



# TEST REPORT

Report Reference No..... : TRE15090055 R/C.....:65253  
FCC ID..... : M7N-BW8510  
Applicant's name..... : Remotec Technology Ltd  
Address..... : Workshop No. 2, 2 nd Fl, Blk B, Tonic Industrial Centre, 19 Lam Hing St, Kowloon Bay, HK  
Manufacturer..... : Remotec Technology Ltd  
Address..... : Workshop No. 2, 2 nd Fl, Blk B, Tonic Industrial Centre, 19 Lam Hing St, Kowloon Bay, HK  
Test item description ..... : ZRC-90US Scene Master  
Trade Mark ..... : -  
Model/Type reference..... : BW8510US  
Listed Model(s) ..... : BW8510NA, BW8511US, BW8511NA, BW8500US, BW8500NA, RMZ3103  
Standard ..... : FCC CFR Title 47 Part 15 Subpart C Section 15.249  
Date of receipt of test sample..... : Sept 17, 2015  
Date of testing..... : Sept 18,2015- Sept 28,2015  
Date of issue..... : Sept 29,2015  
Result..... : PASS

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Jerry Wang

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Hans Hu

Testing Laboratory Name ..... : Shenzhen Huatongwei International Inspection Co., Ltd

Address..... : Keji Nan No.12 Road, Hi-tech Park, Shenzhen, China

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*The test report merely corresponds to the test sample.  
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.*

## Contents

<b><u>1.</u></b>	<b><u>TEST STANDARDS AND TEST DESCRIPTION</u></b>	<b><u>3</u></b>
1.1.	Test Standards	3
1.2.	Test Description	3
<b><u>2.</u></b>	<b><u>SUMMARY</u></b>	<b><u>4</u></b>
2.1.	Client Information	4
2.2.	Product Description	4
2.3.	EUT operation mode	4
2.4.	EUT configuration	4
2.5.	Modifications	4
<b><u>3.</u></b>	<b><u>TEST ENVIRONMENT</u></b>	<b><u>5</u></b>
3.1.	Test Facility	5
3.2.	Environmental conditions	6
3.3.	Statement of the measurement uncertainty	6
3.4.	Equipments Used during the Test	7
<b><u>4.</u></b>	<b><u>TEST CONDITIONS AND RESULTS</u></b>	<b><u>8</u></b>
4.1.	Antenna requirement	8
4.2.	AC Power Conducted Emission	9
4.3.	Radiated Emission	10
4.4.	20dB Bandwidth	15
4.5.	Outside of Band Emission	16

## 1. TEST STANDARDS AND TEST DESCRIPTION

### 1.1. Test Standards

The tests were performed according to following standards:

[FCC Rules Part 15.249](#): Operation within the bands 902-928 MHz, 2400-2483.5 MHz, 5725-5875 MHz, and 24.0-24.25 GHz.

[ANSI C63.10-2013](#): American National Standard for Testing Unlicensed Wireless Devices.

### 1.2. Test Description

Test Item	Section in CFR 47	Result
Conducted Emissions	15.207	N/A
Radiated Emissions	15.249(a)/15.209/15.205(a)	PASS
20dB Bandwidth	15.215(c)	PASS
Outside of Band Emission	15.249/15.205/15.209	PASS

Remark: The measurement uncertainty is not included in the test result.

## 2. SUMMARY

### 2.1. Client Information

Applicant:	Remotec Technology Ltd
Address:	Workshop No. 2, 2 nd Fl, Blk B, Tonic Industrial Centre, 19 Lam Hing St, Kowloon Bay, HK
Manufacturer:	Remotec Technology Ltd
Address:	Workshop No. 2, 2 nd Fl, Blk B, Tonic Industrial Centre, 19 Lam Hing St, Kowloon Bay, HK

### 2.2. Product Description

Name of EUT	ZRC-90US Scene Master
Trade Mark:	-
Model No.:	BW8510US
Listed Model(s):	BW8510NA, BW8511US, BW8511NA, BW8500US, BW8500NA, RMZ3103
Power supply:	DC3.0V AAx2
Adapter information:	/
Operation frequency:	908.42MHz
Channel number:	1
Antenna type:	Intergral Antenna
Antenna gain:	0dBi

### 2.3. EUT operation mode

The EUT has been tested under typical operating condition. The Applicant provides software to control the EUT for staying in continuous transmitting mode for testing.

