# TEST REPORT

| | | |
|---|---|---|
| **Product Name** | : | Bluetooth speaker |
| **Brand Mark** | : | Witslism |
| **Model No.** | : | Q18S,Q18SE,Q18F,Q18P,Q18V,Q18M, Q18C,Q18L,Q18B |
| **Report Number** | : | BLA-EMC-202009-A4701 |
| **FCC ID** | : | 2APCP-Q18 |
| **Date of Sample Receipt** | : | 2020/9/10 |
| **Date of Test** | : | 2020/9/15 to 2020/9/28 |
| **Date of Issue** | : | 2020/9/28 |
| **Test Standard** | : | 47 CFR Part 15, Subpart C 15.247 |
| **Test Result** | : | Pass |

Prepared for:

**WITSLISM TECHNOLOGY.,LIMITED**

**4 / F, Building 6, Futing Industrial Zone, Zhucun, Guanlan New Town, Longhua New District Shenzhen, Guangdong, China**

Prepared by:

**BlueAsia of Technical Services(Shenzhen) Co.,Ltd.**

**IOT Test Centre of BlueAsia**

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Review by: Sweet.Liang

Approved by: Tmen Li

Date: 2020/9/28

BlueAsia of Technical Services(Shenzhen) Co., Ltd. BLA

**REPORT REVISE RECORD**

| Version No. | Date | Description |
|---|---|---|
| 00 | 2020/9/28 | Original |

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# 1 TEST SUMMARY

| Test item | Test Requirement | Test Method | Class/Severity | Result |
|---|---|---|---|---|
| Antenna Requirement | 47 CFR Part 15, Subpart C 15.247 | N/A | 47 CFR Part 15, Subpart C 15.203 & 15.247(c) | Pass |
| Conducted Spurious Emissions | 47 CFR Part 15, Subpart C 15.247 | ANSI C63.10 (2013) Section 7.8.6 & Section 11.11 | 47 CFR Part 15, Subpart C 15.247(d) | Pass |
| Radiated Emissions which fall in the restricted bands | 47 CFR Part 15, Subpart C 15.247 | ANSI C63.10 (2013) Section 6.10.5 | 47 CFR Part 15, Subpart C 15.209 & 15.247(d) | Pass |
| Conducted Band Edges Measurement | 47 CFR Part 15, Subpart C 15.247 | ANSI C63.10 (2013) Section 7.8.8 & Section 11.13.3.2 | 47 CFR Part 15, Subpart C 15.247(d) | Pass |
| Dwell Time | 47 CFR Part 15, Subpart C 15.247 | ANSI C63.10 (2013) Section 7.8.4 | 47 CFR Part 15, Subpart C 15.247a(1)(iii) | Pass |
| Hopping Channel Number | 47 CFR Part 15, Subpart C 15.247 | ANSI C63.10 (2013) Section 7.8.3 | 47 CFR Part 15, Subpart C 15.247a(1)(iii) | Pass |
| Carrier Frequencies Separation | 47 CFR Part 15, Subpart C 15.247 | ANSI C63.10 (2013) Section 7.8.2 | 47 CFR Part 15, Subpart C 15.247a(1) | Pass |
| 20dB Bandwidth | 47 CFR Part 15, Subpart C 15.247 | ANSI C63.10 (2013) Section 7.8.7 | 47 CFR Part 15, Subpart C 15.247(a)(1) | Pass |
| Conducted Peak Output Power | 47 CFR Part 15, Subpart C 15.247 | ANSI C63.10 (2013) Section 7.8.5 | 47 CFR Part 15, Subpart C 15.247(b)(3) | Pass |
| Conducted Emissions at AC Power Line (150kHz-30MHz) | 47 CFR Part 15, Subpart C 15.247 | ANSI C63.10 (2013) Section 6.2 | 47 CFR Part 15, Subpart C 15.207 | Pass |
| Radiated Spurious Emissions | 47 CFR Part 15, Subpart C 15.247 | ANSI C63.10 (2013) Section 6.4,6.5,6.6 | 47 CFR Part 15, Subpart C 15.209 & 15.247(d) | Pass |

## 2 GENERAL INFORMATION

| | |
|---|---|
| **Applicant** | WITSLISM TECHNOLOGY.,LIMITED |
| **Address** | 4 / F, Building 6, Futing Industrial Zone, Zhucun, Guanlan New Town, Longhua New District Shenzhen,Guangdong,China |
| **Manufacturer** | WITSLISM TECHNOLOGY.,LIMITED |
| **Address** | 4 / F, Building 6, Futing Industrial Zone, Zhucun, Guanlan New Town, Longhua New District Shenzhen,Guangdong,China |
| **Factory** | WITSLISM TECHNOLOGY.,LIMITED |
| **Address** | 4 / F, Building 6, Futing Industrial Zone, Zhucun, Guanlan New Town, Longhua New District Shenzhen,Guangdong,China |
| **Product Name** | Bluetooth speaker |
| **Test Model No.** | Q18S |

## 3 GENERAL DESCRIPTION OF E.U.T.

| | |
|---|---|
| **Hardware Version** | Q18S_BK3266_MAIN_V1.0.pcb |
| **Software Version** | Q18S-7V4-PR60D0G-9I22-PA26DB-12-03EQ_QZH_20200907_V5.6 |
| **Operation Frequency:** | 2402MHz-2480MHz |
| **Modulation Type:** | GFSK, pi/4DQPSK, 8DPSK |
| **Channel Spacing:** | 1MHz |
| **Number of Channels:** | 79 |
| **Antenna Type:** | PCB Antenna |
| **Antenna Gain:** | 1.20 dBi (Provided by the customer) |

## 4 TEST ENVIRONMENT

| Environment | Temperature | Voltage |
|---|---|---|
| Normal | 25 ℃ | 3.7Vdc |

## 5 TEST MODE

| TEST MODE | TEST MODE DESCRIPTION |
|---|---|
| Transmitting mode | Keep the EUT in continuously transmitting mode with modulation. (hopping and non hopping mode all have been tested, non hopping mode is worse case for RE ) |
| Remark: *Full battery is used during all test except ac conducted emission, DH1,DH3, DH5 all have been tested, during the test, GFSK, Pi/4QPSK, 8-DPSK modulation were all pre-scanned Only the DH1 of the worst mode would be recorded in this report.* | |

## 6 MEASUREMENT UNCERTAINTY

| Parameter | Expanded Uncertainty (Confidence of 95%) |
|---|---|
| Radiated Emission | ±4.34dB |
| Radiated Emission | ±4.24dB |
| Radiated Emission | ±4.68dB |
| AC Power Line Conducted Emission | ±3.45dB |

| Parameter | Expanded Uncertainty (Confidence of 95%) |
|---|---|
| Occupied Channel Bandwidth | ±5 % |
| RF output power, conducted | ±1.5 dB |
| Power Spectral Density, conducted | ±3.0 dB |
| Unwanted Emissions, conducted | ±3.0 dB |
| Temperature | ±3 °C |
| Supply voltages | ±3 % |
| Time | ±5 % |
| Radiated Emission (30MHz ~ 1000MHz) | ±4.35 dB |
| Radiated Emission (1GHz ~ 18GHz) | ±4.44 dB |

## 7 DESCRIPTION OF SUPPORT UNIT

| Device Type | Manufacturer | Model Name | Serial No. | Remark |
|---|---|---|---|---|
| AC Adapter | UGREEN | CD112 | N/A | N/A |
| PC | HASEE | K610D | N/A | N/A |

## 8 LABORATORY LOCATION

All tests were performed at:
BlueAsia of Technical Services(Shenzhen) Co., Ltd.
IOT Test Centre of BlueAsia
No. 448 Bulong Road, Bantian Street, Longgang District, Shenzhen,China
Telephone: TEL: +86-755-28682673 FAX: +86-755-28682673
Tests were sub-contracted:
Radiation test is conducted by Global United Technology Services Co., Ltd.
No. 123-128, Tower A, Jinyuan Business Building, No.2, Laodong Industrial Zone, Xixiang Road, sBaoan District, Shenzhen, Guangdong, China 518102
FCC —Registration No.: 381383
Job No.: GTS202009000181

## 9 TEST INSTRUMENTS LIST

| Test Equipment Of Conducted Spurious Emissions | | | | | |
|---|---|---|---|---|---|
| **Equipment** | **Manufacturer** | **Model** | **S/N** | **Cal.Date** | **Cal.Due** |
| Spectrum | R&S | FSP40 | 100817 | 7/1/2020 | 6/30/2021 |
| Spectrum | Agilent | N9020A | MY49100060 | 12/17/2019 | 12/16/2020 |
| Signal Generator | Agilent | N5182A | MY49060650 | 12/17/2019 | 12/16/2020 |
| Signal Generator | Agilent | E8257D | MY44320250 | 4/20/2020 | 4/19/2021 |

| Test Equipment Of Hopping Channel Number | | | | | |
|---|---|---|---|---|---|
| **Equipment** | **Manufacturer** | **Model** | **S/N** | **Cal.Date** | **Cal.Due** |
| Spectrum | R&S | FSP40 | 100817 | 7/1/2020 | 6/30/2021 |
| Spectrum | Agilent | N9020A | MY49100060 | 12/17/2019 | 12/16/2020 |
| Signal Generator | Agilent | N5182A | MY49060650 | 12/17/2019 | 12/16/2020 |
| Signal Generator | Agilent | E8257D | MY44320250 | 4/20/2020 | 4/19/2021 |

| Test Equipment Of Carrier Frequencies Separation | | | | | |
|---|---|---|---|---|---|
| **Equipment** | **Manufacturer** | **Model** | **S/N** | **Cal.Date** | **Cal.Due** |
| Spectrum | R&S | FSP40 | 100817 | 7/1/2020 | 6/30/2021 |
| Spectrum | Agilent | N9020A | MY49100060 | 12/17/2019 | 12/16/2020 |
| Signal Generator | Agilent | N5182A | MY49060650 | 12/17/2019 | 12/16/2020 |
| Signal Generator | Agilent | E8257D | MY44320250 | 4/20/2020 | 4/19/2021 |

