Shenzhen Global Test Service Co.,Ltd.
No.7-101 and 8A-104, Building 7 and 8, DCC Cultural and Creative Garden, No.98, Pingxin North Road, Shangmugu Community, Pinghu Street, Longgang District, Shenzhen, Guangdong

FCC PART 15 SUBPART C TEST REPORT

FCC PART 15.239

Report Reference No. ..... :	**GTS20200331005-1-8**
FCC ID. ..... :	**2AV8I-CARPLAYPLUSA**
Compiled by (position+printed name+signature) . :	File administrators Tracy Hu
Supervised by (position+printed name+signature) . :	Test Engineer Moon Tan
Approved by (position+printed name+signature) . :	Manager Simon Hu
Date of issue ..... :	May. 21, 2020
Representative Laboratory Name :	**Shenzhen Global Test Service Co.,Ltd.**
Address ..... :	No.7-101 and 8A-104, Building 7 and 8, DCC Cultural and Creative Garden, No.98, Pingxin North Road, Shangmugu Community, Pinghu Street, Longgang District, Shenzhen, Guangdong
Applicant's name ..... :	**Pacific Time Trading(Shenzhen)Limited**
Address ..... :	Unit 607, block A, Rong Chaoying Long building, 5 longfuRoad, Longcheng street, Longgang District, Shenzhen
Test specification ..... :	
Standard ..... :	**FCC CFR 47 PART 15.239 / ANSI C63.10: 2013**
TRF Originator ..... :	Shenzhen Global Test Service Co.,Ltd.
Master TRF ..... :	Dated 2014-12

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Test item description ..... :	**CARPLAY**
Trade Mark ..... :	N/A
Manufacturer ..... :	**TFVC SHANGHAI CO.,LTD.**
Model/Type reference ..... :	CARPLAY PLUS A
Listed Models ..... :	CARPLAY PLUS D, CARPLAY PLUS S, CARPLAY WIRELESS A, CARPLAY WIRELESS D, CARPLAY WIRELESS S
Modulation Type ..... :	FM
Operation Frequency ..... :	From 88MHz to 108MHz
Hardware Version ..... :	V1.0
Software Version ..... :	V1.0
Rating ..... :	DC 12V
Result ..... :	**PASS**

TEST REPORT

Test Report No. :	GTS20200331005-1-8	May. 21, 2020 Date of issue

Equipment under Test	:	CARPLAY
Model /Type	:	CARPLAY PLUS A
Listed Models	:	CARPLAY PLUS D, CARPLAY PLUS S, CARPLAY WIRELESS A, CARPLAY WIRELESS D, CARPLAY WIRELESS S
Applicant	:	**Pacific Time Trading(Shenzhen)Limited**
Address	:	Unit 607, block A, Rong Chaoying Long building, 5 longfuRoad, Longcheng street, Longgang District, Shenzhen
Manufacturer	:	**TFVC SHANGHAI CO.,LTD.**
Address	:	Rm 103, No.1 Lane 666 Xinhua Road, Changning District, Shanghai

Test Result:	**PASS**

The test report merely corresponds to the test sample.
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

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1. TEST STANDARDS

The tests were performed according to following standards:

FCC Rules Part 15.239: Operation in the band 88-108 MHz
ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices

2. SUMMARY

2.1. General Remarks

Date of receipt of test sample	:	May. 19, 2020
Testing commenced on	:	May. 19, 2020
Testing concluded on	:	May. 21, 2020

2.2. Product Description

Product Name:	CARPLAY
Trade Mark:	N/A
Model/Type reference:	CARPLAY PLUS A
List Model:	CARPLAY PLUS D, CARPLAY PLUS S, CARPLAY WIRELESS A, CARPLAY WIRELESS D, CARPLAY WIRELESS S
Model Declaration	PCB board, structure and internal of these model(s) are the same, So no additional models were tested.
Power supply:	DC 12V
Sample ID	GTS20200331005-1-1#
BT	
Operation frequency	2402-2480MHz
Channel Number	79 channels for Bluetooth (DSS)
Channel Spacing	1MHz for Bluetooth (DSS)
Modulation Type	GFSK, π/4-DQPSK, 8DPSK for Bluetooth (DSS)
Antenna Description	FPC Antenna, 2.7dBi(Max.)
WIFI(2.4G Band)	
Frequency Range	2412MHz ~ 2462MHz
Channel Spacing	5MHz
Channel Number	11 Channel for 20MHz bandwidth(2412~2462MHz) 7 channels for 40MHz bandwidth(2422~2452MHz)
Modulation Type	802.11b: DSSS; 802.11g/n: OFDM
Antenna Description	FPC Antenna, 2.7dBi(Max.)
FM Transmitter	
Frequency Range	88.1 MHz~107.9 MHz
Channel Spacing	100KHz
Channel Number	199 Channel
Modulation Type	FM
Antenna Description	FPC Antenna , 0.0dBi(Max.)

2.3. Equipment Under Test

Power supply system utilised

Power supply voltage	:	○	230V / 50 Hz	○	120V / 60Hz
		●	12 V DC	○	24 V DC
		○	Other (specified in blank below)		

2.4. Short description of the Equipment under Test (EUT)

This is a CARPLAY.

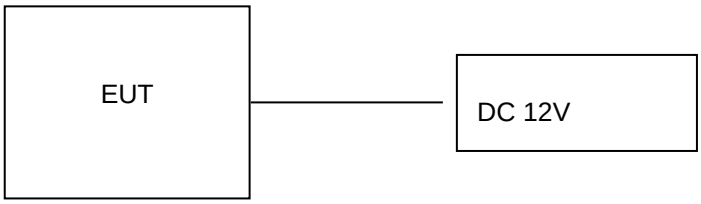
For more details, refer to the user's manual of the EUT.

2.5. EUT operation mode

The Applicant provides communication tools software to control the EUT for staying in continuous transmitting (Duty Cycle more than 98%) and receiving mode for testing .There are 79 channels provided to the EUT. Channel 00/38/78 was selected to test.

