

FCC PART 15B


MEASUREMENT AND TEST REPORT

FOR

Hi Target Survey Instruments Company Ltd.

**10th Floor, Chuangxin Building, Tian'an Technology Zone, No.730 Yingbin
Road, Panyu District, Guangzhou City, China**

FCC ID: XXHGIS001

Report Concerns: Original Report	Equipment Type: GIS Handheld
Model:	<u>Q Series</u>
Report No.:	<u>STR09118026I-2</u>
Test/Witness Engineer:	<u>Susan Su</u>
Test Date:	<u>2009-11-09 to 2009-11-23</u>
Issue Date:	<u>2009-11-25</u>
Prepared By:	SEM.Test Compliance Service Co., Ltd. 3/F, Jinbao Commerce Building, Xin'an Fanshen Road, Bao'an District, Shenzhen, P.R.C. (518101)
Approved & Authorized By:	 _____ Jandy So / PSQ Manager

Note: This test report is limited to the above client company and the product model only. It may not be duplicated without prior permitted by SEM.Test Compliance Service Co., Ltd.

TABLE OF CONTENTS

1. GENERAL INFORMATION.....	3
1.1 PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT).....	3
1.2 TEST STANDARDS.....	3
1.3 RELATED SUBMITTAL(S)/GRANT(S)	3
1.4 TEST METHODOLOGY	3
1.5 TEST FACILITY	4
1.6 EUT EXERCISE SOFTWARE	4
1.7 ACCESSORIES EQUIPMENT LIST AND DETAILS	4
1.8 EUT CABLE LIST AND DETAILS	4
2. SUMMARY OF TEST RESULTS	5
3. §15.107 (A)- CONDUCTED EMISSION	6
3.1 MEASUREMENT UNCERTAINTY	6
3.2 TEST EQUIPMENT LIST AND DETAILS	6
3.3 TEST PROCEDURE.....	6
3.4 BASIC TEST SETUP BLOCK DIAGRAM.....	6
3.5 ENVIRONMENTAL CONDITIONS	7
3.6 TEST RECEIVER SETUP	7
3.7 SUMMARY OF TEST RESULTS/PLOTS	7
3.8 CONDUCTED EMISSIONS TEST DATA.....	7
4. §15.109(A)- RADIATED EMISSION	10
4.1 MEASUREMENT UNCERTAINTY	10
4.2 TEST EQUIPMENT LIST AND DETAILS	10
4.3 TEST PROCEDURE.....	10
4.4 TEST RECEIVER SETUP	11
4.5 CORRECTED AMPLITUDE & MARGIN CALCULATION.....	11
4.6 ENVIRONMENTAL CONDITIONS	11
4.7 SUMMARY OF TEST RESULTS/PLOTS	11

1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant: Hi Target Survey Instruments Company Ltd.
Address of applicant: 10th Floor, Chuangxin Building, Tian'an Technology Zone,
No.730 Yingbin Road, Panyu District, Guangzhou City,
China

Manufacturer: Hi Target Survey Instruments Company Ltd.
Address of manufacturer: 10th Floor, Chuangxin Building, Tian'an Technology Zone,
No.730 Yingbin Road, Panyu District, Guangzhou City,
China

General Description of E.U.T

Items	Description
EUT Description:	GIS Handheld
Trade Name:	/
Model No.:	Q Series
Rated Voltage:	DC 9V
Packaging Size:	9.5X5.5X3.2 cm
For more information refer to the circuit diagram form and the user's manual.	

The test data is gathered from a production sample, provided by the manufacturer.

1.2 Test Standards

The following report is prepared on behalf of the Hi Target Survey Instruments Company Ltd. in accordance with Part 2, Subpart J, and Part 15, Subparts A and B of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC Part 15.107, and 15.109 rules.

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

1.3 Related Submittal(s)/Grant(s)

No Related Submittal(s).

1.4 Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2003, 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.

The equipment under test (EUT) was configured to measure its highest possible susceptibility against the tested phenomena. The test modes were adapted accordingly in reference to the Operating Instructions.

1.5 Test Facility

FCC – Registration No.: **994117**

SEM.Test Compliance Services 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 and the Registration is 994117.

Industry Canada (IC) Registration No.: **7673A**

The 3m Semi-anechoic chamber of SEM.Test Compliance Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 7673A.

1.6 EUT Exercise Software

The EUT exercise program used during radiated and conducted testing was designed to exercise the system components. The test software, provided by the customer, is started while the EUT is on to simulate the normal work. under the Windows XP terminal.

