

TEST REPORT

Annex to Test Report No.: 1-2403-01-07/10-A



Testing Laboratory

CETECOM ICT Services GmbH

Untertürkheimer Straße 6 – 10

66117 Saarbrücken/Germany

Phone: + 49 681 5 98 - 0

Fax: + 49 681 5 98 - 9075

Internet: <http://www.cetecom-ict.de>

e-mail: info@ict.cetecom.de

Accredited Test Laboratory:

The test laboratory (area of testing) is accredited according to DIN EN ISO/IEC 17025

DAR registration number: DGA-PL-176/94-D1

Area of Testing: Radio Satellite Communications

Applicant

Sagem Wireless

2 rue du Petit Albi

95801 Cergy Pontoise Cedex/France

Phone: +33-(0)1-58-11-91-0

Fax: +86 574 27960000

Contact: Xinni Yang

e-mail: Xinni.yang@sagemwireless.com.cn

Phone: +86 574 27960929

Manufacturer

Sagem Wireless

2 rue du Petit Albi

95801 Cergy Pontoise Cedex/France

Test Standard/s

47 CFR Part 15

Title 47 of the Code of Federal Regulations; Chapter I-Federal Communications Commission
subchapter A - general, Part 15-Radio frequency devices

RSS - 210 Issue 7

Spectrum Management and Telecommunications - Radio Standards Specification
Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands):
Category I Equipment

For further applied test standards please refer to section 3 of this test report.

Test Item

Kind of test item: GSM Mobile Phone

Model name: Cosy 2G

FCC ID: M9HCOSY2G

IC: N/A

Frequency [MHz]: 1850.2 – 1909.8 MHz and 824.2 – 848.8 MHz

Power supply: 3.9V DC by power supply / battery + charger

Temperature range: -30 °C to +60 °C



Test performed:

2010-08-04 Marco Bertolino

Test Report authorised:

2010-08-04 i.A.
Stefan Bös

1 Table of contents

1	Table of contents	2
2	General Information	3
2.1	Notes	3
2.2	Application details	3
3	Test standard/s	3
4	Test Environment	3
5	Test item	4
6	Test Laboratories sub-contracted	4
7	Summary of Measurement Results	5
7.1	Receiver	5
8	Measurement Results	6
8.1	RX Spurious Emissions Conducted < 30 MHz	6
8.2	Spurious Emissions Radiated – Receiver Mode	11
9	Test equipment and ancillaries used for tests	18
Annex A	Photographs of the Test Set-up	20
Annex B	External Photographs of the EUT	22
Annex C	Internal Photographs of the EUT	30
Annex D	Document history	43
Annex E	Further information	43

2 General Information

2.1 Notes

The test results of this test report relate exclusively to the test item specified in this test report. CETECOM ICT Services GmbH does not assume responsibility for any conclusions and generalisations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of CETECOM ICT Services GmbH.

2.2 Application details

Date of receipt of order:	2010-06-24
Date of receipt of test item:	2010-06-28
Start of test:	2010-06-28
End of test:	2010-07-12
Person(s) present during the test:	-/-

3 Test standard/s

Test Standard	Version	Test Standard Description
47 CFR Part 15	2009-10	Title 47 of the Code of Federal Regulations; Chapter I-Federal Communications Commission subchapter A - general, Part 15-Radio frequency devices
RSS - 210 Issue 7	2007-06	Spectrum Management and Telecommunications - Radio Standards Specification Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment

4 Test Environment

Temperature:	T_{nom}	+20 °C during room temperature tests
	T_{max}	+60 °C during high temperature test
	T_{min}	-30 °C during low temperature test
Relative humidity content:		53 %
Air pressure:		not relevant for this kind of testing
Power supply:	V_{nom}	3.9 V DC by power supply / battery + charger
	V_{max}	4.2 V
	V_{min}	3.5 V

5 Test item

Kind of test item	:	GSM Mobile Phone 850 / 900 with EGPRS/EDGE
Type identification	:	Cosy 2G
S/N serial number	:	Conducted: 352330040008489 287307702 Radiated: 352330040008497 287307702
HW hardware status	:	V0x
SW software status	:	EA,R05
Frequency Band [MHz]	:	1850.2 – 1909.8 MHz and 824.2 – 848.8 MHz
Type of Modulation	:	300KGXW (GMSK) 300KG7W (8-PSK)
Number of channels	:	300 (PCS1900) and 125 (PCS850) / 278 (FDD II) and 102 (FDD V)
Antenna	:	Integrated PCB antenna → for more information, please take a look at the Annex report.
Power Supply	:	3.9 V DC by power supply / battery + charger
Temperature Range	:	-30°C to +60 °C

6 Test Laboratories sub-contracted

None

7 Summary of Measurement Results



No deviations from the technical specifications were ascertained



There were deviations from the technical specifications ascertained

TC identifier	Description	verdict	date	Remark
RF-Testing	CFR Part 15.107, 15.109 ICES-003, Issue 4	passed	2010-08-04	-/-

7.1 Receiver

Test Case	temperature conditions	power source voltages	Pass	Fail	NA	NP	Results (max.)
RX-Spurious Emissions Conducted < 30 MHz	Nominal	Nominal	☒	☐	☐	☐	Complies
Spurious Emissions Radiated	Nominal	Nominal	☒	☐	☐	☐	Complies

Note:

NA = Not applicable; NP = Not performed

8 Measurement Results

8.1 RX Spurious Emissions Conducted < 30 MHz

Description:

Measurement of the conducted spurious emissions in transmit mode below 30 MHz. The EUT is set to Idle mode. Both power lines, phase and neutral line, are measured. Found peaks are remeasured with average and quasi peak detection to show compliance to the limits.

Measurement:

Measurement parameter	
Detector:	Peak - Quasi Peak / Average
Sweep time:	Auto
Video bandwidth:	F < 150 kHz: 200 Hz F > 150 kHz: 9 kHz
Resolution bandwidth:	F < 150 kHz: 1 kHz F > 150 kHz: 100 kHz
Span:	9 kHz to 30 MHz
Trace-Mode:	Max Hold

Limits:

FCC		IC
CFR Part 15.107(a)		ICES-003, Issue 4
TX Spurious Emissions Conducted < 30 MHz		
Frequency (MHz)	Quasi-Peak (dBμV/m)	Average (dBμV/m)
0.15 – 0.5	66 to 56*	56 to 46*
0.5 – 5	56	46
5 – 30.0	60	50

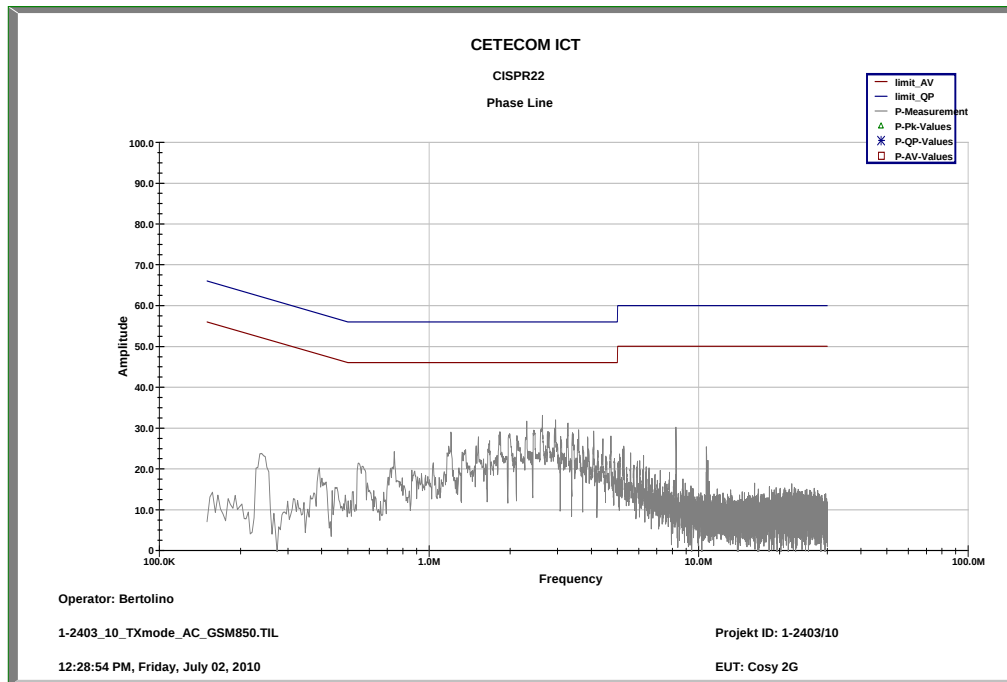
*Decreases with the logarithm of the frequency

