



Test Report

Date : 2024-11-14
No. : HMD24100001

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Applicant : Shantou Chenghai Meigaobao Toys Co.,Ltd.
Xiehe Industrial Park, Chenghai, Shantou, Guangdong, China

Supplier / Manufacturer : Shantou Chenghai Meigaobao Toys Co.,Ltd.
Xiehe Industrial Park, Chenghai, Shantou, Guangdong, China

Description of Sample(s) : Submitted sample(s) said to be
Product: Remote Control Blocks
Brand Name: N/A
Model No.: FC9014
FCC ID: 2A8WD-FC90XX

Date Samples Received : 2024-09-05

Date Tested : 2024-09-25 to 2024-09-30

Investigation Requested : Perform ElectroMagnetic Interference measurement in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15 and ANSI C63.10: 2013 for FCC Certification.

Conclusions : The submitted product COMPLIED with the requirements of Federal Communications Commission [FCC] Rules and Regulations Part 15. The tests were performed in accordance with the standards described above and on Section 2.2 in this Test Report.

Remarks : 2.4GHz wireless (GFSK)
Report for Remote Control
For additional model(s) details, please see page 3.

Test by Susu


Dr.CHAN Kwok Hung, Brian
Authorized Signatory

The Hong Kong Standards and Testing Centre Limited

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1.0 General Details

1.1 Test Laboratory

The Hong Kong Standards and Testing Centre Ltd.
EMC Laboratory
10 Dai Wang Street, Taipo Industrial Estate, New Territories, Hong Kong
Telephone: 852 2666 1888
Fax: 852 2664 4353

1.2 Equipment Under Test [EUT]

Description of Sample(s)

Product:	Remote Control blocks
Manufacturer:	Shantou Chenghai Meigaobao Toys Co.,Ltd.
Brand Name:	Xiehe Industrial Park, Chenghai, Shantou, Guangdong, China
Model Number:	N/A
Additional model number:	FC9006, FC9013, FC9015, FC9016, FC9017, FC9018, FC9019, FC9020, FC9021, FC9022, FC9023, FC9024, FC9025, FC9026, FC9027, FC9028, FC9029, KB7135, KB7136, KB7138, KB7139
Rating:	3.0Vd.c.("AAA" battery *2)

1.3 Description of EUT Operation

The Equipment Under Test (EUT) is a Remote Control blocks. It is a transceiver operating at 2413 MHz~2472MHz and the RF signal was modulated by IC.

RF modulation: GFSK
Antenna gain: 0.5dBi
Antenna type: PCB antenna

1.4 Date of Order

2024-09-04

1.5 Submitted Sample(s):

1 Sample

1.6 Test Duration

2024-09-25 to 2024-09-30

1.7 Country of Origin

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1.8 Frequency list

Channel	Frequency(MHz)	Channel	Frequency(MHz)	Channel	Frequency(MHz)
1	2413	23	2435	45	2457
2	2414	24	2436	46	2458
3	2415	25	2437	47	2459
4	2416	26	2438	48	2460
5	2417	27	2439	49	2461
6	2418	28	2440	50	2462
7	2419	29	2441	51	2463
8	2420	30	2442	52	2464
9	2421	31	2443	53	2465
10	2422	32	2444	54	2466
11	2423	33	2445	55	2467
12	2424	34	2446	56	2468
13	2425	35	2447	57	2469
14	2426	36	2448	58	2470
15	2427	37	2449	59	2471
16	2428	38	2450	60	2472
17	2429	39	2451		
18	2430	40	2452		
19	2431	41	2453		
20	2432	42	2454		
21	2433	43	2455		
22	2434	44	2456		

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2.0 Technical Details

2.1 Investigations Requested

Perform Electromagnetic Interference measurements in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15 Regulations and ANSI C63.10: 2013 for FCC Certification.

2.2 Test Standards and Results Summary Tables

EMISSION Results Summary						
Test Condition	Test Requirement	Test Method	Class / Severity	Test Result		
				Pass	Failed	N/A
Field Strength of Fundamental & Harmonics Emissions	FCC 47CFR 15.249	ANSI C63.10: 2013	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Radiated Emissions	FCC 47CFR 15.209	ANSI C63.10: 2013	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
AC Mains Conducted Emissions	FCC 47CFR 15.207	ANSI C63.10: 2013	N/A	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Antenna requirement	FCC 47CFR 15.203	N/A	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20dB Emission bandwith	FCC 47CFR 15.215(c)	ANSI C63.10: 2013	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Note: N/A - Not Applicable

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3.0 Test Results

3.1 Emission

3.1.1 Radiated Emissions

Ambient temperature 25°C

Relative humidity 57%

Test Requirement: FCC 47CFR 15.249 & FCC 47CFR 15.209

Test Method: ANSI C63.10:2013

Test Date: 2024-09-25

Mode of Operation: Tx mode

Test Method:

For emission measurements at or below 1 GHz, the sample was placed 0.8m above the ground plane of semi-anechoic Chamber*. For emission measurements above 1 GHz, the sample was placed 1.5m above the ground plane of semi-anechoic Chamber*. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.

