

**ELECTROMAGNETIC EMISSIONS
COMPLIANCE REPORT**

Applicant: Cognito Health Inc.
9F-1, No. 3, Yuanqu St. Nangang Dist., Taipei, 115 Taiwan
Manufacturer: Cognito Health Inc.
9F-1, No. 3, Yuanqu St. Nangang Dist., Taipei, 115 Taiwan
Product Name: Control Box 3.1
Brand Name: Cognito Health
Model No.: BA6G-32
Report Number: TERF2411003303E2
FCC ID 2A5HF-BA6GN
Date of EUT Received: November 04, 2024
Date of Test: November 18, 2024 ~ December 24, 2024
Issue Date: January 13, 2025

Approved By

Arno Hsieh

Arno Hsieh

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 §15.225.

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
TERF2411003303E2	00	Original	January 13, 2025	Kate Lai	

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:	Control Box 3.1
Brand Name:	Cognito Health
Model No.:	BA6G-32
Hardware Version:	1.1
Firmware Version:	3.0.1
EUT Series No.:	NFC: B00012 Co-Location: B00014
Power Supply:	12Vdc from AC/DC Adapter
Test Software (Name/Version)	NFC: Default Co-Location: CMD

1.2 RF specification

Radio Technology:	NFC
Operating Frequency	13.56MHz
Transmit Power	8.30 dBuV/m at 30m; 48.30 dBuV/m at 3m
Number of Channels	1
Modulation Type	ASK
Antenna Type	Loop Antenna

Note: Antenna information is provided by the applicant.

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1.3 Test Methodology

FCC Part 15, Subpart C §15.225

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 2		
		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 other accessory attached. This is the worst case condition.

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 0.15 MHz 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. For emission measurements above 1 GHz, the table height shall be 1.5 m. 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 electric field radiated emissions above 1 GHz the EUT 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

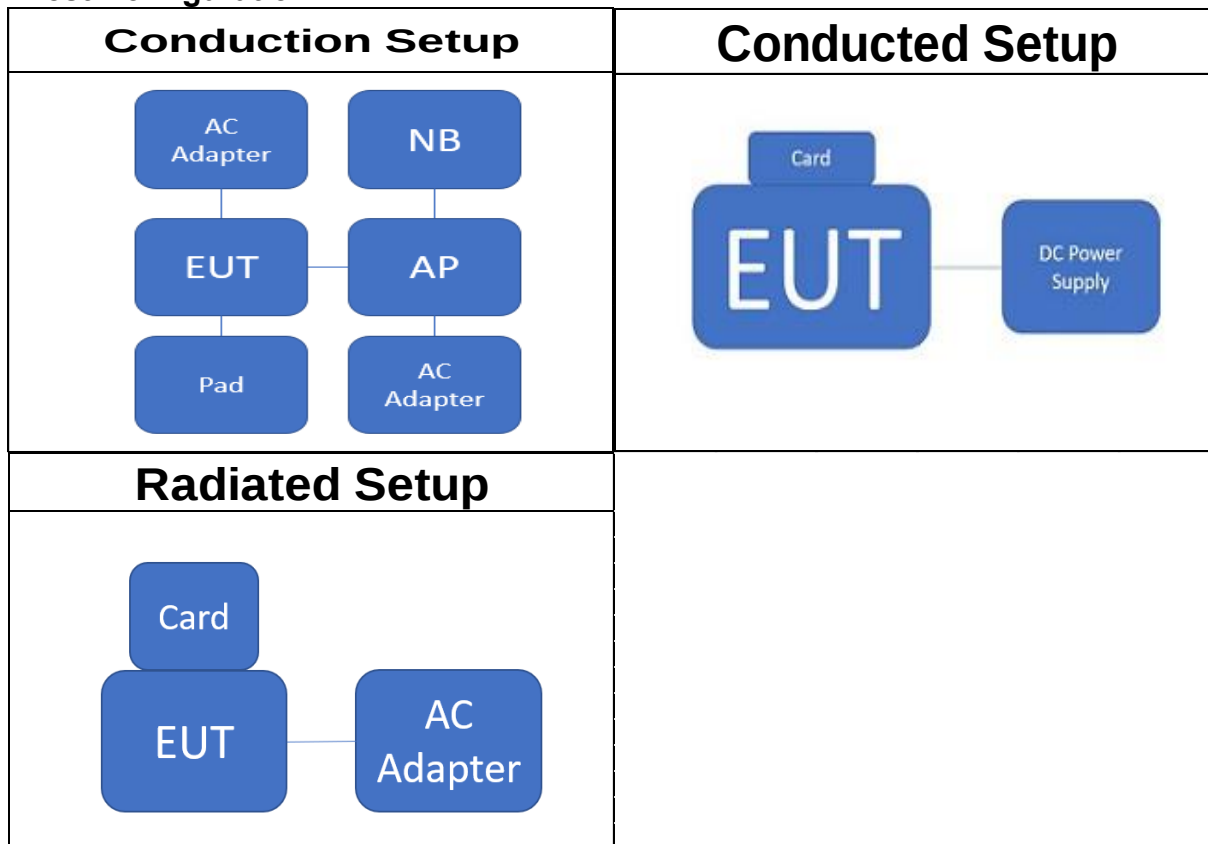
Radiated emission below 30MHz is measured in a 9m*6m*6m semi-anechoic chamber, the measurements correspond to those obtained at an open-field test site.

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

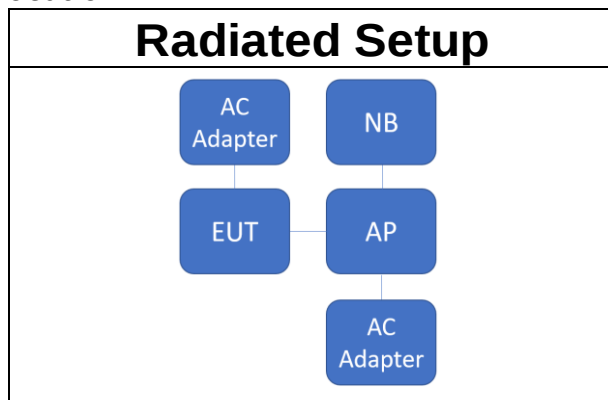
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2.4 Test Configuration



Co-Location



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2.5 Control Unit(s)

AC Power-Line Conducted Emission Test Site: Conduction C					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL. (mm/dd/yyyy)	CAL DUE. (mm/dd/yyyy)
Pad	Cognito Health Inc.	P7FD-22	3PE00014	N/A	N/A
Card	Easy Card	844200956	N/A	N/A	N/A
test cable (for NFC)	JHI Wei	RF-JG01	N/A	N/A	N/A
LAN Cable	eje	CAT5E CCS	N/A	N/A	N/A
LAN Cable	AMP	AMP-6e	4719862256612	N/A	N/A
Notebook	HP	HSN-Q35C-4	P0004691	N/A	N/A
AP	D-LINK	DIR-865L	R3R01C9000402 FCC ID:KA2IR865LA1	N/A	N/A
AC Adapter	ADAPTER TECH.	ATM024T-W120V	2429000065	N/A	N/A
AC Adapter	Asian Power	WA-36C12R	N/A	N/A	N/A
Conducted Emission Test Site: Conducted D					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL. (mm/dd/yyyy)	CAL DUE. (mm/dd/yyyy)
Card	Easy Card	844200956	N/A	N/A	N/A
test cable (for NFC)	JHI Wei	RF-JG01	N/A	N/A	N/A
Radiated Emission Test Site: SAC C					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL. (mm/dd/yyyy)	CAL DUE. (mm/dd/yyyy)
AC Adapter	ADAPTER TECH.	ATM024T-W120V	2429000065	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
§15.225 (a)-(d)	Radiated Emission	Compliant
§15.209	Radiated Emission Limits, general requirement	Compliant
§15.225 (e)	Frequency Stability	Compliant
§2.1049 §15.215 (c)	Emission Bandwidth	Compliant
§15.203	Antenna Requirement	Compliant
§15.205	Restricted Bands	Compliant

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4 DESCRIPTION OF TEST MODES

4.1 The Worst Test Modes and Channel Details

1. The EUT stay in continuous transmission mode.
2. The frequency 13.56 MHz is the default channel to test, where it is the only manipulative channel as this application supports.
3. Only one configuration is supported/applicable as follows.

RADIATED EMISSION TEST			
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION
NFC	1	1	ASK
FREQUENCY STABILITY			
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION
NFC	1	1	ASK
20dB BANDWIDTH			
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION
NFC	1	1	ASK

Co-Location

Transmitter Unwanted Emissions

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE
				(Mbps)
WLAN 2.4G				
802.11n20	1 to 11	1	OFDM	MCS0
Bluetooth				
Bluetooth	0 to 78	39	$\pi/4$ -DQPSK	3DH5
NFC				
NFC	1	1	ASK	-

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE
				(Mbps)
WLAN 5G				
802.11ac20	36 to 48	36	OFDM	MCS0
Bluetooth				
Bluetooth	0 to 78	39	$\pi/4$ -DQPSK	3DH5
NFC				
NFC	1	1	ASK	-

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	+/- 1.54 dB
Frequency Stability	+/- 1.48 Hz
Emission Bandwidth	+/- 1.38 Hz
Temperature	+/- 0.6 °C
Humidity	+/- 3 %
DC / AC Power Source	+/- 1 %

Radiated Spurious Emission Measurement Uncertainty			
Polarization: Vertical	+/-	1.89 dB	9kHz~30MHz
	+/-	4.15 dB	30MHz - 1000MHz
	+/-	3.43 dB	1GHz - 18GHz
	+/-	3.86 dB	18GHz - 40GHz
Polarization: Horizontal	+/-	1.89 dB	9kHz~30MHz
	+/-	4.02 dB	30MHz - 1000MHz
	+/-	3.43 dB	1GHz - 18GHz
	+/-	3.86 dB	18GHz - 40GHz
Radiated Spurious Emission	+/-	2 dB	33GHz-50GHz
	+/-	1.59 dB	50GHz-60GHz
	+/-	1.7 dB	60GHz-90GHz
	+/-	1.64 dB	90GHz-140GHz
	+/-	3.83 dB	140GHz-220GHz

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 Emission from AC power line

AC Power-Line Conducted Emission Test Site: Conduction C					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL. (mm/dd/yyyy)	CAL DUE. (mm/dd/yyyy)
Coaxial Cable	EC Lab	RF-HY-CAB-250	RF-HY-CAB-250-01	03/27/2024	03/26/2025
EMI Test Receiver	R&S	ESCI	101342	04/29/2024	04/28/2025
LISN	SCHWARZBECK Mess-Elektronik	NSLK8127	973	04/22/2024	04/21/2025
Pulse Limiter	EC Lab	VTSD 9561F-N	485	03/27/2024	03/26/2025
Test Software	audix	e3	E3 20923 SGS Ver.9 (C)	N.C.R	N.C.R

6.2 Conducted Measurement

Conducted Emission Test Site: Conducted D					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL. (mm/dd/yyyy)	CAL DUE. (mm/dd/yyyy)
DC Block	PASTERNAK	PE8210	RF157	11/14/2024	11/13/2025
DC Power Supply	Gwinstek	SPS-3610	GEW902165	01/17/2024	01/16/2025
Spectrum Analyzer	KEYSIGHT	N9010B	MY59071570	06/25/2024	06/24/2025
Temperature Chamber	TERCHY	MHK-120LK	1020582	06/12/2024	06/11/2025
H-Loop Near Field Antenna	LANGER EMV-Technik	LF-R 400	02-1597	N.C.R	N.C.R

6.3 Radiated Measurement

Radiated Emission Test Site: SAC C					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL. (mm/dd/yyyy)	CAL DUE. (mm/dd/yyyy)
3m Site NSA	SGS	966 chamber C	N/A	03/02/2024	03/01/2025
Active Loop Antenna	COM-POWER	AL-130R	10160105	12/11/2024	12/10/2025
Broadband Antenna	SCHWARZBECK	VULB 9168	9168-300	11/06/2024	11/05/2025
Coaxial Cable	Huber+Suhner	RG 214/U	W22.03	11/14/2024	11/13/2025
EMI Test Receiver	R&S	ESU 40	100363	04/30/2024	04/29/2025
Pre-Amplifier	EMC Instruments	EMC330	980096	11/14/2024	11/13/2025
Spectrum Analyzer	KEYSIGHT	N9010B	MY63440390	02/16/2024	02/15/2025
Test Software	audix	e3	E3 20923 SGS Ver.9 (C)	N.C.R	N.C.R

