

TEST REPORT

Application No.: SHCR2305000969AT
FCC ID: 2ARLM-CST-3A
Applicant: Pinghu City Cang Sheng Plastic Factory
Address of Applicant: Group22, Zhonghua Village, Xincang Town, Pinghu City, Zhejiang Province, China
Manufacturer: Pinghu City Cang Sheng Plastic Factory
Address of Manufacturer: Group22, Zhonghua Village, Xincang Town, Pinghu City, Zhejiang Province, China
Factory: Pinghu City Cang Sheng Plastic Factory
Address of Factory: Group22, Zhonghua Village, Xincang Town, Pinghu City, Zhejiang Province, China

Equipment Under Test (EUT):
EUT Name: 2.4G REMOTE CONTROL
Model No.: CST-3A, CST-3B
Remark: Please refer to section 2 of this report which indicates which model was actually tested and which were electrically identical.

Standard(s) : 47 CFR Part 15, Subpart C 15.249
Date of Receipt: 2023-05-16
Date of Test: 2023-05-16 to 2023-05-29
Date of Issue: 2023-06-12

| | |
|---------------------|--------------|
| Test Result: | PASS* |
|---------------------|--------------|

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

Parlan Zhan

Parlan Zhan
Laboratory Manager



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| Revision Record | | | |
|-----------------|-------------|------------|--------|
| Version | Description | Date | Remark |
| 00 | Original | 2023-06-12 | / |
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|---------------------------------|--|---------------------------------|--|
| Authorized for issue by: | | | |
| | | Bill Wu | |
| | | <hr/> | |
| | | Bill Wu/Project Engineer | |
| | | Parlam zhan | |
| | | <hr/> | |
| | | Parlam Zhan / Reviewer | |



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2 Test Summary

| Item | FCC Requirement | Method | Result |
|---------------------|-------------------------------------|--------|--------|
| Antenna Requirement | 47 CFR Part 15, Subpart C 15.249 | N/A | Pass |

| Item | FCC Requirement | Method | Result |
|--|-------------------------------------|---|--------|
| 20dB Bandwidth | 47 CFR Part 15, Subpart C 15.249 | ANSI C63.10 (2013) Section 6.9 | Pass |
| Field Strength of the Fundamental Signal (15.249(a)) | 47 CFR Part 15, Subpart C 15.249 | ANSI C63.10 (2013) Section 6.5&6.6 | Pass |
| Restricted Band Around Fundamental Frequency | 47 CFR Part 15, Subpart C 15.249 | ANSI C63.10 (2013) Section 6.4&6.5&6.6 | Pass |
| Radiated Emissions | 47 CFR Part 15, Subpart C 15.249 | ANSI C63.10 (2013) Section 6.4&6.5&6.6 | Pass |

Note: There are series models mentioned in this report, and they are the similar in electrical and electronic characters. Only the model CST-3A was tested since their differences were the model number and appearance.



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4 General Information

4.1 Details of E.U.T.

| | |
|----------------------|-----------------------------------|
| Power supply: | DC 3V By 2*AAA size batteries |
| Test voltage: | DC 3V |
| Operation Frequency: | 2402MHz to 2480MHz |
| Modulation Type: | GFSK |
| Number of Channels: | 27 |
| Antenna Type: | PCB Antenna |
| Antenna Gain: | 1.6dBi (Provided by manufacturer) |

Channel List Table:

| channel number | frequency | channel number | frequency |
|----------------|-----------|----------------|-----------|
| 0 | 2402 | 14 | 2441 |
| 1 | 2414 | 15 | 2444 |
| 2 | 2415 | 16 | 2446 |
| 3 | 2416 | 17 | 2452 |
| 4 | 2417 | 18 | 2454 |
| 5 | 2419 | 19 | 2456 |
| 6 | 2421 | 20 | 2462 |
| 7 | 2426 | 21 | 2464 |
| 8 | 2428 | 22 | 2465 |
| 9 | 2429 | 23 | 2467 |
| 10 | 2430 | 24 | 2469 |
| 11 | 2431 | 25 | 2473 |
| 12 | 2433 | 26 | 2480 |
| 13 | 2439 | | |

4.2 Description of Support Units

The EUT has been tested as an independent unit.

4.3 Measurement Uncertainty

| No. | Item | Measurement Uncertainty |
|-----|--------------------|-------------------------|
| 1 | Radio Frequency | 8.4 x 10 ⁻⁸ |
| 2 | Timeout | 2s |
| 3 | Duty Cycle | 0.37% |
| 4 | Occupied Bandwidth | 3% |
| 5 | RF Radiated Power | 5.1dB (Below 1GHz) |
| | | 4.9dB (Above 1GHz) |



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SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.
EEC EMC Lab

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| | | |
|----|---------------------------------|---------------------|
| 6 | Radiated Spurious Emission Test | 4.2dB (Below 30MHz) |
| | | 4.5dB (30MHz-1GHz) |
| | | 5.1dB (1GHz-18GHz) |
| | | 5.4dB (Above 18GHz) |
| 7 | Temperature Test | 1°C |
| 8 | Humidity Test | 3% |
| 9 | Supply Voltages | 1.5% |
| 10 | Time | 3% |

Note: 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:

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

588 West Jindu Road, Xinqiao, Songjiang, 201612 Shanghai, China

Tel: +86 21 6191 5666

Fax: +86 21 6191 5678

No tests were sub-contracted.

Note:

1. SGS is not responsible for wrong test results due to incorrect information (e.g., max. internal working frequency, antenna gain, cable loss, etc) is provided by the applicant. (If applicable).
2. SGS is not responsible for the authenticity, integrity and the validity of the conclusion based on results of the data provided by applicant. (If applicable).

4.5 Test Facility

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

- **A2LA (Certificate No. 6332.01)**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. is accredited by the American Association for Laboratory Accreditation(A2LA).

- **FCC (Designation Number: CN1301)**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been recognized as an accredited testing laboratory.

- **ISED (CAB Identifier: CN0020)**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. EMC Laboratory has been recognized by Innovation, Science and Economic Development Canada (ISED) as an accredited testing laboratory. Company Number: 8617A

- **VCCI (Member No.: 3061)**

The 3m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-13868, C-14336, T-12221, G-10830 respectively.

4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None



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5 Equipment List

| Equipment | Manufacturer | Model No | Inventory No | Cal Date | Cal Due Date |
|---------------------------|--------------|------------------|-----------------------|------------|--------------|
| RF Radiated Test | | | | | |
| EMI test Receiver | R&S | ESU40 | SHEM051-1 | 2022-12-20 | 2023-12-19 |
| Spectrum Analyzer | R&S | FSP-30 | SHEM002-1 | 2022-12-20 | 2023-12-19 |
| Communication Tester | R&S | CMW500 | SHEM268-1 | 2022-07-25 | 2023-07-24 |
| Loop Antenna (9kHz-30MHz) | Schwarzbeck | FMZB1519 | SHEM135-1 | 2022-12-20 | 2023-12-19 |
| Antenna (25MHz-2GHz) | Schwarzbeck | VULB9168 | SHEM048-1 | 2021-09-11 | 2023-09-10 |
| Antenna (25MHz-2GHz) | Schwarzbeck | VULB9168 | SHEM202-1 | 2022-05-07 | 2024-05-06 |
| Horn Antenna (1-18GHz) | Schwarzbeck | HF906 | SHEM009-1 | 2022/8/11 | 2024-08-10 |
| Horn Antenna (1-18GHz) | Schwarzbeck | BBHA9120D | SHEM050-1 | 2021-09-18 | 2023-09-17 |
| Horn Antenna (14-40GHz) | Schwarzbeck | BBHA 9170 | SHEM049-1 | 2021-09-18 | 2023-09-17 |
| Pre-Amplifier | HP | 8447D | SHEM236-1 | 2022-08-02 | 2023-08-01 |
| High-amplifier (14-40GHz) | Schwarzbeck | 10001 | SHEM049-2 | 2022-12-20 | 2023-12-19 |
| Band Filter | LORCH | 9BRX-875/X150 | SHEM156-1 | / | / |
| Band Filter | LORCH | 13BRX-1950/X500 | SHEM083-2 | / | / |
| Band Filter | LORCH | 5BRX-2400/X200 | SHEM155-1 | / | / |
| Band Filter | LORCH | 5BRX-5500/X1000 | SHEM157-2 | / | / |
| High pass Filter | Wainwright | WHK3.0/18G | SHEM157-1 | / | / |
| High pass Filter | Wainwright | WHKS1700 | SHEM157-3 | / | / |
| Semi/Fully Anechoic | ST | 11*6*6M | SHEM078-2 | 2021-05-25 | 2024-05-24 |
| RE test Cable | / | RE01, RE02, RE06 | / | 2023-01-07 | 2024-01-06 |
| Test software | ESE | E3 | Version: 6.111221a | / | / |



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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

Limit:

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.

