

TEST REPORT

Application No.: SZCR2602000538ET
Applicant: Mattel Asia Pacific Sourcing Ltd.
Address of Applicant: 11/F., South Tower, World Finance Centre, Harbour City, Tsimshatsui, Kowloon, HongKong
Manufacturer: Mattel Asia Pacific Sourcing Ltd.
Address of Manufacturer: 11/F., South Tower, World Finance Centre, Harbour City, Tsimshatsui, Kowloon, HongKong
Equipment Under Test (EUT):
EUT Name: HOT WHEELS™ ALL-TERRAIN GREAT BITE RC™ Vehicle
Model No.: JMM76
Trade Mark: Mattel
FCC ID: PIYJMM76-26A5R
Standard(s) : 47 CFR Part 15, Subpart C 15.249
Date of Receipt: 2026-02-03
Date of Test: 2026-02-05 to 2026-03-01
Date of Issue: 2026-03-03

Test Result:	Pass*
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* In the configuration tested, the EUT complied with the standards specified above.

Keny Xu

Keny Xu
EMC Laboratory Manager



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

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SZEMC-TRF-01 Rev. A/2

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Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2026-03-03		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



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4 General Information

4.1 Details of E.U.T.

Power supply:	Rechargeable battery DC6.4V,700mAh for RX ,Charged by DC5V
Cable(s):	USB cable:40cm unshielded
Operation Frequency:	2420MHz to 2462MHz
Modulation Type:	GFSK
Number of Channels:	43
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



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	2026-02-02	2027-02-01
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	2026-02-02	2027-02-01
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
Loop Antenna	ETS-Lindgren	6502	SEM003-08	2025-11-17	2027-11-16
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
BiConiLog Antenna	ETS-LINDGREN	3142C	SEM003-01	2025-08-29	2027-08-28
Pre-Amplifier	Agilent Technologies	8447D	SEM005-01	2026-02-02	2027-02-01
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



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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	2026-02-02	2027-02-01
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
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
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	2026-02-03	2027-02-02
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	2026-02-02	2027-02-01
Programmable Temperature & Humidity Chamber	Votsch Industrietechnik GmbH	VT 4002	SEM002-15	2026-02-03	2027-02-02

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



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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: Tommy Luo

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: 24.5 °C Humidity: 44.5 % 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

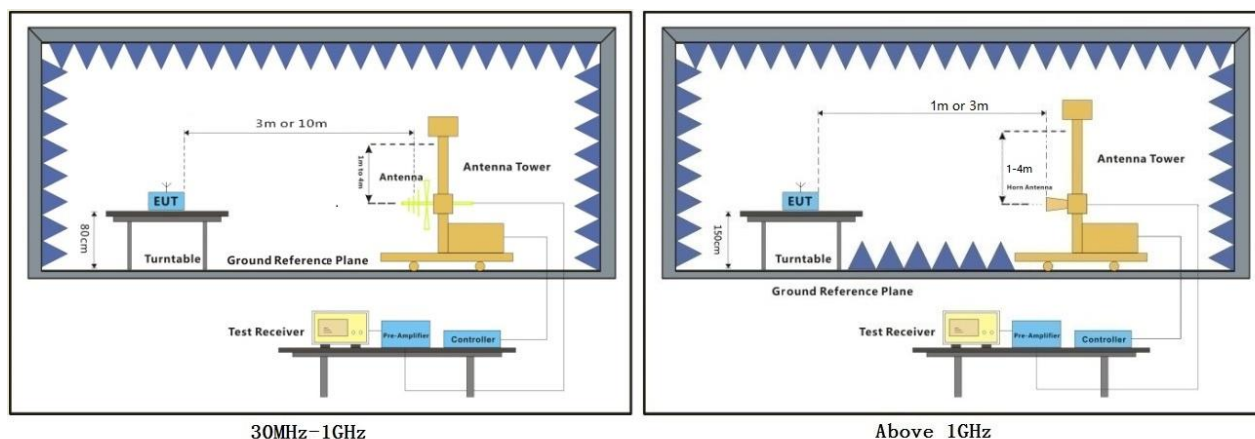


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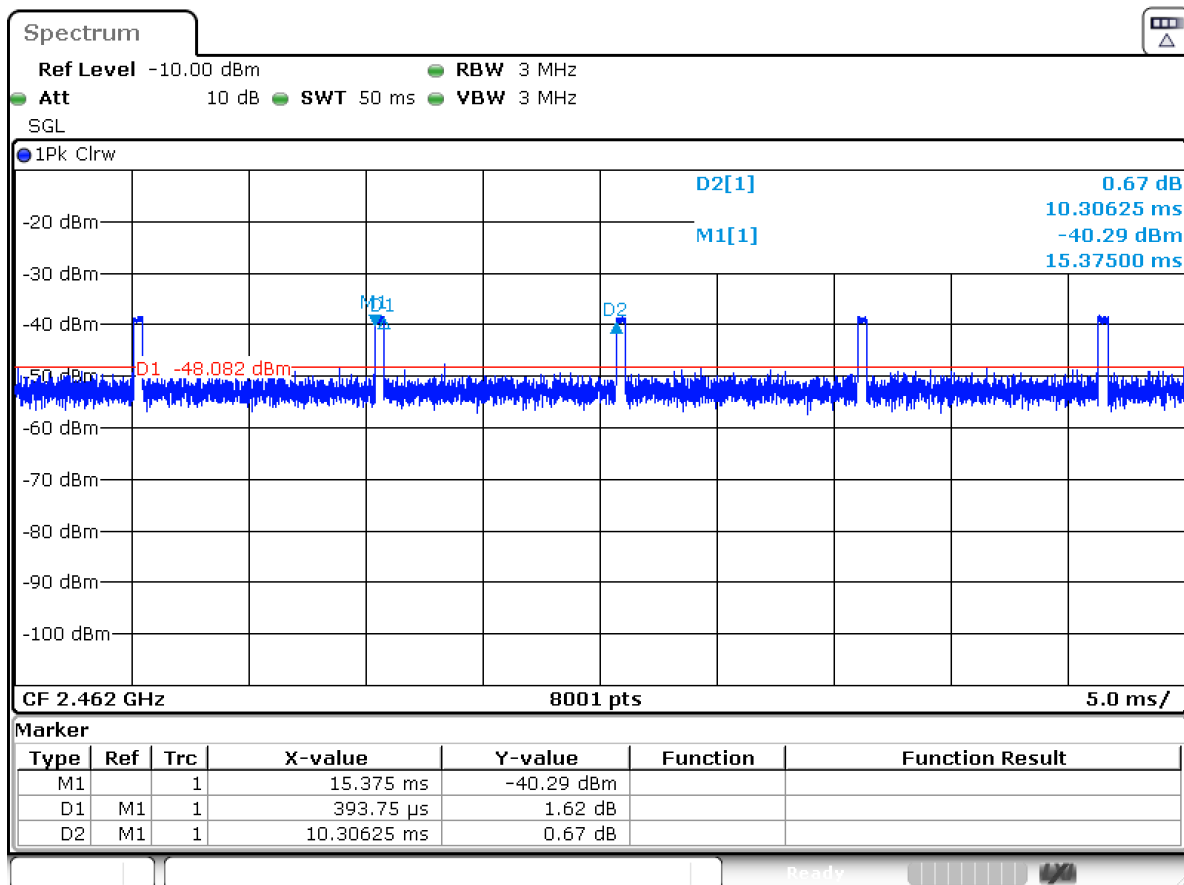
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7.1.4 Measurement Procedure and Data

- For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 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 or 10 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

