TEST REPORT

Application No.:	BTEK240822004AE
Applicant:	Shenzhen Core Image Co., Ltd.
Address of Applicant:	Building 2nd Floor, No. 1 Huafeng Hi-tech Park,Yangwu Konggang, Dongfang Community,Songgang Street, Bao'an Distric, Shenzhen.
Manufacturer:	Shenzhen Core Image Co., Ltd.
Address of Manufacturer:	Building 2nd Floor, No. 1 Huafeng Hi-tech Park,Yangwu Konggang, Dongfang Community,Songgang Street, Bao'an Distric, Shenzhen.
Equipment Under Test (EUT):	
EUT Name:	Remote Control
Test Model.:	RCR002
Adding Model(s):	RCR002A,RC002A-5-2,RCR002B,RP10,RP10-5-1,RP10-5-2
Trade Mark:	/
FCC ID:	2APQK-RCR002
Standard(s) :	47 CFR Part 15, Subpart C 15.231
Date of Receipt:	2024-08-22
Date of Test:	2024-08-22 to 2024-09-10
Date of Issue:	2024-09-24
Test Result:	**Pass***

* In the configuration tested, the EUT complied with the standards specified above.

Lion Cai/ Approved & Authorized
EMC Laboratory Manager

Revision Record				
Version	**Chapter**	**Date**	**Modifier**	**Remark**
V0		*2024-09-12*		*Original*
V1		*2024-09-24*		*1.updated page 20/21/22/23*

Authorized for issue by:				
		Zora. Huang **Zora Huang/ Project Engineer**		
		June Li **June Li / Reviewer**		

2 Test Summary

Radio Spectrum Technical Requirement				
Item	**Standard**	**Method**	**Requirement**	**Result**
Antenna Requirement	47 CFR Part 15, Subpart C 15.203	N/A	47 CFR Part 15, Subpart C 15.203	Pass

Item	Standard	Requirement	Result
Conduction Emission	47 CFR Part 15, Subpart C 15.207	47 CFR Part 15, Subpart C 15.207	N/A
20dB Bandwidth	47 CFR Part 15, Subpart C 15.231	47 CFR Part 15, Subpart C 15.231(c)	Pass
Transmission time		47 CFR Part 15, Subpart C 15.231a(1)	Pass
Duty cycle corrected factor		--	Pass
Field strength of the Fundamental signal		47 CFR Part 15, Subpart C 15.231 (b)	Pass
Radiation Spurious Emission		47 CFR Part 15, Subpart C 15.231(b)/15.205/15.209	Pass

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4 General Information

4.1 Details of E.U.T.

Power supply:	DC 3V CR2032 Battery
Frequency Range:	433.92MHz
Modulation Type:	ASK
Number of Channels:	1
Antenna Type:	PCB antenna
Antenna Gain:	2.78dBi
Remark: The information in this section is provided by the applicant or manufacturer, BANTEK is not liable to the accuracy, suitability, reliability or/and integrity of the information.	
Sample No.:	BTEK240822004AE

4.2 EUT Test Mode and Test Condition

Test Mode	Description	Remark
1	TX	Continue TX
Remark:1.only show the worst case in the test report.		

Test Conditions	
Temperature:	22.25 °C
Relative Humidity:	45.55 %
ATM Pressure:	1010 mbar

4.3 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
--	--	--	--

4.4 Measurement Uncertainty

Test Item	Measurement Uncertainty
Conducted Peak Output Power	± 0.76dB
20dB Bandwidth	± 3%
Conducted Spurious Emissions	± 0.8dB
Radiated Emissions which fall in the restricted bands	±5.1dB (1GHz-6GHz); ±5.2dB(above 6GHz)
Radiated Spurious Emissions (Below 1GHz)	±5.1dB
Radiated Spurious Emissions (Above 1GHz)	±5.1dB (1GHz-6GHz); ±5.2dB(above 6GHz)

4.5 Test Location

All tests were performed at:
Shenzhen BANTEK Testing Co., Ltd.,
A5&A6, Building B1&B2, No.45 Gangtou Road, Bogang Community, Shajing Street, Bao'an District, Shenzhen, Guangdong, China 518104
Tel:0755-2334 4200 Fax: 0755-2334 4200
FCC Registration Number: 264293
Designation Number: CN1356
No tests were sub-contracted.

4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None

5 Equipment List

Conducted Test					
Description	**Manufacturer**	**Model**	**Serial No.**	**Cal. Date**	**Cal. Due**
Shielding Room	YIHENG ENECTRONIC	9*5*3.3	YH-BT-220304-04	2022-03-03	2025-03-02
EMI Test Receiver	Rohde&Schwarz	ESCI	101021	2024-06-11	2025-06-10
Measurement Software	Fara	EZ_EMC Ver. FA-03A2	N/A	N/A	N/A
LISN	Rohde&Schwarz	ENV216	101472	2024-06-11	2025-06-10
LISN	Schwarzbeck	NSLK 8128	05127	2024-06-11	2025-06-10

