

TEST REPORT

Application No.: SZCR2603000828ET(SZHL260300676603TY)
Applicant: SHANTOU WALLGAMES TECHNOLOGY CO., LTD
Address of Applicant: No. 36, Zhongxing Road, Duting Industrial Zone, Duting Village, Lianxia Town, Changhai District, Shantou City, Guangdong Province, China

Equipment Under Test (EUT):

EUT Name: Wall Climbing Remote Control Car
Item No.: W13, W14, W15, W16, W17, W18, W19 ♣
 ♣ Please refer to section 2 of this report which indicates which item was actually tested and which were electrically identical.
FCC ID: 2BWGD-1516
Standard(s) : 47 CFR Part 15, Subpart C 15.249
Date of Receipt: 2026-03-06
Date of Test: 2026-03-17 to 2026-05-11
Date of Issue: 2026-05-27

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



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SZEMC-TRF-01 Rev. A/2

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Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2026-05-27		Original

Authorized for issue by:				
		Martin Tang		
		Martin Tang/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
20dB Bandwidth	47 CFR Part 15, Subpart C 15.249	ANSI C63.10 (2020) Section 6.9	47 CFR Part 15, Subpart C 15.215	Pass
Field Strength of the Fundamental Signal (15.249(a))		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

Declaration of EUT Family Grouping:

Item No.: W13, W14, W15, W16, W17, W18, W19

Only the item W16 was tested, since according to the declaration from the applicant, the electrical circuit design, layout, components used, internal wiring and functions were identical for the above items, with only difference on item No. and colour.



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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) for remote controller
Operating Frequency:	2405MHz-2475MHz
Channel number:	71
Modulation Type:	GFSK
Antenna Type:	Remote controller: PCB Antenna
Antenna Gain:	Remote controller:-9.86dBi

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.

Channel List:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2405	25	2429	49	2453
2	2406	26	2430	50	2454
3	2407	27	2431	51	2455
4	2408	28	2432	52	2456
5	2409	29	2433	53	2457
6	2410	30	2434	54	2458
7	2411	31	2435	55	2459
8	2412	32	2436	56	2460
9	2413	33	2437	57	2461
10	2414	34	2438	58	2462
11	2415	35	2439	59	2463
12	2416	36	2440	60	2464
13	2417	37	2441	61	2465
14	2418	38	2442	62	2466
15	2419	39	2443	63	2467
16	2420	40	2444	64	2468
17	2421	41	2445	65	2469
18	2422	42	2446	66	2470
19	2423	43	2447	67	2471
20	2424	44	2448	68	2472
21	2425	45	2449	69	2473
22	2426	46	2450	70	2474
23	2427	47	2451	71	2475
24	2428	48	2452	/	/



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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.
- the measurement uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.



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4.4 Test Location

All tests were performed at:

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Tel: +86 755 2601 2053 Fax: +86 755 2671 0594

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	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	TST PASS	LNA180400G40	SEM005-39	2025-05-22	2026-05-21

Radiated Emissions (9kHz-30MHz)					
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	2026-03-20 2027-03-19
MXE EMI receiver	KEYSIGHT	N9038A	SEM004-16	2025-07-25	2026-07-24
Trilog-Broadband Antenna	Schwarzbeck	VULB9168	SEM003-18	2025-08-29	2027-08-28
Pre-amplifier	Sonoma Instrument Co	310N	SEM005-04	2025-03-04	2027-02-01
Loop Antenna	ETS-Lindgren	6502	SEM003-08	2025-11-17	2027-11-16
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM029-01	2025-07-05	2026-07-04



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Radiated Emissions 30MHz-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

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
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



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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	2026-02-14	2027-02-13



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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.

Antenna location: Refer to Internal photos



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7 Radio Spectrum Matter Test Results

7.1 20dB Bandwidth

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

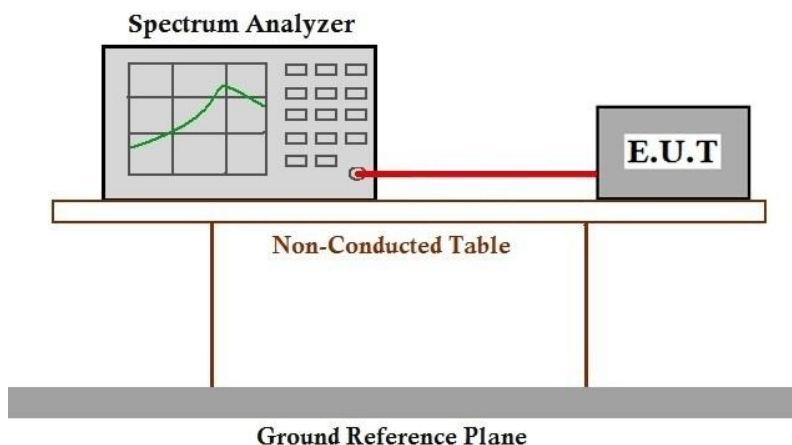
7.1.1 E.U.T. Operation

Operating Environment:
 Temperature: 25.5 °C Humidity: 41.4 % RH Atmospheric Pressure: 1010 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

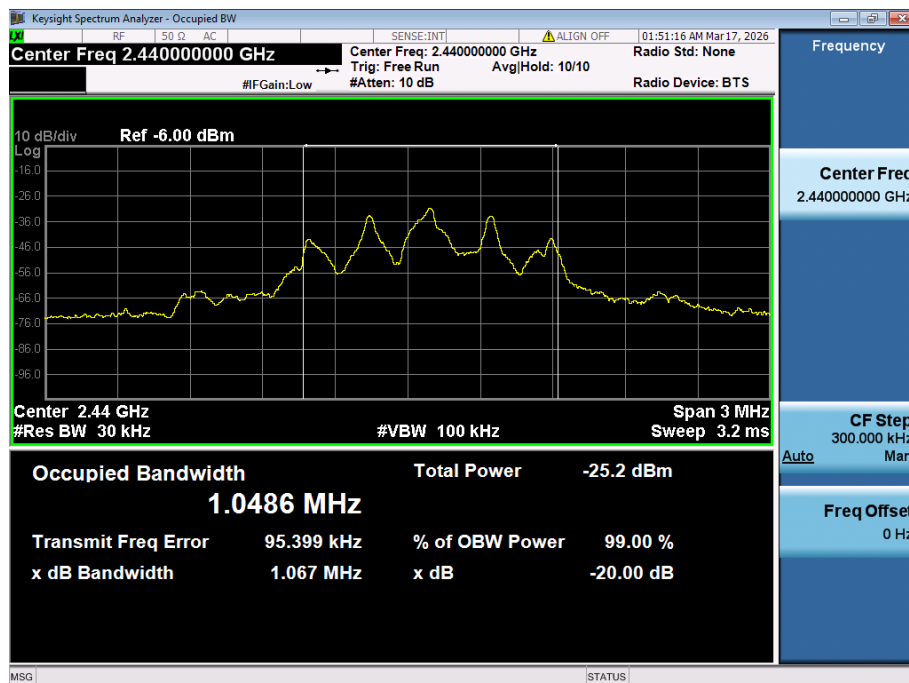
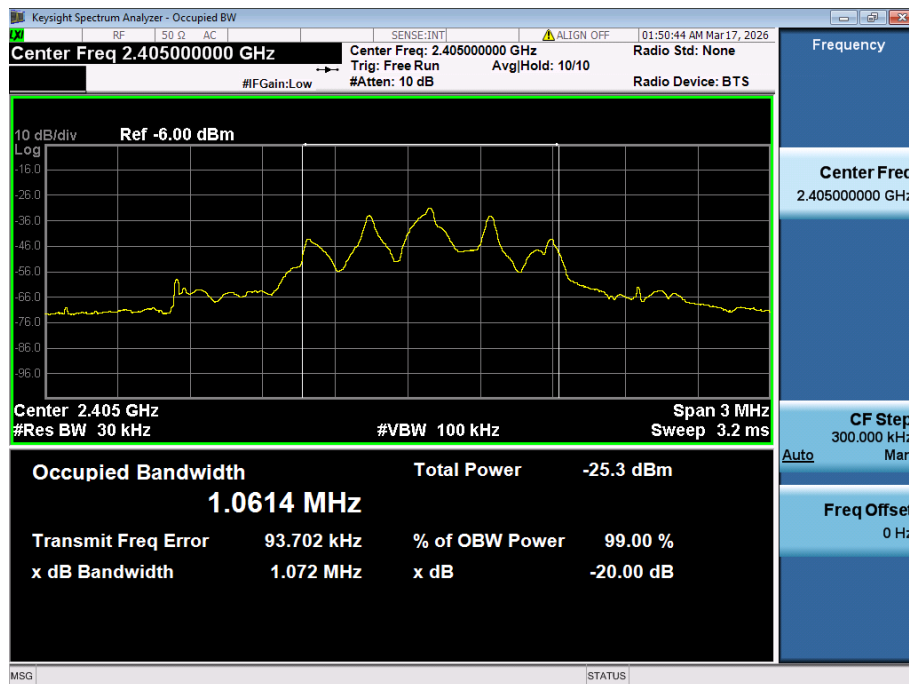
Test channel	20dB bandwidth (MHz)	Results
Lowest	1.072	Pass
Middle	1.067	Pass
Highest	1.069	Pass