- * Semi-Anechoic chamber located on the G/F of The Hong Kong Standards and Testing Centre Ltd. with Registration Number: HK0001
Test Firm Registration Number: 367672

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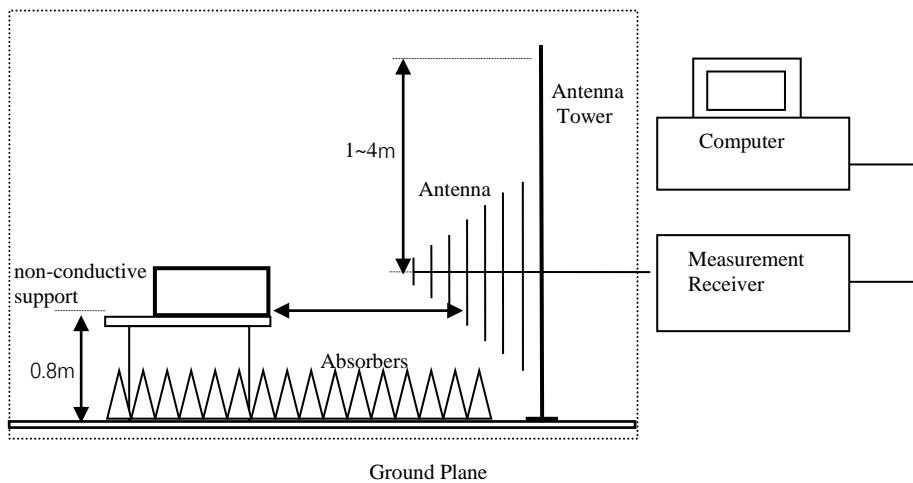
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Spectrum Analyzer Setting:

9KHz – 30MHz (Pk & Av)	RBW: 10kHz VBW: 30kHz Sweep: Auto Span: Fully capture the emissions being measured Trace: Max. hold
30MHz – 1GHz (QP)	RBW: 120kHz VBW: 120kHz Sweep: Auto Span: Fully capture the emissions being measured Trace: Max. hold
Above 1GHz (Pk)	RBW: 1MHz VBW: 1MHz Sweep: Auto Span: Fully capture the emissions being measured Trace: Max. hold
Above 1GHz (Av)	RBW: 1MHz VBW: 10Hz Sweep: Auto Span: Fully capture the emissions being measured Trace: Max. hold

Test Setup:



- Absorbers placed on top of the ground plane are for measurements above 1000MHz only.
- Measurements between 30MHz to 1000MHz made with Bi-log antennas, above 1000MHz horn antennas are used.

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Limits for Field Strength of Fundamental & Harmonics Emissions [FCC 47CFR 15.249]:

Frequency Range of Fundamental [MHz]	Field Strength of Fundamental Emission [microvolts/meter]	Field Strength of Harmonics Emission [microvolts/meter]
902-928	50,000 [Quasi-Peak]	500 [Average]
2400-2483.5	50,000 [Average]	500 [Average]

Remarks:

No additional spurious emissions found between lowest internal used/generated frequency and 30 MHz

Calculated measurement uncertainty
(9kHz-30MHz): 2.0dB
(30MHz -1GHz): 4.9dB
(1GHz -6GHz): 4.02dB
(6GHz -26.5GHz): 4.03dB

Emissions in the vertical and horizontal polarizations have been investigated and the worst-case test results are recorded in this report.

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Results of Tx mode (Lowest Frequency Channel-2413 MHz): Pass

Field Strength of Fundamental Emissions						
Peak Value						
Frequency MHz	Measured Level @3m dB μ V/m	Correction Factor dB μ V/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit @3m μ V/m	E-Field Polarity
2413.00	84.1	-4.8	79.3	9,257.6	500,000	Vertical
2413.00	90.9	-4.7	86.2	20,417.4	500,000	Horizontal

Field Strength of Fundamental Emissions						
Average Value						
Frequency MHz	Measured Level @3m dB μ V/m	Correction Factor dB μ V/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit @3m μ V/m	E-Field Polarity
2413.00	78.2	-4.8	73.4	4,677.4	50,000	Vertical
2413.00	85.1	-4.7	80.4	10,471.3	50,000	Horizontal

Field Strength of Harmonics Emission						
Peak Value						
Frequency MHz	Measured Level @3m dB μ V/m	Correction Factor dB μ V/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit @3m μ V/m	E-Field Polarity
4826.0	56.2	0.8	57.0	709.6	5,000	Vertical
4826.0	57.1	0.5	57.6	758.6	5,000	Horizontal
7239.0	49.7	7.0	56.7	683.9	5,000	Vertical
7239.0	50.2	6.5	56.7	683.9	5,000	Horizontal
9652.0	46.4	8.5	54.9	555.9	5,000	Vertical
9652.0	47.3	8.3	55.6	602.6	5,000	Horizontal
12065.0	44.5	10.9	55.4	588.8	5,000	Vertical
12065.0	44.9	10.8	55.7	609.5	5,000	Horizontal

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Field Strength of Harmonics Emission						
Average Value						
Frequency MHz	Measured Level @3m dB μ V/m	Correction Factor dB μ V/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit @3m μ V/m	E-Field Polarity
4826.0	42.2	0.8	43.0	141.6	500	Vertical
4826.0	42.1	0.5	42.6	134.9	500	Horizontal
7239.0	36.2	7.0	43.2	144.5	500	Vertical
7239.0	35.5	6.5	42.0	125.9	500	Horizontal
9652.0	33.4	8.5	41.9	124.5	500	Vertical
9652.0	32.9	8.3	41.2	114.8	500	Horizontal
12065.0	30.7	10.9	41.6	120.2	500	Vertical
12065.0	30.4	10.8	41.2	114.8	500	Horizontal

Results of Tx mode (Middle Frequency Channel- 2444MHz): Pass

Field Strength of Fundamental Emissions						
Peak Value						
Frequency MHz	Measured Level @3m dB μ V/m	Correction Factor dB μ V/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit @3m μ V/m	E-Field Polarity
2444.00	83.8	-4.8	79.0	8,922.8	500,000	Vertical
2444.00	94.0	-4.7	89.3	29,275.2	500,000	Horizontal

Field Strength of Fundamental Emissions						
Average Value						
Frequency MHz	Measured Level @3m dB μ V/m	Correction Factor dB μ V/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit @3m μ V/m	E-Field Polarity
2444.00	78.0	-4.8	73.2	4,570.9	50,000	Vertical
2444.00	88.2	-4.7	83.5	14,962.4	50,000	Horizontal

