

# ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT



**Applicant:** INVENTEC CORPORATION  
No.66, Hougang street, ShihLin District, Taipei City, Taiwan.  
**Product Name:** All-In-One PC  
**Brand Name:** HP  
**Model No.:** TPC-I051-32  
**Model Difference:** N/A  
**Report Number:** ER/2021/80014  
**FCC ID** DGI-TPC-I051-3202  
**Issue Date:** September 16, 2021  
**Date of Test:** August 11, 2021 ~ September 7, 2021  
**Date of EUT Received:** August 4, 2021

CHUN-CHIEH CHEN

Approved By

Chun Chieh Chen

## We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. Central RF Lab. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10:2013 and the energy emitted by the sample EUT comply with FCC rule part §15C.

The results of this report relate only to the sample identified in this report.

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## Revision History

| Report Number | Revision | Description | Issue Date         | Revised By |
|---------------|----------|-------------|--------------------|------------|
| ER/2021/80014 | 00       | Original    | September 16, 2021 | Yuri Tsai  |
|               |          |             |                    |            |
|               |          |             |                    |            |
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## 1 GENERAL INFORMATION

### 1.1 Product Description

|                   |                                      |
|-------------------|--------------------------------------|
| Product Name:     | All-In-One PC                        |
| Brand Name:       | HP                                   |
| Model No.:        | TPC-I051-32                          |
| Model Difference: | N/A                                  |
| Hardware Version: | N/A                                  |
| Firmware Version: | N/A                                  |
| EUT Series No.:   | 0001760BM6                           |
| Power Supply:     | 12.58Vdc from Switching Power Supply |

### 1.2 RF Specification

|                     |                         |
|---------------------|-------------------------|
| Technology:         | Wireless Power Transfer |
| Operating Frequency | 120 kHz ~ 130 kHz       |
| Transmit Power      | < -27.19dBuV/m at 3m.   |
| Number of Channels  | 1                       |
| Antenna Type        | Loop                    |

**Note:** Antenna information is provided by the applicant.

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### 1.3 Test Methodology

FCC Part 15, Subpart C

ANSI C63.10:2013

### 1.4 Test Facility

| Laboratory                                            | Test Site Address                                                                         | Test Site Name | FCC Designation number | IC CAB identifier |
|-------------------------------------------------------|-------------------------------------------------------------------------------------------|----------------|------------------------|-------------------|
| SGS Taiwan Ltd.<br>Central RF Lab.<br>(TAF code 3702) | No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan. | SAC 1          | TW0027                 | TW3702            |
|                                                       |                                                                                           | SAC 3          |                        |                   |
|                                                       |                                                                                           | Conduction 1   |                        |                   |
|                                                       |                                                                                           | Conducted 1    |                        |                   |
|                                                       |                                                                                           | Conducted 2    |                        |                   |
|                                                       |                                                                                           | Conducted 3    |                        |                   |
|                                                       |                                                                                           | Conducted 4    |                        |                   |
|                                                       |                                                                                           | Conducted 5    |                        |                   |
|                                                       |                                                                                           | Conducted 6    |                        |                   |
|                                                       | No.2, Keji 1st Rd., Guishan District, Taoyuan City, Taiwan 333                            | Conduction C   | TW0028                 |                   |
|                                                       |                                                                                           | SAC C          |                        |                   |
|                                                       |                                                                                           | SAC D          |                        |                   |
|                                                       |                                                                                           | SAC G          |                        |                   |
|                                                       |                                                                                           | Conducted A    |                        |                   |
|                                                       |                                                                                           | Conducted B    |                        |                   |
|                                                       |                                                                                           | Conducted C    |                        |                   |
|                                                       |                                                                                           | Conducted D    |                        |                   |
|                                                       |                                                                                           | Conducted E    |                        |                   |
|                                                       |                                                                                           | Conducted F    |                        |                   |
|                                                       |                                                                                           | Conducted G    |                        |                   |

**Note:** Test site name is remarked on the equipment list in each section of this report as an indication where measurements occurred in specific test site and address.

### 1.5 Special Accessories

There is no special accessory used while test was conducted.

### 1.6 Equipment Modifications

There was no modification incorporated into the EUT.

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## 2 SYSTEM TEST CONFIGURATION

### 2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

### 2.2 EUT Exercise

The Transmitter was operated in the normal operating mode. The Tx frequency was fixed which was for the purpose of the measurements.

### 2.3 Test Procedure

#### 2.3.1 Conducted Emissions

The EUT is placed on a table which is 0.8 m above ground plane. Conducted emissions from the EUT measured in the frequency range between 9kHz and 30MHz. The CISPR Quasi-Peak and Average detector mode is employed. The two LISNs provide 50uH/50 ohm of coupling impedance for the measuring instrument. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

#### 2.3.2 Radiated Emissions

The EUT is placed on a turn table. For emissions testing at or below 1 GHz, the table height shall be 0.8 m above the reference ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this transmitter (EUT) was rotated through three orthogonal axes and measurement procedures for radiated emissions, measurement is to be made "while keeping the antenna in the 'cone of radiation' from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response." is still within the 3dB illumination BW of the measurement antenna.

#### 2.3.3 Radiated Emission Test Sites For Measurements From 9 kHz To 30 MHz

Radiated emission below 30MHz is measured in a 9m\*9m\*6m semi-anechoic chamber,

the measurements correspond to those obtained at an open-field test site.

There is a comparison data of both open-field test site and semi-Anechoic chamber, and the result came out very similar.

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## 2.4 Test Configuration

### 2.4.1 AC Power Line Conducted Emission

A blue rounded rectangle containing the white text "EUT".

### 2.4.2 Emission Measurements

A blue rounded rectangle containing the white text "EUT".

### 2.4.3 Equipment used for test

| Equipment         | Mfr/Brand | Model/Type No. | Series No. |
|-------------------|-----------|----------------|------------|
| WPC Test Software | N/A       | N/A            | N/A        |
|                   |           |                |            |
|                   |           |                |            |

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### 3 SUMMARY OF TEST RESULTS

| FCC Rules   | Description Of Test                           | Result    |
|-------------|-----------------------------------------------|-----------|
| §15.207     | AC Power Line Conducted Emission              | Compliant |
| §15.209     | Radiated Emission Limits, general requirement | Compliant |
| §15.215 (c) | 20 dB OCCUPIED BANDWIDTH                      | Compliant |
| §15.203     | Antenna Requirement                           | Compliant |

### 4 DESCRIPTION OF TEST MODES

The EUT stay in continuous transmitting mode. The frequency is the default channel to test, where it is the only manipulative channel as this application supports.

The field strength of radiation emission was measured as EUT three orthogonal planes, E1 / E2 / H, are positioned to pre-scan the emission generating the highest one. The worst position is tested and recorded.

