



FCC RADIO TEST REPORT

FCC ID : 2AR3T-5338
Equipment : Wireless Earphones
Model Name : TY0929L
Applicant : Expectations LLC
1901 Manhattan Boulevard Building
D Harvey, Louisiana 70058
Standard : FCC Part 15 Subpart C §15.209

The product was received on Jul. 20, 2018 and testing was started from Oct. 31, 2018 and completed on Nov. 07, 2018. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Approved by: Joseph Lin

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory
No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)



Table of Contents

History of this test report.....	3
Summary of Test Result.....	4
1. General Description	5
1.1. Feature of Equipment Under Test.....	5
1.2. Product Specification of Equipment Under Test	5
1.3. Modification of EUT	5
1.4. Test Location.....	5
1.5. Applied Standards	6
2. Test Configuration of Equipment Under Test	7
2.1. Test Mode	7
2.2. Connection Diagram of Test System	7
2.3. Support Unit used in test configuration and system.....	7
3. Test Result	8
3.1. 20dB and 99% Occupied Bandwidth Measurement	8
3.2. Radiated Emission	10
3.3. Antenna Requirements.....	18
4. List of Measuring Equipment.....	19
5. Uncertainty of Evaluation.....	20



History of this test report



Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)
3.1	2.1049	20dB Bandwidth	Reporting Only
3.1	2.1049	99% Occupied Bandwidth	Reporting Only
3.2	15.209	Radiated Emission	Pass
-	15.207	AC Conducted Emission	Not Required
3.3	15.203	Antenna Requirements	Pass

Remark: The RF transmission of earbuds will not be enabled during charging mode, after assessing, the AC Conducted Emission test item is not necessary to carry out..

Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

Comments and Explanations:

None

Reviewed by: Wii Chang

Report Producer: Nancy Yang



1. General Description

1.1. Feature of Equipment Under Test

Product Feature	
Equipment	Wireless Earphones
Model Name	TY0929L
FCC ID	2AR3T-5338
EUT supports Radios application	NFMI Bluetooth BR/EDR/LE

1.2. Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx/Rx Frequency Range	10.579MHz
Channel Number	1
Antenna Type	Coil Antenna
Type of Modulation	ADPCM

Remark: The above EUT's information was declared by manufacturer.

1.3. Modification of EUT

No modifications are made to the EUT during all test items.

1.4. Test Location

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code : 1190) and the FCC designation No. TW1190 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC Test.

Test Site	SPORTON INTERNATIONAL INC.	
Test Site Location	No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.) TEL: +886-3-327-3456 FAX: +886-3-328-4978	
Test Site No.	Sporton Site No.	
	TH03-HY	03CH07-HY

Note: The test site complies with ANSI C63.4 2014 requirement.



1.5. Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ FCC Part 15 Subpart C §15.209
- ♦ ANSI C63.10-2013

Remark: All test items were verified and recorded according to the standards and without any deviation during the test.



2. Test Configuration of Equipment Under Test

2.1. Test Mode

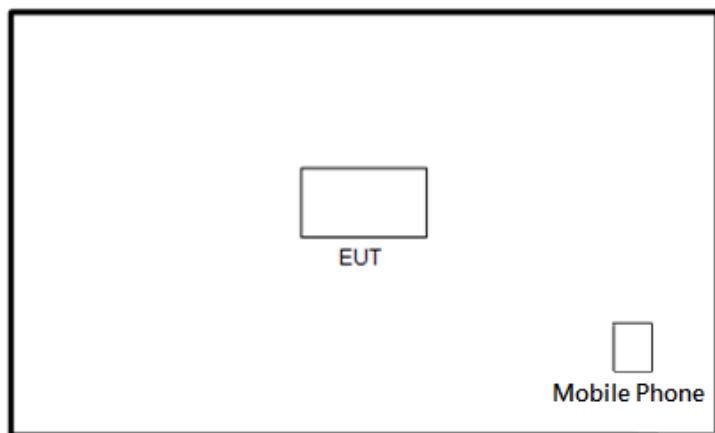
The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application.

Frequency range investigated: radiation (9 kHz to the 1000 MHz).

Test Items	Function Type
Radiated Emission	Mode 1: NFMI Tx

Remark: For radiated emission test items, mobile phone link with the EUT, and EUT use NFMI Tx technology to connect with support equipment for continuous transmitting.

