

FCC TEST REPORT (WLAN/DTS 15.247)

REPORT NO.: RF130710E11E

MODEL NO.: T77H462

FCC ID: MCLT77H462

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ISSUED: May 02, 2014

APPLICANT: Hon Hai PRECISION IND.CO.,LTD

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF130710E11E	Original release	May 02, 2014



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1. CERTIFICATION

PRODUCT: 802.11abgn+BT4.0 module
BRAND NAME: FOXCONN
MODEL NO.: T77H462
TEST SAMPLE: ENGINEERING SAMPLE
APPLICANT: Hon Hai PRECISION IND.CO.,LTD
TESTED: Apr. 18 to 22, 2014
STANDARDS: **FCC Part 15, Subpart C (Section 15.247)**
ANSI C63.10-2009

The above equipment (Model: T77H462) 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 : Midoli Peng , **DATE:** May 02, 2014
(Midoli Peng, Specialist)

APPROVED BY : May Chen , **DATE:** May 02, 2014
(May Chen, Manager)

2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

For 2.4GHz(WLAN), 2400~2483.5MHz Band

APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.247)			
STANDARD SECTION	TEST TYPE	RESULT	REMARK
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -14.08dB at 0.32548MHz
15.247(d) 15.209	Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -0.2dB at 2390.00MHz
15.247(b)	Conducted Output power	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	Antenna connector is i-pex(MHF) not a standard connector.

For 2.4GHz(BT-LE(GFSK)), 2402~2480MHz Band

APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.247)			
STANDARD SECTION	TEST TYPE	RESULT	REMARK
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -10.79dB at 12.65234MHz.
15.247(d) 15.209	Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -4.8dB at 416.40MHz & 448.02MHz
15.247(b)	Conducted Output power	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	Antenna connector is i-pex(MHF) not a standard connector.



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For 5GHz, 5725~5850MHz Band

APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.247)			
STANDARD SECTION	TEST TYPE	RESULT	REMARK
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -9.72dB at 12.57813MHz
15.247(d) 15.209	Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -1.0dB at 5448.56MHz
15.247(b)	Conducted Output power	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	Antenna connector is i-pex(MHF) not a standard connector.

NOTE:

1. This report is prepared for FCC class II permissive change. Only conducted emission, radiated emission and conducted Output power were presented in this test report.
2. The EUT was operating in 2.400 ~ 2.4835GHz, 5.15~5.35GHz, 5.47~5.6GHz & 5.65~5.725GHz and 5.725~5.850GHz frequencies band. This report was recorded the RF parameters including 2.400 ~ 2.4835GHz and 5.725~5.850GHz. For the 5.15~5.35GHz and 5.47~5.6GHz & 5.65~5.725GHz 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)	5.43 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 (WLAN/DTS)

PRODUCT	802.11abgn+BT4.0 module
MODEL NO.	T77H462
POWER SUPPLY	DC 3.3V
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM GFSK(BT <LE> mode) for DTS
MODULATION TECHNOLOGY	DSSS,OFDM, DTS
TRANSFER RATE	802.11b: up to 11Mbps 802.11a/g: up to 54Mbps 802.11n: up to 300Mbps BT-LE (GFSK): 1Mbps
OPERATING FREQUENCY	For 15.407 5GHz: 5.18 ~ 5.24GHz, 5.26 ~ 5.32GHz, 5.50 ~ 5.58GHz & 5.66GHz ~ 5.70GHz
	For 15.247 2.4GHz: WLAN: 2.412 ~ 2.462GHz BT-LE(GFSK): 2.402 ~ 2.480GHz 5GHz: 5.745 ~ 5.825GHz
NUMBER OF CHANNEL	For 15.407 16 for 802.11a, 802.11n (HT20) 7 for 802.11n (HT40)
	For 15.247 (2.4GHz) 11 for 802.11b, 802.11g, 802.11n (HT20) 40 for BT-LE(GFSK) For 15.247 (5GHz) 5 for 802.11a, 802.11n (HT20) 2 for 802.11n (HT40)



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MAXIMUM OUTPUT POWER	For 15.407 802.11a: 101.859mW 802.11n (HT20): 102.688mW 802.11n (HT40): 93.119mW For 15.247 (2.4GHz) 802.11b: 170.216mW 802.11g: 229.615mW 802.11n (HT20): 319.012mW BT-LE(GFSK): 6.237mW For 15.247 (5GHz) 802.11a: 137.404mW 802.11n (HT20): 161.918mW 802.11n (HT40): 166.074mW
ANTENNA TYPE	Please see NOTE
DATA CABLE	NA
I/O PORTS	Refer to user's manual
ASSOCIATED DEVICES	NA

NOTE:

1. This report is prepared for FCC class II permissive change. The difference compared with the Report No.: RF130710E11 design is as the following information:

u Add 4 sets of antennas (set 2~5) as following table:

Original antenna							
Antenna Set 1							
Transmitter Circuit	Brand	Model	Antenna Type	Antenna Gain (dBi)	Frequency range (MHz to MHz)	Connector Type	
Chain (0)	Foxconn	T77H462	PIFA	-0.6	2400~2500	MHF4	
				-2.3	5150~5850		
Chain (1)	Foxconn	T77H462	PIFA	-0.6	2400~2500	MHF4	
				-2.3	5150~5850		
Newly antenna							
Antenna Set 2							
Transmitter Circuit	Brand	Model	Antenna Type	Antenna Gain (dBi) <Including cable loss>	Frequency range (MHz to MHz)	Cable Length (mm)	Connector Type
Chain (0) & Chain (1)	Wistron Neweb Corporation	DC33001GL00	PIFA	1.32	2400~2500	55	MHF4 (i-pex)
				1.62	5150-5350		
				-1.84	5470-5725		
				-2.12	5725-5850		



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Antenna Set 3									
Transmitter Circuit	Brand	Model	Antenna Type	Antenna Gain (dBi) <Including cable loss>	Frequency range (MHz to MHz)	Cable Length (mm)	Connector Type		
Chain (0) & Chain (1)	Wistron Neweb Corporation	DC33001GL10	PIFA	0.48	2400~2500	239	MHF4 (i-plex)		
				-2.19	5150-5350				
				-2.70	5470-5725				
				-1.77	5725-5850				
Antenna Set 4									
Transmitter Circuit	Antenna P/N	Manufacturer	Antenna Type	Cable Assembly P/N and Information	Frequency range (MHz to MHz)	Antenna Gain (dBi) <Including cable loss>	Antenna Gain (dBi) <Excluding cable loss>		
Chain (0)	Main Antenna (P/N: LA22RF754-1H)	LUXSHARE-ICT Co., Ltd.	PIFA	50 ohm coaxial cable Cable length:750 mm Diameter: Lowloss 1.13mm	2400-2500	0.43	2.68		
					5150-5350	-8.70	-5.15		
					5470-5725	-8.82	-5.15		
					5725-5850	-8.98	-5.25		
Chain (1)	Auxiliary Antenna (P/N: LA22RF755-1H)	LUXSHARE-ICT Co., Ltd.	PIFA	50 ohm coaxial cable Cable length: 750 mm Diameter: Lowloss1.13 mm	2400-2500	0.43	2.68		
					5150-5350	-8.70	-5.15		
					5470-5725	-8.82	-5.15		
					5725-5850	-8.98	-5.25		
Antenna Set 5									
Transmitter Circuit	Antenna P/N	Manufacturer	Antenna Type	Cable Assembly P/N and Information	Frequency range (MHz to MHz)	Antenna Gain (dBi) <Including cable loss>	Antenna Gain (dBi) <Excluding cable loss>	Cable loss max.(dB)	VSWR
Chain (0)	Main Antenna (P/N: LA22RF764-1H)	LUXSHARE -ICT Co., Ltd.	PIFA	50 ohm coaxial cable Cable length:220 mm Diameter:1.13mm	2400-2500	2.34	3.0	0.66	2.5 max
					5150-5350	0.67	1.71	1.04	2.5 max
					5470-5725	0.15	1.22	1.07	2.5 max
					5725-5850	-0.54	0.55	1.09	2.5 max
Chain (1)	Auxiliary Antenna (P/N: LA22RF765-1H)	LUXSHARE -ICT Co., Ltd.	PIFA	50 ohm coaxial cable Cable length: 250 mm Diameter:1.13 mm	2400-2500	0.83	1.58	0.75	2.5 max
					5150-5350	2.05	3.23	1.18	2.5 max
					5470-5725	0.61	1.84	1.23	2.5 max
					5725-5850	0.61	1.85	1.24	2.5 max

From the above new antennas, the antenna set 5 was selected as representative antennas for the test and their data were recorded in this report.

2. There are Bluetooth technology and WLAN technology used for the EUT
3. Bluetooth and WLAN technology can't transmit at same time.

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

MODULATION MODE	TX/RX FUNCTION
802.11b	1TX/2RX (Diversity)
802.11g	1TX/2RX (Diversity)
802.11a	1TX/2RX (Diversity)
802.11n (HT20)	1TX/2RX (Diversity) or 2TX/2RX
802.11n (HT40)	1TX/2RX (Diversity) or 2TX/2RX

5. When the EUT operating in 802.11n, the software operation, which is defined by manufacturer, MCS (Modulation and Coding Schemes) from 0 to 15.
6. 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 2400 ~ 2483.5MHz band:

11 channels are provided for 802.11b, 802.11g, 802.11n (HT20):

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
1	2412MHz	7	2442MHz
2	2417MHz	8	2447MHz
3	2422MHz	9	2452MHz
4	2427MHz	10	2457MHz
5	2432MHz	11	2462MHz
6	2437MHz		

40 channels are provided for Bluetooth LE mode:

CHANNEL	FREQ. (MHZ)	CHANNEL	FREQ. (MHZ)	CHANNEL	FREQ. (MHZ)	CHANNEL	FREQ. (MHZ)
0	2402	10	2422	20	2442	30	2462
1	2404	11	2424	21	2444	31	2464
2	2406	12	2426	22	2446	32	2466
3	2408	13	2428	23	2448	33	2468
4	2410	14	2430	24	2450	34	2470
5	2412	15	2432	25	2452	35	2472
6	2414	16	2434	26	2454	36	2474
7	2416	17	2436	27	2456	37	2476
8	2418	18	2438	28	2458	38	2478
9	2420	19	2440	29	2460	39	2480

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 ³ 1G	APCM	
-	√	√	√	√	-

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: 1. “-” means no effect.
2. For 2.4GHz : The EUT’ antenna had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on X-plane.
3. For 5GHz : The EUT’ antenna had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on X-plane(below 1GHz) and Y-plane(above1GHz).