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Field Strength of Harmonics Emission Peak Value						
Frequency MHz	Measured Level @3m dB μ V/m	Correction Factor dB μ V/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit @3m μ V/m	E-Field Polarity
4888.0	56.2	0.8	57.0	709.6	5,000	Vertical
4888.0	57.0	0.5	57.5	749.9	5,000	Horizontal
7332.0	49.4	7.0	56.4	660.7	5,000	Vertical
7332.0	50.0	6.5	56.5	668.3	5,000	Horizontal
9776.0	46.8	8.5	55.3	582.1	5,000	Vertical
9776.0	47.4	8.3	55.7	609.5	5,000	Horizontal
12220.0	45.2	10.9	56.1	638.3	5,000	Vertical
12220.0	44.9	10.8	55.7	609.5	5,000	Horizontal

Field Strength of Harmonics Emission Avarage Value						
Frequency MHz	Measured Level @3m dB μ V/m	Correction Factor dB μ V/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit @3m μ V/m	E-Field Polarity
4888.0	42.0	0.8	42.8	138.4	500	Vertical
4888.0	41.3	0.5	41.8	123.0	500	Horizontal
7332.0	35.1	7.0	42.1	127.4	500	Vertical
7332.0	36.0	6.5	42.5	133.4	500	Horizontal
9776.0	32.5	8.5	41.0	112.2	500	Vertical
9776.0	32.9	8.3	41.2	114.8	500	Horizontal
12220.0	31.2	10.9	42.1	127.4	500	Vertical
12220.0	30.5	10.8	41.3	116.1	500	Horizontal

Results of Tx mode (Highest Frequency Channel – 2472MHz): Pass

Field Strength of Fundamental Emissions Peak Value						
Frequency MHz	Measured Level @3m dB μ V/m	Correction Factor dB μ V/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit @3m μ V/m	E-Field Polarity
2472.00	81.3	-4.8	76.5	6,675.7	500,000	Vertical
2472.00	92.4	-4.7	87.7	24,182.4	500,000	Horizontal

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Field Strength of Fundamental Emissions						
Average Value						
Frequency MHz	Measured Level @3m dB μ V/m	Correction Factor dB μ V/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit @3m μ V/m	E-Field Polarity
2472.00	75.6	-4.8	70.8	3,467.4	50,000	Vertical
2472.00	86.1	-4.7	81.4	11,749.0	50,000	Horizontal

Field Strength of Harmonics Emission						
Peak Value						
Frequency MHz	Measured Level @3m dB μ V/m	Correction Factor dB μ V/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit @3m μ V/m	E-Field Polarity
4944.0	56.2	0.8	57.0	709.6	5,000	Vertical
4944.0	57.0	0.5	57.5	749.9	5,000	Horizontal
7416.0	49.4	7.0	56.4	660.7	5,000	Vertical
7416.0	50.2	6.5	56.7	683.9	5,000	Horizontal
9888.0	46.7	8.5	55.2	575.4	5,000	Vertical
9888.0	46.8	8.3	55.1	568.9	5,000	Horizontal
12360.0	44.9	10.9	55.8	616.6	5,000	Vertical
12360.0	44.8	10.8	55.6	602.6	5,000	Horizontal

Field Strength of Harmonics Emission						
Avarage Value						
Frequency MHz	Measured Level @3m dB μ V/m	Correction Factor dB μ V/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit @3m μ V/m	E-Field Polarity
4944.0	42.1	0.8	42.9	140.0	500	Vertical
4944.0	42.5	0.5	43.0	141.3	500	Horizontal
7416.0	35.4	7.0	42.4	131.8	500	Vertical
7416.0	36.1	6.5	42.6	134.9	500	Horizontal
9888.0	32.8	8.5	41.3	116.1	500	Vertical
9888.0	32.9	8.3	41.2	114.8	500	Horizontal
12360.0	30.7	10.9	41.6	120.2	500	Vertical
12360.0	30.2	10.8	41.0	112.2	500	Horizontal

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Radiated Emissions Measurement:

Limit :

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 5.205(c)).

Result: RF Radiated Emissions (1GHz-26GHz) (Lowest)

Peak Value						
Frequency MHz	Measured Level @3m dB μ V	Correction Factor dB/m	Field Strength dB μ V/m	Limit @3m dB μ V/m	Margin dB μ V/m	E-Field Polarity
2400.0	53.8	-4.8	49.0	74.0	25.0	Vertical
2400.0	57.1	-4.7	52.4	74.0	21.6	Horizontal

Average Value						
Frequency MHz	Measured Level @3m dB μ V	Correction Factor dB/m	Field Strength dB μ V/m	Limit @3m dB μ V/m	Margin dB μ V/m	E-Field Polarity
2400.0	44.0	-4.8	39.2	54.0	14.8	Vertical
2400.0	45.9	-4.7	41.2	54.0	12.9	Horizontal

Result: RF Radiated Emissions (1GHz-26GHz) (Highest)

Peak Value						
Frequency MHz	Measured Level @3m dB μ V	Correction Factor dB/m	Field Strength dB μ V/m	Limit @3m dB μ V/m	Margin dB μ V/m	E-Field Polarity
2483.5	52.4	-4.8	47.6	74.0	26.4	Vertical
2483.5	54.1	-4.7	49.4	74.0	24.6	Horizontal

Average Value						
Frequency MHz	Measured Level @3m dB μ V	Correction Factor dB/m	Field Strength dB μ V/m	Limit @3m dB μ V/m	Margin dB μ V/m	E-Field Polarity
2483.5	43.5	-4.8	38.7	54.0	15.3	Vertical
2483.5	44.0	-4.7	39.3	54.0	14.7	Horizontal

