



Part 15B

TEST REPORT

Product Name	CDMA/LTE smartphone
Model Name	M931
FCC ID	QISM931
Client	Huawei Technologies Co., Ltd.

TA Technology (Shanghai) Co., Ltd.

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GENERAL SUMMARY

Product Name	CDMA/LTE smartphone	Model Name	M931
FCC ID	QISM931		
Report No.	RHA1209-0083EMC01R1		
Client	Huawei Technologies Co., Ltd.		
Manufacturer	Huawei Technologies Co., Ltd.		
Reference Standard(s)	FCC Code CFR47 Part15B (2010-12) Radio frequency device. ANSI C63.4 (2009) Methods of Measurement of Radio-Noise Emission from Low-Voltage Electrical and Electronic Equipment in the Range of 9 KHz to 40GHz.		
Conclusion	This portable wireless equipment has been measured in all cases requested by the relevant standards. Test results in Chapter 2 of this test report are below limits specified in the relevant standards. General Judgment : Pass (Stamp) Date of issue: December 14th 2012		
Comment	The test result only responds to the measured sample.		

Approved by 杨伟中
Director

Revised by 范广羽
EMC Manager

Performed by 刘伟
EMC Engineer

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1. General Information

1.1. Notes of the test report

TA Technology (Shanghai) Co., Ltd. guarantees the reliability of the data presented in this test report, which is the results of measurements and tests performed for the items under test on the date and under the conditions stated in this test report and is based on the knowledge and technical facilities available at TA Technology (Shanghai) Co., Ltd. at the time of execution of the test.

TA Technology (Shanghai) Co., Ltd. is liable to the client for the maintenance by its personnel of the confidentiality of all information related to the items under test and the results of the test. This report only refers to the item that has undergone the test.

This report standalone dose not constitute or imply by its own an approval of the product by the certification Bodies or competent Authorities. This report can not be used partially or in full for publicity and/or promotional purposes without previous written approval of **TA Technology (Shanghai) Co., Ltd.** and the Accreditation Bodies, if it applies.

TA Technology (Shanghai) Co., Ltd. has obtained the accreditation of China National Accreditation Service for Conformity Assessment (CNAS), and accreditation number: L2264.

TA Technology (Shanghai) Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements. The site recognition number is 428261.

TA Technology (Shanghai) Co., Ltd. has been listed by industry Canada to perform electromagnetic emission measurement. The site recognition number is 8510A.

If the electrical report is inconsistent with the printed one, it should be subject to the latter.

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1.2. Testing laboratory

Company: TA Technology (Shanghai) Co., Ltd.
Address: No.145, Jintang Rd, Tangzhen Industry Park, Pudong
City: Shanghai
Post code: 201201
Country: P. R. China
Contact: Yang Weizhong
Telephone: +86-021-50791141/2/3
Fax: +86-021-50791141/2/3-8000
Website: <http://www.ta-shanghai.com>
E-mail: yangweizhong@ta-shanghai.com

1.3. Applicant Information

Company: Huawei Technologies Co., Ltd.
Address: Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District
City: Shenzhen
Postal Code: 518129
Country: P.R. China

1.4. Manufacturer Information

Company: Huawei Technologies Co., Ltd.
Address: Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District
City: Shenzhen
Postal Code: 518129
Country: P.R.China

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1.5. Information of EUT

General information

Product Name:	CDMA/LTE smartphone
IMEI:	99000135008292
Hardware Version:	Ver.D
Software Version:	M931V100R001C177B107
Antenna Type:	Internal Antenna
Used Host Product:	IBM T61

Equipment Under Test (EUT) is CDMA/LTE smartphone with internal antenna. During the test, the EUT connect to the laptop IBM T61.

The sample under test was selected by the Client.

Components list please refer to documents of the manufacturer.

1.6. Test Date

The test is performed from September 28, 2012 to October 8, 2012.

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2. Test Information

2.1. Summary of test results

Number	Test Case	Clause in FCC Rules	Verdict
1	Radiated Emission	15.109, ANSI C63.4-2009	PASS
2	Conducted Emission	15.107, ANSI C63.4-2009	PASS

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2.2. Radiated Emission

Ambient condition

Temperature	Relative humidity	Pressure
24°C~26°C	45%~50%	102.5kPa

Methods of Measurement

The EUT is placed on a non-metallic table 0.8m above the horizontal metal reference ground plane. The distance between EUT and receive antenna should be 3 meters. During the test, the EUT was operating in its typical mode. The test method is according to ANSI C63.4-2009. Sweep the whole frequency band through the range from 30MHz to the 5th harmonic of the carrier. During the test, the height of receive antenna shall be moved from 1 to 4 meters, and the antenna shall be performed under horizontal and vertical polarization. The turn table shall be rotated from 0 to 360 degrees for detecting the maximum of radiated spurious signal level. The measurements shall be repeated with orthogonal polarization of the test antenna. During the test, EUT is connected to a laptop via a USB cable in the case of USB mode. The EUT is used as the peripheral equipment of the PC. The model of laptop is IBM T61 8892-BAC and the serial number of laptop is L3-C9644.

The data is transferred from EUT to PC; PC is connected to server via a long LAN cable.

The data of cable loss and antenna factor has been calibrated in full testing frequency range before the testing. During the test, the EUT is worked at maximum output power.

Set the spectrum analyzer in the following:

Below 1GHz:

RBW=100kHz / VBW=300kHz / Sweep=AUTO

Above 1GHz:

(a) PEAK: RBW=1MHz VBW=3MHz/ Sweep=AUTO

(b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO

The radiated emission was measured in the following position: EUT stand-up position (Z axis), lie-down position (X, Y axis). The worst emission was found in lie-down position (X axis) and the worst case was recorded.

