



# **TEST REPORT**

Report No.: BCTC2408339497-1E

Applicant: Ugreen Group Limited

Product Name: 2-in-1 Magnetic Wireless Charger

Test Model: W710

Tested Date: 2024-08-19 to 2024-08-27

Issued Date: 2024-08-28

Shenzhen BCTC Testing Co., Ltd.



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# FCC ID:2AQI5-W710

Product Name: 2-in-1 Magnetic Wireless Charger

Trademark: UGREEN

Model/Type Reference: W710

Prepared For: Ugreen Group Limited

Address: Ugreen Building, Longcheng Industrial Park, Longguanxi Road, Longhua,

ShenZhen, China

Manufacturer: Ugreen Group Limited

Address: Ugreen Building, Longcheng Industrial Park, Longguanxi Road, Longhua,

ShenZhen, China

Prepared By: Shenzhen BCTC Testing Co., Ltd.

Address: 1-2/F., Building B, Pengzhou Industrial Park, No.158, Fuyuan 1st Road,

Zhancheng, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, China

Sample Received Date: 2024-08-19

Sample Tested Date: 2024-08-19 to 2024-08-27

Issue Date: 2024-08-28

Report No.: BCTC2408339497-1E

Test Standards: FCC Part15.209 ANSI C63.10-2013

Test Results: PASS

Tested by:

kelsey Ton

Kelsey Tan/ Project Handler

Approved by:

Zero Zhou/Reviewer

The test report is effective only with both signature and specialized stamp. This result(s) shown in this report refer only to the sample(s) tested. Without written approval of Shenzhen BCTC Testing Co., Ltd, this report can't be reproduced except in full. The tested sample(s) and the sample information are provided by the client.

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(Note: N/A Means Not Applicable)

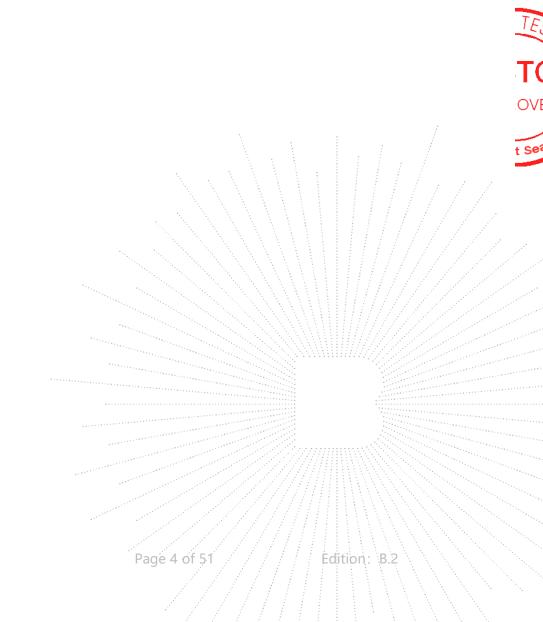


Edition: B.2



# 1. Version

Report No.	Issue Date	Description	Approved
BCTC2408339497-1E	2024-08-28	Original	Valid

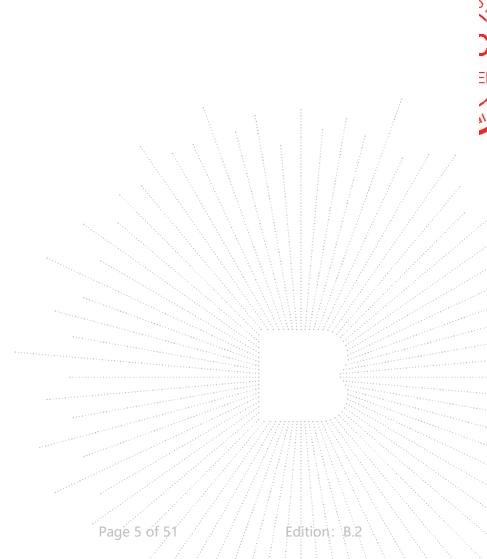




#### **Test Summary** 2.

The Product has been tested according to the following specifications:

No.	Test Parameter	Clause No.	Results
1	Conducted Emission	15.207	PASS
2	Radiated Emission	15.209	PASS
3	20dB Bandwidth	15.215	PASS
4	Antenna Requirement	15.203	PASS

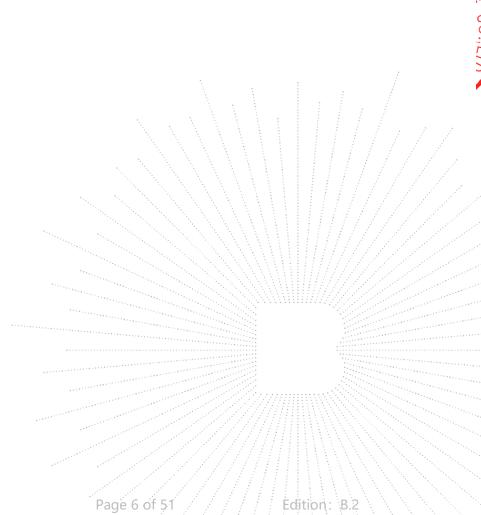




#### **Measurement Uncertainty** 3.

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the Product as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

No.	Item	Uncertainty
1	3m chamber Radiated spurious emission(30MHz-1GHz)	U=4.3dB
2	Conducted Emission (150kHz-30MHz)	U=3.2dB
3	humidity uncertainty	U=5.3%
4	Temperature uncertainty	U=0.59°C





## 4. Product Information And Test Setup

#### 4.1 Product Information

Model/Type Reference: W710

P/N code Differences: All the P/N code and test models are the same circuit and RF module, except for

the appearance color and sales platform.

Hardware Version: V1.0 Software Version: V1.0

Operation Frequency: Airpods: 112kHz-148.5kHz

Phone:5W+7.5W: 112kHz-148.5kHz

15W:360kHz

Modulation: FSK

Antenna installation: loop coil antenna

Ratings: USB-C (IN) Input:5.0V---3.0A/9.0V---3.0A/12.0V---2.5A

Wireless Charging Output:20.0W Max(iPhone:15.0W, AirPods:5.0W)

USB-C2 (OUT) Output:5.0V==-1.0A 5.0W Max

Total Output Power: 25.0W Max

Remark:

- P/N code in the below table, for marketing purpose, will be marked on the marking plate.

# 4.2 Support Equipment

No.	Device Type	Brand	Model	Series No.	Note
E-1	2-in-1 Magnetic Wireless Charger	UGREEN	W710	N/A	EUT /
E-2	Adapter	UGREEN	CD289	N/A	Auxiliary
E-3	Dummy load	N/A	DL01	N/A	Auxiliary
E-4	Wireless earphone	N/A	ZA01	N/A	Auxiliary

#### Notes:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.

2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

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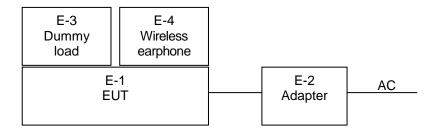


# 4.3 Test Setup Configuration

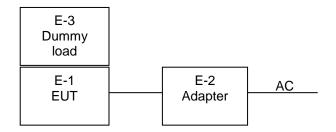
See test photographs attached in *EUT TEST SETUP PHOTOGRAPHS* for the actual connections between Product and support equipment.

Conducted Emission & Radiated Spurious Emission:

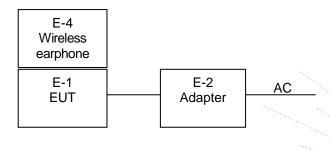
Test Mode 1-3



#### Test Mode 4-6



#### Test Mode 7



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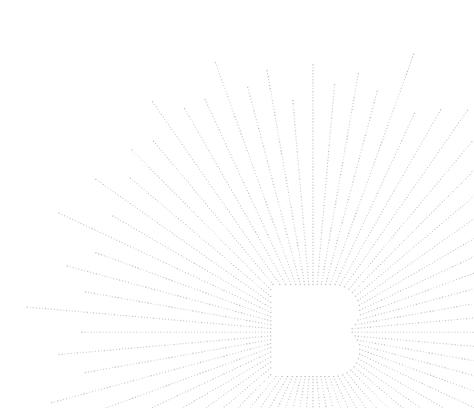


#### 4.4 Test Mode

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

	Mode 1	iPhone:15W+ AirPods:5W
	Mode 2	iPhone:7.5W+ AirPods:5W
	Mode 3	iPhone:5W+ AirPods:5W
AC Mode	Mode 4	iPhone:15W
	Mode 5	iPhone:7.5W
	Mode 6	iPhone:5W
	Mode 7	AirPods:5W

Note: All test mode were tested and passed, only shows the worst case mode which were recorded in this report.



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# 5. Test Facility And Test Instrument Used

# 5.1 Test Facility

All measurement facilities used to collect the measurement data are located at Shenzhen BCTC Testing Co., Ltd. Address:1-2/F., Building B, Pengzhou Industrial Park, No.158, Fuyuan 1st Road, Zhancheng, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, China. The site and apparatus are constructed in conformance with the requirements of ANSI C63.4 and CISPR 16-1-1 other equivalent standards.

