

Prima Ricerca & SviluppoSrl soggetta a direzione e coordinamento da parte della Giovanni Maspero & C. S.p.A. – C.I. 02634780130
Sede legale : 22100 Tavernola (CO) Via Conciliazione, 1 Cod. FISC. e N. R.I. CO 02635860139
Sede operativa : Laboratori Via Campagna, 92 22020 Faloppio fraz. Gaggino (CO) Tel. +39 03135000.11 Fax +39 031991309

EQUIPMENT UNDER TEST :
APPARECCHIO IN PROVA :

USB KEY
PLUG'N'CRYPT

REFERENCE STANDARDS :
NORME DI RIFERIMENTO :

FCC 47 CFR Part 15

CUSTOMER:

RICHIEDENTE:

- Dept. / Firm : *CHARISMATHICS GMBH*
Ente / Società:
- Mr.: *DANIELA PREVITALI*
Sig.:
- Address: *47 SENDLINGER STRASSE – 80331 MUENCHEN – GERMANY*
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Telefono: *Fax:* *e-mail*

Site of test execution: *Via Campagna, 92 - 22020 Gaggino Faloppio (CO) - Italy*
Località esecuzione prove:

Date of test samples receipt: *14/05/2009*
Data ricevimento campioni:

Date of start test: *14/05/2009*
Data inizio prove:

Date of end test: *14/05/2009*
Data fine prove:

Witness to the test:
Presenti alle prove:

Signature of the engineers:
Firma esecutore prove:

Signature of the Laboratory Director:
Firma Direttore Laboratori:

Mr. Nicola Albergati



The test results recorded in this Test Report are exclusively referred to the tested samples.

I risultati del presente rapporto di prova si riferiscono esclusivamente al campione sottoposto a prova.

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1. TECHNICAL INFORMATION OF EQUIPMENT UNDER TEST (EUT)

1.1 Identification

Brand name: CHARISMATHICS GMBH
Manufacturer: EUTRONSEC SPA
Equipment : USB KEY
Model name or No. : PLUG'N'CRYPT mod. ITSEC-I

Derived models: PLUG'N'CRYPT mod. ITSEC-P and PLUG'N'CRYPT mod. FIPS
Serial number : Not present
FCC ID : U5Y-AAB
Country of manufacturer: ITALY

1.2 Technical data

FCC class: Unintentional radiators, Class B
Supply voltage: +5 V dc supplied by USB PC connector
Input Power / Current : 250 mA max.
Maximum internal frequency generated by EUT Oscillator: 24 MHz; Data Exchange Rate:480Mbit/s
Typical usage : Document encrypting and storing
EUT single or system: Single
EUT dimensions : 7,5 x 1,9 x 1,2 cm

1.3 Modifications incorporated in E.U.T.

The following items are the modifications introduced in the equipment under test :

- None

1.4 Derived models

PLUG'N'CRYPT Models

Models	Model ITSEC-I, ITSEC-P and FIPS
Schematics	1467-02-SCH-01R3
Printed circuit	1467-02-PCB-01R2
Bill of Material	1467-02-BOM-01R3
Housing Box	Plastic

How declared by the client, Crypto Combo models differ each other only for crypto chip mounted. Different manufacturers realize this type of component: all the crypto chips used must be completely interchangeable to ensure the same product functionality.

On each product it is also possible to mount one memory chip having a minimum size of 128Mb an maximum size of 2Gb.

Consideration:

- The worst-case model was determined as follow:

Every key differs in quantity of memory an the FCC said that the device has to be “electrically identical” as required by rule Part 2.924.

The different NAND Flash Memories it is possible to note that there in NOT a Worst case, because:

- 1) the packages are the same
- 2) the transfer protocol are the same even if there is different memory size. It always transfers “eight byte” each time in “four cycle” transfer protocol (see memory specifications TCF).
- 3) So, even if they have different memory sizes, the clock is the same, the data communication (between micro and memory) is always the same. This implies that disturbances are the same.

-the test data was taken on the model PLUG'N'CRYPT mod. ITSEC-I with 2 Gb memory chip;

- the reported test data is representative of all models the device (see derived models table)

1.5 Ports identification

This section contains descriptions of all signal ports and AC/DC power input/output ports, the length and the type of the cable provided by manufacturer needed for the tests.

Moreover it is specified if the ports are ever or optionally connected.

Port		Description	Connection
1	Enclosure	Plastic case	*****
2	AC power input/output ports	Line not present	*****
3	DC power input/output ports	+5 V dc supplied by USB PC connector	USB PC connector (Pin 1,4)
4	Signals ports	USB Communication	USB PC connector (Pin 2,3)

Note: During the tests all cables must be what provided the manufacturer or the same that used in the real employment of the EUT.

1.6 Auxiliary equipment

- Personal Computer Compaq EV0 N1020V

2. TEST CONDITIONS

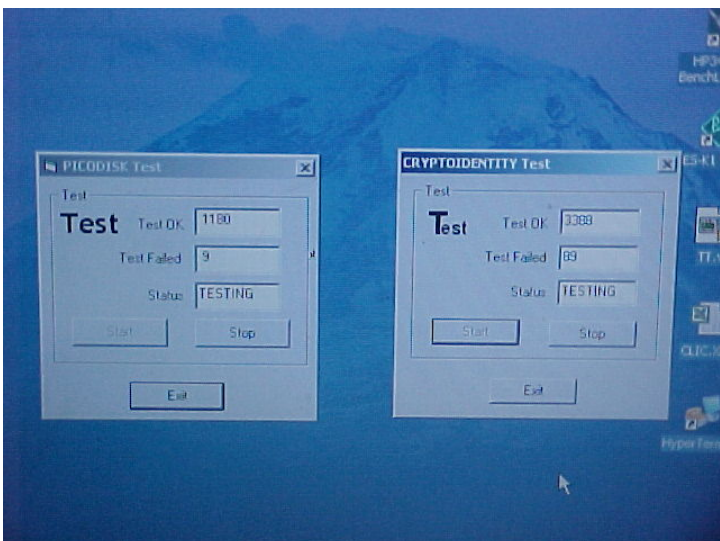
2.1 Operating test modes and test conditions

The equipment has been tested according to the operative conditions described in the user/installation manual provided by the manufacturer and by following reference standards :

Reference Standard:

- FCC Part 15, Subpart B

In the following table there are the operating conditions adopted during tests identified by an indicator (#..) at which has been referred the item “Operating condition of the equipment under test” of all technical sheets of the tests (see Section 4)

Operating condition	Description
#1	<p>Electronic key is connected directly by USB port to PC.</p> <p>One test program is available, as stimulus, to verify the encrypting and data storing properties.</p> 

2.2 Test overview

The appliance is classified as “*unintentional radiator*” in conformity to FCC Part 15 Sub. B §15.109, §15.107 , and it is subject to “*Certification*” procedure.

