

TEST REPORT

Reference No...... : WTX24X04088249W
FCC ID..... : 2BDE5-G40PLUS
Applicant..... : GUANGZHOU GEOSURV INFORMATION TECHNOLOGY Co., Ltd
Address..... : Room C401 TOPS Beidou Base No 83 Kaiyuan Avenue Guangzhou 510700
China
Manufacturer..... : The same as Applicant
Address..... : The same as Applicant
Product Name..... : GNSS RECEIVER
Model No...... : G40Plus
Standards..... : **FCC PART15 SUBPART B**
Date of Receipt sample..... : 2024-04-18
Date of Test..... : 2024-04-18 to 2024-05-22
Date of Issue..... : 2024-05-22
Test Report Form No...... : WTX_FCC PART15B_001
Test Result..... : **Pass**

Remarks:

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of approver.

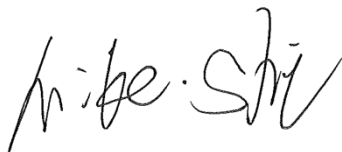
Prepared By:

Waltek Testing Group (Shenzhen) Co., Ltd.

Address: 1/F., Room 101, Building 1, Hongwei Industrial Park, Liuxian 2nd Road,
Block 70 Bao'an District, Shenzhen, Guangdong, China

Tel.: +86-755-33663308 Fax.: +86-755-33663309 Email: sem@waltek.com.cn

Tested by:



Mike Shi

Approved by:



Jason Su

TABLE OF CONTENTS

1. GENERAL INFORMATION 4

1.1 PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT) 4

1.2 TEST STANDARDS 5

1.3 TEST METHODOLOGY 5

1.4 TEST FACILITY 5

1.5 EUT SETUP AND OPERATION MODE 6

1.6 MEASUREMENT UNCERTAINTY 7

1.7 TEST EQUIPMENT LIST AND DETAILS 8

2. SUMMARY OF TEST RESULTS 10

3. CONDUCTED EMISSIONS 11

3.1 TEST PROCEDURE 11

3.2 BASIC TEST SETUP BLOCK DIAGRAM 11

3.3 ENVIRONMENTAL CONDITIONS 11

3.4 SUMMARY OF TEST RESULTS 11

4. RADIATED EMISSION 14

4.1 TEST PROCEDURE 14

4.2 BLOCK DIAGRAM OF TEST SETUP 14

4.3 TEST RECEIVER SETUP 14

4.4 CORRECTED AMPLITUDE & MARGIN CALCULATION 15

4.5 ENVIRONMENTAL CONDITIONS 15

4.6 SUMMARY OF TEST RESULTS 15

APPENDIX PHOTOGRAPHS 22

Report version

Version No.	Date of issue	Description
Rev.00	2024-05-22	Original
/	/	/

1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

General Description of EUT	
Product Name:	GNSS RECEIVER
Trade Name:	GINTEC
Model No.:	G40Plus
Adding Model(s):	G40Pro, F300, G50, G50Plus, G50Ultra
<p><i>Note: The test data is gathered from a production sample, provided by the manufacturer. The appearance of others models listed in the report is different from main-test model G40Plus, but the circuit and the electronic construction do not change, declared by the manufacturer.</i></p>	

Technical Characteristics of EUT	
Rated Voltage:	Battery:DC7.2V
Battery Capacity:	13600mAh
Rated Power:	/
Power Adapter Model:	/
Lowest Internal Frequency:	24MHz
Highest Internal Frequency:	2480MHz
Classification of ITE:	Class B

1.2 Test Standards

The tests were performed according to following standards:

FCC Rules Part 15 Subpart B: Unintentional Radiators.

ANSI C63.4-2014: American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product, which result in lowering the emission, should be checked to ensure compliance has been maintained.

1.3 Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2014, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

1.4 Test Facility

Address of the test laboratory

Laboratory: Waltek Testing Group (Shenzhen) Co., Ltd.

Address: 1/F., Room 101, Building 1, Hongwei Industrial Park, Liuxian 2nd Road, Block 70 Bao'an District, Shenzhen, Guangdong, China

FCC – Registration No.: 125990

Waltek Testing Group (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. The Designation Number is CN5010, and Test Firm Registration Number is 125990.

Industry Canada (IC) Registration No.: 11464A

The 3m Semi-anechoic chamber of Waltek Testing Group (Shenzhen) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 11464A.

1.5 EUT Setup and Operation Mode

The equipment under test (EUT) was configured to measure its highest possible emission. The test modes were adapted according to the operation manual for use, more detailed description as follows:

Test Mode List:

Test Mode	Description	Remark	Power Supply Mode
TM1	Charging And Normal working	Connect to the Adapter;	AC120V 60Hz for adapter
TM2	Downloading	Connect to the Notebook	Battery:DC7.2V

EUT Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
USB-C to USB-C Cable	1.5	Unshielded	Without Ferrite
USB-A to USB-C Cable	1.5	Unshielded	Without Ferrite
Five-core interface Cable	1.6	Unshielded	Without Ferrite

Auxiliary Equipment List and Details

Description	Manufacturer	Model	Serial Number
USB-A to USB-C Cable	1.0	Shielded	Without Ferrite

Special Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
Computer	Lenovo	L13 Yoga	/

1.6 Measurement Uncertainty

Measurement uncertainty		
Parameter	Conditions	Uncertainty
Conducted Emissions	Conducted	9-150kHz ± 3.74 dB
		0.15-30MHz ± 3.34 dB
Radiated Emissions	Radiated	30-200MHz ± 4.52 dB
		0.2-1GHz ± 5.56 dB
		1-6GHz ± 3.84 dB
		6-18GHz ± 3.92 dB

