

FCC Test Report

APPLICANT : GigaDevice Semiconductor Inc.
EQUIPMENT : 2.4 GHz Wi-Fi 6 (802.11 ax) and Bluetooth5 (LE) module
BRAND NAME : GigaDevice
MODEL NAME : GD32VW553-UNIFI-IMH6,
GD32VW553-UNIFI-IMH7,
GD32VW553-UNIFI-EMH6,
GD32VW553-UNIFI-EMH7
FCC ID : 2A3BS-GDVW553UNIFI
STANDARD : 47 CFR Part 15 Subpart B
CLASSIFICATION : Certification
TEST DATE(S) : Apr. 10, 2025 ~ May 14, 2025

We, Sporton International Inc. (Kunshan), would like to declare that the tested sample has been evaluated in accordance with the test procedures given in ANSI C63.4-2014 and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. (Kunshan), the test report shall not be reproduced except in full.

Jason Jia

Approved by: Jason Jia



Sporton International Inc. (Kunshan)

No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300
People's Republic of China



TABLE OF CONTENTS

REVISION HISTORY	3
SUMMARY OF TEST RESULT	4
1. GENERAL DESCRIPTION	5
1.1. Applicant.....	5
1.2. Manufacturer	5
1.3. Product Feature of Equipment Under Test	5
1.4. Product Specification of Equipment Under Test	6
1.5. Modification of EUT	6
1.6. Test Location	6
1.7. Test Software	6
1.8. Applicable Standards	7
2. TEST CONFIGURATION OF EQUIPMENT UNDER TEST	8
2.1. Test Mode	8
2.2. Connection Diagram of Test System	9
2.3. Support Unit used in test configuration and system.....	9
3. TEST RESULT	10
3.1. Test of AC Conducted Emission Measurement	10
3.2. Test of Radiated Emission Measurement	14
4. LIST OF MEASURING EQUIPMENT	19
5. MEASUREMENT UNCERTAINTY	20
APPENDIX A. SETUP PHOTOGRAPHS	



REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FC522404	Rev. 01	Initial issue of report	May 21, 2025

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.107	AC Conducted Emission	< 15.107 limits	PASS	Under limit 9.92 dB at 0.188 MHz
3.2	15.109	Radiated Emission	< 15.109 limits	PASS	Under limit 3.53 dB at 66.13 MHz for Quasi-Peak

Conformity Assessment Condition:

The test results (PASS/FAIL) with all measurement uncertainty excluded are presented against the regulation limits or in accordance with the requirements stipulated by the applicant/manufacture who shall bear all the risks of non-compliance that may potentially occur if measurement uncertainty is taken into account. Please refer to each test results in the section "Measurement Uncertainty".

Disclaimer:

The product specifications of the EUT presented in the test report that may affect the test assessments are declared by the manufacturer who shall take full responsibility for the authenticity.



1. General Description

1.1. Applicant

GigaDevice Semiconductor Inc.

Building No. 8, IC Park, No. 9 Fenghao East Road, Haidian District, Beijing 100094, China

1.2. Manufacturer

Jiangsu Fulian Communication Technology Co.

South of Lanling Road, Yong'an Community, Development Zone, Danyang City, Jiangsu Province, China

1.3. Product Feature of Equipment Under Test

Product Feature	
Equipment	2.4 GHz Wi-Fi 6 (802.11 ax) and Bluetooth5 (LE) module
Brand Name	GigaDevice
Model Name	GD32VW553-UNIFI-IMH6, GD32VW553-UNIFI-IMH7, GD32VW553-UNIFI-EMH6, GD32VW553-UNIFI-EMH7
FCC ID	2A3BS-GDVW553UNIFI
EUT supports Radios application	WLAN 2.4GHz 802.11b/g/n HT20 WLAN 2.4GHz 802.11ax HE20 Bluetooth LE
Sample	Radiation: #14 #16 #23 #3 #10 Conduction: #14 #16 for Sample 1 #19 for Sample 2 #6 for Sample 3 #8 for Sample 4
HW Version	GD32VW553-UNIFI-IMH6-A, GD32VW553-UNIFI-IMH7-A, GD32VW553-UNIFI-EMH6-A, GD32VW553-UNIFI-EMH7-A
SW Version	image-all-mp-1.0.2_02-PA6PA7-20250107, image-all-combine_dtm_basecmd.bin
EUT Stage	Identical Prototype

Remark:

1. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
2. There are four types of EUT, the differences could be referred to the Module Differences Statement which is exhibit separately. According to the difference, we choose sample 1 to full test and the sample 2/3/4 is verified for the difference.

