FCC TEST REPORT

For

Dongguan Dingdian Electronic Technology Co., Ltd.

3 in 1 wireless charger

Test Model: DH77

Prepared for	:	Dongguan Dingdian Electronic Technology Co., Ltd.
Address	:	Room 502, Chengfeng Building, No. 22 Fengyuan Road, Fenggang Town, Dongguan City, Guangdong Province, China
Prepared by	:	Shenzhen LCS Compliance Testing Laboratory Ltd.
Address	:	101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Shajing Street, Baoan District, Shenzhen, China
Tel	:	(+86)755-82591330
Fax	:	(+86)755-82591332
Web	:	www.LCS-cert.com
Mail	:	webmaster@LCS-cert.com
Date of receipt of test sample	:	September 13, 2024
Number of tested samples	:	2
Serial number	:	A240912039-1(Engineer sample), A240912039-2(Normal sample)
Date of Test	:	September 13, 2024 ~ September 19, 2024
Date of Report	:	September 20, 2024

FCC TEST REPORT
FCC CFR 47 PART 15C

Report Reference No.	:	**LCSA09124040EA**
Date Of Issue	:	September 20, 2024
Testing Laboratory Name.....	:	**Shenzhen LCS Compliance Testing Laboratory Ltd.**
Address	:	101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Shajing Street, Baoan District, Shenzhen, China
Testing Location/ Procedure	:	Full application of Harmonised standards ■ Partial application of Harmonised standards □ Other standard testing method □
Applicant's Name	:	**Dongguan Dingdian Electronic Technology Co., Ltd.**
Address	:	Room 502, Chengfeng Building, No. 22 Fengyuan Road, Fenggang Town, Dongguan City, Guangdong Province, China
Test Specification		
Standard.....	:	FCC CFR 47 PART 15C
Test Report Form No.....	:	LCSEMC-1.0
TRF Originator.....	:	Shenzhen LCS Compliance Testing Laboratory Ltd.
Master TRF.....	:	Dated 2011-03

Shenzhen LCS Compliance Testing Laboratory Ltd. All rights reserved.
This publication may be reproduced in whole or in part for non-commercial purposes as long as the Shenzhen LCS Compliance Testing Laboratory Ltd. is acknowledged as copyright owner and source of the material. Shenzhen LCS Compliance Testing Laboratory Ltd. takes no responsibility for and will not assume liability for damages resulting from the reader's interpretation of the reproduced material due to its placement and context.

Test Item Description.....	:	**3 in 1 wireless charger**
Trade Mark	:	N/A
Test Model.....	:	DH77
Power Supply	:	Input: 5V⎓3A, 9V⎓2A, 12V⎓1.5A Output: 15W/10W/7.5W/5W Watch Output: 2.5W Headphone Output: 3W
Result	:	**Positive**

Compiled by:	**Supervised by:**	**Approved by:**
Nadia Zhou	Cary Luo	Gavin Liang
Nadia Zhou/ Administrator	Cary Luo/ Technique principal	Gavin Liang/ Manager

FCC TEST REPORT

Test Report No. : **LCSA09124040EA**	September 20, 2024 Date of issue

Test Model.....	: DH77
EUT.....	: 3 in 1 wireless charger
Applicant.....	**: Dongguan Dingdian Electronic Technology Co., Ltd.**
Address.....	: Room 502, Chengfeng Building, No. 22 Fengyuan Road, Fenggang Town, Dongguan City, Guangdong Province, China
Telephone.....	: /
Fax.....	: /
Manufacturer.....	**: Dongguan Dingdian Electronic Technology Co., Ltd.**
Address.....	: Room 502, Chengfeng Building, No. 22 Fengyuan Road, Fenggang Town, Dongguan City, Guangdong Province, China
Telephone.....	: /
Fax.....	: /
Factory.....	**: Dongguan Dingdian Electronic Technology Co., Ltd.**
Address.....	: Room 502, Chengfeng Building, No. 22 Fengyuan Road, Fenggang Town, Dongguan City, Guangdong Province, China
Telephone.....	: /
Fax.....	: /

Test Result	**Positive**

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.

Revision History

Report Version	Issue Date	Revision Content	Revised By
000	September 20, 2024	Initial Issue	--

TABLE OF CONTENTS

1. GENERAL INFORMATION 6
1.1 Description of Device (EUT) 6
1.2 Support equipment List 6
1.3 External I/O Cable 6
1.4 Description of Test Facility 6
1.5 Statement of the Measurement Uncertainty 7
1.6 Measurement Uncertainty 7
1.7 Description of Test Modes 8
2. TEST METHODOLOGY 9
2.1 EUT Configuration 9
2.2 EUT Exercise 9
2.3 General Test Procedures 9
2.3.1 Conducted Emissions 9
2.3.2 Radiated Emissions 9
2.4. Test Sample 9
3. SYSTEM TEST CONFIGURATION 10
3.1 Justification 10
3.2 EUT Exercise Software 10
3.3 Special Accessories 10
3.4 Block Diagram/Schematics 10
3.5 Equipment Modifications 10
3.6 Test Setup 10
4. SUMMARY OF TEST EQUIPMENT 11
5. SUMMARY OF TEST RESULT 12
6. POWER LINE CONDUCTED MEASUREMENT 13
7. RADIATED EMISSION MEASUREMENT 16
7.1. Block Diagram of Test Setup 16
7.2. Radiated Emission Limit 17
7.3. EUT Configuration on Measurement 17
7.4. Field Strength Calculation 18
7.5. Operating Condition of EUT 18
7.6. Measuring Setting 18
7.7. Test Procedure 18
7.8. Test Results 19
8. 20 DB BANDWIDTH MEASUREMENT 23
8.1. Block Diagram of Test Setup 23
8.2. Test Procedure 23
8.3. Test Results 24
9. PHOTOGRAPHS OF TEST SETUP 25
10. EXTERNAL PHOTOGRAPHS OF THE EUT 25
11. INTERNAL PHOTOGRAPHS OF THE EUT 25

