

FCC PART 15 SUBPART C TEST REPORT

Report Reference No...... : **BSL23082101-P01R05**

FCC ID..... : **UP3-PCTOUCH**

Compiled by
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Date of issue..... : September 7, 2023

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Representative Laboratory Name. : **BSL Testing Co., Ltd.**

Address..... : 1/F, Building B, Xinshidai GR Park, Shiyan Street, Bao'an District, Shenzhen, Guangdong, 518052, People's Republic of China

Applicant's name..... : **Lathem Time Corporation**

Address..... : 210 The Bluffs, Suite 107 SW Austell, GA 30168 United States

Test specification..... :

Standard..... : **FCC Rules and Regulations Part 15 Subpart C**
ANSI C63.10: 2013

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Test item description..... : **Time Clock**

Trade Mark..... : Lathem

Manufacturer..... : SHENZHEN HEROFUN BIO-TECH CO., LTD

Model/Type reference..... : PCTOUCH

Listed Models : N/A

Modulation Type..... : ASK

Operation Frequency..... : 125KHz

Rating..... : DC 12V

Result..... : **PASS**

TEST REPORT

Equipment under Test : Time Clock

Model /Type : PCTOUCH

Listed Models : N/A

Model Declaration : N/A

Applicant : Lathem Time Corporation

Address : 210 The Bluffs, Suite 107 SW Austell, GA 30168 United States

Manufacturer : SHENZHEN HEROFUN BIO-TECH CO., LTD

Address : West 401, Building A2, TianRui Industrial Park, No. 35 FuYuan 1st Road, XinHe Community, FuHai Street, BaoAn District, Shenzhen, China

Test Result:	PASS
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The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

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1 TEST STANDARDS

The tests were performed according to following standards:

[FCC Rules and Regulations Part 15 Subpart C \(Section 15.207\)](#): Conducted limits.

[FCC Rules and Regulations Part 15 Subpart C \(Section 15.209\)](#): Radiated emission limits; general requirements.

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

2 SUMMARY

2.1 General Remarks

Date of receipt of test sample	:	August 21, 2023
Testing commenced on	:	August 21, 2023
Testing concluded on	:	September 7, 2023

2.2 Product Description

Product Name:	Time Clock
Model/Type reference:	PCTOUCH
Hardware version:	V1.0
Software version:	V1.0
Test samples ID:	BSL23082101-P01R05-1# (Engineer sample), BSL23082101-P01R05-2# (Normal sample)
Power supply:	DC 12V
Adapter information (Auxiliary test supplied by testing Lab):	Model: FX18U-120125J Input: AC 100-240V 50/60Hz 0.6A Output: DC 12V 1.25A Firmware Version: EPTA5.14.2 Manufacture: Huizhou Dongyang Yienbi Electronics Co., Ltd
Operation frequency:	125KHz
Modulation type:	ASK
Antenna type:	Coil antenna
Antenna gain:	0 dBi

2.3 Description of the test mode

Equipment under test was operated during the measurement under the following conditions:

☒ Charging and communication mode

Test Modes:		
Mode 1	RFID-TX	Recorded
/	/	/

Note: All test modes were pre-tested, but we only recorded the worst case in this report.

2.4 Special Accessories

Follow auxiliary equipment(s) test with EUT that provided by the manufacturer or laboratory is listed as follow:

Description	Manufacturer	Model	Technical Parameters	Certificate	Provided by
/	/	/	/	/	/

2.5 Modifications

No modifications were implemented to meet testing criteria.

3 TEST ENVIRONMENT

3.1 Address of the test laboratory

BSL Testing Co., Ltd.

1/F, Building B, Xinshidai GR Park, Shiyuan Street, Bao'an District, Shenzhen, Guangdong, 518052, People's Republic of China

3.2 Test Facility

FCC-Registration No.: 562200 Designation Number: CN1338

BSL Testing Co.,Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

Industry Canada Registration Number. Is: 11093A CAB identifier: CN0019

The Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing.

A2LA-Lab Cert. No.: 4707.01

BSL Testing Co.,Ltd. has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.

The 3m-Semi anechoic test site fulfils CISPR 16-1-4 according to ANSI C63.10 and CISPR 16-1-4:2010.

3.3 Environmental conditions

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

Radiated Emission:

Temperature:	24 ° C
Humidity:	45 %
Atmospheric pressure:	950-1050mbar

AC Power Conducted Emission:

Temperature:	25 ° C
Humidity:	46 %
Atmospheric pressure:	950-1050mbar

Conducted testing:

Temperature:	25 ° C
Humidity:	44 %
Atmospheric pressure:	950-1050mbar

3.4 Summary of measurement results

Description of test	Result
Conducted emissions test	Compliant
Radiated emission test	Compliant
The 20dB bandwidth measurement	Compliant
Antenna requirement	Compliant

3.5 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 „Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ and is documented in the BSL Testing Co., Ltd. quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

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

Test	Range	Measurement Uncertainty	Notes
Radiated Emission	9KHz-30MHz	1.06 dB	(1)
Radiated Emission	30~1000MHz	4.06 dB	(1)
Radiated Emission	1~18GHz	5.14 dB	(1)
Radiated Emission	18-40GHz	5.38 dB	(1)
Conducted Disturbance	0.15~30MHz	2.14 dB	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

