

# ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT



**Applicant:** HP Inc.  
1501 Page Mill Road, Palo Alto CA 94304 USA

**Product Name:** Notebook PC

**Brand Name:** HP

**Model No.:** TPN-Q273

**Model Difference:** N/A

**Report Number:** ER/2021/B0082

**FCC ID** 2APYS-HSNL01NFM

**Issue Date:** January 6, 2022

**Date of Test:** December 7, 2021~ December 23, 2021

**Date of EUT Received:** November 23, 2021

Approved By \_\_\_\_\_

**Jim Chang**

## 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	Remark
ER/2021/B0082	00	Original.	January 6, 2022	Susan Lin	

**Note:**

- 1、The remark "\*" indicates modification of the report upon requests from certification body.

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## 1 GENERAL INFORMATION

### 1.1 Product Description

Product Name:	Notebook PC
Brand Name:	HP
Model No.:	TPN-Q273
Model Difference:	N/A
Hardware Version:	N/A
Firmware Version:	N/A
EUT Series No.:	A5CD141619W
NFC Module:	Model No.: HSN-L01NFM, Supplier: Lanto Electronic Ltd
Power Supply:	7.7V from Rechargeable Li-Polymer Battery or 5 / 9 / 12 / 15V from AC/DC Adapter
Test Software (Name/Version):	N/A

### 1.2 RF Specification

Technology:	Wireless Power Transfer
Operating Frequency:	13.56MHz
Transmit Power:	< 14.70dBuV/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. Central RF Lab. (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.

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### 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 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.

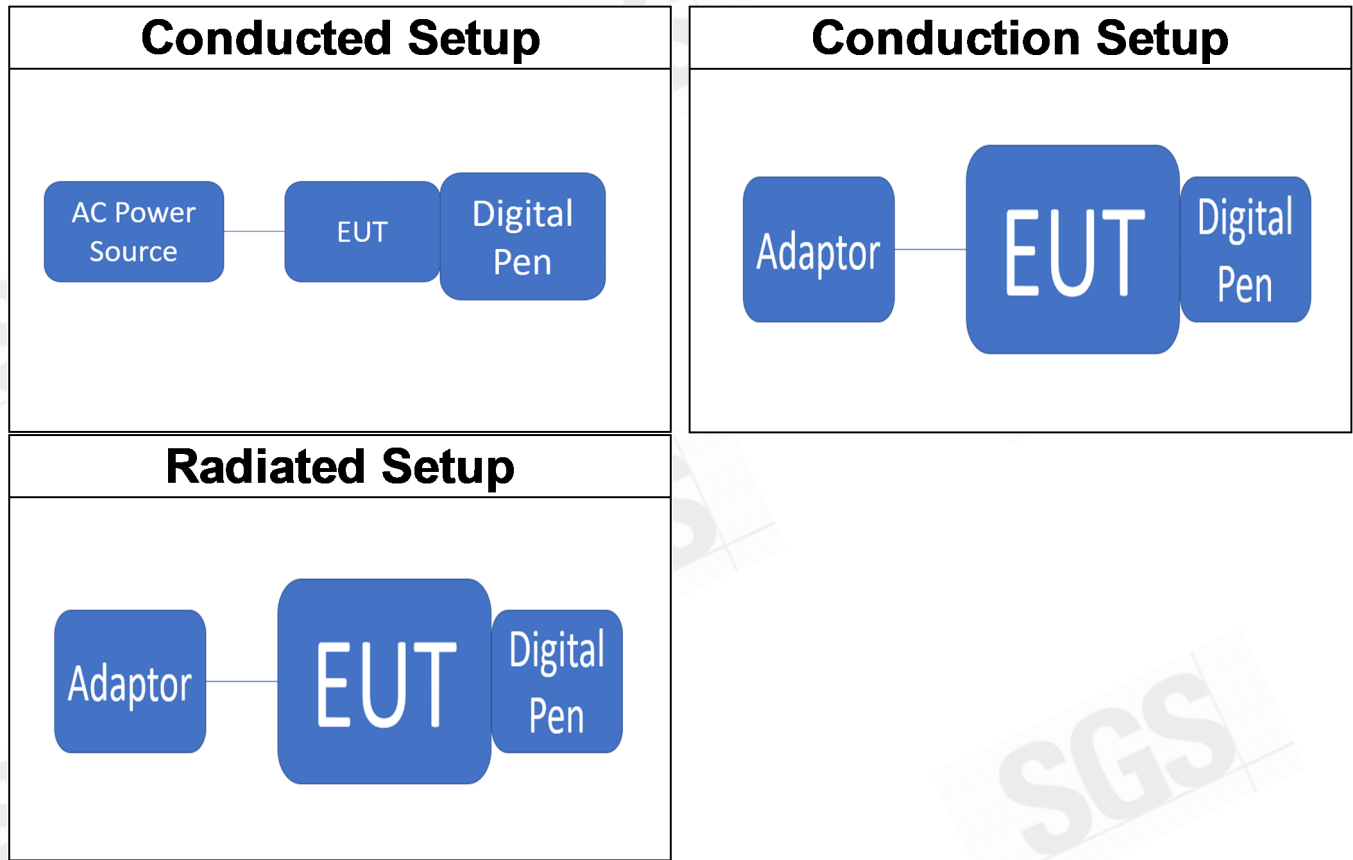
#### 2.3.2 Radiated Emission Test Sites For Measurements From 9 kHz To 30 MHz

Radiated emission below 30MHz is measured in a 9m\*6m\*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



### 2.5 Control Unit(s)

Conducted Emission Test Site: Conducted 4					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Digital Pen	HP	HPS21K2LUA	NA	NA	NA
Adapter	HP	TPN-HA01	NA	NA	NA

Conducted Emission Test Site: Conduction 1					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Test Software	audix	e3	Ver. 9 210322	N.C.R	N.C.R
Digital Pen	HP	HPS21K2LUA	NA	NA	NA
Adapter	HP	TPN-HA01	NA	NA	NA

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Radiated Emission Test Site: SAC 3					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Test Software	audix	e3	Ver. 9 210322	N.C.R	N.C.R
Digital Pen	HP	HPS21K2LUA	NA	NA	NA
Adapter	HP	TPN-HA01	NA	NA	NA

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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 radiated emission was measured as the EUT positioned in different orthogonal planes (E1/E2/H) based on actual usage of the EUT to pre-scan the emissions for determining the worst case scenario.