1. GENERAL INFORMATION

1.1 Description of Device (EUT)

EUT	:	3 in 1 wireless charger
Test Model	:	DH77
Power Supply	:	Input: 5V⎓3A, 9V⎓2A, 12V⎓1.5A Output: 15W/10W/7.5W/5W Watch Output: 2.5W Headphone Output: 3W
Hardware Version	:	/
Software Version	:	/
Wireless Charging	:	
Operating Frequency	:	Coil1: For Phone: 110.0~205kHz Coil2: For Earphone: 110.0~205kHz Coil3: Watch: 300~350kHz
Modulation Type	:	ASK
Antenna Type	:	Coil Antenna

1.2 Support equipment List

Manufacturer	Description	Model	Serial Number	Certificate
SHENZHEN TIANYIN ELECTRONICS CO., LTD	Power Adapter	TPA-46050200UU	--	FCC
Apple	Mobile Phone	iPhone X	--	FCC
Apple	Watch	--	--	FCC
Apple	AirPods	--	--	FCC

Note: Auxiliary equipment is provided by the laboratory.

1.3 External I/O Cable

I/O Port Description	Quantity	Cable
Type-C USB Port	1	USB Cable: 0.8m, unshielded

1.4 Description of Test Facility

NVLAP Accreditation Code is 600167-0.
FCC Designation Number is CN5024
CAB identifier is CN0071.
CNAS Registration Number is L4595.
Test Firm Registration Number: 254912.

The 3m-Semi anechoic test site fulfils CISPR 16-1-4 according to ANSI C63.4:2014 and CISPR 16-1-4:2010 SVSWR requirement for radiated emission above 1GHz.

1.5 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 LCS 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.

1.6 Measurement Uncertainty

Test Item		Frequency Range	Uncertainty	Note
Radiation Uncertainty	:	9KHz~30MHz	3.10dB	(1)
		30MHz~200MHz	2.96dB	(1)
		200MHz~1000MHz	3.10dB	(1)
		1GHz~26.5GHz	3.80dB	(1)
		26.5GHz~40GHz	3.90dB	(1)
Conduction Uncertainty	:	150kHz~30MHz	1.63dB	(1)
Power disturbance	:	30MHz~300MHz	1.60dB	(1)
Occupied Channel Bandwidth	:	1GHz-40GHz	±5%	(1)

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

1.7 Description of Test Modes

Equipment under test was operated during the measurement under the following conditions:

☒ Charging and communication mode

Modulation Type: ASK

Test Modes		
Mode 1	AC/DC Adapter(12V/1.5A) + EUT + Phone + TWS Earphone + Watch(Battery Status: <1%)	Record
Mode 2	AC/DC Adapter (12V/1.5A)+ EUT + Phone + TWS Earphone + Watch (Battery Status: <50%)	Record
Mode 3	AC/DC Adapter (12V/1.5A) + EUT + Phone + TWS Earphone + Watch (Battery Status: 100%)	Record
Mode 4	AC/DC Adapter (9V/2A) + EUT + Phone + TWS Earphone + Watch (Battery Status: <1%)	Pre-tested
Mode 5	AC/DC Adapter (9V/2A) + EUT + Phone + TWS Earphone + Watch (Battery Status: <50%)	Pre-tested
Mode 6	AC/DC Adapter (9V/2A) + EUT + Phone + TWS Earphone + Watch (Battery Status: 100%)	Pre-tested
Mode 7	AC/DC Adapter (5V/3A) + EUT + Phone + TWS Earphone + Watch (Battery Status: <1%)	Pre-tested
Mode 8	AC/DC Adapter (5V/3A) + EUT + Phone + TWS Earphone + Watch (Battery Status: <50%)	Pre-tested
Mode 9	AC/DC Adapter (5V/3A) + EUT + Phone + TWS Earphone + Watch (Battery Status: 100%)	Pre-tested
Mode 10	AC/DC Adapter (5V/3A) + EUT + Phone (Battery Status: <1%)	Pre-tested
Mode 11	AC/DC Adapter (5V/3A) + EUT + Phone (Battery Status: <50%)	Pre-tested
Mode 12	AC/DC Adapter (5V/3A) + EUT + Phone (Battery Status: 100%)	Pre-tested
Mode 13	AC/DC Adapter (5V/3A) + TWS Earphone (Battery Status: <1%)	Pre-tested
Mode 14	AC/DC Adapter (5V/3A) + TWS Earphone (Battery Status: <50%)	Pre-tested
Mode 15	AC/DC Adapter (5V/3A) + TWS Earphone (Battery Status: 100%)	Pre-tested
Mode 16	AC/DC Adapter (5V/3A) + Watch (Battery Status: <1%)	Pre-tested
Mode 17	AC/DC Adapter (5V/3A) + Watch (Battery Status: <50%)	Pre-tested
Mode 18	AC/DC Adapter (5V/3A) + Watch (Battery Status: 100%)	Pre-tested
Mode 19	AC/DC Adapter (9V/2A) + EUT + Phone (Battery Status: <1%)	Pre-tested
Mode 20	AC/DC Adapter (9V/2A) + EUT + Phone (Battery Status: <50%)	Pre-tested
Mode 21	AC/DC Adapter (9V/2A) + EUT + Phone (Battery Status: 100%)	Pre-tested
Mode 22	AC/DC Adapter (9V/2A) + EUT + TWS Earphone (Battery Status: <1%)	Pre-tested
Mode 23	AC/DC Adapter (9V/2A) + EUT + TWS Earphone (Battery Status: <50%)	Pre-tested
Mode 24	AC/DC Adapter (9V/2A) + EUT + TWS Earphone (Battery Status: 100%)	Pre-tested
Mode 25	AC/DC Adapter (9V/2A) + EUT + Watch (Battery Status: <1%)	Pre-tested
Mode 26	AC/DC Adapter (9V/2A) + EUT + Watch (Battery Status: <50%)	Pre-tested
Mode 27	AC/DC Adapter (9V/2A) + EUT + Watch (Battery Status: 100%)	Pre-tested
Mode 28	AC/DC Adapter (12V/1.5A) + EUT + Phone (Battery Status: <1%)	Pre-tested
Mode 29	AC/DC Adapter (12V/1.5A) + EUT + Phone (Battery Status: <50%)	Pre-tested
Mode 30	AC/DC Adapter (12V/1.5A) + EUT + Phon (Battery Status: 100%)	Pre-tested
Mode 31	AC/DC Adapter (12V/1.5A) + EUT + TWS Earphone (Battery Status: <1%)	Pre-tested
Mode 32	AC/DC Adapter (12V/1.5A) + EUT + TWS Earphone (Battery Status: <50%)	Pre-tested
Mode 33	AC/DC Adapter (12V/1.5A) + EUT + TWS Earphone (Battery Status: 100%)	Pre-tested
Mode 34	AC/DC Adapter (12V/1.5A) + EUT + Watch (Battery Status: <1%)	Pre-tested
Mode 35	AC/DC Adapter (12V/1.5A) + EUT + Watch (Battery Status: <50%)	Pre-tested
Mode 36	AC/DC Adapter (12V/1.5A) + EUT + Watch (Battery Status: 100%)	Pre-tested
Note: All test modes were pre-tested, but we only recorded the worst case in this report.		

