



**FCC PART 15 SUBPART C
ISED RSS-247 ISSUE 2**

TEST REPORT

For

RFID Module

MODEL NUMBER: TRW-USM-10

REPORT NUMBER: UL20221202-000943-WFC

FCC ID: BJIOH0007
IC ID: 1004C-MS0001

ISSUE DATE: 7 March 2023

Prepared for

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Prepared by

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Revision History

| <u>Rev.</u> | <u>Issue Date</u> | <u>Revisions</u> | <u>Revised By</u> |
|-------------|-------------------|------------------|-------------------|
| 0 | 3/7/2023 | Initial Issue | - |
| | | | |

**Summary of Test Results**

| Clause | Test Items | FCC Requirements | Test Results |
|--------|----------------------------|--------------------------------------------------------------------------|--------------|
| 1 | Radiated Spurious Emission | FCC 15.247 (d) FCC 15.209 RSS-247 Clause 5.5 RSS-GEN Clause 8.9 | Pass |
| 2 | Peak Output Power | FCC 15.247(b) ISED RSS-247 5.4 | Pass |



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1. ATTESTATION OF TEST RESULTS

Applicant Information

Company Name: Toshiba Tec Singapore Pte Ltd
Address: 2 Ang Mo Kio St 62 Singapore 569138 Singapore

Manufacturer Information

Company Name: PT. Tec Indonesia
Address: Lot 108-110 Batamindo Industrial Park Muka Kuning Batam Riau 29433 Indonesia

EUT Description

EUT Name: RFID Module
Wireless Module: Radio Frequency Identification (RFID) module
Model: TRW-USM-10
Brand Name: TOSHIBA
Sample Status: Mass-production
Sample ID: 2322T520010
Sample Received Date: November 24, 2022
Date of Tested: November 24, 2022 - December 31, 2022

| APPLICABLE STANDARDS | |
|------------------------------------------------------------------------------|--------------|
| STANDARD | TEST RESULTS |
| CFR 47 FCC PART 15 SUBPART C ISED RSS-GEN ISSUE 5 ISED RSS-247 ISSUE 2 | Pass |

Prepared By:

Approved By:

Yu Bin
RF Project Engineer

Lim Kian Meng
Program Manager



2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with 558074 D01 DTS Meas Guidance v05, 414788 D01 Radiated Test Site v01, FCC CFR 47 Part 2, FCC CFR 47 Part 15 and ANSI C63.10-2013.

3. FACILITIES AND ACCREDITATION

| | |
|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Accreditation Certificate | <p>SINGLAS REGISTRATION LA-2009-0450-E</p> <p>FCC REGISTRATION 600804</p> <p>VCCI REGISTRATION R-14163 (RE ≤1GHz) G-10846 (RE ≥1GHz) T-20138 (CE Mains) T-20138 (CE Telecom)</p> <p>ISED CAB Identifier SGAP07</p> |
|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Note: All tests measurement facilities use to collect the measurement data are located at UL INTERNATIONAL-SINGAPORE PTE LTD, 20 KIAN TECK LANE, SINGAPORE 627854. Otherwise, indicated.

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The results reported herein have been performed in accordance with the laboratory's terms of accreditation under the Singapore Accreditation Council.





4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations and is traceable to recognize national standards.

4.2. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

| Test Item | Uncertainty |
|-----------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| Conduction emission | ± 3.83 |
| Radiation Emission test (include Fundamental emission) (30MHz-1GHz) | ± 5.22 |
| Radiation Emission test (include Fundamental emission) (1GHz to 26GHz) | ± 5.48 |
| Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2. | |



5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

| | | |
|---------------------------------|-----------------------|-------------|
| Equipment | RFID Module | |
| EUT Description | RFID Module | |
| Model | TRW-USM-10 | |
| Series Model | N. A | |
| Model Difference | No difference | |
| Radio Technology | RFID | |
| Operation Frequency and Channel | 902.75MHz – 927.25MHz | |
| Modulation | PR-ASK | |
| Data Rate | N. A | |
| Power Supply | Input & Output | DC 5V ± 10% |
| | Battery | N. A |

5.2. MAXIMUM OUTPUT POWER

| Frequency Range (MHz) | Number of Transmit Chains (NTX) | Radio Technology | Frequency (MHz) | No. of Channels | Max PK Conducted Power (dBm) | EIRP (dBm) |
|-----------------------|---------------------------------|------------------|-----------------|-----------------|------------------------------|------------|
| 902 – 928 | 1 | RFID | 902.75 – 927.25 | 50 | 8.8 | -5.2 |

5.3. CHANNEL LIST

| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---------|-----------------|---------|-----------------|---------|-----------------|
| 1 | 902.75 | 21 | 912.75 | 41 | 922.75 |
| 2 | 903.25 | 22 | 913.25 | 42 | 923.25 |
| 3 | 903.75 | 23 | 913.75 | 43 | 923.75 |
| 4 | 904.25 | 24 | 914.25 | 44 | 924.25 |
| 5 | 904.75 | 25 | 914.75 | 45 | 924.75 |
| 6 | 905.25 | 26 | 915.25 | 46 | 925.25 |
| 7 | 905.75 | 27 | 915.75 | 47 | 925.75 |
| 8 | 906.25 | 28 | 916.25 | 48 | 926.25 |
| 9 | 906.75 | 29 | 916.75 | 49 | 926.75 |
| 10 | 907.25 | 30 | 917.25 | 50 | 927.25 |
| 11 | 907.75 | 31 | 917.75 | -/- | -/- |
| 12 | 908.25 | 32 | 918.25 | -/- | -/- |
| 13 | 908.75 | 33 | 918.75 | -/- | -/- |



| | | | | | |
|----|--------|----|--------|-----|-----|
| 14 | 909.25 | 34 | 919.25 | -/- | -/- |
| 15 | 909.75 | 35 | 919.75 | -/- | -/- |
| 16 | 910.25 | 36 | 920.25 | -/- | -/- |
| 17 | 910.75 | 37 | 920.75 | -/- | -/- |
| 18 | 911.25 | 38 | 921.25 | -/- | -/- |
| 19 | 911.75 | 39 | 921.75 | -/- | -/- |
| 20 | 912.25 | 40 | 922.25 | -/- | -/- |

5.4. TEST CHANNEL CONFIGURATION

| RFID | | | |
|-----------------|--------|--------|--------|
| Channel | 1 | 25 | 50 |
| Frequency (MHz) | 902.75 | 914.75 | 927.25 |

5.5. THE WORSE CASE POWER SETTING PARAMETER

| The Worse Case Power Setting Parameter under 902-928MHz Band | | |
|--------------------------------------------------------------|--------------|----------------------|
| Test Mode | Test Channel | Output Power Setting |
| RFID | 1, 25, 50 | Max Output Power |

5.6. DESCRIPTION OF AVAILABLE ANTENNAS

| | | |
|------------------------|-------------------------|-------------------------------------------------------------|
| Antenna Specifications | Frequency | 902 – 928 MHz |
| | Model | SF2049E |
| | Gain | -14 dBi |
| | Type | PCBA |
| | Transmit & Receive Mode | TRX, Chain 1 can be used as transmitting/receiving antenna. |



5.7. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

| Item | Equipment | Brand Name | Model Name | P/N |
|------|-----------|------------|------------|-----|
| 1 | PC | HP | EliteBook | NIL |
| 2 | -/- | -/- | -/- | -/- |

