Radio Test Report

Report No.: CTA231120011W03

Issued for

Zeniko Technology Co.,LTD

1208 Room, Jinshan Building, No. 5033, Shennan East Road, Xinwei Community, Guiyuan Street, Luohu District, Shenzhen City

Product Name:	Smartphone Video Rig
Brand Name:	ZENIKO
Model Name:	MR11
Series Model(s):	N/A
FCC ID:	2BBSYMR11
Test Standards:	FCC Part 15 Subpart C

TEST REPORT

Applicant's Name ..... :	Zeniko Technology Co.,LTD
Address ..... :	1208 Room, Jinshan Building, No. 5033, Shennan East Road, Xinwei Community, Guiyuan Street, Luohu District, Shenzhen City
Manufacturer's Name ..... :	Zeniko Technology Co.,LTD
Address ..... :	1208 Room, Jinshan Building, No. 5033, Shennan East Road, Xinwei Community, Guiyuan Street, Luohu District, Shenzhen City

Product Description

Product Name ..... :	Smartphone Video Rig
Brand ..... :	ZENIKO
Model Number ..... :	MR11
Series Model(s) ..... :	N/A
Test Standards ..... :	FCC Part 15 Subpart C
Test Procedure ..... :	ANSI C63.10-2013

This device described above has been tested by CTA, the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.
The test results presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of the ShenZhen CTA Test Services Co., Ltd.

Date of Test ..... :	
Date of receipt of test item ..... :	31 Oct. 2023
Date (s) of performance of tests :	31 Oct. 2023 ~ 21 Nov. 2023
Date of Issue ..... :	21 Nov. 2023
Test Result ..... :	**Pass**

Testing Engineer : Zoey Cao

(Zoey Cao)

Technical Manager : Amy Wen

(Amy Wen)

Authorized Signatory : Eric Wang

(Eric Wang)

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Revision History

Rev.	Issue Date	Report No.	Effect Page	Contents
00	21 Nov. 2023	CTA231120011W03	ALL	Initial Issue

1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15 , Subpart C			
Standard Section	Test Item	Judgment	Remark
15.207	Conducted Emission	PASS	
15.209(a)	Radiated emission, Spurious Emission	PASS	
2.1049	20 dB Bandwidth	PASS	

1.1 TEST FACTORY

Shenzhen CTA Testing Technology Co., Ltd.
Room 106, Building 1, Yibaolai Industrial Park, Qiaotou Community,Fuhai Street, Bao'an District, Shenzhen, China
FCC test Firm Registration Number: 517856
IC test Firm Registration Number: 27890
A2LA Certificate No.: 6534.01
IC CAB ID: CN0127

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement **y** ±**U**, where expended uncertainty **U** is based on a standard uncertainty multiplied by a coverage factor of **k=2**, providing a level of confidence of approximately **95** %.

Test	Range	Measurement Uncertainty
Radiated Emission	30~1000MHz	4.06 dB
Radiated Emission	1~18GHz	5.14 dB
Radiated Emission	18-40GHz	5.38 dB
Conducted Disturbance	0.15~30MHz	2.14 dB
Output Peak power	30MHz~18GHz	0.55 dB
Power spectral density	/	0.57 dB
Spectrum bandwidth	/	1.1%
Radiated spurious emission (30MHz-1GHz)	30~1000MHz	4.10 dB
Radiated spurious emission (1GHz-18GHz)	1~18GHz	4.32 dB
Radiated spurious emission (18GHz-40GHz)	18-40GHz	5.54 dB

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF THE EUT

Product Name	Smartphone Video Rig
Brand Name	ZENIKO
Model Number	MR11
Series Model(s)	N/A
Model Difference	N/A
Channel List	Please refer to the Note 2.
Antenna Type	Please refer to the Note 3.
Equipemnt Category	Non-ISM frequency
Operating frequency	110.5-205K
Modulation Type	ASK
Rating	Input: USB-C Input: 5V⎓2A Output: Wireless Charging Output: 5V⎓1A USB-A Output: 5V⎓1A Lithium Battery: 7.4V, 3200mAh, 23.68Wh (smartphone rig)3.7V, 30mAh, 0.111Wh
Battery	Rated Voltage: 7.4V Charge Limit Voltage: 8.4V Capacity: 3200mAh, 23.68Wh Rated Voltage: 3.7V Charge Limit Voltage: 4.2V Capacity: 30mAh, 0.111Wh
Hardware version number	20230208H41
Software version number	V1.0
Connecting I/O Port(s)	Please refer to the Note 1.

