FCC Test Report

Report No.: AGC14499240405FR01

FCC ID	:	2BCUQ-W610D
APPLICATION PURPOSE	:	Original Equipment
PRODUCT DESIGNATION	:	Portable DECT Phone
BRAND NAME	:	LINKVIL
MODEL NAME	:	W610D, W610DP, W710P, W610P
APPLICANT	:	Fanvil Link Technology Co., LTD
DATE OF ISSUE	:	Jun. 14, 2024
STANDARD(S)	:	FCC Part 15 Subpart D §15.323
REPORT VERSION	:	V1.0

*A*ttestation of *G*lobal *C*ompliance (Shenzhen) Co., Ltd

Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Jun. 14, 2024	Valid	Initial Release

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1. General Information

Applicant	Fanvil Link Technology Co., LTD
Address	A03, A08, 3rd Floor, Building 2, Dagian IndustralPlant, Zone 67, Xingdong Community, Xin'anStreet, Bao'an District, Shenzhen , China
Manufacturer	Fanvil Link Technology Co., LTD
Address	A03, A08, 3rd Floor, Building 2, Dagian IndustralPlant, Zone 67, Xingdong Community, Xin'anStreet, Bao'an District, Shenzhen , China
Product Designation	Portable DECT Phone
Brand Name	LINKVIL
Test Model	W610D
Series Model	W610DP, W710P, W610P
Difference Description	Only the model names are different
Date of receipt of test item	May 06, 2024
Date of Test	May 06, 2024~Jun. 12, 2024
Deviation from Standard	No any deviation from the test method
Condition of Test Sample	Normal
Test Result	Pass
Test Report Form No	AGCER-FCC-DECT-V1

Note: The test results of this report relate only to the tested sample identified in this report.

Prepared By	Jack Gui (Project Engineer)	Jun. 12, 2024
Reviewed By	Calvin Liu (Reviewer)	Jun. 14, 2024
Approved By	Max Zhang Authorized Officer	Jun. 14, 2024

2. Product Information

2.1 Product Technical Description

Equipment Type	Portable Part (PP)
Frequency Band	1920 MHz to 1930 MHz
Operation Frequency Range	1921.536 MHz to 1928.448 MHz
Hardware Version	V1.0
Software Version	T0.4.8.5
Type of Modulation	Digital (Gaussian Frequency Shift Keying)
Modulation Technique	GFSK
Number of channels	5 RF Channels, 5 × 12 = 60 TDMA Duplex Channels
Channel Separation	1728 kHz
Emission Designator	F7D
Maximum Transmitter Power	18.15dBm for conducted power 20.82dBm for EIRP
Antenna Designation	Integral Antenna
Antenna Gain	4.6dBi
Power Supply	DC 3.8V, 1900mAh by battery or charging for DC 5V by adapter

2.2 Test Frequency List

Frequency Band	Channel Number	Frequency
1920~1930MHz	0	1928.448 MHz
	1	1926.720 MHz
	2	1924.992 MHz
	3	1923.264 MHz
	4	1921.536 MHz
Note: All channels operation in the 1920-1930 MHz band, meeting the requirement of FCC 47 CFR Part 15.303		

2.3 Related Submittal(S) / Grant (S)

This submittal(s) (test report) is intended for FCC ID: **2BCUQ-W610D,** filing to comply with Part 2, Part 15 of the Federal Communication Commission rules.

2.4 Test Methodology

The tests were performed according to following standards:

No.	Identity	Document Title
1	FCC 47 CFR Part 2	Frequency allocations and radio treaty matters; general rules and regulations
2	FCC 47 CFR Part 15	Radio Frequency Devices
3	ANSI C63.4-2014	American National Standard for Methods of Measurement of Radio- Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
4	ANSI C63.10-2013	American National Standard for Testing Unlicensed Wireless Devices
5	ANSI C63.17-2013	American National Standard Methods of Measurement of the Electromagnetic and Operational Compatibility of Unlicensed Personal Communications Services (UPCS) Devices

2.5 Automatic Discontinuation of Transmission

Does the EUT transmit Control and Signaling Information?

☒ Yes	☐ No

Type of EUT:

☐ Initiating Device	☒ Responding Device

The following tests simulate the reaction of the EUT in case of either absence of information to transmit or operational failure after a connection with the companion device is established.

No.	Test	EUT Reaction	Results
1	Power removed: EUT	A	Pass
2	Switch Off: EUT	N/A	Pass
3	Hook-On: EUT	N/A	Pass
4	Power Removed: Companion Device	B	Pass
5	Switch Off: Companion Device	B	Pass
6	Hook-On: Companion Device	B	Pass

Note:
A - Connection breakdown, Cease of all transmissions
B - Connection breakdown, EUT transmits control and signaling information
C - Connection breakdown, Companion Device transmits control and signaling information
N/A : Not Applicable (EUT does not have On/Off switch and cannot perform Hook-On)

2.6 Digital Modulation Techniques

The test sample is an isochronous digital modulated device that operates in 1920-1930 MHz band. This device bases on DECT technology described in European Standards EN 300 175-2 and EN 300 175-3, now operating in frequency channels mentioned above.

The operating modes are MC/TDMA/TDD (Multi carrier / Time Division Multiple Access / Time Division Duplex) using Digital GFSK (Gaussian Frequency Shift Keying) modulation.

For further details see operational description provided by manufacturer.

2.7 Special Accessories

Not available for this EUT intended for grant.

2.8 Equipment Modifications

Not available for this EUT intended for grant.

2.9 Antenna Requirement

Standard Requirement
15.203 requirement: 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, 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.
EUT Antenna:
The non-detachable antenna inside the device cannot be replaced by the user at will. The gain of the antenna is 4.6dBi.

3. Test Environment

3.1 Address of The Test Laboratory

Laboratory: Attestation of Global Compliance (Shenzhen) Co., Ltd.

Address: 1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

3.2 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

CNAS-Lab Code: L5488

Attestation of Global Compliance (Shenzhen) Co., Ltd. has been assessed and proved to follow CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories.)

A2LA-Lab Cert. No.: 5054.02

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to follow ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

FCC-Registration No.: 975832

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files with Registration 975832.

IC-Registration No.: 24842(CAB identifier: CN0063)

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the Certification and Engineering Bureau of Industry Canada. The acceptance letter from the IC is maintained in our files with Registration 24842.

3.3 Environmental Conditions

	Normal Conditions	Extreme Conditions
Temperature range (℃)	15 - 35	-20 - 45
Relative humidity range	20 % - 75 %	20 % - 75 %
Pressure range (kPa)	86 - 106	86 - 106
Power supply	DC 3.8V	LV DC 3.23V/HV DC 4.37V
Note: The Extreme Temperature and Extreme Voltages declared by the manufacturer.		

3.4 Measurement Uncertainty

The reported uncertainty of measurement y ±U, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95%.

Item	Measurement Uncertainty
Uncertainty of Conducted Emission for AC Port	U_c = ±2.9 dB
Uncertainty of Radiated Emission below 1GHz	U_c = ±3.9 dB
Uncertainty of Radiated Emission above 1GHz	U_c = ±4.9 dB
Uncertainty of total RF power, conducted	U_c = ±0.8 dB
Uncertainty of RF power density, conducted	U_c = ±2.6 dB
Uncertainty of spurious emissions, conducted	U_c = ±2 %
Uncertainty of Occupied Channel Bandwidth	U_c = ±2 %

3.5 List of Equipment Used

● RF Conducted Test System							
Used	Equipment No.	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
☒	AGC-ER-E087	Spectrum Analyzer	KEYSIGHT	N9020B	MY56101792	2023-05-25	2025-05-24
☒	AGC-ER-E087	Spectrum Analyzer	KEYSIGHT	N9020B	MY56101792	2024-05-23	2025-05-22
☒	AGC-ER-E075	Small Environmental Tester	SH-242	ESPEC	93008290	2022-08-03	2024-08-02
☒	--	Universal Switch Control Unit	Tonscend	JS	N/A	N/A	N/A
☒	AGC-ER-E037	Signal Generator	Agilent	N5182A	MY50140530	2024-05-23	2025-05-22
☒	AGC-ER-E040	Signal Generator	Agilent	N8257D	MY45141029	2023-03-03	2025-03-02
☒	AGC-ER-E033	RF Test Plat (DECT)	RTX	RTX-2012-HS-RF	N/A	2022-08-04	2024-08-03
☒	--	RF Connection Cable	N/A	1#	N/A	Each time	N/A
☒	--	RF Connection Cable	N/A	2#	N/A	Each time	N/A

● Radiated Spurious Emission							
Used	Equipment No.	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
☒	AGC-EM-E116	EMI Test Receiver	R&S	ESCI	100034	2024-05-24	2025-05-23
☒	AGC-EM-E061	Spectrum Analyzer	Agilent	N9010A	MY53470504	2024-05-28	2025-05-27
☒	AGC-EM-E086	Loop Antenna	ZHINAN	ZN30900C	18051	2024-03-05	2026-03-04
☒	AGC-EM-E005	Wideband Antenna	SCHWARZBECK	VULB9168	VULB9168-494	2023-01-05	2025-01-04
☒	AGC-EM-E102	Broadband Ridged Horn Antenna	ETS	3117	00154520	2023-06-03	2025-06-02
☐	AGC-EM-E082	Horn Antenna	SCHWARZBECK	BBHA 9170	#768	2023-09-24	2025-09-23
☒	AGC-EM-E146	Pre-amplifier	ETS	3117-PA	00246148	2022-08-04	2024-08-03
☒	AGC-EM-A116	Band Stop Filter (1850-1950MHz)	MICRO-TRONICS	BRC50720	N/A	2024-05-23	2025-05-22
☒	AGC-EM-A091	High Pass Filter 2 (1200-18000MHz)	N/A	N/A	N/A	2024-05-23	2025-05-22
☒	AGC-EM-A138	6dB Attenuator	Eeatsheep	LM-XX-6-5W	N/A	N/A	N/A
☐	AGC-EM-A139	6dB Attenuator	Eeatsheep	LM-XX-6-5W	N/A	N/A	N/A

● AC Power Line Conducted Emission							
Used	Equipment No.	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
☒	AGC-EM-E045	EMI Test Receiver	R&S	ESPI	101206	2023-06-03	2024-06-02
☒	AGC-EM-E045	EMI Test Receiver	R&S	ESPI	101206	2024-05-28	2025-05-27
☒	AGC-EM-A130	6dB Attenuator	Eeatsheep	LM-XX-6-5W	DC-6GZ	2023-06-09	2025-06-08
☒	AGC-EM-E023	AMN	R&S	100086	ESH2-Z5	2023-06-03	2024-06-02
☒	AGC-EM-E023	AMN	R&S	100086	ESH2-Z5	2024-05-28	2025-05-27

● Test Software					
Used	Equipment No.	Test Equipment	Manufacturer	Model No.	Version Information
☒	AGC-EM-S011	RSE Test System	Tonscend	TS^+ Ver2.1(JS36-RSE)	4.0.0.0
☒	AGC-EM-S003	RE Test System	FARA	EZ-EMC	V.RA-03A
☒	AGC-EM-S001	CE Test System	R&S	ES-K1	V1.71

4.System Test Configuration

4.1 EUT Configuration

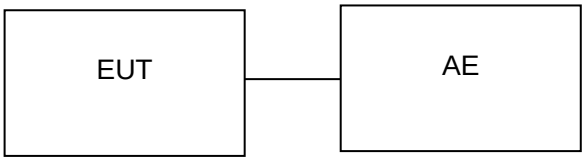
The EUT configuration for testing is installed on RF field strength measurement to meet the Commission's requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

4.2 EUT Exercise

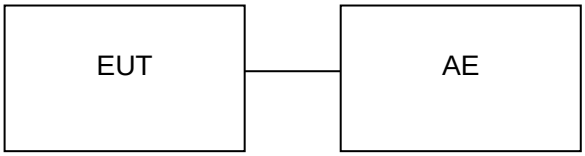
The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

4.3 Configuration of Tested System

Radiated Emission Configure:



Conducted Emission Configure:



4.4 Equipment Used in Tested System

The following peripheral devices and interface cables were connected during the measurement:

☒ Test Accessories Come From The Laboratory

No.	Equipment	Manufacturer	Model No.	Specification Information	Cable
1	Earphone	CXT	N/A	N/A	1.2m unshielded

☒ Test Accessories Come From The Manufacturer

No.	Equipment	Manufacturer	Model No.	Specification Information	Cable
1	Adapter 1#	Gangqi	GQ12-050200-AU	Input: AC 100-240V 50/60Hz, 0.4A Output: DC 5V 2A	1.3m unshielded
2	Adapter 2#	FRECOM	F12L20-050200SPAU	Input: AC 100-240V 50/60Hz, 0.3A Output: DC 5V 2A	1.3m unshielded
3	Bottom socket power supply	LINVIL	N/A	Input: DC 5V 2A Output: DC 4.35V	N/A
4	Battery	YJ	YJ563170	DC 3.8V 1900mA 7.22Wh	N/A
5	Back Clip	N/A	N/A	N/A	N/A
6	DECT System	LINVIL	W710D	N/A	N/A
7	Portable DECT Phone	LINVIL	W610D	N/A	N/A

4.5 Summary of Test Results

No.	FCC Rules	Description of Test	Reference Method	Result
1	§15.203, §15.317	Antenna Equipment	Declaration & Visual inspection	Pass
2	§15.323 (c)(e)	Specific Requirements for Upcs Device	ANSI C63.17-2013 Clause 6.2, 7.3, 7.5, 8.1, 8.2, 8.3, 8.4 and Paragraph 4	Pass
3	§15.303	Channel Frequency	Declaration	Pass
4	§15.319 (b)	Digital Modulation Techniques	Declaration	Pass
5	§15.319 (f)	Automatic Discontinuation of Transmission	Manual evaluation	Pass
6	§15.319(c)(e), §15.31(e)	Peak Transmit Power and Antenna Gain	ANSI C63.17-2013 Clause 6.1.2	Pass
7	§15.323 (a)	26dB Emission Bandwidth &99%Occupied Bandwidth	ANSI C63.17-2013 Clause 6.1.3 or 7.4	Pass
8	§15.319 (d)	Power Spectral Density	ANSI C63.17-2013 Clause 6.1.5	Pass
9	§15.323 (d)	In-Band Emission	ANSI C63.17-2013 Clause 6.1.6.1	Pass
10	§15.323 (d)	Out-of-Band Emission	ANSI C63.17-2013 Clause 6.1.6.2	Pass
11	§15.323 (f)	Carrier Frequency Stability	ANSI C63.17-2013 Clause 6.2.1	Pass
12	§15.319(g), §15.323(d) §15.209(a), §15.109(a)	Radiated Emission	ANSI C63.10-2013 Clause 11.11 & Clause 11.12	Pass
13	§15.207, §15.315	AC Power Line Conducted Emission	ANSI C63.10-2013 Section 6.2	Pass

Note:

1) N/A: In this whole report not applicable.

2) Not required if the Conducted Out-of-Band Emissions test is passed, and assessed in the FCC 47 CFR Part 15B test report.

5. Description of Test Modes

Summary table of Test Cases	
Test Item	Modulation
	DECT- Portable Part/GFSK
Radiated & Conducted Test Cases	Mode 1: UPCS TX CH00_1921.536 MHz (Connect the adapter) Mode 2: UPCS TX CH02_1924.992 MHz (Connect the adapter) Mode 3: UPCS TX CH04_1928.448 MHz (Connect the adapter)
AC Conducted Emission	Mode 1: UPCS connects to PC to Transmit Data (Powered by adapter 1#) Mode 2: UPCS connects to PC to Transmit Data (Powered by adapter 2#)

Note:
1. Only the result of the worst case was recorded in the report, if no other cases.
2. For Radiated Emission, 3axis were chosen for testing for each applicable mode.
3. For Conducted Test method, a temporary antenna connector is provided by the manufacture.

6. 26dB Emission Bandwidth & 99% Occupied Bandwidth

6.1 Provisions Applicable

Please refer to FCC 47 CFR Part 15.319(c) &15.319(e) for specification details:

Operation shall be contained within the 1920–1930 MHz band. The emission bandwidth shall be less than 2.5 MHz. The power level shall be as specified in § 15.319(c), but in no event shall the emission bandwidth be less than 50 kHz

6.2 Measurement Procedure

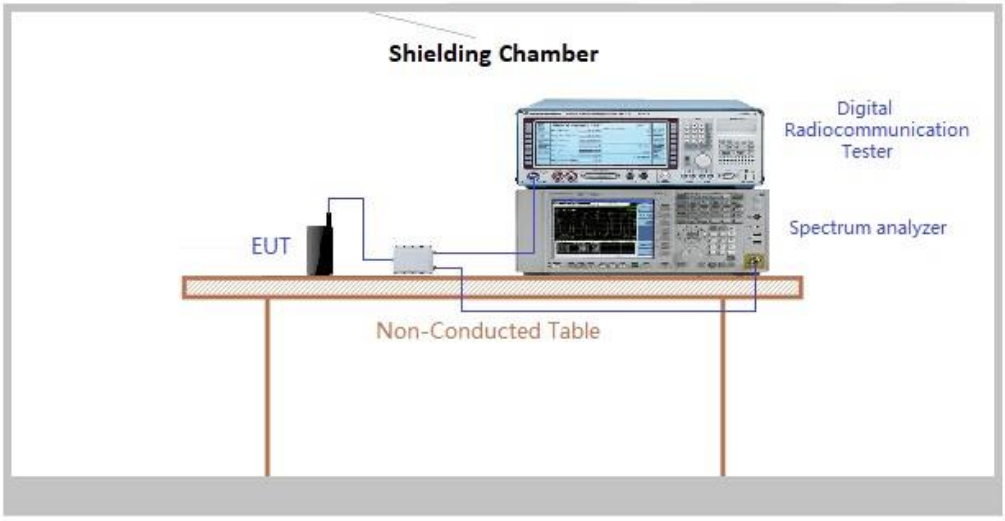
The testing follows the ANSI C63.17-2013 Section 6.1.2

1. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power meter.
2. The EUT shall transmit in a burst mode (shall not be configured to transmit continuously) so that transient effects associated with the burst edges are captured by the emission bandwidth measurement.
3. Use the following spectrum analyzer settings:

a) Set RBW: Approximately 1% of the emission bandwidth (a rough estimate may be obtained from peak power level measurement, or use manufacturer's declared value).
b) Set the video bandwidth (VBW) ⩾ 3 x RBW.
c) Center frequency: Nominal center frequency of channel.
d) Span: ⩾ 2 × the expected emission bandwidth.
e) Sweep time: Coupled to frequency span and RBW.
f) Amplitude scale: Log.
g) Detection: Peak detection with maximum hold enabled.

