



FCC Radio Test Report
FCC ID: OMOLTV-BBQ1
This report concerns (check one): ⊠Original Grant
Project No.: 1901C026Equipment: La Crosse View BBQ sensorModel Name: LTV-BBQ1Series Models: LTV-BBQ1-INT, LTV-BBQ1vX, LTV-BBQ1vX-INT, LTV-BBQ1-XX, LTV-BBQ1-XX-INTApplicant: La Crosse Technology Ltd.Address: 2809 Losey Blvd. S. La Crosse Wisconsin 54601 United States.
Date of Receipt       :       Jan. 07, 2019         Date of Test       :       Jan. 07, 2019 ~ Jan. 10, 2019         Issued Date       :       Jan. 21, 2019         Tested by       :       BTL Inc.
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Certificate #5123.02
port No.:BTL-FCCP-1-1901C026 Page 1 of



#### 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).

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**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.



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# **REPORT ISSUED HISTORY**

Report Version	Description Issued Date	
R00	Original Issue Jan. 17, 201	
R01	Modified the type error on page 32 and 33. Jan. 21, 20	



# **1. GENERAL SUMMARY**

Equipment Brand Name Model Name Series Models	<ul> <li>La Crosse View BBQ sensor</li> <li>LA CROSSE TECHNOLOGY</li> <li>LTV-BBQ1</li> <li>LTV-BBQ1-INT, LTV-BBQ1vX, LTV-BBQ1vX-INT, LTV-BBQ1-XX, LTV-BBQ1-XX-INT</li> </ul>
Applicant Manufacturer Address Factory Address Date of Test Test Sample Standard(s)	<ul> <li>La Crosse Technology Ltd.</li> <li>La Crosse Technology</li> <li>2809 Losey Blvd. S. La Crosse Wisconsin 54601 United States La Crosse Technology</li> <li>2809 Losey Blvd. S. La Crosse Wisconsin 54601 United States</li> <li>Jan. 07, 2019 ~ Jan. 10, 2019</li> <li>Engineering Sample No: D190100097</li> <li>FCC Part15, Subpart C(15.249)/ ANSI C63.10-2013</li> </ul>

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

The test data, data evaluation, and equipment configuration contained in our test report (Ref No. BTL-FCCP-1-1901C026) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of A2LA according to the ISO/IEC 17025 quality assessment standard and technical standard(s).

# 2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standard(s):

FCC Part15, Subpart C (15.249)				
StandardSection Test Item Judgment R				
15.207	15.207 Conducted Emission			
15.209 15.249	Radiated Spurious Emission	PASS		
-	Bandwidth	PASS		

NOTE:

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

(2) EUT is used new battery.



#### 2.1 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

# 2.2 MEASUREMENT UNCERTAINTY

The measurement uncertainty figures shall be calculated according the methods described in the ETSI TR 100 028 and shall correspond to an expansion factor (coverage factor) k=1.96 or k=2(which provide confidence levels of respectively 90% and 95.45% in the case where the distributions characterizing the actual measurement uncertainties are normal (Gaussian)). Measurement Uncertainty for a Level of Confidence of 95 %, U=2xUc(y).

The BTL measurement uncertainty as below table:

Test Site	Method	Measurement Frequency Range	Ant. H / V	U, (dB)
		9 kHz~30 MHz	V	3.79
		9 kHz~30 MHz	Н	3.57
		30 MHz~200 MHz	V	3.82
	03 CISPR	30 MHz~200 MHz	H	3.60
DG-CB03		200 MHz~1,000 MHz	V	3.86
DG-CB03		200 MHz~1,000 MHz	H	3.94
		1 GHz~18 GHz	V	3.12
		1 GHz~18 GHz	H	3.68
		18 GHz~40 GHz	V	4.15
		18 GHz~40 GHz	Н	4.14

