




# TEST REPORT

**Report Reference No.**..... : **CHTEW1911010101**      Report Verification: 

**Project No.**..... : **SHT1910071701EW**

**Applicant's name**..... : **CaptionCall, LLC**

Address..... : 4215 South Riverboat Road, Salt Lake City, UT 84020

Manufacturer..... : CaptionCall, LLC

Address..... : 4215 South Riverboat Road, Salt Lake City, UT 84020

**Test item description** ..... : **MiFi**

Trade Mark ..... : N/A

Model/Type reference..... : CH1

Listed Model(s) ..... : N/A

**Standard** ..... : **47 CFR FCC Part 15 Subpart B**

Date of receipt of test sample..... : Oct.31, 2019

Date of testing..... : Nov.01, 2019- Nov.14, 2019

Date of issue..... : Nov.15, 2019

**Result**..... : **Pass**

Compiled by ( position+printed name+signature)...	File administrators Silvia Li	
Supervised by ( position+printed name+signature)...	Project Engineer Aaron Fang	
Approved by ( position+printed name+signature)...	RF Manager Hans Hu	

**Testing Laboratory Name** ..... : **Shenzhen Huatongwei International Inspection Co., Ltd.**

Address..... : 1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, China

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*The test report merely corresponds to the test sample.*

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## 1. TEST STANDARDS AND REPORT VERSION

### 1.1. Test Standards

The tests were performed according to following standards:

[47 CFR FCC 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 40GHz

### 1.2. Report version information

Revision No.	Date of issue	Description
N/A	2019-11-15	Original

## **2. TEST DESCRIPTION**

<b>Test Item</b>	<b>Section in CFR 47</b>	<b>Result</b>	<b>Test Engineer</b>
Conducted Emissions	15.107(a)	PASS	Kang Yang
Radiated Emissions	15.109(a)	PASS	Barry Chang

Note: The measurement uncertainty is not included in the test result.

### 3. SUMMARY

#### 3.1. Client Information

Applicant:	CaptionCall, LLC
Address:	4215 South Riverboat Road, Salt Lake City, UT 84020
Manufacturer:	CaptionCall, LLC
Address:	4215 South Riverboat Road, Salt Lake City, UT 84020

#### 3.2. Product Description

Name of EUT:	MiFi
Trade Mark:	N/A
Model No.:	CH1
Listed Model(s)	N/A
Power supply:	DC 5V from adapter
Test voltage	120Va.c., 60Hz
Adapter information:	Model: GLH50Z1000 Input: 100-240Va.c., 50/60Hz 0.30A Output: 5.0Vd.c., 1000mA

#### 3.3. EUT operation mode

Test mode	Describe
Working	Power on to make the EUT work normally

## **4. TEST ENVIRONMENT**

### **4.1. Address of the test laboratory**

Laboratory: Shenzhen Huatongwei International Inspection Co., Ltd.

Address: 1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, China

Phone: 86-755-26748019 Fax: 86-755-26748089

### **4.2. Test Facility**

The test facility is recognized, certified, or accredited by the following organizations:

#### **CNAS-Lab Code: L1225**

Shenzhen Huatongwei International Inspection Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories.

#### **A2LA-Lab Cert. No. 3902.01**

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

#### **FCC-Registration No.: 762235**

Shenzhen Huatongwei International Inspection 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. Registration 762235.

#### **IC-Registration No.: 5377A**

Two 3m Alternate Test Site of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 5377A.

#### **ACA**

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory can also perform testing for the Australian C-Tick mark as a result of our A2LA accreditation.

### 4.3. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15~35°C
Relative Humidity:	30~60 %
Air Pressure:	950~1050mba

### 4.4. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 „Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ and is documented in the Shenzhen Huatongwei International Inspection Co., Ltd quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Shenzhen Huatongwei laboratory is reported:

Test	Range	Measurement Uncertainty	Notes
Radiated Emissions	30~1000MHz	4.90 dB	(1)
Radiated Emissions	1~18GHz	4.96 dB	(1)
Conducted Disturbance	0.15~30MHz	3.02 dB	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k=1.96$ .

