

Test Report Electromagnetic Compatibility

Product	Caller ID receiver
Name and address of the applicant	Panasonic Corporation 1-62, 4-Chome Minoshima, Hakata-ku 812-8531 Fukuoka Japan
Name and address of the manufacturer	Panasonic Corporation 1006, Oaza Kadoma, Kadoma-shi Osaka 571-8501 Japan
Model	KX-TGA710
Rating	120V AC, 60Hz
Trademark	Panasonic
Serial number	Not stated
Additional information	-
Tested according to	FCC CFR 47 Part 15 ICES-003, Issue 6:2016
Order number	367389
Tested in period	2019-01-04 and 2019-01-07
Issue date	2019-01-16
Name and address of the testing laboratory	Nemko Group Nemko AS Gaustadalléen 30, P.O.Box 73 Blindern, 0314 Oslo, Norway TEL: +47 22 96 03 30 FAX: +47 22 96 05 50  
An accredited technical test executed under the Norwegian accreditation scheme	
 Prepared by [Thanh Tran]  Approved by [Tore Løvlien]	
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REPORT REVISIONS

Revision #	Date	Order #	Description
00	2019-01-10	367389	First issued
01	2019-01-16	367389	Change the correct marking label including FCC ID in test report.



THIS REPORT APPLIES ONLY TO THE ITEM(S) AND CONFIGURATION(S) TESTED.

It is the manufacturer's responsibility to assure the additional production units of this product are manufactured with identical electrical and mechanical components. The manufacturer is responsible to the authorities for any modifications made to the product, which result in non-compliance to the relevant regulations.

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Opinions expressed within this report regarding general assessments and qualifications for PASS or FAIL to the standards limits and requirements, are not part of the current accreditation. Neither is opinions expressed regarding model variants covered by the testing performed in this report.

Deviations from, additions to, or exclusions from the test specifications are described in "Testing Report Summary".

DESCRIPTION OF TESTED ITEM(S)

Product description.....:	Caller ID receiver
Model/type.....:	KX-TGA710
Serial number.....:	Not stated
Operating voltage.....:	120V AC, 60Hz
Maximum power/current.....:	1.8W
Highest clock frequency.....:	82.5MHz
Hardware version.....:	PNLB2814xx
Software version.....:	SW201

Mounting position.....:	☒ Table top equipment ☐ Wall/ceiling mounted equipment ☐ Floor standing equipment ☐ Handheld equipment ☐ Rack mounted equipment ☐ Console equipment ☐ Other:
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INPUT/OUTPUT PORTS

Port name and description	Cable		
	> 3m	Attached during test	Shielded
AC mains supply	☒	☒	☐

OPERATING MODES

No.	Description	Applied for testing	
		Emissions	Immunity
1	Standby (the connect telephone on-hook)	☒	☐
2	Active line (the connect telephone off-hook)	☒	☐

