



Test Report No.:
GJWSZ2025-0226

RF Test Report

FCC ID : 2AFIW-LWR01

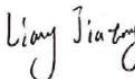
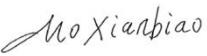
NAME OF SAMPLE : Wireless Human Presence Sensor

APPLICANT : GL Technologies (Hong Kong) Limited

CLASSIFICATION OF TEST : N/A

CVC Testing Technology (Shenzhen) Co., Ltd.



Applicant		Name: GL Technologies (Hong Kong) Limited Address: Unit 601, Building 5W, Hong Kong Science Park, Shatin, N.T., Hong Kong	
Manufacturer		Name: GL Technologies (Hong Kong) Limited Address: Unit 601, Building 5W, Hong Kong Science Park, Shatin, N.T., Hong Kong	
Equipment Under Test		Name: Wireless Human Presence Sensor Model/Type: LWR01 Brand: Lafaer Serial No.: N/A Sampe No.: GJWSZ2025-0226_1-1	
Date of Receipt.	Apr.16,2025	Date of Testing	Apr.13,2025~May.14,2025
Test Specification		Test Result	
FCC Part 15, Subpart C, Section 15.249		PASS	
Evaluation of Test Result		The equipment under test was found to comply with the requirements of the standards applied.	
		Seal of CVC Issue Date: May.15,2025	
Compiled by:  <u>Liang Jiatong</u> Name Signature	Reviewed by:  <u>Mo Xianbiao</u> Name Signature	Approved by:  <u>Dong Sanbi</u> Name Signature	
Other Aspects: NONE.			
Abbreviations:OK, Pass= passed		Fail = failed	N/A= not applicable
EUT= equipment, sample(s) under tested			

This test report relates only to the EUT, and shall not be reproduced except in full, without written approval of CVC.



TABLE OF CONTENTS

RELEASE CONTROL RECORD	4
1 SUMMARY OF TEST RESULTS.....	5
1.1 LIST OF TEST AND MEASUREMENT INSTRUMENTS	6
1.2 MEASUREMENT UNCERTAINTY	8
1.3 TEST LOCATION	9
2 GENERAL INFORMATION.....	10
2.1 GENERAL PRODUCT INFORMATION	10
2.2 OTHER INFORMATION	10
2.3 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL.....	11
2.4 GENERAL DESCRIPTION OF APPLIED STANDARDS	12
2.5 DESCRIPTION OF SUPPORT UNITS	12
3 TEST TYPES AND RESULTS	13
3.1 CONDUCTED EMISSION	13
3.2 RADIATED EMISSION AND BANDEdge MEASUREMENT	16
3.3 20DB BANDWIDTH MEASUREMENT	29
3.4 FIELD STRENGTH & OUT OF BAND EMISSION MEASUREMENT	31
3.5 ANTENNA REQUIREMENT	34
4 PHOTOGRAPHS OF TEST SETUP	35



RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
GJWSZ2025-0226	Original release	May.15,2025



1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 15, Subpart C			
STANDARD SECTION	TEST TYPE AND LIMIT	RESULT	REMARK
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit.
15.249(a) 15.209	Radiated Emissions	PASS	Meet the requirement of limit.
15.249(a) 15.249(d)	Field Strength & Out of band emissions	PASS	Meet the requirement of limit.
15.215(c)	20dB bandwidth	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	Meet the requirement of limit.



1.1 LIST OF TEST AND MEASUREMENT INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial Number	Cal. interval	Cal.Day	Cal. Due
Radiation Spurious(Above 1GHz)						
Spectrum Analyzer	R&S	FSV 40	CS030001	1 year	2025/05/17	2026/05/16
Spectrum Analyzer	R&S	FSVA 3045	CS030004	1 year	2024/05/23	2025/05/22
EMI Test Receiver	R&S	ESR3	CS030005	1 year	2024/05/25	2025/05/24
Horn antenna(1GHz-18GHz)	ETS-Lindgren	3117	CS030007	1 year	2025/03/29	2026/03/28
Horn antenna(18GHz-40GHz)	STEATITE	QMS-00880	CS030008	1 year	2025/03/22	2026/03/21
Automatic control unit(RSE)	R&S	OSP220	CS030019	1 year	2024/07/03	2025/07/02
Filter group(RSE-BT/WiFi)	R&S	WiFi/BT Variant 1	CS030020	1 year	2025/04/23	2026/04/22
Filter group(RSE-Cellular)	R&S	Cellular Variant 1	CS030021	1 year	2025/04/23	2026/04/22
Preamplifier(1GHz-18GHz)	R&S	SCU18F	CS030031-1	1 year	2025/04/23	2026/04/22
Preamplifier(1GHz-18GHz)	R&S	SCU-18F	CS030031	1 year	2025/04/23	2026/04/22
Comprehensive Test Instrument	R&S	CMW 500	CS030033	1 year	2024/05/25	2025/05/24
Antenna(30MHz~1001MHz)	SCHWARZBECK	VULB9168	CS0200006	1 year	2025/01/23	2026/01/22
Preamplifier(1GHz-18GHz)	R&S	SCU-01F	CS0200042	1 year	2025/04/23	2026/04/22
Preamplifier(18GHz-40GHz)	R&S	SCU40A	CS0200044	1 year	2025/04/23	2026/04/22
Attenuator	boyang	BY--N-2W-5dB	/	1 year	2025/01/23	2026/01/22
Temperature and humidity meter	yuhuaze	/	WK0001	1 year	2025/04/29	2026/04/28
#2 control room	MORI	433	CS0300028	3 year	2025/05/17	2026/05/16
3m anechoic chamber	MORI	966	CS0300011	3 year	2025/05/17	2026/05/16
CE Test - 3M Chamber						
EMI Test Receiver	R&S	ESR3	CS030001	1 year	2024/05/25	2025/05/24
Voltage probe	SCHWARZBECK	CVP9222C	CS0200002-2	1 year	2025/04/29	2026/04/28
Voltage probe	R&S	EZ-17	CS0200002-3	1 year	2025/04/23	2026/04/22
ISN network	R&S	ENY81	CS0200015	1 year	2025/04/23	2026/04/22
ISN network	R&S	ENY81Cat6	CS0200016	1 year	2025/04/23	2026/04/22
Artificial Power Network (three-phase)	SCHWARZBECK	NNLK&8129RC	CS0200037	1 year	2025/04/23	2026/04/22
Temperature and humidity meter	UNI-T	A10T	C193561430	1 year	2025/04/29	2026/04/28
limiter (10 dB)	Rohde&Schwarz	ESH3-Z2	102824	1 year	2024/05/16	2025/05/15
RE Test - 3M Chamber(Below 1GHz)						
EMI Test Receiver	Rohde&Schwarz	ESR 26	101718	1 year	2024/05/25	2025/05/24
Loop antenna (8.3k~30MHz)	Rohde&Schwarz	HFH2-Z2E	100951	1 year	2024/06/04	2025/06/03
Antenna(30MHz~1000MHz)	SCHWARZBECK	VULB 9168	1132	1 year	2025/02/28	2026/02/27
3m anechoic chamber	MORI	966	N/A	1 year	2025/05/19	2026/05/18
Preamplifier(10kHz-1GHz)	Rohde&Schwarz	SCU-01F	100298	1 year	2025/04/23	2026/04/22
Preamplifier(1GHz-18GHz)	Rohde&Schwarz	SCU-18F	100799	1 year	2025/04/23	2026/04/22
#1 control room	MORI	433	/	1 year	2025/05/17	2026/05/16
Temperature and humidity meter	/	C193561473	C193561473	1 year	2025/04/29	2026/04/28
RE Test - 3M Chamber(Below 1GHz)						
3m anechoic chamber	MORI	966	CS0300011	3 year	2025/5/19	2026/5/18
#2 control room	MORI	433	CS0300028	3 year	2025/5/17	2026/5/16
Signal&Spectrum Analyzer	keysight	N9040B	CS0300074	1 year	2024/9/25	2025/9/24
SA Expansion Module(40-60GHz)	VDI	N9029AV19	CS0300075	3 year	2024/9/15	2025/9/14
SA Expansion	VDI	N9029AV12	CS0300076	3 year	2024/9/15	2025/9/14



Equipment	Manufacturer	Model No.	Serial Number	Cal. interval	Cal.Day	Cal. Due
Module(60-90GHz)						
SA Expansion Module(90-140GHz)	VDI	N9029AV08	CS0300077	3 year	2024/9/15	2025/9/14
SA Expansion Module(140-220GHz)	VDI	N9029AV05	CS0300078	3 year	2024/9/15	2025/9/14
Horn antenna(40-60GHz)	CMI	HO19R	CS0300086	3 year	2024/9/15	2025/9/14
Horn antenna(60-90GHz)	CMI	HO12R	CS0300088	3 year	2024/9/15	2025/9/14
Horn antenna(90-140GHz)	CMI	HO08R	CS0300090	3 year	2024/9/15	2025/9/14
Horn antenna(140-220GHz)	CMI	HO05R	CS0300092	3 year	2024/9/15	2025/9/14