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10-2013, FCC CFR PART 15C 15.207.

2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT Exercise

The EUT was operated in the normal operating mode for Hopping Numbers and Dwell Time test and a continuous transmits mode for other tests.

According to its specifications, the EUT must comply with the requirements of the Section 15.207 under the FCC Rules Part 15 Subpart C.

2.3 General Test Procedures

2.3.1 Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 6.2.1 of ANSI C63.10-2013 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using Quasi-peak and average detector modes.

2.3.2 Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane below 1GHz and 1.5 m above ground plane above 1GHz. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 6.3 of ANSI C63.10-2013.

2.4. Test Sample

The application provides 2 samples to meet requirement;

Sample Number	Description
Sample 1(A240912039-1)	Engineer sample – continuous transmit
Sample 2(A240912039-2)	Normal sample – Intermittent transmit

3. SYSTEM TEST CONFIGURATION

3.1 Justification

The system was configured for testing in a normal condition.

3.2 EUT Exercise Software

N/A.

3.3 Special Accessories

No.	Equipment	Manufacturer	Model No.	Serial No.	Length	shielded/ unshielded	Notes
/	/	/	/	/	/	/	/

3.4 Block Diagram/Schematics

Please refer to the related document.

3.5 Equipment Modifications

Shenzhen LCS Compliance Testing Laboratory Ltd. has not done any modification on the EUT.

3.6 Test Setup

Please refer to the test setup photo.

4. SUMMARY OF TEST EQUIPMENT

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	MXA Signal Analyzer	Agilent	N9020A	MY49100040	2024-06-06	2025-06-05
2	RS SPECTRUM ANALYZER	R&S	FSP40	100503	2024-06-06	2025-06-05
3	3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	2024-06-06	2025-06-05
4	Positioning Controller	Max-Full	MF7802BS	MF780208586	N/A	N/A
5	EMI Test Software	AUDIX	E3	/	N/A	N/A
6	EMI Test Receiver	R&S	ESR 7	101181	2024-06-06	2025-06-05
7	Active Loop Antenna	SCHWARZBECK	FMZB 1519B	00005	2024-07-13	2027-07-12
8	By-log Antenna	SCHWARZBECK	VULB9163	9163-470	2024-08-03	2027-08-02
9	EMI Test Receiver	R&S	ESPI	101940	2024-06-06	2025-06-05
10	Artificial Mains	R&S	ENV216	101288	2024-06-06	2025-06-05
11	10dB Attenuator	SCHWARZBECK	MTS-IMP-136	261115-001-0032	2024-06-06	2025-06-05
12	EMI Test Software	Farad	EZ	/	N/A	N/A
13	Antenna Mast	Max-Full	MFA-515BSN	1308572	N/A	N/A
14	Pulse Limiter	R&S	ESH3-Z2	102750-NB	2024-06-06	2025-06-05
15	Low-frequency amplifier	SchwarzZBECK	BBV9745	00253	2023-10-18	2024-10-17