| Test Equipment Of 20dB Bandwidth | | | | | |
|---|---|---|---|---|---|
| **Equipment** | **Manufacturer** | **Model** | **S/N** | **Cal.Date** | **Cal.Due** |

| | | | | | |
|---|---|---|---|---|---|
| Spectrum | R&S | FSP40 | 100817 | 7/1/2020 | 6/30/2021 |
| Spectrum | Agilent | N9020A | MY49100060 | 12/17/2019 | 12/16/2020 |
| Signal Generator | Agilent | N5182A | MY49060650 | 12/17/2019 | 12/16/2020 |
| Signal Generator | Agilent | E8257D | MY44320250 | 4/20/2020 | 4/19/2021 |

| **Test Equipment Of Conducted Peak Output Power** | | | | | |
|---|---|---|---|---|---|
| **Equipment** | **Manufacturer** | **Model** | **S/N** | **Cal.Date** | **Cal.Due** |
| Spectrum | R&S | FSP40 | 100817 | 7/1/2020 | 6/30/2021 |
| Spectrum | Agilent | N9020A | MY49100060 | 12/17/2019 | 12/16/2020 |
| Signal Generator | Agilent | N5182A | MY49060650 | 12/17/2019 | 12/16/2020 |
| Signal Generator | Agilent | E8257D | MY44320250 | 4/20/2020 | 4/19/2021 |

| **Test Equipment Of Conducted Emissions at AC Power Line (150kHz-30MHz)** | | | | | |
|---|---|---|---|---|---|
| **Equipment** | **Manufacturer** | **Model** | **S/N** | **Cal.Date** | **Cal.Due** |
| Shield room | SKET | 833 | N/A | 6/10/2018 | 6/9/2021 |
| Receiver | R&S | ESPI3 | 101082 | 4/20/2020 | 4/19/2021 |
| LISN | R&S | ENV216 | 3560.6550.15 | 7/1/2020 | 6/30/2021 |
| LISN | AT | AT166-2 | AKK1806000003 | 12/17/2019 | 12/16/2020 |
| EMI software | EZ | EZ-EMC | N/A | N/A | N/A |

| **Radiated Emission:** | | | | | | |
|---|---|---|---|---|---|---|
| **Item** | **Test Equipment** | **Manufacturer** | **Model No.** | **Inventory No.** | **Cal.Date (mm-dd-yy)** | **Cal.Due date (mm-dd-yy)** |
| 1 | 3m Semi- Anechoic Chamber | ZhongYu Electron | 9.2(L)*6.2(W)* 6.4(H) | GTS250 | July. 02 2020 | July. 01 2025 |
| 2 | Control Room | ZhongYu Electron | 6.2(L)*2.5(W)* 2.4(H) | GTS251 | N/A | N/A |
| 3 | EMI Test Receiver | Rohde & Schwarz | ESU26 | GTS203 | June. 25 2020 | June. 24 2021 |
| 4 | BiConiLog Antenna | SCHWARZBECK MESS-ELEKTRONIK | VULB9163 | GTS214 | June. 25 2020 | June. 24 2021 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 5 | Double -ridged waveguide horn | SCHWARZBECK MESS-ELEKTRONIK | BBHA 9120 D | GTS208 | June. 25 2020 | June. 24 2021 |
| 6 | Horn Antenna | ETS-LINDGREN | 3160 | GTS217 | June. 25 2020 | June. 24 2021 |
| 7 | EMI Test Software | AUDIX | E3 | N/A | N/A | N/A |
| 8 | Coaxial Cable | GTS | N/A | GTS213 | June. 25 2020 | June. 24 2021 |
| 9 | Coaxial Cable | GTS | N/A | GTS211 | June. 25 2020 | June. 24 2021 |
| 10 | Coaxial cable | GTS | N/A | GTS210 | June. 25 2020 | June. 24 2021 |
| 11 | Coaxial Cable | GTS | N/A | GTS212 | June. 25 2020 | June. 24 2021 |
| 12 | Amplifier(100kHz-3GHz) | HP | 8347A | GTS204 | June. 25 2020 | June. 24 2021 |
| 13 | Amplifier(2GHz-20GHz) | HP | 84722A | GTS206 | June. 25 2020 | June. 24 2021 |
| 14 | Amplifier (18-26GHz) | Rohde & Schwarz | AFS33-18002 650-30-8P-44 | GTS218 | June. 25 2020 | June. 24 2021 |
| 15 | Band filter | Amindeon | 82346 | GTS219 | June. 25 2020 | June. 24 2021 |
| 16 | Power Meter | Anritsu | ML2495A | GTS540 | June. 25 2020 | June. 24 2021 |
| 17 | Power Sensor | Anritsu | MA2411B | GTS541 | June. 25 2020 | June. 24 2021 |
| 18 | Wideband Radio Communication Tester | Rohde & Schwarz | CMW500 | GTS575 | June. 25 2020 | June. 24 2021 |
| 19 | Splitter | Agilent | 11636B | GTS237 | June. 25 2020 | June. 24 2021 |
| 20 | Loop Antenna | ZHINAN | ZN30900A | GTS534 | June. 25 2020 | June. 24 2021 |
| 21 | Breitband hornantenne | SCHWARZBECK | BBHA 9170 | GTS579 | Oct. 19 2019 | Oct. 18 2020 |
| 22 | Amplifier | TDK | PA-02-02 | GTS574 | Oct. 19 2019 | Oct. 18 2020 |
| 23 | Amplifier | TDK | PA-02-03 | GTS576 | Oct. 19 2019 | Oct. 18 2020 |
| 24 | PSA Series Spectrum Analyzer | Rohde & Schwarz | FSP | GTS578 | June. 25 2020 | June. 24 2021 |

**Test Equipment Of Conducted Band Edges Measurement**

| Equipment | Manufacturer | Model | S/N | Cal.Date | Cal.Due |
|---|---|---|---|---|---|
| Spectrum | R&S | FSP40 | 100817 | 7/1/2020 | 6/30/2021 |
| Spectrum | Agilent | N9020A | MY49100060 | 12/17/2019 | 12/16/2020 |
| Signal Generator | Agilent | N5182A | MY49060650 | 12/17/2019 | 12/16/2020 |
| Signal Generator | Agilent | E8257D | MY44320250 | 4/20/2020 | 4/19/2021 |

**Test Equipment Of Dwell Time**

| Equipment | Manufacturer | Model | S/N | Cal.Date | Cal.Due |
|---|---|---|---|---|---|
| Spectrum | R&S | FSP40 | 100817 | 7/1/2020 | 6/30/2021 |
| Spectrum | Agilent | N9020A | MY49100060 | 12/17/2019 | 12/16/2020 |
| Signal Generator | Agilent | N5182A | MY49060650 | 12/17/2019 | 12/16/2020 |

| | | | | | |
|---|---|---|---|---|---|
| Signal Generator | Agilent | E8257D | MY44320250 | 4/20/2020 | 4/19/2021 |

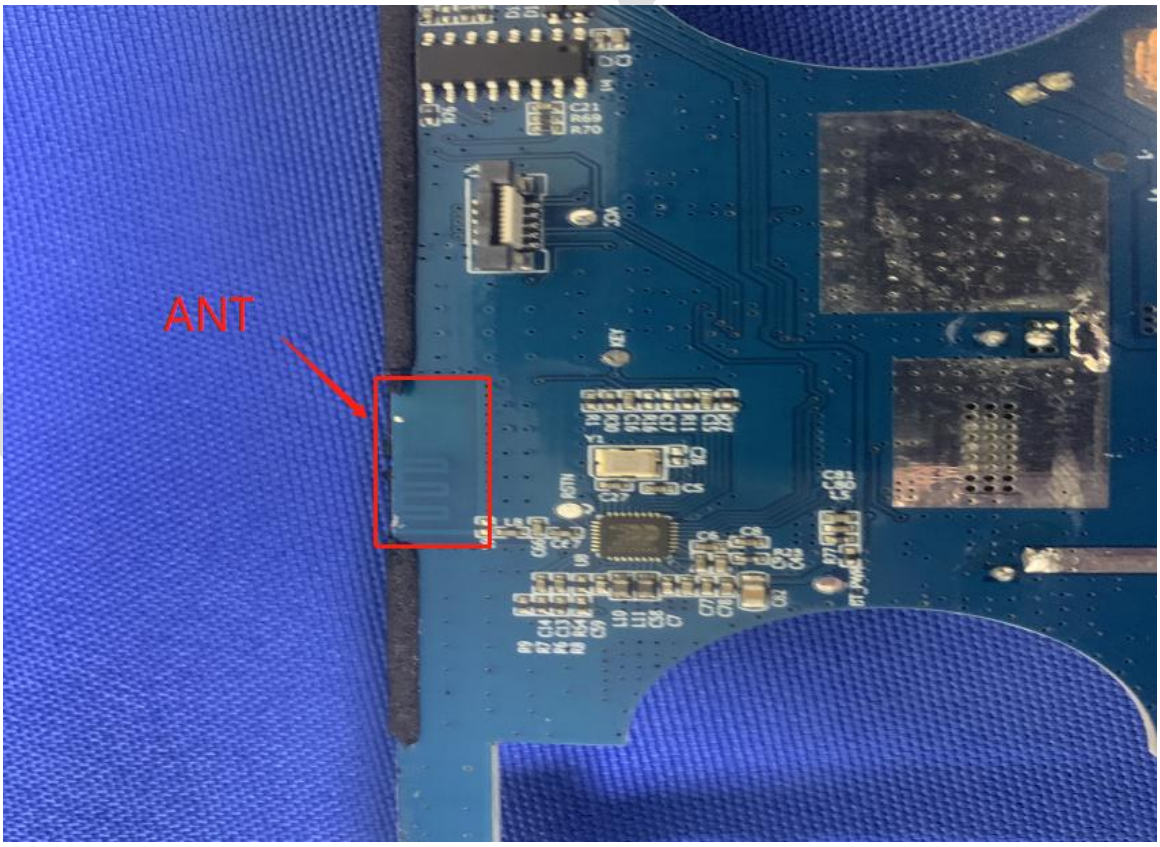
# 10 ANTENNA REQUIREMENT

| | |
|---|---|
| **Test Standard** | 47 CFR Part 15, Subpart C 15.247 |
| **Test Method** | N/A |

## 10.1 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 antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit permanently attached antenna or of an 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 1.20 dBi.



