



TEST REPORT

Application No.: GZCR2106020452HS
Applicant: Gamela Enterprise Co., Ltd
Address of Applicant: 5F., No.657-1, Zhongzheng Rd., Xinzhuang Dist., New Taipei City 242051, Taiwan
Manufacturer: The same as applicant
Address of Manufacturer: The same as applicant
Factory: The same as applicant
Address of Factory: The same as applicant
Equipment Under Test (EUT):
EUT Name: WIRELESS REFRIGERANT SCALE
Model No.: TM58621
Standard(s) : 47 CFR Part 15, Subpart C 15.231
Date of Receipt: 2021-06-16
Date of Test: 2021-06-24 to 2021-09-15
Date of Issue: 2021-09-18

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

Kobe Jian

Kobe Jian

EMC Laboratory Manager



Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2021-09-18		Original

Authorized for issue by:				
		Lily Kuang		
		Lily Kuang/Project Engineer		
		Ricky Liu		
		Ricky Liu/Reviewer		



2 Test Summary

Radio Spectrum Technical Requirement				
Item	Standard	Method	Requirement	Result
Antenna Requirement	47 CFR Part 15, Subpart C 15.231	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 15.231	ANSI C63.10 (2013) Section 6.9	47 CFR Part 15, Subpart C 15.231(c)	Pass
Dwell Time (15.231(a))		ANSI C63.10 (2013) Section 7.8.4	47 CFR Part 15, Subpart C 15.231(a)	Pass
Radiated Emissions		ANSI C63.10 (2013) Section 6.4&6.5&6.6	47 CFR Part 15C Section 15.231(b) and 15.209	Pass
Field Strength of the Fundamental Signal (15.231(b))		ANSI C63.10 (2013) Section 6.5	47 CFR Part 15, Subpart C 15.231(b)	Pass

Note:

E.U.T./EUT means Equipment Under Test.

Pass means the test result passed the test standard requirement, please find the detailed decision rule in the report relative section.

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4 General Information

4.1 Details of E.U.T.

Power supply:	DC 4.5V =3 x DC 1.5V size of "AAA" batteries
Modulation Type:	ASK
Operation Frequency	433.92MHz
Antenna Gain	0 dBi
Antenna Type	Integrated antenna

4.2 Description of Support Units

The EUT has been tested as an independent unit.

4.3 Measurement Uncertainty

Test Item	Measurement Uncertainty
20dB Bandwidth	±3%
Dwell Time (15.231(a))	±3%
Radiated Emissions	±5.06dB (30MHz-1GHz; 3m) ±4.46dB (30MHz-1GHz; 10m) ±5.08dB (1GHz-6GHz); ±5.14dB (above 6GHz)
Field Strength of the Fundamental Signal (15.231(b))	±5.06dB (30MHz-1GHz; 3m); ±4.46dB (30MHz-1GHz; 10m)

4.4 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou Branch EMC Laboratory,
198 Kezhu Road, Sciencetech Park, Guangzhou Economic & Technology Development District,
Guangzhou, China 510663

Tel: +86 20 82155555 Fax: +86 20 82075059

No tests were sub-contracted.

4.5 Test Facility

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

- **NVLAP (Lab Code: 200611-0)**

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 200611-0.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

- **ACMA**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory can also perform testing for the Australian/New Zealand Regulatory Compliance Mark (RCM).

- **SGS UK(Certificate No.: 32), SGS-TUV SAARLAND and SGS-FIMKO**

Have approved SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory as a supplier of EMC TESTING SERVICES and SAFETY TESTING SERVICES.

- **CNAS (Lab Code: L0167)**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been assessed and in compliance with CNAS-CL01:2018 accreditation criteria for testing laboratories (identical to ISO/IEC 17025:2017 General Requirements) for the Competence of Testing Laboratories.

- **FCC Recognized Accredited Test Firm(Registration No.: 486818)**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been accredited and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Designation Number: CN5016, Test Firm Registration Number: 486818.

- **ISED (Registration No.: 4620B, CAB identifier: CN0052)**

SGS-CSTC Standards Technical Services Co., Ltd., has been registered by Innovation Science and Economic Development Canada for Wireless Device Testing laboratories to test to Canadian radio equipment requirements. Registration No. 4620B, CAB identifier: CN0052.

- **VCCI (Registration No.: R-12460, C-12584, G-20107 and T-11179)**

The 10m Semi-anechoic chamber, 966 Anechoic Chamber and Shielded Room of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-12460, C-12584, G-20107 and T-11179 respectively.

- **CBTL (Lab Code: TL129)**

SGS-CSTC Standards Technical Services Co., Ltd., E&E Laboratory has been assessed and fully comply with the requirements of ISO/IEC 17025:2017, the Basic Rules, IECEE 01 and Rules of procedure IECEE 02, and the relevant IECEE CB-Scheme Operational documents.

4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None



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5 Equipment List

20dB Bandwidth					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EXA Signal Analyzer(10Hz-44GHz)	Agilent Technologies	N9010A	EMC2138	2020-09-17	2021-09-16
6dB Attenuator	HP	8491A	EMC2062	2020-04-15	2022-04-14
Test Software JS1120-3	HangTianXing	V2.6	GZE100-69	N/A	N/A
MI CABLE	SGS-EMC	0.8M	EMC2136	2019-11-02	2021-11-01

Dwell Time (15.231(a))					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EXA Signal Analyzer(10Hz-44GHz)	Agilent Technologies	N9010A	EMC2138	2020-09-17	2021-09-16
6dB Attenuator	HP	8491A	EMC2062	2020-04-15	2022-04-14
Test Software JS1120-3	HangTianXing	V2.6	GZE100-69	N/A	N/A
MI CABLE	SGS-EMC	0.8M	EMC2136	2019-11-02	2021-11-01

Radiated Emissions					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Chamber cable(Above 1GHz)	Scoflex	KMKM-8.0m	EMC0545	2020/9/9	2022-09-08
Horn Antenna(1GHz-18GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120D	EMC2026	2019-09-25	2022-09-24
1GHz-26.5 GHz Pre-Amplifier	Agilent	8449B	EMC0521	2021-01-08	2022-01-07
2.4GHz Filter	Micro-Tronics	BRM 50702	EMC2069	2021-01-08	2022-01-07
966 Anechoic Chamber	C.R.T	9m x 6m x 6m	EMC2142	2020-12-20	2023-12-19
MXE EMI Receiver(10Hz-8.4GHz)	Keysight	N9038A	EMC2139	2020-11-13	2021-11-12
EXA Signal Analyzer(10Hz-44GHz)	Keysight	N9010A	EMC2138	2020-09-17	2021-09-16
Test Software E3	Audix	Ver.6.120110a	GZE100-61	N/A	N/A
Notch Filter (5150-5880)	Mico-Tronics	BRM50716	EMC2168	2021-07-29	2022-07-28
Signal Analyzer (20Hz-26.5GHz)	Rohde & Schwarz	FISQ 26	EMC0069	2020/11/13	2021/11/12



Field Strength of the Fundamental Signal (15.231(b))					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Chamber cable	HangTianXing	N/A	EMC0542	2020-09-09	2022-09-08
Trilog Broadband Antenna(25MHz-1GHz)-Lab	SCHWARZBECK MESS-ELEKTRONIK	VULB 9168	SEM003-18	2019-02-22	2022-02-22
Amplifier(9kHz-1.3GHz)	HP	8447F	EMC2065	2021-05-19	2022-05-18
10m Semi-Anechoic Chamber	ETS	N/A	EMC0530	2019-10-20	2022-10-19
Test Software E3	Audix	Ver.6.120110a	GZE100-61	N/A	N/A
EMI Test Receiver(1Hz-8GHz)	Rohde & Schwarz	ESW8	EMC2220	2021-05-26	2022-05-25

General used equipment					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
DMM	Fluke	73	EMC0006	2021-07-05	2022-07-05
DMM	Fluke	73	EMC0007	2021-07-05	2022-07-05



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

Standard Requirement:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a 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 0dBi.

Antenna location: Refer to internal photo.