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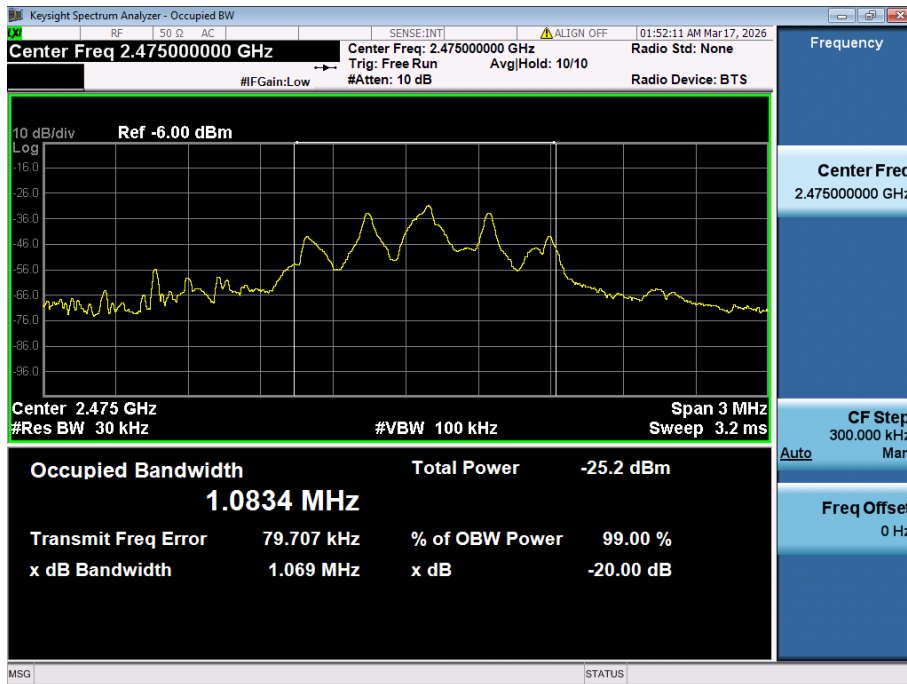
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7.2 Field Strength of the Fundamental Signal (15.249(a))

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.

7.2.1 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.

Average value:

Calculate Formula:	Average value=Peak value + PDCF
	PDCF=20 log(Duty cycle)
	Duty cycle= T on time / T period
Test data:	Ton time =0.16957
	T period =0.28261
	Duty cycle=60.0%
	PDCF value= -4.44dB

