

FCC Test Report

Report No.: RF150723E03

FCC ID: SERRC02

Test Model: KODAK PIXPRO SP360 4K Action Cam

Received Date: July 23, 2015

Test Date: Aug. 24 to 27, 2015

Issued Date: Sep. 16, 2015

Applicant: Sintai Optical (Shenzhen) Co., Ltd.

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
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Table of Contents

Release Control Record	3
1 Certificate of Conformity.....	4
2 Summary of Test Results	5
2.1 Measurement Uncertainty	5
2.2 Modification Record	5
3 General Information.....	6
3.1 General Description of EUT	6
3.2 Description of Test Modes	8
3.2.1 Test Mode Applicability and Tested Channel Detail.....	9
3.3 Duty Cycle of Test Signal	10
3.4 Description of Support Units	11
3.4.1 Configuration of System under Test	11
3.5 General Description of Applied Standards	12
4 Test Types and Results	13
4.1 Radiated Emission and Bandedge Measurement.....	13
4.1.1 Limits of Radiated Emission and Bandedge Measurement	13
4.1.2 Test Instruments	14
4.1.3 Test Procedures.....	15
4.1.4 Deviation from Test Standard	15
4.1.5 Test Set Up	16
4.1.6 EUT Operating Conditions.....	16
4.1.7 Test Results	17
4.2 Conducted Emission Measurement	21
4.2.1 Limits of Conducted Emission Measurement	21
4.2.2 Test Instruments	21
4.2.3 Test Procedures.....	22
4.2.4 Deviation from Test Standard	22
4.2.5 Test Setup.....	22
4.2.6 EUT Operating Conditions.....	22
4.2.7 Test Results	23
5 Pictures of Test Arrangements.....	25
Appendix – Information on the Testing Laboratories	26



A D T

Release Control Record

Issue No.	Description	Date Issued
RF150723E03	Original release.	Sep. 16, 2015



A D T

1 Certificate of Conformity

Product: Action Cam

Brand: KODAK

Test Model: KODAK PIXPRO SP360 4K Action Cam

Sample Status: ENGINEERING SAMPLE

Applicant: Sintai Optical (Shenzhen) Co., Ltd.

Test Date: Aug. 24 to 27, 2015

Standards: 47 CFR FCC Part 15, Subpart C (Section 15.249)
ANSI C63.10: 2013

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

Prepared by :

Date:

Sep. 16, 2015

Midoli Peng / Specialist

Approved by :

Date:

Sep. 16, 2015

May Chen / Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart C (SECTION 15.249)			
FCC Clause	Test Item	Result	Remarks
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -18.61dB at 1.41406MHz.
15.209 15.249 15.249 (d)	Radiated Emission Test Band Edge Measurement Limit: 50dB less than the peak value of fundamental frequency or meet radiated emission limit in section 15.209	PASS	Meet the requirement of limit. Minimum passing margin is -3.4dB at 2480.58MHz.

2.1 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:

Measurement	Frequency	Expended Uncertainty (k=2) ($\pm$)
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.86 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1000MHz	5.37 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	3.65 dB
	6GHz ~ 18GHz	3.88 dB
	18GHz ~ 40GHz	4.11 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Action Cam
Brand	KODAK
Test Model	KODAK PIXPRO SP360 4K Action Cam
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	5V from USB interface or 3.6V from battery
Modulation Type	GFSK
Transfer Rate	1.2k
Operating Frequency	2474.499695MHz~2480.581543MHz
Number of Channel	16
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter x 1 ; Lithium Ion Battery x1
Data Cable Supplied	USB Cable (shielded, 0.6m with one core)

Note:

1. There are WLAN, LPRF and NFC (Passive) technology used for the EUT.
2. WLAN and LPRF technology cannot transmit at same time.
3. The EUT inside has one WLAN module which FCC ID: VPYLBVX532.
4. The antennas provided to the EUT, please refer to the following table:

NFC Antenna Spec.					
Brand	Model No.	Antenna Type	Antenna Connector	Gain(dBi)	Frequency (MHz)
NA	NA	Pattern	NA	-	13.56
LPRF Antenna Spec.					
Brand	Model No.	Antenna Type	Antenna Connector	Gain(dBi)	Frequency (MHz)
Walsin Technology Corporation	RFANT3216120A19F1T	Chip	NA	2	2400~2500
WLAN Antenna Spec.					
Brand	Model No.	Antenna Type	Antenna Connector	Gain(dBi)	Frequency (GHz)
NA	NA	PCB	NA	-3.7	2.4~2.4835

5. The EUT could be supplied with 3.6V battery or power adapter as the following table:

Adapter			
No	Brand Name	Model No.	Spec.
1	Shenzhen Cyclelong Power-Tech Co., Ltd	GAC-03-US	AC I/P: 100-240V, 50/60Hz, 0.15A DC O/P: 5V, 1A
Battery			
Brand Name		Model No.	Spec.
PIXPRO		LB-080	3.6V Min. 1250mAh, 4.5Wh

6. The EUT was pre-tested under following test modes :

Pre-test Mode	Power
Mode A	Battery mode
Mode B	USB adapter mode

From the above modes, the worst radiated emission was found in **Mode B**. Therefore only the test data of the modes were recorded in this report.

7. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

3.2 Description of Test Modes

16 channels are provided to EUT:

Channel	Frequency	Channel	Frequency
0	2474.499695	8	2477.743347
1	2474.905151	9	2478.148803
2	2475.310608	10	2478.55426
3	2475.716064	11	2478.959716
4	2476.121521	12	2479.365173
5	2476.526977	13	2479.77063
6	2476.932434	14	2480.176086
7	2477.33789	15	2480.581543

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT CONFIGURE MODE	APPLICABLE TO			DESCRIPTION
	RE $\geq$ 1G	RE<1G	PLC	
-	√	√	√	-

Where RE $\geq$ 1G: Radiated Emission above 1GHz & Bandedge Measurement
RE<1G: Radiated Emission below 1GHz
PLC: Power Line Conducted Emission

NOTE: 1. The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on Z-plane.

Radiated Emission Test (Above 1GHz):

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TYPE
0 to 15	15	GFSK

Radiated Emission Test (Below 1GHz):

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TYPE
0 to 15	0, 7, 15	GFSK

Power Line Conducted Emission Test:

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

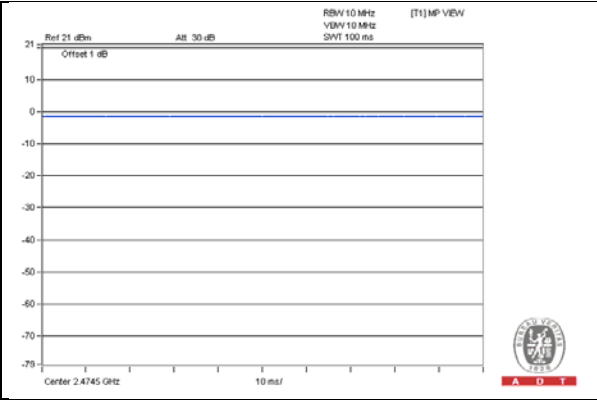
AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TYPE
0 to 15	15	GFSK

Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE $\geq$ 1G	25deg. C, 65%RH	120Vac, 60Hz	Tim Ho
RE<1G	24deg. C, 70%RH	120Vac, 60Hz	Andy Ho
PLC	25deg. C, 65%RH	120Vac, 60Hz	Jyunchun Lin

3.3 Duty Cycle of Test Signal

Duty cycle of test signal is 100 %, duty factor is not required.



3.4 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.