7 Radio Spectrum Matter Test Results

7.1 20dB Bandwidth

Test Requirement 47 CFR Part 15, Subpart C 15.231(c)

Test Method: ANSI C63.10 (2013) Section 6.9

Limit:

Frequency range(MHz)	Limit
70-900	No wider than 0.25% of the center frequency
Above 900	No wider than 0.5% of the center frequency

7.1.1 E.U.T. Operation

Operating Environment:

Temperature: 30.0 °C

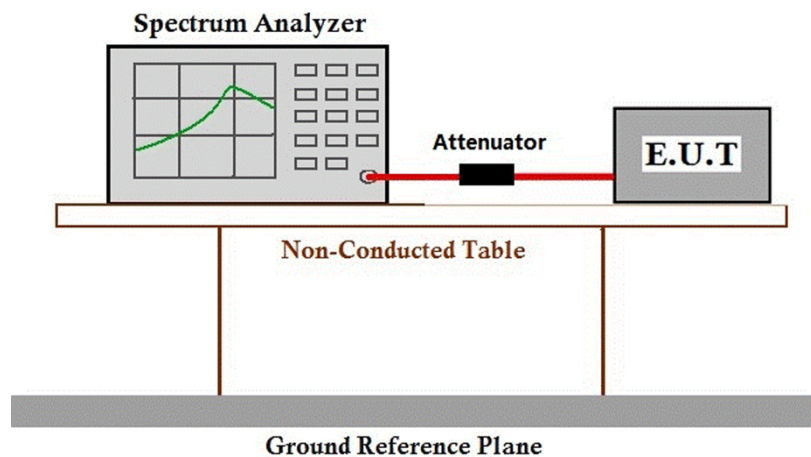
Humidity: 43.7 % RH

Atmospheric Pressure: 1005 mbar

7.1.2 Test Mode Description

Pre-scan / Mode	Description
Final test Code	
Final test 00	Tx mode

7.1.3 Test Setup Diagram



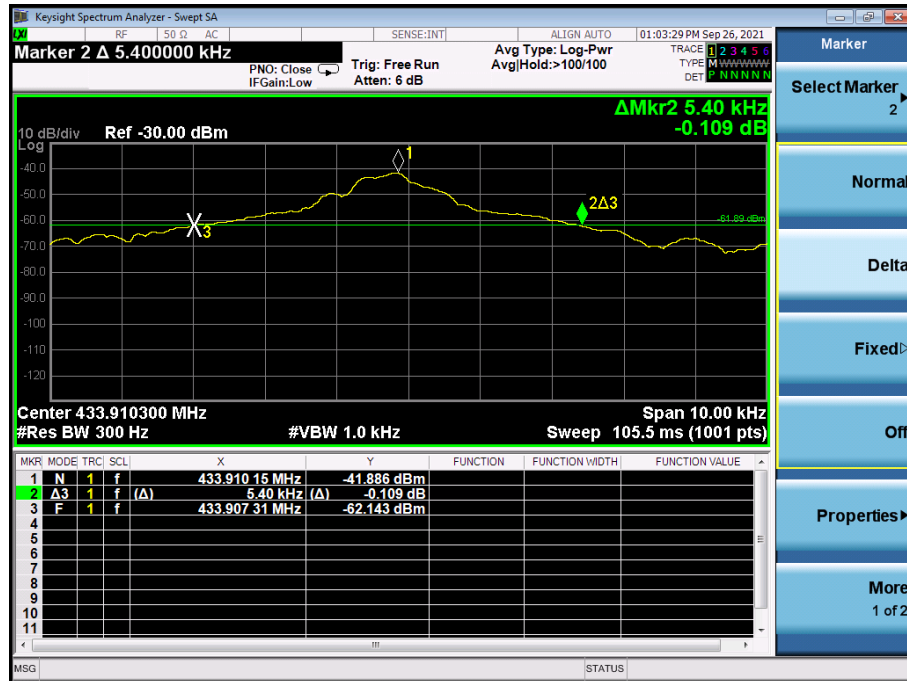
7.1.4 Measurement Procedure and Data

Remark: The setting of RBW was the minimum for the spectrum.

Mode:00

Test Result:

Test Channel	Bandwidth	Limit	Verdict
433.92MHz	5.40kHz	<1.08 MHz	PASS



7.2 Dwell Time (15.231(a))

Test Requirement 47 CFR Part 15, Subpart C 15.231(a)

Test Method: ANSI C63.10 (2013) Section 7.8.4

Limit:

Device type	Limit
Manually operated transmitter	The switch automatically deactivate the transmitter within not more than 5 seconds of being released
Automatically actived transmitter	Cease transmission within 5 seconds after activation
Periodic transmissions to determine system integrity of transmitters used in security or safety applications	The total transmission time does not exceed 2 seconds per hour

7.2.1 E.U.T. Operation

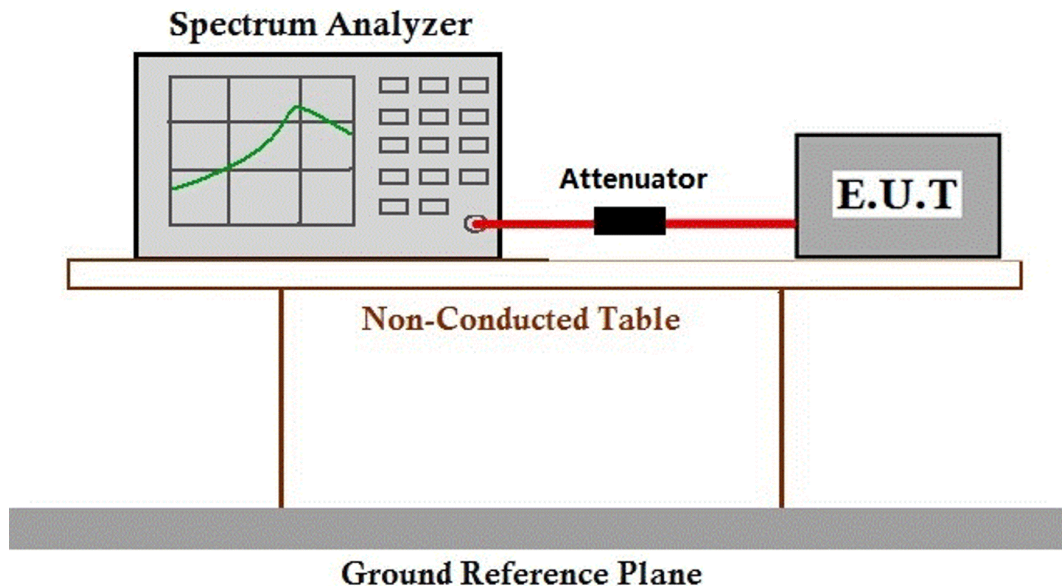
Operating Environment:

Temperature: 30.0 °C Humidity: 43.7 % RH Atmospheric Pressure: 1005 mbar

7.2.2 Test Mode Description

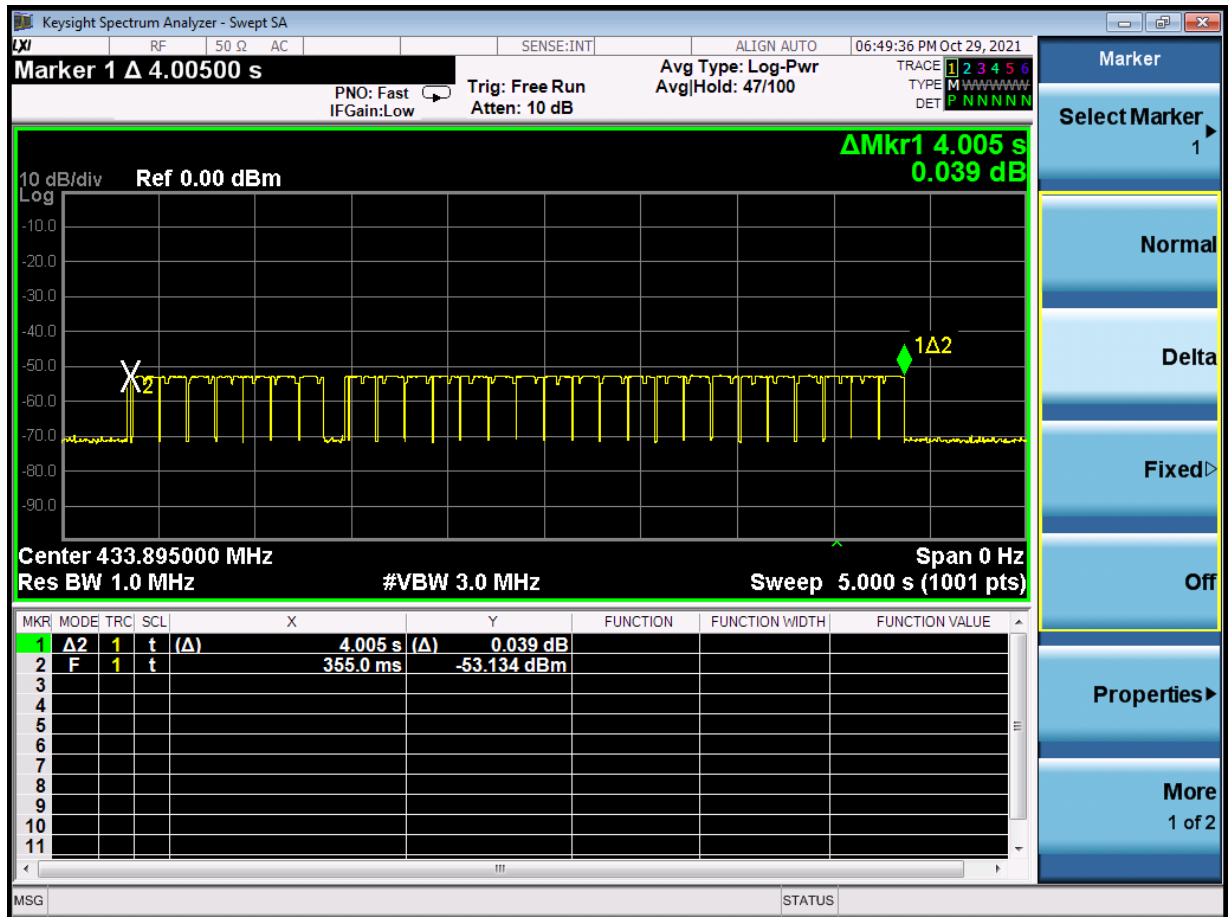
Pre-scan / Mode	Description
Final test Code	
Final test 00	Tx mode

