

TEST REPORT

Application No.: SZCR2601000040ET
Applicant: Mattel Asia Pacific Sourcing Ltd.
Address of Applicant: 11/F., South Tower, World Finance Centre, Harbour City, Tsimshatsui, Kowloon, Hong Kong
Manufacturer: Mattel Asia Pacific Sourcing Ltd.
Address of Manufacturer: 11/F., South Tower, World Finance Centre, Harbour City, Tsimshatsui, Kowloon, Hong Kong

Equipment Under Test (EUT):

EUT Name: MATCHBOX® Land Rover POWER HOOK RC™ Vehicle

Model No.: JKG04, JVG43 ♣

♣ Please refer to section 2 of this report which indicates which model was actually tested and which were electrically identical.

Trade Mark: Mattel

FCC ID: PIYJKG04-25A5T

Standard(s) : 47 CFR Part 15, Subpart C 15.249

Date of Receipt: 2026-01-04

Date of Test: 2026-01-05 to 2026-01-13

Date of Issue: 2026-01-19

Test Result:

Pass*

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

Kenx. Xu

Keny Xu
EMC Laboratory Manager



SGS-CSTC Standards Technical Services Co., Ltd.
Shenzhen Branch EMC Laboratory

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Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2026-01-19		Original

Authorized for issue by:				
		Gebin Sun		
		Gebin Sun/Project Engineer		
		Eric Fu		
		Eric Fu/Reviewer		



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2 Test Summary

Radio Spectrum Technical Requirement				
Item	Standard	Method	Requirement	Result
Antenna Requirement	47 CFR Part 15, Subpart C 15.249	N/A	47 CFR Part 15, Subpart C 15.203	Pass

Radio Spectrum Matter Part				
Item	Standard	Method	Requirement	Result
Field Strength of the Fundamental Signal (15.249(a))	47 CFR Part 15, Subpart C 15.249	ANSI C63.10 (2020) Section 6.5&6.6	47 CFR Part 15, Subpart C 15.249(a)	Pass
Restricted Band Around Fundamental Frequency		ANSI C63.10 (2020) Section 6.10.5	47 CFR Part 15, Subpart C 15.205 & 15.249(d) & 15.209	Pass
Radiated Emissions Below 1GHz		ANSI C63.10 (2020) Section 6.4&6.5	47 CFR Part 15, Subpart C 15.209 & 15.249 (a),(d)	Pass
Radiated Emissions Above 1GHz		ANSI C63.10 (2020) Section 6.6	47 CFR Part 15, Subpart C 15.209 & 15.249 (a),(d)	Pass
20dB Bandwidth		ANSI C63.10 (2020) Section 6.9	47 CFR Part 15, Subpart C 15.215	Pass

Declaration of EUT Family Grouping:

Model No.: JKG04, JVG43

Only the model JKG04 was tested, since according to the declaration from the applicant, the electrical circuit design, PCB layout, components used and internal wiring and functions were identical for the above models, with only difference being of model No.



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4 General Information

4.1 Details of E.U.T.

Power supply:	3V DC(1.5V x 2 "AAA" Size Batteries)
Operation Frequency:	2420MHz to 2462MHz
Modulation Type:	GFSK
Number of Channels:	43
Channel Spacing:	1MHz
Antenna Type:	Wire Antenna
Antenna Gain:	0.52dBi

Remark: The information in this section is provided by the applicant or manufacturer, SGS is not liable to the accuracy, suitability, reliability or/and integrity of the information.

4.2 Description of Support Units

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

The EUT has been tested as an independent unit.

4.3 Measurement Uncertainty

Test Item	Measurement Uncertainty
Field Strength of the Fundamental Signal (15.249(a))	$\pm 6.0\text{dB}$ (Below 1GHz); $\pm 4.6\text{dB}$ (Above 1GHz)
Restricted Band Around Fundamental Frequency	$\pm 6.0\text{dB}$ (Below 1GHz); $\pm 4.6\text{dB}$ (Above 1GHz)
Radiated Emissions Below 1GHz	$\pm 6.0\text{dB}$ for 3m; $\pm 5.0\text{dB}$ for 10m
Radiated Emissions Above 1GHz	$\pm 4.6\text{dB}$ (1GHz-18GHz); $\pm 4.8\text{dB}$ (18MHz-40GHz)
20dB Bandwidth	$\pm 0.3\%$

Remark:

The U_{lab} (lab Uncertainty) is less than $U_{\text{CISPR/ETSI}}$ (CISPR/ETSI Uncertainty), so the test results

- compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.



4.4 Test Location

All tests were performed at:

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No tests were sub-contracted.

4.5 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

• A2LA (Certificate No. 3816.01)

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

• VCCI (Member No. 1937)

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen EMC laboratory have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

• FCC –Designation Number: CN1336

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1336. Test Firm Registration Number: 787754.

• Innovation, Science and Economic Development Canada

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0006.

IC#: 4620C.

4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None



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5 Equipment List

Field Strength of the Fundamental Signal (15.249(a))					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
3m Fully-Anechoic Chamber	AUDIX	N/A	SEM001-02	2025-05-07	2028-05-06
Signal Analyzer	Rohde & Schwarz	FSV40	SEM008-04	2025-03-04	2026-03-03
Horn Antenna	Rohde&Schwarz	HF907	SEM003-07	2025-07-22	2026-07-21
Microwave system amplifier	Agilent	83017A	SEM005-25	2025-09-10	2026-09-09
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM026-01	2025-07-05	2026-07-04

Restricted Band Around Fundamental Frequency					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
3m Fully-Anechoic Chamber	AUDIX	N/A	SEM001-02	2025-05-07	2028-05-06
Signal Analyzer	Rohde & Schwarz	FSV40	SEM008-04	2025-03-04	2026-03-03
Horn Antenna	Rohde&Schwarz	HF907	SEM003-07	2025-07-22	2026-07-21
Microwave system amplifier	Agilent	83017A	SEM005-25	2025-09-10	2026-09-09
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM026-01	2025-07-05	2026-07-04
Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	SEM003-15	2025-07-22	2027-07-21
Pre-Amplifier	Compliance Directions Systems Inc.	PAP-2640-50	SEM005-08	2025-03-21	2026-03-20

Radiated Emissions Below 1GHz					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
10m Semi-Anechoic Chamber	SAEMC	FSAC1018	SEM001-03	2025-03-21	2026-03-20
MXE EMI receiver	KEYSIGHT	N9038A	SEM004-16	2025-07-25	2026-07-24
Pre-amplifier	Sonoma Instrument Co	310N	SEM005-04	2025-03-04	2026-03-03
Loop Antenna	ETS-Lindgren	6502	SEM003-08	2023-11-20	2026-11-19
3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEM001-01	2023-06-19	2026-06-18
MXE EMI Receiver	Agilent Technologies	N9038A	SEM004-15	2025-07-25	2026-07-24



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BiConiLog Antenna	ETS-LINDGREN	3142C	SEM003-01	2025-08-29	2027-08-28
Pre-Amplifier	Agilent Technologies	8447D	SEM005-01	2025-03-04	2026-03-03
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM025-01	2025-07-05	2026-07-04

Radiated Emissions Above 1GHz

Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
3m Fully-Anechoic Chamber	AUDIX	N/A	SEM001-02	2025-05-07	2028-05-06
Signal Analyzer	Rohde & Schwarz	FSV40	SEM008-04	2025-03-04	2026-03-03
Horn Antenna	Rohde&Schwarz	HF907	SEM003-07	2025-07-22	2026-07-21
Microwave system amplifier	Agilent	83017A	SEM005-25	2025-09-10	2026-09-09
Chamber	CRTSGSSAC966	N/A	SZ-WRG-C-063	2025-01-06	2028-01-05
Signal & Spectrum Analyzer	Rohde & Schwarz	FSV	SZ-WRG-M-048	2025-12-16	2026-12-15
Low Noise Amplifier 18G-40GHz	Tonscend	TAP18040048	SZ-WRG-M-052	2025-12-16	2026-12-15
SHF-EHF Horn 15GHz-40GHz	SCHWARZBECK	BBHA 9170	SZ-WRG-M-056	2025-12-13	2026-12-12
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM026-01	2025-07-05	2026-07-04

RF Conducted Test

Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
DC Power Supply	Chroma	62012P-80-60	SEM011-11	2025-07-24	2026-07-23
MXA Signal Analyzer	KEYSIGHT	N9020A	SEM004-19	2025-03-04	2026-03-03
Measurement Software	TST PASS	TST PASS V2.0	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM031-01	2025-07-05	2026-07-04
Attenuator	Huber+Suhner	6620_SMA-50-1	SEM021-09	2025-03-03	2026-03-02
Programmable Temperature & Humidity Chamber	Votsch Industrietechnik GmbH	VT 4002	SEM002-15	2025-02-26	2026-02-25



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General used equipment					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Humidity/ Temperature Indicator	deli	8838	SEM002-32	2025-07-23	2026-07-22
Humidity/ Temperature Indicator	deli	8838	SEM002-33	2025-07-23	2026-07-22
Barometer	Changchun Meteorological Industry Factory	DYM3	SEM002-01	2025-03-03	2026-03-02
Humidity and Temperature Indicator	deli	8838	SEM002-46	2025-07-23	2026-07-22



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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

15.203 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 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.