RF Conducted					
Equipment	**Manufacturer**	**Model No**	**Serial No**	**Cal Date**	**Cal Due Date**
Shielding Room	YIHENG ENECTRONIC	5.5*3.1*3	YH-BT-220304-03	2022-03-03	2025-03-02
EXA Signal Analyzer	KEYSIGHT	N9020A	MY54230486	2024-06-11	2025-06-10
DC Power Supply	E3632A	E3642A	KR75304416	2024-06-11	2025-06-10
Attenuator	RswTech	SMA-JK-6dB	N/A	2024-06-11	2025-06-10
Attenuator	RswTech	SMA-JK-3dB	N/A	2024-06-11	2025-06-10
RF Control Unit	Techy	TR1029-1	N/A	2024-06-11	2025-06-10
RF Sensor Unit	Techy	TR1029-2	N/A	2024-06-11	2025-06-10
WIDEBAND RADIO COMMUNICATION TESTER	R&S	CMW 500	141258	2024-06-11	2025-06-10
MXG Vector Signal Generator	Agilent	N5182A	US46240522	2024-06-11	2025-06-10
Programmable Temperature&Humidity Chamber	GRT	GR-HWX1000	GR22051001	2024-06-11	2025-06-10
Measurement Software	TACHOY	RF TestSoft	N/A	N/A	N/A

RSE					
Equipment	**Manufacturer**	**Model No**	**Serial No**	**Cal Date**	**Cal Due Date**
3m Semi-Anechoic Chamber	YIHENG ENECTRONIC	966	YH-BT-220304-01	2022-05-06	2025-05-05
EMI Test Receiver	Rohde&Schwarz	ESCI	100694	2024-06-11	2025-06-10
TRILOG Broadband Antenna	Schwarzbeck	VULB 9168	01324	2024-06-16	2025-06-15
Pre-Amplifier	Schwarzbeck	BBV 9745	#180	2024-06-11	2025-06-10
Measurement Software	Fara	EZ_EMC Ver. FA-03A2	N/A	2024-06-11	2025-06-10
EXA Signal Analyzer	Keysight	N9020A	MY54440290	2024-06-11	2025-06-10
Horn Antenna	Schwarzbeck	BBHA 9120D	02695	2024-06-15	2025-06-14
Pre-Amplifier	Tonscend	TAP0118045	AP20K806109	2024-06-11	2025-06-10

Horn Antenna	SCHWARZBECK	BBHA9170	1157	2024-06-15	2025-06-14
Low Noise Pre-amplifier	SKET	LNPA-1840G-50	SK2022032902	2024-06-11	2025-06-10
Signal analyzer	ROHDE&SCHWARZ	FSQ40	100010	2024-06-11	2025-06-10
Loop Antenna	ETS	6502	00201177	2024-06-15	2025-06-14

6 Radio Spectrum Technical Requirement

6.1 Antenna Requirement

6.1.1 Test Requirement:

47 CFR Part 15, Subpart C 15.203

6.1.2 Conclusion

This product has a PCB antenna, fulfill the requirement of this section.

7 Radio Spectrum Matter Test Results

7.1 20dB Bandwidth

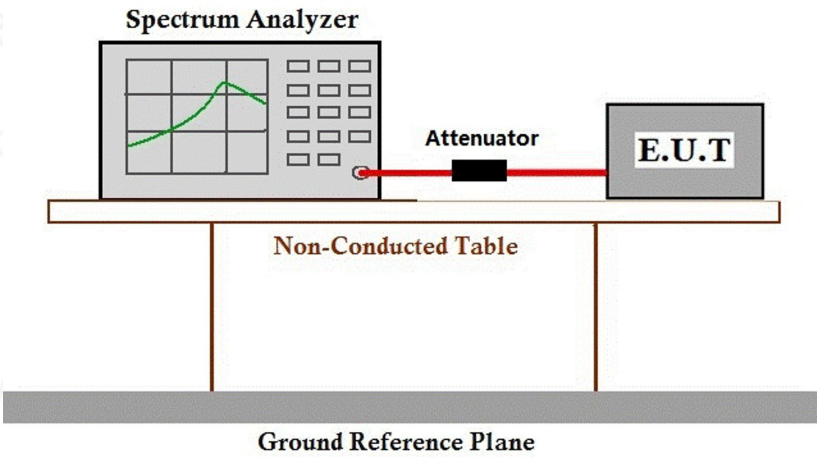
Test Requirement 47 CFR Part 15, Subpart C 15.231(c)

Limit:

Frequency range(MHz)	Limit
70-900	No wider than 0.25% of the center frequency
Above 900	No wider than 0.5% of the center frequency

Remark: For this device, the limit is 434MHz*0.25%=1.085MHz

7.1.1 Test Setup Diagram



7.1.2 Measurement Procedure and Data

With the EUT's antenna attached, the EUT's 20dB Bandwidth power was received by the test antenna, which was connected to the spectrum analyzer with the START, and STOP frequencies set to the EUT's operation band.

