

Date: ESPOO 26.09.2003

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Appendices -

Number:
No. 1 / 1

1031840

Date of handing in: 18.09.2003

Tested by:



T017 (EN ISO/IEC 17025)

Risto Hietanen, Product Manager

Reviewed by:

Aarni Roth, Application Manager

SORT OF EQUIPMENT:

Radio Modem

MARKETING NAME:

SATELLINE

TYPE:

SATELLINE-3ASm/250/LC

MANUFACTURER:

SATEL OY

SERIAL NUMBER:

033322036 and 033322037

CLIENT:

Satel Oy

ADDRESS:

Meriniitynkatu 17, FIN-24100 Salo, Finland

TELEPHONE:

+358 2 777 7838 / Henna Määttä

TEST SPECIFICATION

EN 300 220-3 V1.1.1 (2000-09)

REMARKS:

The test results are valid for the tested unit only. Without a written permission of Nemko Oy it is allowed to copy this report as a whole, but not partially.

Type:	SATELLINE-3ASm/250/LC		
Alignment range:	380,000 - 470,000 MHz		
Switching range:	One channel		
Measurement Frequencies Tx/Rx:	Equipment 1 and 2 Serial no. 033322036 and 033322037 1) 380 MHz 2) 470 MHz	Equipment Serial no. 3)	Equipment Serial no. 4)
	Voltages: Temperatures: Humidity:	Normal 13,5 VDC 24,0 °C 47,5 %	Minimum
Rated carrier power:	10 mW / 1 W	Antenna:	50 ohm (TNC-connector)
Class of emission:	F1D	Production model:	Yes
Number of channels:	1		

The following measurements according to EN 300 220-1 standard have been performed:				
Eq. 3 Ch. 4)	Eq. 1 and 2 Channels 1) 2)		Eq. 4 Ch. 3)	
☐	☐	☐	☐	Transmitter
☐	☐	☐	☐	8.1 Frequency error
☐	☐	☐	☐	8.2 Carrier power (conducted)
☐	☐	☐	☐	8.3 Effective radiated power (radiated)
☐	☐	☐	☐	8.4.1.2 Analogue signals within the audio bandwidth (FM)
☐	☐	☐	☐	8.4.1.3 Analogue signals above the audio bandwidth (FM)
☐	☐	☐	☐	8.4.2.2 Analogue signals within the audio bandwidth (AM)
☐	☐	☐	☐	8.4.2.3 Analogue signals above the audio bandwidth (AM)
☐	☐	☐	☐	8.5 Adjacent channel power
☐	☐	☐	☐	8.6 Range of modulation bandwidth for wide band equipment (>25 kHz)
☐	☐	☐	☐	8.7.2 Conducted spurious emissions / 8.7.1 a) i)
☐	☒	☐	☐	8.7.3 Spurious emissions (cabinet radiation) / 8.7.1 a) ii)
☐	☐	☐	☐	8.7.4 Spurious emissions (cabinet radiation) / 8.7.1 b)
☐	☐	☐	☐	8.8 Frequency stability under low voltage conditions
☐	☐	☐	☐	8.9 Duty Cycle
☐	☐	☐	☐	Receiver
☐	☐	☐	☐	9.1 Adjacent channel selectivity – in band
☐	☐	☐	☐	9.2 Adjacent band selectivity
☐	☐	☐	☐	9.3 Spurious response rejection and blocking / desensitization
☐	☐	☐	☐	9.4.2 Conducted spurious emissions / 9.7.1 a) i)
☐	☒	☐	☐	9.4.3 Spurious emissions (cabinet radiation) / 9.7.1 a) ii)
☐	☐	☐	☐	9.4.4 Spurious emissions (cabinet radiation) / 9.7.1 b)

REMARKS

The customer has ordered two measurements mentioned above according to the standard EN 300 220-1.

Ambient temperature: 24,0 °C Relative humidity: 47,5 % Date: 22.09.2003

TRANSMITTER SPURIOUS EMISSIONS RADIATED **CLAUSE 8.7.4 / 8.7.1 b)**

Setting of the output power: 1 W

Eq. 1		Eq. 2		Remarks
Frequency (MHz)	Level (dBm)	Frequency (MHz)	Level (dBm)	
Tx operating		Tx operating		
All 25 MHz to 1 GHz	< - 65,0	All 25 MHz to 1 GHz	< - 65,0	
All 1 GHz to 4 GHz	< - 50,0	All 1 GHz to 4 GHz	< - 50,0	
Tx on standby		Tx on standby		
All 25 MHz to 12,75 GHz	< -65.0			
Measurement Uncertainty (U95)	- 4.4 dB / +3.4 dB			

LIMITS: Clause 8.7.5

Table 13

State	47 MHz to 74 MHz 87.5 MHz to 118 MHz 174 MHz to 230 MHz 470 MHz to 862 MHz	Other frequencies below 1000 MHz	Frequencies above 1000 MHz
Operating	4 nW (- 53 dBm)	250 nW (- 36 dBm)	1 µW (- 30 dBm)
Standby	2 nW (- 57 dBm)	2 nW (- 57 dBm)	20 nW (- 47 dBm)