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)
For 2.4 GHz 802.11n (HT20)	1 to 11	6	OFDM	BPSK	13
BT-LE	0 to 39	19	DTS	GFSK	1
For 5 GHz 802.11n (HT40)	151 to 159	159	OFDM	BPSK	27

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)
For 2.4 GHz 802.11n (HT20)	1 to 11	6	OFDM	BPSK	13
BT-LE	0 to 39	19	DTS	GFSK	1
For 5 GHz 802.11n (HT40)	151 to 159	159	OFDM	BPSK	27

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)
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
For 2.4 GHz 802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	13
BT-LE	0 to 39	0, 19, 39	DTS	GFSK	1
802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6
For 5 GHz 802.11n (HT20)	149 to 165	149, 157, 165	OFDM	BPSK	13
For 5 GHz 802.11n (HT40)	151 to 159	151, 159	OFDM	BPSK	27

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)
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
For 2.4 GHz 802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	13
BT-LE	0 to 39	0, 19, 39	DTS	GFSK	1
802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6
For 5 GHz 802.11n (HT20)	149 to 165	149, 157, 165	OFDM	BPSK	13
For 5 GHz 802.11n (HT40)	151 to 159	151, 159	OFDM	BPSK	27



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TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER (SYSTEM)	TESTED BY
PLC	25deg. C, 76%RH	120Vac, 60Hz	Ping Liu
RE<1G	19deg. C, 65%RH	120Vac, 60Hz	Andy Ho
RE ³ 1G	25deg. C, 66%RH	120Vac, 60Hz	Andy Ho
	26deg. C, 70%RH	120Vac, 60Hz	Nelson Teng
APCM	25deg. C, 60%RH	120Vac, 60Hz	Chilin Lee

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 C. (15.247)

558074 D01 DTS Meas Guidance v03r01

662911 D01 Multiple Transmitter Output v02r01

ANSI C63.10-2009

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

3.4 DUTY CYCLE OF TEST SIGNAL

WLAN mode(2.4GHz)

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

802.11b: Duty cycle = $1.206 \text{ ms} / 1.22 \text{ ms} = 0.989$

802.11g: Duty cycle = $2.065 \text{ ms} / 2.085 \text{ ms} = 0.99$

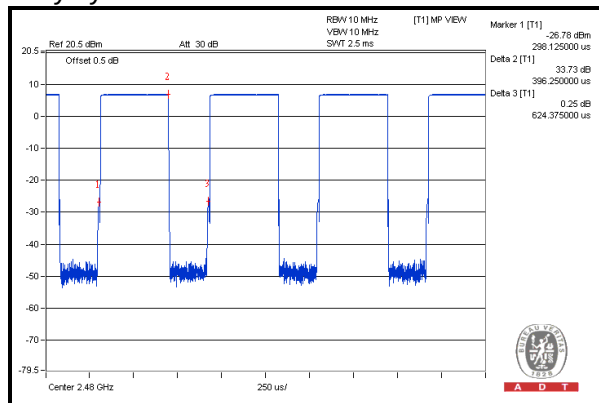
802.11n (HT20): Duty cycle = $1.905 \text{ ms} / 1.93 \text{ ms} = 0.987$



BT-LE mode

Duty cycle of test signal is < 98%.

Duty cycle = $0.396 \text{ ms} / 0.624 \text{ ms} = 0.635$



3.5 DESCRIPTION OF SUPPORT UNITS

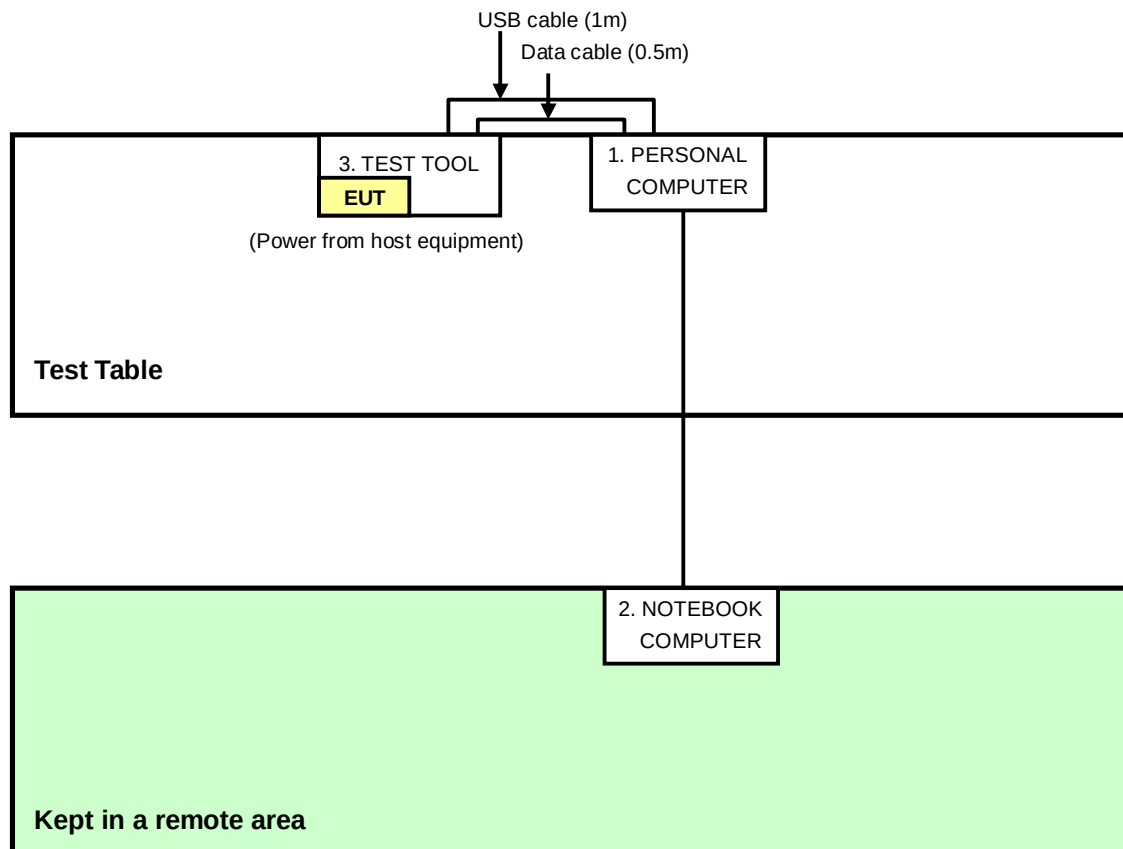
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	PERSONAL COMPUTER	DELL	DCNE	HRJB32S	FCC DoC
2	NOTEBOOK COMPUTER	DELL	PP32LA	FSLB32S	FCC DoC
3	TEST TOOL	Hon Hai	NA	NA	NA

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	USB cable, 1m
2	UTP cable, 10m
3	Data cable, 0.5m

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

3.6 CONFIGURATION OF SYSTEM UNDER TEST



4. TEST TYPES AND RESULTS (FOR 2.4GHz, 2.400 ~ 2.4835GHz Band)

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	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 LIG NEX1	ER-265	L09068005	July 22, 2013	July 21, 2014
Pulse Limiter SCHWARZBECK	VTSD 9561F	9607	Mar. 06, 2014	Mar. 05, 2015
Line-Impedance Stabilization Network (for EUT) SCHWARZBECK	NSLK8127	8127-522	Sep. 05, 2013	Sep. 04, 2014
Line-Impedance Stabilization Network (for Peripheral)	ENV216	100072	June 06, 2013	June 05, 2014
RF Cable (JYEBAO)	5DFB	CONCAB-003	Mar. 07, 2014	Mar. 06, 2015
50 ohms Terminator	50	EMC-03	Sep. 24, 2013	Sep. 23, 2014
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: Apr. 22, 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 levels under (Limit - 20dB) were not recorded.

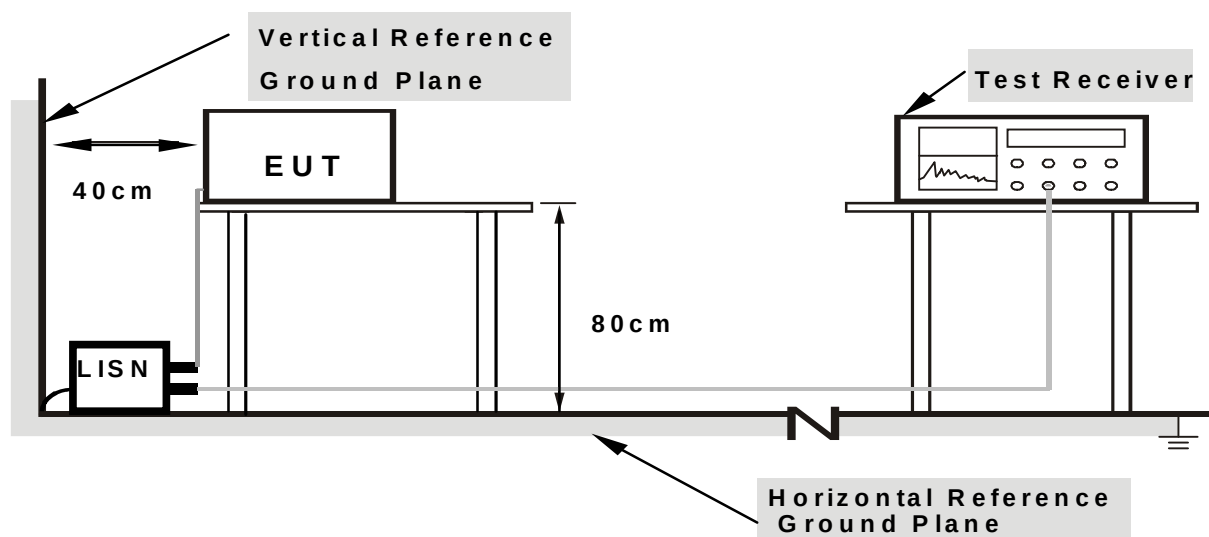
NOTE:

- 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

For WLAN mode:

1. Connect the EUT with the support unit 1 (PC) which is placed on a testing table.
2. The communication partner run test program "MTool_2.0.0.8.exe" to enable EUT under transmission/receiving condition continuously at specific channel frequency.