### 2.4. EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

- - supplied by the manufacturer
- - supplied by the lab

○ PowerCable	Length (m) :	/
	Shield :	/
	Detachable :	/
○ Multimeter	Manufacturer :	/
	Model No. :	/

### 2.5. Modifications

No modifications were implemented to meet testing criteria.

### **3. TEST ENVIRONMENT**

Laboratory: Shenzhen Huatongwei International Inspection Co., Ltd. (Gongming)

Address: Bldg3, Hongfa Hi-tech Industrial Park, Genyu Road, Shenzhen, China

Phone: 86-755-26748019 Fax: 86-755-26748089

#### **3.1. Test Facility**

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

##### **CNAS-Lab Code: L1225**

Shenzhen Huatongwei International Inspection Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories, Date of Registration: February 28, 2015. Valid time is until February 27, 2018.

##### **A2LA-Lab Cert. No. 2243.01**

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing. Valid time is until Sept 30, 2015.

##### **FCC-Registration No.: 662850**

Shenzhen Huatongwei International Inspection Co., 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 662850, Renewal date April. 24, 2015, valid time is until April. 24, 2018.

##### **FCC-Registration No.: 317478**

Shenzhen Huatongwei International Inspection Co., Ltd. (Gongming 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 317478, Renewal date July 18, 2014, valid time is until July. 18, 2017.

##### **IC-Registration No.: 5377A**

The 3m Alternate Test Site of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 5377A on Dec. 31, 2013, valid time is until Dec. 31, 2016.

##### **IC-Registration No.: 5377B**

The 3m Alternate Test Site of Shenzhen Huatongwei International Inspection Co., Ltd. (Gongming EMC Laboratory) has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 5377B on September 3, 2014, valid time is until September 3, 2017.

##### **ACA**

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory can also perform testing for the Australian C-Tick mark as a result of our A2LA accreditation.

##### **VCCI**

The 3m Semi-anechoic chamber (12.2m×7.95m×6.7m) of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-2484. Date of Registration: Dec. 20, 2012. Valid time is until Dec. 29, 2015.

Radiated disturbance above 1GHz measurement of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-292. Date of Registration: Dec. 24, 2013. Valid time is until Dec. 23, 2016.

Main Ports Conducted Interference Measurement of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: C-2726. Date of Registration: Dec. 20, 2012. Valid time is until Dec. 19, 2015.

Telecommunication Ports Conducted Interference Measurement of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: T-1837. Date of Registration: May 07, 2013. Valid time is until May 06, 2016.

##### **DNV**

Shenzhen Huatongwei International Inspection Co., Ltd. has been found to comply with the requirements of DNV towards subcontractor of EMC and safety testing services in conjunction with the EMC and Low voltage Directives and in the voluntary field. The acceptance is based on a formal quality Audit and follow-ups according to relevant parts of ISO/IEC Guide 17025 (2005), in accordance with the requirements of the DNV Laboratory Quality Manual towards subcontractors. Valid time is until Aug. 24, 2016.

### 3.2. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15~35°C
Relative Humidity:	30~60 %
Air Pressure:	950~1050mba

### 3.3. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report according to TR-100028-01 "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 1" and TR-100028-02 "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 2" and is documented in the Shenzhen Huatongwei International Inspection Co., Ltd quality system according to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Shenzhen Huatongwei laboratory is reported:

Test Items	Measurement Uncertainty	Notes
Transmitter power conducted	0.57 dB	(1)
Transmitter power Radiated	2.20 dB	(1)
Conducted spurious emission 9KHz-40 GHz	1.60 dB	(1)
Radiated spurious emission 9KHz-40 GHz	2.20 dB	(1)
Conducted Emission 9KHz-30MHz	3.39 dB	(1)
Radiated Emission 30~1000MHz	4.24 dB	(1)
Radiated Emission 1~18GHz	5.16 dB	(1)
Radiated Emission 18-40GHz	5.54 dB	(1)
Occupied Bandwidth	-----	(1)

- (1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k=1.96$ .

