

FCC Part 15B Measurement and Test Report

For

Santok Limited

Santok House, Unit L, Braintree Industrial Estate, Braintree Road, South

Ruislip, Middlesex, HA4 0EJ United Kingdom

FCC ID: 2AE7RSANTOKQ65

Test Rule(s):	<u>FCC Part 15 Subpart B</u>
Product Description:	<u>Mobile Phone</u>
Tested Model:	<u>Q65</u>
Report No.:	<u>STR15068223I-5</u>
Tested Date:	<u>2015-06-26 to 2015-07-08</u>
Issued Date:	<u>2015-07-08</u>
Tested By:	<u>Lebron Wang / Engineer</u> <i>Lebron Wang</i>
Reviewed By:	<u>Lahm Peng / EMC Manager</u> <i>Lahm peng</i>
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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 Shenzhen SEM.Test Technology Co., Ltd.

TABLE OF CONTENTS

1. GENERAL INFORMATION	3
1.1 PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT).....	3
1.2 TEST STANDARDS.....	4
1.3 TEST METHODOLOGY.....	4
1.4 TEST FACILITY.....	4
1.5 EUT SETUP AND OPERATION MODE.....	5
2. SUMMARY OF TEST RESULTS	6
3. CONDUCTED EMISSIONS	7
3.1 MEASUREMENT UNCERTAINTY.....	7
3.2 TEST EQUIPMENT LIST AND DETAILS.....	7
3.3 TEST PROCEDURE.....	7
3.4 BASIC TEST SETUP BLOCK DIAGRAM.....	7
3.5 ENVIRONMENTAL CONDITIONS.....	8
3.6 SUMMARY OF TEST RESULTS/PLOTS.....	8
3.7 CONDUCTED EMISSIONS TEST DATA.....	8
4. RADIATED EMISSIONS	11
4.1 MEASUREMENT UNCERTAINTY.....	11
4.2 TEST EQUIPMENT LIST AND DETAILS.....	11
4.3 TEST PROCEDURE.....	11
4.4 TEST RECEIVER SETUP.....	12
4.5 CORRECTED AMPLITUDE & MARGIN CALCULATION.....	12
4.6 ENVIRONMENTAL CONDITIONS.....	12
4.7 SUMMARY OF TEST RESULTS/PLOTS.....	12

1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant: Santok Limited
 Address of applicant: Santok House, Unit L, Braintree Industrial Estate, Braintree Road, South Ruislip, Middlesex, HA4 0EJ United Kingdom
 Manufacturer: GIPO HOLDINGS LIMITED
 Address of manufacturer: East 1201, Phase II, Hi-tech Plaza, Futian District, Shenzhen

General Description of EUT	
Product Name:	Mobile Phone
Trade Name:	Tecmobile
Model No.:	Q65
Adding Model(s):	Raspberry, Lychee, Storm 2, Sync 5S, Sync 5i, Sync 5.5
<p><i>The EUT is GSM850/900/DCS1800/PCS1900, WCDMA Band II, V, Mobile Phone. The Mobile Phone is intended for speech and Multimedia Message Service (MMS) transmission. It is equipped with GPRS/EGPRS class 12 for GSM850 and GSM1900 and Bluetooth, Wi-Fi, GPS and camera functions. For more information see the following datasheet</i></p> <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 Q65, but the circuit and the electronic construction do not change, declared by the manufacturer.</i></p>	

Technical Characteristics of EUT	
Rated Voltage:	5.0V
Rated Current:	1000mA
Rated Power:	/
Power Adapter Model:	Q65
Lowest Internal Frequency:	32.768KHz
Highest Internal Frequency:	1.2GHz
Classification of ITE:	Class B

1.2 Test Standards

The following report is prepared on behalf of the Santok Limited 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, Subpart B, and section 15.205, 15.107, and 15.109 rules.

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 C63.4-2009, 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

FCC – Registration No.: 934118

Shenzhen SEM.Test Technology 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 934118.

Industry Canada (IC) Registration No.: 11464A

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

CNAS Registration No.: L4062

Shenzhen SEM.Test Technology Co., Ltd. is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L4062. All measurement facilities used to collect the measurement data are located at 1/F, Building A, Hongwei Industrial Park, Liuxian 2nd Road, Bao'an District, Shenzhen, P.R.C (518101).