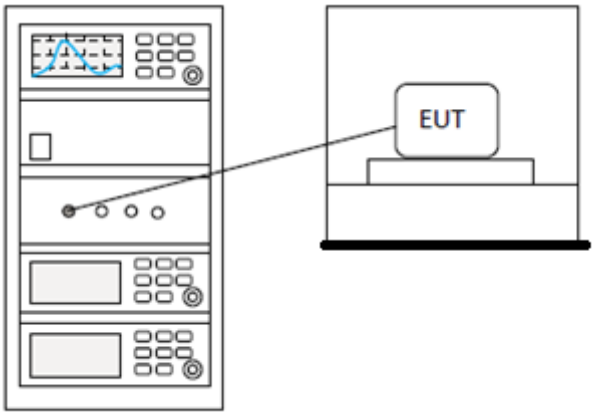
# 11 CONDUCTED SPURIOUS EMISSIONS

| | |
|---|---|
| **Test Standard** | 47 CFR Part 15, Subpart C 15.247 |
| **Test Method** | ANSI C63.10 (2013) Section 7.8.6 & Section 11.11 |
| **Test Mode (Pre-Scan)** | TX |
| **Test Mode (Final Test)** | TX |
| **Tester** | Eason |
| **Temperature** | 26℃ |
| **Humidity** | 54% |

## 11.1 LIMITS

| | |
|---|---|
| **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)). |

## 11.2 BLOCK DIAGRAM OF TEST SETUP




## 11.3 TEST DATA

**Pass: Please Refer To Appendix: For Details**

# 12 RADIATED EMISSIONS WHICH FALL IN THE RESTRICTED BANDS

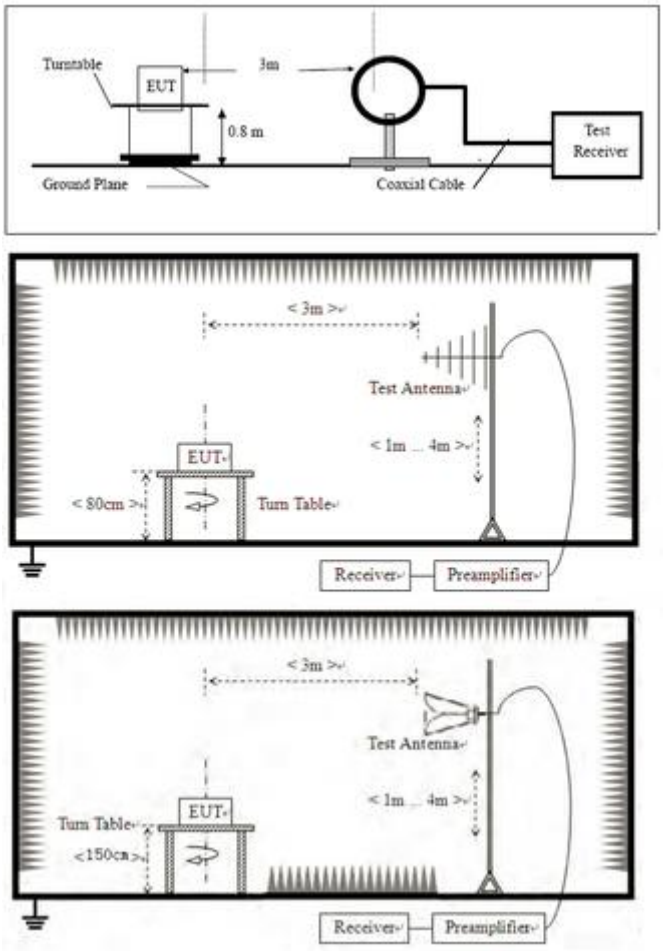
| | |
|---|---|
| **Test Standard** | 47 CFR Part 15, Subpart C 15.247 |
| **Test Method** | ANSI C63.10 (2013) Section 6.10.5 |
| **Test Mode (Pre-Scan)** | TX |
| **Test Mode (Final Test)** | TX |
| **Tester** | Eason |
| **Temperature** | 26℃ |
| **Humidity** | 54% |

## 12.1 LIMITS

| 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.

## 12.2 BLOCK DIAGRAM OF TEST SETUP




## 12.3 PROCEDURE

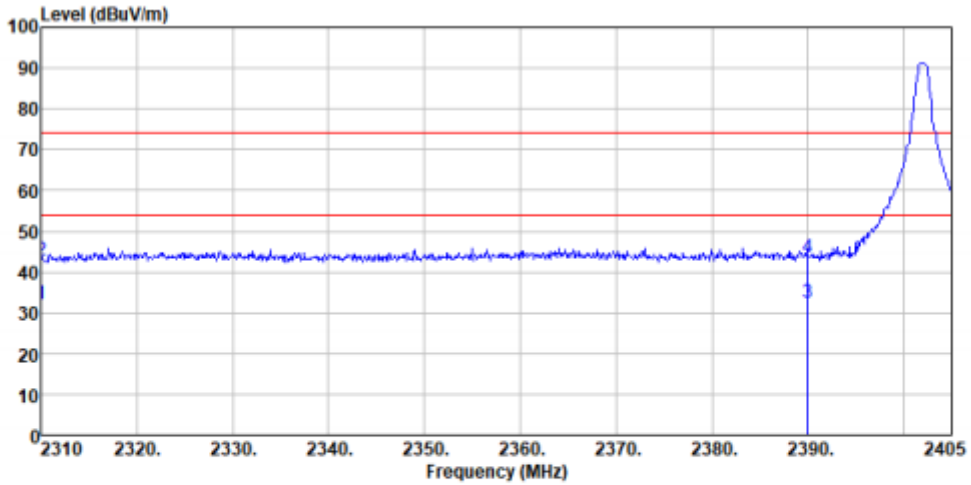
a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters 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.

## 12.4 TEST DATA

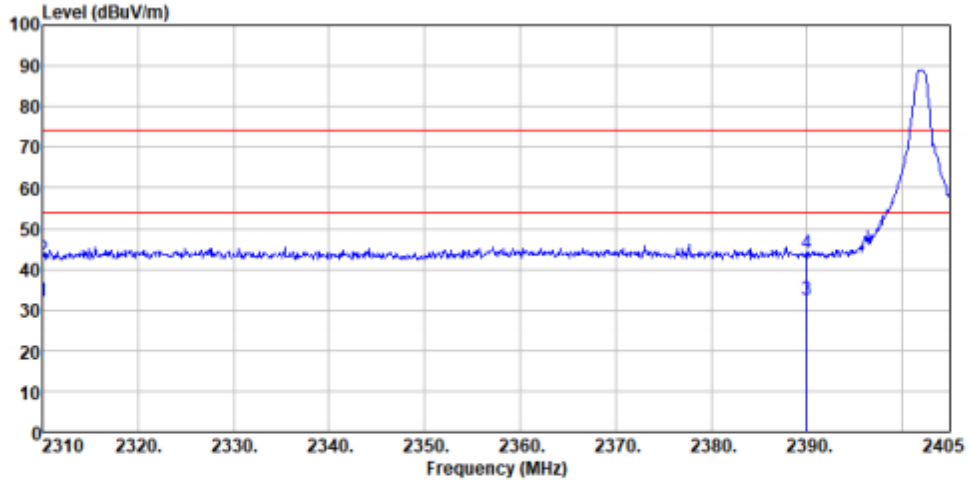
*Remark: During the test, pre-scan the GFSK, Pi/4QPSK, 8-DPSK modulation, and found the 8-DPSK modulation which it is worse case.*

**Lowest channel**




Condition : FCC PART 15 (PK) 3m HORIZONTAL
Job.No : GTS202009000181
Test Mode : TX2402
Test Engineer: hans
Remark : GFSK

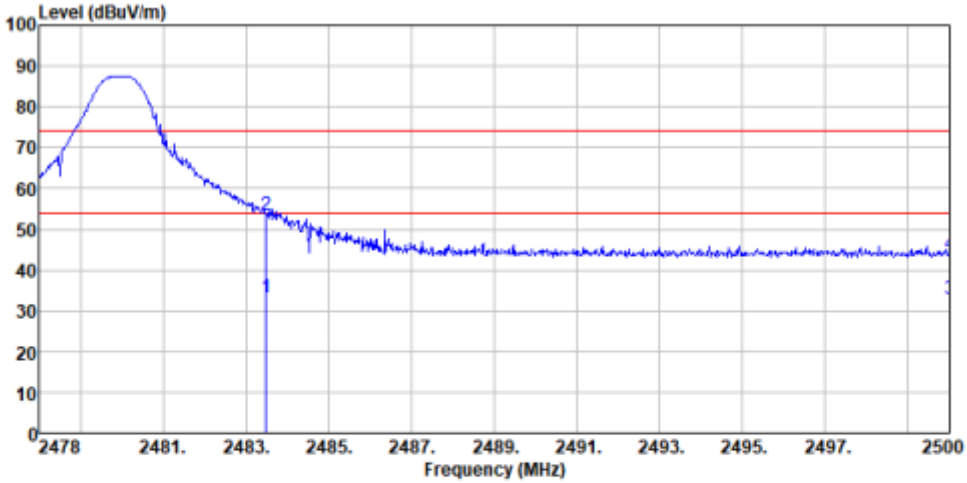
| | Freq | Read Level | Antenna Factor | Preamp Factor | Cable Loss | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB/m | dB | dB | dBuV/m | dBuV/m | dB | |
| 1 | 2310.000 | 32.52 | 27.14 | 30.43 | 2.81 | 32.04 | 54.00 | -21.96 | Average |
| 2 | 2310.000 | 43.30 | 27.14 | 30.43 | 2.81 | 42.82 | 74.00 | -31.18 | Peak |
| 3 | 2390.000 | 32.53 | 27.37 | 30.24 | 2.91 | 32.57 | 54.00 | -21.43 | Average |
| 4 | 2390.000 | 43.54 | 27.37 | 30.24 | 2.91 | 43.58 | 74.00 | -30.42 | Peak |




