Neutron Engineering Inc.= **FCC/IC Radio Test Report** FCC ID: 04GIPDWAP2P IC: 7666A-IPDWAP2P This report concerns (check one): Original Grant Class II Change Issued Date : Mar. 16, 2011 Project No. : 1101C099A Equipment : Information Technology Equipment Model Name : AP202 : Dayton Industrial Co. Ltd. Applicant : 2-12 Kwai Fat Road, 11-A Kwai Chung, N.T. Hong Kong Address Manufacturer : Kendy Enterprise Ltd. Address : 2-12 Kwai Fat Road, 11-A Kwai Chung, N.T. Hong Kong Tested by: Neutron Engineering Inc. EMC Laboratory Date of Receipt: Jan. 06, 2011

Date of Test:

Jan. 06, 2011 ~ Mar. 15, 2011

**Testing Engineer** 

Technical Manager

Authorized Signatory

(Ivan Cao)

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#### Declaration

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# 1. CERTIFICATION

Equipment: Information Technology Equipment Brand Name: N/A Model Name.: AP202 Applicant: Dayton Industrial Co. Ltd. Date of Test: Jan. 06, 2011 ~ Mar. 15, 2011 Test Item: ENGINEERING SAMPLE Standards: FCC Part15, Subpart C(15.249)/ ANSI C63.4: 2003

The above equipment has been tested and found compliance with the requirement of the relative standards by Neutron Engineering Inc. EMC Laboratory.

The test data, data evaluation, and equipment configuration contained in our test report (Ref No. NEI-FICP-1-1101C099A) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of NVLAP and TAF according to the ISO-17025 quality assessment standard and technical standard(s).



# 2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15, Subpart C (15.249) Canada RSS-210:2010						
StandardSection		Test Item	Judgment	Remark		
FCC	RSS-210			Roman		
15.207		Conducted Emission	PASS			
15.209		Radiated Emission	PASS			
15.249	A2.9(a)	Radiated Spurious Emission	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 **DG-C02/DG-CB03**at the location of No.3, Jinshagang 1st Road, ShiXia, Dalang Town, Dong Guan, China.523792 Neutron's test firm number for FCC 319330 Neutron's test firm number for IC 4428B-1

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

A. Conducted Measurement :

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

B. Radiated Measurement :

Test Site	Method	Measurement Frequency Range	Ant. H / V	U,(dB)	NOTE
DG-CB03		30MHz ~ 200MHz	V	2.48	
	CISPR	30MHz ~ 200MHz	Н	2.16	
		200MHz ~ 1,000MHz	V	2.50	
		200MHz ~ 1,000MHz	Н	2.66	

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# **3**. GENERAL INFORMATION

# 3.1 GENERAL DESCRIPTION OF EUT

Equipment	Information Technology	Information Technology Equipment		
Brand Name	N/A			
Model Name.	AP202			
OEM Brand/Model Name	N/A			
Model Difference	N/A			
Product Description	The EUT is an Information Technology Equipment.         Product Type       Low Power Communication         Device         Operation Frequency:       2450~2466 MHz         Modulation Type:       GFSK         Date rate:       1Mbps         Number Of Channel       3CH .Please see note 2.         Antenna Designation:       CHIP antenna         Antenna Gain(Peak)       2.0 dBi         Output Power:       40.27dBuV/m (AV Max.)         More details of EUT technical specification. Please refe         the User's Manual.			
Power Source	# DC Voltage supplied # DC Voltage supplied	·		
Power Rating	# DC 3.3V # I/P AC 120V/60Hz O/P DC 5V			
Connecting I/O Port(s)	Please refer to the User's Manual			
Products Covered	N/A			

#### Note:

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

2.

Channel No.	Frequency
1	2450MHz
2	2457MHz
3	2466MHz

#### 3. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	JOHANSON TECHNOLOGY	2450AT43A 100	CHIP	N/A	2.0



#### 3.2 DESCRIPTION OF TEST MODES

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

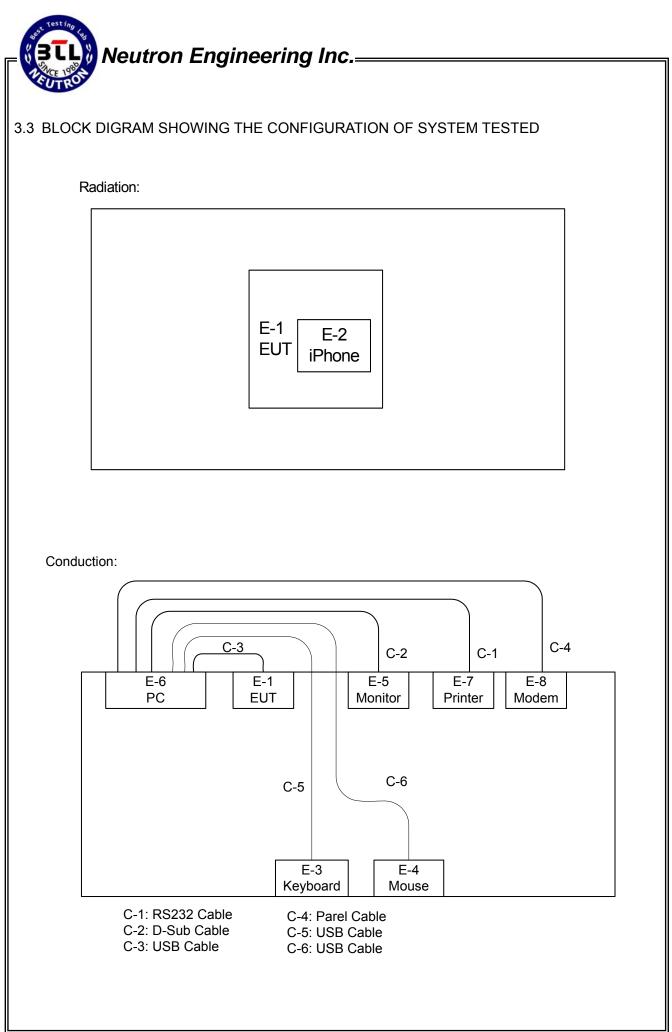
Pretest Mode	Description
Mode 1	CH - 2450MHz
Mode 2	CH - 2457MHz
Mode 3	CH - 2466MHz
Mode 4	Sync and Charge

For Conducted Test				
Final Test Mode Description				
Mode 4	Sync and Charge			

For Radiated Test			
Final Test Mode	Description		
Mode 1	CH - 2450MHz		
Mode 2	CH - 2457MHz		
Mode 3	CH - 2466MHz		

Note:

(1) The EUT is considered a portable unit; it was pre-tested on the positioned of each 3 axis. The worst case was found positioned on X-plane(TX Sample).Therefore only the test data of this X-plane(TX Sample) wae used for radiated emission measurement test.





#### 3.4 DESCRIPTION OF SUPPORT UNITS

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

Item	Equipment	Mfr/Brand	Model/Type No.	FCC ID	Series No.	Note
E-1	Information Technology Equipment	N/A	AP202	O4GIPDWAP2P	N/A	EUT
E-2	IPHONE	APPLE	A1241	BCGA1241	N/A	
E-3	USB Keyboard	Dell	L100	DOC	CNORH6596589071T08NE	
E-4	USB Mouse	Dell	MO56UOA	DOC	FQJ000BS	
E-5	LCD monitor	Dell	E177FPc	DOC	CNOFJ179-64180-6AG-1WNS	
E-6	PC	Dell 320	DCSM	DOC	J4JQ52X	
E-7	Printer	SII	DPU-414	DOC	3018507 B	
E-8	Modem	ACEEX	DM-1414V	IFAXDm1414	0603002131	

Item	Shielded Type	Ferrite Core	Length	Note
C-1	YES	NO	1.5M	
C-2	YES	YES	1.5M	
C-3	YES	NO	1.0M	
C-4	YES	NO	1.5M	
C-5	YES	NO	1.8M	
C-6	YES	NO	1.8M	

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in m in  $\[\]$  Length  $\]$  column.



# 4. EMC EMISSION TEST

# 4.1 CONDUCTED EMISSION MEASUREMENT

# 4.1.1 POWER LINE CONDUCTED EMISSION LIMITS (Frequency Range 150KHz-30MHz)

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

0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	73.00	60.00	56.00	46.00	FCC
5.0 -30.0	73.00	60.00	60.00	50.00	FCC

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 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	LISN	EMCO	3816/2	00052765	May.26.2011
2	LISN	Rolf Heine	NNB-2-16Z	99044	May.26.2011
3	50Ω Terminator	SHX	TF2-3G-A	08122901	May.26.2011
4	Transient Limiter	Agilent	11947A	3107A03668	May.26.2011
5	Test Cable	N/A	C-06_C03	N/A	Nov.15.2011
6	EMI TEST RECEIVER	R&S	ESCS30	8333641017	May.26.2011

Remark: " N/A" denotes No Model Name. , Serial No. or No Calibration specified.