For BT<LE> mode:

1. Connect the EUT with the support unit 1 (PC) which is placed on a testing table.
2. The communication partner run test program "Bluetool.exe [v1.7.0.2]" to enable EUT under transmission/receiving condition continuously at specific channel frequency.

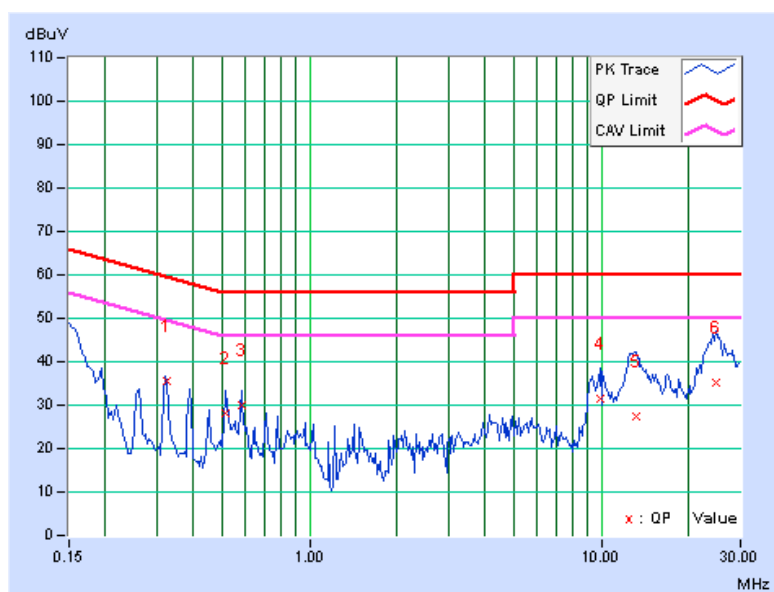
4.1.7 TEST RESULTS (WLAN mode)

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	0.32548	0.07	35.52	35.42	35.59	35.49	59.57	49.57	-23.98	-14.08
2	0.51719	0.07	28.13	26.72	28.20	26.79	56.00	46.00	-27.80	-19.21
3	0.58359	0.08	30.02	26.64	30.10	26.72	56.00	46.00	-25.90	-19.28
4	9.96875	0.39	30.95	25.40	31.34	25.79	60.00	50.00	-28.66	-24.21
5	13.10938	0.48	26.99	19.54	27.47	20.02	60.00	50.00	-32.53	-29.98
6	24.79688	0.80	34.27	25.71	35.07	26.51	60.00	50.00	-24.93	-23.49

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

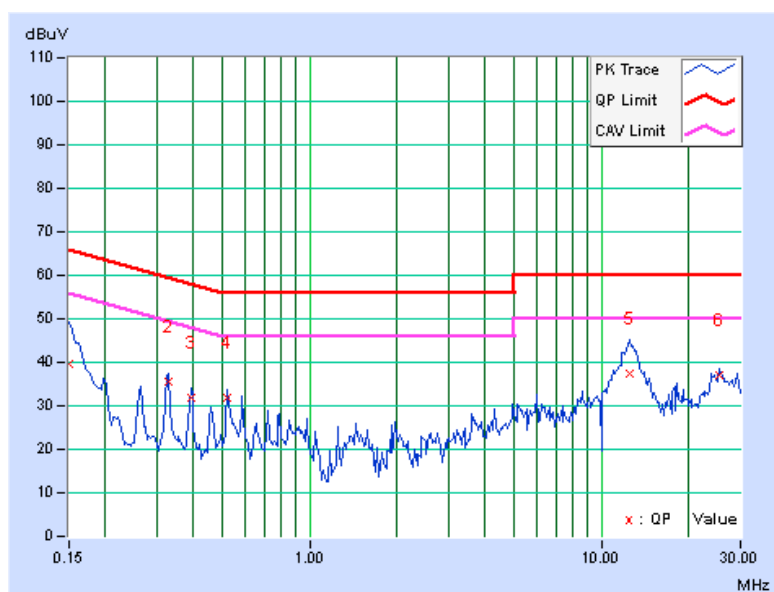


PHASE	Neutral (N)	DETECTOR FUNCTION	Quasi-Peak (QP) / Average (AV)
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No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
	[MHz]	Factor [dB]	[dB (uV)]	[dB (uV)]	[dB (uV)]	[dB (uV)]	[dB (uV)]	[dB (uV)]	[dB]	[dB]
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	0.07	39.73	23.83	39.80	23.90	66.00	56.00	-26.20	-32.10
2	0.32969	0.07	35.38	34.68	35.45	34.75	59.46	49.46	-24.01	-14.71
3	0.39219	0.07	31.88	31.09	31.95	31.16	58.02	48.02	-26.07	-16.86
4	0.52500	0.07	31.81	30.30	31.88	30.37	56.00	46.00	-24.12	-15.63
5	12.44922	0.46	36.90	30.69	37.36	31.15	60.00	50.00	-22.64	-18.85
6	25.49609	0.81	36.18	28.08	36.99	28.89	60.00	50.00	-23.01	-21.11

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



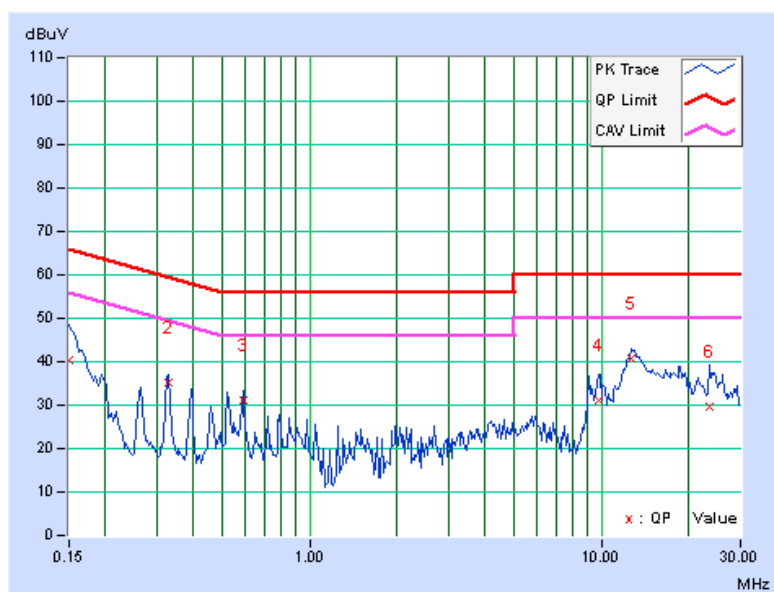
4.1.8 TEST RESULTS (BT<LE> mode)

PHASE	Line (L)	DETECTOR FUNCTION	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr. Factor [dB]	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	0.06	40.28	24.37	40.34	24.43	66.00	56.00	-25.66	-31.57
2	0.32969	0.07	35.26	35.08	35.33	35.15	59.46	49.46	-24.13	-14.31
3	0.59141	0.08	31.03	28.40	31.11	28.48	56.00	46.00	-24.89	-17.52
4	9.75781	0.38	30.89	25.50	31.27	25.88	60.00	50.00	-28.73	-24.12
5	12.65234	0.46	40.35	38.75	40.81	39.21	60.00	50.00	-19.19	-10.79
6	23.54688	0.77	28.75	21.18	29.52	21.95	60.00	50.00	-30.48	-28.05

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

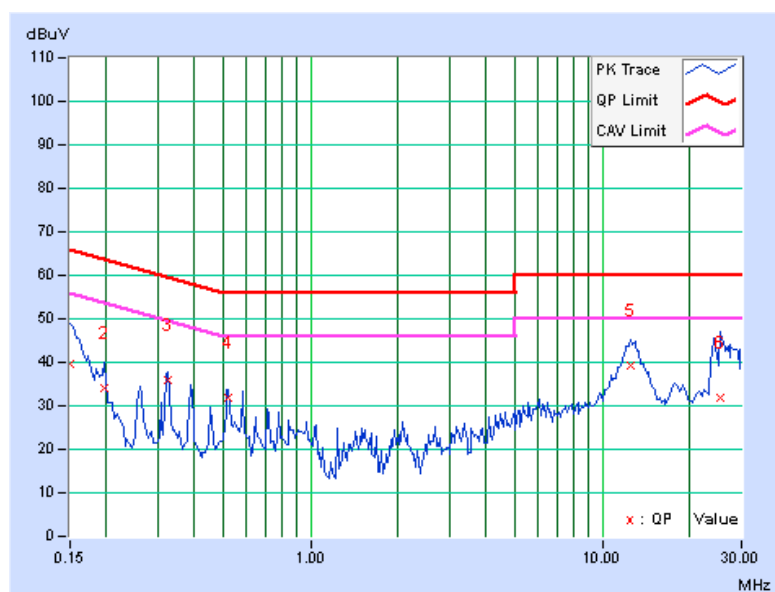


PHASE	Neutral (N)	DETECTOR FUNCTION	Quasi-Peak (QP) / Average (AV)
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	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	0.07	39.63	23.43	39.70	23.50	66.00	56.00	-26.30	-32.50
2	0.19687	0.06	33.84	30.92	33.90	30.98	63.74	53.74	-29.84	-22.76
3	0.32578	0.07	35.99	35.36	36.06	35.43	59.56	49.56	-23.50	-14.13
4	0.52109	0.07	31.85	30.30	31.92	30.37	56.00	46.00	-24.08	-15.63
5	12.52344	0.46	38.70	35.32	39.16	35.78	60.00	50.00	-20.84	-14.22
6	25.25000	0.81	31.11	23.18	31.92	23.99	60.00	50.00	-28.08	-26.01

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. Other emissions shall be at least 20dB below the highest level of the desired power:

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.



A D T

4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
MXE EMI Receiver Agilent	N9038A	MY50010156	Jan. 15, 2014	Jan. 14, 2015
Pre-Amplifier Mini-Circuits	ZFL-1000VH2 B	AMP-ZFL-04	Nov. 13, 2013	Nov. 12, 2014
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-361	Feb. 27, 2014	Feb. 26, 2015
RF Cable	NA	CHHCAB_001	Oct. 06, 2013	Oct. 05, 2014
Spectrum Analyzer R&S	FSV40	100964	July 15, 2013	July 14, 2014
Horn_Antenna AISI	AIH.8018	0000220091110	Dec. 06, 2013	Dec. 05, 2014
Pre-Amplifier Agilent	8449B	3008A01923	Oct. 29, 2013	Oct. 28, 2014
RF Cable	NA	RF104-205 RF104-207 RF104-202	Dec. 12, 2013	Dec. 11, 2014
Spectrum Analyzer Agilent	E4446A	MY48250253	Aug. 28, 2013	Aug. 27, 2014
Pre-Amplifier SPACEK LABS	SLKKa-48-6	9K16	Nov. 13, 2013	Nov. 12, 2014
Horn_Antenna SCHWARZBECK	BBHA 9170	9170-424	Oct. 08, 2013	Oct. 07, 2014
Software	ADT_Radiated _V8.7.07	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: Apr. 18 to 22, 2014

4.2.3 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:

FOR WLAN MODE:

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.

