



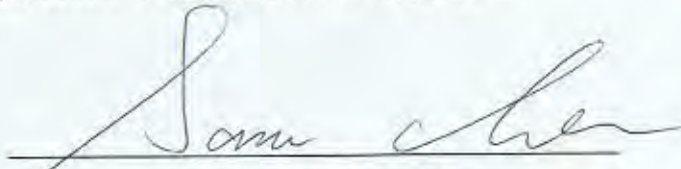
FCC RADIO TEST REPORT

FCC ID : EJE-WB0109
Equipment : STYLISTIC Q739
Brand Name : FUJITSU
Model Name : PQ13B
Applicant : FUJITSU CLIENT COMPUTING LIMITED
1-1, Kamikonadaka 4-chome, Nakahara-ku,
Kawasaki, 211-8588 Japan
Manufacturer : FUJITSU CLIENT COMPUTING LIMITED
1-1, Kamikodanaka 4-chome, Nakahara-ku,
Kawasaki, 211-8588 Japan
Standard : 47 CFR FCC Part 15.255

The product was received on Dec. 04, 2017, and testing was started from Dec. 14, 2017 and completed on Mar. 04, 2019. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2013, 47 CFR FCC Part 15.255, Millimeter Wave Test Procedures and shown compliance with the applicable technical standards.

The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.


Approved by: Sam Chen

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory
No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)



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Appendix A. Test Photos

Photographs of EUT v01



Summary of Test Result

| Report Clause | Ref Std. Clause | Test Items | Result (PASS/FAIL) | Remark |
|---------------|--------------------|--|--------------------|--------|
| 3.1 | FCC 15.207 | AC Power Conducted Emissions | PASS | - |
| 3.2 | FCC 15.255(e) | Occupied Bandwidth | PASS | - |
| 3.3 | FCC 15.255(c) | EIRP Power | PASS | - |
| 3.4 | FCC 15.255(c) | Peak Conducted Power | PASS | - |
| 3.5 | FCC 15.255(d) | Transmitter Spurious Emissions | PASS | - |
| 3.6 | FCC 15.255(f) | Frequency Stability | PASS | - |
| 3.7 | FCC 15.255(a), (h) | Operation Restriction and Group Installation | PASS | - |

Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

Comments and Explanations:

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

Reviewed by: **Sam Chen**

Report Producer: **Emily Chen**



1 General Description

1.1 Information

1.1.1 The Channel Plan(s)

| | |
|---------------------|-----------|
| Frequency Range | 57-71GHz |
| Operation Frequency | 60.48 GHz |

1.1.2 Antenna Information

| Ant. | Brand | Model Name | Antenna Type | Connector | Gain (dBi) |
|------|--------|------------|------------------|-----------|------------|
| 1 | SiBEAM | SB6212 | Integral Antenna | N/A | 0 |

Note: The above information was declared by manufacturer.



1.1.3 Power Levels

| | | | |
|-------------------------|---|----------|------------|
| Applicable power levels | <input type="checkbox"/> Conducted <input checked="" type="checkbox"/> EIRP | | |
| Antenna gain | 0 dBi | | |
| Frequency (GHz) | Highest setting (P _{high}): (dBm) | | |
| | Modulation | AV Power | Peak Power |
| 60.48 | OOK | -1.08 | 7.71 |

1.1.4 Extreme Operating

| The Extreme Operating Temperature Range that Apply to the Equipment | |
|---|--|
| <input type="checkbox"/> -20 °C to +50 °C | |
| <input type="checkbox"/> 0 °C to +40 °C | |
| <input checked="" type="checkbox"/> Other: -5 °C to +35 °C | |
| EUT Power Type | From Power Adapter or Li-Polymer |
| Supply Voltage | <input checked="" type="checkbox"/> AC State AC voltage 120 V |
| Supply Voltage | <input type="checkbox"/> DC State DC voltage V |

1.1.5 Equipment Use Condition

| Equipment Use Condition |
|---|
| <input type="checkbox"/> Fixed field disturbance sensors at 61-61.5GHz |
| <input type="checkbox"/> Except fixed field disturbance sensors at 61-61.5GHz |
| <input checked="" type="checkbox"/> Except fixed field disturbance sensors |

1.1.6 User Condition

| Intended Operation |
|--|
| <input checked="" type="checkbox"/> Indoor |
| <input type="checkbox"/> Outdoor |

Note: The above information was declared by manufacturer.



1.2 Additional Information Provided by the Submitter

1.2.1 Modulation

| Modulation | |
|---|---|
| The modulation is OOK. | |
| Can the transmitter operate un-modulated: | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |

1.2.2 Duty Cycle

| Duty Cycle | Duty Cycle Factor |
|--------------------------------------|-------------------|
| The transmitter is intended for 100% | 0 |

1.3 Accessories

| Accessories | | | | |
|-------------|----------------|------------|------------|---|
| No. | Equipment Name | Brand Name | Model Name | Rating |
| 1 | Adapter | Delta | ADP-65MD B | INPUT: 100-240V ~ 1.5A, 50-60Hz OUTPUT: 19V, 3.42A |
| 2 | Li-Polymer | Fujitsu | FPB0326S | 3450mAh, 11.1V (38Wh) |

1.4 Support Equipment

For AC Power Conducted Emissions test

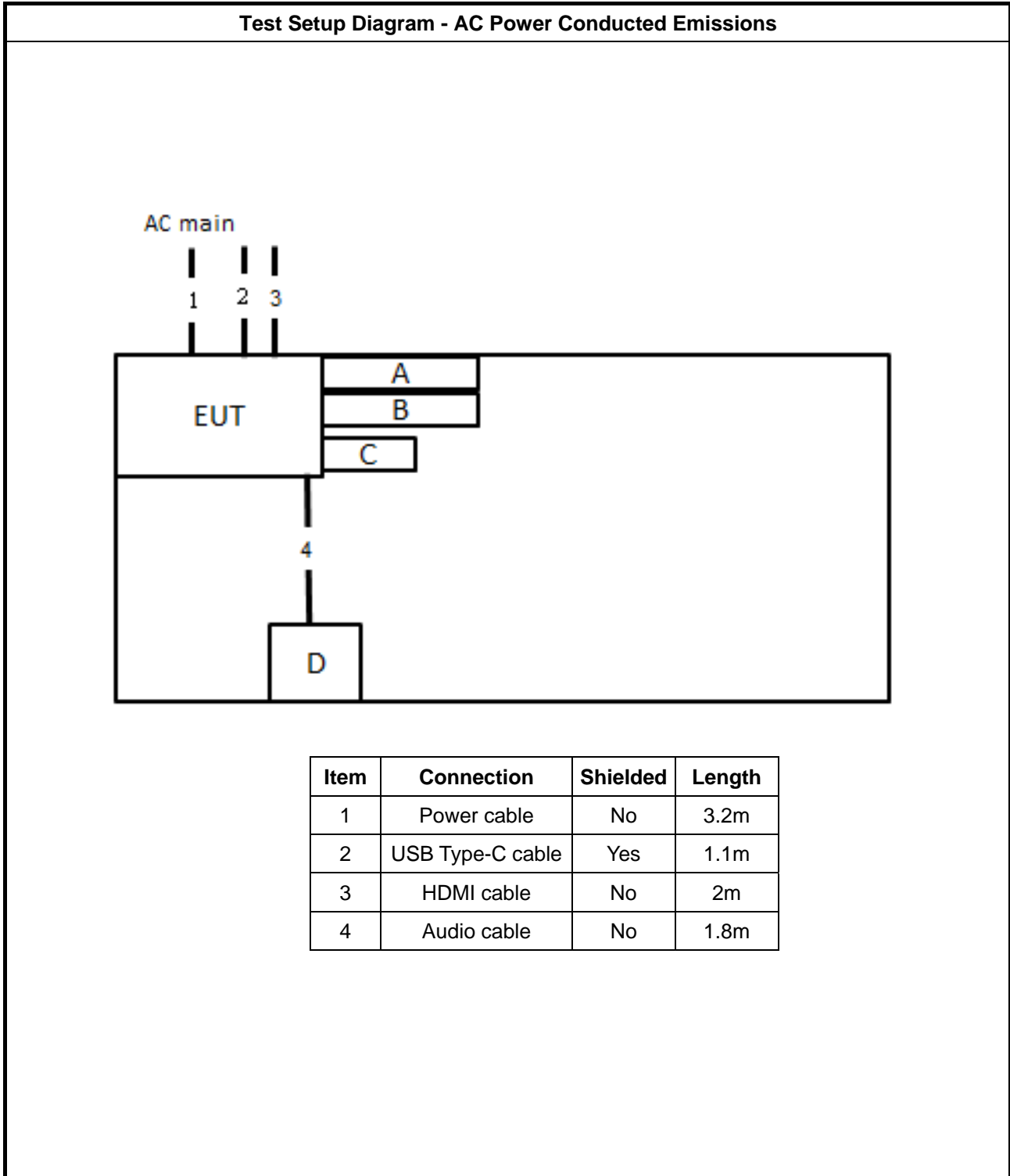
| Support Equipment | | | | |
|-------------------|---------------|------------|--------------|--------|
| No. | Equipment | Brand Name | Model Name | FCC ID |
| A | Flash disk | Transcend | 604108 8255 | N/A |
| B | Flash disk3.0 | Transcend | JetFlash-700 | N/A |
| C | Micro SD Card | Transcend | TS16GUSDHC10 | N/A |
| D | Earphone | SHYARO CHI | MIC-04 | N/A |

