

FCC TEST REPORT (15.407)

REPORT NO.: RF141201E10-1

MODEL NO.: DAP-2553B1

FCC ID: KA2AP2553B1

RECEIVED: Dec. 01, 2014

TESTED: Dec. 04 to 22, 2014

ISSUED: Dec. 30, 2014

APPLICANT: D-Link Corporation

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ISSUED BY: Bureau Veritas Consumer Products Services
(H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory

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Table of Contents

RELEASE CONTROL RECORD	4
1. CERTIFICATION	5
2. SUMMARY OF TEST RESULTS	6
2.1 MEASUREMENT UNCERTAINTY	7
3. GENERAL INFORMATION	8
3.1 GENERAL DESCRIPTION OF EUT	8
3.2 DESCRIPTION OF TEST MODES	11
3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL	12
3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS	14
3.4 DUTY CYCLE OF TEST SIGNAL	15
3.5 DESCRIPTION OF SUPPORT UNITS	16
3.6 CONFIGURATION OF SYSTEM UNDER TEST	17
4. TEST TYPES AND RESULTS	20
4.1 CONDUCTED EMISSION MEASUREMENT	20
4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT	20
4.1.2 TEST INSTRUMENTS	20
4.1.3 TEST PROCEDURES	21
4.1.4 DEVIATION FROM TEST STANDARD	21
4.1.5 TEST SETUP	21
4.1.6 EUT OPERATING CONDITIONS	22
4.1.7 TEST RESULTS (MODE 1)	23
4.1.8 TEST RESULTS (MODE 2)	25
4.1.9 TEST RESULTS (MODE 3)	27
4.2 RADIATED EMISSION AND BANDEDGE MEASUREMENT	29
4.2.1 LIMITS OF RADIATED EMISSION AND BANDEDGE MEASUREMENT	29
4.2.2 LIMITS OF UNWANTED EMISSION OUT OF THE RESTRICTED BANDS	30
4.2.3 TEST INSTRUMENTS	31
4.2.4 TEST PROCEDURES	33
4.2.5 DEVIATION FROM TEST STANDARD	33
4.2.6 TEST SETUP	34
4.2.7 EUT OPERATING CONDITION	34
4.2.8 TEST RESULTS	35
4.3 TRANSMIT POWER MEASUREMENT	52
4.3.1 LIMITS OF TRANSMIT POWER MEASUREMENT	52
4.3.2 TEST INSTRUMENTS	53
4.3.3 TEST PROCEDURE	53
4.3.4 DEVIATION FROM TEST STANDARD	53
4.3.5 TEST SETUP	53



A D T

4.3.6	EUT OPERATING CONDITIONS	54
4.3.7	TEST RESULTS	55
4.4	PEAK POWER SPECTRAL DENSITY MEASUREMENT	56
4.4.1	LIMITS OF PEAK POWER SPECTRAL DENSITY MEASUREMENT	56
4.4.2	TEST INSTRUMENTS	56
4.4.3	TEST PROCEDURES	57
4.4.4	DEVIATION FROM TEST STANDARD	57
4.4.5	TEST SETUP	57
4.4.6	EUT OPERATING CONDITIONS	57
4.4.7	TEST RESULTS	58
4.5	FREQUENCY STABILITY	62
4.5.1	LIMITS OF FREQUENCY STABILITY MEASUREMENT	62
4.5.2	TEST INSTRUMENTS	62
4.5.3	TEST PROCEDURE	62
4.5.4	DEVIATION FROM TEST STANDARD	63
4.5.5	TEST SETUP	63
4.5.6	EUT OPERATING CONDITION	63
4.5.7	TEST RESULTS	64
4.6	6dB BANDWIDTH MEASUREMENT	65
4.6.1	LIMITS OF 6dB BANDWIDTH MEASUREMENT	65
4.6.2	TEST INSTRUMENTS	65
4.6.3	TEST PROCEDURE	65
4.6.4	DEVIATION FROM TEST STANDARD	65
4.6.5	TEST SETUP	66
4.6.6	EUT OPERATING CONDITIONS	66
4.6.7	TEST RESULTS	67
5.	PHOTOGRAPHS OF THE TEST CONFIGURATION.....	69
6.	INFORMATION ON THE TESTING LABORATORIES	70
7.	APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB.....	71



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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF141201E10-1	Original release	Dec. 30, 2014

1. CERTIFICATION

PRODUCT: D-Link AirPremier N Dual Band PoE Access Point,
D-Link Wireless N Dual Band PoE Access Point

BRAND NAME: D-Link

MODEL NO.: DAP-2553B1

TEST SAMPLE: R&D SAMPLE

APPLICANT: D-Link Corporation

TESTED: Dec. 04 to 22, 2014

STANDARDS: **FCC Part 15, Subpart E (Section 15.407)**
ANSI C63.10-2009

The above equipment (Model: DAP-2553B1) 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: Dec. 30, 2014
(Lori Chung, Specialist)

Approved by :  , Date: Dec. 30, 2014
(May Chen, Manager)

2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC PART 15, SUBPART E (SECTION 15.407 Under New Rule)			
STANDARD SECTION	TEST TYPE	RESULT	REMARK
15.407(b)(6)	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -10.86dB at 0.48594MHz
15.407 (b)(1/2/3/4/6)	Radiated Emissions & Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -0.1dB at 5850.00MHz, 5725.00MHz & 5150.00MHz.
15.407(a/1/2/3)	Transmit Power	PASS	Meet the requirement of limit.
15.407(a/1/2/3)	Peak Power Spectral Density	PASS	Meet the requirement of limit.
15.407(e)	6dB bandwidth	PASS	Meet the requirement of limit. (U-NII-3 Band only)
15.407(g)	Frequency Stability	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	Antenna connector is SMA Plug Reverse not a standard connector.

NOTE: 1. The EUT was operating in 2.400 ~ 2.4835GHz, 5.15~5.25GHz and 5.725~5.850GHz frequencies band. This report was recorded the RF parameters including 5.15~5.25GHz and 5.725~5.850GHz. For the 2.400 ~ 2.4835GHz 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	2.86 dB
Radiated emissions (30MHz-1GHz)	5.37 dB
Radiated emissions (1GHz -6GHz)	3.72 dB
Radiated emissions (6GHz -18GHz)	4.00 dB
Radiated emissions (18GHz -40GHz)	4.11 dB

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	D-Link AirPremier N Dual Band PoE Access Point, D-Link Wireless N Dual Band PoE Access Point
MODEL NO.	DAP-2553B1
POWER SUPPLY	5Vdc from power adapter or 48Vdc from POE
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
MODULATION TECHNOLOGY	DSSS,OFDM
TRANSFER RATE	802.11b: up to 11Mbps 802.11a / g: up to 54Mbps 802.11n: up to 450Mbps
OPERATING FREQUENCY	For 15.407 5.18 ~ 5.24GHz, 5.745 ~ 5.825GHz
	For 15.247 2.412 ~ 2.462GHz
NUMBER OF CHANNEL	For 15.407 9 for 802.11a, 802.11n (HT20) 4 for 802.11n (HT40)
	For 15.247 11 for 802.11b, 802.11g, 802.11n (HT20) 7 for 802.11n (HT40)
MAXIMUM OUTPUT POWER	For 15.407 802.11a: 319.714mW 802.11n (HT20): 353.51mW 802.11n (HT40): 227.548mW For 15.247 802.11b: 191.102mW 802.11g: 156.814mW 802.11n (HT20): 157.691mW 802.11n (HT40): 60.288mW
ANTENNA TYPE	Please see Note
DATA CABLE	NA
I/O PORTS	Refer to user's manual
ASSOCIATED DEVICES	Adapter x 1

Note:

- The EUT has below product names, which are identical to each other in all aspects except for the following information:

Product Name	Brand Name	Model Name	Difference
D-Link AirPremier N Dual Band PoE Access Point	D-Link	DAP-2553B1	for marketing requirement
D-Link Wireless N Dual Band PoE Access Point			

- The antennas provided to the EUT, please refer to the following table:

Transmitter Circuit	Brand	Model	Gain (dBi) Without cable loss	Cable loss (dB)	Net Gain (dBi)	Frequency range (MHz to MHz)	Cable Length (mm)	Antenna Type	Connector Type
Chain (0)	WHA YU GROUP	C037-510912-A (SSR-82286)	3.08	0.6	3.02	2400~2483.5	120	Dipole	SMA Plug Reverse
			5.96	1.1	4.86	5150~5250			
			6.23	1.1	5.13	5250~5350			
			6.17	1.1	5.07	5470~5725			
Chain (1)	WHA YU GROUP	C037-510912-A (SSR-82286)	3.08	0.7	2.38	2400~2483.5	140	Dipole	SMA Plug Reverse
			5.96	1.2	4.76	5150~5250			
			6.23	1.2	5.03	5250~5350			
			6.17	1.2	4.97	5470~5725			
Chain (2)	WHA YU GROUP	C037-510912-A (SSR-82286)	3.08	0.7	2.38	2400~2483.5	170	Dipole	SMA Plug Reverse
			5.96	1.2	4.76	5150~5250			
			6.23	1.2	5.03	5250~5350			
			6.17	1.2	4.97	5470~5725			

- The EUT must be supplied with a power adapter or a POE as following table:

Power Adapter			
No	Brand	Model No.	Spec.
1	ELECTRONICS CO.,LTD	F12W3-050200SPA	AC Input: 100-240V, 0.3A, 50/60Hz DC Output: 5V, 2A DC Output cable: Unshielded, 1.52m
2	D-Link	2ABE010B US	AC Input: 100-240V, 0.3A, 50/60Hz DC Output: 5V, 2A DC Output cable: Unshielded, 1.23m
POE (test only, not for sale)			
Brand		Model No.	Spec.
D-LINK		EBU-101G-T2 LF	DC Input: 48V DC output: 48V

* The POE must be supplied with the following adapter:

Brand	Model No.	Spec.
LEI	NU20-L480040-I1	AC Input: 100-240V, 0.4A, 50/60Hz AC input cable: Unshielded, 1.85m with 1 core DC Output: 48V, 0.4A

4. The EUT incorporates a MIMO function.

For 2.4GHz Band			
MODULATION MODE	DATA RATE (MCS)	TX & RX CONFIGURATION	
802.11b	1 ~ 11Mbps	3TX	3RX
802.11g	6 ~ 54Mbps	3TX	3RX
802.11n (HT20)	MCS 0~7	3TX	3RX
	MCS 8~15	3TX	3RX
	MCS 16~23	3TX	3RX
802.11n (HT40)	MCS 0~7	3TX	3RX
	MCS 8~15	3TX	3RX
	MCS 16~23	3TX	3RX
For 5GHz Band			
802.11a	6 ~ 54Mbps	3TX	3RX
802.11n (HT20)	MCS 0~7	3TX	3RX
	MCS 8~15	3TX	3RX
	MCS 16~23	3TX	3RX
802.11n (HT40)	MCS 0~7	3TX	3RX
	MCS 8~15	3TX	3RX
	MCS 16~23	3TX	3RX

5. The EUT was pre-tested under the following modes:

Test Mode	Power
Mode A	With adapter 1
Mode B	With adapter 2
Mode C	With POE

From the above modes, the worst radiated emission was found in **Mode C**. Therefore only the test data of the mode was recorded in this report.

6. 2.4GHz & 5GHz technology cannot transmit at same time.

7. The above EUT information was declared by 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):

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

2 channels are provided for 802.11n (HT40):

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
38	5190 MHz	46	5230 MHz

Operated in 5725 ~ 5850MHz band:

5 channels are provided for 802.11a, 802.11n (HT20):

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
149	5745 MHz	161	5805 MHz
153	5765 MHz	165	5825 MHz
157	5785 MHz		

2 channels are provided for 802.11n (HT40):

CHANNEL	FREQUENCY
151	5755 MHz
159	5795 MHz

3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	PLC	RE < 1G	RE ≥ 1G	APCM	
1	√	-	-	-	With adapter 1
2	√	-	-	-	With adapter 2
3	√	√	√	√	With POE

Where **PLC**: Power Line Conducted Emission

RE < 1G: Radiated Emission below 1GHz

RE ≥ 1G: Radiated Emission above 1GHz

APCM: Antenna Port Conducted Measurement

NOTE: 1. "-" means no effect.

2. The EUT had been pre-tested on the positioned of each 2 axis. The worst case was found when positioned on **stand-up type** (for below 1GHz) and **laying-flat type** (for above 1GHz).

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 & 149 to 165	157	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 & 149 to 165	157	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 & 149 to 165	36, 40, 48, 149, 157, 165	OFDM	BPSK	6
802.11n (HT20)	36 to 48 & 149 to 165	36, 40, 48, 149, 157, 165	OFDM	BPSK	6.5
802.11n (HT40)	38 to 46 & 151 to 159	38, 46, 151, 159	OFDM	BPSK	13.5

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 & 149 to 165	36, 40, 48, 149, 157, 165	OFDM	BPSK	6
802.11n (HT20)	36 to 48 & 149 to 165	36, 40, 48, 149, 157, 165	OFDM	BPSK	6.5
802.11n (HT40)	38 to 46 & 151 to 159	38, 46, 151, 159	OFDM	BPSK	13.5

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
PLC	18deg. C, 68%RH	120Vac, 60Hz	Wythe Lin
RE<1G	25deg. C, 70%RH	120Vac, 60Hz	Tim Ho
RE≥1G	23deg. C, 68%RH	120Vac, 60Hz	Robert Cheng
APCM	25deg. C, 60%RH	120Vac, 60Hz	Anderson Chen

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 D02 General UNII Test Procedures New Rules v01

662911 D01 Multiple Transmitter Output v02r01

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.