EUT Antenna:

The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 0.52dBi.

Antenna location: Refer to internal photos



7 Radio Spectrum Matter Test Results

7.1 Field Strength of the Fundamental Signal (15.249(a))

Test Requirement 47 CFR Part 15, Subpart C 15.249(a)
 Test Method: ANSI C63.10 (2020) Section 6.5&6.6
 Measurement Distance: 3m
 Test Engineer: Logic Wang

Limit:

Fundamental frequency(MHz)	Field strength of fundamental(millivolts/meter)	Field strength of harmonics(microvolts/meter)
902-928	50	500
2400-2483.5	50	500
5725-5875	50	500
24000-24250	250	2500

Remark: The frequencies above 1000MHz 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 fundamental frequency in "902-928MHz", the field strength of fundamental is based on Quasi-Peak.

7.1.1 E.U.T. Operation

Operating Environment:

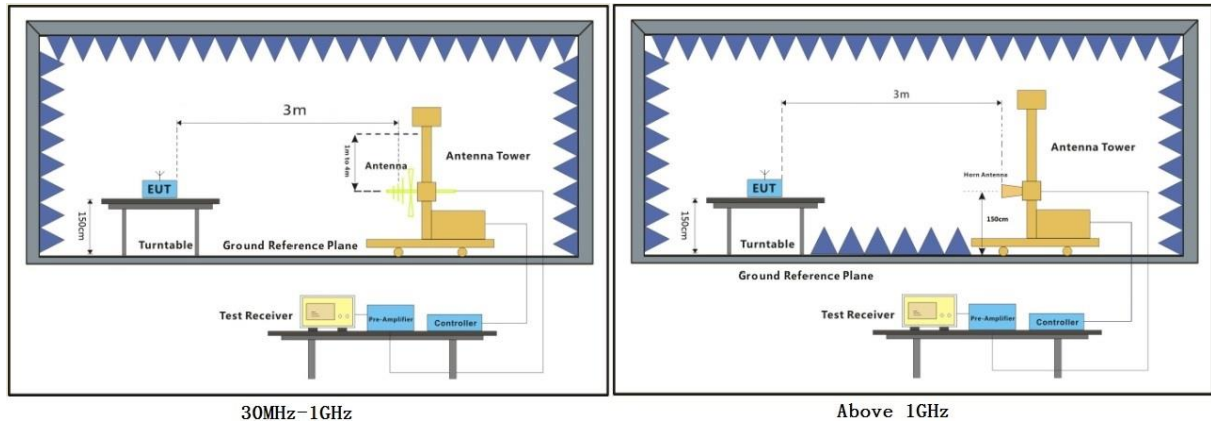
Temperature: 23.5 °C Humidity: 56.3 % RH Atmospheric Pressure: 1020 mbar

7.1.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode_Keep the EUT in transmitting with modulation mode.



7.1.3 Test Setup Diagram



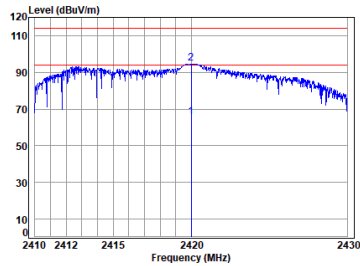
7.1.4 Measurement Procedure and Data

- For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- 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.
- The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- 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.
- 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.
- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- 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.
- Test the EUT in the lowest channel, the middle channel, the Highest channel.
- 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.
- Repeat above procedures until all frequencies measured was complete.

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



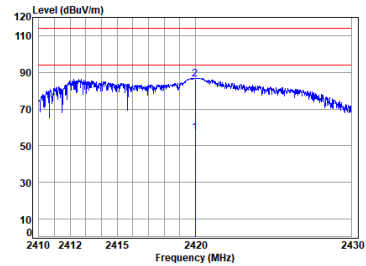
Remote 2.4G SRD_TX_CH_L_Horizontal



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00040ET\00038ET
Mode : 2420 Field strength

Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over Limit	Remark
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 q 2420.000	16.18	29.02	32.76	53.20	65.64	94.00	-28.36	Average
2 p 2420.000	16.18	29.02	32.76	82.50	94.94	114.00	-19.06	Peak

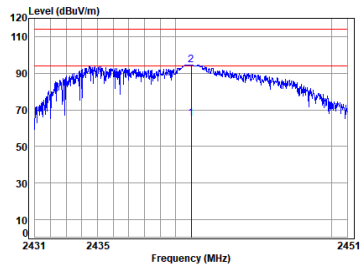
Remote 2.4G SRD_TX_CH_L_Vertical



Site : chamber
Condition: 3m VERTICAL
Job No : 00040ET\00038ET
Mode : 2420 Field strength

Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over Limit	Remark
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 q 2420.000	16.18	29.02	32.76	44.62	57.06	94.00	-36.94	Average
2 p 2420.000	16.18	29.02	32.76	73.92	86.36	114.00	-27.64	Peak

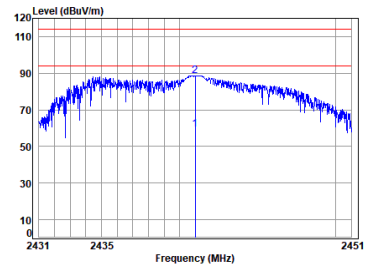
Remote 2.4G SRD_TX_CH_M_Horizontal



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00040ET\00038ET
Mode : 2441 Field strength

Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over Limit	Remark
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 q 2441.000	16.21	28.94	32.75	52.88	65.28	94.00	-28.72	Average
2 p 2441.000	16.21	28.94	32.75	82.18	94.58	114.00	-19.42	Peak

Remote 2.4G SRD_TX_CH_M_Vertical

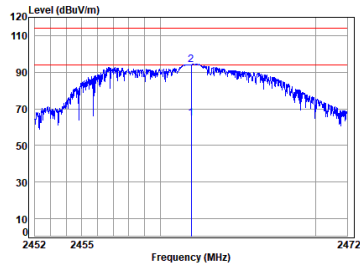


Site : chamber
Condition: 3m VERTICAL
Job No : 00040ET\00038ET
Mode : 2441 Field strength

Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over Limit	Remark
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 q 2441.000	16.21	28.94	32.75	46.87	59.27	94.00	-34.73	Average
2 p 2441.000	16.21	28.94	32.75	76.17	88.57	114.00	-25.43	Peak



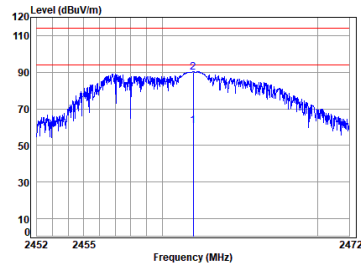
Remote 2.4G SRD_TX_CH_H_Horizontal



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00040ET\00038ET
Mode : 2462 Field strength

Freq	Cable Loss	Factor	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
MHz	dB		dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 q 2462.000	16.24	28.90	32.74	52.48	64.88	94.00	-29.12	Average	
2 p 2462.000	16.24	28.90	32.74	81.78	94.18	114.00	-19.82	Peak	

Remote 2.4G SRD_TX_CH_H_Vertical



Site : chamber
Condition: 3m VERTICAL
Job No : 00040ET\00038ET
Mode : 2462 Field strength

Freq	Cable Loss	Factor	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
MHz	dB		dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 q 2462.000	16.24	28.90	32.74	48.30	60.70	94.00	-33.30	Average	
2 p 2462.000	16.24	28.90	32.74	77.60	90.00	114.00	-24.00	Peak	



7.2 Restricted Band Around Fundamental Frequency

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.249(d) & 15.209
 Test Method: ANSI C63.10 (2020) Section 6.10.5
 Measurement Distance: 3m
 Test Engineer: Logic Wang

Limit:

