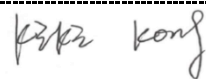
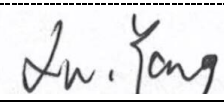


TEST REPORT

For RF

Report No..... :	CHTW25110006	
Project No :	SHT2509020804W	
FCC ID :	2BSSQ-20166RX	
Applicant's name :	Dongguan Silverlit Toys Co., LTD	
Address..... :	No. 292, Huaide Village, Humen Town, Dongguan City, Guangdong Province,523926 China	
Product Name..... :	RC28 ZOOM,RC28T ZOOM	
Trade Mark..... :	-	
Model No..... :	20166	
Listed Model(s) :	20167	
Standard :	FCC CFR Title 47 Part 15 Subpart C § 15.249	
Date of receipt of test sample.....:	2025/10/17	
Date of testing.....:	2025/10/17- 2025/11/28	
Date of issue.....:	2025/11/28	
Result.....:	Pass	

Compiled by (Position+Printed name+Signature) :	File administrator	Xiaodong Zhao	
Supervised by (Position+Printed name+Signature) :	Project Engineer	Kiki Kong	
Approved by (Position+Printed name+Signature) :	RF Manager	Xu Yang	
Testing Laboratory Name	Shenzhen Huatongwei International Inspection Co., Ltd.		
Address..... :	Building 7, Baiwang Idea Factory, No.1051, Songbai Road, Yangguang Community, Xili Subdistrict, Nanshan District, Shenzhen, Guangdong, China		

Test Report Form No. :	R0066
Test Report Form(s) Originator	Shenzhen Huatongwei International Inspection Co., Ltd.
Master TRF	Dated 2025-07

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1. TEST STANDARDS AND REPORT VERSION

1.1. Test Standards

The tests were performed according to following standards:

- [FCC CFR Title 47 Part 15 Subpart C § 15.249](#): Operation within the bands 902-928 MHz, 2400-2483.5 MHz, 5725-5875 MHz, and 24.0-24.25 GHz
- [ANSI C63.10:2020](#): American National Standard for Testing Unlicensed Wireless Devices

1.2. Report version

Revision No.	Date of issue	Description
N/A	2025-11-28	Original

2. TEST DESCRIPTION

Report clause	Test Items	Standard Requirement	Result	Test Engineer
5.1	Antenna Requirement	15.203	PASS	Jiaxing Si
5.2	AC Conducted Emission	15.207	PASS	JUNXU.LIN
5.3	20dB Bandwidth	15.215/15.249	PASS	Jiaxing Si
5.4	99% Occupied Bandwidth	-	PASS ^{*1}	Jiaxing Si
5.5	Duty cycle	-	PASS ^{*1}	Jiaxing Si
5.6	Radiated field strength of the fundamental signal	15.249(a)	PASS	Yifan Wang
5.7	Radiated Band Edge Emission	15.249(a)15.205/15.209	PASS	Yifan Wang
5.8	Radiated Spurious Emission	15.249(d)15.205/15.209	PASS	Yifan Wang

Note:

- The measurement uncertainty is not included in the test result.
- *1: No requirement on standard, only report these test data.

3. SUMMARY

3.1. Client Information

Applicant:	Dongguan Silverlit Toys Co., LTD
Address:	No. 292, Huaide Village, Humen Town, Dongguan City, Guangdong Province, 523926 China
Manufacturer:	Dongguan Silverlit Toys Co., LTD
Address:	No. 292, Huaide Village, Humen Town, Dongguan City, Guangdong Province, 523926 China
Factory:	Dongguan Silverlit Toys Co., LTD
Address:	No. 292, Huaide Village, Humen Town, Dongguan City, Guangdong Province, 523926 China

3.2. Product Description

Main unit information:			
Product Name:	RC28 ZOOM,RC28T ZOOM		
Trade Mark:	-		
Model No.:	20166		
Listed Model(s):	20167		
Model difference	Product Name	Model No	Plastic shell
	RC28 ZOOM	20166	
	RC28T ZOOM	20167	
Power supply:	DC 3.7V from Battery		
Hardware version:	V1.0		
Software version:	V1.0		
Accessory unit information:			
Battery information:	3.7V 150mAh 0.555Wh		

3.3. Radio Specification Description

Operation frequency:	2420-2465MHz
Channel number:	46
Channel separation:	1MHz
Modulation:	GFSK
Antenna type:	Monopole Antenna
Antenna gain:	0 dBi

3.4. Testing Laboratory Information

Laboratory Name	Shenzhen Huatongwei International Inspection Co., Ltd.	
Laboratory Location	Building 7, Baiwang Idea Factory, No.1051, Songbai Road, Yangguang Community, Xili Subdistrict, Nanshan District, Shenzhen, Guangdong, China	
Contact information:	Phone: 400-963-0755 E-mail: cs@szhtw.com.cn http://www.szhtw.com.cn	
Qualifications	Type	Accreditation Number
	FCC Registration Number	762235
	FCC Designation Number	CN1181

4. TEST CONFIGURATION

4.1. Test frequency list

According to section 15.31(m), regards to the operating frequency range over 10 MHz, must select three channels which were tested. The Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, please see the below blue front.

Channel	Frequency (MHz)	Remark
00	2420	CH _L
01	2421	...
:	:	:
23	2443	CH _M
:	:	:
44	2464	...
45	2465	CH _H

4.2. Descriptions of Test mode

For RF test items
The engineering test program was provided and enabled to make EUT continuous transmit.
For AC power line conducted emissions:
The EUT was set to connect with large package sizes transmission.
For Radiated spurious emissions test item:
The engineering test program was provided and enabled to make EUT continuous transmit. The EUT in each of three orthogonal axis emissions had been tested, but only the worst case (X axis) data Recorded in the report.

4.3. Test sample information

Test item	HTW sample no.
RF Conducted test items	Please refer to the description in the appendix report
RF Radiated test items	YPHT25090208002
EMI test items	YPHT25090208004

Note:

RF Conducted test items: 20dB Bandwidth ,99% Occupied Bandwidth, Duty cycle

RF Radiated test items: Radiated Band Edge Emission, Radiated Spurious Emission, Radiated field strength of the fundamental signal

EMI test items : AC Conducted Emission

4.4. Support unit used in test configuration and system

The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application.

The following peripheral devices and interface cables were connected during the measurement:

Whether support unit is used?			
✓ No			
Item	Equipment	Trade Name	Model No.
1			
2			

4.5. Testing environmental condition

Type	Requirement	Actual
Temperature:	15~35°C	25°C
Relative Humidity:	25~75%	50%
Air Pressure:	860~1060mbar	1000mbar

4.6. Statement of the measurement uncertainty

No.	Test Items	Measurement Uncertainty
1	AC Conducted Emission	3.21dB
2	20dB Bandwidth	0.002%
3	99% Occupied Bandwidth	0.002%
4	Duty cycle	-
5	Radiated field strength of the fundamental signal	4.54dB for 30MHz-1GHz 5.10dB for above 1GHz
6	Radiated Band Edge Emission	4.54dB for 30MHz-1GHz 5.10dB for above 1GHz
7	Radiated Spurious Emission	4.54dB for 30MHz-1GHz 5.10dB for above 1GHz

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=1.96$.

4.7. Equipment Used during the Test

● EMC Test Software					
Used	Test Item	Software Name	Manufacturer	Equipment No.	Version
●	Conducted Emission	EMC32	R&S	HTWER012	V10.60.20
●	Radiated Emission	EMC32	R&S	HTWER012	V10.60.20

● RF Test Software					
Used	Test Item	Software Name	Manufacturer	Equipment No.	Version
●	RF Conducted	JS1120-3 RF Test Software	Tonscend	-	V3.6.21
●	Radiated Spurious Emission	E3	AUDIX	HTWER006	V6.110407a

● RF Conducted test item							
Used	Test Equipment	Manufacturer	Equipment No.	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
●	Signal and spectrum Analyzer	R&S	HTWE0242	FSV40	100048	2025/8/19	2026/8/18
●	Vector signal generator	R&S	HTWE0244	SMBV100A	260790	2025/3/13	2026/3/12
●	OSP	R&S	HTWE0243	OSP120	101317	2025/8/19	2026/8/18
●	10dB Attenuator	R&S	HTWE0250-01	10dB Attenuator-1	N/A	2025/8/22	2026/8/21
●	10dB Attenuator	R&S	HTWE0250-02	10dB Attenuator-2	N/A	2025/8/22	2026/8/21
●	10dB Attenuator	R&S	HTWE0250-03	10dB Attenuator-3	N/A	2025/8/22	2026/8/21
●	10dB Attenuator	R&S	HTWE0250-04	10dB Attenuator-4	N/A	2025/8/22	2026/8/21
●	30dB Attenuator	R&S	HTWE0250-05	30dB Attenuator-5	N/A	2025/8/22	2026/8/21

● Auxiliary Equipment							
Used	Test Equipment	Manufacturer	Equipment No.	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
●	Climate chamber	ESPEC	HTWS0715	GPL-2	N/A	2025/6/11	2026/6/10
●	Walk-in Constant Temperature And Humidity Cabinet	重庆银河	HTWS0383	SDJ610A	201800463	2025/6/11	2026/6/10
○	DC Power Supply	Gwinstek	HTWE0274	SPS-2415	GER835793	N/A	N/A
○	DC Power Supply	MESTEK	HTWE0705	DP6010	00230820197	N/A	N/A

● Conducted Emission

Used	Test Equipment	Manufacturer	Equipment No.	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
●	EMI Test Receiver	R&S	HTWE0111	ESCI	101247	2025/8/6	2026/8/5
●	Artificial Mains	SCHWARZBECK	HTWE0113	NNLK 8121	573	2025/8/6	2026/8/5
●	Protection Network	SCHWARZBECK	HTWE0567	VTSD9561FN	00899	2025/8/6	2026/8/5
●	ISN	FCC	HTWE0148	FCC-TLISN-T2-02	20371	2025/8/6	2026/8/5
●	ISN	FCC	HTWE0150	FCC-TLISN-T8-02	20375	2025/8/6	2026/8/5

● Radiated emission- 9kHz~30MHz

Used	Test Equipment	Manufacturer	Equipment No.	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
●	Semi-Anechoic Chamber	Albatross projects	HTWE0127	SAC-3m-02	C11121	2023/4/6	2026/4/5
●	EMI Test Receiver	R&S	HTWE0099	ESCI 7	100900	2025/8/6	2026/8/5
●	Loop Antenna	R&S	HTWE0546	HFH2-Z2E	101073	2024/4/8	2027/4/7

