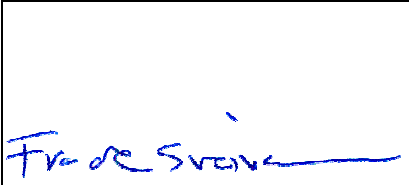
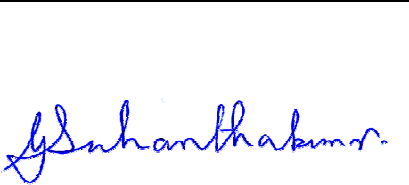


Test Report

Product	Bluetooth Transceiver in Desktop IP Phone		
Name and address of the applicant	Panasonic System Networks Co., Ltd. 1-62,4-Chome, Minoshima, Hakata-ku, Fukuoka 812-8531, Japan		
Name and address of the manufacturer	Panasonic System Networks Co., Ltd. 1-62,4-Chome, Minoshima, Hakata-ku, Fukuoka 812-8531, Japan		
Model	KX-HDV430		
Rating	12V DC (AC Adaptor, 1.5A; 100-240 V AC, 50/60 Hz, 0.5-0.3 A) 48V DC (Power over Ethernet, 135mA)		
Trademark	Panasonic		
Serial number	S22CA000032		
Additional information	Bluetooth 2.1, VoIP, SIP, Power over Ethernet		
Tested according to	FCC Part 15.247 Frequency Hopping Transmitters / Digital Transmission Systems Industry Canada RSS-247, Issue 1 Low Power Licence-Exempt Radiocommunications Devices		
Order number	299714		
Tested in period	2016.04.12 to 2016.04.14		
Issue date	2016.04.18		
Name and address of the testing laboratory	 FCC No: 994405 IC OATS: 2040D-1 TEL: +47 22 96 03 30 FAX: +47 22 96 05 50 Instituttveien 6 Kjeller, Norway		
 Prepared by [Frode Sveinsen]  Approved by [G.Suwanthakumar]			
This report shall not be reproduced except in full without the written approval of Nemko. Opinions and interpretations expressed within this report are not part of the current accreditation. This report was originally distributed electronically with digital signatures. For more information contact Nemko.			

CONTENTS

1	INFORMATION	3
1.1	Test Item.....	3
1.2	Test Environment	4
1.3	Test Engineer(s)	4
1.4	Test Equipment	4
2	TEST REPORT SUMMARY	5
2.1	General.....	5
2.2	Test Summary	6
2.3	Description of modification for Modification Filing	6
2.4	Comments	6
2.5	Family List Rational	6
3	TEST RESULTS.....	7
3.1	Power Line Conducted Emissions.....	7
3.2	Spurious Emissions (Radiated)	10
4	Measurement Uncertainty.....	42
5	LIST OF TEST EQUIPMENT	43
6	BLOCK DIAGRAM.....	44
6.1	Power Line Conducted Emission.....	44
6.2	Test Site Radiated Emission	44

1 INFORMATION

1.1 Test Item

Name :	Panasonic
FCC ID :	ACJ96NKX-HDV430
Industry Canada ID :	216A-KXHVD430
Model/version :	KX-HDV430
Serial number :	S22CA000032
Hardware identity and/or version:	BlueTooth unit PNLB2118 (KX-HDV430: PNLB2455S3)
Software identity and/or version :	BlueTooth unit Ver.1.198 (KX-HDV430: Ver.00.942)
Frequency Range :	2402 – 2480 MHz
Number of Channels :	Minimum 20 and Maximum 79 (Adaptive Frequency Hopping)
Operating Modes :	Bluetooth Headset Mode
Type of Modulation :	Digital (GFSK)
User Frequency Adjustment :	None
Rated Output Power :	6.2 mW
Type of Power Supply :	AC Adaptor Model PNLV6508 (Input 100-240V AC, 0.5 – 0.3A 50/60 Hz, Output 12V DV, 1.5A), or Power over Ethernet (48V DC)
Antenna Connector :	None
Antenna Diversity Supported :	No
Interface :	Ethernet

Description of Test Item

The EUT is a desktop IP telephone with Bluetooth Transceiver for connection of a BT headset.

BT part of this model is identical to previously tested KX-HDV330. See Nemko test report no. 292268-3.

Exposure Evaluation

The EUT is designed to be fixed to a wall etc. and the user manual contains text that it shall be mounted with a separation distance of at least 20 cm from any humans. For the purposes of exposure evaluation this EUT is a mobile or fixed device. MPE Calculation at 20 cm satisfying FCC requirements is submitted as a separate document.

The EUT is exempted from RF Exposure Evaluation to Industry Canada requirements since the output power complies with the power levels of section 2.5.2 of RSS-102 Issue 5.

1.2 Test Environment

1.2.1 Normal test condition

Temperature:	21.8 – 24.7 °C
Relative humidity:	27 - 43 %
Normal test voltage:	120 V AC, 60 Hz

The values are the limit registered during the test period.

1.3 Test Engineer(s)

Frode Sveinsen / Thanh Tran

1.4 Test Equipment

See list of test equipment in clause 5.

2 TEST REPORT SUMMARY

2.1 General

All measurements are traceable to national standards.

The tests were conducted for the purpose of demonstrating compliance with FCC CFR 47 Part 15, paragraph 15.247 and Industry Canada RSS-247 Issue 1.

Tests were performed in accordance with ANSI C63.4-2014 and ANSI C63.10-2013.

Radiated tests were made in a semi-anechoic chamber at measuring distances of 3m and 10m.

A description of the test facility is on file with the FCC and Industry Canada.

☒ New Submission

☒ Production Unit

☐ Class II Permissive Change

☐ Pre-production Unit

DSS Equipment Code

☐ Family Listing



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

Deviations from, additions to, or exclusions from the test specifications are described in "Summary of Test Data".

Nemko Group authorizes the above named company to reproduce this report provided it is reproduced in its entirety and for use by the company's employees only. Any reproduction of parts of this report requires approval in writing from Nemko Group.

Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. Nemko Group accepts no responsibility for damages suffered by any third party as a result of decisions made or actions based on this report.

2.2 Test Summary

Name of test	FCC Part 15 reference	RSS-247 Issue 1, RSS-GEN Issue 4 reference	Result
Supply Voltage Variations	15.31(e)	6.11 (RSS-GEN)	Complies ²
Number of Operating Frequencies	15.31(m)	5.1 (6)	Complies ²
Antenna Requirement	15.203	8.3 (RSS-GEN)	Complies ²
Power Line Conducted Emission	15.107(a) 15.207(a)	8.8 (RSS-GEN)	Complies
Channel Separation	15.247(a)(1)	5.1 (4)	Complies ²
Pseudorandom Hopping Algorithm	15.247(a)(1)	5.1 (3)	Complies ²
Time of Occupancy	15.247(a)(1)(iii)	5.1 (5)	Complies ²
Occupied Bandwidth	15.247(a)(1)	5.1 (7)	Complies ²
Minimum 6 dB Bandwidth	15.247(a)(2)	5.2 (1)	N/A ¹
Peak Power Output	15.247(b)	5.4 (5)	Complies ²
Power Spectral Density	15.247(d)	5.2 (2)	N/A ¹
Spurious Emissions (Antenna Conducted)	15.247(c)	5.5	Complies ²
Spurious Emissions (Radiated)	15.247(c) 15.109(a) 15.209(a)	6.13 (RSS-GEN) 8.9 (RSS-GEN)	Complies

¹ Not applicable for Frequency Hopping equipment.

² Covered by Nemko test report no. 292268-3.

2.3 Description of modification for Modification Filing

Not applicable.

2.4 Comments

The measurements were done with the EUT powered by 120 V AC. It was checked that power variations between 85% and 115% did not have any influence on the measurements.

All ports were populated during spurious emission measurements.

2.5 Family List Rational

Not Applicable.

3 TEST RESULTS

3.1 Power Line Conducted Emissions

Para. No.: 15.207 (a)

Test Performed By: Tore Løvlien

Date of Test: 14-Apr-2016

Measurement procedure: ANSI C63.4-2014 using 50 μ H/50 ohms LISN.

Test Results: Complies.

Measurement Data: See attached graph, (Peak detector).

Highest measured value (L1 and N):

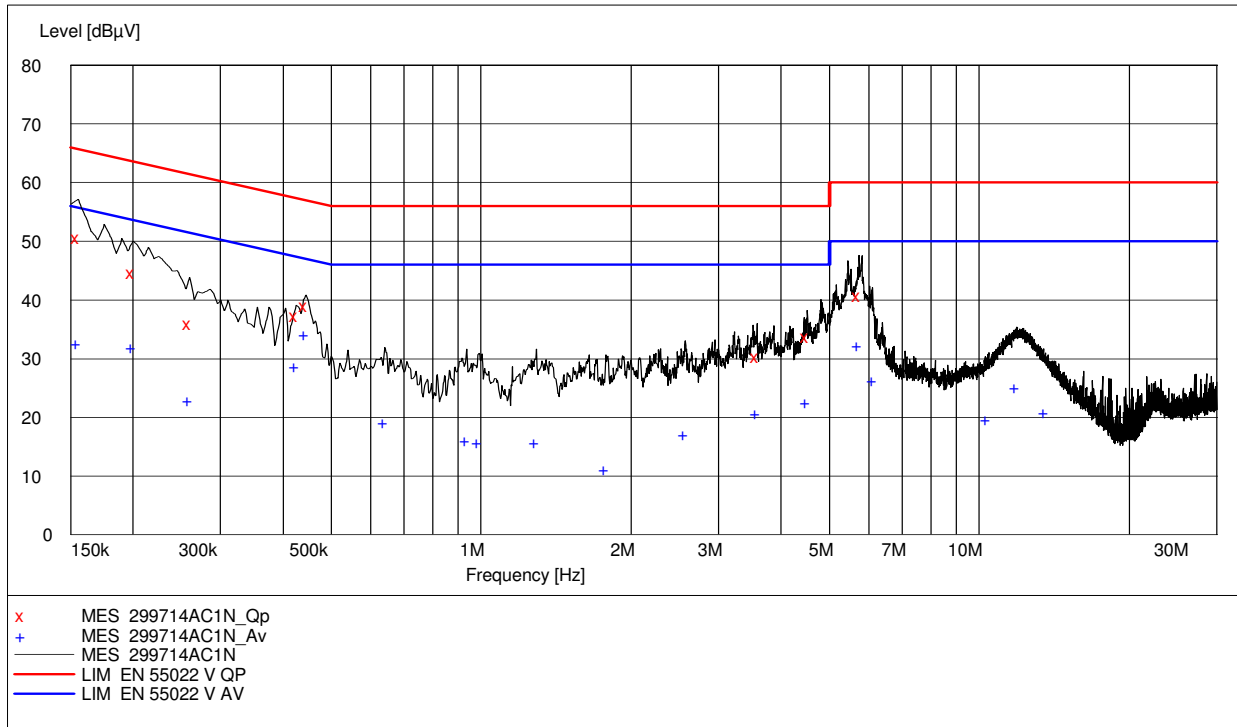
AC Adaptor:

Frequency [MHz]	Level [dBuV]	Af [dB]	Limit [dBuV]	Margin [dB]	Det	Position	Verdict [Pass/Fail]
0.155000	50.60	10.70	65.70	15.10	QP	N	Pass
0.200000	44.70	10.70	63.60	18.90	QP	L1	Pass
0.260000	36.00	10.60	61.40	25.40	QP	N	Pass
0.425000	37.40	10.30	57.30	19.90	QP	N	Pass
0.445000	39.00	10.30	57.00	18.00	QP	N	Pass
3.585000	30.40	10.40	56.00	25.60	QP	L1	Pass
4.520000	33.80	10.50	56.00	22.20	QP	L1	Pass
5.745000	40.80	10.50	60.00	19.20	QP	N	Pass
0.155000	32.70	10.70	55.70	23.00	AV	N	Pass
0.200000	32.20	10.70	53.60	21.40	AV	L1	Pass
0.260000	23.10	10.60	51.40	28.30	AV	N	Pass
0.425000	28.80	10.30	47.30	18.50	AV	N	Pass
0.445000	34.30	10.30	47.00	12.70	AV	N	Pass
0.640000	19.30	10.20	46.00	26.70	AV	L1	Pass
0.935000	16.20	10.30	46.00	29.80	AV	L1	Pass
0.990000	15.90	10.40	46.00	30.10	AV	L1	Pass
1.290000	15.90	10.40	46.00	30.10	AV	L1	Pass
1.780000	11.30	10.40	46.00	34.70	AV	N	Pass
2.570000	17.30	10.40	46.00	28.70	AV	L1	Pass
3.585000	20.80	10.40	46.00	25.20	AV	L1	Pass
4.520000	22.70	10.50	46.00	23.30	AV	L1	Pass
5.745000	32.40	10.50	50.00	17.60	AV	N	Pass
6.135000	26.50	10.60	50.00	23.50	AV	L1	Pass
10.395000	19.80	10.70	50.00	30.20	AV	L1	Pass
11.890000	25.30	10.70	50.00	24.70	AV	L1	Pass
13.600000	21.10	10.80	50.00	28.90	AV	L1	Pass

