TEST REPORT

of

FCC Part 15 Subpart C §15.249

FCC ID : WU2SMRSFQII

Equipment Under Test	:	Digital Radio Slave
Model Name	:	FlashQuick-II
Serial No.	:	N/A
Applicant	:	SMDV
Manufacturer	:	SMDV
Date of Test(s)	:	2012. 06. 22 ~ 2012. 07.04
Date of Issue	:	2012. 08.09

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

Tested By: **Hyunchae You** **Date** **2012. 08.09**

Approved By: **Feel Jeong** **Date** **2012. 08.09**

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1. General information

1.1 Testing laboratory

SGS Korea Co., Ltd. (Gunpo Laboratory)
- 413-15, Gomae-Dong Giheung-Gu, Yongin-Si, Gyeonggi-Do, South Korea.
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1.2 Details of applicant

Applicant	:	SMDV
Address	:	280-11, MORA-1, SASNG-GU, BUSAN, Korea
Contact Person	:	Ji Young, Kim
Phone No.	:	+82 051 324 0788

1.3. Description of EUT

Kind of Product	Digital Radio Slave
Model Name	FlashQuick-II
Serial Number	N/A
Power Supply	DC 1.5 V
Frequency Range	2427 ㎒ ~ 2457 ㎒
Modulation Technique	GFSK
Number of Channels	16
Antenna Type	Micro strip(PCB) Antenna

1.4 Details of modification

-N/A

1.5. Test equipment list

Equipment	Manufacturer	Model	S/N	Cal Date	Cal Interval	Cal Due.
Signal Generator	R&S	SMJ 100A	100882	Nov. 25, 2011	Annual	Nov. 25, 2012
Spectrum Analyzer	R&S	FSV30	101004	Jul. 06, 2011	Annual	Jul. 06, 2012
High Pass Filter	Wainwright	WHK3.0/18G-10SS	344	Jul. 05, 2011	Annual	Jul. 05, 2012
Low Pass Filter	Mini circuits	NLP-1200+	V9500401023-1	Aug. 22, 2011	Annual	Aug. 22, 2012
DC Power Supply	Agilent	U8002A	MY50020026	Mar. 29, 2012	Annual	Mar. 29, 2013
Preamplifier	R & S	8447D	1726A01265	Sep. 28, 2011	Annual	Sep. 28, 2012
Preamplifier	R & S	SCU 18	10070	Aug. 10, 2011	Annual	Aug. 10, 2012
Preamplifier	MITEQ Inc.	JS44-18004000-35-8P	1546891	Jul. 04, 2012	Annual	Jul. 04, 2013
Test Receiver	R & S	ESU40	100075	Feb. 13, 2012	Annual	Feb. 13, 2013
Bilog Antenna	SCHWARZBECK	VULB9163	9163-437	Aug. 03, 2011	Biennial	Aug. 03, 2012
Horn Antenna	R&S	HF906	100326	Nov. 23, 2010	Biennial	Nov. 23, 2012
Horn Antenna	SCHWARZBECK MESSELEKTRONIK	BBHA9170	BBHA9170431	May 15, 2012	Biennial	May 15, 2014
Antenna Master	INN-CO	MA4000-EP	N/A	N.C.R	N/A	N.C.R.
Turn Table	INN-CO	DT-3000S	N/A	N.C.R	N/A	N.C.R.
Anechoic Chamber	SY Corporation	L × W × H (21.5 m × 13.0 m × 9.0 m)	N/A	N.C.R	N/A	N.C.R.