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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	+/-	<b>2.64</b>	<b>dB</b>	9kHz~30MHz
	+/-	<b>4.93</b>	<b>dB</b>	30MHz - 1000MHz
	+/-	<b>4.81</b>	<b>dB</b>	1GHz - 18GHz
	+/-	<b>4.52</b>	<b>dB</b>	18GHz - 40GHz
Polarization: Horizontal	+/-	<b>2.64</b>	<b>dB</b>	9kHz~30MHz
	+/-	<b>4.45</b>	<b>dB</b>	30MHz - 1000MHz
	+/-	<b>4.81</b>	<b>dB</b>	1GHz - 18GHz
	+/-	<b>4.52</b>	<b>dB</b>	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 MEASUREMENT EQUIPMENT USED

### 6.1 Conducted AC Power line

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	12/07/2021	12/06/2022

### 6.2 Emission Bandwidth

Conducted Emission Test Site: Conducted 4					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
EXA Spectrum Analyzer	Agilent	N9010A	MY54200716	10/13/2021	10/12/2022
AC Power Source	Gwinstek	APS-7050E	GEV171679	09/28/2021	09/27/2022
Temperature Chamber	Giant Force	GTH-150-40-CP-AR	MAA0512-018	05/19/2021	05/18/2022
H-Loop Near Field Antenna	EMCI	LF-R 400	02-1637	N/A	N/A

### 6.3 Radiated Measurement

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
Loop Antenna	ETS.LINDGREN	6502	148045	09/29/2021	09/28/2022
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

**NOTE:** N.C.R refers to Not Calibrated Required.

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## 7 CONDUCTED EMISSIONS TEST

### 7.1 Limitation

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

Frequency range MHz	Limits (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

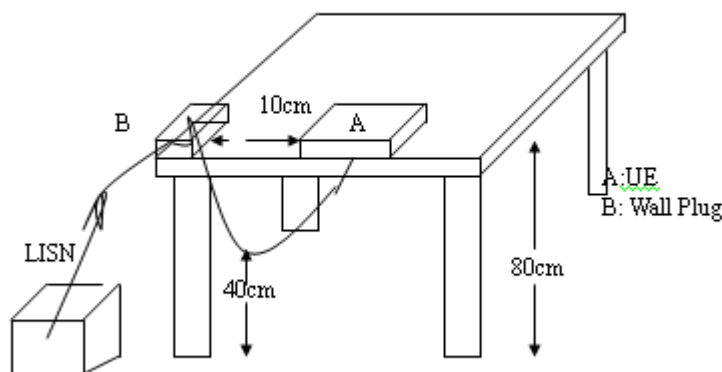
Note

- 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.

### 7.2 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.

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



### 7.4 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.

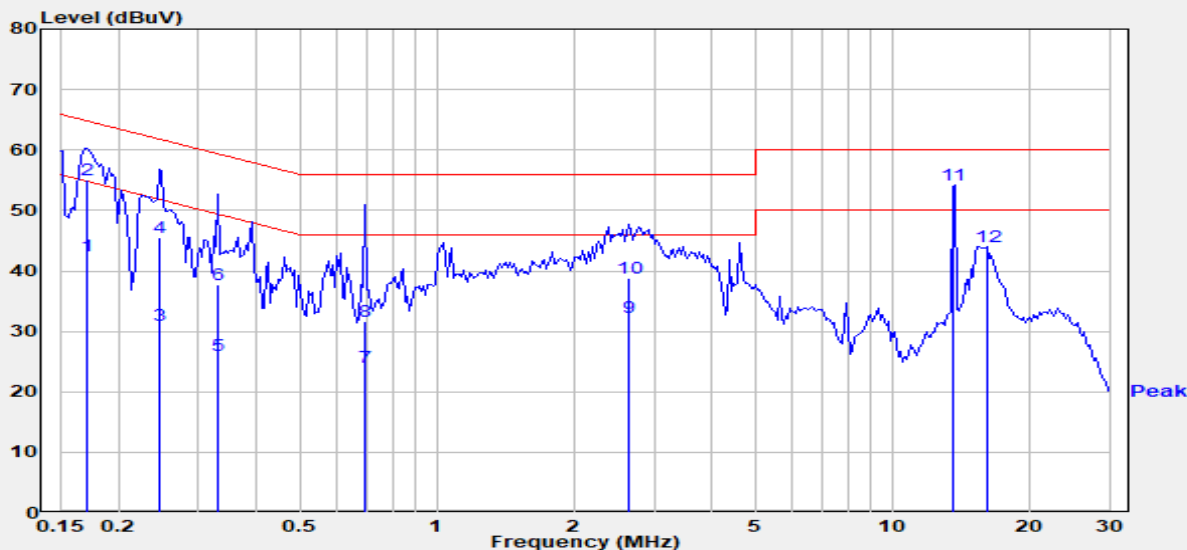
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### 7.5 Measurement Result:

Report Number	:ER-2021-B0082	Test Site	:Conduction 1
Test Mode	:NFC	Test Date	:2021-12-15
Power	:120V/60Hz	Temp./Humi.	:26.6/51
Probe	:L	Engineer	:Ricky Chen
Note:	:		



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV	Limit dBμV	Margin dB
0.170	Average	40.33	2.12	42.45	54.94	-12.49
0.170	QP	52.91	2.12	55.03	64.94	-9.91
0.247	Average	28.85	2.12	30.97	51.86	-20.89
0.247	QP	43.32	2.12	45.44	61.86	-16.42
0.332	Average	23.87	2.12	25.99	49.40	-23.41
0.332	QP	35.62	2.12	37.74	59.40	-21.66
0.697	Average	21.92	2.13	24.05	46.00	-21.95
0.697	QP	29.52	2.13	31.65	56.00	-24.35
2.650	Average	29.95	2.41	32.36	46.00	-13.64
2.650	QP	36.37	2.41	38.78	56.00	-17.22
13.560	Peak	---	2.29	54.21	---	---
16.226	Peak	41.72	2.30	44.03	60.00	-15.97

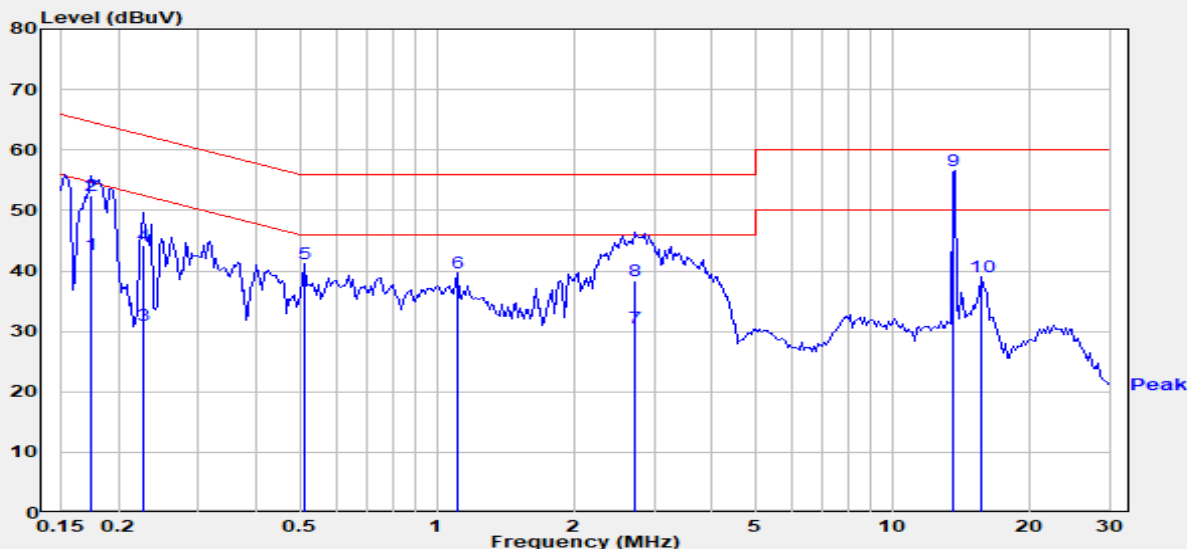
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Report Number :ER-2021-B0082  
 Test Mode :NFC  
 Power :120V/60Hz  
 Probe :N  
 Note: :

