ELECTROMAGNETIC EMISSION COMPLIANCE REPORT FOR LOW-POWER, NON-LICENSED TRANSMITTER

Test Report No.	**: E107R-025**
AGR No	**: A107A-028**
Applicant	**: Challenge Co., Ltd.**
Address	**: Livera Shinokachimachi 4F, 2-14-4, Kojima, Taito-ku, Tokyo, JAPAN, 111-0056**
Manufacturer	**: Challenge Co., Ltd.**
Address	**: Livera Shinokachimachi 4F, 2-14-4, Kojima, Taito-ku, Tokyo, JAPAN, 111-0056**
Type of Equipment	**: WIRELESS TRANSMITTER**
FCC ID.	**: YLSWT-200NF**
Model Name	**: WT-200NF**
Serial number	**: None**
Total page of Report	**: 19 pages (including this page)**
Date of Incoming	**: May 13, 2010**
Date of issue	**: July 13, 2010**

SUMMARY

The equipment complies with the regulation; **FCC Part 15 Subpart C Section 15.231.**

This test report only contains the result of a single test of the sample supplied for the examination.

It is not a generally valid assessment of the features of the respective products of the mass-production.

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EMC/RF Center
ONETECH Corp.

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Revision History

Issue Report No.	Issued Date	Revisions	Effect Section
E107R-025	July 13, 2010	Initial Release	All

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1. VERIFICATION OF COMPLIANCE

Applicant	: Challenge Co., Ltd.
Address	: Livera Shinokachimachi 4F, 2-14-4, Kojima, Taito-ku, Tokyo, JAPAN, 111-0056
Contact Person	: Mr. Kazuo Sasaki / Manager
Telephone No.	: 03-5809-2304
FCC ID	: YLSWT-200NF
Model Name	: WT-200NF
Brand Name	: SECURITY SYSTEM
Serial Number	: N/A
Date	: July 13, 2010

Equipment Class	**DSR – Low Power Communications Transmitter**
Kind of Equipment	WIRELESS TRANSMITTER
This Report Concerns	Original Grant
Measurement Procedures	ANSI C63.4: 2003
Type of Equipment Tested	Pre-Production
Kind of Equipment Authorization Requested	Certification
Equipment Will be operated under FCC Rules Part(s)	FCC PART 15 SUBPART C § 15.231
Modification on the Equipment to Achieve Compliance	No
Final Test was conducted on	3 m open area test site

-. The above equipment was tested by ONETECH Corp. for compliance with the requirement set forth in the FCC Rules and Regulations. This said equipment in the configuration described in this report, shows the maximum emission levels emanating from equipment are within the compliance requirements.

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2. GENERAL INFORMATION

2.1 Product Description

The Challenge Co., Ltd., Model: WT-200NF (referred to as the EUT in this report) is a WIRELESS TRANSMITTER. Product specification information described herein was obtained from product data sheet or user's manual.

CHASSIS TYPE	Plastic
RF FREQUENCY	426.275 MHz
MODULATION	FSK
LIST OF EACH OSC. OR CRY. FREQ.(FREQ.>=1 MHz)	13.321 MHz
ANTENNA TYPE	External Dipole Antenna
TRANSMISSION TIME	Not longer than 5 s
RATED SUPPLY VOLTAGE	DC 12 V from an adaptor
NUMBER OF LAYERS	2 Layers

2.2 Model Differences

-. None

2.3 Related Submittal(s) / Grant(s)

Original submittal only

2.4 Purpose of the test

To determine whether the equipment under test fulfills the requirements of the regulation stated in section 15.231.

2.5 Test Methodology

Both conducted and radiated testing was performed according to the procedures in ANSI C63.4: 2003. Radiated testing was performed at a distance of 3 m from EUT to the antenna.

2.6 Test Facility

The open area test site and conducted measurement facilities are located on at 307-51 Daessangnyeong-ri, Chowol-eup, Gwangju-si, Gyeonggi-do, 464-862, Korea. Description details of test facilities were submitted to the Commission on August 21, 2008. (Registration Number: 340658)

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3. SYSTEM TEST CONFIGURATION

3.1 Justification

This device was configured for testing in a typical way as a normal customer is supposed to be used. During the test, the following components were installed inside of the EUT.