1.7 Test Equipment List and Details

Description	Manufacturer	Model	Serial No.	Cal Date	Due Date
<input type="checkbox"/> Chamber A:Below 1GHz					
Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2024-02-24	2025-02-23
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2024-03-19	2025-03-18
Amplifier	HP	8447F	2805A03475	2024-02-24	2025-02-23
Loop Antenna	Schwarz beck	FMZB 1516	9773	2024-02-26	2025-02-25
Trilog Broadband Antenna	Schwarz beck	VULB9163	9163-333	2024-02-24	2025-02-23
<input type="checkbox"/> Chamber A:Above 1GHz					
Amplifier	C&D	PAP-1G18	2002	2024-02-27	2025-02-26
Horn Antenna	ETS	3117	00086197	2024-02-26	2025-02-25
<input type="checkbox"/> Chamber B:Below 1GHz					
EMI Test Receiver	Rohde & Schwarz	ESPI	101391	2024-02-24	2025-02-23
Trilog Broadband Antenna	Schwarz beck	VULB9163(B)	9163-635	2024-03-17	2027-03-16
Amplifier	Agilent	8447D	2944A10457	2024-02-24	2025-02-23
<input checked="" type="checkbox"/> Chamber C:Below 1GHz					
EMI Test Receiver	Rohde & Schwarz	ESIB 26	100401	2024-02-27	2025-02-26
Trilog Broadband Antenna	Schwarz beck	VULB 9168	1194	2024-04-18	2027-04-17
Loop Antenna	Schwarz beck	FMZB 1516	9773	2024-02-26	2025-02-25
Amplifier	HP	8447F	2944A03869	2024-02-24	2025-02-23
<input checked="" type="checkbox"/> Chamber C:Above 1GHz					
EMI Test Receiver	Rohde & Schwarz	ESIB 26	100401	2024-02-27	2025-02-26
Horn Antenna	POAM	RTF-118A	1820	2023-03-10	2026-03-09
Amplifier	Tonscend	TAP010180 50	AP22E80623 5	2024-02-27	2025-02-26
DRG Horn Antenna	A.H. SYSTEMS	SAS-574	571	2024-03-17	2025-03-16
Pre-amplifier	Schwarzbeck	BBV 9721	9721-031	2024-02-29	2025-02-28
<input type="checkbox"/> Conducted Room 1#					
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2024-02-24	2025-02-23
EMI Test Receiver	Rohde & Schwarz	ESCI	100525	2023-12-12	2024-12-11

Reference No.: WTX24X04088249W

AC LISN	Schwarz beck	NSLK8126	8126-279	2024-02-24	2025-02-23
<input checked="" type="checkbox"/> Conducted Room 2#					
EMI Test Receiver	Rohde & Schwarz	ESPI	101259	2024-02-24	2025-02-23
LISN	Rohde & Schwarz	ENV 216	100097	2024-02-24	2025-02-23

Software List			
Description	Manufacturer	Model	Version
EMI Test Software (Radiated Emission)*	Farad	EZ-EMC	RA-03A1
EMI Test Software (Conducted Emission Room 1#)*	Farad	EZ-EMC	RA-03A1
EMI Test Software (Conducted Emission Room 2#)*	SKET	EMC-I	V2.0

*Remark: indicates software version used in the compliance certification testing.

2. SUMMARY OF TEST RESULTS

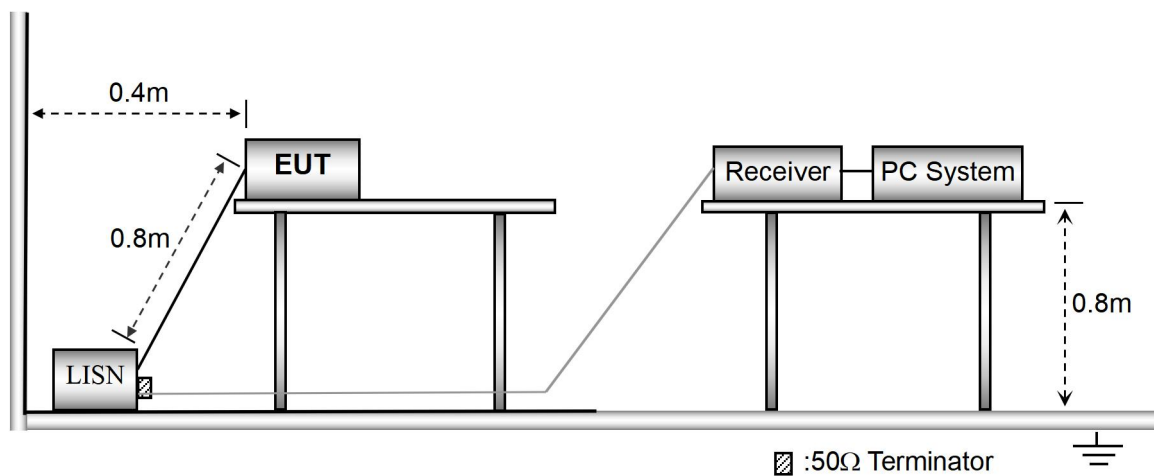
Description of Test	Result
§15.107(a) Conducted Emission	Compliant
§15.109(a) Radiated Emission	Compliant

3. Conducted Emissions

3.1 Test Procedure

Test is conducting under the description of ANSI C63.4-2014, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