Test Site :Conduction 1  
 Test Date :2021-12-15  
 Temp./Humi. :26.6/51  
 Engineer :Ricky Chen



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB $\mu$ V	Factor dB	Actual FS dB $\mu$ V	Limit dB $\mu$ V	Margin dB
0.174	Average	40.43	2.21	42.64	54.77	-12.12
0.174	QP	50.32	2.21	52.53	64.77	-12.23
0.227	Average	28.65	2.27	30.92	52.57	-21.65
0.227	QP	41.95	2.27	44.22	62.57	-18.35
0.513	Peak	38.98	2.12	41.11	56.00	-14.89
1.111	Peak	37.49	2.13	39.63	56.00	-16.37
2.736	Average	28.45	2.16	30.61	46.00	-15.39
2.736	QP	36.12	2.16	38.28	56.00	-17.72
13.560	Peak	---	2.30	56.60	---	---
15.718	Peak	36.69	2.31	38.99	60.00	-21.01

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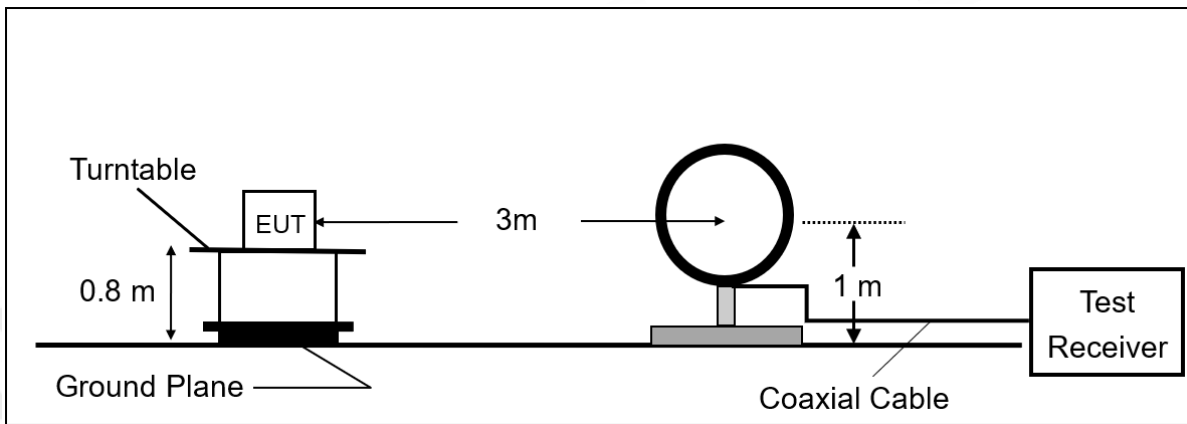
## 8 RADIATED EMISSION TEST

### 8.1 Measurement Procedure

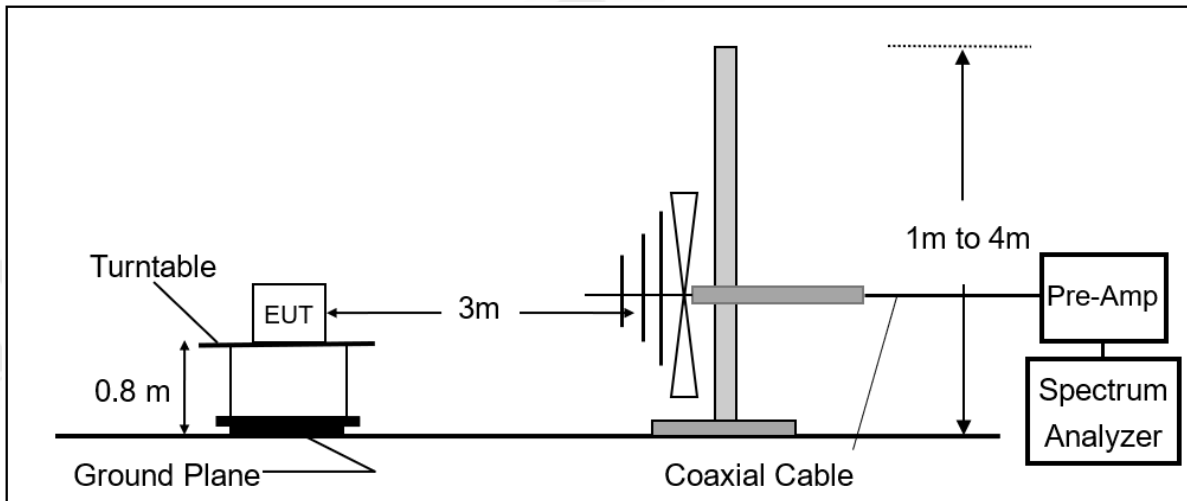
1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.

### 8.2 Test Setup

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



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



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### 8.3 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 ( $\mu\text{V/m}$ )	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  $\text{dB}\mu\text{V/m}=20 \log (\mu\text{V/m})$
2. Distance extrapolation factor =  $40 \log (\text{required distance/ test distance})$  (dB)
3.  $20*\log(30\mu\text{V/m}) + 40\text{dB} = 69.54 \text{ dBuV/m}$
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( $\text{dB}\mu\text{V/m}$ ) = Spectrum. Reading level( $\text{dB}\mu\text{V}$ ) + Factor(dB)  
Factor(dB) = Antenna Factor(dB) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

**Note:**

1. The more stringent limit applies at the transition frequency.
2. Measurements are demonstrated in SAC with distance at 3m.
1. Actual FS( $\text{dB}\mu\text{V/m}$ ) = Spectrum. Reading level( $\text{dB}\mu\text{V}$ ) + 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.