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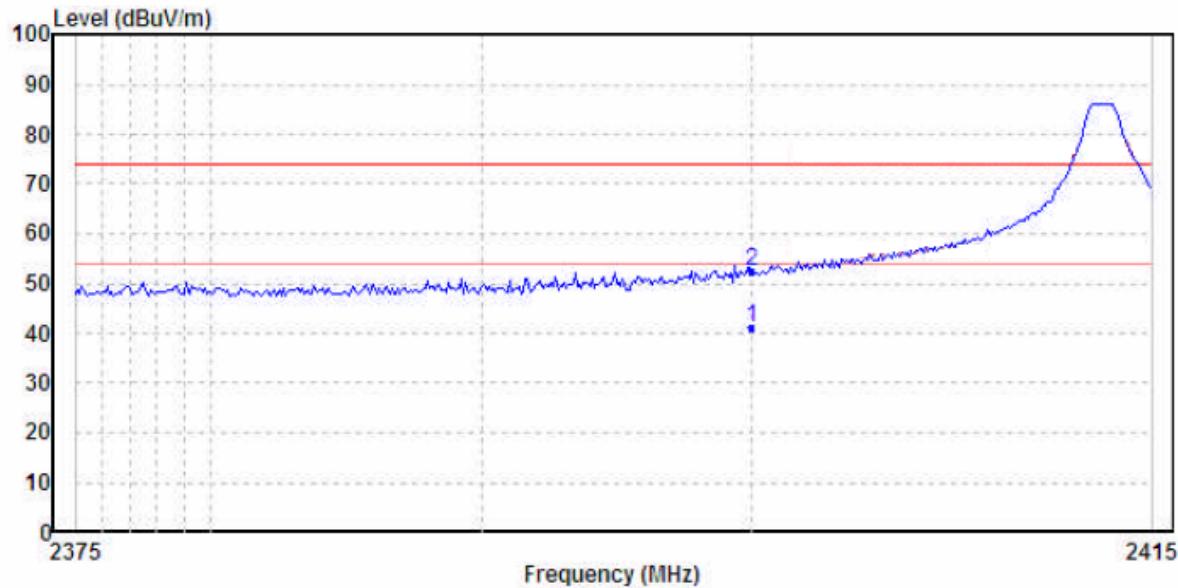
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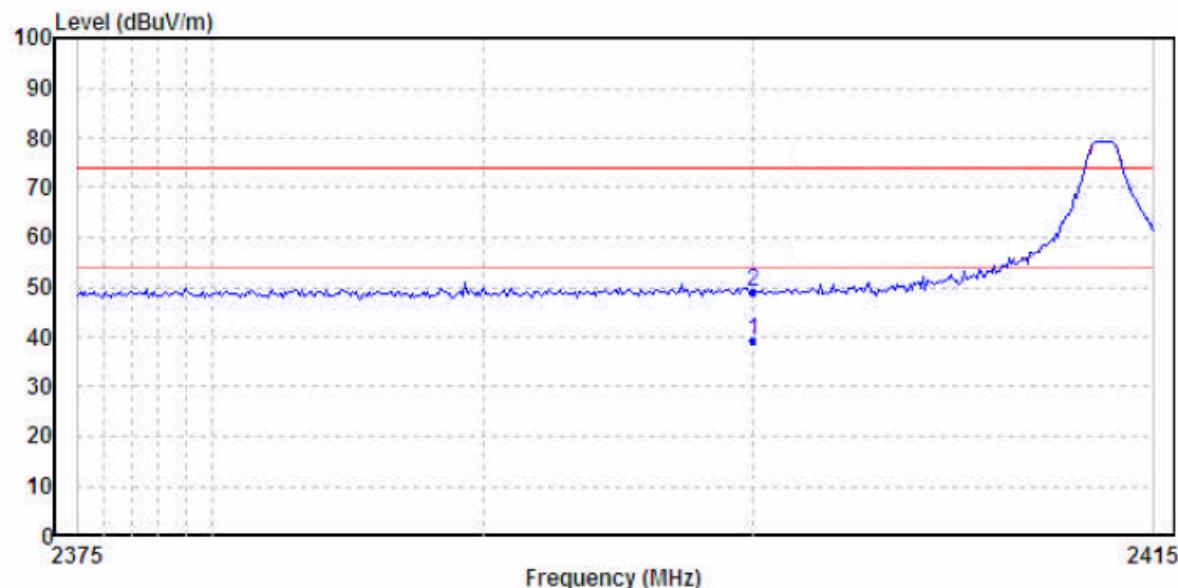
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Emissions radiated outside of the specified frequency bands (Lowest)