Channel	Frequency(MHz)	Channel	Frequency(MHz)
00	**88.1**	100	98.1
01	88.2	101	98.2
02	88.3	102	98.3
--	--	--	--
--	--	--	--
98	97.9	**198**	**107.9**
99	**98.0**		

2.6. Block Diagram of Test Setup



2.7. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for **FCC ID: 2AV8I-CARPLAYPLUSA** filing to comply with Section 15.239 of the FCC Part 15, Subpart C Rules.

2.8. EUT Exercise Software

The product controls the transmission signal and channel switching through the built-in APP.

2.9. Special Accessories

Manufacturer	Description	Model	Serial Number	Certificate
--	--	--	--	--

The Computer and Displayer is provided by the laboratory.

2.10. External I/O Cable

I/O Port Description	Quantity	Cable
DC IN Port	1	1.5M, Unscreened Cable
USB Port	1	N/A
AUX Port	1	N/A
TF Card	1	N/A

2.11. Modifications

No modifications were implemented to meet testing criteria.

3. TEST ENVIRONMENT

3.1. Address of the test laboratory

Shenzhen Global Test Service Co.,Ltd.
No.7-101 and 8A-104, Building 7 and 8, DCC Cultural and Creative Garden, No.98, Pingxin North Road, Shangmugu Community, Pinghu Street, Longgang District, Shenzhen, Guangdong

3.2. Test Facility

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

CNAS (No. CNAS L8169)
Shenzhen Global Test Service Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025: 2019 General Requirements) for the Competence of Testing and Calibration Laboratories.

A2LA (Certificate No. 4758.01)
Shenzhen Global Test Service Co., Ltd. has been assessed by the American Association for Laboratory Accreditation (A2LA). Certificate No. 4758.01.

3.3. Environmental conditions

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

Temperature:	15-35 ° C
Humidity:	30-60 %
Atmospheric pressure:	950-1050mbar

3.4. 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 Global Test Service 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 GTS laboratory is reported:

Test	Range	Measurement Uncertainty	Notes
Radiated Emission	30~1000MHz	4.10 dB	(1)
Radiated Emission	1~18GHz	4.32 dB	(1)
Radiated Emission	18-40GHz	5.54 dB	(1)
Conducted Disturbance	0.15~30MHz	3.12 dB	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

3.5. Summary of measurement results

Applied Standard: FCC CFR 47 PART 15.239			
FCC Rules	Description of Test		Result
15.239 (a)	Occupied Bandwidth	GTS20200331005-1-1#	Note 1
15.239 (b)	Field Strength of Fundamental frequency	GTS20200331005-1-1#	Note 1
15.239 (b)	Radiated Spurious Emissions	GTS20200331005-1-1#	Note 1
15.207 (a)	AC Conducted Emissions	N/A	N/A
15.203	Antenna Requirements	GTS20200331005-1-1#	Note 1

Remark:
1. The measurement uncertainty is not included in the test result.
2. NA = Not Applicable; NP = Not Performed
3. We tested all test mode and recorded worst case in report

3.6. Equipments Used during the Test

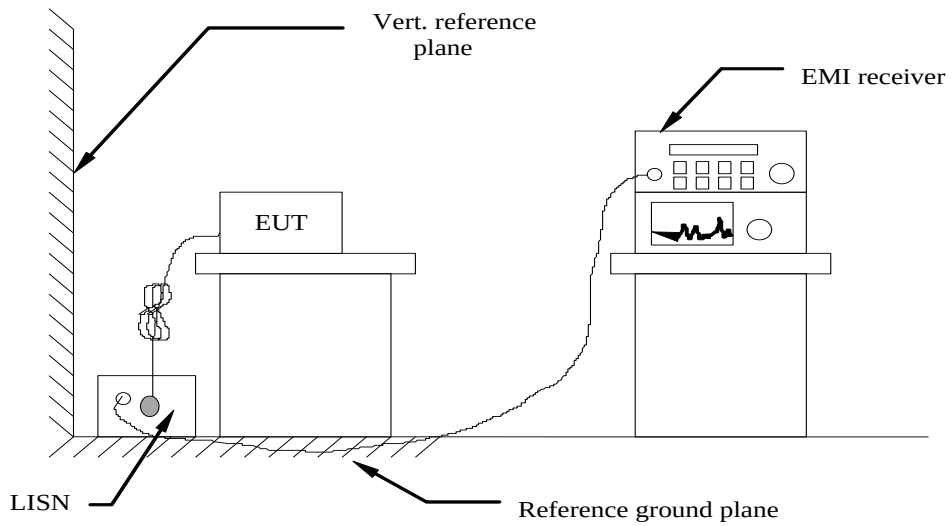
Test Equipment	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Due Date
LISN	R&S	ENV216	3560.6550.08	2019/09/20	2020/09/19
LISN	R&S	ESH2-Z5	893606/008	2019/09/20	2020/09/19
EMI Test Receiver	R&S	ESPI3	101841-cd	2019/09/20	2020/09/19
EMI Test Receiver	R&S	ESCI7	101102	2019/09/20	2020/09/19
Spectrum Analyzer	Agilent	N9020A	MY48010425	2019/09/20	2020/09/19
Spectrum Analyzer	R&S	FSV40	100019	2019/09/20	2020/09/19
Vector Signal generator	Agilent	N5181A	MY49060502	2019/09/20	2020/09/19
Signal generator	Agilent	E4421B	3610AO1069	2019/09/20	2020/09/19
Climate Chamber	ESPEC	EL-10KA	A20120523	2019/09/20	2020/09/19
Controller	EM Electronics	Controller EM 1000	N/A	N/A	N/A
Horn Antenna	Schwarzbeck	BBHA 9120D	01622	2019/09/23	2020/09/22
Active Loop Antenna	Beijing Da Ze Technology Co.,Ltd.	ZN30900C	15006	2019/10/12	2020/10/11
Bilog Antenna	Schwarzbeck	VULB9163	000976	2019/05/26	2020/05/25
Broadband Horn Antenna	SCHWARZBECK	BBHA 9170	791	2019/09/20	2020/09/19
Amplifier	Schwarzbeck	BBV 9743	#202	2019/09/20	2020/09/19
Amplifier	Schwarzbeck	BBV9179	9719-025	2019/09/20	2020/09/19
Amplifier	EMCI	EMC051845B	980355	2019/09/20	2020/09/19
Temperature/Humidity Meter	Gangxing	CTH-608	02	2019/09/20	2020/09/19
High-Pass Filter	K&L	9SH10-2700/X12750-O/O	KL142031	2019/09/20	2020/09/19
High-Pass Filter	K&L	41H10-1375/U12750-O/O	KL142032	2019/09/20	2020/09/19
RF Cable(below 1GHz)	HUBER+SUHNER	RG214	RE01	2019/09/20	2020/09/19
RF Cable(above 1GHz)	HUBER+SUHNER	RG214	RE02	2019/09/20	2020/09/19
Data acquisition card	Agilent	U2531A	TW53323507	2019/09/20	2020/09/19
Power Sensor	Agilent	U2021XA	MY5365004	2019/09/20	2020/09/19
Test Control Unit	Tonscend	JS0806-1	178060067	2019/06/20	2020/06/19
Automated filter bank	Tonscend	JS0806-F	19F8060177	2019/06/20	2020/06/19
EMI Test Software	Tonscend	JS1120-1	Ver 2.6.8.0518	/	/
EMI Test Software	Tonscend	JS1120-3	Ver 2.5.77.0418	/	/
EMI Test Software	Tonscend	JS32-CE	Ver 2.5	/	/
EMI Test Software	Tonscend	JS32-RE	Ver 2.5.1.8	/	/

