

FCC CERTIFICATION
On Behalf of
Fitwave International Technologies, LLC

900MHz Wireless Transmitter
Model No.: FW900WT

FCC ID: Z5S- FW900WT

Prepared for : Fitwave International Technologies, LLC
Address : 5020 Clark Road, #411, Sarasota, FL 34233, USA

Prepared by : ACCURATE TECHNOLOGY CO., LTD
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Report Number : ATE20112123
Date of Test : Oct. 10-18, 2011
Date of Report : Oct. 18, 2011

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APPENDIX I (TEST CURVES) (18 pages)

Test Report Certification

Applicant : Fitwave International Technologies, LLC
Manufacturer : Mangrove Technology Co., Ltd.
EUT Description : 900MHz Wireless Transmitter
(A) MODEL NO.: FW900WT
(B) SERIAL NO.: N/A
(C) POWER SUPPLY: 9V DC (Adapter input)

Measurement Procedure Used:

FCC Rules and Regulations Part 15 Subpart C Section 15.249
ANSI C63.4: 2003

The device described above is tested by ACCURATE TECHNOLOGY CO., LTD to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C Section 15.249 limits. The measurement results are contained in this test report and ACCURATE TECHNOLOGY CO., LTD is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the Equipment Under Test (EUT) is to be technically compliant with the FCC requirements.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of ACCURATE TECHNOLOGY CO., LTD.

Date of Test : Oct. 10-18, 2011

Prepared by :

Apple Lv

(Engineer)

Approved & Authorized Signer :

Heunb

(Manager)

1. GENERAL INFORMATION

1.1.Description of Device (EUT)

EUT	:	900MHz Wireless Transmitter
Model Number	:	FW900WT
Power Supply	:	9V DC (Adapter input)
Adapter	:	Model number: SWPP-09000300-US Input: AC 100-240V; 50/60Hz 1.8A Output: DC 9V; 300mA Output line: Non-shielded, Non-detachable, 1.4m
Signal cable	:	Non-shielded, detachable, 1.8m
Transmitting Frequency	:	905.0050-926.6050MHz
Applicant	:	Fitwave International Technologies, LLC
Address	:	5020 Clark Road, #411, Sarasota, FL 34233, USA
Manufacturer	:	Mangrove Technology Co., Ltd.
Address	:	Room 510, Block 3, Nan Fung Industrial City, 18 Tin Hau Road, Tuen Mun, N.T. Hong Kong
Date of sample received	:	Oct. 10, 2011
Date of Test	:	Oct. 10-18, 2011

1.2.Accessory and Auxiliary Equipment

1.2.1.Audio Generator

Model Number	:	GAG-810
Serial Number	:	D913311
Manufacturer	:	NEW AOKO
Power Cord	:	Shielded, Detachable, 1.5m

1.3.Description of Test Facility

EMC Lab : Accredited by TUV Rheinland Shenzhen

Listed by FCC

The Registration Number is 752051

Listed by Industry Canada

The Registration Number is 5077A-2

Accredited by China National Accreditation Committee
for Laboratories

The Certificate Registration Number is L3193

Name of Firm : ACCURATE TECHNOLOGY CO. LTD

Site Location : F1, Bldg. A, Changyuan New Material Port, Keyuan Rd.
Science & Industry Park, Nanshan, Shenzhen, Guangdong
P.R. China

1.4.Measurement Uncertainty

Conducted Emission Expanded Uncertainty = 2.23dB, k=2

Radiated emission expanded uncertainty = 3.08dB, k=2
(9kHz-30MHz)

Radiated emission expanded uncertainty = 4.42dB, k=2
(30MHz-1000MHz)

Radiated emission expanded uncertainty = 4.06dB, k=2
(Above 1GHz)

2. MEASURING DEVICE AND TEST EQUIPMENT

Table 1: List of Test and Measurement Equipment

Kind of equipment	Manufacturer	Type	S/N	Calibrated until
EMI Test Receiver	Rohde&Schwarz	ESCS30	100307	Jan. 15, 2012
EMI Test Receiver	Rohde&Schwarz	ESPI3	101526/003	Jan. 15, 2012
Spectrum Analyzer	Agilent	E7405A	MY45115511	Jan. 15, 2012
Pre-Amplifier	Rohde&Schwarz	CBLU118354 0-01	3791	Jan. 15, 2012
Loop Antenna	Schwarzbeck	FMZB1516	1516131	Jan. 15, 2012
Bilog Antenna	Schwarzbeck	VULB9163	9163-323	Jan. 15, 2012
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-655	Jan. 15, 2012
Horn Antenna	Schwarzbeck	BBHA9170	9170-359	Jan. 15, 2012
LISN	Rohde&Schwarz	ESH3-Z5	100305	Jan. 15, 2012
LISN	Schwarzbeck	NSLK8126	8126431	Jan. 15, 2012

3. SUMMARY OF TEST RESULTS

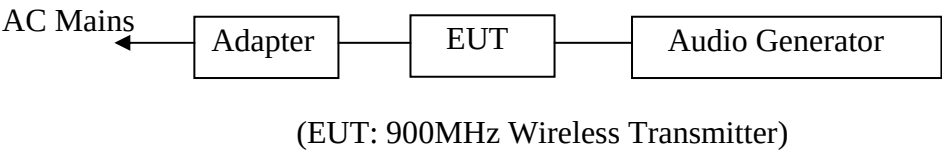
FCC Rules	Description of Test	Result
Section 15.207	Conducted Emission	Compliant
Section 15.249(a)	Fundamental and Harmonics Radiated Emission	Compliant
Section 15.249(d)	Spurious Radiated Emission	Compliant
Section 15.249(d)	Band Edge	Compliant
Section 15.203	Antenna Requirement	Compliant

Remark: “N/A” means “Not applicable”.

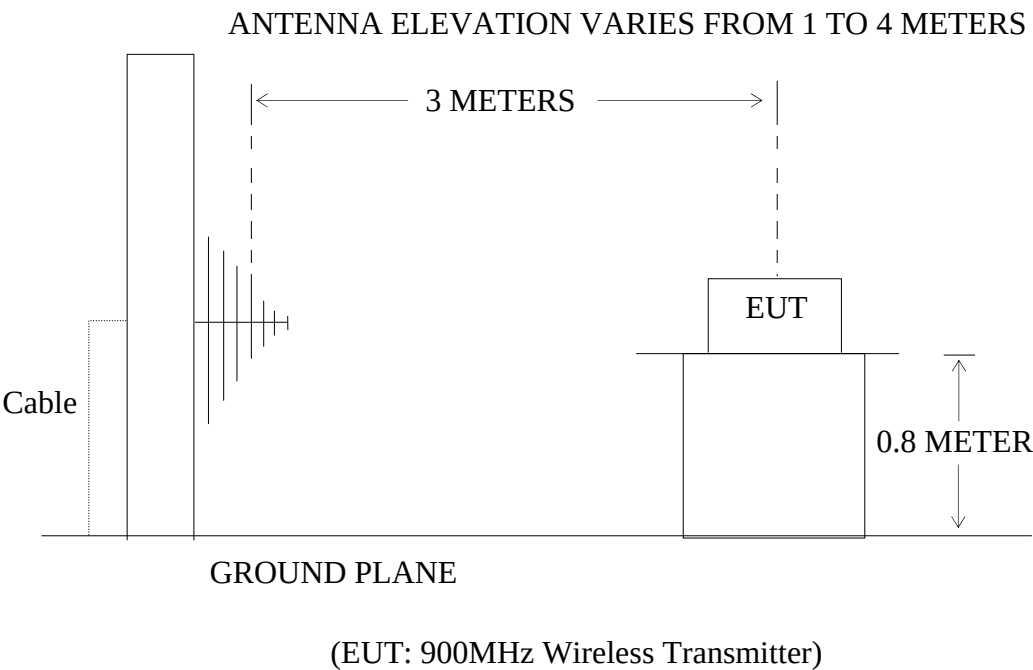
**4. FUNDAMENTAL AND HARMONICS RADIATED EMISSION
FOR SECTION 15.249(A)**

4.1. Block Diagram of Test Setup

4.1.1. Block diagram of connection between the EUT and simulators



4.1.2. Semi-Anechoic Chamber Test Setup Diagram



4.2.The Emission Limit

4.2.1.For intentional radiators, According to section 15.249(a), Operation within the frequency band of 902 to 928MHz, The fundamental field strength shall not exceed 94 dB μ V/m and the harmonics shall not exceed 54 dB μ V/m.

Fundamental Frequency	Field Strength of Fundamental (millivolts/meter)	Field Strength of harmonics (microvolts/meter)
902-928MHz	50	500
2400-2483.5MHz	50	500
5725-5875MHz	50	500
24.0-24.25GHz	250	2500

4.2.2.According to section 15.249(e), as shown in section 15.35(b), the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

4.3.Configuration of EUT on Measurement

The following equipment is installed on Radiated Emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

4.3.1.900MHz Wireless Transmitter (EUT)

Model Number : FW900WT
Serial Number : N/A

4.4.Operating Condition of EUT

4.4.1.Setup the EUT and simulator as shown as Section 4.1.

4.4.2.Turn on the power of all equipment.

4.4.3. Let the EUT work in TX mode measure it. The transmit frequency are 905.0050-926.6050MHz. We are select 905.0050MHz, 914.6050MHz, 926.6050MHz TX frequency to transmit.

4.5. Test Procedure

The EUT and its simulators are placed on a turntable, which is 0.8 meter high above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated bilog antenna) is used as receiving antenna. Both horizontal and vertical polarizations of the antenna are set on measurement. In order to find the maximum emission levels, all of the interface cables must be manipulated according to ANSI C63.4: 2003 on radiated emission measurement.

The bandwidth of test receiver is set at 120kHz in 30-1000MHz. and set at 1MHz in above 1000MHz.

4.6.The Field Strength of Radiation Emission Measurement Results

PASS.