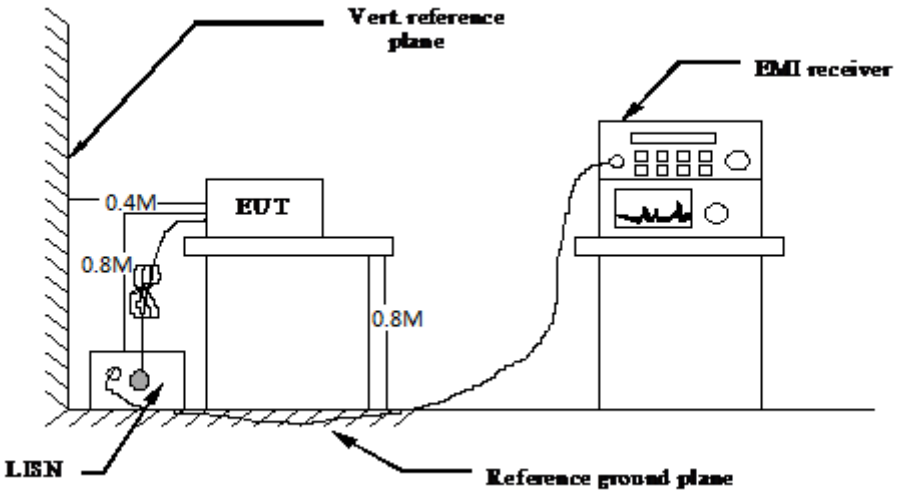
5. SUMMARY OF TEST RESULT

FCC Rules	Description of Test	Test Sample	Result
§15.207(a)	AC Conducted Emissions	Sample 1	Compliant
§15.209	Radiated Spurious Emissions	Sample 1	Compliant
§15.215	20 dB Bandwidth	Sample 1	Compliant

Remark: The measurement uncertainty is not included in the test result.
N/A – Not Applicable!!!

6. POWER LINE CONDUCTED MEASUREMENT

6.1. Block Diagram of Test Setup



6.2. Disturbance Calculation

The AC mains conducted disturbance is calculated by adding the 10dB Pulse Limiter and Cable Factor and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

CD (dBuV) = RA (dBuV) + PL (dB) + CL (dB)

Where CD = Conducted Disturbance	CL = Cable Attenuation Factor (Cable Loss)
RA = Reading Amplitude	PL = 10 dB Pulse Limiter Factor

6.3. Standard Applicable

According to §15.207: For all the consumer devices which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed 250 microvolts (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range are listed as follows:

Frequency Range (MHz)	Limits (dBμV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

* Decreasing linearly with the logarithm of the frequency

6.4 Test Results

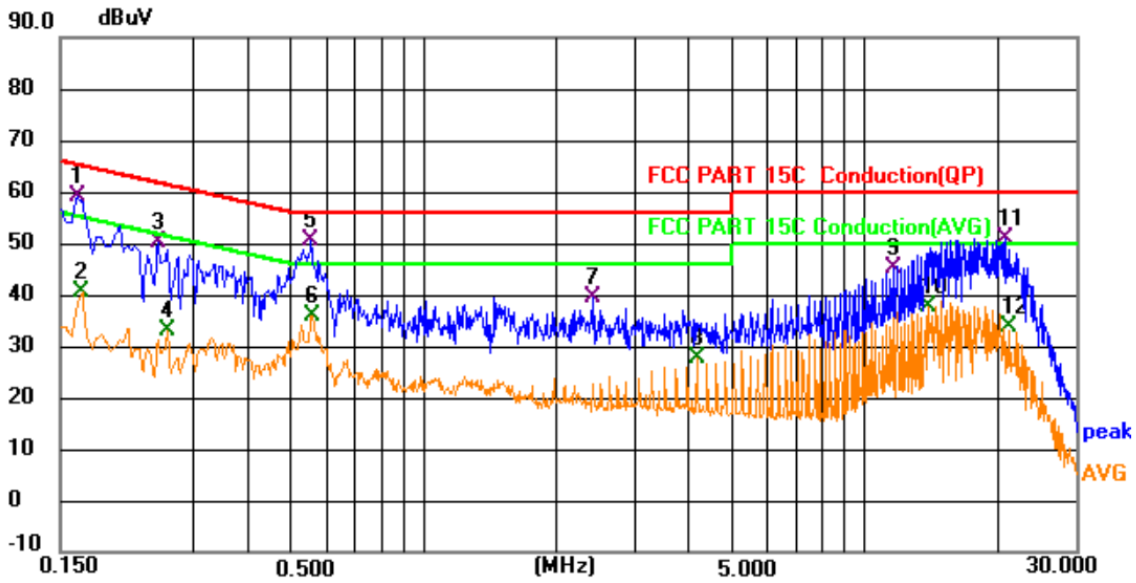
PASS

The test data please refer to following page.

Temperature	22.5℃	Humidity	53.7%
Test Engineer	Jerry Chu	Configurations	Transmit

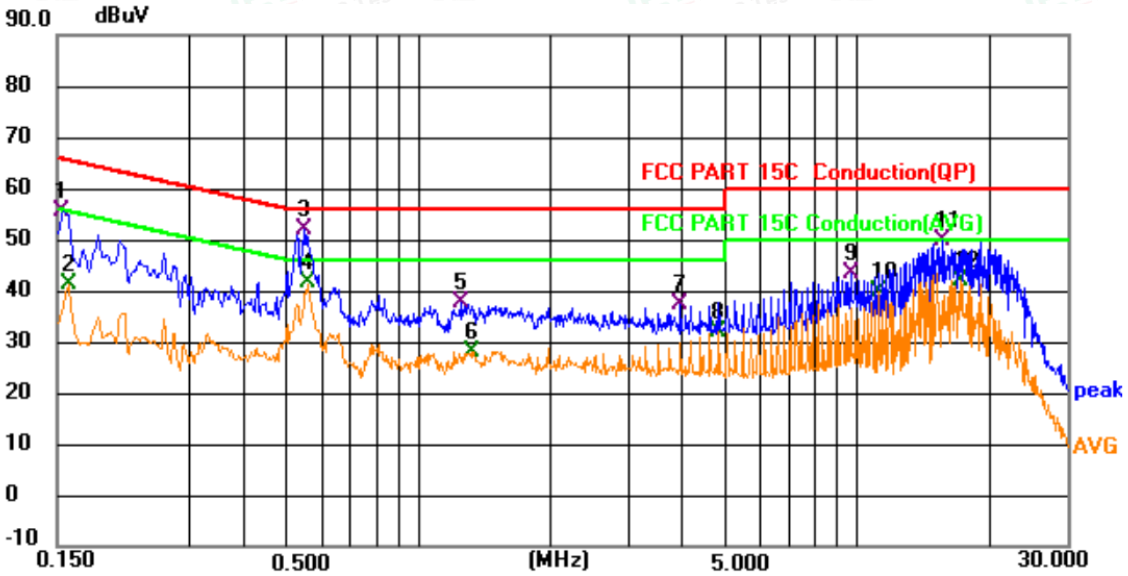
AC Power Line Conducted Emission (Power input to adapter @ AC 120V/60Hz (Worst Case))