I/O CABLES

| Cable No | Port | Connector Type | Cable Type | Cable Length(m) | Remarks |
|----------|----------|----------------|------------|-----------------|---------|
| 1 | Ethernet | Shielded | 0.3 | NIL | 1 |

ACCESSORY

| Item | Accessory | Brand Name | Model Name | Description |
|------|-----------|------------|------------|-------------|
| 1 | -/- | -/- | -/- | -/- |

TEST MODE

RF continuously transmitting mode

**6. MEASURING INSTRUMENT AND SOFTWARE USED**

| Test Equipment | | | | | |
|-------------------------------------|------------------------------------------------------------------------------------|--------------------------------|-------------------|-------------|-----------|
| Used | Equipment | Manufacturer | Model No. | Serial No. | Due. Date |
| <input checked="" type="checkbox"/> | ESW - EMI Test Receiver 2Hz - 44GHz | R & S | ESW44 | 101838 | 13-Apr-23 |
| <input checked="" type="checkbox"/> | Teseq Bilog Antenna 30MHz – 1GHz | Teseq | CBL6111D | 53627 | 11-Jun-23 |
| <input checked="" type="checkbox"/> | Pre-Amplifier 20MHz – 3GHz | EMC Instruments Corporation | EMC330N | 980553 | 4-Jul-23 |
| <input checked="" type="checkbox"/> | Horn Antenna 1-6GHz | Schwarzbeck | BBHA 9120 D | 1019 | 27-Aug-23 |
| <input checked="" type="checkbox"/> | Pre-Amplifier 1-6GHz | COM-POWER | PAM-6000 | 10030027 | 26-Jan-23 |
| <input checked="" type="checkbox"/> | Horn antenna 3 – 18GHz | Schwarzbeck | BBHA 9120 C | 9120C-519 | 14-Mar-23 |
| <input checked="" type="checkbox"/> | Pre-Amplifier 6.0 – 18.0 GHz | Schwarzbeck | HAP06-18W | B1510452202 | 14-Mar-23 |
| <input checked="" type="checkbox"/> | EPM-P Series Dual- Channel Power Meter 9 kHz to 110 GHz, sensor dependent | Keysight Technologies | E4417A | MY56040009 | 1-Sep-23 |
| <input checked="" type="checkbox"/> | Power Sensor 50MHz to 6GHz, 1.5MHz bandwidth | Keysight Technologies | E9322A | MY62360002 | 25-Sep-23 |
| Software | | | | | |
| Used | Description | Manufacturer | Name | Version | |
| <input checked="" type="checkbox"/> | RSE Test Software | Toyo | Toyo EMI Software | V 6.0.120 | |



7. MEASUREMENT METHODS

| No. | Test Item | KDB Name |
|-----|-----------------------------------------------|--------------------------------------------------------------------|
| 1 | 6dB Bandwidth and 99% Bandwidth | KDB 558074 D01 DTS Meas Guidance v05 and ANSI C63.10-2013 11.8.1 |
| 2 | Peak Output Power | KDB 558074 D01 DTS Meas Guidance v05 and ANSI C63.10-2013 11.9.2.2 |
| 3 | Power Spectral Density | KDB 558074 D01 DTS Meas Guidance v05 and ANSI C63.10-2013 |
| 4 | Out-of-band emissions in non-restricted bands | KDB 558074 D01 DTS Meas Guidance v05 and ANSI C63.10-2013 11.11 |
| 5 | Out-of-band emissions in restricted bands | KDB 558074 D01 DTS Meas Guidance v05 and ANSI C63.10-2013 11.12 |
| 6 | Band-edge | KDB 558074 D01 DTS Meas Guidance v05 and ANSI C63.10-2013 |
| 7 | Conducted Emission Test for AC Power Port | ANSI C63.10-2013 |



8. TEST PROCEDURES AND RESULTS

8.1. NORMAL AND EXTREME CONDITIONS

LIMITS

None; for reporting purposes only.

RESULTS

| | Normal Test Conditions (T _{nom}) | Extreme Test Conditions (T _{ext}) |
|-------------------|--------------------------------------------|---------------------------------------------|
| Relative Humidity | 66.1 % | -/- |
| Temperature | 20.1 °C | -/- |



8.2. PEAK CONDUCTED OUTPUT POWER

LIMITS

| CFR 47 FCC Part15 (15.247) Subpart C ISED RSS-247 ISSUE 2 | | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-----------------------------------|-----------------------|
| Section | Test Item | Limit | Frequency Range (MHz) |
| CFR 47 FCC 15.247(b)(3) ISED RSS-247 5.4 (e) | Peak Output Power | 1 watt or 30dBm (See Note 1/2) | 902 – 928 |
| <p>1. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.</p> <p>2. Limit=30dBm – (Directional gain -6) dBi Directional gain = $10\log [(10^{G1/20} + 10^{G2/20})^2 / N_{ANT}] = 8.01 > 6\text{dBi}$, where the N_{ANT} is the numbers of antenna. So, the power limit shall be reduced to $30 - (8.01-6) = 27.99 \text{ dBm}$</p> | | | |

TEST PROCEDURE

Place the EUT on the table and set it in the transmitting mode.

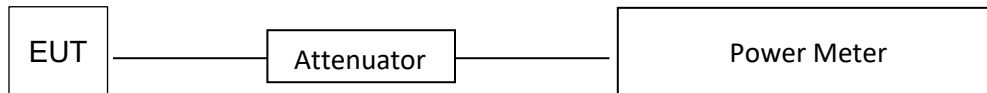
Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the Power sensor.

Measure peak power each channel.

Peak Detector used for Peak result.

AVG Detector used for AVG result.

TEST SETUP



| Test Channel | Maximum Peak Conducted Output Power(dBm) | EIRP (dBm) | Limit (dBm) | Result |
|--------------|------------------------------------------|------------|-------------|--------|
| 1 | 6.8 | -7.3 | 30 | Pass |
| 25 | 8.8 | -5.2 | 30 | Pass |
| 50 | 8.8 | -5.2 | 30 | Pass |



8.3. RADIATED SPURIOUS EMISSION

LIMITS

Please refer to CFR 47 FCC §15.205 and §15.209

Please refer to ISED RSS-GEN Clause 8.9 (Transmitter)

Radiation Disturbance Test Limit for FCC (Class B) (9KHz-1GHz)

| 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 |
| 960~1000 | 500 | 3 |

Note: 1) At frequencies at or above 30 MHz, measurements may be performed at a distance other than what is specified provided: measurements are not made in the near field except where it can be shown that near field measurements are appropriate due to the characteristics of the device; and it can be demonstrated that the signal levels needed to be measured at the distance employed can be detected by the measurement equipment. Measurements shall not be performed at a distance greater than 30 meters unless it can be further demonstrated that measurements at a distance of 30 meters or less are impractical. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse linear-distance for field strength measurements; inverse-linear-distance-squared for power density measurements).

(2) At frequencies below 30 MHz, measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field. Pending the development of an appropriate measurement procedure for measurements performed below 30 MHz, when performing measurements at a closer distance than specified, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade). This paragraph (f) shall not apply to Access BPL devices operating below 30 MHz.