#### The following table is the setting of the receiver

Receiver Parameters	Setting		
Attenuation	10 dB		
Start Frequency	0.15 MHz		
Stop Frequency	30 MHz		
IF Bandwidth	9 kHz		

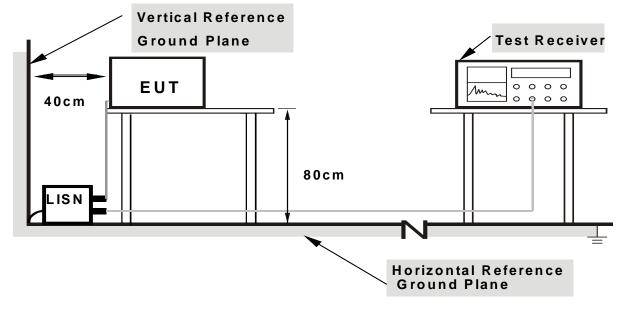


#### 4.1.3 TEST PROCEDURE

- 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.
- 4.1.4 DEVIATION FROM TEST STANDARD

No deviation

#### 4.1.5 TEST SETUP



Note: 1.Support units were connected to second LISN.

2.Both of LISNs (AMN) are 80 cm from EUT and at least 80  $\,$ 

#### from other units and other metal planes

#### 4.1.6 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 mode.

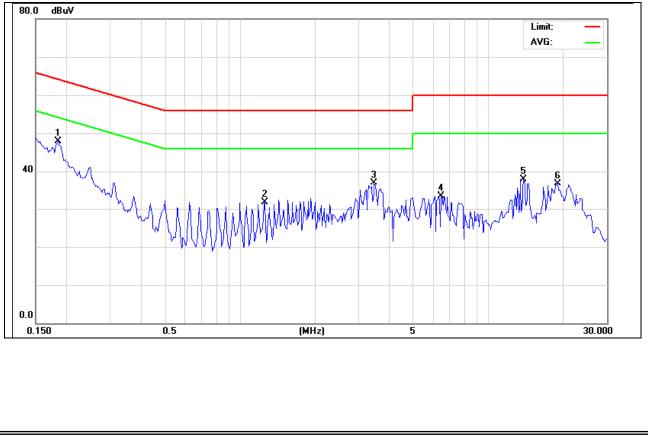


# 4.1.7 TEST RESULTS

EUT : Information Technology Equipment				Model Na	Model Name :		AP202	
Temperatu	ure :	22	°C		Relative H	lumidity:	53 %	
Pressure :		101	I0hPa		Test Powe	er :	AC 120V/60	Hz
Test Mode : Sync and Charge								
Freq.	Termir	nal	Measure	d(dBuV)	Limits	Limits(dBuV)		Note
(MHz)	L/N		QP-Mode	AV-Mode	QP-Mode	AV-Mode	(dB)	NOLE
0.19	Line		47.84	*	64.25	54.25	-16.41	
1.25	Line		31.67	*	56.00	46.00	-24.33	
3.49	Line		36.82	*	56.00	46.00	-19.18	
6.47	Line		33.28	*	60.00	50.00	-26.72	
13.87	Line		37.89	*	60.00	50.00	-22.11	
19.09	Line		36.79	*	60.00	50.00	-23.21	

#### Remark

(1) All readings are QP Mode value unless otherwise stated AVG in column of Note... If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform ∘ In this case, a "\*" marked in AVG Mode column of Interference Voltage Measured ∘



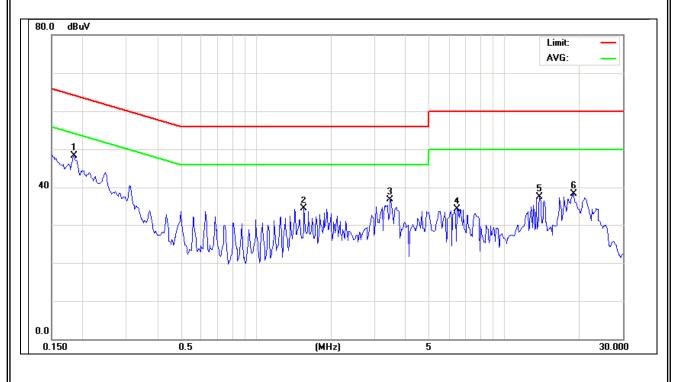
(2) Measuring frequency range from 150KHz to 30MHz  $\circ$ 



EUT:		Information Technology Equipment				Model Name :			AP202	
Temperati	ure :	22	°C			Relative Humidity:			53 %	
Pressure :		101	0hPa			Te	st Power :		AC 1	20V/60Hz
Test Mode : Sync and Charge										
Freq.	Termir	nal	Measure	d(dBuV)	Limits(dBuV)		dBuV)	Margin N		Note
(MHz)	L/N		QP-Mode	AV-Mode	QP-Mod	е	AV-Mode	(dB)		NOLC
0.18	Neutra	al	48.22	*	64.29		54.29	-16	.07	
1.55	Neutral		34.22	*	56.00		46.00	-21	.78	
3.47	Neutra	al	36.64	*	56.00		46.00	-19	.36	
6.45	Neutral		34.19	*	60.00		50.00	-25	.81	
13.84	Neutra	al	37.41	*	60.00		50.00	-22	.59	
19.02	Neutra	al	38.27	*	60.00		50.00	-21	.73	

#### Remark

- (1) All readings are QP Mode value unless otherwise stated AVG in column of <sup>ℂ</sup>Note J. 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  $\circ$



# 4.2 RADIATED EMISSION MEASUREMENT

#### 4.2.1 RADIATED EMISSION LIMITS (FCC 15.209)

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

Harmonic emissions limits comply with below 54 dBuV/m at 3m. Other emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or comply with the radiated emissions limits specified in section 15.209(a) limit in the table below has to be followed.

Note:

- (1) The tighter limit applies at the band edges.
- (2) Emission level (dBuV/m)=20log Emission level (uV/m).

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

FREQUENCY (MHz)	(dBuV/m) (at 3m)			
FREQUENCT (MILZ)	PEAK	AVERAge		
Above 1000	74	54		

Notes:

(1) The limit for radiated test was performed according to FCC PART 15C.

(2) The tighter limit applies at the band edges.

(3) Emission level (dBuV/m)=20log Emission level (uV/m).

#### LIMITS OF RADIATED EMISSION MEASUREMENT (FCC Part 15.249)

FCC Part15 (15.249), Subpart C					
Limit	Frequency Range (MHz)				
Field strength of fundamental 50000 μV/m (94 dBμV/m) @ 3 m	2400-2483.5				
Field strength of harmonics 500 $\mu$ V/m (54 dB $\mu$ V/m) @ 3 m	Above 2483.5				

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# 4.2.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer		Serial No.	Calibrated until
nem	Kind of Equipment	Manufacturer	Type No.	Senai No.	Calibrated until
1	Triple Loop Antenna	R&S	HFH2-Z2	830749/020	May.27.2011
2	Bi-log Antenna	Schwarbeck	VULB9160	9160-3232	May.26.2011
3	Horn Antenna	ETS	3115	00075789	May.12.2011
4	Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170340	Dec.15.2011
5	Amplifier	HP	8447D	2944A09673	May.26.2011
6	Amplifier	Agilent	8449B	3008A02274	May.26.2011
7	Amplifier	EMC	EMC2654045	980039	Aug.12.2011
8	Test Receiver	R&S	ESCI	100895	May.26.2011
9	Spectrum Analyzer	R&S	FSP 40	100185	Nov.26.2011
10	Test Cable	N/A	C-01_CB03	N/A	Jul.05.2011
11	Test Cable	HUBER+SUHNER	SUCOFLEX_8 m	313794/4	Apr.12.2011
12	Controller	СТ	SC100	N/A	N/A

Remark: " N/A" denotes No Model Name. / Serial No. and No Calibration specified.