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6.4 Co-Location Measurement

Radiated Emission Test Site: SAC C					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL. (mm/dd/yyyy)	CAL DUE. (mm/dd/yyyy)
3m Site NSA	SGS	966 chamber C	N/A	03/02/2024	03/01/2025
Active Loop Antenna	COM-POWER	AL-130R	10160105	12/11/2024	12/10/2025
Attenuator	Woken	WATT-218FS-10	RF17	11/14/2024	11/13/2025
Band Rejection Filter	Micro Tronics	BRM50701-01	RF201	11/14/2024	11/13/2025
Broadband Antenna	SCHWARZBECK	VULB 9168	9168-300	11/06/2024	11/05/2025
Coaxial Cable	Huber+Suhner	EMC106-SM-SM-9100	150704	11/14/2024	11/13/2025
Coaxial Cable	Huber+Suhner	RG 214/U	W22.03	11/14/2024	11/13/2025
Coaxial Cable	Huber+Suhner	SUCOFLEX 104	MY17388/4	11/14/2024	11/13/2025
DC Power Supply	HOLA	DP-3003	D7070035	06/14/2024	06/13/2025
EMI Test Receiver	R&S	ESU 40	100363	04/30/2024	04/29/2025
High Pass Filter	Titan Microwave	T04H86002600060S01	210619-2-8	11/14/2024	11/13/2025
Horn Antenna	Schwarzbeck	BBHA9120D	1187	01/24/2024	01/23/2025
Horn Antenna	Schwarzbeck	BBHA9170	185	08/15/2024	08/14/2025
Lowpass Filter	Woken	EWI-56-0019	RF173	11/14/2024	11/13/2025
Pre-Amplifier	EMC Instruments	EMC118A45SE	980789	11/14/2024	11/13/2025
Pre-Amplifier	EMC Instruments	EMC184045SEE	980881	11/14/2024	11/13/2025
Pre-Amplifier	EMC Instruments	EMC330	980096	11/14/2024	11/13/2025
Spectrum Analyzer	KEYSIGHT	N9010B	MY63440390	02/16/2024	02/15/2025
Test Software	audix	e3	E3 20923 SGS Ver.9 (C)	N.C.R	N.C.R

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

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7 CONDUCTED EMISSIONS TEST

7.1 Standard Applicable

Frequency within 150 kHz to 30MHz shall not exceed the limit table as below.

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

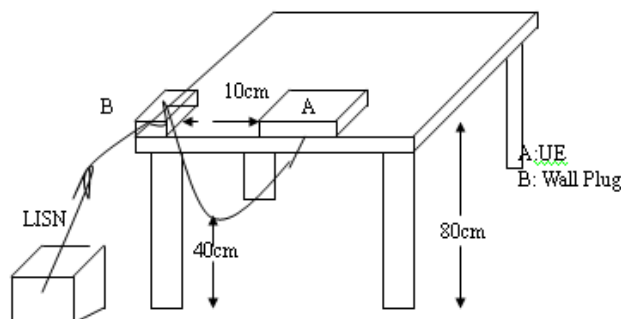
Note

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.

7.5 Measurement Result

Note: Refer to next page for measurement data and plots.

Note2: The * reveals the worst-case results that closest to the limit.

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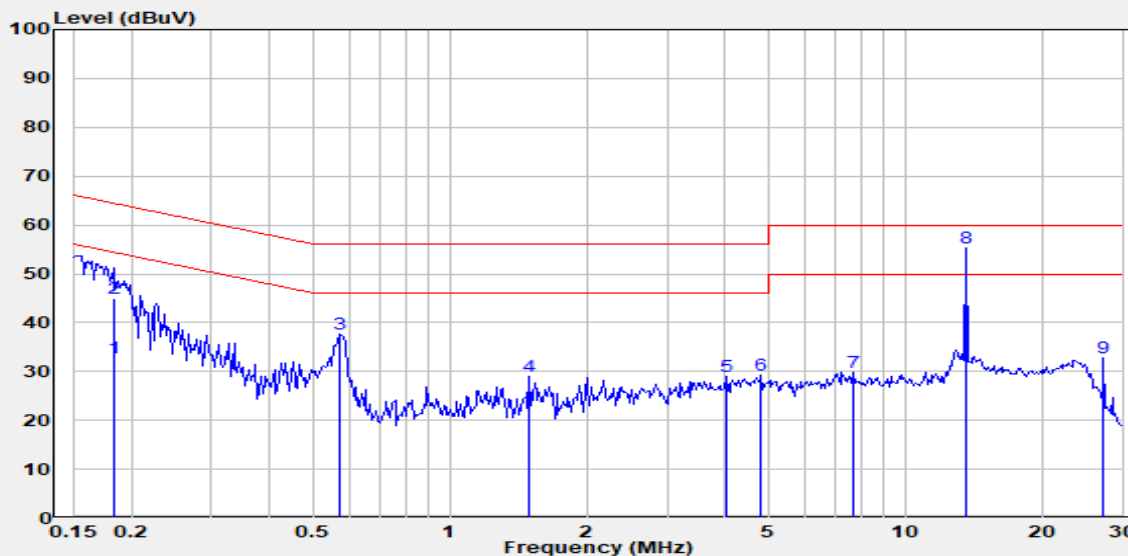
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AC POWER LINE CONDUCTED EMISSION TEST DATA

Report Number :TERF2411003303E2 Test Site :Conduction C
Test Mode :NFC Test Date :2024-12-19
Power :120V/60Hz Temp./Humi. :20.4°C/44%
Probe :L1 Engineer :Alex Li
Note: : NFC On



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V	Limit dB μ V	Margin dB
0.182	Average	22.20	10.65	32.85	54.38	-21.53
0.182	QP	34.30	10.65	44.95	64.38	-19.43
0.574	Peak	27.12	10.63	37.75	56.00	-18.25
1.498	Peak	18.23	10.74	28.97	56.00	-27.03
4.044	Peak	18.12	10.90	29.02	56.00	-26.98
4.834	Peak	18.28	10.95	29.22	56.00	-26.78
7.711	Peak	18.91	10.96	29.86	60.00	-30.14
13.560	Peak	-	-	-	60.00	-
27.120	Peak	21.54	11.32	32.86	60.00	-27.14

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Report Number :TERF2411003303E2

Test Site :Conduction C

Test Mode :NFC

Test Date :2024-12-19

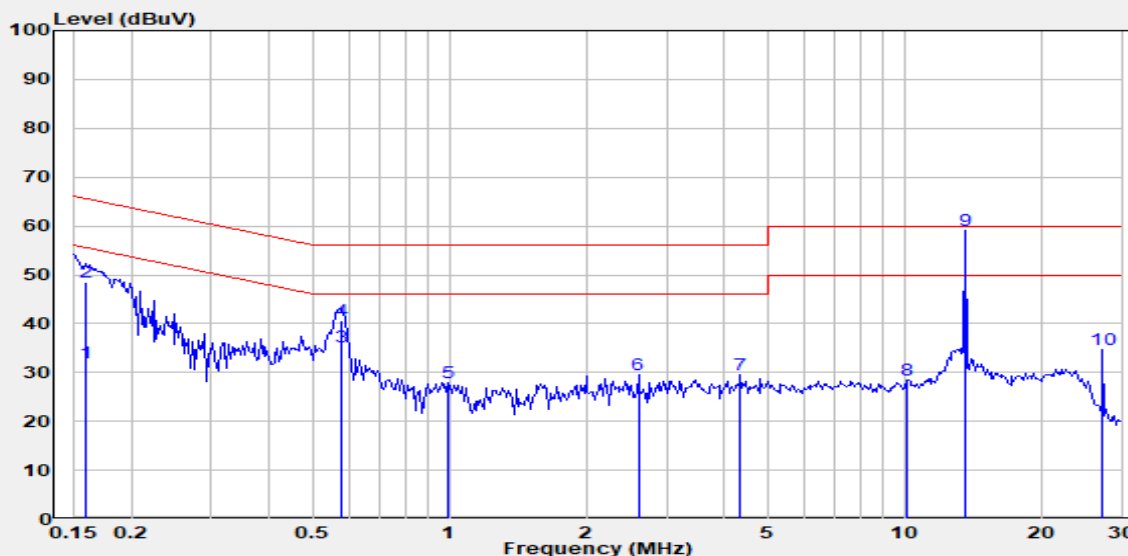
Power :120V/60Hz

Temp./Humi. :20.4℃/44%

Probe :N

Engineer :Alex Li

Note: : NFC On



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV	Limit dBμV	Margin dB
0.159	Average	21.30	10.66	31.96	55.51	-23.55
0.159	QP	37.80	10.66	48.46	65.51	-17.05
0.579	Average	24.50	10.62	35.12	46.00	-10.88
0.579	QP	30.00	10.62	40.62	56.00	-15.38
0.996	Peak	17.38	10.67	28.05	56.00	-27.95
2.601	Peak	18.86	10.80	29.66	56.00	-26.34
4.366	Peak	18.76	10.90	29.66	56.00	-26.34
10.118	Peak	17.59	10.95	28.55	60.00	-31.45
13.560	Peak	-	-	-	60.00	-
27.120	Peak	23.33	11.33	34.66	60.00	-25.34

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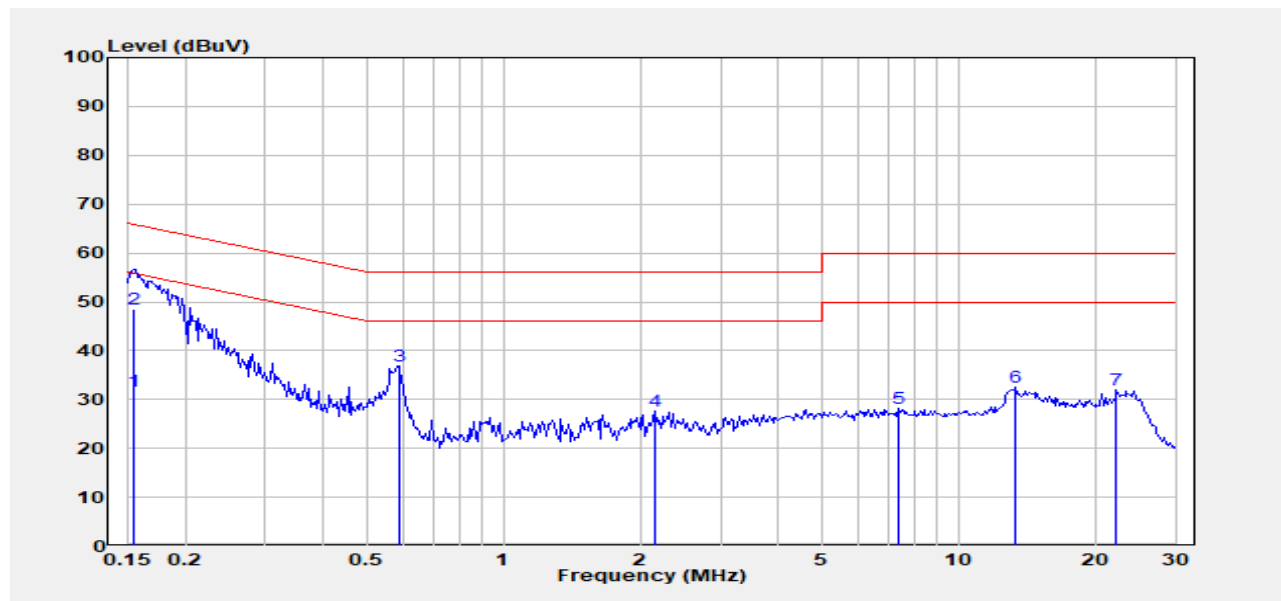
Power :120V/60Hz

Temp./Humi. :20.4℃/44%

Probe :L1

Engineer :Alex Li

Note: : Standby mode



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
MHz	Mode	Reading Level		FS		
	PK/QP/AV	dBμV	dB	dBμV	dBμV	dB
0.154	Average	21.00	10.65	31.65	55.79	-24.14
0.154	QP	37.90	10.65	48.55	65.79	-17.24
0.589	Peak	26.12	10.63	36.75	56.00	-19.25
2.158	Peak	16.86	10.78	27.65	56.00	-28.35
7.391	Peak	17.20	10.96	28.16	60.00	-31.84
13.391	Peak	21.36	11.04	32.41	60.00	-27.59
22.287	Peak	20.89	11.22	32.11	60.00	-27.89