FCC Test Firm Registration Number: 712850 A2LA certificate registration number is: CN1212

ISED Registered No.: 23583 ISED CAB identifier: CN0017

#### 5.2 Test Instrument Used

	Conducted Emissions Test					
Equipment	Manufacturer	Model#	Serial#	Last Cal.	Next Cal.	
Receiver	R&S	ESR3	102075	May 16, 2024	May 15, 2025	
LISN	R&S	ENV216	101375	May 16, 2024	May 15, 2025	
Software	Frad	EZ-EMC	EMC-CON 3A1	\	\	
Pulse limiter	Schwarzbeck	VTSD9561-F	01323	May 16, 2024	May 15, 2025	

		RF Cond	ucted Test		
Equipment	Manufacturer	Model#	Serial#	Last Cal.	Next Cal.
Power Meter	Keysight	E4419		May 16, 2024	May 15, 2025
Power Sensor (AV)	Keysight	E9300A		May 16, 2024	May 15, 2025
Signal Analyzer 20kHz-26.5G Hz	Keysight	N9020A	MY49100060	May 16, 2024	May 15, 2025
Spectrum Analyzer 9kHz-40GHz	R&S	FSP 40	\(\frac{1}{2}\)	May 16, 2024	May 15, 2025

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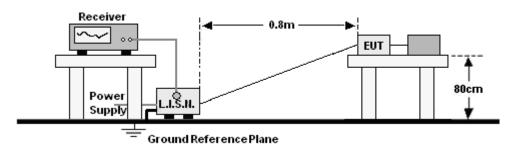
	Radiated Emissions Test (966 Chamber01)				
Equipment	Manufacturer	Model#	Serial#	Last Cal.	Next Cal.
966 chamber	ChengYu	966 Room	966	May 16, 2024	May 15, 2025
Receiver	R&S	ESR3	102075	May 16, 2024	May 15, 2025
Receiver	R&S	ESRP	101154	May 16, 2024	May 15, 2025
Amplifier	Schwarzbeck	BBV9744	9744-0037	May 16, 2024	May 15, 2025
TRILOG Broadband Antenna	Schwarzbeck	VULB9163	942	May 21, 2024	May 20, 2025
Loop Antenna(9KHz -30MHz)	Schwarzbeck	FMZB1519B	00014	May 21, 2024	May 20, 2025
Amplifier	SKET	LAPA_01G1 8G-45dB	SK202104090 1	May 16, 2024	May 15, 2025
Horn Antenna	Schwarzbeck	BBHA9120D	1541	May 21, 2024	May 20, 2025
Amplifier(18G Hz-40GHz)	MITEQ	TTA1840-35- HG	2034381	May 16, 2024	May 15, 2025
Horn Antenn(18GH z-40GHz)	Schwarzbeck	BBHA9170	00822	May 21, 2024	May 20, 2025
Spectrum Analyzer9kHz- 40GHz	R&S	FSP40	100363	May 16, 2024	May 15, 2025
Software	Frad	EZ-EMC	FA-03A2 RE	\	\

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#### 6. Conducted Emissions

## 6.1 Block Diagram Of Test Setup



#### 6.2 Limit

Fraguency (MUz)	Limit (	dBuV)
Frequency (MHz)	Quas-peak	Average
0.15 -0.5	66 - 56 *	56 - 46 *
0.50 -5.0	56.00	46.00
5.0 -30.0	60.00	50.00

#### Notes:

- 1. \*Decreasing linearly with logarithm of frequency.
- 2. The lower limit shall apply at the transition frequencies.

### 6.3 Test procedure

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

- a. The Product was placed on a nonconductive table 0.8 m above the horizontal ground reference plane, and 0.4 m from the vertical ground reference plane, and connected to the main through Line Impedance Stability Network (L.I.S.N).
- b. The RBW of the receiver was set at 9 kHz in 150 kHz ~ 30MHz with Peak and AVG detector in Max Hold mode. Run the receiver's pre-scan to record the maximum disturbance generated from Product in all power lines in the full band.
- c. For each frequency whose maximum record was higher or close to limit, measure its QP and AVG values and record.

#### 6.4 EUT operating Conditions

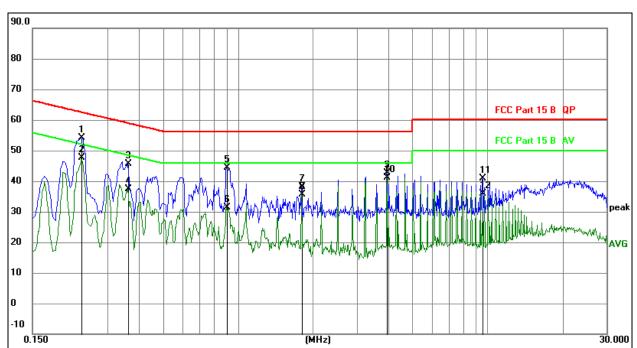
The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

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#### 6.5 Test Result

Temperature:	<b>26</b> ℃	Relative Humidity:	54%RH
Pressure:	101KPa	Phase :	L
Test Mode:	Mode 1(The worst mode)	Test Voltage:	AC 120V/60Hz



### Remark:

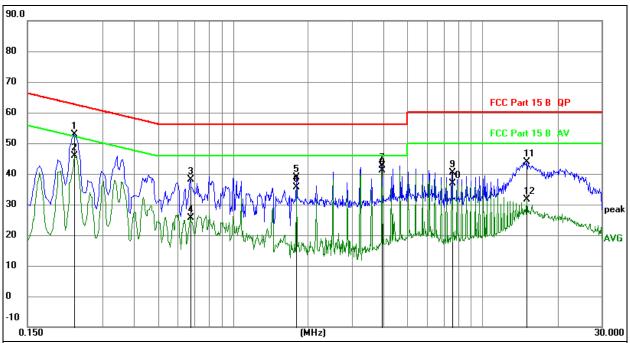
- 1. All readings are Quasi-Peak and Average values.
- Factor = Insertion Loss + Cable Loss.
   Measurement = Reading Level + Correct Factor
- 4. Over = Measurement Limit

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz		dB	dBuV	dBuV	dB	Detector
1		0.2355	34.17	20.07	54.24	62.25	-8.01	QP
2	*	0.2355	27.45	20.07	47.52	52.25	-4.73	AVG
3		0.3615	25.48	20.08	45.56	58.69	-13.13	QP
4		0.3615	17.30	20.08	37.38	48.69	-11.31	AVG
5		0.9014	24.38	20.09	44.47	56.00	-11.53	QP
6		0.9014	11.18	20.09	31.27	46.00	-14.73	AVG
7		1.8014	17.99	20.10	38.09	56.00	-17.91	QP
8		1.8014	15.45	20.10	35.55	46.00	-10.45	AVG
9		3.9615	22.40	20.14	42.54	56.00	-13.46	QP
10		3.9615	21.10	20.14	41.24	46.00	-4.76	AVG
11		9.5280	20.71	20.17	40.88	60.00	-19.12	QP
12		9.5280	15.68	20.17	35.85	50.00	-14.15	AVG

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Temperature:	<b>26</b> ℃	Relative Humidity:	54%RH
Pressure:	101KPa	Phase :	N
Test Mode:	Mode 1(The worst mode)	Test Voltage:	AC 120V/60Hz

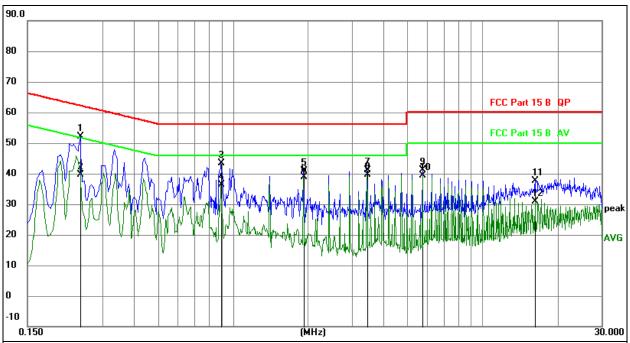


- All readings are Quasi-Peak and Average values.
   Factor = Insertion Loss + Cable Loss.
   Measurement = Reading Level + Correct Factor
   Over = Measurement Limit

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No. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
	MHz		dB	dBuV	dBuV	dB	Detector
1	0.2304	32.83	20.07	52.90	62.44	-9.54	QP
2	0.2304	25.93	20.07	46.00	52.44	-6.44	AVG
3	0.6719	18.02	20.09	38.11	56.00	-17.89	QP
4	0.6719	5.46	20.09	25.55	46.00	-20.45	AVG
5	1.8000	18.89	20.10	38.99	56.00	-17.01	QP
6	1.8000	15.44	20.10	35.54	46.00	-10.46	AVG
7	3.9430	22.55	20.14	42.69	56.00	-13.31	QP
8 *	3.9430	20.90	20.14	41.04	46.00	-4.96	AVG
9	7.5258	20.18	20.16	40.34	60.00	-19.66	QP
10	7.5258	16.71	20.16	36.87	50.00	-13.13	AVG
11	15.0656	23.51	20.31	43.82	60.00	-16.18	QP
12	15.0656	11.38	20.31	31.69	50.00	-18.31	AVG



Temperature:	26 ℃	Relative Humidity:	54%RH
Pressure:	101KPa	Phase :	L
Test Mode:	Mode 2(The worst mode)	Test Voltage:	AC 120V/60Hz

