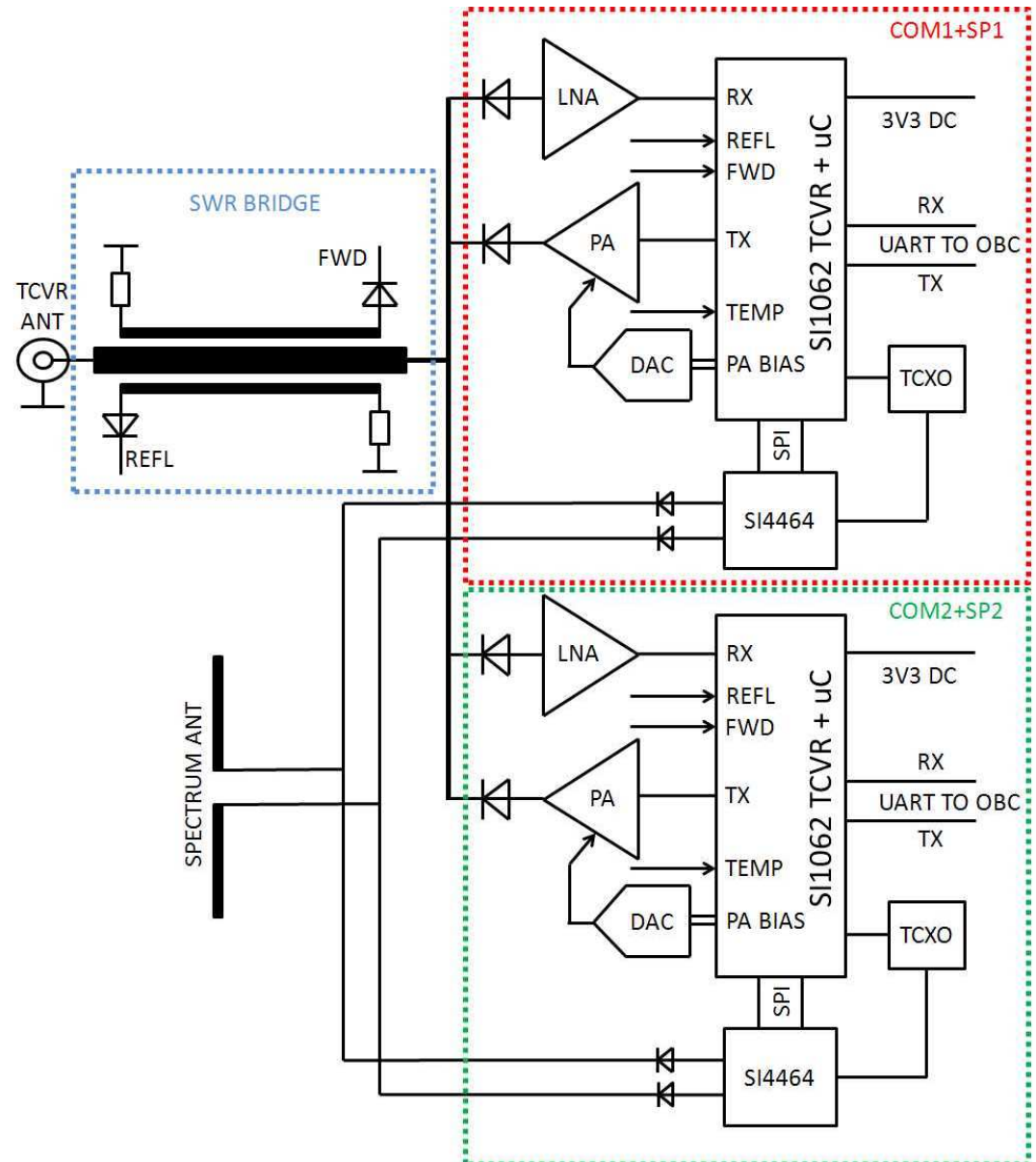
Kísérlet: totáldózis mérés



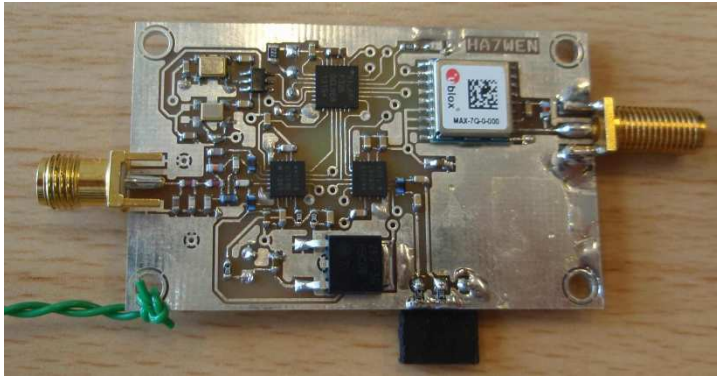
COM

Frekvencia	437	MHz
Hullámhossz	0,69	m
Föld sugár	6370	km
Pályamagasság	400	km
Horizont távolság	2293	km
