FCC TEST REPORT
(WLAN 15.247)

REPORT NO.:	RF140606E01
MODEL NO.:	T77H526
FCC ID:	MCLT77H526
RECEIVED:	June 06, 2014
TESTED:	June 16 to July 01, 2014
ISSUED:	July 09, 2014

APPLICANT:	Hon Hai PRECISION IND.CO.,LTD
ADDRESS:	5F-1, Hsin-An Road, Hsinchu, Science Industrial Park, Taiwan, R.O.C.

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Testing Laboratory
2022

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF140606E01	Original release	July 09, 2014

1. CERTIFICATION

PRODUCT:	802.11ac+802.11abgn + BT4.0+BT3.0+BT2.1/EDR Module
BRAND NAME:	FOXCONN
MODEL NO.:	T77H526
TEST SAMPLE:	ENGINEERING SAMPLE
APPLICANT:	Hon Hai PRECISION IND.CO.,LTD
TESTED:	June 16 to July 01, 2014
STANDARDS:	**FCC Part 15, Subpart C (Section 15.247)** ANSI C63.10-2009

The above equipment (Model: T77H526) 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:** *July 09, 2014*
(Lori Chung, Specialist)

APPROVED BY : _____ , **DATE:** *July 09, 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 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 -23.22dB at 0.36875MHz
15.247(d) 15.209	Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -0.7dB at 4874.00MHz
15.247(d)	Band Edge Measurement	PASS	Meet the requirement of limit.
15.247(a)(2)	6dB bandwidth	PASS	Meet the requirement of limit.
15.247(b)	Conducted Output power	PASS	Meet the requirement of limit.
15.247(e)	Power Spectral Density	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	Antenna connector is IPEX not a standard connector.

NOTE: 1. For WLAN: The EUT was operating in 2400 ~ 2483.5MHz, 5.15~5.35GHz, 5.47~5.725GHz and 5.725~5.850GHz frequencies band. This report was recorded the RF parameters including 2400 ~ 2483.5MHz. For the 5.15~5.35GHz, 5.47~5.725GHz and 5.725~5.850GHz RF parameters was recorded in another test report.

2.1 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

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

Measurement	Value
Conducted emissions	2.86 dB
Radiated emissions (30MHz-1GHz)	5.43 dB
Radiated emissions (1GHz -6GHz)	3.65 dB
Radiated emissions (6GHz -18GHz)	3.88 dB
Radiated emissions (18GHz -40GHz)	4.11 dB

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT (WLAN)

PRODUCT	802.11ac+802.11abgn + BT4.0+BT3.0+BT2.1/EDR Module
MODEL NO.	T77H526
POWER SUPPLY	5Vdc (from host equipment)
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode only
MODULATION TECHNOLOGY	DSSS,OFDM
TRANSFER RATE	802.11b: up to 11Mbps 802.11a / g: up to 54Mbps 802.11n: up to 300Mbps 802.11ac: up to 866.7Mbps
OPERATING FREQUENCY	**For 15.407** 5.18 ~ 5.24GHz, 5.26 ~ 5.32GHz, 5.50 ~ 5.70GHz, 5.745 ~ 5.825GHz
	For 15.247 2.412 ~ 2.462GHz
NUMBER OF CHANNEL	**For 15.407** 24 for 802.11a, 802.11n (HT20), 802.11ac (VHT20) 11 for 802.11n (HT40), 802.11ac (VHT40) 5 for 802.11ac (VHT80)
	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: 56.013mW 802.11ac (VHT20): 57.161mW 802.11ac (VHT40): 51.021mW 802.11ac (VHT80): 50.873mW **For 15.247** 802.11b: 113.018mW 802.11g: 606.691mW 802.11n (HT20): 603.594mW 802.11n (HT40): 472.94mW
ANTENNA TYPE	Please see NOTE
DATA CABLE	NA
I/O PORTS	Refer to user's manual
ASSOCIATED DEVICES	NA

Note:

1. There are Bluetooth 4.0 and WLAN technology used for the EUT.
2. For WLAN, 2.4GHz and 5GHz technology can not transmit at same time.
3. WLAN and Bluetooth technology can transmit at same time.
4. Radiated emissions of the simultaneous operation (WLAN & Bluetooth) has been evaluated and no non-compliance was found.
5. The antennas provided to the EUT, please refer to the following table:

Antenna No.	Transmitter Circuit	Brand	Model	Antenna Gain(dBi) <include cable loss>	Cable Loss (dB)	Frequency range (MHz to MHz)	Antenna Type	Connecter Type	Cable Length (mm)
1	Chain (0)	Wistron Neweb Corporation	DC33001KT00 (Main port)	1.54	1.38	2400~2500	PIFA	I-PEX	363
				1.26	1.98	5150~5350			
				0.57	2.04	5470~5725			
				1.23	2.08	5725~5850			
2	Chain (1)	Wistron Neweb Corporation	DC33001KT10 (Aux port)	0.63	2.13	2400~2500	PIFA	I-PEX	593
				0.16	3.11	5150~5350			
				0.35	3.21	5470~5725			
				1.84	3.27	5725~5850			