TEST EQUIPMENT USED: 45, 176, 89, 185, 417, 201, 318, 403

Ambient temperature: 24,0 °C Relative humidity: 47,5 % Date: 22.09.2003

TRANSMITTER SPURIOUS EMISSIONS RADIATED **CLAUSE 8.7.4 / 8.7.1 b)**

Setting of the output power: 10 mW

Eq. 1		Eq. 2		Remarks
Frequency (MHz)	Level (dBm)	Frequency (MHz)	Level (dBm)	
Tx operating		Tx operating		
All 25 MHz to 1 GHz	< - 65,0	All 25 MHz to 1 GHz	< - 65,0	
All 1 GHz to 4 GHz	< - 50,0	All 1 GHz to 4 GHz	< - 50,0	
Tx on standby		Tx on standby		
All 25 MHz to 12,75 GHz	< -65.0			
Measurement Uncertainty (U95)	- 4.4 dB / +3.4 dB			

LIMITS: Clause 8.7.5

Table 13

State	47 MHz to 74 MHz 87.5 MHz to 118 MHz 174 MHz to 230 MHz 470 MHz to 862 MHz	Other frequencies below 1000 MHz	Frequencies above 1000 MHz
Operating	4 nW (- 53 dBm)	250 nW (- 36 dBm)	1 µW (- 30 dBm)
Standby	2 nW (- 57 dBm)	2 nW (- 57 dBm)	20 nW (- 47 dBm)

TEST EQUIPMENT USED: 45, 176, 89, 185, 417, 201, 318, 403

Ambient temperature: 24,0 °C Relative humidity: 47,5 % Date: 22.09.2003

RECEIVER SPURIOUS EMISSIONS RADIATED **CLAUSE 9.4.4 / 9.4.1 b)**

Channel 1		Channel 2		Remarks
Frequency (MHz)	Level (dBm)	Frequency (MHz)	Level (dBm)	
302,45	- 74,6	392,45	- 79,5	
Others 25 MHz to 1 GHz	< - 80,0	Others 25 MHz to 1 GHz	< - 80,0	
All 1 GHz to 4 GHz	< - 60,0	All 1 GHz to 4 GHz	< - 60,0	
Measurement Uncertainty (U95)	- 4.4 dB / +3.4 dB			

LIMITS: Clause 9.4.5

The limits are applicable to all receiver classes.

