FCC COMPLIANCE REPORT

for

Shenzhen Chuangjiexing Electronics

Transmitter for Wireless Remote Switch

Model Number: 28070S,28072S,28064S

Prepared for : Shenzhen Chuangjiexing Electronics
Address : 3/F., Bldg. A6, Laodong 1st Industrial Zone, XiXiang, BaoAn, SHENZHEN, CHINA

Prepared By : NS Technology Co., Ltd.
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Report Number : NSE-F09073489
Date of Test : Jun. 28~Jul. 9, 2009
Date of Report : Jul. 10, 2009

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NS Technology Co., Ltd.

Applicant: **Address:**	Shenzhen Chuangjiexing Electronics 3/F., Bldg. A6, Laodong 1st Industrial Zone, XiXiang, BaoAn, SHENZHEN, CHINA		
Manufacturer: **Address:**	Shenzhen Chuangjiexing Electronics 3/F., Bldg. A6, Laodong 1st Industrial Zone, XiXiang, BaoAn, SHENZHEN, CHINA		
E.U.T:	Transmitter for Wireless Remote Switch		
Model Number:	28070S,28072S,28064S		
Trade Name:	-----	**Operating Frequency:**	433.92MHz
Date of Receipt:	Jun. 27, 2009	**Date of Test:**	Jun. 28~Jul. 9, 2009
Test Specification:	FCC Part 15 Subpart C: July. 10, 2008 ANSI C63.4:2003		
Test Result:	The equipment under test was found to be compliance with the requirements of the standards applied. **Issue Date: Jul. 10,2009**		

Tested by:	Reviewed by:	Approved by:
Jade	Iceman	Steven
Jade/ Engineer	Iceman Hu / Supervisor	Steven Lee / Manager

Other Aspects:

None.

Abbreviations: OK/P=passed fail/F=failed n.a/N=not applicable E.U.T=equipment under tested

1. GENERAL PRODUCT INFORMATION

1.1. Product Function

The EUT is used to transmit control command only. The operation frequency is 433.92MHz. Press the button on remote transmitter, Please refer to the user's manual for the details.

1.2. Description of Device (EUT)

E.U.T.	:	Transmitter for Wireless Remote Switch
Model No.	:	28064S
Operating Frequency	:	433.92MHz
Number of Channels	:	1 Channels
Type of Modulation	:	ASK
Antenna Type	:	Integral
System Input Voltage	:	Nominal Voltage: DC 3V(Battery)
Temperature Range(Operating)	:	0 ~+ 40℃

1.3. Difference between Model Numbers

***Note**: This product are different only for the number of keys, no antenna. but the appearance and the circuit board are identical.*

1.4. Independent Operation Modes

The basic operation modes are:

1.3.1. TX Mode

2. TEST SITES

2.1. Test Facilities

EMC Lab : Certificated by TUV Rheinland, Germany.
Date of registration: July 28, 2003

Certificated by FCC, USA
Registration No.: 502831
Date of registration: February 09, 2009

Certificated by VCCI, Japan
Registration No.: R-2527 & C-2770
Date of registration: March 23, 2007

Certificated by CNAL, CHINA
Registration No.: L1744
Date of registration: November 25, 2004

Certificated by Intertek ETL SEMKO
Registration No.: TMP-013
Date of registration: June 11, 2005

Certificated by TUV/PS, Hong Kong
Date of registration: December 1, 2005

Certificated by Industry Canada
Registration No.: 5936A
Date of registration: March 4, 2009

Certificated by ATCB, America
Date of registration: August 03, 2006

Name of Firm : NS Technology Co., Ltd.

Site Location : Chenwu Industrial Zone, Houjie Town, Dongguan City, Guangdong, China

2.2. List of Test and Measurement Instruments

2.2.1.For radiated emission test (30MHz-1GHz, 10m Chamber)

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESVS10	841431/004	Jan.19, 09	Jan.19,10
Spectrum Analyzer	HP	E7405A	MY45118807	May 31,09	May 31,10
Bilog Antenna	Teseq	CBL 6111D	25758	Oct. 15,08	Oct. 15,09
Signal Amplifier	Agilent	8447D	2944A11174	Jan.19,09	Jan.19,10
50Ω Coaxial Switch	ANRITSU	MP59B	6200530579	Jan.19,09	Jan.19,10
RF Cable	IMRO	IMRO-400	10m Cable 1#10m	Jan.19,09	Jan.19,10
RF Cable	IMRO	IMRO-400	10m Cable 1#3m	Jan.19,09	Jan.19,10
RF Cable	DRAKA	M17/84-RG223	10m Cable 3#	Jan.19,09	Jan.19,10

2.2.2.For radiated emission test(1GHz-18GHz)

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Spectrum Analyzer	HP	8593E	3448U00806	May 31,09	May 31,10
Horn Antenna	EMCO	3117	00062558	Jan. 19,09	Jan. 19,11
Signal Amplifier	BURGEON	PEC-38-30M18G -12-SFF	NSEMC001	May 31,09	May 31,11
RF Cable	DRAKA	M06/25-RG102	966Cable 3#24G	May 2,09	May 2,10