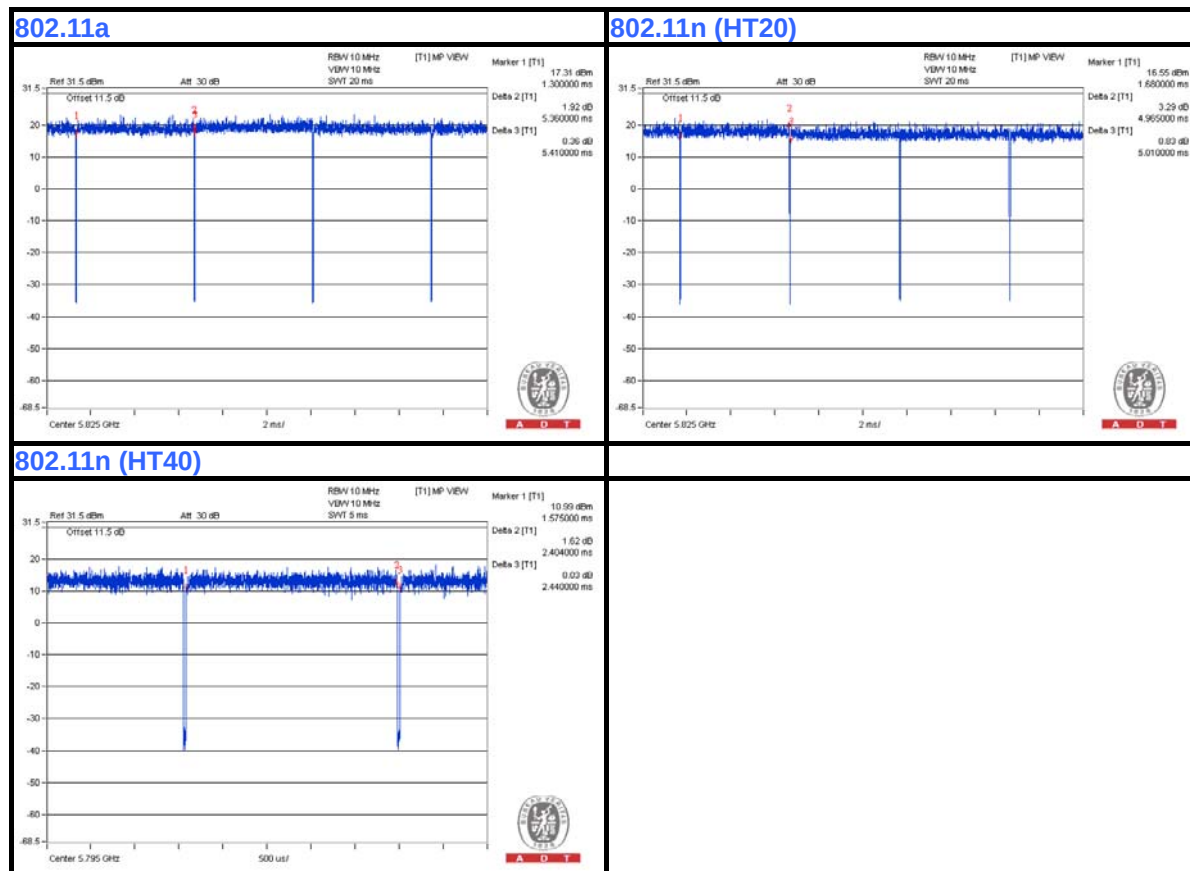
3.4 DUTY CYCLE OF TEST SIGNAL

Duty cycle of test signal is $\geq 98\%$, duty factor is not required.

802.11a: Duty cycle = 5.36 ms/5.41 ms = 0.991

802.11n (HT20): Duty cycle = 4.965 ms/5.01 ms = 0.991

802.11n (HT40): Duty cycle = 2.404 ms/2.44 ms = 0.985



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.

No.	Product	Brand	Model No.	Serial No.	FCC ID	Remark
A	NOTEBOOK COMPUTER	DELL	E5430	HYV4VY1	FCC DoC	Provided by Lab
B	50ohm	NA	NA	NA	NA	Provided by Lab

NOTE:

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

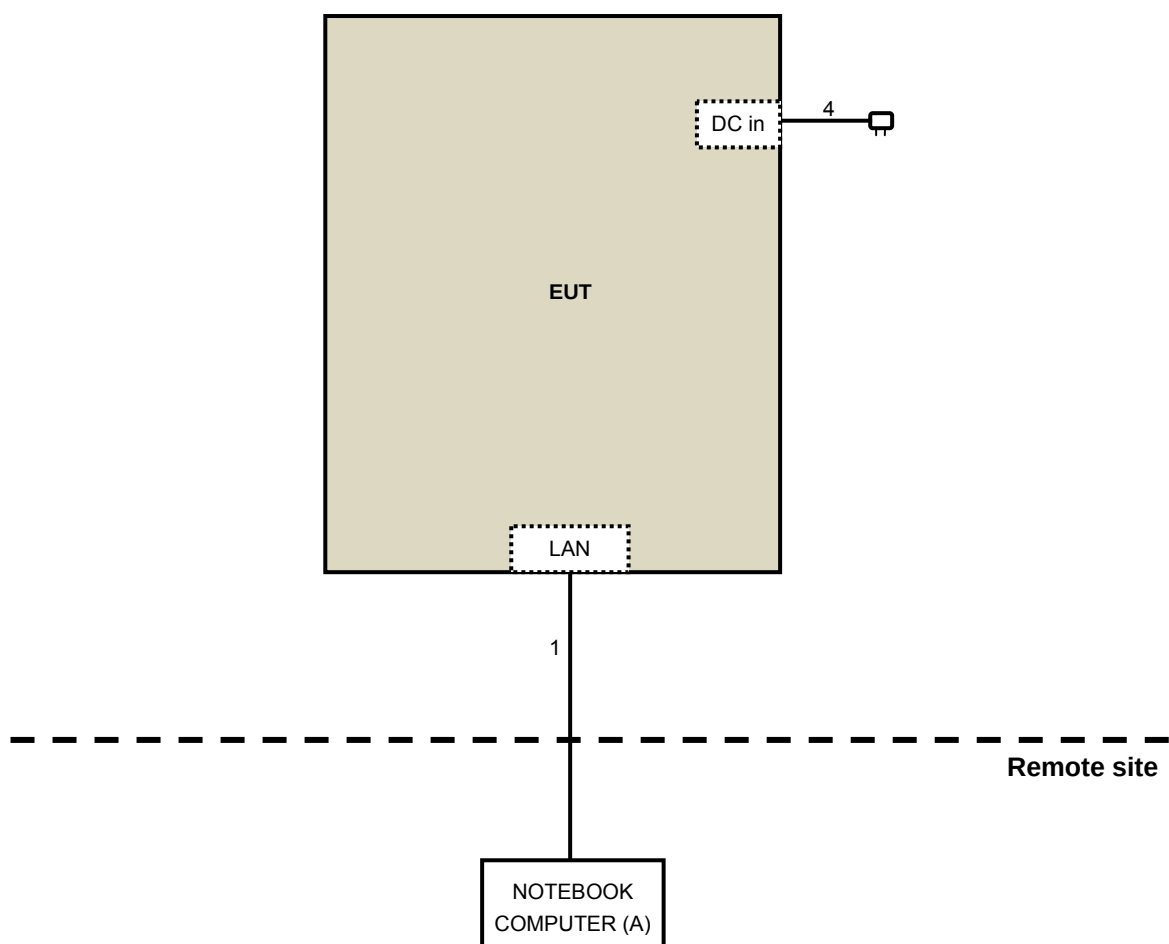
No.	Cable	Qty.	Length (m)	Shielded (Yes/ No)	Cores (Number)	Remark
1.	RJ-45	1	10	No	0	Provided by Lab
2.	RJ-45	1	3	No	0	Provided by Lab
3.	DC	1	1.85	No	1	Supplied by client
4.	DC	1	1.52	No	0	Supplied by client
		1	1.23	No	0	Supplied by client

NOTE:

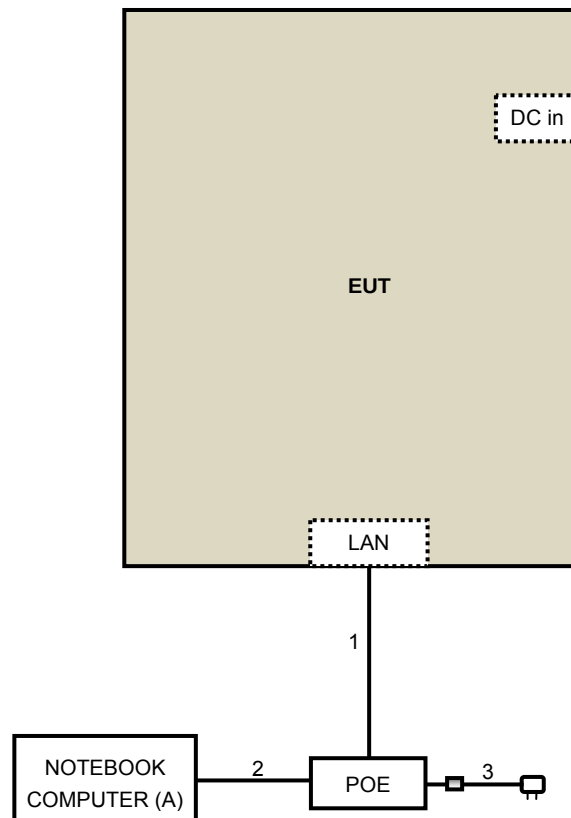
1. The core(s) is(are) originally attached to the cable(s).

3.6 CONFIGURATION OF SYSTEM UNDER TEST

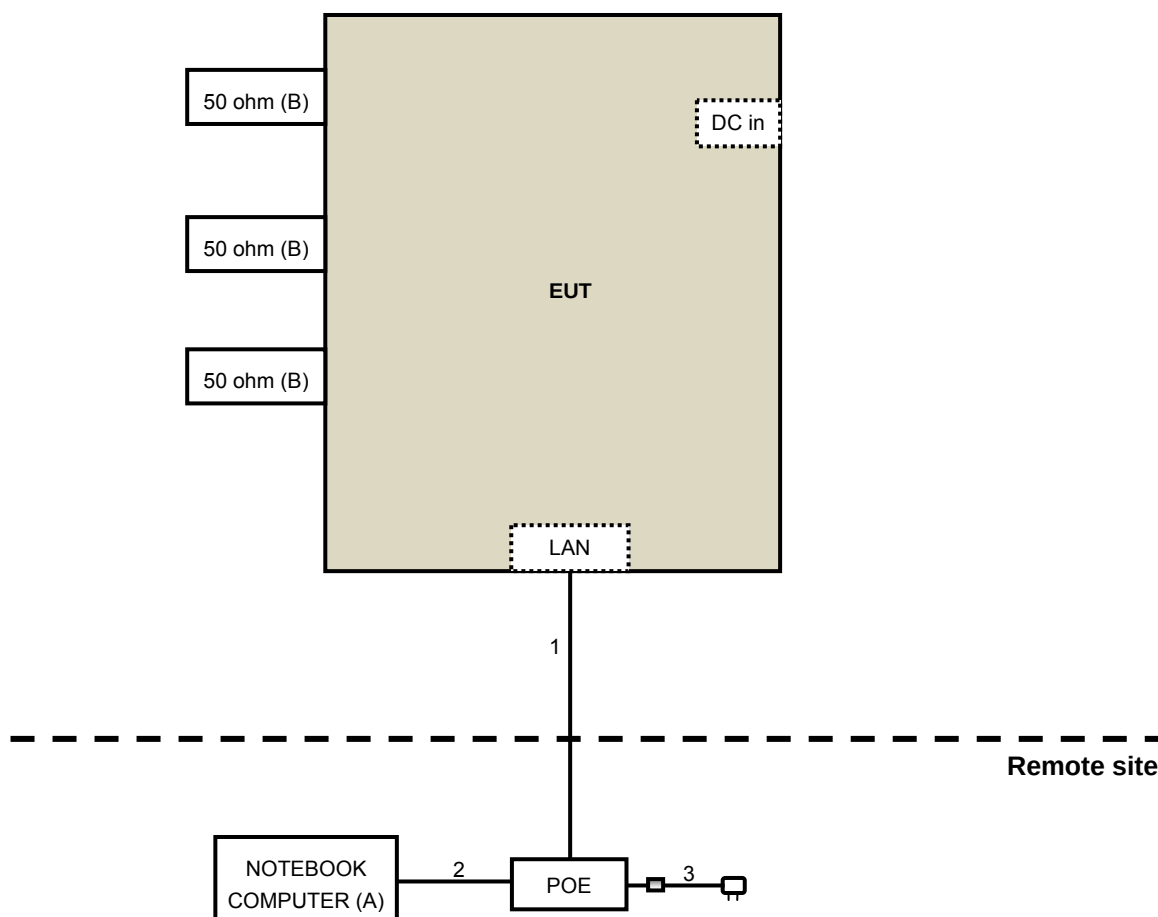
For Conducted emission MODE 1 & 2 test:



For Conducted emission MODE 3 test:



For Radiated emission test:



4. TEST TYPES AND RESULTS

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dB μ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56	56 to 46
0.5-5	56	46
5-30	60	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 ROHDE & SCHWARZ	ESCS 30	100375	Apr. 29, 2014	Apr. 28, 2015
Line-Impedance Stabilization Network (for EUT) SCHWARZBECK	NSLK-8127	8127-522	Sep. 15, 2014	Sep. 14, 2015
Line-Impedance Stabilization Network (for Peripheral) ROHDE & SCHWARZ	ENV216	100071	Nov. 10, 2014	Nov. 09, 2015
RF Cable (JYEBAO)	5DFB	COCCAB-001	Mar. 10, 2014	Mar. 09, 2015
50 ohms Terminator	N/A	EMC-03	Sep. 22, 2014	Sep. 21, 2015
50 ohms Terminator	N/A	EMC-02	Sep. 30, 2014	Sep. 29, 2015
Software ADT	BV ADT_Cond_V7.3.7. 3	NA	NA	NA

Note:

- The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
- The test was performed in Shielded Room No. C.
- The VCCI Con C Registration No. is C-3611.
- Tested Date: Dec. 17, 2014

4.1.3 TEST PROCEDURES

- 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.
- The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- The frequency range from 150kHz to 30MHz was searched. Emission level under (Limit – 20dB) was not recorded.