7.2.3 Test Setup Diagram



7.2.4 Measurement Procedure and Data

Carrier Frequency	Shutdown Time	Limit
433.92MHz	4.005s	≤5s



7.3 Radiated Emissions

Test Requirement 47 CFR Part 15C Section 15.231(b) and 15.209

Test Method: ANSI C63.10 (2013) Section 6.4&6.5&6.6

Measurement Distance: 3m

Limit:

For Restricted bands

Frequency(MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

For Other bands

Fundamental Frequency MHz	Field Strength of Fundamental (dBμV/m @ 3 m)	Field Strength of Harmonics and Spurious Emissions (dBμV/m @ 3 m)
40.66 to 40.70	67.04	47.04
70 to 130	61.94	41.94
130 to 174	61.94 to 71.48	41.94 to 51.48
174 to 260	71.48	51.48
260 to 470	71.48 to 81.94	51.48 to 61.94
Above 470	81.94	61.94
Detector:	Peak for pre-scan	
	QP for 30MHz to 1000 MHz: 120 kHz resolution bandwidth	
	Peak for Above 1 GHz: 1 MHz resolution bandwidth	

7.3.1 E.U.T. Operation

Operating Environment:

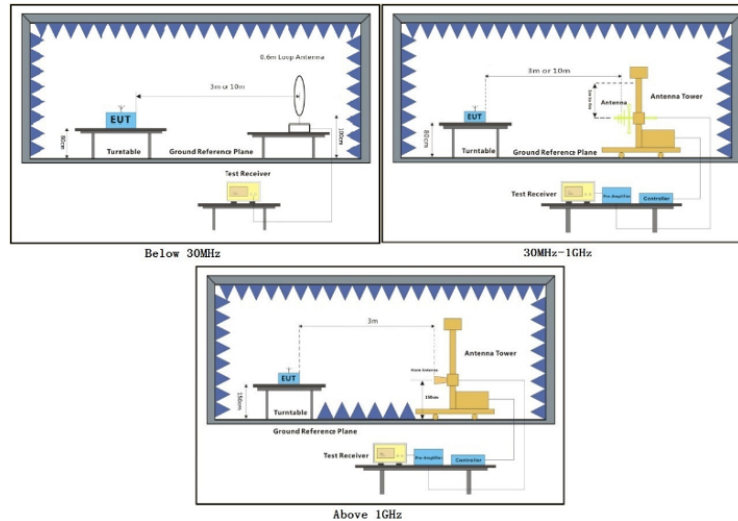
Temperature: 22 °C Humidity: 55 % RH Atmospheric Pressure: 1008 mbar

7.3.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Tx mode



7.3.3 Test Setup Diagram



7.3.4 Measurement Procedure and Data

For testing performed with the loop antenna, the center of the loop was positioned 1 m above the ground and positioned with its plane vertical at the specified distance from the EUT. During testing the loop was rotated about its vertical axis for maximum response at each azimuth and also investigated with the loop positioned in the horizontal plane. Only the worst position of Horizontal was shown in the report.

Measured Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor

The average correction factor is computed by analyzing the on time in 100ms over one complete pulse train. Analysis of the remote transmitter on time in one complete pulse train, therefore the average value of fundamental frequency is: Average = Peak value + 20log (Duty cycle), where the duty factor is calculated from following formula:

$$20\log (\text{Duty cycle}) = 20\log (0.29) = -5.37\text{dB}$$

Here:

$$\text{Duty cycle} = \text{Ton_cum} / \text{Ton+off}$$

$$\text{Ton_cum} = 0.7 \times 22 + 0.2 \times 61 + 1.4 = 29(\text{ms})$$

$$\text{Ton+off} = 100 (\text{ms})$$

$$\text{Duty cycle} = 29 / 100 = 0.29$$

Please refer to the plot in section 7.4 for more details.

Radiated emission below 30MHz

The measurements with active loop antenna were greater than 20dB below the limit, so the test data were not recorded in the test report.

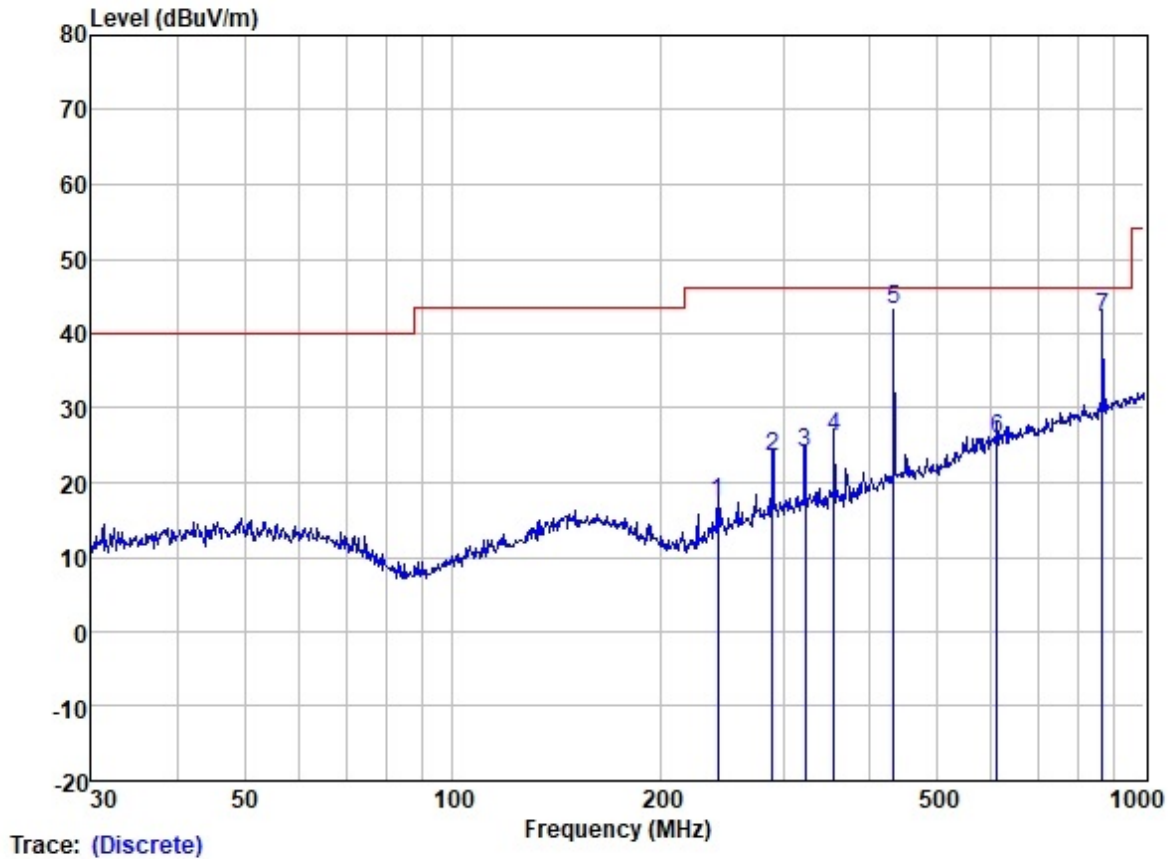


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30 MHz~1 GHz Field Strength of Unwanted Emissions. Quasi-Peak Measurement

Test Mode: 00; Horizontal.



