

FCC Radio Test Report

FCC ID: OMO617-148V2

This report concerns: Original Grant

Project No. : 1909C108A Equipment : ALARM CLOCK **Brand Name** : LA CROSSE Test Model : 617-148v2

Series Model : 617-148xx, 617-148xx-xxx, 617-148xx-xx, 617-148xx-xxx (x can be

> 0~9 or A~Z or a-z, the difference for different version are the product shell color and packaging upgrade version number, when upgrade a

version the number progressed to next number)

Applicant : La Crosse Technology Ltd.

Address : 2809 Losey Blvd. S. La Crosse Wisconsin 54601 United States

Manufacturer : La Crosse Technology Ltd.

: 2809 Losey Blvd. S. La Crosse Wisconsin 54601 United States Address

Factory : La Crosse Technology Ltd.

Address : 2809 Losey Blvd. S. La Crosse Wisconsin 54601 United States

Date of Receipt : Aug. 05, 2021

Date of Test : Aug. 09, 2021 ~ Aug. 10, 2021

Issued Date : Sep. 23, 2021

Report Version : R02

: Engineering Sample No.: DG202108055 Test Sample Standard(s) : FCC CFR Title 47, Part 15, Subpart C

ANSI C63.10-2013

The above equipment has been tested and found compliance with the requirement of the relative standards by BTL Inc.

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Republic of China.







Declaration

BTL represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with standards traceable to international standard(s) and/or national standard(s).

BTL's reports apply only to the specific samples tested under conditions. It is manufacture's responsibility to ensure that additional production units of this model are manufactured with the identical electrical and mechanical components. **BTL** shall have no liability for any declarations, inferences or generalizations drawn by the client or others from **BTL** issued reports.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, A2LA, or any agency of the U.S. Government.

This report is the confidential property of the client. As a mutual protection to the clients, the public and ourselves, the test report shall not be reproduced, except in full, without our written approval.

BTL's laboratory quality assurance procedures are in compliance with the **ISO/IEC 17025** requirements, and accredited by the conformity assessment authorities listed in this test report.

BTL is not responsible for the sampling stage, so the results only apply to the sample as received.

The information, data and test plan are provided by manufacturer which may affect the validity of results, so it is manufacturer's responsibility to ensure that the apparatus meets the essential requirements of applied standards and in all the possible configurations as representative of its intended use.

Limitation

For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective. Please note that the measurement uncertainty is provided for informational purpose only and are not use in determining the Pass/Fail results.



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REPORT ISSUED HISTORY

Report Version	Description	Issued Date
R00	Compared with original report(BTL-FCCP-1-1909C108), 1. Changed the wireless module. 2. Changed the model name. All test items have been re-evaluated and recorded in this report.	Aug. 31, 2021
R01	Modify the report concerns to "Original Grant".	Sep. 16, 2021
R02	Updated the model differences and FCC ID.	Sep. 23, 2021



1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standard(s):

FCC CFR Title 47, Part 15, Subpart C				
Standard(s) Section	Test Result	Judgment	Remark	
15.207	AC Power Line Conducted Emissions	APPENDIX A	PASS	
15.225(a)-(d) 15.205(a) 15.209(a)	Radiated Emission	APPENDIX B APPENDIX C	PASS	

Note:

(1) "N/A" denotes test is not applicable in this test report



1.1 TEST FACILITY

The test facilities used to collect the test data in this report is at the location of No. 3 Jinshagang 1st Rd. Shixia, Dalang Town, Dongguan City, Guangdong, People's Republic of China.

BTL's Test Firm Registration Number for FCC: 357015

BTL's Designation Number for FCC: CN1240

1.2 MEASUREMENT UNCERTAINTY

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2))
The BTL measurement uncertainty as below table:

A. AC power line conducted emissions test:

Test Site	Method	Measurement Frequency Range	U, (dB)
DG-C02	CISPR	150 kHz ~ 30 MHz	2.68

B. Radiated emissions test:

Test Site	Method	Measurement Frequency Range	Ant. H / V	U, (dB)
		9kHz ~ 30MHz	-	3.02
	G-CB03 CISPR	30MHz ~ 200MHz	V	4.26
DG-CB03		30MHz ~ 200MHz	Ι	3.38
		200MHz ~ 1,000MHz	V	3.98
		200MHz ~ 1,000MHz	Η	3.94

Note: Unless specifically mentioned, the uncertainty of measurement has not been taken into account to declare the compliance or non-compliance to the specification.