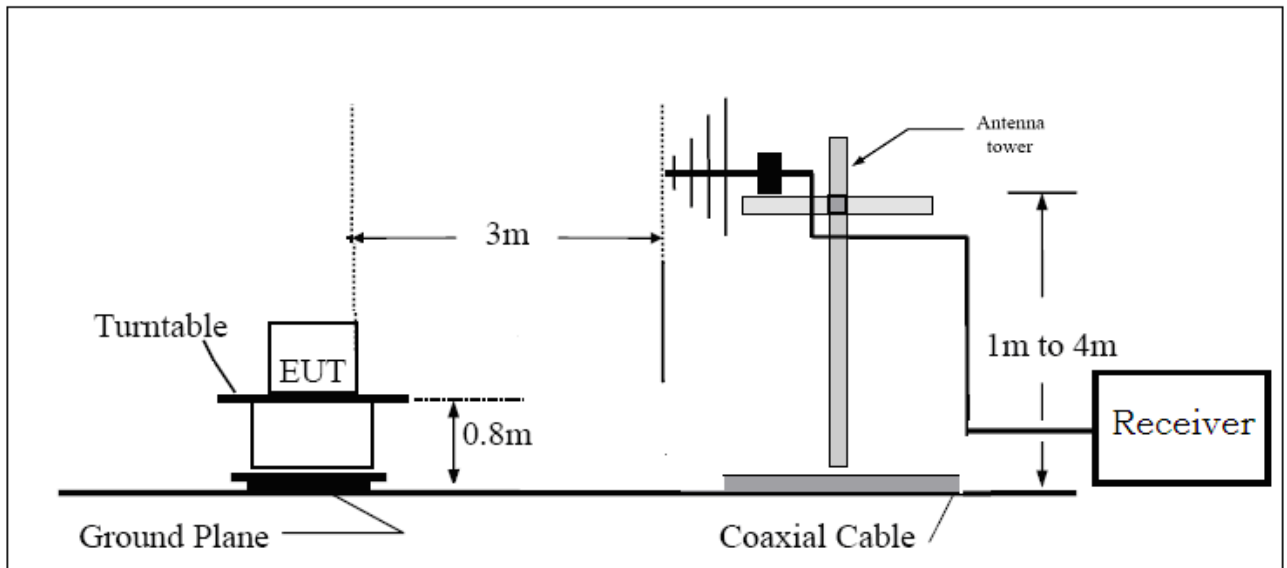
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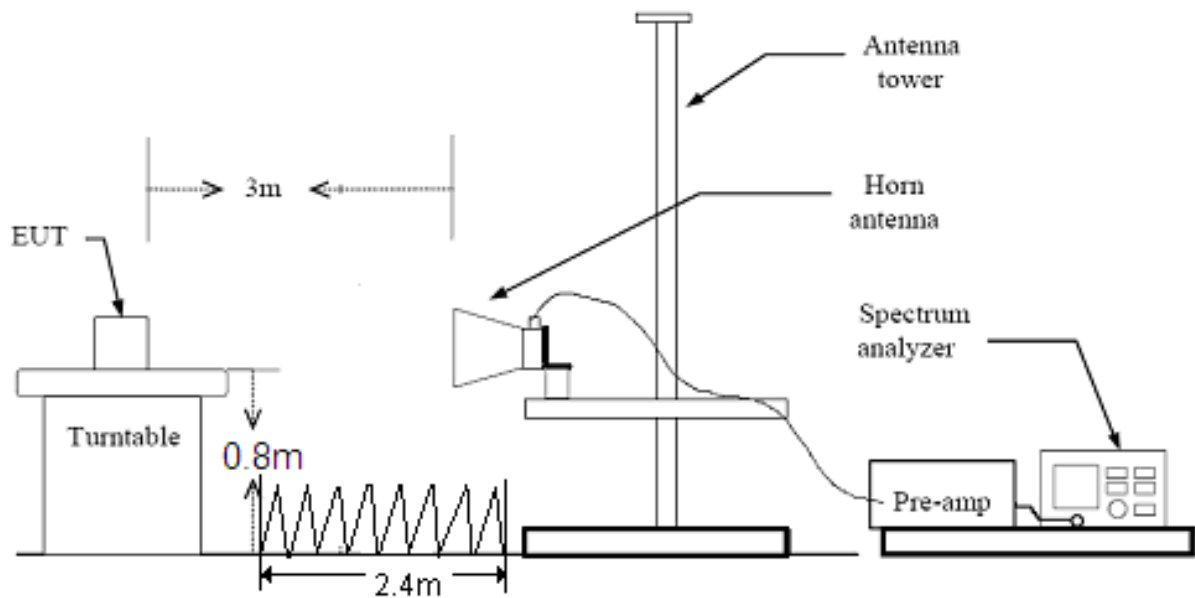
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Test Setup

Below 1GHz



Above 1GHz



Note: Area side:2.4mX3.6m

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Limits

Frequency (MHz)	Field Strength (dB μ V/m)	Detector
30 -88	40.0	Quasi-peak
88-216	43.5	Quasi-peak
216 – 960	46.0	Quasi-peak
960-1000	54.0	Quasi-peak
1000-5 th harmonic of the highest frequency or 40GHz, which is lower	54 74	Average Peak

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$. $U = 3.92$ dB.

