

FCC TEST REPORT

Product : Handheld UHF Reader
Trade mark : CHAINWAY
Model/Type reference : C76
Serial Number : N/A
Report Number : EED32K00243607
FCC ID : 2AC6AC76
Date of Issue : Mar. 28, 2019
Test Standards : 47 CFR Part 15 Subpart C
Test result : PASS

Prepared for:

Shenzhen Chainway Information Technology Co., Ltd.
9/F, Building 2, Daqian Industrial Park, Longchang Rd., District 67,
Bao'an, Shenzhen

Prepared by:

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Date:

Mar. 28, 2019

Check No.:3096338075



2 Version

Version No.	Date	Description
00	Mar. 28, 2019	Original

3 Test Summary

Test Item	Test Requirement	Test method	Result
AC Power Line Conducted Emission	47 CFR Part 15 Subpart C Section 15.207	ANSI C63.10-2013	PASS
Radiated Emission	47 CFR Part 15 Subpart C Section 15.209; 15.225(a)(b)(c)(d)	ANSI C63.10-2013	PASS
Frequency Tolerance	47 CFR Part 15 Subpart C Section 15.225(e)	ANSI C63.10-2013	PASS
Occupied Bandwidth	47 CFR Part 15 Subpart C Section 15.215	ANSI C63.10-2013	PASS

Remark:

The tested sample and the sample information are provided by the client.

4 Contents

	Page
1 COVER PAGE.....	1
2 VERSION.....	2
3 TEST SUMMARY.....	3
4 CONTENTS.....	4
5 GENERAL INFORMATION.....	5
5.1 CLIENT INFORMATION.....	5
5.2 GENERAL DESCRIPTION OF EUT.....	5
5.3 PRODUCT SPECIFICATION SUBJECTIVE TO THIS STANDARD.....	5
5.4 TEST ENVIRONMENT AND MODE.....	5
5.5 DESCRIPTION OF SUPPORT UNITS.....	6
5.6 TEST LOCATION.....	6
5.7 DEVIATION FROM STANDARDS.....	6
5.8 ABNORMALITIES FROM STANDARD CONDITIONS.....	6
5.9 OTHER INFORMATION REQUESTED BY THE CUSTOMER.....	6
5.10 MEASUREMENT UNCERTAINTY (95% CONFIDENCE LEVELS, K=2).....	6
6 EQUIPMENT LIST.....	7
7 TEST RESULT & MEASUREMENT DATA.....	10
7.1 CONDUCTED EMISSIONS.....	10
7.2 RADIATED EMISSIONS.....	13
7.3 FREQUENCY TOLERANCE.....	20
7.4 OCCUPIED BANDWIDTH.....	22
APPENDIX 1 PHOTOGRAPHS OF TEST SETUP.....	24
APPENDIX 2 PHOTOGRAPHS OF EUT.....	26

5 General Information

5.1 Client Information

Applicant:	Shenzhen Chainway Information Technology Co., Ltd.
Address of Applicant:	9/F, Building 2, Daqian Industrial Park, Longchang Rd., District 67, Bao'an, Shenzhen
Manufacturer:	Shenzhen Chainway Information Technology Co., Ltd.
Address of Manufacturer:	9/F, Building 2, Daqian Industrial Park, Longchang Rd., District 67, Bao'an, Shenzhen
Factory:	Shenzhen Chainway Information Technology Co., Ltd.
Address of Factory:	9/F, Building 2, Daqian Industrial Park, Longchang Rd., District 67, Bao'an, Shenzhen

5.2 General Description of EUT

Product Name:	Handheld UHF Reader
Model No.(EUT):	C76
Trade Mark:	CHAINWAY
EUT Supports Radios application:	BT 4.0 Single mode: 2402MHz to 2480MHz; 2.4GHz Wi-Fi: 802.11b/g/n(HT20)(HT40): 2412MHz ~2462 MHz; 5GHz Wi-Fi: U-NII-1: 5.15-5.25GHz; U-NII-2A: 5.25-5.35GHz; U-NII-2C: 5.470-5.725GHz; U-NII-3: 5.725-5.850GHz; 802.11a; 802.11n(20MHz/40MHz); RFID: 902MHz to 928MHz; NFC: 13.56MHz; GPS: 1559MHz to 1610MHz
Power Supply:	Adapter: Model: GME10D-050200FUu Input: 100-240V~ 50/60Hz, 0.28A Output: 5V---2A
USB cable:	100cm(Unshielded)

5.3 Product Specification subjective to this standard

Carrier Frequency:	13.56MHz
Modulation Type:	ASK
Antenna Type and Gain:	RFID: 13.56MHz: Antenna type: PFC, Antenna gain: 0.49dBi
Sample Type:	Portable production
Test voltage:	AC 120V, 60Hz
Sample Received Date:	Sep. 05, 2018
Sample tested Date:	Sep. 12, 2018 to Feb. 20, 2019

5.4 Test Environment and Mode

Operating Environment:	
Temperature:	25°C
Humidity:	49% RH
Atmospheric Pressure:	1010 mbar
Test mode:	
TX mode:	The EUT transmitted the continuous signal at the specific channel(s).

5.5 Description of Support Units

The EUT has been tested with associated equipment below.

Associated equipment name		Manufacture	model	serial number	Supplied by	Certification
AE1	Phone	Apple	A1367	TTF20120027	CTI	FCC
AE2	Router	HuaWei	WS550	K8E8W1531400 2784	CTI	FCC
AE3	PC	Apple	MMGF2 ZP/A	ODN20170212	CTI	FCC

5.6 Test Location

All tests were performed at:

Centre Testing International Group Co., Ltd.

Hongwei Industrial Zone, Bao'an 70 District, Shenzhen, Guangdong, China 518101

Telephone: +86 (0) 755 3368 3668 Fax: +86 (0) 755 3368 3385

No tests were sub-contracted.

5.7 Deviation from Standards

None.

5.8 Abnormalities from Standard Conditions

None.

5.9 Other Information Requested by the Customer

None.