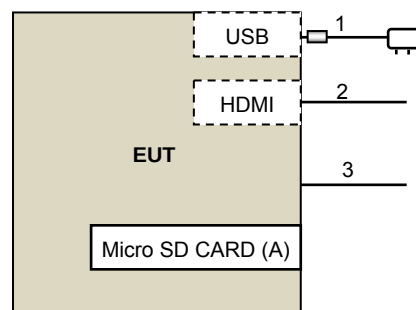
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Micro SD CARD	SanDisk	2GB	NA	NA	Provided by Lab

Note: All power cords of the above support units are non-shielded (1.8m).

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	USB	1	0.6	Yes	1	Supplied by client
2.	HDMI	1	1	Yes	0	Supplied by client
3.	Data	1	1.5	No	0	Supplied by client

Note: The core(s) is(are) originally attached to the cable(s).

3.4.1 Configuration of System under Test



3.5 General Description of Applied Standards

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart C (15.249)

ANSI C63.10-2013

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

NOTE: The EUT has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

The field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following

Fundamental Frequency	Field Strength of Fundamental (millivolts/meter)	Field Strength of Harmonics (microvolts/meter)
902 ~ 928 MHz	50	500
2400 ~ 2483.5 MHz	50	500
5725 ~ 5875 MHz	50	500
24 ~ 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 as below table, whichever is the lesser attenuation

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 ~ 0.490	$2400/F(\text{kHz})$	300
0.490 ~ 1.705	$24000/F(\text{kHz})$	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

NOTE:

- The lower limit shall apply at the transition frequencies.
- Emission level (dBuV/m) = $20 \log$ Emission level (uV/m).
- 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.

4.1.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY51210105	July 24, 2015	July 23, 2016
Pre-Amplifier Mini-Circuits	ZFL-1000VH2 B	AMP-ZFL-03	Nov. 12, 2014	Nov. 11, 2015
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-360	Feb. 06, 2015	Feb. 05, 2016
RF Cable	8D-FB	CHGCAB-001 -1 CHGCAB-001 -2	Oct. 04, 2014	Oct. 03, 2015
	RF-141	CHGCAB-004	Oct. 04, 2014	Oct. 03, 2015
Horn_Antenna AISI	AIH.8018	000032009111 0	Feb. 09, 2015	Feb. 08, 2016
Pre-Amplifier Agilent	8449B	3008A02578	June 23, 2015	June 22, 2016
RF Cable	NA	131205 131216 131217 SNMY23684/ 4	Jan. 16, 2015	Jan. 15, 2016
Spectrum Analyzer R&S	FSV40	100964	June 26, 2015	June 25, 2016
Pre-Amplifier SPACEK LABS	SLKKa-48-6	9K16	Dec. 12, 2014	Dec. 11, 2015
Horn_Antenna SCHWARZBECK	BBHA 9170	9170-424	Feb. 05, 2015	Feb. 04, 2016
RF Cable	NA	329751/4 RF104-204	Dec. 11, 2014	Dec. 10, 2015
Software	ADT_Radiated _V8.7.07	NA	NA	NA
Antenna Tower & Turn Table CT	NA	NA	NA	NA

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in 966 Chamber No. G.
3. The FCC Site Registration No. is 966073.
4. The VCCI Site Registration No. is G-137.
5. The CANADA Site Registration No. is IC 7450H-2.
7. Tested Date: Aug. 24 to 27, 2015

4.1.3 Test Procedures

- a. The EUT was placed on the top of a rotating table 0.8 meters (for below 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. 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. The height of antenna 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 quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