CNAS Registration No.: L1659

CCIC Southern Electronic Product Testing (Shenzhen) Co., Ltd. is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L1659. Some measurement facilities used to collect the measurement data are located at Building 28/29, Shigudong, Xili Industrial Area, Xili Street, Nanshan District, Shenzhen, Guangdong, China

1.5 EUT Setup and Operation Mode

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

Test Mode List:

Test Mode	Description	Remark
TM1	Charging & Playing	Connect to PC
TM2	Downloading	Connect to PC

EUT Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
Earphone Cable	1.2	Unshielded	Without Core
USB Cable	1.0	Shielded	Without Core

Auxiliary Equipment List and Details

Description	Manufacturer	Model	Serial Number
Notebook	Lenovo	E10	LR-63C8R

Special Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
/	/	/	/

2. SUMMARY OF TEST RESULTS

FCC Rules	Description of Test Item	Result
§ 15.107 (a)	Conducted Emissions	Compliant
§ 15.109 (a)	Radiated Emissions	Compliant

N/A: not applicable

3. Conducted Emissions

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 ± 2.88 dB.

3.2 Test Equipment List and Details

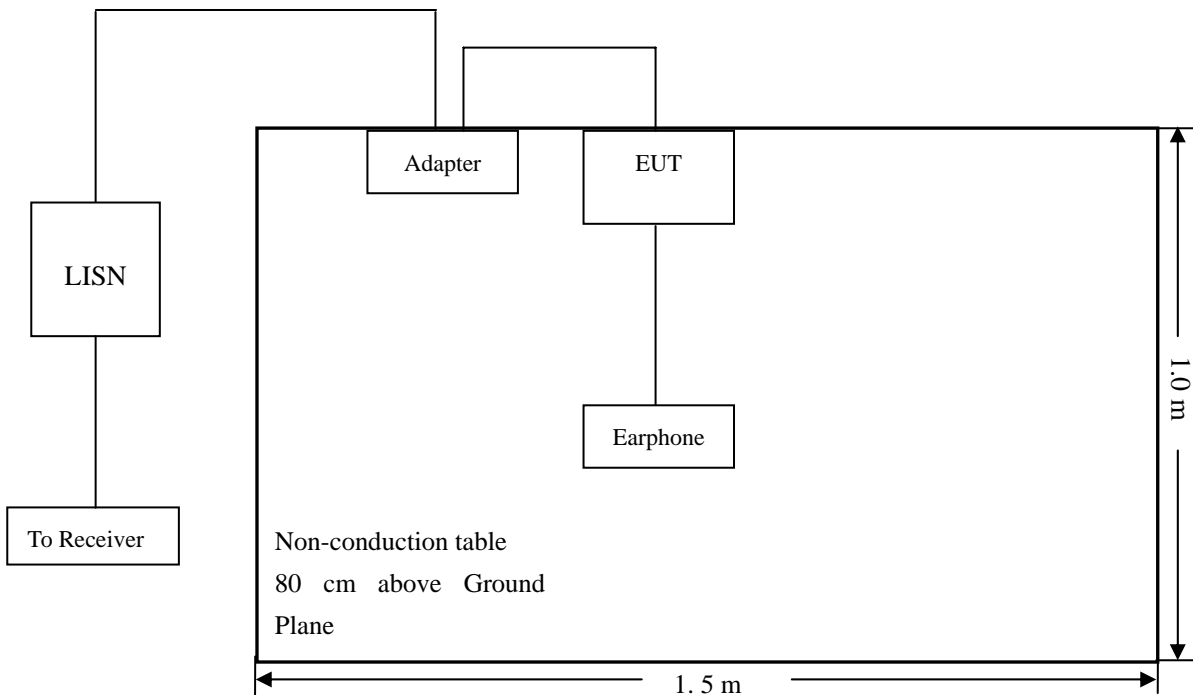
Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2015-05-28	2016-05-27
L.I.S.N	Schwarz beck	NSLK8126	8126-224	2015-05-28	2016-05-27
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2015-05-28	2016-05-27

3.3 Test Procedure

Test is conducting under the description of ANSI C63.4-2009, 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.

Note: Base on the calibrated result, for the impedance characteristic and insertion loss, the effect shall be ignored from the placed multiple outlet power strip between the device and LISN.