FOR BT_LE MODE:

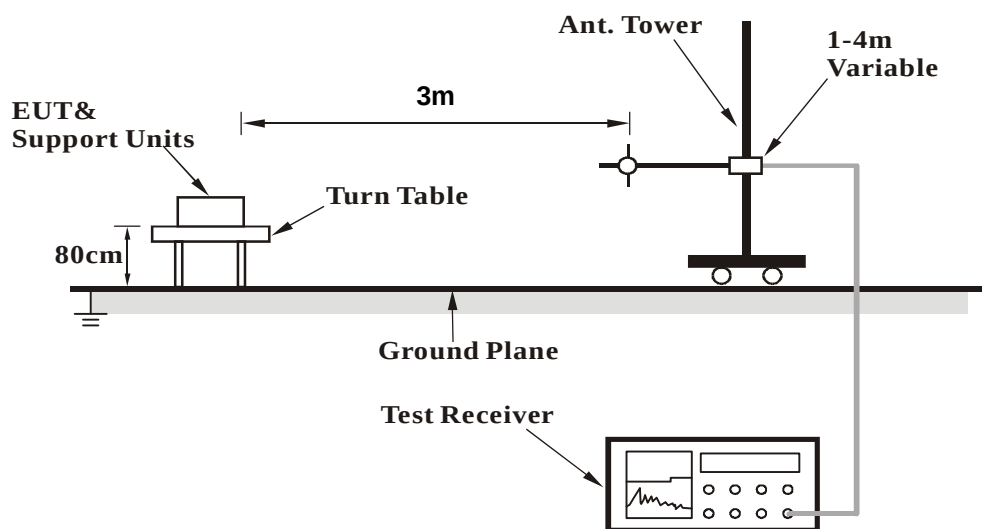
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is $\geq 1/T$ (Duty cycle < 98%) or 10Hz (Duty cycle $\geq 98\%$) for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

4.2.4 DEVIATION FROM TEST STANDARD

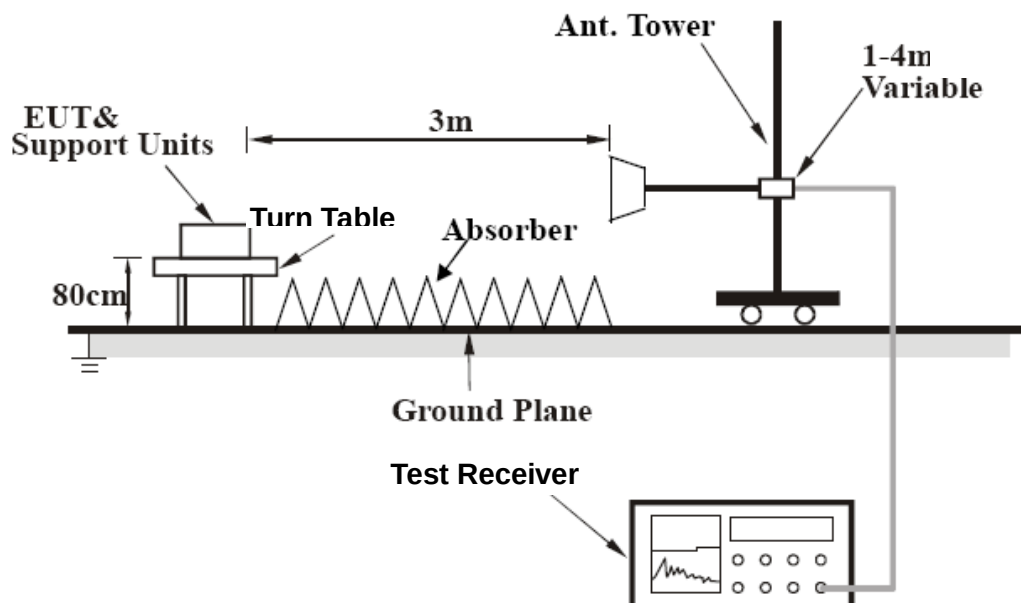
No deviation

4.2.5 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.

4.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6

4.2.7 TEST RESULTS (WLAN MODE)

BELOW 1GHz WORST-CASE DATA

802.11n (HT20)

CHANNEL	TX Channel 6	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	37.13	30.3 QP	40.0	-9.7	2.00 H	60	44.16	-13.82
2	398.21	41.0 QP	46.0	-5.0	1.00 H	213	50.35	-9.37
3	433.08	39.3 QP	46.0	-6.7	2.00 H	348	47.39	-8.06
4	499.72	40.4 QP	46.0	-5.7	1.50 H	360	47.27	-6.92
5	533.04	39.8 QP	46.0	-6.2	1.50 H	328	46.16	-6.34
6	716.32	39.1 QP	46.0	-6.9	1.00 H	44	42.06	-2.96
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	33.20	33.8 QP	40.0	-6.3	1.00 V	112	47.91	-14.16
2	166.58	38.7 QP	43.5	-4.9	1.50 V	132	51.59	-12.94
3	333.13	40.7 QP	46.0	-5.4	1.50 V	345	51.27	-10.62
4	416.40	41.4 QP	46.0	-4.7	1.50 V	309	50.15	-8.80
5	448.02	41.2 QP	46.0	-4.9	1.00 V	283	48.94	-7.79
6	749.60	37.7 QP	46.0	-8.3	1.50 V	28	39.34	-1.64

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

802.11b

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		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	2390.00	59.2 PK	74.0	-14.8	1.14 H	196	64.80	-5.60
2	2390.00	52.0 AV	54.0	-2.0	1.14 H	196	57.60	-5.60
3	*2412.00	105.2 PK			1.14 H	196	110.70	-5.50
4	*2412.00	102.1 AV			1.14 H	196	107.60	-5.50
5	4824.00	51.3 PK	74.0	-22.7	1.14 H	203	47.50	3.80
6	4824.00	47.3 AV	54.0	-6.7	1.14 H	203	43.50	3.80

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	2390.00	55.6 PK	74.0	-18.4	1.01 V	318	61.20	-5.60
2	2390.00	48.1 AV	54.0	-5.9	1.01 V	318	53.70	-5.60
3	*2412.00	101.5 PK			1.01 V	318	107.00	-5.50
4	*2412.00	97.9 AV			1.01 V	318	103.40	-5.50
5	4824.00	51.0 PK	74.0	-23.0	1.14 V	330	47.20	3.80
6	4824.00	47.5 AV	54.0	-6.5	1.14 V	330	43.70	3.80

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.

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		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	2390.00	54.8 PK	74.0	-19.2	1.45 H	215	60.40	-5.60
2	2390.00	45.2 AV	54.0	-8.8	1.45 H	215	50.80	-5.60
3	*2437.00	105.2 PK			1.45 H	215	110.60	-5.40
4	*2437.00	102.3 AV			1.45 H	215	107.70	-5.40
5	2483.50	53.4 PK	74.0	-20.6	1.45 H	215	58.50	-5.10
6	2483.50	42.6 AV	54.0	-11.4	1.45 H	215	47.70	-5.10
7	4874.00	51.7 PK	74.0	-22.3	1.10 H	190	47.90	3.80
8	4874.00	47.7 AV	54.0	-6.3	1.10 H	190	43.90	3.80
9	7311.00	53.5 PK	74.0	-20.5	1.05 H	112	45.20	8.30
10	7311.00	41.2 AV	54.0	-12.8	1.05 H	112	32.90	8.30
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	2390.00	51.3 PK	74.0	-22.7	1.00 V	324	56.90	-5.60
2	2390.00	41.8 AV	54.0	-12.2	1.00 V	324	47.40	-5.60
3	*2437.00	96.8 PK			1.00 V	324	102.20	-5.40
4	*2437.00	93.0 AV			1.00 V	324	98.40	-5.40
5	2483.50	51.0 PK	74.0	-23.0	1.00 V	324	56.10	-5.10
6	2483.50	41.6 AV	54.0	-12.4	1.00 V	324	46.70	-5.10
7	4874.00	51.3 PK	74.0	-22.7	1.15 V	314	47.50	3.80
8	4874.00	47.7 AV	54.0	-6.3	1.15 V	314	43.90	3.80
9	7311.00	54.5 PK	74.0	-19.5	1.02 V	195	46.20	8.30
10	7311.00	41.1 AV	54.0	-12.9	1.02 V	195	32.80	8.30

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.

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		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	*2462.00	105.8 PK			1.42 H	189	111.20	-5.40
2	*2462.00	101.8 AV			1.42 H	189	107.20	-5.40
3	2483.50	65.0 PK	74.0	-9.0	1.42 H	189	70.10	-5.10
4	2483.50	50.0 AV	54.0	-4.0	1.42 H	189	55.10	-5.10
5	4924.00	49.0 PK	74.0	-25.0	1.53 H	276	45.20	3.80
6	4924.00	40.0 AV	54.0	-14.0	1.53 H	276	36.20	3.80
7	7386.00	54.1 PK	74.0	-19.9	1.00 H	115	45.50	8.60
8	7386.00	41.5 AV	54.0	-12.5	1.00 H	115	32.90	8.60
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	*2462.00	96.6 PK			1.00 V	322	102.00	-5.40
2	*2462.00	93.3 AV			1.00 V	322	98.70	-5.40
3	2483.50	55.1 PK	74.0	-18.9	1.00 V	322	60.20	-5.10
4	2483.50	48.0 AV	54.0	-6.0	1.00 V	322	53.10	-5.10
5	4924.00	51.9 PK	74.0	-22.1	1.30 V	324	48.10	3.80
6	4924.00	48.1 AV	54.0	-5.9	1.30 V	324	44.30	3.80
7	7386.00	54.4 PK	74.0	-19.6	1.00 V	211	45.80	8.60
8	7386.00	41.1 AV	54.0	-12.9	1.00 V	211	32.50	8.60

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.

