

TEST REPORT

| | |
|------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Application No.: | BTEK240920003AE |
| Applicant: | Shenzhen Litime Technology Co., Ltd |
| Address of Applicant: | Room 301, Building B, Tongzhou Electronics Longgang Factory, No. 1, Baolong 5th Road, Baolong Community, Baolong Street, Longgang District, Shenzhen, China |
| Manufacturer: | Shenzhen Litime Technology Co., Ltd |
| Address of Manufacturer: | Room 301, Building B, Tongzhou Electronics Longgang Factory, No. 1, Baolong 5th Road, Baolong Community, Baolong Street, Longgang District, Shenzhen, China |
| Equipment Under Test (EUT): | |
| EUT Name: | LiTime 16V100Ah Battery |
| Test Model.: | 16V 100Ah |
| Adding Model(s): | 16V 100Ah Smart, 16V 100Ah BT, 16V 100Ah HBT, 16V 100Ah Self-Heating, 16V 100Ah Group24, 16V 100Ah Group31, 16V 100Ah Group27, 16V 100Ah Plus, 16V 100Ah Pro, 16V 100Ah LTCP |
| Trade Mark: | LiTime |
| FCC ID: | 2BDSV16100 |
| Standard(s) : | 47 CFR Part 15, Subpart C 15.247 KDB558074 D01 15.247 Meas Guidance v05r02 ANSI C63.10:2013 |
| Date of Receipt Sample(s): | 2025-01-13 |
| Date of Test: | 2025-01-13 to 2025-02-25 |
| Date of Issue: | 2025-02-26 |
| Test Result: | Pass* |

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



Lion Cai/ Approved & Authorized
EMC Laboratory Manager



| Revision Record | | | |
|-----------------|------------|-----------|---------|
| Version | Issue Date | Revisions | Remarks |
| V0 | 2025-02-26 | Initial | Valid |
| | | | |
| | | | |

| | | | |
|-------------------------|--|------------------------|--|
| Authorized for issue by | | | |
| | | Karl Liu | |
| | | Karl Liu / File Editor | |
| | | June Li | |
| | | June Li/Reviewer | |

Remarks:

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.



2 Test Summary

| Radio Spectrum Technical Requirement | | | | |
|--------------------------------------|---------------------|--------|-------------------------------------------------|--------|
| Standard | Item | Method | Requirement | Result |
| 47 CFR Part 15, Subpart C 15.247 | Antenna Requirement | N/A | 47 CFR Part 15, Subpart C 15.203 & 15.247(b)(4) | Pass |

| Radio Spectrum Matter Part | | | | |
|----------------------------------|-------------------------------------------------------|----------------------------------------|-------------------------------------------|--------|
| Standard | Item | Method | Requirement | Result |
| 47 CFR Part 15, Subpart C 15.247 | Conducted Emissions at AC Power Line (150kHz-30MHz) | ANSI C63.10 (2013) Section 6.2 | 47 CFR Part 15, Subpart C 15.207 | Pass |
| | Conducted Peak Output Power | ANSI C63.10 (2013) Section 11.9.1.3 | 47 CFR Part 15, Subpart C 15.247(b)(3) | Pass |
| | Minimum 6dB Bandwidth | ANSI C63.10 (2013) Section 11.8.1 | 47 CFR Part 15, Subpart C 15.247a(2) | Pass |
| | Power Spectrum Density | ANSI C63.10 (2013) Section 11.10.2 | 47 CFR Part 15, Subpart C 15.247(e) | Pass |
| | Conducted Band Edges Measurement | ANSI C63.10 (2013) Section 11.13.3.2 | 47 CFR Part 15, Subpart C 15.247(d) | Pass |
| | Conducted Spurious Emissions | ANSI C63.10 (2013) Section 11.11 | 47 CFR Part 15, Subpart C 15.247(d) | Pass |
| | Radiated Emissions which fall in the restricted bands | ANSI C63.10 (2013) Section 6.10.5 | 47 CFR Part 15, Subpart C 15.205 & 15.209 | Pass |
| | Radiated Spurious Emissions | ANSI C63.10 (2013) Section 6.4,6.5,6.6 | 47 CFR Part 15, Subpart C 15.205 & 15.209 | 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 16V 100Ah |
| Frequency Range: | 2402MHz to 2480MHz |
| Bluetooth Version: | V5.2 BLE |
| Modulation Type: | GFSK |
| Number of Channels: | 40 |
| Antenna Type: | PCB Antenna |
| Antenna Gain: | 1.2 dBi |
| Sample No.: | BTEK240920003AE-01 |
| Model(s) Difference Statement | <input type="checkbox"/> Single Model. <input checked="" type="checkbox"/> Multi-Models: 16V 100Ah, 16V 100Ah Smart, 16V 100Ah BT, 16V 100Ah HBT, 16V 100Ah Self-Heating, 16V 100Ah Group24, 16V 100Ah Group31, 16V 100Ah Group27, 16V 100Ah Plus, 16V 100Ah Pro, 16V 100Ah LTCP Only the model 16V 100Ah was tested. According to the declaration from the applicant, the electrical circuit design, layout, components used, internal wiring and functions of other models are identical for the above models, with only difference on Model No. |

4.2 EUT Test Mode and Test Condition

| Test Mode | Description | Remark |
|-----------|----------------------|-------------------------|
| 1 | Low/mid/High Channel | 2402MHz/2440MHz/2480MHz |

Remark: 1. only show the worst case in the test report.