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## 5 MEASUREMENT UNCERTAINTY

| Test Items                       | Uncertainty |
|----------------------------------|-------------|
| AC Power Line Conducted Emission | +/- 2.34 dB |
| Frequency Stability              | +/- 1.53 Hz |
| Emission Bandwidth               | +/- 1.53 Hz |
| Temperature                      | +/- 0.4 °C  |
| Humidity                         | +/- 3.5 %   |
| DC / AC Power Source             | +/- 1 %     |

| Radiated Spurious Emission Measurement Uncertainty |     |         |                 |
|----------------------------------------------------|-----|---------|-----------------|
| Polarization: Vertical                             | +/- | 2.64 dB | 9kHz~30MHz      |
|                                                    | +/- | 4.93 dB | 30MHz - 1000MHz |
|                                                    | +/- | 4.81 dB | 1GHz - 18GHz    |
|                                                    | +/- | 4.52 dB | 18GHz - 40GHz   |
| Polarization: Horizontal                           | +/- | 2.64 dB | 9kHz~30MHz      |
|                                                    | +/- | 4.45 dB | 30MHz - 1000MHz |
|                                                    | +/- | 4.81 dB | 1GHz - 18GHz    |
|                                                    | +/- | 4.52 dB | 18GHz - 40GHz   |

### Note:

1. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.
2. The conformity assessment statement in this report is based solely on the test results, measurement uncertainty is excluded.

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## 6 CONDUCTED EMISSIONS TEST

### 6.1 Limitation

According to section 15.207(a) Conducted Emission Limits as following.

| Frequency range<br>MHz | Limits<br>(dBuV) |          |
|------------------------|------------------|----------|
|                        | Quasi-peak       | Average  |
| 0.15 to 0.50           | 66 to 56         | 56 to 46 |
| 0.50 to 5              | 56               | 46       |
| 5 to 30                | 60               | 50       |

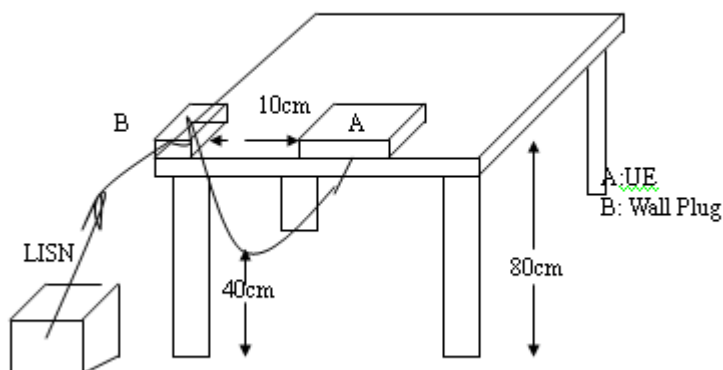
Note

- 1.The lower limit shall apply at the transition frequencies
- 2.The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

### 6.2 EUT Setup

1. The conducted emission tests were performed in the test site, using the setup in accordance with the ANSI C63.10:2013.
2. The AC/DC Power adaptor of EUT was plug-in LISN. The EUT was placed flushed with the rear of the table.
3. The LISN was connected with 120Vac/60Hz power source.

### 6.3 Test SET-UP (Block Diagram of Configuration)



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## 6.5 Measurement Procedure

1. The EUT was placed on a table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.

## 6.6 Measurement Equipment Used:

| Conducted Emission Test Site: Conduction 1 |             |               |               |            |            |
|--------------------------------------------|-------------|---------------|---------------|------------|------------|
| EQUIPMENT TYPE                             | MFR         | MODEL NUMBER  | SERIAL NUMBER | LAST CAL.  | CAL DUE.   |
| EMI Test Receiver                          | R&S         | ESCI 7        | 100759        | 08/26/2021 | 08/25/2022 |
| LISN                                       | SCHWARZBECK | NSLK 8127     | 8127-465      | 04/09/2021 | 04/08/2022 |
| Coaxial Cables                             | N/A         | Coaxial Cable | 161207        | 12/07/2020 | 12/06/2021 |
| Test Software                              | audix       | e3            | Ver. 6.11812c | N.C.R      | N.C.R      |

Note: N.C.R refers to Not Calibrated Required

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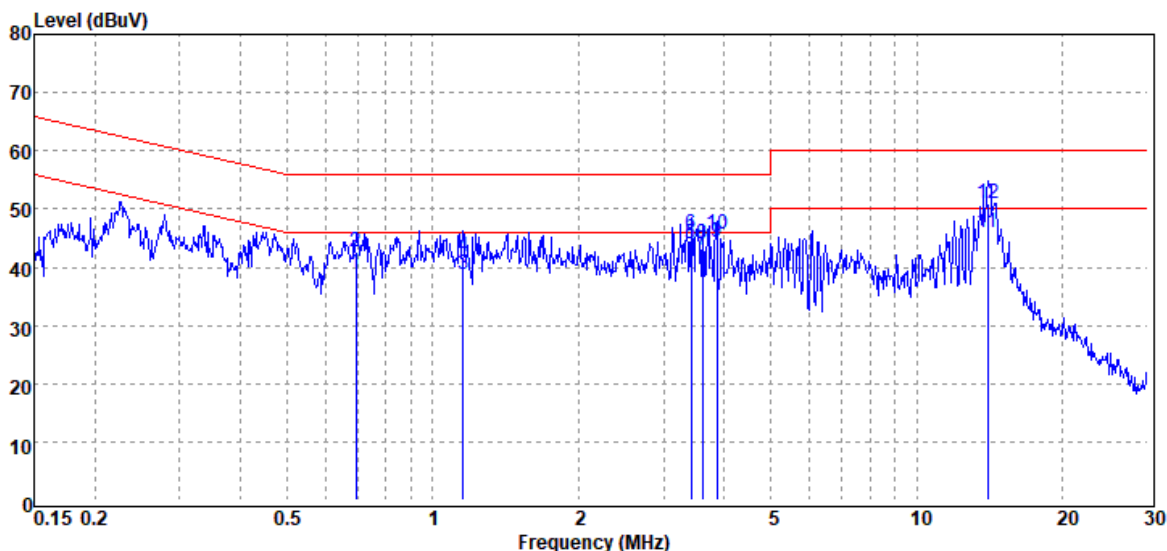
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## 6.7 Measurement Result:

Report Number :ER/2021/80014  
Test Mode :WPC  
Power :AC 120V/60Hz  
Probe :L  
Note: :