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Test Site :Conduction C

Test Mode :NFC

Test Date :2024-12-19

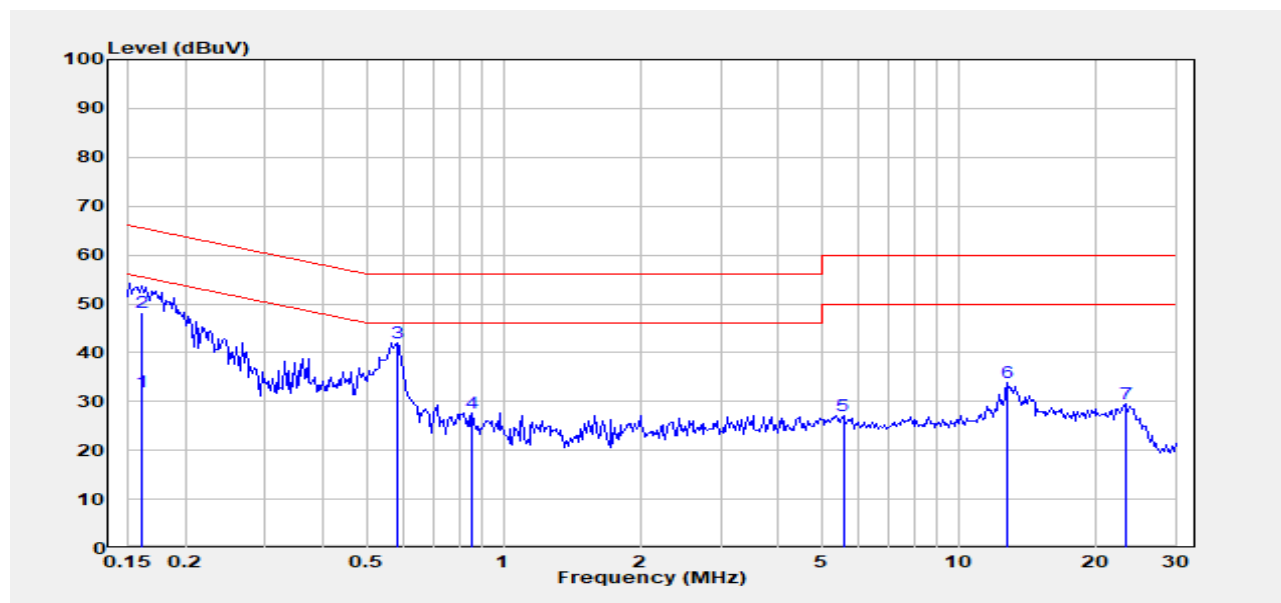
Power :120V/60Hz

Temp./Humi. :20.4℃/44%

Probe :N

Engineer :Alex Li

Note: : Standby mode



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
MHz	Mode	Reading Level		FS		
	PK/QP/AV	dBμV	dB	dBμV	dBμV	dB
0.161	Average	21.30	10.66	31.96	55.44	-23.48
0.161	QP	37.60	10.66	48.26	65.44	-17.18
0.584	Peak	31.34	10.62	41.96	56.00	-14.04
0.855	Peak	17.07	10.65	27.73	56.00	-28.27
5.585	Peak	16.23	10.94	27.17	60.00	-32.83
12.834	Peak	22.98	11.03	34.01	60.00	-25.99
23.254	Peak	18.21	11.25	29.45	60.00	-30.55

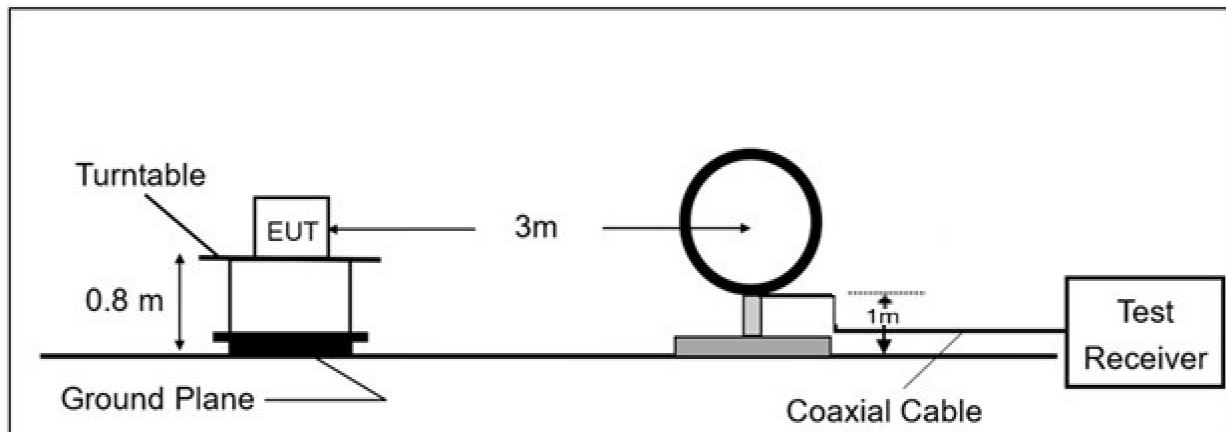
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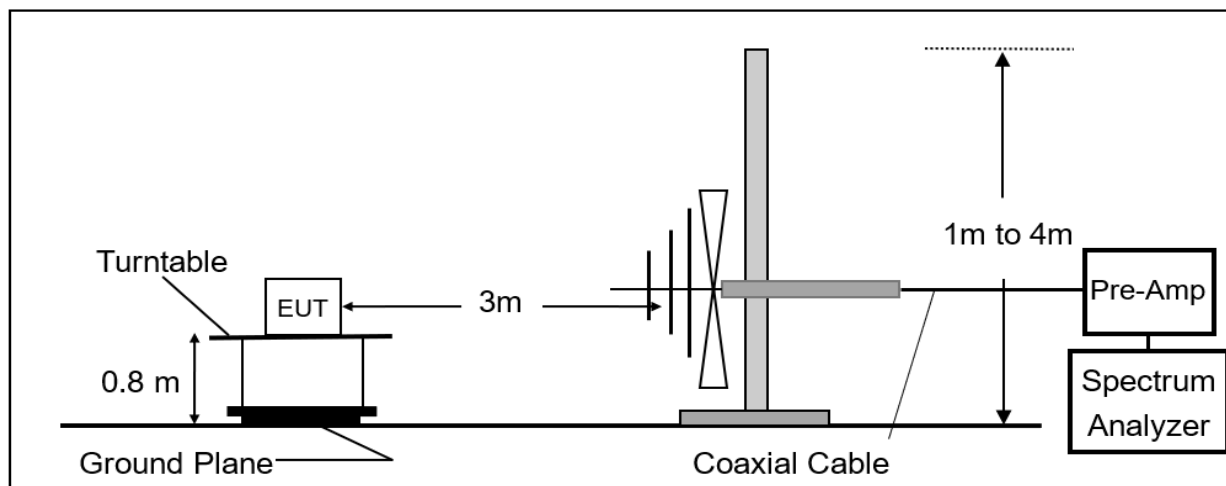
8 RADIATED EMISSION TEST

8.1 Test SET-UP (Block Diagram of Configuration)

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



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



8.2 Measurement Procedure

1. Configure the EUT according to ANSI C63.10.
2. The EUT was placed on a turn table which is 0.8m above ground plane and been measured in the frequency range between 0.009MHz to 30MHz and 30MHz to 1GHz.
3. The turn table shall rotate 360 degrees to determine the position of maximum emission level.
4. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission.
5. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
6. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
7. Repeat above procedures until all default test channel measured were complete.

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8.3 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CL - AG$$

Where FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
RA = Reading Amplitude	AG = Amplifier Gain
AF = Antenna Factor	

8.4 Field Strength of Fundamental Emission

8.4.1 Applicable standard

Rules and specifications	CFR 47 Part 15 section 15.225(a)-(d)	
Frequency of Emission (MHz)	Field Strength (μV/m) at 30m	Field Strength (dBμV/m) at 30m
1.705~13.110	30	29.5
13.110~13.410	106	40.5
13.410~13.553	334	50.5
13.553~13.567	15848	84
13.567~13.710	334	50.5
13.710~14.010	106	40.5
14.010~30.00	30	29.5

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8.4.2 Distance Extrapolation Factor

30m to 3m

Distance extrapolation = $40 \cdot \log(30/3) = 40 \text{ dB}$

30m to 10m

Distance extrapolation = $40 \cdot \log(30/10) = 19.08 \text{ dB}$

10m to 3m

Distance extrapolation = $40 \cdot \log(10/3) = 20.92 \text{ dB}$

Note:

1. Distance extrapolation factor = $40 \log(\text{required distance} / \text{test distance}) \text{ (dB)}$
2. The lower limit shall apply at the transition frequencies.
3. KDB 414788 D01 OATS and 3m semi-anechoic chamber Justification:
Base on FCC 15.31 (f) (2): 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. OATS and 3m SAC chamber testing had been performed and 3m SAC measured test result is the worst case test result.

Actual FS(dBμV/m) = Spectrum. Reading level(dBμV) + Factor(dB)

Below 30 MHz of Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Distance Factor (dB)

Above 30 MHz of Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amp Gain (dB)

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

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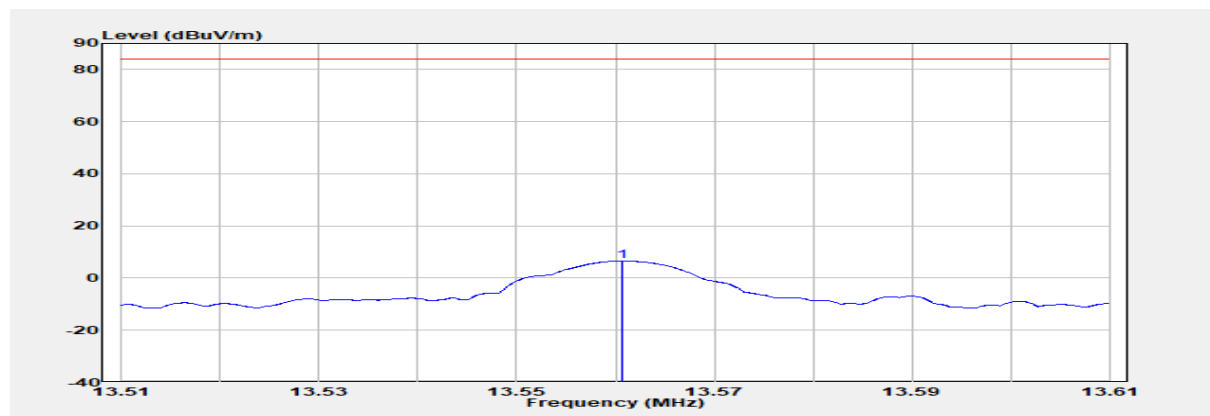
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8.4.3 Field Strength of Fundamental Emission Measurement Result

Report Number	:TERF2411003303E2	Test Site	:SAC C
Operation Mode	:NFC	Test Date	:2024-12-18
Test Frequency	:13.56 MHz	Temp./Humi.	:21.2°C/55%
Test Mode	:Main	Antenna Pol.	:Vertical
EUT Pol	:E2 Plane	Engineer	:Alex Li



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual dB μ V/m	Limit dB μ V/m	Margin dB
13.561	Peak	31.11	-24.57	6.55	84.00	-77.45

Actual level = Reading level + Factor

Factor = Antenna factor + cable loss – Pre_Amplifier Gain – distance factor

Test distance= 3m

For Actual level and limit:

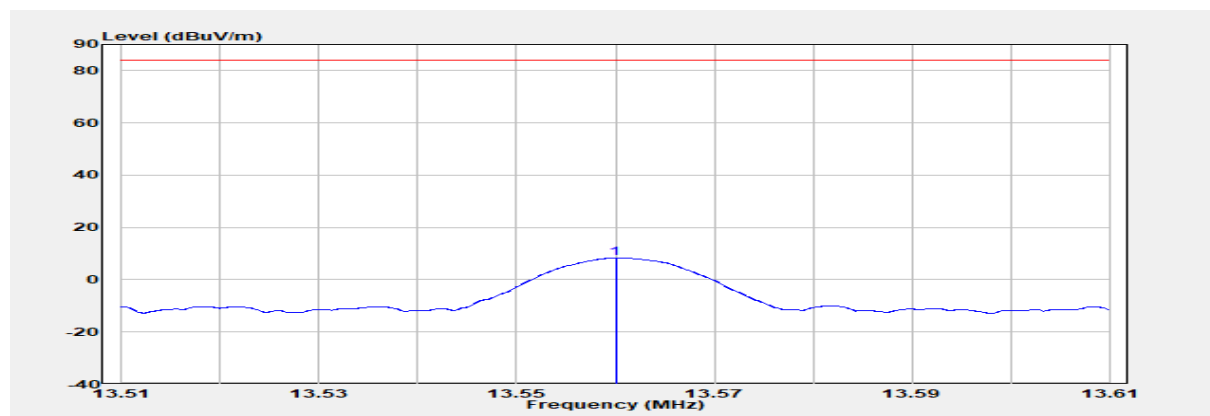
Field strength (dBuV/m) at 300m, within the band 9 kHz - 490 kHz.