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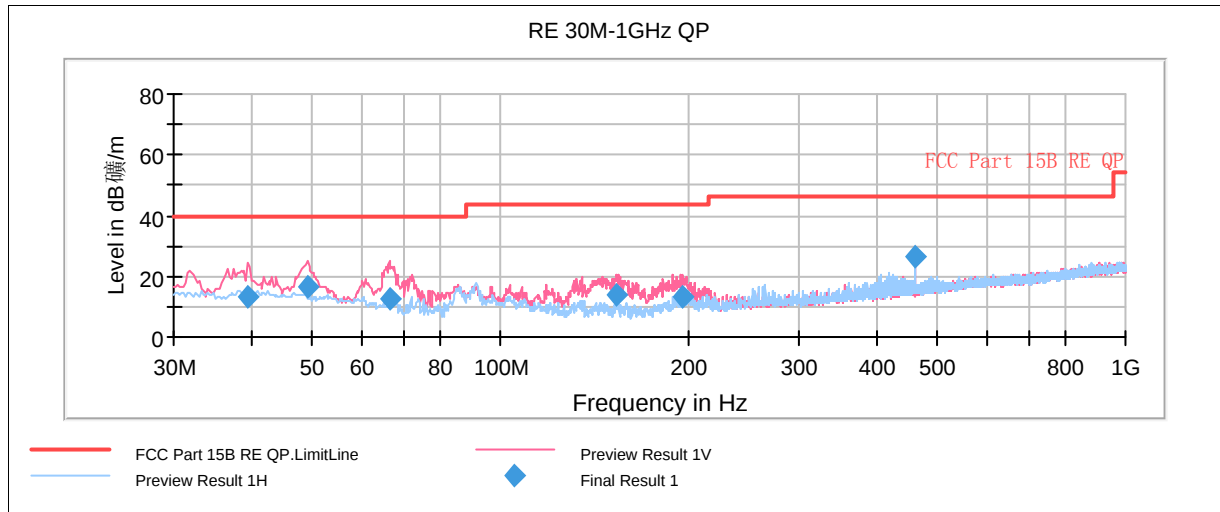
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Test Results

USB Mode



Radiated Emission from 30MHz to 1GHz

Frequency (MHz)	Quasi-Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
39.398856	13.2	175.0	V	310.0	35.5	-22.3	26.8	40.0
49.034606	16.7	100.0	V	32.0	40.3	-23.6	23.3	40.0
66.540938	12.3	120.0	V	328.0	40.4	-28.1	27.7	40.0
153.608919	13.7	100.0	V	86.0	44.5	-30.8	29.8	43.5
195.144144	13.3	100.0	V	6.0	42.1	-28.8	30.2	43.5
460.610000	26.2	100.0	V	340.0	48.2	-22.0	19.8	46.0

Remark: 1. Quasi-Peak = Reading value + Correction factor

2. Correction Factor = Antenna factor+ Insertion loss(cable loss+amplifier gain)

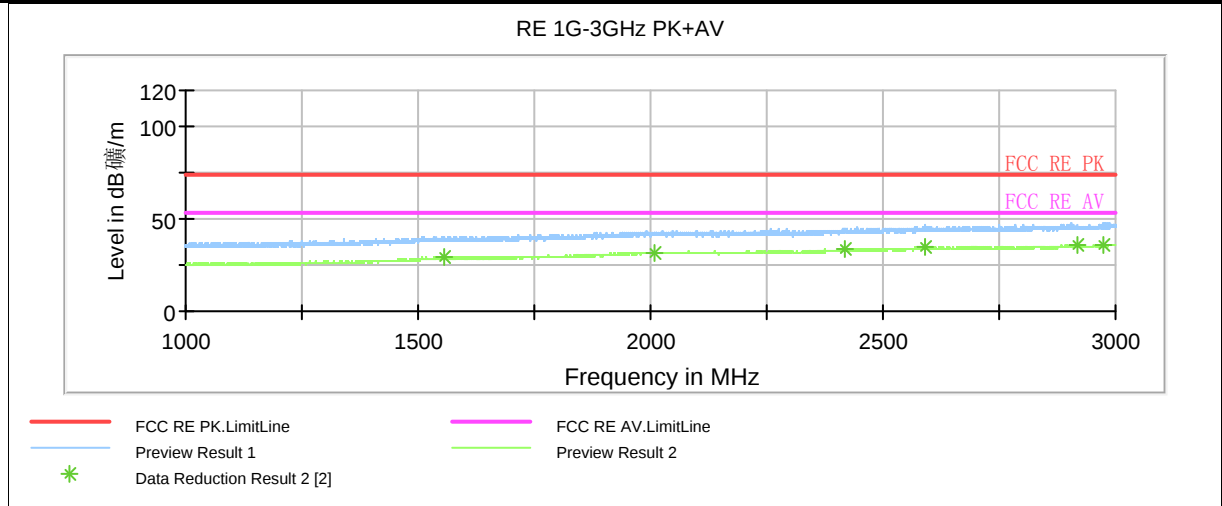
3. Margin = Limit – Quasi-Peak

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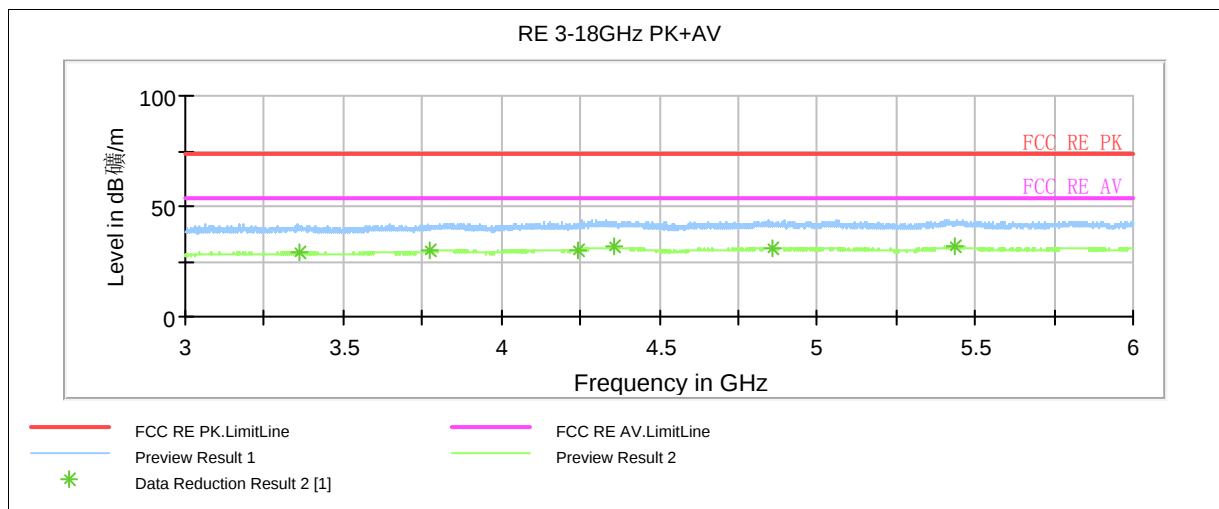
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Note: Blue trace uses the peak detection Green trace uses the average detection