### 3.4. Equipments Used during the Test

Occupied Bandwidth					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Spectrum Analyzer	AGILENT	E4407B	MY44210775	2014/11/01
2	Climate Chamber	ESPEC	EL-10KA	05107008	2014/11/01
3	Spectrum Analyzer	Rohde&Schwarz	FSP40	1164.4391.40	2014/11/01

Transmitter spurious emissions&Outside of Band Emission					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI TEST RECEIVER	Rohde&Schwarz	ESI 26	100009	2014/11/01
2	RF TEST PANEL	Rohde&Schwarz	TS / RSP	335015/0017	N/A
3	EMI TEST SOFTWARE	Rohde&Schwarz	ESK1	N/A	N/A
4	High pass filter	Compliance Direction systems	BSU-6	34202	2014/11/01
5	Ultra-Broadband Antenna	ShwarzBeck	VULB9163	538	2014/11/01
6	Ultra-Broadband Antenna	ShwarzBeck	VULB9163	539	2014/11/01
7	HORNANTENNA	ShwarzBeck	9120D	1011	2014/11/01
8	HORNANTENNA	ShwarzBeck	9120D	1012	2014/11/01
9	TURNTABLE	MATURO	TT2.0	----	N/A
10	ANTENNA MAST	MATURO	TAM-4.0-P	----	N/A
11	EMI TEST SOFTWARE	Audix	E3	N/A	N/A

The Cal.Interval was one year

## **4. TEST CONDITIONS AND RESULTS**

### **4.1. Antenna requirement**

#### **Requirement**

##### **FCC CFR Title 47 Part 15 Subpart C 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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

##### **Refer to statement below for compliance.**

The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. Further, this requirement does not apply to intentional radiators that must be professionally installed.

#### **Test Result:**

The antenna is integral antenna, the best case gain of the antenna is 0dBi



## 4.2. AC Power Conducted Emission

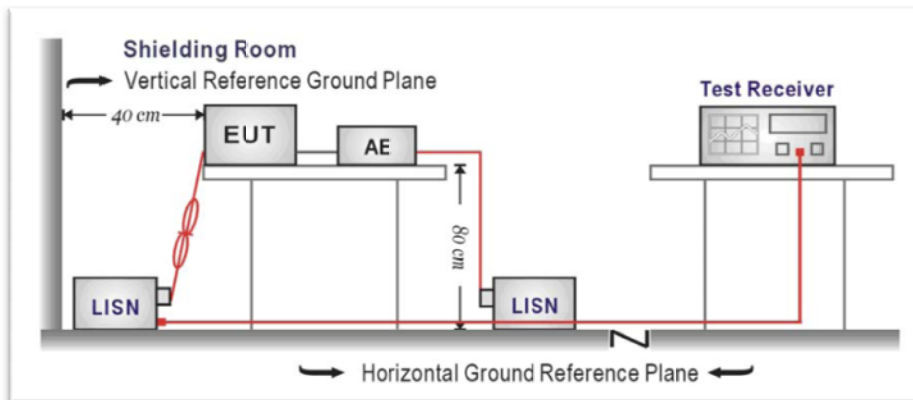
### LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.207

Frequency range (MHz)	Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

\* Decreases with the logarithm of the frequency.

### TEST CONFIGURATION



### TEST PROCEDURE

1. The EUT was setup and tested according to ANSI C63.10:2013 for compliance to FCC 47CFR 15.249 requirements.
2. The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface.
3. The EUT and simulators are connected to the main power through a line impedance stabilization network (LISN). The LISN provides a 50 ohm / 50uH coupling impedance for the measuring equipment.
4. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs)
5. Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source.
6. The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.
7. Conducted emissions were investigated over the frequency range from 0.15 MHz to 30 MHz using a receiver bandwidth of 9 kHz.

