

Test Report of FCC CFR 47 Part 15 Subpart B

On Behalf of

shen zhen oread Electronics Co.,ltd

4th Floor, A9 Building ,Yuansheng Logistics Park, Changsheng Road No.1,
Changzhen, Gongming, Shenzhen,China

Product description: **wireless control instructions Receiver**

Model No.: **ATY-FR01**

FCC ID: **YRV-ATY-FR01R**

Prepared for: **shen zhen oread Electronics Co.,ltd**

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1 - GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant: **shen zhen oread Electronics Co.,ltd**
Address of applicant: 4th Floor, A9 Building ,Yuansheng Logistics Park, Changsheng Road
No.1, Changzhen, Gongming, Shenzhen,China
Manufacturer: **shen zhen oread Electronics Co.,ltd**
Address of manufacturer: 4th Floor, A9 Building ,Yuansheng Logistics Park, Changsheng Road
No.1, Changzhen, Gongming, Shenzhen,China

General Description of E.U.T

Items	Description
EUT Description:	Wireless control instructions Receiver
Trade Name:	N/A
Model No.:	ATY-FR01
Receive Frequency range:	433.89MHz
Number of Channels:	1
Antenna Type:	Built-in Antenna
Adapter Description:	Product name:AC/DC ADAPTER Model NO.:ZBHWX-A290020A Input:100~240V,50/60Hz,1.5A Output:DC29V 2A

Remark: * The test data gathered are from the production sample provided by the manufacturer.

1.2 Test Standards

The following Declaration of Conformity report of EUT is prepared in accordance with

FCC Rules and Regulations Part 15 Subpart B

The objective of the manufacturer is to demonstrate compliance with the described above standards.

1.3 Test Summary

For the EUT described above. The standards used were FCC Part 15 Subpart B for Emissions

Table 1 : Tests Carried Out Under FCC Part 15 Subpart B

Standard	Test Items	Status
FCC Part 15 Subpart B	Conduction Emission, 0.15MHz to 30MHz	✓
FCC Part 15 Subpart B	Radiation Emission, 30MHz to 1000MHz	✓

✓ Indicates that the test is applicable

✗ Indicates that the test is not applicable

1.4 Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2009, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the Operating Instructions.

The maximum emission levels emanating from the device are compared to the FCC Part 15 Subpart B limits for radiation emissions and the measurement results contained in this test report show that EUT is to be technically compliant with FCC requirements.

All measurement required was performed at BONTEK COMPLIANCE TESTING LABORATORY LTD at 1/F, Block East H-3, OCT Eastern Ind. Zone, Qiaocheng East Road, Nanshan, Shenzhen, China

1.5 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

FCC – Registration No.: 338263

BONTEK COMPLIANCE TESTING LABORATORY LTD , EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 338263, March, 2008.

IC Registration No.: 7631A

The 3m alternate test site of BONTEK COMPLIANCE TESTING LABORATORY LTD EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration NO.: 7631A on August 2009.

CNAS - Registration No.: L3923

BONTEK COMPLIANCE TESTING LABORATORY LTD to ISO/IEC 17025:25 General Requirements for the Competence of Testing and Calibration Laboratories(CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

The acceptance letter from the CNAS is maintained in our files: Registration:L3923,February,2009.

TUV - Registration No.: UA 50145371-0001

BONTEK COMPLIANCE TESTING LABORATORY LTD An assessment of the laboratory was conducted according to the"Procedures and Conditions for EMC Test Laboratories"with reference to EN ISO/IEC 17025 by a TUV Rheinland auditor. Audit Report NO. 17010783-001

2 - SYSTEM TEST CONFIGURATION

2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT Exercise

The calibrated antennas used to sample the radiated field strength are mounted on a non-conductive, motorized antenna mast 3 or 10 meters from the leading edge of the turntable.

2.3 General Test Procedures

Conducted Emissions: The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 7.1 of ANSI C63.4-2009 and Part 15.207. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak detector mode.