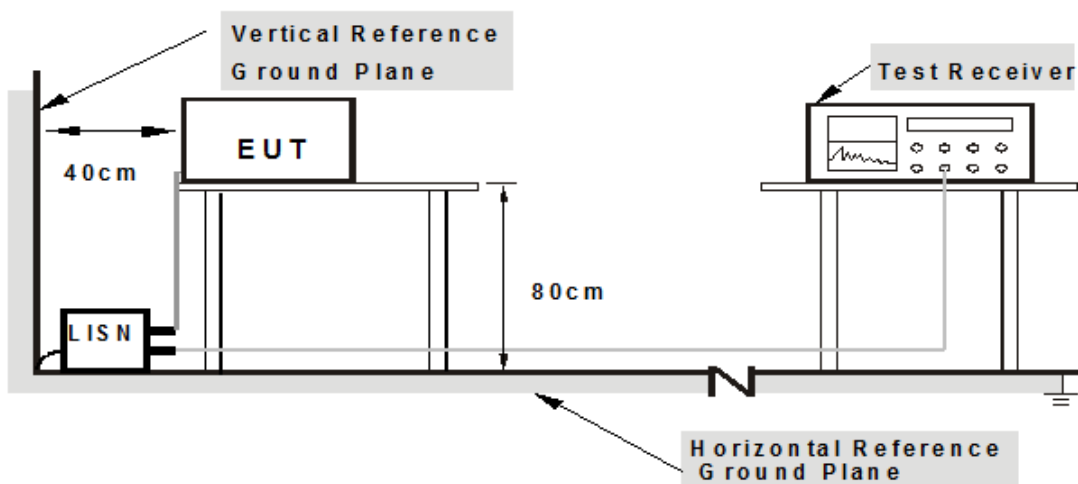
NOTE:

- 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. Connect the EUT with the support unit A (Notebook Computer) which is placed in remote site.
2. Controlling software (cart.bat paste command (art command)) has been activated to set the EUT on specific status.

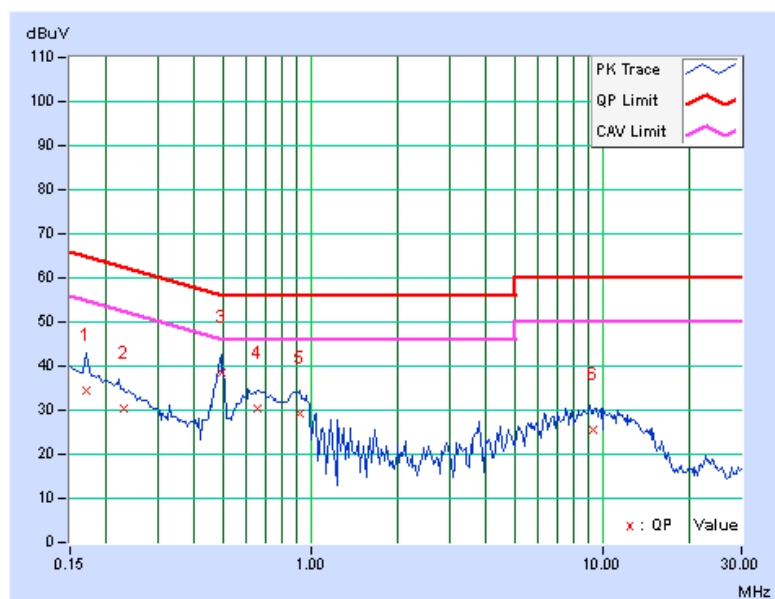
4.1.7 TEST RESULTS (MODE 1)

PHASE	Line (L)	DETECTOR FUNCTION	Quasi-Peak (QP) / Average (AV)
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No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
	[MHz]	Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16953	0.07	34.48	22.49	34.55	22.56	64.98	54.98	-30.44	-32.43
2	0.22891	0.07	30.35	19.09	30.42	19.16	62.49	52.49	-32.07	-33.33
3	0.49825	0.10	38.60	31.58	38.70	31.68	56.03	46.03	-17.33	-14.35
4	0.66172	0.11	30.25	22.09	30.36	22.20	56.00	46.00	-25.64	-23.80
5	0.91953	0.12	29.20	20.98	29.32	21.10	56.00	46.00	-26.68	-24.90
6	9.34375	0.43	25.27	18.15	25.70	18.58	60.00	50.00	-34.30	-31.42

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

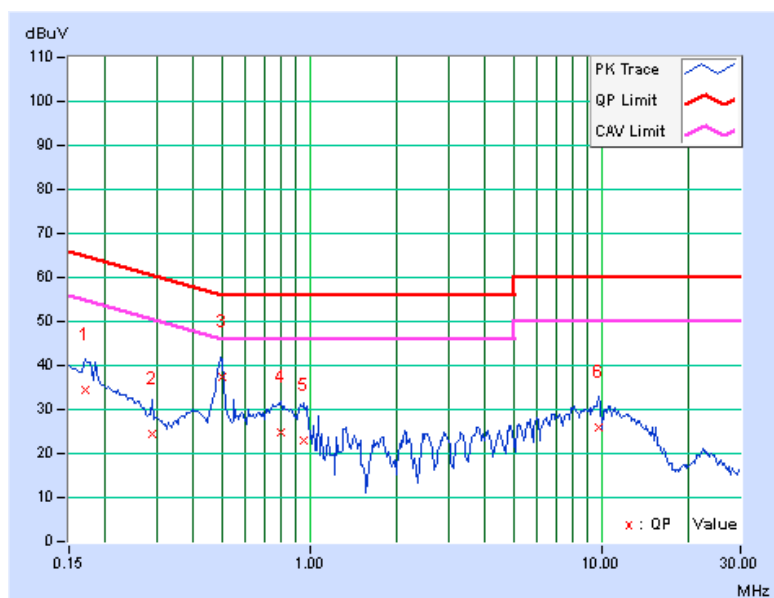


PHASE	Neutral (N)	DETECTOR FUNCTION	Quasi-Peak (QP) / Average (AV)
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	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16953	0.06	34.37	22.73	34.43	22.79	64.98	54.98	-30.55	-32.19
2	0.29063	0.07	24.50	18.29	24.57	18.36	60.51	50.51	-35.93	-32.14
3	0.50156	0.10	37.47	33.71	37.57	33.81	56.00	46.00	-18.43	-12.19
4	0.79844	0.12	24.56	16.31	24.68	16.43	56.00	46.00	-31.32	-29.57
5	0.95078	0.13	22.96	14.55	23.09	14.68	56.00	46.00	-32.91	-31.32
6	9.74219	0.45	25.33	19.02	25.78	19.47	60.00	50.00	-34.22	-30.53

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



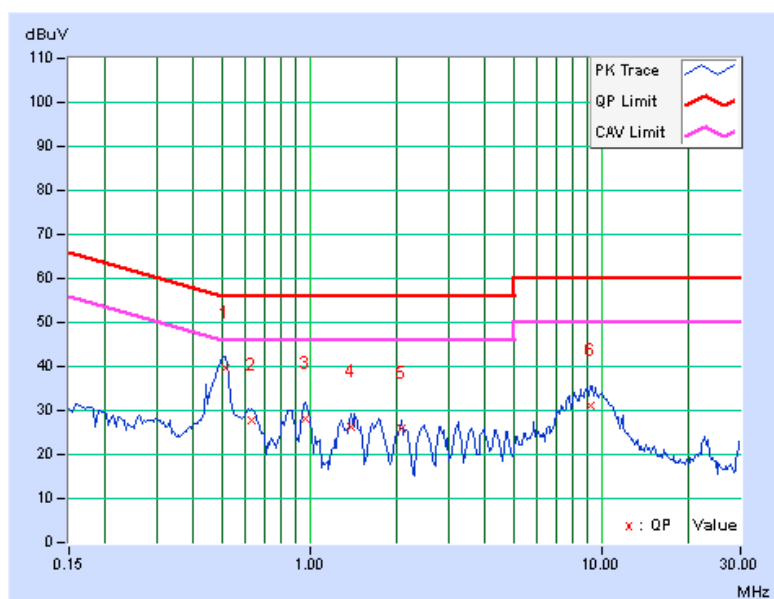
4.1.8 TEST RESULTS (MODE 2)

PHASE	Line (L)	DETECTOR FUNCTION	Quasi-Peak (QP) / Average (AV)
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	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	0.51328	0.10	39.35	33.86	39.45	33.96	56.00	46.00	-16.55	-12.04
2	0.63047	0.11	27.58	21.64	27.69	21.75	56.00	46.00	-28.31	-24.25
3	0.97031	0.13	27.98	22.48	28.11	22.61	56.00	46.00	-27.89	-23.39
4	1.38672	0.15	26.19	21.11	26.34	21.26	56.00	46.00	-29.66	-24.74
5	2.05469	0.18	25.57	20.12	25.75	20.30	56.00	46.00	-30.25	-25.70
6	9.17188	0.42	30.65	23.53	31.07	23.95	60.00	50.00	-28.93	-26.05

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

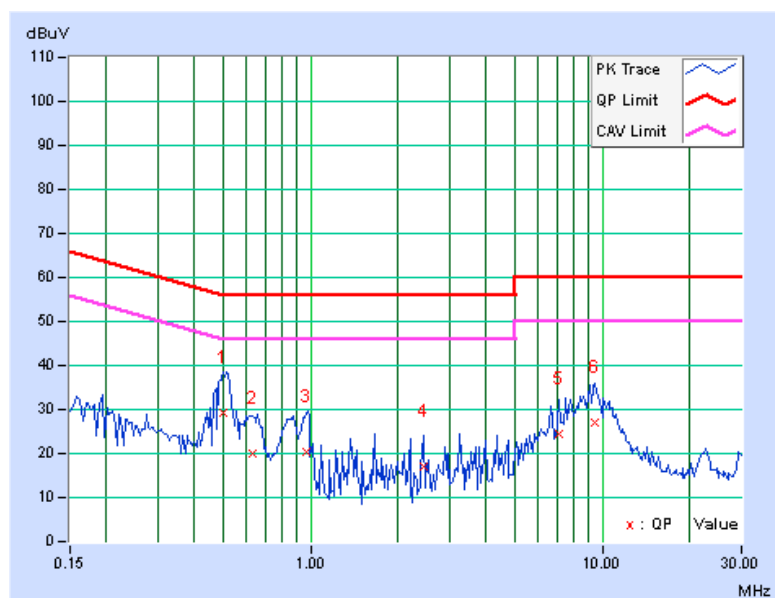


PHASE	Neutral (N)	DETECTOR FUNCTION	Quasi-Peak (QP) / Average (AV)
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	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.50547	0.10	29.18	18.92	29.28	19.02	56.00	46.00	-26.72	-26.98
2	0.63047	0.11	20.07	8.61	20.18	8.72	56.00	46.00	-35.82	-37.28
3	0.96250	0.13	20.23	8.25	20.36	8.38	56.00	46.00	-35.64	-37.62
4	2.44922	0.20	16.74	5.95	16.94	6.15	56.00	46.00	-39.06	-39.85
5	7.14453	0.36	24.20	14.25	24.56	14.61	60.00	50.00	-35.44	-35.39
6	9.47656	0.44	26.68	17.63	27.12	18.07	60.00	50.00	-32.88	-31.93