Note: The Cal.Interval was one year.

4. TEST CONDITIONS AND RESULTS

4.1. AC Power Conducted Emission

TEST CONFIGURATION



TEST PROCEDURE

1 The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10-2013.
2 Support equipment, if needed, was placed as per ANSI C63.10-2013.
3 All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10-2013.
4 The EUT received DC 12V power form battery.
5 All support equipments received AC power from a second LISN, if any.
6 The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7 Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.
8 During the above scans, the emissions were maximized by cable manipulation.

AC Power Conducted Emission Limit

For intentional device, according to § 15.207(a) AC Power Conducted Emission Limits is as following：

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.		

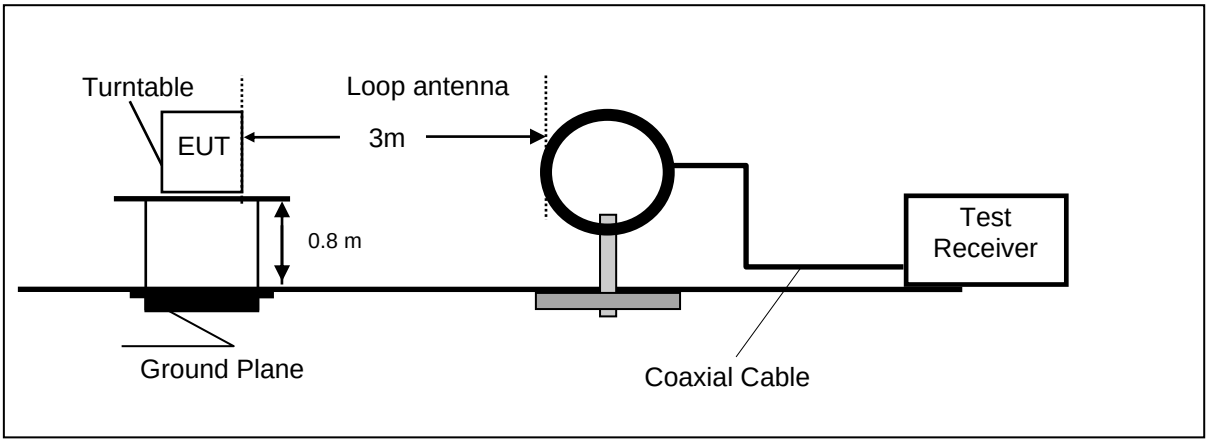
TEST RESULTS

Not Applicable.

