ACCREDITED
TESTING LABORATORY
CERTIFICATE # 4821.01

Bay Area Compliance Labs Corp.

FCC PART 15.247

TEST REPORT

For

CALTTA TECHNOLOGIES CO., LTD.

Floor12, Building G2, international E-City Nanshan District, Shenzhen, China

FCC ID: 2AQV7PH6X0U1

Report Type:	**Product Type:**
Class II Permissive Change	Digital Portable Radio

Report Number: RSZ210401010-00CA1

Report Date: 2021-04-28

Reviewed By: Jacob Kong, RF Engineer

Jacob Kong

Prepared By: Bay Area Compliance Laboratories Corp. (Shenzhen)
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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Product	Digital Portable Radio
Tested Model	PH600 U(1), PH660 U(1)
Multiple Model	PH690 UHF, PH660 UHF, PH600 UHF
Model Differences	Refer to the DoS letter
Frequency Range	BLE: 2402-2480MHz
Maximum Conducted Peak Output Power	BLE: 0.0005W
Modulation Technique	GFSK
Antenna Specification*	-4dBi (provided by the applicant)
Voltage Range	DC 7.4 V from battery or DC 12.0V from adapter
Date of Test	2021-04-13 to 2021-04-22
Sample serial number	RSZ210401010-RF-S1 & RSZ210401010-RF-S2(Assigned by BACL, Shenzhen)
Received date	2021-04-01
Sample/EUT Status	Good condition
Adapter information	Model: ES085H-X120100XYF Input: AC 100-240V~50/60Hz, 0.5A Output: DC 12.0V, 1.0A

Objective

This report is in accordance with Part 2-Subpart J, Part 15-Subparts A and C of the Federal Communication Commission's rules.

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.207, 15.209 and 15.247 rules.

This is a CIIPC application of the device; the differences between the original device and the current one are as follows:

1. Changing the company address to "Floor12, Building G2, international E-City Nanshan District, Shenzhen, China".

2. Changing the product name to "Digital Portable Radio".

3. Adding the model names "PH600 U(1), PH660 U(1), PH690 UHF, PH660 UHF, PH600 UHF".

4. For PH660 U(1), change the screen and keypad.

5. For PH600 U(1), remove the screen and keypad.

6. Adding the adapter for added models.

Based on above differences, we added the test item of "AC LINE CONDUCTED EMISSIONS", "RADIATED SPURIOUS EMISSIONS" for added models and related photos, the other photos and data please refer to the original report.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

And KDB 558074 D01 15.247 Meas Guidance v05r02.

All 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

Parameter		Uncertainty
Occupied Channel Bandwidth		±5%
RF Output Power with Power meter		±0.73dB
RF conducted test with spectrum		±1.6dB
AC Power Lines Conducted Emissions		±1.95dB
Emissions, Radiated	Below 1GHz	±4.75dB
	Above 1GHz	±4.88dB
Temperature		±1℃
Humidity		±6%
Supply voltages		±0.4%

Note: The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

Test Facility

The test site used by Bay Area Compliance Laboratories Corp. (Shenzhen) to collect test data is located on the 5F(B-West) , 6F, 7F, the 3rd Phase of Wan Li Industrial Building D, Shihua Rd, FuTian Free Trade Zone, Shenzhen, China.

The test site has been approved by the FCC under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No.: 342867, the FCC Designation No.: CN1221.

The test site has been registered with ISED Canada under ISED Canada Registration Number 3062B.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

For LE 1M mode, 40 channels are provided to testing:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	20	2442
1	2404	21	2444
2	2406	22	2446
3	2408	23	2448
4	2410	24	2450
5	2412	25	2452
6	2414	26	2454
7	2416	27	2456
8	2418	28	2458
9	2420	29	2460
10	2422	30	2462
11	2424	31	2464
12	2426	32	2466
13	2428	33	2468
14	2430	34	2470
15	2432	35	2472
16	2434	36	2474
17	2436	37	2476
18	2438	38	2478
19	2440	39	2480

EUT was tested with Channel 0, 19 and 39.

Equipment Modifications

No modification was made to the EUT tested.

EUT Exercise Software

“BlueTest3” software was used to the EUT tested and the power level is default*. The power level was provided by the applicant.