Channel Frequency Table:

| BLE | |
|---------|-----------------|
| Channel | Frequency (MHz) |
| 00 | 2402 |
| 01 | 2404 |
| 19 | 2440 |
| 38 | 2478 |
| 39 | 2480 |

| Test Conditions | |
|--------------------|-----------|
| Temperature: | 22~25 °C |
| Relative Humidity: | 45~55 % |
| ATM Pressure: | 1010 mbar |

4.3 Measurement Uncertainty

| Test Item | Measurement Uncertainty |
|-----------|-------------------------|
|-----------|-------------------------|



| | |
|-------------------------------------------------------|-----------------------------------------|
| Conducted Emissions at AC Power Line (150kHz-30MHz) | ±3.12dB |
| Conducted Peak Output Power | ± 0.75dB |
| Minimum 6dB Bandwidth | ± 3% |
| Power Spectrum Density | ± 2.84dB |
| Conducted Band Edges Measurement | ± 0.75dB |
| Conducted Spurious Emissions | ± 0.75dB |
| Radiated Emissions which fall in the restricted bands | ±5.08dB (1GHz-6GHz);±5.14dB(above 6GHz) |
| Radiated Spurious Emissions (Below 1GHz) | ±5.06dB (3m); ±4.46dB (10m) |
| Radiated Spurious Emissions (Above 1GHz) | ±5.08dB (1GHz-6GHz);±5.14dB(above 6GHz) |

4.4 Test Location

All tests were performed at:

Shenzhen BANTEK Testing Co., Ltd.

A5&A6, Building B1&B2, No.45 Gangtou Road, Bogang Community, Shajing Street, Bao'an District, Shenzhen, Guangdong, China 518104

Tel: +86 0755-2334 4200 Fax: +86 0755-2334 4200

FCC Registration Number: 264293

Designation Number: CN1356

No tests were sub-contracted.

4.5 Deviation from Standards

None

4.6 Abnormalities from Standard Conditions

None



5 Equipment List

| Conducted Test | | | | | |
|----------------------|-----------------------|------------------------|-----------------|------------|------------|
| Description | Manufacturer | Model | Serial No. | Cal. Date | Cal. Due |
| Shielding Room | YIHENG ENECLTRONIC | 9*5*3.3 | YH-BT-220304-04 | 2022-03-03 | 2025-03-02 |
| EMI Test Receiver | Rohde&Schwarz | ESCI | 101021 | 2024-06-11 | 2025-06-10 |
| Measurement Software | Fara | EZ EMC Ver. FA-03A2 | N/A | N/A | N/A |
| LISN | Rohde&Schwarz | ENV216 | 101472 | 2024-06-11 | 2025-06-10 |
| LISN | Schwarzbeck | NSLK 8128 | 05127 | 2024-06-11 | 2025-06-10 |

| RF Conducted | | | | | |
|-------------------------------------------------|-----------------------|-------------|---------------------|------------|--------------|
| Equipment | Manufacturer | Model No | Serial No | Cal Date | Cal Due Date |
| Shielding Room | YIHENG ENECLTRONIC | 5.5*3.1*3 | YH-BT- 220304-03 | 2022-03-03 | 2025-03-02 |
| EXA Signal Analyzer | KEYSIGHT | N9020A | MY54230486 | 2024-06-11 | 2025-06-10 |
| DC Power Supply | E3632A | E3642A | KR75304416 | 2024-06-11 | 2025-06-10 |
| Attenuator | RswTech | SMA-JK-6dB | N/A | 2024-06-11 | 2025-06-10 |
| Attenuator | RswTech | SMA-JK-3dB | N/A | 2024-06-11 | 2025-06-10 |
| RF Control Unit | Techy | TR1029-1 | N/A | 2024-06-11 | 2025-06-10 |
| RF Sensor Unit | Techy | TR1029-2 | N/A | 2024-06-11 | 2025-06-10 |
| WIDEBAND RADIO COMMUNICATION TESTER | R&S | CMW 500 | 141258 | 2024-06-11 | 2025-06-10 |
| MXG Vector Signal Generator | Agilent | N5182A | US46240522 | 2024-06-11 | 2025-06-10 |
| Programmable Temperature&Humidity Chamber | GRT | GR-HWX1000 | GR22051001 | 2024-06-11 | 2025-06-10 |
| Measurement Software | TACHOY | RF TestSoft | N/A | N/A | N/A |