Horizontal



Vertical



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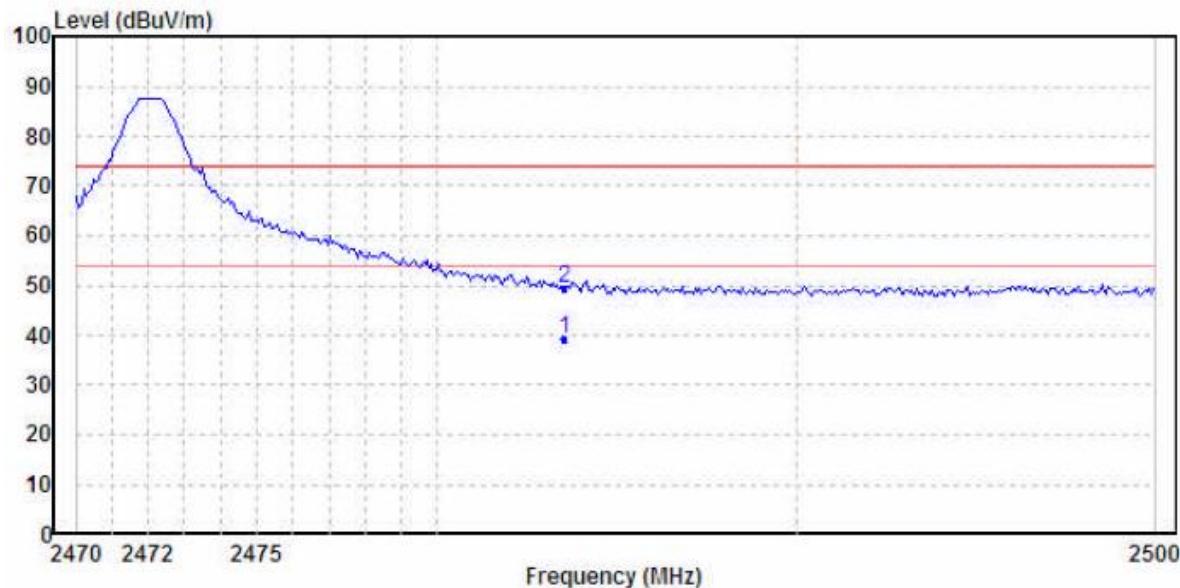
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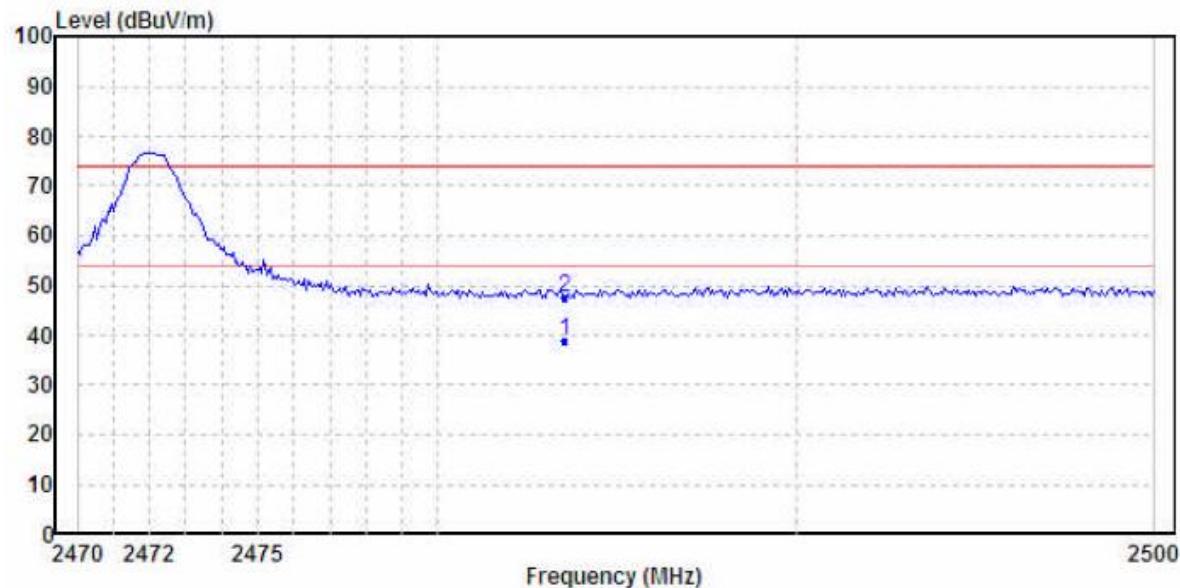
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Emissions radiated outside of the specified frequency bands (Highest)

Horizontal



Vertical



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Limits for Radiated Emissions [FCC 47 CFR 15.209 Class B]:

Frequency Range [MHz]	Quasi-Peak Limits [μ V/m]
0.009-0.490	2400/F (kHz)
0.490-1.705	24000/F (kHz)
1.705-30	30
30-88	100
88-216	150
216-960	200
Above 960	500

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

Remarks:

Calculated measurement uncertainty (9kHz-30MHz): 2.0dB / (30MHz – 1GHz): 4.9dB

Emissions in the vertical and horizontal polarizations have been investigated and the worst-case test results are recorded in this report.

Results of TX mode (9kHz – 30MHz): PASS

Emissions detected are more than 20 dB below the FCC Limits, not reported.

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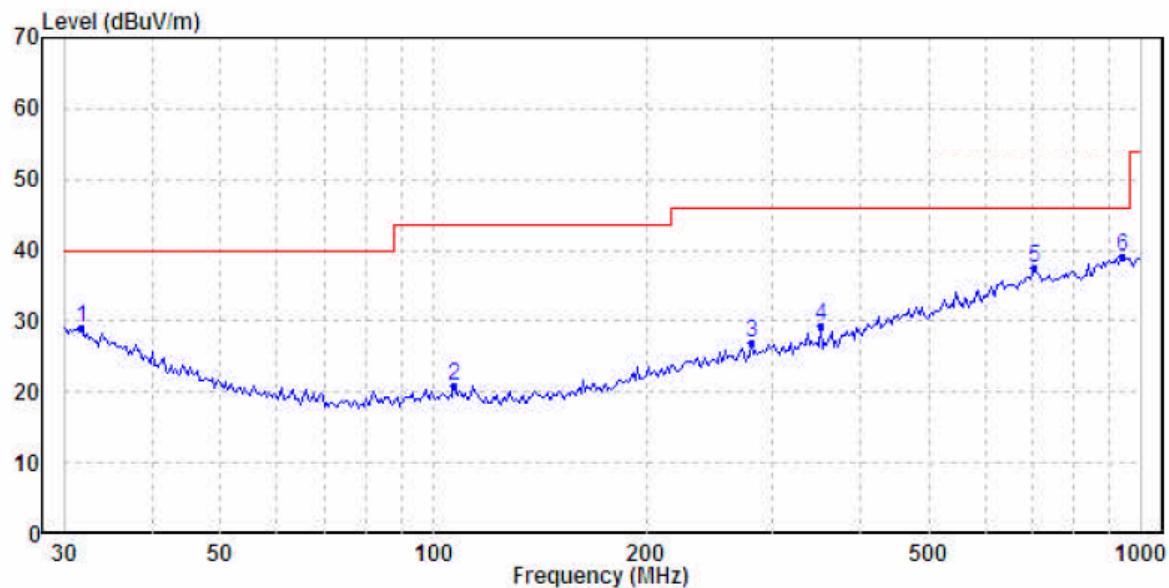
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Results of TX mode (30MHz – 1GHz)(2413MHz worst case): PASS

