

# **FCC Radio Test Report**

FCC ID: E2K-APL260AE

This report concerns (check one): ⊠Original Grant □Class II Change

Project No. : 1410025
Equipment : Access Point
Model Name : APL26-0AE
Applicant : Dell Inc.

Address : One Dell Way Round Rock, Texas 78682 United

States

Date of Receipt : Oct. 17, 2014

Date of Test : Oct. 17, 2014 ~ Nov. 19, 2014

Issued Date : Nov. 20, 2014
Tested by : BTL Inc.

**Testing Engineer** 

**Technical Manager** 

**Authorized Signatory** 

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#### **Declaration**

BTLrepresents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with the standards traceable to National Measurement Laboratory (NML) of R.O.C., or National Institute of Standards and Technology (NIST) of U.S.A.

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#### 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**

Issued No.	Description	Issued Date
BTL-FCCP-2-1410025	Original Issue.	Nov. 20, 2014

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#### 1. CERTIFICATION

Equipment : Access Point

Brand Name: DELL Model Name: APL26-0AE Applicant : Dell Inc.

Date of Test : Oct. 17, 2014 ~ Nov. 19, 2014 Test Sample: ENGINEERING SAMPLE

Standard(s) : FCC Part15, Subpart E(15.407) / ANSI C63.4: 2009 FCC KDB 789033 D02 General UNII Test Procedures New Rules v01.

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- 1410025) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of TAF according to the ISO-17025 quality assessment standard and technical standard(s).

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# 2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standard(s):

FCC Part15, Subpart E				
Standard(s) Section FCC	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) FCC KDB 789033 D02 General UNII Test Procedures New Rules v01.

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#### 2.1TEST FACILITY

The test facilities used to collect the test data in this report:

#### **Conducted emission Test:**

**C02:** 1F., No. 61, Ln. 77, Sing-ai Rd., Neihu Dist., Taipei City 114, Taiwan (R.O.C.)

#### Radiated emission Test (Below 1 GHz):

**CB08:** 1F., No. 61, Ln. 77, Sing-ai Rd., Neihu Dist., Taipei City 114, Taiwan (R.O.C.)

#### Radiated emission Test (Above 1 GHz):

**CB08:** 1F., No. 61, Ln. 77, Sing-ai Rd., Neihu Dist., Taipei City 114, Taiwan (R.O.C.)

#### 2.2MEASUREMENT UNCERTAINTY

#### The measurement uncertainty is not specified by FCC rules and for reference only.

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

The measurement instrumentation uncertainty considerations contained in CISPR 16-4-2.

#### A. Conducted emission test:

Test Site	Measurement Frequency Range	U,(dB)	NOTE
C02	150 kHz ~ 30 MHz	2.59	

#### B. Radiated emission test:

Test Site	Item	Measurement Frequency Range		Uncertainty	NOTE
			30 - 200MHz	3.35 dB	
		Horizontal	200 - 1000MHz	3.11 dB	
	Radiated	Polarization	1 - 18GHz	3.97 dB	
CB08	emission at		18 - 40GHz	4.01 dB	
CBUO	3m		30 - 200MHz	3.22 dB	
	JIII	Vertical	200 - 1000MHz	3.24 dB	
		Polarization	1 - 18GHz	4.05 dB	
			18 - 40GHz	4.04 dB	

Our calculated Measurement Instrumentation Uncertainty is shown in the tables above. These are our  $U_{lab}$  values in CISPR 16-4-2 terminology.

Since Table 1 of CISPR 16-4-2 has values of measurement instrumentation uncertainty, called  $U_{\text{CISPR}}$ , as follows:

Conducted Disturbance (mains port) – 150 kHz – 30 MHz: 3.6 dB

Radiated Disturbance (electric field strength on an open area test site or alternative test site) - 30 MHz - 1000 MHz: 5.2 dB

It can be seen that our  $U_{lab}$  values are smaller than  $U_{CISPR}$ .

If  $U_{lab}$  is less than or equal to  $U_{CISPR}$ , then:

- compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.

#### If $U_{lab}$ is greater than $U_{CISPR}$ , then:

- compliance is deemed to occur if no measured disturbance level, increased by (U<sub>lab</sub> U<sub>CISPR</sub>), exceeds the disturbance limit:
- non-compliance is deemed to occur if any measured disturbance level, increased by (U<sub>lab</sub> U<sub>CISPR</sub>), exceeds the disturbance limit.

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# 3. GENERAL INFORMATION

# 3.1 GENERAL DESCRIPTION OF EUT

Equipment	Access Point		
Brand Name	DELL		
Model Name	APL26-0AE		
Mode Different	N/A		
	Operation Frequency	UNII-1: 5150-5250MHz UNII-3: 5725-5850MHz	
	Modulation Type	OFDM	
	Bit Rate of Transmitter	450Mbps	
Product Description	Output Power (Max.)for UNII-1	802.11a: 19.93dBm 802.11n (20M): 20.56dBm 802.11n (40M): 19.15dBm 802.11ac (20M): 18.34dBm 802.11ac (40M): 17.57dBm 802.11ac (80M): 16.31dBm	
	Output Power (Max.)for UNII-3	802.11a: 20.15dBm 802.11n (20M): 20.59dBm 802.11n (40M): 20.38dBm 802.11ac (20M): 18.27dBm 802.11ac (40M): 18.34dBm 802.11ac (80M): 19.32dBm	
Power Source	#1 DC voltage supplied from AC/DC adapter. #2 Supplied from PoE.		
Power Rating	#1 (1) AMIGO, AMS117-1202000F2 I/P: AC 100-240V~50/60Hz 0.8A Max / O/P: DC 12V 2.0A (2) SUNNY COMPUTER TECHNOLOGY CO., LTD. SYS1544-2412-T3 I/P: AC 100-240V~1.0A MAX 50-60Hz / O/P: DC +12V 2.0A #2 DC 48V		

#### Note:

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

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# 2. Channel List:

802.11a 802.11n 20MHz 802.11ac 20MHz		802.11n 40MHz 802.11ac 40MHz		802.11ad	c 80MHz			
UNII-1		UNII-1 UNII-1		UNII-1		II-1 UNI		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							

802.11a 802.11n 20MHz 802.11ac 20MHz		802.11n 40MHz 802.11ac 40MHz		802.11ad	c 80MHz
UNI	I-3	UNII-3		UN	II-3
Channel	Frequency (MHz)	Chann I	Frequency (MHz)	Channel	Frequency (MHz)
149	5745	151	5755	155	5775
153	5765	159	5795		
157	5785				
161	5805				
165	5825				

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# 3. Antenna Specification:

Ant.	Brand	Part NO.	Antenna Type	Connector	Gain (dBi)	Note
4	<b>M</b> •gear	C147-510905B	Dipole	Reversed TNC	5.89	TX/RX
5	<b>M</b> •gear	C147-510905B	Dipole	Reversed TNC	5.89	TX/RX
6	<b>M</b> •gear	C147-510905B	Dipole	Reversed TNC	5.89	TX/RX

(1) Note: The EUT incorporates a MIMO function. Physically, the EUT provides three completed three transmitters and three receivers (3T3R)..All transmit signals are completely uncorrelated, then, Direction gain =  $G_{ANT}$ , that is Directional gain=5.89.

4.

Operating Mode	a=\(\frac{1}{2}\)
TX Mode	3TX
802.11a	V (ANT 1 + ANT 2+ANT 3)
802.11n (20MHz)	V (ANT 1 + ANT 2+ANT 3)
802.11n (40MHz)	V (ANT 1 + ANT 2+ANT 3)
802.11ac (20MHz)	V (ANT 1 + ANT 2+ANT 3)
802.11ac (40MHz)	V (ANT 1 + ANT 2+ANT 3)
802.11ac (80MHz)	V (ANT 1 + ANT 2+ANT 3)

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## 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 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)
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	

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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: For Radiated Below 1G test, the 802.11a mode is found to be the worst case and recorded.

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## 3.3 TABLE OF PARAMETERS OF TEXT 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	RT		
Frequency (MHz)	5180	5200	5240
A Mode	15.5	15.5	15.5
N20 Mode	16	16	16
Frequency (MHz)	5190	5230	
N40 Mode	15	16.5	

UNII-3			
Test Software Version	ART		
Frequency (MHz)	5745	5785	5825
A Mode	16.5	17	17.5
N20 Mode	17	17.5	18
Frequency (MHz)	5755	5795	
N40 Mode	17.5	18	

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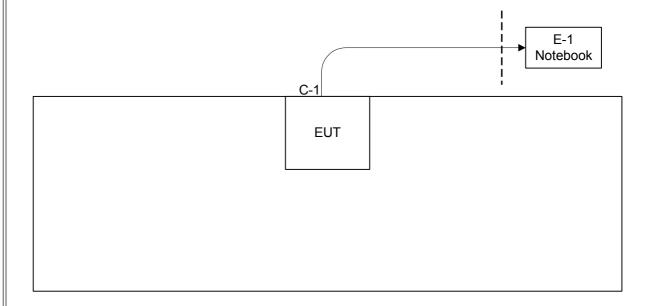
UNII-1				
Test Software Version		ART		
Frequency (MHz)	5180	5200	5240	
AC20 Mode	14	14	14	
Frequency (MHz)	5190	5230		
AC40 Mode	13	15		
Frequency (MHz)	5210			
AC80 Mode	14			

UNII-3			
Test Software Version	ART		
Frequency (MHz)	5745	5785	5825
AC20 Mode	15	15	15.5
Frequency (MHz)	5755	5795	
AC40 Mode	16	16	
Frequency (MHz)	5775		
AC80 Mode	17.5		

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## 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.

Item	Equipment	Mfr/Brand	Model/Type No.	FCC ID/IC	Series No.	Note
E-1	Notebook PC	DELL	PP18L	DOC	PF329 A01	

Item	Shielded Type	Ferrite Core	Length	Note
C-1	NO	NO	10m	RJ-45 Cable

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#### 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.

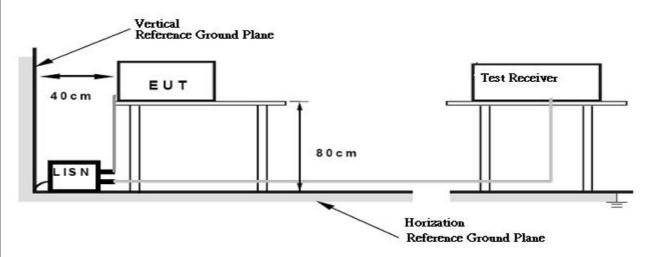
#### 4.1.3 DEVIATION FROM TEST STANDARD

No deviation

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#### 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: 55% Test Voltage: AC 120V/60Hz

#### 4.1.7 TEST RESULTS

Please refer to the Attachment 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 on this case, a " \* " marked in AVG Mode column of Interference Voltage Measured on the Note of Interference Voltage Measured on the Note
- (2) Measuring frequency range from 150KHz to 30MHz o

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#### **4.2 RADIATED EMISSION MEASUREMENT**

#### **4.2.1 RADIATED EMISSION LIMITS**

20dBc in any 100 kHz bandwidth outside the operating frequency band. 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

#### Note:

- (1) The limit for radiated test was performed according to FCC PART 15C.
- (2) The tighter limit applies at the band edges.

