

# FCC Radio Test Report

## FCC ID: OMO617-148

**This report concerns: Original Grant**

**Project No.** : 1909C108  
**Equipment** : ALARM CLOCK  
**Brand Name** : LA CROSSE  
**Test Model** : 617-148  
**Series Model** : CA79806, CA79806-INT, CA79806vX, CA79806vX-INT, CA79806-XX, CA79806-XX-INT, 617-148-INT, 617-148vX, 617-148vX-INT, 617-148-XX, 617-148-XX-INT (X can be 0~9, 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)  
**Applicant** : La Crosse Technology Ltd.  
**Address** : 2809 Losey Blvd. S. La Crosse Wisconsin 54601 United States  
**Manufacturer** : La Crosse Technology  
**Address** : 2809 Losey Blvd. S. La Crosse Wisconsin 54601 United States  
**Factory** : La Crosse Technology  
**Address** : 2809 Losey Blvd. S. La Crosse Wisconsin 54601 United States  
**Date of Receipt** : Sep. 19, 2019  
**Date of Test** : Sep. 20, 2019~ Sep. 26, 2019  
**Issued Date** : Nov. 04, 2019  
**Report Version** : R01  
**Test Sample** : Engineering Sample No.: DG20190919114  
**Standard(s)** : FCC Part15, Subpart C (15.209)  
ANSI C63.10-2013

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

*Vincent. Tan*

Prepared by : Vincent Tan

*Ethan Ma*

Approved by : Ethan Ma



Certificate #5123.02

Add: No.3, Jinshagang 1st Road, Shixia, Dalang Town, Dongguan, Guangdong, China.

Tel: +86-769-8318-3000

Web: [www.newbtl.com](http://www.newbtl.com)

## 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.

Table of Contents	Page
<b>REPORT ISSUED HISTORY</b>	<b>4</b>
<b>1 . SUMMARY OF TEST RESULTS</b>	<b>5</b>
1.1 TEST FACILITY	6
1.2 MEASUREMENT UNCERTAINTY	6
1.3 TEST ENVIRONMENT CONDITIONS	6
<b>2 . GENERAL INFORMATION</b>	<b>7</b>
2.1 GENERAL DESCRIPTION OF EUT	7
2.2 DESCRIPTION OF TEST MODES	8
2.3 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED	9
2.4 SUPPORT UNITS	9
<b>3 . AC POWER LINE CONDUCTED EMISSIONS TEST</b>	<b>10</b>
3.1 LIMIT	10
3.2 TEST PROCEDURE	10
3.3 DEVIATION FROM TEST STANDARD	10
3.4 TEST SETUP	11
3.5 EUT OPERATING CONDITIONS	11
3.6 TEST RESULTS	11
<b>4 . RADIATED EMISSION TEST</b>	<b>12</b>
4.1 LIMIT	12
4.2 TEST PROCEDURE	12
4.3 DEVIATION FROM TEST STANDARD	12
4.4 TEST SETUP	13
4.5 EUT OPERATING CONDITIONS	13
4.6 TEST RESULT - 9 KHZ TO 30 MHZ	13
4.7 TEST RESULT - 30 MHZ TO 1000 MHZ	13
<b>5 . MEASUREMENT INSTRUMENTS LIST</b>	<b>14</b>
<b>6 . EUT TEST PHOTO</b>	<b>15</b>
<b>APPENDIX A - AC POWER LINE CONDUCTED EMISSIONS</b>	<b>18</b>
<b>APPENDIX B - RADIATED EMISSION - 9 KHZ TO 30 MHZ</b>	<b>21</b>
<b>APPENDIX C - RADIATED EMISSION - 30 MHZ TO 1000 MHZ</b>	<b>26</b>

**REPORT ISSUED HISTORY**

Report Version	Description	Issued Date
R00	Original Issue.	Oct. 11, 2019
R01	Changed series model name.	Nov. 04, 2019

## 1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standard(s):

FCC Part15, Subpart C (15.209)				
Standard(s) Section	Test Item	Test Result	Judgment	Remark
15.207	AC Power Line Conducted Emissions	APPENDIX A	PASS	-----
15.209(a)	Radiated Emissions	APPENDIX B APPENDIX C	PASS	-----

NOTE:

(1) "N/A" denotes test is not applicable to this device.