Frequency	Limit (dBuV/m @3m)	Remark
30MHz-88MHz	40.0	Quasi-peak Value
88MHz-216MHz	43.5	Quasi-peak Value
216MHz-960MHz	46.0	Quasi-peak Value
960MHz-1GHz	54.0	Quasi-peak Value
Above 1GHz	54.0	Average Value
Above 1GHz	74.0	Peak Value

Emission radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

7.2.1 E.U.T. Operation

Operating Environment:

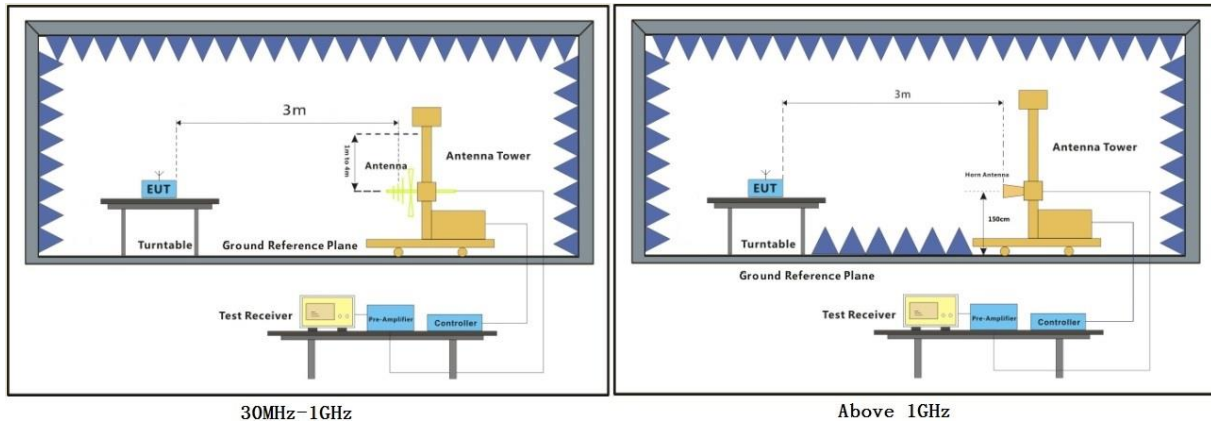
Temperature: 23.5 °C Humidity: 56.3 % RH Atmospheric Pressure: 1020 mbar

7.2.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode_ Keep the EUT in transmitting with modulation mode.



7.2.3 Test Setup Diagram



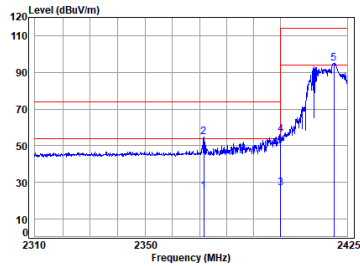
7.2.4 Measurement Procedure and Data

- For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- 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.
- The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- 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.
- 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.
- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- 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.
- Test the EUT in the lowest channel, the middle channel, the Highest channel.
- 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.
- Repeat above procedures until all frequencies measured was complete.

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



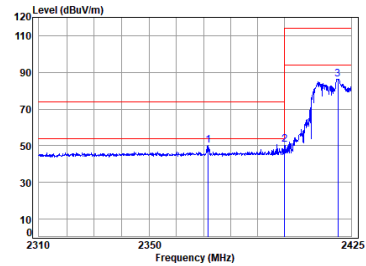
Remote 2.4G SRD_TX_CH_L_Horizontal



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00040ET\00038ET
Mode : 2420 Band edge

	Freq	Cable Loss	Factor	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	dB	
1	2371.521	16.11	29.10	32.79	12.83	25.25	54.00	-28.75	Average	
2	2371.521	16.11	29.10	32.79	42.13	54.55	74.00	-19.45	Peak	
3 q	2400.000	16.15	29.10	32.78	14.56	27.03	54.00	-26.97	Average	
4 p	2400.000	16.15	29.10	32.78	43.86	56.33	74.00	-17.67	Peak	
5	2420.000	16.18	29.02	32.76	82.50	94.94	114.00	-19.06	Peak	

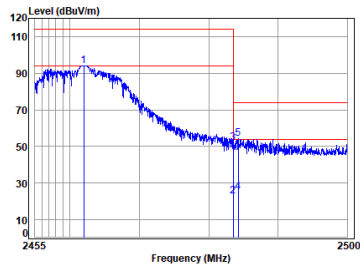
Remote 2.4G SRD_TX_CH_L_Vertical



Site : chamber
Condition: 3m VERTICAL
Job No : 00040ET\00038ET
Mode : 2420 Band edge

	Freq	Cable Loss	Factor	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	dB	
1	2371.636	16.11	29.10	32.79	37.68	50.10	74.00	-23.90	Peak	
2 p	2400.000	16.15	29.10	32.78	37.95	50.42	74.00	-23.58	Peak	
3	2420.000	16.18	29.02	32.76	73.92	86.36	114.00	-27.64	Peak	

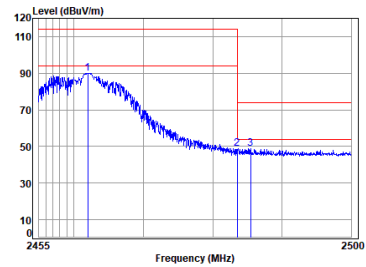
Remote 2.4G SRD_TX_CH_H_Horizontal



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00040ET\00038ET
Mode : 2462 Band edge

	Freq	Cable Loss	Factor	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	dB	
1	2462.000	16.24	28.90	32.74	81.78	94.18	114.00	-19.82	Peak	
2	2483.500	16.28	28.90	32.73	10.29	22.74	54.00	-31.26	Average	
3	2483.500	16.28	28.90	32.73	39.59	52.04	74.00	-21.96	Peak	
4 q	2484.202	16.28	28.90	32.73	12.47	24.92	54.00	-29.08	Average	
5 p	2484.202	16.28	28.90	32.73	41.77	54.22	74.00	-19.78	Peak	

Remote 2.4G SRD_TX_CH_H_Vertical



Site : chamber
Condition: 3m VERTICAL
Job No : 00040ET\00038ET
Mode : 2462 Band edge

	Freq	Cable Loss	Factor	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	dB	
1 p	2462.000	16.24	28.90	32.74	77.60	90.00	114.00	-24.00	Peak	
2	2483.500	16.28	28.90	32.73	36.41	48.86	74.00	-25.14	Peak	
3	2485.421	16.28	28.90	32.73	36.27	48.72	74.00	-25.28	Peak	



7.3 Radiated Emissions Below 1GHz

Test Requirement 47 CFR Part 15, Subpart C 15.209 & 15.249 (a),(d)
 Test Method: ANSI C63.10 (2020) Section 6.4&6.5
 Measurement Distance: 3m
 Test Engineer: Mason Wu

Limit:

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
960-1000	500	3

Note

1: The emission limits for the ranges 9-90 kHz and 110-490 kHz are based on measurements employing a linear average detector.

2. At frequencies below 1GHz, measurements may be performed at a distance different to specified in the regulations.

Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor+ Aux Factor (if applicable)

The aux factor needs to be added when measurements are performed at a distance other than the limit distance provided.

EX. Below 30MHz, Aux Factor = 40 dB/decade of distance, the aux factor is $40\log(3/300) = -80\text{dB}$ (for 3m test distance).

EX. Above 30MHz, Aux Factor = 20 dB/decade of distance, the aux factor is $20\log(10/3) = 10.46\text{dB}$ (for 10m test distance).

7.3.1 E.U.T. Operation

Operating Environment:

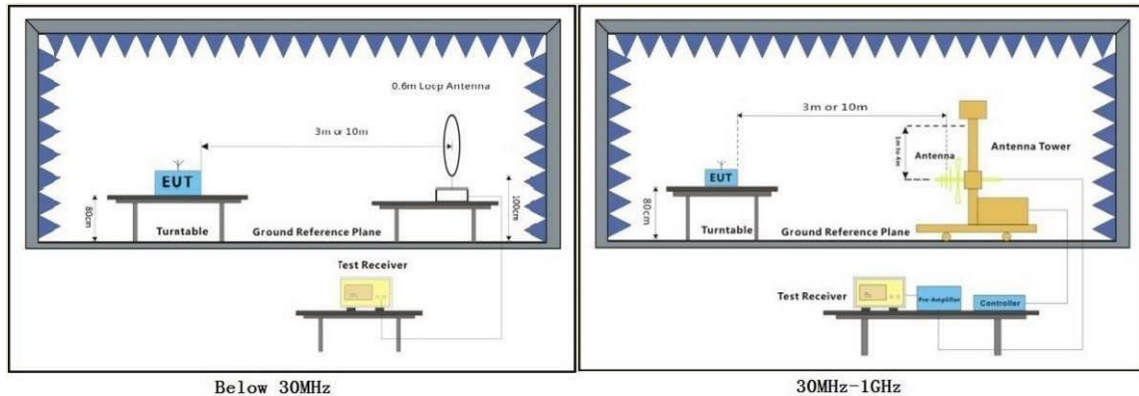
Temperature: 23.5 °C Humidity: 46.8 % RH Atmospheric Pressure: 1020 mbar

7.3.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode_Keep the EUT in transmitting with modulation mode.