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

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Report Number	:TERF2411003303E2	Test Site	:SAC C
Operation Mode	:NFC	Test Date	:2024-12-18
Test Frequency	:13.56 MHz	Temp./Humi.	:21.2°C/55%
Test Mode	:Main	Antenna Pol.	:Horizontal
EUT Pol	:E2 Plane	Engineer	:Alex Li



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
MHz	Mode	Reading Level				
	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
13.560	Peak	32.87	-24.57	8.30	84.00	-75.70

Actual level = Reading level + Factor

Factor = Antenna factor + cable loss – Pre_Amplifier Gain – distance factor

Test distance= 3m

For Actual level and limit:

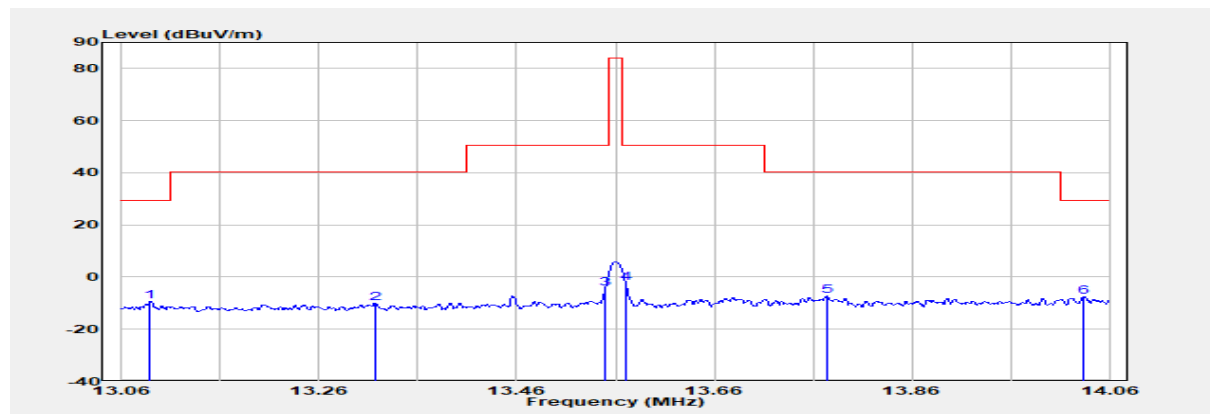
Field strength (dBuV/m) at 300m, within the band 9 kHz - 490 kHz.

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

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Report Number	:TERF2411003303E2	Test Site	:SAC C
Operation Mode	:NFC	Test Date	:2024-12-18
Test Frequency	:13.56 MHz	Temp./Humi.	:21.2°C/55%
Test Mode	:Mask	Antenna Pol.	:Vertical
EUT Pol	:E2 Plane	Engineer	:Alex Li



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
MHz	Mode	Reading Level				
	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
13.089	Peak	15.12	-24.57	-9.45	29.54	-38.99
13.316	Peak	14.59	-24.57	-9.98	40.50	-50.48
13.550	Peak	20.24	-24.57	-4.33	50.47	-54.80
13.570	Peak	22.43	-24.57	-2.13	50.47	-52.60
13.774	Peak	17.17	-24.57	-7.40	40.50	-47.90
14.034	Peak	16.91	-24.57	-7.66	29.54	-37.20

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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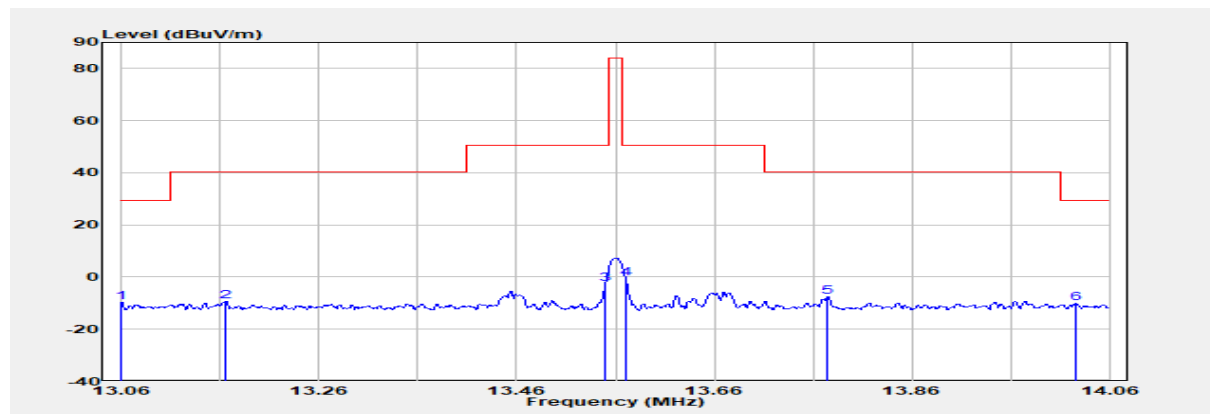
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Report Number	:TERF2411003303E2	Test Site	:SAC C
Operation Mode	:NFC	Test Date	:2024-12-18
Test Frequency	:13.56 MHz	Temp./Humi.	:21.2°C/55%
Test Mode	:Mask	Antenna Pol.	:Horizontal
EUT Pol	:E2 Plane	Engineer	:Alex Li



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
MHz	Mode	Reading Level				
	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
13.060	Peak	14.98	-24.57	-9.58	29.54	-39.12
13.165	Peak	15.32	-24.57	-9.25	40.50	-49.75
13.550	Peak	21.83	-24.57	-2.74	50.47	-53.21
13.570	Peak	24.17	-24.57	-0.40	50.47	-50.87
13.775	Peak	17.09	-24.57	-7.48	40.50	-47.98
14.026	Peak	14.55	-24.57	-10.02	29.54	-39.56

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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8.5 Radiated Spurious Emission Measurement

8.5.1 Standard Applicable

The field strength of any emissions appearing outside of the 13.110-14.010 MHz shall not exceed the general radiated emission limits 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:

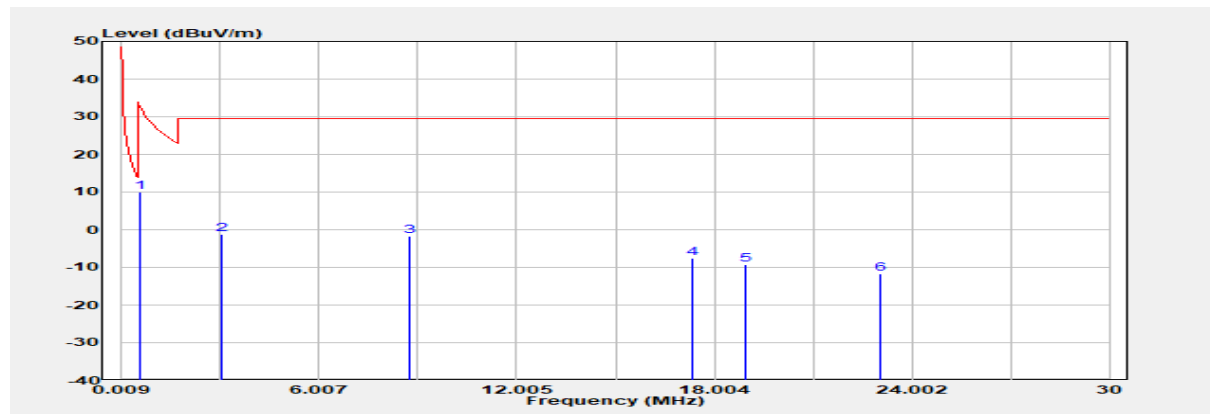
1. Emission level in $\text{dB}\mu\text{V/m} = 20 \log (\mu\text{V/m})$
2. Distance extrapolation factor = $40 \log (\text{required distance/ test distance})$ (dB)
3. $20 * \log(30 \mu\text{V/m}) = 29.54 \text{ dBuV/m}$
4. The lower limit shall apply at the transition frequencies.
5. The measurement 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.

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8.5.2 Radiated Spurious Emission Measurement Result

Report Number	:TERF2411003303E2	Test Site	:SAC C
Operation Mode	:NFC	Test Date	:2024-12-18
Test Frequency	:13.56 MHz	Temp./Humi.	:21.2°C/55%
Test Mode	:Tx	Antenna Pol.	:Vertical
EUT Pol	:E2 Plane	Engineer	:Alex Li



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual dBμV/m	Limit dBμV/m	Margin dB
0.579	Peak	36.57	-26.63	9.94	32.36	-22.42
3.068	Peak	24.61	-25.73	-1.13	29.54	-30.67
8.736	Peak	23.00	-24.76	-1.76	29.54	-31.30
17.314	Peak	16.90	-24.56	-7.66	29.54	-37.20
18.933	Peak	15.35	-24.56	-9.21	29.54	-38.75
23.072	Peak	13.66	-25.29	-11.64	29.54	-41.18

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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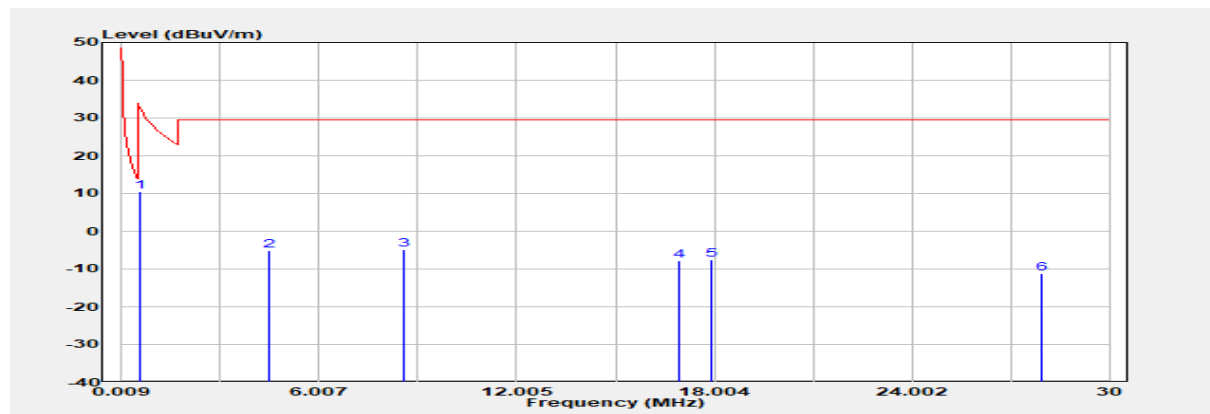
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Report Number	:TERF2411003303E2	Test Site	:SAC C
Operation Mode	:NFC	Test Date	:2024-12-18
Test Frequency	:13.56 MHz	Temp./Humi.	:21.2°C/55%
Test Mode	:Tx	Antenna Pol.	:Horizontal
EUT Pol	:E2 Plane	Engineer	:Alex Li



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual dBμV/m	Limit dBμV/m	Margin dB
0.549	Peak	37.20	-26.65	10.55	32.82	-22.26
4.478	Peak	20.26	-25.44	-5.18	29.54	-34.72
8.556	Peak	19.89	-24.79	-4.90	29.54	-34.44
16.954	Peak	16.81	-24.56	-7.76	29.54	-37.30
17.914	Peak	16.99	-24.56	-7.58	29.54	-37.12
27.931	Peak	15.19	-26.46	-11.27	29.54	-40.81