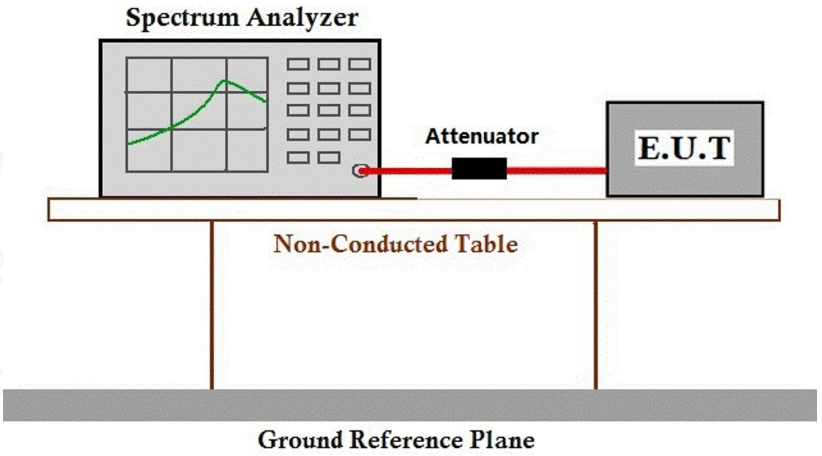
Please Refer to Appendix

7.2 Transmission time

Test Requirement 47 CFR Part 15, Subpart C 15.231a(1)

Limit: A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

7.2.1 Test Setup Diagram



7.2.2 Measurement Procedure and Data

With the EUT's antenna attached, the EUT's output signal was received by the test antenna, which was connected to the spectrum analyzer. Set the center frequency, than set the spectrum analyzer to Zero Span for the release time reading. During the testing, the switch was released then the EUT automatically deactivated.

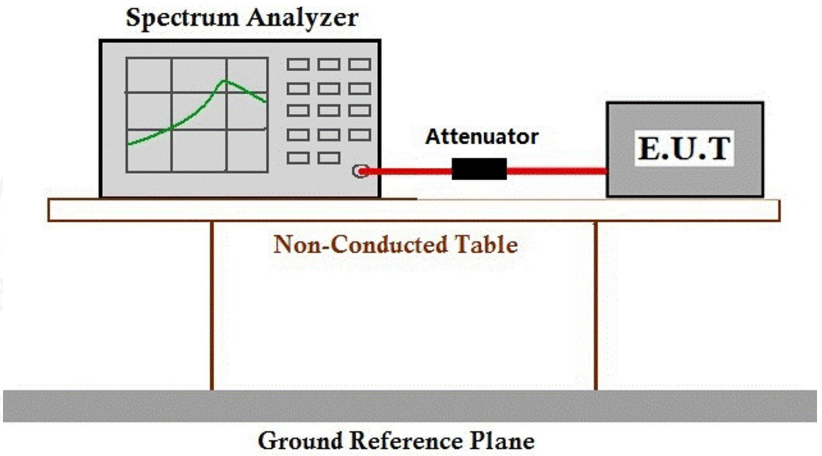
Please Refer to Appendix

7.3 Duty Cycle Corrected Factor

Test Requirement 47 CFR Part 15, Subpart C 15.231

Limit: N/A

7.3.1 Test Setup Diagram



7.3.2 Measurement Procedure and Data

With the EUT's antenna attached, the EUT's output signal was received by the test antenna, which was connected to the spectrum analyzer. Set the center frequency, than set the spectrum analyzer to Zero Span for the release time reading. During the testing, the switch was released then the EUT automatically deactivated.

Please Refer to Appendix

7.4 Field strength of the Fundamental signal

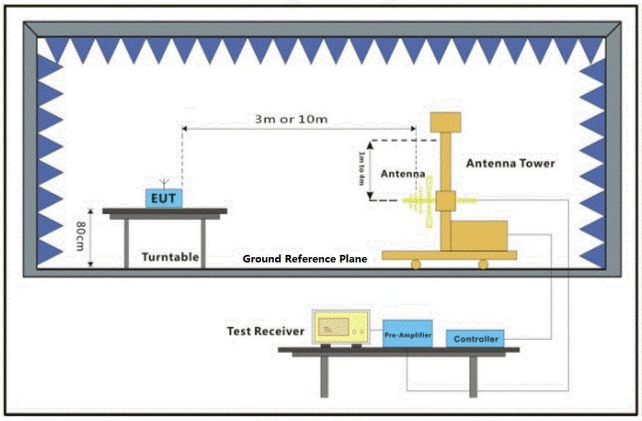
Test Requirement 47 CFR Part 15, Subpart C 15.231(b)

Limit:

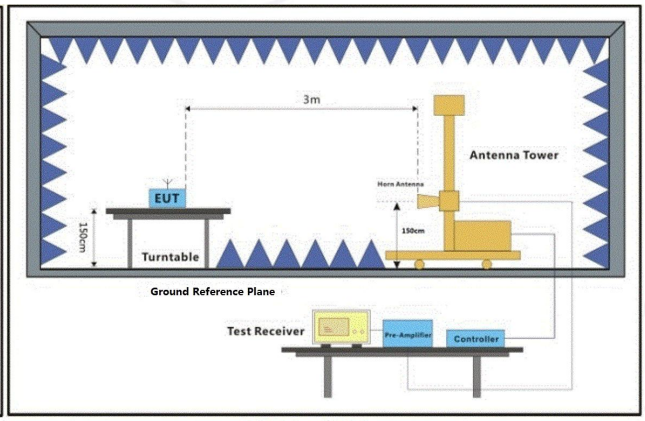
Frequency(MHz)	Field strength of fundamental (microvolts/meter)	Field strength of spurious emissions (microvolts/meter)
40.66–40.70	2,250	225
70–130	1,250	125
130–174	*1,250 to 3,750	*125 to 375
174–260	3,750	375
260–470	*3,750 to 12,500	*375 to 1,250
Above 470	12,500	1,250

*Linear interpolations

7.4.1 Test Setup Diagram



30MHz-1GHz



Above 1GHz

7.4.2 Measurement Procedure and Data

a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

d. 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.

e. 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.

f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

g. 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.

