



FCC Test Report

APPLICANT : Lenovo(Shanghai) Electronics Technology Co., Ltd.
EQUIPMENT : Portable Tablet Computer
BRAND NAME : Lenovo
MODEL NAME : TB336ZU
FCC ID : O57TB336ZU
STANDARD : 47 CFR Part 15 Subpart B
CLASSIFICATION : Certification
TEST DATE(S) : Feb. 14, 2025 ~ Mar. 18, 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)

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People's Republic of China



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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FC512510	Rev. 01	Initial issue of report	Mar. 28, 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 6.24 dB at 0.152 MHz
3.2	15.109	Radiated Emission	< 15.109 limits	PASS	Under limit 3.67 dB at 45.280 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

Lenovo(Shanghai) Electronics Technology Co., Ltd.

Section 304-305, Building No. 4, # 222, Meiyue Road, China (Shanghai) Pilot Free Trade Zone

1.2. Manufacturer

Lenovo PC HK Limited

23/F, Lincoln House, Taikoo Place 979 King's Road, Quarry Bay, Hong Kong, China

1.3. Product Feature of Equipment Under Test

Product Feature	
Equipment	Portable Tablet Computer
Brand Name	Lenovo
Model Name	TB336ZU
FCC ID	O57TB336ZU
EUT supports Radios application	GSM/WCDMA/LTE/5G NR WLAN 2.4GHz 802.11b/g/n HT20/HT40 WLAN 5GHz 802.11a/n HT20/HT40 WLAN 5GHz 802.11ac VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE GNSS
IMEI/SN Code	Conduction: 865246070008878/865246070008886 For sample1 865246070010957/865246070010965 For sample2 GSN01234 For sample3 865246070014835/865246070014843 For sample4 865246070008431/865246070008449 For sample5 GSN01234 For sample6 Radiation: HA28515T For sample1 HA28542T For sample2 HA285ACV For sample3 HA284K34 For sample4 HA2855GK For sample5 HA281QZ5 For sample6
HW Version	TB336ZU
SW Version	Lenovo ZUI 17.0
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 six types of EUT, the differences could be referred to the TB336ZU_Product Equality

Declaration which is exhibit separately. According to the difference, we choose sample 1 to full test and the sample 2/3/4/5/6 is verified for the difference.

1.4. Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx Frequency	GSM850: 824 MHz ~ 849 MHz GSM1900: 1850MHz ~ 1910MHz WCDMA Band II: 1850 MHz ~ 1910 MHz WCDMA Band IV : 1710 MHz ~ 1755 MHz WCDMA Band V: 824 MHz ~ 849 MHz LTE Band 2 : 1850 MHz ~ 1910 MHz LTE Band 4 : 1710 MHz ~ 1755 MHz LTE Band 5 : 824 MHz ~ 849 MHz LTE Band 7 : 2500 MHz ~ 2570 MHz LTE Band 12 : 699 MHz ~ 716 MHz LTE Band 13 : 777 MHz ~ 787 MHz LTE Band 25 : 1850 MHz ~ 1915 MHz LTE Band 26 : 814 MHz ~ 849 MHz LTE Band 38 : 2570 MHz ~ 2620 MHz LTE Band 41 : 2496 MHz ~ 2690 MHz LTE Band 66 : 1710 MHz ~ 1780 MHz 5G NR n2 : 1850 MHz ~ 1910 MHz 5G NR n5 : 824 MHz ~ 849 MHz 5G NR n7 : 2500 MHz ~ 2570 MHz 5G NR n26 : 814 MHz ~ 849 MHz 5G NR n38 : 2570 MHz ~ 2620 MHz 5G NR n41 : 2496 MHz ~ 2690 MHz 5G NR n66 : 1710 MHz ~ 1780 MHz 5G NR n71 : 663 MHz ~ 698 MHz 5G NR n77 : 3450 MHz ~ 3550 MHz; 3700 MHz ~ 3980 MHz; 5G NR n78 : 3450 MHz ~ 3550 MHz; 3700 MHz ~ 3800 MHz; 802.11b/g/n/: 2400 MHz ~ 2483.5 MHz 802.11a/n/ac: 5150 MHz ~ 5250 MHz; 5250 MHz ~ 5350 MHz; 5470 MHz ~ 5725 MHz 5725 MHz ~ 5850 MHz Bluetooth: 2400 MHz ~ 2483.5 MHz
Rx Frequency	GSM850: 869 MHz ~ 894 MHz GSM1900: 1930 MHz ~ 1990 MHz WCDMA Band II: 1930 MHz ~ 1990 MHz WCDMA Band IV : 2110 MHz ~ 2155 MHz WCDMA Band V: 869 MHz ~ 894 MHz LTE Band 2 : 1930 MHz ~ 1990 MHz LTE Band 4 : 2110 MHz ~ 2155 MHz LTE Band 5 : 869 MHz ~ 894 MHz LTE Band 7 : 2620 MHz ~ 2690 MHz LTE Band 12 : 729 MHz ~ 746 MHz LTE Band 13 : 746 MHz ~ 756 MHz LTE Band 25 : 1930 MHz ~ 1995 MHz LTE Band 26 : 859 MHz ~ 894 MHz LTE Band 38: 2570 MHz ~ 2620 MHz