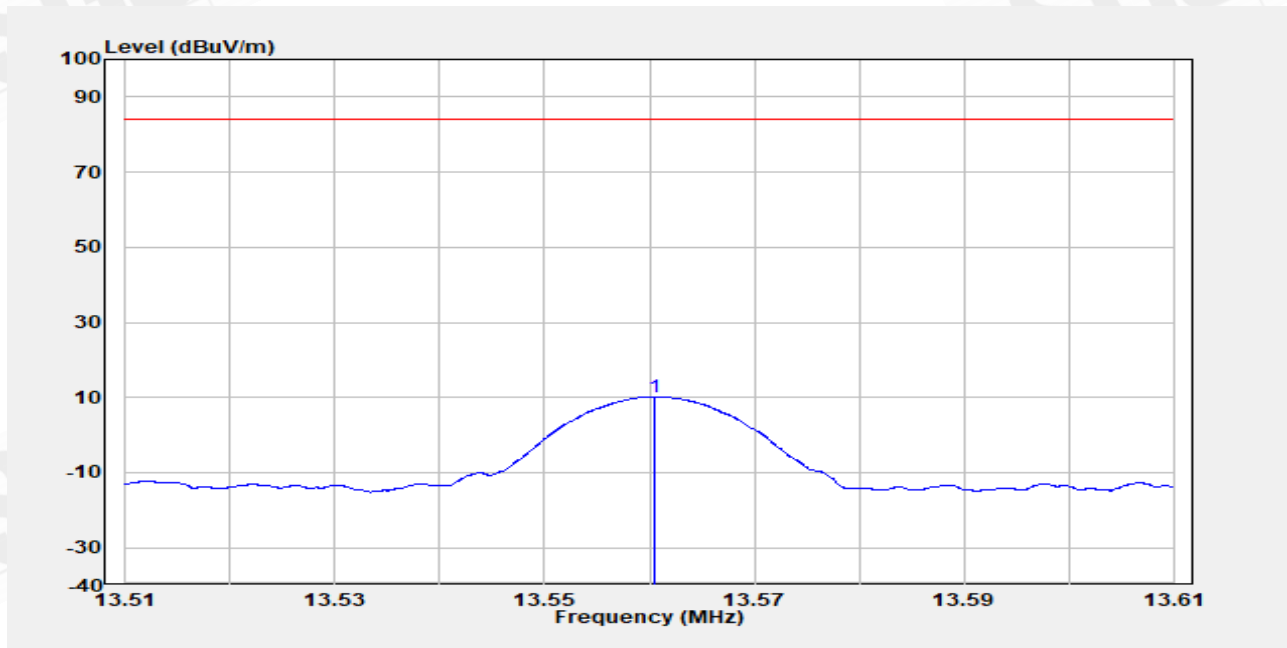
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### 8.4 Test Result

#### 8.4.1 Field Strength of Fundamental Emission

Report Number	:ER-2021-B0082	Test Site	:SAC 3
Operation Mode	:NFC	Test Date	:2021-12-10
Test Frequency	:13.56 MHz	Temp./Humi.	:24.3/58
Test Mode	:Main	Antenna Pol.	:Vertical
EUT Pol	:H Plane	Engineer	:Ricky Chen



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit dBuV/m	Margin dB
13.560	Peak	38.66	-28.47	10.19	84.00	-73.81

Actual level = Reading level + Factor

Factor = Antenna factor + cable loss – Pre\_Amplifier Gain – distance factor

Test distance= 3m

For Actual level and limit:

Field strength (dBuV/m) at 300m,within the band 9 kHz - 490 kHz.

Field strength (dBuV/m) at 30m,within the band 490 kHz - 30 MHz.

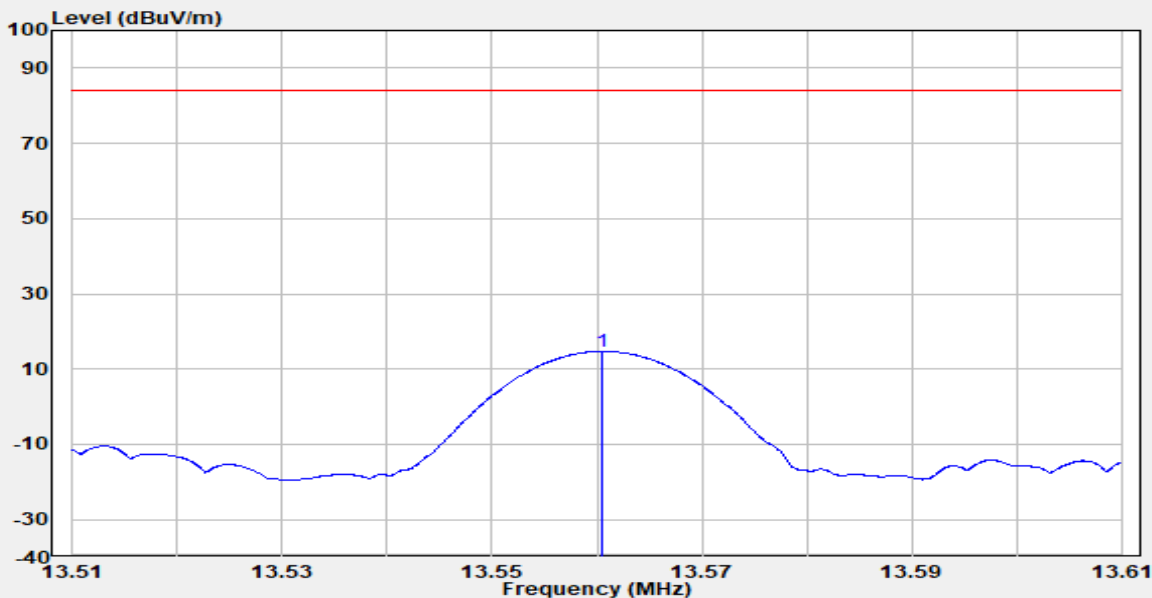
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Report Number :ER-2021-B0082  
 Operation Mode :NFC  
 Test Frequency :13.56 MHz  
 Test Mode :Main  
 EUT Pol :H Plane

Test Site :SAC 3  
 Test Date :2021-12-10  
 Temp./Humi. :24.3/58  
 Antenna Pol. :Horizontal  
 Engineer :Ricky Chen



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBUV	Factor dB	Actual FS dBUV/m	Limit dBUV/m	Margin dB
13.561	Peak	43.17	-28.47	14.70	84.00	-69.30

Actual level = Reading level + Factor

Factor = Antenna factor + cable loss – Pre\_Amplifier Gain – distance factor

Test distance= 3m

For Actual level and limit:

Field strength (dBUV/m) at 300m, within the band 9 kHz - 490 kHz.

Field strength (dBUV/m) at 30m, within the band 490 kHz - 30 MHz.

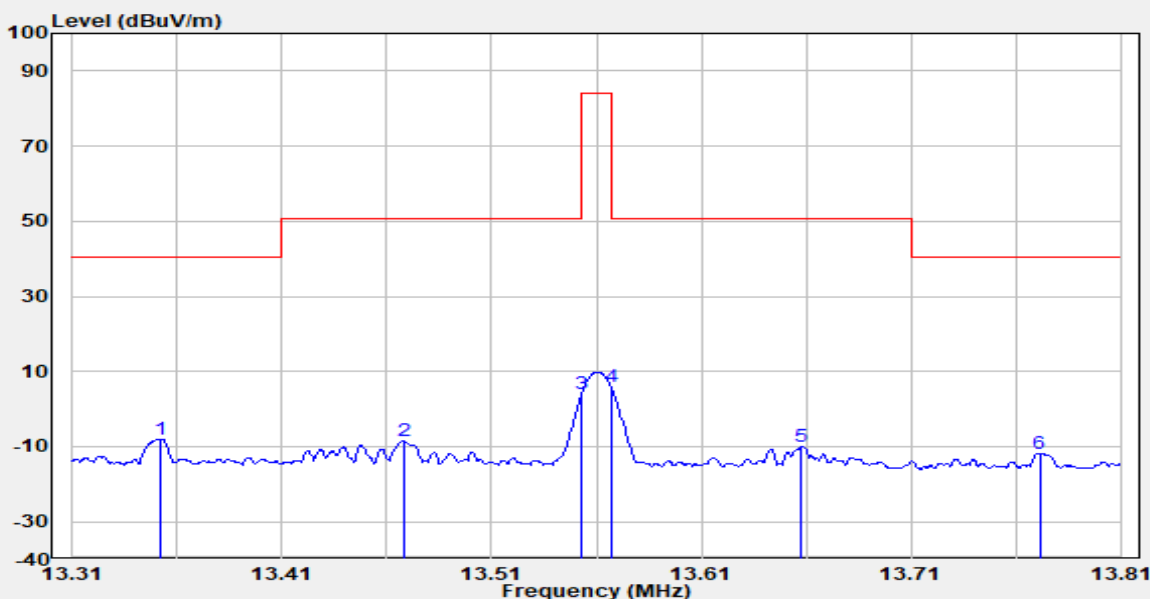
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Report Number :ER-2021-B0082  
 Operation Mode :NFC  
 Test Frequency :13.56 MHz  
 Test Mode :Mask  
 EUT Pol :H Plane

