

FCC PART 15D MEASUREMENT AND TEST REPORT

For

Porta Phone Company Inc

145 Dean Knauss Dr. Narragansett, RI 02882, USA.

FCC ID: B4HCLIP2015

Report Type: Original Report	Product Type: DUPLEX WIRELESS SYSTEMS
Test Engineer: Simon Wang	<i>Simon Wang</i>
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Reviewed By: RF Engineer	<i>Candy Li</i>
Prepared By:	Bay Area Compliance Laboratories Corp. (Shenzhen) 6/F, the 3rd Phase of WanLi Industrial Building ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China Tel: +86-755-33320018 Fax: +86-755-33320008 www.baclcorp.com.cn

Note: This test report is prepared for the customer shown above and for the equipment described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp.

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *Porta Phone Company Inc's* product, model number: *ComStar Clip(CLIP2015)* (FCC ID: *B4HCLIP2015*) or the "EUT" in this report was a *DUPLEX WIRELESS SYSTEMS*, which was measured approximately: 5.5 cm (L) x 5.5 cm (W) x 1.5 cm (H), rated input voltage: DC 3.7V battery.

** All measurement and test data in this report was gathered from production sample serial number: 20151026 (Assigned by BACL, Shenzhen). The EUT supplied by the applicant was received on 2015-10-26.*

Objective

This test report was based on the Electromagnetic Interference (EMI) tests performed on the EUT. The EMI measurements were performed according to the measurement procedure described in ANSI C63.17 - 2013.

The tests were performed in order to determine the compliance of the EUT with FCC Part 15-Subpart D, section 15.207, 15.315, 15.317, 15.319 and 15.323 rules.

Related Submittal(s)/Grant(s)

No related submittal(s).

Test Methodology

All measurements contained in this report were conducted with ANSI C63.17 - 2013, American National Standard Methods of Measurement of the Electromagnetic and Operational Compatibility of Unlicensed Personal Communications Services (UPCS) Devices.

All radiated and conducted emissions measurement was performed at Bay Area Compliance Laboratories Corp. (Shenzhen).

The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Measurement uncertainty with radiated emission is 5.91 dB for 30MHz-1GHz.and 4.92 dB for above 1GHz, 1.95dB for conducted measurement.

Test Facility

The test site used by Bay Area Compliance Laboratories Corp. (Shenzhen) to collect test data is located on the 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China.

Test site at Bay Area Compliance Laboratories Corp. (Shenzhen) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on October 31, 2013. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2014.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 382179. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in TBR6 mode which is provided by the manufacturer.

Equipment Modifications

No modification was made to the EUT tested.

Support Equipment List and Details

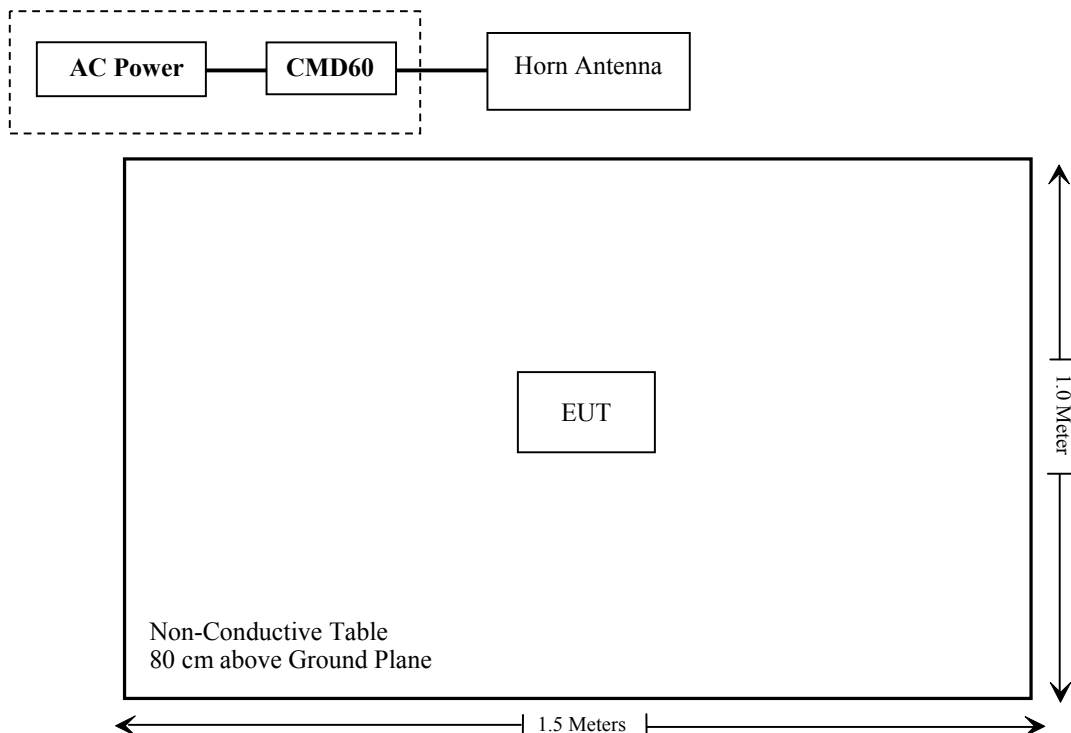
Manufacturer	Description	Model	Serial Number
R&S	Digital Radio-Communication Tester	CMD60	829902/026