Site : SGS
Job :
Model :
Power :
Test Mode : RT

	Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Measured Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dBuV		
1	241.68	29.15	11.93	2.84	26.65	17.27	46.00	-28.73	HORIZONTAL	QP
2	290.02	33.61	13.40	3.12	26.56	23.57	46.00	-22.43	HORIZONTAL	QP
3	323.32	33.08	14.38	3.35	26.68	24.13	46.00	-21.87	HORIZONTAL	QP
4	355.43	35.00	14.60	3.67	27.07	26.20	46.00	-19.80	HORIZONTAL	QP
6	612.06	28.52	20.32	5.23	28.20	25.87	46.00	-20.13	HORIZONTAL	QP
7	869.13	40.53	22.90	6.71	27.89	42.25	46.00	-3.75	HORIZONTAL	QP

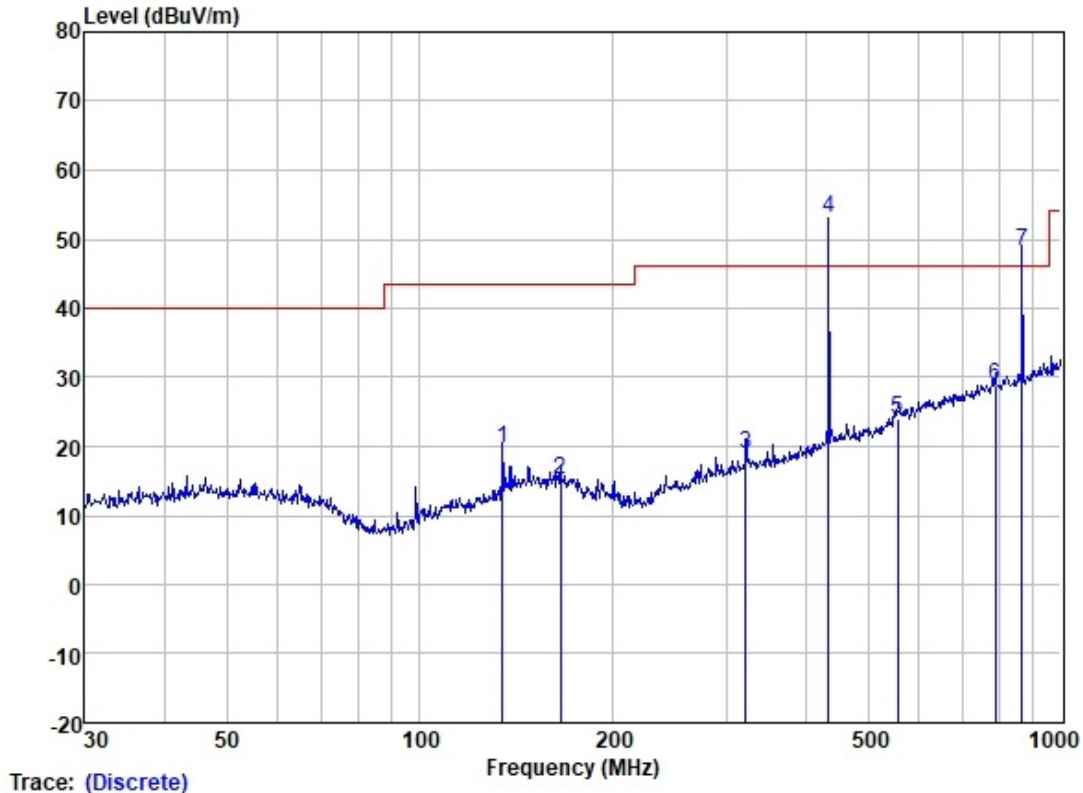
Remark: Point 5 is the fundamental of Field Strength, so please refer to the clause 7.4 for details



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Test Mode: 00;Vertical.



Site : SGS
Job :
Model :
Power :
Test Mode : RT

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Measured Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dBuV		
1	134.56	32.01	12.57	2.01	26.97	19.62	43.50	-23.88	VERTICAL	QP
2	165.49	26.26	13.42	2.37	26.78	15.27	43.50	-28.23	VERTICAL	QP
3	322.19	28.01	14.35	3.35	26.67	19.04	46.00	-26.96	VERTICAL	QP
5	556.77	28.50	18.77	4.88	28.13	24.02	46.00	-21.98	VERTICAL	QP
6	790.62	28.13	22.50	6.14	28.04	28.73	46.00	-17.27	VERTICAL	QP
7*	869.13	46.46	22.90	6.71	27.89	48.18	46.00	2.18	VERTICAL	QP

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Remark
*869.13	46.46	22.90	6.71	27.89	48.18	60.83	-12.65	QP

*Remark: the limit of this point not falling in Restricted bands for the spurious emission is 60.83 dBuV/m.

Remark: Point 4 is the fundamental of Field Strength, so please refer to the clause 7.4 for details



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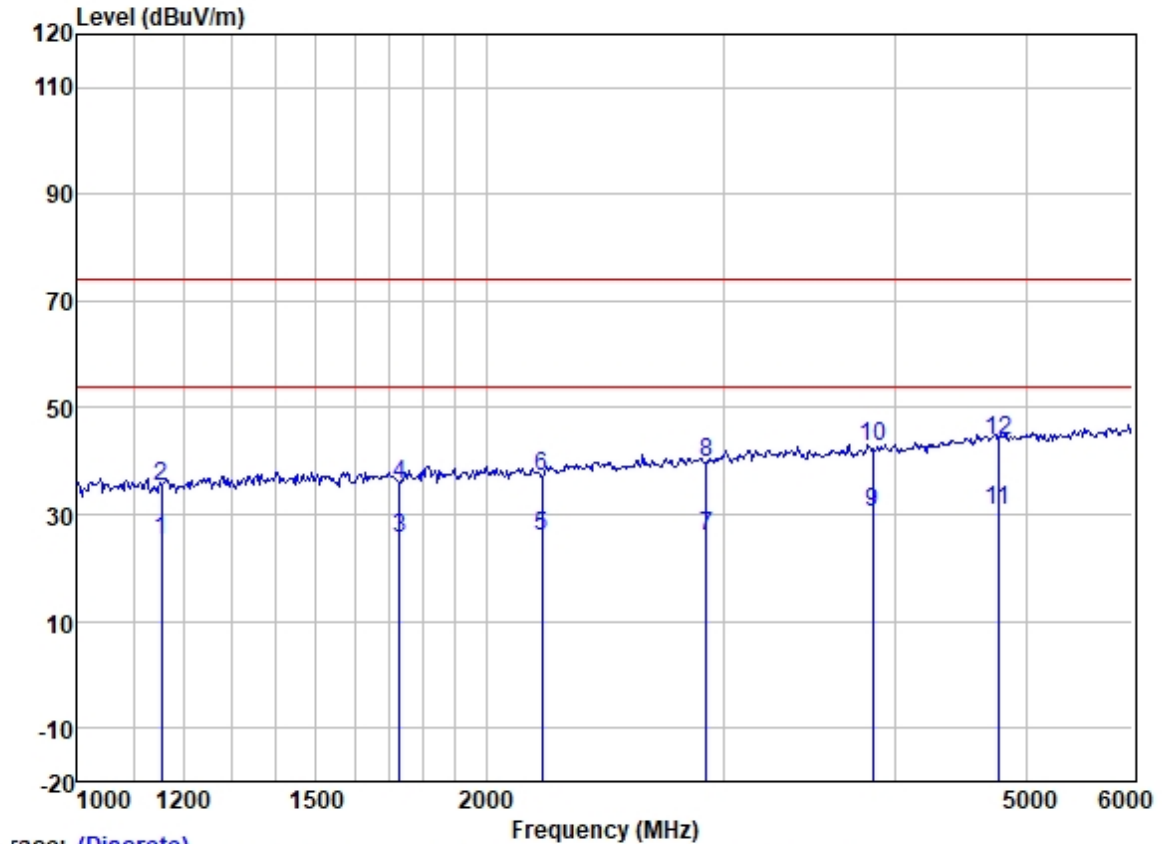
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1GHz~5 GHz Field Strength of Unwanted Emissions.Quasi-Peak Measurement