5.10 Measurement Uncertainty (95% confidence levels, k=2)

No.	Item	Measurement Uncertainty
1	Radio Frequency	7.9×10^{-8}
2	RF power, conducted	0.46dB (30MHz-1GHz)
		0.55dB (1GHz-18GHz)
3	Radiated Spurious emission test	4.3dB (30MHz-1GHz)
		4.5dB (1GHz-12.75GHz)
4	Conduction emission	3.5dB (9kHz to 150kHz)
		3.1dB (150kHz to 30MHz)
5	Temperature test	0.64°C
6	Humidity test	3.8%
7	DC power voltages	0.026%

6 Equipment List

Conducted disturbance Test					
Equipment	Manufacturer	Model No.	Serial Number	Cal. date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
Receiver	R&S	ESCI	100435	05-25-2018	05-24-2019
Temperature/ Humidity Indicator	Defu	TH128	/	07-02-2018	07-01-2019
Communication test set	Agilent	E5515C	GB47050 534	03-16-2018	03-15-2019
Communication test set	R&S	CMW500	152394	03-16-2018	03-15-2019
LISN	R&S	ENV216	100098	05-10-2018	05-10-2019
LISN	schwarzbeck	NNLK8121	8121-529	05-10-2018	05-10-2019
Voltage Probe	R&S	ESH2-Z3 0299.7810.5 6	100042	06-13-2017	06-11-2020
Current Probe	R&S	EZ-17 816.2063.03	100106	05-30-2018	05-29-2019
ISN	TESEQ	ISN T800	30297	01-17-2018 01-16-2019	01-16-2019 01-15-2020
Barometer	changchun	DYM3	1188	07-02-2018	07-01-2019

Radiated Emission Test					
Equipment	Manufacturer	Model No.	Serial Number	Cal. date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
3M Chamber & Accessory Equipment	TDK	SAC-3	---	06-04-2016	06-03-2019
TRILOG Broadband Antenna	Schwarzbeck	VULB9163	9163-401	12-22-2017 07-30-2018	12-21-2018 07-29-2019
TRILOG Broadband Antenna	Schwarzbeck	VULB9163	9163-618	08-21-2018	08-20-2019
Microwave Preamplifier	Agilent	8449B	3008A024 25	01-17-2018 01-16-2019	01-16-2019 01-15-2020
Microwave Preamplifier	Tonscend	EMC051845SE	980380	04-25-2018	04-23-2021
Horn Antenna	Schwarzbeck	BBHA 9120D	9120D- 1869	06-05-2018	06-03-2021
Horn Antenna	ETS- LINDGREN	3117	00057410	06-05-2018	06-04-2021
Double ridge horn antenna	A.H.SYSTEM S	SAS-574	6042	06-05-2018	06-04-2021
Pre-amplifier	A.H.SYSTEM S	PAP-1840-60	6041	06-22-2017	06-21-2019
Loop Antenna	ETS	6502	00071730	05-11-2018	05-10-2019
Spectrum Analyzer	R&S	FSP40	100416	05-25-2018	05-24-2019
Receiver	R&S	ESCI	100435	11-23-2018	11-22-2019
Receiver	R&S	ESCI7	100938- 003	01-09-2018 01-07-2019	01-08-2019 01-06-2020
Multi device Controller	maturio	NCD/070/10711 112	---	05-11-2018	05-10-2019
LISN	schwarzbeck	NNBM8125	81251547	05-11-2018	05-10-2019
LISN	schwarzbeck	NNBM8125	81251548	03-13-2018	03-12-2019
Signal Generator	Agilent	E4438C	MY45095 744	03-13-2018	03-12-2019
Signal Generator	Keysight	E8257D	MY53401 106	10-11-2017 10-12-2018	10-12-2018 10-11-2019
Temperature/ Humidity Indicator	Shanghai qixiang	HM10	1804298	03-16-2018	03-15-2019
Communication test set	Agilent	E5515C	GB47050 534	01-10-2018 01-09-2019	01-09-2019 01-08-2020
Cable line	Fulai(7M)	SF106	5219/6A	01-10-2018 01-09-2019	01-09-2019 01-08-2020
Cable line	Fulai(6M)	SF106	5220/6A	01-10-2018 01-09-2019	01-09-2019 01-08-2020
Cable line	Fulai(3M)	SF106	5216/6A	01-10-2018 01-09-2019	01-09-2019 01-08-2020
Cable line	Fulai(3M)	SF106	5217/6A	01-19-2017 01-18-2018	01-18-2018 01-17-2019
Communication test set	R&S	CMW500	104466	01-10-2018 01-09-2019	01-09-2019 01-08-2020
High-pass filter	Sinoscite	FL3CX03WG18 NM12-0398-002	---	01-10-2018 01-09-2019	01-09-2019 01-08-2020
High-pass filter	MICRO- TRONICS	SPA-F-63029-4	---	01-10-2018 01-09-2019	01-09-2019 01-08-2020
band rejection filter	Sinoscite	FL5CX01CA09 CL12-0395-001	---	01-10-2018 01-09-2019	01-09-2019 01-08-2020
band rejection filter	Sinoscite	FL5CX01CA08 CL12-0393-001	---	01-10-2018 01-09-2019	01-09-2019 01-08-2020
band rejection filter	Sinoscite	FL5CX02CA04 CL12-0396-002	---	01-10-2018 01-09-2019	01-09-2019 01-08-2020
band rejection filter	Sinoscite	FL5CX02CA03 CL12-0394-001	---	06-04-2016	06-03-2019

Conducted RF test					
Equipment	Manufacturer	Mode No.	Serial Number	Cal. date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
Spectrum Analyzer	R&S	FSP40	100416	05-11-2018	05-10-2019
Receiver	R&S	ESCI	100435	05-25-2018	05-24-2019
Signal Generator	Agilent	E4438C	MY45095744	03-01-2019	02-29-2020
Attenuator	HuaXiang	SHX370	15040701	03-01-2019	02-29-2020
High-pass filter(3-18GHz)	Sinoscite	FL3CX03WG18 NM12-0398-002	---	01-09-2019	01-08-2020
High-pass filter(5-18GHz)	MICRO-TRONICS	SPA-F-63029-4	---	01-09-2019	01-08-2020
band rejection filter	Sinoscite	FL5CX01CA09C L12-0395-001	---	01-09-2019	01-08-2020
band rejection filter	Sinoscite	FL5CX01CA08C L12-0393-001	---	01-09-2019	01-08-2020
band rejection filter	Sinoscite	FL5CX02CA04C L12-0396-002	---	01-09-2019	01-08-2020

7 Test Result & Measurement Data

7.1 Conducted Emissions

Test Requirement: 47 CFR Part 15C Section 15.207

Test Method: ANSI C63.10-2013

Test Frequency Range: 150kHz to 30MHz

Limit:

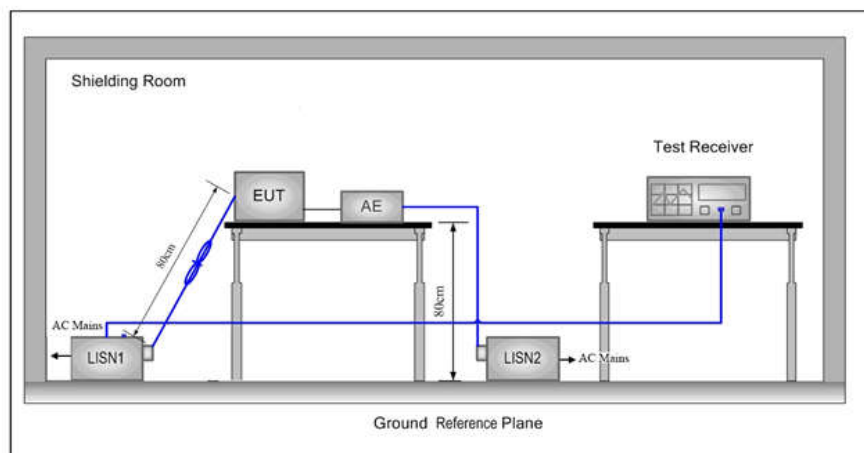
Frequency range (MHz)	Limit (dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

Test Procedure:

- 1) The mains terminal disturbance voltage test was conducted in a shielded room.
- 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a $50\Omega/50\mu\text{H} + 5\Omega$ linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.
- 3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane.
- 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.
- 5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2009 on conducted measurement.