3.4 Basic Test Setup Block Diagram



3.5 Environmental Conditions

Temperature:	23 °C
Relative Humidity:	52%
ATM Pressure:	1011 mbar

3.6 Summary of Test Results/Plots

According to the data in section 3.7, the EUT complied with the FCC Part 15.107(a) Conducted margin for a Class B device, with the *worst* margin reading of:

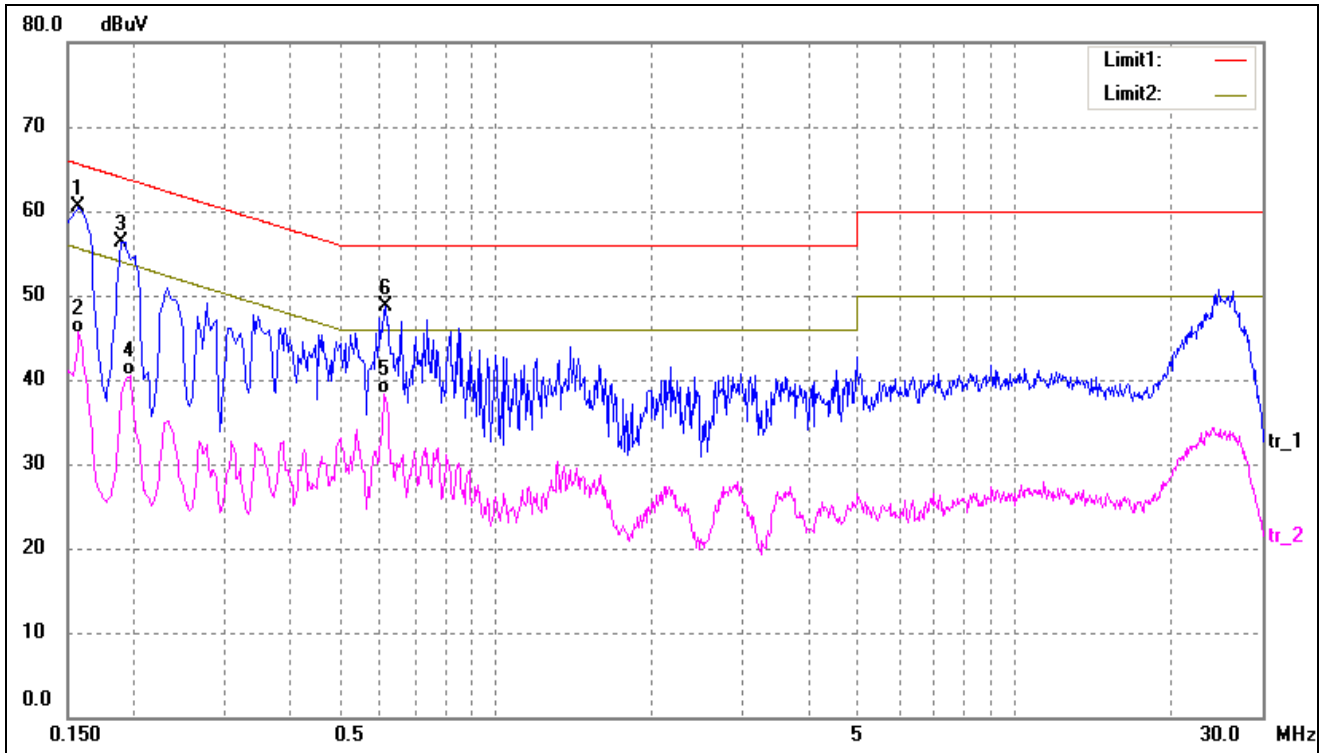
-4.77dB at 0.5980 MHz in the Line, QP detector, 0.15-30MHz