802.11g

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		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	2390.00	73.8 PK	74.0	-0.2	1.17 H	198	79.40	-5.60
2	2390.00	49.6 AV	54.0	-4.4	1.17 H	198	55.20	-5.60
3	*2412.00	106.0 PK			1.17 H	198	111.50	-5.50
4	*2412.00	95.2 AV			1.17 H	198	100.70	-5.50
5	4824.00	48.7 PK	74.0	-25.3	1.00 H	217	44.90	3.80
6	4824.00	36.5 AV	54.0	-17.5	1.00 H	217	32.70	3.80
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	2390.00	71.0 PK	74.0	-3.0	1.22 V	290	76.60	-5.60
2	2390.00	50.2 AV	54.0	-3.8	1.22 V	290	55.80	-5.60
3	*2412.00	100.6 PK			1.22 V	290	106.10	-5.50
4	*2412.00	91.2 AV			1.22 V	290	96.70	-5.50
5	4824.00	46.6 PK	74.0	-27.4	1.00 V	305	42.80	3.80
6	4824.00	35.1 AV	54.0	-18.9	1.00 V	305	31.30	3.80

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.

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		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	2390.00	66.0 PK	74.0	-8.0	1.15 H	202	71.60	-5.60
2	2390.00	49.1 AV	54.0	-4.9	1.15 H	202	54.70	-5.60
3	*2437.00	108.3 PK			1.15 H	202	113.70	-5.40
4	*2437.00	97.6 AV			1.15 H	202	103.00	-5.40
5	2483.50	65.6 PK	74.0	-8.4	1.15 H	202	70.70	-5.10
6	2483.50	47.1 AV	54.0	-6.9	1.15 H	202	52.20	-5.10
7	4874.00	49.3 PK	74.0	-24.7	1.03 H	237	45.50	3.80
8	4874.00	37.0 AV	54.0	-17.0	1.03 H	237	33.20	3.80
9	7311.00	56.0 PK	74.0	-18.0	1.07 H	113	47.70	8.30
10	7311.00	42.9 AV	54.0	-11.1	1.07 H	113	34.60	8.30
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	2390.00	62.6 PK	74.0	-11.4	1.21 V	292	68.20	-5.60
2	2390.00	45.4 AV	54.0	-8.6	1.21 V	292	51.00	-5.60
3	*2437.00	104.4 PK			1.21 V	292	109.80	-5.40
4	*2437.00	93.9 AV			1.21 V	292	99.30	-5.40
5	2483.50	61.5 PK	74.0	-12.5	1.21 V	292	66.60	-5.10
6	2483.50	43.3 AV	54.0	-10.7	1.21 V	292	48.40	-5.10
7	4874.00	47.6 PK	74.0	-26.4	1.01 V	313	43.80	3.80
8	4874.00	35.8 AV	54.0	-18.2	1.01 V	313	32.00	3.80
9	7311.00	55.8 PK	74.0	-18.2	1.13 V	190	47.50	8.30
10	7311.00	43.0 AV	54.0	-11.0	1.13 V	190	34.70	8.30

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.

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		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	*2462.00	105.1 PK			1.10 H	199	110.50	-5.40
2	*2462.00	94.5 AV			1.10 H	199	99.90	-5.40
3	2483.50	73.3 PK	74.0	-0.7	1.10 H	199	78.40	-5.10
4	2483.50	44.4 AV	54.0	-9.6	1.10 H	199	49.50	-5.10
5	4924.00	48.7 PK	74.0	-25.3	1.01 H	238	44.90	3.80
6	4924.00	36.3 AV	54.0	-17.7	1.01 H	238	32.50	3.80
7	7386.00	56.0 PK	74.0	-18.0	1.07 H	106	47.40	8.60
8	7386.00	43.0 AV	54.0	-11.0	1.07 H	106	34.40	8.60
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	*2462.00	99.7 PK			1.19 V	287	105.10	-5.40
2	*2462.00	89.1 AV			1.19 V	287	94.50	-5.40
3	2483.50	68.2 PK	74.0	-5.8	1.19 V	287	73.30	-5.10
4	2483.50	45.8 AV	54.0	-8.2	1.19 V	287	50.90	-5.10
5	4924.00	48.2 PK	74.0	-25.8	1.05 V	286	44.40	3.80
6	4924.00	36.5 AV	54.0	-17.5	1.05 V	286	32.70	3.80
7	7386.00	55.9 PK	74.0	-18.1	1.11 V	212	47.30	8.60
8	7386.00	43.5 AV	54.0	-10.5	1.11 V	212	34.90	8.60

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.

802.11n (HT20)

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		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	2390.00	73.6 PK	74.0	-0.4	1.16 H	195	79.20	-5.60
2	2390.00	48.5 AV	54.0	-5.5	1.16 H	195	54.10	-5.60
3	*2412.00	108.5 PK			1.16 H	195	114.00	-5.50
4	*2412.00	96.2 AV			1.16 H	195	101.70	-5.50
5	4824.00	49.7 PK	74.0	-24.3	1.03 H	215	45.90	3.80
6	4824.00	37.2 AV	54.0	-16.8	1.03 H	215	33.40	3.80
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	2390.00	65.6 PK	74.0	-8.4	1.00 V	318	71.20	-5.60
2	2390.00	39.6 AV	54.0	-14.4	1.00 V	318	45.20	-5.60
3	*2412.00	99.5 PK			1.00 V	318	105.00	-5.50
4	*2412.00	88.9 AV			1.00 V	318	94.40	-5.50
5	4824.00	48.3 PK	74.0	-25.7	1.03 V	296	44.50	3.80
6	4824.00	36.8 AV	54.0	-17.2	1.03 V	296	33.00	3.80

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.

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		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	2390.00	69.7 PK	74.0	-4.3	1.12 H	202	75.30	-5.60
2	2390.00	51.3 AV	54.0	-2.7	1.12 H	202	56.90	-5.60
3	*2437.00	112.6 PK			1.12 H	202	118.00	-5.40
4	*2437.00	99.9 AV			1.12 H	202	105.30	-5.40
5	2483.50	68.5 PK	74.0	-5.5	1.12 H	202	73.60	-5.10
6	2483.50	50.0 AV	54.0	-4.0	1.12 H	202	55.10	-5.10
7	4874.00	49.0 PK	74.0	-25.0	1.00 H	237	45.20	3.80
8	4874.00	36.4 AV	54.0	-17.6	1.00 H	237	32.60	3.80
9	7311.00	55.4 PK	74.0	-18.6	1.00 H	121	47.10	8.30
10	7311.00	42.3 AV	54.0	-11.7	1.00 H	121	34.00	8.30
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	2390.00	65.5 PK	74.0	-8.5	1.29 V	100	71.10	-5.60
2	2390.00	46.9 AV	54.0	-7.1	1.29 V	100	52.50	-5.60
3	*2437.00	104.5 PK			1.29 V	100	109.90	-5.40
4	*2437.00	92.4 AV			1.29 V	100	97.80	-5.40
5	2483.50	64.5 PK	74.0	-9.5	1.29 V	100	69.60	-5.10
6	2483.50	45.8 AV	54.0	-8.2	1.29 V	100	50.90	-5.10
7	4874.00	48.1 PK	74.0	-25.9	1.00 V	301	44.30	3.80
8	4874.00	36.4 AV	54.0	-17.6	1.00 V	301	32.60	3.80
9	7311.00	55.8 PK	74.0	-18.2	1.00 V	205	47.50	8.30
10	7311.00	43.3 AV	54.0	-10.7	1.00 V	205	35.00	8.30

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.

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		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	*2462.00	109.6 PK			1.08 H	205	115.00	-5.40
2	*2462.00	96.3 AV			1.08 H	205	101.70	-5.40
3	2483.50	72.5 PK	74.0	-1.5	1.08 H	205	77.60	-5.10
4	2483.50	46.8 AV	54.0	-7.2	1.08 H	205	51.90	-5.10
5	4924.00	49.2 PK	74.0	-24.8	1.01 H	229	45.40	3.80
6	4924.00	36.8 AV	54.0	-17.2	1.01 H	229	33.00	3.80
7	7386.00	55.9 PK	74.0	-18.1	1.05 H	126	47.30	8.60
8	7386.00	42.7 AV	54.0	-11.3	1.05 H	126	34.10	8.60
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	*2462.00	99.1 PK			1.00 V	307	104.50	-5.40
2	*2462.00	87.2 AV			1.00 V	307	92.60	-5.40
3	2483.50	70.9 PK	74.0	-3.1	1.00 V	307	76.00	-5.10
4	2483.50	45.8 AV	54.0	-8.2	1.00 V	307	50.90	-5.10
5	4924.00	48.2 PK	74.0	-25.8	1.01 V	291	44.40	3.80
6	4924.00	36.3 AV	54.0	-17.7	1.01 V	291	32.50	3.80
7	7386.00	55.3 PK	74.0	-18.7	1.01 V	197	46.70	8.60
8	7386.00	43.0 AV	54.0	-11.0	1.01 V	197	34.40	8.60

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.

4.2.8 TEST RESULTS (BT <LE> MODE)

BELOW 1GHz WORST-CASE DATA

BT_LE-GFSK

CHANNEL	TX Channel 0	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	37.13	30.1 QP	40.0	-9.9	1.00 H	273	43.90	-13.80
2	398.21	41.1 QP	46.0	-4.9	2.00 H	217	50.40	-9.30
3	433.08	39.2 QP	46.0	-6.8	2.00 H	146	47.30	-8.10
4	499.72	40.2 QP	46.0	-5.8	1.50 H	276	47.10	-6.90
5	533.04	39.6 QP	46.0	-6.4	1.50 H	176	46.00	-6.40
6	716.32	39.2 QP	46.0	-6.8	2.00 H	177	42.10	-2.90
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	33.20	33.6 QP	40.0	-6.4	1.00 V	273	47.80	-14.20
2	166.58	38.5 QP	43.5	-5.0	1.50 V	137	51.40	-12.90
3	333.13	40.4 QP	46.0	-5.6	1.50 V	182	51.00	-10.60
4	416.40	41.2 QP	46.0	-4.8	1.50 V	149	50.10	-8.90
5	448.02	41.2 QP	46.0	-4.8	1.00 V	292	49.00	-7.80
6	749.60	37.5 QP	46.0	-8.5	1.50 V	166	39.20	-1.70

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) – 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

BT_LE-GFSK

CHANNEL	TX Channel 0	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		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	2390.00	48.7 PK	74.0	-25.3	1.01 H	216	54.30	-5.60
2	2390.00	37.1 AV	54.0	-16.9	1.01 H	216	42.70	-5.60
3	*2402.00	103.2 PK			1.01 H	216	108.70	-5.50
4	*2402.00	102.4 AV			1.01 H	216	107.90	-5.50
5	4804.00	55.1 PK	74.0	-18.9	1.52 H	322	51.30	3.80
6	4804.00	48.9 AV	54.0	-5.1	1.52 H	322	45.10	3.80

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	2390.00	47.3 PK	74.0	-26.7	1.80 V	234	52.90	-5.60
2	2390.00	36.7 AV	54.0	-17.3	1.80 V	234	42.30	-5.60
3	*2402.00	98.9 PK			1.80 V	234	104.40	-5.50
4	*2402.00	68.4 AV			1.80 V	234	73.90	-5.50
5	4804.00	53.8 PK	74.0	-20.2	1.15 V	173	50.00	3.80
6	4804.00	46.9 AV	54.0	-7.1	1.15 V	173	43.10	3.80

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.

