



SGS-CSTC Standards Technical Services (Suzhou) Co., Ltd

Report No.: SUCR240700026705

Rev.: 01

Page: 1 of 22

TEST REPORT

Application No: SUCR2407000267AT
Applicant: SmartWitness USA, LLC
Address of Applicant: 1016 Lunt Avenue Schaumburg, IL 60193 United States
Manufacturer: SmartWitness USA, LLC
Address of Manufacturer: 1016 Lunt Avenue Schaumburg, IL 60193 United States
EUT Description: Dash Camera
Model No.: CR4026-NAD011, CR4026-NAS011, CR4026-NAS0Y1, CR4026-NAD0Y1, CR4026-NAS2A1
Trade Mark: Sensata
FCC ID: 2AQ2S-CR402X
Standard(s): FCC 47 CFR Part 15, Subpart B
Date of Receipt: July 22, 2024
Date of Test: August 6, 2024 to August 6, 2024
Date of Issue: August 20, 2024

Test Result:	Pass*
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* In the configuration tested, the EUT complied with the standards specified above.

Nature Shen

Prepared by : Nature Shen / Project Manager

Cloud Peng

Approved by: Cloud Peng / Technical Manager

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Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
01		August 20, 2024		Original

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1 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	5th harmonic of the highest frequency or 40GHz, whichever is lower

Remark:

This test report (Report No.: SUCR240700026705 issue on August 20, 2024) is based on the original test report (Report No.: SEWM2308000332RG05 issued on September 1, 2023).

Review this report and original report, this report just changing the parts according to the declaration letter from client.

Therefore in this report Conducted Emissions at Mains Terminals (150kHz-30MHz), Radiated Emissions (30MHz-1GHz) and Radiated Emissions (above 1GHz) were performed based on the worst case of the original report with report number SEWM2308000332RG05 issued on September 1, 2023 and other test data in this report are based on the previous report with report number SEWM2308000332RG05 issued on September 1, 2023.

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2 General Information

Product Name:	Dash Camera		
Model No. (EUT):	CR4026-NAD011, CR4026-NAS011, CR4026-NAS0Y1, CR4026-NAD0Y1, CR4026-NAS2A1		
Trade Mark:	Sensata		
Hardware Version:	V1.3		
Software Version:	SC600YNAPAR06A04_BP03.006_QDM039		
IMEI:	016468000014929		
Frequency Bands:	Band	Tx (MHz)	Rx (MHz)
	LTE Band 2	1850~1910	1930~1990
	LTE Band 4	1710~1755	2110~2155
	LTE Band 5	824~849	869~894
	LTE Band 7	2500~2570	2620~2690
	LTE Band 12	699~716	729~746
	LTE Band 13	777~787	746~756
	LTE Band 14	788~798	746~756
	LTE Band 17	704~716	734~746
	LTE Band 25	1850~1915	1930~1995
	LTE Band 26 (814 to 824 MHz)	814~824	859~869
	LTE Band 26 (824 to 849 MHz)	824~849	869~894
	LTE Band 41	2496~2690	2496~2690
	LTE Band 66	1710~1780	2110~2200
	LTE Band 71	663~698	617~652
	Bluetooth	2402~2480	2402~2480
	Wi-Fi 2.4G	2412~2462	2412~2462
	GNSS (GPS+Beidou+GLONASS)	N/A	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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2.1 Description of Support Units

The EUT has been tested as an independent unit.

2.2 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

2.3 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

2.4 Deviation from Standards

None

2.5 Abnormalities from Standard Conditions

None

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3 Emission Test Results

3.1 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:	101kPa
Pretest these modes to find the worst case:	a: USB (adapter input)+BT+2.4GWLAN +GNSS +LTE Band 5 b: USB (adapter input)+BT+2.4GWLAN +GNSS +LTE Band 12 c: USB (adapter input)+BT+2.4GWLAN +GNSS +LTE Band 13 d: USB (adapter input)+BT+2.4GWLAN +GNSS +LTE Band 14 e: USB (adapter input)+BT+2.4GWLAN +GNSS +LTE Band 17 f: USB (adapter input)+BT+2.4GWLAN +GNSS +LTE Band 26 g: USB (adapter input)+BT+2.4GWLAN +GNSS +LTE Band 71
The worst case for final test:	d: USB (adapter input)+BT+2.4GWLAN +GNSS +LTE Band 14