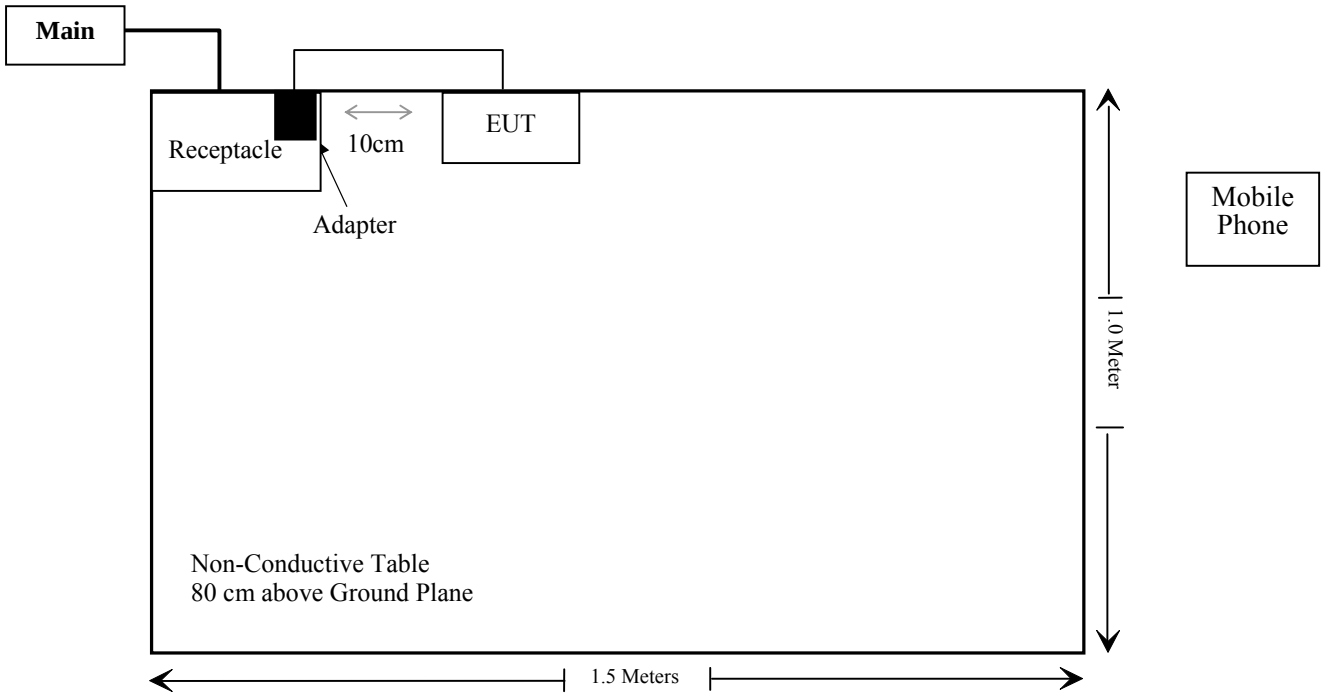
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
HUAWEI	Mobile phone	V20	Unknown

External I/O Cable

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

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.247 (i), §1.1307 (b) (1)& §2.1093	RF Exposure	Compliance
§15.203	Antenna Requirement	Compliance
§15.207 (a)	AC Line Conducted Emissions	Compliance
§15.205, §15.209, §15.247(d)	Spurious Emissions	Compliance
§15.247 (a)(2)	6 dB Emission Bandwidth	Compliance*
§15.247(b)(3)	Maximum Conducted Output Power	Compliance*
§15.247(d)	100 kHz Bandwidth of Frequency Band Edge	Compliance*
§15.247(e)	Power Spectral Density	Compliance*

Compliance*: Please refer to original report RSZ190325001-00C.

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Conducted Emission Test					
Rohde & Schwarz	EMI Test Receiver	ESCI	101120	2020/08/04	2021/08/03
Rohde & Schwarz	LISN	ENV216	101613	2020/08/04	2021/08/03
Rohde & Schwarz	Transient Limitor	ESH3Z2	DE25985	2020/11/29	2021/11/28
Unknown	CE Cable	CE Cable	UF A210B-1-0720-504504	2020/11/29	2021/11/28
Rohde & Schwarz	CE Test software	EMC 32	V8.53.0	NCR	NCR
Radiated Emission Test					
R&S	EMI Test Receiver	ESR3	102455	2020/08/04	2021/08/03
Sonoma instrument	Pre-amplifier	310 N	186238	2020/08/04	2021/08/03
Sunol Sciences	Broadband Antenna	JB1	A040904-2	2020/12/22	2023/12/21
Unknown	Cable 2	RF Cable 2	F-03-EM197	2020/11/29	2021/11/28
Unknown	Cable	Chamber Cable 1	F-03-EM236	2020/11/29	2021/11/28
Unknown	Cable	Chamber Cable 4	EC-007	2020/11/29	2021/11/28
Rohde & Schwarz	Auto test software	EMC 32	V9.10	NCR	NCR

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

FCC§15.247 (i), §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:
[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] · [√f(GHz)] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where
1. f(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.