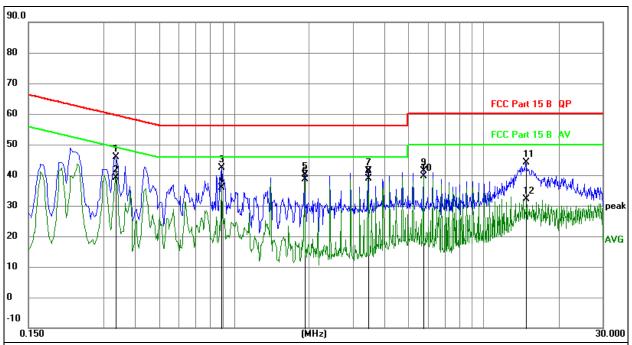


- 1. All readings are Quasi-Peak and Average values.
- 2. Factor = Insertion Loss + Cable Loss.
- 3. Measurement = Reading Level + Correct Factor
- 4. Over = Measurement Limit

4. Over	= ivieasui	ement - Lin	IIL					<u> </u>
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz		dB	dBuV	dBu∀	dB	Detector
1		0.2445	32.13	20.07	52.20	61.94	-9.74	QP
2		0.2445	19.67	20.07	39.74	51.94	-12.20	AVG
3		0.8969	23.35	20.09	43.44	56.00	-12.56	QP
4		0.8969	16.34	20.09	36.43	46.00	-9.57	AVG
5		1.9184	20.66	20.10	40.76	56.00	-15.24	QP
6		1.9184	18.75	20.10	38.85	46.00	-7.15	AVG
7		3.4530	20.99	20.13	41.12	56.00	-14.88	QP
8	*	3.4530	19.59	20.13	39.72	46.00	-6.28	AVG
9		5.7525	21.03	20.15	41.18	60.00	-18.82	QP
10		5.7525	19.21	20.15	39.36	50.00	-10.64	AVG
11		16.2375	17.42	20.31	37.73	60.00	-22.27	QP
12		16.2375	10.47	20.31	30.78	50.00	-19.22	AVG



Temperature:	<b>26</b> ℃	Relative Humidity:	54%RH
Pressure:	101KPa	Phase :	N
Test Mode:	Mode 2(The worst mode)	Test Voltage:	AC 120V/60Hz

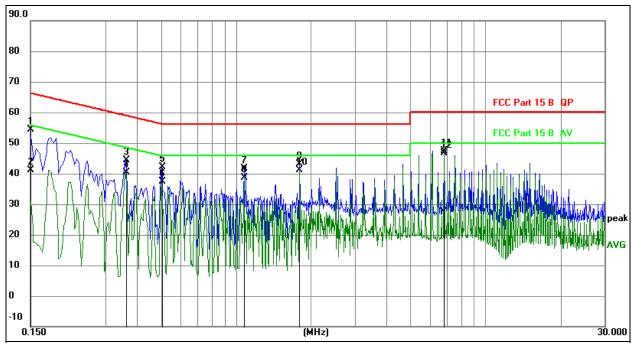


- 1. All readings are Quasi-Peak and Average values.
- 2. Factor = Insertion Loss + Cable Loss.
- Measurement = Reading Level + Correct Factor
   Over = Measurement Limit

					-		
No. M	1k. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
	MHz		dB	dBuV	dBu∀	dB	Detector
1	0.3345	25.91	20.07	45.98	59.34	-13.36	QP
2	0.3345	18.98	20.07	39.05	49.34	-10.29	AVG
3	0.8925	22.25	20.09	42.34	56.00	-13.66	QP
4	0.8925	15.76	20.09	35.85	46.00	-10.15	AVG
5	1.9185	20.11	20.10	40.21	56.00	-15.79	QP
6	1.9185	18.56	20.10	38.66	46.00	-7.34	AVG
7	3.4530	21.29	20.13	41.42	56.00	-14.58	QP
8 *	3.4530	18.72	20.13	38.85	46.00	-7.15	AVG
9	5.7525	21.24	20.15	41.39	60.00	-18.61	QP
10	5.7525	19.38	20.15	39.53	50.00	-10.47	AVG
11	14.7615	23.86	20.30	44.16	60.00	-15.84	QP
12	14.7615	11.79	20.30	32.09	50.00	-17.91	AVG



Temperature:	26 ℃	Relative Humidity:	54%RH
Pressure:	101KPa	Phase :	L
Test Mode:	Mode 4(The worst mode)	Test Voltage:	AC 120V/60Hz



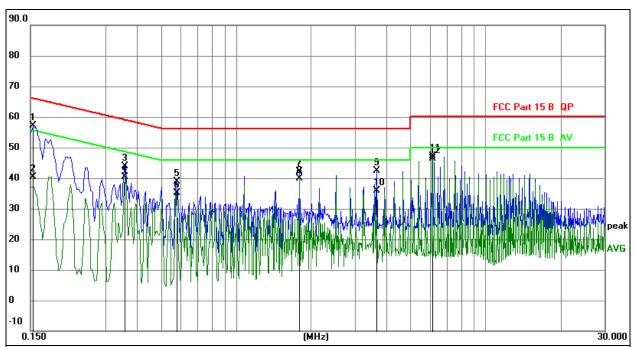
- 1. All readings are Quasi-Peak and Average values.
- 2. Factor = Insertion Loss + Cable Loss.
- 3. Measurement = Reading Level + Correct Factor
- 4. Over = Measurement Limit

MHz  1 0.150 2 0.150 3 0.361 4 0.361 5 0.504 6 0.504 7 1.076 8 1.076 9 1.800	21.06	0.07 41.13 56.00 -	dB Detector -11.71 QP -14.87 AVG
2 0.150 3 0.361 4 0.361 5 0.504 6 0.504 7 1.076 8 1.076 9 1.800	21.06	0.07 41.13 56.00 -	-14.87 AVG
3 0.361 4 0.361 5 0.504 6 0.504 7 1.076 8 1.076 9 1.800			
4 0.361 5 0.504 6 0.504 7 1.076 8 1.076 9 1.800	5 24.27	0.08 44.35 58.69 -	
5 0.504 6 0.504 7 1.076 8 1.076 9 1.800			-14.34 QP
6 0.504 7 1.076 8 1.076 9 1.800	5 20.36	0.08 40.44 48.69	-8.25 AVG
7 1.076 8 1.076 9 1.800	7 21.97	0.08 42.05 56.00 -	-13.95 QP
8 1.076 9 1.800	7 17.37	0.08 37.45 46.00	-8.55 AVG
9 1.800	6 21.56	0.09 41.65 56.00 -	-14.35 QP
	6 18.51	0.09 38.60 46.00	-7.40 AVG
40 4.000	23.14	0.10 43.24 56.00 -	-12.76 QP
10 1.800	21.12	0.10 41.22 46.00	-4.78 AVG
11 6.841	21.12	0.16 47.39 60.00 -	-12.61 QP
12 * 6.841			-3.36 AVG





Temperature:	<b>26</b> ℃	Relative Humidity:	54%RH
Pressure:	101KPa	Phase :	N
Test Mode:	Mode 4(The worst mode)	Test Voltage:	AC 120V/60Hz

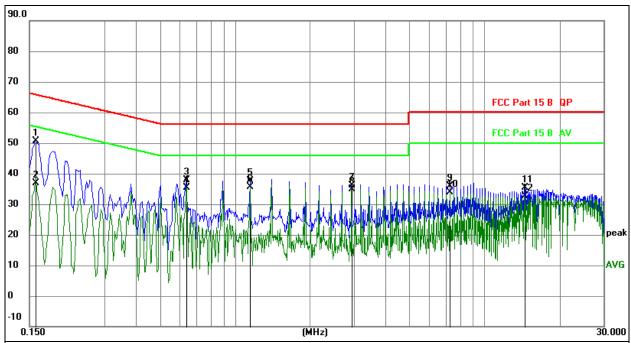


- 1. All readings are Quasi-Peak and Average values.
- 2. Factor = Insertion Loss + Cable Loss.
- Measurement = Reading Level + Correct Factor
   Over = Measurement Limit

No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
	MHz		dB	dBu∨	dBu∀	dB	Detector
1	0.1539	37.12	20.07	57.19	65.79	-8.60	QP
2	0.1539	20.42	20.07	40.49	55.79	-15.30	AVG
3	0.3558	23.74	20.08	43.82	58.83	-15.01	QP
4	0.3558	20.22	20.08	40.30	48.83	-8.53	AVG
5	0.5762	18.79	20.08	38.87	56.00	-17.13	QP
6	0.5762	14.94	20.08	35.02	46.00	-10.98	AVG
7	1.8000	22.08	20.10	42.18	56.00	-13.82	QP
8	1.8000	19.72	20.10	39.82	46.00	-6.18	AVG
9	3.6611	22.30	20.13	42.43	56.00	-13.57	QP
10	3.6611	15.84	20.13	35.97	46.00	-10.03	AVG
11	6.1209	27.01	20.15	47.16	60.00	-12.84	QP
12 *	6.1209	26.34	20.15	46.49	50.00	-3.51	AVG



Temperature:	26 ℃	Relative Humidity:	54%RH
Pressure:	101KPa	Phase :	L
Test Mode:	Mode 6(The worst mode)	Test Voltage:	AC 120V/60Hz