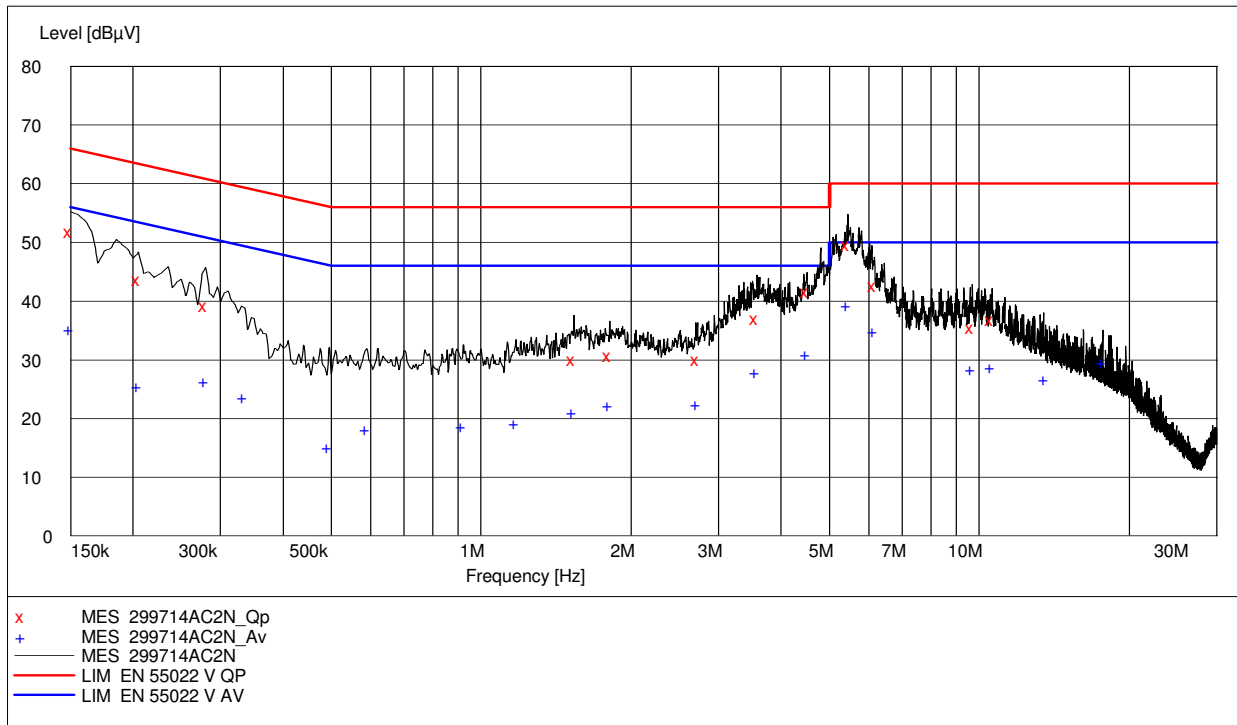
Power over Ethernet:

Frequency [MHz]	Level [dBuV]	Af [dB]	Limit [dBuV]	Margin [dB]	Det	Position	Verdict [Pass/Fail]
0.150000	52.00	10.70	66.00	14.00	QP	N	Pass
0.205000	43.70	10.70	63.40	19.70	QP	L1	Pass
0.280000	39.20	10.50	60.80	21.60	QP	L1	Pass
1.535000	30.10	10.40	56.00	25.90	QP	L1	Pass
1.810000	30.80	10.40	56.00	25.20	QP	N	Pass
2.720000	30.20	10.40	56.00	25.80	QP	N	Pass
3.580000	37.00	10.40	56.00	19.00	QP	N	Pass
4.515000	41.70	10.50	56.00	14.30	QP	N	Pass
5.450000	49.60	10.50	60.00	10.40	QP	N	Pass
6.160000	42.70	10.60	60.00	17.30	QP	L1	Pass
9.680000	35.60	10.60	60.00	24.40	QP	L1	Pass
10.610000	36.90	10.70	60.00	23.10	QP	N	Pass
0.150000	35.30	10.70	56.00	20.70	AV	N	Pass
0.205000	25.60	10.70	53.40	27.80	AV	L1	Pass
0.280000	26.50	10.50	50.80	24.30	AV	L1	Pass
0.335000	23.80	10.50	49.30	25.50	AV	L1	Pass
0.495000	15.20	10.20	46.10	30.90	AV	N	Pass
0.590000	18.30	10.20	46.00	27.70	AV	L1	Pass
0.920000	18.80	10.30	46.00	27.20	AV	L1	Pass
1.175000	19.40	10.40	46.00	26.60	AV	N	Pass
1.535000	21.20	10.40	46.00	24.80	AV	L1	Pass
1.810000	22.40	10.40	46.00	23.60	AV	N	Pass
2.720000	22.50	10.40	46.00	23.50	AV	N	Pass
3.580000	28.00	10.40	46.00	18.00	AV	N	Pass
4.515000	31.10	10.50	46.00	14.90	AV	N	Pass
5.450000	39.40	10.50	50.00	10.60	AV	N	Pass
6.160000	35.10	10.60	50.00	14.90	AV	L1	Pass
9.680000	28.60	10.60	50.00	21.40	AV	L1	Pass
10.610000	28.90	10.70	50.00	21.10	AV	N	Pass
13.600000	26.90	10.80	50.00	23.10	AV	L1	Pass
17.695000	29.70	10.80	50.00	20.30	AV	L1	Pass

Tested with NetGear GS108 Ethernet Switch.



AC Adaptor



Power over Ethernet

3.2 Spurious Emissions (Radiated)

Para. No.: 15.247 (c)

Test Results: Complies

Measurement Data:

Band-Edge Spurious Emissions

	Measured field strength (dBμV/m)		Limit	Margin	
	2390 MHz	2483.5 MHz	dBμV/m	dB	
Peak Detector	45.6	65.0	74	28.4	9.0
Average Detector	45.6	45.0	54	28.4	9.0

Average Detector values are measured with Peak Detector and corrected for Duty Cycle.

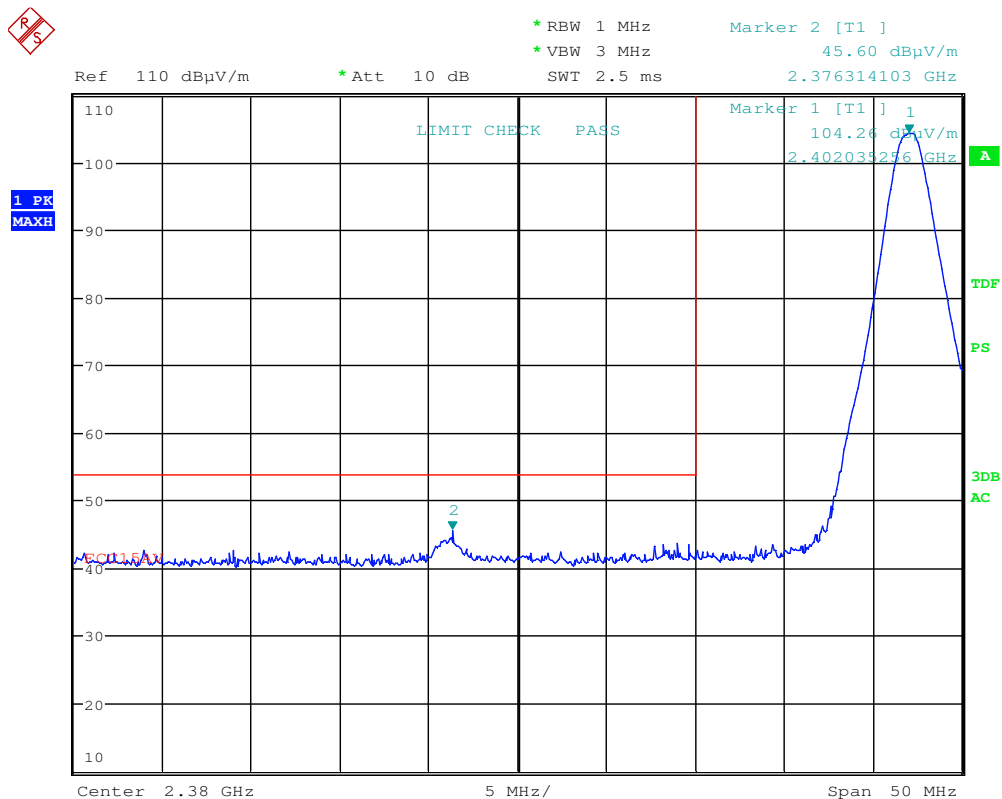
See attached plots.

Duty Cycle Correction Factor Calculation:

Duty Cycle = slot length / (frame length * number of hopping channels)

Duty Cycle Correction factor = $-20 \times \log(\text{Duty Cycle}) > 20 \text{ dB}$

Maximum Duty Cycle Correction Factor according to Para 15.35 (b): 20 dB



Date: 12.APR.2016 15:04:30

Lower Band Edge, Radiated, 2402 MHz



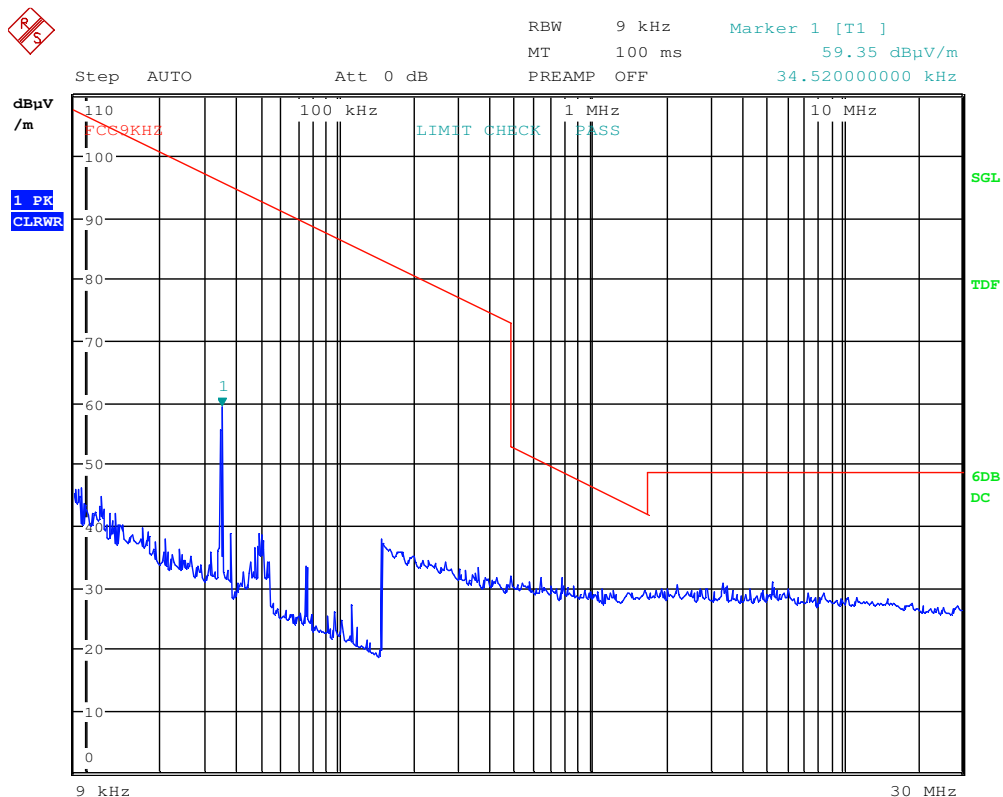
Upper Band Edge, Radiated, 2480 MHz

Radiated emissions 9 kHz-30 MHz.