External I/O Cable

Cable Description	Length (m)	From/Port	To
/	/	/	/

Block Diagram of Test Setup

For radiated emissions:



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§1.1307(b);§2.1093	RF Exposure	Compliance
§ 15.317, § 15.203	Antenna Requirement	Compliance
§ 15.315, § 15.207	Conducted Emission	Not Applicable
§ 15.323 (a)	Emission Bandwidth	Compliance*
§ 15.319 (c)	Peak Transmit Power	Compliance*
§ 15.319 (d)	Power Spectral Density	Compliance*
§ 15.323 (d)	Emission Inside and Outside the sub-band	Compliance*
§ 15.319 (g)	Radiated Emission	Compliance
§ 15.323 (f)	Frequency Stability Handset	Compliance*
§ 15.323 (c)(e) § 15.319 (f)	Specific Requirements for UPCS	Compliance*

Compliance*: the EUT (Model: ComStar Clip(CLIP2015), FCC ID: B4HCLIP2015) has used a certified module with model RF1G9V1 (FCC ID: B4HRF1900V1), the different test data between them is “FCC§15.319 (g) - RADIATED EMISSIONS”, so all the other test data are referred to the report RSZ151110830-00 with model number RF1G9V1 (FCC ID: B4HRF1900V1), issued on 2015-11-16 by Bay Area Compliance Laboratories Corp. (Shenzhen).

Not Applicable: The EUT was powered by battery.

§1.1307 (b) (1) & §2.1093 – RF EXPOSURE

Applicable Standard

According to FCC §2.1093 and §1.1307(b) (1), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

According to KDB 447498 D01 General RF Exposure Guidance

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

$[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$ for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where

1. $f(\text{GHz})$ is the RF channel transmit frequency in GHz.
2. Power and distance are rounded to the nearest mW and mm before calculation.
3. The result is rounded to one decimal place for comparison.
4. When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test Exclusion.

Evaluation data:

The maximum tune-up conducted peak output power is 20 dBm (100 mW) @1928.448 MHz

And

Duty Cycle = $T_{\text{on}}/T_{\text{p}} \cdot 100\% = 4.10\%$

Which, $T_{\text{on}} = 412 \mu\text{s}$, $T_{\text{p}} = 10.05 \text{ ms}$, please refer to the report RSZ151110830-00 with model number RF1G9V1 (FCC ID: B4HRF1900V1) page 44 and 45 for plot detail.

