

**FCC PART 15 SUBPART C TEST REPORT**

**for**

**Remote Controller**

**Model No.: 310**

**FCC ID: SU7FFII310LID21K**

**of**

**Applicant: Controlled Entry Distributors, Inc.**

**Address: 2500 South 3850 West Suite A Salt Lake City 84120 Utah  
United States**

**Tested and Prepared**

**by**

**Worldwide Testing Services (Taiwan) Co., Ltd.**

**FCC Registration No.: 930600**

**Industry Canada filed test laboratory Reg. No. IC 5679A-1**

**A2LA Accredited No.: 2732.01**



**Report No.: W6M21012-11086-C-1**

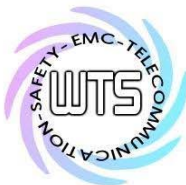
6F, NO. 58, LANE 188, RUEY-KUANG RD., NEIHU TAIPEI 114, TAIWAN, R.O.C.  
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Registration number: W6M21012-11086-C-1  
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**1 General Information**

**1.1 Notes**

The purpose of conformity testing is to increase the probability of adherence to the essential requirements or conformity specifications, as appropriate.

The complexity of the technical specifications, however, means that full and thorough testing is impractical for both technical and economic reasons.

Furthermore, there is no guarantee that a test sample which has passed all the relevant tests conforms to a specification.

Neither is there any guarantee that such a test sample will interwork with other genuinely open systems. The existence of the tests nevertheless provides the confidence that the test sample possesses the qualities as maintained and that its performance generally conforms to representative cases of communications equipment.

The test results of this test report relate exclusively to the item tested as specified in 1.5.

The test report may only be reproduced or published in full.

Reproduction or publication of extracts from the report requires the prior written approval of the Worldwide Testing Services(Taiwan) Co., Ltd.

**Tester:**

December 21, 2010	Rick Chen	<i>Rick Chen.</i>
_____	_____	_____
Date	WTS-Lab. Name	Signature

**Technical responsibility for area of testing:**

December 21, 2010	Chang Tse-Ming	<i>Chang Tse-Ming</i>
_____	_____	_____
Date	WTS Name	Signature



# ***Worldwide Testing Services(Taiwan) Co., Ltd.***

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## **1.2 Testing laboratory**

### **1.2.1 Location**

OATS

No.5-1, Shuang Sing Village,  
LiShuei Rd., Wanli Township,  
Taipei County 207, Taiwan (R.O.C.)

Company

Worldwide Testing Services(Taiwan) Co., Ltd.  
6F, NO. 58, LANE 188, RUEY-KUANG RD.  
NEIHU, TAIPEI 114, TAIWAN R.O.C.

Tel : 886-2-66068877

Fax : 886-2-66068879

### **1.2.2 Details of accreditation status**

Accredited testing laboratory

A2LA accredited number: 2732.01

FCC filed test laboratory Reg. No. 930600

Industry Canada filed test laboratory Reg. No. IC 5679A-1



### **Test location, where different from Worldwide Testing Services (Taiwan) Co., Ltd. :**

Name: ./.  
Accredited number: ./.  
Street: ./.  
Town: ./.  
Country: ./.  
Telephone: ./.  
Fax: ./.

## **1.3 Details of approval holder**

Name: Controlled Entry Distributors, Inc.  
Street: 2500 South 3850 West Suite A Salt Lake City  
Town: 84120 Utah  
Country: United States  
Telephone: ./.  
Fax: ./.



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#### **1.4 Application details**

Date of receipt of test item: December 06, 2010  
Date of test: from December 07, 2010 to December 20, 2010

#### **1.5 Test item**

Description of test item: Remote Controller  
Type identification: 310  
Brand name: ./.  
Multi-listing model number: ./.  
Transmitting frequency: 310 MHz  
Operation mode: simplex  
Voltage supply: 12 VDC

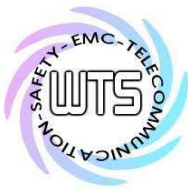
(The device is tested under fresh battery condition.)

Highest clock frequency: 310 MHz  
Antenna type: PCB antenna  
Photos: see Annex

#### **Manufacturer (if applicable)**

Name: Lighting Tech Co., Ltd.  
Street: Room 1, 5F., No.530,Sec.2, Jhongshan Rd., Jhonghe City,  
Town: Taipei County 235,  
Country: Taiwan R.O.C.

Additional information: ./.



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## **1.6 Test standards**

Technical standard : FCC RULES PART SUBPART C § 15.231 (a) (2009-10)

## **2 Technical test**

### **2.1 Summary of test results**

No deviations from the technical specification(s) were ascertained in the course of the tests performed.

**or**

The deviations as specified in 3 were ascertained in the course of the tests performed.

### **2.2 Test environment**

Temperature: 23 °C  
Relative humidity content: 20 ... 75 %  
Air pressure: 86 ... 103 kPa  
Details of power supply: 12VDC (from battery)

### **2.3 Test Mode**

This EUT is the portable device. So the EUT was tested on three different axes. Please see assessment test results as section 3 of this test report.



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## 2.4 Test equipment utilized

No.	Test equipment	Type	Serial No.	Manufacturer	Cal. Date	Next Cal. Date
ETSTW-CE 001	EMI TEST RECEIVER	ESHS10	842121/013	R&S	2010/9/2	2011/9/1
ETSTW-CE 004	ZWEILEITER-V-NETZNACHBILDUNG TWO-LINE V-NETWORK	ESH3-Z5	840731/011	R&S	2010/3/2	2011/3/1
ETSTW-CE 005	Line-Impedance Stabilisation Network	NNBM 8126D	137	Schwarzbeck	2010/9/8	2011/9/7
ETSTW-CE 006	IMPULSBEGRENZER PULSE LIMITER	ESH3-Z2	100226	R&S	2010/5/8	2011/5/7
ETSTW-CE 007	SPECTRUM ANALYZER 5GHz	FSB	849670/001	R&S	Pre-test Use NCR	
ETSTW-CE 008	HF-EICHLLEITUNG RF STEP ATTENUATOR 139dB DPSP	334.6010.02	844581/024	R&S	Function Test	
ETSTW-CE 009	TEMP.&HUMIDITY CHAMBER	GTH-225-40-1P-U	MAA0305-009	GIANT FORCE	2010/7/21	2011/7/20
ETSTW-CE 013	CISPR 22 TWO BALANCED TELECOM PAIRS IMPEDANCE STABILIZATION NETWORK	FCC-TLISN-T4-02	20242	FCC	2010/10/21	2011/10/20
ETSTW-CE 015	CISPR 22 TWO BALANCED TELECOM PAIRS IMPEDANCE STABILIZATION NETWORK	FCC-TLISN-T8-02	20307	FCC	2010/9/6	2011/9/5
ETSTW-RE 002	Function Generator	33220A	MY43004982	Agilent	Function Test	
ETSTW-RE 003	EMI TEST RECEIVER	ESI 26	831438/001	R&S	2010/8/10	2011/8/9
ETSTW-RE 004	EMI TEST RECEIVER	ESI 40	832427/004	R&S	2010/9/14	2011/9/13
ETSTW-RE 005	EMI TEST RECEIVER	ESVS10	843207/020	R&S	2010/9/2	2011/9/1
ETSTW-RE 006	Attenuator 10dB	50HF-010-5N-1	None	STEP	2010/3/5	2011/3/4
ETSTW-RE 010	ABSORBING CLAMP	MDS 21	3469	Schwarzbeck	2010/9/6	2011/9/5
ETSTW-RE 012	TUNABLE BANDREJECT FILTER	D.C 0309	146	K&L	Function Test	
ETSTW-RE 013	TUNABLE BANDREJECT FILTER	D.C 0336	397	K&L	Function Test	
ETSTW-RE 018	MICROWAVE HORN ANTENNA	AT4560	27212	AR	2010/10/4	2011/10/3
ETSTW-RE 020	MICROWAVE HORN ANTENNA	AT4002A	306915	AR	Function Test	
ETSTW-RE 021	SWEEP GENERATOR	SWM05	835130/010	R&S	2010/8/20	2011/8/19
ETSTW-RE 027	Passive Loop Antenna	6512	00034563	EMCO	2010/7/22	2011/7/21
ETSTW-RE 028	Log-Periodic Dipole Array Antenna	3148	34429	EMCO	2010/4/14	2011/4/13
ETSTW-RE 029	Biconical Antenna	3109	33524	EMCO	2010/4/14	2011/4/13
ETSTW-RE 030	Double-Ridged Guide Horn Antenna	3117	00035224	EMCO	2010/3/2	2011/3/1
ETSTW-RE 032	Millivoltmeter	URV 55	849086/013	R&S	2010/10/4	2011/10/3
ETSTW-RE 033	WaveRunner 6000A Serise Oscilloscope	WAVERUNNER 6100A	LCRY0604P14508	LeCroy	Function Test	
ETSTW-RE 034	Power Sensor	URV5-Z4	839313/006	R&S	2010/10/4	2011/10/3
ETSTW-RE 044	Log-Periodic Antenna	HL050	100094	R&S	2010/5/11	2011/5/10
ETSTW-RE 047	PSA SERIES SPECTRUM ANALYZER	E4445A	MY46181369	Agilent	Pre-test Use NCR	
ETSTW-RE 048	Triple Loop Antenna	HXYZ 9170	HXYZ 9170-134	Schwarzbeck	2010/8/30	2011/8/29
ETSTW-RE 049	TRILOG Super Broadband test Antenna	VULB 9160	9160-3185	Schwarzbeck	2010/4/13	2011/4/12
ETSTW-RE 050	Attenuator 10dB	50HF-010-1	None	JFW	2010/3/5	2011/3/4
ETSTW-RE 051	Attenuator 6dB	50HF-006-1	None	JFW	2010/3/5	2011/3/4
ETSTW-RE 053	Attenuator 3dB	50HF-003-1	None	JFW	2010/3/5	2011/3/4



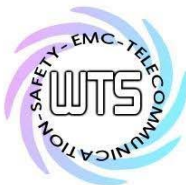
# Worldwide Testing Services(Taiwan) Co., Ltd.