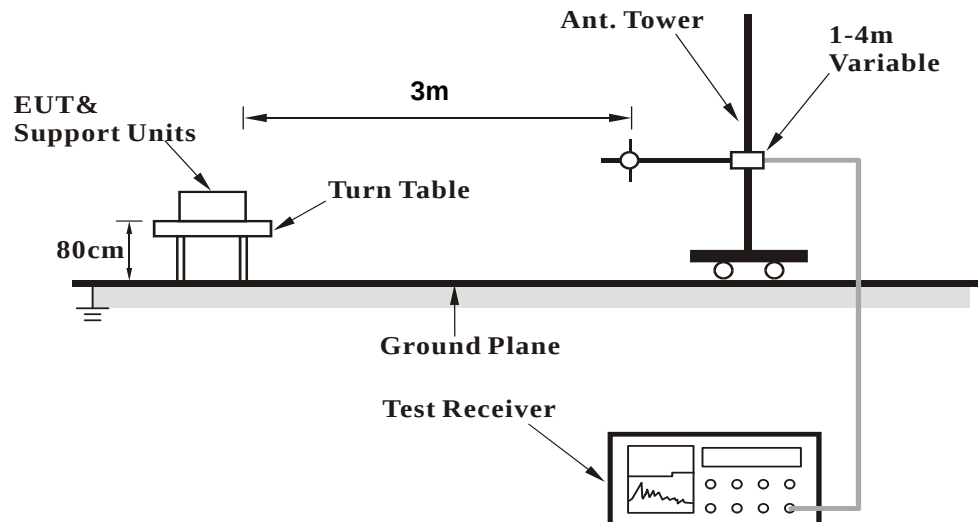
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10 Hz for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

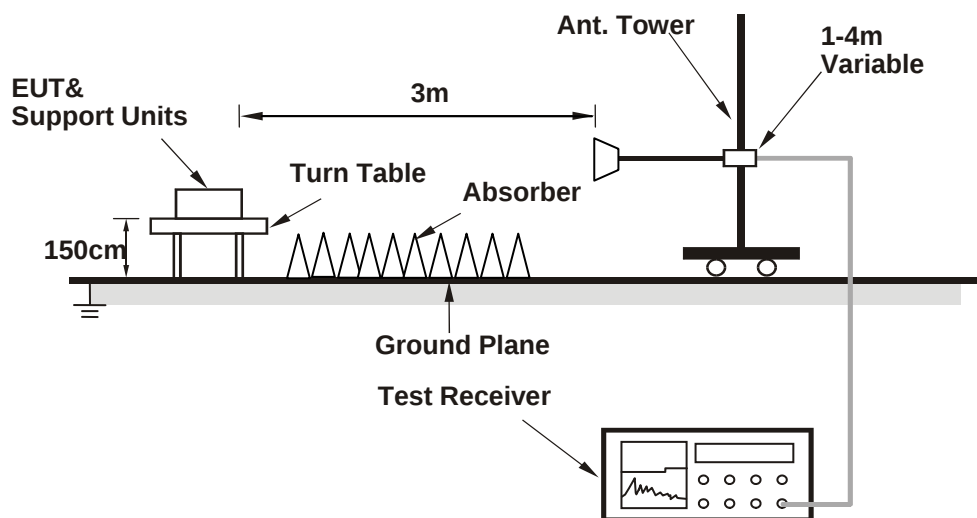
No deviation.

4.1.5 Test Setup

<Frequency Range below 1GHz>



<Frequency Range above 1GHz>



For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.1.6 EUT Operating Conditions

1. Placed the EUT on testing table.
2. Controlling software (SmartRFProgr_1.12.7.exe) has been activated to set the EUT under transmission/receiving condition continuously.

4.1.7 Test Results

Above 1GHz Data

CHANNEL	TX Channel 0	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2400.00	47.5 PK	74.0	-26.5	1.52 H	278	48.91	-1.41
2	2400.00	36.7 AV	54.0	-17.3	1.52 H	278	38.11	-1.41
3	*2474.50	88.3 PK	114.0	-25.7	1.52 H	278	89.53	-1.23
4	*2474.50	88.2 AV	94.0	-5.8	1.52 H	278	89.43	-1.23
5	2483.50	46.5 PK	74.0	-27.5	1.52 H	278	47.71	-1.21
6	2483.50	36.0 AV	54.0	-18.0	1.52 H	278	37.21	-1.21
7	4949.00	48.7 PK	74.0	-25.3	1.00 H	56	41.11	7.59
8	4949.00	45.9 AV	54.0	-8.1	1.00 H	56	38.31	7.59
9	7423.50	48.4 PK	74.0	-25.6	2.11 H	216	33.89	14.51
10	7423.50	41.3 AV	54.0	-12.7	2.11 H	216	26.79	14.51