2.2.3.For 20dB bandwidth test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Spectrum Analyzer	Agilent	E411B	US39240290	Jan.9,09	Jan.9,10

2.2.4.For Deactivate time&Duty cycle test

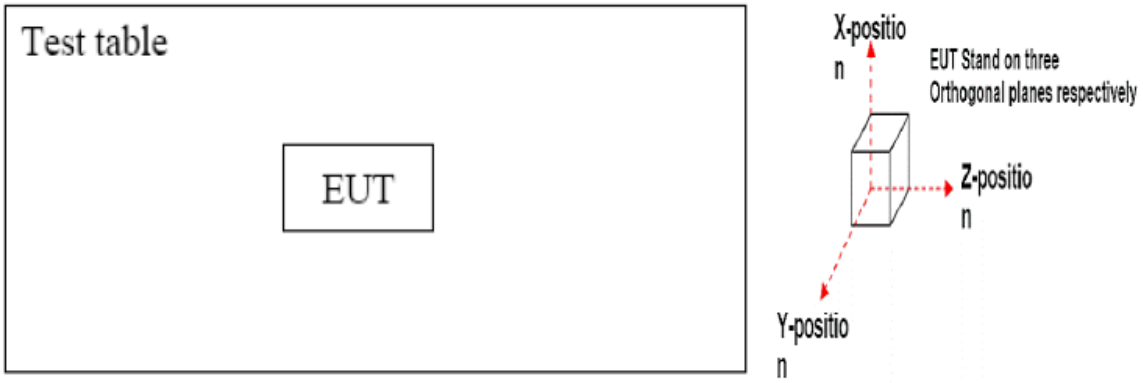
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Spectrum Analyzer	Agilent	E411B	US39240290	Jan.9,09	Jan.9,10

3. TEST SET-UP AND OPERATION MODES

3.1. Principle of Configuration Selection

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

3.2. Block Diagram of Test Set-up



(EUT: Transmitter for Wireless Remote Switch)

***Note**: We test X-axis, Y-axis, and Z-axis,. The Y-axis is the worst mode, so only the worst mode test data was included in the report.*

3.3. Test Operation Mode and Test Software

Refer to clause 1.4

3.4. Special Accessories and Auxiliary Equipment

None.

3.5. Countermeasures to Achieve EMC Compliance

None.

4. TEST SUMMARY

Test Items and Result Lists

No.	Item	Specification	Results
1	Conducted emissions	FCC Part15.207	N/A
2	Radiated emissions	FCC Part 15.231(b)	PASS
3	20dB Occupied Bandwidth	FCC Part 15.231(c)	PASS
4	Deactivate time	FCC Part 15.231(a)	PASS

Note: N/A is an abbreviation for Not Applicable.

5. EMISSION TEST RESULTS

5.1. Conducted Emissions

According to paragraph(f) of FCC Part 15 Section 15.207, measurements to demonstrate compliance with the conducted limits are not required for devices which only employ battery power for operation, and which do not operate from the AC power lines or contain provision for operation while connected to the AC power.

5.2. Radiated emissions

5.2.1. Applied Standard

According to 15.231(b), the field strength of emissions from intentional radiators operated under this Section shall not exceed the following:

Fundamental Frequencies (MHz)	Field strength of Fundamental (uV/meter at 3m)	Unwanted emissions (uV/meter at 3m)
40.66-40.70	2250	225
70-130	1250(470nW)	125
130-174	1250 to 3750**	125 to 375**
174-260	3750(4.2uW)	375
260-470	3750 to 12500**	375 to 1250**
Above470	12500(47uW)	1250

**Linear interpolation with frequency F in MHz
For the band 130-174MHz: Field strength=56.81818(F)-6136.3636
For the band 260-470MHz: Field strength=41.6667(F)-7083.3333
The maximum permitted unwanted emissions level is 20dB below the maximum permitted fundamental level

The field strength of spurious emissions which appear outside of this band shall not exceed the general radiated emission limits in Section 15.209 as following:

Frequencies (MHz)	Field strength uV/meter	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

According to 15.35(b), for frequencies above 1000MHz,the field strength limits are based on average detector, however,the peak field strength of any emission shall not exceed the maximum permitted average limits,specified above by more than 20dB under any condition fo modulation.

5.2.2. Test procedure

The EUT was placed on a turn table which was 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was set 3 meters away from the receiving antenna which was mounted on a antenna tower. At the frequency band of 30MHz to 1GHz,The measuring antenna moved up and down to find out the maximum emission level. It moved from 1 to 4 m for horizontal and vertical polarizations. The broadband antenna (calibrated by dipole antenna) was used as a receiving antenna. At the frequency band of 1GHz to 5GHz,The measuring antenna moved from 1 to 4 m for horizontal and vertical polarization. The horn antenna was used as a receiving antenna.

The resolution bandwidth and video bandwidth of the test receiver was 120 KHz and 300KHz for Quasi-peak detection at frequency below 1GHz.