1.7 Accessories Equipment List and Details

Manufacturer	Description	Model	Serial Number
IBM	Notebook	T22	LV14893
TP-LINK	Modem	TM-EC5658V	KT99CTQC-508
Lenovo	Printer	3110	OD65133711480

1.8 EUT Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
USB&COM Signal Cable	1.6	Unshielded	Without Core
DC Power Cable	0.9	Unshielded	Without Core
AC Power Cable	1.4	Unshielded	Without Core

2. SUMMARY OF TEST RESULTS

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

3. §15.107 (a)- CONDUCTED EMISSION

3.1 Measurement Uncertainty

Base on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement is ± 1.5 dB.

3.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2009-08-12	2010-08-11
L.I.S.N	Schwarz beck	NSLK8126	8126-224	2009-08-12	2010-08-11
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2009-08-12	2010-08-11
AMN	Rohde & Schwarz	ESH3-Z5	828304/014	2009-08-12	2010-08-11

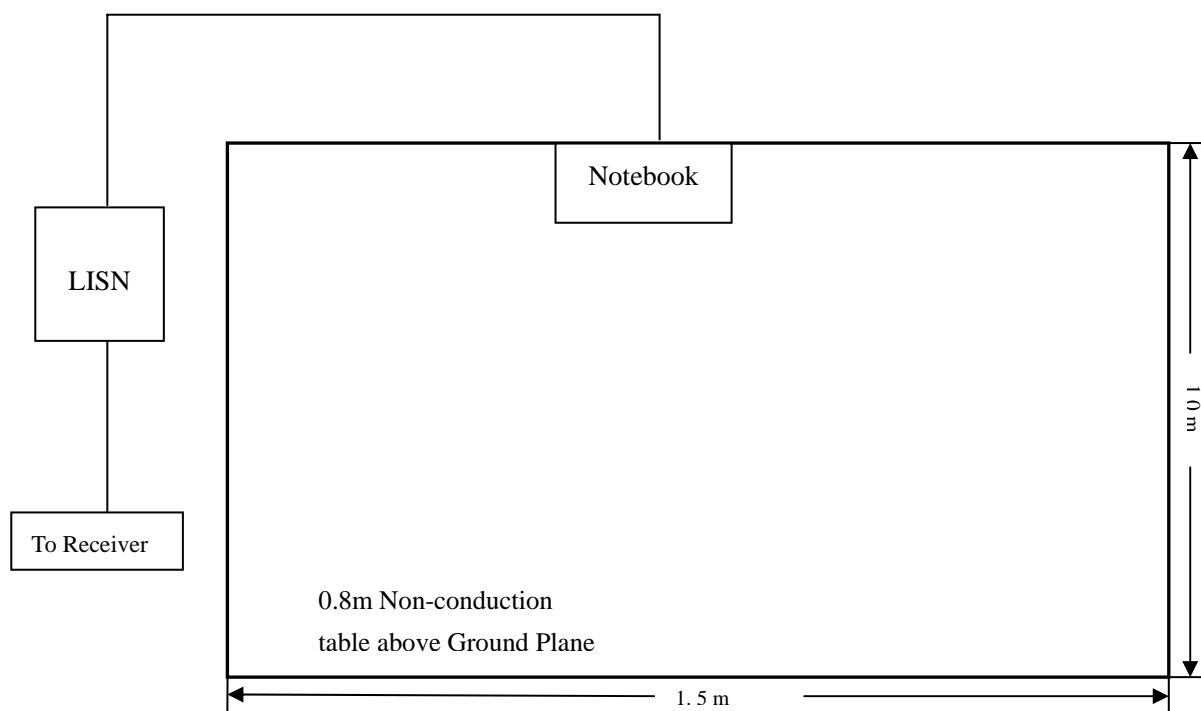
3.3 Test Procedure

The setup of EUT is according with per ANSI C63.4-2003 measurement procedure. The specification used was with the FCC Part 15.107 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.