Spectrum Parameter	Setting		
Attenuation	Auto		
Start Frequency	1000 MHz		
Stop Frequency	10th carrier harmonic		
RB / VB (emission in restricted	1MHz / 1MHz for Peak, AV Mode with Dwell time		
band)	Use 100mS for calculation		

Receiver Parameter	Setting		
Attenuation	Auto		
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP		
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP		
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP		



DUTY CYCLE: TX 2450MHz (1Mbps)

Dwell time=ON/ON+OFF

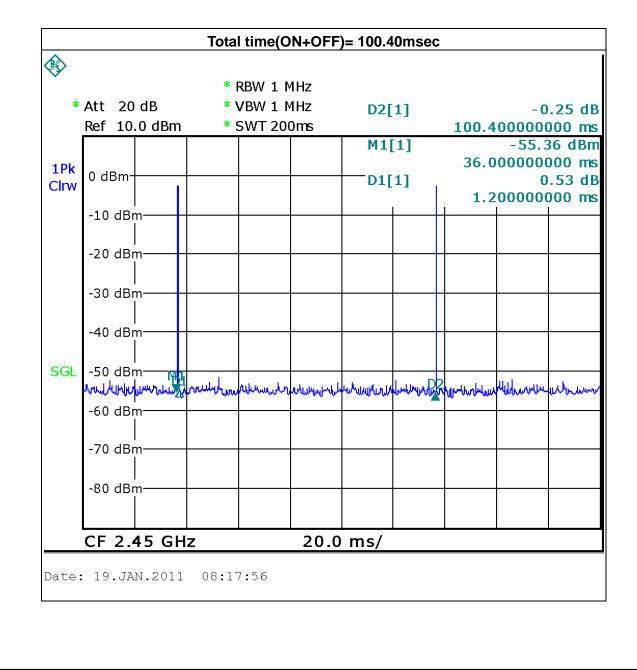
ON: 0.26msec

ON+OFF: (total time):100.40msec

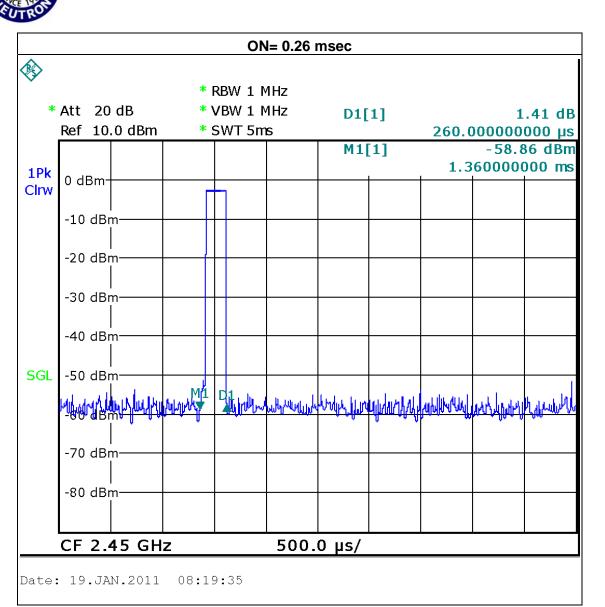
Dwell time: 0.259%

AV=PK+20 log (Dwell time)

AV=PK-51.735



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#### 4.2.3 TEST PROCEDURE

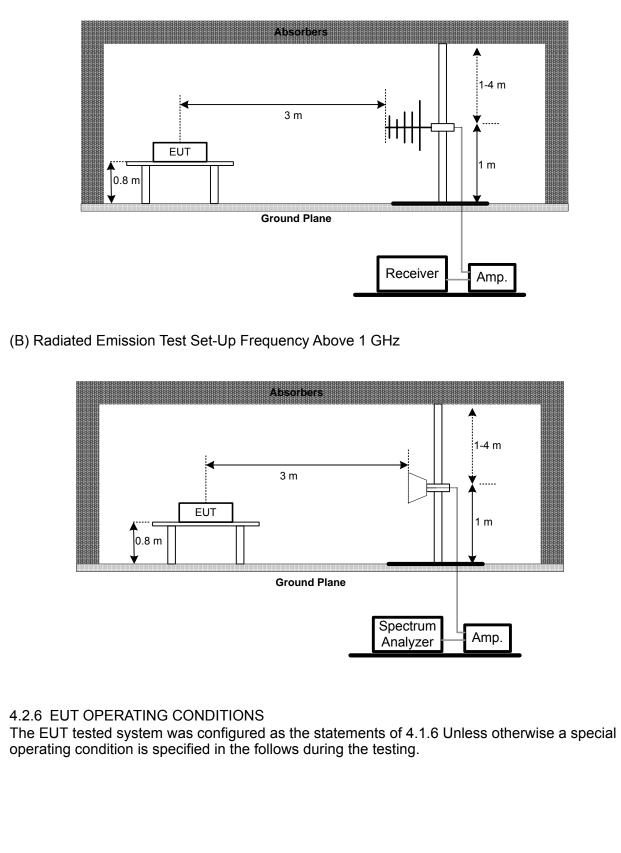
- a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3m meter semi-anechoic chamber. The table was 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.

4.2.4 DEVIATION FROM TEST STANDARD No deviation

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# 4.2.5 TEST SETUP

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



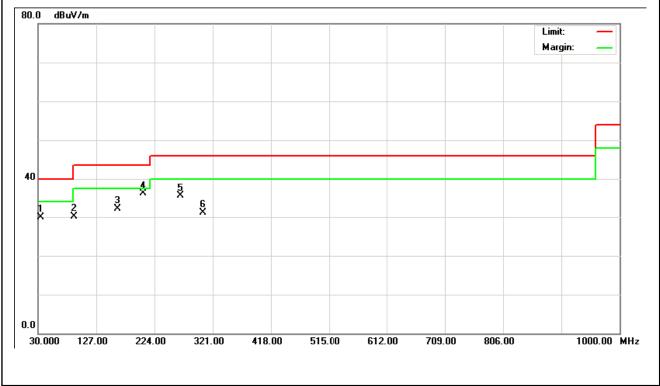


### 4.2.7 TEST RESULTS (BETWEEN 30 - 1000 MHz)

	Information Technology Equipment	Model Name. :	AP202
Temperature :	<b>23</b> °C	Relative Humidity:	51 %
Pressure :	1001 hPa	Test Power :	DC 3.3V
Test Mode :	TX 2450MHz		

Freq.	Ant.	Reading(RA)	Corr.Factor(CF)	Measured(FS)	Limits(QP)	Margin	Note
(MHz)	H/V	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	NOIC
33.12	V	46.53	-16.66	29.87	40.00	- 10.13	
90.12	V	49.18	-19.06	30.12	43.50	- 13.38	
162.35	V	49.62	-17.57	32.05	43.50	- 11.45	
205.24	V	52.57	-16.43	36.14	43.50	- 7.36	
267.25	V	49.02	-13.44	35.58	46.00	- 10.42	
303.56	V	43.03	-11.98	31.05	46.00	- 14.95	

- (1) All readings are Peak unless otherwise stated QP in column of <code>『Note』</code>. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform  $\circ$
- (2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency ° "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency.
- (3) Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Peak detector mode or QP 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.

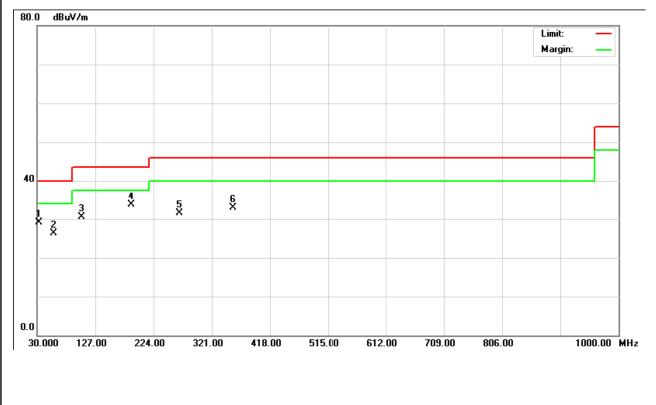




EUT :	Information Technology Equipment	Model Name. :	AP202
Temperature :	<b>23</b> ℃	Relative Humidity:	51 %
Pressure :	1001 hPa	Test Power :	DC 3.3V
Test Mode :	TX 2450MHz		

Freq.	Ant.	Reading(RA)	Corr.Factor(CF)	Measured(FS)	Limits(QP)	Margin	Note
(MHz)	H/V	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	NOLE
32.05	Н	45.52	-16.40	29.12	40.00	- 10.88	
57.82	Н	43.92	-17.58	26.34	40.00	- 13.66	
103.57	Н	48.93	-18.39	30.54	43.50	- 12.96	
186.57	Н	50.51	-16.78	33.73	43.50	- 9.77	
267.51	Н	44.99	-13.42	31.57	46.00	- 14.43	
356.25	H	43.49	-10.61	32.88	46.00	- 13.12	

- (1) All readings are Peak unless otherwise stated QP in column of <code>『Note』</code>. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform  $\circ$
- (2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency ° "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency.
- (3) Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Peak detector mode or QP detector mode of the emission  $\circ$
- (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.

