

TEST REPORT

of

FCC CFR 47 part 1, 1.1307(b), 1.1310
FCC ID: AK8MP-CL1

Equipment Under Test : Mobile Projector
Model Name : MP-CL1
Applicant : Sony Corporation
Manufacturer : Sony Electronics of Korea Co., Ltd.
Date of Test(s) : 2015.06.28 ~ 2015.07.27
Date of Issue : 2015.07.29

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

Tested By:



Youngmin Park

Date:

2015.07.29

Approved By:



Hyunchoe You

Date:

2015.07.29

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1. General Information

1.1. Testing Laboratory

SGS Korea Co., Ltd. (Gunpo Laboratory)

-Wireless Div. 2FL, 10-2, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 435-837

All SGS services are rendered in accordance with the applicable SGS conditions of service available on request and accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx>.

Telephone : + 82 31 688 0901

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1.2. Details of applicant

Applicant : Sony Corporation

Address : 1-7-1 Konan Minato-ku, Tokyo, 108-0075 Japan

Contact Person : Kim, Sung-Chul

Phone No. : +82 55 250 0677

1.3. Description of EUT

Kind of Product	Mobile Projector
Model Name	MP-CL1
Power Supply	DC 3.8 V
Frequency Range	2 412 MHz ~ 2 462 MHz (11b/g/n_HT20), 5 180 MHz ~ 5 240 MHz (Band 1 : 11a/n_HT20), 5 190 MHz ~ 5 230 MHz (Band 1 : 11n_HT40), 5 260 MHz ~ 5 320 MHz (Band 2A : 11a/n_HT20), 5 270 MHz ~ 5 310 MHz (Band 2A : 11n_HT40), 5 500 MHz ~ 5 700 MHz (Band 2C : 11a/n_HT20)_except for TDWR(5.6-5.65 GHz) band, 5 510 MHz ~ 5 670 MHz (Band 2C : 11n_HT40)_except for TDWR(5.6-5.65 GHz) band, 5 745 MHz ~ 5 825 MHz (Band 3 : 11a/n_HT20), 5 755 MHz ~ 5 795 MHz (Band 3 : 11n_HT40)
Modulation Technique	DSSS, OFDM
Number of Channels	11 channels (11b/g/n_HT20), 4 channels (Band 1 : 11a/n_HT20), 2 channels (Band 1 : 11n_HT40), 4 channels (Band 2A : 11a/n_HT20), 2 channels (Band 2A : 11n_HT40), 8 channels (Band 2C : 11a/n_HT20), 3 channels (Band 2C : 11n_HT40), 5 channel (Band 3 : 11a/n_HT20), 2 channel (Band 3 : 11n_HT40)
Antenna Type	Internal type (SISO)
Antenna Gain	2 412 MHz ~ 2 462 MHz: 1.59 dBi, 5 180 MHz ~ 5 320 MHz: 2.88 dBi, 5 500 MHz ~ 5 700 MHz: 0.12 dBi, 5 745 MHz ~ 5 825 MHz: 0.16 dBi

1.4. Test report revision

Revision	Report number	Date of Issue	Description
0	F690501/RF-RTL008971	2015.07.29	Initial

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2. RF Exposure Evaluation

2.1. Environmental evaluation and exposure limit according to FCC CFR 47 part 1, 1.1307(b), 1.1310

LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency Range (MHz)	Electric Field Strength(V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Average Time
(A) Limits for Occupational/Controlled Exposure				
0.3 – 3.0	614	1.63	*100	6
3.0 – 30	1842/f	4.89/f	*900/f ²	6
30 - 300	61.4	0.163	1.0	6
300 – 1 500	-	-	f/300	6
1 500 – 100 000	-	-	5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3 – 1.34	614	1.63	*100	30
1.34 – 30	824/f	2.19/f	*180/f ²	30
30 - 300	27.5	0.073	0.2	30
300 – 1 500	-	-	f/1500	30
<u>1 500 – 100 000</u>	-	-	<u>1.0</u>	<u>30</u>

2.1.1. Friis transmission formula: $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot R^2)$

Where P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

R = distance between observation point and center of the radiator in cm

P_d the limit of MPE, 1 mW/cm². If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance where the MPE limit is reached.

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2.1.2. Test Result of RF Exposure Evaluation

Test Item : RF Exposure Evaluation Data

Test Mode : Normal Operation

2.1.3. Output Power into Antenna & RF Exposure Evaluation Distance

Mode : WLAN (2.4 GHz : 11b)_Maximum tune up tolerance

Channel	Channel Frequency (MHz)	Output Average Power to Antenna (dB m)	Antenna Gain (dB i)	Power Density at 20 cm (mW/cm ²)	Limits (mW/cm ²)
11	2 462	15	1.59	0.009 073	1

Mode : WLAN (2.4 GHz : 11g)_Maximum tune up tolerance

Channel	Channel Frequency (MHz)	Output Average Power to Antenna (dB m)	Antenna Gain (dB i)	Power Density at 20 cm (mW/cm ²)	Limits (mW/cm ²)
11	2 462	15	1.59	0.009 073	1

Mode : WLAN (2.4 GHz : 11n_HT20)_Maximum tune up tolerance

Channel	Channel Frequency (MHz)	Output Average Power to Antenna (dB m)	Antenna Gain (dB i)	Power Density at 20 cm (mW/cm ²)	Limits (mW/cm ²)
1	2 412	14	1.59	0.007 207	1

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Mode : WLAN (5 GHz : 11a)_Maximum tune up tolerance

Channel	Channel Frequency (MHz)	Output Average Power to Antenna (dB m)	Antenna Gain (dB i)	Power Density at 20 cm (mW/cm ²)	Limits (mW/cm ²)
165	5 825	12	0.16	0.003 271	1

Mode : WLAN (5 GHz : 11n_HT20)_Maximum tune up tolerance

Channel	Channel Frequency (MHz)	Output Average Power to Antenna (dB m)	Antenna Gain (dB i)	Power Density at 20 cm (mW/cm ²)	Limits (mW/cm ²)
161	5 805	12	0.16	0.003 271	1

Mode : WLAN (5 GHz : 11n_HT40)_Maximum tune up tolerance

Channel	Channel Frequency (MHz)	Output Average Power to Antenna (dB m)	Antenna Gain (dB i)	Power Density at 20 cm (mW/cm ²)	Limits (mW/cm ²)
159	5 795	12	0.16	0.003 271	1

Note :

1. The power density Pd (5th column) at a distance of 20 cm calculated from the friis transmission formula is far below the limit of 1 mW/cm².
2. The worst case were only reported in each operating mode.