#### 4.5. Equipments Used during the Test

● Conducted Emission							
Used	Test Equipment	Manufacturer	Equipment No.	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
●	Shielded Room	Albatross projects	HTWE0114	N/A	N/A	2018/09/28	2023/09/27
●	EMI Test Receiver	R&S	HTWE0111	ESCI	101247	2019/10/26	2020/10/25
●	Artificial Mains	SCHWARZBECK	HTWE0113	NNLK 8121	573	2019/10/23	2020/10/22
●	Pulse Limiter	R&S	HTWE0033	ESH3-Z2	100499	2019/10/23	2020/10/22
●	RF Connection Cable	HUBER+SUHNER	HTWE0113-02	ENVIROFLE X_142	EF-NM-BNCM-2M	2019/10/23	2020/10/22
●	Test Software	R&S	N/A	ES-K1	N/A	N/A	N/A

● Radiated emission-6th test site							
Used	Test Equipment	Manufacturer	Equipment No.	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
●	Semi-Anechoic Chamber	Albatross projects	HTWE0127	SAC-3m-02	C11121	2018/09/30	2021/09/29
●	EMI Test Receiver	R&S	HTWE0099	ESCI	100900	2019/10/26	2020/10/25
●	Loop Antenna	R&S	HTWE0170	HFH2-Z2	100020	2018/04/02	2021/04/01
●	Ultra-Broadband Antenna	SCHWARZBECK	HTWE0119	VULB9163	546	2017/04/05	2020/04/04
●	Pre-Amplifier	SCHWARZBECK	HTWE0295	BBV 9742	N/A	2019/11/14	2020/11/13
●	RF Connection Cable	HUBER+SUHNER	HTWE0062-01	N/A	N/A	2019/08/21	2020/08/20
●	RF Connection Cable	HUBER+SUHNER	HTWE0062-02	SUCOFLEX 104	501184/4	2019/05/27	2020/05/26
●	Test Software	R&S	N/A	ES-K1	N/A	N/A	N/A

● Radiated emission-7th test site							
Used	Test Equipment	Manufacturer	Equipment No.	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
●	Semi-Anechoic Chamber	Albatross projects	HTWE0122	SAC-3m-01	N/A	2018/09/27	2021/09/26
●	Spectrum Analyzer	R&S	HTWE0098	FSP40	100597	2019/10/26	2020/10/25
●	Horn Antenna	SCHWARZBECK	HTWE0126	9120D	1011	2017/04/01	2020/03/31
●	Horn Antenna	SCHWARZBECK	HTWE0103	BBHA9170	25841	2017/03/27	2020/03/26
●	Broadband Horn Antenna	SCHWARZBECK	HTWE0103	BBHA9170	BBHA9170472	2018/10/11	2021/10/10
●	Pre-amplifier	CD	HTWE0071	PAP-0102	12004	2019/11/14	2020/11/13
●	Broadband Pre-amplifier	SCHWARZBECK	HTWE0201	BBV 9718	9718-248	2019/05/23	2020/05/22
●	RF Connection Cable	HUBER+SUHNER	HTWE0120-01	6m 18GHz S Serisa	N/A	2019/05/10	2020/05/09
●	RF Connection Cable	HUBER+SUHNER	HTWE0120-02	6m 3GHz RG Serisa	N/A	2019/05/10	2020/05/09
●	RF Connection Cable	HUBER+SUHNER	HTWE0120-03	6m 3GHz RG Serisa	N/A	2019/05/10	2020/05/09
●	RF Connection Cable	HUBER+SUHNER	HTWE0120-04	6m 3GHz RG Serisa	N/A	2019/05/10	2020/05/09
●	RF Connection Cable	HUBER+SUHNER	HTWE0121-01	6m 18GHz S Serisa	N/A	2019/05/10	2020/05/09
●	Test Software	Audix	N/A	E3	N/A	N/A	N/A



