FCC TEST REPORT (15.407)

REPORT NO.:	RF130103E06-1
MODEL NO.:	EA6400, EA6300V1
FCC ID:	Q87-EA6400
RECEIVED:	Jan. 03, 2013
TESTED:	Jan. 05 to 15, 2013
ISSUED:	Feb. 26, 2013

APPLICANT:	Cisco Consumer Products LLC
ADDRESS:	121 Theory Drive Irvine California 92617 United States

ISSUED BY:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory
LAB ADDRESS :	No. 81-1, Lu Liao Keng, 9th Ling, Wu Lung Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan, R.O.C.
TEST LOCATION (1):	No. 81-1, Lu Liao Keng, 9th Ling, Wu Lung Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan, R.O.C.
TEST LOCATION (2):	No. 49, Ln. 206, Wende Rd., Shangshan Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan, R.O.C.

This report should not be used by the client to claim product certification, approval, or endorsement by TAF or any government agencies.

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF130103E06-1	Original release	Feb. 26, 2013

1. CERTIFICATION

PRODUCT:	Linksys Smart Wi-Fi Router AC1600, Linksys Smart Wi-Fi Router AC1200
BRAND NAME:	Cisco
MODEL NO.:	EA6400, EA6300V1
TEST SAMPLE:	ENGINEERING SAMPLE
APPLICANT:	Cisco Consumer Products LLC
TESTED:	Jan. 05 to 15, 2013
STANDARDS:	FCC Part 15, Subpart E (Section 15.407) ANSI C63.10-2009

The above equipment (Model: EA6400) has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

PREPARED BY : _____ , **DATE:** *Feb. 26, 2013*
(Midoli Peng, Specialist)

APPROVED BY : _____ , **DATE:** *Feb. 26, 2013*
(May Chen, Deputy Manager)

2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

For 5GHz, 5150~5250MHz

APPLIED STANDARD: FCC PART 15, SUBPART E (SECTION 15.407)			
STANDARD SECTION	**TEST TYPE**	**RESULT**	**REMARK**
15.407(b)(6)	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -6.54dB at 0.15391MHz
15.407(b/1/2/3) (b)(5)	Spurious Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -0.6dB at 5141.85MHz
15.407(a/1/2/3)	Transmit Power	PASS	Meet the requirement of limit.
15.407(a)(6)	Peak Power Excursion	PASS	Meet the requirement of limit.
15.407(a/1/2/3)	Peak Power Spectral Density	PASS	Meet the requirement of limit.
15.407(g)	Frequency Stability	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	No antenna connector is used.

NOTE: The EUT was operating in 2.400 ~ 2.4835GHz, 5.15~5.25GHz and 5.725~5.850GHz frequencies band 5.15~5.25GHz. This report was recorded the RF parameters including5.15~5.25GHz. For the 2.400 ~ 2.4835GHz and 5.725~5.850GHz RF parameters was recorded in another test report.

2.1 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:

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Measurement	Value
Conducted emissions	2.98 dB
Radiated emissions (30MHz-1GHz)	5.69 dB
Radiated emissions (1GHz -6GHz)	3.56 dB
Radiated emissions (6GHz -18GHz)	4.10 dB
Radiated emissions (18GHz -40GHz)	4.24 dB

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Linksys Smart Wi-Fi Router AC1600, Linksys Smart Wi-Fi Router AC1200
MODEL NO.	EA6400, EA6300V1
POWER SUPPLY	DC 12V from power adapter
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode only.
MODULATION TECHNOLOGY	DSSS,OFDM
TRANSFER RATE	802.11b: up to 11Mbps 802.11a / g: up to 54Mbps 802.11n: up to 450Mbps 802.11ac: up to 1300Mbps
OPERATING FREQUENCY	**For 15.407** 802.11a/n/ac: 5.18 ~ 5.24GHz
	For 15.247 802.11b/g/n: 2.412 ~ 2.462GHz 802.11a/n/ac: 5.745 ~ 5.825GHz
NUMBER OF CHANNEL	**For 15.407** 4 for 802.11a, 802.11n (HT20), 802.11ac (VHT20) 2 for 802.11n (HT40), 802.11ac (VHT40) 1 for 802.11ac (VHT80)
	For 15.247 (2.4GHz) 11 for 802.11b, 802.11g, 802.11n (HT20) 7 for 802.11n (HT40) **For 15.247 (5GHz)** 5 for 802.11a, 802.11n (HT20), 802.11ac (VHT20) 2 for 802.11n (HT40), 802.11ac (VHT40) 1 for 802.11ac (VHT80)

MAXIMUM OUTPUT POWER	**For 15.407** 802.11a: 22.856mW 802.11n (HT20): 23.72mW 802.11n (HT40): 28.170mW 802.11ac (VHT80): 20.624mW **For 15.247 (2.4GHz)** 802.11b: 140.281mW 802.11g: 174.181mW 802.11n (HT20): 195.489mW 802.11n (HT40): 60.227mW **For 15.247 (5GHz)** 802.11a: 208.449mW 802.11n (HT20): 521.139mW 802.11n (HT40): 368.271mW 802.11ac (VHT80): 165.068mW
ANTENNA TYPE	Please see NOTE
DATA CABLE	NA
I/O PORTS	Refer to user's manual
ASSOCIATED DEVICES	Adapter x1

NOTE:

1. The EUT is a 2.4GHz & 5GHz WLAN device.

2. The EUT have two product names and model names, which are identical to each other in all aspects except for the following table:

Product	Model No.	Difference
Linksys Smart Wi-Fi Router AC1600	EA6400	For the different marketing
Linksys Smart Wi-Fi Router AC1200	EA6300V1	

From the above models, model: EA6400 was selected as representative model for the test and its data was recorded in this report.

3. The EUT has two different RJ45 XFRM Transformers types could be chosen and please refer the below table:

Type 1(Vendor: MINGTEK)			
Vendor P/N	**Different**	**Vendor**	**Location**
HN1875CG	TRANSFORMER VARIABLE COILS,DIP,350UH,HN1875CG	MINGTEK	T1
HN3675CG	TRANSFORMER VARIABLE COILS,DIP,350UH,HN3675CG	MINGTEK	T2, T3
Type 2(Vendor: MYJWD)			
Vendor P/N	**Different**	**Vendor**	**Location**
DG18107-1 G	TRANSFORMER,DIP,350UH,16.8*8.5*1 1.85MM,18PIN,DG18107-1 G	MYJWD	T1
DG36005-1 G	TRANSFORMER,DIP,350UH,32.7*8.5*1 1.85MM,36PIN	MYJWD	T2, T3

From the above types, the worst case was found in **Type 2(Vendor: MYJWD)**. Therefore only the test data of the type were recorded in this report.

4. The EUT must be supplied with a power adapter and following four different models could be chosen as following table:

No	Brand	Model No.	Spec.	Plug
1	Solytech	CAD3612CW-1	Input: 100-240V, 1.5A, 50-60Hz Output: 12V, 3.0A DC output cable (Unshielded, 1.5m)	US
2	Solytech	CAD3612LW-1	Input: 100-240V, 1.5A, 50-60Hz Output: 12V, 3.0A DC output cable (Unshielded, 1.5m)	Universal (US, EU, AU, UK)
3	Leader (LEI)	MU42-1120300-A1	Input: 100-240V, 1.5A, 50-60Hz Output: 12V, 3.0A DC output cable (Unshielded, 1.5m)	US
4	Leader (LEI)	IU42-1120300-WP	Input: 100-240V, 1.5A, 50-60Hz Output: 12V, 3.0A DC output cable (Unshielded, 1.5m)	Universal (US, EU, AU, UK)
Note: 1. Adapter 1 & 2 only different with plug. 2. For radiated emissions test, the EUT was pre-tested with above Adapter 2, Adapter 3 & Adapter 4, the worst case was found in Adapter 2. Therefore only the test data of the Adapter 2 was recorded in this report.				

5. The antenna provided to the EUT, please refer to the following table:

For 2.4GHz						
Transmitter Circuit	Brand	Model	Antenna Type	Peak Gain(dBi) (Include cable loss)	Frequency range (MHz to MHz)	Connecter Type
Left side Chain (1)	Galtronics	02100073-05389A3	Dipole	1.515	2400~2483.5	NA
Front side Chain (0)	Galtronics	02100073-05389B2	Dipole	3.745	2400~2483.5	NA
For 5GHz (Band 1)						
Transmitter Circuit	Brand	Model	Antenna Type	Peak Gain(dBi) (Include cable loss)	Frequency range (MHz to MHz)	Connecter Type
Left side Chain (1)	Galtronics	02102142-05389A4	Dipole	4.339	5150~5250	NA
Right side Chain (0)	Galtronics	02102142-05389A1	Dipole	2.734	5150~5250	NA
Front side Chain (2)	Galtronics	02102142-05389B1	Dipole	3.178	5150~5250	NA
For 5GHz (Band 4)						
Transmitter Circuit	Brand	Model	Antenna Type	Peak Gain(dBi) (Include cable loss)	Frequency range (MHz to MHz)	Connecter Type
Left side Chain (1)	Galtronics	02102142-05389A2	Dipole	4.162	5725~5850	NA
Right side Chain (0)	Galtronics	02102142-05389A3	Dipole	5.314	5725~5850	NA
Front side Chain (2)	Galtronics	02102142-05389B1	Dipole	3.463	5725~5850	NA
Note: According to the above antennas, there are three antennas will transmit simultaneously (one is Vertical and the others are Horizontal).						

6. The EUT incorporates a MIMO function without beam forming.

MODULATION MODE	TX/RX FUNCTION
802.11b	1TX/2RX
802.11g	1TX (Diversity)/2RX
802.11n (HT20)<2.4GHz>	2TX/2RX
802.11n (HT40) <2.4GHz>	2TX/2RX
802.11a	1TX (Diversity)/3Rx
802.11n (HT20) <5GHz>	3TX/3RX
802.11n (HT40) <5GHz>	3TX/3RX
802.11ac (VHT20)	3TX/3RX
802.11ac (VHT40)	3TX/3RX
802.11ac (VHT80)	3TX/3RX

Note: The modulation and bandwidth are similar for 802.11n mode for 20MHz (40MHz) and 802.11ac mode for 20MHz (40MHz), therefore investigated worst case to representative mode in test report. (Final test mode refer section 3.2.1)

7. Spurious emission of the simultaneous operation (2.4GHz & 5GHz) has been evaluated and no non-compliance was found.

8. When the EUT operating in 802.11n, the software operation, which is defined by manufacturer, MCS (Modulation and Coding Schemes) from 0 to 23.

