

FCC PART 15 SUBPART C TEST REPORT

for

Bluetooth

Model No.: WSP-01 (WSP-××)

of

Applicant: TELEWELL ELECTRIC CO., LTD.

**Address: 5F.NO. 196, SEC.2, CHUNG-HSING RD., HSIN-TIEN, TAIPEI,
TAIWAN**

Tested and Prepared

by

Taiwan ETS Product Service Co., Ltd.

FCC Registration No.: 930600

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

A2LA Accredited No.: 1983.02

PTCRB Accredited Type Certification Test House

FCC ID: UNLWSP01

Report No.: W6M20712-8731-P-15



TABLE OF CONTENTS

1	GENERAL INFORMATION	2
1.1	NOTES	2
1.2	TESTING LABORATORY	3
1.2.1	Location	3
1.2.2	Details of accreditation status	3
1.3	DETAILS OF APPROVAL HOLDER	3
1.4	APPLICATION DETAILS	4
1.5	GENERAL INFORMATION OF TEST ITEM	4
1.6	TEST STANDARDS	5
2	TECHNICAL TEST	5
2.1	SUMMARY OF TEST RESULTS	5
2.2	TEST ENVIRONMENT	5
2.3	TEST EQUIPMENT LIST	6
2.4	GENERAL TEST PROCEDURE	8
3	TEST RESULTS (ENCLOSURE)	9
3.1	PEAK OUTPUT POWER (TRANSMITTER)	10
3.2	EQUIVALENT ISOTROPIC RADIATED POWER	11
3.2.1	Transmitter	11
3.3	RF EXPOSURE COMPLIANCE REQUIREMENTS	11
3.4	OUT OF BAND RADIATED EMISSIONS	11
3.5	SPURIOUS EMISSION (TX)	12
3.6	RADIATED EMISSION FROM DIGITAL PART	15
3.7	RADIATED EMISSION ON THE BAND EDGE	16
3.8	POWER LINE CONDUCTED EMISSION	17
	APPENDIX	18



Taiwan ETS Product Service Co., Ltd.

Registration number: W6M20712-8731-P-15

FCC ID: UNLWSP01

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 Taiwan ETS Product Service Co., Ltd.

Tester:

Jan 21, 2008

Jay Chaing

Date

ETS-Lab.

Name

Signature

Technical responsibility for area of testing:

Jan 21, 2008

Steven Chuang

Date

ETS

Name

Signature



Taiwan ETS Product Service Co., Ltd.

Registration number: W6M20712-8731-P-15
FCC ID: UNLWSP01

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

Taiwan ETS Product Service 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: 1983.02

FCC filed test laboratory Reg. No. 930600

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

PTCRB Accredited Type Certification Test House

1.3 Details of approval holder

Name:	TELEWELL ELECTRIC CO., LTD.
Street:	5F.NO.196, SEC.2, CHUNG-HSING RD., HSIN-TIEN
Town:	TAIPEI,
Country:	TAIWAN
Telephone:	886-2-2915-0386
Fax:	886-2-2914-7461
Teletex:	./.



Taiwan ETS Product Service Co., Ltd.

Registration number: W6M20712-8731-P-15
FCC ID: UNLWSP01

1.4 Application details

Date of receipt of test item: Dec 13, 2007
Date of test: From Dec 13, 2007 to Jan 21, 2008

1.5 General information of Test item

Type of test item: Bluetooth
Model Number: WSP-01 (WSP-xx)
Multi-listing model number: without
Photos: see Annex

Technical data

Frequency band: 2400-2483.5MHz

Operating frequency for video: lowest frequency 2.402 GHz
 center frequency 2.441 GHz
 highest frequency 2.480 GHz

Operation modes: duplex

Modulation Type: GFSK

Antenna type: dipole antenna

Power supply: Battery (3A x 4)

Manufacturer: (if different from applicant)

Name: BESTTEL ELECTRONIC (TAIZHOU) CO., LTD
Street: NO.2.MEILAN WEST RD.,TAIZHOU ECONOMIC DEVELOPMENT
 ZONE,TAIZHOU,JIANGSU,
Town: ./.
Country: China

Additional information: ./.



Registration number: W6M20712-8731-P-15
FCC ID: UNLWSP01

1.6 Test standards

Technical standard : FCC RULES PART 15 SUBPART C § 15.249 (2007-09)

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 2.5 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 Power supply:	Battery (3A x 4)
Extreme conditions parameters:	Not required



Taiwan ETS Product Service Co., Ltd.

Registration number: W6M20712-8731-P-15

FCC ID: UNLWSP01

2.3 Test Equipment List

No.	Test equipment	Type	Serial No.	Manufacturer	Cal. Date	Next Cal. Date
ETSTW-CE 001	EMI TEST RECEIVER	ESHS10	842121/013	R&S	2007/10/15	2008/10/14
ETSTW-CE 002	PREREULATOR MODE DC POWER SUPPLY	None	None		Function Test	
ETSTW-CE 003	AC POWER SOURCE	APS-9102	D161137	GW	Function Test	
ETSTW-CE 004	ZWEILEITER-V-NETZNACHBILDUNG TWO-LINE V-NETWORK	ESH3-Z5	840731/011	R&S	2007/10/15	2008/10/14
ETSTW-CE 005	Line-Impedance Stabilisation Network	NNBM 8126D	137	Schwarzbeck	2007/10/15	2008/10/14
ETSTW-CE 006	IMPULSBEGRENZER PULSE LIMITER	ESH3-Z2	100226	R&S	2007/5/11	2008/5/10
ETSTW-CE 008	ABSORBING CLAMP	MDS 21	3469	Schwarzbeck	2007/10/23	2009/10/22
ETSTW-CE 009	TEMP.&HUMIDITY CHAMBER	GTH-225-40-1P-U	MAA0305-009	GIANT FORCE	2007/8/2	2008/8/1
ETSTW-CE 013	CISPR 22 TWO BALANCED TELECOM PAIRS IMPEDANCE STABILIZATION NETWORK	FCC-TLISN-T4-02	20242	FCC	2007/11/2	2009/11/1
ETSTW-CE 014	CISPR 22 TWO BALANCED TELECOM PAIRS IMPEDANCE STABILIZATION NETWORK	FCC-TLISN-T2-02	20241	FCC	2005/12/7	2008/12/6
ETSTW-CE 015	CISPR 22 TWO BALANCED TELECOM PAIRS IMPEDANCE STABILIZATION NETWORK	FCC-TLISN-T8-02	20307	FCC	2006/11/7	2008/11/6
ETSTW-CE 016	TWO-LINE V-NETWORK	ENV216	100050	R&S	2007/10/29	2008/10/28
ETSTW-RE 002	Function Generator	33220A	MY43004982	Agilent	2007/10/12	2009/10/11
ETSTW-RE 003	EMI TEST RECEIVER	ESI 26	831438/001	R&S	2007/12/3	2008/12/2
ETSTW-RE 004	EMI TEST RECEIVER	ESI 40	832427/004	R&S	2007/10/29	2008/10/28
ETSTW-RE 005	EMI TEST RECEIVER	ESVS10	843207/020	R&S	2007/10/11	2008/10/12
ETSTW-RE 010	PROGRAMMABLE LINEAR POWER SUPPLY	LPS-305	30503070181	MOTECH	Function Test	
ETSTW-RE 011	PROGRAMMABLE LINEAR POWER SUPPLY	LPS-305	30503070165	MOTECH	Function Test	
ETSTW-RE 017	Log-Periodic Antenna	HL025	352886/001	R&S	2006/5/4	2008/5/3
ETSTW-RE 018	MICROWAVE HORN ANTENNA	AT4560	27212	AR	2007/11/7	2010/11/6
ETSTW-RE 020	MICROWAVE HORN ANTENNA	AT4002A	306915	AR	Function Test	
ETSTW-RE 021	SWEEP GENERATOR	SWM05	835130/010	R&S	2007/10/9	2008/10/8
ETSTW-RE 027	Passive Loop Antenna	6512	00034563	EMCO	2007/6/29	2008/6/28
ETSTW-RE 028	Log-Periodic DipoleArray Antenna	3148	34429	EMCO	2006/5/26	2008/5/25
ETSTW-RE 029	Biconical Antenna	3109	33524	EMCO	2006/5/26	2008/5/25
ETSTW-RE 030	Double-Ridged Guide Horn Antenna	3117	00035224	EMCO	2006/5/3	2008/5/2
ETSTW-RE 032	Millivoltmeter	URV 55	849086/013	R&S	2007/10/9	2008/10/8
ETSTW-RE 033	WaveRunner 6000A Serie Oscilloscope	WAVERUNNER 6100A	LCRY0604P14508	LeCroy	2007/7/9	2008/7/8
ETSTW-RE 034	Power Sensor	URV5-Z4	839313/006	R&S	2007/10/16	2009/10/15
ETSTW-RE 042	Biconical Antenna	HK116	100172	R&S	2007/1/11	2009/1/10
ETSTW-RE 043	Log-Periodic Dipole Antenna	HL223	100166	R&S	2006/5/8	2008/5/7
ETSTW-RE 044	Log-Periodic Antenna	HL050	100094	R&S	2006/5/29	2008/5/28
ETSTW-RE 047	ESA-E SERIES SPECTRUM ANALYZER	E4445A	MY46181369	Agilent	2007/7/19	2008/7/18



Taiwan ETS Product Service Co., Ltd.

Registration number: W6M20712-8731-P-15

FCC ID: UNLWSP01

ETSTW-RE 048	Triple Loop Antenna	HXYZ 9170	HXYZ 9170-134	Schwarzbeck	2005/3/22	2008/3/21
ETSTW-RE 049	TRILOG Super Broadband test Antenna	VULB 9160	9160-3185	Schwarzbeck	2007/5/2	2009/5/1
ETSTW-RE 055	SPECTRUM ANALYZER	FSU-26	200074	R&S	2007/7/16	2008/7/15
ETSTW-RE 064	Bluetooth Test Set	MT8852B-042	6K00005709	Anritsu	Function Test	
ETSTW-RE 072	CELL SITE TEST SET	8921A	3339A00375	HP	2007/7/2	2009/7/1



2.4 General Test Procedure

POWER LINE CONDUCTED INTERFERENCE: The procedure used was ANSI STANDARD C63.4-2003 using a 50 μ 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 employing a spectrum analyzer. For investigated frequency is equal to or below 1GHz, the RBW and VBW of the spectrum analyzer was 100 kHz and 100kHz respectively with an appropriate sweep speed. For investigated frequency is above 1GHz, both of RBW and VBW of the spectrum analyzer were 1 MHz with an appropriate sweep speed. The analyzer was calibrated in dB above a microvolt at the output of the antenna. The ambient temperature of the UUT was 23°C with a humidity of 40 %.

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 μ 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 μ V + 10.36 dB + 6 dB = 36.36 dB μ V/m @3m

ANSI STANDARD C63.4-2003 10.1.7 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 10th harmonic of the fundamental.

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

Measurements were made by Taiwan ETS Product Service Co., Ltd. at the registered open field test site located at No.5-1, Shuang Sing Village, LiShuei Rd., Wanli Township, Taipei County 207, Taiwan (R.O.C.) 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.

ANTENNA & GROUND:

This unit uses dipole antenna (see photo).



Taiwan ETS Product Service Co., Ltd.

Registration number: W6M20712-8731-P-15
FCC ID: UNLWSP01

3 Test results (enclosure)

Test case	Para. Number	Required	Test passed	Test failed
Peak Output Power	15.249 (b)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Spurious Emissions radiated – Transmitter operating	15.249 (e)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Spurious Emissions conducted – Transmitter operating	15.249 (e)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Radiated Emission from Digital Part	15.109	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Out of Band Spurious Emission, Band edge-Transmitter operating	15.249 (e)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Power Line Conducted Emission	15.207	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

The follows is intended to leave blank.



Registration number: W6M20712-8731-P-15

FCC ID: UNLWSP01

3.1 Peak Output Power (transmitter)

FCC Rule: 15.249 (b)

This measurement applies to equipment with an integral antenna and to equipment with an antenna connector and equipped with an antenna as declared by the applicant.

The power was measured with modulation (declared by the applicant).

Test conditions		Conducted Power		
		Channel A [dBm]	Channel B [dBm]	Channel C [dBm]
$T_{nom} = 23^{\circ}\text{C}$	$V_{nom} = 3.3\text{ V}$	-9.96	-8.48	-8.59

Test equipment used: ETSTW-RE 003, ETSTW-RE 004, ETSTW-RE 017, ETSTW-RE 028,
ETSTW-RE 030, ETSTW-RE 043, ETSTW-RE 044

Explanation: The diagrams for the field strength measurements are included in appendix.



Taiwan ETS Product Service Co., Ltd.

Registration number: W6M20712-8731-P-15

FCC ID: UNLWSP01

3.2 Equivalent isotropic radiated power

Because using an permanent antenna there are no deviations from the radiated test results according 3.1.

3.2.1 Transmitter

Integral Antenna:

At the transmitter the measurement was transacted with the modulation declared by the manufacturer and the maximum available output power of the EUT.

In this arrangement the EUT fulfils the requirements of the FCC rules § 15.249, subpart C, This unit uses permanent antenna. There is no provision for an external antenna (see photo).

3.3 RF Exposure Compliance Requirements

Not applicable for this Bluetooth for the low power level.

3.4 Out of Band Radiated Emissions

FCC Rule: 15.249 (d)(e), 15.35(b)

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.

For frequency above 1000 MHz, the field strength limits are based on average limits. However, 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. For point-to-point operation, the peak field strength shall not exceed 2500 millivolts/meter at 3 meters along the antenna azimuth.

Limits:

Frequency of Emission (MHz)	Field strength (microvolt/meter)	Field Strength (dB microvolt/meter)
30 - 88	100	40.0
88 – 216	150	43.5
216 – 960	200	46.5
Above 960	500	54.0

For frequencies above 1 GHz (Peak measurements).

Limit + 20 dB 54.0 dB μ V/m + 20 dB= 74dB μ V/m

Or

Must be attenuated at least 50dB below the level of fundament

Test equipment used: ETSTW-RE 003, ETSTW-RE 004, ETSTW-RE 030, ETSTW-RE 017,
ETSTW-RE 028, ETSTW-RE 029, ETSTW-RE 042, ETSTW-RE 043

Explanation: see attached diagram



Taiwan ETS Product Service Co., Ltd.

Registration number: W6M20712-8731-P-15

FCC ID: UNLWSP01

3.5 Spurious emission (tx)

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

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.

For frequencies above 1000 MHz, the field strength limits are based on average limits. However, 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. For point-to-point operation, the peak field strength shall not exceed 2500 millivolts/meter at 3 meters along the antenna azimuth.

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

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

The critical peak value listed in the table agree with the above calculated limits.

Summary table with radiated data of the test plots

Model: WSP-01(WSP-xx) Date: 2008/1/14
 Mode: TX CH0 Temperature: 26 °C Engineer: Danny
 Polarization: Horizontal Humidity: 60 %

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
166.894	26.28	peak	15.12	41.40	43.5	-2.10	200	150
534.269	18.76	peak	20.39	39.15	46	-6.85	140	150
913.026	15.23	peak	26.54	41.77	46	-4.23	330	150

Frequency (MHz)	Reading (dBuV)		Factor (dB)	Result @3m (dBuV/m)		Limit @3m (dBuV/m)		Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
	Peak	Ave.	Corr.	Peak	Ave.	Peak	Ave.			
1601.202	59.12	---	-9.40	49.72	---	74	54	-24.28	180	150
3206.413	54.30	---	-2.26	52.04	---	74	54	-21.96	140	150
4804.024	67.09	47.07	-1.30	65.79	45.77	74	54	11.79	160	150

Polarization: Vertical

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
62.465	20.77	peak	13.57	34.34	40	-5.66	110	150
401.002	19.52	peak	17.81	37.33	46	-8.67	210	150
913.026	14.00	peak	26.54	40.54	46	-5.46	260	150



Taiwan ETS Product Service Co., Ltd.

Registration number: W6M20712-8731-P-15

FCC ID: UNLWSP01

Frequency (MHz)	Reading (dBuV)		Factor (dB) Corr.	Result @3m (dBuV/m)		Limit @3m (dBuV/m)		Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
	Peak	Ave.		Peak	Ave.	Peak	Ave.			
1601.202	60.23	---	-9.40	50.83	---	74	54	-23.17	180	150
3206.413	52.67	---	-2.26	50.41	---	74	54	-23.59	190	150
4804.000	64.33	46.15	-1.30	63.03	44.85	74	54	9.03	160	150

Mode: TX CH39 Temperature: 26 °C Engineer: Danny
Polarization: Horizontal Humidity: 60 %

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
166.894	25.16	peak	15.12	40.28	43.5	-3.22	140	150
534.269	18.76	peak	20.39	39.15	46	-6.85	110	150
913.026	15.23	peak	26.54	41.77	46	-4.23	100	150

Frequency (MHz)	Reading (dBuV)		Factor (dB) Corr.	Result @3m (dBuV/m)		Limit @3m (dBuV/m)		Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
	Peak	Ave.		Peak	Ave.	Peak	Ave.			
1625.251	64.20	62.31	-11.05	53.15	51.26	74	54	-0.85	160	150
3254.509	51.17	---	-5.69	45.48	---	74	54	-28.52	210	150
4881.764	52.36	---	-2.14	50.22	---	74	54	-23.78	160	150

Polarization: Vertical

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
166.353	20.62	peak	15.15	35.77	43.5	-7.73	210	150
401.002	19.52	peak	17.81	37.33	46	-8.67	130	150
913.026	14.00	peak	26.54	40.54	46	-5.46	200	150

Frequency (MHz)	Reading (dBuV)		Factor (dB) Corr.	Result @3m (dBuV/m)		Limit @3m (dBuV/m)		Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
	Peak	Ave.		Peak	Ave.	Peak	Ave.			
1625.251	63.47	---	-11.05	52.42	---	74	54	-21.58	220	150
3044.088	50.53	---	-6.03	44.50	---	74	54	-29.50	330	150
4881.764	48.42	---	-2.14	46.28	---	74	54	-27.72	210	150



Taiwan ETS Product Service Co., Ltd.

Registration number: W6M20712-8731-P-15

FCC ID: UNLWSP01

Mode: TX CH78 Temperature: 26 °C Engineer: Danny
Polarization: Horizontal Humidity: 60 %

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
166.353	25.08	peak	15.15	40.23	43.5	-3.27	140	150
532.866	17.92	peak	20.36	38.28	46	-7.72	180	150
913.026	14.23	peak	26.54	40.77	46	-5.23	260	150

Frequency (MHz)	Reading (dBuV)		Factor (dB) Corr.	Result @3m (dBuV/m)		Limit @3m (dBuV/m)		Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
	Peak	Ave.		Peak	Ave.	Peak	Ave.			
1649.299	64.89	---	-10.88	54.01	---	74	54	-19.99	260	150
1653.375	---	63.34	-10.86	---	52.48	74	54	-1.52	210	150
3308.617	50.33	---	-5.61	44.72	---	74	54	-29.28	290	150
4953.908	50.61	---	-1.81	48.80	---	74	54	-25.20	120	150

Polarization: Vertical

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
166.353	20.62	peak	15.15	35.77	43.5	-7.73	340	150
534.269	22.43	peak	20.39	42.82	46	-3.18	130	150
913.026	14.36	peak	26.54	40.90	46	-5.10	140	150

Frequency (MHz)	Reading (dBuV)		Factor (dB) Corr.	Result @3m (dBuV/m)		Limit @3m (dBuV/m)		Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
	Peak	Ave.		Peak	Ave.	Peak	Ave.			
1649.299	62.60	---	-10.88	51.72	---	74	54	-22.28	300	150
3272.545	49.27	---	-5.66	43.61	---	74	54	-30.39	250	150
4961.924	49.16	---	-1.78	47.38	---	74	54	-26.62	140	150

- Note**
1. **Correction Factor = Antenna factor + Cable loss - Preamplifier**
 2. **The formula of measured value as: Test Result = Corrected Reading + Correction Factor**
 3. **Detector function in the form : P = 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 attached diagram as appendix.**

TEST RESULT (Transmitter): The unit DOES meet the FCC requirements.

Test equipment used: ETSTW-RE 003, ETSTW-RE 004, ETSTW-RE 017, ETSTW-RE 028
ETSTW-RE 029, ETSTW-RE 030, ETSTW-RE 042, ETSTW-RE 043,
ETSTW-RE 044

Explanation: see attached diagrams



Registration number: W6M20712-8731-P-15

FCC ID: UNLWSP01

3.6 Radiated Emission from Digital Part

Except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

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

Test equipment used: ETSTW-RE 003, ETSTW-RE 004, ETSTW-RE 017, ETSTW-RE 028,
ETSTW-RE 029, ETSTW-RE 030, ETSTW-RE 042, ETSTW-RE 043,
ETSTW-RE 044

Explanation: This test is not required.



Registration number: W6M20712-8731-P-15

FCC ID: UNLWSP01

3.7 Radiated Emission on the band edge

From the following plots, they show that the fundamental emissions are confined in the specified band and they are at least 50 dB below the carrier level at band edge (± MHz). It meets the requirement of section 15.249(d).

Test conditions T _{nom} = 23°C, V _{nom} = 12V Frequency [MHz]	Transmitter field strength of Radiated Emission (Peak Detector)	Transmitter field strength of Radiated Emission (Average Detector)
	[dBμV/m]	
2400	47.54	42.81
2483.5	48.96	44.12

Limit:

Frequency Range (MHz)	Limit (dBμV/m)	
	Peak	Average
902 – 928	74	54
2400 – 2483.5		
5725 – 5875		
24000 - 24250		

Test equipment used: ETSTW-RE 003, ETSTW-RE 004, ETSTW-RE 017, ETSTW-RE 028,
ETSTW-RE 030, ETSTW-RE 043, ETSTW-RE 044

Explanation: Please see attached diagram as Appendix.



3.8 Power Line Conducted Emission

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 (dB μ V)	
	quasi-peak	average
150 kHz	lower limit line	Lower limit line

Limits:

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi Peak	Average
0.15-0.5	66 to 56	56 to 46
0.5-5	56	46
5-30	60	50

Test equipment used: ETSTW-CE 001, ETSTW-CE 003, ETSTW-CE 004, ETSTW-CE 006

Explanation: This device uses battery, so test is not required.



Appendix

A Measurement diagrams

1. Peak Output Power (transmitter)
2. Spurious Emissions radiated
3. Bandage

B Photos

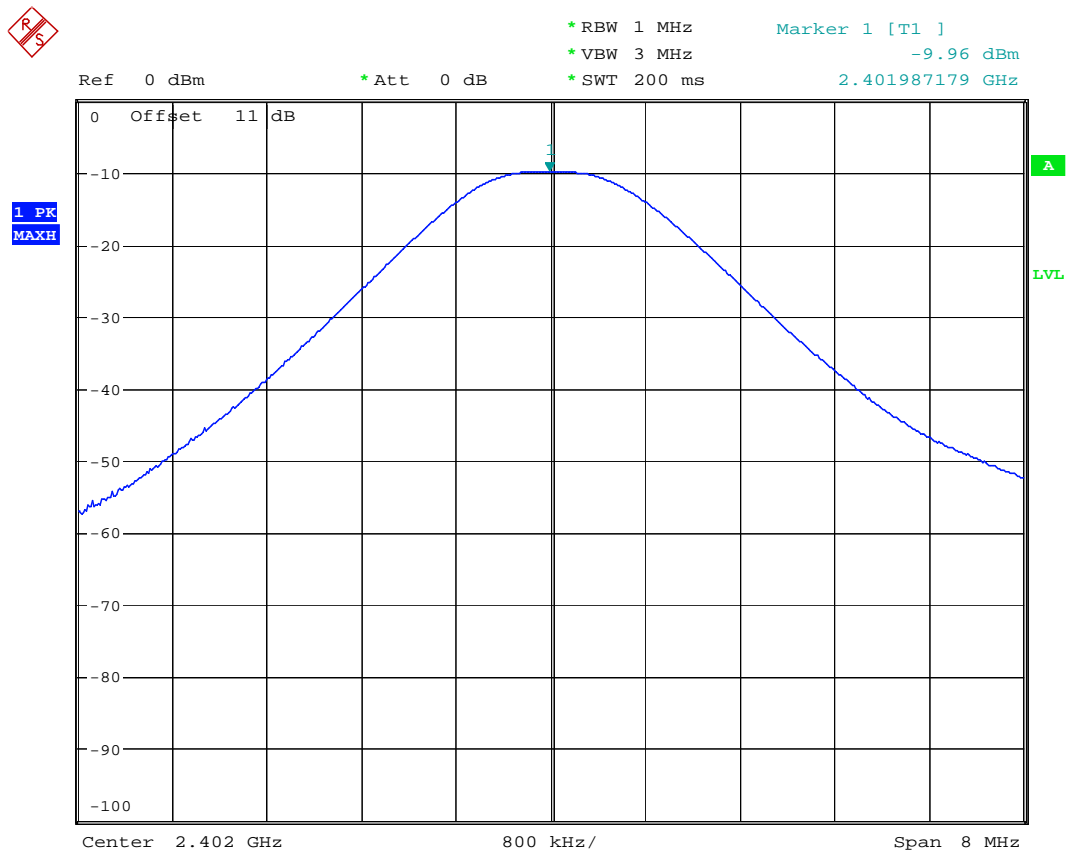
1. External Photos
2. Internal Photos
3. Set Up Photo of Radiated Emission



Registration number: W6M20712-8731-P-15

FCC ID: UNLWSP01

Peak Output Power (transmitter)