Szabadtéri szakaszcsillapítás	152	dB
Műholdfedélzeti adóteljesítmény	20	dBm
Adóantenna nyereség	0	dBi
Vevőantenna nyereség	10	dBi
Vételi RF teljesítmény szint	-122	dBm
2-GMSK adatsebesség	5000	bit/s
RF sávszélesség	7500	Hz
Vételi zajteljesítmény szint	-133	dBm
Vételi jel-zaj viszony	10	dB

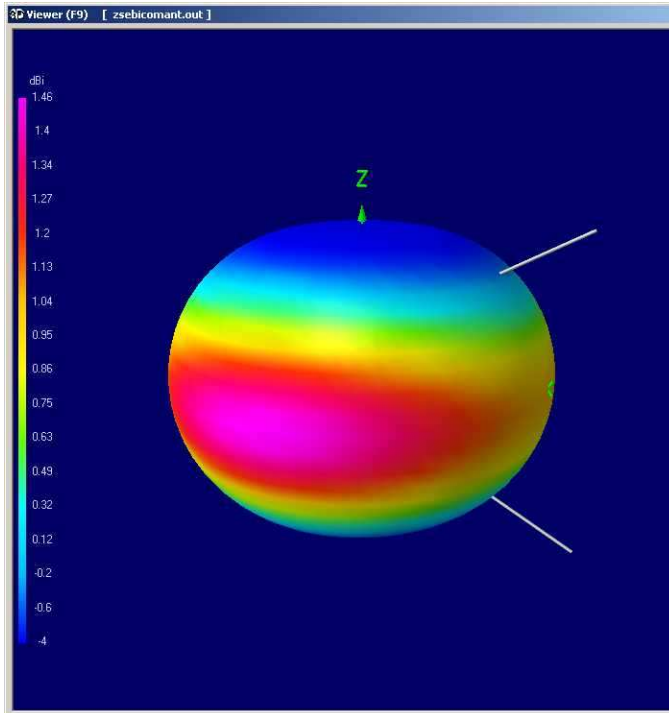
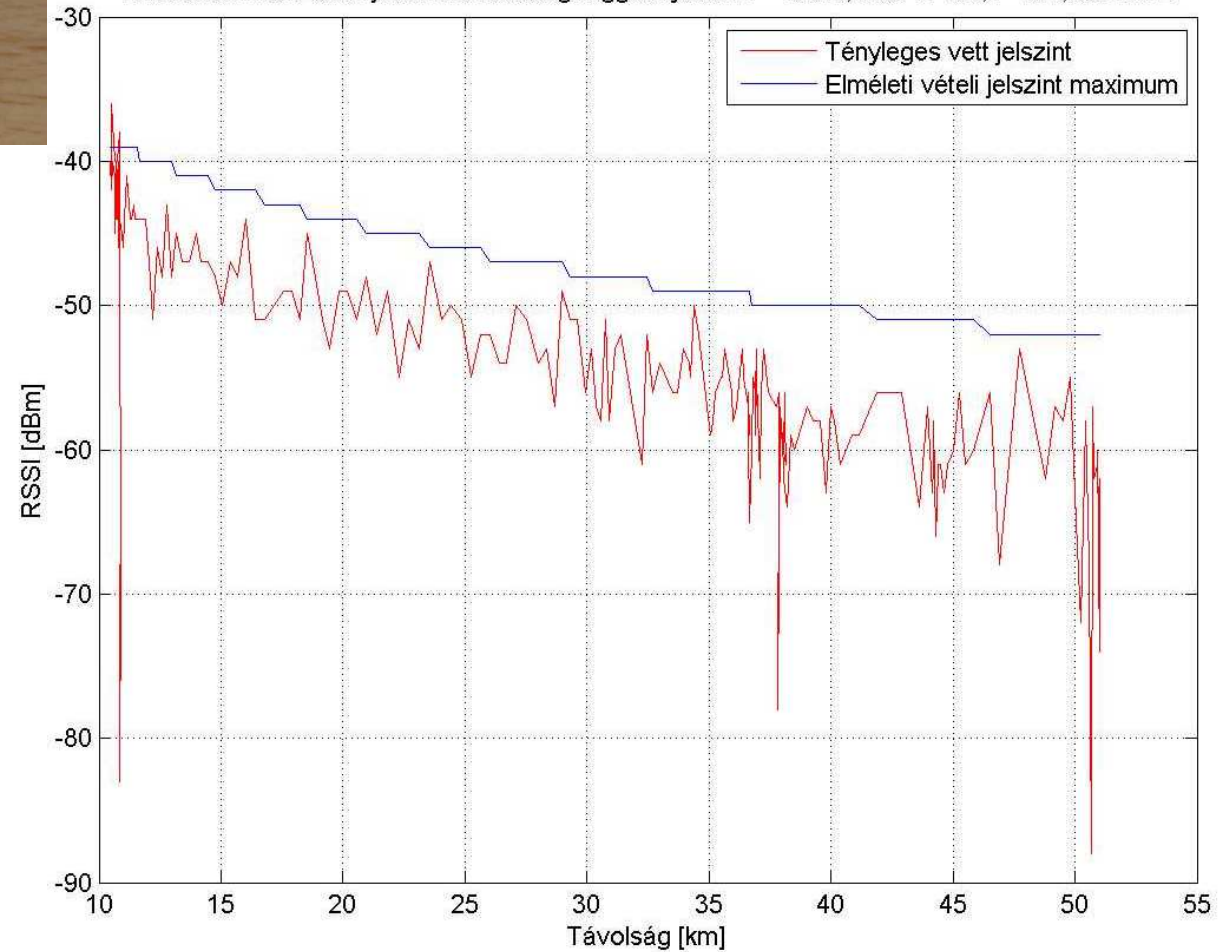
- Adóteljesítmény: max. 20 dBm
- Adatsebesség: 300 – 100 kbps
- Moduláció: CW + GMSK