## 5. TEST CONDITIONS AND RESULTS

### 5.1. Conducted Emissions Test

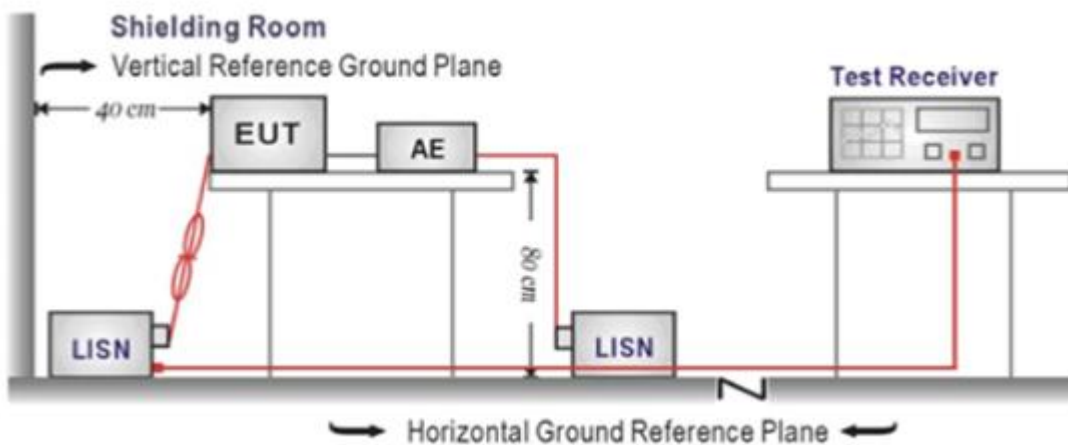
#### LIMIT

FCC CFR Title 47 Part 15 Subpart B Section 15.107:

Frequency range (MHz)	Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

\* Decreases with the logarithm of the frequency.

#### TEST CONFIGURATION



#### TEST PROCEDURE

1. The EUT was setup according to ANSI C63.4:2014
2. The EUT was placed on a plat form of nominal size, 1 m by 1.5 m, raised 10 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 10 cm from any other grounded conducting surface.
3. The EUT and simulators are connected to the main power through a line impedance stabilization network (LISN). The LISN provides a 50ohm / 50uH coupling impedance for the measuring equipment.
4. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs)
5. Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source.
6. The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.
7. Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9 kHz.
8. During the above scans, the emissions were maximized by cable manipulation.

#### TEST MODE:

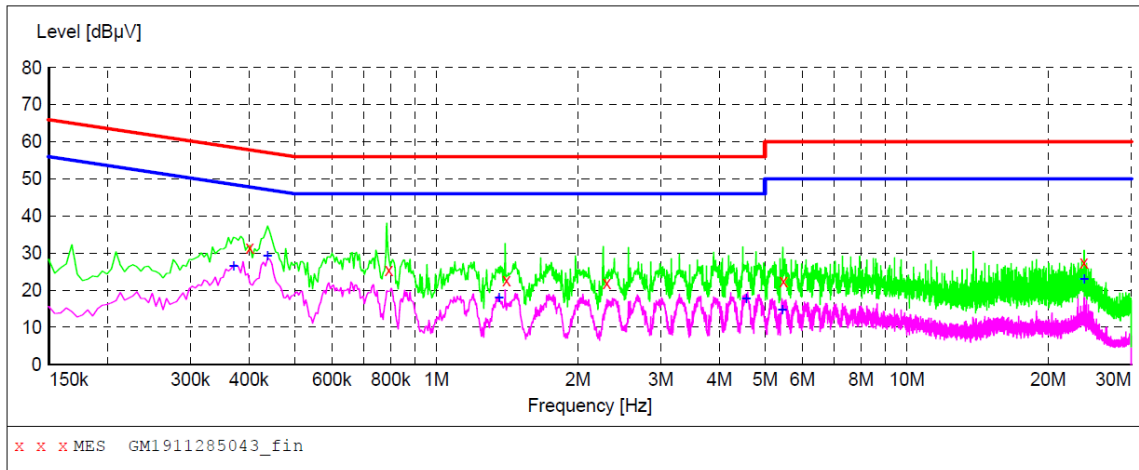
Please refer to the clause 3.3

#### TEST RESULTS

Passed       Not Applicable

Test Line:

L



**MEASUREMENT RESULT: "GM1911285043\_fin"**

11/28/2019 3:44PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.402000	31.60	10.1	58	26.2	QP	L1	GND
0.793500	25.50	10.1	56	30.5	QP	L1	GND
1.410000	22.60	10.1	56	33.4	QP	L1	GND
2.305500	21.90	10.1	56	34.1	QP	L1	GND
5.478000	22.40	10.2	60	37.6	QP	L1	GND
23.829000	27.60	10.2	60	32.4	QP	L1	GND

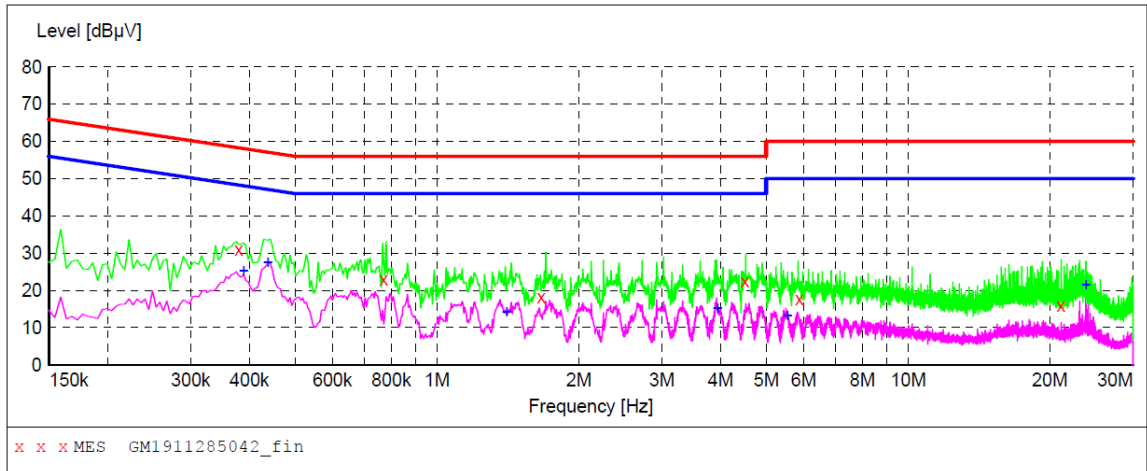
**MEASUREMENT RESULT: "GM1911285043\_fin2"**

11/28/2019 3:44PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.370500	26.40	10.1	49	22.1	AV	L1	GND
0.438000	29.20	10.1	47	17.9	AV	L1	GND
1.360500	17.90	10.1	46	28.1	AV	L1	GND
4.555500	17.80	10.1	46	28.2	AV	L1	GND
5.433000	14.80	10.2	50	35.2	AV	L1	GND
23.833500	23.10	10.2	50	26.9	AV	L1	GND

Test Line:

N



**MEASUREMENT RESULT: "GM1911285042\_fin"**

11/28/2019 3:41PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.379500	31.00	10.1	58	27.3	QP	N	GND
0.771000	22.90	10.1	56	33.1	QP	N	GND
1.666500	18.20	10.1	56	37.8	QP	N	GND
4.510500	22.50	10.1	56	33.5	QP	N	GND
5.878500	17.80	10.2	60	42.2	QP	N	GND
21.084000	16.00	10.2	60	44.0	QP	N	GND

**MEASUREMENT RESULT: "GM1911285042\_fin2"**

11/28/2019 3:41PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.388500	25.30	10.1	48	22.8	AV	N	GND
0.438000	27.50	10.1	47	19.6	AV	N	GND
1.405500	14.30	10.1	46	31.7	AV	N	GND
3.934500	15.10	10.1	46	30.9	AV	N	GND
5.545500	13.20	10.2	50	36.8	AV	N	GND
23.829000	21.40	10.2	50	28.6	AV	N	GND