● Radiated emission- 30MHz~1GHz

Used	Test Equipment	Manufacturer	Equipment No.	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
●	Semi-Anechoic Chamber	Albatross projects	HTWE0127	SAC-3m-02	C11121	2023/4/6	2026/4/5
●	EMI Test Receiver	R&S	HTWE0099	ESCI 7	100900	2025/8/6	2026/8/5
●	Ultra-Broadband Antenna	SCHWARZBECK	HTWE0119	VULB9163	546	2023/2/22	2026/2/21
●	Pre-Amplifier	SCHWARZBECK	HTWE0295	BBV 9742	/	2025/5/26	2026/5/25
●	CMAD	SCHWARZBECK	HTWE0537	CMAD1614	1614-530	2025/8/4	2026/8/3

● Radiated emission- Above 1GHz

Used	Test Equipment	Manufacturer	Equipment No.	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
●	Full-Anechoic Chamber	Albatross projects	HTWE0122	SAC-3m-01	C11122	2023/4/17	2026/4/16
●	Spectrum Analyzer	R&S	HTWE0098	FSP40	100597	2025/8/6	2026/8/5
●	Horn Antenna	SCHWARZBECK	HTWE0126	BBHA 9120D	1011	2023/2/14	2026/2/13
●	Broadband Pre-amplifier	SCHWARZBECK	HTWE0551	SCU18F	100855	2025/5/26	2026/5/25

● Auxiliary Equipment

Used	Test Equipment	Manufacturer	Equipment No.	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
○	DC Power Supply	Gwinstek	HTWE0274	SPS-2415	GER835793	N/A	N/A
○	DC Power Supply	MESTEK	HTWE0705	DP6010	00230820197	N/A	N/A

5. TEST CONDITIONS AND RESULTS

5.1. Antenna Requirement

REQUIREMENT

FCC CFR Title 47 Part 15 Subpart C Section 15.203:

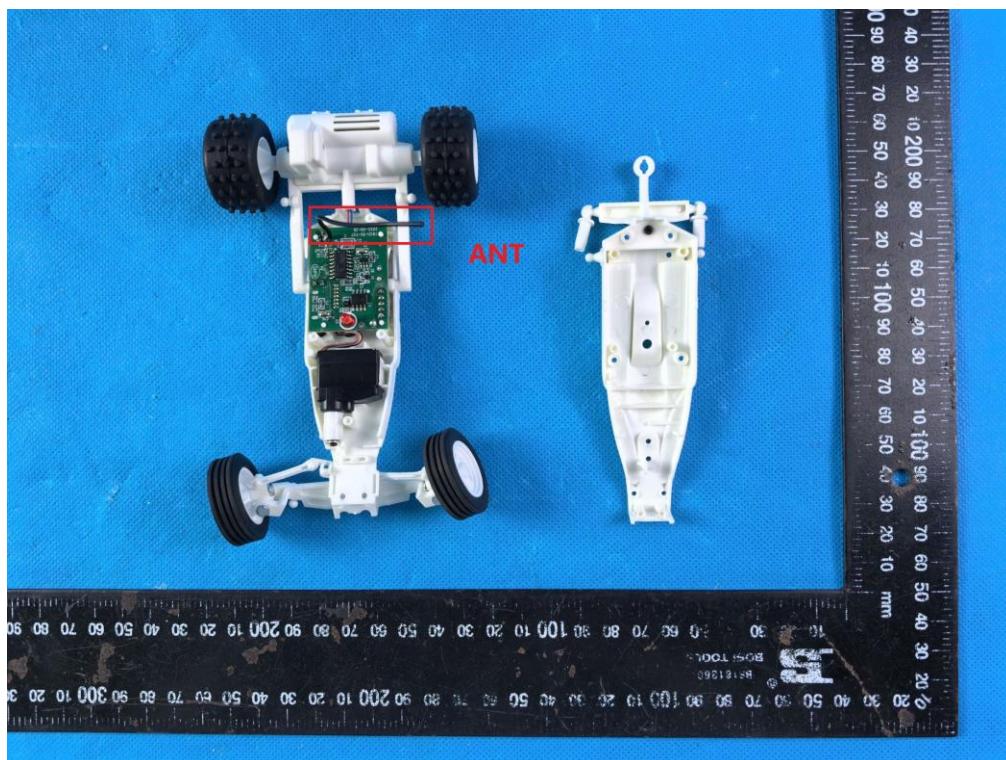
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit 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 RESULT

☒ Passed ☐ Not Applicable

The antenna type is a Monopole antenna, the directional gain of the antenna less than 6 dBi, please refer to the below antenna photo.

I



5.2. AC Conducted Emission

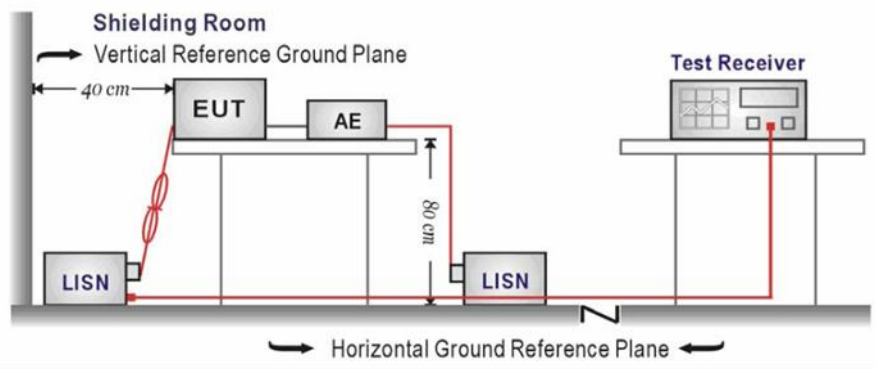
LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.207

Frequency range (MHz)	Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

TEST CONFIGURATION



TEST PROCEDURE

1. The EUT was setup according to ANSI C63.10 requirements.
2. The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface.
3. The EUT and simulators are connected to the main power through a line impedances stabilization network (LISN). The LISN provides a 50 ohm /50uH coupling impedance for the measuring equipment.
4. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs)
5. Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source.
6. The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.
7. Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9 kHz.
8. During the above scans, the emissions were maximized by cable manipulation.

TEST MODE

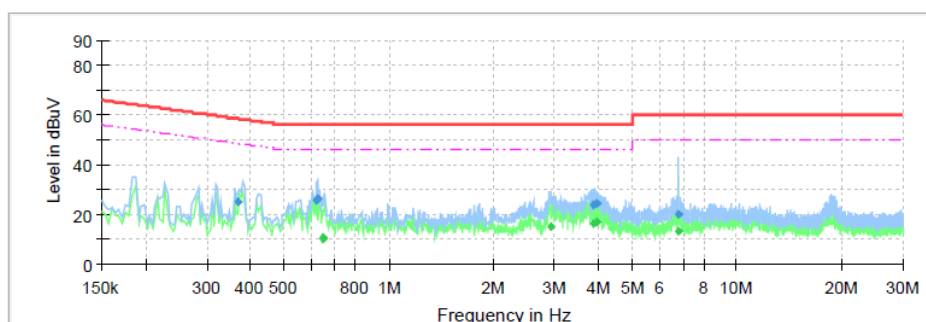
Please refer to the clause 4.2

TEST RESULT

☒ Passed ☐ Not Applicable

Test Line:

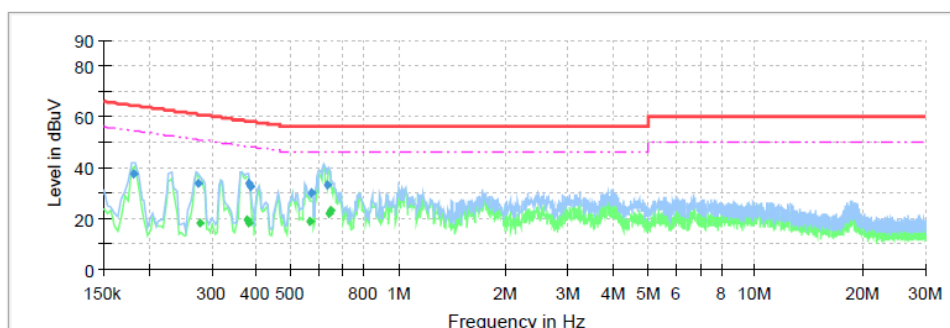
L

**Final Result**

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Corr. (dB)
0.3708	25.19	---	58.48	33.29	L1	10.0
0.6166	25.56	---	56.00	30.44	L1	10.2
0.6254	26.02	---	56.00	29.98	L1	10.2
0.6454	---	10.43	46.00	35.57	L1	10.2
0.6486	---	10.20	46.00	35.80	L1	10.2
2.9198	---	14.70	46.00	31.30	L1	10.3
3.8542	---	16.03	46.00	29.97	L1	10.3
3.8596	23.97	---	56.00	32.03	L1	10.3
3.9411	24.08	---	56.00	31.92	L1	10.2
3.9760	---	16.83	46.00	29.17	L1	10.2
6.8227	---	13.16	50.00	36.84	L1	10.3
6.8307	19.70	---	60.00	40.30	L1	10.3

Test Line:

N

**Final Result**

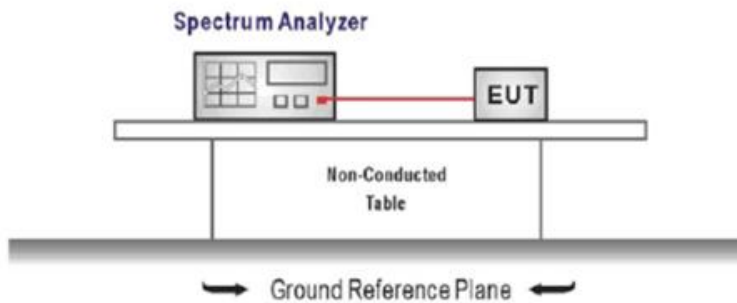
Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Corr. (dB)
0.1811	37.81	---	64.44	26.63	N	10.1
0.2744	33.46	---	60.98	27.52	N	10.3
0.2786	---	17.97	50.86	32.89	N	10.3
0.3762	---	19.33	48.36	29.03	N	10.3
0.3799	---	18.31	48.28	29.97	N	10.3
0.3802	33.72	---	58.28	24.55	N	10.3
0.3839	32.53	---	58.19	25.67	N	10.3
0.5627	---	18.62	46.00	27.38	N	10.3
0.5707	29.94	---	56.00	26.06	N	10.3
0.6336	33.10	---	56.00	22.90	N	10.3
0.6376	---	21.79	46.00	24.21	N	10.3
0.6443	---	23.12	46.00	22.88	N	10.3

5.3. 20dB bandwidth

LIMIT

N/A

TEST CONFIGURATION



TEST PROCEDURE

1. Connect the antenna port(s) to the spectrum analyzer input.
2. Configure the spectrum analyzer as shown below (enter all losses between the transmitter output and the spectrum analyzer).
Center Frequency = channel center frequency
Span= approximately 2 to 3 times the 20 dB bandwidth
RBW = 300 kHz, VBW $\geq 3 \times$ RBW
Sweep time= auto couple
Detector = Peak
Trace mode = max hold
3. Place the radio in continuous transmit mode, allow the trace to stabilize, view the transmitter waveform on the spectrum analyzer.
4. 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, and record the pertinent measurements.