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ETSTW-RE 055	SPECTRUM ANALYZER	FSU 26	200074	R&S	2010/6/3	2011/6/2
ETSTW-RE 060	Attenuator 30dB	5015-30	F651012z-01	ATM	Pre-test Use NCR	
ETSTW-RE 061	Amplifier Module	CHC 1	None	ETS	2010/9/27	2011/9/26
ETSTW-RE 062	Amplifier Module	CHC 2	None	KMIC	2010/11/10	2011/11/9
ETSTW-RE 064	Bluetooth Test Set	MT8852B-042	6K00005709	Anritsu	Function Test	
ETSTW-RE 065	Amplifier	AMF-6F-18002650-25-10P	941608	MITEQ	2010/4/13	2011/4/12
ETSTW-RE 066	Highpass Filter	H1G013G1	206015	MICROWAVE CIRCUITS, INC.	2010/3/5	2011/3/4
ETSTW-RE 072	CELL SITE TEST SET	8921A	3339A00375	HP	2010/10/7	2011/10/6
ETSTW-RE 073	Power Meter	N1911A	MY45100769	Agilent	2010/1/7	2011/1/6
ETSTW-RE 074	Power Sensor	N1921A	MY45241198	Agilent	2010/1/7	2011/1/6
ETSTW-RE 081	Highpass Filter	H03G13G1	4260-02 DC0428	MICROWAVE CIRCUITS, INC.	2010/3/5	2011/3/4
ETSTW-RE 096	SIGNAL GENERATOR	SMIQ 03B	102274	R&S	2010/5/31	2011/5/30
ETSTW-RE 099	DC Block	50DB-007-1	None	JFW	2010/3/5	2011/3/4
ETSTW-RE 105	2.4GHz Notch Filter	NO124411	39555	MICROWAVE CIRCUITS, INC.	2010/3/25	2011/3/24
ETSTW-RE 106	Humidity Temperature Meter	TES-1366	091011113	TES	2010/3/25	2011/3/24
ETSTW-GSM 002	Universal Radio Communication Tester	CMU 200	109439	R&S	2010/10/7	2011/10/6
ETSTW-GSM 019	Band Reject Filter	WRCTF824/849-822/851-40 /12+9SS	3	WI	Function Test	
ETSTW-GSM 020	Band Reject Filter	WRCD1747/1748-1743/1752-32/5SS	1	WI	Function Test	
ETSTW-GSM 021	Band Reject Filter	WRCD1879.5/1880.5-1875.5/1884.5-32/5SS	3	WI	Function Test	
ETSTW-GSM 022	Band Reject Filter	WRCT901.9/903.1-904.25-50/8SS	1	WI	Function Test	
ETSTW-GSM 023	Power Divider	4901.19.A	None	SUHNER	2010/9/20	2011/9/19
ETSTW-Cable 002	Microwave Cable	SUCOFLEX 104 (S_Cable 7)	238093	HUBER+SUHNER	2010/9/27	2011/9/26
ETSTW-Cable 003	Microwave Cable	SUCOFLEX 104 (S_Cable 11)	209953	HUBER+SUHNER	2010/9/27	2011/9/26
ETSTW-Cable 006	Microwave Cable	SUCOFLEX 104 (S_Cable 8)	238095	HUBER+SUHNER	2010/3/5	2011/3/4
ETSTW-Cable 010	BNC Cable	5 M BNC Cable	None	JYE BAO CO.,LTD.	2010/3/5	2011/3/4
ETSTW-Cable 011	BNC Cable	BNC Cable 1	None	JYE BAO CO.,LTD.	2010/8/19	2011/8/18
ETSTW-Cable 012	BNC Cable	BNC Cable 2	None	JYE BAO CO.,LTD.	2010/8/19	2011/8/18
ETSTW-Cable 013	Microwave Cable	SUCOFLEX 104 (S_Cable 5)	232345	HUBER+SUHNER	2010/3/5	2011/3/4
ETSTW-Cable 022	N TYPE Cable	OATS Cable 3	0002	JYE BAO CO.,LTD.	2010/3/5	2011/3/4
ETSTW-Cable 028	Microwave Cable	FA147A0015M2020	30064-2	UTIFLEX	2010/9/13	2011/9/12
ETSTW-Cable 029	Microwave Cable	FA147A0015M2020	30064-3	UTIFLEX	2010/9/13	2011/9/12
ETSTW-Cable 039	Microwave Cable	SUCOFLEX 104 (S_Cable 19)	316739	HUBER+SUHNER	2010/3/5	2011/3/4
WTSTW-SW 001	EMI TEST SOFTWARE	Harmonics-1000	None	EMC PARTNER	HARCS Version 4.16 Firmware Version 2.18	
WTSTW-SW 002	EMI TEST SOFTWARE	EZ EMC	None	Farad	Version ETS-03A1	
WTSTW-SW 003	EMS TEST SOFTWARE	i2	None	AUDIX	Version 3.2007-8-17b	
WTSTW-SW 005	GSM Fading Level Correction	GSMFadLevCor	None	R&S	Version 1.66	





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## **2.5 General Test Procedure**

**POWER LINE CONDUCTED INTERFERENCE:** The procedure used was ANSI STANDARD C63.4-2003 5.2 using a 50 $\mu$ H LISN (if necessary). Both lines were observed. The bandwidth of the spectrum analyzer was 10 kHz with an appropriate sweep speed.

**RADIATION INTERFERENCE:** The test procedure used was according to ANSI STANDARD C63.4-2003 6.4 using a spectrum analyzer. The bandwidth of the spectrum analyzer was 100 kHz with an appropriate sweep speed. The analyzer was calibrated in dB above a microvolt at the output of the antenna. The resolution bandwidth was the 100 kHz and the video bandwidth was 300 kHz.

**FORMULA OF CONVERSION FACTORS:** The Field Strength at 3m was established by adding the meter reading of the spectrum analyzer (which is set to read in units of dB $\mu$ V) to the antenna correction factor supplied by the antenna manufacturer. The antenna correction factors are stated in terms of dB.

Example:

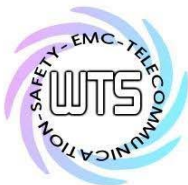
Freq (MHz)      METER READING + ACF + CABLE LOSS (to the receiver) = FS  
33                      20 dB $\mu$ V + 10.36 dB/m + 6 dB = 36.36 dB $\mu$ V/m @3m

**ANSI STANDARD C63.4-2003 6.2.1 MEASUREMENT PROCEDURES:** The UUT was placed on a table 80 cm high and with dimensions of 1m by 1.5m (non metallic table). The UUT was placed in the center of the table. The table used for radiated measurements is capable of continuous rotation. The spectrum was scanned from 30 MHz to 10<sup>th</sup> harmonic of the fundamental.

Peak readings were taken in three (3) orthogonal planes and the highest readings.

Measurements were made by Worldwide Testing Services(Taiwan) Co., Ltd. at the registered open field test site located at. The Registration Number: **930600**

When an emission was found, the table was rotated to produce the maximum signal strength. At this point, the antenna was raised and lowered from 1m to 4m. The antenna was placed in both the horizontal and vertical planes.



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**3 Test results (enclosure)**

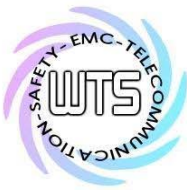
1st test

test after modification

production test

<b>TEST CASE</b>	<b>Para. Number</b>	<b>Required</b>	<b>Test passed</b>	<b>Test failed</b>
Transmission Requirements	FCC 15.231(a)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Radiated Emission	FCC 15.231(b)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Bandwidth of Emission	FCC 15.231(c)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Frequency Tolerance	FCC 15.231(d)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Period Alternate Field Strength Requirements	FCC 15.231(e)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Antenna Requirement	FCC 15.203	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Conducted Measurement at (AC) Power Line	FCC 15.207	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**The follows is intended to leave blank.**



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### **3.1 Transmission Requirements**

FCC 15.231(a)

#### **3.1.1 Limit of Transmission Time**

According to 15.231(a)(1), a manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

According to 15.231(a)(2), a transmitter activated automatically shall cease transmission within 5 seconds after activation.

#### **3.1.2 Active Time**

This manually operated transmitter employs a switch that automatically deactivate the transmitter within 3.536 ms of being released.

Transmission time =  $0.442\text{ms} * 8 = 3.536\text{ms}$

This transmitter is operated by automatic activation and active will cease transmission in \_\_ ms after activation..

Explanation: See attached appendix

Test equipment used : ETSTW-RE 055



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**3.2 Output Power (Field Strength)**

Model: 310 Date: 2010/12/16  
 Mode: Temperature: 15.6 °C Engineer: Rick  
 Polarization: Horizontal Humidity: 58 %

Frequency (MHz)	Reading (dBuV) Peak	Factor (dB)		Result @3m (dBuV/m)		Limit @3m (dBuV/m)		Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
		Corr.	Duty	Peak	Ave.	Peak	Ave.			
310.0261	35.14	16.03	-25.24	51.17	25.93	95.32	75.32	-44.15	240	150

Polarization: Vertical

Frequency (MHz)	Reading (dBuV) Peak	Factor (dB)		Result @3m (dBuV/m)		Limit @3m (dBuV/m)		Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
		Corr.	Duty	Peak	Ave.	Peak	Ave.			
310.0300	21.62	16.03	-25.24	37.65	12.41	95.32	75.32	-57.67	240	150

Limit 15.231(b)

Fundamental Frequency (MHz)	Field strength of fundamental, limit μV/m
40.66 – 40.70	2,250
70 – 130	1,250
130 – 174	1,250 to 3,750
174 – 260	3,750
260 – 470	3,750 to 12,500** (310 MHz: 75.32 dBμV/m = 5833.3437 μV/m)
Above 470	12,500

\*\* linear interpolation

Explanation: see attached diagrams

Test equipment used: ETSTW-RE 003, ETSTW-RE 004, ETSTW-RE 028, ETSTW-RE 029,



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### **3.3 Out of Band Radiated Emissions**

FCC Rule: 15.231(b), 15.35

For out of band emissions that are close to or that exceed the 20 dB attenuation requirement described in the specification, radiated measurements were performed at a 3 m separation distance to determine whether these emissions complied with the general radiated emission requirement.

Guidance on Measurement of pulsed emission: 15.35(c)

“the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value.”

Duty Cycle correction =  $20 \log(\text{dwell time}/100\text{ms or one period})$

Limits:

For frequencies (Average measurements)

Correction factor conform 15.35 (c) (Average measurements)

Duty cycle correction :

Max. Peak reading – duty cycle correction

Max permitted average Limits = Max permitted Fundamental limit – 20 dB

For example for 310 fundamental carrier:

Max permitted average Limit:  $75.32 \text{ dB}\mu\text{V/m} - 20 \text{ dB} = 55.32 \text{ dB}\mu\text{V/m}$

For frequencies above 1GHz (Peak measurements).

Modified Limits for peak conform 15.35 (b) = Max Permitted average Limits + 20dB (because Peak detector is used)



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**3.4 Transmitter Radiated Emissions in restricted Bands**

FCC Rules: 15.231 (b), 15.205, 15.209, 15.35

Radiated emission measurements were performed from 30 MHz to 8000 MHz.

For radiated emission tests, the analyzer setting was as followings:

RES BW VID BW

Frequency <1 GHz 100 kHz 100 kHz (Peak measurements)

Frequency >1 GHz 1 MHz 1 MHz (Peak measurements)

1 MHz 1 MHz (Average measurements)

Limits:

For frequencies below 1GHz :

Frequency of Emission (MHz)	Field strength (microvolts/meter)	Field Strength (dB microvolts/meter)
30 – 88	100	40.0
88 – 216	150	43.5
216 – 960	200	46.0
Above 960	500	54.0

For frequencies above 1GHz (Average measurements).