3.7 Conducted Emissions Test Data

Plot of Conducted Emissions Test Data

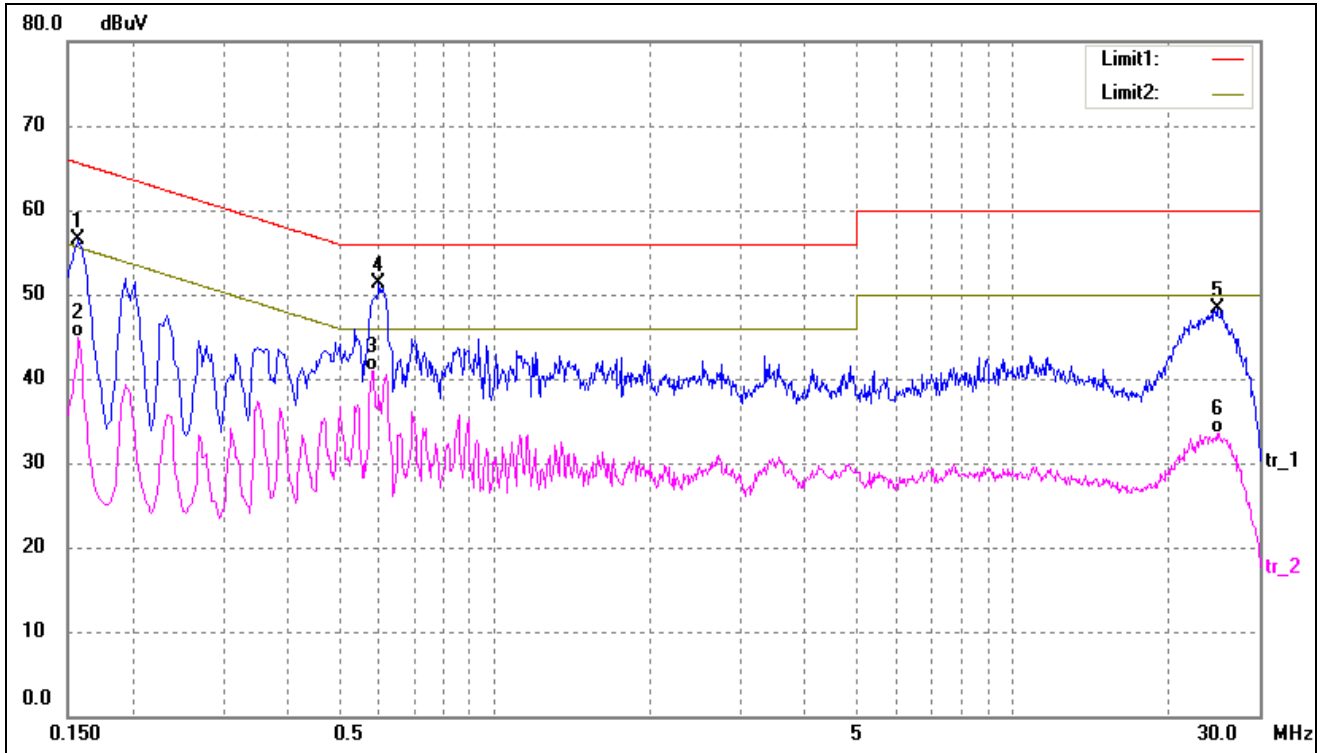
EUT: *Mobile Phone*
 Tested Model: *Q65*
 Operating Condiation: *TM1*
 Comment: *AC 120V/60Hz,USB DC 5V*

Test Specification: *Neutral*



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1580	47.97	12.50	60.47	65.57	-5.10	QP
2	0.1580	33.10	12.50	45.60	55.57	-9.97	AVG
3	0.1904	43.85	12.50	56.35	64.02	-7.67	QP
4	0.1980	28.09	12.50	40.59	53.69	-13.10	AVG
5	0.6100	25.76	12.61	38.37	46.00	-7.63	AVG
6	0.6140	36.04	12.61	48.65	56.00	-7.35	QP

Test Specification: Line



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1580	44.03	12.50	56.53	65.57	-9.04	QP
2	0.1580	32.44	12.50	44.94	55.57	-10.63	AVG
3	0.5820	28.38	12.58	40.96	46.00	-5.04	AVG
4	0.5980	38.63	12.60	51.23	56.00	-4.77	QP
5	24.8660	35.30	12.96	48.26	60.00	-11.74	QP
6	24.8660	20.52	12.96	33.48	50.00	-16.52	AVG

4. Radiated Emissions

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 ± 5.10 dB.