TEST MODE

Please refer to the clause 4.2

TEST RESULT

☒ Passed ☐ Not Applicable

TEST DATA

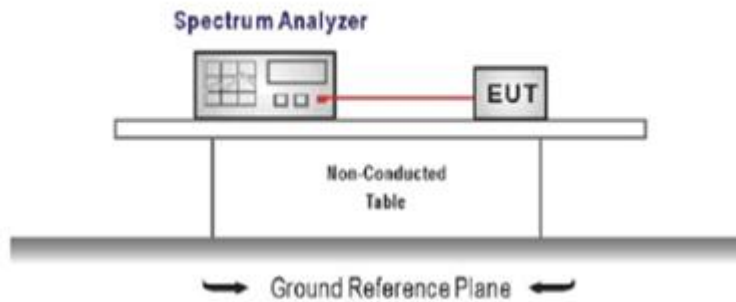
Refer to the appendix report

5.4. 99% Occupied Bandwidth

LIMIT

N/A

TEST CONFIGURATION



TEST PROCEDURE

1. Connect the antenna port(s) to the spectrum analyzer input.
2. Configure the spectrum analyzer as shown below (enter all losses between the transmitter output and the spectrum analyzer).
Center Frequency = channel center frequency
 $\text{Span} \geq 1.5 \times \text{OBW}$
 $\text{RBW} = 1\% \sim 5\% \text{OBW}$
 $\text{VBW} \geq 3 \times \text{RBW}$
Sweep time = auto couple
Detector = Peak
Trace mode = max hold
3. Place the radio in continuous transmit mode, allow the trace to stabilize, view the transmitter waveform on the spectrum analyzer.

TEST MODE

Please refer to the clause 4.2

TEST RESULT

☒ Passed ☐ Not Applicable

TEST DATA

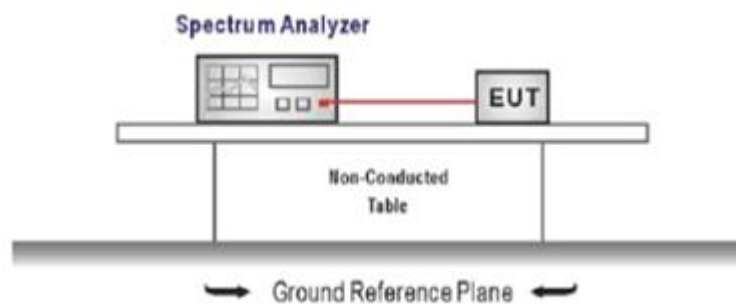
Refer to the appendix report

5.5. Duty Cycle

LIMIT

N/A

TEST CONFIGURATION



TEST PROCEDURE

1. The transmitter output was connected to the spectrum analyzer through an attenuator, the path loss was compensated to the results for each measurement.
2. Set to the maximum power setting and enable the EUT transmit continuously
3. Use the following spectrum analyzer settings:
Span=zero span, Frequency=centered channel, RBW= 10 MHz, VBW $\geq$ RBW
Sweep=as necessary to capture the entire dwell time,
Detector function = peak, Trigger mode
4. Measure and record the duty cycle data

TEST MODE

Please refer to the clause 4.2

TEST RESULT

☒ Passed ☐ Not Applicable

TEST DATA

Refer to the appendix report

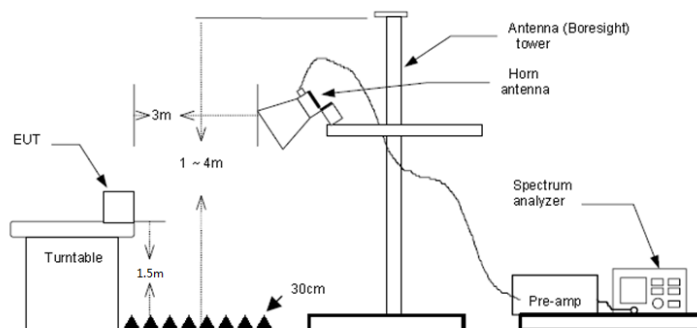
5.6. Radiated field strength of the fundamental signal

LIMIT

Fundamental frequency	Field strength of fundamental (millivolts/meter)	Field strength of harmonics (microvolts/meter)
902-928 MHz	50 (94dBuV/m @3m)	500 (54dBuV/m @3m)
2400-2483.5 MHz	50 (94dBuV/m @3m)	500 (54dBuV/m @3m)
5725-5875 MHz	50 (94dBuV/m @3m)	500 (54dBuV/m @3m)
24.0-24.25 GHz	250 (108dBuV/m @3m)	2500 (68dBuV/m @3m)

Frequencies above 1000 MHz, the field strength limits are based on average limits

TEST CONFIGURATION



TEST PROCEDURE

- The EUT was setup and tested according to ANSI C63.10 requirements.
- The EUT is placed on a turn table which is 1.5 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level.
- The EUT was positioned such that the distance from antenna to the EUT was 3 meters.
- The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10 on radiated measurement.
- Use the following spectrum analyzer settings:
 - Span shall wide enough to fully capture the emission being measured
 - Set RBW=100kHz for <1GHz, VBW=3*RBW, Sweep time=auto, Detector=peak, Trace=max hold
 - Set RBW=1MHz, VBW=3MHz for >1GHz, Sweep time=auto, Detector=peak, Trace=max hold for Peak measurement

For average measurement:

 - VBW=10Hz, When duty cycle is no less than 98 percent
 - VBW $\geq 1/T$, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation, so refer to this clause 5.6 duty cycle.

TEST MODE

Please refer to the clause 4.2

TEST RESULTS

☒ Passed ☐ Not Applicable

Note:

1) Level= Reading + Factor; Factor =Antenna Factor+ Cable Loss- Preamp Factor

2) Margin = Limit – Level

Test channel		CH _L			Polarity		Horizontal		
Mark	Frequency MHz	Reading dBuV/m	Antenna dB	Cable dB	Preamp dB	Level dBuV/m	Limit dBuV/m	Over limit	Remark
1	2419.68	101.59	27.46	4.21	41.00	92.26	114.00	-21.74	Peak
Test channel		CH _L			Polarity		Vertical		
Mark	Frequency MHz	Reading dBuV/m	Antenna dB	Cable dB	Preamp dB	Level dBuV/m	Limit dBuV/m	Over limit	Remark
1	2419.98	102.53	27.46	4.22	41.00	93.21	94.00	-0.79	Average
2	2419.98	106.64	27.46	4.22	41.00	97.32	114.00	-16.68	Peak

Test channel		CH _M			Polarity		Horizontal		
Mark	Frequency MHz	Reading dBuV/m	Antenna dB	Cable dB	Preamp dB	Level dBuV/m	Limit dBuV/m	Over limit	Remark
1	2443.02	102.15	27.41	4.23	41.00	92.79	114.00	-21.21	Peak
Test channel		CH _M			Polarity		Vertical		
Mark	Frequency MHz	Reading dBuV/m	Antenna dB	Cable dB	Preamp dB	Level dBuV/m	Limit dBuV/m	Over limit	Remark
1	2443.01	100.70	27.41	4.23	41.00	91.34	94.00	-2.66	Average
2	2443.02	105.01	27.41	4.23	41.00	95.65	114.00	-18.35	Peak

Test channel		CH _H			Polarity		Horizontal		
Mark	Frequency MHz	Reading dBuV/m	Antenna dB	Cable dB	Preamp dB	Level dBuV/m	Limit dBuV/m	Over limit	Remark
1	2464.70	101.01	27.37	4.25	41.00	91.63	114.00	-22.37	Peak
Test channel		CH _H			Polarity		Vertical		
Mark	Frequency MHz	Reading dBuV/m	Antenna dB	Cable dB	Preamp dB	Level dBuV/m	Limit dBuV/m	Over limit	Remark
1	2464.97	101.67	27.37	4.25	41.00	92.29	94.00	-1.71	Average
2	2464.98	105.64	27.37	4.25	41.00	96.26	114.00	-17.74	Peak

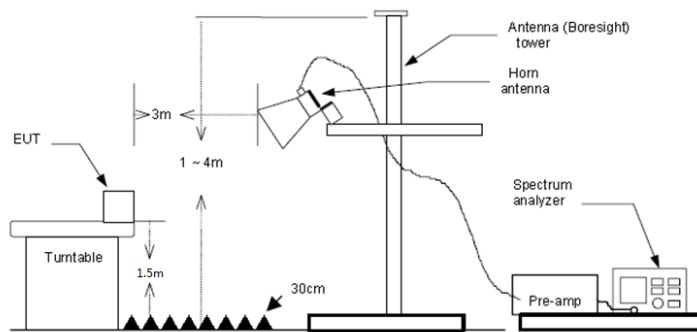
5.7. Radiated Band edge Emission

LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (d):

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, Radiated Emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the Radiated Emissions limits specified in §15.209(a) (see §15.205(c)).

TEST CONFIGURATION



TEST PROCEDURE

1. The EUT was setup and tested according to ANSI C63.10 .
2. The EUT is placed on a turn table which is 1.5 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level.
3. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.
4. The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10 on radiated measurement.
5. Use the following spectrum analyzer settings:
 - a) Span shall wide enough to fully capture the emission being measured
 - b) Set RBW=100kHz for <1GHz, VBW=3*RBW, Sweep time=auto, Detector=peak, Trace=max hold
 - c) Set RBW=1MHz, VBW=3MHz for >1GHz, Sweep time=auto, Detector=peak, Trace=max hold for Peak measurement

For average measurement:

 - VBW=10Hz, When duty cycle is no less than 98 percent
 - $VBW \geq 1/T$, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation, so refer to this clause 5.6 duty cycle.