### TEST RESULTS

**Not applicable to this device.**

### 4.3. Radiated Emission

#### LIMIT

#### Field strength of emissions from intentional radiators

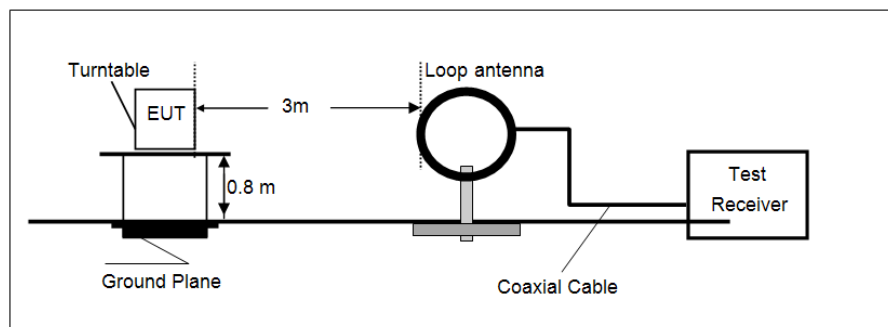
Fundamental Frequency (MHz)	Field strength of fundamental (millivolts/meter)	Field strength of harmonics (microvolts/meter)
902 - 928	50	500

#### Unintentional radiators

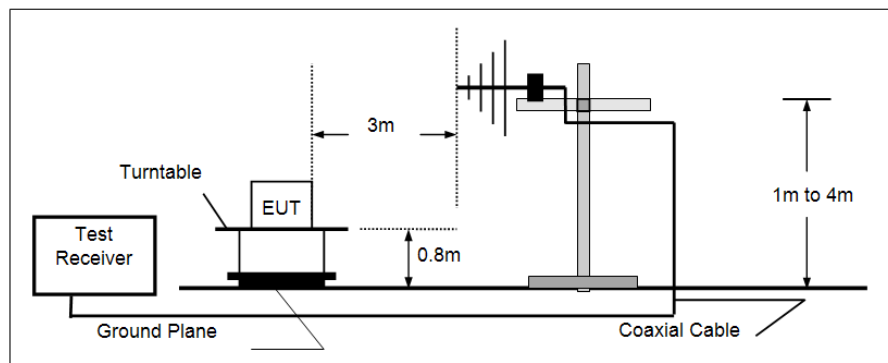
Frequency (MHz)	Distance(Meters)	Radiated(dB $\mu$ V/m)	Radiated( $\mu$ V/m)
30-88	3	40.0	100
88-216	3	43.5	150
216-960	3	46.0	200
Above 960	3	54.0	500