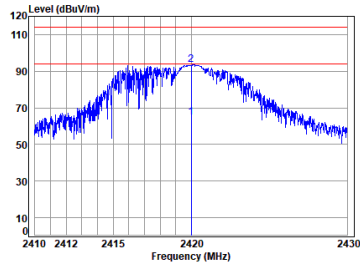


On time(ms)	T(ms)	Duty cycle(%)	Duty factor
0.39375	10.31	0.04	-28.36

Note: Average Level=Peak Level+Duty Factor



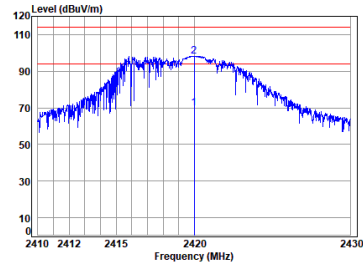
2.4G_SRD_LOW_TX_Horizontal



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00536/00538ET
Mode : 2420 Field strength
: 2.4G SRD
: Car

Freq	Cable	Loss	Factor	Ant	Preamp	Read	Level	Limit	Over	Remark	Aux
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	dB	dB		dB
1 q 2420.000	16.18	29.02	32.76	52.57	65.01	94.00	-28.99	Average	0.00		
2 p 2420.000	16.18	29.02	32.76	80.93	93.37	114.00	-20.63	Peak	0.00		

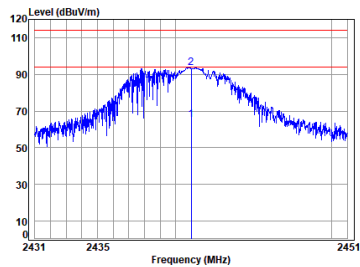
2.4G_SRD_LOW_TX_Vertical



Site : chamber
Condition: 3m VERTICAL
Job No : 00536/00538ET
Mode : 2420 Field strength
: 2.4G SRD
: Car

Freq	Cable	Loss	Factor	Ant	Preamp	Read	Level	Limit	Over	Remark	Aux
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	dB	dB		dB
1 q 2420.000	16.18	29.02	32.76	57.48	69.92	94.00	-24.08	Average	0.00		
2 p 2420.000	16.18	29.02	32.76	85.84	98.28	114.00	-15.72	Peak	0.00		

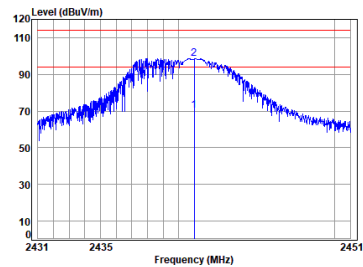
2.4G_SRD_MID_TX_Horizontal



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00536/00538ET
Mode : 2441 Field strength
: 2.4G SRD
: Car

Freq	Cable	Loss	Factor	Ant	Preamp	Read	Level	Limit	Over	Remark	Aux
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	dB	dB		dB
1 q 2441.000	16.21	28.94	32.75	52.79	65.19	94.00	-28.81	Average	0.00		
2 p 2441.000	16.21	28.94	32.75	81.15	93.55	114.00	-20.45	Peak	0.00		

2.4G_SRD_MID_TX_Vertical

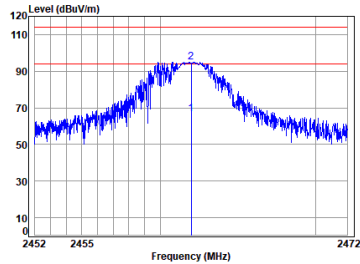


Site : chamber
Condition: 3m VERTICAL
Job No : 00536/00538ET
Mode : 2441 Field strength
: 2.4G SRD
: Car

Freq	Cable	Loss	Factor	Ant	Preamp	Read	Level	Limit	Over	Remark	Aux
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	dB	dB		dB
1 q 2441.000	16.21	28.94	32.75	57.84	70.24	94.00	-23.76	Average	0.00		
2 p 2441.000	16.21	28.94	32.75	86.20	98.60	114.00	-15.40	Peak	0.00		



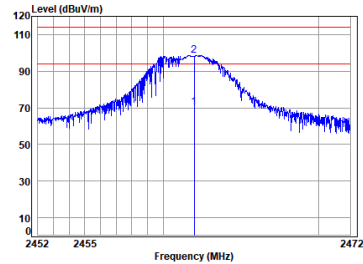
2.4G_SRD_HIGH_TX_Horizontal



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00536/00538ET
Mode : 2462 Field strength
: 2.4G SRD
: Car

Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Over Line	Aux Factor
MHz	dB	dB/m	dB	dBuV	dBuV/m	dB	dB
1 q 2462.000	16.24	28.90	32.74	54.20	66.60	94.00	0.00
2 p 2462.000	16.24	28.90	32.74	82.56	94.96	114.00	0.00

2.4G_SRD_HIGH_TX_Vertical



Site : chamber
Condition: 3m VERTICAL
Job No : 00536/00538ET
Mode : 2462 Field strength
: 2.4G SRD
: Car

Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Over Line	Aux Factor
MHz	dB	dB/m	dB	dBuV	dBuV/m	dB	dB
1 q 2462.000	16.24	28.90	32.74	57.70	70.10	94.00	0.00
2 p 2462.000	16.24	28.90	32.74	86.06	98.46	114.00	0.00



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: Dylan Yang

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:

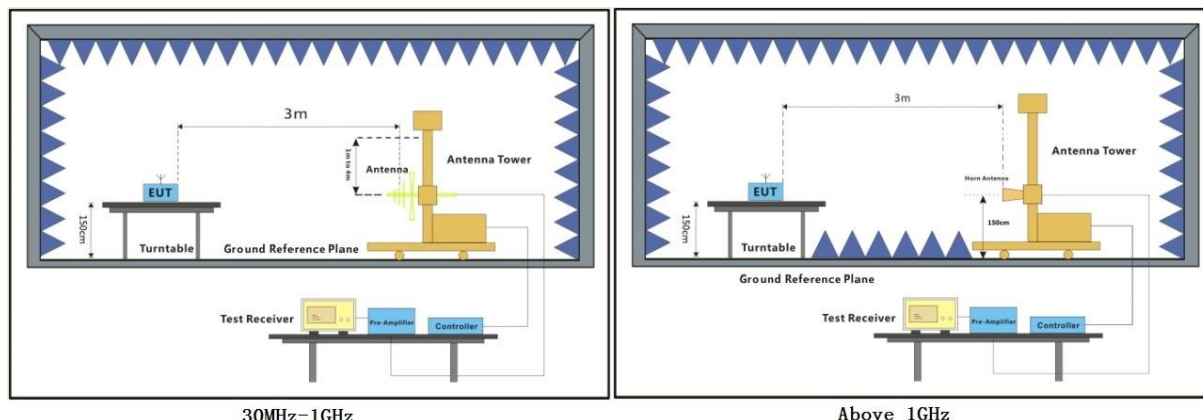
Temperature: 24.5 °C Humidity: 45.5 % RH Atmospheric Pressure: 1020 mbar

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.