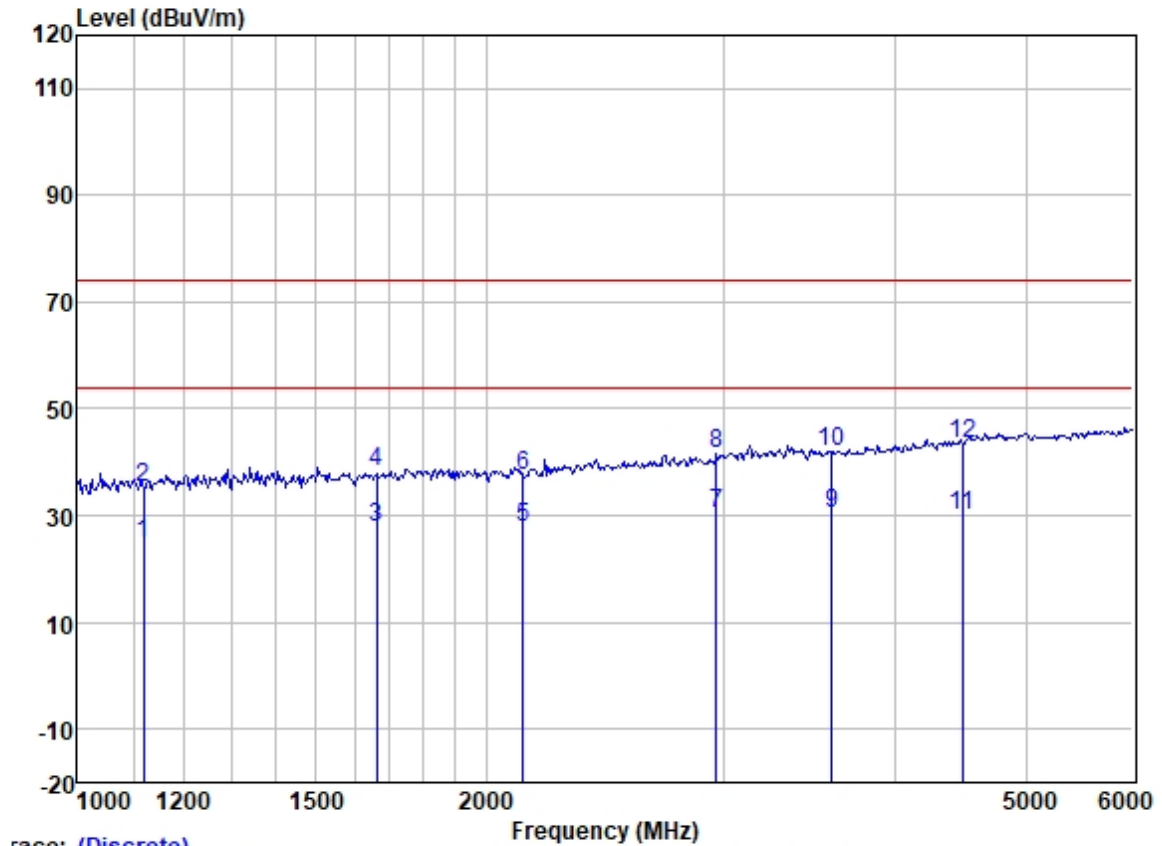
Test Mode: 00; Polarity: Horizontal



Trace: (Discrete)

	ReadAntenna	Cable	Preamp	Limit	Over				
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1154.123	36.81	24.51	2.38	38.42	25.28	54.00	-28.72	HORIZONTAL Average
2	1154.123	46.66	24.51	2.38	38.42	35.13	74.00	-38.87	HORIZONTAL Peak
3	1727.174	34.93	25.78	2.84	37.87	25.68	54.00	-28.32	HORIZONTAL Average
4	1727.174	44.70	25.78	2.84	37.87	35.45	74.00	-38.55	HORIZONTAL Peak
5	2199.817	33.73	26.62	3.20	37.65	25.90	54.00	-28.10	HORIZONTAL Average
6	2199.817	44.96	26.62	3.20	37.65	37.13	74.00	-36.87	HORIZONTAL Peak
7	2909.230	31.28	28.30	3.71	37.34	25.95	54.00	-28.05	HORIZONTAL Average
8	2909.230	45.05	28.30	3.71	37.34	39.72	74.00	-34.28	HORIZONTAL Peak
9	3854.321	33.10	29.62	4.60	36.84	30.48	54.00	-23.52	HORIZONTAL Average
10	3854.321	45.47	29.62	4.60	36.84	42.85	74.00	-31.15	HORIZONTAL Peak
11	4770.324	31.01	31.36	5.40	36.83	30.94	54.00	-23.06	HORIZONTAL Average
12	4770.324	44.09	31.36	5.40	36.83	44.02	74.00	-29.98	HORIZONTAL Peak

Test Mode: 00; Polarity: Vertical



race: (Discrete)

		Freq	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
		MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1		1119.499	36.60	24.41	2.24	38.43	24.82	54.00	-29.18	VERTICAL	Average
2		1119.499	47.06	24.41	2.24	38.43	35.28	74.00	-38.72	VERTICAL	Peak
3		1660.416	37.44	25.65	2.80	37.93	27.96	54.00	-26.04	VERTICAL	Average
4		1660.416	47.76	25.65	2.80	37.93	38.28	74.00	-35.72	VERTICAL	Peak
5		2130.001	36.00	26.37	3.17	37.67	27.87	54.00	-26.13	VERTICAL	Average
6		2130.001	45.53	26.37	3.17	37.67	37.40	74.00	-36.60	VERTICAL	Peak
7		2956.525	35.73	28.36	3.76	37.30	30.55	54.00	-23.45	VERTICAL	Average
8		2956.525	46.68	28.36	3.76	37.30	41.50	74.00	-32.50	VERTICAL	Peak
9		3600.627	33.74	29.04	4.50	36.91	30.37	54.00	-23.63	VERTICAL	Average
10		3600.627	45.48	29.04	4.50	36.91	42.11	74.00	-31.89	VERTICAL	Peak
11		4488.392	30.97	30.78	4.99	36.82	29.92	54.00	-24.08	VERTICAL	Average
12		4488.392	44.53	30.78	4.99	36.82	43.48	74.00	-30.52	VERTICAL	Peak

7.4 Field Strength of the Fundamental Signal (15.231(b))

Test Requirement 47 CFR Part 15, Subpart C 15.231(b)

Test Method: ANSI C63.10 (2013) Section 6.5

Limit:

Fundamental Frequency MHz	Field Strength of Fundamental (dBμV/m @ 3 m)	Field Strength of Harmonics and Spurious Emissions (dBμV/m @ 3 m)
40.66 to 40.70	67.04	47.04
70 to 130	61.94	41.94
130 to 174	**61.94 to 71.48	**41.94 to 51.48
174 to 260	71.48	51.48
260 to 470	**71.48 to 81.94	**51.48 to 61.94
Above 470	81.94	61.94
Detector:	Peak for pre-scan	
	QP for 30MHz to1000 MHz:120 kHz resolution bandwidth	
	Peak for Above 1 GHz: 1 MHz resolution bandwidth	

** linear interpolations

[Where F is the frequency in MHz, the formulas for calculating the maximum permitted fundamental field strengths are as follows:

for the band 130-174 MHz, uV/m at 3 meters = 56.81818(F) - 6136.3636;

for the band 260-470 MHz, uV/m at 3 meters = 41.6667(F) - 7083.3333.

The maximum permitted unwanted emission level is 20 dB below the maximum permitted fundamental level.]

The fundamental frequency of the EUT is 433.92 MHz

The limit for average or QP field strength dBuV/m for the fundamental emission= 80.83 dBuV/m

No fundamental is allowed in the restricted bands.

The limit for average field strength dBuV/m for the spurious emission=60.83 dBuV/m. Spurious in the restricted bands must be less than 60.83 dBuV/m or 15.209, whichever limit permits a higher field strength.