1.6. Support equipment

Equipment	Manufacturer	Model name	S/N
-	-	-	-

1.6. Summary of test results

The EUT has been tested according to the following specifications:

Applied Standard : FCC Part15, Subpart C		
Standard Section	**Test Item**	**Result**
15.209(a) 15.249(a) 15.249(d) 15.205	Fundamental, Spurious emission and edge band radiated emission	Complied

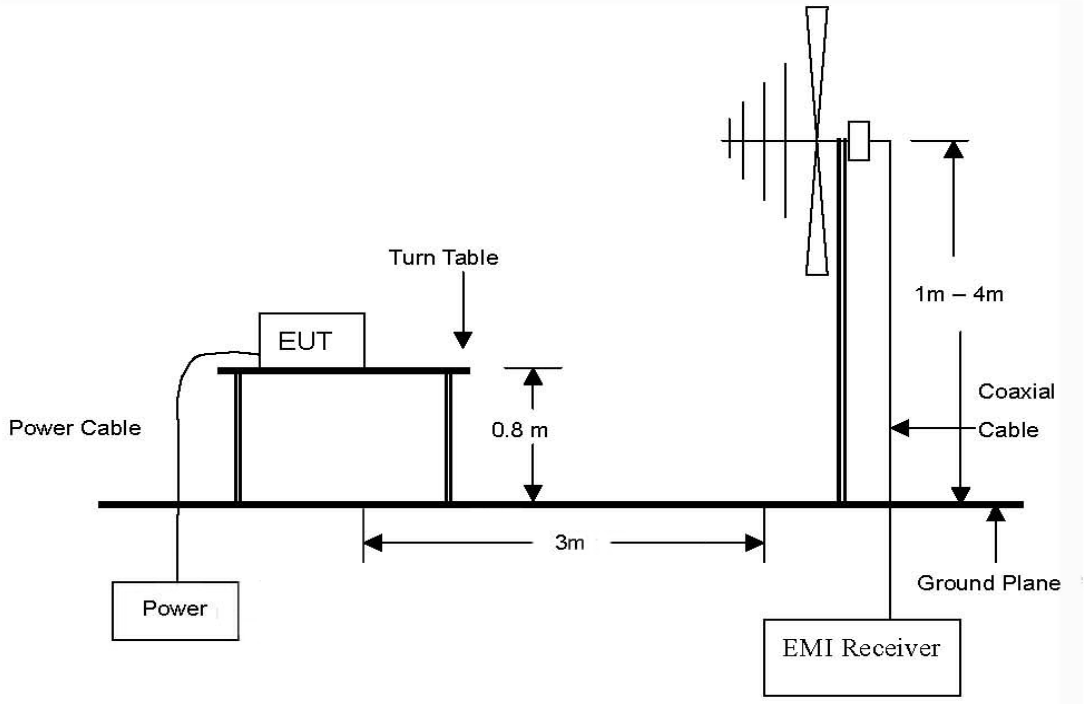
1.7. Test report revision

Revision	Report number	Description
0	F690501/RF-RTL005633	Initial
1	F690501/RF-RTL005633-1	update the Horn antenna in Test equipment list
2	F690501/RF-RTL005633-2	List the average limit

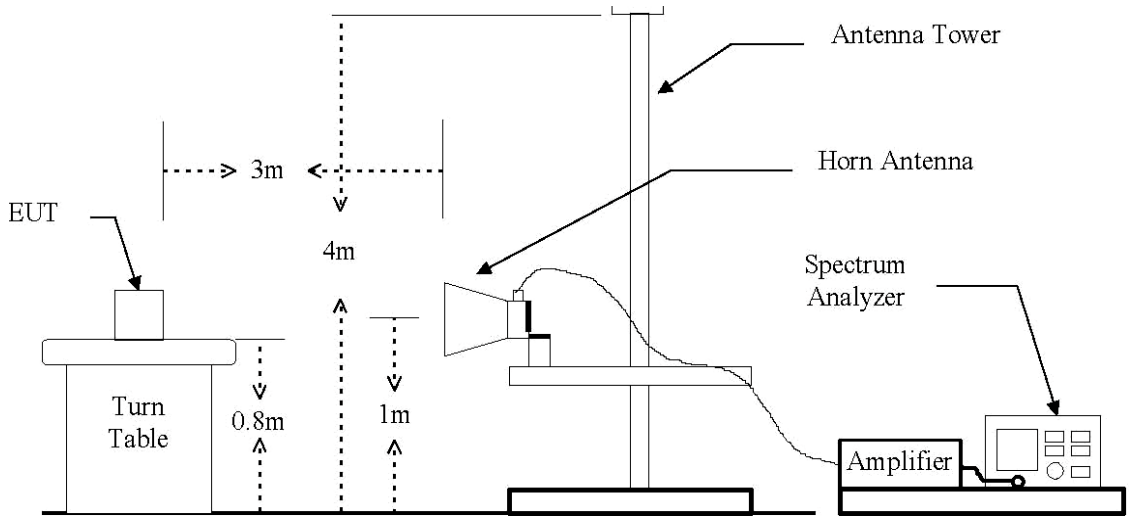
2. Fundamental, Spurious emission and edge band radiated emission