1.2 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

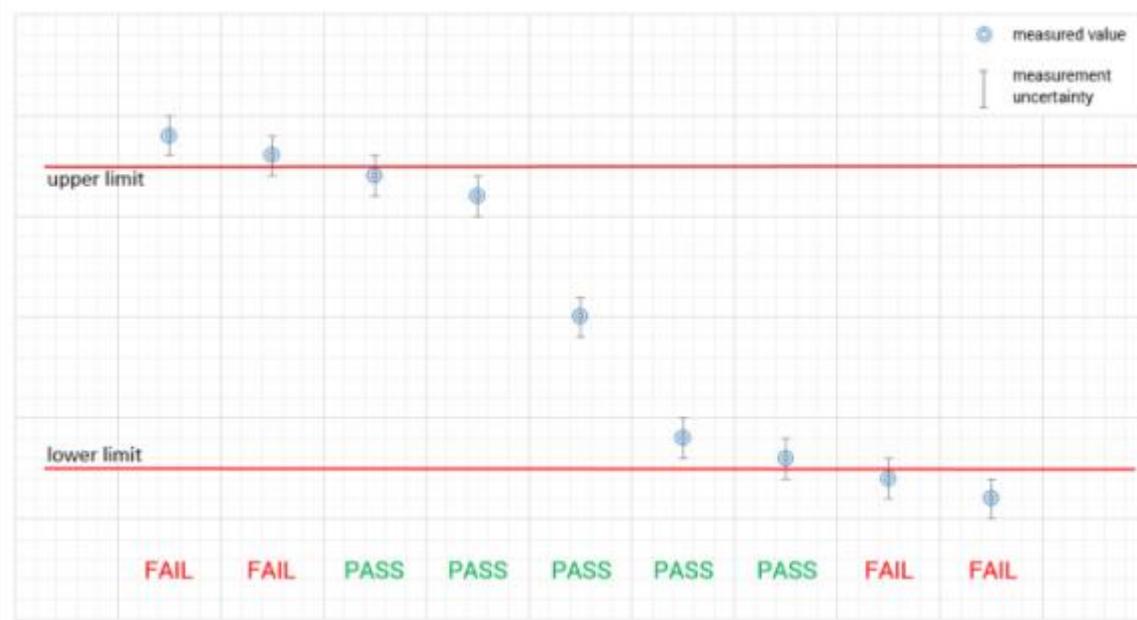
No.	Item	Measurement Uncertainty
1	Conducted emission test	+/-2.7 dB
2	Radiated emission 9kHz-30MHz	+/-5.6 dB
3	Radiated emission 30MHz-1GHz	+/-4.6 dB
4	Radiated emission 1GHz-18GHz	+/-4.4 dB
5	Radiated emission 18GHz-40GHz	+/-5.1 dB
6	Radiated Emissions(40GHz-60GHz)	± 4.8 dB
7	Radiated Emissions(60GHz-90GHz)	± 4.8 dB
8	Radiated Emissions(90GHz-140GHz)	± 5.0 dB
9	Radiated Emissions(140GHz-220GHz)	± 5.1 dB
10	Radiated Emissions(220GHz-300GHz)	± 4.8 dB
11	RF power	+/-0.9 dB
12	Power Spectral Density	+/-0.8 dB
13	Conducted spurious emissions	+/-2.7 dB
14	Transmission Time	+/-0.27%
15	Occupied Bandwidth	+/-1.86%

Remark: 95% Confidence Levels, k=2.

Only the measured values related to their corresponding limits will be used to decide whether the equipment under test meets the requirements of the test standards listed.

The measurement uncertainty is mentioned in this test report, but is not taken into account - neither to the limits nor to the measurement results. Measurement results with a smaller margin to the corresponding limits than the measurement uncertainty have a potential risk of more than 5% that the decision might be wrong.

measured value, measurement uncertainty, verdict





1.3 TEST LOCATION

The tests and measurements refer to this report were performed by EMC testing Lab. of CVC Testing Technology (Shenzhen) Co., Ltd.

Lab Address: No. 1301-14&16, Guanguang Road, Xinlan Community, Guanlan Subdistrict, Longhua District, Shenzhen, Guangdong, China

Post Code: 518110 Tel: 0755-23763060-8805

Fax: 0755-23763060 E-mail: sz-kf@cvc.org.cn

FCC(Test firm designation number: CN1363)

IC(Test firm CAB identifier number: CN0137)

CNAS(Test firm designation number: L16091)



2 GENERAL INFORMATION

2.1 GENERAL PRODUCT INFORMATION

PRODUCT	Wireless Human Presence Sensor
BRAND	Lafaer
MODEL	LWR01
ADDITIONAL MODEL	N/A
POWER SUPPLY	AC 120V/60Hz
MODULATION TYPE	FMCW
OPERATING FREQUENCY	24GHz-24.25GHz
NUMBER OF CHANNEL	1
FIELD STRENGTH	104.66dBuV/m
ANTENNA TYPE (Remark 3)	Integrated Antenna
I/O PORTS	Refer to user's manual
CABLE SUPPLIED	N/A

Remark:

1. For more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
2. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.
3. Please refer to the antenna report.

2.2 OTHER INFORMATION

The EUT only have one channel.

CHANNEL	FREQUENCY (GHz)
1	24-24.25



2.3 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

Pre-scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, xyz axis and antenna ports

EUT CONFIGURE MODE	APPLICABLE TEST ITEMS				DESCRIPTION
	RE<1G	RE≥1G	PLC	BW	
A	√	√	√	√	Radar

Where **RE<1G**: Radiated Emission below 1GHz

PLC: Power Line Conducted Emission

RE≥1G: Radiated Emission above 1GHz

BW: 20db bandwidth

RADIATED EMISSION TEST :

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, XYZ axis, antenna ports (if EUT with antenna diversity architecture) and packet type.
- The worst case was found when positioned on x axis for radiated emission. Following channel(s) was (were) selected for the final test as listed below:

EUT CONFIGURE MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TYPE	DATA RATE
A	1	1	FMCW	default

For the test results, only the worst case was shown in test report.

20DB BANDWIDTH MEASUREMENT:

- This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, antenna ports (if EUT with antenna diversity architecture), and packet types.
- Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TYPE	DATA RATE
A	1	1	FMCW	default

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	TEST VOLTAGE (SYSTEM)	TESTED BY
RE<1G	25.5deg. C, 55%RH	AC 120V/60Hz	Liu Yuan
RE≥1G	25.5deg. C, 55%RH	AC 120V/60Hz	Liu Yuan
PLC	25.5deg. C, 55%RH	AC 120V/60Hz	Zhou Ye
APCM	25.5deg. C, 55%RH	AC 120V/60Hz	Liu Yuan



2.4 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF product, according to the specifications of the manufacturers. It must comply with the requirements of the following standards:

FCC PART 15, Subpart C. Section 15.249
ANSI C63.10-2020

All test items have been performed and recorded as per the above standards

2.5 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Support Equipment					
NO	Description	Brand	Model No.	Serial Number	Supplied by
1	N/A	N/A	N/A	N/A	N/A
Support Cable					
NO	Description	Quantity (Number)	Length (cm)	Detachable (Yes/ No)	Shielded (Yes/ No)
1	N/A	N/A	N/A	N/A	N/A

3 TEST TYPES AND RESULTS

3.1 CONDUCTED EMISSION

3.1.1 Limits

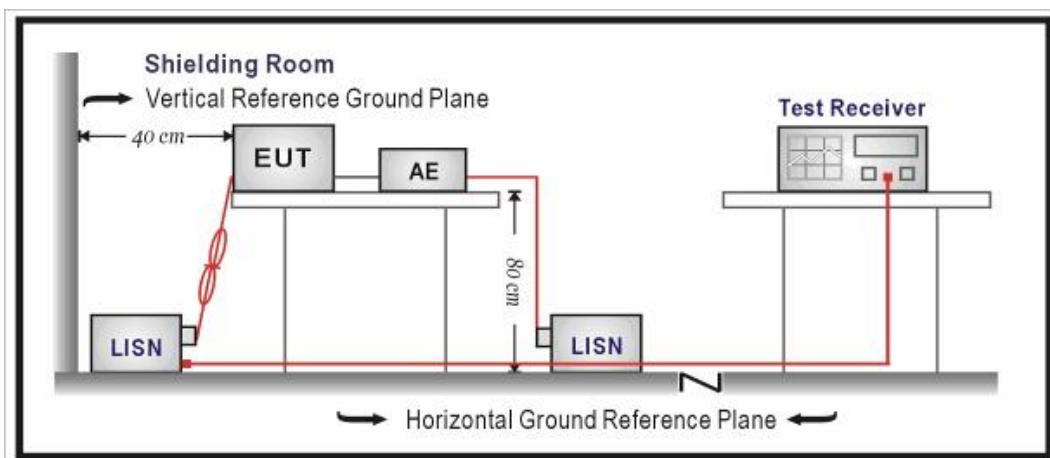
Frequency (MHz)	Conducted Limits(dB μ V)	
	Quasi-peak	Average
0.15 - 0.5	66 to 56 *	56 to 46*
0.5 - 5	56	46
5 - 30	60	50

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

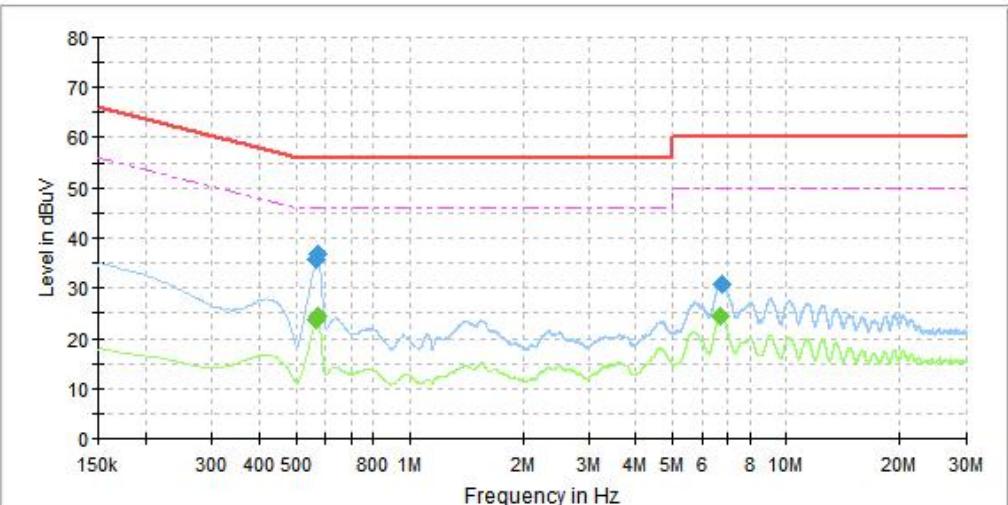
3.1.2 Test Procedures

- a. The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface. The EUT and simulators are connected to the main power through a line impedance stabilization network (LISN). The LISN provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN. (Please refer to the Test photographs) Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source. The equipment under test shall be placed on a support of non-metallic material, the height of which shall be 1.5m above the ground,
- b. The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.
- c. Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9 kHz.