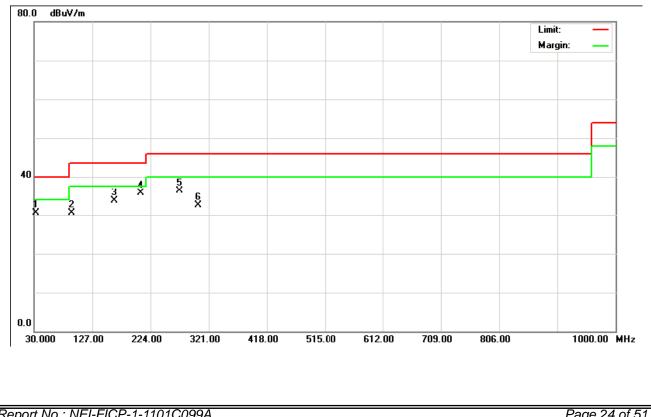




EUT :	Information Technology Equipment	Model Name. :	AP202
Temperature :	<b>23</b> °C	Relative Humidity :	51 %
Pressure :	1001 hPa	Test Power :	DC 3.3V
Test Mode :	RX Standby	-	

Freq.	Ant.	Reading(RA)	Corr.Factor(CF)	Measured(FS)	Limits(QP)	Margin	Note
(MHz)	H/V	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	NOLE
32.50	V	47.05	-16.51	30.54	40.00	- 9.46	
92.86	V	49.25	-18.74	30.51	43.50	- 12.99	
163.58	V	51.16	-17.52	33.64	43.50	- 9.86	
206.57	V	52.09	-16.39	35.70	43.50	- 7.80	
271.94	V	49.36	-13.15	36.21	46.00	- 9.79	
302.80	V	44.59	-12.00	32.59	46.00	- 13.41	

- (1) 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 °
- (2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency • "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency.
- (3) Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Peak detector mode or QP 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.

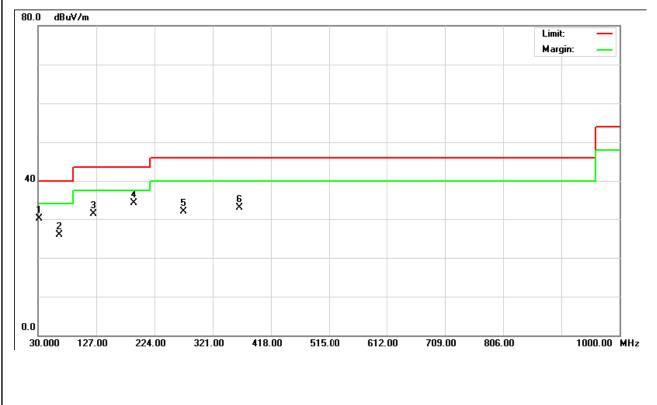




EUT :	Information Technology Equipment	Model Name. :	AP202
Temperature :	<b>23</b> °C	Relative Humidity:	51 %
Pressure :	1001 hPa	Test Power :	DC 3.3V
Test Mode :	RX Standby		

Freq.	Ant.	Reading(RA)	Corr.Factor(CF)	Measured(FS)	Limits(QP)	Margin	Note
(MHz)	H/V	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	NOLE
31.65	Н	46.45	-16.33	30.12	40.00	- 9.88	
65.21	Н	43.61	-17.63	25.98	40.00	- 14.02	
121.59	Н	49.49	-18.25	31.24	43.50	- 12.26	
189.21	Н	50.59	-16.75	34.20	43.50	- 9.30	
271.94	Н	45.05	-13.15	31.90	46.00	- 14.10	
365.14	Н	43.19	-10.29	32.90	46.00	- 13.10	

- (1) All readings are Peak unless otherwise stated QP in column of <code>『Note』</code>. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform  $\circ$
- (2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency ° "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency.
- (3) Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Peak detector mode or QP detector mode of the emission  $\circ$
- (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.



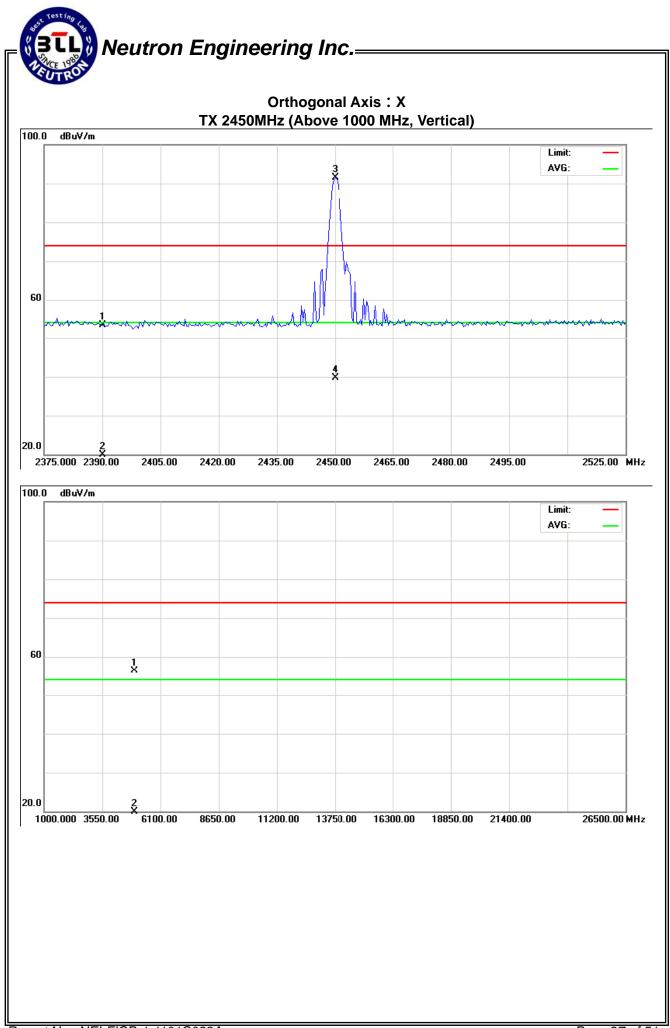
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### 4.2.8 TEST RESULTS (ABOVE 1000 MHz)

	Information Technology Equipment	Model Name. :	AP202
Temperature :	<b>23</b> °C	Relative Humidity:	58 %
Pressure :	1001 hPa	Test Power :	AC 120V/60Hz
Test Mode :	TX 2450MHz		

Freq.	Ant.Pol.	Rea	ding	Ant./CF	Act.		Act. Limit		
		Peak	AV		Peak	AV	Peak	AV	Note
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2390.00	V	22.18	-29.56	31.06	53.24	1.50	74.00	54.00	X/E
2450.00	V	60.32	8.59	31.18	91.50	39.77	114.00	94.00	X/F
4900.02	V	49.12	-2.61	7.11	56.23	4.50	74.00	54.00	X/H

- (1) All readings are Peak unless otherwise stated QP in column of <code>『Note』</code>. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform  $\circ$
- (2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency<sup>o</sup>"F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (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  $\circ$
- (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 Axis:
  - "X" denotes Laid on Table; "Y" denotes Vertical Stand; "Z" denotes Side Stand
- (7) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna
- (8) The average value of fundamental frequency is:
   Average = Peak value + 20log(Duty cycle) , Final AV=PK-51.735





EUT :	Information Technology Equipment	Model Name. :	AP202
Temperature :	<b>23</b> ℃	Relative Humidity :	58 %
Pressure :	1001 hPa	Test Power :	AC 120V/60Hz
Test Mode :	TX 2450MHz		

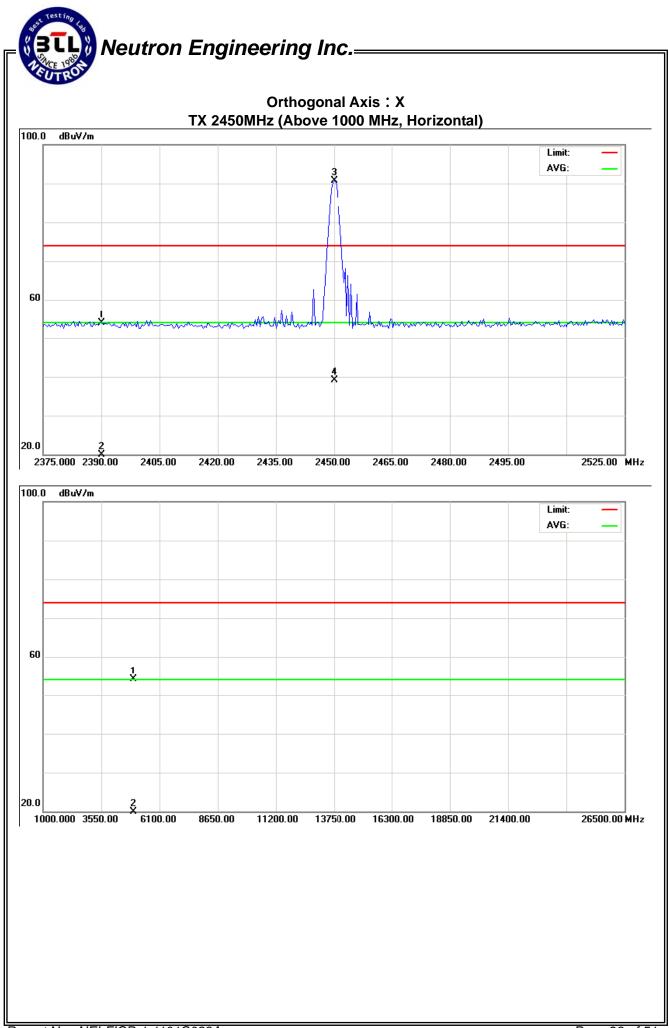
Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Limit		
		Peak	AV		Peak	AV	Peak	AV	Note
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2390.00	Н	22.81	-28.93	31.06	53.87	2.13	74.00	54.00	X/E
2450.00	Н	59.62	7.88	31.18	90.80	39.06	114.00	94.00	X/F
4900.02	Н	47.02	-4.71	7.11	54.13	2.40	74.00	54.00	X/H