Result: Also see plots

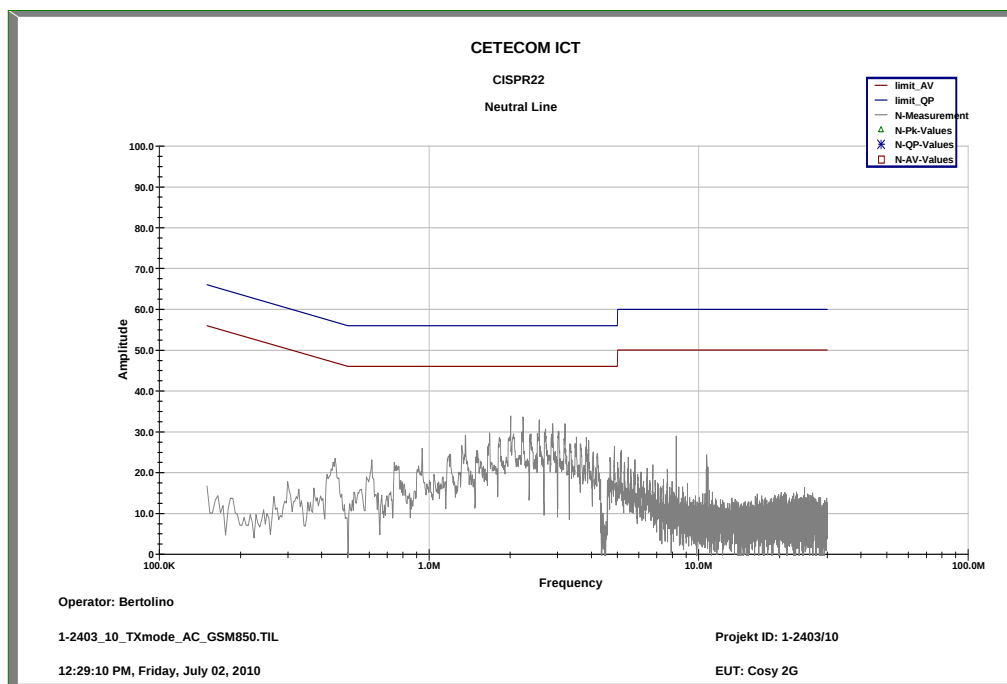
RX Spurious Emissions Conducted < 30 MHz [dBμV/m]		
F [MHz]	Detector	Level [dBμV/m]
No critical peaks found		
Measurement uncertainty	± 3 dB	

Result: The result of the measurement is passed.

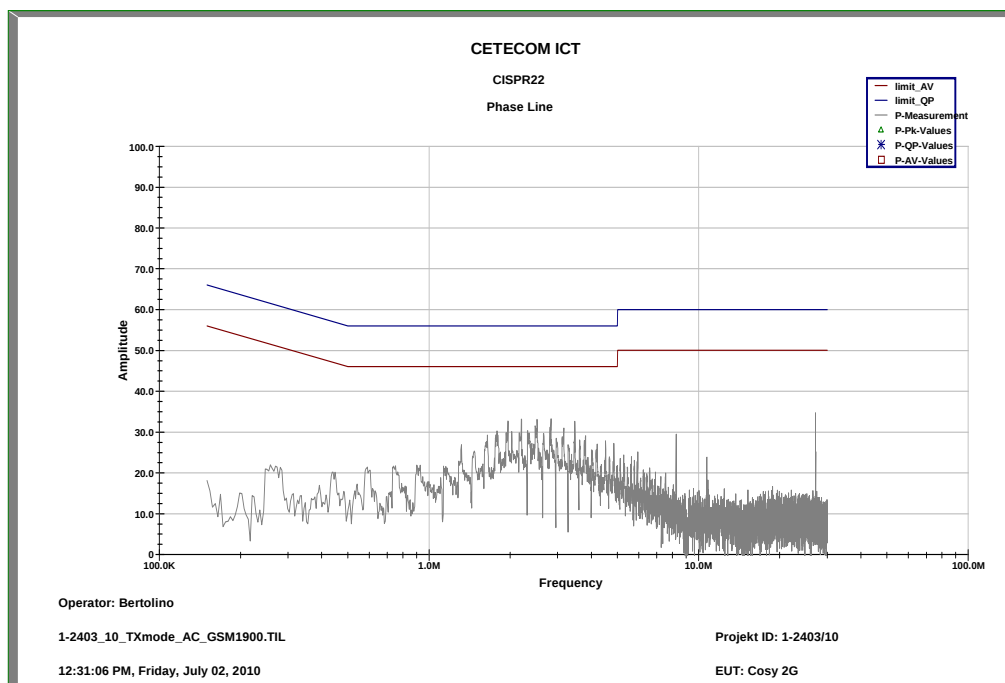
Plot 1: 9 kHz to 30 MHz / Phase Line GSM 850



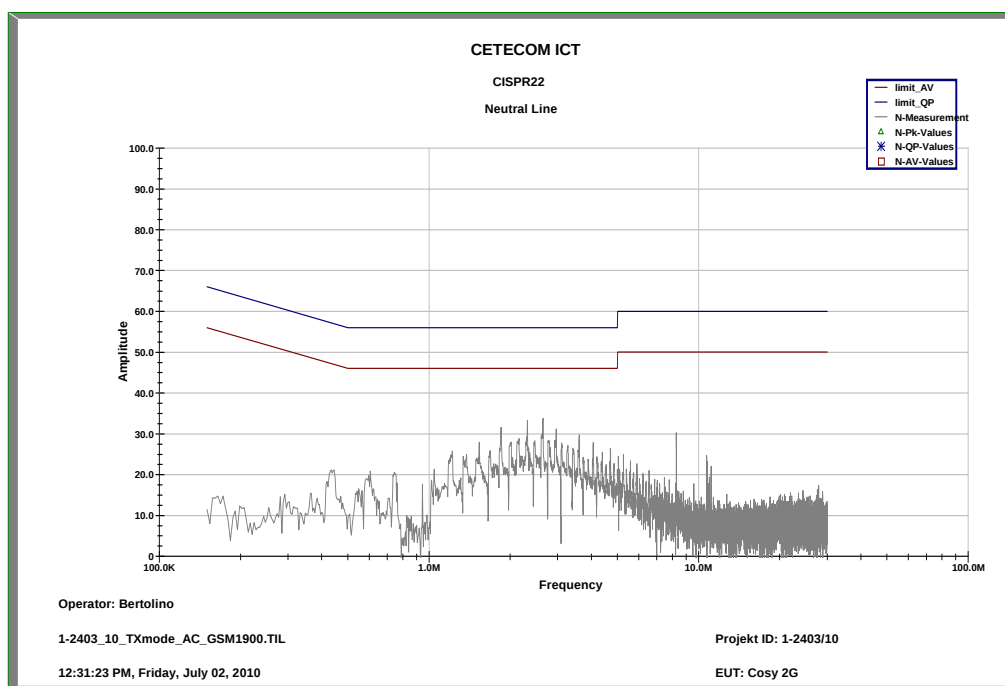
Plot 2: 9 kHz to 30 MHz / Neutral Line GSM 850



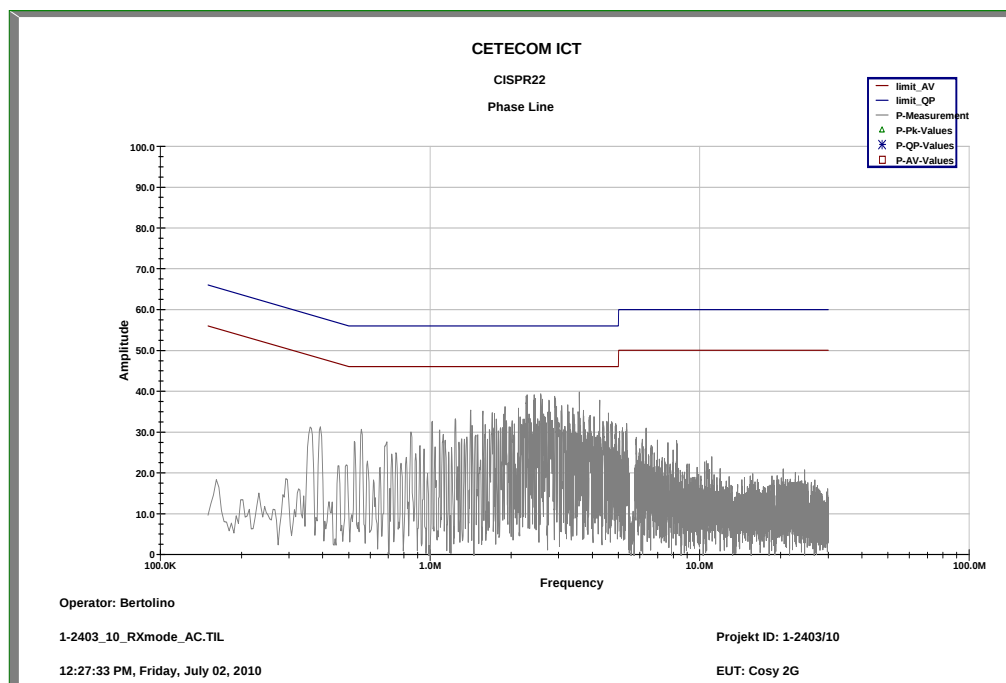
Plot 3: 9 kHz to 30 MHz / Phase Line GSM 1900



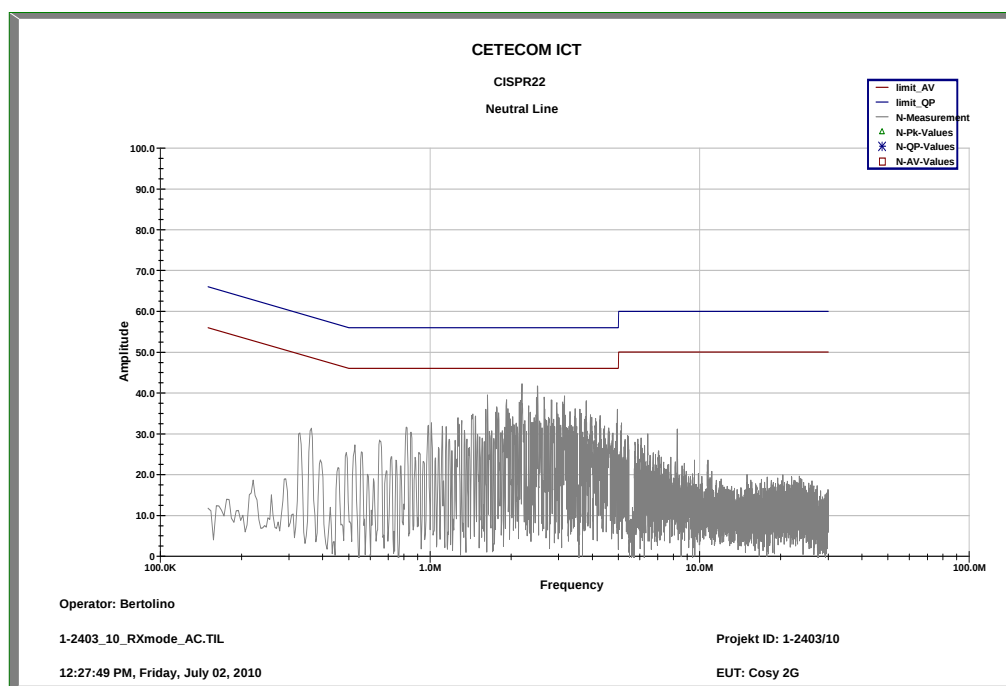
Plot 4: 9 kHz to 30 MHz / Neutral Line GSM 1900



Plot 5: 9 kHz to 30 MHz / Phase Line RX mode



Plot 6: 9 kHz to 30 MHz / Neutral Line RX mode



8.2 Spurious Emissions Radiated – Receiver Mode

Description:

The measurement was performed in worst case. The EUT was not connected to the CMU 200. So the EUT performs a network search. In this mode all oscillators are active.

