

Report No.: SEWM2212000309RG06

Rev.: 02

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TEST REPORT

Application No.: SEWM2212000309RG
Applicant: Sony Corporation
Address of Applicant: 1-7-1 Konan Minato-ku Tokyo, 108-0075 Japan
Manufacturer: Sony Corporation
Address of Manufacturer: 1-7-1 Konan Minato-ku Tokyo, 108-0075 Japan
EUT Description: GSM/WCDMA/LTE Phone with BT, DTS/UNII a/b/g/n/ac, NFC and GNSS
Trade Mark: Sony
FCC ID: PY7-97087H
Standard(s): FCC 47 CFR Part 15, Subpart B
Date of Receipt: 2022/11/30
Date of Test: 2023/01/06 to 2023/01/10
Date of Issue: 2023/03/09

Test Result:	Pass*
---------------------	--------------

* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

Panta Sun

Panta Sun

Wireless Laboratory Manager



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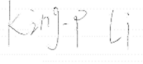
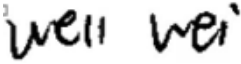
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Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2023/01/13		Original
02		2023/03/09		Add remark in the chapter "E.U.T. Operation" on page 14

This report supersedes our previous report SEWM2212000309RG06, issued on 2023/01/13, which is hereby deemed null and void.

Prepared By	 (King-p Li) / Test Engineer
Checked By	 (Well Wei) / Reviewer



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Test Summary

Emission Part				
Item	Standard	Method	Requirement	Result
Conducted Emissions at Mains Terminals (150kHz-30MHz)	FCC 47 CFR Part 15, Subpart B	ANSI C63.4:2014	Class B	Pass
Radiated Emissions (30MHz-1GHz)	FCC 47 CFR Part 15, Subpart B	ANSI C63.4:2014	Class B	Pass
Radiated Emissions (above 1GHz)	FCC 47 CFR Part 15, Subpart B	ANSI C63.4:2014	Class B	Pass

Internal Source	Upper Frequency
Below 1.705MHz	30MHz
1.705MHz to 108MHz	1GHz
108MHz to 500MHz	2GHz
500MHz to 1GHz	5GHz
Above 1GHz	5 th harmonic of the highest frequency or 40GHz, whichever is lower



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1 General Information

EUT Description:	GSM/WCDMA/LTE Phone with BT, DTS/UNII a/b/g/n/ac, NFC and GNSS		
Trade Mark:	Sony		
Hardware Version:	A		
Software Version:	0.129		
SN:	HQ62B2066A		
Frequency Bands:	Band	Tx (MHz)	Rx (MHz)
	GSM850	824~849	869~894
	GSM1900	1850~1910	1930~1990
	WCDMA Band V	824~849	869~894
	LTE Band 5	824~849	869~894
	LTE Band 12	699~716	729~746
	Wi-Fi 2.4G	2412~2462	2412~2462
	Bluetooth	2402~2480	2402~2480
	Wi-Fi 5G	5150~5850	5150~5850
	NFC	13.56	13.56
	GNSS (GPS L1C/A+Glonass G1+ Beidou B1I+Galileo E1)	/	1559~1610
Remark: As above information is provided and confirmed by the applicant. SGS is not liable to the accuracy, suitability, reliability or/and integrity of the information.			



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Accessory:

Adapter No.	Model No.	Manufacturer
1	XQZ-UC1	Sony Corporation

USB cable no.	Model no.	Manufacturer
1	XQZ-UB1	Sony Corporation
2	UCB20	Sony Corporation

Earphone No.	Model No.	Manufacturer
1	MDR-EX15AP	Sony Corporation



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1.1 Description of Support Units

Description	Manufacturer	Model No.	Inventory No.
Router	Smavwave Technology Co.,Ltd	SRT 421	SUWI-04-34-01
Computer	Lenovo	T14	SUWI-03-33-04
Mouse	Lenovo	3D optical Mouse	SUWI-03-33-05

1.2 Test Location

All tests were performed at:

Company:	SGS-CSTC Standards Technical Services (Suzhou) Co., Ltd.
Address:	South of No. 6 Plant, No. 1, Runsheng Road, Suzhou Industrial Park, Suzhou Area, China (Jiangsu) Pilot Free Trade Zone
Post code:	215000
Test engineer:	King-p Li

1.3 Test Facility

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

• A2LA (Certificate No. 6336.01)

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. Is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 6336.01.

• Innovation, Science and Economic Development Canada

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. Has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0120.

IC#: 27594.

• FCC –Designation Number: CN1312

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. Has been recognized as an accredited testing laboratory.

Designation Number: CN1312.

Test Firm Registration Number: 717327

1.4 Deviation from Standards

None

1.5 Abnormalities from Standard Conditions

None



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2 Emission Test Results

2.1 Conducted Emissions at Mains Terminals (150kHz-30MHz)

Test Requirement:	47 CFR Part 15, Subpart B		
Test Method:	ANSI C63.4:2014		
Frequency Range:	150kHz to 30MHz		
Receiver Setup:	RBW = 9kHz, VBW = 30kHz		
Limit:	Frequency Range (MHz)	Limit(dBμV)	
		Quasi-peak	average
	0.15M-0.5MHz	66 ~ 56*	56 ~ 46*
	0.5M-5MHz	56	46
	5M-30MHz	60	50
*Decreases with the logarithm of the frequency			
Detector: Peak for pre-scan (9kHz resolution bandwidth) 0.15M to 30MHz			

2.1.1 E.U.T. Operation

Operating Environment:

Temperature:	22~23°C
Humidity:	44~46%RH
Atmospheric Pressure:	101.0 kPa
Pretest these modes to find the worst case:	a: adapter+usb Cable+BT+2.4GWLAN +Camera(Rear)+GSM850 b: adapter+usb Cable+BT+5GWLAN +Camera(Front)+WCDMA Band 5 c: adapter+usb Cable+BT+2.4GWLAN +MP4+LTE Band 5 d: adapter+usb Cable+BT+5GWLAN +GPS RX+LTE Band 12 e: adapter+usb Cable+BT+2.4GWLAN +NFC ON+GSM1900 f: Transfer data between the EUT and the PC+USB cable
The worst case for final test:	e: adapter+usb Cable+BT+2.4GWLAN +NFC ON+GSM1900 f: Transfer data between the EUT and the PC+USB cable
Remark:	Select the GSM/WCDMA/LTE with the worst power for the pre-test (TX&RX), and only the worst data will be reflected in the report.



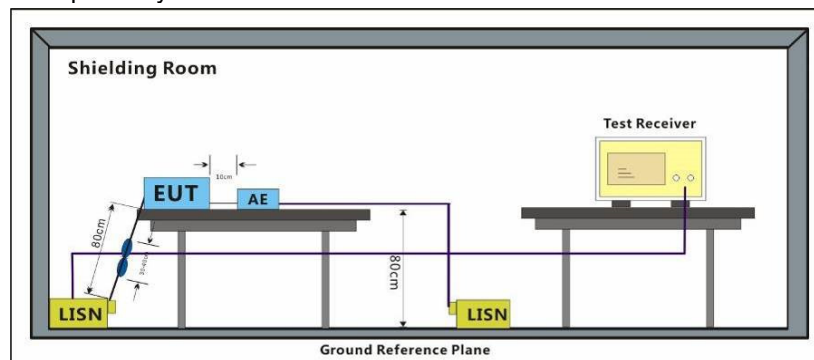
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2.1.2 Test Setup Procedures

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.