3.6 Equipments Used during the Test

Instrument Type	Manufacturer	Model	Serial No.	Date of Cal.	Due Date
ESPI Test Receiver	ROHDE&SCHWARZ	ESPI 3	100379	2022-10-28	2023-10-27
Absorbing Clamp	ROHDE&SCHWARZ	MDS-21	100126	2022-10-28	2023-10-27
Electrostatic analog generator	LIONCEL	ESD-203B	0210502	2022-10-28	2023-10-27
Signal Generator	HP	8648A	3633A02081	2022-10-28	2023-10-27
Amplifier	A&R	500A100	17034	2022-10-28	2023-10-27
Amplifier	A&R	100W/1000M1	17028	2022-10-28	2023-10-27
Isotropic Field Monitor	A&R	FM2000	16829	2022-10-28	2023-10-27
Isotropic Field Probe	A&R	FLW220100	16755	2022-10-28	2023-10-27
Biconic Antenna	EMCO	EVOD PROTANK8	9507-2534	2022-10-28	2023-10-27
Log-periodic Antenna	A&R	AT1080	16812	2022-10-28	2023-10-27
Injection Clamp	EMTEST	F-2031-23MM	368	2022-10-28	2023-10-27
Attenuator	EMTEST	ATT6	0010222a	2022-10-28	2023-10-27
Computer	IBM	8434	1S8434KCE99BL XLO*	-	-
Oscillator	KENWOOD	AG-203D	3070002	2022-10-28	2023-10-27
Spectrum Analyzer	HAMEG	HM5012	-	-	-
Power Supply	LW	APS1502	-	-	-

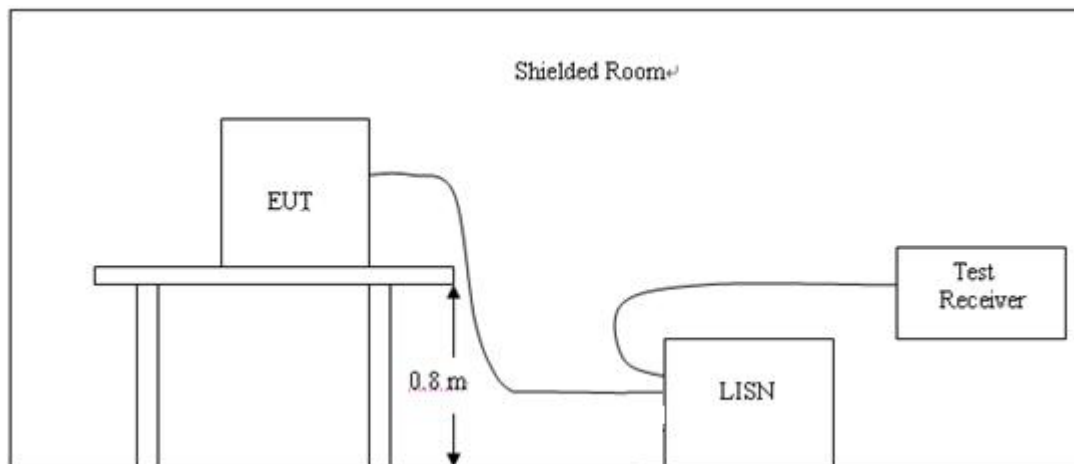
5K VA AC Power Source	California Instruments	5001iX	56060	2022-10-28	2023-10-27
CDN	EM TEST	CDN M2/M3	-	2022-10-28	2023-10-27
Attenuation	EM TEST	ATT6/75	-	2022-10-28	2023-10-27
Resistance	EM TEST	R100	-	2022-10-28	2023-10-27
Electromagnetic Injection Clamp	LITTHI	EM101	35708	2022-10-28	2023-10-27
Inductive Components	EM TEST	MC2630	-	2022-10-28	2023-10-27
Antenna	EM TEST	MS100	-	2022-10-28	2023-10-27
Signal Generator	ROHDE&SCHWARZ	SMT03	100029	2022-10-28	2023-10-27
Power DJ MIXER	AR	150W1000	300999	2022-10-28	2023-10-27
Field probe	Holaday	HI-6005	105152	2022-10-28	2023-10-27
Bilog Antenna	Chase	CBL6111C	2576	2022-10-28	2023-10-27
Loop Antenna	EMCO	6502	00042960	2022-10-28	2023-10-27
ESPI Test Receiver	ROHDE&SCHWARZ	ESI7	838786/013	2022-10-28	2023-10-27
3m OATS	--	--	N/A	2022-10-28	2023-10-27
Horn Antenna	SCHWARZBECK	VULB9168	N/A	2022-10-28	2023-10-27
Horn Antenna	SCHWARZBECK	BBHA9120D	N/A	2022-10-28	2023-10-27
Power meter	Anritsu	ML2487A	6K00003613	2022-10-28	2023-10-27
Power sensor	Anritsu	MA2491A	32263	2022-10-28	2023-10-27
Bilog Antenna	Schwarzbeck	VULB9163	9163/340	2022-10-28	2023-10-27
9*6*6 Anechoic	--	--	N/A	2021-08-21	2024-8-20
Test Receiver	Rohde&Schwarz	ESC17(9kHz-7GHz)	100336	2022-10-28	2023-10-27
Broadband antenna	Schwarzbeck	VULB9168	01222	2022-10-28	2023-10-27
Horn antenna	Schwarzbeck	BBHA9120D	02476	2022-10-28	2023-10-27
Preamplifier	Schwarzbeck	BBV9745	00250	2022-10-28	2023-10-27
Preamplifier	N/A	TRLA-01018G440B	21081001	2022-10-28	2023-10-27
3M method semi anechoic chamber	SKET	9m*6m*6m	2021082304	2021-8-23	2024-8-22
Pointer hygrometer	M&G	ARC92570	N/A	2022-10-28	2023-10-27
Spectrometer	ROHDE&SCHWARZ	FSP 9kHz-40GHz	N/A	2022-10-28	2023-10-27
Synthesizer	ROHDE&SCHWARZ	CMW500	N/A	2022-10-28	2023-10-27
LISN	R&S	ENV216	308	2022-10-28	2023-10-27
LISN	R&S	ENV216	314	2022-10-28	2023-10-27

Note: The Cal.Interval was one year.