Radiated Emissions: The EUT is placed on as turntable, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 13.1.4.1 of ANSI C63.4-2009 and Part 15.209.

2.4 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Parameter	Uncertainty
Power Line Conducted Emission	+/- 2.3 dB
Radiated Emission	+/- 3.4 dB

Uncertainty figures are valid to a confidence level of 95%.

2.5 EUT Exercise Software

The EUT exercising program used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use. The software offered by manufacture, can let the EUT being Normal operation.

2.6 List of Measuring Equipments Used

Test equipments list of BONTEK COMPLIANCE TESTING LABORATORY LTD.

No.	Equipment	Manufacturer	Model No.	S/N	Calculator date	Calculator due date
1	EMI Test Receiver	R&S	ESCI	100687	2010-4-14	2011-4-13
2	EMI Test Receiver	R&S	ESPI	100097	2010-4-14	2011-4-13
3	Amplifier	HP	8447D	1937A02492	2010-4-14	2011-4-13
4	Single Power Conductor Module	FCC	FCC-LISN-5-50-1-01-CISPR25	07101	2010-4-14	2011-4-13
5	Single Power Conductor Module	FCC	FCC-LISN-5-50-1-01-CISPR25	07102	2010-4-14	2011-4-13
6	Power Clamp	SCHWARZBECK	MDS-21	3812	2010-4-14	2011-4-13
7	Positioning Controller	C&C	CC-C-1F	MF7802113	N/A	N/A
8	Electrostatic Discharge Simulator	TESEQ	NSG437	125	2010-4-14	2011-4-13
9	Fast Transient Burst Generator	SCHAFFNER	MODULA6150	34572	2010-4-14	2011-4-13
10	Fast Transient Noise Simulator	Noiseken	FNS-105AX	31485	2010-4-14	2011-4-13
11	Color TV Pattern Generator	PHILIPS	PM5418	TM209947	N/A	N/A
12	Power Frequency Magnetic Field Generator	EVERFINE	EMS61000-8K	608002	2010-4-14	2011-4-13
13	N/A	N/A	N/A	N/A	N/A	N/A
14	Capacitive Coupling Clamp	TESEQ	CDN8014	25096	2010-4-14	2011-4-13
15	High Field Biconical Antenna	ELECTRO-METRICS	EM-6913	166	2010-4-14	2011-4-13
16	Log Periodic Antenna	ELECTRO-METRICS	EM-6950	811	2010-4-14	2011-4-13
17	Remote Active Vertical Antenna	ELECTRO-METRICS	EM-6892	304	2010-4-14	2011-4-13
18	TRILOG	SCHWARZBECK	VULB9163	9163-324	2010-4-14	2011-4-13

	Broadband Test-Antenna					
19	Horn Antenna	SCHWARZBECK	BBHA9120A	B08000991-0001	2010-4-14	2011-4-13
20	Teo Line Single Phase Module	SCHWARZBECK	NSLK8128	D-69250	2010-4-14	2011-4-13
21	10dB attenuator	SCHWARZBECK	MTAIMP-136	R65.90.0001#06	2010-4-14	2011-4-13
22	Electric bridge	Zentech	100 LCR METER	803024	N/A	N/A
23	RF Current Probe	FCC	F-33-4	80	2010-4-14	2011-4-13
24	SIGNAL GENERATOR	HP	8647A	3349A02296	2010-4-14	2011-4-13
25	MICROWAVE AMPLIFIER	HP	8349B	2627A00994	2010-4-14	2011-4-13
26	Triple-Loop Antenna	EVERFINE	LLA-2	607004	2010-4-14	2011-4-13
27	CDN	FRANKONIA	M2+M3	A3027019	2009-10-20	2011-10-19
28	6dB Attenuator	FRANKONIA	75-A-FFN-06	1001698	2009-10-20	2010-10-19
29	EMV-Mess-Systeme GMBH	FRANKONIA	FLL-75	1020A1109	2009-10-20	2010-10-19
30	EM Injection Clamp	FCC	F-203I-13mm	091536	2009-10-20	2010-10-19
31	9KHz-2.4GHz Signal generator	MARCONI INSTRUMENTS	2024	112260/042	2009-10-20	2010-10-19

3 - DISTURBANCE VOLTAGE AT THE MAINS TERMINALS

3.1 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, and LISN.