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

i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.

j. Repeat above procedures until all frequencies measured was complete.

Remark 1: Level= Reading Level + Factor

Remark 2: For frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.

Please Refer to Appendix

7.5 Radiated Spurious Emission

Test Requirement 47 CFR Part 15, Subpart C 15.231(b)/15.209

Limit:

15.209

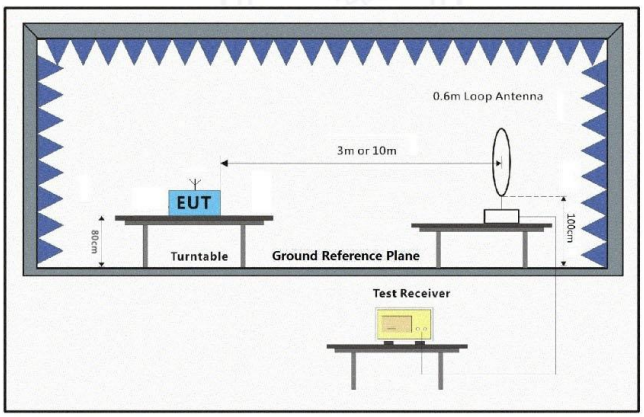
Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

15.231(b)

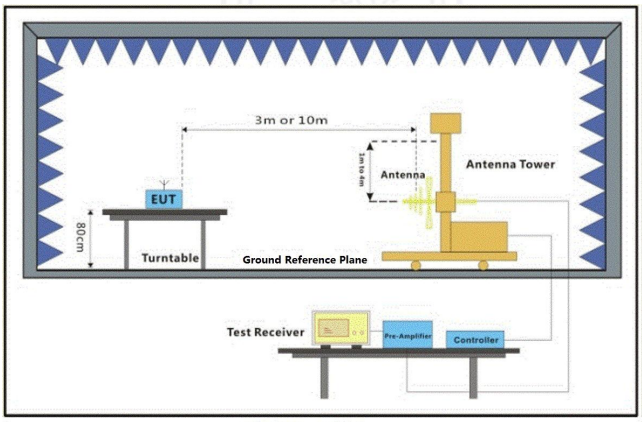
Frequency(MHz)	Field strength of fundamental (microvolts/meter)	Field strength of spurious emissions (microvolts/meter)
40.66–40.70	2,250	225
70–130	1,250	125
130–174	*1,250 to 3,750	*125 to 375
174–260	3,750	375
260–470	*3,750 to 12,500	*375 to 1,250
Above 470	12,500	1,250

*Linear interpolations

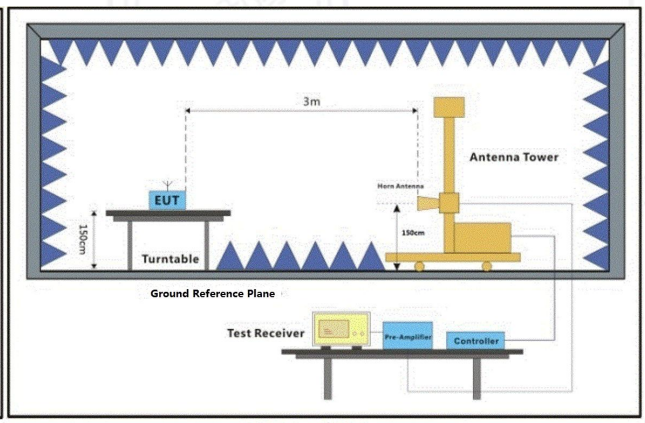
7.5.1 Test Setup Diagram



9KHz~30MHz



30MHz-1GHz



Above 1GHz

7.5.2 Measurement Procedure and Data

1. For testing performed with the loop antenna, the center of the loop was positioned 1 m above the ground and positioned with its plane vertical at the specified distance from the EUT. During testing the loop was rotated about its vertical axis for maximum response at each azimuth and also investigated with the loop positioned in the horizontal plane. Only the worst position of Horizontal was shown in the report.

Measured Level l=Read Level + Antenna Factor + Cable Loss - Preamp Factor

2.The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter camber in below 1GHz, 1.5m above the ground in above 1GHz. The table was rotated 360 degrees to determine the position of the highest radiation.

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

4.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.

5. 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 and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

6. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

7. 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.

Remark:

1) Through pre-scan found the worst case is the lowest channel. Only the worst case is recorded in the report.

2) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level = Reading Level + Factor

3) Scan from 9kHz to 1 GHz, the disturbance below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.

Please Refer to Appendix

Note:

1) Pre-scan all modes and recorded the worst case results in this report (High Channel).

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

3) Level= Reading+ Factor, Margin= Level- Limit, Factor= Antenna Factor Cable Loss-Preamp Factor

8 Test Setup Photo

Please Refer to Appendix – Test Setup Photos.