Line



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.164	39.37	19.82	59.19	65.26	-6.07	QP	
2		0.168	20.71	19.81	40.52	55.06	-14.54	AVG	
3		0.249	30.43	19.72	50.15	61.79	-11.64	QP	
4		0.263	13.14	19.75	32.89	51.34	-18.45	AVG	
5	*	0.555	30.86	19.67	50.53	56.00	-5.47	QP	
6		0.559	16.37	19.65	36.02	46.00	-9.98	AVG	
7		2.418	20.46	19.06	39.52	56.00	-16.48	QP	
8		4.173	8.60	19.12	27.72	46.00	-18.28	AVG	
9		11.652	25.74	19.61	45.35	60.00	-14.65	QP	
10		13.852	17.82	19.83	37.65	50.00	-12.35	AVG	
11		20.872	31.72	19.00	50.72	60.00	-9.28	QP	
12		21.314	14.64	18.96	33.60	50.00	-16.40	AVG	

Neutral

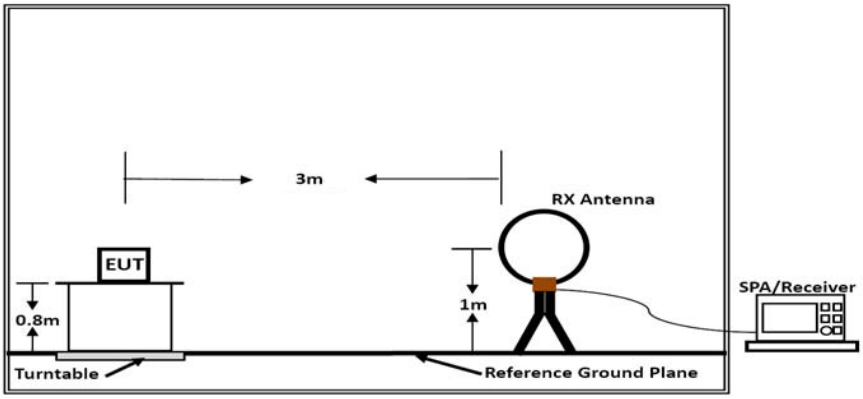


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.154	35.79	19.87	55.66	65.79	-10.13	QP	
2		0.159	21.36	19.84	41.20	55.52	-14.32	AVG	
3	*	0.550	32.31	19.68	51.99	56.00	-4.01	QP	
4		0.559	21.78	19.65	41.43	46.00	-4.57	AVG	
5		1.244	18.51	19.09	37.60	56.00	-18.40	QP	
6		1.329	9.07	19.08	28.15	46.00	-17.85	AVG	
7		3.957	18.31	19.17	37.48	56.00	-18.52	QP	
8		4.835	12.91	18.98	31.89	46.00	-14.11	AVG	
9		9.672	23.88	19.48	43.36	60.00	-16.64	QP	
10		11.216	20.16	19.56	39.72	50.00	-10.28	AVG	
11		15.617	30.02	19.85	49.87	60.00	-10.13	QP	
12		17.142	22.35	19.58	41.93	50.00	-8.07	AVG	

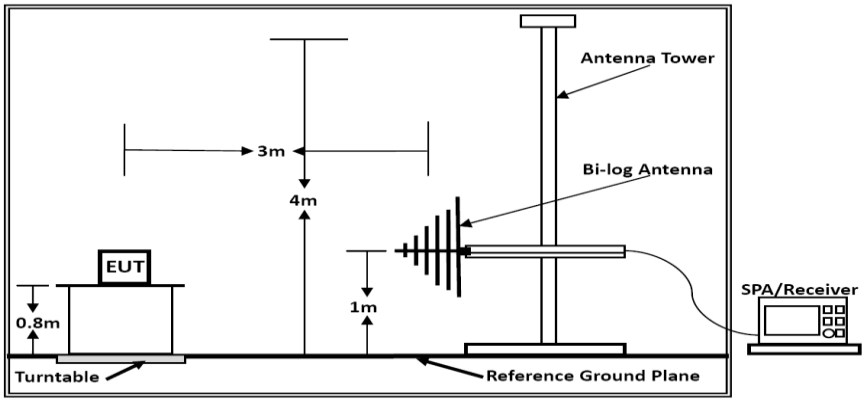
****Note: Pre-scan all modes and recorded the worst case results in this report.*
Margin=Reading level + Correct – Limit
Correct Factor=Lisn Factor+Cable Factor+Insertion loss of Pulse Limiter

7. RADIATED EMISSION MEASUREMENT

7.1. Block Diagram of Test Setup



Below 30MHz



Below 1GHz

7.2. Radiated Emission Limit

15.205 (a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
\1\ 0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293.	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(\2\)
13.36-13.41			

\1\ Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

\2\ Above 38.6

According to §15.247 (d): 20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (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

7.3. EUT Configuration on Measurement

The following equipment are installed on Radiated Emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

7.4. 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 (dBuV/m) = RA (dBuV) + AF (dB/m) + CL (dB) – AG (dB)

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

7.5. Operating Condition of EUT

(1) Setup the EUT as shown in Section 7.1.