Test Setup:



Test Mode: Transmitting mode

Instruments Used: Refer to section 6 for details

Test Results: Pass

Test Data

An initial pre-scan was performed on the live and neutral lines with peak detector.

Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

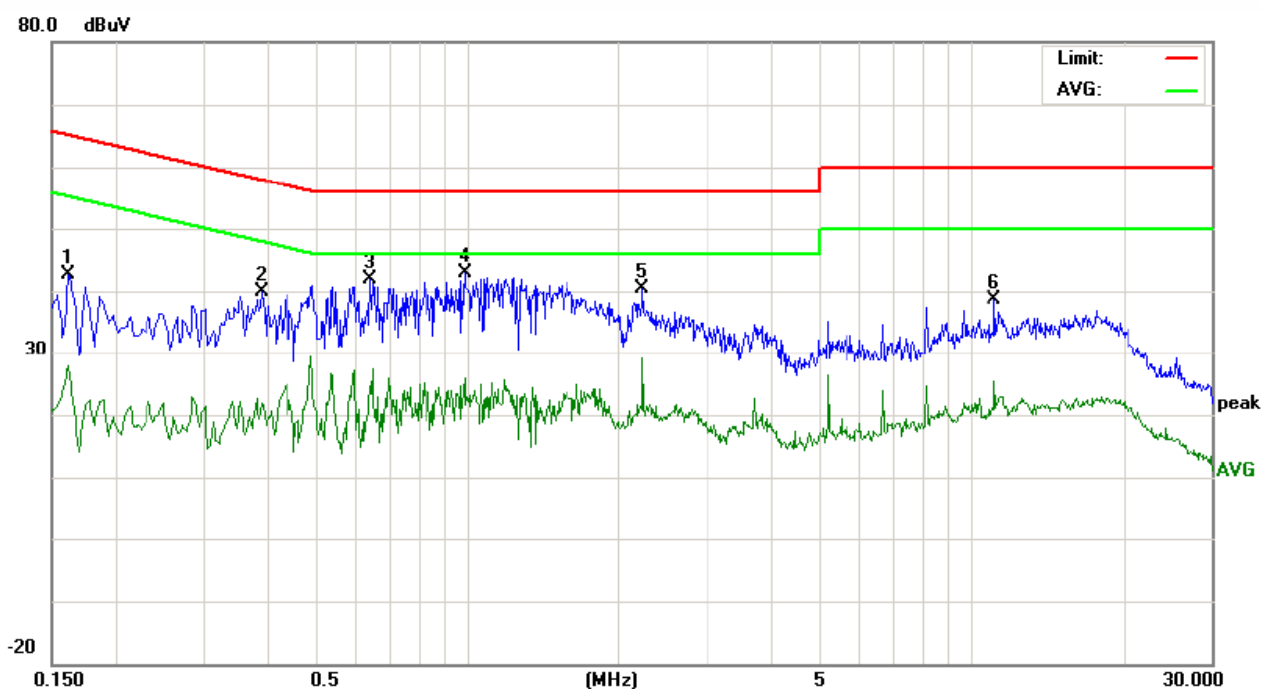
Product : Handheld UHF Reader

Model/Type reference : C76

Temperature : 22°C

Humidity : 53%

Phase : L



No.	Freq. MHz	Reading_Level (dBuV)			Correct Factor dB	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	AVG		peak	QP	AVG	QP	AVG	QP	AVG		
1	0.1620	32.95	29.34	18.03	9.75	42.70	39.09	27.78	65.36	55.36	-26.27	-27.58	P	
2	0.3899	30.10	27.54	12.23	9.75	39.85	37.29	21.98	58.06	48.06	-20.77	-26.08	P	
3	0.6419	32.15	29.41	14.78	9.75	41.90	39.16	24.53	56.00	46.00	-16.84	-21.47	P	
4	0.9900	33.03	30.15	16.23	9.72	42.75	39.87	25.95	56.00	46.00	-16.13	-20.05	P	
5	2.2340	30.62	27.67	19.34	9.71	40.33	37.38	29.05	56.00	46.00	-18.62	-16.95	P	
6	11.1540	28.77	25.41	15.49	9.84	38.61	35.25	25.33	60.00	50.00	-24.75	-24.67	P	