Test Site :SAC 3  
 Test Date :2021-12-10  
 Temp./Humi. :24.3/58  
 Antenna Pol. :Vertical  
 Engineer :Ricky Chen



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit dBμV/m	Margin dB
13.352	Peak	20.43	-28.45	-8.01	40.50	-48.51
13.468	Peak	19.91	-28.46	-8.55	50.50	-59.05
13.553	Peak	32.67	-28.47	4.20	50.50	-46.30
13.567	Peak	34.42	-28.47	5.94	50.50	-44.56
13.658	Peak	18.58	-28.48	-9.90	50.50	-60.40
13.772	Peak	16.76	-28.50	-11.74	40.50	-52.24

Actual level = Reading level + Factor

Factor = Antenna factor + cable loss – Pre\_Amplifier Gain – distance factor

Test distance= 3m

For Actual level and limit:

Field strength (dBuV/m) at 300m, within the band 9 kHz - 490 kHz.

Field strength (dBuV/m) at 30m, within the band 490 kHz - 30 MHz.

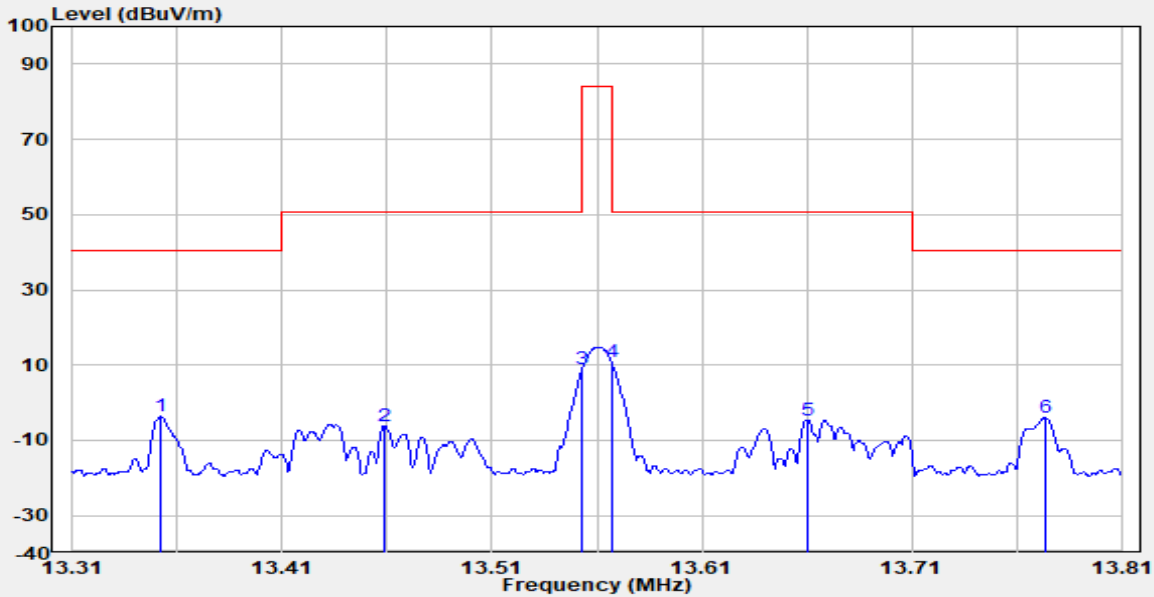
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Report Number :ER-2021-B0082  
 Operation Mode :NFC  
 Test Frequency :13.56 MHz  
 Test Mode :Mask  
 EUT Pol :H Plane

Test Site :SAC 3  
 Test Date :2021-12-10  
 Temp./Humi. :24.3/58  
 Antenna Pol. :Horizontal  
 Engineer :Ricky Chen



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit dBuV/m	Margin dB
13.352	Peak	24.69	-28.45	-3.75	40.50	-44.25
13.459	Peak	22.40	-28.46	-6.06	50.50	-56.56
13.553	Peak	37.38	-28.47	8.91	50.50	-41.59
13.567	Peak	39.30	-28.47	10.83	50.50	-39.67
13.661	Peak	23.95	-28.49	-4.53	50.50	-55.03
13.774	Peak	24.41	-28.50	-4.09	40.50	-44.59

Actual level = Reading level + Factor

Factor = Antenna factor + cable loss – Pre\_Amplifier Gain – distance factor

Test distance= 3m

For Actual level and limit:

Field strength (dBuV/m) at 300m, within the band 9 kHz - 490 kHz.

Field strength (dBuV/m) at 30m, within the band 490 kHz - 30 MHz.

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.

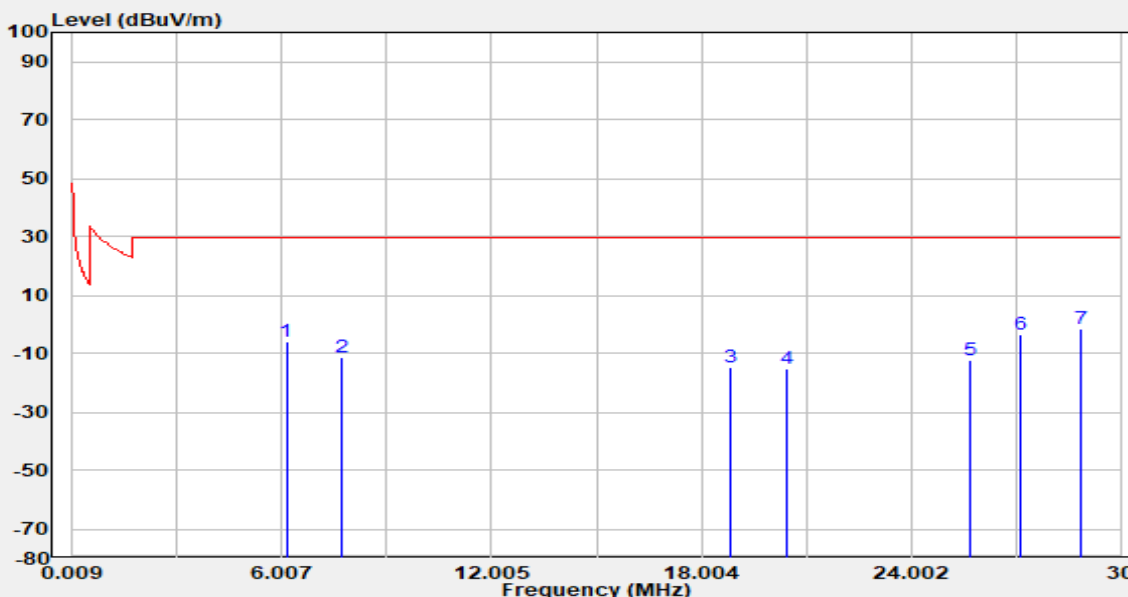
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**8.4.2 Below 30 MHz test result**