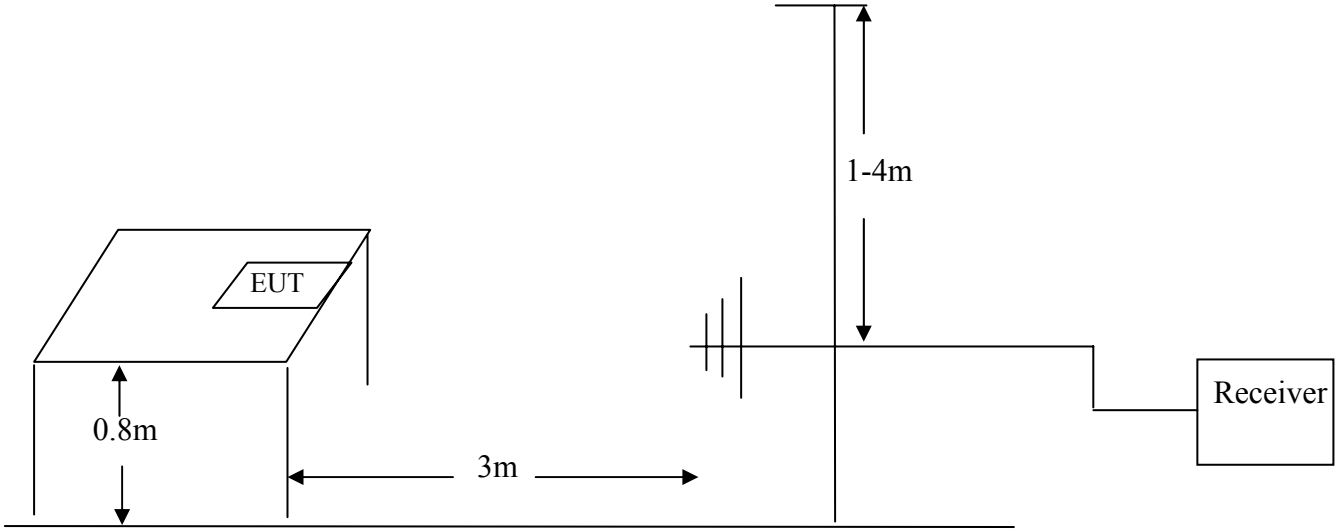
The resolution bandwidth and video bandwidth of the test receiver was1MHz and 1MHz for Peak detection at frequency above 1GHz.

The EUT position(X.-axis, Y-axis, Z-axis) were checked and worse case was happened in Y-axis position.So Y-axis position was chose for find measurement.

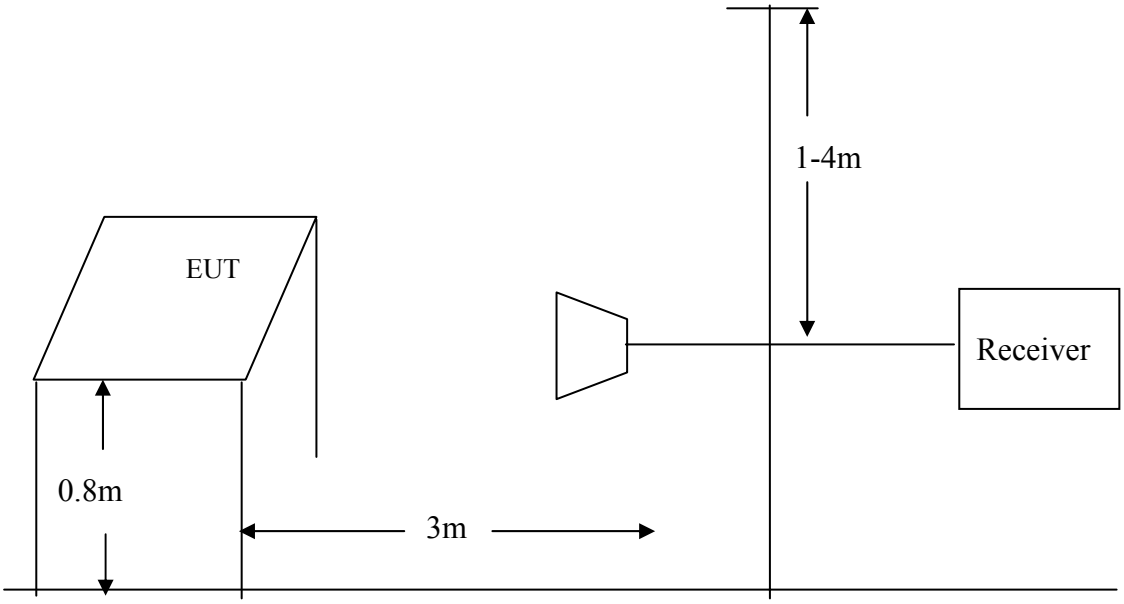
The EUT was tested in Chamber Site.