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



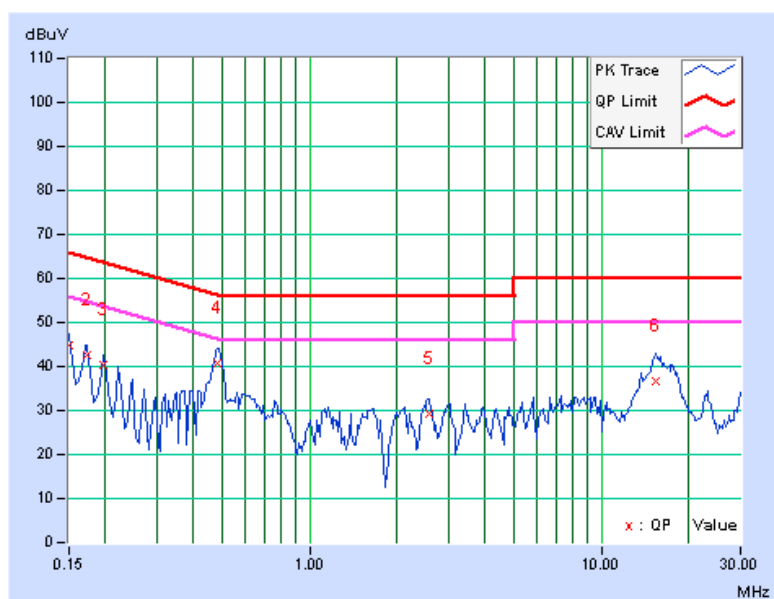
4.1.9 TEST RESULTS (MODE 3)

PHASE	Line (L)	DETECTOR FUNCTION	Quasi-Peak (QP) / Average (AV)
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	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	0.15000	0.07	44.67	34.11	44.74	34.18	66.00	56.00	-21.26	-21.82
2	0.17344	0.07	42.37	32.48	42.44	32.55	64.79	54.79	-22.36	-22.25
3	0.19687	0.07	40.19	31.08	40.26	31.15	63.74	53.74	-23.48	-22.59
4	0.48594	0.10	40.58	33.30	40.68	33.40	56.24	46.24	-15.56	-12.84
5	2.55859	0.20	29.21	23.84	29.41	24.04	56.00	46.00	-26.59	-21.96
6	15.37109	0.59	36.15	28.96	36.74	29.55	60.00	50.00	-23.26	-20.45

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

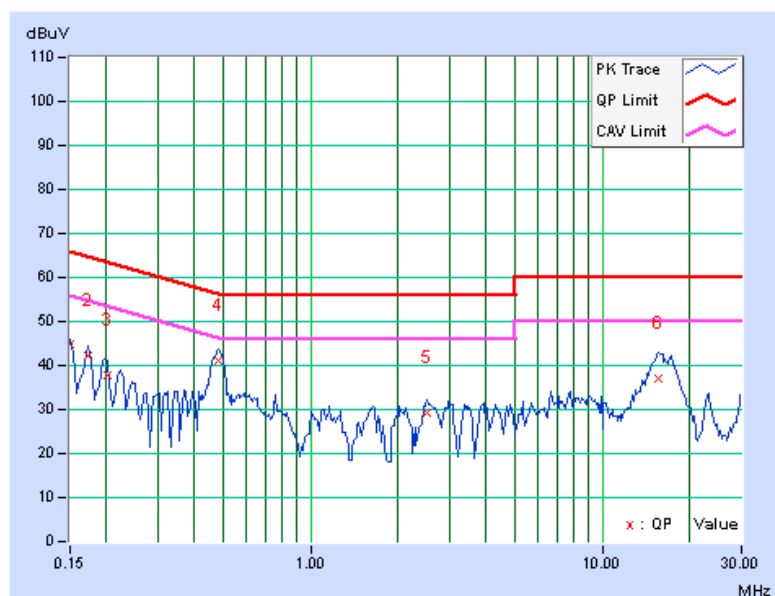


PHASE	Neutral (N)	DETECTOR FUNCTION	Quasi-Peak (QP) / Average (AV)
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	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	0.07	44.65	34.11	44.72	34.18	66.00	56.00	-21.28	-21.82
2	0.17344	0.06	42.11	32.80	42.17	32.86	64.79	54.79	-22.62	-21.93
3	0.20078	0.06	37.84	28.33	37.90	28.39	63.58	53.58	-25.68	-25.19
4	0.48594	0.10	41.13	35.28	41.23	35.38	56.24	46.24	-15.01	-10.86
5	2.51563	0.20	28.99	23.55	29.19	23.75	56.00	46.00	-26.81	-22.25
6	15.61328	0.63	36.24	27.87	36.87	28.50	60.00	50.00	-23.13	-21.50

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 under any condition of modulation.

4.2.2 LIMITS OF UNWANTED EMISSION OUT OF THE RESTRICTED BANDS

APPLICABLE TO	LIMIT	
789033 D02 General UNII Test Procedures New Rules v01	FIELD STRENGTH AT 3m	
	PK:74 (dBμV/m)	AV:54 (dBμV/m)
APPLICABLE TO	EIRP LIMIT	EQUIVALENT FIELD STRENGTH AT 3m
15.407(b)(1)	PK:-27 (dBm/MHz)	PK:68.2(dBμV/m)
15.407(b)(2)		
15.407(b)(3)		
15.407(b)(4)	PK:-27 (dBm/MHz) ^{*1} PK:-17 (dBm/MHz) ^{*2}	PK: 68.2(dBμV/m) ^{*1} PK:78.2 (dBμV/m) ^{*2}

NOTE: ^{*1} beyond 10MHz of the band edge ^{*2} within 10 MHz of band edge

The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength:

$$E = \frac{1000000\sqrt{30P}}{3} \mu\text{V/m, where } P \text{ is the eirp (Watts).}$$



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4.2.3 TEST INSTRUMENTS

For below 1GHz test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
MXE EMI Receiver Agilent	N9038A	MY51210105	July 21, 2014	July 20, 2015
Pre-Amplifier Mini-Circuits	ZFL-1000VH2 B	AMP-ZFL-03	Nov. 12, 2014	Nov. 11, 2015
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-360	Feb. 26, 2014	Feb. 25, 2015
RF Cable	NA	CHGCAB_001	Oct. 04, 2014	Oct. 03, 2015
Horn_Antenna AISI	AIH.8018	0000320091110	Aug. 27, 2014	Aug. 26, 2015
Pre-Amplifier Agilent	8449B	3008A02578	June 24, 2014	June 23, 2015
RF Cable	NA	131205 131214 SNMY23684/4	Jan. 17, 2014	Jan. 16, 2015
Spectrum Analyzer R&S	FSV40	100964	July 05, 2014	July 04, 2015
Pre-Amplifier EMCI	EMC184045	980143	Jan. 17, 2014	Jan. 16, 2015
Horn_Antenna SCHWARZBECK	BBHA 9170	9170-424	Aug. 26, 2014	Aug. 25, 2015
RF Cable	NA	RF104-121 RF104-204	Dec. 12, 2013	Dec. 11, 2014
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: Dec. 04, 2014



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For above 1GHz test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
MXE EMI Receiver Agilent	N9038A	MY51210105	July 21, 2014	July 20, 2015
Pre-Amplifier Mini-Circuits	ZFL-1000VH2 B	AMP-ZFL-03	Nov. 12, 2014	Nov. 11, 2015
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-360	Feb. 26, 2014	Feb. 25, 2015
RF Cable	NA	CHGCAB_001	Oct. 04, 2014	Oct. 03, 2015
Horn_Antenna AISI	AIH.8018	0000320091110	Aug. 27, 2014	Aug. 26, 2015
Pre-Amplifier Agilent	8449B	3008A02578	June 24, 2014	June 23, 2015
RF Cable	NA	131205 131214 SNMY23684/4	Jan. 17, 2014	Jan. 16, 2015
Spectrum Analyzer R&S	FSV40	100964	July 05, 2014	July 04, 2015
Pre-Amplifier EMCI	EMC184045	980143	Jan. 17, 2014	Jan. 16, 2015
Horn_Antenna SCHWARZBECK	BBHA 9170	9170-424	Aug. 26, 2014	Aug. 25, 2015
RF Cable	NA	RF104-121 RF104-204	Dec. 11, 2014	Dec. 10, 2015
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: Dec. 22, 2014

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:

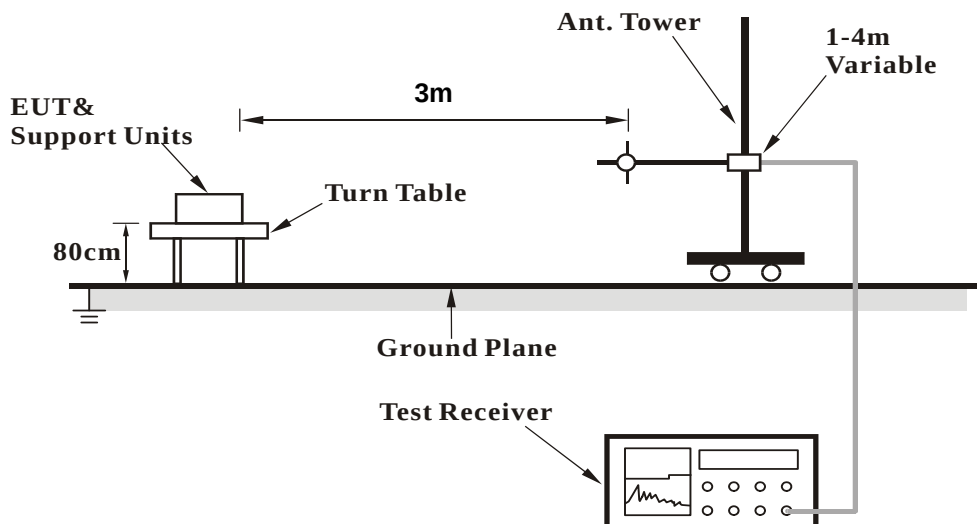
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for RMS Average (Duty cycle < 98%) for Average detection (AV) at frequency above 1GHz, then the measurement results was added to a correction factor ($10 \log(1/\text{duty cycle})$).
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz (Duty cycle $\geq 98\%$) for Average detection (AV) at frequency above 1GHz.
5. All modes of operation were investigated and the worst-case emissions are reported.

4.2.5 DEVIATION FROM TEST STANDARD

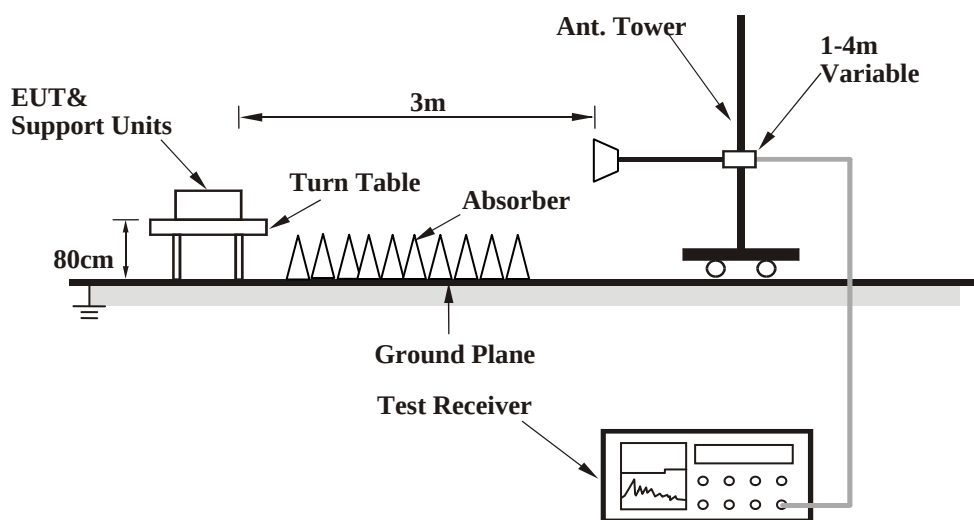
No deviation

4.2.6 TEST SETUP

<Frequency Range below 1GHz>



<Frequency Range above 1GHz>



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 157	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 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	107.99	28.6 QP	43.5	-14.9	2.00 H	101	44.79	-16.17
2	198.20	31.3 QP	43.5	-12.2	1.50 H	144	47.27	-15.93
3	374.98	37.2 QP	46.0	-8.8	1.00 H	326	47.00	-9.78
4	749.98	34.7 QP	46.0	-11.3	2.00 H	220	35.95	-1.21
5	875.02	37.8 QP	46.0	-8.2	1.00 H	0	37.47	0.31
6	899.99	39.8 QP	46.0	-6.3	2.50 H	253	38.96	0.79
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	179.04	30.2 QP	43.5	-13.3	2.00 V	304	44.51	-14.27
2	300.00	40.2 QP	46.0	-5.8	1.00 V	317	52.06	-11.90
3	375.03	36.3 QP	46.0	-9.7	1.68 V	165	46.08	-9.78
4	500.01	33.4 QP	46.0	-12.6	1.00 V	165	40.17	-6.75
5	625.00	39.2 QP	46.0	-6.8	2.00 V	250	42.84	-3.68
6	899.99	38.8 QP	46.0	-7.2	1.50 V	50	38.01	0.79

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) – Pre-Amplifier 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)
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	5039.00	46.2 PK	74.0	-27.8	1.08 H	360	42.22	3.98
2	5039.00	39.5 AV	54.0	-14.5	1.08 H	360	35.52	3.98
3	5150.00	54.5 PK	74.0	-19.5	1.10 H	323	50.22	4.28
4	5150.00	43.4 AV	54.0	-10.6	1.10 H	323	39.12	4.28
5	*5180.00	104.4 PK			1.15 H	322	100.01	4.39
6	*5180.00	93.9 AV			1.15 H	322	89.51	4.39
7	#10360.00	55.6 PK	74.0	-18.4	1.06 H	329	45.54	10.06
8	#10360.00	42.9 AV	54.0	-11.1	1.06 H	329	32.84	10.06
9	15540.00	60.3 PK	74.0	-13.7	1.05 H	130	45.46	14.84
10	15540.00	48.2 AV	54.0	-5.8	1.05 H	130	33.36	14.84
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	5039.00	56.5 PK	74.0	-17.5	1.00 V	360	52.52	3.98
2	5039.00	48.9 AV	54.0	-5.1	1.00 V	360	44.92	3.98
3	5150.00	73.4 PK	74.0	-0.6	1.07 V	43	69.12	4.28
4	5150.00	49.9 AV	54.0	-4.1	1.07 V	43	45.62	4.28
5	*5180.00	119.2 PK			1.05 V	327	114.81	4.39
6	*5180.00	108.9 AV			1.05 V	327	104.51	4.39
7	#10360.00	54.4 PK	74.0	-19.6	1.23 V	195	44.34	10.06
8	#10360.00	43.3 AV	54.0	-10.7	1.23 V	195	33.24	10.06
9	15540.00	61.1 PK	74.0	-12.9	1.06 V	197	46.26	14.84
10	15540.00	49.1 AV	54.0	-4.9	1.06 V	197	34.26	14.84

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) – Pre-Amplifier 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.