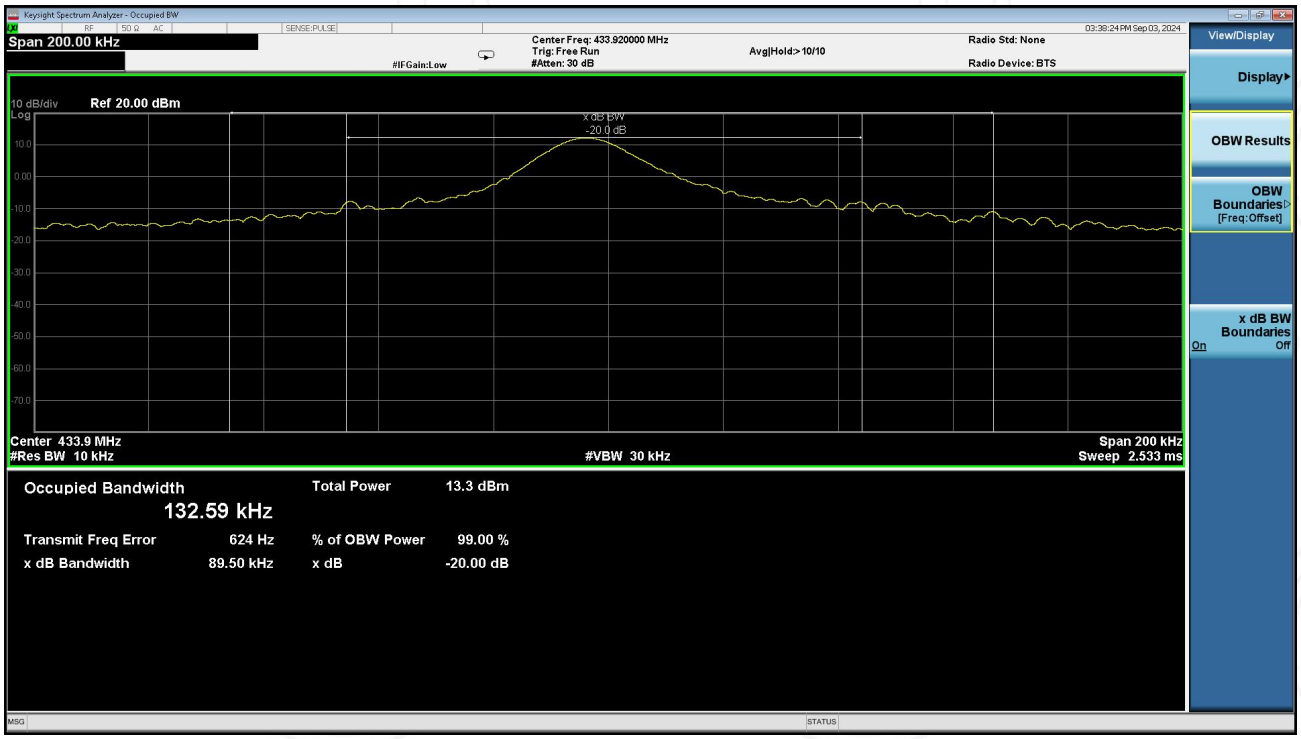
9 EUT Constructional Details (EUT Photos)