#### A. Radiated Measurement:

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



# **3.GENERAL INFORMATION**

### 3.1 GENERAL DESCRIPTION OF EUT

Equipment	La Crosse View BBQ sensor		
Brand Name	LA CROSSE TECHNOLOGY		
Model Name	LTV-BBQ1		
Series Model	LTV-BBQ1-INT, LTV-BBQ1vX, LTV-BBQ1vX-INT, LTV-BBQ1-XX, LTV-BBQ1-XX-INT		
Model Difference	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. These differences do not affect the RF function.		
	Operation Frequency	915 MHz	
Product Description	Modulation Technology	FSK	
	Data rate	9.6bps	
	Field Strength	72.71dBuV/m	
PowerSource	2*AAA Battery supplied		
Power Rating	DC 3V		

#### Note:

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

### 2. Channel List:

Channe	Frequency (MHz)
01	915

#### Table for Filed Antenna:

3.	Ant.	Manufacturer	Model Name	Antenna Type	Connector	Gain (dBi)
	1	N/A	N/A	PCB	N/A	0



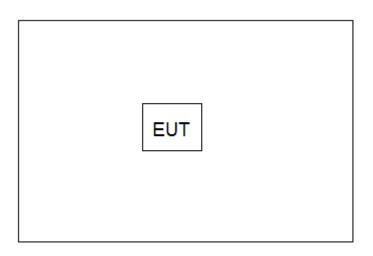
### 3.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generated from EUT, the test system was pre-scanning tested based on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description	
Mode 1	TX Mode	

Final Test Mode	Description
Mode 1	TX Mode

#### 3.3 BLOCKDIAGRAMSHOWINGTHECONFIGURATIONOFSYSTEMTESTED



#### 3.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.
-	-	-	-	-

Item	Shielded Type	Ferrite Core	sLength	Note
-	-	-	-	-

# 4. EMC EMISSION TEST

#### 4.1 RADIATED EMISSION MEASUREMENT

#### 4.1.1 RADIATED EMISSION LIMITS (FCC 15.209 and 15.249)

Frequencies (MHz)	Field Strength (micorvolts/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
960~1000	500	3

Harmonic emissions limits comply with below 54dBuV/m at 3m. Other emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or comply with the radiated emissions limits specified in section15.209(a) limit in the table below has to be followed.

Fundamental Frequency	Field Strength of Fundamental (micorvolts/meter)	Field Strength of Harnibucs (micorvolts/meter)		
902-928 MHz	50	500		

#### LIMITS OF RADIATED EMISSION MEASUREMENT (FCC 15.209)

FREQUENCY (MHz)	(dBuV/m) (at 3m)				
FREQUENCT (MITZ)	PEAK	AVERAGE			
Above 1000	74	54			

Notes:

(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).

Spectrum Parameter	Setting		
Attenuation	Auto		
Start Frequency	1000 MHz		
Stop Frequency	10th carrier harmonic		

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



#### DWELL TIME OF PERIODIC OPERATION MEASUREMENT

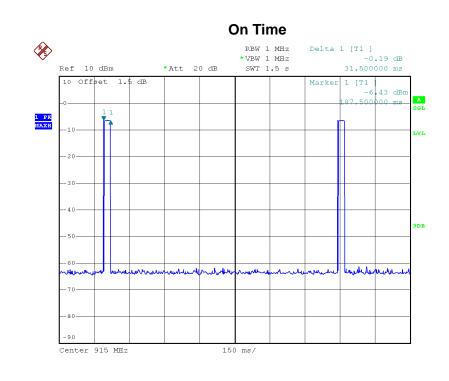
Duty Cycle = On Time/Total Time

T<sub>ON</sub>: 31.50 ms

T<sub>Total</sub>: 100 ms

Duty cycle=31.50/100= 31.5%

Average Reading = Peak value + 20log(Duty cycle) , AV=Peak-10.03



Date: 10.JAN.2019 19:38:53



## 4.1.2 TESTPROCEDURE

- 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 1GHz)
- b. The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 1.5 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. (above 1GHz)
- c. The height of the equipment or of the substitution antenna shall be 0.8 m 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.
- d. 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).
- e. The receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1GHz.
- f. 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.
- g. 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 1GHz)
- h. All readings are Peak Mode value unless otherwise stated AVG in column of Note. If the Peak Mode Measured value compliance with the Peak Limits and lower than AVG Limits, the EUT shall be deemed to meet both Peak & AVG Limits and then only Peak Mode was measured, but AVG Mode didn't perform. (above 1GHz)
- i. For the actual test configuration, please refer to the related Item -EUT Test Photos.