4. Record the maximum level of the modulated carrier. Find the two furthest frequencies above and below the frequency of the maximum level of the modulated carrier where the signal level is 26 dB below the peak level of the carrier. The difference in frequency between these two frequencies is the emission bandwidth

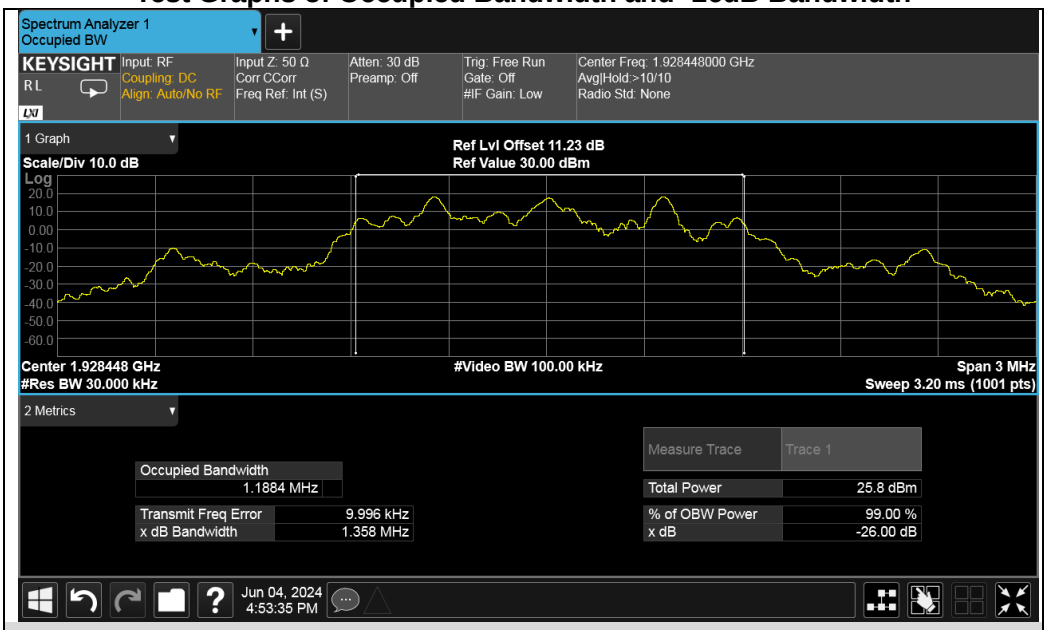
6.3 Measurement Setup (Block Diagram of Configuration)



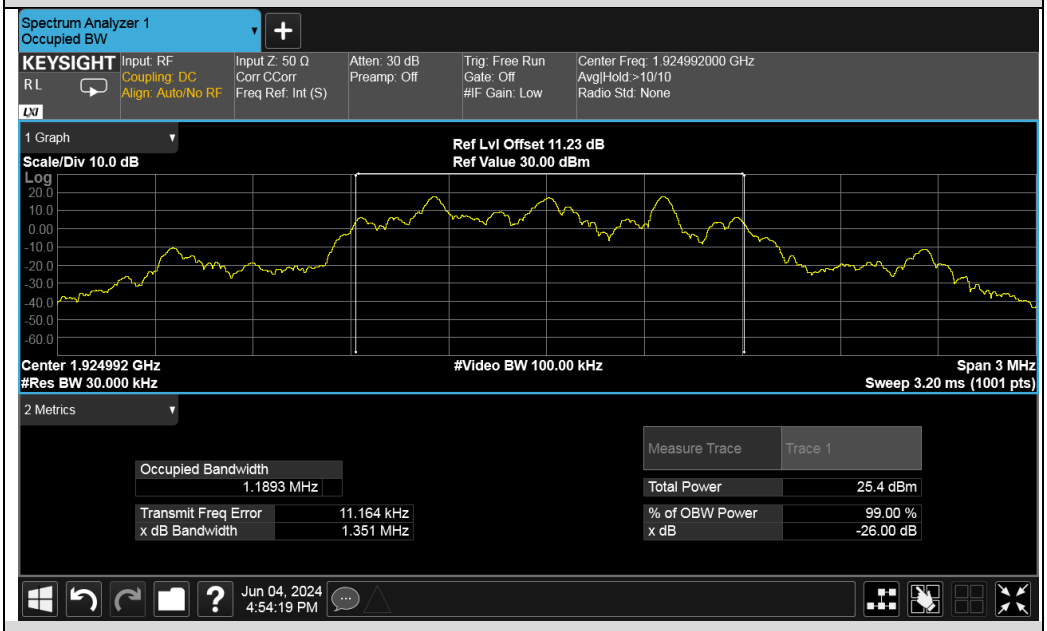
6.4 Measurement Result

Test Channel	Test Frequency (MHz)	Occupied Bandwidth (MHz)	EBW (MHz)	EBW Limits	Pass or Fail
0	1928.448	1.1884	1.358	50 kHz＜Limits＜2.5MHz	Pass
2	1924.992	1.1893	1.351	50 kHz＜Limits＜2.5MHz	Pass
4	1921.536	1.1872	1.356	50 kHz＜Limits＜2.5MHz	Pass

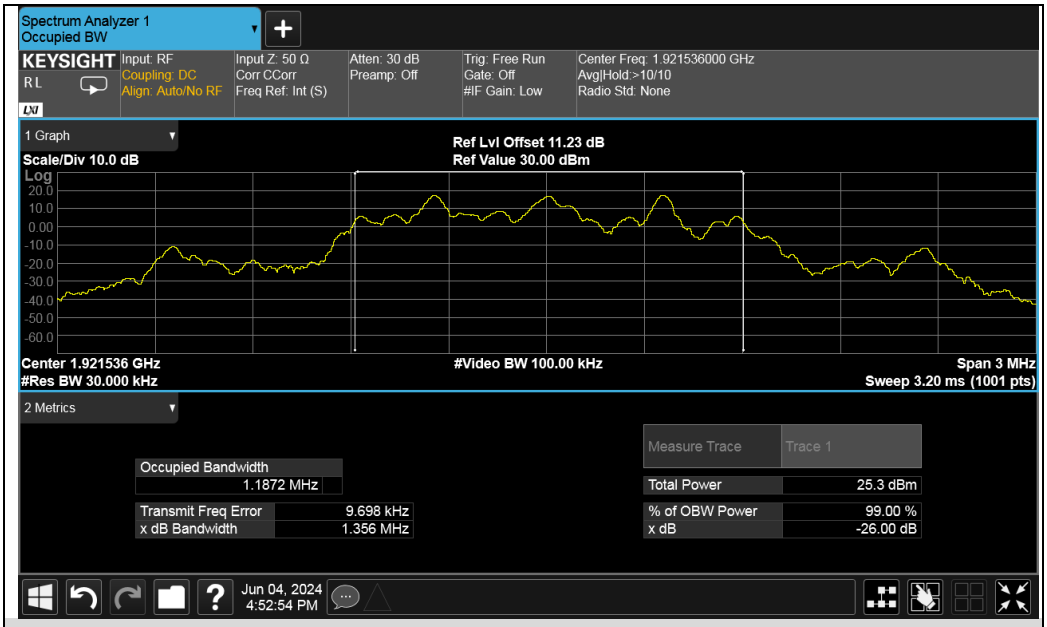
Test Graphs of Occupied Bandwidth and -26dB Bandwidth



Test_Graph_UPCS_ANT1_CH00_GFSK_EBW



Test_Graph_UPCS_ANT1_CH02_GFSK_EBW



Test_Graph_UPCS_ANT1_CH04_GFSK_EBW

7. Peak Transmit Power and Antenna Gain

7.1 Provisions Applicable

Please refer to FCC 47 CFR Part 15.319(c) &15.319(e) for specification details:
Peak transmit power shall not exceed 100 microwatts multiplied by the square root of the emission bandwidth in hertz. Peak transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage. The measurement results shall be properly adjusted for any instrument limitations, such as detector response times, limited resolution bandwidth capability when compared to the emission bandwidth, sensitivity, etc., so as to obtain a true peak measurement for the emission in question over the full bandwidth of the channel.

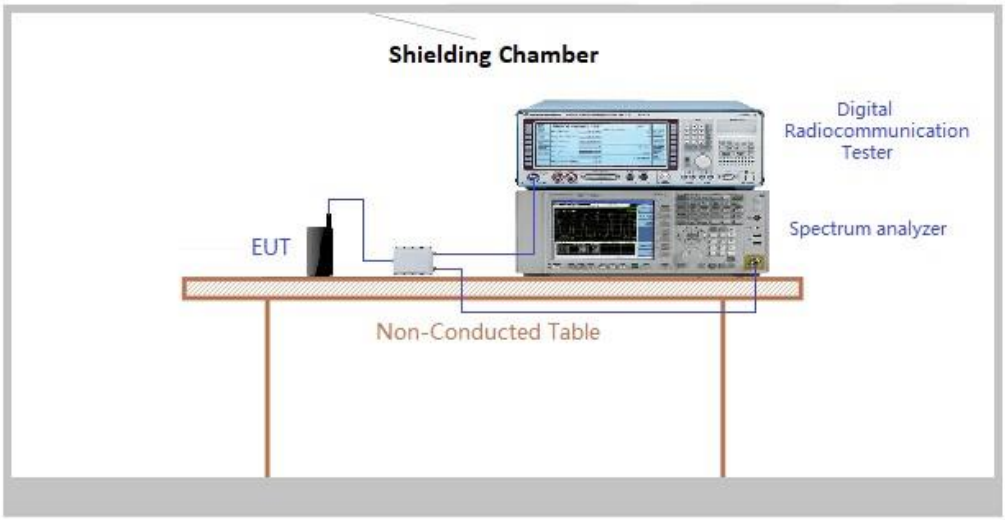
The peak transmit power shall be reduced by the amount in decibels that the maximum directional gain of the antenna exceeds 3 dBi.

7.2 Measurement Procedure

The testing follows the ANSI C63.17-2013 Section 6.1.2

RBW	≥ Emission bandwidth
Video bandwidth	≥ RBW
Span	Span Zero
Center frequency	Nominal center frequency of transmit carrier
Amplitude scale	Log (linear may be used if analyzer has sufficient linear dynamic range and accuracy)
Detection	Peak detection
Trigger Video	Trigger Video
Sweep rate	Sufficiently rapid to permit the transmit pulse to be resolved accurately

7.3 Measurement Setup (Block Diagram of Configuration)



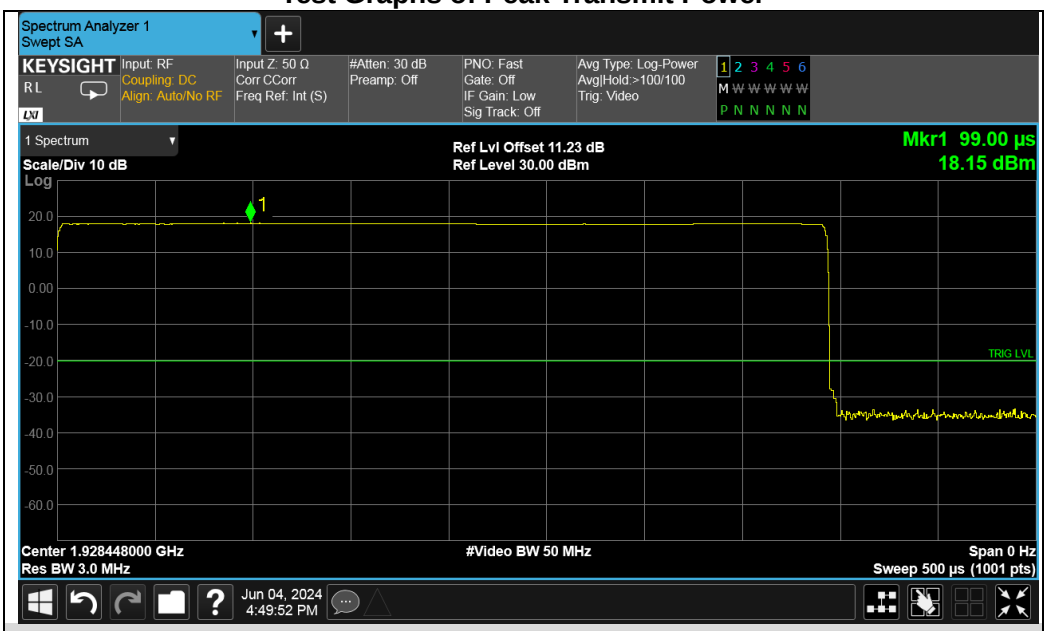
7.4 Measurement Result

Calculation of Peak Transmit Power Limit (P_{max}):		
☐	P_{max} = 5*log$_{10}$ B-10	When G_A ≤ 3dBi
☒	P_{max} = 5*log$_{10}$ B-10 dBm-(G_A - 3dBi)	When G_A > 3dBi
Where,	G_A	= EUT Gain: 4.6 dBi
	B	= Measured Emission Bandwidth (Hz)
Calculation of EIRP Limit:		
☒	$EIRP_{EUT}$	≤P_{max} + g, G_A> g (g=3dBi)
☐	$EIRP_{EUT}$	≤P_{max} + G_A, G_A≤ g (g=3dBi)

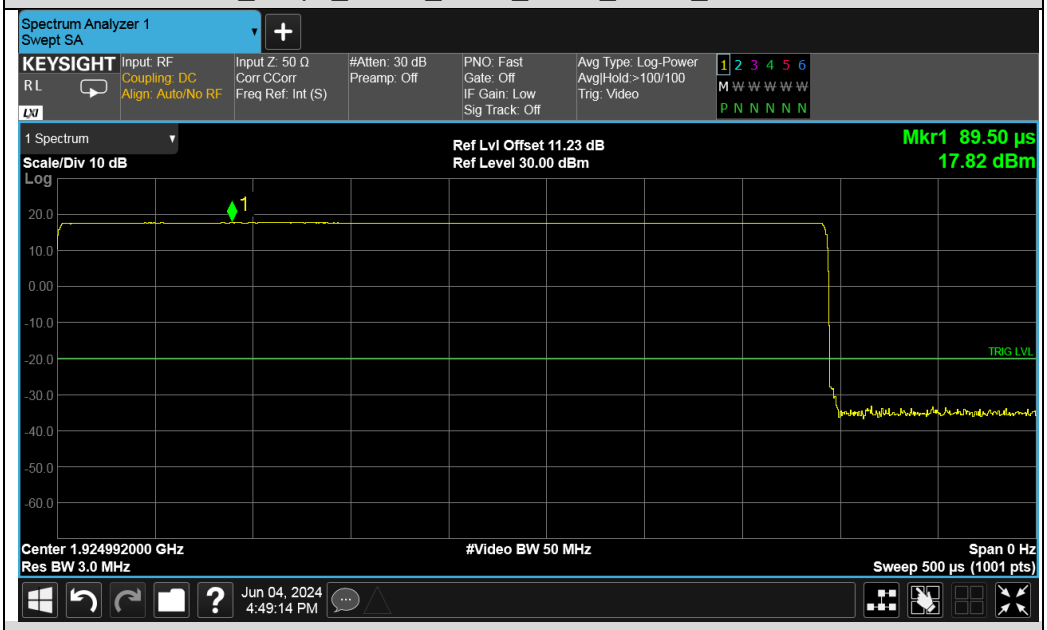
Test Channel	Test Frequency (MHz)	Maximum Antenna Gain (dBi)	EBW (MHz)	Maximum Conducted Peak Transmit Power (dBm)	Limits (dBm)	Pass / Fail
0	1928.448	4.6	1.358	18.15	⩽19.06	Pass
2	1924.992		1.351	17.82	⩽19.05	Pass
4	1921.536		1.356	17.46	⩽19.06	Pass

Test Channel	Test Frequency (MHz)	Maximum Conducted Peak Transmit Power (dBm)	Maximum Antenna Gain (dBi)	E.I.R.P. (dBm)	Limits (dBm)	Pass / Fail
0	1928.448	18.15	3	21.15	⩽22.06	Pass
2	1924.992	17.82		20.82	⩽22.05	Pass
4	1921.536	17.46		20.46	⩽22.06	Pass

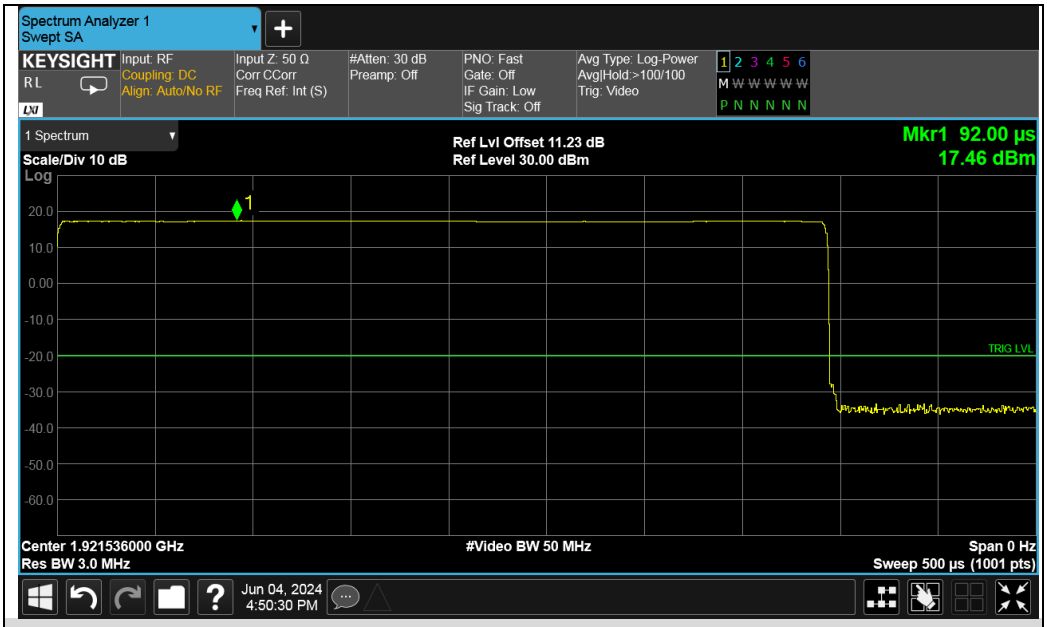
Test Graphs of Peak Transmit Power



Test_Graph_UPCS_ANT1_CH00_GFSK_Peak Power



Test_Graph_UPCS_ANT1_CH02_GFSK_ Peak Power



Test_Graph_UPCS_ANT1_CH04_GFSK_ Peak Power

8. Power Spectral Density

8.1 Provisions Applicable

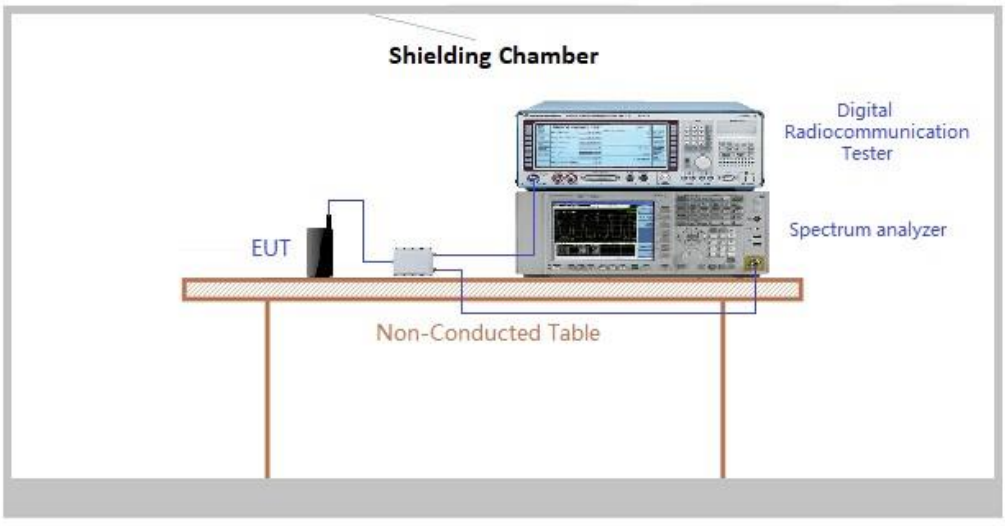
Please refer to FCC 47 CFR Part 15.319(d) for specification details:
Power spectral density shall not exceed 3 milliwatts in any 3 kHz bandwidth as measured with a spectrum analyzer having a resolution bandwidth of 3 kHz.