For others test: N/A

1.5 EUT Operation during Test

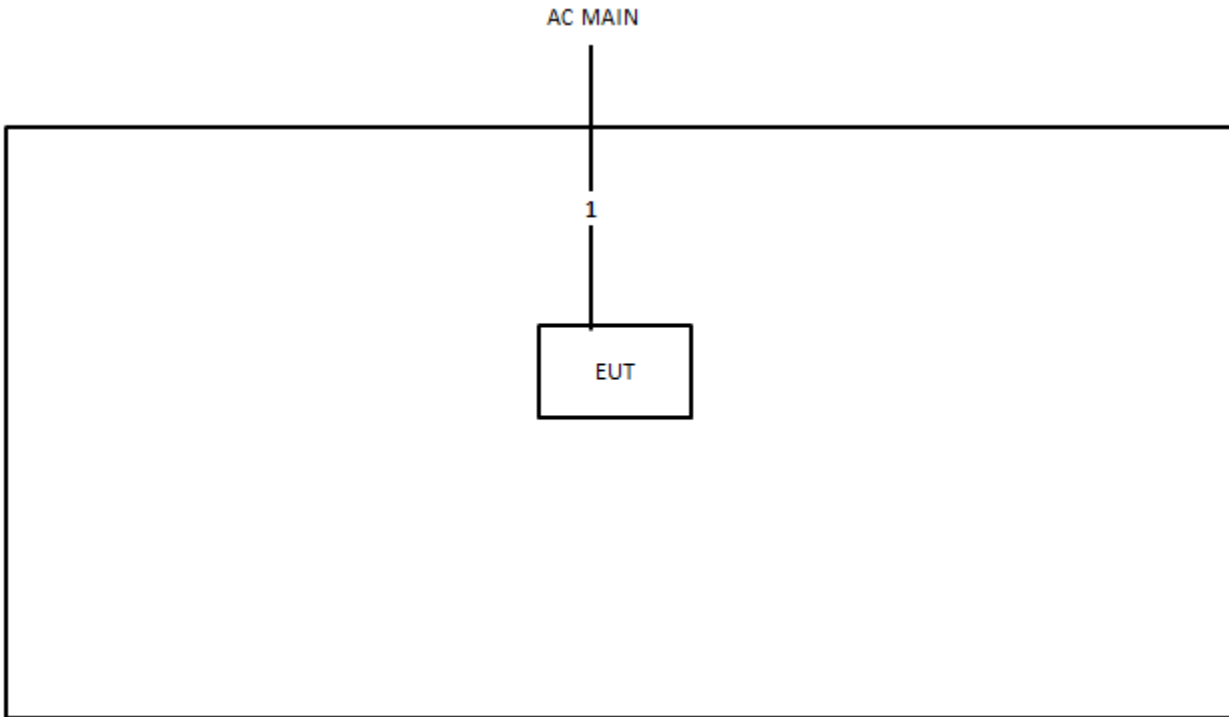
During the test, executed the test program to control the EUT continuously transmit RF signal.

1.6 Test Setup Diagram





Test Setup Diagram - Transmitter Spurious Emissions below 1 GHz



| Item | Connection | Shielded | Length |
|------|-------------|----------|--------|
| 1 | Power cable | No | 3.3m |



Test Setup Diagram - Transmitter Spurious Emissions above 1 GHz

A small rectangular box with a black border, containing the text "EUT" in the center. This box is positioned within a larger rectangular frame that represents the test setup area.

EUT



1.7 Testing Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ 47 CFR FCC Part 15.255
- ♦ ANSI C63.10-2013 Section 9. "Procedures for testing millimeter-wave systems"

1.8 Testing Location

| Testing Location | | |
|-------------------------------------|-----------|--|
| <input type="checkbox"/> | HWA YA | ADD : No. 52, Hwa Ya 1st Rd., Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL : 886-3-327-3456 FAX : 886-3-327-0973 |
| <input checked="" type="checkbox"/> | JHUBEI | ADD : No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C. TEL : 886-3-656-9065 FAX : 886-3-656-9085 |
| Test Site No. | | |
| CO01-CB | 03CH01-CB | TH01-CB |

Test site Designation No. TW0006 with FCC.

Test site registered number IC 4086B with Industry Canada.



2 Test Configuration of Equipment under Test

2.1 Test Channel Frequencies

| Nominal Channel Bandwidth |
|---------------------------|
| 60.48 |

2.2 Conformance Tests and Related Test Frequencies

| Test Item | Test Frequencies (GHz) |
|---|------------------------|
| AC Power Conducted Emissions | CTX |
| Occupied Bandwidth | 60.48 |
| EIRP Power | 60.48 |
| Peak Conducted Power | 60.48 |
| Transmitter Spurious Emissions (below 1 GHz) | CTX |
| Transmitter Spurious Emissions (1 GHz-40 GHz) | 60.48 |
| Transmitter Spurious Emissions (above 40 GHz) | 60.48 |
| Frequency Stability | Un-Modulation |



2.3 Far Field Boundary Calculations

The far-field boundary is given as:

$$\text{far field} = (2 * L^2) / \lambda$$

where:

L = Largest Antenna Dimension, including the reflector, in meters

λ = wavelength in meters

| Far Field (m) | | | | |
|-----------------|-------|------------|------------------|-------------------|
| Frequency (GHz) | L (m) | Lambda (m) | d(Far Field) (m) | d(Far Field) (cm) |
| 60.48 | 0.02 | 0.0049603 | 0.161 | 16.13 |



3 Transmitter Test Result

3.1 AC Power Conducted Emissions

3.1.1 Limit of AC Power Conducted Emissions

| AC Power Conducted Emissions Limit | | |
|------------------------------------|------------|-----------|
| Frequency Emission (MHz) | Quasi-Peak | Average |
| 0.15-0.5 | 66 - 56 * | 56 - 46 * |
| 0.5-5 | 56 | 46 |
| 5-30 | 60 | 50 |

Note: * Decreases with the logarithm of the frequency.

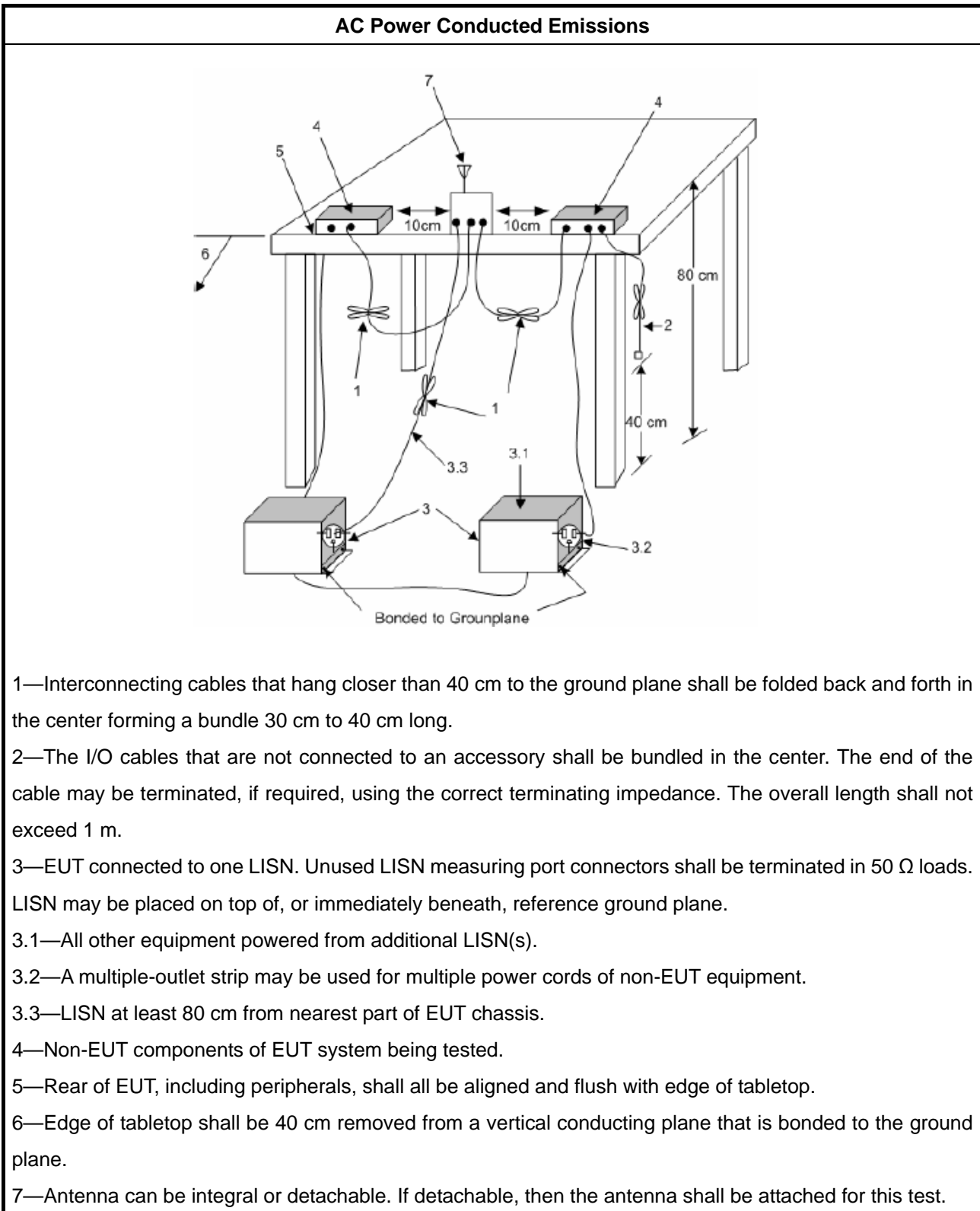
3.1.2 Measuring Instruments

Refer a measuring instruments list in this test report.

3.1.3 Test Procedures

Method of measurement: Refer as ANSI C63.10-2013, clause 6.2.