Condition : FCC PART 15 (PK) 3m VERTICAL
Job.No : GTS202009000181
Test Mode : TX2402
Test Engineer: hans
Remark : GFSK

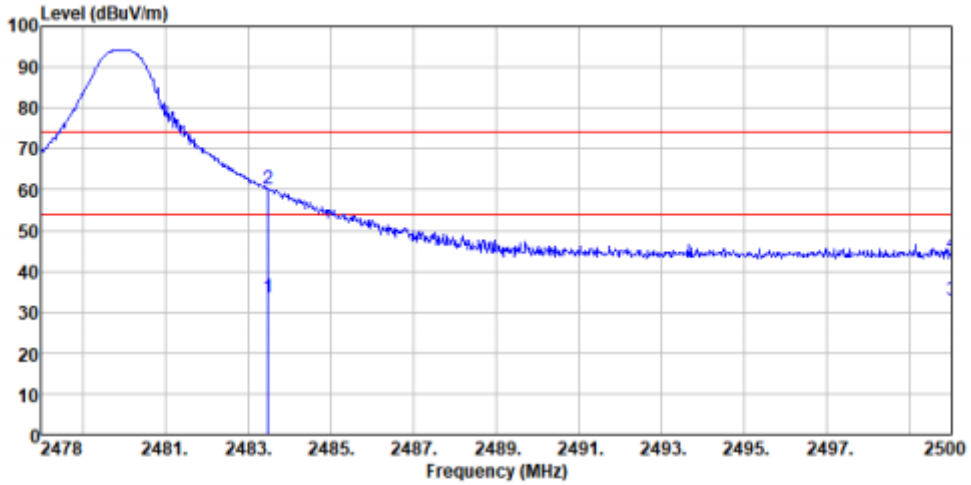
| | Freq | Read Level | Antenna Factor | Preamp Factor | Cable Loss | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB/m | dB | dB | dBuV/m | dBuV/m | dB | |
| 1 | 2310.000 | 32.44 | 27.14 | 30.43 | 2.81 | 31.96 | 54.00 | -22.04 | Average |
| 2 | 2310.000 | 42.84 | 27.14 | 30.43 | 2.81 | 42.36 | 74.00 | -31.64 | Peak |
| 3 | 2390.000 | 32.53 | 27.37 | 30.24 | 2.91 | 32.57 | 54.00 | -21.43 | Average |
| 4 | 2390.000 | 44.04 | 27.37 | 30.24 | 2.91 | 44.08 | 74.00 | -29.92 | Peak |

**Highest channel**




Condition : FCC PART 15 (PK) 3m HORIZONTAL
Job.No : GTS202009000181
Test Mode : TX2480
Test Engineer: hans
Remark : GFSK

| | Freq | ReadLevel | Antenna Factor | Preamp Factor | Cable Loss | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB/m | dB | dB | dBuV/m | dBuV/m | dB | |
| 1 | 2483.500 | 32.58 | 27.66 | 30.12 | 2.99 | 33.11 | 54.00 | -20.89 | Average |
| 2 | 2483.500 | 52.95 | 27.66 | 30.12 | 2.99 | 53.48 | 74.00 | -20.52 | Peak |
| 3 | 2500.000 | 32.29 | 27.70 | 30.13 | 3.01 | 32.87 | 54.00 | -21.13 | Average |
| 4 | 2500.000 | 43.46 | 27.70 | 30.13 | 3.01 | 44.04 | 74.00 | -29.96 | Peak |




Condition : FCC PART 15 (PK) 3m VERTICAL
Job.No : GTS202009000181
Test Mode : TX2480
Test Engineer: hans
Remark : GFSK

| | Freq | ReadLevel | Antenna Factor | Preamp Factor | Cable Loss | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB/m | dB | dB | dBuV/m | dBuV/m | dB | |
| 1 | 2483.500 | 33.13 | 27.66 | 30.12 | 2.99 | 33.66 | 54.00 | -20.34 | Average |
| 2 | 2483.500 | 59.57 | 27.66 | 30.12 | 2.99 | 60.10 | 74.00 | -13.90 | Peak |
| 3 | 2500.000 | 32.14 | 27.70 | 30.13 | 3.01 | 32.72 | 54.00 | -21.28 | Average |
| 4 | 2500.000 | 43.55 | 27.70 | 30.13 | 3.01 | 44.13 | 74.00 | -29.87 | Peak |

**Test Result: Pass**

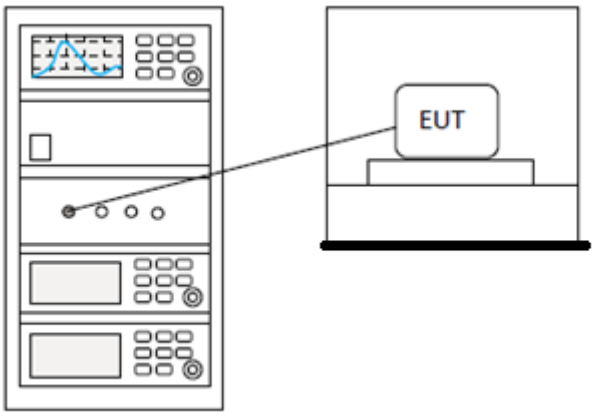
# 13 CONDUCTED BAND EDGES MEASUREMENT

| | |
|---|---|
| **Test Standard** | 47 CFR Part 15, Subpart C 15.247 |
| **Test Method** | ANSI C63.10 (2013) Section 7.8.8 & Section 11.13.3.2 |
| **Test Mode (Pre-Scan)** | TX |
| **Test Mode (Final Test)** | TX |
| **Tester** | Eason |
| **Temperature** | 25℃ |
| **Humidity** | 54% |

## 13.1 LIMITS

| | |
|---|---|
| **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)). |

## 13.2 BLOCK DIAGRAM OF TEST SETUP




## 13.3 TEST DATA

**Pass: Please Refer To Appendix: For Details**

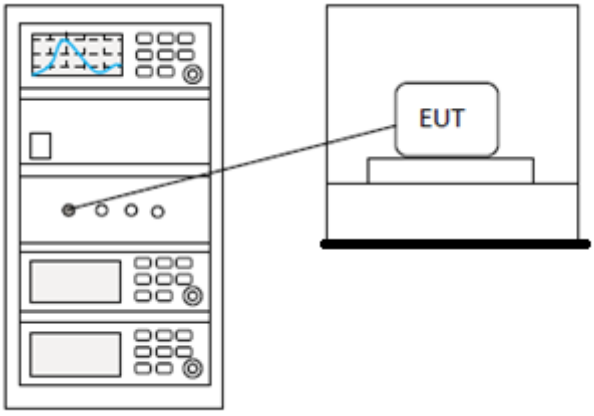
# 14 DWELL TIME

| | |
|---|---|
| **Test Standard** | 47 CFR Part 15, Subpart C 15.247 |
| **Test Method** | ANSI C63.10 (2013) Section 7.8.4 |
| **Test Mode (Pre-Scan)** | TX |
| **Test Mode (Final Test)** | TX |
| **Tester** | Eason |
| **Temperature** | 26℃ |
| **Humidity** | 54% |

## 14.1 LIMITS

| Frequency(MHz) | Limit |
|---|---|
| 902-928 | 0.4S within a 20S period(20dB bandwidth<250kHz) |
| | 0.4S within a 10S period(20dB bandwidth≥250kHz) |
| 2400-2483.5 | 0.4S within a period of 0.4S multiplied by the number of hopping channels |
| 5725-5850 | 0.4S within a 30S period |

## 14.2 BLOCK DIAGRAM OF TEST SETUP




## 14.3 TEST DATA

**Pass: Please Refer To Appendix: For Details**

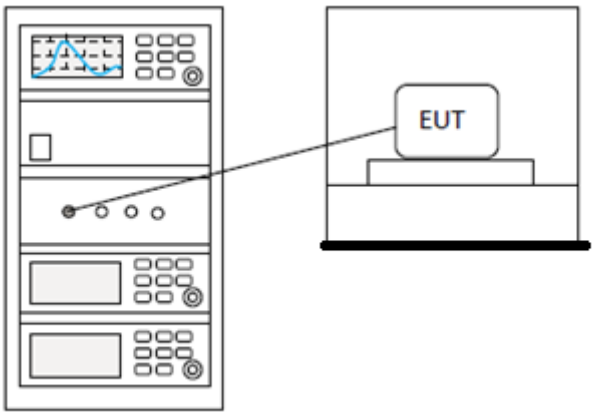
# 15 HOPPING CHANNEL NUMBER

| | |
|---|---|
| **Test Standard** | 47 CFR Part 15, Subpart C 15.247 |
| **Test Method** | ANSI C63.10 (2013) Section 7.8.3 |
| **Test Mode (Pre-Scan)** | TX |
| **Test Mode (Final Test)** | TX |
| **Tester** | Eason |
| **Temperature** | 26℃ |
| **Humidity** | 54% |