Date of Test:	Oct. 15, 2011	Temperature:	21°C
EUT:	900MHz Wireless Transmitter	Humidity:	55%
Model No.:	FW900WT	Power Supply:	AC 120V/60Hz
Test Mode:	TX 905.0050MHz	Test Engineer:	Kai

Fundamental Radiated Emissions

Frequency (MHz)	Reading(dBμV/m) QP	Factor(dB) Corr.	Result(dBμV/m) QP	Limit(dBμV/m) QP	Margin(dB) QP	Polarization
905.0050	48.57	28.80	77.37	94.00	-16.63	Vertical
905.0050	47.16	28.80	75.96	94.00	-18.04	Horizontal

Harmonics Radiated Emissions

Frequency (MHz)	Reading(dBμV/m)		Factor(dB) Corr.	Result(dBμV/m)		Limit(dBμV/m)		Margin(dB)		Polarization
	AV	PEAK		AV	PEAK	AV	PEAK	AV	PEAK	
1810.070	48.69	50.69	-9.94	38.75	40.75	54	74	-15.25	-33.25	Vertical
2715.071	54.73	56.73	-6.27	48.46	50.46	54	74	-5.54	-23.54	
1810.070	55.38	57.38	-9.94	45.44	47.44	54	74	-8.56	-26.56	Horizontal
2715.071	55.87	57.87	-6.27	49.60	51.60	54	74	-4.40	-22.40	
3619.980	49.84	49.84	-2.72	47.12	47.12	54	74	-6.88	-26.88	
4524.980	51.74	51.74	-1.27	50.20	50.20	54	74	-3.80	-23.80	
5429.960	47.77	47.77	0.82	48.59	48.59	54	74	-5.41	-25.41	

Note:

1. Emissions attenuated more than 20 dB below the permissible value are not reported.
2. The field strength is calculated by adding the antenna factor, high pass filter loss(if used) and cable loss, and subtracting the amplifier gain(if any)from the measured reading. The basic equation calculation is as follows:

$$\text{Result} = \text{Reading} + \text{Corrected Factor}$$

$$\text{Where Corrected Factor} = \text{Antenna Factor} + \text{Cable Loss} + \text{High Pass Filter Loss} - \text{Amplifier Gain}$$
3. The spectral diagrams in appendix I display the measurement of peak values.

Date of Test:	Oct. 15, 2011	Temperature:	21°C
EUT:	900MHz Wireless Transmitter	Humidity:	55%
Model No.:	FW900WT	Power Supply:	AC 120V/60Hz
Test Mode:	TX 914.6050MHz	Test Engineer:	Kai

Fundamental Radiated Emissions

Frequency (MHz)	Reading(dBμV/m) QP	Factor(dB) Corr.	Result(dBμV/m) QP	Limit(dBμV/m) QP	Margin(dB) QP	Polarization
914.6050	49.26	28.92	78.18	94.00	-15.82	Vertical
914.6050	49.71	28.92	78.63	94.00	-15.37	Horizontal

Harmonics Radiated Emissions

Frequency (MHz)	Reading(dBμV/m)		Factor(dB) Corr.	Result(dBμV/m)		Limit(dBμV/m)		Margin(dB)		Polarization
	AV	PEAK		AV	PEAK	AV	PEAK	AV	PEAK	
1829.176	58.05	60.55	-9.74	48.31	50.81	54	74	-5.69	-23.19	Vertical
2743.761	54.87	56.37	-6.13	48.74	50.24	54	74	-5.26	-23.76	
3662.980	46.44	48.44	-2.55	43.89	45.89	54	74	-10.11	-28.11	
4572.980	48.63	50.63	-1.19	47.44	49.44	54	74	-6.56	-24.56	
5478.610	46.13	46.63	1.13	47.26	47.76	54	74	-6.74	-26.24	
1829.173	52.92	54.92	-9.74	43.18	45.18	54	74	-10.82	-28.82	Horizontal
2743.761	53.60	55.60	-6.13	47.47	49.47	54	74	-6.53	-24.53	

Note:

1. Emissions attenuated more than 20 dB below the permissible value are not reported.
2. The field strength is calculated by adding the antenna factor, high pass filter loss (if used) and cable loss, and subtracting the amplifier gain (if any) from the measured reading. The basic equation calculation is as follows:

$$\text{Result} = \text{Reading} + \text{Corrected Factor}$$

$$\text{Where Corrected Factor} = \text{Antenna Factor} + \text{Cable Loss} + \text{High Pass Filter Loss} - \text{Amplifier Gain}$$

3. The spectral diagrams in appendix I display the measurement of peak values.

Date of Test:	Oct. 15, 2011	Temperature:	21°C
EUT:	900MHz Wireless Transmitter	Humidity:	55%
Model No.:	FW900WT	Power Supply:	AC 120V/60Hz
Test Mode:	TX 926.6050MHz	Test Engineer:	Kai

Fundamental Radiated Emissions

Frequency (MHz)	Reading(dBμV/m) QP	Factor(dB) Corr.	Result(dBμV/m) QP	Limit(dBμV/m) QP	Margin(dB) QP	Polarization
926.6050	50.01	29.19	79.20	94.00	-14.80	Vertical
926.6050	48.76	29.19	77.95	94.00	-16.05	Horizontal

Harmonics Radiated Emissions

Frequency (MHz)	Reading(dBμV/m)		Factor(dB) Corr.	Result(dBμV/m)		Limit(dBμV/m)		Margin(dB)		Polarization
	AV	PEAK		AV	PEAK	AV	PEAK	AV	PEAK	
1853.200	58.19	60.19	-9.55	48.64	50.64	54	74	-5.36	-23.36	Vertical
2779.785	54.09	56.09	-6.08	48.01	50.01	54	74	-5.99	-23.99	
3706.400	47.44	47.44	-2.39	45.05	45.05	54	74	-8.95	-28.95	
4633.040	49.61	49.61	-1.05	48.56	48.56	54	74	-5.44	-25.44	
5559.590	48.09	48.09	1.36	49.45	49.45	54	74	-4.55	-24.55	
1853.200	51.81	53.81	-9.55	42.26	44.26	54	74	-11.74	-29.74	Horizontal
2779.785	54.81	56.81	-6.08	48.73	50.73	54	74	-5.27	-23.27	

Note:

1. Emissions attenuated more than 20 dB below the permissible value are not reported.
2. The field strength is calculated by adding the antenna factor, high pass filter loss (if used) and cable loss, and subtracting the amplifier gain (if any) from the measured reading. The basic equation calculation is as follows:

$$\text{Result} = \text{Reading} + \text{Corrected Factor}$$

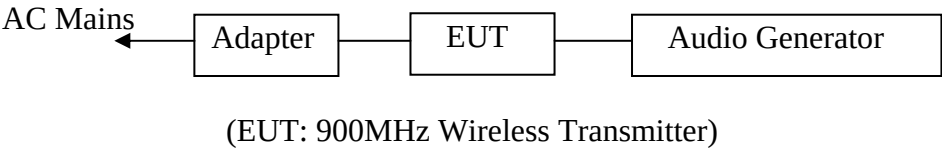
$$\text{Where Corrected Factor} = \text{Antenna Factor} + \text{Cable Loss} + \text{High Pass Filter Loss} - \text{Amplifier Gain}$$

3. The spectral diagrams in appendix I display the measurement of peak values.

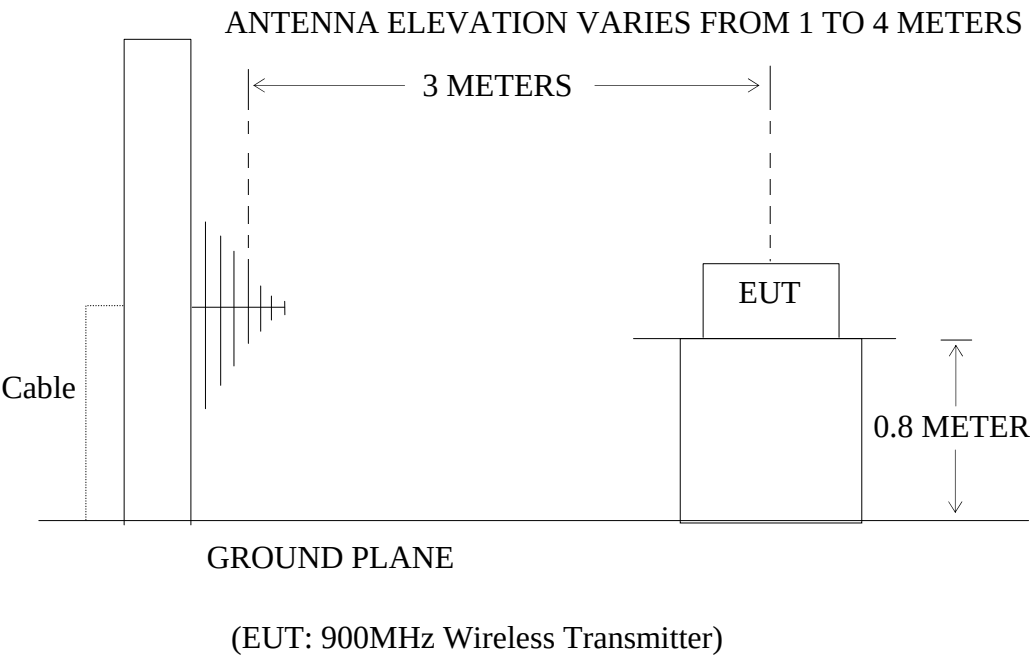
5. SPURIOUS RADIATED EMISSION FOR SECTION 15.249(D)

5.1. Block Diagram of Test Setup

5.1.1. Block diagram of connection between the EUT and simulators



5.1.2. Semi-Anechoic Chamber Test Setup Diagram



5.2.The Emission Limit for Section 15.249(d)

5.2.1.Emission radiated outside of the specified frequency bands, except for harmonics, shall be comply with the general radiated emission limits in Section 15.209.

Radiation Emission Measurement Limits According to Section 15.209

Frequency (MHz)	Limit		The final measurement in band 9-90kHz, 110-490kHz and above 1000MHz is performed with Average detector. Except those frequency bands mention above, the final measurement for frequencies below 1000MHz is performed with Quasi Peak detector.
	Field Strength of Quasi-peak Value (microvolts/m)	Field Strength of Quasi-peak Value (dBμV/m)	
30 - 88	100	40	
88 - 216	150	43.5	
216 - 960	200	46	
Above 960	500	54	

5.3.EUT Configuration on Measurement

The following equipment is installed on the Radiated Emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

5.3.1.900MHz Wireless Transmitter (EUT)

Model Number : FW900WT
Serial Number : N/A

5.4.Operating Condition of EUT

5.4.1.Setup the EUT and simulator as shown as Section 5.1.