For worst case:

Frequency (MHz)	Maximum Tune-up power		Calculated Distance (mm)	Calculated Value	Threshold (1-g SAR)	SAR Test Exclusion
	(dBm)	(mW)				
2480	-3.0	0.5	5	0.2	3.0	**Yes**

Result: No Standalone SAR test is required

FCC §15.203 - ANTENNA REQUIREMENT

Applicable Standard

According to § 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 user of a standard antenna jack or electrical connector is prohibited. The structure and application of the EUT were analyzed to determine compliance with section §15.203 of the rules. §15.203 state that the subject device must meet the following criteria:

a. Antenna must be permanently attached to the unit.
b. Antenna must use a unique type of connector to attach to the EUT.

Unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.
And according to FCC 47 CFR section 15.247 (b), if the transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Antenna Connector Construction

The EUT has one external antenna, the antenna was professionally installed by user and the antenna gain is -4dBi, fulfill the requirement of this section. Please refer to the EUT photos.

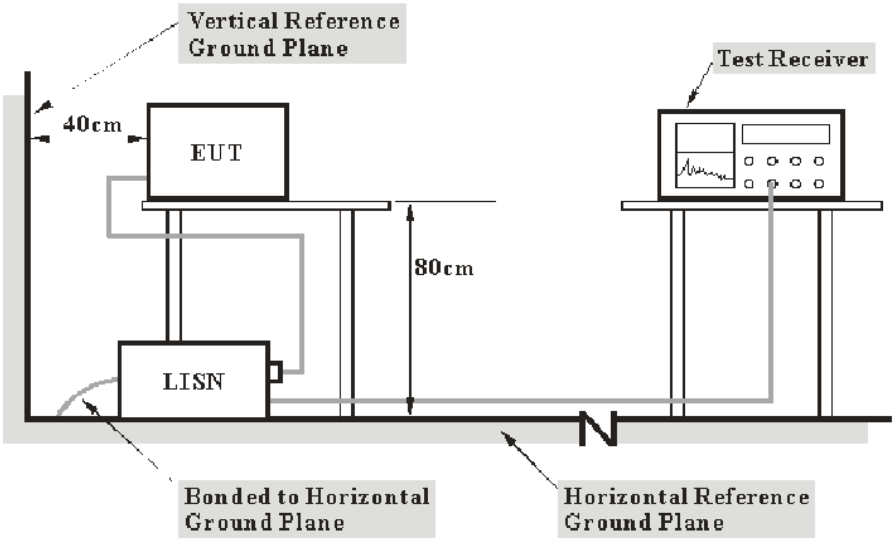
Result: Compliance.

FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS

Applicable Standard

FCC §15.207(a)

EUT Setup



Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The measurement procedure of EUT setup is according with ANSI C63.10-2013. The related limit was specified in FCC Part 15.207.

The spacing between the peripherals was 10 cm.

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

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

Frequency Range	IF B/W
150 kHz – 30 MHz	9 kHz

Test Procedure

During the conducted emission test, the device was connected to the outlet of the LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All final data was recorded in the Quasi-peak and average detection mode.

Corrected Factor & Margin Calculation

The Corrected factor is calculated by adding LISN VDF (Voltage Division Factor), Cable Loss and Transient Limiter Attenuation. The basic equation is as follows:

Correction Factor = LISN VDF + Cable Loss + Transient Limiter Attenuation

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

Margin = Limit – Corrected Amplitude

Test Data

Environmental Conditions

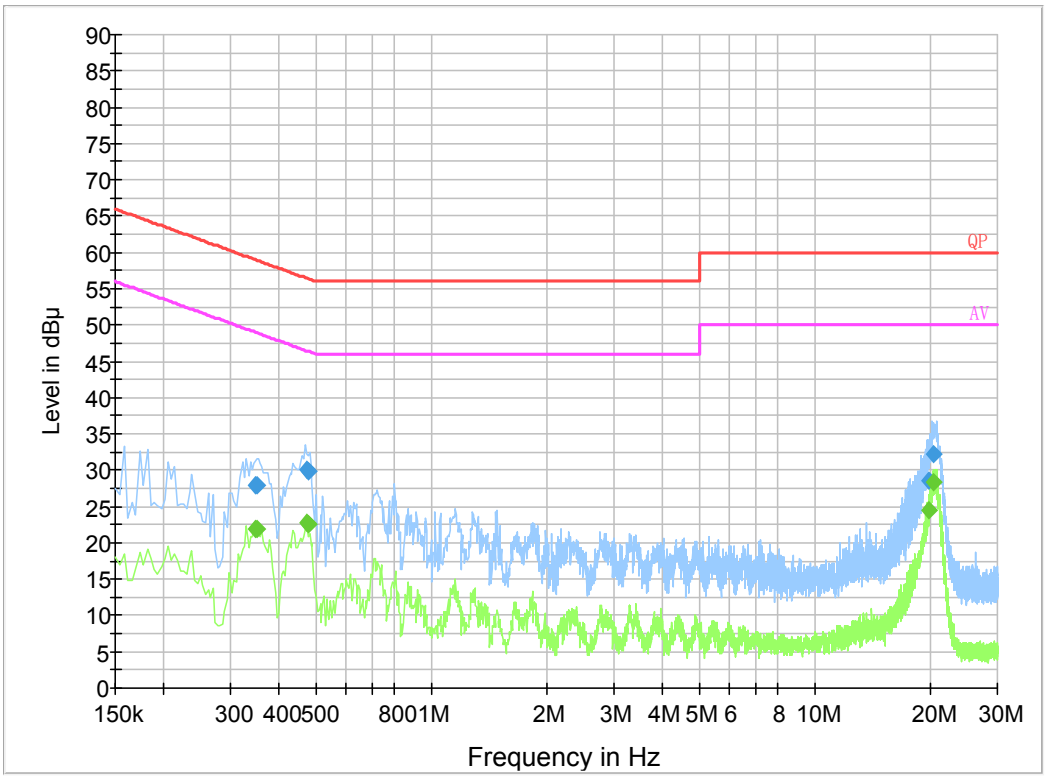
Temperature:	25 ℃
Relative Humidity:	65 %
ATM Pressure:	101.0 kPa

The testing was performed by Haiguo Li on 2021-04-13.

EUT operation mode: BT link

Test Model: PH600 U(1)

AC 120V/60 Hz, Line



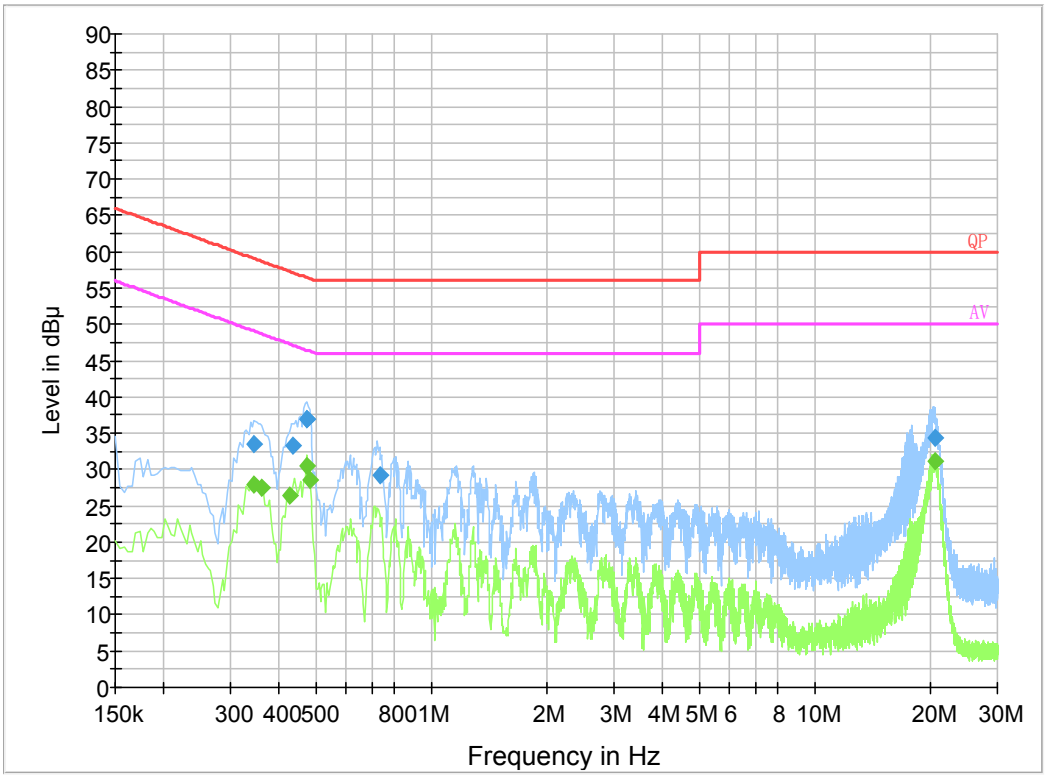
Final Result 1

Frequency (MHz)	QuasiPeak (dB µ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.348690	27.9	9.000	L1	19.9	31.1	59.0
0.352750	27.8	9.000	L1	19.9	31.1	58.9
0.474950	30.1	9.000	L1	19.8	26.3	56.4
0.478770	29.9	9.000	L1	19.8	26.5	56.4
19.828930	28.7	9.000	L1	20.5	31.3	60.0
20.463150	32.1	9.000	L1	20.5	27.9	60.0