Report Number :ER-2021-B0082  
 Operation Mode :NFC  
 Test Frequency :13.56 MHz  
 Test Mode :Tx  
 EUT Pol :H Plane

Test Site :SAC 3  
 Test Date :2021-12-10  
 Temp./Humi. :24.3/58  
 Antenna Pol. :Vertical  
 Engineer :Ricky Chen



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit dBuV/m	Margin dB
6.127	Peak	22.76	-28.56	-5.80	29.54	-35.34
7.717	Peak	17.06	-28.28	-11.22	29.54	-40.76
18.813	Peak	14.30	-29.02	-14.72	29.54	-44.26
20.433	Peak	14.16	-29.24	-15.07	29.54	-44.61
25.681	Peak	18.26	-30.46	-12.21	29.54	-41.75
27.120	Peak	27.42	-30.76	-3.33	29.54	-32.87
28.860	Peak	29.49	-31.09	-1.60	29.54	-31.14

Actual level = Reading level + Factor

Factor = Antenna factor + cable loss – Pre\_Amplifier Gain – distance factor

Test distance= 3m

For Actual level and limit:

Field strength (dBuV/m) at 300m, within the band 9 kHz - 490 kHz.

Field strength (dBuV/m) at 30m, within the band 490 kHz - 30 MHz.

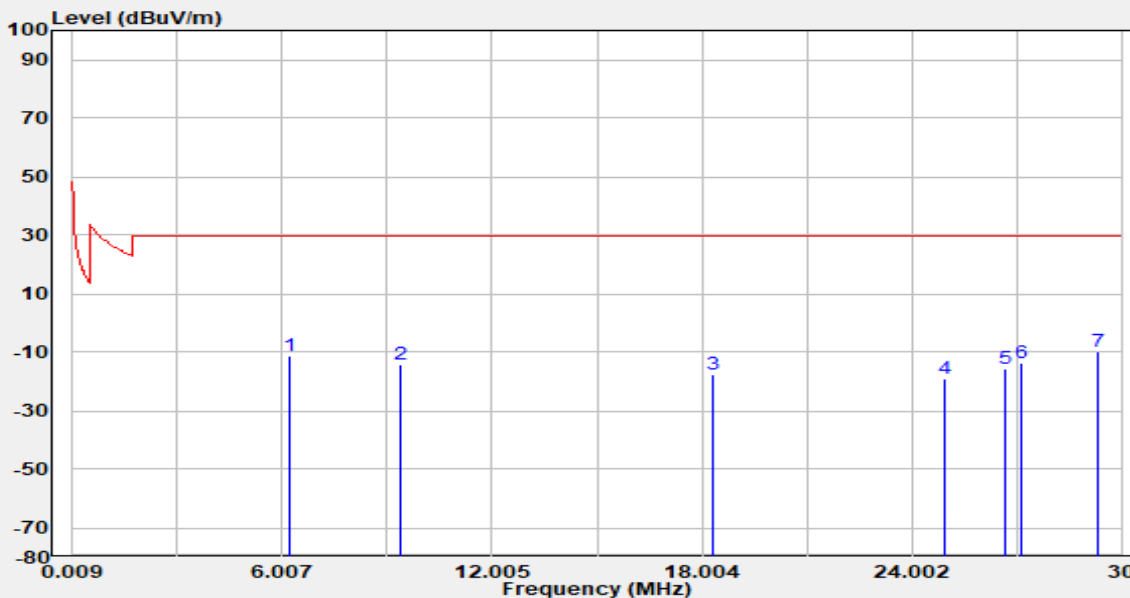
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Report Number :ER-2021-B0082  
 Operation Mode :NFC  
 Test Frequency :13.56 MHz  
 Test Mode :Tx  
 EUT Pol :H Plane

Test Site :SAC 3  
 Test Date :2021-12-10  
 Temp./Humi. :24.3/58  
 Antenna Pol. :Horizontal  
 Engineer :Ricky Chen



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit dBμV/m	Margin dB
6.217	Peak	17.20	-28.54	-11.34	29.54	-40.88
9.366	Peak	13.80	-28.04	-14.25	29.54	-43.79
18.304	Peak	11.34	-28.97	-17.63	29.54	-47.17
24.932	Peak	11.21	-30.31	-19.10	29.54	-48.64
26.701	Peak	15.13	-30.67	-15.54	29.54	-45.08
27.120	Peak	16.93	-30.76	-13.83	29.54	-43.37
29.340	Peak	21.66	-31.18	-9.52	29.54	-39.06

Actual level = Reading level + Factor

Factor = Antenna factor + cable loss – Pre\_Amplifier Gain – distance factor

Test distance= 3m

For Actual level and limit:

Field strength (dBuV/m) at 300m, within the band 9 kHz - 490 kHz.

Field strength (dBuV/m) at 30m, within the band 490 kHz - 30 MHz.

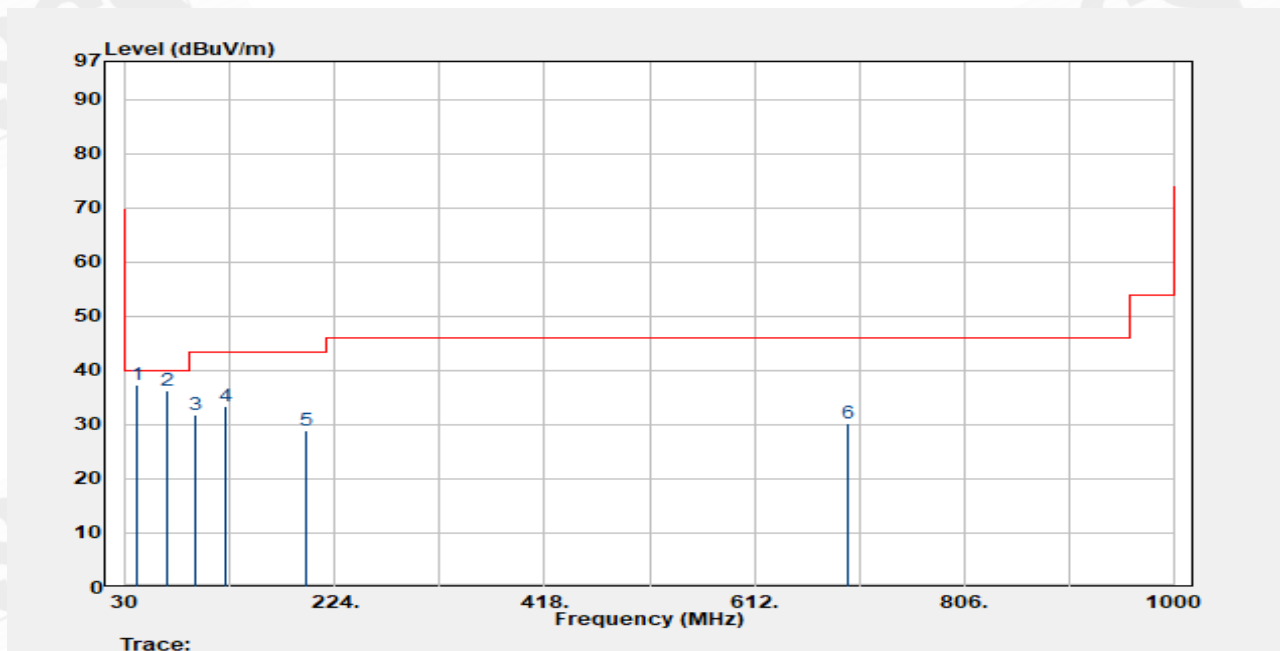
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**8.4.3 FCC Above 30MHz test result**