Test Site :Conduction 1  
Test Date :2021-08-27  
Temp./Humi. :25.2/64  
Engineer :Nick Lin



| Freq.<br>MHz | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level<br>dBμV | Factor<br>dB | Actual<br>FS<br>dBμV | Limit<br>dBμV | Margin<br>dB |
|--------------|------------------------------|-----------------------------------|--------------|----------------------|---------------|--------------|
| 0.69         | Average                      | 38.83                             | 0.12         | 38.95                | 46.00         | -7.05        |
| 0.69         | QP                           | 42.54                             | 0.12         | 42.66                | 56.00         | -13.34       |
| 1.15         | Average                      | 38.65                             | 0.12         | 38.77                | 46.00         | -7.23        |
| 1.15         | QP                           | 41.62                             | 0.12         | 41.74                | 56.00         | -14.26       |
| 3.42         | Average                      | 43.69                             | 0.41         | 44.10                | 46.00         | -1.90        |
| 3.42         | QP                           | 45.25                             | 0.41         | 45.66                | 56.00         | -10.34       |
| 3.61         | Average                      | 42.47                             | 0.42         | 42.89                | 46.00         | -3.11        |
| 3.61         | QP                           | 43.56                             | 0.42         | 43.98                | 56.00         | -12.02       |
| 3.86         | Average                      | 43.93                             | 0.44         | 44.37                | 46.00         | -1.63        |
| 3.86         | QP                           | 45.24                             | 0.44         | 45.68                | 56.00         | -10.32       |
| 14.01        | Average                      | 44.82                             | 1.00         | 45.82                | 50.00         | -4.18        |
| 14.01        | QP                           | 49.98                             | 1.00         | 50.98                | 60.00         | -9.02        |

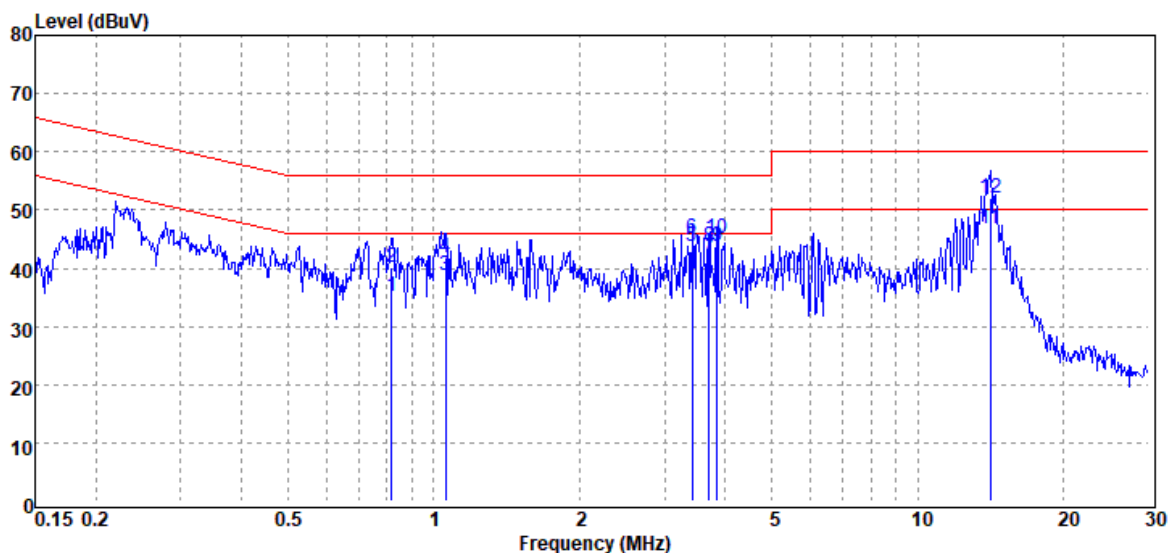
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Report Number :ER/2021/80014  
 Test Mode :WPC  
 Power :AC 120V/60Hz  
 Probe :N  
 Note: :

Test Site :Conduction 1  
 Test Date :2021-08-27  
 Temp./Humi. :25.2/64  
 Engineer :Nick Lin



| Freq.<br>MHz | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level<br>dBμV | Factor<br>dB | Actual<br>FS<br>dBμV | Limit<br>dBμV | Margin<br>dB |
|--------------|------------------------------|-----------------------------------|--------------|----------------------|---------------|--------------|
| 0.82         | Average                      | 34.94                             | 0.17         | 35.11                | 46.00         | -10.89       |
| 0.82         | QP                           | 40.07                             | 0.17         | 40.24                | 56.00         | -15.76       |
| 1.06         | Average                      | 38.49                             | 0.16         | 38.65                | 46.00         | -7.35        |
| 1.06         | QP                           | 41.60                             | 0.16         | 41.76                | 56.00         | -14.24       |
| 3.42         | Average                      | 43.29                             | 0.38         | 43.67                | 46.00         | -2.33        |
| 3.42         | QP                           | 44.71                             | 0.38         | 45.09                | 56.00         | -10.91       |
| 3.71         | Average                      | 41.45                             | 0.39         | 41.84                | 46.00         | -4.16        |
| 3.71         | QP                           | 43.32                             | 0.39         | 43.71                | 56.00         | -12.29       |
| 3.85         | Average                      | 43.32                             | 0.39         | 43.71                | 46.00         | -2.29        |
| 3.85         | QP                           | 44.71                             | 0.39         | 45.10                | 56.00         | -10.90       |
| 14.12        | Average                      | 45.83                             | 0.93         | 46.76                | 50.00         | -3.24        |
| 14.12        | QP                           | 51.10                             | 0.93         | 52.03                | 60.00         | -7.97        |

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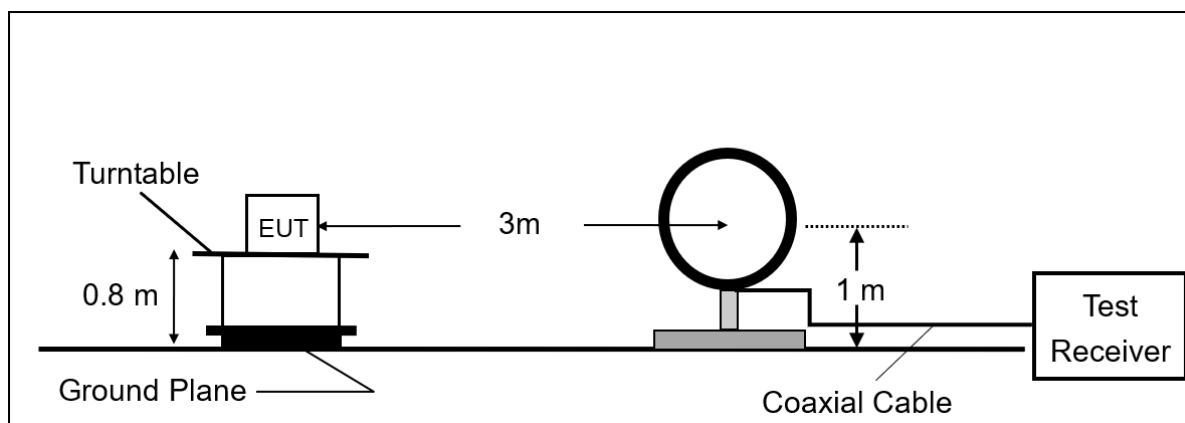
## 7 RADIATED EMISSION TEST

