

FCC PART 15 SUBPART C TEST REPORT

for

ID Programmer

Model No.: OPSS-1

FCC ID: TH9OPSS-1

of

Applicant: Orange Electronic Co., Ltd

Address: 2F, No.91, Lane 36, Sec.2, Tansing Rd., Tanzih Township,
Taichung County 427, Taiwan

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.: W6M21001-10351-P-15

6F, NO. 58, LANE 188, RUEY-KUANG RD., NEIHU TAIPEI 114, TAIWAN, R.O.C.
TEL: 886-2-66068877 FAX: 886-2-66068879 E-mail: wtst@wtst-lab.com



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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:

January 20, 2010

Kevin Wang

Date

WTS-Lab.

Name

Signature

Technical responsibility for area of testing:

January 20, 2010

Chang Tse-Ming

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: Orange Electronic Co., Ltd
Street: 2F, No.91, Lane 36, Sec.2, Tansing Rd., Tanzih Township,
Town: Taichung County 427,
Country: Taiwan
Telephone: +886-4-2538 8086
Fax: +886-4-2538-8028



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1.4 Application details

Date of receipt of test item: January 18, 2010
Date of test: from January 18, 2010 to January 20, 2010

1.5 General information of Test item

Type of test item: ID Programmer
Model Number: OPSS-1
Multi-listing model number: ./.
Brand name: Orange Electronic
Photos: see Appendix

Technical data

Transmitting Frequency: 125 kHz
Operation modes: simplex
Modulation Type: AM
Antenna Type: Helical Antenna
Antenna Gain: Max. 0 dBi
Power supply: Adaptor (I/P: AC 115 V / 50-60 Hz / 0.2 A,
O/P: 9 Vdc / 1.1 A)

Manufacturer: (if different from Approval Holder)

Name: ./.
Street: ./.
City: ./.
Country: ./.

Additional information: ./.



1.6 Test standards

2 Technical test

2.1 Summary of test results

☒

or

□

2.2 Test environment

Temperature: 23 °C

Relative humidity content: 20 ... 75 %

Air pressure: 86 ... 103 kPa

Details of power supply	Adaptor (I/P: AC 115 V / 50-60 Hz / 0.2 A, O/P: 9 Vdc / 1.1 A)
-------------------------	---

Extreme conditions parameters:

	test voltage : -- extreme
	min : -- V
	max : -- V



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2.3 Test Equipment List

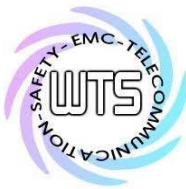
No.	Test equipment	Type	Serial No.	Manufacturer	Cal. Date	Next Cal. Date
ETSTW-CE 001	EMI TEST RECEIVER	ESHS10	842121/013	R&S	2009/9/10	2010/9/9
ETSTW-CE 003	AC POWER SOURCE	APS-9102	D161137	GW	Function Test	
ETSTW-CE 004	ZWEILEITER-V-NETZNACHBILDUNG TWO-LINE V-NETWORK	ESH3-Z5	840731/011	R&S	2009/3/27	2010/3/26
ETSTW-CE 005	Line-Impedance Stabilisation Network	NNBM 8126D	137	Schwarzbeck	2009/9/9	2010/9/8
ETSTW-CE 006	IMPULSBEGRENZER PULSE LIMITER	ESH3-Z2	100226	R&S	2009/5/9	2010/5/8
ETSTW-CE 009	TEMP.&HUMIDITY CHAMBER	GTH-225-40-1P-U	MAA0305-009	GIANT FORCE	2009/7/21	2010/7/20
ETSTW-CE 015	CISPR 22 TWO BALANCED TELECOM PAIRS IMPEDANCE STABILIZATION NETWORK	FCC-TLISN-T8-02	20307	FCC	2009/9/12	2010/9/11
ETSTW-CE 016	TWO-LINE V-NETWORK	ENV216	100050	R&S	2009/9/9	2010/9/8
ETSTW-RE 002	Function Generator	33220A	MY43004982	Agilent	Function Test	
ETSTW-RE 003	EMI TEST RECEIVER	ESI 26	831438/001	R&S	2009/10/1	2010/9/30
ETSTW-RE 004	EMI TEST RECEIVER	ESI 40	832427/004	R&S	2009/9/18	2010/9/17
ETSTW-RE 005	EMI TEST RECEIVER	ESVS10	843207/020	R&S	2009/9/11	2010/9/10
ETSTW-RE 010	ABSORBING CLAMP	MDS 21	3469	Schwarzbeck	2009/9/11	2010/9/10
ETSTW-RE 011	PROGRAMMABLE LINEAR POWER SUPPLY	LPS-305	30503070165	MOTECH	Function Test	
ETSTW-RE 017	Log-Periodic Antenna	HL025	352886/001	R&S	2009/5/4	2010/5/3
ETSTW-RE 018	MICROWAVE HORN ANTENNA	AT4560	27212	AR	2009/10/1	2010/9/30
ETSTW-RE 020	MICROWAVE HORN ANTENNA	AT4002A	306915	AR	Function Test	
ETSTW-RE 021	SWEEP GENERATOR	SWM05	835130/010	R&S	2009/8/19	2010/8/18
ETSTW-RE 027	Passive Loop Antenna	6512	00034563	EMCO	2009/8/14	2011/8/13
ETSTW-RE 028	Log-Periodic Dipole Array Antenna	3148	34429	EMCO	2009/4/15	2010/4/14
ETSTW-RE 029	Biconical Antenna	3109	33524	EMCO	2009/4/15	2010/4/14
ETSTW-RE 030	Double-Ridged Guide Horn Antenna	3117	00035224	EMCO	2009/3/23	2010/3/22
ETSTW-RE 032	Millivoltmeter	URV 55	849086/013	R&S	2009/8/23	2010/8/22
ETSTW-RE 033	WaveRunner 6000A Serise Oscilloscope	WAVERUNNER 6100A	LCRY0604P14508	LeCroy	2009/6/15	2010/6/14
ETSTW-RE 034	Power Sensor	URV5-Z4	839313/006	R&S	2009/8/23	2010/8/22
ETSTW-RE 042	Biconical Antenna	HK116	100172	R&S	2010/1/7	2011/1/6
ETSTW-RE 043	Log-Periodic Dipole Antenna	HL223	100166	R&S	2009/5/5	2010/5/4
ETSTW-RE 044	Log-Periodic Antenna	HL050	100094	R&S	2009/5/21	2010/5/20
ETSTW-RE 047	PSA SERIES SPECTRUM ANALYZER	E4445A	MY46181369	Agilent	2009/6/15	2010/6/14
ETSTW-RE 048	Triple Loop Antenna	HXYZ 9170	HXYZ 9170-134	Schwarzbeck	2009/8/31	2010/8/30
ETSTW-RE 049	TRILOG Super Broadband test Antenna	VULB 9160	9160-3185	Schwarzbeck	2009/4/14	2010/4/13
ETSTW-RE 055	SPECTRUM ANALYZER	FSU 26	200074	R&S	2009/6/10	2010/6/09



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ETSTW-RE 064	Bluetooth Test Set	MT8852B-042	6K00005709	Anritsu	Function Test	
ETSTW-RE 065	Amplifier	AMF-6F-18002650-25-10P	941608	MITEQ	2009/4/21	2010/4/20
ETSTW-RE 072	CELL SITE TEST SET	8921A	3339A00375	HP	2009/10/2	2010/10/1
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 091	Match Pad	MDCS1500	None	WOKEN	Function Test	
ETSTW-RE 092	Match Pad	MDCS1510	None	WOKEN	Function Test	
ETSTW-RE 093	LUMPED ELEMENT POWER DIVIDER	PL2-10	146	MCLI	2009/3/6	2010/3/5
ETSTW-RE 095	Digital Thermo-Hygro Meter	0410	01	WISEWIND	2009/3/24	2010/3/23
ETSTW-RE 096	SIGNAL GENERATOR	SMIQ 03B	102274	R&S	2009/6/5	2010/6/4
ETSTW-RE 097	GPS SIGNAL GENERATOR	GSG-L1	06-0507-0311	Naviva	Function Test	
ETSTW-GSM 002	Universal Radio Communication Tester	CMU 200	109439	R&S	2009/9/22	2010/9/21
ETSTW-GSM 023	Power Divider	4901.19.A	None	SUHNER	2009/9/21	2010/9/20
ETSTW-Cable 001	Microwave Cable	SUCOFLEX 104 (S_Cable 1)	238094	HUBER+SUHNER	2009/9/16	2010/9/15
ETSTW-Cable 002	Microwave Cable	SUCOFLEX 104 (S_Cable 7)	238093	HUBER+SUHNER	2009/9/16	2010/9/15
ETSTW-Cable 003	Microwave Cable	SUCOFLEX 104 (S_Cable 11)	209953	HUBER+SUHNER	2009/9/16	2010/9/15
ETSTW-Cable 006	Microwave Cable	SUCOFLEX 104 (S_Cable 8)	238095	HUBER+SUHNER	2009/3/6	2010/3/5
ETSTW-Cable 010	BNC Cable	5 M BNC Cable	None	JYE BAO CO.,LTD.	2009/3/6	2010/3/5
ETSTW-Cable 011	BNC Cable	BNC Cable 1	None	JYE BAO CO.,LTD.	2009/8/20	2010/8/19
ETSTW-Cable 012	BNC Cable	BNC Cable 2	None	JYE BAO CO.,LTD.	2009/8/20	2010/8/19
ETSTW-Cable 013	Microwave Cable	SUCOFLEX 104 (S_Cable 5)	232345	HUBER+SUHNER	2009/3/6	2010/3/5
ETSTW-Cable 022	N TYPE Cable	OATS Cable 3	0002	JYE BAO CO.,LTD.	2009/3/6	2010/3/5



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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.