3.4 Basic Test Setup Block Diagram



3.5 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	52%
ATM Pressure:	1012 mbar

3.6 Test Receiver Setup

During the conducted emission test, the test receiver was set with the following configurations:

Start Frequency 150 kHz
 Stop Frequency..... 30 MHz
 Sweep Speed Auto
 IF Bandwidth..... 10 kHz
 Quasi-Peak Adapter Bandwidth 9 kHz
 Quasi-Peak Adapter Mode Normal

3.7 Summary of Test Results/Plots

According to the data in section 3.8, the EUT complied with the FCC 15B Conducted margin for a Class B device, with the *worst* margin reading of:

-3.86 dB μ V at 3.998 MHz in the Line, Ave detector, 0.15-30MHz

3.8 Conducted Emissions Test Data

LINE CONDUCTED EMISSIONS				FCC 15 CLASS B	
Frequency	Amplitude	Detector	Phase	Limit	Margin
MHz	dB μ V	QP/Ave/Pk	Line/Neutral	dB μ V	dB
3.998	42.13	Ave	Line	45.99	-3.86
3.690	39.62	Ave	Neutral	45.99	-6.37
3.518	49.61	Pk	Line	55.99	-6.38
21.070	43.01	Ave	Line	49.99	-6.98
0.154	58.77	Pk	Neutral	65.77	-7.00
21.070	51.62	Pk	Line	59.99	-8.37
3.690	47.52	Pk	Neutral	55.99	-8.47
0.154	56.68	Pk	Line	65.78	-9.10
5.186	40.72	Ave	Line	49.99	-9.27
21.486	50.40	Pk	Neutral	59.99	-9.59
0.182	43.91	Ave	Neutral	54.38	-10.47
0.406	36.64	Ave	Line	47.73	-11.09
5.286	48.07	Pk	Line	60.00	-11.93
21.158	38.05	Ave	Neutral	49.99	-11.94
5.406	46.44	Pk	Neutral	59.99	-13.55