7.4.1 E.U.T. Operation

Operating Environment:

Temperature: 24.3 °C

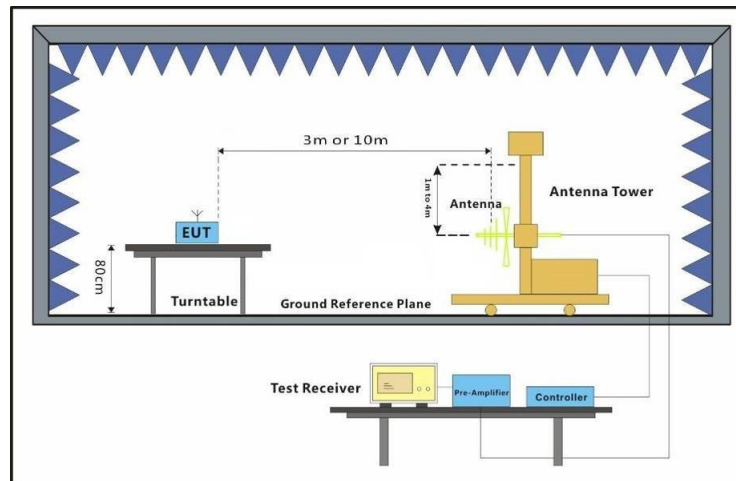
Humidity: 52.5 % RH

Atmospheric Pressure: 1010 mbar

7.4.2 Test Mode Description

Pre-scan /	Mode	Description
Final test	Code	
Final test	00	Tx mode

7.4.3 Test Setup Diagram



7.4.4 Measurement Procedure and Data

And according 15.35(a)

15.35(a) On any frequency or frequencies below or equal to 1000 MHz, the limits shown are based on measuring equipment employing a CISPR quasi-peak detector function and related measurement bandwidths, unless otherwise specified. The specifications for the measuring instrument using the CISPR quasi-peak detector can be found in Publication 16 of the International Special Committee on Radio Interference (CISPR) of the International Electrotechnical Commission. As an alternative to CISPR quasi-peak measurements, the responsible party, at its option, may demonstrate compliance with the emission limits using measuring equipment employing a peak detector function, properly adjusted for such factors as pulse desensitization, as long as the same bandwidths as indicated for CISPR quasi-peak measurements are employed.

Note: For pulse modulated devices with a pulse-repetition frequency of 20 Hz or less and for which CISPR quasi-peak measurements are specified, compliance with the regulations shall be demonstrated using measuring equipment employing a peak detector function, properly adjusted for such factors as pulse desensitization, using the same measurement bandwidths that are indicated for CISPR quasi-peak measurements.

According to 15.35 (b) Unless otherwise specified, on any frequency or frequencies above 1000 MHz, the radiated emission limits are based on the use of measurement instrumentation employing an average detector function. Unless otherwise specified, measurements above 1000 MHz shall be performed using a minimum resolution bandwidth of 1 MHz. When average radiated emission measurements are specified in this part, including average emission measurements below 1000 MHz, there also is a limit on the peak level of the radio frequency emissions. Unless otherwise specified, e.g., see §§ 15.250, 15.252, 15.255, and 15.509-15.519 of this part, the limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device, e.g., the total peak power level. Note that the use of a pulse desensitization correction factor may be needed to determine the total peak emission level. The instruction manual or application note for the measurement instrument should be consulted for determining pulse desensitization factors, as necessary.

The average correction factor is computed by analyzing the on time in 100ms over one complete pulse train. Analysis of the remote transmitter on time in one complete pulse train, therefore the average value of fundamental frequency is: Average = Peak value + 20log (Duty cycle), where the duty factor is calculated from following formula:

$$20\log (\text{Duty cycle})=20\log(0.29)=-5.37\text{dB}$$

Here:

$$\text{Duty cycle} = \text{Ton}_{\text{cum}} / \text{Ton} + \text{off}$$

$$\text{Ton}_{\text{cum}} = 0.7 \times 22 + 0.2 \times 61 + 1.4 = 29(\text{ms})$$

$$\text{Ton} + \text{off} = 100 (\text{ms})$$

$$\text{Duty cycle} = 29 / 100 = 0.29$$

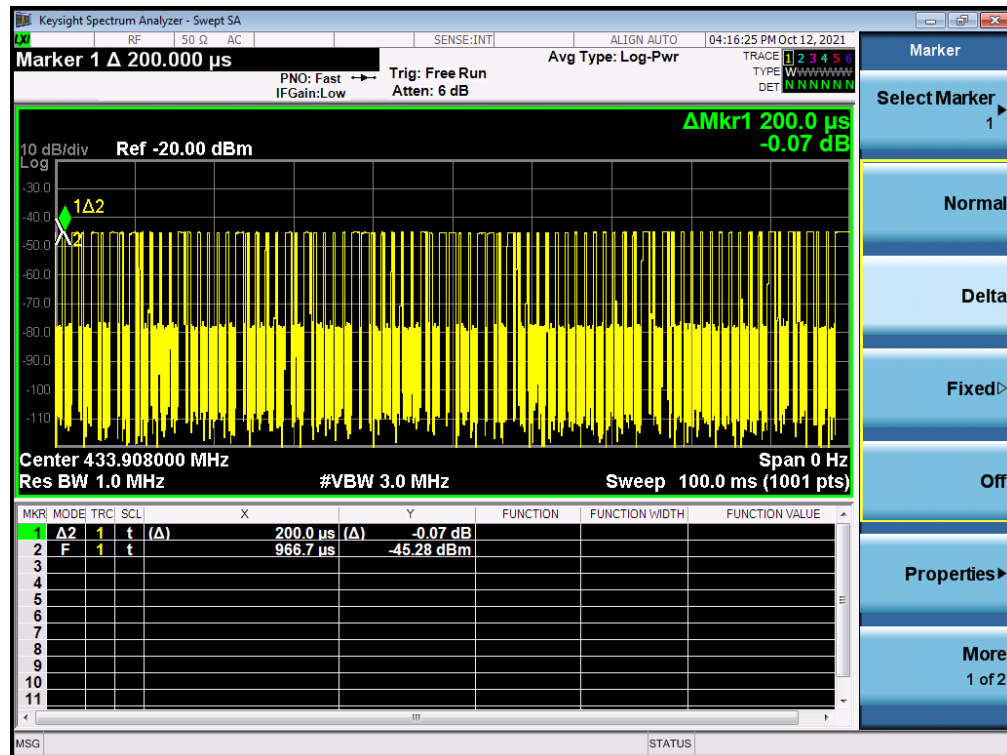
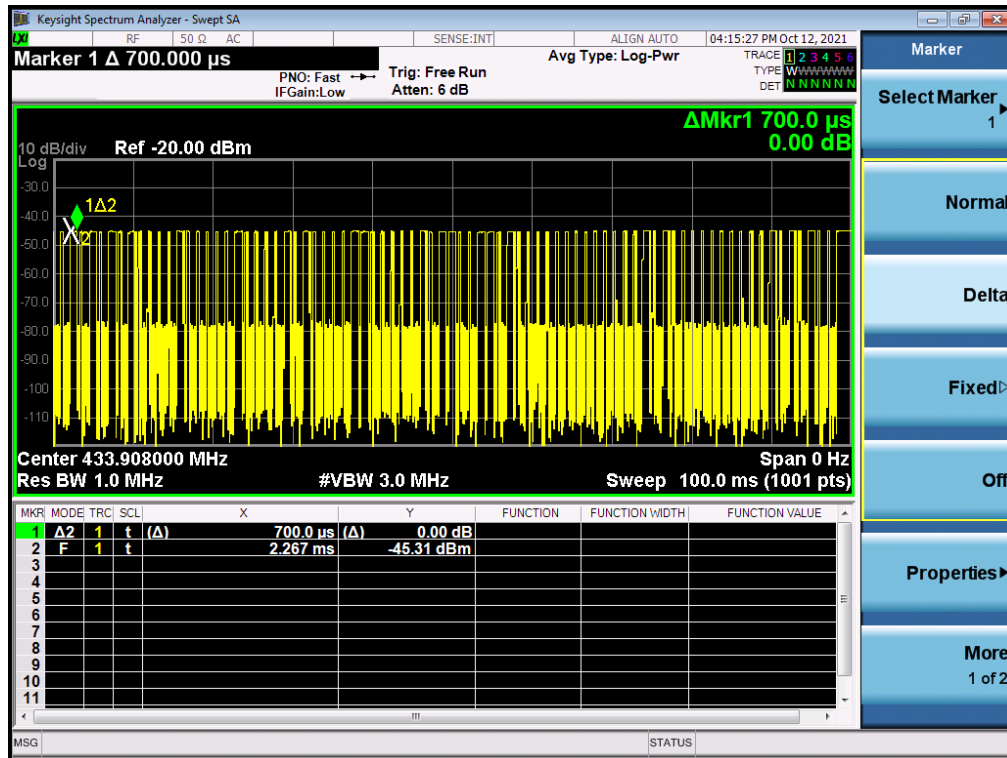
Please refer to below plots for more details.