6. The EUT incorporates a MIMO function without beamforming.

MODULATION MODE	DATA RATE (MCS)	TX & RX CONFIGURATION	
802.11a	6 ~ 54Mbps	2TX	2RX
802.11b	1 ~ 11Mbps	2TX	2RX
802.11g	6 ~ 54Mbps	2TX	2RX
802.11n (HT20)	MCS 0~7	2TX	2RX
	MCS 8~15	2TX	2RX
802.11n (HT40)	MCS 0~7	2TX	2RX
	MCS 8~15	2TX	2RX
802.11ac (VHT20) (5GHz)	MCS0~8 (256QAM) Nss= 1	2TX	2RX
	MCS0~8 (256QAM) Nss= 2	2TX	2RX
802.11ac (VHT40) (5GHz)	MCS0~9 (256QAM) Nss= 1	2TX	2RX
	MCS0~9 (256QAM) Nss= 2	2TX	2RX
802.11ac (VHT80) (5GHz)	MCS0~9 (256QAM) Nss= 1	2TX	2RX
	MCS0~9 (256QAM) Nss= 2	2TX	2RX

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

7. 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 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		

7 channels are provided for 802.11n (HT40):

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
3	2422MHz	7	2442MHz
4	2427MHz	8	2447MHz
5	2432MHz	9	2452MHz
6	2437MHz		

3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

EUT CONFIGURE MODE	APPLICABLE TO					DESCRIPTION
	PLC	RE < 1G	RE ≥ 1G	APCM	OB	
-	√	√	√	√	√	-

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

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

OB: Conducted Out-Band Emission Measurement

NOTE: 1. The EUT's antenna (PIFA) had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **Y-plane**

POWER LINE CONDUCTED EMISSION TEST:

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

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11g	1 to 11	6	OFDM	BPSK	6

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)
802.11g	1 to 11	6	OFDM	BPSK	6

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
802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
802.11n (HT40)	3 to 9	3, 6, 9	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)
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	13.5

CONDUCTED OUT-BAND EMISSION 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
802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	13.5

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER (SYSTEM)	TESTED BY
PLC	25deg. C, 70%RH	120Vac, 60Hz	Mike Hsieh
RE<1G	25deg. C, 65%RH	120Vac, 60Hz	Nelson Teng
RE≥1G	22deg. C, 67%RH 26deg. C, 75%RH	120Vac, 60Hz	Tim Ho Gary Cheng
APCM	25deg. C, 60%RH	120Vac, 60Hz	Nelson Teng
OB	25deg. C, 60%RH	120Vac, 60Hz	Nelson Teng

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

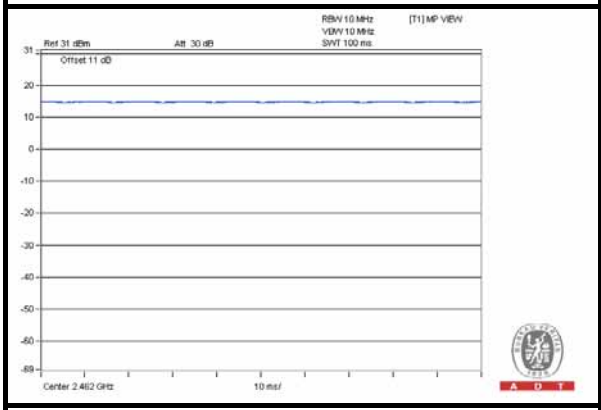
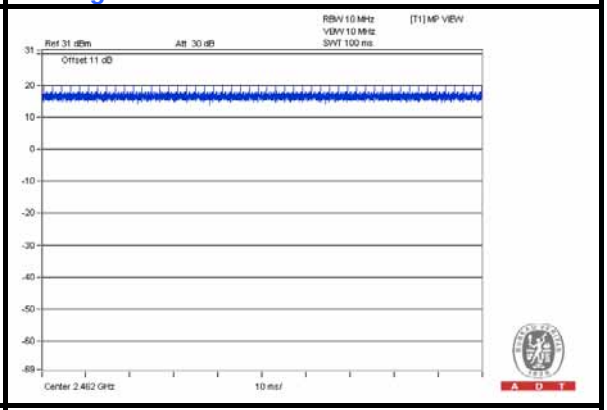
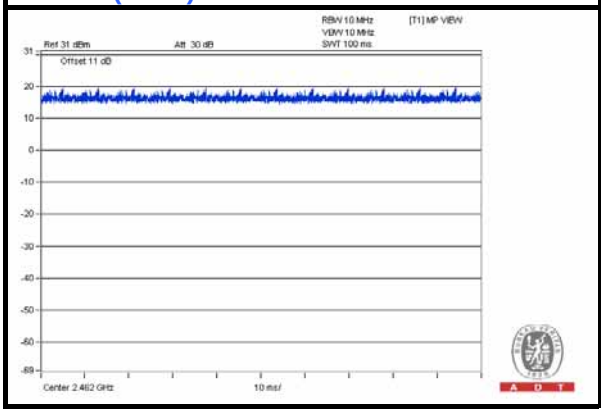
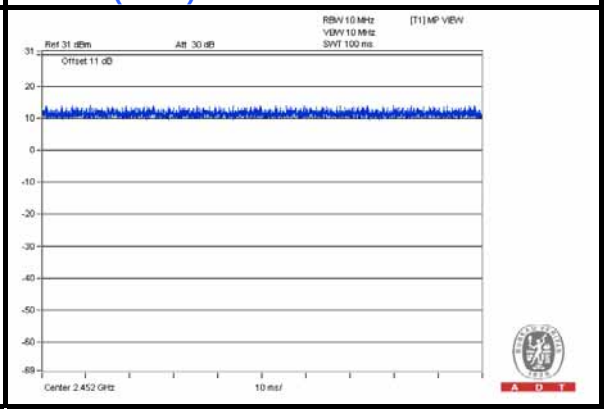
662911 D01 Multiple Transmitter Output v02r01