## 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 Road, Shixia, Dalang Town, Dongguan, Guangdong, 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 Measurement:

Test Site	Method	Measurement Frequency Range	U, (dB)
DG-C02	CISPR	150 kHz ~ 30 MHz	2.32

B. Radiated emissions Measurement:

Test Site	Method	Measurement Frequency Range	Ant. H / V	U, (dB)
DG-CB03	CISPR	9kHz ~ 30MHz	V	3.79
		9kHz ~ 30MHz	H	3.57
		30MHz ~ 200MHz	V	4.88
		30MHz ~ 200MHz	H	4.14
		200MHz ~ 1,000MHz	V	4.62
		200MHz ~ 1,000MHz	H	4.80
		1GHz ~ 6GHz	-	4.58
		6GHz ~ 18GHz	-	5.18
		18GHz ~ 26.5GHz	-	3.80
		26.5GHz ~ 40GHz	-	4.30

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	Robin Zhuang
Radiated Emissions	25°C	60%	AC 120V/60Hz	Laughing Zhang

## 2. GENERAL INFORMATION

### 2.1 GENERAL DESCRIPTION OF EUT

Equipment	ALARM CLOCK
Brand Name	LA CROSSE
Test Model	617-148
Series Model	CA79806, CA79806-INT, CA79806vX, CA79806vX-INT, CA79806-XX, CA79806-XX-INT, 617-148-INT, 617-148vX, 617-148vX-INT, 617-148-XX, 617-148-XX-INT
Model Difference(s)	X can be 0~9, 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
Power Source	DC Voltage supplied from AC/DC 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

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
CH01	110kHz~205kHz

## 2.2 DESCRIPTION OF TEST MODES

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

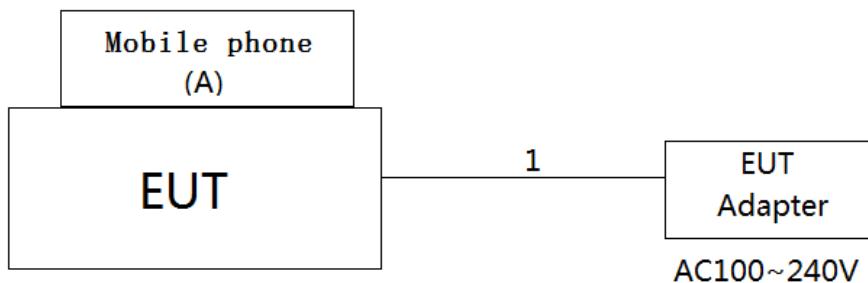
Pretest Mode	Description
Mode 1	TX Mode

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

<b>AC power line conducted emissions test</b>	
Final Test Mode	Description
Mode 1	TX Mode

<b>Radiated emissions test</b>	
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	Brand	Model No.	Series No.
A	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 TEST

#### 3.1 LIMIT

Frequency of Emission (MHz)	Limit (dB $\mu$ V)	
	Quasi-peak	Average
0.15 - 0.50	66 to 56*	56 to 46*
0.50 - 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.

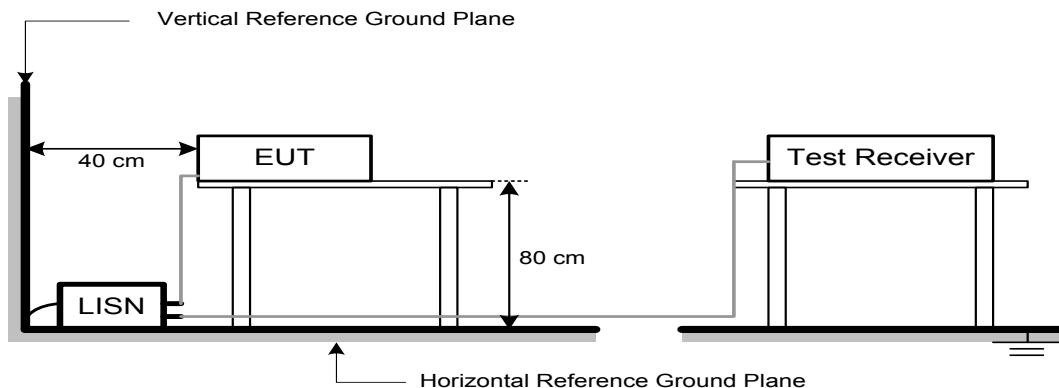
#### 3.2 TEST PROCEDURE

- 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.