Measuring distance 10 m, measured with Peak detector.

No component detected, see attached plot.

Limit is converted to 10 m using 40 dB/decade according to 15.31 (f) (2).



Date: 12.APR.2016 17:10:58

Radiated emission 30 – 1000 MHz.

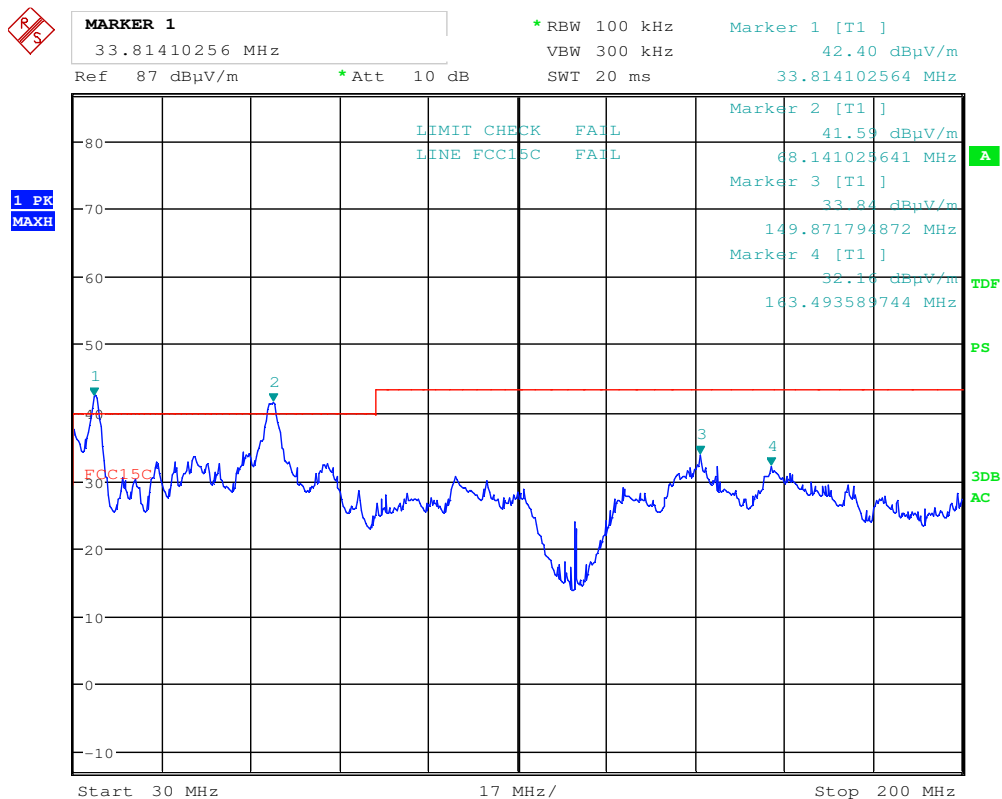
Detector: Quasi-Peak

Measuring distance 3m according to FCC 15.209.

Tested with BT active.

Frequency	Operational condition	Polarization	Field strength	Measuring distance	Limit FCC15.209	Margin
MHz			dB μ V/m	metres	dB μ V/m	dB
33.814	PSU	V	35.8	3	40	4.2
68.141	PSU	V	36.6	3	40	3.4
149.872	PSU	V	26.4	3	43.5	17.1
163.493	PSU	V	27.1	3	43.5	16.4
34.086	PoE	V	38.2	3	40	1.8
46.073	PoE	V	34.5	3	40	5.5
67.869	PoE	V	34.9	3	40	5.1
80.128	PoE	V	29.3	3	40	10.7

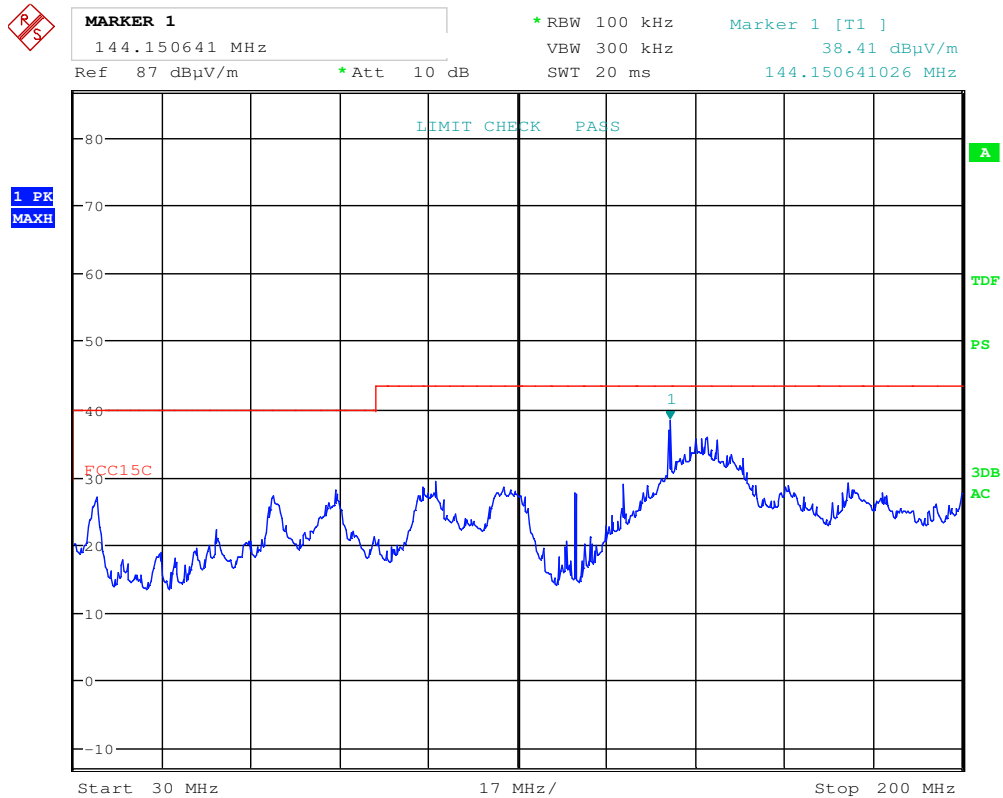
See attached plots.



Date: 12.APR.2016 13:20:31

Radiated Emissions, 30 -200MHz, VP

All Radiated Emissions were below the limit when measured with a QuasiPeak detector



Date: 12.APR.2016 12:09:05

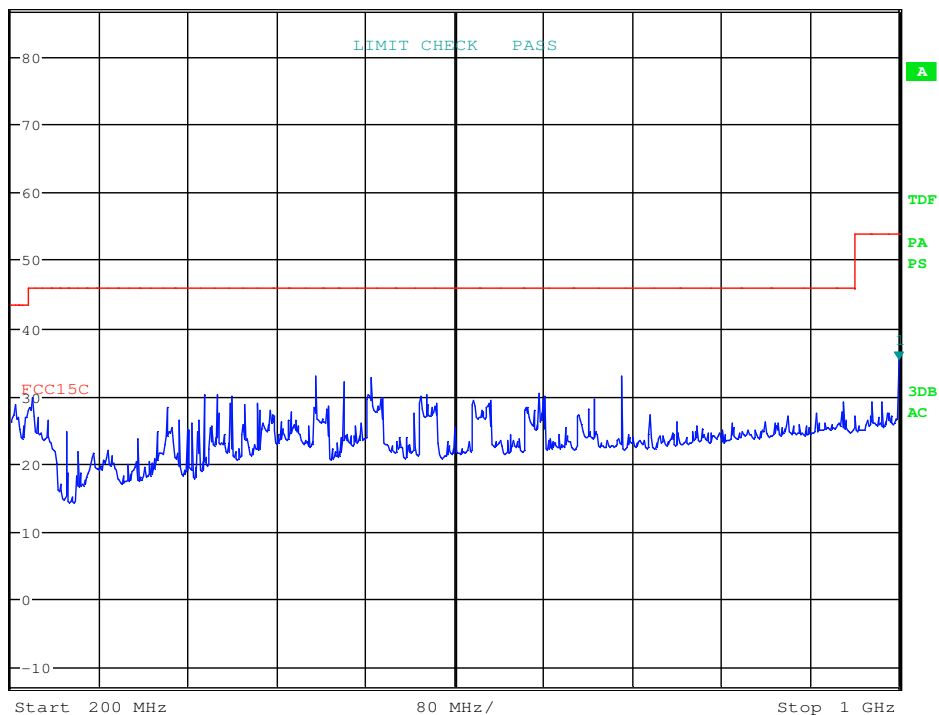
Radiated Emissions, 30 -200MHz, HP



MARKER 1
1 GHz
Ref 87 dBµV/m *Att 10 dB

*RBW 100 kHz Marker 1 [T1]
VBW 300 kHz 35.21 dBµV/m
SWT 80 ms 1.000000000 GHz

1 PK
MAXH



Date: 12.APR.2016 10:39:39

Radiated Emissions, 200 -1000MHz, VP

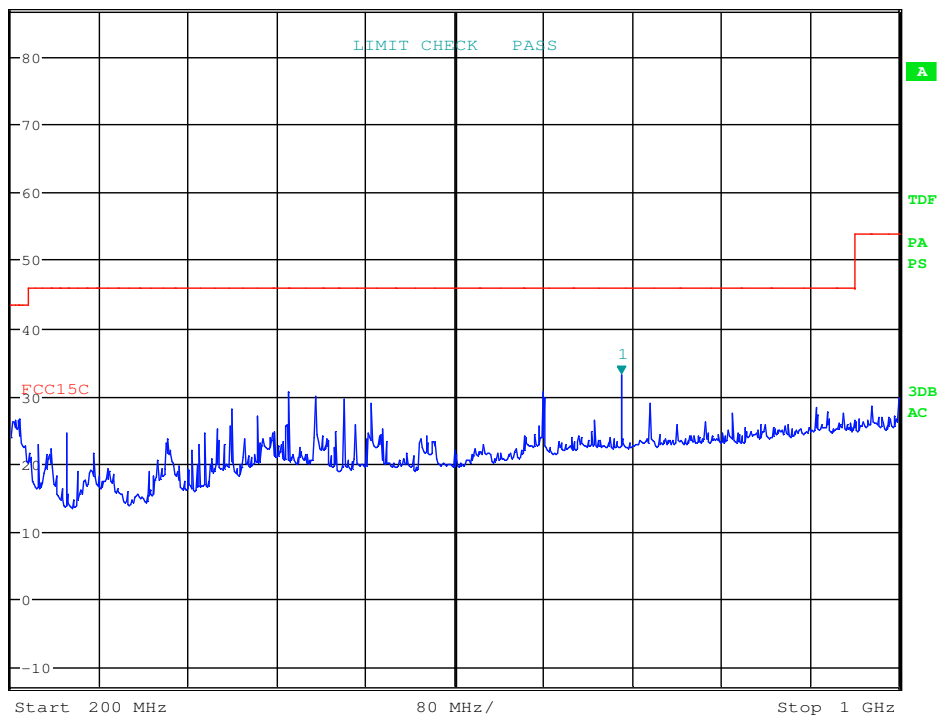


MARKER 1
750 MHz
Ref 87 dBμV/m

*RBW 100 kHz Marker 1 [T1]
VBW 300 kHz 33.09 dBμV/m
SWT 80 ms 750.000000000 MHz

*Att 10 dB

1 PK
MAXH

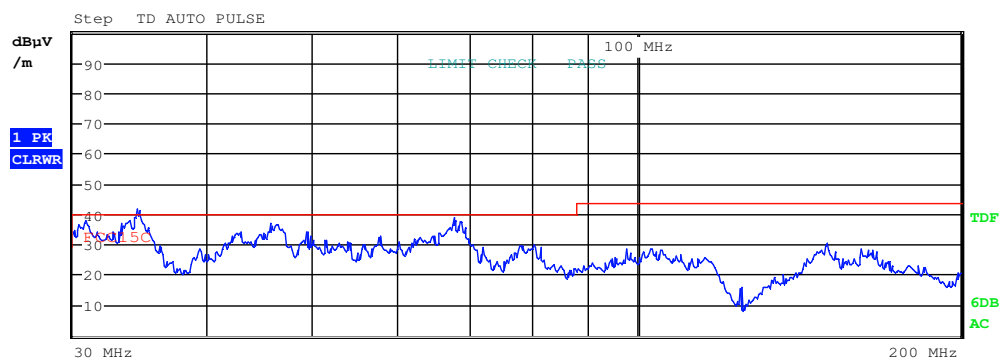
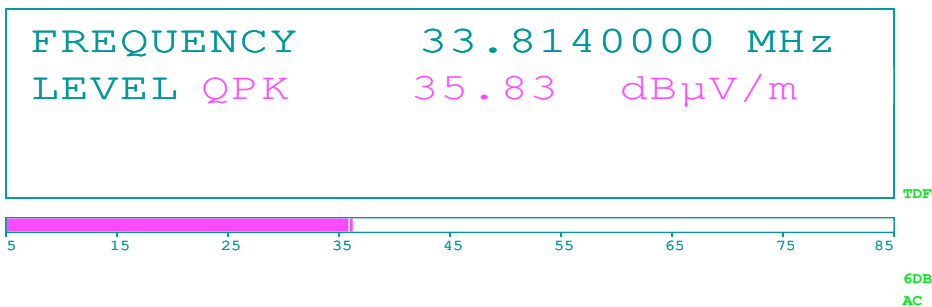