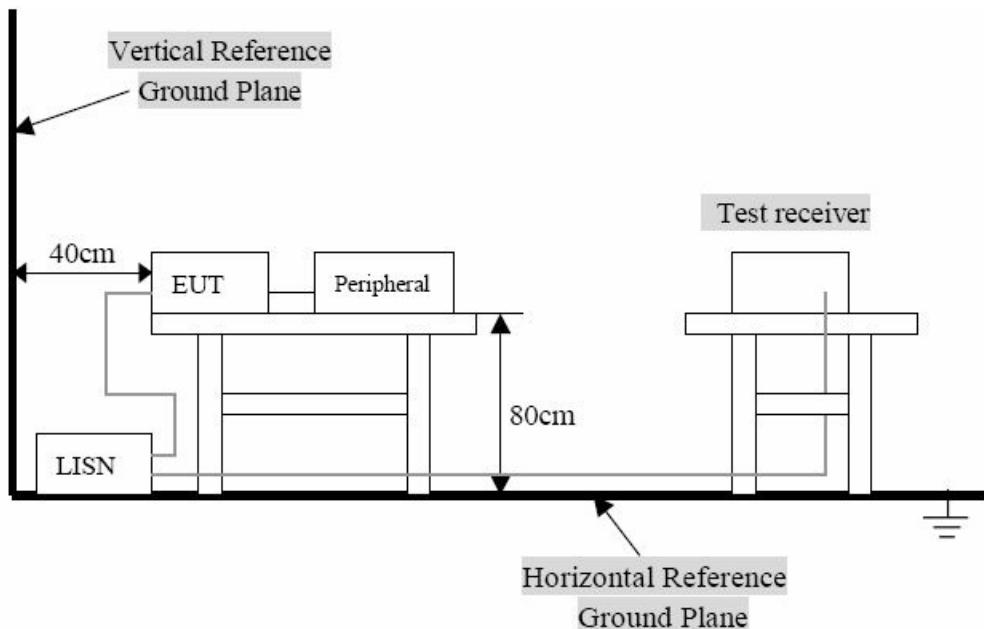
The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement is 3.4 dB.

3.2 Limit of Disturbance Voltage at The Mains Terminals

Frequency Range (MHz)	Limits (dBuV)	
	Quasi-Peak	Average
0.150~0.500	66~56	56~46
0.500~5.000	56	46
5.000~30.00	60	50

Note: (1)The tighter limit shall apply at the edge between two frequency bands.

3.3 EUT Setup



Remark: The EUT'S adapter was connected to a 120 VAC/ 60Hz power source.

3.4 Instrument Setup

The test receiver was set with the following configurations:

Test Receiver Setting:

Frequency Range.....150 KHz to 30 MHz
Detector.....Peak & Quasi-Peak & Average
Sweep Speed.....Auto
IF Band Width.....9 KHz

3.5 Test Procedure

During the conducted emission test, the EUT power cord was connected to the auxiliary outlet of the first Artificial Mains.

Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance using all installation combination.

All data was recorded in the peak detection mode. Quasi-peak and Average readings were only performed when an emission was found to be marginal (within $-10 \text{ dB}_{\mu}\text{V}$ of specification limits). Quasi-peak readings are distinguished with a "QP". Average readings are distinguished with a "AV".