Radiated Emission from 1GHz to 3GHz



Note: Blue trace uses the peak detection Green trace uses the average detection

Radiated Emission from 3GHz to 6GHz

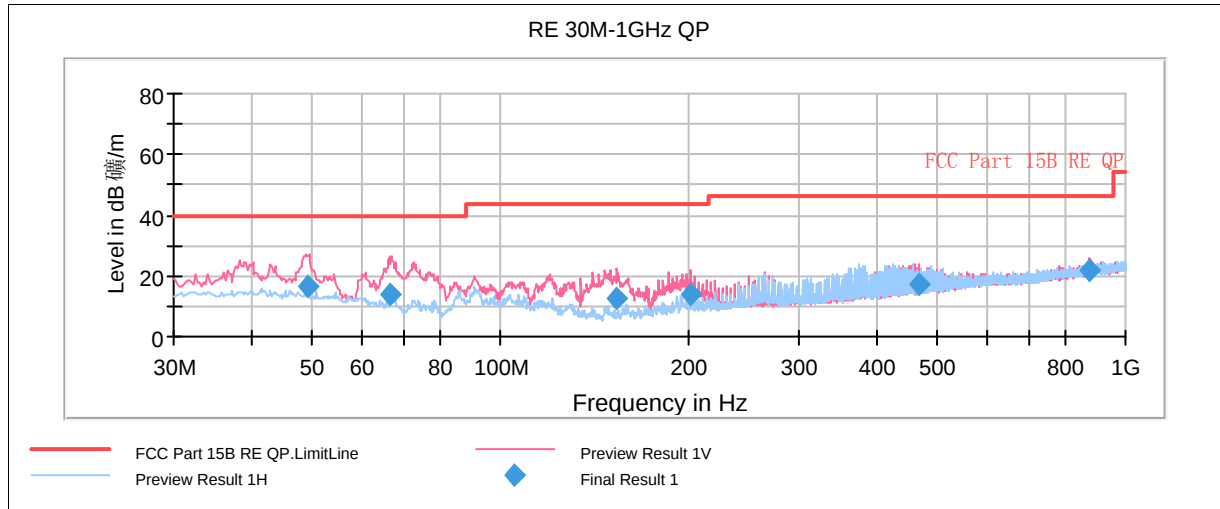
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Charger Mode



Radiated Emission from 30MHz to 1GHz

Frequency (MHz)	Quasi-Peak (dB μ V/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dB μ V/m)	Correct Factor (dB)	Margin (dB)	Limit (dB μ V/m)
49.037288	16.3	100.0	V	5.0	39.9	-23.6	23.7	40.0
66.692850	14.1	225.0	V	334.0	42.2	-28.1	25.9	40.0
153.608919	12.7	100.0	V	30.0	43.5	-30.8	30.8	43.5
201.584000	14.1	100.0	V	13.0	42.7	-28.6	29.4	43.5
467.179500	17.3	120.0	V	39.0	39.1	-21.8	28.7	46.0
878.511000	21.7	121.0	V	316.0	36.7	-15.0	24.3	46.0