Date: 12.APR.2016 10:45:26

Radiated Emissions, 200 -1000MHz, HP



Att 10 dB RBW 120 kHz
MT 100 ms
PREAMP OFF



Date: 12.APR.2016 13:24:05

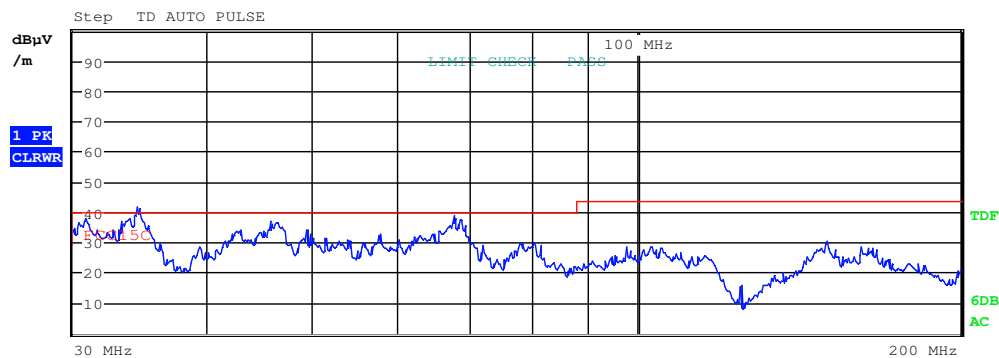
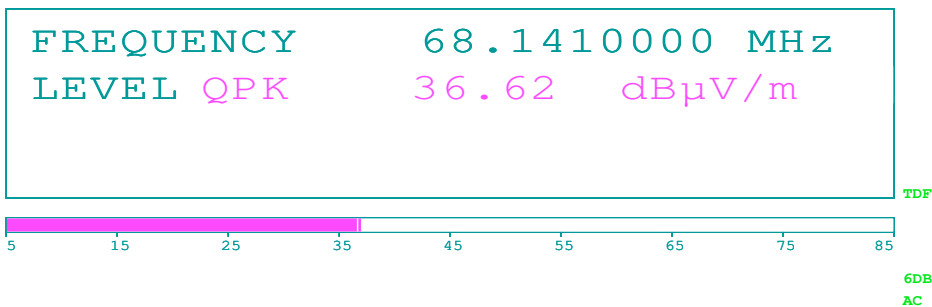
Radiated Emissions, 33.814 MHz, VP

With Power Supply



Att 10 dB

RBW 120 kHz
MT 100 ms
PREAMP OFF



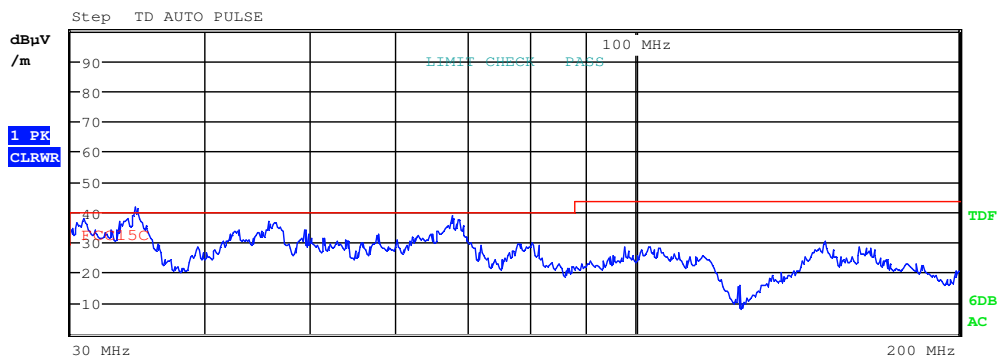
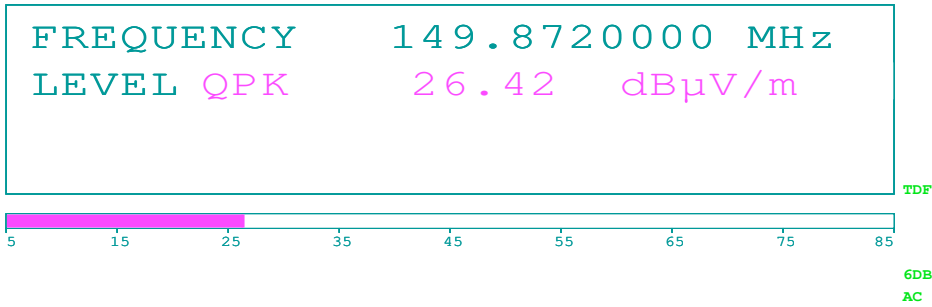
Date: 12.APR.2016 13:27:11

Radiated Emissions, 68.141 MHz, VP

With Power Supply



Att 10 dB RBW 120 kHz
MT 100 ms
PREAMP OFF



Date: 12.APR.2016 13:28:36

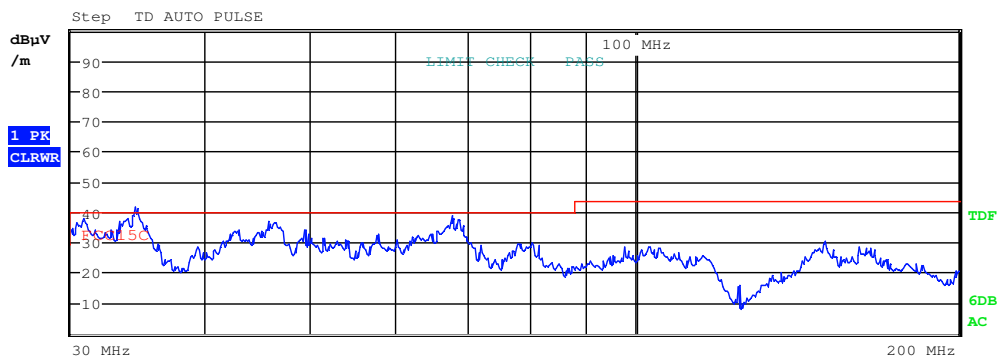
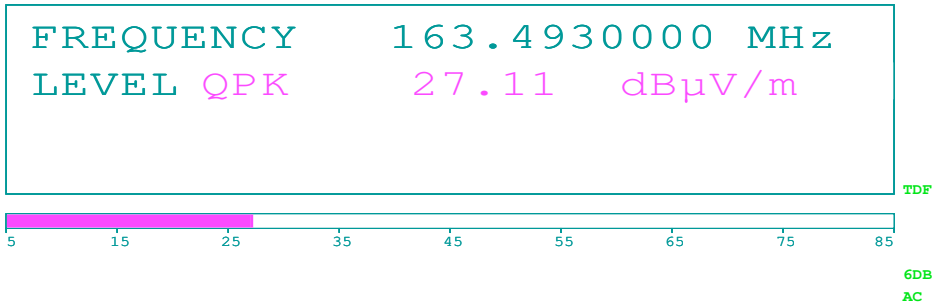
Radiated Emissions, 149.872 MHz, VP

With Power Supply



Att 10 dB

RBW 120 kHz
MT 100 ms
PREAMP OFF



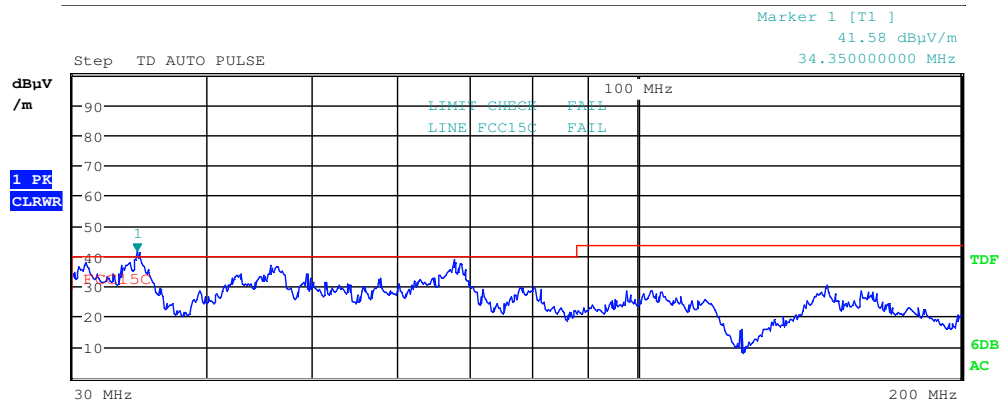
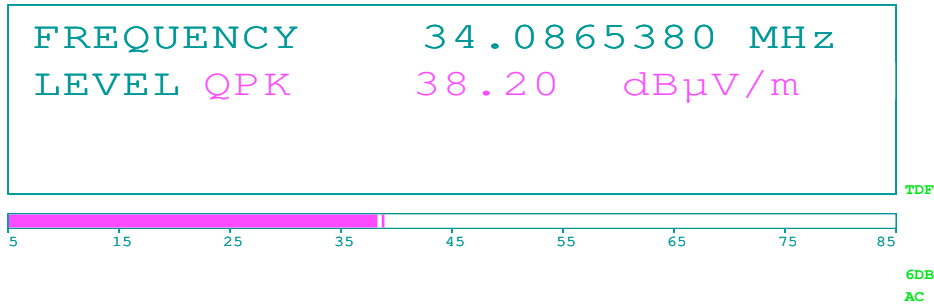
Date: 12.APR.2016 13:30:54

Radiated Emissions, 163.493 MHz, VP

With Power Supply



Att 10 dB RBW 120 kHz
MT 100 ms
PREAMP OFF



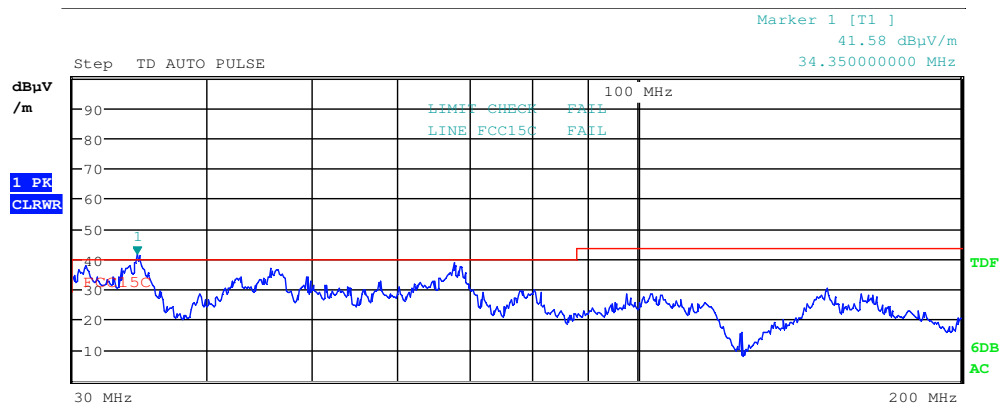
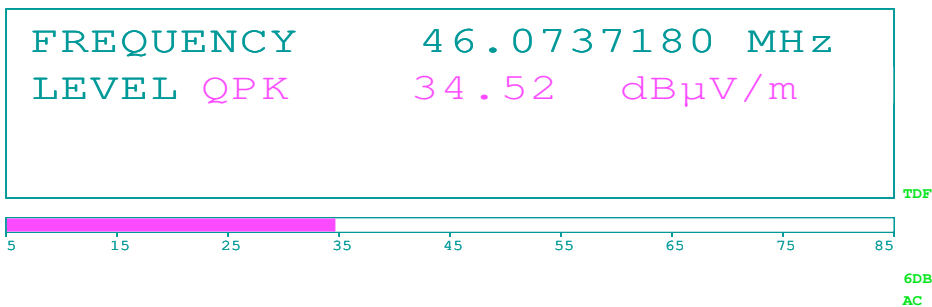
Date: 12.APR.2016 13:04:42