7.3.3 Test Setup Diagram



7.3.4 Measurement Procedure and Data

- The EUT was placed on the top of a rotating table 0.8 meters above the ground for below 1GHz at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- 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.
- 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.
- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- 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.
- Test the EUT in the lowest channel, the middle channel, the Highest channel, only the test worst case mode data is recorded in the report.
- The radiation measurements are performed in X, Y, Z axis positioning. And found the X axis positioning which it is worse case, only the test worst case mode is recorded in the report.
- Repeat above procedures until all frequencies measured was complete.

Remark:

- Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor
- Scan from 9kHz to 1GHz, the disturbance below 30MHz was very low. The points marked on the plots are the highest emissions could be found when testing, so only these 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.



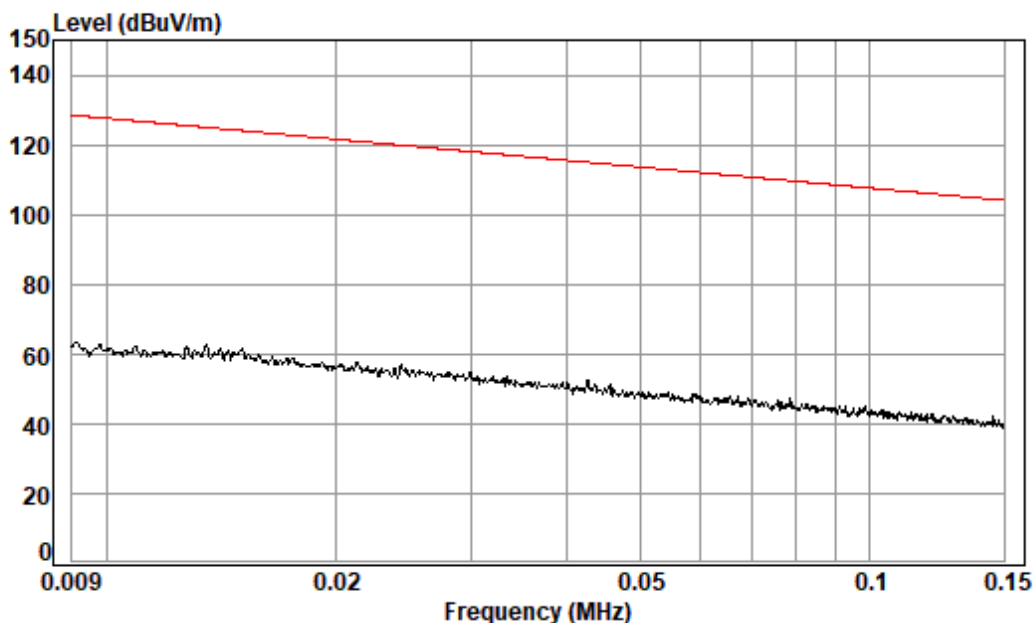
SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

SZEMC-TRF-01 Rev. A/2

Report No.: SZCR260100004002

Page: 21 of 36

Test Mode: 00; Polarity: Coaxial



Condition: 3m

Job No. : 00040ET

Test Mode: 00

: coaxial



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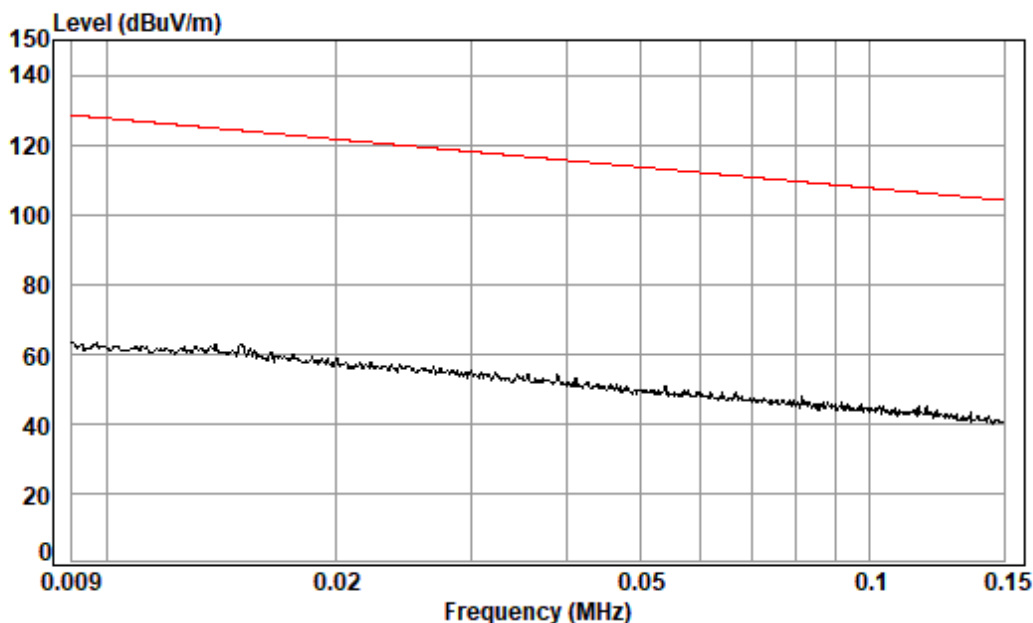
SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

SZEMC-TRF-01 Rev. A/2

Report No.: SZCR260100004002

Page: 22 of 36

Test Mode: 00; Polarity: Coplanar



Condition: 3m

Job No. : 00040ET

Test Mode: 00

: coplanar



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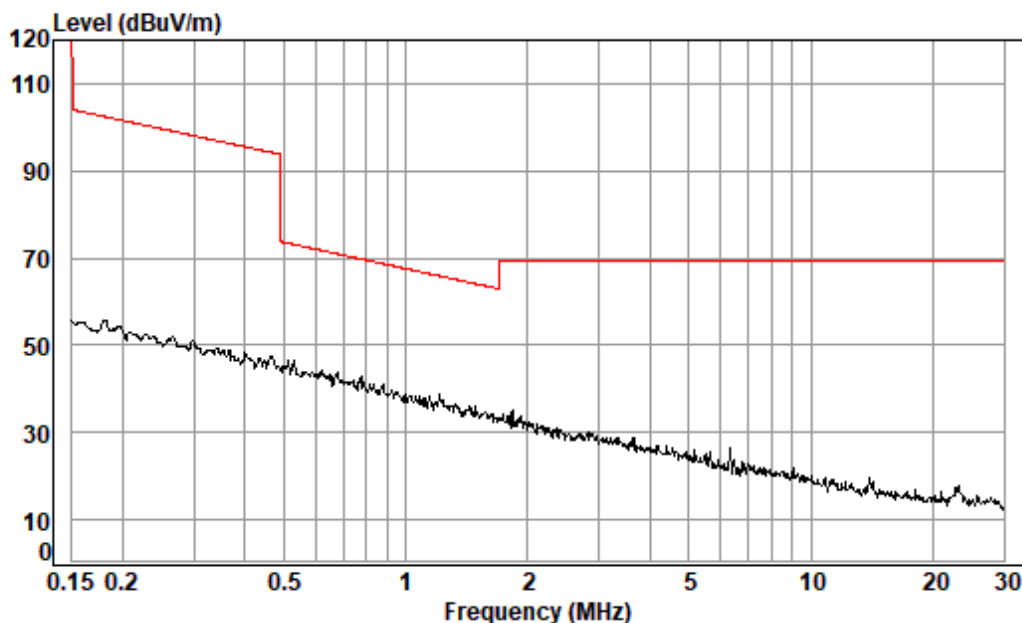
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Test Mode: 00; Polarity: Coaxial