3.1.3 Test setup



3.1.4 Test Results

Test Mode	Radar	Frequency Range	150KHz ~ 30MHz																																																								
Test Voltage	AC 120V/60Hz	PHASE	Line (L)																																																								
 A line graph showing the spectral emissions of a device. The y-axis is 'Level in dBuV' ranging from 0 to 80. The x-axis is 'Frequency in Hz' on a logarithmic scale from 150k to 30M. A red solid line represents the emission spectrum, which peaks at approximately 56.0 dBuV at 0.564 MHz. A blue dashed line represents the Emissions Mask. A green line shows the noise floor. Two blue diamond markers are placed on the emission spectrum at 0.564 MHz and 6.738 MHz, and two green diamond markers are placed at 0.571 MHz and 6.686 MHz. The margin is the difference between the emission level and the mask level.																																																											
<table border="1"><thead><tr><th>NO</th><th>Frequency (MHz)</th><th>QuasiPeak (dBuV)</th><th>Average (dBuV)</th><th>Limit (dBuV)</th><th>Margin (dB)</th><th>Line</th><th>Corr.Factor (dB)</th></tr></thead><tbody><tr><td>1</td><td>0.564</td><td>35.6</td><td>---</td><td>56.0</td><td>20.4</td><td>L1</td><td>20.3</td></tr><tr><td>2</td><td>0.564</td><td>---</td><td>23.7</td><td>46.0</td><td>22.3</td><td>L1</td><td>20.3</td></tr><tr><td>3</td><td>0.571</td><td>36.8</td><td>---</td><td>56.0</td><td>19.2</td><td>L1</td><td>20.3</td></tr><tr><td>4</td><td>0.571</td><td>---</td><td>24.5</td><td>46.0</td><td>21.5</td><td>L1</td><td>20.3</td></tr><tr><td>5</td><td>6.686</td><td>---</td><td>24.4</td><td>50.0</td><td>25.6</td><td>L1</td><td>22.6</td></tr><tr><td>6</td><td>6.738</td><td>30.9</td><td>---</td><td>60.0</td><td>29.1</td><td>L1</td><td>22.6</td></tr></tbody></table>				NO	Frequency (MHz)	QuasiPeak (dBuV)	Average (dBuV)	Limit (dBuV)	Margin (dB)	Line	Corr.Factor (dB)	1	0.564	35.6	---	56.0	20.4	L1	20.3	2	0.564	---	23.7	46.0	22.3	L1	20.3	3	0.571	36.8	---	56.0	19.2	L1	20.3	4	0.571	---	24.5	46.0	21.5	L1	20.3	5	6.686	---	24.4	50.0	25.6	L1	22.6	6	6.738	30.9	---	60.0	29.1	L1	22.6
NO	Frequency (MHz)	QuasiPeak (dBuV)	Average (dBuV)	Limit (dBuV)	Margin (dB)	Line	Corr.Factor (dB)																																																				
1	0.564	35.6	---	56.0	20.4	L1	20.3																																																				
2	0.564	---	23.7	46.0	22.3	L1	20.3																																																				
3	0.571	36.8	---	56.0	19.2	L1	20.3																																																				
4	0.571	---	24.5	46.0	21.5	L1	20.3																																																				
5	6.686	---	24.4	50.0	25.6	L1	22.6																																																				
6	6.738	30.9	---	60.0	29.1	L1	22.6																																																				
Remark: The emission levels of other frequencies were very low against the limit.																																																											



Test Mode	Radar	Frequency Range	150KHz ~ 30MHz				
Test Voltage	AC 120V/60Hz	PHASE	Line (N)				
NO	Frequency (MHz)	QuasiPeak (dBuV)	Average (dBuV)	Limit (dBuV)	Margin (dB)	Line	Corr.Factor (dB)
1	0.427	27.7	---	57.3	29.7	N	20.2
2	0.431	---	21.3	47.2	25.9	N	20.2
3	0.564	34.7	---	56.0	21.3	N	20.2
4	0.564	---	30.3	46.0	15.7	N	20.2
5	0.571	35.8	---	56.0	20.2	N	20.2
6	0.571	---	31.2	46.0	14.8	N	20.2



3.2 RADIATED EMISSION AND BANDEdge MEASUREMENT

3.2.1 Limit

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

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

NOTE: 1. The lower limit shall apply at the transition frequencies.
NOTE: 2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
NOTE: 3. As shown in 15.35(b), for frequencies above 1000MHz, 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 20dB under any condition of modulation.

3.2.2 Measurement procedure

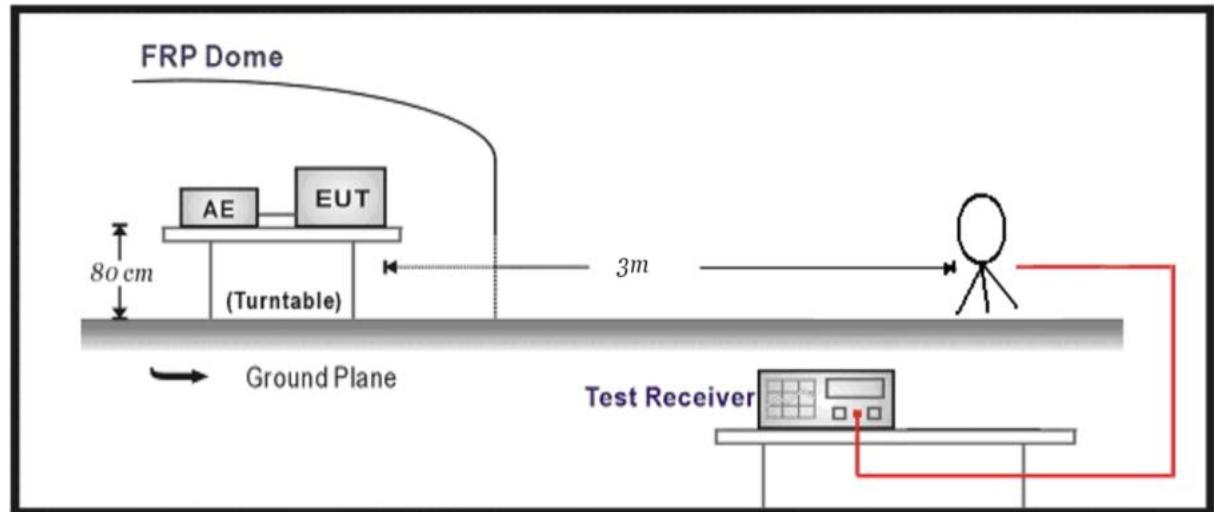
- a. The EUT was placed on the top of a rotating table 1.5 meters(above 1GHz) and 0.8 meters(below 1GHz) above the ground at a 3 meters semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. For below 1GHz was used bilog antenna, and above 1GHz was used horn antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. For below 30MHz, a loop antenna with its vertical plane is place 3m from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. And the centre of the loop shall be 1m above the ground.
- g. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, For battery operated equipment, the equipment tests shall be perform using fresh batteries. The turntable was rotated to maximize the emission level.

NOTE:

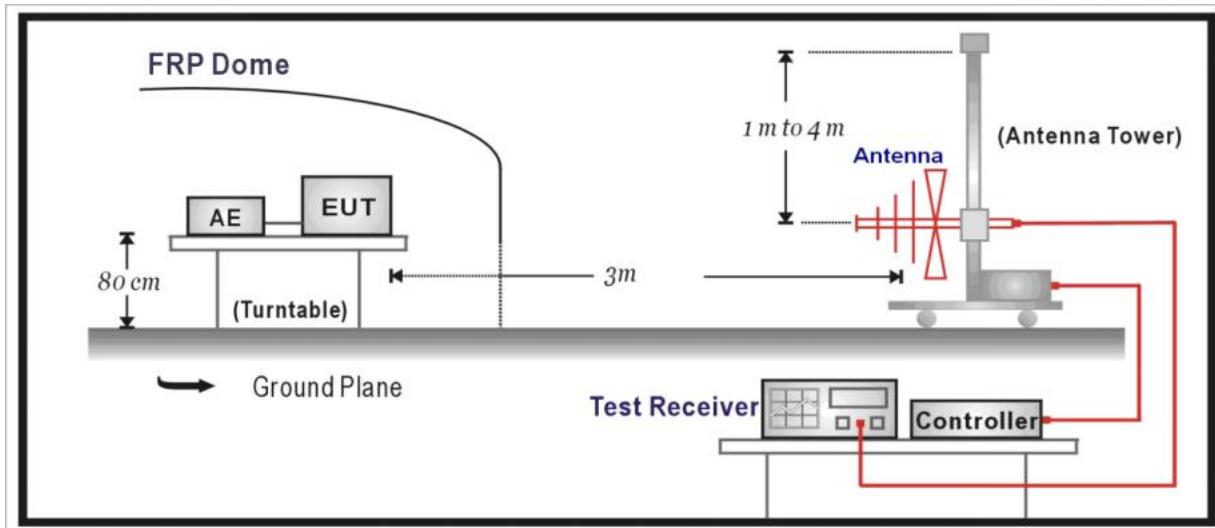
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is $\geq 1/T$ (Duty cycle < 98%) or 10Hz(Duty cycle > 98%) for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.
5. The testing of the EUT was performed on all 3 orthogonal axes; the worst-case test configuration was reported on the file test setup photo.

3.2.3 Test setup

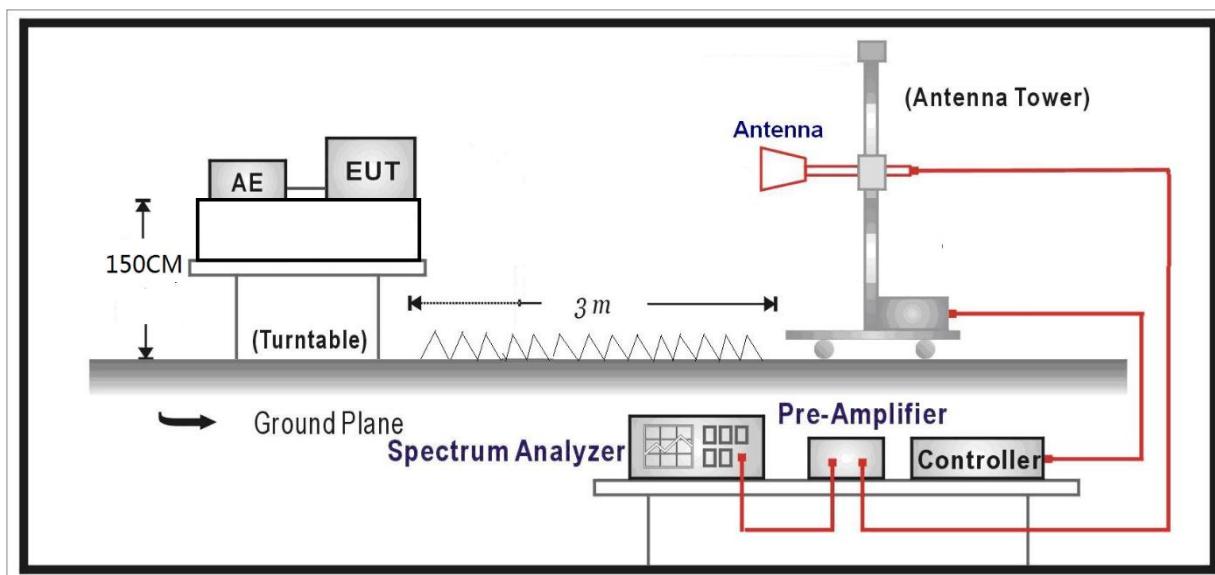
Below 30MHz Test Setup:



Below 1GHz Test Setup:



Above 1GHz Test Setup:



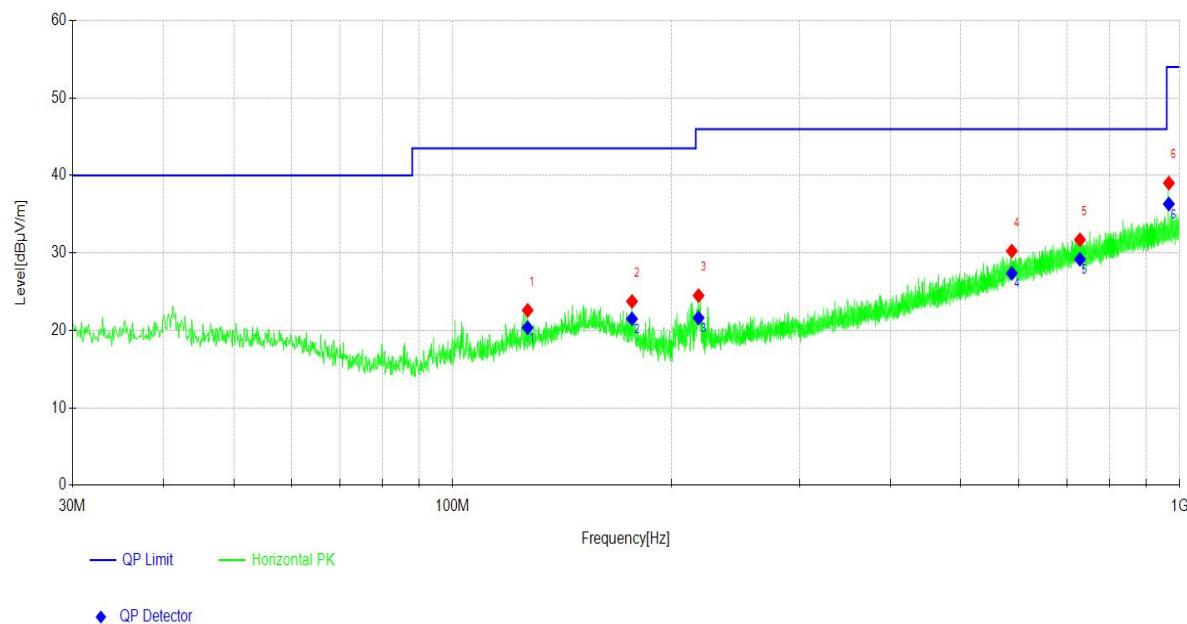


3.2.4 Test results(9kHz-30MHz)

The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

3.2.5 Test results(30MHz-1GHz)

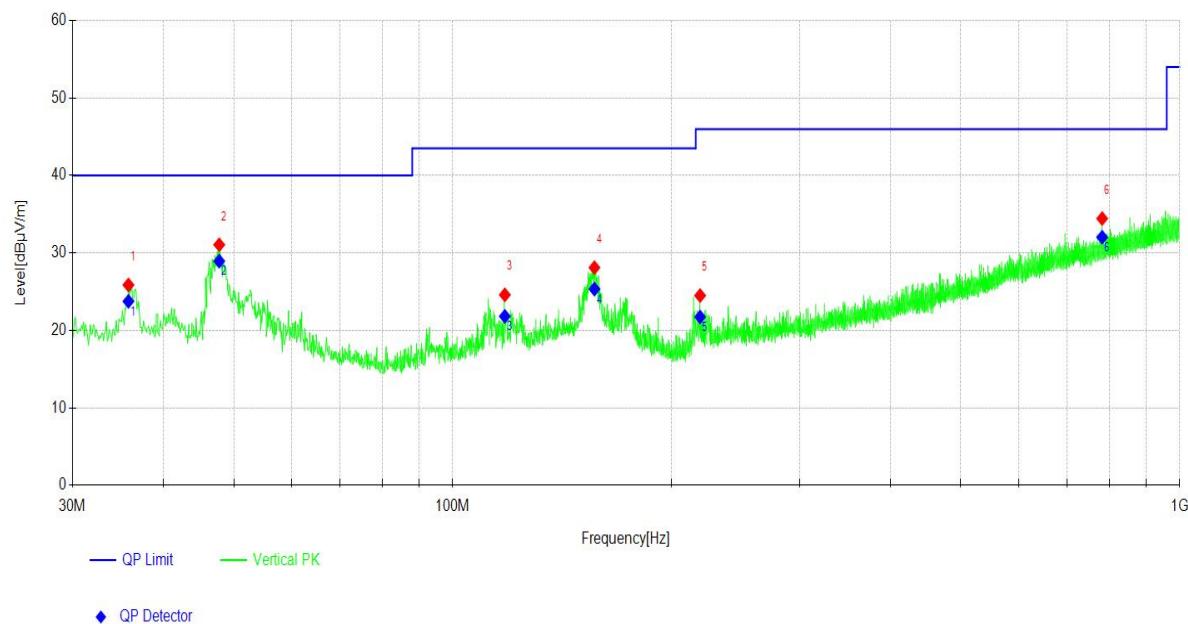
Mode	Radar	Modulation	FMCW
Frequency Range	30MHz ~ 1GHz	Detector Function	Quasi-Peak (QP)
Horizontal			



NO.	Freq. [MHz]	Factor [dB]	QP Value [dB μ V/m]	QP Limit [dB μ V/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity
1	126.816	19.36	20.34	43.50	23.16	100	248	Horizontal
2	176.485	19.43	21.49	43.50	22.01	200	290	Horizontal
3	217.908	17.92	21.61	46.00	24.39	200	65	Horizontal
4	587.612	26.50	27.36	46.00	18.64	100	142	Horizontal
5	729.149	28.64	29.18	46.00	16.82	200	150	Horizontal
6	966.241	31.15	36.32	54.00	17.68	200	240	Horizontal

Remark: 1. Level (dBuV/m) = Reading (dBuV) + Factor (dB/m).
2. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. Margin(dB) = Limit(dBuV/m) - Level (dBuV/m)

Mode	Radar	Modulation	FMCW
Frequency Range	30MHz ~ 1GHz	Detector Function	Quasi-Peak (QP)
Vertical			

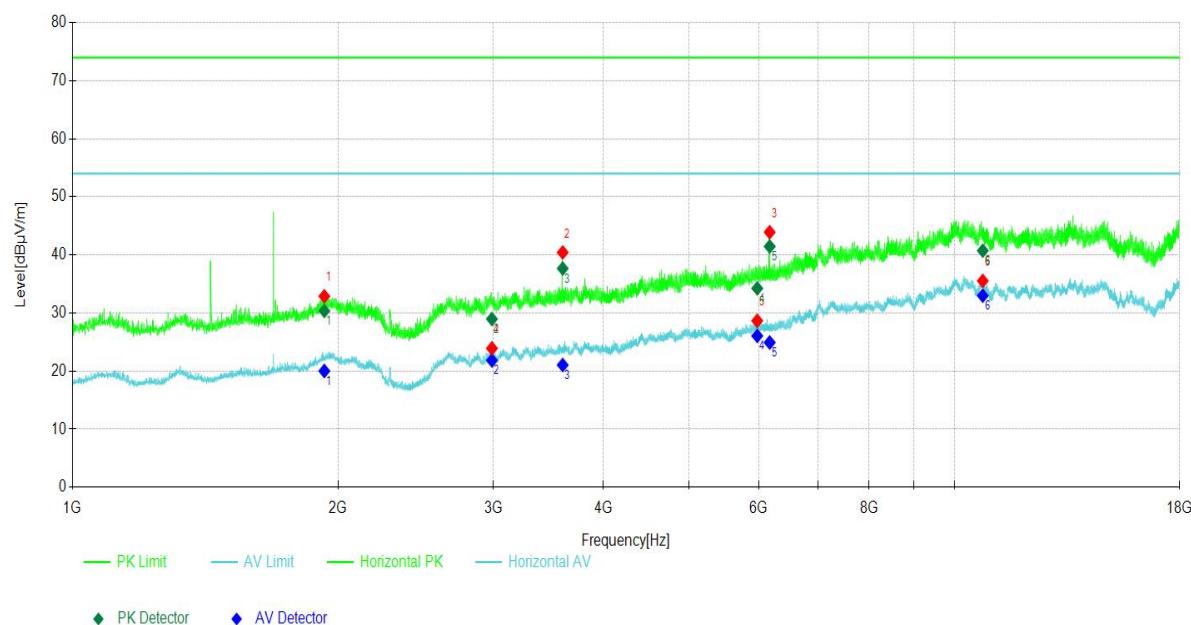


NO.	Freq. [MHz]	Factor [dB]	QP Value [dB μ V/m]	QP Limit [dB μ V/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity
1	35.821	20.00	23.75	40.00	16.25	100	144	Vertical
2	47.753	20.19	28.94	40.00	11.06	100	341	Vertical
3	117.988	18.97	21.82	43.50	21.68	100	337	Vertical
4	156.695	21.27	25.34	43.50	18.16	100	63	Vertical
5	218.975	17.98	21.73	46.00	24.27	100	346	Vertical
6	782.310	29.31	32.03	46.00	13.97	100	169	Vertical

Remark: 1. Level (dB μ V/m) = Reading (dB μ V) + Factor (dB/m).
2. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. Margin(dB) = Limit(dB μ V/m) - Level (dB μ V/m)