Final Result 2

Frequency (MHz)	Average (dB µ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.348690	21.8	9.000	L1	19.9	27.1	49.0
0.352750	21.8	9.000	L1	19.9	27.1	48.9
0.474950	22.7	9.000	L1	19.8	23.8	46.4
0.478770	22.7	9.000	L1	19.8	23.7	46.4
19.828930	24.5	9.000	L1	20.5	25.5	50.0
20.463150	28.5	9.000	L1	20.5	21.5	50.0

AC 120V/60 Hz, Neutral



Final Result 1

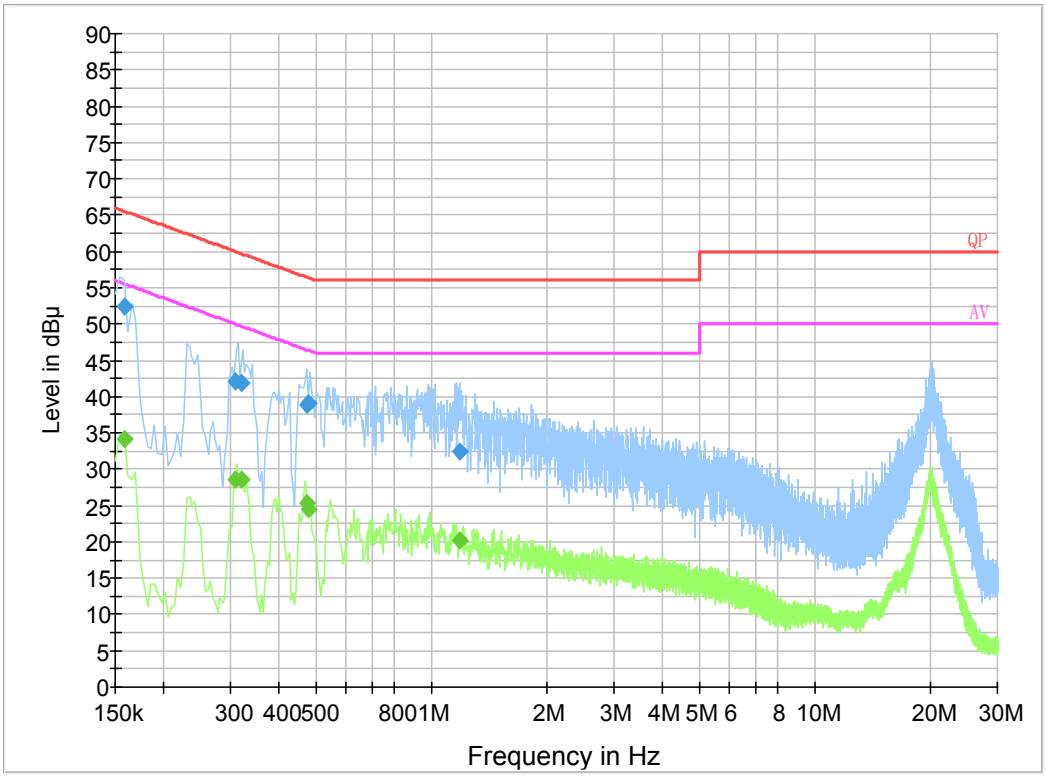
Frequency (MHz)	QuasiPeak (dB µ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.344810	33.6	9.000	N	19.8	25.5	59.1
0.435550	33.3	9.000	N	19.8	23.8	57.1
0.474770	37.0	9.000	N	19.8	19.4	56.4
0.474890	37.0	9.000	N	19.8	19.4	56.4
0.735110	29.2	9.000	N	19.8	26.8	56.0
20.544330	34.3	9.000	N	20.4	25.7	60.0

Final Result 2

Frequency (MHz)	Average (dB µ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.346000	28.0	9.000	N	19.8	21.1	49.1
0.362000	27.5	9.000	N	19.9	21.2	48.7
0.426000	26.5	9.000	N	19.8	20.8	47.3
0.474000	30.5	9.000	N	19.8	15.9	46.4
0.482000	28.6	9.000	N	19.8	17.7	46.3
20.602000	31.1	9.000	N	20.4	18.9	50.0

Test Model: PH660 U(1)