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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	5080.00	51.7 PK	74.0	-22.3	1.07 H	338	47.61	4.09
2	5080.00	42.5 AV	54.0	-11.5	1.07 H	338	38.41	4.09
3	5150.00	57.9 PK	74.0	-16.1	1.13 H	316	53.62	4.28
4	5150.00	47.7 AV	54.0	-6.3	1.13 H	316	43.42	4.28
5	*5200.00	109.2 PK			1.12 H	308	104.76	4.44
6	*5200.00	99.3 AV			1.12 H	308	94.86	4.44
7	5399.00	55.4 PK	74.0	-18.6	1.10 H	360	50.74	4.66
8	5399.00	44.7 AV	54.0	-9.3	1.10 H	360	40.04	4.66
9	#10400.00	55.4 PK	74.0	-18.6	1.00 H	321	45.33	10.07
10	#10400.00	42.9 AV	54.0	-11.1	1.00 H	321	32.83	10.07
11	15600.00	60.9 PK	74.0	-13.1	1.00 H	125	45.84	15.06
12	15600.00	48.6 AV	54.0	-5.4	1.00 H	125	33.54	15.06
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	5080.00	57.3 PK	74.0	-16.7	1.00 V	335	53.21	4.09
2	5080.00	48.2 AV	54.0	-5.8	1.00 V	335	44.11	4.09
3	5150.00	63.9 PK	74.0	-10.1	1.05 V	330	59.62	4.28
4	5150.00	53.7 AV	54.0	-0.3	1.05 V	330	49.42	4.28
5	*5200.00	124.3 PK			1.06 V	335	119.86	4.44
6	*5200.00	114.5 AV			1.06 V	335	110.06	4.44
7	5399.00	61.4 PK	74.0	-12.6	1.00 V	332	56.74	4.66
8	5399.00	50.8 AV	54.0	-3.2	1.00 V	332	46.14	4.66
9	#10400.00	54.2 PK	74.0	-19.8	1.22 V	198	44.13	10.07
10	#10400.00	43.3 AV	54.0	-10.7	1.22 V	198	33.23	10.07
11	15600.00	60.9 PK	74.0	-13.1	1.00 V	204	45.84	15.06
12	15600.00	49.1 AV	54.0	-4.9	1.00 V	204	34.04	15.06

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) – Pre-Amplifier 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.



A D T

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	5150.00	62.4 PK	74.0	-11.6	1.11 H	331	58.12	4.28
2	5150.00	45.9 AV	54.0	-8.1	1.11 H	331	41.62	4.28
3	*5240.00	114.0 PK			1.18 H	319	109.59	4.41
4	*5240.00	104.2 AV			1.18 H	319	99.79	4.41
5	5350.00	56.6 PK	74.0	-17.4	1.11 H	352	52.09	4.51
6	5350.00	42.5 AV	54.0	-11.5	1.11 H	352	37.99	4.51
7	#10480.00	53.8 PK	74.0	-20.2	1.31 H	59	43.54	10.26
8	#10480.00	40.7 AV	54.0	-13.3	1.31 H	59	30.44	10.26
9	15720.00	58.8 PK	74.0	-15.2	1.00 H	171	44.13	14.67
10	15720.00	46.9 AV	54.0	-7.1	1.00 H	171	32.23	14.67

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	5150.00	68.9 PK	74.0	-5.1	1.15 V	159	64.62	4.28
2	5150.00	52.4 AV	54.0	-1.6	1.15 V	159	48.12	4.28
3	*5240.00	129.2 PK			1.00 V	337	124.79	4.41
4	*5240.00	119.2 AV			1.00 V	337	114.79	4.41
5	5350.00	62.8 PK	74.0	-11.2	1.20 V	129	58.29	4.51
6	5350.00	48.9 AV	54.0	-5.1	1.20 V	129	44.39	4.51
7	#10480.00	59.9 PK	74.0	-14.1	1.05 V	169	49.64	10.26
8	#10480.00	46.7 AV	54.0	-7.3	1.05 V	169	36.44	10.26
9	15720.00	67.6 PK	74.0	-6.4	1.34 V	115	52.93	14.67
10	15720.00	53.2 AV	54.0	-0.8	1.34 V	115	38.53	14.67

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) – Pre-Amplifier 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.



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CHANNEL	TX Channel 149	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	#5715.00	54.7 PK	74.0	-19.3	1.51 H	332	49.80	4.90
2	#5715.00	40.5 AV	54.0	-13.5	1.51 H	332	35.60	4.90
3	#5725.00	63.2 PK	78.2	-15.0	1.51 H	331	58.27	4.93
4	*5745.00	105.7 PK			1.24 H	329	100.78	4.92
5	*5745.00	95.3 AV			1.24 H	329	90.38	4.92
6	11490.00	56.4 PK	74.0	-17.6	1.08 H	155	45.75	10.65
7	11490.00	44.6 AV	54.0	-9.4	1.08 H	155	33.95	10.65
8	#17235.00	63.4 PK	74.0	-10.6	1.09 H	139	43.95	19.45
9	#17235.00	50.3 AV	54.0	-3.7	1.09 H	139	30.85	19.45

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	#5715.00	64.2 PK	74.0	-9.8	1.39 V	360	59.30	4.90
2	#5715.00	48.2 AV	54.0	-5.8	1.39 V	360	43.30	4.90
3	#5725.00	77.4 PK	78.2	-0.8	1.02 V	360	72.47	4.93
4	*5745.00	117.2 PK			1.02 V	7	112.28	4.92
5	*5745.00	109.7 AV			1.02 V	7	104.78	4.92
6	11490.00	55.8 PK	74.0	-18.2	1.00 V	360	45.15	10.65
7	11490.00	44.3 AV	54.0	-9.7	1.00 V	360	33.65	10.65
8	#17235.00	64.3 PK	74.0	-9.7	1.00 V	236	44.85	19.45
9	#17235.00	50.5 AV	54.0	-3.5	1.00 V	236	31.05	19.45

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) – Pre-Amplifier 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.



A D T

CHANNEL	TX Channel 157	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	#5700.00	62.0 PK	74.0	-12.0	1.21 H	321	57.09	4.91
2	#5700.00	44.6 AV	54.0	-9.4	1.21 H	321	39.69	4.91
3	#5725.00	65.9 PK	78.2	-12.3	1.24 H	331	60.97	4.93
4	*5785.00	107.9 PK			1.22 H	339	102.95	4.95
5	*5785.00	100.3 AV			1.22 H	339	95.35	4.95
6	#5860.00	61.0 PK	74.0	-13.0	1.27 H	334	55.96	5.04
7	#5860.00	40.0 AV	54.0	-14.0	1.27 H	334	34.96	5.04
8	11570.00	55.7 PK	74.0	-18.3	1.11 H	149	45.02	10.68
9	11570.00	44.1 AV	54.0	-9.9	1.11 H	149	33.42	10.68
10	#17355.00	62.7 PK	74.0	-11.3	1.04 H	139	42.94	19.76
11	#17355.00	49.9 AV	54.0	-4.1	1.04 H	139	30.14	19.76

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	#5700.00	70.8 PK	74.0	-3.2	1.13 V	6	65.89	4.91
2	#5700.00	53.8 AV	54.0	-0.2	1.13 V	6	48.89	4.91
3	#5725.00	74.5 PK	78.2	-3.7	1.25 V	360	69.57	4.93
4	*5785.00	118.9 PK			1.00 V	8	113.95	4.95
5	*5785.00	111.5 AV			1.00 V	8	106.55	4.95
6	#5860.00	69.7 PK	74.0	-4.3	1.10 V	358	64.66	5.04
7	#5860.00	49.2 AV	54.0	-4.8	1.10 V	358	44.16	5.04
8	11570.00	55.2 PK	74.0	-18.8	1.08 V	360	44.52	10.68
9	11570.00	43.9 AV	54.0	-10.1	1.08 V	360	33.22	10.68
10	#17355.00	63.7 PK	74.0	-10.3	1.13 V	250	43.94	19.76
11	#17355.00	50.1 AV	54.0	-3.9	1.13 V	250	30.34	19.76

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) – Pre-Amplifier 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.



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CHANNEL	TX Channel 165	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	*5825.00	107.0 PK			1.20 H	325	102.02	4.98
2	*5825.00	99.2 AV			1.20 H	325	94.22	4.98
3	#5850.00	68.7 PK	78.2	-9.5	1.29 H	323	63.68	5.02
4	#5860.00	56.9 PK	74.0	-17.1	1.26 H	319	51.86	5.04
5	#5860.00	42.9 AV	54.0	-11.1	1.26 H	319	37.86	5.04
6	11650.00	56.8 PK	74.0	-17.2	1.09 H	155	46.21	10.59
7	11650.00	44.9 AV	54.0	-9.1	1.09 H	155	34.31	10.59
8	#17475.00	63.2 PK	74.0	-10.8	1.07 H	139	43.25	19.95
9	#17475.00	49.8 AV	54.0	-4.2	1.07 H	139	29.85	19.95

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	*5825.00	118.3 PK			1.00 V	6	113.32	4.98
2	*5825.00	110.3 AV			1.00 V	6	105.32	4.98
3	#5850.00	77.8 PK	78.2	-0.4	1.12 V	355	72.78	5.02
4	#5860.00	65.9 PK	74.0	-8.1	1.00 V	360	60.86	5.04
5	#5860.00	51.7 AV	54.0	-2.3	1.00 V	360	46.66	5.04
6	11650.00	55.3 PK	74.0	-18.7	1.10 V	360	44.71	10.59
7	11650.00	43.7 AV	54.0	-10.3	1.10 V	360	33.11	10.59
8	#17475.00	64.1 PK	74.0	-9.9	1.09 V	264	44.15	19.95
9	#17475.00	50.3 AV	54.0	-3.7	1.09 V	264	30.35	19.95

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) – Pre-Amplifier 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.



A D T

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	5150.00	67.8 PK	74.0	-6.2	1.11 H	317	63.52	4.28
2	5150.00	43.1 AV	54.0	-10.9	1.11 H	317	38.82	4.28
3	*5180.00	101.4 PK			1.19 H	308	97.01	4.39
4	*5180.00	90.9 AV			1.19 H	308	86.51	4.39
5	#10360.00	54.9 PK	74.0	-19.1	1.06 H	328	44.84	10.06
6	#10360.00	42.6 AV	54.0	-11.4	1.06 H	328	32.54	10.06
7	15540.00	61.4 PK	74.0	-12.6	1.01 H	136	46.56	14.84
8	15540.00	49.1 AV	54.0	-4.9	1.01 H	136	34.26	14.84
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	73.5 PK	74.0	-0.5	1.05 V	319	69.22	4.28
2	5150.00	49.1 AV	54.0	-4.9	1.05 V	319	44.82	4.28
3	*5180.00	116.6 PK			1.07 V	326	112.21	4.39
4	*5180.00	106.0 AV			1.07 V	326	101.61	4.39
5	#10360.00	53.7 PK	74.0	-20.3	1.18 V	206	43.64	10.06
6	#10360.00	43.0 AV	54.0	-11.0	1.18 V	206	32.94	10.06
7	15540.00	61.1 PK	74.0	-12.9	1.00 V	200	46.26	14.84
8	15540.00	49.5 AV	54.0	-4.5	1.00 V	200	34.66	14.84

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) – Pre-Amplifier 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.