| RSE | | | | | |
|-----------------------------|-----------------------|------------------------|---------------------|------------|--------------|
| Equipment | Manufacturer | Model No | Serial No | Cal Date | Cal Due Date |
| 3m Semi-Anechoic Chamber | YIHENG ENECLTRONIC | 966 | YH-BT- 220304-01 | 2022-05-06 | 2025-05-05 |
| EMI Test Receiver | Rohde&Schwarz | ESCI | 100694 | 2024-06-11 | 2025-06-10 |
| TRILOG Broadband Antenna | Schwarzbeck | VULB 9168 | 01324 | 2024-06-16 | 2025-06-15 |
| Pre-Amplifier | Schwarzbeck | BBV 9745 | #180 | 2024-06-11 | 2025-06-10 |
| Measurement Software | Fara | EZ EMC Ver. FA-03A2 | N/A | 2024-06-11 | 2025-06-10 |
| EXA Signal Analyzer | Keysight | N9020A | MY54440290 | 2024-06-11 | 2025-06-10 |
| Horn Antenna | Schwarzbeck | BBHA 9120D | 02695 | 2024-06-15 | 2025-06-14 |
| Pre-Amplifier | Tonscend | TAP0118045 | AP20K806109 | 2024-06-11 | 2025-06-10 |
| Horn Antenna | SCHWARZBECK | BBHA9170 | 1157 | 2024-06-15 | 2025-06-14 |
| Low Noise Pre-amplifier | SKET | LNPA-1840G- 50 | SK202203290 2 | 2024-06-11 | 2025-06-10 |
| Signal analyzer | ROHDE&SCHWARZ | FSQ40 | 100010 | 2024-06-11 | 2025-06-10 |



| Loop Antenna | ETS | 6502 | 00201177 | 2024-06-15 | 2025-06-14 |
|--------------|------|------------------------|----------|------------|------------|
| Cable | BTEK | LMR400UF-NMNM-7.00M | / | 2024-06-15 | 2025-06-14 |
| Cable | BTEK | LMR400UF-NMNM-2.50M | / | 2024-06-15 | 2025-06-14 |
| Cable | BTEK | LMR400UF-NMNM-3.00M | / | 2024-06-15 | 2025-06-14 |
| Cable | BTEK | SFT205PUR-MNSWSM-7.00M | / | 2024-06-15 | 2025-06-14 |
| Cable | BTEK | SFT205PUR-MNSWSM-2.50M | / | 2024-06-15 | 2025-06-14 |
| Cable | BTEK | SFT205PUR-MNSWSM-2.50M | / | 2024-06-15 | 2025-06-14 |
| Cable | BTEK | SFT205PUR-MNSWSM-0.30M | / | 2024-06-15 | 2025-06-14 |



6 Radio Spectrum Technical Requirement

6.1 Antenna Requirement

6.1.1 Test Requirement:

47 CFR Part 15, Subpart C 15.203 & 15.247(b)(4)

6.1.2 Conclusion

This product has a PCB antenna, fulfill the requirement of this section.



7 Radio Spectrum Matter Test Results

7.1 Conducted Peak Output Power

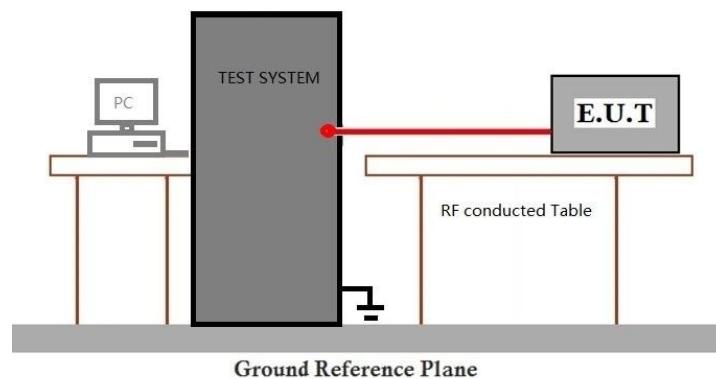
Test Requirement 47 CFR Part 15, Subpart C 15.247(b)(3)

Test Method: ANSI C63.10 (2013) Section 11.9.1.3

Limit:

| Frequency range(MHz) | Output power of the intentional radiator(watt) |
|----------------------|--------------------------------------------------------|
| 902-928 | 1 for ≥ 50 hopping channels |
| | 0.25 for $25 \leq$ hopping channels < 50 |
| | 1 for digital modulation |
| 2400-2483.5 | 1 for ≥ 75 non-overlapping hopping channels |
| | 0.125 for all other frequency hopping systems |
| | 1 for digital modulation |
| 5725-5850 | 1 for frequency hopping systems and digital modulation |

7.1.1 Test Setup Diagram



7.1.2 Measurement Procedure and Data

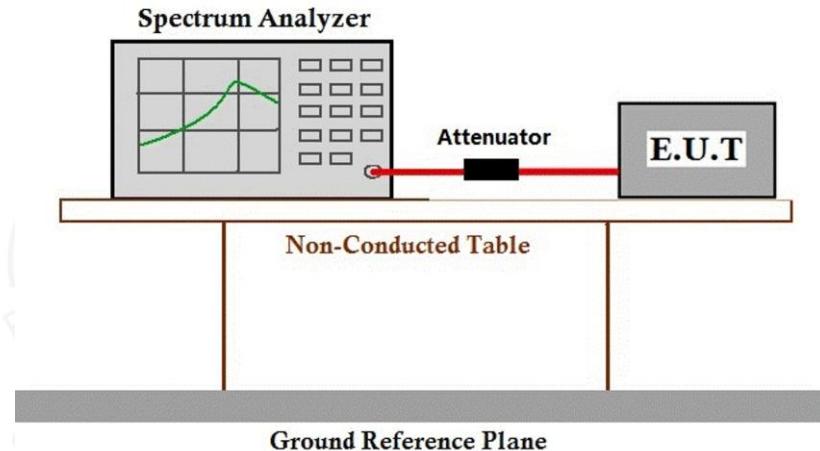
- Please Refer to Appendix for Details



7.2 Minimum 6dB Bandwidth

Test Requirement 47 CFR Part 15, Subpart C 15.247a(2)
Test Method: ANSI C63.10 (2013) Section 11.8.1
Limit: ≥ 500 kHz