Radiation Disturbance Test Limit for FCC (Above 1G)

| Frequency (MHz) | dB(uV/m) (at 3 meters) | |
|-----------------|------------------------|---------|
| | Peak | Average |
| Above 1000 | 74 | 54 |

FCC Restricted bands of operation:

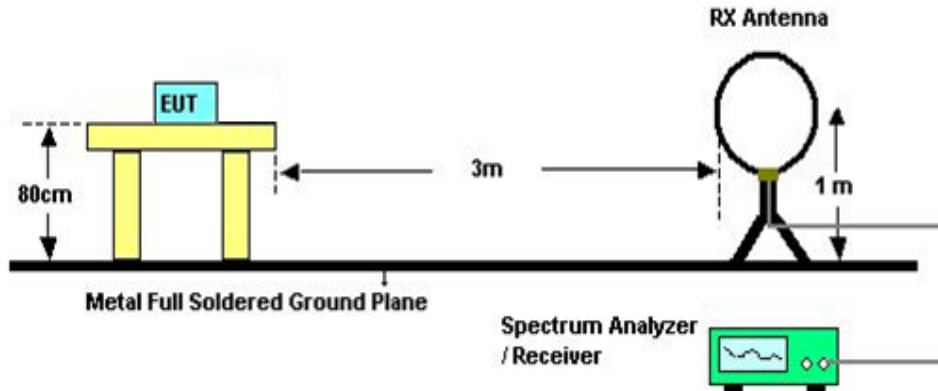
| MHz | MHz | MHz | GHz |
|--------------------------|---------------------|---------------|------------------|
| 0.090-0.110 | 16.42-16.423 | 399.9-410 | 4.5-5.15 |
| ¹ 0.495-0.505 | 16.69475-16.69525 | 608-614 | 5.35-5.46 |
| 2.1735-2.1905 | 16.80425-16.80475 | 960-1240 | 7.25-7.75 |
| 4.125-4.128 | 25.5-25.67 | 1300-1427 | 8.025-8.5 |
| 4.17725-4.17775 | 37.5-38.25 | 1435-1626.5 | 9.0-9.2 |
| 4.20725-4.20775 | 73-74.6 | 1645.5-1646.5 | 9.3-9.5 |
| 6.215-6.218 | 74.8-75.2 | 1660-1710 | 10.6-12.7 |
| 6.26775-6.26825 | 108-121.94 | 1718.8-1722.2 | 13.25-13.4 |
| 6.31175-6.31225 | 123-138 | 2200-2300 | 14.47-14.5 |
| 8.291-8.294 | 149.9-150.05 | 2310-2390 | 15.35-16.2 |
| 8.362-8.366 | 156.52475-156.52525 | 2483.5-2500 | 17.7-21.4 |
| 8.37625-8.38675 | 156.7-156.9 | 2690-2900 | 22.01-23.12 |
| 8.41425-8.41475 | 162.0125-167.17 | 3260-3267 | 23.6-24.0 |
| 12.29-12.293 | 167.72-173.2 | 3332-3339 | 31.2-31.8 |
| 12.51975-12.52025 | 240-285 | 3345.8-3358 | 36.43-36.5 |
| 12.57675-12.57725 | 322-335.4 | 3600-4400 | (²) |
| 13.36-13.41 | | | |

Note: ¹Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

²Above 38.6c

TEST SETUP AND PROCEDURE

Below 30MHz



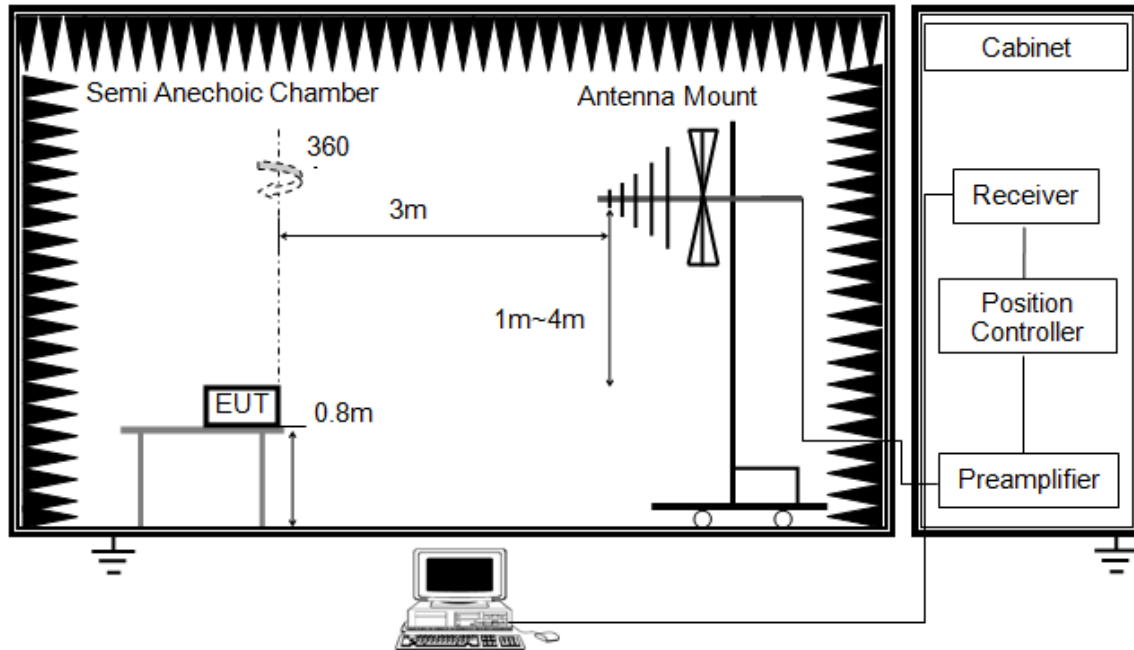
The setting of the spectrum analyser

| | |
|----------|------------------------------------------------------------|
| RBW | 200Hz (From 9kHz to 0.15MHz)/ 9KHz (From 0.15MHz to 30MHz) |
| VBW | 200Hz (From 9kHz to 0.15MHz)/ 9KHz (From 0.15MHz to 30MHz) |
| Sweep | Auto |
| Detector | Peak/QP/ Average |
| Trace | Max hold |

1. The testing follows the guidelines in ANSI C63.10-2013
2. The EUT was arranged to its worst case and then turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both Horizontal, Face-on and Face-off polarizations of the antenna are set to make the measurement.

3. The EUT was placed on a turntable with 0.8 meter above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a 1m height antenna tower.
5. For measurement below 1GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured. If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
6. For the actual test configuration, please refer to the related item in this test report (Photographs of the Test Configuration)
7. Although these tests were performed other than open area test site, adequate comparison measurements were confirmed against 30m open are test site. Therefore, sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 414788.