So, the maximum conducted source-based, time-averaged output power is:
 $100 \cdot 4.10\% \text{ mW} = 4.10 \text{ mW} @ 1928.448 \text{ MHz}$

$$(4.10/5) \cdot \sqrt{1.928448} = 1.14 < 3.0$$

Result: No SAR test is required

FCC§15.317 & §15.203 - ANTENNA REQUIREMENT

Applicable Standard

According to FCC § 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

Antenna Connector Construction

The EUT has one integral antennas arrangement, which was permanently attached and the gain is 0 dBi, fulfill the requirement of this section. Please refer to the EUT photos.

Result: Compliant.

FCC§15.319 (g) - RADIATED EMISSIONS

Applicable Standard

According to FCC§15.319(g), notwithstanding other technical requirements specified in this subpart, attenuation of emissions below the general emission limits in §15.209 is not required.

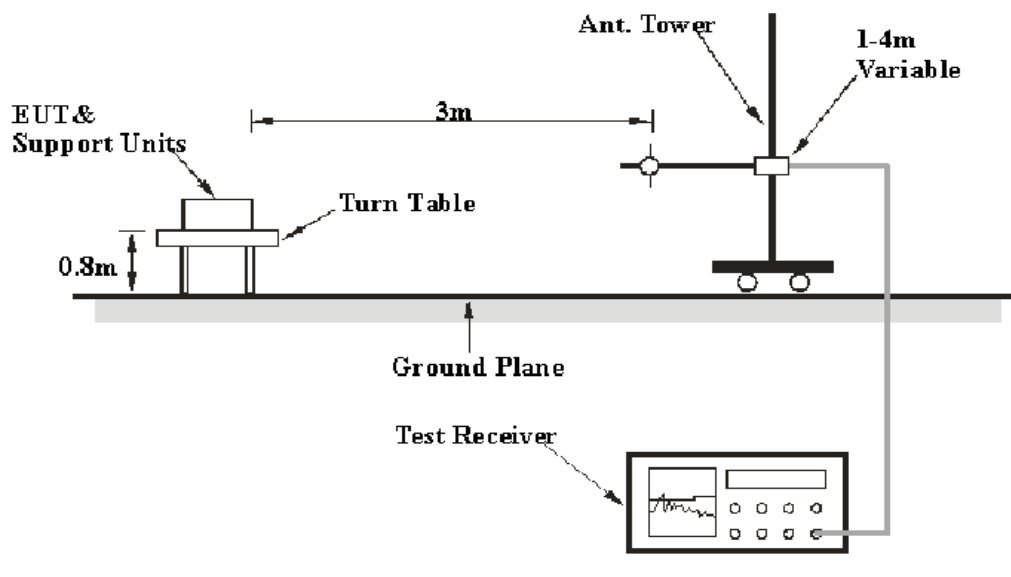
Measurement Uncertainty

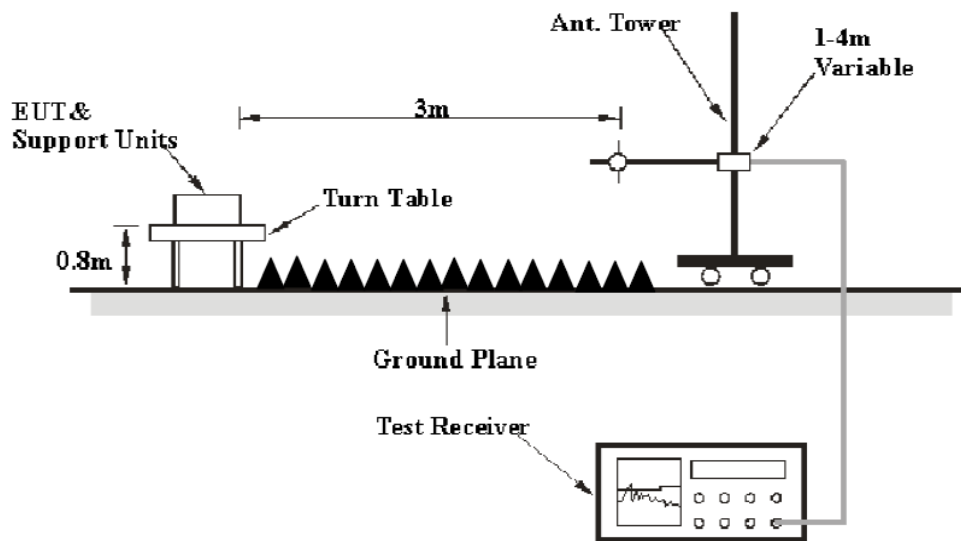
All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on CISPR 16-4-2:2011, the expanded combined standard uncertainty of radiation emissions at Bay Area Compliance Laboratories Corp. (Shenzhen) is 5.91 dB for 30MHz-1GHz and 4.92 dB for above 1GHz, and it will not be taken into consideration for the test data recorded in the report