8.2 Measurement Procedure

The testing follows the ANSI C63.17-2013 Section 6.1.5

RBW	3 kHz
Video bandwidth	≥ 3*RBW
Span	Span Zero
Center frequency	Nominal center frequency of transmit carrier
Amplitude scale	RMS
Detection	Sample detection and averaged for a minimum of 100 sweeps
Trigger Video	External or internal
Sweep Time	For burst signals, sufficient to include essentially all of the maximum length burst at the output of a 3 kHz filter (e.g., maximum input burst duration plus 600μs). For continuous signals, 20ms.

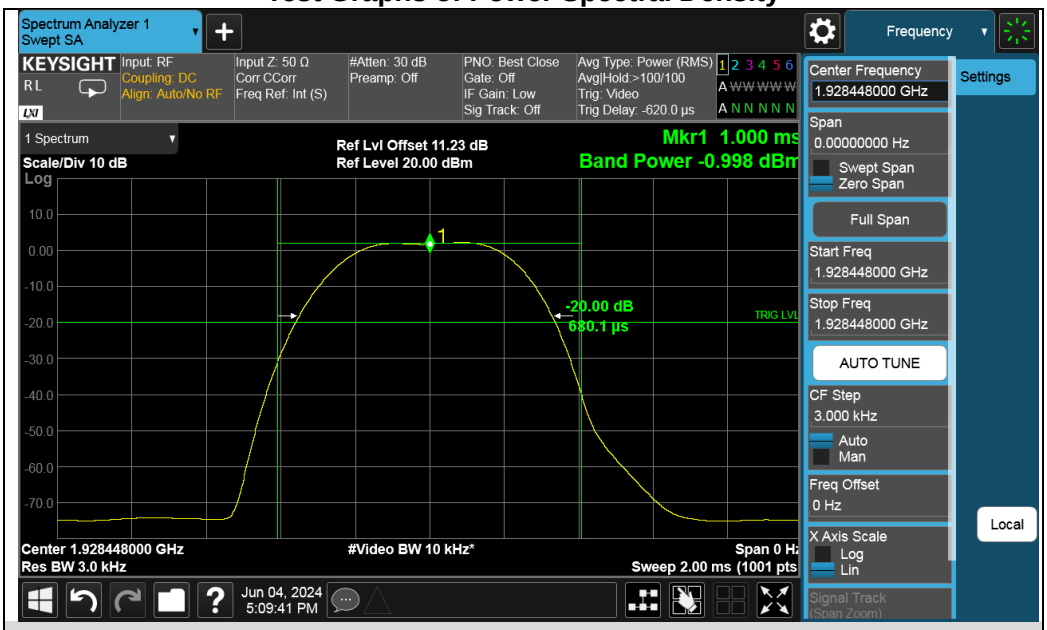
8.2 Measurement Setup (Block Diagram of Configuration)



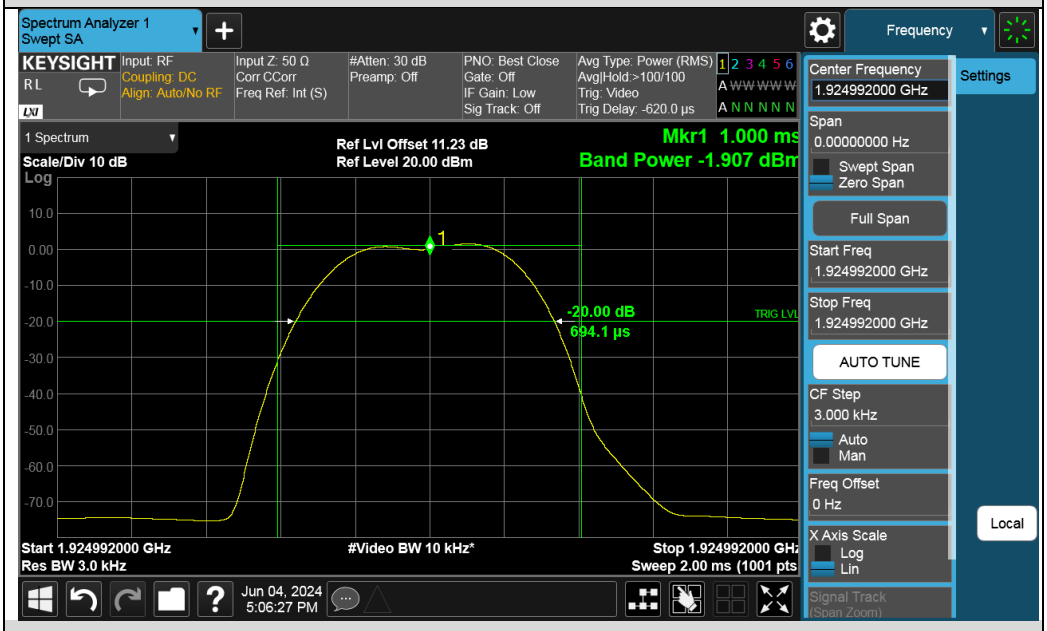
8.3 Measurement Result

Test Channel	Test Frequency (MHz)	Power density (dBm/3kHz)	Power density (mW/3kHz)	Limit (mW/3kHz)	Pass or Fail
0	1928.448	-0.998	0.79	⩽3	Pass
2	1924.992	-1.907	0.64	⩽3	Pass
4	1921.536	-1.527	0.70	⩽3	Pass

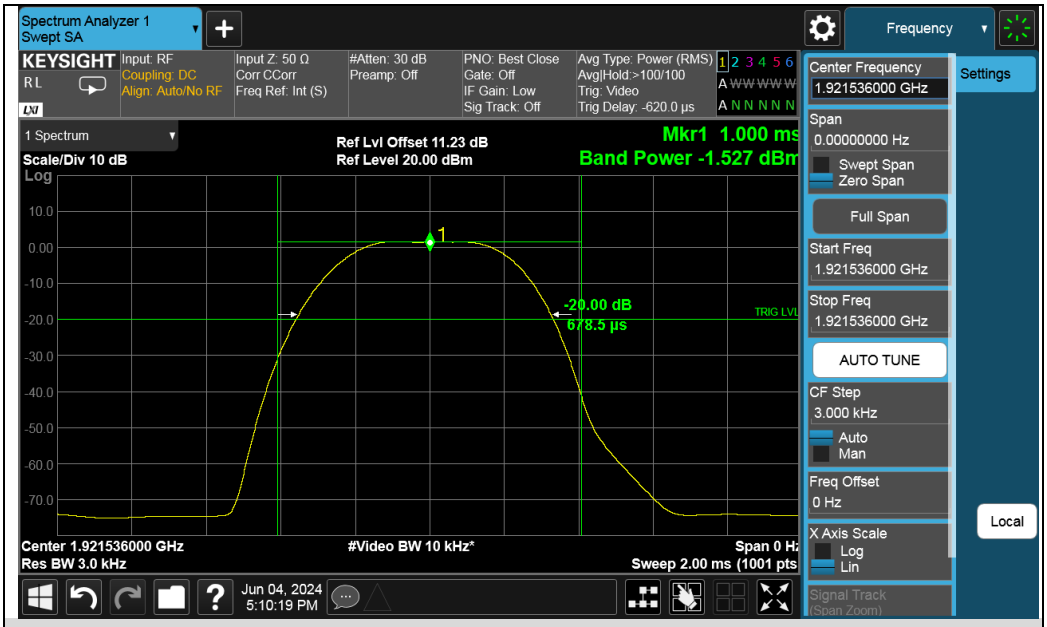
Test Graphs of Power Spectral Density



Test_Graph_UPCS_ANT1_CH00_GFSK_PSD



Test_Graph_UPCS_ANT1_CH02_GFSK_PSD



Test_Graph_UPCS_ANT1_CH04_GFSK_PSD

9. In-Band Unwanted Emissions

9.1 Provisions Applicable

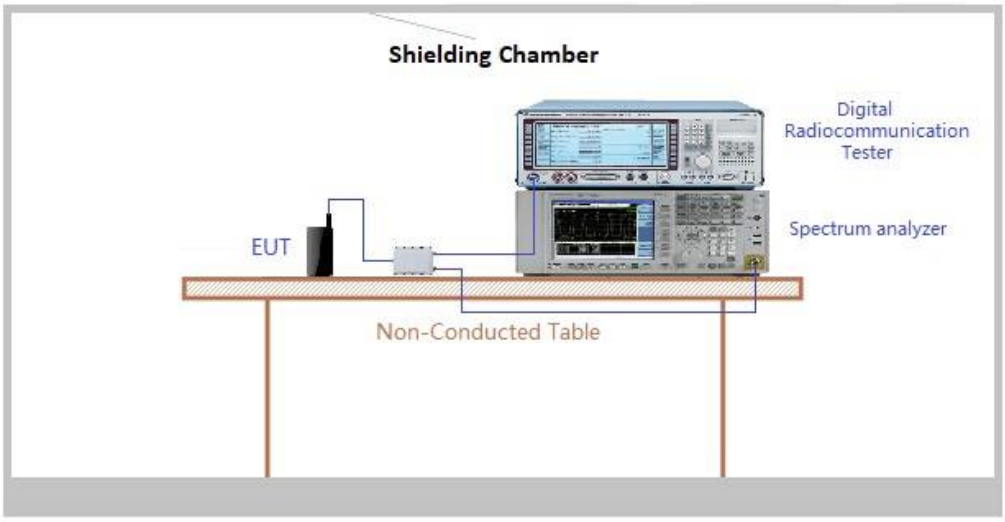
Please refer to FCC 47 CFR Part 15.323(d) for specification details:
Emissions inside the band must comply with the following emission mask: In the bands between 1B and 2B measured from the center of the emission bandwidth the total power emitted by the device shall be at least 30 dB below the transmit power permitted for that device; in the bands between 2B and 3B measured from the center of the emission bandwidth the total power emitted by an intentional radiator shall be at least 50 dB below the transmit power permitted for that radiator; in the bands between 3B and the band edge the total power emitted by an intentional radiator in the measurement bandwidth shall be at least 60 dB below the transmit power permitted for that radiator. B'' is defined as the emission bandwidth of the device in hertz. Compliance with the emission limits is based on the use of measurement instrumentation employing peak detector function with an instrument resolution bandwidth approximately equal to 1.0 percent of the emission bandwidth of the device under measurement.

9.2 Measurement Procedure

The testing follows the ANSI C63.17-2013 Section 6.1.6.1

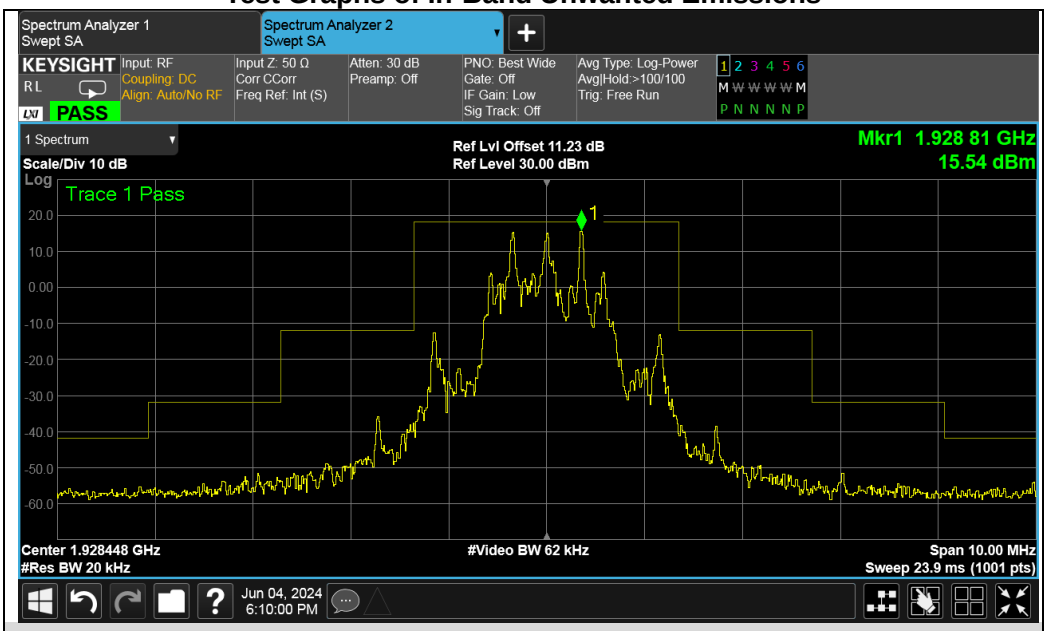
RBW	Approximately 1% of the Emission bandwidth (B)
Video bandwidth	≥ 3*RBW
Span	Approximately equal to 3.5 B
Center frequency	Nominal center frequency of transmit carrier
Detection	Peak detection and max hold enabled
Amplitude scale	Log
Sweep Time	The sweep time shall be sufficiently slow that the swept frequency rate shall not exceed one RBW per three transmit bursts.
Number of sweeps	Sufficient to stabilize the trace

9.3 Measurement Setup (Block Diagram of Configuration)

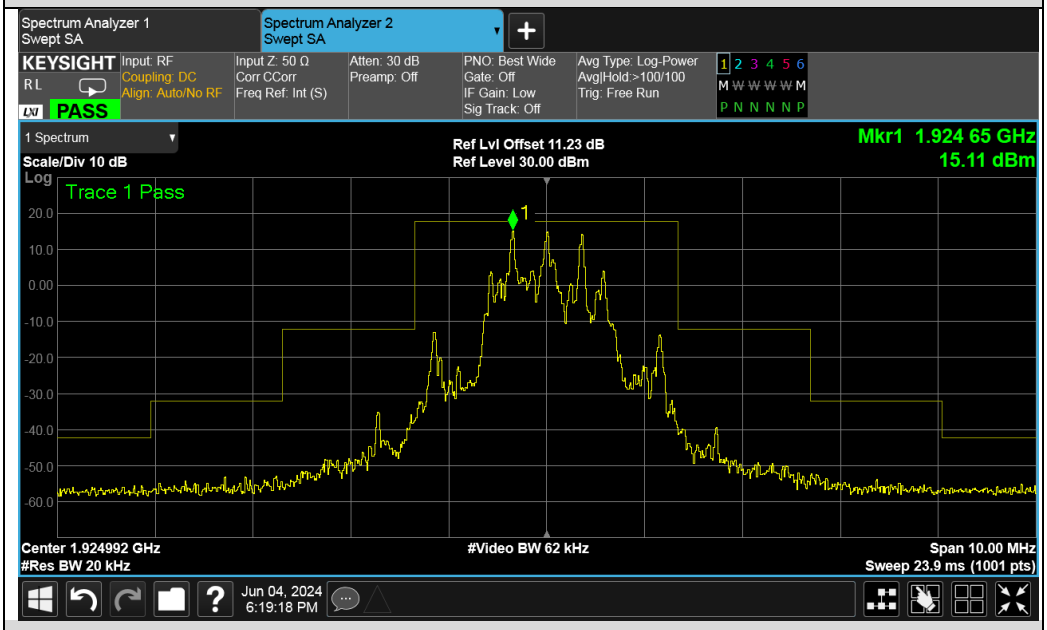


9.4 Measurement Result

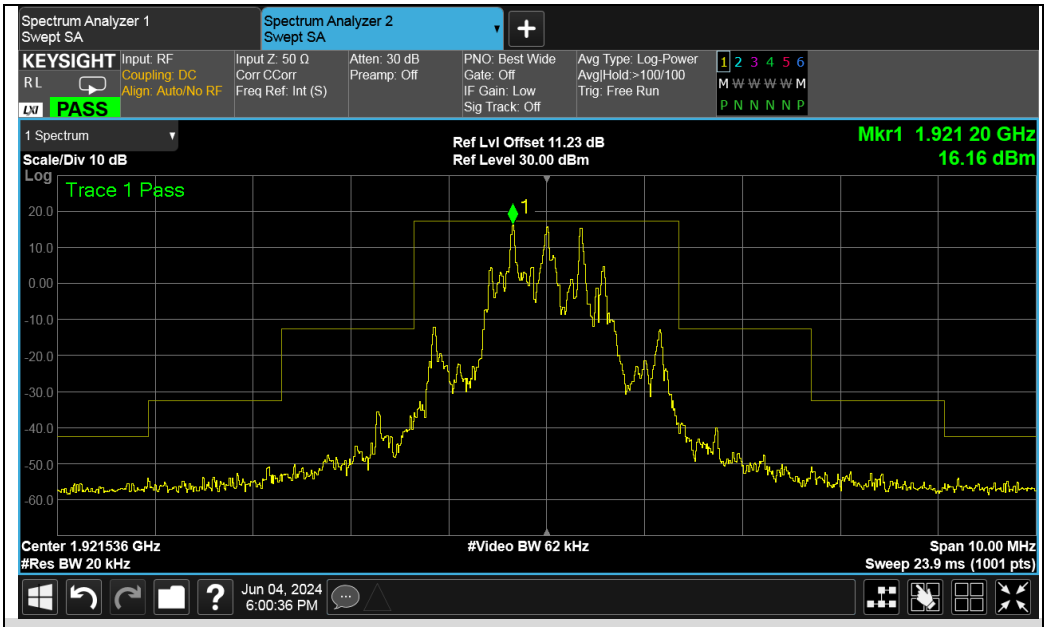
Test Graphs of In-Band Unwanted Emissions



Test_Graph_UPCS_ANT1_CH00_GFSK_Emission Mask



Test_Graph_UPCS_ANT1_CH02_GFSK_ Emission Mask



Test_Graph_UPCS_ANT1_CH04_GFSK_ Emission Mask

10. Out-of-Band Unwanted Emissions

10.1 Provisions Applicable

Please refer to FCC 47 CFR Part 15.323(d) for specification details:

a) In the region between the band edges and 1.25 MHz below and above the lower and the upper band edges, respectively, the measured emission level shall not exceed −9.5 dBm.

b) In the region between 1.25 and 2.5 MHz below and above the lower and the upper band edges, respectively, the measured emission level shall not exceed −29.5 dBm.