1.4. Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx / Rx Frequency	WLAN 802.11b/g/n/ax: 2412 MHz ~ 2462 MHz Bluetooth LE: 2402 MHz ~ 2480 MHz
Antenna Type	WLAN : PCB Antenna/Dipole Antenna Bluetooth: PCB Antenna/Dipole Antenna
Type of Modulation	802.11b: DSSS (DBPSK / DQPSK / CCK) 802.11g/n: OFDM (BPSK / QPSK / 16QAM / 64QAM) 802.11ax: OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM) Bluetooth LE : GFSK

1.5. Modification of EUT

No modifications are made to the EUT during all test items.

1.6. Test Location

Sporton International Inc. (Kunshan) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.02.

Test Firm	Sporton International Inc. (Kunshan)		
Test Site Location	No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People's Republic of China TEL : +86-512-57900158		
Test Site No.	Sporton Site No.	FCC Designation No.	FCC Test Firm Registration No.
	03CH08-KS CO01-KS	CN1257	314309

1.7. Test Software

Item	Site	Manufacturer	Name	Version
1.	03CH08-KS	AUDIX	E3	210616
2.	CO01-KS	AUDIX	E3	6.2009-8-24

1.8. Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ 47 CFR Part 15 Subpart B
- ♦ ANSI C63.4-2014

Remark: All test items were verified and recorded according to the standards and without any deviation during the test.

2. Test Configuration of Equipment Under Test

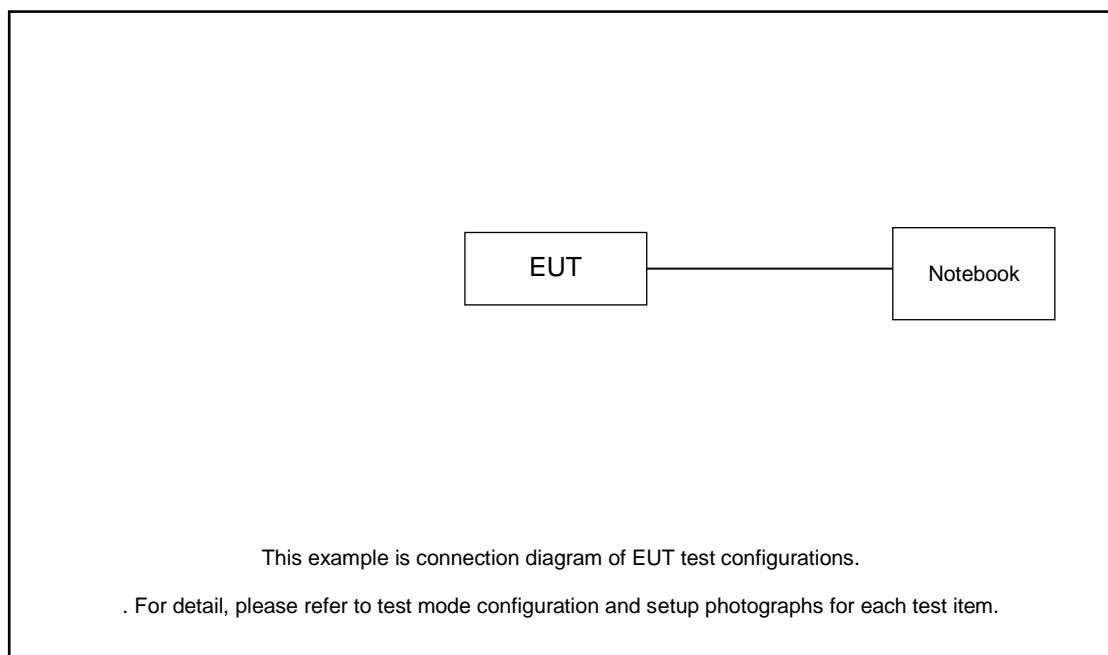
2.1. Test Mode

The EUT has been associated with peripherals pursuant to ANSI C63.4-2014 and configuration operated in a manner tended to maximize its emission characteristics in a typical application.

Frequency range investigated: conduction emission (150 kHz to 30 MHz), radiation emission (30MHz to the 5th harmonic of the highest frequency or to 40 GHz, whichever is lower).