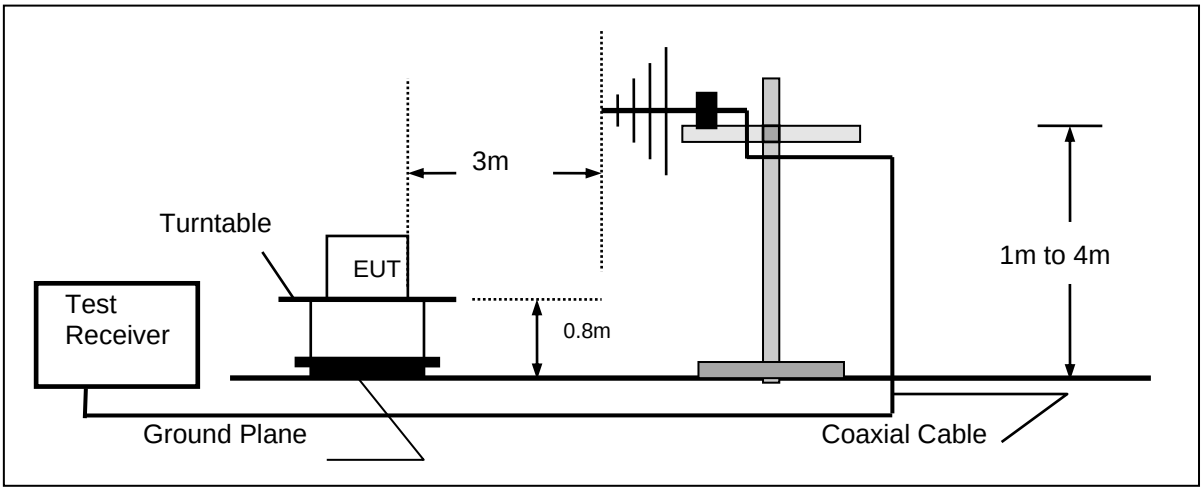
4.2. Radiated Emission

TEST CONFIGURATION

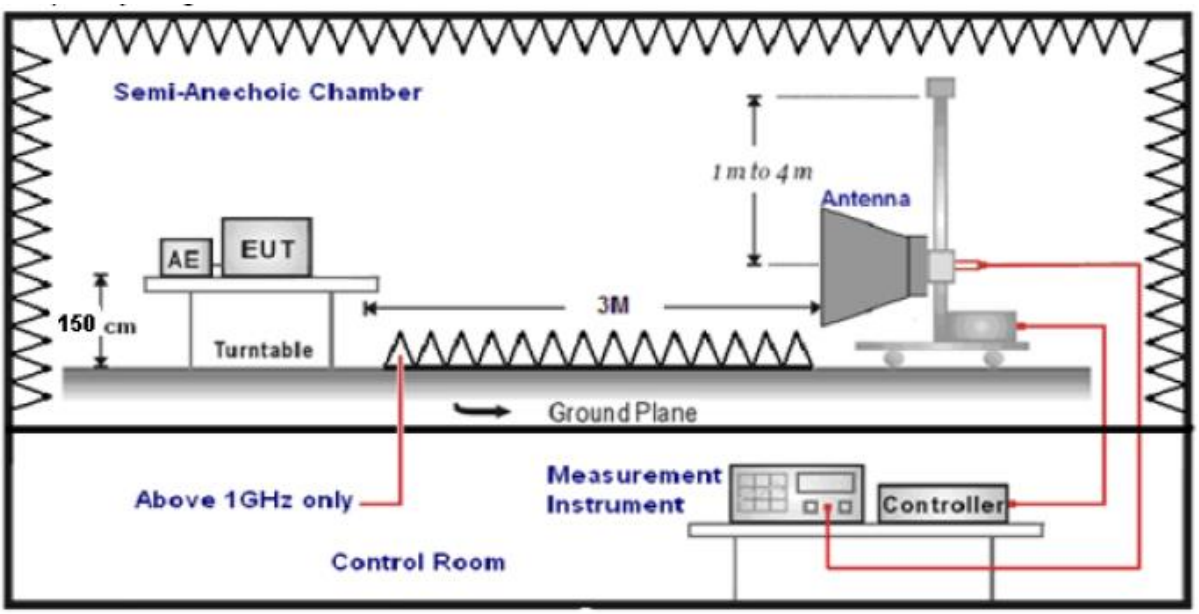
Frequency range 9 KHz – 30MHz



Frequency range 30MHz – 1000MHz



Frequency range above 1GHz-25GHz



TEST PROCEDURE

1. The EUT was placed on a turn table which is 0.8m above ground plane when testing frequency range 9 KHz –1GHz;the EUT was placed on a turn table which is 1.5m above ground plane when testing frequency range 1GHz – 25GHz.
2. Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0℃ to 360℃ to acquire the highest emissions from EUT.
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measurements have been completed.
5. The EUT minimum operation frequency was 32.768KHz and maximum operation frequency was 108MHz.so radiated emission test frequency band from 9KHz to 25GHz.
6. The distance between test antenna and EUT as following table states:

Test Frequency range	Test Antenna Type	Test Distance
9KHz-30MHz	Active Loop Antenna	3
30MHz-1GHz	Ultra-Broadband Antenna	3
1GHz-18GHz	Double Ridged Horn Antenna	3
18GHz-25GHz	Horn Anternna	1

7. Setting test receiver/spectrum as following table states:

Test Frequency range	Test Receiver/Spectrum Setting	Detector
9KHz-150KHz	RBW=200Hz/VBW=3KHz,Sweep time=Auto	QP
150KHz-30MHz	RBW=9KHz/VBW=100KHz,Sweep time=Auto	QP
30MHz-1GHz	RBW=120KHz/VBW=1000KHz,Sweep time=Auto	QP
1GHz-40GHz	Peak Value: RBW=1MHz/VBW=3MHz, Sweep time=Auto Average Value: RBW=1MHz/VBW=10Hz, Sweep time=Auto	Peak

Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor(if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CL - AG

Where FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
RA = Reading Amplitude	AG = Amplifier Gain
AF = Antenna Factor	

Transd=AF +CL-AG

RADIATION LIMIT

For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emission from intentional radiators at a distance of 3 meters shall not exceed the following table. According to § 15.247(d), in any 100kHz bandwidth outside the frequency band in which the EUT is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the100kHz bandwidth within the band that contains the highest level of desired power.
The pre-test have done for the EUT in three axes and found the worst emission at position shown in test setup photos.

Frequency (MHz)	Distance (Meters)	Radiated (dBμV/m)	Radiated (μV/m)
0.009-0.49	3	20log(2400/F(KHz))+40log(300/3)	2400/F(KHz)
0.49-1.705	3	20log(24000/F(KHz))+ 40log(30/3)	24000/F(KHz)
1.705-30	3	20log(30)+ 40log(30/3)	30
30-88	3	40.0	100
88-216	3	43.5	150
216-960	3	46.0	200
Above 960	3	54.0	500

TEST RESULTS

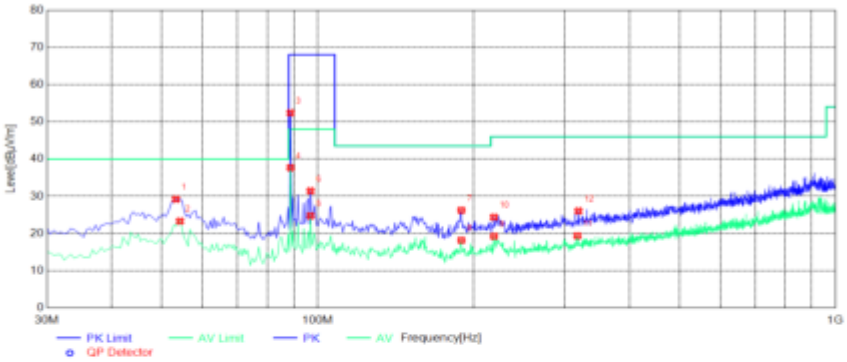
Only record the worst test result in this report.
The test data please refer to following page:

Temperature	24.5℃	Humidity	53.7%
Test Engineer	Jimmy Wang	Configurations	FM

For 30MHz-1GHz

Horizontal(TX-88.1MHz)