TEST MODE

Please refer to the clause 4.2

TEST RESULT

☒ Passed ☐ Not Applicable

Note:

- 3) Level= Reading + Factor; Factor =Antenna Factor+ Cable Loss- Preamp Factor
- 4) Over Limit = Level– Limit
- 5) Average measurement was not performed if peak level is lower than average limit(54 dBuV/m).

Test channel		CH _L			Polarity			Horizontal	
Mark	Frequency MHz	Reading dBuV/m	Antenna dB	Cable dB	Preamp dB	Level dBuV/m	Limit dBuV/m	Over limit	Remark
1	2310.00	48.12	27.86	4.11	41.00	39.09	74.00	-34.91	Peak
2	2389.99	55.13	27.54	4.19	41.00	45.86	74.00	-28.14	Peak
Mark	Frequency MHz	Reading dBuV/m	Antenna dB	Cable dB	Preamp dB	Level dBuV/m	Limit dBuV/m	Over limit	Remark
1	2310.00	37.71	27.86	4.11	41.00	28.68	54.00	-25.32	Average
2	2389.99	38.14	27.54	4.19	41.00	28.87	54.00	-25.13	Average
Test channel		CH _L			Polarity			Vertical	
Mark	Frequency MHz	Reading dBuV/m	Antenna dB	Cable dB	Preamp dB	Level dBuV/m	Limit dBuV/m	Over limit	Remark
1	2310.00	48.24	27.86	4.11	41.00	39.21	74.00	-34.79	Peak
2	2389.99	60.13	27.54	4.19	41.00	50.86	74.00	-23.14	Peak
Mark	Frequency MHz	Reading dBuV/m	Antenna dB	Cable dB	Preamp dB	Level dBuV/m	Limit dBuV/m	Over limit	Remark
1	2310.00	38.28	27.86	4.11	41.00	29.25	54.00	-24.75	Average
2	2389.99	39.71	27.54	4.19	41.00	30.44	54.00	-23.56	Average

Test channel		CH _H			Polarity			Horizontal	
Mark	Frequency MHz	Reading dBuV/m	Antenna dB	Cable dB	Preamp dB	Level dBuV/m	Limit dBuV/m	Over limit	Remark
1	2483.48	59.91	27.33	4.27	41.00	50.51	74.00	-23.49	Peak
2	2500.00	53.74	27.30	4.28	41.00	44.32	74.00	-29.68	Peak
Mark	Frequency MHz	Reading dBuV/m	Antenna dB	Cable dB	Preamp dB	Level dBuV/m	Limit dBuV/m	Over limit	Remark
1	2483.48	41.33	27.33	4.27	41.00	31.93	54.00	-22.07	Average
2	2500.00	38.39	27.30	4.28	41.00	28.97	54.00	-25.03	Average
Test channel		CH _H			Polarity			Vertical	
Mark	Frequency MHz	Reading dBuV/m	Antenna dB	Cable dB	Preamp dB	Level dBuV/m	Limit dBuV/m	Over limit	Remark
1	2483.48	63.72	27.33	4.27	41.00	54.32	74.00	-19.68	Peak
2	2500.00	58.07	27.30	4.28	41.00	48.65	74.00	-25.35	Peak
Mark	Frequency MHz	Reading dBuV/m	Antenna dB	Cable dB	Preamp dB	Level dBuV/m	Limit dBuV/m	Over limit	Remark
1	2483.48	44.10	27.33	4.27	41.00	34.70	54.00	-19.30	Average
2	2500.00	39.14	27.30	4.28	41.00	29.72	54.00	-24.28	Average

5.8. Radiated Spurious Emission

LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.209

Frequency	Limit (dBuV/m)	Value
0.009 MHz ~0.49 MHz	2400/F(kHz) @300m	Quasi-peak
0.49 MHz ~ 1.705 MHz	24000/F(kHz) @30m	Quasi-peak
1.705 MHz ~30 MHz	30 @30m	Quasi-peak

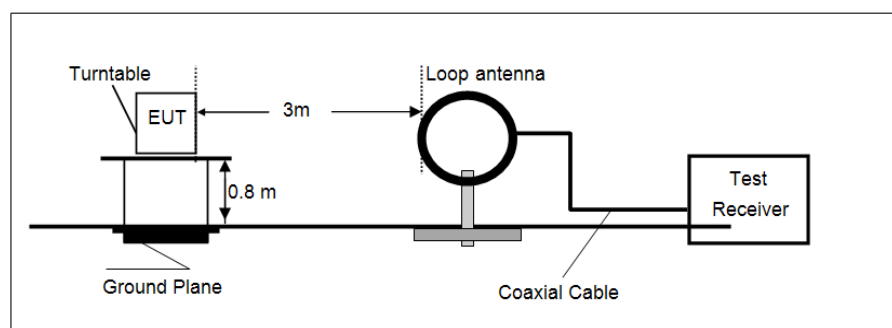
Note: Limit dBuV/m @3m = Limit dBuV/m @300m + $40 \cdot \log(300/3)$ = Limit dBuV/m @300m +80,

Limit dBuV/m @3m = Limit dBuV/m @30m + $40 \cdot \log(30/3)$ = Limit dBuV/m @30m + 40.

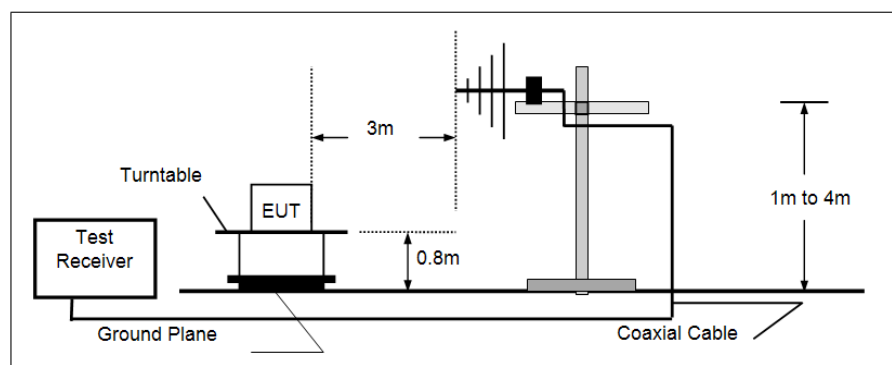
Frequency	Limit (dBuV/m @3m)	Value
30MHz~88MHz	40.00	Quasi-peak
88MHz~216MHz	43.50	Quasi-peak
216MHz~960MHz	46.00	Quasi-peak
960MHz~1GHz	54.00	Quasi-peak
Above 1GHz	54.00	Average
	74.00	Peak

TEST CONFIGURATION

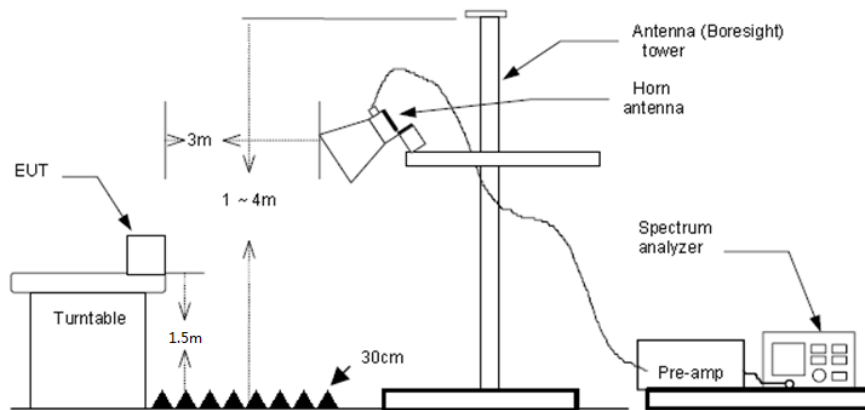
- 9 kHz ~ 30 MHz



- 30 MHz ~ 1 GHz



- Above 1 GHz



TEST PROCEDURE

1. The EUT was setup and tested according to ANSI C63.10 .
2. The EUT is placed on a turn table which is 0.8 meter above ground for below 1 GHz, and 1.5 m for above 1 GHz. The turn table is rotated 360 degrees to determine the position of the maximum emission level.
3. The EUT was set 3 meters from the receiving antenna, which was mounted on the top of a variable height antenna tower.
4. For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines.
5. Set to the maximum power setting and enable the EUT transmit continuously.
6. Use the following spectrum analyzer settings
 - a) Span shall wide enough to fully capture the emission being measured;
 - b) Below 1 GHz:

RBW=120 kHz, VBW=300 kHz, Sweep=auto, Detector function=peak, Trace=max hold;

If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
 - c) Set RBW=1MHz, VBW=3MHz for >1GHz, Sweep time=auto, Detector=peak, Trace=max hold for Peak measurement

For average measurement:

 - VBW=10Hz, When duty cycle is no less than 98 percent
 - VBW $\geq 1/T$, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation, so refer to this clause 5.6 duty cycle.

TEST MODE

Please refer to the clause 4.2

TEST RESULT

☒ Passed ☐ Not Applicable

Note:

- 1) Level= Reading + Factor/Transd; Factor/Transd =Antenna Factor+ Cable Loss- Preamp Factor
- 2) Over Limit = Level– Limit

- 3) Average measurement was not performed if peak level is lower than average limit(54 dBuV/m) for above 1GHz.

For 9 kHz ~ 30 MHz

The EUT was pre-scanned this frequency band, found the radiated level 20dB lower than the limit, so don't show data on this report.