Below 1G

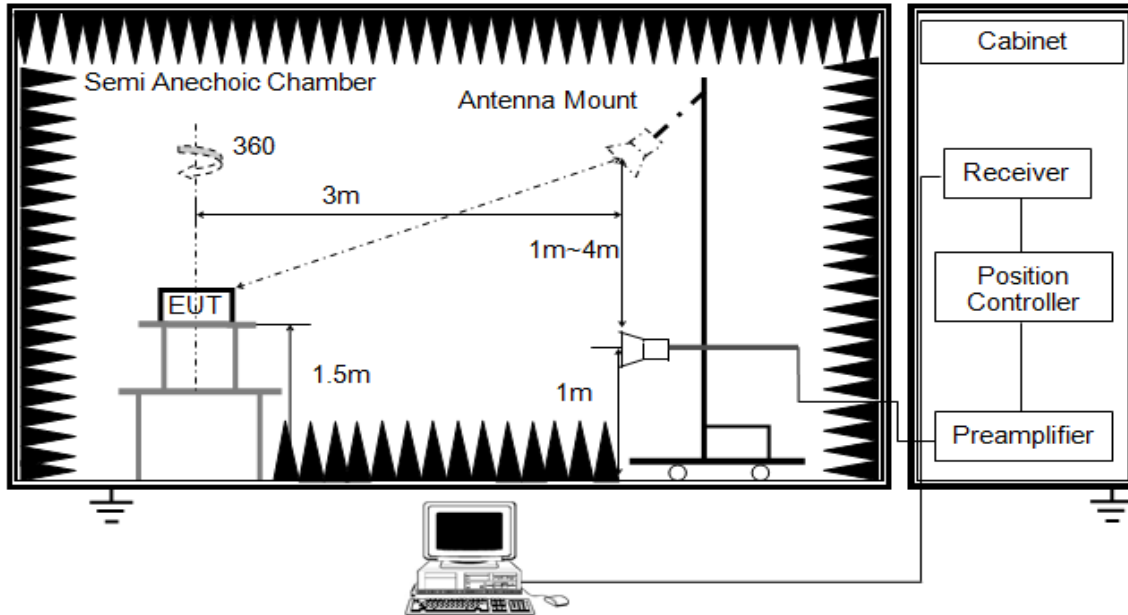


The setting of the spectrum analyser

| | |
|----------|----------|
| RBW | 120K |
| VBW | 300K |
| Sweep | Auto |
| Detector | Peak/QP |
| Trace | Max hold |

1. The testing follows the guidelines in ANSI C63.10-2013.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter

ABOVE 1G



are used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

3. The EUT was placed on a turntable with 0.8 meter above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. For measurement below 1GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured. If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.

The setting of the spectrum analyser

| | |
|----------|-----------------------------|
| RBW | 1M |
| VBW | PEAK: 3M AVG: see note 6 |
| Sweep | Auto |
| Detector | Peak |
| Trace | Max hold |

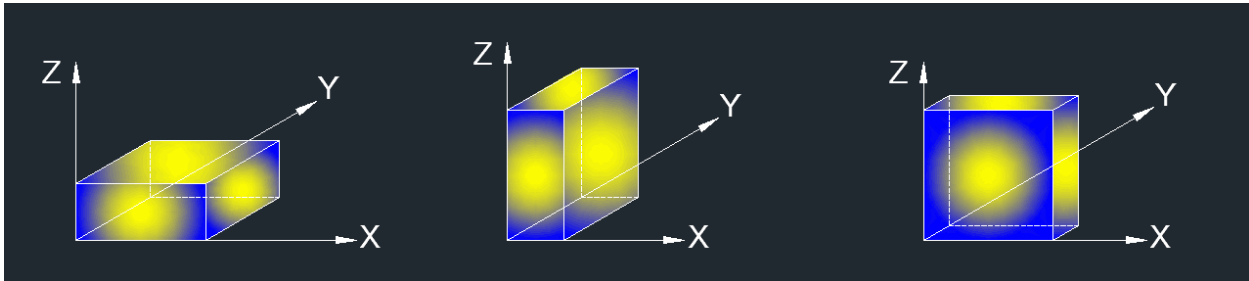
1. The testing follows the guidelines in ANSI C63.10-2013.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
3. The EUT was placed on a turntable with 1.5m above ground.

4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.

5. For measurement above 1GHz, the emission measurement will be measured by the peak detector. This peak level, once corrected, must comply with the limit specified in Section 15.209.

6. For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 3 MHz for peak measurements and 1 MHz resolution bandwidth with 1/T video bandwidth with peak detector for average measurements. For the Duty Cycle please refer to clause 8.1. ON TIME AND DUTY CYCLE.

X axis, Y axis, Z axis positions :



Note 1: For all radiated test, EUT in each of three orthogonal axis emissions had been tested, but only the worst case (X axis) data recorded in the report.

Note 2: The EUT was fully exercised with external accessories during the test. In the case of multiple accessory external ports, an external accessory shall be connected to one of each type of port.



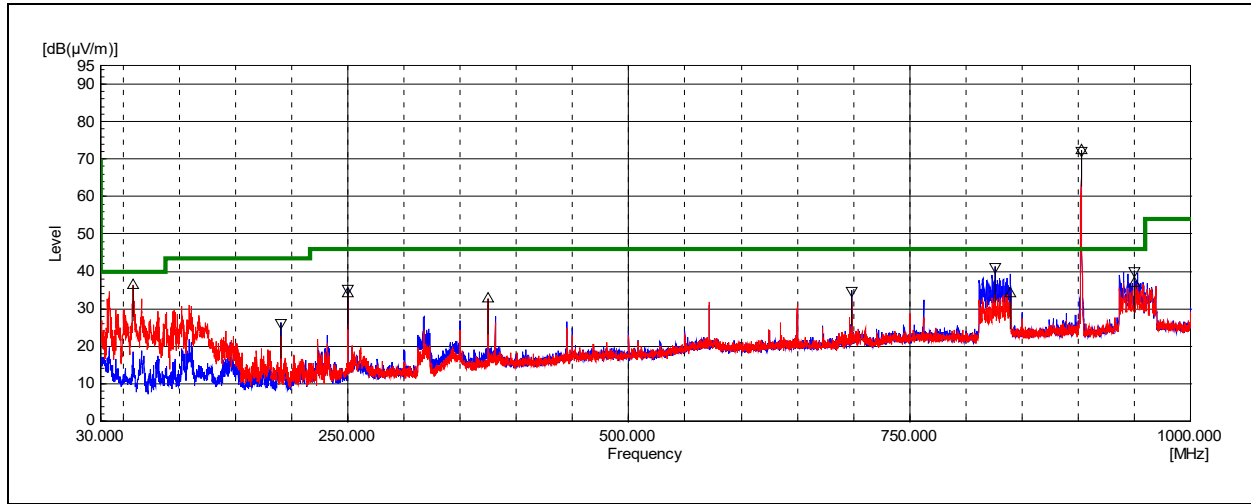
RESULT

30MHz – 1GHz (Low/Mid/High)