3.6 Summary of Test Results

According to the data in section 3.6, the EUT complied with the FCC Part 15 B Conducted margin, with the worst margin reading of:

3.7 Disturbance Voltage Test Data

Temperature (°C) : 23~25	EUT: Wireless control instructions Receiver
Humidity (%RH) : 45~58	M/N: ATY-FR01
Barometric Pressure (mbar) : 950~1000	Operation Condition: Normal operation

Remark: (1) When PK reading is less than relevant limit 20dB, the QP reading and AV reading will not be recorded.
(2) Where QP reading is less than relevant AV limit, the AV reading will not be measured

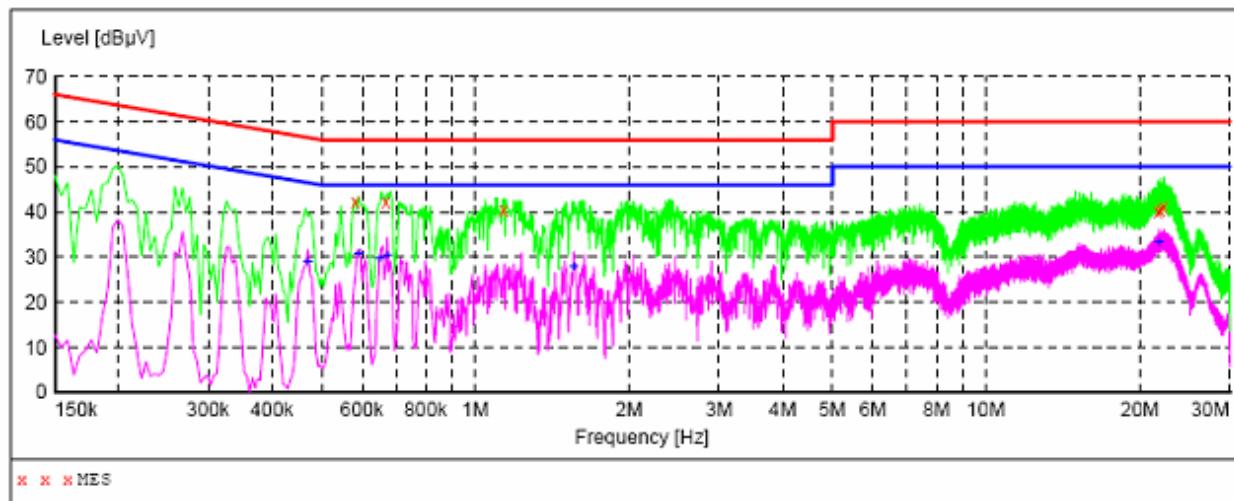
3.8 Test Result

PASS

Conducted Emission:

EUT: Wireless control instructions Receiver
 Model No.: ATY-FR01
 Operating Condition: Normal operation
 Test Site: Shielded Room
 Operator: Andy
 Test Specification: AC/DC adapter (AC 120V/60Hz)
 Comment: Live Line

SCAN TABLE: "Voltage (150K-30M) FIN"
Short Description: 150K-30M Voltage



MEASUREMENT RESULT:

Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Detector	Line	PE
0.582000	42.20	9.9	56	13.8	QP	L1	GND
0.667500	42.30	9.9	56	13.7	QP	L1	GND
1.135500	40.30	9.9	56	15.7	QP	L1	GND
21.700500	40.10	9.7	60	19.9	QP	L1	GND
21.979500	40.50	9.7	60	19.5	QP	L1	GND
22.245000	41.00	9.7	60	19.0	QP	L1	GND