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User Manual.
2.

Test channel list	
Coil	Frequency(KHz)
1	129.3

3. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	NOTE
1	ZENIKO	MR11	Coil	N/A	Antenna

2.2 DESCRIPTION OF THE TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	Wireless charging (phone)
Mode 2	Wireless charging (phone)+USB charging

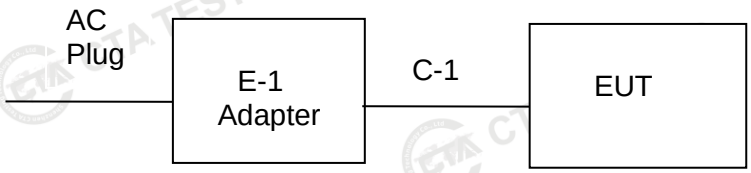
For Conducted Emission	
Final Test Mode	Description
Mode 1	Wireless charging (phone)
Mode 2	Wireless charging (phone)+USB charging

For Radiated Emission	
Final Test Mode	Description
Mode 1	Wireless charging (phone)
Mode 2	Wireless charging (phone)+USB charging

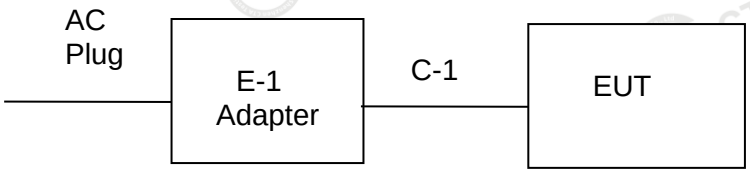
2.3 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters

Radiated Emission Test



Conducted EmissionTest



2.4 DESCRIPTION OF NECESSARY ACCESSORIES AND 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.

Necessary accessories

Item	Equipment	Mfr/Brand	Model/Type No.	Length	Note
N/A	N/A	N/A	N/A	N/A	N/A

Support units

Item	Equipment	Mfr/Brand	Model/Type No.	Length	Note
	Adapter	HUAWEI	HW-050450C00	N/A	N/A
	USB Cable	N/A	N/A	150cm	NO
	Mobile Phone	iPhone	iPhone8	N/A	N/A

Note:

(1) For detachable type I/O cable should be specified the length in cm in『Length』column.

(2) “YES” is means “with core”; “NO” is means “without core”.

2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

Test Equipment	Manufacturer	Model No.	Equipment No.	Calibration Date	Calibration Due Date
LISN	R&S	ENV216	CTA-308	2023/08/02	2024/08/01
LISN	R&S	ENV216	CTA-314	2023/08/02	2024/08/01
EMI Test Receiver	R&S	ESPI	CTA-307	2023/08/02	2024/08/01
EMI Test Receiver	R&S	ESCI	CTA-306	2023/08/02	2024/08/01
Spectrum Analyzer	Agilent	N9020A	CTA-301	2023/08/02	2024/08/01
Spectrum Analyzer	R&S	FSP	CTA-337	2023/08/02	2024/08/01
Vector Signal generator	Agilent	N5182A	CTA-305	2023/08/02	2024/08/01
Analog Signal Generator	R&S	SML03	CTA-304	2023/08/02	2024/08/01
WIDEBAND RADIO COMMUNICATIO N TESTER	CMW500	R&S	CTA-302	2023/08/02	2024/08/01
Temperature and humidity meter	Chigo	ZG-7020	CTA-326	2023/08/02	2024/08/01
Ultra-Broadband Antenna	Schwarzbeck	VULB9163	CTA-310	2023/10/17	2024/10/16
Horn Antenna	Schwarzbeck	BBHA 9120D	CTA-309	2023/10/13	2024/10/12
Loop Antenna	Zhinan	ZN30900C	CTA-311	2023/10/17	2024/10/16
Horn Antenna	Beijing Hangwei Dayang	OBH100400	CTA-336	2021/08/07	2024/08/06
Amplifier	Schwarzbeck	BBV 9745	CTA-312	2023/08/02	2024/08/01
Amplifier	Taiwan chengyi	EMC051845B	CTA-313	2023/08/02	2024/08/01
Directional coupler	NARDA	4226-10	CTA-303	2023/08/02	2024/08/01
High-Pass Filter	XingBo	XBLBQ-GTA18	CTA-402	2023/08/02	2024/08/01
High-Pass Filter	XingBo	XBLBQ-GTA27	CTA-403	2023/08/02	2024/08/01
Automated filter bank	Tonscend	JS0806-F	CTA-404	2023/08/02	2024/08/01
Power Sensor	Agilent	U2021XA	CTA-405	2023/08/02	2024/08/01
Amplifier	Schwarzbeck	BBV9719	CTA-406	2023/08/02	2024/08/01
Test Equipment	Manufacturer	Model No.	Version number	Calibration Date	Calibration Due Date

