EMC TEST REPORT

Test item	: Tablet PC
Model No.	: OCS911
Order No.	: 1110-01330
Date of receipt	: 2011-10-18
Test duration	: 2011-10-31 ~ 2011-11-10
Use of report	: FCC Marking
Date of Issue	: 2012-02-14

Applicant : Ocosmos Co., Ltd.
317 Hanshin S-Meca, 1359 Gwanpyeong-dong, Yuseong-gu, Daejeon, Korea

Test laboratory : Digital EMC Co., Ltd.
683-3, Yubang-Dong, Cheoin-Gu, Yongin-Si, Gyeonggi-Do, 449-080, Korea

Test specification : ANSI C 63.4:2003
FCC Part 15 Subpart B
Class B personal computers and peripherals

Test environment : Temperature (20 ~ 22) °C,
Humidity (39 ~ 40) % R.H.

Test result : ☒ Comply ☐ Not Comply

Tested by:

Engineer
S.H.KIM

Reviewed by:

General Manager
C.H.LEE

The above test report is the accredited test results by Korea Laboratory Accreditation Scheme, which signed the ILAC-MRA.

PRESIDENT OF DIGITAL EMC CO., LTD.

CONTENTS

1. General Remarks

This report contains the result of tests performed by:

DIGITAL EMC CO., LTD.

Address : 683-3, Yubang-Dong, Cheoin-Gu, Yongin-Si, Gyeonggi-Do, 449-080, Korea

http://www.digitalemc.com

Tel: +82-31-321-2664 Fax: +82-31-321-1664

2. Test Laboratory

Digital EMC Co., Ltd. has been accredited / filed / authorized by the agencies listed in the following table;

Certificate	Nation	Agency	Code	Mark
Accreditation	Korea	KOLAS	393	ISO/IEC 17025
Site Filing	USA	FCC	101842 678747	Test Facility list & NSA Data
	Japan	VCCI	C-1427 R-1364, R-3385 T-1442, G-338	Test Facility list & NSA Data
Certification	Korea	KC	KR0034	Test Facility list & NSA Data
	Germany	TUV	ROK1028C	ISO/IEC 17025

Quality control in the testing laboratory is implemented as per ISO/IEC 17025 which is the “General requirements for the competent of calibration and testing laboratory”.

3. General Information of EUT

Equipment under Test	Tablet PC
Model No.	OCS911
Type of Sample Tested	Pre-Production
Clock Frequency	1.5GHz
Supplied Power for Test	AC120V, 60Hz
Applicant	Ocosmos Co., Ltd. 317 Hanshin S-Meca, 1359 Gwanpyeong-dong, Yuseong-gu, Daejeon, Korea
Manufacture	Wanlida Group Co., Ltd. No. 618, Jiahe Road, Xiamen, Fujian, China

4. Test Summary

4.1 Applied standards and test results

Test Items	Applied Standards	Results
Conducted Disturbance	ANSI C63.4:2003	**Comply**
Radiated Disturbance	ANSI C63.4:2003	**Comply**

The data in this test report are traceable to the national or international standards.

4.2 Test environment and conditions

Test Items	Test date (MM-DD)	Temp (℃)	Humidity (% R.H.)	Pressure (hPa)
Conducted Disturbance	10-31	20	39	-
Radiated Disturbance	11-09 11-10	22 21	40 39	

5. Test Set-up and operation mode

5.1 Principle of Configuration Selection

Emission : The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the instructions for use.

5.2 Test Operation Mode

- The measurement was made of the maximized : “H” character scroll, Write / Delete, Reading the “H” patterrn in disk drive, MP3 file play, Web Camera Preview Mode.

5.3 Support Equipment Used

Unit	Model No.	Serial No.	Manufacturer	CABLE			Backshell	FCC ID
				Connect type	Length (m)	shield		
USB KEYBOARD	SK-8115	CN-ODJ321-71616-83J-09J9	YET FOUNDATE Ltd.	USB	1.6	Shield	Plastic	DOC
USB MOUSE	M-UAE96	LZ751AP01MC	MONITEREY INTERNATIONAL CORP.	USB	1.3	Shield	Plastic	DOC
SD MEMORY	MICRO SDHC	N/A	SANDISK	SD	-	-	-	-

NOTE

- See “APPENDIX 2 Photographs” for actual system test setup

6. Test Results : Emission

6.1 Conducted Disturbance

6.1.1 Measurement Procedure

In the range of 0.15MHz to 30MHz, the conducted disturbance was measured and set-up was made accordance with **ANSI C63.4:2003.**

If the EUT is table top equipment, it was placed on a wooden table with a height of 0.8m above the reference ground plane and 0.4m from the conducting wall of the shielded room.