The application is mainly used as document encrypting and data storing.

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3. REFERENCE STANDARD FOR PERFORMED TESTS

<i>Reference standard :</i>	<i>Title :</i>
FCC Part 15 part A	Code of Regulations Part 15 (Radio Frequency Devices), Subpart A (General) of the Federal Communication Commission (FCC)
FCC Part 15 part B	Code of Regulations Part 15 (Radio Frequency Devices), Subpart B (Unintentional Radiators) of the Federal Communication Commission (FCC)
ANSI C63.4	American National Standard for Methods of Measuring of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz – 40 GHz

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4. SUMMARY OF TEST RESULTS

4.1 Emission tests

Port		Phenomena	Basic standard	Operating condition ¹	Result
1	Enclosure	Radiated emission	FCC Part 15 § 15 109	#1	Within the limit
2	AC mains Input ports	RF Disturbance voltage: • continuous	FCC Part 15 § 15 107	#1	Within the limit
3	Antenna terminals	Antenna power conduction limits for receivers	FCC Part 15 §15 111	Not applicable ²	

¹ Ref. Tab. of Section 2

² Applicable only to equipments which have an external antenna connector

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5. TEST RESULTS

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**TEST
1.****RADIATED EMISSION 30 - 4000 MHZ****REFERENCE
DOCUMENT**

FCC PART 15 subpart B

- **TEST LOCATION:** Semi-anechoic chamber
- **TEST EQUIPMENT USED FOR TEST:** EMI receiver Rohde & Schwarz Mod. ESU40
Chase Antenna Mod. CBL 6111 A
Log-periodica Broadband Antenna mod. HL025
- **TESTED PORT:** Enclosure
- **EMISSION LIMITS:** Acc. to Section 15.109 of reference document
- **UNCERTAINTY OF MEASURE:** Combined uncertainty = ± 1.75 dB
Total uncertainty = $(k=2) \pm 3.5$ dB

TEST CONDITIONS:	MEASURED
Ambient temperature : 15 - 35 °C	23,5 \pm 3 °C
Ambient humidity : 25 - 75 %rH	39 \pm 5 %rH
Pressure : 85 - 106 kPa (860 mbar - 1060 mbar)	950 \pm 50 mbar
Voltage :	+5 V dc USB

OPERATING CONDITION (Rif. Section. 2) : #1**RESULT: WITHIN THE LIMIT**

EMI Auto Test Template: Electric Field Strength FCC

Hardware Setup: Electric Field Strength FCC
Measurement Type: Open-Area-Test-Site
Frequency Range: 30 MHz - 1 GHz
Graphics Level Range: 0 dB μ V/m - 80 dB μ V/m

Preview Measurements:
Scan Test Template: Electric Field Strength FCC pre

Data Reduction:
Limit Line #1: FCC 15_109 Peak
Limit Line #2: FCC 15_109 AV
Peak Search: 6 dB
Maximum Results: 5
Subrange Maxima: 0
Maxima per Subrange: 1
Acceptance Offset: -10 dB
Maximum Number of Results: 5

Adjustment:
Template for Single Meas.: Electric Field Strength FCC fin

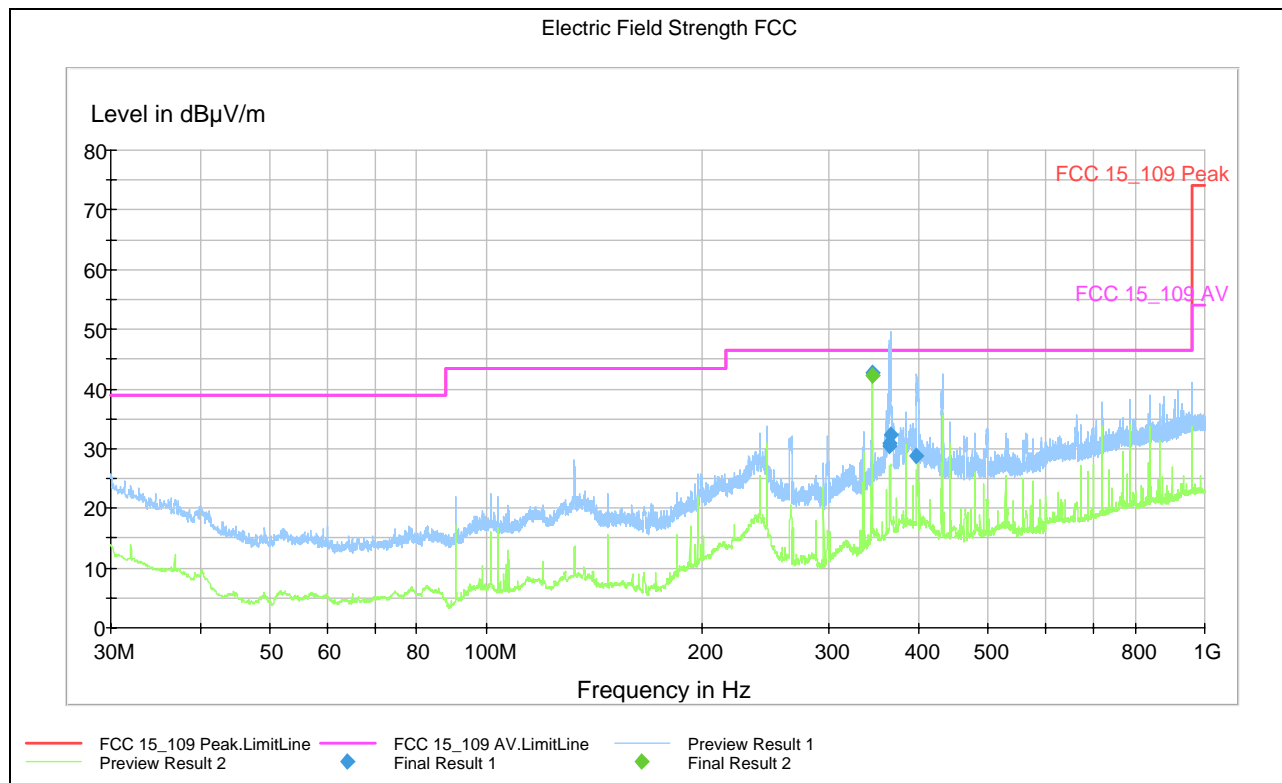
Final Measurements:
Template for Single Meas.: Electric Field Strength FCC fin