ANSI C63.10-2009

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

3.4 DUTY CYCLE OF TEST SIGNAL

Duty cycle of test signal is 100 %, duty factor is not required.

802.11b	802.11g
	
802.11n (HT20)	**802.11n (HT40)**
	

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.

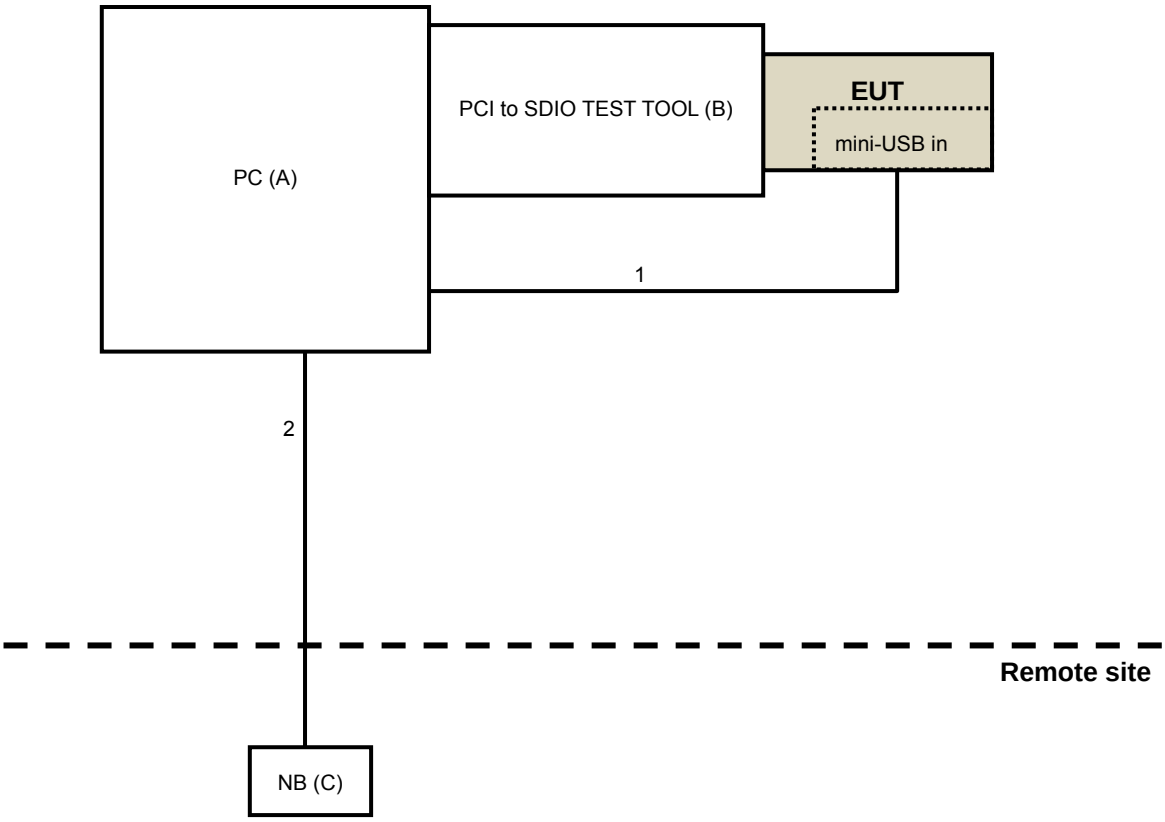
No.	Product	Brand	Model No.	Serial No.	FCC ID	Remark
A	PC	DELL	DCNE	HRJB32S	FCC DoC	Provided by Lab
B	PCI to SDIO TEST TOOL	Foxconn	NA	NA	NA	Supplied by client
C	NB	DELL	PP32LA	DSLB32S	FCC DoC	Provided by Lab