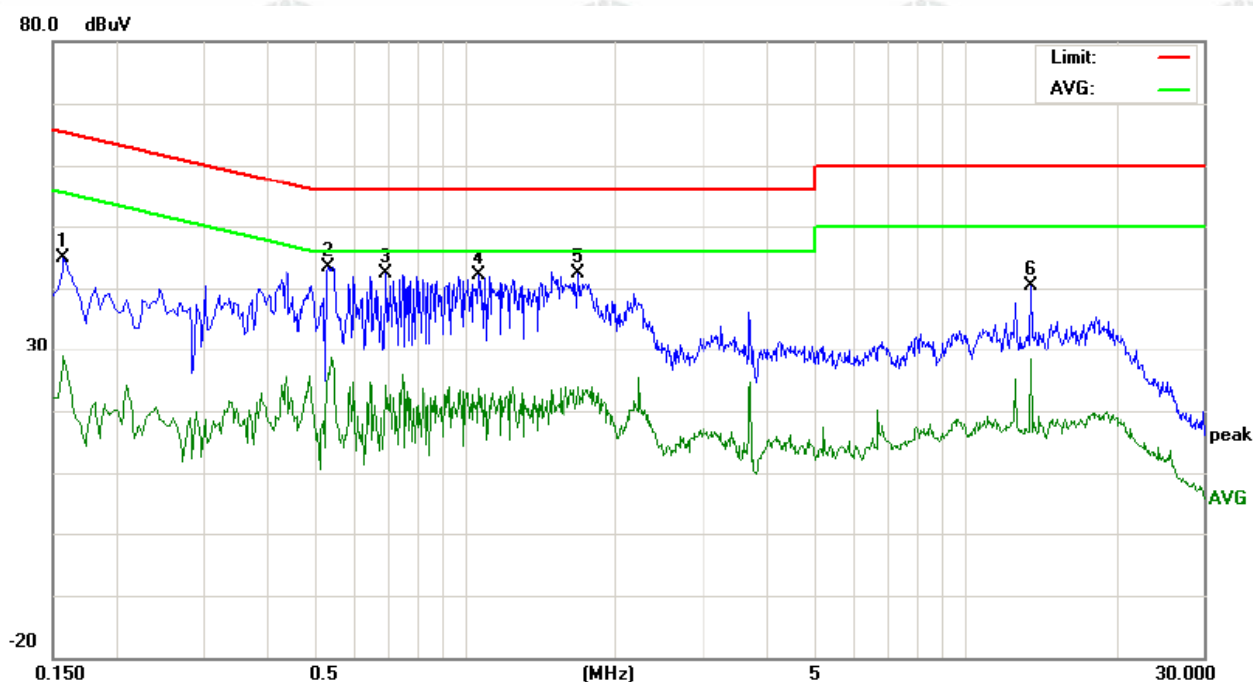
Product : Handheld UHF Reader

Model/Type reference : C76

Temperature : 22°C

Humidity : 53%

Phase : N



No.	Freq. MHz	Reading_Level (dBuV)			Correct Factor dB	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	AVG		peak	QP	AVG	QP	AVG	QP	AVG		
1	0.1580	34.99	31.23	19.04	9.76	44.75	40.99	28.80	65.56	55.56	-24.57	-26.76	P	
2	0.5340	33.65	30.47	16.31	9.72	43.37	40.19	26.03	56.00	46.00	-15.81	-19.97	P	
3	0.6940	32.58	29.65	14.38	9.75	42.33	39.40	24.13	56.00	46.00	-16.60	-21.87	P	
4	1.0700	32.48	29.47	13.82	9.72	42.20	39.19	23.54	56.00	46.00	-16.81	-22.46	P	
5	1.6940	32.77	29.56	14.09	9.72	42.49	39.28	23.81	56.00	46.00	-16.72	-22.19	P	
6	13.5580	30.54	27.54	18.38	9.95	40.49	37.49	28.33	60.00	50.00	-22.51	-21.67	P	

Notes:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level = Receiver Reading + LISN Factor + Cable Loss.
3. 13.56MHz is the Fundamental field strength of NFC. According to the 15.207, the limit is not apply.

7.2 Radiated Emissions

Test Requirement: 47 CFR Part 15 Subpart C Section 15.209; 15.225(a)(b)(c)(d)

Test Method: ANSI C63.10-2013

Test Site: 3m (Semi-Anechoic Chamber)

Requirements:

- (a) The field strength of any emissions within the band 13.553-13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters.
- (b) Within the bands 13.410-13.553 MHz and 13.567-13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters.
- (c) Within the bands 13.110-13.410 MHz and 13.710-14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters.
- (d) The field strength of any emissions appearing outside of the 13.110-14.010 MHz band shall not exceed the general radiated emission limits in § 15.209.

Receiver Setup:

Frequency	Detector	RBW	VBW	Remark
0.009MHz-0.090MHz	Quasi-peak	10kHz	30kHz	Peak
0.009MHz-0.090MHz	Quasi-peak	10kHz	30kHz	Average
0.090MHz-0.110MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
0.110MHz-0.490MHz	Quasi-peak	10kHz	30kHz	Peak
0.110MHz-0.490MHz	Quasi-peak	10kHz	30kHz	Average
0.490MHz -30MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
30MHz-1GHz	Quasi-peak	120 kHz	300kHz	Quasi-peak
Above 1GHz	Peak	1MHz	3MHz	Peak
	Peak	1MHz	10Hz	Average

Test Setup:

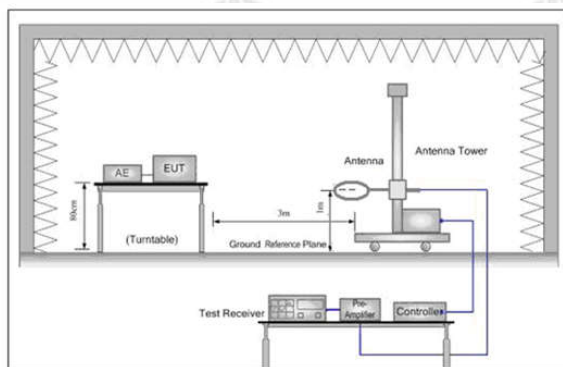


Figure 1. Below 30MHz

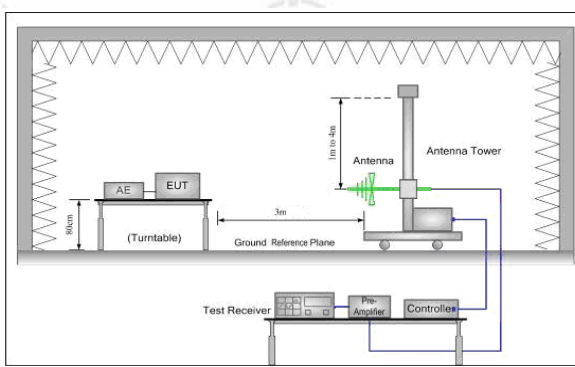


Figure 2. 30MHz to 1GHz

Test Procedure:

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is moved from 1m to 4m to find out the maximum emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.
7. The limit 1.705MHz to 30MHz in clause 4.3 are specified at 30 meters, and measurements were made at 3 meters, the limit is translated to 3 meters by using a formula as follows:
$$\text{Limit}_{3m} = \text{Limit}_{30m} + 40\log(30m/3)$$
8. The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report.

Test Mode:

Transmitting mode

Instruments Used:

Refer to section 6 for details

Test Result:

Pass

1.705-30MHz

Mode

Test Procedure: For testing performed with the loop antenna, testing was performed in accordance to ANSI C63.4: 2014, section 8.2.1. The center of the loop was positioned 1 m above the ground and positioned with its plane vertical at the specified distance from the EUT. During testing the loop was rotated about its vertical axis for maximum response at each azimuth and also investigated with the loop positioned in the horizontal plane. Only the worst position of vertical was shown in the report.