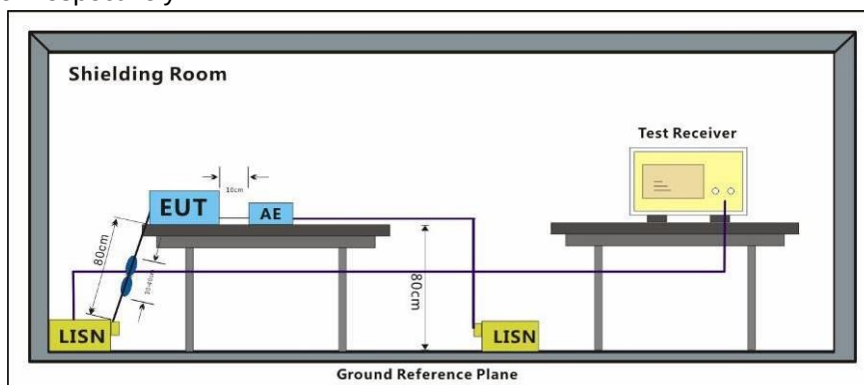
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2.1.2 Test Setup Procedures

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

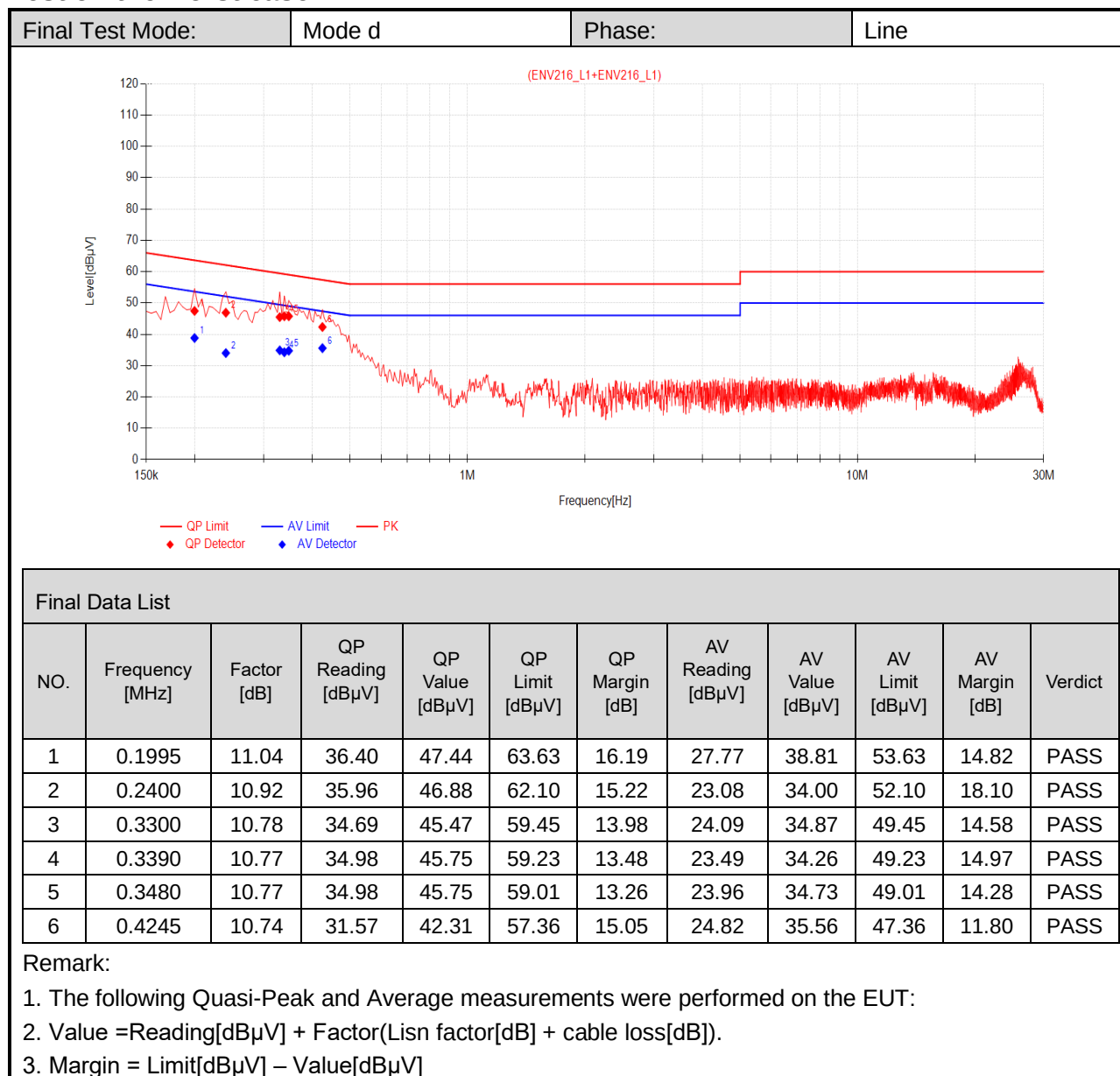
An initial pre-scan was performed with peak detector. Quasi-Peak or Average measurement were performed at the frequencies with maximized peak emission were detected.