9. When the EUT operating in 802.11ac, the software operation, which is defined by manufacturer, MCS (Modulation and Coding Schemes) from 0 to 9.

10. The above EUT information was declared by the manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

3.2 DESCRIPTION OF TEST MODES

Operated in 5150 ~ 5250MHz band:

4 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

CHANNEL	FREQUENCY
36	5180 MHz
40	5200 MHz
44	5220 MHz
48	5240 MHz

2 channels are provided for 802.11n (HT40), 802.11ac (VHT40):

CHANNEL	FREQUENCY
38	5190 MHz
46	5230 MHz

1 channels are provided for 802.11ac (VHT80):

CHANNEL	FREQUENCY
42	5210 MHz

3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	PLC	RE < 1G	RE ³ 1G	APCM	
1	√	√	√	√	Adapter 2
2	√	-	-	-	Adapter 3
3	√	-	-	-	Adapter 4

Where **PLC:** Power Line Conducted Emission **RE < 1G:** Radiated Emission below 1GHz

RE ³ 1G: Radiated Emission above 1GHz **APCM:** Antenna Port Conducted Measurement

Note: The EUT had been pre-tested on the positioned of each 2 axis. The worst case was found when positioned on **Y-plane .**

POWER LINE CONDUCTED EMISSION TEST:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (MBPS)
802.11n (HT20)	36 to 48	48	OFDM	BPSK	6.5

RADIATED EMISSION TEST (BELOW 1 GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11n (HT20)	36 to 48	48	OFDM	BPSK	6.5

RADIATED EMISSION TEST (ABOVE 1 GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11a	36 to 48	36, 40, 48	OFDM	BPSK	6
802.11n (HT20)	36 to 48	36, 40, 48	OFDM	BPSK	6.5
802.11n (HT40)	38 to 46	38, 46	OFDM	BPSK	13.5
802.11ac (VHT80)	42	42	OFDM	BPSK	87.8

ANTENNA PORT CONDUCTED MEASUREMENT:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11a	36 to 48	36, 40, 48	OFDM	BPSK	6
802.11n (HT20)	36 to 48	36, 40, 48	OFDM	BPSK	6.5
802.11n (HT40)	38 to 46	38, 46	OFDM	BPSK	13.5
802.11ac (VHT80)	42	42	OFDM	BPSK	87.8

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER (SYSTEM)	TESTED BY
PLC	24deg. C,74%RH	120Vac, 60Hz	Scott Chen
RE<1G	23deg. C, 68%RH	120Vac, 60Hz	Robert Cheng
RE≥1G	24deg. C, 66%RH	120Vac, 60Hz	Nelson Teng
APCM	25deg. C, 60%RH	120Vac, 60Hz	Amos Chuang

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart E (15.407)

789033 D01 General UNII Test Procedures

662911 D01 Multiple Transmitter Output

ANSI C63.10-2009

All test items have been performed and recorded as per the above standards.

Note: The EUT has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.

3.4 DUTY CYCLE OF TEST SIGNAL

Duty cycle of test signal is > 98 %, duty factor is not required.

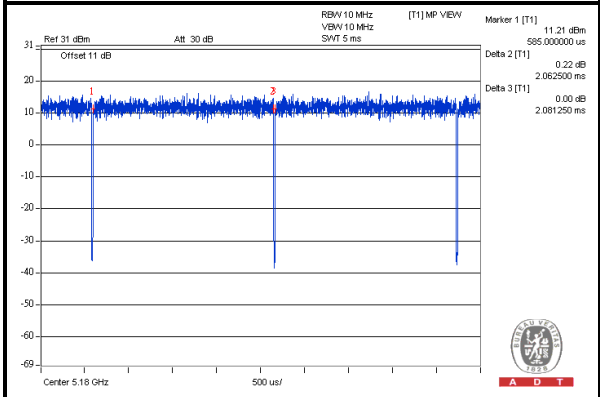
802.11a: Duty cycle = 2.063 ms/2.081 ms = 0.991

802.11n (HT20): Duty cycle = 1.918 ms/1.939 ms = 0.989

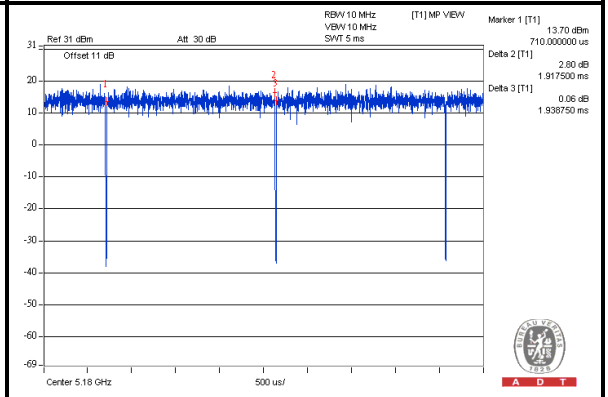
802.11n (HT40): Duty cycle = 0.943 ms/0.961 ms = 0.981

802.11ac (VHT80): Duty cycle = 0.469 ms/0.477 ms = 0.983

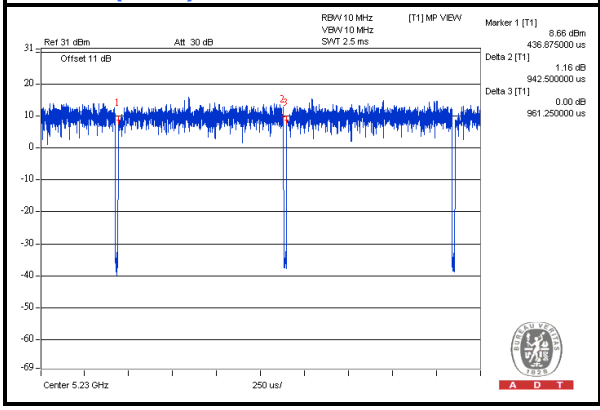
802.11a



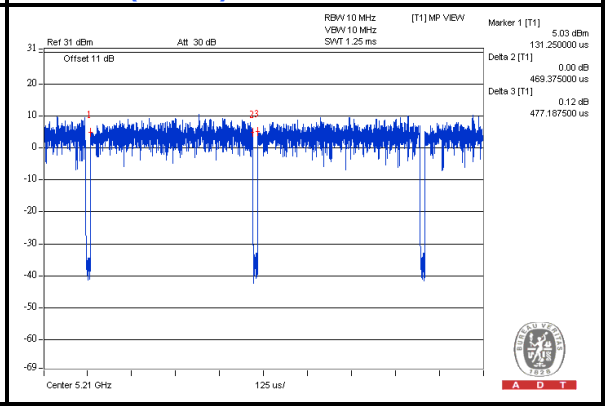
802.11n (HT20)



802.11n (HT40)



802.11ac (VHT80)



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.

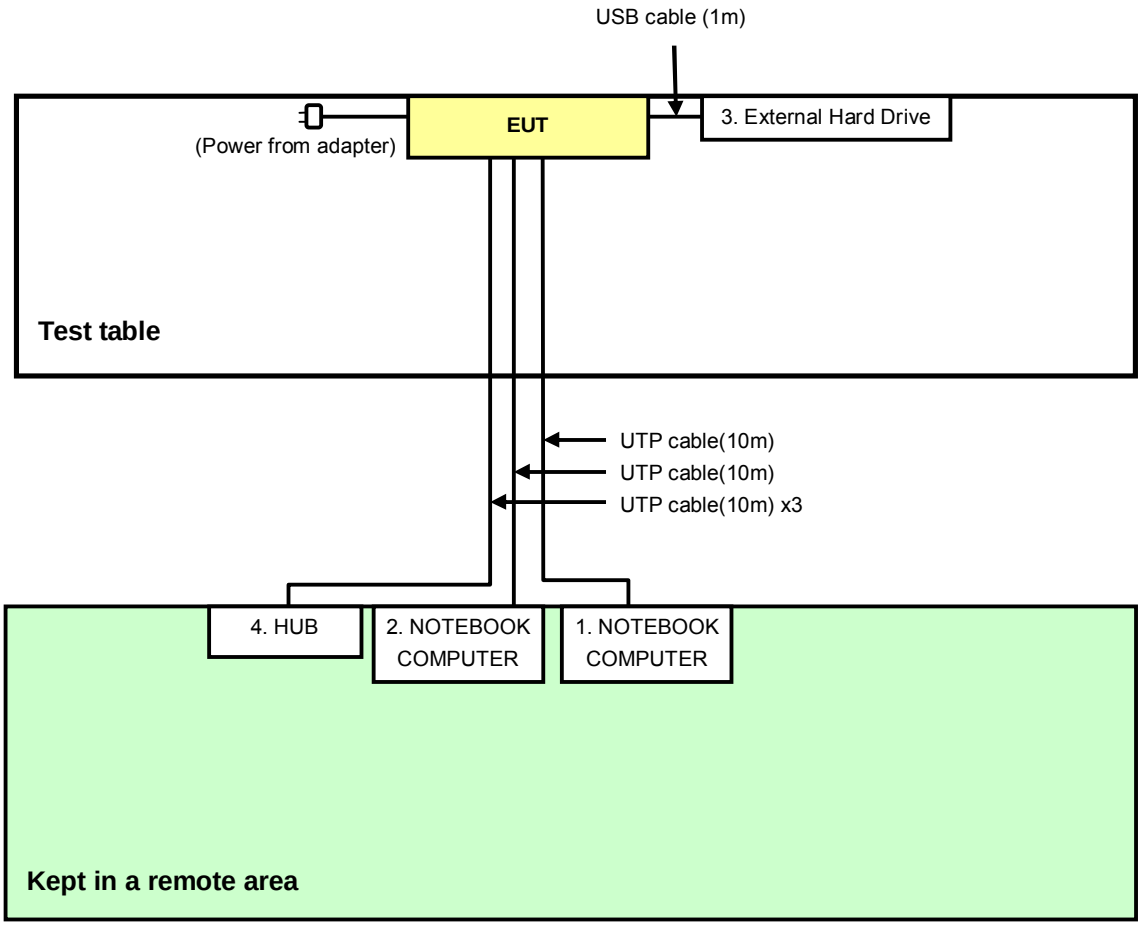
For conducted emission test					
NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK COMPUTER	DELL	PP27L	6YLB32S	FCC DoC
2	NOTEBOOK COMPUTER	DELL	PP27L	7YLB32S	FCC DoC
3	External Hard Drive	WD	WDBACW0010H BK-SESN	WCAV5R678284	FCC DoC
4	HUB	Linksys	SD208	NA	NA
For other test items					
NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK COMPUTER	DELL	PP32LA	FSLB32S	FCC DoC
2	NOTEBOOK COMPUTER	DELL	PP32LA	GSLB32S	FCC DoC
3	External Hard Drive	WD	WDBACW0010H BK-SESN	WXK1A51E5819	FCC DoC
4	HUB	ZyXEL	ES-116P	S060H02000215	FCC DoC