Product : Handheld UHF Reader

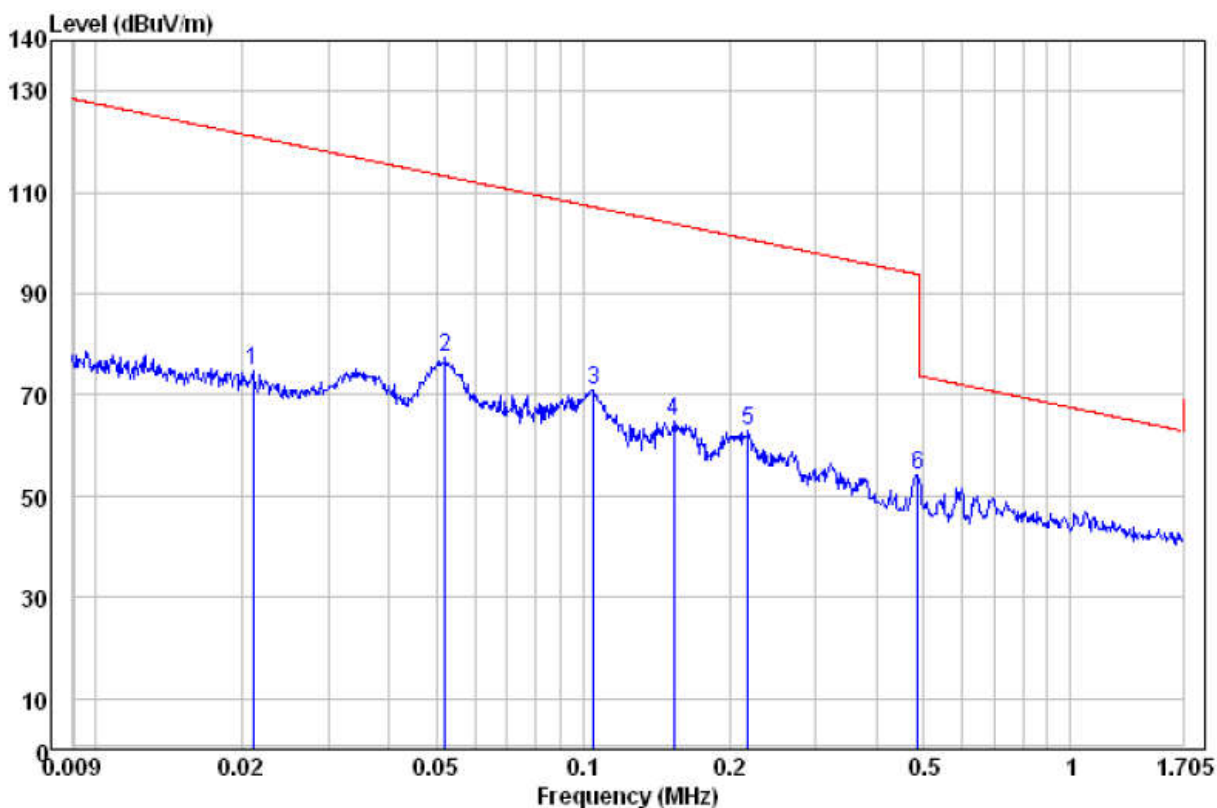
Model/Type reference : C76

Temperature : 21℃

Humidity : 60%

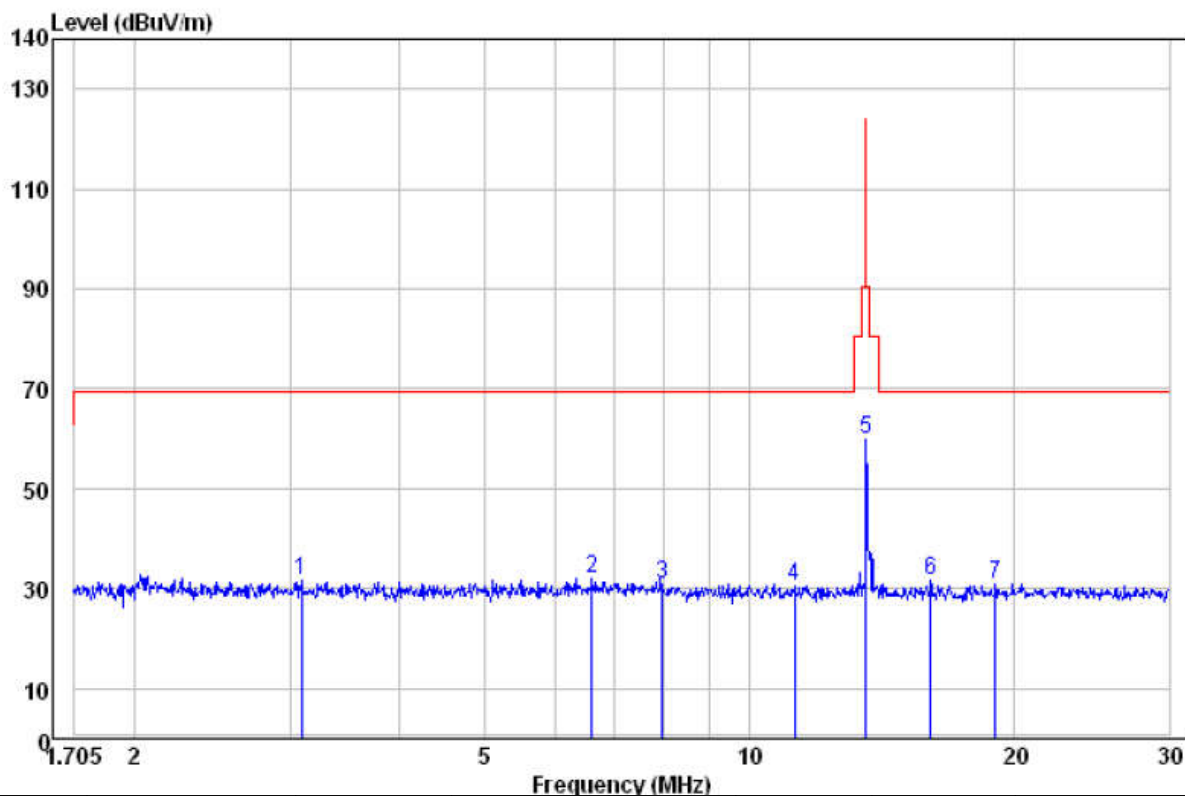
Test data:

9 kHz-1.705MHz



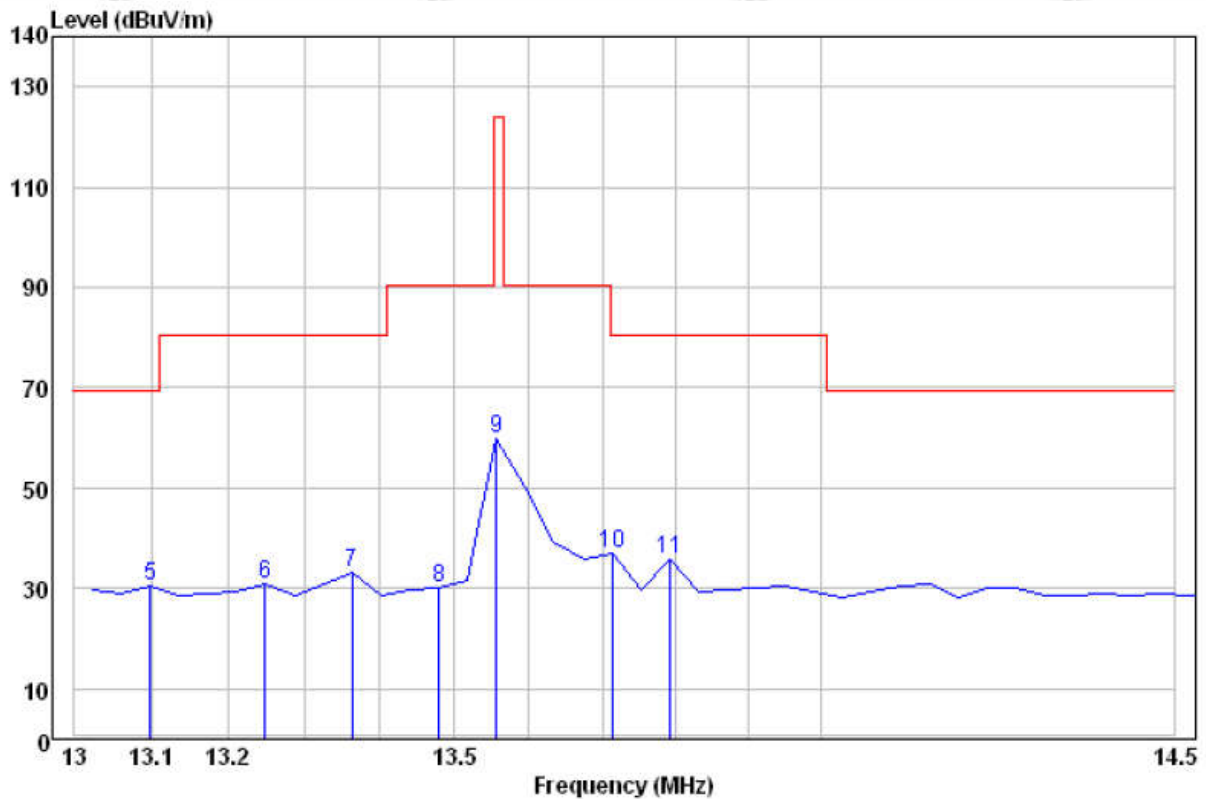
Frequency (MHz)	Antenna_Factor (dB/m)	Cable_Loss (dB)	Read_Level (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)	Polarization	Remark
0.021	20.35	0.05	54.46	74.86	121.13	-46.27	X	PK
0.052	20.31	0.07	54.98	77.36	113.25	-35.89	X	PK
0.105	20.28	0.11	50.68	71.07	107.15	-36.08	X	PK
0.154	20.26	0.11	44.54	64.91	103.87	-38.96	X	PK
0.218	20.25	0.11	42.68	63.04	100.82	-37.78	X	PK
0.487	20.22	0.12	33.90	54.24	93.86	-39.62	X	PK