DEVICE TYPE	MANUFACTURER	MODEL/PART NUMBER	FCC ID
Main Board	Challenge Co., Ltd.	WT-200NF V1.3	N/A

3.2 Peripheral equipment

Defined as equipment needed for correct operation of the EUT, but not considered as tested:

Model	Manufacturer	FCC ID	Description	Connected to
WT-200NF	Challenge Co., Ltd.	YLSWT-200NF	WIRELESS TRANSMITTER (EUT)	-
ARC-300F	Challenge Co., Ltd.	QDYARC-300F	Wireless Remote Controller	-
N/A	N/A	N/A	Siren	EUT

3.3 Mode of operation during the test

To get a maximum radiated emission from the EUT, the button on the wireless remote controller was continuously pressed to transmit the signal. To activate continuous transmission, place a small plastic block between rubber band and the push button on the wireless remote controller.

3.4. EUT MODIFICATIONS

-. None

3.5 Configuration of Test System

Line Conducted Test: The EUT was connected to adaptor and the power of adaptor was connected to LISN. All supporting equipments were connected to another LISN. Preliminary Power line Conducted Emission test was performed by using the procedure in ANSI C63.4: 2003 7.2.3 to determine the worse operating conditions.

Radiated Emission Test: Preliminary radiated emissions test were conducted using the procedure in ANSI C63.4: 2003 8.3.1.1 and 13.1.4.1 to determine the worse operating conditions. Final radiated emission tests were conducted at 3meter open area test site.

The turntable was rotated through 360 degrees and the EUT was tested by positioned three orthogonal planes to obtain the highest reading on the field strength meter. Once maximum reading was determined, the search antenna was raised and lowered in both vertical and horizontal polarization.

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Occupied Bandwidth Measurement:

This measurement is performed with the antenna located close enough to give a full-scale deflection of the modulated carrier on the spectrum analyzer. The plot is taken at 20 kHz/division frequency span, 10 kHz resolution bandwidth and 5 dB/division logarithmic display from the spectrum analyzer.

3.6 Antenna Requirement

According to section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

Antenna Construction:

The antenna of the EUT shall be connected with the inside of the EUT by screw at the manufacturer side, so no consideration of replacement by the user.

4. PRELIMINARY TEST

4.1 AC Power line Conducted Emissions Tests

During Preliminary Tests, the following operating mode was investigated

Operation Mode	The Worse operating condition (Please check one only)
TX Mode	-
RX Mode	X

4.2 General Radiated Emissions Tests

During Preliminary Tests, the following operating modes were investigated

Operation Mode	The Worse operating condition (Please check one only)
TX Mode	X
RX Mode	-

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5. FINAL RESULT OF MEASURMENT

Preliminary test was done in normal operation mode. And the final measurement was selected for the maximized emission level.

5.1 Conducted Emission Test

5.1.1 Operating Condition: Transmitting mode

Humidity Level : 42 % R.H. Temperature: 22 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.231

Type of Test : INTENTIONAL RADIATOR

Result : PASSED BY -33.97 dB at 3.42 MHz

EUT : WIRELESS TRANSMITTER Date: May 13, 2010

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 9 kHz)

Frequency (MHz)	Line	Peak (dBµV)		Margin (dB)
		Emission level	Limits	
0.35	N	21.76	58.96	-37.20
0.36	H	20.79	58.61	-37.82
1.19	N	16.03	56.00	-39.97
3.28	H	20.05	56.00	-35.95
3.41	H	21.16	56.00	-34.84
3.42	N	22.03	56.00	-33.97
Frequency (MHz)	**Line**	**Average (dBµV)**		**Margin (dB)**
		Emission level	**Limits**	
-				
-				

Line Conducted Emission Tabulated Data

Remark : "H": Hot Line, "N": Neutral Line

Average mode was not measured, because peak values were under the average limit.

See next page for an overview sweep performed with peak detector.