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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	5150.00	66.9 PK	74.0	-7.1	1.04 H	321	62.62	4.28
2	5150.00	43.8 AV	54.0	-10.2	1.04 H	321	39.52	4.28
3	*5200.00	109.4 PK			1.21 H	336	104.96	4.44
4	*5200.00	99.0 AV			1.21 H	336	94.56	4.44
5	#10400.00	55.5 PK	74.0	-18.5	1.02 H	336	45.43	10.07
6	#10400.00	43.0 AV	54.0	-11.0	1.02 H	336	32.93	10.07
7	15600.00	60.5 PK	74.0	-13.5	1.03 H	123	45.44	15.06
8	15600.00	48.2 AV	54.0	-5.8	1.03 H	123	33.14	15.06

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	73.2 PK	74.0	-0.8	1.07 V	329	68.92	4.28
2	5150.00	50.2 AV	54.0	-3.8	1.07 V	329	45.92	4.28
3	*5200.00	123.7 PK			1.17 V	338	119.26	4.44
4	*5200.00	113.6 AV			1.17 V	338	109.16	4.44
5	#10400.00	54.4 PK	74.0	-19.6	1.16 V	210	44.33	10.07
6	#10400.00	43.4 AV	54.0	-10.6	1.16 V	210	33.33	10.07
7	15600.00	60.5 PK	74.0	-13.5	1.02 V	217	45.44	15.06
8	15600.00	48.9 AV	54.0	-5.1	1.02 V	217	33.84	15.06

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) – Pre-Amplifier 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.



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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	5150.00	62.3 PK	74.0	-11.7	1.12 H	329	58.02	4.28
2	5150.00	46.1 AV	54.0	-7.9	1.12 H	329	41.82	4.28
3	*5240.00	114.9 PK			1.11 H	312	110.49	4.41
4	*5240.00	105.0 AV			1.11 H	312	100.59	4.41
5	5350.00	57.0 PK	74.0	-17.0	1.04 H	360	52.49	4.51
6	5350.00	42.7 AV	54.0	-11.3	1.04 H	360	38.19	4.51
7	#10480.00	55.6 PK	74.0	-18.4	1.00 H	330	45.34	10.26
8	#10480.00	42.9 AV	54.0	-11.1	1.00 H	330	32.64	10.26
9	15720.00	60.8 PK	74.0	-13.2	1.01 H	138	46.13	14.67
10	15720.00	48.6 AV	54.0	-5.4	1.01 H	138	33.93	14.67

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	5150.00	68.8 PK	74.0	-5.2	1.15 V	158	64.52	4.28
2	5150.00	52.5 AV	54.0	-1.5	1.15 V	158	48.22	4.28
3	*5240.00	129.8 PK			1.02 V	334	125.39	4.41
4	*5240.00	119.6 AV			1.02 V	334	115.19	4.41
5	5350.00	62.7 PK	74.0	-11.3	1.26 V	128	58.19	4.51
6	5350.00	48.6 AV	54.0	-5.4	1.26 V	128	44.09	4.51
7	#10480.00	59.7 PK	74.0	-14.3	1.07 V	176	49.44	10.26
8	#10480.00	46.7 AV	54.0	-7.3	1.07 V	176	36.44	10.26
9	15720.00	67.3 PK	74.0	-6.7	1.33 V	103	52.63	14.67
10	15720.00	53.1 AV	54.0	-0.9	1.33 V	103	38.43	14.67

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) – Pre-Amplifier 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.



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CHANNEL	TX Channel 149	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	#5715.00	58.8 PK	74.0	-15.2	1.19 H	327	53.90	4.90
2	#5715.00	43.5 AV	54.0	-10.5	1.19 H	327	38.60	4.90
3	#5725.00	69.4 PK	78.2	-8.8	1.26 H	321	64.47	4.93
4	*5745.00	106.1 PK			1.25 H	337	101.18	4.92
5	*5745.00	98.0 AV			1.25 H	337	93.08	4.92
6	11490.00	56.5 PK	74.0	-17.5	1.14 H	146	45.85	10.65
7	11490.00	44.6 AV	54.0	-9.4	1.14 H	146	33.95	10.65
8	#17235.00	63.0 PK	74.0	-11.0	1.05 H	129	43.55	19.45
9	#17235.00	50.1 AV	54.0	-3.9	1.05 H	129	30.65	19.45

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	#5715.00	67.6 PK	74.0	-6.4	1.01 V	358	62.70	4.90
2	#5715.00	52.3 AV	54.0	-1.7	1.01 V	358	47.40	4.90
3	#5725.00	78.1 PK	78.2	-0.1	1.01 V	360	73.17	4.93
4	*5745.00	117.4 PK			1.01 V	8	112.48	4.92
5	*5745.00	109.2 AV			1.01 V	8	104.28	4.92
6	11490.00	55.3 PK	74.0	-18.7	1.09 V	360	44.65	10.65
7	11490.00	43.9 AV	54.0	-10.1	1.09 V	360	33.25	10.65
8	#17235.00	63.5 PK	74.0	-10.5	1.08 V	235	44.05	19.45
9	#17235.00	49.8 AV	54.0	-4.2	1.08 V	235	30.35	19.45

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) – Pre-Amplifier 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.



A D T

CHANNEL	TX Channel 157	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	#5700.00	56.6 PK	74.0	-17.4	1.20 H	317	51.69	4.91
2	#5700.00	45.1 AV	54.0	-8.9	1.20 H	317	40.19	4.91
3	#5725.00	63.4 PK	78.2	-14.8	1.22 H	332	58.47	4.93
4	*5785.00	107.6 PK			1.20 H	335	102.65	4.95
5	*5785.00	100.5 AV			1.20 H	335	95.55	4.95
6	#5850.00	64.8 PK	78.2	-13.4	1.18 H	315	59.78	5.02
7	#5860.00	54.0 PK	74.0	-20.0	1.20 H	339	48.96	5.04
8	#5860.00	38.9 AV	54.0	-15.1	1.20 H	339	33.86	5.04
9	11570.00	55.1 PK	74.0	-18.9	1.00 H	268	44.42	10.68
10	11570.00	43.1 AV	54.0	-10.9	1.00 H	268	32.42	10.68
11	#17355.00	65.0 PK	74.0	-9.0	1.00 H	320	45.24	19.76
12	#17355.00	52.1 AV	54.0	-1.9	1.00 H	320	32.34	19.76

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	#5700.00	65.3 PK	74.0	-8.7	1.13 V	360	60.39	4.91
2	#5700.00	53.6 AV	54.0	-0.4	1.13 V	360	48.69	4.91
3	#5725.00	72.5 PK	78.2	-5.7	1.01 V	360	67.57	4.93
4	*5785.00	118.3 PK			1.00 V	360	113.35	4.95
5	*5785.00	111.2 AV			1.00 V	360	106.25	4.95
6	#5850.00	73.5 PK	78.2	-4.7	1.00 V	360	68.48	5.02
7	#5860.00	62.9 PK	74.0	-11.1	1.00 V	17	57.86	5.04
8	#5860.00	47.6 AV	54.0	-6.4	1.00 V	17	42.56	5.04
9	11570.00	58.2 PK	74.0	-15.8	1.00 V	360	47.52	10.68
10	11570.00	46.4 AV	54.0	-7.6	1.00 V	360	35.72	10.68
11	#17355.00	66.2 PK	74.0	-7.8	1.00 V	12	46.44	19.76
12	#17355.00	52.6 AV	54.0	-1.4	1.00 V	12	32.84	19.76

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) – Pre-Amplifier 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.



A D T

CHANNEL	TX Channel 165	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	*5825.00	107.4 PK			1.24 H	319	102.42	4.98
2	*5825.00	99.1 AV			1.24 H	319	94.12	4.98
3	#5850.00	67.0 PK	78.2	-11.2	1.25 H	338	61.98	5.02
4	#5860.00	57.4 PK	74.0	-16.6	1.29 H	345	52.36	5.04
5	#5860.00	42.0 AV	54.0	-12.0	1.29 H	345	36.96	5.04
6	11650.00	56.2 PK	74.0	-17.8	1.13 H	154	45.61	10.59
7	11650.00	44.4 AV	54.0	-9.6	1.13 H	154	33.81	10.59
8	#17475.00	63.8 PK	74.0	-10.2	1.08 H	144	43.85	19.95
9	#17475.00	50.8 AV	54.0	-3.2	1.08 H	144	30.85	19.95

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	*5825.00	118.4 PK			1.09 V	7	113.42	4.98
2	*5825.00	110.2 AV			1.09 V	7	105.22	4.98
3	#5850.00	75.8 PK	78.2	-2.4	1.00 V	14	70.78	5.02
4	#5860.00	65.8 PK	74.0	-8.2	1.00 V	354	60.76	5.04
5	#5860.00	50.6 AV	54.0	-3.4	1.00 V	354	45.56	5.04
6	11650.00	54.7 PK	74.0	-19.3	1.05 V	360	44.11	10.59
7	11650.00	43.4 AV	54.0	-10.6	1.05 V	360	32.81	10.59
8	#17475.00	63.8 PK	74.0	-10.2	1.08 V	245	43.85	19.95
9	#17475.00	50.1 AV	54.0	-3.9	1.08 V	245	30.15	19.95

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) – Pre-Amplifier 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.



A D T

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	62.9 PK	74.0	-11.1	1.15 H	321	58.62	4.28
2	5150.00	47.8 AV	54.0	-6.2	1.15 H	321	43.52	4.28
3	*5190.00	95.8 PK			1.20 H	320	91.39	4.41
4	*5190.00	86.7 AV			1.20 H	320	82.29	4.41
5	#10380.00	55.1 PK	74.0	-18.9	1.00 H	307	45.03	10.07
6	#10380.00	42.7 AV	54.0	-11.3	1.00 H	307	32.63	10.07
7	15570.00	60.7 PK	74.0	-13.3	1.00 H	137	45.75	14.95
8	15570.00	48.3 AV	54.0	-5.7	1.00 H	137	33.35	14.95
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	68.9 PK	74.0	-5.1	1.00 V	360	64.62	4.28
2	5150.00	53.9 AV	54.0	-0.1	1.00 V	360	49.62	4.28
3	*5190.00	111.2 PK			1.00 V	360	106.79	4.41
4	*5190.00	101.9 AV			1.00 V	360	97.49	4.41
5	#10380.00	54.1 PK	74.0	-19.9	1.27 V	183	44.03	10.07
6	#10380.00	43.3 AV	54.0	-10.7	1.27 V	183	33.23	10.07
7	15570.00	61.3 PK	74.0	-12.7	1.08 V	196	46.35	14.95
8	15570.00	49.4 AV	54.0	-4.6	1.08 V	196	34.45	14.95

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) – Pre-Amplifier 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.



A D T

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	5150.00	60.1 PK	74.0	-13.9	1.08 H	322	55.82	4.28
2	5150.00	47.2 AV	54.0	-6.8	1.08 H	322	42.92	4.28
3	*5230.00	105.3 PK			1.16 H	328	100.88	4.42
4	*5230.00	96.5 AV			1.16 H	328	92.08	4.42
5	5360.00	48.3 PK	74.0	-25.7	1.13 H	360	43.76	4.54
6	5360.00	37.3 AV	54.0	-16.7	1.13 H	360	32.76	4.54
7	#10460.00	55.0 PK	74.0	-19.0	1.04 H	314	44.79	10.21
8	#10460.00	42.5 AV	54.0	-11.5	1.04 H	314	32.29	10.21
9	15690.00	60.9 PK	74.0	-13.1	1.04 H	116	46.22	14.68
10	15690.00	48.8 AV	54.0	-5.2	1.04 H	116	34.12	14.68

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	66.3 PK	74.0	-7.7	1.13 V	163	62.02	4.28
2	5150.00	53.2 AV	54.0	-0.8	1.13 V	163	48.92	4.28
3	*5230.00	120.2 PK			1.17 V	1	115.78	4.42
4	*5230.00	111.2 AV			1.17 V	1	106.78	4.42
5	5360.00	54.2 PK	74.0	-19.8	1.00 V	321	49.66	4.54
6	5360.00	43.2 AV	54.0	-10.8	1.00 V	321	38.66	4.54
7	#10460.00	54.3 PK	74.0	-19.7	1.19 V	193	44.09	10.21
8	#10460.00	43.4 AV	54.0	-10.6	1.19 V	193	33.19	10.21
9	15690.00	61.3 PK	74.0	-12.7	1.07 V	204	46.62	14.68
10	15690.00	49.3 AV	54.0	-4.7	1.07 V	204	34.62	14.68

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) – Pre-Amplifier 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.



A D T

CHANNEL	TX Channel 151	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	#5715.00	57.5 PK	74.0	-16.5	1.28 H	325	52.60	4.90
2	#5715.00	44.5 AV	54.0	-9.5	1.28 H	325	39.60	4.90
3	#5725.00	65.4 PK	78.2	-12.8	1.20 H	333	60.47	4.93
4	*5755.00	98.7 PK			1.28 H	324	93.77	4.93
5	*5755.00	90.4 AV			1.28 H	324	85.47	4.93
6	11510.00	56.4 PK	74.0	-17.6	1.04 H	143	45.74	10.66
7	11510.00	44.9 AV	54.0	-9.1	1.04 H	143	34.24	10.66
8	#17265.00	63.2 PK	74.0	-10.8	1.04 H	140	43.68	19.52
9	#17265.00	50.4 AV	54.0	-3.6	1.04 H	140	30.88	19.52

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	#5715.00	66.5 PK	74.0	-7.5	1.01 V	352	61.60	4.90
2	#5715.00	53.5 AV	54.0	-0.5	1.01 V	352	48.60	4.90
3	#5725.00	74.3 PK	78.2	-3.9	1.01 V	360	69.37	4.93
4	*5755.00	110.2 PK			1.02 V	7	105.27	4.93
5	*5755.00	101.9 AV			1.02 V	7	96.97	4.93
6	11510.00	55.3 PK	74.0	-18.7	1.04 V	356	44.64	10.66
7	11510.00	43.7 AV	54.0	-10.3	1.04 V	356	33.04	10.66
8	#17265.00	64.2 PK	74.0	-9.8	1.07 V	247	44.68	19.52
9	#17265.00	50.5 AV	54.0	-3.5	1.07 V	247	30.98	19.52

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) – Pre-Amplifier 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.