2.2. Connection Diagram of Test System



2.3. Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Mobile Phone	SONY	N/A	FCC DoC	N/A	N/A

3. Test Result

3.1. 20dB and 99% Occupied Bandwidth Measurement

3.1.1. Limit of 20dB and 99% Occupied Bandwidth

Reporting only

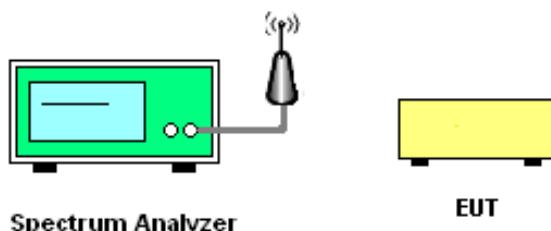
3.1.2. Measuring Instruments

See list of measuring equipment of this test report.

3.1.3. Test Procedures

1. The 20dB bandwidth is measured with a spectrum analyzer connected via a receiver antenna placed near the EUT in peak Max hold mode.
2. Use the following spectrum analyzer settings for 99 % Bandwidth measurement.
3. For Bandwidth measurement, the RBW is set 1-5% of the emission bandwidth, and set the Video bandwidth (VBW) $\geq 3 * \text{RBW}$, Sweep = 20ms.
4. Measure and record the results in the test report.

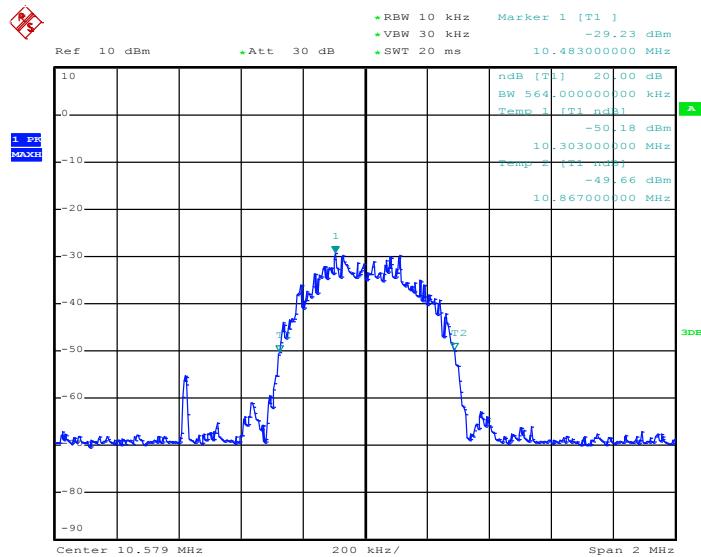
3.1.4. Test Setup



3.1.5. Test Result of 20dB and 99% Bandwidth

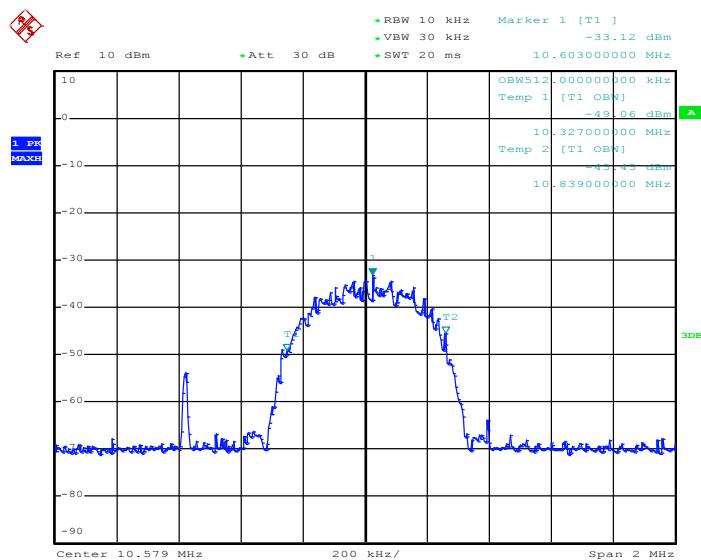
Test Engineer :	Tommy Lee	Temperature :	22~24°C
		Relative Humidity :	52~55%

20 dB Bandwidth Plot



Date: 7.NOV.2018 17:56:58

99% Occupied Bandwidth Plot



Date: 7.NOV.2018 17:57:39



3.2. Radiated Emission

3.2.1. Limit of Radiated Emission

The emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

3.2.2. Measuring Instruments

See list of measuring equipment of this test report.