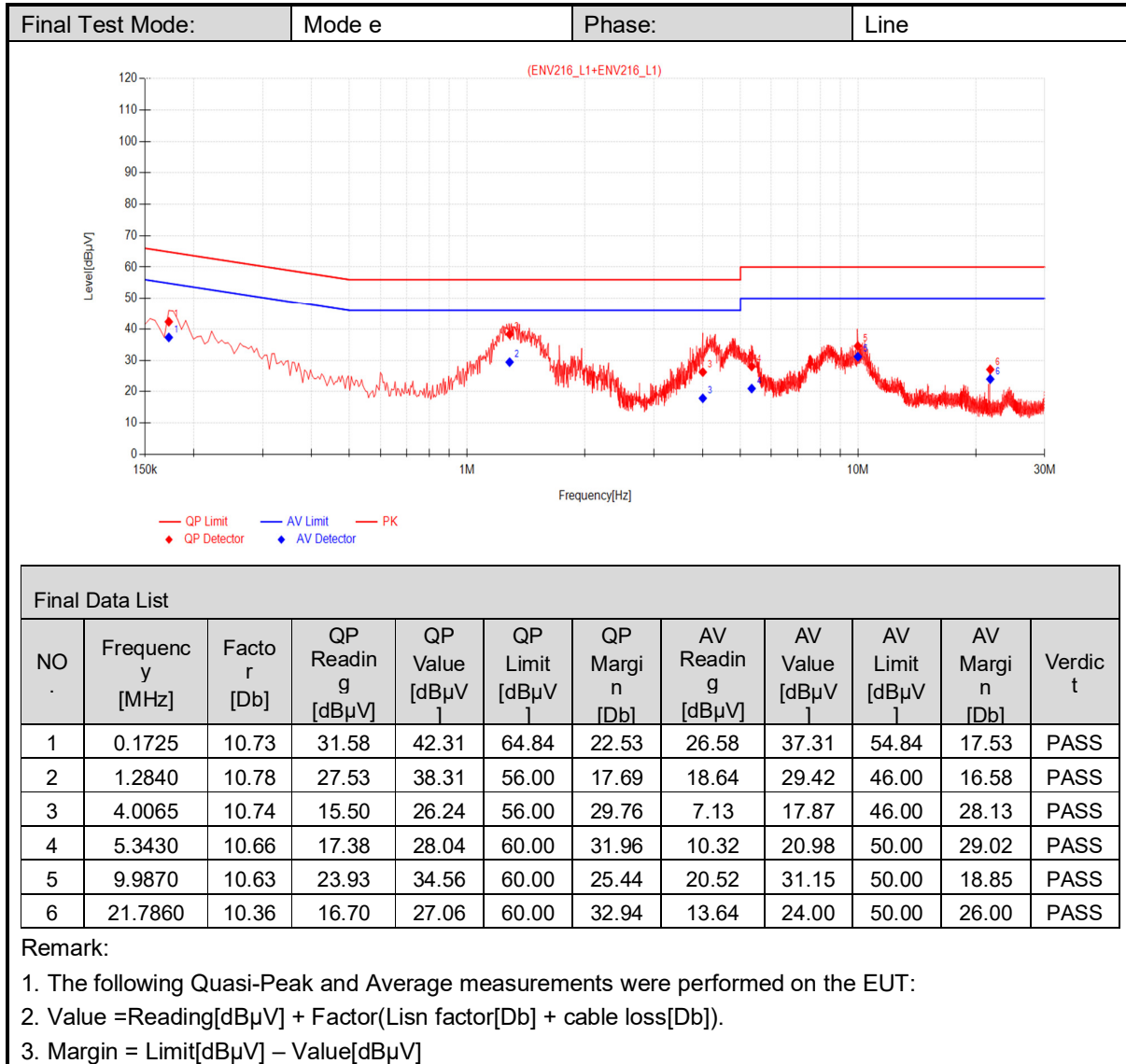
2.1.3 Measurement Data

An initial pre-scan was performed with peak detector. Quasi-Peak or Average measurement were performed at the frequencies with maximized peak emission were detected.