7.2.1 Test Setup Diagram



7.2.2 Measurement Procedure and Data

Please Refer to Appendix for Details



7.3 Power Spectrum Density

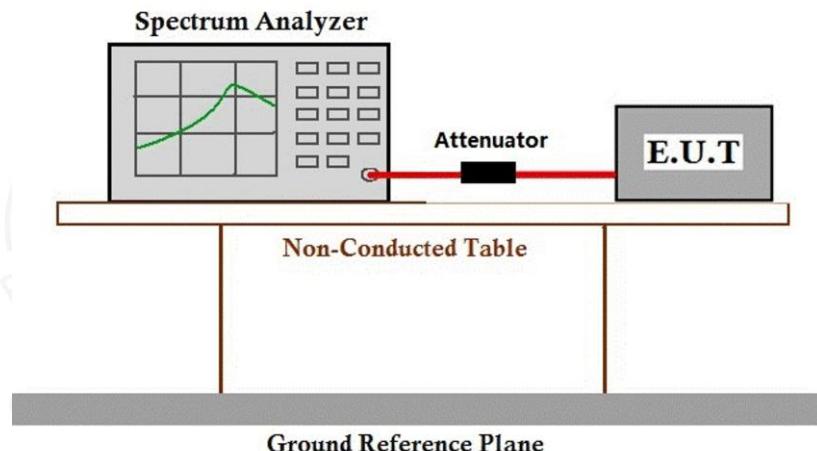
Test Requirement 47 CFR Part 15, Subpart C 15.247(e)

Test Method: ANSI C63.10 (2013) Section 11.10.2

Limit:

≤8dBm in any 3 kHz band during any time interval of continuous transmission

7.3.1 Test Setup Diagram



7.3.2 Measurement Procedure and Data

Please Refer to Appendix for Details



7.4 Conducted Band Edges Measurement

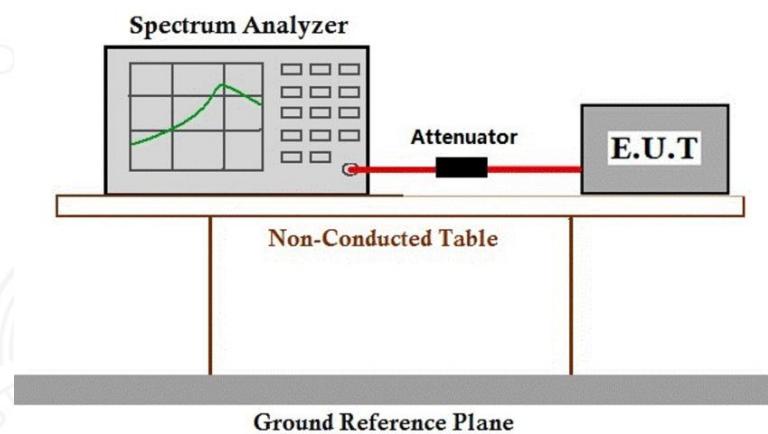
Test Requirement 47 CFR Part 15, Subpart C 15.247(d)

Test Method: ANSI C63.10 (2013) Section 11.13.3.2

Limit:

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

7.4.1 Test Setup Diagram



7.4.2 Measurement Procedure and Data

Please Refer to Appendix for Details



7.5 Conducted Spurious Emissions

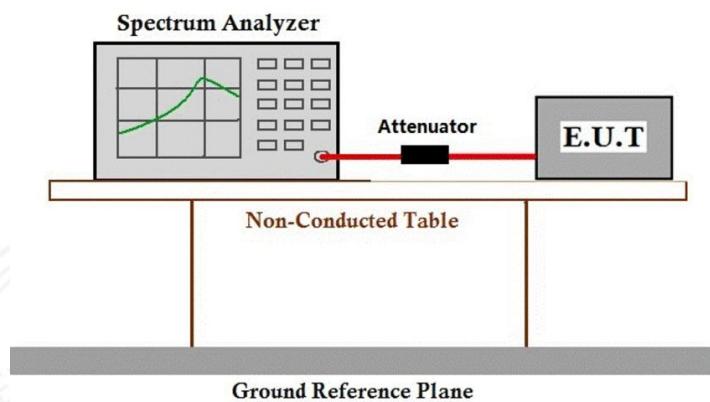
Test Requirement 47 CFR Part 15, Subpart C 15.247(d)

Test Method: ANSI C63.10 (2013) Section 11.11

Limit:

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

7.5.1 Test Setup Diagram



7.5.2 Measurement Procedure and Data

Please Refer to Appendix for Details



7.6 Radiated Emissions which fall in the restricted bands

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.209

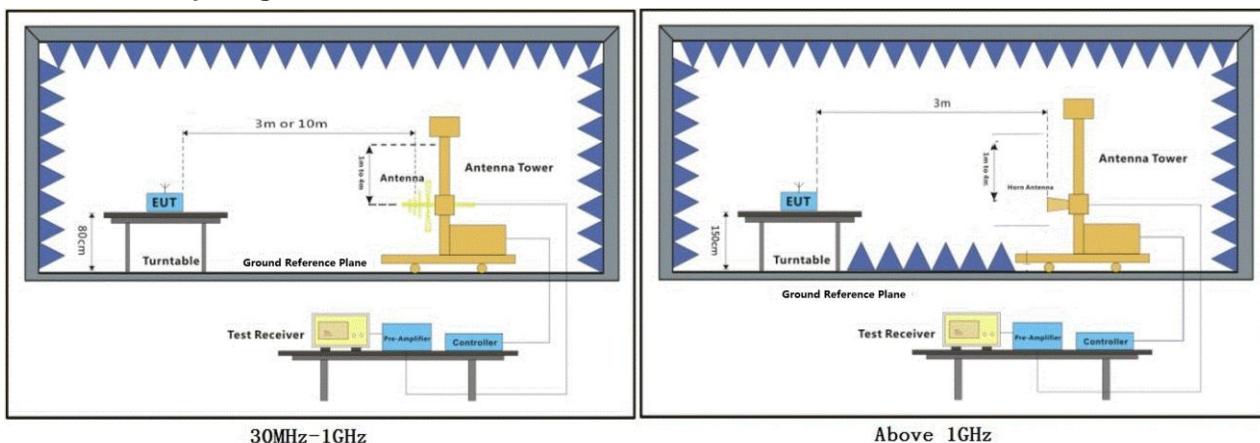
Test Method: ANSI C63.10 (2013) Section 6.10.5

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.

7.6.1 Test Setup Diagram



7.6.2 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 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 gain, Margin=Level-Limit

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.

3. If the peak-detected amplitude can be shown to comply with the average limit, then it is not necessary to perform a separate average measurement.



Horizontal; Modulation:GFSK; ; Channel:Low

| No. | Frequency (MHz) | Reading (dBuv) | Factor (dB/m) | Level (dBuv/m) | Limit (dBuv/m) | Margin(dB) | Detector | P/F |
|-----|-----------------|----------------|---------------|----------------|----------------|------------|----------|-----|
| 1 | 2310.000 | 63.61 | -24.14 | 39.47 | 74.00 | -34.53 | peak | P |
| 2 | 2390.000 | 71.94 | -23.92 | 48.02 | 74.00 | -25.98 | peak | P |
| 3 | 2400.000 | 66.51 | -23.92 | 42.59 | 74.00 | -31.41 | peak | P |

Polarity: Vertical; Modulation:GFSK; ; Channel:Low

| No. | Frequency (MHz) | Reading (dBuv) | Factor (dB/m) | Level (dBuv/m) | Limit (dBuv/m) | Margin(dB) | Detector | P/F |
|-----|-----------------|----------------|---------------|----------------|----------------|------------|----------|-----|
| 1 | 2310.000 | 70.62 | -24.14 | 46.48 | 74.00 | -27.52 | peak | P |
| 2 | 2390.000 | 69.60 | -23.92 | 45.68 | 74.00 | -28.32 | peak | P |
| 3 | 2400.000 | 69.67 | -23.92 | 45.75 | 74.00 | -28.25 | peak | P |

Polarity: Horizontal; Modulation:GFSK; ; Channel:High

| No. | Frequency (MHz) | Reading (dBuv) | Factor (dB/m) | Level (dBuv/m) | Limit (dBuv/m) | Margin(dB) | Detector | P/F |
|-----|-----------------|----------------|---------------|----------------|----------------|------------|----------|-----|
| 1 | 2483.500 | 68.97 | -23.65 | 45.32 | 74.00 | -28.68 | peak | P |
| 2 | 2500.000 | 74.90 | -23.65 | 51.25 | 74.00 | -22.75 | peak | P |

Polarity: Vertical; Modulation:GFSK; ; Channel:High

| No. | Frequency (MHz) | Reading (dBuv) | Factor (dB/m) | Level (dBuv/m) | Limit (dBuv/m) | Margin(dB) | Detector | P/F |
|-----|-----------------|----------------|---------------|----------------|----------------|------------|----------|-----|
| 1 | 2483.500 | 69.83 | -23.65 | 46.18 | 74.00 | -27.82 | peak | P |
| 2 | 2500.000 | 72.86 | -23.65 | 49.21 | 74.00 | -24.79 | peak | P |