AC 120V/60 Hz, Line



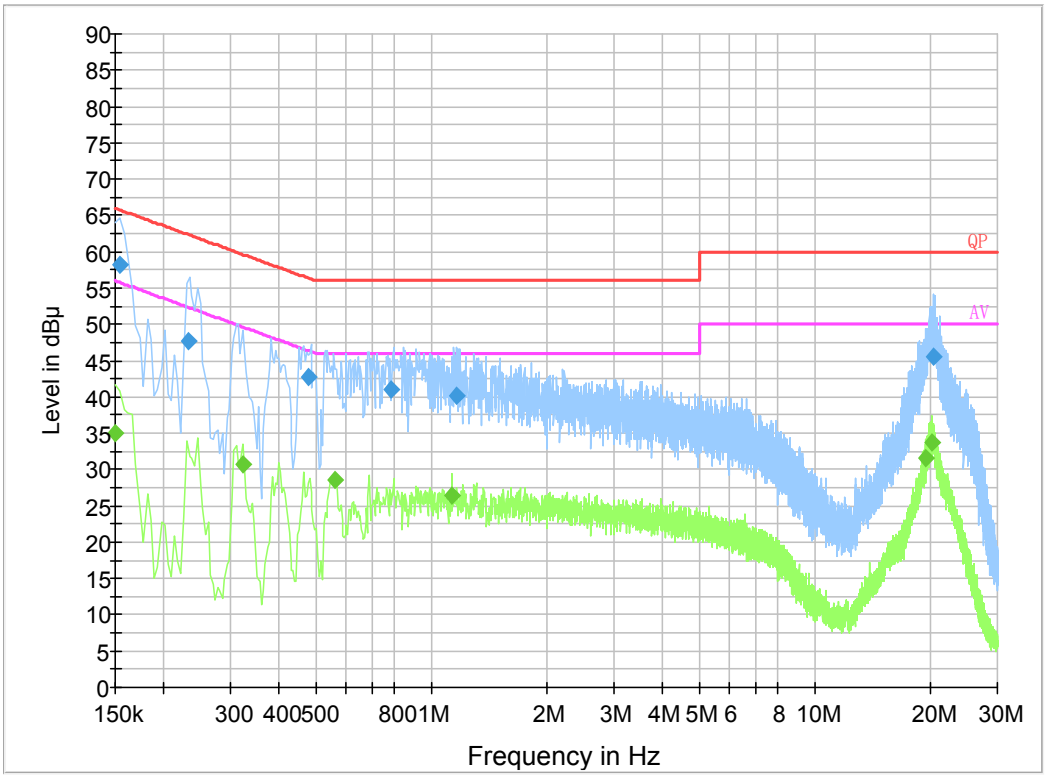
Final Result 1

Frequency (MHz)	QuasiPeak (dB µ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.158000	52.5	9.000	L1	19.8	13.1	65.6
0.309290	42.0	9.000	L1	19.7	18.0	60.0
0.321170	41.9	9.000	L1	19.8	17.8	59.7
0.474770	38.9	9.000	L1	19.8	17.5	56.4
0.478890	39.0	9.000	L1	19.8	17.4	56.4
1.192270	32.5	9.000	L1	19.8	23.5	56.0

Final Result 2

Frequency (MHz)	Average (dB µ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.158000	34.2	9.000	L1	19.8	21.4	55.6
0.309290	28.5	9.000	L1	19.7	21.5	50.0
0.321170	28.6	9.000	L1	19.8	21.1	49.7
0.474770	25.4	9.000	L1	19.8	21.0	46.4
0.478890	24.4	9.000	L1	19.8	22.0	46.4
1.192270	20.3	9.000	L1	19.8	25.7	46.0

AC 120V/60 Hz, Neutral



Final Result 1

Frequency (MHz)	QuasiPeak (dB µ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.154000	58.3	9.000	N	19.8	7.5	65.8
0.233500	47.7	9.000	N	19.8	14.6	62.3
0.478710	42.8	9.000	N	19.8	13.6	56.4
0.786030	40.9	9.000	N	19.8	15.1	56.0
1.160810	40.3	9.000	N	19.8	15.7	56.0
20.355370	45.6	9.000	N	20.4	14.4	60.0