Tested by: Young-Cheol, Park / Engineer

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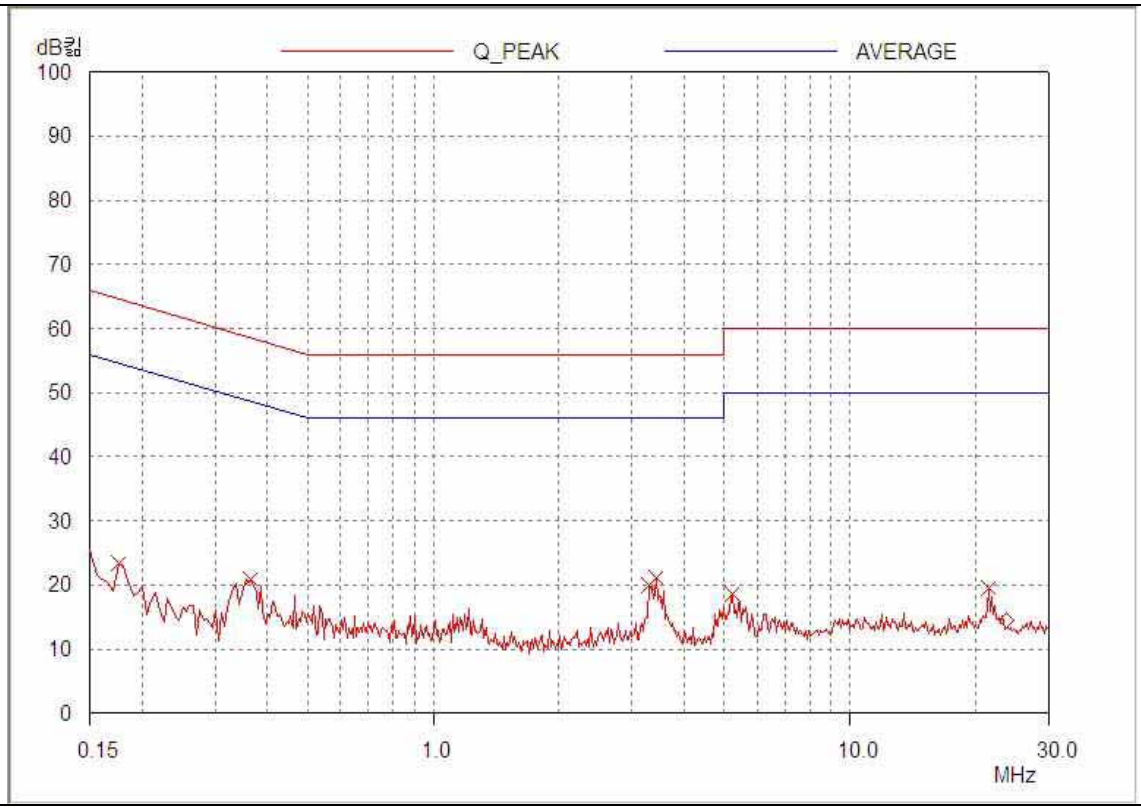
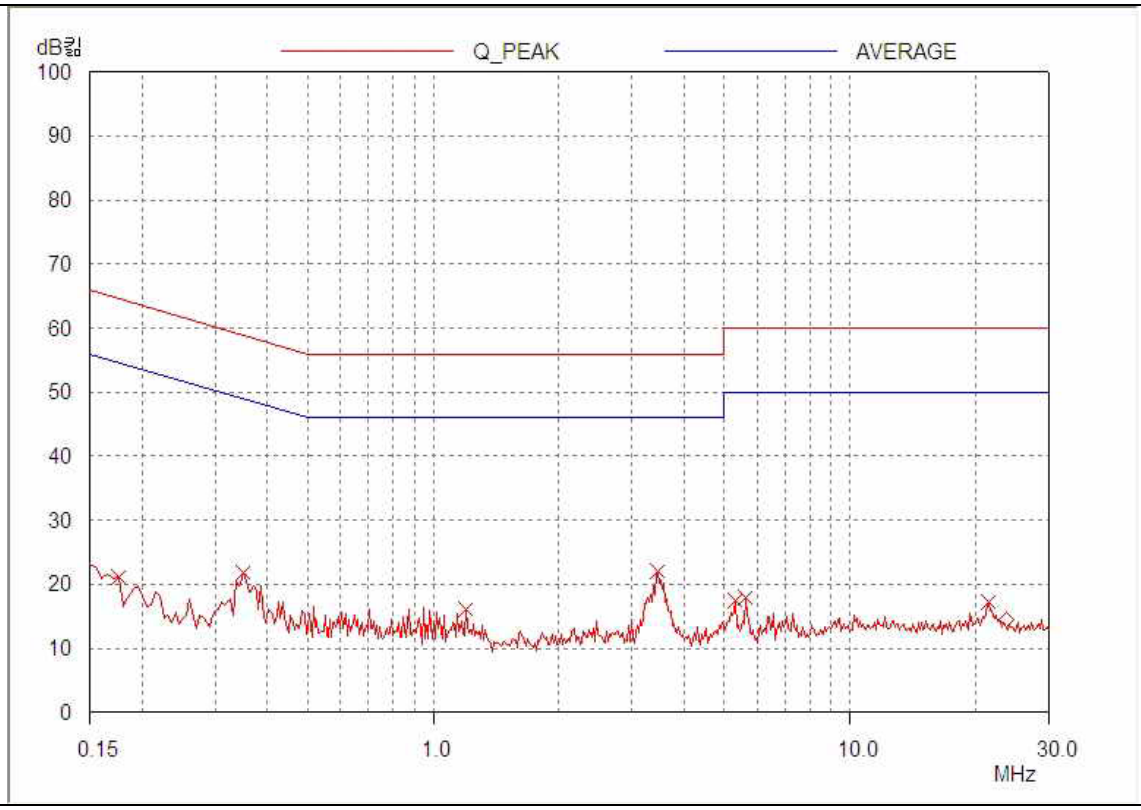