3.1.4 Test Setup





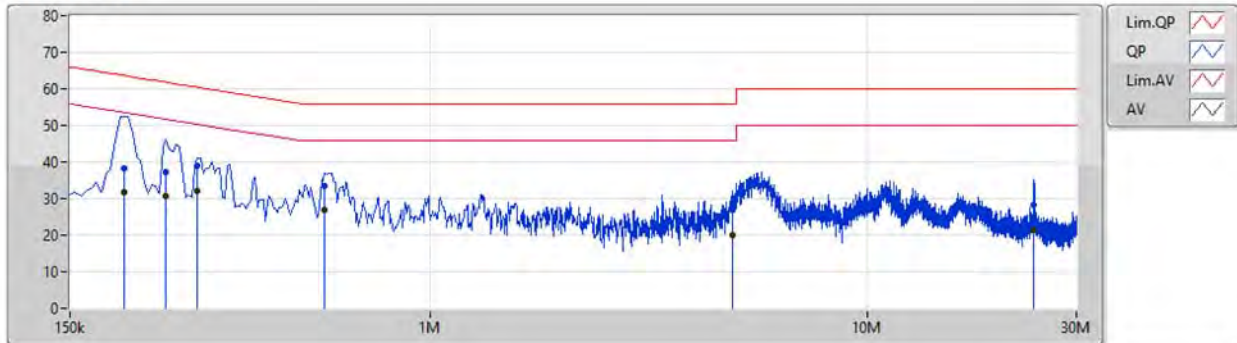
3.1.5 Test Result of AC Power Conducted Emissions

| | |
|--|-------------------------------|
| Test Conditions | see ANSI C63.10, clause 5.11 |
| Test Setup | see ANSI C63.10, clause 6.2.3 |
| <p>NOTE 1: If equipment having different channel plan and nominal channel bandwidth modes (see test report clause 1.1.1), the measurements are uninfluenced by different channel plan and nominal channel bandwidth modes, may not need to be repeated for all modes. If equipment having different transmit operating modes (see test report clause 1.1.2), the measurements are uninfluenced by different transmit operating modes, may not need to be repeated for all the operating modes. Similar, if the equipment supports different modulations and/or data rates, the measurements described in ANSI C63.10, clause 5.12 may not need to be repeated for all these modulations and data rates. Simple comparison of engineering test across all operating modes, modulations and data rates may need to be performed to define the worse case combination to be used for the conformance testing.</p> <p>NOTE 2: ">20dB" means the tables in this clause should only list values of spurious emissions that exceed the level of 20 dB below the applicable limit, see ANSI C63.4, clause 10.1.8.1.</p> | |



| | | | |
|---------------|---------------|-----------|---------------|
| Temp | 22.7°C~23.1°C | Humidity | 61%~62% |
| Test Engineer | Peter Wu | Phase | Line |
| Configuration | CTX | Test Date | Mar. 04, 2019 |

04/03/2019

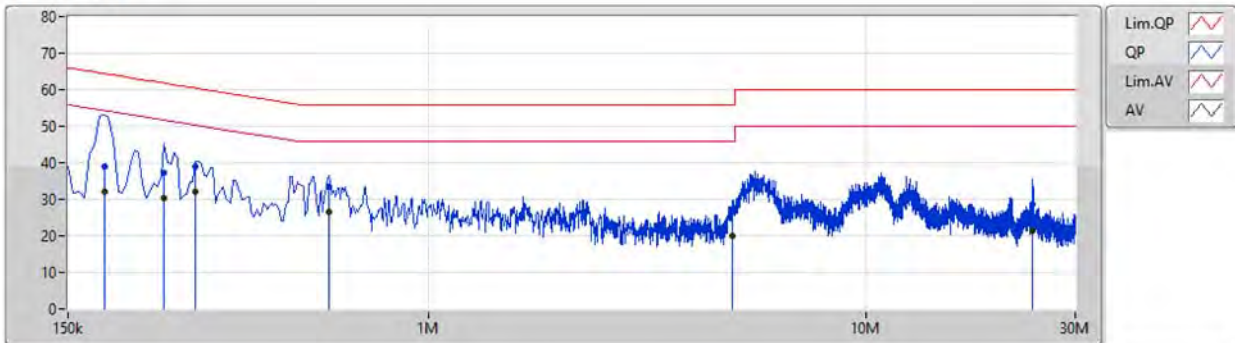


| Type | Freq (Hz) | Level (dBuV) | Limit (dBuV) | Margin (dB) | Factor (dB) | Condition | Comment | Raw (dBuV) | AF (dB) | CL (dB) | AT (dB) |
|------|-----------|--------------|--------------|-------------|-------------|-----------|---------|------------|---------|---------|---------|
| QP | 199.5k | 38.38 | 63.63 | -25.25 | 9.99 | Line | - | 28.39 | 0.06 | 0.14 | 9.79 |
| AV | 199.5k | 31.62 | 53.63 | -22.01 | 9.99 | Line | - | 21.63 | 0.06 | 0.14 | 9.79 |
| QP | 249k | 37.21 | 61.79 | -24.58 | 9.99 | Line | - | 27.22 | 0.06 | 0.13 | 9.80 |
| AV | 249k | 30.55 | 51.79 | -21.24 | 9.99 | Line | - | 20.56 | 0.06 | 0.13 | 9.80 |
| QP | 294k | 38.97 | 60.42 | -21.45 | 9.99 | Line | - | 28.98 | 0.06 | 0.13 | 9.80 |
| AV | 294k | 32.17 | 50.42 | -18.25 | 9.99 | Line | "Worst" | 22.18 | 0.06 | 0.13 | 9.80 |
| QP | 573k | 33.59 | 56.00 | -22.41 | 10.02 | Line | - | 23.57 | 0.06 | 0.15 | 9.81 |
| AV | 573k | 26.95 | 46.00 | -19.05 | 10.02 | Line | - | 16.93 | 0.06 | 0.15 | 9.81 |
| QP | 4.898M | 26.98 | 56.00 | -29.02 | 10.10 | Line | - | 16.88 | 0.14 | 0.13 | 9.83 |
| AV | 4.898M | 19.99 | 46.00 | -26.01 | 10.10 | Line | - | 9.89 | 0.14 | 0.13 | 9.83 |
| QP | 24.023M | 28.26 | 60.00 | -31.74 | 10.59 | Line | - | 17.67 | 0.32 | 0.26 | 10.01 |
| AV | 24.023M | 21.43 | 50.00 | -28.57 | 10.59 | Line | - | 10.84 | 0.32 | 0.26 | 10.01 |



| | | | |
|---------------|---------------|-----------|---------------|
| Temp | 22.7°C~23.1°C | Humidity | 61%~62% |
| Test Engineer | Peter Wu | Phase | Neutral |
| Configuration | CTX | Test Date | Mar. 04, 2019 |

04/03/2019



| Type | Freq (Hz) | Level (dBuV) | Limit (dBuV) | Margin (dB) | Factor (dB) | Condition | Comment | Raw (dBuV) | AF (dB) | CL (dB) | AT (dB) |
|------|-----------|--------------|--------------|-------------|-------------|-----------|---------|------------|---------|---------|---------|
| QP | 181.5k | 38.96 | 64.41 | -25.45 | 9.98 | Neutral | - | 28.98 | 0.04 | 0.15 | 9.79 |
| AV | 181.5k | 32.21 | 54.41 | -22.20 | 9.98 | Neutral | - | 22.23 | 0.04 | 0.15 | 9.79 |
| QP | 249k | 37.24 | 61.79 | -24.55 | 9.97 | Neutral | - | 27.27 | 0.04 | 0.13 | 9.80 |
| AV | 249k | 30.49 | 51.79 | -21.30 | 9.97 | Neutral | - | 20.52 | 0.04 | 0.13 | 9.80 |
| QP | 294k | 38.90 | 60.42 | -21.52 | 9.97 | Neutral | - | 28.93 | 0.04 | 0.13 | 9.80 |
| AV | 294k | 32.09 | 50.42 | -18.33 | 9.97 | Neutral | "Worst" | 22.12 | 0.04 | 0.13 | 9.80 |
| QP | 591k | 33.49 | 56.00 | -22.51 | 10.01 | Neutral | - | 23.48 | 0.05 | 0.15 | 9.81 |
| AV | 591k | 26.71 | 46.00 | -19.29 | 10.01 | Neutral | - | 16.70 | 0.05 | 0.15 | 9.81 |
| QP | 4.943M | 26.73 | 56.00 | -29.27 | 10.09 | Neutral | - | 16.64 | 0.12 | 0.13 | 9.84 |
| AV | 4.943M | 20.07 | 46.00 | -25.93 | 10.09 | Neutral | - | 9.98 | 0.12 | 0.13 | 9.84 |
| QP | 24.023M | 28.48 | 60.00 | -31.52 | 10.58 | Neutral | - | 17.90 | 0.31 | 0.26 | 10.01 |
| AV | 24.023M | 21.39 | 50.00 | -28.61 | 10.58 | Neutral | - | 10.81 | 0.31 | 0.26 | 10.01 |



3.2 Occupied Bandwidth

3.2.1 Limit of Occupied Bandwidth

| | |
|--|------|
| 6dBc Bandwidth (see Note 1) | None |
| 26dBc Bandwidth | None |
| 99% Occupied Bandwidth (see Note 2) | None |

NOTE 1: The 6dBc bandwidth is the frequency bandwidth of the signal power at the -6 dBc points when measured with a 100 kHz resolution bandwidth. These measurements shall also be performed at normal test conditions.

NOTE 2: The 99% occupied bandwidth is the frequency bandwidth of the signal power at the 99% channel power of occupied bandwidth when resolution bandwidth should be approximately 1 % to 5 % of the occupied bandwidth (OBW). These measurements shall also be performed at normal test conditions.