EMI Test Software	Tonscend	TS®JS32-RE	5.0.0.2	N/A	N/A
EMI Test Software	Tonscend	TS®JS32-CE	5.0.0.1	N/A	N/A
RF Test Software	Tonscend	TS®JS1120-3	3.1.65	N/A	N/A
RF Test Software	Tonscend	TS®JS1120	3.1.46	N/A	N/A

3. CONDUCTED EMISSION TEST RESULT (SECTION 15.207)

3.1 POWER LINE CONDUCTED EMISSION LIMITS

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.

FREQUENCY (MHz)	Class B (dBuV)	
	Quasi-peak	Average
0.15 -0.5	66 - 56 *	56 - 46 *
0.50 -5.0	56.00	46.00
5.0 -30.0	60.00	50.00

Note:

(1) The tighter limit applies at the band edges.

(2) The limit of "*" marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

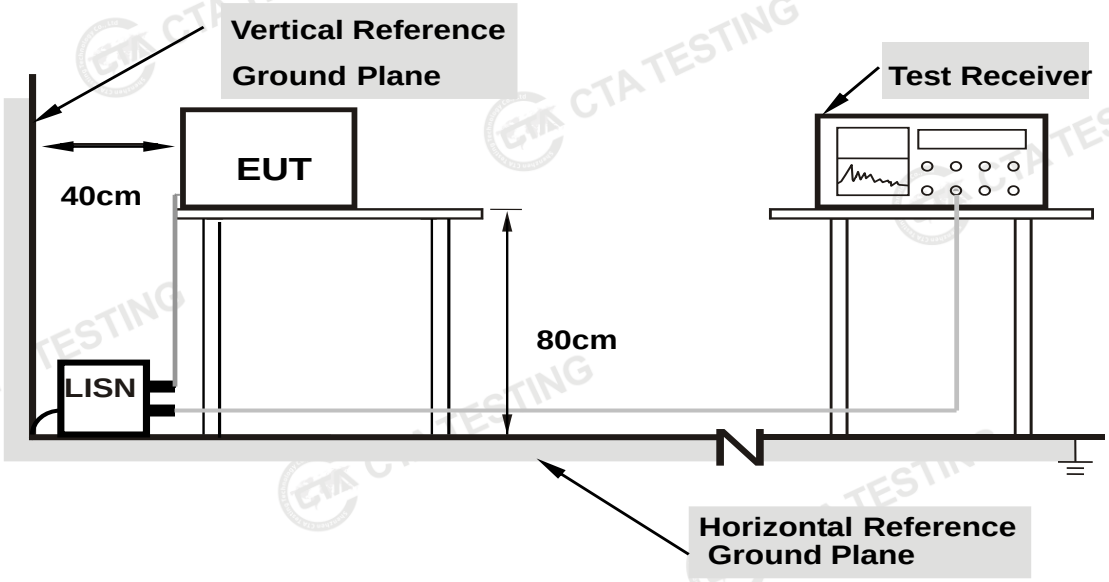
The following table is the setting of the receiver

Receiver Parameters	**Setting**
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

3.2 TEST PROCEDURE

a. The EUT is 0.8 m from the horizontal ground plane and 0.4 m from the vertical ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments are powered from additional LISN(s). The LISN provides 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
d. LISN is at least 80 cm from the nearest part of EUT chassis.
e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.3 TEST SETUP



Note: 1. Support units were connected to second LISN.