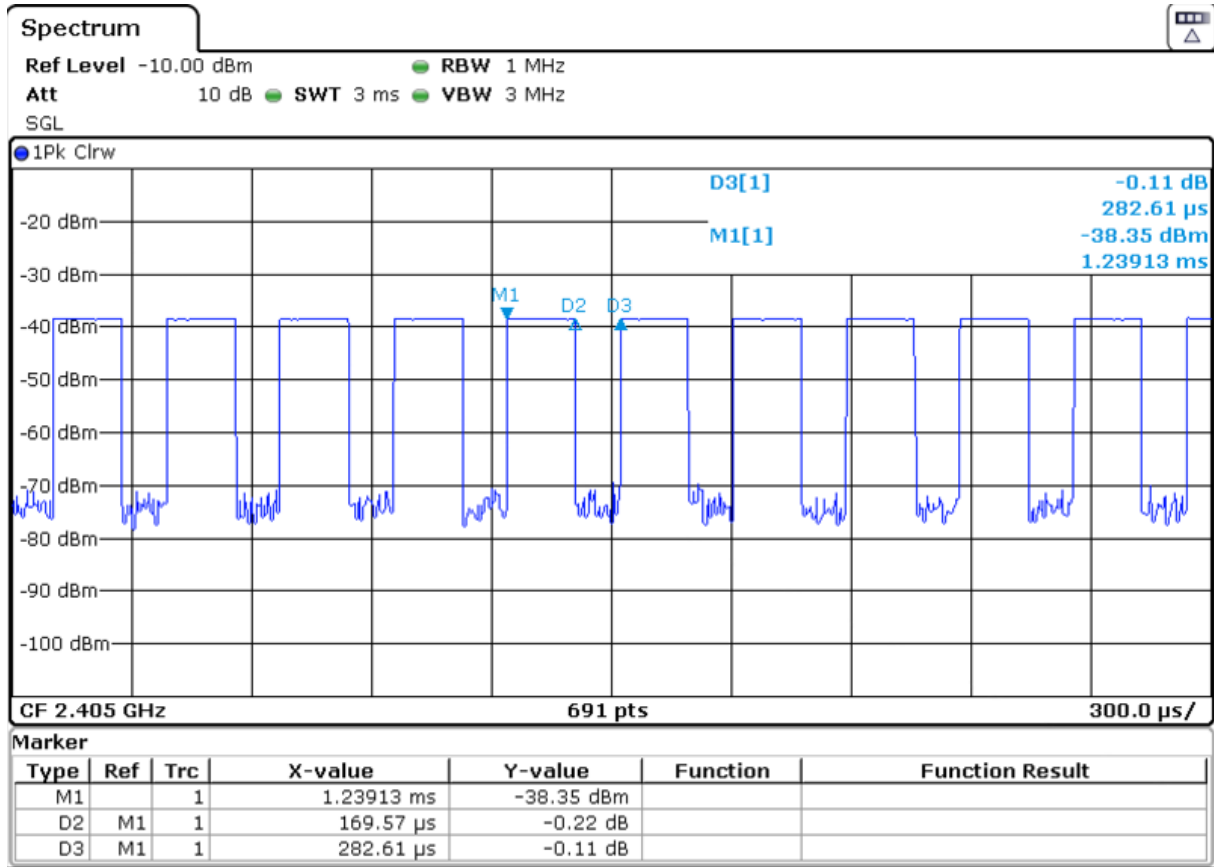


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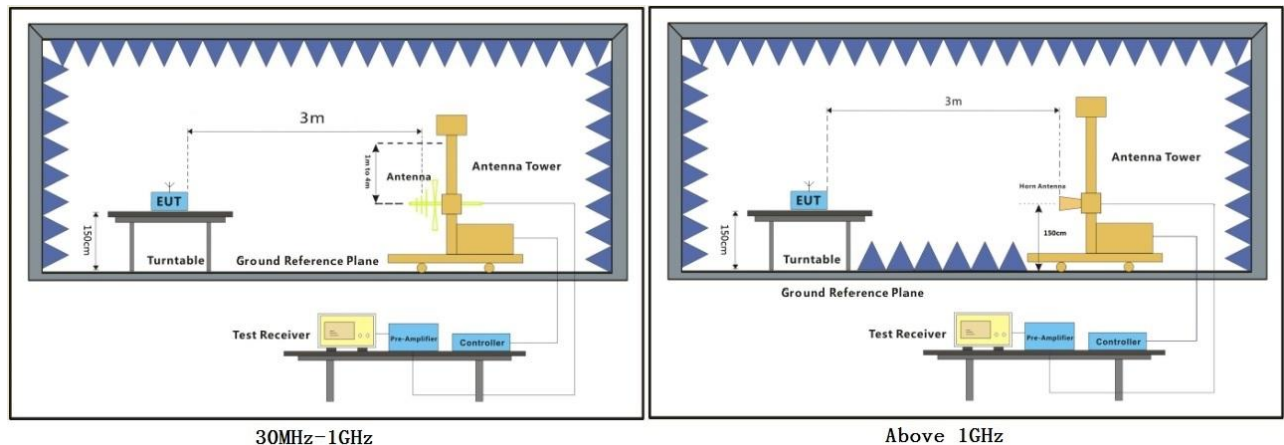
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7.2.3 Test Setup Diagram



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7.2.4 Measurement Procedure and Data

- a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
 - b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
 - c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
 - d. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
 - e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
 - f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
 - g. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
 - h. Test the EUT in the lowest channel, the middle channel, the Highest channel.
 - i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
 - j. Repeat above procedures until all frequencies measured was complete.
- Remark: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor



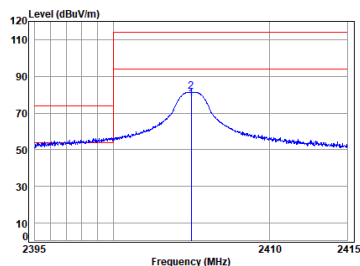
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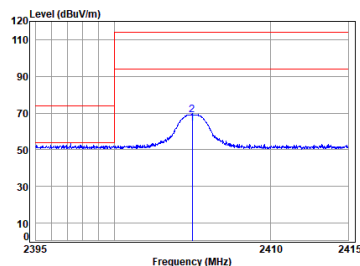
2.4G SRD_TX_CH_L_Horizontal



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00828ET
Mode : 2405 Field strength

Field strength	Cable Loss	Ant Factor	Preamplifier	Read Level	Level	Limit	Over Limit	Remark	Aux Factor
Freq	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		dB
1 q 2405.000	16.16	29.08	32.77	64.91	77.38	94.00	-16.62	Average	0.00
2 p 2405.000	16.16	29.08	32.77	69.35	81.82	114.00	-32.18	Peak	0.00

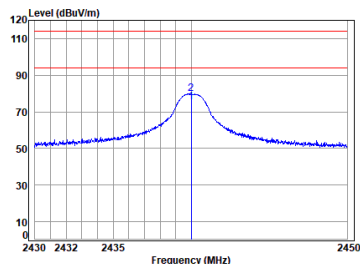
2.4G SRD_TX_CH_L_Vertical



Site : chamber
Condition: 3m VERTICAL
Job No : 00828ET
Mode : 2405 Field strength

Field strength	Cable Loss	Ant Factor	Preamplifier	Read Level	Level	Limit	Over Limit	Remark	Aux Factor
Freq	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		dB
1 q 2405.000	16.16	29.08	32.77	52.07	64.54	94.00	-29.46	Average	0.00
2 p 2405.000	16.16	29.08	32.77	56.51	68.98	114.00	-45.02	Peak	0.00

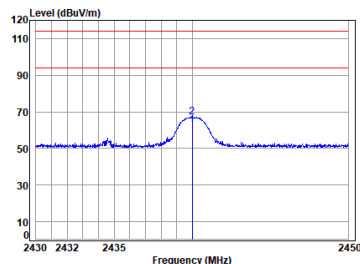
2.4G SRD_TX_CH_M_Horizontal



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00828ET
Mode : 2440 Field strength

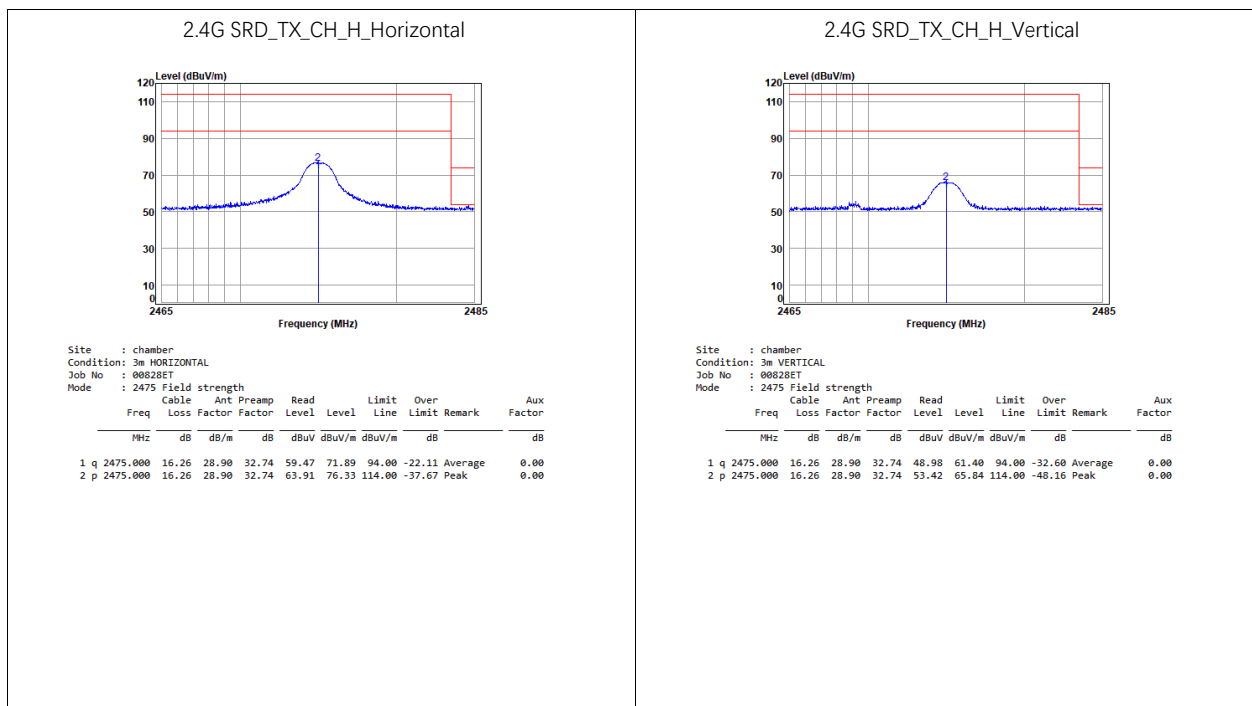
Field strength	Cable Loss	Ant Factor	Preamplifier	Read Level	Level	Limit	Over Limit	Remark	Aux Factor
Freq	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		dB
1 q 2440.000	16.21	28.94	32.75	62.87	75.27	94.00	-18.73	Average	0.00
2 p 2440.000	16.21	28.94	32.75	67.31	79.71	114.00	-34.29	Peak	0.00