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 EUT was placed on a table 80 cm height and with dimensions of 1m by 1.5m (non metallic table). The EUT was placed in the centre 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 Worldwide Testing Services(Taiwan) 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.



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3 Test results (enclosure)

Test case	Para. Number	Required	Test passed	Test failed
Peak Output Power	15.209	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Spurious Emissions radiated – Transmitter operating	15.209	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Occupied bandwidth	2.1049	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Antenna Requirement	15.203	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Power Line Conducted Emission	15.207(a)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

The follows is intended to leave blank.



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3.1 Peak Output Power

FCC Rules: 15.209

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

Frequency (kHz)	Transmitter field strength (dBμV/m)
126.041666667	82.54
Measurement uncertainty	± 4.86 dB

Limits: 15.209

Frequency of Emission (MHz)	Field Strength of Fundamental Limit uV/m	Measurement distance
0.009 – 0.490	2400 / f (KHz)	300
0.49 – 1.705	24000 / f (KHz)	30
1.705 – 30	30	30
30 – 88	100	3
88 – 216	150	3
216 – 960	200	3
Above 960	500	3

The test was performed in the anechoic chamber at 3 meter test distance, i.e. the distance between measuring antenna and EUT boundary. The results were extrapolated by using the square of an inverse linear distance factor DF:

DF (distance factor) = $40 \log (D_1/D_2) = 80 \text{ dB}$, where

D_1 is the 300 meter specified measurement distance,
 D_2 is the 3 meter test measurement distance.

For 125 kHz frequency the calculated limit is:

$\text{Limit}_{3m} = \text{Limit}_{300m} + \text{DF} = 25.6\text{dBuV/m} + 80 \text{ dB} = 105.6 \text{ dBuV/m}$

Test equipment used: ETSTW-RE 003, ETSTW-RE 004, ETSTW-RE 027, ETSTW-RE 055.

Explanation: See attached diagrams in appendix.



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3.2 Spurious Emissions radiated – Transmitter operating

FCC Rules: 15.209

The field strength of any emission appearing outside of the specific band shall not exceed the general radiated emission limits in 15.209.

For the frequency from 9 kHz to 30 MHz:

Frequency (kHz)	Test Result (dBμV/m)	Limit ^(Note 3) (dBμV/m)	Margin (dB)
13.026693 ^(Note 1)	103.12	125.30	-22.18
64.855681 ^(Note 1)	93.20	111.36	-18.16
125.974623 ^(Note 2)	86.29	105.59	-19.30
1869.136205	54.68	69.54	-14.86
2002.526973	53.79	69.54	-15.75
2246.332717	53.34	69.54	-16.20
2496.767680	52.45	69.54	-17.09
Measurement uncertainty	± 4.86dB		

Note:

1. These signals are from test equipment.
2. This signal is the Fundamental signal.
3. The above field strength limits are specified at a distance of 3 meters.

For the frequency from 30 MHz to 1000 MHz.:

Model: OPSS-1 Date: 2010/1/18
Mode: Temperature: 24 °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)
54.3487	15.11	peak	13.97	29.08	40.00	-10.92	240	310
78.6974	13.03	peak	10.22	23.25	40.00	-16.75	260	320
298.3768	11.81	peak	16.19	28.00	46.00	-18.00	250	250
699.7996	9.10	peak	24.84	33.94	46.00	-12.06	260	140
879.3587	9.06	peak	27.31	36.37	46.00	-9.63	130	130
941.0822	7.40	peak	28.40	35.80	46.00	-10.20	145	120



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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)
54.3487	22.22	peak	13.97	36.19	40.00	-3.81	210	140
78.1563	19.85	peak	10.33	30.18	40.00	-9.82	200	135
111.7034	21.21	peak	12.85	34.06	43.50	-9.44	190	140
520.2405	13.69	peak	21.51	35.20	46.00	-10.80	160	310
876.5531	8.81	peak	27.26	36.07	46.00	-9.93	250	320
939.6794	7.09	peak	28.38	35.47	46.00	-10.53	285	350

- 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. Measurement uncertainty 0.009-30MHz = $\pm 4.86\text{dB}$, 30-1000MHz = $\pm 4.94\text{dB}$, 1-18 GHz = $\pm 5.50\text{dB}$, 18-40 GHz = $\pm 5.20\text{ dB}$; Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of $k = 2$.**
 - 6. See the attached diagram as appendix.**

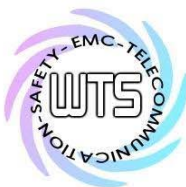
All other not noted test plots do not contain significant test results in relation to the limits.

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

Limits: 15.209

Frequency of Emission (MHz)	Field Strength of Fundamental Limit uV/m	Measurement distance
0.009 – 0.490	2400 / f (KHz)	300
0.49 – 1.705	24000 / f (KHz)	30
1.705 – 30	30	30
30 – 88	100	3
88 – 216	150	3
216 – 960	200	3
Above 960	500	3

* In the emission table above, the tighter limit applies at the band edges.



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The test was performed in the anechoic chamber at 3 meter test distance, i.e. the distance between measuring antenna and EUT boundary. The results were extrapolated by using the square of an inverse linear distance factor DF:

$$DF = 40 \log (D_1/D_2) = 80 \text{ dB, where}$$

For D_1 is the 300 meter specified measurement distance.

D_2 is the 3 meter test measurement distance.

The DF = 80 dB was applied for limit calculation at 3 meter test distance measurements.

For D_1 is the 30 meter specified measurement distance.

D_2 is the 3 meter test measurement distance.

The DF = 40 dB was applied for limit calculation at 3 meter test distance measurements.

If the frequency between 9 – 490 kHz,

$$\text{Limit} = 20\log(2400/f(\text{kHz})) + 80$$

If the frequency between 490 – 1705 kHz,

$$\text{Limit} = 20\log(2400/f(\text{kHz})) + 40$$

If the frequency between 1705 – 30000 kHz,

$$\text{Limit} = 20\log 30 + 40$$

For 125 kHz frequency the calculated limit is:

$$\text{Limit}_{3m} = \text{Limit}_{300m} + DF = 25.6\text{dBuV/m} + 80 \text{ dB} = 105.6 \text{ dBuV/m}$$

Test equipment used: ETSTW-RE 003, ETSTW-RE 004, ETSTW-RE 027, ETSTW-RE 028,
ETSTW-RE 029, ETSTW-RE 055, ETSTW-RE 049.

Explanation: See attached diagrams in appendix.



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3.3 Occupied Bandwidth

FCC Rules: 2.1049

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated are each equal to 0.5% of the total mean power radiated by a given emission.

The resolution bandwidth of the spectrum analyzer shall be set to a value greater than 5.0% of the allowed bandwidth specifications are given, the following guidelines are used:

Fundamental frequency	Minimum resolution bandwidth
9 kHz to 30 MHz	1 kHz
30 MHz to 1000 MHz	10 kHz
1000 MHz to 40 GHz	100 kHz

Test result:

Frequency (kHz)	Occupied Channel Bandwidth (kHz)
124.894189678	28.685897436

Test equipment: ETSTW-RE 055

Explanation: See attached diagrams in appendix.



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3.4 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 antenna is Helical Antenna which passes antenna requirement.