4.2 Test Equipment List and Details

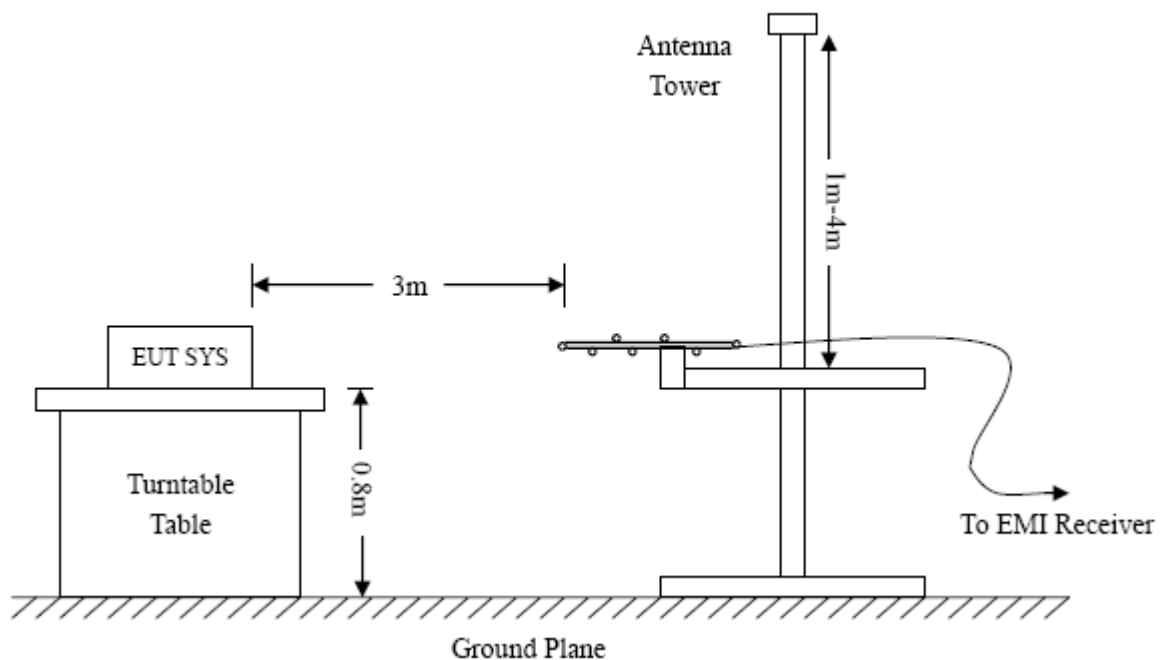
Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	R&S	FSP	836079/035	2015-05-28	2016-05-27
EMI Test Receiver	R&S	ESVB	825471/005	2015-05-28	2016-05-27
Pre-amplifier	Agilent	8447F	3113A06717	2015-05-28	2016-05-27
Pre-amplifier	Compliance Direction	PAP-0118	24002	2015-05-28	2016-05-27
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2015-05-24	2016-05-23
Horn Antenna	ETS	3117	00086197	2015-05-24	2016-05-23
Loop Antenna	SCHWARZECK	HFRA 5165	9365	2015-05-28	2016-05-27

4.3 Test Procedure

The setup of EUT is according with per ANSI C63.4-2009 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.