5.4.2.Turn on the power of all equipment.

5.4.3. Let the EUT work in TX mode measure it. The transmit frequency are 905.0050-926.6050MHz MHz. We are select 905.0050MHz, 914.6050MHz, 926.6050MHz TX frequency to transmit.

5.5. Test Procedure

The EUT and its simulators are placed on a turntable, which is 0.8 meter high above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated bilog antenna) is used as receiving antenna. Both horizontal and vertical polarizations of the antenna are set on measurement. In order to find the maximum emission levels, all of the interface cables must be manipulated according to ANSI C63.4: 2003 on radiated emission measurement.

The bandwidth of test receiver is set at 120kHz in 30-1000MHz. and set at 1MHz in above 1000MHz.

The frequency range from 30MHz to 10000MHz is checked.

The final measurement in band 9-90kHz, 110-490kHz and above 1000MHz is performed with Average detector. Except those frequency bands mention above, the final measurement for frequencies below 1000MHz is performed with Quasi Peak detector.

5.6.The Emission Measurement Result

PASS.

Date of Test:	Oct. 15, 2011	Temperature:	21°C
EUT:	900MHz Wireless Transmitter	Humidity:	55%
Model No.:	FW900WT	Power Supply:	AC 120V/60Hz
Test Mode:	TX 905.0050MHz	Test Engineer:	Kai

Frequency (MHz)	Reading (dBμV/m)	Factor(dB) Corr.	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Polarization
	QP		QP	QP	QP	
-	-	-	-	-	-	Vertical
-	-	-	-	-	-	Horizontal

Note:

1. Emissions attenuated more than 20 dB below the permissible value are not reported.
2. The field strength is calculated by adding the antenna factor, high pass filter loss (if used) and cable loss, and subtracting the amplifier gain (if any) from the measured reading. The basic equation calculation is as follows:

Result = Reading + Corrected Factor

Where Corrected Factor = Antenna Factor + Cable Loss + High Pass Filter Loss – Amplifier Gain

3. The spectral diagrams in appendix I display the measurement of peak values.

Date of Test:	<u>Oct. 15, 2011</u>	Temperature:	<u>21°C</u>
EUT:	<u>900MHz Wireless Transmitter</u>	Humidity:	<u>55%</u>
Model No.:	<u>FW900WT</u>	Power Supply:	<u>AC 120V/60Hz</u>
Test Mode:	<u>TX 914.6050MHz</u>	Test Engineer:	<u>Kai</u>

Frequency (MHz)	Reading (dBμV/m)	Factor(dB) Corr.	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Polarization
	QP		QP	QP	QP	
-	-	-	-	-	-	Vertical
-	-	-	-	-	-	Horizontal

Note:

1. Emissions attenuated more than 20 dB below the permissible value are not reported.
2. The field strength is calculated by adding the antenna factor, high pass filter loss (if used) and cable loss, and subtracting the amplifier gain (if any) from the measured reading. The basic equation calculation is as follows:

$$\text{Result} = \text{Reading} + \text{Corrected Factor}$$

Where Corrected Factor = Antenna Factor + Cable Loss + High Pass Filter Loss – Amplifier Gain
3. The spectral diagrams in appendix I display the measurement of peak values.

Date of Test:	Oct. 15, 2011	Temperature:	21°C
EUT:	900MHz Wireless Transmitter	Humidity:	55%
Model No.:	FW900WT	Power Supply:	AC 120V/60Hz
Test Mode:	TX 926.6050MHz	Test Engineer:	Kai

Frequency (MHz)	Reading (dBμV/m)	Factor(dB) Corr.	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Polarization
	QP		QP	QP	QP	
-	-	-	-	-	-	Vertical
-	-	-	-	-	-	Horizontal

Note:

1. Emissions attenuated more than 20 dB below the permissible value are not reported.
2. The field strength is calculated by adding the antenna factor, high pass filter loss (if used) and cable loss, and subtracting the amplifier gain (if any) from the measured reading. The basic equation calculation is as follows:

$$\text{Result} = \text{Reading} + \text{Corrected Factor}$$

Where Corrected Factor = Antenna Factor + Cable Loss + High Pass Filter Loss – Amplifier Gain
3. The spectral diagrams in appendix I display the measurement of peak values.

6. BAND EDGES

6.1.The Requirement

6.1.1.Band Edge from 902MHz to 928MHz. Emission radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

6.2.EUT Configuration on Measurement

The following equipment is installed on the emission measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

6.2.1.900MHz Wireless Transmitter (EUT)

Model Number : FW900WT
Serial Number : N/A

6.3.Operating Condition of EUT

6.3.1.Setup the EUT and simulator as shown as Section 4.1.

6.3.2.Turn on the power of all equipment.

6.3.3. Let the EUT work in TX mode measure it. The transmit frequency are 905.0050-926.6050MHz MHz. We are select 905.0050MHz, 926.6050MHz TX frequency to transmit.

6.4.Test Procedure

The EUT and its simulators are placed on a turntable, which is 0.8 meter high above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated bilog antenna) is used as receiving antenna. Both horizontal and vertical polarizations of the antenna are set on measurement. In order to find the maximum emission levels, all of the interface cables must be manipulated according to ANSI C63.4: 2003 on radiated emission measurement.

The bandwidth of test receiver is set at 120kHz in 30-1000MHz. and set at 1MHz in above 1000MHz.

6.5.The Measurement Result

PASS.

Date of Test:	Oct. 15, 2011	Temperature:	21°C
EUT:	900MHz Wireless Transmitter	Humidity:	55%
Model No.:	FW900WT	Power Supply:	AC 120V/60Hz
Test Mode:	TX 905.0050MHz	Test Engineer:	Kai

Frequency (MHz)	Reading (dBμV/m)	Factor(dB) Corr.	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Polarization
	QP		QP	QP	QP	
-	-	-	-	-	-	Vertical
-	-	-	-	-	-	Horizontal

Note:

1. Emissions attenuated more than 20 dB below the permissible value are not reported.
2. The field strength is calculated by adding the antenna factor, high pass filter loss (if used) and cable loss, and subtracting the amplifier gain (if any) from the measured reading. The basic equation calculation is as follows:

Result = Reading + Corrected Factor

Where Corrected Factor = Antenna Factor + Cable Loss + High Pass Filter Loss – Amplifier Gain

3. The spectral diagrams in appendix I display the measurement of peak values.

Date of Test:	<u>Oct. , 2011</u>	Temperature:	<u>21°C</u>
EUT:	<u>900MHz Wireless Transmitter</u>	Humidity:	<u>55%</u>
Model No.:	<u>FW900WT</u>	Power Supply:	<u>AC 120V/60Hz</u>
Test Mode:	<u>TX 926.6050MHz</u>	Test Engineer:	<u>Kai</u>

Frequency (MHz)	Reading (dBμV/m)	Factor(dB) Corr.	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Polarization
	QP		QP	QP	QP	
-	-	-	-	-	-	Vertical
-	-	-	-	-	-	Horizontal

Note:

1. Emissions attenuated more than 20 dB below the permissible value are not reported.
2. The field strength is calculated by adding the antenna factor, high pass filter loss (if used) and cable loss, and subtracting the amplifier gain (if any) from the measured reading. The basic equation calculation is as follows:

$$\text{Result} = \text{Reading} + \text{Corrected Factor}$$

$$\text{Where Corrected Factor} = \text{Antenna Factor} + \text{Cable Loss} + \text{High Pass Filter Loss} - \text{Amplifier Gain}$$
3. The spectral diagrams in appendix I display the measurement of peak values.

7. AC POWER LINE CONDUCTED EMISSION FOR FCC PART 15 SECTION 15.207(A)

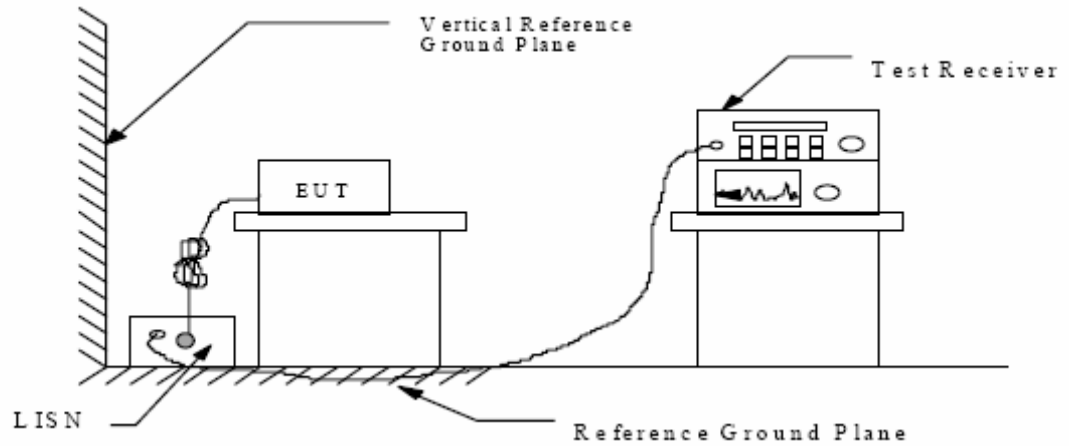
7.1. Block Diagram of Test Setup

7.1.1. Block diagram of connection between the EUT and simulators



(EUT: 900MHz Wireless Transmitter)

7.1.2. Shielding Room Test Setup Diagram



(EUT: 900MHz Wireless Transmitter)

7.2. The Emission Limit

7.2.1. Conducted Emission Measurement Limits According to Section 15.207(a)

Frequency (MHz)	Limit dB(μV)	
	Quasi-peak Level	Average Level
0.15 - 0.50	66.0 – 56.0 *	56.0 – 46.0 *
0.50 - 5.00	56.0	46.0
5.00 - 30.00	60.0	50.0

* Decreases with the logarithm of the frequency.