The equipment meets the requirements	yes <input checked="" type="checkbox"/>	no <input type="checkbox"/>
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3.5 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 (dBμV)	
	quasi-peak	average
150 kHz	Lower limit line	Lower limit line

Model: OPSS-1 Date: 2010/1/18
Mode: Temperature: 24 °C Engineer: Danny
Polarization: N Humidity: 60 %

Frequency (MHz)	Reading (dBuV)		Factor (dB) Corr.	Result (dBuV)		Limit (dBuV)		Margin (dB)
	QP	Ave.		QP	Ave.	QP	Ave.	
0.1620	45.04	38.46	10.75	55.79	49.21	65.36	55.36	-6.15
0.3235	40.63	35.63	10.72	51.35	46.35	59.62	49.62	-3.27
0.6462	40.47	33.24	10.59	51.06	43.83	56.00	46.00	-2.17
0.8065	40.28	32.12	10.49	50.77	42.61	56.00	46.00	-3.39
1.6166	35.69	29.81	10.20	45.89	40.01	56.00	46.00	-5.99
18.6691	21.26	16.32	10.79	32.05	27.11	60.00	50.00	-22.89

Polarization: L1

Frequency (MHz)	Reading (dBuV)		Factor (dB) Corr.	Result (dBuV)		Limit (dBuV)		Margin (dB)
	QP	Ave.		QP	Ave.	QP	Ave.	
0.1620	45.04	38.46	10.75	55.79	49.21	65.36	55.36	-6.15
0.3235	40.63	35.63	10.72	51.35	46.35	59.62	49.62	-3.27
0.6462	40.47	33.24	10.59	51.06	43.83	56.00	46.00	-2.17
0.8065	40.28	32.12	10.49	50.77	42.61	56.00	46.00	-3.39
1.6166	35.69	29.81	10.20	45.89	40.01	56.00	46.00	-5.99
18.6691	21.26	16.32	10.79	32.05	27.11	60.00	50.00	-22.89



Registration number: W6M21001-10351-P-15
FCC ID: TH9OPSS-1

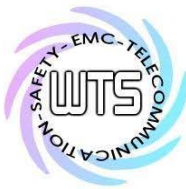
- Note**
- 1. The formula of measured value as: Test Result = Reading + Correction Factor**
 - 2. The Correction Factor = Cable Loss + LISN Insertion Loss + Pulse Limit Loss**
 - 3. Detector function in the form : PK = Peak, QP = Quasi Peak, AV = Average**
 - 4. All not in the table noted test results are more than 20 dB below the relevant limits.**
 - 5. Measurement uncertainty = $\pm 1.30\text{dB}$; Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of $k = 2$.**
 - 6. See attached diagrams as appendix.**

Limits:

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi Peak	Average
0.15-0.5	66 to 56	56 to 46
	56	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,
ETSTW-RE 064.

Explanation: See attached diagrams in appendix.



Appendix

A Measurement diagrams

1. Peak Output Power
2. Spurious Emissions radiated- transmitter
3. Occupied Bandwidth
4. Power Line Conducted Emission

B Photos

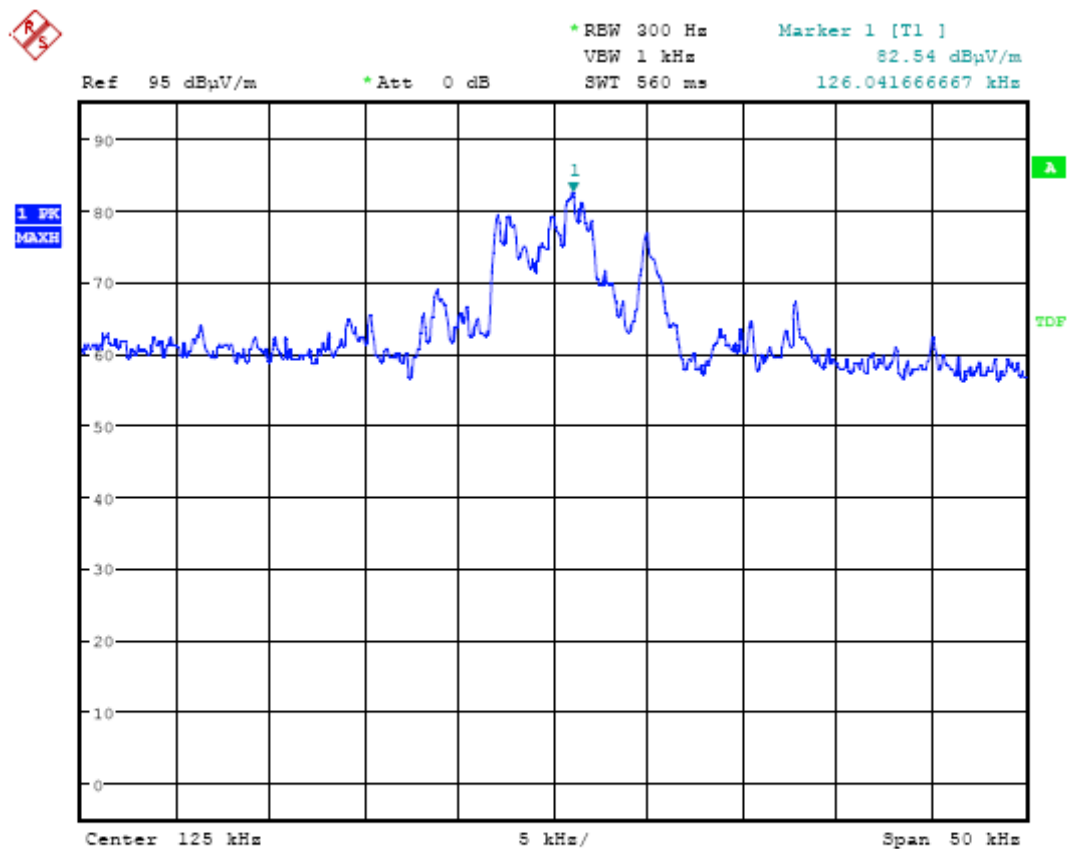
1. External Photos
2. Internal Photos
3. Set Up Photo of Radiated Emission
4. Set Up Photo of Conducted Emission



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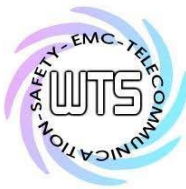
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FCC ID: TH9OPSS-1

Peak Output Power



POWER

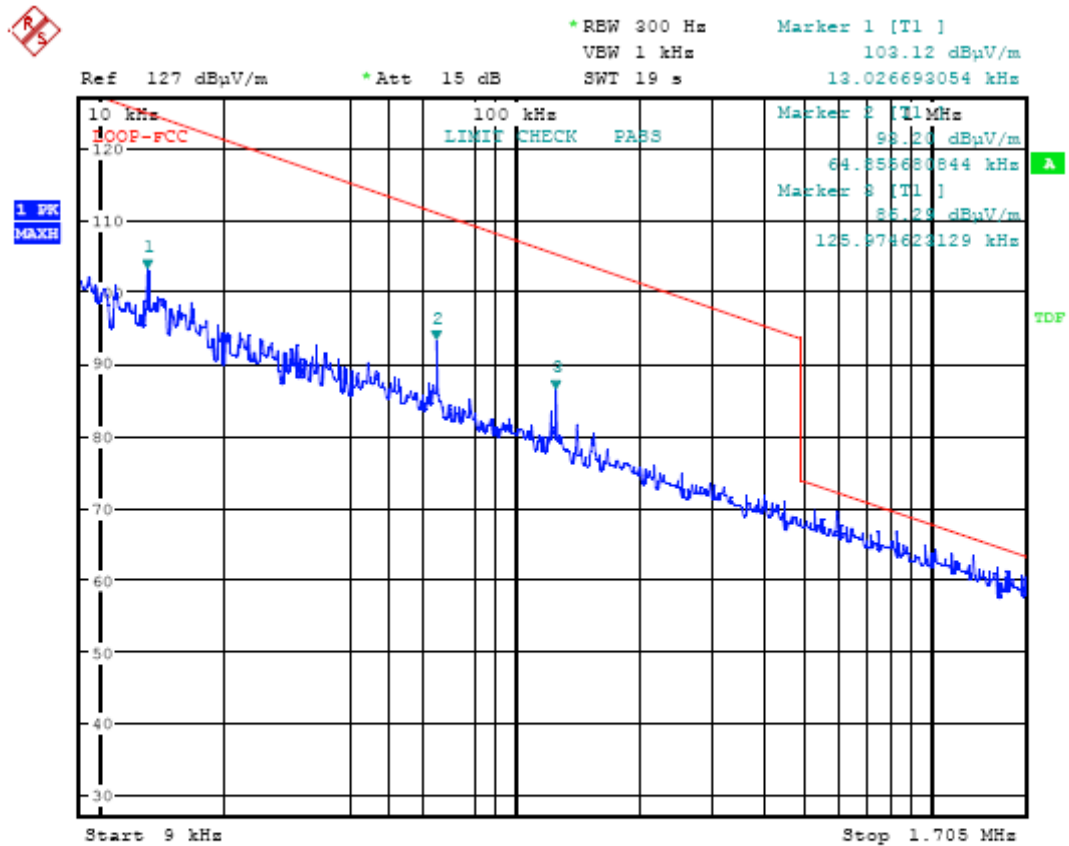
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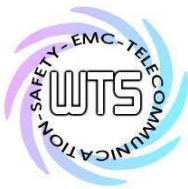
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Spurious Emissions radiated- transmitter
Frequency from 9 kHz to 30000 kHz:



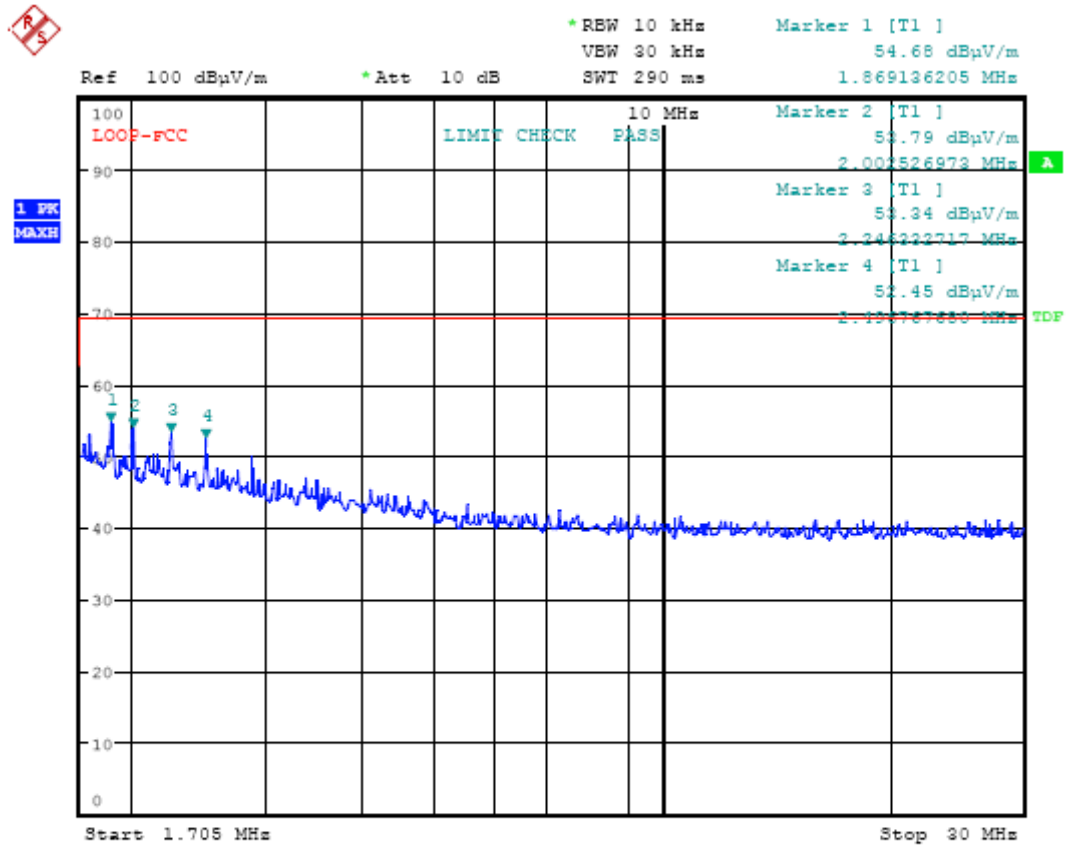
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Worldwide Testing Services(Taiwan) Co., Ltd.

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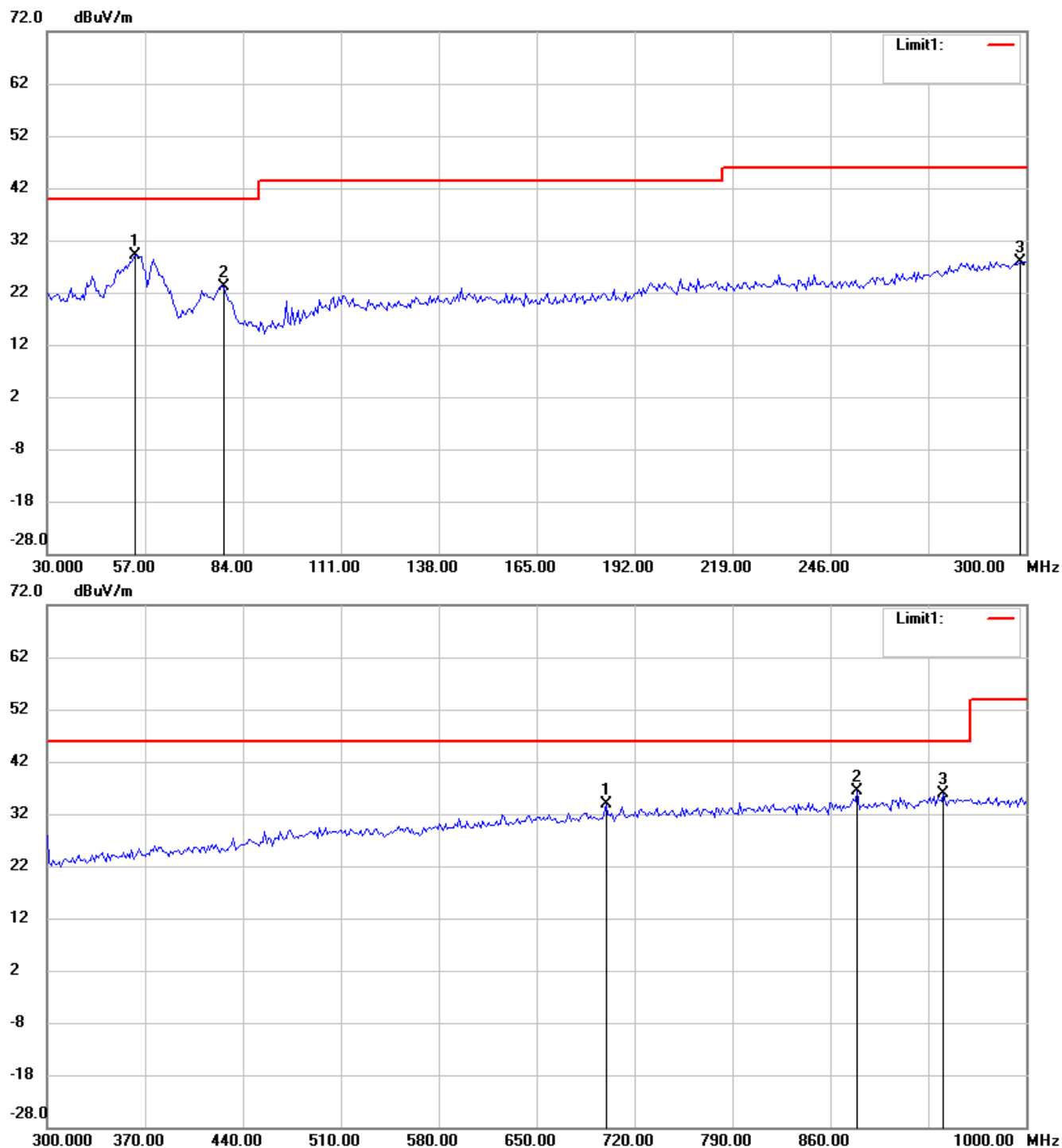
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Registration number: W6M21001-10351-P-15
FCC ID: TH9OPSS-1

Frequency from 30 MHz to 1000 MHz:

Antenna Polarization H



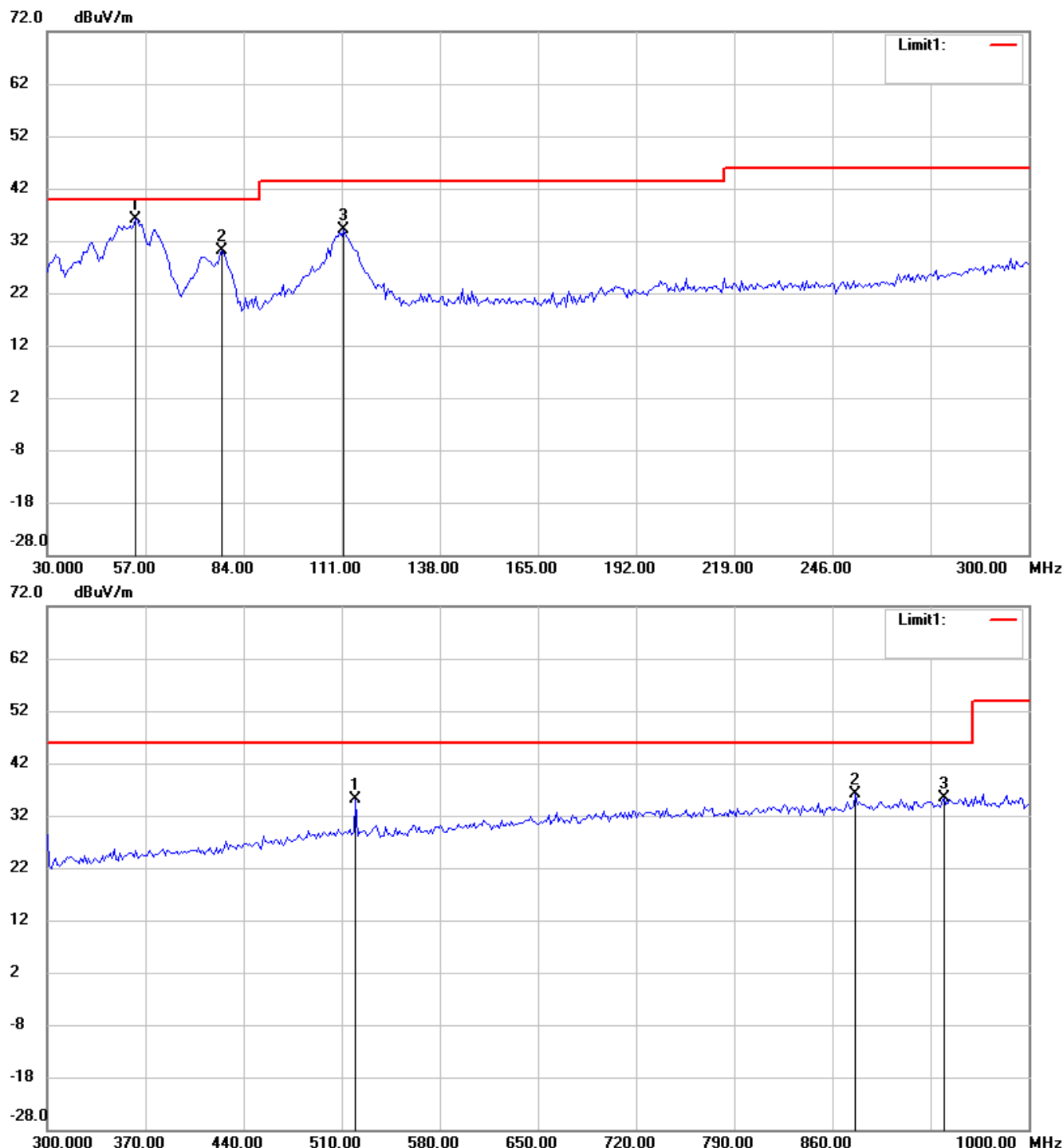
Note:

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: W6M21001-10351-P-15
FCC ID: TH9OPSS-1

Antenna Polarization V



Note:

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.

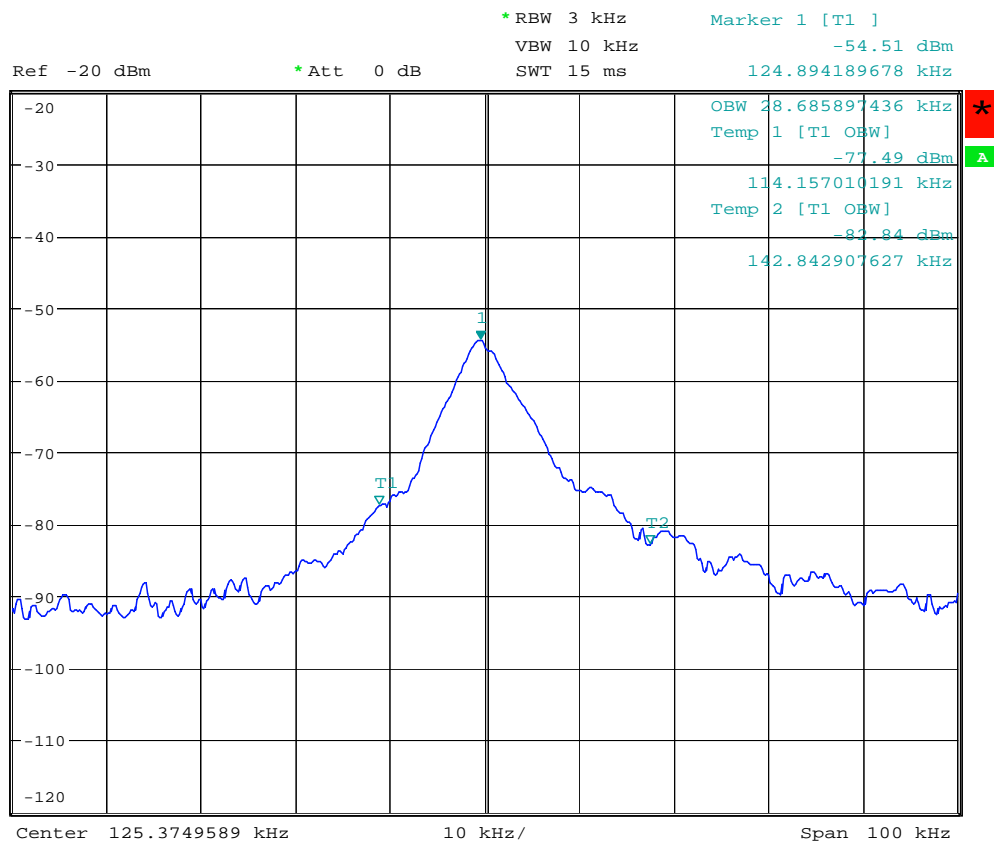


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FCC ID: TH9OPSS-1

Occupied Bandwidth



1 PK
VIEW



TRANSIENT POWER

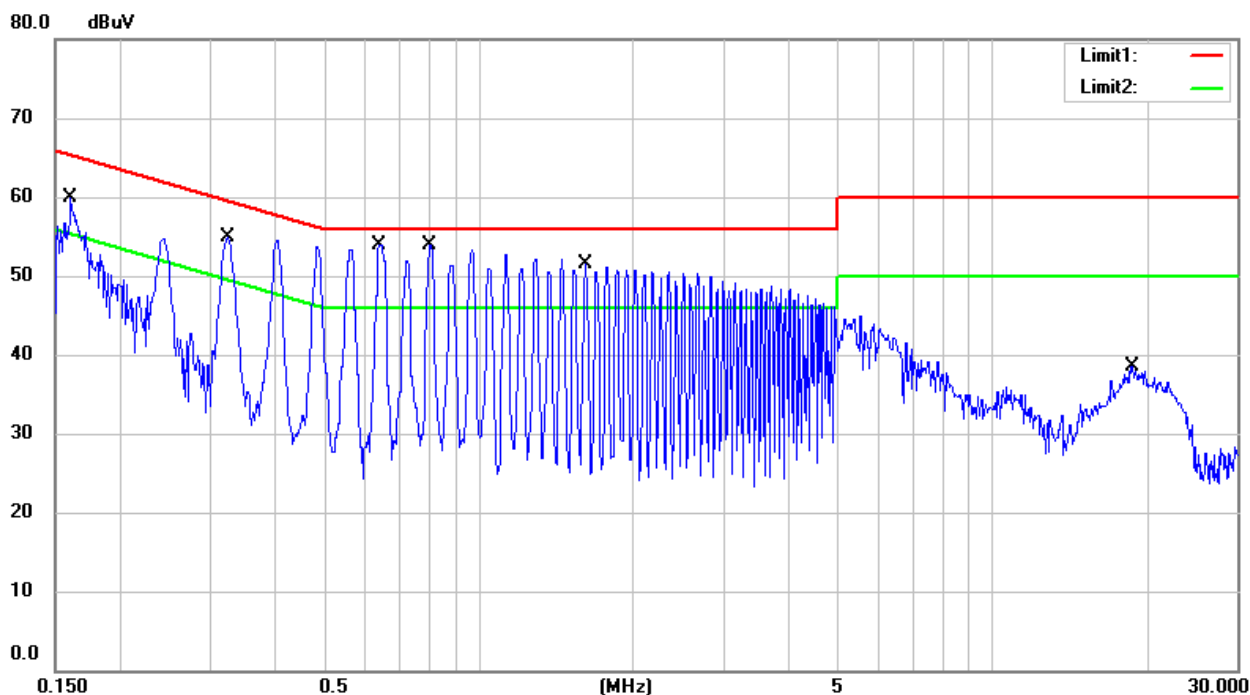
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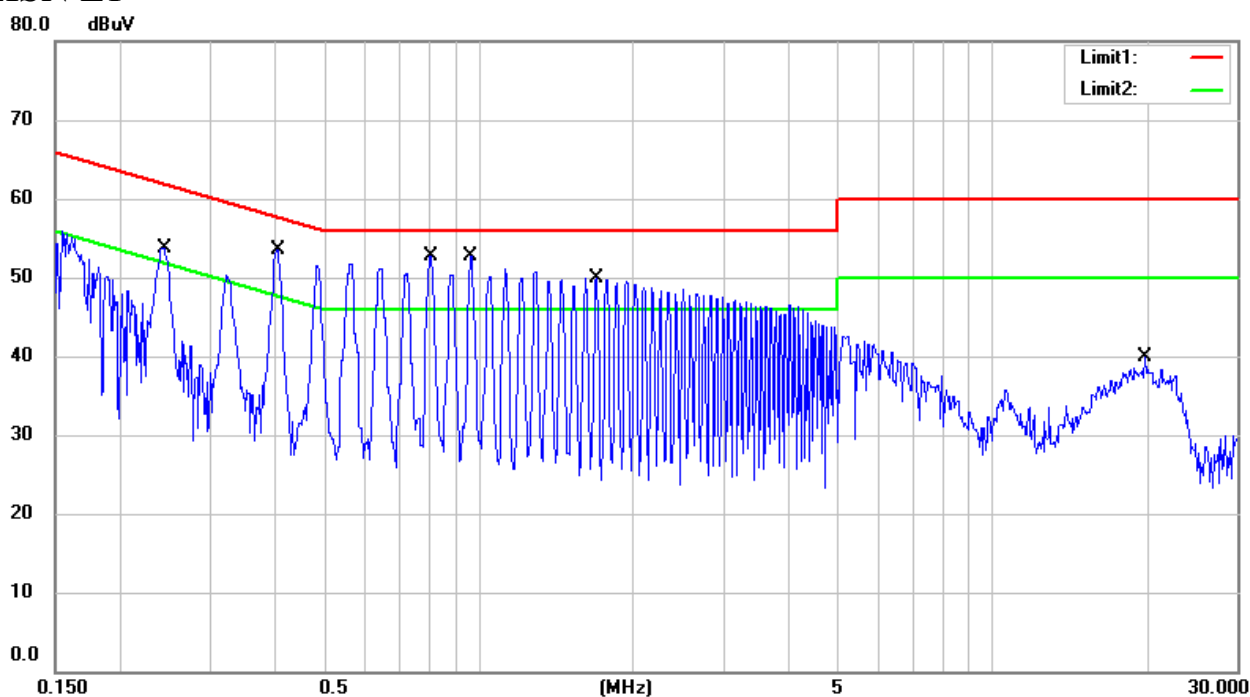
Registration number: W6M21001-10351-P-15
FCC ID: TH9OPSS-1