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30 MHz - 1 GHz	QuasiPeak; Average	120 kHz	1 s	Receiver
1 GHz - 3.6 GHz	QuasiPeak; Average	1 MHz	1 s	Receiver
3.6 GHz - 18 GHz	QuasiPeak; Average	1 MHz	1 s	Receiver

Report Settings:
Report Template: Sample EMI Auto Test Report
Create Electronic Report: RTF
Document Name: EMI Report

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30 MHz – 1GHz HORIZONTAL POLARIZATION



Final Result 1

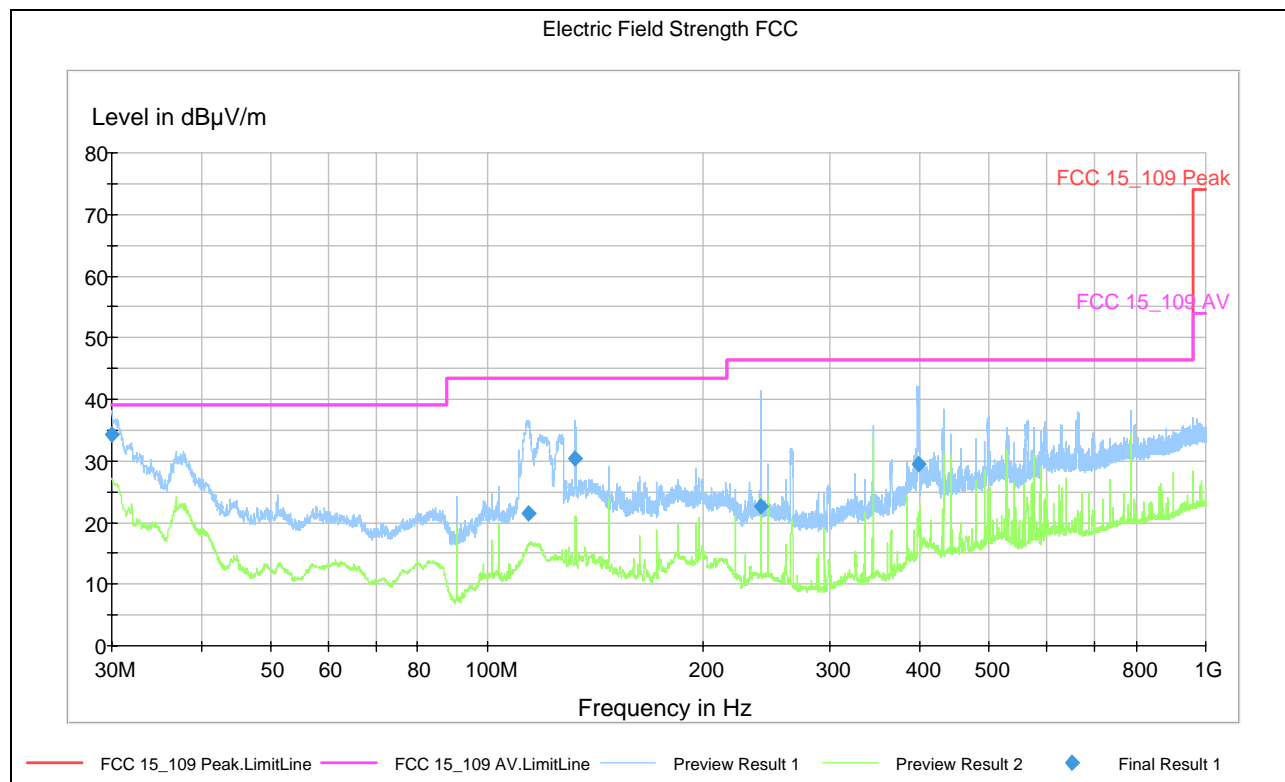
Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
344.100000	42.8	1000.000	120.000	100.0	H	112.0	17.9	3.60	46.40
363.750000	30.8	1000.000	120.000	270.0	H	112.0	18.4	15.60	46.40
364.680000	30.5	1000.000	120.000	249.0	H	112.0	18.4	15.90	46.40
365.280000	32.3	1000.000	120.000	249.0	H	112.0	18.4	14.10	46.40
397.350000	28.8	1000.000	120.000	125.0	H	293.0	19.4	17.60	46.40

Final Result 2

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
344.100000	42.2	1000.000	120.000	100.0	H	112.0	17.9	4.20	46.40

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30 MHz – 1GHz VERTICAL POLARIZATION



Final Result 1

Frequency (MHz)	QuasiPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
30.030000	34.3	1000.000	120.000	276.0	V	201.0	20.5	4.70	39.00
114.300000	21.4	1000.000	120.000	100.0	V	292.0	13.4	22.10	43.50
132.360000	30.5	1000.000	120.000	125.0	V	97.0	14.1	13.00	43.50
240.030000	22.5	1000.000	120.000	125.0	V	186.0	14.4	23.90	46.40
397.500000	29.6	1000.000	120.000	100.0	V	201.0	19.4	16.80	46.40

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EMI Auto Test Template: Electric Field Strength FCC

Hardware Setup: Electric Field Strength FCC
Measurement Type: Open-Area-Test-Site
Frequency Range: 1 GHz - 3.6 GHz
Graphics Level Range: 0 dB μ V/m - 80 dB μ V/m

Preview Measurements:

Scan Test Template: Electric Field Strength FCC pre

Data Reduction:

Limit Line #1: FCC 15 109 Peak
Limit Line #2: FCC 15 109 AV
Peak Search: 6 dB
Maximum Results: 5
Subrange Maxima: 0
Maxima per Subrange: 1
Acceptance Offset: -10 dB
Maximum Number of Results: 5

Adjustment:

Template for Single Meas.: Electric Field Strength FCC fin

Final Measurements:

Template for Single Meas.: Electric Field Strength FCC fin

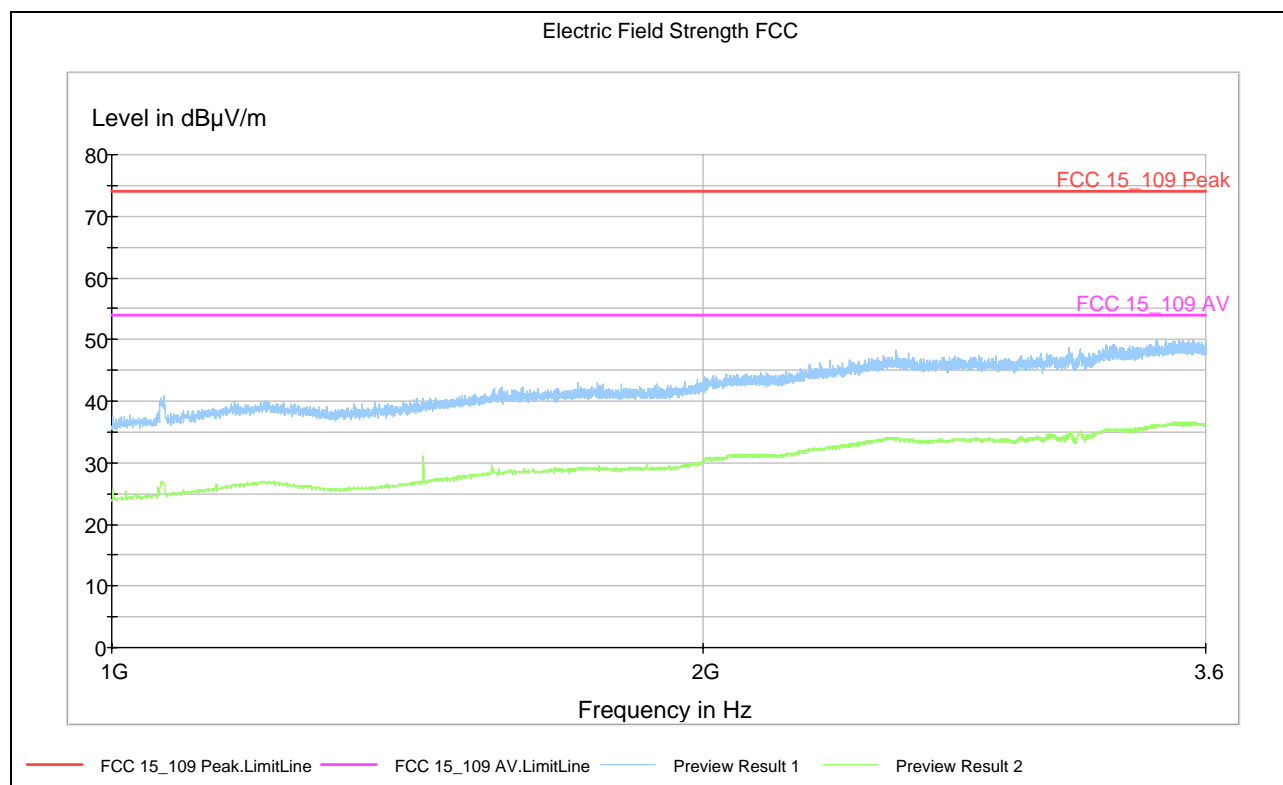
Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30 MHz - 1 GHz	QuasiPeak; Average	120 kHz	1 s	Receiver
1 GHz - 3.6 GHz	QuasiPeak; Average	1 MHz	1 s	Receiver
3.6 GHz - 18 GHz	QuasiPeak; Average	1 MHz	1 s	Receiver

Report Settings:

Report Template: Sample EMI Auto Test Report
Create Electronic Report: RTF
Document Name: EMI Report

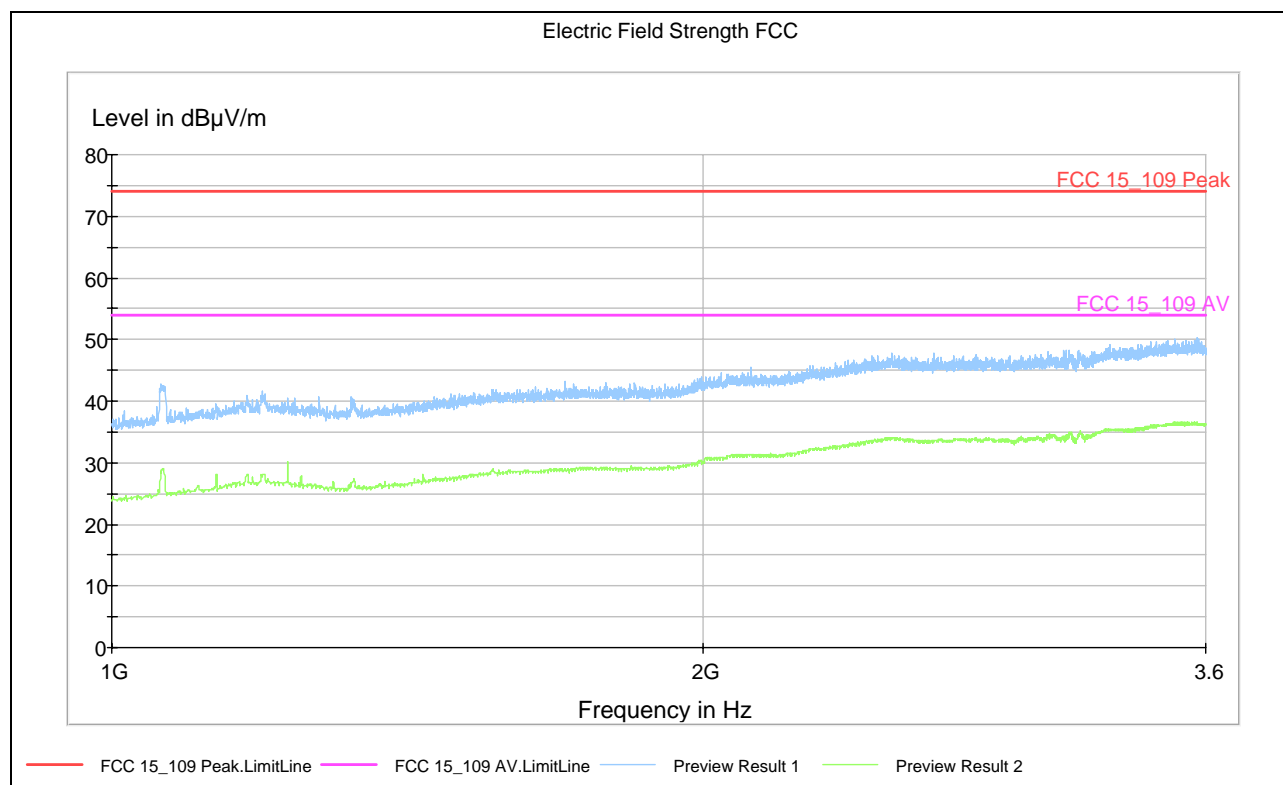
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1GHz -3,6GHz HORIZONTAL POLARIZATION