For conducted emission test	
NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	UTP cable, 10m
2	UTP cable, 10m
3	USB cable, 1m
4	UTP cable, 10m
For other test items	
NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	UTP cable, 10m
2	UTP cable, 10m
3	USB cable, 0.45m
4	UTP cable, 10m

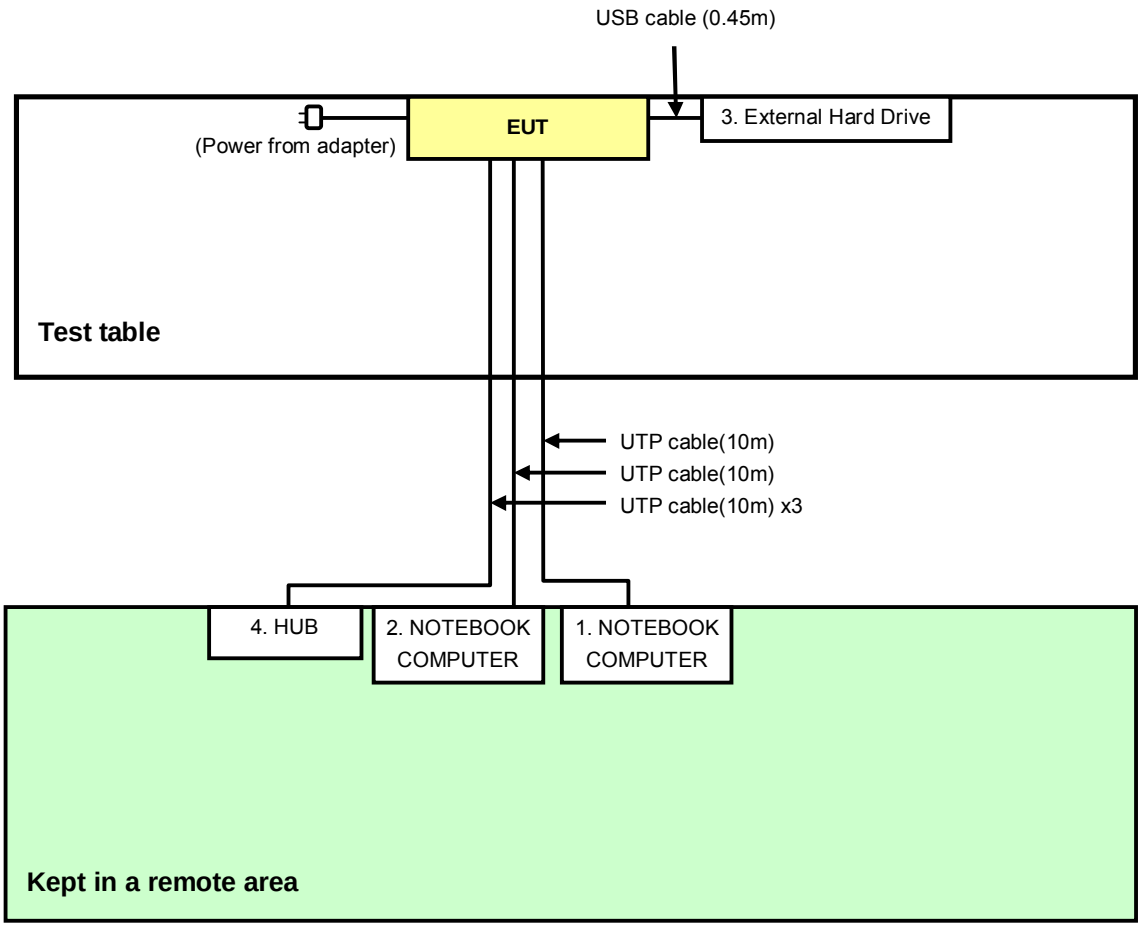
NOTE: All power cords of the above support units are non shielded (1.8m).

3.6 CONFIGURATION OF SYSTEM UNDER TEST

For Conducted Emission test:



For other test items:



4. TEST TYPES AND RESULTS

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dBμV)	
	Quasi-peak	Average
0.15-0.5 0.5-5 5-30	66 to 56 56 60	56 to 46 46 50

NOTE: 1. The lower limit shall apply at the transition frequencies.
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.

4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver	ESCS 30	100375	Mar. 12, 2012	Mar.11, 2013
Line-Impedance Stabilization Network (for EUT) SCHWARZBECK	NSLK8127	8127-522	Sep. 06, 2012	Sep. 05, 2013
Line-Impedance Stabilization Network (for Peripheral)	ENV216	100072	June 08,2012	June 07,2013
RF Cable (JYEBAO)	5DFB	COCCAB-001	Aug. 28, 2012	Aug. 27, 2013
50 ohms Terminator	50	EMC-3	Sep. 25, 2012	Sep. 24, 2013
Software ADT	BV ADT_Cond_V7.3.7.3	NA	NA	NA

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Shielded Room No. C.
3 The VCCI Con C Registration No. is C-3611.
4 Tested Date: Jan.15, 2013

4.1.3 TEST PROCEDURES

a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN.
b. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
c. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
d. The frequency range from 150kHz to 30MHz was searched. Emission level under (Limit – 20dB) was not recorded.

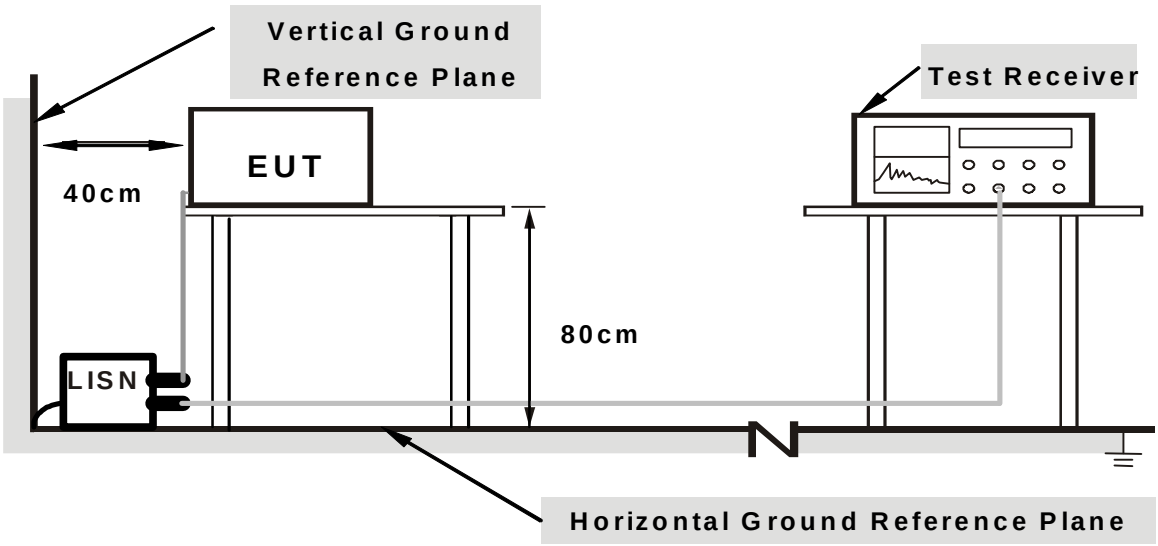
NOTE:

1. The resolution bandwidth of test receiver is 9kHz for Quasi-peak detection (QP) & Average detection (AV).

4.1.4 DEVIATION FROM TEST STANDARD

No deviation

4.1.5 TEST SETUP



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

For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

4.1.6 EUT OPERATING CONDITIONS

1. Turn on the power of EUT.
2. The communication partner run test program “MTool V1.0.0.10” to enable EUT under transmission/receiving condition continuously at specific channel frequency.