CHANNEL	TX Channel 19	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		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	*2440.00	104.9 PK			1.07 H	230	110.30	-5.40
2	*2440.00	104.3 AV			1.07 H	230	109.70	-5.40
3	4880.00	55.0 PK	74.0	-19.0	1.56 H	322	51.30	3.70
4	4880.00	49.0 AV	54.0	-5.0	1.56 H	322	45.30	3.70
5	7320.00	54.3 PK	74.0	-19.7	1.23 H	37	46.00	8.30
6	7320.00	42.7 AV	54.0	-11.3	1.23 H	37	34.40	8.30
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	*2440.00	97.7 PK			1.83 V	258	103.10	-5.40
2	*2440.00	67.6 AV			1.83 V	258	73.00	-5.40
3	4880.00	53.7 PK	74.0	-20.3	1.10 V	179	50.00	3.70
4	4880.00	46.8 AV	54.0	-7.2	1.10 V	179	43.10	3.70
5	7320.00	53.4 PK	74.0	-20.6	1.65 V	137	45.10	8.30
6	7320.00	42.1 AV	54.0	-11.9	1.65 V	137	33.80	8.30

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.

CHANNEL	TX Channel 39	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		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	*2480.00	104.6 PK			1.03 H	6	109.70	-5.10
2	*2480.00	103.9 AV			1.03 H	6	109.00	-5.10
3	2483.50	49.8 PK	74.0	-24.2	1.03 H	6	54.90	-5.10
4	2483.50	36.9 AV	54.0	-17.1	1.03 H	6	42.00	-5.10
5	4960.00	54.8 PK	74.0	-19.2	1.59 H	321	51.10	3.70
6	4960.00	48.8 AV	54.0	-5.2	1.59 H	321	45.10	3.70
7	7440.00	53.8 PK	74.0	-20.2	1.23 H	27	45.20	8.60
8	7440.00	42.3 AV	54.0	-11.7	1.23 H	27	33.70	8.60
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	*2480.00	98.3 PK			1.79 V	244	103.40	-5.10
2	*2480.00	68.0 AV			1.79 V	244	73.10	-5.10
3	2483.50	47.1 PK	74.0	-26.9	1.79 V	244	52.20	-5.10
4	2483.50	36.8 AV	54.0	-17.2	1.79 V	244	41.90	-5.10
5	4960.00	53.7 PK	74.0	-20.3	1.12 V	168	50.00	3.70
6	4960.00	46.9 AV	54.0	-7.1	1.12 V	168	43.20	3.70
7	7440.00	54.0 PK	74.0	-20.0	1.61 V	151	45.40	8.60
8	7440.00	42.4 AV	54.0	-11.6	1.61 V	151	33.80	8.60

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.

4.3 CONDUCTED OUTPUT POWER MEASUREMENT

4.3.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30dBm)

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 ≥ 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 INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Power meter Anritsu	ML2495A	1014008	Apr. 23, 2013	Apr. 22, 2014
Power sensor Anritsu	MA2411B	0917122	Apr. 23, 2013	Apr. 22, 2014

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 : Apr. 22, 2014

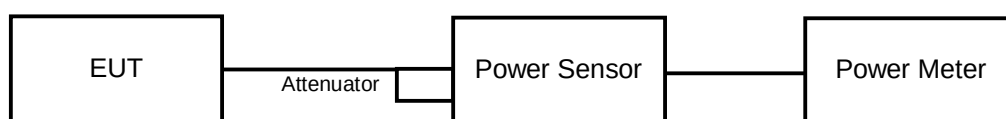
4.3.3 TEST PROCEDURES

The peak / average power sensor was used on the output port of the EUT. A power meter was used to read the response of the peak / average power sensor. Record the peak power level.

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 lowest, middle and highest channel frequencies individually.

4.3.7 TEST RESULTS

FOR PEAK POWER

802.11b

CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	LIMIT (dBm)	PASS/FAIL
1	2412	118.032	20.72	30	PASS
6	2437	170.216	22.31	30	PASS
11	2462	105.682	20.24	30	PASS

802.11g

CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	LIMIT (dBm)	PASS/FAIL
1	2412	203.236	23.08	30	PASS
6	2437	229.615	23.61	30	PASS
11	2462	128.233	21.08	30	PASS

802.11n (HT20)

CHANNEL	FREQUENCY (MHz)	PEAK POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
1	2412	20.71	21.18	248.981	23.96	30	PASS
6	2437	21.76	22.28	319.012	25.04	30	PASS
11	2462	20.14	20.57	217.301	23.37	30	PASS

BT_LE-GFSK

CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	LIMIT (dBm)	PASS/FAIL
0	2402	6.138	7.88	30	PASS
19	2440	6.237	7.95	30	PASS
39	2480	5.808	7.64	30	PASS

FOR AVERAGE POWER

802.11b

CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (mW)	AVERAGE POWER (dBm)
1	2412	54.325	17.35
6	2437	91.622	19.62
11	2462	49.204	16.92

802.11g

CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (mW)	AVERAGE POWER (dBm)
1	2412	31.842	15.03
6	2437	80.538	19.06
11	2462	19.011	12.79

802.11n (HT20)

CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)
		CHAIN 0	CHAIN 1		
1	2412	12.62	13.03	38.372	15.84
6	2437	16.97	17.76	109.478	20.39
11	2462	11.93	12.01	31.481	14.98

BT_LE-GFSK

CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (mW)	AVERAGE POWER (dBm)
0	2402	5.689	7.55
19	2440	5.794	7.63
39	2480	5.420	7.34

5. TEST TYPES AND RESULTS (FOR 5GHz, 5.725~5.850GHz Band)

5.1 CONDUCTED EMISSION MEASUREMENT

5.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dBμV)	
	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.

5.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver LIG NEX1	ER-265	L09068005	July 22, 2013	July 21, 2014
Pulse Limiter SCHWARZBECK	VTSD 9561F	9607	Mar. 06, 2014	Mar. 05, 2015
Line-Impedance Stabilization Network (for EUT) SCHWARZBECK	NSLK8127	8127-522	Sep. 05, 2013	Sep. 04, 2014
Line-Impedance Stabilization Network (for Peripheral)	ENV216	100072	June 06, 2013	June 05, 2014
RF Cable (JYEBAO)	5DFB	CONCAB-003	Mar. 07, 2014	Mar. 06, 2015
50 ohms Terminator	50	EMC-03	Sep. 24, 2013	Sep. 23, 2014
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: Apr. 22, 2014

5.1.3 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 levels under (Limit – 20dB) were not recorded.

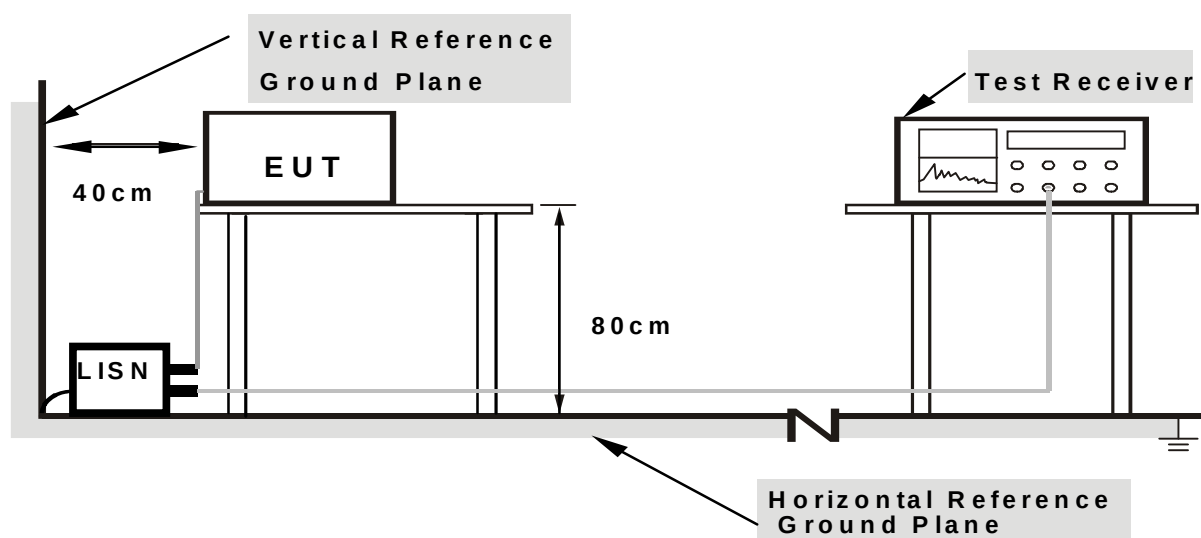
NOTE:

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

5.1.4 DEVIATION FROM TEST STANDARD

No deviation

5.1.5 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.



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5.1.6 EUT OPERATING CONDITIONS

1. Connect the EUT with the support unit 1 (Notebook Computer) which is placed on a testing table.
2. The communication partner run test program "MTool_2.0.0.8.exe" to enable EUT under transmission/receiving condition continuously at specific channel frequency.