Guidance on Measurement of pulsed emission:

“If the emission is pulsed, modify the unit for continues operation , use the settings shown above, then correct the reading by subtracting the peak-average correction factor, derived from the appropriate duty cycle calculation.

For frequencies above 1GHz (Average measurements).

The correction factor, based on the channel dwell time in a 100 ms period, may be mathematically applied to a measurement made with an average detector, to further reduce the value.

Duty cycle correction =  $20 \log(\text{dwell time}/100\text{ms})$

No duty cycle correction was added to the reading

Modified Limits for peak conform 15.35 (b) = Max Permitted average Limits + 20dB (because Peak detector is used)

Above 960 MHz

For mode DSSS CW:  $54 \text{ dB}\mu\text{V/m} + 20 \text{ dB} = 74 \text{ dB}\mu\text{V/m}$

Explanation: See attached diagrams.



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**3.5 Spurious Emission radiated, Transmitter**

Spurious emission was measured with modulation (declared by manufacturer).

The limits on the field strength of the spurious emission in the table § 15.231(b) are based on the fundamental frequency of the intentional radiator. Spurious emission shall be attenuated to the average (or alternatively, CISPR quasi-peak) limits shown in this table or to the general limits shown in § 15.209, whichever limit permits a higher field strength.

In addition, radiated emission which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

SAMPLE CALCULATION OF LIMIT. All results will be updated by an automatic measuring system in accordance to point 2.3.

Calculation of test results:

Such factors like antenna correction, cable loss, external attenuation etc. are already included in the provided measurement results. This is done by using validated test software and calibrated test system according the accreditation requirements.

The peak and average spurious emission plots was measured with the average limits.

In the Table being listed the critical peak and average value an exhibit the compliance with the above calculated Limits.

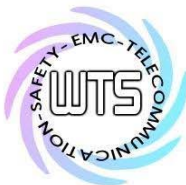
Summary table with radiated data of the test plots

Model: 310 Date: 2010/12/17  
 Mode: Temperature: 15.6 °C Engineer: Rick  
 Polarization: Horizontal 58 Humidity: 60 %

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
279.9800	14.84	peak	15.32	30.16	46.00	-15.84	310	150

Polarization: Horizontal

Frequency (MHz)	Reading (dBuV) Peak	Factor (dB)		Result (dBuV/m)		Limit (dBuV/m)		Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
		Corr.	Duty	Peak	Ave.	Peak	Ave.			
619.8397	16.82	23.10	-25.24	39.92	14.68	75.32	55.32	-35.40	250	150
930.0000	9.32	27.49	-25.24	36.81	11.57	75.32	55.32	-38.51	210	150
1240.0000	-3.77	35.66	-25.24	31.89	6.65	74.00	54.00	-42.11	260	150
1550.0000	-11.88	44.58	-25.24	32.70	7.46	74.00	54.00	-41.30	110	150
1860.0000	-19.21	53.49	-25.24	34.28	9.04	75.32	55.32	-41.04	210	150
2170.0000	-26.60	62.41	-25.24	35.81	10.57	75.32	55.32	-39.51	110	150



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Polarization: Vertical

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
282.1443	13.23	peak	15.37	28.60	46.00	-17.40	260	150

Polarization: Vertical

Frequency (MHz)	Reading (dBuV) Peak	Factor (dB)		Result (dBuV/m)		Limit (dBuV/m)		Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
		Corr.	Duty	Peak	Ave.	Peak	Ave.			
620.0000	7.22	23.10	-25.24	30.32	5.08	75.32	55.32	-45.00	260	150
930.0000	7.34	27.49	-25.24	34.83	9.59	75.32	55.32	-40.49	210	150
1240.0000	-5.01	35.66	-25.24	30.65	5.41	74.00	54.00	-43.35	260	150
1550.0000	-12.34	44.58	-25.24	32.24	7.00	74.00	54.00	-41.76	270	150
1860.0000	-19.79	53.49	-25.24	33.70	8.46	75.32	55.32	-41.62	210	150
2170.0000	-28.28	62.41	-25.24	34.13	8.89	75.32	55.32	-41.19	280	150

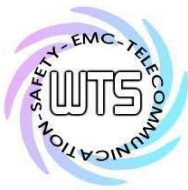
- Note**
- 1. Correction Factor = Antenna factor + Cable loss - Preamplifier**
  - 2. The formula of measured value as: Test Result = Reading + Correction Factor**
  - 3. Detector function in the form : PK = Peak, QP = Quasi Peak, AV = Average**
  - 4. All not in the table noted test results are more than 20 dB below the relevant limits.**
  - 5. See the attached diagram as appendix.**

All other not noted test plots do not contain significant test results in relation to the limits  
 Test results: The unit meet the FCC requirements.

Explanation: See attached diagrams.

Test equipment used: ETSTW-RE 003, ETSTW-RE 004, ETSTW-RE 028, ETSTW-RE 029,  
 ETSTW-RE 030, ETSTW-RE 044





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### **3.6 Channel Bandwidth**

Measurement of Necessary Bandwidth (BN)

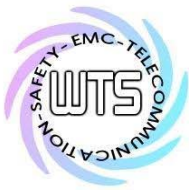
Used frequency	Bandwidth	Limit
310.024839744 MHz	46.474358974 kHz	0.775 MHz

Explanation: The bandwidth fulfills the requirements of FCC § 15.231,  
see attached diagrams.

Limits:

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.

Test equipment used: ETSTW-RE 055



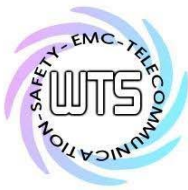
Registration number: W6M21012-11086-C-1  
FCC ID: SU7FFII310LID21K

### **3.7 Antenna requirement**

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 shall be considered sufficient to comply with the provisions of this Section. 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. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.

Explanation: This PCB antenna is integral antenna which passes antenna requirement.

The equipment meets the requirements	yes <input checked="" type="checkbox"/>	no <input type="checkbox"/>
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### **3.8 Duty Cycle**

The correction factor, based on the channel dwell time in a 100ms period, may be mathematically applied to a measurement made with an average detector, to further reduce the measured value.

Average Reading = Peak Reading (dBuV/m) + Duty Cycle Correction

Duty Cycle Correction =  $20 \log(\text{Cycle})$

In order to determine the Duty Cycle, the EUT is measured as:

Testing Mode	T period (ms)	T on (ms)	Duty Cycle	Duty Cycle Correction $20*\log(\text{Duty Cycle})$
Transmitting mode	64.61	3.536	0.05472837	-25.24

Explanation: See attached diagram.

Test equipment used: ETSTW-RE 055



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**3.9 Conducted Measurement at (AC) Power Line**

For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the table bellows with this provision shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminals.

This measurement was transact first with instrumentation using an average and peak detector and a 10 kHz bandwidth. If the peak detector achieves a calculated level, the measurement is repeated by an instrumentation using a quasi-peak detector.

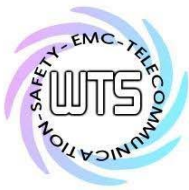
Frequency	Level	
	quasi-peak (dB $\mu$ V/m)	average (dB $\mu$ V/m)
-- kHz	--	--

**Limits:**

Frequency of Emission (MHz)	Conducted Limit (dB $\mu$ V)	
	Quasi Peak	Average
0.15-0.5	66 to 56	56 to 46
0.5-5	56	46
5-30	60	50

Explanation: Test is not required because the sample is using a battery.

Test equipment used: ETSTW-CE 001, ETSTW-CE 004, ETSTW-CE 006



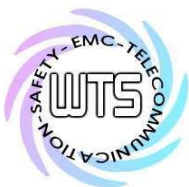
## **Appendix**

### **A Measurement diagrams**

1. Active Time
2. Output Power
3. Spurious Emissions radiated
4. Bandwidth
5. Duty Cycle

### **B Photos**

1. External Photos
2. Internal Photos
3. Set Up Photos



Registration number: W6M21012-11086-C-1

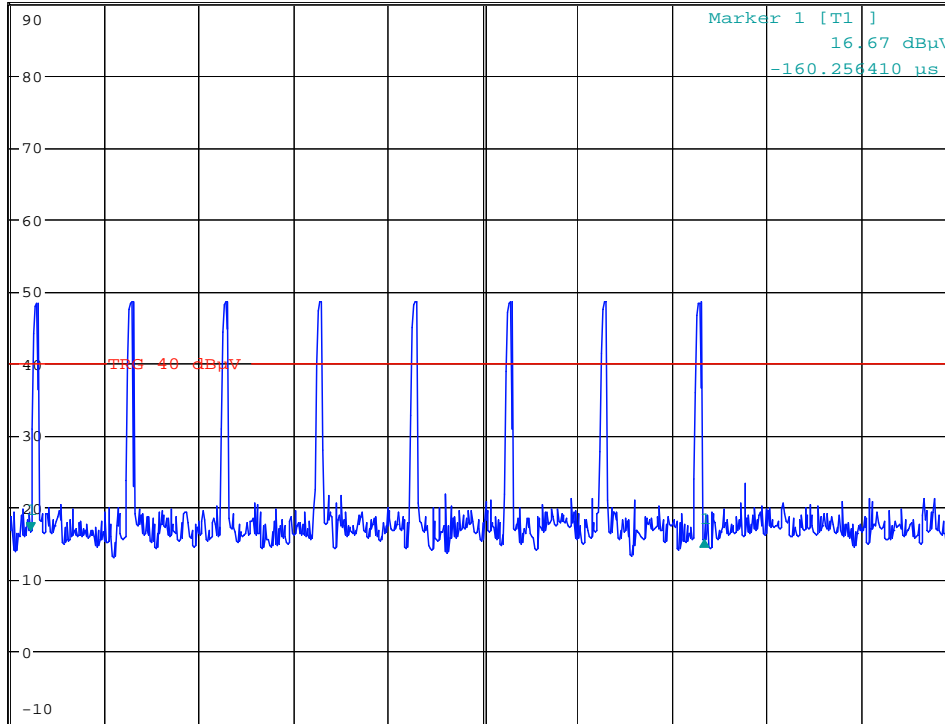
FCC ID: SU7FFII310LID21K

## Active Time



Ref 90 dBμV      \*Att 5 dB      RBW 100 kHz      Delta 1 [T1 ]  
\*VBW 100 kHz      -1.26 dB  
SWT 40 ms      28.519231 ms