## 15.1 LIMITS

| Frequency range(MHz) | Number of hopping channels (minimum) |
|---|---|
| 902-928 | 50 for 20dB bandwidth <250kHz |
| | 25 for 20dB bandwidth ≥250kHz |
| 2400-2483.5 | 15 |
| 5725-5850 | 75 |

## 15.2 BLOCK DIAGRAM OF TEST SETUP




## 15.3 TEST DATA

**Pass: Please Refer To Appendix: For Details**

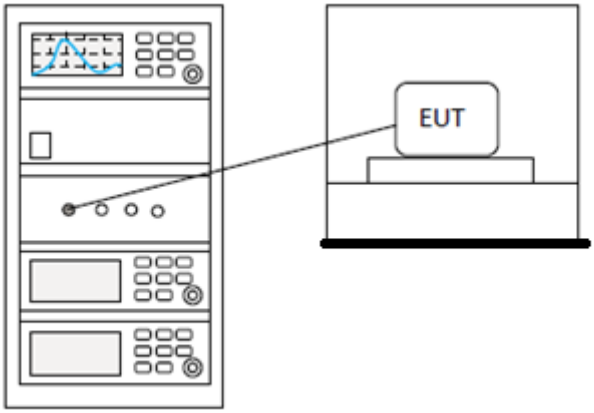
# 16 CARRIER FREQUENCIES SEPARATION

| | |
|---|---|
| **Test Standard** | 47 CFR Part 15, Subpart C 15.247 |
| **Test Method** | ANSI C63.10 (2013) Section 7.8.2 |
| **Test Mode (Pre-Scan)** | TX |
| **Test Mode (Final Test)** | TX |
| **Tester** | Eason |
| **Temperature** | 26℃ |
| **Humidity** | 54% |

## 16.1 LIMITS

| | |
|---|---|
| **Limit:** | 2/3 of the 20dB bandwidth base on the transmission power is less than 0.125W |

## 16.2 BLOCK DIAGRAM OF TEST SETUP



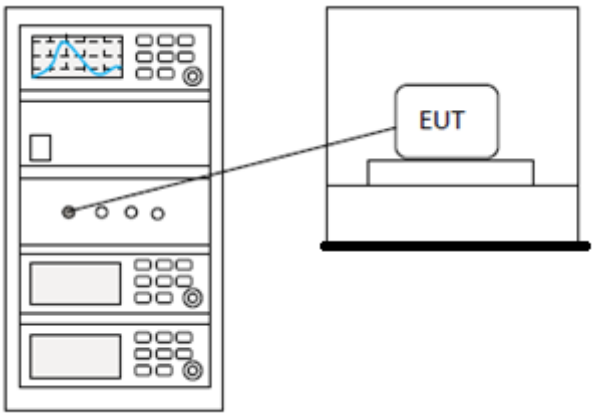

## 16.3 TEST DATA

**Pass: Please Refer To Appendix: For Details**

# 17 20DB BANDWIDTH

| | |
|---|---|
| **Test Standard** | 47 CFR Part 15, Subpart C 15.247 |
| **Test Method** | ANSI C63.10 (2013) Section 7.8.7 |
| **Test Mode (Pre-Scan)** | TX |
| **Test Mode (Final Test)** | TX |
| **Tester** | Eason |
| **Temperature** | 26℃ |
| **Humidity** | 54% |

## 17.1 BLOCK DIAGRAM OF TEST SETUP




## 17.2 TEST DATA

**Pass: Please Refer To Appendix: For Details**

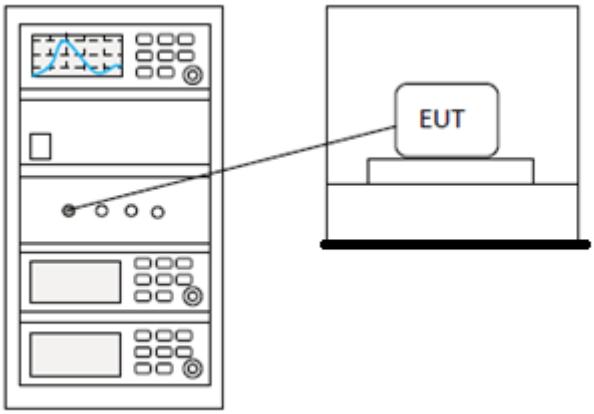
# 18 CONDUCTED PEAK OUTPUT POWER

| | |
|---|---|
| **Test Standard** | 47 CFR Part 15, Subpart C 15.247 |
| **Test Method** | ANSI C63.10 (2013) Section 7.8.5 |
| **Test Mode (Pre-Scan)** | TX |
| **Test Mode (Final Test)** | TX |
| **Tester** | Eason |
| **Temperature** | 26℃ |
| **Humidity** | 54% |

## 18.1 LIMITS

| Frequency range(MHz) | Output power of the intentional radiator(watt) |
|---|---|
| 902-928 | 1 for ≥50 hopping channels |
| | 0.25 for 25≤ 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 |

## 18.2 BLOCK DIAGRAM OF TEST SETUP




## 18.3 TEST DATA

**Pass: Please Refer To Appendix: For Details**

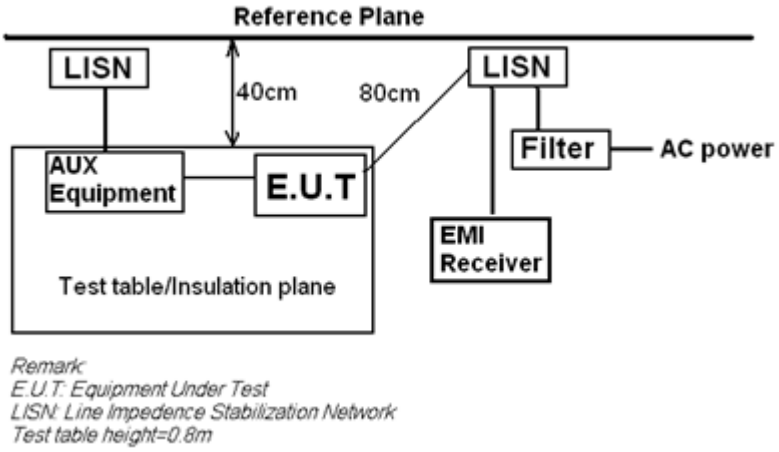
# 19 CONDUCTED EMISSIONS AT AC POWER LINE (150KHZ-30MHZ)

| | |
|---|---|
| **Test Standard** | 47 CFR Part 15, Subpart C 15.247 |
| **Test Method** | ANSI C63.10 (2013) Section 6.2 |
| **Test Mode (Pre-Scan)** | TX |
| **Test Mode (Final Test)** | TX |
| **Tester** | Eason |
| **Temperature** | 26℃ |
| **Humidity** | 54% |

## 19.1 LIMITS

| Frequency of emission(MHz) | Conducted limit(dBμV) | |
|---|---|---|
| | Quasi-peak | Average |
| 0.15-0.5 | 66 to 56* | 56 to 46* |
| 0.5-5 | 56 | 46 |
| 5-30 | 60 | 50 |
| *Decreases with the logarithm of the frequency. | | |

## 19.2 BLOCK DIAGRAM OF TEST SETUP



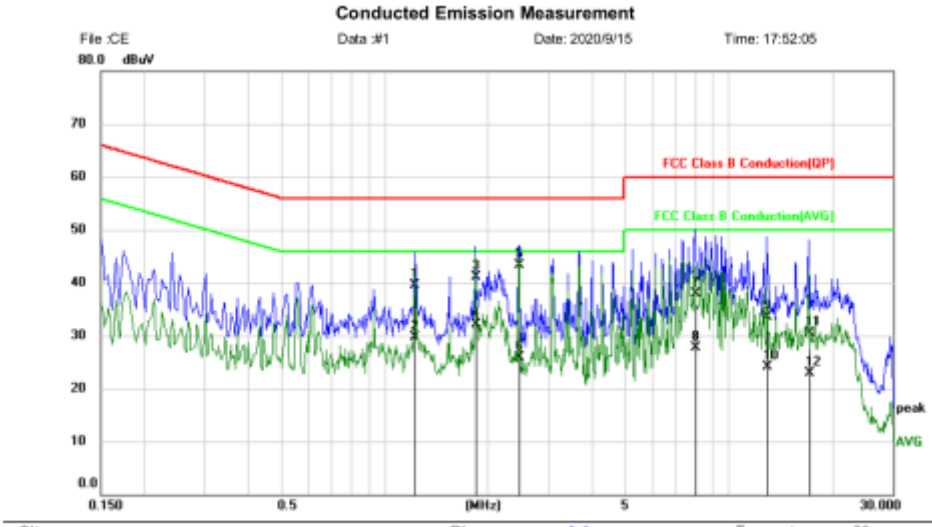

## 19.3 PROCEDURE

1) The mains terminal disturbance voltage test was conducted in a shielded room.
2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50ohm/50?H + 5ohm linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.
3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And

for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane,
4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.
5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10 on conducted measurement.
Remark: LISN=Read Level+ Cable Loss+ LISN Factor

### 19.4 TEST DATA

[TestMode: TX]; [Line: Line]
Power:AC120V60Hz




Site
Limit: FCC Class B Conduction(QP)
EUT: Bluetooth speaker
M/N: Q18S
Mode: BT mode
Note:

Phase: L1
Power:

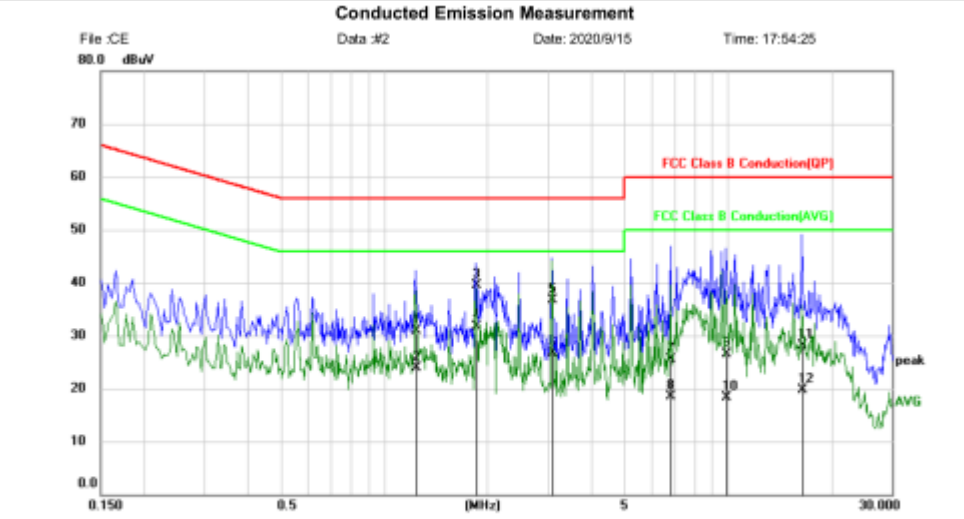
Temperature: 26
Humidity: 60 %

| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | | |
|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV | dBuV | dB | Detector | Comment |
| 1 | | 1.2260 | 29.76 | 9.81 | 39.57 | 56.00 | -16.43 | QP | |
| 2 | | 1.2260 | 19.88 | 9.81 | 29.69 | 46.00 | -16.31 | AVG | |
| 3 | | 1.8420 | 31.34 | 9.83 | 41.17 | 56.00 | -14.83 | QP | |
| 4 | | 1.8420 | 22.37 | 9.83 | 32.20 | 46.00 | -13.80 | AVG | |
| 5 | * | 2.4620 | 33.44 | 9.81 | 43.25 | 56.00 | -12.75 | QP | |
| 6 | | 2.4620 | 16.16 | 9.81 | 25.97 | 46.00 | -20.03 | AVG | |
| 7 | | 7.9820 | 28.08 | 9.87 | 37.95 | 60.00 | -22.05 | QP | |
| 8 | | 7.9820 | 17.90 | 9.87 | 27.77 | 50.00 | -22.23 | AVG | |
| 9 | | 12.9500 | 23.52 | 9.94 | 33.46 | 60.00 | -26.54 | QP | |
| 10 | | 12.9500 | 14.19 | 9.94 | 24.13 | 50.00 | -25.87 | AVG | |
| 11 | | 17.1299 | 20.57 | 10.00 | 30.57 | 60.00 | -29.43 | QP | |
| 12 | | 17.1299 | 12.90 | 10.00 | 22.90 | 50.00 | -27.10 | AVG | |

**Test Result: Pass**

[TestMode: TX]; [Line: Neutral]

Power:AC120V60Hz




Site

Limit: FCC Class B Conduction(QP)

EUT: Bluetooth speaker

M/N: Q18S

Mode: BT mode

Note:

Phase: N

Power:

Temperature: 26

Humidity: 60 %

| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | | |
|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV | dBuV | dB | Detector | Comment |
| 1 | | 1.2420 | 21.06 | 9.83 | 30.89 | 56.00 | -25.11 | QP | |
| 2 | | 1.2420 | 14.14 | 9.83 | 23.97 | 46.00 | -22.03 | AVG | |
| 3 | | 1.8540 | 29.56 | 9.85 | 39.41 | 56.00 | -16.59 | QP | |
| 4 | * | 1.8540 | 21.78 | 9.85 | 31.63 | 46.00 | -14.37 | AVG | |
| 5 | | 3.0820 | 26.81 | 9.89 | 36.70 | 56.00 | -19.30 | QP | |
| 6 | | 3.0820 | 16.89 | 9.89 | 26.78 | 46.00 | -19.22 | AVG | |
| 7 | | 6.8260 | 15.69 | 9.85 | 25.54 | 60.00 | -34.46 | QP | |
| 8 | | 6.8260 | 8.60 | 9.85 | 18.45 | 50.00 | -31.55 | AVG | |
| 9 | | 9.8740 | 16.61 | 9.97 | 26.58 | 60.00 | -33.42 | QP | |
| 10 | | 9.8740 | 8.30 | 9.97 | 18.27 | 50.00 | -31.73 | AVG | |
| 11 | | 16.4220 | 17.99 | 10.02 | 28.01 | 60.00 | -31.99 | QP | |
| 12 | | 16.4220 | 9.59 | 10.02 | 19.61 | 50.00 | -30.39 | AVG | |

**Test Result: Pass**

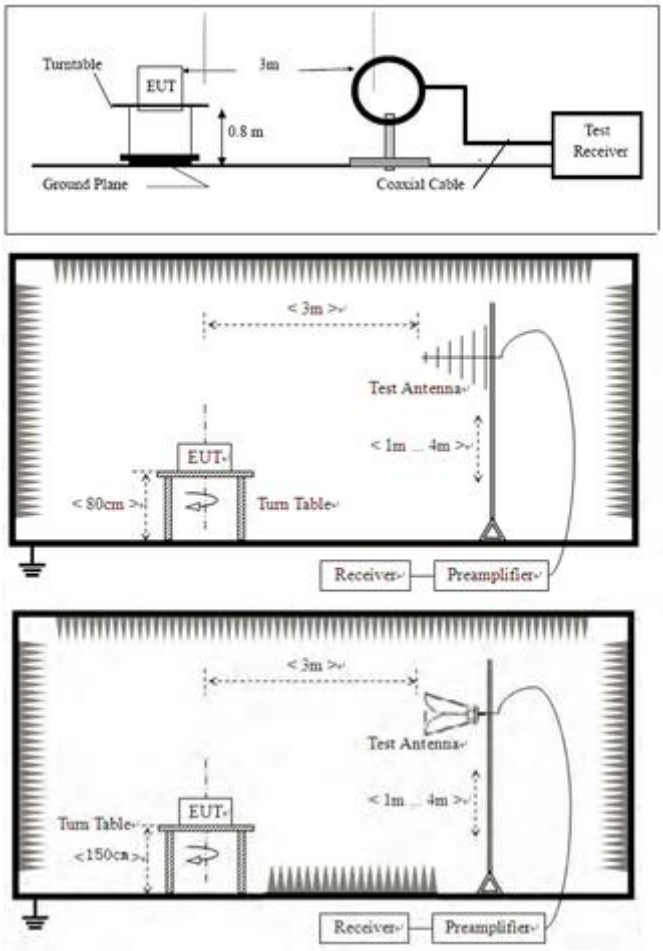
# 20 RADIATED SPURIOUS EMISSIONS

| | |
|---|---|
| **Test Standard** | 47 CFR Part 15, Subpart C 15.247 |
| **Test Method** | ANSI C63.10 (2013) Section 6.4,6.5,6.6 |
| **Test Mode (Pre-Scan)** | TX mode (SE) below 1G; TX mode (SE) above 1G |
| **Test Mode (Final Test)** | TX mode (SE) below 1G; TX mode (SE) above 1G |
| **Tester** | Eason |
| **Temperature** | 26℃ |
| **Humidity** | 54% |

## 20.1 LIMITS

| 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. | | |

## 20.2 BLOCK DIAGRAM OF TEST SETUP




## 20.3 PROCEDURE

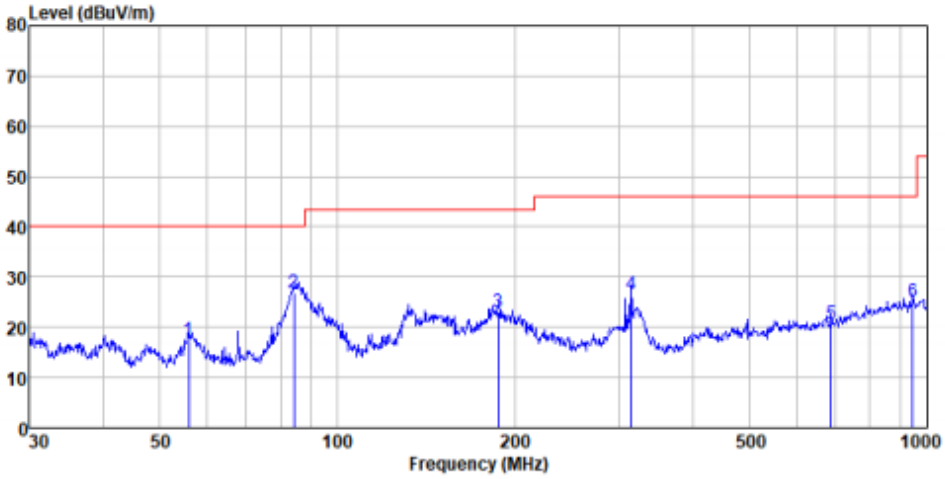
a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters 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 ¨ C 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 in the report.