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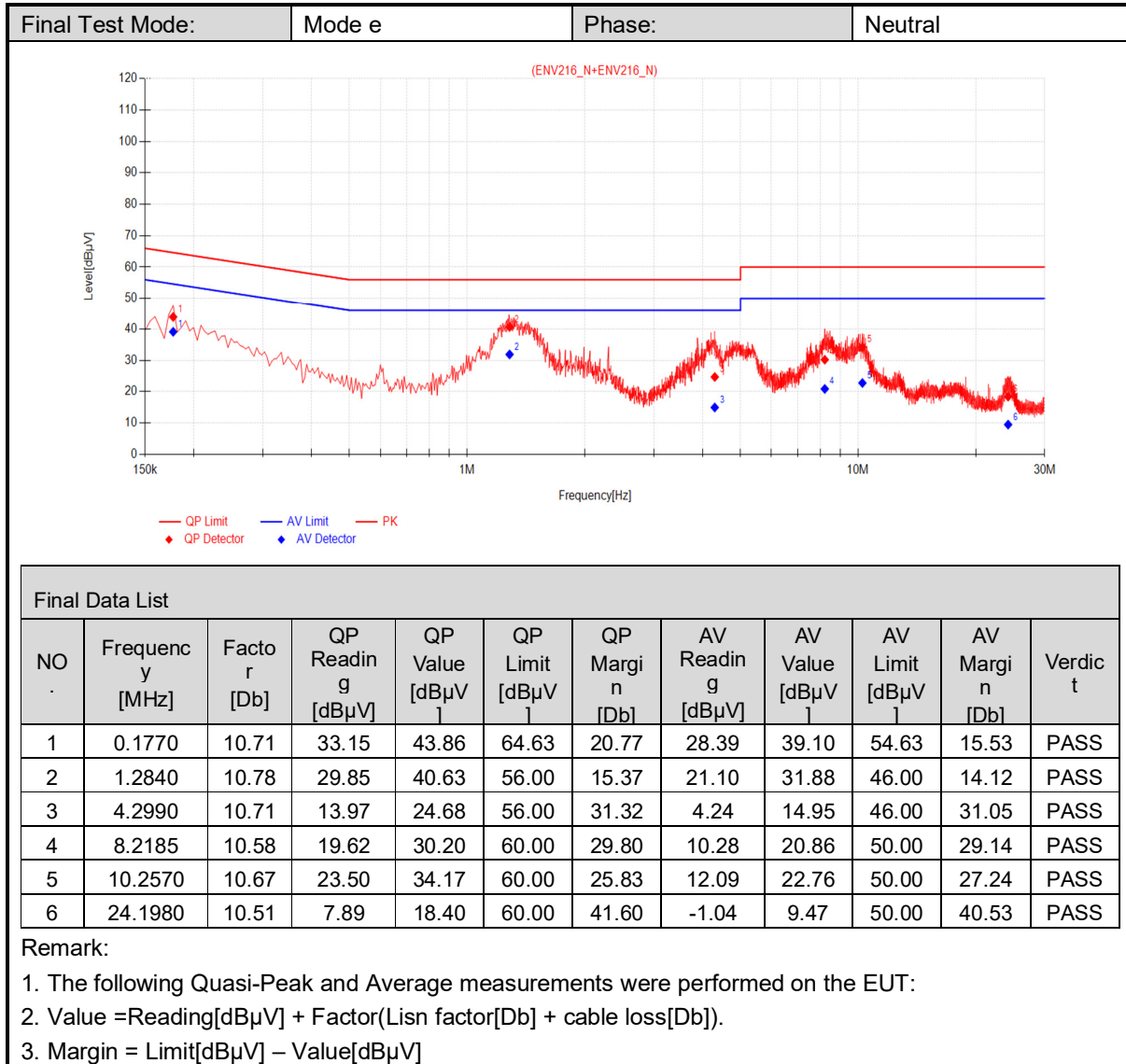
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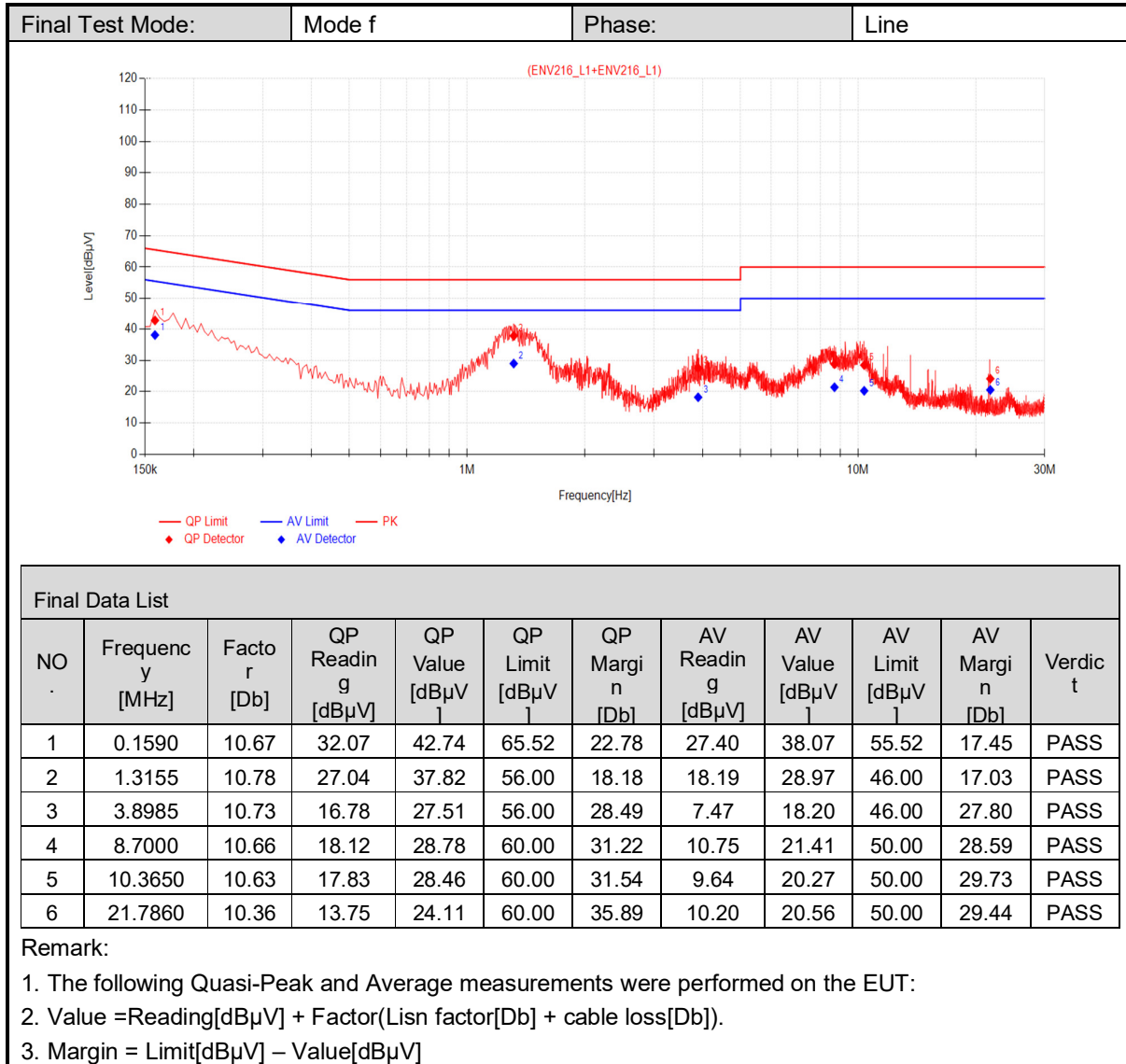
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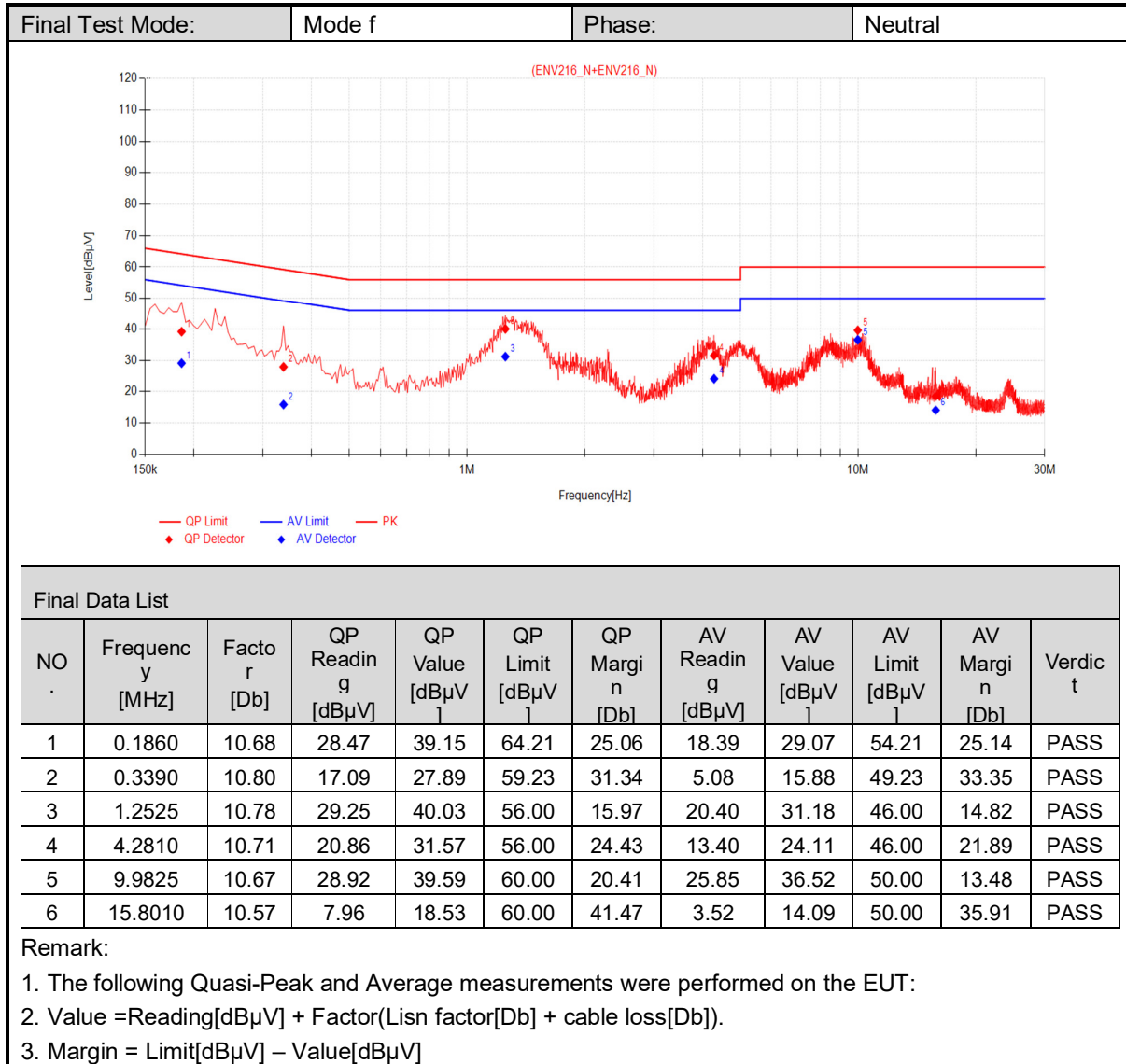
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2.2 Radiated Emissions (30MHz-1GHz)