MAX OUTPUT POWER CH0

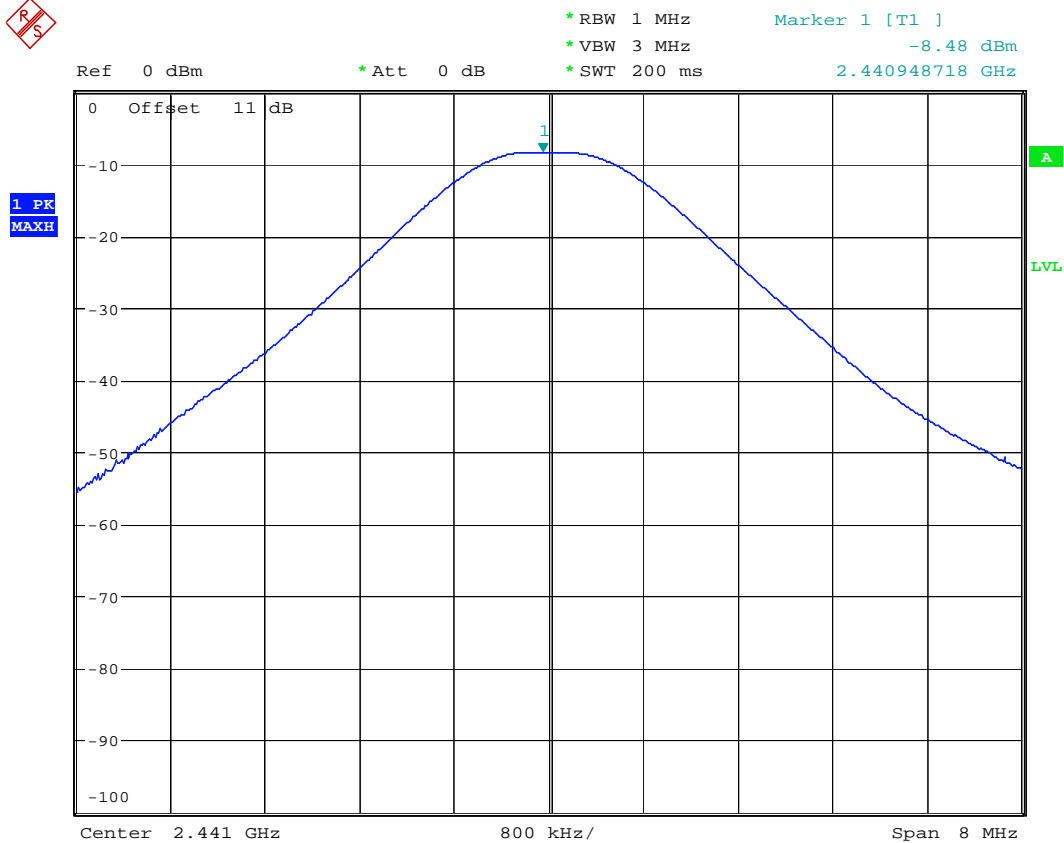
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Registration number: W6M20712-8731-P-15

FCC ID: UNLWSP01



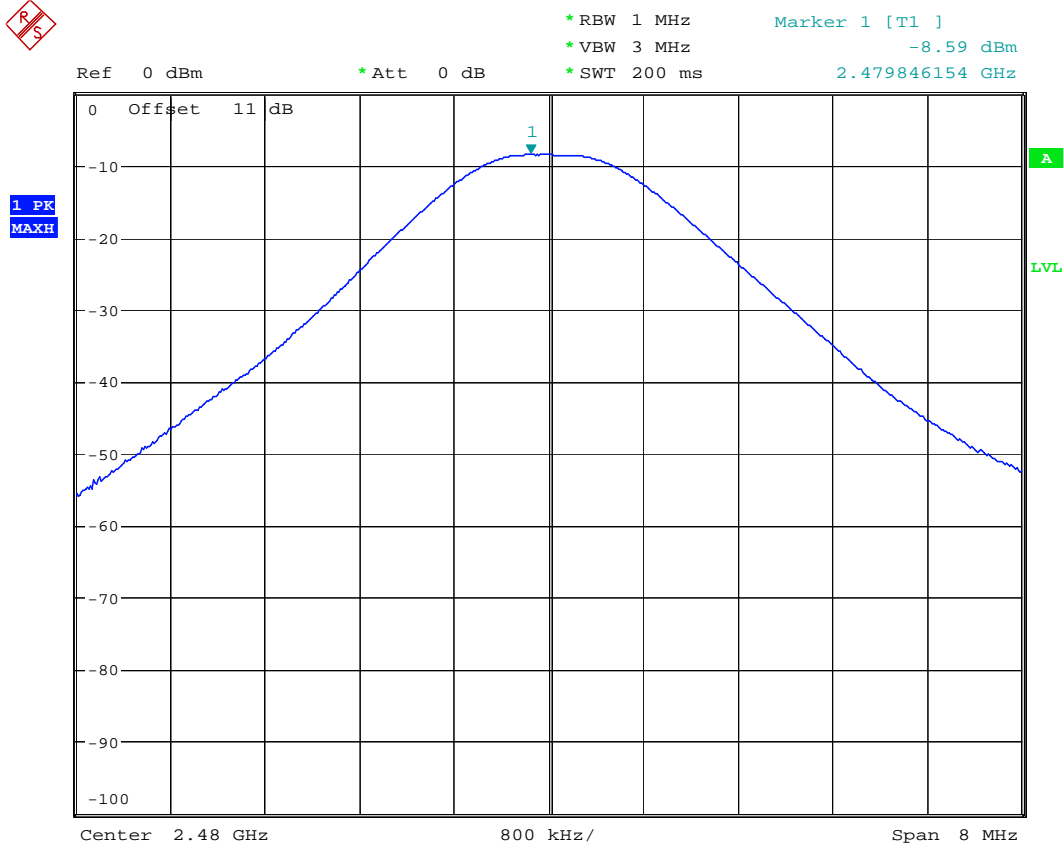
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Taiwan ETS Product Service Co., Ltd.

Registration number: W6M20712-8731-P-15
FCC ID: UNLWSP01



MAX OUTPUT POWER CH78

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Taiwan ETS Product Service Co., Ltd.

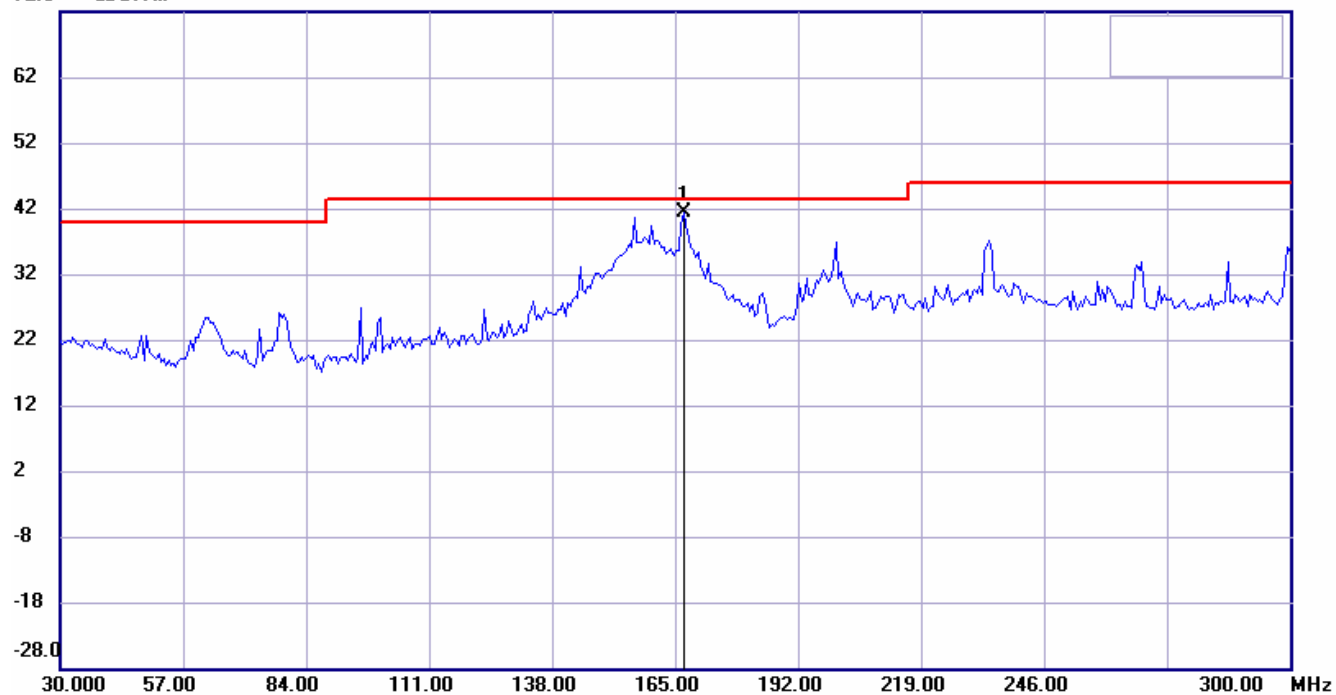
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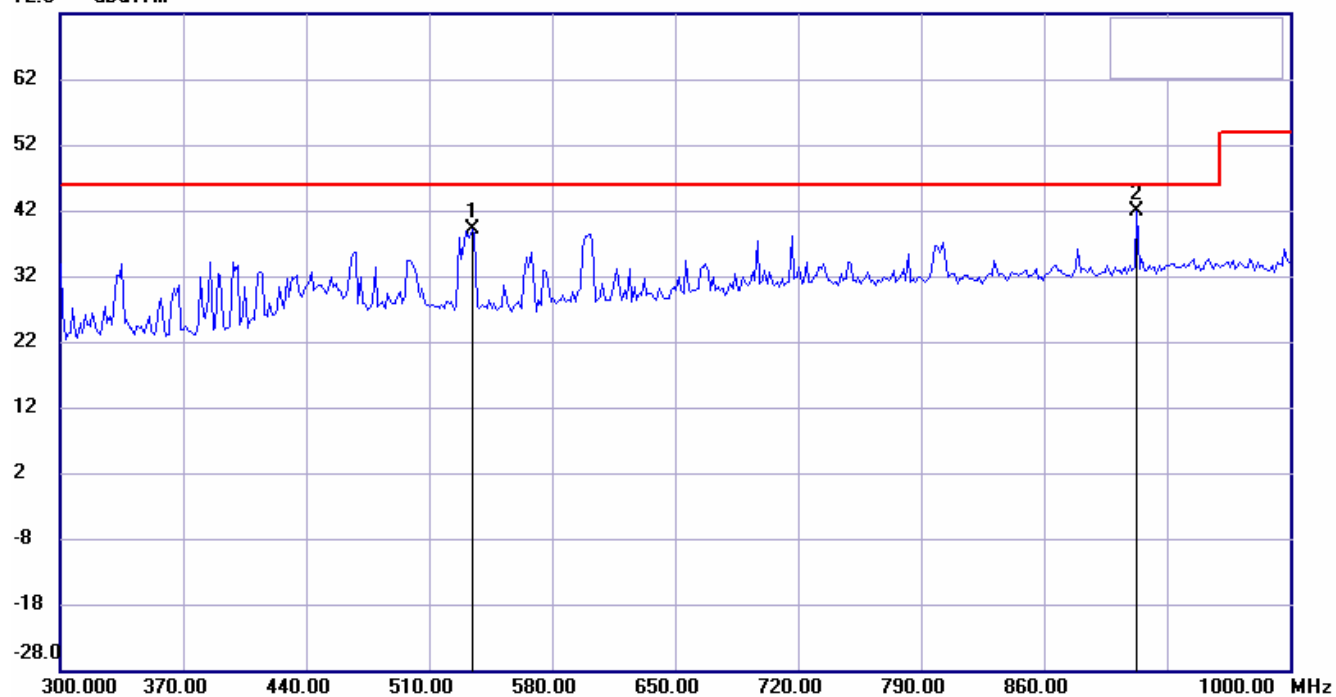
Spurious Emissions radiated

Antenna Polarization H_ low channel

72.0 dBuV/m



72.0 dBuV/m

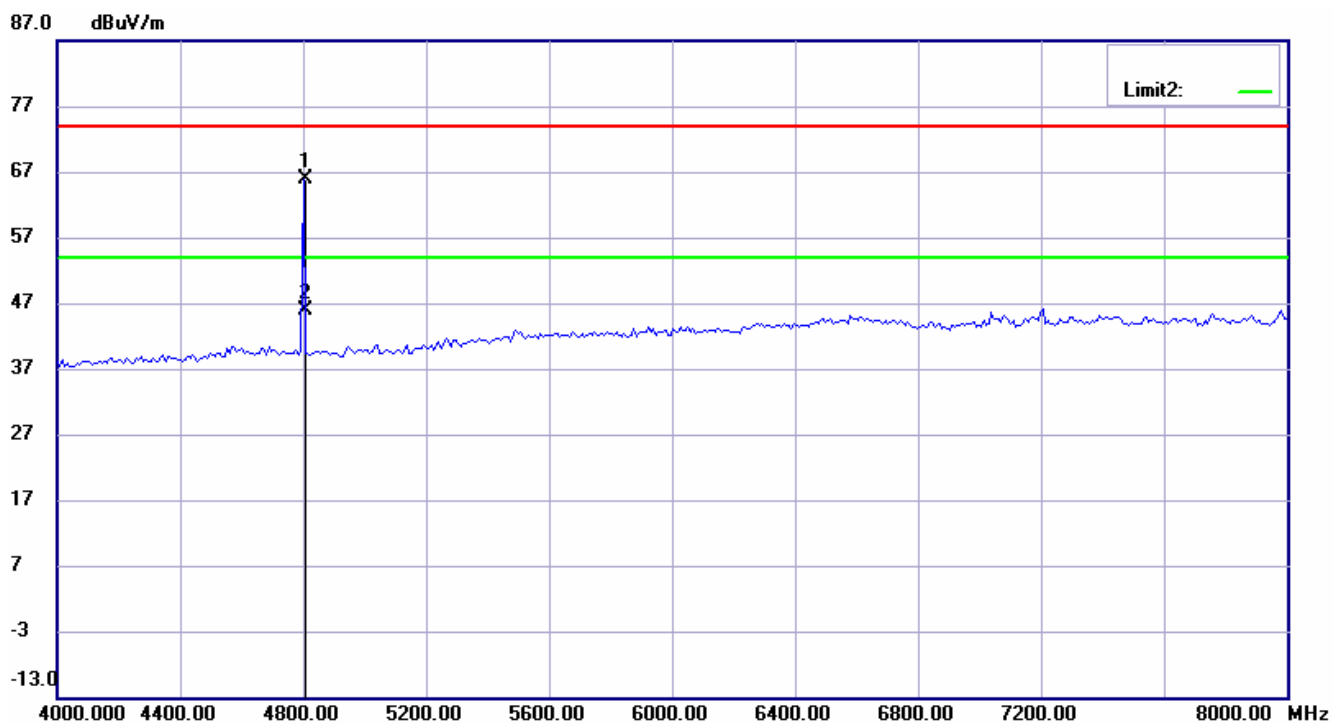
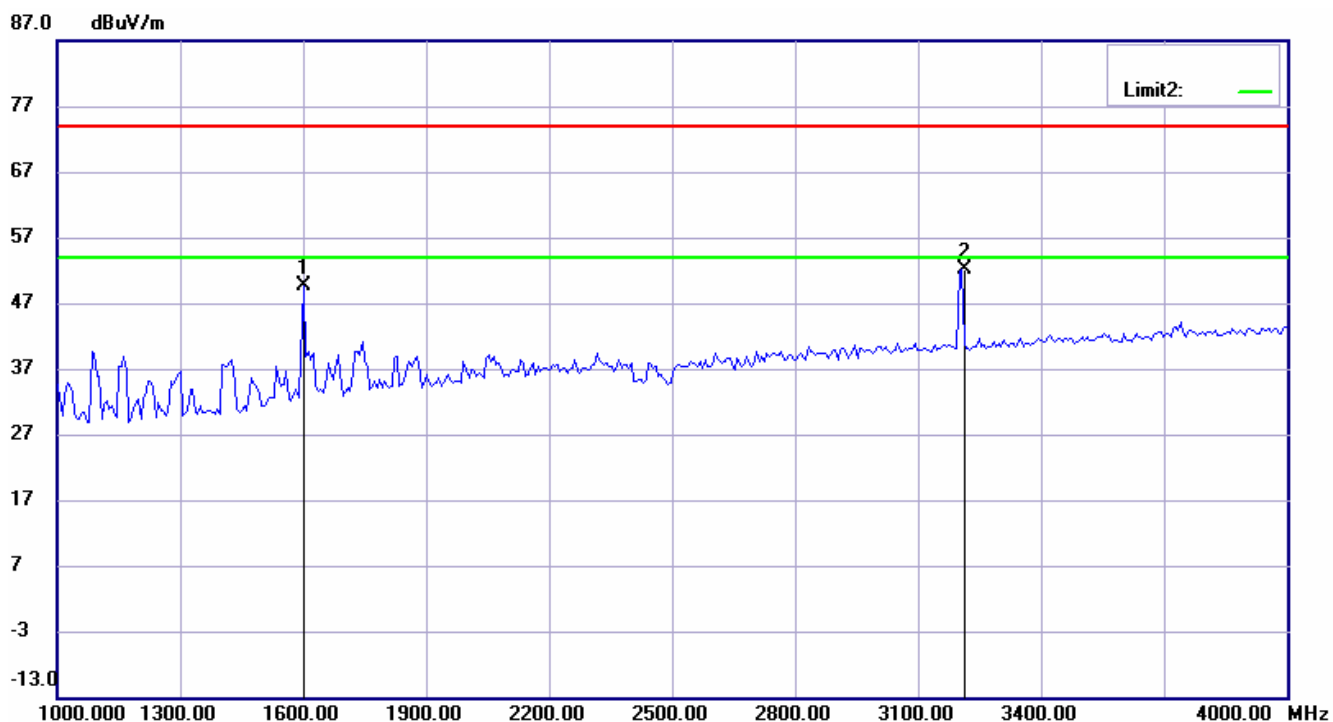




Taiwan ETS Product Service Co., Ltd.

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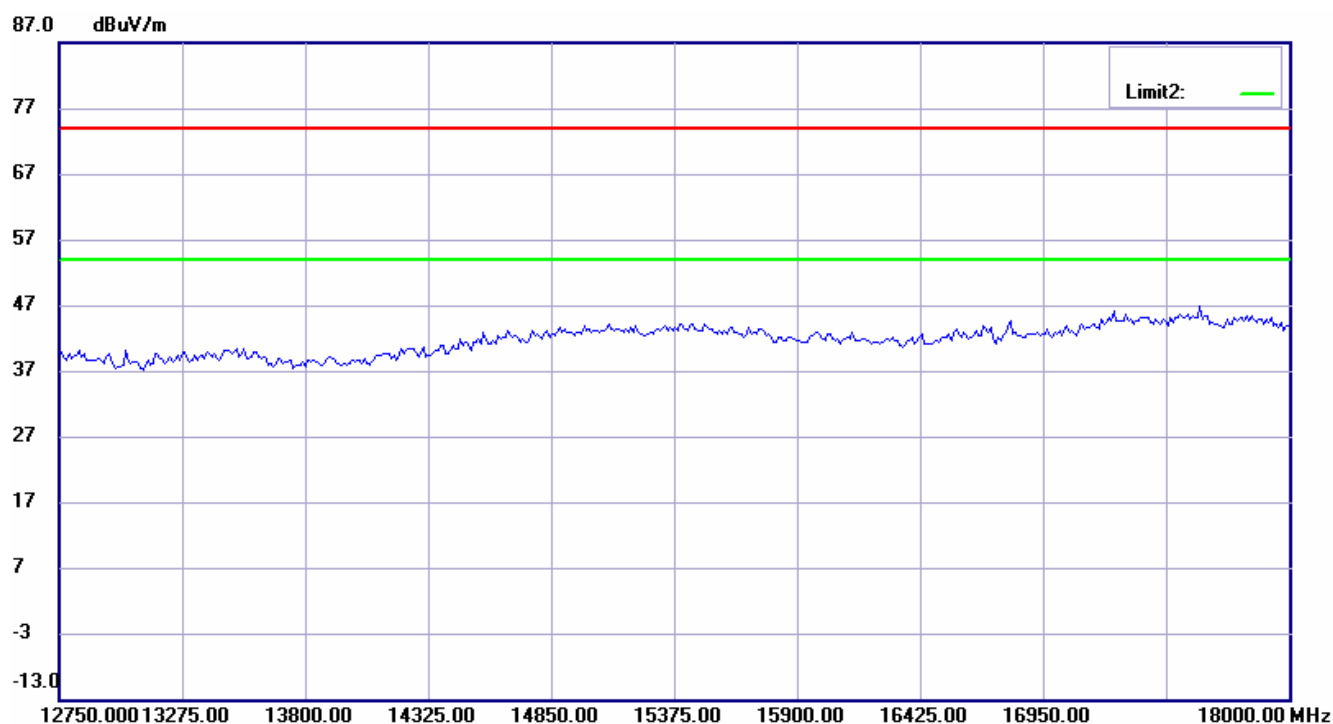
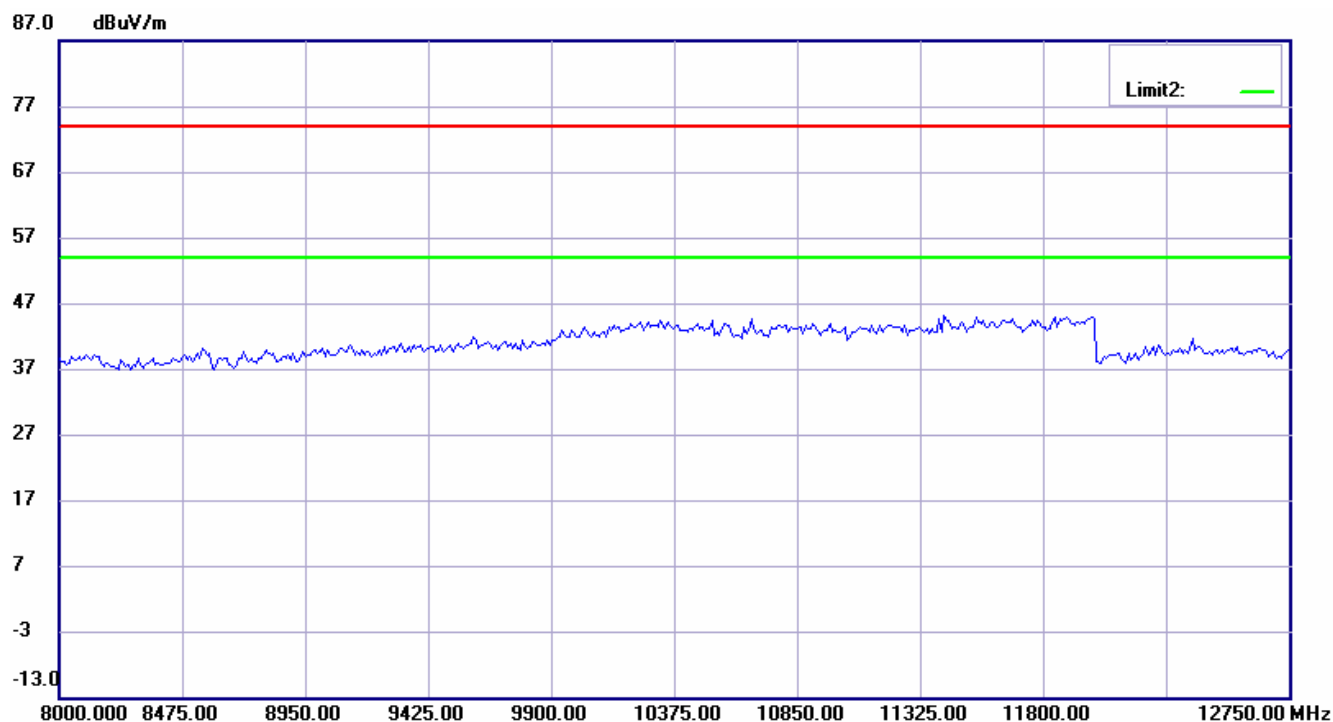




Taiwan ETS Product Service Co., Ltd.

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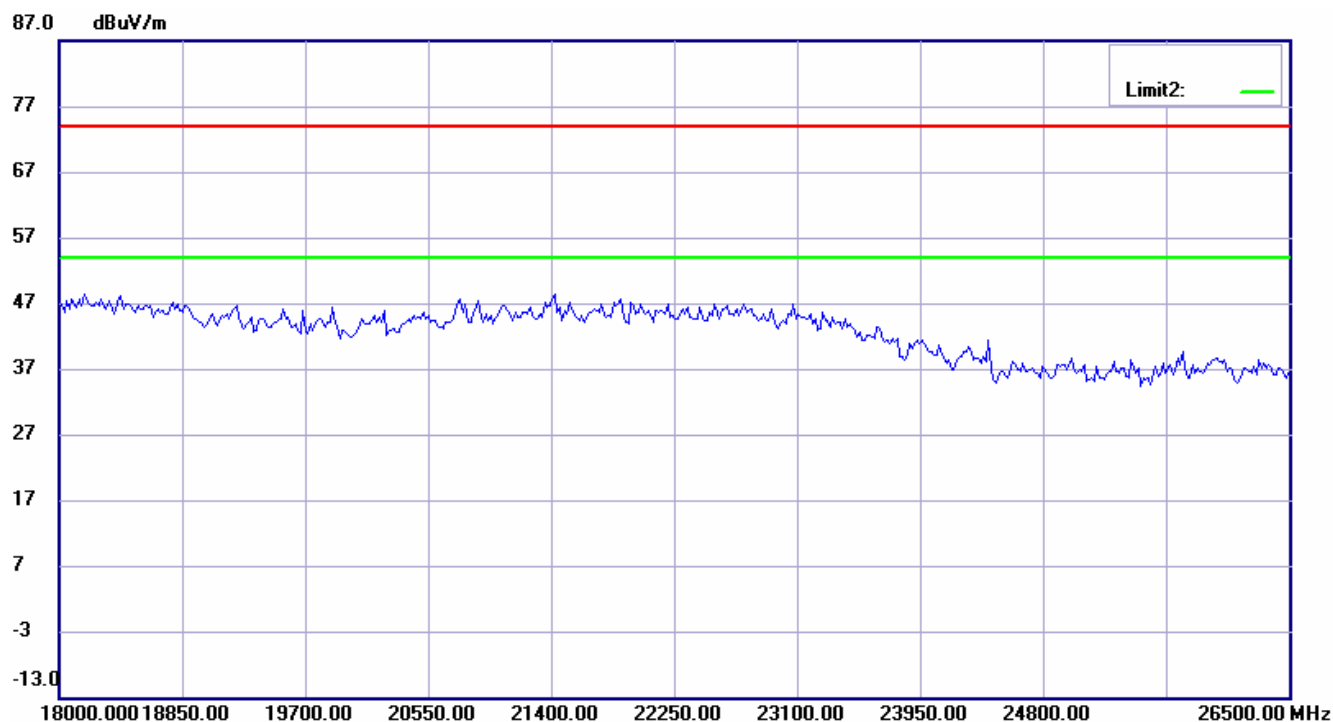




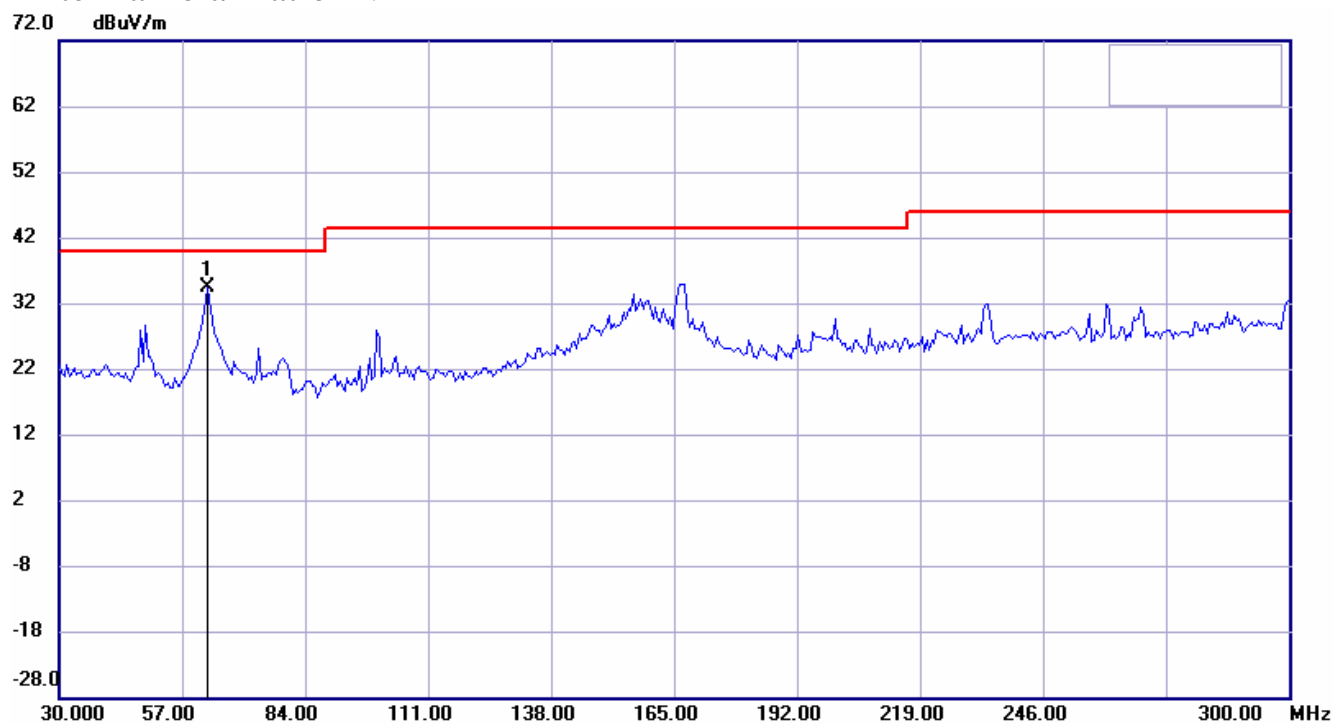
Taiwan ETS Product Service Co., Ltd.