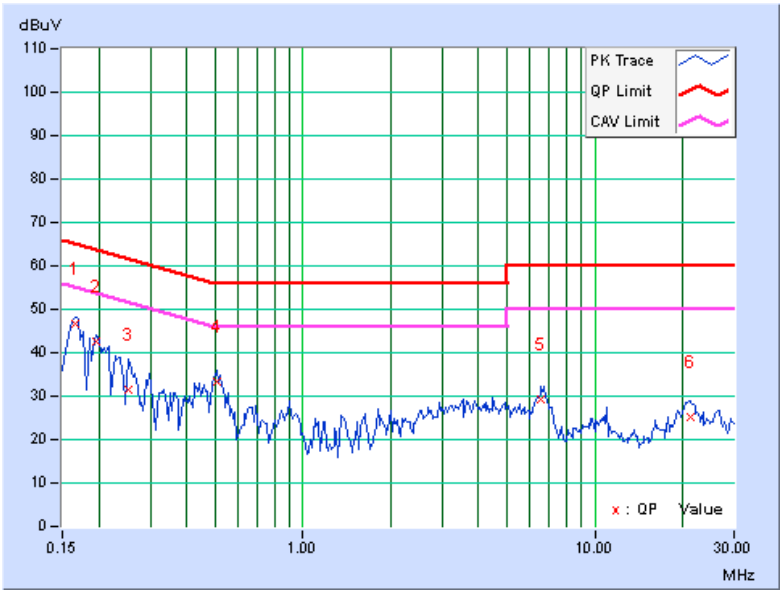
4.1.7 TEST RESULTS(MODE 1)

PHASE	Line (L)	DETECTOR FUNCTION	Quasi-Peak (QP) / Average (AV)

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16562	0.11	46.64	37.70	46.75	37.81	65.18	55.18	-18.42	-17.36
2	0.19687	0.13	42.34	32.74	42.47	32.87	63.74	53.74	-21.27	-20.87
3	0.25156	0.14	31.32	13.76	31.46	13.90	61.71	51.71	-30.24	-37.80
4	0.50938	0.19	33.10	20.16	33.29	20.35	56.00	46.00	-22.71	-25.65
5	6.55859	0.52	28.66	23.92	29.18	24.44	60.00	50.00	-30.82	-25.56
6	21.28125	1.33	23.80	18.42	25.13	19.75	60.00	50.00	-34.87	-30.25

REMARKS:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value.

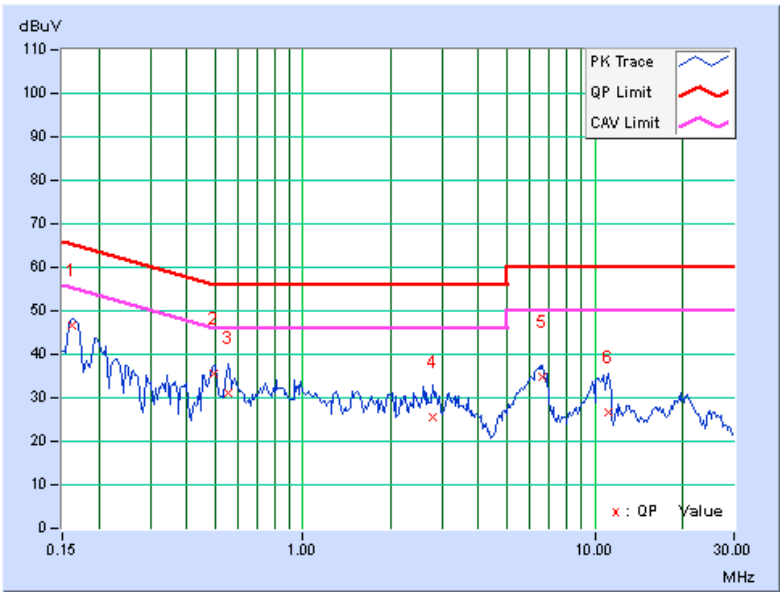


PHASE	Neutral (N)	DETECTOR FUNCTION	Quasi-Peak (QP) / Average (AV)

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16172	0.10	46.46	37.46	46.56	37.56	65.38	55.38	-18.81	-17.81
2	0.49766	0.17	35.42	29.36	35.59	29.53	56.04	46.04	-20.44	-16.50
3	0.55234	0.18	30.92	24.54	31.10	24.72	56.00	46.00	-24.90	-21.28
4	2.80078	0.30	25.42	17.38	25.72	17.68	56.00	46.00	-30.28	-28.32
5	6.64844	0.49	34.26	28.76	34.75	29.25	60.00	50.00	-25.25	-20.75
6	11.12891	0.70	26.08	19.40	26.78	20.10	60.00	50.00	-33.22	-29.90

REMARKS:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value.



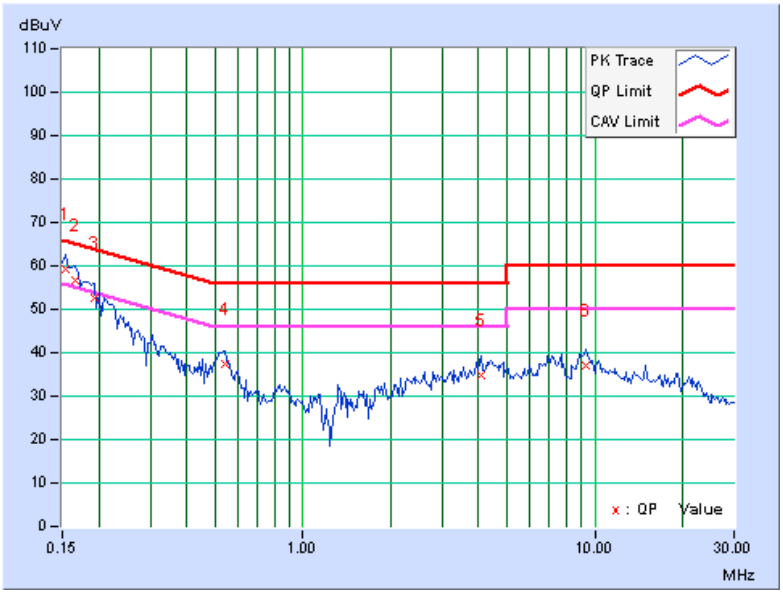
4.1.8 TEST RESULTS(MODE 2)

PHASE	Line (L)	DETECTOR FUNCTION	Quasi-Peak (QP) / Average (AV)

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	**0.15391**	**0.11**	**59.14**	**47.64**	**59.25**	**47.75**	**65.79**	**55.79**	**-6.54**	**-8.04**
2	0.16562	0.11	56.52	37.28	56.63	37.39	65.18	55.18	-8.54	-17.78
3	0.19297	0.13	52.46	35.92	52.59	36.05	63.91	53.91	-11.32	-17.86
4	0.54063	0.19	37.04	28.38	37.23	28.57	56.00	46.00	-18.77	-17.43
5	4.07422	0.35	34.28	27.70	34.63	28.05	56.00	46.00	-21.37	-17.95
6	9.28125	0.71	36.40	31.08	37.11	31.79	60.00	50.00	-22.89	-18.21

REMARKS:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value.

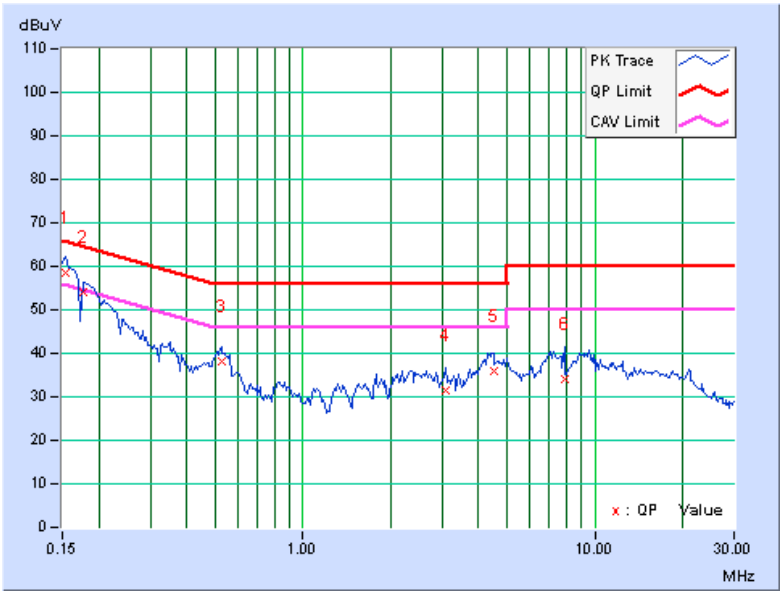


PHASE	Neutral (N)	DETECTOR FUNCTION	Quasi-Peak (QP) / Average (AV)

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15391	0.10	58.56	47.48	58.66	47.58	65.79	55.79	-7.13	-8.21
2	0.17734	0.11	53.86	37.44	53.97	37.55	64.61	54.61	-10.64	-17.06
3	0.52500	0.18	38.02	30.86	38.20	31.04	56.00	46.00	-17.80	-14.96
4	3.07813	0.31	31.28	24.82	31.59	25.13	56.00	46.00	-24.41	-20.87
5	4.50391	0.38	35.48	29.72	35.86	30.10	56.00	46.00	-20.14	-15.90
6	7.85938	0.55	33.52	27.20	34.07	27.75	60.00	50.00	-25.93	-22.25

REMARKS:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value.



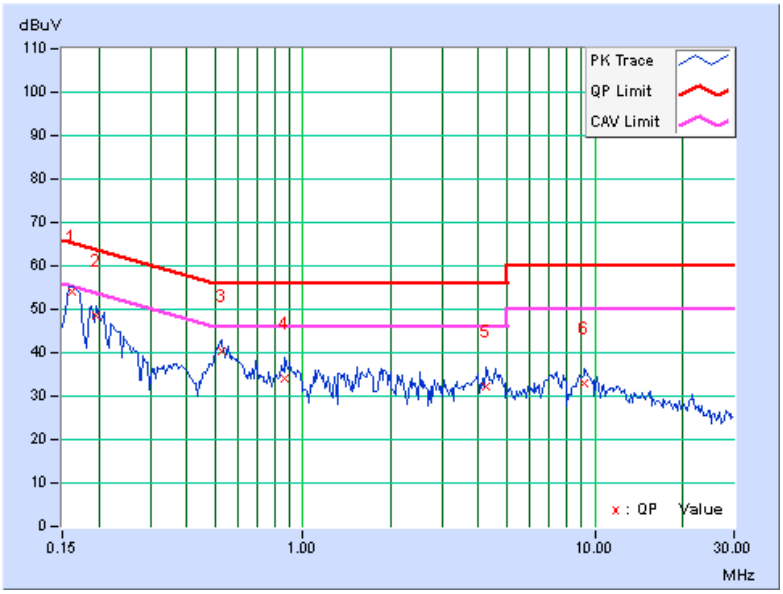
4.1.9 TEST RESULTS(MODE 3)

PHASE	Line (L)	DETECTOR FUNCTION	Quasi-Peak (QP) / Average (AV)

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16172	0.11	54.08	43.56	54.19	43.67	65.38	55.38	-11.18	-11.70
2	0.19687	0.13	48.34	36.46	48.47	36.59	63.74	53.74	-15.27	-17.15
3	0.52500	0.19	40.18	33.76	40.37	33.95	56.00	46.00	-15.63	-12.05
4	0.86875	0.21	33.90	29.48	34.11	29.69	56.00	46.00	-21.89	-16.31
5	4.23047	0.36	31.76	26.04	32.12	26.40	56.00	46.00	-23.88	-19.60
6	9.23828	0.71	32.10	27.36	32.81	28.07	60.00	50.00	-27.19	-21.93

REMARKS:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value.