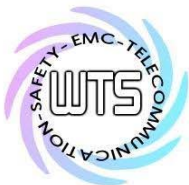
1 PK  
MAXH



Center 310.0248397 MHz      4 ms/

Duration time

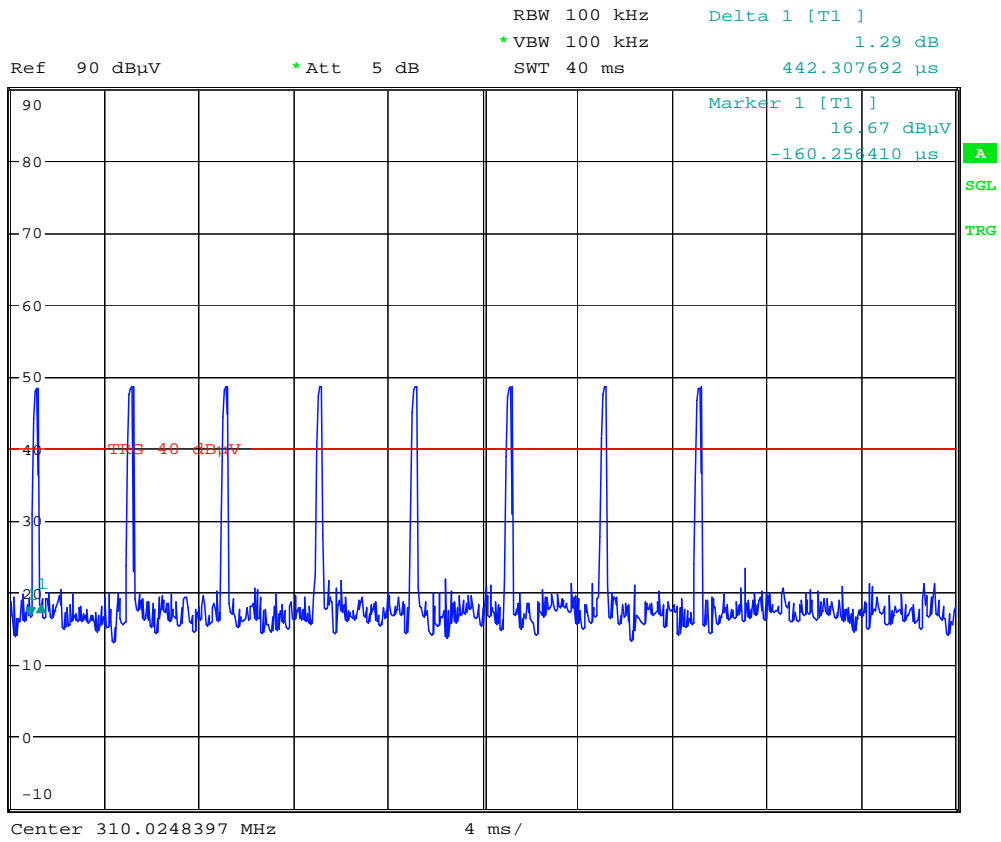
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Registration number: W6M21012-11086-C-1  
FCC ID: SU7FFII310LID21K

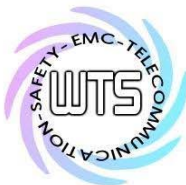


1 PK  
MAXH



Duration time

Date: 20.DEC.2010 12:04:12

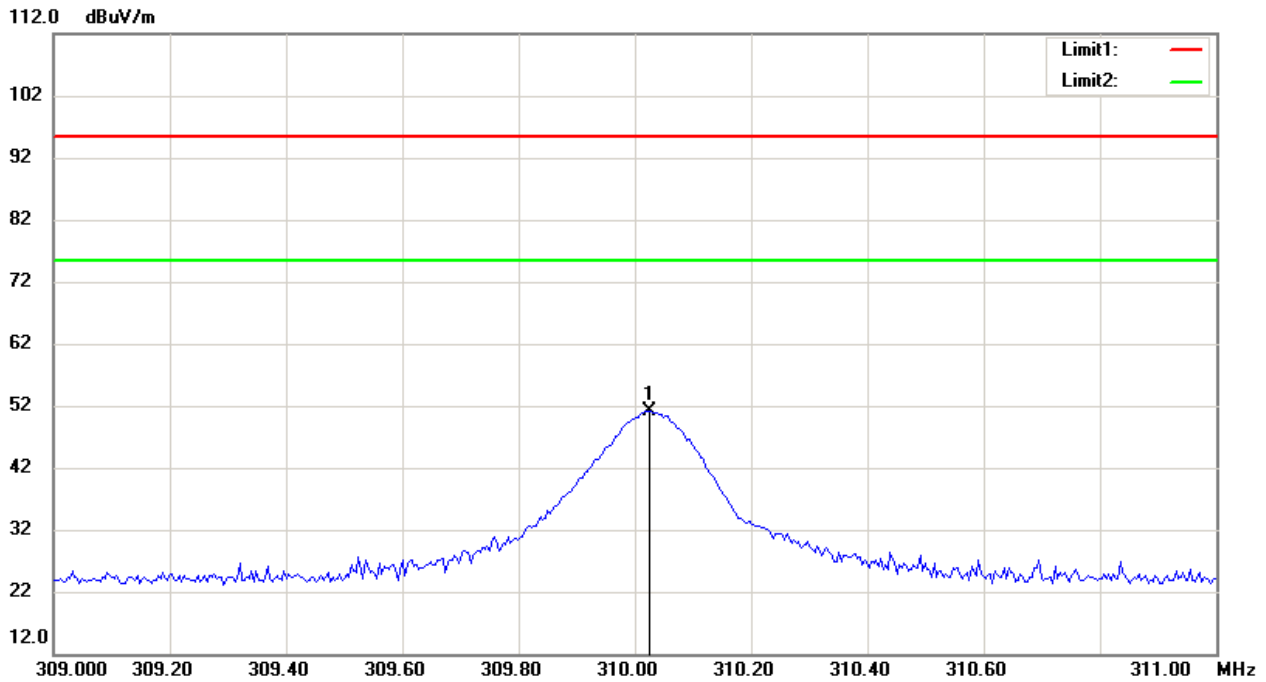


Registration number: W6M21012-11086-C-1

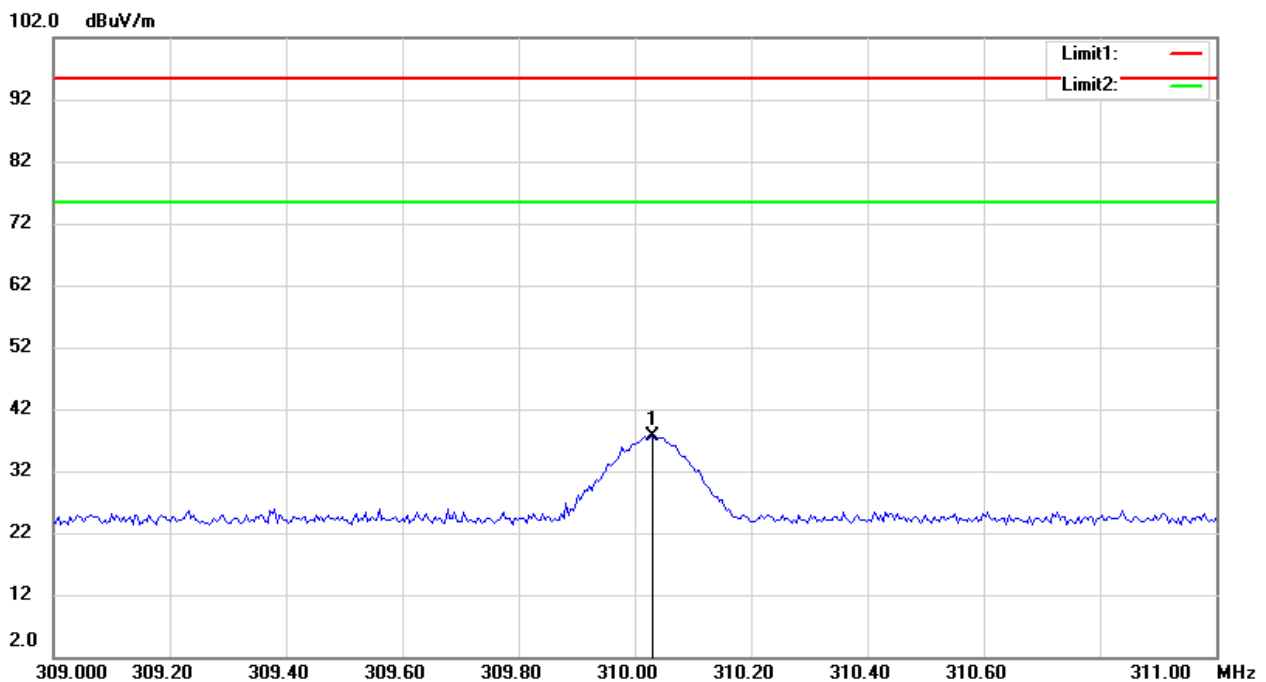
FCC ID: SU7FFII310LID21K

## Output Power

### Antenna Polarization H



### Antenna Polarization V

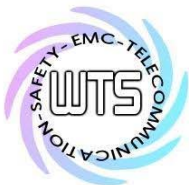


#### Note:

Up Line: Peak Limit Line, Down Line: Ave Limit Line

1. The attached measurement plots are preliminarily pre-scanned with peak detector for determining the final checking frequencies and are for reference only.
2. The some frequencies may exceed the limit line without the specified detectors, but that cannot present the results are failed to the specification of test standard.
3. For corrected test results are listed in the relevant table of output power test data of this test report.