#### TEST CONFIGURATION

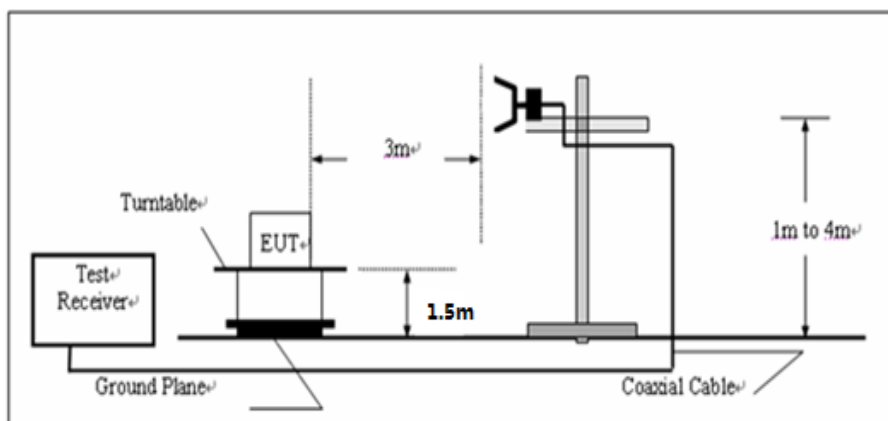
Below 30MHz



30MHz~1000MHz



Above 1GHz



**TEST PROCEDURE**

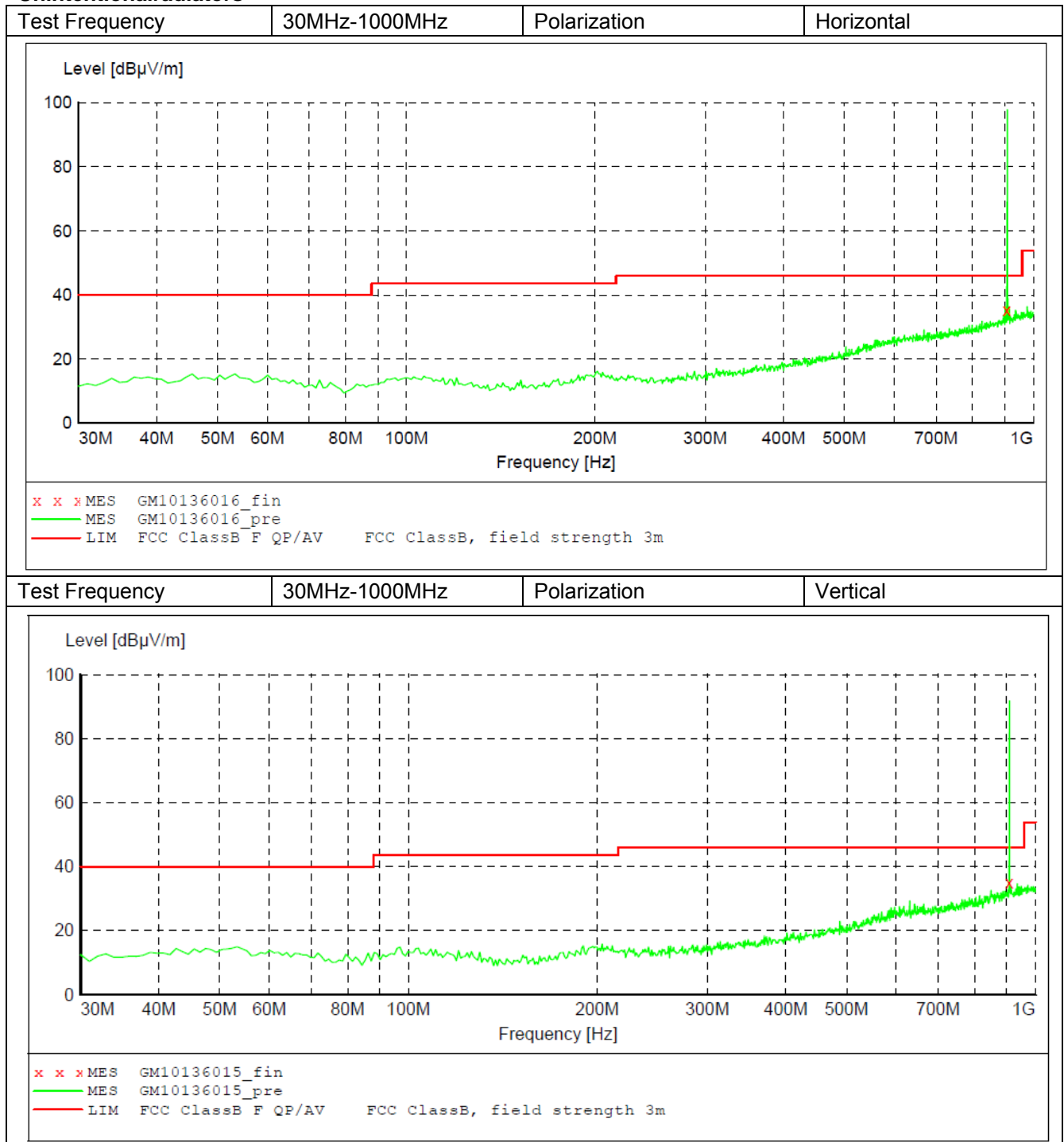
1. The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.
2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
3. The antenna 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 polarizations 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 rotating table was turned from 0 degrees to 360 degrees to find the maximum reading.
5. Use the following spectrum analyzer settings
  - a) Span shall wide enough to fully capture the emission being measured;
  - b) Below 1GHz, RBW=120KHz, VBW=300KHz, Sweep=auto, Detector function=peak, Trace=max hold;  
*If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.*
  - c) Above 1GHz, RBW=1MHz, VBW=3MHz, Detector function=peak for Peak value  
RBW=1MHz, VBW=10Hz, Detector function=peak for Average value.