Test Requirement:	47 CFR Part 15, Subpart B		
Test Method:	ANSI C63.4:2014		
Frequency Range:	30MHz to 1GHz		
Measurement Distance:	3m		
Limit:	Frequency Range (MHz)	Limit(dBμV/m)	Detector
	30MHz -88MHz	40.0	Quasi-peak
	88MHz-216MHz	43.5	Quasi-peak
	216MHz-960MHz	46.0	Quasi-peak
	960MHz-1000MHz	54.0	Quasi-peak
Detector:	Peak for pre-scan (120kHz resolution bandwidth) 30M to1000MHz		

2.2.1 E.U.T. Operation

Temperature:	22~23°C
Humidity:	44~46%RH
Atmospheric Pressure:	101.0 kPa
Pretest these modes to find the worst case:	a: adapter+usb Cable+BT+2.4GWLAN +Camera(Rear)+GSM850 b: adapter+usb Cable+BT+5GWLAN +Camera(Front)+WCDMA Band 5 c: adapter+usb Cable+BT+2.4GWLAN +MP4+LTE Band 5 d: adapter+usb Cable+BT+5GWLAN +GPS RX+LTE Band 12 e: adapter+usb Cable+BT+2.4GWLAN +NFC ON+GSM1900 f: Transfer data between the EUT and the PC+USB cable
The worst case for final test:	c: adapter+usb Cable+BT+2.4GWLAN +MP4+LTE Band 5 f: Transfer data between the EUT and the PC+USB cable
Remark:	1. Select the GSM/WCDMA/LTE with the worst power for the pre-test (TX&RX), and only the worst data will be reflected in the report. 2. The dominant frequency has been processed by the filter.



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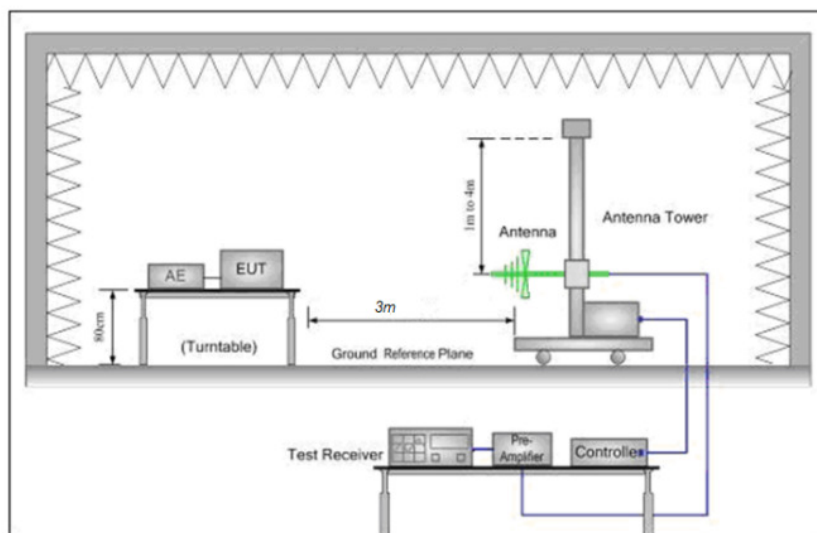
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2.2.2 Test Setup Procedures

1. The EUT was placed in a semi Anechoic Chamber as show below
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 height is adjusted between 1 to 4 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 with specified bandwidth with Maximum Hold Mode, and the trace was allowed to stabilize.
7. If the emission level of the EUT in peak mode was 6 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.



2.2.3 Measurement Data

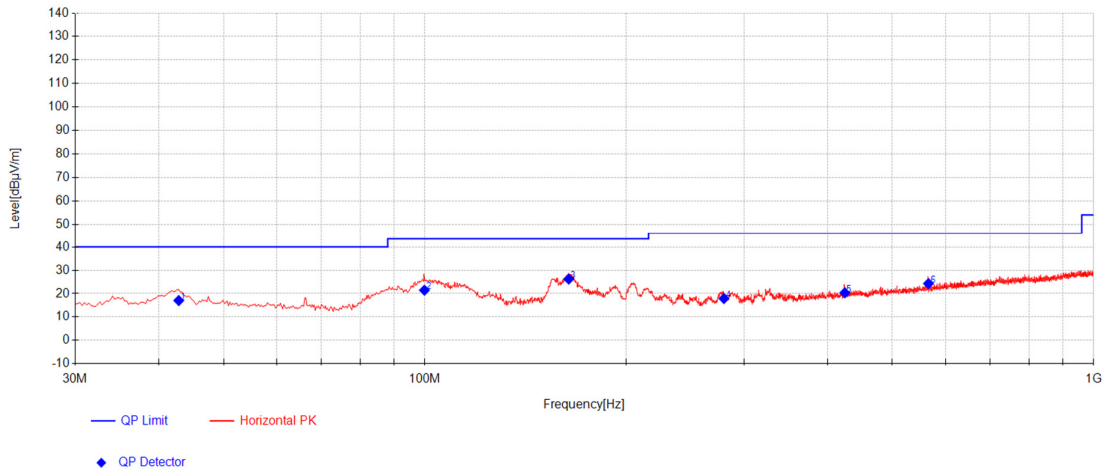
An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by BiConiLog antenna with 2 orthogonal polarities. The three polarities of X,Y,Z were measured by EUT, but only the worst data had been displayed.

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Final Test Mode: Mode c Polarization: Horizontal



Final Data List

NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	QP Value [dBμV/m]	QP Limit [dBμV/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity
1	42.8525	31.26	13.83	-28.06	17.03	40.00	22.97	126	308	Horizontal
2	99.84	38.69	10.14	-27.36	21.46	43.50	22.04	265	88	Horizontal
3	164.1025	38.63	14.25	-26.64	26.24	43.50	17.26	241	289	Horizontal
4	280.0175	32.29	12.31	-26.71	17.89	46.00	28.11	142	360	Horizontal
5	424.5475	30.29	15.34	-25.29	20.35	46.00	25.65	263	194	Horizontal
6	566.1675	31.26	17.69	-24.66	24.29	46.00	21.71	221	259	Horizontal

Remark:

1. The Quasi-Peak measurements were performed on the EUT.

2. Value = Reading + AF + Factor:

AF = Antenna Factor(dB/m)

Factor = Cable Factor(dB) - Preamplifier (dB)

Margin = Limit[dBμV/m] -Value[dBμV/m]