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1GHz -3,6GHz VERTICAL POLARIZATION



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EMI Auto Test Template: Electric Field Strength FCC

Hardware Setup: Electric Field Strength FCC
Measurement Type: Open-Area-Test-Site
Frequency Range: 3.6 GHz - 4 GHz
Graphics Level Range: 0 dBμV/m - 80 dBμV/m

Preview Measurements:

Scan Test Template: Electric Field Strength FCC pre

Data Reduction:

Limit Line #1: FCC 15 109 Peak
Limit Line #2: FCC 15 109 AV
Peak Search: 6 dB
Maximum Results: 5
Subrange Maxima: 0
Maxima per Subrange: 1
Acceptance Offset: -10 dB
Maximum Number of Results: 5

Adjustment:

Template for Single Meas.: Electric Field Strength FCC fin

Final Measurements:

Template for Single Meas.: Electric Field Strength FCC fin

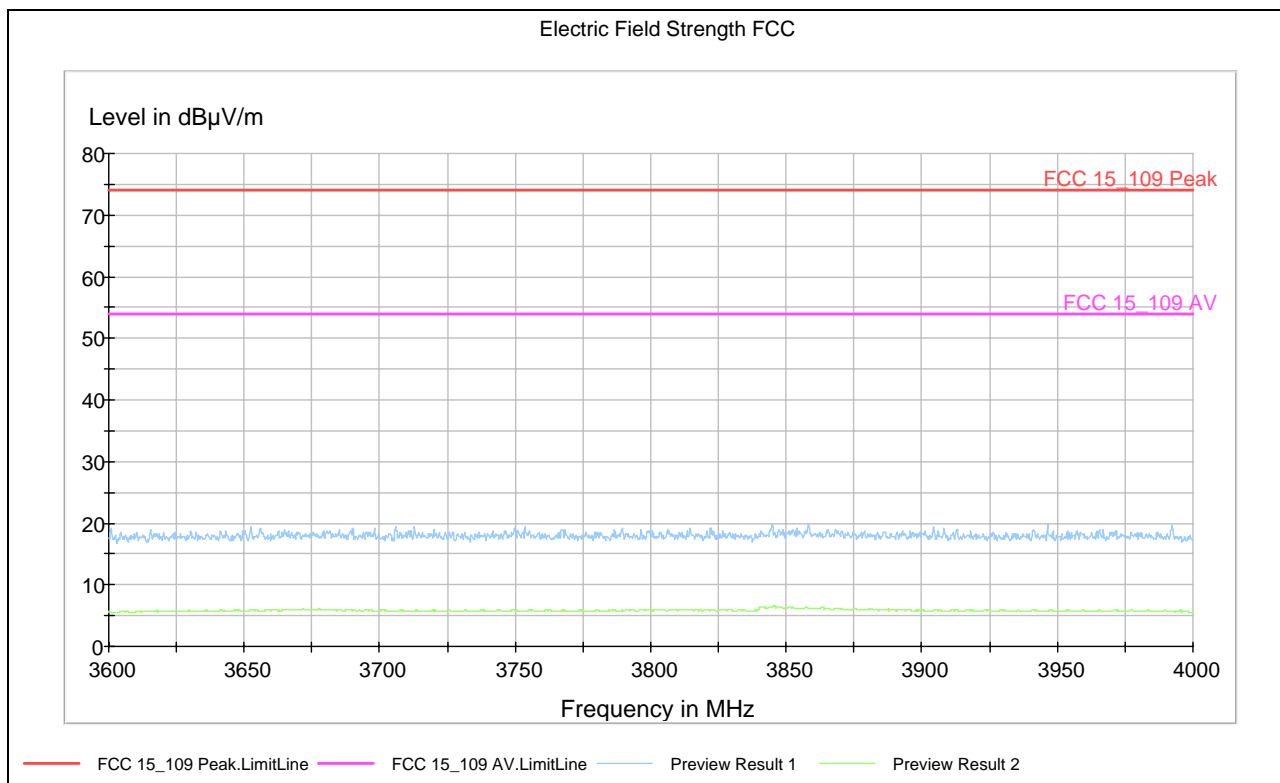
Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30 MHz - 1 GHz	QuasiPeak; Average	120 kHz	1 s	Receiver
1 GHz - 3.6 GHz	QuasiPeak; Average	1 MHz	1 s	Receiver
3.6 GHz - 18 GHz	QuasiPeak; Average	1 MHz	1 s	Receiver

Report Settings:

Report Template: Sample EMI Auto Test Report
Create Electronic Report: RTF
Document Name: EMI Report

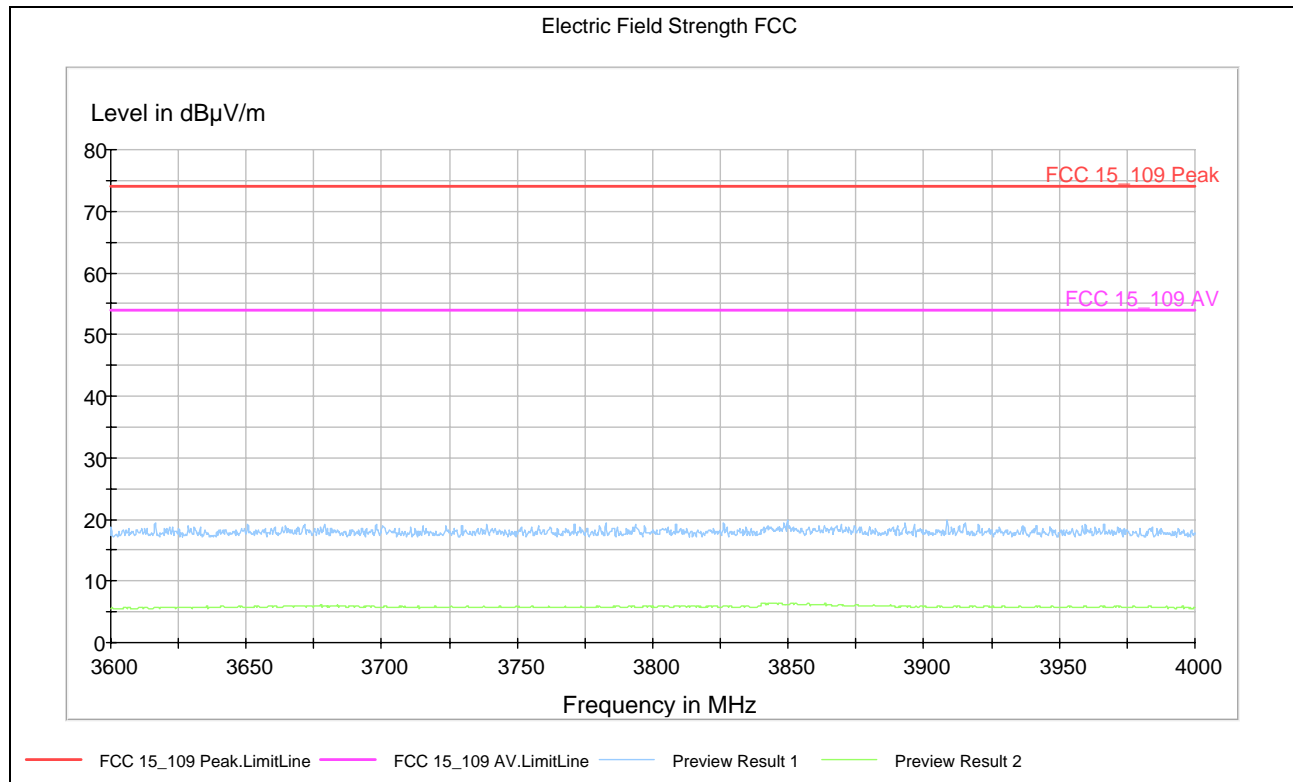
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3,6GHz -4GHz HORIZONTAL POLARIZATION