4 TEST CONDITIONS AND RESULTS

4.1 AC Power Conducted Emission

TEST CONFIGURATION



TEST PROCEDURE

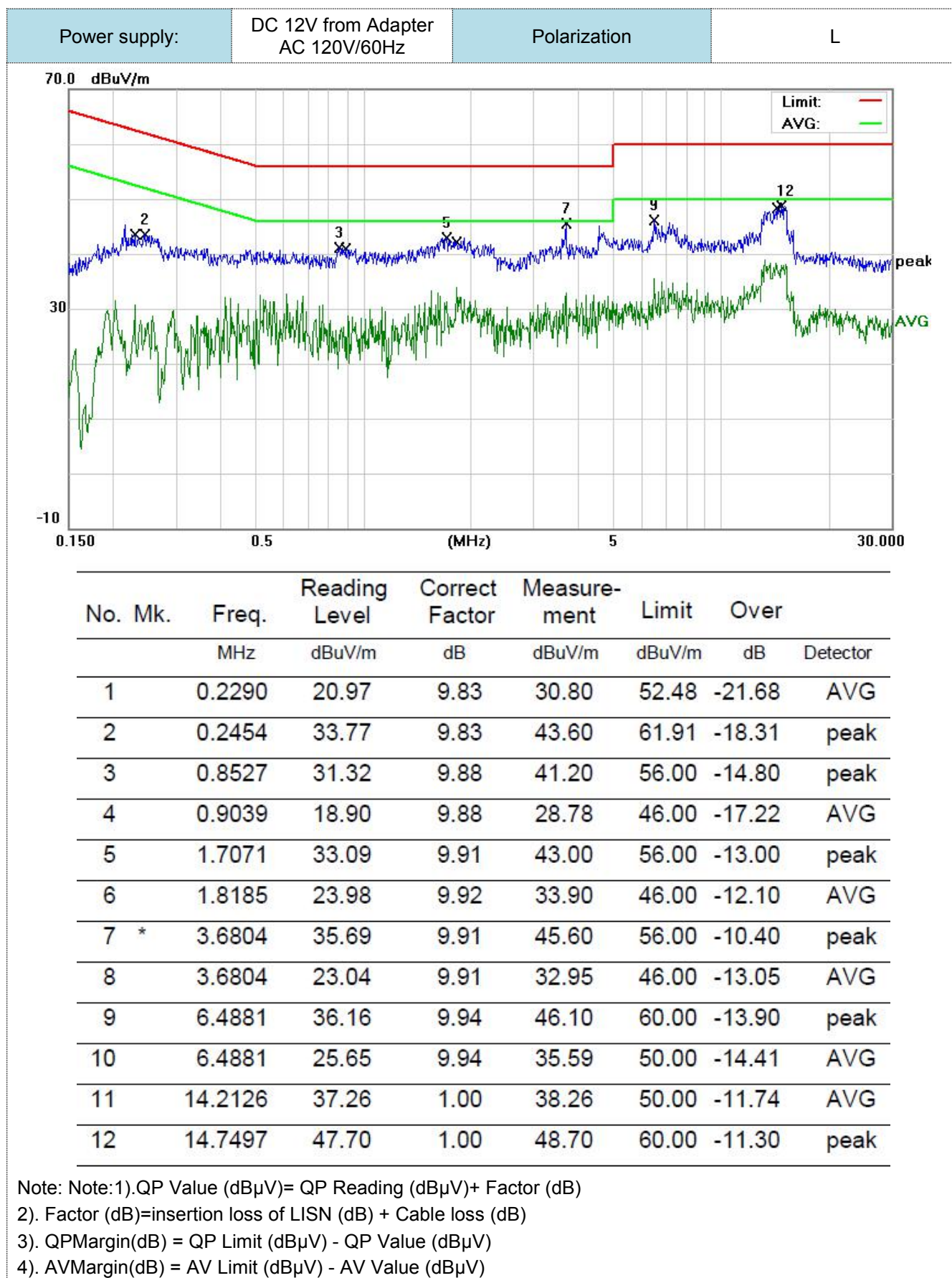
- 1, The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10.
- 2, Support equipment, if needed, was placed as per ANSI C63.10.
- 3, All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.
- 4, If a EUT received DC power from the USB Port of Notebook PC, the PC's adapter received power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
- 5, All support equipments received AC power from a second LISN, if any.
- 6, The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
- 7, Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.

AC Power Conducted Emission Limit

For intentional device, according to § 15.207(a) AC Power Conducted Emission Limits is as following :

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

* Decreases with the logarithm of the frequency.