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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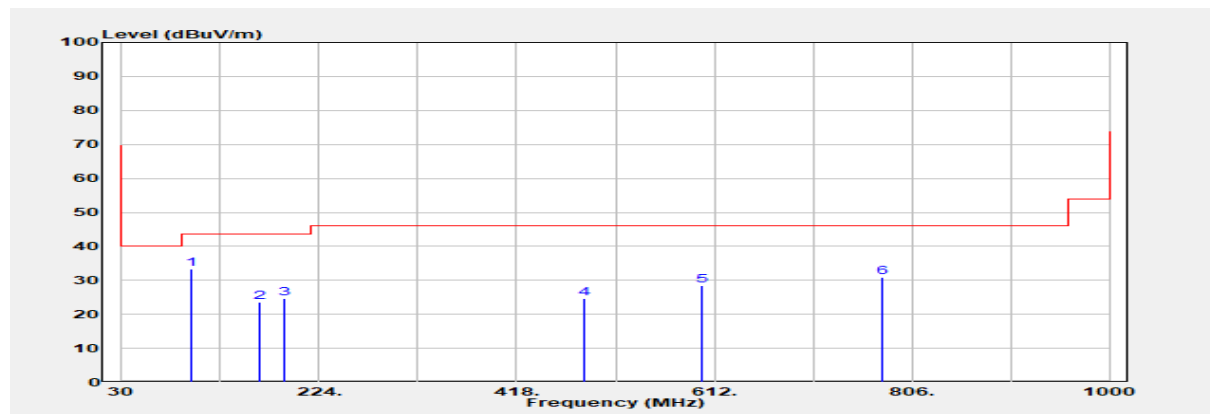
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Report Number	:TERF2411003303E2	Test Site	:SAC C
Operation Mode	:NFC	Test Date	:2024-12-18
Test Frequency	:13.56 MHz	Temp./Humi.	:21.2°C/55%
Test Mode	:Tx	Antenna Pol.	:Vertical
EUT Pol	:E2 Plane	Engineer	:Alex Li

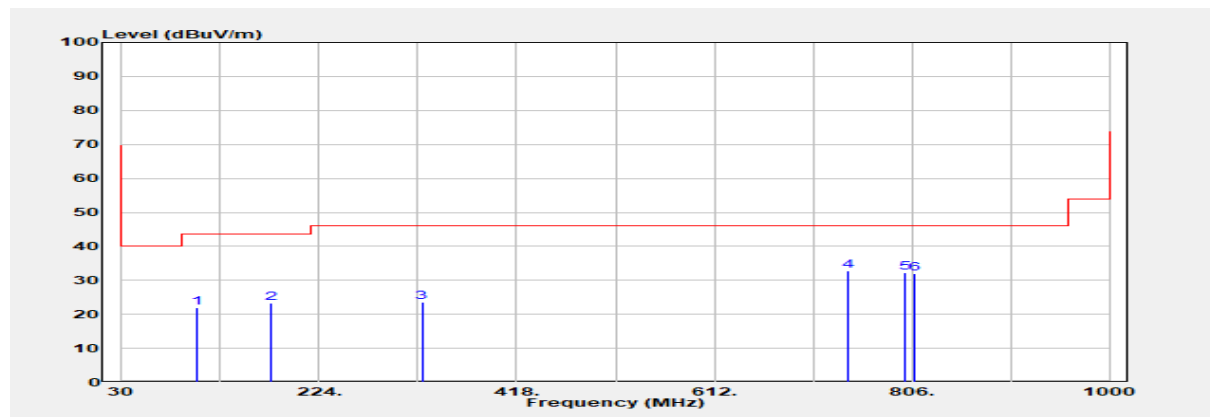


Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
98.870	Peak	50.38	-16.92	33.45	43.50	-10.05
165.800	Peak	35.67	-12.10	23.57	43.50	-19.93
190.050	Peak	39.30	-14.64	24.65	43.50	-18.85
483.960	Peak	30.99	-6.24	24.74	46.00	-21.26
600.360	Peak	31.99	-3.66	28.33	46.00	-17.67
776.900	Peak	31.65	-0.66	30.99	46.00	-15.01

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Report Number	:TERF2411003303E2	Test Site	:SAC C
Operation Mode	:NFC	Test Date	:2024-12-18
Test Frequency	:13.56 MHz	Temp./Humi.	:21.2°C/55%
Test Mode	:Tx	Antenna Pol.	:Horizontal
EUT Pol	:E2 Plane	Engineer	:Alex Li



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
104.690	Peak	37.72	-15.83	21.89	43.50	-21.61
176.470	Peak	36.28	-12.92	23.36	43.50	-20.14
324.880	Peak	33.88	-10.23	23.65	46.00	-22.35
743.920	Peak	34.01	-1.17	32.83	46.00	-13.17
800.180	Peak	32.73	-0.41	32.32	46.00	-13.68
807.940	Peak	32.36	-0.30	32.06	46.00	-13.94

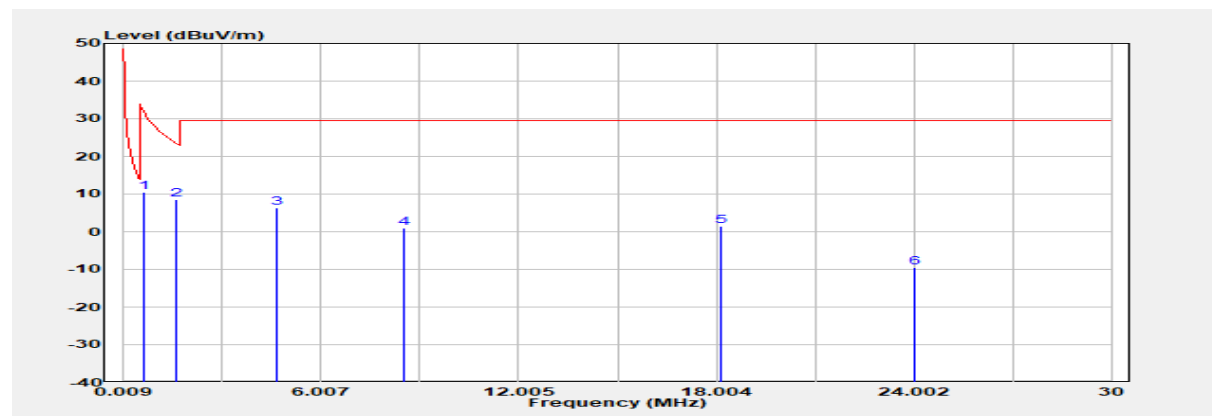
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Co-Location

Report Number	:TERF2411003303E2	Test Site	:SAC C
Operation Mode	:802.11n20+EDR+NFC	Test Date	:2024-12-24
Test Frequency	:2412MHz+2441MHz+13.56MHz	Temp./Humi.	:20.7°C/61%
Test Mode	:Tx	Antenna Pol.	:Vertical
EUT Pol	:E2 Plane	Engineer	:Alex Li



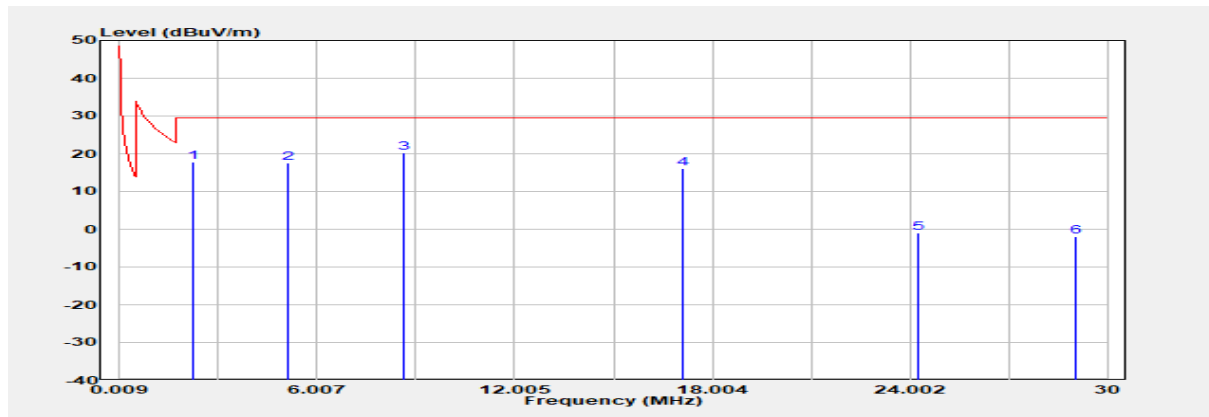
Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
0.639	Peak	37.11	-26.59	10.52	31.50	-20.98
1.629	Peak	34.68	-26.18	8.50	23.37	-14.87
4.658	Peak	31.86	-25.40	6.46	29.54	-23.08
8.526	Peak	25.78	-24.79	0.98	29.54	-28.56
18.124	Peak	26.13	-24.56	1.56	29.54	-27.98
24.032	Peak	16.07	-25.52	-9.46	29.54	-39.00

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Report Number :TERF2411003303E2 Test Site :SAC C
Operation Mode :802.11n20+EDR+NFC Test Date :2024-12-24
Test Frequency :2412MHz+2441MHz+13.56MHz Temp./Humi. :20.7°C/61%
Test Mode :Tx Antenna Pol. :Horizontal
EUT Pol :E2 Plane Engineer :Alex Li



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
2.258	Peak	43.90	-25.98	17.92	29.54	-11.62
5.107	Peak	42.94	-25.31	17.63	29.54	-11.91
8.646	Peak	44.96	-24.78	20.18	29.54	-9.36
17.104	Peak	40.65	-24.56	16.09	29.54	-13.45
24.242	Peak	24.65	-25.57	-0.92	29.54	-30.46
29.040	Peak	24.86	-26.72	-1.86	29.54	-31.40

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Report Number :TERF2411003303E2

Test Site :SAC C

Operation Mode :802.11ac20+EDR+NFC

Test Date :2024-12-24

Test Frequency :5180MHz+2441MHz+13.56MHz

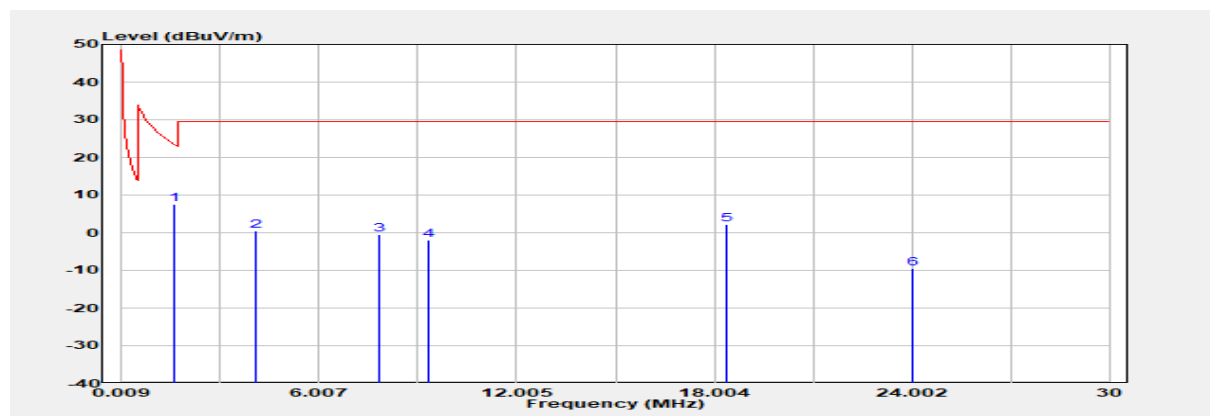
Temp./Humi. :20.7°C/61%

Test Mode :Tx

Antenna Pol. :Vertical

EUT Pol :E2 Plane

Engineer :Alex Li

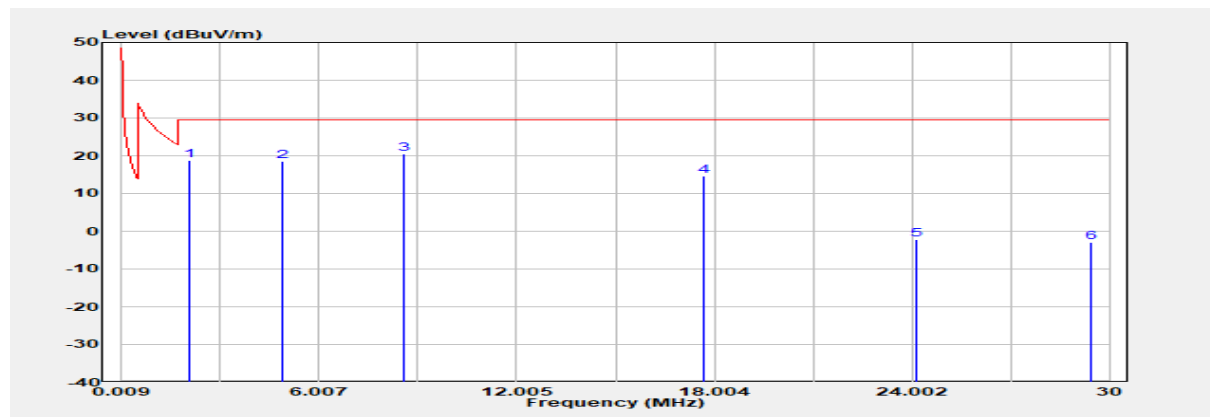


Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
1.629	Peak	33.68	-26.18	7.50	23.37	-15.87
4.088	Peak	25.95	-25.52	0.43	29.54	-29.11
7.837	Peak	24.50	-24.90	-0.40	29.54	-29.94
9.306	Peak	22.64	-24.68	-2.04	29.54	-31.58
18.393	Peak	26.87	-24.56	2.31	29.54	-27.23
24.032	Peak	16.07	-25.52	-9.46	29.54	-39.00