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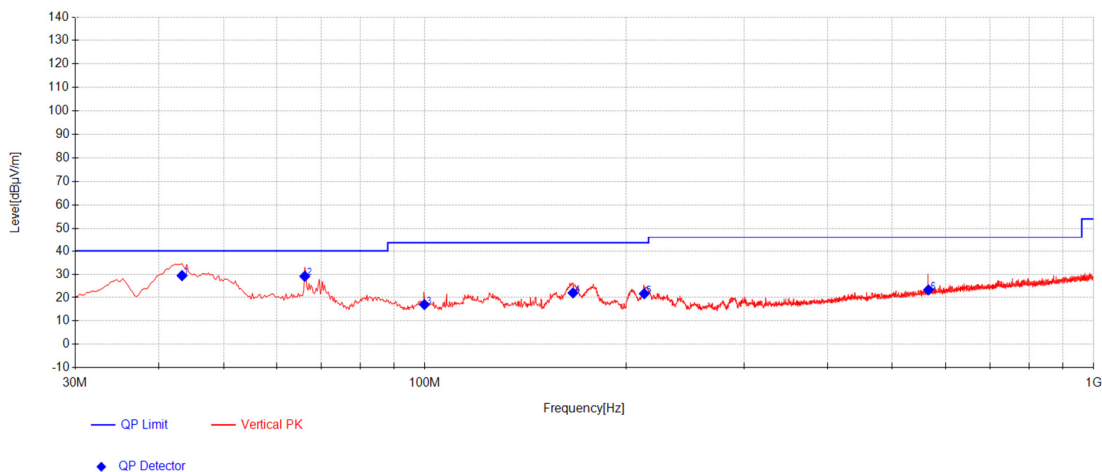
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Final Test Mode:	Mode c	Polarization:	Vertical
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Final Data List										
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	QP Value [dBμV/m]	QP Limit [dBμV/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity
1	43.3375	43.68	13.79	-28.06	29.41	40.00	10.59	102	255	Vertical
2	66.1325	45.26	11.57	-27.70	29.13	40.00	10.87	296	33	Vertical
3	99.84	34.26	10.14	-27.36	17.03	43.50	26.47	265	359	Vertical
4	166.5275	34.26	14.32	-26.57	22.01	43.50	21.49	142	314	Vertical
5	212.845	37.96	10.33	-26.60	21.69	43.50	21.81	263	358	Vertical
6	566.1675	30.26	17.69	-24.66	23.29	46.00	22.71	211	304	Vertical

Remark:

1. The Quasi-Peak measurements were performed on the EUT.

2. Value = Reading + AF + Factor:

AF = Antenna Factor(dB/m)

Factor = Cable Factor(dB) - Preamplifier (dB)

Margin = Limit[dBμV/m] -Value[dBμV/m]



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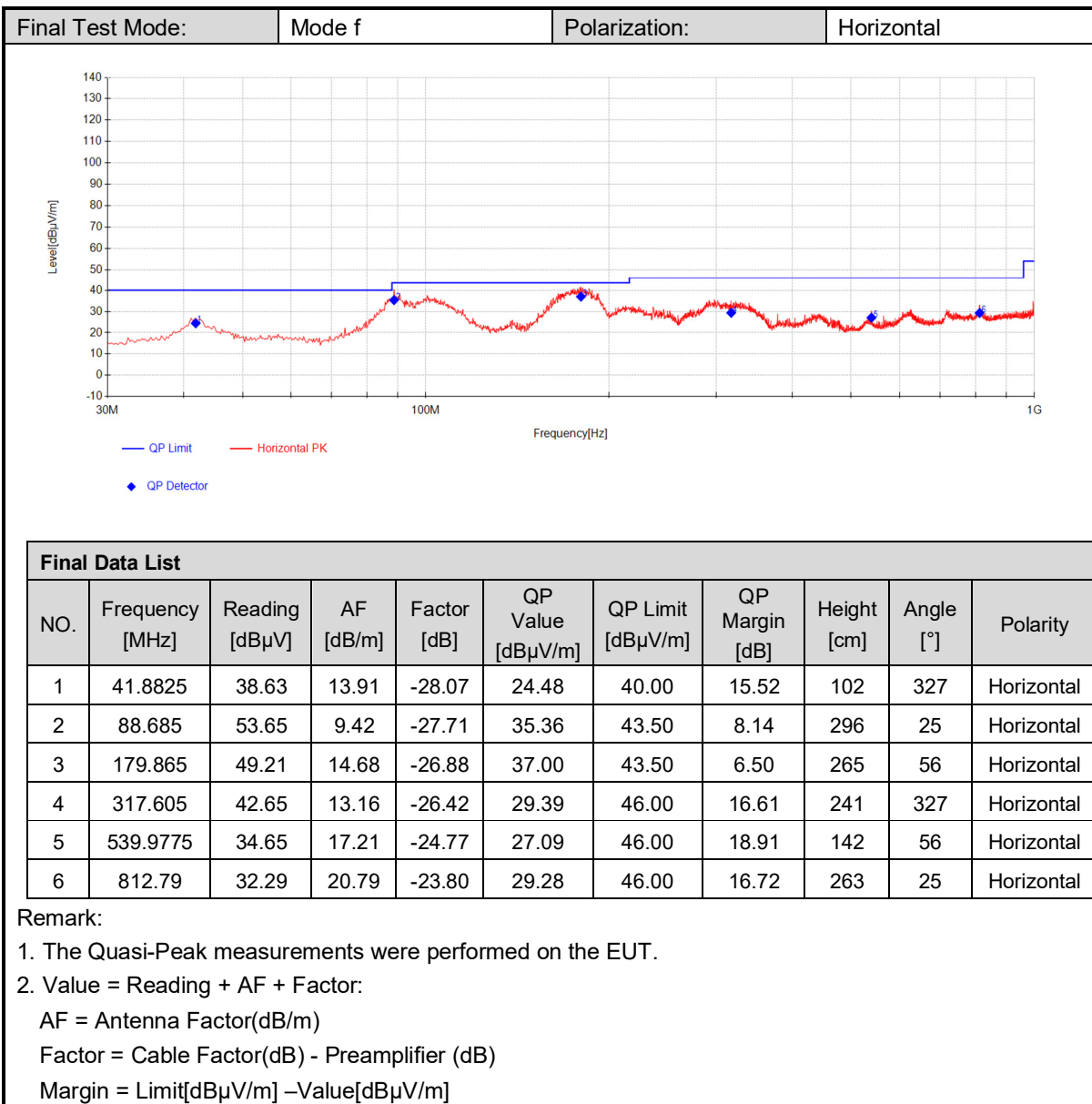
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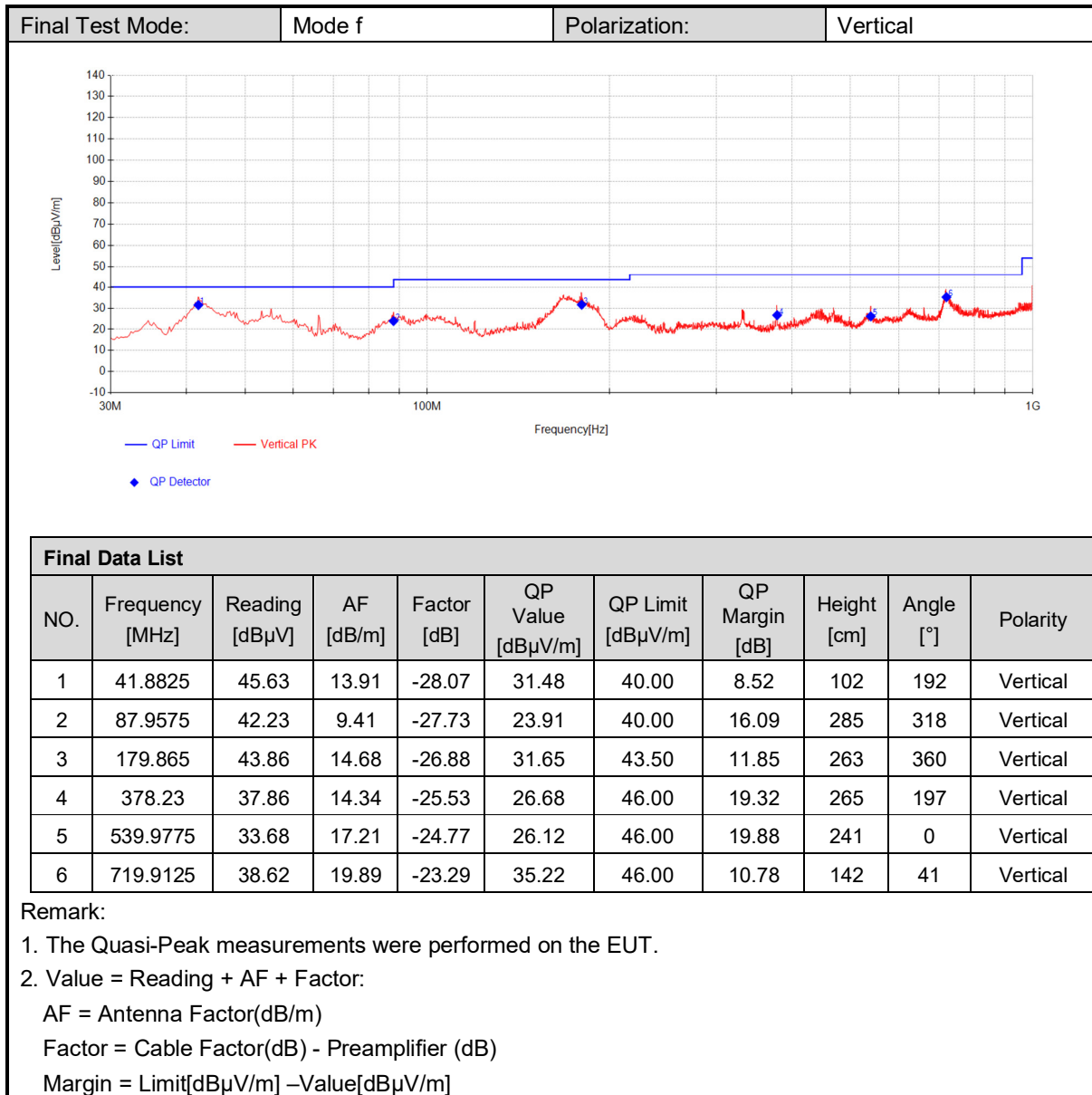
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2.3 Radiated Emissions (above 1GHz)