LIMITS OF UNWANTED EMISSION OUT OF THE RESTRICTED BANDS

Frequencies (MHz)	EIRP Limit (dBm)	Equivalent Field Strength at 3m (dBµV/m)
5150-5250	-27	68.3
5725 5950	-27 (beyond 10MHz of the band edge)	68.3
5725-5850	-17 (within 10 MHz of band edge)	78.3

Note: The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength:  $E=\frac{1000000\sqrt{30P}}{3}$  µV/m, where P is the eirp (Watts)

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#### **4.2.2 TEST PROCEDURE**

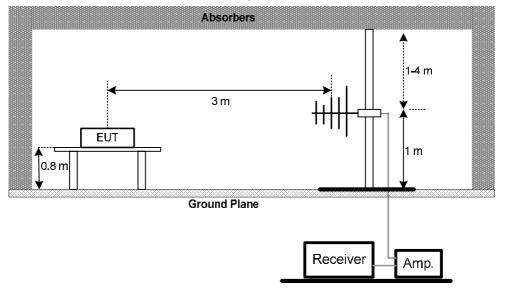
- a. The measuring distance of at 3m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The height of the equipment or of the substitution antenna shall be 0.8 m; 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. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- f. 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

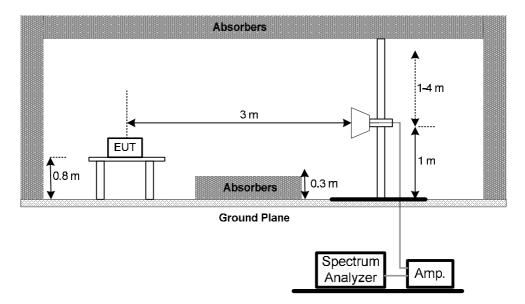
## (A) Radiated Emission Test Set-Up Frequency30 - 1000MHz



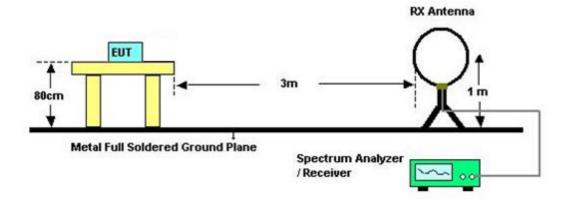
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# (B) Radiated Emission Test Set-Up Frequency Above 1 GHz



## (C) Radiated emissions below 30MHz



## **4.2.5 EUT 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.

## **4.2.6 EUT TEST CONDITIONS**

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

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## 4.2.7 TEST RESULTS (9K TO 30MHz)

Please refer to the Attachment 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 Attachment C.

#### Remark:

- (1) Reading in which marked as QP or Peak means measurements by using are Quasi-Peak Mode or Peak Mode with Detector BW=120KHz ; SPA setting in RBW=120KHz, VBW =120KHz, Swp. Time =  $0.3 \text{ sec./MHz} \circ$
- (2) All readings are Peak unless otherwise stated QP in column of  $\lceil$ Note $_{
  m l}$ . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform  $_{
  m o}$
- (3) Measuring frequency range from 30MHz to 1000MHz o
- (4) If the peak scan value lower limit more than 20dB, then this signal data does not show in table  $\circ$

## 4.2.9 TEST RESULTS (ABOVE 1000 MHz)

Please refer to the Attachment D.

#### Remark:

- (1) Spectrum Setting: 30MHz 1000MHz , RBW= 100KHz, VBW=100KHz, Sweep time = 200 ms. 1GHz- 40GHz, RBW= 1MHz, VBW= 1MHz, Sweep time = Auto
- (2) All readings are Peak unless otherwise stated AV in column of 『Note』. Peak denotes that the Peak reading compliance with the AV Limits and then AV Mode measurement didn't perform.
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission ∘
- (4) Data of measurement within this frequency range shown " \* " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axes:
  - "X" denotes Laid on Table; "Y" denotes Vertical Stand; "Z" denotes Side Stand
- (7) During the measurements above 1GHz it is taken care of that the EUT is always within the 3dB cone of radiation BW of the used antenna.
- (8) No limit: This is fundamental signal, the judgment is not applicable. For fundamental signal judgment was referred to Peak output test.

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## 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 Bandwidth	5725-5850	PASS

#### **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
	VBW	1000 kHz
	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



## **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.

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5.1.5 EUT TEST CO	NDITIONS	
Temperature: 25°C	Relative Humidity: 55%	Test Voltage: AC 120V/60Hz
<b>5.1.6 TEST RESULT</b> Please refer to the At		

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## **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

## **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 Fraguency	Encompass the entire emissions bandwidth (EBW) of the
Span Frequency	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.

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## **6.1.2 DEVIATION FROM STANDARD**

No deviation.

## 6.1.3 TEST SETUP

EUT	Power Meter
	1 Ower Meter

## **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: 55% Test Voltage: AC 120V/60Hz

## **6.1.6 TEST RESULTS**

Please refer to the Attachment F.

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## 7. ANTENNA CONDUCTED SPURIOUS EMISSION

## 7.1 APPLIED PROCEDURES / LIMIT

FCC Part15, Subpart E			
Test Item	Limit	Frequency Range (MHz)	Result
	-27dBm/MHz	5150-5250	PASS
Antenna conducted Spurious Emission	Below -17dBm/MHz within 10MHz of band edge, below -27dBm/MHz beyond 10MHz of the band edge	5725-5850	PASS

#### 7.1.1 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
	RBW	1000kHz
	VBW	1000kHz
	Trace	Max Hold
	Sweep Time	Auto

## 7.1.2 DEVIATION FROM STANDARD

No deviation.

#### 7.1.3 TEST SETUP



## 7.1.4 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.

## 7.1.5 EUT TEST CONDITIONS

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

## 7.1.6 TEST RESULTS

Please refer to the Attachment G.

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#### 8. POWER SPECTRAL DENSITY TEST

## 8.1 APPLIED PROCEDURES / LIMIT

FCC Part15, Subpart E			
Test Item	Limit	Frequency Range (MHz)	Result
Other then Mobile and portable:17dBm/MHz Density Mobile and portable:11dBm/MHz		5150-5250	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
	Span Fraguency	Encompass the entire emissions bandwidth (EBW) of the
	Span Frequency	signal
	RBW	= 1MHz.
	VBW	≥ 3MHz.
	Detector	RMS
	Trace	Max Hold
	Sweep Time	Auto

#### Note:

- 1. For UNII-3, according to KDB publication 789033 D02 General UNII Test Procedures New Rules v01, 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.
- 2. 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.

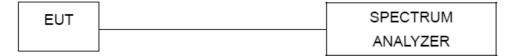
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## **8.1.1 DEVIATION FROM STANDARD**

No deviation.

## 8.1.2 TEST SETUP



## **8.1.3 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.

## **8.1.4 EUT TEST CONDITIONS**

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

## 8.1.5 TEST RESULTS

Please refer to the Attachment H.

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## 9. FREQUENCY STABILITY MEASUREMENT

## 9.1 APPLIED PROCEDURES / LIMIT

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

## 9.1.1 TEST PROCEDURE

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

	and block diagram bolow,		
b.	Spectrum Parameter Setting		
	Attenuation	Auto	
	Span Frequency	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.

## 9.1.2 DEVIATION FROM STANDARD

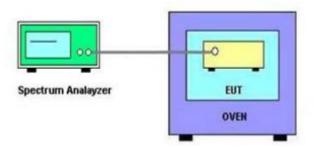
No deviation.

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d. User manual temperature is 0°C~50°C.



## **9.1.3 TEST SETUP**



## 9.1.4 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.

## 9.1.5 EUT TEST CONDITIONS

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

## 9.1.6 TEST RESULTS

Please refer to the Attachment I.

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# 10. MEASUREMENT INSTRUMENTS LIST

	Conducted Emission Measurement						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until		
1	LISN	R&S	ENV216	100087	Nov. 23, 2014		
2	Test Cable	TIMES	CFD300-NL	C01	Jun. 15, 2015		
3	EMI Test Receiver	R&S	ESCI	100082	Apr. 13, 2015		
4	Measurement Software	EZ	EZ_EMC (Version NB-02A)	N/A	N/A		

	Radiated Emission Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until	
1	Spectrum Analyzer	R&S	FSP30	100854	Oct. 26, 2015	
2	Horn Antenna	Schwarzbeck	BBHA 9120	D-325	Apr. 14, 2015	
3	Microwave Pre_amplifier	Agilent	8449B	3008A01714	Apr. 15, 2015	
4	Microflex Cable	Harbour industries	27478LL142	1m	May. 12, 2015	
5	Microflex Cable	EMC	S104-SMA	8m	May. 12, 2015	
6	Microflex Cable	Harbour industries	27478LL142	3m	May. 12, 2015	
7	Test Cable	LMR	LMR-400	12m	May. 13, 2015	
8	Test Cable	LMR	LMR-400	3m	May. 13, 2015	
9	Pre-Amplifier	Anritsu	MH648A	M92649	Jun. 17, 2015	
10	Log-Bicon Antenna	Schwarzbeck	VULB9168-352	9168-352	July. 10, 2015	
11	Preamplifier With Adaptor	EMC	EMC2654045	980030	Feb. 17, 2015	
12	Horn Antenna	Schwarzbeck	BBHA 9170	340	Nov. 13, 2015	

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Spectrum Bandwidth Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP30	100854	Oct. 26, 2015

	Maximum Conducted Output Power Measurement					
Ite	m Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until	
1	Power Meter	Anritsu	ML2495A	1128008	Aug. 08, 2014	
2	Power Meter Sensor	Anritsu	MA2411B	1126001	Aug. 08, 2014	

	Antenna Conducted Spurious Emission Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until	
1	Spectrum Analyzer	R&S	FSP30	100854	Oct. 26, 2015	

Power Spectral Density Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP30	100854	Oct. 26, 2015

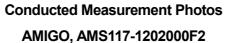
Frequency Stability Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP30	100854	Oct. 26, 2015

