

MPE TEST REPORT

of

FCC CFR 47 part 1, 1.1307(b), 1.1310

FCC ID: A3LEICN10

Equipment Under Test : IP Camera
Model Name : EI-CN10
Serial No. : N/A
Applicant : SAMSUNG ELECTRONICS CO., LTD.
Manufacturer : SAMSUNG ELECTRONICS CO., LTD.
Date of Test(s) : 2013.07.08
Date of Issue : 2013.07.08

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

Tested By:



Date

2013.07.08

Harim Lee

Approved By:



Date

2013.07.08

Feel Jeong

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1. General information

1.1 Testing laboratory

SGS Korea Co., Ltd. (Gunpo Laboratory)

- Wireless Div. 3FL, 18-34, Sanbon-dong, Gunpo-si, Gyeonggi-do, Korea 435-040

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1.2 Details of applicant

Applicant : SAMSUNG ELECTRONICS CO., LTD.

Address : 19-29, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 443-742 Rep. of Korea

Contact Person : Park, Min-Ho

Phone No. : +82 10 7145 7838

1.3. Description of EUT

Kind of Product	IP Camera
Model Name	EI-CN10
Serial Number	N/A
Power Supply	DC 5.0 V
Frequency Range	2 402 MHz ~ 2 480 MHz (BT), 2 412 MHz ~ 2 462 MHz (11b/g/n_HT20), 5 745 MHz ~ 5 825 MHz (11a/n_HT20), 5 755 MHz ~ 5 795 MHz (11n_HT40), 5 180 MHz ~ 5 240 MHz (11a/n_HT20 – Non DFS), 5 190 MHz ~ 5 230 MHz (11n_HT40 – Non DFS), 5 260 MHz ~ 5 320 MHz (11a/n_HT20 – DFS), 5 270 MHz ~ 5 310 MHz (11n_HT40 – DFS), 5 500 MHz ~ 5 700 MHz (11a/n_HT20 – DFS), 5 510 MHz ~ 5 670 MHz (11n_HT40 – DFS)
Modulation Technique	GFSK, $\pi/4$ DQPSK, 8DPSK, DSSS, OFDM
Number of Channels	11 channel (11b/g/n_HT20), 5 channel (11a/n_HT20), 2 channel (11n_HT40), 4 channel (11a/n_HT20-Non DFS), 2 channel (11n_HT40-Non DFS), 15 channel (11a/n_HT20-DFS), 7 channel (11n_HT40-DFS), 79 channel (BT)
Antenna Type	Internal type(SISO)
Antenna Gain	2 402 MHz ~ 2 480 MHz, 2 412 MHz ~ 2 462 MHz: 0.35 dB i, 5 180 MHz ~ 5 320 MHz: -0.35 dB i, 5 500 MHz ~ 5 700 MHz: -0.14 dB i, 5 745 MHz ~ 5 825 MHz: 0.87 dB i

1.4. Test report revision

Revision	Report number	Description
0	F690501/RF-RTL00	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

According to FCC 1.1310 : The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in §1.1307(b)

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 /Control Exposures				
300 – 1 500	--	--	F/300	6
1 500 – 100 000	--	--	5	6
(B) Limits for General Population/Uncontrol Exposures				
300 – 1 500	--	--	F/1500	6
1 500 – 100 000	--	--	1	30

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

- 11b

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	13.25	0.35	0.004 558	1
6	2 437	13.63	0.35	0.004 974	1
11	2 462	13.94	0.35	0.005 342	1

- 11g

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	12.76	0.35	0.004 071	1
6	2 437	13.20	0.35	0.004 505	1
11	2 462	13.46	0.35	0.004 783	1

- 11n_TH20

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	10.58	0.35	0.002 465	1
6	2 437	10.98	0.35	0.002 702	1
11	2 462	11.24	0.35	0.002 869	1

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- 11a

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)
149	5 745	14.36	0.87	0.006 633	1
157	5 785	14.34	0.87	0.006 603	1
165	5 825	14.72	0.87	0.007 207	1

- 11n_HT20

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)
149	5 745	13.36	0.87	0.005 269	1
157	5 785	13.25	0.87	0.005 137	1
165	5 825	13.45	0.87	0.005 379	1

- 11n_TH40

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)
151	5 755	11.29	0.87	0.003 271	1
159	5 795	11.46	0.87	0.003 402	1

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- 11a

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)
36	5 180	13.35	-0.35	0.003 969	1
44	5 220	13.04	-0.35	0.003 696	
48	5 240	13.14	-0.35	0.003 782	
52	5 260	13.23	-0.35	0.003 861	
60	5 300	12.90	-0.35	0.003 579	
64	5 320	13.97	-0.35	0.004 579	
100	5 500	13.05	-0.14	0.003 888	
116	5 580	13.34	-0.14	0.004 157	
140	5 700	13.06	-0.14	0.003 897	

- 11n_HT20

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)
36	5 180	12.05	-0.35	0.002 943	1
44	5 220	11.90	-0.35	0.002 843	
48	5 240	12.10	-0.35	0.002 977	
52	5 260	12.05	-0.35	0.002 943	
60	5 300	11.73	-0.35	0.002 734	
64	5 320	11.68	-0.35	0.002 702	
100	5 500	11.89	-0.14	0.002 977	
116	5 580	12.26	-0.14	0.003 241	
140	5 700	13.25	-0.14	0.004 071	

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- 11n_HT40

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)
38	5 190	10.14	-0.35	0.001 896	1
46	5 230	9.76	-0.35	0.001 737	
54	5 270	10.09	-0.35	0.001 874	
62	5 310	9.79	-0.35	0.001 749	
102	5 510	9.88	-0.14	0.001 874	
110	5 550	9.97	-0.14	0.001 913	
134	5 670	10.17	-0.14	0.002 003	

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- BT(GFSK)

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)
0	2 402	6.82	0.35	0.001 037	1
39	2 441	7.45	0.35	0.001 199	1
78	2 480	6.73	0.35	0.001 016	1

- BT(π /4DQPSK)

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)
0	2 402	4.55	0.35	0.000 615	1
39	2 441	4.80	0.35	0.000 651	1
78	2 480	3.86	0.35	0.000 524	1

- BT(8DPSK)

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)
0	2 402	4.54	0.35	0.000 613	1
39	2 441	4.87	0.35	0.000 662	1
78	2 480	3.82	0.35	0.000 520	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.

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