#### 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 fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

### 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 **Note**. 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 TEST

### 4.1 LIMIT

In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

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

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (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 PART 15C.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

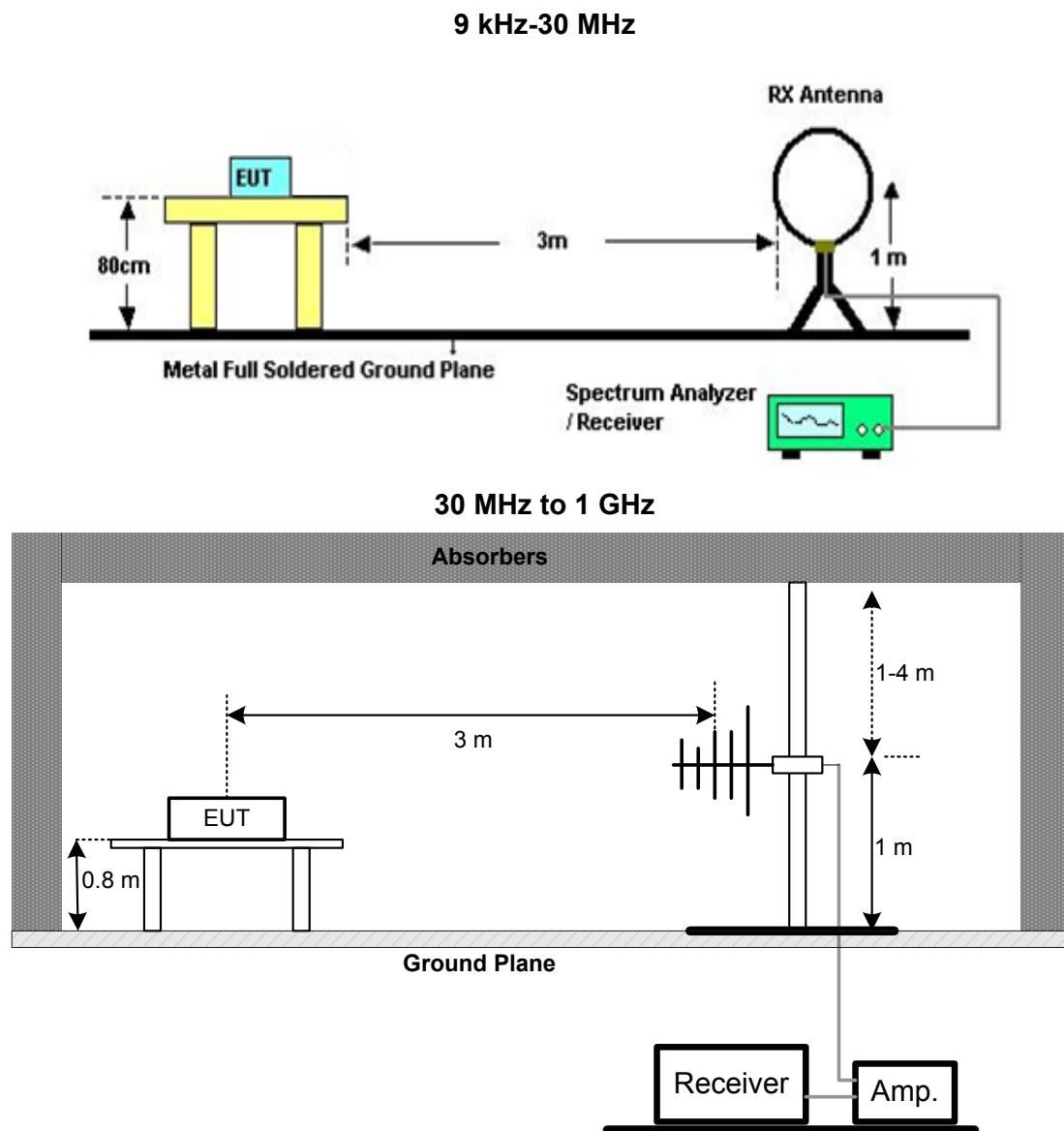
### 4.2 TEST PROCEDURE

- a. The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1 GHz)
- b. The height of the equipment or of the substitution antenna shall be 0.8m or 1.5m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- c. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights find the maximum reading (used Bore sight function).
- d. The initial step in collecting radiated emission data is a receiver peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- e. All readings are Peak unless otherwise stated QP in column of Note. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform. (below 1 GHz)
- f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

### 4.3 DEVIATION FROM TEST STANDARD

No deviation.

#### 4.4 TEST SETUP



#### 4.5 EUT OPERATING CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

#### 4.6 TEST RESULT - 9 kHz TO 30 MHz

Please refer to the APPENDIX B

Remark:

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