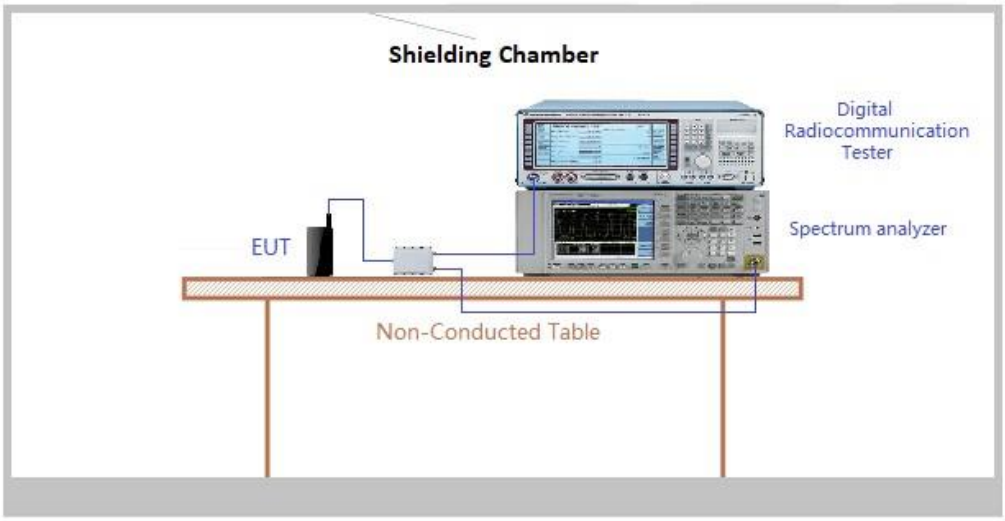
c) In the region at 2.5 MHz or greater below and above the lower and upper band edges, respectively, the measured emission level shall not exceed −39.5 dBm.

10.2 Measurement Procedure

The testing follows the ANSI C63.17-2013 Section 6.1.6.2

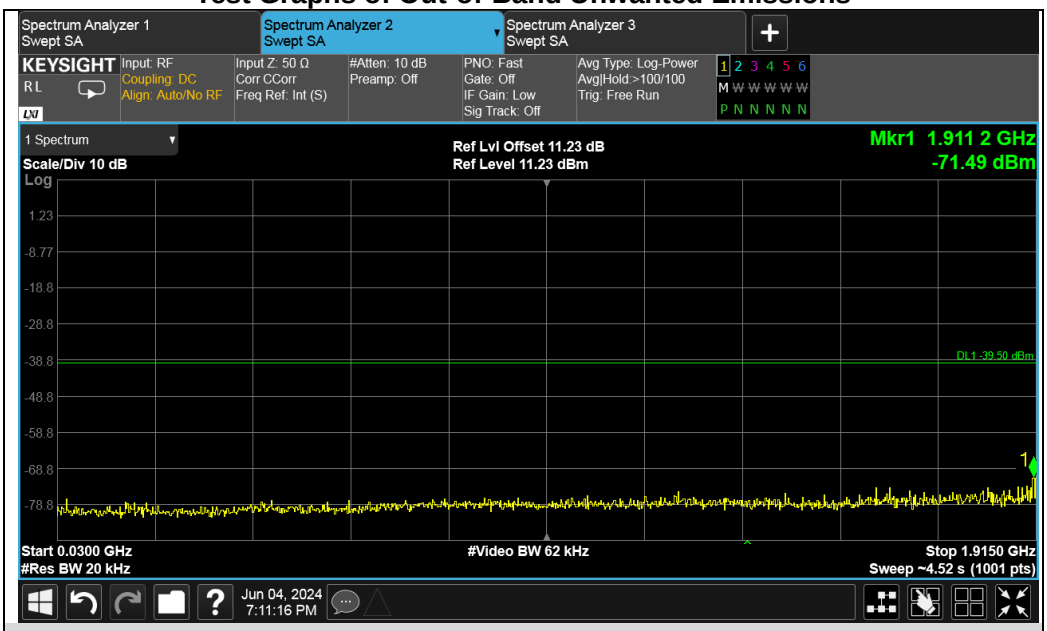
RBW	Approximately 1% of the Emission bandwidth (B)
Video bandwidth	≥ 3*RBW
Span	Approximately equal to 3.5 B
Center frequency	Nominal center frequency of transmit carrier
Detection	Peak detection and max hold enabled
Amplitude scale	Log
Sweep Time	The sweep time shall be sufficiently slow that the swept frequency rate shall not exceed one RBW per three transmit bursts.
Number of sweeps	Sufficient to stabilize the trace

10.3 Measurement Setup (Block Diagram of Configuration)

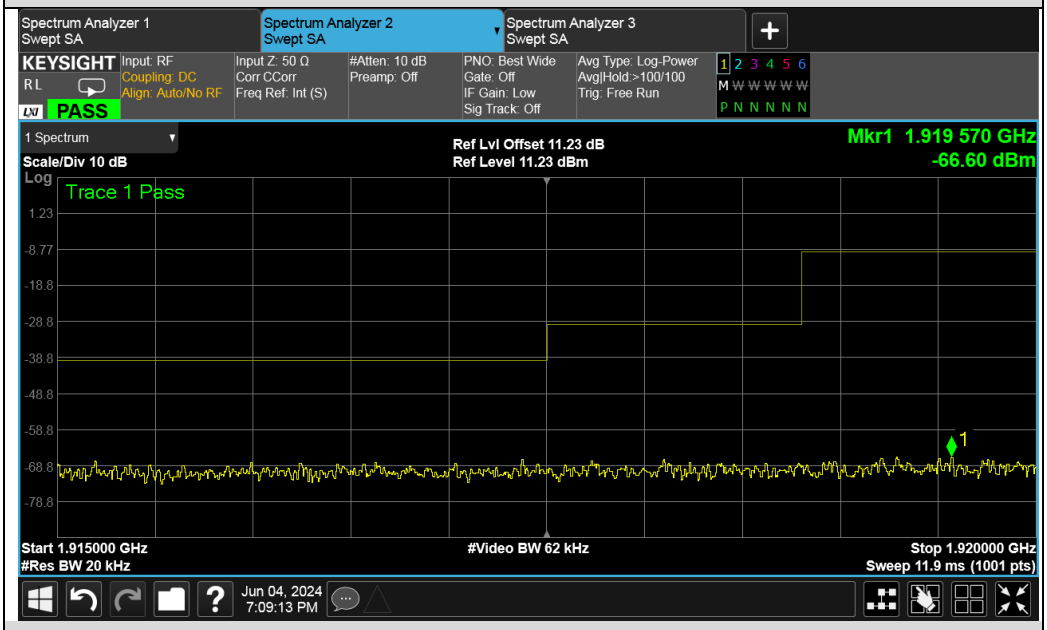


10.4 Measurement Result

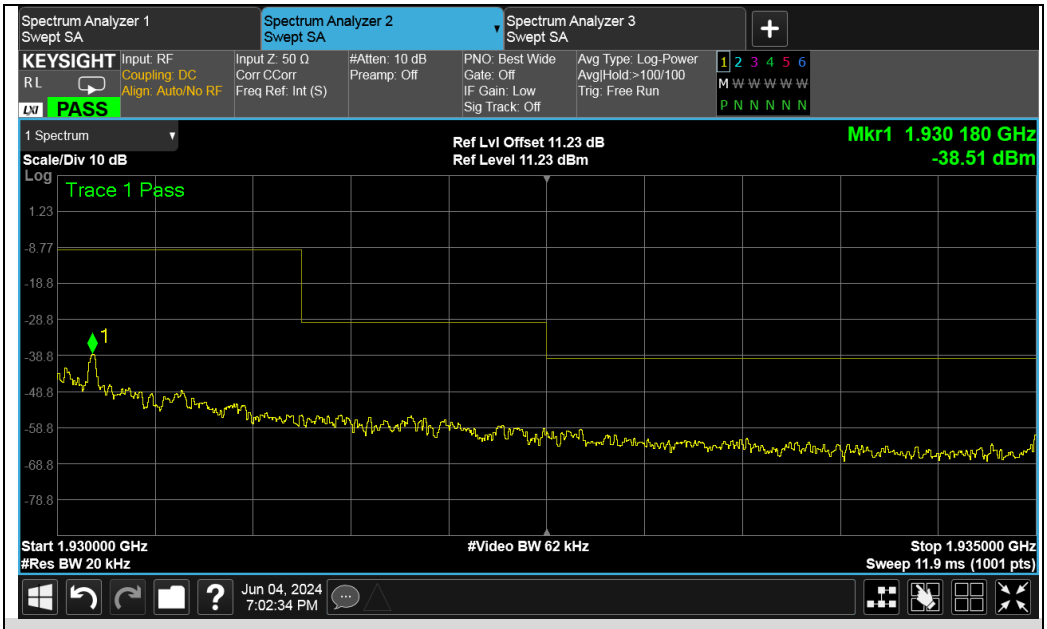
Test Graphs of Out-of-Band Unwanted Emissions



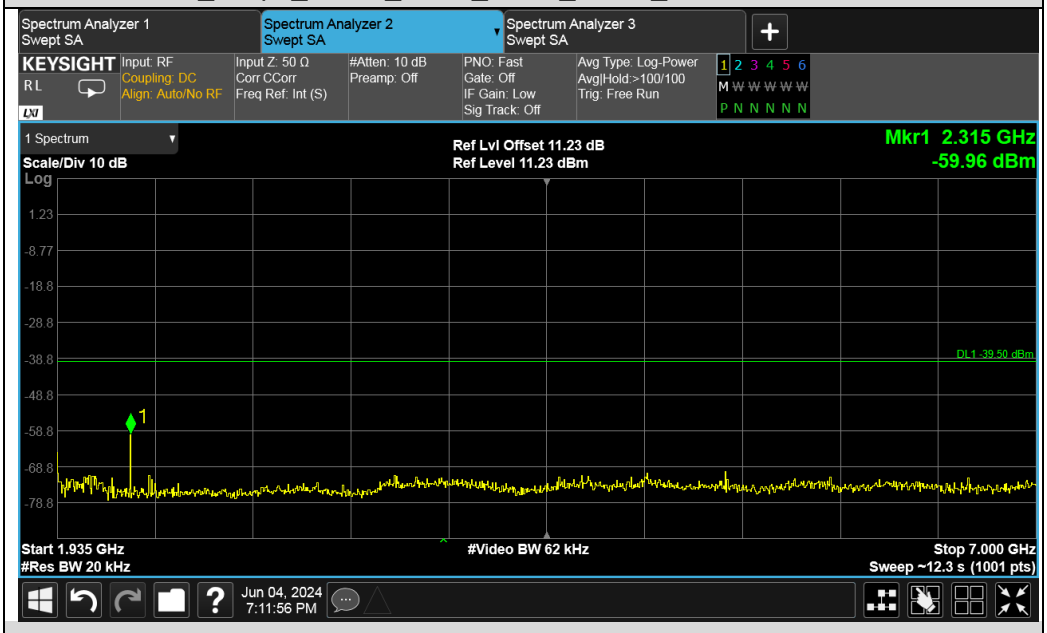
Test_Graph_UPCS_ANT1_CH00_GFSK_ Emissions Band 1



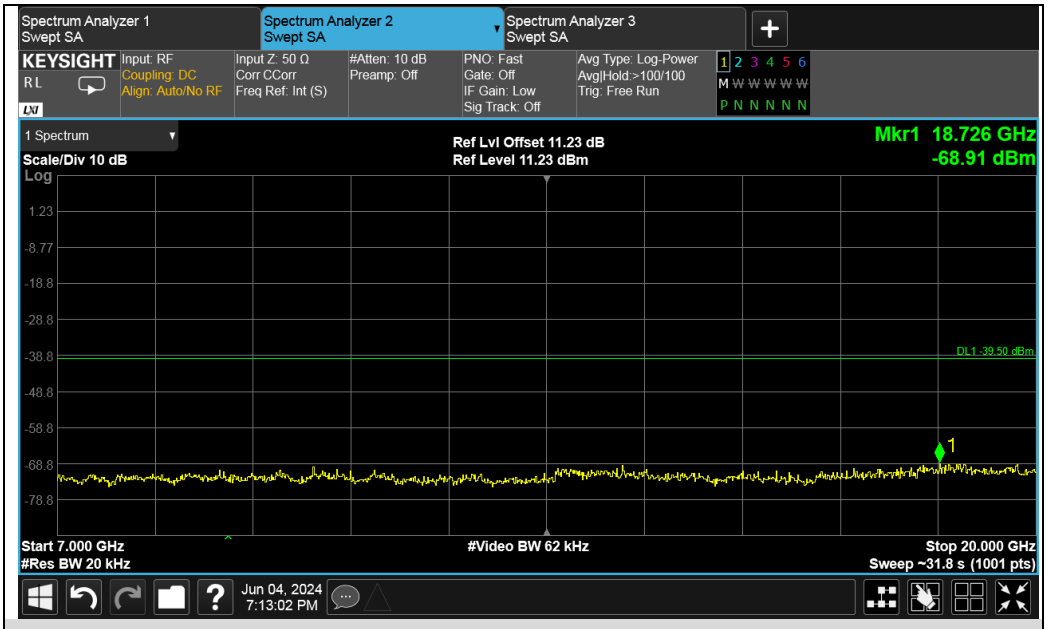
Test_Graph_UPCS_ANT1_CH00_GFSK_ Emissions Band 2



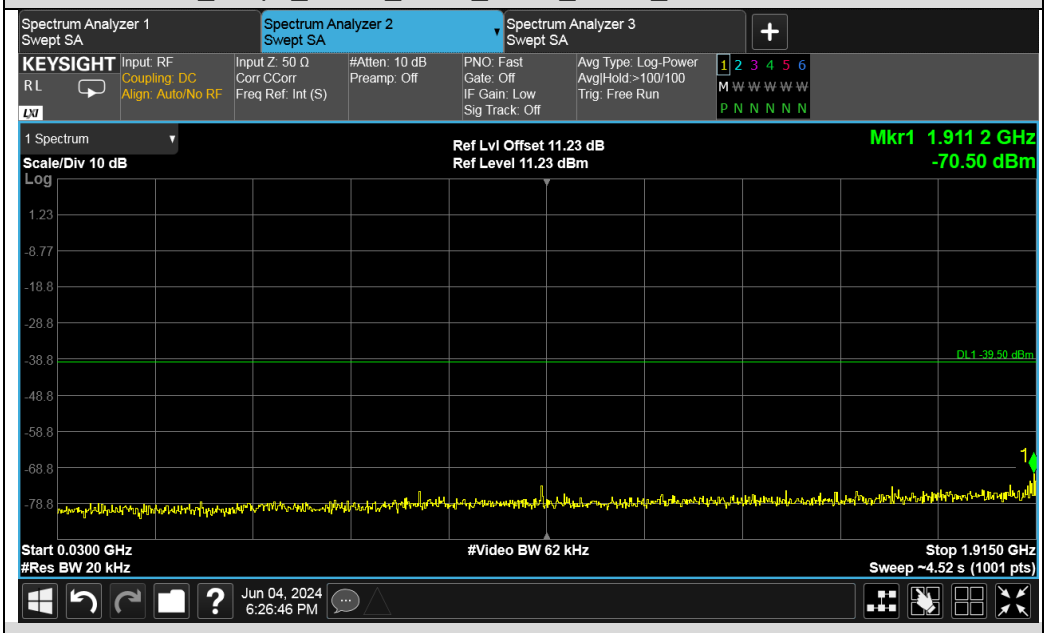
Test_Graph_UPCS_ANT1_CH00_GFSK_ Emissions Band 3



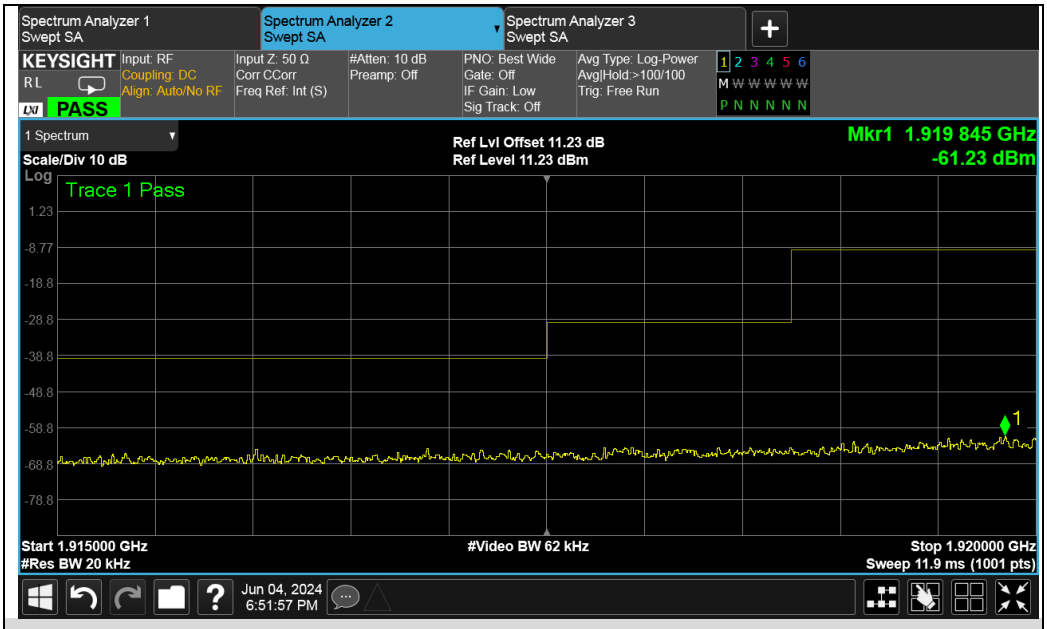
Test_Graph_UPCS_ANT1_CH00_GFSK_ Emissions Band 4



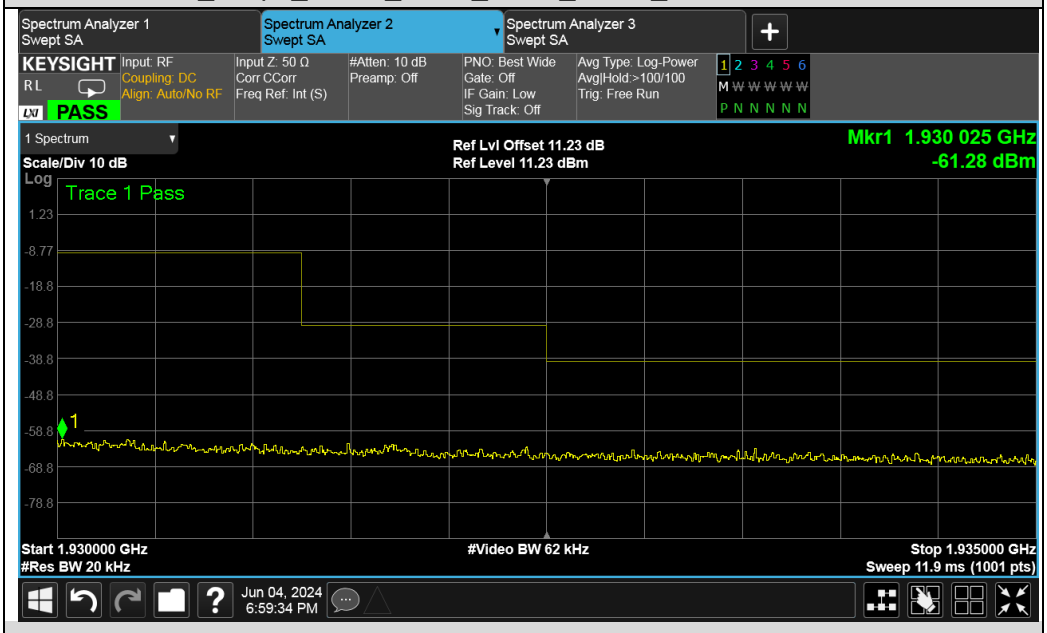
Test_Graph_UPCS_ANT1_CH00_GFSK_ Emissions Band 5