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2400.00	47.2 PK	74.0	-26.8	1.17 V	52	48.61	-1.41
2	2400.00	36.7 AV	54.0	-17.3	1.17 V	52	38.11	-1.41
3	*2474.50	90.3 PK	114.0	-23.7	1.17 V	52	91.53	-1.23
4	*2474.50	90.2 AV	94.0	-3.8	1.17 V	52	91.43	-1.23
5	2483.50	47.3 PK	74.0	-26.7	1.17 V	52	48.51	-1.21
6	2483.50	36.5 AV	54.0	-17.5	1.17 V	52	37.71	-1.21
7	4949.00	47.3 PK	74.0	-26.7	1.22 V	302	39.71	7.59
8	4949.00	43.1 AV	54.0	-10.9	1.22 V	302	35.51	7.59
9	7423.50	48.5 PK	74.0	-25.5	2.26 V	281	33.99	14.51
10	7423.50	40.7 AV	54.0	-13.3	2.26 V	281	26.19	14.51

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 7	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2477.34	87.8 PK	114.0	-26.2	1.48 H	265	89.02	-1.22
2	*2477.34	87.7 AV	94.0	-6.3	1.48 H	265	88.92	-1.22
3	2483.50	46.9 PK	74.0	-27.1	1.48 H	265	48.11	-1.21
4	2483.50	36.2 AV	54.0	-17.8	1.48 H	265	37.41	-1.21
5	4954.68	48.4 PK	74.0	-25.6	1.00 H	64	40.79	7.61
6	4954.68	45.2 AV	54.0	-8.8	1.00 H	64	37.59	7.61
7	7432.01	47.9 PK	74.0	-26.1	2.19 H	223	33.39	14.51
8	7432.01	40.7 AV	54.0	-13.3	2.19 H	223	26.19	14.51
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2477.34	90.5 PK	114.0	-23.5	1.20 V	39	91.72	-1.22
2	*2477.34	90.1 AV	94.0	-3.9	1.20 V	39	91.32	-1.22
3	2483.50	47.2 PK	74.0	-26.8	1.20 V	39	48.41	-1.21
4	2483.50	36.5 AV	54.0	-17.5	1.20 V	39	37.71	-1.21
5	4954.68	47.8 PK	74.0	-26.2	1.21 V	319	40.19	7.61
6	4954.68	43.3 AV	54.0	-10.7	1.21 V	319	35.69	7.61
7	7432.01	47.6 PK	74.0	-26.4	2.26 V	282	33.09	14.51
8	7432.01	40.1 AV	54.0	-13.9	2.26 V	282	25.59	14.51

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 15	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2480.58	87.9 PK	114.0	-26.1	1.50 H	273	89.11	-1.21
2	*2480.58	87.8 AV	94.0	-6.2	1.50 H	273	89.01	-1.21
3	2483.50	47.3 PK	74.0	-26.7	1.50 H	273	48.51	-1.21
4	2483.50	36.8 AV	54.0	-17.2	1.50 H	273	38.01	-1.21
5	4961.16	48.6 PK	74.0	-25.4	1.00 H	66	40.95	7.65
6	4961.16	45.5 AV	54.0	-8.5	1.00 H	66	37.85	7.65
7	7441.74	48.4 PK	74.0	-25.6	2.14 H	230	33.89	14.51
8	7441.74	41.1 AV	54.0	-12.9	2.14 H	230	26.59	14.51
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2480.58	90.8 PK	114.0	-23.2	1.21 V	37	92.01	-1.21
2	*2480.58	90.6 AV	94.0	-3.4	1.21 V	37	91.81	-1.21
3	2483.50	49.7 PK	74.0	-24.3	1.21 V	37	50.91	-1.21
4	2483.50	40.5 AV	54.0	-13.5	1.21 V	37	41.71	-1.21
5	4961.16	47.5 PK	74.0	-26.5	1.16 V	308	39.85	7.65
6	4961.16	43.3 AV	54.0	-10.7	1.16 V	308	35.65	7.65
7	7441.74	48.4 PK	74.0	-25.6	2.30 V	266	33.89	14.51
8	7441.74	40.6 AV	54.0	-13.4	2.30 V	266	26.09	14.51