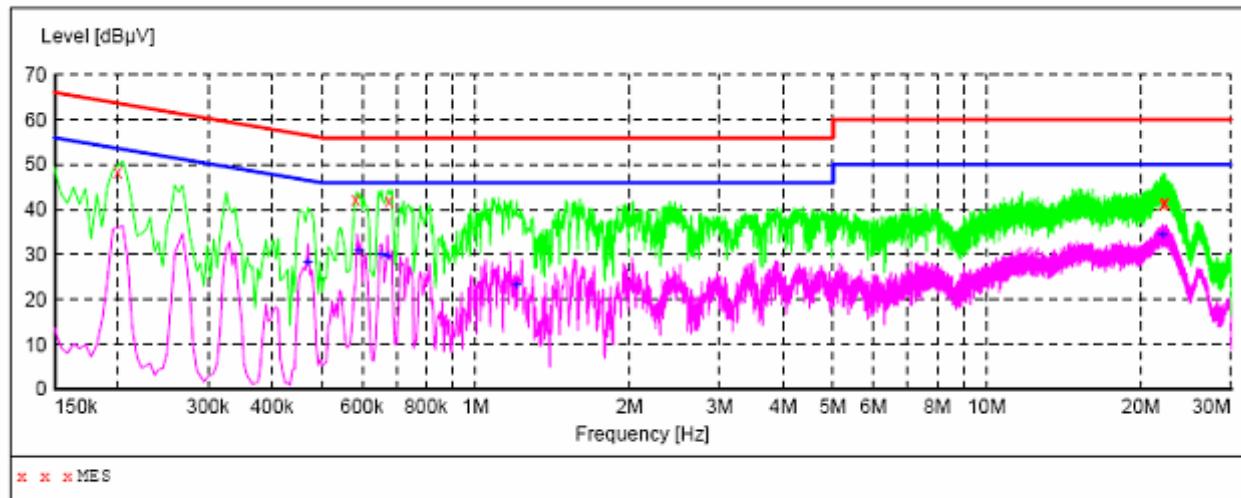
MEASUREMENT RESULT:

Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Detector	Line	PE
0.469500	28.80	9.9	47	17.7	AV	L1	GND
0.591000	30.80	9.9	46	15.2	AV	L1	GND
0.649500	29.80	9.9	46	16.2	AV	L1	GND
0.672000	30.20	9.9	46	15.8	AV	L1	GND
1.558500	27.80	9.9	46	18.2	AV	L1	GND
21.835500	33.30	9.7	50	16.7	AV	L1	GND

Conducted Emission:

EUT: Wireless control instructions Receiver
Model No.: ATY-FR01
Operating Condition: Normal operation
Test Site: Shielded Room
Operator: Andy
Test Specification: AC/DC adapter (AC 120V/60Hz)
Comment: Neutral Line

SCAN TABLE: "Voltage (150K-30M) FIN"
Short Description: 150K-30M Voltage



MEASUREMENT RESULT:

Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Detector	Line	PE
0.199500	48.30	9.9	64	15.3	QP	N	GND
0.582000	42.30	9.9	56	13.7	QP	N	GND
0.676500	41.90	9.9	56	14.1	QP	N	GND
22.119000	41.30	9.7	60	18.7	QP	N	GND
22.222500	41.50	9.7	60	18.5	QP	N	GND
22.276500	41.40	9.7	60	18.6	QP	N	GND

MEASUREMENT RESULT:

Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Detector	Line	PE
0.469500	28.10	9.9	47	18.4	AV	N	GND
0.591000	30.80	9.9	46	15.2	AV	N	GND
0.654000	30.10	9.9	46	15.9	AV	N	GND
0.672000	29.60	9.9	46	16.4	AV	N	GND
1.203000	23.20	9.9	46	22.8	AV	N	GND
22.087500	34.40	9.7	50	15.6	AV	N	GND

4 - RADIATED DISTURBANCES

4.1 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement is 4.0 dB.

4.2 Limit of Radiated Disturbances

Frequency (MHz)	Distance (Meters)	Field Strengths Limits (dB μ V/m)
30 ~ 88	3	40
88~216	3	43.5
216 ~ 960	3	46
Above 960	3	54

Note: (1) The tighter limit shall apply at the edge between two frequency bands.
(2) Distance refers to the distance in meters between the test instrument antenna and the closest point of any part of the E.U.T.