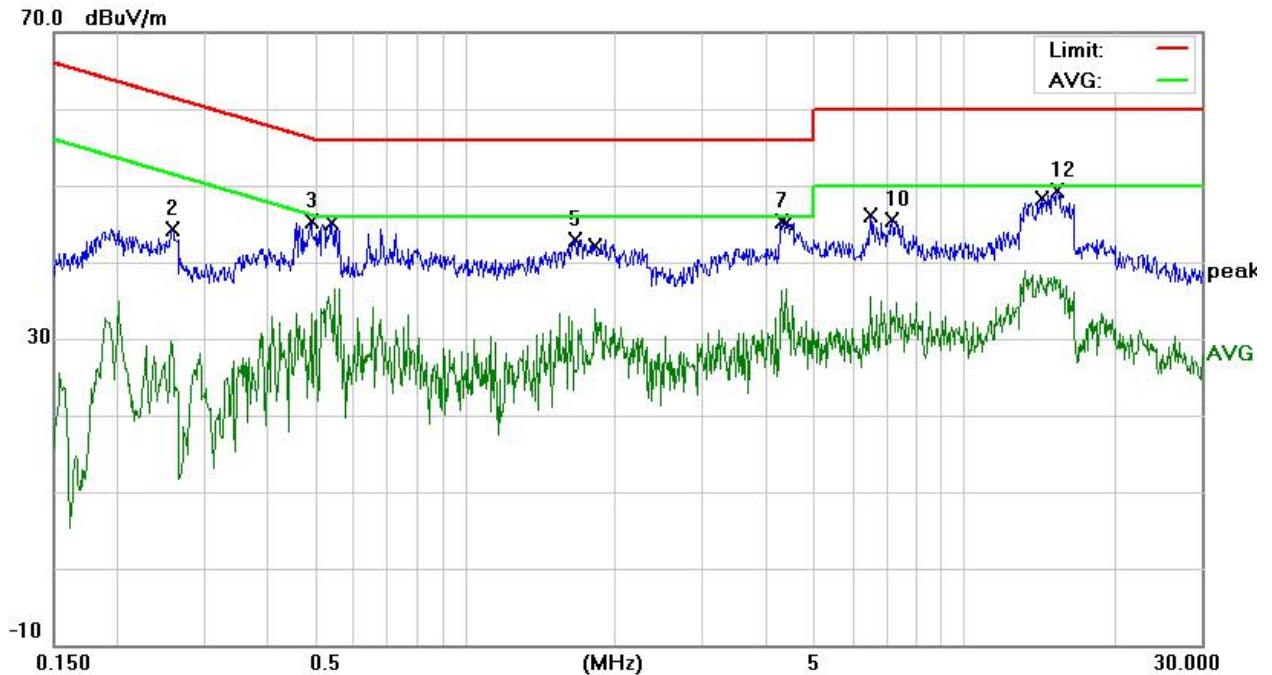
TEST RESULTS

Power supply:

DC 12V from Adapter
AC 120V/60Hz

Polarization

N



No.	Mk.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		0.2575	19.87	9.83	29.70	51.51	-21.81	AVG
2		0.2584	34.57	9.83	44.40	61.48	-17.08	peak
3		0.4914	35.41	9.89	45.30	56.14	-10.84	peak
4		0.5463	26.61	9.89	36.50	46.00	-9.50	AVG
5		1.6624	33.09	9.91	43.00	56.00	-13.00	peak
6		1.8185	23.98	9.92	33.90	46.00	-12.10	AVG
7		4.3146	35.48	9.92	45.40	56.00	-10.60	peak
8	*	4.4069	26.59	9.92	36.51	46.00	-9.49	AVG
9		6.4881	25.65	9.94	35.59	50.00	-14.41	AVG
10		7.1753	35.65	9.95	45.60	60.00	-14.40	peak
11		14.2126	37.26	1.00	38.26	50.00	-11.74	AVG
12		15.3879	48.40	1.00	49.40	60.00	-10.60	peak

Note: Note:1).QP Value (dBμV)= QP Reading (dBμV)+ Factor (dB)

2). Factor (dB)=insertion loss of LISN (dB) + Cable loss (dB)

3). QPMargin(dB) = QP Limit (dBμV) - QP Value (dBμV)

4). AVMargin(dB) = AV Limit (dBμV) - AV Value (dBμV)

4.2 Radiated Emission

Limit

For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emission out of authorized band shall not exceed the following table at a 3 meters measurement distance.

In addition, radiated emissions 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)

FCC Part 15.209				
Frequency (MHz)	Field Strength Limitation		Field Strength Limitation Frequency tion at 3m Measurement Dist	
	(uV/m)	Dist	(uV/m)	(dBuV/m)
0.009 – 0.490	2400 / F(KHz)	300m	10000 * 2400/F(KHz)	20log 2400/F(KHz) + 80
0.490 – 1.705	24000 / F(KHz)	30m	100 * 24000/F(KHz)	20log 24000/F(KHz) + 40
1.705 – 30.00	30	30m	100* 30	20log 30 + 40
30.0 – 88.0	100	3m	100	20log 100
88.0 – 216.0	150	3m	150	20log 150
216.0 – 960.0	200	3m	200	20log 200
Above 960.0	500	3m	500	20log 500

