

FCC Ra	adio Test Report
FCC ID:	KA2COVRP2500A1
This report concerns (check one):	⊠Original Grant □Class I Change □Class II Change
Hom Test Model : COV Series Model : COV Applicant : D-LIN Address : 1759	BC071 le Home Powerline Wi-Fi Extender NWhole e Powerline Wi-Fi System (R-P2500 (R-P2502 NK Corporation D5 Mt. Herrmann, Fountain Valley, California, ed States 92708
Date of Test : Aug.	03, 2017 03, 2017 ~ Sep. 18, 2017 19, 2017 Inc.
Testing Engineer	: <u>Shawn Xiao</u> (Shawn Xiao)
Technical Manager	: David Mao (David Mao)
Authorized Signatory	: <u>Steven Lu</u>
No.3, Jinshagang 1st F Gi	L INC. Road, Shixia, Dalang Town, Dongguan, uangdong, China. 8-3000 FAX: +86-769-8319-6000
	Lab Code: 200788-0



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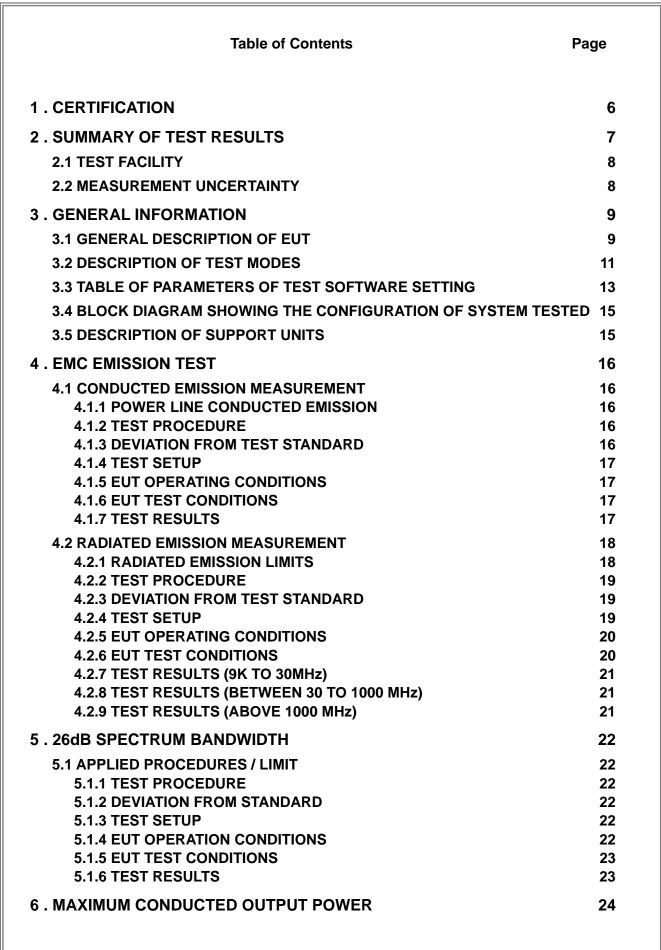
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BTL's laboratory quality assurance procedures are in compliance with the **ISO Guide 17025** requirements, and accredited by the conformity assessment authorities listed in this test report.

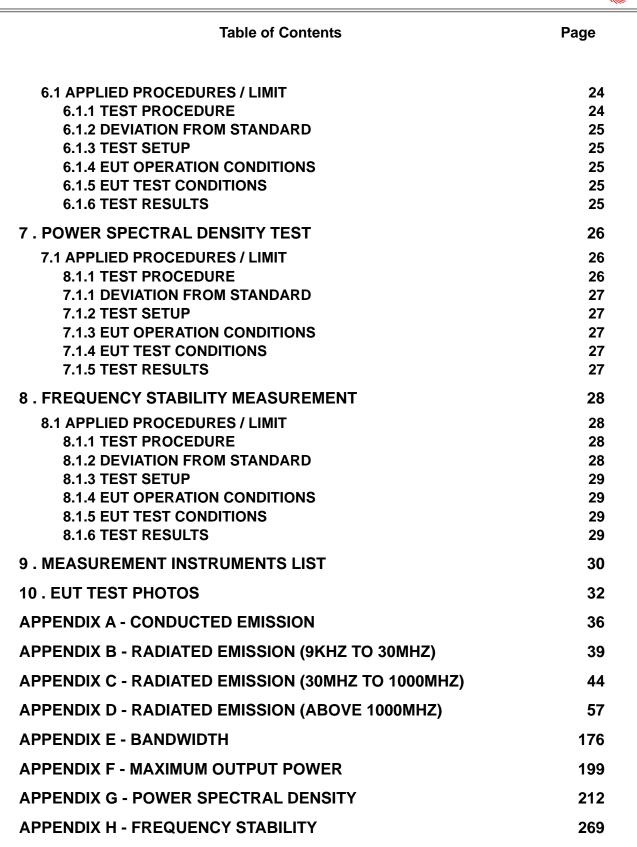
Limitation

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.













DODT ISSUED HISTORY

K	REPORT ISSUED HISTORY		
Issued No.	Description	Issued Date	
BTL-FCCP-2-1708C071	Original Issue.	Sep. 19, 2017	





1. CERTIFICATION

Equipment :	Whole Home Powerline Wi-Fi Extender Vhole Home Powerline Wi-Fi System
Brand Name:	D-Link
Test Model :	COVR-P2500
Series Model :	COVR-P2502
Applicant :	D-LINK Corporation
Manufacturer :	D-LINK Corporation
Address :	No.289, Sinhu 3rd Rd., Neihu District Taipei City 114, Taiwan, R.O.C
Date of Test :	Aug. 03, 2017 ~ Sep. 18, 2017
Test Sample :	ENGINEERING SAMPLE
Standard(s) :	FCC Part15, Subpart E(15.407) / ANSI C63.10-2013

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-2-1708C071) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of NVLAP according to the ISO-17025 quality assessment standard and technical standard(s).



2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standard(s):

	FCC Part15, Subpart E(15.407)			
Standard(s) Section	Test Item	Judgment	Remark	
15.207	AC Power Line Conducted Emissions	PASS		
15.407(a)	26dB Spectrum Bandwidth	PASS		
15.407(a)	Maximum Conducted Output Power	PASS		
15.407(a)	Power Spectral Density	PASS		
15.407(a)	Radiated Emissions	PASS		
15.407(b)	Band Edge Emissions	PASS		
15.407(g)	Frequency Stability	PASS		
15.203	Antenna Requirements	PASS		

Note:

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



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 number for FCC: 854385

BTL's designation number for FCC: CN5020

2.2 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. The BTL measurement uncertainty is less than the CISPR 16-4-2 U_{cispr} requirement.

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95 %.