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

Below 1GHz Data

CHANNEL	TX Channel 15	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	Below 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	32.52	18.2 QP	40.0	-21.8	1.00 H	254	39.87	-21.67
2	112.64	21.5 QP	43.5	-22.1	1.50 H	232	44.10	-22.65
3	186.17	23.5 QP	43.5	-20.0	1.00 H	105	46.03	-22.57
4	239.08	29.0 QP	46.0	-17.0	1.50 H	130	50.60	-21.62
5	366.30	39.6 QP	46.0	-6.4	1.00 H	252	57.17	-17.59
6	499.63	22.7 QP	46.0	-23.3	2.00 H	51	37.00	-14.27
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	40.23	31.5 QP	40.0	-8.5	1.00 V	13	52.26	-20.76
2	105.42	25.4 QP	43.5	-18.1	1.50 V	286	49.01	-23.60
3	236.12	26.1 QP	46.0	-19.9	1.00 V	132	47.96	-21.83
4	367.95	35.1 QP	46.0	-10.9	1.50 V	118	52.70	-17.56
5	418.82	21.1 QP	46.0	-24.9	1.00 V	206	37.21	-16.13
6	511.27	20.6 QP	46.0	-25.4	1.50 V	0	34.49	-13.88

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15 - 0.5	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30.0	60	50

Note: 1. The lower limit shall apply at the transition frequencies.

2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

4.2.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver R&S	ESCS 30	100375	May 06, 2015	May 05, 2016
Line-Impedance Stabilization Network (for EUT) SCHWARZBECK	NSLK-8127	8127-522	Sep. 15, 2014	Sep. 14, 2015
Line-Impedance Stabilization Network (for Peripheral) R&S	ENV216	100072	June 11, 2015	June 10, 2016
RF Cable	5D-FB	COCCAB-001	Mar. 09, 2015	Mar. 08, 2016
50 ohms Terminator	N/A	EMC-03	Sep. 22, 2014	Sep. 21, 2015
50 ohms Terminator	N/A	EMC-02	Sep. 30, 2014	Sep. 29, 2015
Software BVADT	BVADT_Cond_ V7.3.7.3	NA	NA	NA

Note:

1. The calibration interval of the above test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Shielded Room No. C.
3. The VCCI Con C Registration No. is C-3611.
4. Tested Date: Aug. 24, 2015

4.2.3 Test Procedures

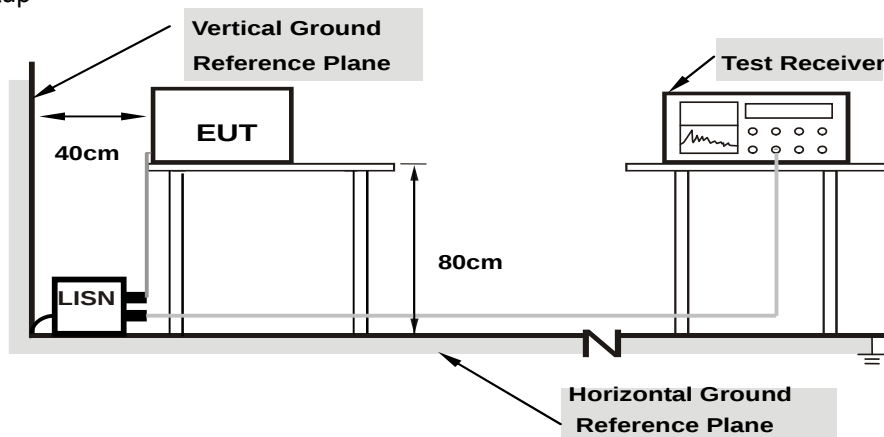
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

NOTE: The resolution bandwidth and video bandwidth of test receiver is 9kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15MHz-30MHz.