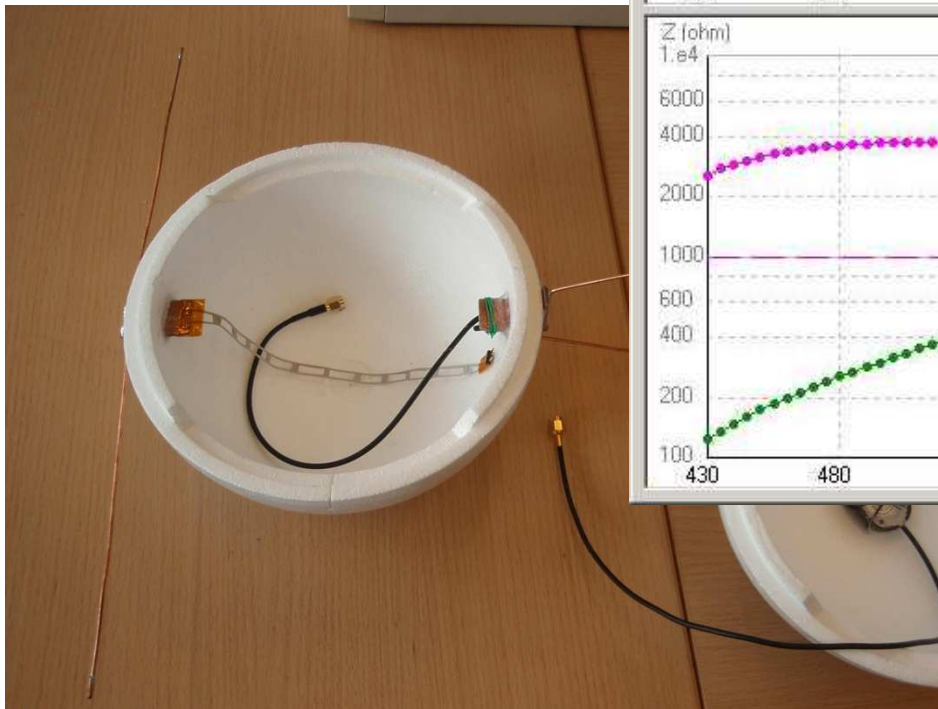
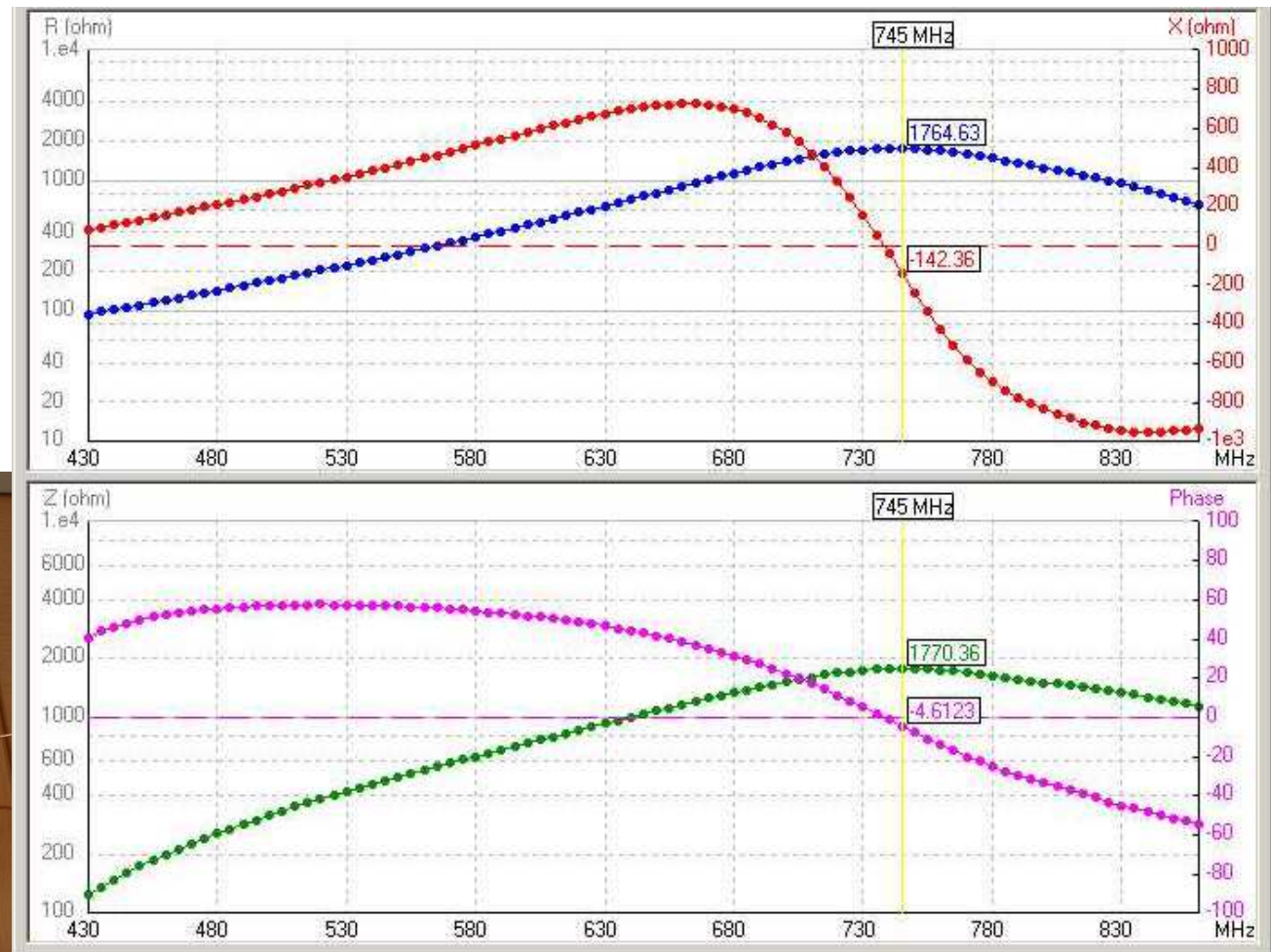
COM: adó-vevő antenna