1.705MHz-30MHz



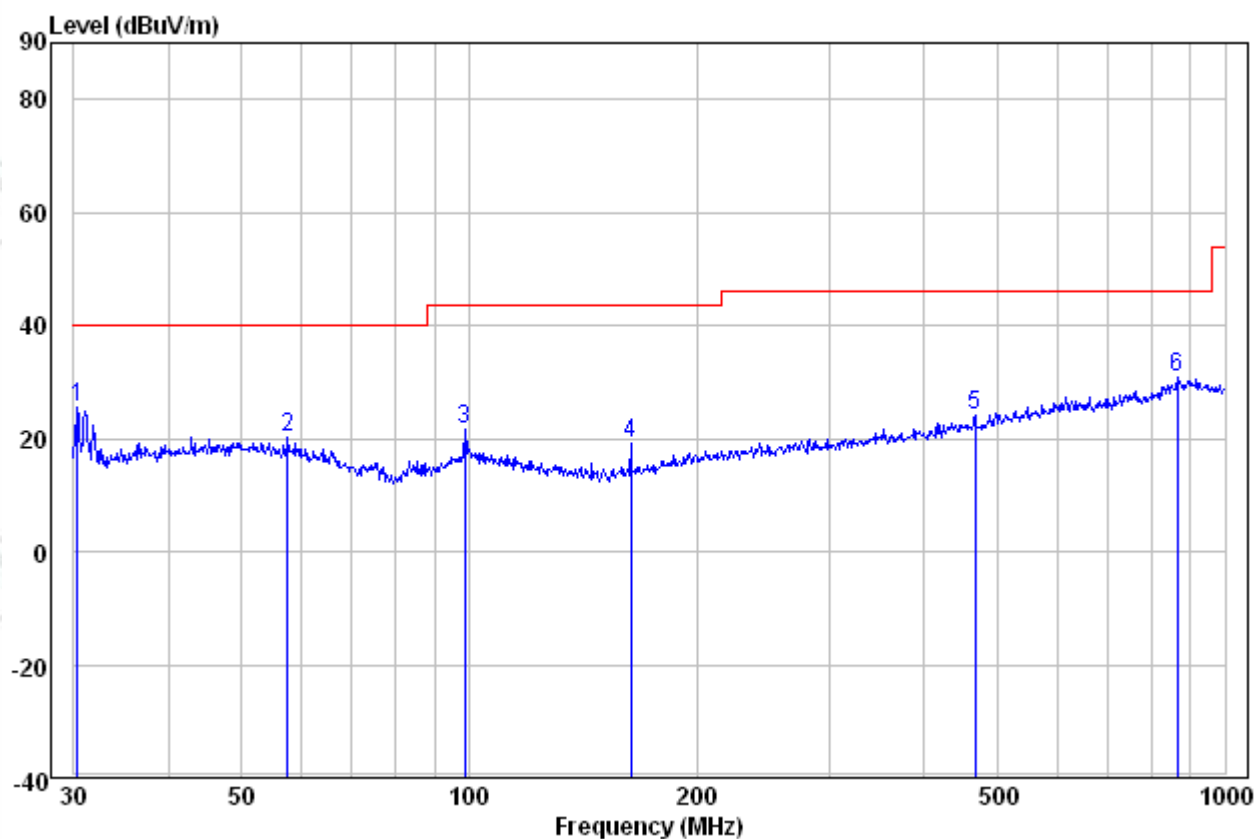
Frequency (MHz)	Antenna_Factor (dB/m)	Cable_Loss (dB)	Read_Level (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)	Polarization	Remark
3.087	20.14	0.16	11.35	31.65	69.50	-37.85	X	QP
6.619	20.11	0.34	11.77	32.22	69.50	-37.28	X	QP
7.952	20.10	0.47	10.36	30.93	69.50	-38.57	X	QP
11.251	20.09	0.66	9.83	30.58	69.50	-38.92	X	QP
13.556	20.08	0.69	39.06	59.83	123.90	-64.07	X	QP
16.056	20.08	0.72	10.84	31.64	69.50	-37.86	X	QP
19.015	20.07	0.76	10.18	31.01	69.50	-38.49	X	QP