2.4G SRD_TX_CH_M_Vertical



Site : chamber
Condition: 3m VERTICAL
Job No : 00828ET
Mode : 2440 Field strength

Field strength	Cable Loss	Ant Factor	Preamplifier	Read Level	Level	Limit	Over Limit	Remark	Aux Factor
Freq	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		dB
1 q 2440.000	16.21	28.94	32.75	50.23	62.63	94.00	-31.37	Average	0.00
2 p 2440.000	16.21	28.94	32.75	54.67	67.07	114.00	-46.93	Peak	0.00



Remark:

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

Final Test Level = Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor

2) The peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20dB under any condition of modulation. So, only the above measurement data were shown in the report.



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7.3 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.

7.3.1 E.U.T. Operation

Operating Environment:
 Temperature: 23.5 °C Humidity: 56.3 % 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.



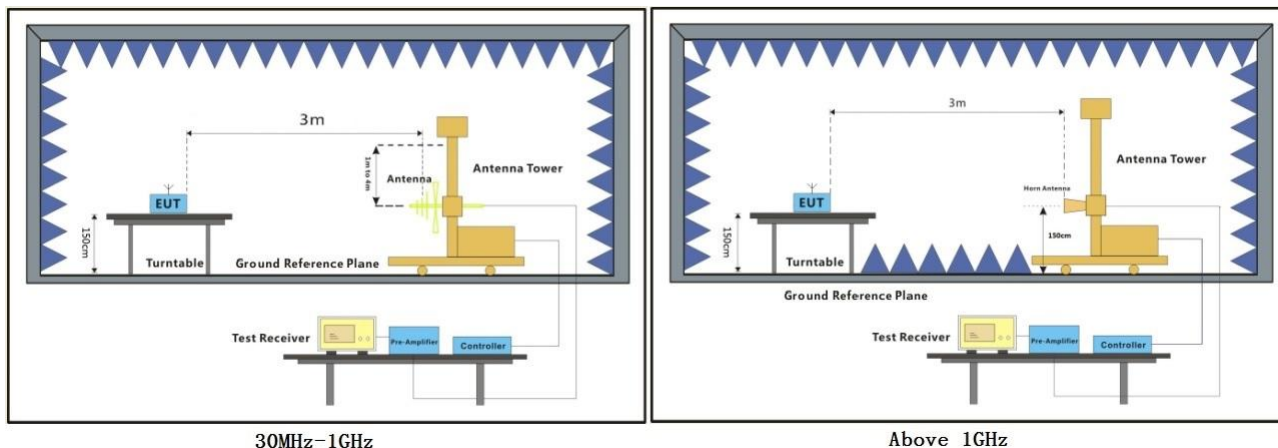
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7.3.3 Test Setup Diagram



30MHz-1GHz

Above 1GHz

7.3.4 Measurement Procedure and Data

- a. 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.
- b. The EUT was set 3m or 10m away from the interference-receiving antenna, which was mounted on the variable-height antenna tower.
- 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 (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.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. 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.
- g. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- h. 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.
- i. Repeat above procedures until all frequencies measured was complete.

Remark:

1. 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).

2. Scan from 9kHz to 30MHz, the disturbance below 30MHz was very low. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.

3. 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.

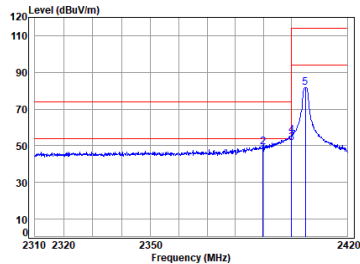


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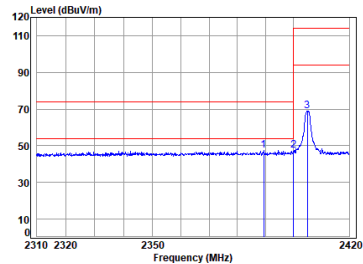
2.4G SRD_TX_CH_L_Horizontal



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00828ET
Mode : 2405 Band edge

	Freq	Loss	Factor	Ant	Preamp	Read	Level	Limit	Over	Remark	Aux
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	dB		dB
1	2389.794	16.13	29.10	32.78	32.54	44.99	54.00	-9.01	Average		0.00
2	2389.794	16.13	29.10	32.78	36.98	49.43	74.00	-24.57	Peak		0.00
3	2400.000	16.15	29.10	32.78	38.88	51.35	54.00	-2.65	Average		0.00
4	2400.000	16.15	29.10	32.78	43.32	55.79	74.00	-18.21	Peak		0.00
5	2405.000	16.16	29.08	32.77	69.35	81.82	114.00	-32.18	Peak		0.00

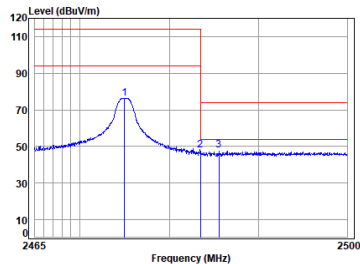
2.4G SRD_TX_CH_L_Vertical



Site : chamber
Condition: 3m VERTICAL
Job No : 00828ET
Mode : 2405 Band edge

	Freq	Loss	Factor	Ant	Preamp	Read	Level	Limit	Over	Remark	Aux
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	dB		dB
1 p	2389.349	16.13	29.10	32.78	35.12	47.57	74.00	-26.43	Peak		0.00
2	2400.000	16.14	29.10	32.78	34.85	47.31	74.00	-26.69	Peak		0.00
3	2405.000	16.16	29.08	32.77	56.51	68.98	114.00	-45.02	Peak		0.00