Test Requirement:	47 CFR Part 15, Subpart B		
Test Method:	ANSI C63.4:2014		
Frequency Range:	Above 1GHz		
Measurement Distance:	3m		
Limit:	Frequency (MHz)	Limit (dBμV/m)	Detector
	Above 1GHz	74	Peak
		54	Average
Detector:	Peak for pre-scan (1000kHz resolution bandwidth) 5th harmonic of the highest frequency or 40GHz, whichever is lower.		

2.3.1 E.U.T. Operation

Temperature:	22~23°C
Humidity:	44~46%RH
Atmospheric Pressure:	101.0 kPa
Pretest these modes to find the worst case:	a: adapter+usb Cable+BT+2.4GWLAN +Camera(Rear)+GSM850 b: adapter+usb Cable+BT+5GWLAN +Camera(Front)+WCDMA Band 5 c: adapter+usb Cable+BT+2.4GWLAN +MP4+LTE Band 5 d: adapter+usb Cable+BT+5GWLAN +GPS RX+LTE Band 12 e: adapter+usb Cable+BT+2.4GWLAN +NFC ON+GSM1900 f: Transfer data between the EUT and the PC+USB cable
The worst case for final test:	e: adapter+usb Cable+BT+2.4GWLAN +NFC ON+GSM1900 f: Transfer data between the EUT and the PC+USB cable
Remark:	1. Select the GSM/WCDMA/LTE with the worst power for the pre-test (TX&RX), and only the worst data will be reflected in the report. 2. The dominant frequency has been processed by the filter.



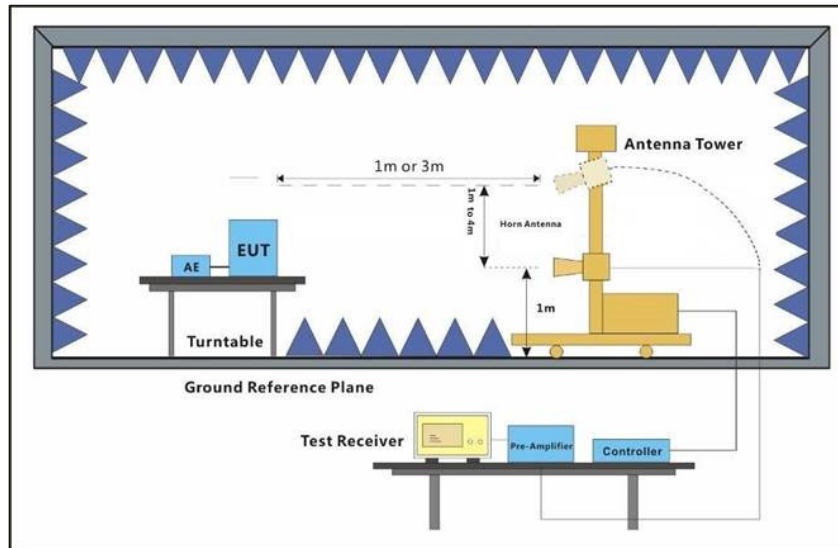
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2.3.2 Test Setup Procedures

1. The EUT was placed in a full Anechoic Chamber as show below
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
(Distance from antenna to EUT is 1m for measurements >18GHz).
4. The antenna height is adjusted between 1 to 4 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 and AV Detect Function with specified bandwidth with Maximum Hold Mode, and the trace was allowed to stabilize.
7. At a measurement distance of 1 meter the limit line was increased by $20 \cdot \log(3/1) = 9.54 \text{ dB}$.