	LTE Band 41 : 2496 MHz ~ 2690 MHz LTE Band 66 : 2110 MHz~ 2180 MHz 5G NR n2 : 1930 MHz ~ 1990 MHz 5G NR n5 : 869 MHz ~ 894 MHz 5G NR n7 : 2620 MHz ~ 2690 MHz 5G NR n26 : 859 MHz ~ 894 MHz 5G NR n38: 2570 MHz ~ 2620 MHz 5G NR n41 : 2496 MHz ~ 2690 MHz 5G NR n66 : 2110 MHz~ 2180 MHz 5G NR n71 : 617 MHz ~ 652 MHz 5G NR n77 : 3450 MHz ~ 3550 MHz; 3700 MHz ~ 3980 MHz; 5G NR n78 : 3450 MHz ~ 3550 MHz; 3700 MHz ~ 3800 MHz; 802.11b/g/n: 2400 MHz ~ 2483.5 MHz 802.11a/n/ac: 5150 MHz ~ 5250 MHz; 5250 MHz ~ 5350 MHz; 5470 MHz ~ 5725 MHz 5725 MHz ~ 5850 MHz Bluetooth: 2400 MHz ~ 2483.5 MHz GNSS : 1559 MHz ~ 1610 MHz
Antenna Type	WWAN : PIFA Antenna WLAN : PIFA Antenna Bluetooth : PIFA Antenna GNSS: PIFA Antenna
Type of Modulation	GSM/GPRS: GMSK EDGE(MCS 0-4): GMSK / (MCS 5-9): 8PSK WCDMA : BPSK HSPA : QPSK HSPA+ : 16QAM(16QAM not support uplink) DC-HSDPA : 64QAM LTE: QPSK / 16QAM / 64QAM / 256QAM 5G NR: DFT-s-OFDM (PI/2 BPSK / QPSK / 16QAM / 64QAM / 256QAM) CP-OFDM (QPSK / 16QAM / 64QAM / 256QAM) 802.11b: DSSS (DBPSK / DQPSK / CCK) 802.11a/g/n: OFDM (BPSK / QPSK / 16QAM / 64QAM) 802.11ac: OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM) Bluetooth LE : GFSK Bluetooth (1Mbps) : GFSK Bluetooth (2Mbps) : $\pi/4$ -DQPSK Bluetooth (3Mbps) : 8-DPSK GNSS : BPSK

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.
	CO01-KS 03CH02-KS 10CH01-KS	CN1257	314309

1.7. Test Software

Item	Site	Manufacturer	Name	Version
1.	03CH02-KS	AUDIX	E3	6.2009-8-24a1
2.	10CH01-KS	AUDIX	E3	210616
3.	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.

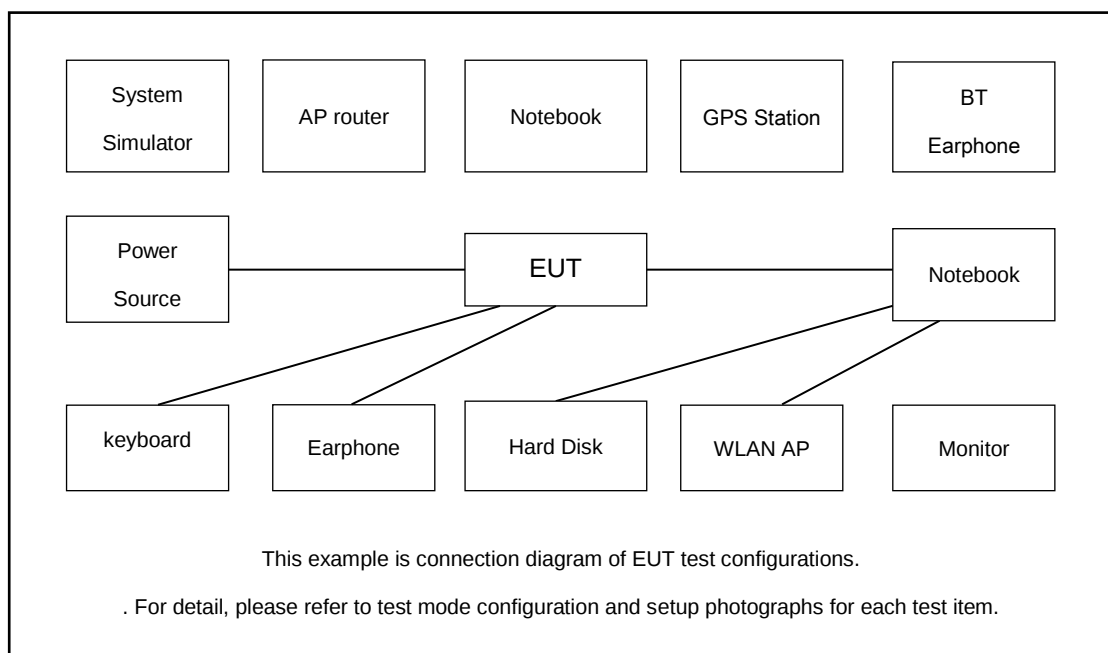
Frequency range investigated: conduction emission (150 kHz to 30 MHz), radiation emission (30MHz to the 5th harmonic of the highest frequency or to 40 GHz, whichever is lower).