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 PCB antenna and no consideration of replacement. The best case gain of the antenna is 1.6dBi.

Antenna location: Refer to Appendix (Internal Photos)



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7 Radio Spectrum Matter Test Results

7.1 20dB Bandwidth

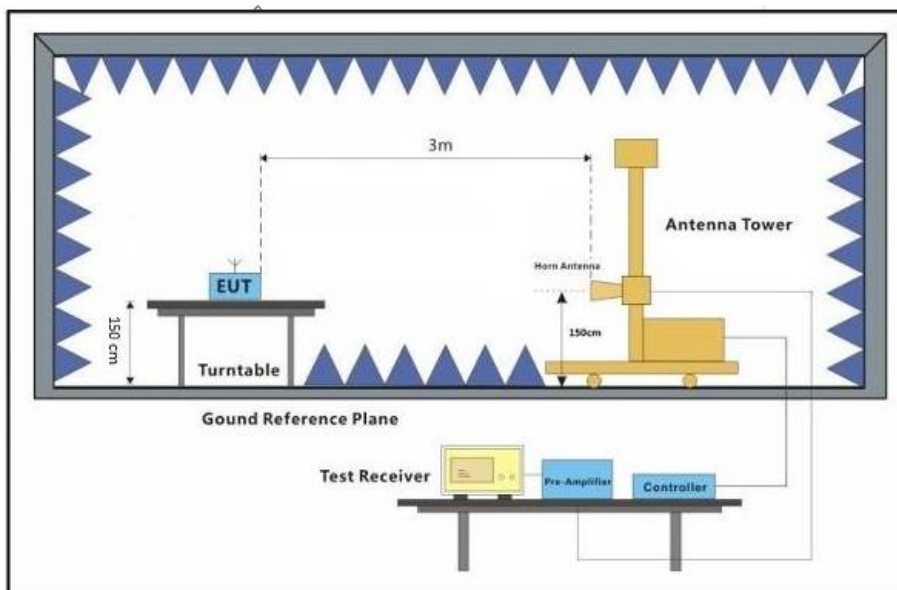
Test Requirement 47 CFR Part 15, Subpart C 15.215
 Test Method: ANSI C63.10 (2013) Section 6.9

7.1.1 E.U.T. Operation

Operating Environment:

Temperature: 20 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar
 Test mode a:TX mode_Keep the EUT in transmitting with modulation mode.

7.1.2 Test Setup Diagram



7.1.3 Measurement Procedure and Data

1. Place the EUT on the table and set it in Engineering mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW = 1 % to 5 % of the OBW, VBW= approximately 3* RBW, Span=between 2 to 5 times the OBW, Sweep=auto, Detector function = peak, Trace = max hold.
4. Allow the trace to stabilize, Mark the peak frequency and -20dB (upper and lower) frequency.
5. Repeat above procedures until all frequency measured was complete.



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| Frequency (MHz) | Bandwidth (MHz) | Result |
|-----------------|-----------------|--------|
| 2402 | 1.10 | PASS |
| 2441 | 1.20 | PASS |
| 2480 | 1.33 | PASS |

Test plot as follows:

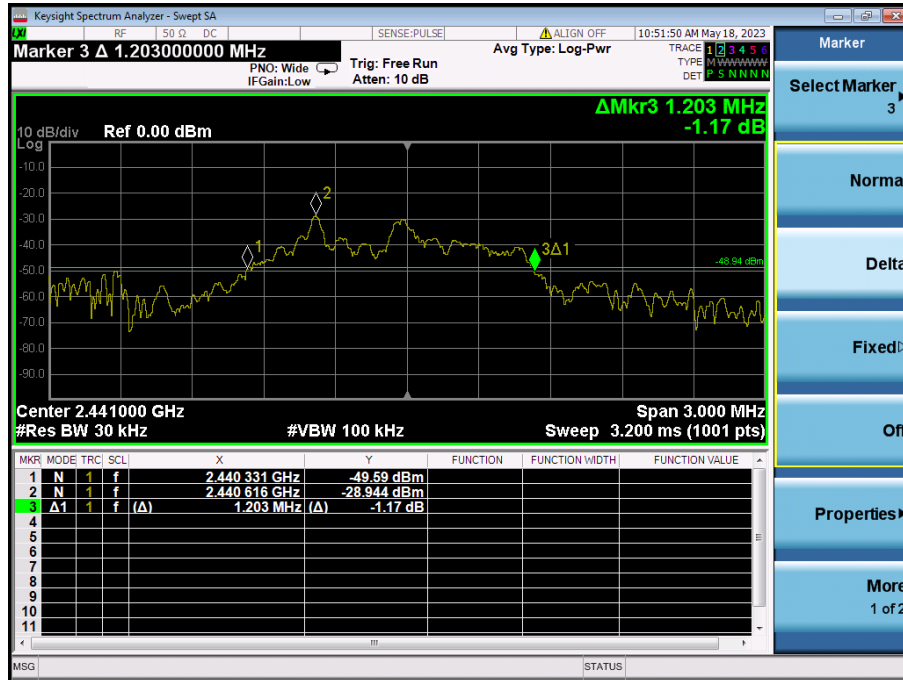
Channel: 2402MHz



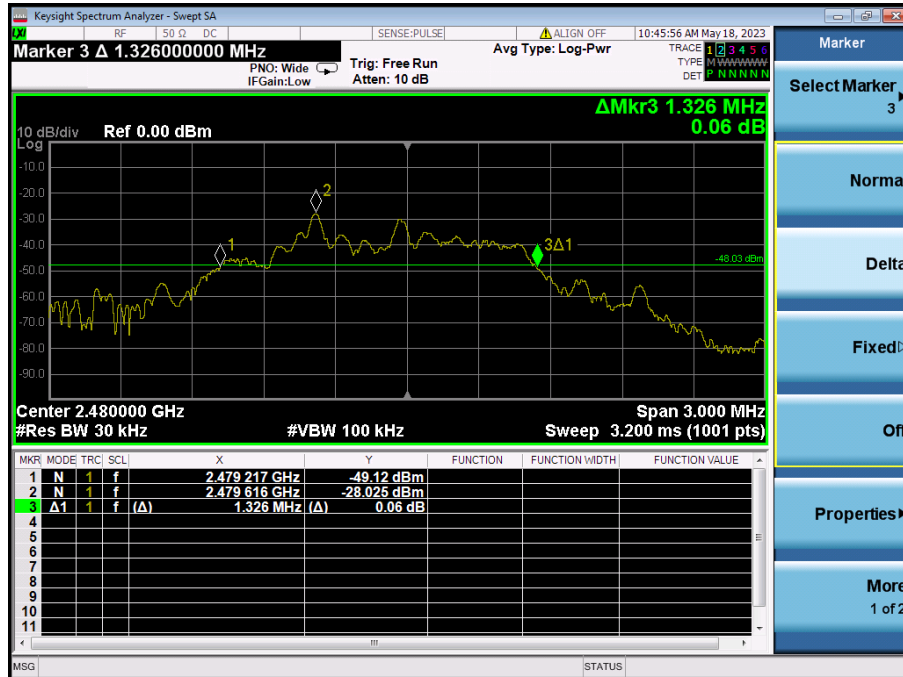
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Channel: 2441MHz