Test Items	Function Type
AC Conducted Emission	Mode 1: Bluetooth On + Charging from NB for Sample 1 Mode 2: WLAN (2.4G) On + Charging from NB for Sample 1 Mode 3: WLAN (2.4G) On + Charging from NB for Sample 2 Mode 4: WLAN (2.4G) On + Charging from NB for Sample 3 Mode 5: WLAN (2.4G) On + Charging from NB for Sample 4
Radiated Emissions	Mode 1: BLE On + Charging from NB for Sample 1 Mode 2: WLAN (2.4G) On + Charging from NB for Sample 1 Mode 3: WLAN (2.4G) On + Charging from NB for Sample 2 Mode 4: WLAN (2.4G) On + Charging from DC for Sample 3 Mode 5: WLAN (2.4G) On + Charging from DC for Sample 4
Remark: 1. The worst case of AC is mode 2; only the test data of this mode is reported. 2. The worst case of RE is mode 2; only the test data of this mode is reported. Sample1: GD32VW553-UNIFI-IMH7; Sample2: GD32VW553-UNIFI-EMH7; Sample3: GD32VW553-UNIFI-IMH6; Sample4: GD32VW553-UNIFI-EMH6;	

2.2.Connection Diagram of Test System



The EUT has been associated with peripherals pursuant to ANSI C63.4-2014 and configuration operated in a manner tended to maximize its emission characteristics in a typical application

2.3. Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	WLAN AP	TP-Link	TL-WDR5600	N/A	N/A	Unshielded,1.8m
2.	WLAN AP	D-link	DIR-655	KA21R655B1	N/A	Unshielded,1.8m
3.	Notebook	Lenovo	V130-14IKB001	N/A	N/A	N/A
4.	Notebook	Lenovo	G480	QDS-BRCM1050I	N/A	shielded cable DC O/P 1.8m , Unshielded AC I/P cable 1.8m
5.	Hard DISK	WD	C6B	N/A	N/A	N/A

3. Test Result

3.1. Test of AC Conducted Emission Measurement

3.1.1 Limits of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

<Class B Limit>

Frequency of emission (MHz)	Conducted limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

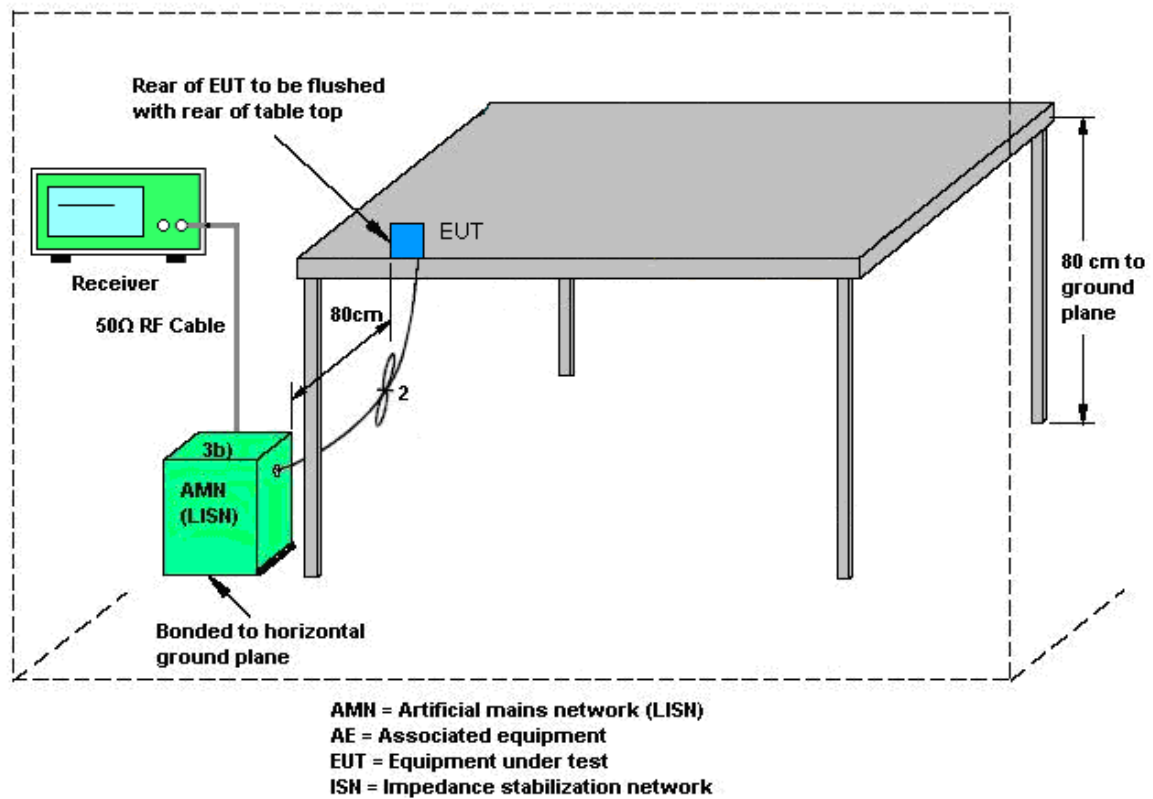
3.1.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.1.3 Test Procedure