Horizontal



Ambient Temperature: 26.3C

Relative Humidity : 54.7%

Air Pressure : 100.9kPa

Freq	Level	Limit		Over Line Limit	Remark	Pol/Phase
		MHz	dBuV/m			
1	31.731	29.08	40.00	-10.92	QP	Horizontal
2	106.759	20.87	43.50	-22.63	QP	Horizontal
3	281.008	26.87	46.00	-19.13	QP	Horizontal
4	351.708	29.36	46.00	-16.64	QP	Horizontal
5	704.226	37.51	46.00	-8.49	QP	Horizontal
6	938.833	39.07	46.00	-6.93	QP	Horizontal

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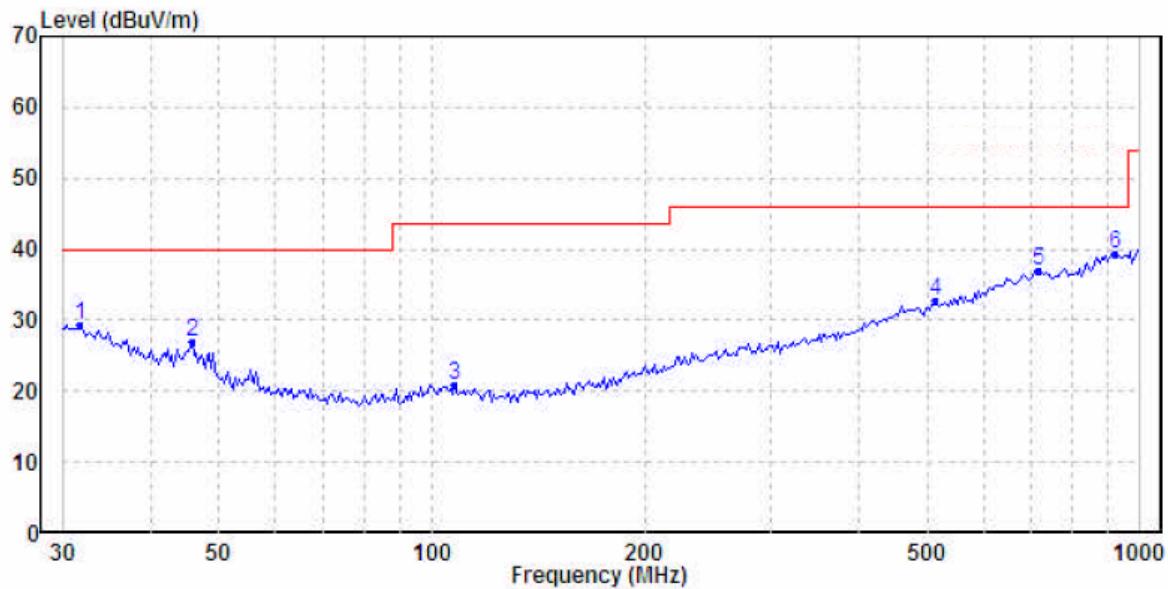
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Results of TX mode (30MHz – 1GHz) (2413MHz worst case): PASS

Vertical



Ambient Temperature: 26.3C

Relative Humidity : 54.7%

Air Pressure : 100.9kPa

Freq	Level	Limit		Over	Remark	Pol/Phase
		Line	Limit			
1	31.731	29.32	40.00	-10.68	QP	Vertical
2	45.695	26.82	40.00	-13.18	QP	Vertical
3	107.510	20.98	43.50	-22.52	QP	Vertical
4	513.633	32.73	46.00	-13.27	QP	Vertical
5	719.200	37.03	46.00	-8.97	QP	Vertical
6	919.287	39.46	46.00	-6.54	QP	Vertical

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3.1.2 Antenna Requirement

Ambient temperature 25°C

Relative humidity 57%

Test Requirements: § 15.203

Test Specification:

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.

Test Results:

This is PCB antenna. There is no external antenna, the antenna gain =0.5dBi. User is unable to remove or changed the Antenna.

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3.1.3 20dB Bandwidth of Fundamental Emission

Ambient temperature 25°C

Relative humidity 57%

Test Requirement: FCC 47 CFR 15.249
Test Method: ANSI C63.10:2013
Test Date: 2024-09-09
Mode of Operation: Tx mode

Test Method:

The bandwidth is measured at an amplitude level reduced from the reference level by a specified ratio. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst-case (i.e. the widest) bandwidth.

Test Setup:

As Test Setup of clause 3.1.1 in this test report.