Remark: 1. Quasi-Peak = Reading value + Correction factor

2. Correction Factor = Antenna factor+ Insertion loss(cable loss+amplifier gain)

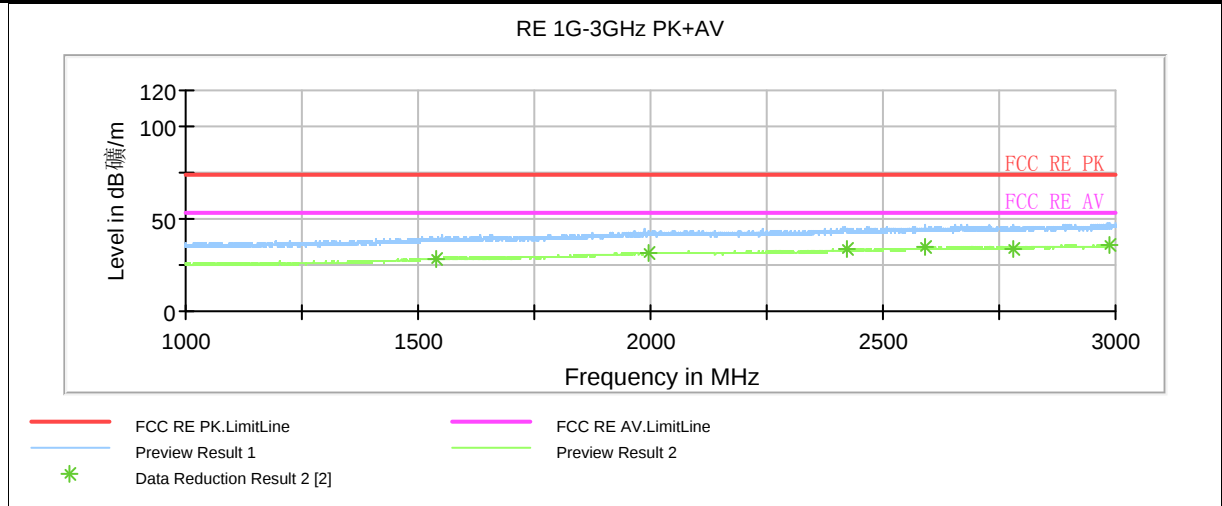
3. Margin = Limit – Quasi-Peak

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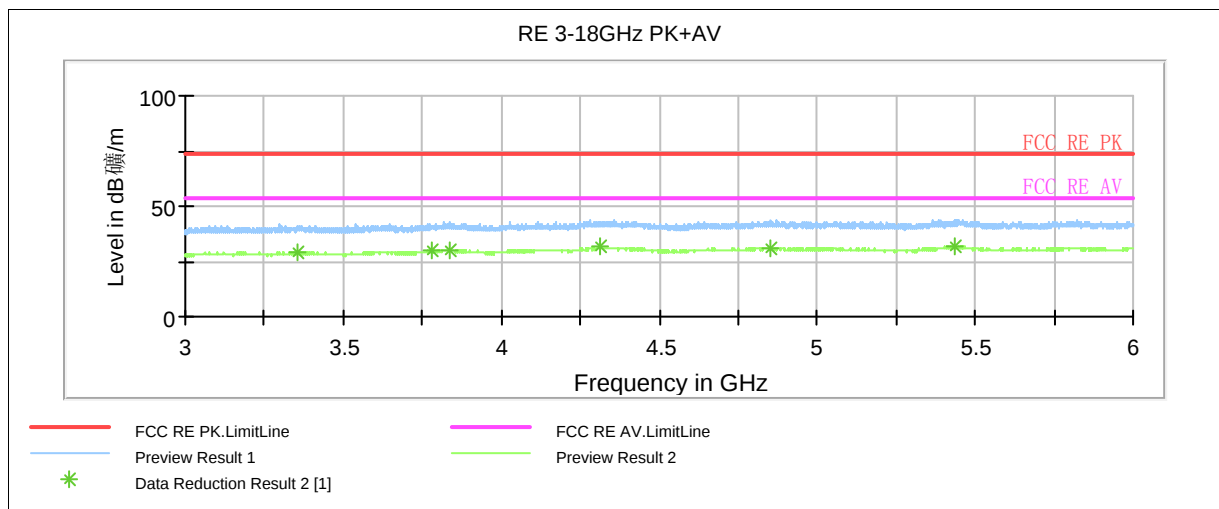
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Note: Blue trace uses the peak detection Green trace uses the average detection

Radiated Emission from 1GHz to 3GHz



Note: Blue trace uses the peak detection Green trace uses the average detection

Radiated Emission from 3GHz to 6GHz

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2.3. Conducted Emission

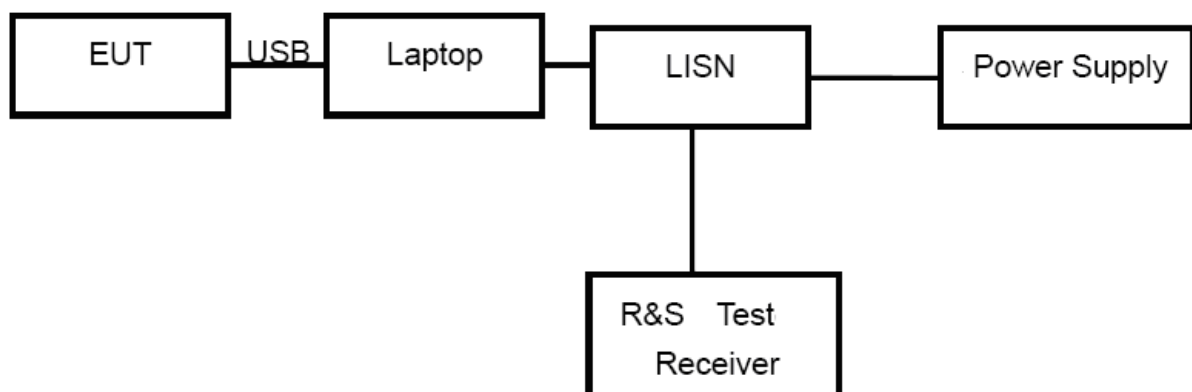
Ambient condition

Temperature	Relative humidity	Pressure
24°C ~26°C	50%~55%	102.5kPa

Methods of Measurement

The EUT is placed on a non-metallic table of 80cm height above the horizontal metal reference ground plane. During the test, the EUT was operating in its typical mode. The test method is according to ANSI C63.4-2009. Connect the AC power line of the EUT to the L.I.S.N. Use EMI receiver to detect the average and Quasi-peak value. RBW is set to 9 kHz, VBW is set to 30kHz. The measurement result should include both L line and N line. During the test, EUT is connected to a laptop via a USB cable in the case of USB mode. The EUT is used as the peripheral equipment of the PC. The model of laptop is IBM T61 8892-BAC and the serial number of laptop is L3-C9644.

Test Setup



Note: Power Supply is AC Power source and it is used to change the voltage from 220V/50Hz to 110V/60Hz.

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Limits

Frequency (MHz)	Conducted Limits(dBμV)	
	Quasi-peak	Average
0.15 - 0.5	66 to 56 *	56 to 46 *
0.5 - 5	56	46
5 - 30	60	50
*: Decreases with the logarithm of the frequency.		

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$. $U = 2.69$ dB.