Plot of Conducted Emissions Test Data

Conducted Disturbance

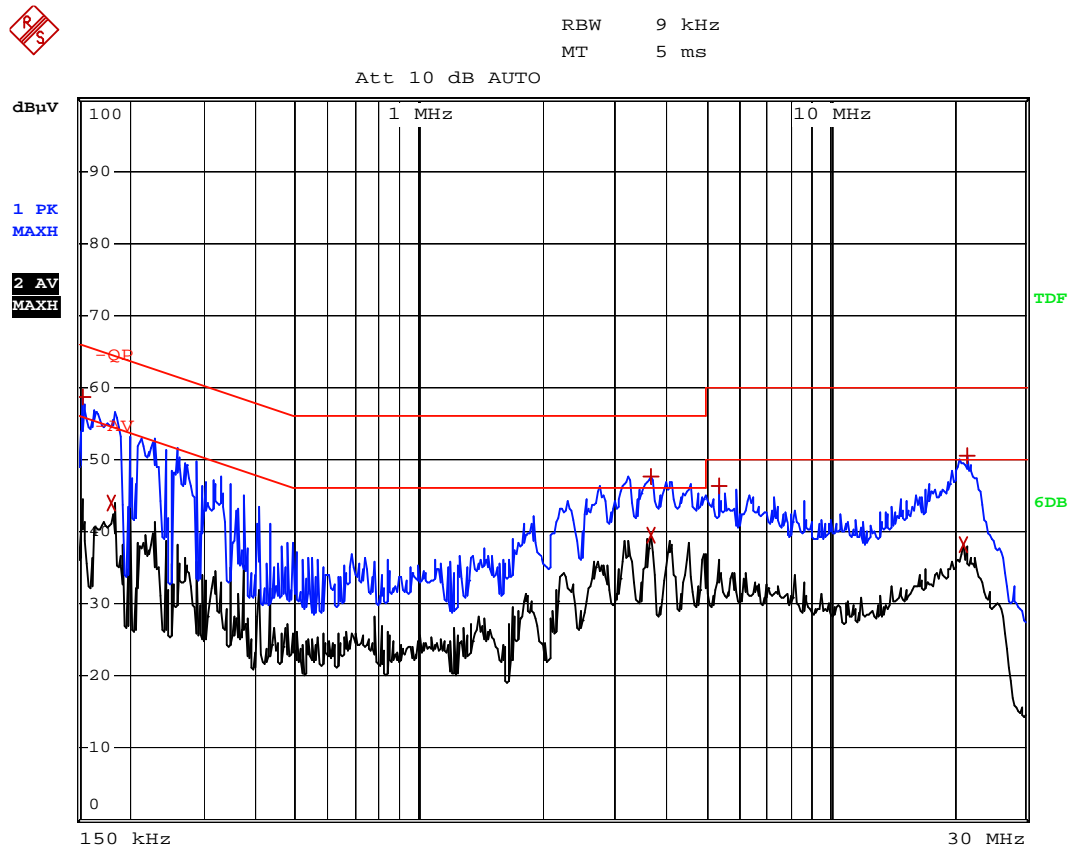
EUT: GIS Handheld

M/N: Q Series

Operating Condition: Charging

Test Specification: N

Comment: AC 120V/60Hz



Plot of Conducted Emissions Test Data

Conducted Disturbance

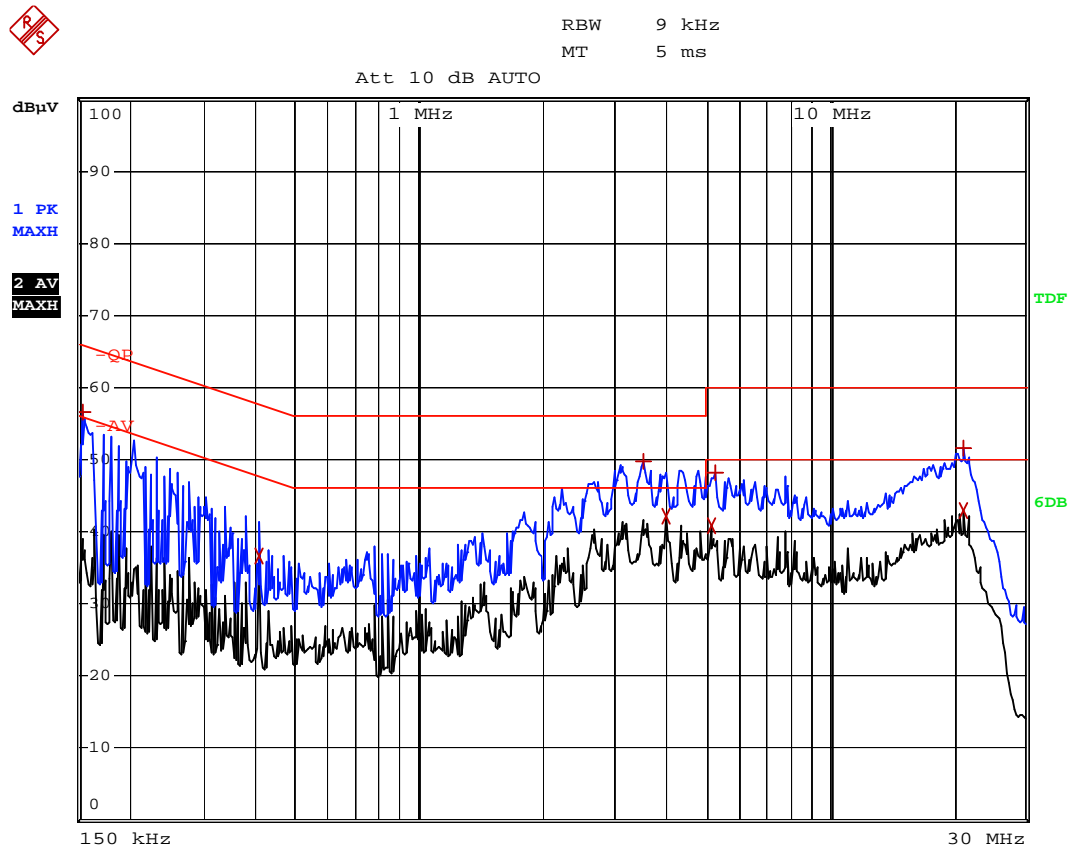
EUT: GIS Handheld

M/N: Q Series

Operating Condition: Charging

Test Specification: L

Comment: AC 120V/60Hz



4. §15.109(a)- RADIATED EMISSION

4.1 Measurement Uncertainty

Base on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any radiation emissions measurement is ± 3.0 dB.