2.1. Test setup

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 .The spurious emissions were investigated form 1 ㎓ to the 10th harmonic of the highest fundamental frequency or 40 ㎓, whichever is lower.



2.2. Test procedures

Radiated emissions from the EUT were measured according to the dictates of ANSI C63.4:2003

1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter anechoic Chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
2. During performing radiated emission above 1 ㎓, the EUT was set 3 meter away from the interference-receiving antenna.
3. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarization of the antenna are set to make the measurement.
4. 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 table was turned from 0 degrees to 360 degrees to find the maximum reading.
5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. If the emission level of the EUT in peak mode was 10 ㏈ lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

Note：

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 ㎒ for Peak detection and frequency above 1 ㎓.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 ㎒ and the video bandwidth is 10 ㎐ for Average detection (AV) at frequency above 1 ㎓.

2.3. 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	2 500

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 MHz 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

2.4. Test result

Ambient temperature : (24 ± 2) ℃
Relative humidity : 47 % R.H.

2.4.1. Below 1 ㎓

The frequency spectrum from 30 MHz to 1000 MHz was investigated. Emission levels are not reported much lower than the limits by over 30 dB. All reading values are quasi-peak values.

Radiated Emissions			Ant	Correction Factors		Total	FCC Limit	
Frequency (㎒)	Reading (dB㎶)	Detect Mode	Pol.	AF (dB/m)	AMP + CL (dB)	Actual (dB㎶/m)	Limit (dB㎶/m)	Margin (dB)
Below 1 000.00	Not detected	-	-					

Remark
1. To get a maximum emission level from the EUT, the EUT was moved throughout the XY, XZ and YZ planes. XZ plane is worst case.
2. All spurious emission at channels are almost the same below 1 ㎓, so that the channel was chosen at representative in final test.

2.4.2. Above 1 ㎓

A. Low Channel (2 427 ㎒)

Radiated Emissions			Ant	Correction Factors		Total	FCC Limit	
Frequency (㎒)	Reading (dB㎶)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Actual (dB㎶/m)	Limit (dB㎶/m)	Margin (dB)
2 427.00	53.38	Peak	H	29.42	8.98	91.78	114.00	22.22
2 427.00	-	Average	-	-	-	-	94.00	2.22
Radiated Emissions			**Ant**	**Correction Factors**		**Total**	**FCC Limit**	
Frequency (㎒)	**Reading (dB㎶)**	**Detect Mode**	**Pol.**	**AF (dB/m)**	**AMP+CL (dB)**	**Actual (dB㎶/m)**	**Limit (dB㎶/m)**	**Margin (dB)**
*2 390.00	48.62	Peak	H	29.34	-33.03	44.93	74.00	29.07
*2 390.00	-	Average	-	-	-	-	54.00	9.07
4 854.00	48.95	Peak	H	34.11	-30.12	52.94	74.00	21.06
4 854.00	36.50	Average	H	34.11	-30.12	40.49	54.00	13.51
Above 4 900.00	Not Detected	-	-	-	-	-	-	-