Final Result 2

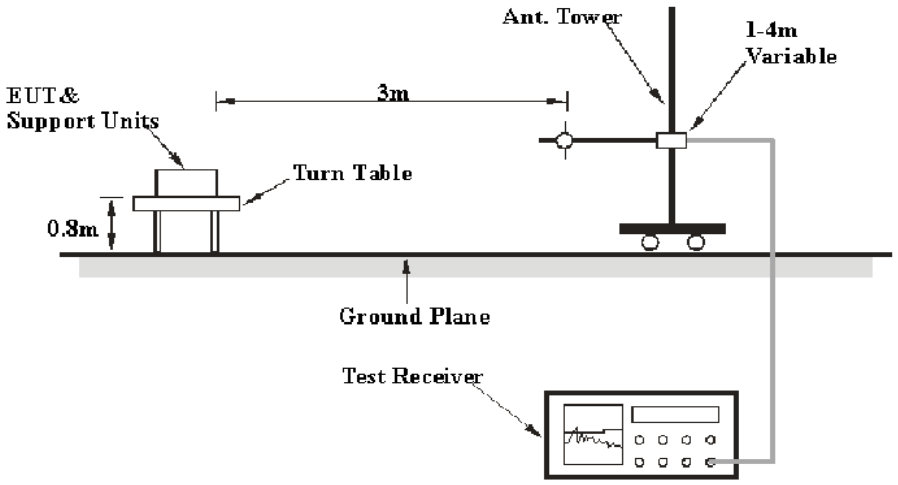
Frequency (MHz)	Average (dB µ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.150000	35.0	9.000	N	19.8	21.0	56.0
0.322000	30.8	9.000	N	19.8	18.9	49.7
0.562000	28.7	9.000	N	19.8	17.3	46.0
1.134000	26.5	9.000	N	19.8	19.5	46.0
19.578000	31.6	9.000	N	20.4	18.4	50.0
20.158000	33.8	9.000	N	20.4	16.2	50.0

FCC §15.209, §15.205 & §15.247(d) - SPURIOUS EMISSIONS

Applicable Standard

FCC §15.247 (d); §15.209; §15.205;

EUT Setup



The radiated emission tests were performed in the 3 meters test site, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC 15.209, and FCC 15.247 limits.

EMI Test Receiver & Spectrum Analyzer Setup

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	Measurement
30 MHz – 1000 MHz	100 kHz	300 kHz	120 kHz	QP

Test Procedure

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

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:

Corrected Amplitude = Meter Reading + Antenna Factor + Cable Loss - 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 limit. The equation for margin calculation is as follows:

Margin = Limit – Corrected Amplitude

Test Data

Environmental Conditions

Temperature:	26 ℃
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

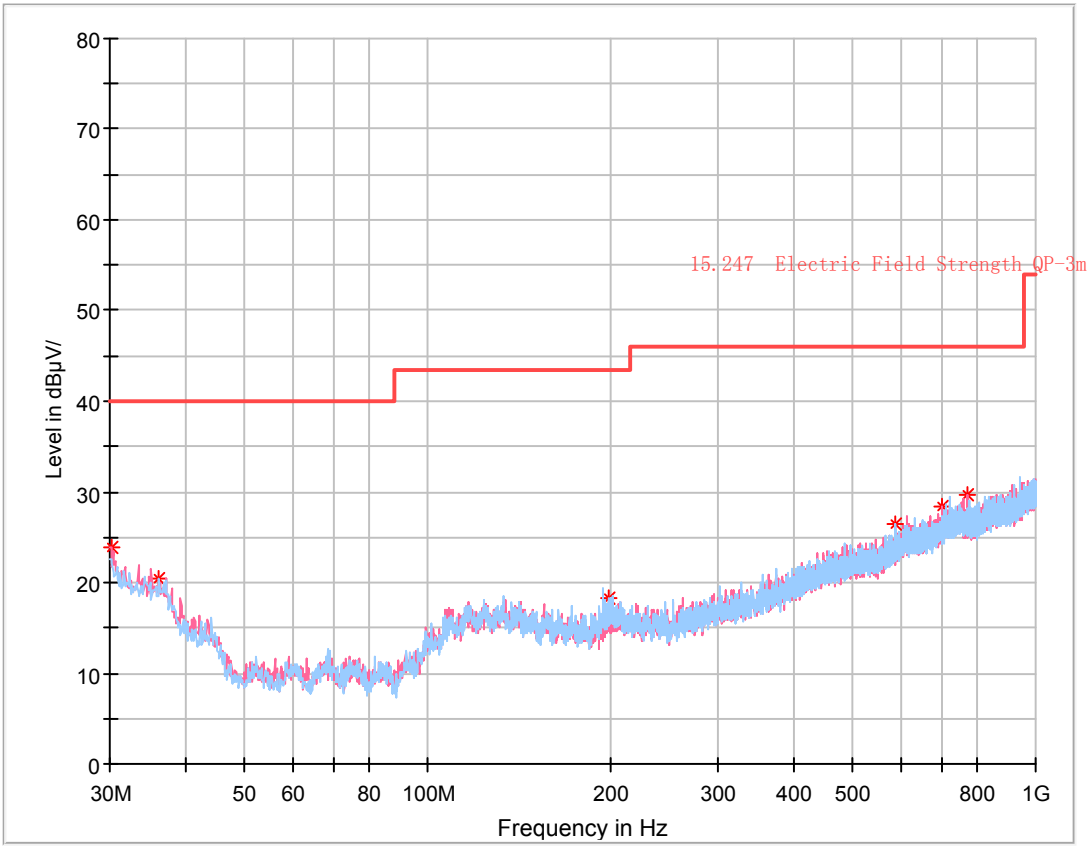
The testing was performed by Andy Yu on 2021-04-22.