Condition: 3m

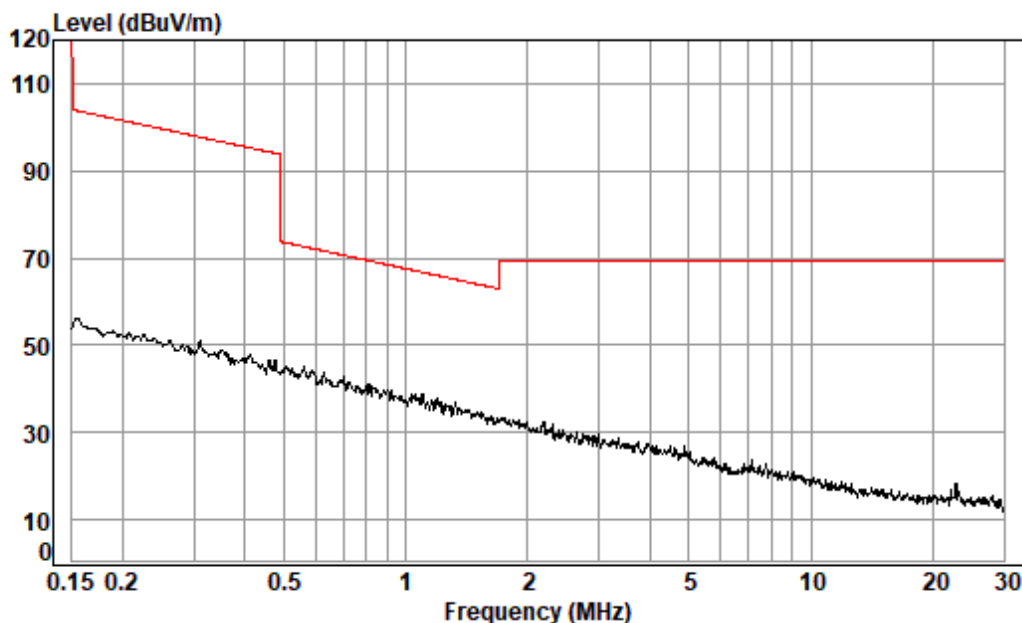
Job No. : 00040ET

Test Mode: 00

: coaxial



Test Mode: 00; Polarity: Coplanar



Condition: 3m

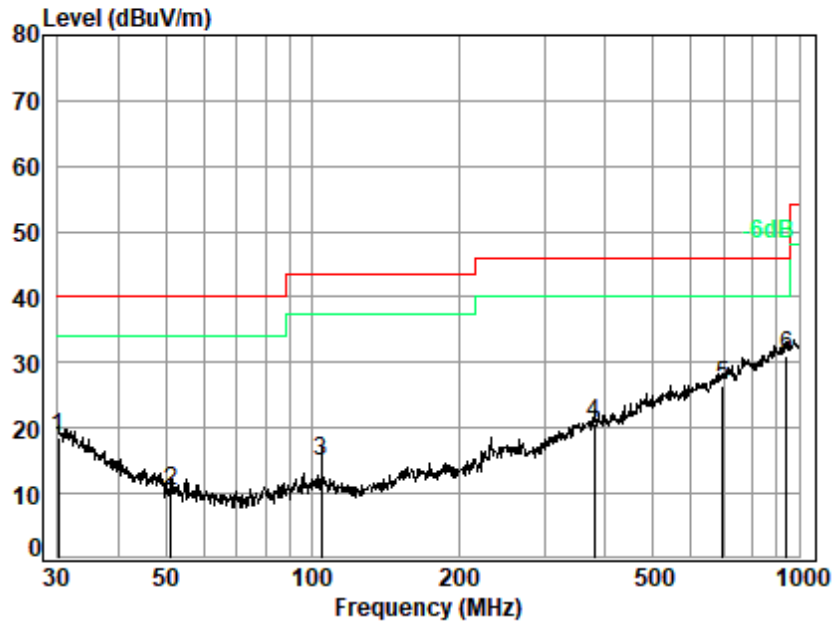
Job No. : 00040ET

Test Mode: 00

: coplanar



Test Mode: 00; Polarity: Horizontal

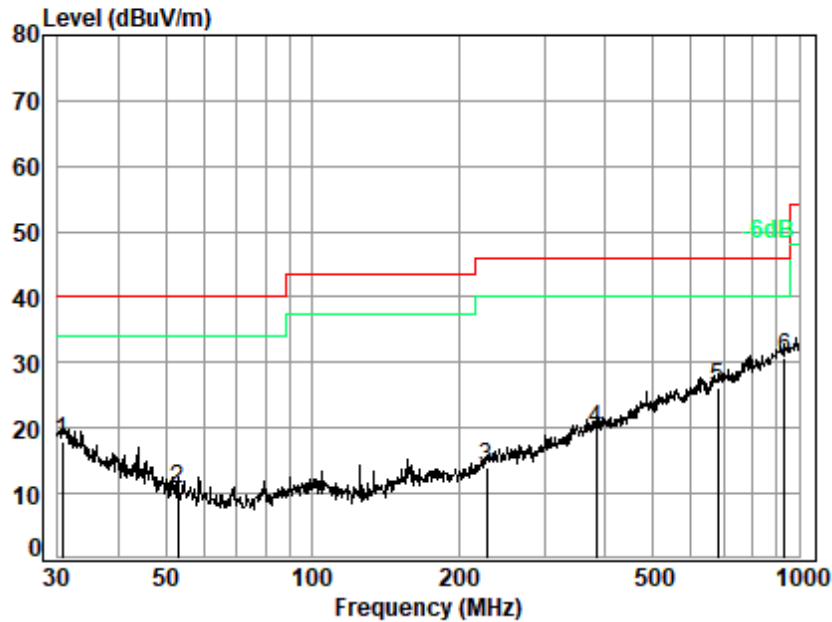


Site : chamber
Condition: 3m HORIZONTAL
Job No. : 00040ET
Test Mode: 00

	Ant	Cable	Preamp	Read		Limit	Over	
	Freq	Factor	Loss	Factor	Level	Level	Line	Limit Remark
	MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB
1	30.105	21.40	0.74	27.65	24.02	18.51	40.00	-21.49 QP
2	51.301	12.77	0.90	27.63	24.20	10.24	40.00	-29.76 QP
3	104.536	12.47	1.25	27.61	28.85	14.96	43.50	-28.54 QP
4	379.914	20.45	2.42	27.70	25.65	20.82	46.00	-25.18 QP
5	696.857	25.83	3.40	27.84	25.03	26.42	46.00	-19.58 QP
6 q	942.131	29.01	4.06	26.72	24.76	31.11	46.00	-14.89 QP



Test Mode: 00; Polarity: Vertical



Site : chamber
Condition: 3m VERTICAL
Job No. : 00040ET
Test Mode: 00

	Ant	Cable	Preamp	Read		Limit	Over	
Freq	Factor	Loss	Factor	Level	Level	Line	Limit	Remark
MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB	
1	30.638	21.12	0.75	27.65	23.80	18.02	40.00	-21.98 QP
2	52.945	12.45	0.91	27.63	24.83	10.56	40.00	-29.44 QP
3	227.691	16.33	1.83	27.70	23.41	13.87	46.00	-32.13 QP
4	383.932	20.37	2.44	27.71	24.77	19.87	46.00	-26.13 QP
5	682.348	25.64	3.36	27.88	25.19	26.31	46.00	-19.69 QP
6 q	935.546	28.92	4.05	26.76	24.50	30.71	46.00	-15.29 QP



7.4 Radiated Emissions Above 1GHz

Test Requirement 47 CFR Part 15, Subpart C 15.209 & 15.249 (a),(d)
 Test Method: ANSI C63.10 (2020) Section 6.6
 Measurement Distance: 3m
 Test Engineer: Logic Wang

Limit:

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
Above 1000	500	3

7.4.1 E.U.T. Operation

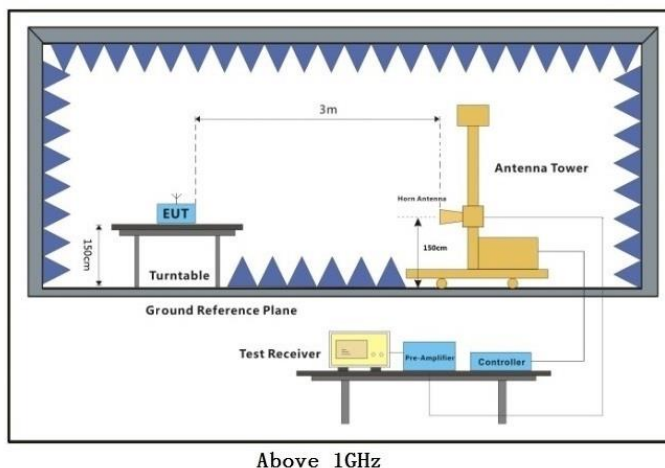
Operating Environment:

Temperature: 23.5 °C Humidity: 56.3 % RH Atmospheric Pressure: 1020 mbar

7.4.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode_Keep the EUT in transmitting with modulation mode.