### 7.1 Measurement Procedure

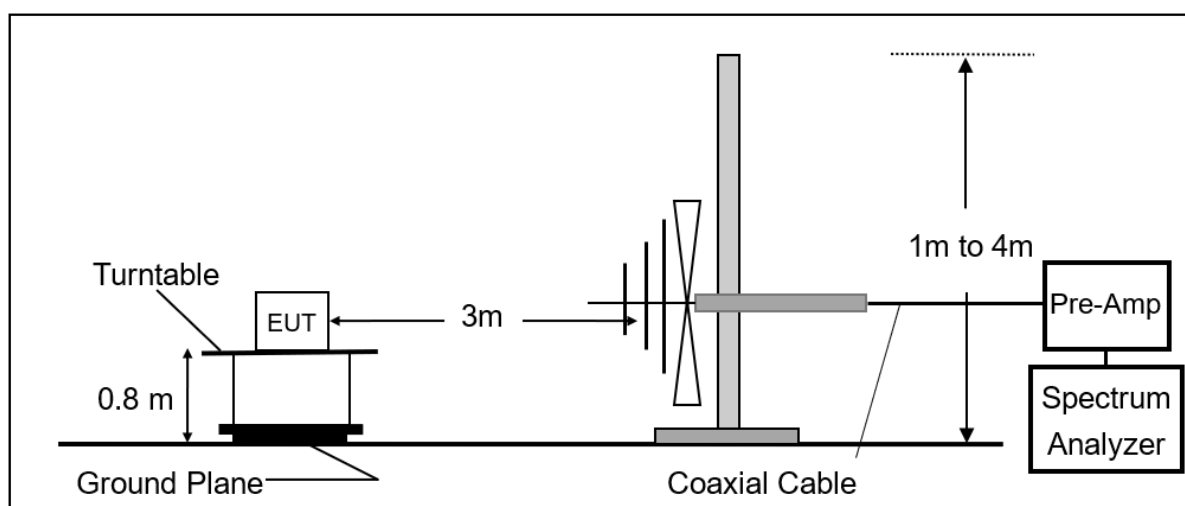
1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.

### 7.2 Test SET-UP:

(A) Radiated Emission Test Set-Up, Frequency Below 30MHz.



(B) Radiated Emission Test Set-Up, Frequency From 30MHz to 1000MHz.



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## 7.3 Measurement Equipment Used:

| Radiated Emission Test Site: SAC 3 |              |                 |               |            |            |
|------------------------------------|--------------|-----------------|---------------|------------|------------|
| EQUIPMENT TYPE                     | MFR          | MODEL NUMBER    | SERIAL NUMBER | LAST CAL.  | CAL DUE.   |
| Bi-log Antenna                     | SCHWARZBECK  | VULB9168        | 378           | 08/20/2021 | 08/19/2022 |
| PXA Spectrum Analyzer              | Agilent      | N9030A          | MY53120760    | 04/27/2021 | 04/26/2022 |
| EMI Test Receiver                  | R&S          | ESCI 7          | 100759        | 08/26/2021 | 08/25/2022 |
| Pre-Amplifier                      | HP           | 8447D           | 2944A07676    | 12/16/2020 | 12/15/2021 |
| Coaxial Cable                      | Huber Suhner | SUCOFLEX 102    | MY2636/2      | 12/16/2020 | 12/15/2021 |
| Coaxial Cable                      | Huber Suhner | SUCOFLEX 104    | 340057/4      | 12/16/2020 | 12/15/2021 |
| Coaxial Cable                      | Huber Suhner | SUCOFLEX 104PEA | 800052/2      | 12/16/2020 | 12/15/2021 |
| Site Cal                           | SGS          | SAC 3           | N/A           | 01/01/2021 | 12/31/2021 |
| Test Software                      | audix        | e3              | Ver. 6.11812c | N.C.R      | N.C.R      |

Note: N.C.R refers to Not Calibrated Required

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## 7.4 Applicable Standard

The field strength of any emissions appearing outside of operation frequency shall not exceed the general radiated emission limits in section 15.209 as below.

| Frequency (MHz) | Field strength (μV/m) | Distance (meters) |
|-----------------|-----------------------|-------------------|
| 0.009~0.490     | 2400/F(kHz)           | 300               |
| 0.490~1.705     | 24000/F(kHz)          | 30                |
| 1.705-30        | 30                    | 30                |
| 30-88           | 100                   | 3                 |
| 88-216          | 150                   | 3                 |
| 216-960         | 200                   | 3                 |
| Above 960       | 500                   | 3                 |

### Note:

1. Emission level in dBμV/m=20 log (μV/m)
2. Distance extrapolation factor = 40 log (required distance/ test distance) (dB)
3.  $20 \cdot \log(30 \mu\text{V/m}) + 40\text{dB} = 69.54 \text{ dBuV/m}$
4. The lower limit shall apply at the transition frequencies.
5. The measurement was undertaken in closer distance at 3m, where extrapolation factor is offset to convert the limit of the measurement.
6. Only spurious frequency is permitted to locate within the Restricted Bands specified in provision of §15.205.
7. The general radiated emission limits in §15.209 apply for the spurious emission generate from UE, except for the fundamental emission where the respective section specifies otherwise.
8. Actual FS(dBμV/m) = Spectrum. Reading level(dBμV) + Factor(dB)  
Factor(dB) = Antenna Factor(dB) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

1.

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#### 7.4.1 Frequency range 30 MHz to 1000 MHz

The electric field radiated emissions within 30 – 1000 MHz from the WPT subassembly of WPT source and client devices and WPT systems shall comply with the limits applicable to induction cooking equipment, as set out in ICES-001 table 4.