Channel: 2480MHz



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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 (2013) Section 6.5&6.6

Test Site: Measurement Distance: 3m

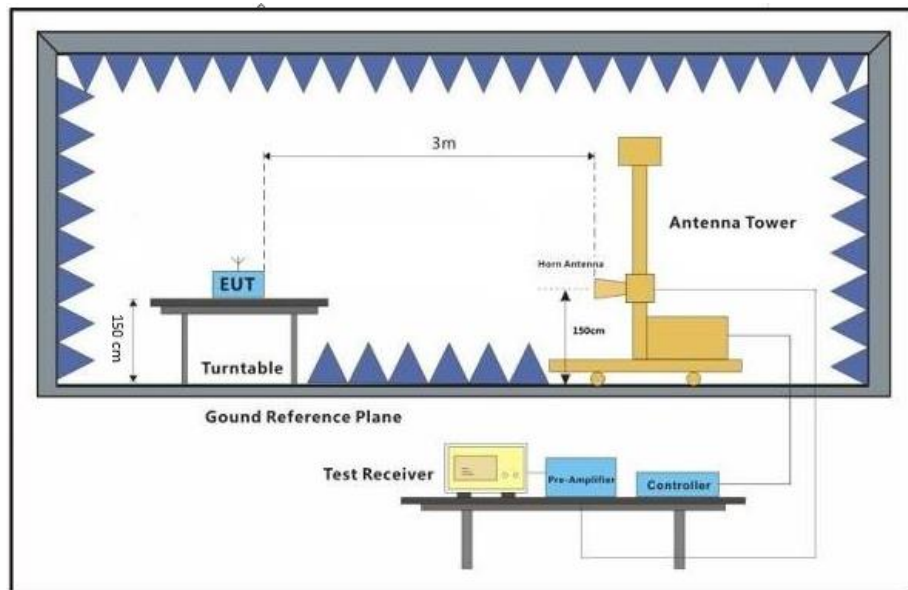
Receiver Setup:

| Frequency | Detector | RBW | VBW | Remark |
|------------|----------|------|------|---------|
| Above 1GHz | Peak | 1MHz | 3MHz | Peak |
| | Peak | 1MHz | 10Hz | Average |

Limit:

| Frequency | Limit (dBuV/m) | Remark |
|-----------------|----------------|---------|
| 2400~2483.5 MHz | 114 | Peak |
| | 94 | Average |

Test Setup:



Test Procedure:

- The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to Peak Detect Function and Specified



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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 peak, quasi-peak or average method as specified and then reported in a data sheet.

Test Results: Pass

Measurement Data

Peak value:

| Frequency (MHz) | Read Level (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | Detector | Polarization |
|-----------------|-------------------|---------------|----------------|---------------------|-----------------|----------|--------------|
| 2402 | 93.47 | -3.21 | 90.26 | 94 | -3.74 | Peak | Horizontal |
| | 87.40 | -3.21 | 84.19 | 94 | -9.81 | Peak | Vertical |

| Frequency (MHz) | Read Level (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | Detector | Polarization |
|-----------------|-------------------|---------------|----------------|---------------------|-----------------|----------|--------------|
| 2441 | 94.53 | -3.11 | 91.42 | 94 | -2.58 | Peak | Horizontal |
| | 86.33 | -3.11 | 83.22 | 94 | -10.78 | Peak | Vertical |

| Frequency (MHz) | Read Level (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | Detector | Polarization |
|-----------------|-------------------|---------------|----------------|---------------------|-----------------|----------|--------------|
| 2480 | 94.24 | -2.97 | 91.27 | 94 | -2.73 | Peak | Horizontal |
| | 85.79 | -2.97 | 82.82 | 94 | -11.18 | Peak | Vertical |

Remark:

- 1) The basic equation with a sample calculation is as follows: Level = Read Level + Factor.
(The Factor is calculated by adding the Antenna Factor, Cable Loss and Preamp Factor)
- 2) If the Peak value below the Average Limit, the Quasi-Peak test doesn't perform for this submission.



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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 (2013) Section 6.4&6.5&6.6

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 |
| 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.

7.3.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1002 mbar

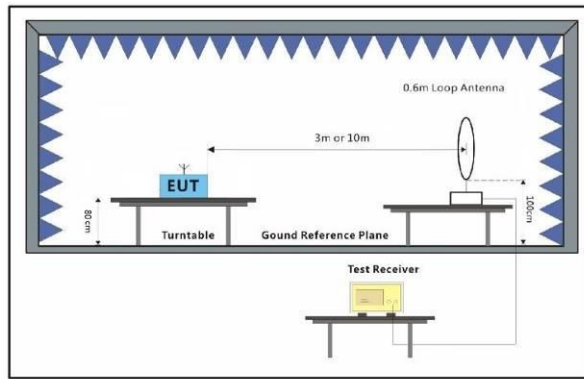
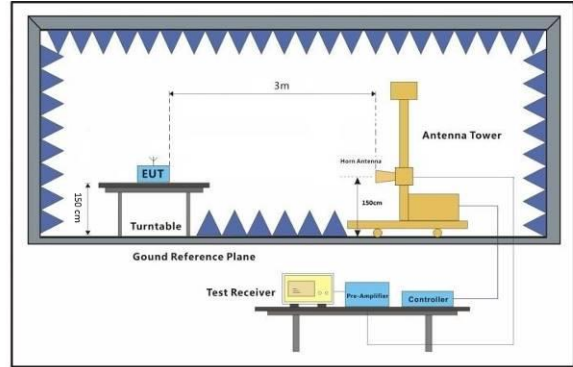
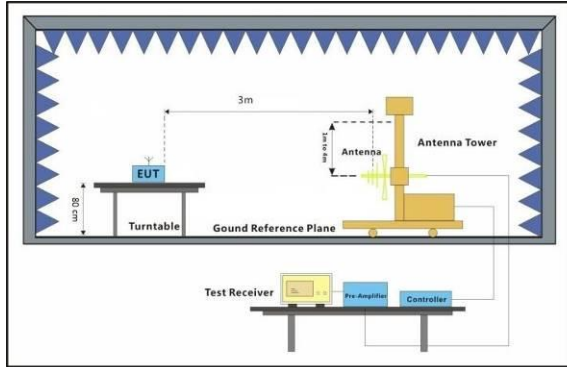
Test mode a:TX mode_Keep the EUT in transmitting with modulation mode.