Please Refer to Appendix - External and Internal Appendix EUT Photos

10 Appendix

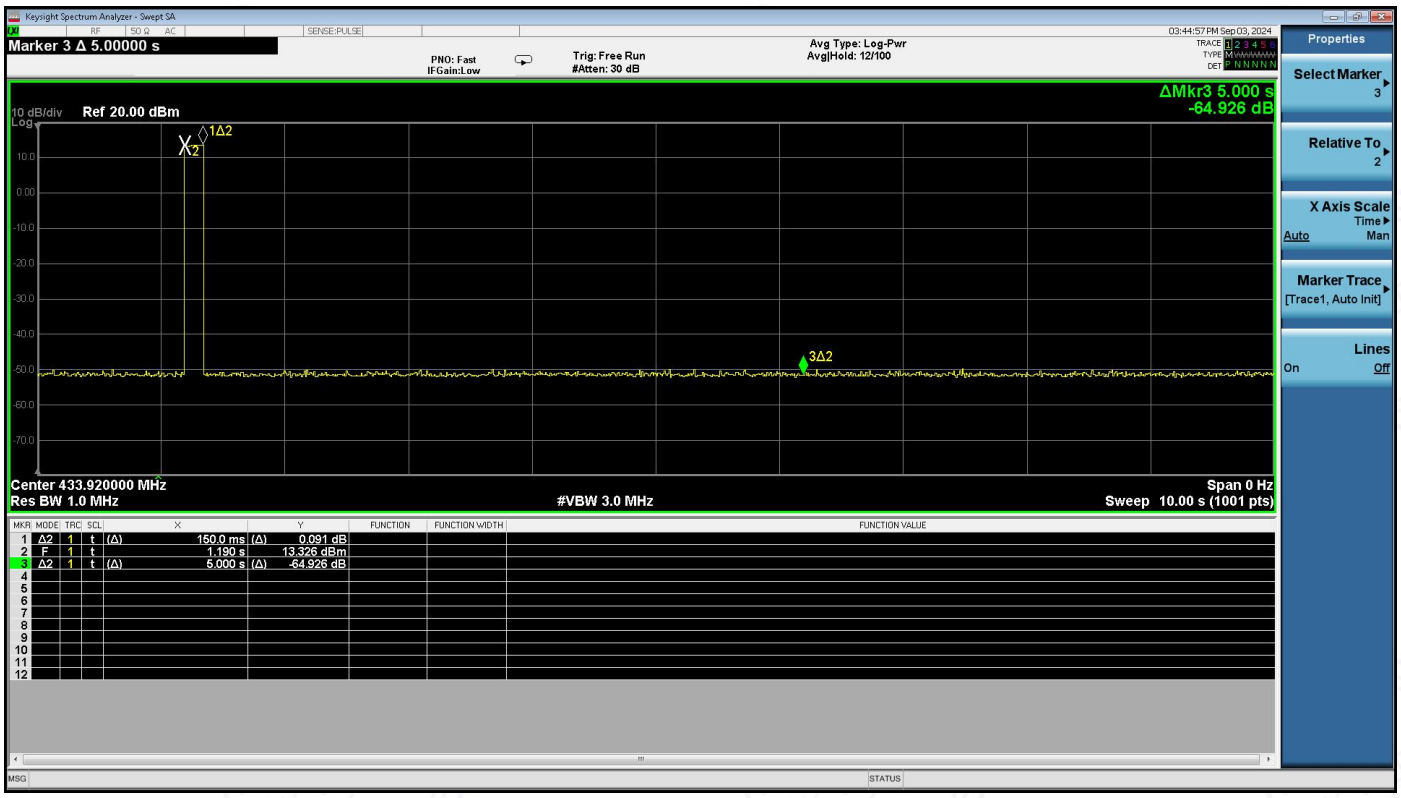
10.1 20dB Bandwidth

Test Channel	Bandwidth	Limit	Verdict
433.92MHz	89.5kHz	1.085MHz	PASS



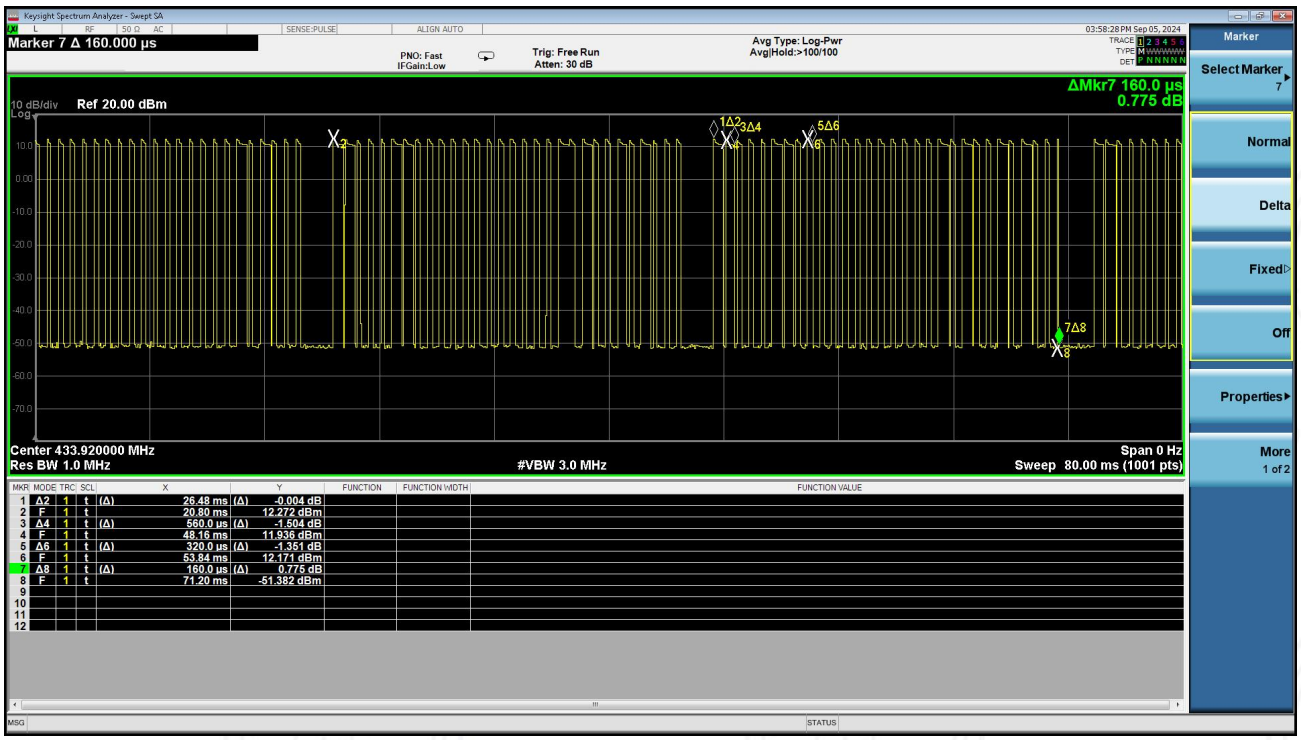
10.2 Transmission time

Transmission time(second)	Limit(second)	Result
0.15	5	Pass



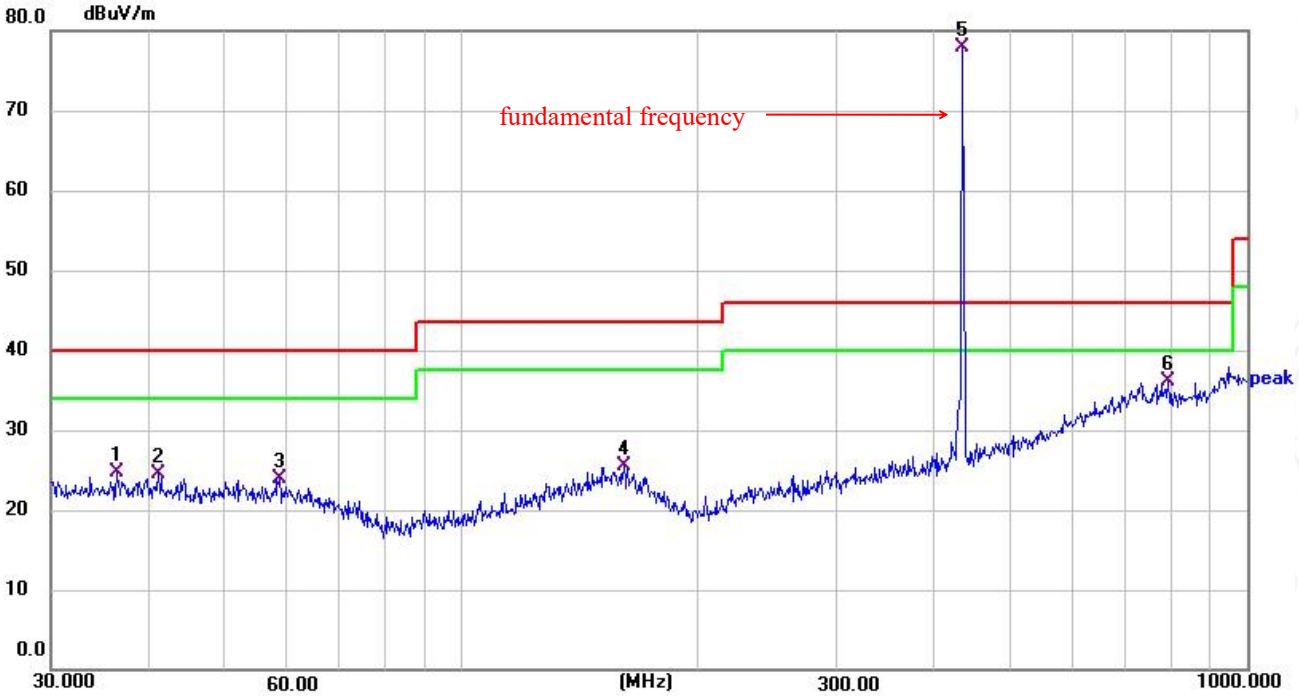
10.3 Duty cycle corrected factor

T_{ON}(ms)	(0.56*8+0.32*21+0.16)=11.36
T_{ON} number	30
Period (ms)	26.48
Duty Cycle	11.36/26.48=0.429
Duty Cycle Corrected Factor	20*log(0.429)=-7.35