Power Line Conducted Emission

LISN N



LISN L1



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

Note:

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.

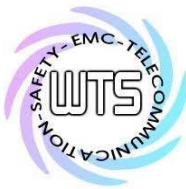


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External Photos





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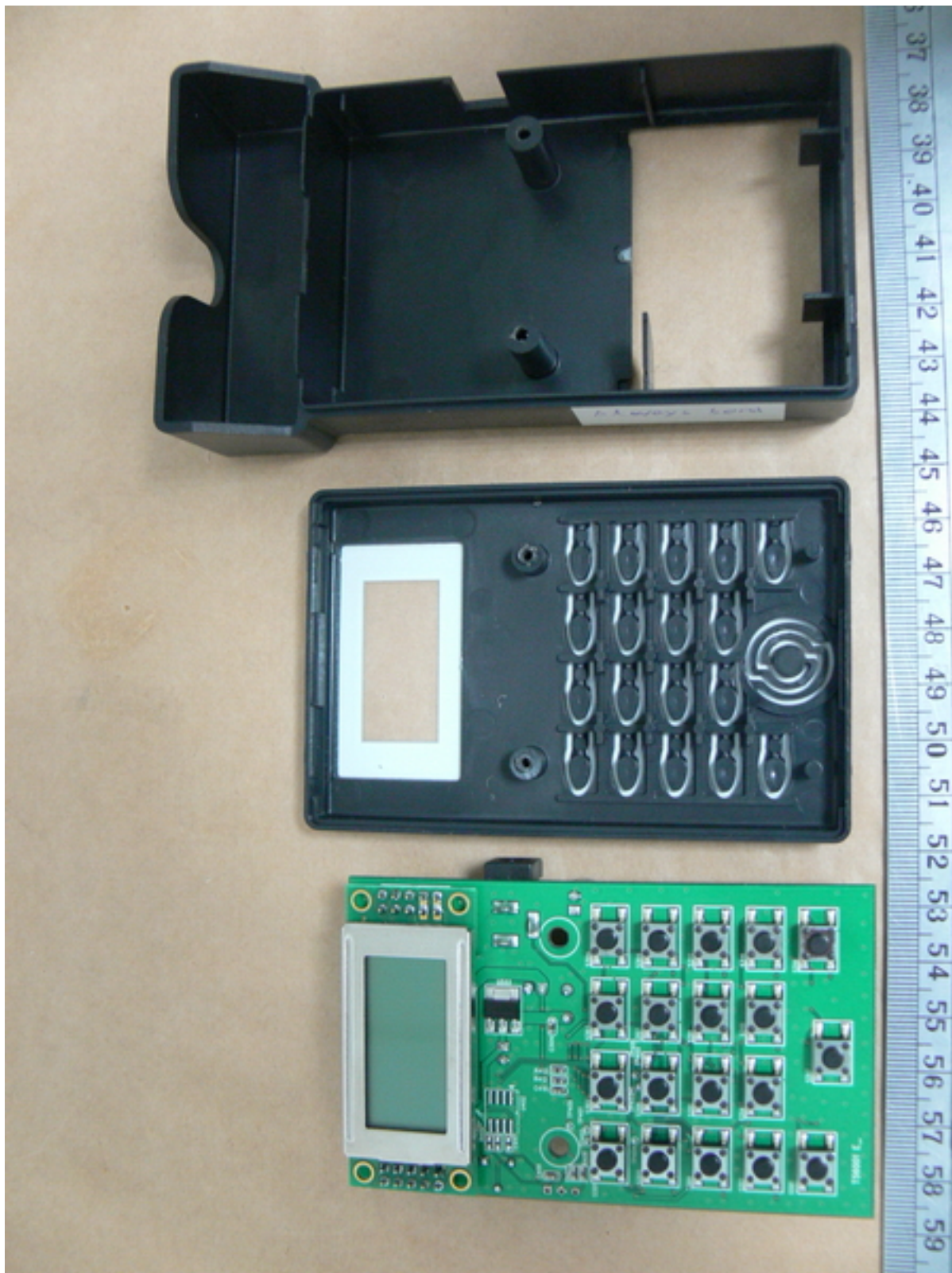
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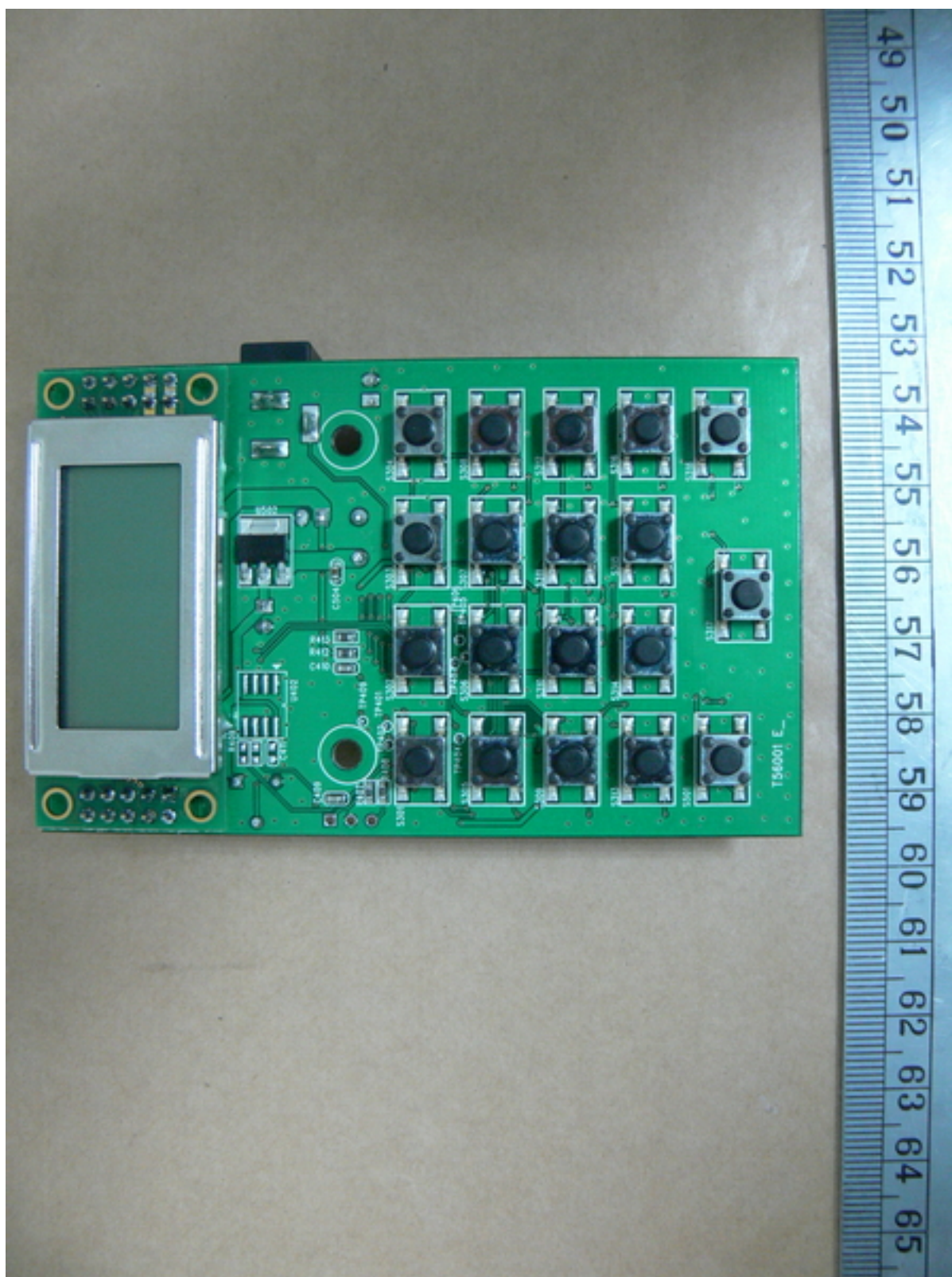
Internal Photos





