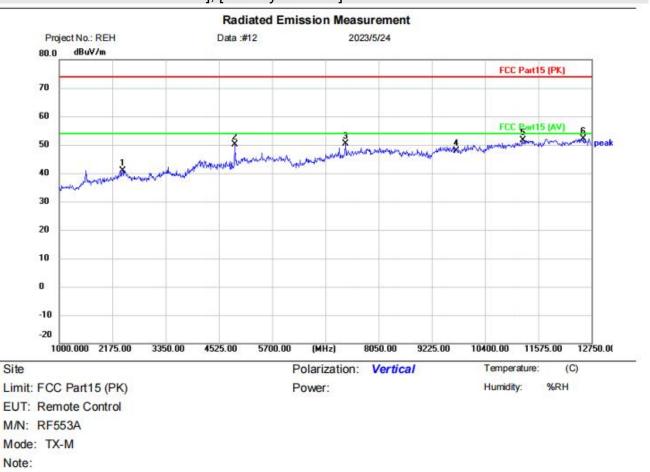


[TestMode: TX middle channel]; [Polarity: Horizontal]

No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		3385.250	43.64	-1.82	41.82	74.00	-32.18	peak	
2		4877.500	47.78	4.35	52.13	74.00	-21.87	peak	
3	*	4877.500	46.53	4.35	50.88	54.00	-3.12	AVG	
4		7321.500	41.89	8.20	50.09	74.00	-23.91	peak	
5		9768.000	36.23	11.31	47.54	74.00	-26.46	peak	
6		10635.00	38.17	12.88	51.05	74.00	-22.95	peak	
7		11716.00	38.31	13.77	52.08	74.00	-21.92	peak	

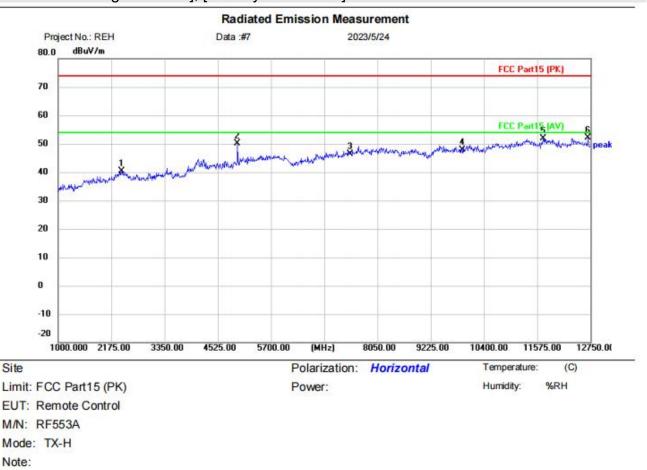




[TestMode: TX middle channel]; [Polarity: Vertical]

No.	Mk	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	1	2398.250	41.90	-1.14	40.76	74.00	-33.24	peak	
2	1 3	4877.500	45.79	4.35	50.14	74.00	-23.86	peak	
3	3	7321.500	42.06	8.20	50.26	74.00	-23.74	peak	
4	3	9768.000	36.48	11.31	47.79	74.00	-26.21	peak	
5	S	11234.25	38.09	13.55	51.64	74.00	-22.36	peak	
6	*	12562.00	38.35	13.88	52.23	74.00	-21.77	peak	

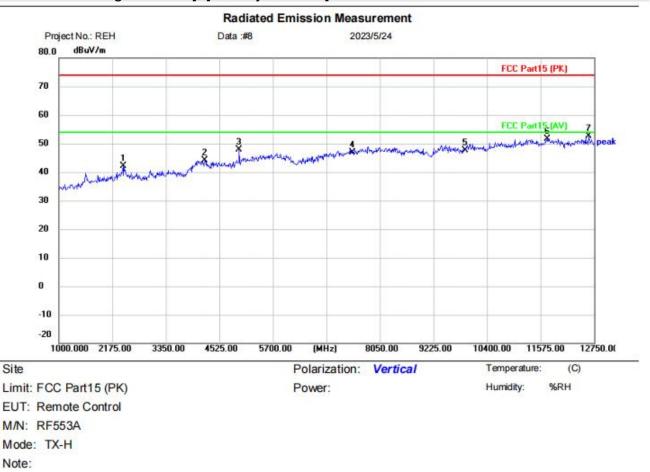




[TestMode: TX High channel]; [Polarity: Horizontal]