5.2.3. Test Setup Diagram

For frequency range: 30MHz-1000MHz



For frequency range: 1 GHz -5GHz



5.2.4. Test result

Pass.

Test Data (worst mode: Y-axis)

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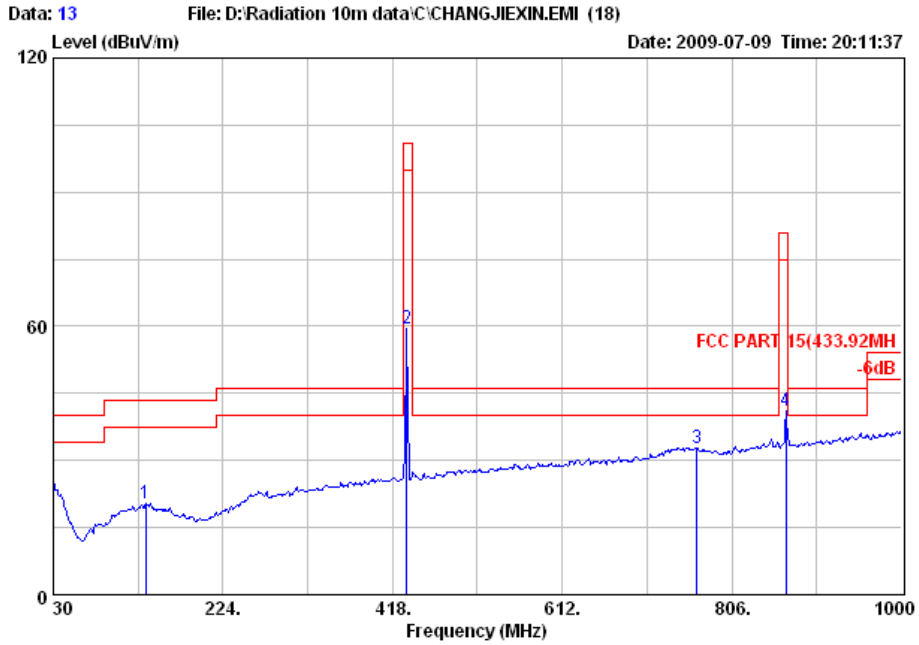


```
Test Site      : 10m Chamber
Limit          : FCC PART 15(433.92MH
Dis. / Ant.    : 3m   25758-3              Ant. Pol.: VERTICAL
EUT            : Transmitter for Wireless Remote Switch
M/N            : 28064S
Power          : DC 3V
Test Engineer  : Jade
Comment        : Temp.:25.2'C   Humi.:55%
Test Mode      : TX Mode
```

	Freq. (MHz)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Ant. Reading (dBuV)	Factor (dB/m)	Cable Loss (dB)	Remark
1	135.73	20.45	43.50	23.05	7.15	12.06	1.24	QP
2	433.92	59.37	100.80	41.43	39.85	17.27	2.25	Peak
3	766.23	32.92	46.00	13.08	6.83	23.01	3.08	QP
4	867.84	41.22	80.80	39.58	14.20	23.72	3.30	Peak

Remark:

1. Emission Level = Antenna Factor + Cable Loss + Meter Reading
2. Peak Limit=Average Limit+20dB
3. Test uncertainty: ±4.76dB at a level of confidence of 95%.

Fundamental and Harmonics Result					
Freq (MHz)	Peak Level (dB μ V/m)	PDCF(dB μ V/m) (See Section 5.4)	Average Level (dB μ V/m)	Limit(dB μ V/m) average	Conclusion
433.92	59.37	-10.95	48.42	80.8	PASS
867.84	41.22	-10.95	30.27	60.8	PASS

Test Data (worst mode: Y-axis)

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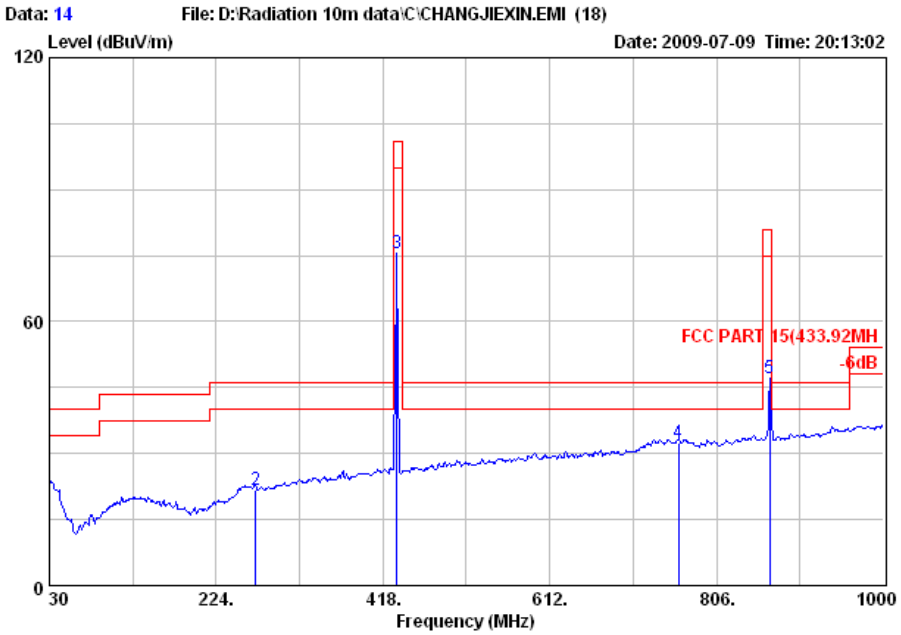


```
Test Site      : 10m Chamber
Limit          : FCC PART 15(433.92MH
Dis. / Ant.    : 3m   25758-3              Ant. Pol.: HORIZONTAL
EUT            : Transmitter for Wireless Remote Switch
M/N            : 28064S
Power          : DC 3V
Test Engineer  : Jade
Comment        : Temp.:25.2'C   Humi.:55%
Test Mode      : TX Mode
```