3.2 Basic Test Setup Block Diagram



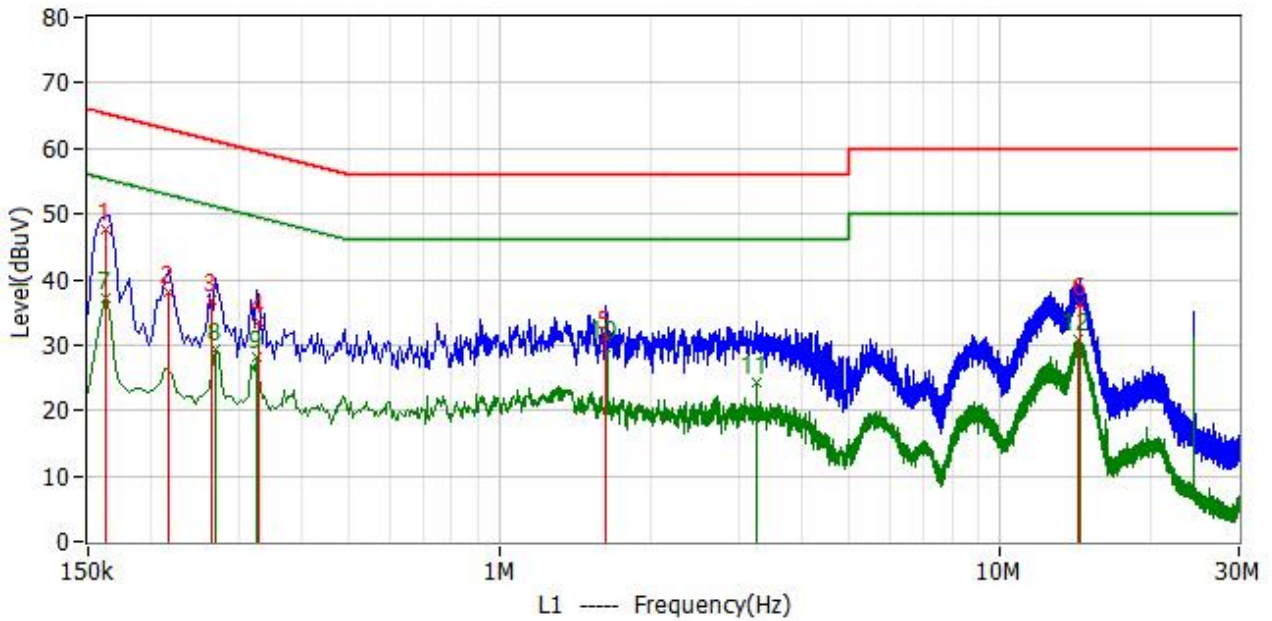
3.3 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	45%
ATM Pressure:	1011 mbar

3.4 Summary of Test Results

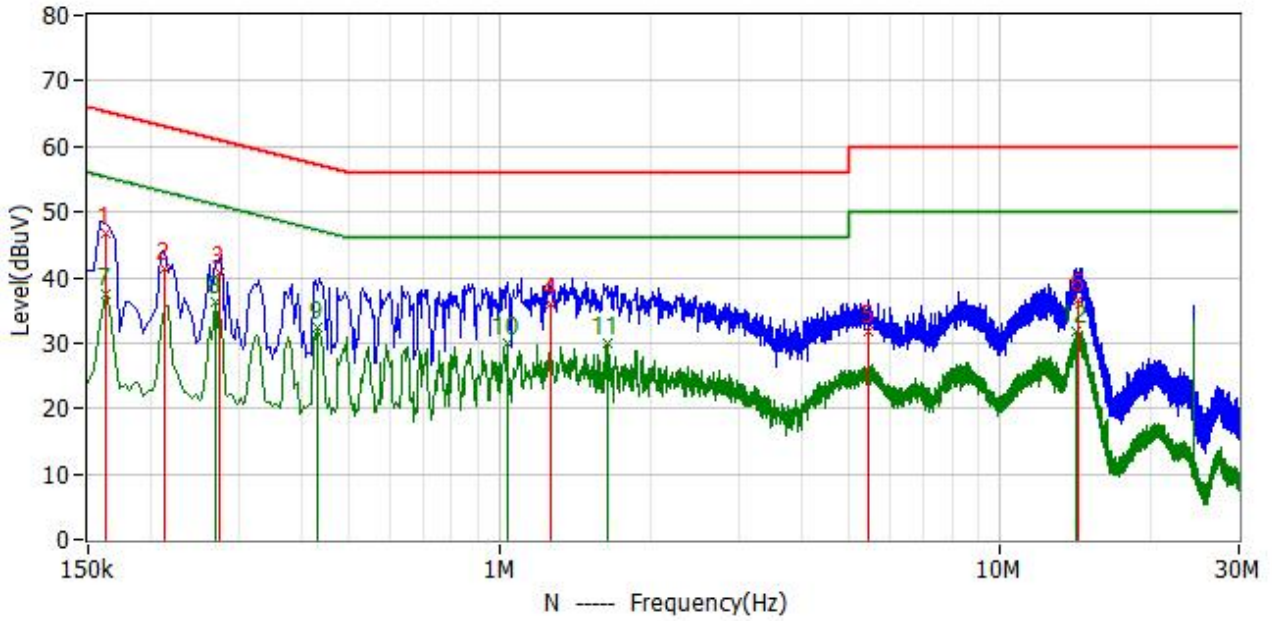
Look at the graphs and data below:

Test mode:	TM1	Polarity:	Line
------------	-----	-----------	------



No.	Frequency	Reading dBuV	Factor dB	Level dBuV	Limit dBuV	Delta dB	Detector
1	162.000kHz	37.6	9.9	47.5	65.4	-17.9	QP
2	218.000kHz	28.5	9.7	38.2	62.9	-24.7	QP
3	266.000kHz	26.8	10.0	36.8	61.2	-24.5	QP
4	330.000kHz	23.6	10.1	33.7	59.5	-25.8	QP
5	1.630MHz	21.5	9.8	31.3	56.0	-24.7	QP
6	14.386MHz	26.5	9.7	36.2	60.0	-23.8	QP
7*	162.000kHz	27.2	9.9	37.1	55.4	-18.3	AV
8*	270.000kHz	19.4	10.0	29.4	51.1	-21.7	AV
9*	326.000kHz	18.0	10.1	28.1	49.6	-21.4	AV
10*	1.630MHz	19.8	9.8	29.6	46.0	-16.4	AV
11*	3.262MHz	14.3	9.9	24.2	46.0	-21.8	AV
12*	14.370MHz	21.1	9.7	30.8	50.0	-19.2	AV