Registration number: W6M20712-8731-P-15

FCC ID: UNLWSP01



Antenna Polarization V

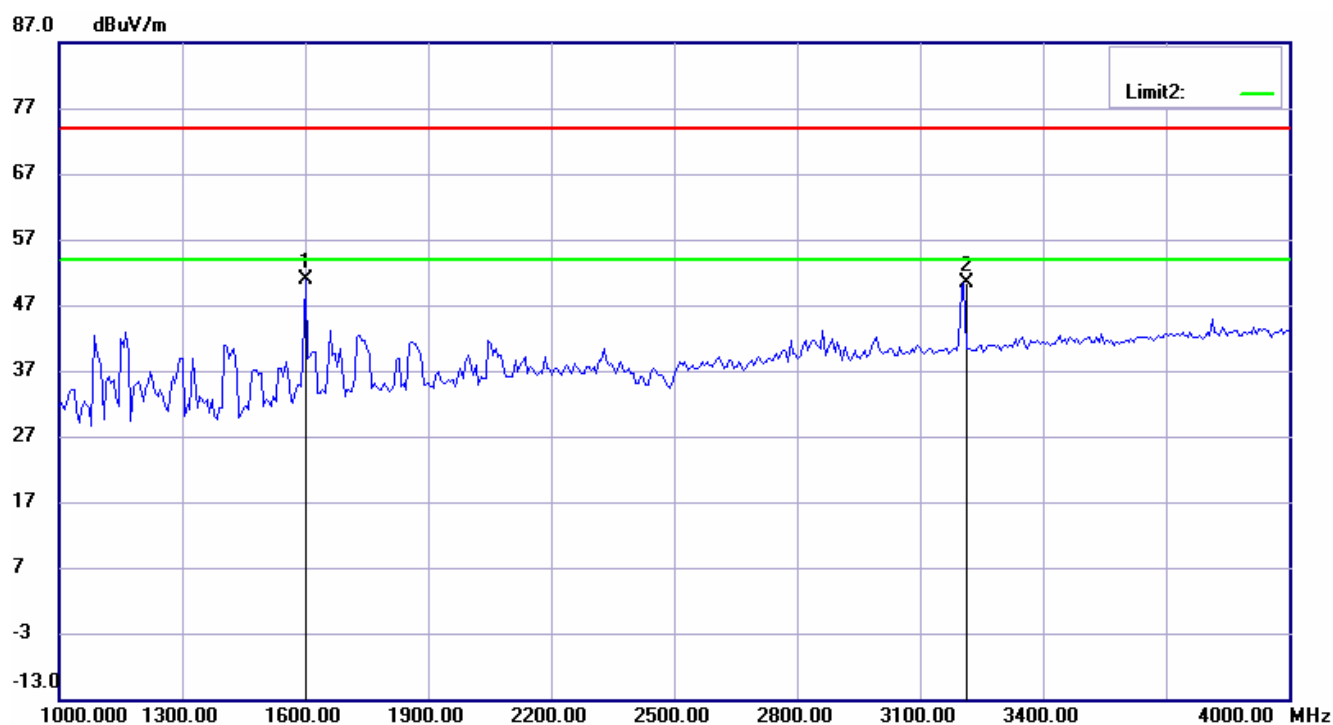
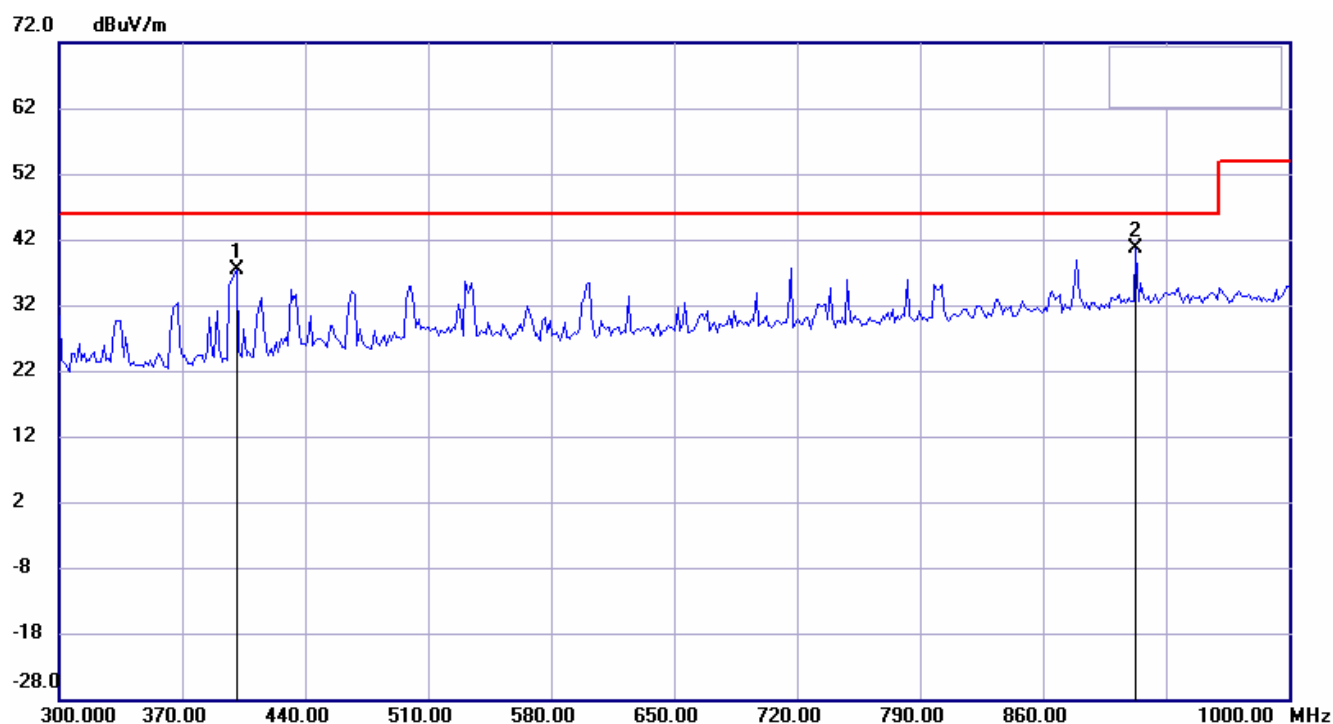




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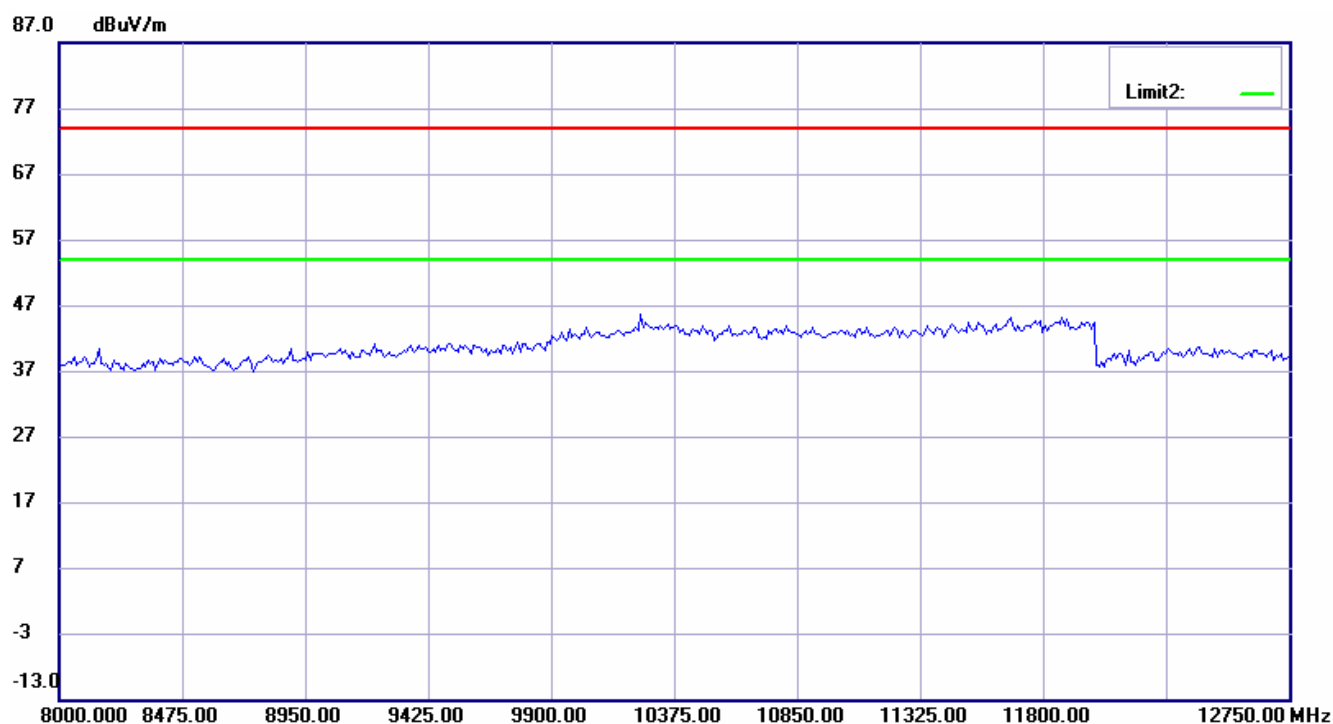
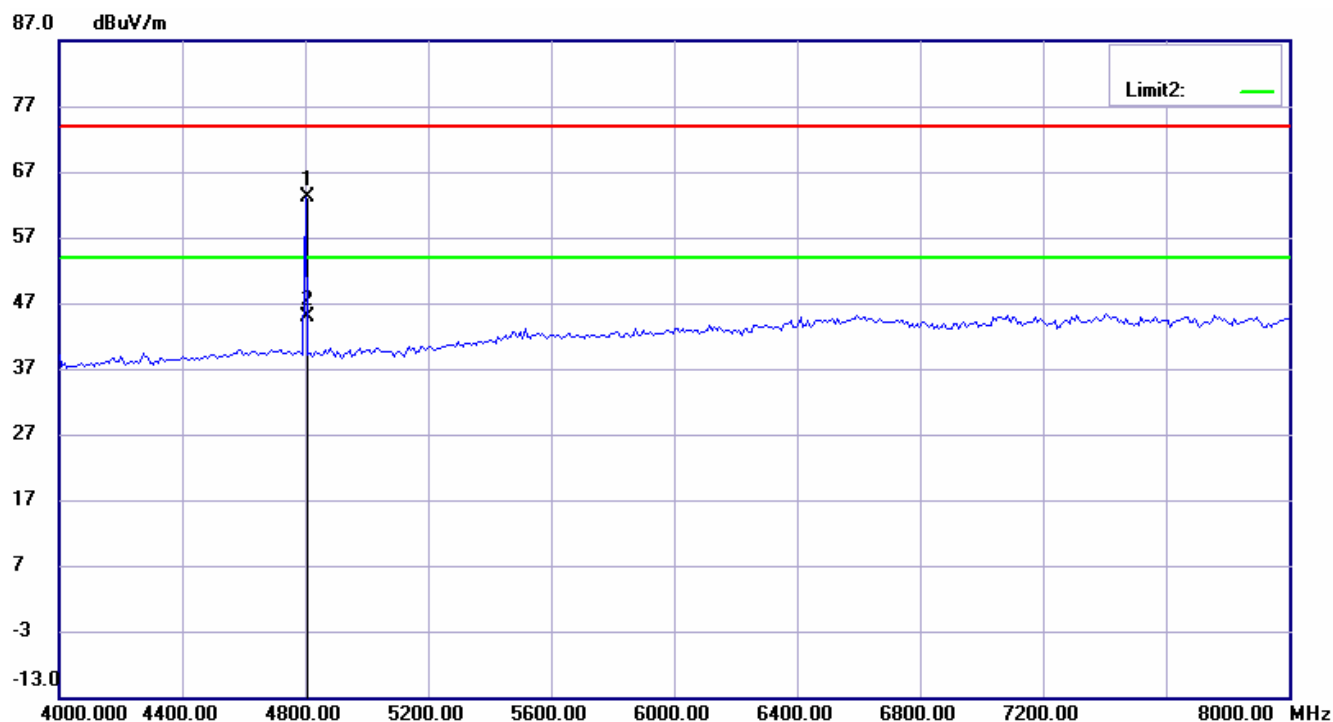




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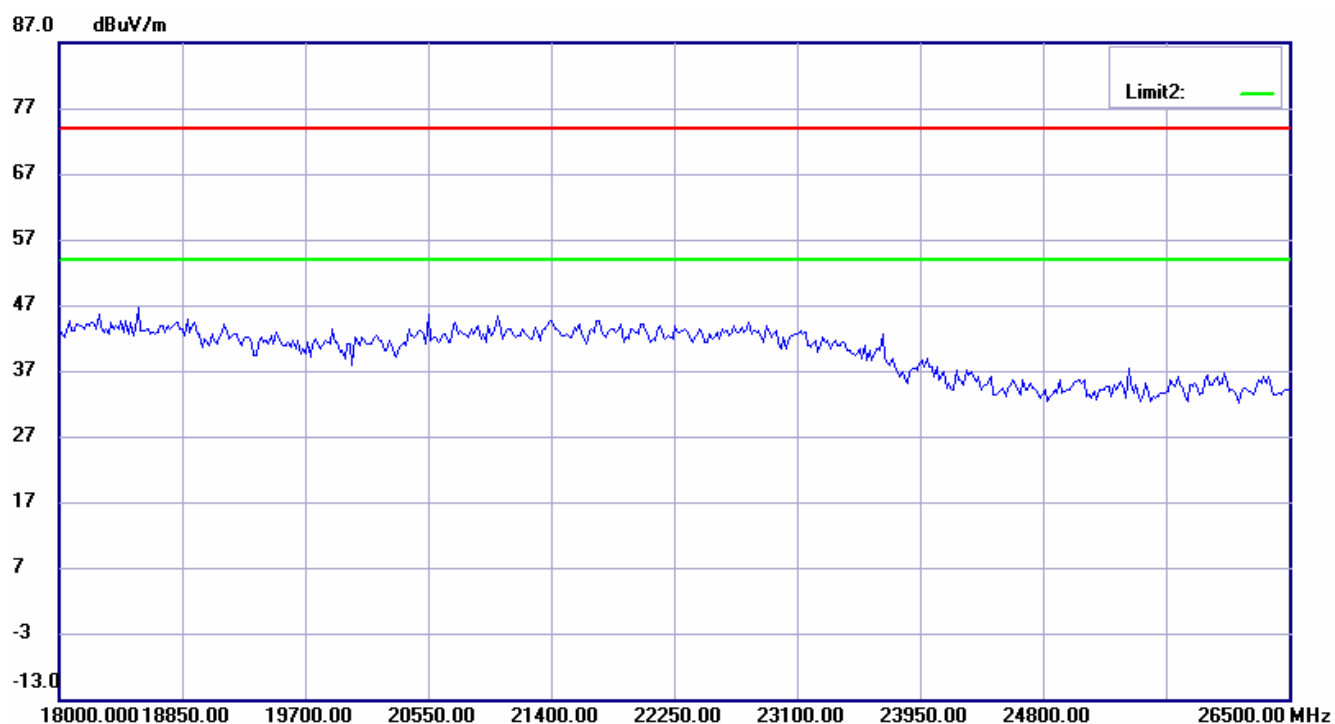
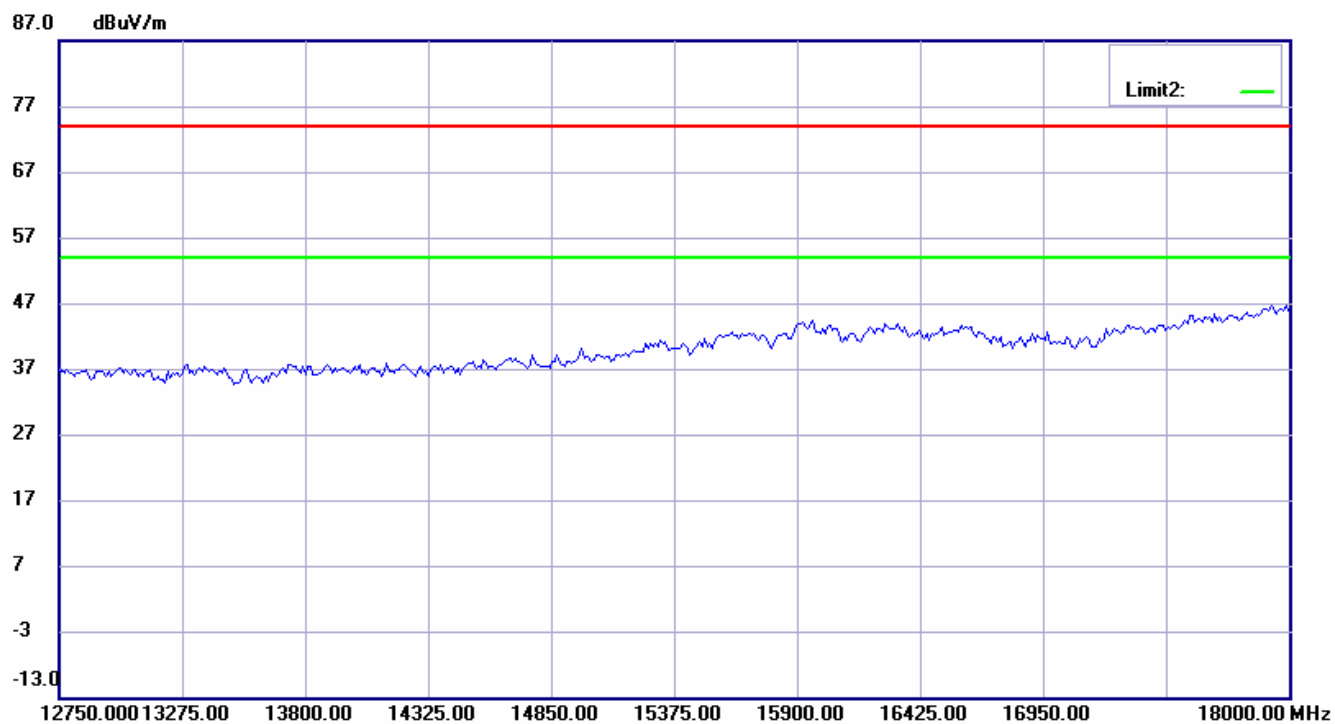




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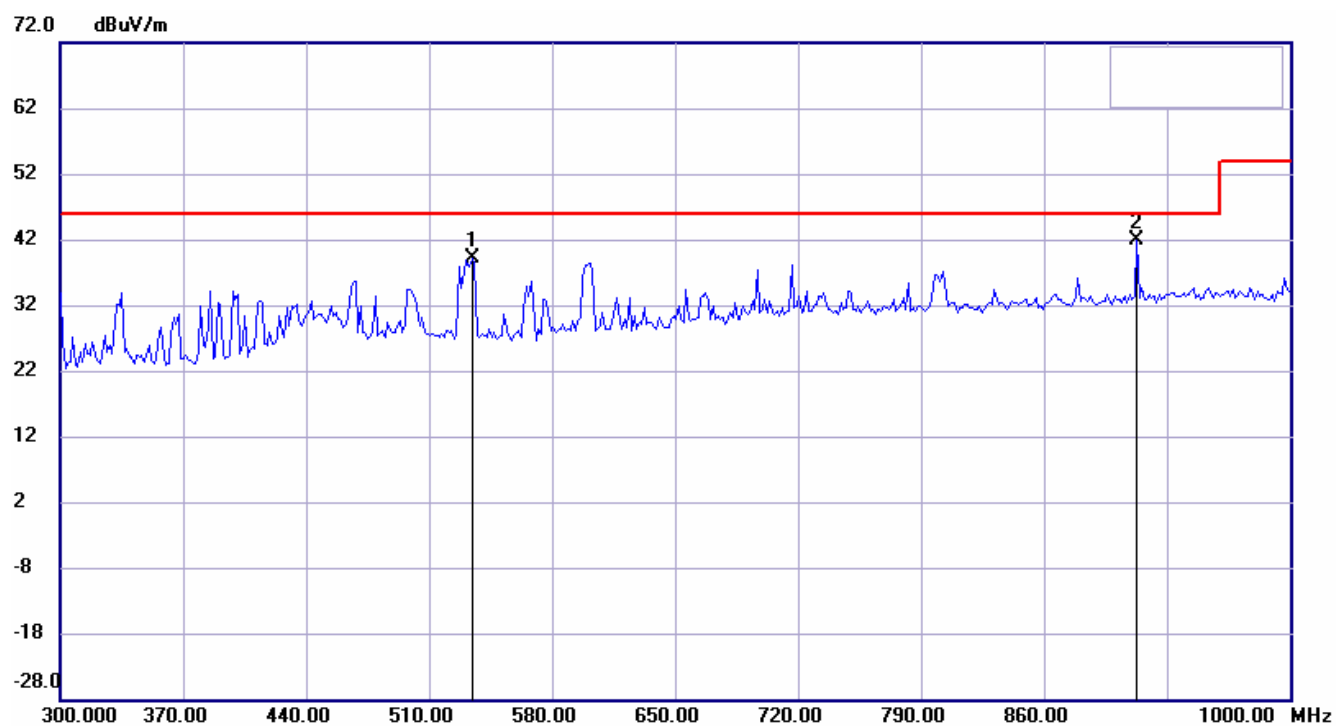
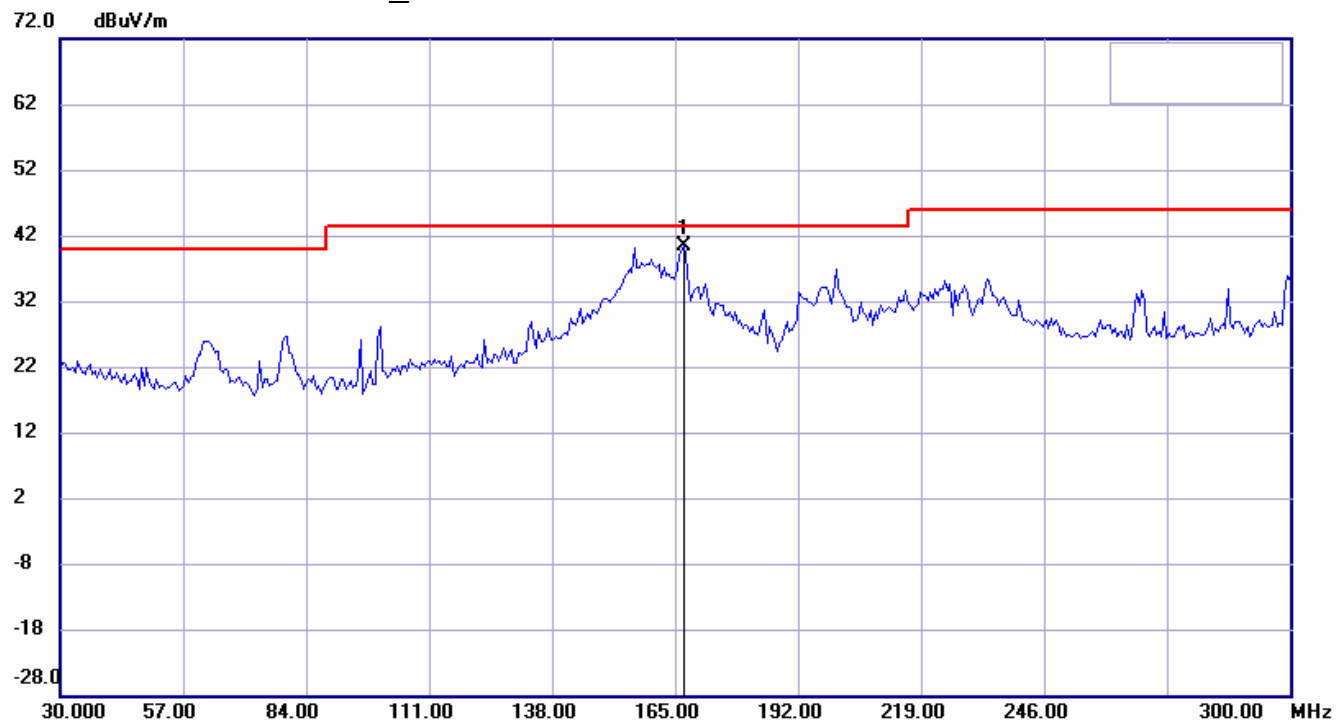


Taiwan ETS Product Service Co., Ltd.