4.2 Test Equipment List and Details

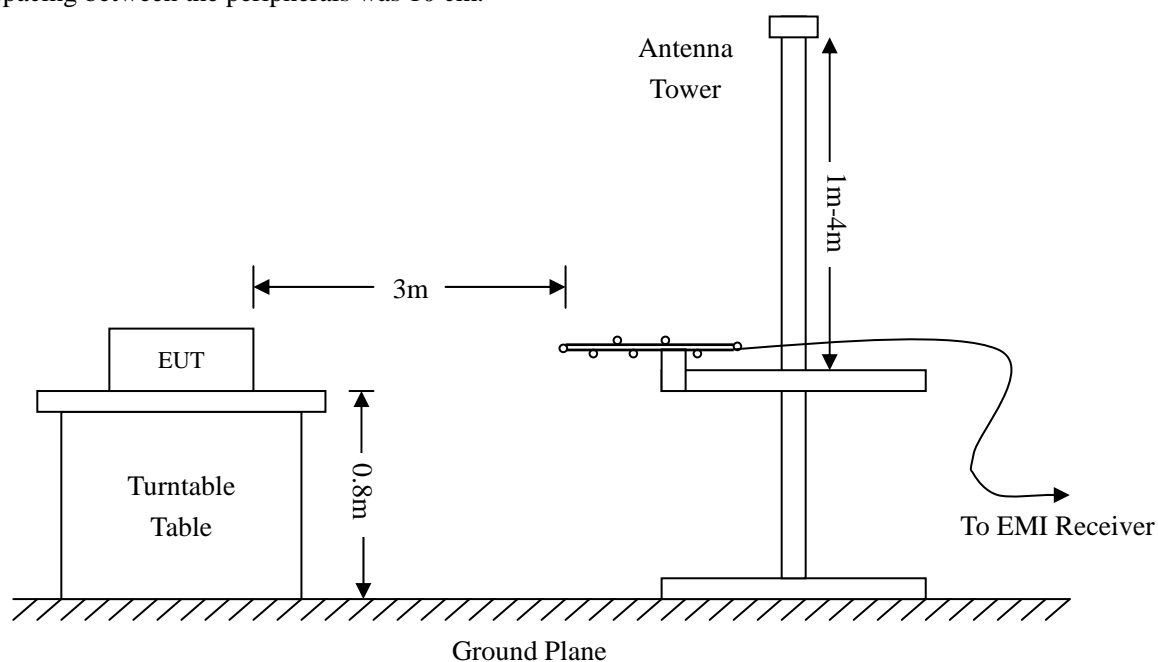
Manufacturer	Description	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	ROHDE&SCHWARZ	FSEA20	DE25181	2009-08-12	2010-08-11
Positioning Controller	C&C	CC-C-1F	N/A	2009-08-12	2010-08-11
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2009-07-21	2010-07-20
Horn Antenna	SCHWARZBECK	BBHX 9120	9120-426	2009-07-21	2010-07-20
RF Switch	EM	EMSW18	SW060023	2009-08-12	2010-08-11
Amplifier	Agilent	8447F	3113A06717	2009-08-12	2010-08-11
Coaxial Cable	SCHWARZBECK	AK9513	9513-10	2009-08-12	2010-08-11
EMI Test Receiver	ROHDE&SCHWARZ	ESPI	25498514	2009-08-12	2010-08-11

4.3 Test Procedure

The setup of EUT is according with per ANSI C63.4-2003 measurement procedure. The specification used was with the FCC Part 15.205 and 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.



4.4 Test Receiver Setup

During the conducted emission test, the test receiver was set with the following configurations:

Start Frequency 30 MHz
 Stop Frequency..... 1000 MHz
 Sweep Speed Auto
 IF Bandwidth..... 10 kHz
 Quasi-Peak Adapter Bandwidth 120 kHz
 Quasi-Peak Adapter Mode Normal

4.5 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:

$$\text{Corr. Ampl.} = \text{Indicated Reading} - \text{Corr. Factor}$$

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 Class B. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{FCC Part 15B Limit}$$