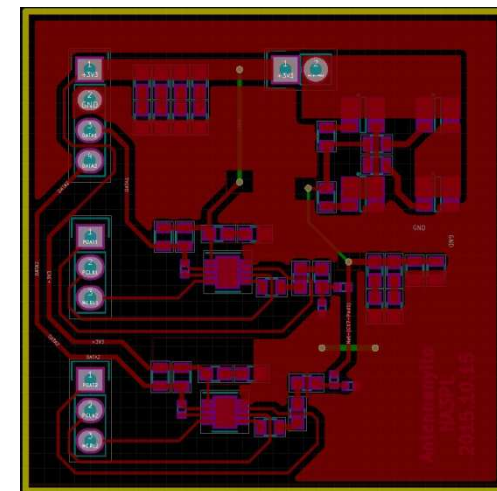
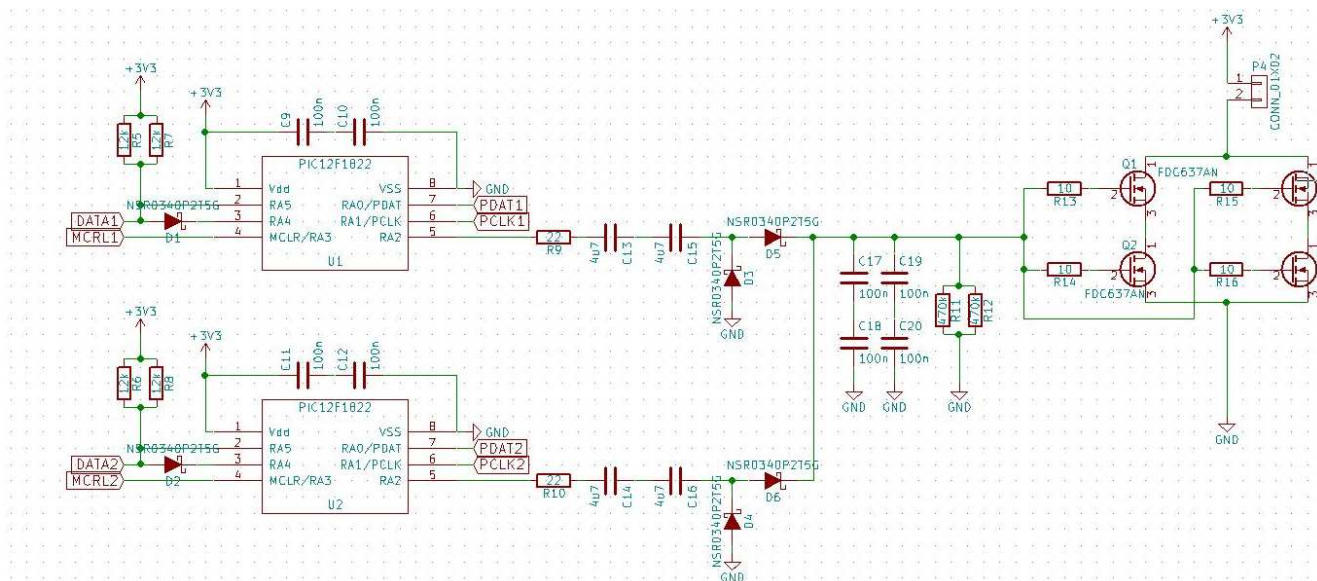
A ballonon mért vételi jelszint a távolság függvényében $P=100\text{W}$, $G_{tx}=17\text{ dB}$, $f=434,950\text{ MHz}$