Also if the EUT is floor-standing equipment, it was placed on a non-conducted support with a height up to 0.15m above the reference ground plane.

Connect the EUT's power source lines to the appropriate power mains / peripherals through the LISN. All the other peripherals are connected to the 2nd LISN, if any.

Unused measuring port of the LISN was resistively terminated by 50 ohm terminator.

The measuring port of the LISN for EUT was connected to spectrum analyzer.

Using conducted emission test software, the emissions were scanned with peak detector mode.

After scanning over the frequency range, suspected emissions were selected to perform final measurement. When performing final measurement, the receiver was used which has Quasi-Peak detector and Average detector.

By varying the configuration of the test sample and the cable routing it was attempted to maximize the emission.

For further description of the configuration refer to the picture of the test set-up.

6.1.2 Limit for Conducted Disturbance

(1) Conducted disturbance at mains ports.

Frequency range (MHz)	Limits dB(μV)			
	Quasi-peak		Average	
	Class A	Class B	Class A	Class B
0.15 to 0.50	79	66 to 56	66	56 to 46
0.50 to 5	73	56	60	46
5 to 30		60		50
Note 1 The lower limit shall apply at the transition frequencies. Note 2 The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.5MHz.				

Test Result

Digital EMC

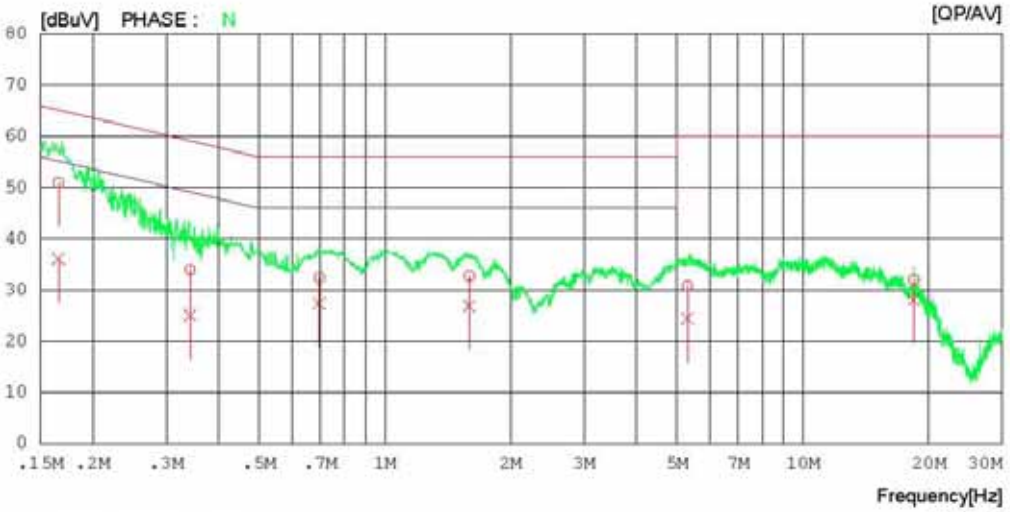
Results of Conducted Emission

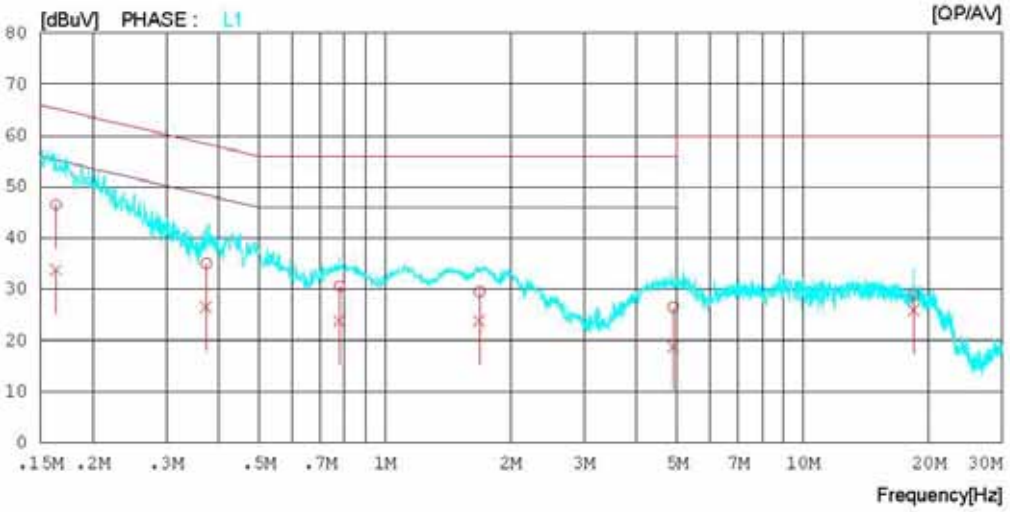
Digital EMC
Date : 2011-10-31

Model No.	:	OCS811	Referrence No.	:	
Type	:		Power Supply	:	120V 60Hz
Serial No.	:		Temp/Humi.	:	20 'C 39% R.H.
Test Condition	:	CAM+RW+MP3+'H' SCROLL	Operator	:	

Memo :

LIMIT : CISPR22_B QP
CISPR22_B AV





Results of Conducted Emission

Digital EMC
Date : 2011-10-31

Model No.	:	OCS911	Referrence No.	:	
Type	:		Power Supply	:	120V 60Hz
Serial No.	:		Temp/Humi.	:	20 'C 39% R.H.
Test Condition	:	CAM+RW+MP3+'H' SCROLL	Operator	:	

Memo :

LIMIT : CISPR22_B QP
CISPR22_B AV

NO	FREQ	READING QP	READING AV	C.FACTOR	RESULT QP	RESULT AV	LIMIT QP	LIMIT AV	MARGIN QP	MARGIN AV	PHASE