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Report Number :TERF2411003303E2 Test Site :SAC C
Operation Mode :802.11ac20+EDR+NFC Test Date :2024-12-24
Test Frequency :5180MHz+2441MHz+13.56MHz Temp./Humi. :20.7°C/61%
Test Mode :Tx Antenna Pol. :Horizontal
EUT Pol :E2 Plane Engineer :Alex Li



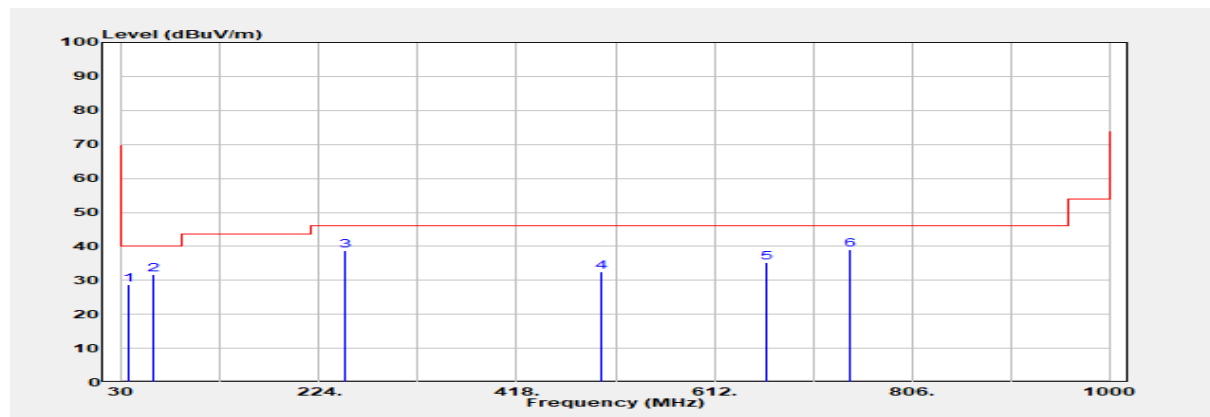
Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
2.078	Peak	44.69	-26.04	18.66	29.54	-10.88
4.898	Peak	43.81	-25.35	18.46	29.54	-11.08
8.586	Peak	45.24	-24.78	20.45	29.54	-9.09
17.704	Peak	39.30	-24.56	14.74	29.54	-14.80
24.122	Peak	23.36	-25.55	-2.18	29.54	-31.72
29.460	Peak	23.89	-26.82	-2.93	29.54	-32.47

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Report Number :TERF2411003303E2 Test Site :SAC C
Operation Mode :802.11n20+EDR+NFC Test Date :2024-12-24
Test Frequency :2412MHz+2441MHz+13.56MHz Temp./Humi. :20.7°C/61%
Test Mode :Tx Antenna Pol. :Vertical
EUT Pol :E2 Plane Engineer :Alex Li



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
36.790	QP	41.30	-12.59	28.71	40.00	-11.29
61.040	QP	44.30	-12.67	31.63	40.00	-8.37
250.190	Peak	51.63	-12.85	38.79	46.00	-7.21
500.450	Peak	38.42	-5.94	32.48	46.00	-13.52
662.440	Peak	38.15	-2.82	35.33	46.00	-10.67
744.890	Peak	40.26	-1.15	39.11	46.00	-6.89

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Report Number :TERF2411003303E2

Test Site :SAC C

Operation Mode :802.11n20+EDR+NFC

Test Date :2024-12-24

Test Frequency :2412MHz+2441MHz+13.56MHz

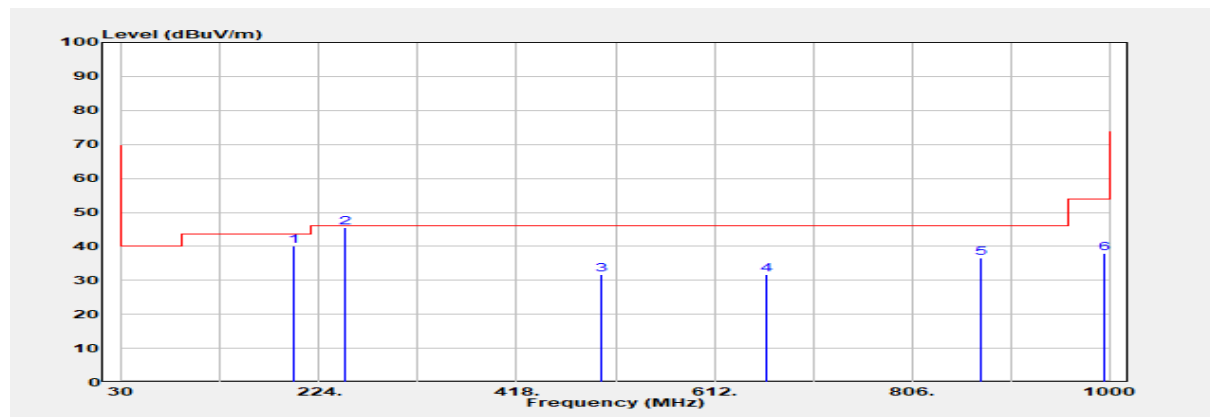
Temp./Humi. :20.7°C/61%

Test Mode :Tx

Antenna Pol. :Horizontal

EUT Pol :E2 Plane

Engineer :Alex Li



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
199.750	QP	55.20	-15.13	40.07	43.50	-3.43
250.190	QP	58.40	-12.85	45.55	46.00	-0.45
500.450	Peak	37.59	-5.94	31.65	46.00	-14.35
662.440	Peak	34.39	-2.82	31.57	46.00	-14.43
874.870	Peak	36.30	0.26	36.55	46.00	-9.45
995.150	Peak	36.55	1.47	38.02	54.00	-15.98

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SGS Taiwan Ltd.

No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號

台灣檢驗科技股份有限公司

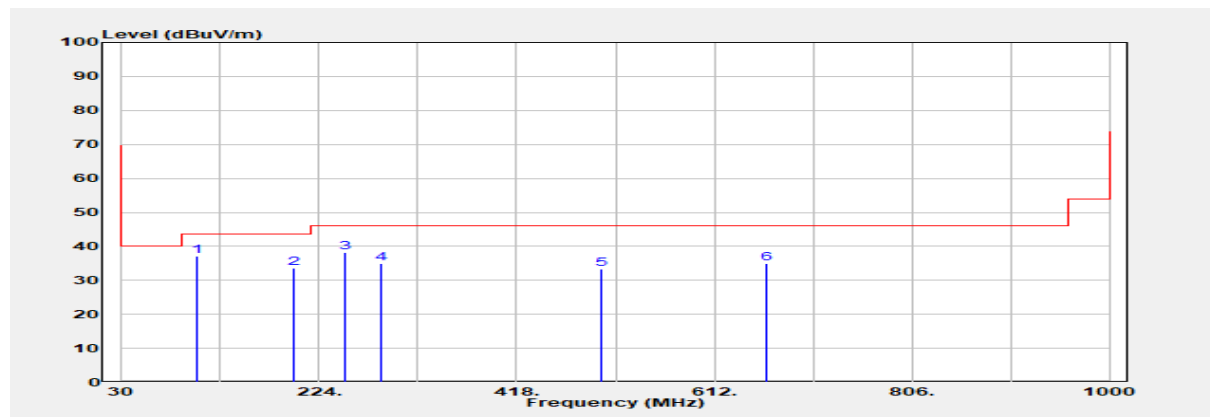
t (886-2) 2299-3279

f (886-2) 2298-0488

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Member of SGS Group

Report Number :TERF2411003303E2 Test Site :SAC C
Operation Mode :802.11ac20+EDR+NFC Test Date :2024-12-24
Test Frequency :5180MHz+2441MHz+13.56MHz Temp./Humi. :20.7°C/61%
Test Mode :Tx Antenna Pol. :Vertical
EUT Pol :E2 Plane Engineer :Alex Li



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
103.720	Peak	53.13	-16.08	37.04	43.50	-6.46
199.750	Peak	48.67	-15.13	33.54	43.50	-9.96
250.190	Peak	51.00	-12.85	38.15	46.00	-7.85
285.110	Peak	46.29	-11.25	35.03	46.00	-10.97
500.450	Peak	39.41	-5.94	33.47	46.00	-12.53
662.440	Peak	37.78	-2.82	34.96	46.00	-11.04

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Report Number :TERF2411003303E2

Test Site :SAC C

Operation Mode :802.11ac20+EDR+NFC

Test Date :2024-12-24

Test Frequency :5180MHz+2441MHz+13.56MHz

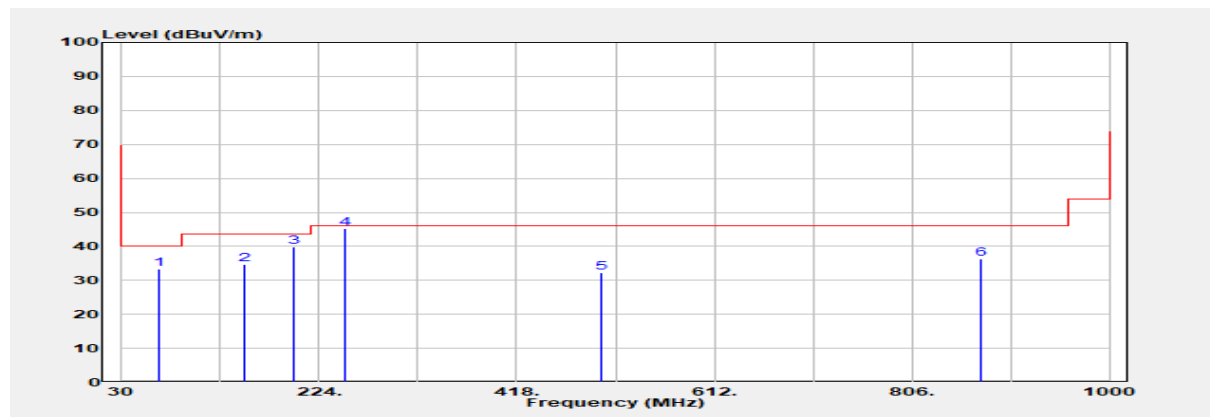
Temp./Humi. :20.7°C/61%

Test Mode :Tx

Antenna Pol. :Horizontal

EUT Pol :E2 Plane

Engineer :Alex Li



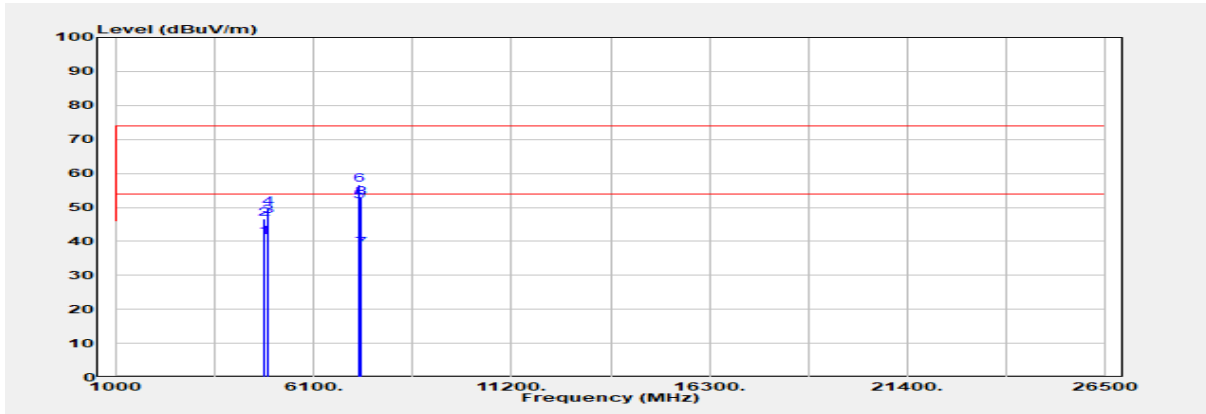
Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
66.860	Peak	47.02	-13.77	33.26	40.00	-6.74
150.280	Peak	46.73	-12.00	34.73	43.50	-8.77
199.750	QP	55.10	-15.13	39.97	43.50	-3.53
250.190	QP	58.10	-12.85	45.25	46.00	-0.75
500.450	Peak	38.30	-5.94	32.36	46.00	-13.64
874.870	Peak	36.14	0.26	36.39	46.00	-9.61