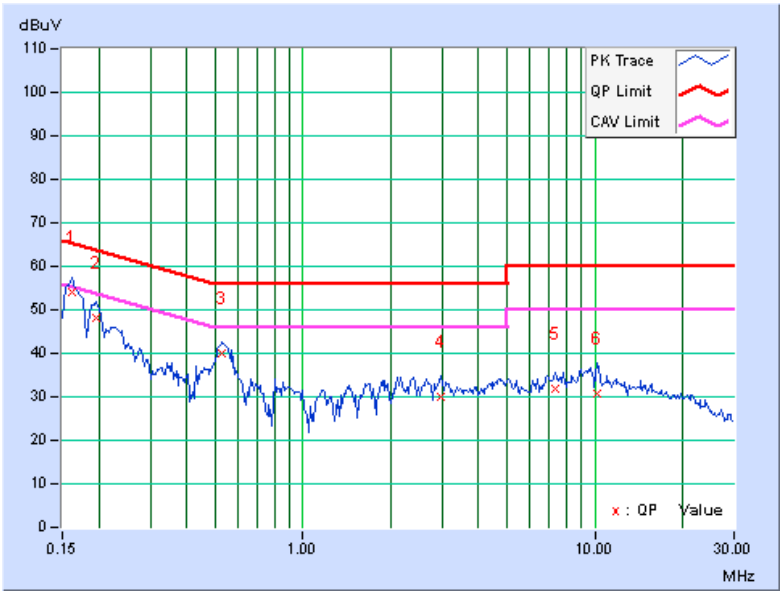


PHASE	Neutral (N)	DETECTOR FUNCTION	Quasi-Peak (QP) / Average (AV)

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16172	0.10	54.04	43.52	54.14	43.62	65.38	55.38	-11.23	-11.75
2	0.19687	0.12	48.16	36.40	48.28	36.52	63.74	53.74	-15.46	-17.22
3	0.52891	0.18	39.92	33.54	40.10	33.72	56.00	46.00	-15.90	-12.28
4	2.96484	0.30	29.86	22.92	30.16	23.22	56.00	46.00	-25.84	-22.78
5	7.33594	0.52	31.50	26.56	32.02	27.08	60.00	50.00	-27.98	-22.92
6	10.16016	0.67	29.96	24.56	30.63	25.23	60.00	50.00	-29.37	-24.77

REMARKS:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value.



4.2 RADIATED EMISSION AND BANDEDGE MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION AND BANDEDGE MEASUREMENT

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table:

Frequencies (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB.

4.2.2 LIMITS OF UNWANTED EMISSION OUT OF THE RESTRICTED BANDS

APPLICABLE TO	LIMIT	
	FIELD STRENGTH AT 3m (dBµV/m)	
	PK	AV
	74	54
	EIRP LIMIT (dBm)	EQUIVALENT FIELD STRENGTH AT 3m (dBµV/m)
√	PK	PK
	-27	68.3

NOTE:

1. 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).

4.2.3 TEST INSTRUMENTS

Below 1GHz test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer Agilent	E4446A	MY48250253	Sep. 03, 2012	Sep. 02, 2013
Pre-Selector Agilent	N9039A	MY46520310	Sep. 03, 2012	Sep. 02, 2013
Signal Generator Agilent	N5181A	MY49060347	July 24, 2012	July 23, 2013
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-04	Nov. 14, 2012	Nov. 13, 2013
Pre-Amplifier Agilent	8449B	3008A02465	Feb. 27, 2012	Feb. 26, 2013
SPACEK LABS	SLKKa-48-6	9K16	Nov. 14, 2012	Nov. 13, 2013
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-361	Apr. 06, 2012	Apr. 05, 2013
Horn_Antenna AISI	AIH.8018	0000220091110	Nov. 27, 2012	Nov. 26, 2013
Horn_Antenna SCHWARZBECK	BBHA 9170	9170-424	Oct. 12, 2012	Oct. 11, 2013
RF Cable	NA	RF104-205 RF104-207 RF104-202	Dec. 25, 2012	Dec. 24, 2013
RF Cable	NA	CHHCAB_001	Oct. 07, 2012	Oct. 06, 2013
Software	ADT_Radiated_V8.7.05	NA	NA	NA
Antenna Tower & Turn Table CT	NA	NA	NA	NA

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The horn antenna, preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
3 The test was performed in 966 Chamber No. H.
4. The FCC Site Registration No. is 797305.
5 The CANADA Site Registration No. is IC 7450H-3.
6 Tested Date: Jan. 08, 2013

Above 1GHz test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer Agilent	E4446A	MY48250254	July 09, 2012	July 08, 2013
Pre-Selector Agilent	N9039A	MY46520311	July 09, 2012	July 08, 2013
Signal Generator Agilent	N5181A	MY49060517	July 09, 2012	July 08, 2013
Pre-Amplifier Mini-Circuits	ZFL-1000VH2 B	AMP-ZFL-03	Nov. 14, 2012	Nov. 13, 2013
Pre-Amplifier Agilent	8449B	3008A02578	June 26, 2012	June 25, 2013
Pre-Amplifier SPACEK LABS	SLKKa-48-6	9K16	Nov. 14, 2012	Nov. 13, 2013
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-360	Apr. 09, 2012	Apr. 08, 2013
Horn_Antenna AISI	AIH.8018	0000320091110	Nov. 19, 2012	Nov. 18, 2013
Horn_Antenna SCHWARZBECK	BBHA 9170	9170-424	Oct. 12, 2012	Oct. 11, 2013
RF Cable	NA	RF104-201 RF104-203 RF104-204	Dec. 25, 2012	Dec. 24, 2013
RF Cable	NA	CHGCAB_001	Oct. 06, 2012	Oct. 05, 2013
Software	ADT_Radiated _V8.7.05	NA	NA	NA
Antenna Tower & Turn Table CT	NA	NA	NA	NA

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The horn antenna, preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
3 The test was performed in 966 Chamber No. G.
4. The FCC Site Registration No. is 966073.
5 The VCCI Site Registration No. is G-137.
6 The CANADA Site Registration No. is IC 7450H-2.
7 Tested Date: Jan. 08, 2013

4.2.4 TEST PROCEDURES

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.

f. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

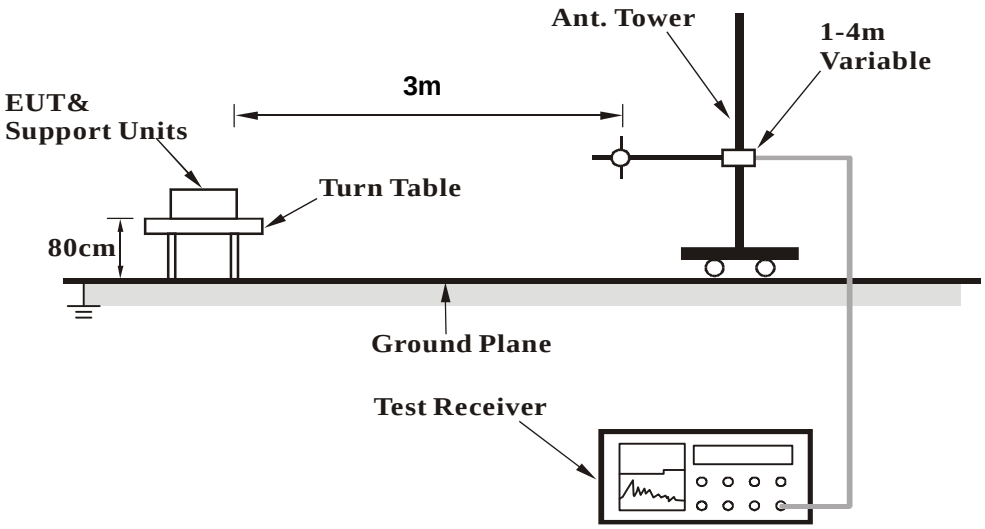
NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10 Hz for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

4.2.5 DEVIATION FROM TEST STANDARD

No deviation

4.2.6 TEST SETUP



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

4.2.7 EUT OPERATING CONDITION

Same as 4.1.6

4.2.8 TEST RESULTS

BELOW 1GHz WORST-CASE DATA

802.11n (HT20)

CHANNEL	TX Channel 48	**DETECTOR FUNCTION**	Quasi-Peak (QP)
FREQUENCY RANGE	Below 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	55.58	31.9 QP	40.0	-8.1	1.24 H	124	18.22	13.68
2	193.90	32.6 QP	43.5	-10.9	1.24 H	111	20.97	11.61
3	323.81	35.8 QP	46.0	-10.2	1.34 H	136	19.86	15.90
4	500.00	36.4 QP	46.0	-9.6	1.67 H	304	16.31	20.10
5	833.38	32.8 QP	46.0	-13.2	1.45 H	341	6.64	26.13
6	997.63	28.4 QP	54.0	-25.6	1.74 H	214	-0.35	28.77
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	96.53	36.8 QP	43.5	-6.7	1.24 V	36	27.58	9.26
2	106.10	35.2 QP	43.5	-8.3	1.47 V	145	24.74	10.50
3	193.17	35.0 QP	43.5	-8.5	1.78 V	147	23.33	11.68
4	323.30	36.3 QP	46.0	-9.7	1.36 V	145	20.40	15.88
5	427.77	35.6 QP	46.0	-10.4	1.11 V	222	17.25	18.38
6	997.51	43.3 QP	54.0	-10.7	1.34 V	245	14.49	28.77

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.