COM: spektrum monitor antenna

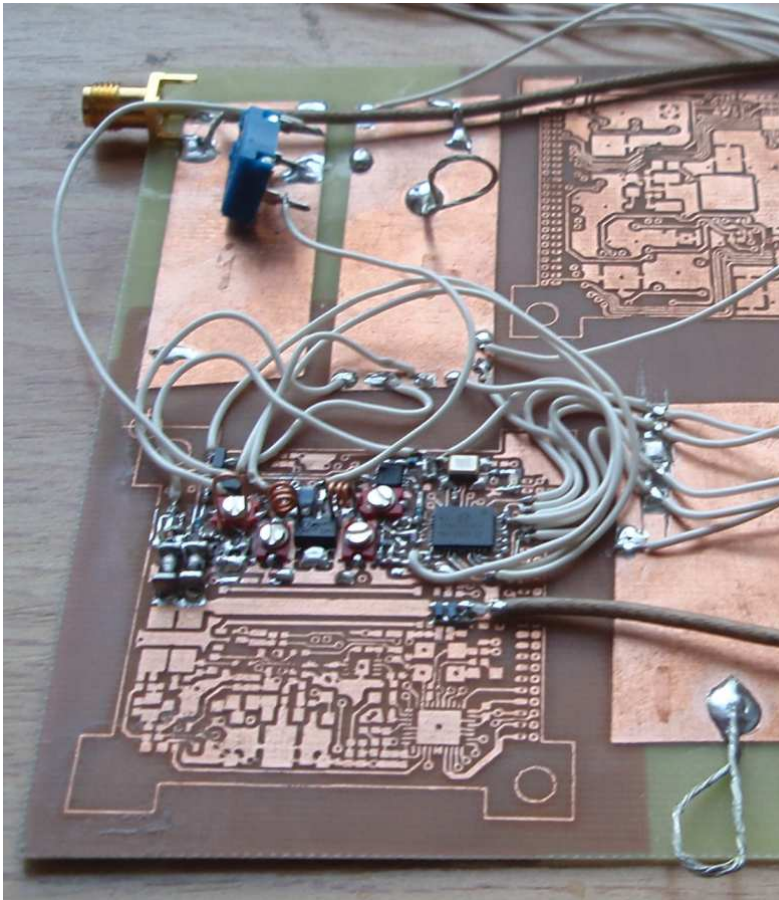


Antennanyitó

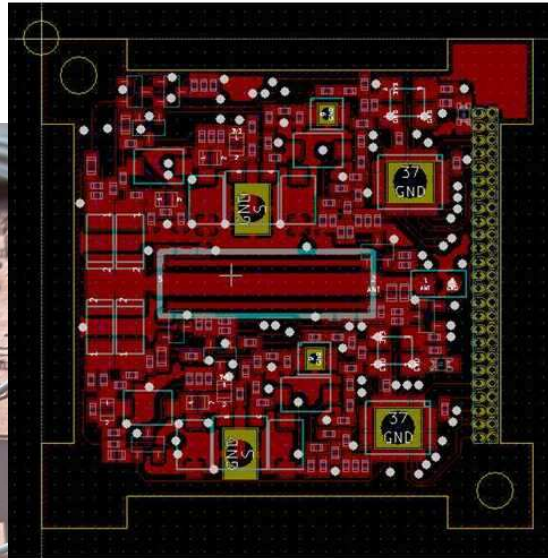


Ellenállás [Ohm]	Tok [r]	Névleges teljesítmény [W]	Ráadott feszültség [V]	Folyó áram [A]	Disszipált teljesítmény [W]	Olvasási idő [s]
4,7	3r	0,5	3	0,63	1,89	Inf
4,7	3r	0,5	3,3	0,64	2,112	20
4,7	3r	0,5	3,6	0,68	2,448	10
4,7	3r	0,5	4	0,75	3	5
3,3	3r	0,5	2,8	0,78	2,18	30
3,3	3r	0,5	3	0,8	2,46	20
3,3	3r	0,5	3,3	0,9	3	6
10	2r	0,4	3,3	0,33	1,08	Inf
10	2r	0,4	3,7	0,36	1,3	14
6,8	2r	0,4	2,7	0,39	1,05	60
6,8	2r	0,4	3	0,43	1,3	6
6,8	2r	0,4	3,2	0,47	1,5	4

