TEST REPORT

Part 15 Subpart C 15.249

Equipment Under Test	2.4 ㎓ Wireless Keyboard
Model Name	K7907G
FCC ID	FKDK7907G
Applicant	Monterey International Corp.
Manufacturer	Monterey Electronic Factory
Date of test(s)	2011.07.25 ~ 2011.08.04
Date of issue	2011.08.09

Issued to

Monterey International Corp.
No.28 Wu-Chun 6th RD,Wu-Ku IND Park Taipei Hsien Taiwan R.O.C

Issued by

KES Co., Ltd.
C3701 Dongil Techno Town, 889-1, Gwanyang 2-dong, Dongan-gu, Anyang-si,
Gyeonggi-do, 431-716, Korea
477-6, Hageo-ri, Yeoju-eup, Yeoju-gun, Gyeonggi-do, 469-803, Korea
Tel: +82-31-425-6200 / Fax: +82-31-424-0450

Test and report completed by :	**Report approval by :**
	
Jeff Do Test engineer	Gyu-cheol Shin Technical manager

Revision history

Revision	Date of issue	Test report No.	Description
-	2011.08.09	TK-FR11048	Initial

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1.0 General product description

Equipment under test	2.4 ㎓ Wireless Keyboard
Model name	K7907G
Serial number	N/A
Frequency Range	2403 ㎒ ~ 2478 ㎒
Modulation technique	GFSK
Number of channels	20
Antenna type	PCB Antenna
Power source	DC 3 V(Battery 1.5 V × 2)

1.1 Test frequency

	Low channel	**Middle channel**	**High channel**
Frequency (㎒)	2403	2453	2478

1.2 Model differences

N/A

1.3 Device modifications

N/A

1.4 Test facility

C3701 Dongil Techno Town, 889-1, Gwanyang 2-dong, Dongan-gu, Anyang-si, Gyeonggi-do, 431-716, Korea
477-6, Hageo-ri, Yeoju-eup, Yeoju-gun, Gyeonggi-do, 469-803, Korea

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

1.5 Laboratory accreditations and listings

Country	Agency	Scope of accreditation	Logo
USA	FCC	3 & 10 meter Open Area Test Sites and one conducted site to perform FCC Part 15/18 measurements.	343818
KOREA	KCC	EMI (10 meter Open Area Test Site and two conducted sites) Radio (3 & 10 meter Open Area Test Sites and one conducted site)	KR0100
Canada	IC	3 & 10 meter Open Area Test Sites and one conducted site	4769B-1

2.0 Summary of tests

Section in FCC Part 15	Parameter	Status
15.209(a) 15.249(a) 15.249(d) 15.205	Fundamental, spurious emission and band edge radiated emission	C
Note 1: C=Complies NC=Not complies NT=Not tested NA=Not applicable		

2.1 Technical characteristic test

2.1.1 Fundamental, spurious emission and band edge radiated emission

Test location

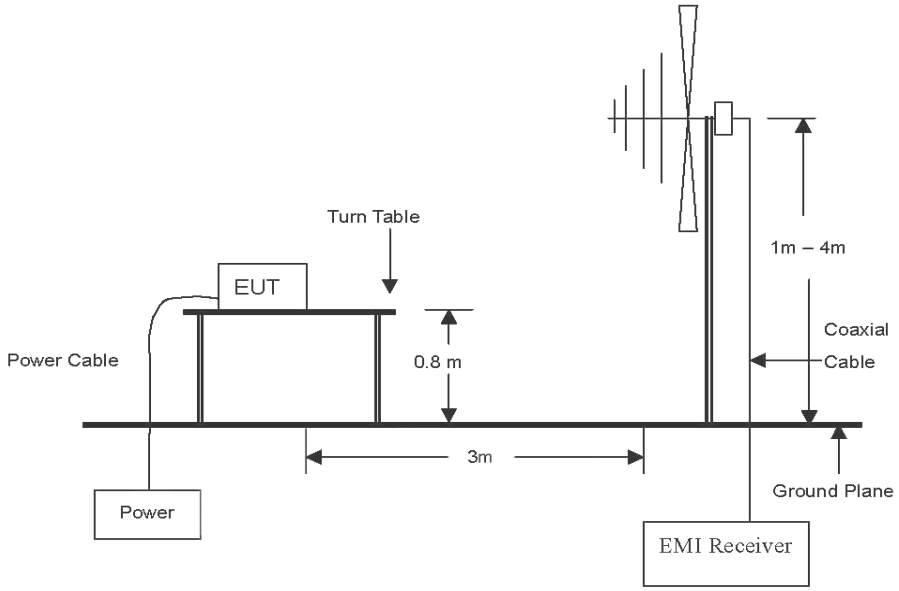
Testing was performed at a test distance of 3 meter Open Area Test Site