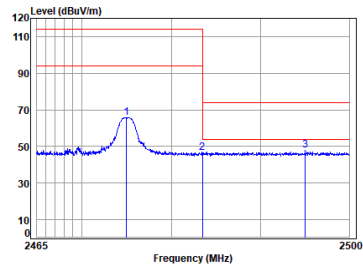
2.4G SRD_TX_CH_H_Horizontal



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00828ET
Mode : 2475 Band edge

	Freq	Loss	Factor	Ant	Preamp	Read	Level	Limit	Over	Remark	Aux
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	dB		dB
1	2475.000	16.26	28.90	32.74	63.91	76.33	114.00	-37.67	Peak		0.00
2 p	2483.500	16.28	28.90	32.73	35.42	47.87	74.00	-26.13	Peak		0.00
3	2485.990	16.28	28.90	32.73	35.26	47.71	74.00	-26.29	Peak		0.00

2.4G SRD_TX_CH_H_Vertical



Site : chamber
Condition: 3m VERTICAL
Job No : 00828ET
Mode : 2475 Band edge

	Freq	Loss	Factor	Ant	Preamp	Read	Level	Limit	Over	Remark	Aux
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	dB		dB
1	2475.000	16.26	28.90	32.74	53.42	65.84	114.00	-48.16	Peak		0.00
2	2483.500	16.28	28.90	32.73	34.12	46.57	74.00	-27.43	Peak		0.00
3 p	2495.035	16.29	28.90	32.73	35.34	47.80	74.00	-26.20	Peak		0.00



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7.4 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).

7.4.1 E.U.T. Operation

Operating Environment:

Temperature: 23.5 °C Humidity: 46.8 % 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.



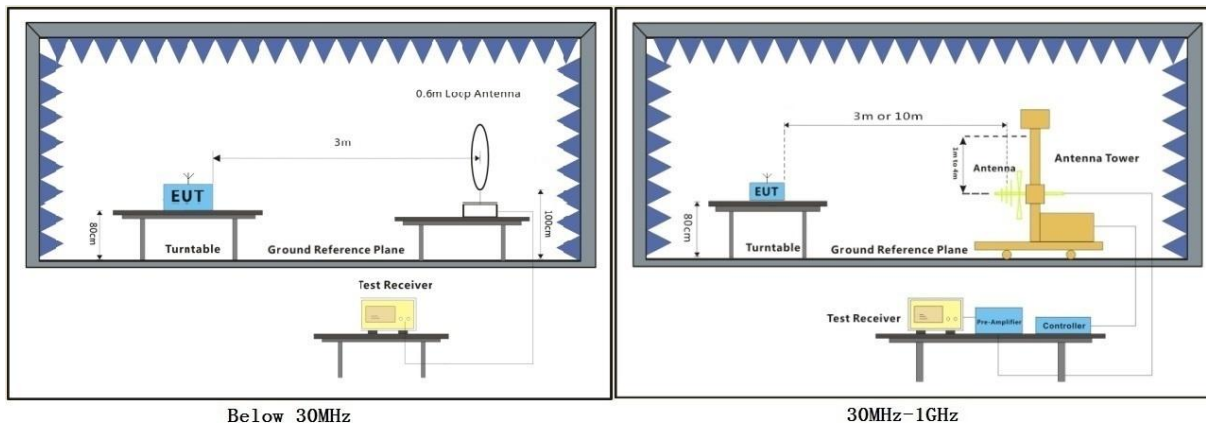
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7.4.3 Test Setup Diagram



7.4.4 Measurement Procedure and Data

- a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- 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 (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.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. 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.
- g. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- h. 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.
- i. 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 below 30MHz once a closer distance used.

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

2. 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 above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.

3. Scan from 30MHz-1GHz, 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.



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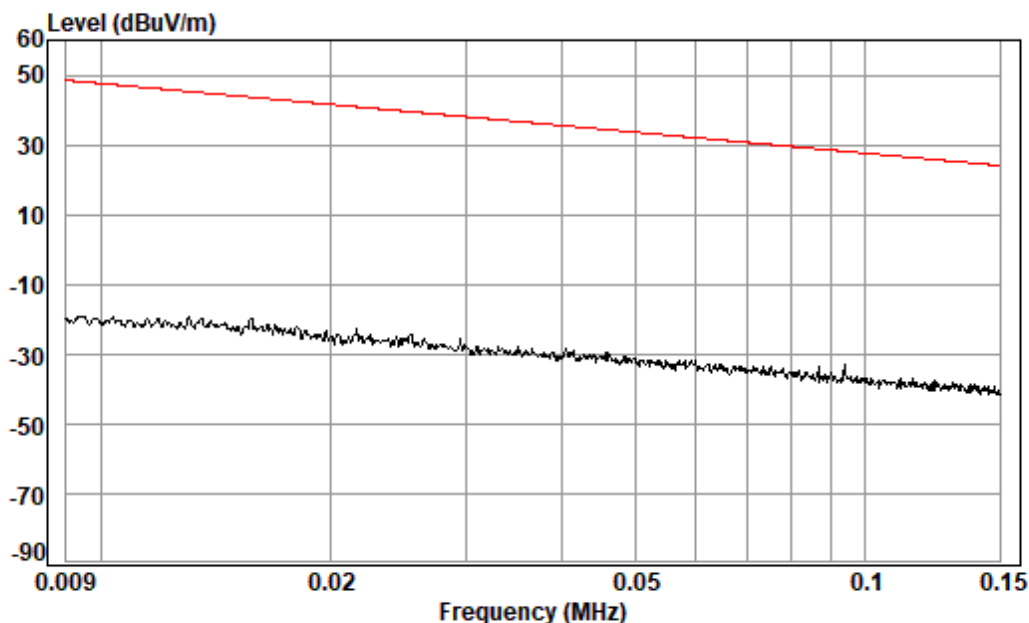
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SZEMC-TRF-01 Rev. A/2

Report No.: SZCR260300082802

Page: 28 of 39

Test Mode: 00; Polarity: Coaxial



Condition: 3m

Job No. : 00828ET

Test Mode: 00

: coaxial



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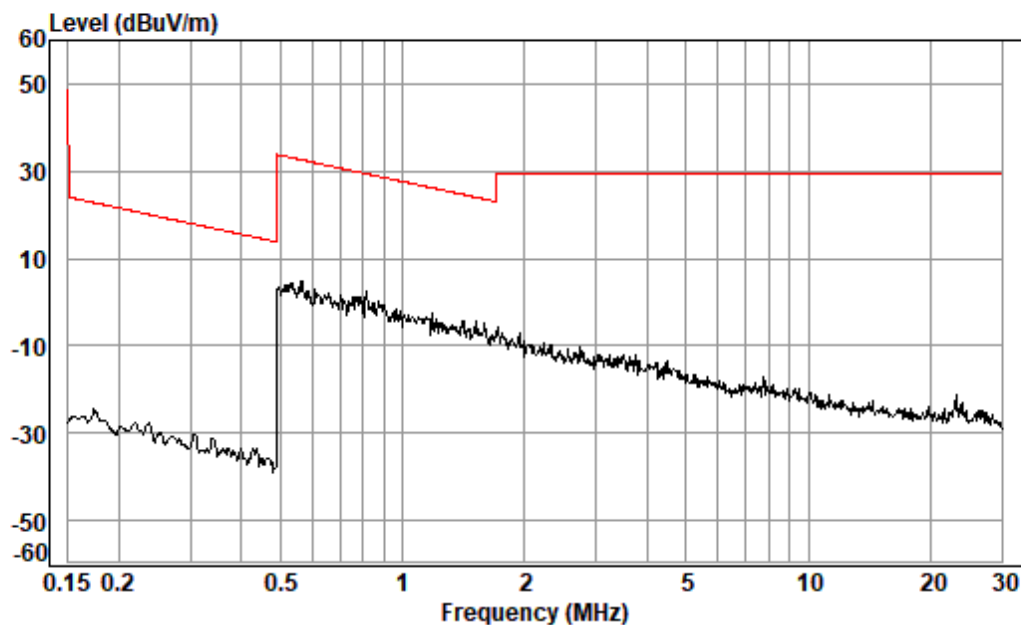
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SZEMC-TRF-01 Rev. A/2