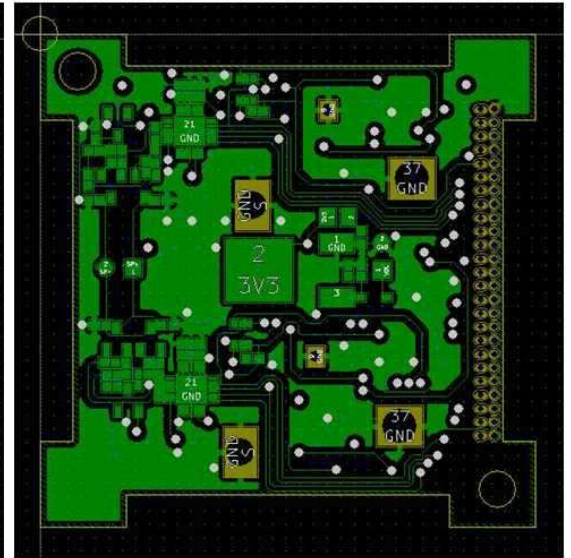
COM: PCB + proto



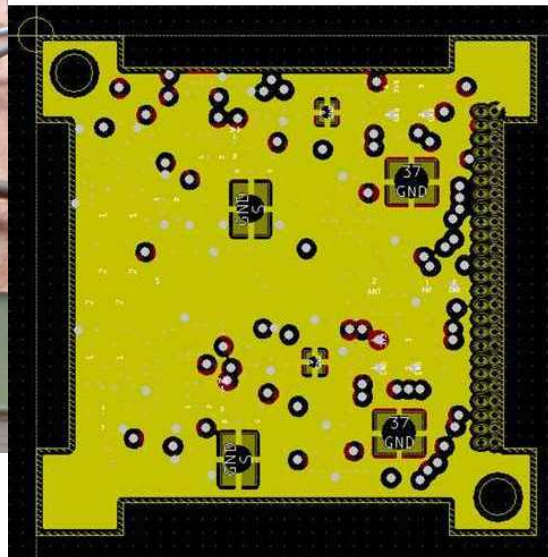
TOP



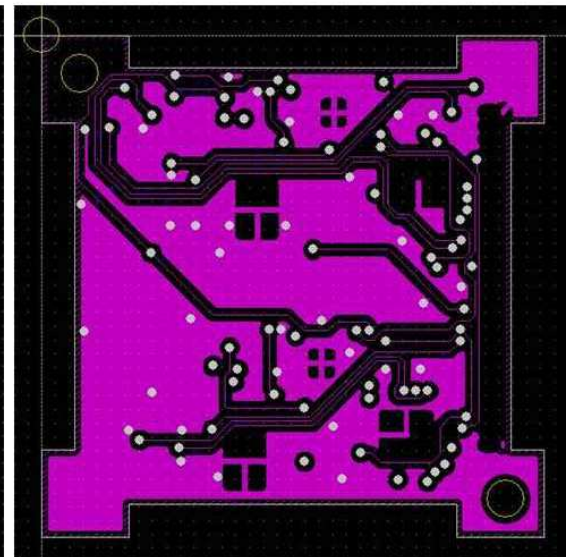
BOT



IN1



IN2



COM: Fogasztás adásban

TX DC IN	3.3 V	100 mA	330 mW
Power Amp.	NE5550234	65 mA	
RF TX	SI4460	20 mA	
DIODE	UM9401	10 mA	DC BIAS
MicroController	C8051F930	5 mA	25 MHz CLK
RF POWER	437 MHz	20 dBm	@ 50 Ω
RF POWER	2 x 437 MHz	-25 dBm	@ 50 Ω
RF POWER	3 x 437 MHz	-13 dBm	@ 50 Ω
Efficiency		PA	46.6 %
		ALL	30.3 %
RF OUT	0 dBm	20 dBm	1 dB step

COM: Fogasztás vételben

RX DC IN	3.3 V	41 mA	136 mW
LNA	ADL5350	16 mA	DC BIAS
RF RX	SI4460	13 mA	RX STATE
DIODE	UM9401	7 mA	DC BIAS
MicroController	C8051F930	5 mA	25 MHz CLK
Sensitivity	-120 dBm	5 kbps	GMSK @ 50 Ω

Telecommand vétel

Spektrum mérés

RX DC IN	3.3 V	32 mA	106 mW
RF RX	SI4464	13 mA	RX STATE
DIODE	HSMS2810	7 + 7 mA	DC BIAS
MicroController	C8051F930	5 mA	25 MHz CLK

Automatizált műholdvezérlő állomás



Masat-1 GND antenna



SMOG-1 GND antenna

Rotary, Kutatók éjszakája, ...





www.gnd.bme.hu