A. Conducted Measurement:

Test Site	Method	Measurement Frequency Range	U, (dB)
DG-C02	CISPR	150 KHz ~ 30MHz	1.94

B. Radiated Measurement:

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

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	Whole Home Powerline Wi-Fi Extender、Whole Home Powerline Wi-Fi System		
Brand Name	D-Link		
Test Model	COVR-P2500		
Series Model	COVR-P2502		
Model Difference	Only differ in single pack or dou pack while COVR - P2502 is dou	ble pack. COVR - P2500 is single ble pack	
Power Source	AC Mains.		
Power Rating	AC 100-240V, 50/60Hz, 0.3A		
	Operation Frequency	UNII-1: 5150-5250MHz UNII-3: 5725-5850MHz	
	Modulation Type	OFDM	
	Bit Rate of Transmitter	867Mbps	
Product Description	Output Power (Max.)for UNII-1	802.11a: 24.60dBm 802.11n (20M): 24.36dBm 802.11n (40M): 23.35dBm 802.11ac (20M): 24.61dBm 802.11ac (40M): 23.30dBm 802.11ac (80M): 15.18dBm	
	Output Power (Max.)for UNII-3	802.11a: 24.42dBm 802.11n (20M): 22.72dBm 802.11n (40M): 20.92dBm 802.11ac (20M): 21.04dBm 802.11ac (40M): 21.52dBm 802.11ac (80M): 22.86dBm	





Note:

- 1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
- 2. Channel List:

UNI	I-1	UN	II-1	UN	II-1
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	38	5190	42	5210
40	5200	46	5230		
44	5220				
48	5240				

UNI	I-3	UN	II-3	UN	II-3
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
149	5745	151	5755	155	5775
153	5765	159	5795		
157	5785				
161	5805				
165	5825				

3. Antenna Specification:

Ant.	Manufacturer	Model Name	Antenna Type	Connector	Gain (dBi)
1	CHANGSHU HONGBO	DB_ANT-1 TO IPEX	Dipole	N/A	3.94
2	CHANGSHU HONGBO	DB_ANT-1 TO IPEX	Dipole	N/A	3.94

Note:

This EUT supports MIMO 2X2, any transmit signals are correlated with each other, so Direction al gain = G_{ANT} +10log(N)dBi, that is Directional gain=3.94+10log(2)dBi=6.95 greater than 6dB. So, the out power limit is 30-6.95+6=29.05 for UNII-1 and UNII-3, the power density limit is 17-6.95+6=16.05 for UNII-1, the limit is 30-6.95+6=29.05 for UNII-3.

4

2TX
217
V (ANT 1+ANT 2)



3.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base 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 A Mode / CH36, CH40, CH48 (UNII-1)
Mode 2	TX N20 Mode / CH36, CH40, CH48 (UNII-1)
Mode 3	TX N40 Mode / CH38, CH46 (UNII-1)
Mode 4	TX AC20 Mode / CH36, CH40, CH48 (UNII-1)
Mode 5	TX AC40 Mode / CH38, CH46 (UNII-1)
Mode 6	TX AC80 Mode / CH42 (UNII-1)
Mode 7	TX A Mode / CH149,CH157,CH165 (UNII-3)
Mode 8	TX N20 Mode / CH149,CH157,CH165 (UNII-3)
Mode 9	TX N40 Mode / CH151,CH159 (UNII-3)
Mode 10	TX AC20 Mode / CH149,CH157,CH165 (UNII-3)
Mode 11	TX AC40 Mode / CH151,CH159 (UNII-3)
Mode 12	TX AC80 Mode / CH155 (UNII-3)
Mode 13	TX Mode

The EUT system operated these modes were found to be the worst case during the pre-scanning test as following:

For Conducted Test		
Final Test Mode	Description	
Mode 13	TX Mode	



For Radiated Test			
Final Test Mode	Description		
Mode 1	TX A Mode / CH36, CH40, CH48 (UNII-1)		
Mode 2	TX N20 Mode / CH36, CH40, CH48 (UNII-1)		
Mode 3	TX N40 Mode / CH38, CH46 (UNII-1)		
Mode 4	TX AC20 Mode / CH36, CH40, CH48 (UNII-1)		
Mode 5	TX AC40 Mode / CH38, CH46 (UNII-1)		
Mode 6	TX AC80 Mode / CH42 (UNII-1)		
Mode 7	TX A Mode / CH149,CH157,CH165 (UNII-3)		
Mode 8	TX N20 Mode / CH149,CH157,CH165 (UNII-3)		
Mode 9	TX N40 Mode / CH151,CH159 (UNII-3)		
Mode 10	TX AC20 Mode / CH149,CH157,CH165 (UNII-3)		
Mode 11	TX AC40 Mode / CH151,CH159 (UNII-3)		
Mode 12	TX AC80 Mode / CH155 (UNII-3)		

Note:

(1) For radiated below 1GHz test, the 802.11a mode is found to be the worst case and recorded.





3.3 TABLE OF PARAMETERS OF TEST SOFTWARE SETTING

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product

UNII-1				
Test Software Version	QRCT			
Frequency (MHz)	5180	5200	5240	
A Mode	18	19	19	
Frequency (MHz)	5180	5200	5240	
N20 Mode	18	20	19	
Frequency (MHz)	5190	5230		
N40 Mode	10	18		

UNII-3				
Test Software Version		QRCT		
Frequency (MHz)	5745	5785	5825	
A Mode	24	24	24	
Frequency (MHz)	5745	5785	5825	
N20 Mode	24	24	24	
Frequency (MHz)	5755	5795		
N40 Mode	24	24		





	UNII-1		
Test Software Version		QRCT	
Frequency (MHz)	5180	5200	5240
AC20 Mode	18	20	19
Frequency (MHz)	5190	5230	
AC40 Mode	10	18	
Frequency (MHz)	5210		
AC80 Mode	10		

UNII-3

01011-3			
Test Software Version	QRCT		
Frequency (MHz)	5745	5785	5825
AC20 Mode	24	24	24
Frequency (MHz)	5755	5795	
AC40 Mode	24	24	
Frequency (MHz)	5775		
AC80 Mode	24		



3.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

3.5 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.

ltem	Equipment	Mfr/Brand	Model/Type No.	FCC ID	Series No.
А	Notebook	Lenovo	INSPIRON 1420-	DOC	JX193A01SDC2

Item	Shielded Type	Ferrite Core	Length	Note
1	NO	NO	10m	RJ45 Cable



4. EMC EMISSION TEST

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 POWER LINE CONDUCTED EMISSION (Frequency Range 150kHz-30MHz)

	Class A (dBuV)		Class B (dBuV)	
FREQUENCY (MHz)	Quasi-peak	Average	Quasi-peak	Average
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *
0.50 -5.0	73.00	60.00	56.00	46.00
5.0 -30.0	73.00	60.00	60.00	50.00

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.