13MHz~14.5MHz

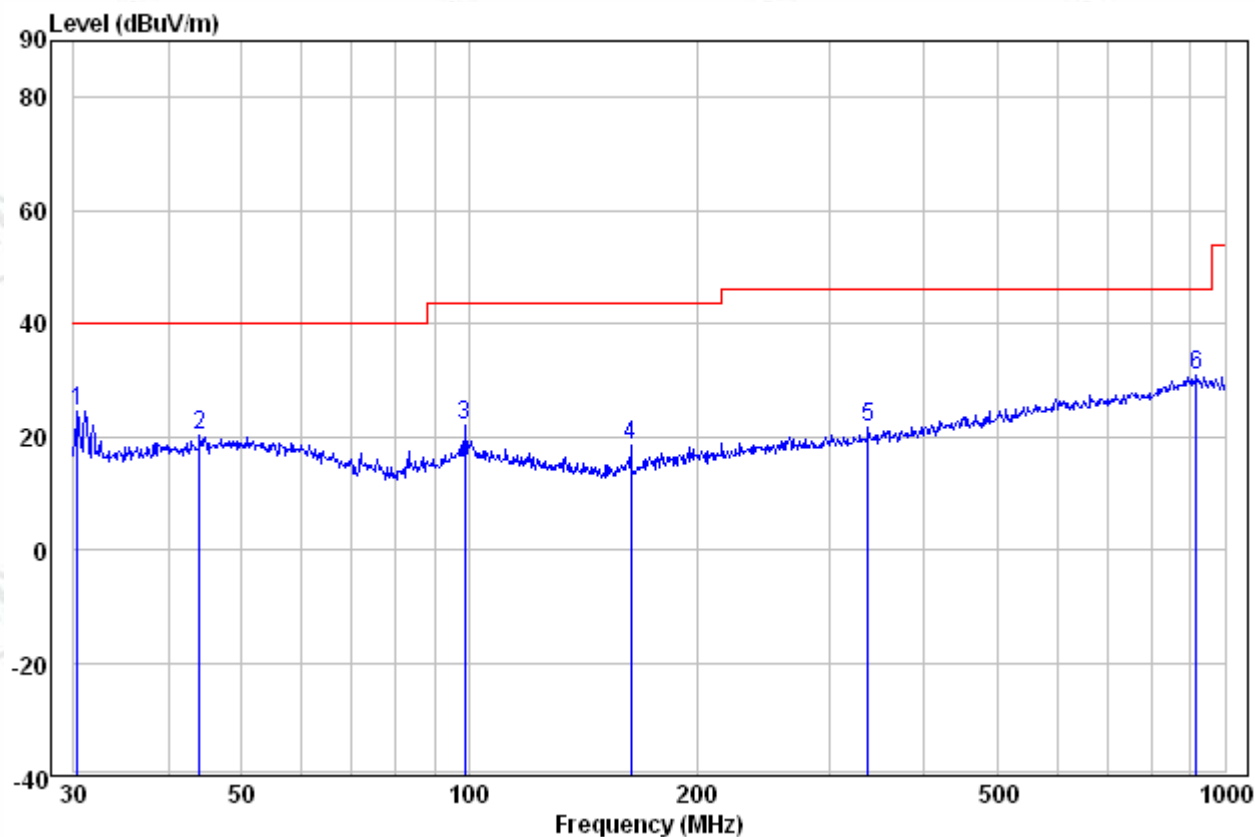


Frequency (MHz)	Antenna_Factor (dB/m)	Cable_Loss (dB)	Read_Level (dBUV)	Level (dBUV/m)	Limit_Line (dBUV/m)	Over_Limit (dB)	Polarization	Remark
3.087	20.14	0.16	11.35	31.65	69.50	-37.85	X	QP
6.619	20.11	0.34	11.77	32.22	69.50	-37.28	X	QP
7.952	20.10	0.47	10.36	30.93	69.50	-38.57	X	QP
11.251	20.09	0.66	9.83	30.58	69.50	-38.92	X	QP
13.098	20.08	0.68	9.70	30.46	69.50	-39.04	X	QP
13.249	20.08	0.68	10.16	30.92	80.50	-49.58	X	QP
13.363	20.08	0.68	12.28	33.04	80.50	-47.46	X	QP
13.479	20.08	0.68	9.26	30.02	90.40	-60.38	X	QP
13.556	20.08	0.69	39.06	59.83	123.90	-64.07	X	QP
13.713	20.08	0.69	16.36	37.13	80.50	-43.37	X	QP
13.792	20.08	0.69	15.13	35.90	80.50	-44.60	X	QP
16.056	20.08	0.72	10.84	31.64	69.50	-37.86	X	QP
19.015	20.07	0.76	10.18	31.01	69.50	-38.49	X	QP

Remark: The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case X axis is shown in the report.



	Ant	Cable	Read	Preamp	Limit	Over			
Freq	Factor	Loss	Level	Factor	Level	Line	Limit	Pol/Phase	F
MHz	dB/m	dB	dBuV	dB	dBuV/m	dBuV/m	dB		
1	30.317	11.97	0.09	13.57	0.00	25.63	40.00	-14.37	Horizontal
2	57.594	13.44	0.19	6.50	0.00	20.13	40.00	-19.87	Horizontal
3	98.833	12.32	0.57	8.85	0.00	21.74	43.50	-21.76	Horizontal
4	163.755	9.62	0.76	8.90	0.00	19.28	43.50	-24.22	Horizontal
5	467.235	16.45	1.49	6.12	0.00	24.06	46.00	-21.94	Horizontal
6	866.088	21.56	2.46	6.87	0.00	30.89	46.00	-15.11	Horizontal



Ant Cable Read Preamp Limit Over
Freq Factor Loss Level Factor Level Line Limit Pol/Phase

	MHz	dB/m	dB	dBuV	dB	dBuV/m	dBuV/m	dB	
1	30.317	11.97	0.09	12.57	0.00	24.63	40.00	-15.37	Vertical
2	43.966	14.14	0.08	5.88	0.00	20.10	40.00	-19.90	Vertical
3	98.833	12.32	0.57	9.07	0.00	21.96	43.50	-21.54	Vertical
4	163.755	9.62	0.76	8.22	0.00	18.60	43.50	-24.90	Vertical
5	337.216	14.16	1.26	6.07	0.00	21.49	46.00	-24.51	Vertical
6	916.069	22.07	2.44	6.33	0.00	30.84	46.00	-15.16	Vertical

Remark:

The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level = Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor

7.3 Frequency Tolerance

Test Requirement:	47 CFR Part 15 Subpart C Section 15.225(e)
Test Method:	ANSI C63.10-2013
Frequency range:	Operation within the band 13.110-14.010 MHz
Requirement :	The frequency tolerance of the carrier signal shall be maintained within +/- 0.01% of the operating frequency over a temperature variation of -20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.
Test Mode:	Transmitter mode
Method of measurement:	The EUT was placed in an environmental test chamber and powered such that control element received normal voltage and the transmitter provided maximum RF output.
Instruments Used:	Refer to section 6 for details
Test Result:	Pass

Test Frequency: 13.56MHz				Temperature:22℃
Supply Voltage (V)	Test Result (MHz)	Deviation (kHz)	Limit (kHz)	Result
3.8	13.55988	0.12	1.356	Pass

Test Frequency: 13.56MHz				Temperature:21℃
Supply Voltage (V)	Test Result (MHz)	Deviation (kHz)	Limit (kHz)	Result
3.23	13.55988	0.12	1.356	Pass
3.6	13.55988	0.12	1.356	Pass
3.8	13.55988	0.12	1.356	Pass
4.0	13.55988	0.12	1.356	Pass
4.37	13.55992	0.08	1.356	Pass

Test Frequency: 13.56MHz				Voltage: 3.8V
Temperature (℃)	Test Result (MHz)	Deviation (kHz)	Limit (kHz)	Result
-20	13.55991	0.09	1.356	Pass
-10	13.55991	0.09	1.356	
0	13.55988	0.12	1.356	
10	13.55988	0.12	1.356	
20	13.55988	0.12	1.356	
30	13.55988	0.12	1.356	
40	13.55988	0.12	1.356	
50	13.55988	0.12	1.356	