**Table 4: Electric field strength radiated emission limits for induction cooking appliances**

| Frequency range (MHz)                                                                                       | OATS or SAC*<br>10 m measurement<br>distance<br>Quasi-<br>peak (dBμV/m) | OATS or SAC*<br>3 m measurement<br>distance<br>Quasi-<br>peak (dBμV/m) | FAR*<br>3 m measurement<br>distance<br>Quasi-<br>peak (dBμV/m) |
|-------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|------------------------------------------------------------------------|----------------------------------------------------------------|
| 30 – 230                                                                                                    | 30                                                                      | 40                                                                     | 42 to 35 **                                                    |
| 230 – 1000                                                                                                  | 37                                                                      | 47                                                                     | 42                                                             |
| * OATS = open-area test site, SAC = semi-anechoic chamber, FAR = fully-anechoic room (see CSA CISPR 11:19). |                                                                         |                                                                        |                                                                |
| ** The limit level in dBμV/m decreases linearly with the logarithm of frequency.                            |                                                                         |                                                                        |                                                                |

**Note:**

1. The more stringent limit applies at the transition frequency.
2. Measurements are demonstrated in SAC with distance at 3m.
2. Actual FS(dBμV/m) = Spectrum. Reading level(dBμV) + Factor(dB)  
Factor(dB) = Antenna Factor(dB) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

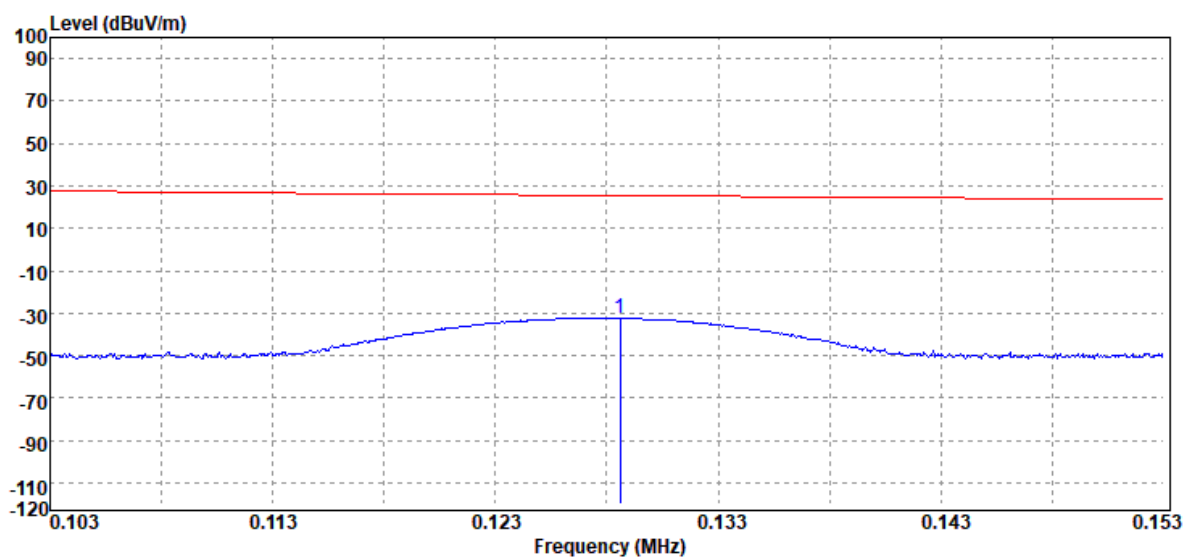
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## 7.5 Test Result

### 7.5.1 Field Strength of Fundamental Emission

|                |                |              |             |
|----------------|----------------|--------------|-------------|
| Report Number  | :ER-2021-80014 | Test Site    | :SAC 3      |
| Operation Mode | :WPC           | Test Date    | :2021-08-11 |
| Test Frequency | :128KHz        | Temp./Humi.  | :26.4/50    |
| Test Mode      | :Main          | Antenna Pol. | :VERTICAL   |
| EUT Pol        | :H Plane       | Engineer     | :Nick Lin   |



| Freq.<br>MHz | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level<br>dBμV | Factor<br>dB | Actual<br>FS<br>dBμV/m | Limit<br>dBμV/m | Margin<br>dB |
|--------------|------------------------------|-----------------------------------|--------------|------------------------|-----------------|--------------|
| 0.13         | Peak                         | 37.08                             | -69.18       | -32.10                 | 25.42           | -57.52       |

Actual level = Reading level + Factor

Factor = Antenna factor + cable loss – distance factor

distance factor=3m to 300m, within the band 9kHz-490kHz

3m to 30m, within the band 490kHz-30MHz

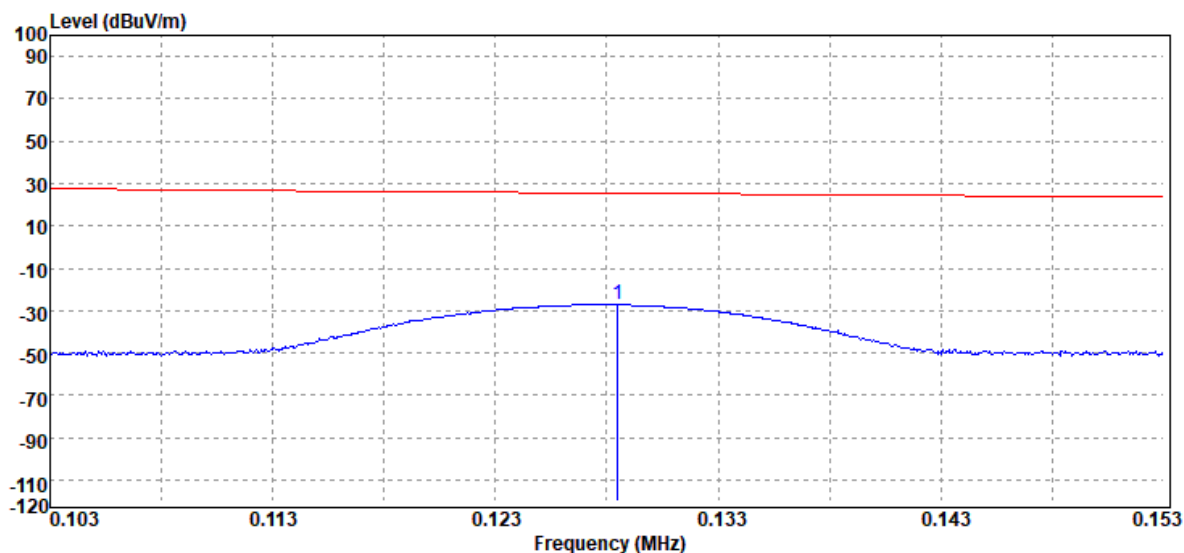
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Report Number :ER-2021-80014  
 Operation Mode :WPC  
 Test Frequency :128KHz  
 Test Mode :Main  
 EUT Pol :H Plane