B. Middle Channel (2 441 ㎒)

Radiated Emissions			Ant	Correction Factors		Total	FCC Limit	
Frequency (㎒)	Reading (dB㎶)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Actual (dB㎶/m)	Limit (dB㎶/m)	Margin (dB)
2 441.00	53.23	Peak	H	29.46	9.02	91.71	114.00	22.29
2 441.00	-	Average	H	-	-	-	94.00	2.29
Radiated Emissions			**Ant**	**Correction Factors**		**Total**	**FCC Limit**	
Frequency (㎒)	**Reading (dB㎶)**	**Detect Mode**	**Pol.**	**AF (dB/m)**	**AMP+CL (dB)**	**Actual (dB㎶/m)**	**Limit (dB㎶/m)**	**Margin (dB)**
4 882.00	49.65	Peak	H	34.15	-30.21	53.59	74.00	20.41
4 882.00	37.61	Average	H	34.15	-30.21	41.55	54.00	12.45
Above 4 900.00	Not Detected	-	-	-	-	-	-	-

C. High Channel (2 457 ㎒)

Radiated Emissions			Ant	Correction Factors		Total	FCC Limit	
Frequency (㎒)	Reading (dB㎶)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Actual (dB㎶/m)	Limit (dB㎶/m)	Margin (dB)
2 457.00	53.40	Peak	H	29.50	9.07	91.97	114.00	22.03
2 457.00	-	Average	H	-	-	-	94.00	2.03
Radiated Emissions			**Ant**	**Correction Factors**		**Total**	**FCC Limit**	
Frequency (㎒)	**Reading (dB㎶)**	**Detect Mode**	**Pol.**	**AF (dB/m)**	**AMP+CL (dB)**	**Actual (dB㎶/m)**	**Limit (dB㎶/m)**	**Margin (dB)**
*2 483.50	47.56	Peak	H	29.34	-33.03	44.93	74.00	29.07
*2 483.50	-	Average	-	-	-	-	54.00	9.07
4 914.00	48.32	Peak	H	34.19	-30.32	52.19	74.00	21.81
4 914.00	36.71	Average	H	34.19	-30.32	40.58	54.00	13.42
Above 5 000.00	Not Detected	-	-	-	-	-	-	-

Remarks ;

1. "*" means the restricted band.
2. To get a maximum emission level from the EUT, the EUT was moved throughout the XY, XZ and YZ planes. XZ plane is worst case
3. Measuring frequencies from 1 ㎓ to the 10th harmonic of highest fundamental Frequency.
4. Radiated emissions measured in frequency above 1 000 ㎒ were made with an instrument using peak/average detector mode.
5. Average test would be performed if the peak result were greater than the average limit.
6. Actual = Reading + AF - Amp Gain + CL