No.	Mk	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over			
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment	
1	13	2398.250	41.5 <mark>1</mark>	-1.14	40.37	74.00	-33.63	peak		
2	- 18	4959.750	44.60	5.42	50.02	74.00	-23.98	peak		
3	1	7440.000	37.94	8.48	46.42	74.00	-27.58	peak		
4	1.2	9920.000	36.30	11.69	47.99	74.00	-26.01	peak		
5		11704.25	38.01	13.77	51.78	74.00	-22.22	peak		
6	*	12691.25	38.30	13.86	52.16	74.00	-21.84	peak		





[TestMode: TX High channel]; [Polarity: Vertical]

No.	Mk	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	le l	2410.000	43.30	-1.26	42.04	74.00	-31.96	peak	
2	1	4207.750	39.16	5.07	44.23	74.00	-29.77	peak	
3	3	4959.750	42.56	5.42	47.98	74.00	-26.02	peak	
4		7440.000	38.47	8.48	46.95	74.00	-27.05	peak	
5	- 3	9920.000	35.96	11.69	47.65	74.00	-26.35	peak	
6	4	11716.00	37.82	13.77	51.59	74.00	-22.41	peak	
7	*	12632.50	38.67	13.86	52.53	74.00	-21.47	peak	



13 ANTENNA REQUIREMENT

Test Standard	47 CFR Part 15, Subpart C 15.247					
Test Method	N/A					

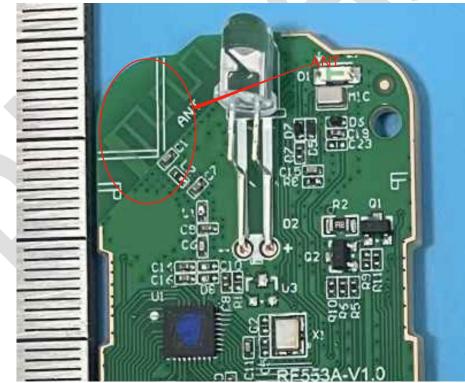
13.1 CONCLUSION

Standard Requirement:

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 antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit permanently attached antenna or of an so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

EUT Antenna:

The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 0.31dBi.





14 RADIATED EMISSIONS WHICH FALL IN THE RESTRICTED BANDS

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 6.10.5
Test Mode (Pre-Scan)	ТХ
Test Mode (Final Test)	ТХ
Tester	Charlie
Temperature	25°C
Humidity	60%

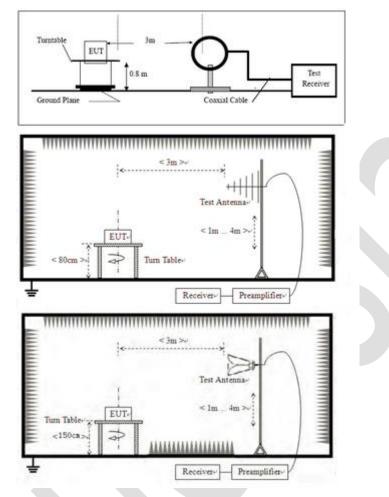
14.1 LIMITS

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

Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, 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.



14.2 BLOCK DIAGRAM OF TEST SETUP



14.3 PROCEDURE

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 middle 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.

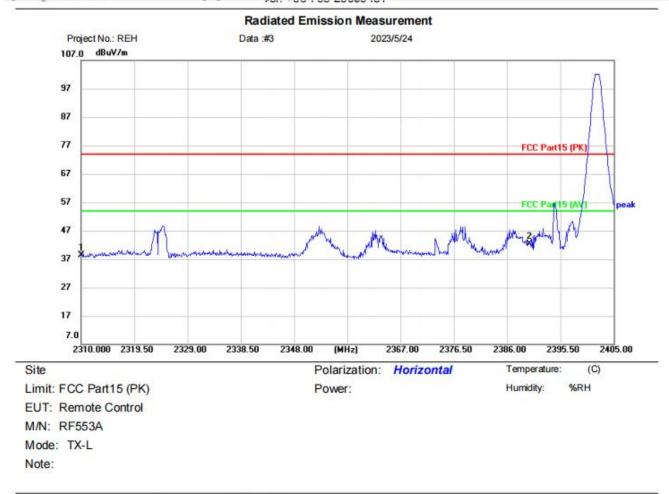
j. Repeat above procedures until all frequencies measured was complete.

Remark 1: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp 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.