4.1.2 TEST PROCEDURE

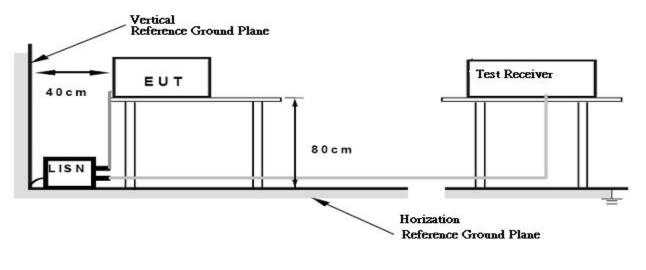
- a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- 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.

4.1.3 DEVIATION FROM TEST STANDARD

No deviation



4.1.4 TEST SETUP



4.1.5 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.

The EUT was programmed to be in continuously transmitting/TX Mode mode.

4.1.6 EUT TEST CONDITIONS

Temperature: 25°C Relative Humidity: 53% Test Voltage: AC 120V/60Hz

4.1.7 TEST RESULTS

Please refer to the Appendix A.

Remark:

- (1) All readings are QP Mode value unless otherwise stated AVG in column of ^ℂNote_□. 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 150kHz to 30MHz •



4.2 RADIATED EMISSION MEASUREMENT

4.2.1 RADIATED EMISSION LIMITS

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.

Frequencies	Field Strength	Measurement Distance
(MHz)	(micorvolts/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

Frequencies	EIRP Limit (dBm)	Equivalent Field Strength
(MHz)		at 3m (dBµV/m)
5150-5250	-27	68.3
5725-5850	-27(Note 2)	68.3
	10(Note 2)	105.3
	15.6(Note 2)	110.9
	27(Note 2)	122.3

Note:

1. The following formula is used to convert the equipment isotropic radiated power (eirp) to $100000\sqrt{30P}$

field strength: $E = \frac{1}{3} \mu V/m$, where P is the eirp (Watts)

2. According to FCC 16-24,All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below theband edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above orbelow the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27dBm/MHz at the band edge.



4.2.2 TEST PROCEDURE

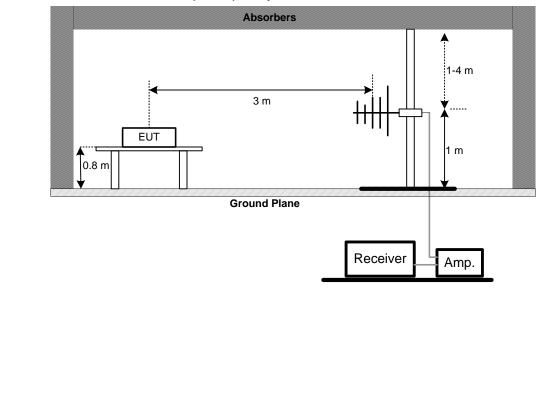
- a. The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1GHz)
- b. The measuring distance 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 0.8m 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.
- 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.

4.2.3 DEVIATION FROM TEST STANDARD

No deviation

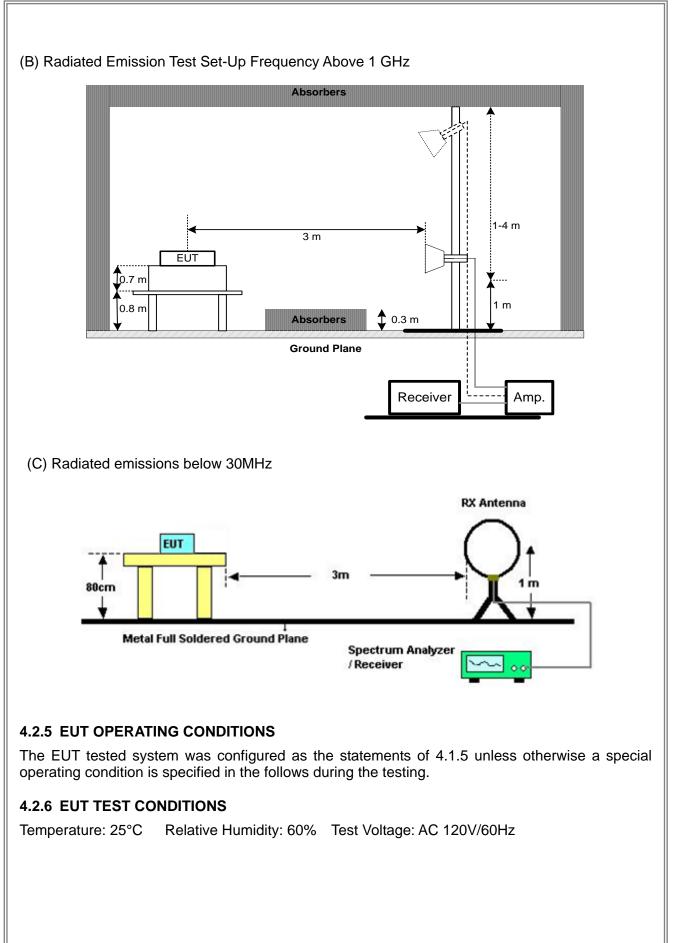
4.2.4 TEST SETUP

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











4.2.7 TEST RESULTS (9K TO 30MHz)

Please refer to the Appendix B

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.

4.2.8 TEST RESULTS (BETWEEN 30 TO 1000 MHz)

Please refer to the Appendix C.

4.2.9 TEST RESULTS (ABOVE 1000 MHz)

Please refer to the Appendix D.

Remark:

(1) No limit: This is fundamental signal, the judgment is not applicable. For fundamental signal judgment was referred to Peak output test.

5. 26dB SPECTRUM BANDWIDTH

5.1 APPLIED PROCEDURES / LIMIT

FCC Part15, Subpart E				
Test Item	Limit	Frequency Range (MHz)	Result	
	26 dB Bandwidth	5150-5250	PASS	
Bandwidth	Minimum 500kHz 6dB	5725-5850	PASS	
	Bandwidth	5725-5650	1 400	

5.1.1 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 Parameters	Setting
	Attenuation	Auto
	Span Frequency	> 26dB Bandwidth
	RBW	300 kHz(Bandwidth 20MHz)
	NBW	1MHz(Bandwidth 40MHz and 80MHz)
	VBW	1MHz(Bandwidth 20MHz)
	VBW	3MHz(Bandwidth 40MHz and 80MHz)
	Detector	Peak
	Trace	Max Hold
	Sweep Time	Auto

c. Measured the spectrum width with power higher than 26dB below carrier

5.1.2 DEVIATION FROM STANDARD

No deviation.

5.1.3 TEST SETUP

EUT	SPECTRUM	
	ANALYZER	

5.1.4 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.