Test procedures

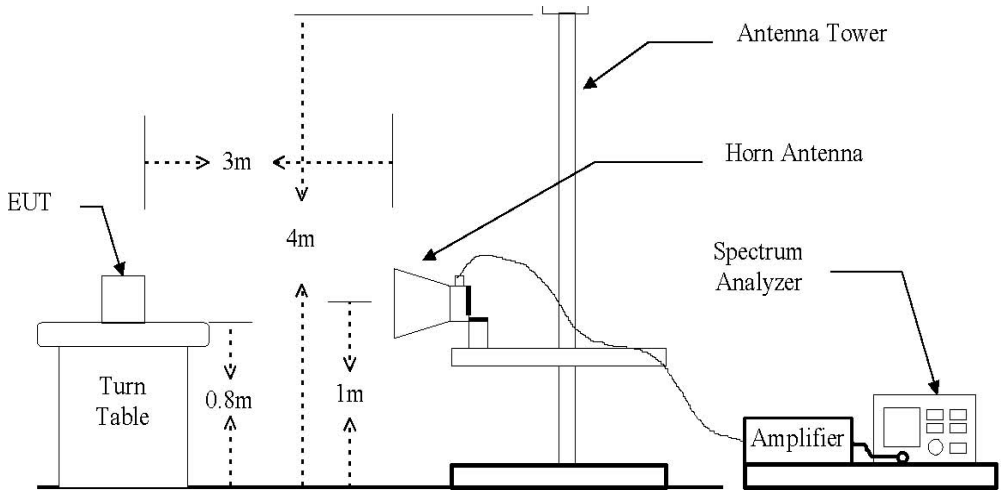
The height of the measuring antenna was varied between 1 to 4 m and the table was rotated a full revolution in order to obtain maximum values of the electric field intensity.
The measurement was made in both the vertical and horizontal polarization, and the maximum value is presented in the report.

The spectrum analyzer is set to:
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer 120 ㎑ for Peak detection (PK) or Quasi-peak detection (QP) at frequency below 1 ㎓.
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 ㎒ for Peak detection and frequency above 1 ㎓.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 ㎒ and the video bandwidth is 10 Hz for Average detection (AV) at frequency above 1 ㎓.

The diagram below shows the test setup that is utilized to make the measurements for emission from 30 ㎒ to 1 ㎓ emissions.



The diagram below shows the test setup that is utilized to make the measurements for emission from 1 ㎓ to 24 ㎓ emissions.



Limit

In the section 15.249(a) :
Except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental frequency	Field strength of fundamental (㎷/ m)	Field strength of harmonics (㎶/m)
902 ~ 928 ㎒	50	500
2 400 ~ 2 483.5 ㎒	50	500
5 725 ~ 5 875 ㎒	50	500
24.0 ~ 24.25 ㎓	250	2500

Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Fundamental frequency (㎒)	Field strength (㎶/m)	Measurement distance (m)
30 ~ 88	100*	3
88 ~ 216	150*	3
216 ~ 960	200*	3
Above 960	500	3

※ Remark

Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54 - 72 ㎒, 76 - 88 ㎒, 174 - 216 ㎒ or 470 - 806 ㎒. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

In the above emission table, the tighter limit applies at the band edges.