## 5.2. Radiated Emissions Test

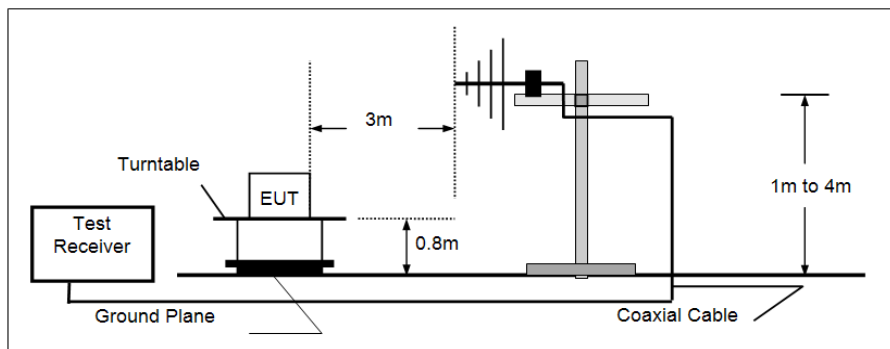
### LIMIT

#### FCC CFR Title 47 Part 15 Subpart B Section 15.109

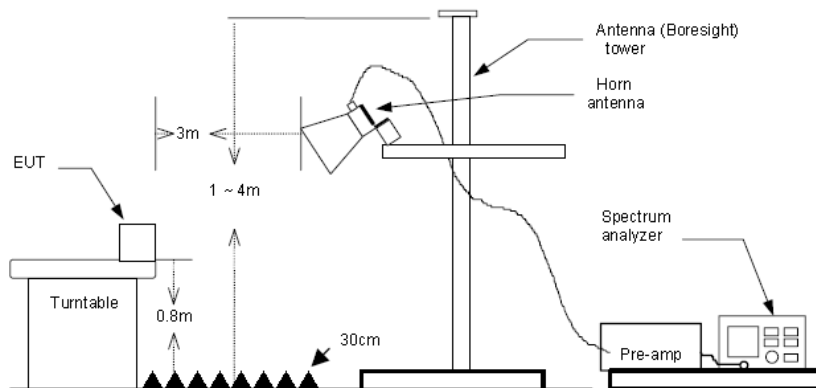
Frequency	Limit (dBuV/m @3m)	Value
30MHz-88MHz	40.00	Quasi-peak
88MHz-216MHz	43.50	Quasi-peak
216MHz-960MHz	46.00	Quasi-peak
960MHz-1GHz	54.00	Quasi-peak
Above 1GHz	54.00	Average
	74.00	Peak

### TEST CONFIGURATION

#### ➤ 30MHz ~ 1GHz



#### ➤ Above 1GHz



### TEST PROCEDURE

1. The EUT was tested according to ANSI C63.4:2014.
2. The EUT is placed on a turn table which is 0.8 meter above ground.
3. The turn table is rotated 360 degrees to determine the position of the maximum emission level.
4. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.
5. The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna.
6. Use the following spectrum analyzer settings
  - (1) Span shall wide enough to fully capture the emission being measured;
  - (2) Below 1GHz,  
 RBW=120KHz, VBW=300KHz, Sweep=auto, Detector function=peak, Trace=max hold;  
 If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
  - (3) From 1GHz to 5th harmonic, RBW=1MHz, VBW=3MHz