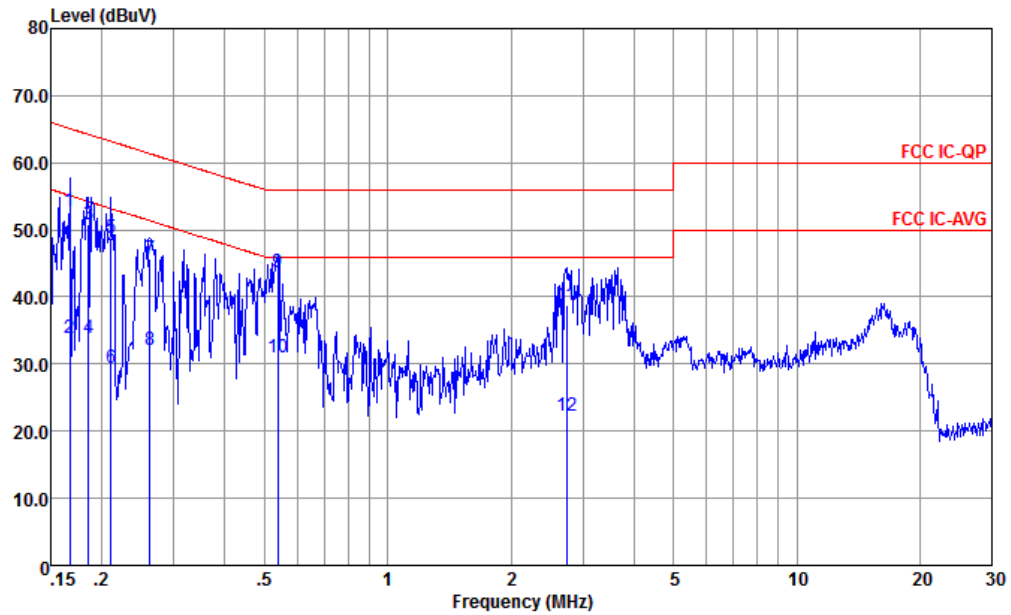
1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth (IF Bandwidth = 9kHz) with Maximum Hold Mode. Then measurement is also conducted by Average Detector and Quasi-Peak Detector Function respectively.

3.1.4 Test Setup



3.1.5 Test Result of AC Conducted Emission

Test Engineer :	Amos	Temperature :	25.3~26.2°C
		Relative Humidity :	38~40%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		