#### 4.7 TEST RESULT - 30 MHz TO 1000 MHz

Please refer to the APPENDIX C.

**5. MEASUREMENT INSTRUMENTS LIST**

<b>AC Power Line Conducted Emissions</b>					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	EMI Test Receiver	R&S	ESCI	100382	Mar. 10, 2020
2	LISN	EMCO	3816/2	52765	Mar. 10, 2020
3	50ohm Terminator	SHX	TF5-3	15041305	Mar. 10, 2020
4	Artificial-Mains Network	Schwarzbeck	NSLK 8127	8127685	Mar. 10, 2020
5	TRANSIENT LIMITER	EM	EM-7600	772	Mar. 10, 2020
6	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A
7	Cable	N/A	RG223	12m	Mar. 12, 2020

<b>Radiated Emissions - 9 kHz to 30 MHz</b>					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Loop Antenna	EM	EM-6876-1	230	Jan. 15, 2020
2	Cable	N/A	RG 213/U	C-102	May 31, 2020
3	EMI Test Receiver	R&S	ESCI	100895	Mar. 10, 2020
4	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A

<b>Radiated Emissions - 30 MHz to 1 GHz</b>					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Antenna	Schwarzbeck	VULB9160	9160-3232	Mar. 09, 2020
2*	Amplifier	HP	8447D	2944A09673	Aug. 11, 2021
3	Receiver	Agilent	N9038A	MY52130039	Aug. 03, 2020
4	Cable	emci	LMR-400(30MHz-1GHz)(8m+5m)	N/A	May 24, 2020
5	Controller	CT	SC100	N/A	N/A
6	Controller	MF	MF-7802	MF780208416	N/A
7	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A

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

\*\* calibration period of equipment list is three year.

Except \* item, all calibration period of equipment list is one year.

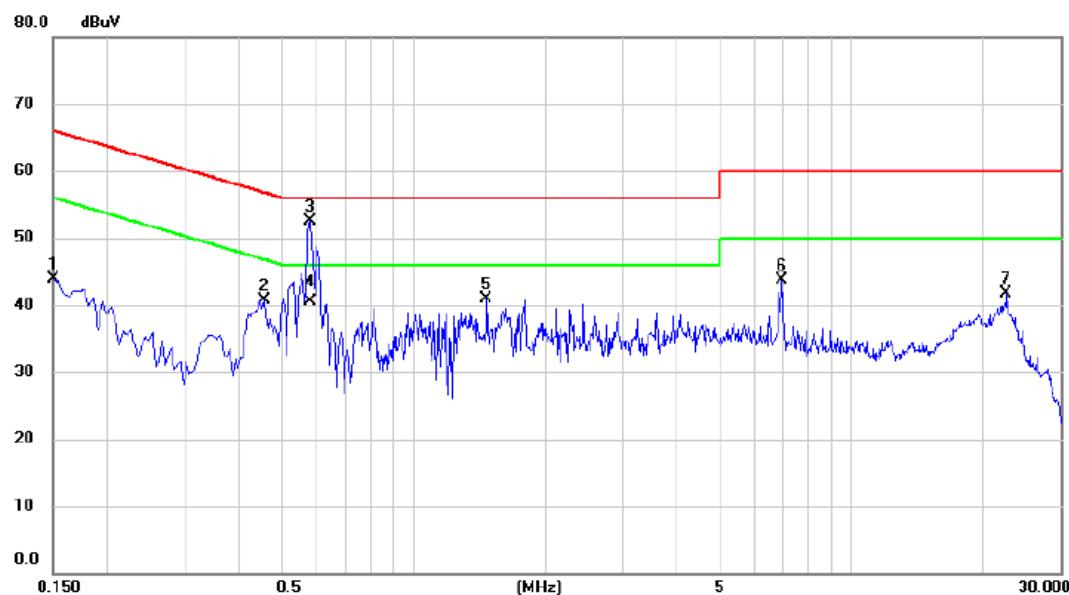
**6. EUT TEST PHOTO****AC Power Line Conducted Emissions Test Photos**