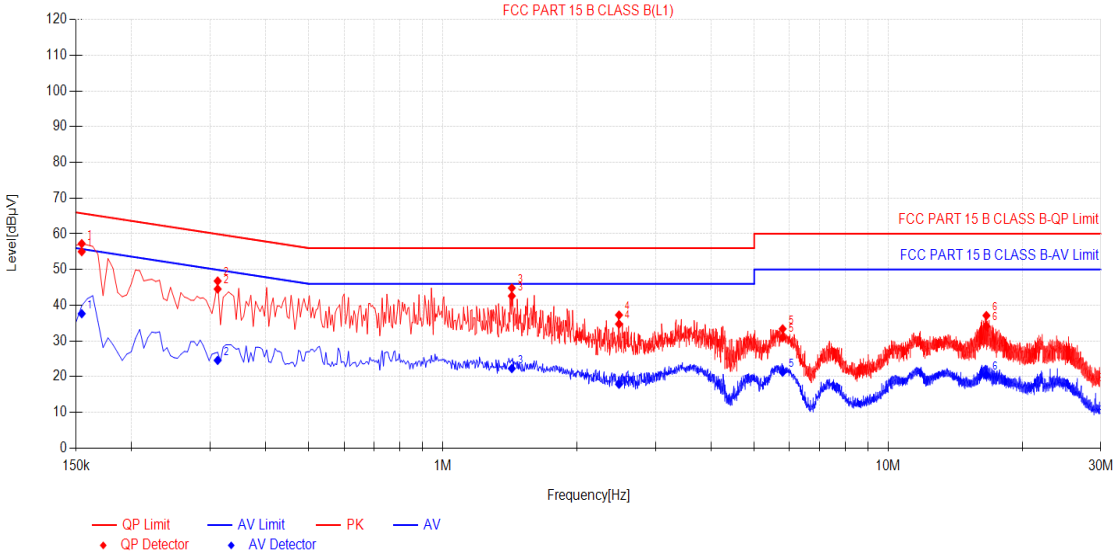
2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes support units.

3.4 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

3.5 TEST RESULTS

Temperature:	26.2 ℃	Relative Humidity:	54%
Test Voltage:	AC 120V/60Hz	Phase:	L
Test Mode:	Mode 2		



Final Data List

NO.	Freq. [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	0.1545	10.50	44.51	55.01	65.75	10.74	27.14	37.64	55.75	18.11	PASS
2	0.312	10.50	34.05	44.55	59.92	15.37	14.07	24.57	49.92	25.35	PASS
3	1.428	10.50	32.10	42.60	56.00	13.40	11.78	22.28	46.00	23.72	PASS
4	2.4855	10.50	24.24	34.74	56.00	21.26	7.37	17.87	46.00	28.13	PASS
5	5.793	10.50	20.45	30.95	60.00	29.05	10.74	21.24	50.00	28.76	PASS
6	16.611	10.50	23.66	34.16	60.00	25.84	9.93	20.43	50.00	29.57	PASS

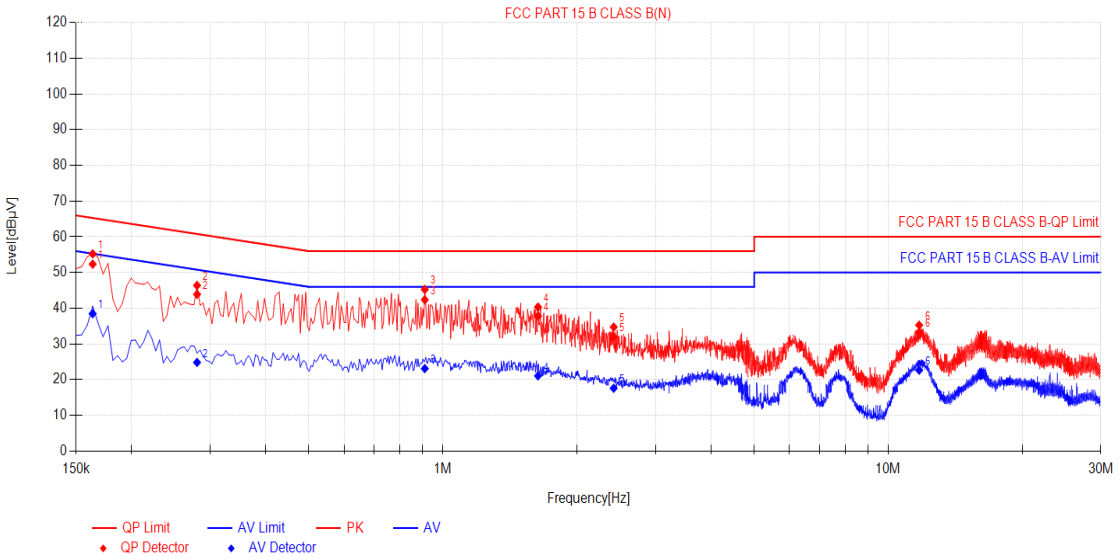
Note:1).QP Value (dBµV)= QP Reading (dBµV)+ Factor (dB)