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Report Number	:TERF2411003303E2	Test Site	:SAC C
Operation Mode	:802.11n20+EDR+NFC	Test Date	:2024-12-24
Test Frequency	:2412MHz+2441MHz+13.56MHz	Temp./Humi.	:20.7°C/61%
Test Mode	:Tx	Antenna Pol.	:Vertical
EUT Pol	:E2 Plane	Engineer	:Alex Li

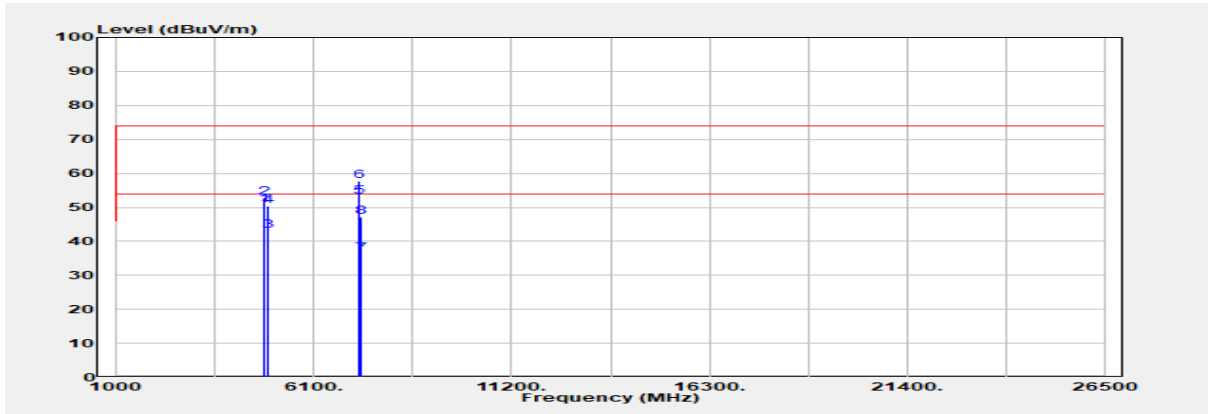


Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
4824.000	Average	41.09	0.15	41.24	54.00	-12.76
4824.000	Peak	46.37	0.15	46.51	74.00	-27.49
4882.000	Average	47.17	0.28	47.44	54.00	-6.56
4882.000	Peak	49.67	0.28	49.95	74.00	-24.05
7236.000	Average	45.37	6.32	51.69	54.00	-2.31
7236.000	Peak	50.24	6.32	56.56	74.00	-17.44
7323.000	Average	31.49	6.55	38.04	54.00	-15.96
7323.000	Peak	46.22	6.55	52.77	74.00	-21.23

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Operation Mode :802.11n20+EDR+NFC Test Date :2024-12-24
Test Frequency :2412MHz+2441MHz+13.56MHz Temp./Humi. :20.7°C/61%
Test Mode :Tx Antenna Pol. :Horizontal
EUT Pol :E2 Plane Engineer :Alex Li



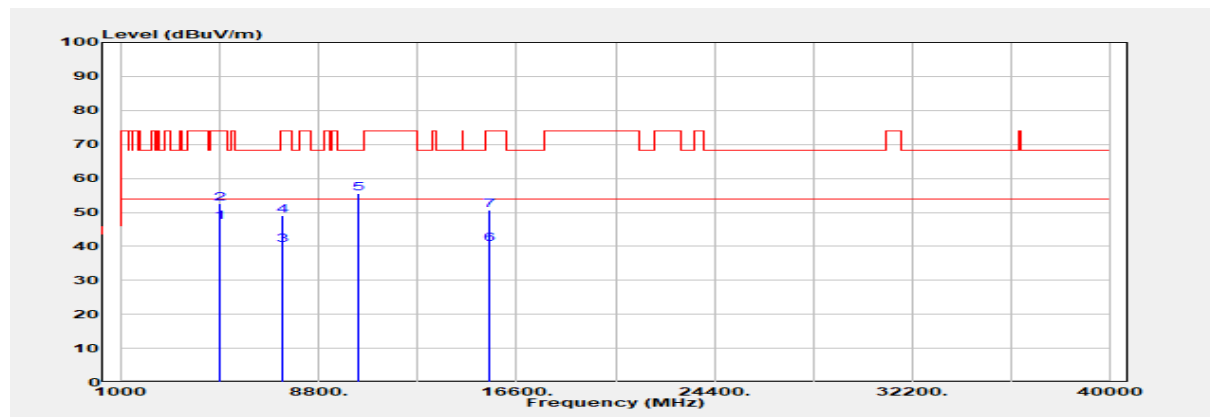
Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
4824.000	Average	50.40	0.15	50.54	54.00	-3.46
4824.000	Peak	52.71	0.15	52.86	74.00	-21.14
4882.000	Average	42.72	0.28	43.00	54.00	-11.00
4882.000	Peak	50.06	0.28	50.34	74.00	-23.66
7236.000	Average	46.86	6.32	53.18	54.00	-0.82
7236.000	Peak	51.31	6.32	57.63	74.00	-16.37
7323.000	Average	29.74	6.55	36.30	54.00	-17.70
7323.000	Peak	40.68	6.55	47.24	74.00	-26.76

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Report Number :TERF2411003303E2 Test Site :SAC C
Operation Mode :802.11ac20+EDR+NFC Test Date :2024-12-24
Test Frequency :5180MHz+2441MHz+13.56MHz Temp./Humi. :20.7°C/61%
Test Mode :Tx Antenna Pol. :Vertical
EUT Pol :E2 Plane Engineer :Alex Li



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
4882.000	Average	46.82	0.28	47.10	54.00	-6.90
4882.000	Peak	52.38	0.28	52.66	74.00	-21.34
7323.000	Average	33.93	6.55	40.48	54.00	-13.52
7323.000	Peak	42.44	6.55	48.99	74.00	-25.01
10360.000	Peak	46.85	8.68	55.54	68.20	-12.66
15540.000	Average	33.97	6.60	40.57	54.00	-13.43
15540.000	Peak	44.11	6.60	50.71	74.00	-23.29

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Report Number :TERF2411003303E2

Test Site :SAC C

Operation Mode :802.11ac20+EDR+NFC

Test Date :2024-12-24

Test Frequency :5180MHz+2441MHz+13.56MHz

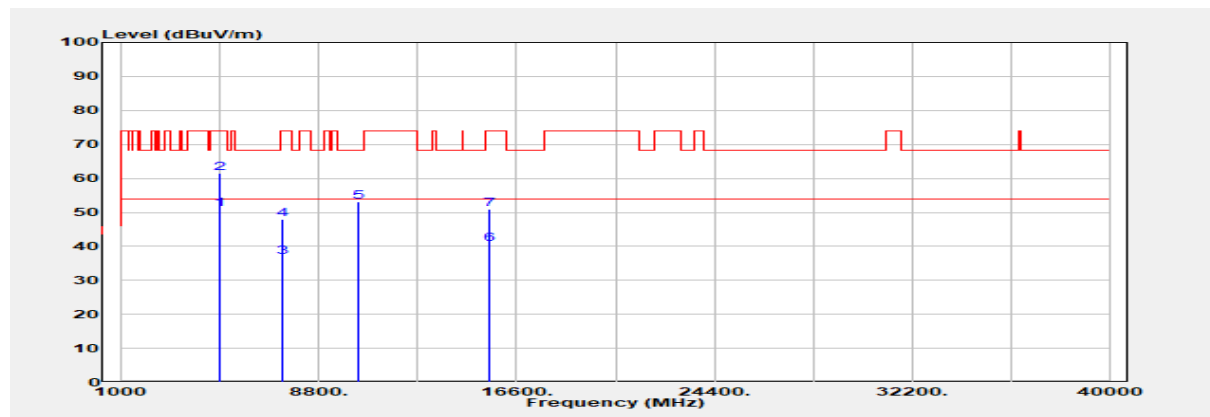
Temp./Humi. :20.7°C/61%

Test Mode :Tx

Antenna Pol. :Horizontal

EUT Pol :E2 Plane

Engineer :Alex Li



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
4882.000	Average	50.56	0.28	50.84	54.00	-3.16
4882.000	Peak	61.21	0.28	61.49	74.00	-12.51
7323.000	Average	30.35	6.55	36.90	54.00	-17.10
7323.000	Peak	41.53	6.55	48.08	74.00	-25.92
10360.000	Peak	44.55	8.68	53.23	68.20	-14.97
15540.000	Average	33.99	6.60	40.60	54.00	-13.40
15540.000	Peak	44.44	6.60	51.04	74.00	-22.96

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9 FREQUENCY STABILITY

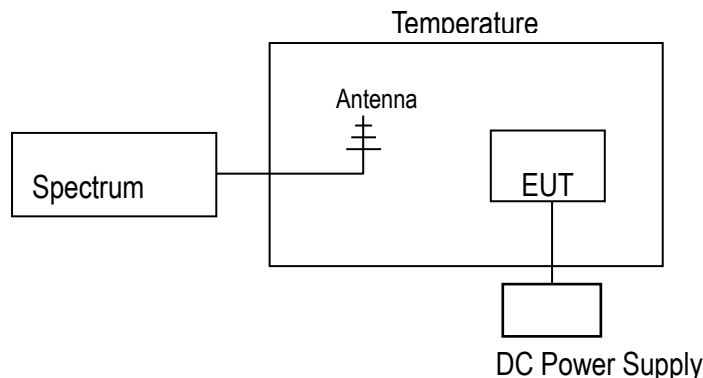
9.1 Applicable Standard

The frequency tolerance of the carrier signal shall be maintained within $\pm 0.01\%$ of the operating frequency over a temperature variation of -20 degrees to $+50$ degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

9.2 Measurement Procedure

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Set EUT as normal operation
3. Set SPA Center Frequency = fundamental frequency, RBW, VBW= 10kHz, Span =100kHz.
4. Set SPA Max hold. Mark peak.