7.3.Configuration of EUT on Measurement

The following equipment are installed on the Conducted Emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

7.3.1.900MHz Wireless Transmitter (EUT)

Model Number : FW900WT
Serial Number : N/A

7.4.Operating Condition of EUT

7.4.1. Setup the EUT and simulator as shown as Section 7.1.

7.4.2. Turn on the power of all equipment.

7.4.3. Let the EUT work in (Tx) mode measure it.

7.5.Test Procedure

The EUT is put on the plane 0.8m high above the ground by insulating support and is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC lines are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to ANSI C63.4: 2003 on Conducted Emission Measurement.

The bandwidth of test receiver (R & S ESCS30) is set at 9kHz.

The frequency range from 150kHz to 30MHz is checked.

7.6.Power Line Conducted Emission Measurement Results

PASS.

The frequency range from 150kHz to 30MHz is checked.

Date of Test:	October 15, 2011	Temperature:	25°C
EUT:	900MHz Wireless Transmitter	Humidity:	50%
Model No.:	FW900WT	Power Supply:	AC 120V/60Hz
Test Mode:	TX 914.6050MHz	Test Engineer:	Pei

Frequency (MHz)	Result (dBμV)	Limit (dBμV)	Margin (dB)	Detector	Line
0.161820	46.40	65.4	19.0	QP	Live
0.406930	37.60	57.7	20.1	QP	
8.626006	25.50	60	34.5	QP	
0.162467	31.10	55.3	24.2	AV	
0.406930	36.50	47.7	11.2	AV	
0.432041	26.60	47.2	20.6	AV	
0.161175	48.80	65.4	16.6	QP	Neutral
0.400483	32.20	57.8	25.6	QP	
8.695152	30.20	60	29.8	QP	
0.161175	35.20	55.4	20.2	AV	
0.403694	35.60	47.8	12.2	AV	
0.430320	28.10	47.2	19.1	AV	

Emissions attenuated more than 20 dB below the permissible value are not reported.
The spectral diagrams are attached as below.

8. ANTENNA REQUIREMENT

8.1.The Requirement

8.1.1. 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.

8.2.Antenna Construction

The antenna type used in this product is Reverse Polarity (RP-SMA) connectors. and it is considered to meet antenna requirement of FCC. Refer to the product photo.



Antenna

APPENDIX I (Test Curves)


ACCURATE TECHNOLOGY CO., LTD.

 F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
 Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 966 chamber

Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: Kai #1034

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 24 C / 48 %

EUT: 900MHz wireless transmitter

Mode: TX Channel 1

Model: FW900WT

Manufacturer: Mangrove Technology Co.,Ltd

Polarization: Horizontal

Power Source: AC 120V/60Hz

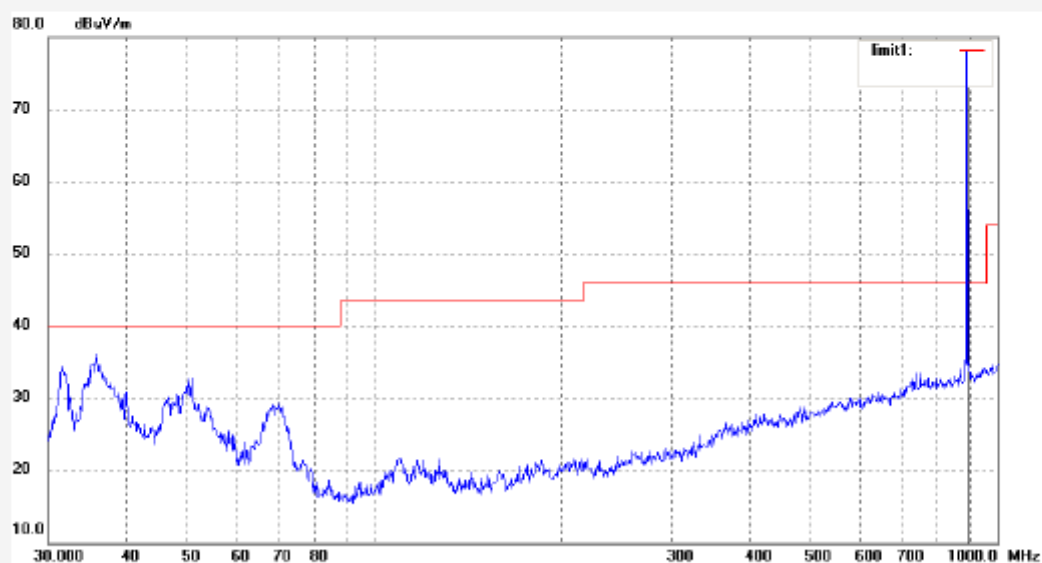
Date: 11/10/15/

Time: 8/45/54

Engineer Signature: Kai

Distance: 3m

Note: Report No.:ATE20112123



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	905.0050	47.16	28.80	75.96	94.00	-18.04	QP			


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Site: 966 chamber

Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: Kai #1033

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 24 C / 48 %

EUT: 900MHz wireless transmitter

Mode: TX Channel 1

Model: FW900WT

Manufacturer: Mangrove Technology Co.,Ltd

Polarization: Vertical

Power Source: AC 120V/60Hz

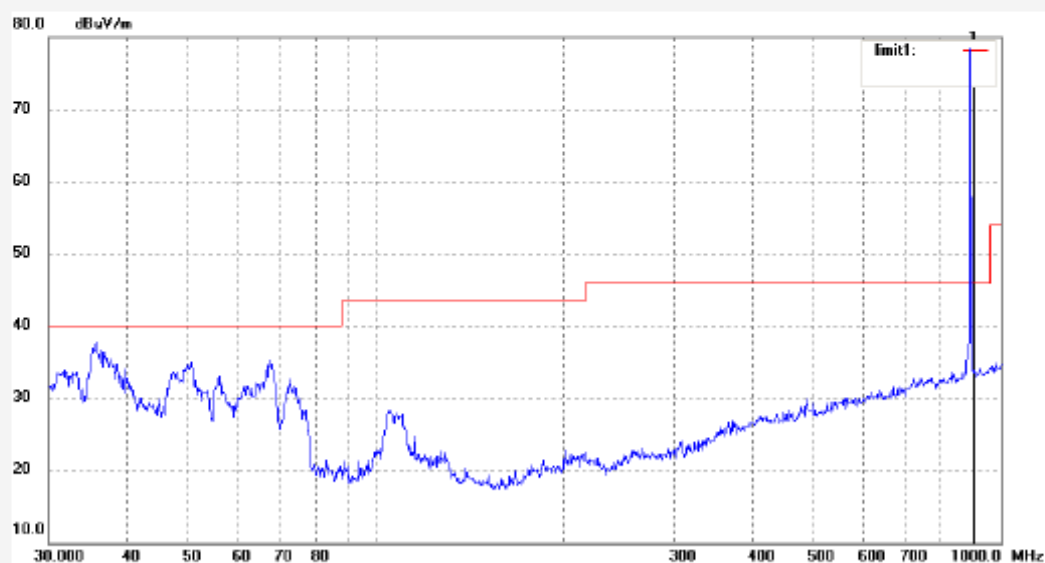
Date: 11/10/15/

Time: 8/44/25

Engineer Signature: Kai

Distance: 3m

Note: Report No.: ATE20112123



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	905.0050	48.57	28.80	77.37	94.00	-16.63	QP			


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Site: 966 chamber

Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: Kai #1056

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 24 C / 48 %

EUT: 900MHz wireless transmitter

Mode: TX Channel 1

Model: FW900WT

Manufacturer: Mangrove Technology Co.,Ltd

Polarization: Horizontal

Power Source: AC 120V/60Hz

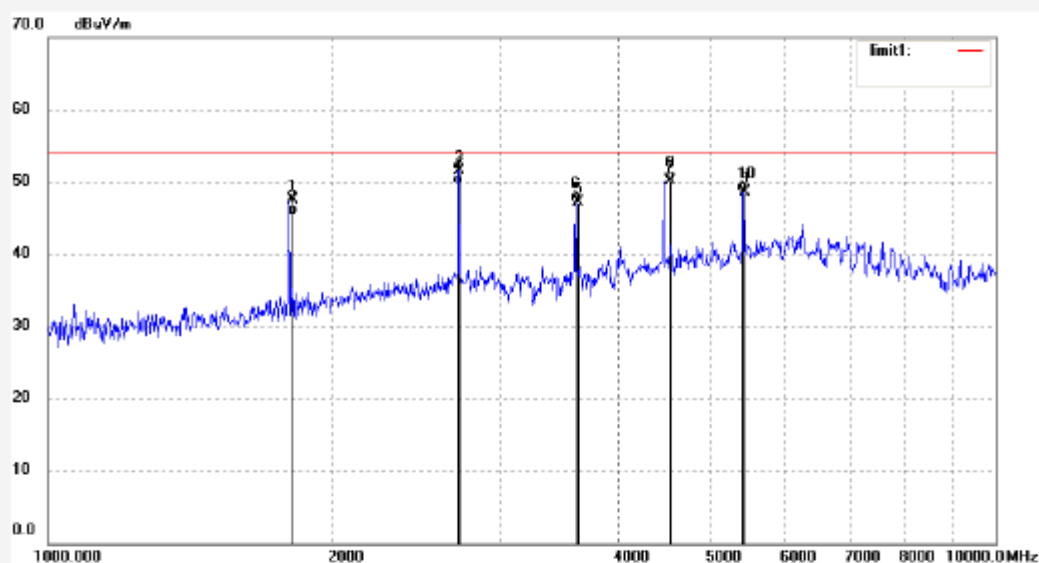
Date: 11/10/15/

Time: 10/32/14

Engineer Signature: Kai

Distance: 3m

Note: Report No.: ATE20112123



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	1810.070	57.38	-9.94	47.44	74.00	-26.56	peak			
2	1810.070	55.38	-9.94	45.44	54.00	-8.56	AVG			
3	2715.071	57.87	-6.27	51.60	74.00	-22.40	peak			
4	2715.071	55.87	-6.27	49.60	54.00	-4.40	AVG			
5	3619.980	49.84	-2.72	47.12	74.00	-26.88	peak			
6	3619.980	49.84	-2.72	47.12	54.00	-6.88	AVG			
7	4524.980	51.47	-1.27	50.20	74.00	-23.80	peak			
8	4524.980	51.47	-1.27	50.20	54.00	-3.80	AVG			
9	5429.960	47.77	0.82	48.59	74.00	-25.41	peak			
10	5429.960	47.77	0.82	48.59	54.00	-5.41	AVG			