HOT LINE



NEUTRAL LINE

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5.1.2 Operating Condition: Receiving mode

Humidity Level : 42 % R.H. Temperature: 22 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.231

Type of Test : INTENTIONAL RADIATOR

Result : PASSED BY -31.39 dB at 3.48 MHz

EUT : WIRELESS TRANSMITTER Date: May 13, 2010

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 9 kHz)

Frequency (MHz)	Line	Peak (dBµV)		Margin (dB)
		Emission level	Limits	
0.26	N	21.61	61.43	-39.82
3.30	H	22.12	56.00	-33.88
3.35	H	21.52	56.00	-34.48
3.41	N	24.23	56.00	-31.77
3.46	H	20.99	56.00	-35.01
3.48	N	24.61	56.00	-31.39
Frequency (MHz)	**Line**	**Average (dBµV)**		**Margin (dB)**
		Emission level	**Limits**	
-				
-				

Line Conducted Emission Tabulated Data

Remark : "H": Hot Line, "N": Neutral Line

Average mode was not measured, because peak values were under the average limit.

See next page for an overview sweep performed with peak detector.

Tested by: Young-Cheol, Park / Engineer

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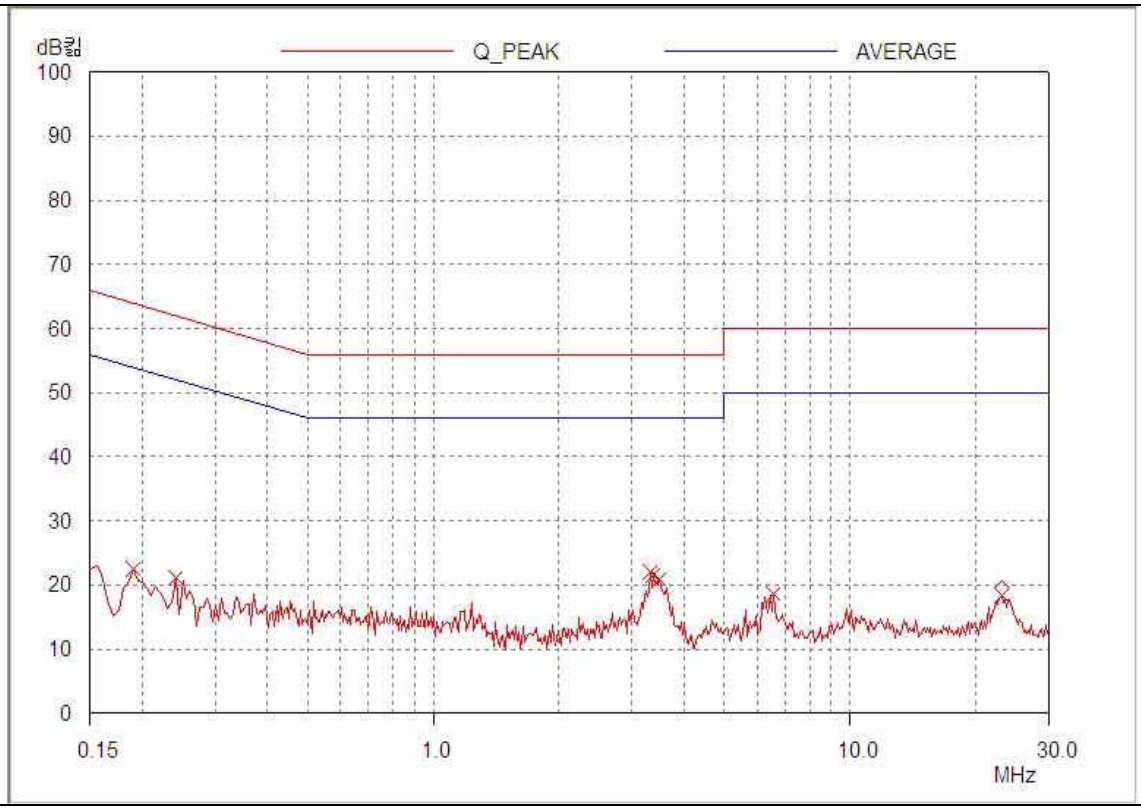
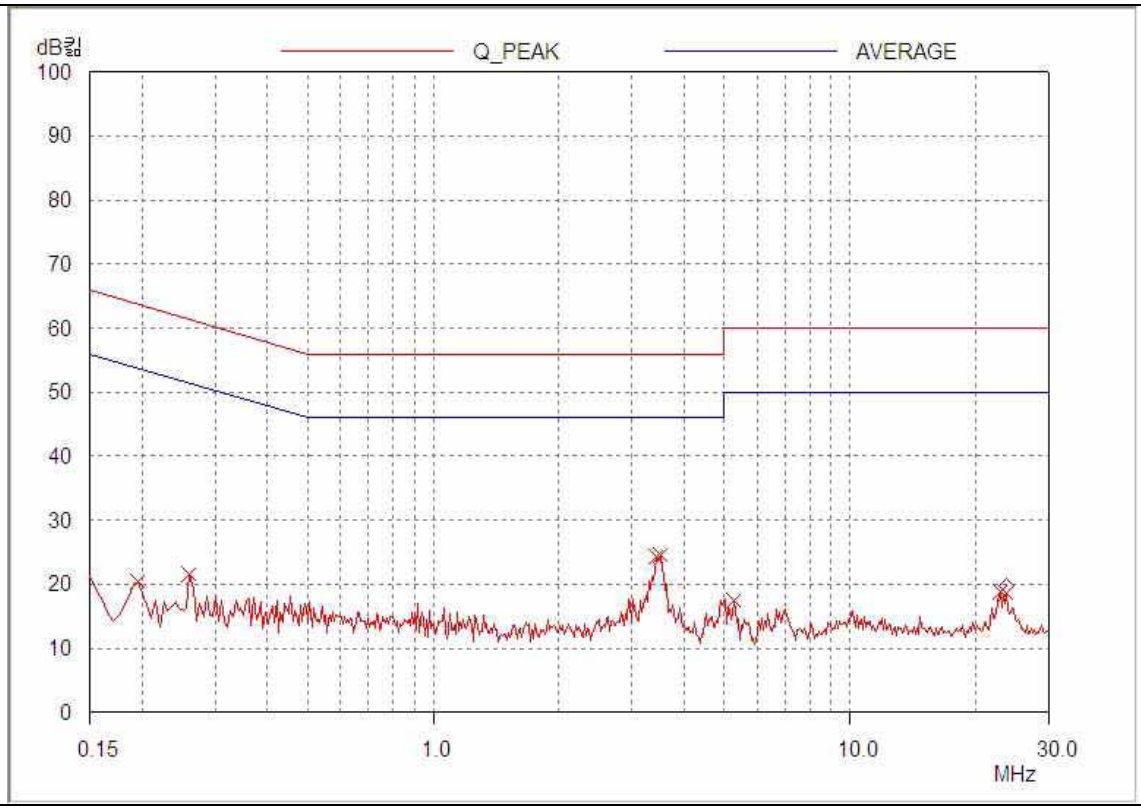


HOT LINE



NEUTRAL LINE

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5.2 Field Strength of the Carrier Test

The following table shows the highest levels of radiated emission on both polarizations of horizontal and vertical.