1.3 TEST ENVIRONMENT CONDITIONS

Test Item	Temperature	Humidity	Test Voltage	Tested By
AC Power Line Conducted Emissions	25°C	53%	AC 120V/60Hz	Laughing Zhang
Radiated Emissions-9kHz to 30MHz	25°C	30%	AC 120V/60Hz	Laughing Zhang
Radiated Emissions-30MHz to 1000MHz	26°C	52%	AC 120V/60Hz	Berton Luo



2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	ALARM CLOCK	
Brand Name	LA CROSSE	
Test Model	617-148v2	
Series Model	617-148xx, 617-148xx-xxx, 617-148xx-xx, 617-148xx-xx-xxx	
Model Difference(s)	x can be 0~9 or A~Z or a-z, the difference for different version are the product shell color and packaging upgrade version number, when upgrade a version the number progressed to next number	
Power Source	DC Voltage supplied from AC adapter. Model: HX13-0502500-AU-001	
Power Rating	I/P: 100-240V~ 50/60Hz 0.5A Max O/P: 5.0V === 2.5A	
Operation Frequency	110kHz~205kHz	
Antenna Type	Loop Antenna	

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.

2. Channel List:

Test Channel	Test Frequency (kHz)
01	110 ~ 205

2.2 DESCRIPTION OF TEST MODES

The test system was pre-tested based on the consideration of all possible combinations of EUT operation mode.

Pretest Mode	Description
Mode 1	TX Mode

Following mode(s) was (were) found to be the worst case(s) and selected for the final test.

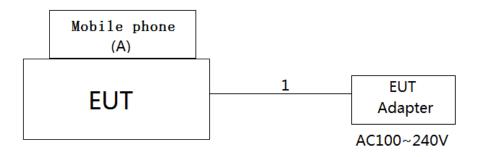
AC power line conducted emissions test		
Final Test Mode	Description	
Mode 1	TX Mode	

Radiated emissions test - Below 1GHz		
Final Test Mode	Description	
Mode 1	TX Mode	

Remark: The EUT has the maximum average output power when the support unit is in low power and being charged by EUT.



2.3 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



2.4 SUPPORT UNITS

Item	Equipment	Mfr/Brand	Model	Series No.
Α	Mobile phone	SAMSUNG	GALAXY S9	N/A

Item	Cable Type	Shielded Type	Ferrite Core	Length	
1	DC Cable	NO	NO	1.8m	



3. AC POWER LINE CONDUCTED EMISSIONS

3.1 LIMIT

Fraguency of Emission (MHz)	Limit (dBμV)				
Frequency of Emission (MHz)	Quasi-peak	Average			
0.15 - 0.5	66 to 56*	56 to 46*			
0.5 - 5.0	56	46			
5.0 - 30.0	60	50			

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

3.2 TEST PROCEDURE

- a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipment powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d. LISN at least 80 cm from nearest part of EUT chassis.
- e. For the actual test configuration, please refer to the related Item EUT Test Photos.

The following table is the setting of the receiver

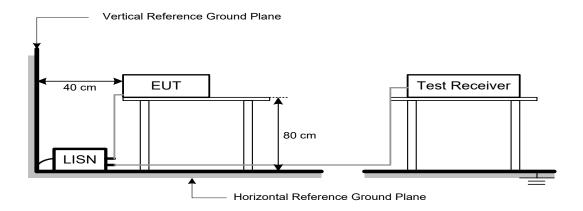
Receiver Parameter	Setting
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

3.3 DEVIATION FROM TEST STANDARD

No deviation.



3.4 TEST SETUP



3.5 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical function (as a customer would normally use it), EUT was programmed to be in continuously transmitting data or hopping on mode.

3.6 TEST RESULTS

Please refer to the APPENDIX A.

Remark:

- (1) All readings are QP Mode value unless otherwise stated AVG in column of <code>Note</code>. If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform in this case, a "*" marked in AVG Mode column of Interference Voltage Measured.
- (2) Measuring frequency range from 150 kHz to 30 MHz.