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Test on the worst case:

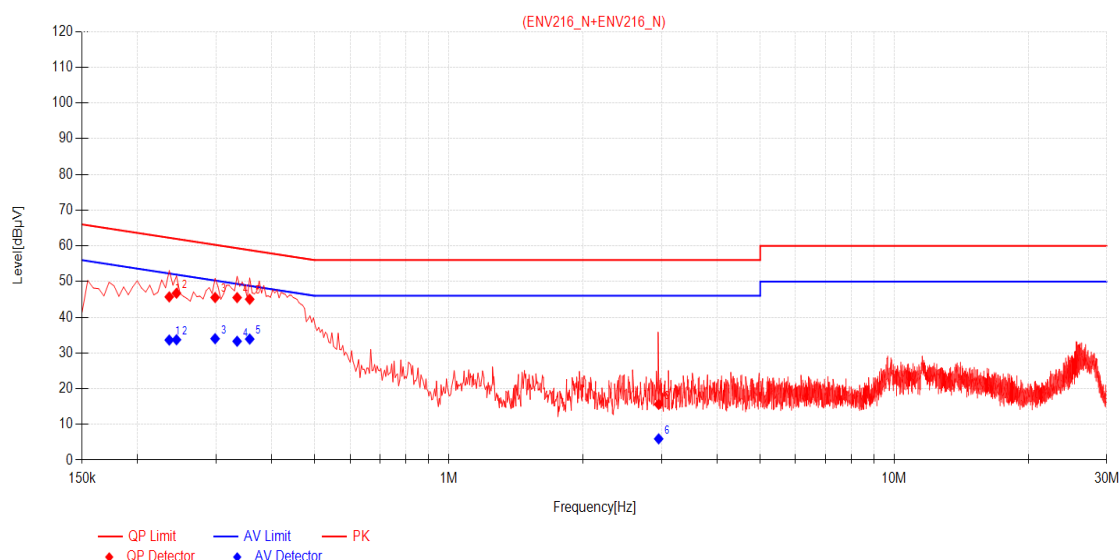


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Final Test Mode:	Mode d	Phase:	Neutral
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Final Data List

NO.	Frequency [MHz]	Factor [dB]	QP Reading [dBμV]	QP Value [dBμV]	QP Limit [dBμV]	QP Margin [dB]	AV Reading [dBμV]	AV Value [dBμV]	AV Limit [dBμV]	AV Margin [dB]	Verdict
1	0.2355	10.86	34.85	45.71	62.25	16.54	22.75	33.61	52.25	18.64	PASS
2	0.2445	10.83	35.91	46.74	61.94	15.20	22.88	33.71	51.94	18.23	PASS
3	0.2985	10.69	34.84	45.53	60.28	14.75	23.31	34.00	50.28	16.28	PASS
4	0.3345	10.69	34.81	45.50	59.34	13.84	22.59	33.28	49.34	16.06	PASS
5	0.3570	10.68	34.36	45.04	58.80	13.76	23.22	33.90	48.80	14.90	PASS
6	2.9580	10.93	4.69	15.62	56.00	40.38	-4.98	5.95	46.00	40.05	PASS

Remark:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Value = Reading[dBμV] + Factor(Lisn factor[dB] + cable loss[dB]).
3. Margin = Limit[dBμV] – Value[dBμV]

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3.2 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		