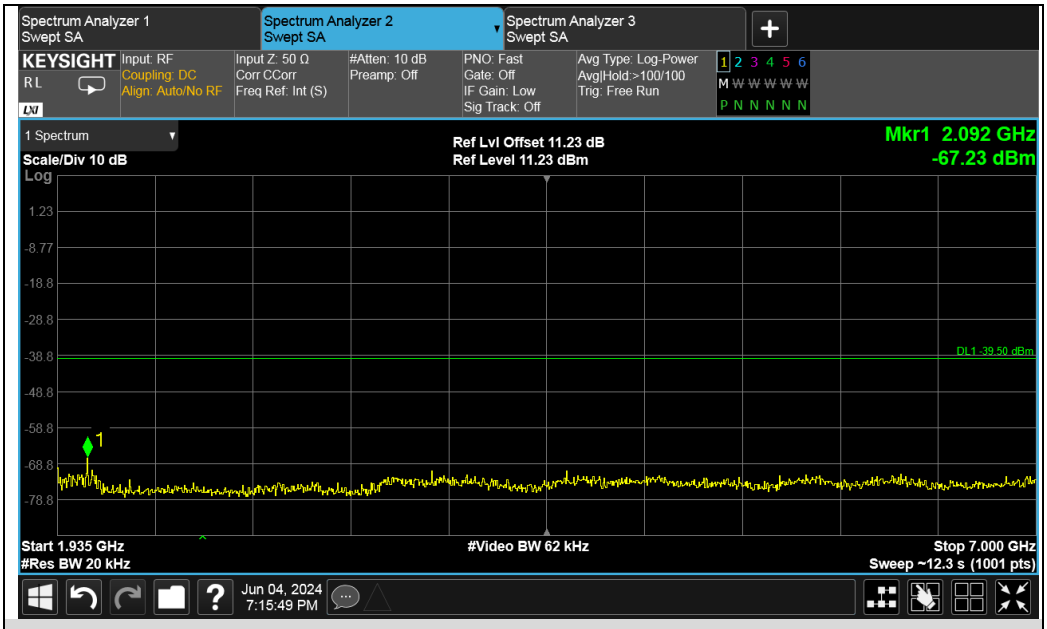
Test_Graph_UPCS_ANT1_CH02_GFSK_ Emissions Band 1



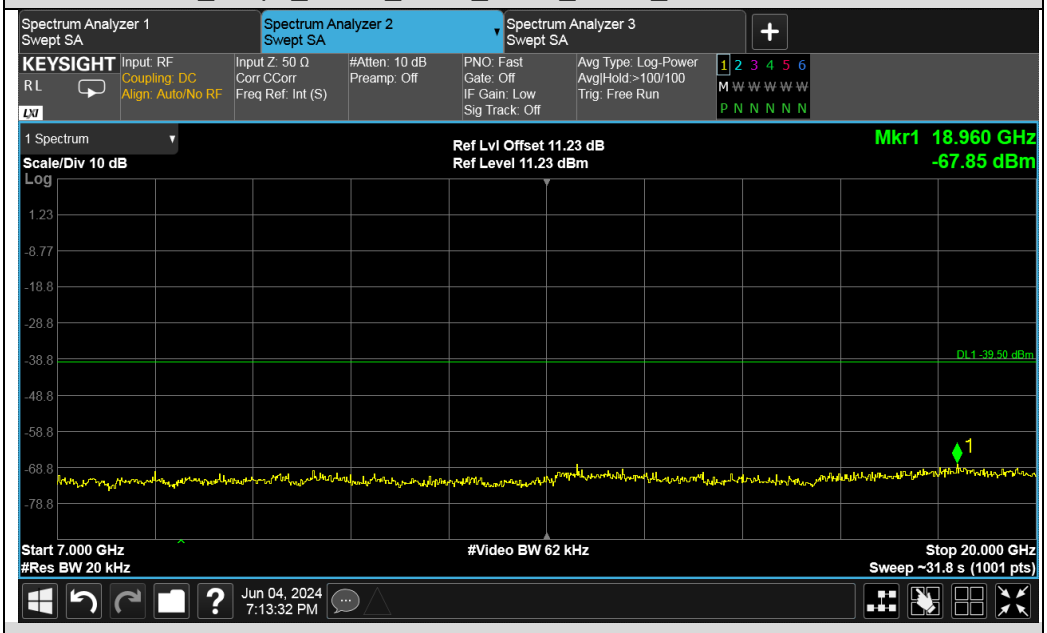
Test_Graph_UPCS_ANT1_CH02_GFSK_ Emissions Band 2



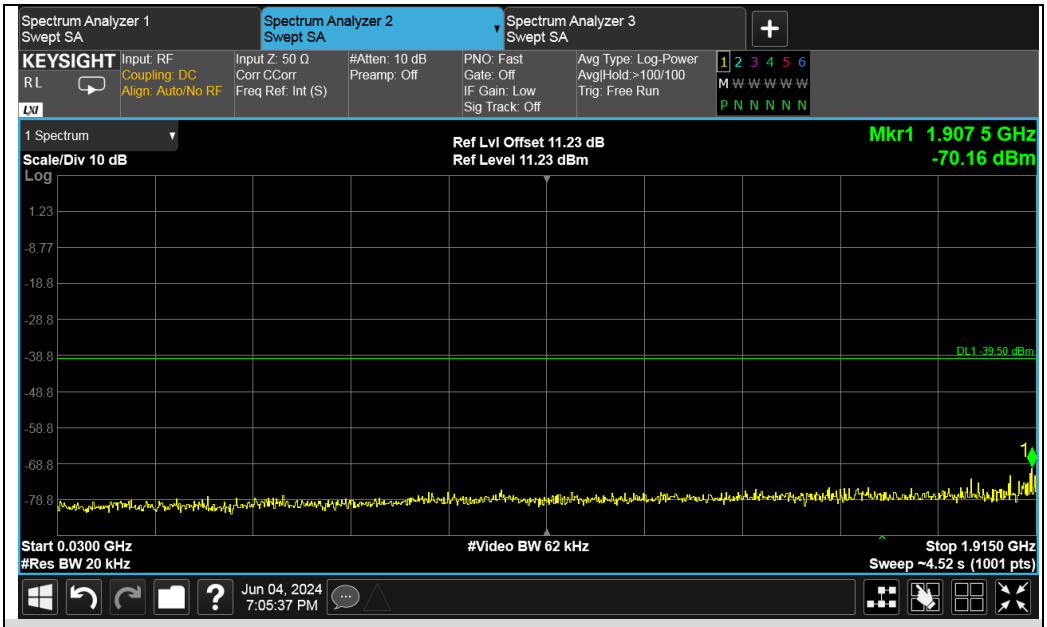
Test_Graph_UPCS_ANT1_CH02_GFSK_ Emissions Band 3



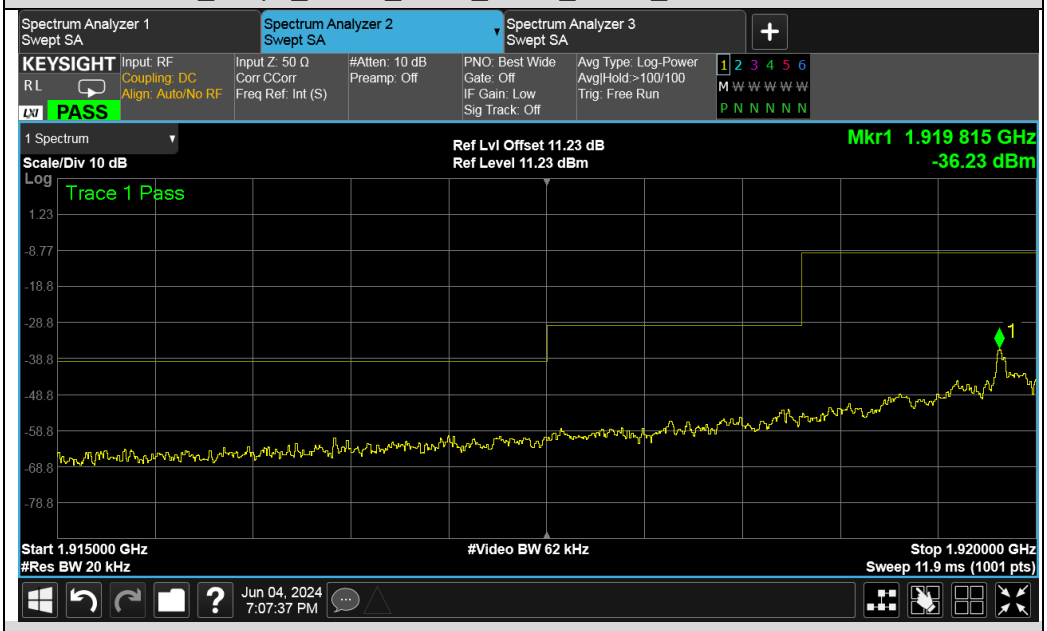
Test_Graph_UPCS_ANT1_CH02_GFSK_ Emissions Band 4



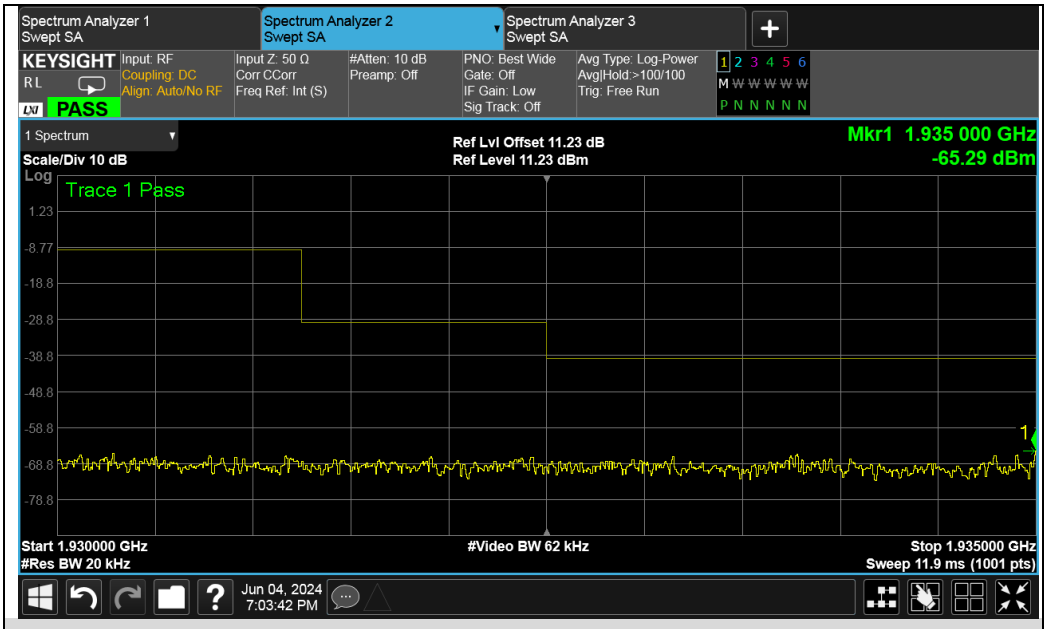
Test_Graph_UPCS_ANT1_CH02_GFSK_ Emissions Band 5



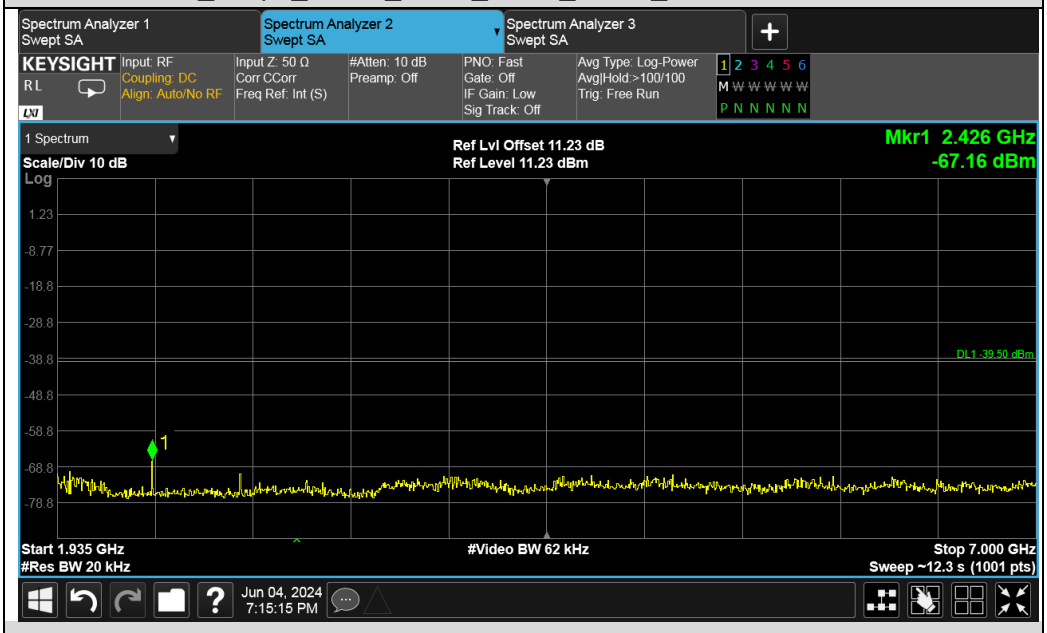
Test_Graph_UPCS_ANT1_CH04_GFSK_ Emissions Band 1



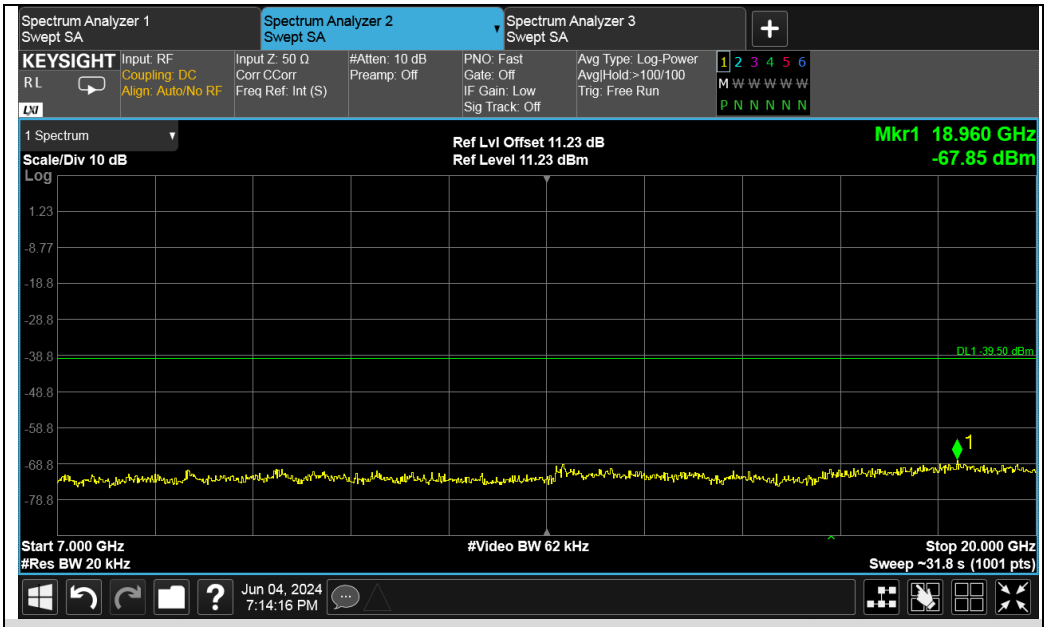
Test_Graph_UPCS_ANT1_CH04_GFSK_ Emissions Band 2



Test_Graph_UPCS_ANT1_CH04_GFSK_ Emissions Band 3



Test_Graph_UPCS_ANT1_CH04_GFSK_ Emissions Band 4



Test_Graph_UPCS_ANT1_CH04_GFSK_ Emissions Band 5

11. Radiated Emission

11.1 Limits of Radiated Emission Test

15.209 Limit in the below table has to be followed

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(kHz)	300
0.490~1.705	24000/F(kHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000 MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20 dB under any condition of modulation.

Note: All modes were tested for restricted band radiated emission, the test records reported below are the worst result compared to other modes.

11.2 Measurement Procedure

1. The EUT was placed on the top of the turntable 0.8 or 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emission, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use 1MHz RBW and 3MHz VBW for peak reading. Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for

maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum values.
8. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High - Low scan is not required in this case.

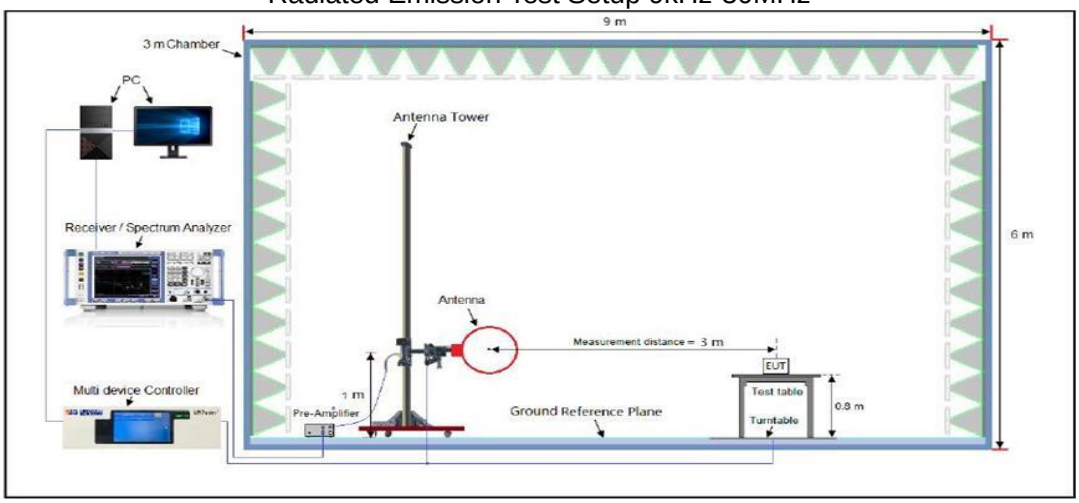
The following table is the setting of spectrum analyzer and receiver.