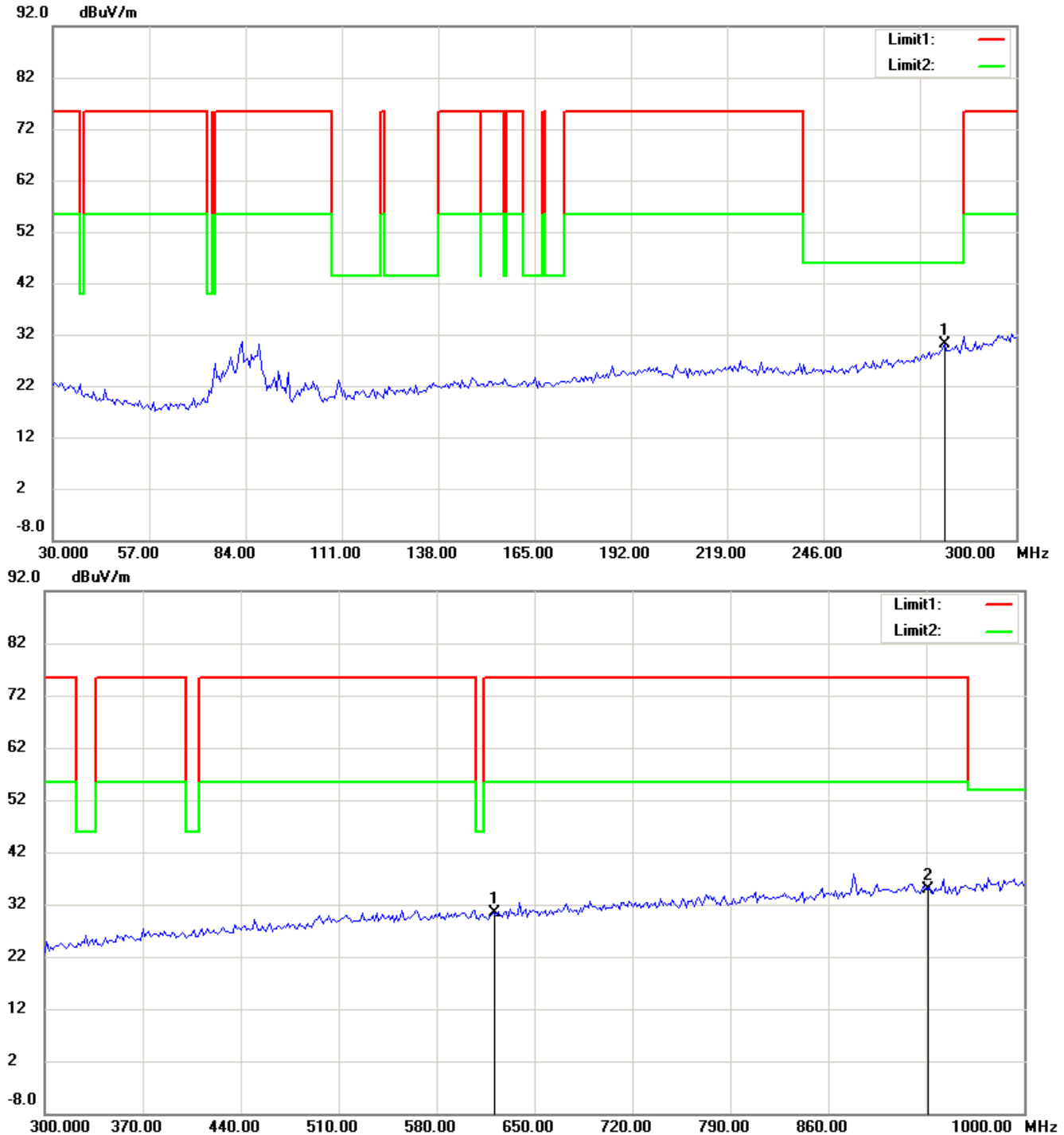


Registration number: W6M21012-11086-C-1

FCC ID: SU7FFII310LID21K

## Spurious Emissions radiated

### Antenna Polarization H



#### Note:

Up Line: Peak Limit Line, Down Line: Ave Limit Line

1. The attached measurement plots are preliminarily pre-scanned with peak detector for determining the final checking frequencies and are for reference only.
2. The some frequencies may exceed the limit line without the specified detectors, but that cannot present the results are failed to the specification of test standard.
3. For corrected test results are listed in the relevant table of radiated test data of this test report.

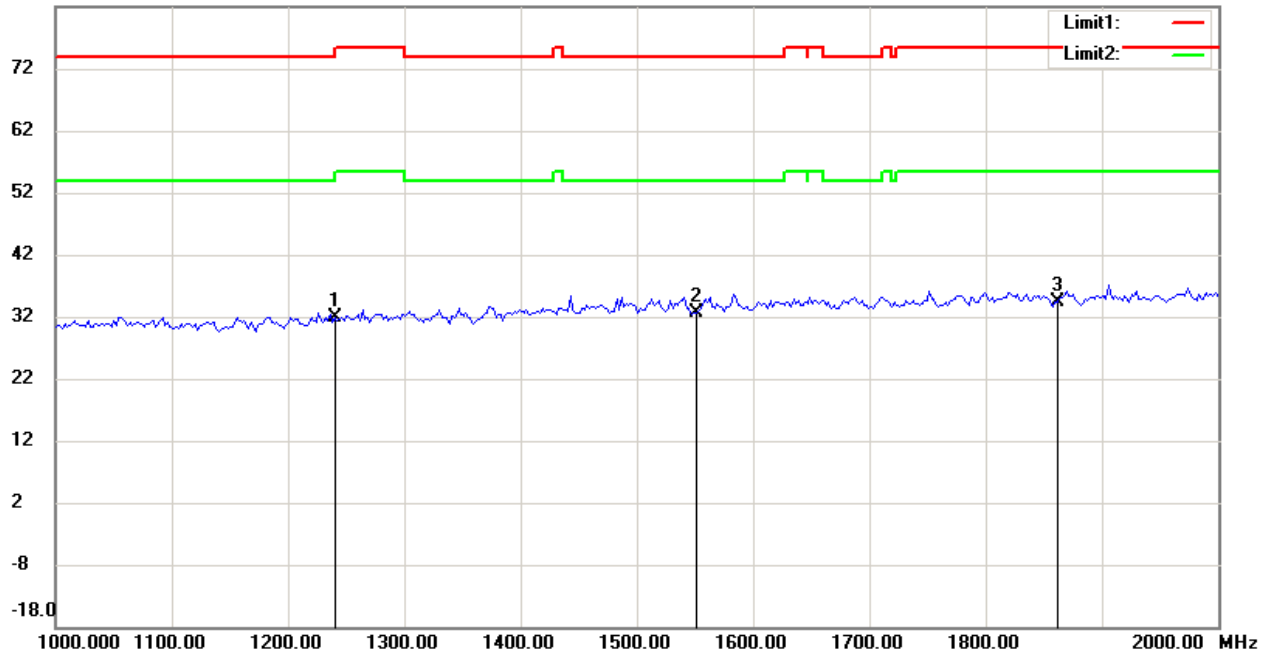


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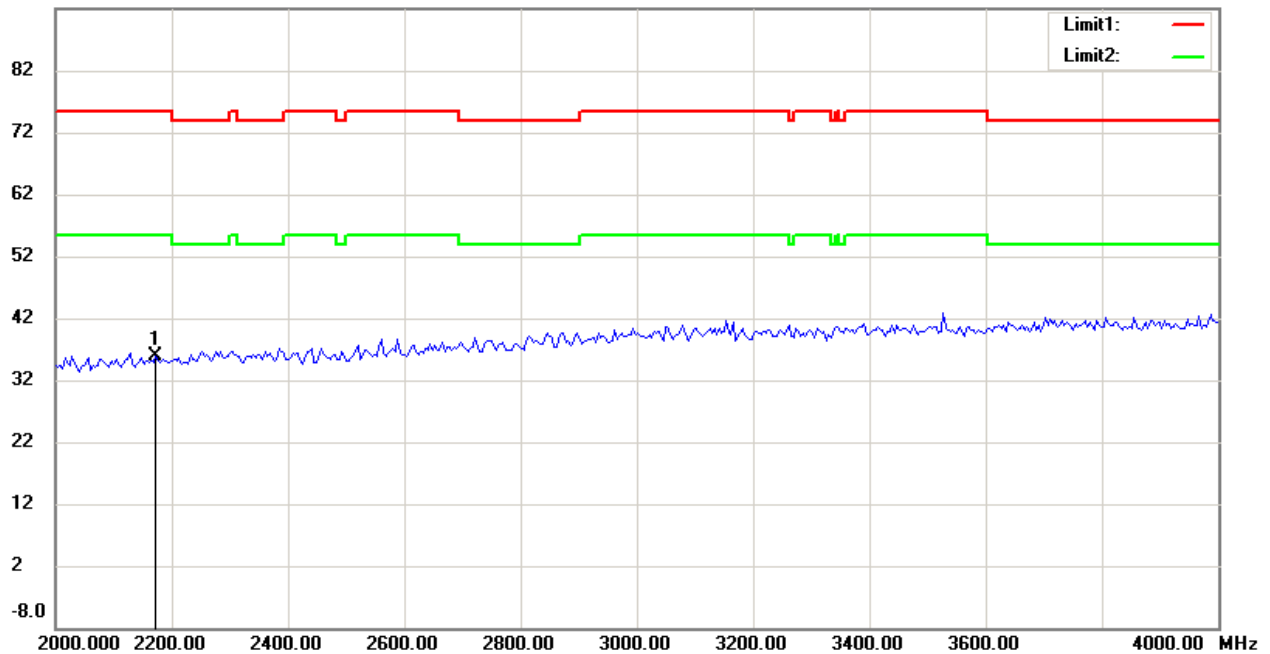
Registration number: W6M21012-11086-C-1