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Antenna Polarization H_middle channel

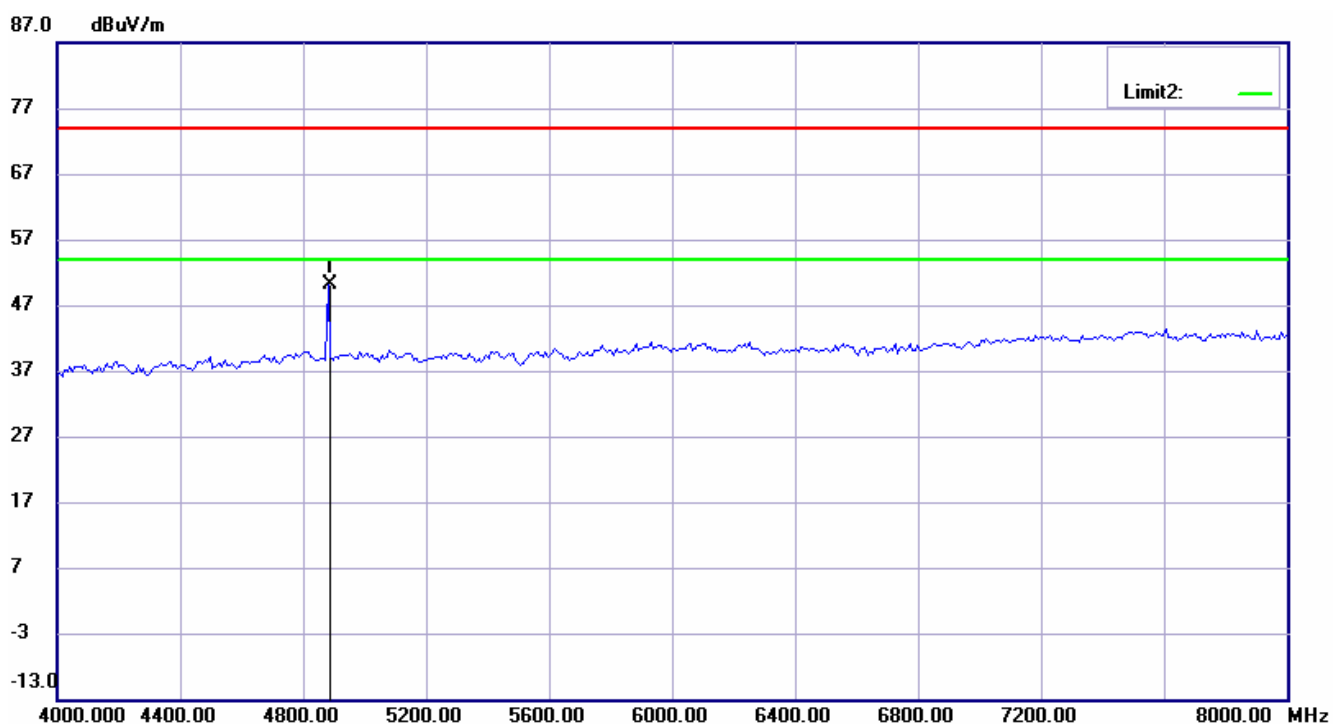
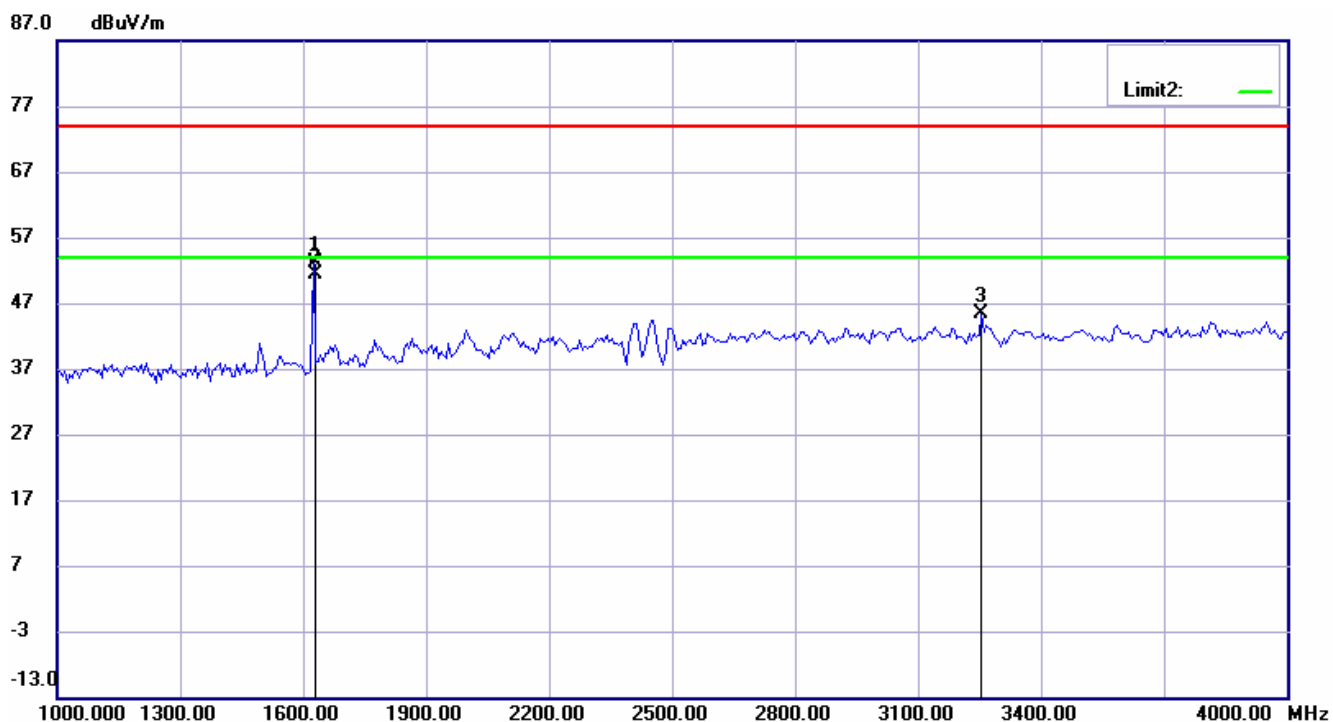




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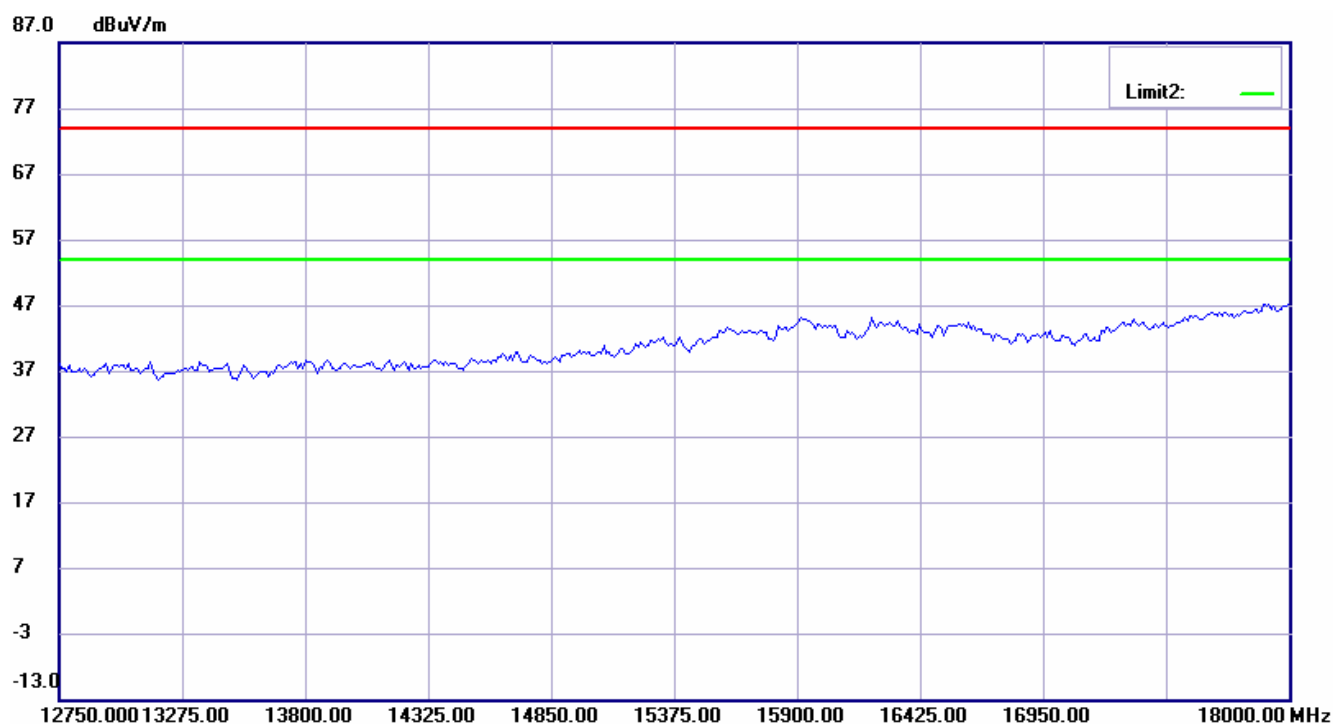
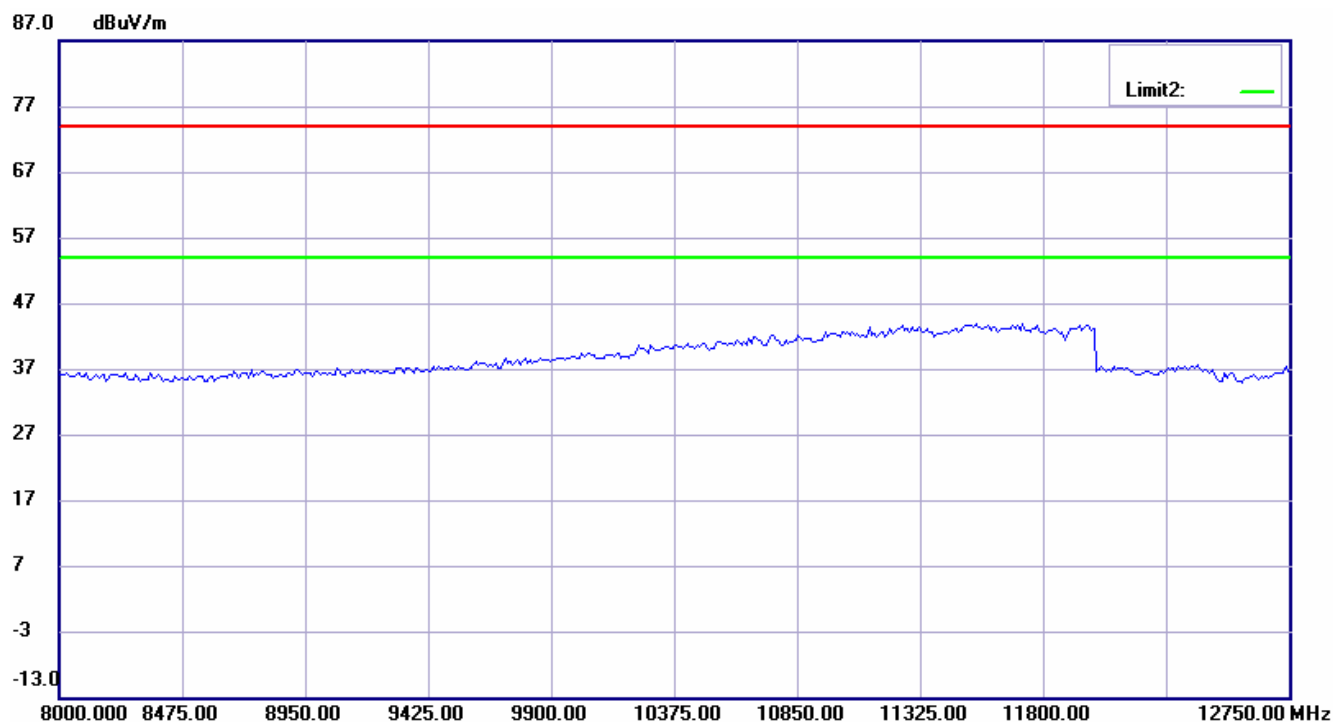




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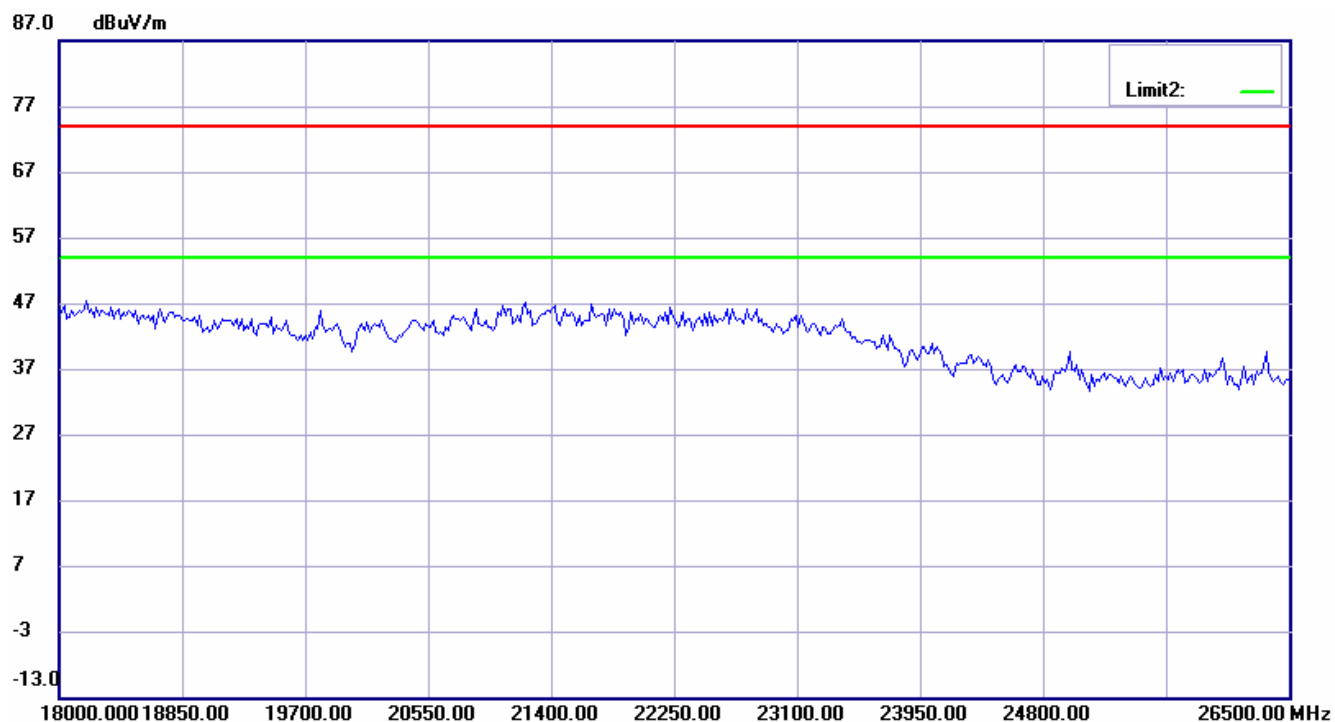




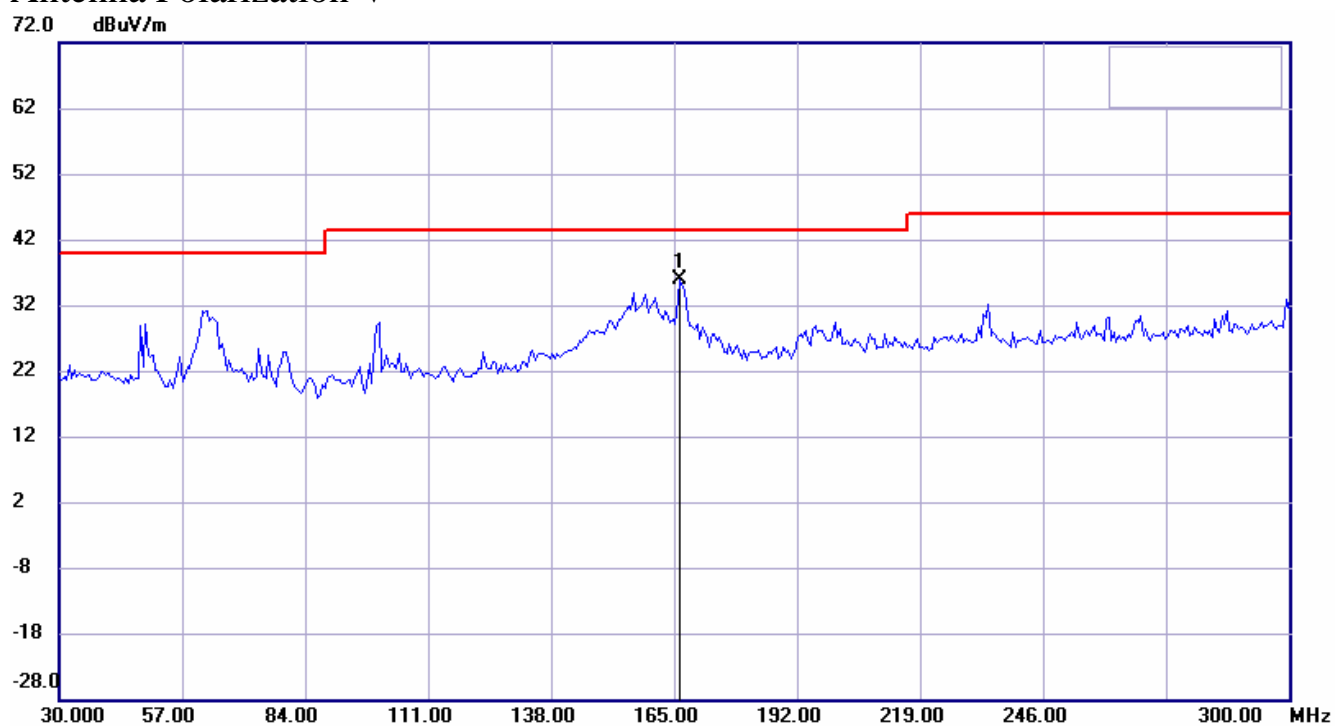
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Antenna Polarization V

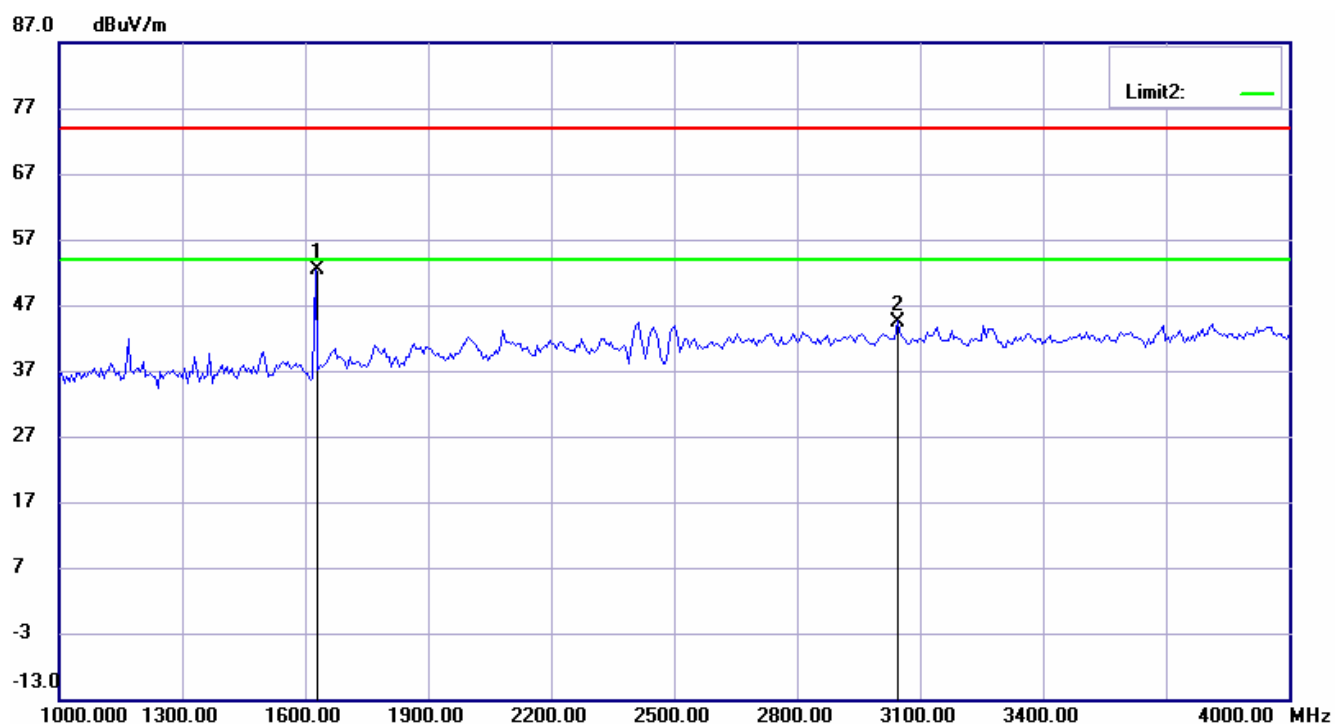
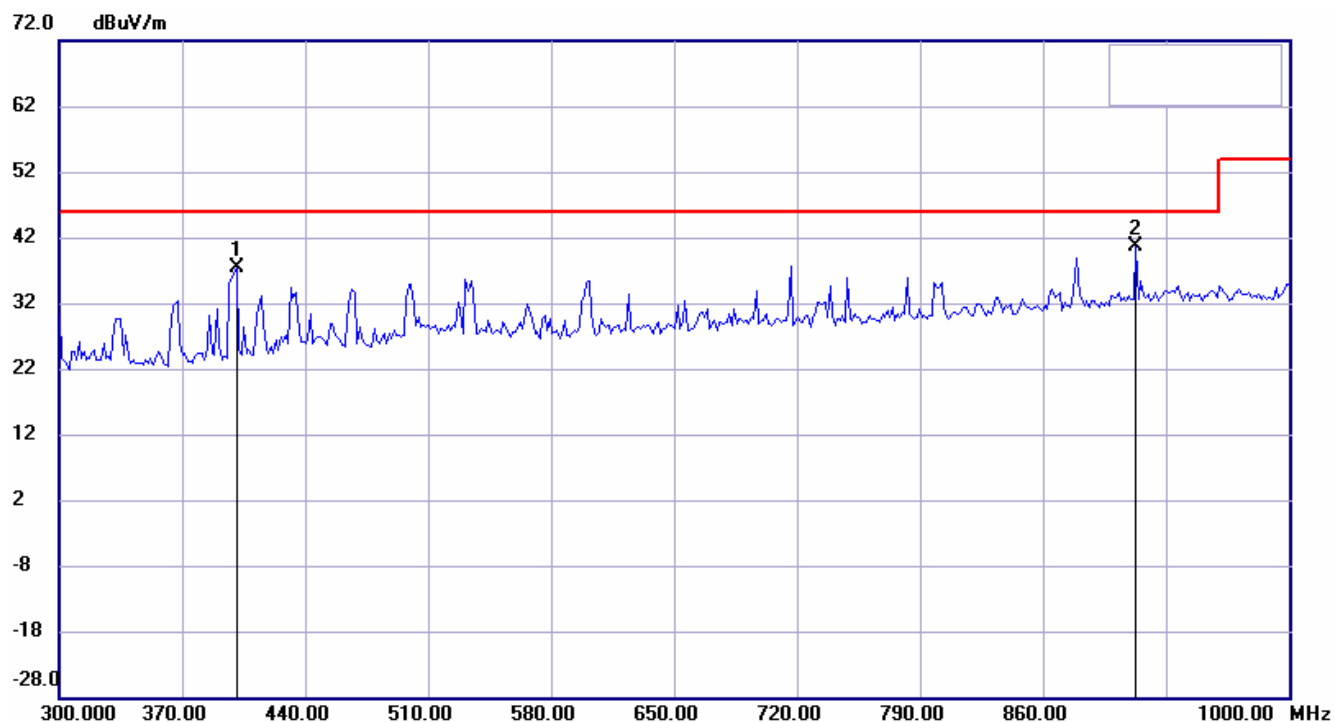