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.	mini USB to USB	1	1	No	0	Provided by Lab
2.	UTP RJ-45	1	10	No	0	Provided by Lab

3.6 CONFIGURATION OF SYSTEM UNDER 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 (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 ROHDE & SCHWARZ	ESCS 30	100375	Apr. 29, 2014	Apr. 28, 2015
Line-Impedance Stabilization Network (for EUT) SCHWARZBECK	NSLK8127	8127-522	Sep. 12, 2013	Sep. 11, 2014
Line-Impedance Stabilization Network (for Peripheral)	ENV216	100071	Nov. 13, 2013	Nov. 12, 2014
RF Cable (JYEBAO)	5DFB	COCCAB-001	Mar. 10 , 2014	Mar. 09, 2015
50 ohms Terminator	N/A	EMC-03	Sep. 24, 2013	Sep. 23, 2014
50 ohms Terminator	N/A	EMC-02	Oct. 01, 2013	Sep. 30, 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: June 27, 2014

4.1.3 TEST PROCEDURES

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

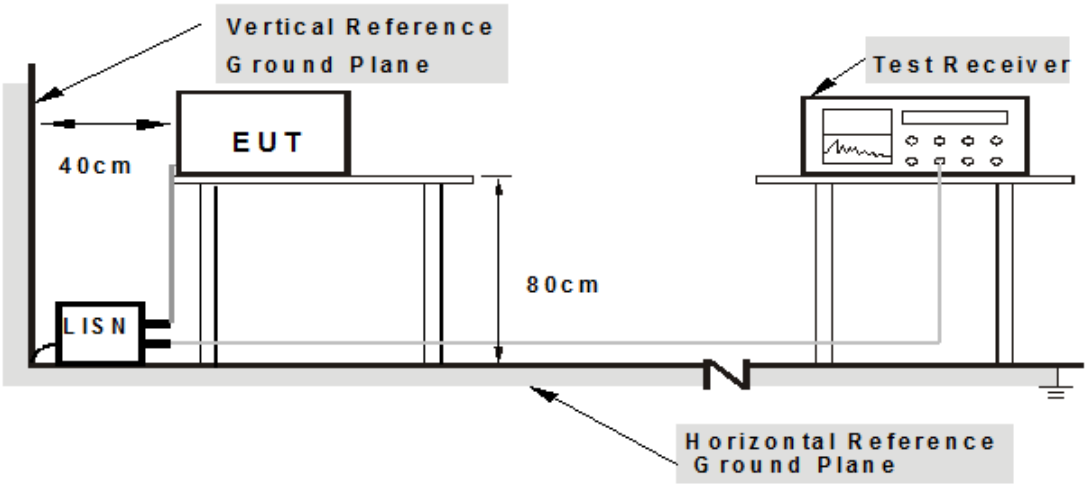
NOTE:

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

4.1.4 DEVIATION FROM TEST STANDARD

No deviation

4.1.5 TEST SETUP



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

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

4.1.6 EUT OPERATING CONDITIONS

1. Connect the EUT with the support unit A (PC) which is placed on a testing table.
2. The communication partner run test program “DutApiMimoBtFmBrdigeUart.exe [WIN-X86-2.1.0.44-14.2.201.p98]” to enable EUT under transmission/receiving condition continuously at specific channel frequency.