3.2.1 E.U.T. Operation

Temperature:	22~23°C
Humidity:	44~46%RH
Atmospheric Pressure:	101kPa
Pretest these modes to find the worst case:	a: USB (adapter input)+BT+2.4GWLAN +GNSS +LTE Band 5 b: USB (adapter input)+BT+2.4GWLAN +GNSS +LTE Band 12 c: USB (adapter input)+BT+2.4GWLAN +GNSS +LTE Band 13 d: USB (adapter input)+BT+2.4GWLAN +GNSS +LTE Band 14 e: USB (adapter input)+BT+2.4GWLAN +GNSS +LTE Band 17 f: USB (adapter input)+BT+2.4GWLAN +GNSS +LTE Band 26 g: USB (adapter input)+BT+2.4GWLAN +GNSS +LTE Band 71
The worst case for final test:	f: USB (adapter input)+BT+2.4GWLAN +GNSS +LTE Band 26

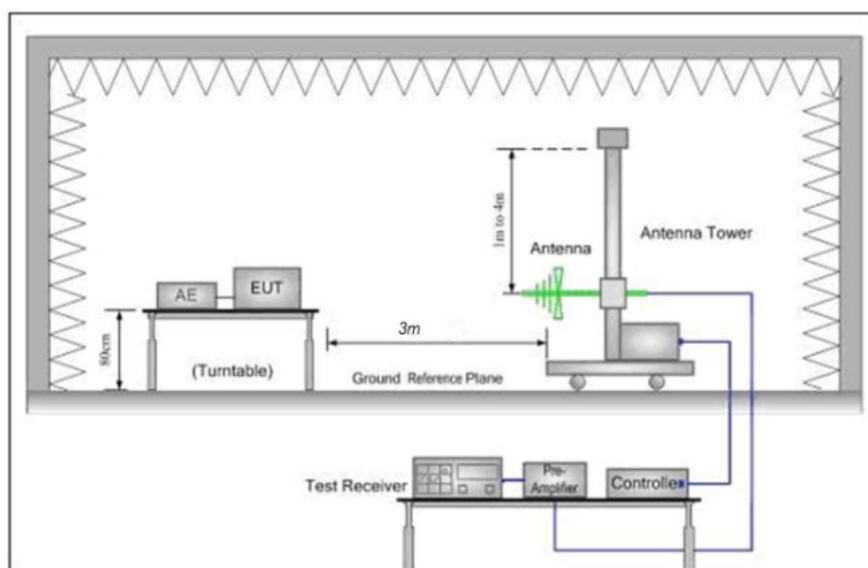
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3.2.2 Test Setup Procedures

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.