Test Site :SAC 3  
 Test Date :2021-08-11  
 Temp./Humi. :26.4/50  
 Antenna Pol. :HORIZONTAL  
 Engineer :Nick Lin



| Freq.<br>MHz | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level<br>dBμV | Factor<br>dB | Actual<br>FS<br>dBμV/m | Limit<br>dBμV/m | Margin<br>dB |
|--------------|------------------------------|-----------------------------------|--------------|------------------------|-----------------|--------------|
| 0.13         | Peak                         | 41.99                             | -69.18       | -27.19                 | 25.42           | -52.61       |

Actual level = Reading level + Factor

Factor = Antenna factor + cable loss – distance factor

distance factor=3m to 300m, within the band 9kHz-490kHz

3m to 30m, within the band 490kHz-30MHz

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

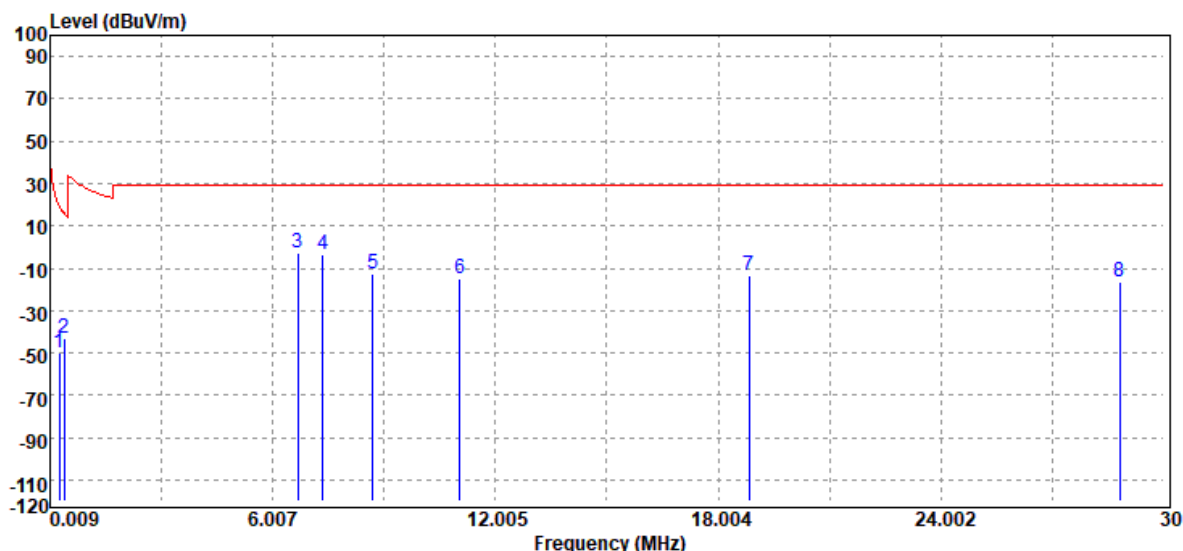
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### 7.5.3 Below 30 MHz test result

Report Number :ER-2021-80014  
Operation Mode :WPC  
Test Frequency :128KHz  
Test Mode :Tx  
EUT Pol :H Plane

Test Site :SAC 3  
Test Date :2021-08-11  
Temp./Humi. :26.4/50  
Antenna Pol. :VERTICAL  
Engineer :Nick Lin



| Freq.<br>MHz | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level<br>dBuV | Factor<br>dB | Actual<br>FS<br>dBuV/m | Limit<br>dBuV/m | Margin<br>dB |
|--------------|------------------------------|-----------------------------------|--------------|------------------------|-----------------|--------------|
| 0.26         | Peak                         | 19.03                             | -68.76       | -49.73                 | 19.44           | -69.17       |
| 0.38         | Peak                         | 25.83                             | -68.65       | -42.82                 | 15.91           | -58.73       |
| 6.69         | Peak                         | 26.01                             | -28.45       | -2.44                  | 29.54           | -31.98       |
| 7.37         | Peak                         | 25.09                             | -28.31       | -3.22                  | 29.54           | -32.76       |
| 8.69         | Peak                         | 15.47                             | -28.06       | -12.59                 | 29.54           | -42.13       |
| 11.05        | Peak                         | 12.78                             | -27.94       | -15.16                 | 29.54           | -44.70       |
| 18.85        | Peak                         | 14.76                             | -28.45       | -13.69                 | 29.54           | -43.23       |
| 28.82        | Peak                         | 14.08                             | -30.55       | -16.47                 | 29.54           | -46.01       |

Actual level = Reading level + Factor

Factor = Antenna factor + cable loss – distance factor

distance factor=3m to 300m, within the band 9kHz-490kHz

3m to 30m, within the band 490kHz-30MHz

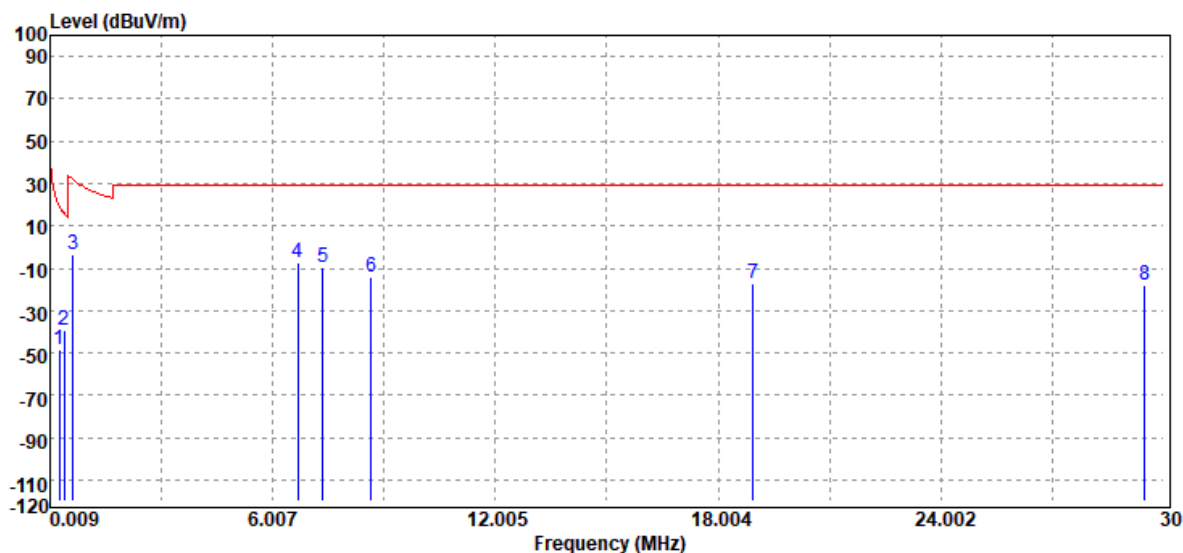
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Report Number :ER-2021-80014  
 Operation Mode :WPC  
 Test Frequency :128KHz  
 Test Mode :Tx  
 EUT Pol :H Plane