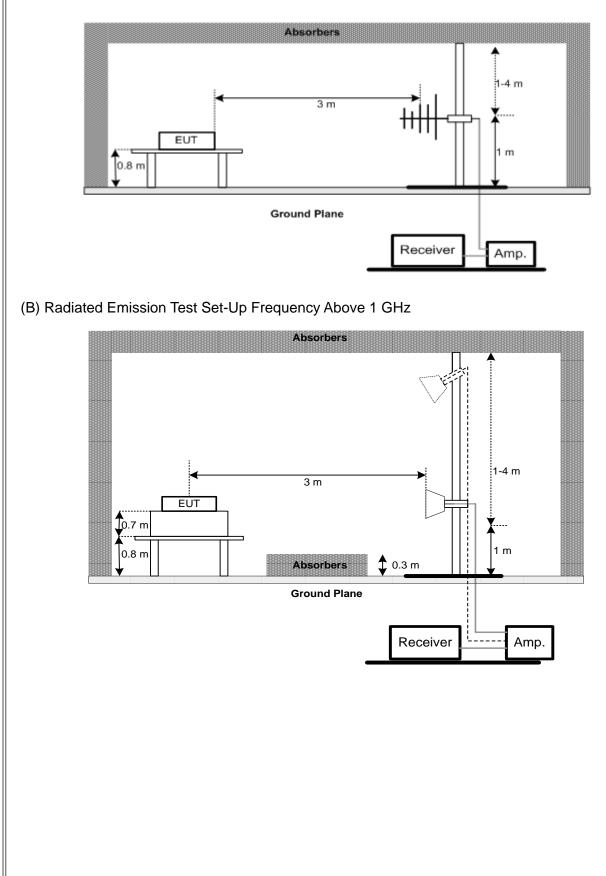
#### 4.1.3 DEVIATIONFROMTESTSTANDARD

No deviation



# 4.1.4 TESTSETUP

(A) Radiated Emission Test Set-Up Frequency Below 1 GHz





# 4.1.5EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 4.1.5 unless otherwise a special operating condition is specified in the follows during the testing.

# 4.1.6 EUT TEST CONDITIONS

Temperature: 25°C Relative Humidity: 60% Test Voltage: DC 3V

#### 4.1.7 TEST RESULTS (BELOW 30MHz)

Please refer to the Appendix A.

Remark:

- (1) The amplitude of spurious emissions which are attenuated by more than 20 dB below the permissible value has no need to be reported.
- (2) Distance extrapolation factor = 40 log (specific distance / test distance) (dB);.
- (3) Limit line = specific limits (dBuV) + distance extrapolation factor.

#### 4.1.8 TEST RESULTS (30 TO 1000 MHz)

Please refer to the Appendix B

### 4.1.9 TEST RESULTS(ABOVE1000 MHz)

Please refer to the Appendix C

Remark:

- (1) EUT Orthogonal Axis:
  - "X" denotes Laid on Table ; "Y" denotes Vertical Stand ; "Z" denotes Side Stand
- (2) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna



# 5. BANDWIDTH TEST

#### 5.1 TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- b. Spectrum Setting: RBW= 3kHz, VBW=3kHz, Sweep time = Auto.

#### 5.2 DEVIATION FROM STANDARD

No deviation.

#### 5.3 TEST SETUP



#### 5.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 4.1.5 unless otherwise a special operating condition is specified in the follows during the testing.