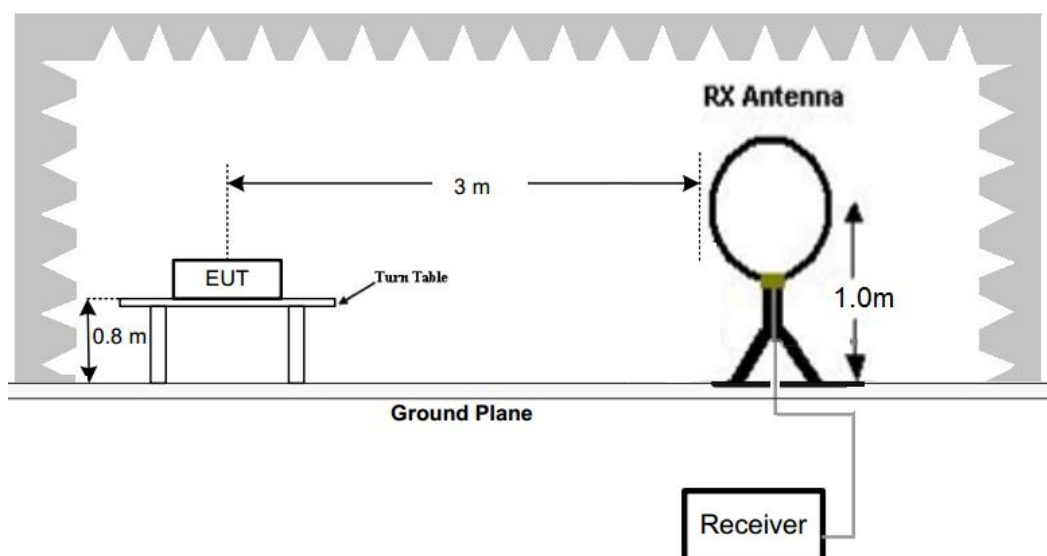
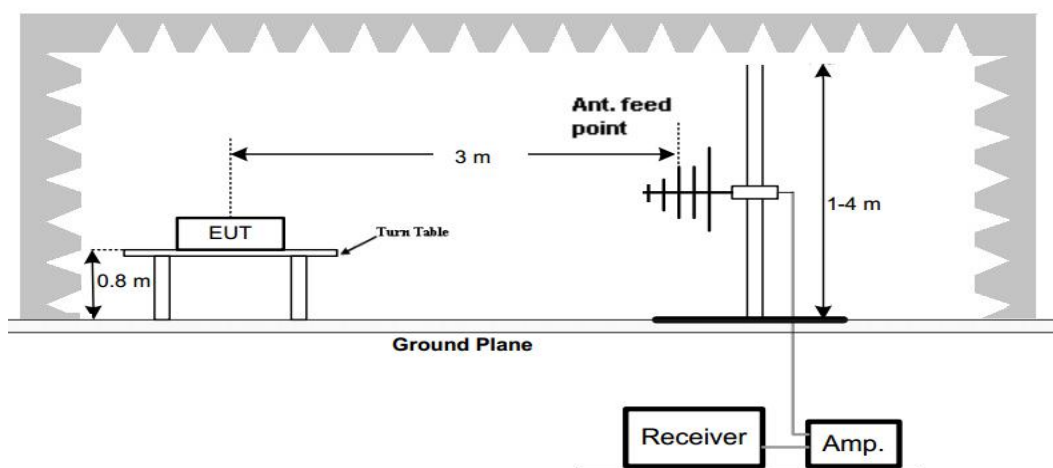
15.205 Restricted bands of operation

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	(²)

Remark: 1. Emission level in dBuV/m=20 log (uV/m)

2. Measurement was performed at an antenna to the closed point of EUT distance of meters.

3. Only spurious frequency is permitted to locate within the Restricted Bands specified in provision of §15.205, and the emissions located in restricted bands also comply with 15.209 limit.

TEST CONFIGURATION**1. Radiated Emission Test Set-Up, Frequency Below 30MHz****2. Radiated Emission Test Set-Up, Frequency below 1000MHz****Test Procedure**

- Below 1GHz measurement the EUT is placed on a turntable which is 0.8m above ground plane.
- Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0° to 360° to acquire the highest emissions from EUT
- And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- Repeat above procedures until all frequency measurements have been completed.
- Radiated emission test frequency band from 9KHz to 1000MHz.
- The distance between test antenna and EUT as following table states:

Test Frequency range	Test Antenna Type	Test Distance
9KHz-30MHz	Active Loop Antenna	3
30MHz-1GHz	Bilog Antenna	3

- Setting test receiver/spectrum as following table states:

Test Frequency range	Test Receiver/Spectrum Setting	Detector
9KHz-150KHz	RBW=200Hz/VBW=3KHz,Sweep time=Auto	QP
150KHz-30MHz	RBW=9KHz/VBW=100KHz,Sweep time=Auto	QP