Spectrum Parameter	Setting
Start ~Stop Frequency	9kHz~150kHz/RB 200Hz for QP
Start ~Stop Frequency	150kHz~30MHz/RB 9kHz for QP
Start ~Stop Frequency	30MHz~1000MHz/RB 120kHz for QP
Start ~Stop Frequency	1GHz~26.5GHz 1MHz/3MHz for Peak, 1MHz/3MHz for Average

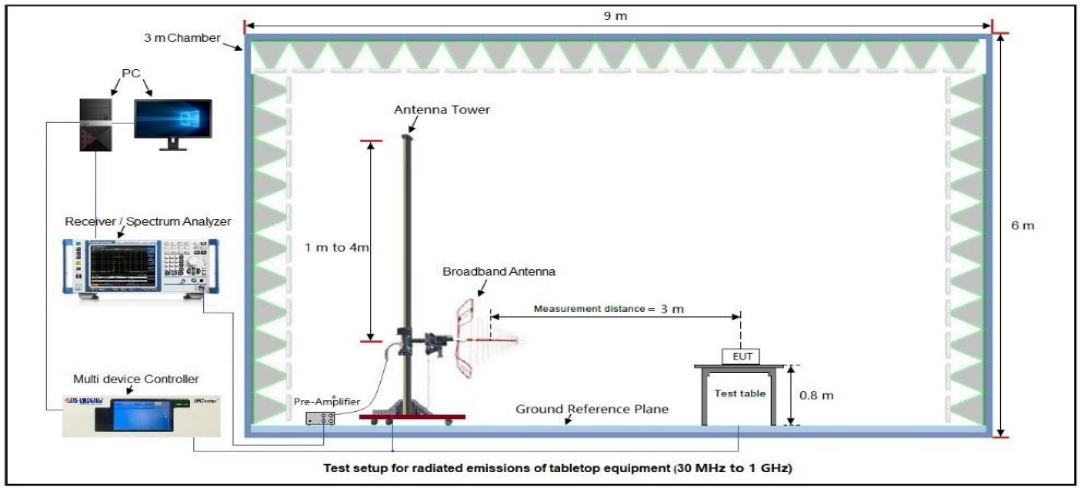
Receiver Parameter	Setting
Start ~Stop Frequency	9kHz~150kHz/RB 200Hz for QP
Start ~Stop Frequency	150kHz~30MHz/RB 9kHz for QP
Start ~Stop Frequency	30MHz~1000MHz/RB 120kHz for QP

11.3 Measurement Setup (Block Diagram of Configuration)

Radiated Emission Test Setup 9kHz-30MHz

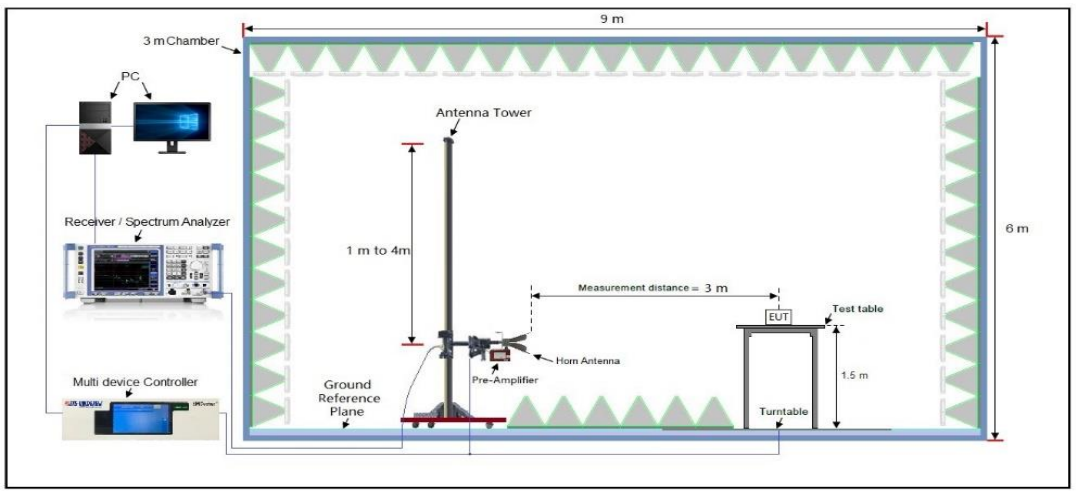


Radiated Emission Test Setup 30MHz-1000MHz



Test setup for radiated emissions of tabletop equipment (30 MHz to 1 GHz)

Radiated Emission Test Setup Above 1000MHz

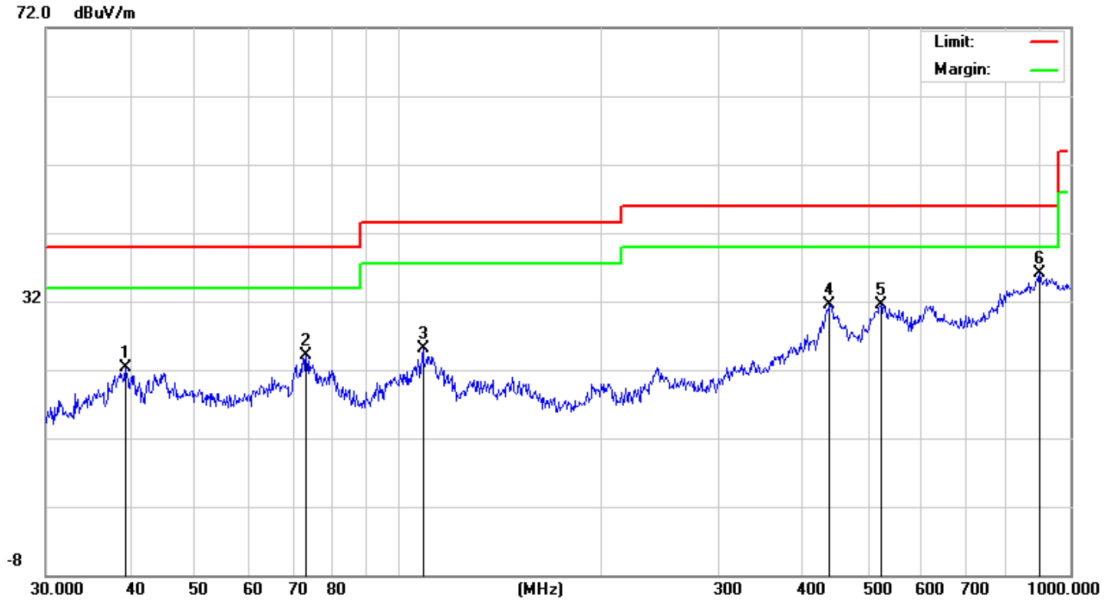


11.4 Measurement Result

Radiated Emission Below 30MHz

The amplitude of spurious emissions from 9kHz to 30MHz which are attenuated more than 20 dB below the permissible value need not be reported.

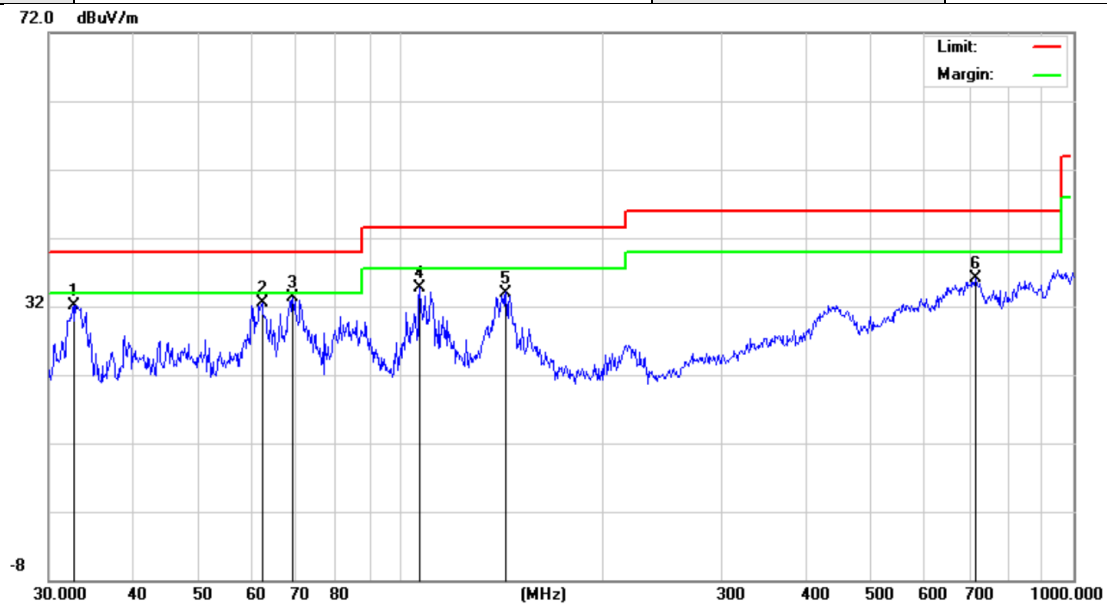
Radiated Emission Test Results at 30MHz-1GHz			
EUT Name	Portable DECT Phone	**Model Name**	W610D
Temperature	25° C	**Relative Humidity**	55.4%
Pressure	960hPa	**Test Voltage**	DC 5V by adapter 1#
Test Mode	Mode 3	**Antenna Polarity**	Horizontal



Final Average Data List

NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	39.4371	22.25	13.66	40.00	17.75	100	160	Horizontal
2	73.1025	24.09	12.89	40.00	15.91	100	170	Horizontal
3	109.0285	25.09	16.29	43.50	18.41	100	90	Horizontal
4	438.6553	31.52	24.81	46.00	14.48	100	220	Horizontal
5	522.7178	31.53	25.02	46.00	14.47	100	160	Horizontal
6	900.1473	36.09	31.78	46.00	9.91	100	140	Horizontal

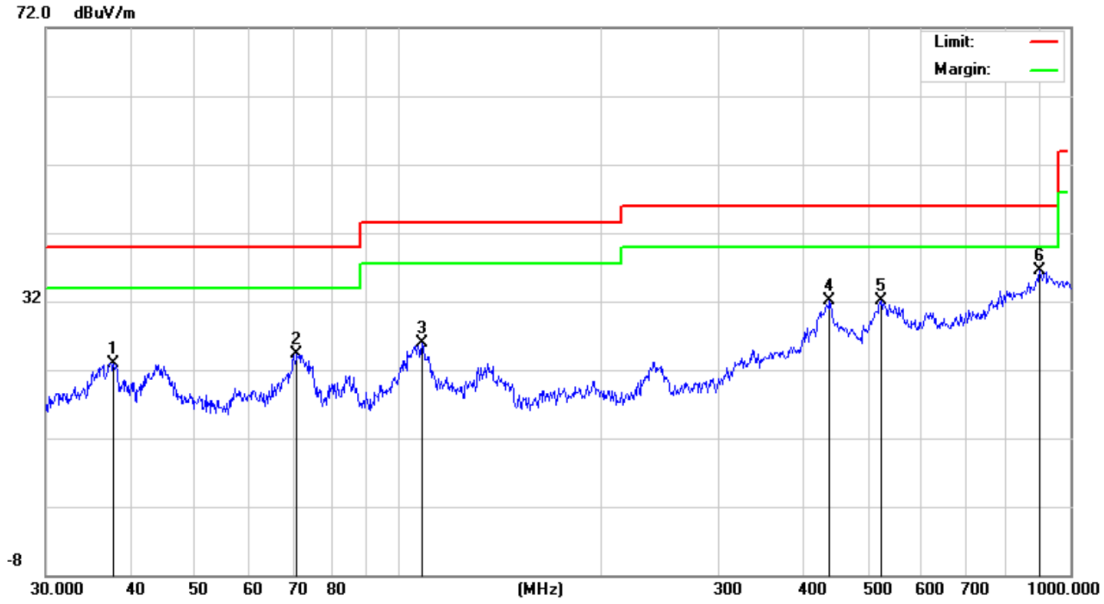
Radiated Emission Test Results at 30MHz-1GHz			
EUT Name	Portable DECT Phone	**Model Name**	W610D
Temperature	25° C	**Relative Humidity**	55.4%
Pressure	960hPa	**Test Voltage**	DC 5V by adapter 1#
Test Mode	Mode 3	**Antenna Polarity**	Vertical



Final Average Data List

NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	32.6340	32.16	14.47	40.00	7.84	100	200	Vertical
2	62.2128	32.45	17.08	40.00	7.55	100	110	Vertical
3	69.1140	33.22	17.01	40.00	6.78	100	80	Vertical
4	106.7587	34.76	15.38	43.50	8.74	100	250	Vertical
5	143.3260	34.00	18.20	43.50	9.5	100	170	Vertical
6	714.1734	36.09	28.60	46.00	9.91	100	180	Vertical

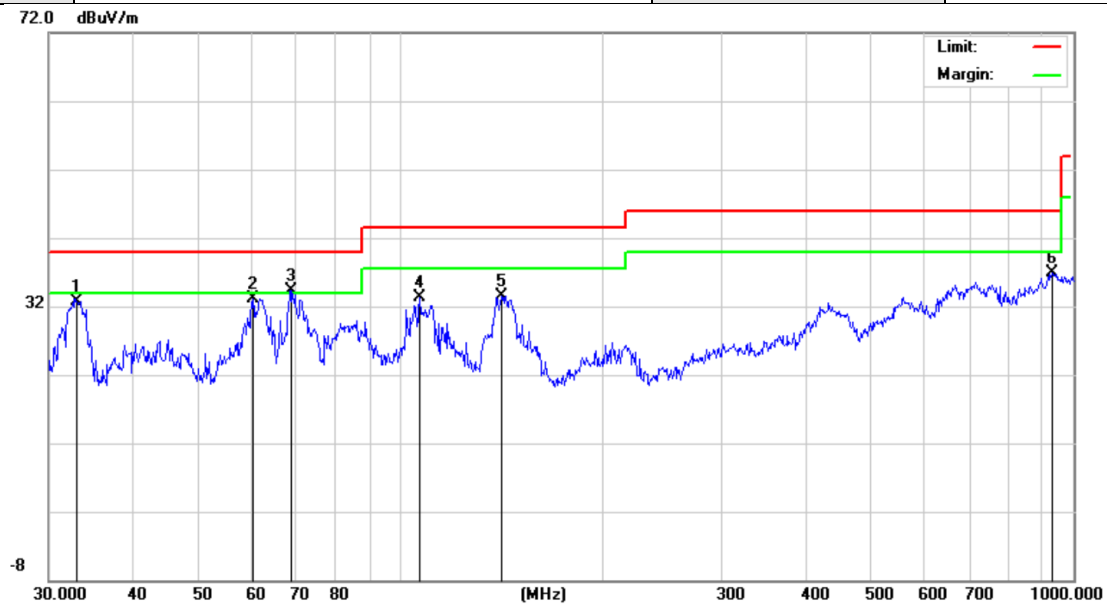
Radiated Emission Test Results at 30MHz-1GHz			
EUT Name	Portable DECT Phone	**Model Name**	W610D
Temperature	25° C	**Relative Humidity**	55.4%
Pressure	960hPa	**Test Voltage**	DC 5V by adapter 2#
Test Mode	Mode 3	**Antenna Polarity**	Horizontal



Final Average Data List

NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	37.8121	22.95	12.96	40.00	17.05	100	160	Horizontal
2	70.8315	24.32	12.82	40.00	15.68	100	170	Horizontal
3	108.6470	25.85	16.29	43.50	17.65	100	90	Horizontal
4	438.6553	32.02	24.81	46.00	13.98	100	220	Horizontal
5	522.7178	32.03	25.02	46.00	13.97	100	160	Horizontal
6	900.1473	36.59	31.78	46.00	9.41	100	140	Horizontal

Radiated Emission Test Results at 30MHz-1GHz			
EUT Name	Portable DECT Phone	**Model Name**	W610D
Temperature	25° C	**Relative Humidity**	55.4%
Pressure	960hPa	**Test Voltage**	DC 5V by adapter 2#
Test Mode	Mode 3	**Antenna Polarity**	Vertical



Final Average Data List

NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	32.9791	32.64	14.58	40.00	7.36	100	200	Vertical
2	60.2800	33.13	17.10	40.00	6.87	100	110	Vertical
3	68.8721	34.21	17.01	40.00	5.79	100	80	Vertical
4	106.7587	33.26	15.38	43.50	10.24	100	250	Vertical
5	141.3298	33.51	18.20	43.50	9.99	100	170	Vertical
6	929.0081	36.89	29.52	46.00	9.11	100	180	Vertical

RESULT: PASS

Note: 1. Factor=Antenna Factor + Cable loss, Margin=Measurement-Limit.