EUT Setup

Below 1GHz:



Above 1GHz:

The radiated emission tests were performed in the 3 meters test site, using the setup accordance with the ANSI C63.4 - 2014. The specification used was the FCC 15§ 15.319(g).

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

EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 20 GHz.

During the radiated emission test, the EMI test receiver & Spectrum Analyzer Setup were set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Detector
30 MHz – 1000 MHz	100 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1 MHz	3 MHz	/	PK

Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

Data was recorded in Quasi-peak detection mode for frequency range of 30 MHz-1 GHz and peak and Average detection modes for frequencies above 1 GHz.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Amplifier	HP8447E	1937A01046	2015-05-06	2016-05-06
Rohde & Schwarz	EMI Test Receiver	ESCI	101120	2015-11-12	2016-11-12
Sunol Sciences	Bi-log Antenna	JB1	A040904-2	2014-12-07	2017-12-06
Mini	Pre-amplifier	ZVA-183-S+	5969001149	2015-04-23	2016-04-23
Sunol Sciences	Horn Antenna	DRH-118	A052304	2015-12-01	2016-11-30
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2015-12-11	2016-12-11
the electro-Mechanics Co.	Horn Antenna	3116	9510-2270	2013-10-14	2016-10-13
DUCOMMUN	Pre-amplifier	ALN-22093530-01	991373-01	2015-08-03	2016-08-03

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements, traceable to National Primary Standards and International System of Units (SI).

Corrected Amplitude & Margin Calculation

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

$$\text{Corrected Amplitude} = \text{Meter Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the maximum limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

Test Results Summary

According to the recorded data in following table, the worst margin reading as below:

17.05 dB at 278.6 MHz in the Horizontal polarization for Low Channel

Refer to CISPR16-4-2:2011 and CISPR 16-4-1:2009, the measured level is in compliance with the limit if

$$L_m + U_{(Lm)} \leq L_{lim} + U_{cispr}$$

In BACL, $U_{(Lm)}$ is less than U_{cispr} , if L_m is less than L_{lim} , it implies that the EUT complies with the limit.

Test Data**Environmental Conditions**

Temperature:	25 °C
Relative Humidity:	49 %
ATM Pressure:	101.0 kPa

The testing was performed by Simon Wang on 2015-12-14.

Test mode: Transmitting

Test Result: Compliance. Please refer to following tables.

