Dongguan Nore Testing Center Co., Ltd. Report No.: NTC2009409FV00 FCC ID: OMOCA77932



# **RADIO TEST REPORT**

The device described below is tested by Dongguan Nore Testing Center Co., Ltd. to determine the maximum emission levels emanating from the device, the severe levels which the device can endure and E.U.T.'s performance criterion. The test results, data evaluation, test procedures, and equipment of configurations shown in this report were made in accordance with the procedures in ANSI C63.10(2013).

	Applicant / Manufacture	• :	La Crosse Technology Ltd.
	Address	:	2809 Losey Blvd. S. La Crosse Wisconsin 54601 United States
	Factory	:	La Crosse Technology Ltd.
	Address	:	2809 Losey Blvd. S. La Crosse Wisconsin 54601 United States
	E.U.T.	:	ALARM CLOCK
	Brand Name	:	La Crosse
The second se	Model No.	:	CA77932, CA77932-INT, CA77932vX, CA77932vX-XXX, CA77932-XX, CA77932-XX, CA77932-XX, CA77932-XX-XXX
	FCC ID	:	OMOCA77932
	Measurement Standard	:	FCC PART 15 Subpart C
	Date of Receiver	:	September 24, 2020
and the second se	Date of Test	:	September 24, 2020 to October 19, 2020
	Date of Report	:	October 19, 2020

This Test Report is Issued Under the Authority of :

Prepared by

Rose Hu / Engineer



This test report is for the customer shown above and their specific product only. This report applies to above tested sample only and shall not be reproduced in part without written approval of Dongguan Nore Testing Center Co., Ltd.

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## **Revision History of This Test Report**

Report Number	Description	Issued Date
NTC2009409FV00	Initial Issue	2020-10-19



## **1. GENERAL INFORMATION**

### **1.1 Product Description for Equipment under Test**

Product name Main model	:	ALARM CLOCK CA77932
Additional model	:	CA77932-INT, CA77932vX, CA77932vX-XXX, CA77932-XX, CA77932-XXX, CA77932-XX-XXX ("X" can be 0~9 or A~Z, the difference for different version are the product shell color, software, and packaging upgrade version number, when upgrade a version the number progressed to next number)
Description of Model Difference	:	<ol> <li>These models have the same circuitry, electrical mechanical, PCB layout and physical construction. The difference is model number, shell color and software due to trading purpose.</li> <li>The software version does not involve changes to RF information.</li> </ol>
Rating Adapter	:	DC 5V come from Adapter Manufacturer: Huaxu Electronics factory M/N: HX13-0502500-AU-001 Input: AC100-240V 50/60Hz 0.5A Max Output: DC 5.0V 2.5A
Test voltage	:	AC 120V 60Hz, AC 240V 60Hz (Only the worst case was record in the report.)
Cable	:	DC Line: 1.83m, unshielded
Software version Hardware version		V1.0 V1.0
S/N	:	779320001
Note Remark	:	N/A According to the model difference, all tests were performed on model CA77932.
Frequency Range Test frequency	:	110.5-205KHz 113.75KHz



#### 1.2 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: **OMOCA77932** filing to comply with FCC Part 15 (2017), Subpart C Rule.

#### **1.3 Test Methodology**

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.10 (2013). Radiated emission measurement was performed in semi-anechoic chamber and conducted emission measurement was performed in shield room. For radiated emission measurement, preliminary scans were performed in the semi-anechoic chamber only to determine the worst case modes. All radiated tests were performed at an antenna to EUT distance of 3 meters.

#### **1.4 Equipment Modifications**

Not available for this EUT intended for grant.