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Job No.: Kai #1055

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 24 C / 48 %

EUT: 900MHz wireless transmitter

Mode: TX Channel 1

Model: FW900WT

Manufacturer: Mangrove Technology Co.,Ltd

Polarization: Vertical

Power Source: AC 120V/60Hz

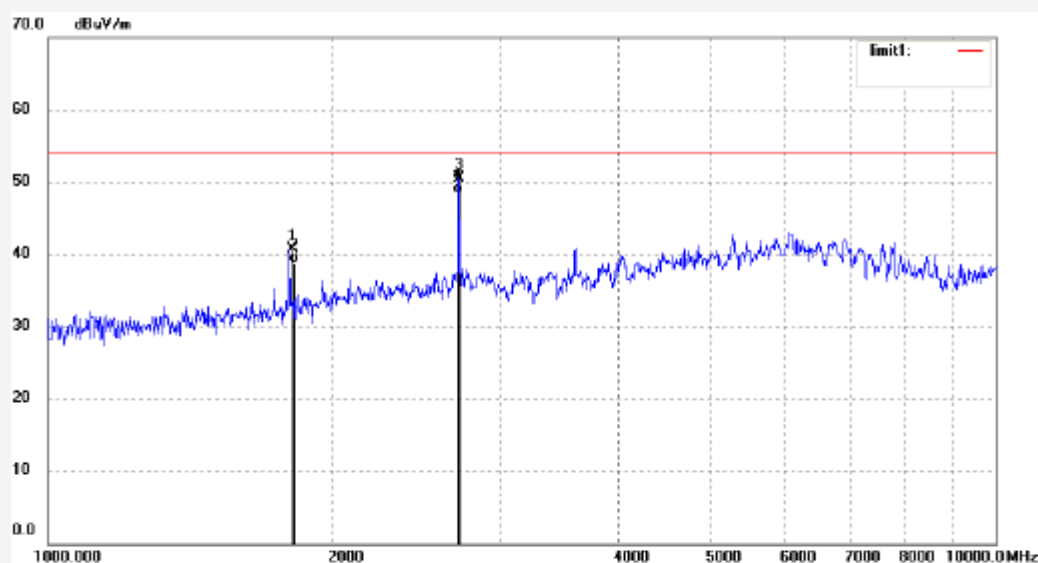
Date: 11/10/15/

Time: 10/28/58

Engineer Signature: Kai

Distance: 3m

Note: Report No.: ATE20112123



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	1810.070	50.69	-9.94	40.75	74.00	-33.25	peak			
2	1810.070	48.69	-9.94	38.75	54.00	-15.25	AVG			
3	2715.071	56.73	-6.27	50.46	74.00	-23.54	peak			
4	2715.071	54.73	-6.27	48.46	54.00	-5.54	AVG			


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Job No.: Kai #1038

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 24 C / 48 %

EUT: 900MHz wireless transmitter

Mode: TX Channel 19

Model: FW900WT

Manufacturer: Mangrove Technology Co.,Ltd

Polarization: Horizontal

Power Source: AC 120V/60Hz

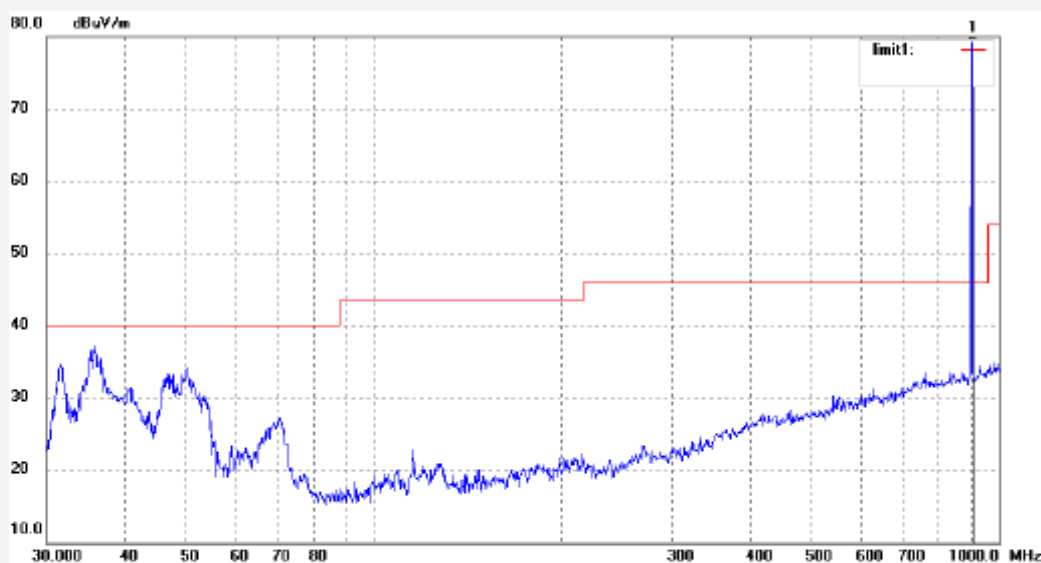
Date: 11/10/15/

Time: 9/01/35

Engineer Signature: Kai

Distance: 3m

Note: Report No.:ATE20112123



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	914.6050	49.71	28.92	78.63	94.00	-15.37	QP			



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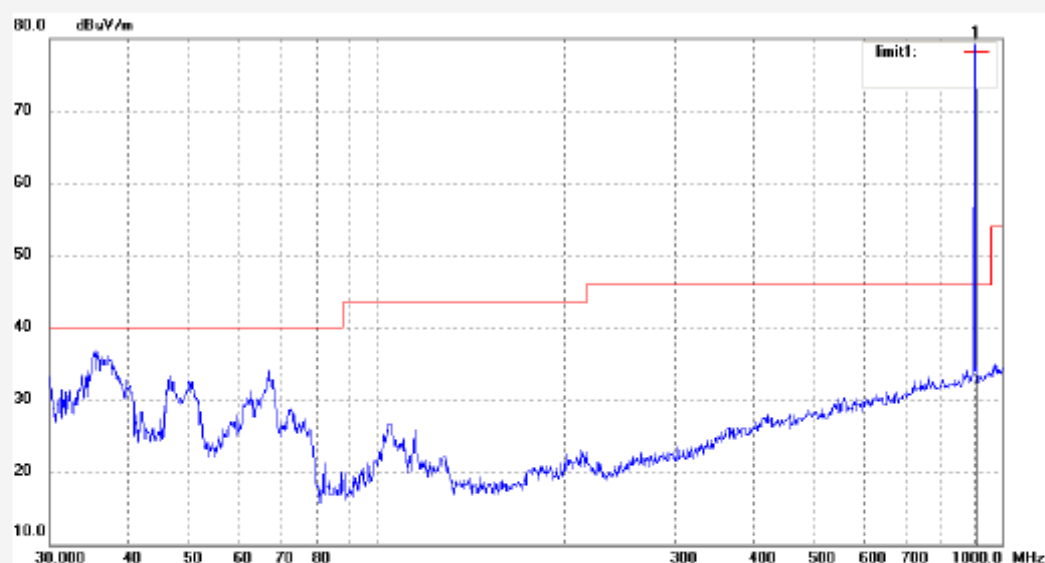
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 966 chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: Kai #1037
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 24 C / 48 %
EUT: 900MHz wireless transmitter
Mode: TX Channel 19
Model: FW900WT
Manufacturer: Mangrove Technology Co.,Ltd

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 11/10/15/
Time: 8/59/43
Engineer Signature: Kai
Distance: 3m

Note: Report No.:ATE20112123



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	914.6050	49.26	28.92	78.18	94.00	-15.82	QP			


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Fax:+86-0755-26503396

Job No.: Kai #1054

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 24 C / 48 %

EUT: 900MHz wireless transmitter

Mode: TX Channel 19

Model: FW900WT

Manufacturer: Mangrove Technology Co.,Ltd

Polarization: Horizontal

Power Source: AC 120V/60Hz

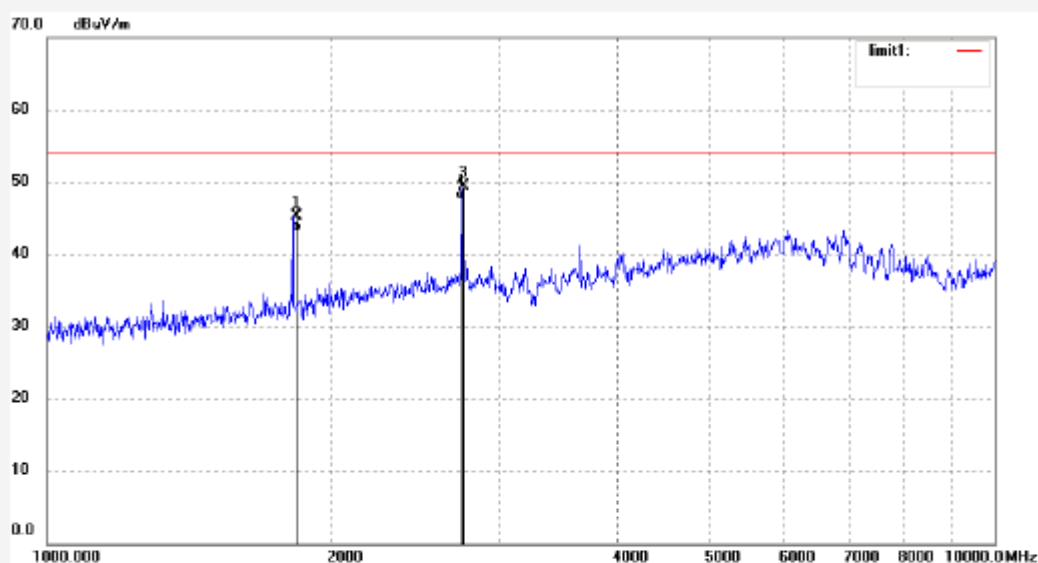
Date: 11/10/15/

Time: 10/27/07

Engineer Signature: Kai

Distance: 3m

Note: Report No.:ATE20112123



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	1829.173	54.92	-9.74	45.18	74.00	-28.82	peak			
2	1829.173	52.92	-9.74	43.18	54.00	-10.82	AVG			
3	2743.761	55.60	-6.13	49.47	74.00	-24.53	peak			
4	2743.761	53.60	-6.13	47.47	54.00	-6.53	AVG			