Radiated Emissions, 38.086 MHz, VP

With Power over Ethernet



Att 10 dB RBW 120 kHz
MT 100 ms
PREAMP OFF



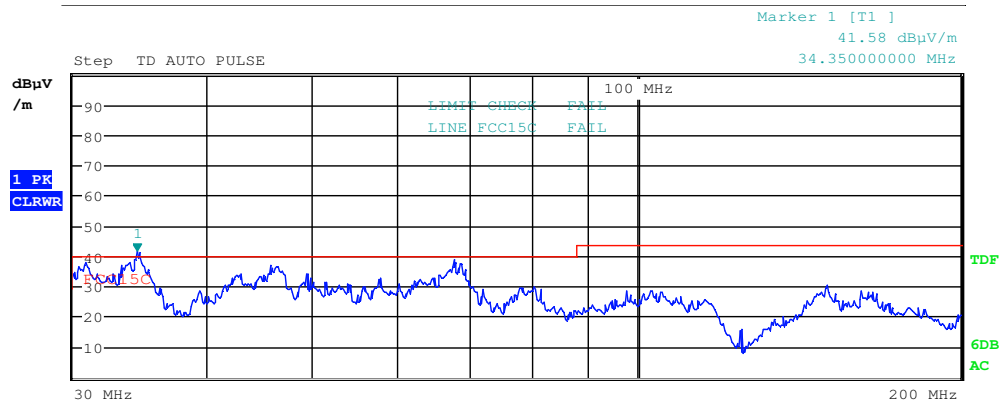
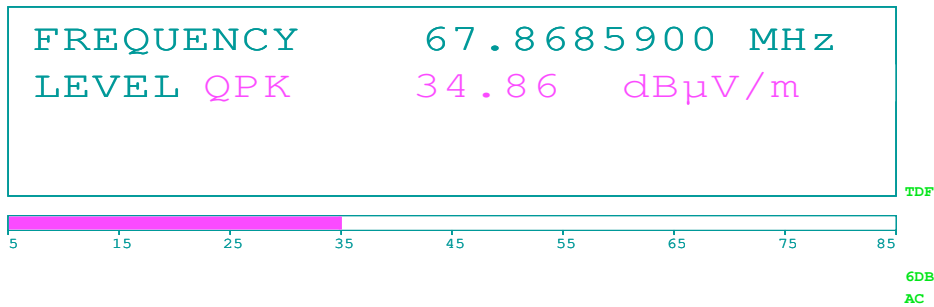
Date: 12.APR.2016 13:10:26

Radiated Emissions, 46.073 MHz, VP

With Power over Ethernet



Att 10 dB RBW 120 kHz
MT 100 ms
PREAMP OFF



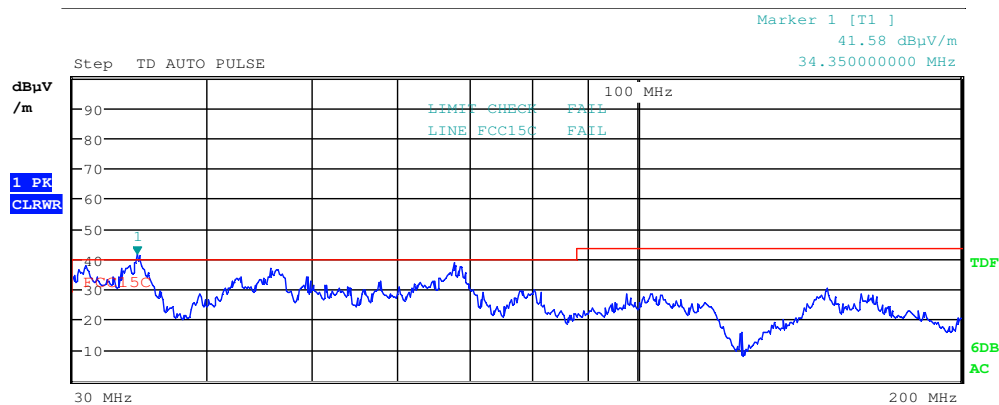
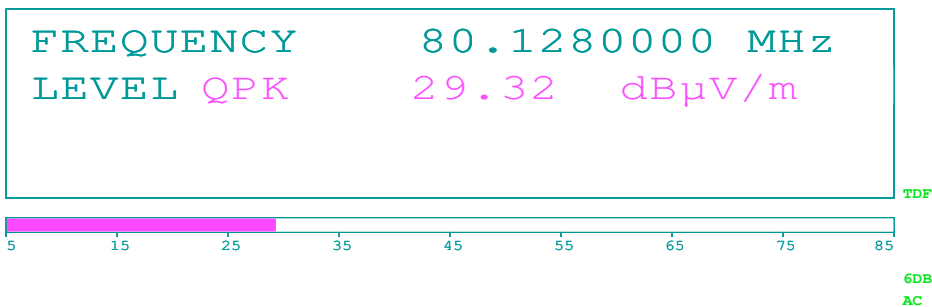
Date: 12.APR.2016 13:08:01

Radiated Emissions, 67.869 MHz, VP

With Power over Ethernet



Att 10 dB RBW 120 kHz
MT 100 ms
PREAMP OFF



Date: 12.APR.2016 13:13:40

Radiated Emissions, 80.128 MHz, VP

With Power over Ethernet

Radiated Emissions, 1 -25 GHz

Measuring distance: 3m (1 – 8.5 GHz)
1m (5.5 – 25 GHz)

Peak Detector:

Frequency	RF channel	Dist. corr. factor	Field strength, Peak Detector, 3m	Limit	Margin
GHz	L,M,H	dB	dB μ V/m	dB μ V/m	dB
Other freqs	L,M,H	0	None detected	74	>20

Average Detector:

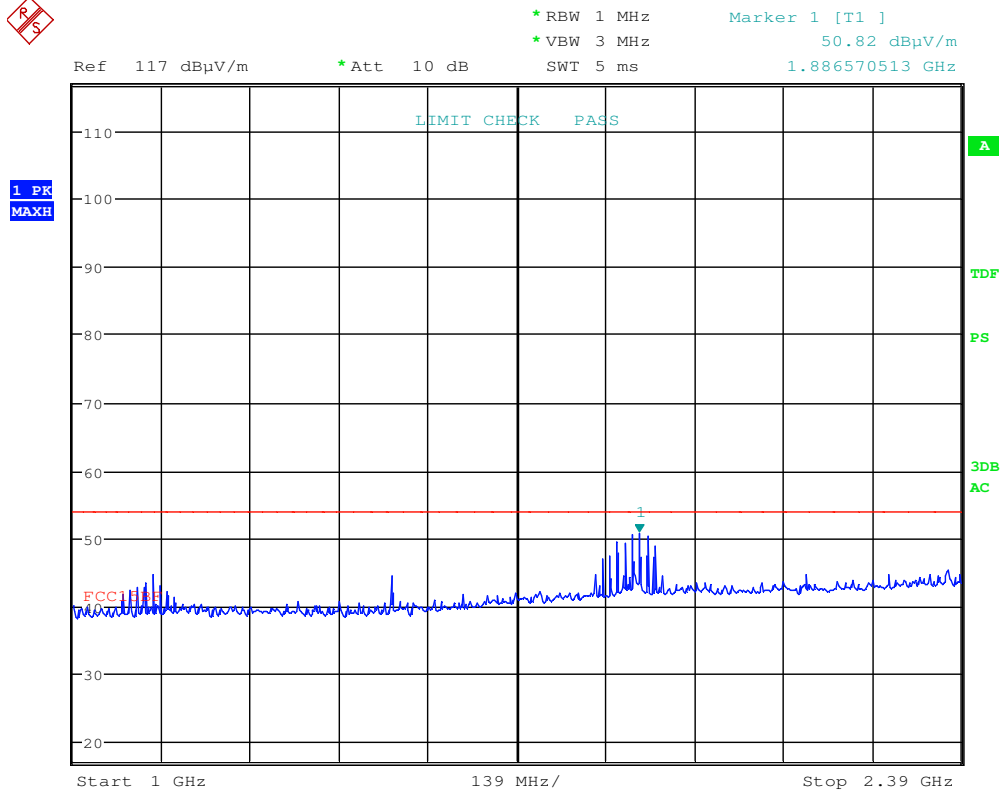
Frequency	RF channel	Dist. corr. factor	Field strength, Peak Detector, 3m	Duty cycle corr. factor	Limit	Margin
GHz	L,M,H	dB	dB μ V/m	dB	dB μ V/m	dB
Other freqs	L,M,H	0	None detected	20	54	>20

Average Detector values are calculated from Peak values by Duty Cycle Correction Factor.

Antenna factor, amplifier gain and cable loss are included in spectrum analyzer "Transducer factor".

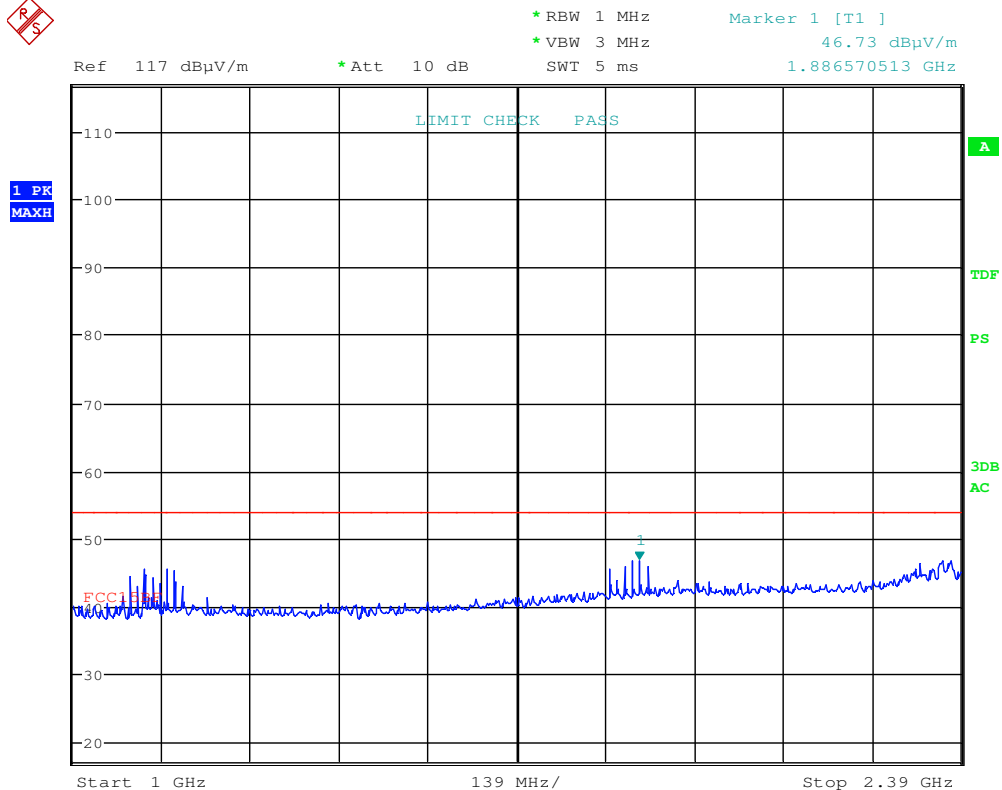
Distance correction factor is included on the plots when the measurement is performed @1m.