2. All test modes had been pre-tested. The mode 3 is the worst case and recorded in the report.

Radiated Emission Above 1GHz

EUT	Portable DECT Phone	**Model Name**	W610D
Temperature	25° C	**Relative Humidity**	55.4%
Pressure	960hPa	**Test Voltage**	DC 5V by adapter 1#
Test Mode	Mode 1	**Antenna**	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3856.896	51.11	0.11	51.22	74.00	-22.78	Peak
3856.896	37.89	0.11	38.00	54.00	-16.00	AVG
5785.344	48.75	2.45	51.20	74.00	-22.80	Peak
5785.344	40.16	2.45	42.61	54.00	-11.39	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT	Portable DECT Phone	**Model Name**	W610D
Temperature	25° C	**Relative Humidity**	55.4%
Pressure	960hPa	**Test Voltage**	DC 5V by adapter 1#
Test Mode	Mode 1	**Antenna**	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3856.896	50.41	0.11	50.52	74.00	-23.48	Peak
3856.896	38.54	0.11	38.65	54.00	-15.35	AVG
5785.344	49.37	2.45	51.82	74.00	-22.18	Peak
5785.344	40.52	2.45	42.97	54.00	-11.03	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT	Portable DECT Phone	Model Name	W610D
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	DC 5V by adapter 1#
Test Mode	Mode 2	Antenna	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3849.984	49.33	0.12	49.45	74.00	-24.55	Peak
3849.984	39.12	0.12	39.24	54.00	-14.76	AVG
5774.976	48.51	2.46	50.97	74.00	-23.03	Peak
5774.976	39.77	2.46	42.23	54.00	-11.77	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT	Portable DECT Phone	Model Name	W610D
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	DC 5V by adapter 1#
Test Mode	Mode 2	Antenna	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3849.984	50.19	0.12	50.31	74.00	-23.69	Peak
3849.984	38.72	0.12	38.84	54.00	-15.16	AVG
5774.976	49.33	2.46	51.79	74.00	-22.21	Peak
5774.976	38.75	2.46	41.21	54.00	-12.79	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT	Portable DECT Phone	Model Name	W610D
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	DC 5V by adapter 1#
Test Mode	Mode 3	Antenna	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3843.072	48.52	0.13	48.65	74.00	-25.35	Peak
3843.072	39.74	0.13	39.87	54.00	-14.13	AVG
5764.608	48.93	2.51	51.44	74.00	-22.56	Peak
5764.608	39.55	2.51	42.06	54.00	-11.94	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT	Portable DECT Phone	Model Name	W610D
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	DC 5V by adapter 1#
Test Mode	Mode 3	Antenna	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3843.072	49.63	0.13	49.76	74.00	-24.24	Peak
3843.072	39.42	0.13	39.55	54.00	-14.45	AVG
5764.608	49.21	2.51	51.72	74.00	-22.28	Peak
5764.608	39.17	2.51	41.68	54.00	-12.32	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT	Portable DECT Phone	Model Name	W610D
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	DC 5V by adapter 2#
Test Mode	Mode 1	Antenna	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3856.896	49.52	0.11	49.63	74.00	-24.37	Peak
3856.896	40.15	0.11	40.26	54.00	-13.74	AVG
5785.344	48.74	2.45	51.19	74.00	-22.81	Peak
5785.344	41.03	2.45	43.48	54.00	-10.52	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT	Portable DECT Phone	Model Name	W610D
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	DC 5V by adapter 2#
Test Mode	Mode 1	Antenna	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3856.896	50.15	0.11	50.26	74.00	-23.74	Peak
3856.896	39.77	0.11	39.88	54.00	-14.12	AVG
5785.344	49.34	2.45	51.79	74.00	-22.21	Peak
5785.344	40.58	2.45	43.03	54.00	-10.97	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT	Portable DECT Phone	Model Name	W610D
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	DC 5V by adapter 2#
Test Mode	Mode 2	Antenna	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3849.984	51.30	0.12	51.42	74.00	-22.58	Peak
3849.984	40.04	0.12	40.16	54.00	-13.84	AVG
5774.976	49.51	2.46	51.97	74.00	-22.03	Peak
5774.976	39.02	2.46	41.48	54.00	-12.52	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT	Portable DECT Phone	Model Name	W610D
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	DC 5V by adapter 2#
Test Mode	Mode 2	Antenna	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3849.984	49.90	0.12	50.02	74.00	-23.98	Peak
3849.984	39.85	0.12	39.97	54.00	-14.03	AVG
5774.976	49.74	2.46	52.20	74.00	-21.80	Peak
5774.976	40.01	2.46	42.47	54.00	-11.53	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT	Portable DECT Phone	Model Name	W610D
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	DC 5V by adapter 2#
Test Mode	Mode 3	Antenna	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3843.072	49.89	0.13	50.02	74.00	-23.98	Peak
3843.072	40.02	0.13	40.15	54.00	-13.85	AVG
5764.608	50.24	2.51	52.75	74.00	-21.25	Peak
5764.608	38.41	2.51	40.92	54.00	-13.08	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT	Portable DECT Phone	Model Name	W610D
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	DC 5V by adapter 2#
Test Mode	Mode 3	Antenna	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3843.072	50.02	0.13	50.15	74.00	-23.85	Peak
3843.072	39.65	0.13	39.78	54.00	-14.22	AVG
5764.608	50.01	2.51	52.52	74.00	-21.48	Peak
5764.608	39.07	2.51	41.58	54.00	-12.42	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

RESULT: PASS

Note:

The amplitude of other spurious emissions from 1G to 20 GHz which are attenuated more than 20 dB below the permissible value need not be reported.

Factor = Antenna Factor + Cable loss - Amplifier gain, Margin=Measure result-Limit.

The “Factor” value can be calculated automatically by software of measurement system.

12. AC Power Line Conducted Emission

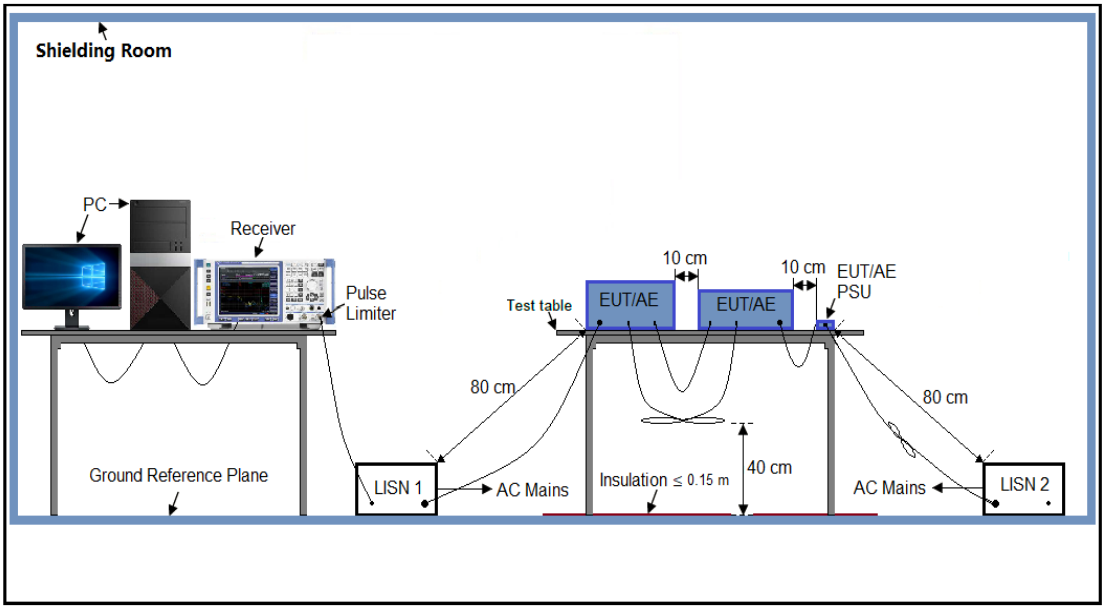
12.1 Limits of Line Conducted Emission Test

Frequency	Maximum RF Line Voltage	
	Q.P. (dBμV)	Average (dBμV)
150kHz~500kHz	66-56	56-46
500kHz~5MHz	56	46
5MHz~30MHz	60	50

Note:

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

12.2 Measurement Setup (Block Diagram of Configuration)



12.3 Preliminary Procedure of Line Conducted Emission Test

1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
2. Support equipment, if needed, was placed as per ANSI C63.10.
3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.
4. All support equipment received AC120V/60Hz power from a LISN, if any.
5. The EUT received DC 5V power from adapter which received AC120V/60Hz power from a LISN.
6. The test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7. Analyzer / Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.
8. During the above scans, the emissions were maximized by cable manipulation.
9. The test mode(s) were scanned during the preliminary test.

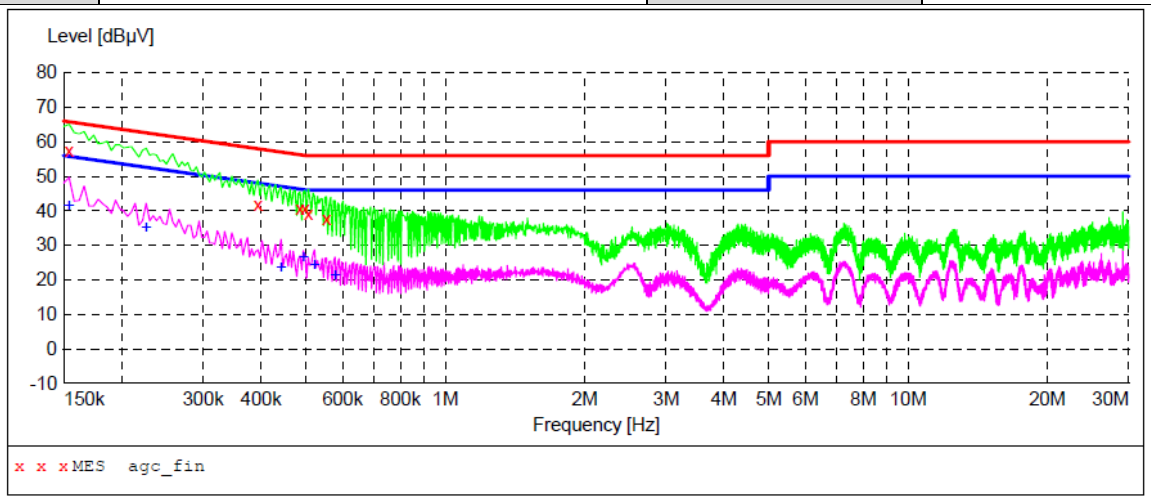
Then, the EUT configuration and cable configuration of the above highest emission level were recorded for reference of final testing.

12.4 Final Procedure of Line Conducted Emission Test

1. EUT and support equipment was set up on the test bench as per step 2 of the preliminary test.
2. A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. If EUT emission level was less –2dB to the A.V. limit in Peak mode, then the emission signal was re-checked using Q.P and Average detector.
3. The test data of the worst case condition(s) was reported on the Summary Data page.

12.5 Measurement Result

AC Power Line Conducted Emission Test			
Test Mode	Mode 1	LISN line	Hot Side



MEASUREMENT RESULT: "agc_fin"

2024/5/22 8:41

Frequency MHz	Leve dBµ					
0.154000	57.30	6.1	66	8.5	QP	L1
0.394000	41.90	6.1	58	16.1	QP	L1
0.486000	40.50	6.1	56	15.7	QP	L1
0.498000	40.80	6.1	56	15.2	QP	L1
0.506000	39.30	6.2	56	16.7	QP	L1
0.554000	37.70	6.2	56	18.3	QP	L1

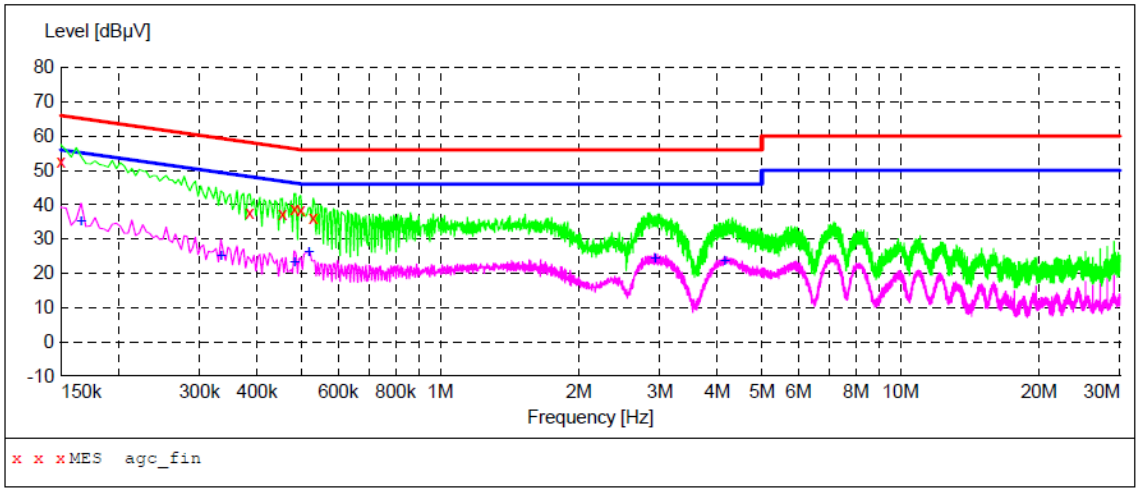
MEASUREMENT RESULT: "agc_fin2"

2024/5/22 8:41

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line
0.154000	41.50	6.1	56	14.3	AV	L1
0.226000	35.00	6.1	53	17.6	AV	L1
0.442000	23.40	6.1	47	23.6	AV	L1
0.494000	26.40	6.1	46	19.7	AV	L1
0.522000	24.30	6.2	46	21.7	AV	L1
0.578000	21.40	6.2	46	24.6	AV	L1

RESULT: PASS

AC Power Line Conducted Emission Test			
Test Mode	Mode 1	LISN line	Hot Side



MEASUREMENT RESULT: "agc_fin"

2024/5/22 8:45

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line
0.150000	52.50	6.1	66	13.5	QP	N
0.386000	37.50	6.1	58	20.6	QP	N
0.454000	37.40	6.1	57	19.4	QP	N
0.482000	38.70	6.1	56	17.6	QP	N
0.498000	38.40	6.1	56	17.6	QP	N
0.530000	36.00	6.2	56	20.0	QP	N

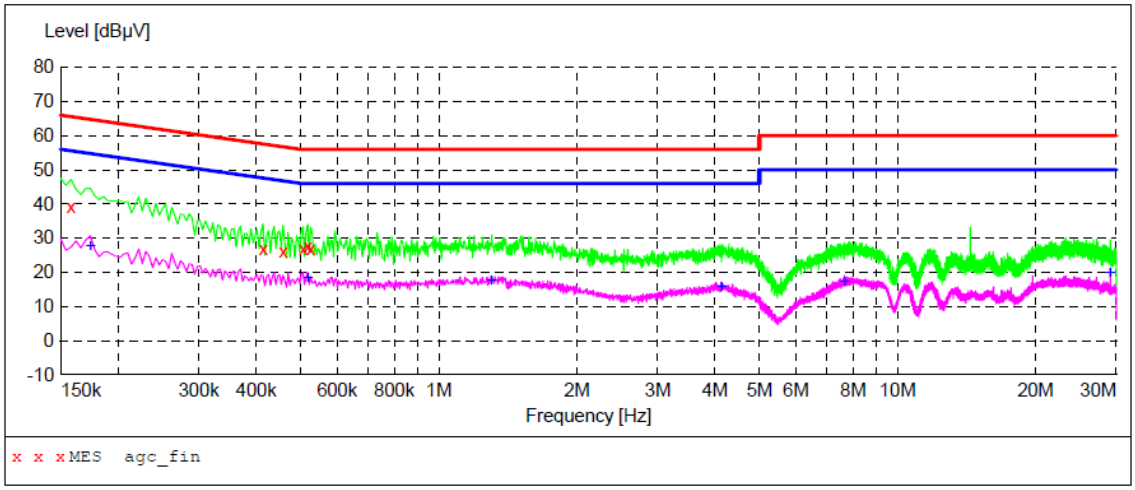
MEASUREMENT RESULT: "agc_fin2"

2024/5/22 8:45

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line
0.166000	35.00	6.1	55	20.2	AV	N
0.334000	25.00	6.1	49	24.4	AV	N
0.482000	23.00	6.1	46	23.3	AV	N
0.518000	26.20	6.2	46	19.8	AV	N
2.926000	24.10	6.3	46	21.9	AV	N
4.150000	23.40	6.3	46	22.6	AV	N

RESULT: PASS

AC Power Line Conducted Emission Test			
Test Mode	Mode 2	LISN line	Hot Side



MEASUREMENT RESULT: "agc_fin"

2024/5/22 8:54

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line
0.158000	39.10	6.1	66	26.5	QP	L1
0.414000	27.00	6.1	58	30.6	QP	L1
0.458000	26.10	6.1	57	30.6	QP	L1
0.506000	26.90	6.2	56	29.1	QP	L1
0.518000	27.70	6.2	56	28.3	QP	L1
0.526000	26.80	6.2	56	29.2	QP	L1

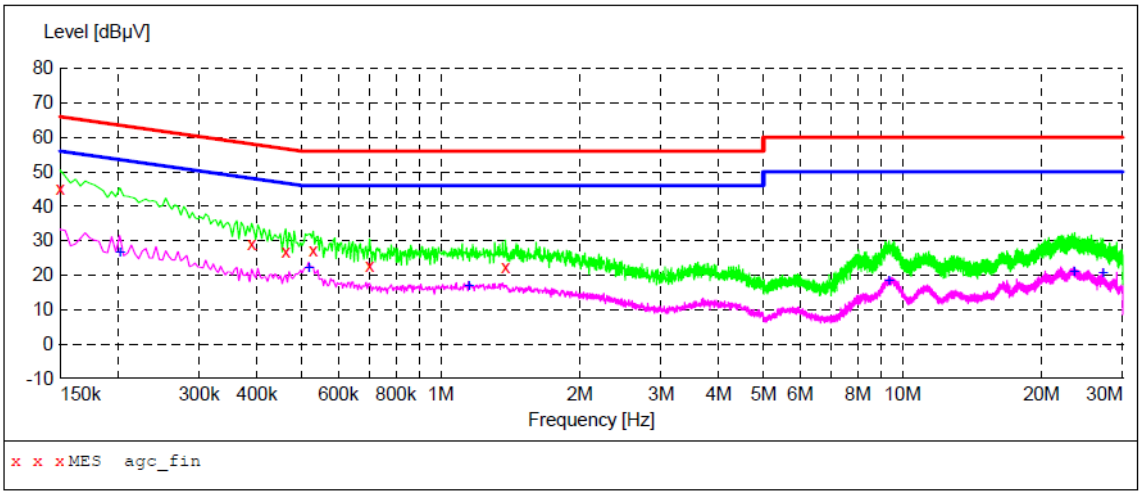
MEASUREMENT RESULT: "agc_fin2"

2024/5/22 8:54

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line
0.174000	27.60	6.1	55	27.2	AV	L1
0.518000	18.30	6.2	46	27.7	AV	L1
1.302000	17.70	6.2	46	28.3	AV	L1
4.130000	15.60	6.3	46	30.4	AV	L1
7.662000	17.20	6.5	50	32.8	AV	L1
29.114000	19.70	8.3	50	30.3	AV	L1

RESULT: PASS

AC Power Line Conducted Emission Test			
Test Mode	Mode 2	LISN line	Hot Side



MEASUREMENT RESULT: "agc_fin"

2024/5/22 8:50

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line
0.150000	45.00	6.1	66	21.0	QP	N
0.390000	28.90	6.1	58	29.2	QP	N
0.462000	27.00	6.1	57	29.7	QP	N
0.530000	27.30	6.2	56	28.7	QP	N
0.702000	22.90	6.2	56	33.1	QP	N
1.382000	22.30	6.2	56	33.7	QP	N

MEASUREMENT RESULT: "agc_fin2"

2024/5/22 8:50

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line
0.202000	26.40	6.1	54	27.1	AV	N
0.518000	22.10	6.2	46	23.9	AV	N
1.150000	16.60	6.2	46	29.4	AV	N
9.350000	18.40	6.6	50	31.6	AV	N
23.522000	20.80	7.7	50	29.2	AV	N
27.174000	20.40	8.1	50	29.6	AV	N

RESULT: PASS

13. Carrier Frequency Stability

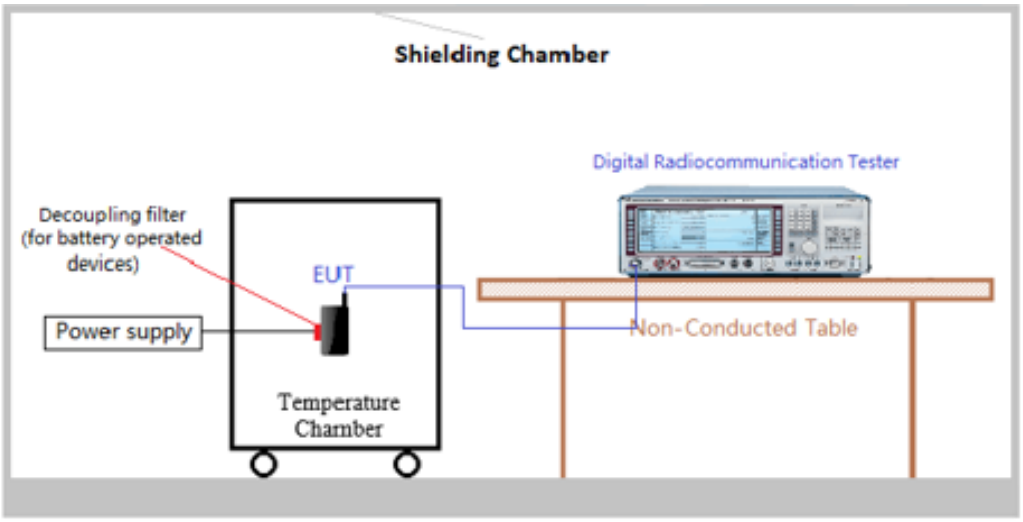
13.1 Provisions Applicable

Please refer to FCC 47 CFR Part 15.319(c) &15.319(e) for specification details:
The frequency stability of the carrier frequency of the intentional radiator shall be maintained within ±10 ppm over 1 hour or the interval between channel access monitoring, whichever is shorter. The frequency stability shall be maintained over a temperature variation of -20° to + 50 °C at normal supply voltage, and over a variation in the primary supply voltage of 85 percent to 115 percent of the rated supply voltage at a temperature of 20 °C. For equipment that is capable only of operating from a battery, the frequency stability tests shall be performed using a new battery without any further requirement to vary supply voltage.