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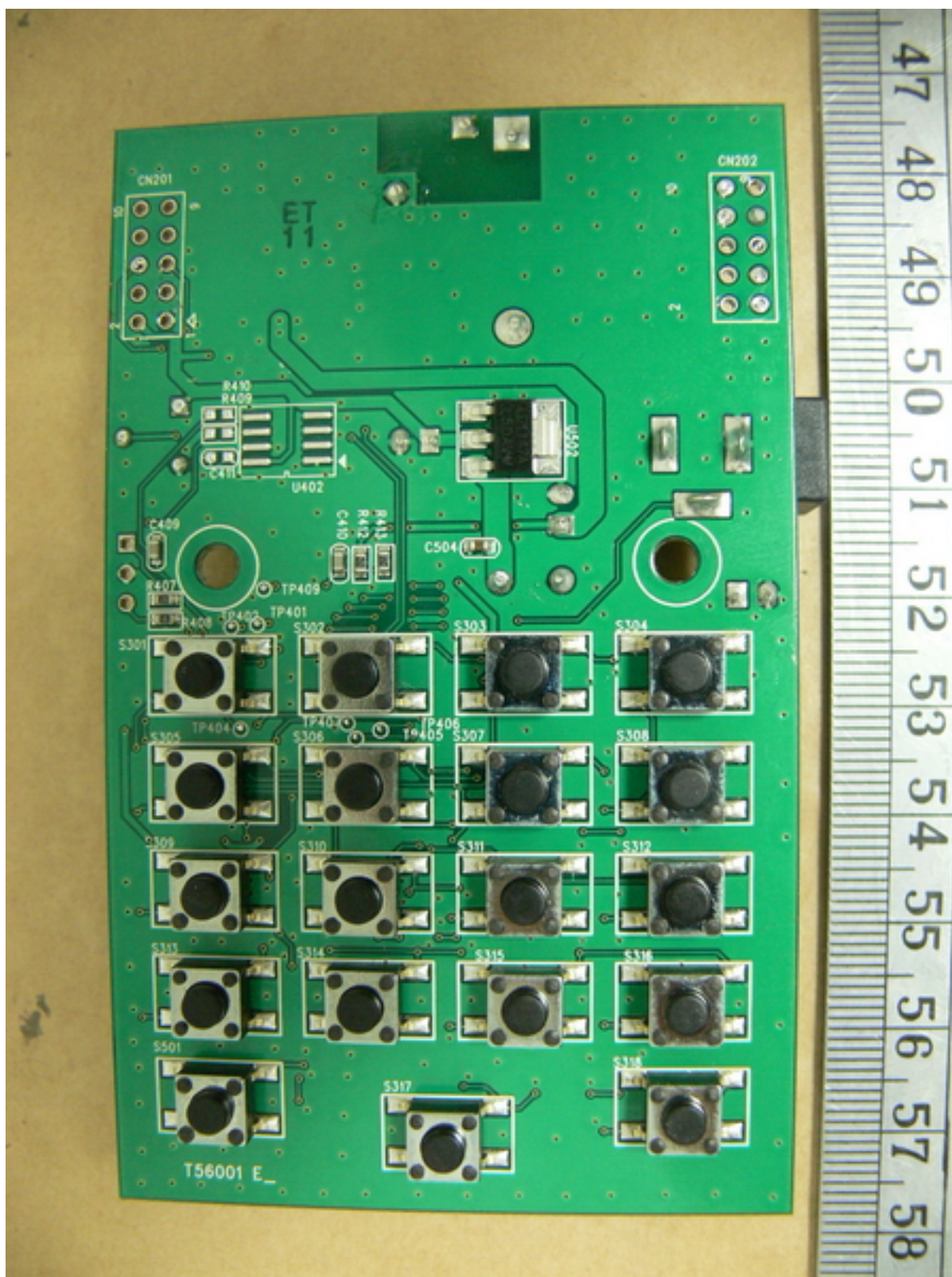
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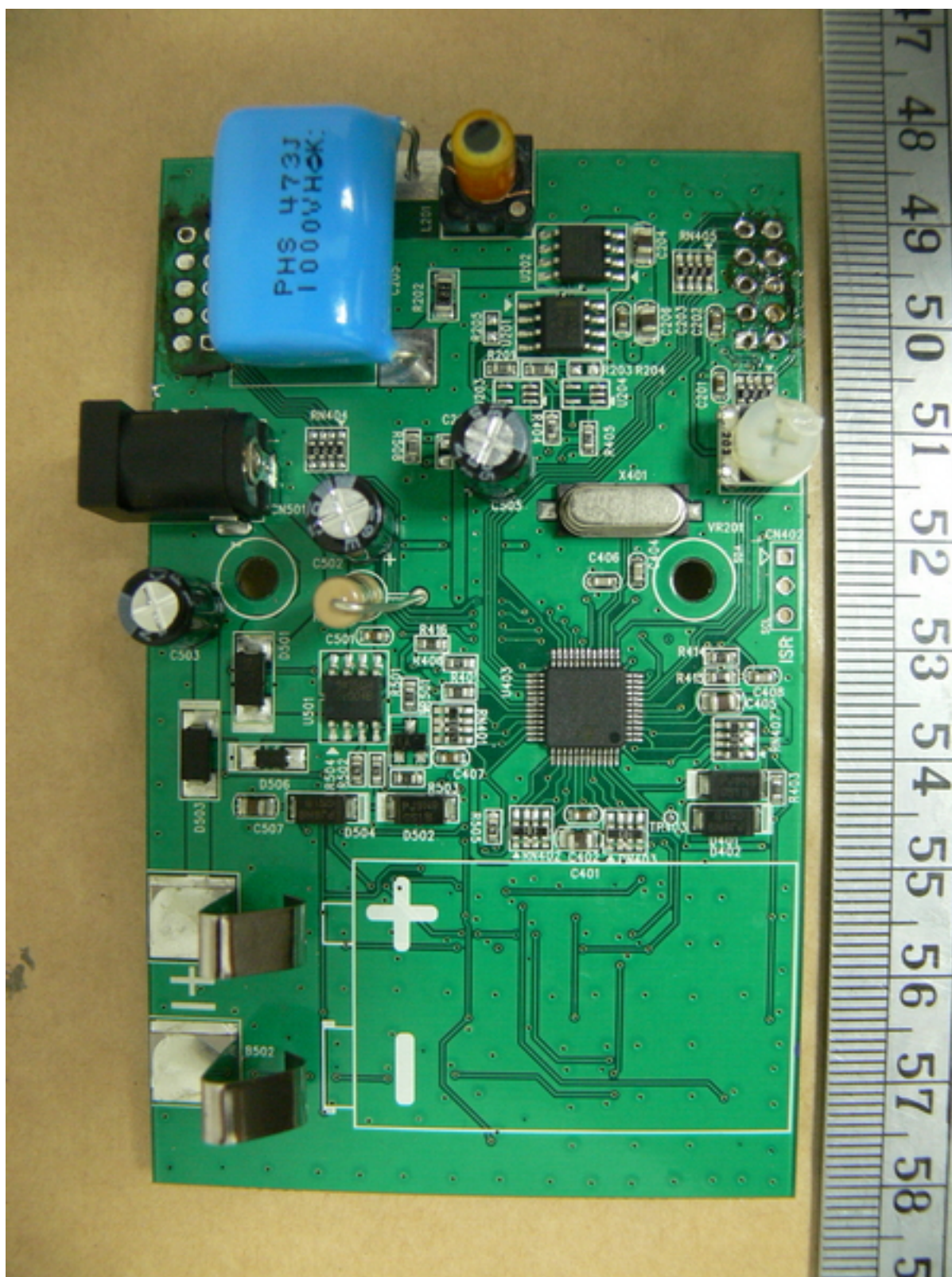