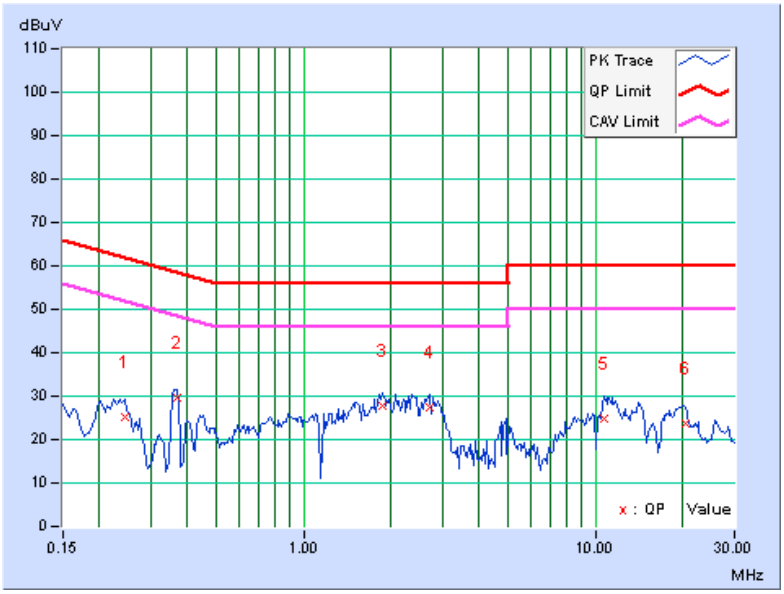
4.1.7 TEST RESULTS

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

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.24375	0.07	25.23	20.37	25.30	20.44	61.97	51.97	-36.66	-31.52
2	**0.36875**	**0.09**	**29.42**	**25.22**	**29.51**	**25.31**	**58.53**	**48.53**	**-29.02**	**-23.22**
3	1.87500	0.17	27.76	19.99	27.93	20.16	56.00	46.00	-28.07	-25.84
4	2.69141	0.20	27.20	18.76	27.40	18.96	56.00	46.00	-28.60	-27.04
5	10.76563	0.47	24.42	17.71	24.89	18.18	60.00	50.00	-35.11	-31.82
6	20.39063	0.72	23.14	18.28	23.86	19.00	60.00	50.00	-36.14	-31.00

REMARKS:

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

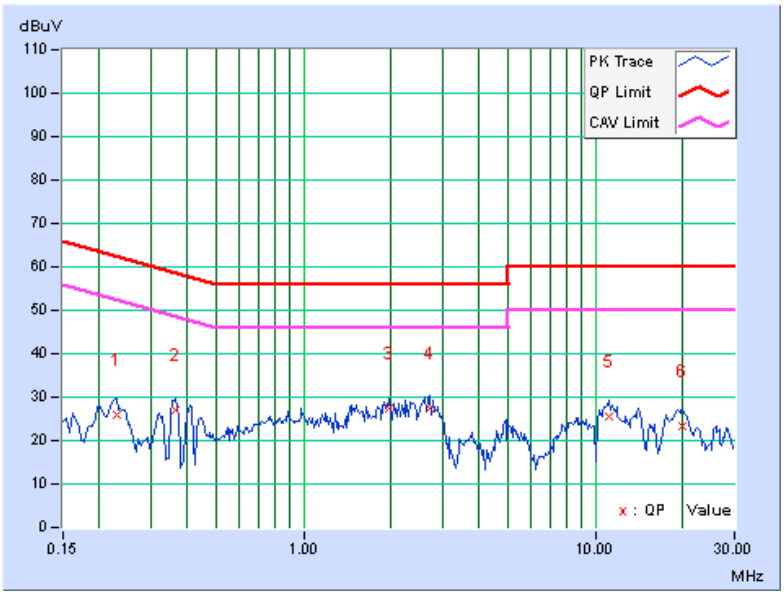


PHASE	Neutral (N)	DETECTOR FUNCTION	Quasi-Peak (QP) / Average (AV)

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.22812	0.07	25.88	20.05	25.95	20.12	62.52	52.52	-36.57	-32.40
2	0.36484	0.09	26.93	24.81	27.02	24.90	58.62	48.62	-31.60	-23.72
3	1.96094	0.18	27.29	20.38	27.47	20.56	56.00	46.00	-28.53	-25.44
4	2.71875	0.21	27.02	17.97	27.23	18.18	56.00	46.00	-28.77	-27.82
5	11.12500	0.48	25.26	18.81	25.74	19.29	60.00	50.00	-34.26	-30.71
6	19.79688	0.70	22.47	17.14	23.17	17.84	60.00	50.00	-36.83	-32.16

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 under any condition of modulation.

4.2.2 TEST INSTRUMENTS

For Below 1GHz test:

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: June 16, 2014

For Above 1GHz test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
MXE EMI Receiver Agilent	N9038A	MY51210105	Jan. 21,2014	Jan. 20,2015
Pre-Amplifier Mini-Circuits	ZFL-1000VH2 B	AMP-ZFL-03	Nov. 13, 2013	Nov. 12, 2014
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-360	Feb. 26, 2014	Feb. 25, 2015
RF Cable	NA	CHGCAB_001	Oct. 05, 2013	Oct. 04, 2014
Spectrum Analyzer R&S	FSV40	100964	July 15, 2013	July 14, 2014
Horn_Antenna AISI	AIH.8018	0000320091110	Nov. 18, 2013	Nov. 17, 2014
Pre-Amplifier Agilent	8449B	3008A01923	Oct. 29, 2013	Oct. 28, 2014
RF Cable	NA	RF104-201 RF104-203 RF104-204	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. 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: June 28, 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:

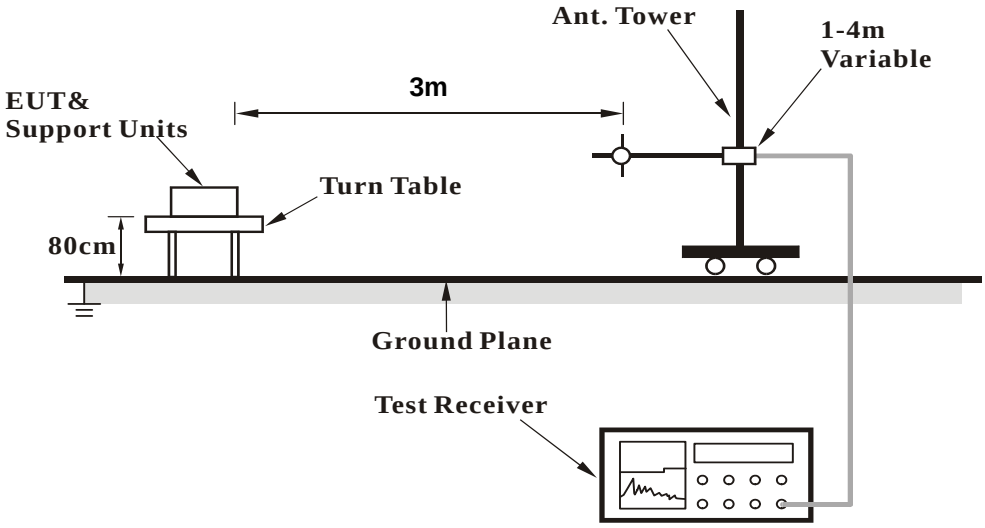
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

4.2.4 DEVIATION FROM TEST STANDARD

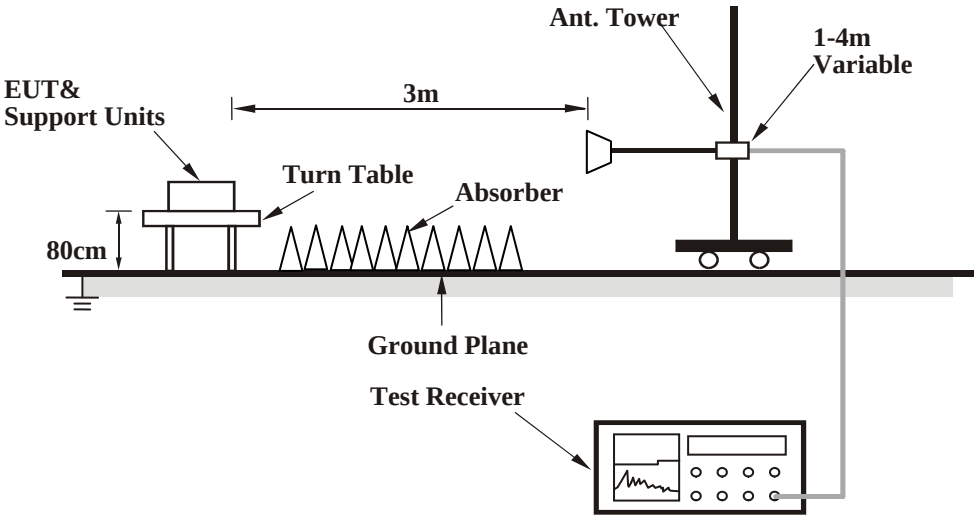
No deviation

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

BELOW 1GHz WORST-CASE DATA

802.11g

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	120.02	32.7 QP	43.5	-10.8	1.50 H	224	47.33	-14.62
2	133.26	40.5 QP	43.5	-3.0	2.00 H	132	53.96	-13.49
3	166.53	40.4 QP	43.5	-3.1	1.50 H	137	53.37	-12.93
4	266.49	42.9 QP	46.0	-3.1	1.00 H	146	55.95	-13.04
5	331.91	39.7 QP	46.0	-6.3	1.00 H	242	50.30	-10.61
6	399.81	35.4 QP	46.0	-10.6	2.00 H	360	44.76	-9.32
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	133.21	40.1 QP	43.5	-3.4	1.00 V	270	53.61	-13.50
2	156.92	36.3 QP	43.5	-7.3	1.00 V	246	48.76	-12.51
3	166.53	40.4 QP	43.5	-3.1	2.00 V	67	53.32	-12.93
4	266.49	42.9 QP	46.0	-3.2	1.50 V	359	55.89	-13.04
5	283.17	35.7 QP	46.0	-10.3	2.00 V	0	47.95	-12.29
6	331.86	36.7 QP	46.0	-9.3	1.50 V	206	47.35	-10.61