Test mode:	TM1	Polarity:	Neutral
------------	-----	-----------	---------



No.	Frequency	Reading dBuV	Factor dB	Level dBuV	Limit dBuV	Delta dB	Detector
1	162.000kHz	36.9	9.7	46.6	65.4	-18.8	QP
2	214.000kHz	31.5	9.8	41.3	63.0	-21.7	QP
3	274.000kHz	30.8	9.9	40.7	61.0	-20.3	QP
4	1.262MHz	26.4	9.7	36.1	56.0	-19.9	QP
5	5.458MHz	22.0	9.8	31.8	60.0	-28.2	QP
6	14.266MHz	27.0	9.7	36.7	60.0	-23.3	QP
7*	162.000kHz	27.7	9.7	37.4	55.4	-18.0	AV
8*	270.000kHz	26.4	9.9	36.3	51.1	-14.8	AV
9*	430.000kHz	22.7	9.8	32.5	47.3	-14.8	AV
10*	1.034MHz	20.2	9.7	29.9	46.0	-16.1	AV
11*	1.634MHz	20.4	9.7	30.1	46.0	-15.9	AV
12*	14.198MHz	22.2	9.7	31.9	50.0	-18.1	AV

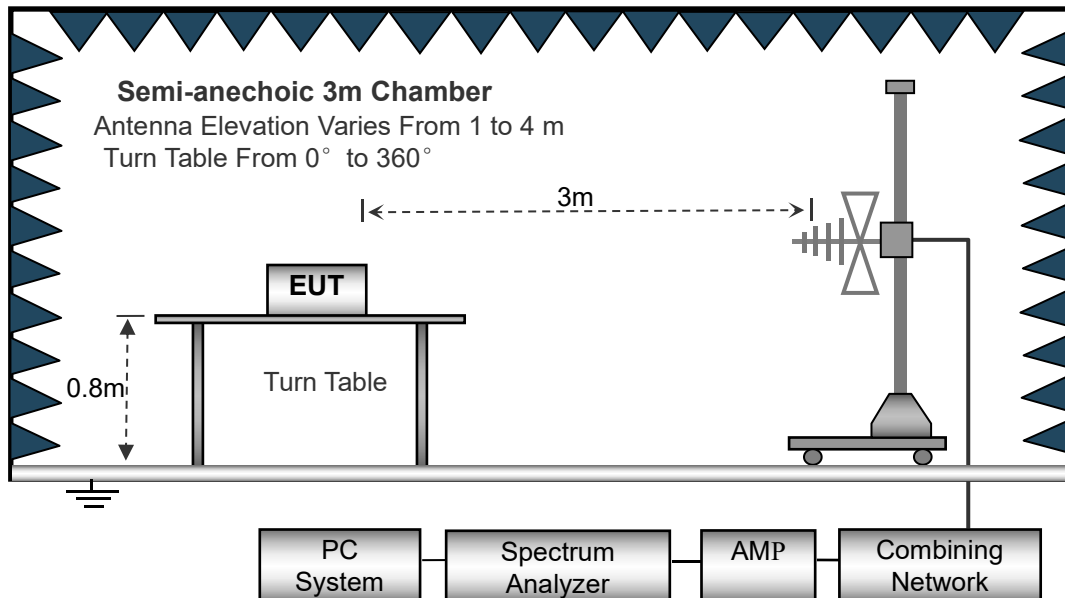
4. RADIATED EMISSION

4.1 Test Procedure

The setup of EUT is according with per ANSI C63.4-2014 measurement procedure. The specification used was with the FCC Part 15.109 Limit.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle. The spacing between the peripherals was 10 cm.

4.2 Block Diagram of Test Setup



4.3 Test Receiver Setup

Frequency :9kHz-30MHz

RBW=10KHz,

VBW =30KHz

Sweep time= Auto

Trace = max hold

Detector function = peak

Frequency :30MHz-1GHz

RBW=120KHz,

VBW=300KHz

Sweep time= Auto

Trace = max hold

Detector function = peak, QP

Frequency :Above 1GHz

RBW=1MHz,

VBW=3MHz(Peak), 10Hz(AV)

Sweep time= Auto

Trace = max hold

Detector function = peak, AV

4.4 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and the Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\begin{aligned} \text{Corr. Ampl.} &= \text{Indicated Reading} + \text{Correct} \\ \text{Correct} &= \text{Ant. Factor} + \text{Cable Loss} - \text{Ampl. Gain} \end{aligned}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -6dB μ V means the emission is 6dB μ V below the maximum limit for a Class B device. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{FCC Part 15.109(a) Limit}$$