	Freq. (MHz)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Ant. Reading (dBuV)	Ant. Factor (dB/m)	Cable Loss (dB)	Remark
1	30.00	24.18	40.00	15.82	6.00	17.60	0.58	QP
2	269.53	21.88	46.00	24.12	7.00	13.10	1.78	QP
3	433.92	75.53	100.80	25.27	56.01	17.27	2.25	Peak
4	761.38	32.35	46.00	13.65	6.19	23.09	3.07	QP
5	867.84	47.02	80.80	33.78	20.00	23.72	3.30	Peak

Remark:
1. Emission Level = Antenna Factor + Cable Loss + Meter Reading
2. Peak Limit=Average Limit+20dB
3. Test uncertainty: ±4.76dB at a level of confidence of 95%.

Fundamental and Harmonics Result					
Freq (MHz)	Peak Level (dB μ V/m)	PDCF(dB μ V/m) (See Section 5.4)	Average Level (dB μ V/m)	Limit(dB μ V/m) average	Conclusion
433.92	75.53	-10.95	64.58	80.8	PASS
867.84	47.02	-10.95	36.07	60.8	PASS

Test Data (worst mode: Y-axis)

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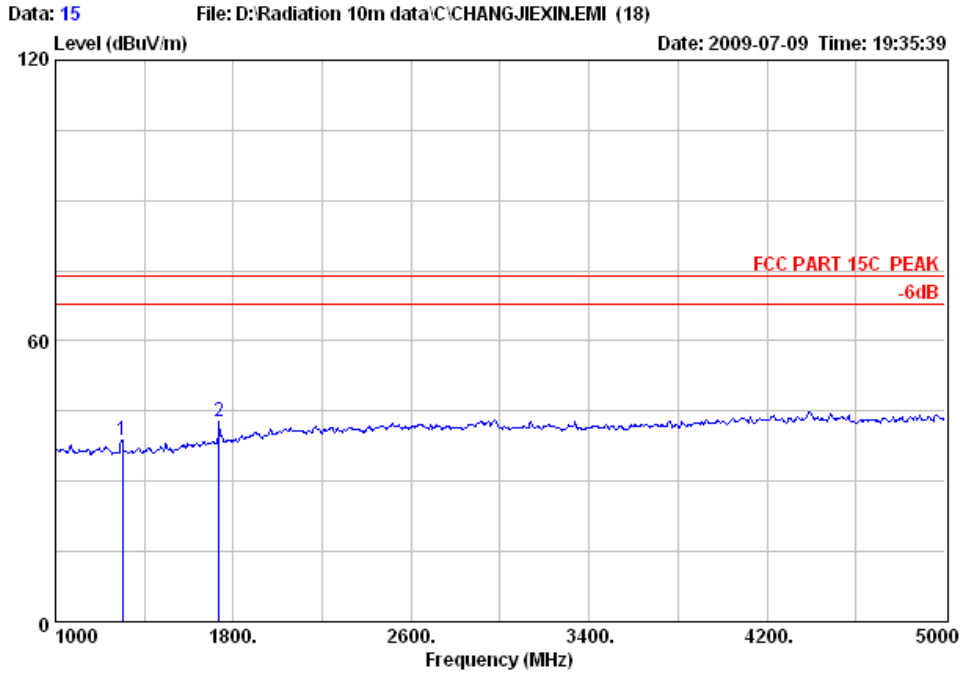


```
Test Site      : 10m Chamber
Limit          : FCC PART 15C  PEAK
Dis. / Ant.    : 3m   3117                Ant. Pol.: HORIZONTAL
EUT            : Transmitter for Wireless Remote Switch
M/N            : 28064S
Power          : DC 3V
Test Engineer  : Jade
Comment        : Temp.:25.2'C   Humi.:55%
Test Mode      : TX Mode
```

	Freq. (MHz)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Ant. Reading (dBuV)	Factor (dB/m)	Cable Loss (dB)	Remark
1	1301.76	38.94	74.00	35.06	9.30	27.51	2.13	Peak
2	1735.68	42.64	74.00	31.36	11.13	29.34	2.17	Peak

Remark:

1. Emission Level = Antenna Factor + Cable Loss + Meter Reading
2. Peak Limit=Average Limit+20dB
3. Test uncertainty: ±4.76dB at a level of confidence of 95%.