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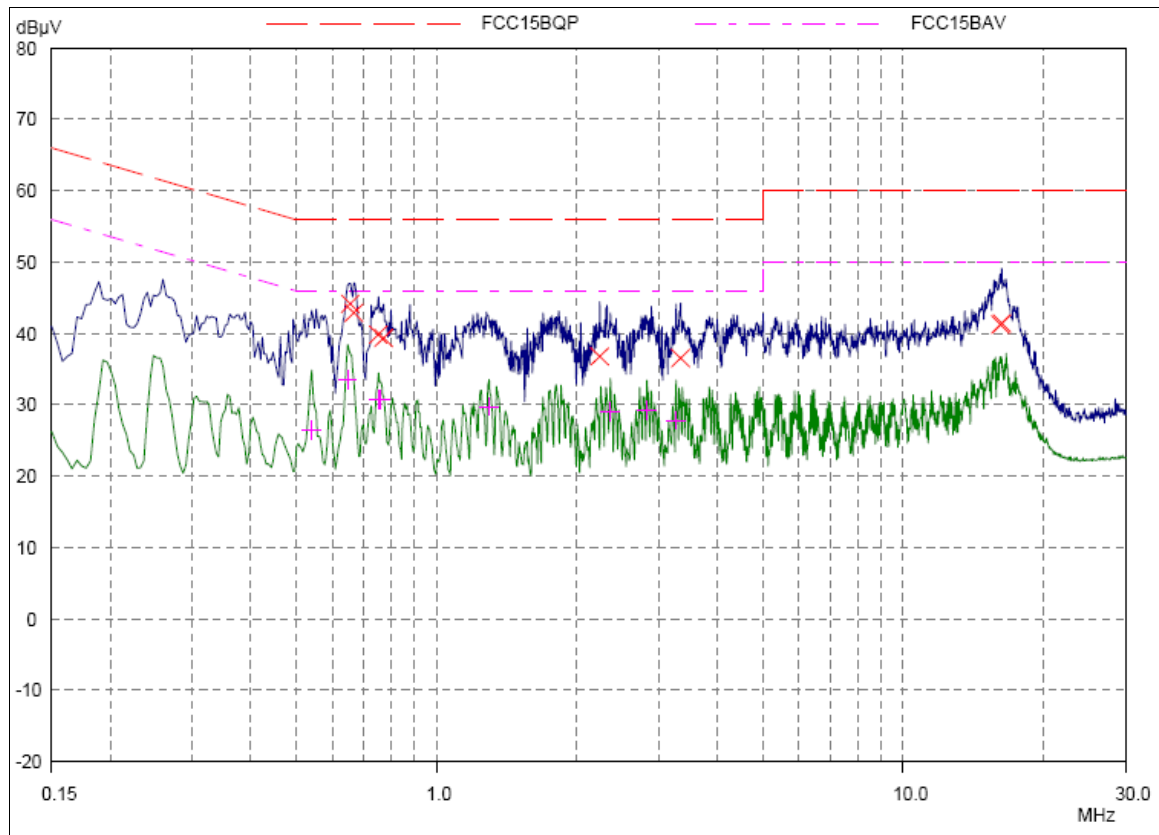
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Test Results