2 nW (- 56 dBm) below 1000 MHz

20 nW (- 47 dBm) above 1000 MHz

TEST EQUIPMENT USED: 45, 199, 176, 89, 185, 417, 201, 318, 403

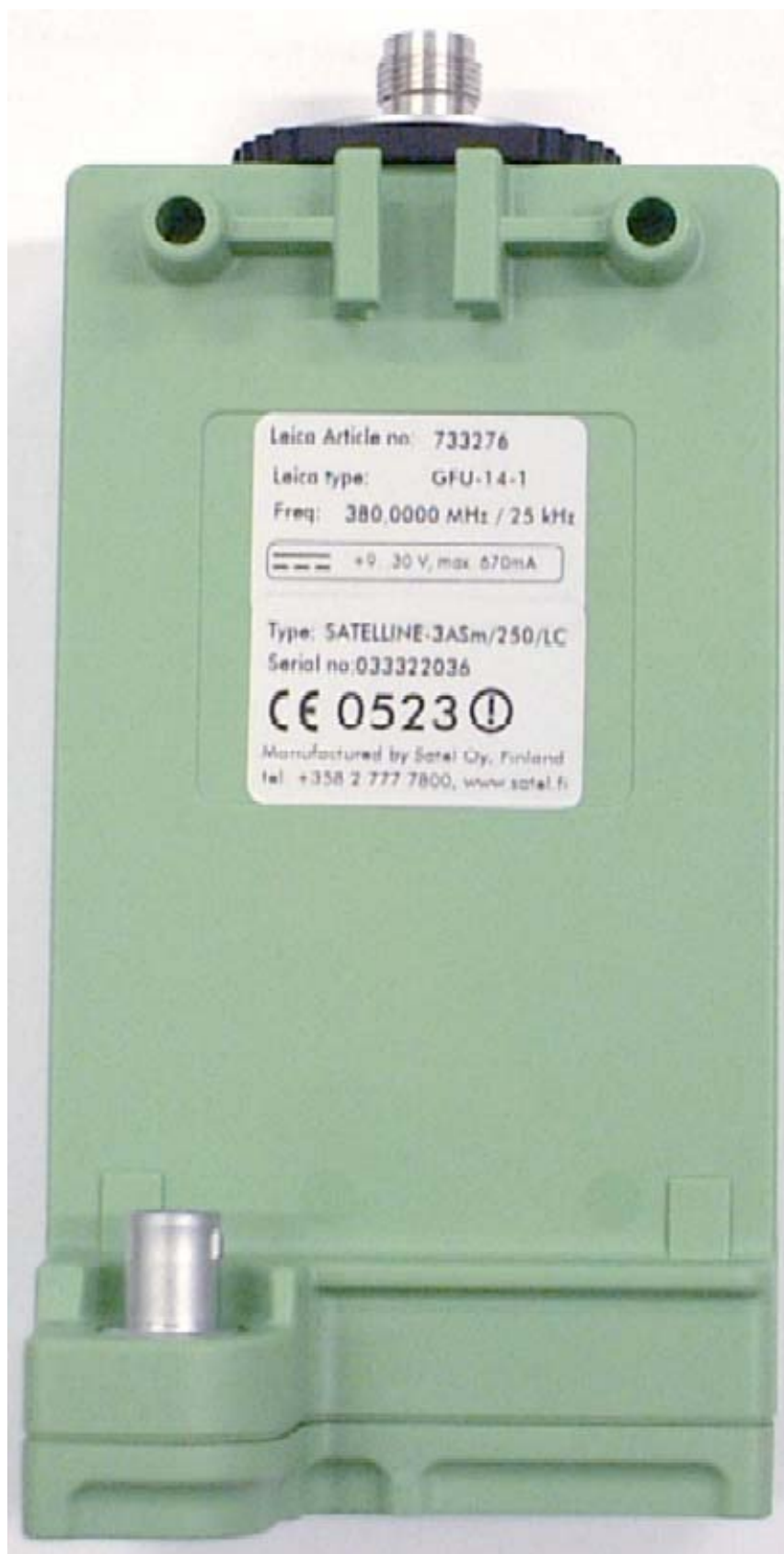






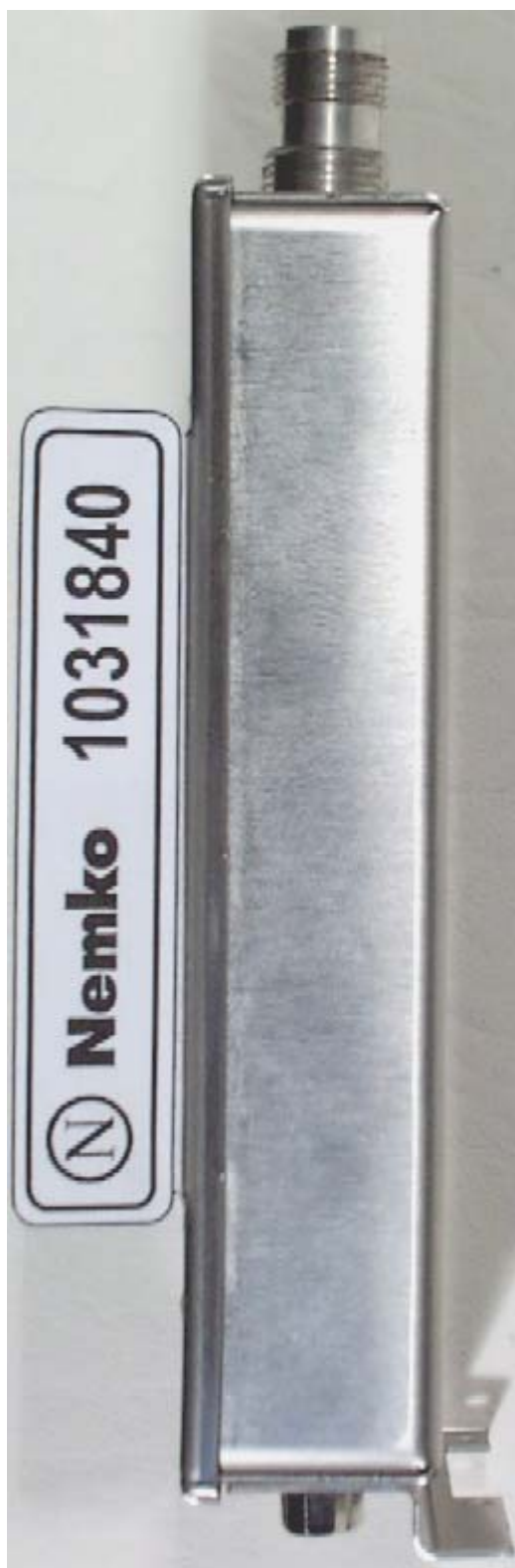










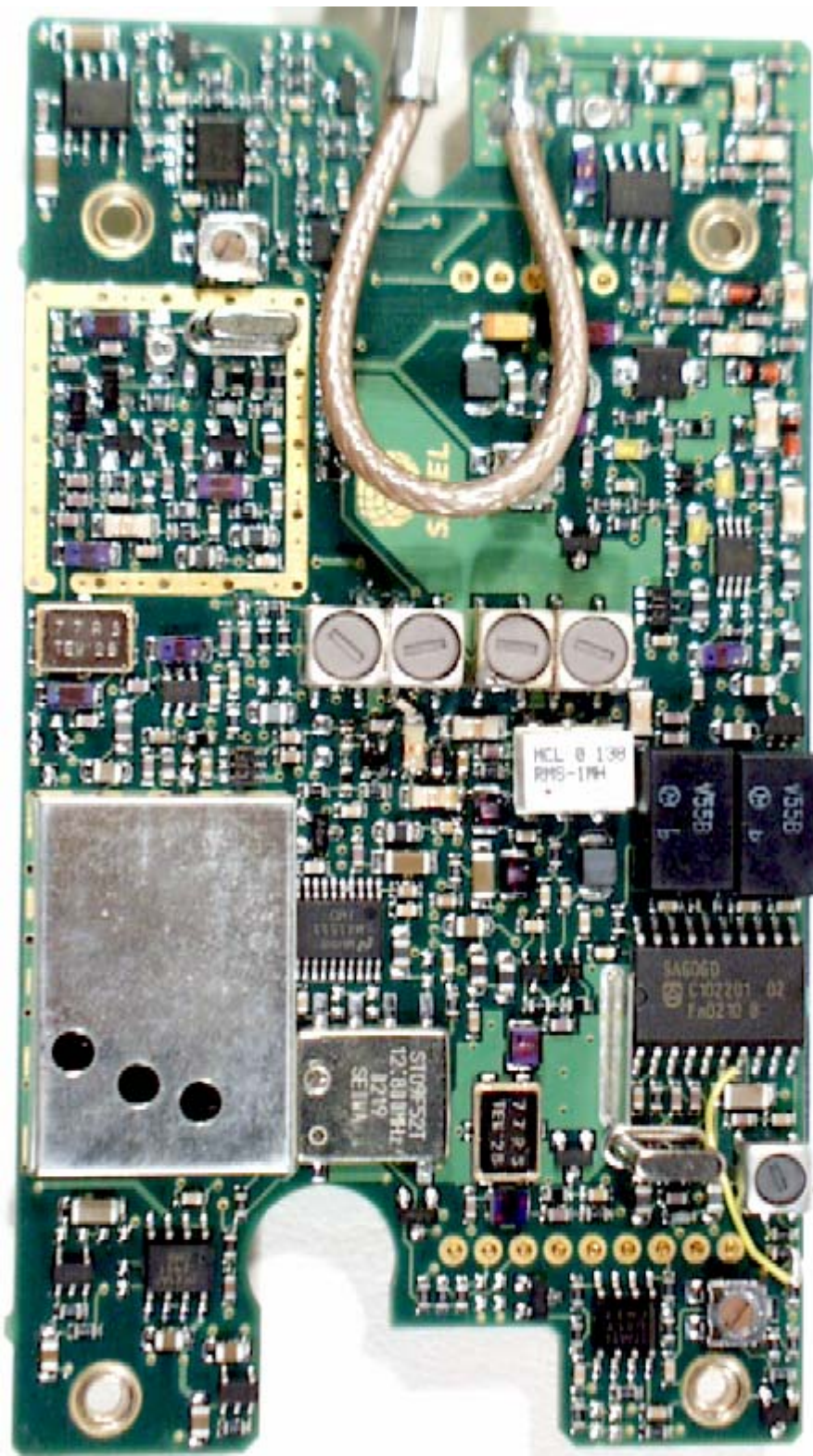