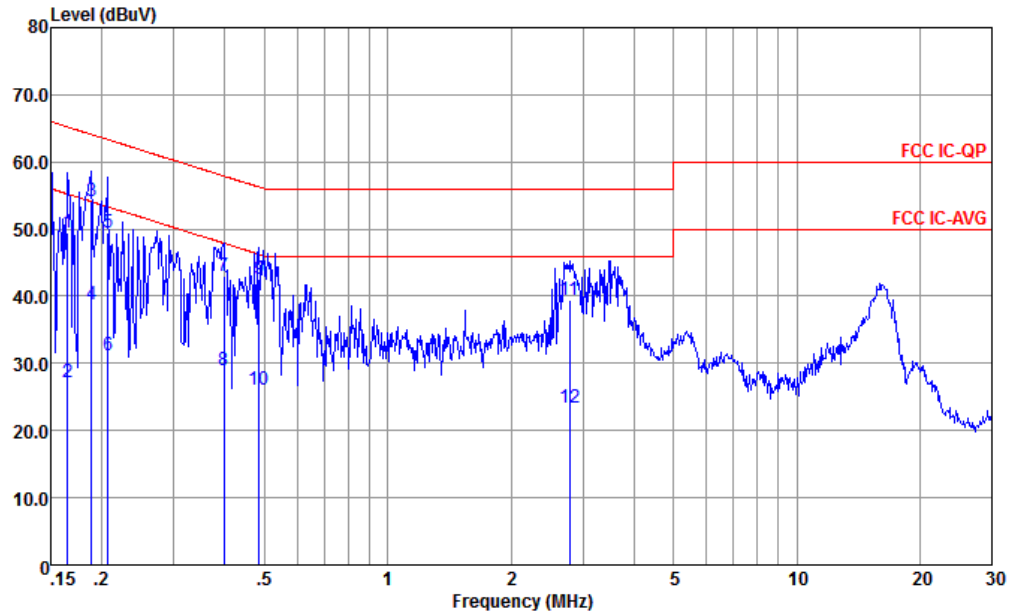


Site : CO01-KS
Condition : FCC IC-QP LISN-060105-L 2024 LINE

	Freq	Level	Over	Limit	Read	LISN	Cable	Remark
	MHz	dBuV	Limit	Line	Level	Factor	Loss	
			dB	dBuV	dBuV	dB	dB	
1	0.167	52.76	-12.36	65.12	42.20	0.11	10.45	QP
2	0.167	33.86	-21.26	55.12	23.30	0.11	10.45	Average
3	0.185	50.75	-13.49	64.24	40.20	0.09	10.46	QP
4	0.185	33.85	-20.39	54.24	23.30	0.09	10.46	Average
5	0.211	48.74	-14.44	63.18	38.20	0.08	10.46	QP
6	0.211	29.34	-23.84	53.18	18.80	0.08	10.46	Average
7	0.262	45.76	-15.62	61.38	35.20	0.09	10.47	QP
8	0.262	32.16	-19.22	51.38	21.60	0.09	10.47	Average
9 *	0.538	43.78	-12.22	56.00	33.51	-0.12	10.39	QP
10	0.538	30.88	-15.12	46.00	20.61	-0.12	10.39	Average
11	2.736	38.85	-17.15	56.00	28.79	-0.17	10.23	QP
12	2.736	22.25	-23.75	46.00	12.19	-0.17	10.23	Average



Test Engineer :	Amos	Temperature :	25.3~26.2°C
		Relative Humidity :	38~40%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



	Freq	Level	Over	Limit	Read	LISN	Cable	Remark
	MHz	dBuV	Limit	Line	Level	Factor	Loss	
			dB	dBuV	dBuV	dB	dB	
1	0.165	49.38	-15.83	65.21	38.81	0.12	10.45	QP
2	0.165	27.18	-28.03	55.21	16.61	0.12	10.45	Average
3 *	0.188	54.19	-9.92	64.11	43.60	0.13	10.46	QP
4	0.188	38.79	-15.32	54.11	28.20	0.13	10.46	Average
5	0.207	49.37	-13.95	63.32	38.81	0.10	10.46	QP
6	0.207	31.17	-22.15	53.32	20.61	0.10	10.46	Average
7	0.398	42.95	-14.95	57.90	32.60	-0.14	10.49	QP
8	0.398	28.95	-18.95	47.90	18.60	-0.14	10.49	Average
9	0.484	42.47	-13.80	56.27	32.20	-0.15	10.42	QP
10	0.484	26.17	-20.10	46.27	15.90	-0.15	10.42	Average
11	2.779	39.52	-16.48	56.00	29.50	-0.21	10.23	QP
12	2.779	23.32	-22.68	46.00	13.30	-0.21	10.23	Average

Note:

1. Level(dBμV) = Read Level(dBμV) + LISN Factor(dB) + Cable Loss(dB)
2. Over Limit(dB) = Level(dBμV) – Limit Line(dBμV)

3.2. Test of Radiated Emission Measurement

3.2.1. Limit of Radiated Emission

The emissions from an unintentional radiator shall not exceed the field strength levels specified in the following table:

<Class B Limit>

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

3.2.2. Measuring Instruments

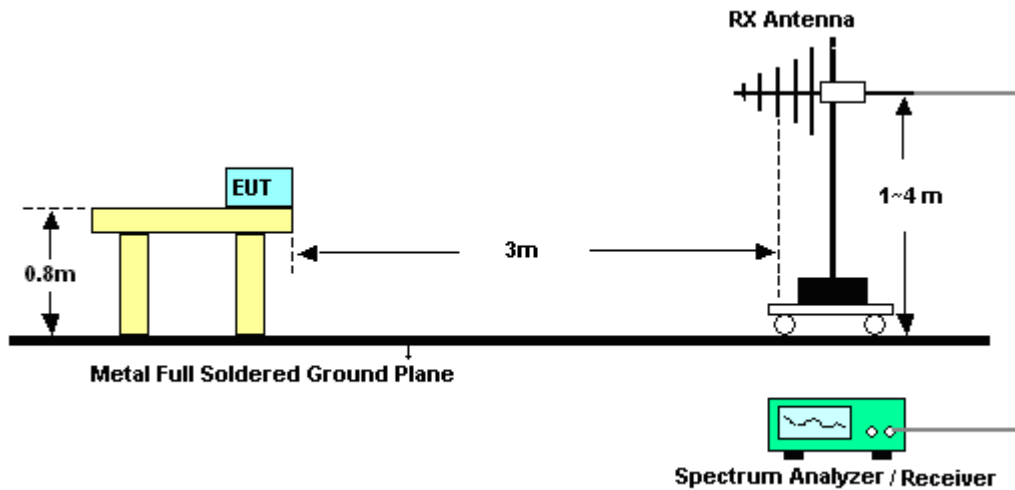
The measuring equipment is listed in the section 4 of this test report.