4.5 Environmental Conditions

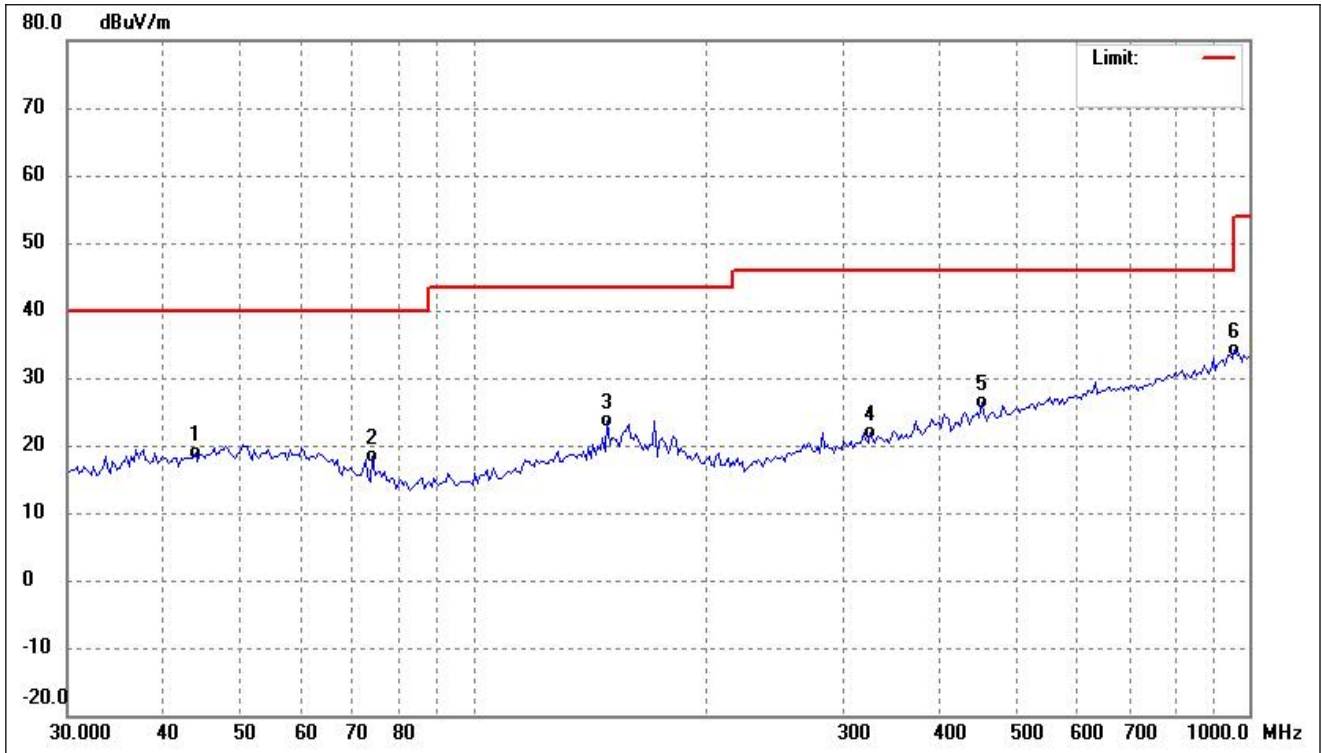
Temperature:	22.5 °C
Relative Humidity:	54 %
ATM Pressure:	1011 mbar

4.6 Summary of Test Results

Look at the graphs and data below:

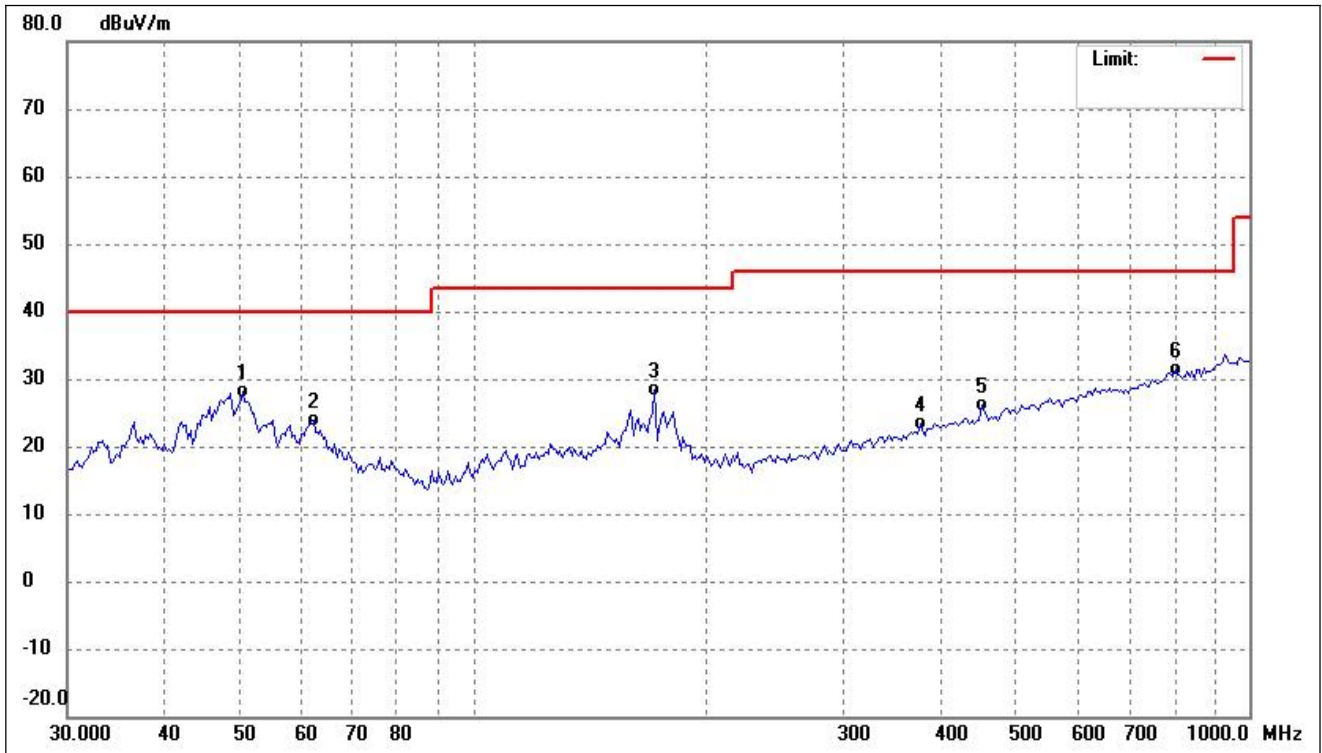
➤ Below 1GHz

Test mode:	TM1	Polarity:	Horizontal
------------	-----	-----------	------------



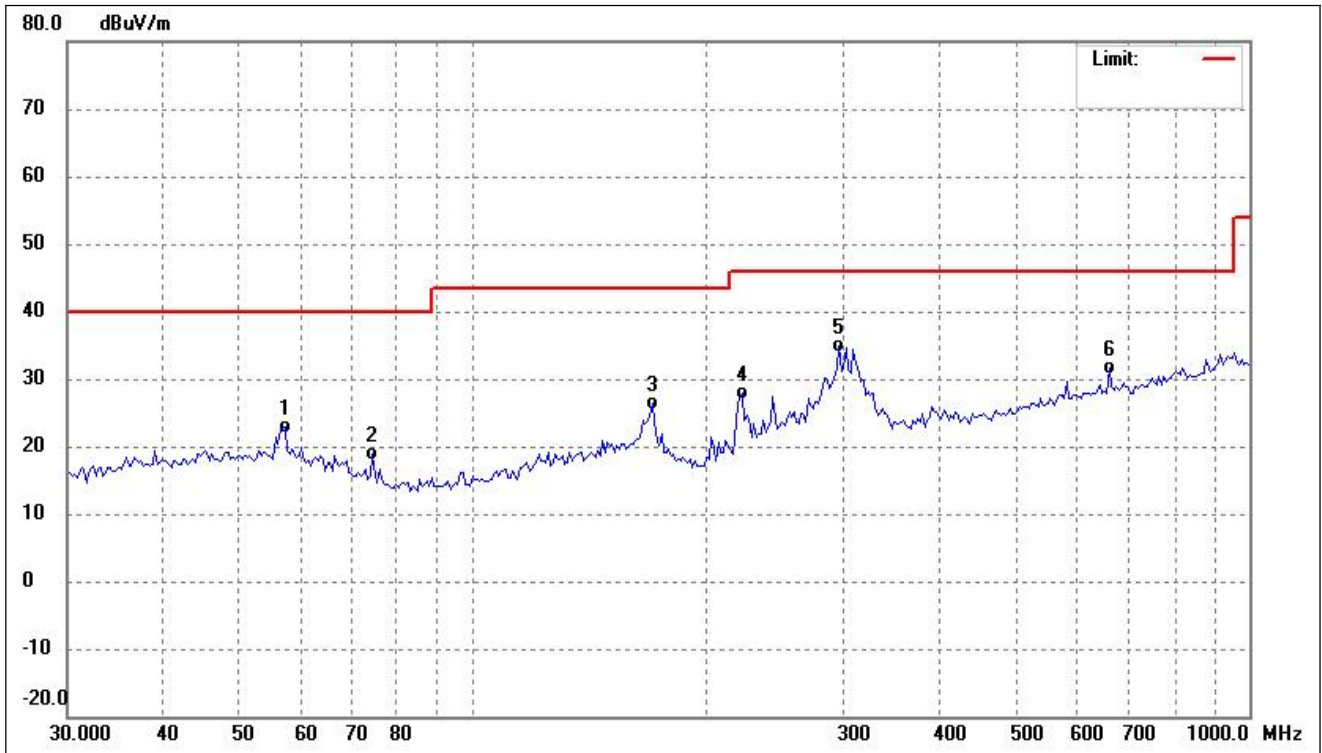
No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	43.8452	27.38	-8.48	18.90	40.00	-21.10	-	-	QP
2	74.2696	30.00	-11.70	18.30	40.00	-21.70	-	-	QP
3	148.9175	32.40	-8.68	23.72	43.50	-19.78	-	-	QP
4	324.8645	29.48	-7.55	21.93	46.00	-24.07	-	-	QP
5	452.0013	30.82	-4.56	26.26	46.00	-19.74	-	-	QP
6	958.7135	31.76	2.26	34.02	46.00	-11.98	-	-	QP

Test mode:	TM1	Polarity:	Vertical
------------	-----	-----------	----------



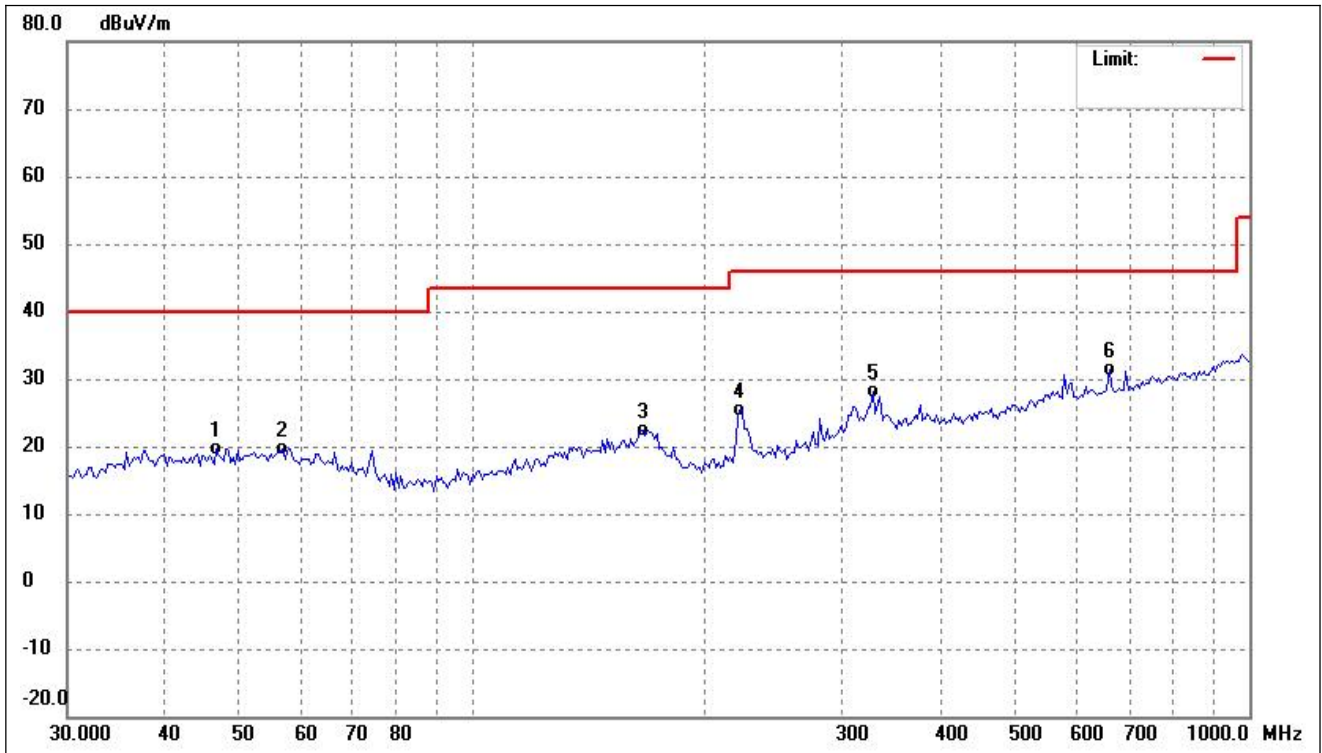
No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	50.4614	36.16	-8.14	28.02	40.00	-11.98	-	-	QP
2	62.3038	33.19	-9.35	23.84	40.00	-16.16	-	-	QP
3	171.3890	37.44	-9.08	28.36	43.50	-15.14	-	-	QP
4	376.5227	29.70	-6.44	23.26	46.00	-22.74	-	-	QP
5	452.0013	30.77	-4.56	26.21	46.00	-19.79	-	-	QP
6	804.2523	31.08	0.34	31.42	46.00	-14.58	-	-	QP