EUT operation mode: Transmitting

Note: For above 1GHz, please refer to original report.

30 MHz~1 GHz: (Worst case is middle channel)

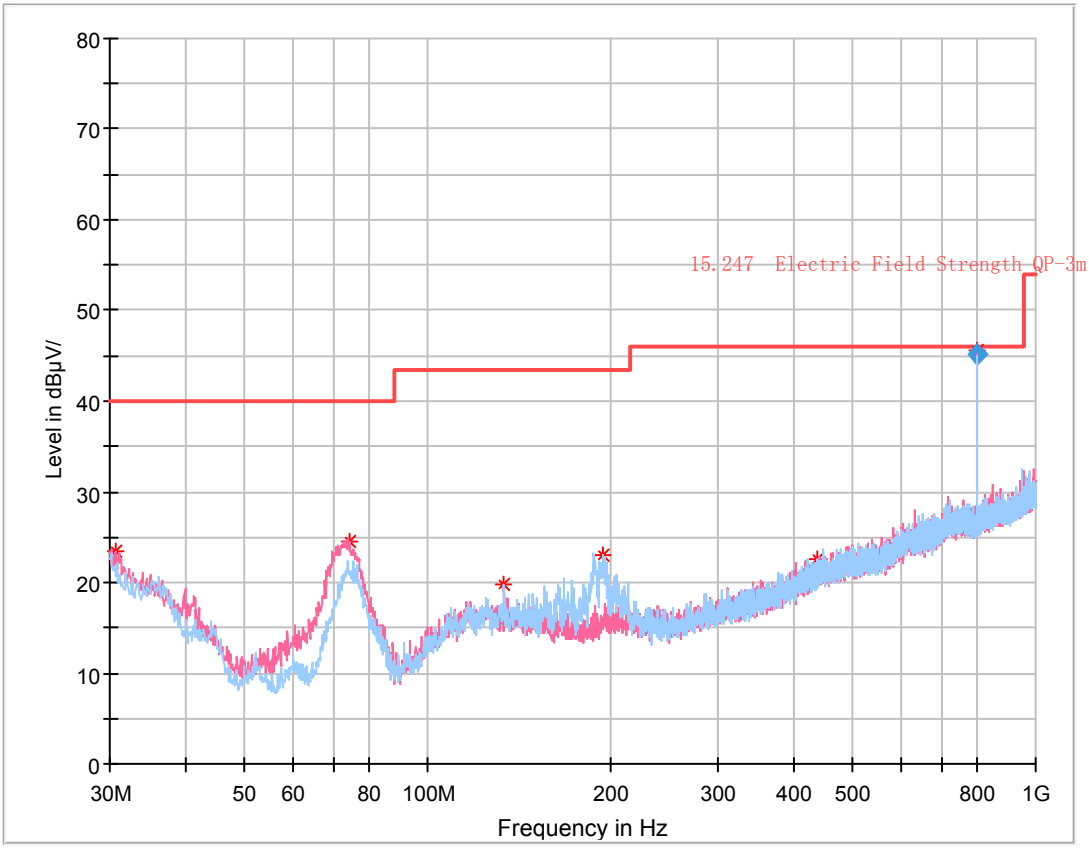
Test Model: PH600 U(1)



Critical_Freqs

Frequency (MHz)	MaxPeak (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
30.121250	23.90	40.00	16.10	300.0	V	15.0	-3.6
36.183750	20.52	40.00	19.48	300.0	H	0.0	-8.1
199.265000	18.32	43.50	25.18	100.0	H	166.0	-11.1
589.447500	26.48	46.00	19.52	100.0	H	125.0	-3.4
699.785000	28.28	46.00	17.72	200.0	V	0.0	-1.5
769.988750	29.57	46.00	16.43	400.0	V	345.0	-0.5

Test Model: PH660 U(1)



Final_Result

Frequency (MHz)	QuasiPeak (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
800.009750	45.19	46.00	0.81	205.0	V	186.0	-0.5

Critical_Freqs

Frequency (MHz)	MaxPeak (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
30.606250	23.40	40.00	16.60	200.0	V	301.0	-4.0
74.256250	24.60	40.00	15.40	200.0	V	0.0	-16.4
133.668750	19.69	43.50	23.81	300.0	H	101.0	-10.5
194.415000	23.09	43.50	20.41	100.0	H	128.0	-11.7
438.855000	22.52	46.00	23.48	100.0	H	171.0	-6.0
800.009750	45.58	46.00	0.42	203.0	V	186.0	-0.5

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