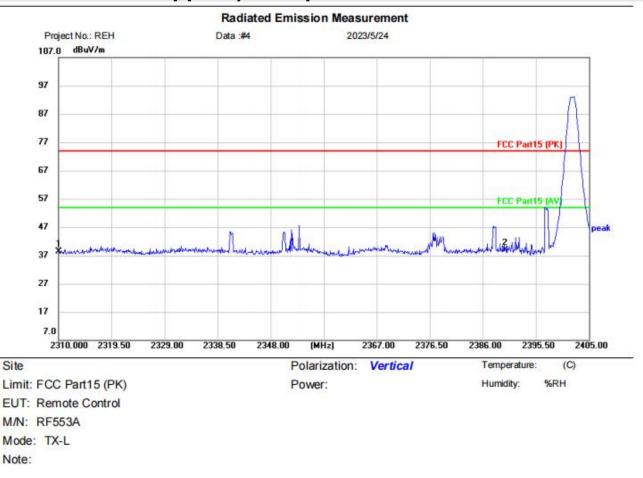
14.4 TEST DATA



[TestMode: TX low channel]; [Polarity: Horizontal]

No.	Mł	k. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over			
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment	
1		2310.000	42.63	-4.27	38.36	74.00	-35.64	peak		
2	*	2390.000	46.29	-3.82	42.47	74.00	-31.53	peak		

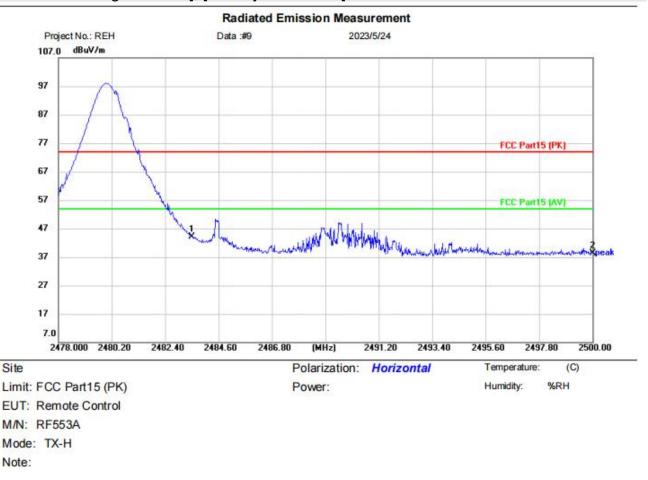




[TestMode:TX low channel]; [Polarity: Vertical]

No.	Mk.	. Freq.	Reading Level dBuV	Correct Factor	Measure- ment dBuV/m	Limit	Over			
		MHz		dB		dBuV/m	dB	Detector	Comment	
1		2310.000	42.65	-4.27	38.38	74.00	-35.62	peak		
2	*	2390.000	42.63	-3.82	38.81	74.00	-35.19	peak		

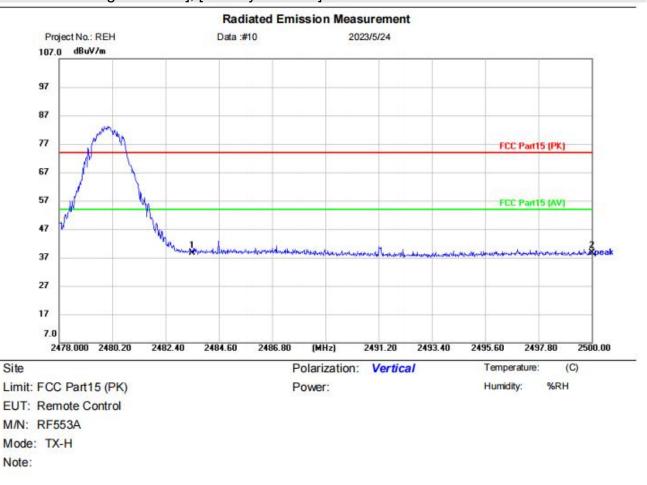




[TestMode: TX High channel]; [Polarity: Horizontal]

No.	Mk	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over			
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment	
1	*	2483.500	48.16	-3.96	44.20	74.00	-29.80	peak		
2	1	2500.000	42.38	-4.00	38.38	74.00	-35.62	peak		





[TestMode:TX High channel]; [Polarity: Vertical]

No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over			
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment	
1	*	2483.500	42.50	-3.96	38.54	74.00	-35.46	peak		
2		2500.000	42.52	-4.00	38.52	74.00	-35.48	peak		



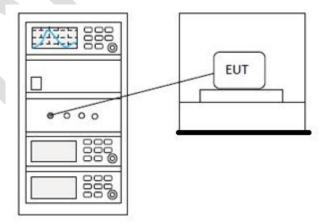
15 CONDUCTED SPURIOUS EMISSIONS

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 7.8.6 & Section 11.11
Test Mode (Pre-Scan)	ТХ
Test Mode (Final Test)	ТХ
Tester	Charlie
Temperature	25°C
Humidity	60%

15.1 LIMITS

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, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.209(a) (see §15.205(c)).