5.1.5 EUT TEST CONDITIONS

Temperature: 25°C Relative Humidity: 60% Test Voltage: AC 120V/60Hz

5.1.6 TEST RESULTS

Please refer to the Appendix E.



6. MAXIMUM CONDUCTED OUTPUT POWER

6.1 APPLIED PROCEDURES / LIMIT

FCC Part15, Subpart E					
Test Item	Limit Frequency Range (MHz)		Result		
	Fixed:1 Watt (30dBm)				
Conducted Output	Mobile and portable:	5150-5250	PASS		
Power	250mW (24dBm)				
	1 Watt (30dBm)	5725-5850	PASS		
Note: The maximum e.i.r.p at anyelevation angle above 30 degrees as measured from the					
horizon must not exceed 125mW(21dBm)					

6.1.1 TEST PROCEDURE

a. The EUT was directly connected to the power meter and antenna output port as show in the block diagram below,

b.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Encompass the entire emissions bandwidth (EBW) of the signal
RBW	= 1MHz.
VBW	≥ 3MHz.
Detector	RMS
Trace	Max Hold
Sweep Time	auto

c. Test was performed in accordance with method of KDB 789033 D02.



6.1.2 DEVIATION FROM STANDARD

No deviation.

6.1.3 TEST SETUP

EUT Power Meter	EUT
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6.1.4 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.

6.1.5 EUT TEST CONDITIONS

Temperature: 25°C Relative Humidity: 60% Test Voltage: AC 120V/60Hz

6.1.6 TEST RESULTS

Please refer to the Appendix F.

7. POWER SPECTRAL DENSITY TEST

7.1 APPLIED PROCEDURES / LIMIT

FCC Part15, Subpart E					
Test Item	Limit	Frequency Range (MHz)	Result		
Power Spectral Density			PASS		
	30dBm/500kHz	5725-5850	PASS		

8.1.1 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 Parameter	Setting
	Attenuation	Auto
	Shan Eraquanay	Encompass the entire emissions bandwidth (EBW) of the
	Span Frequency	signal
	RBW	= 1MHz.
	VBW	≥ 3MHz.
	Detector	RMS
	Trace average	100 trace
	Sweep Time	Auto

Note:

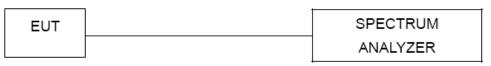
- 1. For UNII-3, according to KDB publication 789033 D02 General UNII Test Procedures New Rules v01r02, section II.F.5., it is acceptable to set RBW at 1MHz and VBW at 3MHz if the spectrum analyzer does not have 500kHz RBW.
- The value measured with RBW=1MHz is to be added with 10log(500kHz/1MHz) which is -3dB. For example, if the measured value is +10dBm using RBW=1MHz (that is +10dBm/MHz), then the converted value will be +7dBm/500kHz.



7.1.1 DEVIATION FROM STANDARD

No deviation.

7.1.2 TEST SETUP



7.1.3 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.

7.1.4 EUT TEST CONDITIONS

Temperature: 25°C Relative Humidity: 60% Test Voltage: AC 120V/60Hz

7.1.5 TEST RESULTS

Please refer to the Appendix H.

8. FREQUENCY STABILITY MEASUREMENT

8.1 APPLIED PROCEDURES / LIMIT

FCC Part15, Subpart E					
Test Item	Limit	Frequency Range (MHz)	Result		
Francisco estate ilitera	Specified in the user's manual	5150-5250	PASS		
Frequency Stability		5725-5850	PASS		

8.1.1 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 Parameter	Setting
	Attenuation	Auto
Span Frequency Entire absence of modulation emissions ba		Entire absence of modulation emissions bandwidth
	RBW	10 kHz
	VBW	10 kHz
	Sweep Time	Auto

- c. The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value.
- d. User manual temperature is 0°C~40°C.

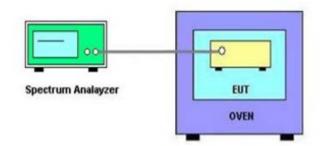
8.1.2 DEVIATION FROM STANDARD

No deviation.





8.1.3 TEST SETUP



8.1.4 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.

8.1.5 EUT TEST CONDITIONS

Temperature: 25°C Relative Humidity: 55% Test Voltage: AC 120V/60Hz

8.1.6 TEST RESULTS

Please refer to the Appendix I.



9. MEASUREMENT INSTRUMENTS LIST

	Conducted Emission					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until	
1	EMI Test Receiver	R&S	ESCI	100382	Mar. 26, 2018	
2	LISN	EMCO	3816/2	52765	Mar. 26, 2018	
3	50Ω Terminator	SHX	TF2-3G-A	8122901	Mar. 26, 2018	
4	TWO-LINE V-NETWORK	R&S	ENV216	101447	Mar. 26, 2018	
5	Cable	N/A	RG223	12m	Oct. 20, 2017	
6	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A	

	Radiated Emission Below 1GHz					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until	
1	Antenna	Schwarbeck	VULB9160	9160-3232	Mar. 26, 2018	
2	Amplifier	HP	8447D	2944A09673	Oct. 20, 2017	
3	Receiver	Agilent	N9038A	MY52130039	Sep. 03, 2018	
4	Cable	emci	LMR-400(30MHz-1 GHz)(8m+5m)	N/A	Jun. 26, 2018	
5	Controller	СТ	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	
8	Active Loop Antenna	R&S	HFH2-Z2	830749/020	Sep. 05, 2018	



	Radiated Emission Above 1GHz					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until	
1	Double Ridged Guide Antenna	ETS	3115	75789	Mar. 26, 2018	
2	Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170319	Jun. 08, 2018	
3	Amplifier	Agilent	8449B	3008A02274	May. 16, 2018	
4	Microwave Preamplifier With Adaptor	EMC INSTRUMENT	EMC2654045	980039 & HA01	Mar. 26, 2018	
5	Receiver	Agilent	N9038A	MY52130039	Sep. 03, 2018	
6	Antenna	EM	EM-6876-1	230	Jul. 07, 2018	
7	Controller	СТ	SC100	N/A	N/A	
8	Controller	MF	MF-7802	MF780208416	N/A	
9	Cable	emci	EMC104-SM-SM-1 2000(12m)	N/A	Jun. 26, 2018	
10	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A	

	Spectrum Bandwidth Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until	
1	Spectrum Analyzer	R&S	FSP 40	100185	Sep. 03, 2018	

	Max	Measurement			
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	P-series Power meter	Agilent	N1911A	MY45100473	Mar. 26, 2018
2	Wireband Power sensor	Agilent	N1921A	MY51100041	Mar. 26, 2018

	Power Spectral Density Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until	
1	Spectrum Analyzer	R&S	FSP 40	100185	Sep. 03, 2018	

Frequency Stability Measure				ment	
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Sep. 03, 2018
2	Precision Oven Tester	HOLINK	H-T-1F-D	BA03101701	Mar. 26, 2018