7.4.3 Test Setup Diagram



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No.1 Workshop, M-10, Middle Section, Science & Technology Park, Nanshan District, Shenzhen, Guangdong, China 518057 t (86-755) 26012053 f (86-755) 26710594 www.sgs.com.cn
 中国·广东·深圳市南山区科技园中区M-10栋1号厂房 邮编: 518057 t (86-755) 26012053 f (86-755) 26710594 sgs.china@sgs.com

7.4.4 Measurement Procedure and Data

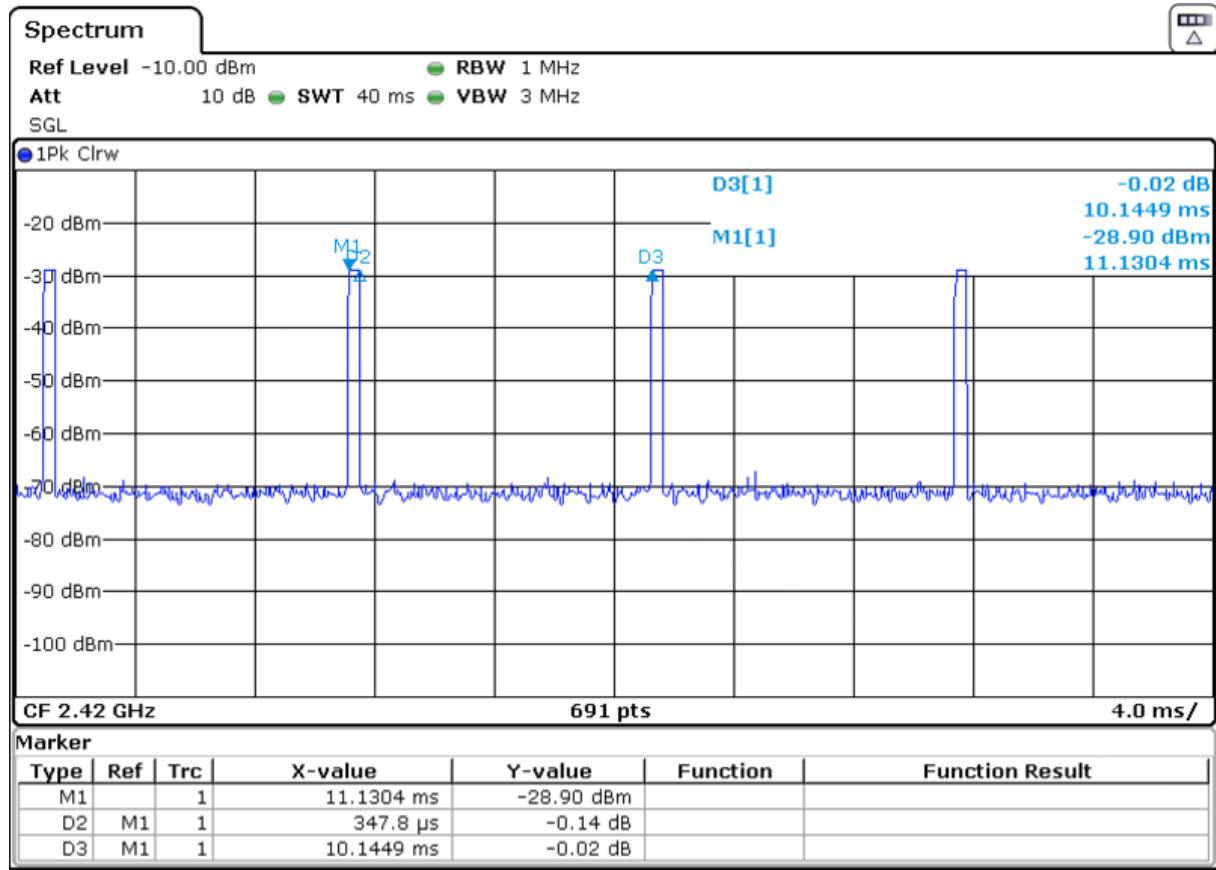
- a. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation. The EUT was set 3 meters away from the interference-receiving antenna from 1GHz to 18GHz, and 1 meter away from the interference-receiving antenna above 18GHz.
- b. The interference-receiving antenna was mounted on the variable-height antenna tower, with its boresight facing the EUT throughout the test.
- c. 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.
- d. 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.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- g. 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.
- h. Repeat above procedures until all frequencies measured was complete.

Remark:

1. Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor+ Aux Factor (if applicable)
The aux factor needs to be added for the frequency above 18GHz once a closer distance used.
Aux Factor = 20 dB/decade of distance, the aux factor is $20\log(1/3) = -9.54\text{dB}$ (for 1 meter test distance).
2. Scan from 1GHz to 10th harmonic of the highest frequency or 40 GHz, whichever is lower.
3. As shown in this section, 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.
4. For the frequency above 18GHz, testing had been executed under all test modes, only the worst-case test curve is displayed in the report.
5. For devices with multiple operating modes, measurements on the middle channel is used to determine the worst-case mode(s). Only the worst-case mode with the highest output power and the mode with the highest output power spectral density for each modulation family (e.g., OFDM and direct sequence spread spectrum) is recorded in the test report.

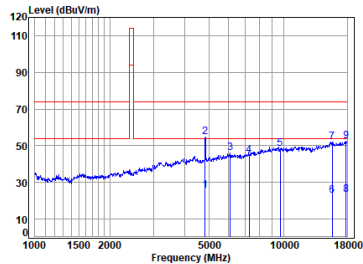


Remote



On time(ms)	T(ms)	Duty cycle(%)	Duty factor
0.3478	10.1449	0.0343	-29.30

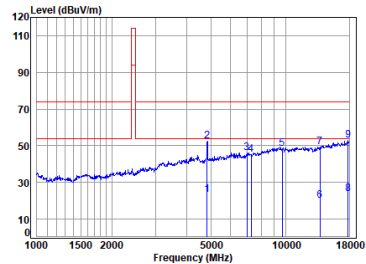
Remote 2.4G SRD_TX_CH_L_Horizontal



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00040ET\00038ET
Mode : 2420 TX RSE

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	q 4840.000	7.44	34.46	54.21	37.89	25.58	54.00	-28.42	Average
2	p 4840.000	7.44	34.46	54.21	67.19	54.88	74.00	-19.12	Peak
3	6106.616	8.92	35.07	53.11	55.24	46.12	74.00	-27.88	Peak
4	7260.000	8.48	35.70	53.17	53.80	44.81	74.00	-29.19	Peak
5	9680.000	10.72	37.50	53.32	53.27	48.17	74.00	-25.83	Peak
6	15668.210	10.89	41.17	52.06	22.72	22.72	54.00	-31.28	Average
7	15668.210	10.89	41.17	52.06	52.02	52.02	74.00	-21.98	Peak
8	17793.090	11.38	43.89	52.50	20.51	23.28	54.00	-30.72	Average
9	17793.090	11.38	43.89	52.50	49.81	52.58	74.00	-21.42	Peak

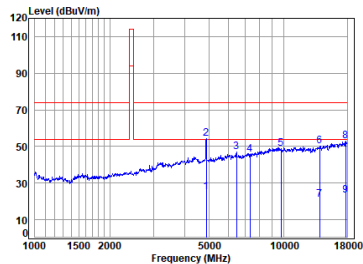
Remote 2.4G SRD_TX_CH_L_Vertical



Site : chamber
Condition: 3m VERTICAL
Job No : 00040ET\00038ET
Mode : 2420 TX RSE

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	4840.000	7.44	34.46	54.21	35.64	23.33	54.00	-30.67	Average
2	4840.000	7.44	34.46	54.21	64.94	52.63	74.00	-21.37	Peak
3	6995.172	8.56	35.71	53.20	55.02	46.09	74.00	-27.91	Peak
4	7260.000	8.48	35.70	53.17	54.03	45.04	74.00	-28.96	Peak
5	9680.000	10.72	37.50	53.32	53.42	48.32	74.00	-25.68	Peak
6	13717.560	10.93	39.14	52.98	23.11	20.20	54.00	-33.80	Average
7	13717.560	10.93	39.14	52.98	52.41	49.50	74.00	-24.50	Peak
8	q17844.590	11.41	43.90	52.48	20.68	23.51	54.00	-30.49	Average
9	p17844.590	11.41	43.90	52.48	49.98	52.81	74.00	-21.19	Peak