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

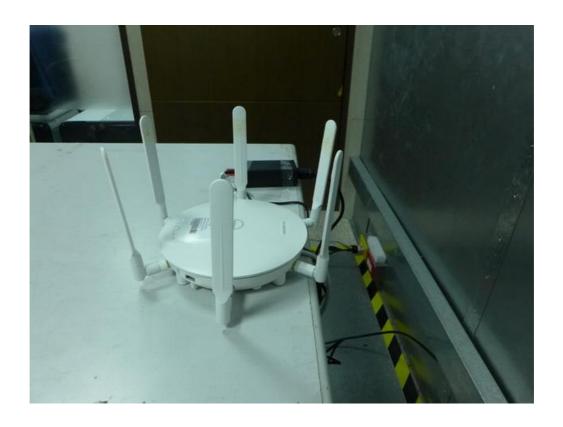
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# **11. EUT TEST PHOTOS**



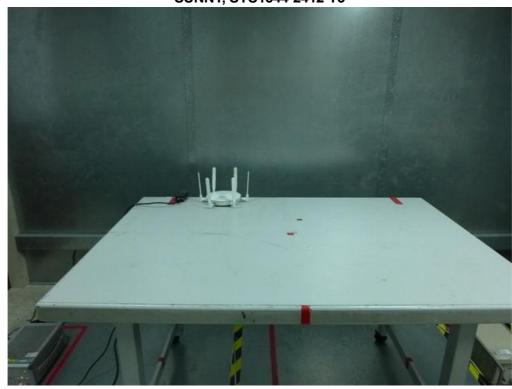




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Conducted Measurement Photos SUNNY, SYS1544-2412-T3

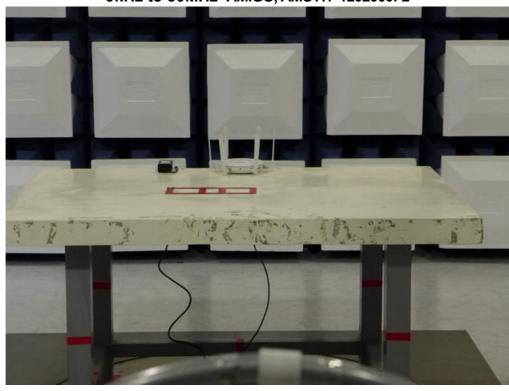




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9kHz to 30MHz-AMIGO, AMS117-1202000F2

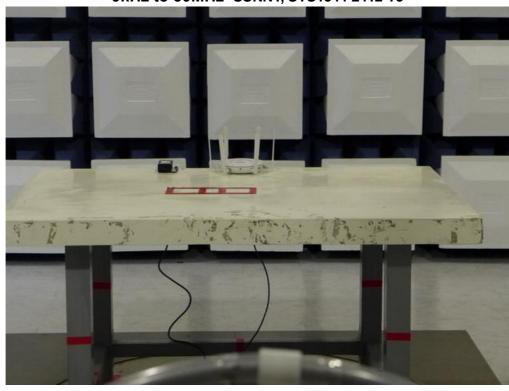




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9kHz to 30MHz- SUNNY, SYS1544-2412-T3

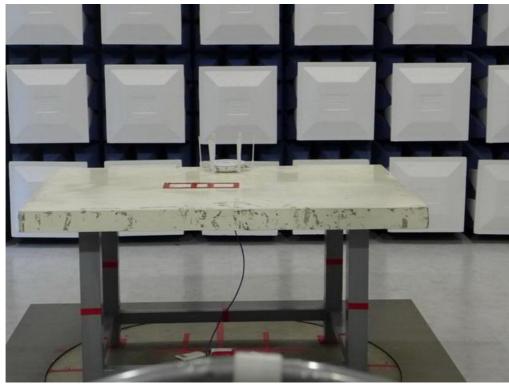


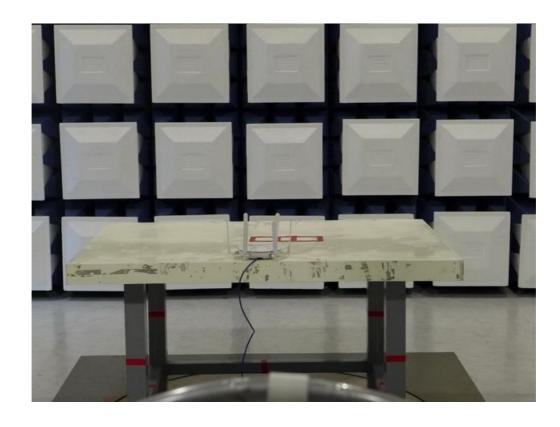


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9kHz to 30MHz-PoE

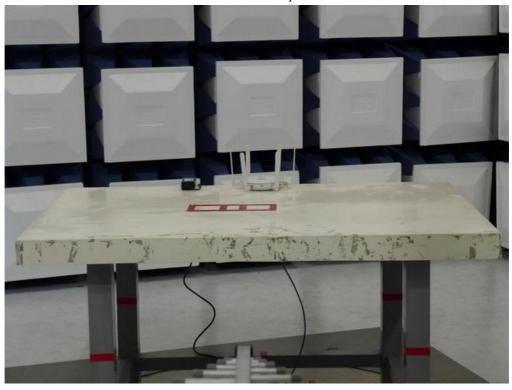


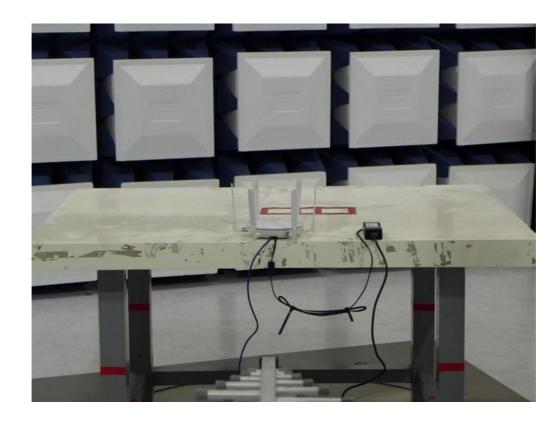


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**30MHz** to **1000MHz- AMIGO**, **AMS117-1202000F2** 

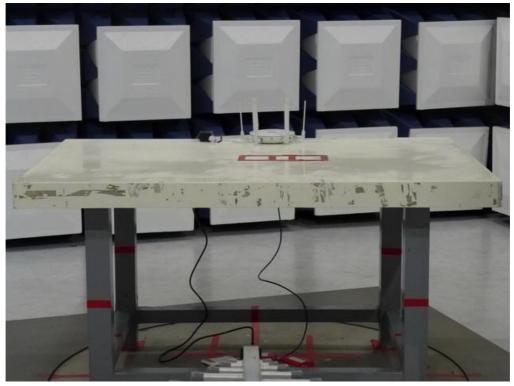


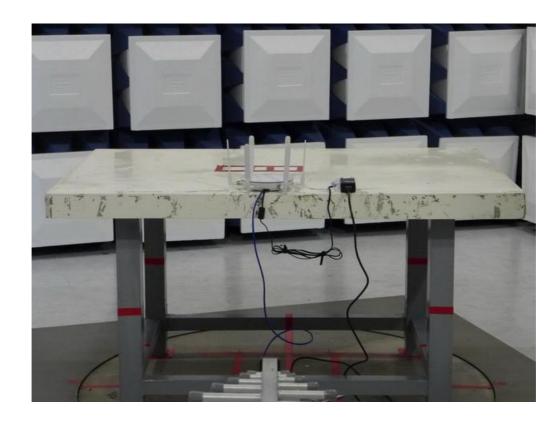


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30MHz to 1000MHz-SUNNY, SYS1544-2412-T3

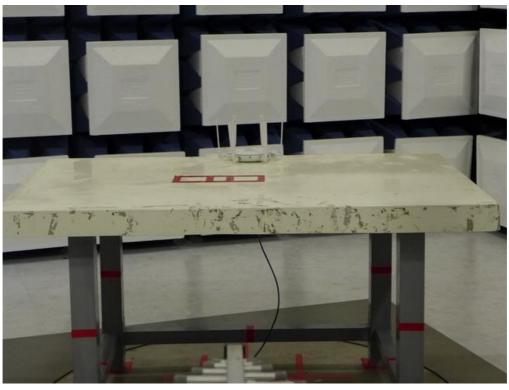


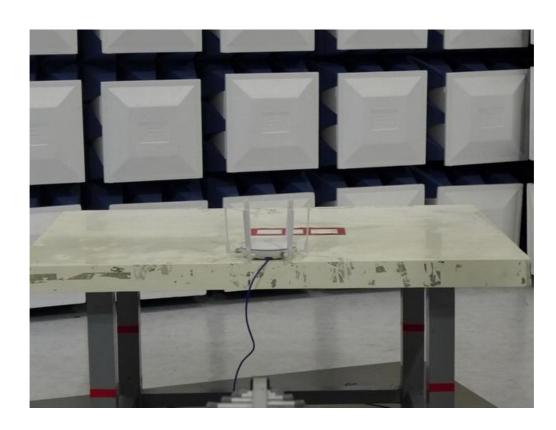


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30MHz to 1000MHz-PoE



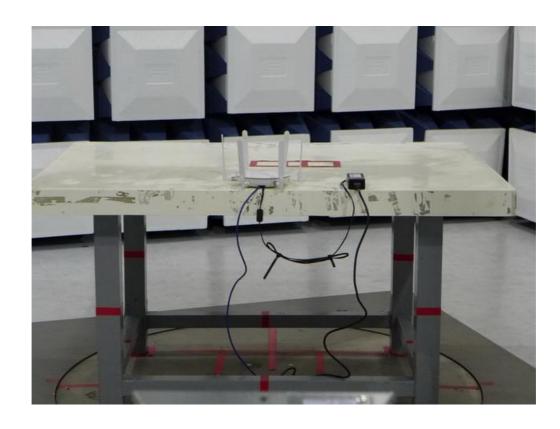


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# Above 1000MHz





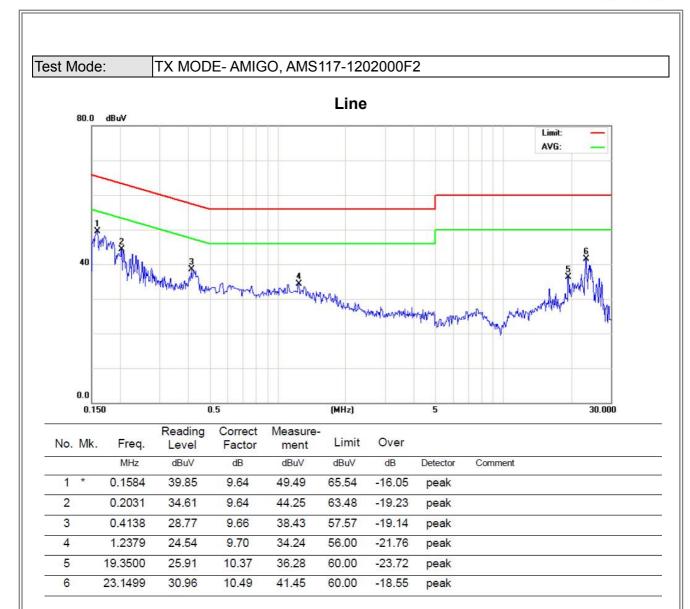
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ATTACHMENT A - CONDUCTED EMISSION