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





10. EUT TEST PHOTOS

Conducted Measurement Photos







Radiated Measurement Photos

9kHz to 30MHz







Radiated Measurement Photos

30MHz to 1000MHz







Radiated Measurement Photos

Above 1000MHz

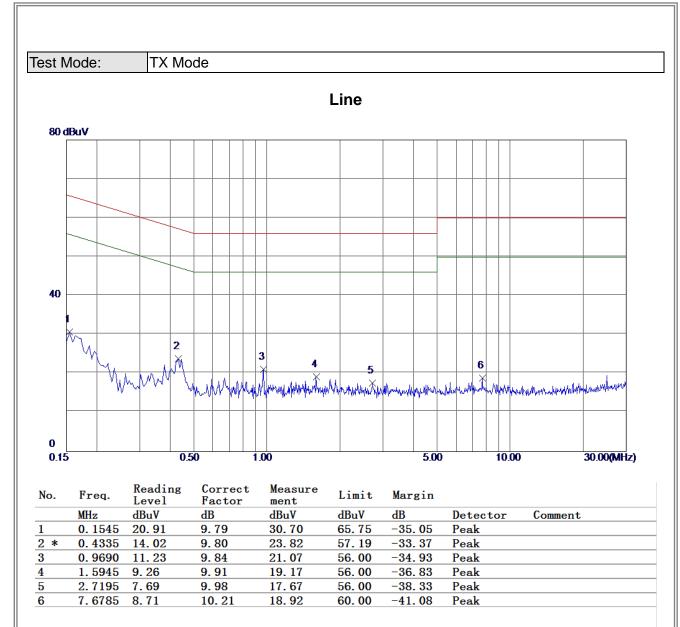






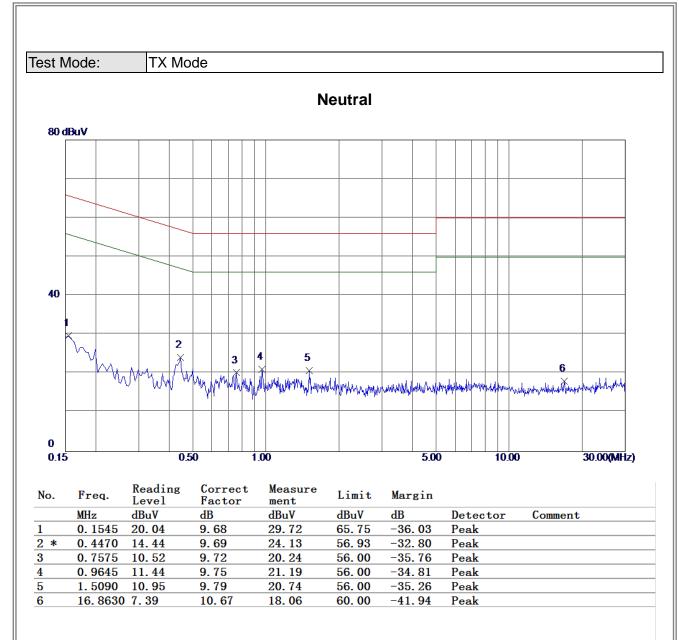
APPENDIX A - CONDUCTED EMISSION





Note : The test result has included the cable loss.





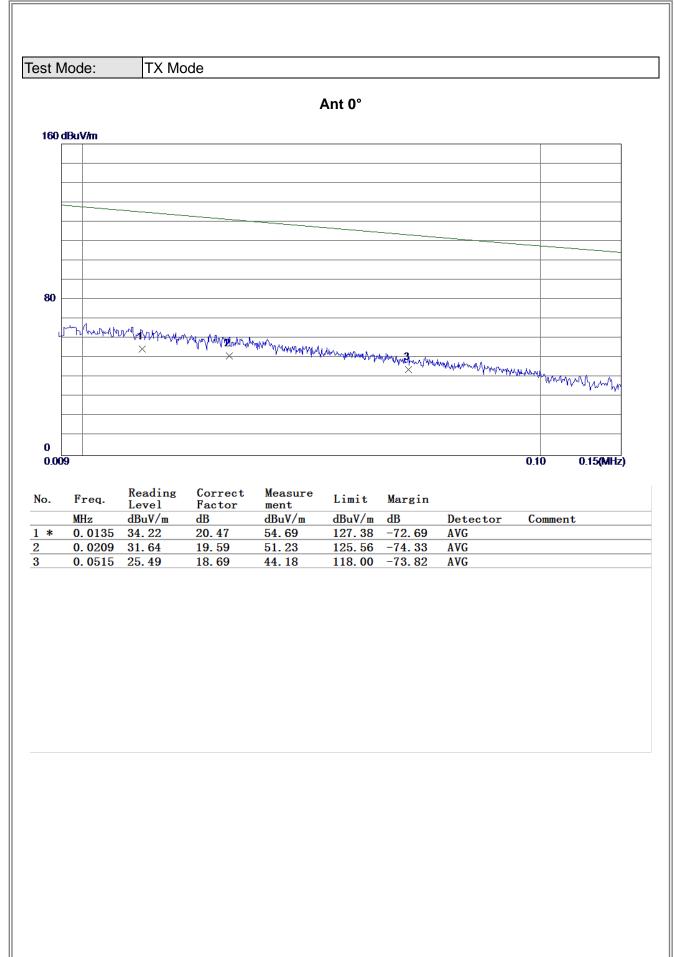
Note : The test result has included the cable loss.



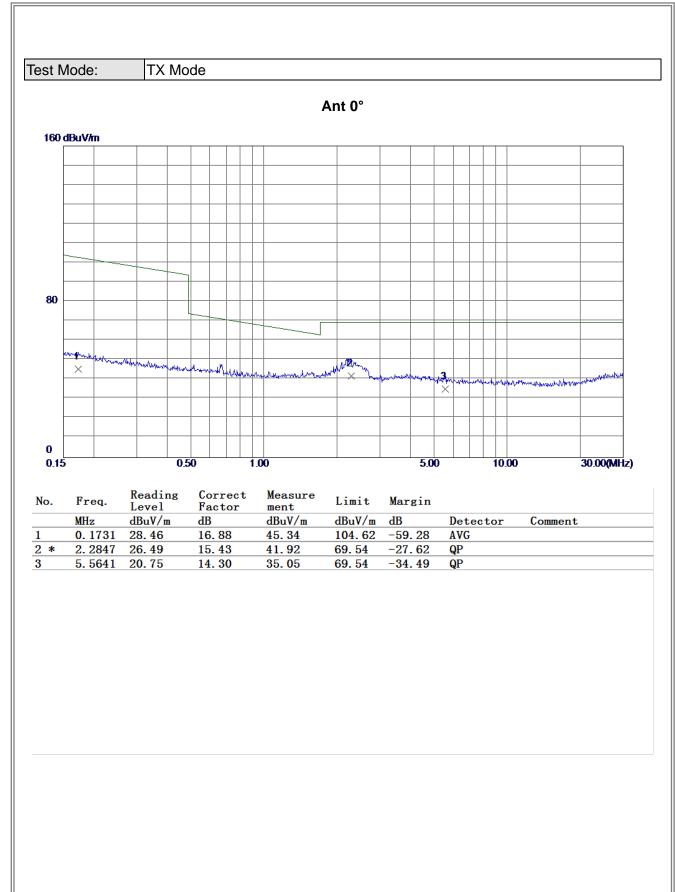
APPENDIX B - RADIATED EMISSION (9KHZ TO 30MHZ)