Report Number	:ER-2021-B0082	Test Site	:SAC 3
Operation Mode	:NFC	Test Date	:2021-12-10
Test Frequency	:13.56 MHz	Temp./Humi.	:24.3/58
Test Mode	:Tx	Antenna Pol.	:Vertical
EUT Pol	:H Plane	Engineer	:Ricky Chen



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
40.680	QP	45.71	-8.38	37.33	40.00	-2.67
67.800	QP	46.02	-9.86	36.17	40.00	-3.83
94.920	Peak	45.66	-13.85	31.81	43.50	-11.69
122.040	Peak	42.93	-9.53	33.40	43.50	-10.10
197.810	Peak	38.62	-9.74	28.88	43.50	-14.62
698.330	Peak	28.51	1.62	30.13	46.00	-15.87

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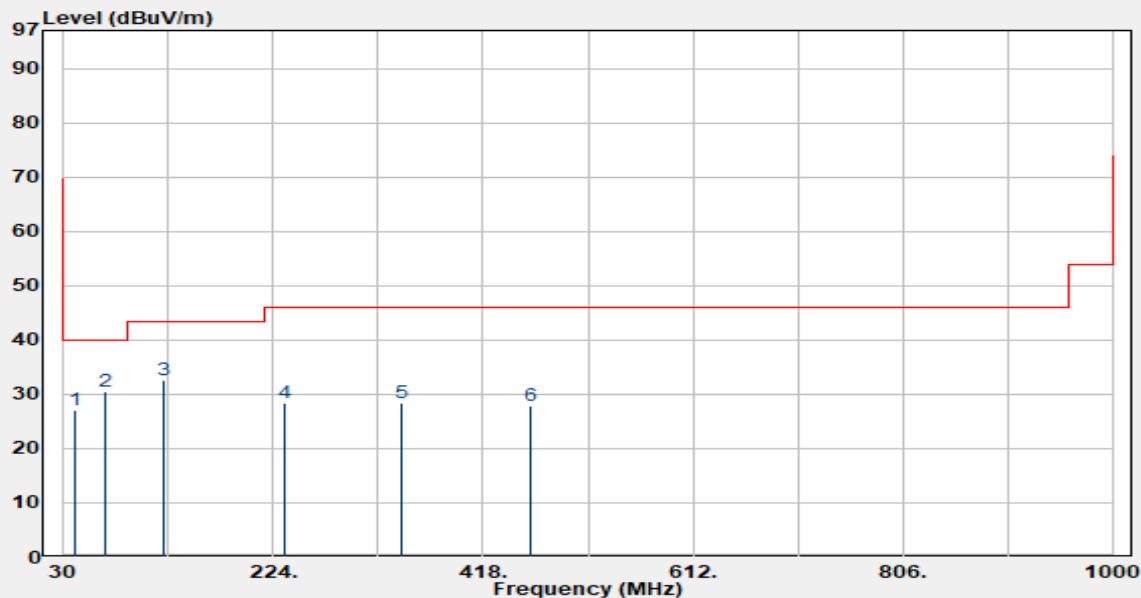
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Report Number :ER-2021-B0082  
 Operation Mode :NFC  
 Test Frequency :13.56 MHz  
 Test Mode :Tx  
 EUT Pol :H Plane

Test Site :SAC 3  
 Test Date :2021-12-10  
 Temp./Humi. :24.3/58  
 Antenna Pol. :Horizontal  
 Engineer :Ricky Chen



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBUV	Factor dB	Actual FS dBUV/m	Limit @3m dBUV/m	Margin dB
40.680	Peak	35.42	-8.38	27.04	40.00	-12.96
67.800	Peak	40.26	-9.86	30.40	40.00	-9.60
122.040	Peak	42.04	-9.53	32.50	43.50	-11.00
234.670	Peak	36.84	-8.51	28.33	46.00	-17.67
342.340	Peak	33.47	-4.95	28.52	46.00	-17.48
461.650	Peak	30.19	-2.37	27.82	46.00	-18.18

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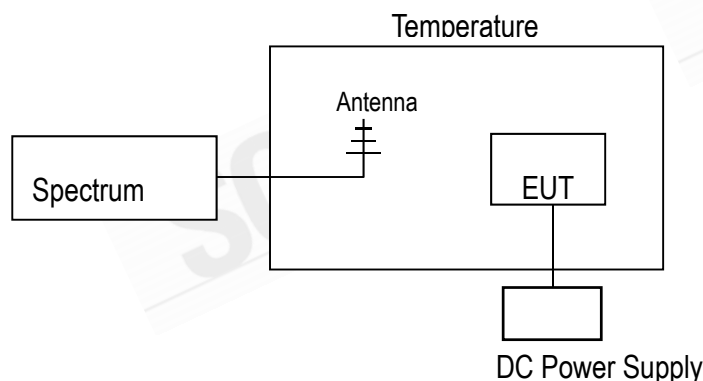
## 9 20 dB OCCUPIED BANDWIDTH MEASUREMENT

### 9.1 Standard Applicable:

§2.1049 & §15.215 (c)