Measurement:

Measurement parameters	
Detector:	Peak
Sweep time:	Auto
Video bandwidth:	3.5 * RBW
Resolution bandwidth:	120 kHz below 1 GHz 1 MHz up to 25 GHz
Span:	100 MHz steps
Trace-Mode:	Max. hold

Limits:

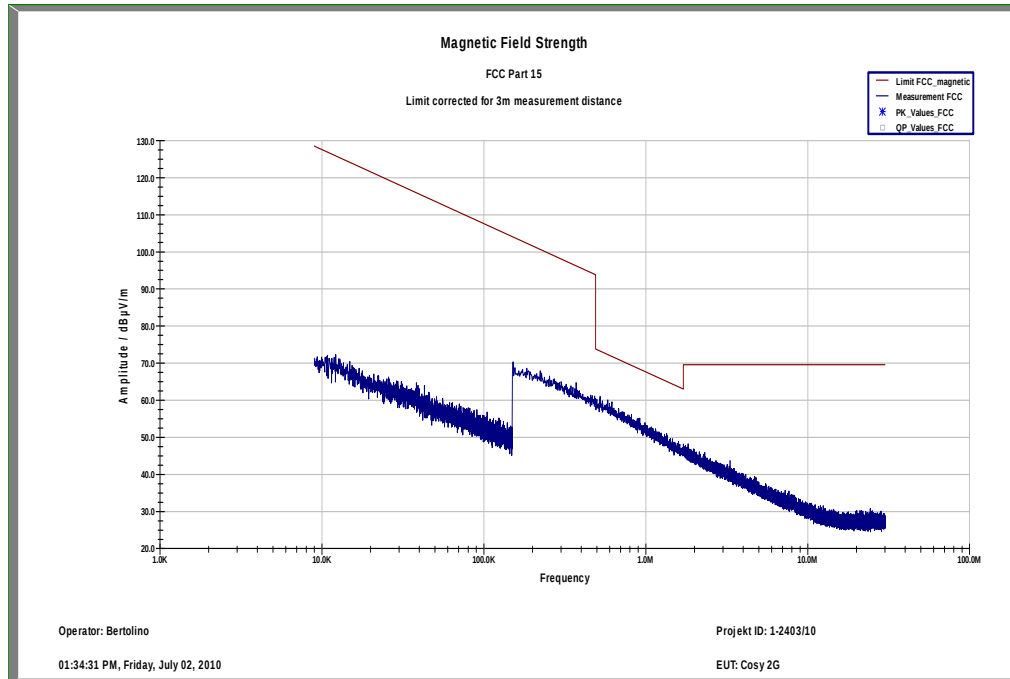
FCC		IC
CFR Part 15.109 CFR Part 2.1053		RSS Gen, Issue 2, Section 4.10 ICES-003 Issue 4
Spurious Emissions Radiated – Receiver Mode		
Frequency (MHz)	Field Strength (dBμV/m)	Measurement distance (m)
30 – 88	30.0	10
88 - 216	33.5	10
216 – 960	36.0	10
Above 960	54.0	3

Results:

Spurious Emission Level (dB μ V/m)		
Frequency (MHz)	Detector	Level (dB μ V/m)
No critical peaks detected! All detected emissions are below the limit!		
Measurement uncertainty		$\pm 3\text{dB}$

Result: [The result of the measurement is passed.](#)

Plot 1: Receiver mode up to 30 MHz



Plot 2: Receiver mode (30 MHz - 1 GHz), vertical & horizontal polarization

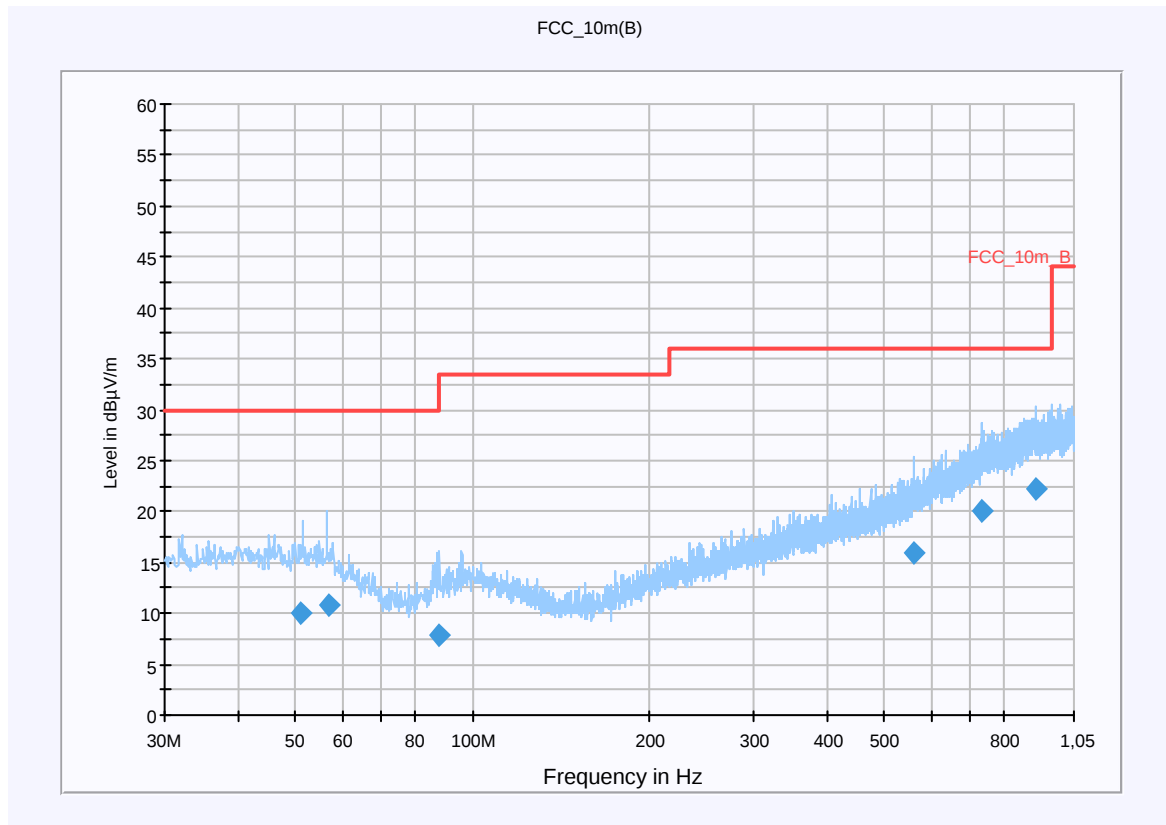
Common Information

EUT: Sagem Cosy
Serial Number: 35233004008455
Test Description: FCC part 15 B @ 10 m
Operating Conditions: GSM idle + NFC
Operator Name: Klos
Comment: powered with 110 V / 60 Hz

Scan Setup: STAN_Fin [EMI radiated]

Hardware Setup: Electric Field (NOS)
Level Unit: dB μ V/m

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30 MHz - 1,05 GHz	QuasiPeak	120 kHz	15 s	Receiver