Fundamental and Harmonics Result					
Freq (MHz)	Peak Level (dB μ V/m)	PDCF(dB μ V/m) (See Section 5.4)	Average Level (dB μ V/m)	Limit(dB μ V/m) average	Conclusion
1301.76	38.94	-10.95	27.99	54.00	PASS
1735.68	42.64	-10.95	31.69	54.00	PASS

Test Data (worst mode: Y-axis)

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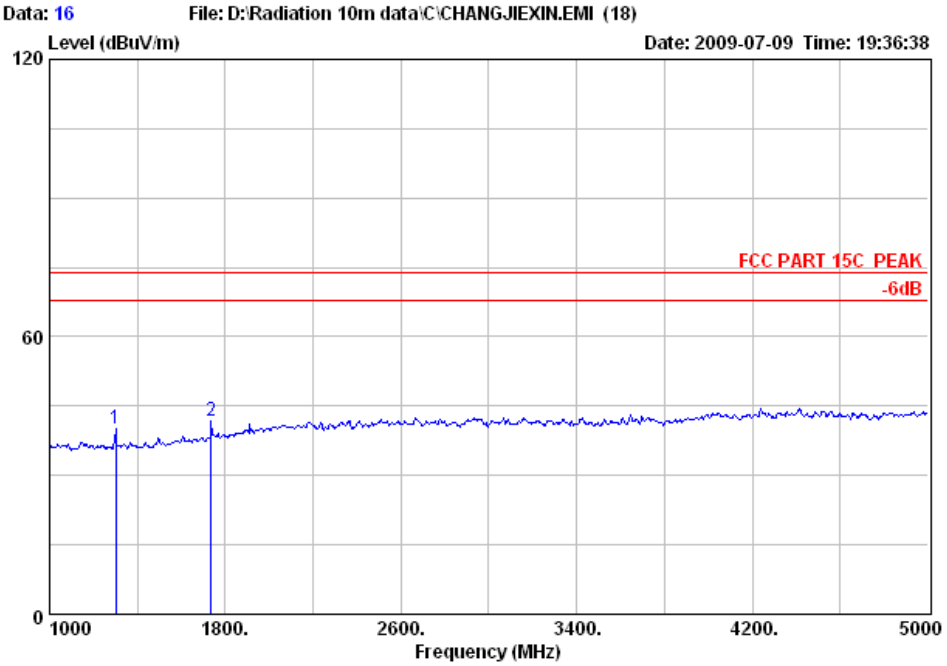



```
Test Site      : 10m Chamber
Limit          : FCC PART 15C  PEAK
Dis. / Ant.    : 3m   3117                Ant. Pol.: VERTICAL
EUT            : Transmitter for Wireless Remote Switch
M/N            : 28064S
Power          : DC 3V
Test Engineer  : Jade
Comment        : Temp.:25.2'C   Humi.:55%
Test Mode      : TX Mode
```

	Freq. (MHz)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Reading (dBuV)	Ant. Factor (dB/m)	Cable Loss (dB)	Remark
1	1301.76	39.98	74.00	34.02	10.34	27.51	2.13	Peak
2	1735.68	41.86	74.00	32.14	10.35	29.34	2.17	Peak

Remark:

1. Emission Level = Antenna Factor + Cable Loss + Meter Reading
2. Peak Limit=Average Limit+20dB
3. Test uncertainty: ±4.76dB at a level of confidence of 95%.

Fundamental and Harmonics Result					
Freq (MHz)	Peak Level (dB μ V/m)	PDCF(dB μ V/m) (See Section 5.4)	Average Level (dB μ V/m)	Limit(dB μ V/m) average	Conclusion
1301.76	39.98	-10.95	29.03	54.00	PASS
1735.68	41.86	-10.95	30.91	54.00	PASS

5.3. 20dB Occupied Bandwidth

5.3.1. Applied Standard

According to 15.231(c), The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.

5.3.2. Test procedure

Step 1: The EUT was placed on a table which is 0.8m above ground plane.
Step 2: EUT was set to transmit continuously.
Step 3: Set SA Center Frequency = fundamental frequency , RBW=100kHz,VBW=100kHz
Step 4:. Set SA trace max hold, then view.