- (1) All readings are Peak unless otherwise stated QP in column of <code>『Note』</code>. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform  $\circ$
- (2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency<sup>o</sup>"F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (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  $\circ$
- (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 Axis:

"X" - denotes Laid on Table; "Y" - denotes Vertical Stand; "Z" - denotes Side Stand

- (7) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna
- (8) The average value of fundamental frequency is:

Average = Peak value + 20log(Duty cycle) , Final AV=PK-51.735

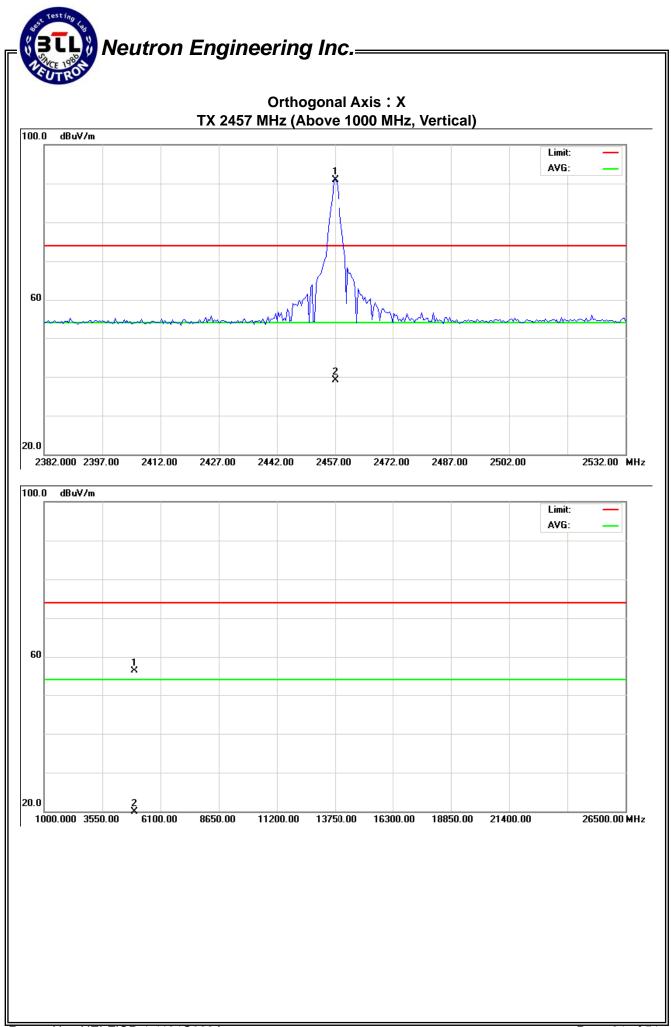




	Information Technology Equipment	Model Name. :	AP202
Temperature :	<b>23</b> °C	Relative Humidity:	58 %
Pressure :	1001 hPa	Test Power :	AC 120V/60Hz
Test Mode :	TX 2457MHz		

Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Limit		
		Peak	AV		Peak	AV	Peak	AV	Note
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2457.00	V	59.71	7.97	31.20	90.91	39.17	114.00	94.00	X/F
4914.05	V	48.13	-3.61	7.13	55.26	3.52	74.00	54.00	X/H

- (1) All readings are Peak unless otherwise stated QP in column of <code>"Note\_"</code>. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform  $\circ$
- (2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency<sup>o</sup>"F" denotes fundamental frequency; "H" denotes spurious frequency.
   "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (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 Axis:
  - "X" denotes Laid on Table; "Y" denotes Vertical Stand; "Z" denotes Side Stand
- (7) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna
- (8) The average value of fundamental frequency is: Average = Peak value + 20log(Duty cycle) , Final AV=PK-51.735

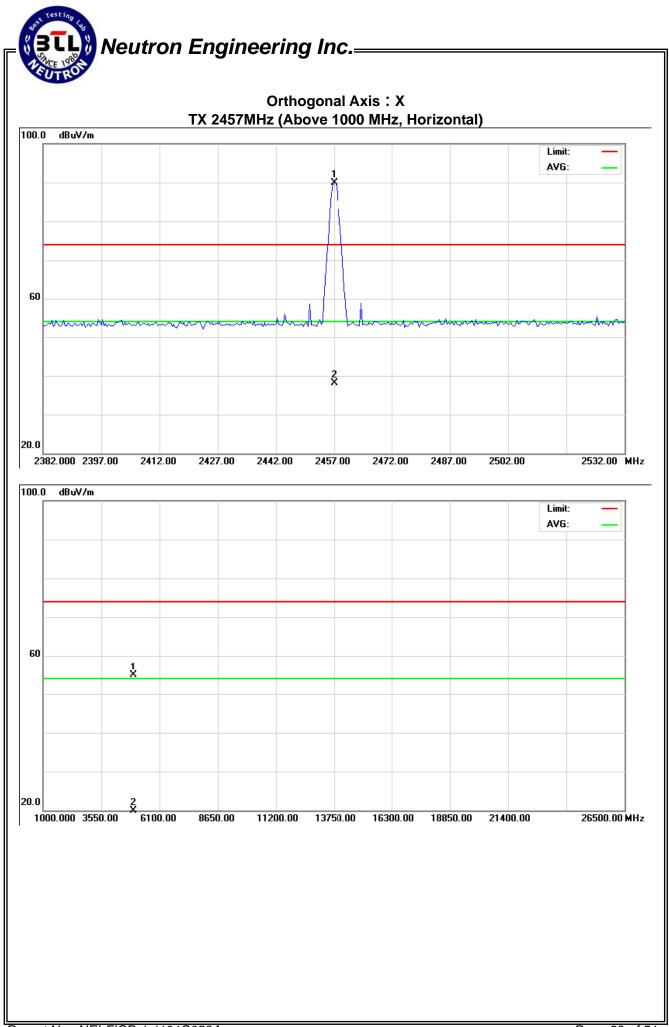




EUT :	Information Technology Equipment	Model Name. :	AP202
Temperature :	<b>23</b> ℃	Relative Humidity:	58 %
Pressure :	1001 hPa	Test Power :	AC 120V/60Hz
Test Mode :	TX 2457MHz		

Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Limit		
		Peak	AV		Peak	AV	Peak	AV	Note
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2457.00	Н	58.70	6.82	31.20	89.90	38.02	114.00	94.00	X/F
4914.05	Н	47.68	-4.05	7.13	54.81	3.08	74.00	54.00	X/H

- (1) All readings are Peak unless otherwise stated QP in column of <code>"Note\_"</code>. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform  $\circ$
- (2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency<sup>o</sup>"F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (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  $\circ$
- (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 Axis : "X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand
- (7) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna
- (8) The average value of fundamental frequency is: Average = Peak value + 20log(Duty cycle) , Final AV=PK-51.735

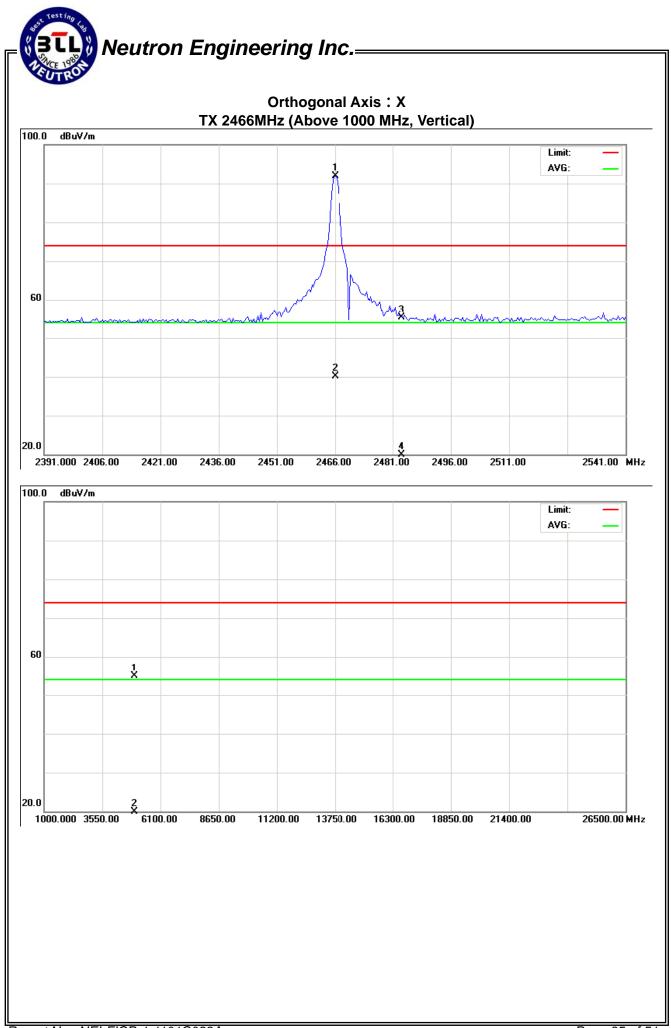




	Information Technology Equipment	Model Name. :	AP202
Temperature :	<b>23</b> °C	Relative Humidity:	58 %
Pressure :	1001 hPa	Test Power :	AC 120V/60Hz
Test Mode :	TX 2466MHz		

Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Limit		
		Peak	AV		Peak	AV	Peak	AV	Note
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2466.00	V	60.68	8.95	31.21	91.89	40.16	114.00	94.00	X/F
2483.50	V	24.03	-27.70	31.25	55.28	3.55	74.00	54.00	X/E
4932.01	V	47.83	-3.91	7.16	54.99	3.25	74.00	54.00	X/H

- (1) All readings are Peak unless otherwise stated QP in column of <code>『Note』</code>. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform  $\circ$
- (2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency<sup>o</sup>"F" denotes fundamental frequency; "H" denotes spurious frequency.
   "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (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  $\circ$
- (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 Axis:
  - "X" denotes Laid on Table; "Y" denotes Vertical Stand; "Z" denotes Side Stand
- (7) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna
- (8) The average value of fundamental frequency is: Average = Peak value + 20log(Duty cycle) , Final AV=PK-51.735





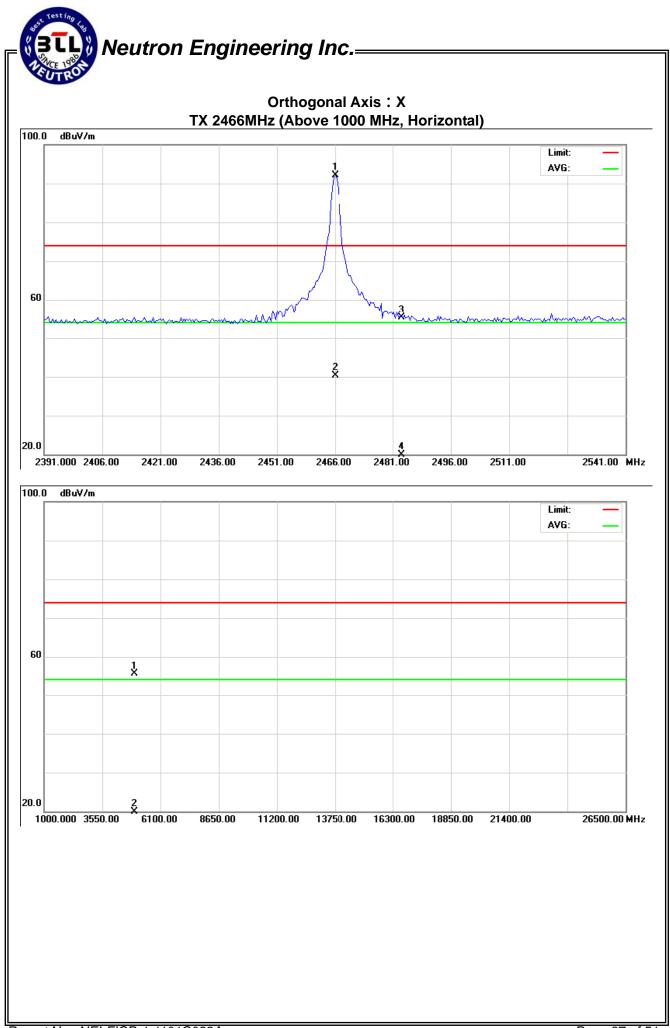
	Information Technology Equipment	Model Name. :	AP202
Temperature :	<b>23</b> °C	Relative Humidity:	58 %
Pressure :	1001 hPa	Test Power :	AC 120V/60Hz
Test Mode :	TX 2466MHz		

Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Limit		
		Peak	AV		Peak	AV	Peak	AV	Note
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2466.00	Н	60.80	9.06	31.21	92.01	40.27	114.00	94.00	X/F
2483.50	Н	24.06	-27.68	31.25	55.31	3.57	74.00	54.00	X/E
4932.01	Н	48.25	-3.49	7.16	55.41	3.67	74.00	54.00	X/H

- (1) All readings are Peak unless otherwise stated QP in column of <code>『Note』</code>. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform  $\circ$
- (2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency<sup>o</sup>"F" denotes fundamental frequency; "H" denotes spurious frequency.
   "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (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  $\circ$
- (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 Axis:

"X" - denotes Laid on Table; "Y" - denotes Vertical Stand; "Z" - denotes Side Stand

- (7) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna
- (8) The average value of fundamental frequency is:
   Average = Peak value + 20log(Duty cycle) , Final AV=PK-51.735





EUT		Equipment				AP202				
	peratu	re: 2	23℃   Relative Humidity : 58 %							
	sure :		1001 hPa Test Power : AC 120V/60Hz			0Hz				
Test I	Mode	:	RX Standl	ру						
Fre	a	Ant.Pol.	Re	ading	Ant./CF	Δ	ct.	Li	mit	
110	γ <b>.</b>	7411.1 01.	Peak	AV	7410.701	Peak	AV	Peak	AV	No
(M⊦	Hz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
1865	5.39	V	57.69	43.97	-2.70	54.99	41.27	74.00	54.00	Х/
	(2)	perform Measurir fundame "E" deno Requiren Radiated	g frequen ntal freque ites band nent.) emission	ng complian ncy range fro ency∘"F" der edge freq s measurec eak detector	om 1000N notes fund uency. (T I in freque	/IHz to 600 amental free This judgme ency range	0MHz or th quency; "H" ent method above 100	e 10th han denotes sp i includes 00MHz wer	monic of h ourious freq the Band re made w n ∘	nighe: uenc Edg <i>v</i> ith a
	(4) (5) (6)	reading o strength i A pream measure EUT Orth	f emissior s too sma p and hi ment sens logonal Ax	kis:	uated more sured. er were	e than 20dE used for tl	3 below the his test in	permissible order to p	e limits or th provide su	ne fiel
00.0	(4) (5) (6)	reading c strength i A pream measure EUT Orth "X" - deno	f emissior s too sma p and hi ment sens logonal Ax	ns are attenu Il to be meas gh pass filt sitivity.	uated more sured. er were	e than 20dE used for tl	3 below the his test in	permissible order to p denotes Sid	e limits or th provide su	ne fiel
00.0	(4) (5) (6)	reading c strength i A pream measure EUT Orth "X" - deno	f emissior s too sma p and hi ment sens logonal Ax	ns are attenu Il to be meas gh pass filt sitivity. kis :	uated more sured. er were	e than 20dE used for tl	3 below the his test in	permissible order to p denotes Sid	e limits or th provide su de Stand Limit: -	ne fiel
60	(4) (5) (6) dBuW/	reading c strength i A pream measure EUT Orth "X" - deno	f emissior s too sma p and hi ment sens logonal Ax	ns are attenu Il to be meas gh pass filt sitivity. kis :	uated more sured. er were	e than 20dE used for tl	3 below the his test in	permissible order to p denotes Sid	e limits or th provide su de Stand Limit: -	ne fiel
	(4) (5) (6)	reading c strength i A pream measure EUT Orth "X" - deno	f emissior s too sma p and hi ment sens logonal Ax	ns are attenu Il to be meas gh pass filt sitivity. kis :	uated more sured. er were	e than 20dE used for tl	3 below the his test in	permissible order to p denotes Sid	e limits or th provide su de Stand Limit: -	ne fiel
60	(4) (5) (6) dBuW//	reading c strength i A pream measure EUT Orth "X" - deno	f emissior s too sma p and hi ment sens logonal Ax	ns are attenu Il to be meas gh pass filt sitivity. kis :	uated more sured. er were	e than 20dE used for tl	3 below the his test in	permissible order to p denotes Sid	e limits or th provide su de Stand Limit: -	ne fiel
	(4) (5) (6) dBuV/	reading c strength i A pream measure EUT Orth "X" - deno	f emissior s too sma p and hi ment sens logonal Ax	ns are attenu Il to be meas gh pass filt sitivity. kis :	uated more sured. er were	e than 20dE used for tl	3 below the his test in	permissible order to p denotes Sid	e limits or th provide su de Stand Limit: -	ne fiel