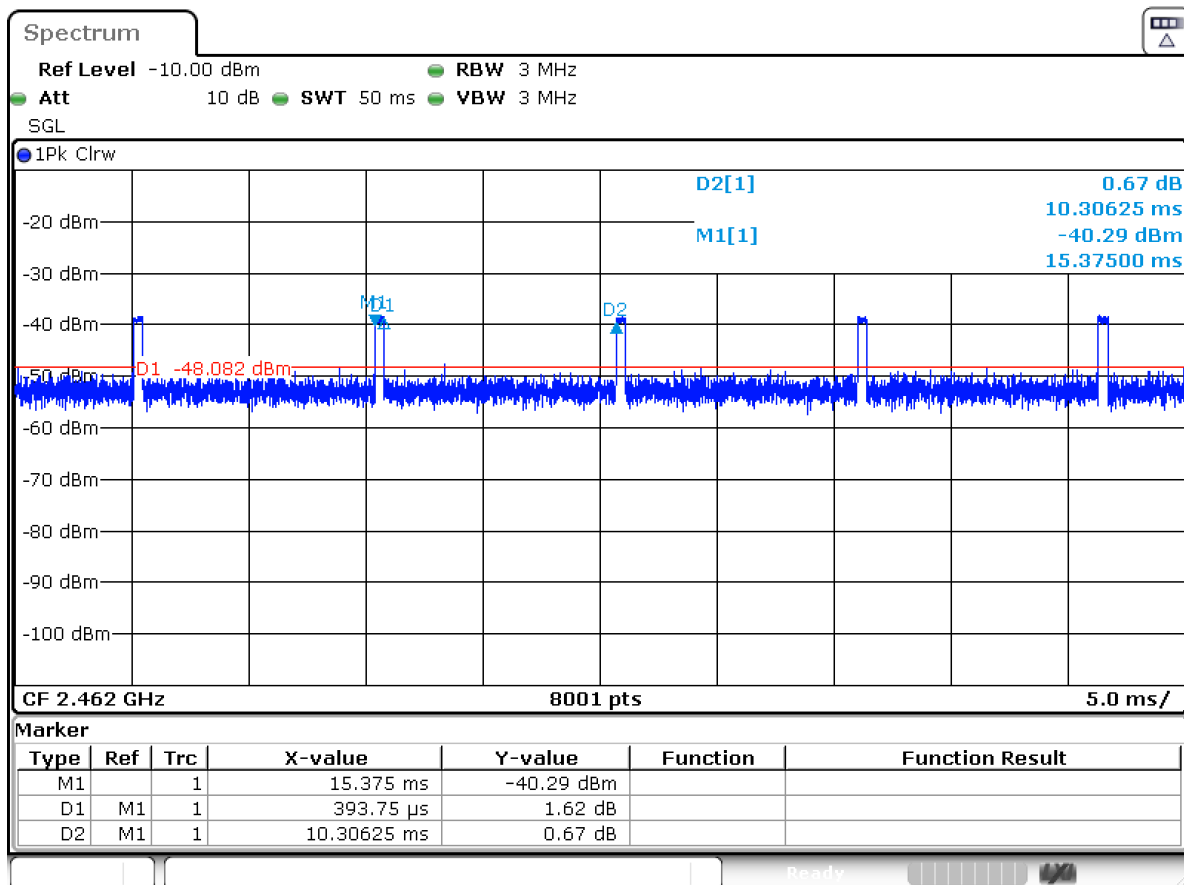
7.2.3 Test Setup Diagram



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 or 10 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 or 10 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

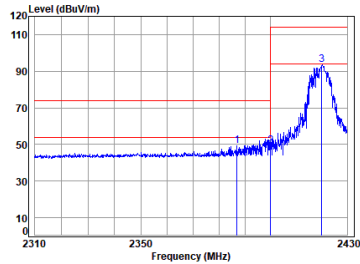


On time(ms)	T(ms)	Duty cycle(%)	Duty factor
0.39375	10.31	0.04	-28.36

Note: Average Level=Peak Level+Duty Factor



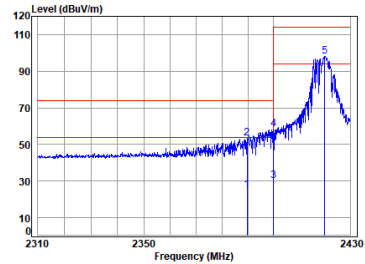
2.4G_SRD_LOW_TX_Horizontal



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00536/00538ET
Mode : 2420 Band edge
: 2.4G SRD
: Car

Freq	Cable	Loss	Factor	Ant	Preamp	Read	Level	Limit	Over	Remark	Aux
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	dB	dB		dB
1 2386.944	16.13	29.10	32.78	36.71	49.16	74.00	-24.84	Peak	0.00		
2 2400.000	16.15	29.10	32.78	36.70	49.17	74.00	-24.83	Peak	0.00		
3 p 2420.000	16.18	29.02	32.76	80.99	93.43	114.00	-20.57	Peak	0.00		

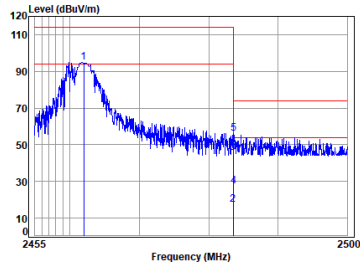
2.4G_SRD_LOW_TX_Vertical



Site : chamber
Condition: 3m VERTICAL
Job No : 00536/00538ET
Mode : 2420 Band edge
: 2.4G SRD
: Car

Freq	Cable	Loss	Factor	Ant	Preamp	Read	Level	Limit	Over	Remark	Aux
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	dB	dB		dB
1 2389.726	16.13	29.10	32.78	40.88	53.33	74.00	-20.67	Average	0.00		
2 2389.726	16.13	29.10	32.78	40.88	53.33	74.00	-20.67	Peak	0.00		
3 q 2400.000	16.15	29.10	32.78	17.48	29.95	54.00	-24.05	Average	0.00		
4 p 2400.000	16.15	29.10	32.78	45.84	58.31	74.00	-15.69	Peak	0.00		
5 2420.000	16.18	29.02	32.76	85.82	98.26	114.00	-15.74	Peak	0.00		

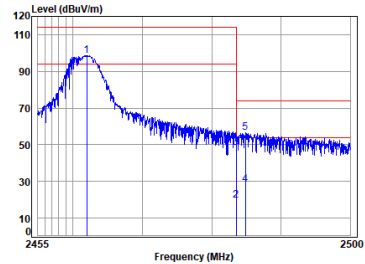
2.4G_SRD_HIGH_TX_Horizontal



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00536/00538ET
Mode : 2462 Band edge
: 2.4G SRD
: Car

Freq	Cable	Loss	Factor	Ant	Preamp	Read	Level	Limit	Over	Remark	Aux
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	dB	dB		dB
1 2462.000	16.24	28.90	32.74	82.41	94.81	114.00	-19.19	Peak	0.00		
2 2483.500	16.28	28.90	32.73	4.90	17.35	54.00	-36.65	Average	0.00		
3 2483.500	16.28	28.90	32.73	33.26	45.71	74.00	-28.29	Peak	0.00		
4 q 2483.525	16.28	28.90	32.73	15.13	27.58	54.00	-26.42	Average	0.00		
5 p 2483.525	16.28	28.90	32.73	43.49	55.94	74.00	-18.06	Peak	0.00		

2.4G_SRD_HIGH_TX_Vertical



Site : chamber
Condition: 3m VERTICAL
Job No : 00536/00538ET
Mode : 2462 Band edge
: 2.4G SRD
: Car

Freq	Cable	Loss	Factor	Ant	Preamp	Read	Level	Limit	Over	Remark	Aux
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	dB	dB		dB
1 p 2462.000	16.24	28.90	32.74	85.99	98.39	114.00	-15.61	Peak	0.00		
2 2483.500	16.28	28.90	32.73	7.35	19.80	54.00	-34.20	Average	0.00		
3 2483.500	16.28	28.90	32.73	35.71	48.16	74.00	-25.84	Peak	0.00		
4 q 2484.834	16.28	28.90	32.73	15.95	28.40	54.00	-25.60	Average	0.00		
5 2484.834	16.28	28.90	32.73	44.31	56.76	74.00	-17.24	Peak	0.00		



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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: Kaito Zeng

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:

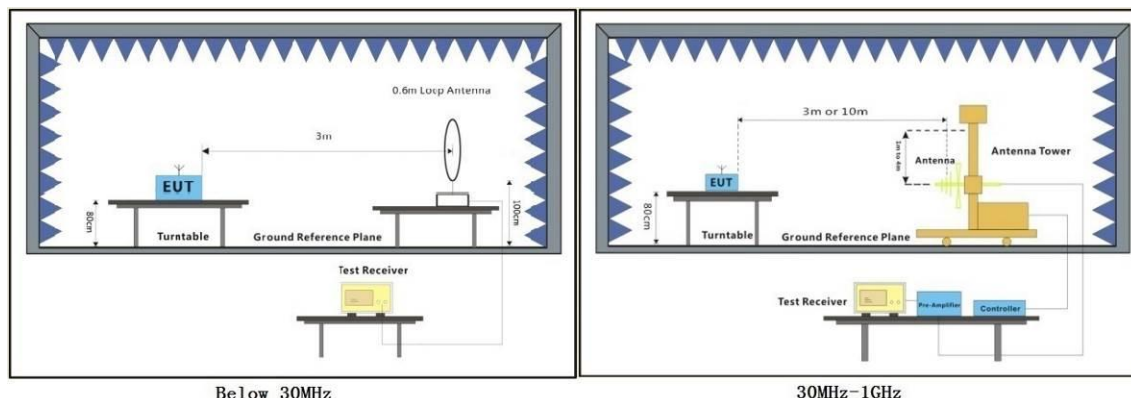
Temperature: 23.5 °C Humidity: 46.8 % RH Atmospheric Pressure: 1020 mbar

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



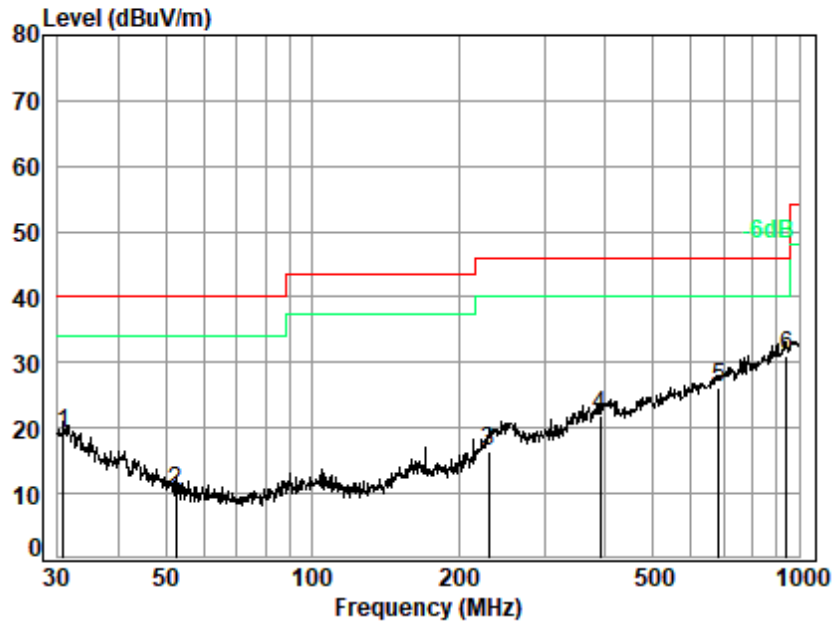
7.3.4 Measurement Procedure and Data

- For below 1GHz, the EUT was placed on the top of a rotating table 0.8m above the ground at a semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3m away from the interference-receiving antenna, which was mounted on the variable-height antenna tower.
- The antenna height is varied from 1m to 4m 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 1m to 4m (for the test frequency of below 30MHz, the antenna was tuned to heights 1m) 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 quasi-peak 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:

- Scan from 9kHz to 30MHz, the disturbance below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only below 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.
- The disturbance below 1GHz was very low and the harmonics were the highest point could be found when testing, so only the worst-case test curve is displayed.

Test Mode: 00; Polarity: Horizontal



Site : chamber
Condition: 3m HORIZONTAL
Job No. : 00536ET/00538ET
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	30.853	21.01	0.75	27.65	24.96	19.07	40.00	-20.93 QP
2	52.391	12.56	0.91	27.63	24.61	10.45	40.00	-29.55 QP
3	230.099	16.73	1.84	27.70	25.64	16.51	46.00	-29.49 QP
4	390.723	20.38	2.46	27.73	26.72	21.83	46.00	-24.17 QP
5	684.745	25.66	3.37	27.87	24.89	26.05	46.00	-19.95 QP
6 q	942.131	29.01	4.06	26.72	24.77	31.12	46.00	-14.88 QP



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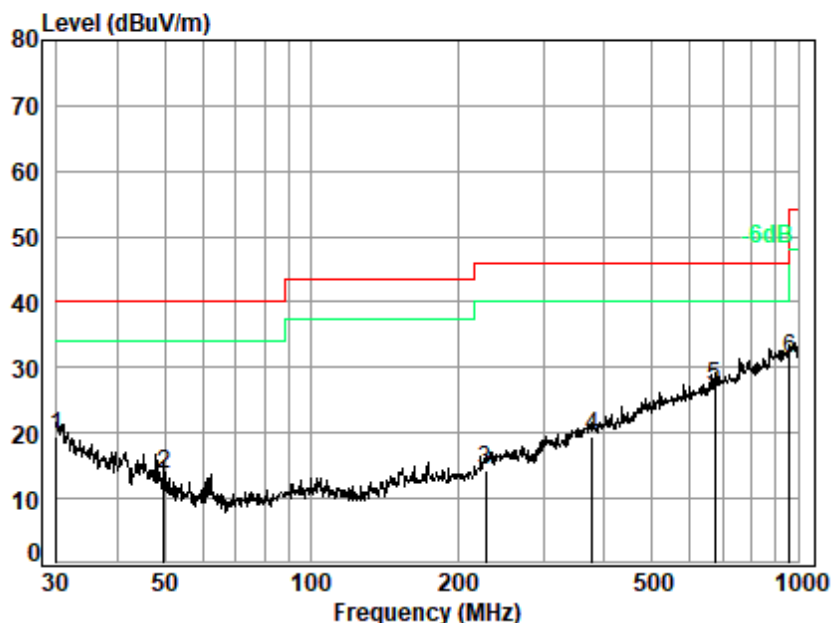
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Test Mode: 00; Polarity: Vertical



Site : chamber
Condition: 3m VERTICAL
Job No. : 00536ET/00538ET
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	30.000	21.45	0.74	27.65	24.91	19.45	40.00	-20.55 QP
2	49.881	13.07	0.90	27.63	27.25	13.59	40.00	-26.41 QP
3	227.691	16.33	1.83	27.70	23.86	14.32	46.00	-31.68 QP
4	377.259	20.46	2.41	27.70	24.38	19.55	46.00	-26.45 QP
5	675.208	25.53	3.34	27.89	26.18	27.16	46.00	-18.84 QP
6 q	958.794	29.31	4.09	26.63	24.69	31.46	46.00	-14.54 QP