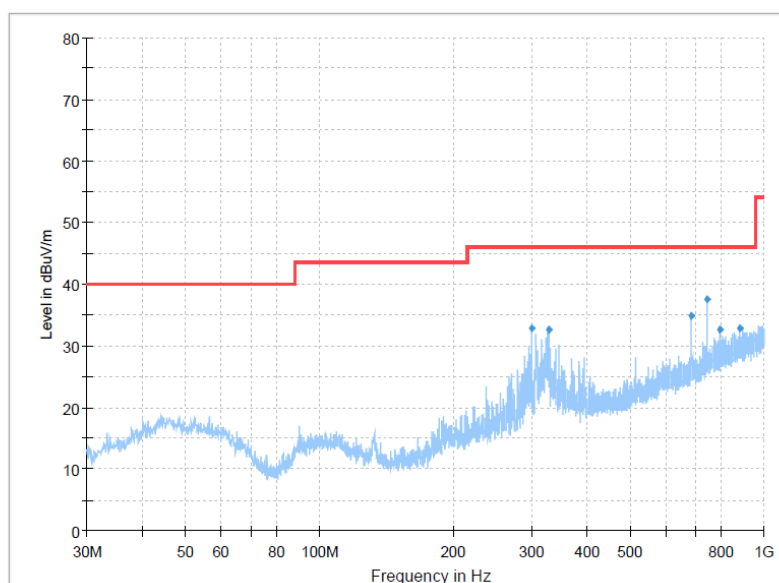
For 30 MHz ~ 1000 MHz

Have pre-scan all test channel, found CH_M which it was worst case, so only show the worst case's data on this report.

Model: 20166

Polarization:

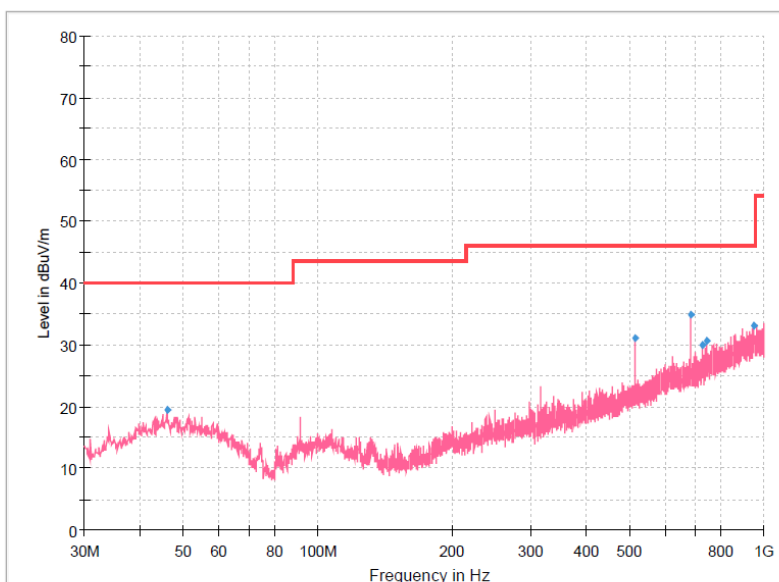
Horizontal

**Final Result**

Frequency (MHz)	MaxPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
299.2963	32.89	46.00	13.11	100.0	H	277.0	-7.3
327.1838	32.56	46.00	13.44	100.0	H	91.0	-6.5
687.5388	34.87	46.00	11.13	100.0	H	225.0	2.1
744.0413	37.49	46.00	8.51	300.0	H	227.0	3.6
797.9975	32.60	46.00	13.40	100.0	H	80.0	4.4
879.2350	32.87	46.00	13.13	100.0	H	80.0	6.0

Polarization:

Vertical

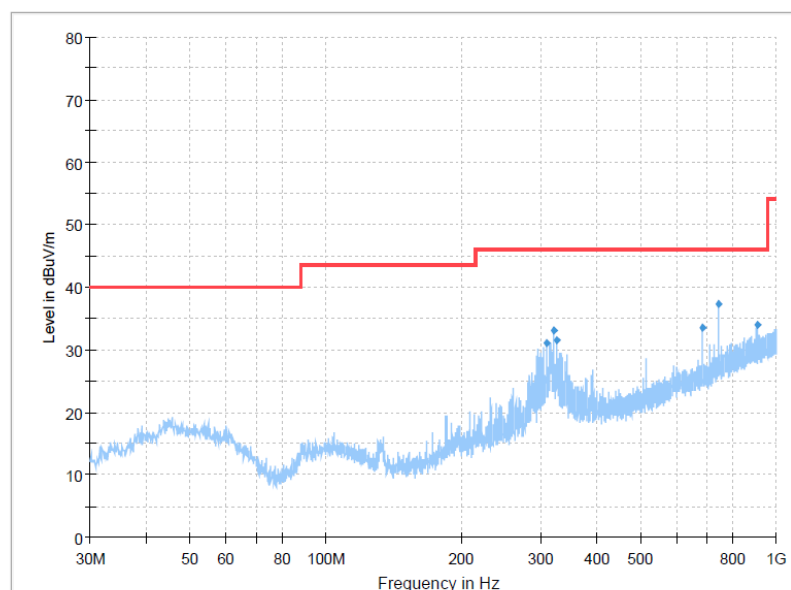
**Final Result**

Frequency (MHz)	MaxPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
45.8838	19.44	40.00	20.56	100.0	V	0.0	-8.6
513.0600	31.02	46.00	14.98	100.0	V	238.0	-1.7
687.5388	34.90	46.00	11.10	100.0	V	225.0	2.1
729.8550	29.84	46.00	16.16	100.0	V	247.0	3.2
744.0413	30.53	46.00	15.47	100.0	V	100.0	3.6
951.9850	33.06	46.00	12.94	100.0	V	322.0	7.1

Model: 20167

Polarization:

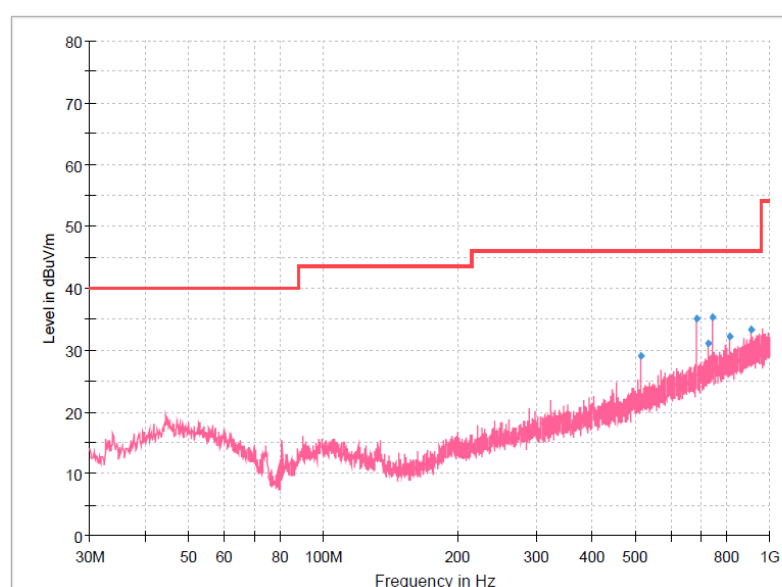
Horizontal

**Final Result**

Frequency (MHz)	MaxPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
309.4813	31.01	46.00	14.99	100.0	H	253.0	-7.3
319.9088	33.02	46.00	12.98	100.0	H	280.0	-6.9
325.4863	31.47	46.00	14.53	100.0	H	253.0	-6.6
687.5388	33.61	46.00	12.39	100.0	H	338.0	2.1
744.0413	37.24	46.00	8.76	100.0	H	5.0	3.6
905.9100	33.94	46.00	12.06	100.0	H	94.0	6.6

Polarization:

Vertical

**Final Result**

Frequency (MHz)	MaxPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
513.0600	28.97	46.00	17.03	100.0	V	111.0	-1.7
687.5388	35.10	46.00	10.90	100.0	V	37.0	2.1
729.8550	31.13	46.00	14.87	100.0	V	300.0	3.2
744.0413	35.38	46.00	10.62	100.0	V	291.0	3.6
812.5475	32.26	46.00	13.74	100.0	V	227.0	4.5
906.6375	33.40	46.00	12.60	100.0	V	0.0	6.6

For 1 GHz ~ 25 GHz

Test channel		CH _L			Polarity			Horizontal	
Mark	Frequency MHz	Reading dBuV/m	Antenna dB	Cable dB	Preamp dB	Level dBuV/m	Limit dBuV/m	Over limit	Remark
1	3634.91	44.15	29.23	5.27	40.69	37.96	74.00	-36.04	Peak
2	4846.37	52.35	31.21	6.25	40.08	49.73	74.00	-24.27	Peak
3	7264.28	43.45	36.03	7.84	38.96	48.36	74.00	-25.64	Peak
4	11515.68	40.83	40.47	9.33	40.02	50.61	74.00	-23.39	Peak

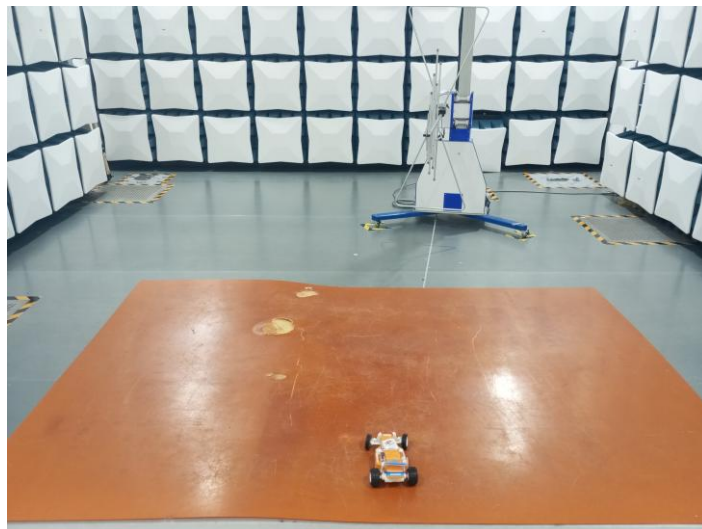
Test channel		CH _M			Polarity			Horizontal	
Mark	Frequency MHz	Reading dBuV/m	Antenna dB	Cable dB	Preamp dB	Level dBuV/m	Limit dBuV/m	Over limit	Remark
1	3653.46	43.10	29.20	5.26	40.68	36.88	74.00	-37.12	Peak
2	4883.52	51.90	31.20	6.35	40.04	49.41	74.00	-24.59	Peak
3	7508.69	40.13	36.18	7.98	39.20	45.09	74.00	-28.91	Peak
4	11486.41	39.31	40.49	9.29	40.02	49.07	74.00	-24.93	Peak