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Site: 966 chamber

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Job No.: Kai #1053

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 24 C / 48 %

EUT: 900MHz wireless transmitter

Mode: TX Channel 19

Model: FW900WT

Manufacturer: Mangrove Technology Co.,Ltd

Polarization: Vertical

Power Source: AC 120V/60Hz

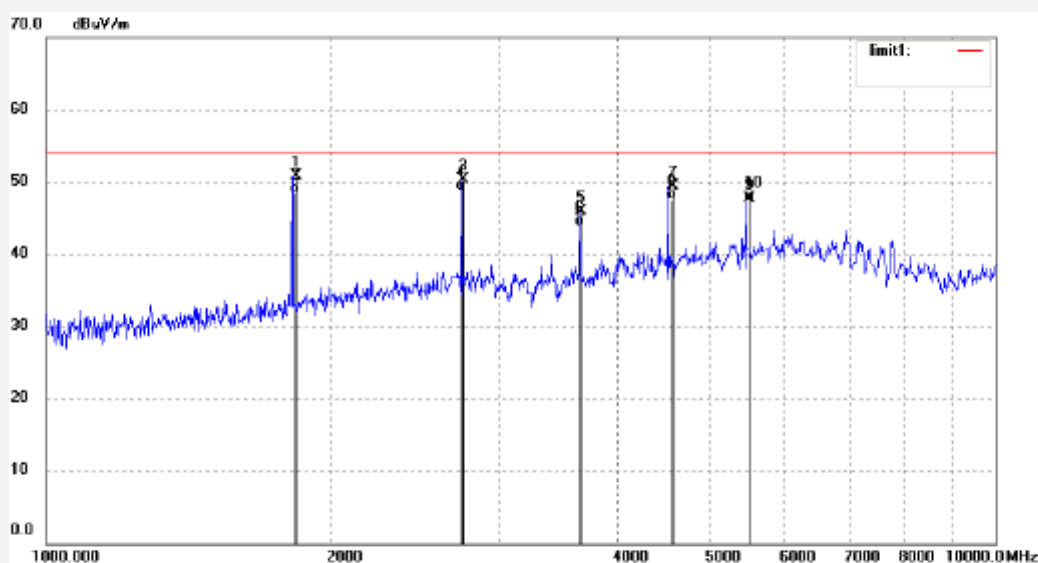
Date: 11/10/15/

Time: 10/22/38

Engineer Signature: Kai

Distance: 3m

Note: Report No.:ATE20112123



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	1829.176	60.55	-9.74	50.81	74.00	-23.19	peak			
2	1829.176	58.05	-9.74	48.31	54.00	-5.69	AVG			
3	2743.761	56.37	-6.13	50.24	74.00	-23.76	peak			
4	2743.761	54.87	-6.13	48.74	54.00	-5.26	AVG			
5	3662.980	48.44	-2.55	45.89	74.00	-28.11	peak			
6	3662.980	46.44	-2.55	43.89	54.00	-10.11	AVG			
7	4572.980	50.63	-1.19	49.44	74.00	-24.56	peak			
8	4572.980	48.63	-1.19	47.44	54.00	-6.56	AVG			
9	5487.610	46.63	1.13	47.76	74.00	-26.24	peak			
10	5487.610	46.13	1.13	47.26	54.00	-6.74	AVG			


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Site: 966 chamber

Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: Kai #1035

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 24 C / 48 %

EUT: 900MHz wireless transmitter

Mode: TX Channel 39

Model: FW900WT

Manufacturer: Mangrove Technology Co.,Ltd

Polarization: Horizontal

Power Source: AC 120V/60Hz

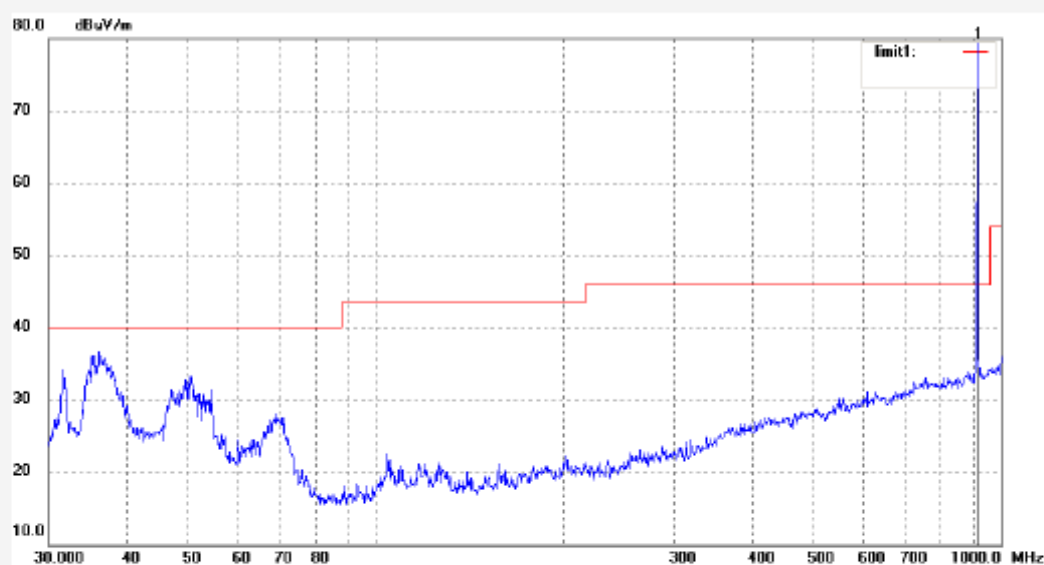
Date: 11/10/15/

Time: 8/49/39

Engineer Signature: Kai

Distance: 3m

Note: Report No.:ATE20112123



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	926.6050	48.76	29.19	77.95	94.00	-16.05	QP			


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Site: 966 chamber

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Fax:+86-0755-26503396

Job No.: Kai #1036

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 24 C / 48 %

EUT: 900MHz wireless transmitter

Mode: TX Channel 39

Model: FW900WT

Manufacturer: Mangrove Technology Co.,Ltd

Polarization: Vertical

Power Source: AC 120V/60Hz

Date: 11/10/15/

Time: 8/51/46

Engineer Signature: Kai

Distance: 3m

Note: Report No.: ATE20112123



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	926.6050	50.01	29.19	79.20	94.00	-14.80	QP			


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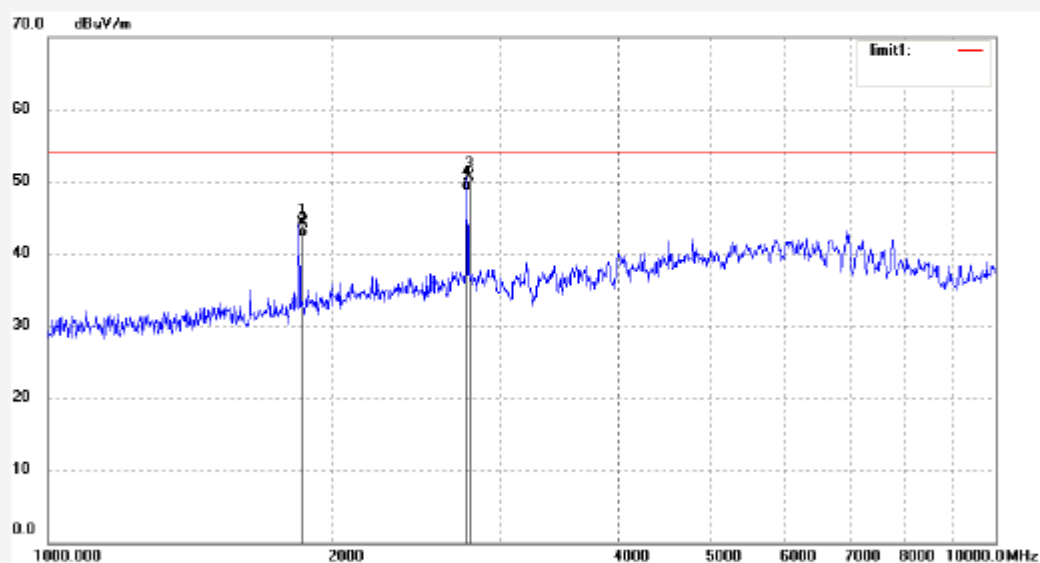
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 Science & Industry Park,Nanshan Shenzhen,P.R.China

 Site: 966 chamber
 Tel:+86-0755-26503290
 Fax:+86-0755-26503396

 Job No.: Kai #1058
 Standard: FCC Class B 3M Radiated
 Test item: Radiation Test
 Temp.(C)/Hum.(%) 24 C / 48 %
 EUT: 900MHz wireless transmitter
 Mode: TX Channel 39
 Model: FW900WT
 Manufacturer: Mangrove Technology Co.,Ltd

 Polarization: Horizontal
 Power Source: AC 120V/60Hz
 Date: 11/10/15/
 Time: 10/42/56
 Engineer Signature: Kai
 Distance: 3m

Note: Report No.: ATE20112123



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	1853.200	53.81	-9.55	44.26	74.00	-29.74	peak			
2	1853.200	51.81	-9.55	42.26	54.00	-11.74	AVG			
3	2779.785	56.81	-6.08	50.73	74.00	-23.27	peak			
4	2779.785	54.81	-6.08	48.73	54.00	-5.27	AVG			