ACCESSORIES USED DURING TEST

Description	Manufacturer	Type
Feeding bridge	ULA	-
Telephone	Panasonic	KX-TG6621

PHOTOS AND DRAWINGS

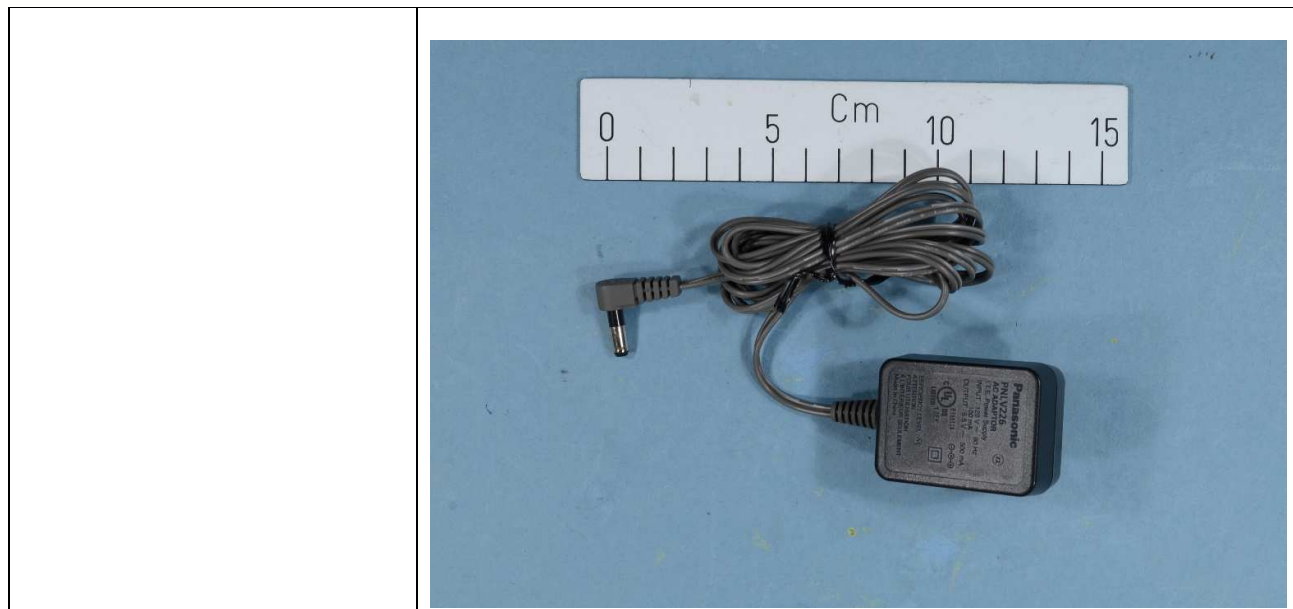
Copy of marking label.....:

Panasonic
Model No.
KX-TGA710 B
Power Source : 5,5 V = 500 mA
INFORMATION TECHNOLOGY EQUIPMENT
(USE ONLY AC ADAPTOR LISTED
IN THE OPERATING INSTRUCTIONS.)
Reg.No. US : ACJW401AKX-TGA710 REN : 0,1 A
FCC ID : ACJ96NKX-TGA710
Intertek
4004466
Panasonic Corporation of North America
Made in Malaysia
PNGTA748ZA

Photo of the test item.....:







OTHER INFORMATION

Modifications to the test item.....:	None
Additional information.....:	None

Note: This equipment has been tested with certain cable types and cable configurations. Any changes to these parameters when installed may influence on the EMC properties of this equipment

TEST ENVIRONMENT

Test laboratory.....:	☐ GAUSTAD (Gaustadalleen 30, N-0314 Oslo, Norway) ☒ KJELLER (Instituttveien 6, N-2007 Kjeller, Norway)
Laboratory accreditation.....:	 Norsk Akkreditering – TEST 033 P06 – Electromagnetic Compatibility
Environmental ref. conditions.....:	The climatic conditions during the tests are within limits specified by the manufacturer for the operation of the product and the test equipment. The climatic conditions during tests are within the following limits: Ambient temperature: 15 – 35 °C Relative humidity: 25 – 75 %RH Atmospheric pressure: 86 – 106 kPa If explicitly required by the test standard, or the requirements are tighter than the above; the climatic conditions are recorded and documented separately in this test report.
Calibration.....:	All instruments used in the tests of this test report are calibrated and traceable to national or international standards. Between calibrations test set-ups are controlled and verified on a regular basis by intermediate checks to ensure, with 95% confidence that the instruments remain within their calibrated levels. The instrumentation accuracy is within limits agreed by the IEC/CTL and defined by Nemko reference document TM-NO/301.
Measurement uncertainties.....:	EMC uncertainty is specified in CISPR 16-4-2. Only if our uncertainty is larger than the maximum value UCISPR, the uncertainty is added to the measurement result. EMC test uncertainties for transient immunity are kept within the requirements of the relevant basic standard. Further information about measurement uncertainties is provided on request

POWER SUPPLY SYSTEM UTILISED

Power supply voltage.....:	☐ 240V AC 50Hz ☐ 230V AC 50Hz ☐ 200V AC 60Hz ☒ 120V AC 60Hz	☐ 400V 3NAC 50Hz ☐ 230V 3AC 50Hz ☐ 12V DC ☐ 24V DC
Grounding conditions	☒ Not grounded ☐ Ground is received from its power supply connection ☐ Additional chassis grounding	

EVALUATION OF PERFORMANCE

PERFORMANCE TESTS

Performance checks.....:	Check on display that the connected Line in and telephone is successful. Change the state of connected telephone on-hook and off-hook.
Performance tests.....:	Connect the Line in and telephone. Change the state of connected telephone on-hook and off-hook.
Monitoring during tests.....:	Monitoring on display that the connected Line in and telephone is successful. The EUT in standby mode when the telephone is on-hook and active line TALK when the telephone is off-hook.
Note 1: Performance check is a short functional test carried out during or after a technical test to confirm that the equipment operates. Note 2: Performance test is a measurement or a group of measurements carried out during and/or after a technical test to confirm that the equipment complies with selected parameters as defined in the equipment standard. Note 3: Monitoring during tests describes which functions were monitored and how.	