FCC ID: SU7FFII310LID21K

82.0 dBuV/m



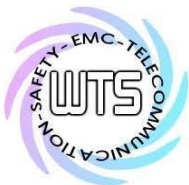
92.0 dBuV/m



## Note:

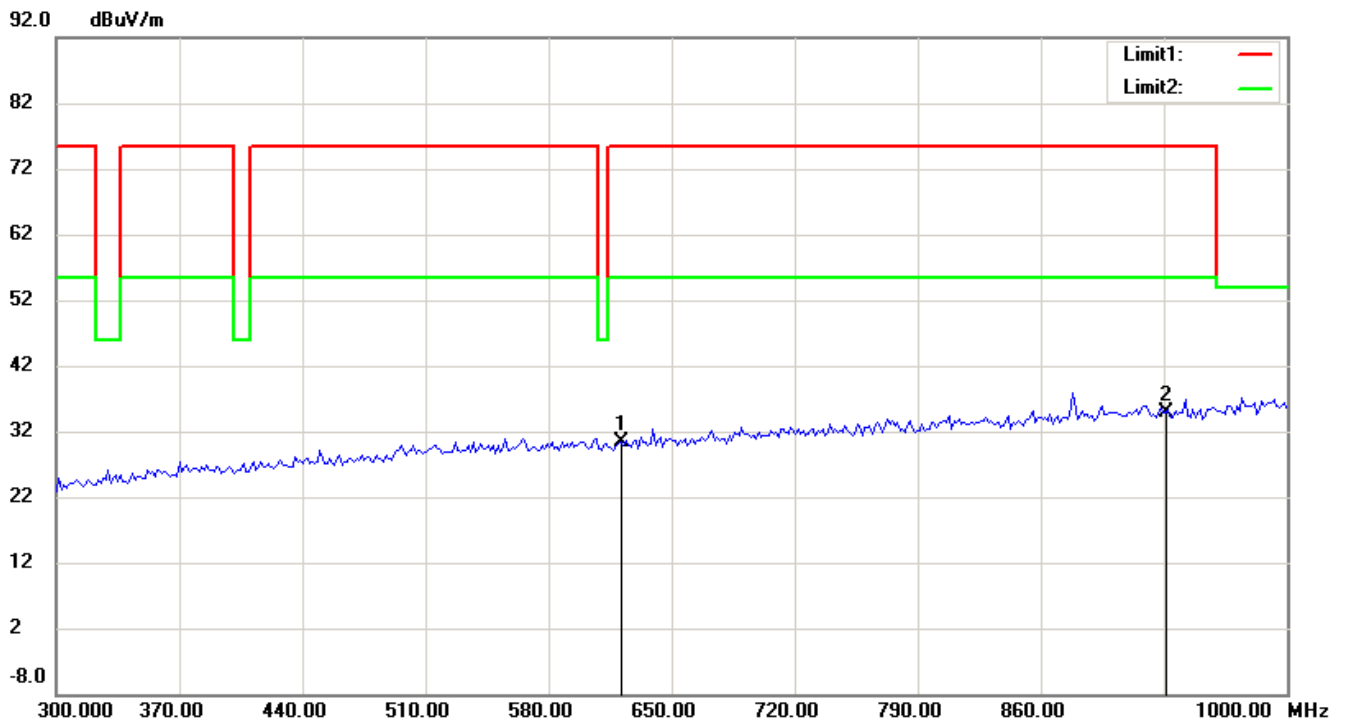
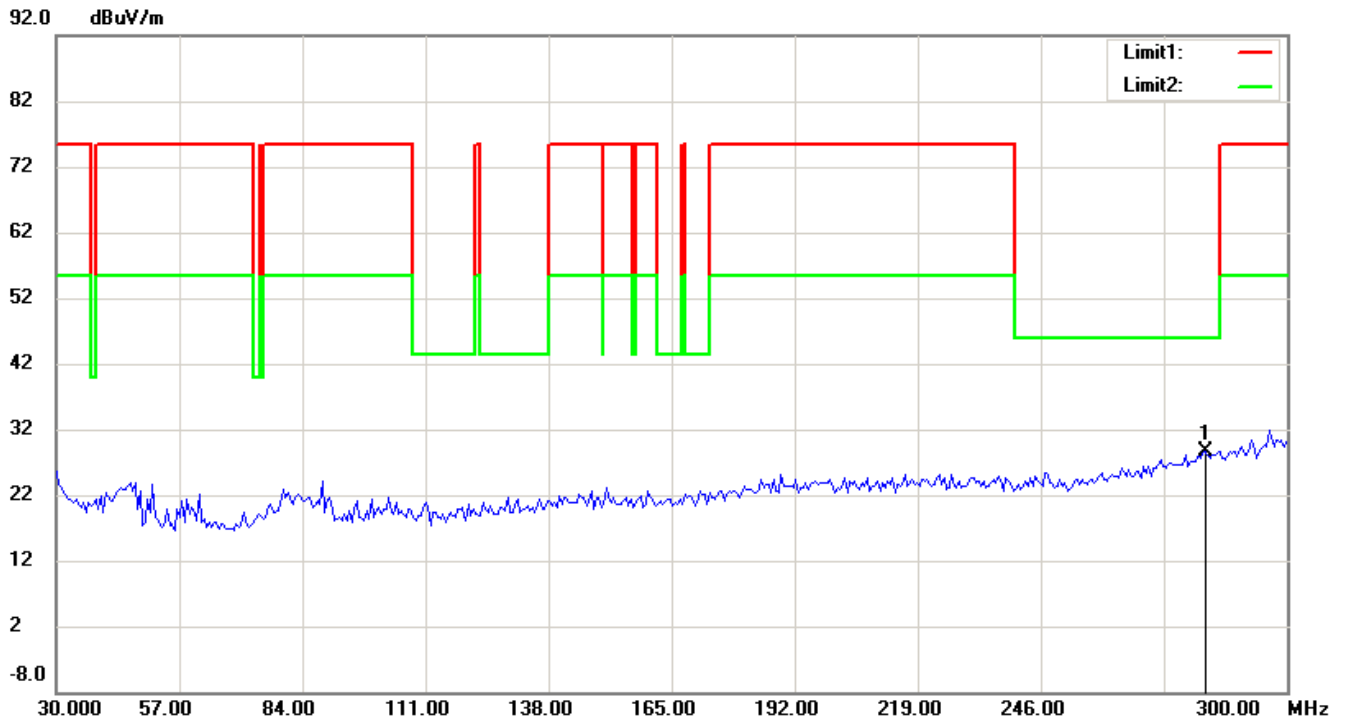
Up Line: Peak Limit Line, Down Line: Ave Limit Line

1. The attached measurement plots are preliminarily pre-scanned with peak detector for determining the final checking frequencies and are for reference only.
2. The some frequencies may exceed the limit line without the specified detectors, but that cannot present the results are failed to the specification of test standard.
3. For corrected test results are listed in the relevant table of radiated test data of this test report.



Registration number: W6M21012-11086-C-1  
FCC ID: SU7FFII310LID21K

## Antenna Polarization V



### Note:

Up Line: Peak Limit Line, Down Line: Ave Limit Line

1. The attached measurement plots are preliminarily pre-scanned with peak detector for determining the final checking frequencies and are for reference only.
2. The some frequencies may exceed the limit line without the specified detectors, but that cannot present the results are failed to the specification of test standard.
3. For corrected test results are listed in the relevant table of radiated test data of this test report.

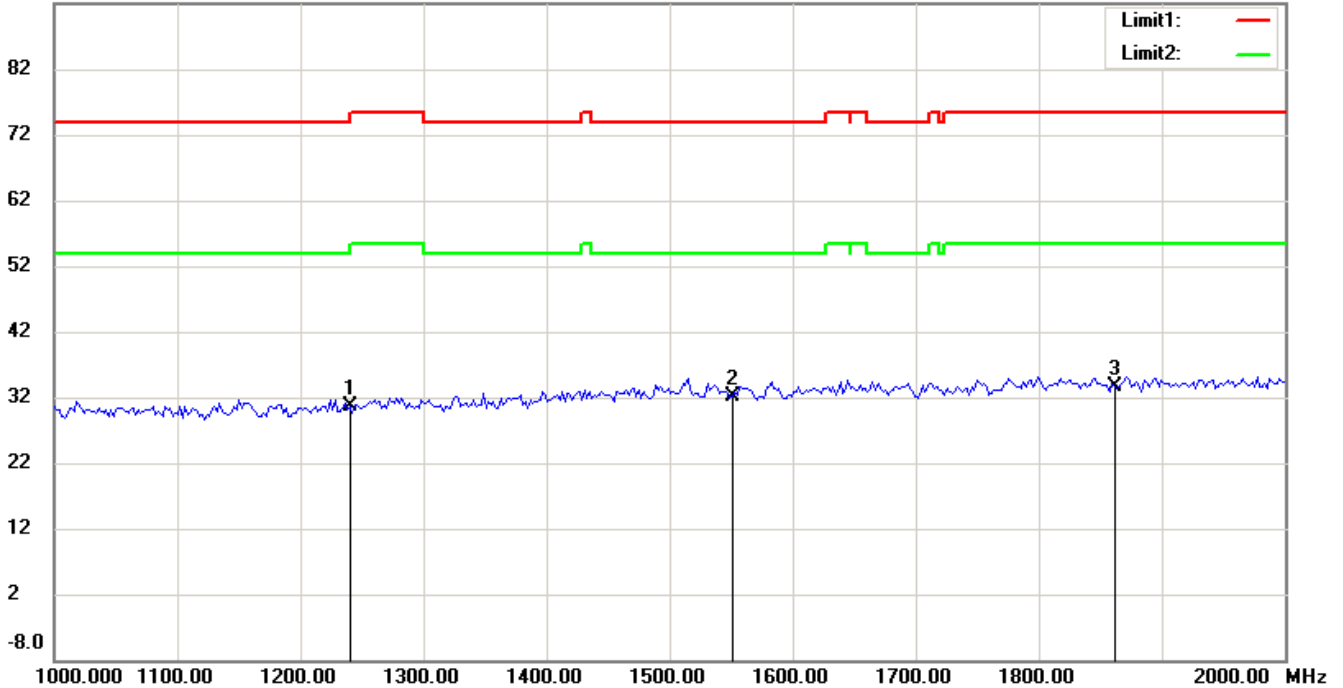


# Worldwide Testing Services(Taiwan) Co., Ltd.

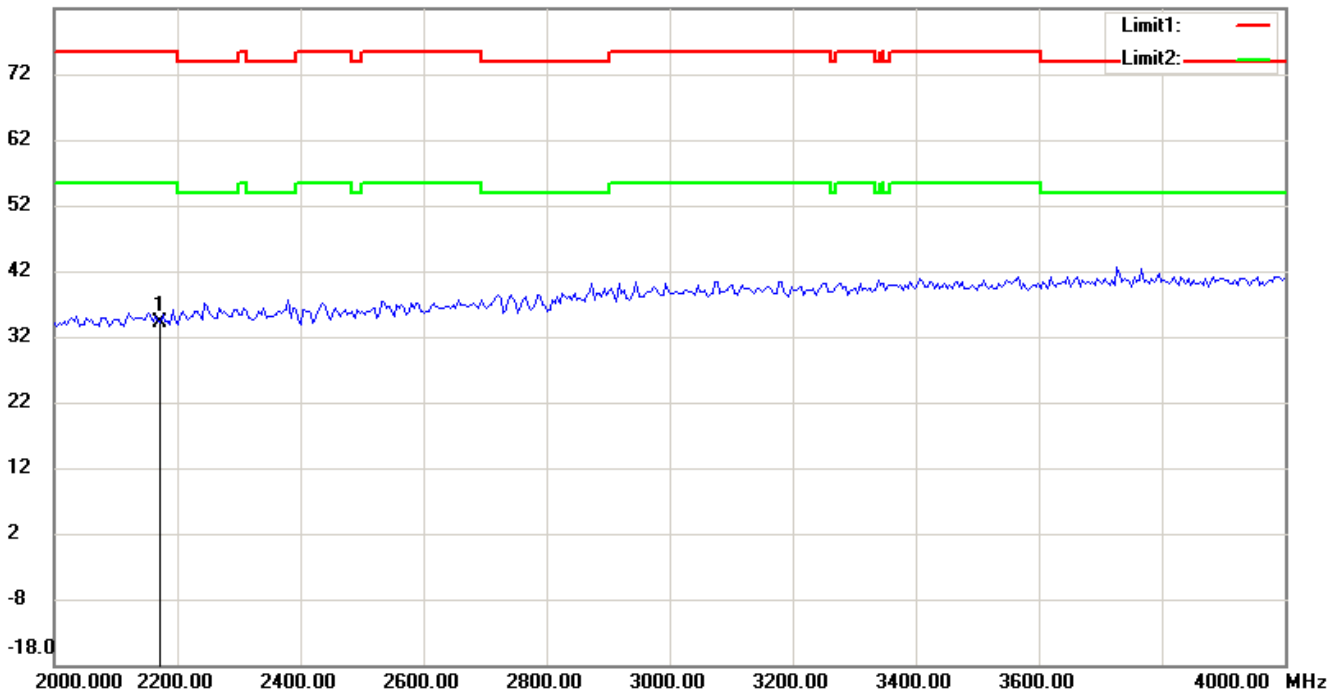
Registration number: W6M21012-11086-C-1

FCC ID: SU7FFII310LID21K

92.0 dBuV/m



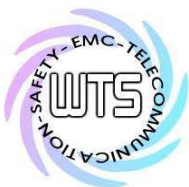
82.0 dBuV/m



**Note:**

Up Line: Peak Limit Line, Down Line: Ave Limit Line

1. The attached measurement plots are preliminarily pre-scanned with peak detector for determining the final checking frequencies and are for reference only.
2. The some frequencies may exceed the limit line without the specified detectors, but that cannot present the results are failed to the specification of test standard.
3. For corrected test results are listed in the relevant table of radiated test data of this test report.