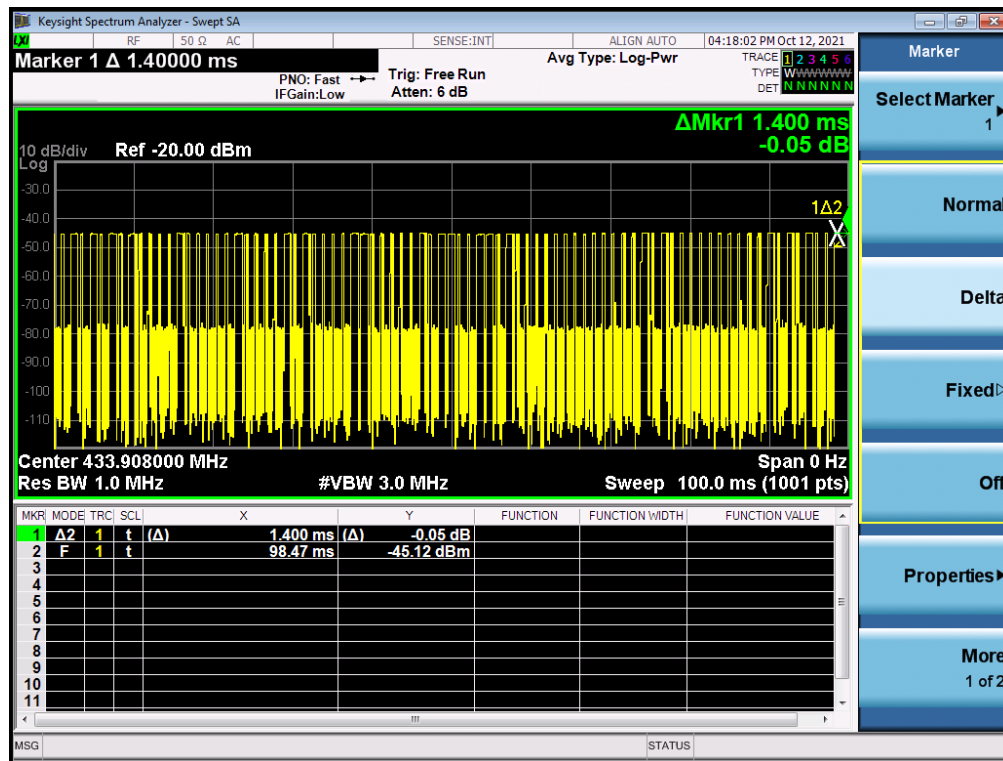


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Test plot

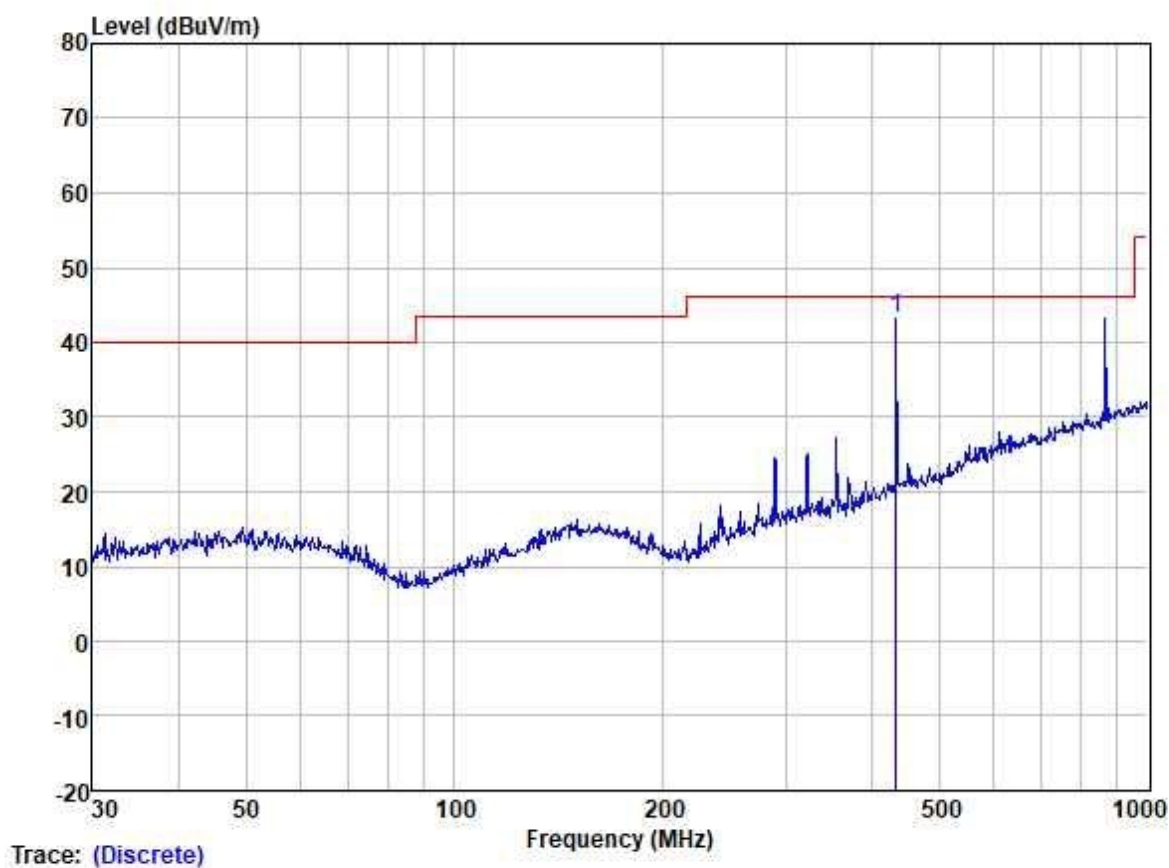




Antenna polarization: Horizontal:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Remark
433.92	49.92	16.85	4.09	27.53	43.33	100.83	-57.50	Peak
433.92	N/A	N/A	N/A	N/A	37.96	80.83	-42.87	Average

Test Mode: 00; Polarity: Horizontal



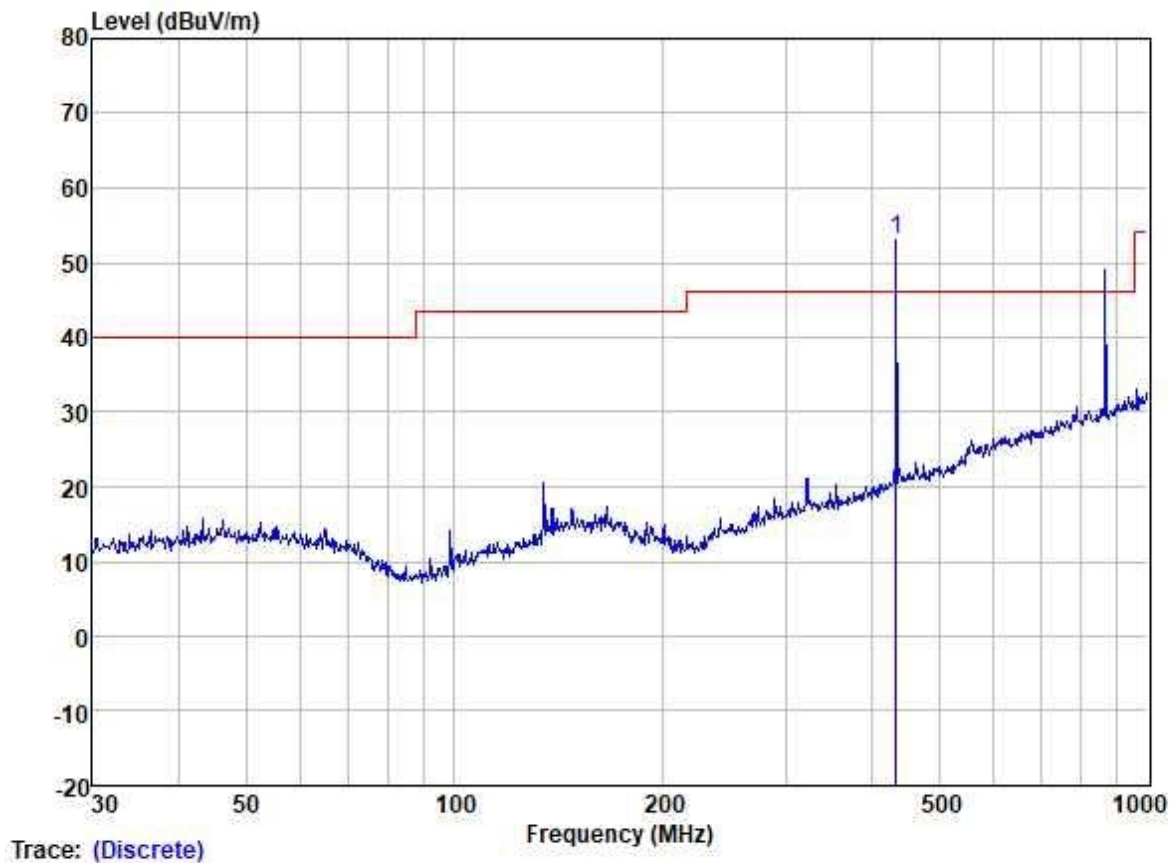
Site : SGS
Job :
Model :
Power :
Test Mode : RT