3.2.3 Measurement Data

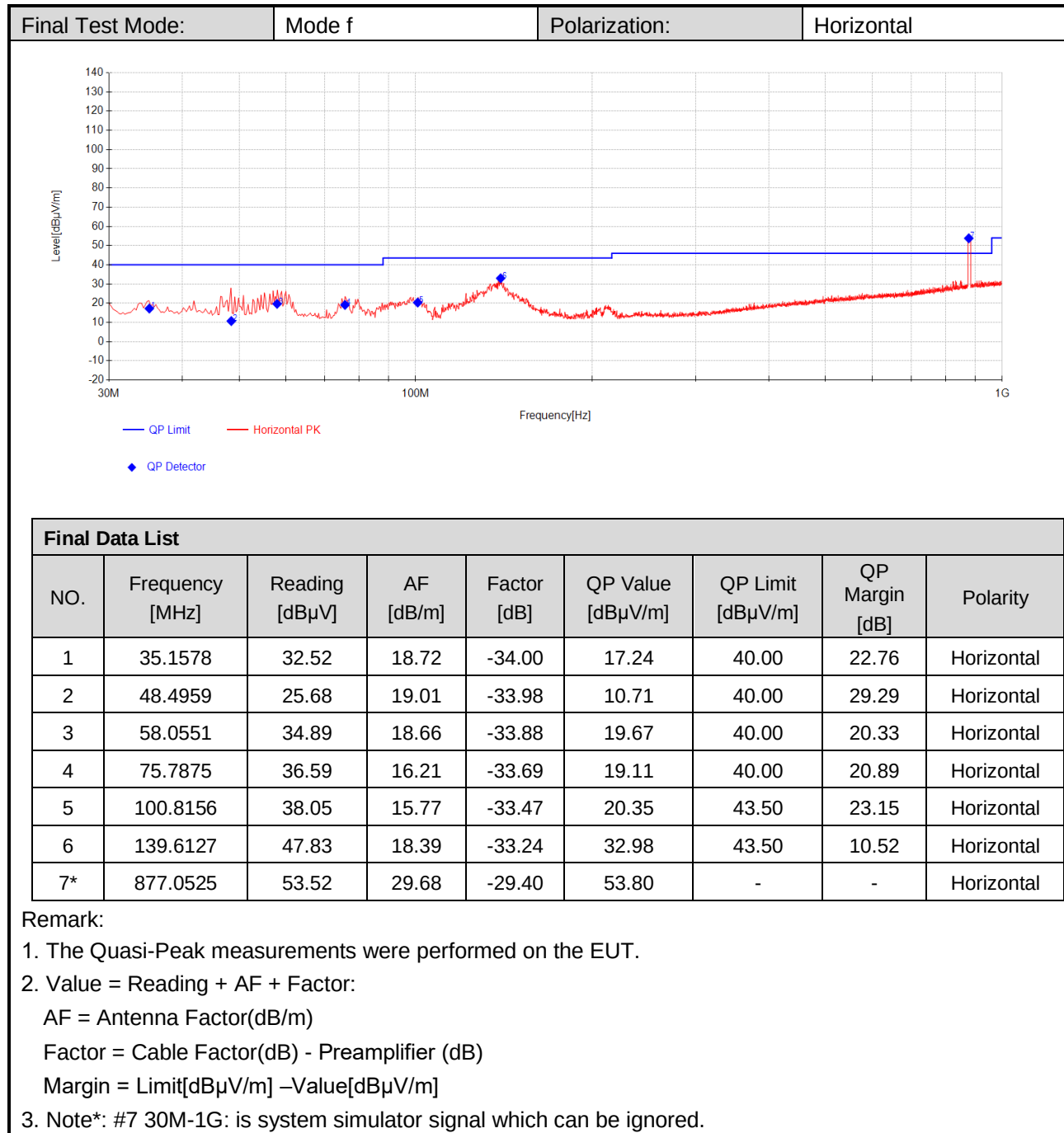
An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by BiConiLog antenna with 2 orthogonal polarities. The three polarities of X,Y,Z were measured by EUT, but only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

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Test on the worst case:

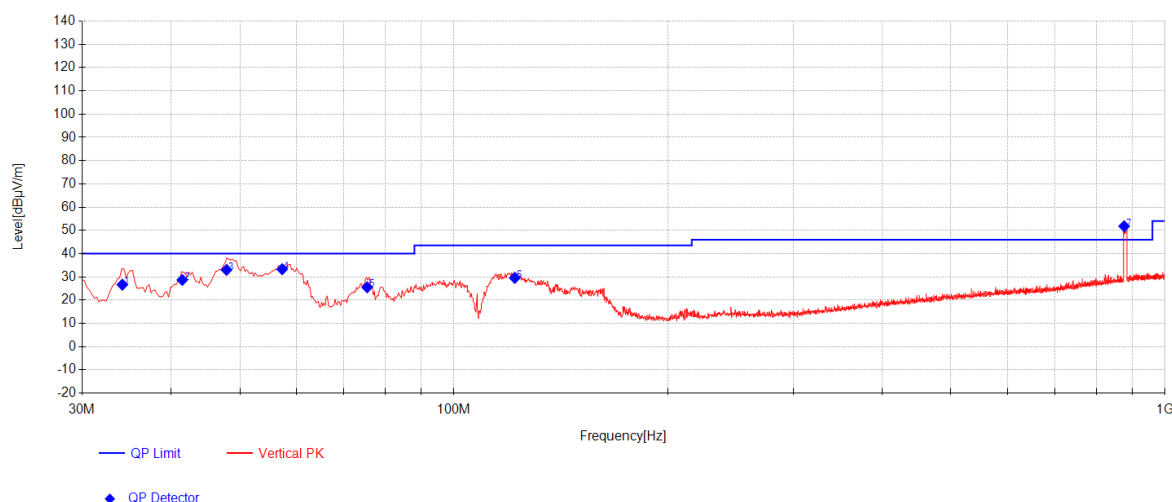


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Final Test Mode:	Mode f	Polarization:	Vertical
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Final Data List

NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	QP Value [dBμV/m]	QP Limit [dBμV/m]	QP Margin [dB]	Polarity
1	34.1823	42.09	18.56	-34.00	26.65	40.00	13.35	Vertical
2	41.4981	43.18	19.50	-33.99	28.69	40.00	11.31	Vertical
3	47.8954	47.95	19.04	-33.98	33.01	40.00	6.99	Vertical
4	57.3431	48.51	18.68	-33.89	33.30	40.00	6.70	Vertical
5	75.5116	42.93	16.29	-33.69	25.53	40.00	14.47	Vertical
6	121.7778	45.67	17.22	-33.33	29.56	43.50	13.94	Vertical
7*	875.84	51.56	29.66	-29.41	51.81	-	-	Vertical

Remark:

- The Quasi-Peak measurements were performed on the EUT.
- Value = Reading + AF + Factor:
 AF = Antenna Factor(dB/m)
 Factor = Cable Factor(dB) - Preamplifier (dB)
 Margin = Limit[dBμV/m] -Value[dBμV/m]
- Note*: #7 30M-1G: is system simulator signal which can be ignored.

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3.3 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.		

3.3.1 E.U.T. Operation

Temperature:	22~23°C
Humidity:	44~46%RH
Atmospheric Pressure:	101kPa
Pretest these modes to find the worst case:	a: USB (adapter input)+BT+2.4GWLAN +GNSS +LTE Band 5 b: USB (adapter input)+BT+2.4GWLAN +GNSS +LTE Band 12 c: USB (adapter input)+BT+2.4GWLAN +GNSS +LTE Band 13 d: USB (adapter input)+BT+2.4GWLAN +GNSS +LTE Band 14 e: USB (adapter input)+BT+2.4GWLAN +GNSS +LTE Band 17 f: USB (adapter input)+BT+2.4GWLAN +GNSS +LTE Band 26 g: USB (adapter input)+BT+2.4GWLAN +GNSS +LTE Band 71
The worst case for final test:	g: USB (adapter input)+BT+2.4GWLAN +GNSS +LTE Band 71

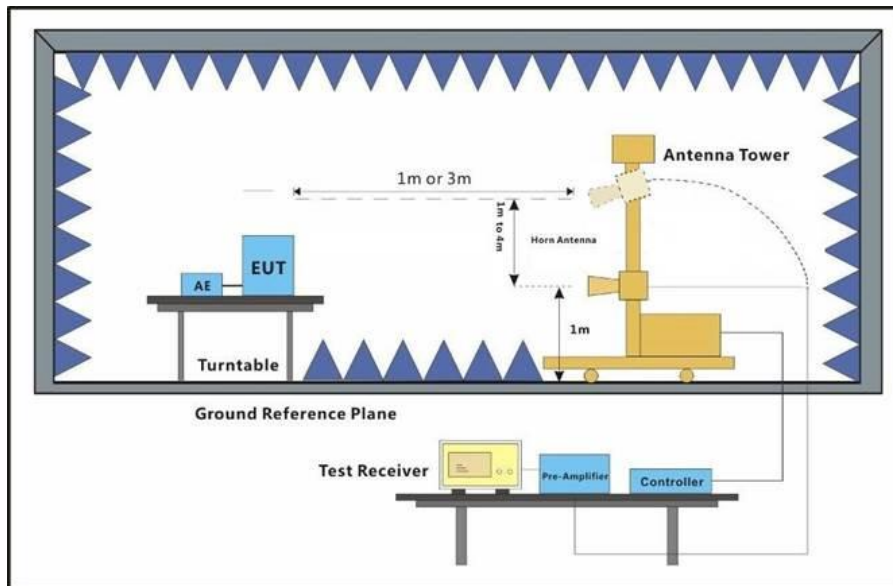
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3.3.2 Test Setup Procedures

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 $20 \cdot \log(3/1) = 9.54$ dB.



3.3.3 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.