4. RADIATED EMISSION

4.1 LIMIT

§15.225 (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.

§15.225 (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.

§15.225 (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.

§15.225 (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.

§15.209 (a)

Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

LIMITS OF RADIATED EMISSION MEASUREMENT (9 kHz-1000 MHz)

Frequency	Field Strength	Measurement Distance		
(MHz)	(microvolts/meter)	(meters)		
0.009-0.490	2400/F(kHz)	300		
0.490-1.705	24000/F(kHz)	30		
1.705-30.0	30	30		
30-88	100	3		
88-216	150	3		
216-960	200	3		
Above 960	500	3		

Note:

- (1) The limit for radiated test was performed according to FCC CFR Title 47, Part 15, Subpart C.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).



4.2 TEST PROCEDURE

The test set-up was made in accordance to the general provisions of ANSI C63.10-2013. The Equipment Under Test (EUT) was set up on a non-conductive table in the semi-anechoic chamber. The test was performed at the distance of 3 m between the EUT and the receiving antenna. The radiated emissions measurements were made in a typical installation configuration.

Sweep the whole frequency band through the range from 9 kHz to the 10th harmonic of the carrier, and the emissions less than 20 dB below the permissible value are reported.

During the test, below 30MHz, the center of the loop shall be 1 meters; above 30MHz, the height of receive antenna shall be moved from 1 to 4 meters, and the antenna shall be performed under horizontal and vertical polarization. The turntable shall be rotated from 0 to 360 degrees for detecting the maximum of radiated spurious signal level. The measurements shall be repeated with orthogonal polarization of the test antenna. The data of cable loss and antenna factor has been calibrated in full testing frequency range before the testing.

Spectrum Parameters	Setting
Start ~ Stop Frequency	9 kHz~150 kHz for RBW 200 Hz
Start ~ Stop Frequency	0.15 MHz~30 MHz for RBW 9 kHz
Start ~ Stop Frequency	30 MHz~1000 MHz for RBW 100 kHz

Receiver Parameters	Setting
Start ~ Stop Frequency	9 kHz~90 kHz for PK/AVG detector
Start ~ Stop Frequency	90 kHz~110 kHz for QP detector
Start ~ Stop Frequency	110 kHz~490 kHz for PK/AVG detector
Start ~ Stop Frequency	490 kHz~30 MHz for QP detector
Start ~ Stop Frequency	30 MHz~1000 MHz for QP detector

The radiated emission was measured in the following position: EUT stand-up position (Z axis), lie-down position (X, Y axis). The worst emission was found in stand-up position (Z axis) and the worst case was recorded.

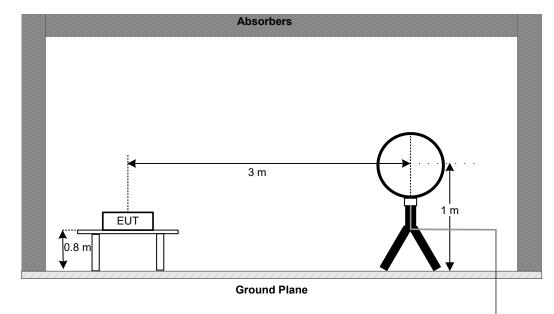
4.3 DEVIATION FROM TEST STANDARD

No deviation.



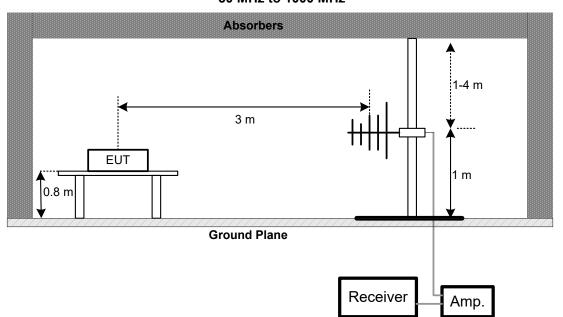
4.4 TEST SETUP

9 kHz to 30 MHz



30 MHz to 1000 MHz

Receiver







4.5 EUT OPERATING CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

4.6 TEST RESULTS - 9 kHz TO 30 MHz

Please refer to the APPENDIX B.