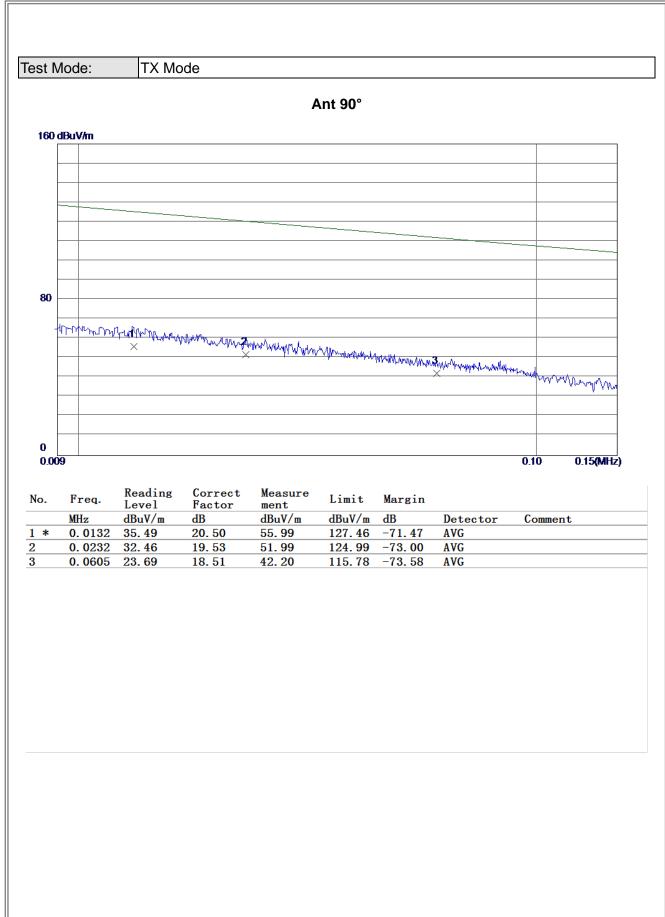












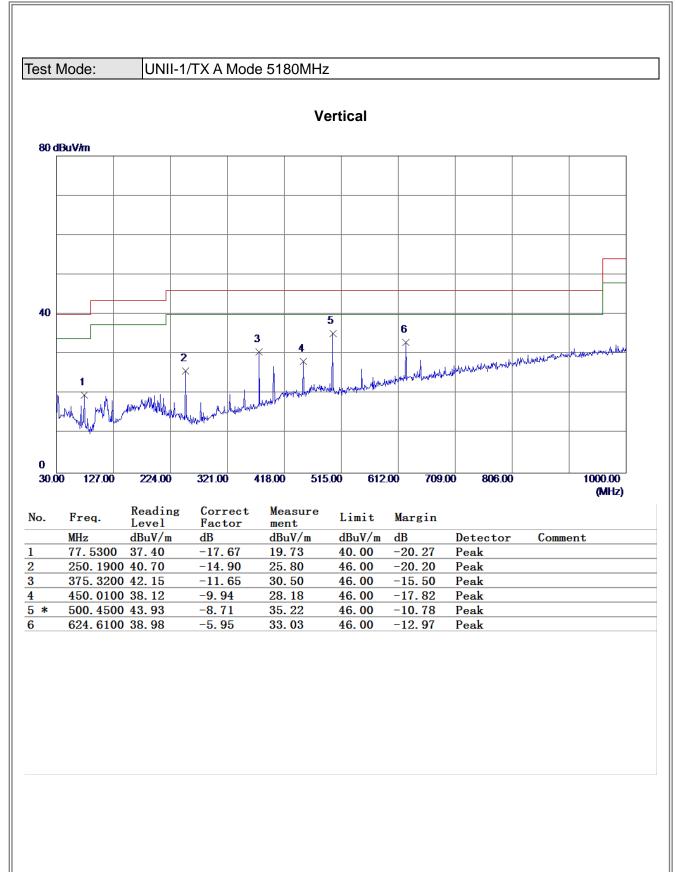


Test Mode: TX Mode Ant 90° 160 dBuV/m 80 Man have marked WWW 42 يه مالي الم \times 0 30.00(MHz) 0.15 0.50 1.00 5.00 10.00 Measure Reading Correct No. Freq. Limit Margin Level Factor ment MHz dBuV/m dB dBuV/m dBuV/m dB Detector Comment 1 0.2455 26.48 16.67 43.15 102.15 -59.00 AVG 2.2968 2 * 20.86 15.43 36.29 69.54 -33.25 QP 3 5.0312 14.37 21.71 36.08 -33.46 QP 69.54



APPENDIX C - RADIATED EMISSION (30MHZ TO 1000MHZ)