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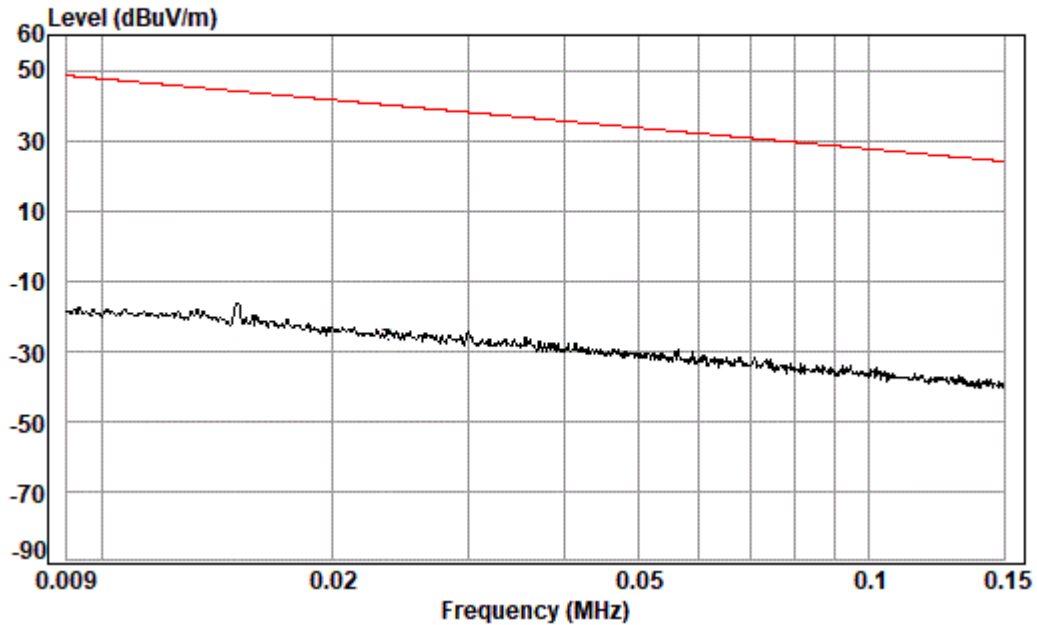
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SZEMC-TRF-01 Rev. A/2

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Test Mode: 00; Polarity: coaxial



Condition: 3m
Job No. : 00538ET
Test Mode: 00
: coaxial



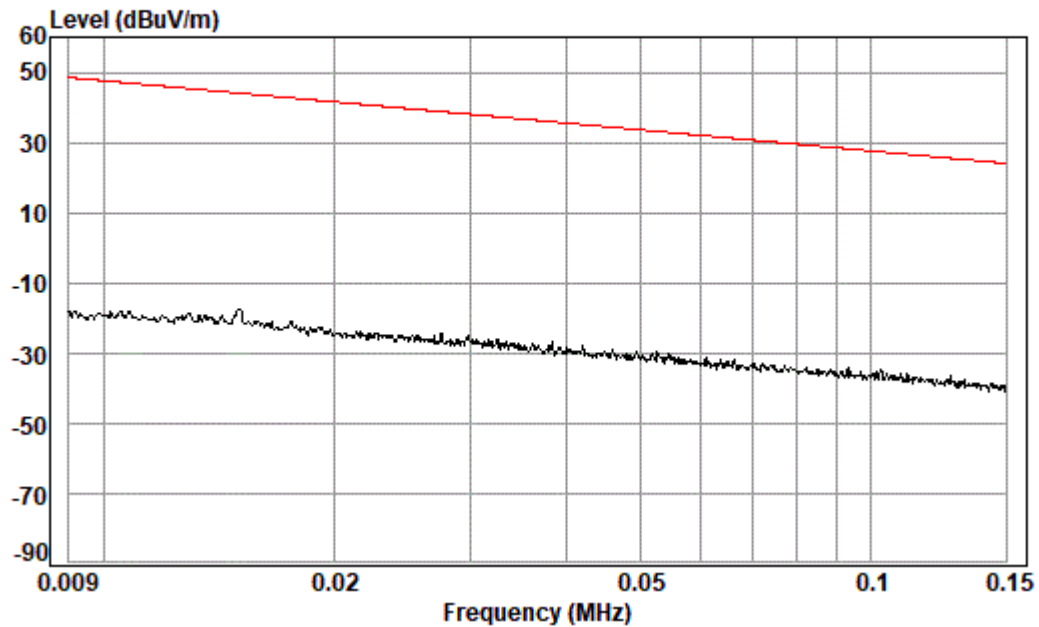
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Shenzhen Branch

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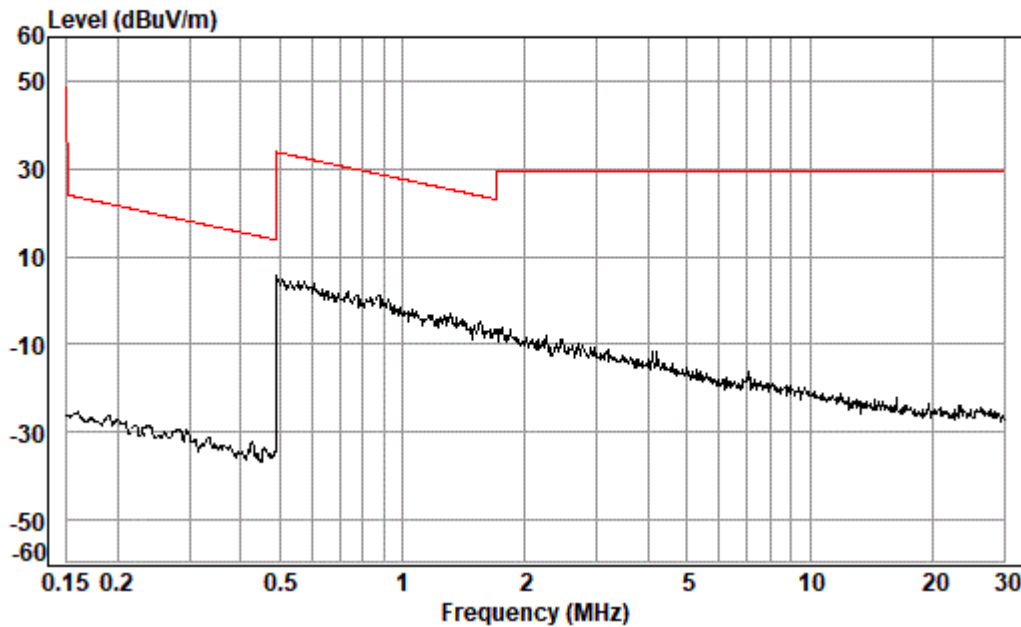
Test Mode: 00; Polarity: Coplanar



Condition: 3m
 Job No. : 00538ET
 Test Mode: 00
 : coplanar



Test Mode: 00; Polarity: coaxial



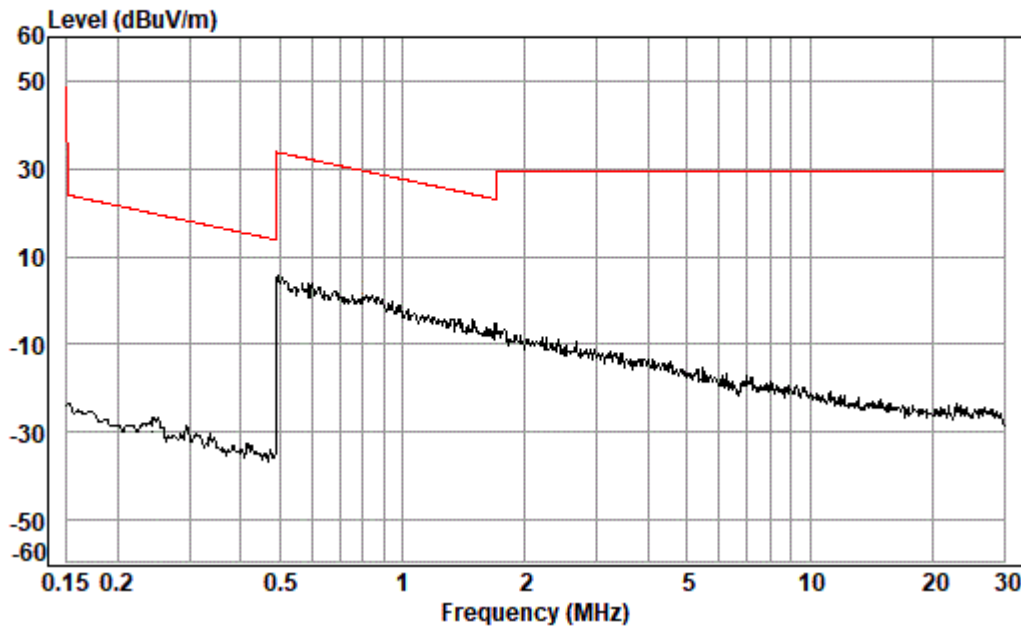
Condition: 3m
Job No. : 00538ET
Test Mode: 00
: coaxial



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Test Mode: 00; Polarity: coplanar



Condition: 3m

Job No. : 00538ET

Test Mode: 00

: coplanar



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: Tommy Luo

Limit:

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

Note:

At Above 18GHz, measurements may be performed at a distance shorter than that 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. Above 18GHz, Aux Factor = 20 dB/decade of distance, the aux factor is $20\log(1/3) = -9.54\text{dB}$ (for 1m test distance).