**TEST MODE:**

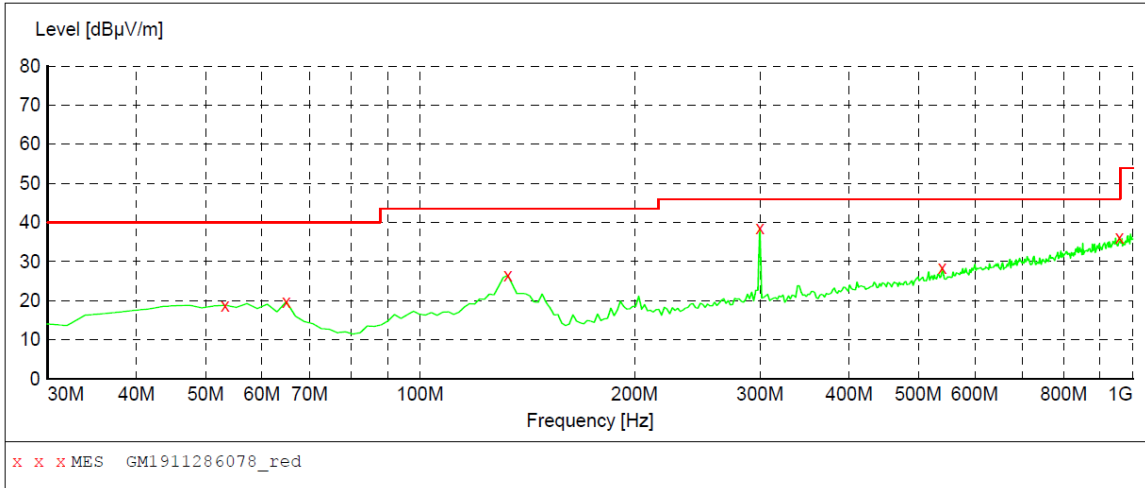
Please refer to the clause 3.3

**TEST RESULTS**

**Passed**       **Not Applicable**

Note: Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor  
The emission levels of frequency above 6GHz are very lower than limit and not show in test report.