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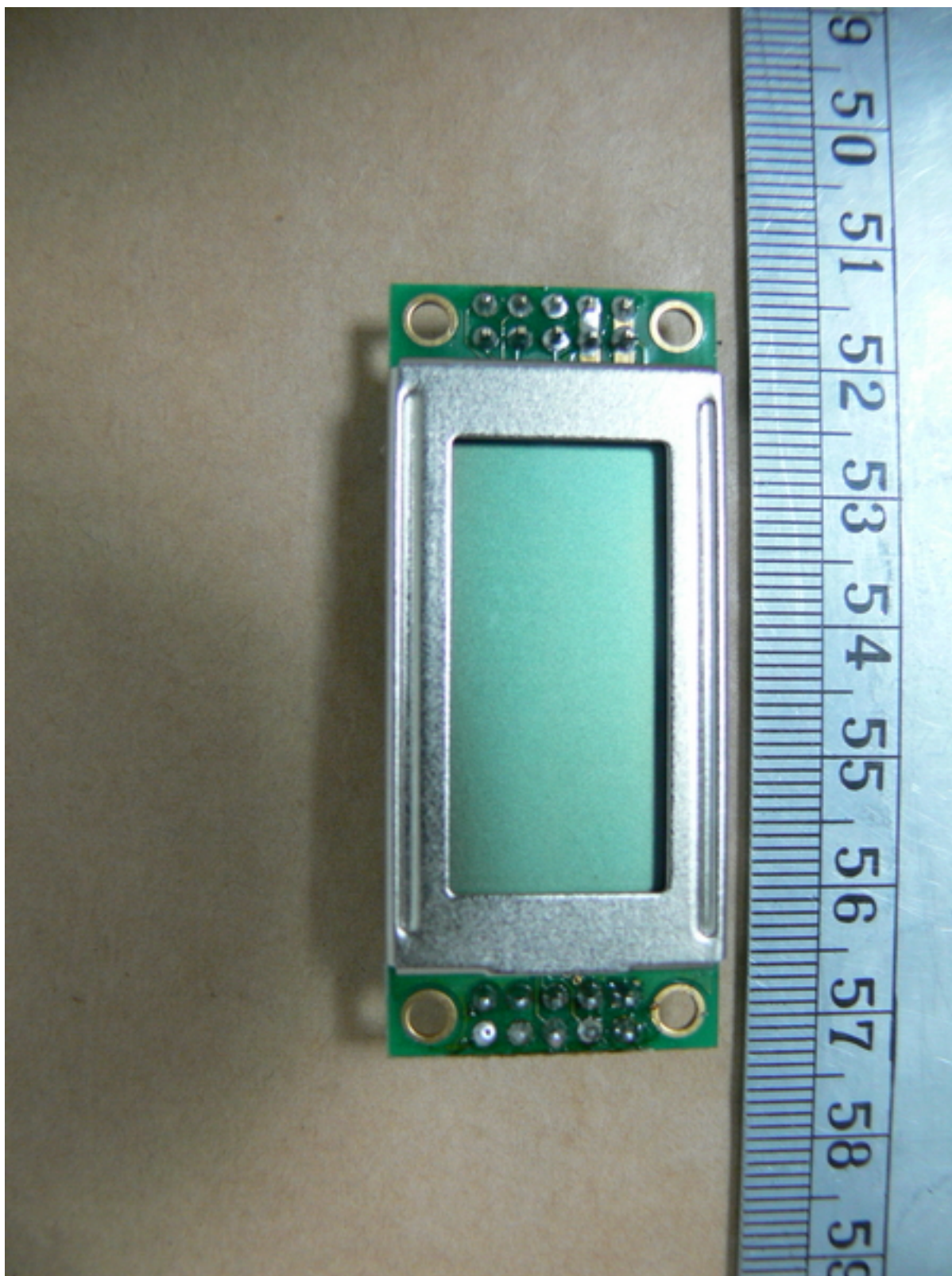


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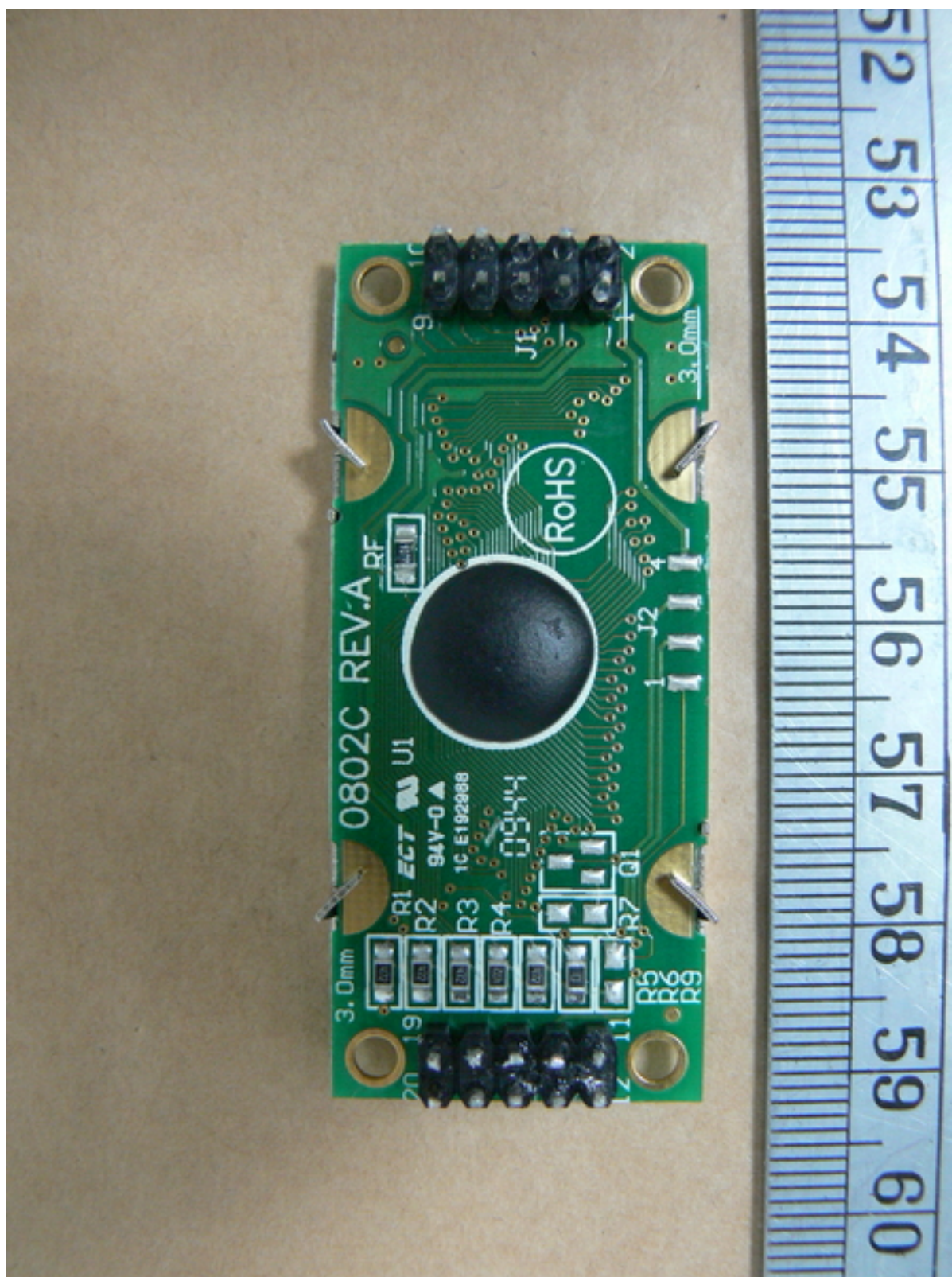
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FCC ID: TH9OPSS-1





Registration number: W6M21001-10351-P-15
FCC ID: TH9OPSS-1

Set Up Photo of Radiated Emission
Frequency from 9 kHz to 30000 kHz





Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21001-10351-P-15
FCC ID: TH9OPSS-1

Frequency from 30 MHz to 1000 MHz





Registration number: W6M21001-10351-P-15
FCC ID: TH9OPSS-1

Set Up Photo of Conducted Emission