3.2.3. Measuring Instrument Setting

The following table is the setting of receiver.

Receiver Parameter	Setting
Attenuation	Auto
Frequency Range: 9 kHz ~ 150 kHz	RBW 200 Hz for QP
Frequency Range: 150 kHz ~ 30 MHz	RBW 9 kHz for QP
Frequency Range: 30 MHz ~ 1000 MHz	RBW 120 kHz for Peak

Note: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz and 110-490 kHz. Radiated emission limits in these two bands are based on measurements employing an average detector.



3.2.4. Test Procedures

<9kHz-30MHz>

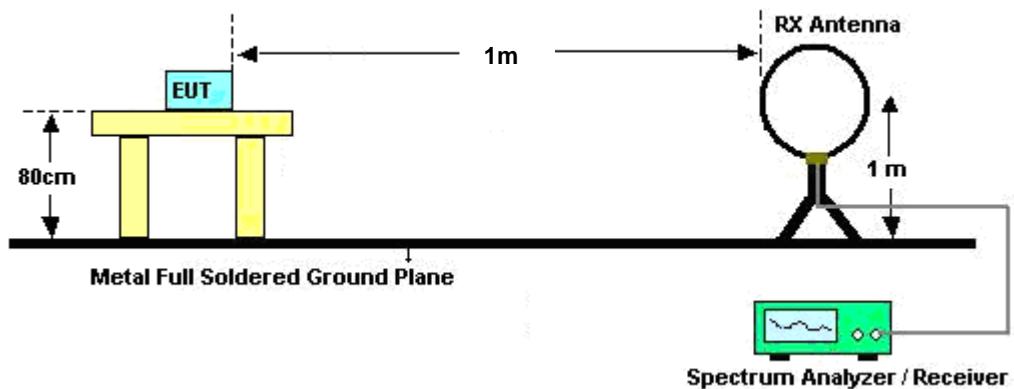
1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the loop receiving antenna mounted antenna tower was placed 1 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the receiving antenna was fixed at one meter above ground to find the maximum emissions field strength.
4. For emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver.
5. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value.

**<30MHz-1GHz>**

1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 1 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value.

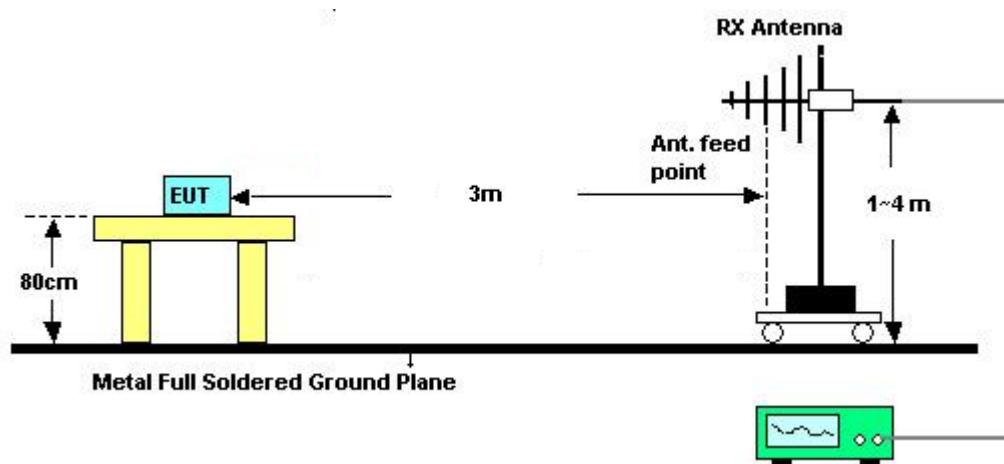
3.2.5. Test Setup of Radiated Emission

For radiated emissions below 30MHz



Note: There is a comparison data of both open-field test site and semi-Anechoic chamber, and the result came out very similar.