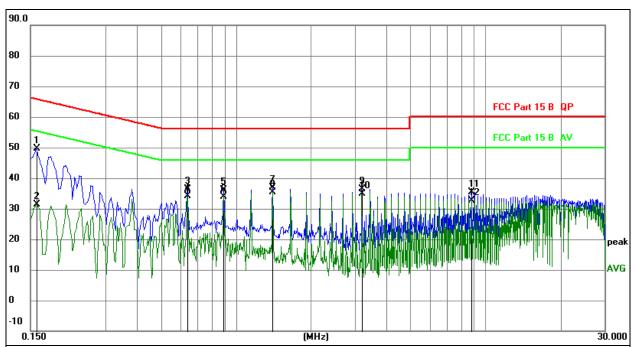


- 1. All readings are Quasi-Peak and Average values.
- 2. Factor = Insertion Loss + Cable Loss.
- 3. Measurement = Reading Level + Correct Factor
- 4. Over = Measurement Limit

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No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz		dB	dBu∨	dBu∀	dB	Detector
1		0.1582	30.52	20.07	50.59	65.56	-14.97	QP
2		0.1582	16.85	20.07	36.92	55.56	-18.64	AVG
3		0.6372	17.91	20.09	38.00	56.00	-18.00	QP
4		0.6372	15.30	20.09	35.39	46.00	-10.61	AVG
5		1.1473	17.43	20.09	37.52	56.00	-18.48	QP
6	*	1.1473	15.65	20.09	35.74	46.00	-10.26	AVG
7		2.9307	16.05	20.12	36.17	56.00	-19.83	QP
8		2.9307	14.87	20.12	34.99	46.00	-11.01	AVG
9		7.2518	15.81	20.16	35.97	60.00	-24.03	QP
10		7.2518	13.68	20.16	33.84	50.00	-16.16	AVG
11		14.4404	15.19	20.29	35.48	60.00	-24.52	QP
12		14.4404	12.46	20.29	32.75	50.00	-17.25	AVG



Temperature:	<b>26</b> ℃	Relative Humidity:	54%RH
Pressure:	101KPa	Phase :	N
Test Mode:	Mode 6(The worst mode)	Test Voltage:	AC 120V/60Hz

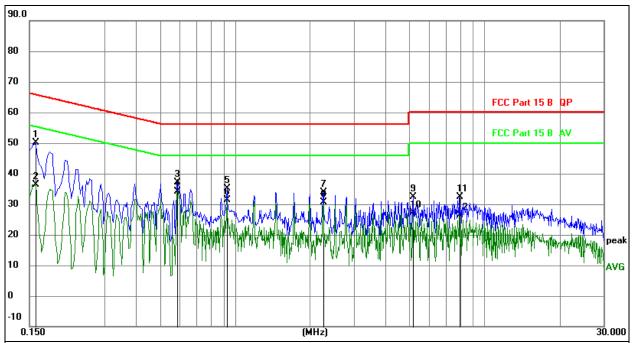


- All readings are Quasi-Peak and Average values.
   Factor = Insertion Loss + Cable Loss.
- 3. Measurement = Reading Level + Correct Factor
  4. Over = Measurement Limit

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz		dB	dBuV	dBuV	dB	Detector
1		0.1582	29.46	20.07	49.53	65.56	-16.03	QP
2		0.1582	11.34	20.07	31.41	55.56	-24.15	AVG
3		0.6372	16.32	20.09	36.41	56.00	-19.59	QP
4		0.6372	14.07	20.09	34.16	46.00	-11.84	AVG
5		0.8944	16.10	20.09	36.19	56.00	-19.81	QP
6		0.8944	13.91	20.09	34.00	46.00	-12.00	AVG
7		1.4032	16.69	20.09	36.78	56.00	-19.22	QP
8	*	1.4032	15.30	20.09	35.39	46.00	-10.61	AVG
9		3.1900	16.29	20.12	36.41	56.00	-19.59	QP
10		3.1900	14.66	20.12	34.78	46.00	-11.22	AVG
11		8.7757	15.19	20.17	35.36	60.00	-24.64	QP
12		8.7757	12.56	20.17	32.73	50.00	-17.27	AVG



Temperature:	26 ℃	Relative Humidity:	54%RH
Pressure:	101KPa	Phase :	L
Test Mode:	Mode 7(The worst mode)	Test Voltage:	AC 120V/60Hz

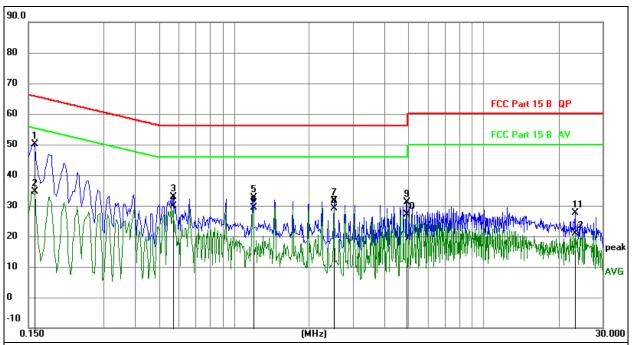


- 1. All readings are Quasi-Peak and Average values.
- 2. Factor = Insertion Loss + Cable Loss.
- 3. Measurement = Reading Level + Correct Factor
- 4. Over = Measurement Limit

		Reading	Correct	Measure-			
No. Mk.	Freq.	Level	Factor	ment	Limit	Over	
	MHz		dB	dBu∀	dBu∀	dB	Detector
1	0.1582	30.01	20.07	50.08	65.56	-15.48	QP
2	0.1582	16.30	20.07	36.37	55.56	-19.19	AVG
3	0.5885	17.01	20.08	37.09	56.00	-18.91	QP
4 *	0.5885	14.05	20.08	34.13	46.00	-11.87	AVG
5	0.9282	14.98	20.09	35.07	56.00	-20.93	QP
6	0.9282	11.20	20.09	31.29	46.00	-14.71	AVG
7	2.2606	13.65	20.11	33.76	56.00	-22.24	QP
8	2.2606	10.60	20.11	30.71	46.00	-15.29	AVG
9	5.1663	12.14	20.15	32.29	60.00	-27.71	QP
10	5.1663	6.87	20.15	27.02	50.00	-22.98	AVG
11	7.9353	12.12	20.16	32.28	60.00	-27.72	QP
12	7.9353	6.14	20.16	26.30	50.00	-23.70	AVG



Temperature:	<b>26</b> ℃	Relative Humidity:	54%RH
Pressure:	101KPa	Phase :	Ν
Test Mode:	Mode 7(The worst mode)	Test Voltage:	AC 120V/60Hz



- All readings are Quasi-Peak and Average values.
   Factor = Insertion Loss + Cable Loss.
   Measurement = Reading Level + Correct Factor
   Over = Measurement Limit

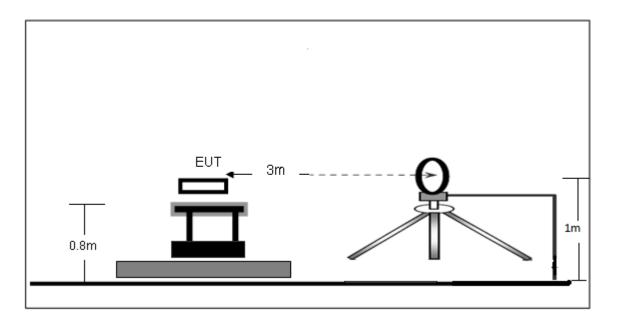
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz		dB	dBuV	dBu∀	dB	Detector
1	*	0.1590	29.94	20.07	50.01	65.52	-15.51	QP
2		0.1590	14.53	20.07	34.60	55.52	-20.92	AVG
3		0.5730	12.80	20.08	32.88	56.00	-23.12	QP
4		0.5730	9.90	20.08	29.98	46.00	-16.02	AVG
5		1.1940	12.59	20.09	32.68	56.00	-23.32	QP
6		1.1940	9.25	20.09	29.34	46.00	-16.66	AVG
7		2.5260	11.61	20.11	31.72	56.00	-24.28	QP
8		2.5260	8.97	20.11	29.08	46.00	-16.92	AVG
9		4.9110	11.02	20.15	31.17	56.00	-24.83	QP
10		4.9110	6.92	20.15	27.07	46.00	-18.93	AVG
11		23.2665	7.32	20.31	27.63	60.00	-32.37	QP
12		23.2665	0.69	20.31	21.00	50.00	-29.00	AVG
			•					



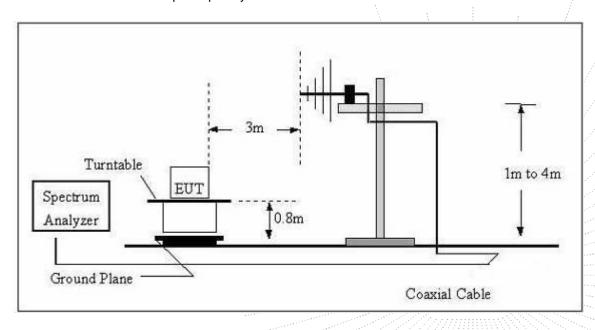
#### 7. Radiated Emissions

# 7.1 Block Diagram Of Test Setup

(A) Radiated Emission Test-Up Frequency Below 30MHz



(B) Radiated Emission Test-Up Frequency 30MHz~1GHz



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#### 7.2 Limit

FCC §15.209; §15.205.