7.7 Radiated Spurious Emissions

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.209

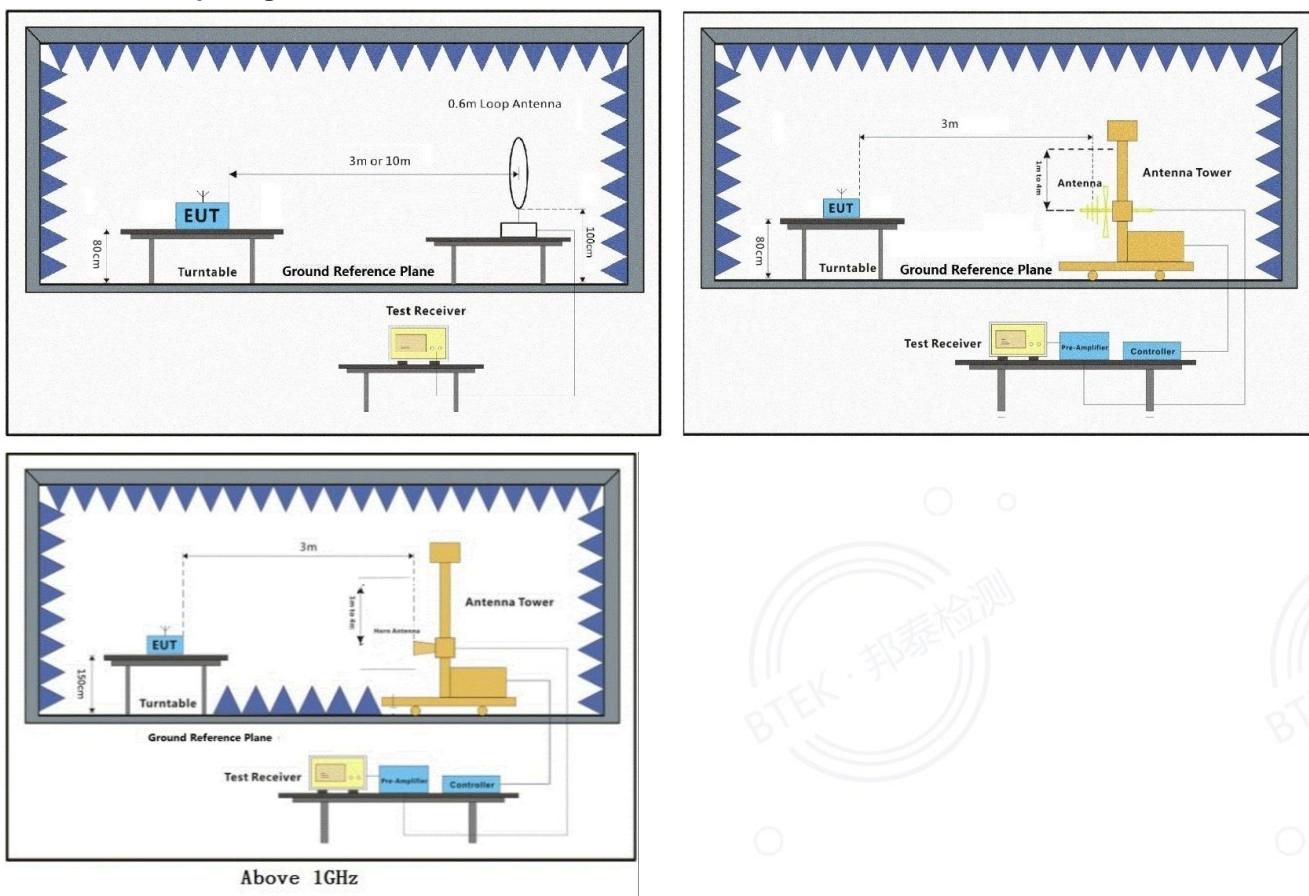
Test Method: ANSI C63.10 (2013) Section 6.4,6.5,6.6

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.