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Test Mode: 00; Polarity: Coaxial



Condition: 3m
Job No. : 00828ET
Test Mode: 00
: coaxial



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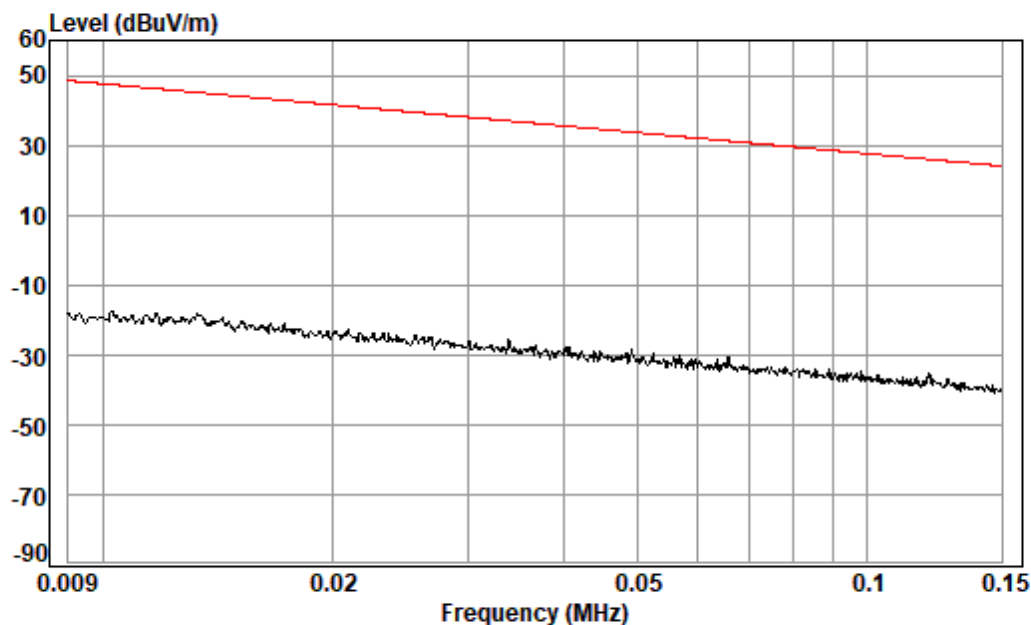
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Test Mode: 00; Polarity: Coplanar



Condition: 3m

Job No. : 00828ET

Test Mode: 00

: coplanar



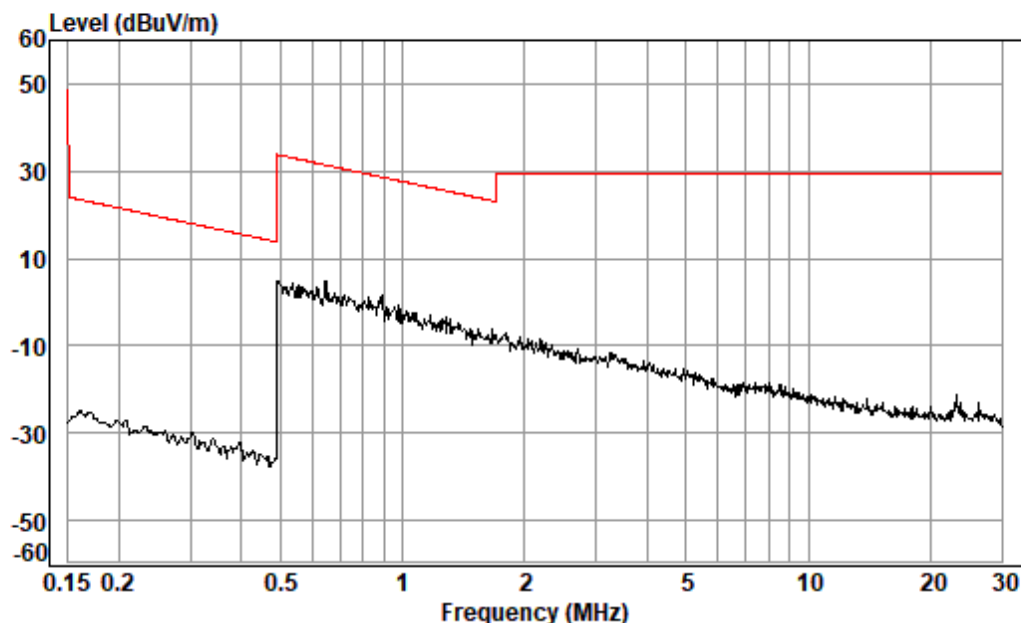
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Test Mode: 00; Polarity: Coplanar



Condition: 3m

Job No. : 00828ET

Test Mode: 00

: coplanar



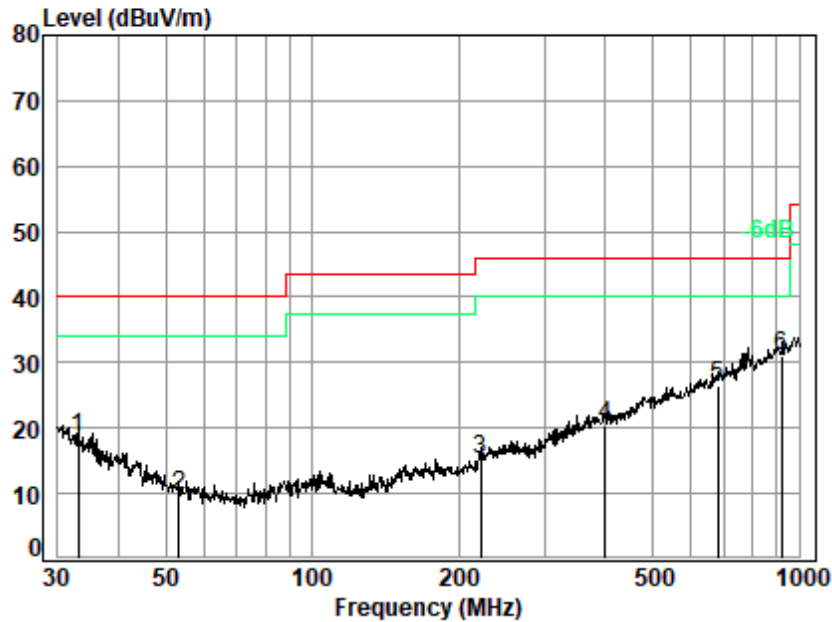
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Test Mode: 00; Polarity: Horizontal