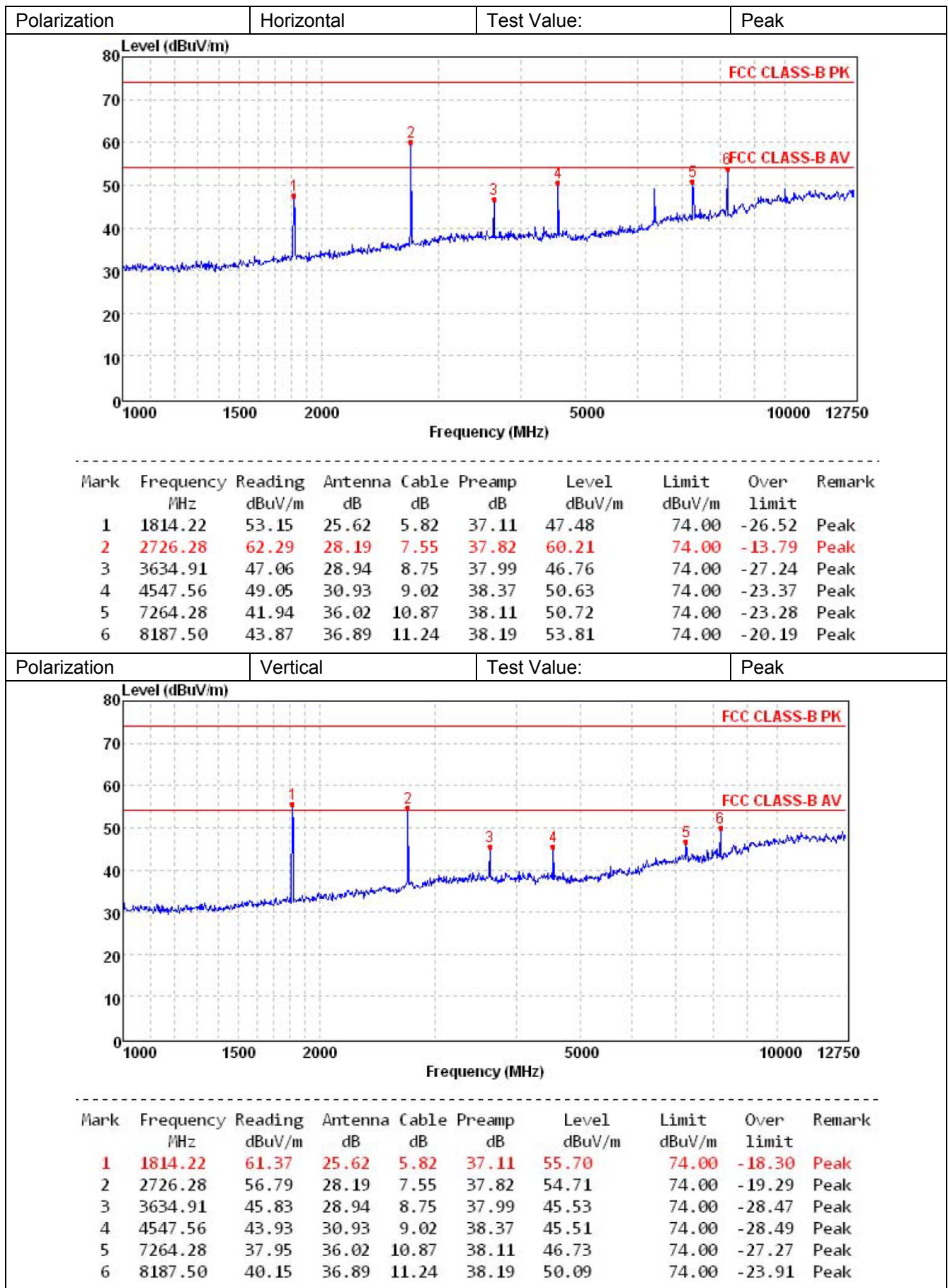
**TEST RESULTS**

Note: Duty cycle=100%, duty factor =1.

**Field strength of emissions from intentional radiators**

Frequency (MHz)	Reading (dBuv/m)	Antenna factor (dB)	Cable loss (dB)	Preamplifier factor (dB)	Level (dBuv/m)	Limit (dBuv/m)	Over limit	Remark	Polarization
908.45	66.09	22.61	3.62	0.00	92.32	94.00	-1.68	QP	Horizontal
908.45	61.15	22.61	3.62	0.00	87.38	94.00	-6.62	QP	Vertical

**Unintentionalradiators**



Polarization		Horizontal		Test Value:		Average	
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Mark	Frequency MHz	Reading dBUV/m	Antenna dB	Cable dB	Preamp dB	Level dBUV/m	Limit dBUV/m	Over limit	Remark
1	1814.22	47.30	25.62	5.82	37.11	41.63	54.00	-12.37	Average
2	2726.28	49.75	28.19	7.55	37.82	47.67	54.00	-6.33	Average