**Radiated Measurement Photos****9 kHz to 30 MHz**

**Radiated Emissions Test Photos****30 MHz to 1000 MHz**

## APPENDIX A - AC POWER LINE CONDUCTED EMISSIONS

Test Mode: TX Mode

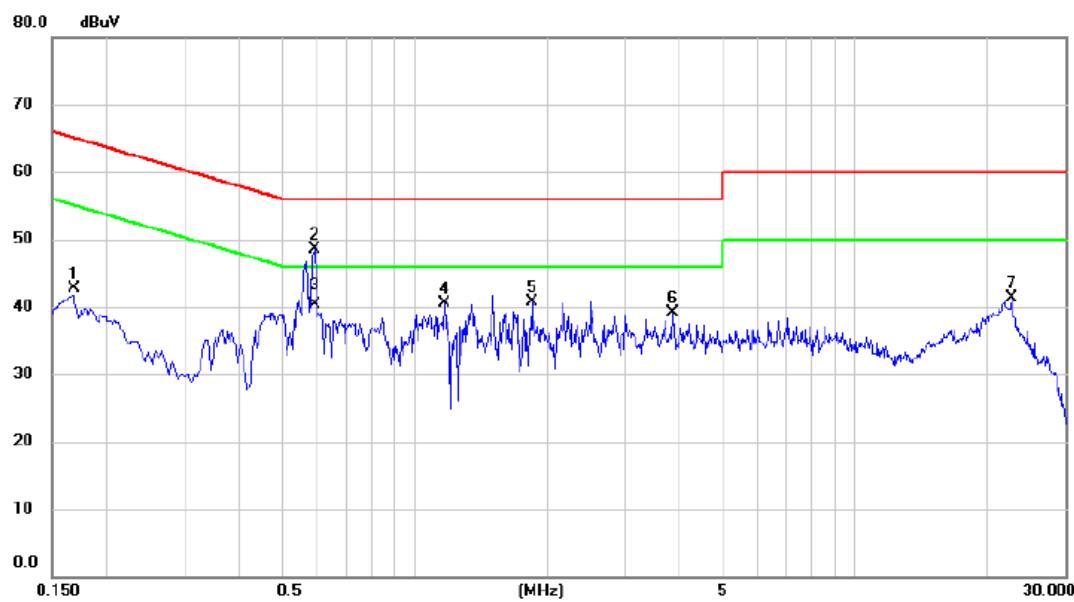
**Line**

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.150	34.05	9.82	43.87	66.00	-22.13	peak	
2		0.456	30.79	9.87	40.66	56.77	-16.11	peak	
3 *		0.582	42.55	9.89	52.44	56.00	-3.56	peak	
4		0.582	30.70	9.89	40.59	46.00	-5.41	AVG	
5		1.468	30.96	9.95	40.91	56.00	-15.09	peak	
6		6.936	33.47	10.32	43.79	60.00	-16.21	peak	
7		22.601	30.62	11.16	41.78	60.00	-18.22	peak	