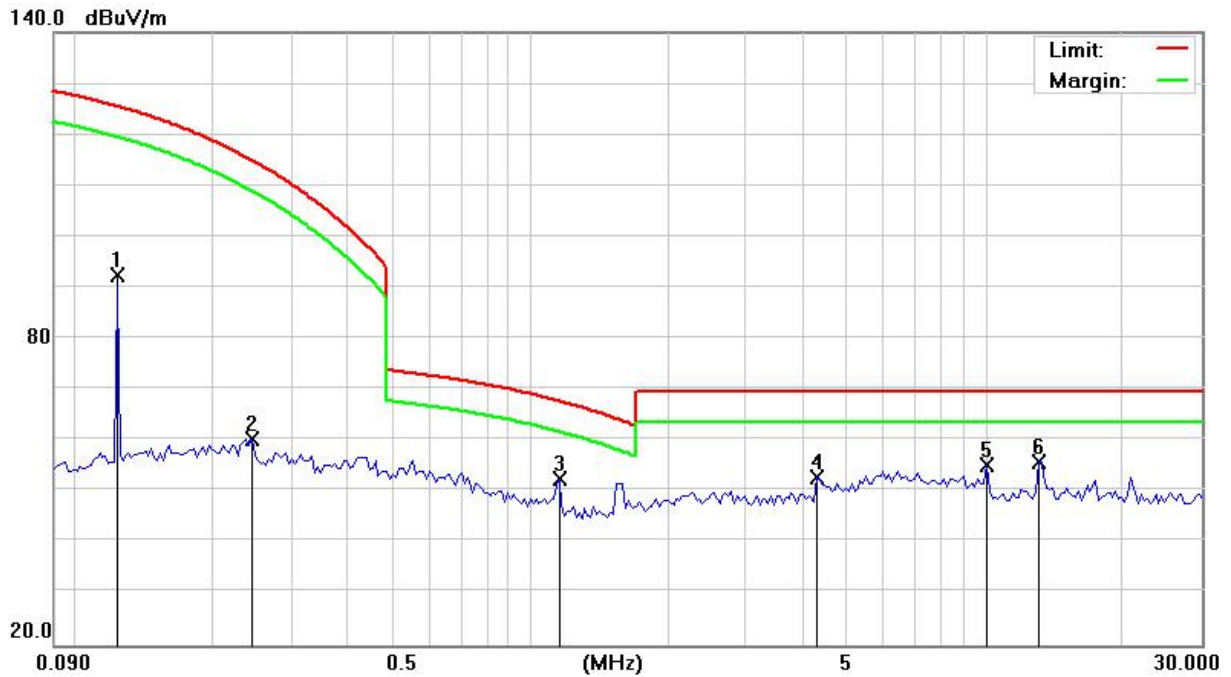
30MHz-1GHz

RBW=120KHz/VBW=1000KHz,Sweep time=Auto

QP

TEST RESULTS**For 9 KHz-30MHz**

Horizontal

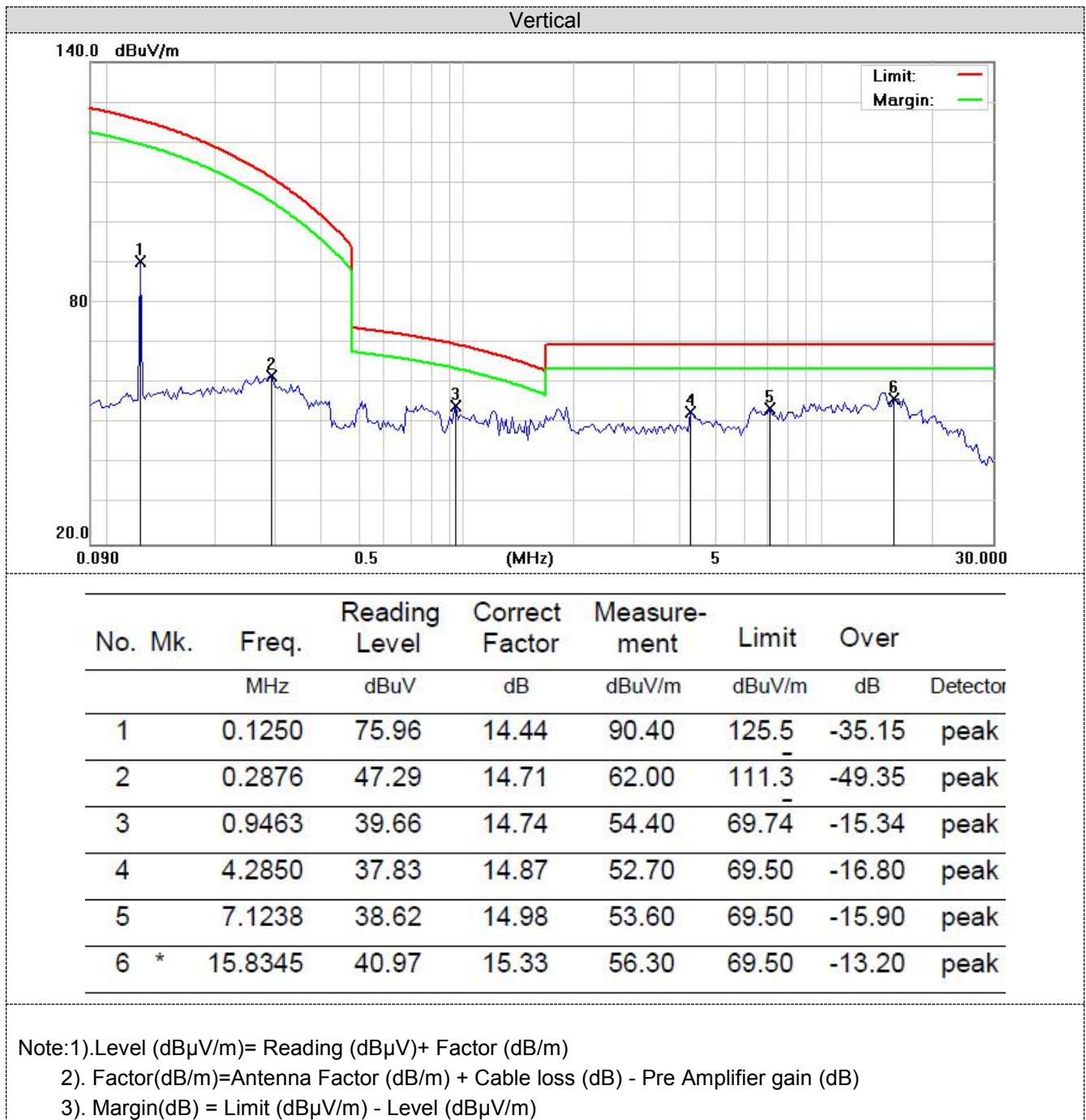


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		0.1250	78.00	14.45	92.45	125.4	-33.01	peak
2		0.2452	45.60	14.70	60.30	115.0	-54.73	peak
3		1.1596	37.86	14.74	52.60	67.85	-15.25	peak
4		4.2851	37.83	14.87	52.70	69.50	-16.80	peak
5		10.0944	40.20	15.10	55.30	69.50	-14.20	peak
6	*	13.1103	40.48	15.22	55.70	69.50	-13.80	peak