3. Bandwidth of operation frequency

3.1. Test setup

3.2. Limit

None; for reporting purpose only

3.3. Test procedure

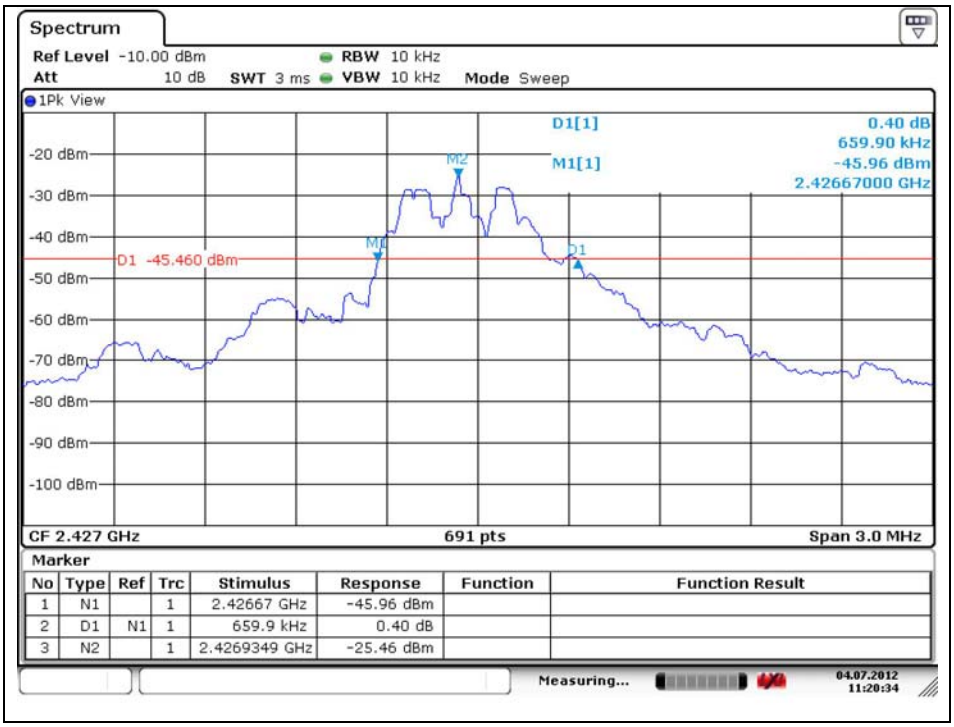
1. The transmitter output is connected to the spectrum analyzer.
2. The bandwidth of the fundamental frequency was measured with the spectrum analyzer using RBW=10 ㎑, VBW=10 ㎑ and Span=3 ㎒.

3.4. Test result

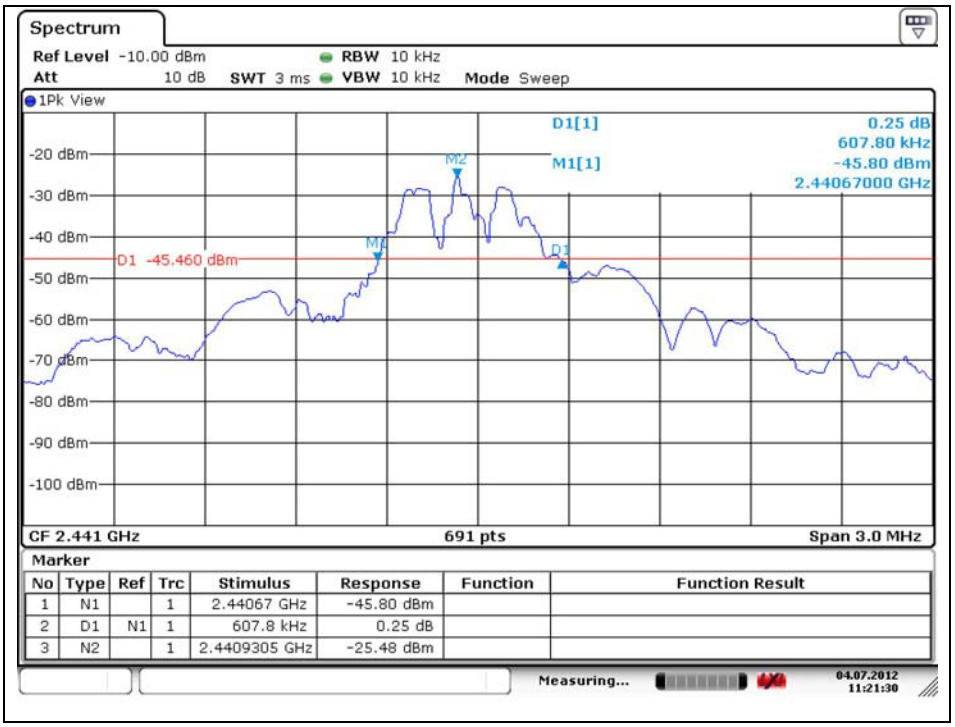
Ambient temperature : (24 ± 2) ℃
Relative humidity : 47 % R.H.

Channel	20 dB Bandwidth (㎑)
Low	660
Middle	608
High	608

Low channel



Middle channel



High channel