PERFORMANCE CRITERIA

Performance criteria is.....:	☒ based on the applied product standard ☐ based on a declaration from the customer
Criterion A.....:	The device shall continue to operate as intended both during and after the test. No degradation of performance or loss of function is allowed below the expected performance level of the device
Criterion B.....:	The device shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below the expected performance level of the device
Criterion C.....:	Temporary loss of function during test is allowed, provided the function is self-recoverable or can be restored by the operation of the controls

Note: In the subsequent test sections of this report, the required and actual specimen performance during immunity testing is indicated by the nomenclatures as given by the table above (A, B or C).

TEST REPORT SUMMARY

APPLIED STANDARDS

Standards	Titles
FCC CFR 47 Part 15	<i>Digital devices - Unintentional radiators, Class B Digital Device</i>
ICES-003, Issue 6:2016	<i>Spectrum Management and Telecommunications Policy. Interference-Causing Equipment Standard. Information Technology Equipment (Including Digital Apparatus - Limits and Methods of Measurement (Issue 6, June 2016)</i>

TEST SUMMARY

Requirements – Tests	Reference standards	Verdict
Conducted Emissions	FCC CFR 47 Part 15 ICES-003, Issue 6:2016 ANSI C63.4-2014	PASS
Conducted Emissions (Telecom Port)	ICES-003, Issue 6:2016 CAN/CSA-CISPR 22-10 (R2014)	N/A
Radiated Emissions (30MHz-1000MHz)	FCC CFR 47 Part 15 ICES-003, Issue 6:2016 CISPR 16-2-3:2014, Ed.3.2	PASS
Radiated Emissions (1GHz-6GHz)	FCC CFR 47 Part 15 ICES-003, Issue 6:2016 CISPR 16-2-3:2014, Ed.3.2	N/A

- PASS : Tested and complied with the requirements
 FAIL : Tested and failed the requirements
 N/A : Test not relevant to this specimen (evaluated by the test laboratory)
 – : Test not performed (instructed by the applicant)
 * : An asterisk (*) placed after the verdict in the Result column indicates test items that are not within Nemko's scope of accreditation
 # : A grid (#) placed after the verdict in the Result column indicates test items that are only partly covered by Nemko's scope of accreditation. Further information is detailed in the test section

NOTES

Note 1: Product standards with dated references to basic standards may have been performed by Nemko AS according to the newest edition of the basic standard. This may impact the compliance criteria or technical performance of the test, still this is considered to be adequate as long as the test is expected to confirm compliance to the intention of the product standard. The table above lists the actual editions of the basic standards which have been used during testing.

Note 2: The choice of immunity test levels could be higher than those specified by the reference standards when we take into account the nature of the specimen and its intended use, or based on customer requests.

Test Results

CONDUCTED EMISSIONS

TEST DESCRIPTION

Method

The reference method for this test is listed in the table under clause TEST SUMMARY.

Set-up

The measurement was performed at the power supply terminal of the specimen. Nominal supply voltage was provided.

The specimen was energized and in normal operating mode during the measurement.

- ☐ The specimen and its cables were elevated 10 cm above a ground plane.
- ☐ The specimen and its cables were elevated 40 cm above a ground plane.
- ☒ The specimen and its cables were placed 40 cm from a vertical ground plane, 80 cm over ground plane.
- ☐ The specimen was mounted directly on and bonded to a ground plane. Cables and auxiliary equipment were elevated by 1 cm

☒ The specimen was connected to an Artificial Mains Network (AMN) by its power supply cable, which was adjusted to 100cm length by folding.

☐ The specimen was connected to an Artificial Mains Network (AMN) by a 0.8 m shielded power supply cable directly connected to the AMN

Conditions

- ☐ Frequency range was 9kHz – 30MHz.
- ☐ Frequency range was 10kHz – 30MHz.
- ☒ Frequency range was 150kHz – 30MHz.