For radiated emissions above 30MHz





3.2.6. Test Result of Radiated Emission (9kHz ~ 30MHz)

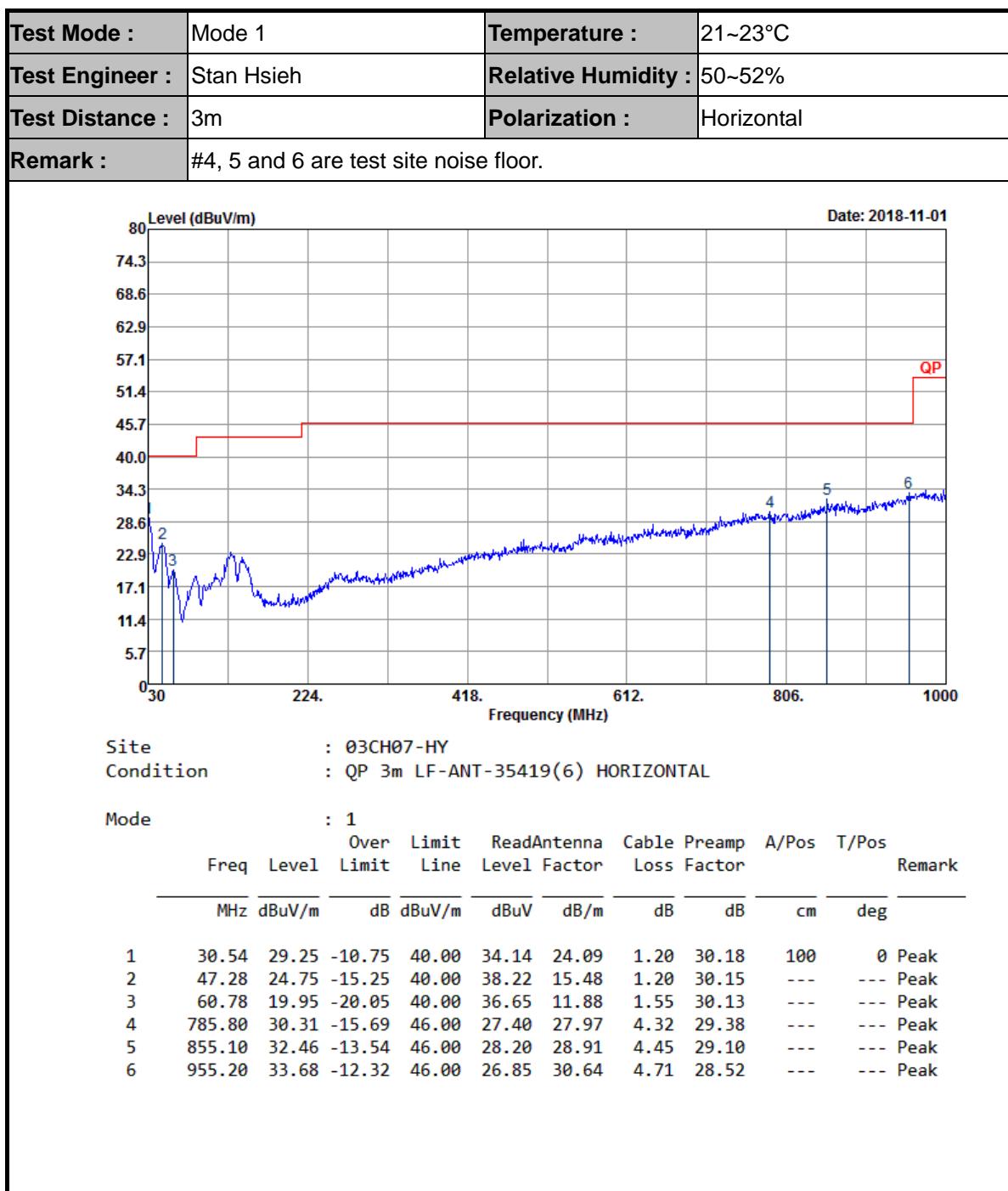
Test Mode :	Mode 1		Temperature :	21~23°C							
Test Engineer :	Stan Hsieh		Relative Humidity :	50~52%							
Test Distance :	1m		Polarization :	Horizontal							
Remark:	#7 is fundamental signal.										
Freq. (MHz)	Level (dB μ V/m)	Distance extrapolation Factor (dB)	Result converting Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Ant. Factor (dB)	Cable Loss (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
0.00905	41.9	99.08	-57.18	-105.63	48.45	20.84	20.63	0.43	-	-	Average
0.06201	40.73	99.08	-58.35	-90.09	31.74	20.2	20.1	0.43	-	-	Average
0.09018	40.19	99.08	-58.89	-87.38	28.49	19.67	20.09	0.43	-	-	QP
0.11112	41.12	99.08	-57.96	-84.64	26.68	20.6	20.09	0.43	-	-	Average
0.15272	41.62	99.08	-57.46	-81.38	23.92	21.13	20.06	0.43	-	-	Average
0.52755	41.89	59.08	-17.19	-50.35	33.16	21.47	19.99	0.43	-	-	QP
10.579	44.45	59.08	-14.63	-44.13	29.5	24.08	19.94	0.43	-	-	QP
15.784	36.4	59.08	-22.68	-52.18	29.5	15.99	19.98	0.43	-	-	QP
22.471	38.11	59.08	-20.97	-50.47	29.5	16.49	20.42	1.2	-	-	QP
29.76	39.48	59.08	-19.6	-49.1	29.5	18.29	19.99	1.2	100	0	QP