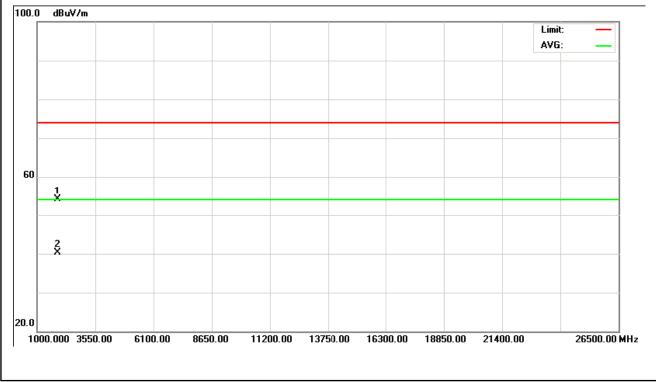


EUT :	Information Technology Equipment	Model Name. :	AP202
Temperature :	<b>23</b> °C	Relative Humidity:	58 %
Pressure :	1001 hPa	Test Power :	AC 120V/60Hz
Test Mode :	RX Standby		

Freq.	Ant.Pol.	Rea	ding	Ant./CF	A	ct.	Lir	nit	
		Peak	AV		Peak	AV	Peak	AV	Note
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
1865.39	Н	56.83	42.87	-2.70	54.13	40.17	74.00	54.00	X/E

#### Remark :

- (1) All readings are Peak unless otherwise stated QP in column of <code>『Note』</code>. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform  $\circ$
- (2) Measuring frequency range from 1000MHz to 6000MHz or the 10th harmonic of highest fundamental frequency<sup>o</sup>"F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (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  $\circ$
- (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 Axis:
  - "X" denotes Laid on Table ; "Y" denotes Vertical Stand ; "Z" denotes Side Stand



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#### 4.2.9 TEST RESULTS (2400 - 2483.5 MHz)

	Information Technology Equipment	Model Name. :	AP202
Temperature :	<b>23</b> °C	Relative Humidity:	58 %
Pressure :	1001 hPa	Test Power :	AC 120V/60Hz
Test Mode :	TX CH 2450MHz/2457MHz/2466MHz		

		Peak	AV		Peak	AV	Peak	AV	
Freq.	Ant.Pol.	Rea	ding	Ant./CL/	Actua	al FS	Lim	it3m	
(MHz)	(H/V)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	NOTE
2450.00	V	60.32	8.59	31.18	91.50	39.77	114.00	94.00	CH01
2450.00	Н	59.62	7.88	31.18	90.80	39.06	114.00	94.00	CH01
2457.00	V	59.71	7.97	31.20	90.91	39.17	114.00	94.00	CH02
2457.00	Н	58.70	6.82	31.20	89.90	38.02	114.00	94.00	CH02
2466.00	V	60.68	8.95	31.21	91.89	40.16	114.00	94.00	CH03
2466.00	Н	60.80	9.06	31.21	92.01	40.27	114.00	94.00	CH03

#### Remark :

- (1) All readings are Peak unless otherwise stated QP in column of <code>"Note\_"</code>. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform  $\circ$
- (2) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission  $\circ$
- (3) 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.
- (4) EUT Orthogonal Axis:

"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand

(5) The average value of fundamental frequency is:
 Average = Peak value + 20log(Duty cycle) , Final AV=PK-51.735

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#### 5. BANDWIDTH TEST

#### 5.1 MEASUREMENT INSTRUMENTS LIST

Iten	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Nov.26.2011

Remark: " N/A" denotes No Model Name. , Serial No. or No Calibration specified.

#### 5.2 TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- b. Spectrum Setting : RBW= 100KHz, VBW=100KHz, Sweep time = 2.5 ms.

#### 5.3 DEVIATION FROM STANDARD

No deviation.

5.4 TEST SETUP

EUT	SPECTRUM
	ANALYZER

#### 5.5 EUT OPERATION CONDITIONS

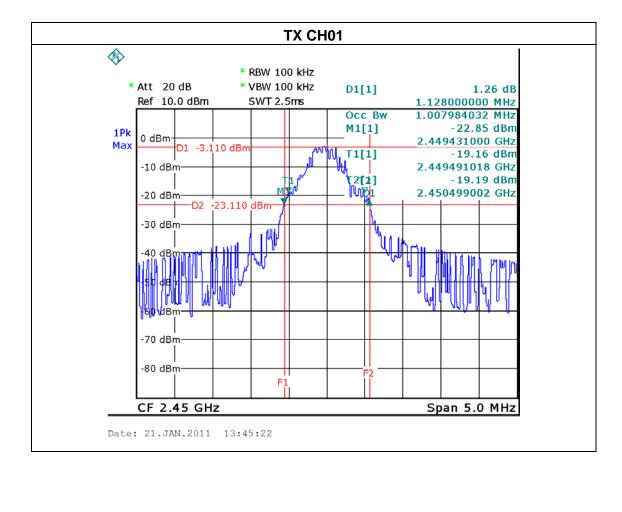
The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

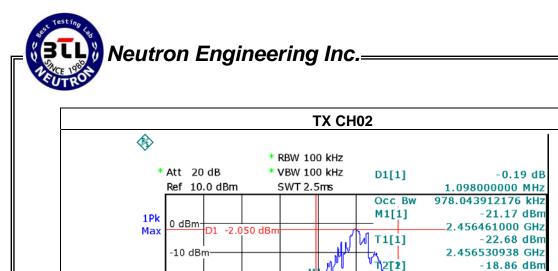
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#### 5.6 TEST RESULTS

IFUI.	Information Technology Equipment	Model Name. :	AP202
Temperature :	<b>20</b> °C	Relative Humidity:	55 %
Pressure :	1001 hPa	Test Power :	DC 3.3V
Test Mode :	TX CH01		

Test Channel	Frequency (MHz)	20 dBc Bandwidth (MHz)	99% Occupied BW (MHz)
CH01	2450	1.128	1.008
CH02	2457	1.098	0.978
CH03	2466	1.058	0.968



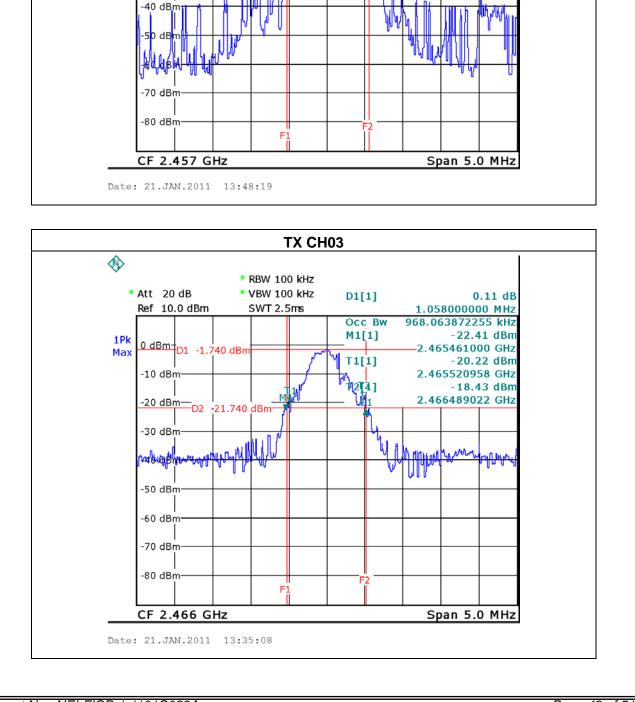


-22.050 dBm

-20 dBm

-30 dBm

-D2



2.457508982 GHz

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#### 6. ANTENNA CONDUCTED SPURIOUS EMISSION

#### 6.1 APPLIED PROCEDURES / LIMIT

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

#### 6.1.1 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Nov.26.2011

Remark: " N/A" denotes No Model Name. , Serial No. or No Calibration specified.

#### 6.1.2 TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- b. Spectrum Setting : RBW= 100KHz, VBW=100KHz, Sweep time = 10 ms.

#### 6.1.3 DEVIATION FROM STANDARD

No deviation.