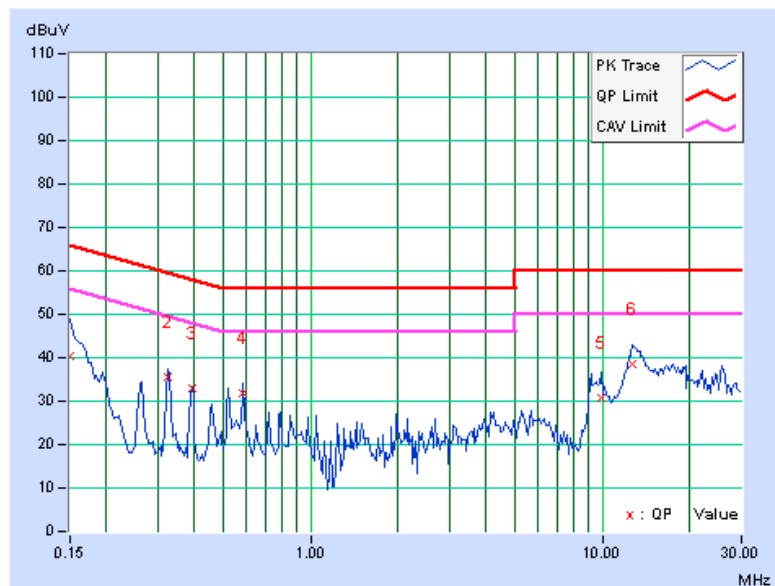
5.1.7 TEST RESULTS

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]	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	0.06	40.34	24.39	40.40	24.45	66.00	56.00	-25.60	-31.55
2	0.32578	0.07	35.38	35.18	35.45	35.25	59.56	49.56	-24.11	-14.31
3	0.39219	0.07	32.79	31.83	32.86	31.90	58.02	48.02	-25.16	-16.12
4	0.58750	0.08	31.65	28.28	31.73	28.36	56.00	46.00	-24.27	-17.64
5	9.90625	0.39	30.30	24.39	30.69	24.78	60.00	50.00	-29.31	-25.22
6	12.75000	0.47	37.91	34.14	38.38	34.61	60.00	50.00	-21.62	-15.39

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

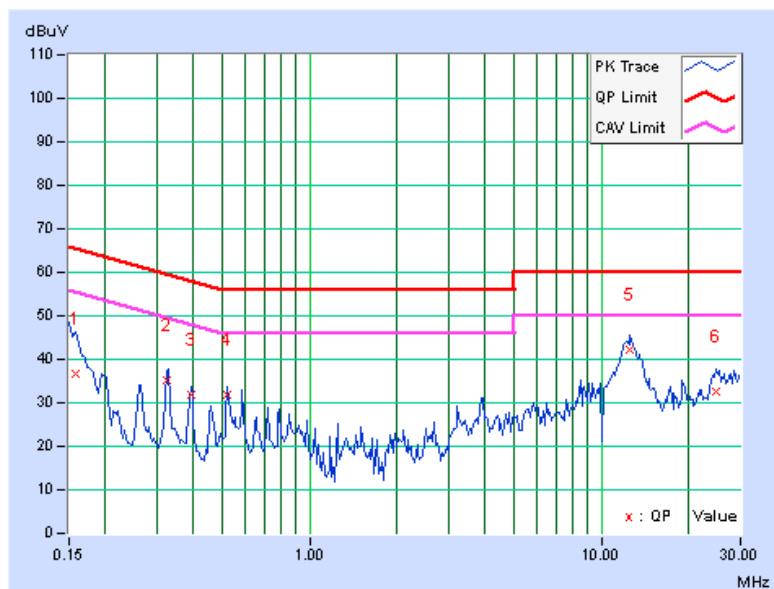


PHASE	Neutral (N)	DETECTOR FUNCTION	Quasi-Peak (QP) / Average (AV)
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	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15781	0.07	36.66	21.66	36.73	21.73	65.58	55.58	-28.85	-33.85
2	0.32578	0.07	35.12	34.41	35.19	34.48	59.56	49.56	-24.37	-15.08
3	0.39219	0.07	31.85	31.03	31.92	31.10	58.02	48.02	-26.10	-16.92
4	0.52500	0.07	31.77	30.26	31.84	30.33	56.00	46.00	-24.16	-15.67
5	12.57813	0.46	41.90	39.82	42.36	40.28	60.00	50.00	-17.64	-9.72
6	24.75000	0.79	31.82	24.46	32.61	25.25	60.00	50.00	-27.39	-24.75

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



5.2 RADIATED AND BANDEGE EMISSION MEASUREMENT

5.2.1 LIMITS OF RADIATED AND BANDEGE EMISSION MEASUREMENT

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 20dB below the highest level of the desired power:

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.



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5.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
MXE EMI Receiver Agilent	N9038A	MY50010156	Jan. 15, 2014	Jan. 14, 2015
Pre-Amplifier Mini-Circuits	ZFL-1000VH2 B	AMP-ZFL-04	Nov. 13, 2013	Nov. 12, 2014
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-361	Feb. 27, 2014	Feb. 26, 2015
RF Cable	NA	CHHCAB_001	Oct. 06, 2013	Oct. 05, 2014
Spectrum Analyzer R&S	FSV40	100964	July 15, 2013	July 14, 2014
Horn_Antenna AISl	AIH.8018	0000220091110	Dec. 06, 2013	Dec. 05, 2014
Pre-Amplifier Agilent	8449B	3008A01923	Oct. 29, 2013	Oct. 28, 2014
RF Cable	NA	RF104-205 RF104-207 RF104-202	Dec. 12, 2013	Dec. 11, 2014
Spectrum Analyzer Agilent	E4446A	MY48250253	Aug. 28, 2013	Aug. 27, 2014
Pre-Amplifier SPACEK LABS	SLKKa-48-6	9K16	Nov. 13, 2013	Nov. 12, 2014
Horn_Antenna SCHWARZBECK	BBHA 9170	9170-424	Oct. 08, 2013	Oct. 07, 2014
Software	ADT_Radiated _V8.7.07	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: Apr. 18 to 21, 2014

5.2.3 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:

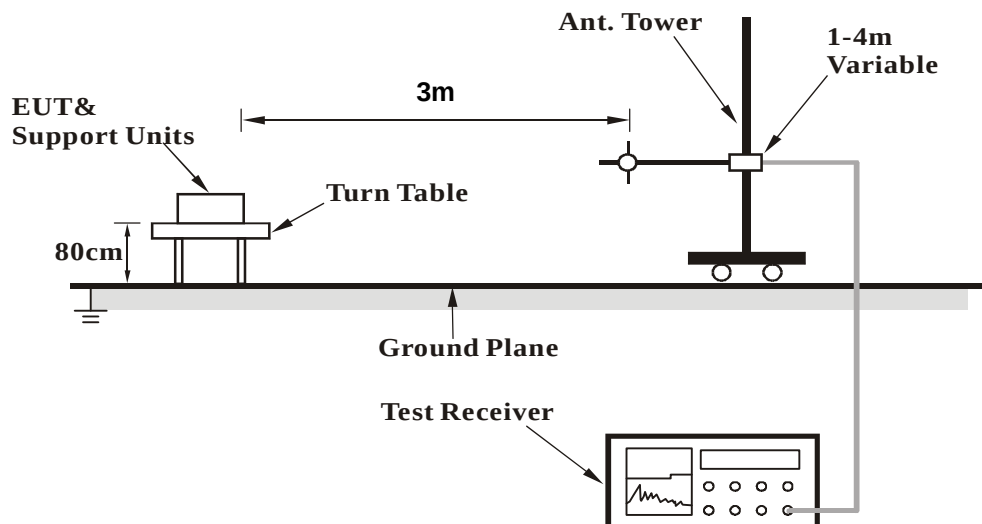
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
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.

5.2.4 DEVIATION FROM TEST STANDARD

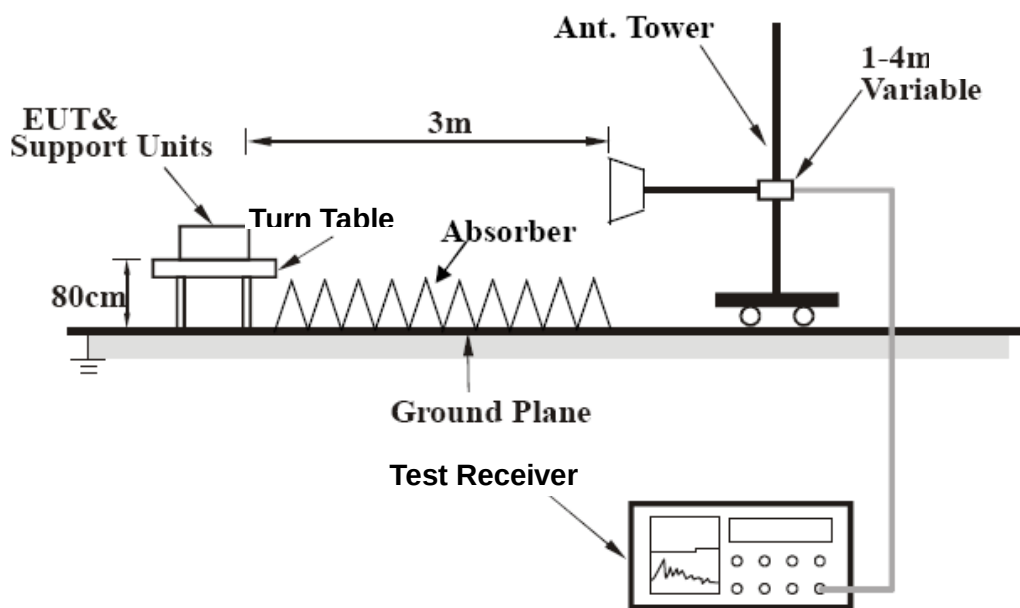
No deviation

5.2.5 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.

5.2.6 EUT OPERATING CONDITIONS

Same as the 5.1.6

5.2.7 TEST RESULTS

BELOW 1GHz WORST-CASE DATA

802.11n (HT40)

CHANNEL	TX Channel 159	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	37.13	30.4 QP	40.0	-9.6	2.00 H	116	44.24	-13.82
2	398.21	41.3 QP	46.0	-4.7	1.00 H	158	50.67	-9.37
3	433.09	40.2 QP	46.0	-5.8	1.50 H	218	48.30	-8.06
4	499.72	40.4 QP	46.0	-5.6	1.50 H	224	47.35	-6.92
5	533.04	39.9 QP	46.0	-6.1	1.50 H	227	46.27	-6.34
6	716.32	40.2 QP	46.0	-5.8	1.00 H	56	43.16	-2.96
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	33.20	33.7 QP	40.0	-6.3	1.00 V	223	47.90	-14.16
2	166.57	38.7 QP	43.5	-4.8	1.20 V	246	51.66	-12.94
3	333.13	40.7 QP	46.0	-5.3	1.00 V	256	51.34	-10.62
4	416.41	41.4 QP	46.0	-4.6	2.00 V	118	50.23	-8.80
5	448.02	41.2 QP	46.0	-4.8	1.00 V	136	49.01	-7.79
6	749.60	37.8 QP	46.0	-8.3	1.00 V	54	39.39	-1.64

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 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	5443.61	57.1 PK	74.0	-16.9	1.67 H	196	52.40	4.70
2	5443.61	48.1 AV	54.0	-5.9	1.67 H	196	43.40	4.70
3	*5745.00	109.9 PK			1.68 H	212	105.00	4.90
4	*5745.00	100.5 AV			1.68 H	212	95.60	4.90
5	11490.00	57.6 PK	74.0	-16.4	1.85 H	195	47.00	10.60
6	11490.00	44.9 AV	54.0	-9.1	1.85 H	195	34.30	10.60

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	5443.61	60.4 PK	74.0	-13.6	1.00 V	195	55.70	4.70
2	5443.61	51.1 AV	54.0	-2.9	1.00 V	195	46.40	4.70
3	*5745.00	110.6 PK			1.81 V	110	105.70	4.90
4	*5745.00	102.3 AV			1.81 V	110	97.40	4.90
5	11490.00	58.0 PK	74.0	-16.0	1.50 V	207	47.40	10.60
6	11490.00	45.1 AV	54.0	-8.9	1.50 V	207	34.50	10.60

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.