3	3634.91	33.12	28.94	8.75	37.99	32.82	54.00	-21.18	Average
4	4547.56	32.62	30.93	9.02	38.37	34.20	54.00	-19.80	Average
5	6363.65	26.82	34.56	10.18	37.96	33.60	54.00	-20.40	Average
6	8187.50	25.87	36.89	11.24	38.19	35.81	54.00	-18.19	Average

Polarization		Vertical		Test Value:		Average	
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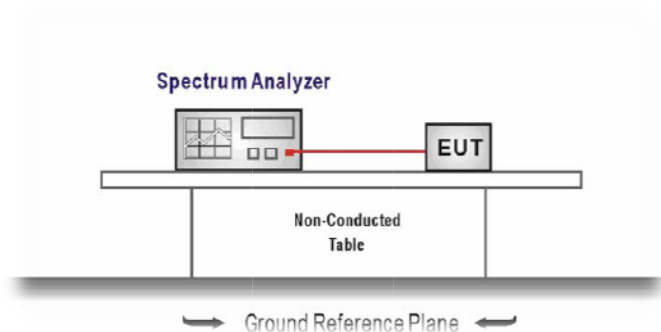
Mark	Frequency MHz	Reading dBUV/m	Antenna dB	Cable dB	Preamp dB	Level dBUV/m	Limit dBUV/m	Over limit	Remark
1	1814.22	52.14	25.62	5.82	37.11	46.47	54.00	-7.53	Average
2	2726.28	45.30	28.19	7.55	37.82	43.22	54.00	-10.78	Average
3	3634.91	31.83	28.94	8.75	37.99	31.53	54.00	-22.47	Average
4	4547.56	32.18	30.93	9.02	38.37	33.76	54.00	-20.24	Average
5	7264.28	23.51	36.02	10.87	38.11	32.29	54.00	-21.71	Average
6	8187.50	23.16	36.89	11.24	38.19	33.10	54.00	-20.90	Average