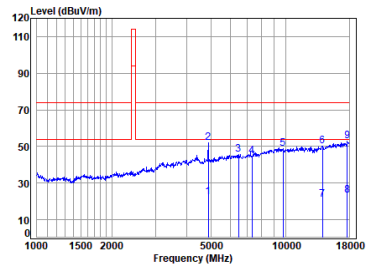
Remote 2.4G SRD_TX_CH_M_Horizontal



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00040ET\00038ET
Mode : 2441 TX RSE

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	q 4882.000	7.47	34.63	54.21	37.17	25.06	54.00	-28.94	Average
2	p 4882.000	7.47	34.63	54.21	66.47	54.36	74.00	-19.64	Peak
3	6470.026	8.88	35.54	53.15	55.66	46.93	74.00	-27.07	Peak
4	7323.000	8.46	35.70	53.17	54.41	45.40	74.00	-28.60	Peak
5	9764.000	10.69	37.37	53.29	53.87	48.64	74.00	-25.36	Peak
6	13957.530	10.97	39.62	52.91	52.39	50.07	74.00	-23.93	Peak
7	13957.530	10.97	39.62	52.91	23.09	20.77	54.00	-33.23	Average
8	17741.740	11.35	43.84	52.53	50.08	52.74	74.00	-21.26	Peak
9	17741.740	11.35	43.84	52.53	20.78	23.44	54.00	-30.56	Average

Remote 2.4G SRD_TX_CH_M_Vertical

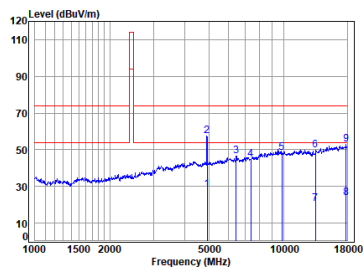


Site : chamber
Condition: 3m VERTICAL
Job No : 00040ET\00038ET
Mode : 2441 TX RSE

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	4882.000	7.47	34.63	54.21	34.67	22.56	54.00	-31.44	Average
2	4882.000	7.47	34.63	54.21	63.97	51.86	74.00	-22.14	Peak
3	6470.026	8.88	35.54	53.15	54.58	45.85	74.00	-28.15	Peak
4	7323.000	8.46	35.70	53.17	53.74	44.73	74.00	-29.27	Peak
5	9764.000	10.69	37.37	53.29	54.01	48.78	74.00	-25.22	Peak
6	14038.450	10.94	39.74	52.89	52.38	50.17	74.00	-23.83	Peak
7	14038.450	10.94	39.74	52.89	23.08	20.87	54.00	-33.13	Average
8	q17690.530	11.32	43.78	52.55	20.89	23.44	54.00	-30.56	Average
9	p17690.530	11.32	43.78	52.55	50.19	52.74	74.00	-21.26	Peak



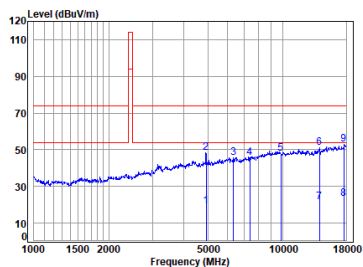
Remote 2.4G SRD_TX_CH_H_Horizontal



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00040ET\00038ET
Mode : 2462 TX RSE

	Freq	Cable	Ant	Preamp	Read	Level	Limit	Over	
	MHz	Loss	Factor	Factor	Level	dBuV	dBuV/m	Line	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	q 4924.000	7.50	34.65	54.21	40.40	28.34	54.00	-25.66	Average
2	p 4924.000	7.50	34.65	54.21	69.70	57.64	74.00	-16.36	Peak
3	6451.353	8.88	35.50	53.15	55.18	46.41	74.00	-27.59	Peak
4	7386.000	8.44	35.77	53.16	53.51	44.56	74.00	-29.44	Peak
5	9848.000	10.66	37.20	53.26	53.72	48.32	74.00	-25.68	Peak
6	13442.810	10.86	38.80	53.06	53.23	49.83	74.00	-24.17	Peak
7	13442.810	10.86	38.80	53.06	23.93	20.53	54.00	-33.47	Average
8	17844.590	11.41	43.90	52.48	20.76	23.59	54.00	-30.41	Average
9	17844.590	11.41	43.90	52.48	50.06	52.89	74.00	-21.11	Peak

Remote 2.4G SRD_TX_CH_H_Vertical

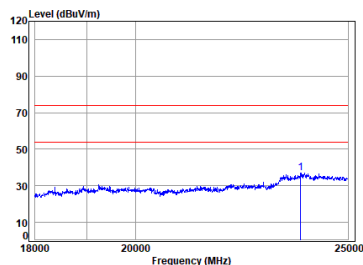


Site : chamber
Condition: 3m VERTICAL
Job No : 00040ET\00038ET
Mode : 2462 TX RSE

	Freq	Cable	Ant	Preamp	Read	Level	Limit	Over	
	MHz	Loss	Factor	Factor	Level	dBuV	dBuV/m	dBuV/m	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	4924.000	7.50	34.65	54.21	31.24	19.18	54.00	-34.82	Average
2	4924.000	7.50	34.65	54.21	60.54	48.48	74.00	-25.52	Peak
3	6340.436	8.90	34.92	53.14	55.17	45.85	74.00	-28.15	Peak
4	7386.000	8.44	35.77	53.16	54.68	45.73	74.00	-28.27	Peak
5	9848.000	10.66	37.20	53.26	53.40	48.00	74.00	-26.00	Peak
6	14038.450	10.94	39.74	52.89	53.16	50.95	74.00	-23.05	Peak
7	14038.450	10.94	39.74	52.89	23.86	21.65	54.00	-32.35	Average
8	q17639.470	11.28	43.68	52.58	21.05	23.43	54.00	-30.57	Average
9	p17639.470	11.28	43.68	52.58	50.35	52.73	74.00	-21.27	Peak

Worst case data for above 18GHz

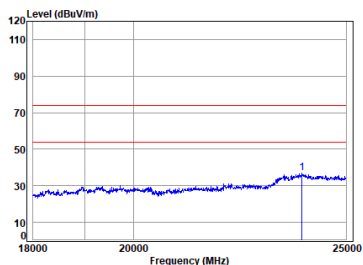
Remote 2.4G_SRD_TX_CH_M_Horizontal



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00040ET\00038ET
Mode : 2441 TX RSE

	Freq	Cable	Ant	Preamp	Read	Level	Limit	Over	Aux
	MHz	Loss	Factor	Factor	Level	dBuV	dBuV/m	dBuV/m	Factor
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	dB
1	p23790.150	6.77	38.92	50.36	51.19	36.98	74.00	-37.02	Peak

Remote 2.4G_SRD_TX_CH_M_Vertical



Site : chamber
Condition: 3m VERTICAL
Job No : 00040ET\00038ET
Mode : 2441 TX RSE

	Freq	Cable	Ant	Preamp	Read	Level	Limit	Over	Aux
	MHz	Loss	Factor	Factor	Level	dBuV	dBuV/m	dBuV/m	Factor
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	dB
1	p23876.270	6.78	38.95	50.38	51.22	37.03	74.00	-36.97	Peak



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7.5 20dB Bandwidth

Test Requirement 47 CFR Part 15, Subpart C 15.215
 Test Method: ANSI C63.10 (2020) Section 6.9
 Test Engineer: Linvo Ding

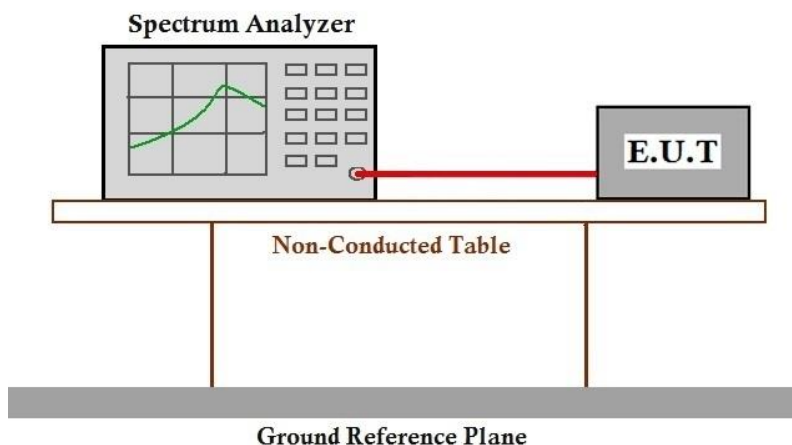
7.5.1 E.U.T. Operation

Operating Environment:
 Temperature: 22.8 °C Humidity: 31.4 % RH Atmospheric Pressure: 1020 mbar