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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	5353.19	57.2 PK	74.0	-16.8	1.54 H	188	52.80	4.40
2	5353.19	48.3 AV	54.0	-5.7	1.54 H	188	43.90	4.40
3	*5785.00	109.2 PK			1.67 H	192	104.30	4.90
4	*5785.00	100.1 AV			1.67 H	192	95.20	4.90
5	11570.00	57.5 PK	74.0	-16.5	1.89 H	191	46.80	10.70
6	11570.00	45.1 AV	54.0	-8.9	1.89 H	191	34.40	10.70
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	5353.19	57.9 PK	74.0	-16.1	1.77 V	40	53.50	4.40
2	5353.19	47.6 AV	54.0	-6.4	1.77 V	40	43.20	4.40
3	*5785.00	110.1 PK			1.76 V	355	105.20	4.90
4	*5785.00	102.3 AV			1.76 V	355	97.40	4.90
5	11570.00	57.2 PK	74.0	-16.8	1.48 V	195	46.50	10.70
6	11570.00	44.6 AV	54.0	-9.4	1.48 V	195	33.90	10.70

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) – 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.

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	5390.65	56.9 PK	74.0	-17.1	1.56 H	184	52.20	4.70
2	5390.65	48.5 AV	54.0	-5.5	1.56 H	184	43.80	4.70
3	*5825.00	108.4 PK			1.66 H	203	103.30	5.10
4	*5825.00	99.6 AV			1.66 H	203	94.50	5.10
5	11650.00	58.2 PK	74.0	-15.8	1.85 H	190	47.60	10.60
6	11650.00	45.6 AV	54.0	-8.4	1.85 H	190	35.00	10.60
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	5390.65	59.1 PK	74.0	-14.9	1.74 V	41	54.40	4.70
2	5390.65	47.8 AV	54.0	-6.2	1.74 V	41	43.10	4.70
3	*5825.00	110.5 PK			1.74 V	39	105.40	5.10
4	*5825.00	101.9 AV			1.74 V	39	96.80	5.10
5	11650.00	56.1 PK	74.0	-17.9	1.39 V	206	45.50	10.60
6	11650.00	43.6 AV	54.0	-10.4	1.39 V	206	33.00	10.60

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.



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802.11n (HT20)

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	5448.56	57.3 PK	74.0	-16.7	1.56 H	157	52.60	4.70
2	5448.56	48.9 AV	54.0	-5.1	1.56 H	157	44.20	4.70
3	*5745.00	108.1 PK			1.61 H	183	103.20	4.90
4	*5745.00	99.5 AV			1.61 H	183	94.60	4.90
5	11490.00	57.8 PK	74.0	-16.2	1.81 H	189	47.20	10.60
6	11490.00	45.3 AV	54.0	-8.7	1.81 H	189	34.70	10.60
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	5448.56	64.3 PK	74.0	-9.7	1.39 V	98	59.60	4.70
2	5448.56	53.0 AV	54.0	-1.0	1.39 V	98	48.30	4.70
3	*5745.00	110.4 PK			1.39 V	98	105.50	4.90
4	*5745.00	100.2 AV			1.39 V	98	95.30	4.90
5	11490.00	58.0 PK	74.0	-16.0	1.53 V	208	47.40	10.60
6	11490.00	45.1 AV	54.0	-8.9	1.53 V	208	34.50	10.60

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.

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	*5785.00	107.2 PK			1.59 H	178	102.30	4.90
2	*5785.00	98.7 AV			1.59 H	178	93.80	4.90
3	11570.00	57.7 PK	74.0	-16.3	1.78 H	176	47.00	10.70
4	11570.00	45.4 AV	54.0	-8.6	1.78 H	176	34.70	10.70
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	*5785.00	110.9 PK			1.44 V	91	106.00	4.90
2	*5785.00	100.6 AV			1.44 V	91	95.70	4.90
3	11570.00	57.9 PK	74.0	-16.1	1.51 V	212	47.20	10.70
4	11570.00	44.9 AV	54.0	-9.1	1.51 V	212	34.20	10.70

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) – 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.

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	108.1 PK			1.55 H	174	103.00	5.10
2	*5825.00	99.4 AV			1.55 H	174	94.30	5.10
3	11650.00	57.8 PK	74.0	-16.2	1.84 H	173	47.20	10.60
4	11650.00	45.3 AV	54.0	-8.7	1.84 H	173	34.70	10.60
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	110.7 PK			1.43 V	93	105.60	5.10
2	*5825.00	100.3 AV			1.43 V	93	95.20	5.10
3	11650.00	57.7 PK	74.0	-16.3	1.53 V	195	47.10	10.60
4	11650.00	45.0 AV	54.0	-9.0	1.53 V	195	34.40	10.60

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.

802.11n (HT40)

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	5452.36	61.9 PK	74.0	-12.1	1.61 H	175	57.30	4.60
2	5452.36	49.2 AV	54.0	-4.8	1.61 H	175	44.60	4.60
3	*5755.00	104.2 PK			1.57 H	180	99.30	4.90
4	*5755.00	95.8 AV			1.57 H	180	90.90	4.90
5	11510.00	57.3 PK	74.0	-16.7	1.84 H	171	46.60	10.70
6	11510.00	45.4 AV	54.0	-8.6	1.84 H	171	34.70	10.70
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	5452.36	62.5 PK	74.0	-11.5	1.40 V	125	57.90	4.60
2	5452.36	49.9 AV	54.0	-4.1	1.40 V	125	45.30	4.60
3	*5755.00	107.2 PK			1.57 V	113	102.30	4.90
4	*5755.00	95.1 AV			1.57 V	113	90.20	4.90
5	11510.00	57.8 PK	74.0	-16.2	1.50 V	205	47.10	10.70
6	11510.00	45.0 AV	54.0	-9.0	1.50 V	205	34.30	10.70

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) – 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.

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	*5795.00	102.9 PK			1.59 H	172	98.10	4.80
2	*5795.00	94.5 AV			1.59 H	172	89.70	4.80
3	11590.00	57.8 PK	74.0	-16.2	1.84 H	152	47.10	10.70
4	11590.00	45.8 AV	54.0	-8.2	1.84 H	152	35.10	10.70
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	*5795.00	107.3 PK			1.57 V	120	102.50	4.80
2	*5795.00	95.0 AV			1.57 V	120	90.20	4.80
3	11590.00	57.4 PK	74.0	-16.6	1.54 V	203	46.70	10.70
4	11590.00	44.8 AV	54.0	-9.2	1.54 V	203	34.10	10.70

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) – 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.

5.3 CONDUCTED OUTPUT POWER MEASUREMENT

5.3.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT

For systems using digital modulation in the 5725 –5850 MHz band: 1 Watt (30dBm)

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 ≥ 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.

5.3.2 INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Power meter Anritsu	ML2495A	1014008	Apr. 23, 2013	Apr. 22, 2014
Power sensor Anritsu	MA2411B	0917122	Apr. 23, 2013	Apr. 22, 2014

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 : Apr. 22, 2014

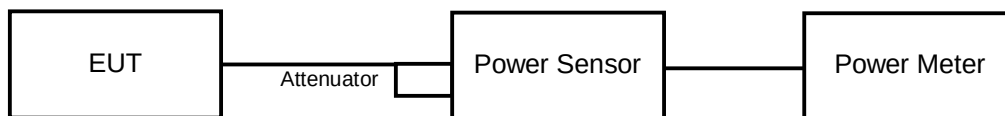
5.3.3 TEST PROCEDURES

The peak / average power sensor was used on the output port of the EUT. A power meter was used to read the response of the peak / average power sensor. Record the peak power level.

5.3.4 DEVIATION FROM TEST STANDARD

No deviation.

5.3.5 TEST SETUP



5.3.6 EUT OPERATING CONDITIONS

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

5.3.7 TEST RESULTS

FOR PEAK POWER

802.11a

CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	LIMIT (dBm)	PASS/FAIL
149	5745	137.404	21.38	30	PASS
157	5785	133.352	21.25	30	PASS
165	5825	126.183	21.01	30	PASS

802.11n (HT20)

CHANNEL	FREQUENCY (MHz)	PEAK POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
149	5745	18.15	19.85	161.918	22.09	30	PASS
157	5785	18.24	19.27	151.209	21.80	30	PASS
165	5825	18.08	19.66	156.739	21.95	30	PASS

802.11n (HT40)

CHANNEL	FREQUENCY (MHz)	PEAK POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
151	5755	18.12	19.64	156.908	21.96	30	PASS
159	5795	18.54	19.76	166.074	22.20	30	PASS

FOR AVERAGE POWER

802.11a

CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (mW)	AVERAGE POWER (dBm)
149	5745	104.954	20.21
157	5785	102.329	20.10
165	5825	99.541	19.98

802.11n (HT20)

CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)
		CHAIN 0	CHAIN 1		
149	5745	17.08	17.24	104.016	20.17
157	5785	16.81	17.40	102.927	20.13
165	5825	16.78	17.53	104.267	20.18

802.11n (HT40)

CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)
		CHAIN 0	CHAIN 1		
151	5755	16.87	17.34	102.841	20.12
159	5795	16.75	17.17	99.434	19.98

6. PHOTOGRAPHS OF THE TEST CONFIGURATION

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



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7. 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:

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



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8. 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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