ABOVE 1GHz DATA

802.11a

CHANNEL	TX Channel 36	**DETECTOR FUNCTION**	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5100.94	63.4 PK	74.0	-10.6	1.37 H	265	21.27	42.13
2	5100.94	53.3 AV	54.0	-0.7	1.37 H	265	11.17	42.13
3	*5180.00	107.5 PK			1.41 H	269	65.10	42.40
4	*5180.00	97.2 AV			1.41 H	269	54.80	42.40
5	#10360.00	57.6 PK	68.3	-10.7	1.00 H	21	8.39	49.21
6	15540.00	63.5 PK	74.0	-10.5	1.00 H	271	8.40	55.10
7	15540.00	51.0 AV	54.0	-3.0	1.00 H	271	-4.10	55.10
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5100.78	61.1 PK	74.0	-12.9	1.12 V	193	18.97	42.13
2	5100.78	49.8 AV	54.0	-4.2	1.12 V	193	7.67	42.13
3	*5180.00	103.3 PK			1.53 V	347	60.90	42.40
4	*5180.00	94.2 AV			1.53 V	347	51.80	42.40
5	#10360.00	56.3 PK	68.3	-12.0	1.00 V	193	7.09	49.21
6	15540.00	63.2 PK	74.0	-10.8	1.00 V	253	8.10	55.10
7	15540.00	51.1 AV	54.0	-2.9	1.00 V	253	-4.00	55.10

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 40	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5120.00	63.4 PK	74.0	-10.6	1.39 H	264	21.20	42.20
2	5120.00	53.2 AV	54.0	-0.8	1.39 H	264	11.00	42.20
3	*5200.00	108.5 PK			1.36 H	281	66.03	42.47
4	*5200.00	98.4 AV			1.36 H	281	55.93	42.47
5	#10400.00	58.3 PK	68.3	-10.0	1.00 H	28	9.47	48.83
6	15600.00	63.3 PK	74.0	-10.7	1.00 H	265	8.33	54.97
7	15600.00	51.3 AV	54.0	-2.7	1.00 H	265	-3.67	54.97
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	104.1 PK			1.53 V	351	61.63	42.47
2	*5200.00	95.3 AV			1.53 V	351	52.83	42.47
3	#10400.00	56.1 PK	68.3	-12.2	1.00 V	192	7.27	48.83
4	15600.00	63.2 PK	74.0	-10.8	1.00 V	253	8.23	54.97
5	15600.00	51.3 AV	54.0	-2.7	1.00 V	253	-3.67	54.97

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 48	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	108.5 PK			1.36 H	262	65.99	42.51
2	*5240.00	98.5 AV			1.36 H	262	55.99	42.51
3	5350.00	62.2 PK	74.0	-11.8	1.41 H	266	19.61	42.59
4	5350.00	50.6 AV	54.0	-3.4	1.41 H	266	8.01	42.59
5	5402.82	62.2 PK	74.0	-11.8	1.40 H	277	19.58	42.62
6	5402.82	51.5 AV	54.0	-2.5	1.40 H	277	8.88	42.62
7	#10480.00	57.5 PK	68.3	-10.8	1.00 H	25	8.11	49.39
8	15720.00	63.2 PK	74.0	-10.8	1.00 H	151	8.50	54.70
9	15720.00	51.5 AV	54.0	-2.5	1.00 H	151	-3.20	54.70
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	104.4 PK			1.52 V	348	61.89	42.51
2	*5240.00	95.6 AV			1.52 V	348	53.09	42.51
3	5402.40	61.9 PK	74.0	-12.1	1.00 V	195	19.28	42.62
4	5402.40	51.3 AV	54.0	-2.7	1.00 V	195	8.68	42.62
5	#10480.00	56.3 PK	68.3	-12.0	1.00 V	189	6.91	49.39
6	15720.00	63.1 PK	74.0	-10.9	1.00 V	251	8.40	54.70
7	15720.00	51.4 AV	54.0	-2.6	1.00 V	251	-3.30	54.70

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

802.11n (HT20)

CHANNEL	TX Channel 36	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5100.50	62.0 PK	74.0	-12.0	1.38 H	265	19.87	42.13
2	5100.50	52.0 AV	54.0	-2.0	1.38 H	265	9.87	42.13
3	*5180.00	109.0 PK			1.38 H	281	66.60	42.40
4	*5180.00	99.3 AV			1.38 H	281	56.90	42.40
5	#10360.00	59.1 PK	68.3	-9.2	1.00 H	63	9.89	49.21
6	15540.00	63.1 PK	74.0	-10.9	1.00 H	121	8.00	55.10
7	15540.00	51.5 AV	54.0	-2.5	1.00 H	121	-3.60	55.10
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5094.00	59.7 PK	74.0	-14.3	1.00 V	192	17.58	42.12
2	5094.00	50.6 AV	54.0	-3.4	1.00 V	192	8.48	42.12
3	*5180.00	108.2 PK			1.00 V	185	65.80	42.40
4	*5180.00	98.3 AV			1.00 V	185	55.90	42.40
5	#10360.00	57.6 PK	68.3	-10.7	1.00 V	154	8.39	49.21
6	15540.00	62.3 PK	74.0	-11.7	1.00 V	235	7.20	55.10
7	15540.00	51.3 AV	54.0	-2.7	1.00 V	235	-3.80	55.10

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 40	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5125.28	62.0 PK	74.0	-12.0	1.39 H	282	19.78	42.22
2	5125.28	51.9 AV	54.0	-2.1	1.39 H	282	9.68	42.22
3	*5200.00	108.1 PK			1.34 H	280	65.63	42.47
4	*5200.00	98.7 AV			1.34 H	280	56.23	42.47
5	#10400.00	58.9 PK	68.3	-9.4	1.00 H	59	10.07	48.83
6	15600.00	62.9 PK	74.0	-11.1	1.00 H	145	7.93	54.97
7	15600.00	51.5 AV	54.0	-2.5	1.00 H	145	-3.47	54.97
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5125.00	60.6 PK	74.0	-13.4	1.00 V	193	18.39	42.21
2	5125.00	51.2 AV	54.0	-2.8	1.00 V	193	8.99	42.21
3	*5200.00	108.2 PK			1.00 V	184	65.73	42.47
4	*5200.00	98.7 AV			1.00 V	184	56.23	42.47
5	#10400.00	57.5 PK	68.3	-10.8	1.00 V	159	8.67	48.83
6	15600.00	62.6 PK	74.0	-11.4	1.00 V	233	7.63	54.97
7	15600.00	51.6 AV	54.0	-2.4	1.00 V	233	-3.37	54.97

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 48	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	110.6 PK			1.35 H	262	68.09	42.51
2	*5240.00	101.2 AV			1.35 H	262	58.69	42.51
3	5398.27	62.6 PK	74.0	-11.4	1.37 H	276	19.99	42.61
4	5398.27	51.6 AV	54.0	-2.4	1.37 H	276	8.99	42.61
5	#10480.00	58.8 PK	68.3	-9.5	1.00 H	62	9.41	49.39
6	15720.00	63.2 PK	74.0	-10.8	1.00 H	149	8.50	54.70
7	15720.00	51.3 AV	54.0	-2.7	1.00 H	149	-3.40	54.70
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	109.3 PK			1.00 V	181	66.79	42.51
2	*5240.00	99.9 AV			1.00 V	181	57.39	42.51
3	5400.00	59.6 PK	74.0	-14.4	1.00 V	193	16.99	42.61
4	5400.00	50.3 AV	54.0	-3.7	1.00 V	193	7.69	42.61
5	#10480.00	57.9 PK	68.3	-10.4	1.00 V	153	8.51	49.39
6	15720.00	62.7 PK	74.0	-11.3	1.00 V	231	8.00	54.70
7	15720.00	51.8 AV	54.0	-2.2	1.00 V	231	-2.90	54.70

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

802.11n (HT40)

CHANNEL	TX Channel 38	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	64.3 PK	74.0	-9.7	1.39 H	282	22.00	42.30
2	5150.00	51.9 AV	54.0	-2.1	1.39 H	282	9.60	42.30
3	*5190.00	103.8 PK			1.35 H	282	61.36	42.44
4	*5190.00	93.4 AV			1.35 H	282	50.96	42.44
5	#10380.00	58.9 PK	68.3	-9.4	1.00 H	57	9.88	49.02
6	15570.00	63.2 PK	74.0	-10.8	1.00 H	153	8.16	55.04
7	15570.00	51.3 AV	54.0	-2.7	1.00 H	153	-3.74	55.04
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5115.00	61.7 PK	74.0	-12.3	1.00 V	192	19.52	42.18
2	5115.00	50.2 AV	54.0	-3.8	1.00 V	192	8.02	42.18
3	*5190.00	105.3 PK			1.00 V	192	62.86	42.44
4	*5190.00	94.5 AV			1.00 V	192	52.06	42.44
5	#10380.00	57.3 PK	68.3	-11.0	1.00 V	155	8.28	49.02
6	15570.00	62.6 PK	74.0	-11.4	1.00 V	235	7.56	55.04
7	15570.00	51.3 AV	54.0	-2.7	1.00 V	235	-3.74	55.04