7.6. Measuring Setting

The following table is the setting of spectrum analyzer and receiver.

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP/Average
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP/Average
Start ~ Stop Frequency	30MHz~1000MHz / RB 100kHz for QP

7.7. Test Procedure

1) Sequence of testing 9 kHz to 30 MHz

Setup:

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

--- If the EUT is a tabletop system, a rotatable table with 0.8 m height is used.

--- If the EUT is a floor standing device, it is placed on the ground.

--- Auxiliary equipment and cables were positioned to simulate normal operation conditions.

--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.

--- The measurement distance is 3 meter.

--- The EUT was set into operation.

Premeasurement:

--- The turntable rotates from 0° to 315° using 45° steps.

--- The antenna height is 1.0 meter.

--- At each turntable position the analyzer sweeps with peak detection to find the maximum of all emissions

Final measurement:

--- Identified emissions during the premeasurement the software maximizes by rotating the turntable position (0° to 360°) and by rotating the elevation axes (0° to 360°).

--- The final measurement will be done in the position (turntable and elevation) causing the highest

emissions with QPK detector.

--- The final levels, frequency, measuring time, bandwidth, turntable position, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement and the limit will be stored.

2) Sequence of testing 30 MHz to 1 GHz

Setup:

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

--- If the EUT is a tabletop system, a table with 0.8 m height is used, which is placed on the ground plane.

--- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.

--- Auxiliary equipment and cables were positioned to simulate normal operation conditions

--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.

--- The measurement distance is 3 meter.

--- The EUT was set into operation.

Premeasurement:

--- The turntable rotates from 0° to 315° using 45° steps.

--- The antenna is polarized vertical and horizontal.

--- The antenna height changes from 1 to 3 meter.

--- At each turntable position, antenna polarization and height the analyzer sweeps three times in peak to find the maximum of all emissions.

Final measurement:

--- The final measurement will be performed with minimum the six highest peaks.

--- According to the maximum antenna and turntable positions of premeasurement the software maximize the peaks by changing turntable position (± 45°) and antenna movement between 1 and 4 meter.

--- The final measurement will be done with QP detector with an EMI receiver.

--- The final levels, frequency, measuring time, bandwidth, antenna height, antenna polarization, turntable angle, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement with marked maximum final measurements and the limit will be stored.

7.8. Test Results

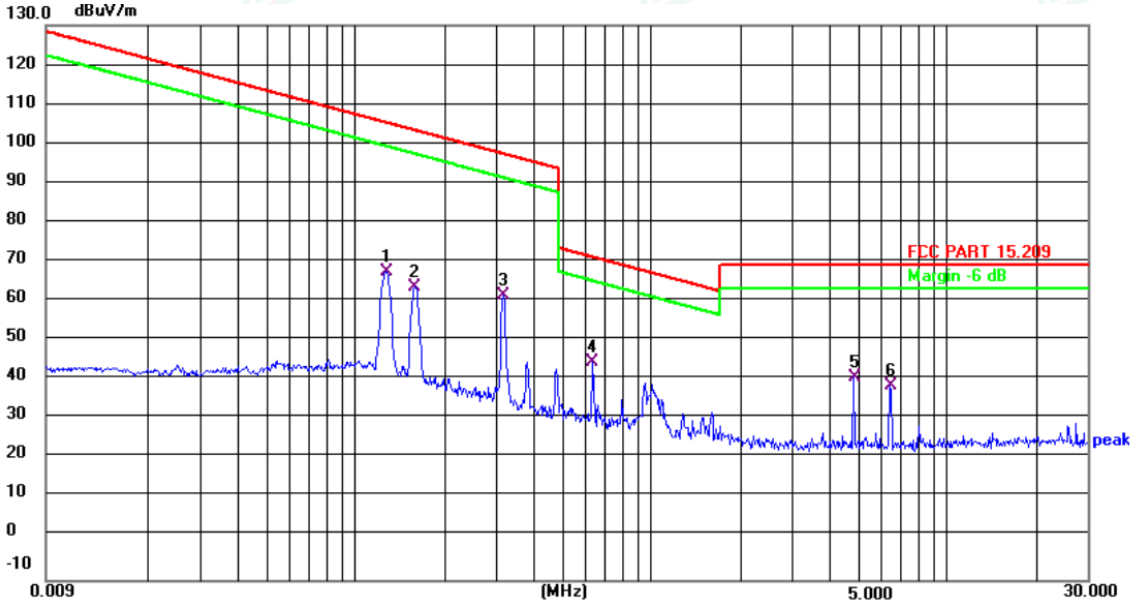
PASS.