30 MHz ~ 20 GHz:

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/m)	FCC Part 15.319(g)/209/205	
	Reading (dBμV)	Detector (PK/QP/Ave.)		Height (m)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
Low Channel (1921.536 MHz)									
278.6	42.55	QP	261	1.4	H	-13.6	28.95	46	17.05
1921.50	106.07	PK	20	1.9	H	3.23	109.30	/	/
1921.50	105.17	PK	210	1.4	V	3.23	108.40	/	/
3843.00	34.93	PK	180	1.2	H	13.75	48.68	74	25.32
3843.00	34.77	PK	310	1.2	V	13.75	48.52	74	25.48
5764.50	33.67	PK	33	1.7	H	19.23	52.90	74	21.10
5764.50	32.14	PK	69	1.9	V	19.23	51.37	74	22.63
7686.00	32.24	PK	248	1.1	H	20.82	53.06	74	20.94
7686.00	33.12	PK	207	1.4	V	20.82	53.94	74	20.06
Middle Channel (1924.992 MHz)									
278.6	42.03	QP	152	1.5	H	-13.6	28.43	46	17.57
1924.99	104.90	PK	36	1.9	H	3.23	108.13	/	/
1924.99	105.86	PK	6	2.2	V	3.23	109.09	/	/
3849.98	35.14	PK	278	1.6	H	13.75	48.89	74	25.11
3849.98	34.76	PK	73	1.1	V	13.75	48.51	74	25.49
5774.98	34.57	PK	14	1.5	H	19.23	53.80	74	20.20
5774.98	34.02	PK	33	1.1	V	19.23	53.25	74	20.75
7699.97	33.28	PK	4	1.7	H	20.82	54.10	74	19.90
7699.97	32.87	PK	307	1.2	V	20.82	53.69	74	20.31
High Channel (1928.448 MHz)									
278.6	42.41	QP	58	1.6	H	-13.6	28.81	46	17.19
1928.45	104.12	PK	333	1.7	H	3.23	107.35	/	/
1928.45	105.21	PK	51	1.4	V	3.23	108.44	/	/
3856.90	35.64	PK	332	1.6	H	12.48	48.12	74	25.88
3856.90	35.13	PK	138	1.1	V	12.48	47.61	74	26.39
5785.34	34.68	PK	218	2.1	H	19.23	53.91	74	20.09
5785.34	34.23	PK	343	1.1	V	19.23	53.46	74	20.54
7713.79	32.89	PK	175	2.3	H	20.82	53.71	74	20.29
7713.79	32.23	PK	22	1.5	H	20.82	53.05	74	20.95

Note:

Corrected Factor = Antenna factor (RX) + Cable Loss – Amplifier Factor

Corrected Amplitude = Corrected Factor + Reading

Margin = Limit - Corrected. Amplitude

Field Strength of Radiated Emission Average						
Frequency (MHz)	Corrected Peak Amplitude (dBμV/m)	Rx Antenna	Duty Cycle Factor (dB)	Corrected Average Amplitude (dBμV/m)	FCC Part 15.319(g)/209/205	
		Polar (H/V)			Limit (dBμV/m)	Margin (dB)
Low Channel (1921.536 MHz)						
1921.50	109.30	H	-27.75	81.55	/	/
1921.50	108.40	V	-27.75	80.65	/	/
3843.00	48.68	H	-27.75	20.93	54	33.07
3843.00	48.52	V	-27.75	20.77	54	33.23
5764.50	52.90	H	-27.75	25.15	54	28.85
5764.50	51.37	V	-27.75	23.62	54	30.38
7686.00	53.06	H	-27.75	25.31	54	28.69
7686.00	53.94	V	-27.75	26.19	54	27.81
Middle Channel (1924.992 MHz)						
1924.99	108.13	H	-27.75	80.38	/	/
1924.99	109.09	V	-27.75	81.34	/	/
3849.98	48.89	H	-27.75	21.14	54	32.86
3849.98	48.51	V	-27.75	20.76	54	33.24
5774.98	53.80	H	-27.75	26.05	54	27.95
5774.98	53.25	V	-27.75	25.50	54	28.50
7699.97	54.10	H	-27.75	26.35	54	27.65
7699.97	53.69	V	-27.75	25.94	54	28.06
High Channel (1928.448 MHz)						
1928.45	107.35	H	-27.75	79.60	/	/
1928.45	108.44	V	-27.75	80.69	/	/
3856.90	48.12	H	-27.75	20.37	54	33.63
3856.90	47.61	V	-27.75	19.86	54	34.14
5785.34	53.91	H	-27.75	26.16	54	27.84
5785.34	53.46	V	-27.75	25.71	54	28.29
7713.79	53.71	H	-27.75	25.96	54	28.04
7713.79	53.05	V	-27.75	25.30	54	28.70

Note:

Corrected Average Amplitude = Corrected Peak Amplitude + Duty Cycle Factor

Margin = Limit - Corrected Average Amplitude

Duty Cycle = Ton/Tp*100%, Ton = 412μs, Tp= 10.05ms

Duty Cycle Factor = 20lg (Duty Cycle) = -27.75

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