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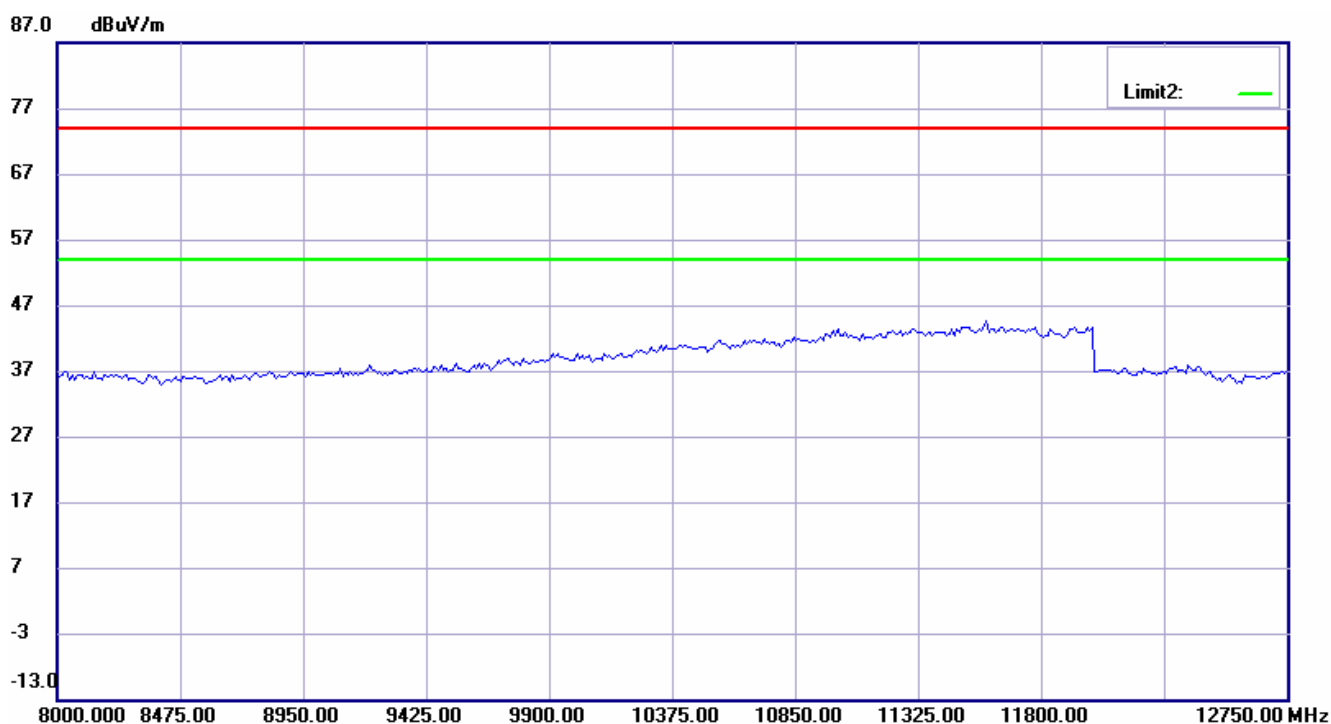
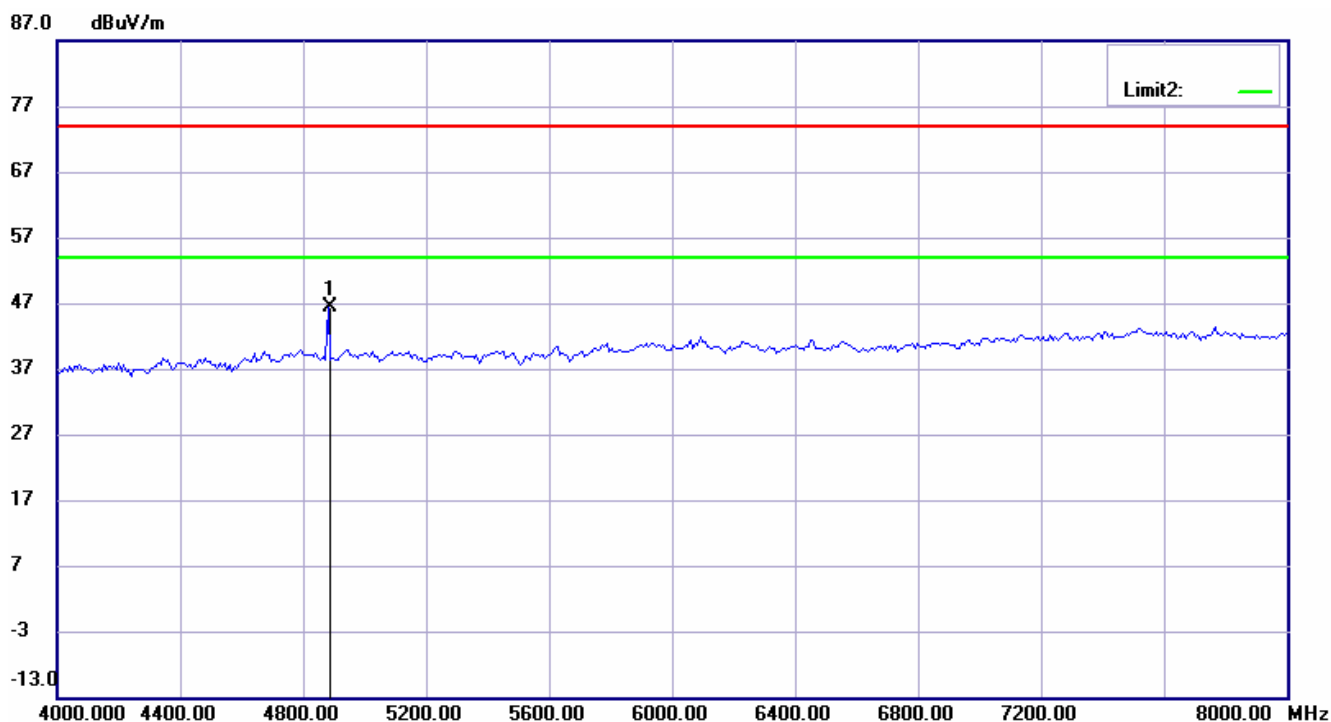




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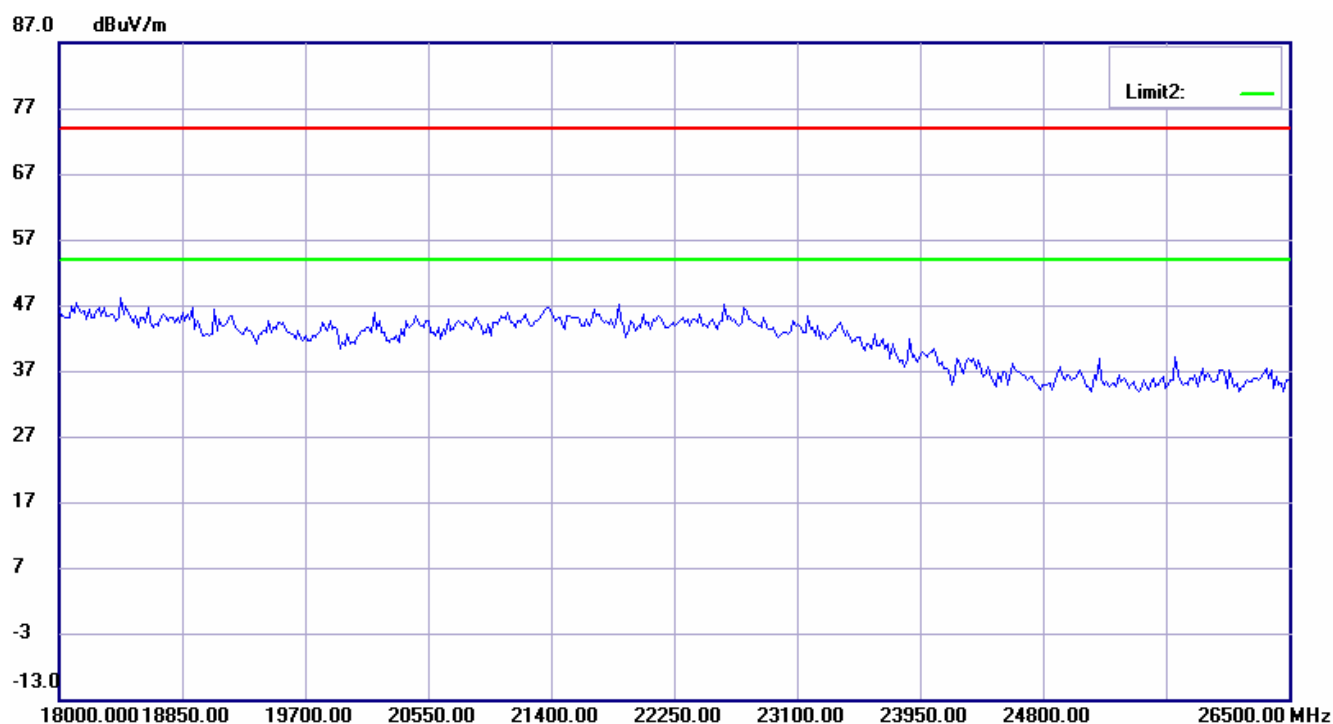
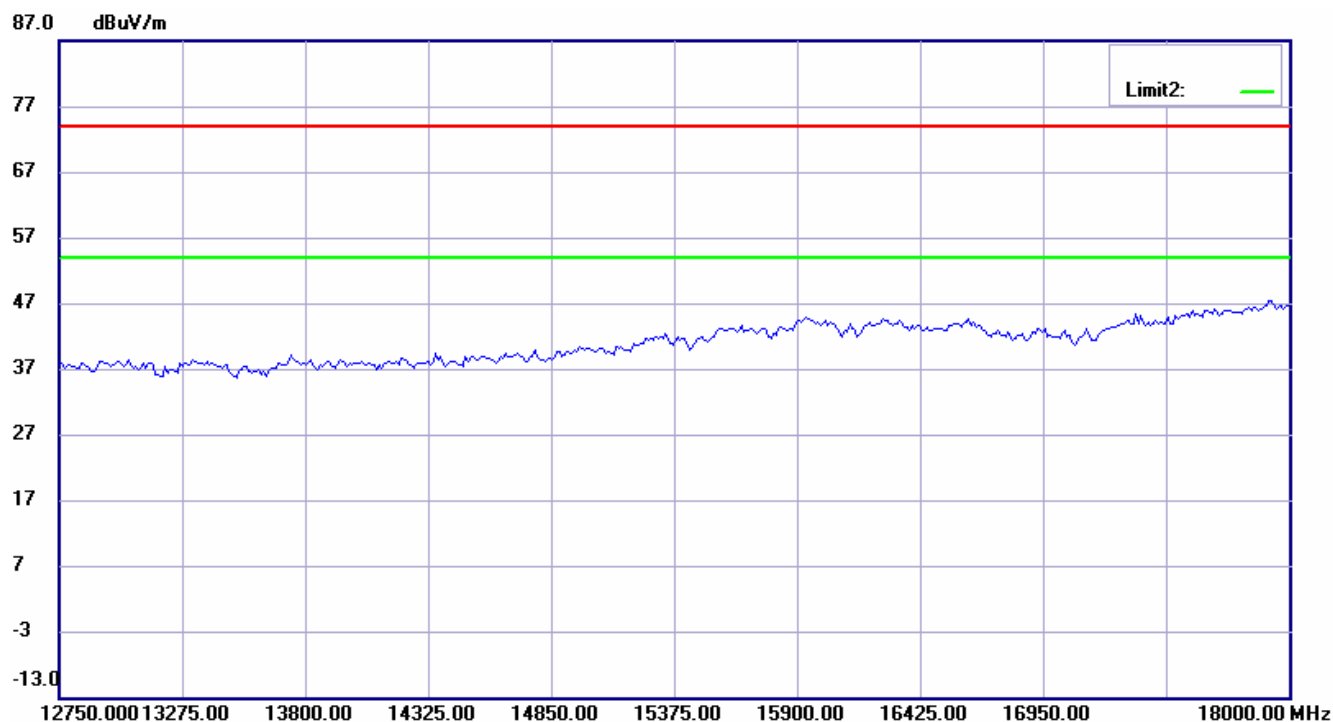




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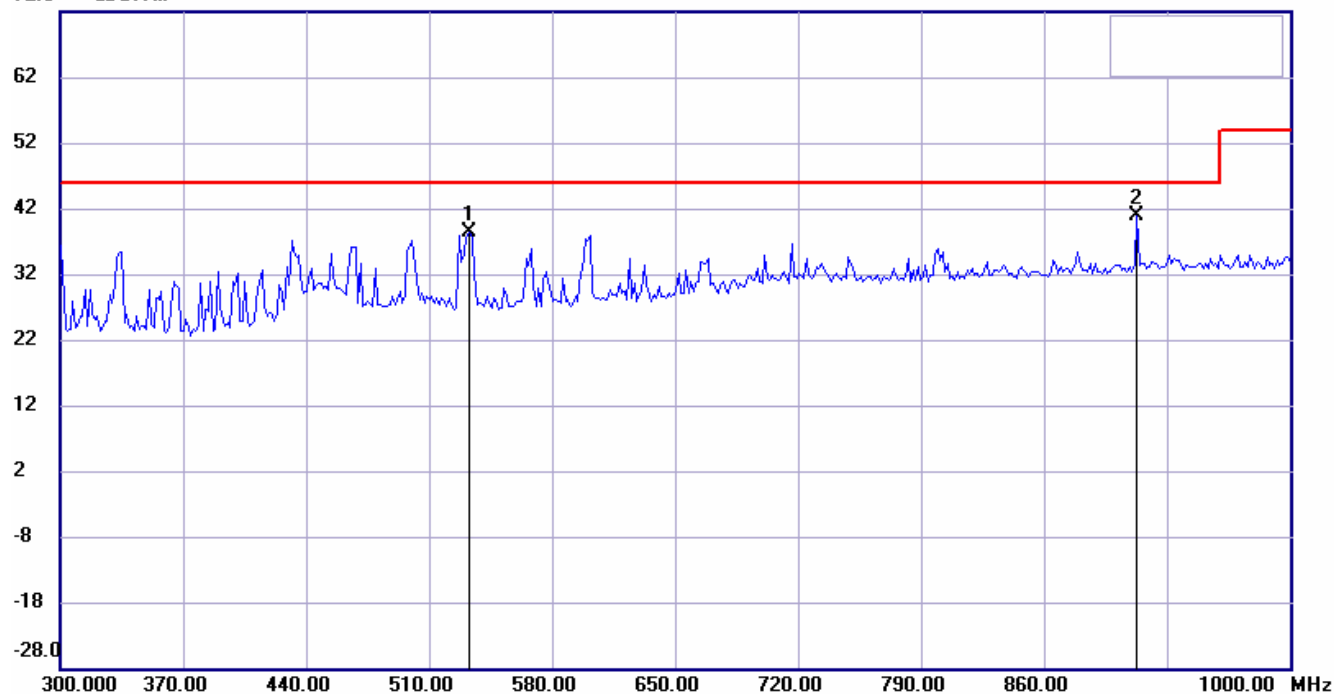
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Antenna Polarization H_high channel

72.0 dBuV/m



72.0 dBuV/m

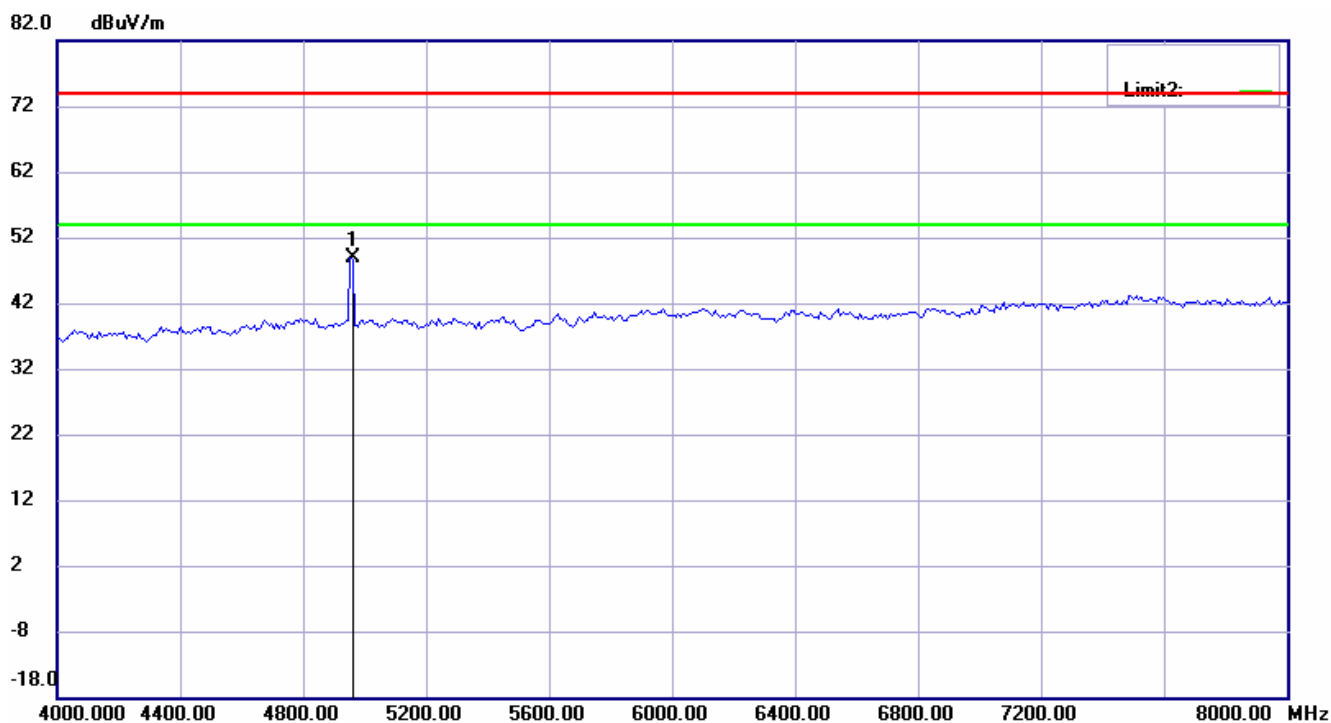
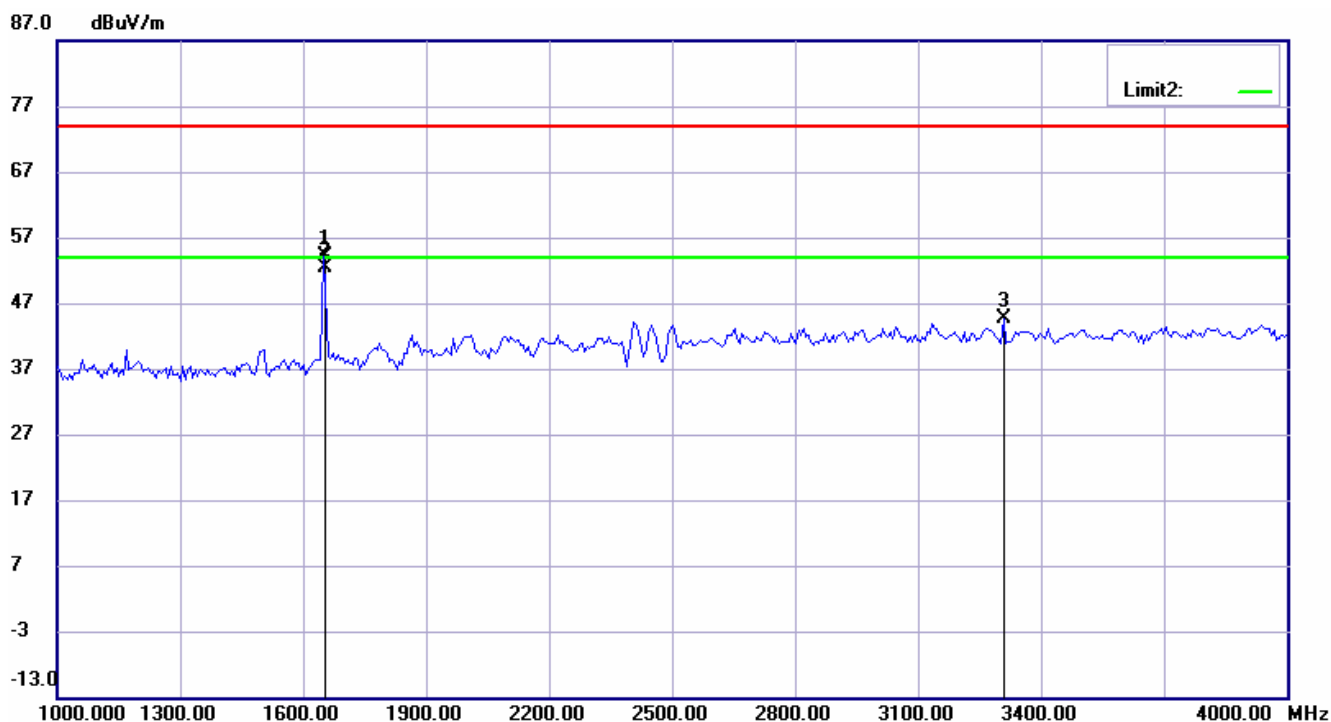




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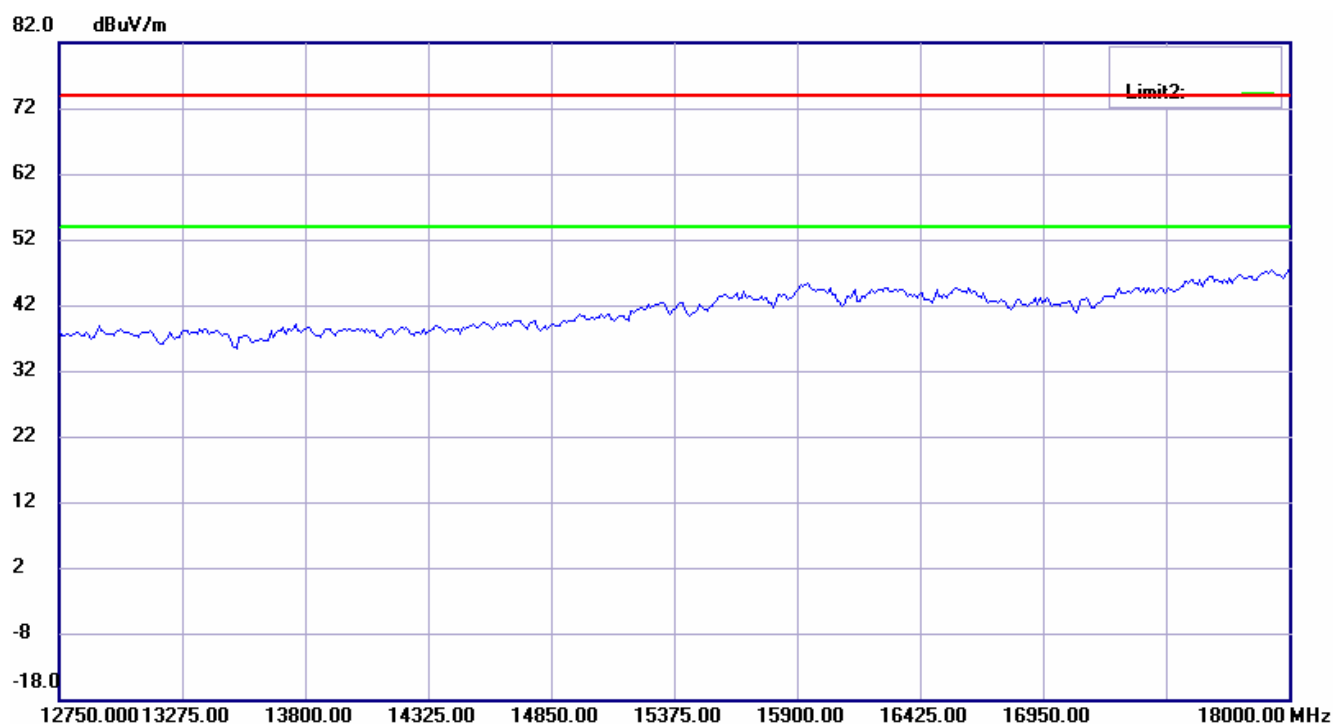
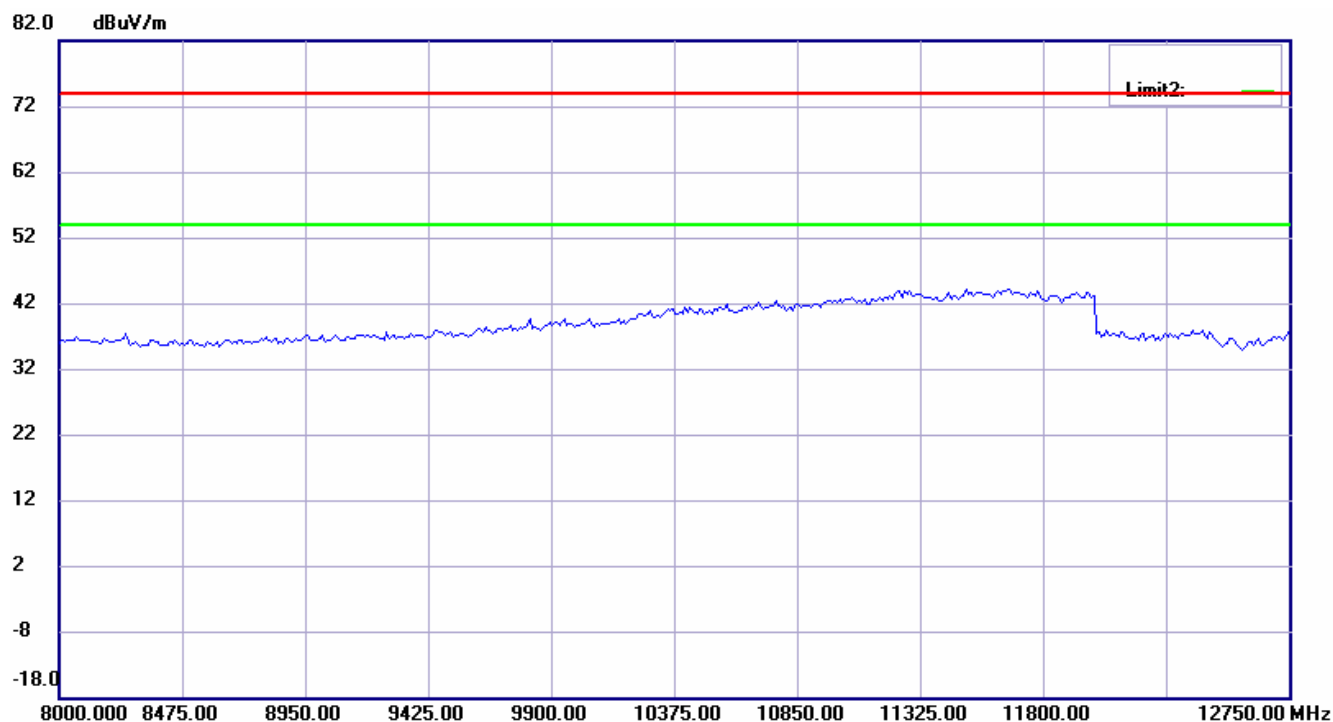




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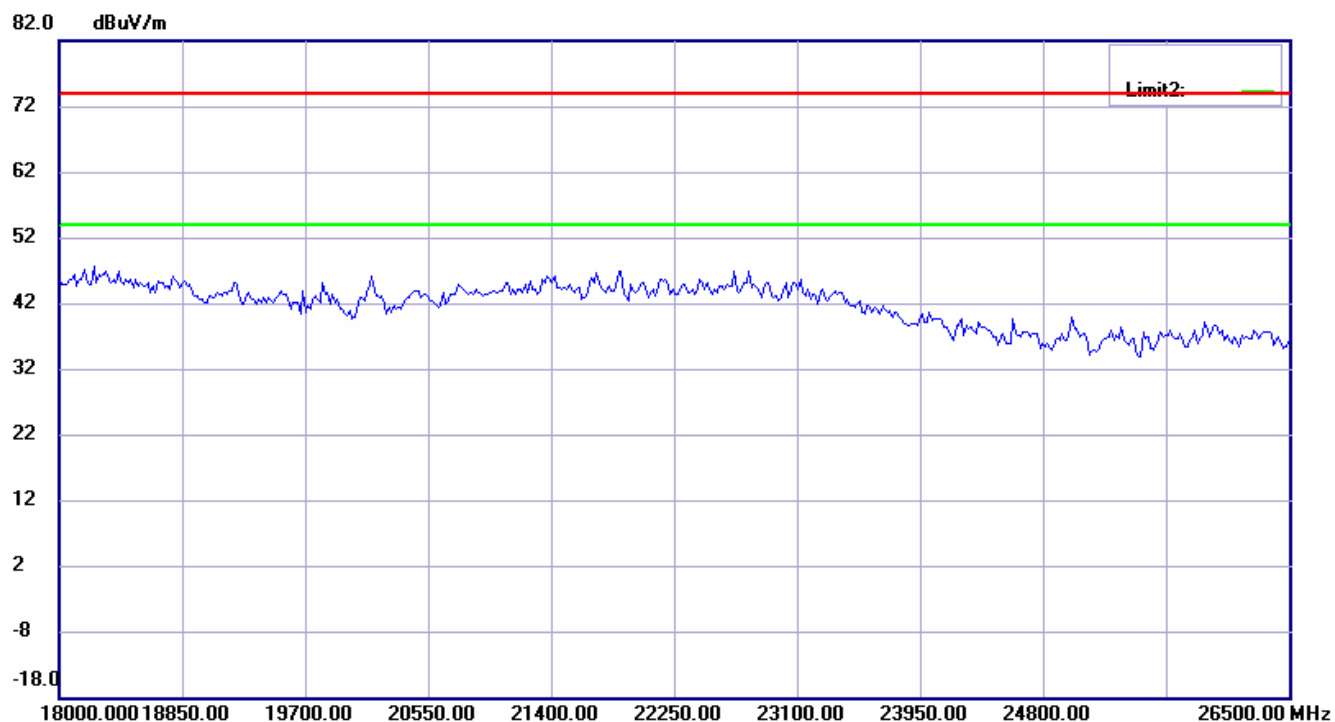