3.2.3. Test Procedures

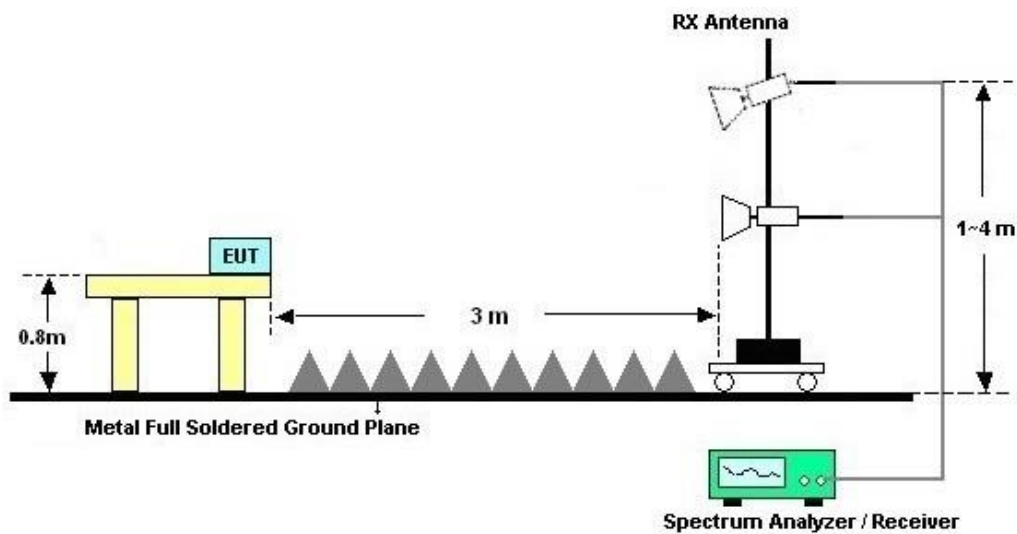
1. The EUT was placed on a turntable with 0.8 meter above ground.
2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
4. The table was rotated 360 degrees to determine the position of the highest radiation.
5. The antenna is a Bi-Log antenna and its height is adjusted between one to four meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
6. For each suspected emission, the EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
7. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode (RBW=120kHz/VBW=300kHz for frequency below 1GHz; RBW=1MHz VBW=3MHz (Peak), RBW=1MHz/VBW=10Hz (Average) for frequency above 1GHz).
8. If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, peak values of EUT will be reported. Otherwise, the emission will be repeated by using the quasi-peak method and reported.
9. Emission level (dBμV/m) = 20 log Emission level (μV/m)
10. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
11. Exploratory radiated emissions testing of handheld and/or body-worn devices shall include rotation of the EUT through three orthogonal axes (X/Y/Z Plane) to determine the orientation (attitude) that maximizes the emissions.