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3,6GHz -4GHz VERTICAL POLARIZATION



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**TEST
2.****EMISSION OF MAINS TERMINAL DISTURBANCE VOLTAGE****REFERENCE
DOCUMENT**

FCC PART 15 subpart B

- **TEST LOCATION:** Semianechoic chamber
- **TEST EQUIPMENT USED FOR TEST:** EMI receiver Rohde & Schwarz Mod. ESU40
Artificial Network Rohde & Schwarz Mod. ESH3-Z5

- **TESTED PORT:** AC mains
- **FREQUENCY RANGE:** 0.15 - 30 MHz
- **EMISSION LIMITS:** Acc. to reference document 15.107
- **MEASUREMENT UNCERTAINTY:** Total uncertainty (k=2) ± 2.5 dB

TEST CONDITIONS:		MEASURED
Ambient temperature :	15 - 35 °C	24 \pm 3 °C
Ambient humidity :	25 - 75 %rH	40 \pm 5 %rH
Pressure :	85 - 106 kPa (860 mbar - 1060 mbar)	950 \pm 50 mbar
Voltage :	220Vac	98 Vac \pm 3%

OPERATING CONDITION (Rif. Section. 2) : #1**RESULT: Within the limits**

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EMI Auto Test Template: Voltage FCC15 with 2-Line-LISN

Hardware Setup: Voltage with 2-Line-LISN
Measurement Type: 2 Line LISN
Frequency Range: 150 kHz - 30 MHz
Graphics Level Range: 0 dBμV - 80 dBμV

Preview Measurements:
Scan Test Template: Voltage with 2-Line-LISN pre

Data Reduction:
Limit Line #1: FCC 15 V QP
Limit Line #2: FCC 15 V AV
Peak Search: 6 dB
Maximum Results: 12
Subrange Maxima: 0
Maxima per Subrange: 1
Acceptance Offset: -10 dB
Maximum Number of Results: 12

Frequency Zoom:
Zoom Scan Template: Voltage with 2-Line-LISN max

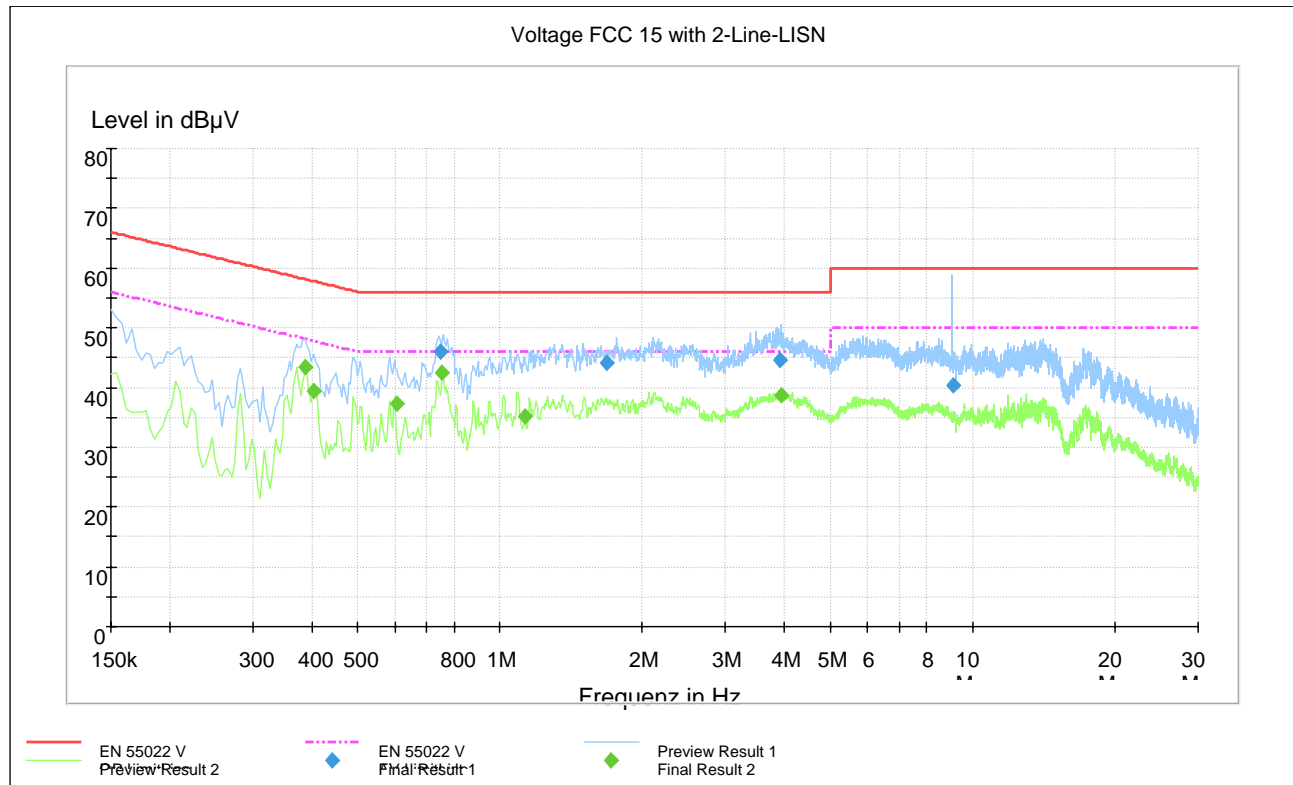
Final Measurements:
Template for Single Meas.: Voltage with 2-Line-LISN fin