4.4 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

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

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

4.6 Environmental Conditions

Temperature:	23 °C
Relative Humidity:	55 %
ATM Pressure:	1011 mbar

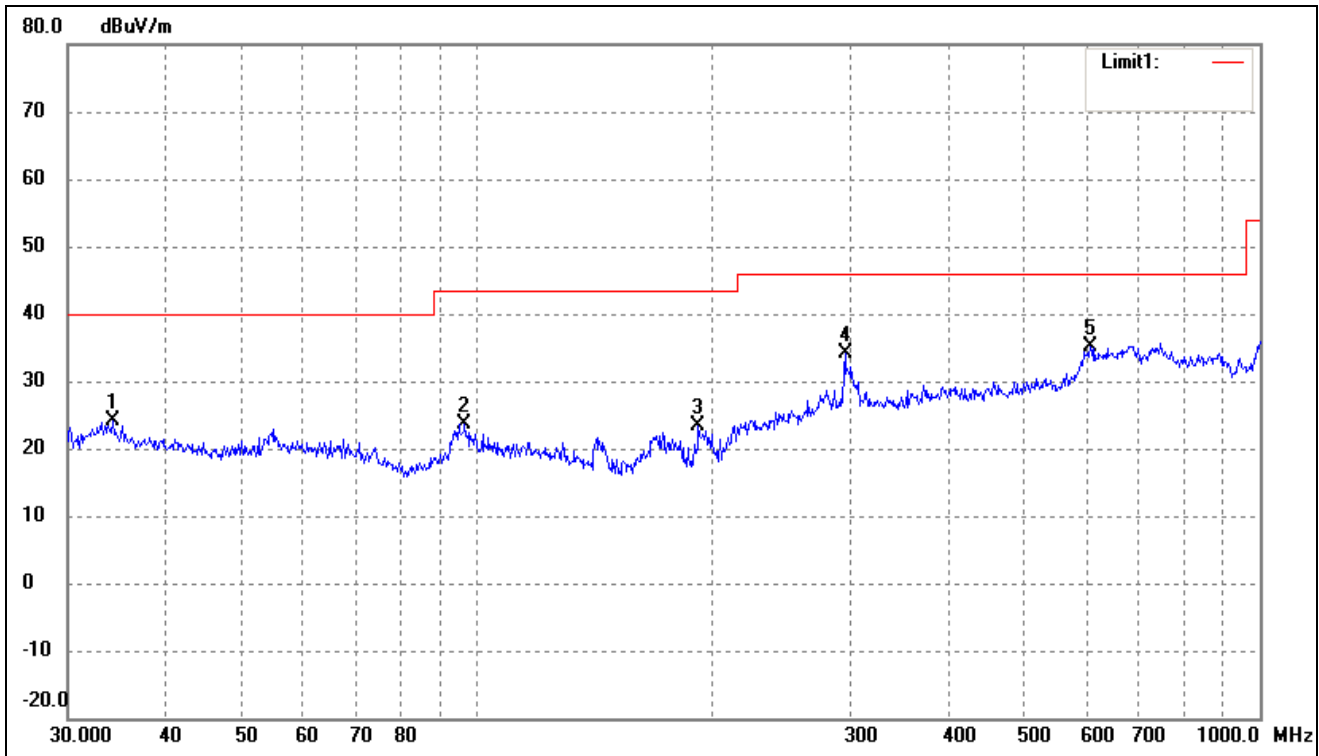
4.7 Summary of Test Results/Plots

According to the data, the EUT complied with the FCC Part 15.109(a) rule, and had the worst margin of:

-1.43 dB at 721.7259 MHz in the Horizontal polarization, TM2 mode, 9 kHz to 6 GHz, 3Meters

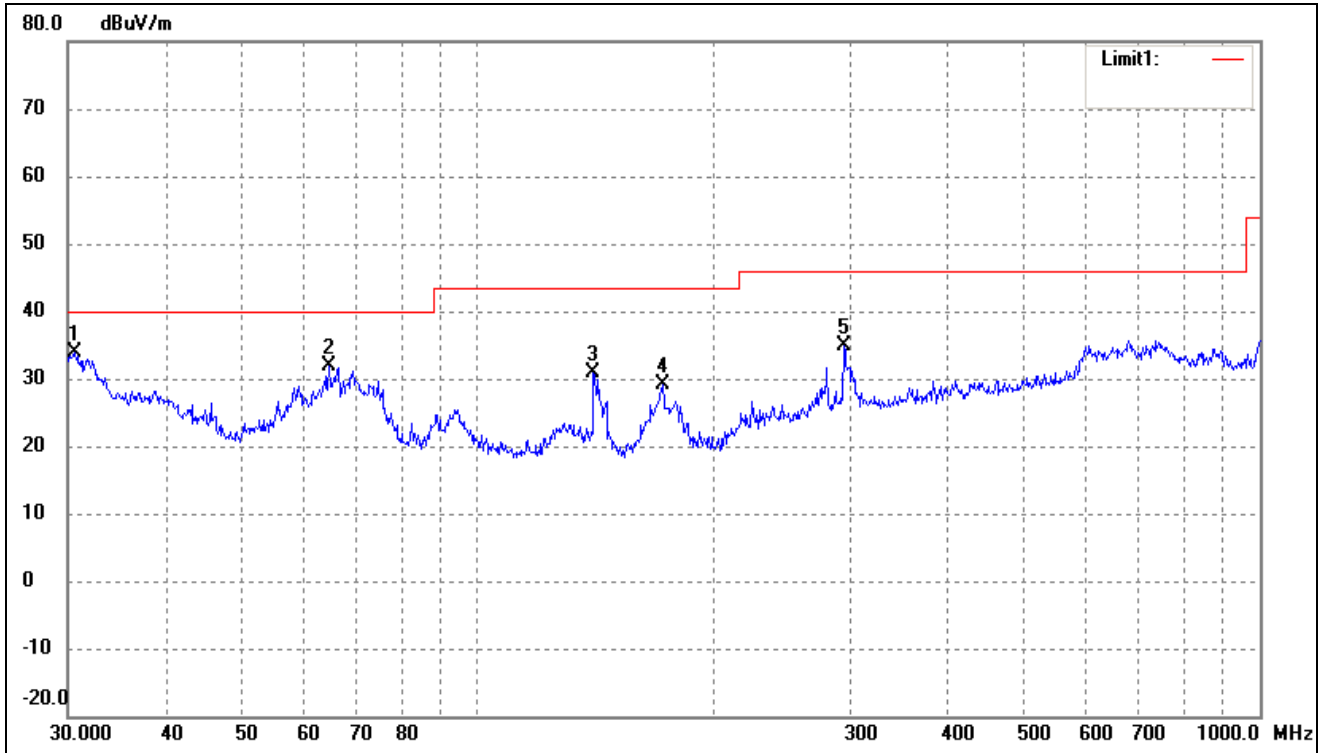
Plot of Radiated Emissions Test Data

EUT: *Mobile Phone*
 Tested Model: *Q65*
 Operating Condition: *TM1*
 Comment: *AC 120V/60Hz, USB DC 5V*
 Test Specification: *Horizontal*