Site : chamber
Condition: 3m HORIZONTAL
Job No. : 00828ET
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	33.095	19.77	0.77	27.65	25.59	18.48	40.00	-21.52 QP
2	53.318	12.38	0.91	27.63	24.21	9.87	40.00	-30.13 QP
3	221.392	15.49	1.80	27.72	25.61	15.18	46.00	-30.82 QP
4	400.432	20.48	2.49	27.75	25.02	20.24	46.00	-25.76 QP
5	682.348	25.64	3.36	27.88	25.38	26.50	46.00	-19.50 QP
6 q	922.516	28.82	4.02	26.83	25.07	31.08	46.00	-14.92 QP

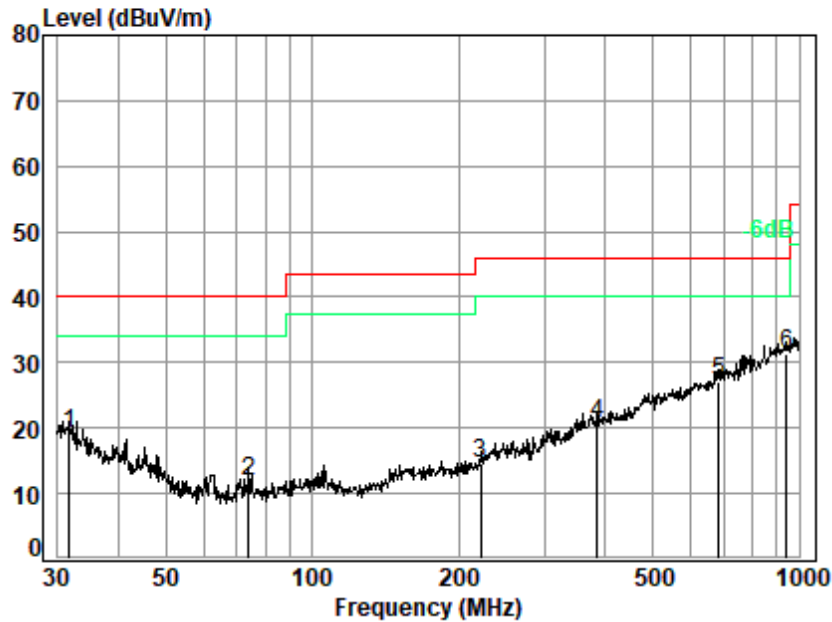


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Test Mode: 00; Polarity: Vertical



Site : chamber
Condition: 3m VERTICAL
Job No. : 00828ET
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	31.731	20.56	0.76	27.65	25.37	19.04	40.00	-20.96 QP
2	74.135	10.52	1.03	27.61	28.01	11.95	40.00	-28.05 QP
3	221.392	15.49	1.80	27.72	24.92	14.49	46.00	-31.51 QP
4	385.281	20.36	2.44	27.72	25.55	20.63	46.00	-25.37 QP
5	684.745	25.66	3.37	27.87	25.80	26.96	46.00	-19.04 QP
6 q	942.131	29.01	4.06	26.72	24.90	31.25	46.00	-14.75 QP



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SZEMC-TRF-01 Rev. A/2

Report No.: SZCR260300082802

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7.5 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: 1-18GHz: 3m; Above 18GHz: 1m
 Test Engineer: Logic Wang

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).

7.5.1 E.U.T. Operation

Operating Environment:

Temperature: 23.5 °C Humidity: 56.3 % 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.

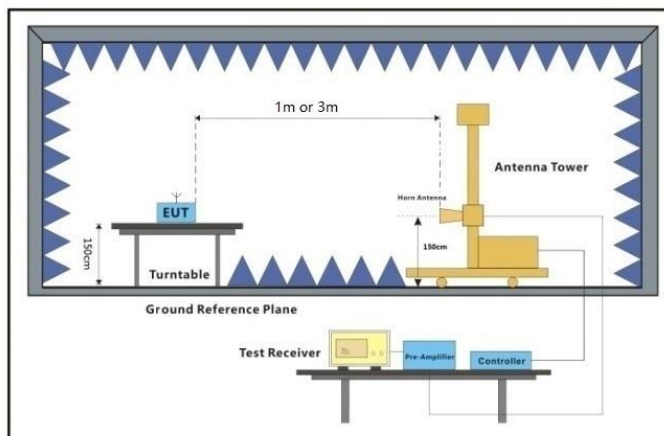


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7.5.3 Test Setup Diagram



Above 1GHz

7.5.4 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.



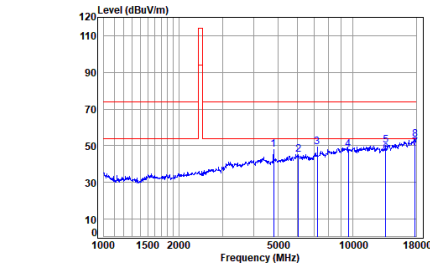
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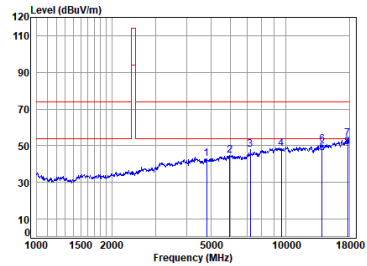
2.4G SRD_TX_CH_L_Horizontal



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00828ET
Mode : 2405 TX RSE

Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over	Aux
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	dB
1 4810.000	7.42	34.34	54.22	60.41	47.95	74.00	-26.05 Peak	0.00
2 6053.894	8.92	35.01	53.11	54.17	44.99	74.00	-29.01 Peak	0.00
3 7215.000	8.49	35.70	53.18	58.41	49.42	74.00	-24.58 Peak	0.00
4 9620.000	10.73	37.44	53.35	52.08	47.70	74.00	-26.30 Peak	0.00
5 13559.000	10.90	38.06	53.03	53.27	50.00	74.00	-24.00 Peak	0.00
6 13559.880	10.90	38.06	53.03	48.83	45.56	54.00	-8.44 Average	0.00
7 q17844.590	11.41	43.90	52.48	46.10	48.93	54.00	-5.07 Average	0.00
8 p17844.590	11.41	43.90	52.48	50.54	53.37	74.00	-20.63 Peak	0.00

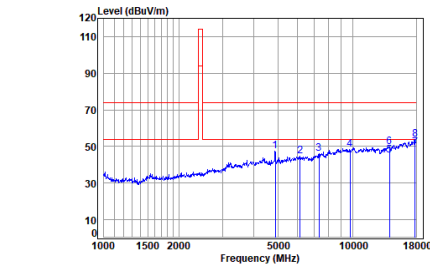
2.4G SRD_TX_CH_L_Vertical



Site : chamber
Condition: 3m VERTICAL
Job No : 00828ET
Mode : 2405 TX RSE

Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over	Aux
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	dB
1 4810.000	7.42	34.34	54.22	55.39	42.93	74.00	-31.07 Peak	0.00
2 5949.811	8.86	34.70	53.15	54.39	44.80	74.00	-29.20 Peak	0.00
3 7215.000	8.49	35.70	53.18	56.99	48.00	74.00	-26.00 Peak	0.00
4 9620.000	10.73	37.44	53.35	53.33	48.15	74.00	-25.85 Peak	0.00
5 13997.930	10.98	39.70	52.90	48.20	45.98	54.00	-8.02 Average	0.00
6 13997.930	10.98	39.70	52.90	52.64	50.42	74.00	-23.58 Peak	0.00
7 p17741.740	11.35	43.84	52.53	51.15	53.81	74.00	-20.19 Peak	0.00
8 q17741.740	11.35	43.84	52.53	46.71	49.37	54.00	-4.63 Average	0.00