Humidity Level : 41 % R.H. Temperature: 21 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.231

Type of Test : INTENTIONAL RADIATOR

Result : PASSED BY –4.55 dB

EUT : WIRELESS TRANSMITTER Date: May 14, 2010

Operating Condition : TX mode

Distance : 3 m

Radiated Emissions			Ant	Correction Factors		Total(dBμV/m)	FCC Limit (dBμV/m)	
Carrier Freq. (MHz)	Amp. (dBμV)	Detect Mode	Pol.	Ant. (dB/m)	Cable (dB)	Peak	Limit	Margin (dB)
426.275	53.90	Average	H	17.96	4.16	76.02	80.57	-4.55
	46.60	Average	V			68.72	80.57	-11.85

* Remark: “H”: Horizontal Polarization, “V”: Vertical Polarization

Tested by: Young-Cheol, Park / Engineer

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5.3 Transmitter Transmission Duration

Humidity Level : 41 % R.H. Temperature: 20 °C

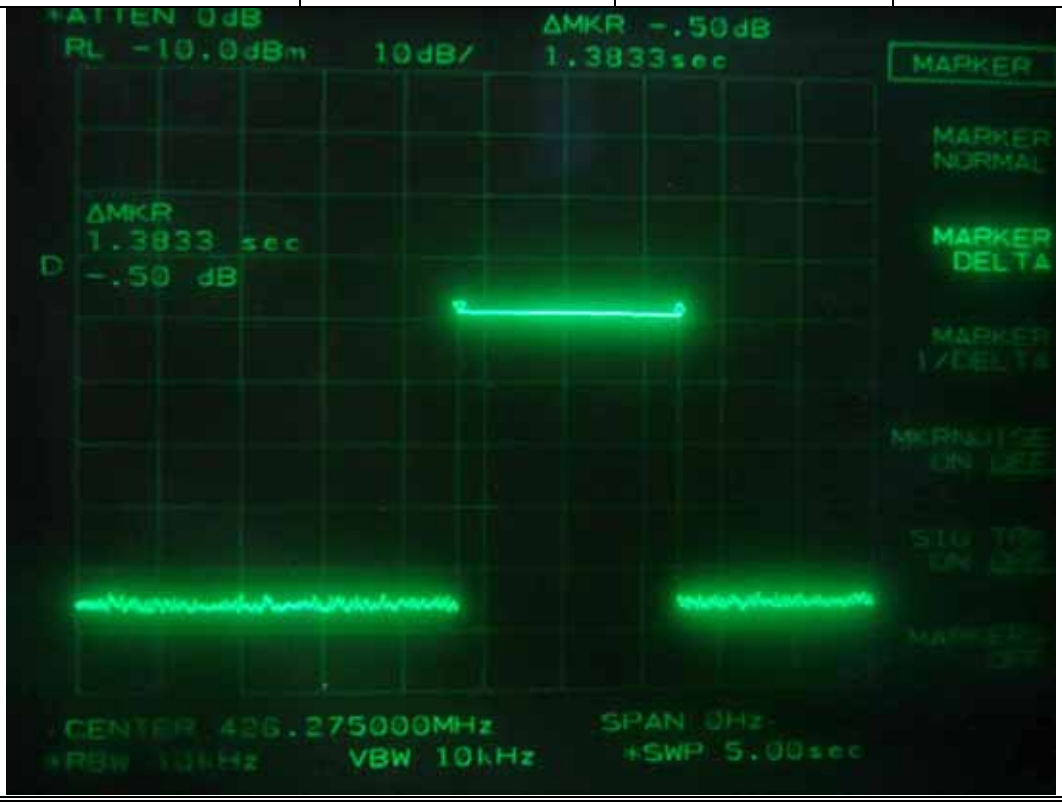
Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.231 (a)

Type of Test : INTENTIONAL RADIATOR

EUT : WIRELESS TRANSMITTER Date: May 17, 2010

Operating Condition : Switch on the wireless remote controller was continuously pushed

Manually Activated Duration (s)	Limit (s)	Margin (s)	Result
1.383	5.0	-3.617	Pass



Tested by: Young-Cheol, Park / Engineer

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5.4 Spurious Emission Test

The following table shows the highest levels of radiated emissions on both polarizations of horizontal and vertical.