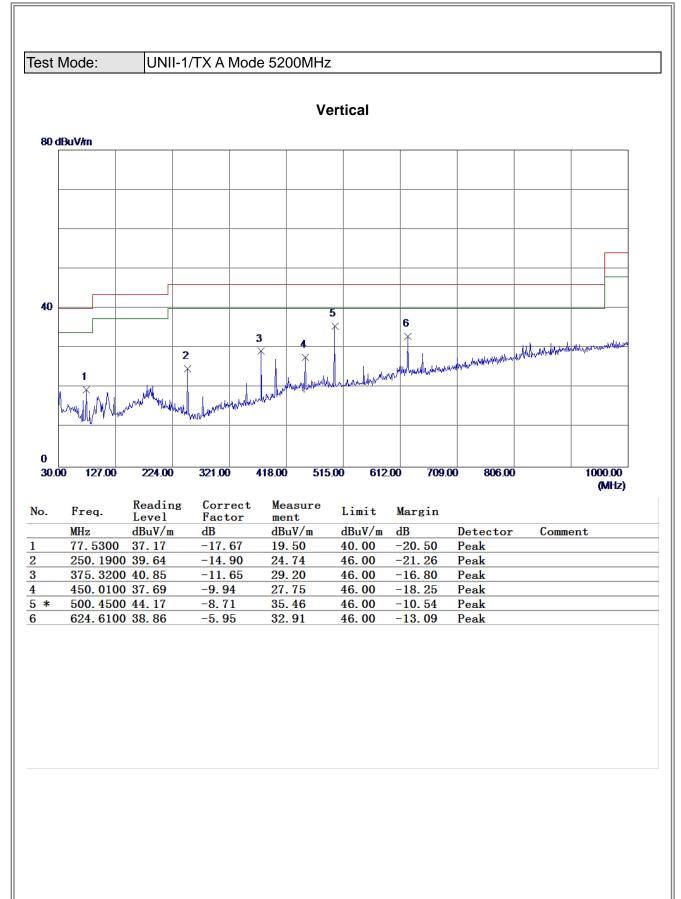






Test Mode: UNII-1/TX A Mode 5180MHz Horizontal 80 dBuV/m 40 6 2 1 5 ¥ ¥ 4 3 madding to have a state of the state w 0 30.00 127.00 224.00 321.00 418.00 515.00 612.00 709.00 806.00 1000.00 (MHz) Reading Measure Correct No. Freq. Limit Margin Level Factor mentMHz dBuV/m dBuV/m dBuV/m dB Comment dB Detector 250.1900 49.37 -14.90 34.47 46.00 -11. 53 Peak 1 375. 3200 47. 06 2 -11.65 35.41 46.00 -10.59 Peak 3 450.0100 40.02 -9.94 30.08 46.00 -15.92 Peak 4 500.4500 39.94 -8.71 31.23 46.00 -14.77Peak 819.5800 34.88 5 -0.83 34.05 46.00 -11.95 Peak 874.8700 34.94 46.00 -10.55 6 * 0.51 35.45 Peak









Test Mode: UNII-1/TX A Mode 5200MHz Horizontal 80 dBuV/m 40 6 2 1 ¥ Ж 4 3 5 ¥ Nepherturk LOUMMANN . N. M. Martin 0 30.00 127.00 224.00 321.00 418.00 515.00 612.00 709.00 806.00 1000.00 (MHz) Reading Measure Correct No. Freq. Limit Margin Level Factor mentMHz dBuV/m dB dBuV/m dBuV/m dB Comment Detector 250.1900 50.19 -14.90 35.29 46.00 -10.71 Peak 1 2 375.3200 47.18 -11.65 35.53 46.00 -10.47 Peak 3 450.0100 40.12 -9.94 30.18 46.00 -15.82 Peak 4 500.4500 40.15 -8.71 31.44 46.00 -14.56 Peak 649.8300 33.80 5 -5.48 28.32 46.00 -17.68 Peak 819.5800 38.54 -**0.** 83 37.71 46.00 -8.29 6 * Peak





Test Mode: UNII-1/TX A Mode 5240MHz Vertical 80 dBuV/m 40 5 6 3 Ж would would would we would be and the second لعميديان 2 ¥ NMAL 0 127.00 224.00 321.00 418.00 515.00 612.00 709.00 806.00 1000.00 30.00 (MHz) Reading Correct Measure No. Freq. Limit Margin Level Factor ment MHz dBuV/m dB dBuV/m dBuV/m dB Detector Comment 1 77.5300 37.92 -17.67 20.25 40.00 -19.75 Peak 2 250. 1900 40. 58 -14.90 25.68 46.00 -20.32 Peak 3 375. 3200 40. 51 -11.65 28.86 46.00 -17.14Peak 450.0100 37.38 4 -9.94 27.44 46.00 -18.56 Peak 34.82 46.00 500.4500 43.53 -8.71 5 * -11.18 Peak 6 624.6100 38.62 -<mark>5. 9</mark>5 32.67 46.00 -13.33 Peak

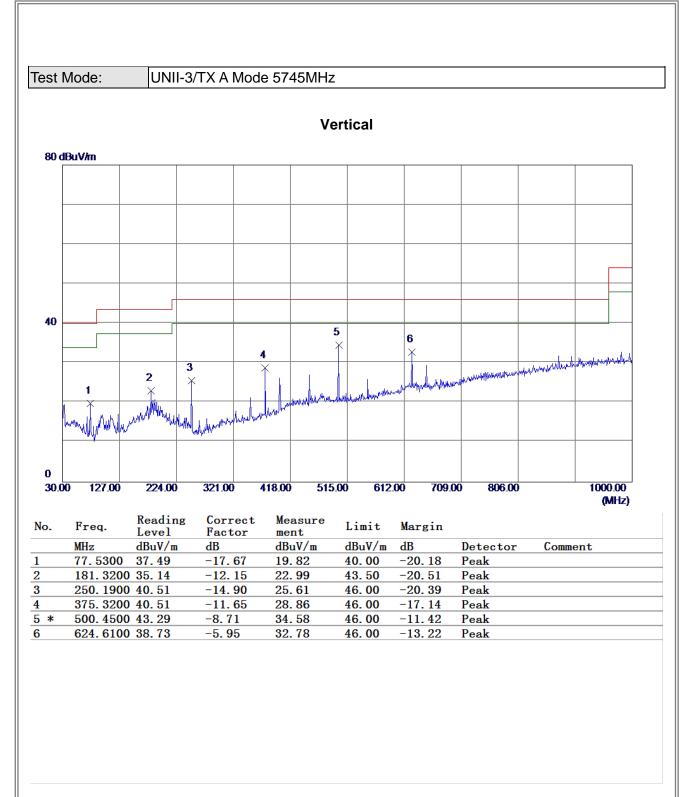




Test Mode: UNII-1/TX A Mode 5240MHz Horizontal 80 dBuV/m 40 6 1 ¥ 3 4 5 Northalters 1 where the way 0 30.00 127.00 224.00 321.00 418.00 515.00 612.00 709.00 806.00 1000.00 (MHz) Reading Measure Correct No. Freq. Limit Margin Level Factor mentMHz dBuV/m dB dBuV/m dBuV/m dB Comment Detector 250.1900 49.56 -14.90 34.66 46.00 -11.34 Peak 1 2 375.3200 47.29 -11.65 35.64 46.00 -10.36 Peak 3 450.0100 40.48 -9.94 30.54 46.00 -15.46 Peak 4 500.4500 39.84 -8.71 31.13 46.00 -14.87 Peak 649.8300 35.33 5 -5.48 29.85 46.00 -16.15 Peak 874.8700 35.64 0.51 46.00 -**9.**85 6 * 36.15 Peak











Test Mode: UNII-3/TX A Mode 5745MHz Horizontal 80 dBuV/m 40 3 6 Ж ¥ 5 4 Ж Munit wanter mound Mr. Mark where the 0 30.00 127.00 224.00 321.00 418.00 515.00 612.00 709.00 806.00 1000.00 (MHz) Reading Correct Measure No. Freq. Limit Margin Level Factor mentMHz dBuV/m dBuV/m dBuV/m dB Comment dB Detector 1 * 250. 1900 50. 77 -14.90 35.87 46.00 -10.13 Peak 2 324.8800 43.46 -12.39 31.07 46.00 -14.93 Peak 3 375. 3200 47. 34 -11.65 35.69 46.00 -10.31 Peak 4 450.0100 39.71 -9.94 29.77 46.00 -16.23 Peak 5 500.4500 40.89 -8.71 32.18 46.00 -13.82 Peak 818.6100 35.41 -**0.** 85 46.00 6 34.56 -11.44 Peak