#### 1.5 Support Device

N/A



### 1.6 Test Facility and Location

Site Description EMC Lab	:	Listed by CNAS, August 13, 2018 The certificate is valid until August 13, 2024 The Laboratory has been assessed and proved to be in compliance with CNAS/CL01 The Certificate Registration Number is L5795.
		Listed by A2LA, November 01, 2017 The certificate is valid until December 31, 2021 The Laboratory has been assessed and proved to be in compliance with ISO17025 The Certificate Registration Number is 4429.01
		Listed by FCC, November 06, 2017 The Designation Number is CN1214 Test Firm Registration Number: 907417
Name of Firm	:	Listed by Industry Canada, June 08, 2017 The Certificate Registration Number. Is 46405-9743 Dongguan Nore Testing Center Co., Ltd. (Dongguan NTC Co., Ltd.)
Site Location	:	Building D, Gaosheng Science and Technology park, Hongtu road, Nancheng district, Dongguan city, Guangdong province, China

#### 1.7 Summary of Test Results

FCC Rules	Description Of Test	Uncertainty	Result
§15.35	20dB Bandwidth	±1.42 x10 <sup>-4</sup> %	Compliant
§15.207 (a)	AC Power Conducted Emission	±1.06dB	Compliant
§15.209	Radiated Emission	±4.60dB	Compliant



## 2. System Test Configuration

#### 2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

#### 2.2 pecial Accessories

Not available for this EUT intended for grant.

#### 2.3 Description of test modes

The EUT has been tested under operating condition. Test program used to control the EUT for staying in continuous transmitting and normal mode is programmed. The Lowest, middle and highest channel were chosen for testing.

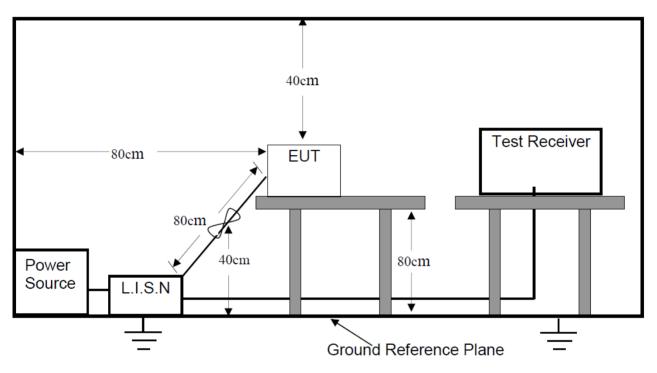
#### 2.4 EUT Exercise

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements.



## **3. Conducted Emissions Test**





3.2 Test Condition

Test Requirement: FCC Part 15.207

Frequency Range: 150KHz ~ 30MHz

Detector: RBW 9KHz, VBW 30KHz

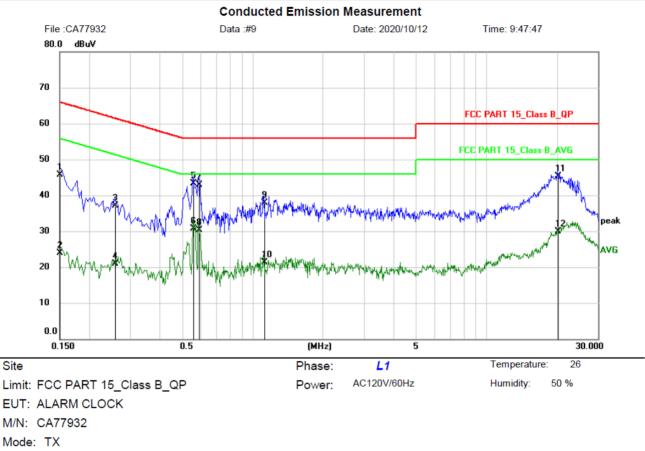
Operation Mode: Full Load, Half Load, Empty Load

#### 3.3 Measurement Results

Please refer to following plots of the worst case: Full Load.





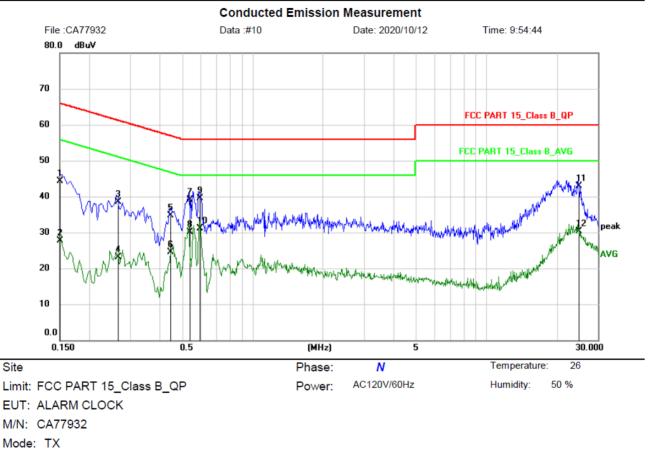


Note:

No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	0.1500	35.10	10.60	45.70	66.00	-20.30	QP	
2	0.1500	13.40	10.60	24.00	56.00	-32.00	AVG	
3	0.2580	26.60	10.60	37.20	61.50	-24.30	QP	
4	0.2580	10.30	10.60	20.90	51.50	-30.60	AVG	
5 *	0.5580	32.76	10.64	43.40	56.00	-12.60	QP	
6	0.5580	20.06	10.64	30.70	46.00	-15.30	AVG	
7	0.5899	32.36	10.64	43.00	56.00	-13.00	QP	
8	0.5899	19.66	10.64	30.30	46.00	-15.70	AVG	
9	1.1180	27.20	10.70	37.90	56.00	-18.10	QP	
10	1.1180	10.60	10.70	21.30	46.00	-24.70	AVG	
11	20.2020	34.53	10.77	45.30	60.00	-14.70	QP	
12	20.2020	19.13	10.77	29.90	50.00	-20.10	AVG	







Note:

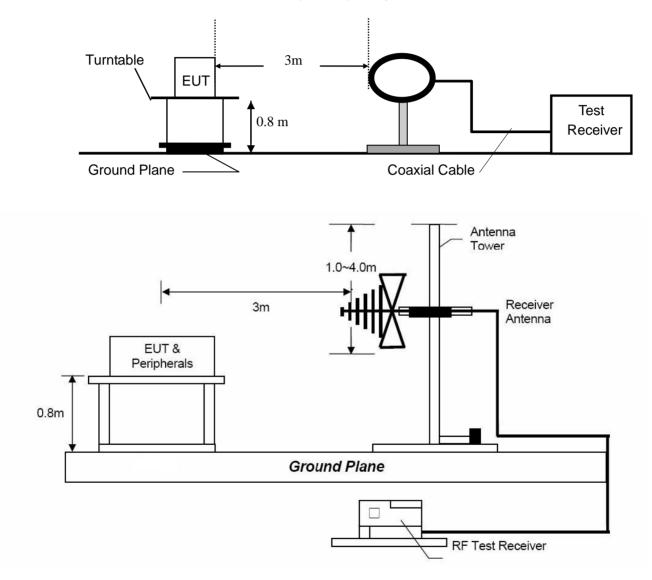
MHz 1 0.150	dBuV	dB	dBuV	10.14			
1 0.150	22.70			dBuV	dB	Detector	Comment
0.150	) 33.70	10.60	44.30	66.00	-21.70	QP	
2 0.150	0 17.10	10.60	27.70	56.00	-28.30	AVG	
3 0.266	28.00	10.60	38.60	61.24	-22.64	QP	
4 0.266	0 12.50	10.60	23.10	51.24	-28.14	AVG	
5 0.446	24.18	10.62	34.80	56.95	-22.15	QP	
6 0.446	13.88	10.62	24.50	46.95	-22.45	AVG	
7 0.538	28.47	10.63	39.10	56.00	-16.90	QP	
8 0.538	) 19.47	10.63	30.10	46.00	-15.90	AVG	
9 0.594	28.86	10.64	39.50	56.00	-16.50	QP	
10 * 0.594	20.46	10.64	31.10	46.00	-14.90	AVG	
11 24.782	32.22	10.78	43.00	60.00	-17.00	QP	
12 24.782	) 19.52	10.78	30.30	50.00	-19.70	AVG	