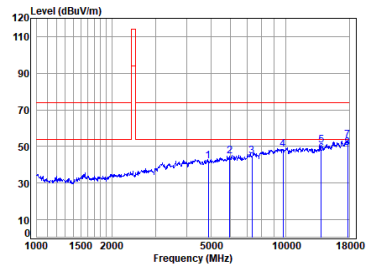
2.4G SRD_TX_CH_M_Horizontal



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00828ET
Mode : 2440 TX RSE

Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over	Aux
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	dB
1 4880.000	7.47	34.62	54.21	59.46	47.34	74.00	-26.66 Peak	0.00
2 6142.019	8.92	34.93	53.12	53.82	44.55	74.00	-29.45 Peak	0.00
3 7320.000	8.46	35.70	53.17	55.28	46.27	74.00	-27.73 Peak	0.00
4 9760.000	10.69	37.38	53.29	53.40	48.18	74.00	-25.82 Peak	0.00
5 14079.000	10.89	39.78	52.88	47.60	45.39	54.00	-8.61 Average	0.00
6 14079.000	10.89	39.78	52.88	52.04	49.83	74.00	-24.17 Peak	0.00
7 q17793.090	11.38	43.89	52.50	46.44	49.21	54.00	-4.79 Average	0.00
8 p17793.090	11.38	43.89	52.50	50.88	53.65	74.00	-20.35 Peak	0.00

2.4G SRD_TX_CH_M_Vertical



Site : chamber
Condition: 3m VERTICAL
Job No : 00828ET
Mode : 2440 TX RSE

Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over	Aux
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	dB
1 4880.000	7.47	34.62	54.21	54.13	42.01	74.00	-31.99 Peak	0.00
2 5949.811	8.86	34.70	53.15	54.35	44.76	74.00	-29.24 Peak	0.00
3 7320.000	8.46	35.70	53.17	53.88	44.87	74.00	-29.13 Peak	0.00
4 9760.000	10.69	37.38	53.29	53.44	48.22	74.00	-25.78 Peak	0.00
5 13877.000	10.96	39.45	52.94	52.98	50.45	74.00	-23.55 Peak	0.00
6 13877.000	10.96	39.45	52.94	48.54	46.01	54.00	-7.99 Average	0.00
7 p17741.740	11.35	43.84	52.53	50.84	53.50	74.00	-20.50 Peak	0.00
8 q17741.740	11.35	43.84	52.53	46.40	49.06	54.00	-4.94 Average	0.00



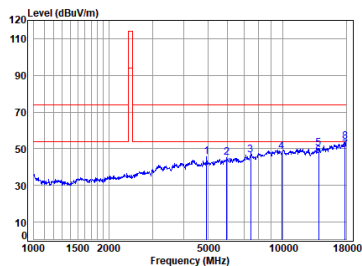
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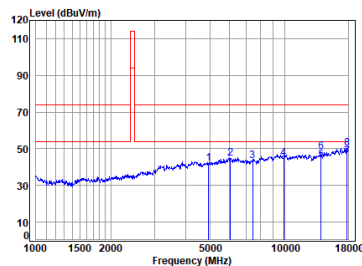
2.4G SRD_TX_CH_H_Horizontal



Site : chamber
Condition: 3m HORIZONTAL
Job No : 08828ET
Mode : 2475 TX RSE

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 4950.000	7.52	34.60	54.20	57.50	45.42	74.00	-28.58	Peak	0.00
2 5949.011	8.06	34.70	53.15	54.55	44.96	74.00	-29.04	Peak	0.00
3 7425.000	8.43	35.90	53.16	55.43	46.60	74.00	-27.40	Peak	0.00
4 9900.000	10.65	37.30	53.24	53.55	48.26	74.00	-25.74	Peak	0.00
5 13957.530	10.97	39.62	52.91	52.66	50.34	74.00	-23.66	Peak	0.00
6 13957.530	10.97	39.62	52.91	48.22	45.90	54.00	-8.10	Average	0.00
7 q17844.590	11.41	43.90	52.48	46.44	49.27	54.00	-4.73	Average	0.00
8 p17844.590	11.41	43.90	52.48	50.88	53.71	74.00	-20.29	Peak	0.00

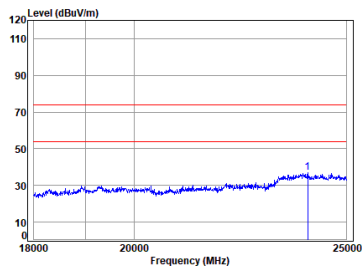
2.4G SRD_TX_CH_H_Vertical



Site : chamber
Condition: 3m VERTICAL
Job No : 08828ET
Mode : 2475 TX RSE

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 4950.000	7.52	34.60	54.20	54.20	42.12	74.00	-31.88	Peak	0.00
2 6053.894	8.92	35.01	53.11	54.06	44.00	74.00	-29.12	Peak	0.00
3 7425.000	8.43	35.90	53.16	52.38	43.55	74.00	-30.45	Peak	0.00
4 9900.000	10.65	37.30	53.24	50.19	44.90	74.00	-29.10	Peak	0.00
5 13997.930	10.98	39.70	52.90	45.99	43.77	54.00	-10.23	Average	0.00
6 13997.930	10.98	39.70	52.90	50.43	48.21	74.00	-25.79	Peak	0.00
7 q17844.590	11.41	43.90	52.48	42.89	45.72	54.00	-8.28	Average	0.00
8 p17844.590	11.41	43.90	52.48	47.33	50.16	74.00	-23.84	Peak	0.00

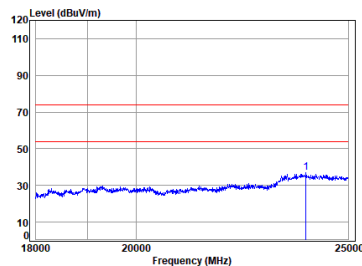
2.4G SRD_TX_CH_M_Horizontal



Site : chamber
Condition: 3m HORIZONTAL
Job No : 08828ET
Mode : 2440 TX RSE

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 p24009.990	6.78	39.00	50.42	51.24	37.06	74.00	-36.94	Peak	-9.54

2.4G SRD_TX_CH_M_Vertical



Site : chamber
Condition: 3m VERTICAL
Job No : 08828ET
Mode : 2440 TX RSE

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 p23915.520	6.78	38.97	50.38	50.94	36.77	74.00	-37.23	Peak	-9.54

8 Test Setup Photo

Refer to Appendix - Test Setup Photo for SZCR2603000828ET

9 EUT Constructional Details (EUT Photos)

Refer to Appendix_ external and internal photos for SZCR2603000828ET

- End of the Report -



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