USB Mode



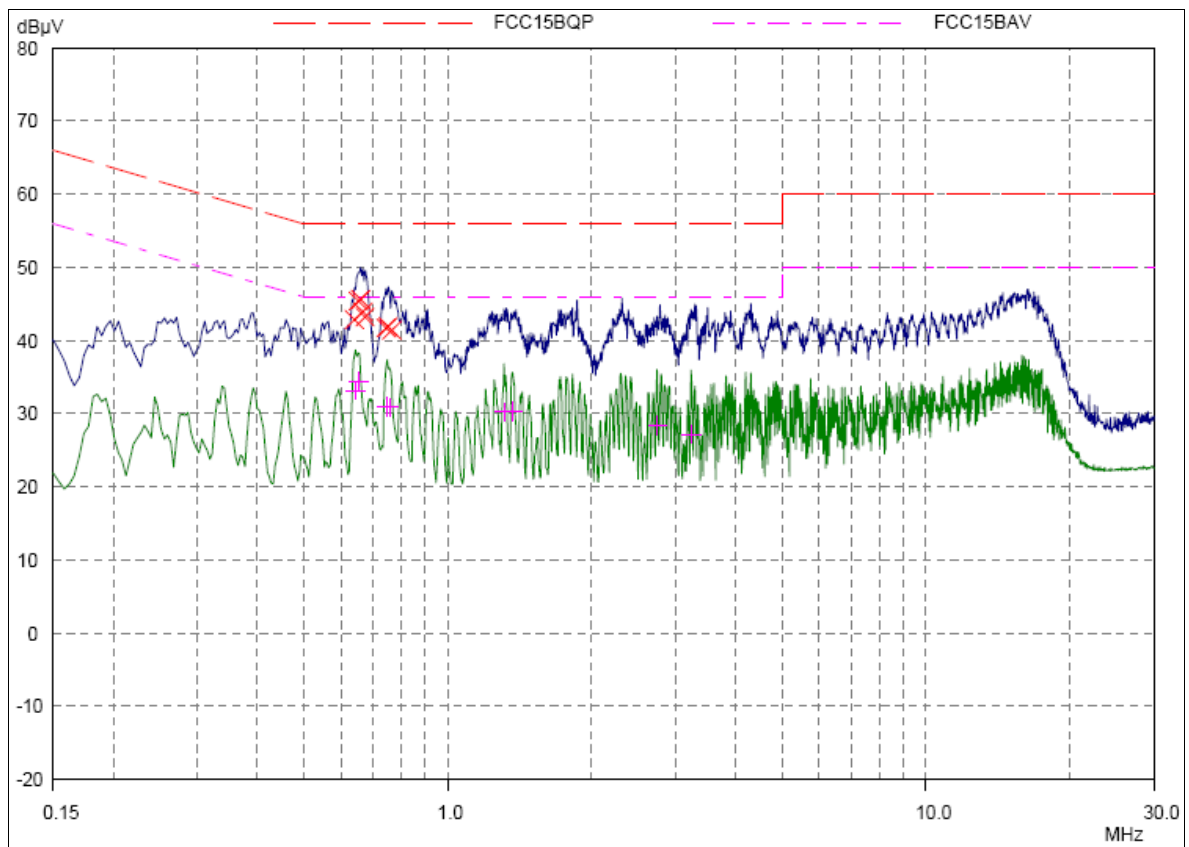
L line

Final Measurement Results				
Frequency MHz	QP Level dBμV	QP Limit dBμV	QP Delta dB	Phase -
0.6539	44.17	56.00	11.83	L1
0.66562	42.89	56.00	13.11	L1
0.75156	39.87	56.00	16.13	L1
0.77109	39.36	56.00	16.64	L1
2.23984	36.80	56.00	19.20	L1
3.33359	36.57	56.00	19.43	L1
16.16171	41.25	60.00	18.75	L1
16.29062	41.41	60.00	18.59	L1
Frequency MHz	AV Level dBμV	AV Limit dBμV	AV Delta dB	Phase -
0.54062	26.41	46.00	19.59	L1
0.64609	33.53	46.00	12.47	L1
0.75156	30.70	46.00	15.30	L1
0.75937	30.75	46.00	15.25	L1
1.29843	29.79	46.00	16.21	L1
2.35703	29.04	46.00	16.96	L1
2.82968	29.23	46.00	16.77	L1
3.26328	27.82	46.00	18.18	L1

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N line

Final Measurement Results				
Frequency MHz	QP Level dBμV	QP Limit dBμV	QP Delta dB	Phase -
0.63828	42.86	56.00	13.14	N
0.65	45.39	56.00	10.61	N
0.65781	45.61	56.00	10.39	N
0.66562	43.93	56.00	12.07	N
0.67343	43.23	56.00	12.77	N
0.74375	41.71	56.00	14.29	N
0.75156	41.91	56.00	14.09	N
0.76328	41.40	56.00	14.60	N
Frequency MHz	AV Level dBμV	AV Limit dBμV	AV Delta dB	Phase -
0.64218	33.15	46.00	12.85	N
0.65	34.39	46.00	11.61	N
0.74765	31.00	46.00	15.00	N
0.75546	30.93	46.00	15.07	N
1.31015	30.24	46.00	15.76	N
1.36875	30.39	46.00	15.61	N
2.74375	28.42	46.00	17.58	N
3.22812	27.21	46.00	18.79	N

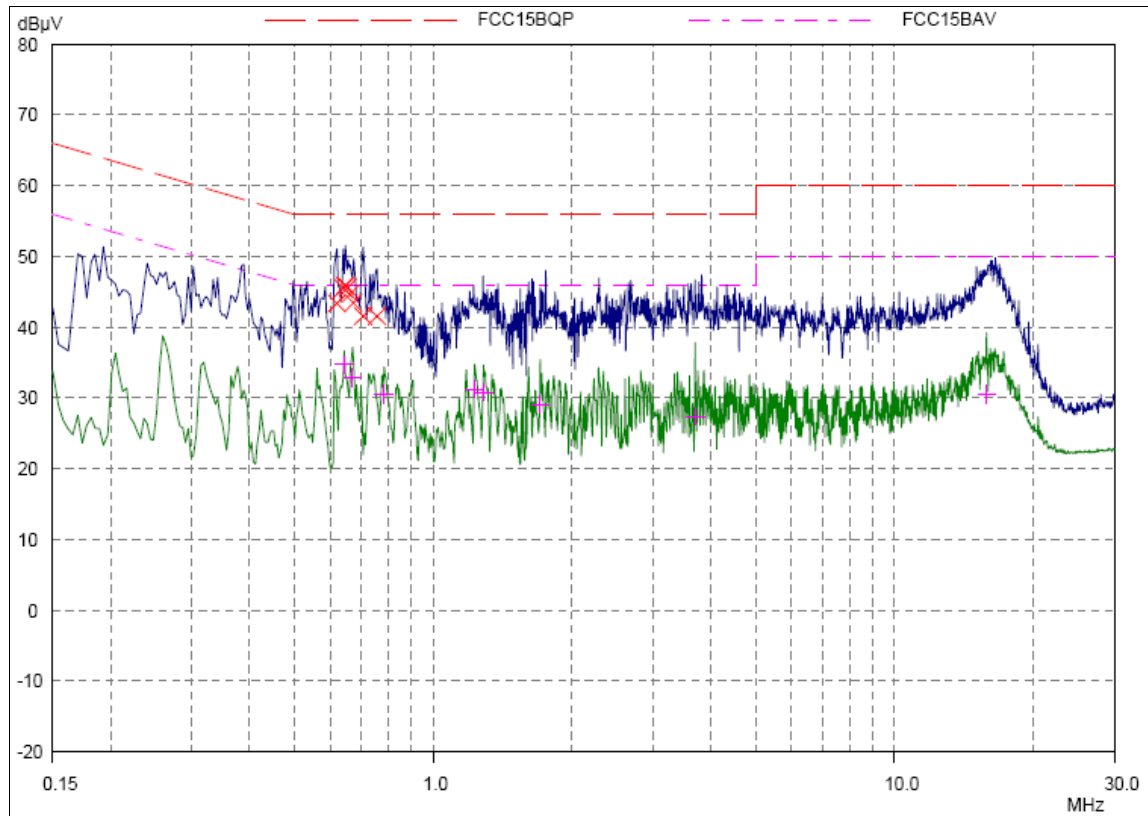
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Charger Mode