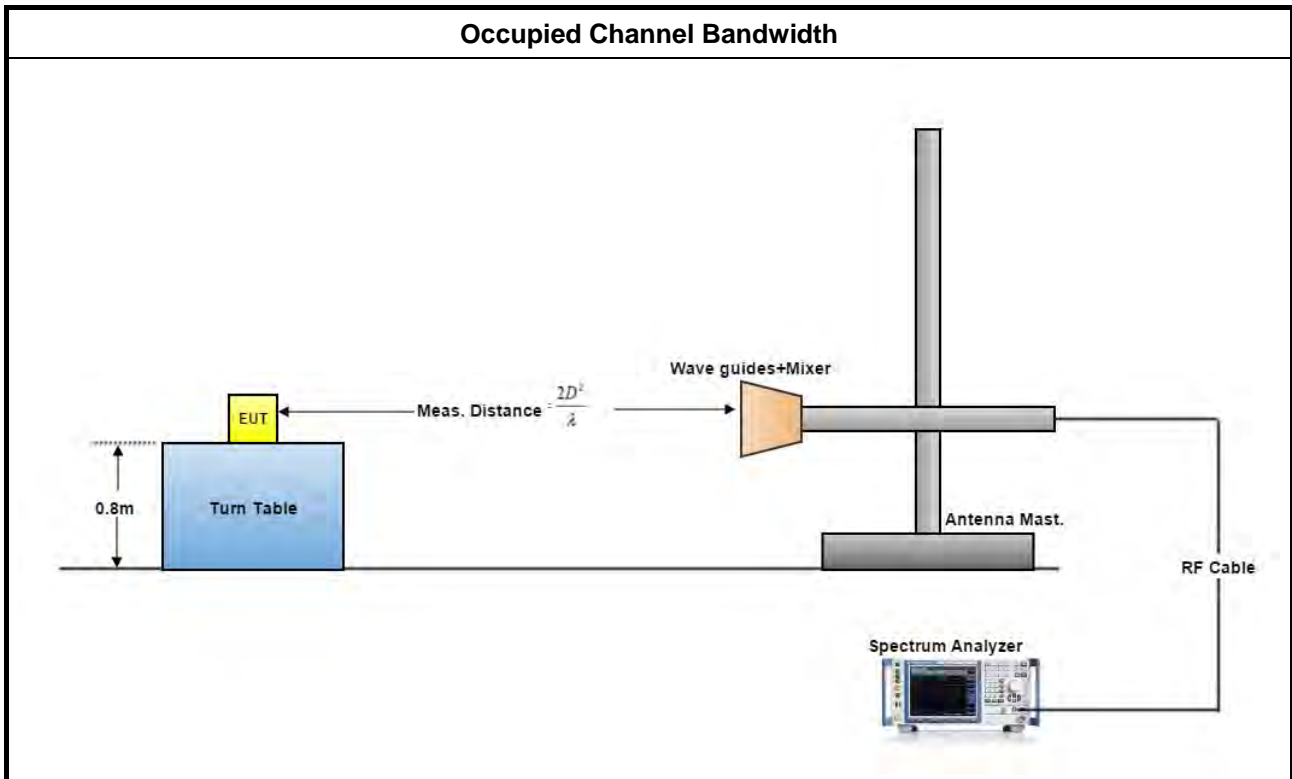
3.2.2 Measuring Instruments

Refer a measuring instruments list in this test report.

3.2.3 Test Procedures

Method of measurement: Refer as ANSI C63.10-2013, clauses 6.9.2.

3.2.4 Test Setup





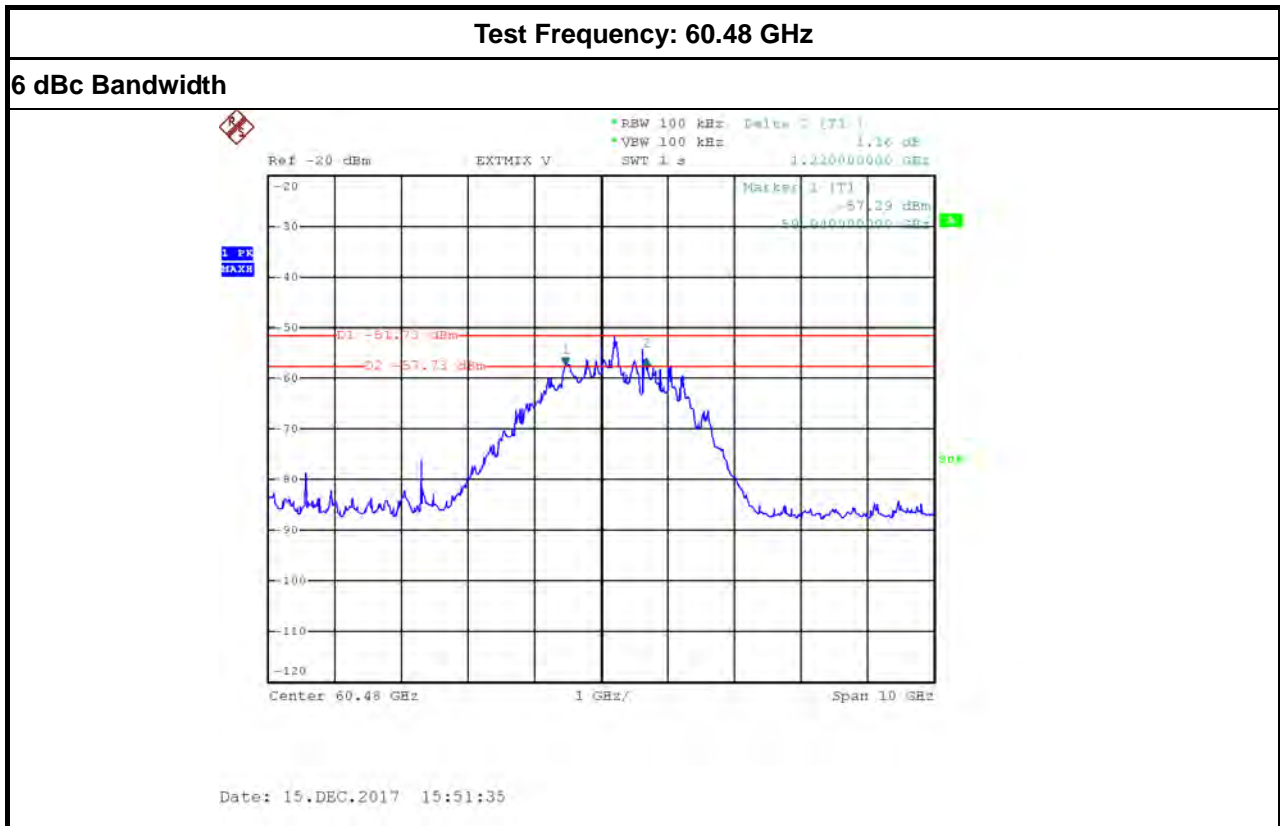
3.2.5 Test Result of Occupied Bandwidth

| | |
|---|-------------------------------|
| Test Conditions | see ANSI C63.10, clause 5.11 |
| Test Setup | see ANSI C63.10, clause 6.9.2 |
| <p>NOTE: If equipment having different transmit operating modes (see test report clause 1.1.2), the measurements are uninfluenced by different transmit operating modes, may not need to be repeated for all the operating modes. Similar, if the equipment supports different modulations and/or data rates, the measurements described in ANSI C63.10, clause 5.11 may not need to be repeated for all these modulations and data rates. Simple comparison of engineering test across all operating modes, modulations and data rates may need to be performed to define the worse case combination to be used for the conformance testing. Refer as ANSI C63.10, clause 15, observe and record with plotted graphs or photographs the worst-case (i.e., widest) occupied bandwidth produced by these different modulation sources.</p> | |

| | | | | |
|-----------------------------|----------------------------------|-------------------------------------|-----------------------------------|------------------------|
| Temp | 22°C | Humidity | 54% | |
| Test Engineer | Gary Chu | | | |
| Test Results | | | | |
| Test Freq. (GHz) | 6 dBc Bandwidth (MHz) | Occupied Bandwidth (MHz) | 26 dBc Bandwidth (MHz) | Limit (MHz) |
| 60.48 | 1220.00 | 4510.00 | 7520.00 | N/A |



3.2.5.1 Bandwidth Plots





3.3 EIRP Power

3.3.1 Limit of EIRP Power

| EIRP Power Limit | | |
|---|--------------------|-----------------|
| Use Condition | EIRP Average Power | EIRP Peak Power |
| Fixed field disturbance sensors at within the frequency band 61-61.5GHz | 40 dBm | 43 dBm |
| Fixed field disturbance sensors at outside of the band 61-61.5GHz | 10 dBm | 13 dBm |
| Except fixed field disturbance sensors at 61-61.5GHz | N/A | 10 dBm |
| Except fixed field disturbance sensors(indoor) | 40 dBm | 43 dBm |
| Except fixed field disturbance sensors(outdoor) | 82 dBm | 85 dBm |

NOTE: For the applicable limit, see FCC 15.255 (b)

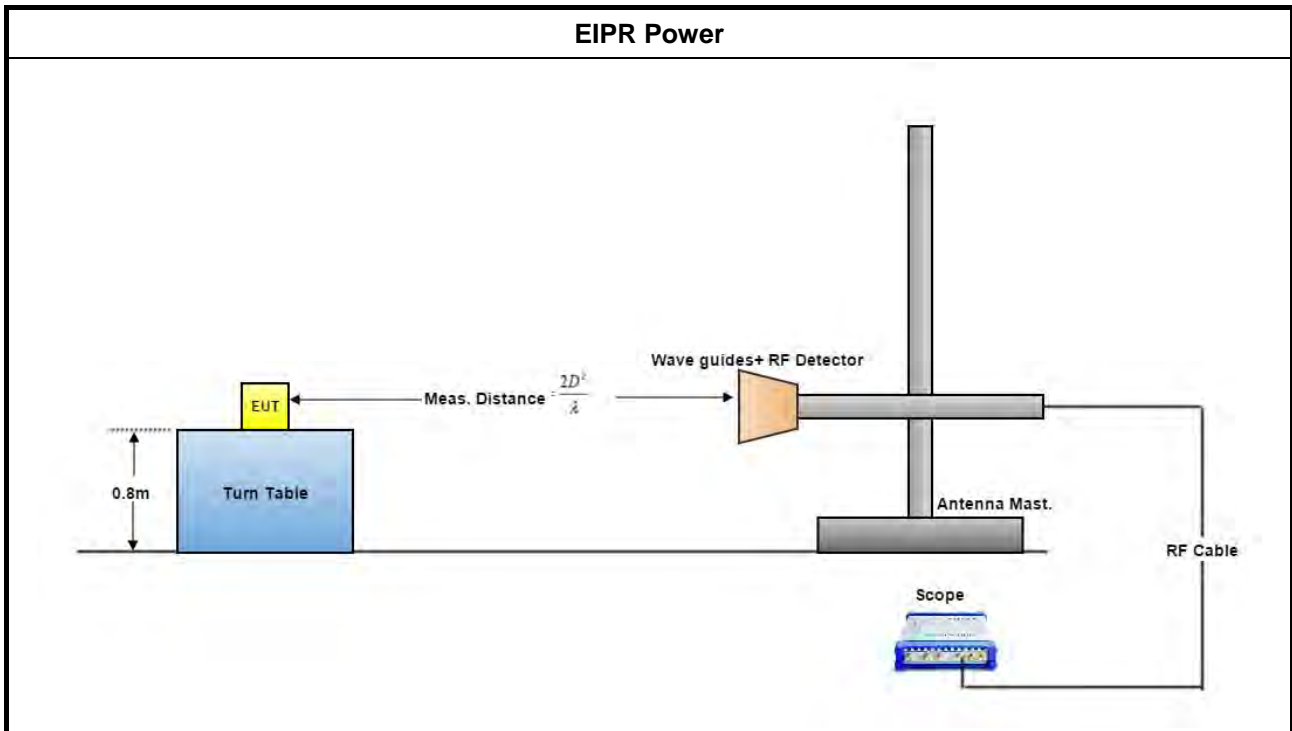
3.3.2 Measuring Instruments

Refer a measuring instruments list in this test report.