5.3.3. Test Result

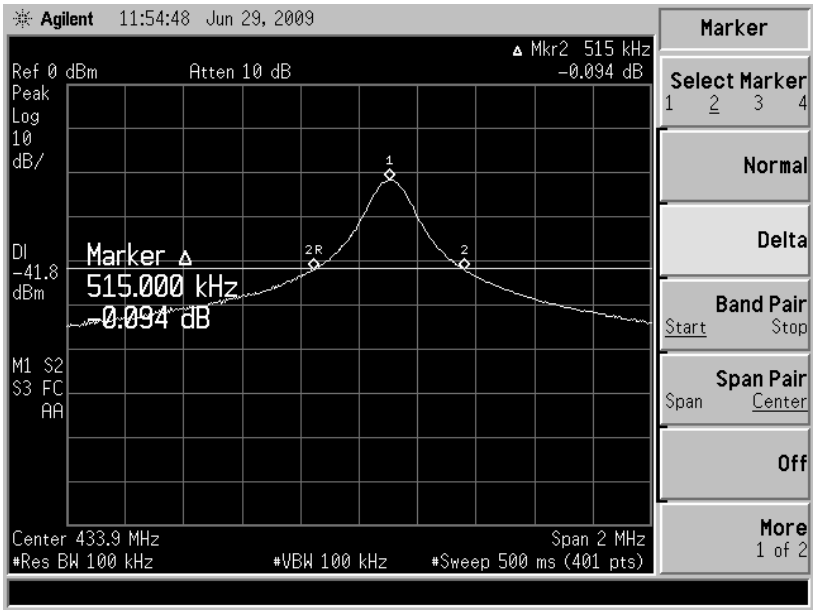
Pass.

Test Data

Fundamental frequency (MHz)	Bandwidth Measurement (kHz)	Limit (kHz)	Result
433.92MHz	515kHz	1084.8kHz	PASS

Note: Limit= Fundamental frequency×0.25%=433.92×0.25%=1084.8kHz

The test plots as following:



5.4. Deactivation time

5.4.1. Applied Standard

According to 15.231(a), A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released. A transmitter activated automatically shall cease transmission within 5 seconds after activation.

5.4.2. Test procedure

Step 1: The EUT was placed on a table which is 0.8m above ground plane.
Step 2: Set EUT as normal operation.
Step 3: Set SA Center Frequency = fundamental frequency , RBW=100kHz,VBW=300kHz
Step 4: Set SA trace max hold, then view.

5.4.3. Test Setup Diagram

Refer to clause 5.3.3

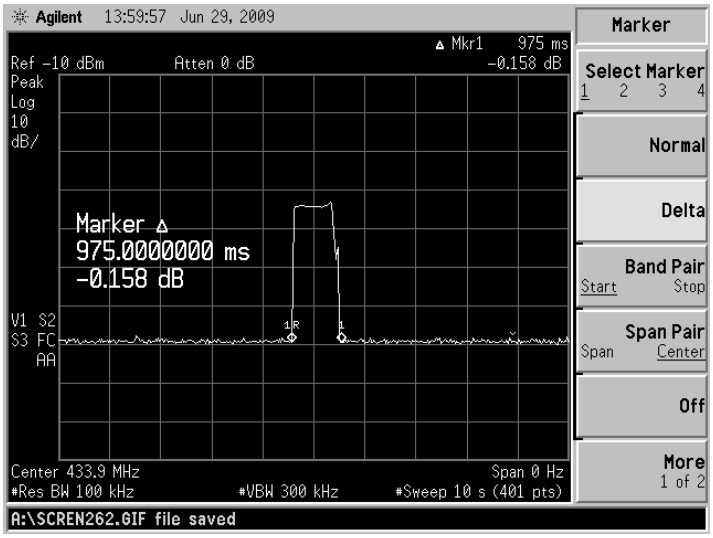
5.4.4. Test Result

Pass.

Test Data

Fundamental frequency (MHz)	Transmission time (ms)	Limit (s)	Result
433.92MHz	0.975s	5s	PASS

The test plots as following:



5.5. Duty Cycle

5.5.1. Test procedure&condition

Step 1: The EUT was placed on a table which is 0.8m above ground plane.
Step 2: EUT was set to transmit continuously.
Step 3: Set SA Center Frequency = fundamental frequency , RBW=100kHz,VBW=300kHz
Step 4:. Set SA trace max hold, then view.

The duty cycle was determined by the following equation :

$$\text{Duty Cycle}(\%)=\frac{\text{(Total On Interval in a Complete Pulse Train)}}{\text{(Length of a Complete Pulse Train or 100ms)}}\ \text{X100\%}$$

Note: Length of a Complete Pulse Train or 100ms, whichevers is less.

5.5.2. Test Data

Pulse Train	Number of Pulse	T(ms)	Total Time
Pulse1	8	1.263ms	10.104ms
Pulse2	13	0.4ms	5.2ms
Total ON interval in a complete pulse train(ms)			15.304ms

$$\text{Duty Cycle}(\%)=\frac{15.304\text{ms}}{54\text{ms}}\times 100\%=28.3\%$$

Pulse Desensitization Correction Factor(PDCF)=20×log(Duty Cycle)
=20×log(28.3%)=-10.95

The test plots as following:

Table 1

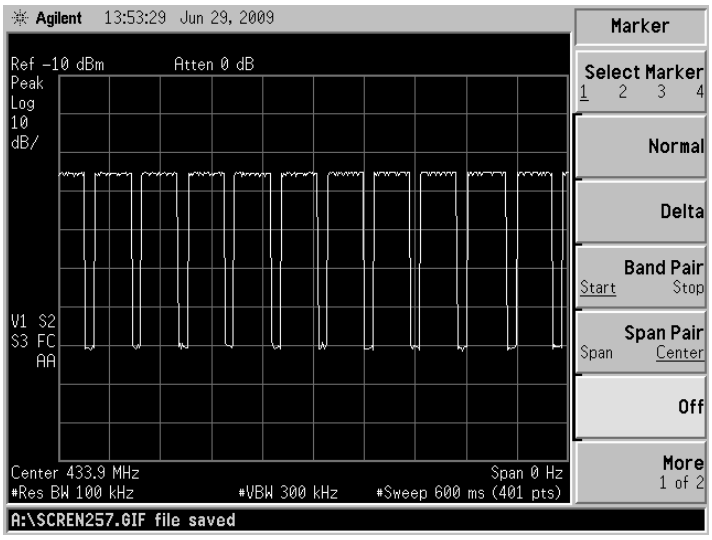


Table 2

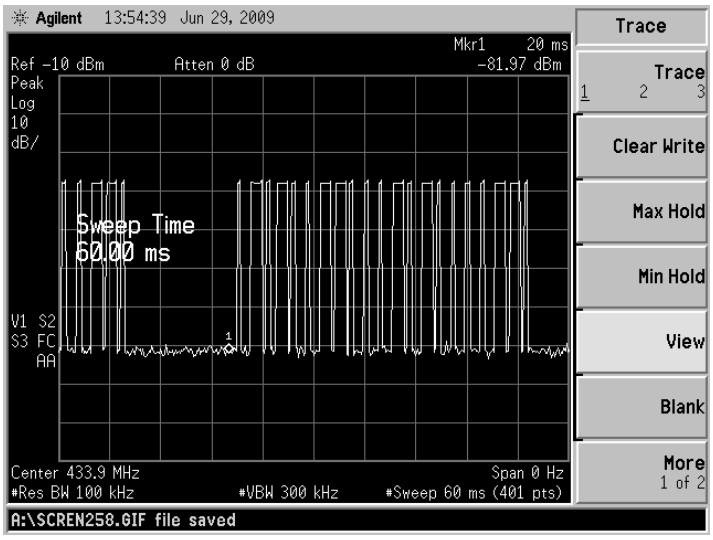


Table 3

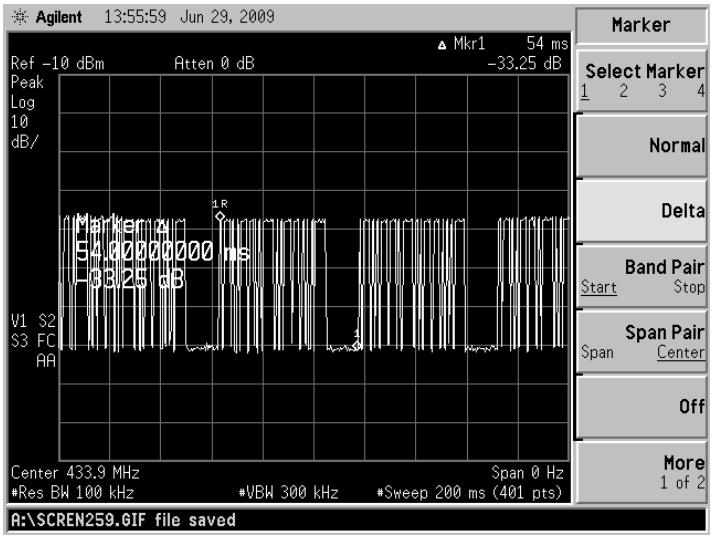


Table 4 Pulse 1

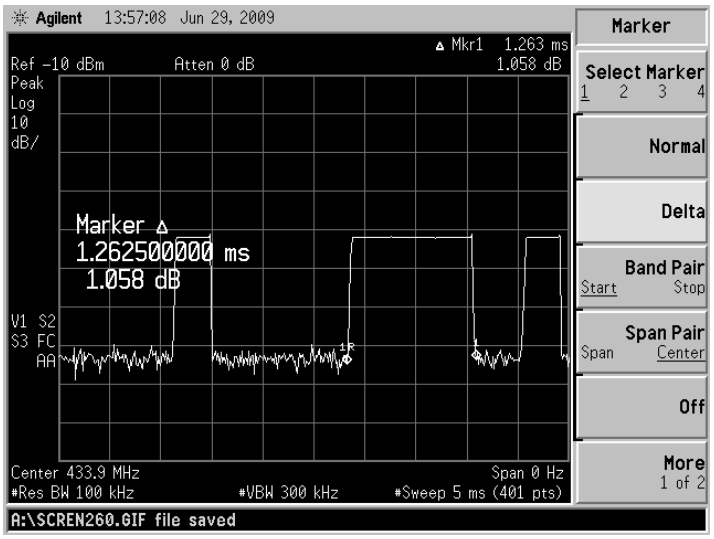


Table 5 Pulse 2