3.2.4. Test Setup of Radiated Emission

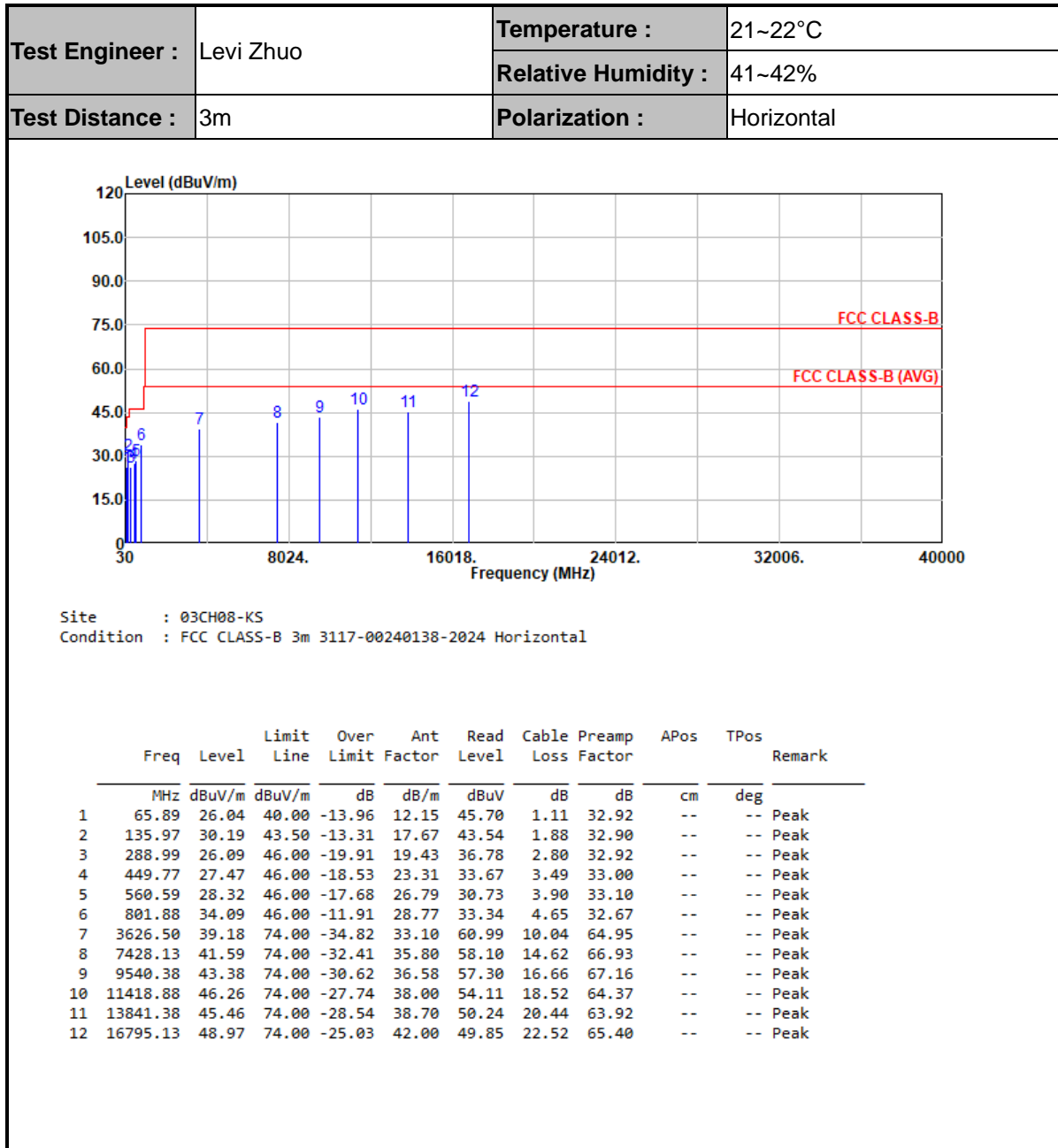
For radiated emissions from 30MHz to 1GHz