Test Site :SAC 3  
 Test Date :2021-08-11  
 Temp./Humi. :26.4/50  
 Antenna Pol. :HORIZONTAL  
 Engineer :Nick Lin



| Freq.<br>MHz | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level<br>dBμV | Factor<br>dB | Actual<br>FS<br>dBμV/m | Limit<br>dBμV/m | Margin<br>dB |
|--------------|------------------------------|-----------------------------------|--------------|------------------------|-----------------|--------------|
| 0.26         | Peak                         | 20.26                             | -68.76       | -48.50                 | 19.44           | -67.94       |
| 0.38         | Peak                         | 29.14                             | -68.65       | -39.51                 | 15.95           | -55.46       |
| 0.64         | Peak                         | 25.11                             | -28.59       | -3.48                  | 31.54           | -35.02       |
| 6.69         | Peak                         | 21.18                             | -28.45       | -7.27                  | 29.54           | -36.81       |
| 7.37         | Peak                         | 18.62                             | -28.31       | -9.69                  | 29.54           | -39.23       |
| 8.66         | Peak                         | 13.52                             | -28.07       | -14.55                 | 29.54           | -44.09       |
| 18.93        | Peak                         | 10.88                             | -28.45       | -17.57                 | 29.54           | -47.11       |
| 29.50        | Peak                         | 12.36                             | -30.68       | -18.32                 | 29.54           | -47.86       |

Actual level = Reading level + Factor

Factor = Antenna factor + cable loss – distance factor

distance factor=3m to 300m, within the band 9kHz-490kHz

3m to 30m, within the band 490kHz-30MHz

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

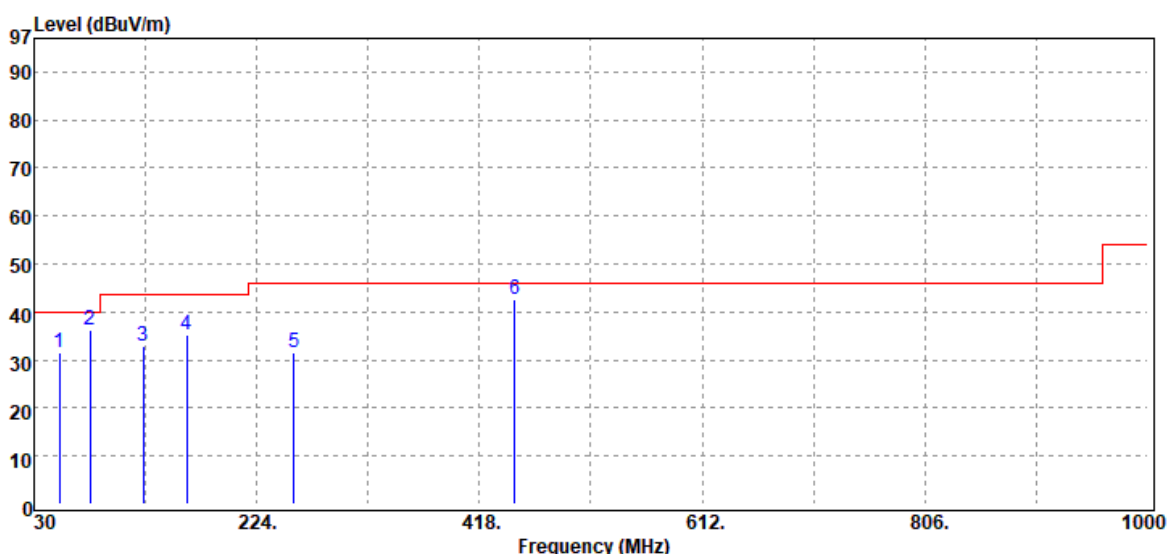
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## 7.5.5 Above 30MHz test result

Report Number :ER-2021-80014  
 Operation Mode :WPC  
 Test Frequency :128KHz  
 Test Mode :Tx  
 EUT Pol :H Plane

Test Site :SAC 3  
 Test Date :2021-08-11  
 Temp./Humi. :26.4/50  
 Antenna Pol. :VERTICAL  
 Engineer :Nick Lin



| Freq.<br>MHz | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level<br>dBμV | Factor<br>dB | Actual<br>FS<br>dBμV/m | Limit<br>@3m<br>dBμV/m | Margin<br>dB |
|--------------|------------------------------|-----------------------------------|--------------|------------------------|------------------------|--------------|
| 52.31        | Peak                         | 40.41                             | -8.89        | 31.52                  | 40.00                  | -8.48        |
| 78.50        | Peak                         | 48.52                             | -12.35       | 36.17                  | 40.00                  | -3.83        |
| 125.06       | Peak                         | 42.45                             | -9.47        | 32.98                  | 43.50                  | -10.52       |
| 162.89       | Peak                         | 43.24                             | -7.99        | 35.25                  | 43.50                  | -8.25        |
| 256.01       | Peak                         | 40.07                             | -8.48        | 31.59                  | 46.00                  | -14.41       |
| 448.35       | QP                           | 46.01                             | -3.31        | 42.70                  | 46.00                  | -3.30        |

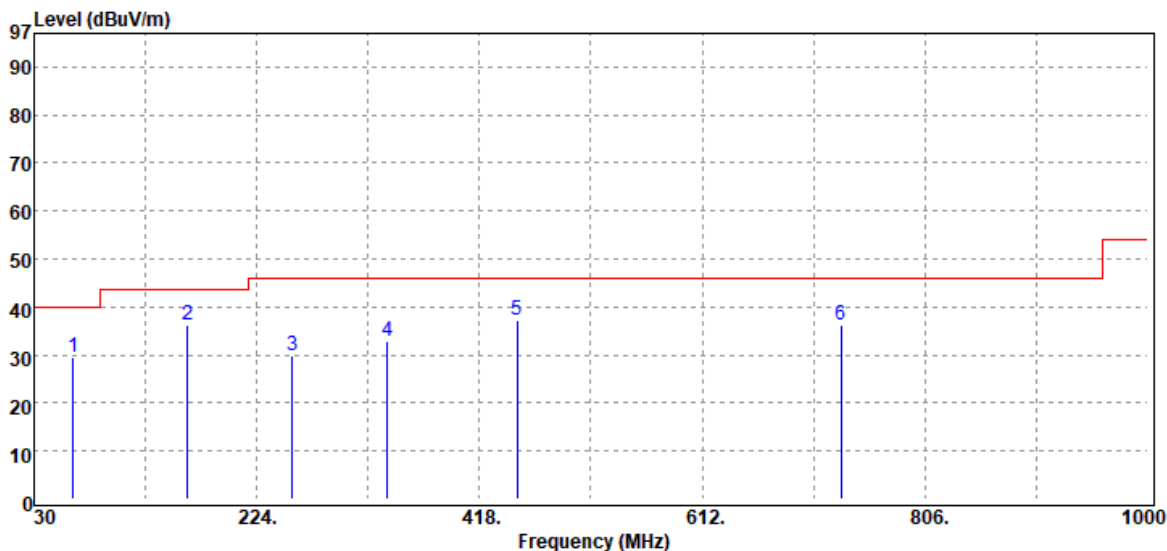
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Report Number :ER-2021-80014  
 Operation Mode :WPC  
 Test Frequency :128KHz  
 Test Mode :Tx  
 EUT Pol :H Plane