Test Items	Function Type
AC Conducted Emission	Mode 1: GSM 850 Rx(Middle) + Bluetooth Idle + WLAN (2.4G) Idle + Camera(Rear) + Earphone 1 + pen + USB Cable 1(Charging from Adapter1) + Battery 1 + SIM 1 for sample 1
	Mode 2: WCDMA II Rx + Bluetooth Idle + WLAN (5G) Idle + Camera(Front) + Earphone 1 + pen + USB Cable2 (Charging from Adapter2) + Battery 1 + SIM 2 for sample 1
	Mode 3: LTE Band 12 Rx(Middle) + Bluetooth Idle + WLAN (2.4G) Idle + MPEG4(Run Color Bar) + Earphone 1 + pen + USB Cable1 (Data Link with Notebook) + EUT (eMMC) USB Data Link to PC/NB + Battery 1 + SIM 1 for sample 1
	Mode 4: LTE Band 13 Rx(High) + Bluetooth Idle + WLAN (5G) Idle + GNSS Rx + Earphone 1 + pen + USB Cable1 (Data Link with Notebook) + PC/NB USB Data Link to EUT (eMMC) + Battery 1 + SIM 1 for sample 1
	Mode 5: LTE Band 26 Rx(Low) + Bluetooth Idle + WLAN (2.4G) Idle + MPEG4(Run Color Bar) + Earphone 1 + pen + USB Cable1 (Data Link with Notebook) + EUT (SD) USB Data Link to PC/NB + Battery 1 + SIM 1 for sample 1
	Mode 6: LTE Band 5 Rx(Middle) + Bluetooth Idle + WLAN (5G) Idle + MPEG4(Run Color Bar) + Earphone 1 + pen + USB Cable 1(Data Link with Notebook) + PC/NB USB Data Link to EUT (SD) + Battery 1 + SIM 1 for sample 1
	Mode 7: 5G NR n71 Rx(Middle) + Bluetooth Idle + WLAN (2.4G) Idle + MPEG4(Run Color Bar) + Earphone 1 + pen + USB Cable 2(Data Link with Notebook) + EUT (eMMC) USB Data Link to PC/NB + Battery 1 + SIM 1 for sample 1
	Mode 8: LTE Band 12 Rx(Middle) + Bluetooth Idle + WLAN (5G) Idle + Camera(Rear) + Earphone 1 + pen + USB Cable (2) (Charging from Adapter (2)) + Battery 2 + SIM 1 for sample 2
	Mode 9: LTE Band 12 Rx(Middle) + Bluetooth Idle + WLAN (5G) Idle + MPEG4(Run Color Bar) + Earphone 1 + pen + USB Cable 1(Data Link with Notebook) + EUT (eMMC) USB Data Link to PC/NB + Battery 2 + SIM 1 for sample 2
	Mode 10 : LTE Band 12 Rx(Middle) + Bluetooth Idle + WLAN (5G) Idle + MPEG4(Run Color Bar) + Earphone 1 + pen + USB Cable 1(Data Link with Notebook) + EUT (eMMC) USB Data Link to PC/NB + Battery 1 + SIM 1 for sample 3
	Mode 11 : LTE Band 12 Rx(Middle) + Bluetooth Idle + WLAN (5G) Idle + MPEG4(Run Color Bar) + Earphone 1 + pen + USB Cable 1(Data Link with Notebook) + EUT (eMMC) USB Data Link to PC/NB + Battery 2 + SIM 1 for sample 4
	Mode 12 : LTE Band 12 Rx(Middle) + Bluetooth Idle + WLAN (5G) Idle + MPEG4(Run Color Bar) + Earphone 1 + pen + USB Cable 1(Data Link with Notebook) + EUT (eMMC) USB Data Link to PC/NB + Battery 1 + SIM 1 for sample 5
	Mode 13 : LTE Band 12 Rx(Middle) + Bluetooth Idle + WLAN (5G) Idle + MPEG4(Run Color Bar) + Earphone 1 + pen + USB Cable 1(Data Link with Notebook) + EUT (eMMC) USB Data Link to PC/NB + Battery 2 + SIM 1 for sample 6
	Mode 14 : LTE Band 12 Rx(Middle) + Bluetooth Idle + WLAN (5G) Idle + MPEG4(Run Color Bar) + Earphone 1 + pen + Keyboard with Pogo Pin + USB Cable 1(Data Link with Notebook) + EUT (eMMC) USB Data Link to PC/NB + Battery 1 +



	SIM 1 for sample 1
Radiated Emissions	Mode 1: GSM 850 Rx(Middle) + Bluetooth Idle + WLAN (2.4G) Idle + Camera(Rear) + Earphone 1 + pen + USB Cable 1(Charging from Adapter1) + Battery 1 + SIM 1 for sample 1
	Mode 2: WCDMA II Rx + Bluetooth Idle + WLAN (5G) Idle + Camera(Front) + Earphone 1 + pen + USB Cable2 (Charging from Adapter2) + Battery 1 + SIM 2 for sample 1
	Mode 3: LTE Band 12 Rx(Middle) + Bluetooth Idle + WLAN (2.4G) Idle + MPEG4(Run Color Bar) + Earphone 1 + pen + USB Cable1 (Data Link with Notebook) + EUT (eMMC) USB Data Link to PC/NB + Battery 1 + SIM 1 for sample 1
	Mode 4: LTE Band 13 Rx(High) + Bluetooth Idle + WLAN (5G) Idle + GNSS Rx + Earphone 1 + pen + USB Cable1 (Data Link with Notebook) + PC/NB USB Data Link to EUT (eMMC) + Battery 1 + SIM 1 for sample 1
	Mode 5: LTE Band 26 Rx(Low) + Bluetooth Idle + WLAN (2.4G) Idle + MPEG4(Run Color Bar) + Earphone 1 + pen + USB Cable1 (Data Link with Notebook) + EUT (SD) USB Data Link to PC/NB + Battery 1 + SIM 1 for sample 1
	Mode 6: LTE Band 5 Rx(Middle) + Bluetooth Idle + WLAN (5G) Idle + MPEG4(Run Color Bar) + Earphone 1 + pen + USB Cable 1(Data Link with Notebook) + PC/NB USB Data Link to EUT (SD) + Battery 1 + SIM 1 for sample 1
	Mode 7: 5GNR n71 Rx(Middle) + Bluetooth Idle + WLAN (2.4G) Idle + MPEG4(Run Color Bar) + Earphone 1 + pen + USB Cable 2(Data Link with Notebook) + EUT (eMMC) USB Data Link to PC/NB + Battery 1 + SIM 1 for sample 1
	Mode 8: LTE Band 12 Rx(Middle) + Bluetooth Idle + WLAN (5G) Idle + Camera(Rear) + Earphone 1 + pen + USB Cable (2) (Charging from Adapter (2)) + Battery 2 + SIM 1 for sample 2
	Mode 9: LTE Band 5 Rx(Middle) + Bluetooth Idle + WLAN (5G) Idle + Camera(Rear) + Earphone 2 + pen + Battery 1 + SIM 1 for sample 1
	Mode 10 : LTE Band 5 Rx(Middle) + Bluetooth Idle + WLAN (5G) Idle + Camera(Rear) + Earphone 2 + pen + USB Cable 1(Charging from Adapter1) + Battery 2 + SIM 1 for sample 2
	Mode 11 : LTE Band 5 Rx(Middle) + Bluetooth Idle + WLAN (5G) Idle + MPEG4(Run Color Bar) + Earphone 2 + pen + USB Cable 1(Data Link with Notebook) + PC/NB USB Data Link to EUT (eMMC)) + Battery 2 + SIM 1 for sample 2
	Mode 12 : LTE Band 5 Rx(Middle) + Bluetooth Idle + WLAN (5G) Idle + MPEG4(Run Color Bar) + Earphone 1 + pen + USB Cable 1(Data Link with Notebook) + PC/NB USB Data Link to EUT (SD) + Battery 1 + SIM 1 for sample 3
	Mode 13 : LTE Band 5 Rx(Middle) + Bluetooth Idle + WLAN (5G) Idle + MPEG4(Run Color Bar) + Earphone 1 + pen + USB Cable 1(Data Link with Notebook) + PC/NB USB Data Link to EUT (SD) + Battery 2 + SIM 1 for sample 4
	Mode 14 : LTE Band 5 Rx(Middle) + Bluetooth Idle + WLAN (5G) Idle + MPEG4(Run Color Bar) + Earphone 1 + pen + USB Cable 1(Data Link with Notebook) + PC/NB USB Data Link to EUT (eMMC) + Battery 1 + SIM 1 for sample 5
	Mode 15 : LTE Band 5 Rx(Middle) + Bluetooth Idle + WLAN (5G) Idle + MPEG4(Run Color Bar) + Earphone 1 + pen + USB Cable 1(Data Link with Notebook) + PC/NB USB Data Link to EUT (SD) + Battery 2 + SIM 1 for sample 6
	Mode 16 : LTE Band 5 Rx(Middle) + Bluetooth Idle + WLAN (5G) Idle + MPEG4(Run Color Bar) + Earphone 1 + pen + Keyboard with Pogo Pin + USB Cable 1(Data Link with Notebook) + PC/NB USB Data Link to EUT (SD) + Battery 2 + SIM 1 for sample 6
Remark: 1. The worst case of AC is mode 3; only the test data of this mode is reported. 2. The worst case of RE is mode 15; only the test data of this mode is reported. 3. Data Link with Notebook means data application transferred mode between EUT and Notebook 4. Pre-scanned Low/Middle/High channel for 30M-960MHz band, the worst channel was recorded in this report.	