3.3.3 Test Procedures

Method of measurement: Refer as ANSI C63.10-2013 clause 9.3 & 9.5.

3.3.4 Test Setup



3.3.5 Test Result of EIRP Power

| | |
|---|---|
| Test Conditions | see ANSI C63.10, clause 5.11 & clause 9 |
| Test Setup | see ANSI C63.10, clause 9.11 |
| <p>NOTE: If the equipment supports different modulations and/or data rates, the measurements described in ANSI C63.10, clause 5.11 may not need to be repeated for all these modulations and data rates. Simple comparison of engineering test across all operating modes, modulations and data rates may need to be performed to define the worst case combination to be used for the conformance testing.</p> | |



3.3.5.1 Test Result of EIRP Power

| | | | |
|---------------|-----------------------------|---------------|-------|
| Temp | 22°C | Humidity | 54% |
| Test Engineer | Gary Chu | Test Distance | 0.5 m |
| Test Date | Dec. 14, 2017~Dec. 15, 2017 | | |

| Test Results | | | | | | | | | | | |
|---------------------|------------------|-------------|-------|----------------------------|--------|-------------------------------|--------|---------------|-------|------------------------------|----|
| Test Freq. (GHz) | RX Gain (dBi) | DSO (mV) | | Power Measured (dBm) | | E _{Meas} (dBuV/m) | | EIRP (dBm) | | EIRP Limit (dBm) (note 1) | |
| | | Peak | AV | Peak | AV | Peak | AV | Peak | AV | Peak | AV |
| 60.48 | 23 | 1.56 | 0.338 | -31.36 | -40.15 | 118.53 | 109.74 | 7.71 | -1.08 | 43 | 40 |

The measured power level is converted to EIRP using the Friis equation:
 For radiated emissions, calculate the field strength (E) in dBµV/meter.
 $E = 126.8 - 20\log(\lambda) + P - G$
 where:
 E : is the field strength of the emission at the measurement distance, in dBµV/m
 P : is the power measured at the output of the test antenna, in dBm
 λ : is the wavelength of the emission under investigation [300/fMHz], in m
 G : is the gain of the test antenna, in dBi For radiated emissions, calculate the EIRP (dBm). If the measurement was performed in the far field, calculate the EIRP.
 $EIRP = E-meas + 20\log(d-meas) - 104.7$
 where:
 EIRP : is the equivalent isotopically radiated power, in dBm
 E-meas. : is the field strength of the emission at the measurement distance, in dBµV/m
 d-meas. : is the measurement distance, in m
 NOTE 1: For the applicable limit, see FCC 15.255 (b)
 NOTE 2: The comparison method which replaces EUT with a signal generator is used to find the correct conversion factor between “DSO(mV)” & “Power Measured(dBm)”.



3.4 Peak Conducted Power

3.4.1 Limit of Peak Conducted Power

| Peak Conducted Power Limit | |
|---|-------------------------------|
| 6dBc Bandwidth | Peak Conducted Power (note 1) |
| > 100MHz | 500mW |
| ≤ 100MHz | 500mW x (BW/100) (see note 2) |
| NOTE 1: For the applicable limit, see FCC 15.255(d) | |
| NOTE 2: BW= 6dB bandwidth (measured at RBW 100kHz) | |

3.4.2 Measuring Instruments

Refer a measuring instruments list in this test report.

3.4.3 Test Procedures

Method of measurement: Refer as ANSI C63.10-2013, clause 9.5

3.4.4 Test Result of Peak Conducted Power

| | |
|--|---|
| Test Conditions | see ANSI C63.10, clause 5.11 & clause 9 |
| Test Setup | see ANSI C63.10, clause 9.11 |
| NOTE: If the equipment supports different modulations and/or data rates, the measurements described in ANSI C63.10, clause 5.11 may not need to be repeated for all these modulations and data rates. Simple comparison of engineering test across all operating modes, modulations and data rates may need to be performed to define the worst case combination to be used for the conformance testing. | |



3.4.4.1 Peak Conducted Power

| Temp | 22°C | Humidity | 54% | | | |
|---|-------------------------------|----------------------------|--------------------------------|--------------------|-----------------------------|-------------------------------------|
| Test Engineer | Gary Chu | | | | | |
| Test Date | Dec. 14, 2017 ~ Dec. 15, 2017 | | | | | |
| Test Results | | | | | | |
| Test Freq. (GHz) | EIRP (dBm) | Max. Ant. Gain (dBi) | Peak Power (dBm) (note1) | Peak Power (mW) | 6dBc BW (MHz) (note2) | Peak Power Limit (mW) (note3) |
| 60.48 | 7.71 | 0 | 7.71 | 5.901 | 1220 | 500 |
| NOTE 1: Because EUT used for the integral antenna without temporary RF connector provided. Therefore peak conducted power is equal to EIRP power subtract the antenna gain. | | | | | | |
| NOTE 2: For the 6dBc bandwidth, see test report clause 3.2.5. | | | | | | |
| NOTE 3: For the applicable limit, see FCC 15.255(d) | | | | | | |
| NOTE 4: For radiated emission measurements, calculate conducted transmitter output power P(cond)(dBm) $P(\text{cond}) = \text{EIRP} - G(\text{dBi})$ where: G(dBi) is gain of EUT antenna. | | | | | | |



3.5 Transmitter Spurious Emissions

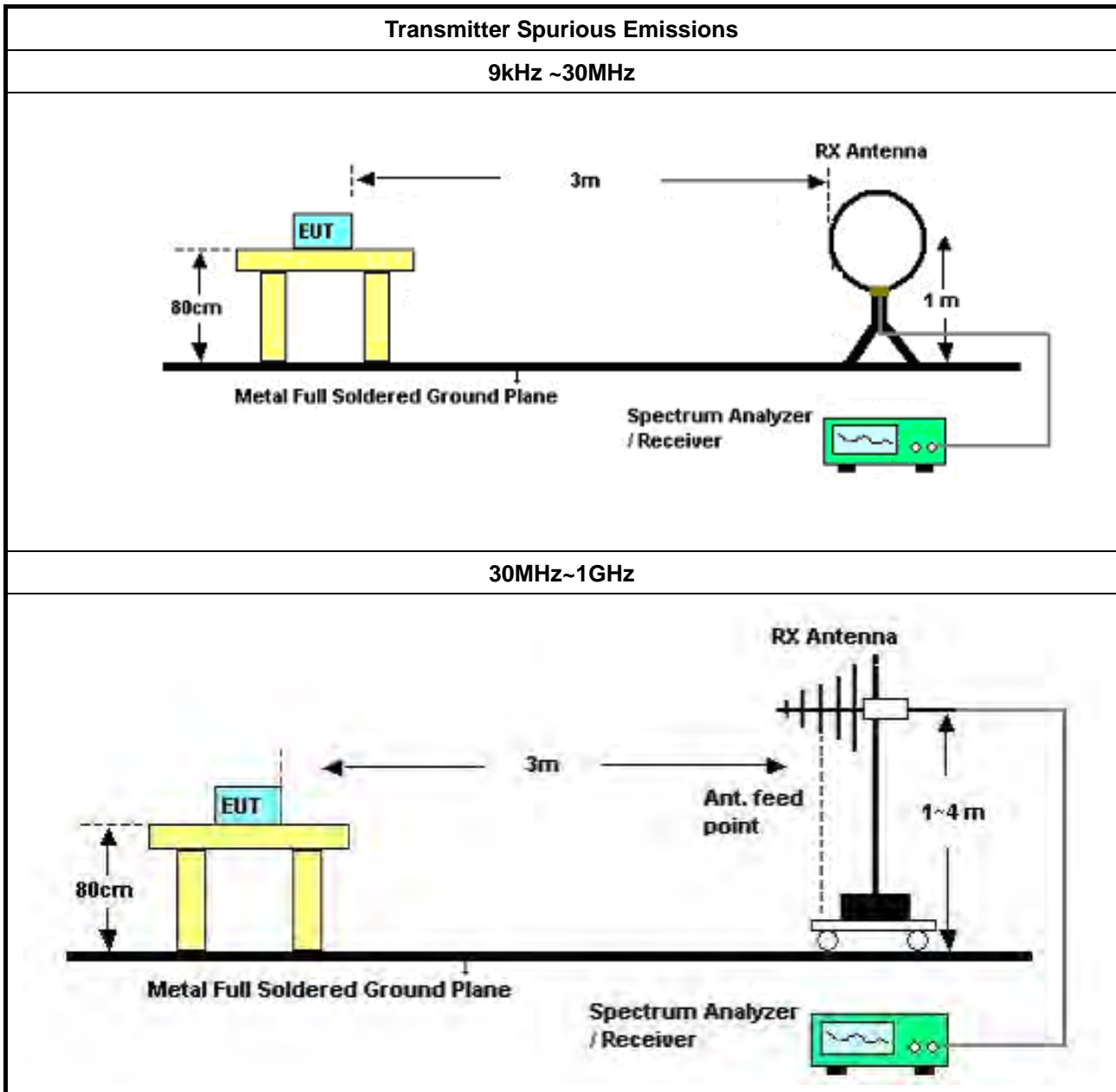
3.5.1 Limit of Transmitter Spurious Emissions