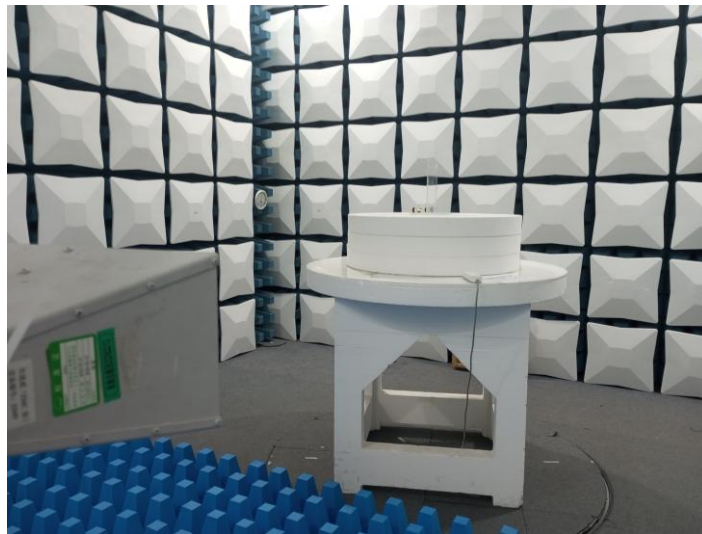
Test channel		CH _H			Polarity			Horizontal	
Mark	Frequency MHz	Reading dBuV/m	Antenna dB	Cable dB	Preamp dB	Level dBuV/m	Limit dBuV/m	Over limit	Remark
1	4202.50	43.96	29.91	5.79	40.40	39.26	74.00	-34.74	Peak
2	4933.50	51.99	31.20	6.36	39.98	49.57	74.00	-24.43	Peak
3	7394.88	43.42	36.20	7.90	39.17	48.35	74.00	-25.65	Peak
4	11399.03	40.19	40.40	9.22	40.12	49.69	74.00	-24.31	Peak

Test channel		CH _H			Polarity			Vertical	
Mark	Frequency MHz	Reading dBuV/m	Antenna dB	Cable dB	Preamp dB	Level dBuV/m	Limit dBuV/m	Over limit	Remark
1	3943.39	43.92	29.70	5.51	40.46	38.67	74.00	-35.33	Peak
2	4933.50	53.82	31.20	6.36	39.98	51.40	74.00	-22.60	Peak
3	7394.88	42.94	36.20	7.90	39.17	47.87	74.00	-26.13	Peak
4	11428.08	40.03	40.43	9.24	40.09	49.61	74.00	-24.39	Peak

6. TEST SETUP PHOTOS

Radiated Emission



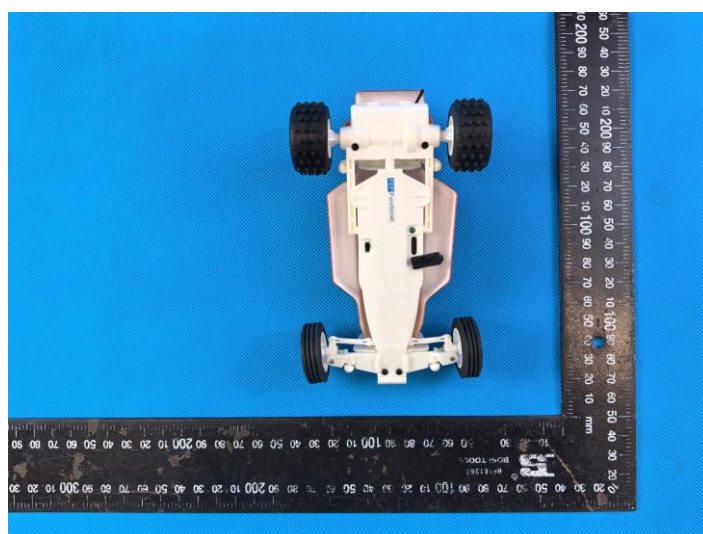
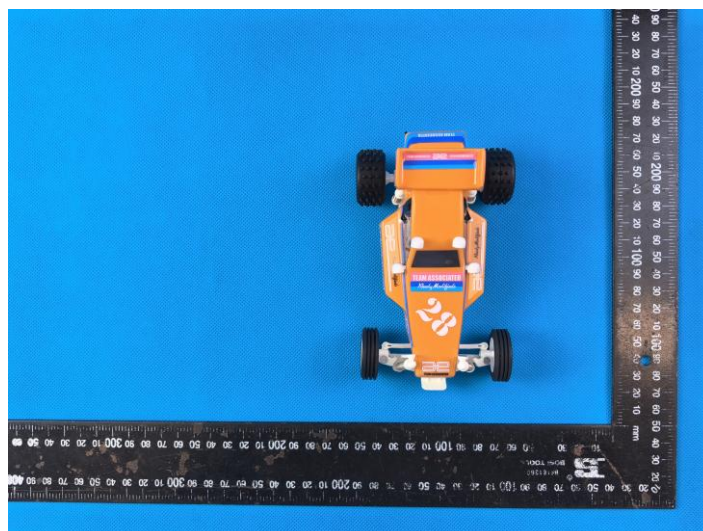


AC Conducted Emission



7. EXTERNAL AND INTERNAL PHOTOS OF THE EUT

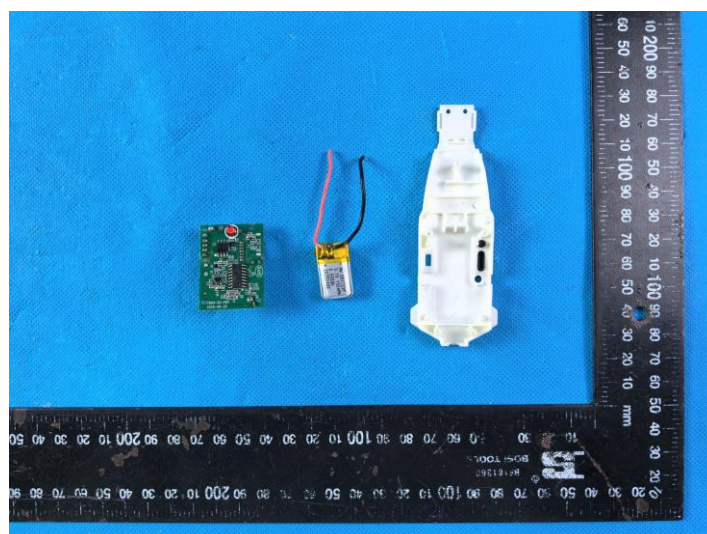
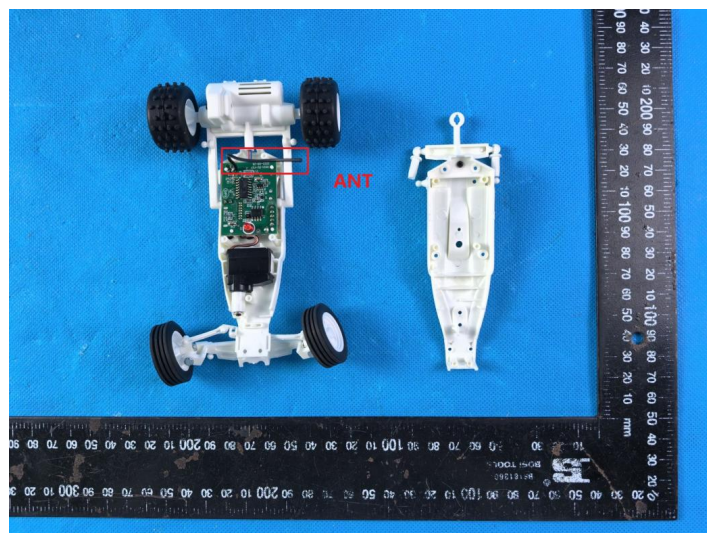
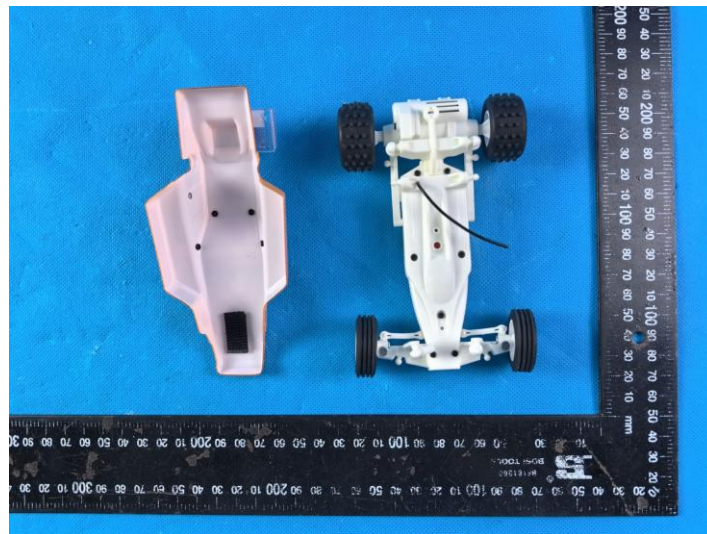
7.1. External Photos

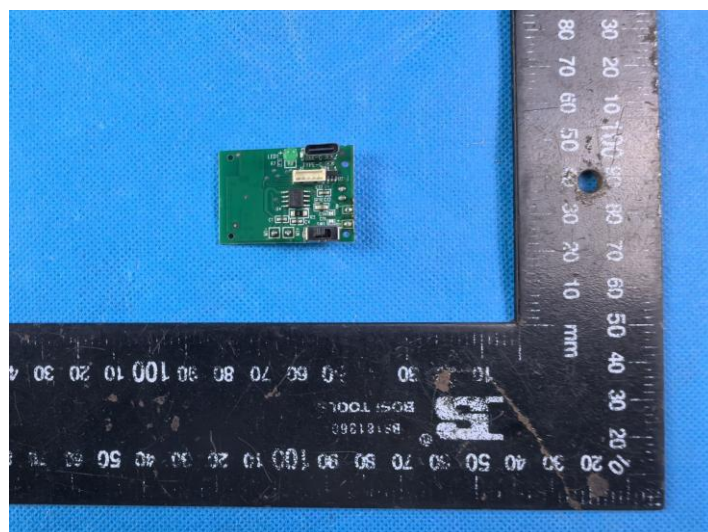
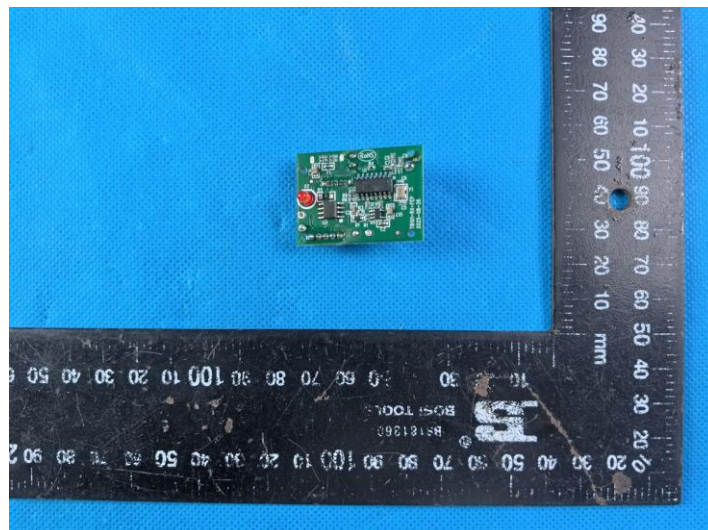