10.4 Field strength of the Fundamental signal & Radiation Spurious Emission

Test Antenna Horizontal (30MHz to 1GHz)
Level = Reading + Factor

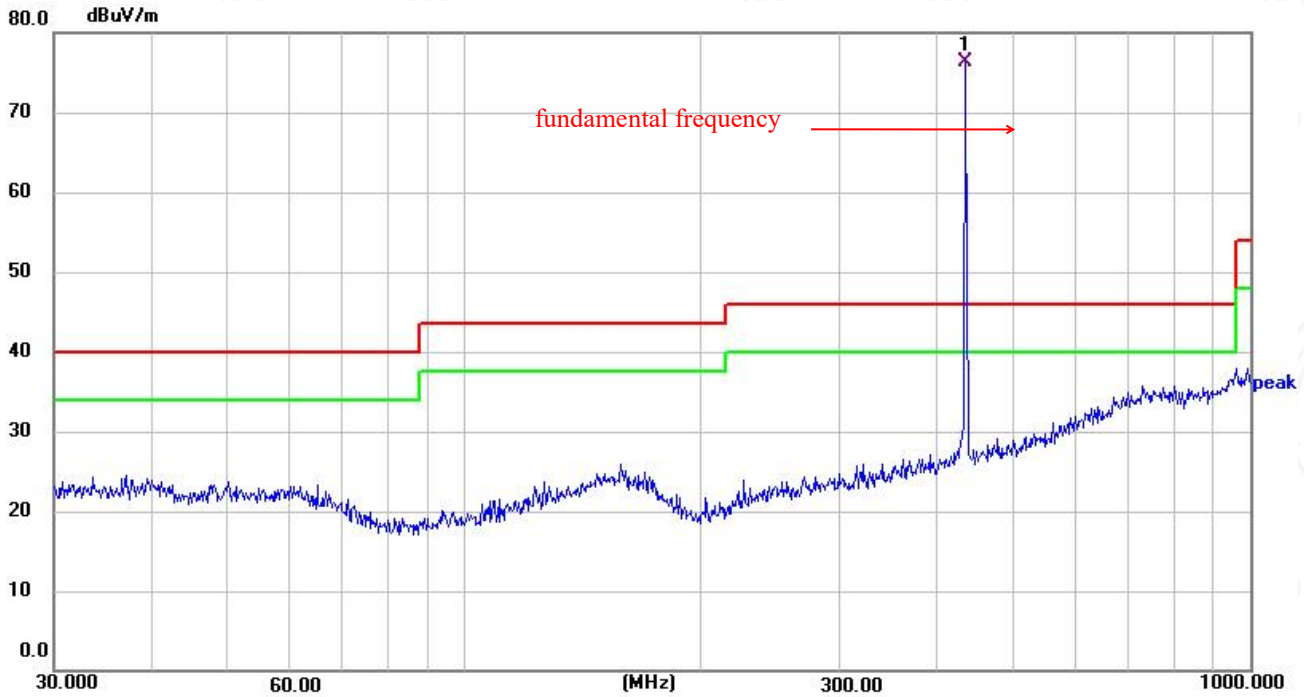


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	36.3813	41.94	-17.33	24.61	40.00	-15.39	QP	100	0	P	
2	41.1320	41.69	-17.09	24.60	40.00	-15.40	QP	100	0	P	
3	58.6126	42.15	-18.15	24.00	40.00	-16.00	QP	100	0	P	
4	160.9090	42.87	-17.43	25.44	43.50	-18.06	QP	100	0	P	
5 *	434.0650	92.52	-14.55	77.97	100.83	-22.86	Peak	100	0	P	
6	868.3960	44.87	-8.81	36.06	80.83	-44.77	Peak	100	0	P	