	[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	
1	0.16580	50.8	36.0	0.1	50.9	36.1	65.2	55.2	14.3	19.1	N
2	0.34245	33.9	24.9	0.1	34.0	25.0	59.1	49.1	25.1	24.1	N
3	0.69749	32.2	27.2	0.2	32.4	27.4	56.0	46.0	23.6	18.6	N
4	1.59300	32.5	26.7	0.2	32.7	26.9	56.0	46.0	23.3	19.1	N
5	5.29750	30.4	24.0	0.4	30.8	24.4	60.0	50.0	29.2	25.6	N
6	18.43300	31.1	27.2	0.9	32.0	28.1	60.0	50.0	28.0	21.9	N
7	0.16338	46.4	33.7	0.1	46.5	33.8	65.3	55.3	18.8	21.5	L1
8	0.37389	34.9	26.4	0.1	35.0	26.5	58.4	48.4	23.4	21.9	L1
9	0.77908	30.4	23.7	0.2	30.6	23.9	56.0	46.0	25.4	22.1	L1
10	1.68500	29.4	23.6	0.2	29.6	23.8	56.0	46.0	26.4	22.2	L1
11	4.90400	26.1	18.4	0.4	26.5	18.8	56.0	46.0	29.5	27.2	L1
12	18.43200	28.1	25.0	0.9	29.0	25.9	60.0	50.0	31.0	24.1	L1

6.2 Radiated Disturbance

6.2.1 Measurement Procedure

The radiated disturbance was measured and set-up was made accordance with **ANSI C63.4:2003.**

If the EUT is tabletop equipment, it was placed on a wooden table with a height of 0.8m above the reference ground plane and 3m away from the interference receiving antenna in the **10m semi-anechoic chamber.**

Also if the EUT is floor-standing equipment, it was placed on a non-conducted support with a height up to 0.15m above the reference ground plane.

Rotate the EUT from 0° to 360° and position the receiving antenna at heights from 1 to 4m above the reference ground plane continuously to determine associated with higher emission levels and record them.

In addition, exploratory radiated emissions testing of hand-held or body-worn devices shall include rotation of the EUT through three orthogonal axes to determine the attitude that maximizes the emissions.

The measurement was made in both the vertical and horizontal polarization, and the maximum value is presented in the report.

For below 1GHz frequency range, Quasi-Peak detector with 120kHz RBW was used.

Also Peak and Average detector with 1MHz RBW were used for above 1GHz frequency range.

For further description of the configuration refer to the picture of the test set-up.

6.2.2 Limit for Radiated Disturbance

- The test frequency range of Radiated Disturbance measurements are listed below.

Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement range (MHz)
Below 108	1000
108 – 500	2000
500 – 1000	5000
Above 1000	5th harmonic of the highest frequency or 40GHz, whichever is lower

(1) Limit for Radiated Emission below 1000MHz

Frequency range (MHz)	Class A Equipment (10m distance)	Class B Equipment (3m distance)
	Quasi-peak limits (dBμV/m)	Quasi-peak limits (dBμV/m)
30 to 88	39.1	40
88 to 216	43.5	43.5
216 to 960	46.4	46
960 to 1000	49.5	54
Note 1 The lower limit shall apply at the transition frequency. Note 2 Additional provisions may be required for cases where interference occurs. Note 3 According to 15.109(g), as an alternative to the radiated emission limit shown above, digital devices may be shown to comply with the standards(CISPR), Pub. 22 shown as below.		
30 to 230	40	30
230 to 1000	47	37

(2) Limits for Radiated Emission in the frequency range 1000 - 2000MHz at a measuring distance of 10m

Frequency (GHz)	Class A Equipment		Class B Equipment	
	peak (dBμV/m)	Average (dBμV/m)	peak (dBμV/m)	Average (dBμV/m)
1 to 2	69.5	49.5	63.5	43.5

(3) Limits for Radiated Emission above 1000MHz at a measuring distance of 3m

Frequency (GHz)	Class A Equipment		Class B Equipment	
	peak (dBμV/m)	Average (dBμV/m)	peak (dBμV/m)	Average (dBμV/m)
1 to 40	80	60	74	54

Test Result

< 30MHz-1GHz >

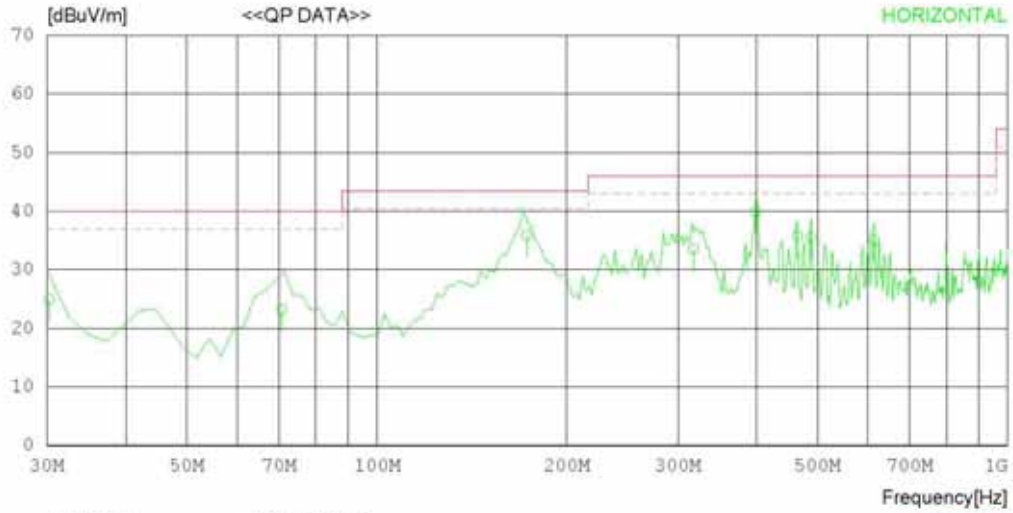
RADIATED EMISSION

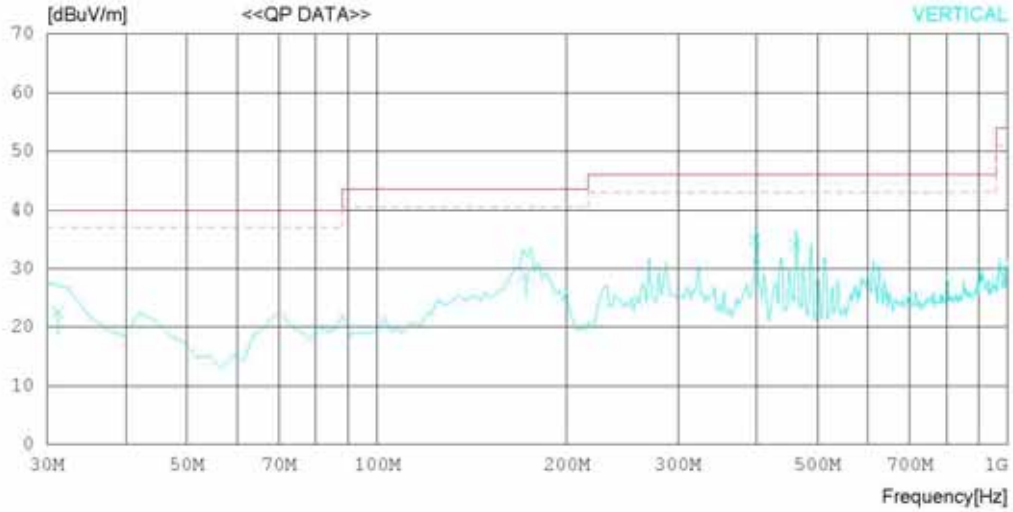
Date : 2011-11-10

Model Name	: OCS911	Reference No.	:
Model No.	:	Power Supply	: 120V 60Hz
Serial No.	:	Temp/Humi	: 21 'C 39% R.H.
Test Condition	: RW+H SCROLL+MP3+CAMERA	Operator	:

Memo :

LIMIT : FCC Part15 Subpart.B Class B (3m)
MARGIN: 3 dB





RADIATED EMISSION

Date : 2011-11-10

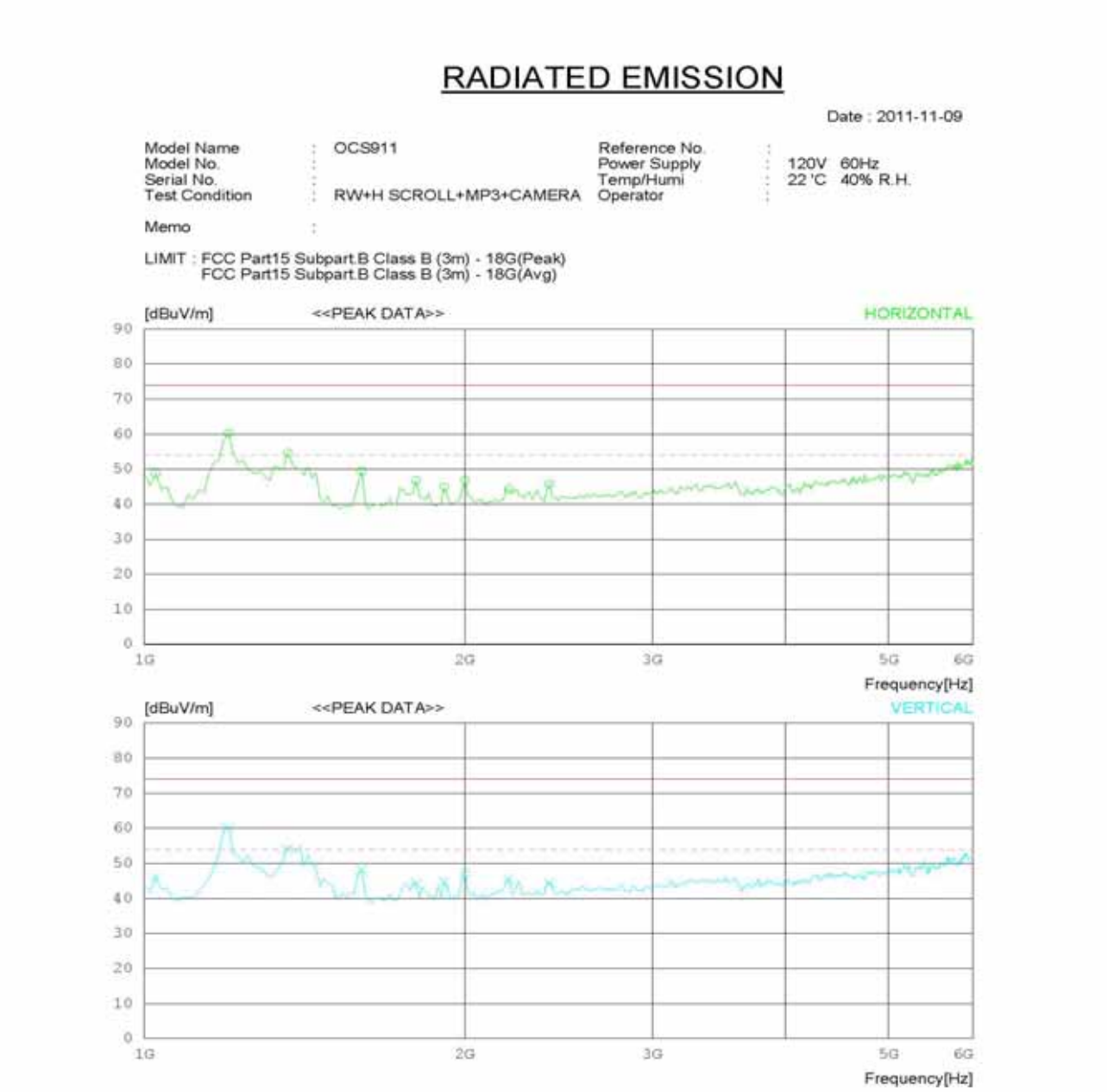
Model Name	:	OCS911	Reference No.	:	
Model No.	:		Power Supply	:	120V 60Hz
Serial No.	:		Temp/Humi	:	21 'C 39% R.H.
Test Condition	:	RW+H SCROLL+MP3+CAMERA	Operator	:	