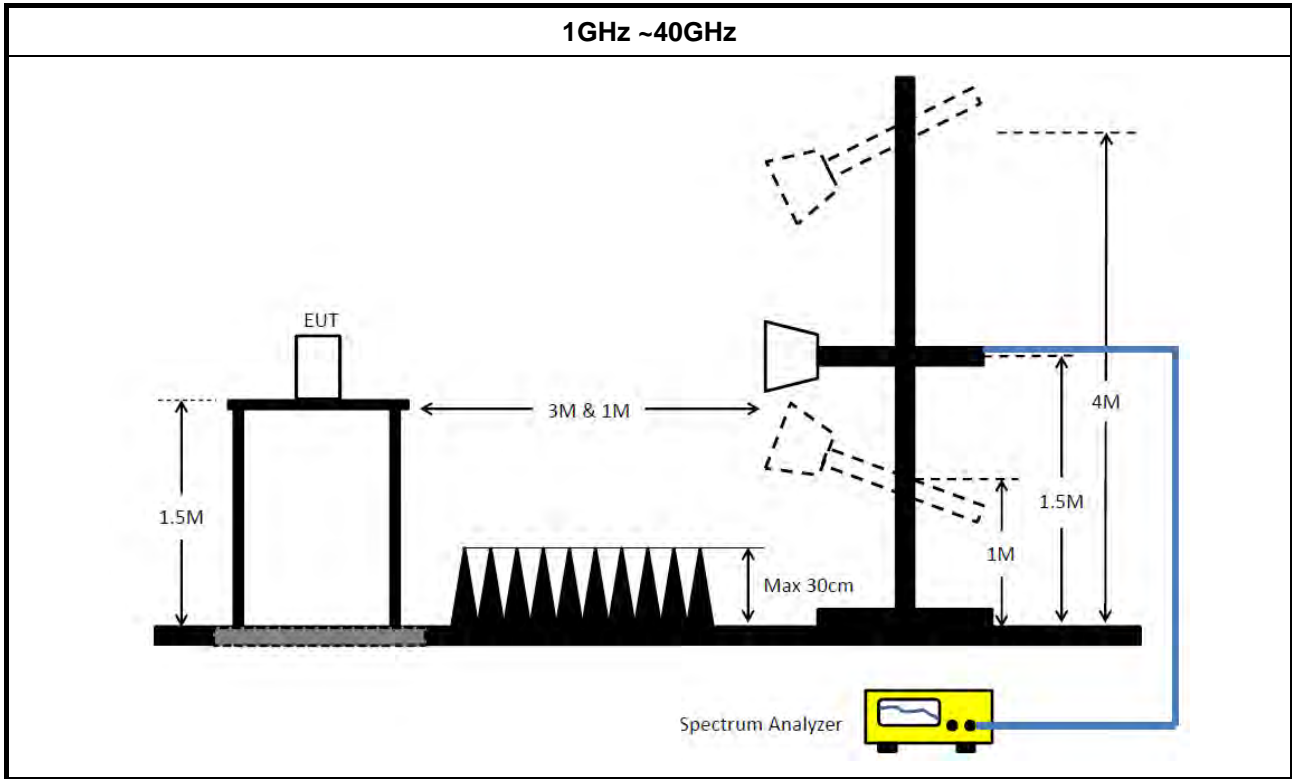
| Frequency Range | Limit |
|--|--|
| Radiated emissions below 40 GHz | FCC 15.209 |
| Radiated emissions above 40 GHz – 200GHz | 90 pW/cm ² @ 3 m (Equivalent EIRP 102 μW, -9.91dBm) |
| NOTE 1: For the applicable limit, see FCC 15.255(d) | |
| NOTE 2: Spurious emissions shall not exceed the level of the fundamental emission. | |

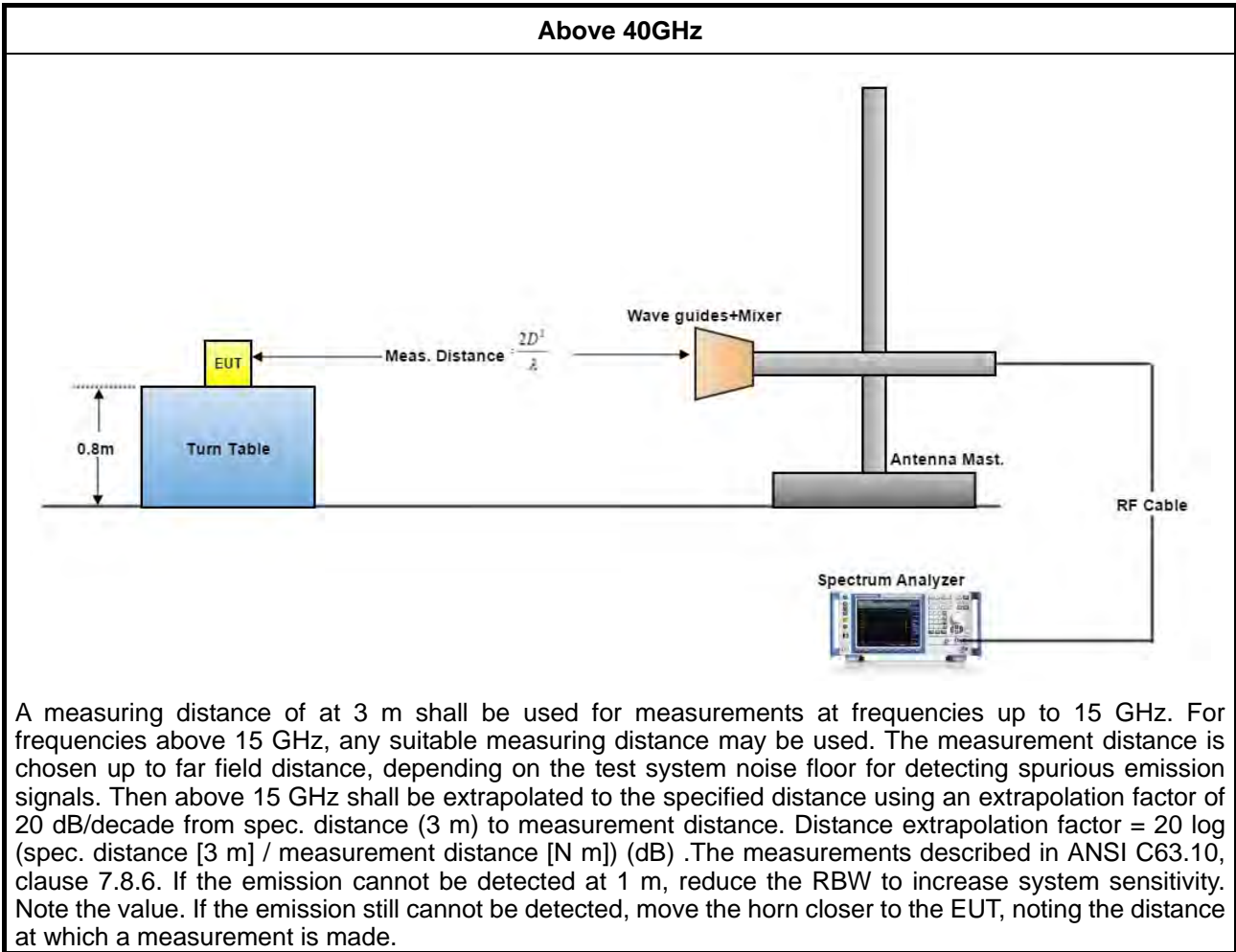
3.5.2 Test Procedures

Method of measurement: Refer as ANSI C63.10-2013, clause 9.12

3.5.3 Test Setup







3.5.4 Test Result of Transmitter Spurious Emissions

| | |
|--|---|
| Test Conditions | see ANSI C63.10, clause 5.11 & clause 9 |
| Test Setup | see ANSI C63.10, clause 9.12 ~ 9.13 |
| NOTE: If equipment having different channel plan and nominal channel bandwidth modes (see test report clause 1.1.1), the measurements are uninfluenced by different channel plan and nominal channel bandwidth modes, may not need to be repeated for all modes. | |

3.5.4.1 Test Result of Transmitter Spurious Emissions (Below 30MHz)

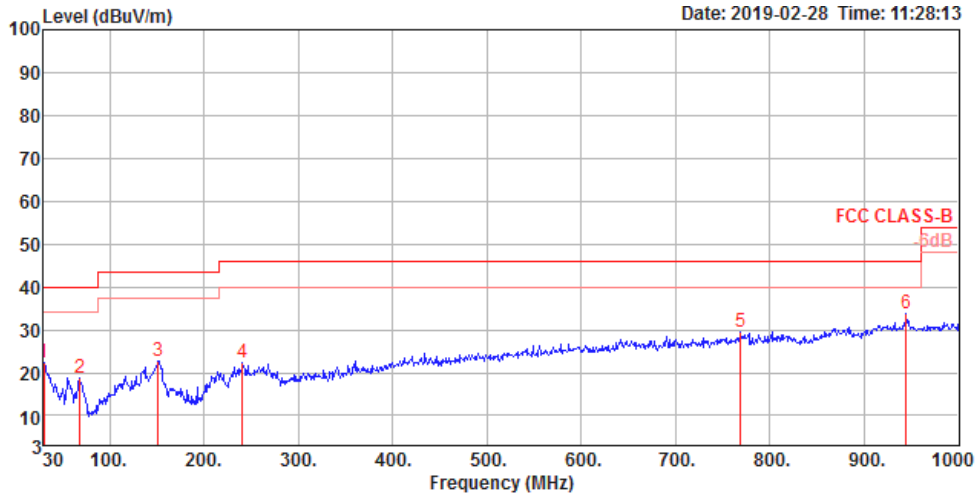
All amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported.