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	34.2760	19.77	4.28	24.05	40.00	-15.95	108	150	QP
2	96.4362	19.00	4.60	23.60	43.50	-19.90	130	100	QP
3	191.7450	20.14	3.29	23.43	43.50	-20.07	229	150	QP
4	295.1469	22.22	11.99	34.21	46.00	-11.79	120	100	QP
5	607.7867	16.27	18.77	35.04	46.00	-10.96	147	100	QP

Test Specification: Vertical

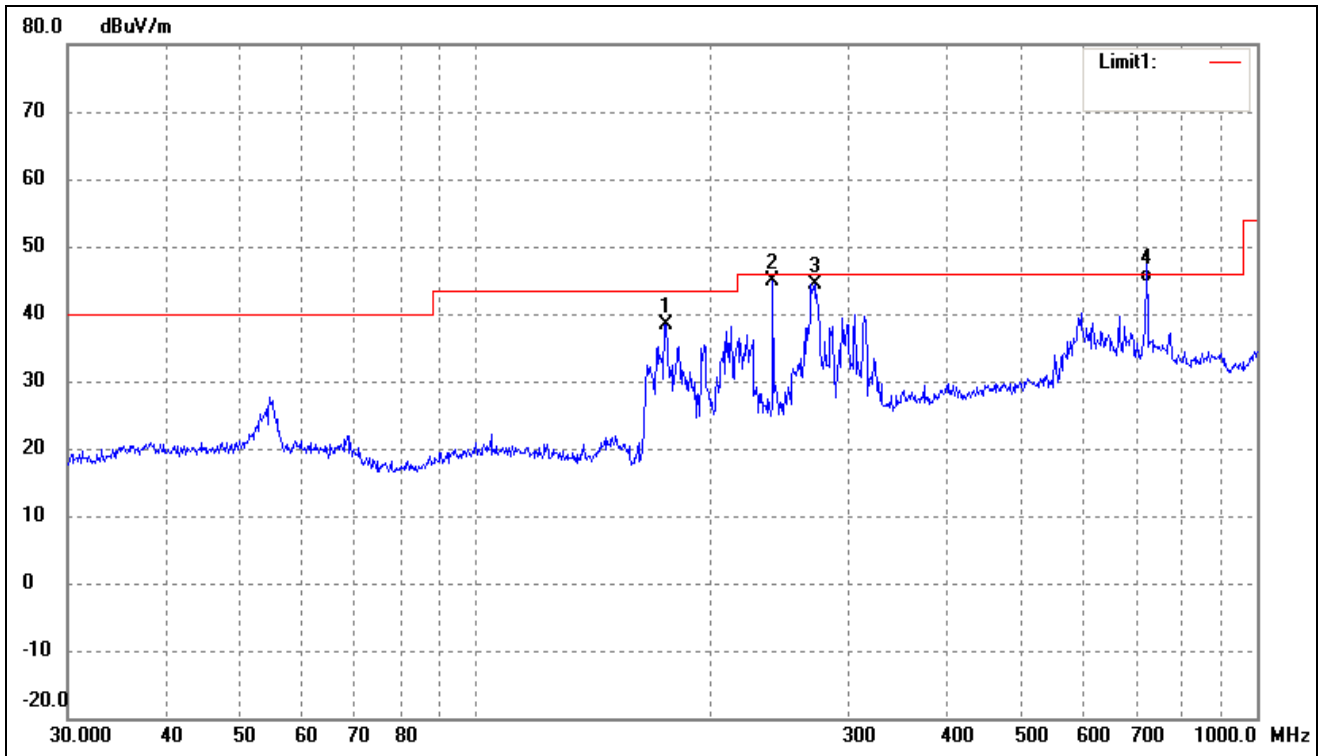


No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	30.6379	30.06	3.74	33.80	40.00	-6.20	251	100	QP
2	64.6594	27.56	4.35	31.91	40.00	-8.09	308	100	QP
3	140.8351	27.53	3.37	30.90	43.50	-12.60	120	100	QP
4	172.5988	26.43	2.70	29.13	43.50	-14.37	359	100	QP
5	294.1137	22.98	11.94	34.92	46.00	-11.08	158	100	QP