Memo :

LIMIT : FCC Part15 Subpart.B Class B (3m)
MARGIN: 3 dB

No.	FREQ [MHz]	READING QP [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal ------										
1	30.204	29.3	17.4	0.8	22.6	24.9	40.0	15.1	200	8
2	70.555	38.2	6.4	1.2	22.6	23.2	40.0	16.8	200	200
3	172.633	47.1	10.0	1.9	23.1	35.9	43.5	7.6	200	1
4	317.361	40.6	14.2	2.6	23.9	33.5	46.0	12.5	100	302
5	398.831	45.2	16.0	3.0	24.3	39.9	46.0	6.1	100	219
6	464.074	39.8	17.1	3.3	24.5	35.7	46.0	10.3	100	111
7	488.324	39.2	17.5	3.4	24.6	35.5	46.0	10.5	100	358
8	613.856	36.6	18.8	3.9	24.3	35.0	46.0	11.0	301	358
----- Vertical ------										
9	31.202	27.1	17.3	0.8	22.6	22.6	40.0	17.4	100	68
10	172.168	40.0	10.0	1.8	23.1	28.7	43.5	14.8	199	336
11	397.716	40.3	15.9	3.0	24.3	34.9	46.0	11.1	100	1
12	461.192	38.2	17.0	3.3	24.5	34.0	46.0	12.0	199	358

< 1-6GHz_Peak >



RADIATED EMISSION

Date : 2011-11-09

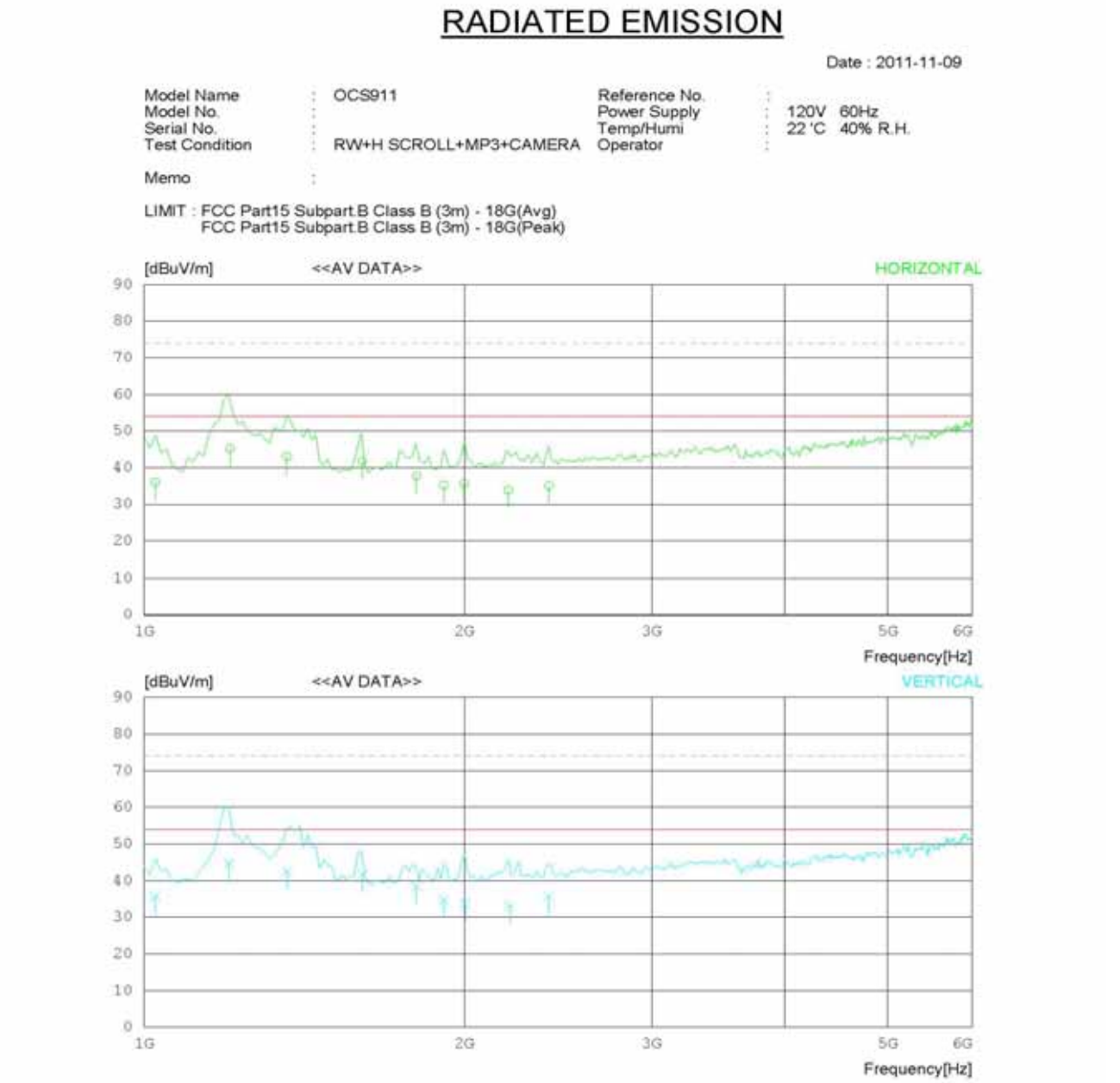
Model Name	:	OCS911	Reference No.	:	
Model No.	:		Power Supply	:	120V 60Hz
Serial No.	:		Temp/Humi	:	22 'C 40% R.H.
Test Condition	:	RW+H SCROLL+MP3+CAMERA	Operator	:	