A D T

CHANNEL	TX Channel 159	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	#5700.00	56.5 PK	74.0	-17.5	1.25 H	319	51.59	4.91
2	#5700.00	41.8 AV	54.0	-12.2	1.25 H	319	36.89	4.91
3	#5725.00	64.2 PK	78.2	-14.0	1.32 H	340	59.27	4.93
4	*5795.00	103.4 PK			1.25 H	323	98.44	4.96
5	*5795.00	95.2 AV			1.25 H	323	90.24	4.96
6	#5850.00	68.8 PK	78.2	-9.4	1.24 H	327	63.78	5.02
7	#5860.00	61.9 PK	74.0	-12.1	1.23 H	313	56.86	5.04
8	#5860.00	43.8 AV	54.0	-10.2	1.23 H	313	38.76	5.04
9	11590.00	56.9 PK	74.0	-17.1	1.09 H	152	46.21	10.69
10	11590.00	44.9 AV	54.0	-9.1	1.09 H	152	34.21	10.69
11	#17385.00	63.8 PK	74.0	-10.2	1.14 H	141	43.94	19.86
12	#17385.00	50.6 AV	54.0	-3.4	1.14 H	141	30.74	19.86

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	#5700.00	65.4 PK	74.0	-8.6	1.24 V	350	60.49	4.91
2	#5700.00	50.7 AV	54.0	-3.3	1.24 V	350	45.79	4.91
3	#5725.00	73.3 PK	78.2	-4.9	1.25 V	353	68.37	4.93
4	*5795.00	114.5 PK			1.01 V	357	109.54	4.96
5	*5795.00	106.5 AV			1.01 V	357	101.54	4.96
6	#5850.00	78.1 PK	78.2	-0.1	1.00 V	23	73.08	5.02
7	#5860.00	71.2 PK	74.0	-2.8	1.11 V	40	66.16	5.04
8	#5860.00	53.1 AV	54.0	-0.9	1.11 V	40	48.06	5.04
9	11590.00	55.8 PK	74.0	-18.2	1.03 V	360	45.11	10.69
10	11590.00	44.3 AV	54.0	-9.7	1.03 V	360	33.61	10.69
11	#17385.00	63.8 PK	74.0	-10.2	1.19 V	250	43.94	19.86
12	#17385.00	50.0 AV	54.0	-4.0	1.19 V	250	30.14	19.86

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) – Pre-Amplifier 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

Operation Band	EUT Category		LIMIT
U-NII-1		Outdoor Access Point	1 Watt (30 dBm) (Max. e.i.r.p $\leq$ 125mW(21 dBm) at any elevation angle above 30 degrees as measured from the horizon)
		Fixed point-to-point Access Point	1 Watt (30 dBm)
	√	Indoor Access Point	1 Watt (30 dBm)
		Mobile and Portable client device	250mW (24 dBm)
U-NII-2A	---		250mW (24 dBm) or 11 dBm+10 log B*
U-NII-2C	---		250mW (24 dBm) or 11 dBm+10 log B*
U-NII-3	---		1 Watt (30 dBm)

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

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

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

Array Gain = 0 dB (i.e., no array gain) for channel widths $\geq$ 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 $\geq$ 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
Power meter Anritsu	ML2495A	1014008	Apr. 30, 2014	Apr. 29, 2015
Power sensor Anritsu	MA2411B	0917122	Apr. 30, 2014	Apr. 29, 2015

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 : Dec. 22, 2014

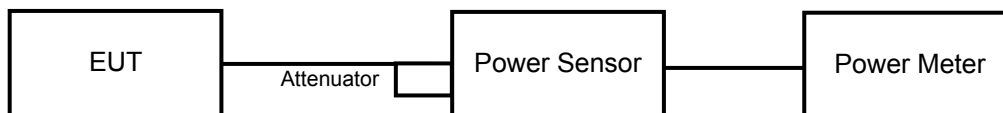
4.3.3 TEST PROCEDURE

Method PM is used to perform output power measurement, trigger and gating function of wide band power meter is enabled to measure max output power of TX on burst. Duty factor is not added to measured value.

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

802.11a

CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
36	5180	14.41	14.16	15.20	86.781	19.38	30	PASS
40	5200	20.34	19.56	20.67	315.189	24.99	30	PASS
48	5240	20.14	20.23	20.14	311.991	24.94	30	PASS
149	5745	14.73	14.68	14.45	86.954	19.39	30	PASS
157	5785	20.89	20.20	19.65	319.714	25.05	30	PASS
165	5825	17.84	16.21	16.16	143.902	21.58	30	PASS

802.11n (HT20)

CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
36	5180	14.51	14.36	14.74	85.324	19.31	30	PASS
40	5200	20.88	19.59	19.61	304.864	24.84	30	PASS
48	5240	20.35	20.20	19.94	311.734	24.94	30	PASS
149	5745	13.75	13.54	13.65	69.482	18.42	30	PASS
157	5785	21.03	20.33	20.75	353.51	25.48	30	PASS
165	5825	15.02	15.47	16.75	114.321	20.58	30	PASS

802.11n (HT40)

CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
38	5190	11.72	12.75	12.76	52.575	17.21	30	PASS
46	5230	18.95	18.16	19.22	227.548	23.57	30	PASS
151	5755	11.96	11.06	11.99	44.28	16.46	30	PASS
159	5795	16.60	16.48	17.05	140.871	21.49	30	PASS



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4.4 PEAK POWER SPECTRAL DENSITY MEASUREMENT

4.4.1 LIMITS OF PEAK POWER SPECTRAL DENSITY MEASUREMENT

Operation Band	EUT Category		LIMIT
U-NII-1		Outdoor Access Point	17dBm/ MHz
		Fixed point-to-point Access Point	
	√	Indoor Access Point	
		Mobile and Portable client device	11dBm/ MHz
U-NII-2A	---		11dBm/ MHz
U-NII-2C	---		11dBm/ MHz
U-NII-3	---		30dBm/ 500kHz

4.4.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
SPECTRUM ANALYZER R&S	FSP 40	100060	May 08, 2014	May 07, 2015

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 : Dec. 22, 2014

4.4.3 TEST PROCEDURES

Using method SA-1

For U-NII-1:

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 1 MHz, Set VBW $\geq$ 3 MHz, Detector = RMS
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

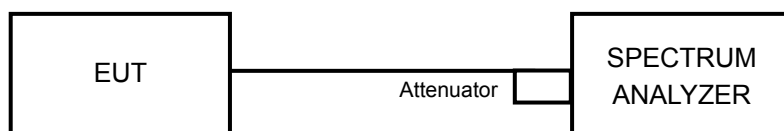
For U-NII-3:

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 300 kHz, Set VBW $\geq$ 1 MHz, Detector = RMS
3. Use the peak marker function to determine the maximum power level in any 300 kHz band segment within the fundamental EBW.
4. Scale the observed power level to an equivalent value in 500 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where $BWCF = 10\log(500 \text{ kHz}/300\text{kHz})$
5. Sweep time = auto, trigger set to “free run”.
6. Trace average at least 100 traces in power averaging mode.
7. 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

For U-NII-1:

802.11a

CHANNEL	CHANNEL FREQUENCY (MHz)	PSD (dBm)			TOTAL POWER DENSITY (dBm)	MAX. LIMIT (dBm)	PASS/FAIL
		CHAIN 0	CHAIN 1	CHAIN 2			
36	5180	-0.11	0.62	1.41	5.46	13.44	PASS
40	5200	6.41	6.27	7.13	11.39	13.44	PASS
48	5240	6.20	6.15	6.97	11.23	13.44	PASS

NOTE: 1. Method a) 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 = $10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2 / 3]$ = 9.56dBi > 6dBi , so the power density limit shall be reduced to 17-(9.56-6) = 13.44dBm.

802.11n (HT20)

CHANNEL	CHANNEL FREQUENCY (MHz)	PSD (dBm)			TOTAL POWER DENSITY (dBm)	MAX. LIMIT (dBm)	PASS/FAIL
		CHAIN 0	CHAIN 1	CHAIN 2			
36	5180	-0.12	0.21	0.89	5.12	13.44	PASS
40	5200	4.95	5.60	6.05	10.33	13.44	PASS
48	5240	6.22	5.60	6.43	10.87	13.44	PASS

NOTE: 1. Method a) 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 = $10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2 / 3]$ = 9.56dBi > 6dBi , so the power density limit shall be reduced to 17-(9.56-6) = 13.44dBm.

802.11n (HT40)

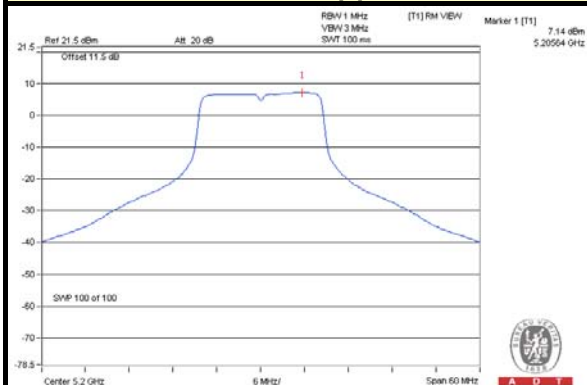
CHANNEL	CHANNEL FREQUENCY (MHz)	PSD (dBm)			TOTAL POWER DENSITY (dBm)	MAX. LIMIT (dBm)	PASS/FAIL
		CHAIN 0	CHAIN 1	CHAIN 2			
38	5190	-7.06	-5.54	-5.27	-1.12	13.44	PASS
46	5230	1.95	1.35	1.47	6.37	13.44	PASS

NOTE: 1. Method a) 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.

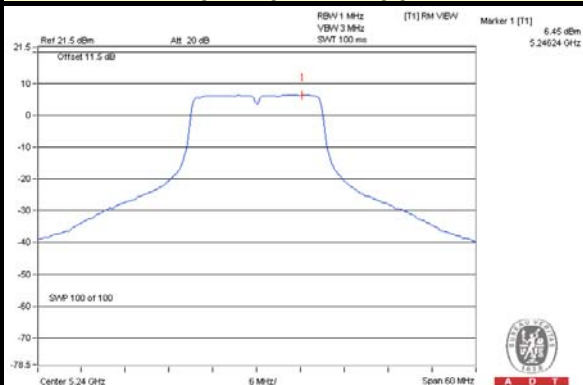
2. Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2 / 3]$ = 9.56dBi > 6dBi , so the power density limit shall be reduced to 17-(9.56-6) = 13.44dBm.

SPECTRUM PLOT OF WORST VALUE

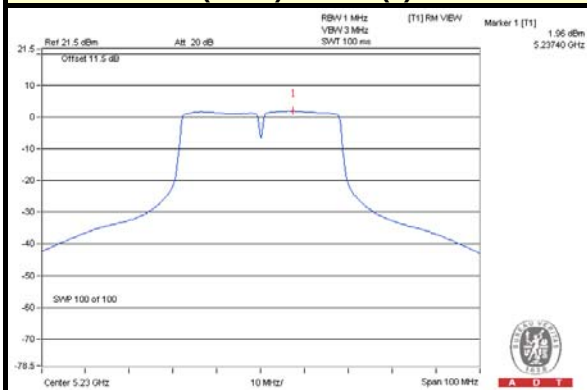
802.11a / Chain(2) : CH40



802.11n (HT20) / Chain(2) : CH48



802.11n (HT40) / Chain(0) : CH46



For U-NII-3:

802.11a

TX CHAIN	CHANNEL	FREQUENCY (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=3) dB	TOTAL PSD (dBm/500kHz)	LIMIT (dBm/500kHz)	PASS /FAIL
0	149	5745	-7.60	-5.38	4.77	-0.61	26.23	PASS
	157	5785	-1.75	0.47	4.77	5.24	26.23	PASS
	165	5825	-5.12	-2.90	4.77	1.87	26.23	PASS
1	149	5745	-7.51	-5.29	4.77	-0.52	26.23	PASS
	157	5785	-1.39	0.83	4.77	5.60	26.23	PASS
	165	5825	-5.65	-3.43	4.77	1.34	26.23	PASS
2	149	5745	-6.54	-4.32	4.77	0.45	26.23	PASS
	157	5785	-1.56	0.66	4.77	5.43	26.23	PASS
	165	5825	-4.67	-2.45	4.77	2.32	26.23	PASS

NOTE: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2 / 3] = 9.77\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $30-(9.77-6) = 26.23\text{dBm}$.