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7.3.2 Test Setup Diagram



7.3.3 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 1: $Level = Read\ Level + Cable\ Loss + Antenna\ Factor - Preamp\ Factor$

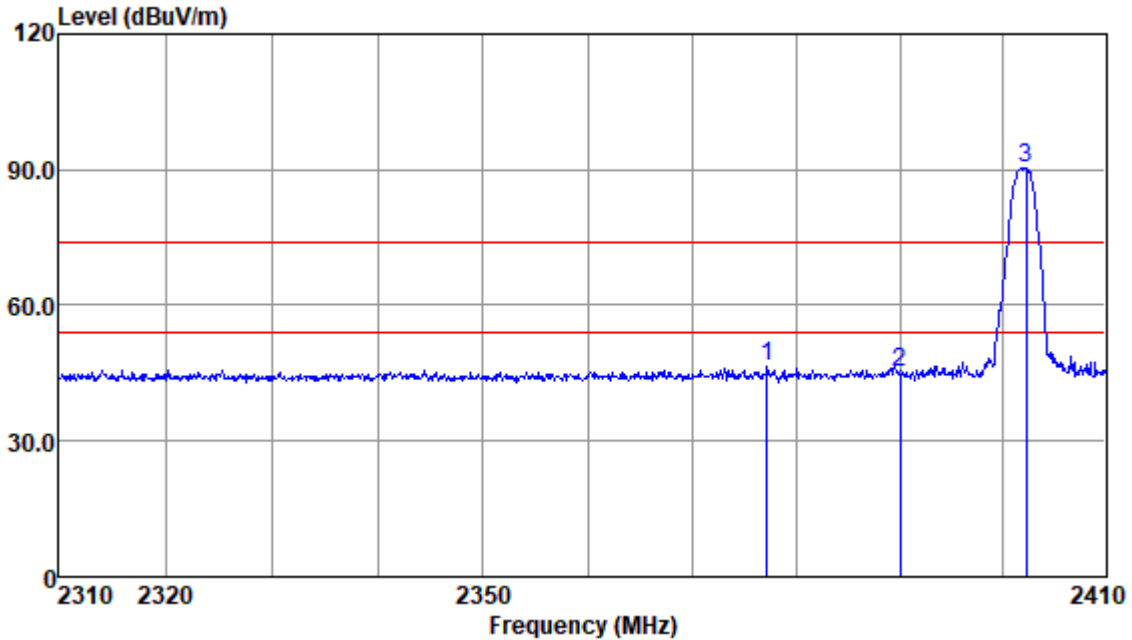
Remark 2: For frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.



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2402MHz:



Antenna Polarity :HORIZONTAL

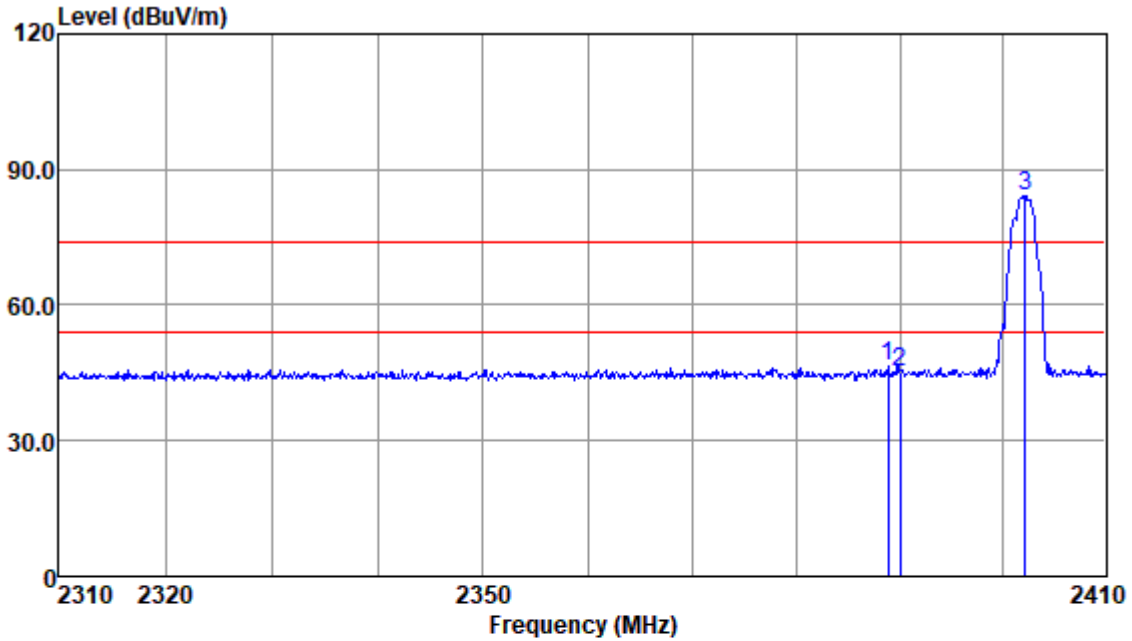
| Read Freq | Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark |
|-----------|-------|----------------|------------|---------------|----------------|------------|------------|--------|
| MHz | dBuv | dB/m | dB | dB | dBuv/m | dBuv/m | dB | |
| 2377.14 | 49.64 | 28.76 | 3.14 | 35.17 | 46.37 | 74.00 | -27.63 | Peak |
| 2390.00 | 48.39 | 28.80 | 3.13 | 35.18 | 45.14 | 74.00 | -28.86 | Peak |
| 2402.25 | 93.47 | 28.85 | 3.13 | 35.19 | 90.26 | 74.00 | 16.26 | Peak |

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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Antenna Polarity :VERTICAL

| Freq | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark |
|---------|------------|----------------|------------|---------------|----------------|------------|------------|--------|
| MHz | dBuv | dB/m | dB | dB | dBuv/m | dBuv/m | dB | |
| 2388.85 | 49.59 | 28.80 | 3.13 | 35.18 | 46.34 | 74.00 | -27.66 | Peak |
| 2390.00 | 48.54 | 28.80 | 3.13 | 35.18 | 45.29 | 74.00 | -28.71 | Peak |
| 2402.15 | 87.40 | 28.85 | 3.13 | 35.19 | 84.19 | 74.00 | 10.19 | Peak |

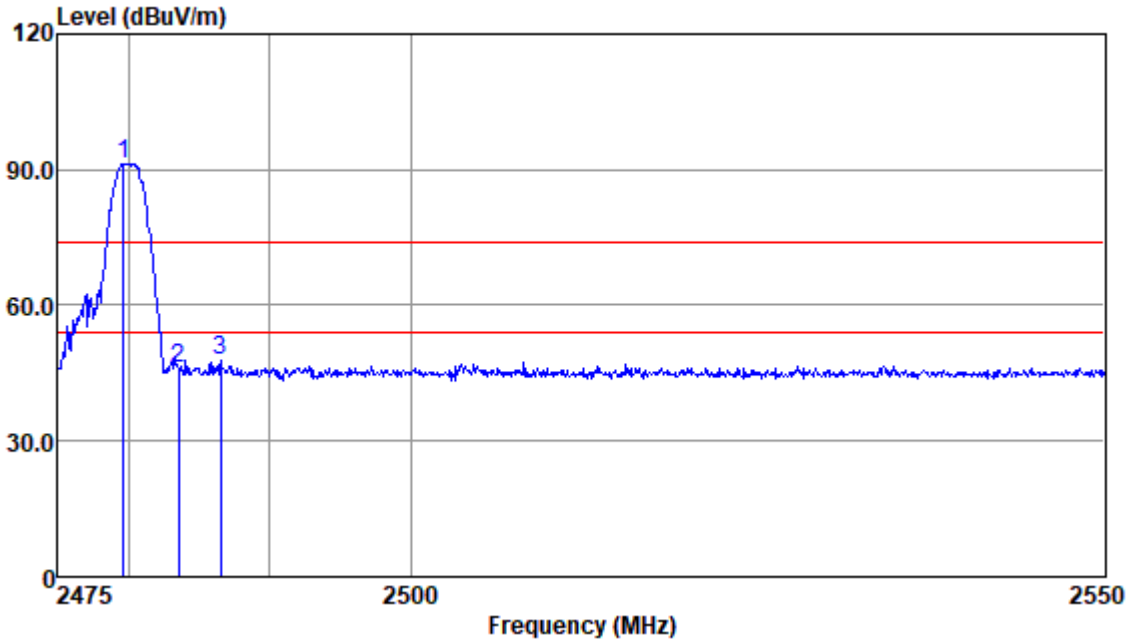
Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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2480MHz:



Antenna Polarity :HORIZONTAL

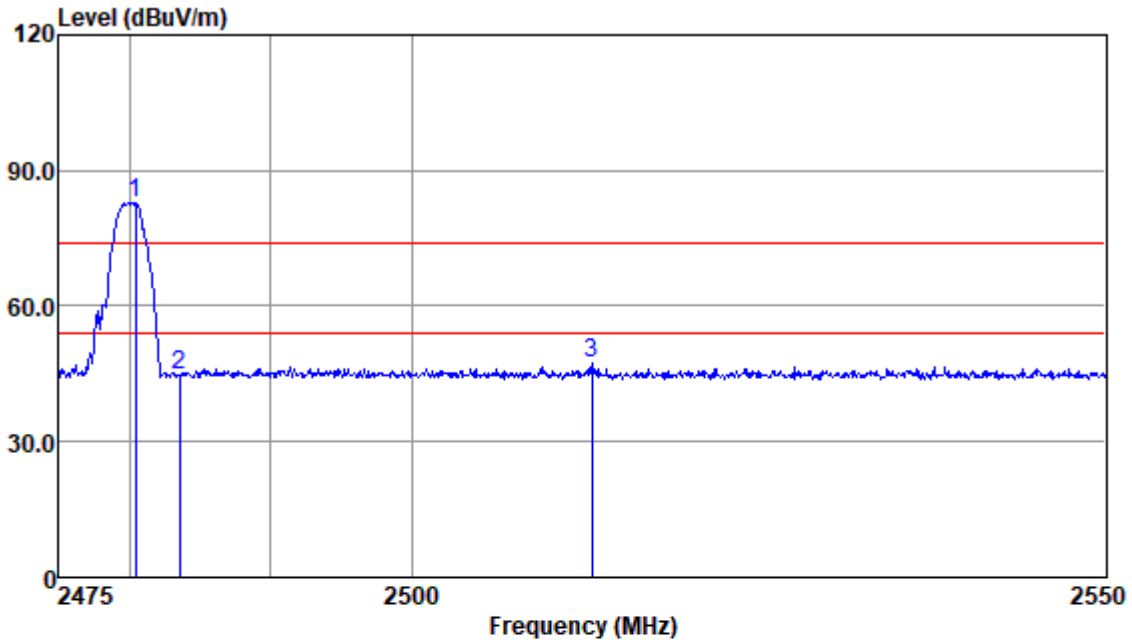
| Read Freq | Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark |
|-----------|-------|----------------|------------|---------------|----------------|------------|------------|--------|
| MHz | dBuv | dB/m | dB | dB | dBuv/m | dBuv/m | dB | |
| 2479.66 | 94.24 | 29.08 | 3.20 | 35.25 | 91.27 | 74.00 | 17.27 | Peak |
| 2483.50 | 49.03 | 29.09 | 3.20 | 35.26 | 46.06 | 74.00 | -27.94 | Peak |
| 2486.48 | 50.98 | 29.09 | 3.20 | 35.26 | 48.01 | 74.00 | -25.99 | Peak |

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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Antenna Polarity :VERTICAL

| Freq | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark |
|---------|------------|----------------|------------|---------------|----------------|------------|------------|--------|
| MHz | dBuv | dB/m | dB | dB | dBuv/m | dBuv/m | dB | |
| 2480.40 | 85.79 | 29.08 | 3.20 | 35.25 | 82.82 | 74.00 | 8.82 | Peak |
| 2483.50 | 47.80 | 29.09 | 3.20 | 35.26 | 44.83 | 74.00 | -29.17 | Peak |
| 2512.90 | 50.33 | 29.13 | 3.27 | 35.29 | 47.44 | 74.00 | -26.56 | Peak |

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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7.4 Radiated Emissions

Test Requirement 47 CFR Part 15, Subpart C 15.209 & 15.249 (a),(d)

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

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 |
| 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.

7.4.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1002 mbar

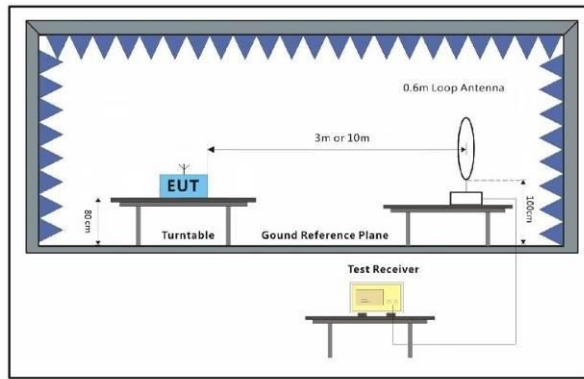
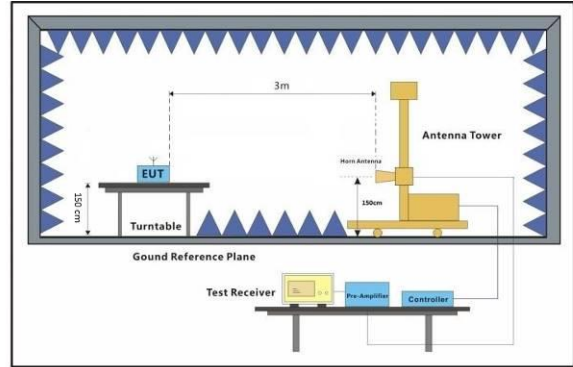
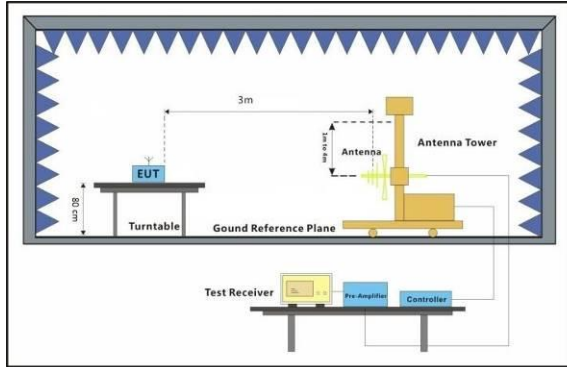
Test mode a:TX mode_Keep the EUT in transmitting with modulation mode.



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7.4.2 Test Setup Diagram



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7.4.3 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:

- 1) For emission below 1GHz, through pre-scan found the worst case is the lowest channel. Only the worst case is recorded in the report.
- 2) 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
- 3) Scan from 9kHz to 25GHz, the disturbance above 18GHz and 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.
- 4) 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

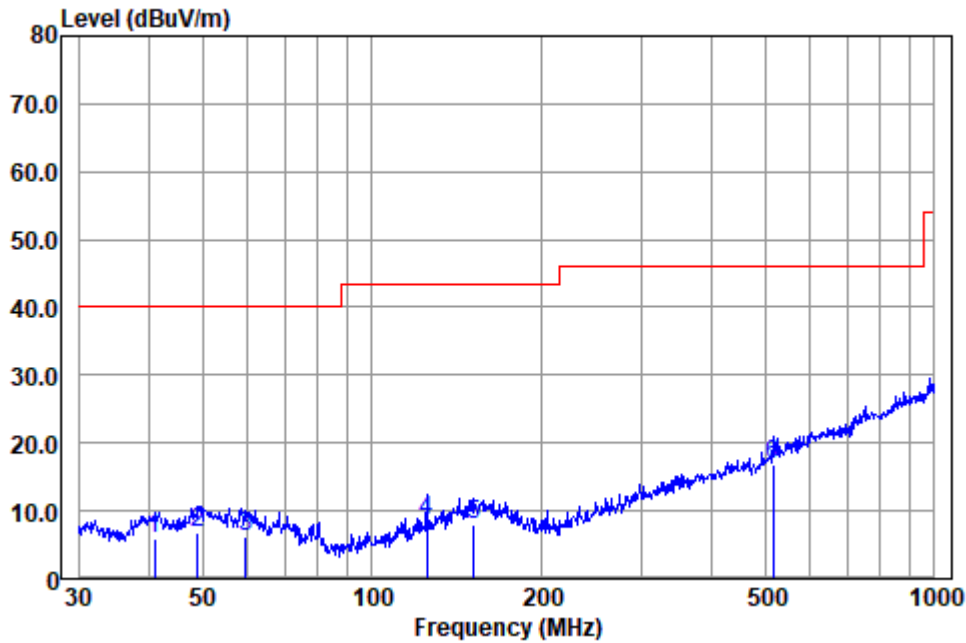


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中国·上海·松江区金都西路588号 邮编: 201612 t (86-21) 61915666 f (86-21) 61915678 sgs.china@sgs.com