4.3 EUT Setup

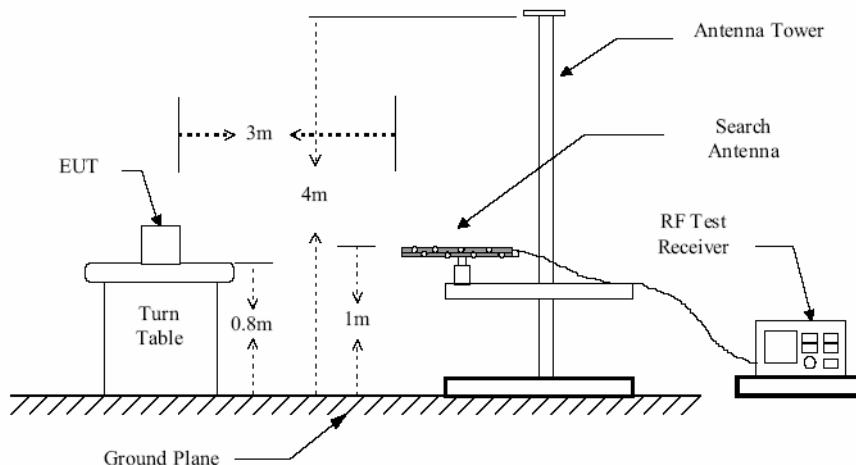
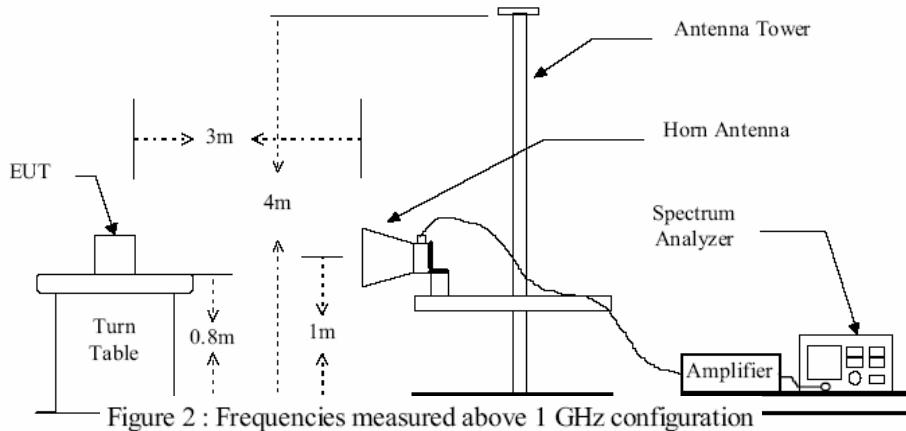


Figure 1 : Frequencies measured below 1 GHz configuration



4.4 Test Receiver Setup

According to FCC Part 15 rule, the frequency was investigated from 30 to 1000 MHz. During the radiated emission test, the test receiver was set with the following configurations:

Test Receiver Setting:

Detector.....Peak & Quasi-Peak
 IF Band Width.....120KHz
 Frequency Range.....30MHz to 1000MHz
 Turntable Rotated.....0 to 360 degrees

Antenna Position:

Height.....1m to 4m
 Polarity.....Horizontal and Vertical

4.5 Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

All data was recorded in the peak detection mode. Quasi-peak readings performed only when an emission was found to be marginal (within $-10 \text{ dB}\mu\text{V}$ of specification limits), and are distinguished with a "QP" in the data table.

4.6 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Amplifier Gain}$$

The "Margin" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of $-7 \text{ dB}\mu\text{V}$ means the emission is $7 \text{ dB}\mu\text{V}$ below the maximum limit for Subpart B. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Corr. Ampl.}$$

4.7 Radiated Emissions Test Result

Temperature (°C) : 22~23	EUT: Wireless control instructions Receiver
Humidity (%RH): 50~54	M/N: ATY-FR01
Barometric Pressure (mbar): 950~1000	Operation Condition: Normal operation

Remark: (1) When PK reading is less than relevant limit 20dB, the QP reading and AV reading will not be recorded.
(2) Where QP reading is less than relevant AV limit, the AV reading will not be measured