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.	LTE Base Station	Anritus	MT8821C	N/A	N/A	Unshielded,1.8m
2.	5GNR Base Station	Anritus	MT8000A	N/A	N/A	Unshielded,1.8m
3.	WLAN AP	D-link	DIR-655	KA21R655B1	N/A	Unshielded,1.8m
4.	Bluetooth Earphone	Lenovo	thinkplus-BH3	N/A	N/A	N/A
5.	Notebook	Lenovo	G480	QDS-BRCM1050I	N/A	shielded cable DC O/P 1.8m, Unshielded AC I/P cable 1.8m
6.	Vector Signal Generator	R&S	SMBV100A	258305	N/A	N/A
7.	Hard Disk	Lenovo	F310	DoC	Shielded, 1.2m	N/A
8.	SD Card	Kingston	8GB	N/A	N/A	N/A
9.	Earphone 1	N/A	N/A	N/A	3.5mm	N/A
10.	Earphone 2	N/A	N/A	N/A	Type-C	N/A

2.4. EUT Operation Test Setup

The EUT was in GSM or WCDMA or LTE or 5G NR idle mode during the testing. The EUT was synchronized to the BCCH, and is in continuous receiving mode by setting system simulator's paging reorganization.

At the same time, the EUT was attached to the Bluetooth earphone or WLAN AP, and the following programs installed in the EUT were programmed during the test.

1. Data application is transferred between notebook and EUT via USB cable.
2. Turn on camera to capture images.
3. Turn on MPEG4 function.
4. Turn on GNSS function to make the EUT receive continuous signals from GNSS station.

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.

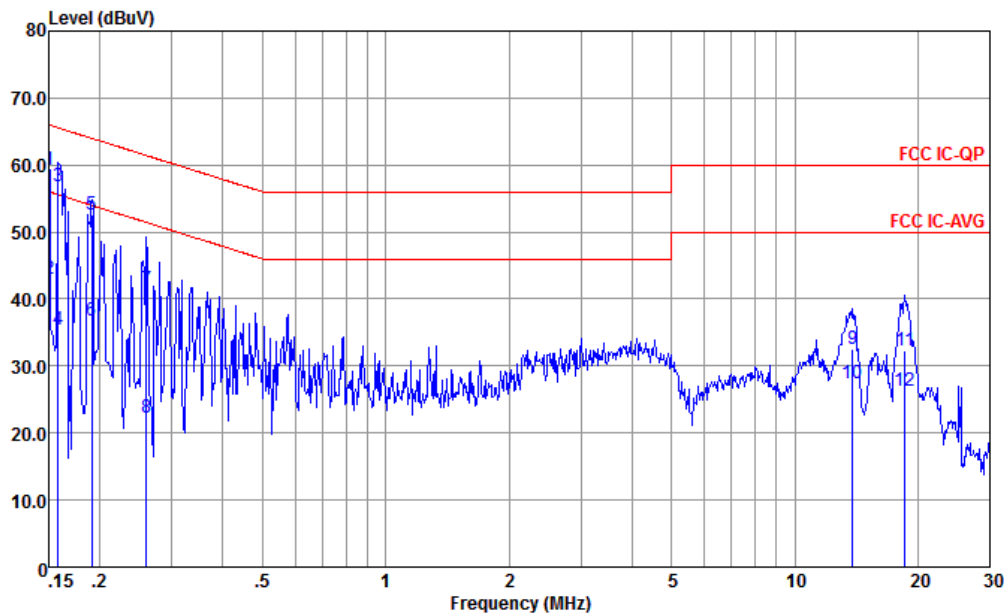
3.1.4 Test Setup





3.1.5 Test Result of AC Conducted Emission

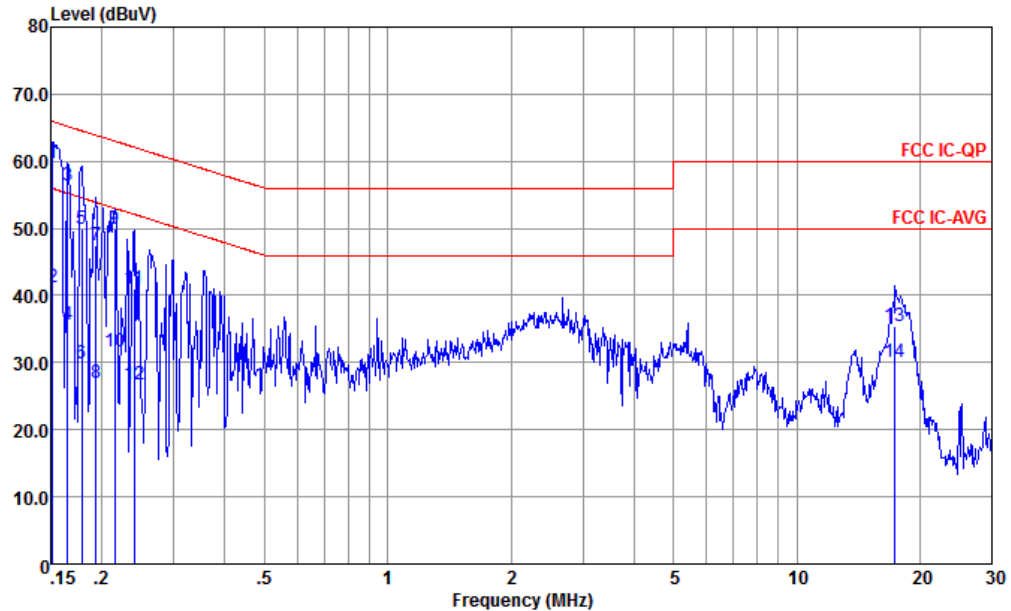
Test Engineer :	Amos Zhang	Temperature :	24.2~25.6°C
		Relative Humidity :	37~39%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Site : CO01-KS
Condition : FCC IC-QP LISN-060103-L 2024 LINE