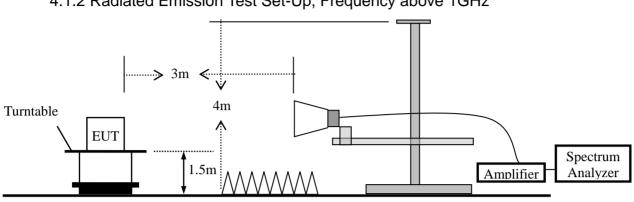
## 4. Radiated Emission Test

#### 4.1 Test SET-UP (Block Diagram of Configuration)

4.1.1 Radiated Emission Test Set-Up, Frequency Below 30MHz







#### 4.1.2 Radiated Emission Test Set-Up, Frequency above 1GHz

#### 4.2 Measurement Procedure

- a. Blow 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi- anechoic chamber room.
- b. For the radiated emission test above 1GHz:

The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter full anechoic chamber room. The table was rotated 360 degrees to determine the position of the highest radiation. Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

- c. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- d. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. The test-receiver system was set to peak detect function and specified bandwidth with maximum hold mode.
- f. A Quasi-peak measurement was then made for that frequency point for below 1GHz test. PK and AV for above 1GHz emission test.



During the radiated emission test, the spectrum analyzer was set with the following configurations:

Frequency Band (MHz)	Level	Resolution Bandwidth	Video Bandwidth
30 to 1000	QP	120 kHz	300 kHz
Above 1000	Peak	1 MHz	3 MHz
	Average	1 MHz	10 Hz

#### 4.3 Limit

Frequency range	<b>Distance Meters</b>	Field Strengths Limit (15.209)
MHz		μV/m
0.009 ~ 0.490	300	2400/F(kHz)
0.490 ~ 1.705	30	24000/F(kHz)
1.705 ~ 30	30	30
30 ~ 88	3	100
88 ~ 216	3	150
216 ~ 960	3	200
Above 960	3	500

Remark: (1) Emission level (dB) $\mu$ V = 20 log Emission level  $\mu$ V/m

- (2) The smaller limit shall apply at the cross point between two frequency bands.
- (3) As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.
- (4) The frequency range scanned is from the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or 40 GHz, whichever is lower.



Receiver Parameter	Setting
Attenuation	Auto
	9KHz~90KHz/ RB 200Hz for AV
	90KHz~110KHz/ RB 200Hz for QP
Start ~ Stop Frequency	110KHz~490KHz/ RB 200Hz for AV
	490KHz~30MHz/ RB 9KHz for QP
	30MHz~1000MHz/ RB 120KHz for QP

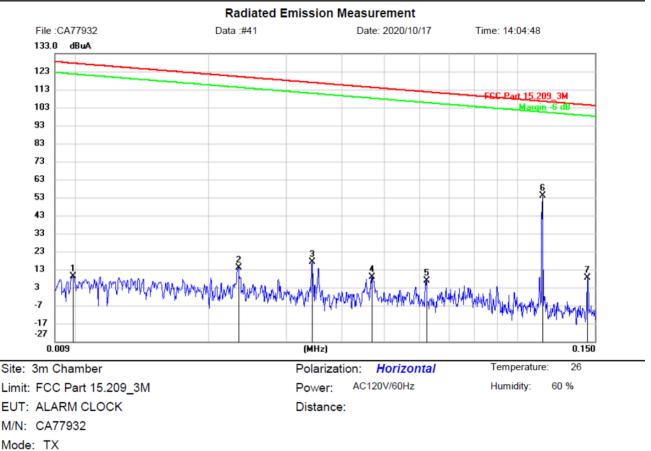
FCC 15.209 (d) The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90KHz, 110-490KHz and above 1000MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

#### 4.4 Measurement Results

Please refer to following plots of the worst case: Full Load.