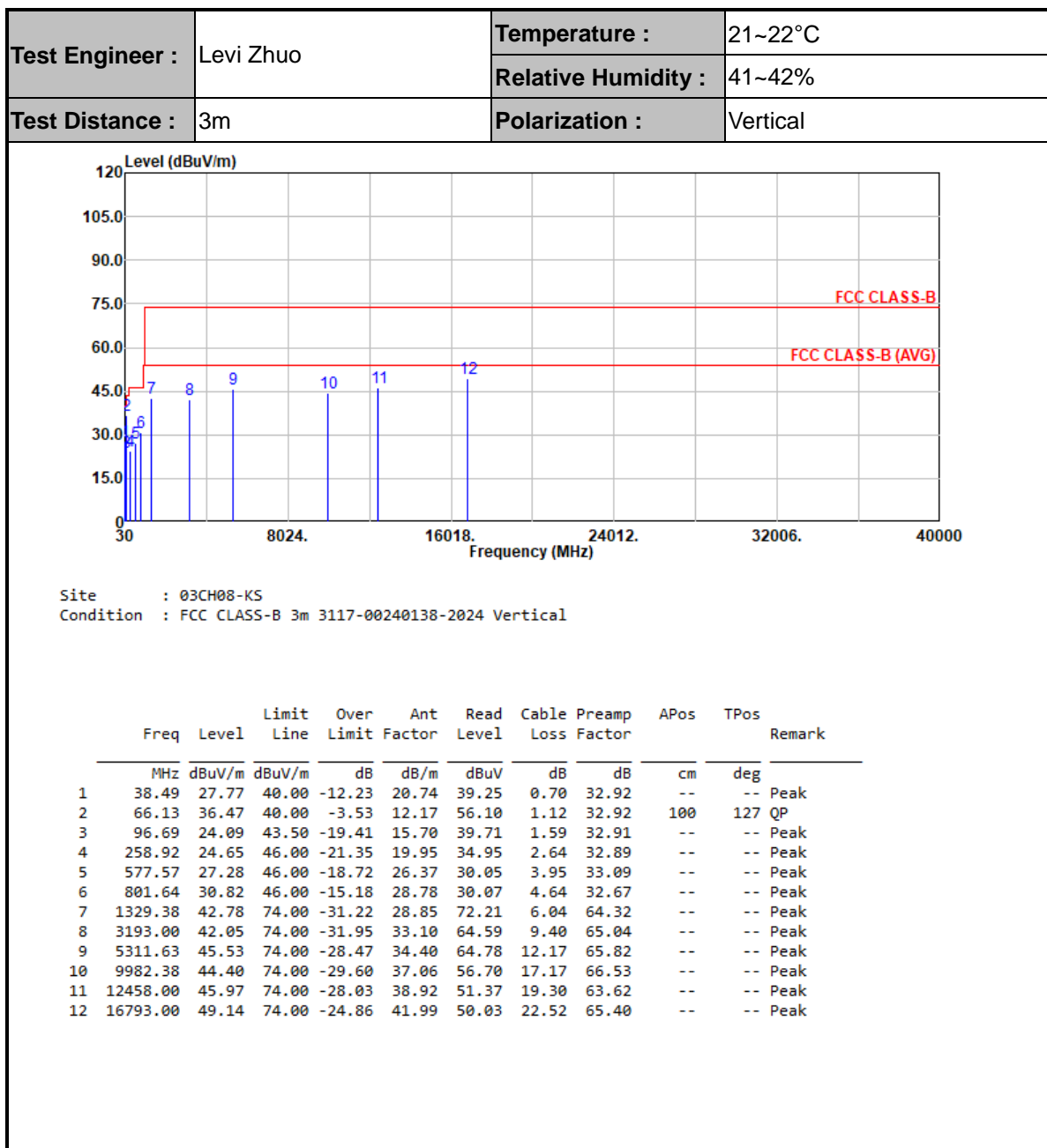


For radiated emissions above 1GHz



3.2.5. Test Result of Radiated Emission





Note:

- Level(dBμV/m) = Read Level(dBμV) + Antenna Factor(dB/m) + Cable Loss(dB) - Preamp Factor(dB)
- Over Limit(dB) = Level(dBμV/m) – Limit Line(dBμV/m)



4. List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
EMI Test Receiver	Keysight	N9038A	MY57290151	3Hz~8.5GHz;Max 30dBm	Jul. 04, 2024	Apr. 10, 2025	Jul. 03, 2025	Radiation (03CH08-KS)
EXA Spectrum Analyzer	Keysight	N9010B	MY57441079	10Hz~44GHz	Oct. 09, 2024	Apr. 10, 2025	Oct. 08, 2025	Radiation (03CH08-KS)
Bilog Antenna	TESEQ	CBL 6111D	59915	30MHz~1GHz	Aug. 18, 2024	Apr. 10, 2025	Aug.17, 2025	Radiation (03CH08-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	00240138	1GHz~18GHz	Jul. 06, 2024	Apr. 10, 2025	Jul. 05, 2025	Radiation (03CH08-KS)
SHF-EHF Horn	Com-power	AH-840	101116	18GHz~40GHz	Oct. 22, 2024	Apr. 10, 2025	Oct. 21, 2025	Radiation (03CH08-KS)
Amplifier	EM	EM18G40GGA	060737	18~40GHz	Jan. 03, 2025	Apr. 10, 2025	Jan. 02, 2026	Radiation (03CH08-KS)
Amplifier	SONOMA	310N	380826	9KHz~1GHz	Jul. 03, 2024	Apr. 10, 2025	Jul. 02, 2025	Radiation (03CH08-KS)
Amplifier	Keysight	83017A	MY53270417	500MHz~26.5GHz	Oct. 09, 2024	Apr. 10, 2025	Oct. 08, 2025	Radiation (03CH08-KS)
AC Power Source	Chroma	61601	616010002473	N/A	NCR	Apr. 10, 2025	NCR	Radiation (03CH08-KS)
Turn Table	EM	EM 1000-T	N/A	0~360 degree	NCR	Apr. 10, 2025	NCR	Radiation (03CH08-KS)
Antenna Mast	EM	EM 1000-A	N/A	1 m~4 m	NCR	Apr. 10, 2025	NCR	Radiation (03CH08-KS)
EMI Receiver	R&S	ESC17	100768	9kHz~7GHz;	Apr. 17, 2025	May 14, 2025	Apr. 16, 2026	Conduction (CO01-KS)
AC LISN (for auxiliary equipment)	MessTec	AN3016	060103	9kHz~30MHz	Aug. 20, 2024	May 14, 2025	Aug. 19, 2025	Conduction (CO01-KS)
AC LISN	MessTec	AN3016	060105	9kHz~30MHz	Apr. 17, 2025	May 14, 2025	Apr. 16, 2026	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP000000811	AC 0V~300V, 45Hz~1000Hz	Oct. 09, 2024	May 14, 2025	Oct. 08, 2025	Conduction (CO01-KS)

NCR: No Calibration Required

5. Measurement Uncertainty

Uncertainty of Conducted Emission Measurement (150 kHz ~ 30 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	2.84 dB
--	---------

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	6.04 dB
--	---------

Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.26 dB
--	---------

Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.40 dB
--	---------

----- THE END -----