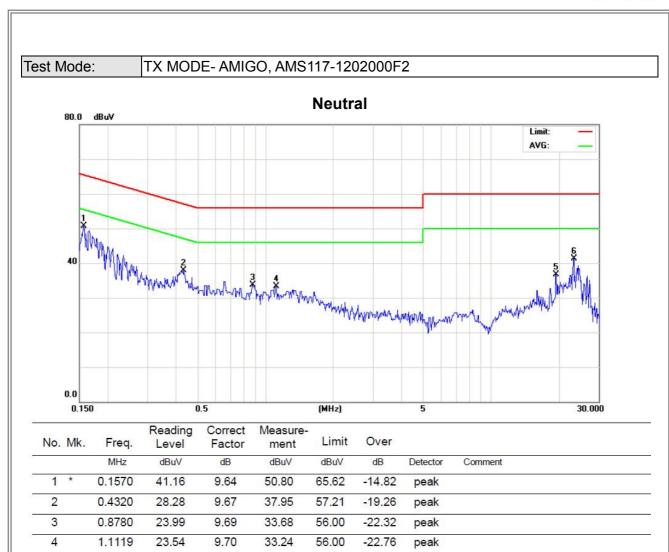
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10.37

10.49

36.69

41.32

60.00

60.00

-23.31

-18.68

peak

peak

26.32

30.83

5

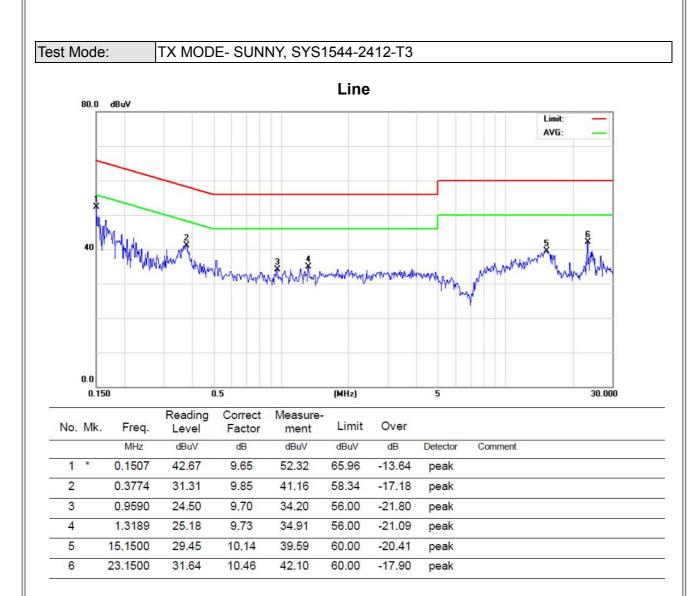
6

19.3500

23.1500

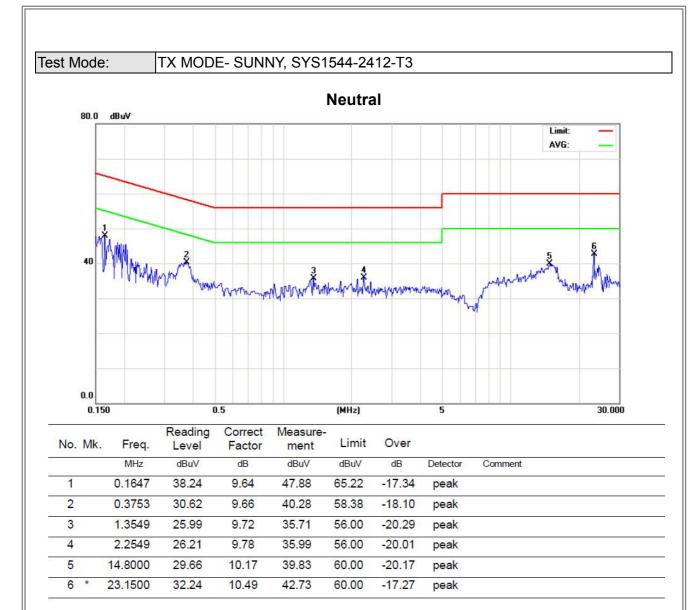
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ATTACHMENT B - RADIATED EMISSION (9KHZ TO 30MHZ)

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Test Mode: TX Mode- AMIGO, AMS117-1202000F2

Freq.	Ant.	Reading(RA)	Corr.Factor(CF)	Measured(FS)	Limits(QP)	Margin	Note
(MHz)	0°/90°	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	NOLE
0.2523	0°	46.24	11.40	57.64	79.57	-21.93	AVG
0.2523	0°	53.11	11.40	64.51	99.57	-35.06	PK
0.3712	0°	38.47	11.14	49.61	76.21	-26.60	AVG
0.3712	0°	46.29	11.14	57.43	96.21	-38.78	PK
0.432	0°	50.32	11.18	61.50	74.89	-13.40	AVG
0.432	0°	49.17	11.18	60.35	94.89	-34.55	PK
0.744	0°	44.52	11.30	55.82	90.55	-34.73	QP
0.772	0°	40.15	11.33	51.48	69.85	-18.37	QP
1.356	0°	38.29	11.53	49.82	64.96	-15.14	QP

Freq.	Ant.	Reading(RA)	Corr.Factor(CF)	Measured(FS)	Limits(QP)	Margin	Note
(MHz)	0°/90°	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	Note
0.255	90°	46.52	11.38	57.90	79.47	-21.57	AVG
0.255	90°	57.44	11.38	68.82	99.47	-30.65	PK
0.377	90°	37.35	11.14	48.49	76.08	-27.58	AVG
0.377	90°	46.29	11.14	57.43	96.08	-38.64	PK
0.435	90°	42.11	11.18	53.29	74.83	-21.55	AVG
0.435	90°	51.27	11.18	62.45	94.83	-32.39	PK
0.746	90°	44.32	11.30	55.62	90.55	-34.93	QP
0.788	90°	40.51	11.34	51.85	69.67	-17.83	QP
1.365	90°	38.64	11.53	50.17	64.90	-14.73	QP

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Test Mode: TX Mode- SUNNY, SYS1544-2412-T3

Freq.	Ant.	Reading(RA)	Corr.Factor(CF)	Measured(FS)	Limits(QP)	Margin	Note
(MHz)	0°/90°	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	Note
0.2527	0°	46.85	11.40	58.25	79.55	-21.31	AVG
0.2527	0°	53.22	11.40	64.62	99.55	-34.94	PK
0.3700	0°	38.36	11.14	49.50	76.24	-26.74	AVG
0.3700	0°	46.15	11.14	57.29	96.24	-38.95	PK
0.4330	0°	40.39	11.18	51.57	74.87	-23.31	AVG
0.4330	0°	49.41	11.18	60.59	94.87	-34.29	PK
0.7410	0°	44.28	11.30	55.58	90.55	-34.97	QP
0.7780	0°	40.36	11.33	51.69	69.78	-18.09	QP
1.3620	0°	38.74	11.53	50.27	64.92	-14.65	QP

Freq.	Ant.	Reading(RA)	Corr.Factor(CF)	Measured(FS)	Limits(QP)	Margin	Note
(MHz)	0°/90°	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	14010
0.2540	90°	46.28	11.39	57.67	79.51	-21.84	AVG
0.2540	90°	57.47	11.39	68.86	99.51	-30.65	PK
0.3720	90°	37.22	11.14	48.36	76.19	-27.83	AVG
0.3720	90°	46.39	11.14	57.53	96.19	-38.66	PK
0.4330	90°	42.51	11.18	53.69	74.87	-21.19	AVG
0.4330	90°	51.62	11.18	62.80	94.87	-32.08	PK
0.7470	90°	44.28	11.30	55.58	90.55	-34.97	QP
0.7780	90°	40.47	11.33	51.80	69.78	-17.98	QP
1.3620	90°	38.62	11.53	50.15	64.92	-14.77	QP

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Test Mode: TX Mode- PoE

Freq.	Ant.	Reading(RA)	Corr.Factor(CF)	Measured(FS)	Limits(QP)	Margin	Note
(MHz)	0°/90°	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	NOIC
0.2510	0°	46.29	11.41	57.70	79.61	-21.91	AVG
0.2510	0°	53.25	11.41	64.66	99.61	-34.95	PK
0.3780	0°	38.11	11.14	49.25	76.05	-26.80	AVG
0.3780	0°	46.63	11.14	57.77	96.05	-38.28	PK
0.4310	0°	40.57	11.18	51.75	74.91	-23.17	AVG
0.4310	0°	49.24	11.18	60.42	94.91	-34.50	PK
0.7450	0°	44.16	11.30	55.46	90.55	-35.09	QP
0.7780	0°	40.42	11.33	51.75	69.78	-18.03	QP
1.3620	0°	38.12	11.53	49.65	64.92	-15.27	QP

Freq.	Ant.	Reading(RA)	Corr.Factor(CF)	Measured(FS)	Limits(QP)	Margin	Note
(MHz)	0°/90°	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	14010
0.2523	90°	46.28	11.40	57.68	79.57	-21.89	AVG
0.2523	90°	57.09	11.40	68.49	99.57	-31.08	PK
0.3760	90°	37.25	11.14	48.39	76.10	-27.71	AVG
0.3760	90°	46.68	11.14	57.82	96.10	-38.28	PK
0.4400	90°	42.89	11.18	54.07	74.74	-20.66	AVG
0.4400	90°	51.32	11.18	62.50	94.74	-32.23	PK
0.7470	90°	44.73	11.30	56.03	90.55	-34.52	QP
0.7780	90°	40.68	11.33	52.01	69.78	-17.77	QP
1.3620	90°	38.22	11.53	49.75	64.92	-15.17	QP

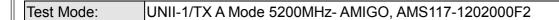
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ATTACHMENT C - RADIATED EMISSION (30MHZ TO 1000MHZ)