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



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

For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.2.6 EUT Operating Conditions

Same as 4.1.6.

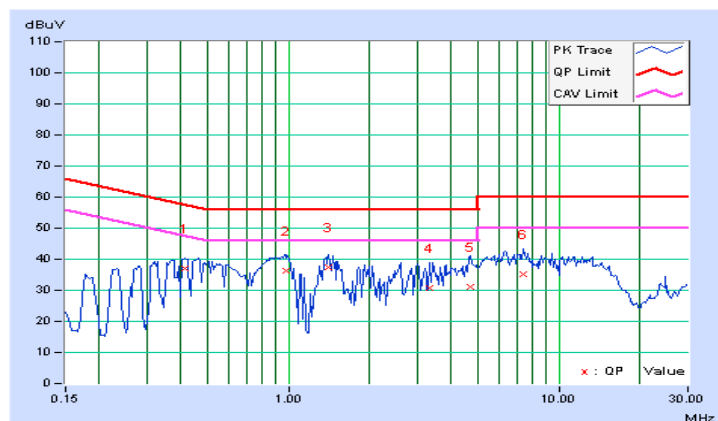
4.2.7 Test Results

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
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Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.41563	0.23	36.83	23.99	37.06	24.22	57.54	47.54	-20.47	-23.31
2	0.98594	0.28	36.01	21.85	36.29	22.13	56.00	46.00	-19.71	-23.87
3	1.41406	0.31	37.08	24.34	37.39	24.65	56.00	46.00	-18.61	-21.35
4	3.33203	0.40	30.16	18.87	30.56	19.27	56.00	46.00	-25.44	-26.73
5	4.72266	0.47	30.74	20.63	31.21	21.10	56.00	46.00	-24.79	-24.90
6	7.37500	0.65	34.61	25.21	35.26	25.86	60.00	50.00	-24.74	-24.14

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

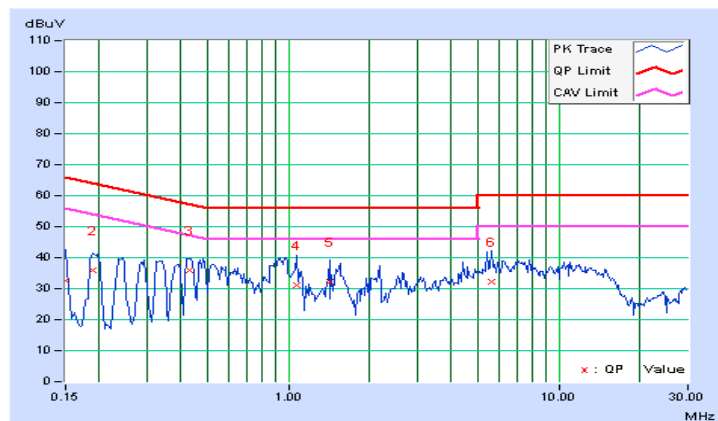


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
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Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	0.22	32.47	17.20	32.69	17.42	66.00	56.00	-33.31	-38.58
2	0.18906	0.26	35.69	26.89	35.95	27.15	64.08	54.08	-28.13	-26.93
3	0.42888	0.30	35.53	25.80	35.83	26.10	57.27	47.27	-21.44	-21.17
4	1.07031	0.34	30.89	17.32	31.23	17.66	56.00	46.00	-24.77	-28.34
5	1.41797	0.37	31.74	20.09	32.11	20.46	56.00	46.00	-23.89	-25.54
6	5.60938	0.61	31.71	22.39	32.32	23.00	60.00	50.00	-27.68	-27.00

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value



5 Pictures of Test Arrangements

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

Appendix – Information on the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

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Email: service.adt@tw.bureauveritas.com

Web Site: www.bureauveritas-adt.com

The address and road map of all our labs can be found in our web site also.

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