### 20.4 TEST DATA

[TestMode: TX mode (SE) below 1G]; [Polarity: Horizontal]
Power:AC120V/60Hz

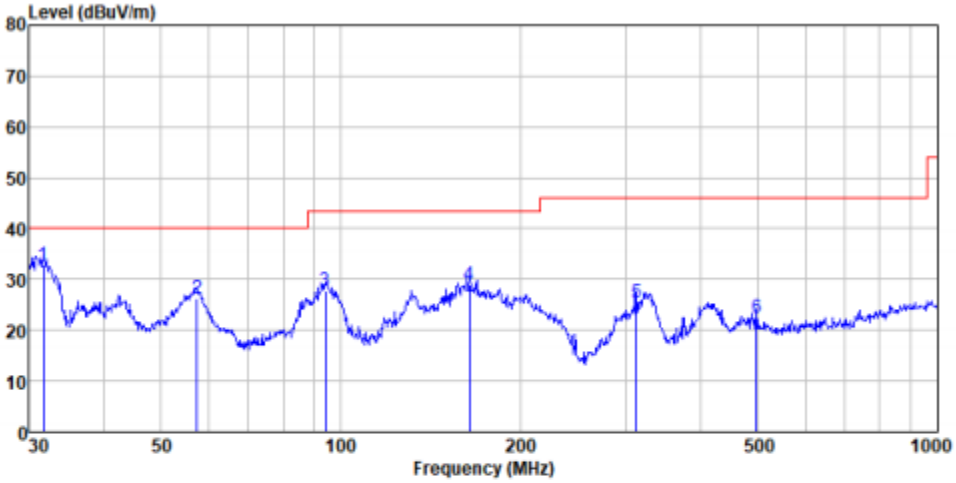



Condition : FCC CLASS-B 3m HORIZONTAL
Job.No : GTS202009000181
Test Mode : BT mode
Test Engineer: Hans
Remark :

| | Freq | ReadAntenna Level | Factor | Preamp Factor | Cable Loss | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB/m | dB | dB | dBuV/m | dBuV/m | dB | |
| 1 | 56.001 | 41.19 | 11.68 | 36.27 | 0.83 | 17.43 | 40.00 | -22.57 | QP |
| 2 | 84.405 | 53.57 | 8.92 | 36.59 | 1.07 | 26.97 | 40.00 | -13.03 | QP |
| 3 | 187.753 | 48.79 | 9.65 | 37.27 | 1.78 | 22.95 | 43.50 | -20.55 | QP |
| 4 | 314.377 | 47.61 | 13.87 | 37.44 | 2.44 | 26.48 | 46.00 | -19.52 | QP |
| 5 | 687.151 | 34.59 | 19.59 | 37.62 | 4.05 | 20.61 | 46.00 | -25.39 | QP |
| 6 | 945.440 | 35.02 | 22.48 | 37.56 | 5.03 | 24.97 | 46.00 | -21.03 | QP |

**Test Result: Pass**

[TestMode: TX mode (SE) below 1G]; [Polarity: Vertical]
Power:AC120V/60Hz




Condition : FCC CLASS-B 3m VERTICAL
Job.No : GTS202009000181
Test Mode : BT mode
Test Engineer: Hans
Remark :

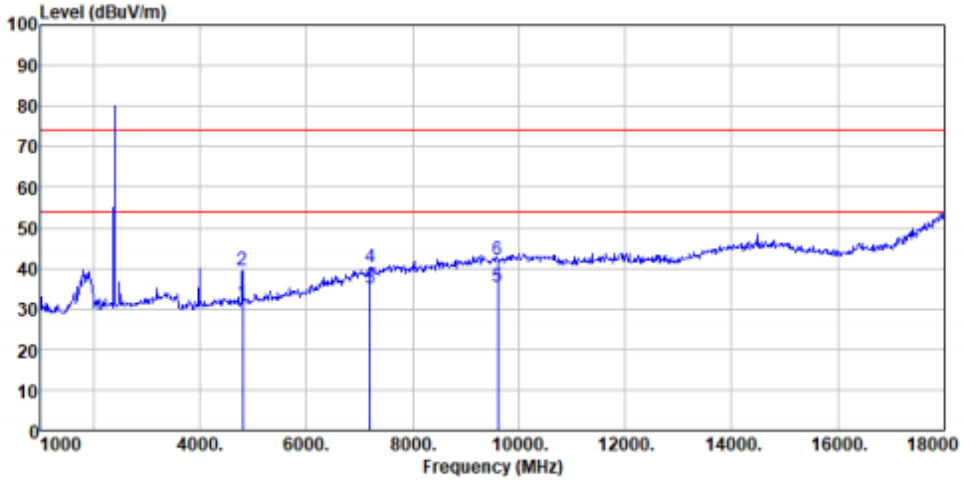
| | Freq | ReadAntenna Level | Factor | Preamp Factor | Cable Loss | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB/m | dB | dB | dBuV/m | dBuV/m | dB | |
| 1 | 31.731 | 56.10 | 11.24 | 35.13 | 0.57 | 32.78 | 40.00 | -7.22 | QP |
| 2 | 57.392 | 50.25 | 11.55 | 36.29 | 0.84 | 26.35 | 40.00 | -13.65 | QP |
| 3 | 94.098 | 51.84 | 11.31 | 36.67 | 1.14 | 27.62 | 43.50 | -15.88 | QP |
| 4 | 164.330 | 55.92 | 8.39 | 37.16 | 1.65 | 28.80 | 43.50 | -14.70 | QP |
| 5 | 313.276 | 46.65 | 13.85 | 37.44 | 2.43 | 25.49 | 46.00 | -20.51 | QP |
| 6 | 497.677 | 39.25 | 17.26 | 37.51 | 3.29 | 22.29 | 46.00 | -23.71 | QP |

**Test Result: Pass**

[TestMode: *GFSK*]

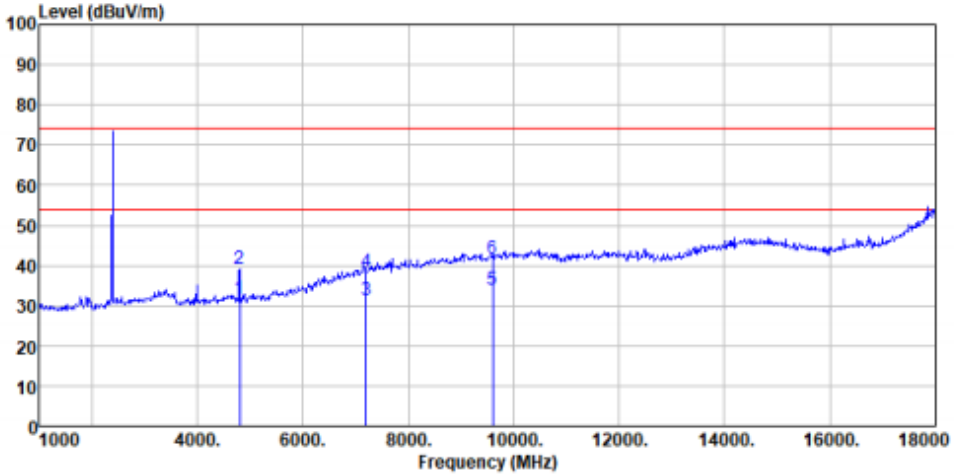
*Remark: During the test, pre-scan the GFSK, Pi/4QPSK, 8-DPSK modulation, and found the 8-DPSK modulation which it is worse case.*

Test channel:lowest




Condition : FCC PART 15 (PK) 3m VERTICAL
Job.No : GTS202009000181
Test Mode : TX2402
Test Engineer: hans
Remark : GFSK

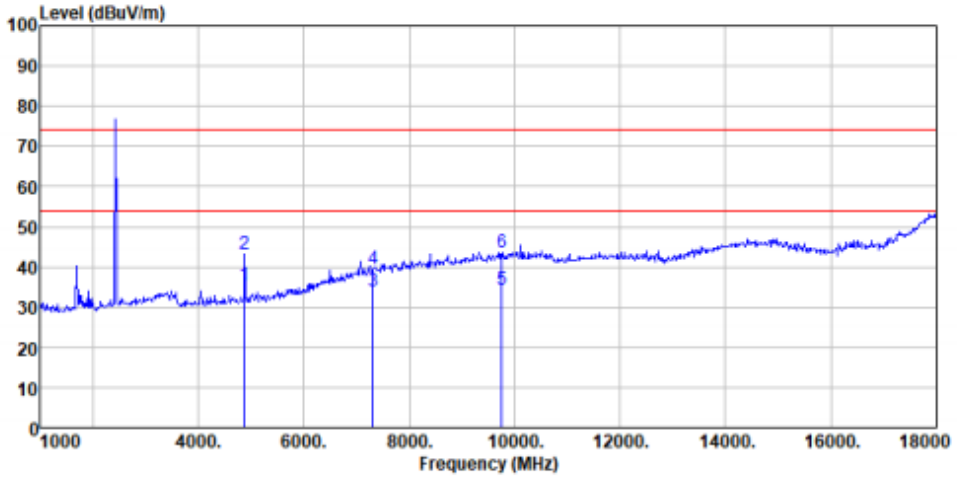
| | Freq | Read Level | Antenna Factor | Preamp Factor | Cable Loss | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB/m | dB | dB | dBuV/m | dBuV/m | dB | |
| 1 | 4804.000 | 33.23 | 31.20 | 37.73 | 4.61 | 31.31 | 54.00 | -22.69 | Average |
| 2 | 4804.000 | 41.27 | 31.20 | 37.73 | 4.61 | 39.35 | 74.00 | -34.65 | Peak |
| 3 | 7206.000 | 27.93 | 36.16 | 35.63 | 6.48 | 34.94 | 54.00 | -19.06 | Average |
| 4 | 7206.000 | 33.38 | 36.16 | 35.63 | 6.48 | 40.39 | 74.00 | -33.61 | Peak |
| 5 | 9608.000 | 24.32 | 37.93 | 34.94 | 7.97 | 35.28 | 54.00 | -18.72 | Average |
| 6 | 9608.000 | 30.94 | 37.93 | 34.94 | 7.97 | 41.90 | 74.00 | -32.10 | Peak |




Condition : FCC PART 15 (PK) 3m HORIZONTAL
Job.No : GTS202009000181
Test Mode : TX2402
Test Engineer: hans
Remark : GFSK