Test Site :SAC 3  
 Test Date :2021-08-11  
 Temp./Humi. :26.4/50  
 Antenna Pol. :HORIZONTAL  
 Engineer :Nick Lin



| Freq.<br>MHz | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level<br>dBuV | Factor<br>dB | Actual<br>FS<br>dBuV/m | Limit<br>@3m<br>dBuV/m | Margin<br>dB |
|--------------|------------------------------|-----------------------------------|--------------|------------------------|------------------------|--------------|
| 63.95        | Peak                         | 39.04                             | -9.42        | 29.62                  | 40.00                  | -10.38       |
| 163.86       | Peak                         | 44.21                             | -7.99        | 36.22                  | 43.50                  | -7.28        |
| 255.04       | Peak                         | 38.52                             | -8.49        | 30.03                  | 46.00                  | -15.97       |
| 337.49       | Peak                         | 38.70                             | -5.65        | 33.05                  | 46.00                  | -12.95       |
| 450.60       | QP                           | 40.51                             | -3.25        | 37.26                  | 46.00                  | -8.74        |
| 733.25       | Peak                         | 34.74                             | 1.36         | 36.10                  | 46.00                  | -9.90        |

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## 8 20 dB OCCUPIED BANDWIDTH MEASUREMENT

### 8.1 Standard Applicable:

§2.1049 & §15.215 (c)

### 8.2 Limit:

None

### 8.3 Test Set-up

Refer to section 6.2 in this report

### 8.4 Measurement Procedure

20dB bandwidth

1. The transmitter output (antenna port) was connected to the spectrum analyzer in peak mode.
2. 20dB Bandwidth the resolution bandwidth of 200 Hz and the video bandwidth of 1 kHz were used.
3. Measured the spectrum width with power higher than 20dB below carrier.

### 8.5 Measurement Equipment Used:

| Conducted Emission Test Site: Conducted 2 |               |              |               |            |            |
|-------------------------------------------|---------------|--------------|---------------|------------|------------|
| EQUIPMENT TYPE                            | MFR           | MODEL NUMBER | SERIAL NUMBER | LAST CAL.  | CAL DUE.   |
| Loop Antenna                              | ETS.LINDGREN  | 6502         | 148045        | 10/19/2020 | 10/18/2021 |
| EXA Spectrum Analyzer                     | KEYSIGHT      | N9010B       | MY60240503    | 12/11/2020 | 12/10/2021 |
| DC Block                                  | Mini-Circuits | BLK-18-S+    | 1             | 12/16/2020 | 12/15/2021 |

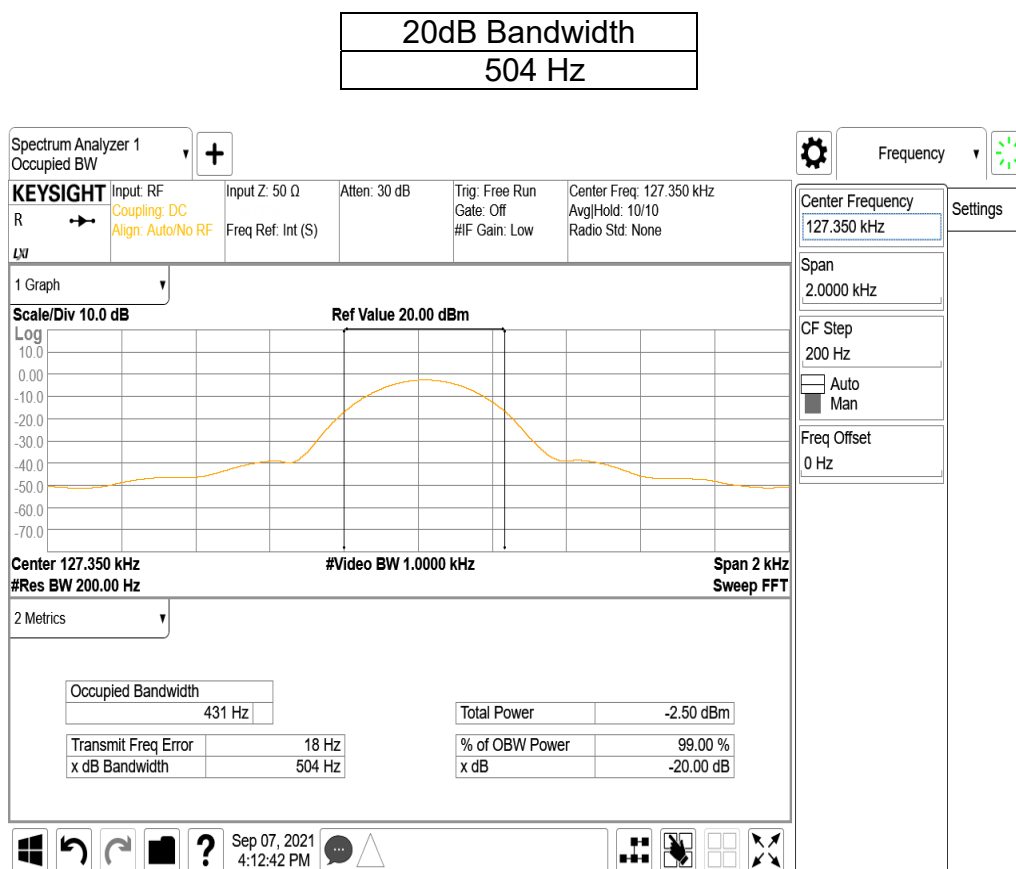
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## 8.7 Measurement Result

### -20dB Bandwidth



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## 9 ANTENNA REQUIREMENT

### 9.1 Standard Applicable:

For intentional device, according to §15.203, an intentional radiator shall be designed to ensure that no antenna other than furnished by the responsible party shall be used with the device.

### 9.2 Antenna Connected Construction:

The antenna is designed as permanently attached and no consideration of replacement. Please see EUT photo and antenna spec. for details.

*~ End of Report ~*

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