13.2 Measurement Procedure

The testing follows the ANSI C63.17-2013 Section 6.2.1

13.3 Measurement Setup (Block Diagram of Configuration)



13.4 Measurement Result

- Carrier Frequency Stability over Time at Nominal Temperature:

Average Mean Carrier Frequency (MHz)	Max. Diff. (kHz)	Min. Diff. (kHz)	Max Dev. (ppm)	Limit (ppm)
1924.993573	6.8	1.3	2.86	±10
1921.538456	6.5	1.3	2.71	±10
1928.449426	6.4	1.5	2.54	±10

Note 1: Max Dev. (ppm) = [(Max. Diff. - Min. Diff.) / Average Mean Carrier Freq.]*10^6

- Carrier Frequency Stability over Time at Nominal Temperature:

Voltage (V)	Measured Carrier Frequency (MHz)	Difference (kHz)	Deviation (ppm)	Limit (ppm)
3.80	1924.9941	2.1	1.09	±10
	1921.5342	-1.8	-0.94	
	1928.4476	-0.4	-0.21	
3.23	1924.9932	1.2	0.62	
	1921.5369	0.9	0.47	
	1928.4458	-2.2	-1.14	
4.37	1924.9951	3.1	1.61	
	1921.5366	0.6	0.31	
	1928.4489	0.9	0.47	

Note 1: Difference (kHz) = Measured Carrier Freq. - Carrier Freq.

Note 2: Deviation (ppm) = [Difference (kHz) / Carrier Freq.] x 10^6

- Carrier Frequency Stability over Temperature:

Temperature (°C)	Measured Carrier Frequency (MHz)	Difference (kHz)	Deviation (ppm)	Limit (ppm)
T = +20°C	1924.9941	Ref	Ref	±10
	1921.5342	Ref	Ref	
	1928.4476	Ref	Ref	
T = -20°C	1924.9939	1.9	0.99	
	1921.5367	0.7	0.36	
	1928.4456	-2.4	-1.24	
T = +45°C	1924.9949	2.9	1.51	
	1921.5363	0.3	0.16	
	1928.4485	0.5	0.26	

Note 1: Set the Measured Carrier Frequency (MHz) $T = +20°C$ as Ref Level

Note 2: Difference (kHz) = Measured Carrier Freq. $T = -20°C$ - Measured Carrier Freq. $T = +20°C$ or Measured Carrier Freq. $T = +45°C$ - Measured Carrier Freq. $T = +20°C$

Note 3: Deviation (ppm) = [Difference (kHz) / Carrier Freq.] x $10^{6.}$

14. Specific Requirements for UPCS Device

14.1 Monitoring Time Requirements

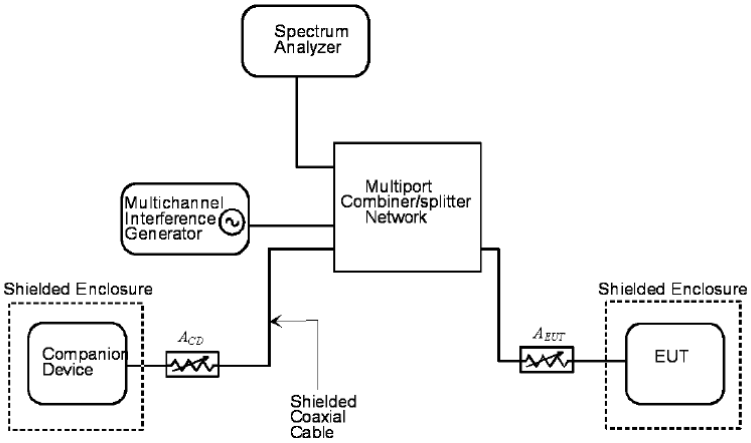
According to the requirements of FCC Part 15.323(c)(1) as follows:

Immediately prior to initiating transmission, devices must monitor the combined time and spectrum window in which they intend to transmit. For a period of at least 10 milliseconds for systems designed to use a 10 milliseconds or shorter frame period or at least 20 milliseconds for systems designed to use a 20 milliseconds frame period.

14.1.1 Measurement Procedure

For detailed test methods, please refer to ANSI C63.17-2013 Clause 7.3.4, 7.5

14.1.2 Measurement Setup



13.1.2 Measurement Result

Initial transmit channel and Interferer level	Final transmit Channel	Results
Apply the interference on f1 at level TU+UM, and no interference on f2. Initiate transmission and verify thetransmission on f2.	f2	Pass
Apply the interference on f2 at level TU+UM, at the same time, no interference on f1. After about 20ms, initiate transmission and verify the transmission on f1.	f1	Pass

14.2 Lowest Monitoring Threshold Requirements

According to the requirements of FCC Part 15.323(c)(2) as follows:

The monitoring threshold must not be more than 30 dB above the thermal noise power for a bandwidth equivalent to the emission bandwidth used by the device.

14.2.1 Measurement Procedure

For detailed test methods, please refer to ANSI C63.17-2013 Clause 7.3.1

14.2.2 Measurement Result

Not Applicable

14.3 Acknowledgements and Transmission Duration Requirements

According to the requirements of FCC Part 15.323(c)(3)(4) as follows:

Occupation of the same combined time and spectrum windows by a device or group of cooperating devices continuously over a period of time longer than 8 hours is not permitted without repeating the access criteria.

Once access to specific combined time and spectrum windows is obtained an acknowledgement from a system participant must be received by the initiating transmitter within one second or transmission must cease.

Periodic acknowledgements must be received at least every 30 seconds or transmission must cease. Channels used exclusively for control and signaling information may transmit continuously for 30 seconds without receiving an acknowledgement, at which time the access criteria must be repeated.

14.3.1 Measurement Procedure

For detailed test methods, please refer to ANSI C63.17-2013 Clause 8.2.1& 8.2.2.

14.3.2 Measurement Result

Test ref. to ANSI C63.17 clause 8.2.1	Observation	Verdict
Initial transmission without acknowledgements	Not applicable for EUT that transmits control and signaling information	N/A
Transmission time after loss of acknowledgements	10.0	Pass

Test ref. to ANSI C63.17 clause 8.2.2	Observation	Verdict
Transmission duration on same time and frequency window	Only for initiating device that controls which time slot is used	N/A

14.4 Least Interfered Channel (LIC) Selection Requirements

According to the requirements of FCC Part 15.323(c)(5) as follows:

Occupation of the same combined time and spectrum windows by a device or group of cooperating devices

If access to spectrum is not available as determined by the above, and a minimum of 40 duplex system access channels are defined for the system, the time and spectrum windows with the lowest power level below a monitoring threshold of 50 dB above the thermal noise power determined for the emission bandwidth may be accessed.

Calculation of monitoring threshold limits for isochroous devices:

Lowest threshold: TL = -174+10Log10B + Mu + P_{MAX}-P_{EUT}(dBm)

Upper threshold: TU = -174+10Log10B + Mu + P_{MAX}-P_{EUT}(dBm)

Where: B=Emission bandwidth (Hz)

Mu=dB the threshold may exceed thermal noise (30 for TL& 50 for TU)

P_{MAX}=5*Log10B-10(dBm)

P_{EUT}=Transmitted power (dBm)

Monitor Threshold	B (MHz)	M_U (dB)	P_{MAX} (dBm)	P_{EUT} (dBm)	Threshold (dBm)
TL	1.351	30	19.05	18.15	-81.79
TU	1.351	50	19.05	18.15	-61.79

The EUT must not transmit until the interference level is less than or equal to: Measured Threshold Level ≤TU

Where: TU=Upper threshold level

14.4.1 Measurement Procedure

For detailed test methods, please refer to ANSI C63.17-2013 Clause 7.3.2& 7.3.3& 7.3.4.

14.4.2 Measurement Result

Monitor threshold	Measured Threshold Level	Limit (dBm)
Lowest Threshold (dBm)	N/A	-81.79
Upper Threshold (dBm)	N/A	-61.79

Note: N/A Not applicable - EUT which supports at least of 40 duplex system access channels and implements Least Interfered Channel (LIC) algorithm is permitted to use an upper monitoring threshold.

14.5 Random Waiting Requirements

According to the requirements of FCC Part 15.323(c)(6) as follows:

If the selected combined time and spectrum windows are unavailable, the device may either monitor and select different windows or seek to use the same window after waiting an amount of time, randomly chosen from a uniform random distribution between 10 and 150 milliseconds, commencing when the channel becomes available.

14.5.1 Measurement Procedure

For detailed test methods, please refer to ANSI C63.17-2013 Clause 8.1.3.

14.5.2 Measurement Result

Not Applicable

Note: The manufacturer declares that this provision is not utilized by the EUT.

14.6 Monitoring Bandwidth Requirements

According to the requirements of FCC Part 15.323(c)(7) as follows:

The monitoring system bandwidth must be equal to or greater than the occupied bandwidth of the intended transmission. Note: Testing of the monitoring system bandwidth is not required if the designed bandwidth from the manufacturer is available and given in the test report.

The maximum reaction time of the monitor shall be less than 50*SQRT{1.25/EBW or OBW[MHz]} μs for signals at the applicable threshold level but shall not be required to be less than 50μs.

If a signal of 6 dB or more above the threshold level is detected, the maximum reaction time shall be 35*SQRT{1.25/EBW or OBW[MHz]} μs but shall not be required to be less than 35μs.

14.6.1 Measurement Procedure

For detailed test methods, please refer to ANSI C63.17-2013 Clause 7.5.

14.6.2 Measurement Result

Test Equation (μs)	EBW (MHz)	Pulse width(μs)	Limit (us)	Result
50 $(1.25/B)^{1/2}$	1.351	48.09	50	Pass
25 $(1.25/B)^{1/2}$	1.351	24.05	35	Pass

14.7 Monitoring Antenna Requirements

According to the requirements of FCC Part 15.323(c)(8)(9) as follows:

The monitoring system shall use the same antenna used for transmission, or an antenna that yields equivalent reception at that location.

14.7.1 Measurement Procedure

For detailed test methods, please refer to ANSI C63.17-2013 paragraph 4.

14.7.2 Measurement Result

The antenna of the EUT used for transmission is the same interior antenna that used for monitoring.

14.8 Dual Access Criteria Check Requirements

According to the requirements of FCC Part 15.323(c)(10) as follows:

A device initiating a communication (hereafter called an initiating device) may attempt to establish a duplex connection by monitoring both its intended transmit and receive time and spectrum windows.

If both the intended transmit and receive time and spectrum windows meet the access criteria, then the initiating device can initiate a transmission in the intended transmit time and spectrum window.

If the power detected by the responding device can be decoded as a duplex connection signal from the initiating device, then the responding device may immediately begin transmitting in the receive time and spectrum window monitored by the initiating device.

14.8.1 Measurement Procedure

For detailed test methods, please refer to ANSI C63.17-2013 Clause 8.3.1&8.3.2.

14.8.2 Measurement Result

EUT that do NOT implements the LIC procedure:

Test ref. to ANSI C63.17 clause 8.3.1	Observation	Verdict
b) EUT is restricted to a single carrier *f1* for TDMA systems. The Test is Pass if EUT can transmit	EUT can transmit	Pass
c) d) Interference at level T_L+ U_M on all timeslots except one receive slot where interference is at least 10 dB below TL	No connection possible	N/A
e) f) Interference at level T_L+ U_M on all timeslots except one transmit slot where interference is at least 10 dB below T_L	No connection possible	N/A

EUTs that implements the LIC procedure:

Test ref. to ANSI C63.17 clause 8.3.1	Observation	Verdict
b) EUT is restricted to a single carrier *f1* for TDMA systems. The Test is Pass if EUT can transmit	EUT can transmit	Pass
c) d) Transmission on interference-free receive time/spectrum window	Connected on the target Rx window and its duplex mate.	Pass
e) f) Transmission on interference-free transmit time/spectrum window	Connected on the target Tx window and its duplex mate.	Pass

14.9 Alternative Monitoring Interval for Co-Located Devices Requirements

According to the requirements of FCC Part 15.323(c)(11) as follows:

An initiating device that is prevented from monitoring during its intended transmit window due to monitoring system blocking from the transmissions of a co-located (within 1 m) transmitter of the same system, may monitor the portions of the time and spectrum window in which they are to receive over a period of at least 10 ms.

The monitored time and spectrum window must total at least 50% of the 10 ms frame interval and the monitored spectrum must be within 1.25 MHz of the centre frequency of channel(s) already occupied by that device or co-located cooperating devices.

If the access criteria are met for the intended receive time and spectrum window under the above conditions, then transmission in the intended transmit window by the initiating device may commence.

14.9.1 Measurement Procedure

For detailed test methods, please refer to ANSI C63.17-2013 Clause 8.4.

14.9.2 Measurement Result

Note:The manufacturer declares that this provision is not utilized by the EUT.

14.10 Frame Repetition Stability And Period And Jitter

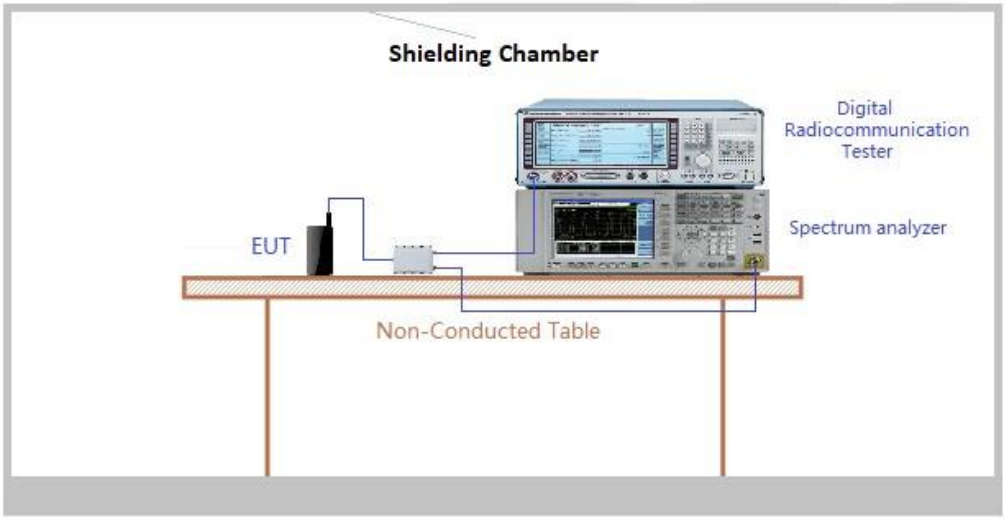
According to the requirements of FCC Part 15.323(c)(13) as follows:

The frame period (a set of consecutive time slots in which the position of each time slot can be identified by reference to a synchronizing source) of an intentional radiator operating in this band shall be 20 milliseconds or 10 milliseconds/X where X is a positive whole number. Each device that implements time division for the purposes of maintaining a duplex connection on a given frequency carrier shall maintain a frame repetition rate with a frequency stability of at least 50 parts per million (ppm). Each device which further divides access in time in order to support multiple communication links on a given frequency carrier shall maintain a frame repetition rate with a frequency stability of at least 10 ppm. The jitter (time-related, abrupt, spurious variations in the duration of the frame interval) introduced at the two ends of such a communication link shall not exceed 25 microseconds for any two consecutive transmissions. Transmissions shall be continuous in every time and spectrum window during the frame period defined for the device.

14.10.1 Measurement Procedure

For detailed test methods, please refer to ANSI C63.17-2013 Clause 6.2.2&6.2.3

14.10.2 Measurement Setup



14.10.3 Measurement Result

Carrier Frequency (MHz)	Frame Jitter (us)					Limit of △
	min	mean	max	△min	△max	
1924.992	-0.79	0	0.98	-0.79	0.91	±25

Appendix I: Photographs of Test Setup

Refer to the Report No.: AGC14499240405AP04

Appendix II: Photographs of Test EUT

Refer to the Report No.: AGC14499240405AP03

-----End of Report-----

Conditions of Issuance of Test Reports

1. All samples and goods are accepted by the Attestation of Global Compliance (Shenzhen) Co., Ltd (the "Company") solely for testing and reporting in accordance with the following terms and conditions. The company provides its services on the basis that such terms and conditions constitute express agreement between the company and any person, firm or company requesting its services (the "Clients").

2. Any report issued by Company as a result of this application for testing services (the "Report") shall be issued in confidence to the Clients and the Report will be strictly treated as such by the Company. It may not be reproduced either in its entirety or in part and it may not be used for advertising or other unauthorized purposes without the written consent of the Company. The Clients to whom the Report is issued may, however, show or send it, or a certified copy thereof prepared by the Company to its customer, supplier or other persons directly concerned. The Company will not, without the consent of the Clients, enter into any discussion or correspondence with any third party concerning the contents of the Report, unless required by the relevant governmental authorities, laws or court orders.

3.The Company shall not be called or be liable to be called to give evidence or testimony on the Report in a court of law without its prior written consent, unless required by the relevant governmental authorities, laws or court orders.

4. In the event of the improper use of the report as determined by the Company, the Company reserves the right to withdraw it, and to adopt any other additional remedies which may be appropriate.

5. Samples submitted for testing are accepted on the understanding that the Report issued cannot form the basis of, or be the instrument for, any legal action against the Company.

6. The Company will not be liable for or accept responsibility for any loss or damage however arising from the use of information contained in any of its Reports or in any communication whatsoever about its said tests or investigations.

7.Clients wishing to use the Report in court proceedings or arbitration shall inform the Company to that effect prior to submitting the sample for testing.

8. The Company is not responsible for recalling the electronic version of the original report when any revision is made to them. The Client assumes the responsibility to providing the revised version to any interested party who uses them.

9. Subject to the variable length of retention time for test data and report stored hereinto as otherwise specifically required by individual accreditation authorities, the Company will only keep the supporting test data and information of the test report for a period of six years. The data and information will be disposed of after the aforementioned retention period has elapsed. Under no circumstances shall we provide any data and information which has been disposed of after retention period. Under no circumstances shall we be liable for damage of any kind, including (but not limited to) compensatory damages, lost profits, lost data, or any form of special, incidental, indirect, consequential or punitive damages of any kind, whether based on breach of contract of warranty, tort (including negligence), product liability or otherwise, even if we are informed in advance of the possibility of such damages.