#### 5.5 EUT TEST CONDITIONS

Temperature: 24.8°C Relative Humidity: 63% Test Voltage: DC 3V

#### 5.6 TEST RESULTS

Please refer to the Appendix D

	Radiated Emissions - 9 kHz to 30 MHz									
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until					
1 Loop Antenna EM		EM-6876-1	230	Feb. 07, 2019						
2	Cable	emci	EMC80-NM-NM-12 000(9KHz-1GHz)	N/A	N/A					
3	EMI Test Receiver	R&S	ESCI	100382	Mar. 11, 2019					
4	4 Measurement Software Farad		EZ-EMC Ver.NB-03A1-01	N/A	N/A					

# 6. MEASUREMENT INSTRUMENTS LIST AND SETTING

	Radiated Emissions - 30 MHz to 1 GHz									
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until					
1	Antenna Schwarzbeck		VULB9160	9160-3232	Mar. 11, 2019					
2	2 Amplifier HP		8447D	2944A08908	Mar. 11, 2019					
3	Receiver Agilent		N9038A	MY52130039	Aug. 11, 2019					
4	Cable emci		LMR-400(30MHz-1 GHz)(8m+5m)	N/A	May 25, 2019					
5	Controller	СТ	SC100	N/A	N/A					
6	Controller	MF	MF-7802	MF780208416	N/A					
7	7 Measurement Software Farad		EZ-EMC Ver.NB-03A1-01	N/A	N/A					

	Radiated Emissions - Above 1 GHz										
Item Kind of Equipment		Manufacturer	Type No.	Serial No.	Calibrated until						
1	Double Ridged Guide Antenna	ETS	3115	75789	Mar. 11, 2019						
2	Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170319	Jun. 30, 2019						
3	Amplifier	Amplifier Agilent		3008A02274	Mar. 11, 2019						
4	Microwave Preamplifier With Adaptor		EMC2654045	980039 & HA01	Mar. 11, 2019						
5	Receiver	Agilent	N9038A	MY52130039	Aug. 11, 2019						
6	Controller	СТ	SC100	N/A	N/A						
7	Controller	MF	MF-7802	MF780208416	N/A						
8	Cable	mitron	B10-01-01-12M	18072744	Jul. 30, 2019						
9	9 Measurement Software Farad		EZ-EMC Ver.NB-03A1-01	N/A	N/A						
		Farad		N/A	N/A						





	Bandwidth									
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until					
1	Spectrum Analyzer	R&S	FSP40	100185	Aug. 11, 2019					
			EMC104-SM-SM-							
2	Test Cable	emci	9000(0.01GHz -	C-100	N/A					
			26.5GHz)							

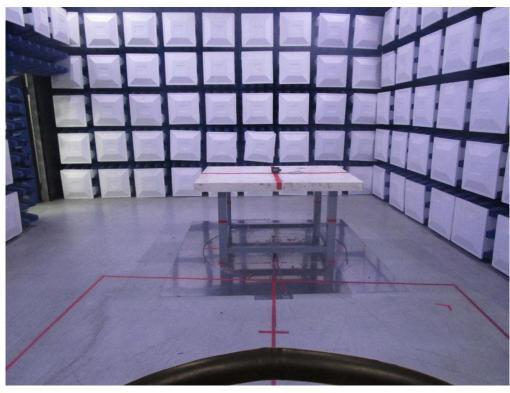
Remark: "N/A" denotes no model name, serial no. or calibration specified. All calibration period of equipment list is one year.

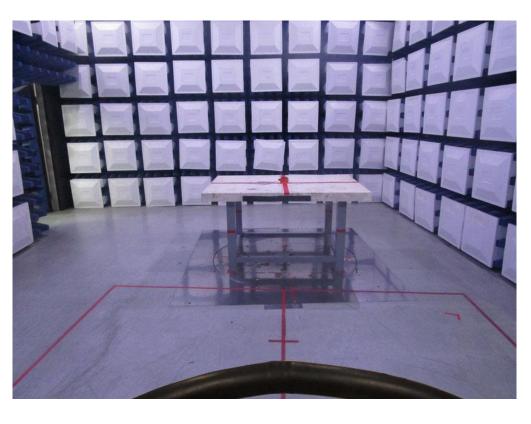


# 7. EUT TEST PHOTO

### **Radiated Measurement Photos**

9KHz to 30MHz





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## **Radiated Measurement Photos**