802.11n (HT20)

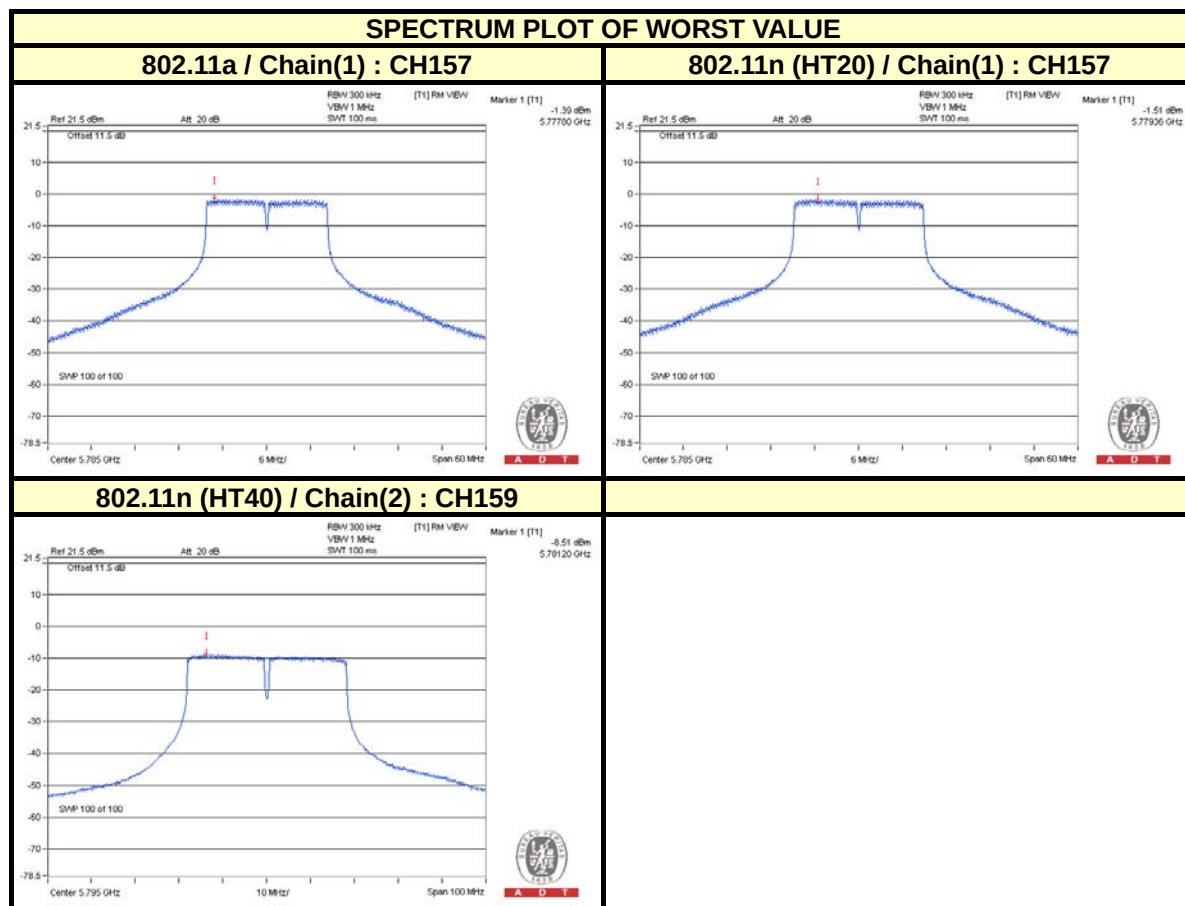
TX CHAIN	CHANNEL	FREQUENCY (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=3) dB	TOTAL PSD (dBm/500kHz)	LIMIT (dBm/500kHz)	PASS /FAIL
0	149	5745	-9.05	-6.83	4.77	-2.06	26.23	PASS
	157	5785	-2.12	0.10	4.77	4.87	26.23	PASS
	165	5825	-6.84	-4.62	4.77	0.15	26.23	PASS
1	149	5745	-9.01	-6.79	4.77	-2.02	26.23	PASS
	157	5785	-1.51	0.71	4.77	5.48	26.23	PASS
	165	5825	-7.32	-5.10	4.77	-0.33	26.23	PASS
2	149	5745	-8.03	-5.81	4.77	-1.04	26.23	PASS
	157	5785	-1.93	0.29	4.77	5.06	26.23	PASS
	165	5825	-5.98	-3.76	4.77	1.01	26.23	PASS

NOTE: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2 / 3] = 9.77\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $30-(9.77-6) = 26.23\text{dBm}$.

802.11n (HT40)

TX CHAIN	CHANNEL	FREQUENCY (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=3) dB	TOTAL PSD (dBm/500kHz)	LIMIT (dBm/500kHz)	PASS /FAIL
0	151	5755	-14.83	-12.61	4.77	-7.84	26.23	PASS
	159	5795	-9.39	-7.17	4.77	-2.40	26.23	PASS
1	151	5755	-14.35	-12.13	4.77	-7.36	26.23	PASS
	159	5795	-8.81	-6.59	4.77	-1.82	26.23	PASS
2	151	5755	-13.26	-11.04	4.77	-6.27	26.23	PASS
	159	5795	-8.51	-6.29	4.77	-1.52	26.23	PASS

NOTE: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2 / 3] = 9.77\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $30 - (9.77 - 6) = 26.23\text{dBm}$.





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4.5 FREQUENCY STABILITY

4.5.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT

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

4.5.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
SPECTRUM ANALYZER R&S	FSP 40	100060	May 08, 2014	May 07, 2015
Temperature & Humidity Chamber GIANTFORCE	GTH-150-40-SP-AR	MAA0812-008	Jan. 13, 2014	Jan. 12, 2015

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 : Dec. 22, 2014

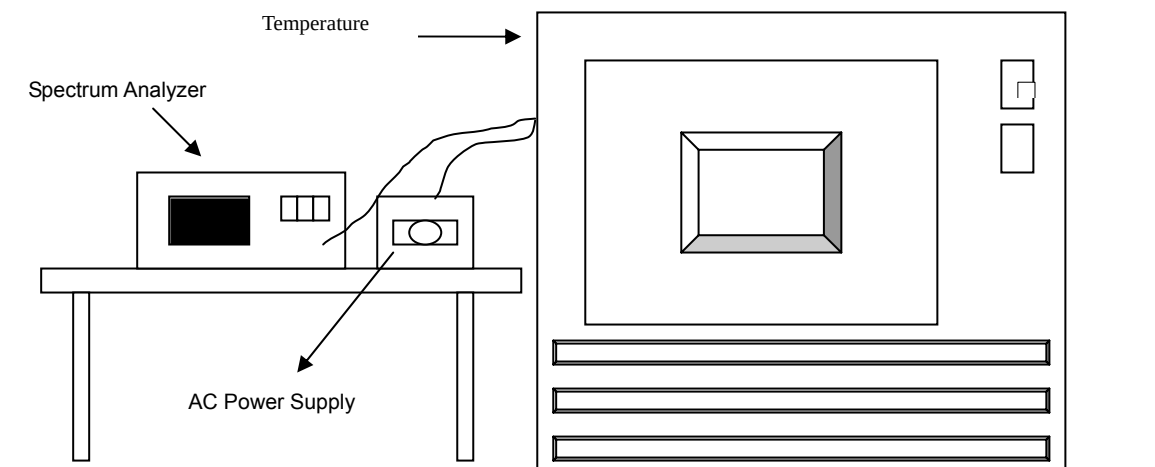
4.5.3 TEST PROCEDURE

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.

4.5.4 DEVIATION FROM TEST STANDARD

No deviation

4.5.5 TEST SETUP



4.5.6 EUT OPERATING CONDITION

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



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4.5.7 TEST RESULTS

FREQUENCY STABILITY VERSUS TEMP.									
OPERATING FREQUENCY: 5240MHz									
TEMP. (°C)	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)	%	(MHz)	%	(MHz)	%	(MHz)	%
50	120	5240.0094	0.00018	5240.0098	0.00019	5240.009	0.00017	5240.0083	0.00016
40	120	5240.0044	0.00008	5240.0028	0.00005	5240.0001	0.00000	5240.0044	0.00008
30	120	5240.0127	0.00024	5240.009	0.00017	5240.0122	0.00023	5240.011	0.00021
20	120	5240.0209	0.00040	5240.0168	0.00032	5240.0172	0.00033	5240.0178	0.00034
10	120	5240.0026	0.00005	5240.0015	0.00003	5240.003	0.00006	5240.0022	0.00004
0	120	5240.0153	0.00029	5240.0147	0.00028	5240.016	0.00031	5240.0181	0.00035
-10	120	5239.996	-0.00008	5239.9952	-0.00009	5239.9972	-0.00005	5239.9984	-0.00003
-20	120	5240.0024	0.00005	5240.0045	0.00009	5240.0053	0.00010	5240.0047	0.00009
-30	120	5240.0207	0.00040	5240.0177	0.00034	5240.0193	0.00037	5240.019	0.00036

FREQUENCY STABILITY VERSUS VOLTAGE									
OPERATING FREQUENCY: 5240MHz									
TEMP. (°C)	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)	%	(MHz)	%	(MHz)	%	(MHz)	%
20	138	5240.0218	0.00042	5240.0177	0.00034	5240.0166	0.00032	5240.0186	0.00035
	120	5240.0209	0.00040	5240.0168	0.00032	5240.0172	0.00033	5240.0178	0.00034
	102	5240.0217	0.00041	5240.0169	0.00032	5240.0181	0.00035	5240.0177	0.00034



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4.6 6dB BANDWIDTH MEASUREMENT

4.6.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.6.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
SPECTRUM ANALYZER R&S	FSP 40	100060	May 08, 2014	May 07, 2015

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 : Dec. 22, 2014

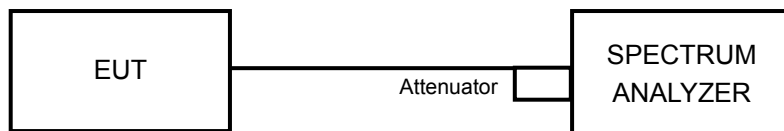
4.6.3 TEST PROCEDURE

1. Set resolution bandwidth (RBW) = 100kHz.
2. Set the video bandwidth (VBW) $\geq 3 \times$ RBW, Detector = Peak.
3. Trace mode = max hold.
4. Sweep = auto couple.
5. Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission

4.6.4 DEVIATION FROM TEST STANDARD

No deviation

4.6.5 TEST SETUP



4.6.6 EUT OPERATING CONDITIONS

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.6.7 TEST RESULTS

802.11a

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
149	5745	16.41	16.41	16.43	0.5	PASS
157	5785	16.38	16.42	16.41	0.5	PASS
165	5825	16.40	16.41	16.40	0.5	PASS

802.11n (HT20)

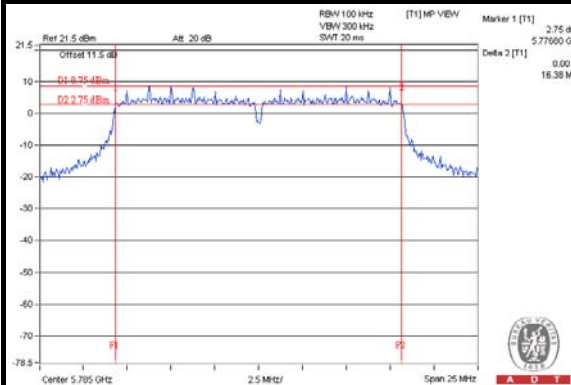
CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
149	5745	17.63	17.73	17.64	0.5	PASS
157	5785	17.63	17.59	17.65	0.5	PASS
165	5825	17.62	17.63	17.62	0.5	PASS

802.11n (HT40)

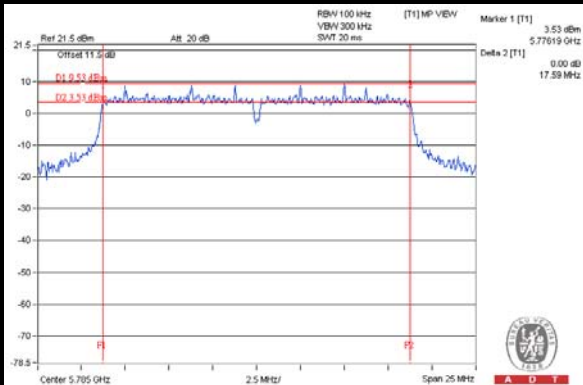
CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
151	5755	36.44	35.96	35.78	0.5	PASS
159	5795	36.43	36.44	36.07	0.5	PASS

SPECTRUM PLOT OF WORST VALUE

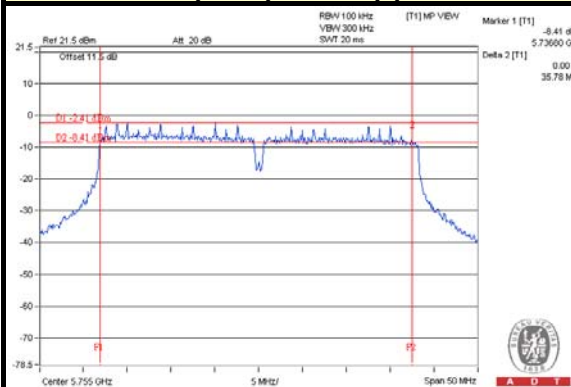
802.11a / Chain(0): CH157



802.11n (HT20) / Chain(1) : CH157



802.11n (HT40) / Chain(2) : CH151



5. PHOTOGRAPHS OF THE TEST CONFIGURATION

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



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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/Telecom Lab:

Tel: 886-3-5935343

Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety 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.



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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.

--- END ---