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
150 kHz - 30 MHz	QuasiPeak; CAverage	9 kHz	1.5 s	Receiver

Report Settings:
Report Template: Sample EMI Auto Test Report
Create Electronic Report: RTF
Document Name: EMI Report - Voltage with 2-Line-LISN

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- With EUT powered by a Personal Computer Compaq EV0 N1020V. Line N



Final Result 1

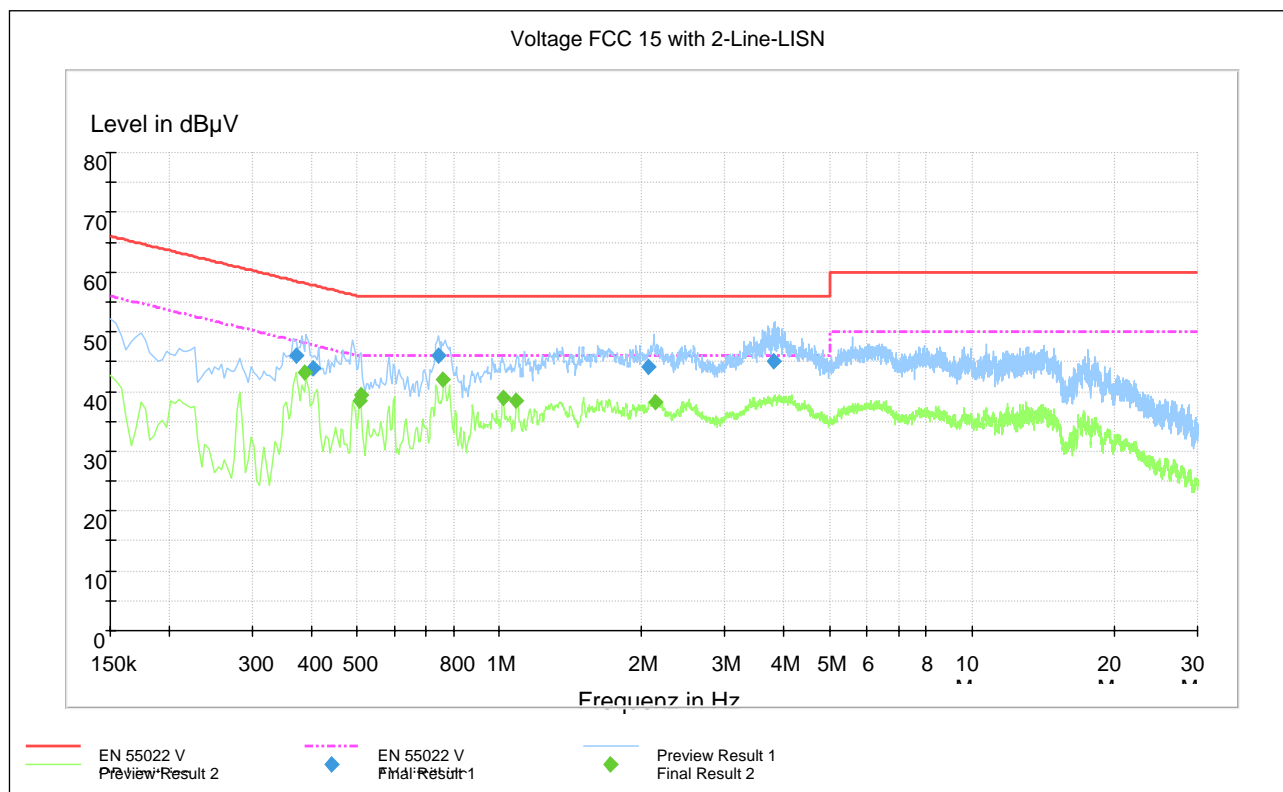
Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.748000	46.0	1500.00	9.000	GN	N	10.2	10.00	56.00	
1.684000	44.1	1500.00	9.000	GN	N	10.1	11.90	56.00	
3.912000	44.6	1500.00	9.000	GN	N	10.2	11.40	56.00	
9.068000	40.4	1500.00	9.000	GN	N	10.5	19.60	60.00	

Final Result 2

Frequency (MHz)	CAverage (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.388000	43.4	1500.000	9.000	GN	N	10.1	4.71	48.11	
0.404000	39.5	1500.000	9.000	GN	N	10.1	8.27	47.77	
0.604000	37.3	1500.000	9.000	GN	N	10.2	8.70	46.00	
0.752000	42.5	1500.000	9.000	GN	N	10.2	3.50	46.00	
1.128000	35.2	1500.000	9.000	GN	N	10.1	10.80	46.00	
3.944000	38.8	1500.000	9.000	GN	N	10.2	7.20	46.00	

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With EUT powered by a Personal Computer Compaq EV0 N1020V. Line L



Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.372000	45.9	1500.000	9.000	GN	L1	10.1	12.56	58.46	
0.404000	43.9	1500.000	9.000	GN	L1	10.1	13.87	57.77	
0.740000	46.1	1500.000	9.000	GN	L1	10.2	9.90	56.00	
2.068000	44.1	1500.000	9.000	GN	L1	10.1	11.90	56.00	
3.808000	45.1	1500.000	9.000	GN	L1	10.2	10.90	56.00	

Final Result 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.388000	43.3	1500.000	9.000	GN	L1	10.1	4.81	48.11	
0.504000	38.3	1500.000	9.000	GN	L1	10.1	7.70	46.00	
0.508000	39.5	1500.000	9.000	GN	L1	10.1	6.50	46.00	
0.756000	42.1	1500.000	9.000	GN	L1	10.2	3.90	46.00	
1.016000	38.9	1500.000	9.000	GN	L1	10.1	7.10	46.00	
1.084000	38.6	1500.000	9.000	GN	L1	10.1	7.40	46.00	
2.132000	38.3	1500.000	9.000	GN	L1	10.1	7.70	46.00	

6. EUT TECHNICAL DOCUMENTATION

6.1 Wiring diagrams

	Document reference (n., edition, date, ...)
WIRING DIAGRAM	Not applicable
PART LIST	1467-02-BOM-01R3