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

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	2386.00	47.1 PK	74.0	-26.9	1.00 H	355	49.59	-2.49
2	2386.00	36.4 AV	54.0	-17.6	1.00 H	355	38.89	-2.49
3	*2412.00	105.5 PK			1.00 H	355	107.87	-2.37
4	*2412.00	102.9 AV			1.00 H	355	105.27	-2.37
5	4824.00	58.6 PK	74.0	-15.4	1.08 H	201	52.89	5.71
6	4824.00	50.6 AV	54.0	-3.4	1.08 H	201	44.89	5.71
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	2386.00	46.6 PK	74.0	-27.4	1.52 V	124	49.09	-2.49
2	2386.00	33.8 AV	54.0	-20.2	1.52 V	124	36.29	-2.49
3	*2412.00	99.5 PK			1.52 V	124	101.87	-2.37
4	*2412.00	96.8 AV			1.52 V	124	99.17	-2.37
5	4824.00	55.3 PK	74.0	-18.7	1.35 V	277	49.59	5.71
6	4824.00	53.2 AV	54.0	-0.8	1.35 V	277	47.49	5.71

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

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	53.6 PK	74.0	-20.4	1.00 H	347	56.07	-2.47
2	2390.00	33.2 AV	54.0	-20.8	1.00 H	347	35.67	-2.47
3	*2437.00	106.2 PK			1.00 H	347	108.45	-2.25
4	*2437.00	103.8 AV			1.00 H	347	106.05	-2.25
5	2483.50	48.3 PK	74.0	-25.7	1.00 H	347	50.33	-2.03
6	2483.50	35.1 AV	54.0	-18.9	1.00 H	347	37.13	-2.03
7	4874.00	59.1 PK	74.0	-14.9	1.05 H	211	53.20	5.90
8	4874.00	50.9 AV	54.0	-3.1	1.05 H	211	45.00	5.90
9	7311.00	51.4 PK	74.0	-22.6	1.34 H	255	38.23	13.17
10	7311.00	36.5 AV	54.0	-17.5	1.34 H	255	23.33	13.17

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	51.4 PK	74.0	-22.6	1.49 V	134	53.87	-2.47
2	2390.00	31.6 AV	54.0	-22.4	1.49 V	134	34.07	-2.47
3	*2437.00	99.7 PK			1.49 V	134	101.95	-2.25
4	*2437.00	97.1 AV			1.49 V	134	99.35	-2.25
5	2483.50	46.9 PK	74.0	-27.1	1.49 V	134	48.93	-2.03
6	2483.50	33.2 AV	54.0	-20.8	1.49 V	134	35.23	-2.03
7	4874.00	55.6 PK	74.0	-18.4	1.34 V	275	49.70	5.90
8	**4874.00**	**53.3 AV**	**54.0**	**-0.7**	**1.34 V**	**275**	**47.40**	**5.90**
9	7311.00	53.1 PK	74.0	-20.9	1.00 V	163	39.93	13.17
10	7311.00	38.8 AV	54.0	-15.2	1.00 V	163	25.63	13.17

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	107.2 PK			1.00 H	321	109.34	-2.14
2	*2462.00	104.7 AV			1.00 H	321	106.84	-2.14
3	2483.50	49.8 PK	74.0	-24.2	1.00 H	321	51.83	-2.03
4	2483.50	39.5 AV	54.0	-14.5	1.00 H	321	41.53	-2.03
5	4924.00	59.4 PK	74.0	-14.6	1.05 H	214	53.29	6.11
6	4924.00	51.0 AV	54.0	-3.0	1.05 H	214	44.89	6.11
7	7386.00	51.4 PK	74.0	-22.6	1.30 H	256	38.22	13.18
8	7386.00	36.5 AV	54.0	-17.5	1.30 H	256	23.32	13.18
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	100.4 PK			1.51 V	134	102.54	-2.14
2	*2462.00	97.6 AV			1.51 V	134	99.74	-2.14
3	2483.50	47.9 PK	74.0	-26.1	1.51 V	134	49.93	-2.03
4	2483.50	37.6 AV	54.0	-16.4	1.51 V	134	39.63	-2.03
5	4924.00	56.2 PK	74.0	-17.8	1.07 V	272	50.09	6.11
6	4924.00	53.1 AV	54.0	-0.9	1.07 V	272	46.99	6.11
7	7386.00	53.9 PK	74.0	-20.1	1.00 V	157	40.72	13.18
8	7386.00	39.3 AV	54.0	-14.7	1.00 V	157	26.12	13.18

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	72.3 PK	74.0	-1.7	1.00 H	325	74.77	-2.47
2	2390.00	51.6 AV	54.0	-2.4	1.00 H	325	54.07	-2.47
3	*2412.00	106.2 PK			1.00 H	325	108.57	-2.37
4	*2412.00	97.1 AV			1.00 H	325	99.47	-2.37
5	4824.00	53.6 PK	74.0	-20.4	1.05 H	214	47.89	5.71
6	4824.00	45.3 AV	54.0	-8.7	1.05 H	214	39.59	5.71
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	70.8 PK	74.0	-3.2	1.47 V	130	73.27	-2.47
2	2390.00	49.3 AV	54.0	-4.7	1.47 V	130	51.77	-2.47
3	*2412.00	100.6 PK			1.47 V	130	102.97	-2.37
4	*2412.00	91.4 AV			1.47 V	130	93.77	-2.37
5	4824.00	50.3 PK	74.0	-23.7	1.08 V	272	44.59	5.71
6	4824.00	47.4 AV	54.0	-6.6	1.08 V	272	41.69	5.71