9.3 Test SET-UP (Block Diagram of Configuration)



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9.4 Measurement Results

Startup

A. Temperature Variation

Power Supply	Environment	Frequency	Delta (kHz)	Limit (kHz)
Vdc	Temperature (°C)	(MHz)		
12	-20	13.5603225	0.32250	+/- 1.356
12	-10	13.5603239	0.32390	+/- 1.356
12	0	13.5603282	0.32820	+/- 1.356
12	10	13.5603255	0.32550	+/- 1.356
12	20	13.560325	0.32500	+/- 1.356
12	30	13.5603159	0.31590	+/- 1.356
12	40	13.5603189	0.31890	+/- 1.356
12	50	13.5603245	0.32450	+/- 1.356

B. Supply Voltage Variation

Power Supply	Environment	Frequency	Delta (kHz)	Limit (kHz)
Vdc	Temperature (°C)	(MHz)		
13.8	20	13.560319	0.31900	+/- 1.356
12	20	13.560325	0.32500	+/- 1.356
10.2	20	13.5603161	0.31610	+/- 1.356

2 minutes

A. Temperature Variation

Power Supply	Environment	Frequency	Delta (kHz)	Limit (kHz)
Vdc	Temperature (°C)	(MHz)		
12	-20	13.5603203	0.32030	+/- 1.356
12	-10	13.560322	0.32200	+/- 1.356
12	0	13.560324	0.32400	+/- 1.356
12	10	13.560319	0.31900	+/- 1.356
12	20	13.5603289	0.32890	+/- 1.356
12	30	13.5603292	0.32920	+/- 1.356
12	40	13.5603171	0.31710	+/- 1.356
12	50	13.560317	0.31700	+/- 1.356

B. Supply Voltage Variation

Power Supply	Environment	Frequency	Delta (kHz)	Limit (kHz)
Vdc	Temperature (°C)	(MHz)		
13.8	20	13.5603332	0.33320	+/- 1.356
12	20	13.5603289	0.32890	+/- 1.356
10.2	20	13.5603328	0.33280	+/- 1.356

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5 minutes

A. Temperature Variation

Power Supply	Environment	Frequency	Delta (kHz)	Limit (kHz)
Vdc	Temperature (°C)	(MHz)		
12	-20	13.5603346	0.33460	+/- 1.356
12	-10	13.5603255	0.32550	+/- 1.356
12	0	13.5603249	0.32490	+/- 1.356
12	10	13.5603335	0.33350	+/- 1.356
12	20	13.5603296	0.32960	+/- 1.356
12	30	13.5603249	0.32490	+/- 1.356
12	40	13.5603156	0.31560	+/- 1.356
12	50	13.5603341	0.33410	+/- 1.356

B. Supply Voltage Variation

Power Supply	Environment	Frequency	Delta (kHz)	Limit (kHz)
Vdc	Temperature (°C)	(MHz)		
13.8	20	13.5603227	0.32270	+/- 1.356
12	20	13.5603296	0.32960	+/- 1.356
10.2	20	13.560325	0.32500	+/- 1.356

10 minutes

A. Temperature Variation

Power Supply	Environment	Frequency	Delta (kHz)	Limit (kHz)
Vdc	Temperature (°C)	(MHz)		
12	-20	13.5603245	0.32450	+/- 1.356
12	-10	13.5603173	0.31730	+/- 1.356
12	0	13.5603217	0.32170	+/- 1.356
12	10	13.5603196	0.31960	+/- 1.356
12	20	13.5603248	0.32480	+/- 1.356
12	30	13.5603234	0.32340	+/- 1.356
12	40	13.5603211	0.32110	+/- 1.356
12	50	13.5603308	0.33080	+/- 1.356

B. Supply Voltage Variation

Power Supply	Environment	Frequency	Delta (kHz)	Limit (kHz)
Vdc	Temperature (°C)	(MHz)		
13.8	20	13.5603218	0.32180	+/- 1.356
12	20	13.5603248	0.32480	+/- 1.356
10.2	20	13.56033	0.33000	+/- 1.356

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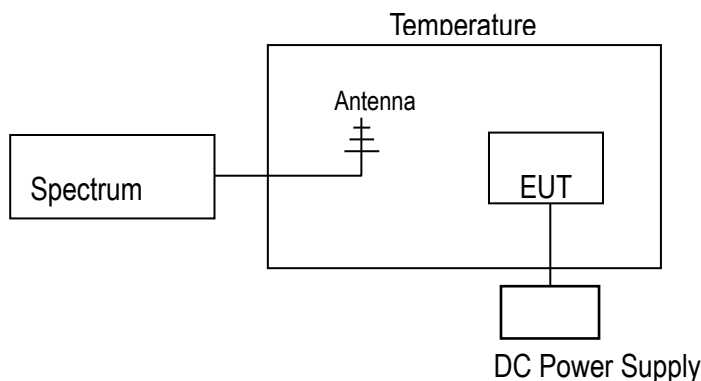
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10 EMISSION BANDWIDTH MEASUREMENT

10.1 Applicable Standard:

The 20 dB and 99% bandwidth shall be specified in operating frequency band.

10.2 Test Set-up



10.3 Measurement Procedure

1. Placed the EUT on the testing table.
2. Set the EUT under transmission condition continuously at specific channel frequency.
3. Set SPA Center Frequency = fundamental frequency, RBW=1% to 5% OBW, VBW=3 x RBW, Span = large enough to capture all products of the modulation process.
4. Measured the spectrum width with power higher than 20dB below carrier and turn on the 99% bandwidth function, max reading.

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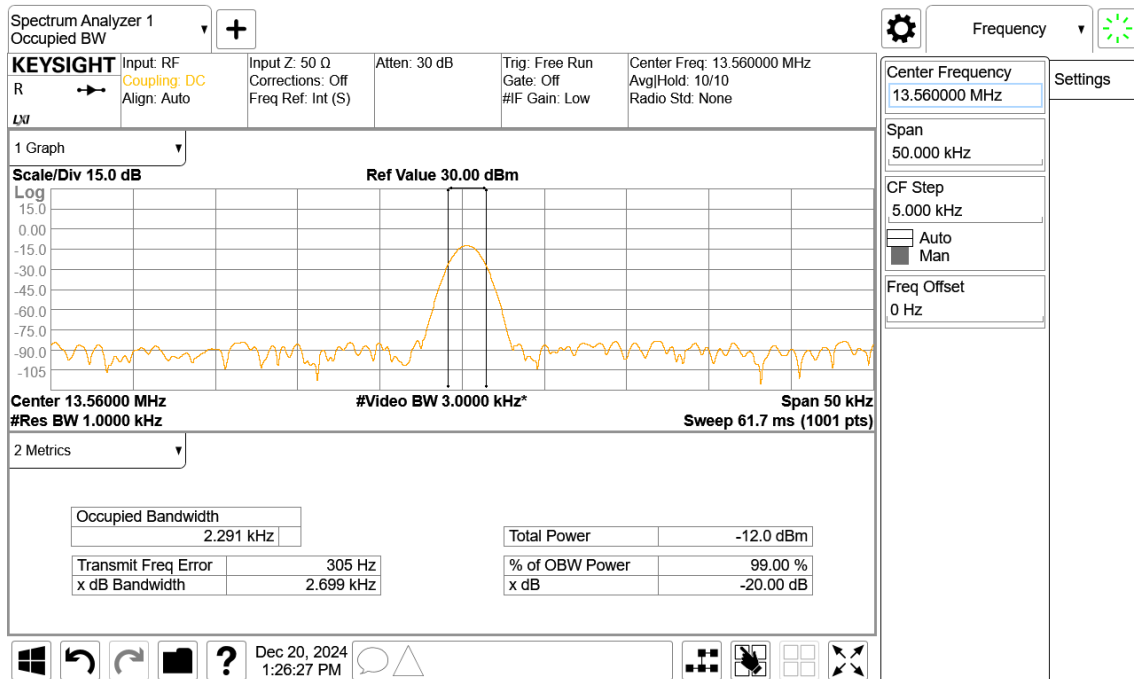
10.4 Measurement Result

FCC

20dB BW (kHz)
2.699

Operation range	Frequency (MHz)	Limit (MHz)
Low	13.55915	>13.11
High	13.56150	<14.01

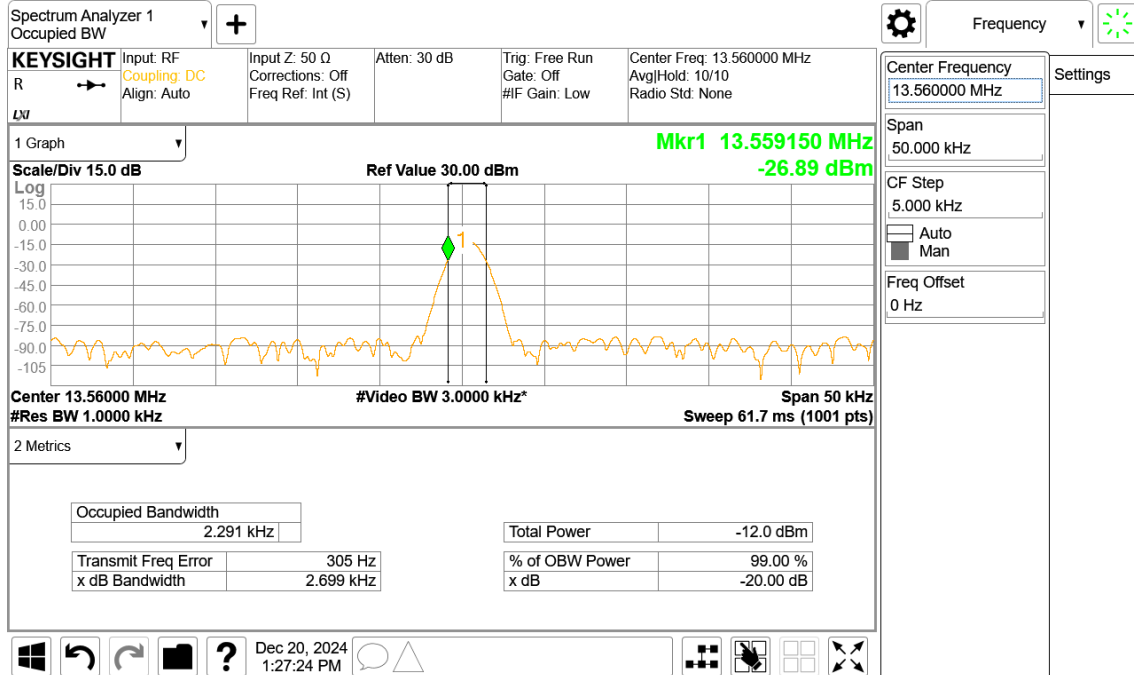
Bandwidth



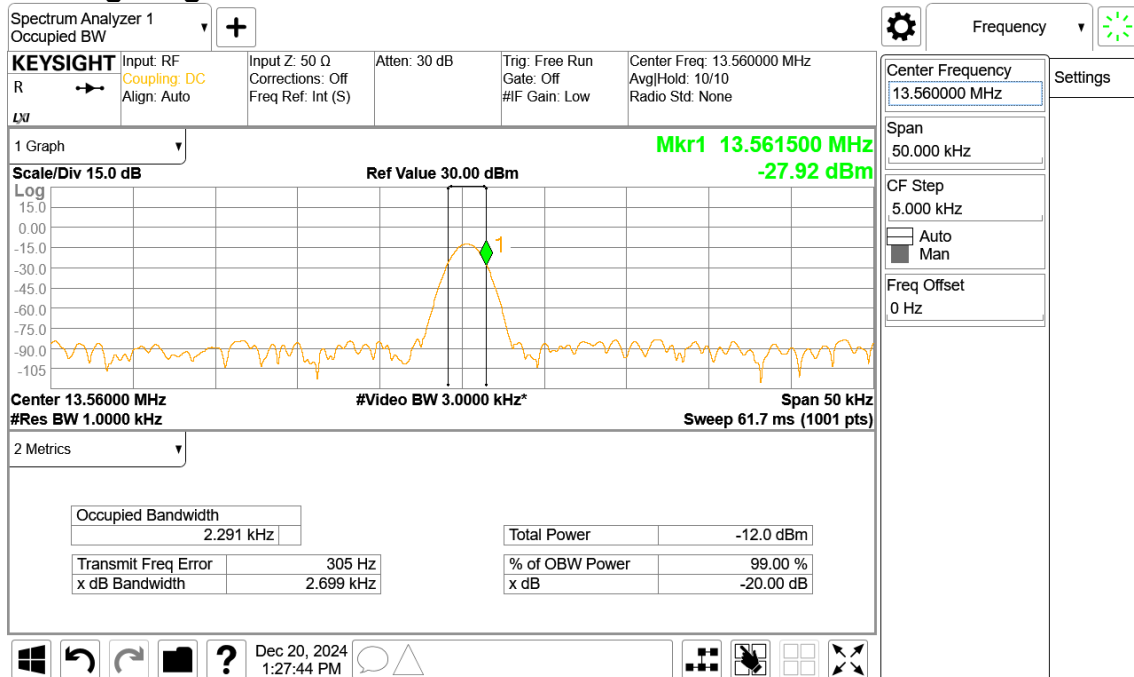
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Operation range Low



Operation range High



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11 ANTENNA REQUIREMENT

11.1 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.

11.2 Antenna Connected Construction:

The antenna complies with this requirement and no consideration of replacement. Please see EUT photo for details.

~ End of Report ~

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