380 MHz

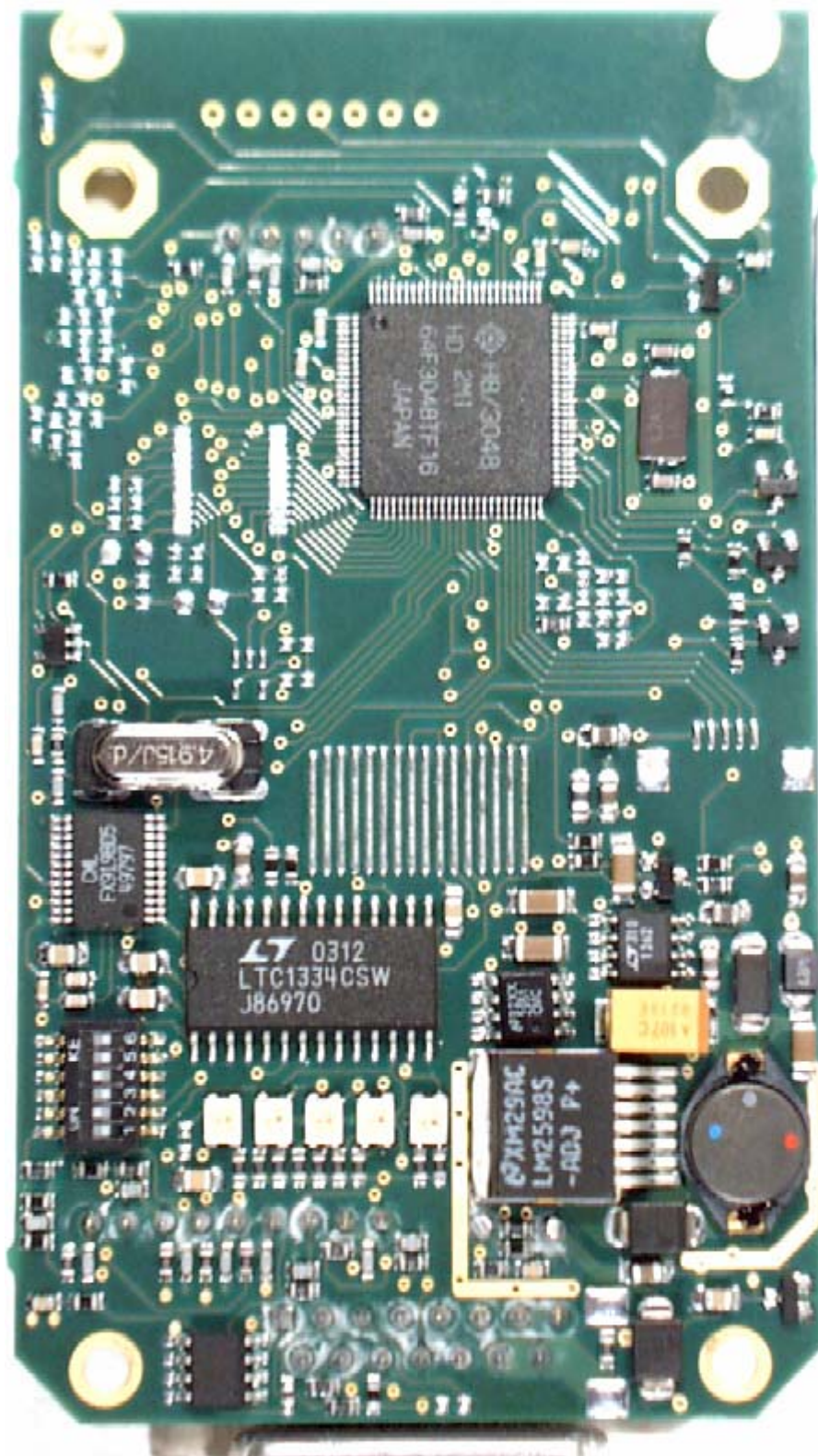


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380 MHz

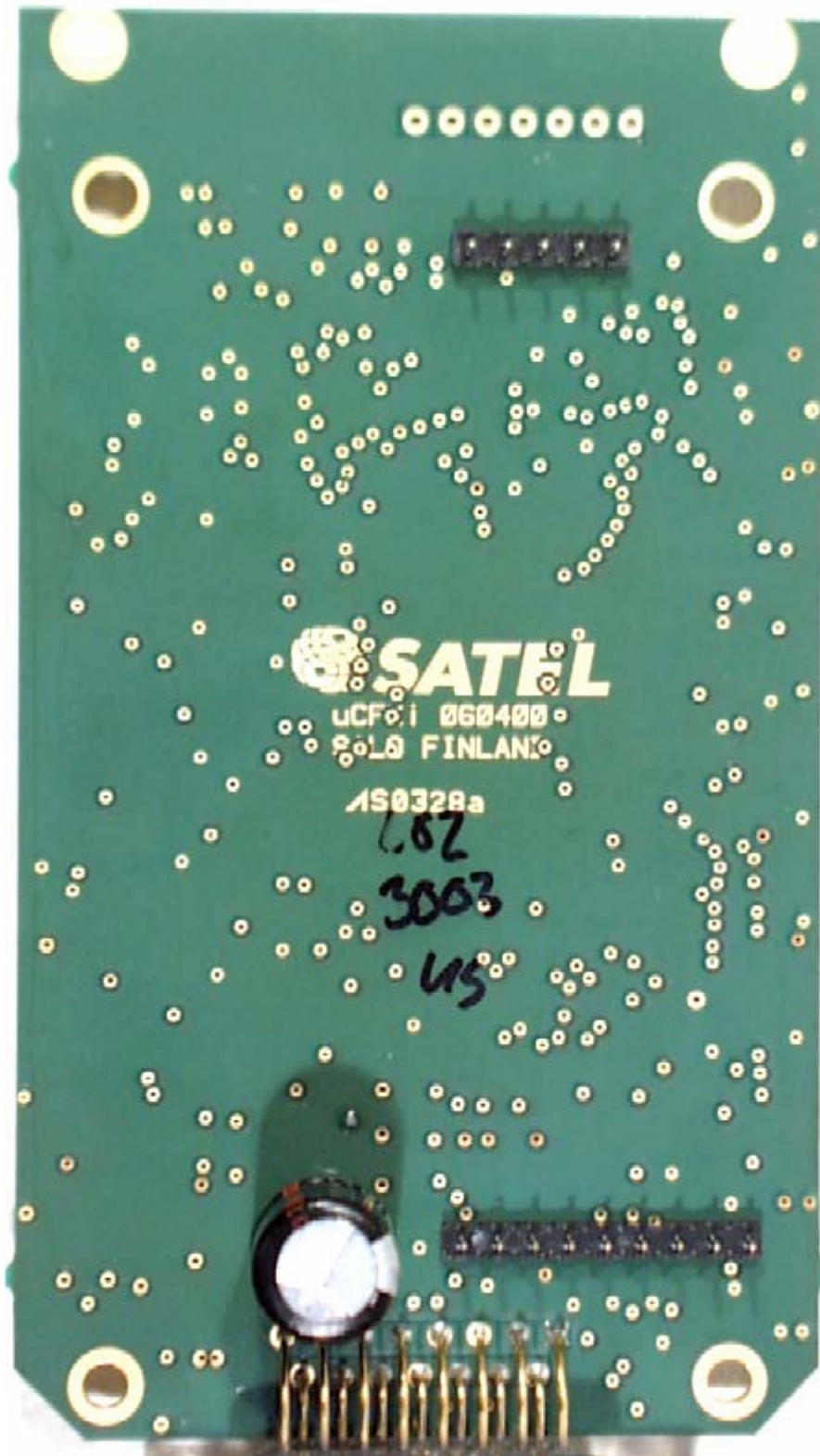