Test Report

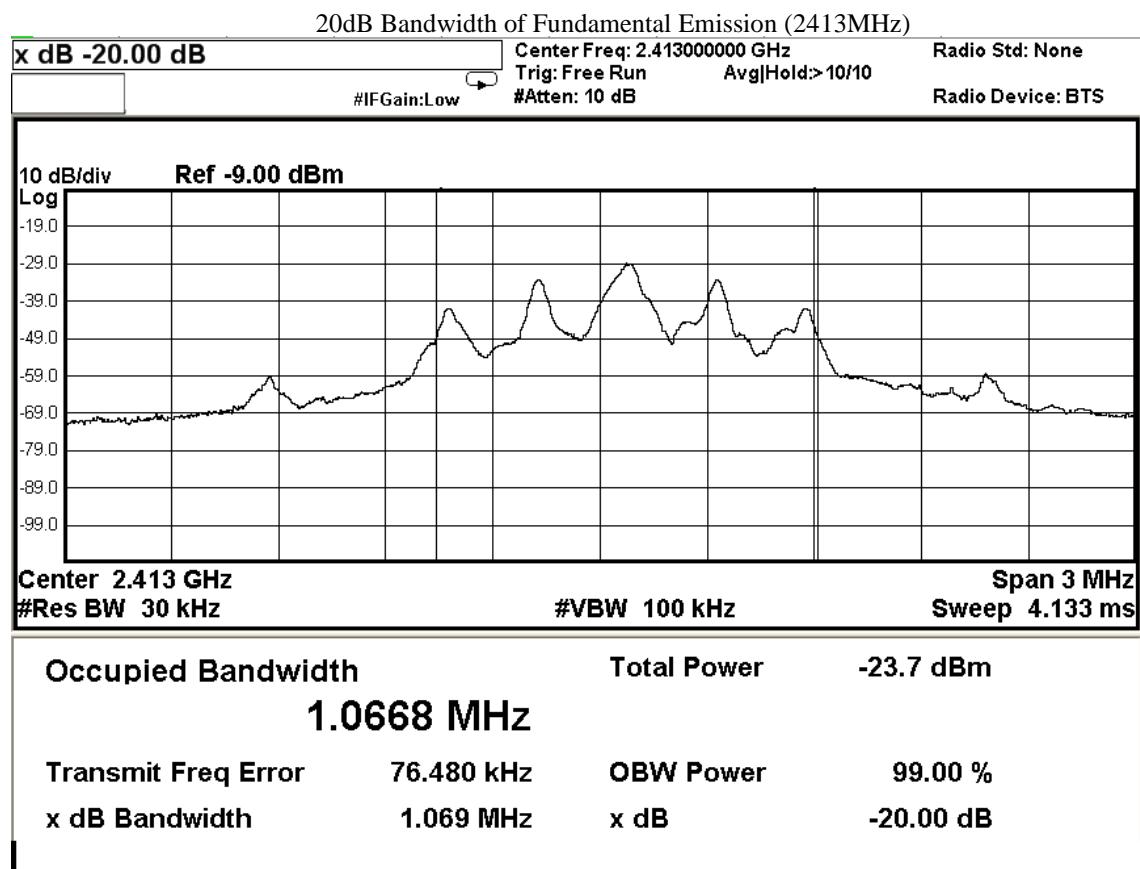
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Limits for 20dB Bandwidth of Fundamental Emission (Low Frequency Channel):

Frequency Range [MHz]	20dB Bandwidth [MHz]
2413.0	1.069



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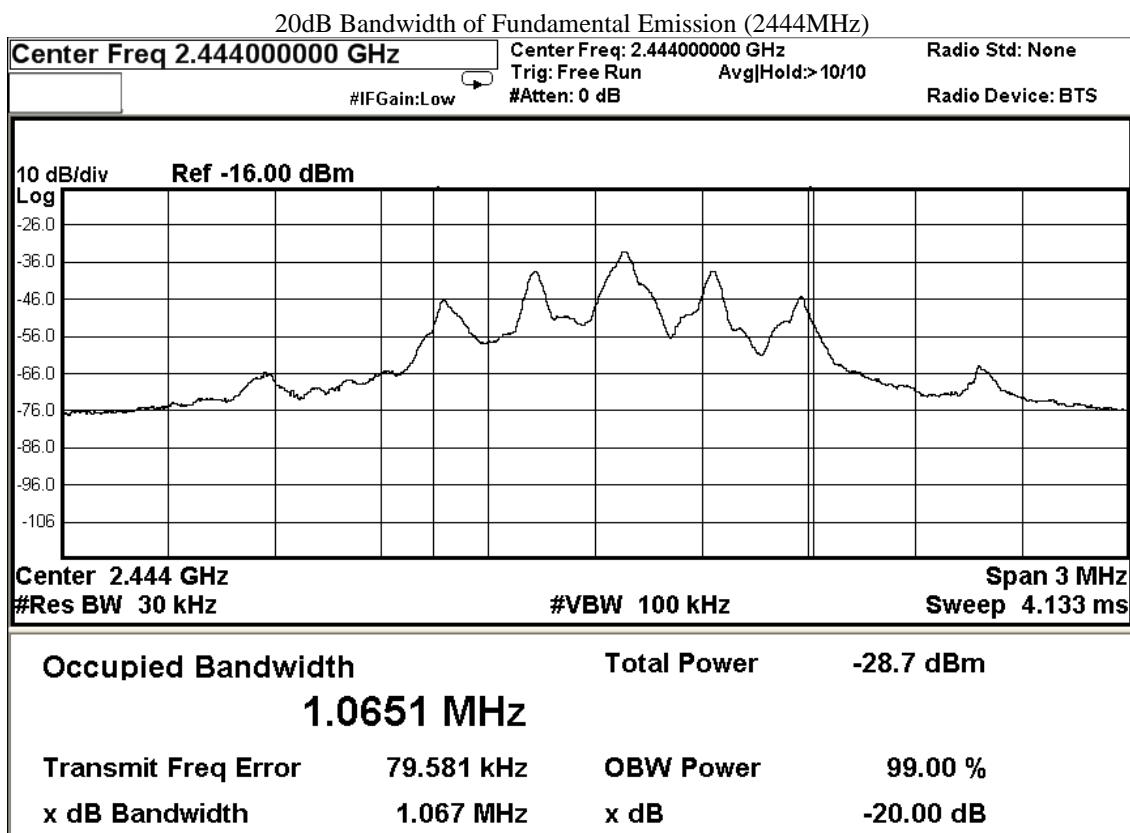
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Limits for 20dB Bandwidth of Fundamental Emission (Middle Frequency Channel):