Test Standard	FCC Part15 C Section 15.209 and 15.205							
	Frequency (MHz)	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)			
	0.009MHz~0.490MHz	2400/F(kHz)	-	-	300			
	0.490MHz-1.705MHz	24000/F(kHz)	-	-	30			
	1.705MHz-30MHz	30	-	-	30			
Test Limit	30MHz~88MHz	100	40.0	Quasi-peak	3			
	88MHz~216MHz	150	43.5	Quasi-peak	3			
	216MHz~960MHz	200	46.0	Quasi-peak	3			
	960MHz~1000MHz	500	54.0	Quasi-peak	3			
	Above 1000MHz	500	54.0	Average	3			
	Above 1000MHZ		74.0	Peak	3			

Report No.: BCTC2408339497-1E

#### 7.3 Test procedure

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

Below 1GHz test procedure as below:

a.The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.

b.The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d.For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. e.The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

f.If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

Above 1GHz test procedure as below:

g.Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber and change form table 0.8 metre to 1.5 metre( Above 18GHz the distance is 1 meter and table is 1.5 metre).

h.Test the EUT in the lowest channel ,the middle channel ,the Highest channel.

Note: Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported.

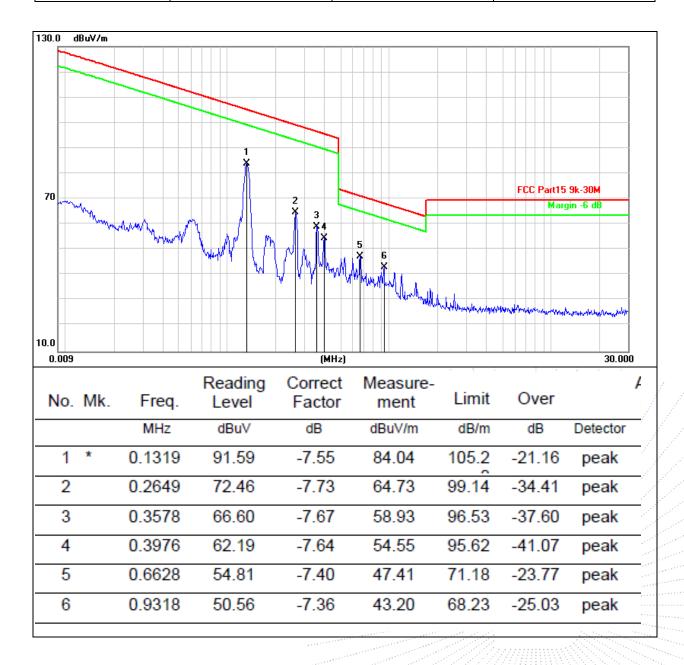
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#### 7.4 Test Result

#### 9kHz-30MHz

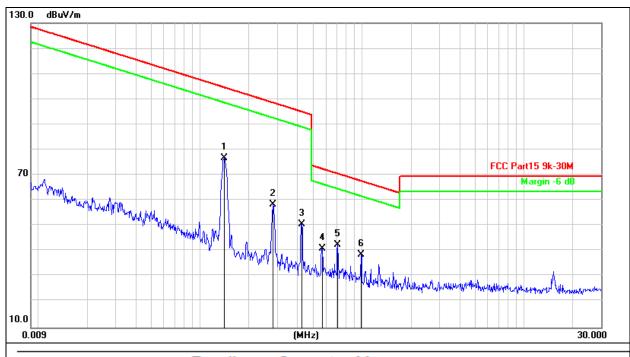
Temperature:	26℃	Relative Humidity:	54%RH
Pressure:	101 kPa	Test Voltage:	AC 120V/60Hz
Test Mode:	Mode 1(The worst mode)	Polarization:	Coaxial(Worst)



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Temperature:	26℃	Relative Humidity:	54%RH
Pressure:	101 kPa	Test Voltage:	AC 120V/60Hz
Test Mode:	Mode 1(The worst mode)	Polarization:	Coplanar (Worst)

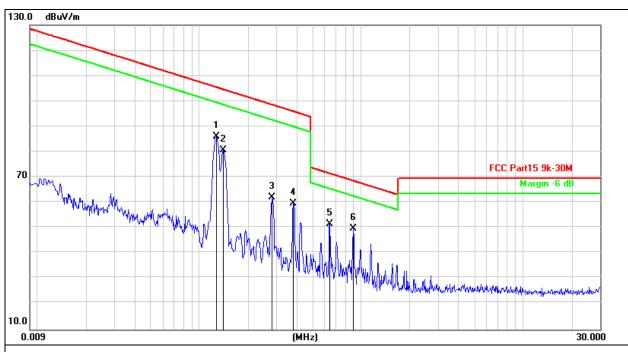


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1	*	0.1408	84.31	-7.56	76.75	104.6	-27.88	peak
2		0.2828	66.05	-7.72	58.33	98.57	-40.24	peak
3		0.4242	58.37	-7.62	50.75	95.05	-44.30	peak
4		0.5681	48.59	-7.50	41.09	72.52	-31.43	peak
5		0.7072	49.96	-7.36	42.60	70.62	-28.02	peak
6		0.9863	46.06	-7.36	38.70	67.74	-29.04	peak

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Temperature:	26℃	Relative Humidity:	54%RH
Pressure:	101 kPa	Test Voltage:	AC 120V/60Hz
Test Mode:	Mode 2(The worst mode)	Polarization:	Coaxial(Worst)



No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
	MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1	0.1276	93.54	-7.54	86.00	105.4	-19.49	peak
2	0.1408	88.12	-7.56	80.56	104.6	-24.07	peak
3	0.2828	69.82	-7.72	62.10	98.57	-36.47	peak
4	0.3818	67.38	-7.65	59.73	95.97	-36.24	peak
5	0.6416	58.90	-7.42	51.48	71.47	-19.99	peak
6 *	0.8948	57.16	-7.36	49.80	68.58	-18.78	peak

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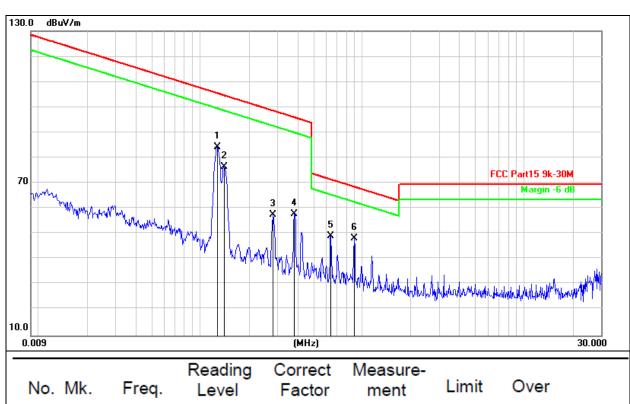
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Temperature:	26℃	Relative Humidity:	54%RH
Pressure:	101 kPa	Test Voltage:	AC 120V/60Hz
Test Mode:	Mode 2(The worst mode)	Polarization:	Coplanar (Worst)

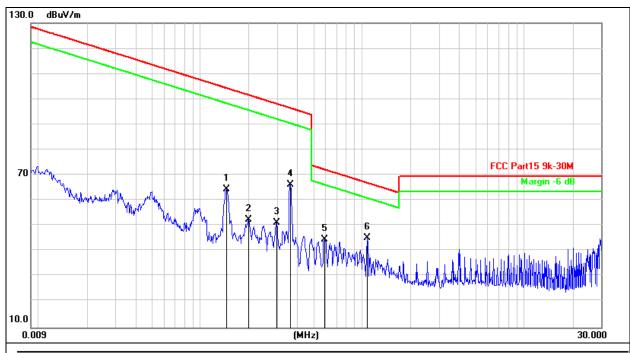


No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
	MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1	0.1277	91.87	-7.54	84.33	105.4	-21.15	peak
2	0.1408	84.16	-7.56	76.60	104.6	-28.03	peak
3	0.2828	65.25	-7.72	57.53	98.57	-41.04	peak
4	0.3818	65.55	-7.65	57.90	95.97	-38.07	peak
5	0.6416	56.61	-7.42	49.19	71.47	-22.28	peak
6 *	0.8948	55.54	-7.36	48.18	68.58	-20.40	peak

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Temperature:	26℃	Relative Humidity:	54%RH
Pressure:	101 kPa	Test Voltage:	AC 120V/60Hz
Test Mode:	Mode 4(The worst mode)	Polarization:	Coaxial(Worst)



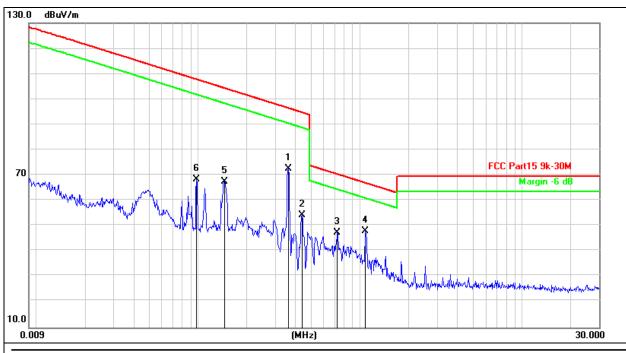
No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
	MHz	dBu∨	dB	dBu∀/m	dB/m	dB	Detector
1	0.1454	72.06	-7.57	64.49	104.3	-39.86	peak
2	0.1995	60.32	-7.78	52.54	101.6	-49.07	peak
3	0.2969	58.94	-7.71	51.23	98.15	-46.92	peak
4	0.3607	74.03	-7.67	66.36	96.46	-30.10	peak
5	0.5868	52.09	-7.48	44.61	72.24	-27.63	peak
6 *	1.0783	52.51	-7.36	45.15	66.97	-21.82	peak