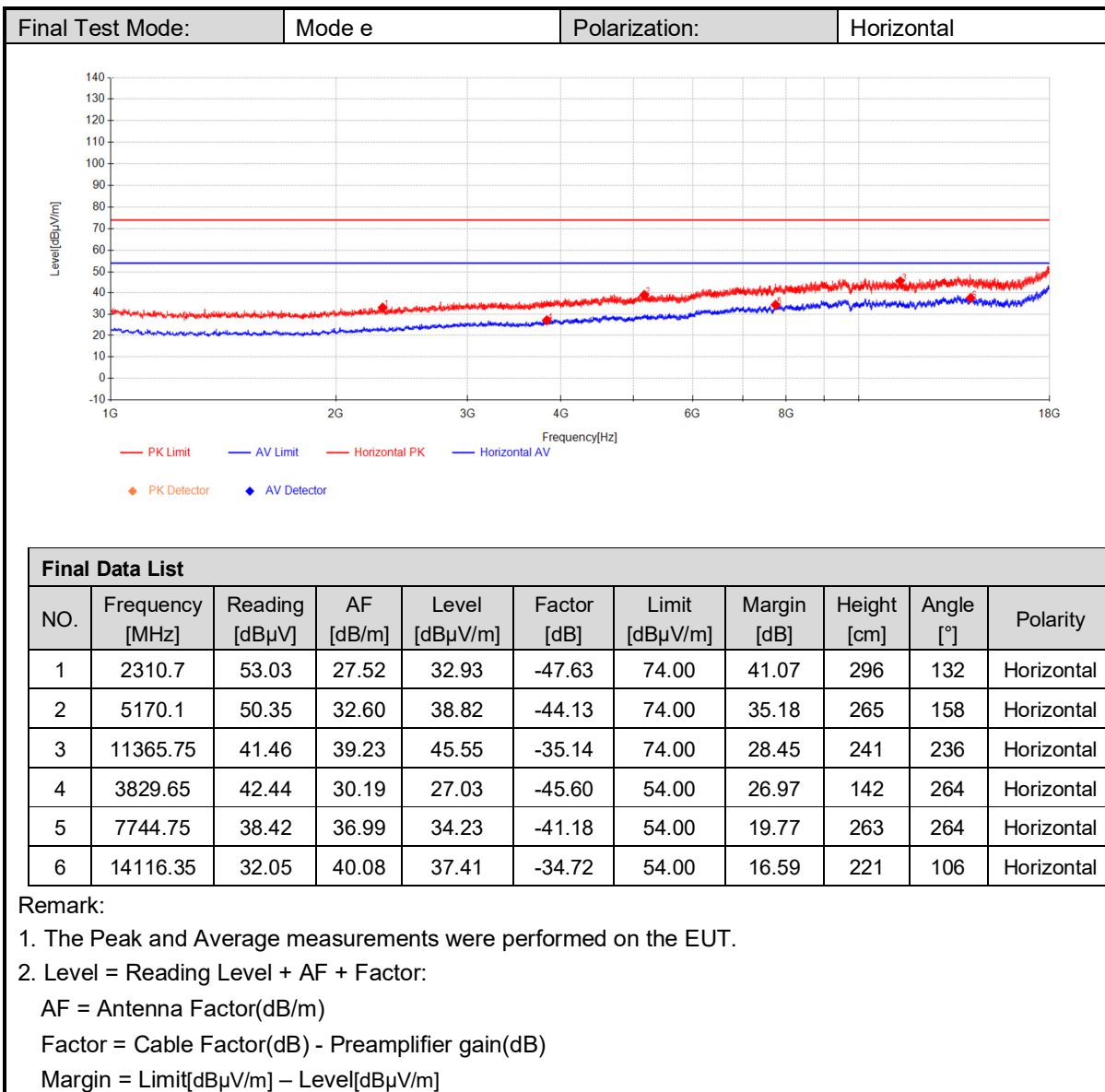


2.3.3 Measurement Data

An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Average measurements were conducted based on the peak sweep graph. The EUT was measured by Horn antenna with 2 orthogonal polarities.

The three polarities of X, Y, Z were measured by EUT, but only the worst data had been displayed. Scan from 5th harmonic of the highest frequency or 40GHz, whichever is lower, the disturbance above 18GHz was very low. The points marked on below plots are the highest emissions could be found when testing, so only below points had been displayed.

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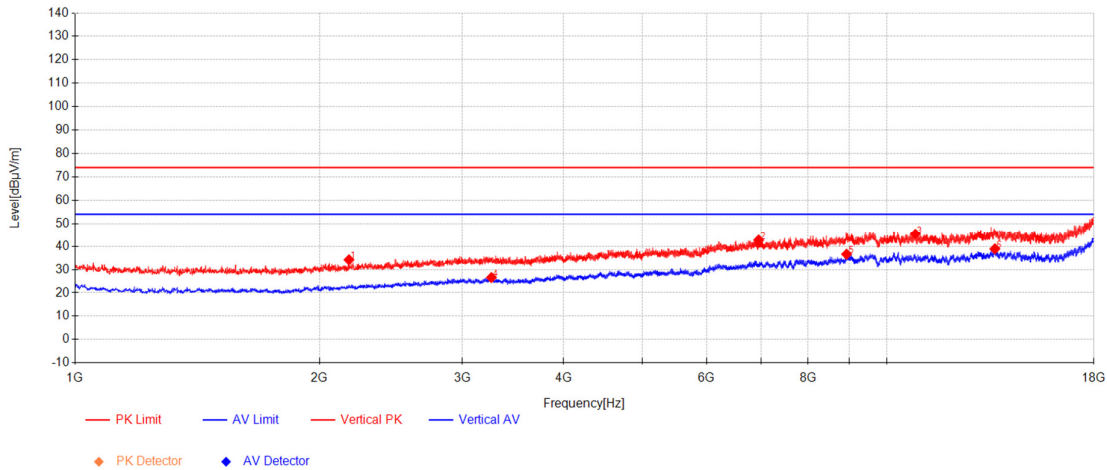
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Final Test Mode:

Mode e

Polarization:

Vertical



Final Data List

NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2175.55	54.69	27.25	34.17	-47.77	74.00	39.83	196	306	Vertical
2	6954.25	49.19	36.11	42.67	-42.63	74.00	31.33	265	253	Vertical
3	10847.25	41.70	39.43	45.42	-35.71	74.00	28.58	241	332	Vertical
4	3258.45	43.22	29.50	26.54	-46.18	54.00	27.46	142	176	Vertical
5	8925.4	37.31	38.52	36.56	-39.27	54.00	17.44	263	0	Vertical
6	13590.2	33.22	39.95	38.84	-34.34	54.00	15.16	228	357	Vertical

Remark:

1. The Peak and Average measurements were performed on the EUT.

2. Level = Reading Level + AF + Factor:

AF = Antenna Factor(dB/m)

Factor = Cable Factor(dB) - Preamplifier gain(dB)

Margin = Limit[dBμV/m] – Level[dBμV/m]