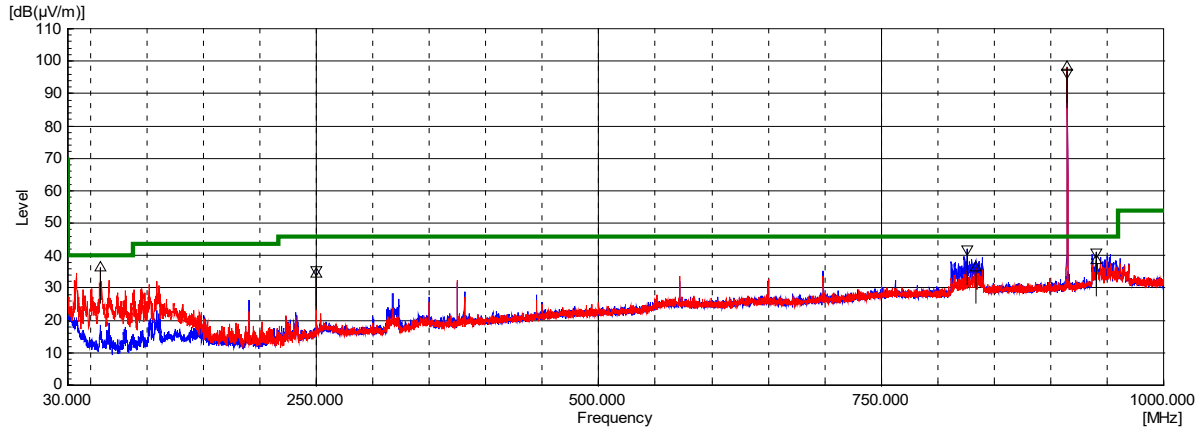
Horizontal



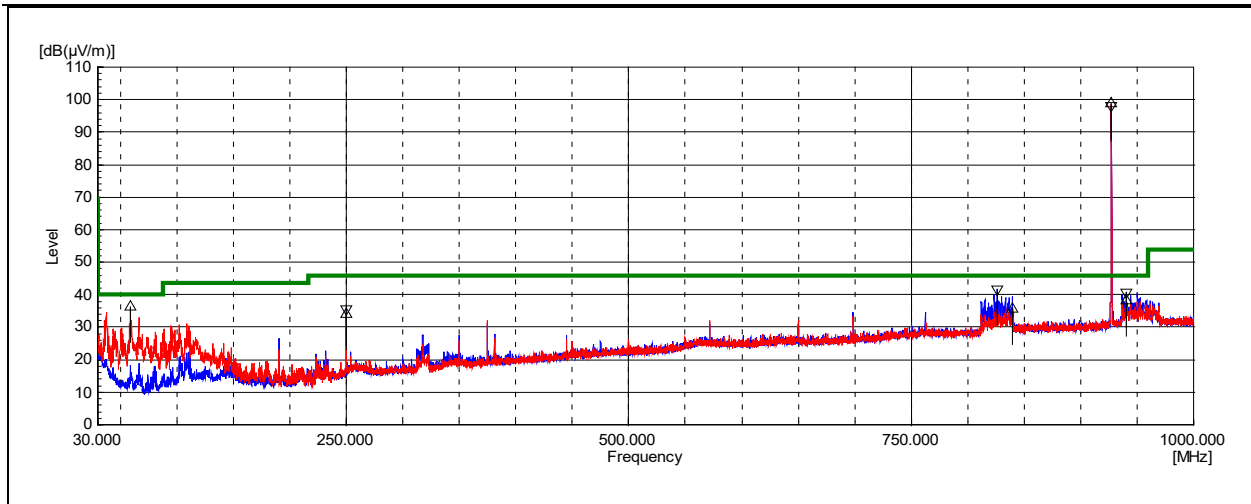
Vertical



| Frequency [MHz] | (P) | Reading [dB(μV)] | Factor [dB(1/m)] | Level PK [dB(μV/m)] | Limit QP [dB(μV/m)] | Margin QP [dB] | Height [cm] | Angle [°] | Remark |
|-----------------|-----|------------------|------------------|---------------------|---------------------|----------------|-------------|-----------|--------------------------------|
| 58.656 | V | 61 | -24.8 | 36.2 | 40 | 3.8 | 200 | 24 | |
| 249.943 | V | 50.7 | -16.7 | 34 | 46 | 12 | 100 | 19 | |
| 374.977 | V | 46.5 | -13.7 | 32.8 | 46 | 13.2 | 200 | 129 | |
| 839.844 | V | 37.3 | -3.2 | 34.1 | 46 | 11.9 | 100 | 49 | |
| 902.79 | V | 75 | -2.7 | 72.3 | - | - | 100 | 109 | intentional frequency from EUT |
| 950.183 | V | 37.8 | -0.9 | 36.9 | 46 | 9.1 | 100 | 335 | |
| 249.943 | H | 52.1 | -16.7 | 35.4 | 46 | 10.6 | 100 | 47 | |
| 825.884 | H | 45.1 | -3.8 | 41.3 | 46 | 4.7 | 100 | 304 | |
| 902.79 | H | 75 | -2.7 | 72.3 | - | - | 300 | 115 | intentional frequency from EUT |
| 950.183 | H | 41 | -0.9 | 40.1 | 46 | 5.9 | 200 | 94 | |
| 698.89 | H | 41.4 | -6.4 | 35 | 46 | 11 | 100 | 304 | |
| 190.548 | H | 47.5 | -21.2 | 26.3 | 43.5 | 17.2 | 200 | 94 | |



| Frequency [MHz] | (P) | Reading [dB(µV)] | Factor [dB(1/m)] | Level PK [dB(µV/m)] | Limit QP [dB(µV/m)] | Margin QP [dB] | Height [cm] | Angle [°] | |
|-----------------|-----|------------------|------------------|---------------------|---------------------|----------------|-------------|-----------|--------------------------------|
| 249.943 | H | 52.4 | -16.7 | 35.7 | 46 | 10.3 | 100 | 47 | |
| 825.884 | H | 45.7 | -3.8 | 41.9 | 46 | 4.1 | 100 | 289 | |
| 914.792 | H | 99 | -2.4 | 96.6 | - | - | 200 | 19 | intentional frequency from EUT |
| 940.509 | H | 42.4 | -1.2 | 41.2 | 46 | 4.8 | 200 | 94 | |
| 58.656 | V | 61.1 | -24.8 | 36.3 | 40 | 3.7 | 100 | 19 | |
| 249.943 | V | 51 | -16.7 | 34.3 | 46 | 11.7 | 200 | 0 | |
| 914.792 | V | 100.4 | -2.4 | 98 | - | - | 100 | 359 | intentional frequency from EUT |
| 940.509 | V | 39.7 | -1.2 | 38.5 | 46 | 7.5 | 200 | 280 | |
| 833.476 | V | 39.5 | -3.4 | 36.1 | 46 | 9.9 | 100 | 185 | |



| Frequency [MHz] | (P) | Reading [dB(µV)] | Factor [dB(1/m)] | Level PK [dB(µV/m)] | Limit QP [dB(µV/m)] | Margin QP [dB] | Height [cm] | Angle [°] | |
|-----------------|-----|------------------|------------------|---------------------|---------------------|----------------|-------------|-----------|--------------------------------|
| 58.656 | V | 61.2 | -24.8 | 36.4 | 40 | 3.6 | 100 | 359 | |
| 249.943 | V | 50.6 | -16.7 | 33.9 | 46 | 12.1 | 100 | 19 | |
| 927.283 | V | 100.5 | -1.8 | 98.7 | - | - | 100 | 359 | intentional frequency from EUT |
| 940.631 | V | 39.2 | -1.2 | 38 | 46 | 8 | 200 | 280 | |
| 839.844 | V | 38.9 | -3.2 | 35.7 | 46 | 10.3 | 100 | 320 | |
| 249.943 | H | 52.3 | -16.7 | 35.6 | 46 | 10.4 | 100 | 62 | |
| 825.884 | H | 45.4 | -3.8 | 41.6 | 46 | 4.4 | 100 | 289 | |
| 927.283 | H | 100 | -1.8 | 98.2 | - | - | 100 | 183 | intentional frequency from EUT |
| 940.509 | H | 42 | -1.2 | 40.8 | 46 | 5.2 | 200 | 94 | |

Note:

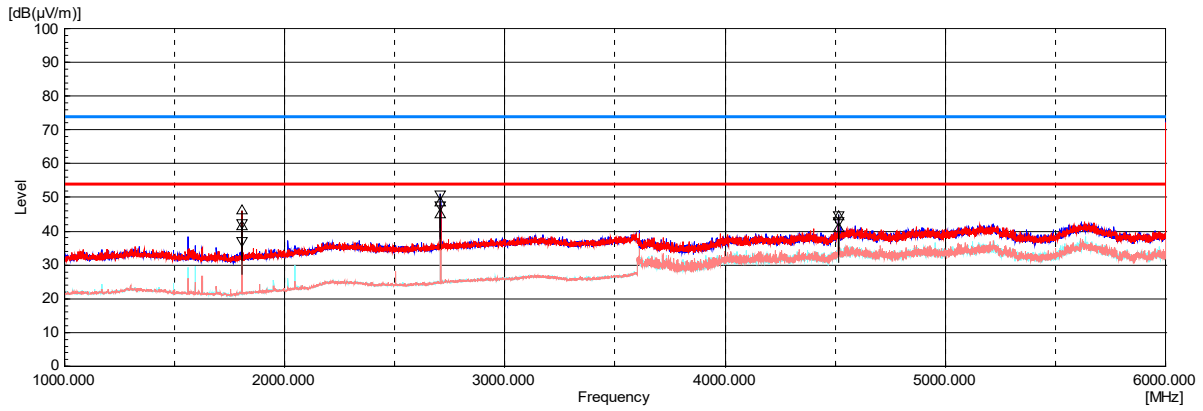
1. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
2. Only the worst-case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.
3. For all the test results have been considered the correct factors.