Registration number: W6M21012-11086-C-1

FCC ID: SU7FFII310LID21K

## Bandwidth

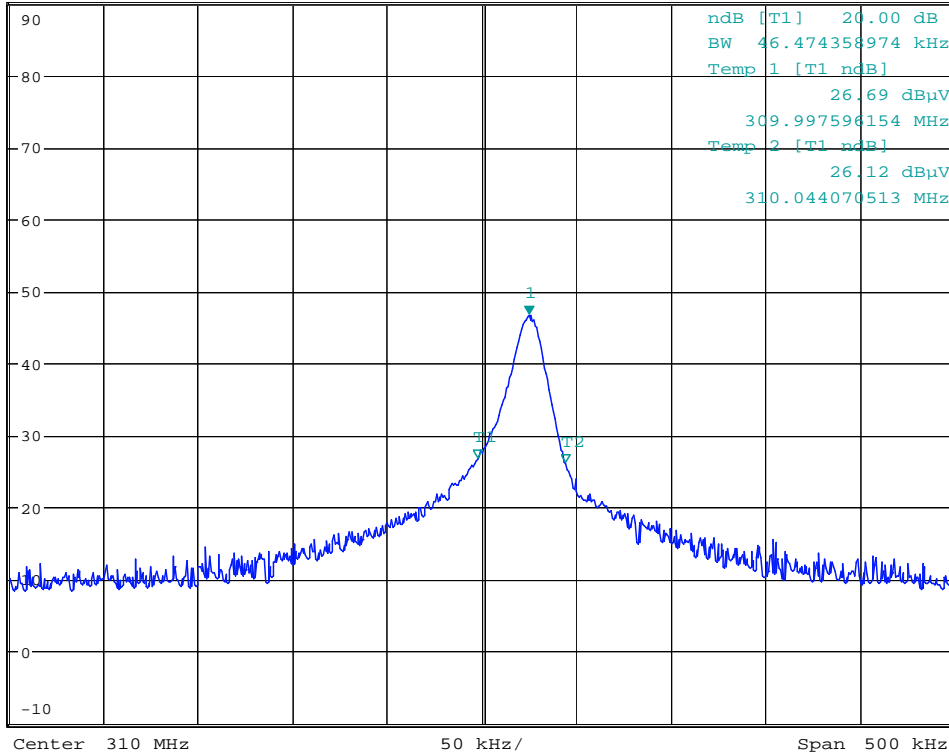


\*RBW 10 kHz      Marker 1 [T1 ]  
\*VBW 30 kHz      46.66 dBμV  
\*SWT 200 ms      310.024839744 MHz

Ref 90 dBμV

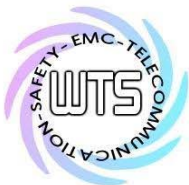
\*Att 5 dB

1 PK  
MAXH



20DB BANDWIDTH

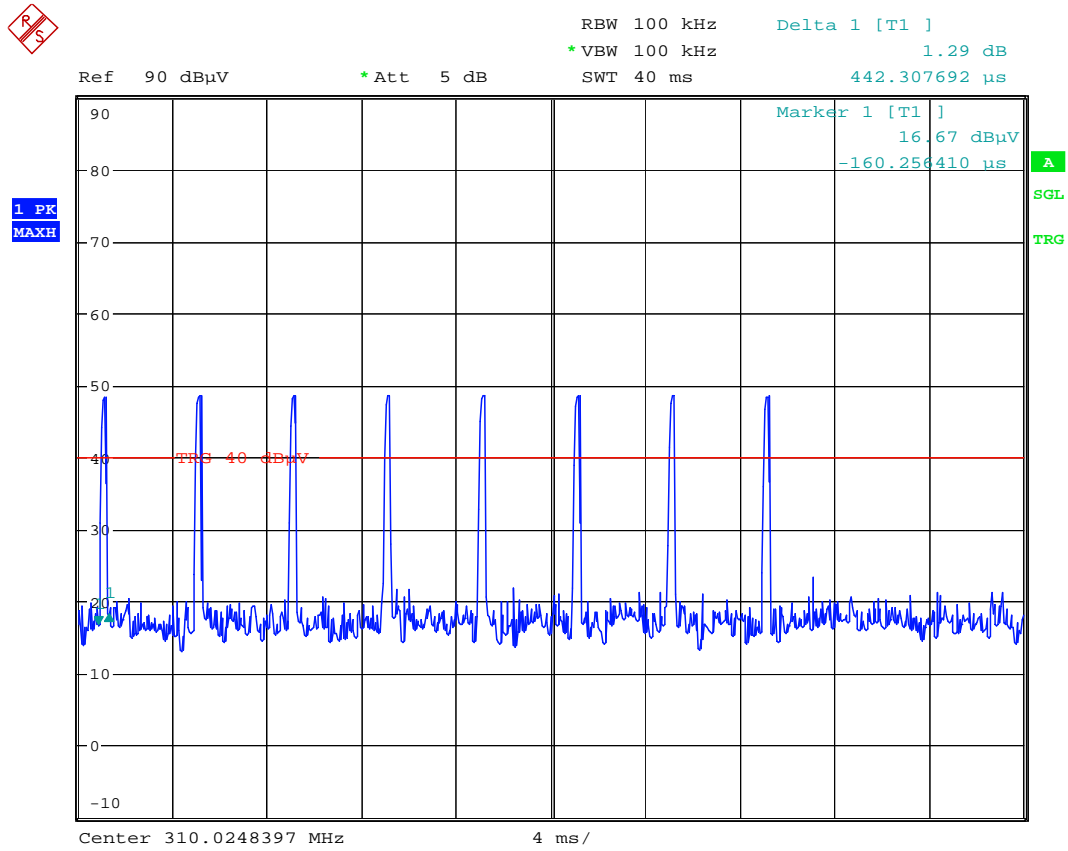
Date: 20.DEC.2010 11:56:37



Registration number: W6M21012-11086-C-1

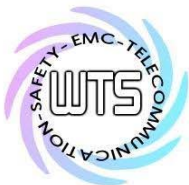
FCC ID: SU7FFII310LID21K

## Duty Cycle



DUTY CYCLE

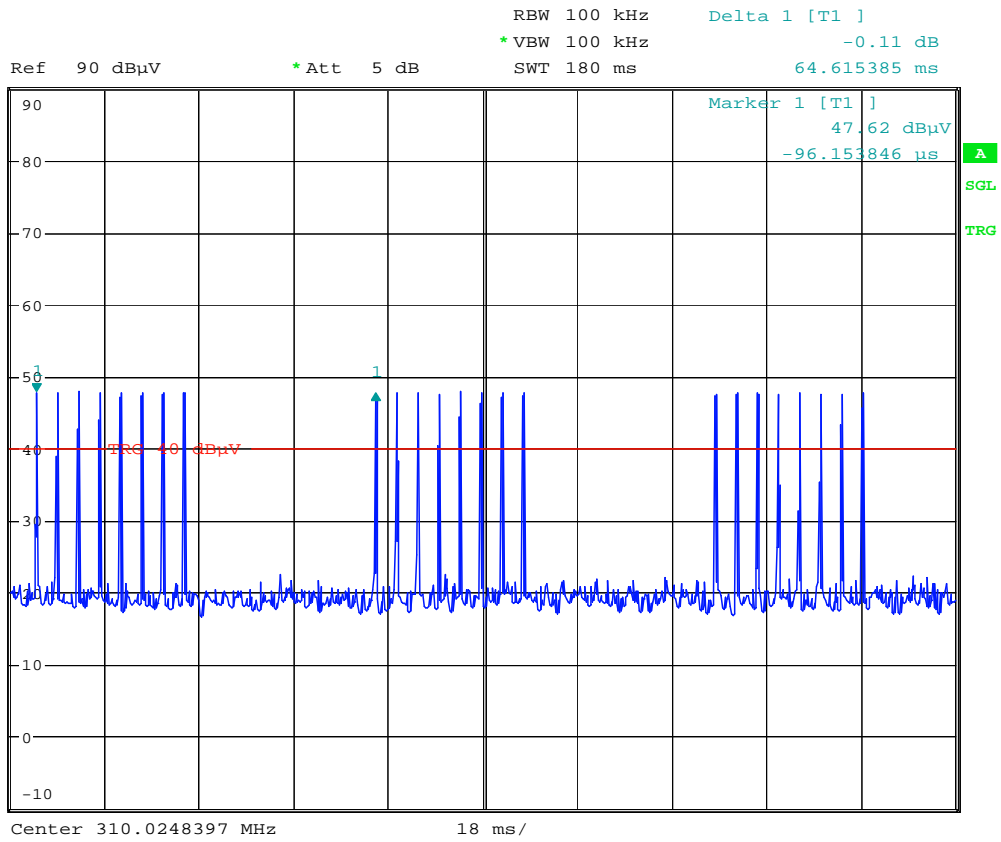
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Registration number: W6M21012-11086-C-1  
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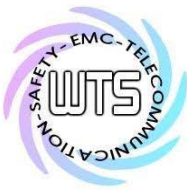