7.4.1 E.U.T. Operation

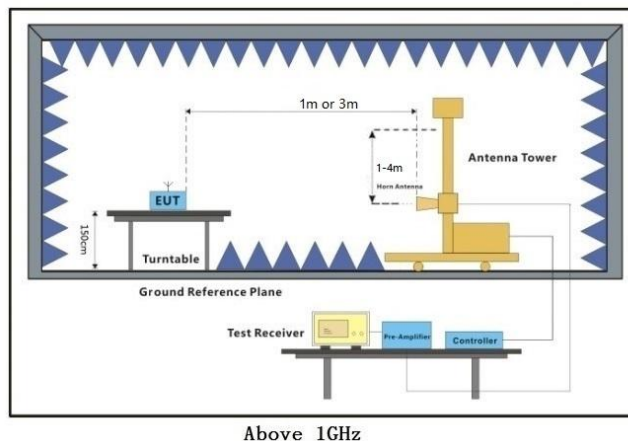
Operating Environment:

Temperature: 24.5 °C Humidity: 45.5 % 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



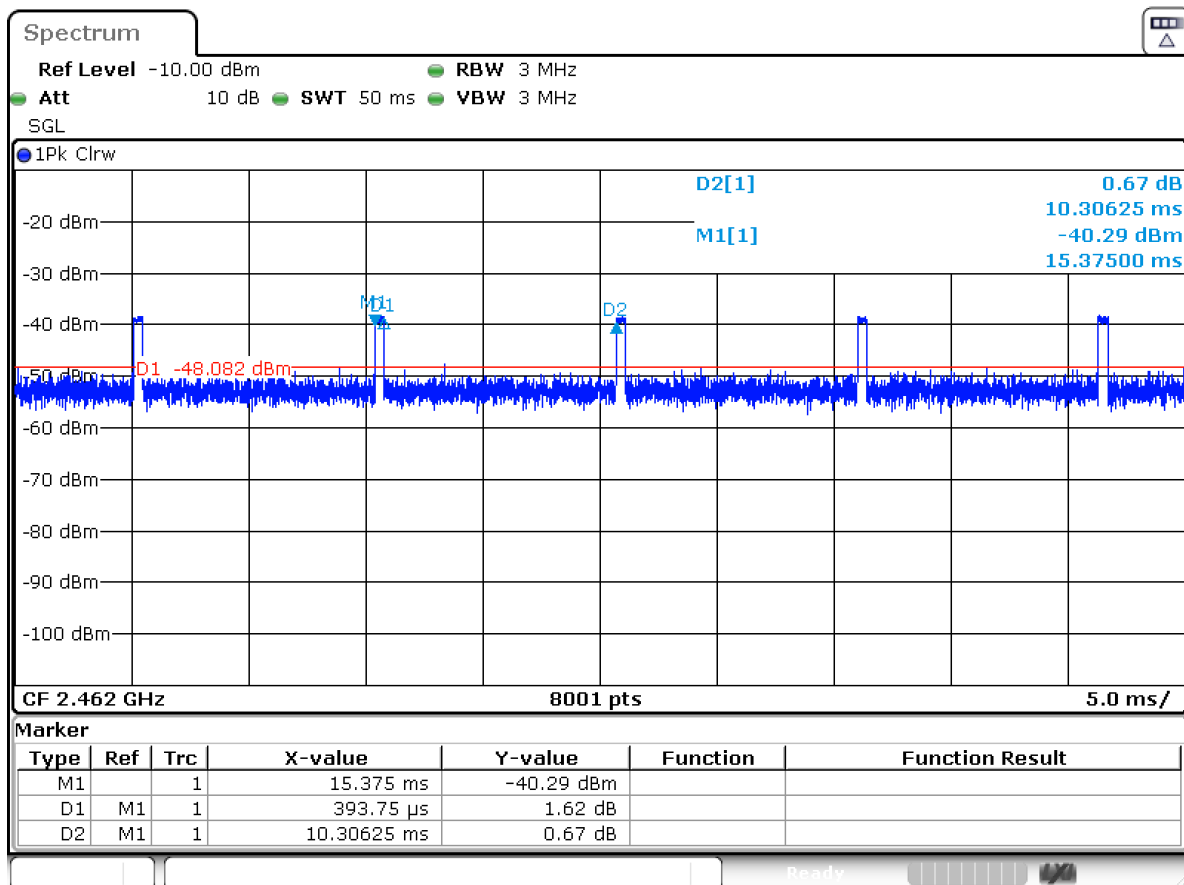
7.4.4 Measurement Procedure and Data

- a. For above 1GHz, the EUT was placed on the top of a rotating table 1.5m above the ground at a 3m fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation. The EUT was set 3m away from the interference-receiving antenna from 1GHz to 18GHz, and 1m 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 1m to 4m 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 1m to 4m 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. Scan from 1GHz to 10th harmonic of the highest frequency or 40 GHz, whichever is lower.
2. 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.
3. For the frequency above 18GHz, testing had been executed under all test modes, only the worst-case test curve is displayed in the report.
4. 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.



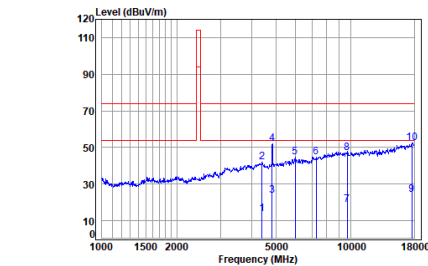


On time(ms)	T(ms)	Duty cycle(%)	Duty factor
0.39375	10.31	0.04	-28.36

Note: Average Level=Peak Level+Duty Factor



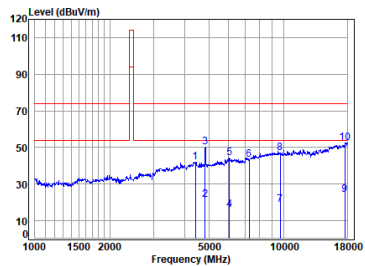
2.4G_SRD_LOW_TX_Horizontal



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00536/00538ET
Mode : 2420 TX RSE
: 2.4G SRD
: Car

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit Line	Over Limit	Remark	Aux Factor
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	dB
1	4405.090	7.12	34.74	54.26	25.88	13.48	54.00	-40.52 Average	0.00
2	4405.090	7.12	34.74	54.26	54.24	41.84	74.00	-32.16 Peak	0.00
3	4840.000	7.44	34.46	54.21	35.96	23.65	54.00	-30.35 Average	0.00
4	4840.000	7.44	34.46	54.21	64.32	52.01	74.00	-21.99 Peak	0.00
5	5984.305	8.91	34.84	53.12	53.92	44.55	74.00	-29.45 Peak	0.00
6	7260.000	8.48	35.70	53.17	53.54	44.55	74.00	-29.45 Peak	0.00
7	9680.000	10.72	37.50	53.32	23.69	18.59	54.00	-35.41 Average	0.00
8	9680.000	10.72	37.50	53.32	52.05	46.95	74.00	-27.05 Peak	0.00
9	q17588.560	11.25	43.58	52.60	21.78	24.01	54.00	-29.99 Average	0.00
10	p17588.560	11.25	43.58	52.60	50.14	52.37	74.00	-21.63 Peak	0.00