See plots.



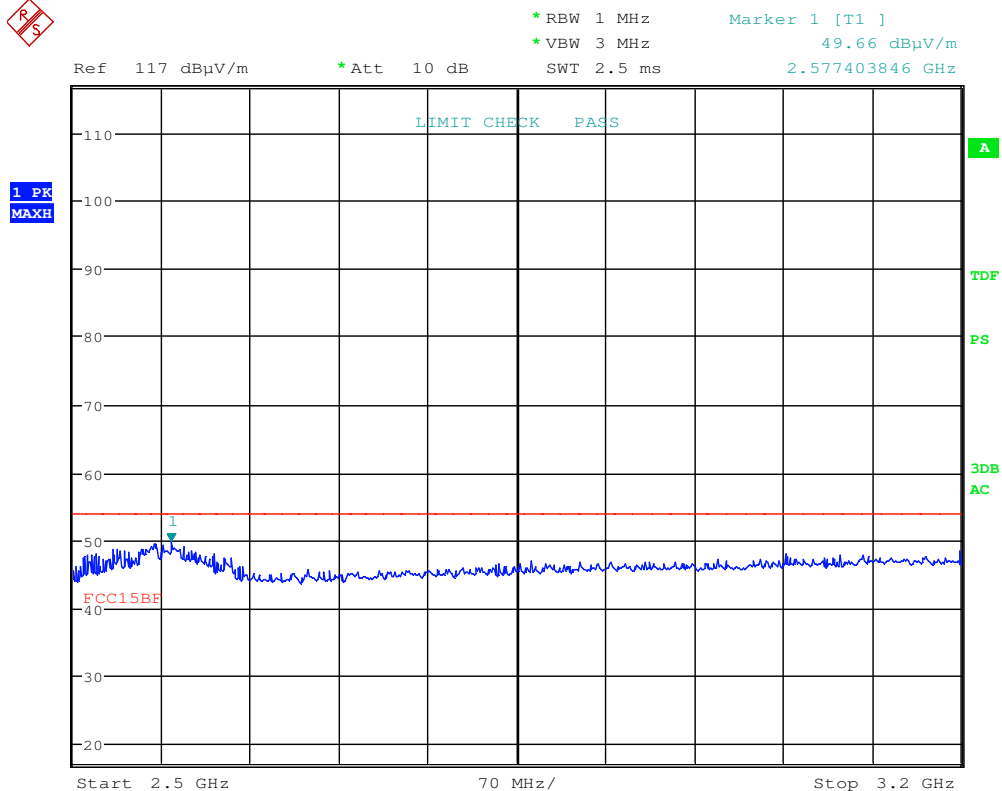
Date: 12.APR.2016 13:55:36

Radiated Emissions, 1000 -2390MHz, 2402MHz, VP



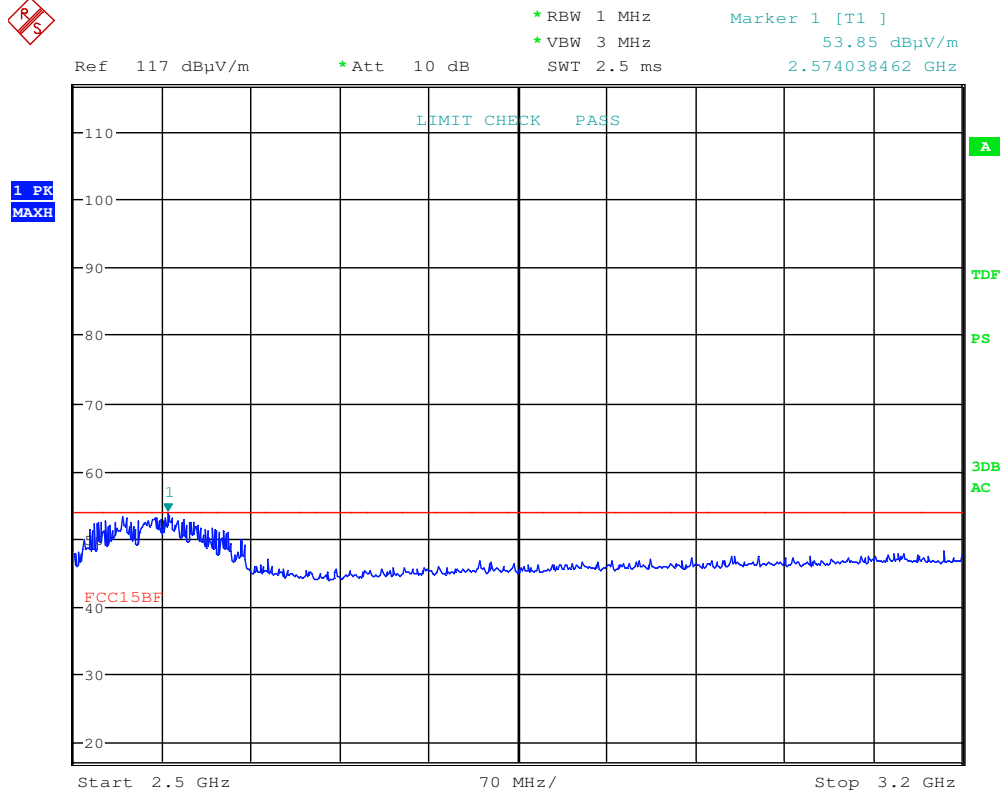
Date: 12.APR.2016 13:57:28

Radiated Emissions, 1000 -2390MHz, 2402MHz, HP



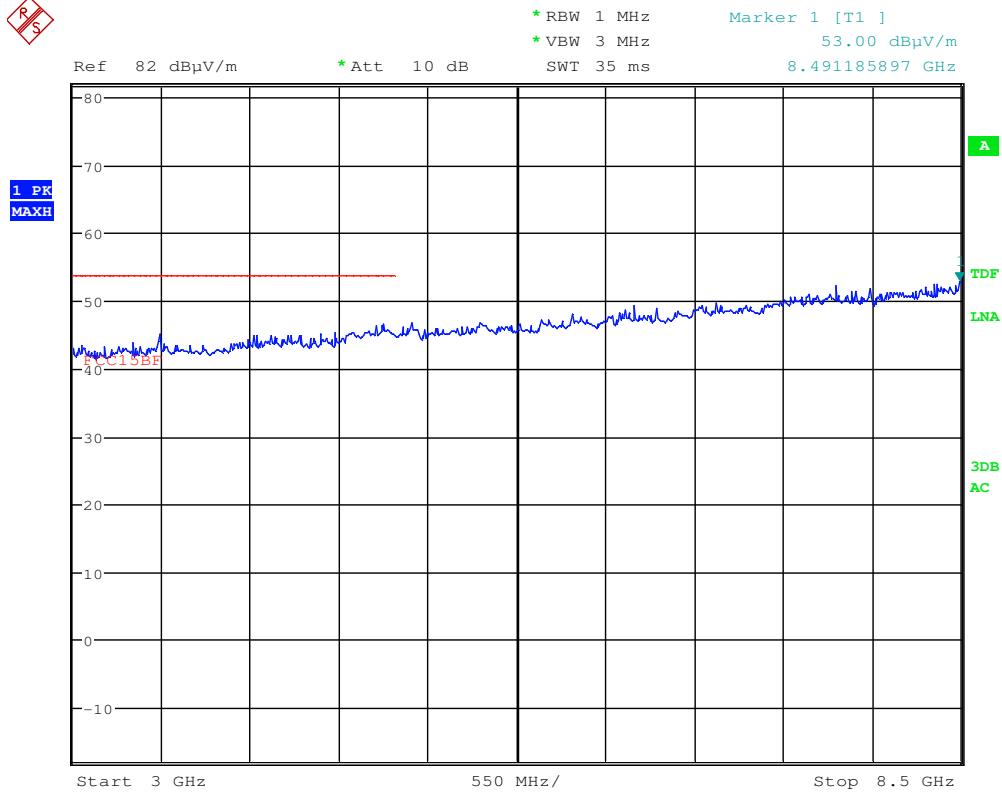
Date: 12.APR.2016 14:01:49

Radiated Emissions, 2500 -3200MHz, 2480MHz, VP



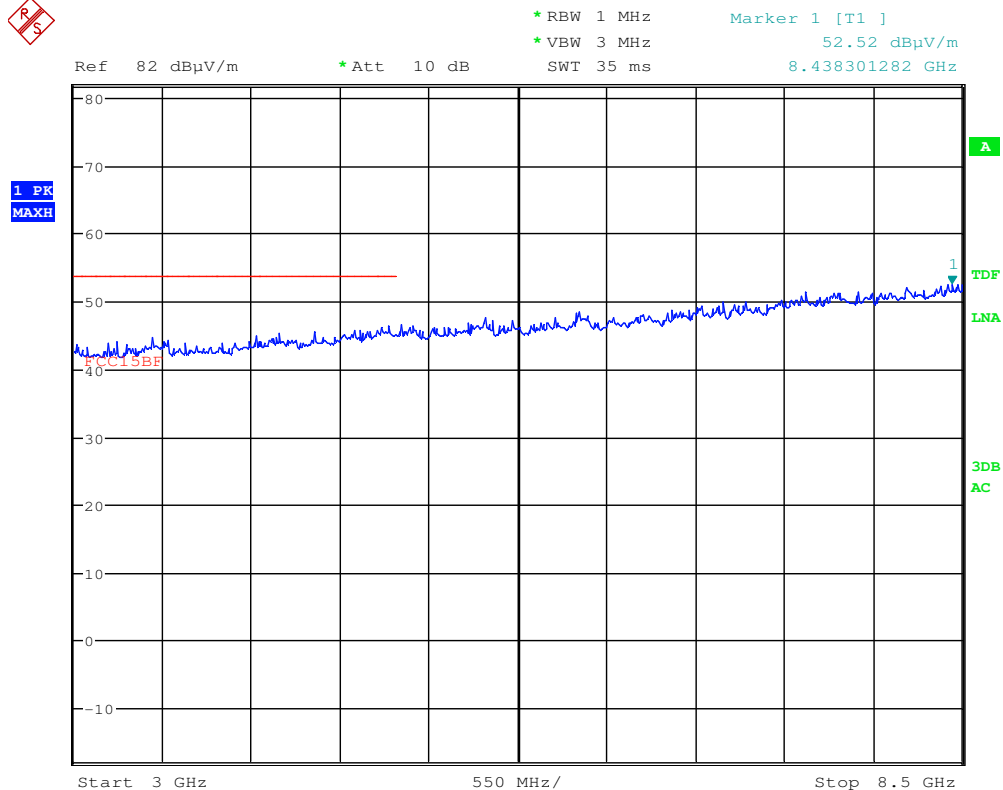
Date: 12.APR.2016 14:03:40

Radiated Emissions, 2500 -3200MHz, 2480MHz, HP



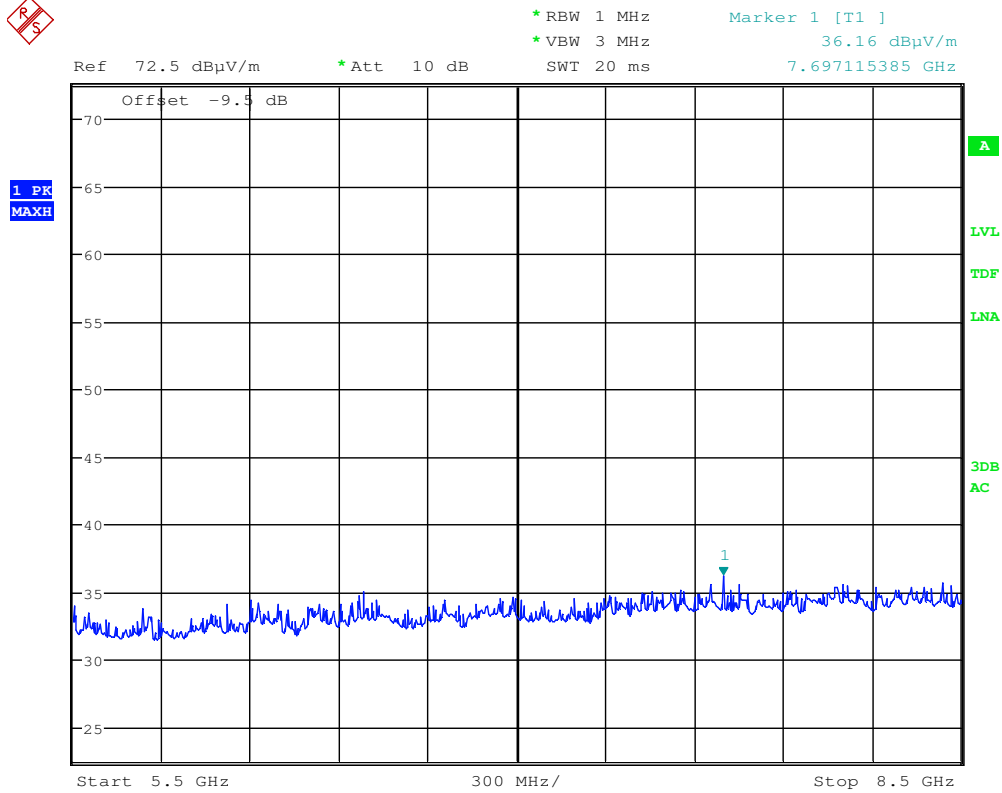
Date: 12.APR.2016 14:47:31

Radiated Emissions, 3000 -8500MHz, 2441MHz, VP



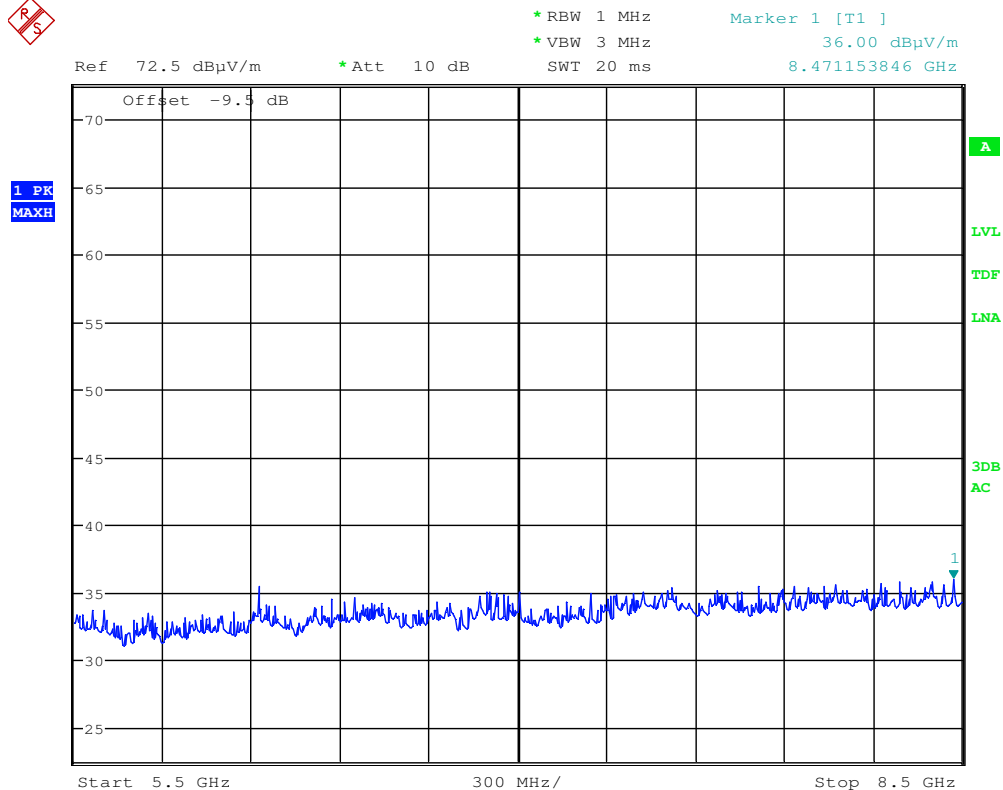
Date: 12.APR.2016 14:49:22

Radiated Emissions, 3000 -8500MHz, 2441MHz, HP



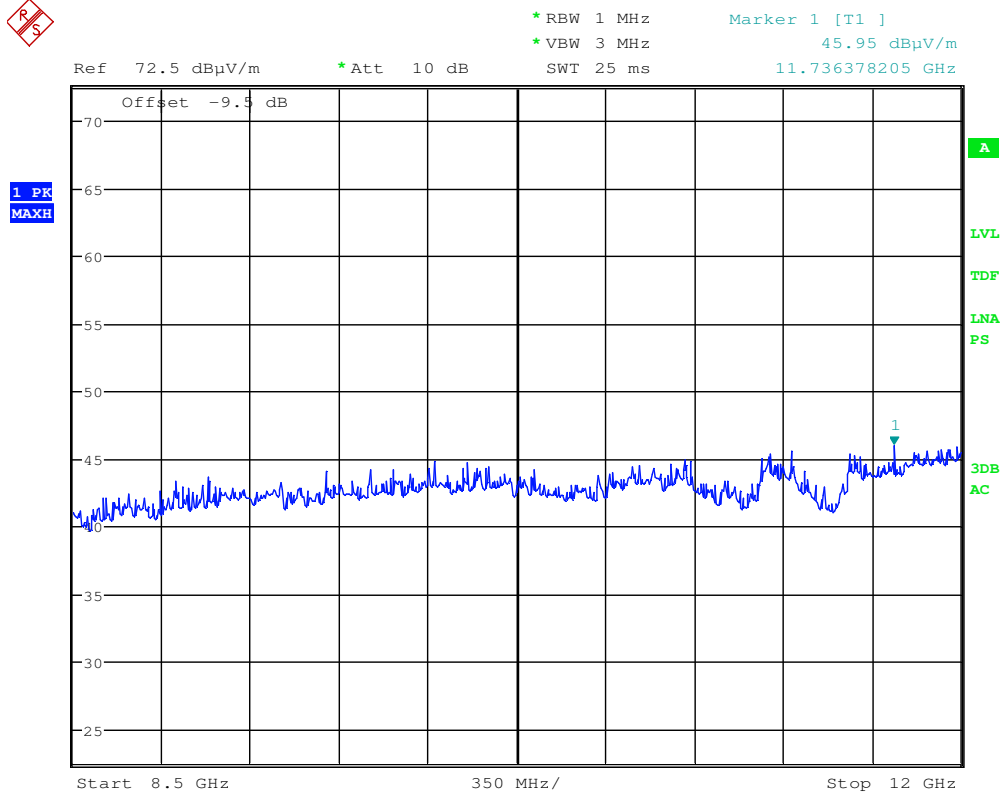
Date: 12.APR.2016 15:35:23

Radiated Emissions, 5500 -8500MHz, 2441MHz, VP, 1m



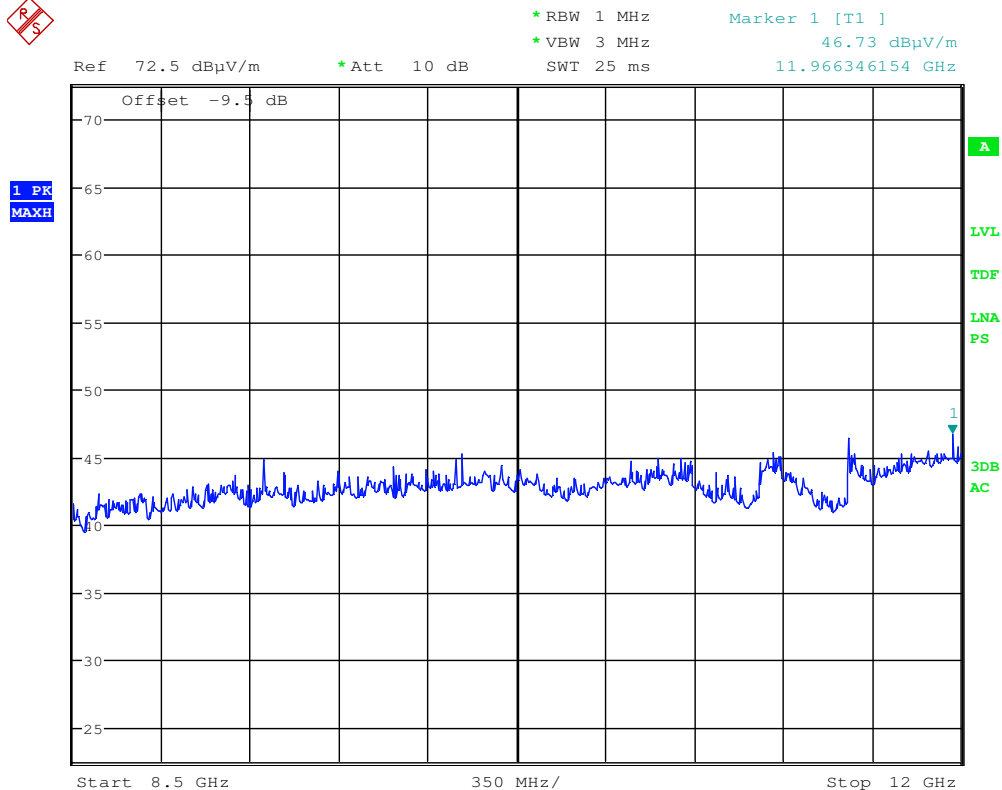
Date: 12.APR.2016 15:37:14

Radiated Emissions, 5500 -8500MHz, 2441MHz, HP, 1m



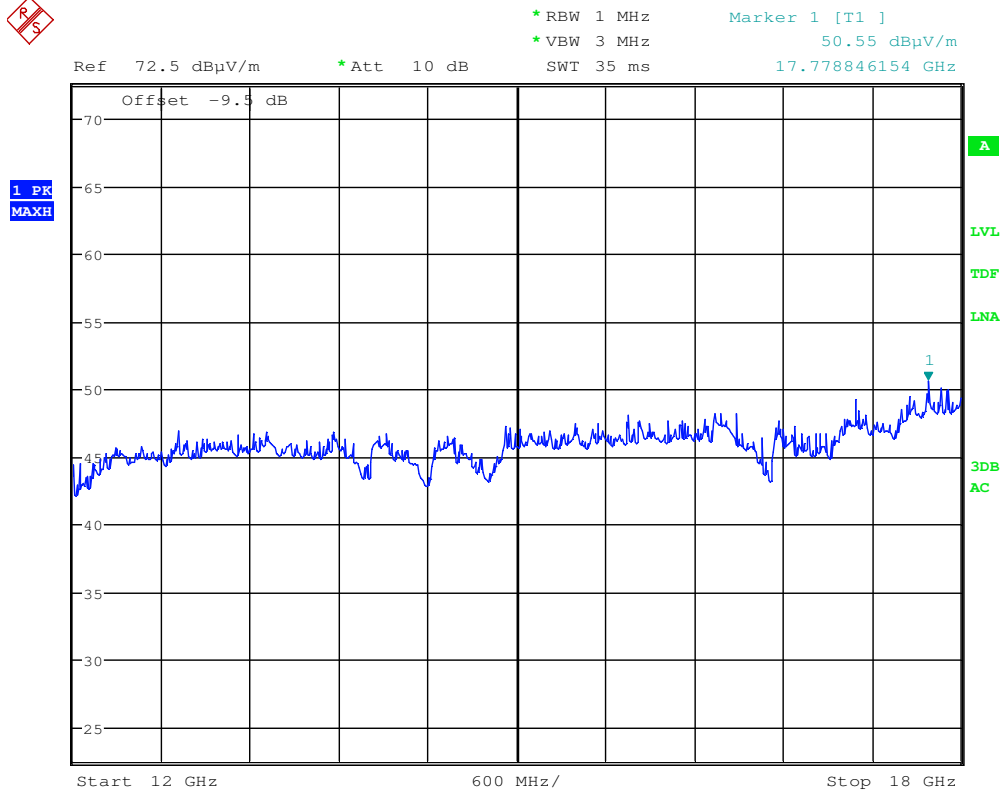
Date: 12.APR.2016 15:51:33

Radiated Emissions, 8500 -12000MHz, 2441MHz, VP, 1m



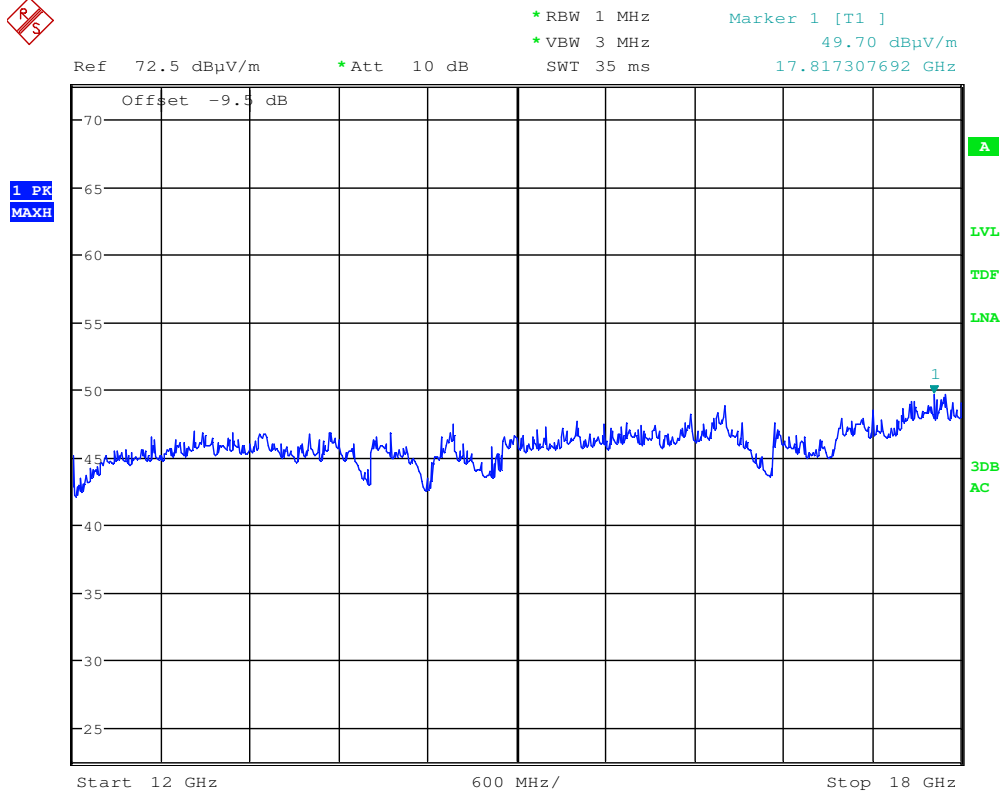
Date: 12.APR.2016 15:53:26

Radiated Emissions, 8500 -12000MHz, 2441MHz, HP, 1m