	Freq	Level	Over	Limit	Read	LISN	Cable	Remark
	MHz	dBuV	Limit	Line	Level	Factor	Loss	
			dB	dBuV	dBuV	dB	dB	
1 *	0.150	59.30	-6.70	66.00	48.40	0.45	10.45	QP
2	0.150	43.10	-12.90	56.00	32.20	0.45	10.45	Average
3	0.158	56.78	-8.78	65.56	45.90	0.43	10.45	QP
4	0.158	35.48	-20.08	55.56	24.60	0.43	10.45	Average
5	0.191	52.69	-11.29	63.98	41.80	0.43	10.46	QP
6	0.191	36.79	-17.19	53.98	25.90	0.43	10.46	Average
7	0.260	41.43	-19.99	61.42	30.50	0.46	10.47	QP
8	0.260	22.23	-29.19	51.42	11.30	0.46	10.47	Average
9	13.841	32.60	-27.40	60.00	21.70	0.63	10.27	QP
10	13.841	27.40	-22.60	50.00	16.50	0.63	10.27	Average
11	18.622	32.42	-27.58	60.00	21.49	0.63	10.30	QP
12	18.622	26.22	-23.78	50.00	15.29	0.63	10.30	Average

Test Engineer :	Amos Zhang	Temperature :	24.2~25.6°C
		Relative Humidity :	37~39%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Site : CO01-KS
Condition : FCC IC-QP LISN-060105-N 2024 NEUTRAL

	Freq	Level	Over	Limit	Read	LISN	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1 *	0.152	59.67	-6.24	65.91	49.10	0.12	10.45	QP
2	0.152	41.17	-14.74	55.91	30.60	0.12	10.45	Average
3	0.165	56.48	-8.73	65.21	45.91	0.12	10.45	QP
4	0.165	35.58	-19.63	55.21	25.01	0.12	10.45	Average
5	0.179	49.98	-14.57	64.55	39.39	0.13	10.46	QP
6	0.179	29.78	-24.77	54.55	19.19	0.13	10.46	Average
7	0.193	47.49	-16.40	63.89	36.90	0.13	10.46	QP
8	0.193	26.99	-26.90	53.89	16.40	0.13	10.46	Average
9	0.215	49.85	-13.16	63.01	39.31	0.08	10.46	QP
10	0.215	31.75	-21.26	53.01	21.21	0.08	10.46	Average
11	0.240	41.08	-21.00	62.08	30.59	0.02	10.47	QP
12	0.240	26.78	-25.30	52.08	16.29	0.02	10.47	Average
13	17.383	35.52	-24.48	60.00	25.50	-0.27	10.29	QP
14	17.383	30.12	-19.88	50.00	20.10	-0.27	10.29	Average

Note:

- Level(dBμV) = Read Level(dBμV) + LISN Factor(dB) + Cable Loss(dB)
- 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

Note: Measurement below 1GHz follows the CISPR 22 limit line as below :

15.109 (g) As an alternative to the radiated emission limits shown in paragraphs (a) and (b) of this section, digital devices may be shown to comply with the standards contained in Third Edition of the International Special Committee on Radio Interference (CISPR), Pub. 22, "Information Technology Equipment - Radio Disturbance Characteristics - Limits and Methods of Measurement"

<CISPR 22 Class B Limit>

Frequency (MHz)	Field Strength (dBuV/meter)	Measurement Distance (meters)
30 – 230	30	10
230 – 1000	37	10

3.2.2. Measuring Instruments

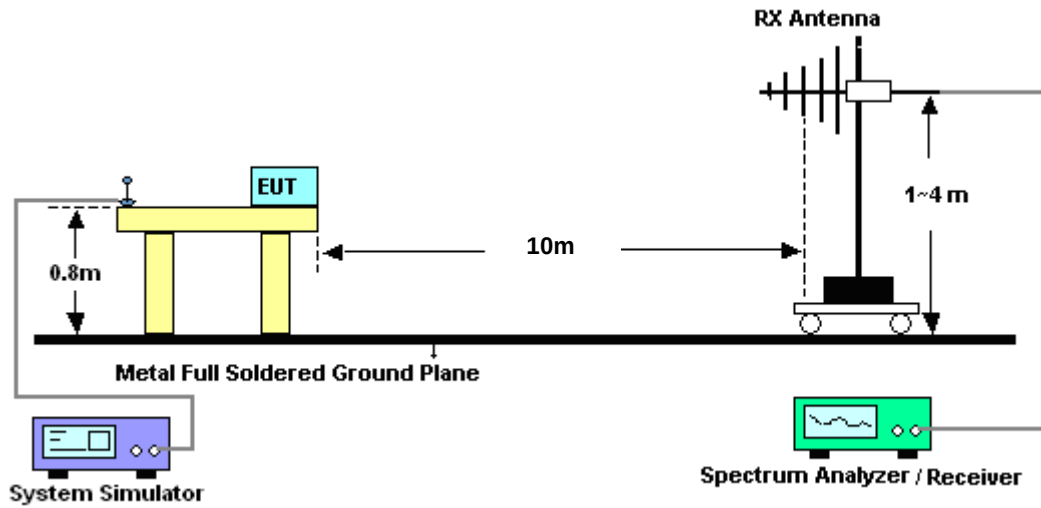
The measuring equipment is listed in the section 4 of this test report.