**REMARKS:**

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

Test Mode: TX Mode

**Neutral**

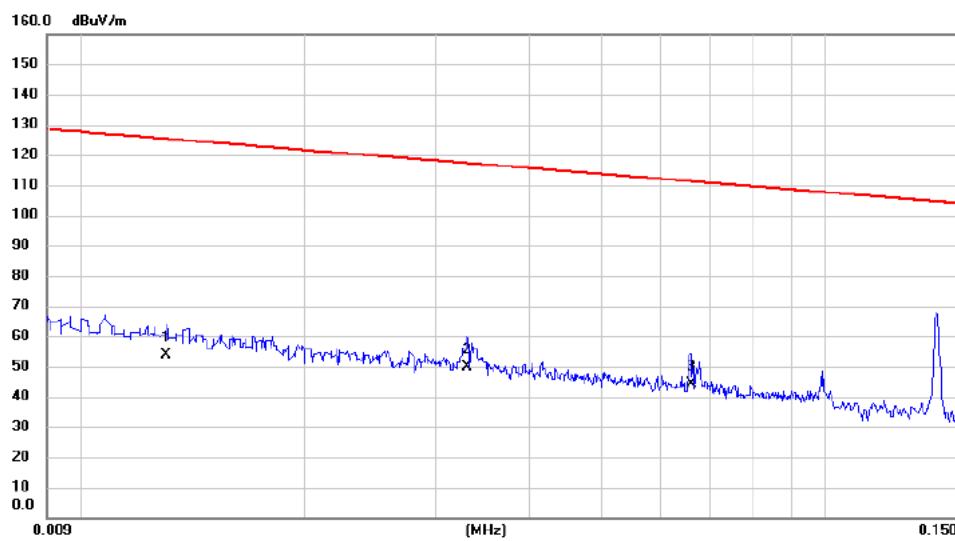
No.	Mk.	Freq. MHz	Reading Level	Correct Factor	Measure- ment	Limit dBuV	Margin dB	Detector	Comment
			dBuV	dB	dBuV				
1		0.168	32.71	9.91	42.62	65.06	-22.44	peak	
2		0.591	38.40	10.04	48.44	56.00	-7.56	peak	
3 *		0.591	30.31	10.04	40.35	46.00	-5.65	AVG	
4		1.171	30.29	10.13	40.42	56.00	-15.58	peak	
5		1.847	30.54	10.18	40.72	56.00	-15.28	peak	
6		3.853	28.75	10.31	39.06	56.00	-16.94	peak	
7		22.619	29.87	11.48	41.35	60.00	-18.65	peak	

**REMARKS:**

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

**APPENDIX B - RADIATED EMISSION - 9 KHZ TO 30 MHZ**

Test Mode: TX Mode

**Ant 0°**

No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin	
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector Comment
1	0.0130	37.82	15.92	53.74	125.33	-71.59	AVG
2	0.0330	35.86	13.87	49.73	117.23	-67.50	AVG
3 *	0.0660	30.44	13.67	44.11	111.21	-67.10	AVG