Date: 12.APR.2016 15:57:03

Radiated Emissions, 12000 -18000MHz, 2441MHz, VP, 1m

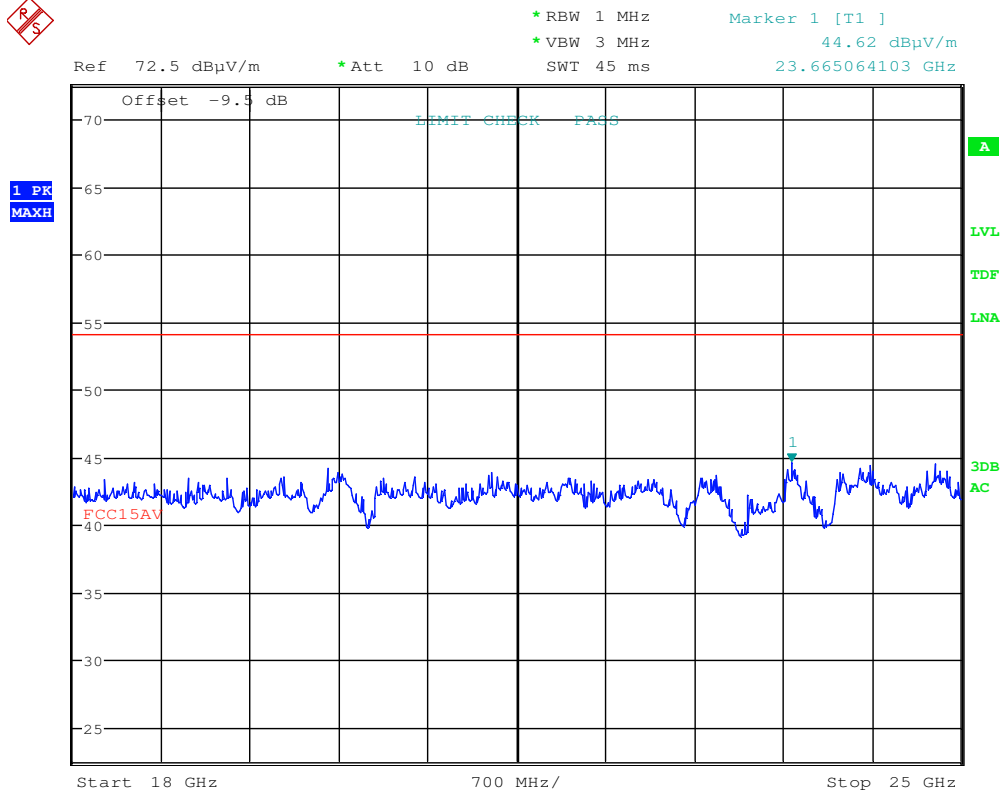


Date: 12.APR.2016 15:58:56

Radiated Emissions, 12000 -18000MHz, 2441MHz, HP, 1m



Nemko Norway, Instituttveien 6, Kjeller, Norway



Date: 12.APR.2016 16:38:26

Radiated Emissions, 18000 -25000MHz, 2441MHz, HP, 1m

4 Measurement Uncertainty

Measurement Uncertainty Values		
Test Item		Uncertainty
Output Power		±0.5 dB
Power Spectral Density		±0.5 dB
Out of Band Emissions, Conducted	< 3.6 GHz	±0.6 dB
	> 3.6 GHz	±0.9 dB
Spurious Emissions, Radiated	< 1 GHz	±2.5 dB
	> 1 GHz	±2.2 dB
Emission Bandwidth		±4 %
Power Line Conducted Emissions		+2.9 / -4.1 dB
Spectrum Mask Measurements	Frequency	±5 %
	Amplitude	±1.0 dB
Frequency Error		±0.6 ppm
Temperature Uncertainty		±1 °C

All uncertainty values are expanded standard uncertainty to give a confidence level of 95%, based on coverage factor k=2

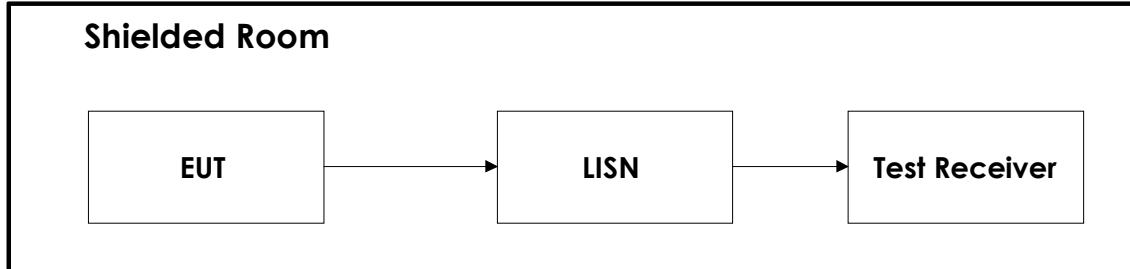
5 LIST OF TEST EQUIPMENT

To facilitate inclusion on each page of the test equipment used for related tests, each item of test equipment and ancillaries are identified (numbered) by the Test Laboratory.

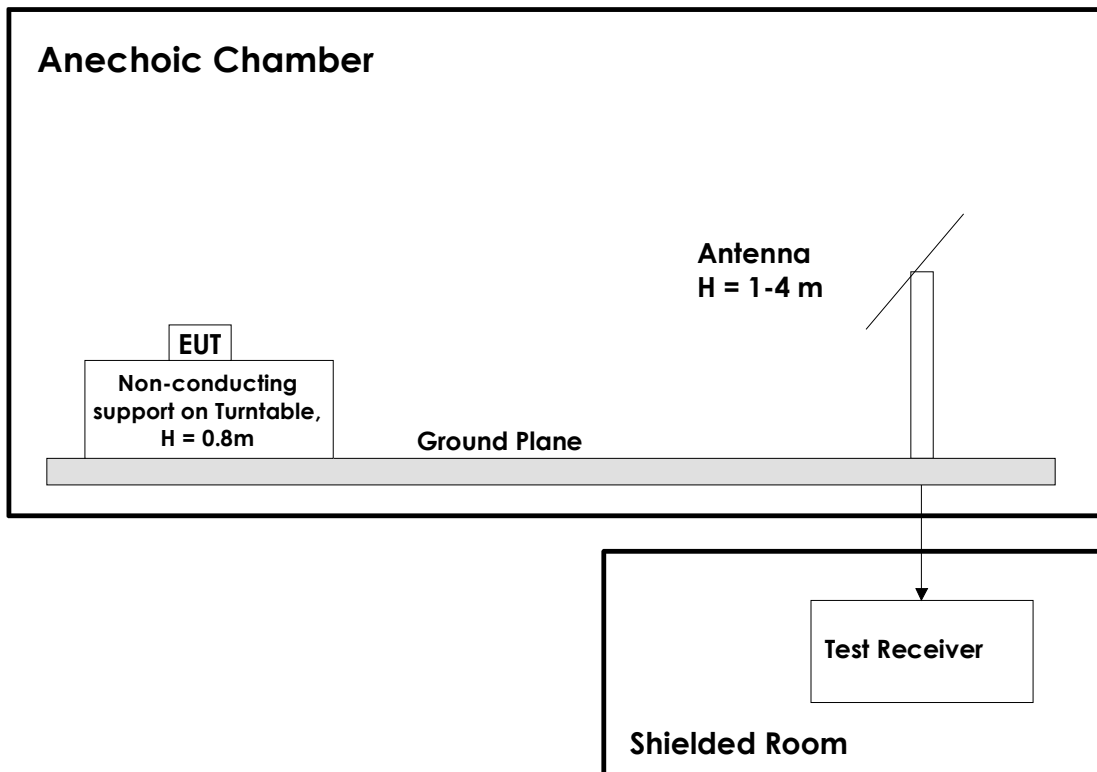