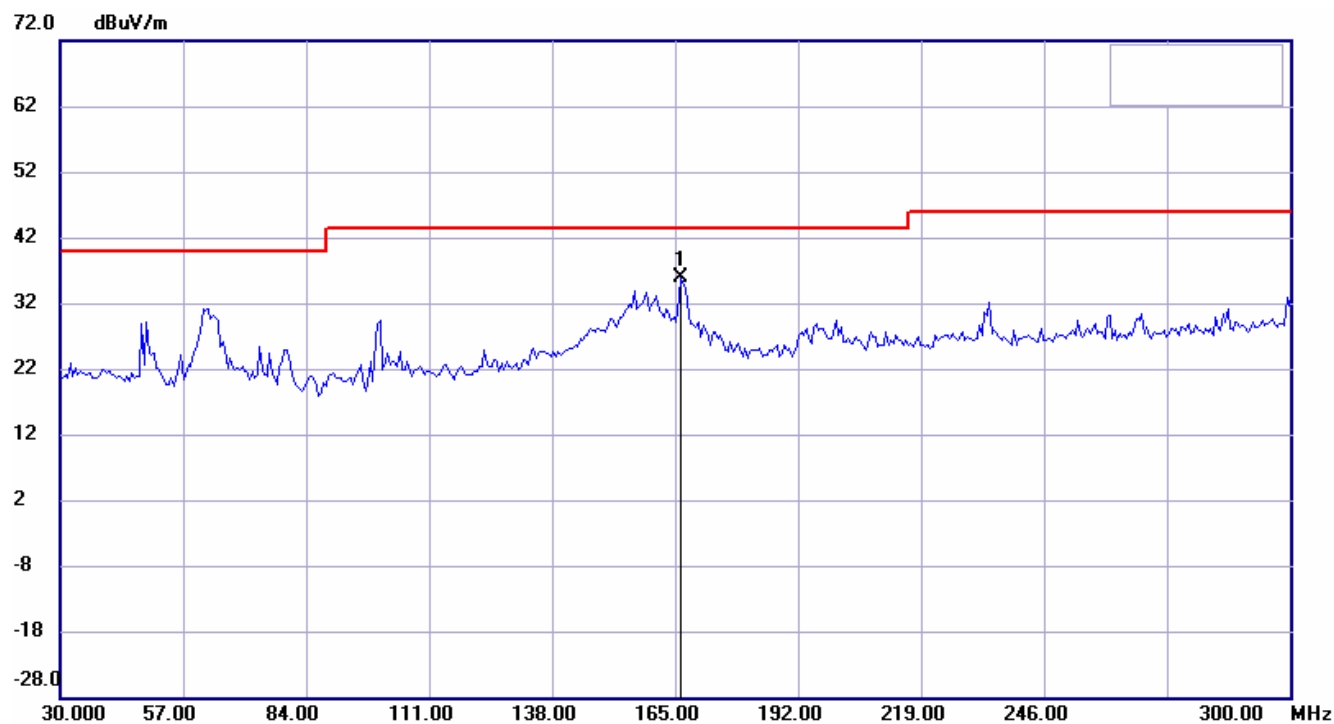
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Antenna Polarization V

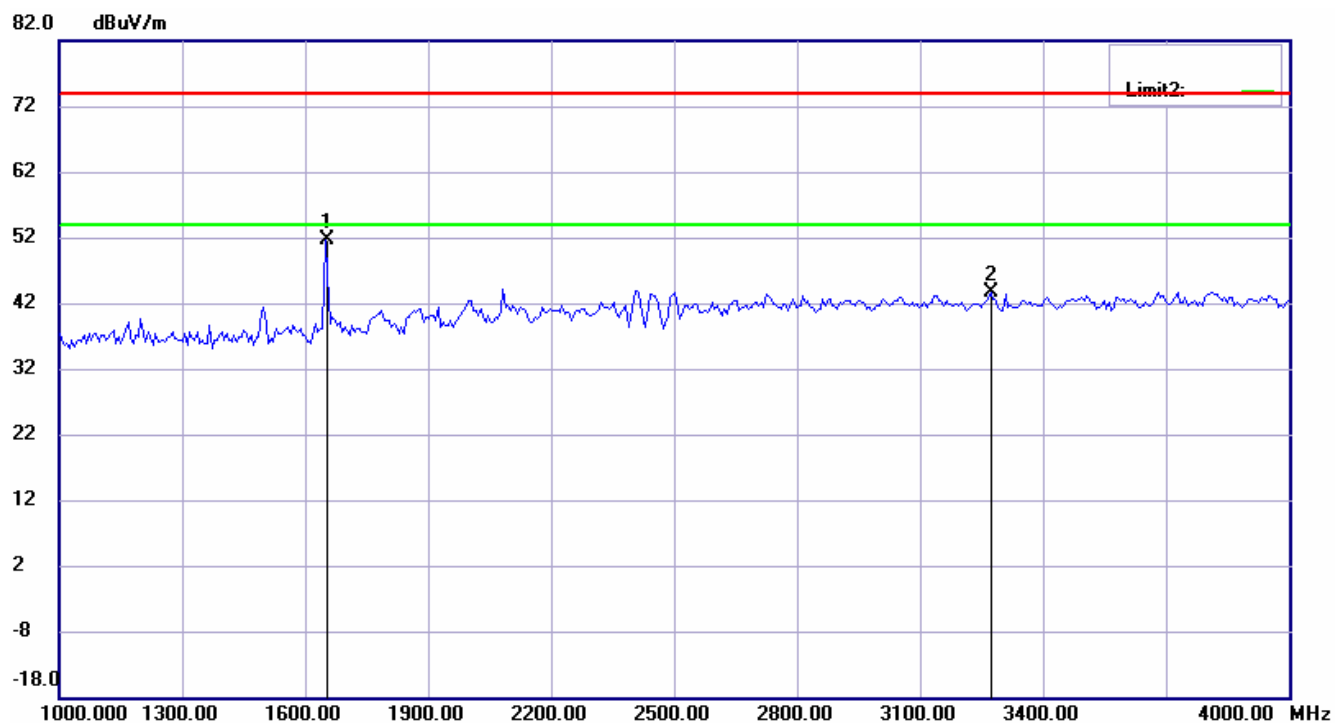
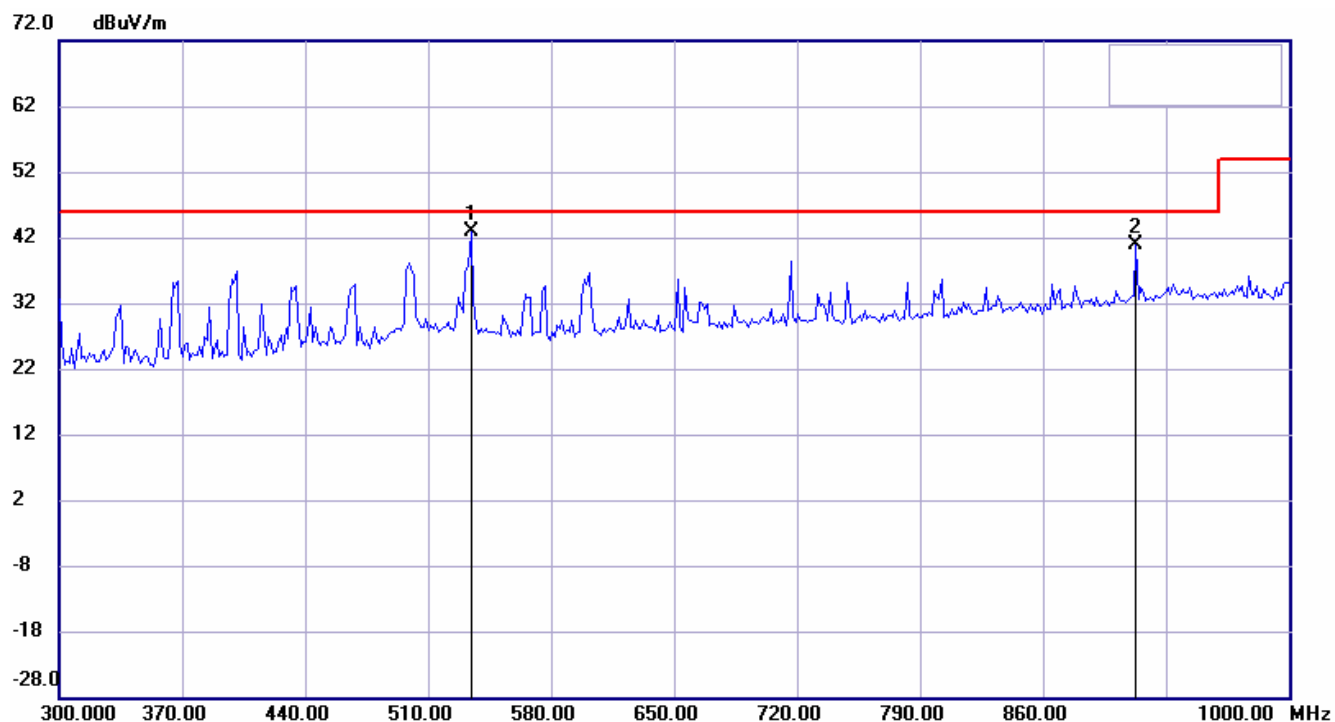




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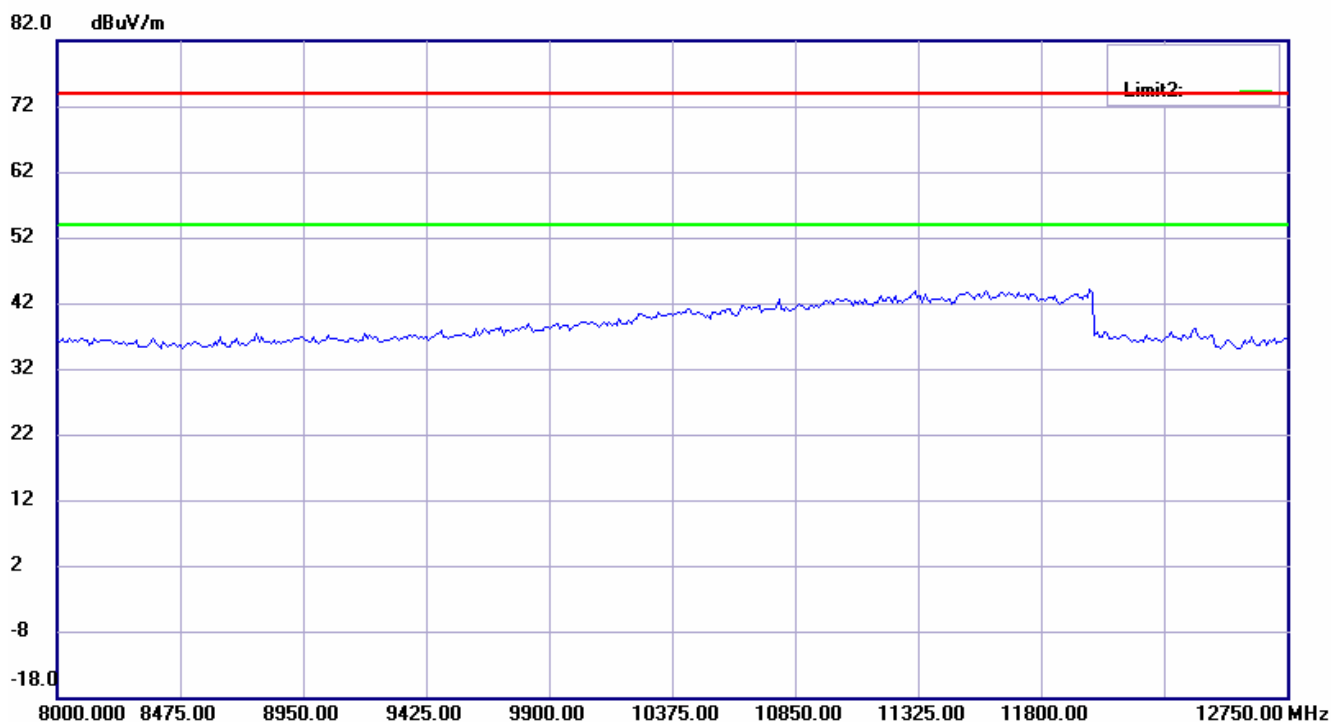
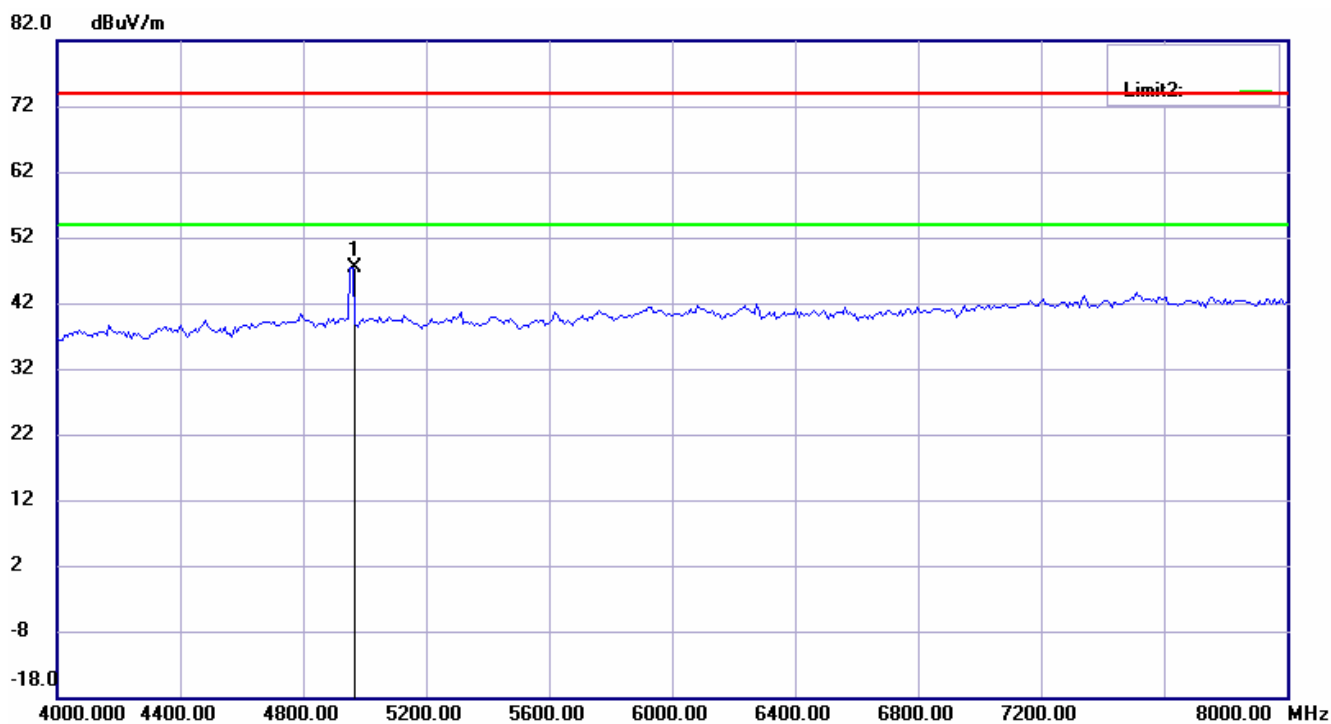




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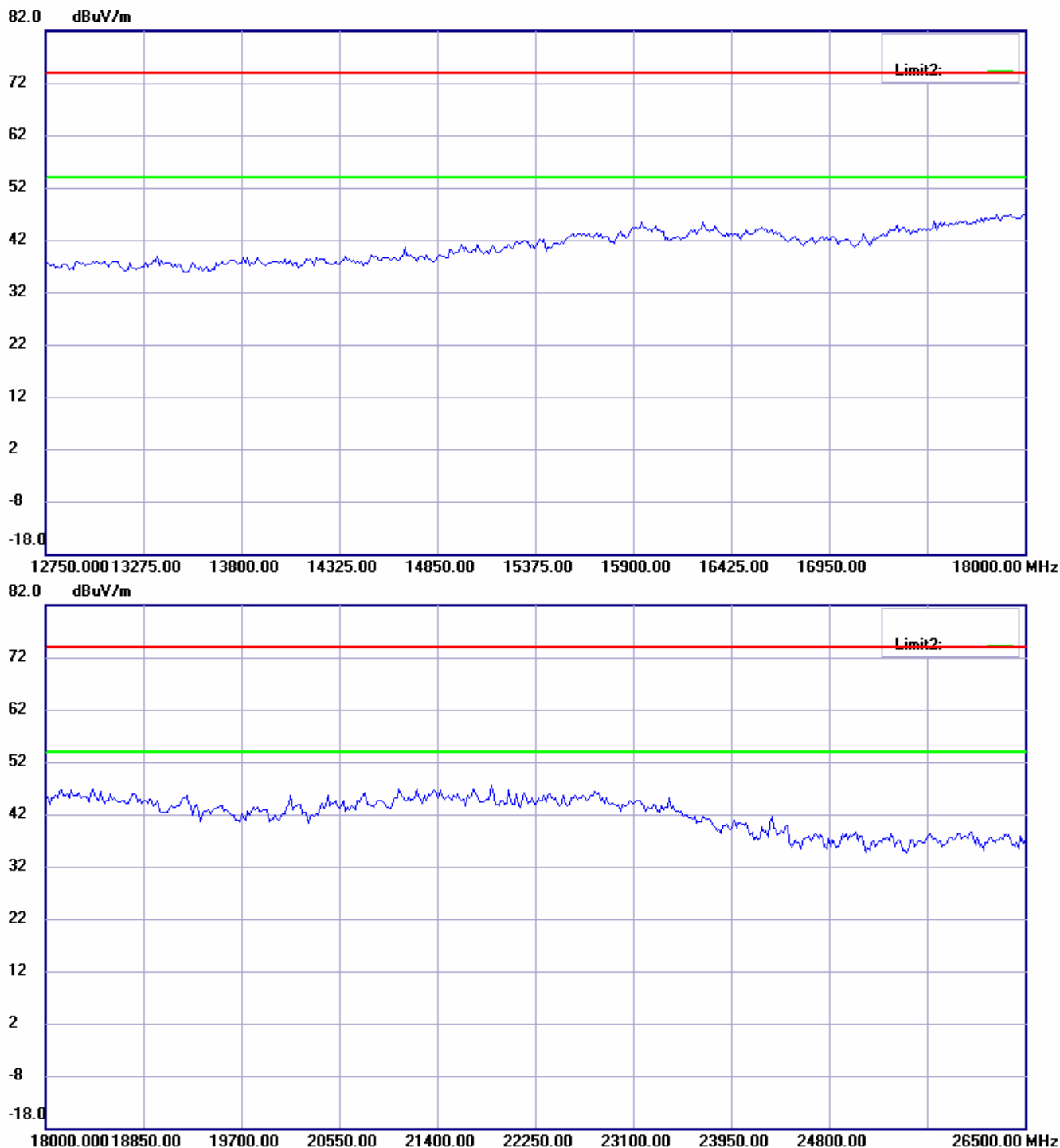




Taiwan ETS Product Service Co., Ltd.

Registration number: W6M20712-8731-P-15

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Up Line: QP Limit Line

Down Line: Ave Limit Line

Note:

1. The plots are pre-scanned data for determining the tested points and for reference only.
2. The exact test result is shown in the data table of Radiated emission test of this test report.

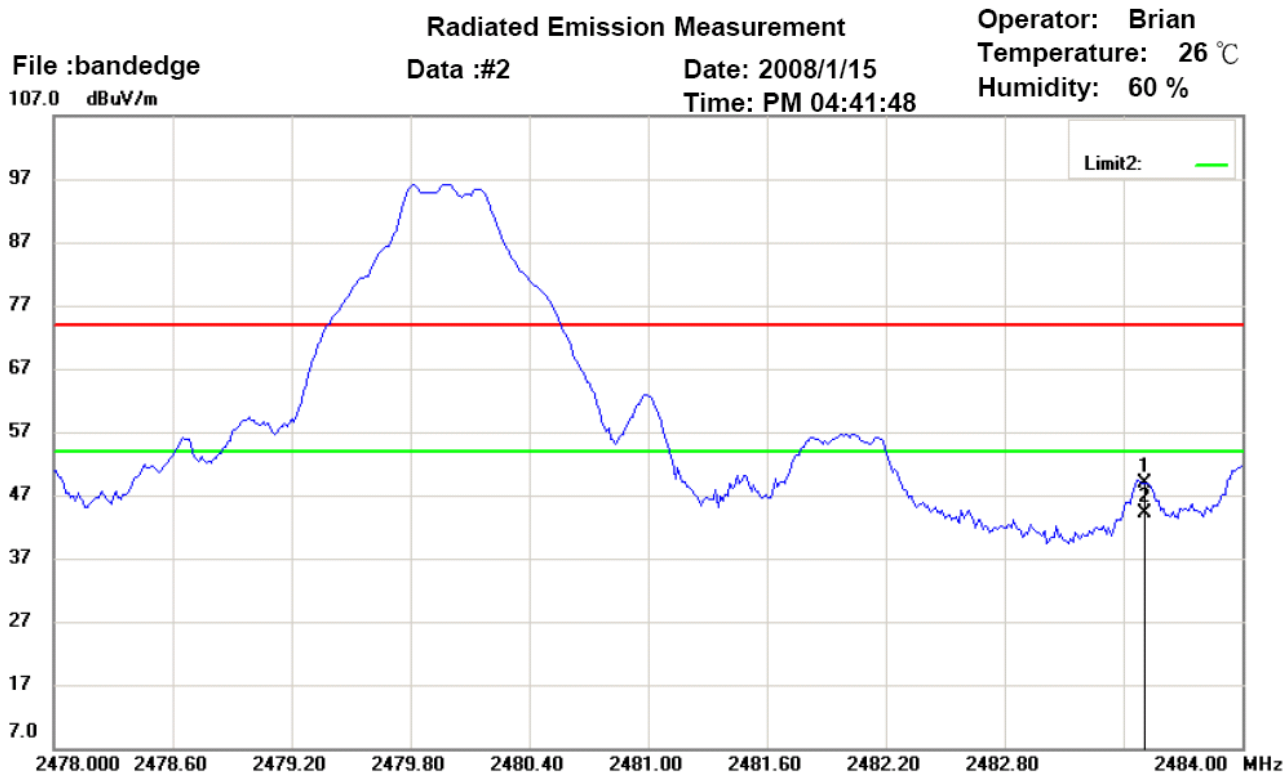
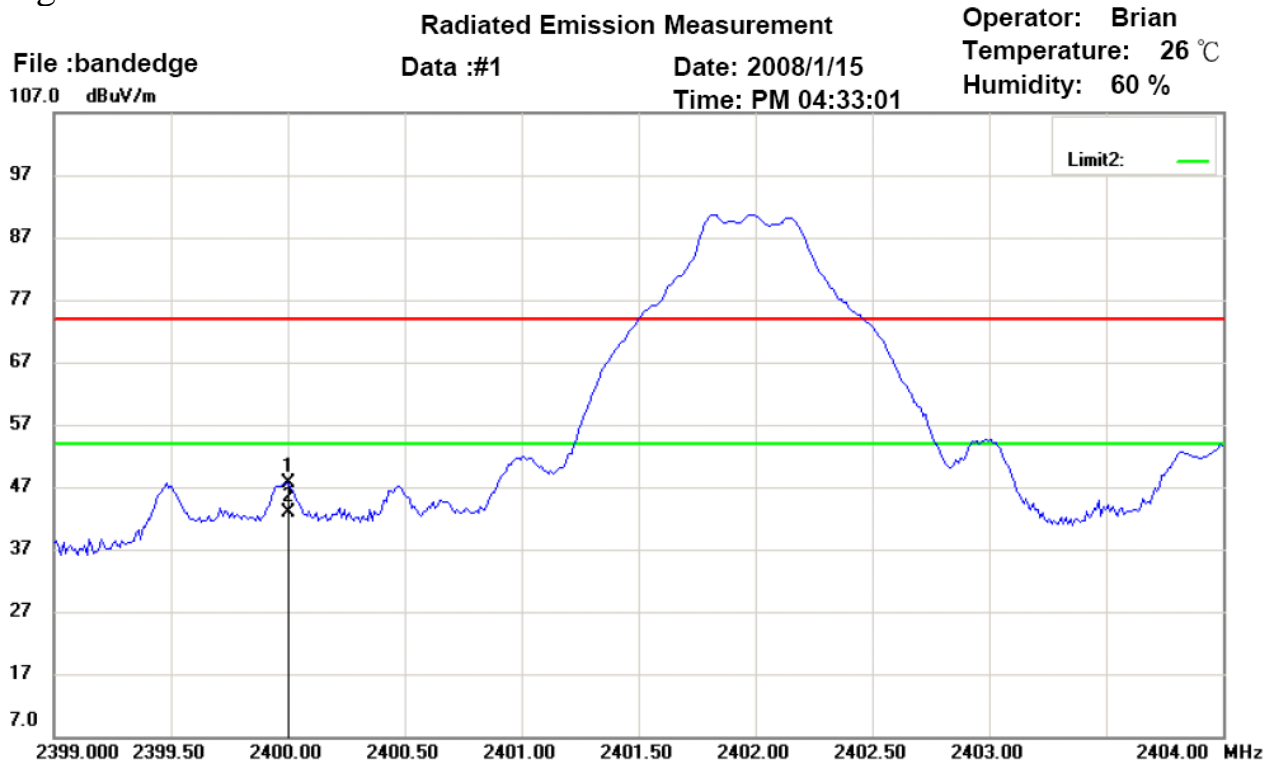


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FCC ID: UNLWSP01

Bandage





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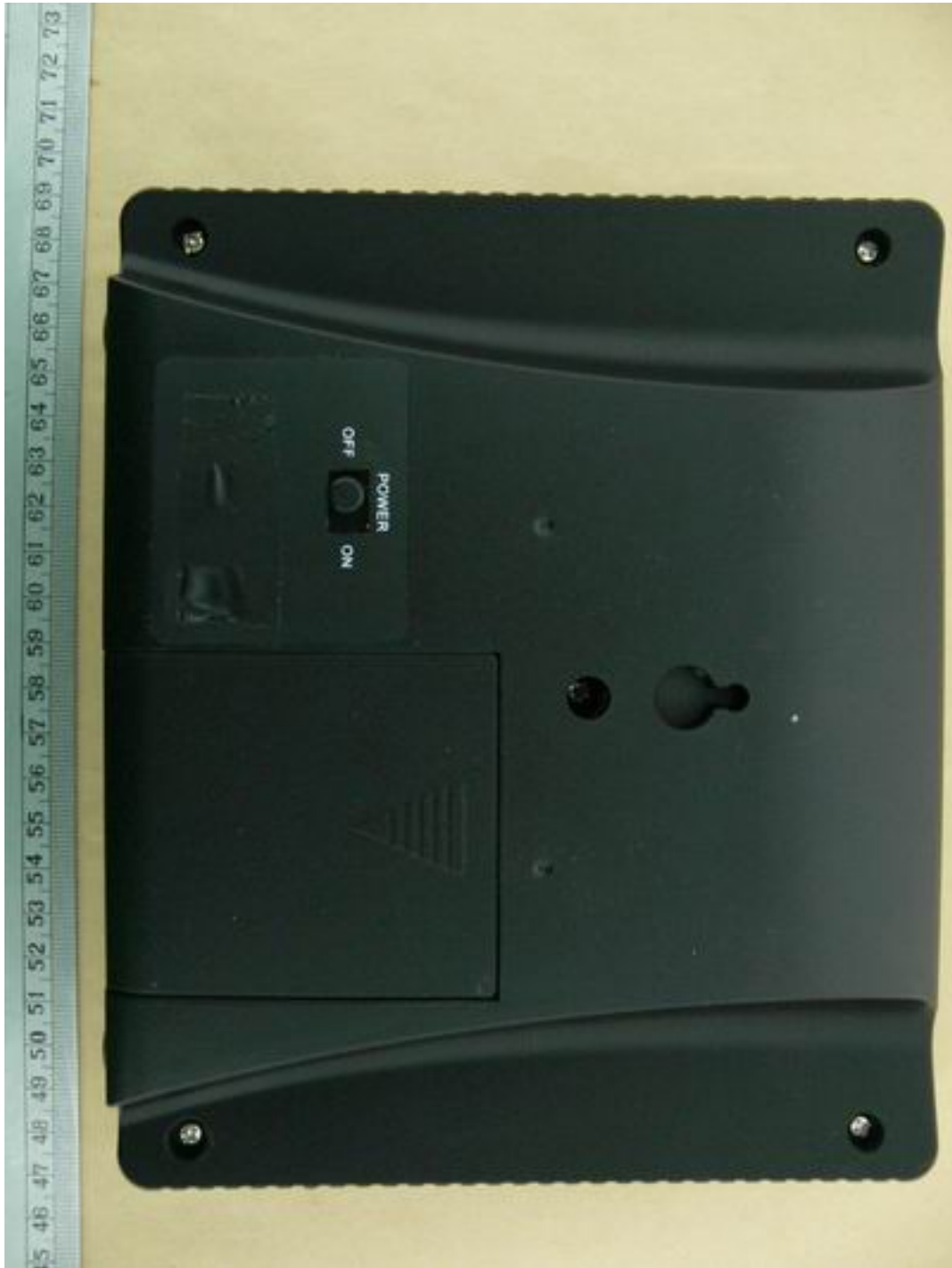
External Photos





Taiwan ETS Product Service Co., Ltd.