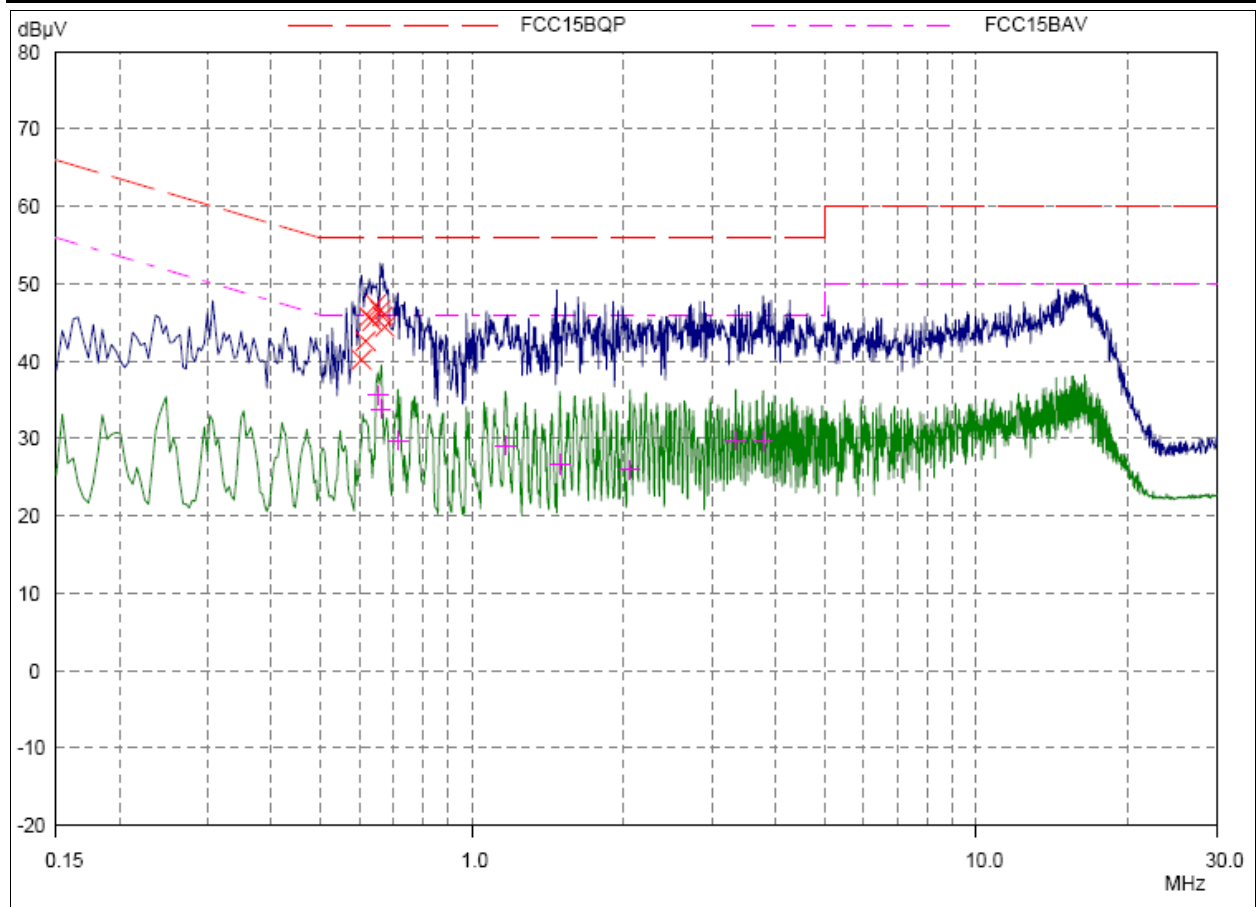
L line

Final Measurement Results				
Frequency MHz	QP Level dBμV	QP Limit dBμV	QP Delta dB	Phase -
0.61875	43.40	56.00	12.60	L1
0.63828	45.52	56.00	10.48	L1
0.64609	45.86	56.00	10.14	L1
0.6539	45.61	56.00	10.39	L1
0.66171	44.73	56.00	11.27	L1
0.67343	43.47	56.00	12.53	L1
0.70468	41.56	56.00	14.44	L1
0.75546	41.56	56.00	14.44	L1
Frequency MHz	AV Level dBμV	AV Limit dBμV	AV Delta dB	Phase -
0.64218	34.72	46.00	11.28	L1
0.66953	32.82	46.00	13.18	L1
0.78281	30.49	46.00	15.51	L1
1.23203	31.28	46.00	14.72	L1
1.28671	30.82	46.00	15.18	L1
1.70468	29.15	46.00	16.85	L1
3.69296	27.36	46.00	18.64	L1
15.83359	30.50	50.00	19.50	L1

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N line

Final Measurement Results				
Frequency MHz	QP Level dBμV	QP Limit dBμV	QP Delta dB	Phase -
0.60312	40.19	56.00	15.81	N
0.61484	42.61	56.00	13.39	N
0.62656	45.70	56.00	10.30	N
0.63437	45.22	56.00	10.78	N
0.64609	47.26	56.00	8.74	N
0.65781	46.57	56.00	9.43	N
0.66562	45.79	56.00	10.21	N
0.67343	44.43	56.00	11.57	N
Frequency MHz	AV Level dBμV	AV Limit dBμV	AV Delta dB	Phase -
0.65	35.57	46.00	10.43	N
0.66171	33.86	46.00	12.14	N
0.7125	29.76	46.00	16.24	N
1.16562	29.15	46.00	16.85	N
1.49375	26.63	46.00	19.37	N
2.06015	25.98	46.00	20.02	N
3.3414	29.74	46.00	16.26	N
3.7789	29.60	46.00	16.40	N

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3. Main Test Instruments

No.	Name	Type	Manufacturer	Serial Number	Calibration Date	Valid Period
01	EMI Test Receiver	ESCI	R&S	100948	2012-06-30	One year
02	Trilog Antenna	VULB 9163	SCHWARZB ECK	9163-201	2010-06-20	Three years
03	Signal Analyzer	FSV30	R&S	100815	2012-06-30	One year
04	Horn Antenna	HF907	R&S	100126	2012-07-01	Three years
05	EMI Test Receiver	ESCS30	R&S	100138	2012-01-16	One year
06	LISN	ENV216	R&S	101171	2010-04-16	Three years

*******END OF REPORT BODY*******