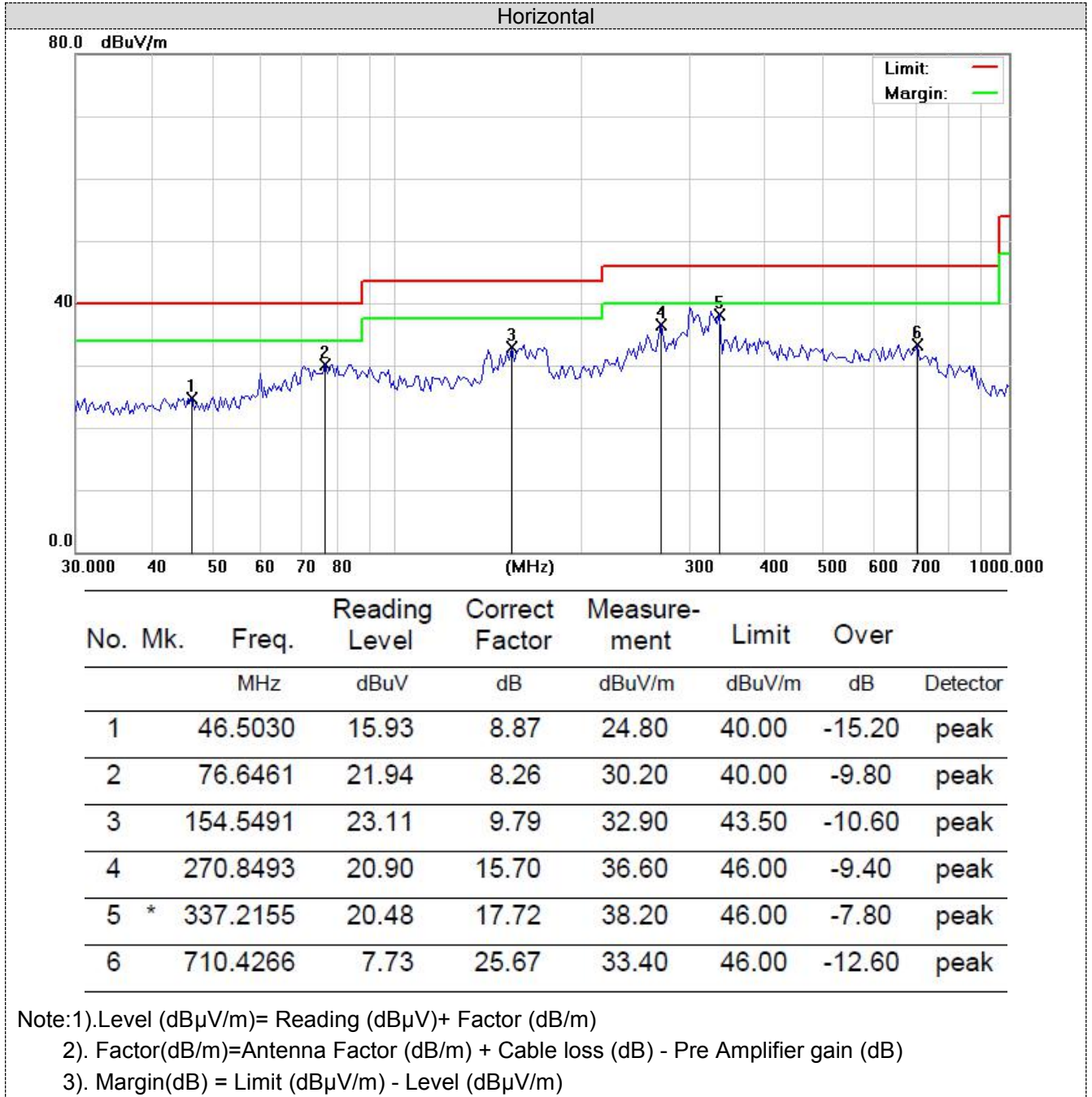
Note:1).Level (dBμV/m)= Reading (dBμV)+ Factor (dB/m)