Test Graph

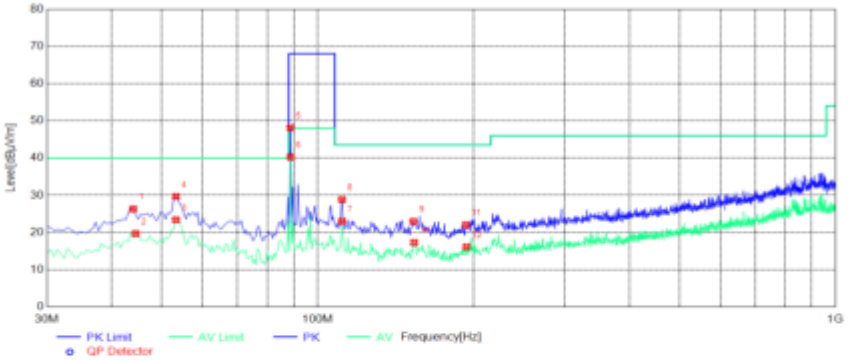


Suspected List

NO.	Frequency [MHz]	Reading [dBµV/m]	Factor [dB]	Result [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Polarity	Remark
1	53.2800	36.07	-6.86	29.21	40.00	10.79	100	250	PK	Horizonta	PASS
2	54.2500	30.22	-6.91	23.31	40.00	16.69	100	230	AV	Horizonta	PASS
3	88.6850	63.31	-10.92	52.39	68.00	15.61	100	10	PK	Horizonta	PASS
4	88.6850	48.57	-10.92	37.65	48.00	10.35	100	90	AV	Horizonta	PASS
5	96.9300	33.74	-9.00	24.74	48.00	23.26	100	200	AV	Horizonta	PASS
6	96.9300	40.44	-9.00	31.44	68.00	36.56	100	290	PK	Horizonta	PASS
7	189.5650	36.46	-10.24	26.22	43.50	17.28	100	300	PK	Horizonta	PASS
8	189.5650	28.41	-10.24	18.17	43.50	25.33	100	300	AV	Horizonta	PASS
9	219.1500	28.56	-9.32	19.24	46.00	26.76	100	280	AV	Horizonta	PASS
10	219.1500	33.69	-9.32	24.37	46.00	21.63	100	280	PK	Horizonta	PASS
11	317.6050	26.44	-7.07	19.37	46.00	26.63	100	40	AV	Horizonta	PASS
12	319.0600	33.03	-6.98	26.05	46.00	19.95	100	60	PK	Horizonta	PASS

Vertical (TX-88.1MHz)

Test Graph



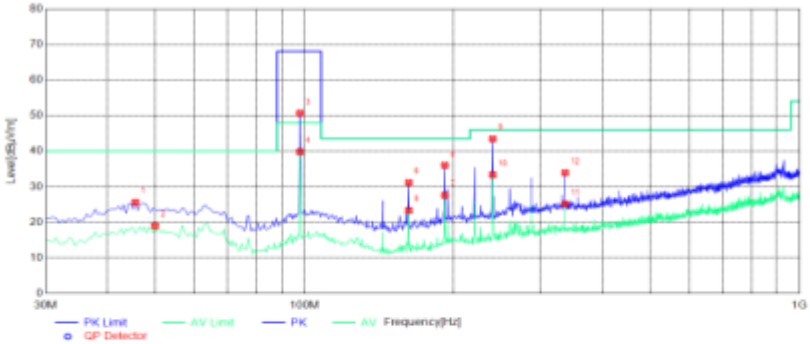
Suspected List

NO.	Frequency [MHz]	Reading [dBµV/m]	Factor [dB]	Result [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Polarity	Remark
1	44.0650	32.82	-6.53	26.29	40.00	13.71	100	110	PK	Vertical	PASS
2	44.5500	26.21	-6.52	19.69	40.00	20.31	100	240	AV	Vertical	PASS
3	53.2800	30.26	-6.86	23.40	40.00	16.60	100	210	AV	Vertical	PASS
4	53.2800	36.52	-6.86	29.66	40.00	10.34	100	330	PK	Vertical	PASS
5	88.6850	59.04	-10.92	48.12	68.00	19.88	100	270	PK	Vertical	PASS
6	88.6850	51.18	-10.92	40.26	48.00	7.74	100	260	AV	Vertical	PASS
7	111.4800	31.80	-8.79	23.01	43.50	20.49	100	330	AV	Vertical	PASS
8	111.4800	37.61	-8.79	28.82	43.50	14.68	100	330	PK	Vertical	PASS
9	153.1900	35.38	-12.42	22.96	43.50	20.54	100	350	PK	Vertical	PASS
10	153.6750	29.79	-12.52	17.27	43.50	26.23	100	330	AV	Vertical	PASS
11	193.4450	31.90	-9.84	22.06	43.50	21.44	100	220	PK	Vertical	PASS
12	193.9300	25.79	-9.69	16.10	43.50	27.40	100	240	AV	Vertical	PASS

Note: 1. Result (dBuV/m) = Reading (dBuV/m) + Factor (dB/m) .
2. Factor (dB) = Antenna Factor (dB/m) + Cable loss (dB) – Pre Amplifier gain (dB).