Test mode:	TM2	Polarity:	Horizontal
------------	-----	-----------	------------



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	57.2654	31.76	-8.77	22.99	40.00	-17.01	-	-	QP
2	74.2696	30.57	-11.70	18.87	40.00	-21.13	-	-	QP
3	170.1888	35.29	-8.91	26.38	43.50	-17.12	-	-	QP
4	222.2807	39.83	-11.97	27.86	46.00	-18.14	-	-	QP
5	296.5023	43.20	-8.38	34.82	46.00	-11.18	-	-	QP
6	660.6025	32.87	-1.28	31.59	46.00	-14.41	-	-	QP

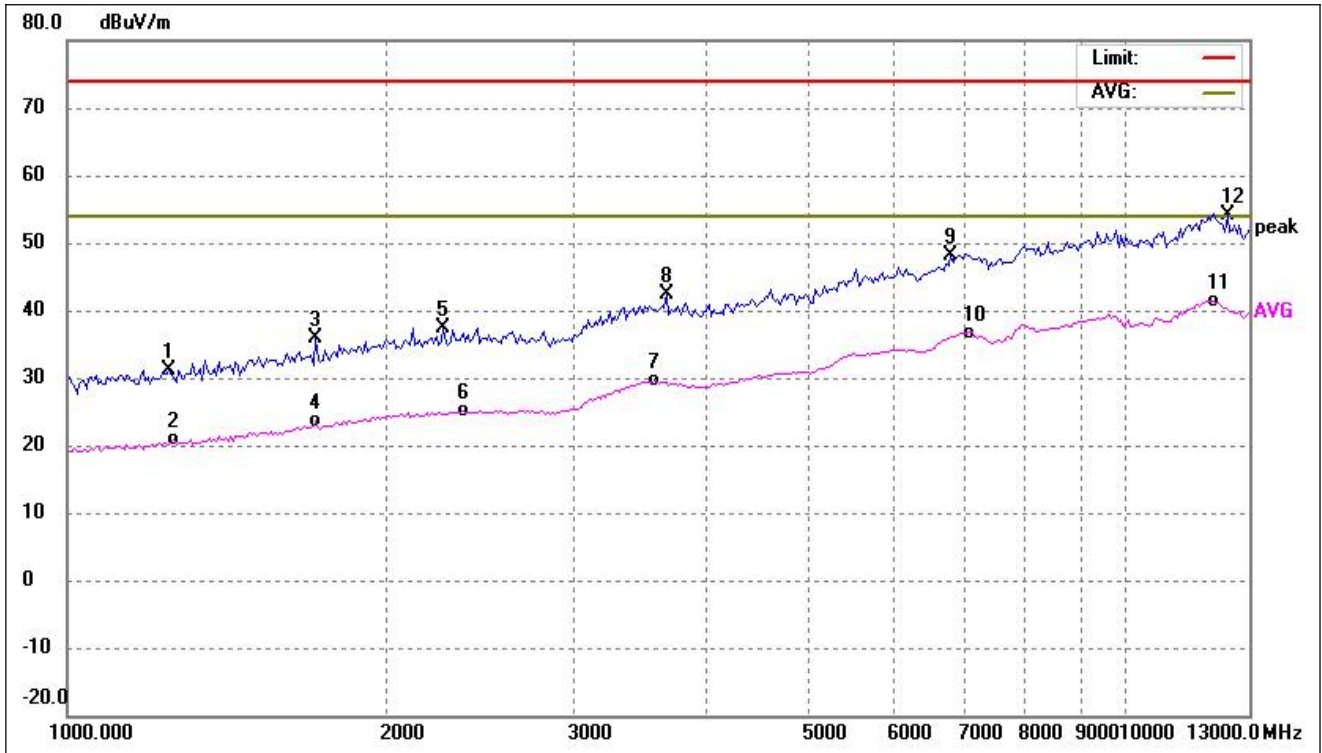
Test mode:	TM2	Polarity:	Vertical
------------	-----	-----------	----------



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	46.7077	27.94	-8.34	19.60	40.00	-20.40	-	-	QP
2	56.8644	28.45	-8.75	19.70	40.00	-20.30	-	-	QP
3	165.4716	31.14	-8.76	22.38	43.50	-21.12	-	-	QP
4	220.7241	37.47	-12.04	25.43	46.00	-20.57	-	-	QP
5	327.1554	35.76	-7.51	28.25	46.00	-17.75	-	-	QP
6	660.6025	32.65	-1.28	31.37	46.00	-14.63	-	-	QP