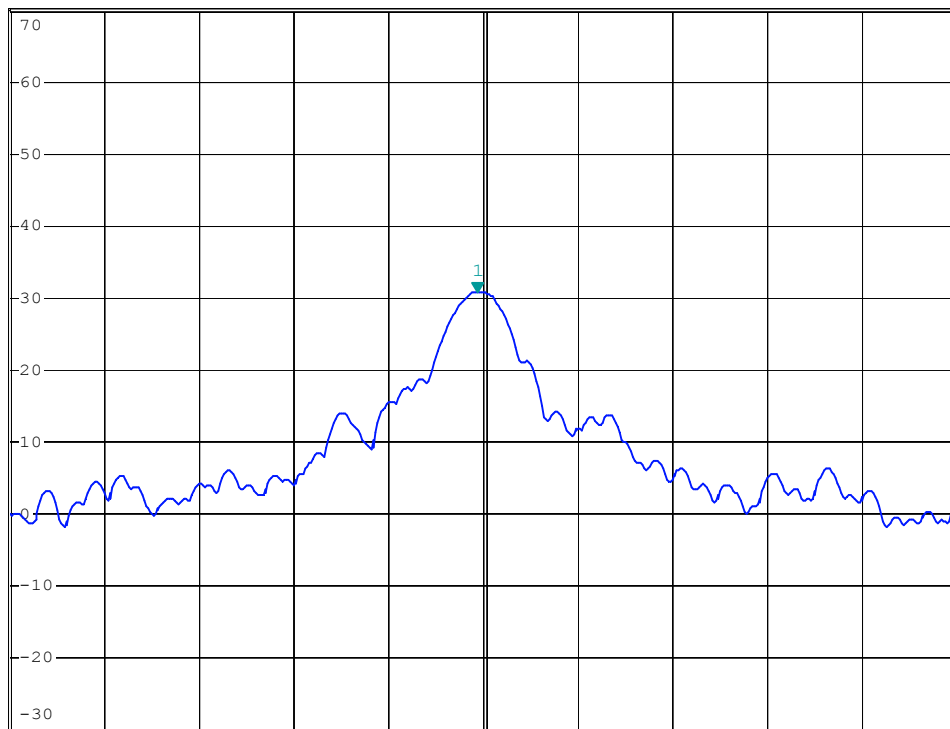


*RBW 1 kHz Marker 1 [T1]
*VBW 3 kHz 30.87 dBμV
SWT 20 ms 13.559880000 MHz

Ref 70 dBμV

*Att 0 dB

1 PK
MAXH



Center 13.56 MHz

2 kHz/

Span 20 kHz

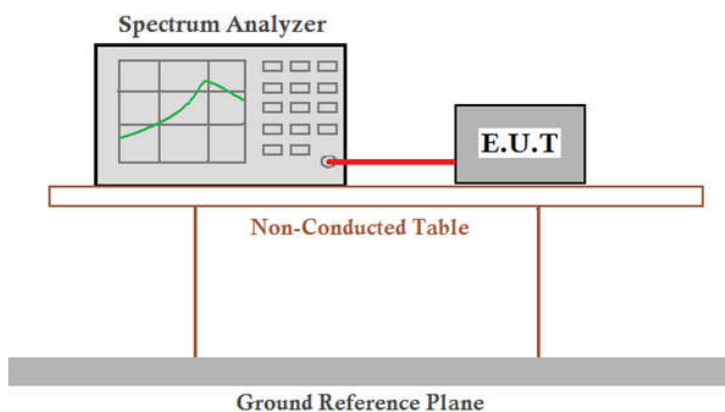
7.4 Occupied Bandwidth

Test Requirement: 47 CFR Part 15C Section 15.215 (C)
Test Method: ANSI C63.10-2013
Frequency range: Operation within the band 13.110 – 14.010 MHz

Requirement :

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.

Test Setup:



Test Mode: Transmitter mode
Instruments Used: Refer to section 6 for details
Test Result: Pass

The graph as below: represents the emissions take for this device.

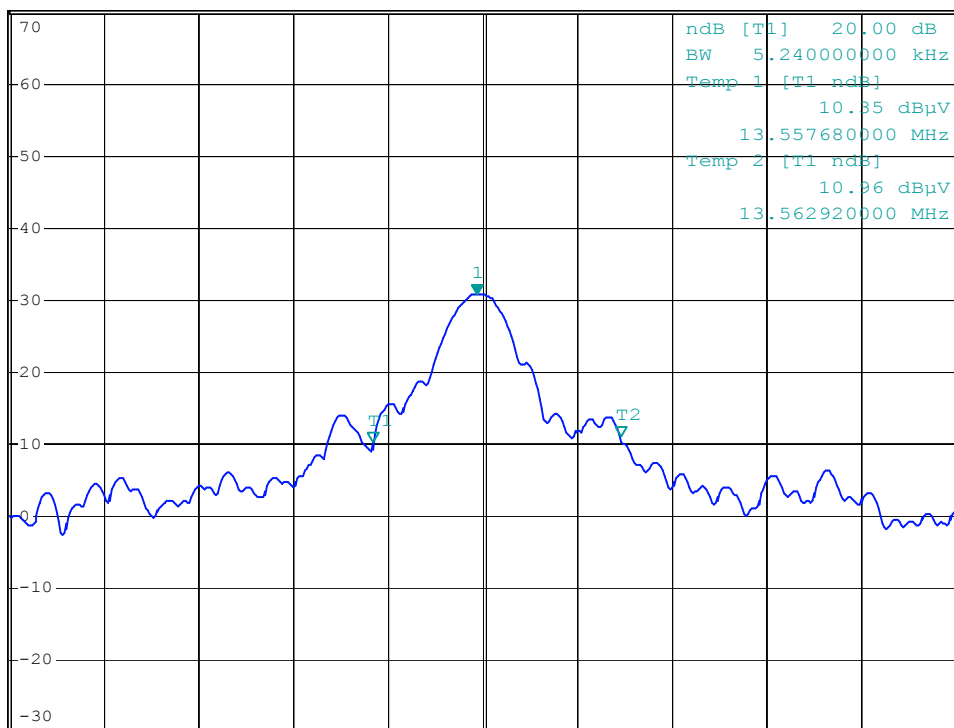


*RBW 1 kHz Marker 1 [T1]
*VBW 3 kHz 30.87 dBμV
SWT 20 ms 13.559880000 MHz

Ref 70 dBμV

*Att 0 dB

1 PK
MAXH



Center 13.56 MHz

2 kHz/

Span 20 kHz

APPENDIX 1 PHOTOGRAPHS OF TEST SETUP

Test Model No.: C76



Radiated emission Test Setup (Below 30MHz)



Radiated emission Test Setup (30MHz~1000MHz)



Conducted Emissions Test Setup

APPENDIX 2 PHOTOGRAPHS OF EUT

Refer to Report No.EED32K00243601 for EUT external and internal photos.

*** End of Report ***

The test report is effective only with both signature and specialized stamp. The result(s) shown in this report refer only to the sample(s) tested. Without written approval of CTI, this report can't be reproduced except in full.