1 PK  
MAXH



DUTY CYCLE

Date: 20.DEC.2010 12:01:12



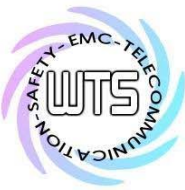
Registration number: W6M21012-11086-C-1

FCC ID: SU7FFII310LID21K

**External Photos**







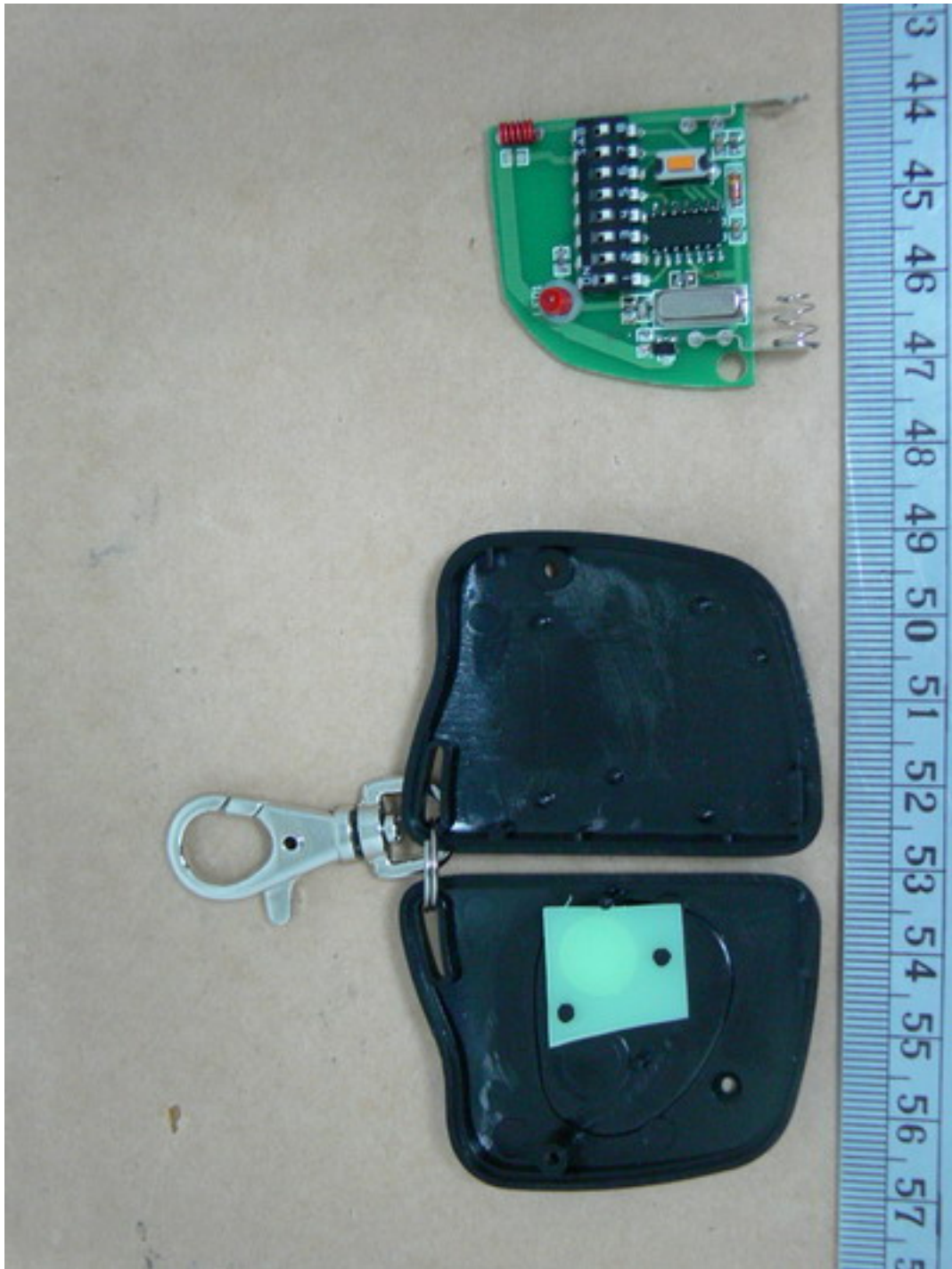
Registration number: W6M21012-11086-C-1  
FCC ID: SU7FFII310LID21K



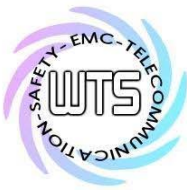
Registration number: W6M21012-11086-C-1

FCC ID: SU7FFII310LID21K

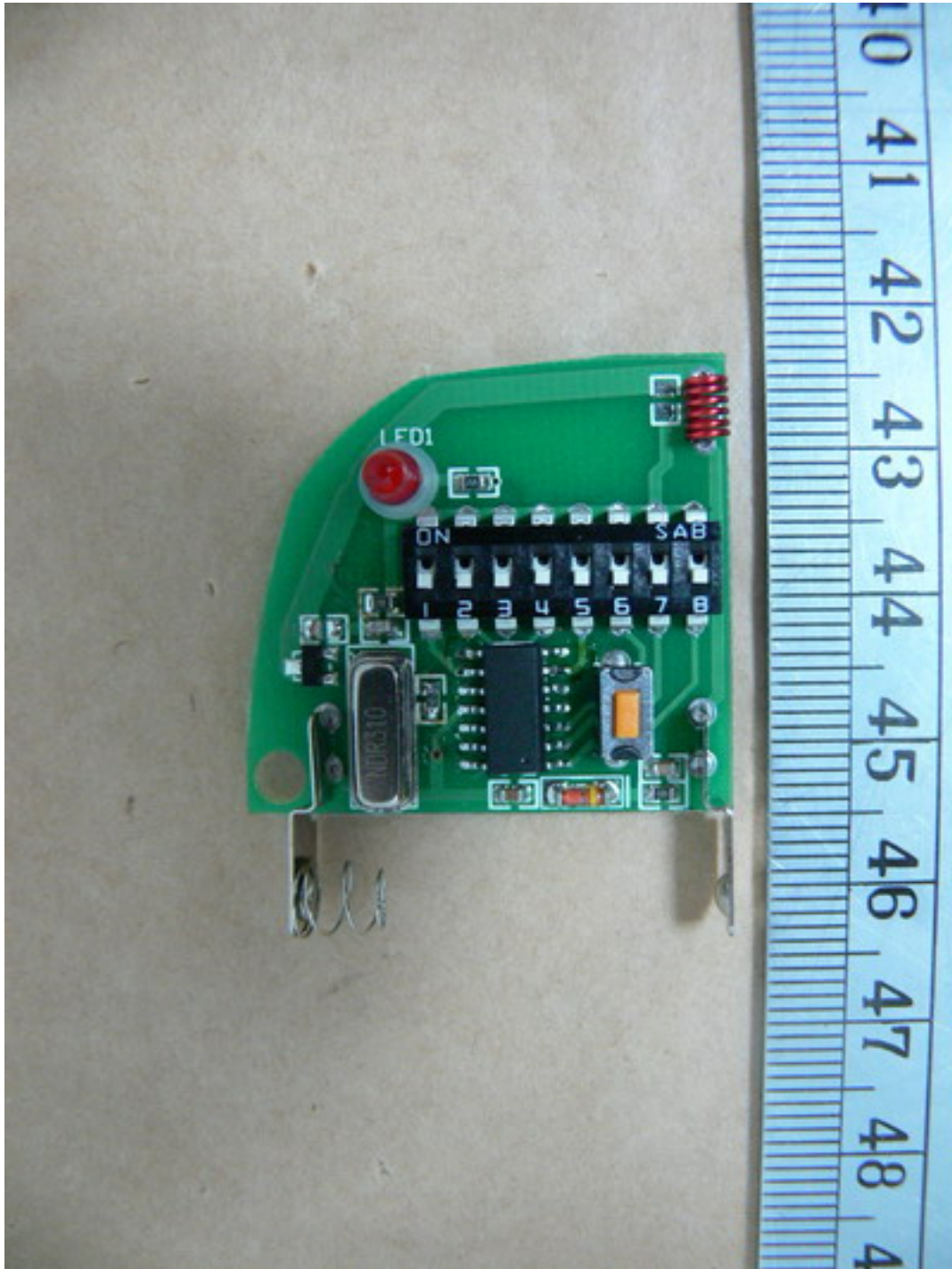
**Internal Photos**

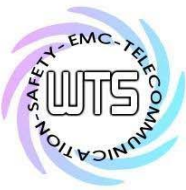




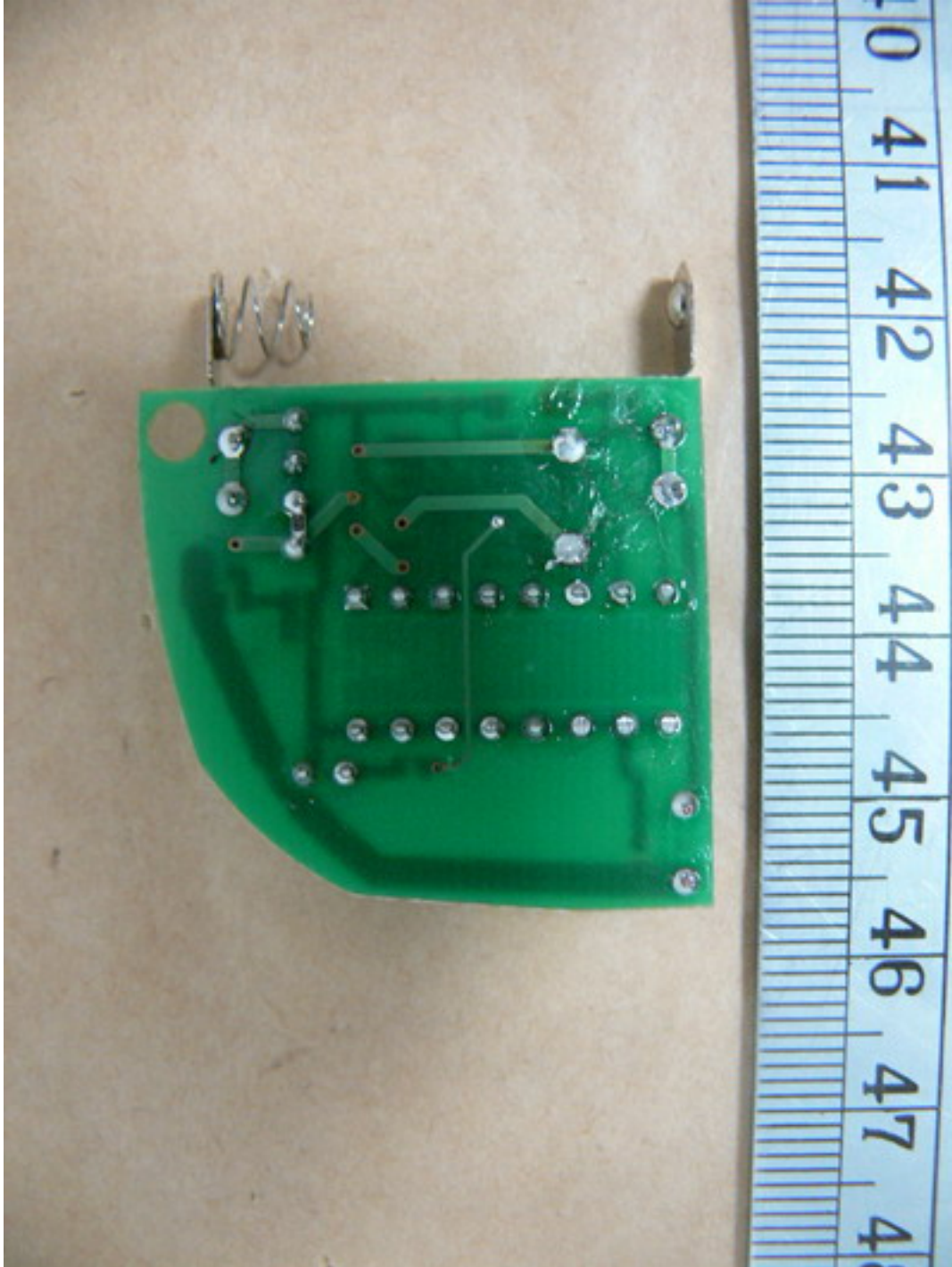


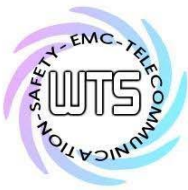
Registration number: W6M21012-11086-C-1  
FCC ID: SU7FFII310LID21K





Registration number: W6M21012-11086-C-1  
FCC ID: SU7FFII310LID21K





Registration number: W6M21012-11086-C-1

FCC ID: SU7FFII310LID21K

**Set Up Photos**