Memo :

LIMIT : FCC Part15 Subpart.B Class B (3m) - 18G(Peak)
FCC Part15 Subpart.B Class B (3m) - 18G(Avg)

No.	FREQ [MHz]	READING PEAK [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal ------										
1	1025.000	61.0	24.3	5.3	41.8	48.8	74.0	25.2	100	35
2	1200.000	71.4	25.0	5.7	41.8	60.3	74.0	13.7	100	358
3	1362.500	64.9	25.6	6.0	41.9	54.6	74.0	19.4	100	68
4	1600.000	58.2	26.5	6.6	41.9	49.4	74.0	24.6	100	358
5	1800.000	54.4	27.2	7.1	42.0	46.7	74.0	27.3	100	358
6	1912.500	51.8	27.6	7.4	42.0	44.8	74.0	29.2	100	19
7	2000.000	53.2	28.0	7.7	42.0	46.9	74.0	27.1	100	120
8	2200.000	50.0	28.4	7.9	42.0	44.3	74.0	29.7	100	358
9	2400.000	50.8	28.8	8.1	42.0	45.7	74.0	28.3	100	358
----- Vertical ------										
10	1025.000	58.2	24.3	5.3	41.8	46.0	74.0	28	100	1
11	1200.000	71.3	25.0	5.7	41.8	60.2	74.0	13.8	100	1
12	1362.500	64.5	25.6	6.0	41.9	54.2	74.0	19.8	100	1
13	1600.000	56.8	26.5	6.6	41.9	48.0	74.0	26	100	1
14	1800.000	51.9	27.2	7.1	42.0	44.2	74.0	29.8	100	1
15	1912.500	51.8	27.6	7.4	42.0	44.8	74.0	29.2	100	1
16	2000.000	53.4	28.0	7.7	42.0	47.1	74.0	26.9	100	1
17	2200.000	51.3	28.4	7.9	42.0	45.6	74.0	28.4	100	289
18	2400.000	49.4	28.8	8.1	42.0	44.3	74.0	29.7	100	1

< 1-6GHz_Average >



RADIATED EMISSION

Date : 2011-11-09

Model Name	:	OCS911	Reference No.	:	
Model No.	:		Power Supply	:	120V 60Hz
Serial No.	:		Temp/Humi	:	22 'C 40% R.H.
Test Condition	:	RW+H SCROLL+MP3+CAMERA	Operator	:	

Memo :

LIMIT : FCC Part15 Subpart.B Class B (3m) - 18G(Avg)
FCC Part15 Subpart.B Class B (3m) - 18G(Peak)