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

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



### 9.3 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.

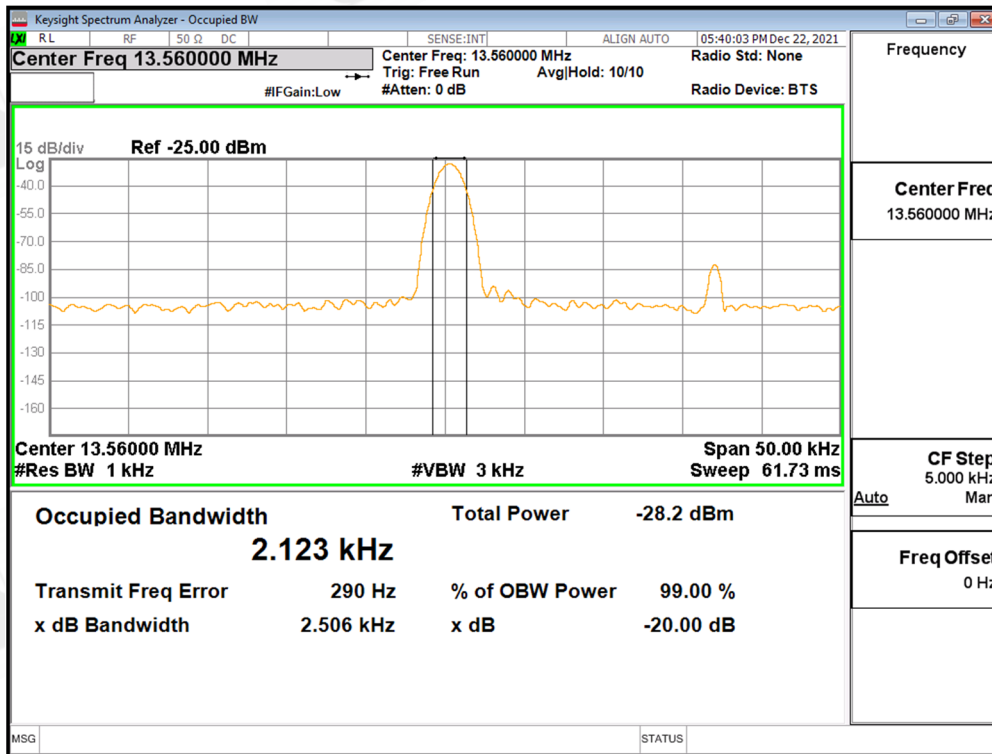
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9.4 Measurement Result  
-20dB Bandwidth

20dB Bandwidth
2.506 kHz



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## 10 ANTENNA REQUIREMENT

### 10.1 Standard Applicable:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §§ 15.211, 15.213, 15.217, 15.219, 15.221, or § 15.236. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with § 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

### 10.2 Antenna Connected Construction:

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

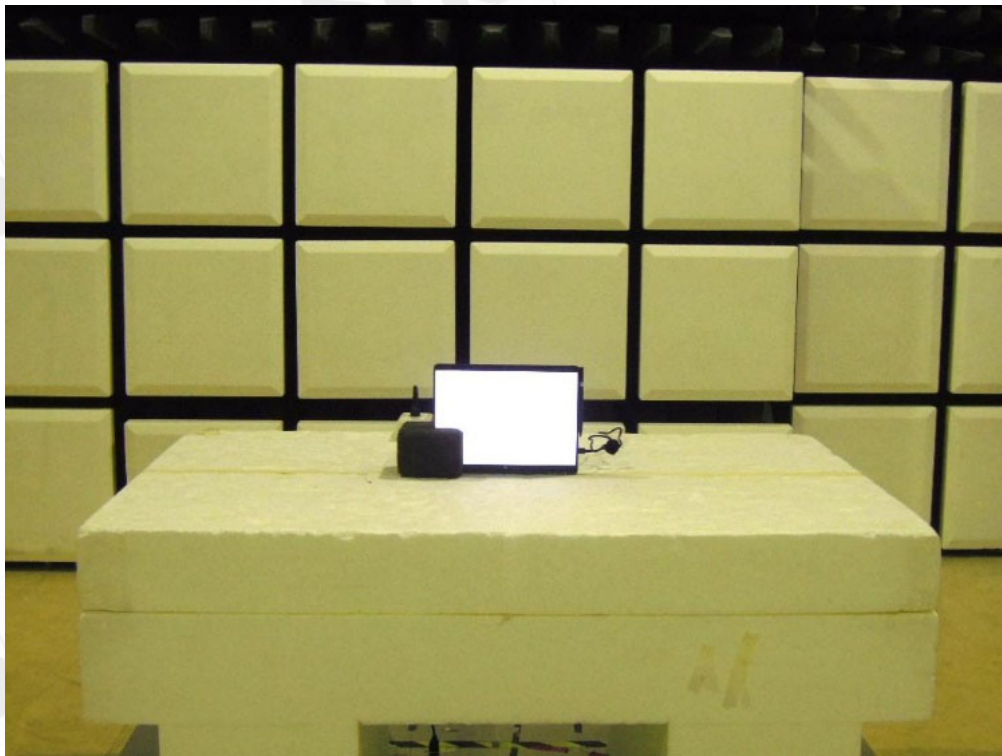
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## 11 PHOTOGRAPHS OF SET UP

### Radiated Emission Set up Photos



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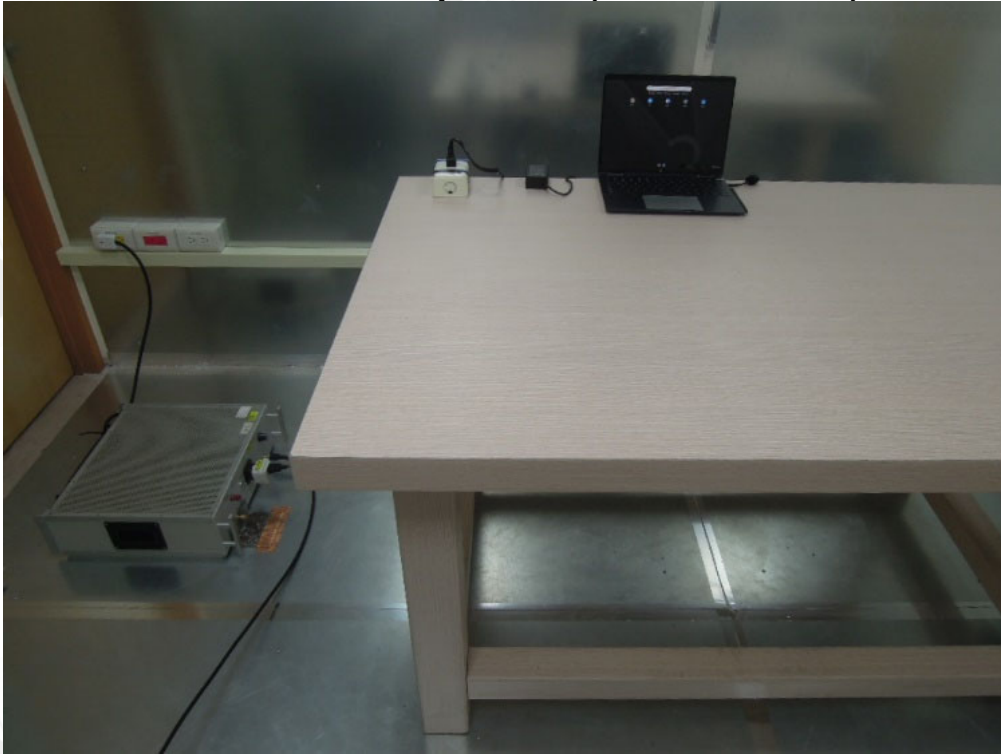


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## Conducted Setup Photo (AC Power line)



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## 12 PHOTOGRAPHS OF EUT

Please refer to the attached file (EUT Photo)

~ End of Report ~

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