Fundamental frequency (㎒)	**Field strength (㎶/m at 3 meter)**	**Field strength (dB㎶/m at 3 meter)**
30 ~ 88	100	40
88 ~ 216	150	43.5
216 ~ 960	200	46
Above 960	500	54

Test results (Below 1000 ㎒)

The frequency spectrum from 30 ㎒ to 1000 ㎒ was investigated. Emission levels are not reported much lower than the limits by over 20 ㏈.

Radiated emissions		Ant.	Correction factors		Total	Limit	
Frequency (㎒)	Reading (㏈㎶)	Pol.	Ant. factor (㏈/m)	Cable loss (㏈)	Actual (㏈㎶/m)	Limit (㏈㎶/m)	Margin (㏈)
179.5	15.15	V	11.76	1.63	28.54	43.50	14.96
196.3	15.50	H	10.11	1.63	27.24	43.50	16.26
333.9	14.99	V	13.57	1.95	30.51	46.00	15.49
371.8	15.36	H	14.26	2.07	31.69	46.00	14.31
508.0	16.48	H	16.65	2.58	35.71	46.00	10.29
551.5	16.07	V	17.42	2.71	36.20	46.00	9.80
631.5	16.03	V	18.88	2.96	37.87	46.00	8.13
767.7	16.84	V	20.46	3.22	40.52	46.00	5.48
770.5	16.74	H	20.49	3.22	40.45	46.00	5.55
846.3	17.25	H	11.76	1.63	30.64	46.00	45.36

※ Remark

1. All spurious emission at channels are almost the same below 1 ㎓, so that Low channel was chosen at representative in final test.
2. Actual = Reading + Ant. factor + Cable loss
3. Detector mode: Quasi peak
4. To get a maximum emission level from the EUT, the EUT was moved throughout the XY, XZ and YZ planes.

Test results (Above 1000 ㎒)

A. Low channel (2403 ㎒)

Radiated emissions			Ant.	Correction factors		Total	Limit	
Frequency (㎒)	Reading (dB㎶)	Detector mode	Pol.	Ant. factor (dB/m)	Cable loss (dB)	Actual (dB㎶/m)	Limit (dB㎶/m)	Margin (dB)
2403.00	55.68	Peak	H	28.34	7.57	91.59	114.00	22.41
2403.00	25.06	Average	H	28.34	7.57	60.97	94.00	33.03
2403.00	54.18	Peak	V	28.34	7.57	90.09	114.00	23.91
2403.00	23.73	Average	V	28.34	7.57	59.64	94.00	34.36
Radiated emissions			**Ant.**	**Correction factors**		**Total**	**Limit**	
Frequency (㎒)	**Reading (dB㎶)**	**Detector mode**	**Pol.**	**Ant. factor (dB/m)**	**Amp + CL (dB)**	**Actual (dB㎶/m)**	**Limit (dB㎶/m)**	**Margin (dB)**
2390.0*	63.48	Peak	H	28.31	-38.02	53.77	74.00	20.23
2390.0*	39.76	Average	H	28.31	-38.02	30.05	54.00	23.95
2390.0*	58.28	Peak	V	28.31	-38.02	48.57	74.00	25.43
2390.0*	34.66	Average	V	28.31	-38.02	24.95	54.00	29.05
4806.0*	65.32	Peak	H	33.91	-34.10	65.13	74.00	8.87
4806.0*	40.91	Average	H	33.91	-34.10	40.72	54.00	13.28
4806.0*	64.59	Peak	V	33.91	-34.10	64.40	74.00	9.60
4806.0*	40.86	Average	V	33.91	-34.10	40.67	54.00	13.33