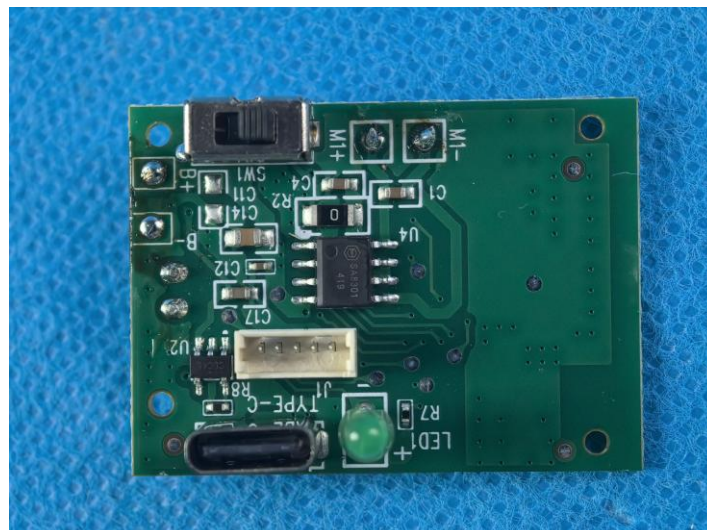
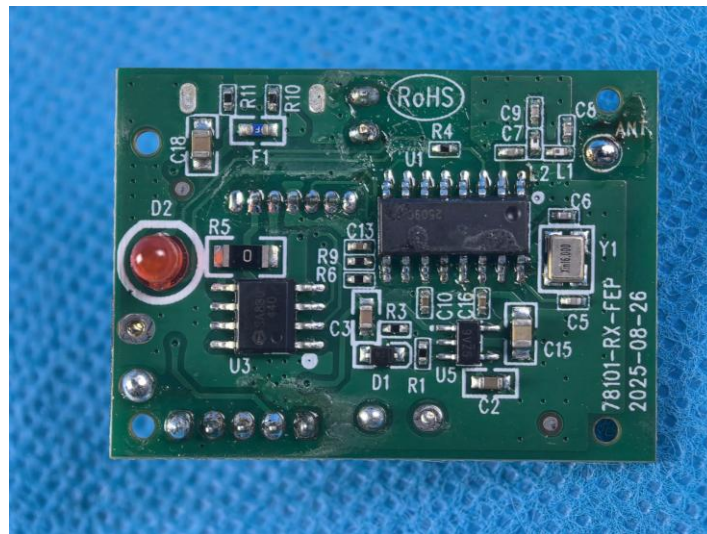




7.2. Internal Photos







8. APPENDIX REPORT

APPENDIX REPORT

Project No.	SHT2509020804W	Radio Specification	2.4G
Test sample No.	YPHT25090208002	Model No.	20166
Start test date	2025-10-24	Finish date	2025-11-28
Temperature	22.6℃	Humidity	58%
Test Engineer	Jiaxing Si	Auditor	Xiaodong Zhuo

Appendix clause	Test item	Result
A	20dB Bandwidth	PASS
B	99% Occupied Bandwidth	PASS
C	Duty Cycle	PASS

Appendix A: 20dB Bandwidth

Test Result

TestMode	Frequency[MHz]	20db Bandwidth [MHz]	Limit[MHz]	Verdict
2.4G	2420	14.327	---	---
2.4G	2443	15.702	---	---
2.4G	2465	17.511	---	---

Test Graphs



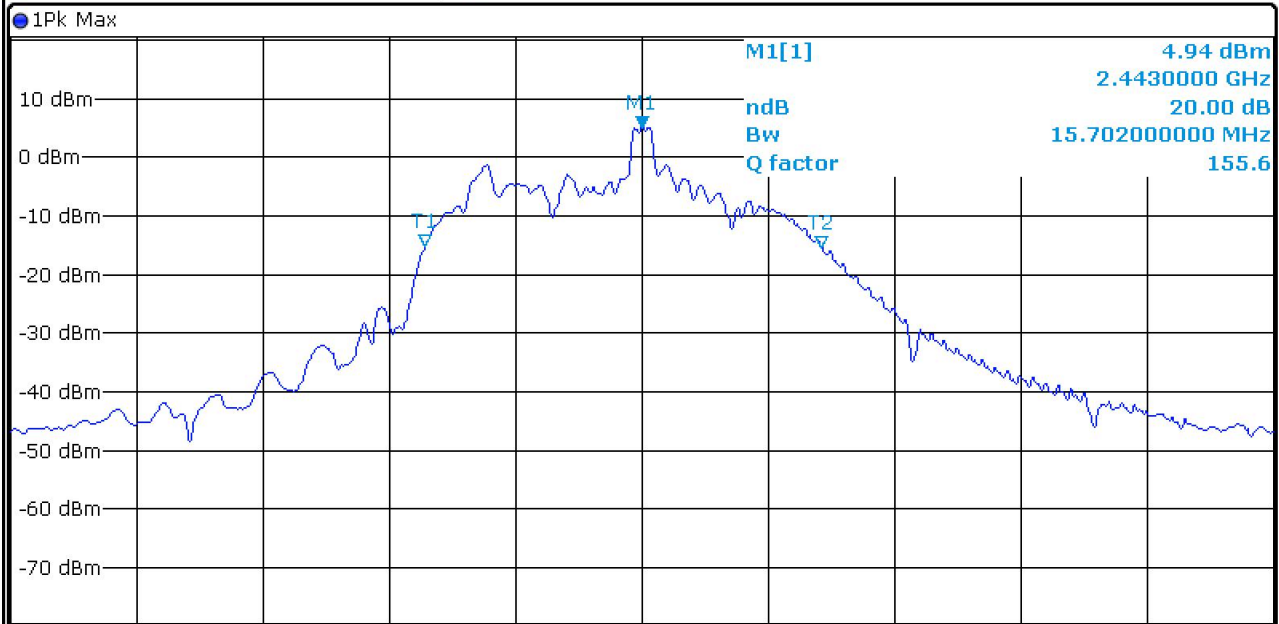
Date: 28.NOV.2025 08:43:15

2.4G-2420

Spectrum



Ref Level 20.50 dBm Offset 0.50 dB RBW 300 kHz
Att 30 dB SWT 44.2 μ s VBW 1 MHz Mode Auto FFT



CF 2.443 GHz 691 pts Span 50.0 MHz

Marker						
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.443 GHz	4.94 dBm	ndB down	15.702 MHz
T1		1	2.434389 GHz	-15.17 dBm	ndB	20.00 dB
T2		1	2.450091 GHz	-15.48 dBm	Q factor	155.6

Measuring...

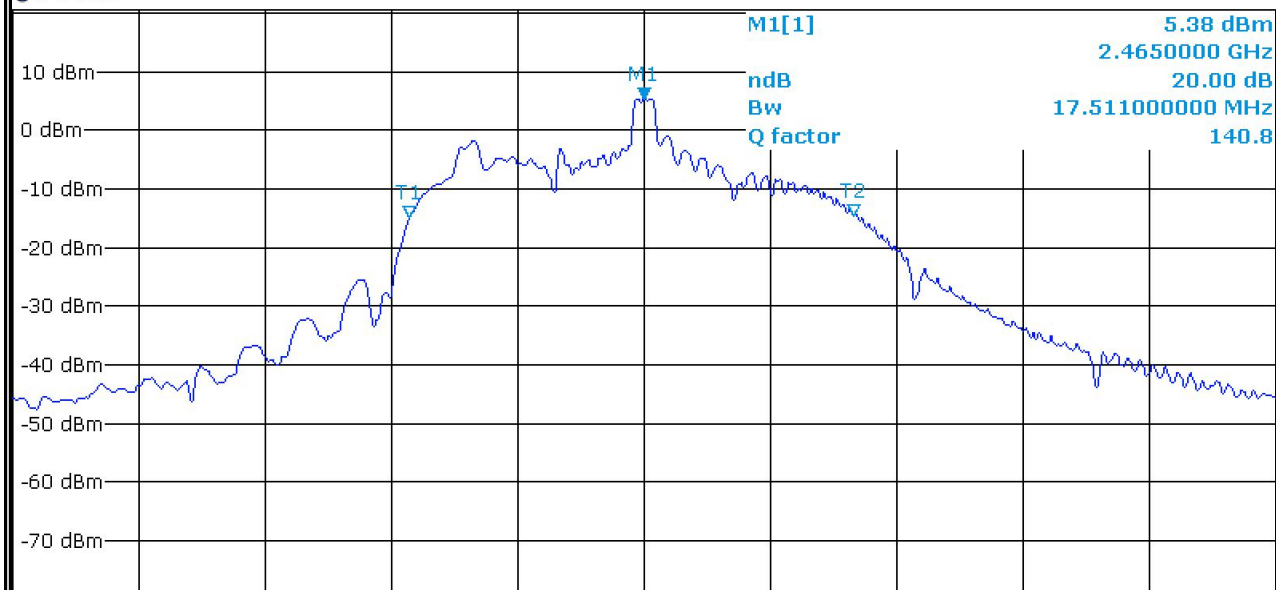
Date: 28 NOV 2025 08:36:23

Spectrum



Ref Level 20.50 dBm Offset 0.50 dB RBW 300 kHz
Att 30 dB SWT 44.2 μ s VBW 1 MHz Mode Auto FFT

1Pk Max



CF 2.465 GHz

691 pts

Span 50.0 MHz

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.465 GHz	5.38 dBm	ndB down	17.511 MHz
T1		1	2.455738 GHz	-14.80 dBm	ndB	20.00 dB
T2		1	2.473249 GHz	-14.64 dBm	Q factor	140.8

Measuring...