2). Factor (dB)=insertion loss of LISN (dB) + Cable loss (dB)

3). QPMargin(dB) = QP Limit (dBµV) - QP Value (dBµV)

4). AVMargin(dB) = AV Limit (dBµV) - AV Value (dBµV)

Temperature:	26.2(C)	Relative Humidity:	54%RH
Test Voltage:	AC 120V/60Hz	Phase:	N
Test Mode:	Mode 2		



Final Data List

NO.	Freq. [MHz]	Factor [dB]	QP Reading[dB µV]	QP Value [dBµV]	QP Limit [dBµV]	QP Margin [dB]	AV Reading [dBµV]	AV Value [dBµV]	AV Limit [dBµV]	AV Margin [dB]	Verdict
1	0.1635	10.50	41.85	52.35	65.28	12.93	27.99	38.49	55.28	16.79	PASS
2	0.2805	10.50	33.40	43.90	60.80	16.90	14.34	24.84	50.80	25.96	PASS
3	0.9105	10.50	31.88	42.38	56.00	13.62	12.61	23.11	46.00	22.89	PASS
4	1.635	10.50	27.34	37.84	56.00	18.16	10.55	21.05	46.00	24.95	PASS
5	2.418	10.50	21.43	31.93	56.00	24.07	7.10	17.60	46.00	28.40	PASS
6	11.733	10.50	22.76	33.26	60.00	26.74	12.16	22.66	50.00	27.34	PASS

Note:1).QP Value (dBµV)= QP Reading (dBµV)+ Factor (dB)

2). Factor (dB)=insertion loss of LISN (dB) + Cable loss (dB)

3). QPMargin(dB) = QP Limit (dBµV) - QP Value (dBµV)

4). AVMargin(dB) = AV Limit (dBµV) - AV Value (dBµV)

4. RADIATED& FIELD EMISSION TEST RESULT (SECTIOU 15.209)

4.1 LIMIT

Frequency [MHz]	Field Strength [uV/m]	Measurement Distance [Meters]
0.009 ~ 0.490	2400/F (kHz)	300
0.490 ~ 1.705	24000/F (kHz)	30
1.705 ~ 30	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

Note:

(1) The limit for radiated test was performed according to FCC PART 15C.

(2) The tighter limit applies at the band edges.

(3) Emission level (dBuV/m)=20log Emission level (uV/m).

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~90kHz / RB 200Hz for AV
Start ~ Stop Frequency	90kHz~110kHz / RB 200Hz for QP
Start ~ Stop Frequency	110kHz~490kHz / RB 200Hz for AV
Start ~ Stop Frequency	490kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