Remark:

- (1) Distance extrapolation factor = 40 log (specific distance / test distance) (dB).
- (2) Limit line = specific limits (dBuV) + distance extrapolation factor.

4.7 TEST RESULTS - 30 MHz TO 1000 MHz

Please refer to the APPENDIX C.



5. MEASUREMENT INSTRUMENTS LIST

	AC Power Line Conducted Emissions							
Item	Calibrated until							
1	EMI Test Receiver	R&S	ESCI	100382	Feb. 28, 2022			
2	LISN	EMCO	3816/2	52765	Feb. 27, 2022			
3	3 TWO-LINE R&S ENV216		101447	Feb. 27, 2022				
4	50Ω Terminator	SHX	TF5-3	15041305	Feb. 27, 2022			
5	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A			
6	Cable	N/A	RG223 12m Ma		Mar. 09, 2022			
7	7 643 Shield Room ETS 6*4*3m		N/A	N/A				

	Radiated Emissions - 9 kHz to 30 MHz							
Item Kind of Equipment Manufacturer Type No.				Serial No.	Calibrated until			
1	1 EMI Test Receiver R&S ESCI		100895	Feb. 27, 2022				
2	2 Antenna EM EM-6876-1		230	Apr. 28, 2022				
3	Cable N/A RG 213/U		RG 213/U	N/A	May 27, 2022			
4	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A			
5	966 Chambe Room	Room RM 9*6*6m		N/A	Jul. 24, 2022			

	Radiated Emissions - 30 MHz to 1000 MHz							
Item Kind of Equipment Manufacturer Type No. Ser					Calibrated until			
1	Antenna	Schwarzbeck	VULB9160	9160-3231	Apr. 14, 2022			
2	Amplifier	HP	8447D	2944A08908	Feb. 28, 2022			
3	Receiver	Agilent	N9038A	MY52130039	Mar. 19, 2022			
4	Cable emci (30MHz-1GHz) (8m+5m)			N/A	May 20, 2022			
5	Controller	CT	SC100	N/A	N/A			
6	Controller MF MF-7802		MF-7802	MF780208416	N/A			
7	Measurement Software	Farad		N/A	N/A			
8	966 Chambe Room	RM	9*6*6m	N/A Jul. 24, 2022				

Remark "N/A" denotes no model name, serial no. or calibration specified.

All calibration period of equipment list is one year.