Test Mode :	Mode 1			Temperature :		21~23°C											
Test Engineer :	Stan Hsieh			Relative Humidity :		50~52%											
Test Distance :	1m			Polarization :		Vertical											
Remark:	#7 is fundamental signal.																
Freq. (MHz)	Level (dB μ V/m)	Distance extrapolation Factor (dB)	Result converting Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Ant. Factor (dB)	Cable Loss (dB)	Ant Pos (cm)	Table Pos (deg)	Remark						
0.01022	40.83	99.08	-58.25	-105.64	47.39	19.77	20.63	0.43	-	-	Average						
0.06246	41.13	99.08	-57.95	-89.63	31.68	20.6	20.1	0.43	-	-	Average						
0.0936	41.35	99.08	-57.73	-85.9	28.17	20.83	20.09	0.43	-	-	QP						
0.12708	41.97	99.08	-57.11	-82.63	25.52	21.47	20.07	0.43	-	-	Average						
0.15068	40.52	99.08	-58.56	-82.6	24.04	20.03	20.06	0.43	-	-	Average						
0.49	41.95	59.08	-17.13	-50.93	33.8	21.53	19.99	0.43	-	-	QP						
10.579	39.88	59.08	-19.2	-48.7	29.5	16.19	19.94	0.43	-	-	QP						
15.72	36.54	59.08	-22.54	-52.04	29.5	16.13	19.98	0.43	-	-	QP						
24.415	37.94	59.08	-21.14	-50.64	29.5	16.25	20.49	1.2	-	-	QP						
29.51	38.26	59.08	-20.82	-50.32	29.5	17.02	20.04	1.2	100	0	QP						

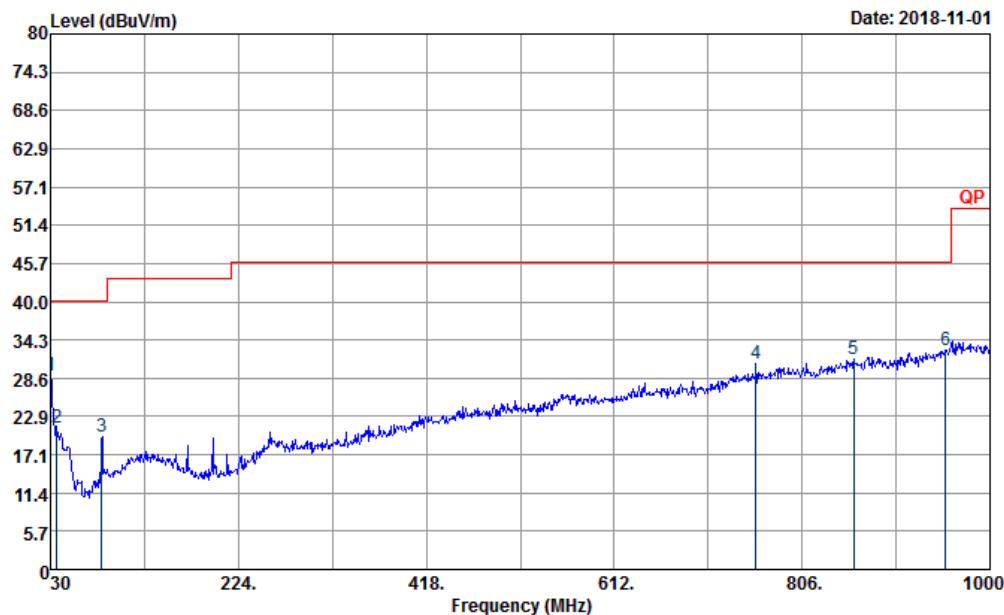


3.2.7. Test Result of Radiated Emission (30MHz ~ 1000MHz)





Test Mode :	Mode 1	Temperature :	21~23°C
Test Engineer :	Stan Hsieh	Relative Humidity :	50~52%
Test Distance :	3m	Polarization :	Vertical
Remark :	#4, 5 and 6 are test site noise floor.		