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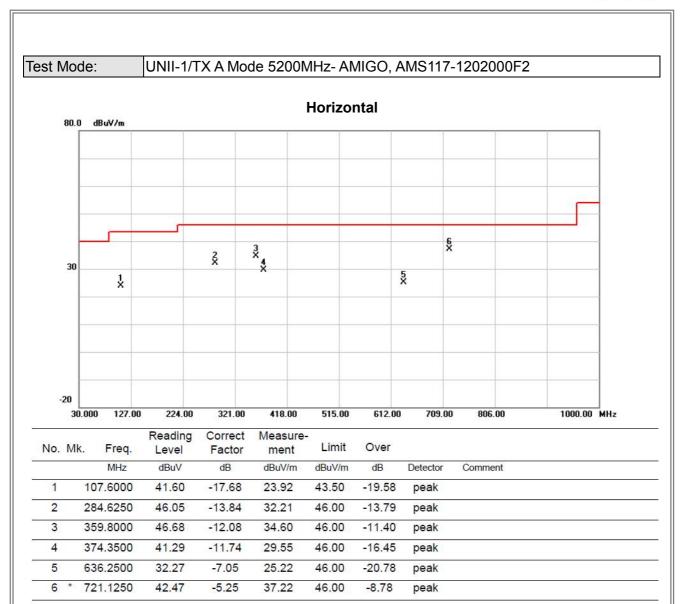


# Vertical 80.0 dBuV/m 5 X 4 × 30 1 X Š 3 2 X -20 30.000 127.00 224.00 321.00 418.00 515.00 612.00 709.00 806.00 1000.00 MHz

	No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over			
100			MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment	
50	1		46.9750	41.12	-13.68	27.44	40.00	-12.56	peak		
	2		107.6000	42.08	-17.68	24.40	43.50	-19.10	peak		
	3		267.6500	40.57	-14.29	26.28	46.00	-19.72	peak		
: <del>-</del>	4		359.8000	43.66	-12.08	31.58	46.00	-14.42	peak		
: <del>-</del>	5	*	721.1250	42.87	-5.25	37.62	46.00	-8.38	peak		
	6		873.9000	31.83	-3.36	28.47	46.00	-17.53	peak		

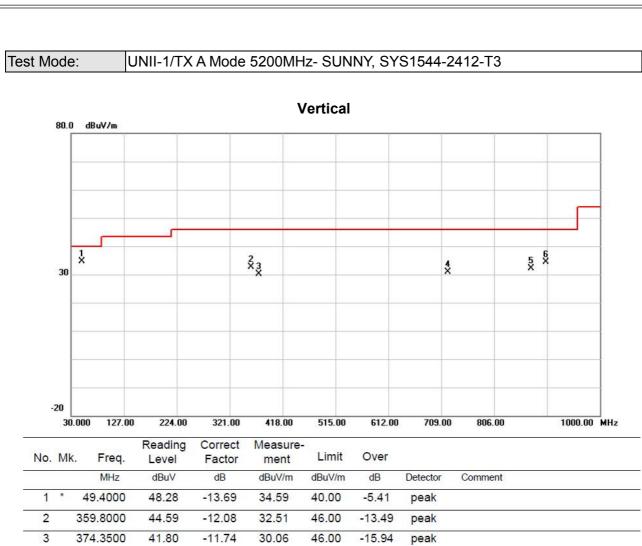
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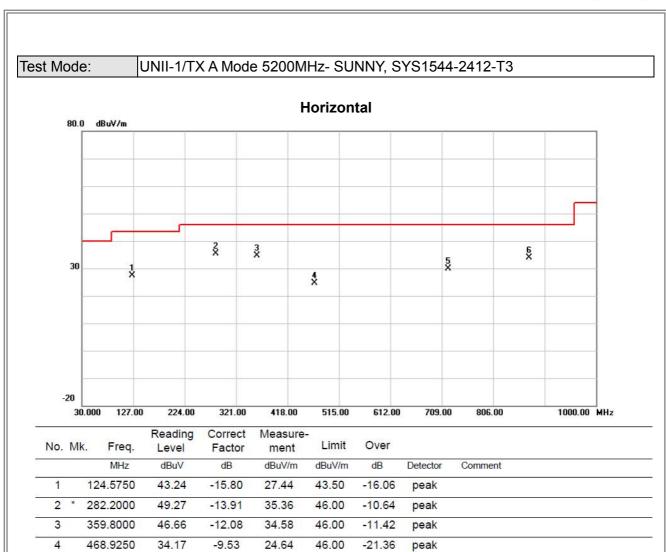




No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over			
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment	
1	*	49.4000	48.28	-13.69	34.59	40.00	-5.41	peak		
2		359.8000	44.59	-12.08	32.51	46.00	-13.49	peak		
3		374.3500	41.80	-11.74	30.06	46.00	-15.94	peak		
4		721.1250	36.08	-5.25	30.83	46.00	-15.17	peak		
5		873.9000	35.48	-3.36	32.12	46.00	-13.88	peak		
6		900.5750	37.29	-2.82	34.47	46.00	-11.53	peak		

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5

6

721.1250

873.9000

35.02

37.16

-5.25

-3.36

29.77

33.80

46.00

46.00

-16.23

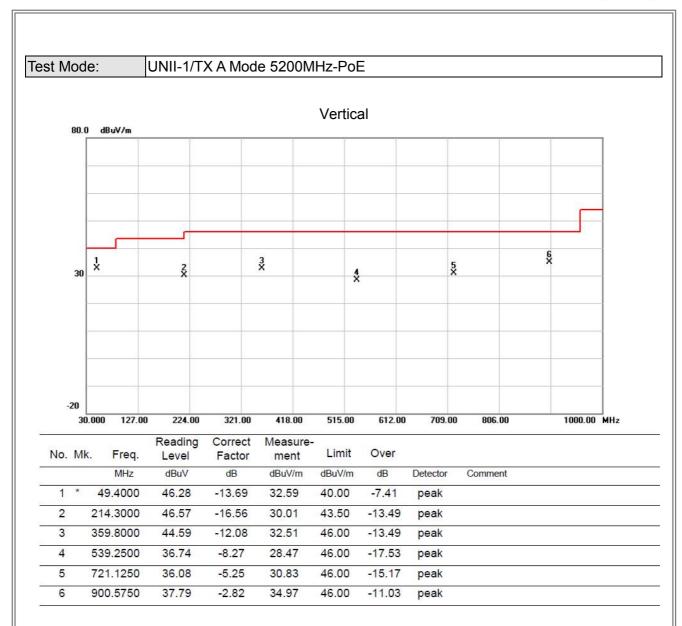
-12.20

peak

peak

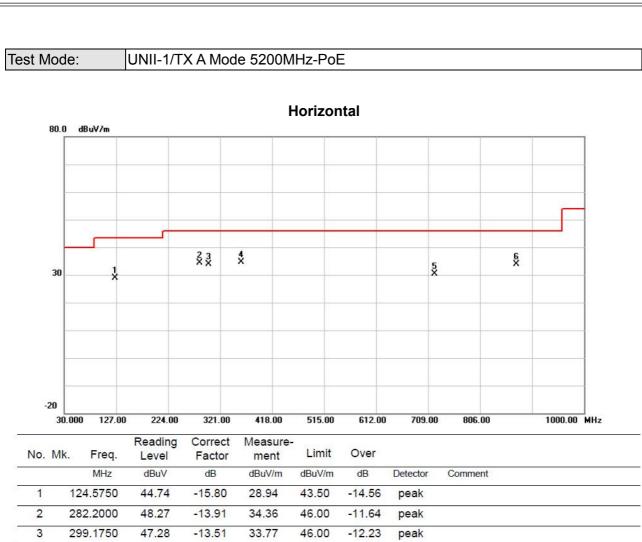
Report No.: BTL-FCCP-2-1410025 Page 57 of 333





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No.	Mk.	Freq.	Level	Factor	ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	1	24.5750	44.74	-15.80	28.94	43.50	-14.56	peak	
2	2	82.2000	48.27	-13.91	34.36	46.00	-11.64	peak	
3	2	99.1750	47.28	-13.51	33.77	46.00	-12.23	peak	
4	* 3	59.8000	46.66	-12.08	34.58	46.00	-11.42	peak	
5	7	21.1250	35.52	-5.25	30.27	46.00	-15.73	peak	
6	8	73.9000	37.16	-3.36	33.80	46.00	-12.20	peak	

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ATTACHMENT D - RADIATED EMISSION (ABOVE 1000MHZ)	

Report No.: BTL-FCCP-2-1410025 Page 60 of 333



Orthogonal Axis: X
Test Mode: UNII-1/ TX A Mode 5180MHz

# Vertical 120.0 dBuV/m 70 20.0 5130.000 5140.00 5150.00 5160.00 5170.00 5180.00 5190.00 5200.00 5210.00 5230.00 MHz

No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over			
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment	
1		5150.000	24.56	37.74	62.30	68.30	-6.00	peak	14 (44 ) (44 )	
2		5150.000	14.57	37.74	52.31	54.00	-1.69	AVG		
3	*	5178.000	79.38	37.83	117.21	68.30	48.91	peak	no limit	
4	X	5178.000	72.58	37.83	110.41	68.30	42.11	AVG	no limit	

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Orthogonal Axis:	X
Test Mode:	UNII-1/ TX A Mode 5180MHz

# 

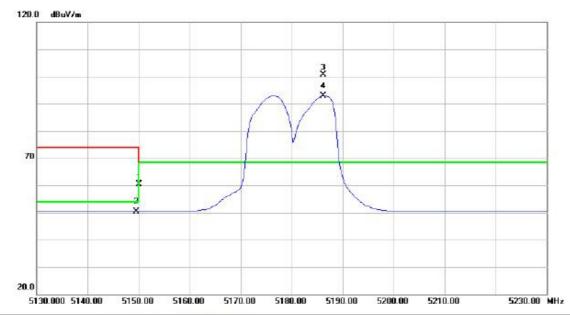
No.	M	k.	Freq.	Reading Level	Correct	Measure- ment	Limit	Over		
			MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		10	0359.61	44.10	17.74	61.84	68.30	-6.46	peak	
2		10	0359.61	32.80	17.74	50.54	68.30	-17.76	AVG	
3		15	5540.89	44.00	19.30	63.30	74.00	-10.70	peak	
4	*	15	5540.89	32.31	19.30	51.61	54.00	-2.39	AVG	

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Orthogonal Axis:	X
Test Mode:	UNII-1/ TX A Mode 5180MHz

# Horizontal



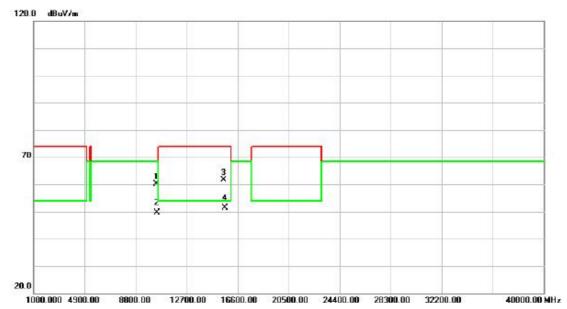
No.	Mk	c. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over			
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment	
1		5150.000	22.65	37.74	60.39	68.30	-7.91	peak	11-0-11-0-0-0-0-0	
2		5150.000	12.76	37.74	50.50	54.00	-3.50	AVG		
3	*	5186.250	62.66	37.86	100.52	68.30	32.22	peak	no limit	
4	X	5186.250	55.14	37.86	93.00	68.30	24.70	AVG	no limit	