30MHz to 1000MHz

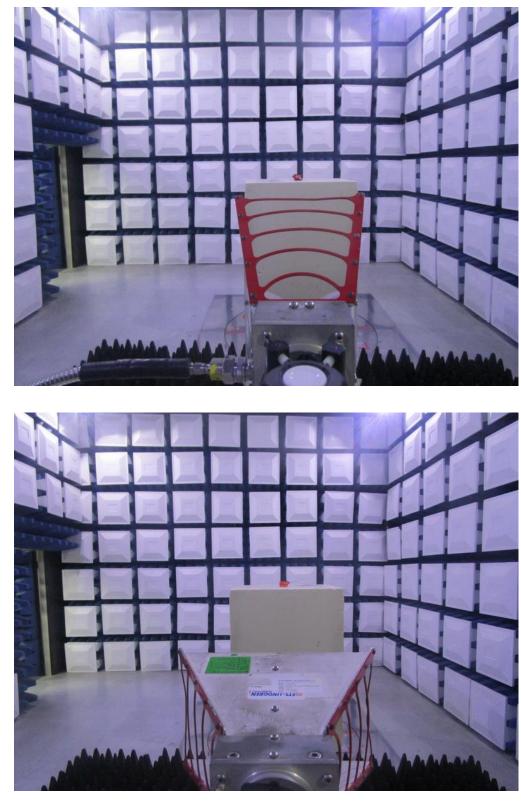






# **Radiated Measurement Photos**

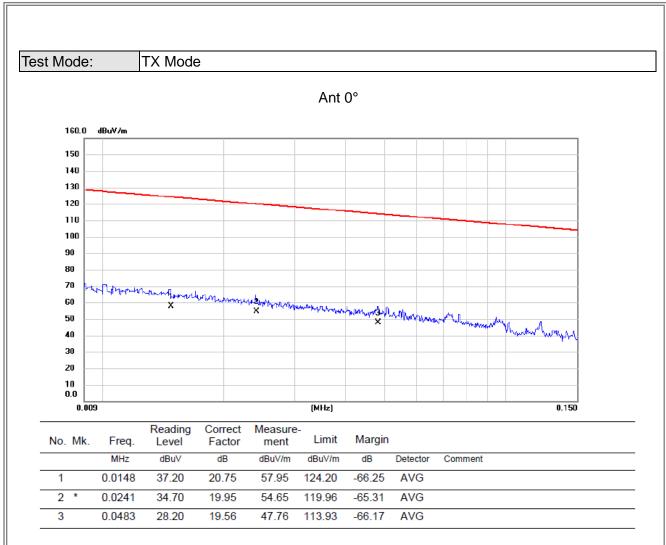
Above 1000MHz



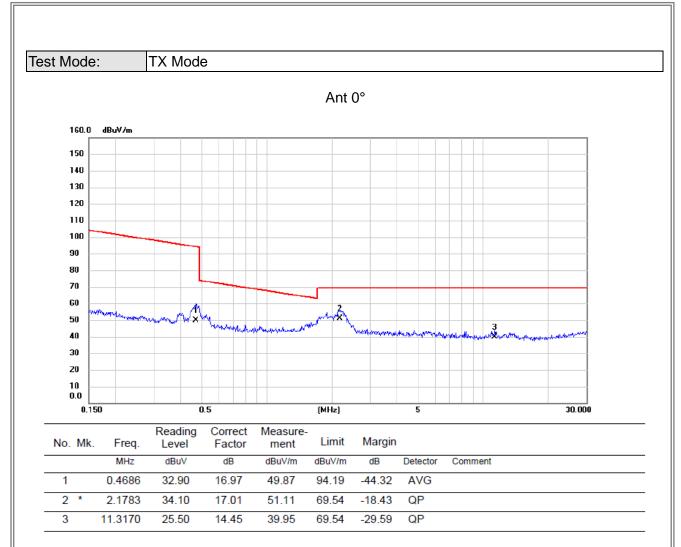


# **APPENDIX A -RADIATED EMISSION (9KHZ to 30MHZ)**

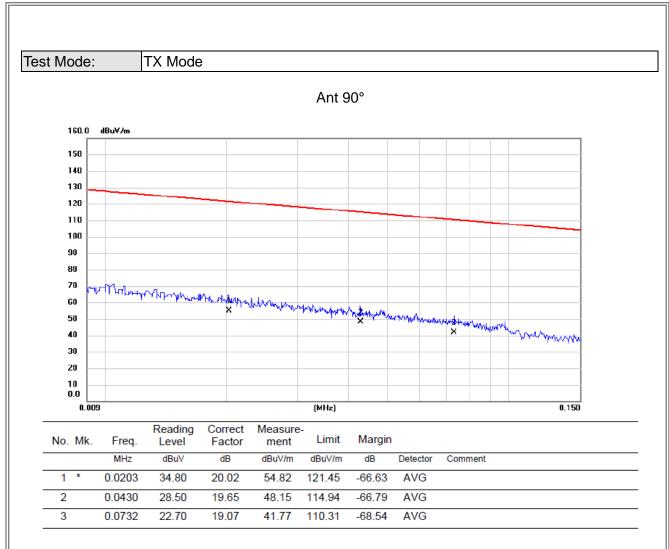




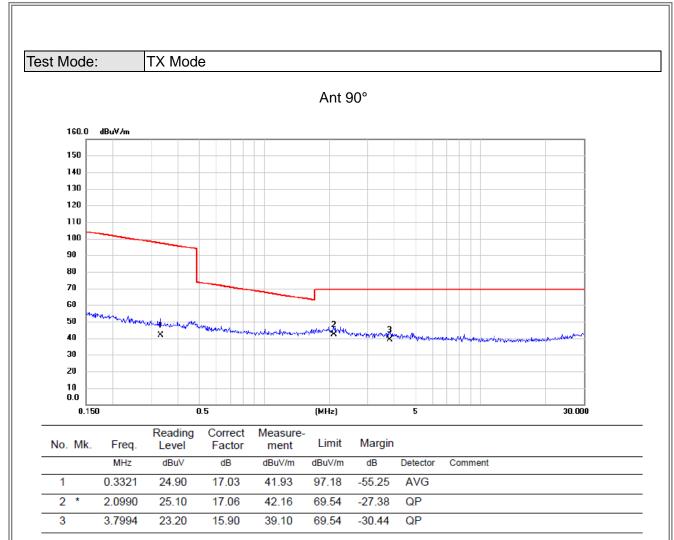










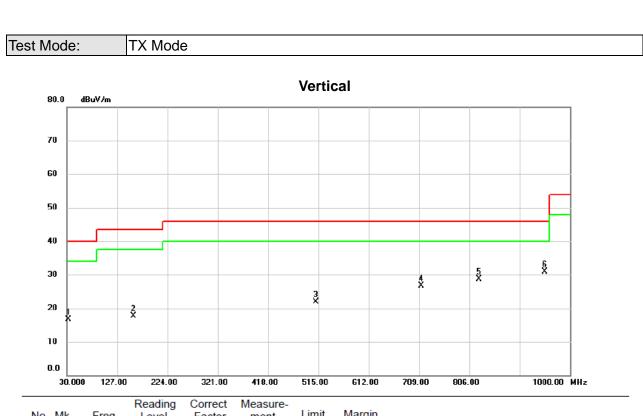