Registration number: W6M20712-8731-P-15
FCC ID: UNLWSP01





Taiwan ETS Product Service Co., Ltd.

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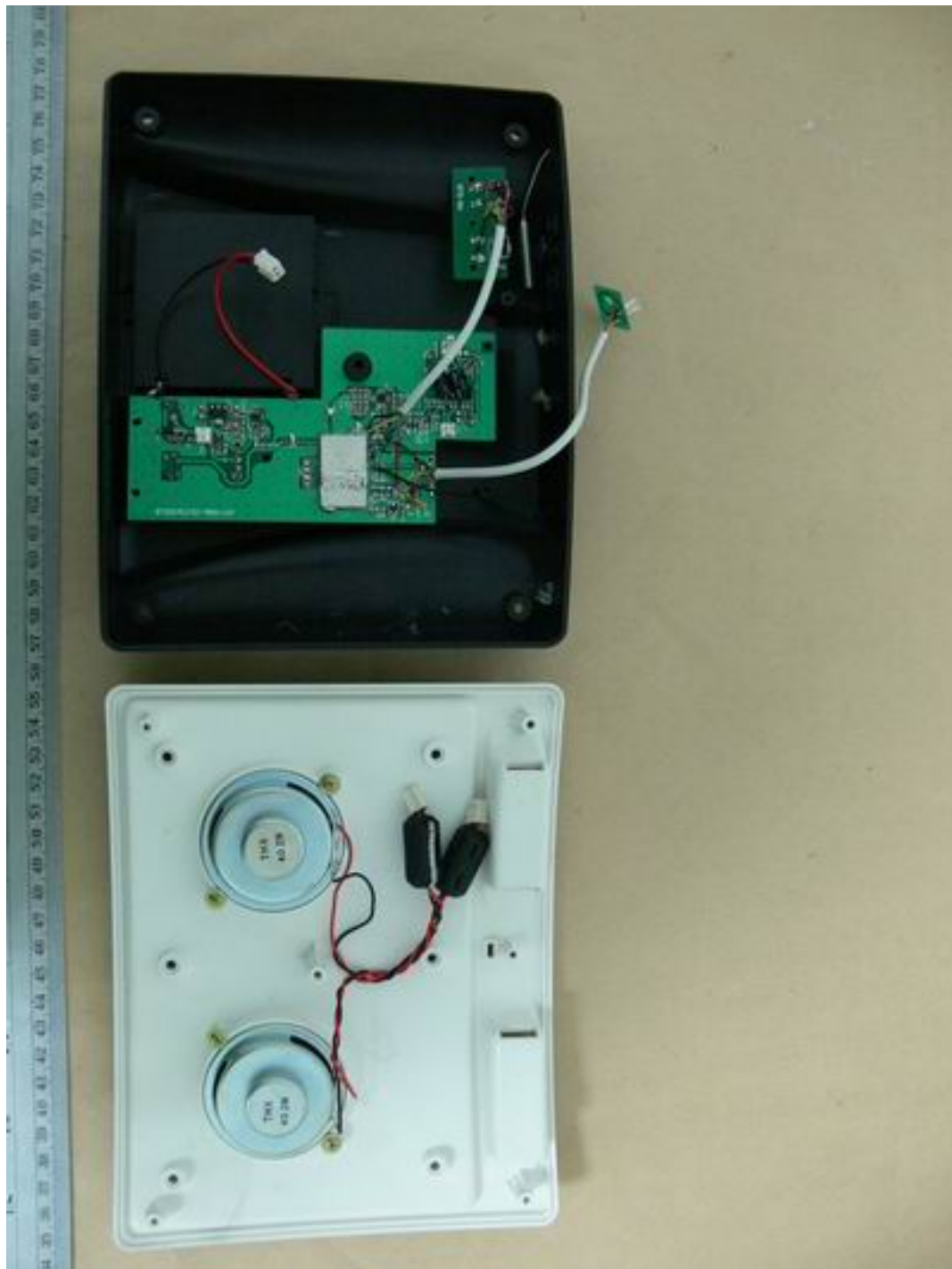




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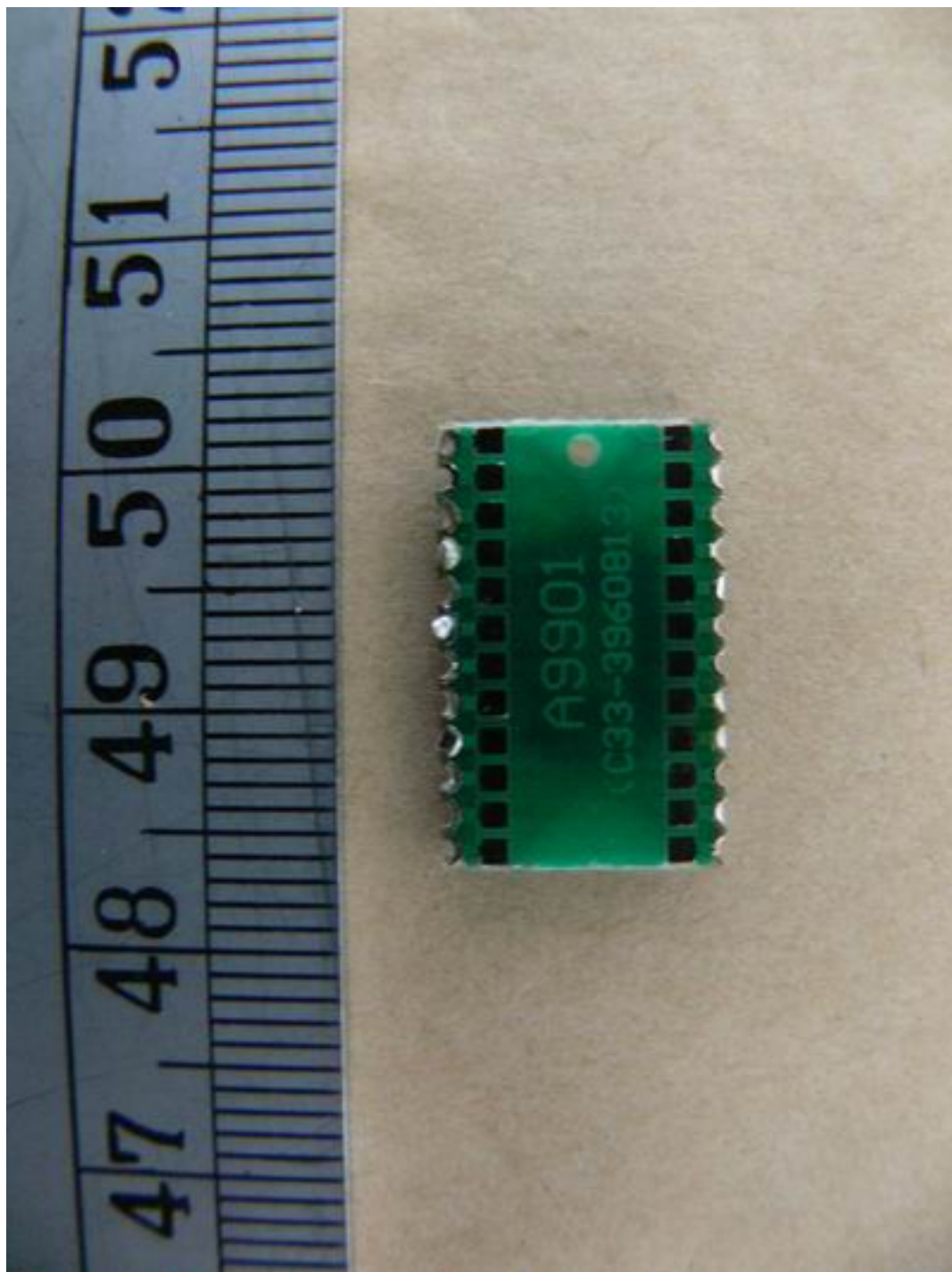
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Taiwan ETS Product Service Co., Ltd.

Registration number: W6M20712-8731-P-15
FCC ID: UNLWSP01





Taiwan ETS Product Service Co., Ltd.