3.5.4.2 Test Result of Transmitter Spurious Emissions

| | | | |
|---------------|-------------------|--------------------|---------|
| Temp | 22°C~24°C | Humidity | 50%~60% |
| Test Engineer | RH Huang | Test Distance | 3 m |
| Test Range | 30 MHz – 1000 MHz | Test Configuration | CTX |

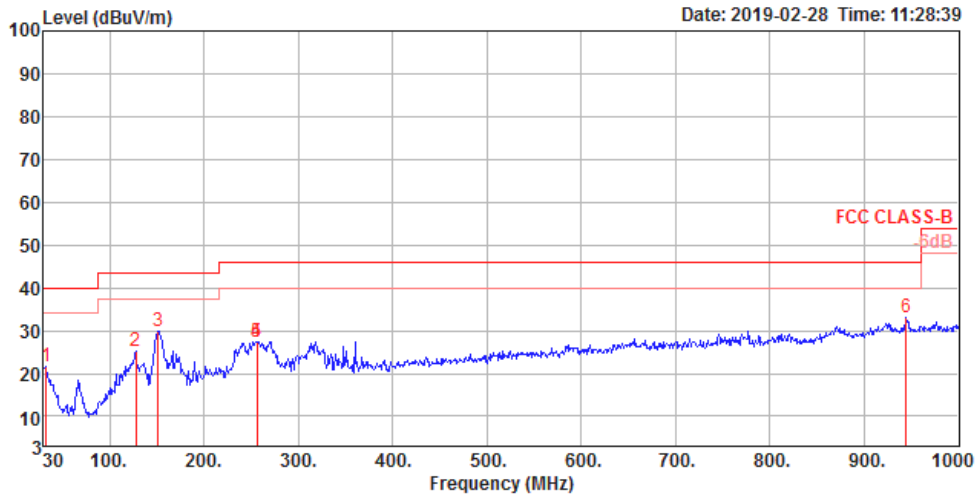
Vertical



| | Freq | Level | Limit | Over | Read | CableAntenna | Preamp | A/Pos | T/Pos | Remark | Pol/Phase |
|---|--------|--------|--------|--------|-------|--------------|--------|-------|-------|----------|-----------|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | |
| 1 | 30.00 | 22.47 | 40.00 | -17.53 | 30.18 | 0.67 | 24.23 | 32.61 | 150 | 345 Peak | VERTICAL |
| 2 | 68.80 | 18.79 | 40.00 | -21.21 | 38.16 | 1.17 | 12.03 | 32.57 | 200 | 162 Peak | VERTICAL |
| 3 | 151.25 | 22.85 | 43.50 | -20.65 | 37.13 | 1.89 | 16.34 | 32.51 | 200 | 276 Peak | VERTICAL |
| 4 | 240.49 | 22.21 | 46.00 | -23.79 | 34.92 | 2.56 | 17.19 | 32.46 | 100 | 206 Peak | VERTICAL |
| 5 | 769.14 | 29.37 | 46.00 | -16.63 | 30.81 | 5.44 | 25.51 | 32.39 | 125 | 297 Peak | VERTICAL |
| 6 | 944.71 | 33.64 | 46.00 | -12.36 | 32.34 | 6.29 | 26.41 | 31.40 | 150 | 247 Peak | VERTICAL |



Horizontal



| | Freq | Level | Limit | Over | Read | CableAntenna | Preamp | A/Pos | T/Pos | Remark | Pol/Phase |
|---|--------|--------|--------|--------|-------|--------------|--------|-------|-------|--------|--------------------|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | |
| 1 | 32.91 | 21.55 | 40.00 | -18.45 | 30.97 | 0.67 | 22.51 | 32.60 | 125 | 360 | Peak HORIZONTAL |
| 2 | 127.97 | 25.24 | 43.50 | -18.26 | 38.16 | 1.76 | 17.84 | 32.52 | 300 | 360 | Peak HORIZONTAL |
| 3 | 151.25 | 29.96 | 43.50 | -13.54 | 44.24 | 1.89 | 16.34 | 32.51 | 200 | 161 | Peak HORIZONTAL |
| 4 | 256.01 | 27.50 | 46.00 | -18.50 | 38.33 | 2.67 | 18.96 | 32.46 | 150 | 96 | Peak HORIZONTAL |
| 5 | 256.01 | 27.50 | 46.00 | -18.50 | 38.33 | 2.67 | 18.96 | 32.46 | 150 | 96 | Peak HORIZONTAL |
| 6 | 944.71 | 33.14 | 46.00 | -12.86 | 31.84 | 6.29 | 26.41 | 31.40 | 150 | 122 | Peak HORIZONTAL |



| | | | |
|----------------------|----------------|-------------------------|-------|
| Temp | 22°C | Humidity | 54% |
| Test Engineer | DK Chang | Test Distance | 3 m |
| Test Range | 1 GHz – 40 GHz | Test Freq. (GHz) | 60.48 |
| Test Date | Dec. 14, 2017 | | |

Vertical

| | Freq | Level | Limit Line | Over Limit | Read Level | CableAntenna Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---------|--------|------------|------------|------------|-------------------|----------------|---------------|-------|-------|---------|-----------|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 3499.11 | 45.70 | 74.00 | -28.30 | 43.40 | 7.31 | 28.70 | 33.71 | 230 | 158 | Peak | VERTICAL |
| 2 | 3500.40 | 32.61 | 54.00 | -21.39 | 30.31 | 7.31 | 28.70 | 33.71 | 230 | 158 | Average | VERTICAL |

Horizontal

| | Freq | Level | Limit Line | Over Limit | Read Level | CableAntenna Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---------|--------|------------|------------|------------|-------------------|----------------|---------------|-------|-------|---------|------------|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 3504.00 | 33.23 | 54.00 | -20.77 | 30.89 | 7.32 | 28.72 | 33.70 | 168 | 113 | Average | HORIZONTAL |
| 2 | 3504.40 | 45.72 | 74.00 | -28.28 | 43.38 | 7.32 | 28.72 | 33.70 | 168 | 113 | Peak | HORIZONTAL |



| | | | |
|----------------------|----------------|------------------|---------------|
| Temp | 22°C | Humidity | 54% |
| Test Engineer | DK Chang | Test Date | Dec. 14, 2017 |
| Test Range | 40GHz – 200GHz | | |

| Test Frequency (GHz) | Rx Antenna Gain (dBi) | Measurement Distance (m) | Read Worse Frequency (GHz) | Read Level (dBm) |
|----------------------|----------------------------|-------------------------------------|-----------------------------|------------------|
| 60.48 | 23 | 0.5 | 48.09 | -81.71 |
| EIRP (dBm) | Specification Distance (m) | Power Density (pW/cm ²) | Limit (pW/cm ²) | Test Result |
| -44.65 | 3 | 0.0303 | 90 | Complied |

Note:
 $EIRP = Prx - Grx + \text{Free Space Path Loss} = Prx - Grx + 20\text{Log}(4\pi d / \lambda)^2$
 Which
 $Prx = \text{Read Level.}$
 $Grx = \text{Rx Antenna Gain.}$
 A distance factor is offset and the formula is $20\text{LOG}(D1/D2)$
 Which
 $D1 = \text{Specification Distance}$
 $D2 = \text{Measurement Distance}$

3.6 Frequency Stability

3.6.1 Limit of Frequency Stability

| Frequency Stability | Limit |
|---|----------------------------|
| Refer as FCC 15.255(f) and ANSI C63.10-2013, clause 9.14 | within the frequency bands |
| Note: These measurements shall also be performed at normal and extreme test conditions. | |

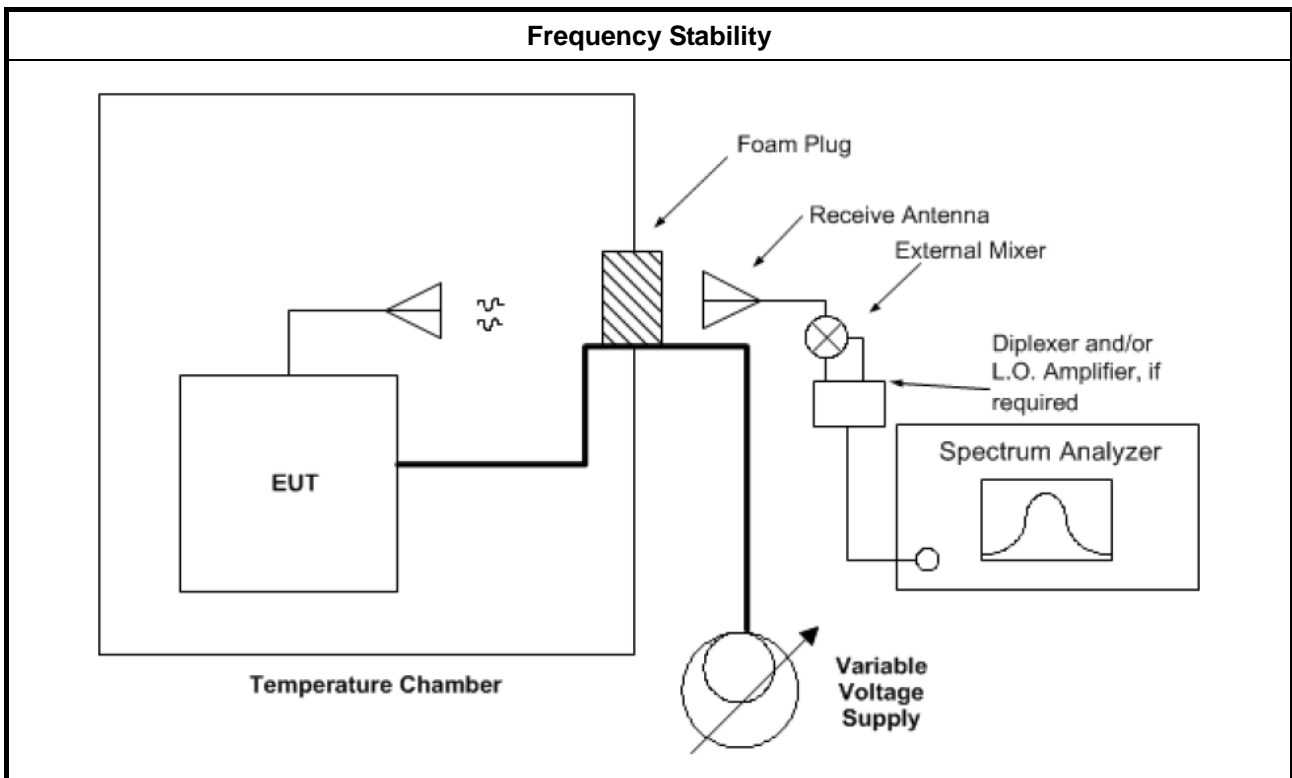
3.6.2 Measuring Instruments

Refer a measuring instruments list in this test report.

3.6.3 Test Procedures

Method of measurement: Refer as ANSI C63.10-2013, clauses 9.14.