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Temperature:	26℃	Relative Humidity:	54%RH
Pressure:	101 kPa	Test Voltage:	AC 120V/60Hz
Test Mode:	Mode 4(The worst mode)	Polarization:	Coplanar (Worst)

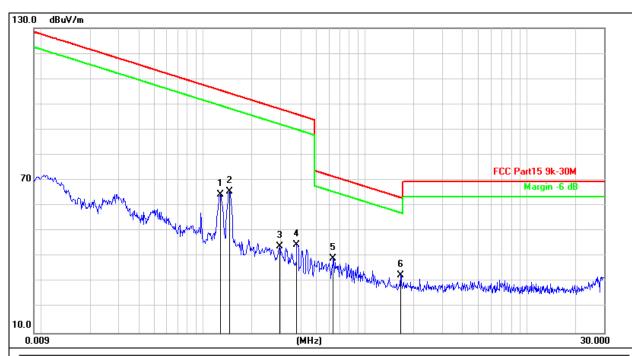


No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
	MHz	dBu∨	dB	dBu∀/m	dB/m	dB	Detector
1	0.3607	80.07	-7.67	72.40	96.46	-24.06	peak
2	0.4382	61.79	-7.61	54.18	94.77	-40.59	peak
3	0.7246	54.62	-7.36	47.26	70.41	-23.15	peak
4 *	1.0783	55.35	-7.36	47.99	66.97	-18.98	peak
5	0.1454	75.16	-7.57	67.59	104.3	-36.76	peak
6	0.0976	75.76	-7.51	68.25	107.8	-39.57	peak

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Temperature:	26℃	Relative Humidity:	54%RH
Pressure:	101 kPa	Test Voltage:	AC 120V/60Hz
Test Mode:	Mode 6(The worst mode)	Polarization:	Coaxial(Worst)

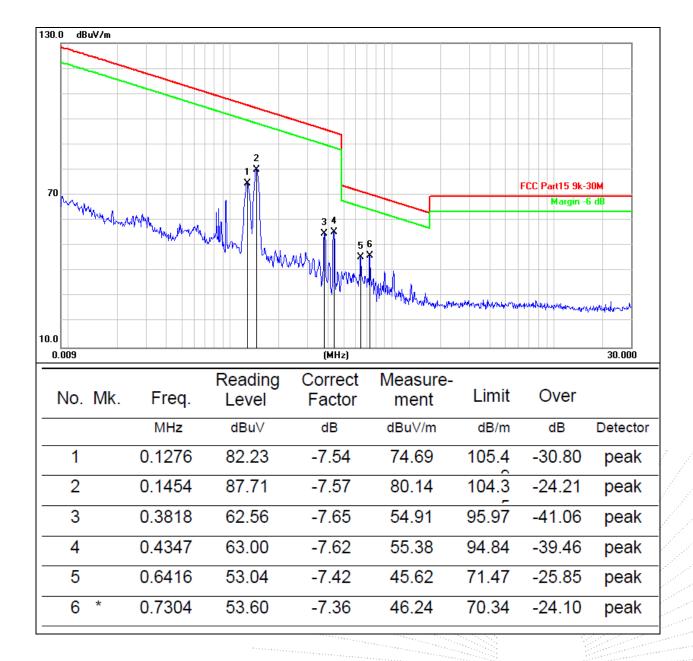


1 2	MHz 0.1276	dBu∨ 71.90	dB	dBuV/m	dB/m	dB	Detector
<u> </u>	0.1276	71.90				uD.	Detector
2		7 1.00	-7.54	64.36	105.4	-41.13	peak
_	0.1454	73.36	-7.57	65.79	104.3	-38.56	peak
3	0.2969	51.77	-7.71	44.06	98.15	-54.09	peak
4	0.3787	52.24	-7.65	44.59	96.04	-51.45	peak
5	0.6363	46.81	-7.43	39.38	71.54	-32.16	peak
6 *	1.6575	40.06	-7.33	32.73	63.24	-30.51	peak

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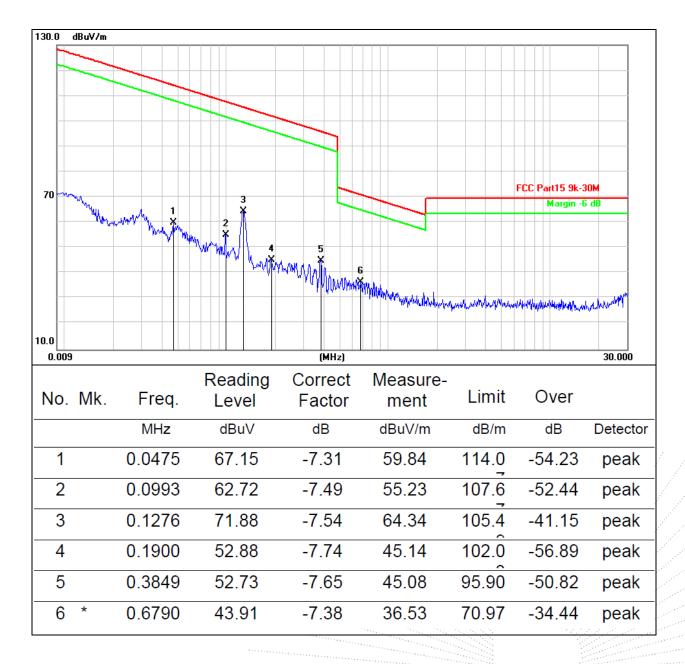


Temperature:	26℃	Relative Humidity:	54%RH
Pressure:	101 kPa	Test Voltage:	AC 120V/60Hz
Test Mode:	Mode 6(The worst mode)	Polarization:	Coplanar (Worst)





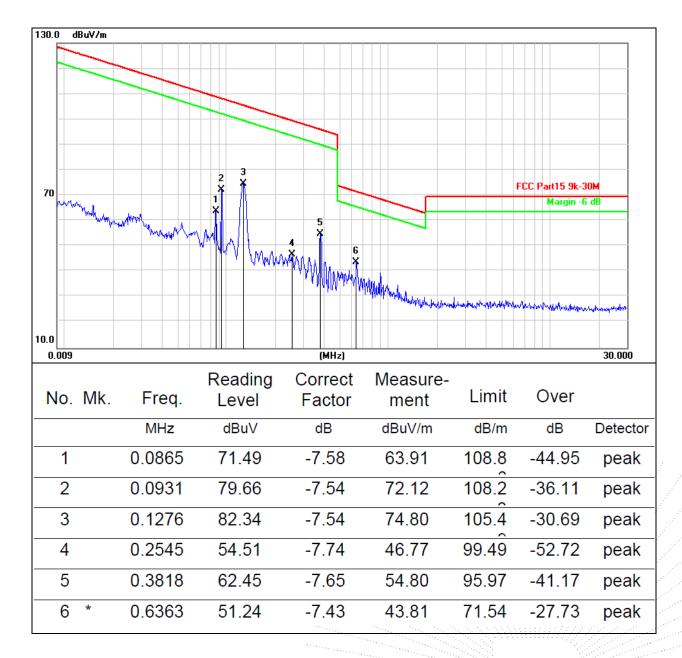
Temperature:	26℃	Relative Humidity:	54%RH
Pressure:	101 kPa	Test Voltage:	AC 120V/60Hz
Test Mode:	Mode 7(The worst mode)	Polarization:	Coaxial(Worst)



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Temperature:	26℃	Relative Humidity:	54%RH
Pressure:	101 kPa	Test Voltage:	AC 120V/60Hz
Test Mode:	Mode 7(The worst mode)	Polarization:	Coplanar (Worst)



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#### Between 30MHz - 1GHz

Temperature:	26 ℃	Relative Humidity:	54%RH
Pressure:	101KPa	Phase :	Horizontal
Test Mode:	Mode 1(The worst mode)	Test Voltage:	AC 120V/60Hz



#### Remark:

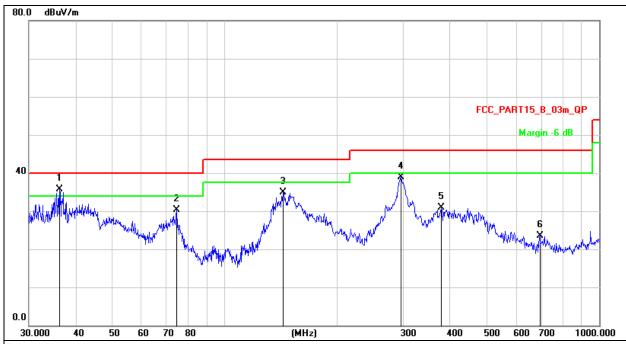
- Factor = Antenna Factor + Cable Loss Pre-amplifier.
   Measurement = Reading Level + Correct Factor
   Over = Measurement Limit

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		52.7600	38.55	-14.27	24.28	40.00	-15.72	QP
2	,	152.6641	44.81	-19.23	25.58	43.50	-17.92	QP
3		222.9502	43.74	-15.06	28.68	46.00	-17.32	QP
4	*	304.6099	51.32	-13.08	38.24	46.00	-7.76	QP
5	•	425.0280	40.32	-10.35	29.97	46.00	-16.03	QP
6		869.1302	28.35	-3.65	24.70	46.00	-21.30	QP