6. EUT TEST PHOTO



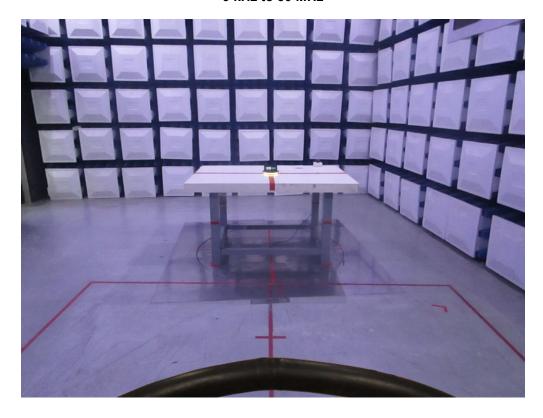






Radiated Measurement Photos

9 kHz to 30 MHz







Radiated Emissions Test Photos

30 MHz to 1000 MHz

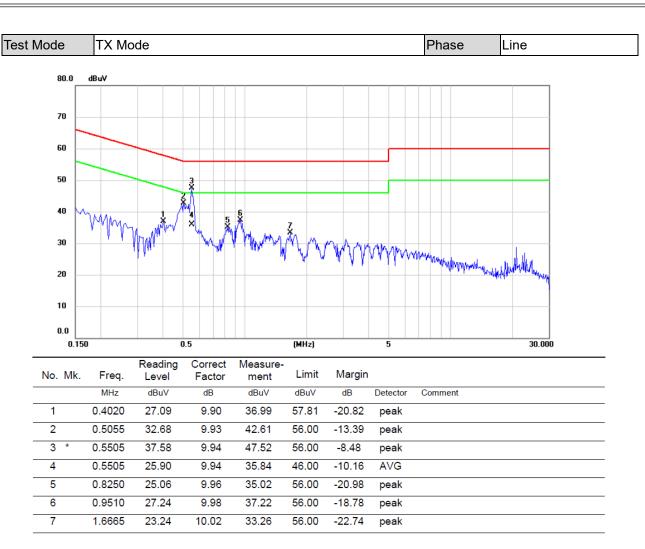






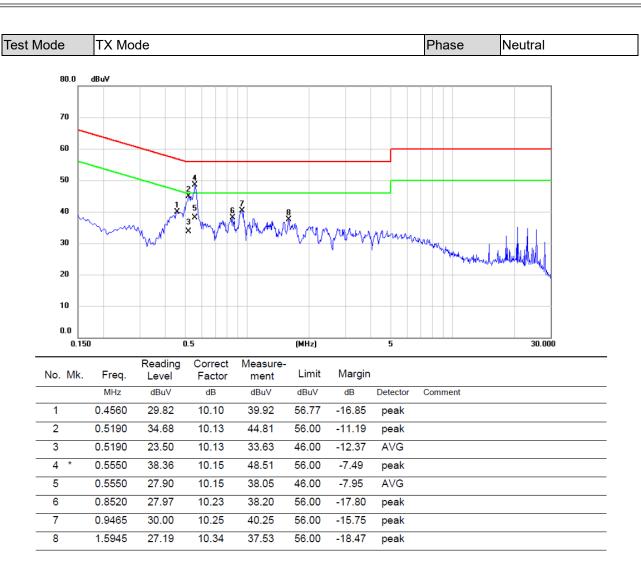
APPENDIX A - AC POWER LINE CONDUCTED EMISSIONS





- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.



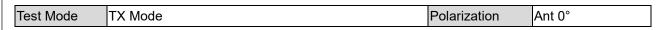


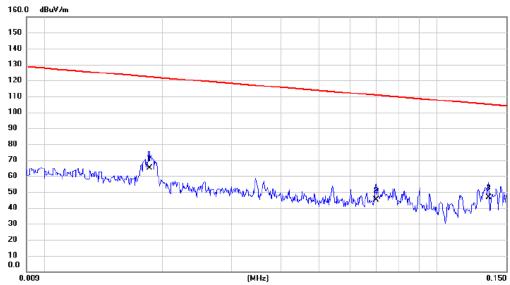
- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.



APPENDIX B - RADIATED EMISSION - 9 KHZ TO 30 MHZ



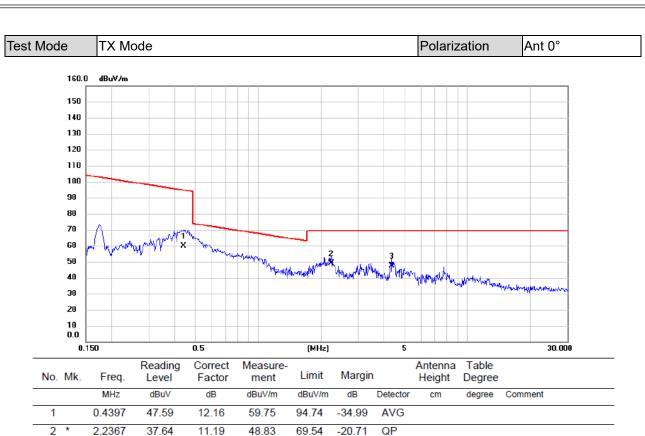




No. Mk.	Freq.	_	Correct Factor	Measure- ment	Limit	Margir	1	Antenna Height		
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1 *	0.0185	51.42	13.68	65.10	122.26	-57.16	AVG			
2	0.0700	32.56	12.54	45.10	110.70	-65.60	AVG			
3	0.1352	33.74	12.73	46.47	104.99	-58.52	AVG			

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.