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Orthogonal Axis:	X
Test Mode:	UNII-1/ TX A Mode 5180MHz

# Horizontal

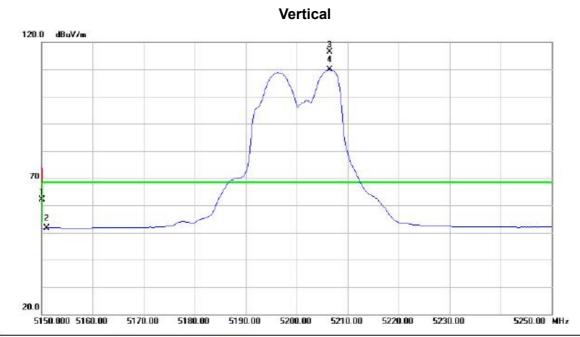


No.	Mk	ζ.	Freq.	Reading Level	Correct	Measure- ment	Limit	Over		
			MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		103	60.19	42.44	17.74	60.18	68.30	-8.12	peak	
2		103	60.19	31.88	17.74	49.62	68.30	-18.68	AVG	
3		155	40.92	42.34	19.30	61.64	74.00	-12.36	peak	
4	*	155	40.92	32.17	19.30	51.47	54.00	-2.53	AVG	

Report No.: BTL-FCCP-2-1410025 Page 64 of 333



Orthogonal Avia	v
Orthogonal Axis:	^
Test Mode:	UNII-1/ TX A Mode 5200MHz



No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over			
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment	
1		5150.000	24.47	37.74	62.21	68.30	-6.09	peak		
2		5150.000	13.92	37.74	51.66	54.00	-2.34	AVG		
3	*	5206.500	78.44	37.94	116.38	68.30	48.08	peak	no limit	
4	X	5206.500	71.89	37.94	109.83	68.30	41.53	AVG	no limit	

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40000.00 MHz

Orthogonal Axis:	X
Test Mode:	UNII-1/ TX A Mode 5200MHz

# 

No.	Mk.	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over			
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment	
1		10399.92	42.58	17.92	60.50	68.30	-7.80	peak		
2		10399.92	32.30	17.92	50.22	68.30	-18.08	AVG		
3		15600.52	42.98	19.32	62.30	74.00	-11.70	peak		
4	*	15600.52	32.15	19.32	51.47	54.00	-2.53	AVG		

12700.00 16600.00 20500.00 24400.00 28300.00 32200.00

20.0

1000.000 4900.00

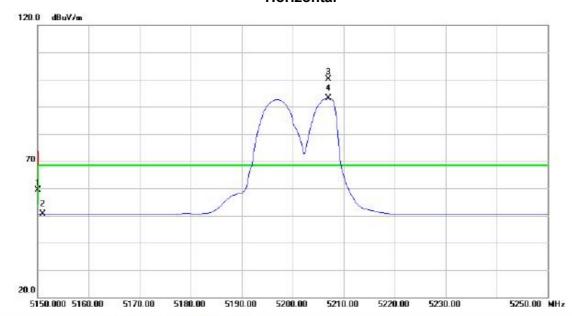
8800.00

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Orthogonal Axis:	X
Test Mode:	UNII-1/ TX A Mode 5200MHz

# Horizontal



No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over			
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment	
1		5150.000	21.75	37.74	59.49	68.30	-8.81	peak	10 000 000	
2		5150.000	12.77	37.74	50.51	54.00	-3.49	AVG		
3	*	5207.000	62.28	37.94	100.22	68.30	31.92	peak	no limit	Ÿ
4	Χ	5207.000	55.16	37.94	93.10	68.30	24.80	AVG	no limit	

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Orthogonal Axis:	X
Test Mode:	UNII-1/ TX A Mode 5200MHz

# Horizontal

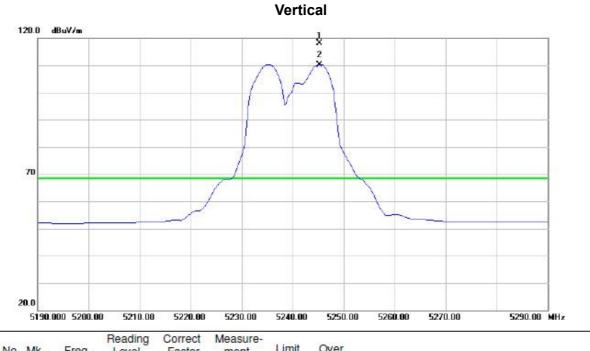


No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over			
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment	
1		10400.03	43.39	17.92	61.31	68.30	-6.99	peak		
2		10400.03	31.57	17.92	49.49	68.30	-18.81	AVG		
3		15600.18	44.00	19.32	63.32	74.00	-10.68	peak		
4	*	15600.18	32.04	19.32	51.36	54.00	-2.64	AVG		

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Orthogonal Axis:	x
Test Mode:	UNII-1/ TX A Mode 5240MHz



No.	Mk	k. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over			
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment	
1	٠	5245.250	80.08	38.06	118.14	68.30	49.84	peak	no limit	
2	X	5245.250	72.10	38.06	110.16	68.30	41.86	AVG	no limit	

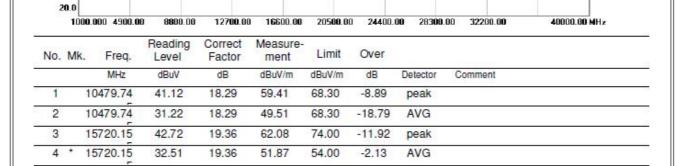
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Orthogonal Axis:	X
Test Mode:	UNII-1/ TX A Mode 5240MHz

# Vertical 120.0 dBuV/m

3



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Orthogonal Axis:	X
Test Mode:	UNII-1/ TX A Mode 5240MHz

# Horizontal



No.	Mk	c. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over			
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment	
1	٠	5232.750	59.94	38.03	97.97	68.30	29.67	peak	no limit	
2	X	5232.750	52.46	38.03	90.49	68.30	22.19	AVG	no limit	

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Orthogonal Axis:	X
Test Mode:	UNII-1/ TX A Mode 5240MHz

# Horizontal



No.	Mk	ζ.	Freq.	Reading Level	Correct	Measure- ment	Limit	Over		
			MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		104	480.55	41.29	18.29	59.58	68.30	-8.72	peak	
2		104	480.55	30.60	18.29	48.89	68.30	-19.41	AVG	
3		157	720.45	43.59	19.36	62.95	74.00	-11.05	peak	
4	*	157	720.45	32.44	19.36	51.80	54.00	-2.20	AVG	

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Orthogonal Axis: X
Test Mode: UNII-1/ TX N20 Mode 5180MHz

# Vertical 120.0 dBuV/m 70 20.0 5130.000 5140.00 5150.00 5160.00 5170.00 5180.00 5190.00 5200.00 5210.00 5230.00 MHz

No.	Mk	c. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over			
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment	
1		5150.000	25.36	37.74	63.10	68.30	-5.20	peak		
2		5150.000	14.59	37.74	52.33	54.00	-1.67	AVG		
3	*	5174.750	79.44	37.82	117.26	68.30	48.96	peak	no limit	
4	Χ	5174.750	63.88	37.82	101.70	68.30	33.40	AVG	no limit	

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Orthogonal Axis:	x
Test Mode:	UNII-1/ TX N20 Mode 5180MHz

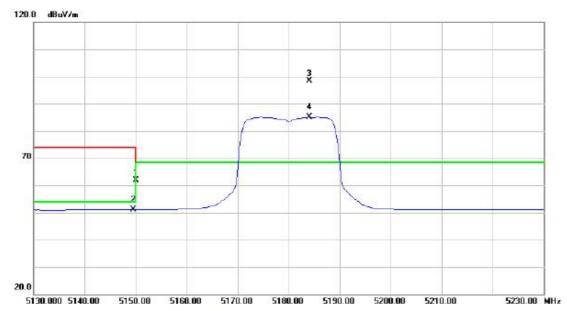
## 

No.	Mk	Freq.	Level	Factor	Measure- ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		10360.20	44.35	17.74	62.09	68.30	-6.21	peak	
2		10360.20	33.37	17.74	51.11	68.30	-17.19	AVG	
3		15540.76	44.62	19.30	63.92	74.00	-10.08	peak	
4	*	15540.76	32.62	19.30	51.92	54.00	-2.08	AVG	

Report No.: BTL-FCCP-2-1410025 Page 74 of 333



Orthogonal Axis:	X
Test Mode:	UNII-1/ TX N20 Mode 5180MHz

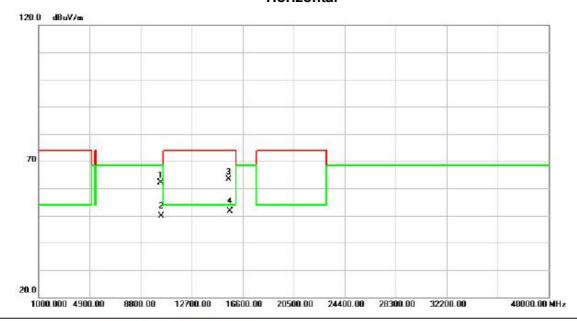


No.	Mk	Κ.	Freq.	Level	Factor	ment	Limit	Over			
			MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment	
1		515	0.000	24.20	37.74	61.94	68.30	-6.36	peak		
2		515	0.000	13.30	37.74	51.04	54.00	-2.96	AVG		
3	*	518	34.000	60.60	37.86	98.46	68.30	30.16	peak	no limit	
4	X	518	34.000	47.18	37.86	85.04	68.30	16.74	AVG	no limit	

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Orthogonal Axis:	X
Test Mode:	UNII-1/ TX N20 Mode 5180MHz

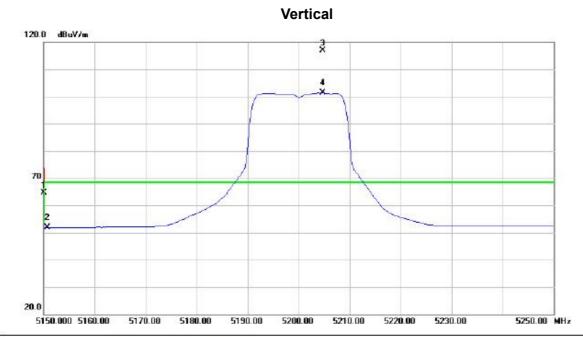


No.	Mk	K.	Freq.	Reading Level	Correct	Measure- ment	Limit	Over			
			MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment	
1		10	359.90	44.37	17.74	62.11	68.30	-6.19	peak		
2		10	359.90	32.23	17.74	49.97	68.30	-18.33	AVG		
3		15	540.13	44.09	19.30	63.39	74.00	-10.61	peak		
4	*	15	5540.13	32.41	19.30	51.71	54.00	-2.29	AVG		