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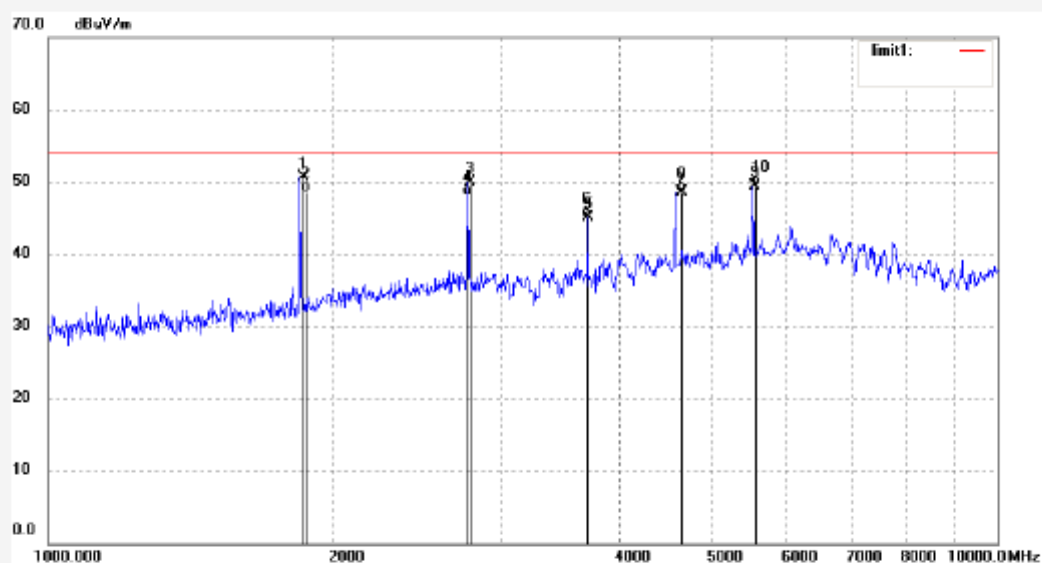
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 Science & Industry Park,Nanshan Shenzhen,P.R.China

 Site: 966 chamber
 Tel:+86-0755-26503290
 Fax:+86-0755-26503396

 Job No.: Kai #1057
 Standard: FCC Class B 3M Radiated
 Test item: Radiation Test
 Temp.(C)/Hum.(%) 24 C / 48 %
 EUT: 900MHz wireless transmitter
 Mode: TX Channel 39
 Model: FW900WT
 Manufacturer: Mangrove Technology Co.,Ltd

 Polarization: Vertical
 Power Source: AC 120V/60Hz
 Date: 11/10/15/
 Time: 10/37/58
 Engineer Signature: Kai
 Distance: 3m

Note: Report No.: ATE20112123



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	1853.200	60.19	-9.55	50.64	74.00	-23.36	peak			
2	1853.200	58.19	-9.55	48.64	54.00	-5.36	AVG			
3	2779.785	56.09	-6.08	50.01	74.00	-23.99	peak			
4	2779.785	54.09	-6.08	48.01	54.00	-5.99	AVG			
5	3706.400	47.44	-2.39	45.05	74.00	-28.95	peak			
6	3706.400	47.44	-2.39	45.05	54.00	-8.95	AVG			
7	4633.040	49.61	-1.05	48.56	74.00	-25.44	peak			
8	4633.040	49.61	-1.05	48.56	54.00	-5.44	AVG			
9	5559.590	48.09	1.36	49.45	74.00	-24.55	peak			
10	5559.590	48.09	1.36	49.45	54.00	-4.55	AVG			

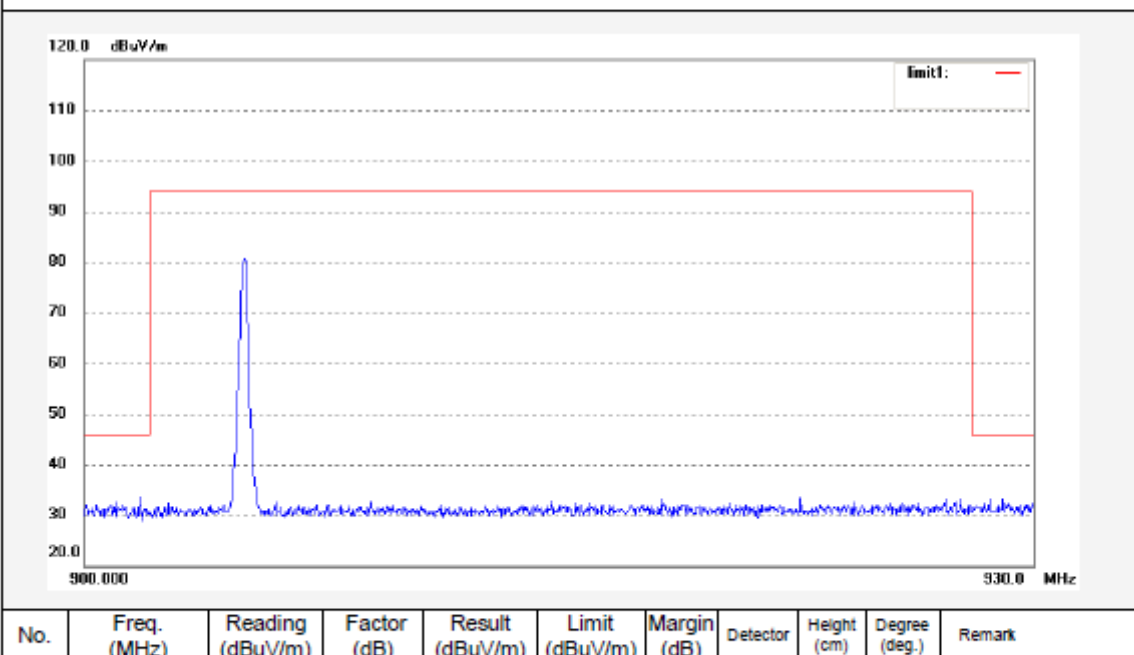

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 Science & Industry Park,Nanshan Shenzhen,P.R.China

 Site: 966 chamber
 Tel:+86-0755-26503290
 Fax:+86-0755-26503396

Job No.: Kai #1062	Polarization: Horizontal
Standard: FCC 900MHz Band Edge	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 2011/10/15
Temp.(C)/Hum.(%) 24 C / 48 %	Time: 11:11:48
EUT: 900MHZ wireless transmitter	Engineer Signature: Kai
Mode: TX Channel 1	Distance: 3m
Model: FW900WT	
Manufacturer: Mangrove Technology Co.,Ltd	

Note: Report No.:ATE20112123

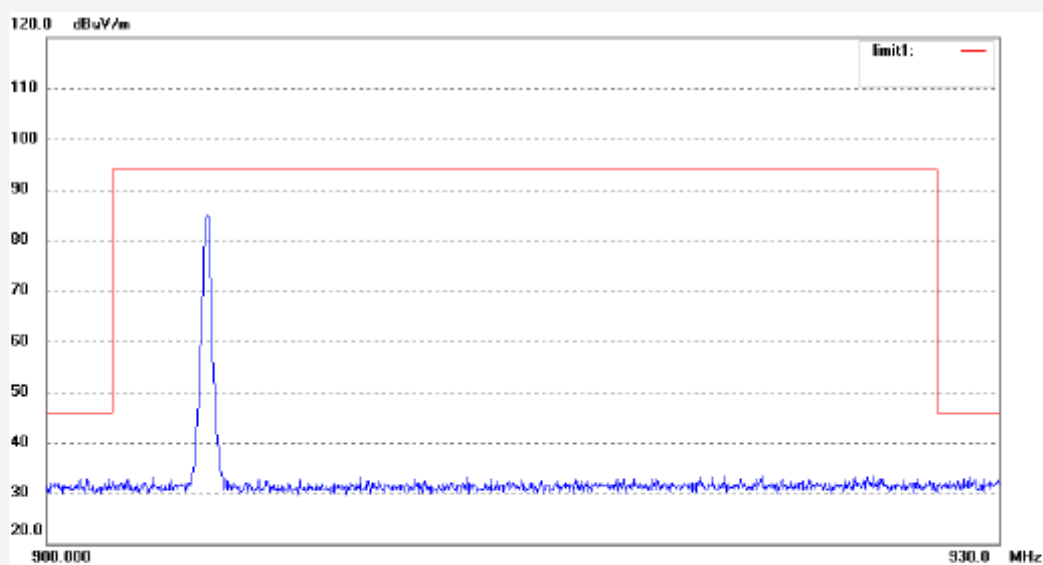



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 Site: 966 chamber
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Job No.: Kai #1061	Polarization: Vertical
Standard: FCC 900MHz Band Edge	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 2011/10/15
Temp.(C)/Hum.(%) 24 C / 48 %	Time: 11:10:41
EUT: 900MHZ wireless transmitter	Engineer Signature: Kai
Mode: TX Channel 1	Distance: 3m
Model: FW900WT	
Manufacturer: Mangrove Technology Co.,Ltd	
Note: Report No.:ATE20112123	



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
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 Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 966 chamber

Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: Kai #1059

Standard: FCC 900MHz Band Edge

Test item: Radiation Test

Temp.(C)/Hum.(%) 24 C / 48 %

EUT: 900MHZ wireless transmitter

Mode: TX Channel 39

Model: FW900WT

Manufacturer: Mangrove Technology Co.,Ltd

Polarization: Horizontal

Power Source: AC 120V/60Hz

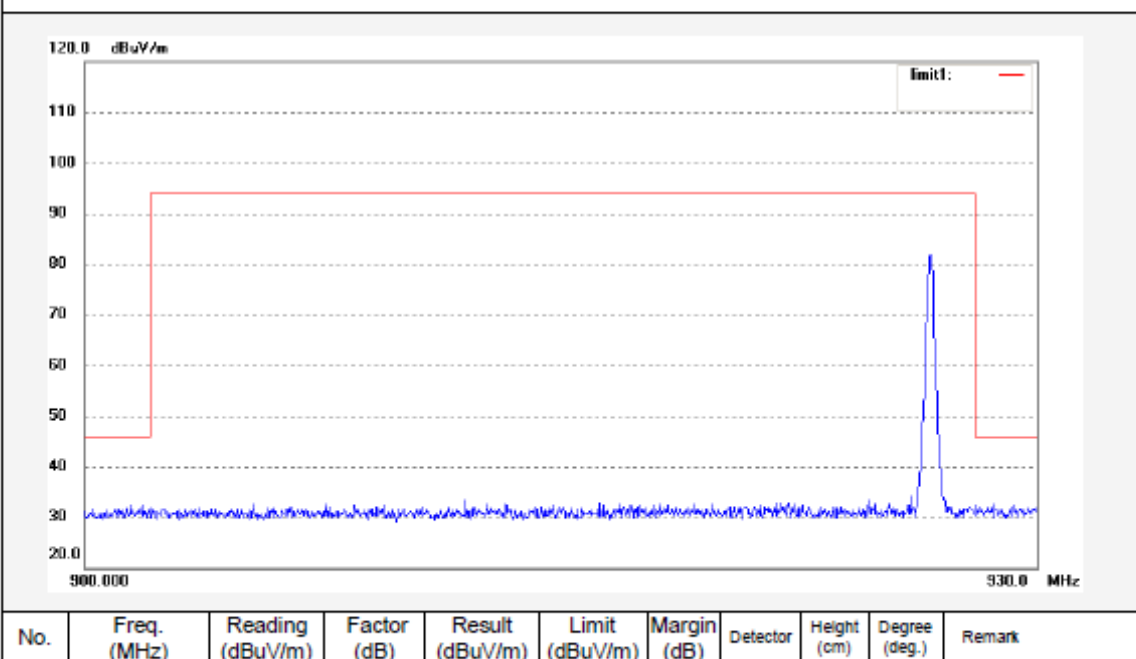
Date: 2011/10/15

Time: 11:04:35

Engineer Signature: Kai

Distance: 3m

Note: Report No.:ATE20112123




ACCURATE TECHNOLOGY CO., LTD.