4.6 Environmental Conditions

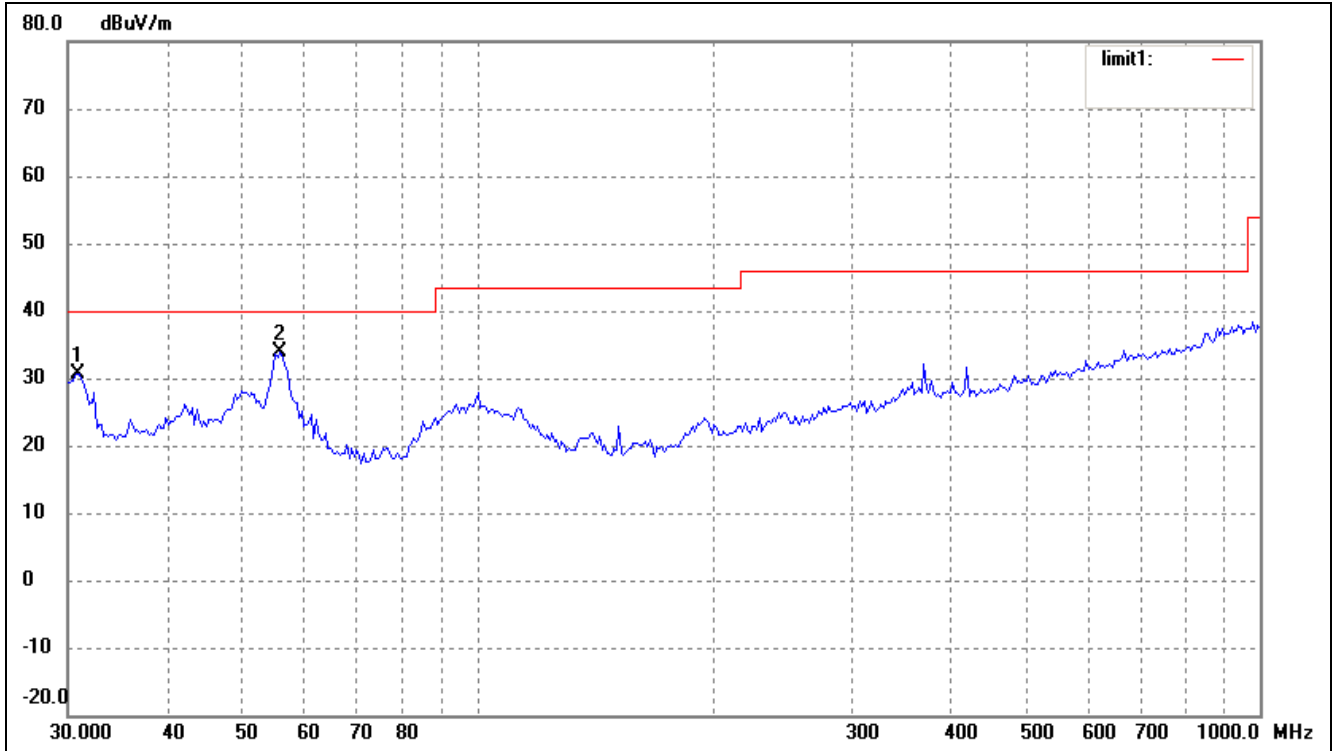
Temperature:	22 °C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

4.7 Summary of Test Results/Plots

According to the data, the EUT complied with the FCC 15B Class B standards, and had the worst margin of:

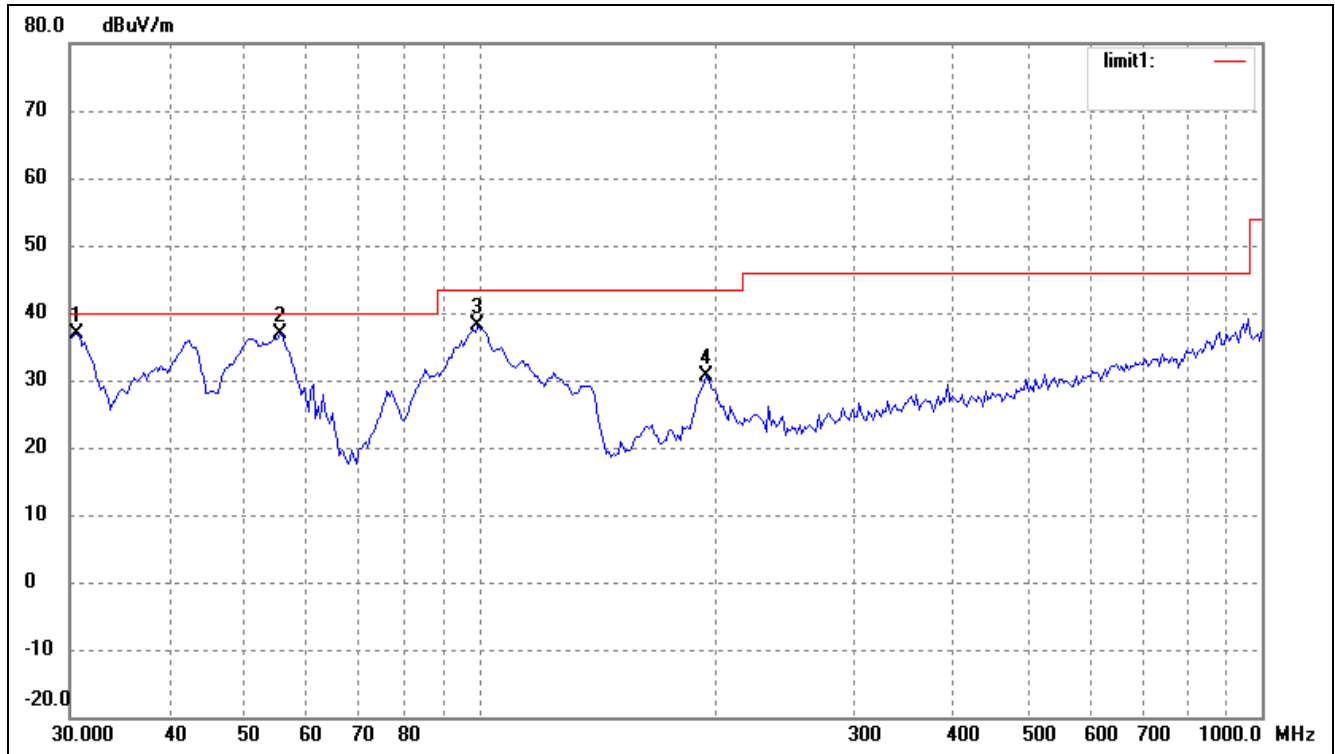
-3.09 dB μ V at 30.6379 MHz in the Vertical polarization, Charging mode, 30 MHz to 1 GHz, 3Meters