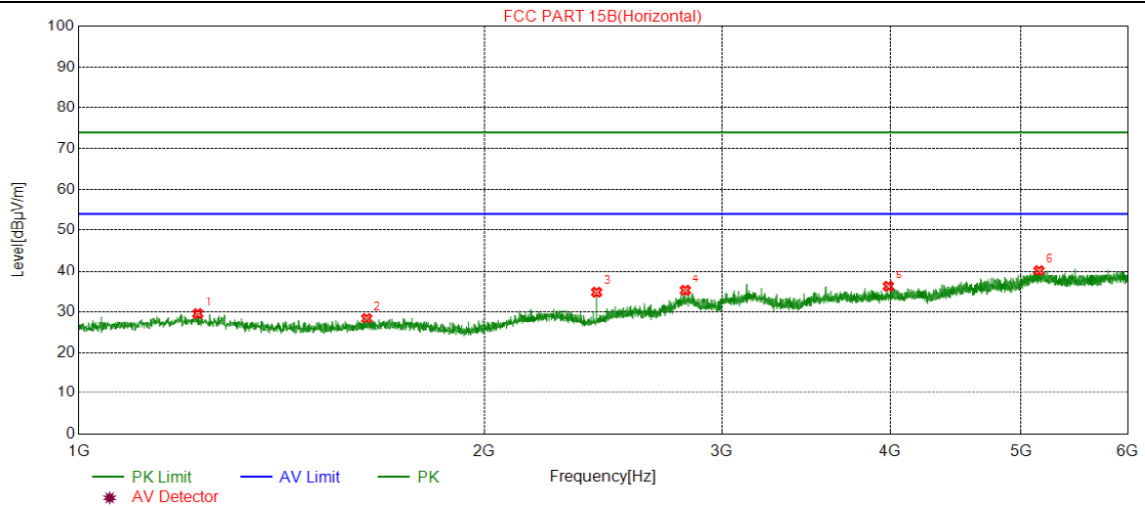
Polarization: Horizontal



**MEASUREMENT RESULT: "GM1911286078\_red"**

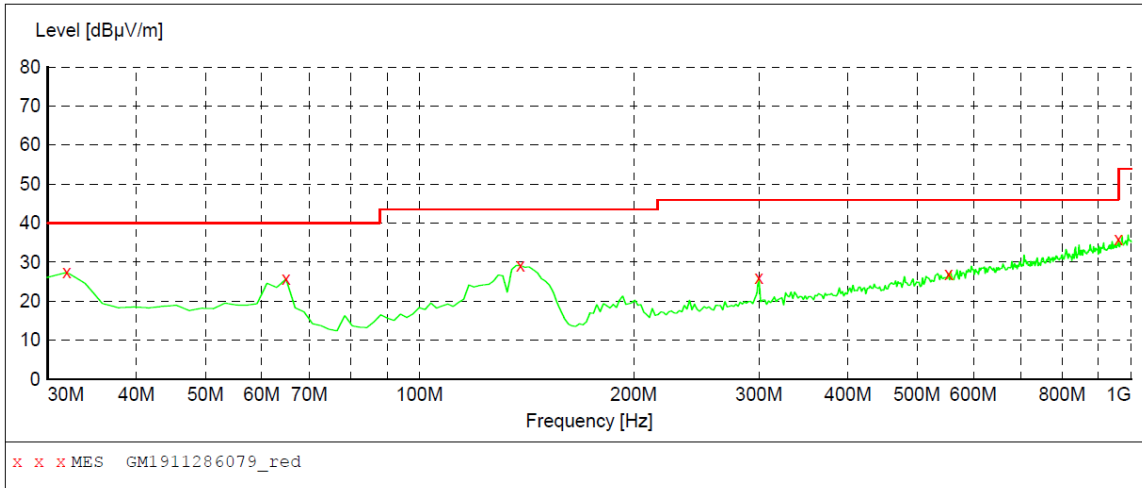
11/28/2019 6:25PM

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
53.280000	18.80	-8.6	40.0	21.2	QP	100.0	255.00	HORIZONTAL
64.920000	19.70	-11.0	40.0	20.3	QP	300.0	12.00	HORIZONTAL
132.820000	26.50	-13.2	43.5	17.0	QP	300.0	0.00	HORIZONTAL
299.660000	38.60	-6.4	46.0	7.4	QP	100.0	0.00	HORIZONTAL
540.220000	28.40	-0.2	46.0	17.6	QP	100.0	267.00	HORIZONTAL
957.320000	36.20	8.3	46.0	9.8	QP	300.0	279.00	HORIZONTAL



Suspected Data List								
NO.	Freq. [MHz]	Reading [dBµV/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity	Detector
1	1225.625	35.31	-5.76	29.55	74.00	44.45	Horizontal	PK
2	1635.625	34.63	-6.22	28.41	74.00	45.59	Horizontal	PK
3	2422.500	37.14	-2.35	34.79	74.00	39.21	Horizontal	PK
4	2818.750	33.47	1.78	35.25	74.00	38.75	Horizontal	PK
5	3987.500	33.21	2.98	36.19	74.00	37.81	Horizontal	PK
6	5157.500	31.38	8.90	40.28	74.00	33.72	Horizontal	PK

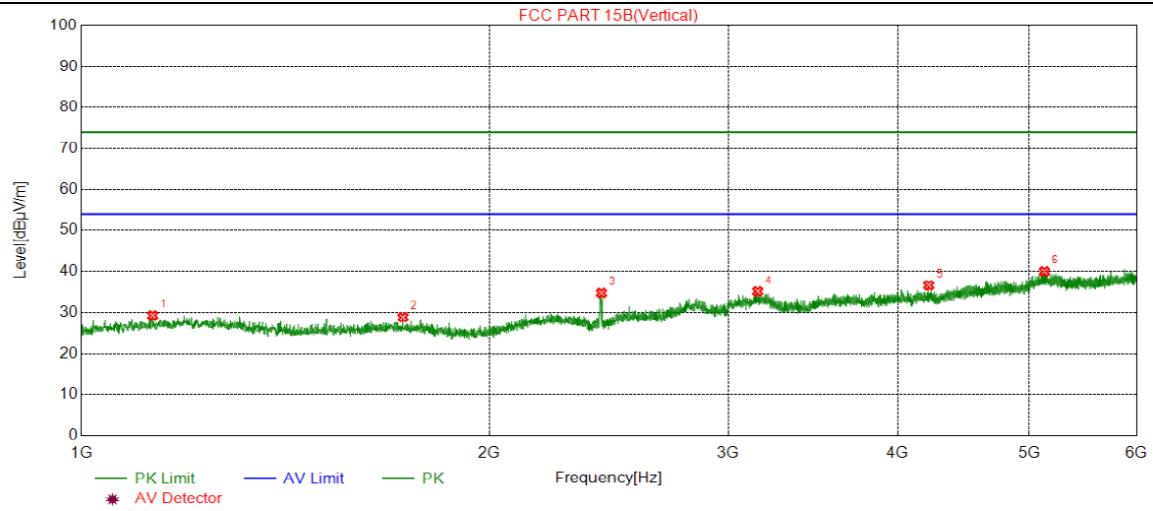
Polarization: Vertical



**MEASUREMENT RESULT: "GM1911286079\_red"**

11/28/2019 6:28PM

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
31.940000	27.40	-12.7	40.0	12.6	QP	100.0	359.00	VERTICAL
64.920000	25.70	-11.0	40.0	14.3	QP	100.0	298.00	VERTICAL
138.640000	29.20	-13.5	43.5	14.3	QP	100.0	160.00	VERTICAL
299.660000	25.90	-6.4	46.0	20.1	QP	100.0	188.00	VERTICAL
553.800000	27.10	0.2	46.0	18.9	QP	100.0	188.00	VERTICAL
959.260000	36.00	8.4	46.0	10.0	QP	100.0	198.00	VERTICAL