15.2 BLOCK DIAGRAM OF TEST SETUP





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15.3 TEST DATA



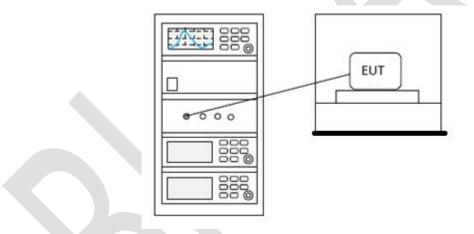
16 POWER SPECTRUM DENSITY

Test Standard	47 CFR Part 15, Subpart C 15.247			
Test Method	ANSI C63.10 (2013) Section 11.10.2			
Test Mode (Pre-Scan)	ТХ			
Test Mode (Final Test)	ТХ			
Tester	Charlie			
Temperature	25°C			
Humidity	60%			

16.1 LIMITS

Limit: \leq 8dBm in any 3 kHz band during any time interval of continuous transmission

16.2 BLOCK DIAGRAM OF TEST SETUP



16.3 TEST DATA



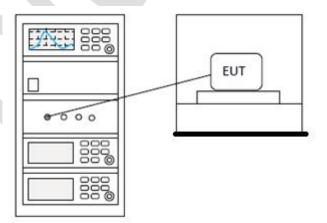
17 CONDUCTED PEAK OUTPUT POWER

Test Standard	47 CFR Part 15, Subpart C 15.247				
Test Method	ANSI C63.10 (2013) Section 7.8.5				
Test Mode (Pre-Scan)	ТХ				
Test Mode (Final Test)	ТХ				
Tester	Charlie				
Temperature	25°C				
Humidity	60%				

17.1 LIMITS

Frequency range(MHz)	Output power of the intentional radiator(watt)			
	1 for \geq 50 hopping channels			
902-928	0.25 for 25≤ hopping channels <50			
	1 for digital modulation			
2400-2483.5	1 for ≥75 non-overlapping hopping channels			
	0.125 for all other frequency hopping systems			
	1 for digital modulation			
5705 5050	1 for frequency hopping systems and digital			
5725-5850	modulation			

17.2 BLOCK DIAGRAM OF TEST SETUP





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17.3 TEST DATA



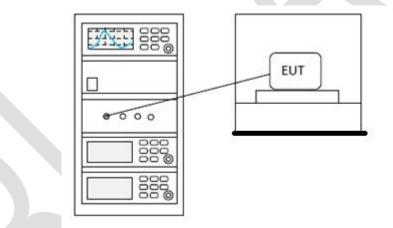
18 MINIMUM 6DB BANDWIDTH

Test Standard	47 CFR Part 15, Subpart C 15.247				
Test Method	ANSI C63.10 (2013) Section 11.8.1				
Test Mode (Pre-Scan)	ТХ				
Test Mode (Final Test)	ТХ				
Tester	Charlie				
Temperature	25°C				
Humidity	60%				

18.1 LIMITS

Limit: | ≥500 kHz

18.2 BLOCK DIAGRAM OF TEST SETUP



18.3 TEST DATA

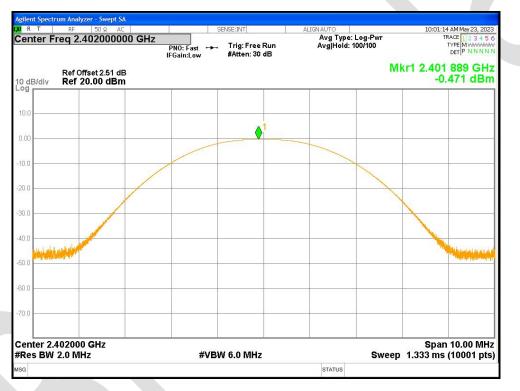


19 APPENDIX

Appendix1

19.1 MAXIMUM CONDUCTED OUTPUT POWER

Condition	Mode	Frequency	Antenna	Conducted Power	Limit	Verdict
		(MHz)		(dBm)	(dBm)	
NVNT	BLE 1M	2402	Ant1	-0.471	30	Pass
NVNT	BLE 1M	2442	Ant1	-0.273	30	Pass
NVNT	BLE 1M	2480	Ant1	-1.723	30	Pass



Power NVNT BLE 1M 2402MHz Ant1

Power NVNT BLE 1M 2442MHz Ant1





Power NVNT BLE 1M 2480MHz Ant1