Only report the worst test data (Mode 1) in test report;

The test data please refer to following page:

Temperature	23.6℃	Humidity	52.2%
Test Engineer	Jerry Chu	Configurations	Transmit

0.009 MHz – 30 MHz
0 degree



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	0.1276	78.14	-10.39	67.75	105.42	-37.67	QP
2	0.1589	74.55	-10.37	64.18	103.53	-39.35	QP
3	0.3168	72.39	-10.35	62.04	97.57	-35.53	QP
4	0.6363	55.23	-10.23	45.00	71.53	-26.53	QP
5	4.8358	51.02	-9.90	41.12	69.54	-28.42	QP
6	6.4235	49.06	-9.90	39.16	69.54	-30.38	QP

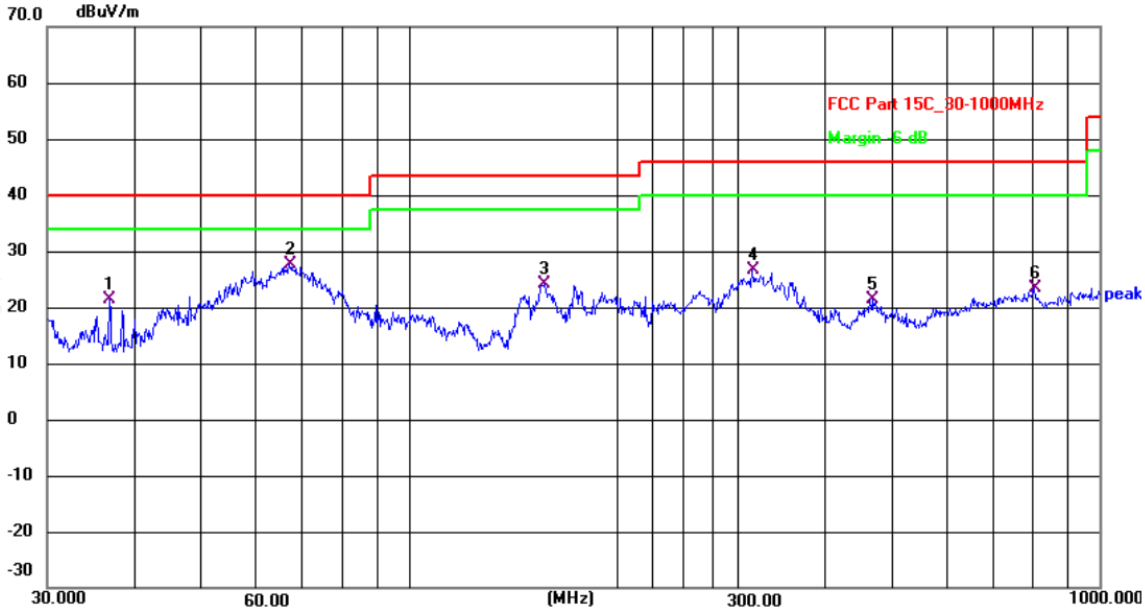
Remark: 1). Measured at antenna position 0 degree and 90 degree, recorded worst case at 0 degree.

2). Margin=Reading level + Factor- Limit
Correct Factor=Antenna Factor+Cable Factor- Pre-amplifier Factor

Temperature	23.8℃	Humidity	52.1%
Test Engineer	Jerry Chu	Configurations	Transmit

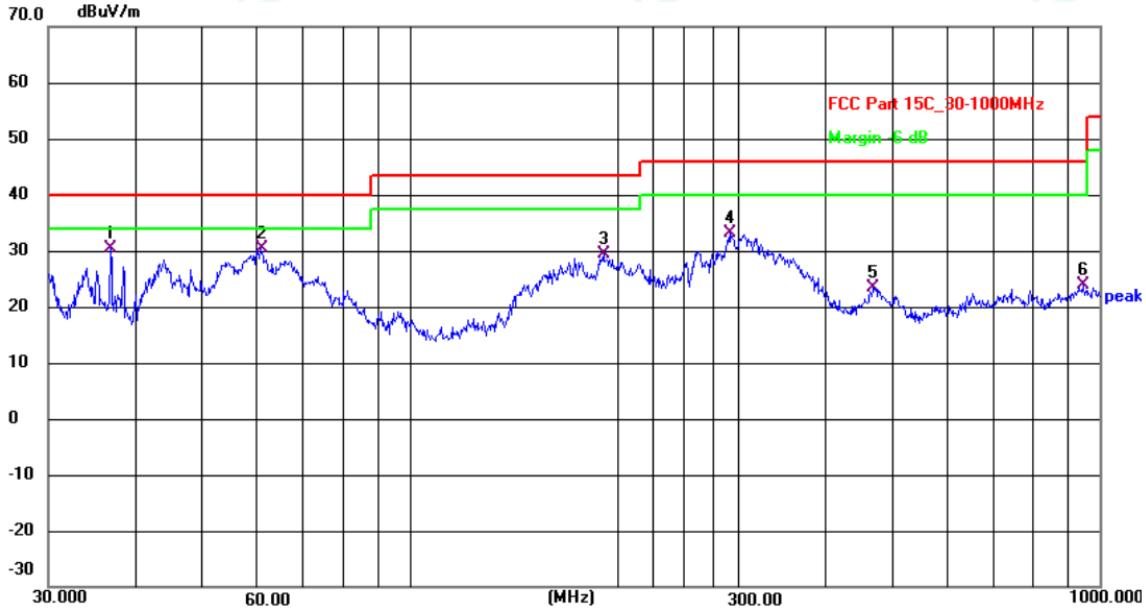
Below 1GHz

Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	36.8953	38.93	-17.43	21.50	40.00	-18.50	QP
2	67.2022	45.98	-18.34	27.64	40.00	-12.36	QP
3	157.0074	45.10	-20.90	24.20	43.50	-19.30	QP
4	314.3765	42.06	-15.43	26.63	46.00	-19.37	QP
5	470.5232	34.22	-12.90	21.32	46.00	-24.68	QP
6	804.6028	32.48	-9.09	23.39	46.00	-22.61	QP

Vertical



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	36.8953	48.02	-17.69	30.33	40.00	-9.67	QP
2	60.9176	49.18	-18.92	30.26	40.00	-9.74	QP
3	191.0738	47.62	-18.24	29.38	43.50	-14.12	QP
4	291.0360	48.63	-15.53	33.10	46.00	-12.90	QP
5	470.5232	37.93	-14.47	23.46	46.00	-22.54	QP
6	945.4399	31.96	-8.12	23.84	46.00	-22.16	QP

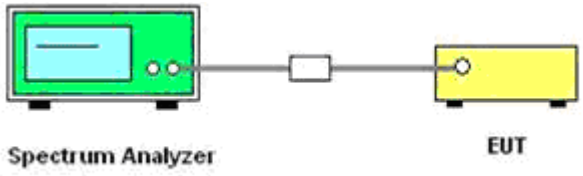
1). Emission level (dBuV/m) = 20 log Emission level (uV/m).