7.5.2 Test Mode Description

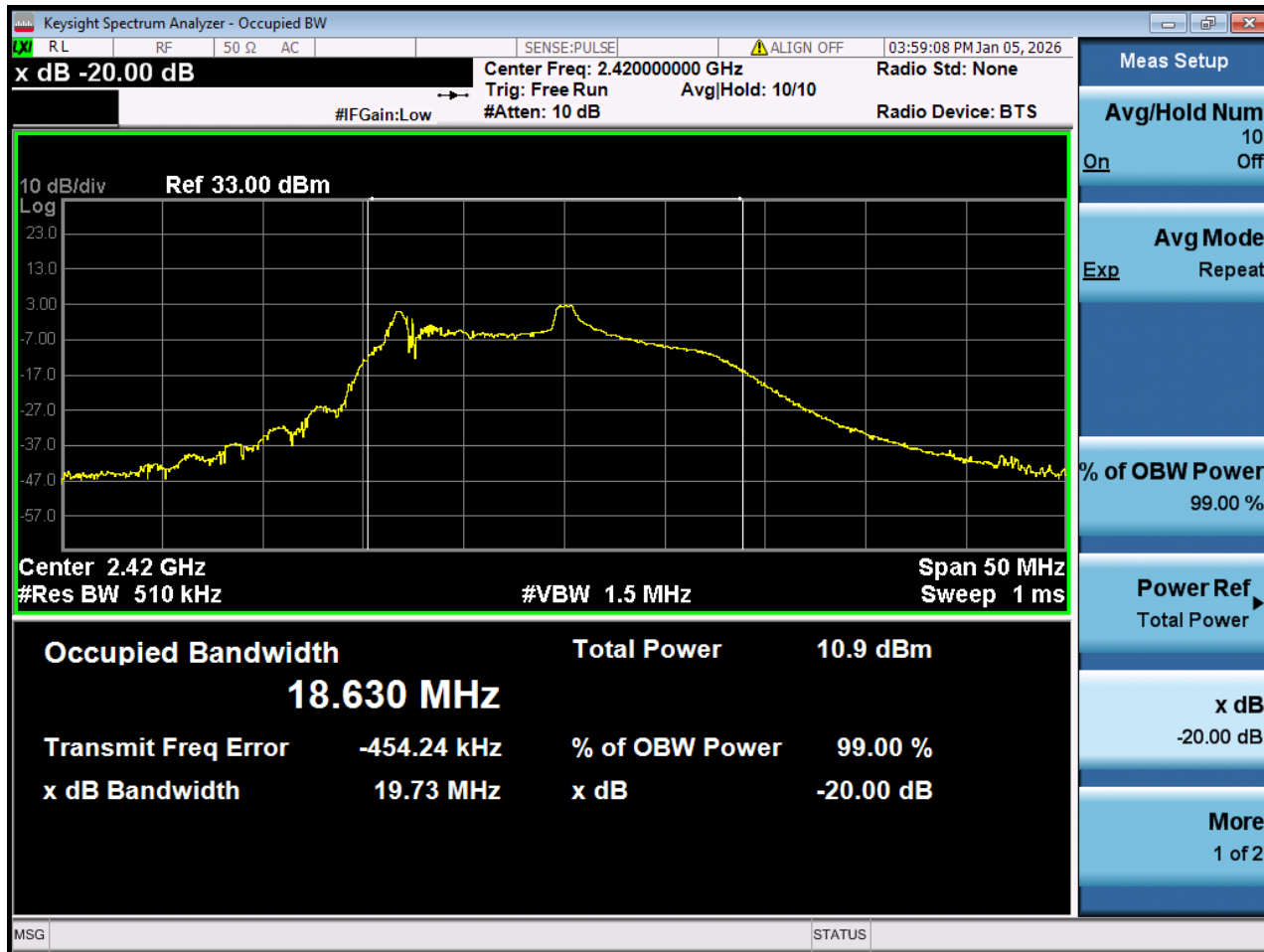
Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode_Keep the EUT in transmitting with modulation mode.

7.5.3 Test Setup Diagram



7.5.4 Measurement Procedure and Data

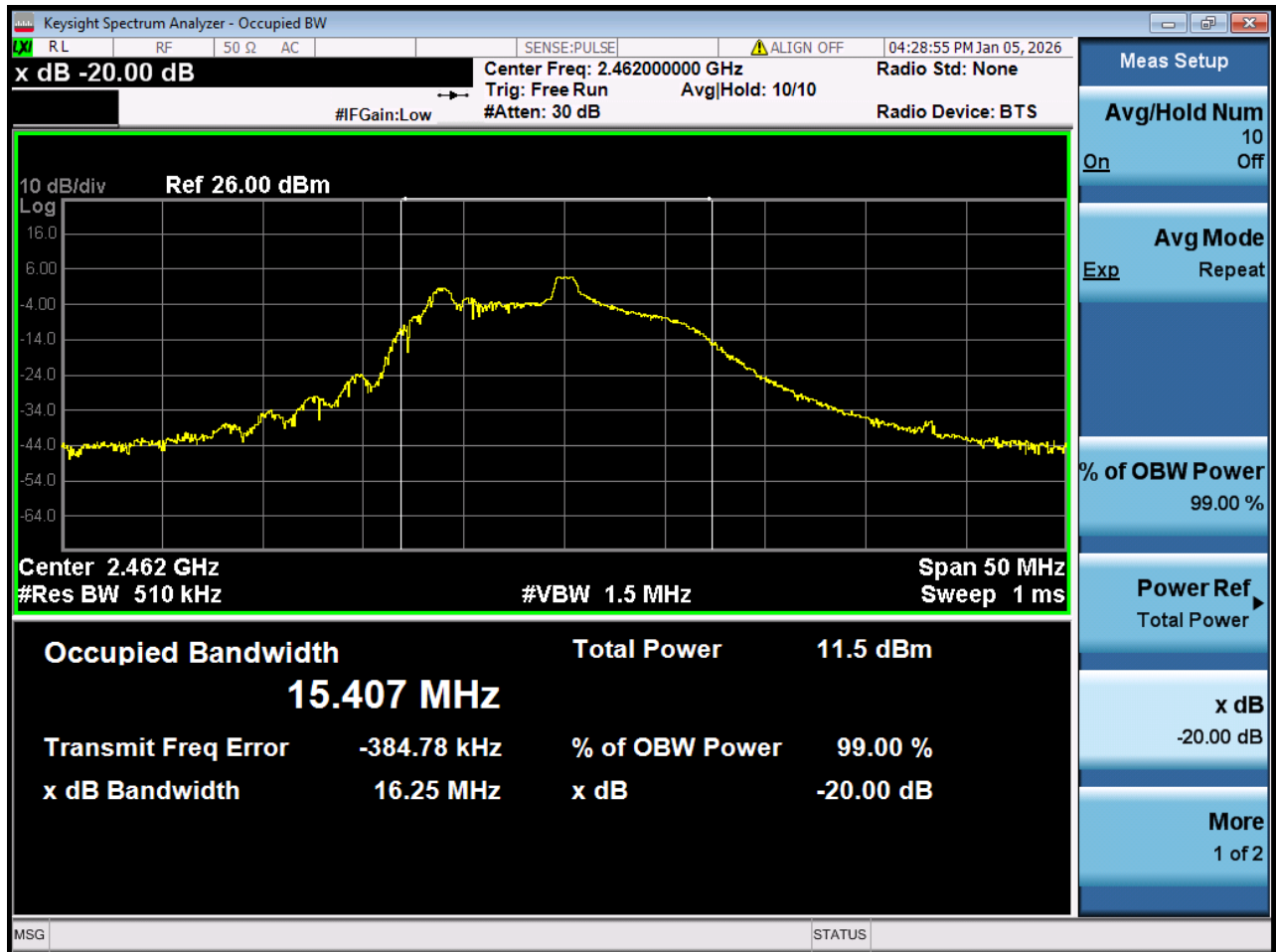
2420MHz_1



2441MHz_1



2462MHz_1



8 Test Setup Photo

Refer to Appendix - Test Setup Photo for SZCR2601000040ET

9 EUT Constructional Details (EUT Photos)

Refer to External and Internal Photos for SZCR2601000040ET

- End of the Report -