§ 15.209(d)The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

4.2 TEST PROCEDURE

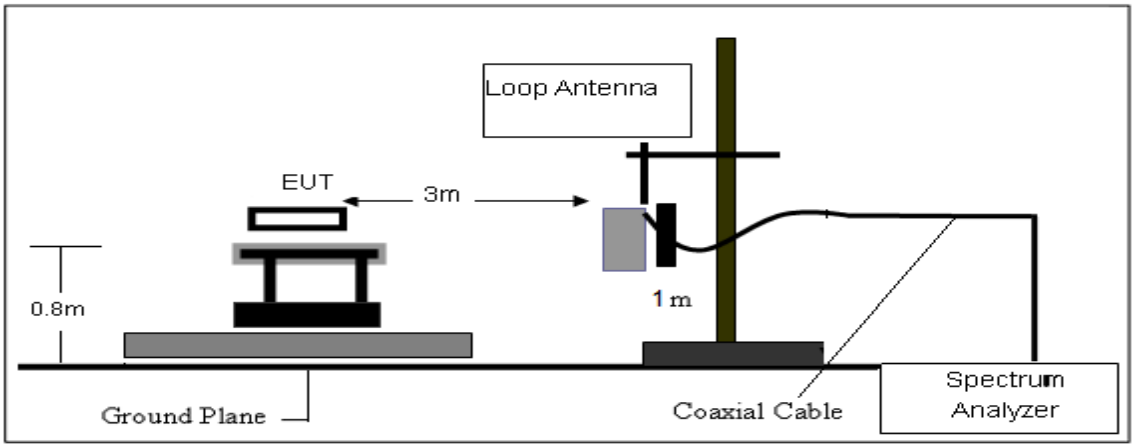
a. The measuring distance of at 3 m shall be used for measurements at frequency 0.009MHz up to 1GHz.
b. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
c. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
d. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note:

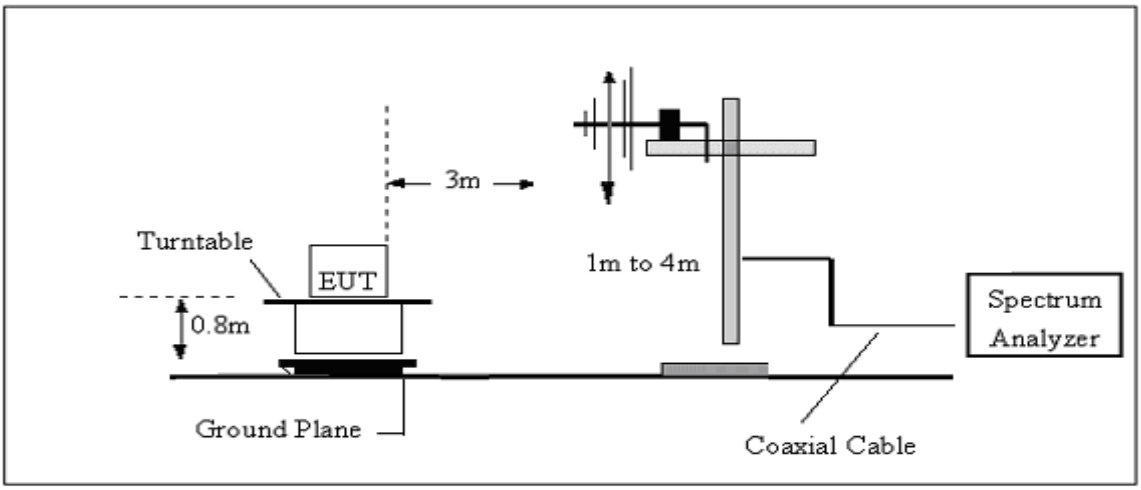
Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported.

4.3 TEST SETUP

(A) Radiated Emission Test-Up Frequency Below 30MHz



(B) Radiated Emission Test-Up Frequency 30MHz~1GHz



4.4 TEST RESULTS

Temperature：	23.1℃	Relative Humidity：	60%
Test Voltage ：	AC 120V/60Hz	Test Mode ：	Mode 1