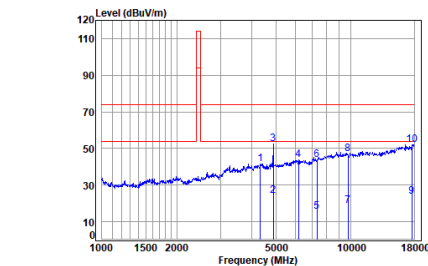
2.4G_SRD_LOW_TX_Vertical



Site : chamber
Condition: 3m VERTICAL
Job No : 00536/00538ET
Mode : 2420 TX RSE
: 2.4G SRD
: Car

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Over Limit	Remark	Aux Factor	
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	dB	
1	4417.841	7.13	34.59	54.26	54.61	42.07	74.00	-31.93	Peak	0.00
2	4840.000	7.44	34.46	54.21	33.92	21.61	54.00	-32.39	Average	0.00
3	4840.000	7.44	34.46	54.21	62.28	49.97	74.00	-24.03	Peak	0.00
4	6053.894	8.92	35.01	53.11	25.24	16.06	54.00	-37.94	Average	0.00
5	6053.894	8.92	35.01	53.11	53.60	44.42	74.00	-29.58	Peak	0.00
6	7260.000	8.48	35.70	53.17	52.47	43.48	74.00	-30.52	Peak	0.00
7	9680.000	10.72	37.50	53.32	23.58	18.40	54.00	-35.52	Average	0.00
8	9680.000	10.72	37.50	53.32	51.94	46.84	74.00	-27.16	Peak	0.00
9	q17588.560	11.25	43.58	52.60	21.86	24.09	54.00	-29.91	Average	0.00
10	p17588.560	11.25	43.58	52.60	50.22	52.45	74.00	-21.55	Peak	0.00

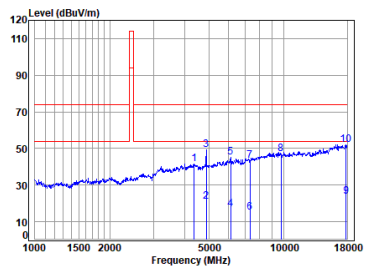
2.4G_SRD_MID_TX_Horizontal



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00536/00538ET
Mode : 2441 TX RSE
: 2.4G SRD
: Car

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Over Limit	Remark	Aux Factor
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	dB
1	4341.886	7.09	34.34	54.26	54.50	41.67	74.00	-32.33 Peak	0.00
2	4882.000	7.47	34.63	54.21	36.36	24.25	54.00	-29.75 Average	0.00
3	4882.000	7.47	34.63	54.21	64.72	52.61	74.00	-21.39 Peak	0.00
4	6177.627	8.91	34.79	53.12	53.23	43.81	74.00	-30.19 Peak	0.00
5	7323.000	8.46	35.70	53.17	24.30	15.29	54.00	-38.71 Average	0.00
6	7323.000	8.46	35.70	53.17	52.66	43.65	74.00	-30.35 Peak	0.00
7	9764.000	10.69	37.37	53.29	23.94	18.71	54.00	-35.29 Average	0.00
8	9764.000	10.69	37.37	53.29	52.30	47.07	74.00	-26.93 Peak	0.00
9	17639.470	11.28	43.68	52.58	21.48	23.86	54.00	-30.14 Average	0.00
10	17639.470	11.28	43.68	52.58	49.84	52.22	74.00	-21.78 Peak	0.00

2.4G_SRD_MID_TX_Vertical

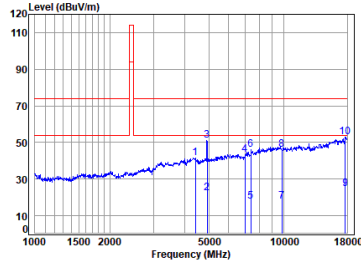


Site : chamber
Condition: 3m VERTICAL
Job No : 00536/00538ET
Mode : 2441 TX RSE
: 2.4G SRD
: Car

Freq	Cable	Ant	Preamp	Read	Level	Limit	Over		Aux
	Loss	Factor		Level			Limit	Remark	Factor
MHz	dB	dB/m		dBuV	dBuV/m	dBuV/m	dB		dB
1	4367.058	7.10	34.54	54.26	54.21	41.59	74.00	-32.41 Peak	0.00
2	4882.000	7.47	34.63	54.21	32.92	20.81	54.00	-33.19 Average	0.00
3	4882.000	7.47	34.63	54.21	61.28	49.17	74.00	-24.83 Peak	0.00
4	6124.292	8.92	35.00	53.11	26.00	16.81	54.00	-37.19 Average	0.00
5	6124.292	8.92	35.00	53.11	54.36	45.17	74.00	-28.83 Peak	0.00
6	7323.000	8.46	35.70	53.17	24.04	15.03	54.00	-38.97 Average	0.00
7	7323.000	8.46	35.70	53.17	52.40	43.39	74.00	-30.61 Peak	0.00
8	9764.000	10.69	37.37	53.29	52.27	47.04	74.00	-26.96 Peak	0.00
9	q17793.090	11.38	43.89	52.50	21.09	23.86	54.00	-30.14 Average	0.00
10	p17793.090	11.38	43.89	52.50	49.45	52.22	74.00	-21.78 Peak	0.00



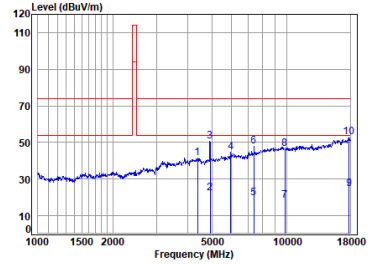
2.4G_SRD_HIGH_TX_Horizontal



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00536/00538ET
Mode : 2462 TX RSE
: 2.4G SRD
: Car

Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over	Remark	Aux Factor
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		dB
1	4417.841	7.13	34.59	54.26	54.01	41.47	74.00	-32.53 Peak	0.00
2	4924.000	7.50	34.67	54.21	34.56	22.52	54.00	-31.48 Average	0.00
3	4924.000	7.50	34.67	54.21	62.92	50.88	74.00	-23.12 Peak	0.00
4	6995.172	8.56	35.71	53.20	52.46	43.53	74.00	-30.47 Peak	0.00
5	7386.000	8.44	35.77	53.16	26.53	17.58	54.00	-36.42 Average	0.00
6	7386.000	8.44	35.77	53.16	54.89	45.94	74.00	-28.06 Peak	0.00
7	9848.000	10.66	37.20	53.26	23.19	17.79	54.00	-36.21 Average	0.00
8	9848.000	10.66	37.20	53.26	51.55	46.15	74.00	-27.85 Peak	0.00
9	q17690.530	11.32	43.78	52.55	22.03	24.58	54.00	-29.42 Average	0.00
10	p17690.530	11.32	43.78	52.55	50.39	52.94	74.00	-21.06 Peak	0.00

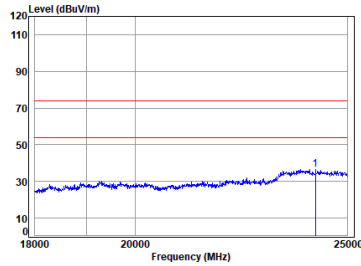
2.4G_SRD_HIGH_TX_Vertical



Site : chamber
Condition: 3m VERTICAL
Job No : 00536/00538ET
Mode : 2462 TX RSE
: 2.4G SRD
: Car

Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over	Remark	Aux Factor
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		dB
1	4392.376	7.11	34.74	54.26	54.14	41.73	74.00	-32.27 Peak	0.00
2	4924.000	7.50	34.67	54.21	34.34	22.30	54.00	-31.70 Average	0.00
3	4924.000	7.50	34.67	54.21	62.70	50.66	74.00	-23.34 Peak	0.00
4	5967.033	8.88	34.77	53.13	54.21	44.73	74.00	-29.27 Peak	0.00
5	7386.000	8.44	35.77	53.16	28.69	19.74	54.00	-34.26 Average	0.00
6	7386.000	8.44	35.77	53.16	57.05	48.10	74.00	-25.90 Peak	0.00
7	9848.000	10.66	37.20	53.26	23.77	18.37	54.00	-35.63 Average	0.00
8	9848.000	10.66	37.20	53.26	52.13	46.73	74.00	-27.27 Peak	0.00
9	q17793.090	11.38	43.89	52.50	21.77	24.54	54.00	-29.46 Average	0.00
10	p17793.090	11.38	43.89	52.50	50.13	52.90	74.00	-21.10 Peak	0.00

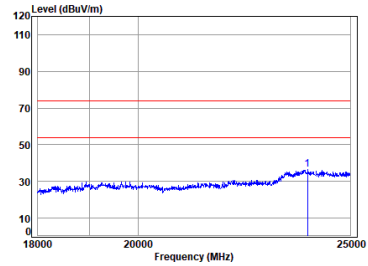
2.4G_SRD_HIGH_TX_Horizontal



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00536/00538ET
Mode : 2462 TX RSE
: 2.4G SRD
: Car

Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over	Remark	Aux Factor
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		dB
1	p24184.140	6.79	39.00	50.84	51.14	36.55	74.00	-37.45 Peak	-9.54

2.4G_SRD_HIGH_TX_Vertical



Site : chamber
Condition: 3m VERTICAL
Job No : 00536/00538ET
Mode : 2462 TX RSE
: 2.4G SRD
: Car

Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over	Remark	Aux Factor
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		dB
1	p23907.670	6.78	38.96	50.38	50.61	36.43	74.00	-37.57 Peak	-9.54

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

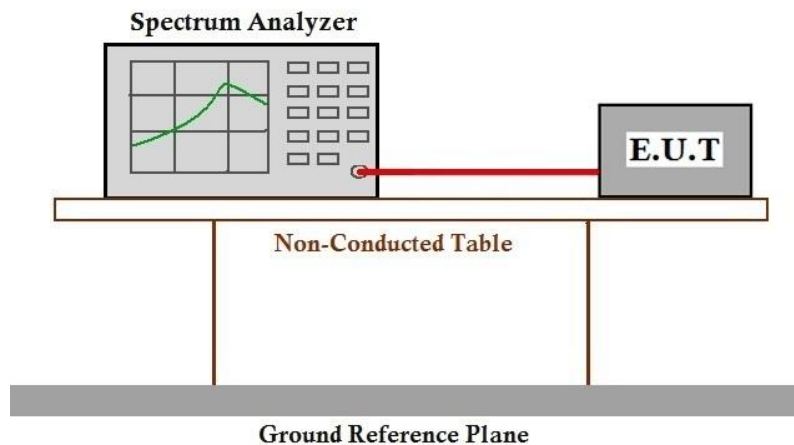
Operating Environment:

Temperature: 29.5 °C Humidity: 38.8 % 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

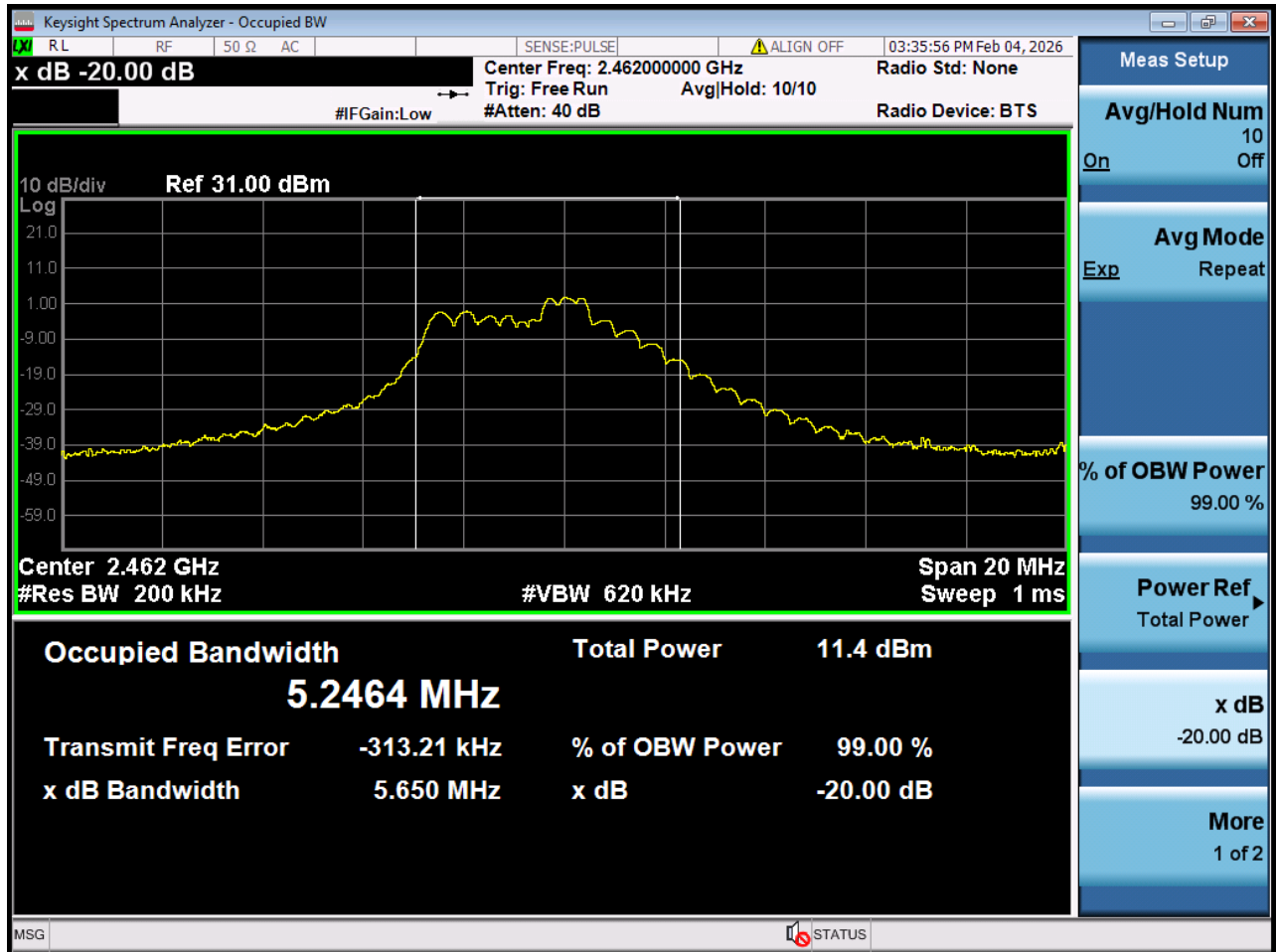
2420MHz



2441MHz



2462MHz



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8 Test Setup Photo

Refer to Appendix - Test Setup Photo for SZCR2602000538ET

9 EUT Constructional Details (EUT Photos)

Refer to External and Internal Photos for SZCR2602000538ET

- End of the Report -