Site : 03CH07-HY
Condition : QP 3m LF-ANT-35419(6) VERTICAL

Mode	: 1									
	Freq	Level	Over Limit	Limit	ReadAntenna	Cable	Preamp	A/Pos	T/Pos	Remark
MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	30.00	28.95	-11.05	40.00	33.33	24.60	1.20	30.18	100	0 Peak
2	36.21	21.15	-18.85	40.00	28.61	21.51	1.20	30.17	---	--- Peak
3	82.92	19.84	-20.16	40.00	34.76	13.63	1.55	30.10	---	--- Peak
4	758.50	30.69	-15.31	46.00	28.16	27.82	4.18	29.47	---	--- Peak
5	859.30	31.33	-14.67	46.00	26.95	29.01	4.45	29.08	---	--- Peak
6	954.50	32.84	-13.16	46.00	26.07	30.59	4.71	28.53	---	--- Peak



3.3. Antenna Requirements

3.3.1. Standard Applicable

Except for special regulations, the Low-power Radio-frequency Devices must not be equipped with any jacket for installing an antenna with extension cable. 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 the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited.

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 rule.

3.3.2. Antenna Anti-Replacement Construction

An embedded-in antenna design is used.



4. List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
AC Power Source	AC POWER	AFC-500W	F104070011	50Hz~60Hz	Mar. 21, 2018	Nov. 07, 2018	Mar. 20, 2019	Conducted (TH03-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP30	101329	9kHz~30GHz	Jun. 29, 2018	Nov. 07, 2018	Jun. 28, 2019	Conducted (TH03-HY)
Temperature Chamber	ESPEC	SU-641	92013721	-30°C ~70°C	Dec. 06, 2017	Nov. 07, 2018	Dec. 05, 2019	Conducted (TH03-HY)
Bilog Antenna	TESEQ	CBL 6111D&008	35419&03	30MHz to 1GHz	Dec. 18, 2017	Oct. 31, 2018 ~ Nov. 01, 2018	Dec. 17, 2018	Radiation (03CH07-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100315	9 kHz~30 MHz	Nov. 10, 2017	Oct. 31, 2018 ~ Nov. 01, 2018	Nov. 09, 2018	Radiation (03CH07-HY)
Preamplifier	COM-POWER	PA-103A	161241	10MHz-1GHz	May 21, 2018	Oct. 31, 2018 ~ Nov. 01, 2018	May 20, 2019	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY24971/4,M Y28655/4	9KHz~30MHz	Jan. 02, 2018	Oct. 31, 2018 ~ Nov. 01, 2018	Jan. 01, 2019	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY28655/4, MY24971/4,	30MHz~1GHz	Feb. 27, 2018	Oct. 31, 2018 ~ Nov. 01, 2018	Feb. 26, 2019	Radiation (03CH07-HY)
Antenna Mast	Max-Full	MFA520BS	N/A	1m~4m	N/A	Oct. 31, 2018 ~ Nov. 01, 2018	N/A	Radiation (03CH07-HY)
Turn Table	ChainTek	Chaintek 3000	N/A	0~360 Degree	N/A	Oct. 31, 2018 ~ Nov. 01, 2018	N/A	Radiation (03CH07-HY)
EMI Test Receiver	Agilent	N9038A (MXE)	MY53290053	20Hz to 26.5GHz	Jan. 16, 2018	Oct. 31, 2018 ~ Nov. 01, 2018	Jan. 15, 2019	Radiation (03CH07-HY)
Software	Audix	E3 6.2009-8-24	80504004656H	N/A	N/A	Oct. 31, 2018 ~ Nov. 01, 2018	N/A	Radiation (03CH07-HY)



5. Uncertainty of Evaluation

Uncertainty of Radiated Emission Measurement (9 kHz ~ 30 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_{C(y)}$)	3.4
---	-----

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_{C(y)}$)	5.7
---	-----

—————THE END—————