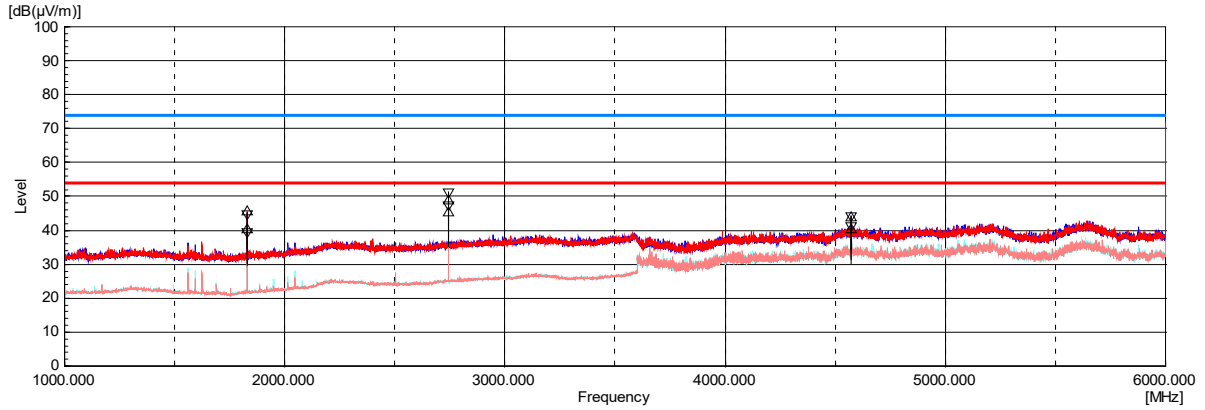
1GHz – 6GHz (Low/Mid/High)

Horizontal

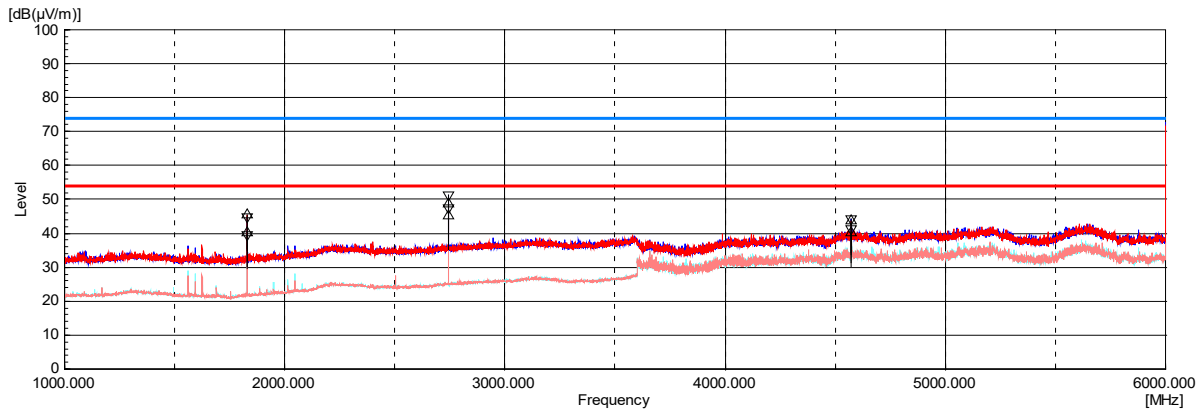
Vertical



| Frequency [MHz] | (P) | Reading [dB(μV)] | Factor [dB(1/m)] | Level PK [dB(μV/m)] | Level AV [dB(μV/m)] | Limit PK [dB(μV/m)] | Limit AV [dB(μV/m)] | Margin PK [dB] | Margin AV [dB] | Height [cm] | Angle [°] |
|-----------------|-----|------------------|------------------|---------------------|---------------------|---------------------|---------------------|----------------|----------------|-------------|-----------|
| 1805.475 | V | 60.9 | -14.9 | 46 | ----- | 74 | ----- | 28 | ----- | 200 | 89 |
| 1805.475 | V | 56.2 | -14.9 | ----- | 41.3 | ----- | 54 | ----- | 12.7 | 200 | 110 |
| 2708.163 | V | 58.4 | -9.9 | 48.5 | ----- | 74 | ----- | 25.5 | ----- | 100 | 237 |
| 2708.163 | V | 54.8 | -9.9 | ----- | 44.9 | ----- | 54 | ----- | 9.1 | 200 | 131 |
| 4513.538 | V | 47.2 | -3 | 44.2 | ----- | 74 | ----- | 29.8 | ----- | 300 | 228 |
| 4513.538 | V | 43.8 | -3 | ----- | 40.8 | ----- | 54 | ----- | 13.2 | 200 | 27 |
| 1805.475 | H | 57.4 | -14.9 | 42.5 | ----- | 74 | ----- | 31.5 | ----- | 100 | 318 |
| 1805.475 | H | 52.2 | -14.9 | ----- | 37.3 | ----- | 54 | ----- | 16.7 | 200 | 166 |
| 2708.163 | H | 60.8 | -9.9 | 50.9 | ----- | 74 | ----- | 23.1 | ----- | 400 | 154 |
| 2708.163 | H | 57.7 | -9.9 | ----- | 47.8 | ----- | 54 | ----- | 6.2 | 400 | 50 |
| 4513.538 | H | 47.9 | -3 | 44.9 | ----- | 74 | ----- | 29.1 | ----- | 200 | 353 |
| 4513.538 | H | 46 | -3 | ----- | 43 | ----- | 54 | ----- | 11 | 200 | 353 |