No.	Model number	Description	Manufacturer	Ref. no.	Cal. date	Cal. Due
1	ESU40	Measuring Receiver	Rohde & Schwarz	LR 1639	2015.11	2016.11
2	6HC3000/18000	Highpass Filter	Trilithic	LR 1614	Cal b4 use	
3	HK116	Biconical Antenna	Rohde & Schwarz	LR 1260	2013.12	2016.12
4	HL223	LPDA antenna	Rohde & Schwarz	LR 1261	2013.12	2016.12
5	3115	Horn Antenna	EMCO	LR 1226	2013.12	2018.12
6	8449A	Pre-amplifier	Hewlett Packard	LR 1322	2015.10	2016.10
7	642	Antenna Horn	Narda	LR 220	2009.01.26	2017.01.26
8	PM7320X	Antenna horn	Siverts lab	LR 103	2009.01.26	2017.01.26
9	DBF-520-20	Antenna horn	Systron Donner	LR 101	2009.01.26	2017.01.26
10	638	Antenna Horn	Narda	LR 1480	2010.06	2020.06
1	HFH2-Z2	Loop Antenna	Rohde & Schwarz	LR 1660	2014.10	2017.10
12	Model 87V	Multimeter	Fluke	N-4672	2015.10	2016.10
13	ESHS10	EMI	Rohde & Schwarz	N 3528	2015.08	2016.08
14	ESH3-Z5	Two-line V-Network	Rohde & Schwarz	LR 1076	2014.04.23	2016.04.23
15	ESH3-Z2	Pulse limiter	Rohde & Schwarz	LR 1074	2015.03.05	2017.03.05
16	6812B	AC power Source	Agilent	LR 1515	2015.12	2016.12

6 BLOCK DIAGRAM

6.1 Power Line Conducted Emission



6.2 Test Site Radiated Emission



Revision history

Version	Date	Comment	Sign
1.0	2016.04.15	First Edition	FS