 F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
 Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 966 chamber

Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: Kai #1060

Standard: FCC 900MHz Band Edge

Test item: Radiation Test

Temp.(C)/Hum.(%) 24 C / 48 %

EUT: 900MHZ wireless transmitter

Mode: TX Channel 39

Model: FW900WT

Manufacturer: Mangrove Technology Co.,Ltd

Polarization: Vertical

Power Source: AC 120V/60Hz

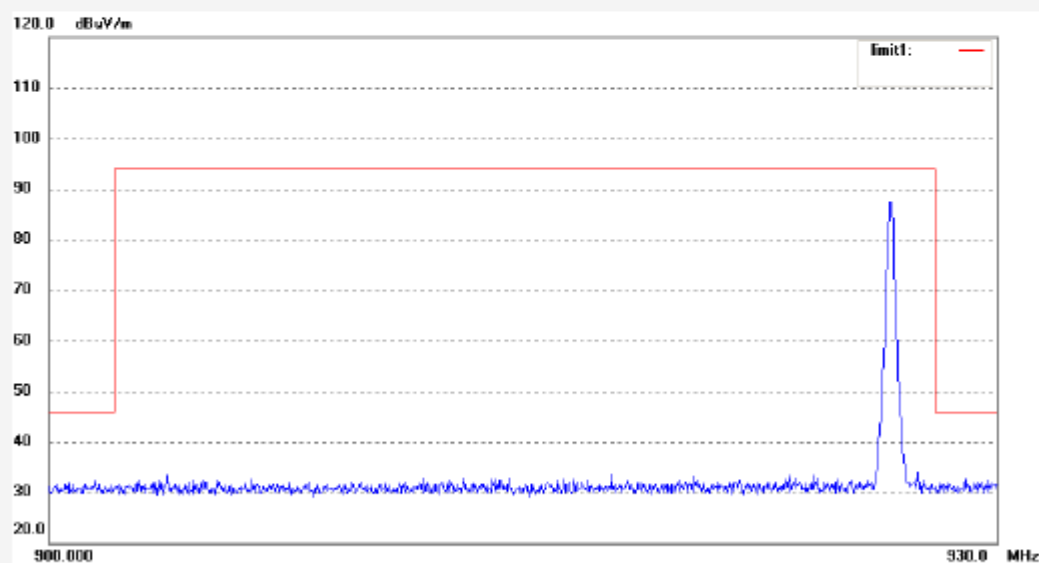
Date: 2011/10/15

Time: 11:05:51

Engineer Signature: Kai

Distance: 3m

Note: Report No.:ATE20112123



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
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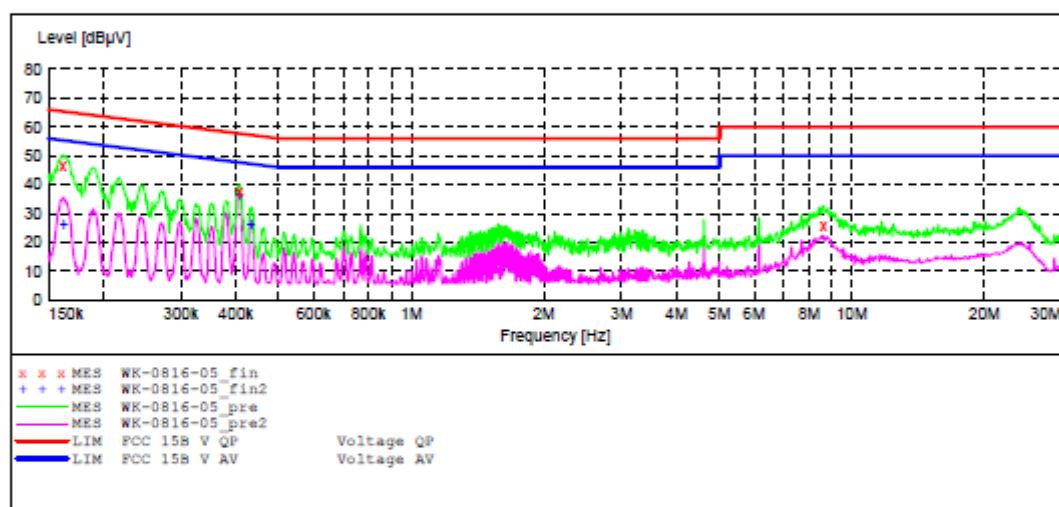
ACCURATE TECHNOLOGY CO., LTD

CONDUCTED EMISSION STANDARD FCC PART 15 B

EUT: 900MHz wireless transmitter M/N:FW900WT
 Manufacturer: Mangrove
 Operating Condition: TX Channel 19
 Test Site: 1#Shielding Room
 Operator: Kai
 Test Specification: L 120V/60Hz
 Comment: Mains port
 Report No.: ATE20112123

SCAN TABLE: "V 150K-30MHz fin"

Short Description: _SUB_STD_VTERM2 1.70
 Start Stop Step Detector Meas. IF Transducer
 Frequency Frequency Width Time Bandw.
 150.0 kHz 30.0 MHz 0.8 % QuasiPeak 1.0 s 9 kHz NSLK8126 2008
 Average



MEASUREMENT RESULT: "WK-0816-05_fin"

10/17/2011 5:21PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.161820	46.40	11.1	65.4	19.0	QP	L1	GND
0.406930	37.60	11.8	57.7	20.1	QP	L1	GND
8.626006	25.50	11.3	60	34.5	QP	L1	GND

MEASUREMENT RESULT: "WK-0816-05_fin2"

10/17/2011 5:21PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.162467	31.10	11.1	55.3	24.2	AV	L1	GND
0.406930	36.50	11.8	47.7	11.2	AV	L1	GND
0.432041	26.60	11.9	47.2	20.6	AV	L1	GND

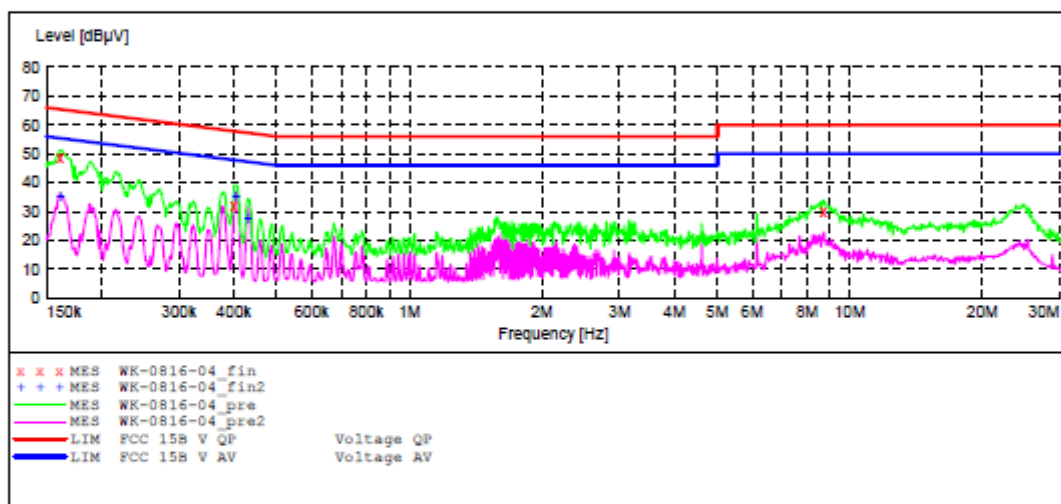
ACCURATE TECHNOLOGY CO., LTD

CONDUCTED EMISSION STANDARD FCC PART 15 B

EUT: 900MHz wireless transmitter M/N:FW900WT
 Manufacturer: Mangrove
 Operating Condition: TX Channel 19
 Test Site: 1#Shielding Room
 Operator: Kai
 Test Specification: N 120V/60Hz
 Comment: Mains port
 Report No.: ATE20112123

SCAN TABLE: "V 150K-30MHz fin"

Short Description: _SUB_STD_VTERM2 1.70
 Start Stop Step Detector Meas. IF Transducer
 Frequency Frequency Width Time Bandw.
 150.0 kHz 30.0 MHz 0.8 % QuasiPeak 1.0 s 9 kHz NSLK8126 2008
 Average



MEASUREMENT RESULT: "WK-0816-04_fin"

10/17/2011 5:17PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.161175	48.80	11.1	65.4	16.6	QP	N	GND
0.400483	32.20	11.8	57.8	25.6	QP	N	GND
8.695152	30.20	11.3	60	29.8	QP	N	GND

MEASUREMENT RESULT: "WK-0816-04_fin2"

10/17/2011 5:17PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.161175	35.20	11.1	55.4	20.2	AV	N	GND
0.403694	35.60	11.8	47.8	12.2	AV	N	GND
0.430320	28.10	11.9	47.2	19.1	AV	N	GND