5.4.1 Operating Condition: Transmitting mode

Humidity Level : 41 % R.H. Temperature: 21 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.231(b)

Type of Test : INTENTIONAL RADIATOR

Result : PASSED BY –2.18 dB at 1 278.82 MHz under average mode

EUT : WIRELESS TRANSMITTER Date: May 14, 2010

Distance : 3 m

Radiated Emissions		Ant	Correction Factors		Total(dBμV/m)	FCC Limit(dBμV/m)	
Freq. (MHz)	Amp. (dBμV)	Pol.	Ant. (dB/m)	Cable (dB)	Peak	Limit	Margin(dB)
852.55	20.60	H(P)	22.77	6.81	50.18	60.57	-10.39
1 278.82	30.60	H(A)	25.36	2.43	58.39	60.57	-2.18
1 705.10	25.80	H(A)	25.74	2.50	54.04	60.57	-6.53
2 131.37	17.40	H(A)	26.36	2.56	46.32	60.57	-14.25
2 557.65	8.60	H(A)	27.51	3.17	39.28	60.57	-21.29
Other spurious frequencies were not found up to 4 300 MHz.							

*Remark: “H”: Horizontal Polarization, “V”: Vertical Polarization, “P” Peak detect mode, “A” Average detect mode

Tested by: Young-Cheol, Park / Engineer

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5.4.2 Operating Condition: Receiving mode

Humidity Level : 41 % R.H. Temperature: 21 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.209

Type of Test : INTENTIONAL RADIATOR

Result : PASSED BY –5.27 dB at 831.12 MHz

EUT : WIRELESS TRANSMITTER Date: May 14, 2010

Distance : 3 m

Radiated Emission		Antenna		Turn	Correction Factors		Total	Limit	Margin
Freq. (MHz)	Amplitude (dBμV)	Pol.	Height (m)	Table (°)	Ant. (dBμV/m)	Cable (dB)	Amplitude (dBμV/m)	(dBμV/m)	(dB)
166.21	8.60	H(P)	1.30	90.00	15.63	2.70	26.93	43.52	-16.59
249.32	5.40	V(P)	1.20	230.00	17.39	3.40	26.19	46.02	-19.83
332.43	18.50	H(P)	1.80	110.00	15.13	3.60	37.23	46.02	-8.79
415.55	11.70	H(P)	2.00	130.00	17.75	4.09	33.54	46.02	-12.48
677.60	9.10	V(P)	1.80	330.00	21.87	5.42	36.39	46.02	-9.63
831.12	11.60	H(P)	1.00	100.00	22.54	6.61	40.75	46.02	-5.27

*Remark: “H”: Horizontal Polarization, “V”: Vertical Polarization, “P” Peak detect mode

Tested by: Young-Cheol, Park / Engineer

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5.5 Bandwidth of the operating frequency

Humidity Level : 41 % R.H. Temperature: 20 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.231

Type of Test : INTENTIONAL RADIATOR

Result : PASSED

EUT : WIRELESS TRANSMITTER Date: May 17, 2010

Operating Condition : TX mode

Minimum Resolution Bandwidth : 1 kHz

Carrier Freq. (MHz)	Bandwidth of the emission. (kHz)	Limit (kHz)	Remark
426.275	36.30	1 065.70	The point 20 dB down from the modulated carrier

Remark: Please refer to Photo Data for bandwidth for test data.