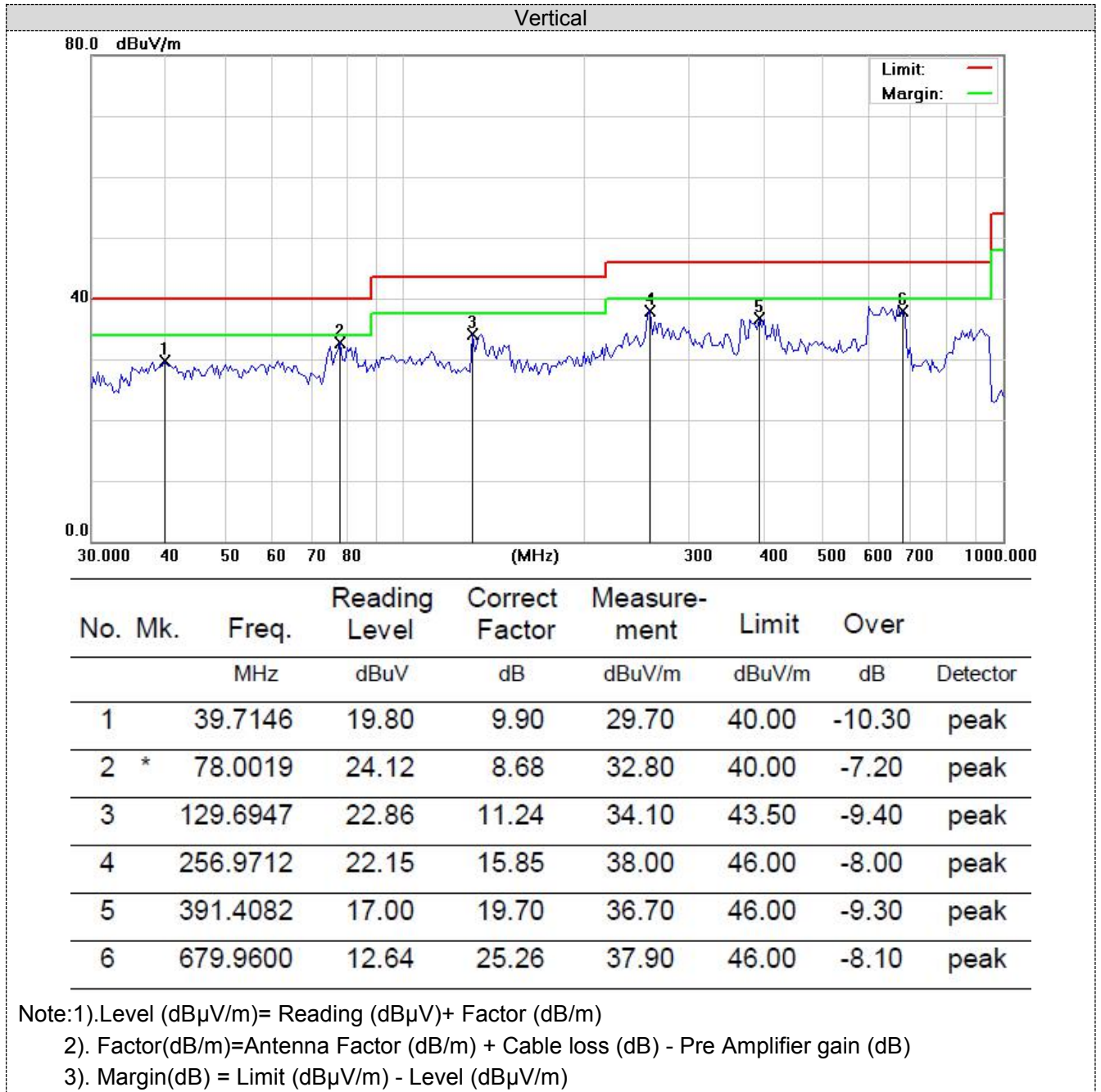
2). Factor(dB/m)=Antenna Factor (dB/m) + Cable loss (dB) - Pre Amplifier gain (dB)

3). Margin(dB) = Limit (dBμV/m) - Level (dBμV/m)



For 30MHz-1GHz





4.3 The 20dB bandwidth

TEST CONFIGURATION



TEST PROCEDURE

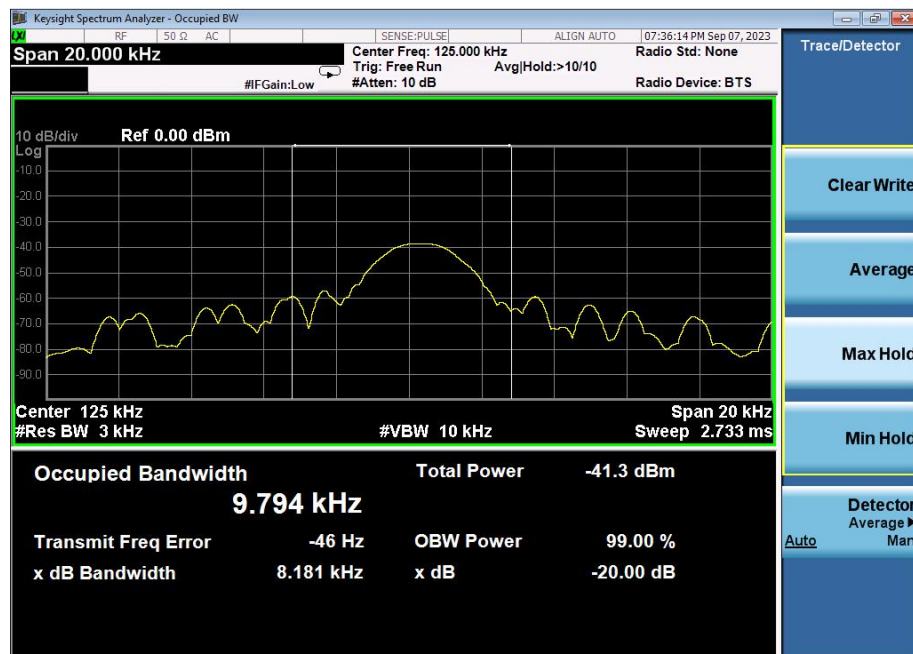
Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§15.217 through 15.257 and in subpart E of this part, must be designed to ensure that 20dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equip compliance with the 20dB attenuation specification may base on measurement at the intentional radiator's antenna output terminal unless the intentional radiator uses a permanently attached antenna, in which case compliance shall be demonstrated by measuring the radiated emissions.

LIMIT

The 20dB bandwidth shall be less than 80% of the permitted frequency band.

TEST RESULTS

Mode	Freq (KHz)	20dB Bandwidth (KHz)	Conclusion
Tx Mode	125	8.181	PASS



4.4 Antenna Requirement

Standard Applicable

Standard Applicable

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

Antenna Information

The antenna used in this product is a Coil Antenna, The directional gains of antenna used for transmitting is 0dBi.

5 Test Setup Photos of the EUT

Reference to the appendix I for details.

6 PHOTOS OF THE EUT

Reference to the appendix II for details.

******* End of Report *******