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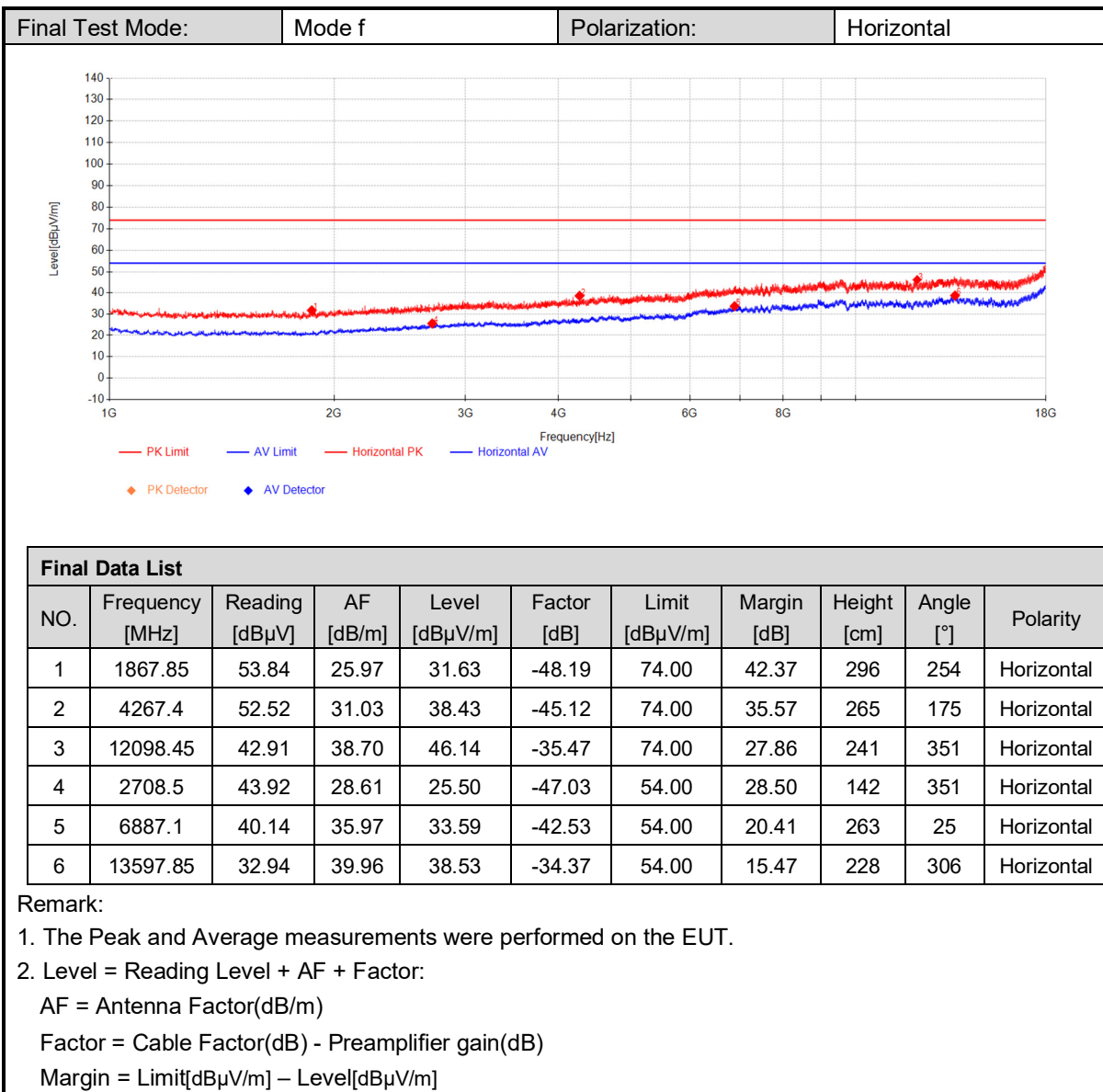
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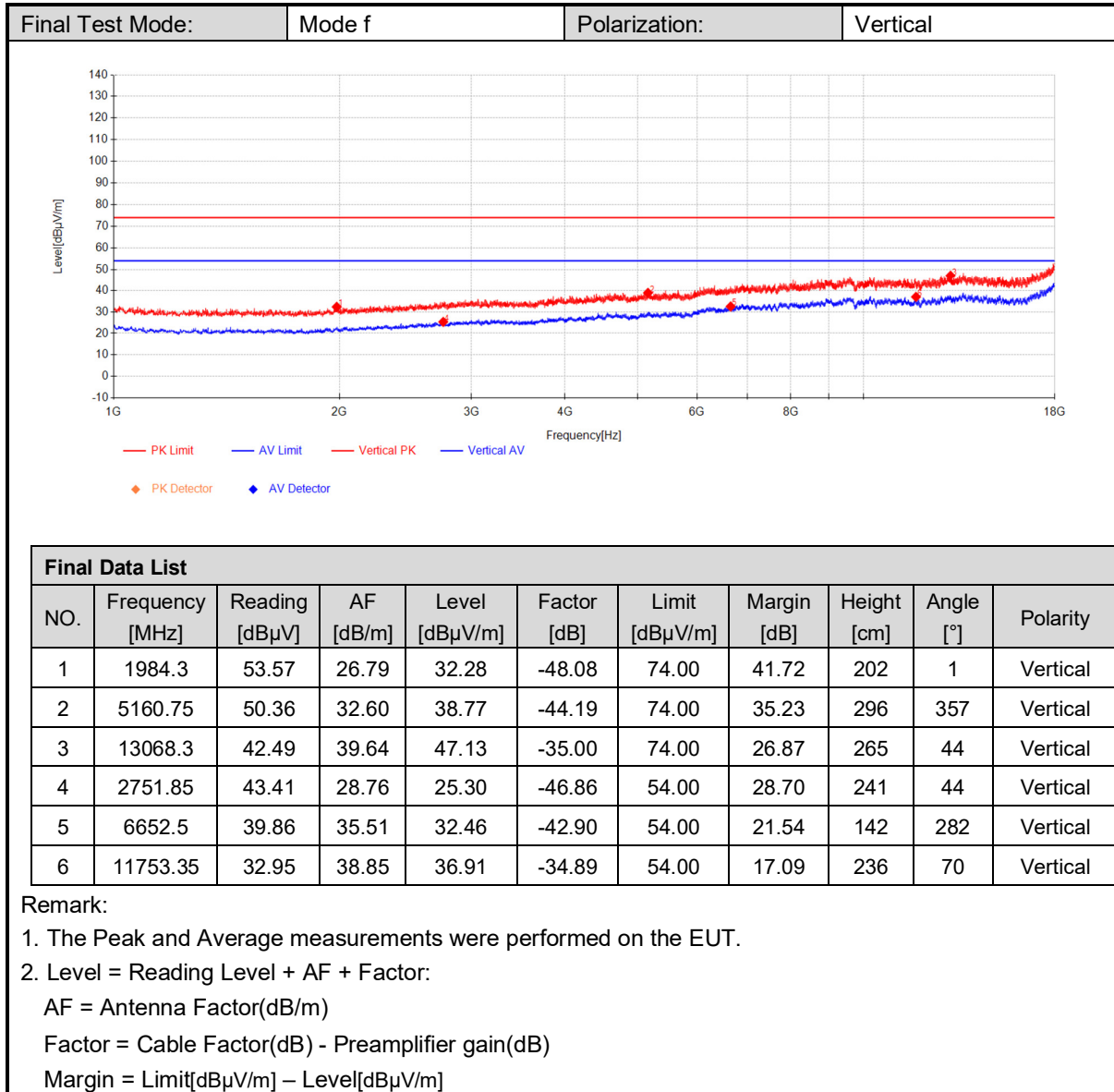
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3 Equipment List

CE Test System					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date (yyyy/mm/dd)	Cal Due Date (yyyy/mm/dd)
Wideband Radio Communication Tester	Anritsu	MT8820C	SUWI-01-16-08	2022/02/14	2023/02/13
Temperature and humidity meter	MingGao	TH101B	SUWI-01-01-06	2022/02/16	2023/02/15
Test receiver	ROHDE&SCHWARZ	ESR7	SUWI-01-10-01	2022/02/19	2023/02/18
Artificial network	ROHDE&SCHWARZ	ENV216	SUWI-01-19-01	2022/02/19	2023/02/18
Artificial network	ROHDE&SCHWARZ	ENV216	SUWI-01-19-02	2022/02/19	2023/02/18
Measurement Software CE	Tonsend	JS32-CE V4.0.0.2	SUWI-02-09-05	NCR	NCR



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RE Test System					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date (yyyy/mm/dd)	Cal Due Date (yyyy/mm/dd)
Semi-Anechoic Chamber	Brilliant-emc	N/A	SUWI-04-02-01	2021/05/08	2024/05/07
Temperature and humidity meter	MingGao	TH101B	SUWI-01-01-05	2022/02/16	2023/02/15
Signal Analyzer	ROHDE&SCHWARZ	FSW43	SUWI-01-02-04	2022/05/28	2023/05/27
Test receiver	ROHDE&SCHWARZ	ESR7	SUWI-01-10-01	2022/02/19	2023/02/18
Receiving antenna	SCHWRZBECK MESS- ELEKTRONIK	VULB 9163	SUWI-01-11-01	2021/05/16	2023/05/15
Receiving antenna	SCHWRZBECK MESS- ELEKTRONIK	BBHA 9120D	SUWI-01-11-02	2021/05/16	2023/05/15
Receiving antenna	SCHWRZBECK MESS- ELEKTRONIK	BBHA 9170	SUWI-01-11-03	2021/05/14	2023/05/13
Amplifier	Tonscend	TAP9K3G40	SUWI-01-14-01	2022/02/14	2023/02/13
Amplifier	Tonscend	TAP01018050	SUWI-01-14-02	2022/02/14	2023/02/13
Amplifier	Tonscend	TAP18040048	SUWI-01-14-03	2022/02/19	2023/02/18
Active Loop Antenna	SCHWRZBECK MESS- ELEKTRONIK	FMZB 1519B	SUWI-01-21-01	2021/06/10	2023/06/09
Wideband Radio Communication Tester	Anritsu	MT8820C	SUWI-01-16-08	2022/02/14	2023/02/13
Measurement Software	Tonscend	JS32-RE 4.0.0.0	SUWI-02-09-04	NCR	NCR



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4 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Conduction Emission	± 2.9dB (150kHz to 30MHz)
2	Radiated Emission	± 4.8dB (30MHz -1GHz)
		± 4.8dB (1GHz to 18GHz)
		± 4.80dB (Above 18GHz)
Remark: The U _{lab} (lab Uncertainty) is less than U _{CISPR/ETSI} (CISPR/ETSI Uncertainty), so the test results – compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit; – non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.		



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5 Photographs

5.1 Test Setup

Refer to Appendix A.1 15B Setup Photos.

---End of Report---



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