3.2.6 Test results(1GHz-18GHz)

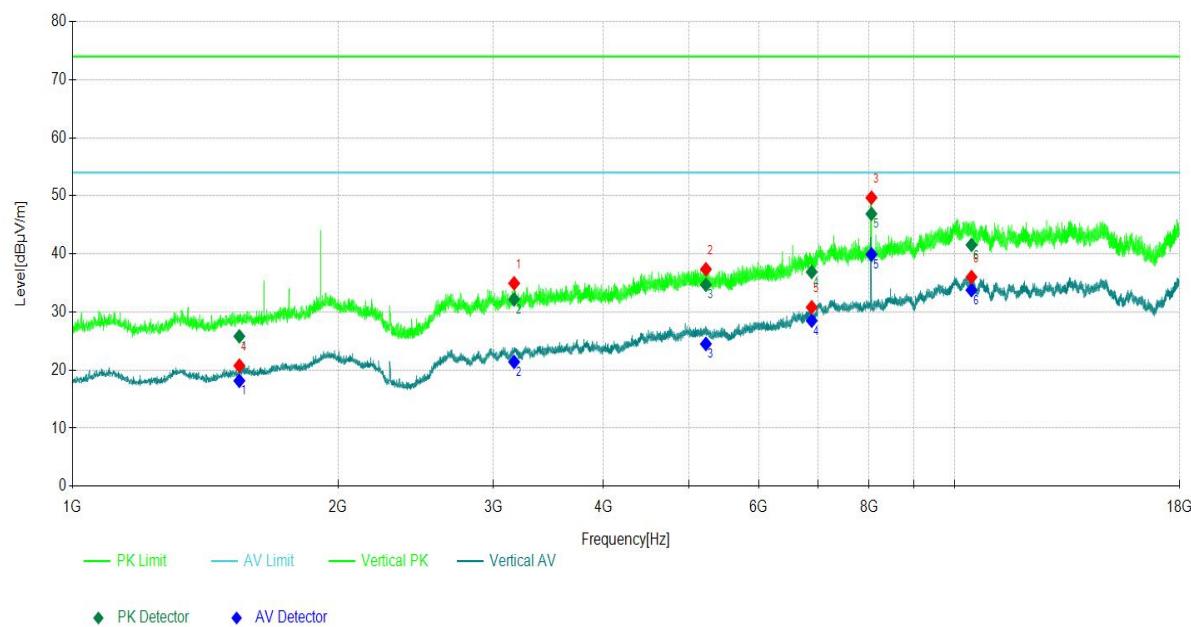
Mode	Radar	Modulation	FMCW
Frequency Range	1GHz~18GHz	Detector Function	PK/AV
Horizontal			



Frequency [MHz]	Factor [dB/m]	PK Value [dB μ V/m]	PK Limit [dB μ V/m]	PK Margin [dB]	AV Value [dB μ V/m]	AV Limit [dB μ V/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1930.093	-19.91	30.37	74.00	43.63	20.02	54.00	33.98	100	4	Horizontal
2989.199	-18.20	28.97	74.00	45.03	21.85	54.00	32.15	100	225	Horizontal
3595.860	-16.85	37.67	74.00	36.33	21.05	54.00	32.95	100	336	Horizontal
5975.098	-9.44	34.25	74.00	39.75	26.07	54.00	27.93	100	196	Horizontal
6172.517	-9.05	41.46	74.00	32.54	24.93	54.00	29.07	100	65	Horizontal
10765.677	-1.11	40.73	74.00	33.27	32.99	54.00	21.01	100	16	Horizontal

Remark: 1. Level (dB μ V/m) = Reading (dB μ V/m) + Factor (dB/m).
2. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. Margin(dB) = Limit[dB μ V/m] - Level [dB μ V/m]

Mode	Radar	Modulation	FMCW
Frequency Range	1GHz~18GHz	Detector Function	PK/AV
Vertical			



Frequency [MHz]	Factor [dB/m]	PK Value [dB μ V/m]	PK Limit [dB μ V/m]	PK Margin [dB]	AV Value [dB μ V/m]	AV Limit [dB μ V/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1546.055	-23.10	25.82	74.00	48.18	18.16	54.00	35.84	100	121	Vertical
3167.417	-17.34	32.17	74.00	41.83	21.42	54.00	32.58	100	104	Vertical
5225.623	-11.40	34.70	74.00	39.30	24.50	54.00	29.50	100	206	Vertical
6887.789	-6.56	36.90	74.00	37.10	28.52	54.00	25.48	100	248	Vertical
8050.605	-5.16	46.89	74.00	27.11	39.93	54.00	14.07	100	313	Vertical
10453.245	-0.90	41.56	74.00	32.44	33.77	54.00	20.23	100	337	Vertical

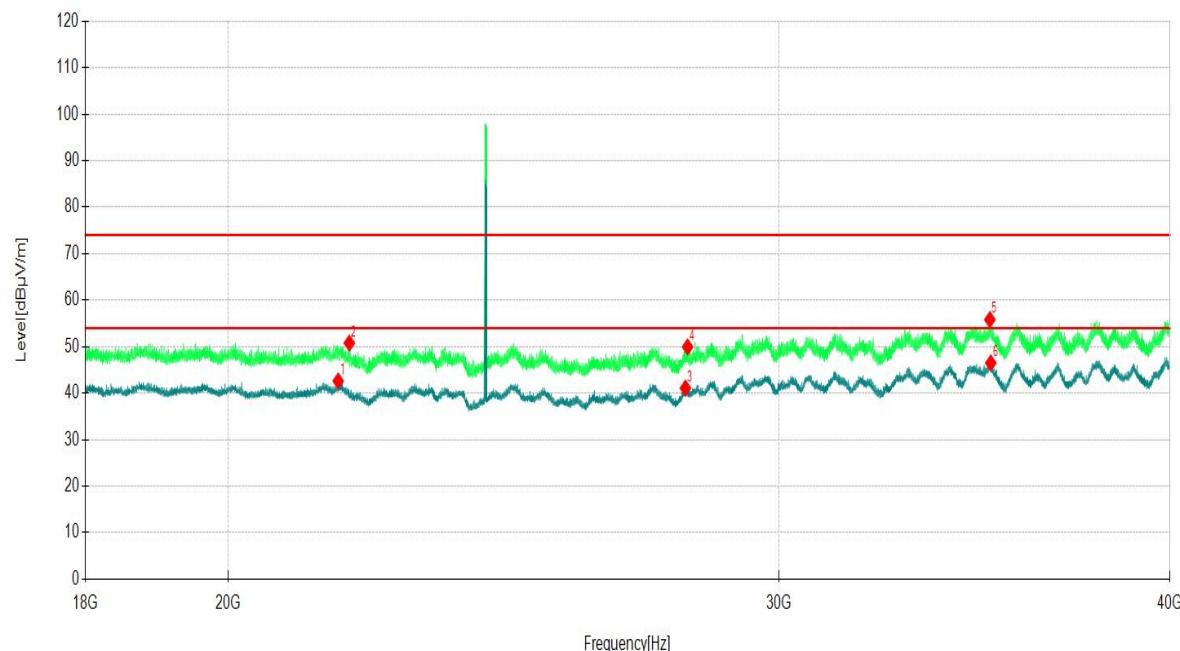
Remark: 1. Level (dB μ V/m) = Reading (dB μ V/m) + Factor (dB/m).

2. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).

3. Margin(dB) = Limit[dB μ V/m] - Level [dB μ V/m]

3.2.7 Test results(18GHz-40GHz)

Mode	Radar	Modulation	FMCW
Frequency Range	18GHz~40GHz	Detector Function	PK/AV
Horizontal			

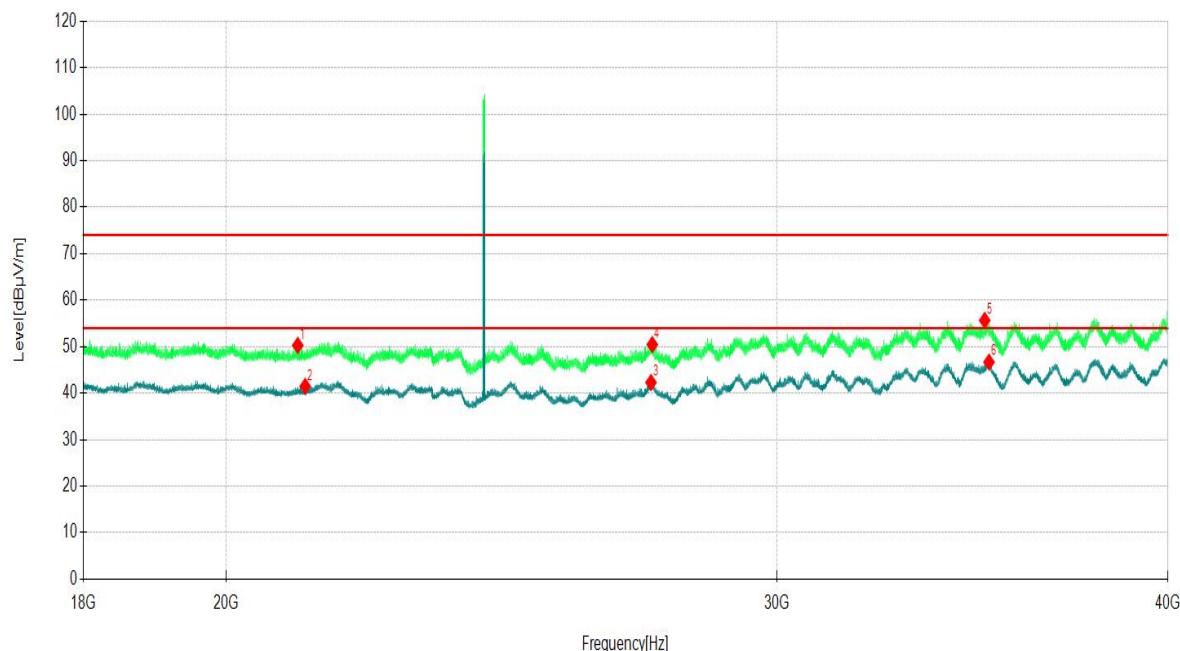


NO.	Freq. [MHz]	Reading [dB μ V]	Factor [dB/m]	Level [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Detector	Polarity
1	21684.17	47.42	-4.80	42.62	54.00	11.38	AV	Horizontal
2	21862.18	56.39	-5.62	50.77	74.00	23.23	PK	Horizontal
3	27999.45	45.45	-4.35	41.10	54.00	12.90	AV	Horizontal
4	28044.46	54.08	-4.13	49.95	74.00	24.05	PK	Horizontal
5	35032.77	56.76	-0.95	55.81	74.00	18.19	PK	Horizontal
6	35056.78	47.43	-0.95	46.48	54.00	7.52	AV	Horizontal