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Orthogonal Axis:	x
Test Mode:	UNII-1/ TX N20 Mode 5200MHz



No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over			
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment	
1		5150.000	26.82	37.74	64.56	68.30	-3.74	peak	14 000141 00000	
2		5150.000	14.07	37.74	51.81	54.00	-2.19	AVG		
3	*	5204.750	79.07	37.93	117.00	68.30	48.70	peak	no limit	
4	X	5204.750	63.43	37.93	101.36	68.30	33.06	AVG	no limit	

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40000.00 MHz

Orthogonal Axis:	X
Test Mode:	UNII-1/ TX N20 Mode 5200MHz

# 

20.0

1000.000 4900.00

8800.00

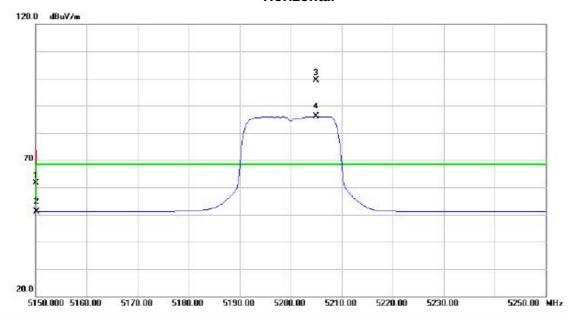
No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over			
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment	
1		10400.07	44.11	17.92	62.03	68.30	-6.27	peak		
2		10400.07	33.08	17.92	51.00	68.30	-17.30	AVG		
3		15600.46	44.23	19.32	63.55	74.00	-10.45	peak		
4	*	15600.46	32.81	19.32	52.13	54.00	-1.87	AVG		

12700.00 16600.00 20500.00 24400.00 28300.00 32200.00

Report No.: BTL-FCCP-2-1410025 Page 78 of 333



Orthogonal Axis:	X
Test Mode:	UNII-1/ TX N20 Mode 5200MHz



No.	Mk	c. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over			
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment	
1		5150.000	23.98	37.74	61.72	68.30	-6.58	peak	10-0-10-0-0-0-0-0	
2		5150.000	13.31	37.74	51.05	54.00	-2.95	AVG		
3	*	5205.000	61.40	37.93	99.33	68.30	31.03	peak	no limit	
4	X	5205.000	48.10	37.93	86.03	68.30	17.73	AVG	no limit	

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Orthogonal Axis:	X
Test Mode:	UNII-1/ TX N20 Mode 5200MHz

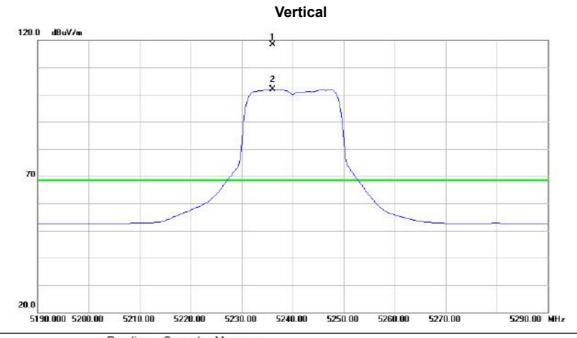


No.	Mk	ζ.	Freq.	Reading Level	Correct	Measure- ment	Limit	Over		
			MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		10	400.10	43.56	17.92	61.48	68.30	-6.82	peak	
2		10	400.10	31.97	17.92	49.89	68.30	-18.41	AVG	
3		15	600.18	44.56	19.32	63.88	74.00	-10.12	peak	
4	*	15	600.18	32.71	19.32	52.03	54.00	-1.97	AVG	

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Orthogonal Axis: X
Test Mode: UNII-1/ TX N20 Mode 5240MHz



No.	Mk	k. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over			
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment	
1	٠	5236.000	80.23	38.03	118.26	68.30	49.96	peak	no limit	
2	X	5236.000	63.83	38.03	101.86	68.30	33.56	AVG	no limit	

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Orthogonal Axis:	X
Test Mode:	UNII-1/ TX N20 Mode 5240MHz

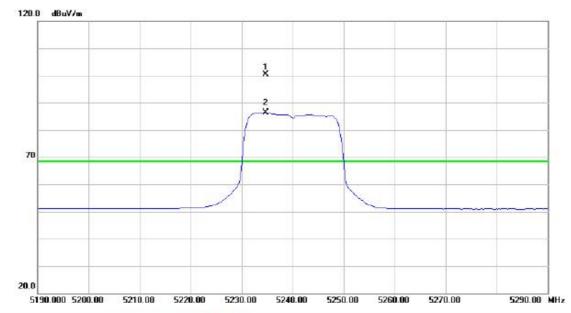
# Vertical 120.0 dBuV/m 70 3 4 20.0 1000.000 4900.00 8800.00 12700.00 16500.00 20500.00 24400.00 28300.00 32200.00 40000.00 MHz

No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over			
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment	
1		10480.04	43.77	18.29	62.06	68.30	-6.24	peak		
2		10480.04	31.51	18.29	49.80	68.30	-18.50	AVG		
3		15720.25	44.95	19.36	64.31	74.00	-9.69	peak		
4	*	15720.25	32.66	19.36	52.02	54.00	-1.98	AVG		

Report No.: BTL-FCCP-2-1410025 Page 82 of 333



Orthogonal Axis:	X
Test Mode:	UNII-1/ TX N20 Mode 5240MHz



No.	Mk	. Freq.	Reading Level		Measure- ment	Limit	Over			
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment	
1	٠	5234.750	62.25	38.03	100.28	68.30	31.98	peak	no limit	
2	X	5234.750	48.24	38.03	86.27	68.30	17.97	AVG	no limit	

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Orthogonal Axis:	X
Test Mode:	UNII-1/ TX N20 Mode 5240MHz



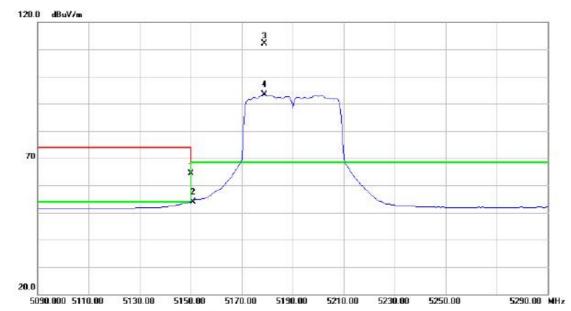
No.	M	k.	Freq.	Reading Level	Correct	Measure- ment	Limit	Over		
			MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		10	479.98	43.22	18.29	61.51	68.30	-6.79	peak	
2		10	479.98	31.54	18.29	49.83	68.30	-18.47	AVG	
3		15	720.24	45.26	19.36	64.62	74.00	-9.38	peak	
4	*	15	720.61	32.62	19.37	51.99	54.00	-2.01	AVG	

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Orthogonal Axis:	X
Test Mode:	UNII-1/ TX N40 Mode 5190MHz

### Vertical



Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over			
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment	
	5150.000	26.58	37.74	64.32	68.30	-3.98	peak	19 10 10 10 10 10 10 10 10 10 10 10 10 10	
	5150.000	16.15	37.74	53.89	54.00	-0.11	AVG		
*	5179.000	74.28	37.83	112.11	68.30	43.81	peak	no limit	Ÿ
X	5179.000	55.53	37.83	93.36	68.30	25.06	AVG	no limit	
	*	MHz 5150.000 5150.000	Mk. Freq. Level  MHz dBuV  5150.000 26.58  5150.000 16.15  * 5179.000 74.28	Mk.         Freq.         Level         Factor           MHz         dBuV         dB           5150.000         26.58         37.74           5150.000         16.15         37.74           * 5179.000         74.28         37.83	Mk.         Freq.         Level         Factor         ment           MHz         dBuV         dB         dBuV/m           5150.000         26.58         37.74         64.32           5150.000         16.15         37.74         53.89           * 5179.000         74.28         37.83         112.11	Mk.         Freq.         Level         Factor         ment         Limit           MHz         dBuV         dB         dBuV/m         dBuV/m           5150.000         26.58         37.74         64.32         68.30           5150.000         16.15         37.74         53.89         54.00           * 5179.000         74.28         37.83         112.11         68.30	Mk.         Freq.         Level         Factor         ment         Limit         Over           MHz         dBuV         dB         dBuV/m         dBuV/m         dB         dBuV/m         dB           5150.000         26.58         37.74         64.32         68.30         -3.98           5150.000         16.15         37.74         53.89         54.00         -0.11           * 5179.000         74.28         37.83         112.11         68.30         43.81	Mk.         Freq.         Level         Factor         ment         Limit         Over           MHz         dBuV         dB         dBuV/m         dBuV/m         dB         Detector           5150.000         26.58         37.74         64.32         68.30         -3.98         peak           5150.000         16.15         37.74         53.89         54.00         -0.11         AVG           * 5179.000         74.28         37.83         112.11         68.30         43.81         peak	Mk.         Freq.         Level         Factor         ment         Limit         Over           MHz         dBuV         dB         dBuV/m         dBuV/m         dB         Detector         Comment           5150.000         26.58         37.74         64.32         68.30         -3.98         peak           5150.000         16.15         37.74         53.89         54.00         -0.11         AVG           * 5179.000         74.28         37.83         112.11         68.30         43.81         peak         no limit

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40000.00 MHz

Orthogonal Axis:	X
Test Mode:	UNII-1/ TX N40 Mode 5190MHz

# 

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over			
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment	
1		10380.55	45.27	17.83	63.10	68.30	-5.20	peak		
2		10380.55	32.62	17.83	50.45	68.30	-17.85	AVG		
3		15569.81	46.35	19.31	65.66	74.00	-8.34	peak		
4	٠	15569.81	31.91	19.31	51.22	54.00	-2.78	AVG		

12700.00 16600.00 20500.00 24400.00 28300.00 32200.00

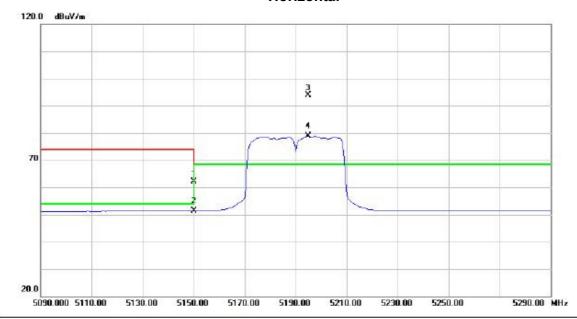
1000.000 4900.00

8800.00

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Orthogonal Axis:	X
Test Mode:	UNII-1/ TX N40 Mode 5190MHz