380 MHz



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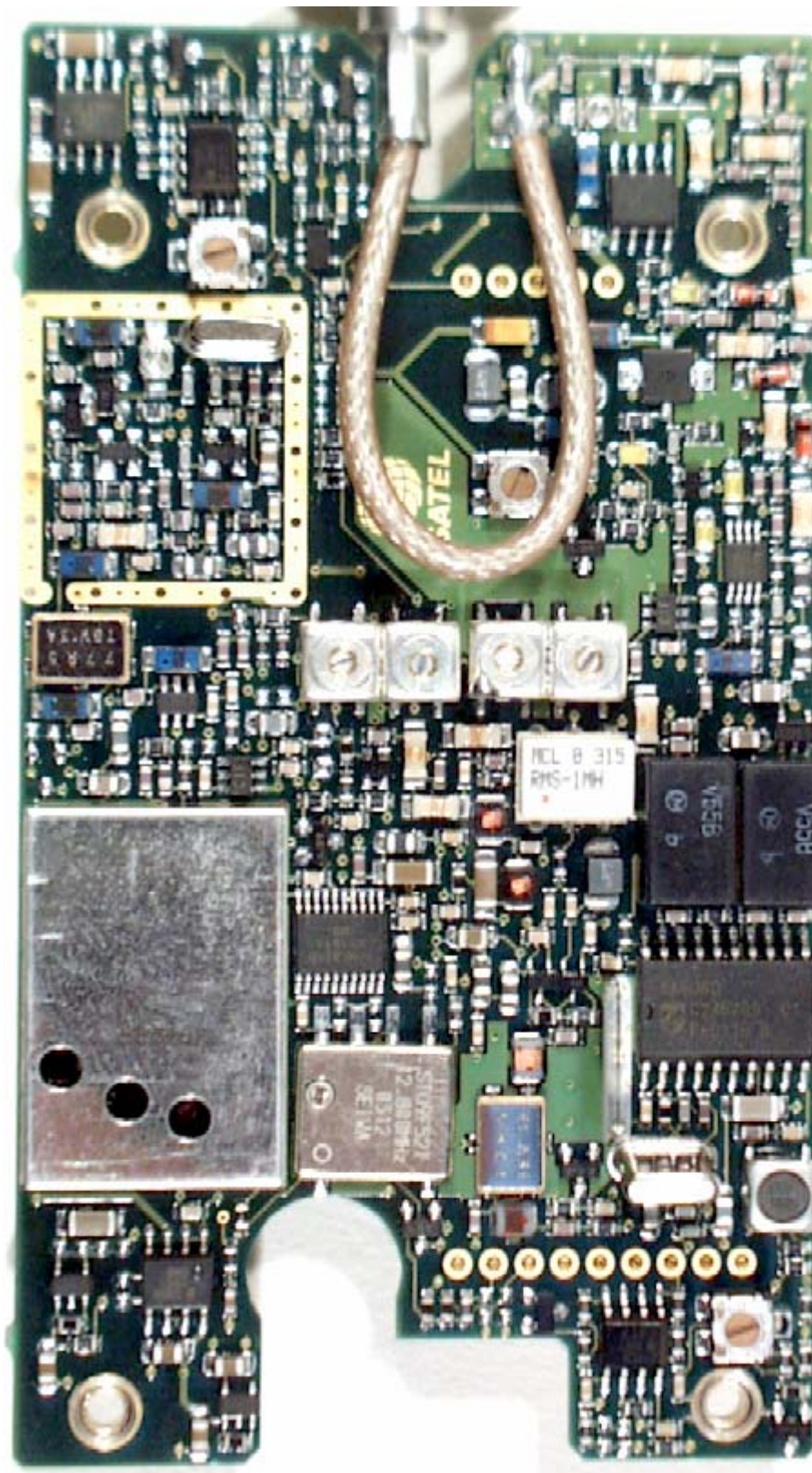
380 MHz