Frequency Range [MHz]	20dB Bandwidth [MHz]
2444.0	1.067



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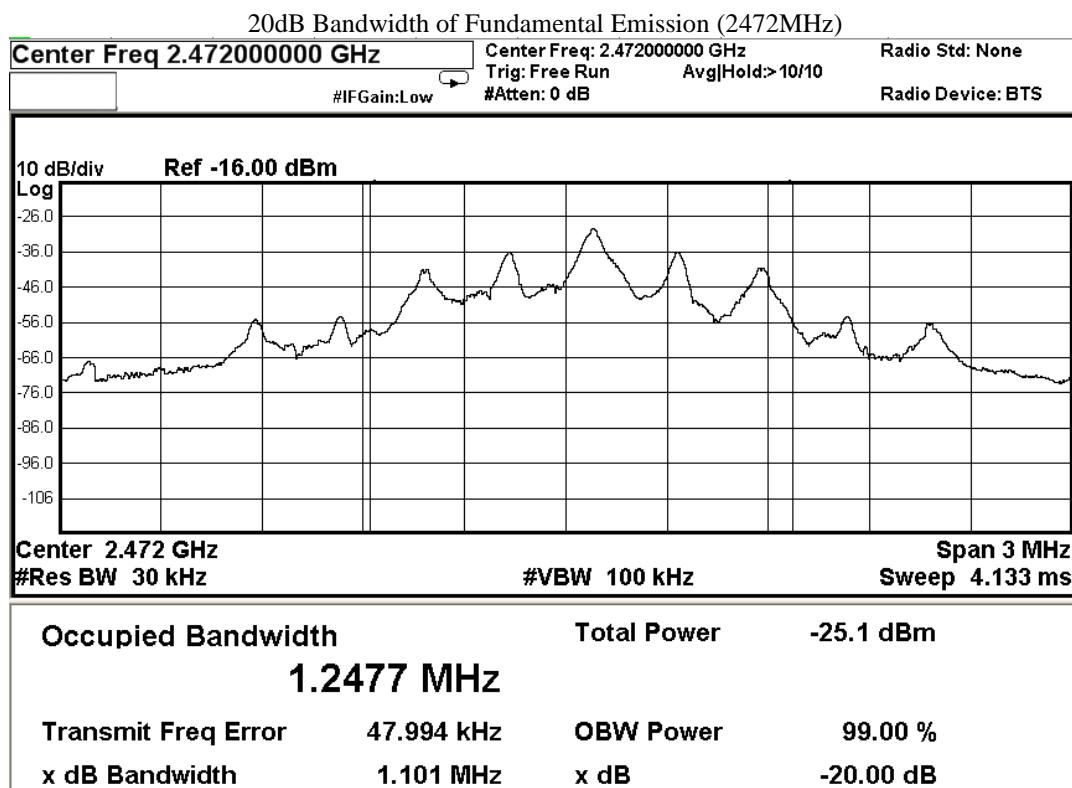
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Limits for 20dB Bandwidth of Fundamental Emission (High Frequency Channel):

Frequency Range [MHz]	20dB Bandwidth [MHz]
2472.0	1.101



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Appendix A

List of Measurement Equipment

Radiated Emission

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL	DUE CAL
EM215	MULTIDEVICE CONTROLLER	EMCO	2090	00024676	N/A	N/A
EM217	ELECTRIC POWERED TURNTABLE	EMCO	2088	00029144	N/A	N/A
EM218	ANECHOIC CHAMBER	ETS-LINDGREN	FACT-3	--	2024-04-18	2029-04-18
EM356	ANTENNA POSITIONING TOWER	ETS-LINDGREN	2171B	00150346	N/A	N/A
EM293	SPECTRUM ANALYZER	AGILENT TECHNOLOGIES	N9020A	MY50510152	2023-03-21	2025-03-21
EM363	SIGNAL ANALYZER(10HZ-40GHZ)	R & S	FSV40	101231	2024-01-17	2026-01-17
EM299	BROADBAND HORN ANTENNA	ETS-LINDGREN	3115	00114120	2023-01-25	2025-01-25
EM300	PYRAMIDAL STANDARD GAIN HORN ANTENNA	ETS-LINDGREN	3160-09	00130130	2023-01-16	2025-01-16
EM301	PYRAMIDAL STANDARD GAIN HORN ANTENNA	ETS-LINDGREN	3160-10	00130988	2023-02-15	2025-02-15
EM353	LOOP ANTENNA	ETS_LINDGREN	6502	00206533	2022-09-26	2025-09-26
EM355	BICONILOG ANTENNA	ETS-LINDGREN	3143B	00094856	2022-08-26	2025-08-26
EM200	DUAL CHANNEL POWER METER	R & S	NRVD	100592	2023-08-02	2025-08-02

Remarks:-

N/A Not Applicable or Not Available

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Appendix B

Photographs of EUT

Front View of the product



Rear View of the product



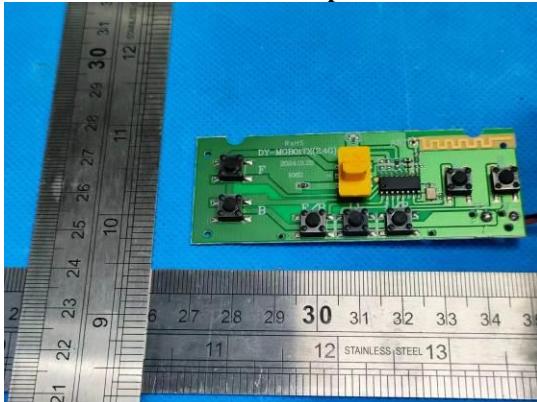
Inner Circuit Top View



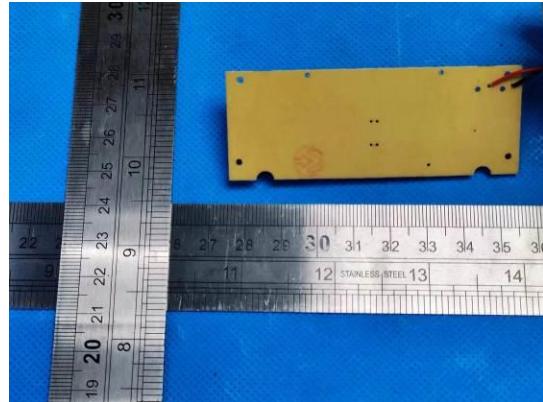
Inner Circuit Bottom View



Inner Circuit Top View



Inner Circuit Bottom View



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Photographs of EUT

Radiated emissions test set up (9KHz-30MHz)



Radiated emissions test set up (30MHz-1000MHz)



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Photographs of EUT

Radiated emissions test set up (Above 1GHz)



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