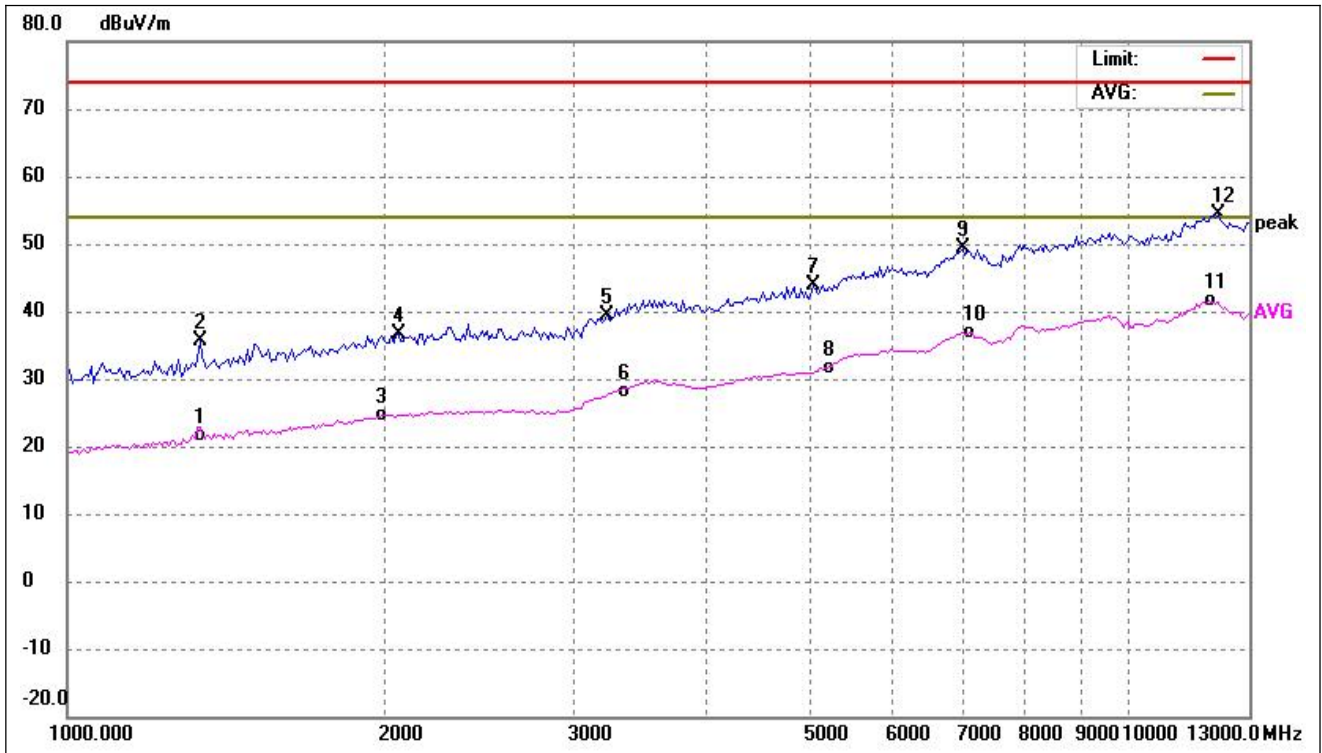
➤ Above 1GHz

Test mode:	TM1(worst case)	Polarity:	Horizontal
------------	-----------------	-----------	------------



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	1247.358	54.66	-23.54	31.12	74.00	-42.88	-	-	peak
2	1260.247	44.27	-23.49	20.78	54.00	-33.22	-	-	AVG
3	1715.524	57.10	-21.31	35.79	74.00	-38.21	-	-	peak
4	1715.524	45.04	-21.31	23.73	54.00	-30.27	-	-	AVG
5	2264.352	56.56	-19.12	37.44	74.00	-36.56	-	-	peak
6	2359.406	44.06	-18.92	25.14	54.00	-28.86	-	-	AVG
7	3577.858	43.82	-14.29	29.53	54.00	-24.47	-	-	AVG
8	3671.004	56.82	-14.39	42.43	74.00	-31.57	-	-	peak
9	6802.477	54.81	-6.66	48.15	74.00	-25.85	-	-	peak
10	6979.573	42.53	-5.79	36.74	54.00	-17.26	-	-	AVG
11	11973.627	41.16	0.19	41.35	54.00	-12.65	-	-	AVG
12	12412.298	55.33	-1.22	54.11	74.00	-19.89	-	-	peak

Test mode:	TM1(worst case)	Polarity:	Vertical
------------	-----------------	-----------	----------



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	1313.151	44.79	-23.27	21.52	54.00	-32.48	-	-	AVG
2	1333.557	58.87	-23.19	35.68	74.00	-38.32	-	-	peak
3	1981.083	44.48	-19.74	24.74	54.00	-29.26	-	-	AVG
4	2053.663	56.17	-19.52	36.65	74.00	-37.35	-	-	peak
5	3228.317	55.32	-16.06	39.26	74.00	-34.74	-	-	peak
6	3278.485	43.90	-15.72	28.18	54.00	-25.82	-	-	AVG
7	5048.829	56.10	-12.15	43.95	74.00	-30.05	-	-	peak
8	5180.271	43.16	-11.50	31.66	54.00	-22.34	-	-	AVG
9	6979.573	55.07	-5.79	49.28	74.00	-24.72	-	-	peak
10	7088.035	42.86	-5.92	36.94	54.00	-17.06	-	-	AVG
11	11912.238	41.45	0.06	41.51	54.00	-12.49	-	-	AVG
12	12159.698	54.63	-0.32	54.31	74.00	-19.69	-	-	peak

Remark: '-Means' the test Degree and Height are not recorded by the test software and only show the worst case in the test report.

Reference No.: WTX24X04088249W

APPENDIX PHOTOGRAPHS

Please refer to "ANNEX"

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