3.2.3. Test Procedures

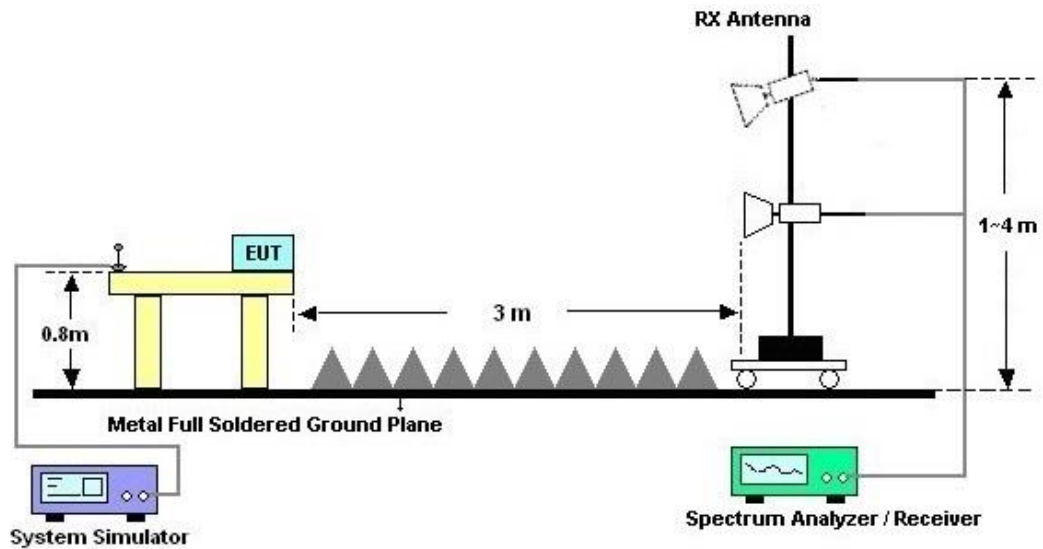
1. The EUT was placed on a turntable with 0.8 meter above ground.
2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiation.
4. The antenna 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.
5. 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.
6. 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).
7. 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.
8. Emission level (dBμV/m) = 20 log Emission level (μV/m)
9. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
10. 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