Test Mode: UNII-3/TX A Mode 5785MHz Vertical 80 dBuV/m 40 5 6 ¥ with with the and the adaption of the work of the work ¥ 3 Ж 2 WARD WARD 0 30.00 127.00 224.00 321.00 418.00 515.00 612.00 709.00 806.00 1000.00 (MHz) Reading Correct Measure No. Freq. Limit Margin Level Factor ment MHz dBuV/m dB dBuV/m dBuV/m dB Detector Comment 1 33.8800 37.65 -14.73 22.92 40.00 -17.08 Peak 2 77.5300 38.05 -17.67 20.38 40.00 -19.62 Peak 3 250. 1900 40. 77 -14.90 25.87 46.00 -20.13 Peak 375. 3200 39. 91 -11.65 4 28.26 46.00 -17.74Peak 5 * 500.4500 42.82 46.00 -8.71 34.11 -11.89 Peak 624.6100 38.50 6 -<mark>5. 9</mark>5 32.55 46.00 -13.45 Peak

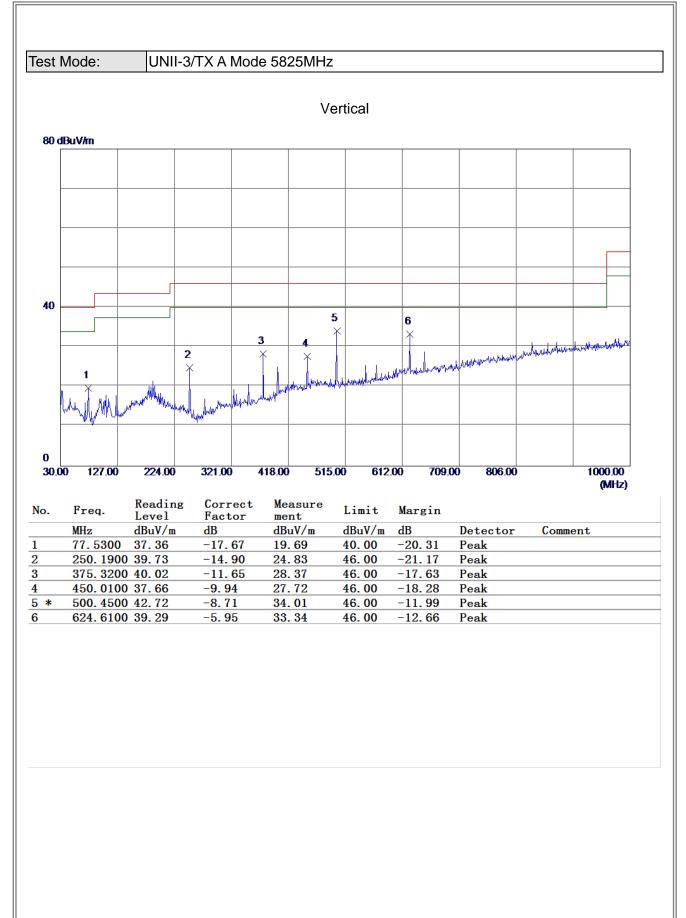




Test Mode: UNII-3/TX A Mode 5785MHz Horizontal 80 dBuV/m 5 40 ĥ 3 1 Ж 4 X Ж Ж inthelite AUA.) 0 30.00 127.00 224.00 321.00 418.00 515.00 612.00 709.00 806.00 1000.00 (MHz) Reading Measure Correct No. Freq. Limit Margin Level Factor mentMHz dBuV/m dB dBuV/m dBuV/m dB Comment Detector 250. 1900 50. 29 -14.90 35. 39 46.00 -10.61 Peak 1 2 324.8800 42.19 -12.39 29.80 46.00 -16.20 Peak 3 375. 3200 47. 54 -11.65 35.89 46.00 -10.11 Peak 4 500.4500 40.93 -8.71 32.22 46.00 -13.78 Peak 821. 5200 38. 82 5 * -0.77 38.05 46.00 -7.95 Peak 874.8700 35.75 36.26 46.00 -9.74 6 0.51 Peak

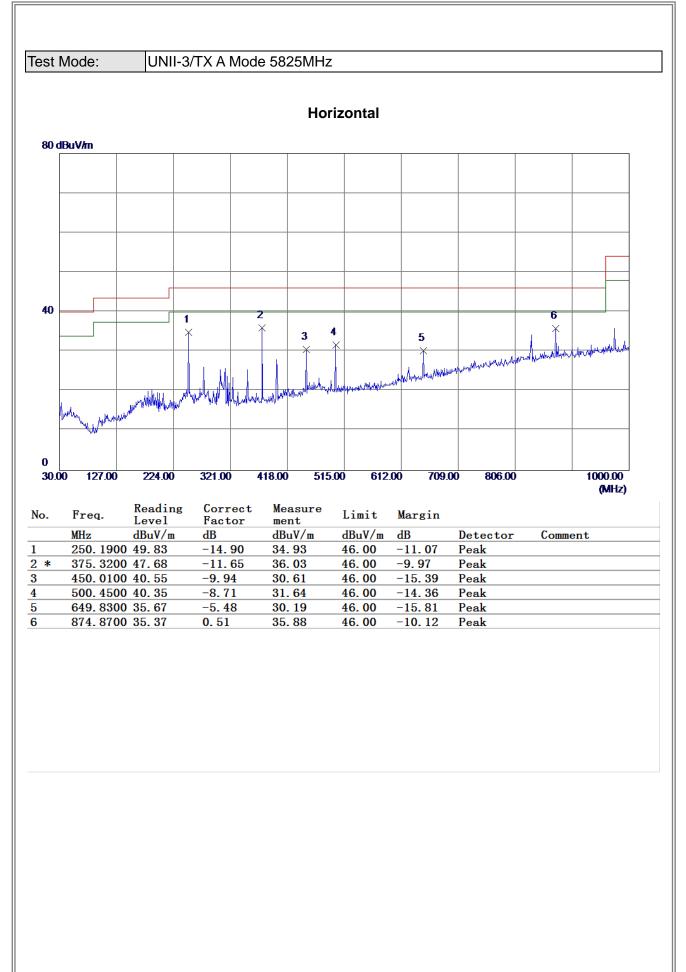














APPENDIX D - RADIATED EMISSION (ABOVE 1000MHZ)

Report No.: BTL-FCCP-2-1708C071