3.6.4 Test Setup





3.6.5 Test Result of Frequency Stability

| | |
|--|---|
| Test Conditions | see ANSI C63.10, clause 5.11 & clause 9 |
| Test Setup | see ANSI C63.10, clause 9.14 |
| NOTE: If equipment having different channel plan and nominal channel bandwidth modes (see test report clause 1.1.1), the measurements are uninfluenced by different channel plan and nominal channel bandwidth modes, may not need to be repeated for all modes. | |

3.6.5.1 Frequency Stability with Respect to Ambient Temperature

| Frequency Stability with Respect to Ambient Temperature | | | |
|---|--------------------------|-----------------------|-------------------------------|
| Temp | 22°C | Humidity | 54% |
| Test Engineer | Gary Chu | Test Date | Dec. 14, 2017 ~ Dec. 15, 2017 |
| Test Results | | | |
| Test Temperature (°C) | Measured Frequency (MHz) | Delta Frequency (kHz) | Limit (±kHz) |
| -5 | 60479.6181 | 263.70 | within band |
| 0 | 60479.6953 | 340.90 | within band |
| 10 | 60479.4824 | 128.00 | within band |
| 20 | 60479.3544 | Reference | within band |
| 30 | 60479.5327 | 178.31 | within band |
| 35 | 60479.5771 | 222.70 | within band |
| NOTE: The manufacturer's specified temperature range of -5 to 35°C. | | | |



3.6.5.2 Frequency Stability When Varying Supply Voltage

| Frequency Stability When Varying Supply Voltage | | | |
|---|--------------------------|-----------------------|-------------------------------|
| Temp | 22°C | Humidity | 54% |
| Test Engineer | Gary Chu | Test Date | Dec. 14, 2017 ~ Dec. 15, 2017 |
| Test Results | | | |
| Test Voltage: (Vac) | Measured Frequency (MHz) | Delta Frequency (kHz) | Limit (±kHz) |
| 102 | 60479.5741 | 142.60 | within band |
| 120 | 60479.4315 | Reference | within band |
| 138 | 60479.5917 | 160.20 | within band |



3.7 Operation Restriction and Group Installation

3.7.1 Limit of Operation Restriction and Group Installation

| Item | Limit |
|-----------------------|---|
| Operation Restriction | Operation is not permitted for the following products: <ul style="list-style-type: none">♦ Equipment used on aircraft or satellites. (Refer as FCC 15.255 (a))♦ Field disturbance sensors, including vehicle radar systems, unless the field disturbance sensors are employed for fixed operation. (Refer as FCC 15.255 (a)) |
| Group Installation | Operation is not permitted for the following products: <ul style="list-style-type: none">♦ External phase-locking (Refer as FCC 15.255(g)) |

3.7.2 Result of Operation Restriction

Manufacturer declares that EUT will not be used on aircraft or satellites. Then user manual will include a statement to caution EUT is not permitted for use on aircraft or satellites. EUT is a wireless video area network (WVAN) for the connection of consumer electronic (CE) audio and video devices.

3.7.3 Result of Group Installation

The frequency, amplitude and phase of the transmit signal are set within the EUT. There are no external phase-locking inputs or any other means of combining two or more units together to realize a beam-forming array.



4 Test Equipment and Calibration Data

| Instrument | Manufacturer | Model No. | Serial No. | Characteristics | Calibration Date | Calibration Due Date | Remark |
|-----------------------------------|--------------|----------------------|-------------------|-----------------|------------------|----------------------|-----------------------|
| EMI Receiver | Agilent | N9038A | My52260123 | 9kHz ~ 8.45GHz | Jan. 28, 2019 | Jan. 29, 2020 | Conduction (CO01-CB) |
| LISN | F.C.C. | FCC-LISN-50-1 6-2 | 04083 | 150kHz ~ 100MHz | Dec. 24, 2018 | Dec. 23, 2019 | Conduction (CO01-CB) |
| LISN | Schwarzbeck | NSLK 8127 | 8127647 | 9kHz ~ 30MHz | Jan. 11, 2019 | Jan. 10, 2020 | Conduction (CO01-CB) |
| COND Cable | Woken | Cable | Low cable-CO01 | 150kHz ~ 30MHz | May 22, 2018 | May 21, 2019 | Conduction (CO01-CB) |
| Software | Audix | E3 | 6.120210n | - | N.C.R. | N.C.R. | Conduction (CO01-CB) |
| BILOG ANTENNA with 6dB Attenuator | TESEQ & EMCI | CBL6112D & N-6-06 | 37880 & AT-N0609 | 20MHz ~ 2GHz | Aug. 27, 2018 | Aug. 26, 2019 | Radiation (03CH01-CB) |
| Loop Antenna | Teseq | HLA 6120 | 24155 | 9kHz - 30 MHz | Mar. 16, 2016* | Mar. 15, 2018* | Radiation (03CH01-CB) |
| Horn Antenna | EMCO | 3115 | 00075790 | 750MHz ~ 18GHz | Nov. 20, 2017 | Nov. 19, 2018 | Radiation (03CH01-CB) |
| Horn Antenna | Schwarzbeck | BBHA 9170 | BBHA9170252 | 15GHz ~ 40GHz | Jul. 05, 2017 | Jul. 04, 2018 | Radiation (03CH01-CB) |
| Pre-Amplifier | EMCI | EMC330N | 980332 | 20MHz ~ 3GHz | May 02, 2018 | May 01, 2019 | Radiation (03CH01-CB) |
| Pre-Amplifier | Agilent | 8449B | 3008A02310 | 1GHz ~ 26.5GHz | Jan. 16, 2017 | Jan. 15, 2018 | Radiation (03CH01-CB) |
| Pre-Amplifier | MITEQ | TTA1840-35-HG | 1864479 | 18GHz ~ 40GHz | Jul. 10, 2017 | Jul. 09, 2018 | Radiation (03CH01-CB) |
| Spectrum Analyzer | R&S | FSP40 | 100056 | 9kHz ~ 40GHz | Nov. 23, 2017 | Nov. 22, 2018 | Radiation (03CH01-CB) |
| Spectrum Analyzer | R&S | FSP40 | 100056 | 9kHz ~ 40GHz | Jan. 31, 2019 | Jan. 30, 2020 | Radiation (03CH01-CB) |
| EMI Test Receiver | R&S | ESCS | 100359 | 9kHz ~ 2.75GHz | Jul. 03, 2018 | Jul. 02, 2019 | Radiation (03CH01-CB) |
| RF Cable-low | Woken | Low Cable-16+17 | N/A | 30 MHz ~ 1 GHz | Oct. 08, 2018 | Oct. 07, 2019 | Radiation (03CH01-CB) |
| RF Cable-high | Woken | High Cable-16 | N/A | 1 GHz ~ 18 GHz | Oct. 11, 2017 | Oct. 10, 2018 | Radiation (03CH01-CB) |



| Instrument | Manufacturer | Model No. | Serial No. | Characteristics | Calibration Date | Calibration Due Date | Remark |
|----------------------------|------------------|------------------|--------------|-----------------|------------------|----------------------|-----------------------|
| RF Cable-high | Woken | High Cable-16+17 | N/A | 1 GHz ~ 18 GHz | Oct. 11, 2017 | Oct. 10, 2018 | Radiation (03CH01-CB) |
| RF Cable-high | Woken | High Cable-40G#1 | N/A | 18GHz ~ 40 GHz | Oct. 11, 2017 | Oct. 10, 2018 | Radiation (03CH01-CB) |
| RF Cable-high | Woken | High Cable-40G#2 | N/A | 18GHz ~ 40 GHz | Oct. 11, 2017 | Oct. 10, 2018 | Radiation (03CH01-CB) |
| Test Software | Audix | E3 | 6.2009-I0-7 | N/A | N/A | N/A | Radiation (03CH01-CB) |
| Mixer | OML | M19HW/A | U91113-1 | 40 ~ 60 GHz | Oct. 12, 2017 | Oct. 11, 2018 | Radiation (03CH01-CB) |
| Mixer | OML | M15HW/A | V91113-1 | 50 ~ 75 GHz | Oct. 12, 2017 | Oct. 11, 2018 | Radiation (03CH01-CB) |
| Mixer | OML | M12HW/A | E91113-1 | 60 ~ 90 GHz | Oct. 12, 2017 | Oct. 11, 2018 | Radiation (03CH01-CB) |
| Mixer | OML | M08HW/A | F91113-1 | 90 ~ 140 GHz | Oct. 12, 2017 | Oct. 11, 2018 | Radiation (03CH01-CB) |
| Mixer | OML | M05HW/A | G91113-1 | 140 ~ 220 GHz | Oct. 12, 2017 | Oct. 11, 2018 | Radiation (03CH01-CB) |
| Standard Horn Antenna | Custom Microwave | M19RH | U91113-A | 40 ~ 60 GHz | N.C.R. | N.C.R. | Radiation (03CH01-CB) |
| Standard Horn Antenna | Custom Microwave | M15RH | V91113-A | 50 ~ 75 GHz | N.C.R. | N.C.R. | Radiation (03CH01-CB) |
| Standard Horn Antenna | Custom Microwave | M12RH | E91113-A | 60 ~ 90 GHz | N.C.R. | N.C.R. | Radiation (03CH01-CB) |
| Standard Horn Antenna | Custom Microwave | M08RH | F91113-A | 90 ~ 140 GHz | N.C.R. | N.C.R. | Radiation (03CH01-CB) |
| Standard Horn Antenna | Custom Microwave | M05RH | G91113-A | 140 ~ 220 GHz | N.C.R. | N.C.R. | Radiation (03CH01-CB) |
| Detector | Millitech | DET-15-RPFW0 | #A16473(067) | 50 ~ 75 GHz | Mar. 06, 2017 | Mar. 05, 2018 | Radiation (03CH01-CB) |
| Pico Scope | Pico | Pico Scope 6402C | CX372/002 | N/A | Jul. 26, 2017 | Jul. 25, 2018 | Radiation (03CH01-CB) |
| Temp. and Humidity Chamber | Ten Billion | TTH-D3SP | TBN-931011 | -30~100 degree | Jun. 02, 2017 | Jun. 01, 2018 | Conducted (TH01-CB) |

Note: Calibration Interval of instruments listed above is one year.

*Calibration Interval of instruments listed above is two year.

N.C.R. means Non-Calibration required.



5 Measurement Uncertainty

| Test Items | Uncertainty | Remark |
|--------------------------------------|-------------|--------------------------|
| Conducted Emission (150kHz ~ 30MHz) | 2.0 dB | Confidence levels of 95% |
| Radiated Emission (30MHz ~ 1,000MHz) | 3.6 dB | Confidence levels of 95% |
| Radiated Emission (1GHz ~ 18GHz) | 3.7 dB | Confidence levels of 95% |
| Radiated Emission (18GHz ~ 40GHz) | 3.5 dB | Confidence levels of 95% |
| Radiated Emission (40GHz ~ 220GHz) | 4.7 dB | Confidence levels of 95% |
| Temperature | 0.7°C | Confidence levels of 95% |