Remark: 1. Level (dB μ V/m) = Reading (dB μ V/m) + Factor (dB/m).
2. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. Margin(dB) = Limit[dB μ V/m] - Level [dB μ V/m]



Mode	Radar	Modulation	FMCW
Frequency Range	18GHz~40GHz	Detector Function	PK/AV
Vertical			



NO.	Freq. [MHz]	Reading [dB μ V]	Factor [dB/m]	Level [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Detector	Polarity
1	21079.14	56.70	-6.42	50.28	74.00	23.72	PK	Vertical
2	21194.15	47.40	-5.93	41.47	54.00	12.53	AV	Vertical
3	27339.42	44.93	-2.63	42.30	54.00	11.70	AV	Vertical
4	27364.43	53.28	-2.83	50.45	74.00	23.55	PK	Vertical
5	34951.77	56.61	-0.96	55.65	74.00	18.35	PK	Vertical
6	35062.78	47.67	-0.99	46.68	54.00	7.32	AV	Vertical

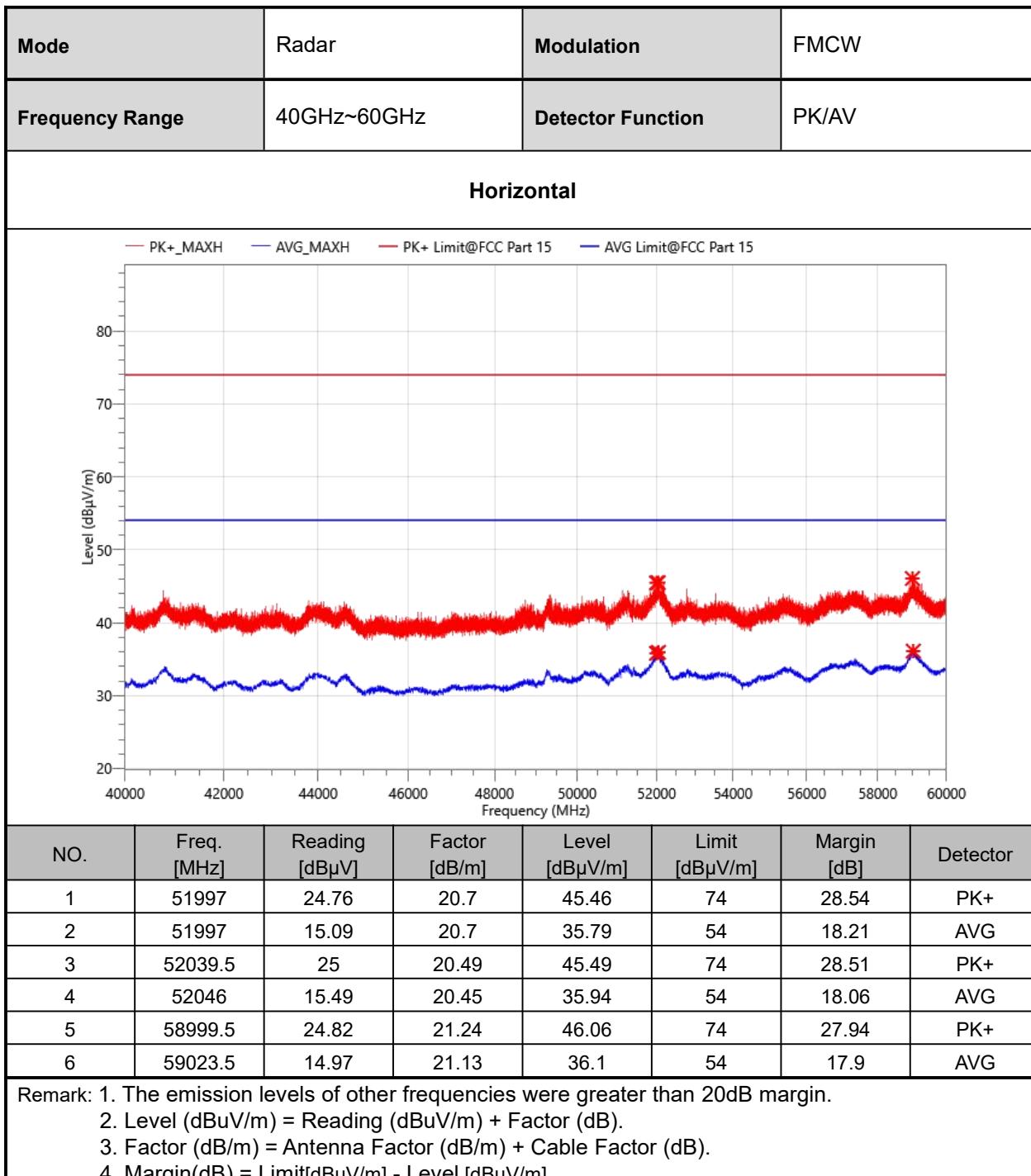
Remark: 1. Level (dB μ V/m) = Reading (dB μ V/m) + Factor (dB/m).

2. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).

3. Margin(dB) = Limit[dB μ V/m] - Level [dB μ V/m]

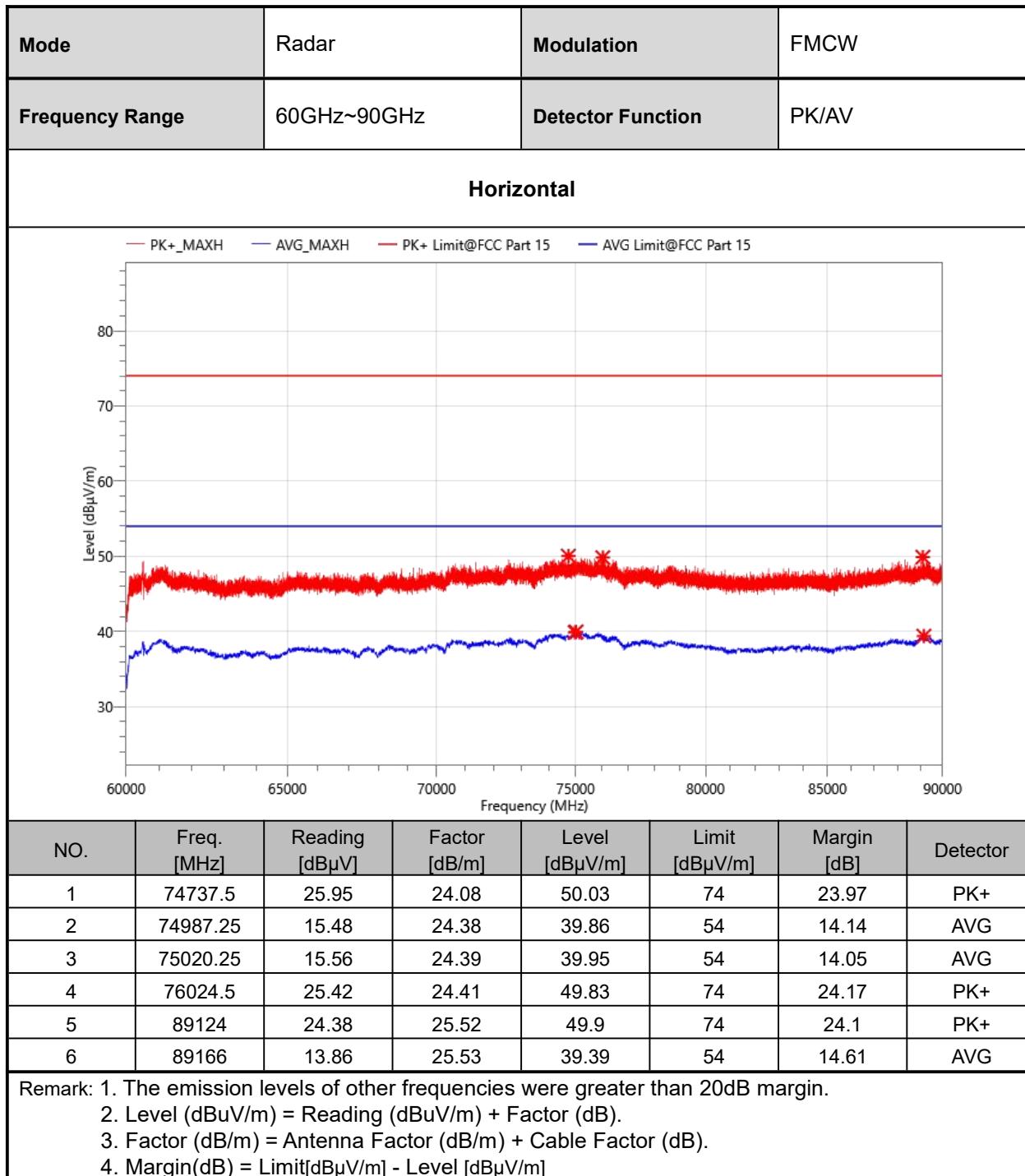
3.2.8 Test results(40GHz-100GHz)

Only showing the highest value, “worst case” (Vertical polarity)