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Temperature:	<b>26</b> ℃	Relative Humidity:	54%RH
Pressure:	101KPa	Phase :	Vertical
Test Mode:	Mode 1(The worst mode)	Test Voltage:	AC 120V/60Hz



#### Remark:

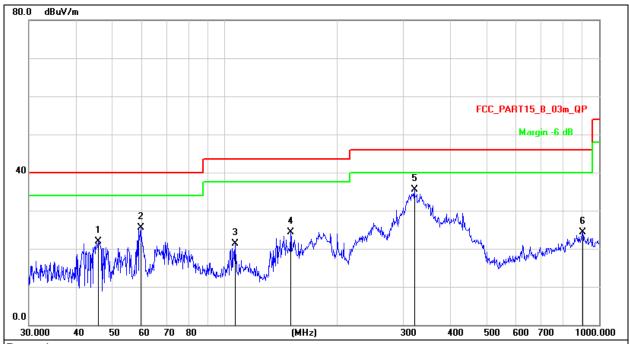
- 1. Factor = Antenna Factor + Cable Loss Pre-amplifier.
- Measurement = Reading Level + Correct Factor
   Over = Measurement Limit

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1	*	36.2541	51.10	-15.44	35.66	40.00	-4.34	QP
2		74.3955	49.10	-18.77	30.33	40.00	-9.67	QP
3		143.3261	53.87	-18.96	34.91	43.50	-8.59	QP
4		295.1469	52.17	-13.34	38.83	46.00	-7.17	QP
5	,	378.5843	42.08	-11.11	30.97	46.00	-15.03	QP
6	(	694.4174	29.30	-5.76	23.54	46.00	-22.46	QP

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Temperature:	26 ℃	Relative Humidity:	54%RH
Pressure:	101KPa	Phase :	Horizontal
Test Mode:	Mode 2(The worst mode)	Test Voltage:	AC 120V/60Hz

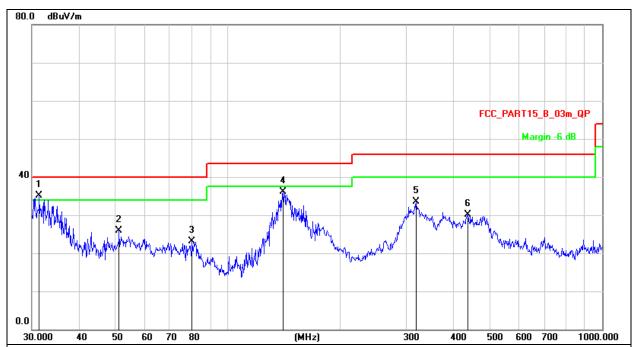


- 1. Factor = Antenna Factor + Cable Loss Pre-amplifier.
- Measurement = Reading Level + Correct Factor
   Over = Measurement Limit

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∨	dB	dBu∀/m	dB/m	dB	Detecto
1	4	16.0164	36.06	-14.23	21.83	40.00	-18.17	QP
2	5	59.6493	40.70	-15.20	25.50	40.00	-14.50	QP
3	10	06.7587	37.72	-16.40	21.32	43.50	-22.18	QP
4	15	50.0108	43.78	-19.43	24.35	43.50	-19.15	QP
5	* 32	21.0608	47.96	-12.50	35.46	46.00	-10.54	QP
6	90	3.3094	27.35	-3.11	24.24	46.00	-21.76	QP
							1, 11,	



Temperature:	<b>26</b> ℃	Relative Humidity:	54%RH
Pressure:	101KPa	Phase :	Vertical
Test Mode:	Mode 2(The worst mode)	Test Voltage:	AC 120V/60Hz



- 1. Factor = Antenna Factor + Cable Loss Pre-amplifier.
- Measurement = Reading Level + Correct Factor
   Over = Measurement Limit

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∨	dB	dBuV/m	dB/m	dB	Detect
1	*	31.3992	51.39	-16.38	35.01	40.00	-4.99	QP
2		51.3005	40.07	-14.08	25.99	40.00	-14.01	QP
3		80.3619	42.71	-19.66	23.05	40.00	-16.95	QP
4		140.8351	54.93	-18.79	36.14	43.50	-7.36	QP
5	,	318.8170	46.01	-12.58	33.43	46.00	-12.57	QP
6	4	438.6554	40.19	-10.08	30.11	46.00	-15.89	QP



Temperature:	26 ℃	Relative Humidity:	54%RH
Pressure:	101KPa	Phase :	Horizontal
Test Mode:	Mode 4(The worst mode)	Test Voltage:	AC 120V/60Hz

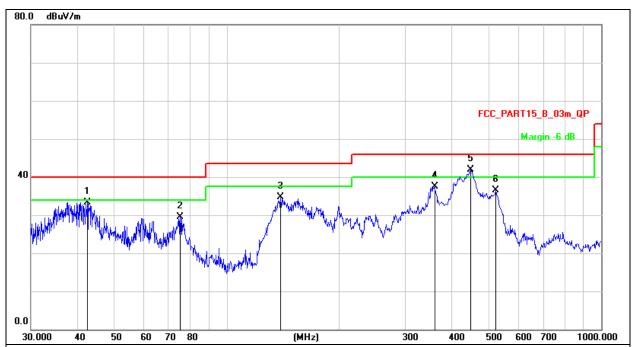


- 1. Factor = Antenna Factor + Cable Loss Pre-amplifier.
- Measurement = Reading Level + Correct Factor
   Over = Measurement Limit

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detecto
1		39.1616	34.58	-14.88	19.70	40.00	-20.30	QP
2		74.3955	37.19	-18.77	18.42	40.00	-21.58	QP
3		202.1005	45.27	-15.66	29.61	43.50	-13.89	QP
4	İ	360.4476	51.86	-11.35	40.51	46.00	-5.49	QP
5	*	444.8514	51.77	-9.96	41.81	46.00	-4.19	QP
6		771.4486	31.51	-4.74	26.77	46.00	-19.23	QP



Temperature:	<b>26</b> ℃	Relative Humidity:	54%RH
Pressure:	101KPa	Phase :	Vertical
Test Mode:	Mode 4(The worst mode)	Test Voltage:	AC 120V/60Hz



- 1. Factor = Antenna Factor + Cable Loss Pre-amplifier.
- Measurement = Reading Level + Correct Factor
   Over = Measurement Limit

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detecto
1		42.4508	47.88	-14.52	33.36	40.00	-6.64	QP
2		75.1822	48.51	-18.91	29.60	40.00	-10.40	QP
3		139.3613	53.33	-18.69	34.64	43.50	-8.86	QP
4		359.1860	48.78	-11.36	37.42	46.00	-8.58	QP
5	*	447.9822	51.71	-9.90	41.81	46.00	-4.19	QP
6		522.7180	45.92	-9.41	36.51	46.00	-9.49	QP



Temperature:	26 ℃	Relative Humidity:	54%RH
Pressure:	101KPa	Phase :	Horizontal
Test Mode:	Mode 6(The worst mode)	Test Voltage:	AC 120V/60Hz

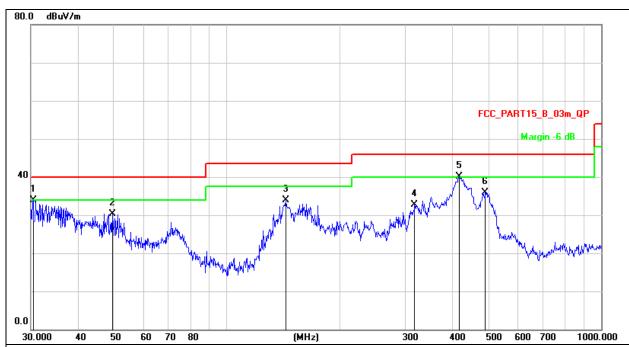


- 1. Factor = Antenna Factor + Cable Loss Pre-amplifier.
- Measurement = Reading Level + Correct Factor
   Over = Measurement Limit

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detecto
1		36.0007	32.06	-15.49	16.57	40.00	-23.43	QP
2		73.1025	34.34	-18.54	15.80	40.00	-24.20	QP
3	•	143.8295	46.17	-19.00	27.17	43.50	-16.33	QP
4	2	283.9791	45.43	-13.58	31.85	46.00	-14.15	QP
5	3	359.1860	51.00	-11.36	39.64	46.00	-6.36	QP
6	* 4	116.1791	50.39	-10.52	39.87	46.00	-6.13	QP



Temperature:	26 ℃	Relative Humidity:	54%RH
Pressure:	101KPa	Phase :	Vertical
Test Mode:	Mode 6(The worst mode)	Test Voltage:	AC 120V/60Hz

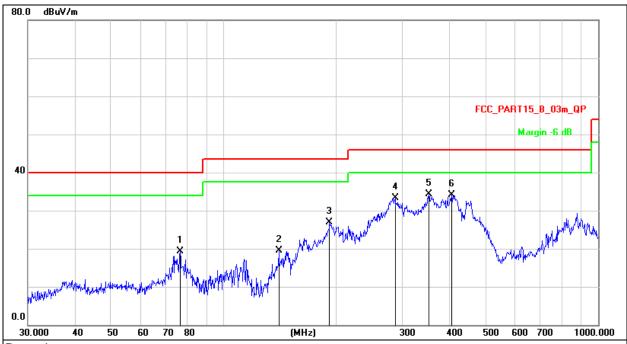


- 1. Factor = Antenna Factor + Cable Loss Pre-amplifier.
- Measurement = Reading Level + Correct Factor
   Over = Measurement Limit