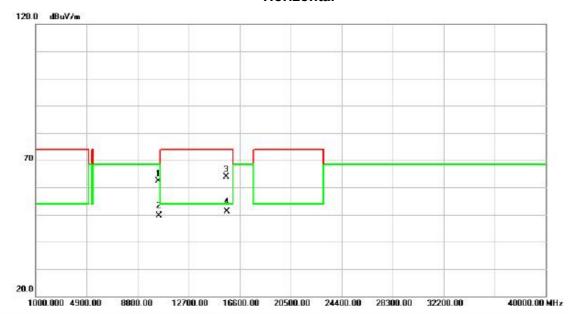


No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over			
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment	
1		5150.000	24.30	37.74	62.04	68.30	-6.26	peak		
2		5150.000	13.76	37.74	51.50	54.00	-2.50	AVG		
3	*	5195.000	55.99	37.89	93.88	68.30	25.58	peak	no limit	
4	X	5195.000	40.96	37.89	78.85	68.30	10.55	AVG	no limit	

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Orthogonal Axis:	X
Test Mode:	UNII-1/ TX N40 Mode 5190MHz



No.	Mk	k.	Freq.	Reading Level	Correct	Measure- ment	Limit	Over		
			MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		10	0380.39	44.63	17.83	62.46	68.30	-5.84	peak	
2		10	0380.39	31.83	17.83	49.66	68.30	-18.64	AVG	
3		15	5570.04	44.46	19.31	63.77	74.00	-10.23	peak	
4	*	15	5570.04	31.80	19.31	51.11	54.00	-2.89	AVG	

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Orthogonal Axis:	X
Test Mode:	UNII-1/ TX N40 Mode 5230MHz

# Vertical 120.0 dBuV/m 70 20.0 5130.000 5150.00 5170.00 5190.00 5210.00 5230.00 5250.00 5270.00 5290.00 5330.00 MHz

No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over			
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment	
1		5150.000	24.88	37.74	62.62	68.30	-5.68	peak		
2		5150.000	13.71	37.74	51.45	54.00	-2.55	AVG		
3	*	5234.500	76.43	38.03	114.46	68.30	46.16	peak	no limit	
4	X	5234.500	58.15	38.03	96.18	68.30	27.88	AVG	no limit	

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Orthogonal Axis:	x
Test Mode:	UNII-1/ TX N40 Mode 5230MHz

## 

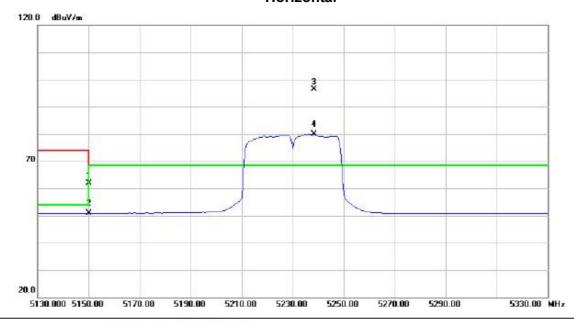
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over			
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment	
1		10460.21	44.96	18.21	63.17	68.30	-5.13	peak		
2		10460.21	32.35	18.21	50.56	68.30	-17.74	AVG		
3		15690.83	45.83	19.35	65.18	74.00	-8.82	peak		
4	*	15690.83	32.58	19.35	51.93	54.00	-2.07	AVG		

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Orthogonal Axis: X
Test Mode: UNII-1/ TX N40 Mode 5230MHz

### Horizontal



No.	Mk	c. F	req.	Level	Factor	ment	Limit	Over			
		N	ИHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment	
1		5150	.000	24.10	37.74	61.84	68.30	-6.46	peak		
2		5150	.000	13.21	37.74	50.95	54.00	-3.05	AVG		
3	*	5238	.500	58.36	38.05	96.41	68.30	28.11	peak	no limit	
4	X	5238	.500	41.93	38.05	79.98	68.30	11.68	AVG	no limit	

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Orthogonal Axis:	X
Test Mode:	UNII-1/ TX N40 Mode 5230MHz



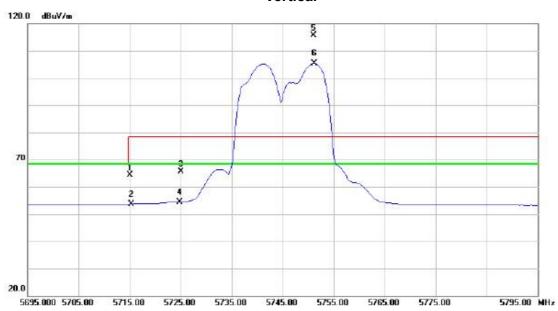
No.	Mk	ζ.	Freq.	Reading Level	Correct	Measure- ment	Limit	Over			
			MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment	
1		104	60.71	45.18	18.21	63.39	68.30	-4.91	peak		
2		104	60.71	31.99	18.21	50.20	68.30	-18.10	AVG		
3		156	89.23	45.56	19.36	64.92	74.00	-9.08	peak		
4	*	156	89.23	32.63	19.36	51.99	54.00	-2.01	AVG		

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Orthogonal Axis: X Test Mode: UNII-3/TX A Mode 5745MHz

### Vertical



No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over			
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment	
1		5715.000	24.85	39.43	64.28	68.30	-4.02	peak		
2		5715.000	14.30	39.43	53.73	68.30	-14.57	AVG		
3		5725.000	26.10	39.45	65.55	78.30	-12.75	peak		
4	П	5725.000	14.90	39.45	54.35	68.30	-13.95	AVG		
5		5751.000	76.09	39.51	115.60	78.30	37.30	peak	no limit	
6	X	5751.000	65.81	39.51	105.32	68.30	37.02	AVG	no limit	

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Orthogonal Axis:	X
Test Mode:	UNII-3/TX A Mode 5745MHz

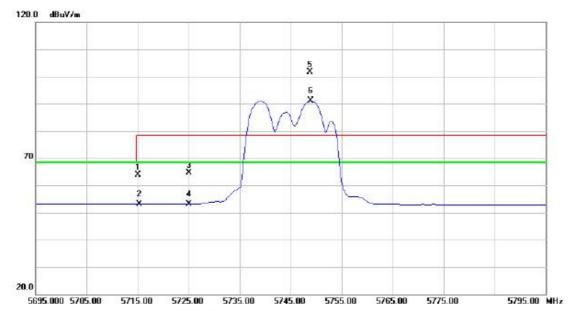
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No.	M	k. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over			
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment	
1		11490.90	43.97	20.34	64.31	74.00	-9.69	peak		
2	*	11490.90	31.94	20.34	52.28	54.00	-1.72	AVG		

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Orthogonal Axis:	X
Test Mode:	UNII-3/TX A Mode 5745MHz



No.	Mk	c. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		5715.000	24.36	39.43	63.79	68.30	-4.51	peak	
2		5715.000	13.70	39.43	53.13	68.30	-15.17	AVG	
3		5725.000	25.18	39.45	64.63	78.30	-13.67	peak	
4	П	5725.000	13.68	39.45	53.13	68.30	-15.17	AVG	
5	•	5748.750	62.01	39.51	101.52	78.30	23.22	peak	no limit
6	X	5748.750	51.51	39.51	91.02	68.30	22.72	AVG	no limit

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Orthogonal Axis:	X
Test Mode:	UNII-3/TX A Mode 5745MHz

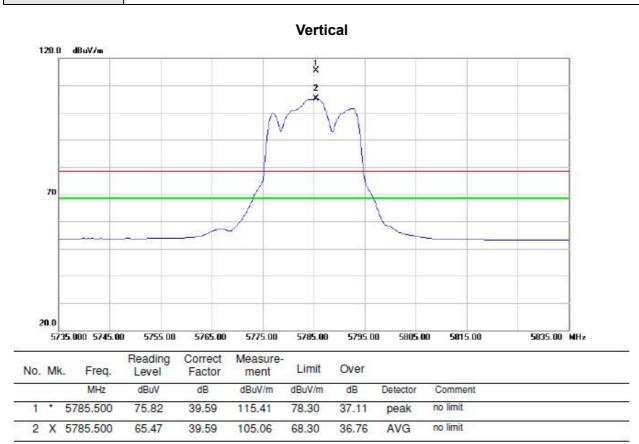


No.	Mk	. Freq.	Level	Factor	ment	Limit	Over			
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment	
1		11490.07	43.49	20.34	63.83	74.00	-10.17	peak		
2	*	11490.07	31.71	20.34	52.05	54.00	-1.95	AVG		

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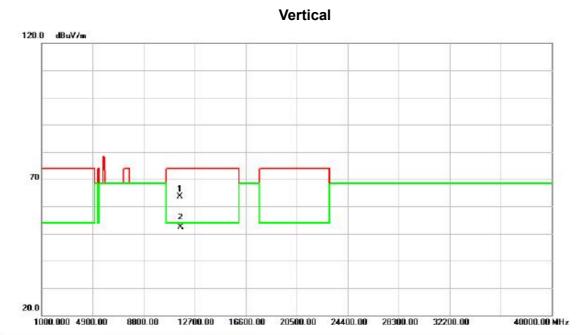
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Test Mode:	UNII-3/TX A Mode 5785MHz



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Orthogonal Axis:	X
Test Mode:	UNII-3/TX A Mode 5785MHz

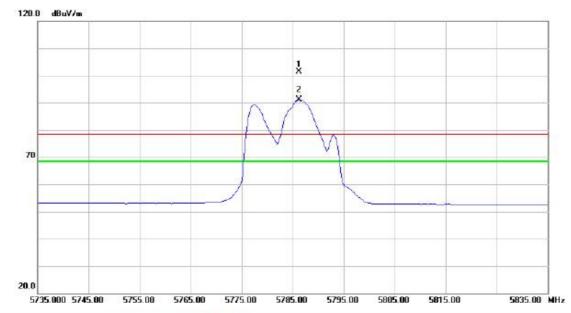


No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over			
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment	
1		11571.00	43.18	20.42	63.60	74.00	-10.40	peak		
2	*	11571.00	31.93	20.42	52.35	54.00	-1.65	AVG		

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Orthogonal Axis:	X
Test Mode:	UNII-3/TX A Mode 5785MHz



No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over			
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment	
1	*	5786.250	61.67	39.60	101.27	78.30	22.97	peak	no limit	
2	X	5786.250	51.42	39.60	91.02	68.30	22.72	AVG	no limit	

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Orthogonal Axis:	X
Test Mode:	UNII-3/TX A Mode 5785MHz

## 

No.	Mk	c. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over			
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment	
1		11569.98	43.41	20.41	63.82	74.00	-10.18	peak		
2	*	11569.98	31.75	20.41	52.16	54.00	-1.84	AVG		

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