Final Result 1

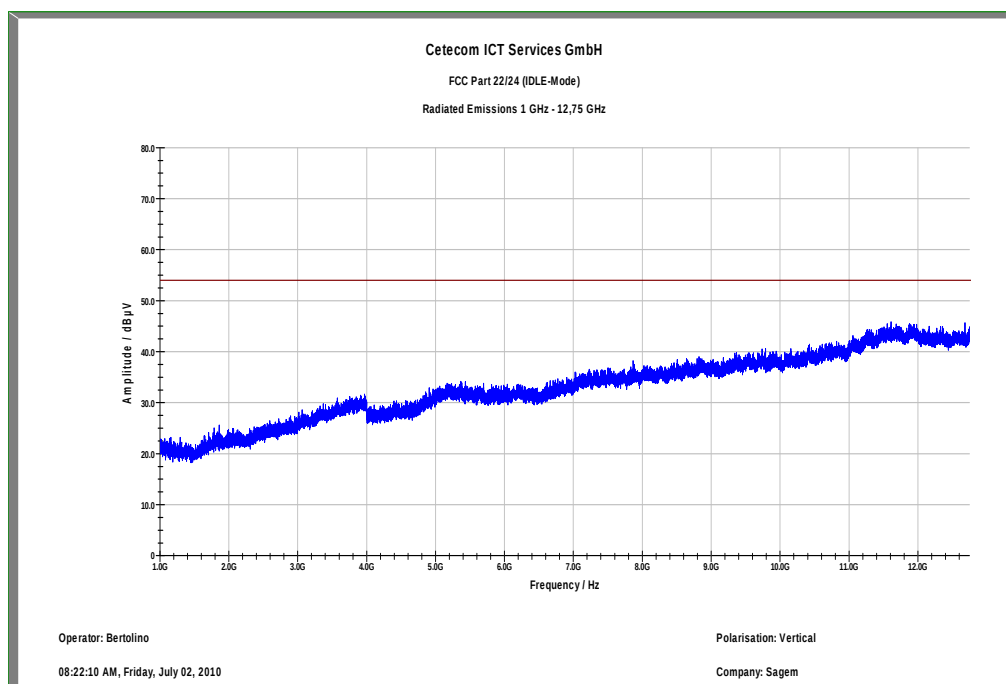
Frequency (MHz)	QuasiPeak (dB μ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)	Comment
50.948850	10.0	15000.000	120.000	132.0	V	303.0	13.3	20.0	30.0	
56.986650	10.8	15000.000	120.000	182.0	V	268.0	12.4	19.2	30.0	
87.408300	8.0	15000.000	120.000	330.0	V	236.0	10.2	22.0	30.0	
560.948550	15.9	15000.000	120.000	200.0	H	50.0	19.7	20.1	36.0	
732.131250	20.2	15000.000	120.000	100.0	V	263.0	23.2	15.8	36.0	
906.030600	22.2	15000.000	120.000	293.0	V	232.0	25.2	13.8	36.0	

Hardware Setup: EMI radiated\Electric Field (NOS) - [EMI radiated]

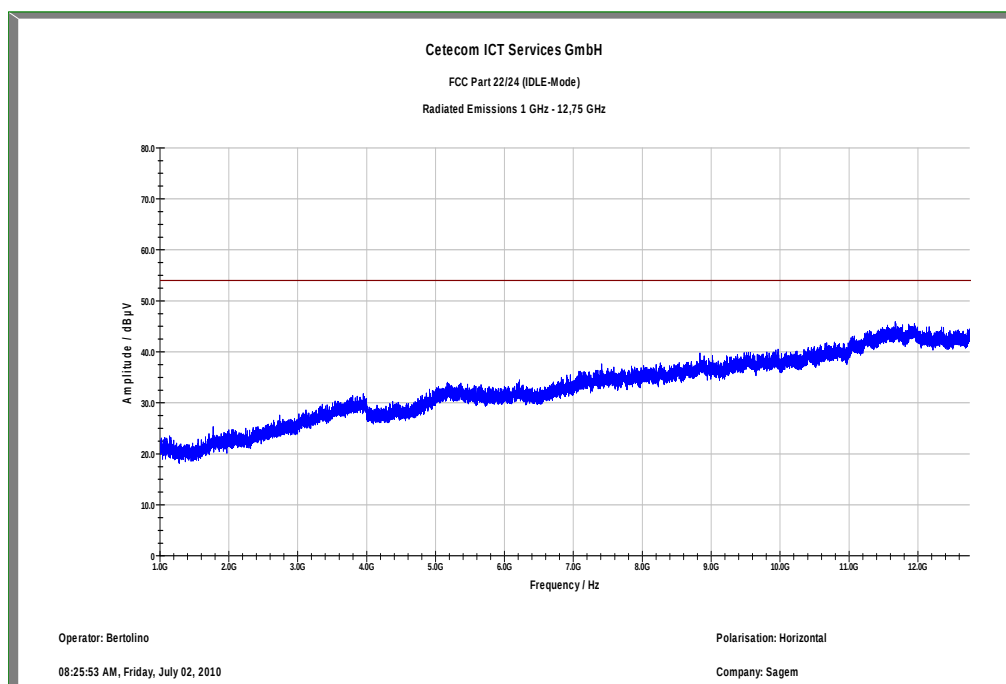
Subrange 1	
Frequency Range:	30 MHz - 2 GHz
Receiver:	Receiver [ESCI 3] @ GPIB0 (ADR 20), SN 100083/003, FW 4.32
Signal Path:	without Notch FW 1.0
Antenna:	VULB 9163 SN 9163-295, FW --- Correction Table (vertical): VULP6113 Correction Table (horizontal): VULP6113 Correction Table: Cable_EN_1GHz (1005)
Antenna Tower:	Tower [EMCO 2090 Antenna Tower] @ GPIB0 (ADR 8), FW REV 3.12
Turntable:	Turntable [EMCO Turntable] @ GPIB0 (ADR 9), FW REV 3.12

EMC 32 Version 8.10.00

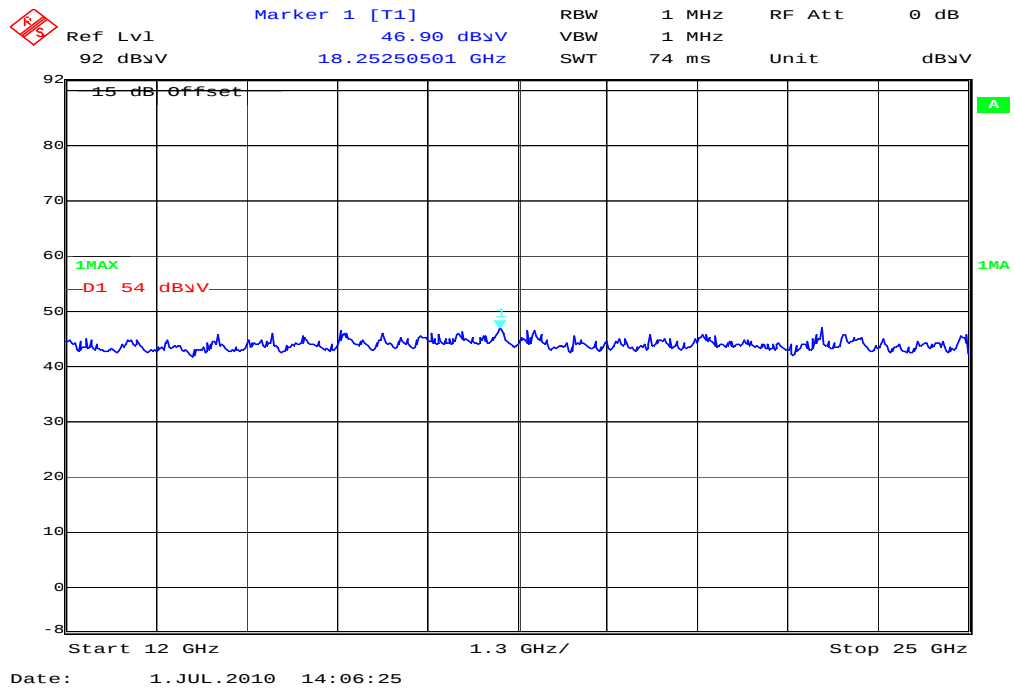
Plot 3: Receiver mode (1 GHz – 12.75 GHz), vertical polarization



Plot 4: Receiver mode (1 GHz – 12.75 GHz), horizontal polarization



Plot 5: Receiver mode (12 GHz – 25 GHz), vertical & horizontal polarization



9 Test equipment and ancillaries used for tests

In order to simplify the identification of the equipment used at each specific test, each item of test equipment and ancillaries are provided with an identifier or number in the equipment list below.

Typically, the calibrations of the test apparatus are commissioned to and performed by an accredited calibration laboratory. The calibration intervals are determined in accordance with the DIN EN ISO/IEC 17025. In addition to the external calibrations, the laboratory executes comparison measurements with other calibrated test systems or effective verifications. Weekly chamber inspections and range calibrations are performed. Where possible, rf-generating and signalling equipment as well as measuring receivers and analyzers are connected to an external high-precision 10 MHz reference (GPS-based or rubidium frequency standard).

No.	Labor / Item	Equipment	Type	Manufact.	Serial No.	INV. No Cetecom	Kal. Art	Last Calibration	Next Calibration
1	45	Switch-Unit	3488A	HP Meßtechnik	2719A14505	300000368	g		
2	50	DC power supply, 60Vdc, 50A, 1200 W	6032A	HP Meßtechnik	2920A04466	300000580	k	06.01.2009	06.01.2011
3	n. a.	software	SPS_PHE 1.4f	Spitzberger & Spieß	B5981; 5D1081;B5979	300000210	ne		
4	n. a.	EMI Test Receiver	ESCI 1166.5950.03	R&S	100083	300003312	k	08.01.2010	08.01.2012
5	n. a.	Analyzerr-Reference-System (Harmonics and Flicker)	ARS 16/1	SPS	A3509 07/0 0205	300003314	k		
6	n. a.	Amplifier	JS42-00502650-28-5A	MITEQ	1084532	300003379	ev		
7	n. a.	Antenna Tower	Model 2175	ETS-LINDGREN	64762	300003745	izw		
8	n. a.	Positioning Controller	Model 2090	ETS-LINDGREN	64672	300003746	izw		
9	n. a.	Turntable Interface-Box	Model 105637	ETS-LINDGREN	44583	300003747	izw		
10	n. a.	TRILOG Broadband Test-Antenna 30 MHz - 3 GHz	VULB9163	Schwarzbeck	295	300003787	k		
11	n. a.	Spectrum-Analyzer	FSU26	R&S	200809	300003874	k	08.01.2010	08.01.2012
12	n. a.	Double-Ridged Waveguide Horn Antenna 1-18.0GHz	3115	EMCO	8812-3088	300001032	vlKI!	05.03.2009	05.03.2011
13	n. a.	Active Loop Antenna	6502	EMCO	2210	300001015	ne		
14	n. a.	Anechoic chamber		MWB	87400/02	300000996			
15	Spec.A. 2_2e	System rack for EMI measurement solution	85900	HP I.V.	*	300000222	ne		
16	9	Artificial Mains 9 kHz to 30 MHz, 4 x 25 Ampere	ESH3-Z5	R&S	828576/020	300001210	Ve	06.01.2010	06.01.2012
17	n. a.	Relais Matrix	3488A	HP Meßtechnik	2719A15013	300001156	ne		
18	n. a.	Relais Matrix	PSU	R&S	890167/024	300001168	ne		
19	n. a.	Isolating Transformer	RT5A	Grundig	9242	300001263	ne		
20	n. a.	Three-Way Power Splitter, 50 Ohm	11850C	HP Meßtechnik		300000997	ne		
21	n. a.	Switch / Control Unit	3488A	HP	2605e08770	300001443	ne		
22	n. a.	Band Reject filter	WRCG1855/1910-1835/1925-40/8SS	Wainwright	7	300003350	ev		
23	n. a.	Band Reject filter	WRCG2400/2483-2375/2505-	Wainwright	11	300003351	ev		