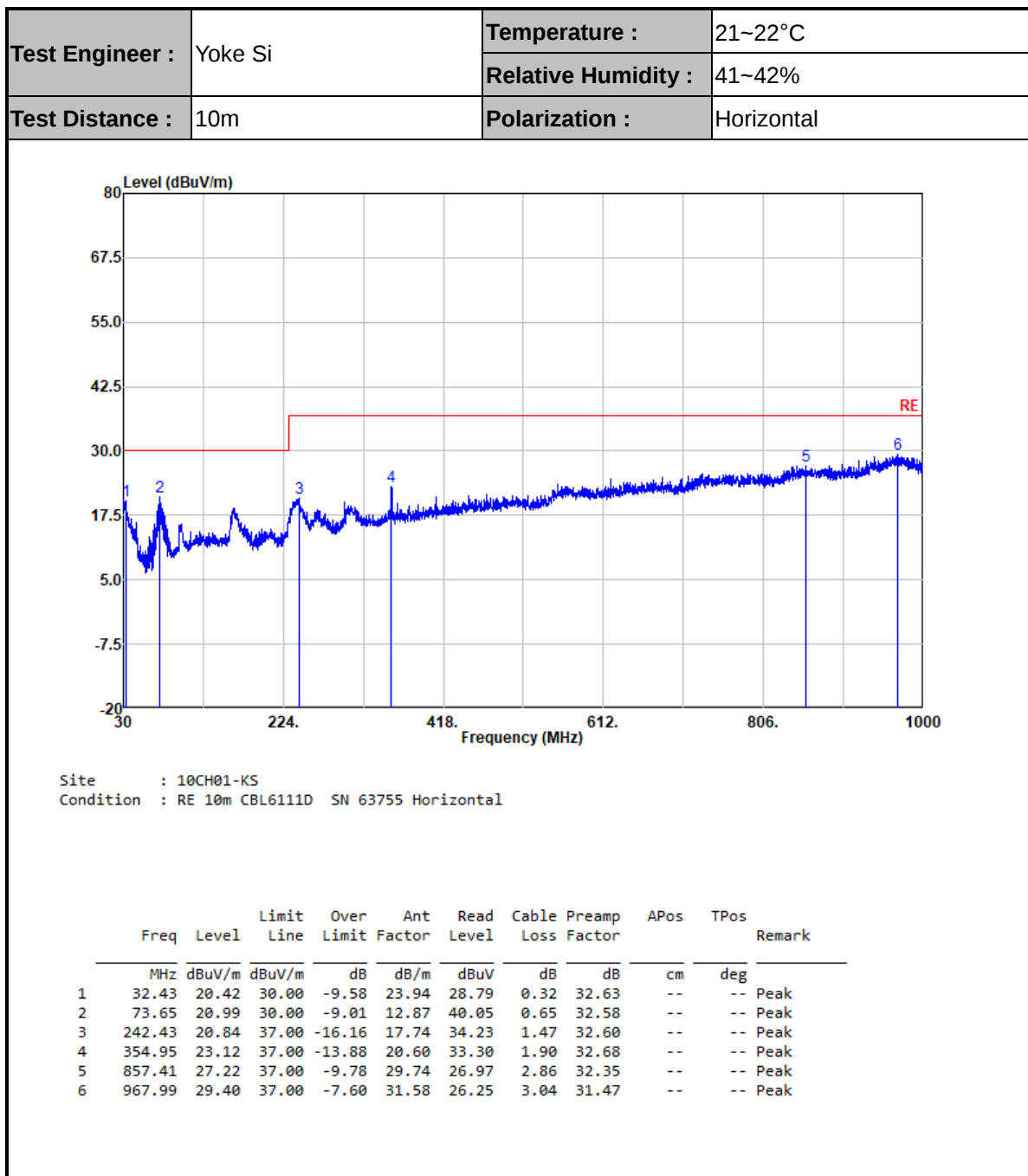


For radiated emissions above 1GHz

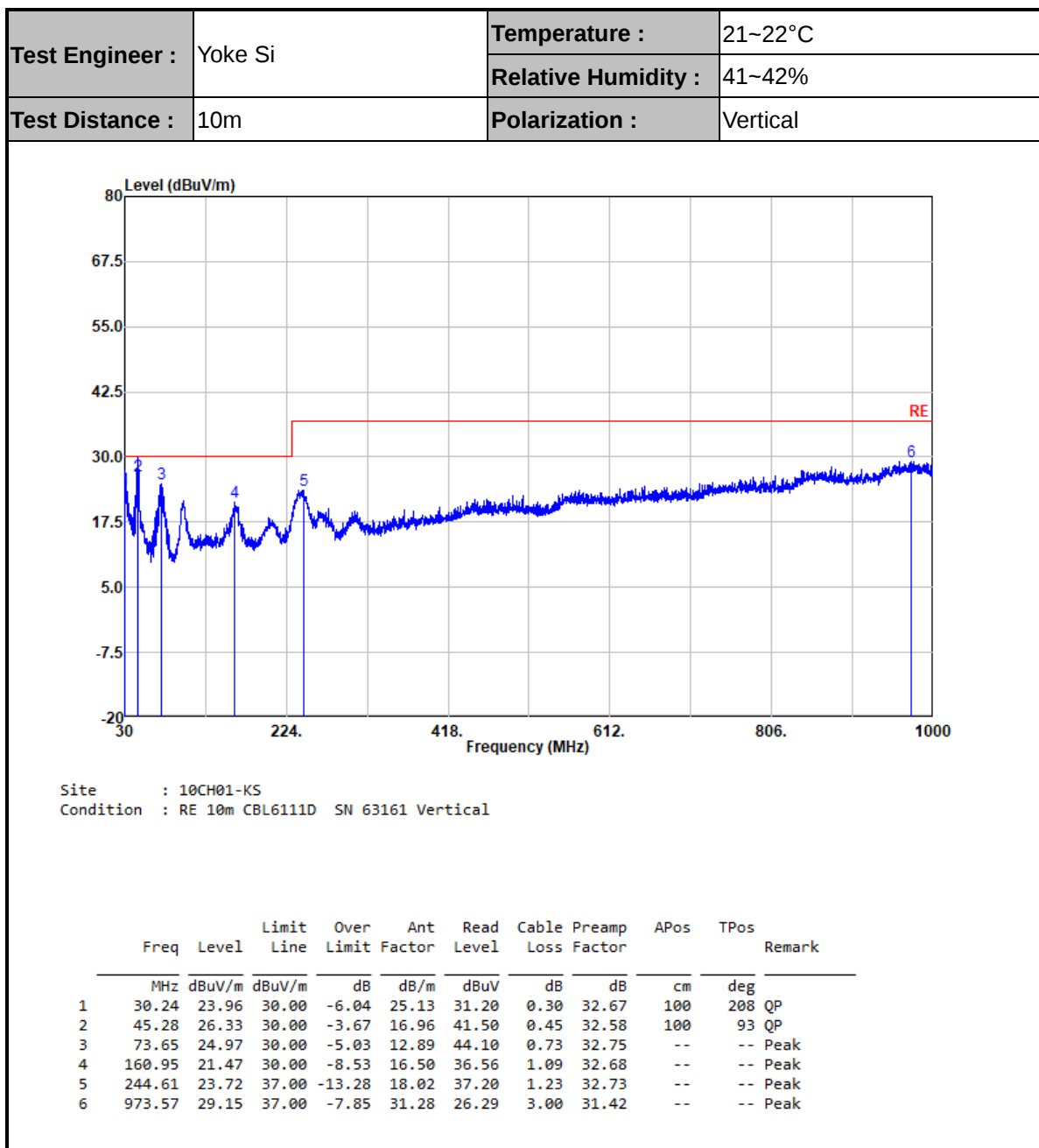


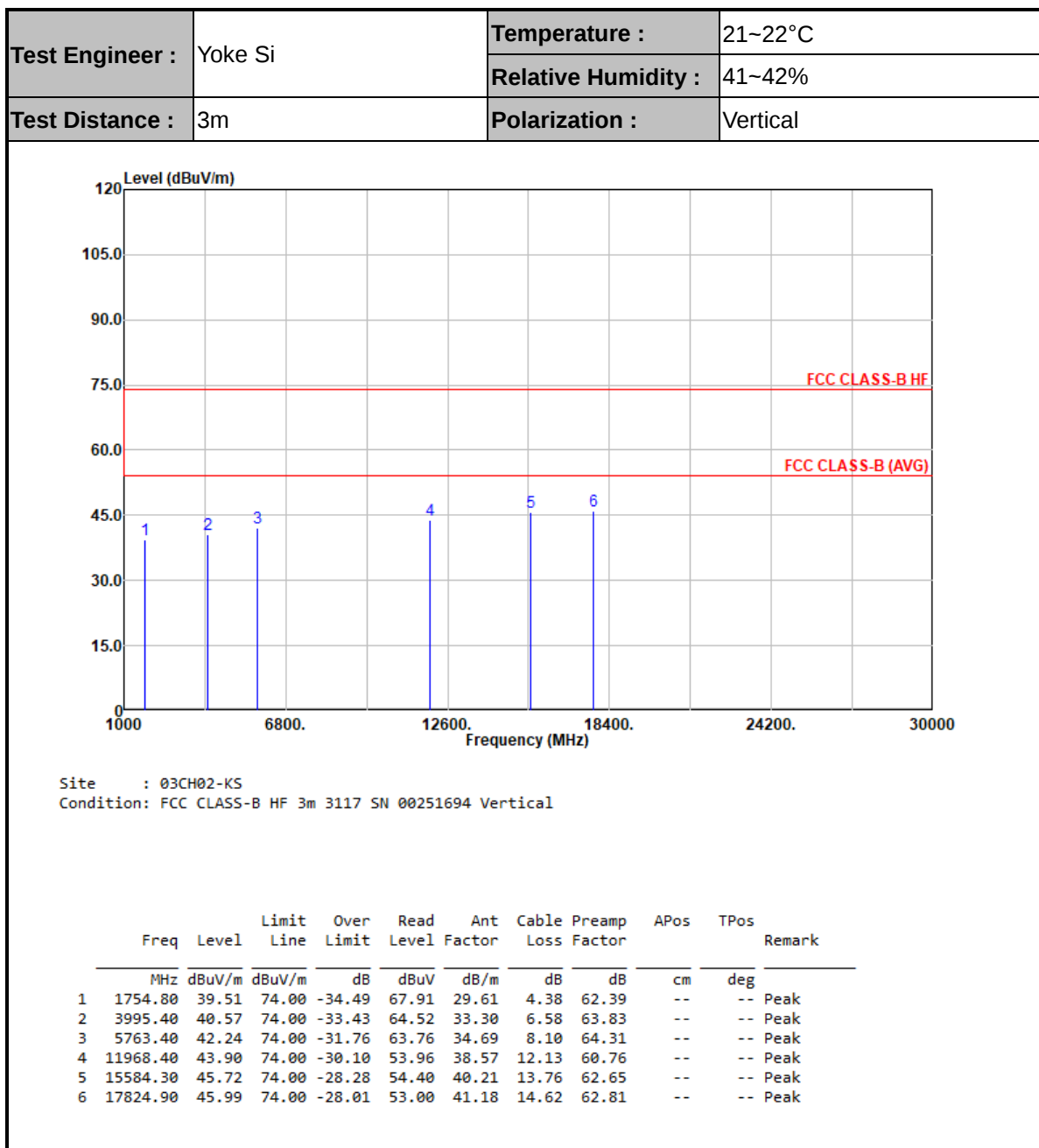


3.2.5. Test Result of Radiated Emission









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
EXA Spectrum Analyzer	Keysight	N9010A	MY55370528	10Hz-44G,MAX 30dB	Oct. 11, 2024	Feb. 14, 2025 ~Mar. 18, 2025	Oct. 10, 2025	Radiation (03CH02-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	75959	1GHz~18GHz	Mar. 01, 2024	Feb. 14, 2025 ~Mar. 18, 2025	Feb. 28, 2025	Radiation (03CH02-KS)
SHF-EHF Horn	Com-power	AH-840	101115	18GHz~40GHz	Oct. 22, 2024	Feb. 14, 2025 ~Mar. 18, 2025	Oct. 21, 2025	Radiation (03CH02-KS)
Amplifier	EM	EM18G40GA	060852	18~40GHz	Jan. 03, 2025	Feb. 14, 2025 ~Mar. 18, 2025	Jan. 02, 2026	Radiation (03CH02-KS)
Amplifier	EM	EM01G18G	060840	1Ghz-18Ghz	Oct. 09, 2024	Feb. 14, 2025 ~Mar. 18, 2025	Oct. 08, 2025	Radiation (03CH02-KS)
AC Power Source	Chroma	61601	616010002473	N/A	NCR	Feb. 14, 2025 ~Mar. 18, 2025	NCR	Radiation (03CH02-KS)
Turn Table	MF	MF7802	N/A	0~360 degree	NCR	Feb. 14, 2025 ~Mar. 18, 2025	NCR	Radiation (03CH02-KS)
Antenna Mast	MF	MF7802	N/A	1 m~4 m	NCR	Feb. 14, 2025 ~Mar. 18, 2025	NCR	Radiation (03CH02-KS)
Bilog Antenna	TESEQ	CBL6111D	63161	30MHz~1GHz	Oct. 25, 2024	Feb. 14, 2025 ~Mar. 18, 2025	Oct. 24, 2025	Radiation (10CH01-KS)
Bilog Antenna	TESEQ	CBL6111D	63755	30MHz~1GHz	Oct. 25, 2024	Feb. 14, 2025 ~Mar. 18, 2025	Oct. 24, 2025	Radiation (10CH01-KS)
EMI test receiver	R&S	ESR7	102630	9KHz~7GHz	Oct. 09, 2024	Feb. 14, 2025 ~Mar. 18, 2025	Oct. 08, 2025	Radiation (10CH01-KS)
EMI test receiver	R&S	ESR7	102631	9KHz~7GHz	Oct. 09, 2024	Feb. 14, 2025 ~Mar. 18, 2025	Oct. 08, 2025	Radiation (10CH01-KS)
Amplifier	SONOMA	310N	422544	9KHz ~1GHZ	Oct. 09, 2024	Feb. 14, 2025 ~Mar. 18, 2025	Oct. 08, 2025	Radiation (10CH01-KS)
Amplifier	SONOMA	310N	422545	9KHz ~1GHZ	Oct. 09, 2024	Feb. 14, 2025 ~Mar. 18, 2025	Oct. 08, 2025	Radiation (10CH01-KS)