4.4.1 Spurious Radiated Emission Below 30 MHz

9KHz-150KHz

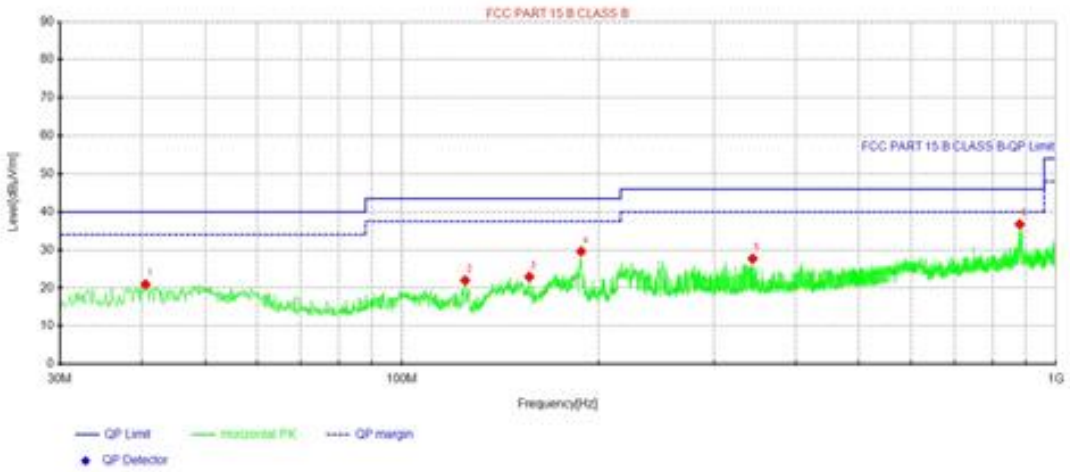
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.0196	8.47	20.07	28.54	121.76	-93.22	AV
2	0.0258	8.50	19.98	28.48	119.37	-90.89	AV
3	0.0419	8.80	19.66	28.46	115.16	-86.70	AV
4	0.0500	14.14	19.50	33.64	113.63	-79.99	AV
5	0.0711	13.79	18.91	32.70	110.57	-77.87	AV
6	0.1293	31.74	17.54	49.28	105.37	-56.09	peak Fundamental

150KHz-30MHz

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.3589	8.29	20.14	28.43	96.50	-68.07	AV
2	0.5082	5.58	20.20	25.78	73.48	-47.70	QP
3	1.5231	9.09	20.30	29.39	63.95	-34.56	QP
4	3.8514	8.26	20.36	28.62	69.50	-40.88	QP
5	8.3886	8.33	20.30	28.63	69.50	-40.87	QP
6	18.2391	6.90	22.08	28.98	69.50	-40.52	QP

4.4.2 Spurious Radiated Emission below 1 GHz

Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	AC 120V/60Hz	Phase:	Horizontal
Test Mode:	Mode 2		



Suspected Data List									
NO.	Freq. [MHz]	Reading [dBuV]	Level [dBuV/m]	Factor [dB/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	40.5488	38.02	20.95	-17.07	40.00	19.05	100	318	Horizontal
2	124.938	42.80	22.00	-20.80	43.50	21.50	100	205	Horizontal
3	156.585	44.60	22.93	-21.67	43.50	20.57	100	156	Horizontal
4	187.988	49.65	29.61	-20.04	43.50	13.89	100	156	Horizontal
5	343.795	43.91	27.70	-16.21	46.00	18.30	100	269	Horizontal
6	880.447	46.18	36.76	-9.42	46.00	9.24	100	100	Horizontal

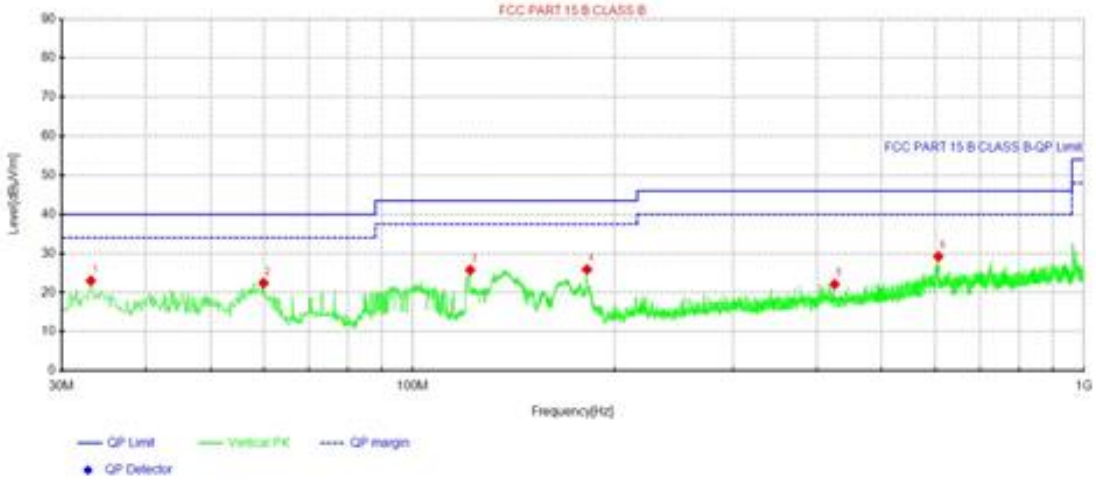
Note:1).Level (dBμV/m)= Reading (dBμV)+ Factor (dB/m)

2). Factor(dB/m)=Antenna Factor (dB/m) + Cable loss (dB) - Pre Amplifier gain (dB)

3). Margin(dB) = Limit (dBμV/m) - Level (dBμV/m)

4). All modes have been tested, only show the worst case.

Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage:	AC 120V/60Hz	Phase:	Vertical
Test Mode:	Mode 2		



Suspected Data List									
NO.	Freq. [MHz]	Reading [dBµV]	Level [dBµV/m]	Factor [dB/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	33.1525	41.21	23.02	-18.19	40.00	16.98	100	261	Vertical
2	59.9488	40.62	22.42	-18.20	40.00	17.58	100	12	Vertical
3	121.786	46.25	25.78	-20.47	43.50	17.72	100	358	Vertical
4	181.805	46.31	25.88	-20.43	43.50	17.62	100	222	Vertical
5	425.032	37.38	22.10	-15.28	46.00	23.90	100	67	Vertical
6	607.028	41.42	29.24	-12.18	46.00	16.76	100	261	Vertical

Note:1).Level (dBµV/m)= Reading (dBµV)+ Factor (dB/m)

2). Factor(dB/m)=Antenna Factor (dB/m) + Cable loss (dB) - Pre Amplifier gain (dB)

3). Margin(dB) = Limit (dBµV/m) - Level (dBµV/m)

4). All modes have been tested, only show the worst case.

5. 20 DB BANDWIDTH TEST

5.1 Limit

FCC Part 2.1049, Only applicable to report.

5.2 TEST SETUP

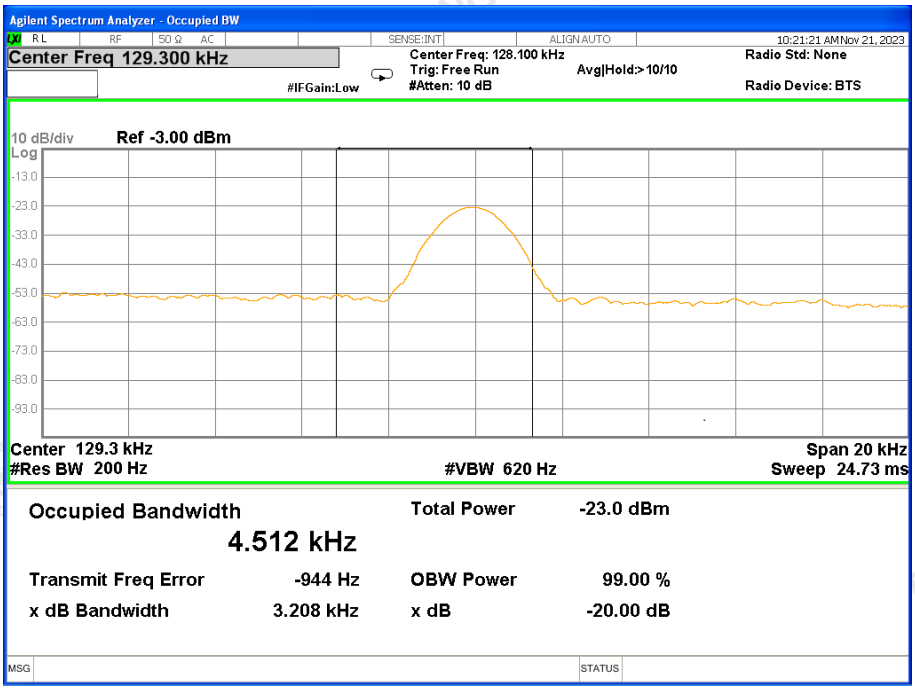
Spectrum Parameter	Setting
Span Frequency	approximately 2 to 3 times the 20 dB bandwidth
RB	greater than 1 % of the 20 dB bandwidth,
VB	equal to the RBW
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

The test program and configuration,Refer to 4.2 and 4.3

5.3 TEST RESULTS

OperatingFrequency (kHz)	20 dB Bandwhidth (Hz)
129.3	3.208

CH00



APPENDIX-PHOTOS OF TEST SETUP

Note: See test photos in setup photo document for the actual connections between Product and support equipment.

※※※※※END OF THE REPORT※※※※※