-1.88 dB μ V at 407.5145 MHz in the Vertical polarization, Downloading mode, 30 MHz to 1 GHz, 3Meters

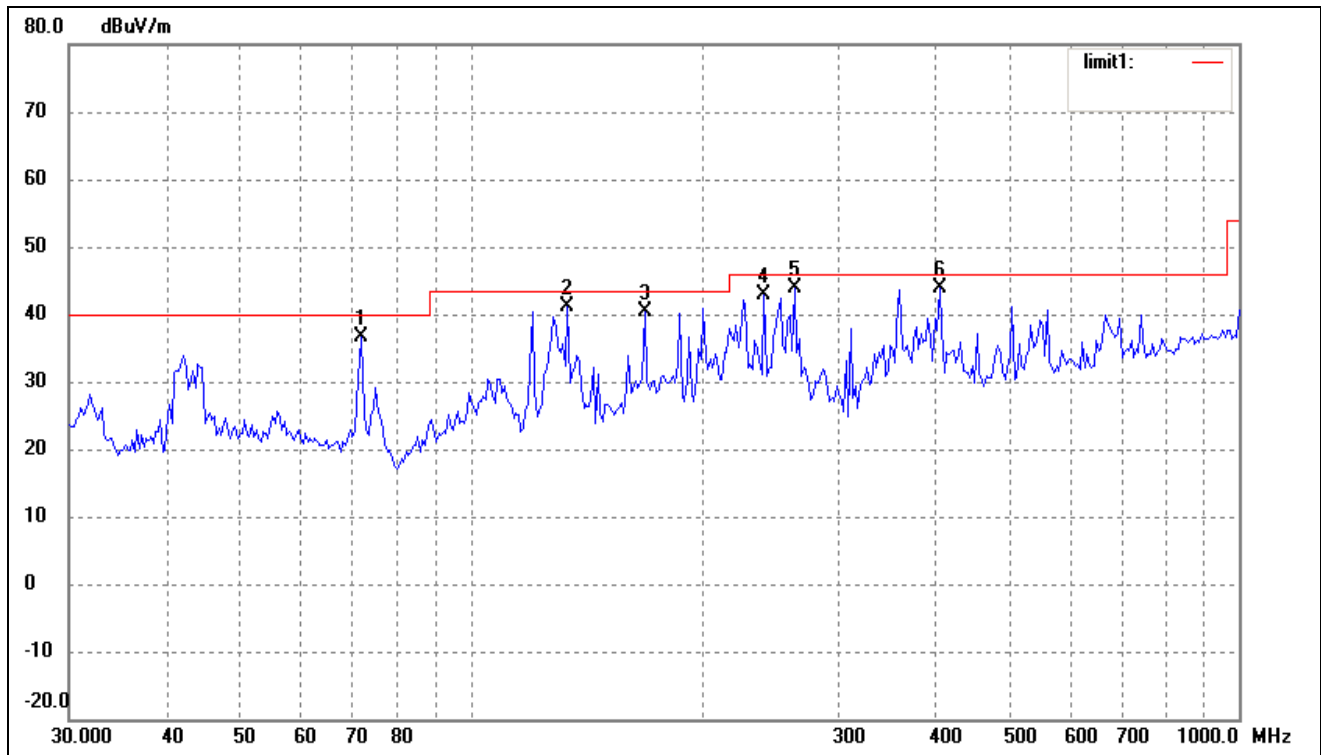
Plot of Radiation Emissions Test Data*Radiated Disturbance**EUT: GIS Handheld**M/N: Q Series**Operating Condition: Charging**Test Specification: Horizontal & Vertical**Comment: AC 120V/60Hz**Horizontal*