# APPENDIX B -RADIATED EMISSION (30MHZ TO 1000MHZ)

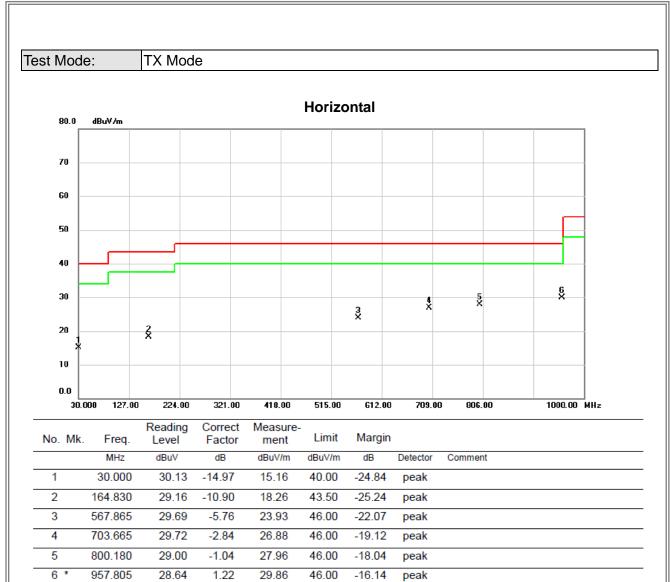




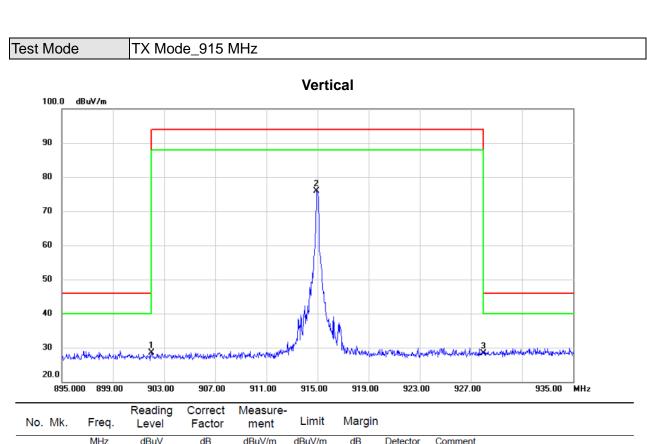


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		32.910	31.57	-14.94	16.63	40.00	-23.37	peak	
2		158.525	28.48	-10.73	17.75	43.50	-25.75	peak	
3		510.150	29.89	-7.91	21.98	46.00	-24.02	peak	
4		712.880	29.77	-3.08	26.69	46.00	-19.31	peak	