Horizontal (TX-98.0MHz)

Test Graph

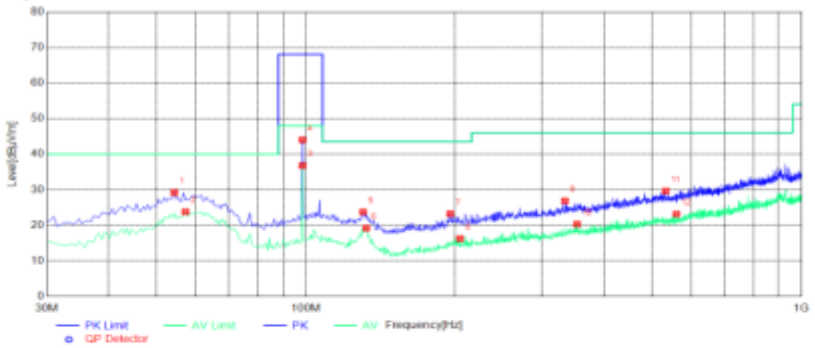


Suspected List

NO.	Frequency [MHz]	Reading [dBμV/m]	Factor [dB]	Result [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Polarity	Remark
1	45.5200	32.04	-6.44	25.60	40.00	14.40	100	41	PK	Horizonta	PASS
2	49.8850	25.59	-6.58	19.01	40.00	20.99	100	2	AV	Horizonta	PASS
3	97.9000	59.35	-8.69	50.66	68.00	17.34	100	25	PK	Horizonta	PASS
4	97.9000	48.52	-8.69	39.83	48.00	8.17	100	28	AV	Horizonta	PASS
5	162.4050	34.87	-11.51	23.36	43.50	20.14	100	51	AV	Horizonta	PASS
6	162.4050	42.65	-11.51	31.14	43.50	12.36	100	54	PK	Horizonta	PASS
7	191.9900	37.67	-10.08	27.59	43.50	15.91	100	75	AV	Horizonta	PASS
8	191.9900	46.10	-10.08	36.02	43.50	7.48	100	75	PK	Horizonta	PASS
9	240.0050	52.05	-8.62	43.43	46.00	2.57	100	356	PK	Horizonta	PASS
10	240.0050	42.00	-8.62	33.38	46.00	12.62	100	356	AV	Horizonta	PASS
11	336.0350	31.53	-6.33	25.20	46.00	20.80	100	351	AV	Horizonta	PASS
12	336.0350	40.26	-6.33	33.93	46.00	12.07	100	351	PK	Horizonta	PASS

Vertical (TX-98.0MHz)

Test Graph



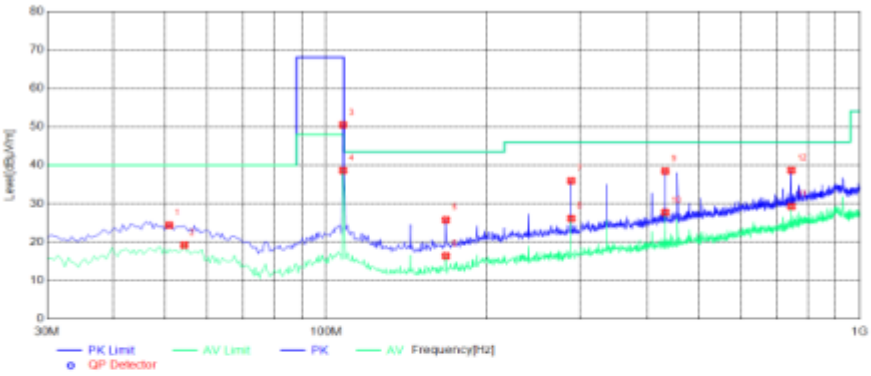
Suspected List

NO.	Frequency [MHz]	Reading [dBμV/m]	Factor [dB]	Result [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Polarity	Remark
1	54.2500	36.12	-6.91	29.21	40.00	10.79	100	315	PK	Vertical	PASS
2	57.1600	30.84	-7.05	23.79	40.00	16.21	100	234	AV	Vertical	PASS
3	98.3850	45.39	-8.60	36.79	48.00	11.21	100	224	AV	Vertical	PASS
4	98.3850	52.58	-8.60	43.98	68.00	24.02	100	232	PK	Vertical	PASS
5	130.3950	36.17	-12.42	23.75	43.50	19.75	100	56	PK	Vertical	PASS
6	132.3350	31.60	-12.43	19.17	43.50	24.33	100	76	AV	Vertical	PASS
7	195.3850	32.70	-9.45	23.25	43.50	20.25	100	360	PK	Vertical	PASS
8	204.6000	25.63	-9.40	16.23	43.50	27.27	100	252	AV	Vertical	PASS
9	333.1250	33.29	-6.44	26.85	46.00	19.15	100	30	PK	Vertical	PASS
10	352.5250	26.36	-6.02	20.34	46.00	25.66	100	33	AV	Vertical	PASS
11	531.9750	32.82	-3.20	29.62	46.00	16.38	100	295	PK	Vertical	PASS
12	559.1350	25.96	-2.81	23.15	46.00	22.85	100	315	AV	Vertical	PASS

Note: 1. Result (dBuV/m) = Reading (dBuV/m) + Factor (dB/m) .
2. Factor (dB) = Antenna Factor (dB/m) + Cable loss (dB) – Pre Amplifier gain (dB).

Horizontal (TX-107.9MHz)