No.	FREQ [MHz]	READING AV [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal ------										
1	1024.510	48.3	24.3	5.3	41.8	36.1	54.0	17.9	100	35
2	1204.851	56.3	25.0	5.7	41.8	45.2	54.0	8.8	100	358
3	1361.958	53.3	25.6	6.0	41.9	43.0	54.0	11.0	100	68
4	1603.451	50.6	26.5	6.6	41.9	41.8	54.0	12.2	100	358
5	1802.845	45.5	27.2	7.1	42.0	37.8	54.0	16.2	100	358
6	1911.474	42.2	27.6	7.4	42.0	35.2	54.0	18.8	100	19
7	1998.585	41.9	28.0	7.7	42.0	35.6	54.0	18.4	100	120
8	2198.533	39.6	28.4	7.9	42.0	33.9	54.0	20.1	100	358
9	2402.658	40.2	28.8	8.1	42.0	35.1	54.0	18.9	100	358
----- Vertical ------										
10	1024.844	47.8	24.3	5.3	41.8	35.6	54.0	18.4	100	1
11	1201.514	55.9	25.0	5.7	41.8	44.8	54.0	9.2	100	1
12	1362.697	52.7	25.6	6.0	41.9	42.4	54.0	11.6	100	1
13	1602.847	50.5	26.5	6.6	41.9	41.7	54.0	12.3	100	1
14	1803.415	46.1	27.2	7.1	42.0	38.4	54.0	15.6	100	1
15	1911.452	41.6	27.6	7.4	42.0	34.6	54.0	19.4	100	1
16	2003.474	40.0	28.0	7.7	42.0	33.7	54.0	20.3	100	1
17	2206.232	38.8	28.4	7.9	42.0	33.1	54.0	20.9	100	289
18	2401.147	40.7	28.8	8.1	42.0	35.6	54.0	18.4	100	1

＊Not found emissions above 6GHz.

Appendix 1

List of Test and Measurement Instruments

1. Conducted Disturbance

Name of Instrument		Model No.	Serial No.	Manufacturer	Cal. Date	Next Cal. Date
☒	EMI Test Receiver	ESCI	100364	Rohde & Schwarz	2011.03.08	2012.03.08
☒	LISN	LISN1600	197204	TTI	2011.07.02	2012.07.02
☒	LISN(EUT)	ESH2-Z5	828739/006	R&S	2011.09.30	2012.09.30
☒	50 ohm Terminator	CT-01	N/A	TME	2011.01.11	2012.01.11
☐	Spectrum Analyzer	8591E	3649A05889	H/P	2011.03.07	2012.03.07
☐	RFI/Field intensity Meter	KNM-2402	4N-170-3	KYORITSU	2011.07.02	2012.07.02
☐	LISN	KNW-407	8-317-8	KYORITSU	2011.01.11	2012.01.11
☐	LISN	KNW-242	8-654-15	KYORITSU	2011.07.02	2012.07.02
☐	50 ohm Terminator	CT-01	N/A	TME	2011.01.11	2012.01.11
☐	ISN	T4A	24869	Teseq GmbH	2011.01.11	2012.01.11
☐	LISN(DC)	NNBM8125	8125-821	SCHWARZBECK	2011.07.01	2012.07.01

2. Radiated Disturbance

Name of Instrument		Model No.	Serial No.	Manufacturer	Cal. Date	Next Cal. Date
☒	EMI Test Receiver	ESU	100014	Rohde & Schwarz	2011.01.20	2012.01.20
☒	Bilog Antenna	CBL6112B	2737	SCHAFFNER	2010.07.14	2012.07.14
☒	Horn Antenna	BBHA9120A	322	SCHWARZBECK	2010.04.13	2012.04.13
☒	Amplifier(22dB)	8447E	2945A02865	H/P	2011.01.11	2012.01.11
☒	Pre Amplifier	MLA-00108-B02-36	1518831	TSJ	2011.01.11	2012.01.11
☒	Controller	5905A	N/A	TOKIN	-	-
☒	ANT.master	N/A	N/A	TOKIN	-	-
☐	EMI Test Receiver	ESCI	100364	Rohde & Schwarz	2011.03.08	2012.03.08
☐	BICONICAL ANT.	VHA 9103	91031946	SCHWARZBECK	2010.12.21	2012.12.21
☐	LOG-PERIODIC ANT.	UHALP 9108A-A1	1098	SCHWARZBECK	2010.11.29	2012.11.29
☐	Pre Amplifier	MLA-100K01-B01-26	1252741	TSJ	2011.03.07	2012.03.07
☐	Position Controller	5901T	14173	TOKIN	-	-
☐	DRIVER	5902T2	14174	TOKIN	-	-
☐	Spectrum Analyzer	E4411B	US41062735	Agilent	2011.07.01	2012.07.01
☐	Amplifier (25dB)	8447D	2443A03690	Agilent	2011.07.01	2012.07.01
☐	Bilog Antenna	VULB9160	3151	SCHAFFNER	2010.08.25	2012.08.25
☐	Controller	5900	N/A	TOKIN	-	-