| Frequency [MHz] | (P) | Reading [dB(μV)] | Factor [dB(1/m)] | Level PK [dB(μV/m)] | Level AV [dB(μV/m)] | Limit PK [dB(μV/m)] | Limit AV [dB(μV/m)] | Margin PK [dB] | Margin AV [dB] | Height [cm] | Angle [°] |
|-----------------|-----|------------------|------------------|---------------------|---------------------|---------------------|---------------------|----------------|----------------|-------------|-----------|
| 1829.463 | V | 60.5 | -14.9 | 45.6 | ----- | 74 | ----- | 28.4 | ----- | 200 | 339 |
| 1829.463 | V | 54.9 | -14.9 | ----- | 40 | ----- | 54 | ----- | 14 | 100 | 359 |
| 2744.144 | V | 58.3 | -9.7 | 48.6 | ----- | 74 | ----- | 25.4 | ----- | 200 | 214 |
| 2744.144 | V | 54.8 | -9.7 | ----- | 45.1 | ----- | 54 | ----- | 8.9 | 200 | 235 |
| 4573.506 | V | 46.8 | -3 | 43.8 | ----- | 74 | ----- | 30.2 | ----- | 300 | 62 |
| 4574.138 | V | 43.1 | -3 | ----- | 40.1 | ----- | 54 | ----- | 13.9 | 300 | 41 |
| 1829.463 | H | 59.8 | -14.9 | 44.9 | ----- | 74 | ----- | 29.1 | ----- | 200 | 187 |
| 1829.463 | H | 54.6 | -14.9 | ----- | 39.7 | ----- | 54 | ----- | 14.3 | 200 | 166 |
| 2744.144 | H | 60.9 | -9.7 | 51.2 | ----- | 74 | ----- | 22.8 | ----- | 400 | 71 |
| 2744.144 | H | 57.3 | -9.7 | ----- | 47.6 | ----- | 54 | ----- | 6.4 | 400 | 50 |
| 4573.506 | H | 47.2 | -3 | 44.2 | ----- | 74 | ----- | 29.8 | ----- | 200 | 311 |
| 4574.138 | H | 44.5 | -3 | ----- | 41.5 | ----- | 54 | ----- | 12.5 | 400 | 195 |



| Frequency [MHz] | (P) | Reading [dB(µV)] | Factor [dB(1/m)] | Level PK [dB(µV/m)] | Level AV [dB(µV/m)] | Limit PK [dB(µV/m)] | Limit AV [dB(µV/m)] | Margin PK [dB] | Margin AV [dB] | Height [cm] | Angle [°] |
|-----------------|-----|------------------|------------------|---------------------|---------------------|---------------------|---------------------|----------------|----------------|-------------|-----------|
| 1854.081 | V | 58.6 | -14.8 | 43.8 | ----- | 74 | ----- | 30.2 | ----- | 300 | 145 |
| 1854.081 | V | 53.2 | -14.8 | ----- | 38.4 | ----- | 54 | ----- | 15.6 | 300 | 125 |
| 2781.387 | V | 53.4 | -9.5 | ----- | 43.9 | ----- | 54 | ----- | 10.1 | 200 | 214 |
| 2782.019 | V | 58.8 | -9.5 | 49.3 | ----- | 74 | ----- | 24.7 | ----- | 200 | 152 |
| 1854.081 | H | 59 | -14.8 | 44.2 | ----- | 74 | ----- | 29.8 | ----- | 100 | 48 |
| 1854.081 | H | 53.6 | -14.8 | ----- | 38.8 | ----- | 54 | ----- | 15.2 | 100 | 68 |
| 2781.387 | H | 52.5 | -9.5 | ----- | 43 | ----- | 54 | ----- | 11 | 300 | 276 |
| 2782.019 | H | 57.7 | -9.5 | 48.2 | ----- | 74 | ----- | 25.8 | ----- | 300 | 48 |

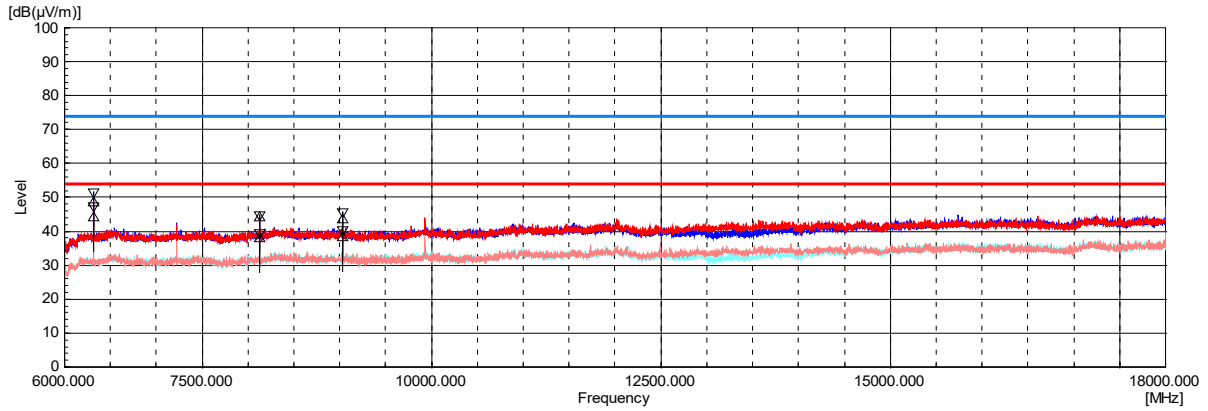
Note:

1. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
2. Only the worst-case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.
3. For all the test results have been considered the correct factors.
4. 2.4GHz band-stop filter is applied in the duration of the scan.

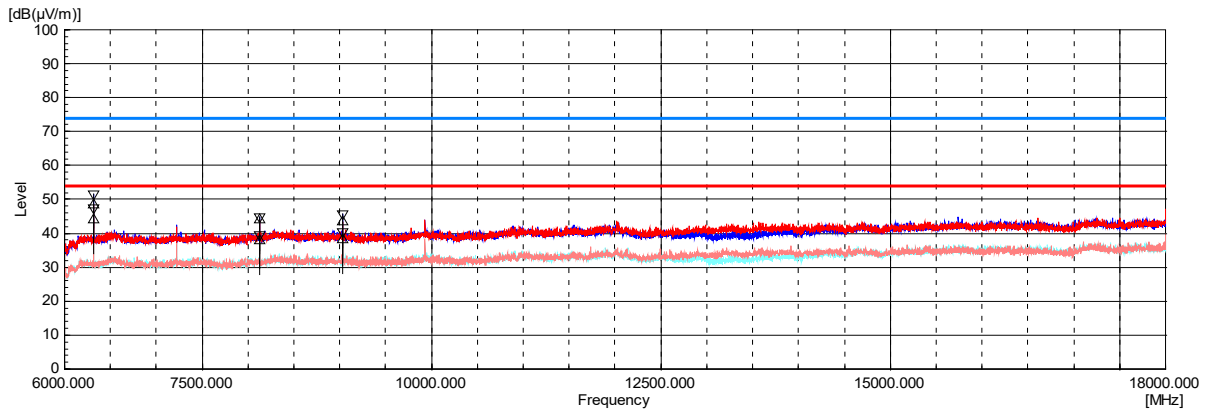


6GHz – 18GHz (Low/Mid/High)