Test Graph

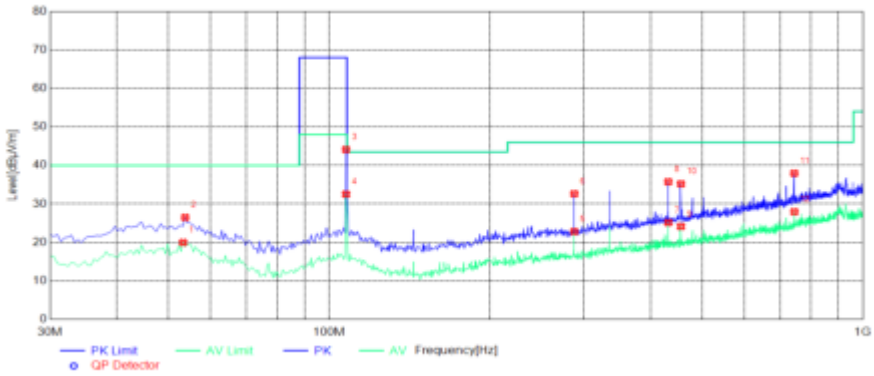


Suspected List

NO.	Frequency [MHz]	Reading [dBµV/m]	Factor [dB]	Result [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Polarity	Remark
1	50.8550	31.07	-6.68	24.39	40.00	15.61	100	241	PK	Horizonta	PASS
2	54.2500	26.14	-6.91	19.23	40.00	20.77	100	236	AV	Horizonta	PASS
3	107.6000	58.84	-8.37	50.47	68.00	17.53	100	56	PK	Horizonta	PASS
4	107.6000	47.00	-8.37	38.63	48.00	9.37	100	64	AV	Horizonta	PASS
5	167.7400	37.27	-11.51	25.76	43.50	17.74	100	312	PK	Horizonta	PASS
6	167.7400	27.92	-11.51	16.41	43.50	27.09	100	314	AV	Horizonta	PASS
7	288.0200	43.55	-7.62	35.93	46.00	10.07	100	4	PK	Horizonta	PASS
8	288.0200	33.75	-7.62	26.13	46.00	19.87	100	109	AV	Horizonta	PASS
9	432.0650	43.19	-4.72	38.47	46.00	7.53	100	165	PK	Horizonta	PASS
10	432.0650	32.41	-4.72	27.69	46.00	18.31	100	157	AV	Horizonta	PASS
11	744.4050	29.07	0.21	29.28	46.00	16.72	100	320	AV	Horizonta	PASS
12	744.4050	38.46	0.21	38.67	46.00	7.33	100	320	PK	Horizonta	PASS

Vertical (TX-107.9MHz)

Test Graph



Suspected List

NO.	Frequency [MHz]	Reading [dBµV/m]	Factor [dB]	Result [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Polarity	Remark
1	53.2800	26.83	-6.86	19.97	40.00	20.03	100	305	AV	Vertical	PASS
2	53.7650	33.29	-6.81	26.48	40.00	13.52	100	226	PK	Vertical	PASS
3	107.6000	52.48	-8.37	44.11	68.00	23.89	100	156	PK	Vertical	PASS
4	107.6000	40.90	-8.37	32.53	48.00	15.47	100	156	AV	Vertical	PASS
5	288.0200	30.43	-7.62	22.81	46.00	23.19	100	17	AV	Vertical	PASS
6	288.0200	40.26	-7.62	32.64	46.00	13.36	100	27	PK	Vertical	PASS
7	432.0650	29.86	-4.72	25.14	46.00	20.86	100	200	AV	Vertical	PASS
8	432.0650	40.47	-4.72	35.75	46.00	10.25	100	200	PK	Vertical	PASS
9	456.3150	28.56	-4.42	24.14	46.00	21.86	100	331	AV	Vertical	PASS
10	456.3150	39.63	-4.42	35.21	46.00	10.79	100	221	PK	Vertical	PASS
11	743.9200	37.75	0.20	37.95	46.00	8.05	100	176	PK	Vertical	PASS
12	744.4050	27.75	0.21	27.96	46.00	18.04	100	192	AV	Vertical	PASS

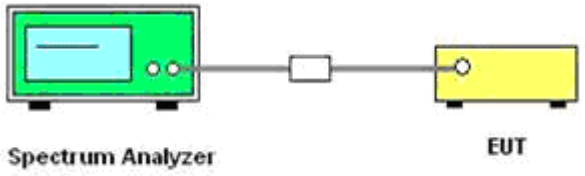
Note: 1. Result (dBuV/m) = Reading (dBuV/m) + Factor (dB/m) .
2. Factor (dB) = Antenna Factor (dB/m) + Cable loss (dB) – Pre Amplifier gain (dB).
3.The result below 30MHz and above 1GHz is too low so there is no record. The test setup show in the test setup photograph is the worst case.

4.3. 99% Bandwidth

Limit

According to §15.239 (a) Emissions from the intentional radiator shall be confined within a band 200 kHz wide centered on the operating frequency. The 200 kHz band shall lie wholly within the frequency range of 88-108MHz.

Block Diagram of Test Setup



Test Procedure

1) The transmitter shall be operated at its maximum carrier power measured under normal test conditions

2) The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts.

3) The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the occupied bandwidth (OBW) and video bandwidth (VBW) shall be approximately 3x RBW.

4) Detector function = peak.

5) Trace = max hold.

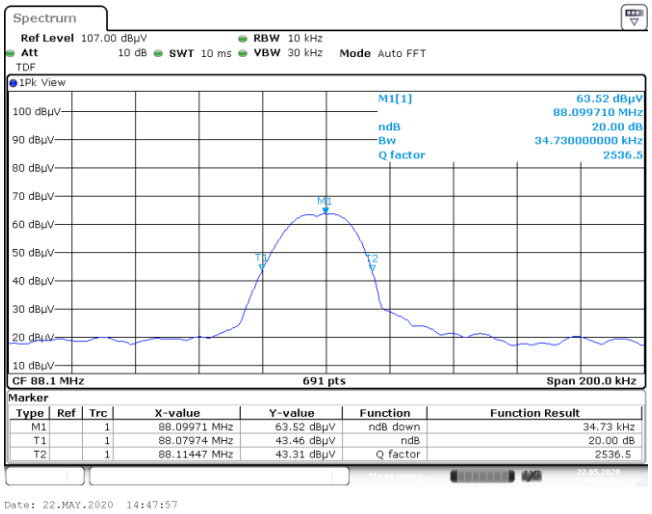
Test Results

Temperature	24.5℃	Humidity	53.7%
Test Engineer	Moon Tan	Configurations	FM

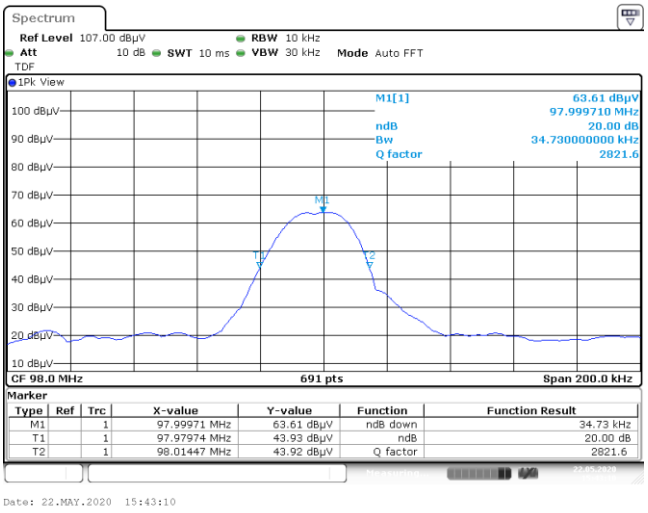
Frequency (MHz)	20dB Bandwidth (KHz)	99% Bandwidth (KHz)	Limit (KHz)	Conclusion
88.1	34.73	22.29	200.00	PASS
98.0	34.73	29.81	200.00	PASS
107.9	31.84	23.44	200.00	PASS

Remark:
1. Test results including cable loss;
2. Please refer to the following page.