5		824.915	30.08	-1.43	28.65	46.00	-17.35	peak	
6	*	951.985	29.47	1.36	30.83	46.00	-15.17	peak	









	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	902.000	29.03	-0.52	28.51	46.00	-17.49	peak	
2	914.940	75.82	0.01	75.83	94.00	-18.17	peak	
3	928.000	27.79	0.52	28.31	46.00	-17.69	peak	

#### Remark:

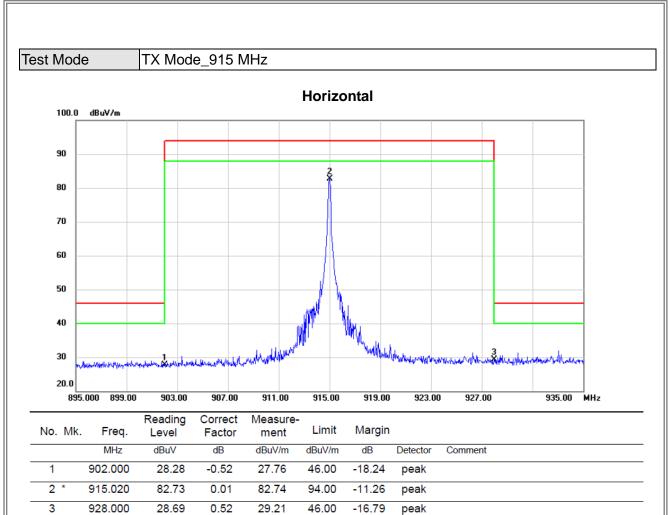
(1) The QP value of fundamental frequency is:

QP Reading = Peak value + 20log(Duty cycle) , QP=Peak-10.03

U	0			
Frequency	Peak value	QP value	QP Limit	Deput
(MHz)	(dBuV/m)	(dBuV/m)	(dBuV/m)	Result
915	75.83	65.80	94	PASS







#### Remark:

(1) The QP value of fundamental frequency is:

QP Reading = Peak value + 20log(Duty cycle), QP=Peak-10.03

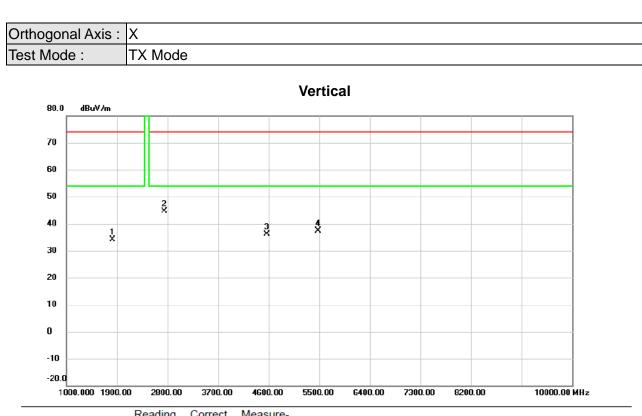
Frequency	Peak value	QP value	QP Limit	Pocult
(MHz)	(dBuV/m)	(dBuV/m)	(dBuV/m)	Result
915	82.74	72.71	94	PASS



# APPENDIX C -RADIATED EMISSION (ABOVE 1000MHZ)







No. M	k. Fred	Reading	Correct Factor	Measure- ment		Margin		
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	1823.50	0 37.92	-3.69	34.23	74.00	-39.77	peak	
2 *	2741.50	0 45.93	-1.23	44.70	74.00	-29.30	peak	
3	4568.50	0 32.47	3.69	36.16	74.00	-37.84	peak	
4	5486.50	0 31.73	5.61	37.34	74.00	-36.66	peak	

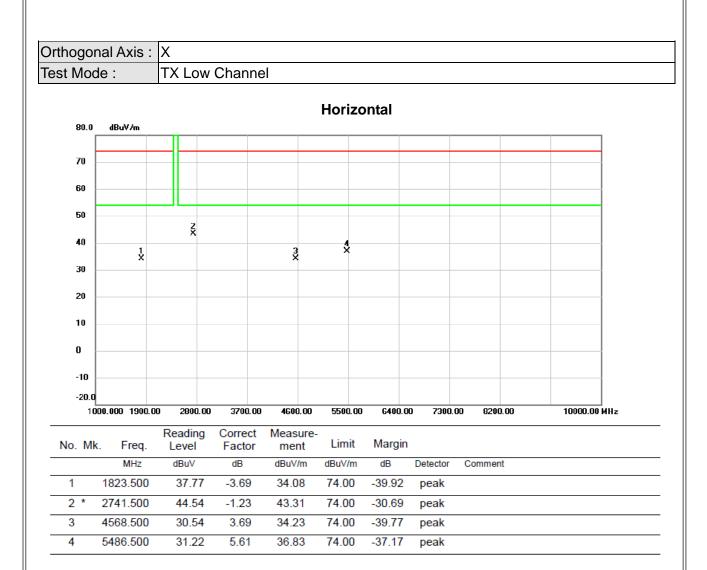
#### Remark:

- (1) The average value of fundamental frequency is:
  - Average Reading = Peak value + 20log(Duty cycle), AV = Peak-10.03

Frequency	Peak value	AV value	AV Limit	Result	
(MHz)	(dBuV/m)	(dBuV/m)	(dBuV/m)	Result	
2741.5	44.70	34.67	94	PASS	







#### Remark:

(1) The average value of fundamental frequency is:

```
Average Reading = Peak value + 20log(Duty cycle), AV = Peak-10.03
```

Frequency (MHz)	Peak value (dBuV/m)	AV value (dBuV/m)	AV Limit (dBuV/m)	Result
2741.5	43.31	33.28	94	PASS



# **APPENDIX D - BANDWIDTH**