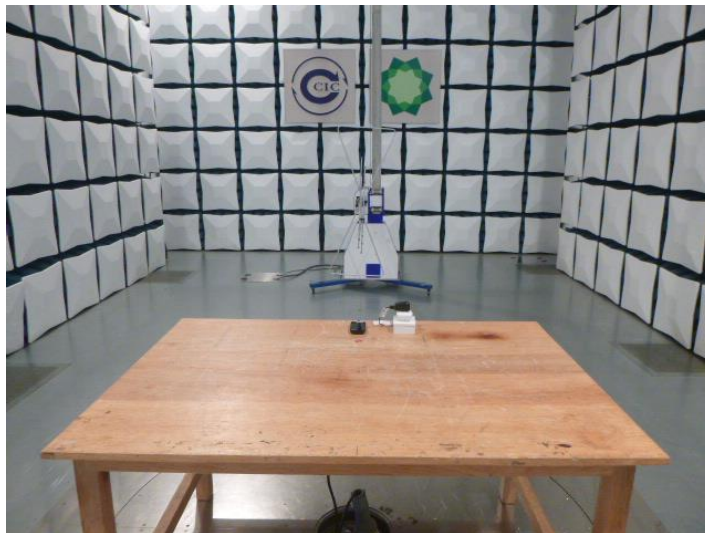
Suspected Data List								
NO.	Freq. [MHz]	Reading [dBµV/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity	Detector
1	1128.750	35.88	-6.59	29.29	74.00	44.71	Vertical	PK
2	1726.875	34.87	-6.02	28.85	74.00	45.15	Vertical	PK
3	2418.750	37.15	-2.36	34.79	74.00	39.21	Vertical	PK
4	3153.750	34.56	0.60	35.16	74.00	38.84	Vertical	PK
5	4216.875	32.81	3.81	36.62	74.00	37.38	Vertical	PK
6	5131.875	31.15	8.86	40.01	74.00	33.99	Vertical	PK

## 6. TEST SETUP PHOTOS OF THE EUT

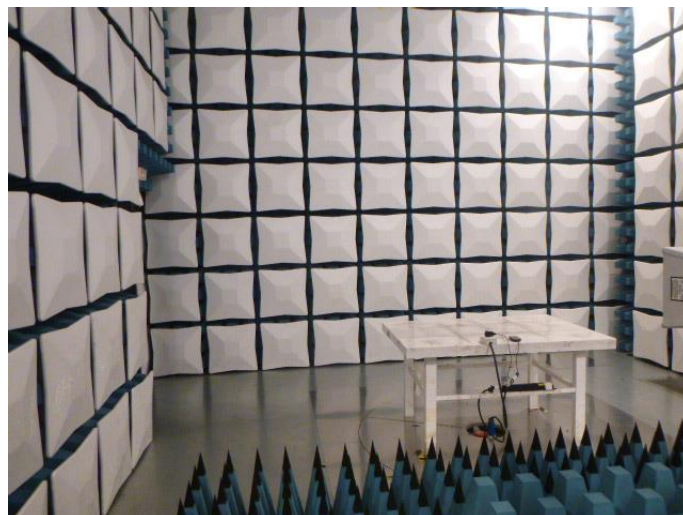
### Conducted Emissions (AC Mains)



### Radiated Emissions (30MHz-1GHz)



### Radiated Emissions (Above 1GHz)





## 7. **EXTERNAL AND INTERNAL PHOTOS OF THE EUT**

Reference to the test report No.: CHTEW19110101

-----End of Report-----