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 46	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5141.85	62.8 PK	74.0	-11.2	1.39 H	282	20.53	42.27
2	**5141.85**	**53.4 AV**	**54.0**	**-0.6**	**1.39 H**	**282**	**11.13**	**42.27**
3	*5230.00	107.1 PK			1.39 H	269	64.60	42.50
4	*5230.00	97.5 AV			1.39 H	269	55.00	42.50
5	5388.20	60.8 PK	74.0	-13.2	1.37 H	275	18.19	42.61
6	5388.20	49.9 AV	54.0	-4.1	1.37 H	275	7.29	42.61
7	#10460.00	58.6 PK	68.3	-9.7	1.00 H	58	9.35	49.25
8	15690.00	63.3 PK	74.0	-10.7	1.00 H	154	8.63	54.67
9	15690.00	51.6 AV	54.0	-2.4	1.00 H	154	-3.07	54.67
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5145.00	62.1 PK	74.0	-11.9	1.00 V	192	19.82	42.28
2	5145.00	52.3 AV	54.0	-1.7	1.00 V	192	10.02	42.28
3	*5230.00	108.3 PK			1.00 V	182	65.80	42.50
4	*5230.00	98.6 AV			1.00 V	182	56.10	42.50
5	5383.00	60.9 PK	74.0	-13.1	1.00 V	192	18.30	42.60
6	5383.00	50.5 AV	54.0	-3.5	1.00 V	192	7.90	42.60
7	#10460.00	57.6 PK	68.3	-10.7	1.00 V	151	8.35	49.25
8	15690.00	62.5 PK	74.0	-11.5	1.00 V	235	7.83	54.67
9	15690.00	51.4 AV	54.0	-2.6	1.00 V	235	-3.27	54.67

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

802.11ac (VHT80)

CHANNEL	TX Channel 42	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	64.4 PK	74.0	-9.6	1.40 H	281	23.85	40.55
2	5150.00	51.0 AV	54.0	-3.0	1.40 H	281	10.45	40.55
3	*5210.00	100.0 PK			1.39 H	262	59.20	40.80
4	*5210.00	88.7 AV			1.39 H	262	47.90	40.80
5	5350.00	59.6 PK	74.0	-14.4	1.33 H	251	18.45	41.15
6	5350.00	48.2 AV	54.0	-5.8	1.33 H	251	7.05	41.15
7	#10420.00	58.9 PK	68.3	-9.4	1.00 H	62	11.47	47.43
8	15630.00	63.5 PK	74.0	-10.5	1.00 H	151	10.63	52.87
9	15630.00	51.4 AV	54.0	-2.6	1.00 H	151	-1.47	52.87
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	64.5 PK	74.0	-9.5	1.11 V	174	23.95	40.55
2	5150.00	51.3 AV	54.0	-2.7	1.11 V	174	10.75	40.55
3	*5210.00	102.6 PK			1.11 V	174	61.80	40.80
4	*5210.00	89.1 AV			1.11 V	174	48.30	40.80
5	5350.00	59.7 PK	74.0	-14.3	1.00 V	152	18.55	41.15
6	5350.00	47.9 AV	54.0	-6.1	1.00 V	152	6.75	41.15
7	#10420.00	57.8 PK	68.3	-10.5	1.00 V	153	10.37	47.43
8	15630.00	62.6 PK	74.0	-11.4	1.00 V	234	9.73	52.87
9	15630.00	51.3 AV	54.0	-2.7	1.00 V	234	-1.57	52.87

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

4.3 TRANSMIT POWER MEASUREMENT

4.3.1 LIMITS OF TRANSMIT POWER MEASUREMENT

Frequency Band	Limit
5.15 – 5.25GHz	The lesser of 50mW (17dBm) or 4dBm + 10logB
5.25 – 5.35GHz	The lesser of 250mW (24dBm) or 11dBm + 10logB
5.47 – 5.725GHz	The lesser of 250mW (24dBm) or 11dBm + 10logB
5.725 – 5.825GHz	The lesser of 1W (30dBm) or 17dBm + 10logB

NOTE: Where B is the 26dB emission bandwidth in MHz.

Per KDB 662911 D01 Multiple Transmitter Output v01r02 Method of conducted output power measurement on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for NANT ≤ 4;

Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any NANT;

Array Gain = 5 log(NANT/NSS) dB or 3 dB, whichever is less for 20-MHz channel widths with NANT ≥ 5.

For power measurements on all other devices: Array Gain = 10 log(NANT/NSS) dB.

4.3.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S Spectrum Analyzer	FSP40	100037	Nov. 01, 2012	Oct. 31, 2013

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. Tested date : Jan. 07, 2013

4.3.3 TEST PROCEDURE

FOR POWER OUTPUT MEASUREMENT

Follow FCC KDB 789033 UNII test procedure:
Method SA-1

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW =1MHz.
3. Set the VBW ≥ 3 x RBW.
4. Number of points in sweep ≥ 2 Span / RBW.
5. Sweep time = auto.
6. Set trigger to free run (duty cycle ≥ 98 percent) ; Set video trigger (duty cycle < 98 percent)
7. Detector = RMS.
8. Trace average at least 100 traces in power averaging mode
9. Compute power by integrating the spectrum across the 26 dB EBW of the signal.

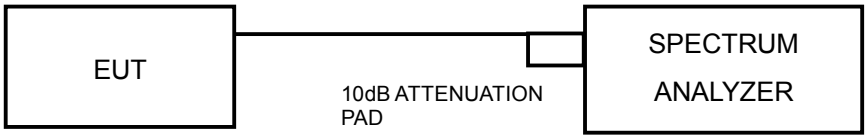
FOR 26dB OCCUPIED BANDWIDTH

1. Set RBW = approximately 1% of the emission bandwidth.
2. Set the VBW > RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%

4.3.4 DEVIATION FROM TEST STANDARD

No deviation

4.3.5 TEST SETUP



4.3.6 EUT OPERATING CONDITIONS

The software provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.

4.3.7 TEST RESULTS

POWER OUTPUT:

802.11a

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (mW)	AVERAGE POWER (dBm)	POWER LIMIT (dBm)	PASS/FAIL
36	5180	22.387	13.50	17	PASS
40	5200	22.856	13.59	17	PASS
48	5240	21.928	13.41	17	PASS

802.11n (HT20)

CHAN.	CHAN. FREQ. (MHz)	AVERAGE POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
36	5180	8.16	8.77	9.05	22.115	13.45	17	PASS
40	5200	8.41	8.72	9.22	22.737	13.57	17	PASS
48	5240	8.52	8.92	9.45	23.720	13.75	17	PASS

802.11n (HT40)

CHAN.	CHAN. FREQ. (MHz)	AVERAGE POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
38	5190	9.29	9.63	10.21	28.170	14.50	17	PASS
46	5230	9.07	9.49	10.09	27.173	14.34	17	PASS

802.11ac (VHT80)

CHAN.	CHAN. FREQ. (MHz)	AVERAGE POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
42	5210	7.94	8.15	8.96	20.624	13.14	17	PASS

26dB OCCUPIED BANDWIDTH:

802.11a

CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)
36	5180	19.35
40	5200	19.33
48	5240	19.31

802.11n (HT20)

CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)		
		CHAIN 0	CHAIN 1	CHAIN 2
36	5180	19.95	19.91	19.85
40	5200	19.92	19.76	19.54
48	5240	19.90	19.76	19.66

802.11n (HT40)

CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)		
		CHAIN 0	CHAIN 1	CHAIN 2
38	5190	40.54	40.27	40.08
46	5230	40.52	40.17	39.93

802.11ac (VHT80)

CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)		
		CHAIN 0	CHAIN 1	CHAIN 2
42	5210	81.87	81.39	81.76

4.4 PEAK POWER SPECTRAL DENSITY MEASUREMENT

4.4.1 LIMITS OF PEAK POWER SPECTRAL DENSITY MEASUREMENT

Frequency Band	Limit
5.15 ~ 5.25GHz	4dBm
5.25 ~ 5.35GHz	11dBm
5.47 – 5.725GHz	11dBm
5.725 ~ 5.825GHz	17dBm

4.4.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S Spectrum Analyzer	FSP40	100037	Nov. 01, 2012	Oct. 31, 2013

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. Tested date : Jan. 07, 2013

4.4.3 TEST PROCEDURES

Using method SA-1

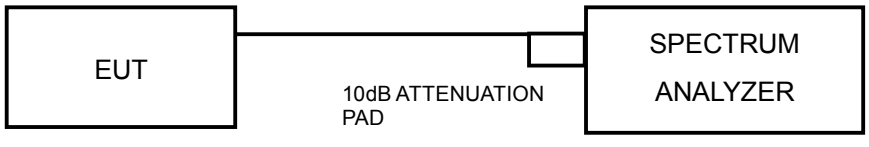
Set span to encompass the entire emission bandwidth (EBW) of the signal.

1. Set RBW = 30 KHz, Set VBW ≥ 1 MHz, Detector = RMS
2. Set Channel power measure = 1MHz
3. Sweep time = auto, trigger set to “free run”.
4. Trace average at least 100 traces in power averaging mode.
5. Record the max value

4.4.4 DEVIATION FROM TEST STANDARD

No deviation

4.4.5 TEST SETUP



4.4.6 EUT OPERATING CONDITIONS

Same as 4.3.6

4.4.7 TEST RESULTS

802.11a

CHANNEL	FREQUENCY (MHz)	PSD (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
36	5180	3.75	4	PASS
40	5200	3.83	4	PASS
48	5240	3.58	4	PASS

802.11n (HT20)

CHANNEL	FREQUENCY (MHz)	PSD (dBm)			TOTAL POWER DENSITY (dBm)	MAX. LIMIT (dBm)	PASS/FAIL
		CHAIN 0	CHAIN 1	CHAIN 2			
36	5180	-2.72	-1.54	-0.90	3.12	3.42	PASS
40	5200	-2.55	-1.51	-0.60	3.29	3.42	PASS
48	5240	-2.33	-1.38	-0.73	3.34	3.42	PASS

NOTE:

1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6.58dBi > 6dBi , so the power density limit shall be reduced to 4-(6.58-6) = 3.42dBm.

802.11n (HT40)

CHANNEL	FREQUENCY (MHz)	PSD (dBm)			TOTAL POWER DENSITY (dBm)	MAX. LIMIT (dBm)	PASS/FAIL
		CHAIN 0	CHAIN 1	CHAIN 2			
38	5190	-4.53	-3.45	-2.50	1.36	3.42	PASS
46	5230	-4.95	-3.78	-2.54	1.13	3.42	PASS

NOTE:

1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6.58dBi > 6dBi , so the power density limit shall be reduced to 4-(6.58-6) = 3.42dBm.