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detecto
1		30.4238	50.39	-16.57	33.82	40.00	-6.18	QP
2		49.5328	44.27	-13.94	30.33	40.00	-9.67	QP
3		143.8295	52.96	-19.00	33.96	43.50	-9.54	QP
4	,	317.7011	45.35	-12.62	32.73	46.00	-13.27	QP
5	*	417.6411	50.52	-10.49	40.03	46.00	-5.97	QP
6		490.7447	44.83	-8.84	35.99	46.00	-10.01	QP



Temperature:	26 ℃	Relative Humidity:	54%RH
Pressure:	101KPa	Phase :	Horizontal
Test Mode:	Mode 7(The worst mode)	Test Voltage:	AC 120V/60Hz

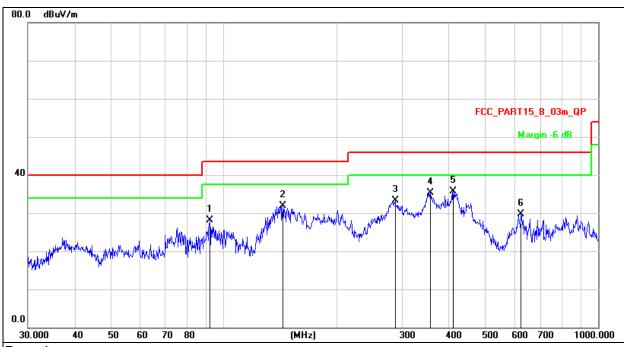


- 1. Factor = Antenna Factor + Cable Loss Pre-amplifier.
- Measurement = Reading Level + Correct Factor
   Over = Measurement Limit

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		76.5121	38.39	-19.14	19.25	40.00	-20.75	QP
2	1	40.3421	38.34	-18.75	19.59	43.50	-23.91	QP
3	1	91.7450	43.32	-16.33	26.99	43.50	-16.51	QP
4	2	86.9823	46.74	-13.51	33.23	46.00	-12.77	QP
5	* 3	52.9433	45.67	-11.44	34.23	46.00	-11.77	QP
6	4	06.0880	44.73	-10.72	34.01	46.00	-11.99	QP



Temperature:	26 ℃	Relative Humidity:	54%RH
Pressure:	101KPa	Phase :	Vertical
Test Mode:	Mode 7(The worst mode)	Test Voltage:	AC 120V/60Hz



- 1. Factor = Antenna Factor + Cable Loss Pre-amplifier.
- Measurement = Reading Level + Correct Factor
   Over = Measurement Limit

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detecto
1	(	91.8163	45.16	-17.13	28.03	43.50	-15.47	QP
2	14	13.8295	50.94	-19.00	31.94	43.50	-11.56	QP
3	28	36.9823	46.74	-13.51	33.23	46.00	-12.77	QP
4	3	6.6758	46.66	-11.39	35.27	46.00	-10.73	QP
5	* 4	10.3825	46.26	-10.64	35.62	46.00	-10.38	QP
6	62	22.8900	36.25	-6.63	29.62	46.00	-16.38	QP



### 8. Bandwidth Test

### 8.1 Test Procedure

- 1. Set RBW = 1%~5% OBW.
- 2. Set the video bandwidth (VBW)  $\geq$  3 x RBW.
- 3. Detector = Peak.
- 4. Trace mode = max hold.
- 5. Sweep = auto couple.
- 6. Allow the trace to stabilize.
- 7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 20 dB relative to the maximum level measured in the fundamental emission.

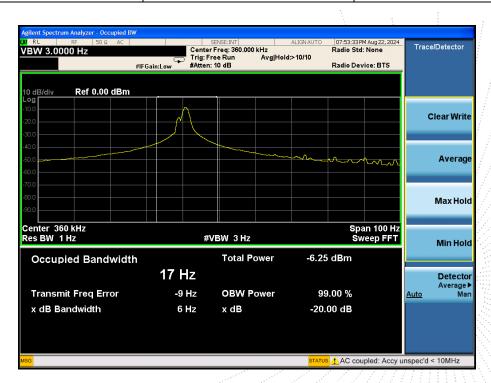
# 8.2 Test Setup



#### 8.3 Test Result

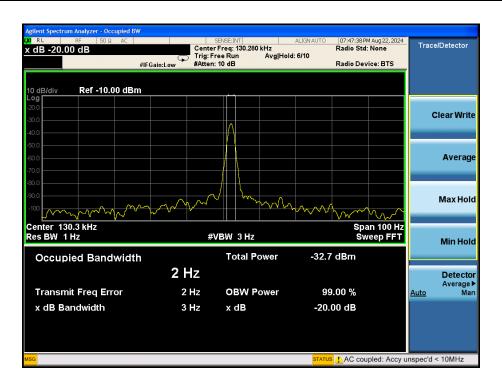
#### Phone

Frequency (kHz)	20dB bandwidth (kHz)	Result
360	0.006	Pass





Frequency (kHz)	20dB bandwidth (kHz)	Result
130.3	0.003	Pass



Airpods

Frequency (kHz)	20dB bandwidth (kHz)	Result
124.7	0.014	Pass





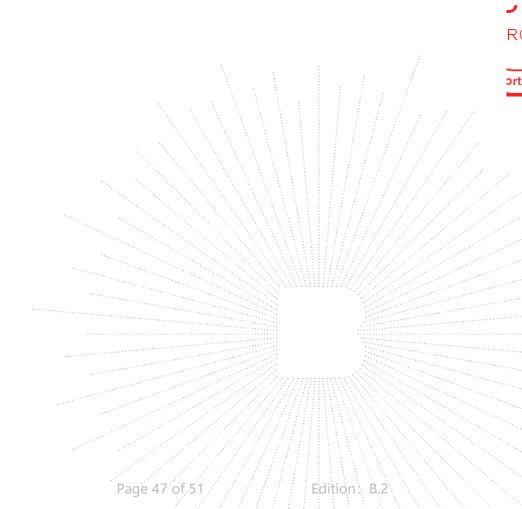
# 9. Antenna Requirements

### 9.1 Limit

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. 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.

#### 9.2 Test Result

The antenna used for this product is Inductive loop coil antenna.



No.: BCTC/RF-EMC-005



# 10. EUT Photographs

**EUT Photo** 





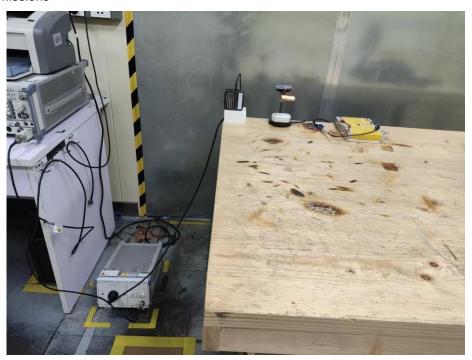
NOTE: Appendix-Photographs Of EUT Constructional Details

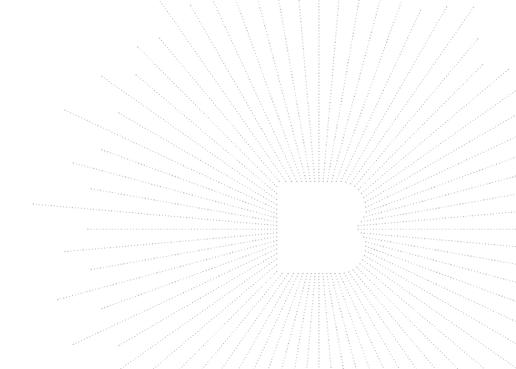
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# 11. EUT Test Setup Photographs

# Conducted emissions





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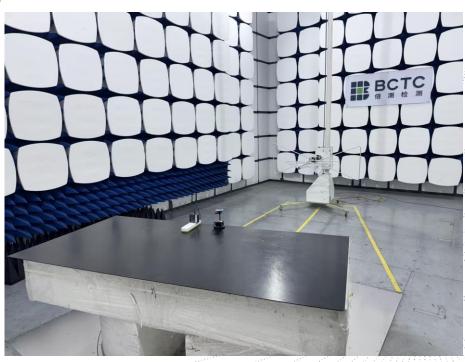


### Radiated Measurement Photos

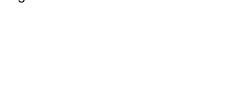
9kHz-30MHz



30MHz-1GHz



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### **STATEMENT**

- 1. The equipment lists are traceable to the national reference standards.
- 2. The test report can not be partially copied unless prior written approval is issued from our lab.
- 3. The test report is invalid without the "special seal for inspection and testing".
- 4. The test report is invalid without the signature of the approver.
- 5. The test process and test result is only related to the Unit Under Test.
- 6. Sample information is provided by the client and the laboratory is not responsible for its authenticity.
- 7. The quality system of our laboratory is in accordance with ISO/IEC17025.
- 8. If there is any objection to this test report, the client should inform issuing laboratory within 15 days from the date of receiving test report.

#### Address:

1-2/F., Building B, Pengzhou Industrial Park, No.158, Fuyuan 1st Road, Zhancheng, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, China

TEL: 400-788-9558

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\*\*\*\* END \*\*\*\*