7.7.1 Test Setup Diagram



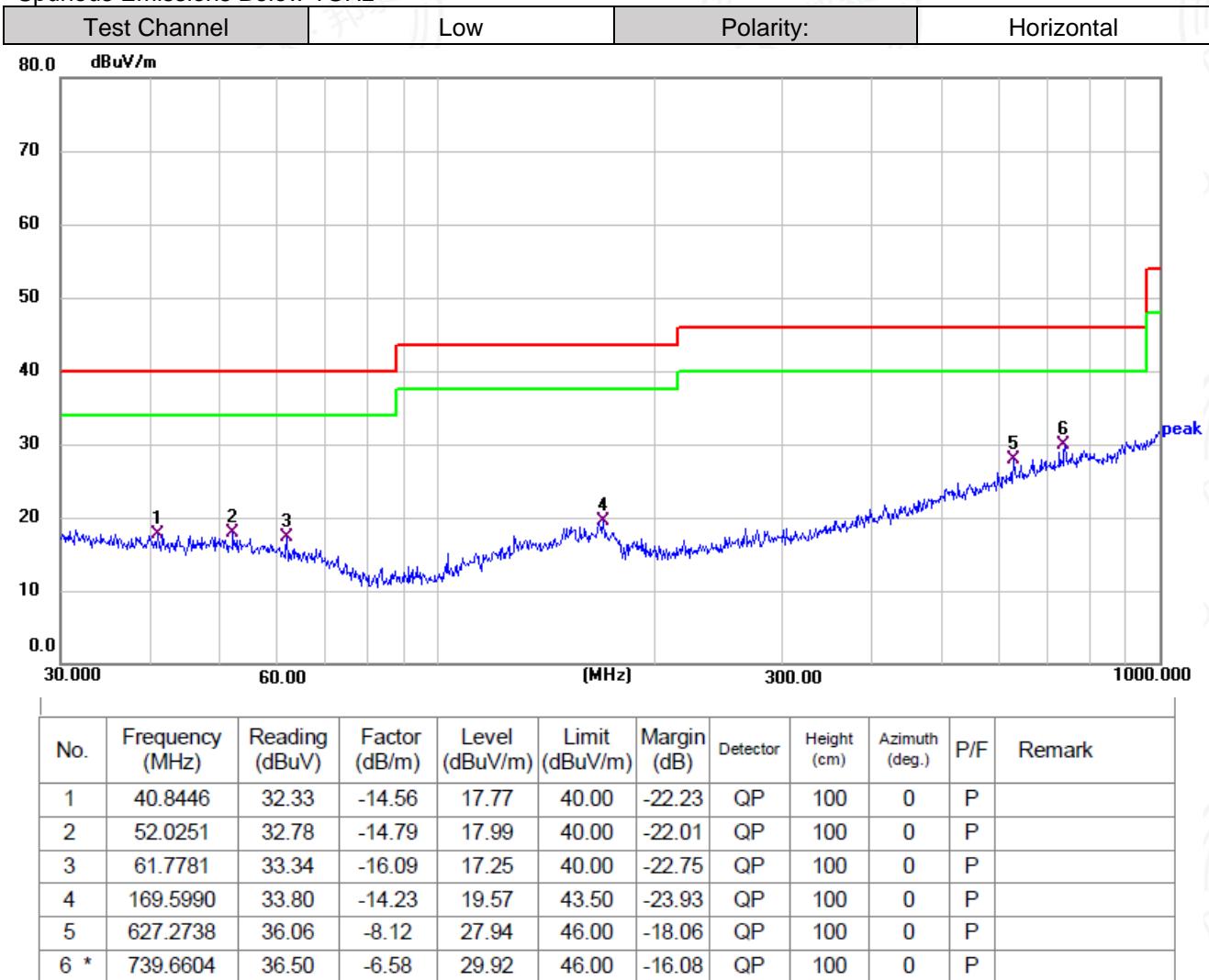
7.7.2 Measurement Procedure and Data

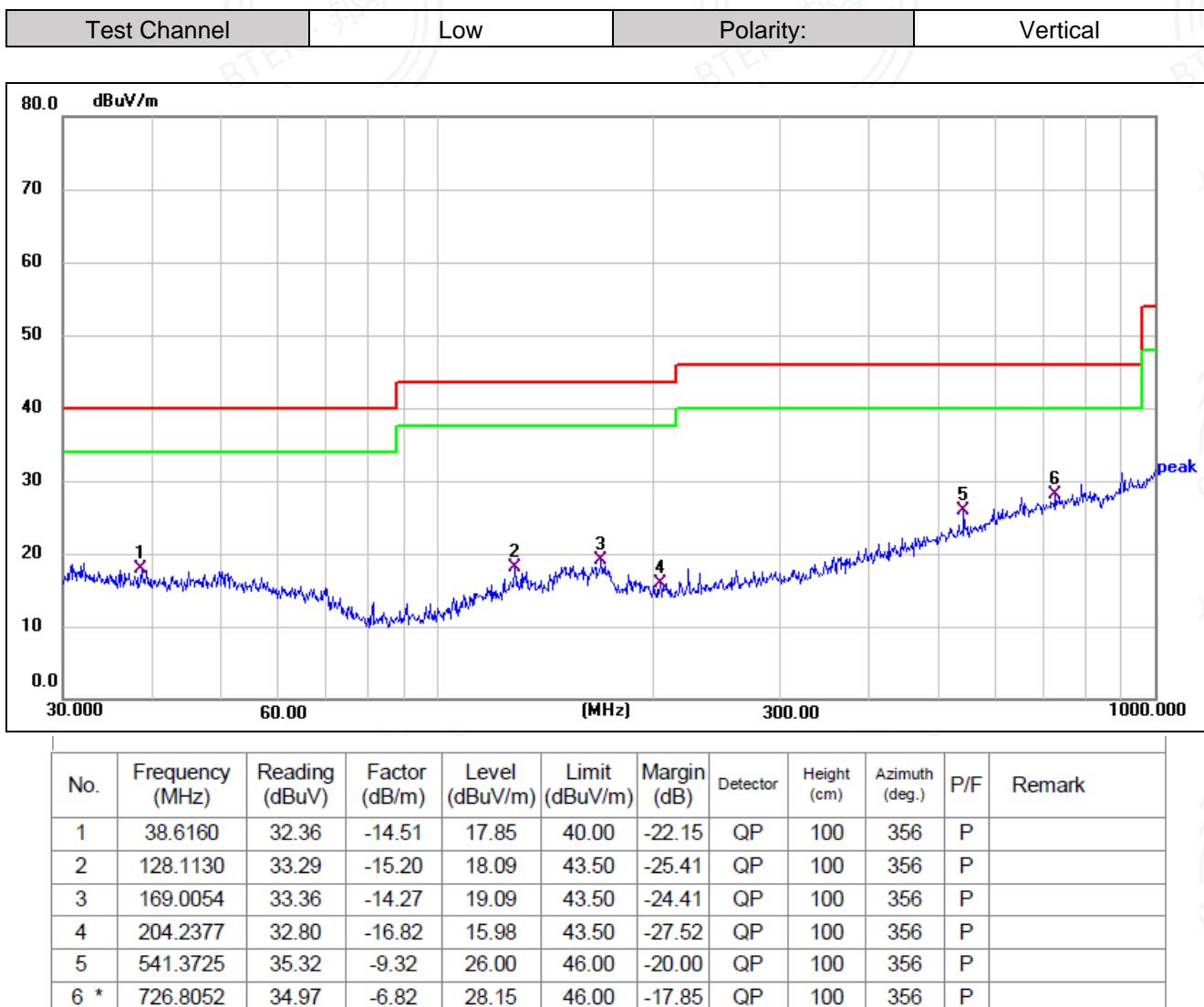
- a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- 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 peak, quasi-peak or average 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.