802.11ac (VHT80)

CHANNEL	FREQUENCY (MHz)	PSD (dBm)			TOTAL POWER DENSITY (dBm)	MAX. LIMIT (dBm)	PASS/FAIL
		CHAIN 0	CHAIN 1	CHAIN 2			
42	5210	-8.82	-8.02	-7.25	-3.21	3.42	PASS

NOTE:

1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6.58dBi > 6dBi , so the power density limit shall be reduced to 4-(6.58-6) = 3.42dBm.

4.5 PEAK POWER EXCURSION MEASUREMENT

4.5.1 LIMITS OF PEAK POWER EXCURSION MEASUREMENT

Shall not exceed 13 dB

4.5.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S Spectrum Analyzer	FSP40	100037	Nov. 01, 2012	Oct. 31, 2013

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. Tested date : Jan. 07, 2013

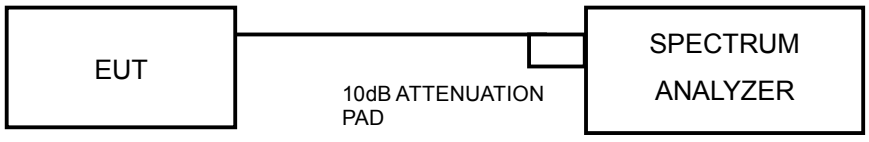
4.5.3 TEST PROCEDURE

1. Set RBW = 1 MHz, VBW ≥ 3 MHz, Detector = peak.
2. Trace mode = max-hold. Allow the sweeps to continue until the trace stabilizes.
3. Use the peak search function to find the peak of the spectrum.
4. Measure the PPSD.
5. Compute the ratio of the maximum of the peak-max-hold spectrum to the PPSD.

4.5.4 DEVIATION FROM TEST STANDARD

No deviation

4.5.5 TEST SETUP



4.5.6 EUT OPERATING CONDITIONS

The software provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.

4.5.7 TEST RESULTS

802.11a

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK VALUE (dBm)	PPSD (dBm)	PEAK EXCURSION (dB)	LIMIT (dB)	PASS/FAIL
36	5180	11.46	3.75	7.71	13	PASS
40	5200	11.58	3.83	7.75	13	PASS
48	5240	11.47	3.58	7.89	13	PASS

802.11n (HT20)

CHAN.	CHAN. FREQ. (MHz)	PEAK VALUE (dBm)			PPSD (dBm)			PEAK EXCURSION (dB)			LIMIT (dB)	PASS/FAIL
		CHAIN 0	CHAIN 1	CHAIN 2	CHAIN 0	CHAIN 1	CHAIN 2	CHAIN 0	CHAIN 1	CHAIN 2		
36	5180	6.38	7.75	8.57	-2.72	-1.54	-0.90	9.10	9.29	9.47	13	PASS
40	5200	6.22	8.04	8.37	-2.55	-1.51	-0.60	8.77	9.55	8.97	13	PASS
48	5240	6.73	8.09	8.70	-2.33	-1.38	-0.73	9.06	9.47	9.43	13	PASS

802.11n (HT40)

CHAN.	CHAN. FREQ. (MHz)	PEAK VALUE (dBm)			PPSD (dBm)			PEAK EXCURSION (dB)			LIMIT (dB)	PASS/FAIL
		CHAIN 0	CHAIN 1	CHAIN 2	CHAIN 0	CHAIN 1	CHAIN 2	CHAIN 0	CHAIN 1	CHAIN 2		
38	5190	4.91	6.21	7.40	-4.53	-3.45	-2.50	9.44	9.66	9.90	13	PASS
46	5230	4.99	6.27	7.00	-4.95	-3.78	-2.54	9.94	10.05	9.54	13	PASS

802.11ac (VHT80)

CHAN.	CHAN. FREQ. (MHz)	PEAK VALUE (dBm)			PPSD (dBm)			PEAK EXCURSION (dB)			LIMIT (dB)	PASS/FAIL
		CHAIN 0	CHAIN 1	CHAIN 2	CHAIN 0	CHAIN 1	CHAIN 2	CHAIN 0	CHAIN 1	CHAIN 2		
42	5210	0.35	2.16	3.34	-8.82	-8.02	-7.25	9.17	10.18	10.59	13	PASS

4.6 FREQUENCY STABILITY

4.6.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT

The frequency of the carrier signal shall be maintained within band of operation

4.6.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S Spectrum Analyzer	FSP40	100037	Nov. 01, 2012	Oct. 31, 2013

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. Tested date : Jan. 07, 2013

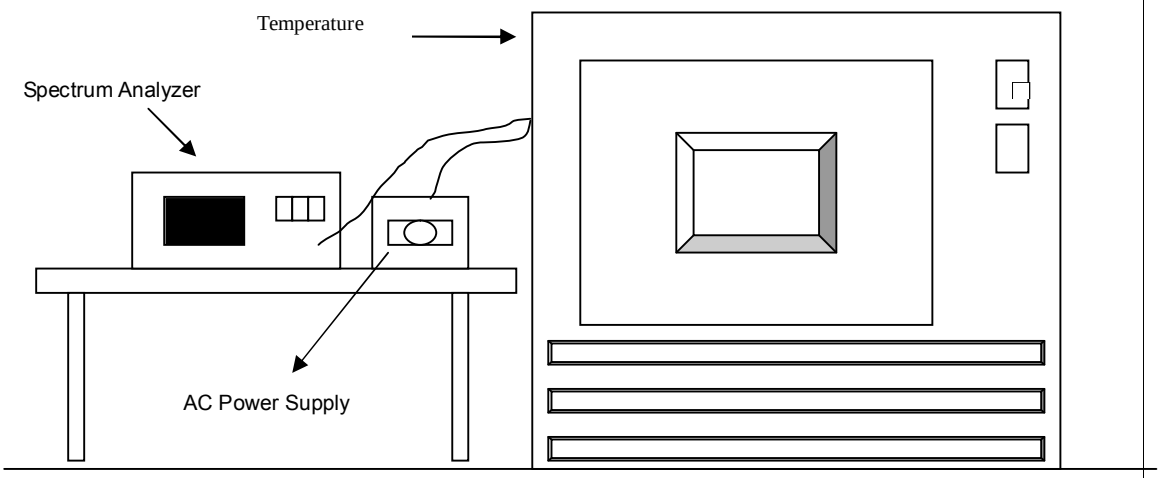
4.6.3 TEST PROCEDURE

1. The EUT was placed inside the environmental test chamber and powered by nominal AC voltage.
2. Turn the EUT on and couple its output to a spectrum analyzer.
3. Turn the EUT off and set the chamber to the highest temperature specified.
4. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 minutes.
5. Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.
6. The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.

4.6.4 DEVIATION FROM TEST STANDARD

No deviation

4.6.5 TEST SETUP



4.6.6 EUT OPERATING CONDITION

Set the EUT transmit at un-modulation mode to test frequency stability.

4.6.7 TEST RESULTS

FREQUEMCY STABILITY VERSUS TEMP.									
OPERATING FREQUENCY: 5240MHz									
TEMP. (℃)	POWER SUPPLY (Vac)	0 MINUTE		2 MINUTE		5 MINUTE		10 MINUTE	
		Measured Frequency	Frequency Drift	Measured Frequency	Frequency Drift	Measured Frequency	Frequency Drift	Measured Frequency	Frequency Drift
		(MHz)	ppm	(MHz)	ppm	(MHz)	ppm	(MHz)	ppm
50	120	5239.9864	-2.5954	5239.9882	-2.2519	5239.9921	-1.5076	5239.9967	-0.6298
40	120	5240.0238	4.5420	5240.0271	5.1718	5240.0186	3.5496	5240.0218	4.1603
30	120	5239.9793	-3.9504	5239.9843	-2.9962	5239.9786	-4.0840	5239.9874	-2.4046
20	120	5240.0225	4.2939	5240.0223	4.2557	5240.0199	3.7977	5240.0221	4.2176
10	120	5240.0306	5.8397	5240.0257	4.9046	5240.0263	5.0191	5240.0243	4.6374
0	120	5240.0267	5.0954	5240.0281	5.3626	5240.0212	4.0458	5240.0235	4.4847
-10	120	5240.0233	4.4466	5240.0271	5.1718	5240.0228	4.3511	5240.0263	5.0191
-20	120	5240.0029	0.5534	5240.0056	1.0687	5239.997	-0.5725	5240.0015	0.2863
-30	120	5239.9925	-1.4313	5239.9939	-1.1641	5239.9965	-0.6679	5239.9919	-1.5458

FREQUEMCY STABILITY VERSUS VOLTAGE									
OPERATING FREQUENCY: 5240MHz									
TEMP. (℃)	POWER SUPPLY (Vac)	0 MINUTE		2 MINUTE		5 MINUTE		10 MINUTE	
		Measured Frequency	Frequency Drift	Measured Frequency	Frequency Drift	Measured Frequency	Frequency Drift	Measured Frequency	Frequency Drift
		(MHz)	ppm	(MHz)	ppm	(MHz)	ppm	(MHz)	ppm
20	138	5240.0214	4.0840	5240.0229	4.3702	5240.0207	3.9504	5240.0216	4.1221
	120	5240.0225	4.2939	5240.0223	4.2557	5240.0199	3.7977	5240.0221	4.2176
	102	5240.0223	4.2557	5240.0231	4.4084	5240.0209	3.9885	5240.0204	3.8931

5. PHOTOGRAPHS OF THE TEST CONFIGURATION

Please refer to the attached file (Test Setup Photo).

6. INFORMATION ON THE TESTING LABORATORIES

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

Linko EMC/RF Lab:
Tel: 886-2-26052180
Fax: 886-2-26052943

Hsin Chu EMC/RF Lab:
Tel: 886-3-5935343
Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety/Telecom Lab:
Tel: 886-3-3183232
Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com
Web Site: www.bureauveritas-adt.com

The address and road map of all our labs can be found in our web site also.

7.APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No modifications were made to the EUT by the lab during the test.

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