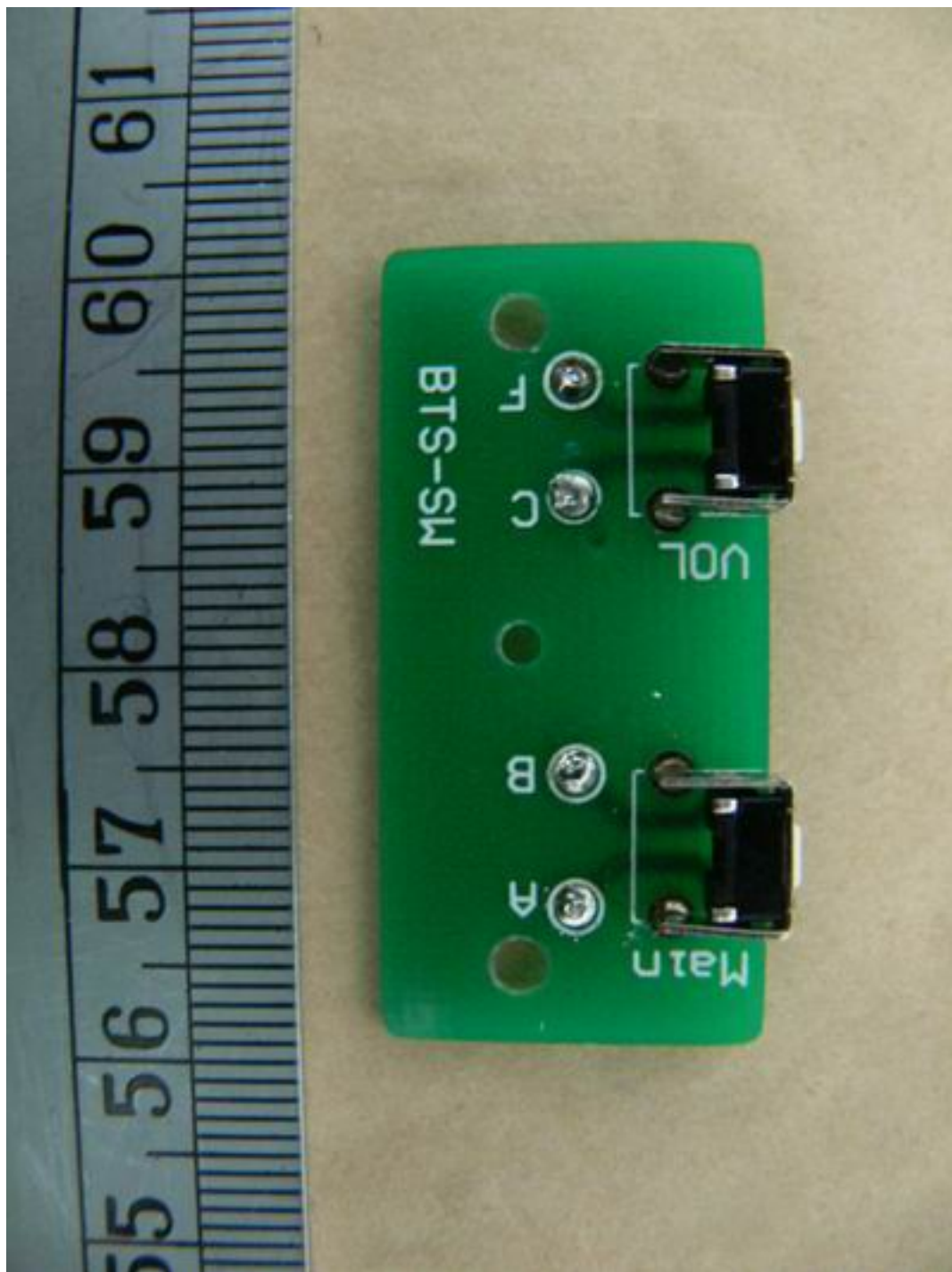
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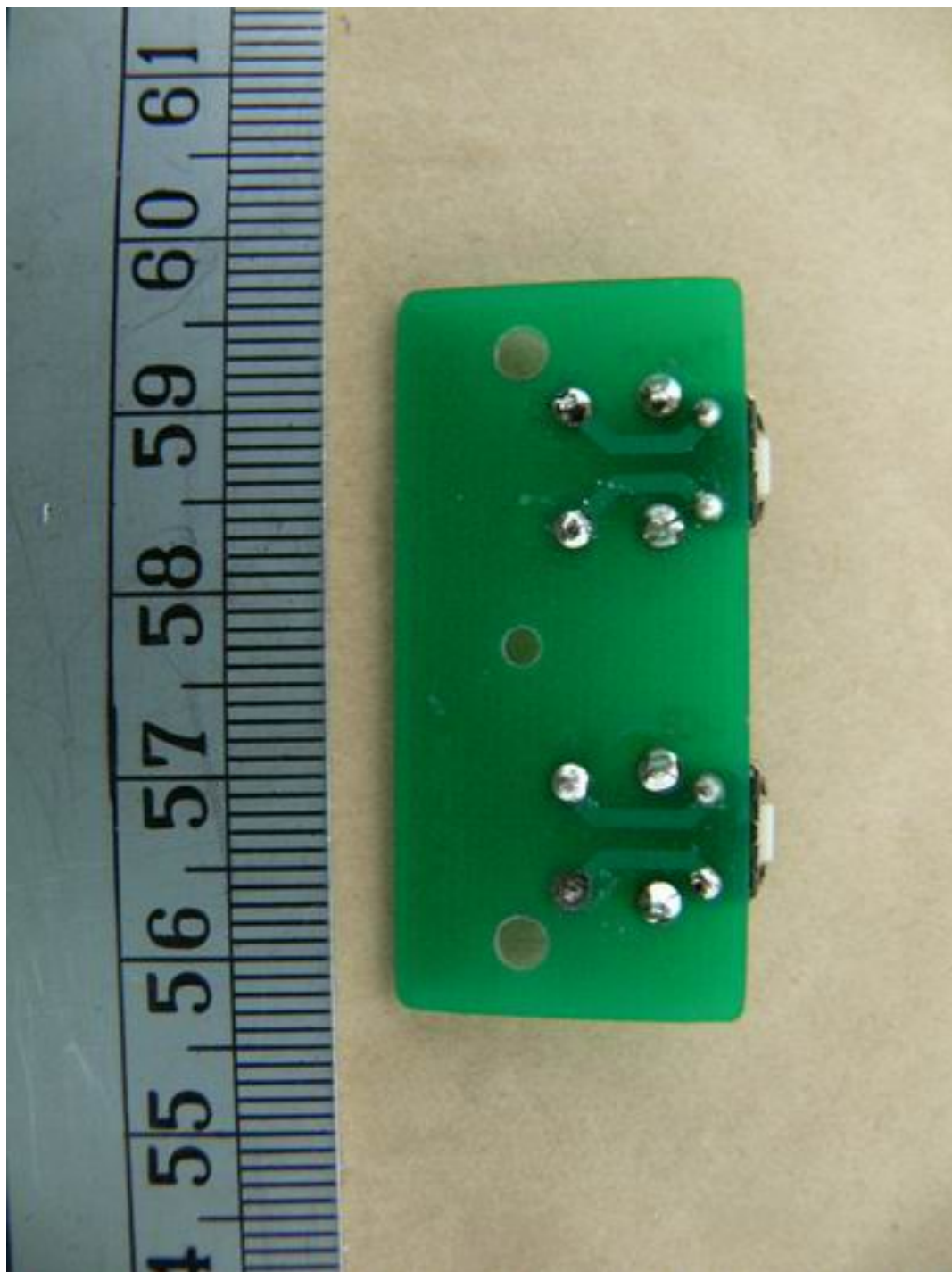
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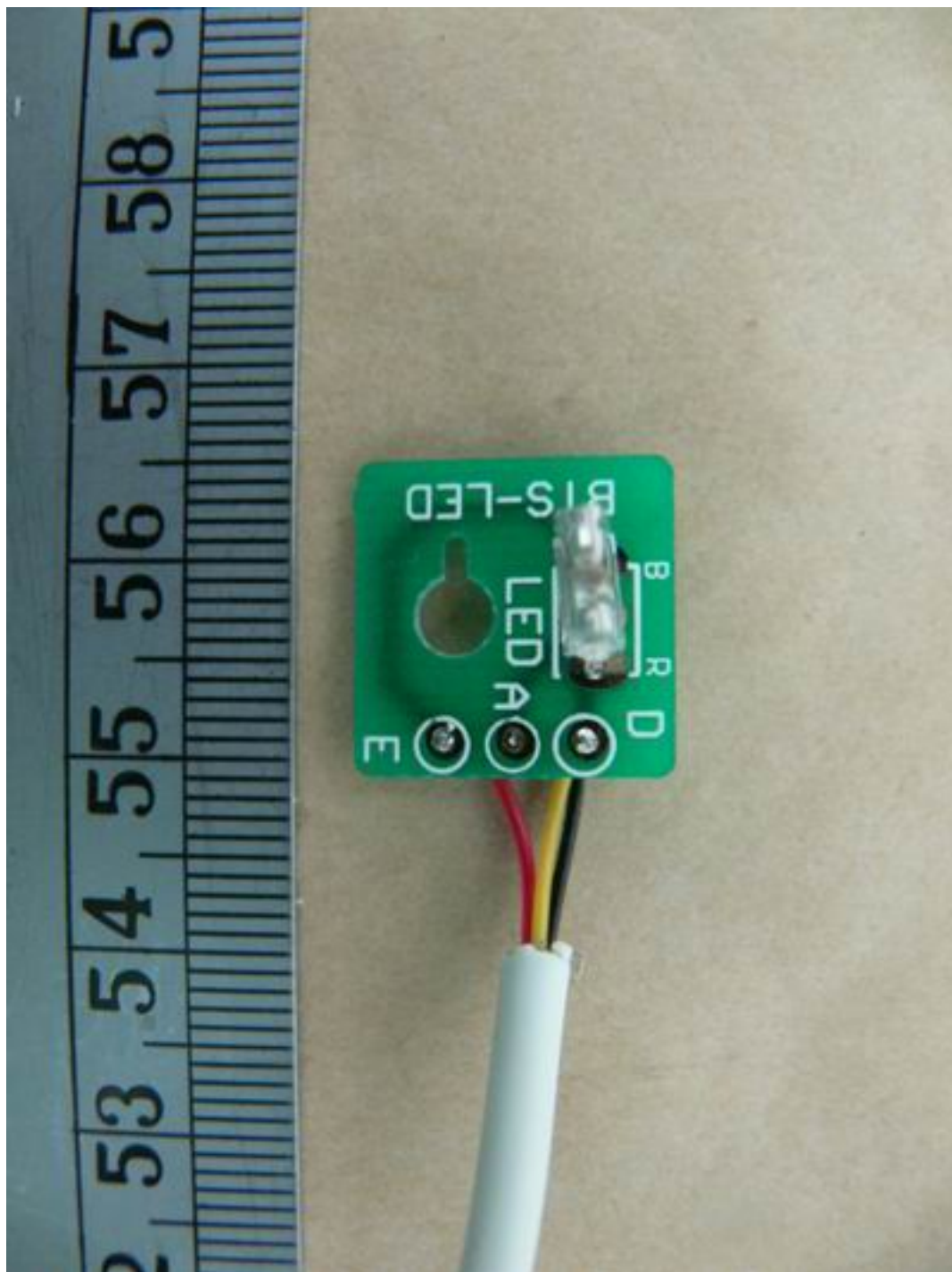
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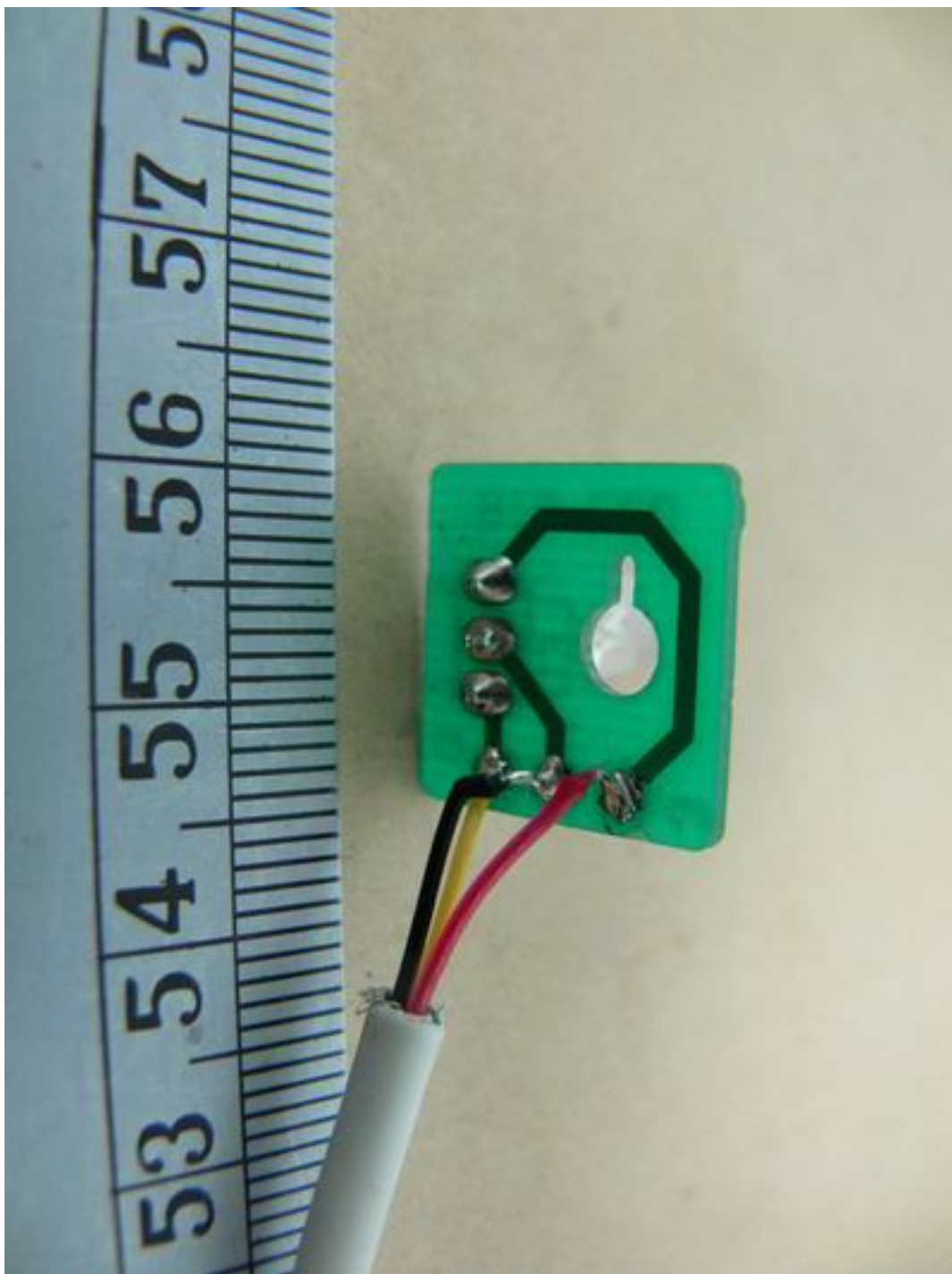
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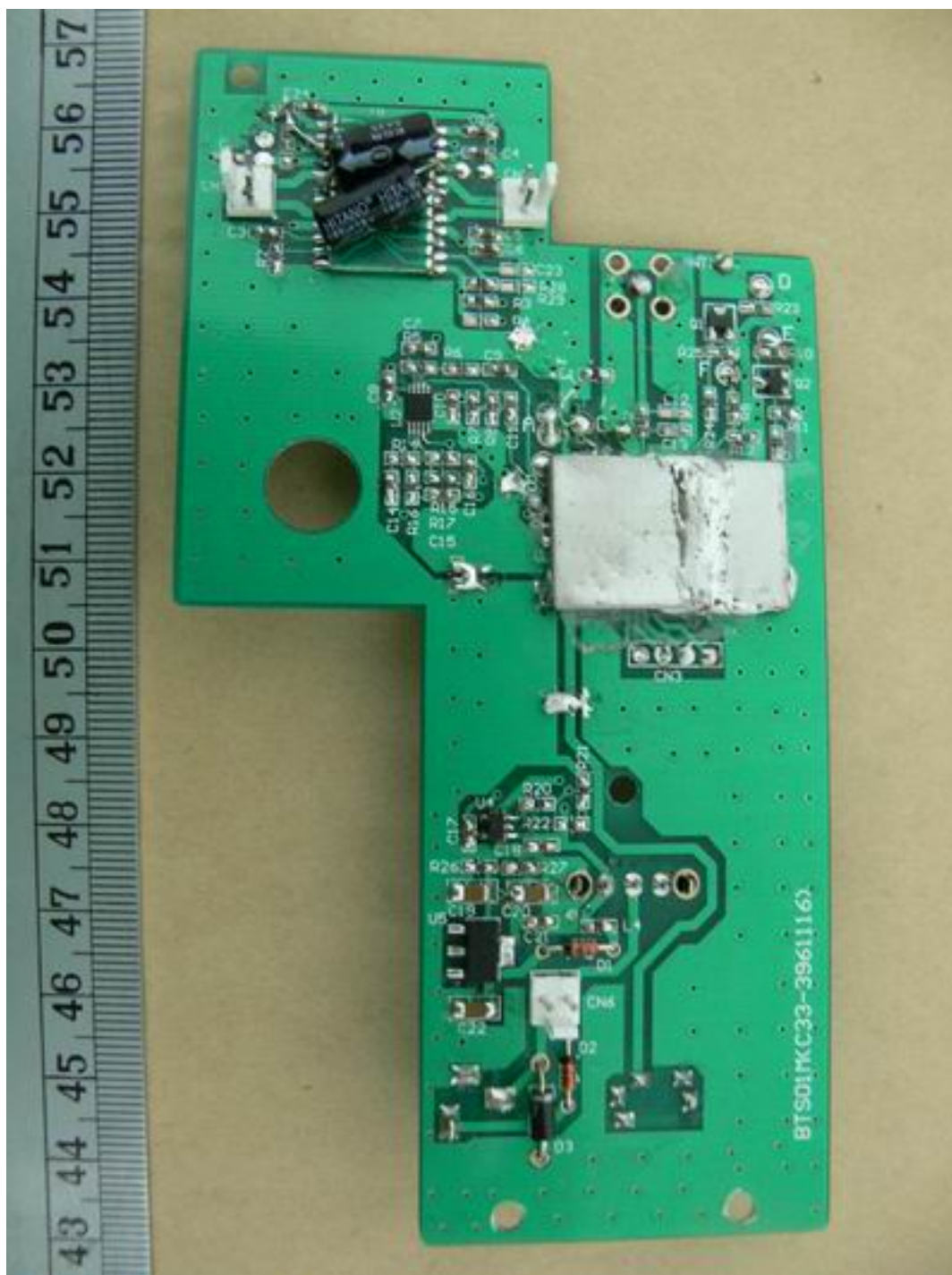
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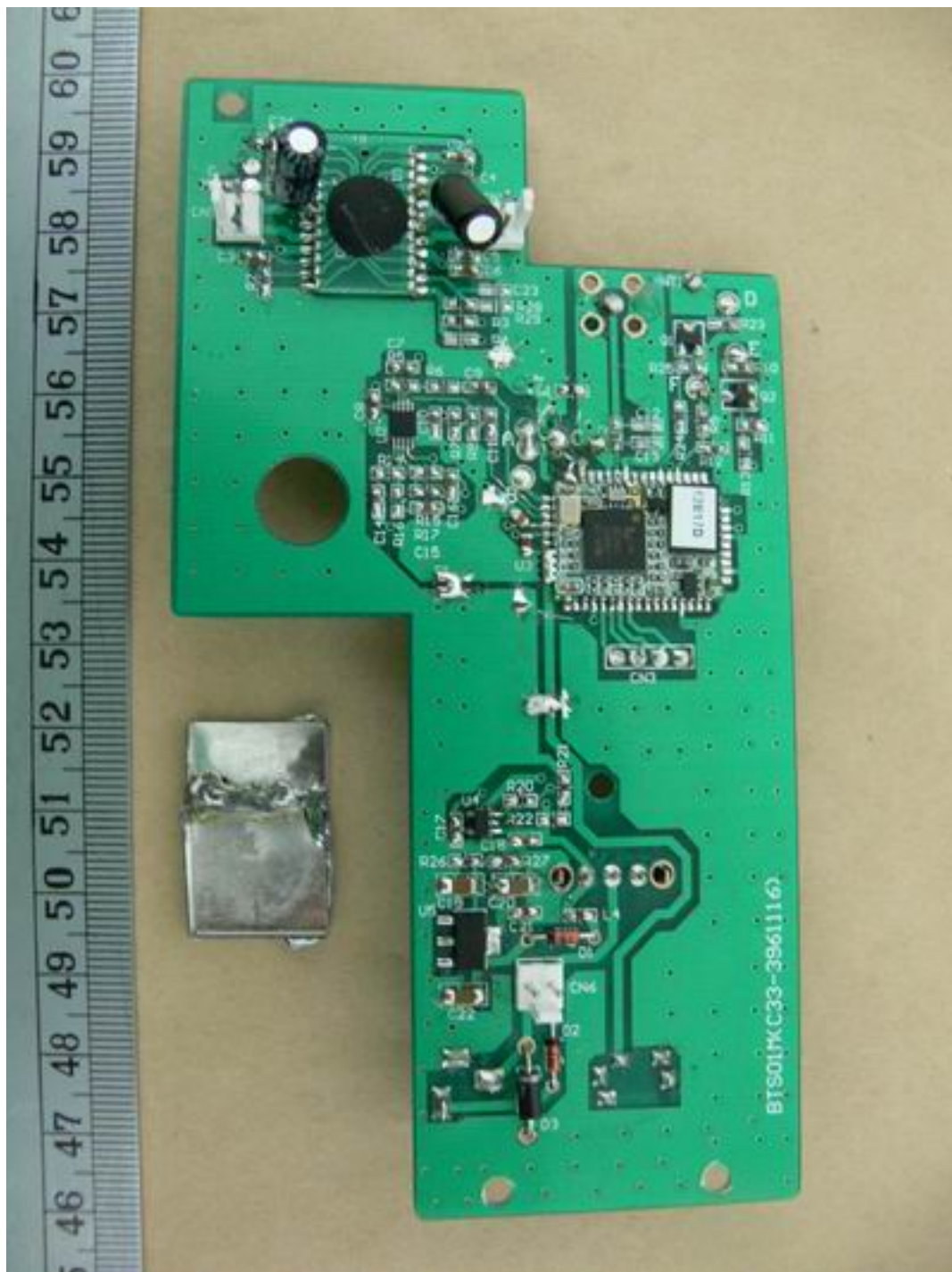
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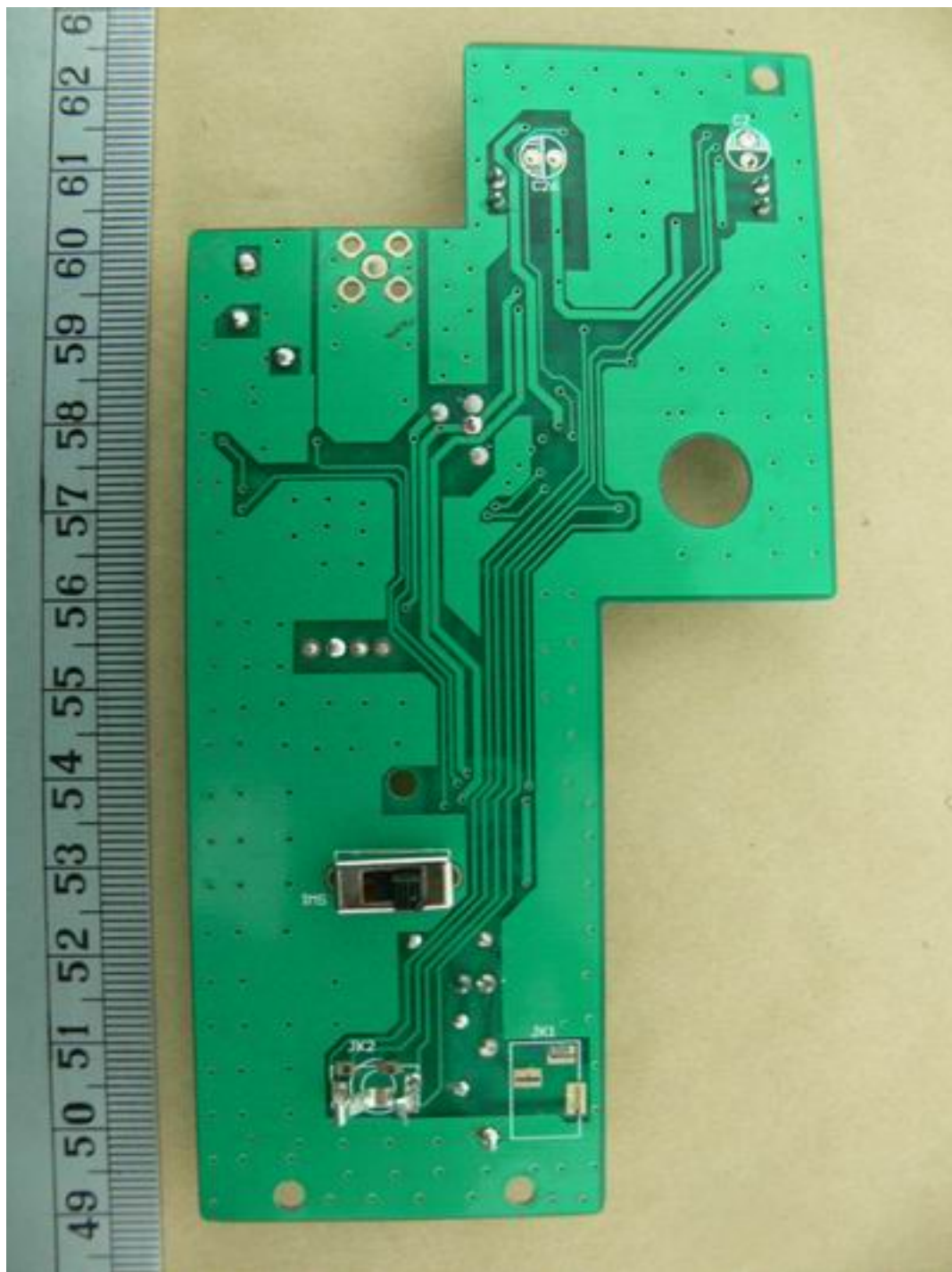
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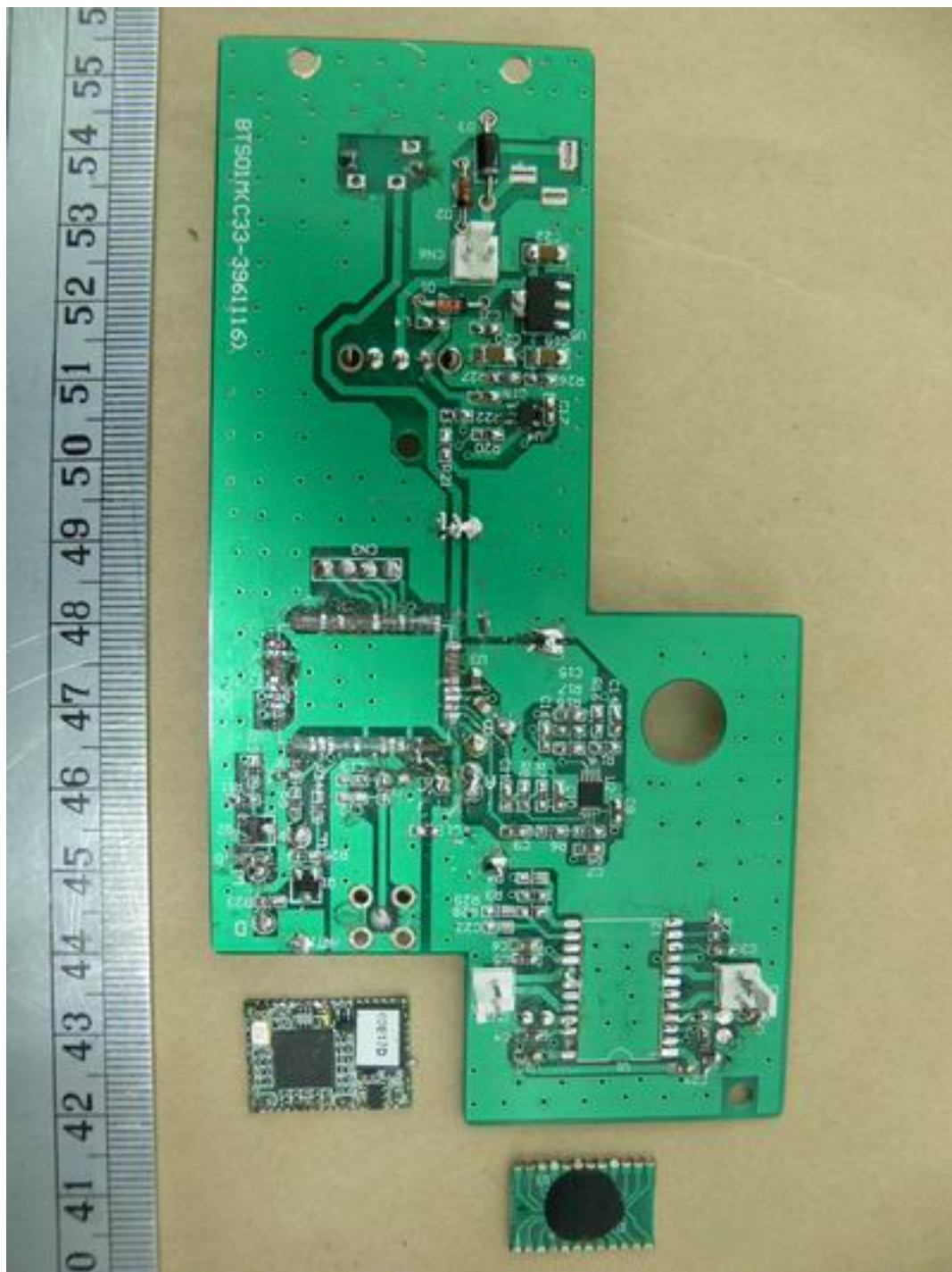
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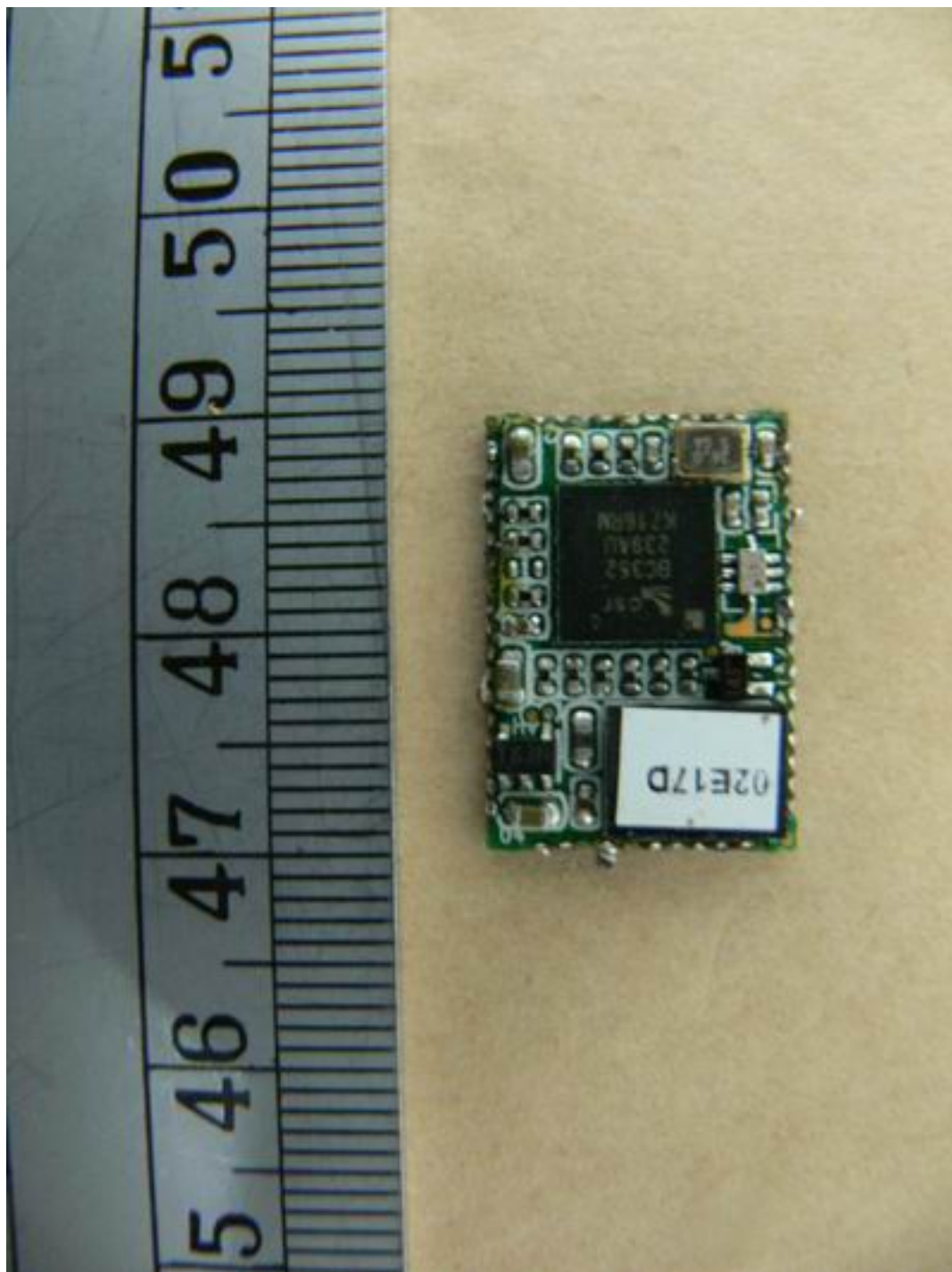
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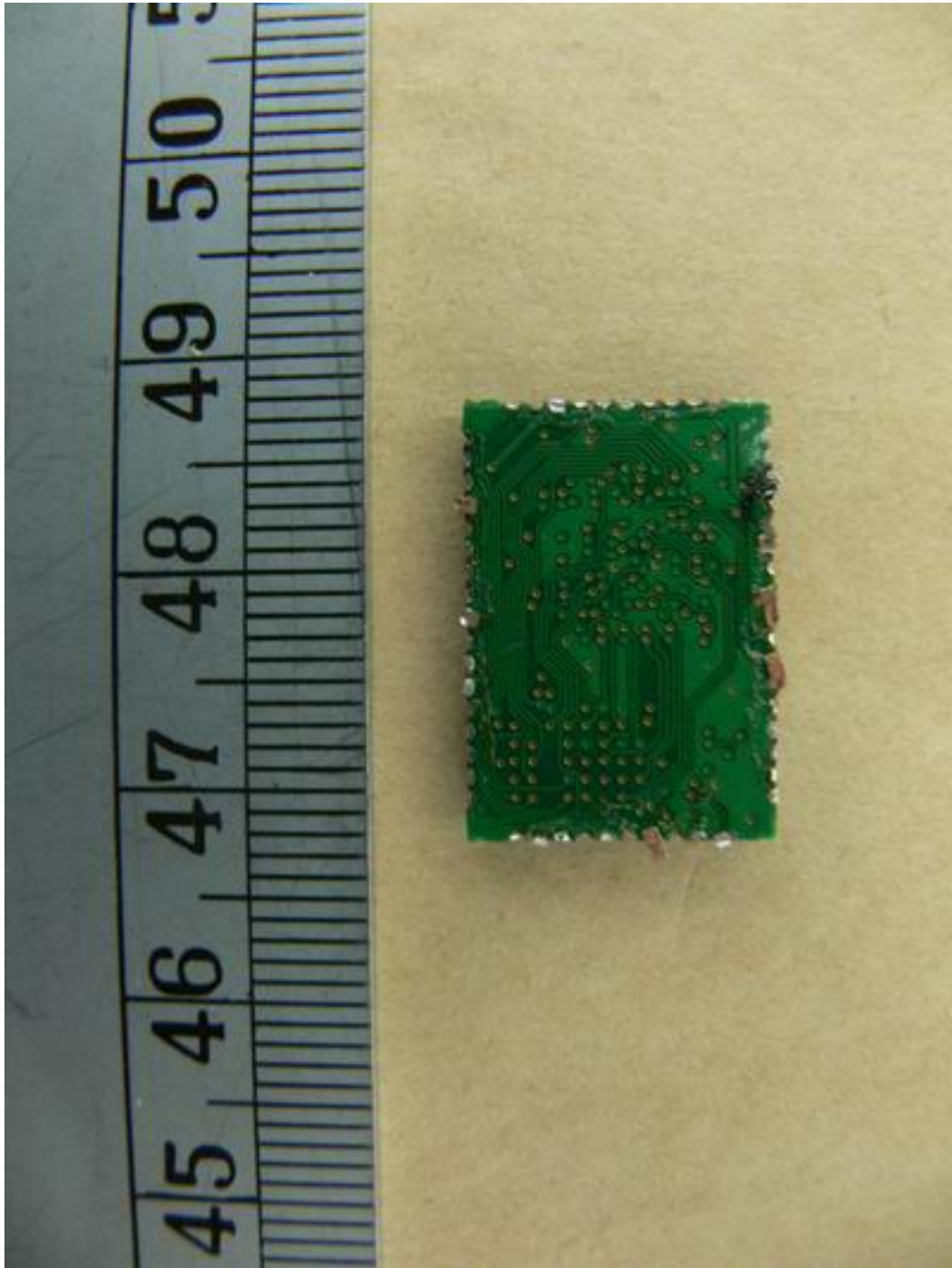
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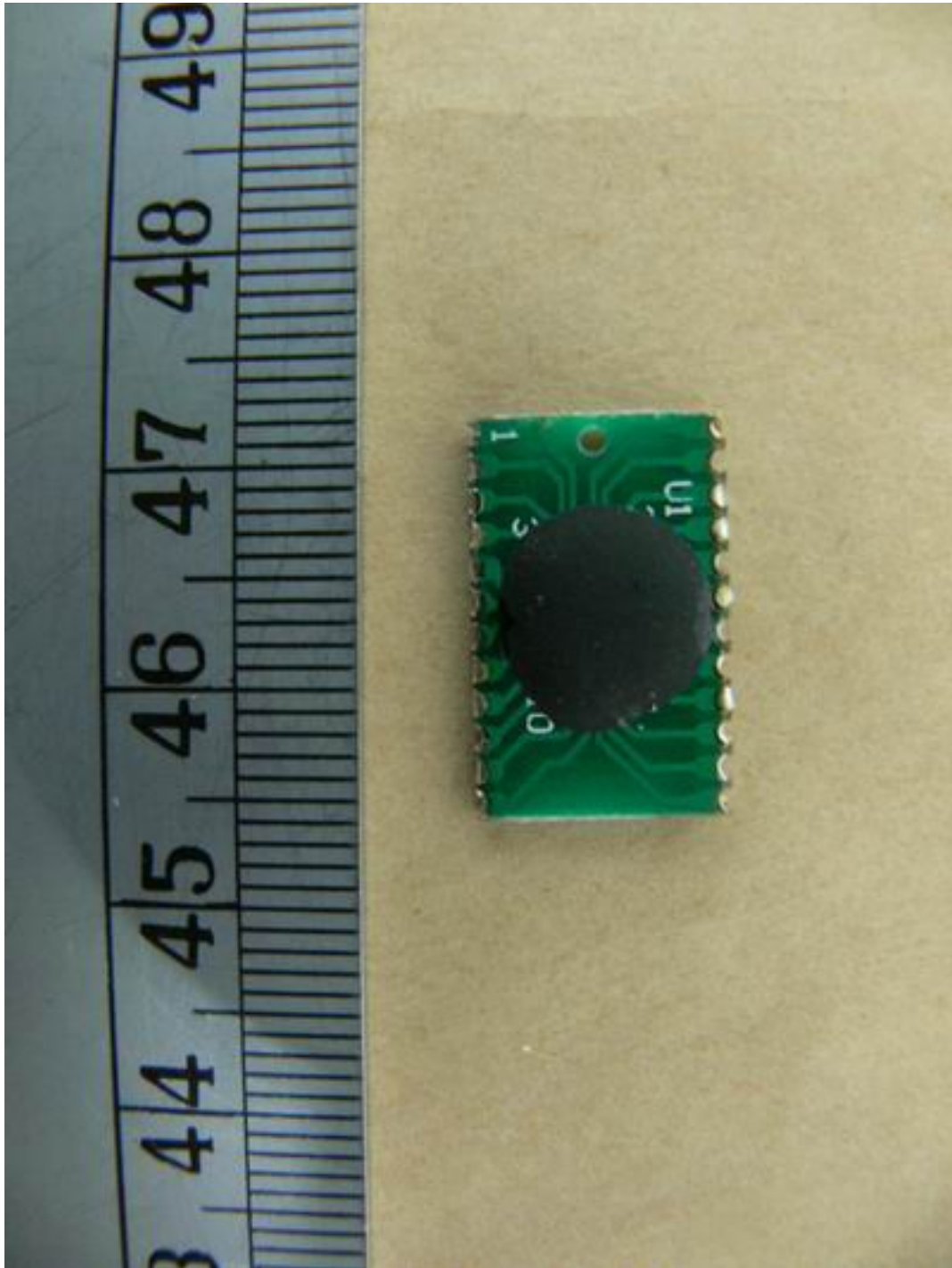
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Taiwan ETS Product Service Co., Ltd.

Registration number: W6M20712-8731-P-15
FCC ID: UNLWSP01





Registration number: W6M20712-8731-P-15

FCC ID: UNLWSP01

Set Up Photo of Radiated Emission