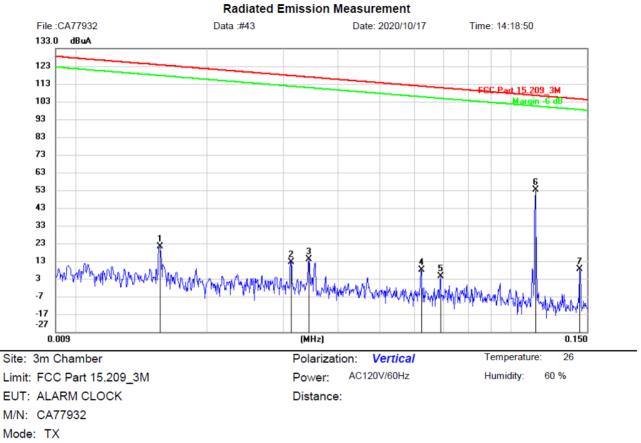


Note:

No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		Antenna Height	Table Degree	
	MHz	dBuV	dB/m	dBuA	dBuA	dB	Detector	cm	degree	Comment
1	0.0099	-10.26	19.33	9.07	127.60	-118.53	b peak			
2	0.0234	-6.39	20.45	14.06	120.15	-106.09	peak			
3	0.0343	-3.24	20.52	17.28	116.83	-99.55	peak			
4	0.0469	-11.81	20.59	8.78	114.12	-105.34	peak			
5	0.0622	-13.86	20.53	6.67	111.68	-105.01	peak			
6 *	0.1139	33.57	20.53	54.10	106.44	-52.34	peak			
7	0.1442	-12.23	20.53	8.30	104.40	-96.10	peak			





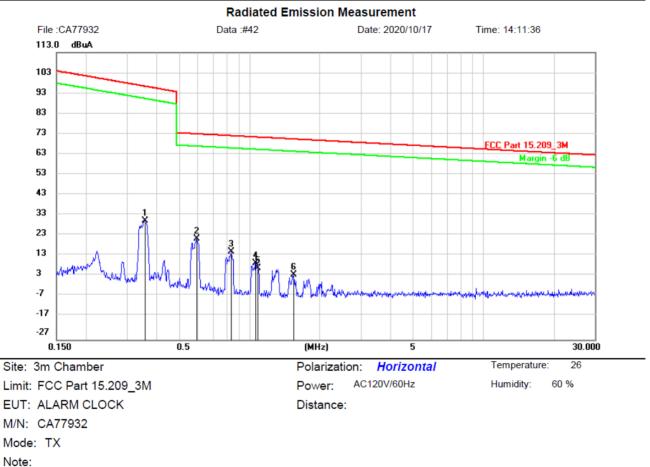


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No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		Antenna Height	Table Degree	
	MHz	dBuV	dB/m	dBuA	dBuA	dB	Detector	cm	degree	Comment
1	0.0156	0.99	20.05	21.04	123.66	-102.62	2 peak			
2	0.0313	-7.91	20.51	12.60	117.63	-105.03	b peak			
3	0.0343	-6.34	20.52	14.18	116.83	-102.65	i peak			
4	0.0622	-12.53	20.53	8.00	111.68	-103.68	b peak			
5	0.0690	-16.19	20.52	4.33	110.78	-106.45	j peak			
6 *	0.1139	32.87	20.53	53.40	106.44	-53.04	peak			
7	0.1442	-11.95	20.53	8.58	104.40	-95.82	peak			



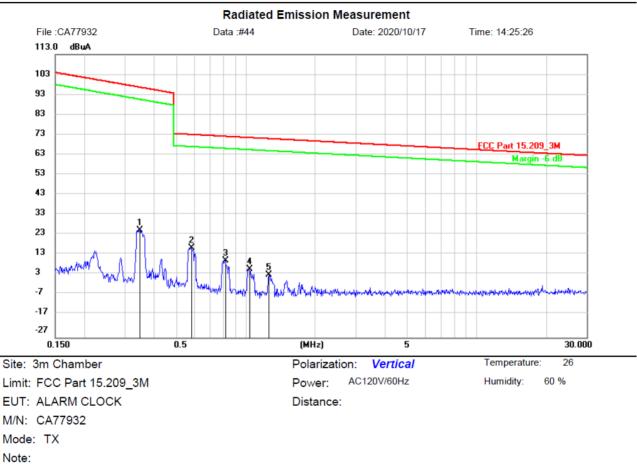




No. M	lk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuA	dBuA	dB	Detector	cm	degree	Comment
1		0.3558	10.58	20.47	31.05	96.57	-65.52	peak			
2 *		0.5979	1.76	20.44	22.20	73.28	-51.08	peak			
3		0.8349	-4.50	20.41	15.91	72.40	-56.49	peak			
4		1.0653	-10.01	20.40	10.39	71.76	-61.37	peak			
5		1.0881	-12.55	20.40	7.85	71.70	-63.85	peak			
6		1.5436	-15.66	20.40	4.74	70.78	-66.04	peak			