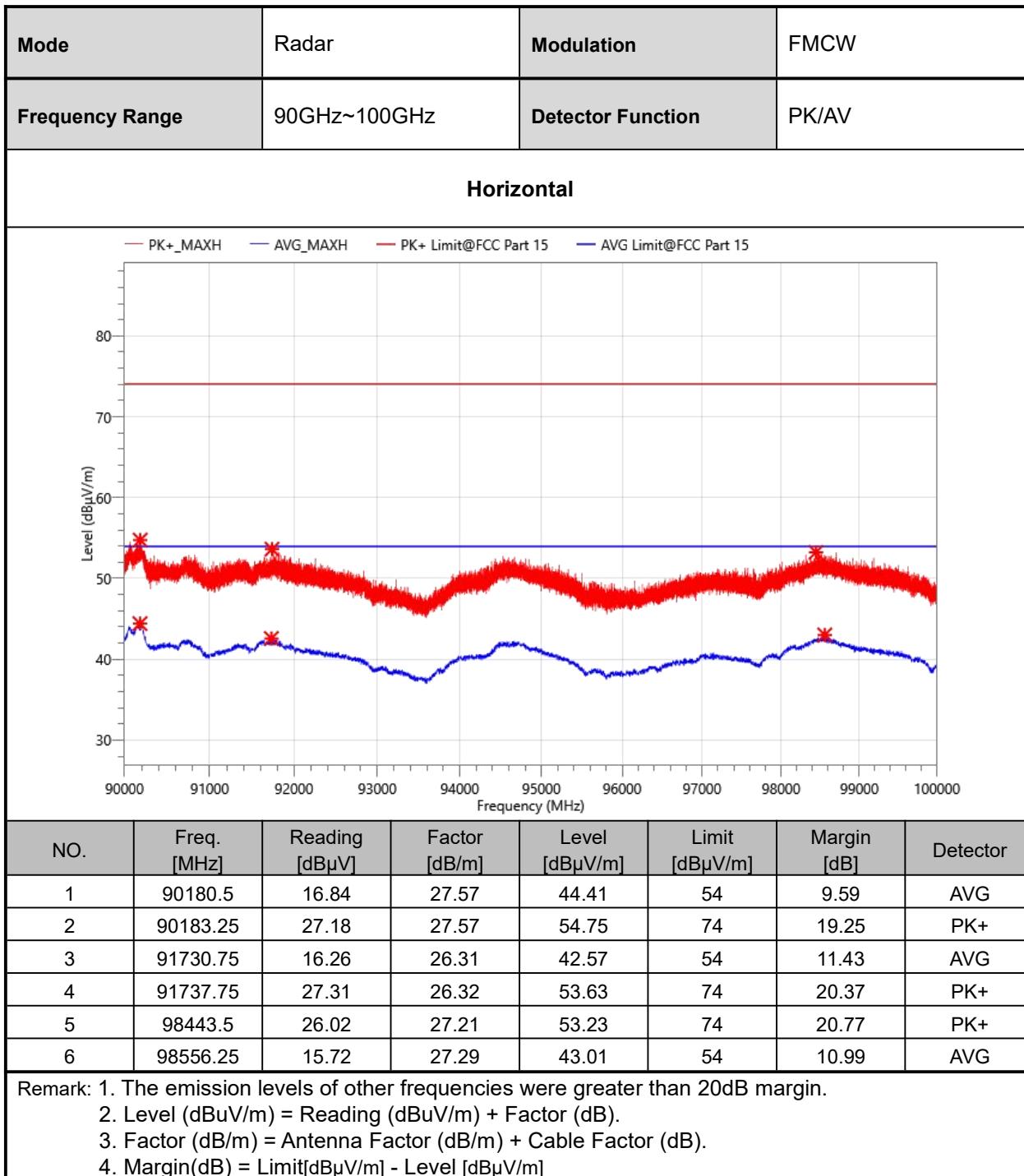


Only showing the highest value, “worst case” (Vertical polarity)





Only showing the highest value, “worst case” (Vertical polarity)



3.3 20DB BANDWIDTH MEASUREMENT

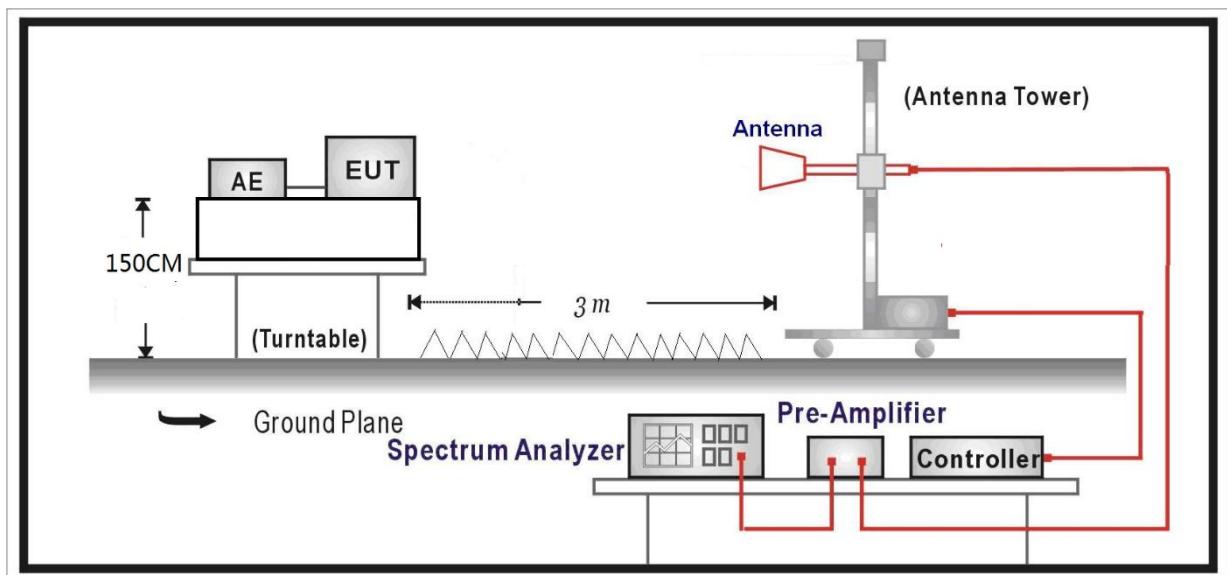
3.3.1 Limits

This section is for reporting purpose only, there is no restriction limit of bandwidth

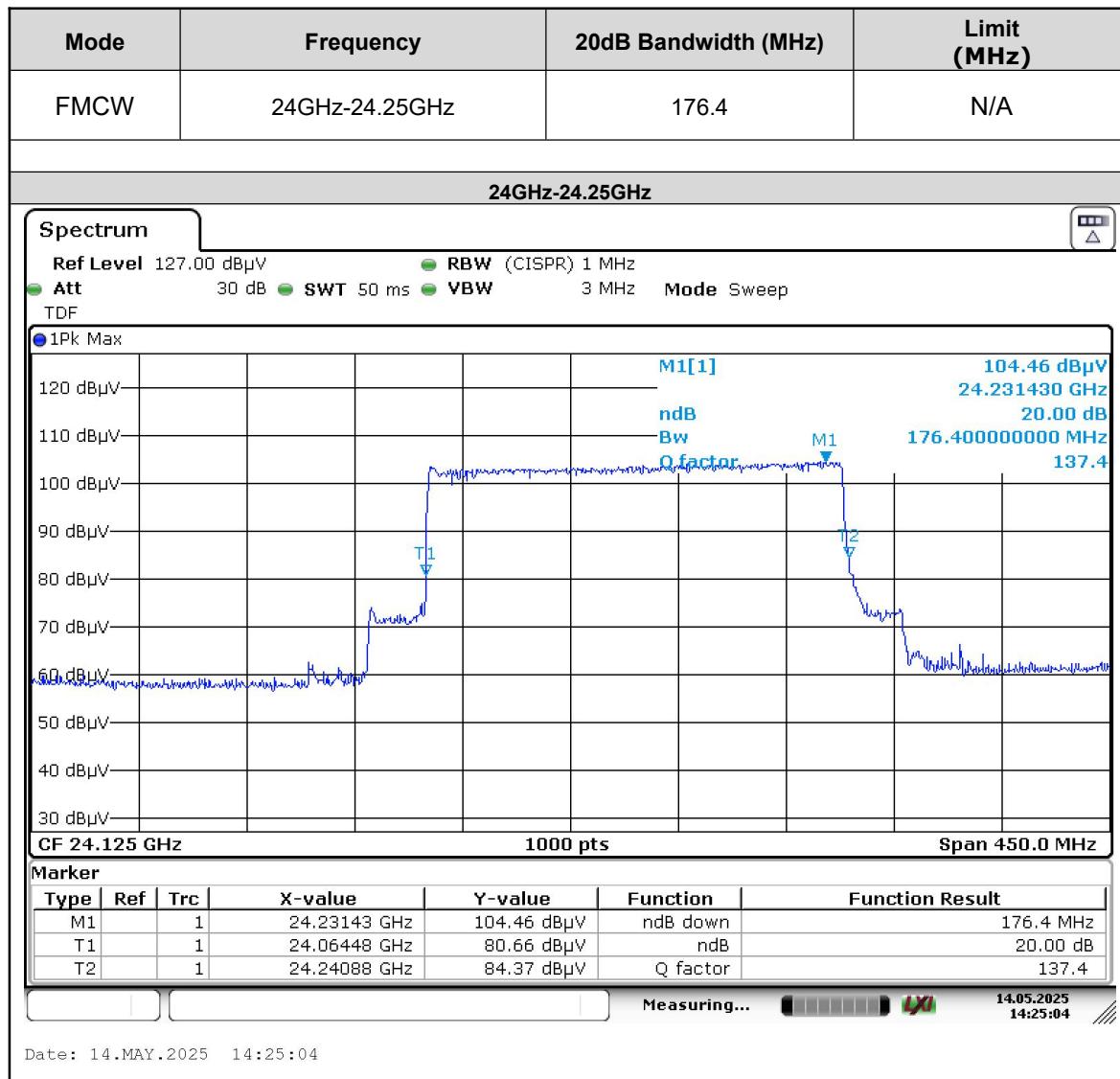
3.3.2 Measurement procedure

- a. Set resolution bandwidth (RBW) = 3MHz
- b. Set the video bandwidth (VBW) $\geq 3 \times$ RBW, Detector = Peak.
- c. Trace mode = max hold.
- d. Sweep = auto couple.
- e. Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

3.3.3 Test setup



3.3.4 Test result



3.4 FIELD STRENGTH & OUT OF BAND EMISSION MEASUREMENT

3.4.1 Limits

According to §15.249(a), the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