Date: 28 NOV 2025 08:40:28

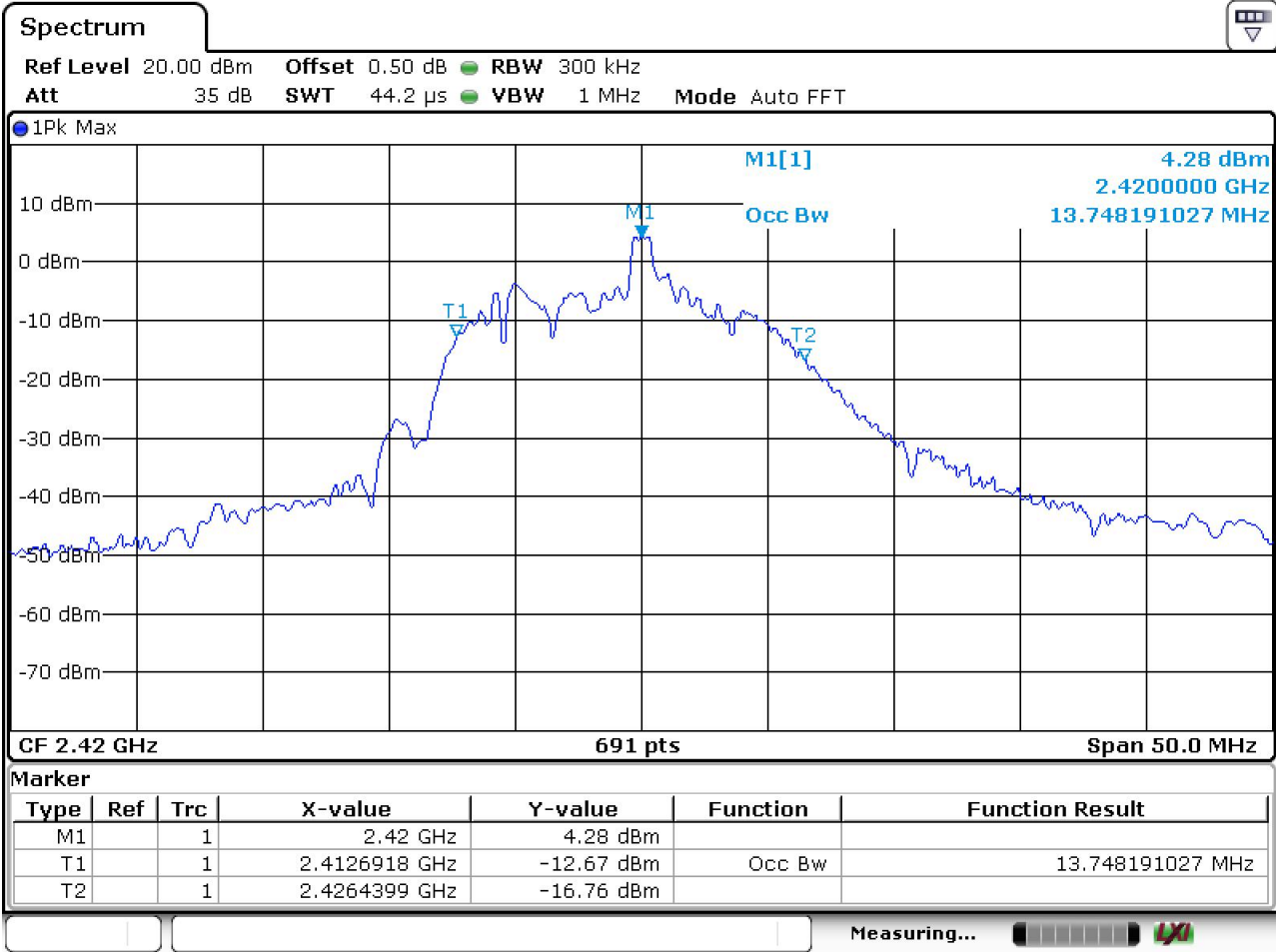
2.4G-2465

Appendix B: 99% Occupied Bandwidth

Test Result

TestMode	Frequency[MHz]	99% Occupied Bandwidth [MHz]	Limit[MHz]	Verdict
2.4G	2420	13.748	---	---
2.4G	2443	14.110	---	---
2.4G	2465	15.123	---	---

Test Graphs



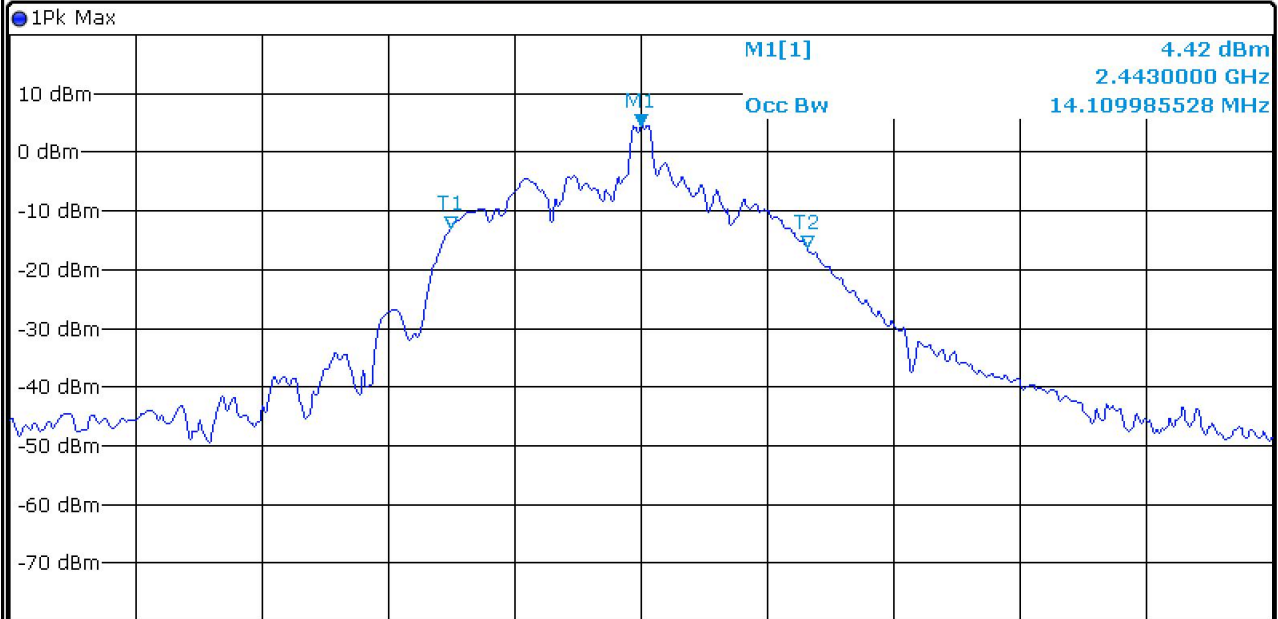
Date: 27.NOV.2025 13:27:12

2.4G-2420

Spectrum



Ref Level 20.00 dBm Offset 0.50 dB RBW 300 kHz
Att 35 dB SWT 44.2 μ s VBW 1 MHz Mode Auto FFT



CF 2.443 GHz 691 pts Span 50.0 MHz

Marker						
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.443 GHz	4.42 dBm		
T1		1	2.4354747 GHz	-12.90 dBm	Occ Bw	14.109985528 MHz
T2		1	2.4495847 GHz	-16.16 dBm		

Measuring...

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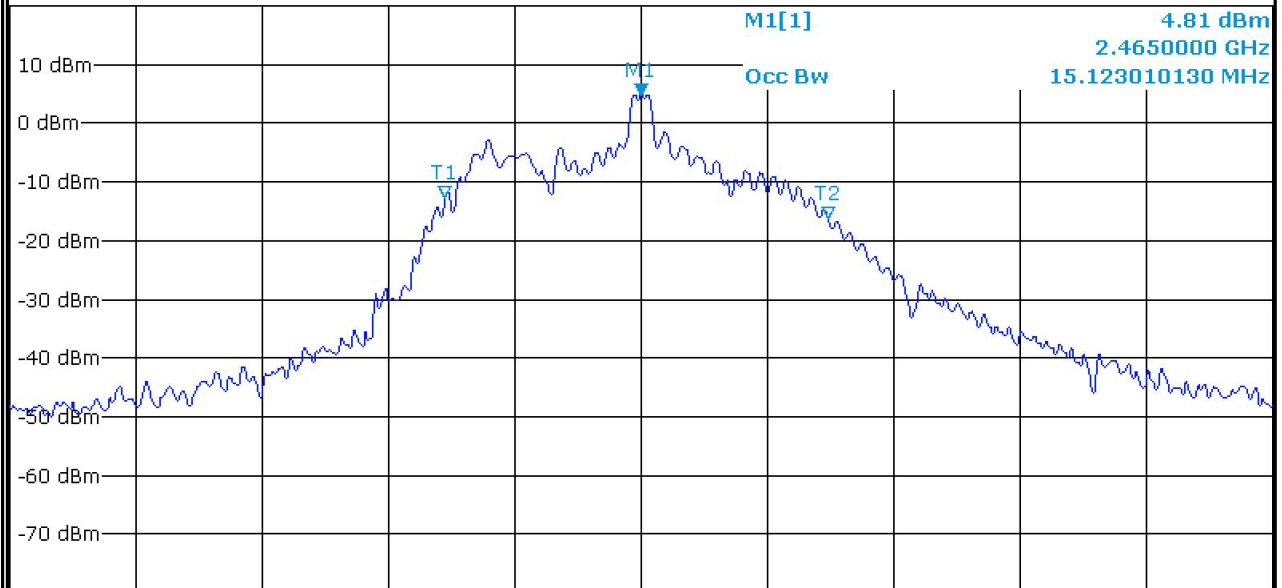
2.4G-2443

Spectrum



Ref Level 20.00 dBm Offset 0.50 dB RBW 300 kHz
Att 35 dB SWT 44.2 μ s VBW 1 MHz Mode Auto FFT

1Pk Max



CF 2.465 GHz

691 pts

Span 50.0 MHz

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.465 GHz	4.81 dBm		
T1		1	2.4572576 GHz	-12.72 dBm	Occ Bw	15.12301013 MHz
T2		1	2.4723806 GHz	-16.20 dBm		

Measuring...



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2.4G-2465

Appendix C: Duty Cycle