Tested by: Young-Cheol, Park / Engineer

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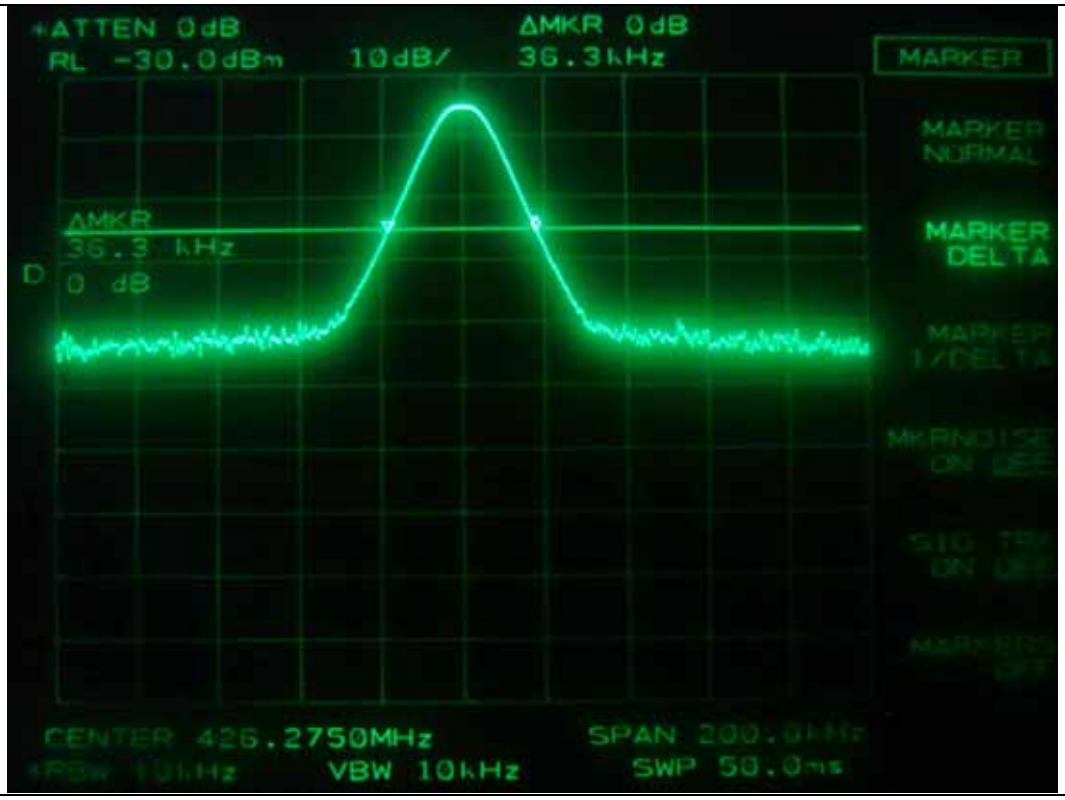
Photo Data for bandwidth



6. FIELD STRENGTH CALCULATION

Meter readings are compared to the specification limit correcting for antenna and cable losses

+	Meter reading	(dBμV)
+	Cable Loss	(dB)
+	Antenna Factor (Loss)	(dB/m)
=	Corrected Reading	(dBμV/m)
-	Specification Limit	(dBμV/m)
=	dB Relative to Spec	(± dB)

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7. LIST OF TEST EQUIPMENT

No.	EQUIPMENTS	MFR.	MODEL	SER. NO.	LAST CAL	DUE CAL	USE
1.	Test receiver	R/S	ESVD	838453/018	NOV/09	12MONTH	■
	Test receiver	R/S	ESU	100261	JAN/10	12MONTH	■
2.	Test receiver	R/S	ESHS 10	834467/007	MAY/10	12MONTH	■
3.	Spectrum analyzer	HP	8566B	2421A00473	NOV/09	12MONTH	■
4.	Loop Antenna	R/S	HFH 2-Z2	889 285 / 26	OCT/08	24MONTH	
5.	TRILOG Broadband Antenna	Schwarzbeck	VULB9163	VULB9163 202	MAY/10	24MONTH	
6.	Biconical antenna	EMCO	3110	9003-1121	FEB/10	24MONTH	
		Schwarzbeck	VHA9103	91031852	MAR/10		■
7.	Log Periodic antenna	Schwarzbeck	9108-A(494)	62281001	MAR/10	24MONTH	■
8.	LISN	EMCO	3825/2	9109-1867	JUN/10	12MONTH	
				9109-1869	JUN/10		
		Schwarzbeck	NSLK 8128	8128-216	JUN/10		■
9.	Position Controller	HD GmbH	HD100	N/A	N/A	N/A	■
10.	Turn Table	HD GmbH	DS420S	N/A	N/A	N/A	■
11.	Antenna Master	HD GmbH	MA240	N/A	N/A	N/A	■
12.	RF Amplifier	HP	8447D	2727A04987	JUN/10	12MONTH	■
13.	Horn Antenna	Schwarzbeck	BBHA9120D	BBHA9120D294	JUL/09	24MONTH	■
14.	Spectrum Analyzer	HP	8564E	3650A00756	JUN/10	12MONTH	■
15.	Isolation Transformer	Digitek Power	DPT	DPF-22027	N/A	N/A	■
16.	Isolation Transformer	Digitek Power	DPT	DPF-22028	N/A	N/A	■
17.	Frequency Converter	Digitek Power	VFS/DEFC	N/A	N/A	N/A	■

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