#### 4.4. 20dB Bandwidth

##### LIMIT

N/A

##### TEST CONFIGURATION

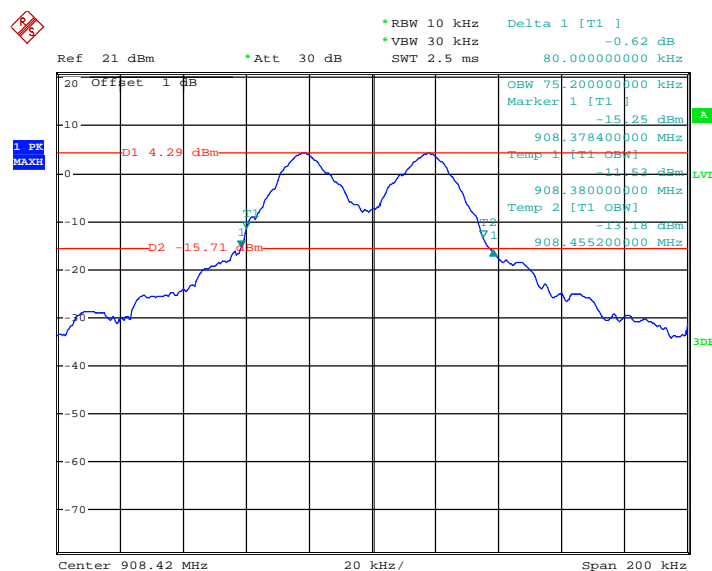


##### TEST PROCEDURE

1. The transmitter output was connected to the spectrum analyzer through an attenuator.
2. The bandwidth of the fundamental frequency was measured by spectrum analyzer with  $RBW \geq 1\%$  of the 20 dB bandwidth and  $VBW \geq RBW$ .
3. The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

##### TEST RESULTS

Channel Frequency (MHz)	20dB Bandwidth (KHz)	Limit (MHz)	Result
908.42	80	N/A	PASS



Date: 28.OCT.2015 14:12:39



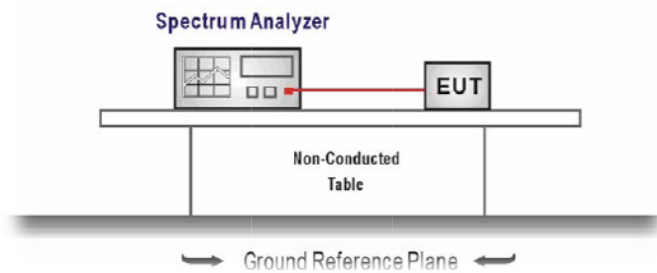
## 4.5. Outside of Band Emission

### LIMIT

FCC Part15.249(d):

Emissions 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 §15.209, whichever is the lesser attenuation.

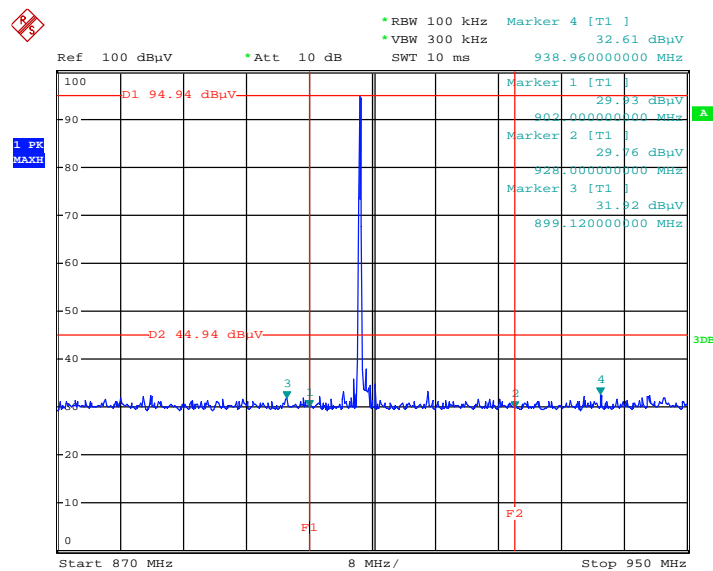
### TEST CONFIGURATION



### TEST PROCEDURE

1. The transmitter output was connected to the spectrum analyzer through an attenuator.
2. The bandwidth of the fundamental frequency was measured by spectrum analyzer with RBW=100KHz, VBW=300KHz
3. Record the level of 902MHz and 928MHz.

### TEST RESULTS



Date: 28.SEP.2015 15:59:08

.....End of Report.....