**REMARKS:**

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

Test Mode: TX Mode

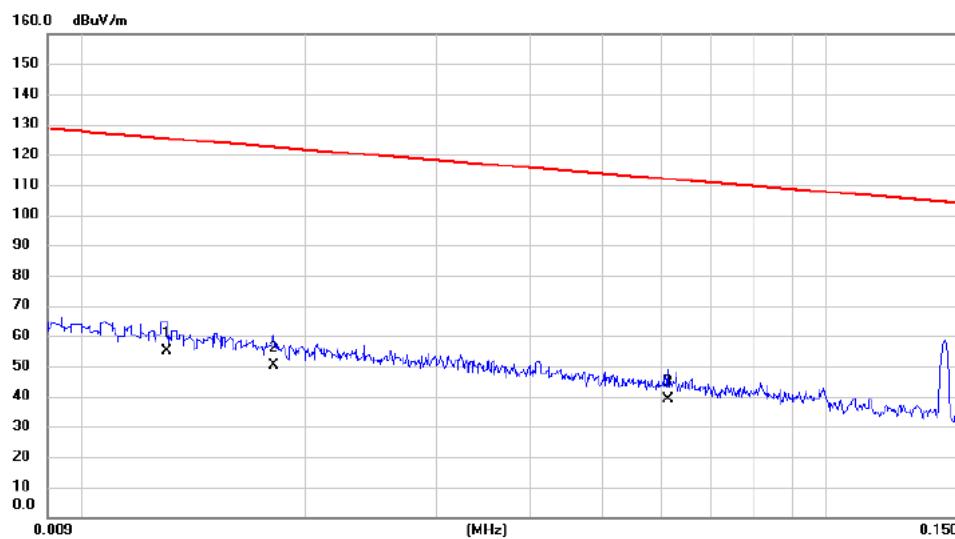
**Ant 0°**

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector Comment
1		0.2788	30.42	13.59	44.01	98.70	-54.69	AVG
2	*	0.8664	37.68	12.54	50.22	68.85	-18.63	QP
3		1.9284	36.28	11.86	48.14	69.54	-21.40	QP

**REMARKS:**

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

Test Mode: TX Mode

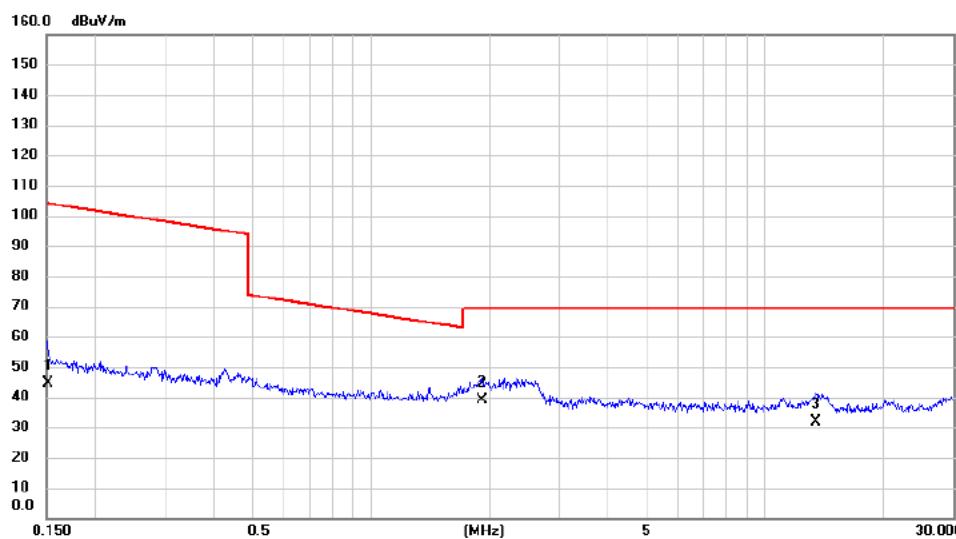
**Ant 90°**

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin	Detector	Comment
			Level	Factor	ment				
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1	*	0.0130	39.02	15.92	54.94	125.33	-70.39	AVG	
2		0.0181	35.73	14.39	50.12	122.45	-72.33	AVG	
3		0.0613	25.40	13.75	39.15	111.86	-72.71	AVG	

**REMARKS:**

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

Test Mode: TX Mode

**Ant 90°**

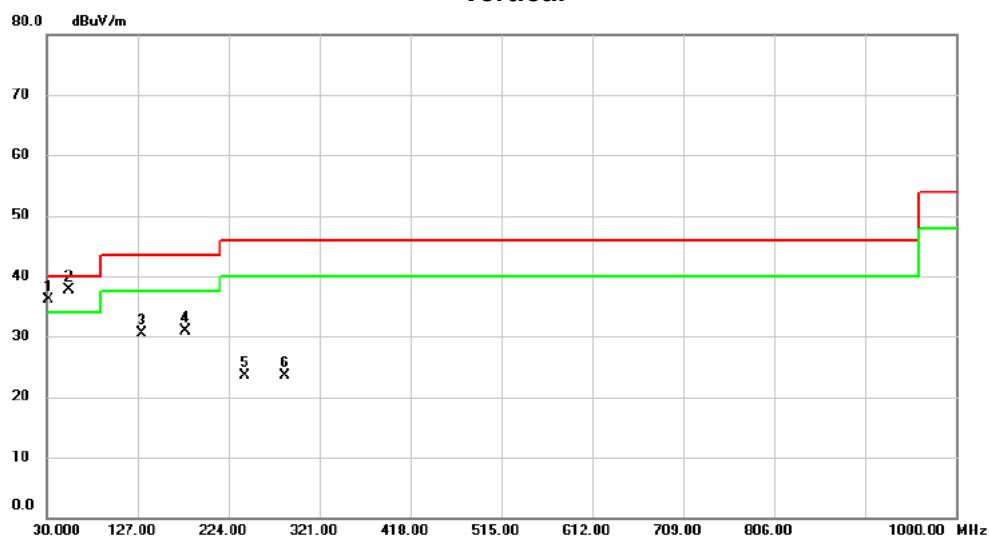
No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin		
			Level	Factor	ment				
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		0.1514	31.24	13.56	44.80	104.00	-59.20	AVG	
2	*	1.9180	27.14	11.87	39.01	69.54	-30.53	QP	
3		13.4792	20.35	11.59	31.94	69.54	-37.60	QP	