- a. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- 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 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 peak, quasi-peak or average 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.



Spurious Emissions Below 1GHz





Remark:

- 1) 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:

$$\text{Final Test Level} = \text{Reading Level} + \text{Factor}, \text{Margin} = \text{Level} - \text{Limit}.$$

$$\text{Factor} = \text{Cable loss} + \text{Antenna factor} - \text{Pre_amplifier gain}.$$
- 3) Scan from 9kHz to 1 GHz, 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.



Polarity: Horizontal; Modulation:GFSK; Channel:Low

| No. | Frequency (MHz) | Reading (dBuv) | Factor (dB/m) | Level (dBuv/m) | Limit (dBuv/m) | Margin(dB) | Detector | P/F |
|-----|-----------------|----------------|---------------|----------------|----------------|------------|----------|-----|
| 1 | 4803.010 | 67.18 | -15.60 | 51.58 | 74.00 | -22.42 | peak | P |
| 2 | 7206.260 | 56.65 | -10.97 | 45.68 | 74.00 | -28.32 | peak | P |

Polarity: Vertical; Modulation:GFSK; Channel:Low

| No. | Frequency (MHz) | Reading (dBuv) | Factor (dB/m) | Level (dBuv/m) | Limit (dBuv/m) | Margin(dB) | Detector | P/F |
|-----|-----------------|----------------|---------------|----------------|----------------|------------|----------|-----|
| 1 | 4801.058 | 65.16 | -15.60 | 49.56 | 74.00 | -24.44 | peak | P |
| 2 | 7206.000 | 55.98 | -10.97 | 45.01 | 74.00 | -28.99 | peak | P |

Polarity: Horizontal; Modulation:GFSK; Channel:middle

| No. | Frequency (MHz) | Reading (dBuv) | Factor (dB/m) | Level (dBuv/m) | Limit (dBuv/m) | Margin(dB) | Detector | P/F |
|-----|-----------------|----------------|---------------|----------------|----------------|------------|----------|-----|
| 1 | 4880.987 | 70.52 | -15.60 | 54.92 | 74.00 | -19.08 | peak | P |
| 2 | 7320.000 | 55.88 | -10.97 | 44.91 | 74.00 | -29.09 | peak | P |

Polarity: Vertical; Modulation:GFSK; Channel:middle

| No. | Frequency (MHz) | Reading (dBuv) | Factor (dB/m) | Level (dBuv/m) | Limit (dBuv/m) | Margin(dB) | Detector | P/F |
|-----|-----------------|----------------|---------------|----------------|----------------|------------|----------|-----|
| 1 | 4880.697 | 66.75 | -15.60 | 51.15 | 74.00 | -22.85 | peak | P |
| 2 | 7320.000 | 58.97 | -10.97 | 48.00 | 74.00 | -26.00 | peak | P |

Polarity: Horizontal; Modulation:GFSK; Channel:High

| No. | Frequency (MHz) | Reading (dBuv) | Factor (dB/m) | Level (dBuv/m) | Limit (dBuv/m) | Margin(dB) | Detector | P/F |
|-----|-----------------|----------------|---------------|----------------|----------------|------------|----------|-----|
| 1 | 4960.265 | 67.37 | -15.60 | 51.77 | 74.00 | -22.23 | peak | P |
| 2 | 7439.634 | 58.85 | -10.97 | 47.88 | 74.00 | -26.12 | peak | P |

Polarity: Vertical; Modulation:GFSK; Channel:High

| No. | Frequency (MHz) | Reading (dBuv) | Factor (dB/m) | Level (dBuv/m) | Limit (dBuv/m) | Margin(dB) | Detector | P/F |
|-----|-----------------|----------------|---------------|----------------|----------------|------------|----------|-----|
| 1 | 4960.000 | 68.67 | -15.60 | 53.07 | 74.00 | -20.93 | peak | P |
| 2 | 7440.000 | 58.94 | -10.97 | 47.97 | 74.00 | -26.03 | peak | P |

Note:1. Testing is carried out with frequency rang 1GHz to the tenth harmonics, other than listed in the table above are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

2. If the peak-detected amplitude can be shown to comply with the average limit, then it is not necessary to perform a separate average measurement.

3. Final Test Level = Reading Level + Factor, Margin= Level-Limit. Factor= Cabel loss +Antenna factor-Pre_amplifier gain.



8 Test Setup Photo

Please refer to the Appendix Test Setup Photos

9 EUT Constructional Details (EUT Photos)

Please refer to the Appendix EUT Photos

- End of the Report -