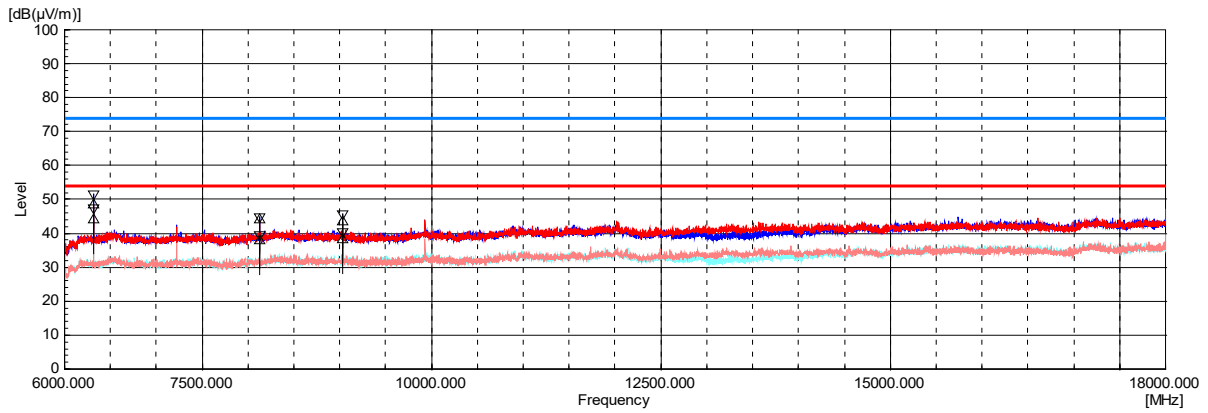
Horizontal
Vertical



| Frequency [MHz] | (P) | Reading [dB(μV)] | Factor [dB(1/m)] | Level PK [dB(μV/m)] | Level AV [dB(μV/m)] | Limit PK [dB(μV/m)] | Limit AV [dB(μV/m)] | Margin PK [dB] | Margin AV [dB] | Height [cm] | Angle [°] |
|-----------------|-----|------------------|------------------|---------------------|---------------------|---------------------|---------------------|----------------|----------------|-------------|-----------|
| 6318.15 | V | 56.3 | -7.9 | 48.4 | ----- | 74 | ----- | 25.6 | ----- | 300 | 89 |
| 6318.15 | V | 51.9 | -7.9 | ----- | 44 | ----- | 54 | ----- | 10 | 300 | 109 |
| 8124.03 | V | 52.1 | -8.2 | 43.9 | ----- | 74 | ----- | 30.1 | ----- | 200 | 145 |
| 8124.03 | V | 46 | -8.2 | ----- | 37.8 | ----- | 54 | ----- | 16.2 | 300 | 89 |
| 9026.97 | V | 45.6 | -7.5 | ----- | 38.1 | ----- | 54 | ----- | 15.9 | 300 | 131 |
| 9026.97 | V | 50.9 | -7.5 | 43.4 | ----- | 74 | ----- | 30.6 | ----- | 300 | 131 |
| 6318.15 | H | 59.5 | -7.9 | 51.6 | ----- | 74 | ----- | 22.4 | ----- | 300 | 187 |
| 6318.15 | H | 55.4 | -7.9 | ----- | 47.5 | ----- | 54 | ----- | 6.5 | 300 | 166 |
| 8124.03 | H | 53.2 | -8.2 | 45 | ----- | 74 | ----- | 29 | ----- | 300 | 353 |
| 8124.03 | H | 47.9 | -8.2 | ----- | 39.7 | ----- | 54 | ----- | 14.3 | 100 | 154 |
| 9026.97 | H | 48 | -7.5 | ----- | 40.5 | ----- | 54 | ----- | 13.5 | 200 | 110 |
| 9026.97 | H | 53.3 | -7.5 | 45.8 | ----- | 74 | ----- | 28.2 | ----- | 200 | 89 |



| Frequency [MHz] | (P) | Reading [dB(μV)] | Factor [dB(1/m)] | Level PK [dB(μV/m)] | Level AV [dB(μV/m)] | Limit PK [dB(μV/m)] | Limit AV [dB(μV/m)] | Margin PK [dB] | Margin AV [dB] | Height [cm] | Angle [°] |
|-----------------|-----|------------------|------------------|---------------------|---------------------|---------------------|---------------------|----------------|----------------|-------------|-----------|
| 6401.475 | V | 55.9 | -7.6 | 48.3 | ----- | 74 | ----- | 25.7 | ----- | 200 | 332 |
| 6401.475 | V | 48.1 | -7.6 | ----- | 40.5 | ----- | 54 | ----- | 13.5 | 200 | 312 |
| 8231.595 | V | 46 | -7.9 | ----- | 38.1 | ----- | 54 | ----- | 15.9 | 300 | 297 |
| 8231.595 | V | 52.3 | -7.9 | 44.4 | ----- | 74 | ----- | 29.6 | ----- | 300 | 276 |
| 9146.655 | V | 48.6 | -7.9 | 40.7 | ----- | 74 | ----- | 33.3 | ----- | 200 | 104 |
| 9146.655 | V | 42.5 | -7.9 | ----- | 34.6 | ----- | 54 | ----- | 19.4 | 100 | 26 |
| 6401.475 | H | 55.4 | -7.6 | 47.8 | ----- | 74 | ----- | 26.2 | ----- | 300 | 208 |
| 6401.475 | H | 48.1 | -7.6 | ----- | 40.5 | ----- | 54 | ----- | 13.5 | 100 | 29 |
| 8231.595 | H | 44.6 | -7.9 | ----- | 36.7 | ----- | 54 | ----- | 17.3 | 400 | 68 |
| 8231.595 | H | 51.7 | -7.9 | 43.8 | ----- | 74 | ----- | 30.2 | ----- | 400 | 276 |
| 9146.655 | H | 51.4 | -7.9 | 43.5 | ----- | 74 | ----- | 30.5 | ----- | 200 | 89 |
| 9146.655 | H | 46.5 | -7.9 | ----- | 38.6 | ----- | 54 | ----- | 15.4 | 200 | 109 |



| Frequency [MHz] | (P) | Reading [dB(μV)] | Factor [dB(1/m)] | Level PK [dB(μV/m)] | Level AV [dB(μV/m)] | Limit PK [dB(μV/m)] | Limit AV [dB(μV/m)] | Margin PK [dB] | Margin AV [dB] | Height [cm] | Angle [°] |
|-----------------|-----|------------------|------------------|---------------------|---------------------|---------------------|---------------------|----------------|----------------|-------------|-----------|
| 6489.345 | V | 53.4 | -7.4 | 46 | ----- | 74 | ----- | 28 | ----- | 300 | 193 |
| 6489.345 | V | 47.1 | -7.4 | ----- | 39.7 | ----- | 54 | ----- | 14.3 | 300 | 151 |
| 7416.525 | V | 48.9 | -8.3 | 40.6 | ----- | 74 | ----- | 33.4 | ----- | 100 | 68 |
| 7416.525 | V | 41.3 | -8.3 | ----- | 33 | ----- | 54 | ----- | 21 | 400 | 217 |
| 8343.705 | V | 43 | -7.9 | ----- | 35.1 | ----- | 54 | ----- | 18.9 | 300 | 339 |
| 8343.705 | V | 51 | -7.9 | 43.1 | ----- | 74 | ----- | 30.9 | ----- | 300 | 317 |
| 6489.345 | H | 55 | -7.4 | 47.6 | ----- | 74 | ----- | 26.4 | ----- | 100 | 175 |
| 6489.345 | H | 49.2 | -7.4 | ----- | 41.8 | ----- | 54 | ----- | 12.2 | 100 | 154 |
| 7416.525 | H | 50.4 | -8.3 | 42.1 | ----- | 74 | ----- | 31.9 | ----- | 400 | 151 |
| 7416.525 | H | 44.1 | -8.3 | ----- | 35.8 | ----- | 54 | ----- | 18.2 | 400 | 172 |
| 8343.705 | H | 43.1 | -7.9 | ----- | 35.2 | ----- | 54 | ----- | 18.8 | 300 | 104 |
| 8343.705 | H | 50.5 | -7.9 | 42.6 | ----- | 74 | ----- | 31.4 | ----- | 400 | 47 |

Note:

1. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
2. Only the worst-case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.
3. For all the test results have been considered the correct factors.



END OF REPORT