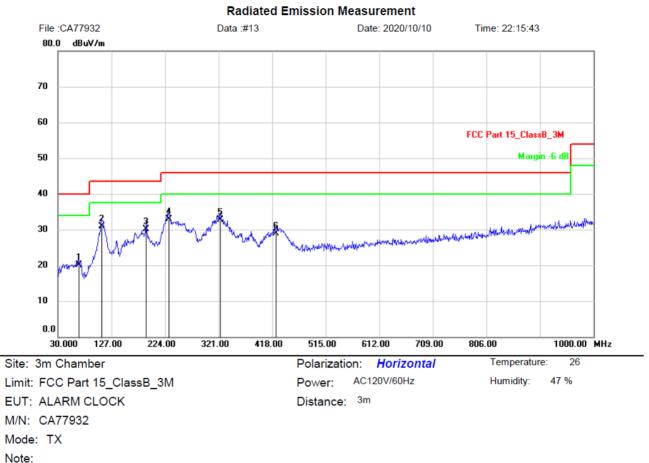




No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		Antenna Height	Table Degree	
	MHz	dBuV	dB/m	dBuA	dBuA	dB	Detector	cm	degree	Comment
1	0.3483	5.65	20.47	26.12	96.76	-70.64	peak			
2 *	0.5823	-3.30	20.44	17.14	73.35	-56.21	peak			
3	0.8174	-9.42	20.41	10.99	72.45	-61.46	peak			
4	1.0375	-13.71	20.40	6.69	71.83	-65.14	peak			
5	1.2621	-16.47	20.40	3.93	71.31	-67.38	peak			



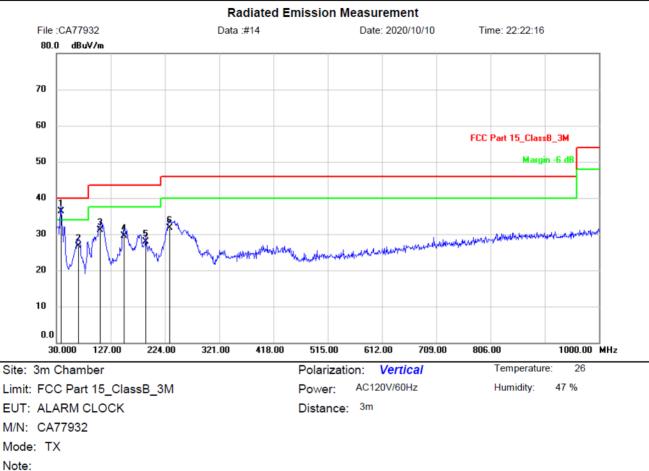




No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		67.8300	29.34	-9.14	20.20	40.00	-19.80	QP			
2	*	109.5400	38.45	-7.55	30.90	43.50	-12.60	QP			
3		190.0500	38.47	-8.27	30.20	43.50	-13.30	QP			
4		230.7900	39.83	-6.93	32.90	46.00	-13.10	QP			
5		323.9100	37.56	-4.86	32.70	46.00	-13.30	QP			
6		424.7900	31.94	-2.94	29.00	46.00	-17.00	QP			







No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	37.7599	44.61	-8.31	36.30	40.00	-3.70	QP			
2		68.8000	37.06	-10.26	26.80	40.00	-13.20	QP			
3		108.5700	41.40	-10.20	31.20	43.50	-12.30	QP			
4		150.2800	41.47	-11.87	29.60	43.50	-13.90	QP			
5		189.0800	37.12	-9.12	28.00	43.50	-15.50	QP			
6		231.7600	39.70	-7.90	31.80	46.00	-14.20	QP			



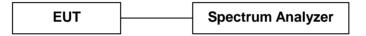
## 5. 20dB Bandwidth

#### **5.1 Measurement Procedure**

Maximum 20dB RF Bandwidth, FCC Rule 15.35:

The antenna port of the EUT was connected to the input of a spectrum analyzer. Analyzer RBW was chosen so that the display was a result of the hopping channel modulation. For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier. Use the spectrum 20dB down delta function to measure the bandwidth.