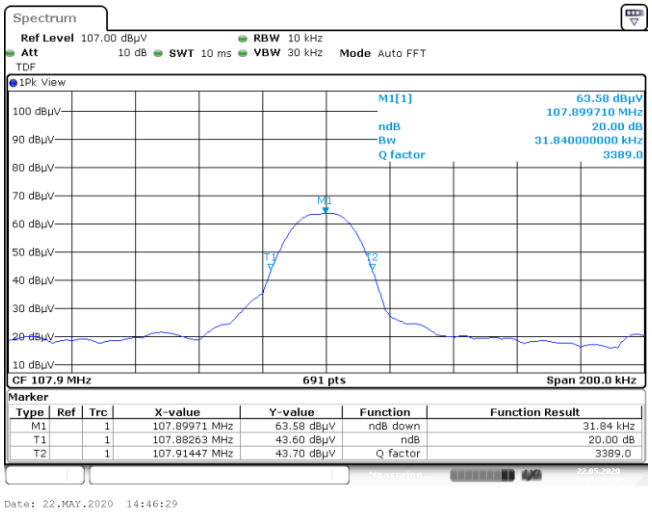
20dB Bandwidth



Low Channel / 88.1 MHz

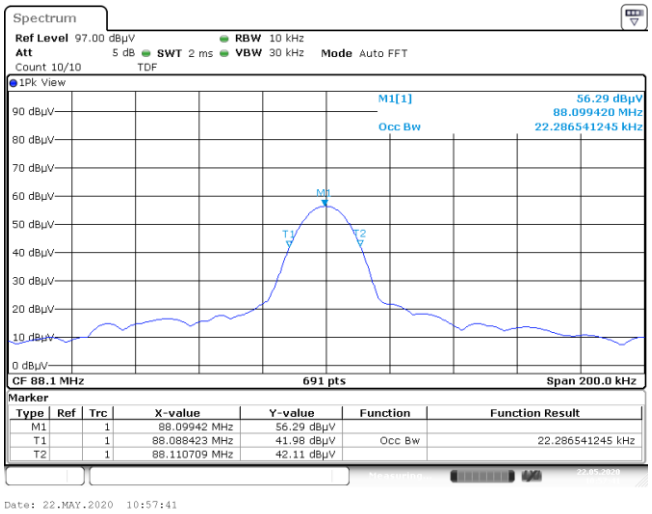


Middle Channel / 98.0 MHz

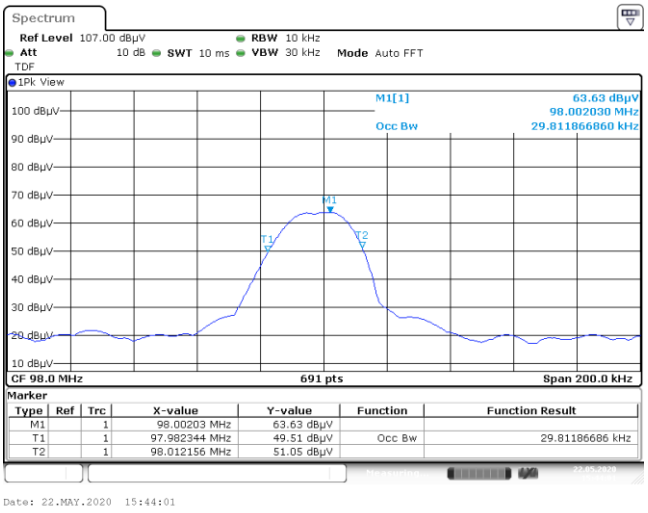


High Channel / 107.9 MHz

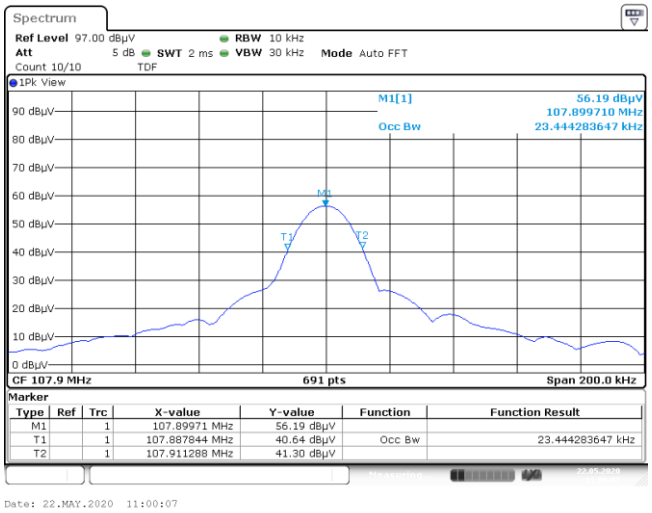
99% Bandwidth



Low Channel / 88.1 MHz



Middle Channel / 98.0 MHz



High Channel / 107.9 MHz

4.4. Antenna Requirement

Standard Applicable

For intentional device, according to FCC 47 CFR Section 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.

And according to FCC 47 CFR Section 15.247 (c), if 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 6dBi.

Test Result

The antenna used for this product is FPC Antenna and that no antenna other than that furnished by the responsible party shall be used with the device, the maximum peak gain of the transmit antenna is only 0.0dBi.

Reference to the Test Report: **GTS20200331005-1-6.**

5. TEST SETUP PHOTOS OF THE EUT

Reference to the test report No. **GTS20200331005-1-6**

6. EXTERNAL AND INTERNAL PHOTOS OF THE EUT

Reference to the test report No. **GTS20200331005-1-6**

.....End of Report.....