380 MHz

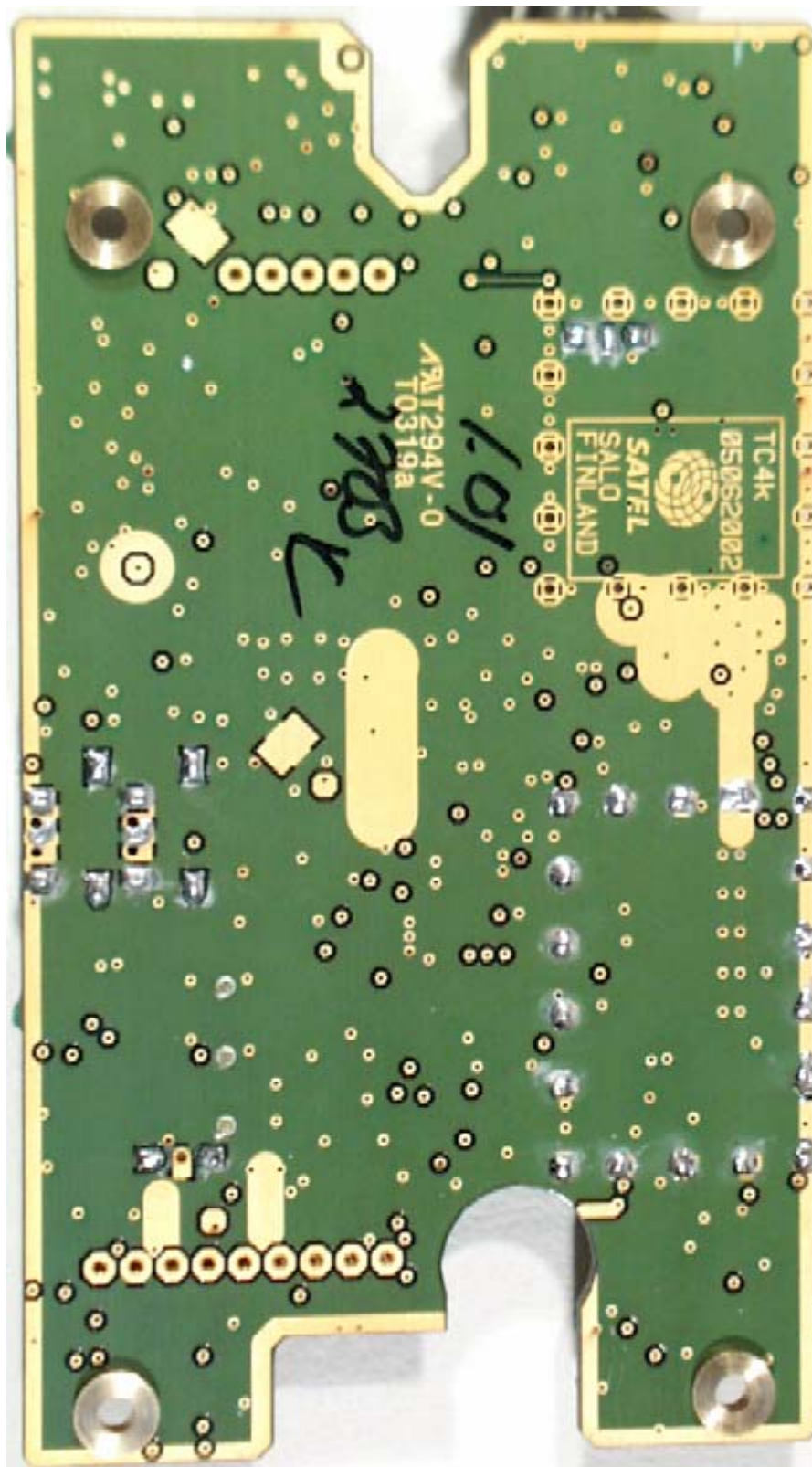


470 MHz

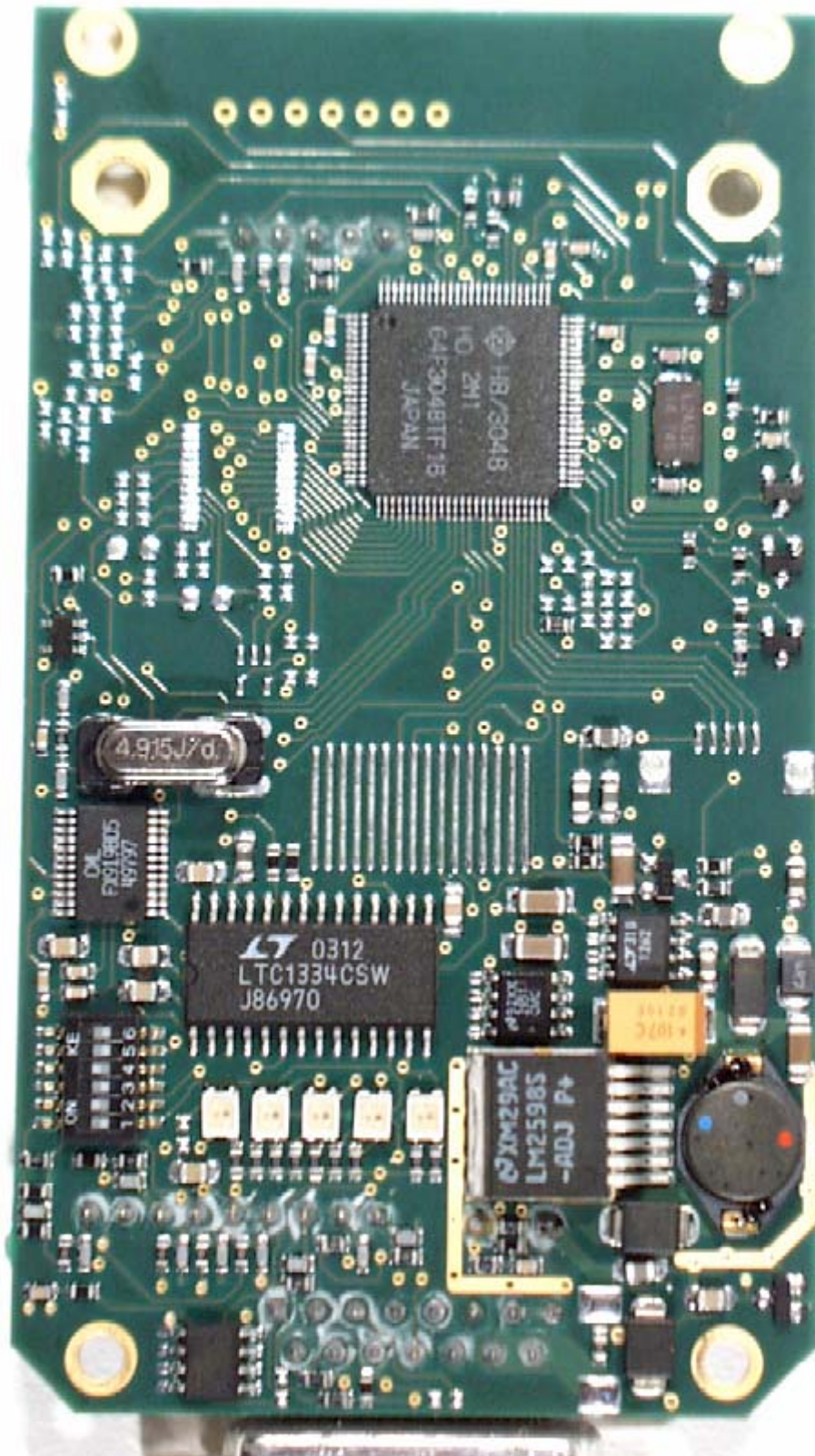


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470 MHz

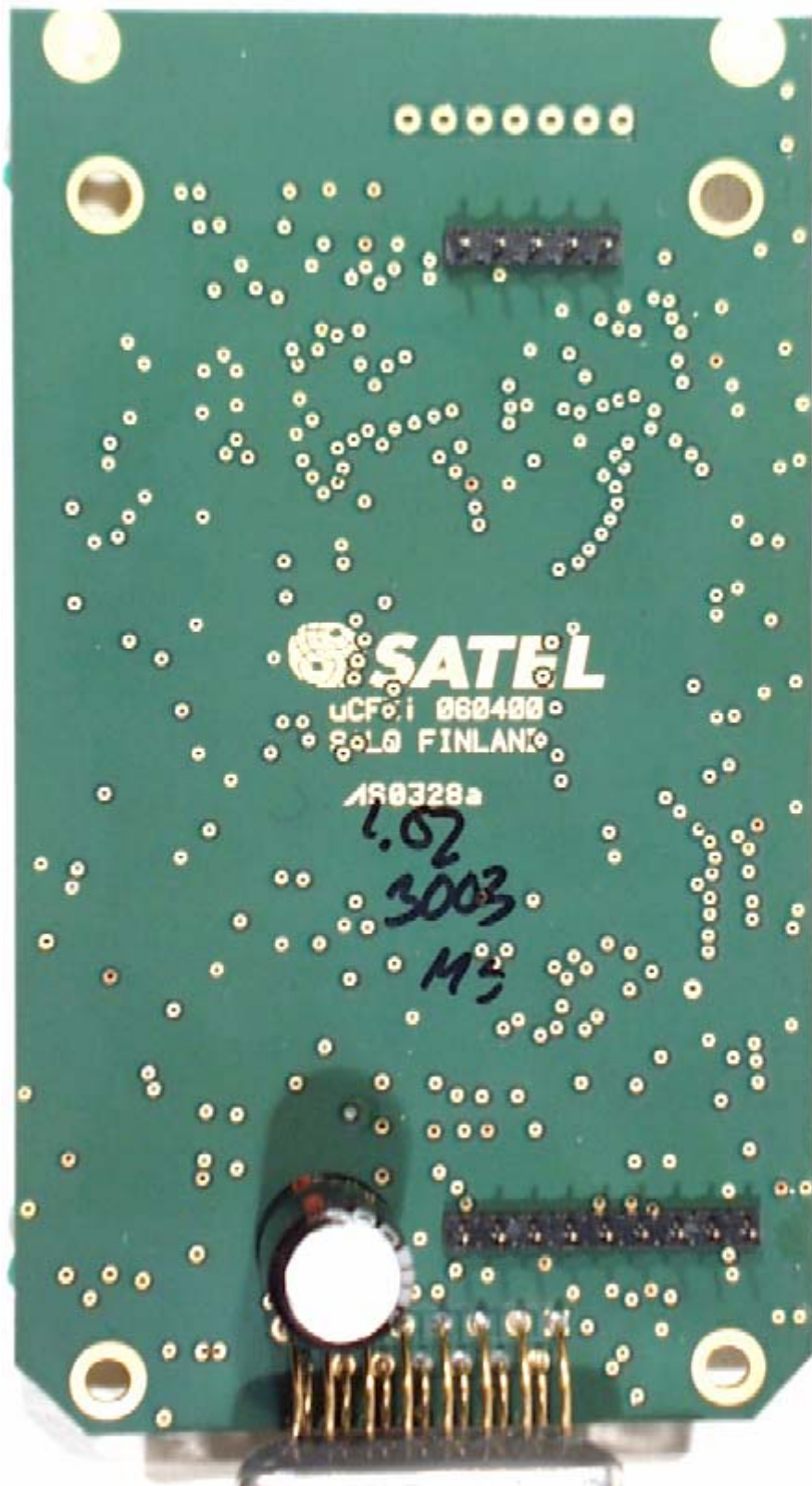


470 MHz



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470 MHz



470 MHz



List of measuring equipment:

No.	Equipment	Type	Manufacturer	Serial Number
45	Spectrum analyzer	FSBS	Rohde & Schwarz	862563/010
89	Antenna	3147	EMCO	9202-1078
176	Anechoic chamber	888 cm x 585 cm x 416 cm	length of absorber 66 cm	
185	Antenna	PRL LogPer	Self made	1A93
199	RF-Amplifier	ZHL-1042J	Mini-Circuits	
201	RF-Generator	2042	Marconi	119571/062
318	Power supply	B 603 D/F	Oltronix	76945
403	Processmeter	787	Fluke	6975028
417	Antenna, bilog	CBL 6141	Chase	4028