#### 5.2 Test SET-UP (Block Diagram of Configuration)



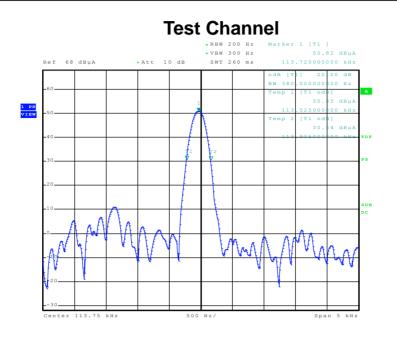
#### 5.3 Measurement Results

Refer to attached data chart.

RBW:	200Hz	VBW:	300Hz
Test By:	Ray	Spectrum Detector:	PK
Temperature :	<b>24</b> °C	Test Date :	October 17, 2020
Test Result:	PASS	Humidity :	50 %

Channel frequency (KHz)	20dB Down BW(Hz)
113.75	380





Date: 17.0CT.2020 14:11:57



## 6. Antenna Application

#### 6.1 Antenna requirement

According to of FCC part 15C section 15.203 and 15.240:

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, 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.

#### 6.2 Measurement Results

The antenna is coil antenna that no antenna other than furnished by the responsible party shall be used with the device, and the best case gain of the antenna is 0dBi, So, the antenna is consider meet the requirement.



## 7. Test Equipment List

ltem	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde & Schwarz	ESCI7	100837	Mar. 13, 2020	1 Year
2.	Antenna	Schwarzbeck	VULB9162	9162-010	Mar. 23, 2020	1 Year
3.	Spectrum Analyzer	Rohde & Schwarz	FSU26	200409/026	Mar. 13, 2020	1 Year
4.	Spectrum Analyzer	Keysight	N9020A	MY54200831	Mar. 13, 2020	1 Year
5.	Spectrum Analyzer	Rohde & Schwarz	FSV40	101094	Mar. 13, 2020	1 Year
6.	Horn Antenna	Schwarzbeck	BBHA9170	9170-172	Mar. 22, 2019	2 Year
7.	Power Sensor	DARE	RPR3006W	15I00041SNO 64	Mar. 13, 2020	1 Year
8.	Communication Tester	Rohde & Schwarz	CMW500	149004	Mar. 13, 2020	1 Year
9.	Horn Antenna	COM-Power	AH-118	071078	Mar. 23, 2020	1 Year
10.	Pre-Amplifier	HP	HP 8449B	3008A00964	Mar. 13, 2020	1 Year
11.	Pre-Amplifier	HP	HP 8447D	1145A00203	Mar. 13, 2020	1 Year
12.	Loop Antenna	Schwarzbeck	FMZB 1513	1513-272	Mar. 23, 2020	1 Year
13	Test Receiver	Rohde & Schwarz	ESCI	101152	Mar. 14, 2020	1 Year
14	L.I.S.N	Rohde & Schwarz	ENV 216	101317	Mar. 13, 2020	1 Year
15.	L.I.S.N	Rohde & Schwarz	ESH2-Z5	893606/014	Mar. 13, 2020	1 Year
16.	RF Switching Unit	Compliance Direction Systems Inc.	RSU-M2	38311	Mar.13, 2020	1 Year
17.	Temperature & Humidity Chamber	REMAFEE	SYHR225L	N/A	Mar. 13, 2020	1 Year
18.	DC Source	Maynuo	MY8811	N/A	Mar. 13, 2020	1 Year
19.	Temporary antenna connector	TESCOM	SS402	N/A	N/A	N/A
20.	Chamber	SAEMC	9*7*7m	N/A	Jun. 20, 2019	2 Year
21.	Test Software	EZ	EZ_EMC	N/A	N/A	N/A

Note: The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.

---End---