30MHz-1GHz:

Mode:a; Polarization:Horizontal



Antenna Polarity :HORIZONTAL
 EUT/Project :0969AT
 Test mode :00

| | Freq | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark |
|---|---------|------------|----------------|------------|---------------|----------------|------------|------------|--------|
| | MHz | dBuV | dB/m | dB | dB | dBuV/m | dBuV/m | dB | |
| 1 | 40.988 | 25.01 | 13.60 | 0.95 | 33.70 | 5.86 | 40.00 | -34.14 | QP |
| 2 | 49.014 | 25.39 | 14.00 | 1.00 | 33.70 | 6.69 | 40.00 | -33.31 | QP |
| 3 | 59.649 | 25.48 | 13.04 | 1.19 | 33.60 | 6.11 | 40.00 | -33.89 | QP |
| 4 | 125.007 | 28.37 | 11.50 | 2.15 | 33.54 | 8.48 | 43.50 | -35.02 | QP |
| 5 | 151.597 | 25.10 | 13.80 | 2.45 | 33.49 | 7.86 | 43.50 | -35.64 | QP |
| 6 | 515.437 | 26.56 | 18.20 | 5.16 | 33.00 | 16.92 | 46.00 | -29.08 | QP |

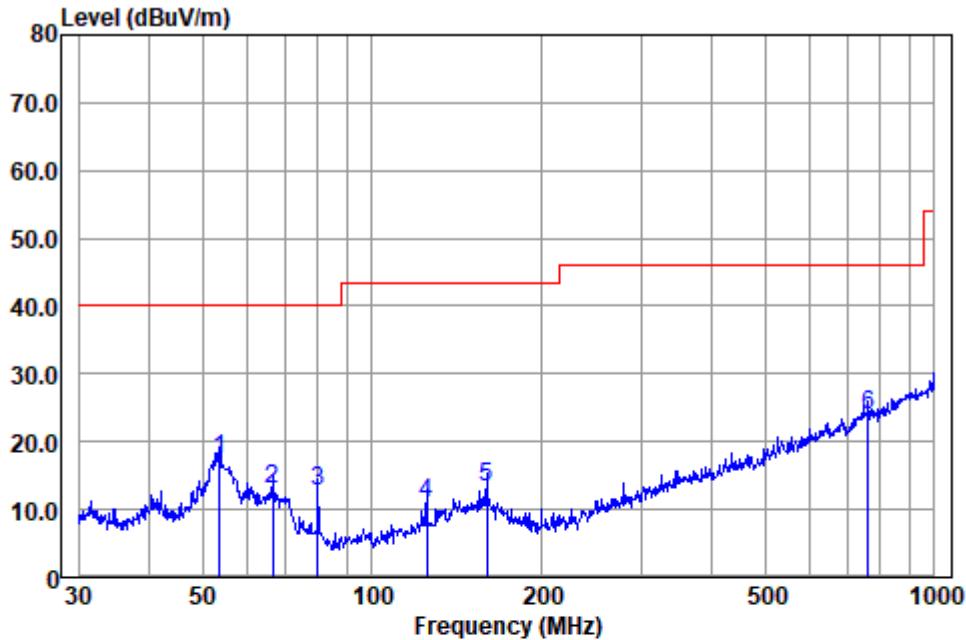
Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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Mode:a; Polarization:Vertical



Antenna Polarity :VERTICAL
 EUT/Project :0969AT
 Test mode :00

| | Freq | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark |
|---|---------|------------|----------------|------------|---------------|----------------|------------|------------|--------|
| | MHz | dBuV | dB/m | dB | dB | dBuV/m | dBuV/m | dB | |
| 1 | 53.505 | 35.96 | 13.90 | 1.09 | 33.66 | 17.29 | 40.00 | -22.71 | QP |
| 2 | 66.499 | 33.12 | 12.15 | 1.35 | 33.60 | 13.02 | 40.00 | -26.98 | QP |
| 3 | 80.081 | 35.33 | 9.00 | 1.76 | 33.50 | 12.59 | 40.00 | -27.41 | QP |
| 4 | 125.007 | 30.76 | 11.50 | 2.15 | 33.54 | 10.87 | 43.50 | -32.63 | QP |
| 5 | 159.784 | 30.60 | 13.60 | 2.49 | 33.45 | 13.24 | 43.50 | -30.26 | QP |
| 6 | 760.704 | 27.58 | 22.60 | 6.39 | 32.67 | 23.90 | 46.00 | -22.10 | QP |

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

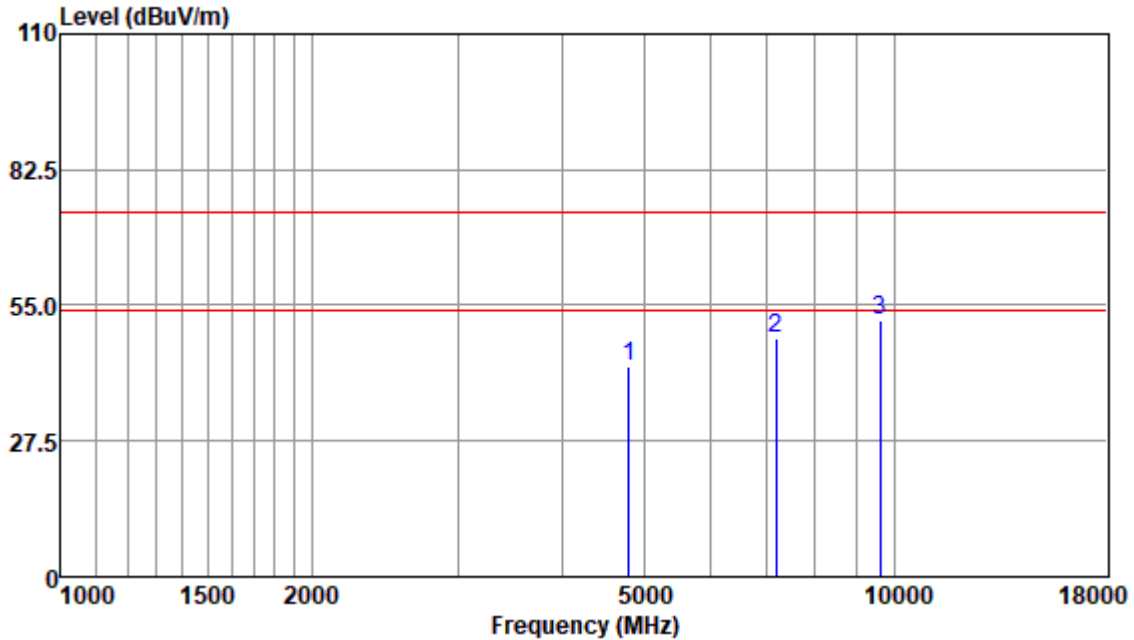


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Above 1GHz:

2402MHz:



Antenna Polarity :HORIZONTAL

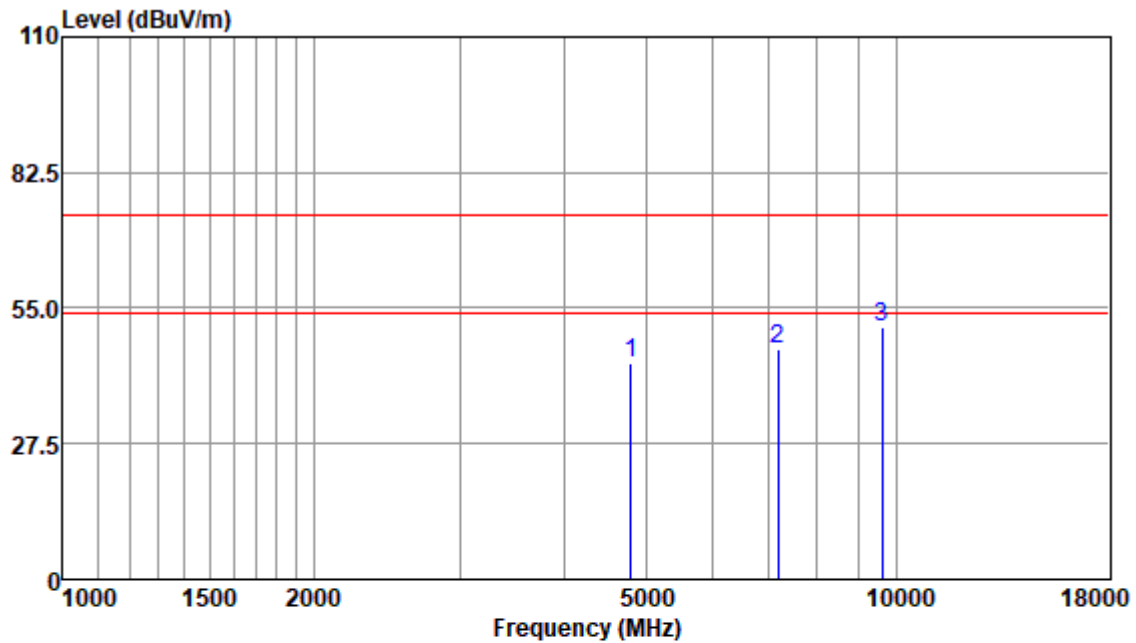
| Read Freq | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark |
|-----------|------------|----------------|------------|---------------|----------------|------------|------------|--------|
| MHz | dBuv | dB/m | dB | dB | dBuv/m | dBuv/m | dB | |
| 4804.00 | 41.47 | 33.57 | 4.53 | 36.79 | 42.78 | 74.00 | -31.22 | Peak |
| 7206.00 | 41.08 | 36.24 | 6.66 | 35.53 | 48.45 | 74.00 | -25.55 | Peak |
| 9608.00 | 39.43 | 37.75 | 8.56 | 33.58 | 52.16 | 74.00 | -21.84 | Peak |

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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Antenna Polarity :VERTICAL

| Read Freq | Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark |
|-----------|-------|----------------|------------|---------------|----------------|------------|------------|--------|
| MHz | dBuv | dB/m | dB | dB | dBuv/m | dBuv/m | dB | |
| 4804.00 | 42.50 | 33.57 | 4.53 | 36.79 | 43.81 | 74.00 | -30.19 | Peak |
| 7206.00 | 39.20 | 36.24 | 6.66 | 35.53 | 46.57 | 74.00 | -27.43 | Peak |
| 9608.00 | 38.59 | 37.75 | 8.56 | 33.58 | 51.32 | 74.00 | -22.68 | Peak |

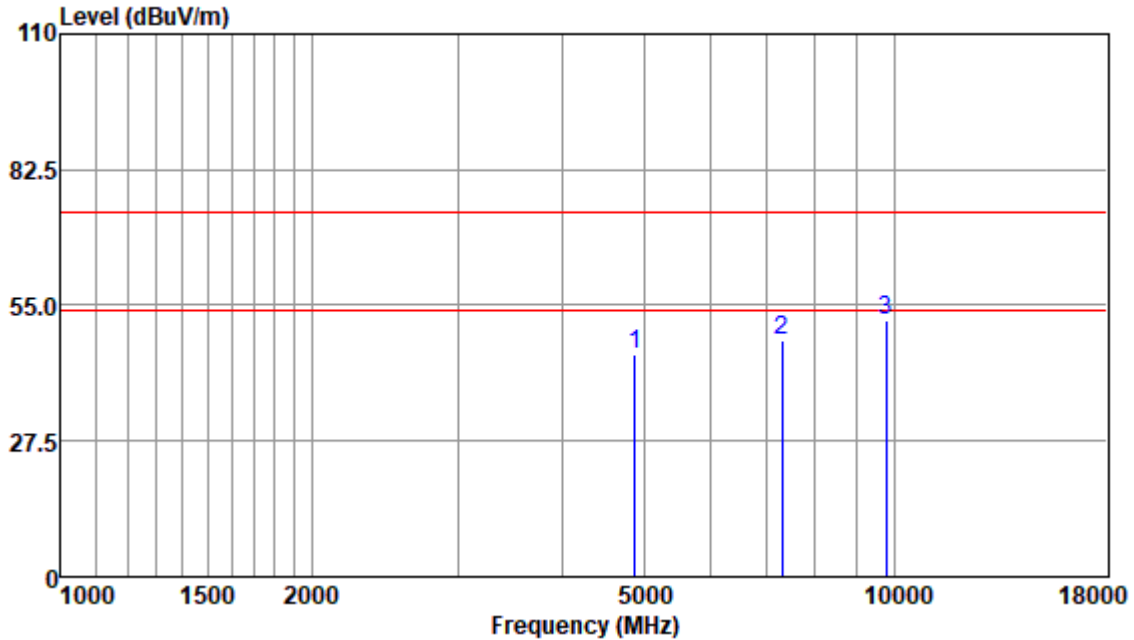
Note: Emission Level = Read Level + Antenna Factor + Cable loss - Preamp Factor



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2441MHz:



Antenna Polarity :HORIZONTAL

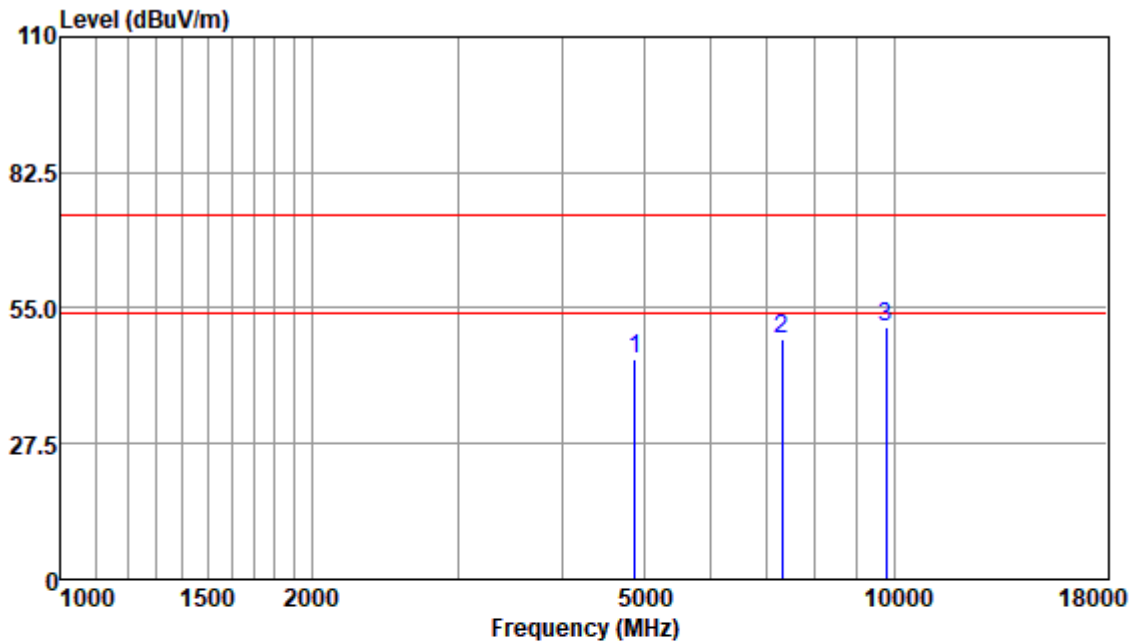
| Read Freq | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark |
|-----------|------------|----------------|------------|---------------|----------------|------------|------------|--------|
| MHz | dBUV | dB/m | dB | dB | dBUV/m | dBUV/m | dB | |
| 4882.00 | 43.43 | 33.66 | 4.73 | 36.81 | 45.01 | 74.00 | -28.99 | Peak |
| 7323.00 | 40.20 | 36.33 | 6.59 | 35.42 | 47.70 | 74.00 | -26.30 | Peak |
| 9764.00 | 39.20 | 37.54 | 8.70 | 33.50 | 51.94 | 74.00 | -22.06 | Peak |