**REMARKS:**

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

**APPENDIX C - RADIATED EMISSION - 30 MHZ TO 1000 MHZ**

Test Mode: TX Mode

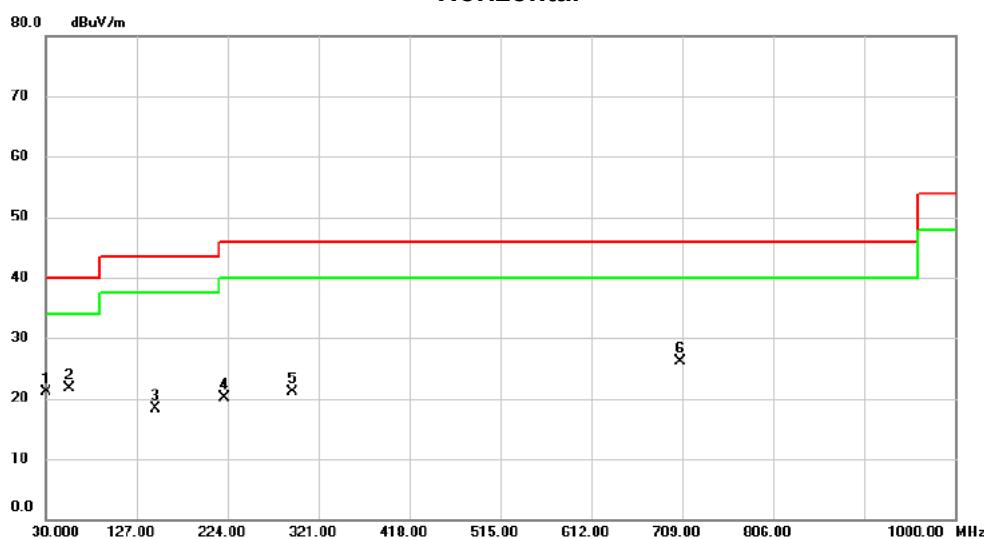
**Vertical**

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin		
			Level	Factor	ment		dB	dBuV/m	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	!	32.425	51.03	-14.86	36.17	40.00	-3.83	peak	
2	*	54.250	51.64	-13.92	37.72	40.00	-2.28	peak	
3		131.850	43.47	-13.01	30.46	43.50	-13.04	peak	
4		177.925	43.82	-12.98	30.84	43.50	-12.66	peak	
5		240.975	37.57	-13.97	23.60	46.00	-22.40	peak	
6		284.140	35.77	-12.33	23.44	46.00	-22.56	peak	

**REMARKS:**

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

Test Mode: TX Mode

**Horizontal**

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin	Detector	Comment
			Level	Factor	ment				
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1		30.000	36.06	-15.01	21.05	40.00	-18.95	peak	
2 *		54.735	35.62	-13.95	21.67	40.00	-18.33	peak	
3		147.370	30.67	-12.44	18.23	43.50	-25.27	peak	
4		221.090	34.61	-14.60	20.01	46.00	-25.99	peak	
5		292.870	32.98	-11.82	21.16	46.00	-24.84	peak	
6		707.060	30.09	-3.95	26.14	46.00	-19.86	peak	

**REMARKS:**

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

**End of Test Report**