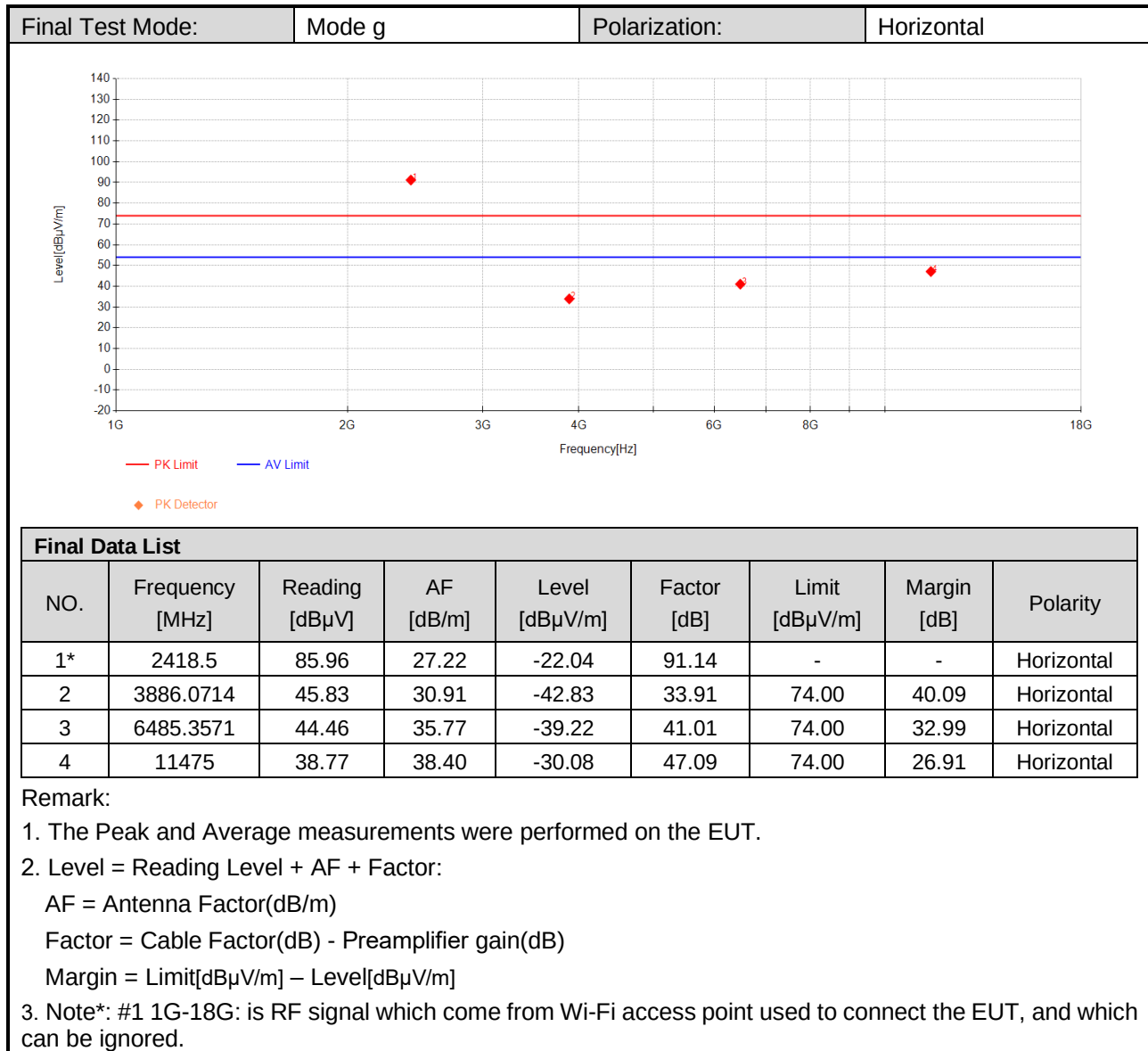
Scan from 5th harmonic of the highest frequency or 40GHz, whichever is lower, the disturbance above 18GHz was very low. The points marked on below plots are the highest emissions could be found when testing, so only below points had been displayed.

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Test on the worst case:

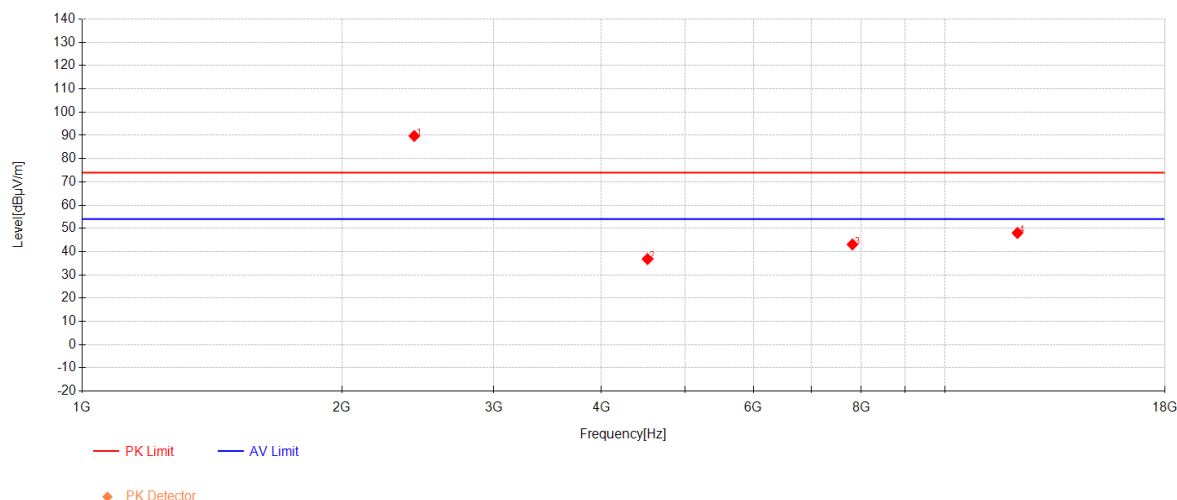


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Final Test Mode:	Mode g	Polarization:	Vertical
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Final Data List

NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Polarity
1*	2426.8333	84.55	27.24	-22.03	89.76	-	-	Vertical
2	4522.5	46.58	32.15	-41.94	36.79	74.00	37.21	Vertical
3	7815.5357	42.94	36.92	-36.75	43.10	74.00	30.90	Vertical
4	12137.6786	38.90	38.57	-29.43	48.03	74.00	25.97	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]

3. Note*: #1 1G-18G: is RF signal which come from Wi-Fi access point used to connect the EUT, and which can be ignored.

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4 Equipment List

Conduction Test Equipment					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date (yyyy/mm/dd)	Cal.Due date (yyyy/mm/dd)
Test receiver	ROHDE&SCHWARZ	ESR7	SUWI-01-10-01	2024/02/01	2025/01/31
Temperature and humidity meter	MingGao	TH101B	SUWI-01-01-06	2024/02/04	2025/02/03
Artificial network	ROHDE&SCHWARZ	ENV216	SUWI-01-19-03	2024/02/04	2025/02/03
Artificial network	ROHDE&SCHWARZ	ENV216	SUWI-01-19-04	2024/02/04	2025/02/03
Measurement Software	Tonscend	JS32-CE 4.0.0.2	SUWI-02-09-05	NCR	NCR
Wideband Radio Communication Tester	Anritsu	MT8821C	SUWI-01-26-03	2023/11/21	2024/11/20

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RE Test Equipment					
Test 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	2023/06/03	2026/06/02
Temperature and humidity meter	MingGao	TH101B	SUWI-01-01-05	2024/02/18	2025/02/17
Signal Analyzer	KEYSIGHT	N9020A	SUWI-01-02-07	2023/11/21	2024/11/20
Test receiver	ROHDE&SCHWARZ	ESR7	SUWI-01-10-01	2024/02/01	2025/01/31
Receiving antenna	SCHWRZBEC K MESS-ELEKTRONIK	VULB 9163	SUWI-01-11-01	2023/05/13	2025/05/12
Receiving antenna	SCHWRZBEC K MESS-ELEKTRONIK	BBHA 9120D	SUWI-01-11-02	2023/05/13	2025/05/12
Amplifier	Tonscend	TAP9K3G40	SUWI-01-14-01	2024/02/04	2025/02/03
Amplifier	Tonscend	TAP01018050	SUWI-01-14-02	2024/02/04	2025/02/03
Wideband Radio Communication Tester	Anritsu	MT8821C	SUWI-01-26-03	2023/11/21	2024/11/20
Measurement Software	Tonscend	JS32-RE V4.0.0.0	SUWI-02-09-04	NCR	NCR

Remark: NCR=No Calibration Requirement.

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5 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Conduction Emission	± 2.9dB (150kHz to 30MHz)
2	Radiated Emission	± 4.8dB (Below 1GHz)
		± 4.8dB (1GHz to 18GHz)
		± 4.8dB (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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6 Photographs

6.1 Test Setup

Refer to Appendix A.1 15B Setup Photos.

---End of Report---

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