#### 6.1.4 TEST SETUP

EUT	SPECTRUM
	ANALYZER

#### 6.1.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.



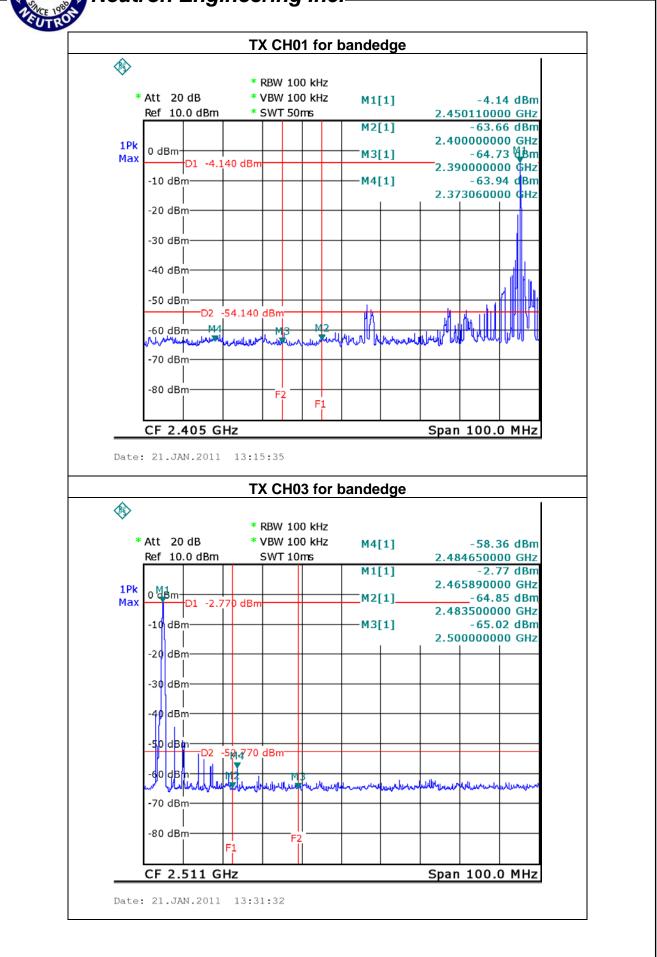
#### 6.1.6 TEST RESULTS

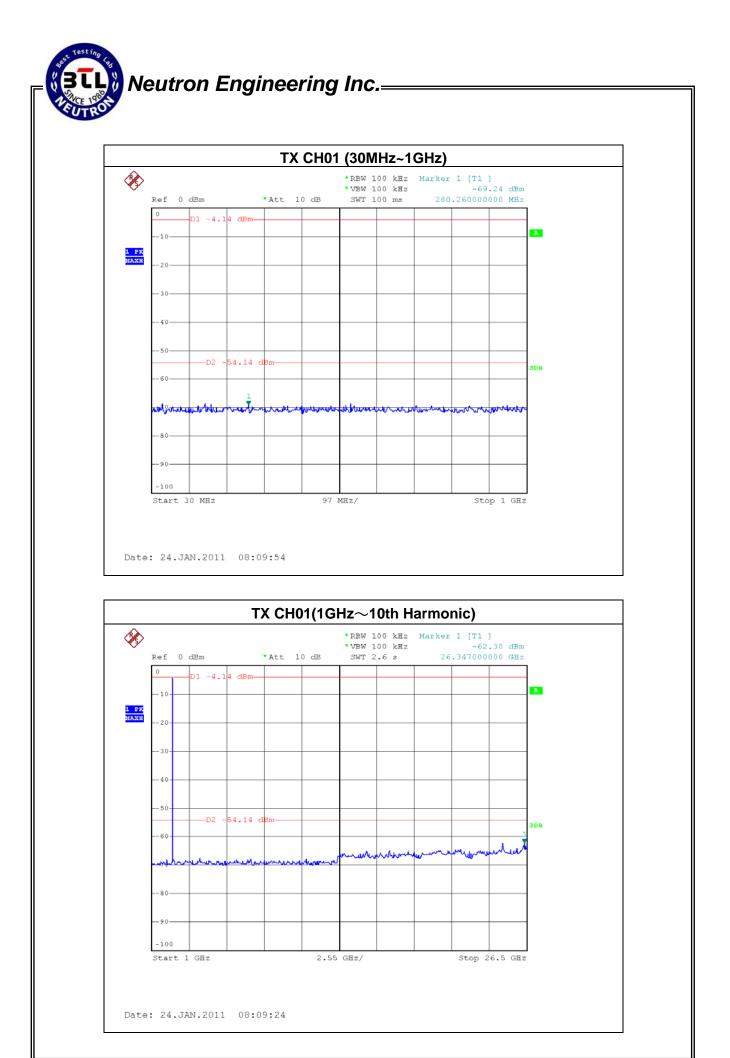
EUI.	Information Technology Equipment	Model Name. :	AP202
Temperature :	<b>20</b> °C	Relative Humidity:	55 %
Pressure :	1001 hPa	Test Power :	DC 3.3V
Test Mode :	TX CH01/02/03		

Channel of Worst Data: CH03					
	cy power in any 100kHz the frequency band	The max. radio frequency power in any 100 kHz bandwidth within the frequency band.			
FREQUENCY(MHz)	POWER(dBm)	FREQUENCY(MHz)	POWER(dBm)		
2373.06	-63.94	2484.65	-58.36		
Result					

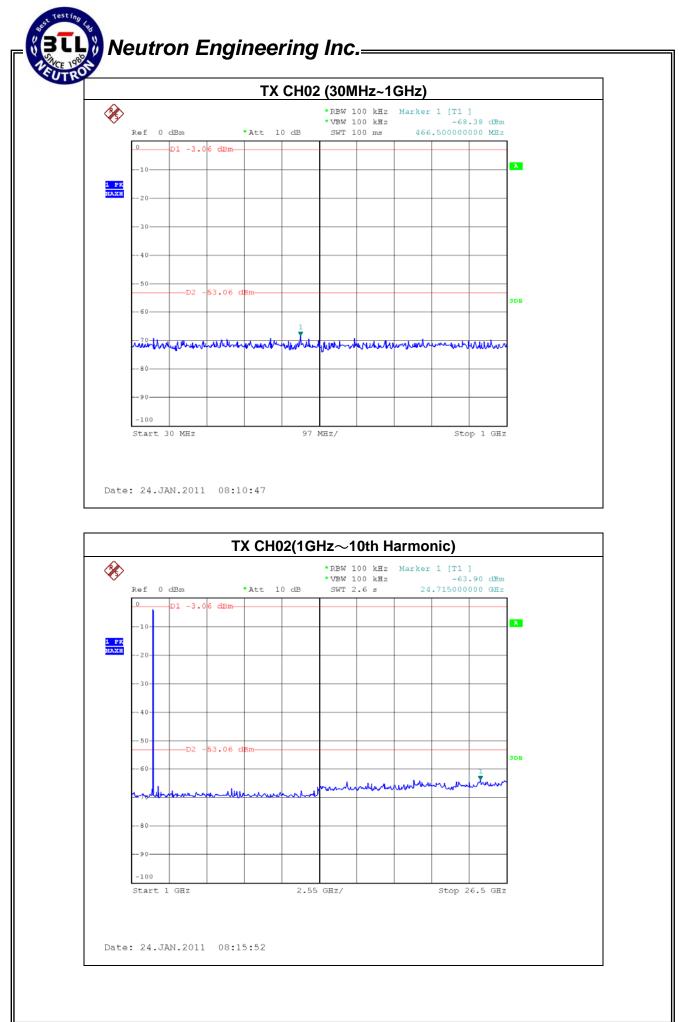
In any 100kHz bandwidth outside the frequency band, the radio frequency power is at least 20dB below that in the 100kHz bandwidth within the band that contains the highest lever of the desired power.

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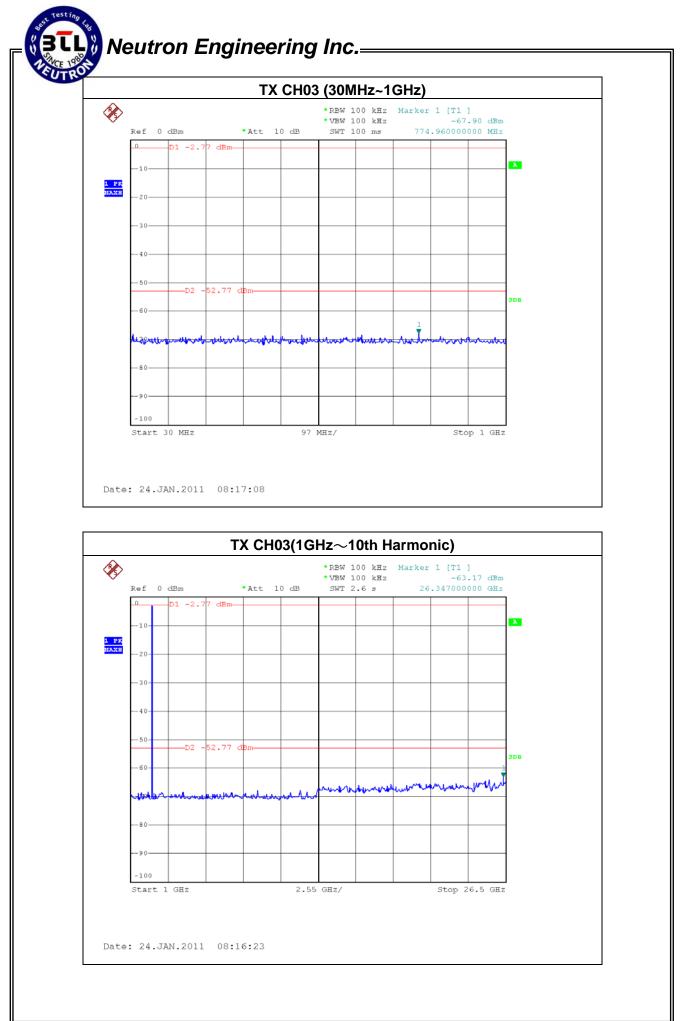




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