Average value:

No.	Freq. [MHz]	PKLevel [dBμV/m]	DCCF [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity	Detector
1	434.0650	77.97	-7.35	70.62	80.83	-10.21	Horizontal	AV
2	868.3960	36.06	-7.35	28.71	60.83	-32.12	Horizontal	AV

Test Antenna Vertical (30MHz to 1GHz)
Level = Reading + Factor



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	37.0250	41.80	-17.21	24.59	40.00	-15.41	QP	100	0	P	
2	50.0566	41.19	-17.54	23.65	40.00	-16.35	QP	100	0	P	
3	126.3285	42.02	-18.31	23.71	43.50	-19.79	QP	100	0	P	
4	158.1123	43.10	-17.24	25.86	43.50	-17.64	QP	100	0	P	
5 *	434.0650	90.94	-14.55	76.39	100.83	-24.44	Peak	100	0	P	
6	868.3582	44.77	-8.97	35.80	80.83	-45.03	Peak	100	0	P	

Average value:

No.	Freq. [MHz]	PKLevel [dBμV/m]	DCCF [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity	Detector
1	434.0650	76.39	-7.35	69.04	80.83	-11.79	Vertical	AV
2	869.1301	35.80	-7.35	28.45	60.83	-32.38	Vertical	AV

Test Antenna Horizontal Above 1GHz

No.	Frequency (MHz)	Reading (dBuv)	Factor (dB/m)	Level (dBuv/m)	Limit (dBuv/m)	Margin(dB)	Detector	P/F
1	1300.000	80.7	-26.3	54.4	74.00	-19.6	peak	P
2	1735.000	81.76	-25.71	56.05	80.83	-24.78	peak	P
3	2170.000	75.73	-24.54	51.19	80.83	-30.64	peak	P
4	2605.000	64.63	-23.01	41.62	80.83	-39.21	peak	P
5	3035.000	57.52	-20.73	36.80	80.83	-44.03	peak	P
6	3470.000	57.44	-20.21	37.23	80.83	-43.60	peak	P
7	3905.000	53.27	-18.86	34.41	74.00	-39.59	peak	P
8	4340.000	52.52	-17.41	35.11	74.00	-38.89	peak	P

Average value:

No.	Freq. [MHz]	PKLevel [dBμV/m]	DCCF [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	P/F
1	1300.00	54.57	-7.35	47.22	54.00	-6.78	AV	P
2	1735.00	56.05	-7.35	48.70	60.83	-12.13	AV	P
3	2170.00	50.19	-7.35	42.84	60.83	-17.99	AV	P
4	2605.00	41.62	-7.35	34.27	60.83	-26.56	AV	P
5	3040.00	36.80	-7.35	29.45	60.83	-31.38	AV	P
6	3470.00	37.23	-7.35	29.88	60.83	-30.95	AV	P
7	3905.28	34.41	-7.35	27.06	54.00	-26.94	AV	P
8	4339.2	35.11	-7.35	27.76	54.00	-26.24	AV	P

Test Antenna Vertical Above 1GHz

No.	Frequency (MHz)	Reading (dBuv)	Factor (dB/m)	Level (dBuv/m)	Limit (dBuv/m)	Margin(dB)	Detector	P/F
1	1300.000	76.03	-26.3	49.73	74.00	-24.27	peak	P
2	1735.000	77.49	-25.71	51.78	80.83	-29.05	peak	P
3	2170.000	68.87	-24.54	44.33	80.83	-37.50	peak	P
4	2605.000	61.73	-23.01	38.72	80.83	-42.11	peak	P
5	3035.000	62.22	-20.73	41.49	80.83	-36.33	peak	P
6	3470.000	58.69	-20.21	38.48	80.83	-42.35	peak	P
7	3905.000	53.69	-18.86	34.83	74.00	-39.17	peak	P
8	4340.000	53.42	-17.41	36.01	74.00	-37.99	peak	P

Average value:

No.	Freq. [MHz]	PKLevel [dBμV/m]	DCCF [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	P/F
1	1300.00	49.73	-7.35	42.38	54.00	-11.62	AV	P
2	1735.00	51.78	-7.35	44.43	60.83	-16.40	AV	P
3	2170.00	43.33	-7.35	35.98	60.83	-24.85	AV	P
4	2605.00	38.72	-7.35	31.37	60.83	-29.46	AV	P
5	3040.00	41.50	-7.35	34.15	60.83	-26.68	AV	P
6	3470.00	38.48	-7.35	31.13	60.83	-29.70	AV	P
7	3905.28	34.83	-7.35	27.48	54.00	-26.52	AV	P
8	4339.2	36.01	-7.35	28.66	54.00	-25.34	AV	P

- End of the Report -