			50/10SS						
24	n. a.	TILE-Software Emission	Quantum Change, Modell TILE-ICS/FULL	EMCO	none	300003451	ne		
25	n. a.	Highpass Filter	WHKX2.9/18G-12SS	Wainwright	1	300003492	ev		
26	n. a.	Highpass Filter	WHK1.1/15G-10SS	Wainwright	3	300003255	ev		
27	n. a.	Highpass Filter	WHKX7.0/18G-8SS	Wainwright	18	300003789	ne		
28	n. a.	PSA Spectrum Analyzer 3 Hz - 26.5 GHz	E4440A	Agilent Technologies	MY48250080	300003812	k	05.08.2008	05.08.2010
29	n. a.	MXG Microwave Analog Signal Generator	N5183A	Agilent Technologies	MY47420220	300003813	k	06.08.2008	06.08.2010
30	n. a.	RF Filter Section 9kHz - 1GHz	N9039A	Agilent Technologies	MY48260003	300003825	vIKI!	19.08.2008	19.08.2010
31	n. a.	TRILOG Broadband Test-Antenna 30 MHz - 3 GHz	VULB9163	Schwarzbeck	371	300003854	vIKI!	17.12.2008	17.12.2010
32	n. a.	Signal Analyzer 20Hz-26,5GHz-150 to + 30 DBM	FSIQ26	R&S	835540/018	300002681-0005	k	07.01.2010	07.01.2012
33	n. a.	Universal Communication Tester	CMU200	R&S	832221/055	300002862	k	20.03.2008	20.03.2011
34	19	Double-Ridged Waveguide Horn Antenna 1-18.0GHz	3115	EMCO	9107-3697	300001605	Ve		

Annex A Photographs of the Test Set-up

Photo documentation:

Photo 1:

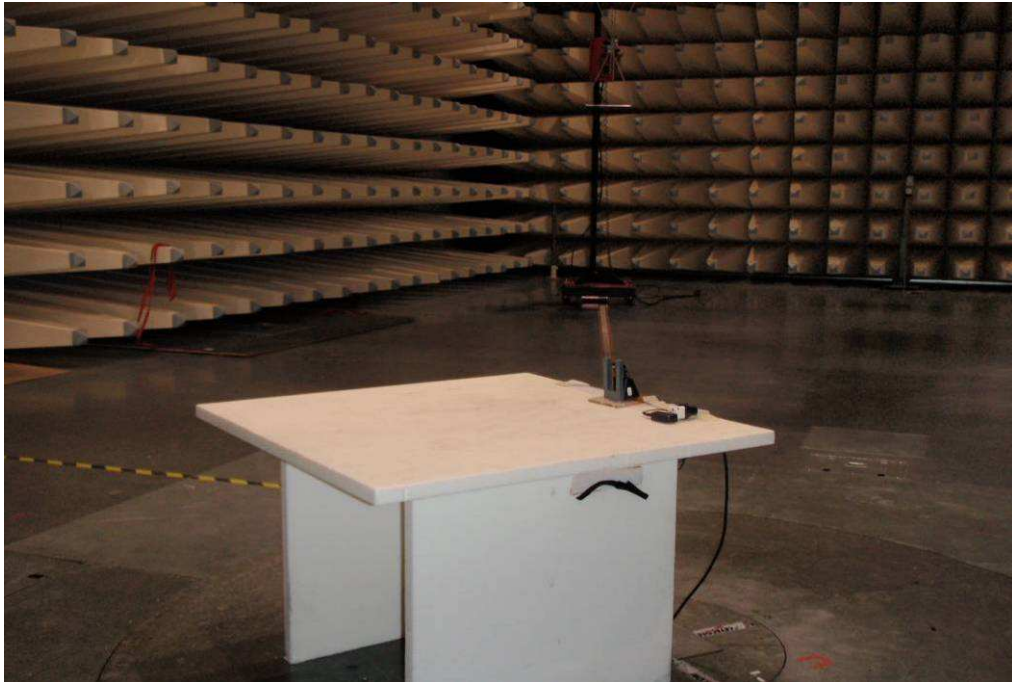


Photo 2:

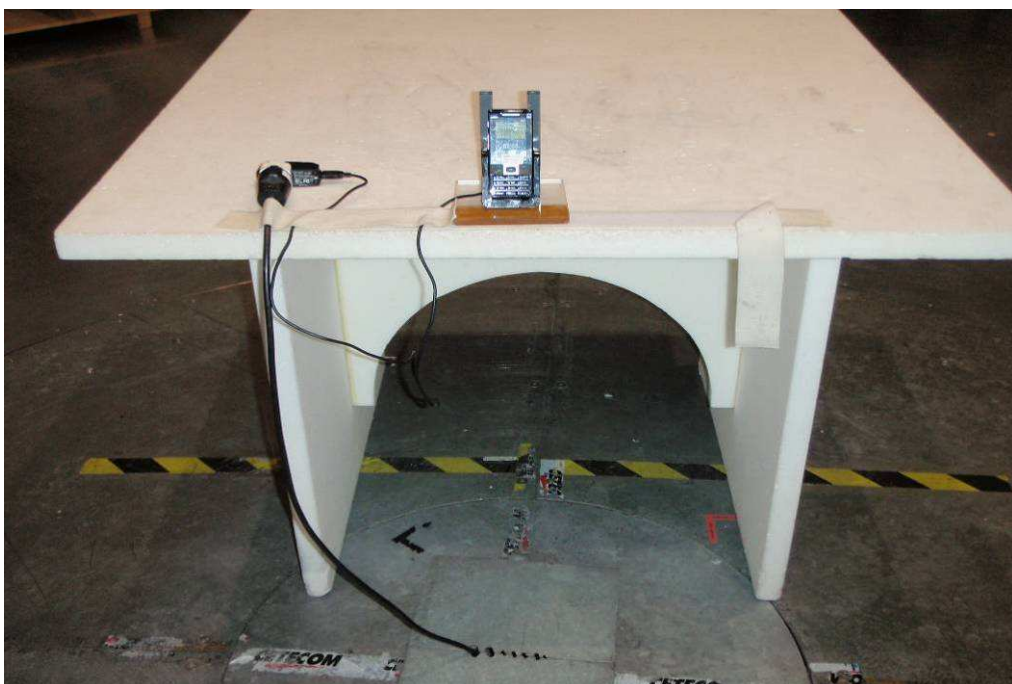


Photo 3:



Annex B External Photographs of the EUT

Photo documentation:

Photo 1:



Photo 2:



Photo 3:



Photo 4:



Photo 5:



Photo 6:



Photo 7:



Photo 8:



Photo 9:



Photo 10:



Photo 11:



Photo 12:



Photo 13:



Photo 14:



Photo 15:



Annex C Internal Photographs of the EUT

Photo documentation:

Photo 1:



Photo 2:



Photo 3:



Photo 4:



Photo 5:



Photo 6:

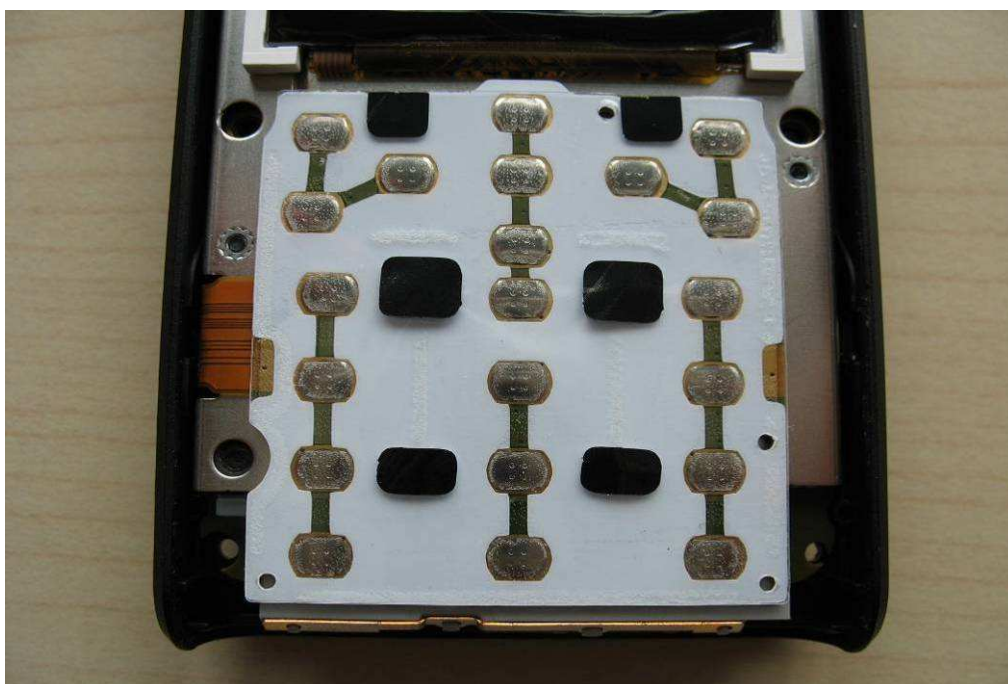


Photo 7:



Photo 8:

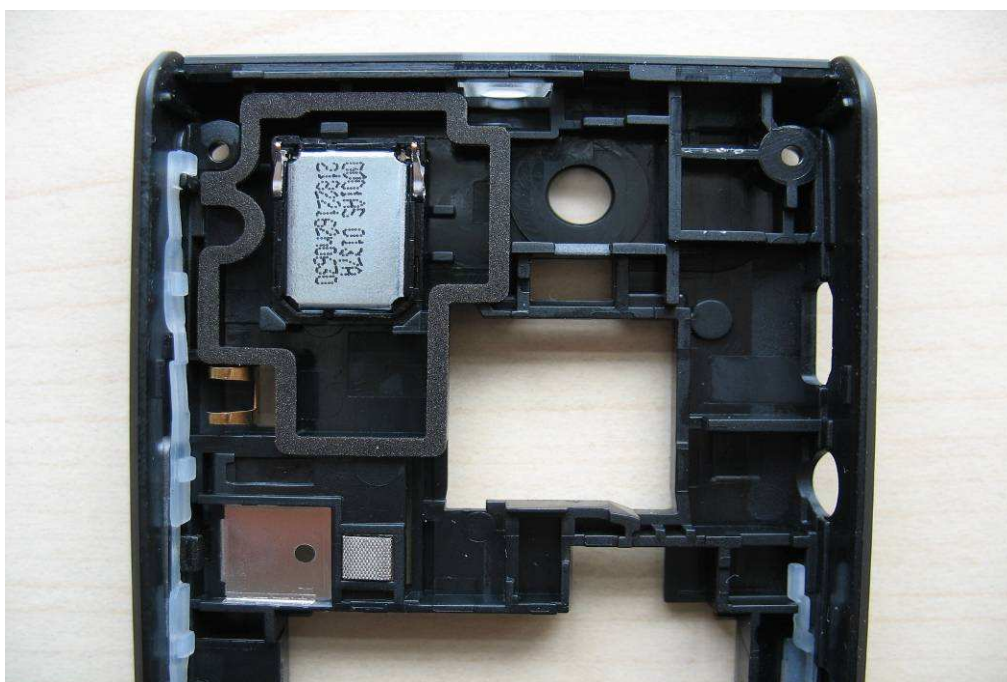


Photo 9:



Photo 10:

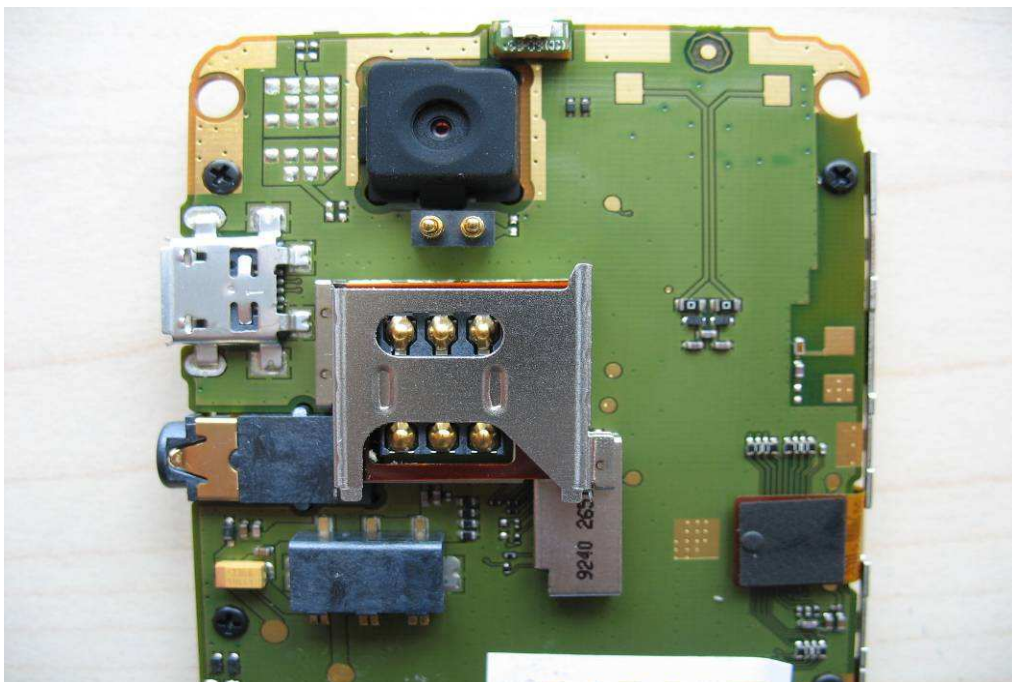


Photo 11:



Photo 12:

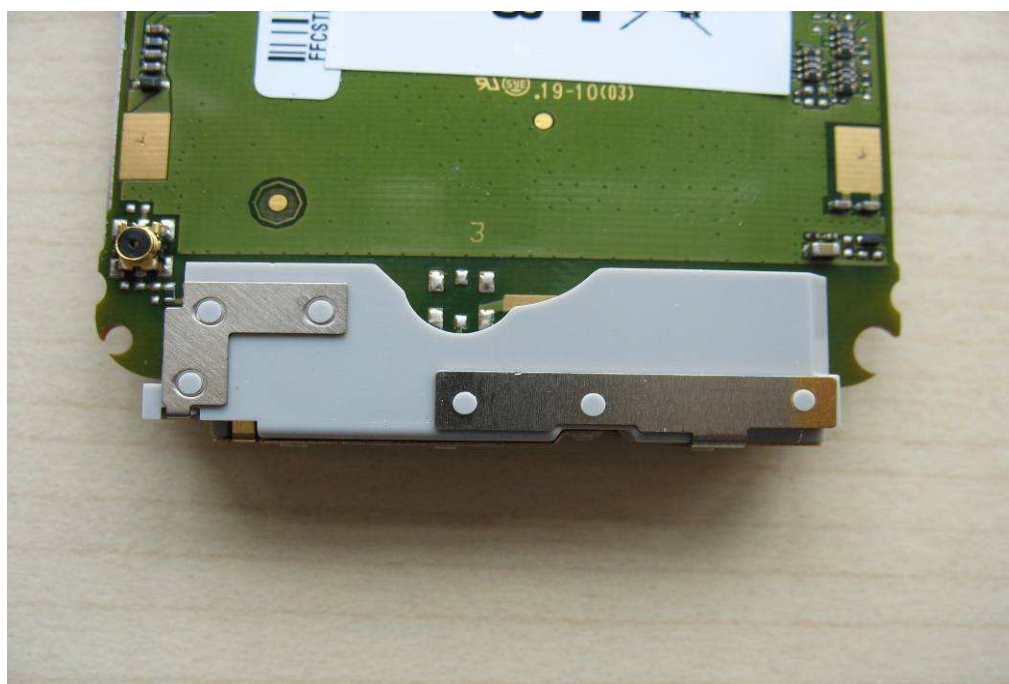


Photo 13:



Photo 14:



Photo 15:



Photo 16:

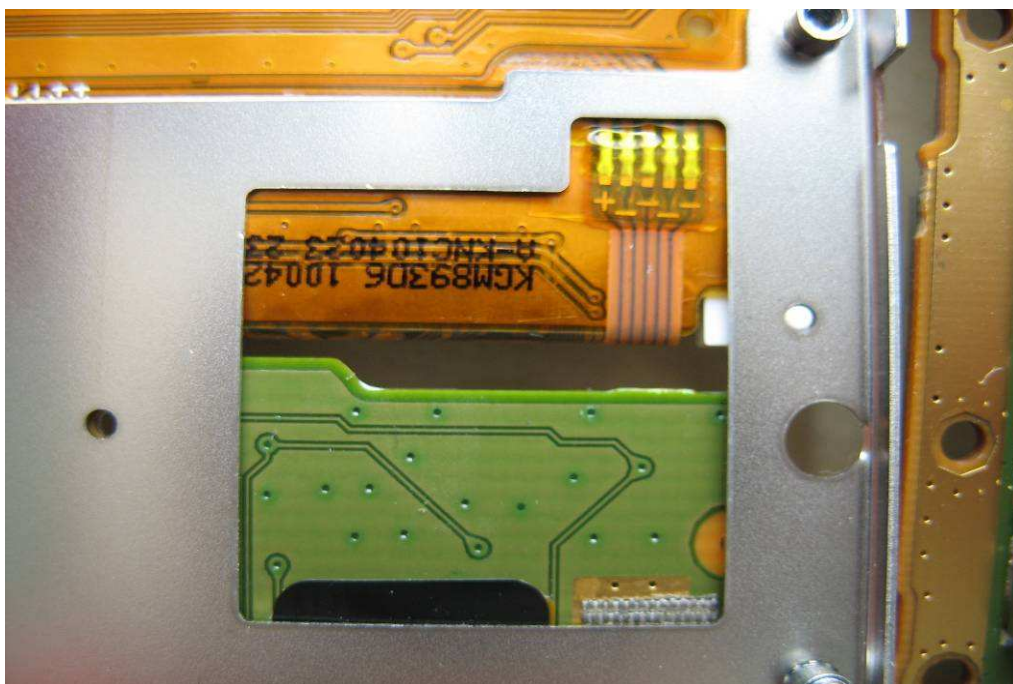


Photo 17:

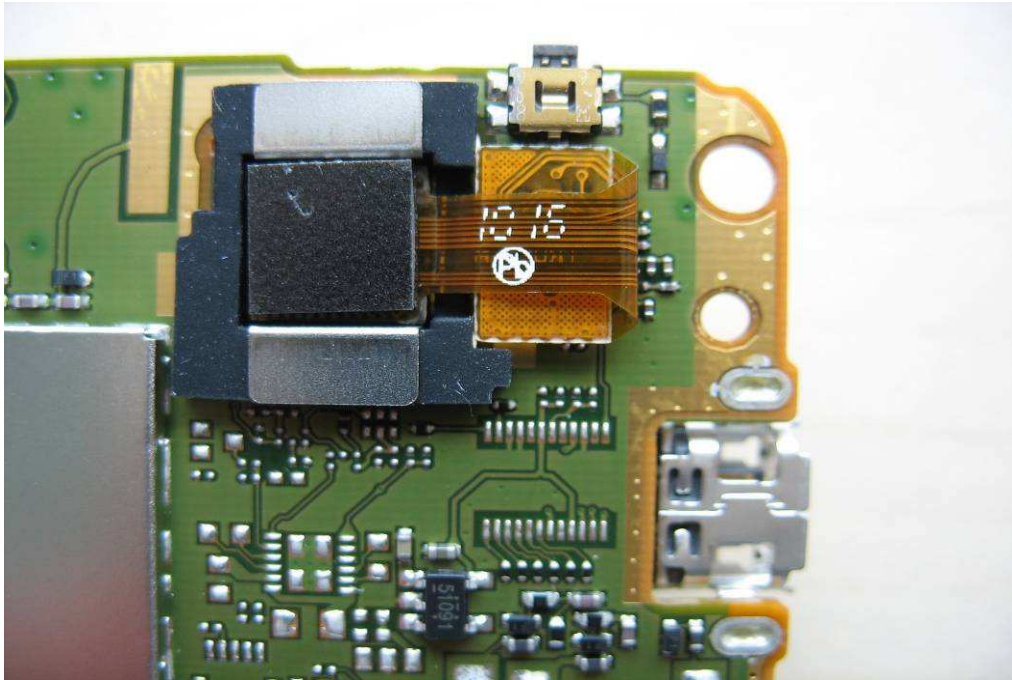


Photo 18:

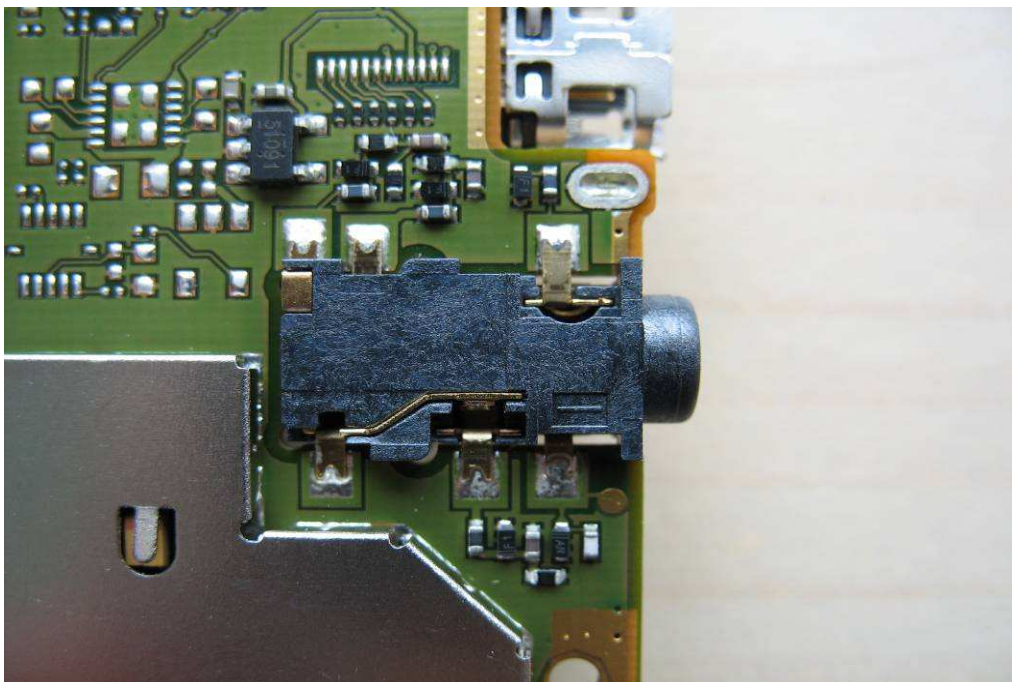


Photo 21:

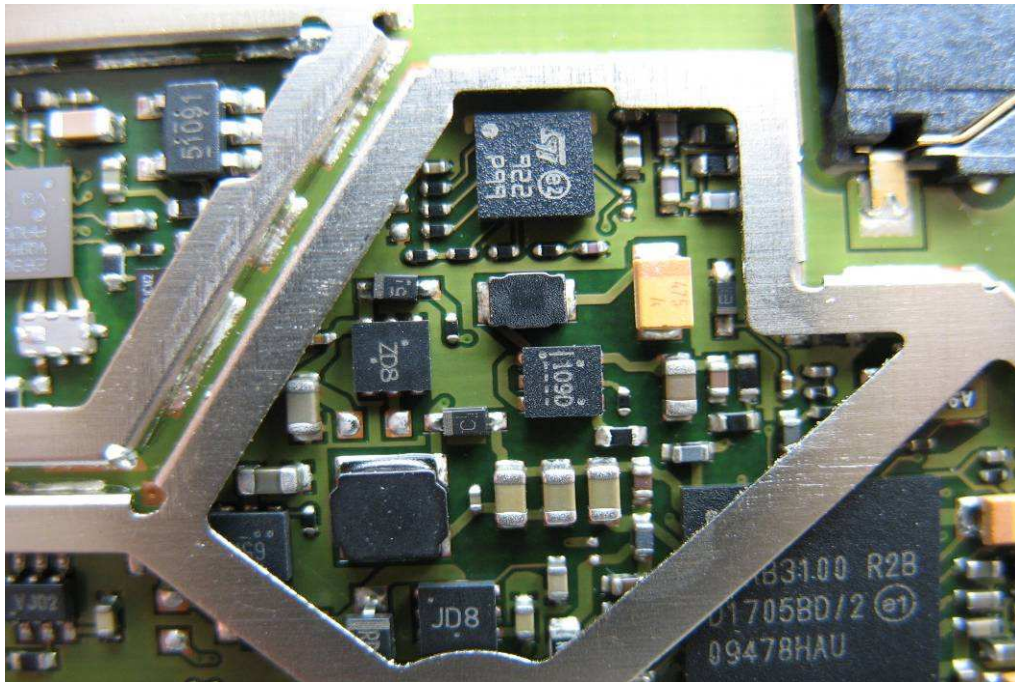


Photo 22:

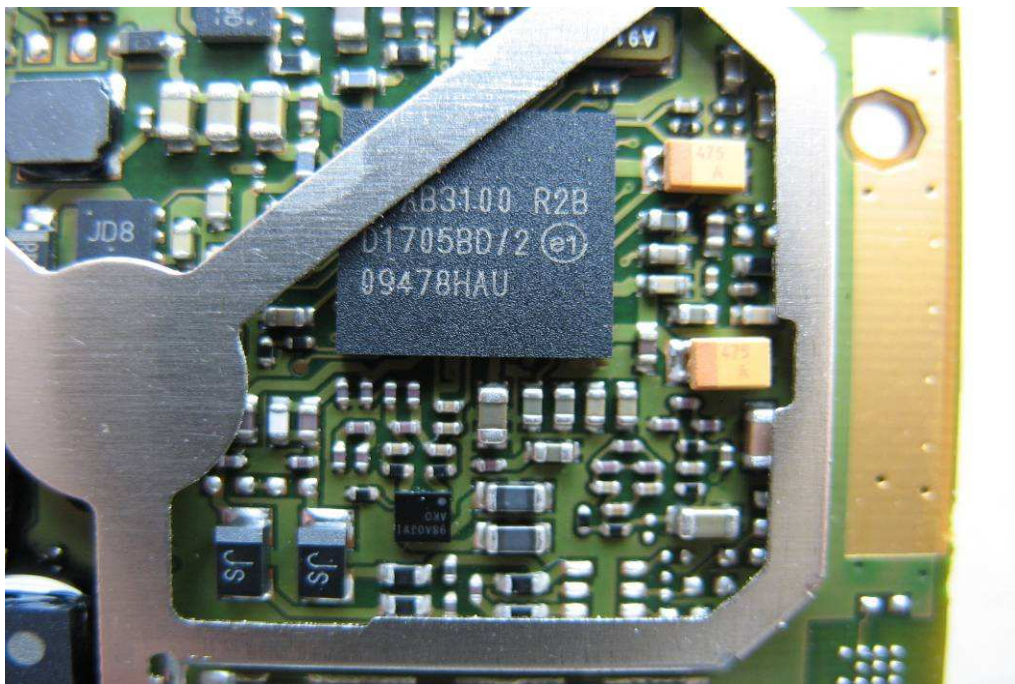


Photo 23:

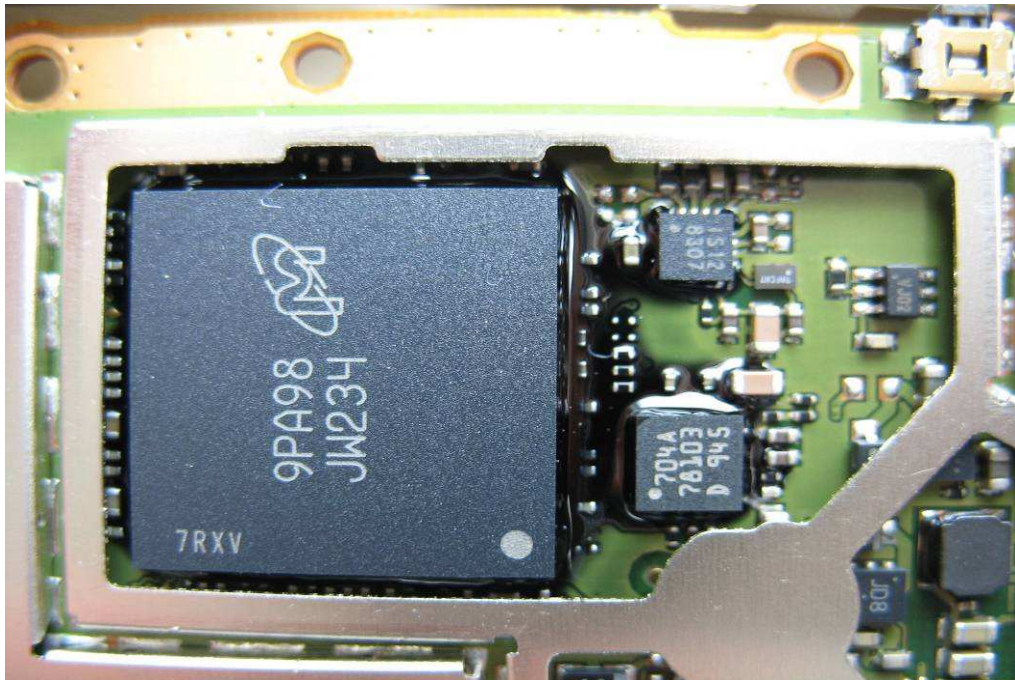


Photo 24:

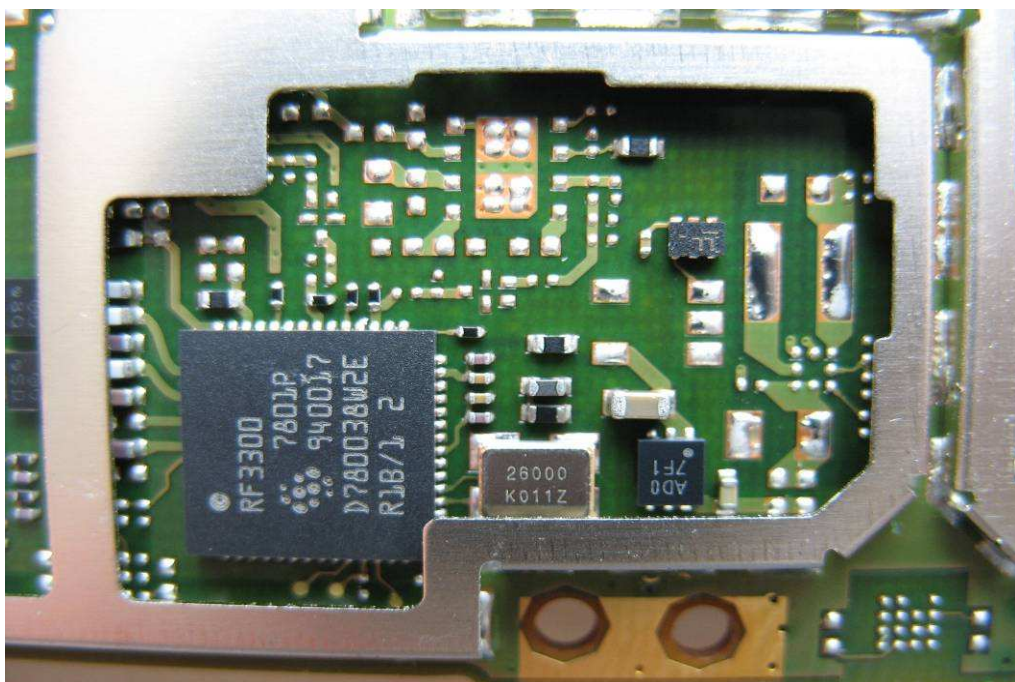


Photo 25:

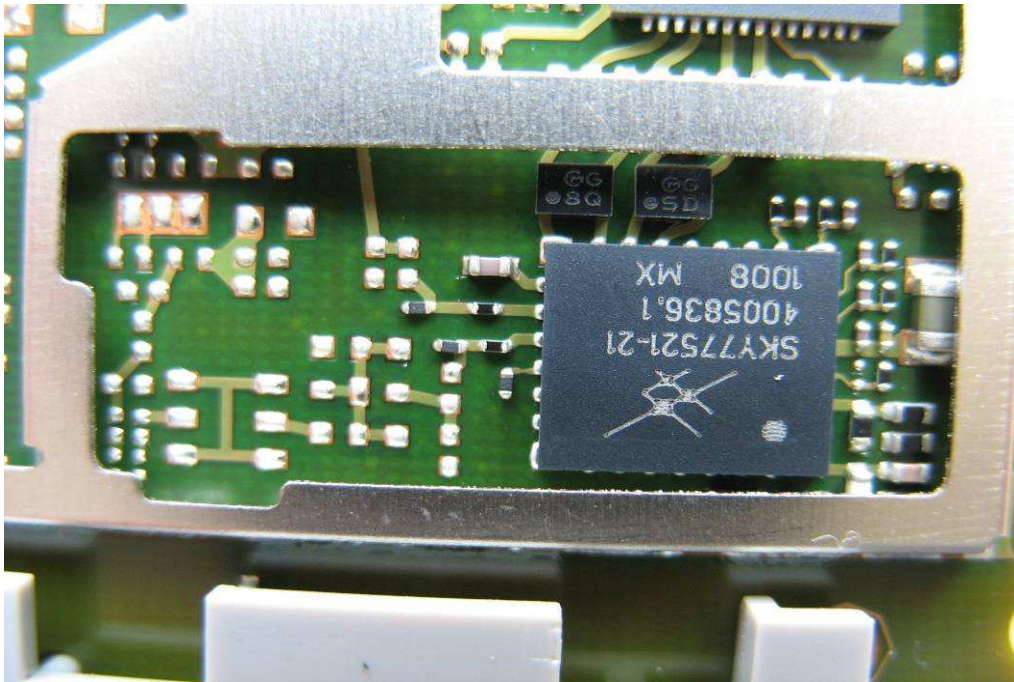
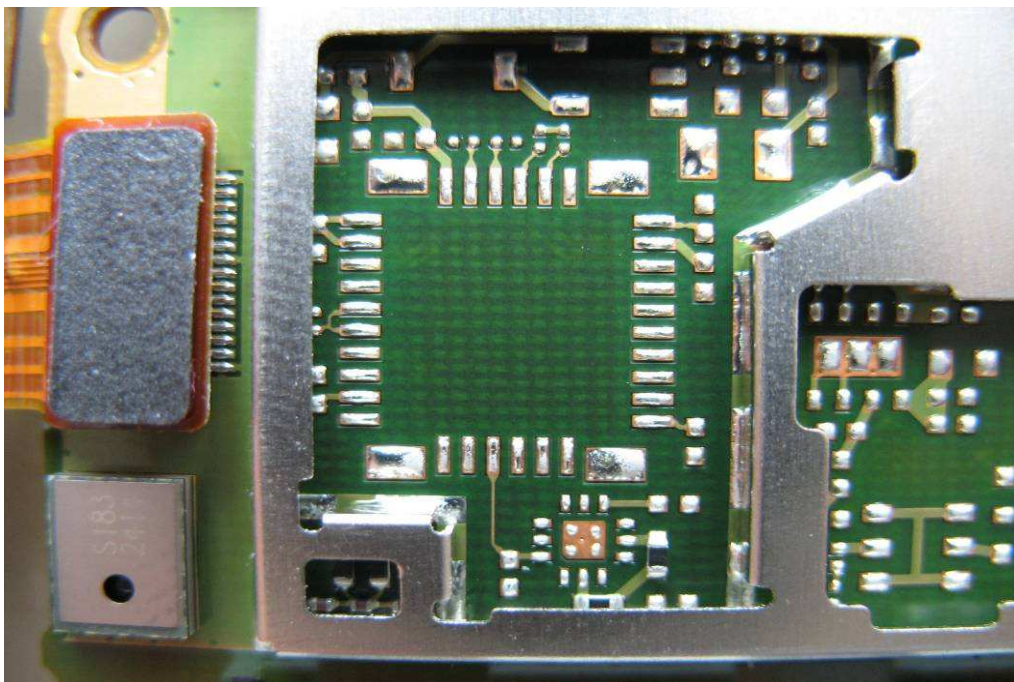


Photo 26:



Annex D Document history

Version	Applied changes	Date of release
1.0	Initial release	2010-08-03

Annex E Further information

Glossary

DUT	-	Device under Test
EMC	-	Electromagnetic Compatibility
EUT	-	Equipment under Test
FCC	-	Federal Communication Commission
FCC ID	-	Company Identifier at FCC
HW	-	Hardware
IC	-	Industry Canada
Inv. No.	-	Inventory number
N/A	-	not applicable
S/N	-	Serial Number
SW	-	Software