Plot of Radiated Emissions Test Data

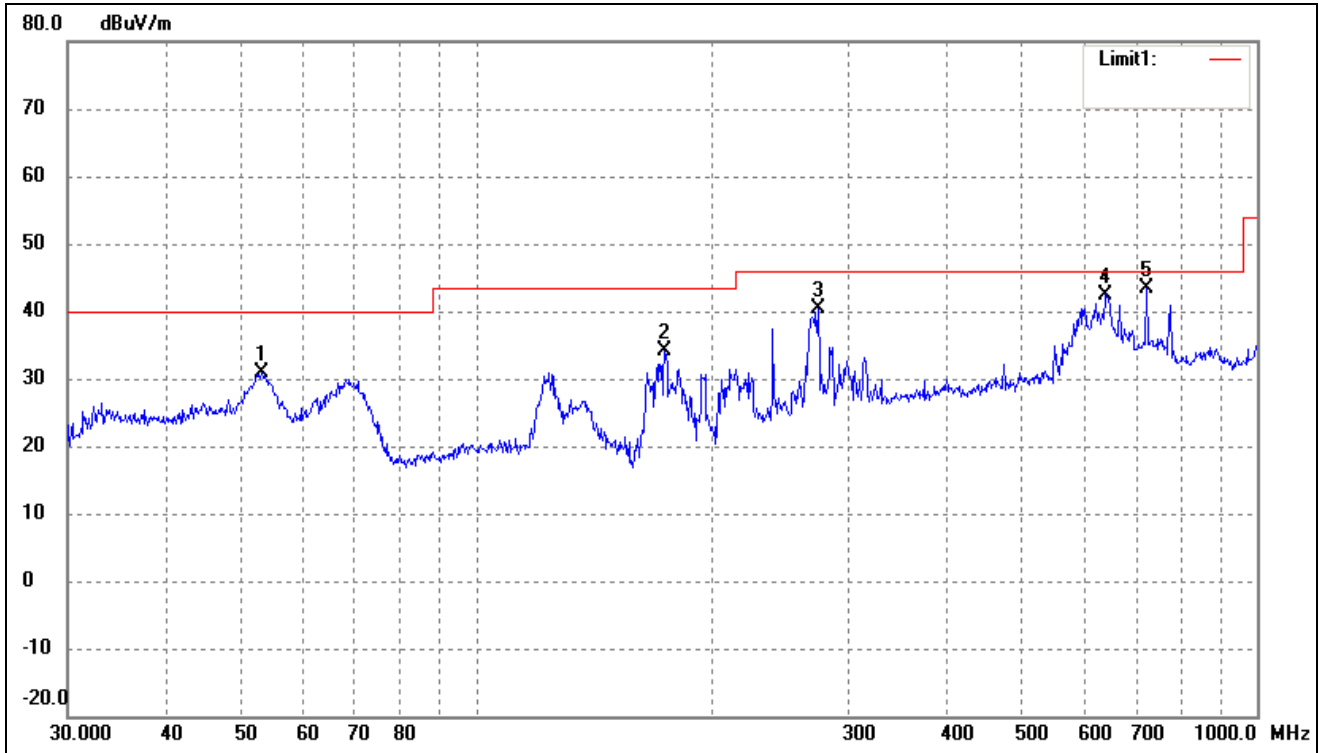
EUT: *Mobile Phone*
 Tested Model: *Q65*
 Operating Condition: *TM2*
 Comment: *AC 120V/60Hz, USB DC 5V*

Test Specification: *Horizontal*



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	175.0368	35.70	2.71	38.41	43.50	-5.09	158	100	QP
2	239.9874	35.11	9.33	44.44	46.00	-1.56	226	100	QP
3	271.3246	33.53	10.81	44.34	46.00	-1.66	129	100	QP
4	721.7259	26.10	18.47	44.57	46.00	-1.43	109	100	QP

Test Specification: Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	53.1313	25.62	5.30	30.92	40.00	-9.08	51	100	QP
2	174.4241	31.43	2.71	34.14	43.50	-9.36	308	100	QP
3	274.1939	29.39	11.00	40.39	46.00	-5.61	120	100	QP
4	640.6110	23.90	18.60	42.50	46.00	-3.50	359	100	QP
5	721.7259	24.98	18.47	43.45	46.00	-2.55	125	100	QP

Note: Testing is carried out with frequency rang 9kHz to the 6GHz, which above 1GHz is close to the noise base even antenna close up to 1meter distance according the measurement of ANSI C63.4.

The measurements greater than 20dB below the limit from 9kHz to 30MHz and test data are not provided.

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