No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	30.8535	23.71	6.93	30.64	40.00	-9.36	236	100	peak
2	56.0007	26.21	7.73	33.94	40.00	-6.06	148	100	peak

Vertical

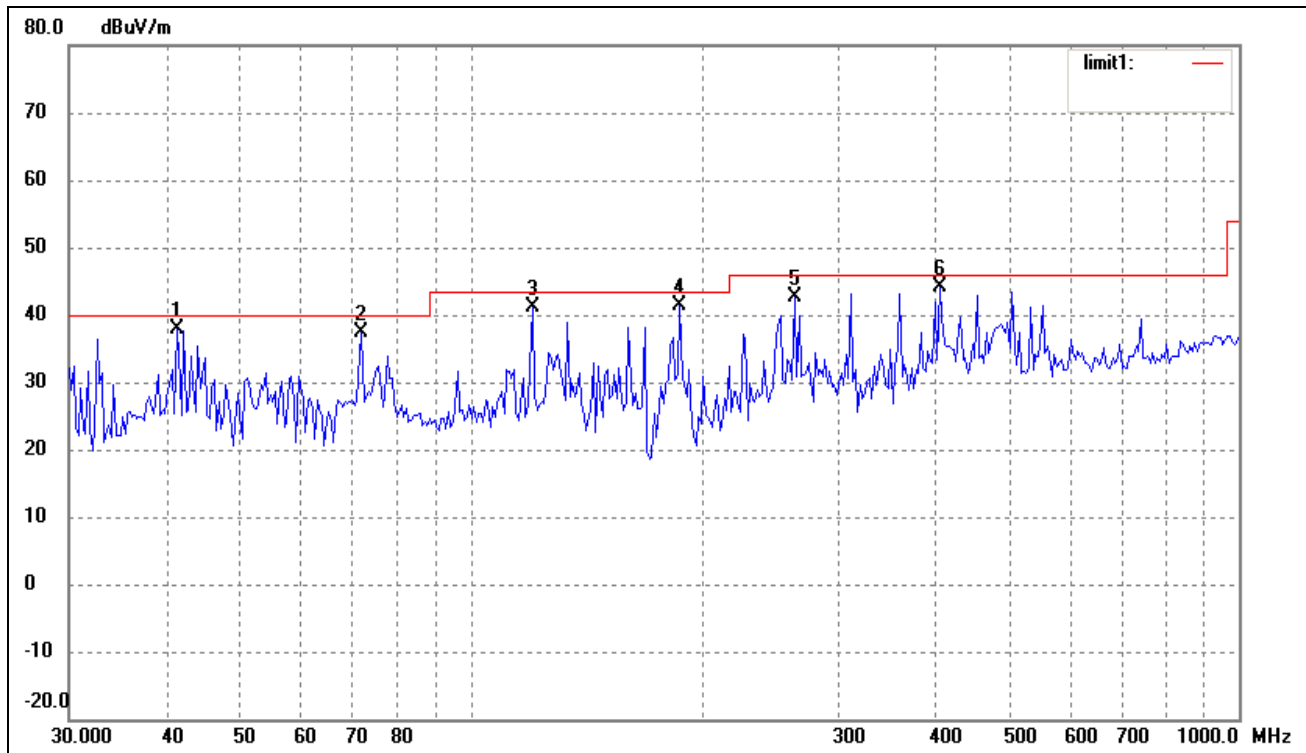


No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	30.6379	29.98	6.93	36.91	40.00	-3.09	66	100	QP
2	55.6094	29.10	7.74	36.84	40.00	-3.16	312	100	QP
3	99.5281	29.69	8.40	38.09	43.50	-5.41	79	100	QP
4	195.1365	23.87	6.86	30.73	43.50	-12.77	211	100	peak

*Radiated Disturbance**EUT: GIS Handheld**M/N: Q Series**Operating Condition: Connect to PC**Test Specification: Horizontal & Vertical**Comment: AC 120V/60Hz**Horizontal*

No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	72.0843	33.22	3.30	36.52	40.00	-3.48	114	110	QP
2	133.6188	36.85	4.35	41.20	43.50	-2.30	42	100	QP
3	168.4138	35.59	4.83	40.42	43.50	-3.08	103	100	QP
4	240.8304	34.15	8.84	42.99	46.00	-3.01	66	100	QP
5	263.8190	34.80	9.16	43.96	46.00	-2.04	99	100	QP
6	407.5145	31.73	12.22	43.95	46.00	-2.05	57	100	QP

Vertical



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