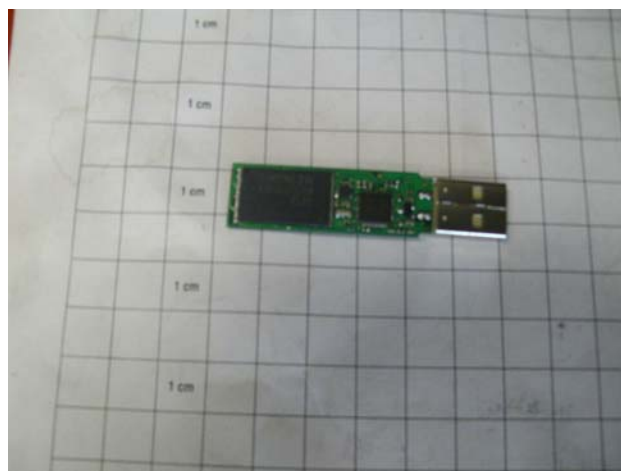
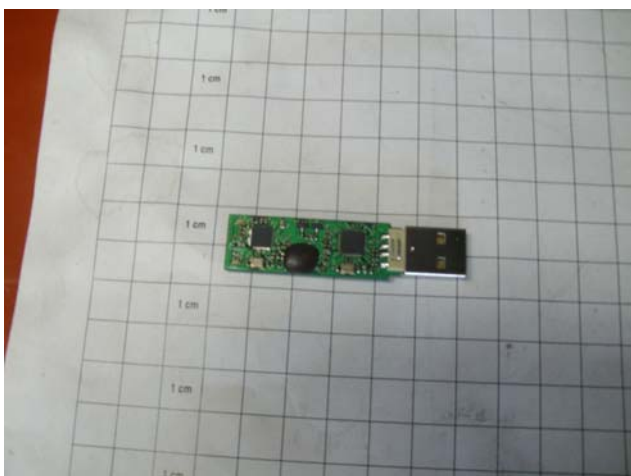
6.2 Technical manual

	Document reference (n., edition, date, ...)
USER MANUAL	Plug'n'crypt Overview 1.2
TEST PLAN	1467-00-SDT-08R1.0

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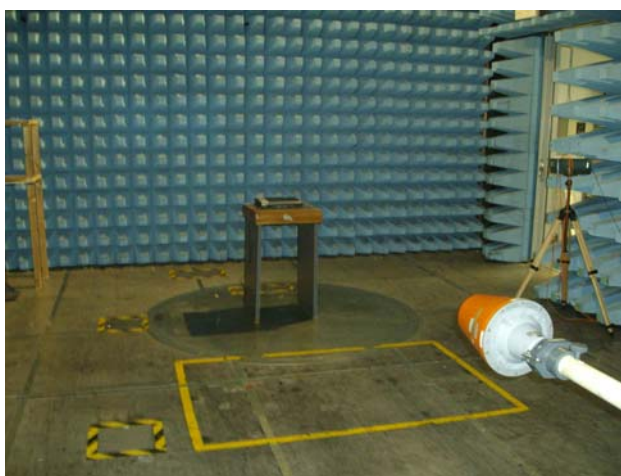
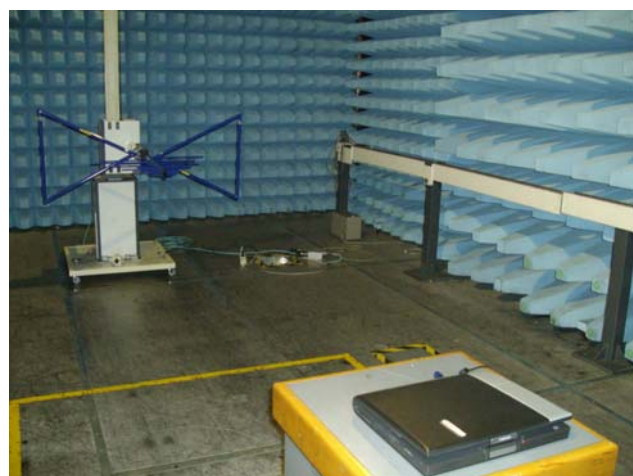
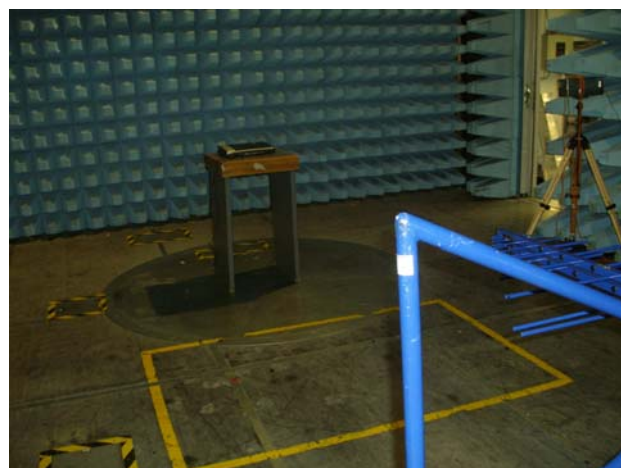
6.3 Photographic documentation

PHOTO No. 1 – EQUIPMENT UNDER TEST



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PHOTO No. 2 – SET-UP FOR EMISSION RADIATED TEST



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7. EQUIPMENT LIST

7.1 *Equipment list used for EUT testing*

EQUIPMENT	MANUFACTURER	MODEL	SERIAL N.	CAL. DUE
NETWORK SIMULATOR	SPITZENBERGER	PAS5000	A154201/00595	APR.2010
DIGITAL IEC LOW FREQ. EMI ANALYZER -	SPITZENBERGER	B10	0411026003	APR.2010
EMI TEST RECEIVER 20HZ 40GHZ	ROHDE & SCHWARZ	ESU40	100111	JUL 2009
ARTIFICIAL MAINS NETWORK	ROHDE & SCHWARZ	ESH 2 - Z5	841887/011	SEPT.2009
ABSORBING CLAMP	ROHDE & SCHWARZ	MDS21	840031/005	JUL.2009
RF SEMI-ANECHOIC CHAMBER (CSSA)	SIEMENS	B83117-D6019-T232	003-005-134/94C	APR.2010
BILOG ANTENNA	CHASE	CBL6111A	1798	JUL.2009
BILOG ANTENNA	CHASE	CBL6111C	2717	JUL.2009
DISCONTINUOUS INTERFERENCE ANALYZER	CHASE	DIA 1512D	21548	JUN.2009
LOG PERIODIC ANTENNA BROAD BAND 1-18 GHZ	ROHDE & SCHWARZ	HL025	350380/007	DEC.2009