Radio communication analyzer	Anritsu	MT8821C	6261806798	2G/3G/LTEband 1-46 ,48,65-70	Jul, 04, 2024	Feb. 14, 2025 ~Mar. 18, 2025	Jul, 03, 2025	Radiation (10CH01-KS)
Loop Antenna	R&S	HFH2-Z2E	101125	9kHz~30MHz	Sep. 08, 2024	Feb. 14, 2025 ~Mar. 18, 2025	Sep. 07, 2025	Radiation (10CH01-KS)
Bore-site Antenna Mast	EM	MBD-400-1	NA	1 m~4 m	NCR	Feb. 14, 2025 ~Mar. 18, 2025	NCR	Radiation (10CH01-KS)
Antenna Mast	EM	MBD-400-1	NA	1 m~4 m	NCR	Feb. 14, 2025 ~Mar. 18, 2025	NCR	Radiation (10CH01-KS)
Controller	EM	3000-1	NA	NA	NCR	Feb. 14, 2025 ~Mar. 18, 2025	NCR	Radiation (10CH01-KS)
Turn Table	EM	T-300-1	NA	0~360 degree	NCR	Feb. 14, 2025 ~Mar. 18, 2025	NCR	Radiation (10CH01-KS)
EMI Receiver	R&S	ESC17	100768	9kHz~7GHz;	Apr. 18, 2024	Mar. 10, 2025	Apr. 17, 2025	Conduction (CO01-KS)
AC LISN (for auxiliary equipment)	MessTec	AN3016	060103	9kHz~30MHz	Aug. 20, 2024	Mar. 10, 2025	Aug. 19, 2025	Conduction (CO01-KS)
AC LISN	MessTec	AN3016	060105	9kHz~30MHz	Apr. 18, 2024	Mar. 10, 2025	Apr. 17, 2025	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP000000811	AC 0V~300V, 45Hz~1000Hz	Oct. 09, 2024	Mar. 10, 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% ($U = 2U_c(y)$)	2.84dB
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Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)-03CH02-KS

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	5.12dB
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Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)-03CH02-KS

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	5.30dB
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Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz) - 10CH01-KS(Horizontal)

Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$)	5.12dB
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Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz) - 10CH01-KS(Vertical)

Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$)	5.12dB
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