4.8 Test Result

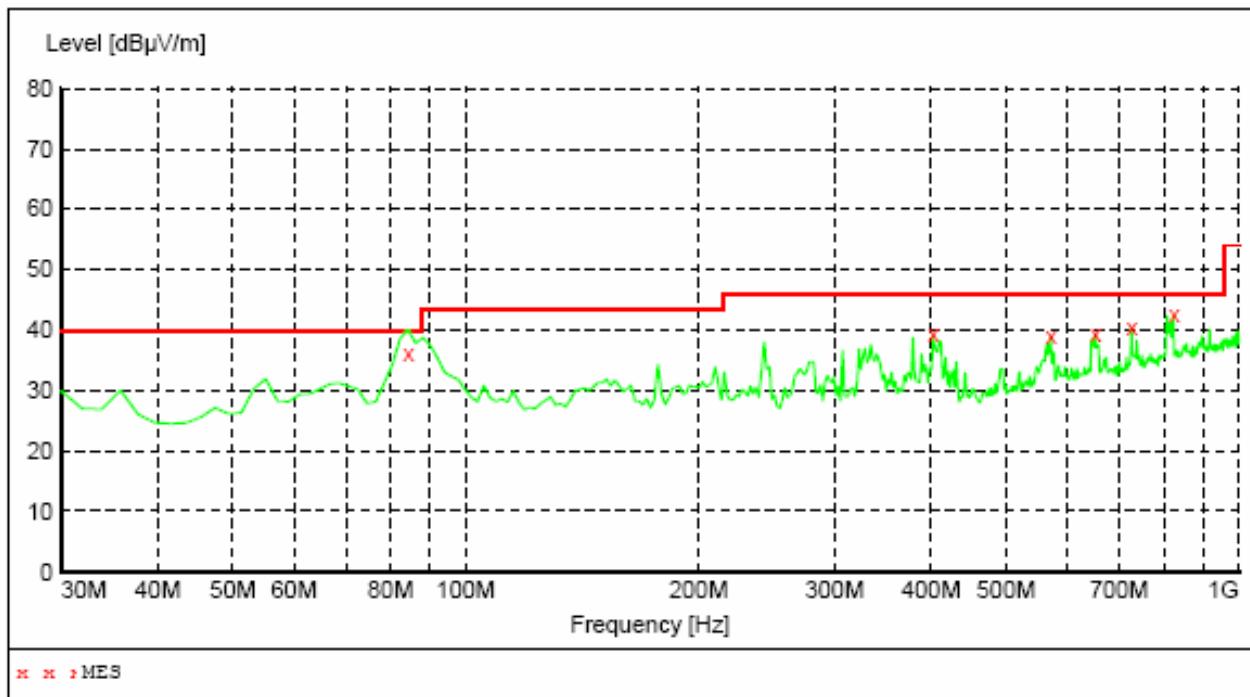
PASS

Radiated Emission Test Data:

EUT: Wireless control instructions Receiver
M/N: ATY-FR01
Operating Condition: Normal operation
Test Site: 3m CHAMBER
Operator: Chen
Test Specification: AC 120V/60Hz for Adapter
Comment: Polarization: Horizontal
Tem:25°C Hum:50%

SWEEP TABLE: "test (30M-1G)"

Short Description:		Field Strength		
Start Frequency	Stop Frequency	Detector	Meas.	IF
30.0 MHz	1.0 GHz	MaxPeak	Coupled	100 kHz
				Transducer
				VULB9163 NEW



MEASUREMENT RESULT:

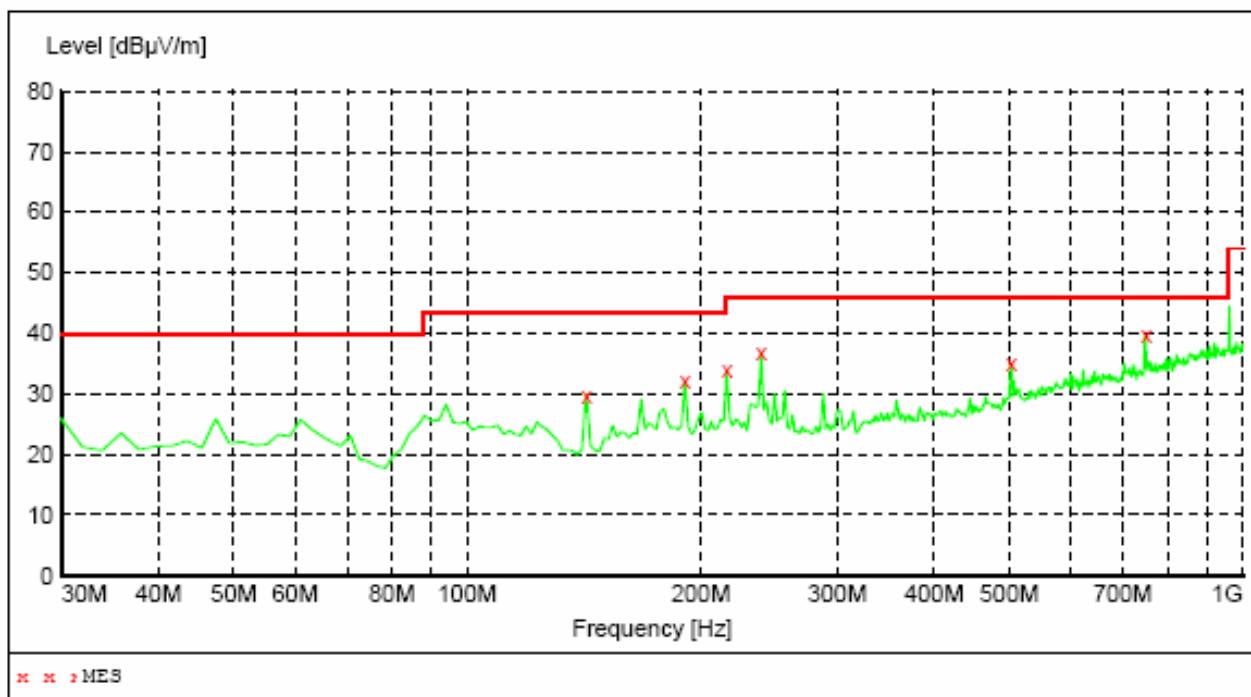
Frequency MHz	Level dB μ V/m	Transd dB	Limit dB μ V/m	Margin dB	Det. QP	Height cm	Azimuth deg	Polarization
84.320000	36.00	14.1	40.0	4.0	QP	300.0	0.00	HORIZONTAL
402.480000	39.20	21.5	46.0	6.8	QP	100.0	0.00	HORIZONTAL
571.260000	38.90	25.7	46.0	7.1	QP	100.0	0.00	HORIZONTAL
652.740000	39.40	27.0	46.0	6.6	QP	100.0	0.00	HORIZONTAL
726.460000	40.40	28.1	46.0	5.6	QP	100.0	0.00	HORIZONTAL
823.460000	42.50	29.9	46.0	3.5	QP	300.0	0.00	HORIZONTAL

Radiated Emission Test Data:

EUT: Wireless control instructions Receiver
M/N: ATY-FR01
Operating Condition: Normal operation
Test Site: 3m CHAMBER
Operator: Chen
Test Specification: AC 120V/60Hz for Adapter
Comment: Polarization: Vertical
Tem:25°C Hum:50%

SWEEP TABLE: "test (30M-1G)"

Short Description:		Field Strength		
Start Frequency	Stop Frequency	Detector	Meas.	IF
30.0 MHz	1.0 GHz	MaxPeak	Coupled	100 kHz
Transducer VULB9163 NEW				



MEASUREMENT RESULT:

Frequency MHz	Level dB μ V/m	Transd dB	Limit dB μ V/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
142.520000	29.80	13.1	43.5	13.7	QP	100.0	0.00	VERTICAL
191.020000	32.20	16.1	43.5	11.3	QP	100.0	0.00	VERTICAL
216.240000	33.80	16.1	46.0	12.2	QP	100.0	0.00	VERTICAL
239.520000	36.90	17.1	46.0	9.1	QP	100.0	0.00	VERTICAL
503.360000	35.00	23.9	46.0	11.0	QP	100.0	0.00	VERTICAL
749.740000	39.70	28.5	46.0	6.3	QP	100.0	0.00	VERTICAL