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Measured Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dBuV		
1	433.92	49.92	16.85	4.09	27.53	43.33	46.00	-2.67	HORIZONTAL	Peak

Antenna polarization: Vertical:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Remark
433.92	59.73	16.85	4.09	27.53	53.14	100.83	-47.69	Peak
433.92	N/A	N/A	N/A	N/A	47.77	80.83	-33.06	Average

Test Mode: 00; Polarity: Vertical



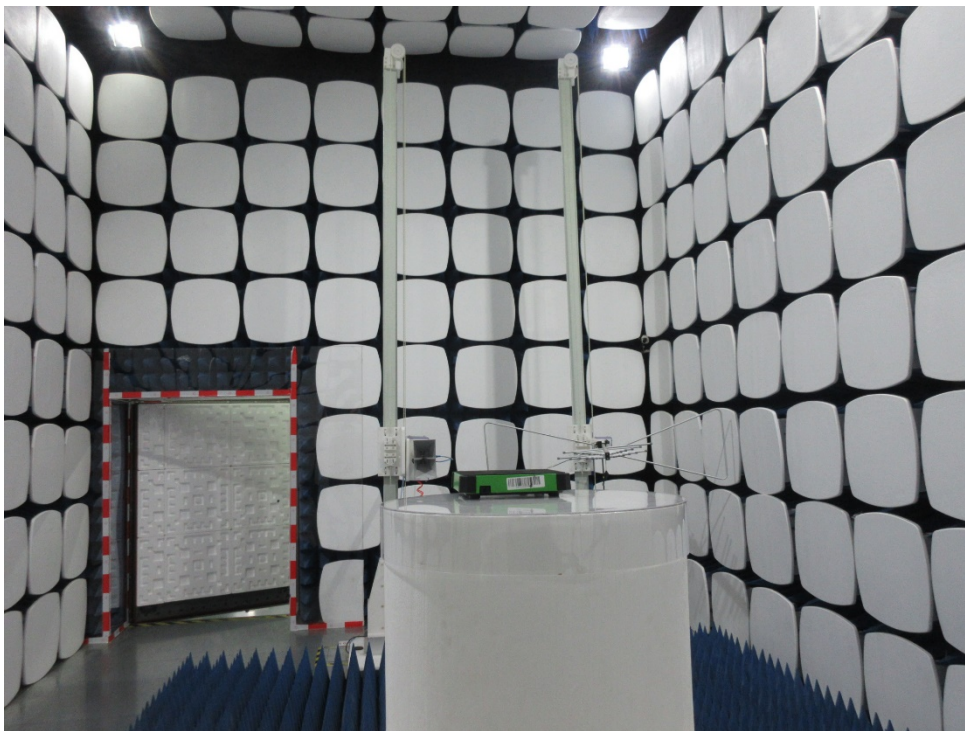
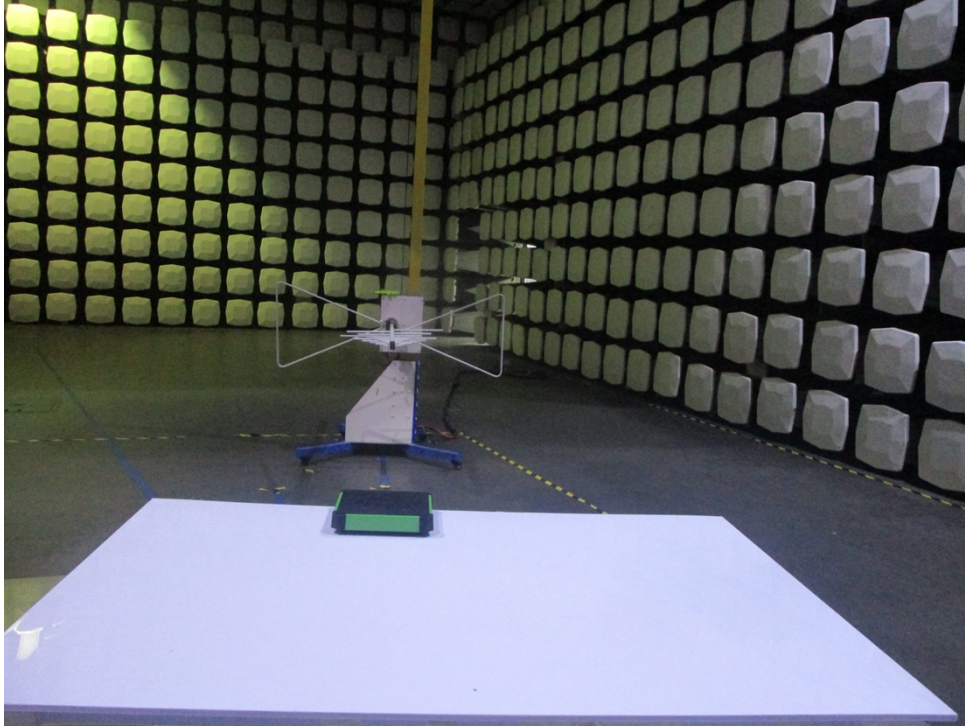
Site : SGS
Job :
Model :
Power :
Test Mode : RT

	Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Measured Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dBuV		
1*	433.92	59.73	16.85	4.09	27.53	53.14	46.00	7.14	VERTICAL	Peak

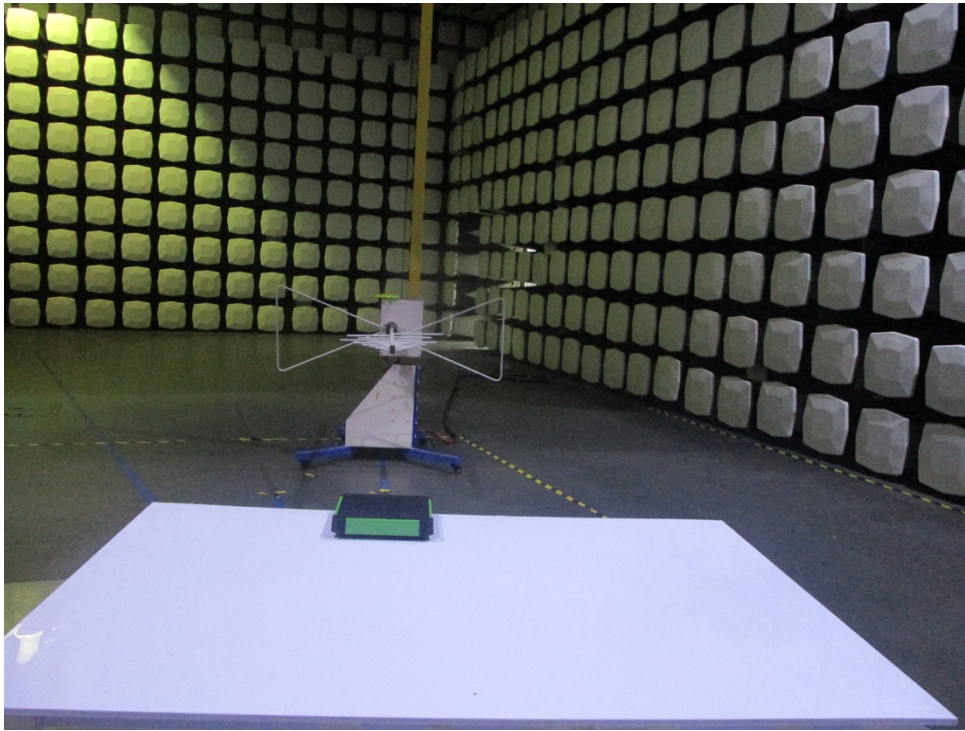
Remarks: 867.843MHz is the harmonics of Field Strength, so please reference the clause 7.4

8 Test Setup Photo

Radiated Emissions



Field Strength of the Fundamental Signal (15.231(b))



9 EUT Constructional Details (EUT Photos)

Refer to External and Internal Photos for GZCR2106020452HS

- End of the Report -