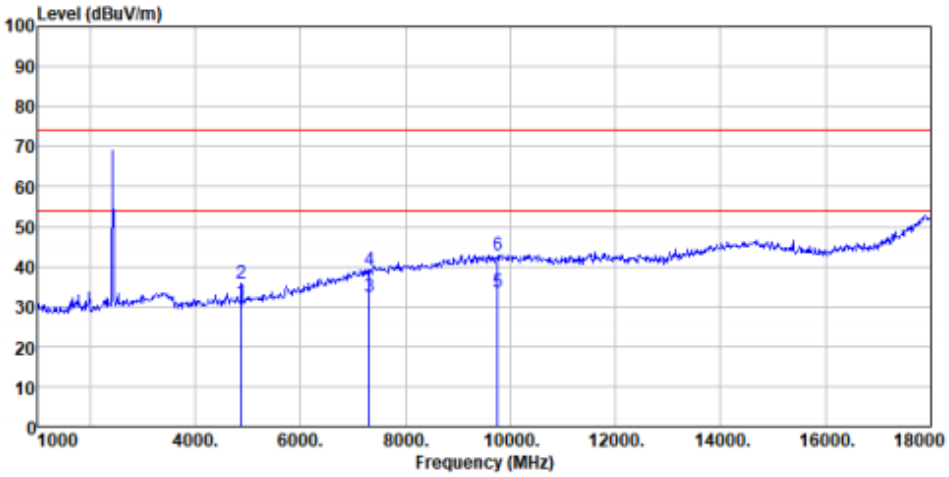
| | Freq | ReadLevel | Antenna Factor | Preamp Factor | Cable Loss | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB/m | dB | dB | dBuV/m | dBuV/m | dB | |
| 1 | 4804.000 | 33.59 | 31.20 | 37.73 | 4.61 | 31.67 | 54.00 | -22.33 | Average |
| 2 | 4804.000 | 41.10 | 31.20 | 37.73 | 4.61 | 39.18 | 74.00 | -34.82 | Peak |
| 3 | 7206.000 | 24.52 | 36.16 | 35.63 | 6.48 | 31.53 | 54.00 | -22.47 | Average |
| 4 | 7206.000 | 31.21 | 36.16 | 35.63 | 6.48 | 38.22 | 74.00 | -35.78 | Peak |
| 5 | 9608.000 | 23.07 | 37.93 | 34.94 | 7.97 | 34.03 | 54.00 | -19.97 | Average |
| 6 | 9608.000 | 30.90 | 37.93 | 34.94 | 7.97 | 41.86 | 74.00 | -32.14 | Peak |

Test channel:Middle




Condition : FCC PART 15 (PK) 3m HORIZONTAL
Job.No : GTS202009000181
Test Mode : TX2441
Test Engineer: hans
Remark : GFSK

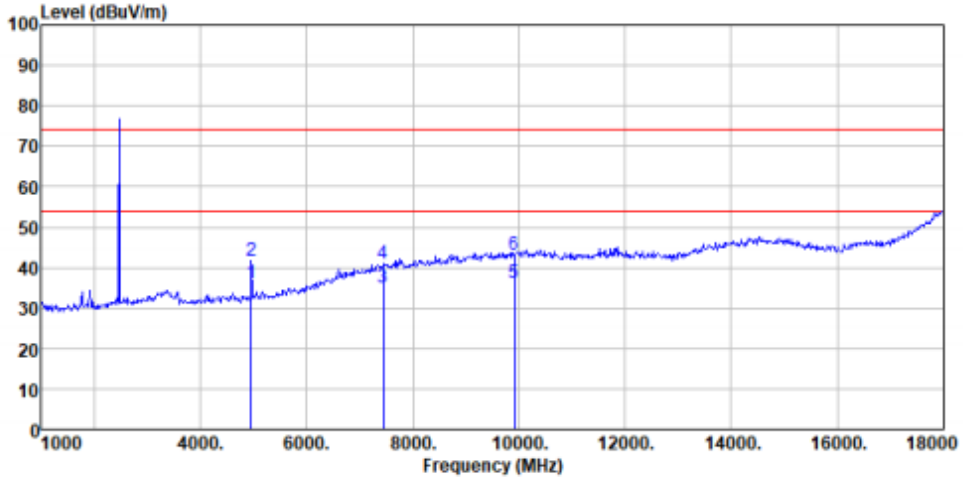
| | Freq | Read Level | Antenna Factor | Preamp Factor | Cable Loss | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB/m | dB | dB | dBuV/m | dBuV/m | dB | |
| 1 | 4882.000 | 37.24 | 31.33 | 37.76 | 4.69 | 35.50 | 54.00 | -18.50 | Average |
| 2 | 4882.000 | 44.92 | 31.33 | 37.76 | 4.69 | 43.18 | 74.00 | -30.82 | Peak |
| 3 | 7323.000 | 26.41 | 36.43 | 35.60 | 6.63 | 33.87 | 54.00 | -20.13 | Average |
| 4 | 7323.000 | 32.05 | 36.43 | 35.60 | 6.63 | 39.51 | 74.00 | -34.49 | Peak |
| 5 | 9764.000 | 23.09 | 38.10 | 35.03 | 8.03 | 34.19 | 54.00 | -19.81 | Average |
| 6 | 9764.000 | 32.36 | 38.10 | 35.03 | 8.03 | 43.46 | 74.00 | -30.54 | Peak |




Condition : FCC PART 15 (PK) 3m VERTICAL
Job.No : GTS202009000181
Test Mode : TX2441
Test Engineer: hans
Remark : GFSK

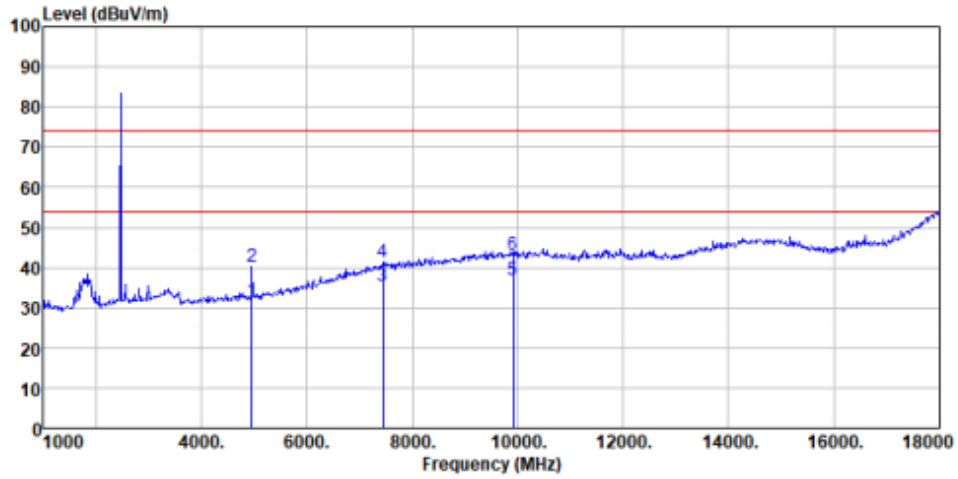
| | Freq | ReadLevel | Antenna Factor | Preamp Factor | Cable Loss | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB/m | dB | dB | dBuV/m | dBuV/m | dB | |
| 1 | 4882.000 | 32.63 | 31.33 | 37.76 | 4.69 | 30.89 | 54.00 | -23.11 | Average |
| 2 | 4882.000 | 37.69 | 31.33 | 37.76 | 4.69 | 35.95 | 74.00 | -38.05 | Peak |
| 3 | 7323.000 | 24.94 | 36.43 | 35.60 | 6.63 | 32.40 | 54.00 | -21.60 | Average |
| 4 | 7323.000 | 31.50 | 36.43 | 35.60 | 6.63 | 38.96 | 74.00 | -35.04 | Peak |
| 5 | 9764.000 | 22.60 | 38.10 | 35.03 | 8.03 | 33.70 | 54.00 | -20.30 | Average |
| 6 | 9764.000 | 31.65 | 38.10 | 35.03 | 8.03 | 42.75 | 74.00 | -31.25 | Peak |

Test channel:Highest




Condition : FCC PART 15 (PK) 3m HORIZONTAL
Job.No : GTS202009000181
Test Mode : TX2480
Test Engineer: hans
Remark : GFSK

| | Freq | Read Level | Antenna Factor | Preamp Factor | Cable Loss | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB/m | dB | dB | dBuV/m | dBuV/m | dB | |
| 1 | 4960.000 | 37.61 | 31.44 | 37.78 | 4.79 | 36.06 | 54.00 | -17.94 | Average |
| 2 | 4960.000 | 43.28 | 31.44 | 37.78 | 4.79 | 41.73 | 74.00 | -32.27 | Peak |
| 3 | 7440.000 | 27.33 | 36.66 | 35.56 | 6.77 | 35.20 | 54.00 | -18.80 | Average |
| 4 | 7440.000 | 33.12 | 36.66 | 35.56 | 6.77 | 40.99 | 74.00 | -33.01 | Peak |
| 5 | 9920.000 | 24.97 | 38.30 | 35.14 | 8.09 | 36.22 | 54.00 | -17.78 | Average |
| 6 | 9920.000 | 31.94 | 38.30 | 35.14 | 8.09 | 43.19 | 74.00 | -30.81 | Peak |




Condition : FCC PART 15 (PK) 3m VERTICAL
Job.No : GTS202009000181
Test Mode : TX2480
Test Engineer: hans
Remark : GFSK

| | Freq | Read Level | Antenna Factor | Preamp Factor | Cable Loss | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB/m | dB | dB | dBuV/m | dBuV/m | dB | |
| 1 | 4960.000 | 33.44 | 31.44 | 37.78 | 4.79 | 31.89 | 54.00 | -22.11 | Average |
| 2 | 4960.000 | 41.79 | 31.44 | 37.78 | 4.79 | 40.24 | 74.00 | -33.76 | Peak |
| 3 | 7440.000 | 27.41 | 36.66 | 35.56 | 6.77 | 35.28 | 54.00 | -18.72 | Average |
| 4 | 7440.000 | 33.38 | 36.66 | 35.56 | 6.77 | 41.25 | 74.00 | -32.75 | Peak |
| 5 | 9920.000 | 25.57 | 38.30 | 35.14 | 8.09 | 36.82 | 54.00 | -17.18 | Average |
| 6 | 9920.000 | 31.90 | 38.30 | 35.14 | 8.09 | 43.15 | 74.00 | -30.85 | Peak |

**Test Result: Pass**