B. Middle channel (2453 ㎒)

Radiated emissions			Ant.	Correction factors		Total	Limit	
Frequency (㎒)	Reading (dB㎶)	Detector mode	Pol.	Ant. factor (dB/m)	Cable loss (dB)	Actual (dB㎶/m)	Limit (dB㎶/m)	Margin (dB)
2453.00	51.17	Peak	H	28.44	7.68	87.29	114.00	26.71
2453.00	20.62	Average	H	28.44	7.68	56.74	94.00	37.26
2453.00	50.99	Peak	V	28.44	7.68	87.11	114.00	26.89
2453.00	20.95	Average	V	28.44	7.68	57.07	94.00	36.93
Radiated emissions			**Ant.**	**Correction factors**		**Total**	**Limit**	
Frequency (㎒)	**Reading (dB㎶)**	**Detector mode**	**Pol.**	**Ant. factor (dB/m)**	**Amp + CL (dB)**	**Actual (dB㎶/m)**	**Limit (dB㎶/m)**	**Margin (dB)**
4906.0*	60.59	Peak	H	34.24	-33.86	60.97	74.00	13.03
4906.0*	40.84	Average	H	34.24	-33.86	41.22	54.00	12.78
4906.0*	63.24	Peak	V	34.24	-33.86	63.62	74.00	10.38
4906.0*	40.35	Average	V	34.24	-33.86	40.73	54.00	13.27

C. High channel (2478 ㎒)

Radiated emissions			Ant.	Correction factors		Total	Limit	
Frequency (㎒)	Reading (dB㎶)	Detector mode	Pol.	Ant. factor (dB/m)	Cable loss (dB)	Actual (dB㎶/m)	Limit (dB㎶/m)	Margin (dB)
2478.00	49.74	Peak	H	28.49	7.73	85.96	114.00	28.04
2478.00	19.66	Average	H	28.49	7.73	55.88	94.00	38.12
2478.00	49.29	Peak	V	28.49	7.73	85.51	114.00	28.49
2478.00	18.61	Average	V	28.49	7.73	54.83	94.00	39.17
Radiated emissions			**Ant.**	**Correction factors**		**Total**	**Limit**	
Frequency (㎒)	**Reading (dB㎶)**	**Detector mode**	**Pol.**	**Ant. factor (dB/m)**	**Amp + CL (dB)**	**Actual (dB㎶/m)**	**Limit (dB㎶/m)**	**Margin (dB)**
2483.5*	61.32	Peak	H	28.50	-37.81	52.01	74.00	21.99
2483.5*	35.84	Average	H	28.50	-37.81	26.53	54.00	27.47
2483.5*	65.26	Peak	V	28.50	-37.81	55.95	74.00	18.05
2483.5*	39.56	Average	V	28.50	-37.81	30.25	54.00	23.75
4956.0*	68.88	Peak	H	34.41	-33.74	69.55	74.00	4.45
4956.0*	40.82	Average	H	34.41	-33.74	41.49	54.00	12.51
4956.0*	64.02	Peak	V	34.41	-33.74	64.69	74.00	9.31
4956.0*	40.64	Average	V	34.41	-33.74	41.31	54.00	12.69

※ Remark

1. "*" means the restricted band.
2. Measuring frequencies from 1 ㎓ to the 10th harmonic of highest fundamental frequency.
3. Radiated emissions measured in frequency above 1000 ㎒ were made with an instrument using peak/average detector mode.
4. Average test would be performed if the peak result were greater than the average limit.
5. Actual = Reading + Ant. factor + Amp + CL (Cable loss)
6. To get a maximum emission level from the EUT, the EUT was moved throughout the XY, XZ and YZ planes.

Appendix A – Test equipment used for test

Equipment	Manufacturer	Model	Calibration due.
Spectrum Analyzer	R&S	FSV30	2012-01-07
Trilog-Broadband Antenna	SCHWARZBECK	VULB 9168	2013-04-28
Horn Antenna	A.H. System	SAS-571	2013-03-22
High Pass Filter	Wainwright Instrument	WHJS3000-10TT	2012-01-07
Preamplifier	HP	8447F	2012-05-04
Preamplifier	A.H. System	PAM-0118	2012-05-04

Peripheral devices

Device	Manufacturer	Model No.	Serial No.
N/A			

Test setup photo and configuration

Radiated field emissions