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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Antenna Polarity :VERTICAL

| Read Freq | Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark |
|-----------|-------|----------------|------------|---------------|----------------|------------|------------|--------|
| MHz | dBuv | dB/m | dB | dB | dBuv/m | dBuv/m | dB | |
| 4882.00 | 43.10 | 33.66 | 4.73 | 36.81 | 44.68 | 74.00 | -29.32 | Peak |
| 7323.00 | 41.02 | 36.33 | 6.59 | 35.42 | 48.52 | 74.00 | -25.48 | Peak |
| 9764.00 | 38.53 | 37.54 | 8.70 | 33.50 | 51.27 | 74.00 | -22.73 | Peak |

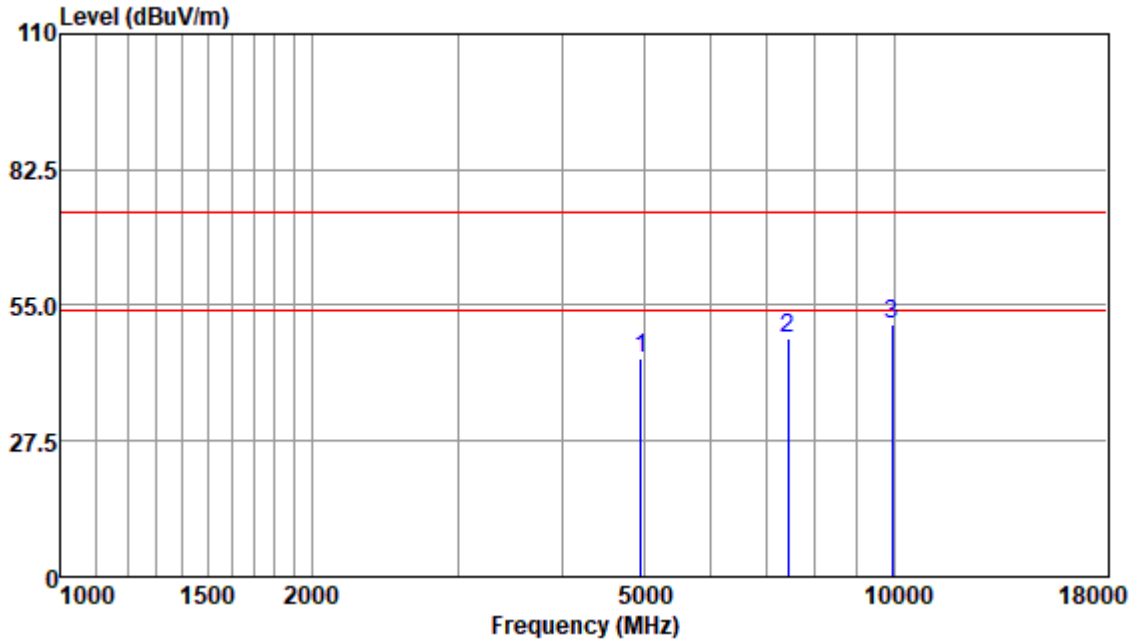
Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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2480MHz:



Antenna Polarity :HORIZONTAL

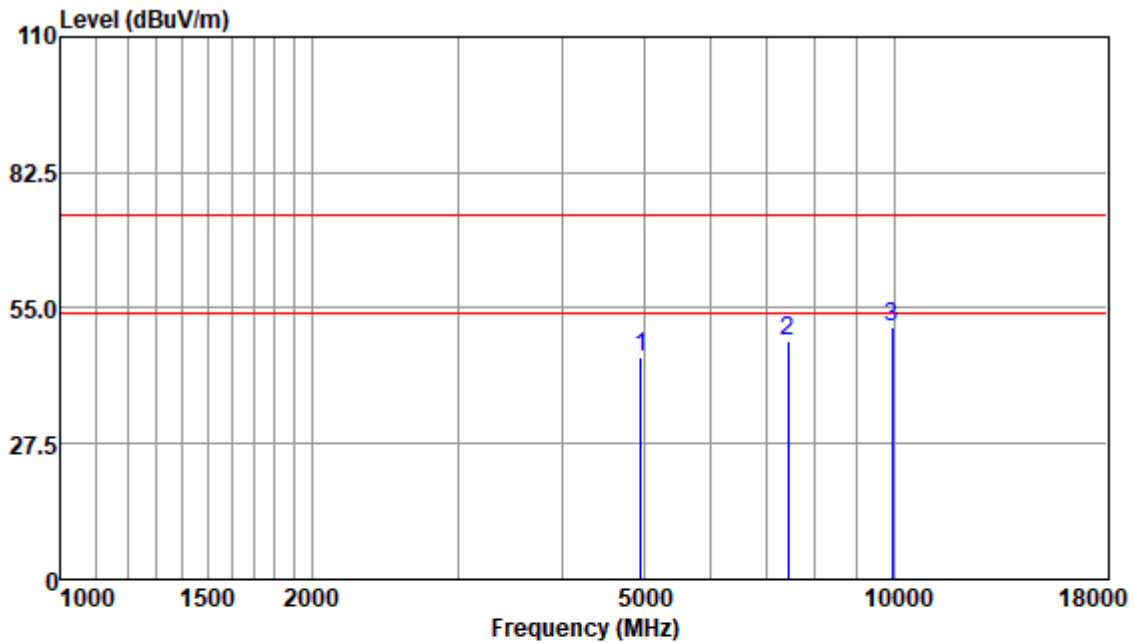
| Read Freq | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark |
|-----------|------------|----------------|------------|---------------|----------------|------------|------------|--------|
| MHz | dBuv | dB/m | dB | dB | dBuv/m | dBuv/m | dB | |
| 4960.00 | 42.62 | 33.65 | 4.92 | 36.83 | 44.36 | 74.00 | -29.64 | Peak |
| 7440.00 | 40.89 | 36.31 | 6.61 | 35.34 | 48.47 | 74.00 | -25.53 | Peak |
| 9920.00 | 37.96 | 37.62 | 8.87 | 33.41 | 51.04 | 74.00 | -22.96 | Peak |

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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Antenna Polarity :VERTICAL

| Read Freq | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark |
|-----------|------------|----------------|------------|---------------|----------------|------------|------------|--------|
| MHz | dBuv | dB/m | dB | dB | dBuv/m | dBuv/m | dB | |
| 4960.00 | 43.47 | 33.65 | 4.92 | 36.83 | 45.21 | 74.00 | -28.79 | Peak |
| 7440.00 | 40.71 | 36.31 | 6.61 | 35.34 | 48.29 | 74.00 | -25.71 | Peak |
| 9920.00 | 38.21 | 37.62 | 8.87 | 33.41 | 51.29 | 74.00 | -22.71 | Peak |

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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8 Test Setup Photo

Refer to Appendix - Test Setup Photo for SHCR2305000969HS

9 EUT Constructional Details (EUT Photos)

Refer to Appendix - Photographs of EUT Constructional Details for SHCR2305000969HS

- End of the Report -



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