The measuring bandwidth is 200Hz in the frequency range 9 kHz – 150 kHz. Measurement was made with a 100 Hz step size and 100 ms dwell time.

The measuring bandwidth is 9 kHz in the frequency range 150 kHz – 30 MHz. Measurement was made with a 4.5 kHz step size and 20 ms dwell time.

Measurement uncertainty: ± 3.8 dB (9 kHz – 150 kHz); ± 3.5 dB (150 kHz – 30 MHz)

Instruments used during measurement

Instrument list: AMN: R&S / ENV216 (LR-1665) (11/2019)
EMI Receiver: R&S / ESCI 3 (N-4259) (10/2019)

Conformity

Verdict:

PASS

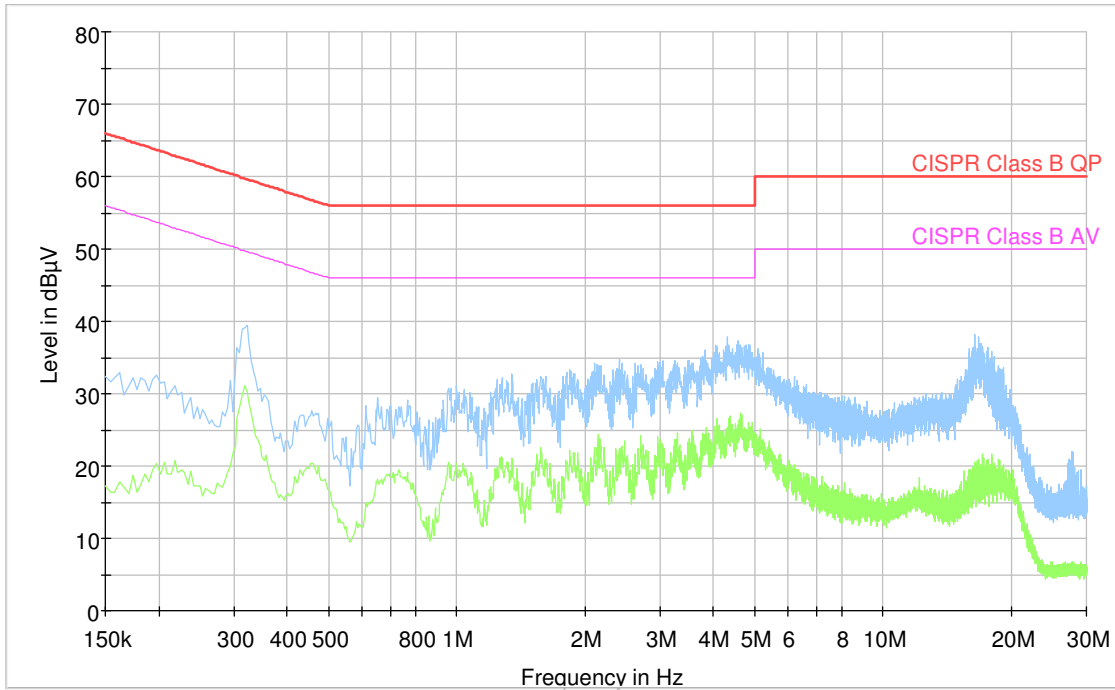
Test engineer:

Thanh Tran

EMISSION SPECTRUM AND MEASUREMENT DATA

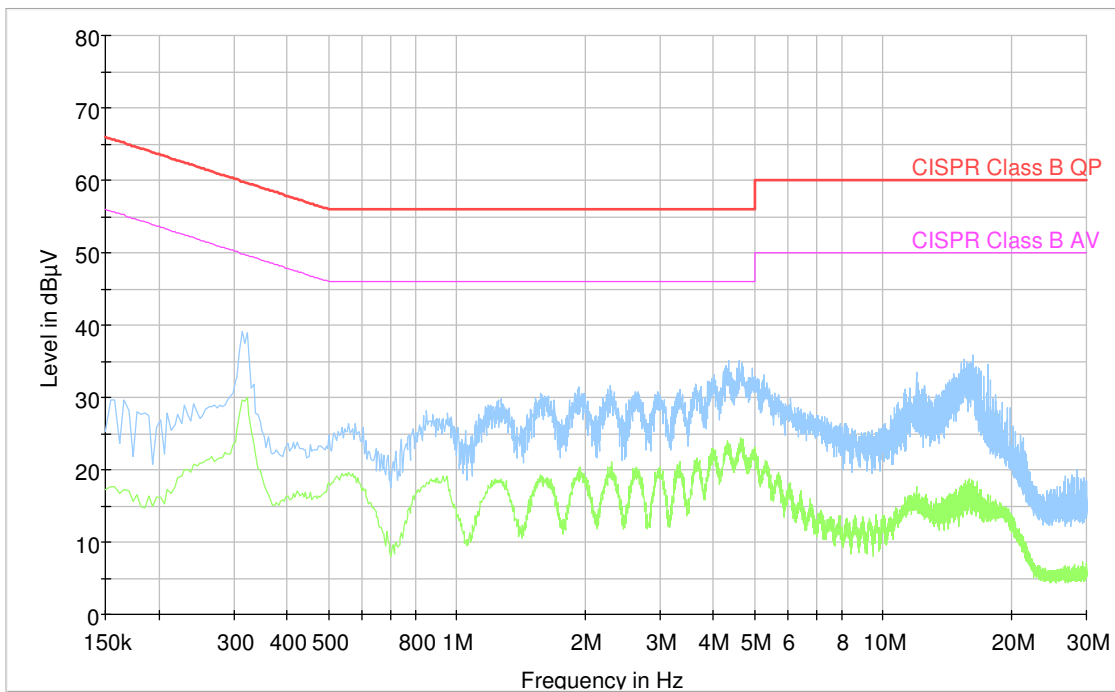
Standby mode:

Full Spectrum



Active line, TALK mode:

Full Spectrum



RADIATED EMISSIONS (30MHZ-1000MHZ)

TEST DESCRIPTION

Method

The reference method for this test is listed in the table under clause TEST SUMMARY.

Set-up

The measurements were performed in a semi-anechoic chamber (SAC). Nominal supply voltage was provided.

The specimen was energized and in normal operating mode during the measurement.

- ☐ The specimen and its cables were elevated 10 cm above the site ground plane, and placed in the centre of the turntable.
- ☒ The specimen and its cables were placed on a table 80 cm above the site ground plane, and placed in the centre of the turntable.

The measuring antenna was located 10 meters from the specimen. Measurements were performed with a hybrid bilog antenna. Antenna elevation = 100-400 cm above the ground reference plane. Specimen rotation = 0-360°.

Conditions

The measuring bandwidth is 120 kHz in the frequency range 30 MHz – 1000 MHz. Frequency sweeps with RBW = 120 kHz and VBW = 1 MHz was applied with a sweep time of 20 ms (step size resolution < 60 kHz).

Measurement uncertainty: ± 4.1 dB (30 MHz – 200 MHz); ± 4.2 dB (200 MHz – 1000 MHz)

Instruments used during measurement

Instrument list: Antenna, bilog: Sunol / JB3 (N-4525) (11/2019)
 EMI Receiver: R&S / ESU40 (LR-1639) (11/2019)
 Preamplifier: Sonoma / 310N (LR-1686) (07/2019)

Conformity

Verdict:

PASS

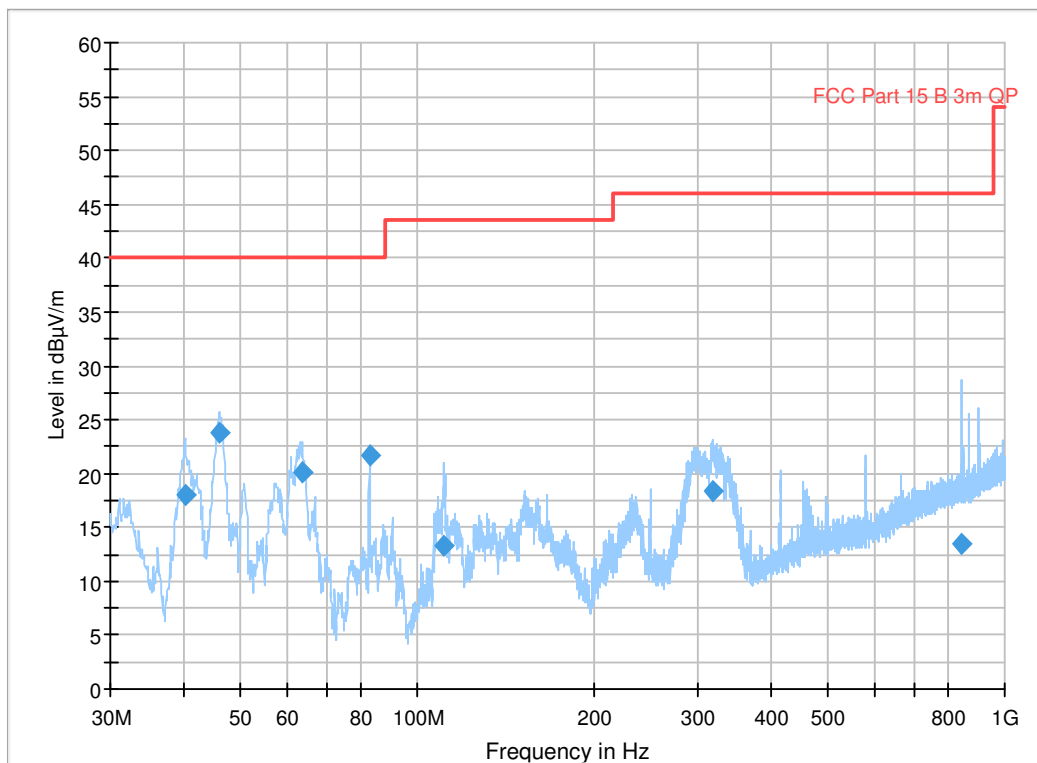
Test engineer:

Thanh Tran

EMISSION SPECTRUM AND MEASUREMENTS DATA

Standby mode:

Full Spectrum

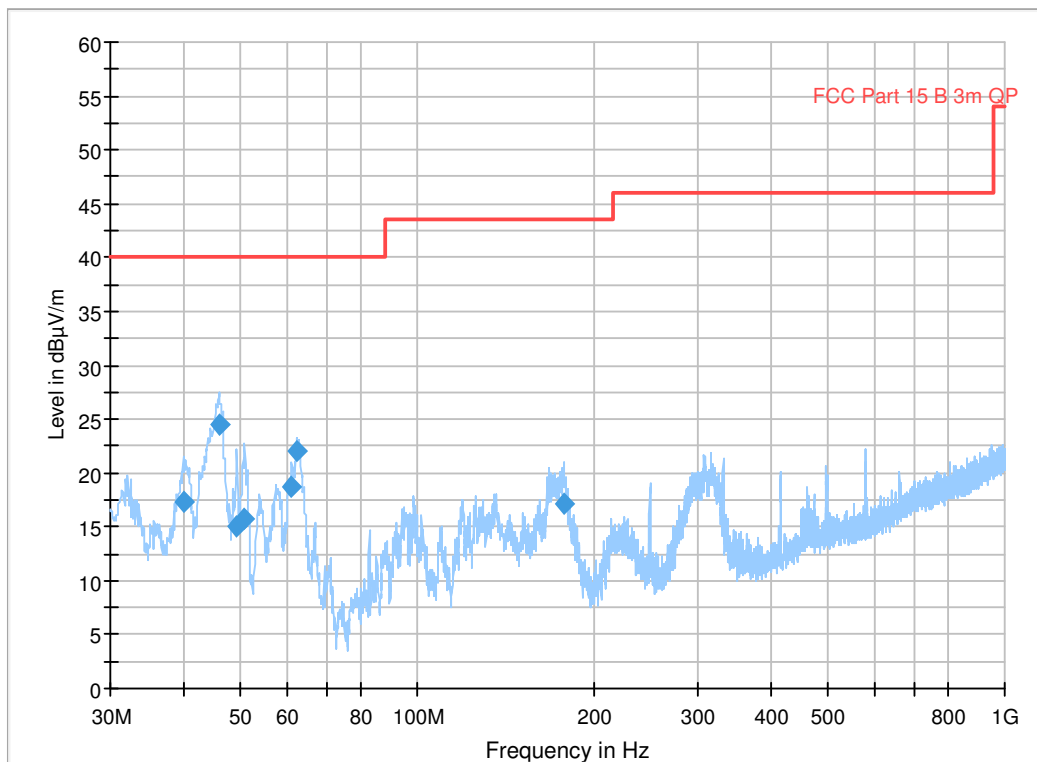


Final Result

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
40.357050	18.08	40.00	21.92	1000.0	120.000	137.0	V	210.0
45.959250	23.84	40.00	16.16	1000.0	120.000	108.0	V	212.0
63.803450	20.07	40.00	19.93	1000.0	120.000	100.0	V	0.0
82.955900	21.64	40.00	18.36	1000.0	120.000	157.0	V	144.0
110.668400	13.26	43.50	30.24	1000.0	120.000	109.0	V	208.0
317.529200	18.36	46.00	27.64	1000.0	120.000	100.0	H	296.0
842.765300	13.50	46.00	32.50	1000.0	120.000	250.0	V	202.0

Active line, TALK mode:

Full Spectrum



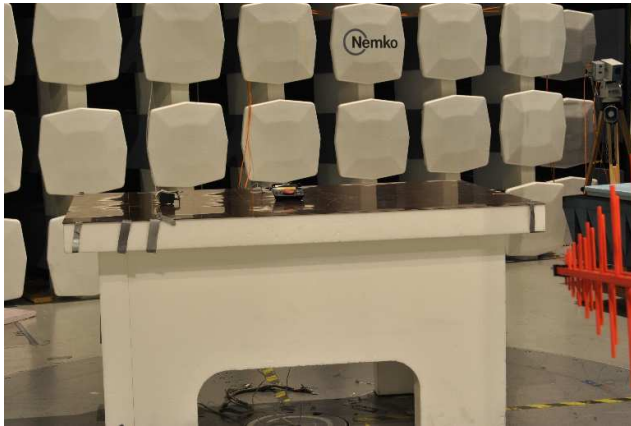
Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
40.121850	17.39	40.00	22.61	1000.0	120.000	113.0	V	236.0
46.133650	24.47	40.00	15.53	1000.0	120.000	104.0	V	221.0
49.070250	15.06	40.00	24.94	1000.0	120.000	101.0	V	258.0
50.652250	15.66	40.00	24.34	1000.0	120.000	101.0	V	215.0
61.031800	18.78	40.00	21.22	1000.0	120.000	100.0	V	203.0
62.230900	22.02	40.00	17.98	1000.0	120.000	104.0	V	220.0
178.033150	17.12	43.50	26.38	1000.0	120.000	159.0	H	95.0

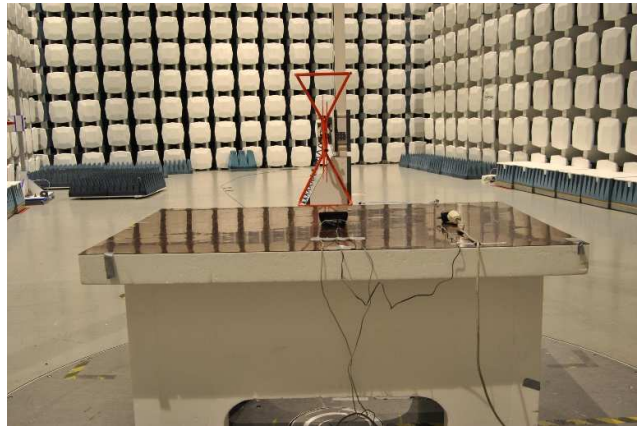
Annexes

PHOTOS

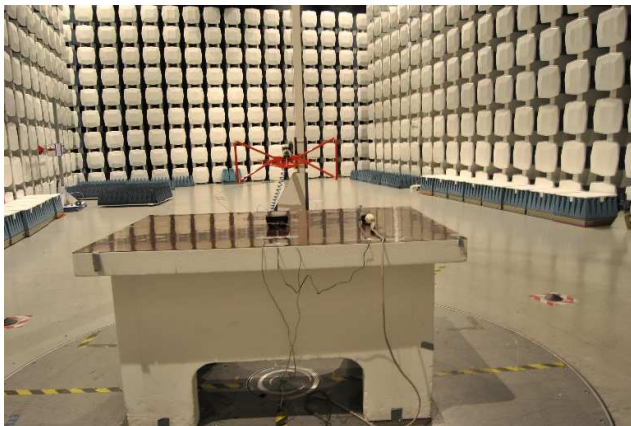
Test set-up for EMC emissions measurements



Radiated emission test



Radiated emission test



Radiated emission test



Conducted emission test