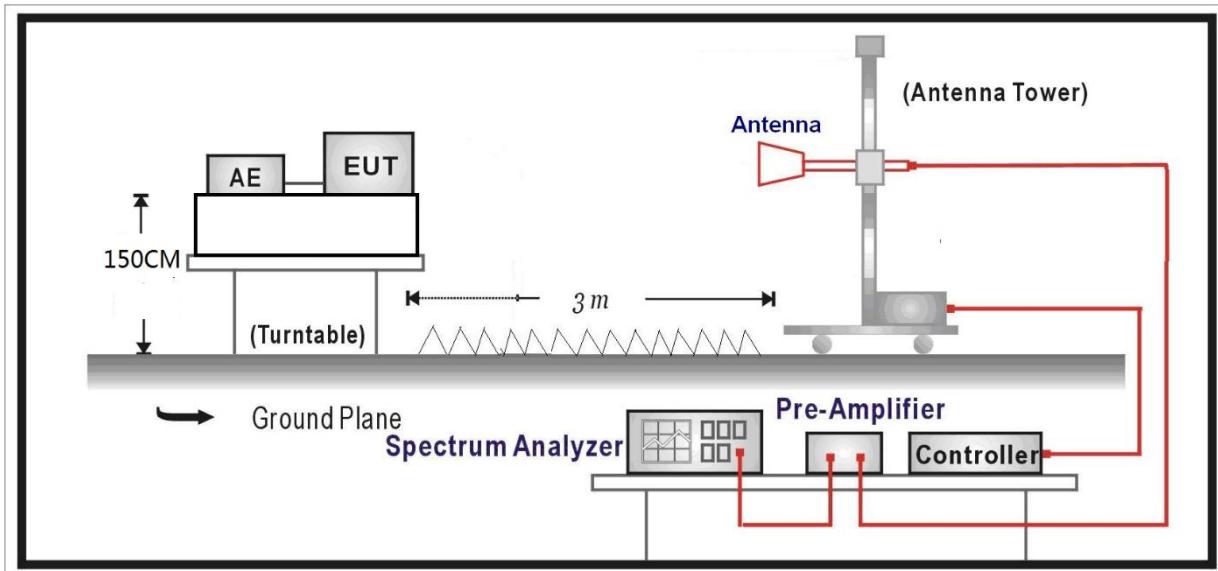
Fundamental Frequency	Field strength of fundamental (milli-volts/meter)	Field strength of harmonics (micro-volts/meter)
902-928 MHz	50	500
2400-2483.5 MHz	50	500
5725-5875 MHz	50	500
24.0-24.25 GHz	250	2500

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

3.4.2 Measurement procedure

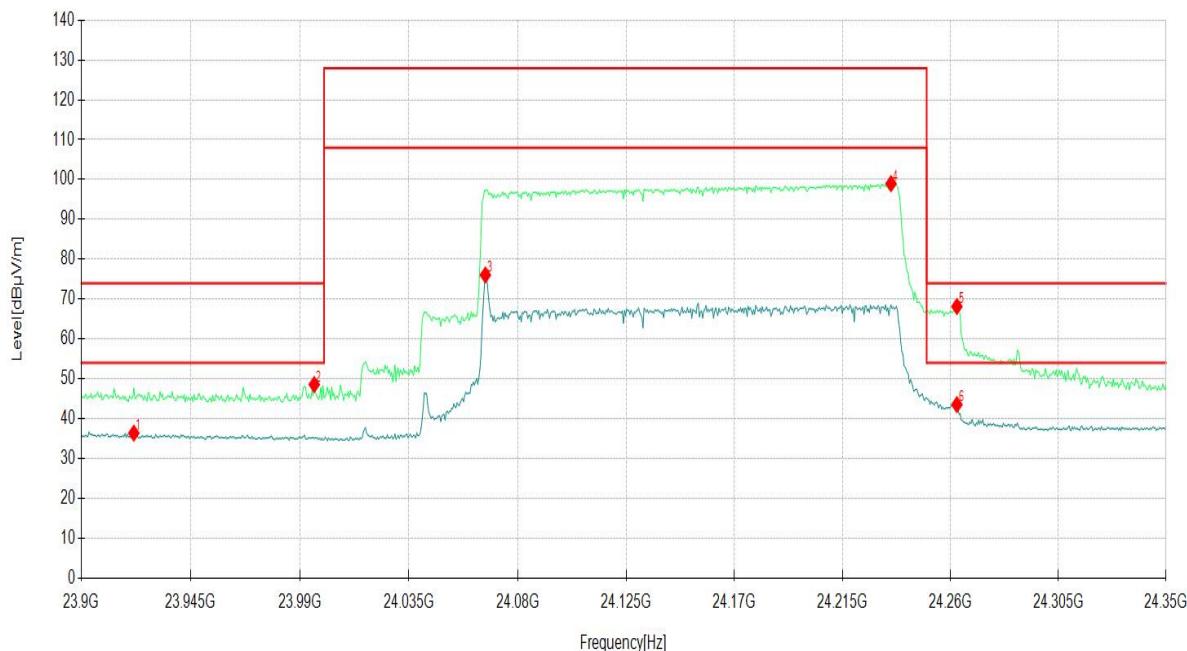
- The EUT is placed on a turntable, which is 1.5m above ground plane.
- The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
- EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
- The spectrum analyzer or receiver is set as: (1) Peak: RBW = 1MHz / VBW = 1MHz / Sweep = Auto (2) Average: RBW = 1MHz / VBW = 10Hz / Sweep = Auto
- Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.

3.4.3 Test setup



3.4.4 Test result

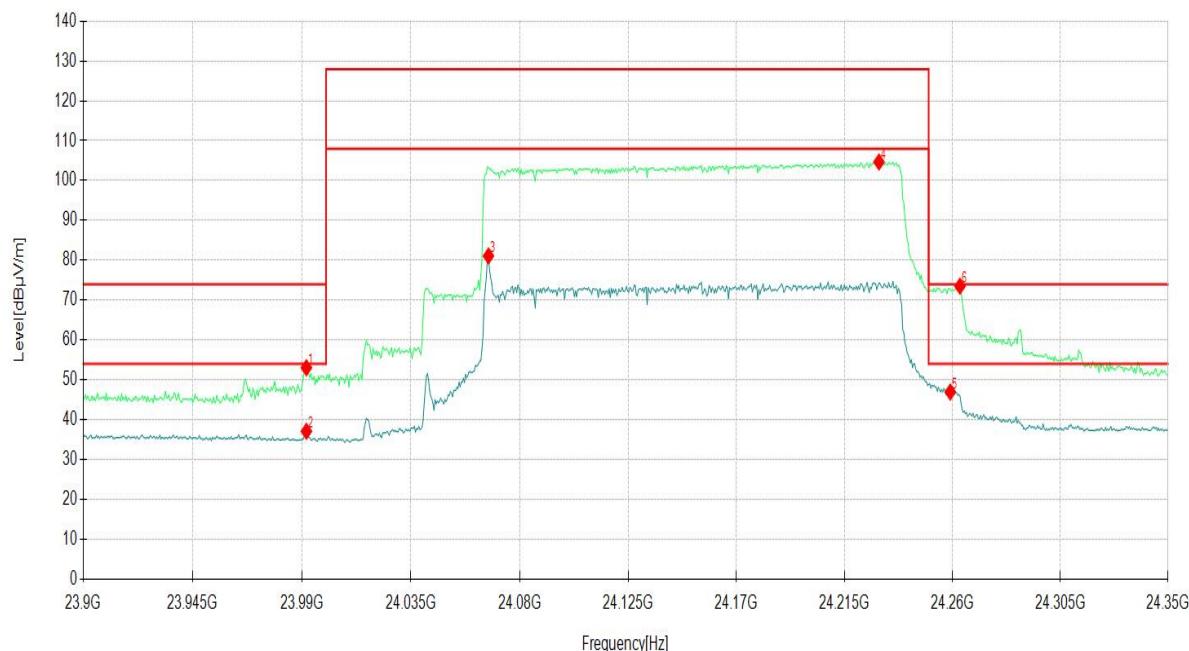
Mode	Radar	Modulation	FMCW
Frequency Range	23.90GHz~24.35GHz	Detector Function	PK/AV
Horizontal			



NO.	Freq. [MHz]	Reading [dB μ V]	Factor [dB/m]	Level [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Detector	Polarity
1	23921.62	41.81	-5.41	36.40	54.00	17.60	AV	Horizontal
2	23995.95	54.92	-6.33	48.59	74.00	25.41	PK	Horizontal
3	24066.67	82.05	-5.99	76.06	107.96	31.90	AV	Horizontal
4	24235.14	102.68	-3.70	98.98	127.96	28.98	PK	Horizontal
5	24262.61	71.52	-3.34	68.18	74.00	5.82	PK	Horizontal
6	24262.61	46.88	-3.34	43.54	54.00	10.46	AV	Horizontal

Remark: 1. Level (dB μ V/m) = Reading (dB μ V/m) + Factor (dB/m).
2. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. Margin(dB) = Limit[dB μ V/m] - Level [dB μ V/m]

Mode	Radar	Modulation	FMCW
Frequency Range	23.90GHz~24.35GHz	Detector Function	PK/AV
Horizontal			



NO.	Freq. [MHz]	Reading [dB μ V]	Factor [dB/m]	Level [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Detector	Polarity
1	23991.89	59.33	-6.28	53.05	74.00	20.95	PK	Vertical
2	23991.89	43.40	-6.28	37.12	54.00	16.88	AV	Vertical
3	24067.12	87.09	-5.99	81.10	107.96	26.86	AV	Vertical
4	24229.28	108.43	-3.77	104.66	127.96	23.30	PK	Vertical
5	24259.01	50.33	-3.37	46.96	54.00	7.04	AV	Vertical
6	24263.06	76.86	-3.34	73.52	74.00	0.48	PK	Vertical

Remark: 1. Level (dB μ V/m) = Reading (dB μ V/m) + Factor (dB/m).
2. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. Margin(dB) = Limit[dB μ V/m] - Level [dB μ V/m]



3.5 ANTENNA REQUIREMENT

3.5.1 LIMITS OFFREQUENCY STABILITY

For intentional device, according to FCC 47 CFR Section 15.203, 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. And according to FCC 47 CFR Section 15.247 (b) , if transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

3.5.2 ANTENNA ANTI-REPLACEMENT CONSTRUCTION

The antenna used for this product is Integrated Antenna and that no antenna other than that furnished by the responsible party shall be used with the device



4 PHOTOGRAPHS OF TEST SETUP

Please refer to the attached file (Test Setup Photo).

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



Important

- (1) The test report is invalid without the official stamp of CVC;
- (2) Any part photocopies of the test report are forbidden without the written permission from CVC;
- (3) The test report is invalid without the signatures of Approval and Reviewer;
- (4) The test report is invalid if altered;
- (5) Objections to the test report must be submitted to CVC within 15 days.
- (6) Generally, commission test is responsible for the tested samples only.
- (7) As for the test result “-” or “N” means “not applicable”, “/” means “not test”, “P” means “pass” and “F” means “fail”

Address: No. 1301-14&16, Guanguang Road, Xinlan Community, Guanlan Subdistrict, Longhua District, Shenzhen, Guangdong, China

Post Code: 518110 Tel: 0755-23763060-8805

Fax: 0755-23763060 E-mail: sz-kf@cvc.org.cn

<http://www.cvc.org.cn>