3

4.3376

36.58

11.00

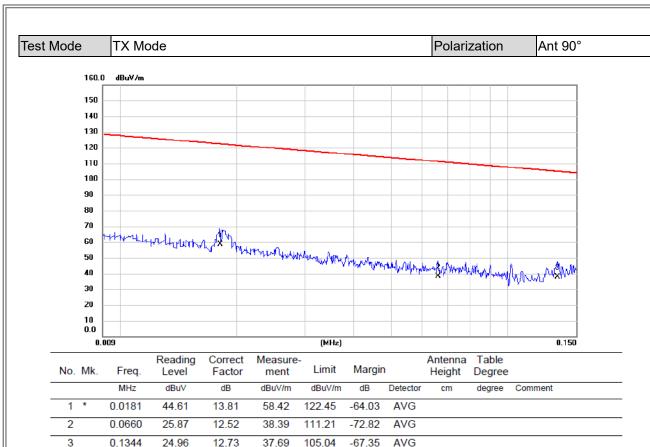
47.58

69.54

-21.96

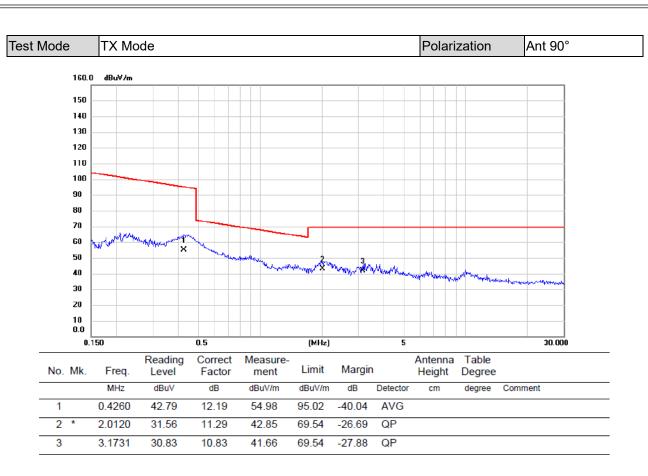
- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.





- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.



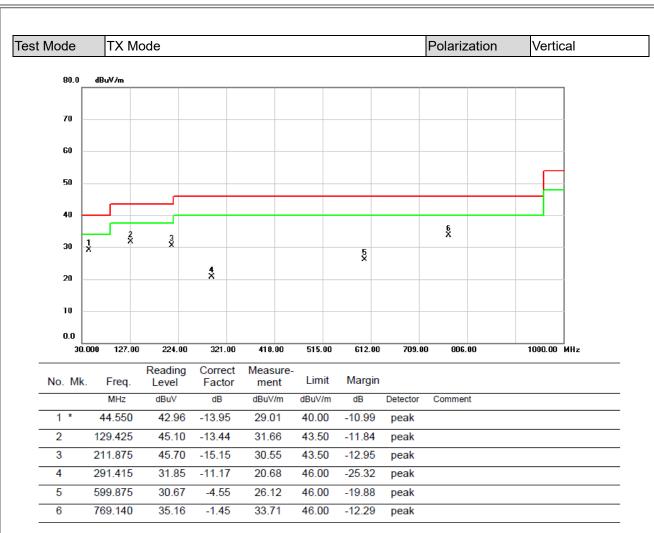


- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.



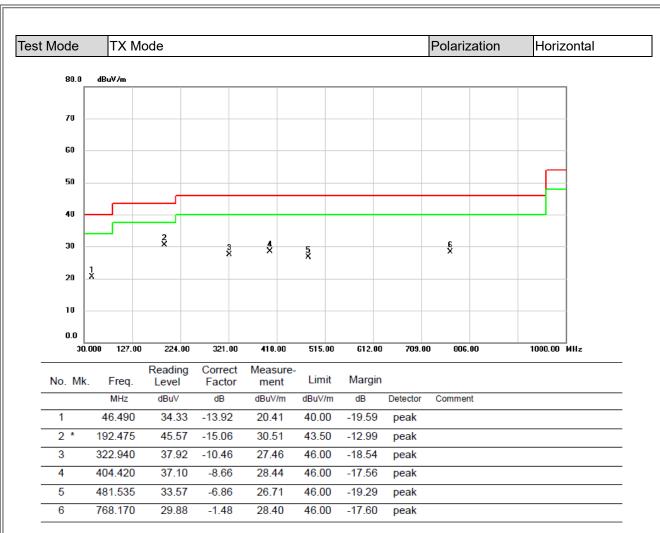
APPENDIX C - RADIATED EMISSION - 30 MHZ TO 1000 MHZ





- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.





- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.

End of Test Report