2). Margin=Reading level + Factor- Limit.

Correct Factor=Antenna Factor+Cable Factor- Pre-amplifier Factor

8. 20 DB BANDWIDTH MEASUREMENT

8.1. Block Diagram of Test Setup



8.2. Test Procedure

Use the following spectrum analyzer settings:

Span = 1KHz

RBW = 3Hz

VBW = 10Hz

Sweep = auto

Detector function = peak

Trace = max hold

The EUT should be transmitting at its maximum data rate. Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. Use the marker-delta function to measure 20 dB down one side of the emission. Reset the marker-delta function, and move the marker to the other side of the emission, until it is (as close as possible to) even with the reference marker level. The marker-delta reading at this point is the 20 dB bandwidth of the emission. If this value varies with different modes of operation (e.g., data rate, modulation format, etc.), repeat this test for each variation. The limit is specified in one of the subparagraphs of this Section. Submit this plot(s).

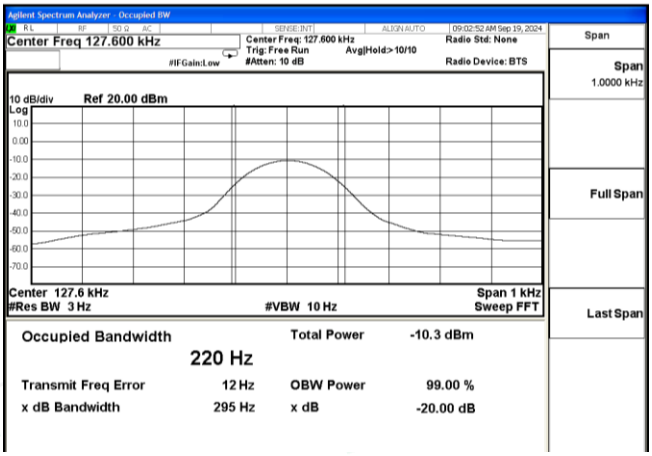
8.3. Test Results

Test Result Of 20dB Bandwidth Measurement		
Test Frequency (MHz)	20dB Bandwidth (kHz)	Limit (kHz)
0.1276	0.295	Non-Specified
0.1589	0.246	Non-Specified
0.3168	0.293	Non-Specified

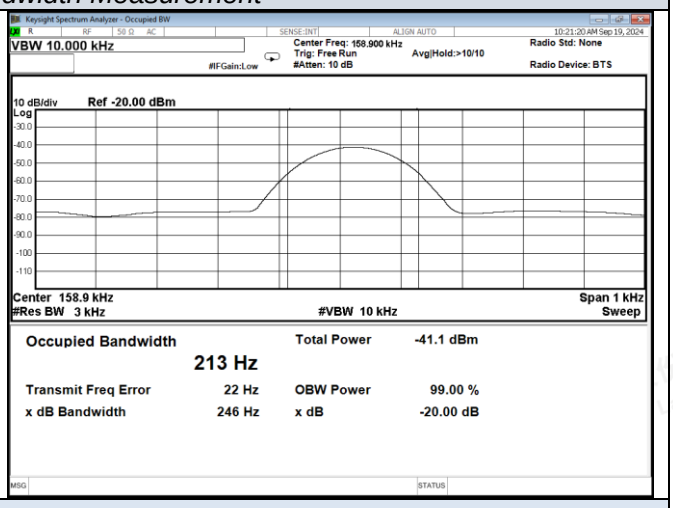
Result: Pass

Please refer to the following page for test plot.

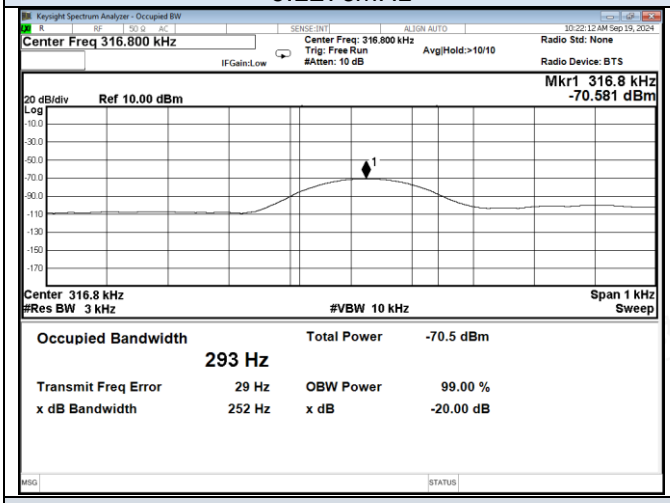
Test plot of 20 dB Bandwidth Measurement



0.1276*MHz*



0.1589*MHz*



0.3168*MHz*

9. PHOTOGRAPHS OF TEST SETUP

Please refer to separated files for Test Setup Photos of the EUT.

10. EXTERNAL PHOTOGRAPHS OF THE EUT

Please refer to separated files for External Photos of the EUT.

11. INTERNAL PHOTOGRAPHS OF THE EUT

Please refer to separated files for Internal Photos of the EUT.

----------THE END OF REPORT----------