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	57.7 PK	74.0	-16.3	1.00 H	356	60.17	-2.47
2	2390.00	37.4 AV	54.0	-16.6	1.00 H	356	39.87	-2.47
3	*2437.00	110.4 PK			1.00 H	356	112.65	-2.25
4	*2437.00	100.9 AV			1.00 H	356	103.15	-2.25
5	2483.50	59.7 PK	74.0	-14.3	1.00 H	356	61.73	-2.03
6	2483.50	37.0 AV	54.0	-17.0	1.00 H	356	39.03	-2.03
7	4874.00	56.6 PK	74.0	-17.4	1.05 H	220	50.70	5.90
8	4874.00	48.3 AV	54.0	-5.7	1.05 H	220	42.40	5.90
9	7311.00	50.3 PK	74.0	-23.7	1.30 H	255	37.13	13.17
10	7311.00	35.4 AV	54.0	-18.6	1.30 H	255	22.23	13.17

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	55.3 PK	74.0	-18.7	1.48 V	132	57.77	-2.47
2	2390.00	35.4 AV	54.0	-18.6	1.48 V	132	37.87	-2.47
3	*2437.00	100.7 PK			1.48 V	132	102.95	-2.25
4	*2437.00	91.6 AV			1.48 V	132	93.85	-2.25
5	2483.50	57.3 PK	74.0	-16.7	1.48 V	132	59.33	-2.03
6	2483.50	35.4 AV	54.0	-18.6	1.48 V	132	37.43	-2.03
7	4874.00	58.4 PK	74.0	-15.6	1.02 V	263	52.50	5.90
8	4874.00	49.4 AV	54.0	-4.6	1.02 V	263	43.50	5.90
9	7311.00	52.4 PK	74.0	-21.6	1.00 V	155	39.23	13.17
10	7311.00	41.6 AV	54.0	-12.4	1.00 V	155	28.43	13.17

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	106.7 PK			1.00 H	358	108.84	-2.14
2	*2462.00	97.1 AV			1.00 H	358	99.24	-2.14
3	2483.50	70.0 PK	74.0	-4.0	1.00 H	358	72.03	-2.03
4	2483.50	50.2 AV	54.0	-3.8	1.00 H	358	52.23	-2.03
5	4924.00	53.5 PK	74.0	-20.5	1.06 H	203	47.39	6.11
6	4924.00	45.5 AV	54.0	-8.5	1.06 H	203	39.39	6.11
7	7386.00	50.6 PK	74.0	-23.4	1.27 H	256	37.42	13.18
8	7386.00	35.7 AV	54.0	-18.3	1.27 H	256	22.52	13.18
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	101.1 PK			1.43 V	140	103.24	-2.14
2	*2462.00	91.7 AV			1.43 V	140	93.84	-2.14
3	2483.50	68.4 PK	74.0	-5.6	1.48 V	140	70.43	-2.03
4	2483.50	48.9 AV	54.0	-5.1	1.48 V	140	50.93	-2.03
5	4924.00	49.7 PK	74.0	-24.3	1.07 V	268	43.59	6.11
6	4924.00	47.0 AV	54.0	-7.0	1.07 V	268	40.89	6.11
7	7386.00	52.8 PK	74.0	-21.2	1.02 V	139	39.62	13.18
8	7386.00	42.1 AV	54.0	-11.9	1.02 V	139	28.92	13.18

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

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	69.8 PK	74.0	-4.2	1.00 H	323	72.27	-2.47
2	2390.00	50.9 AV	54.0	-3.1	1.00 H	323	53.37	-2.47
3	*2412.00	109.3 PK			1.00 H	323	111.67	-2.37
4	*2412.00	99.5 AV			1.00 H	323	101.87	-2.37
5	4824.00	53.4 PK	74.0	-20.6	1.10 H	219	47.69	5.71
6	4824.00	45.2 AV	54.0	-8.8	1.10 H	219	39.49	5.71
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	67.4 PK	74.0	-6.6	1.53 V	134	69.87	-2.47
2	2390.00	48.7 AV	54.0	-5.3	1.53 V	134	51.17	-2.47
3	*2412.00	103.6 PK			1.53 V	134	105.97	-2.37
4	*2412.00	93.5 AV			1.53 V	134	95.87	-2.37
5	4824.00	50.1 PK	74.0	-23.9	1.12 V	278	44.39	5.71
6	4824.00	47.4 AV	54.0	-6.6	1.12 V	278	41.69	5.71

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	68.6 PK	74.0	-5.4	1.00 H	357	71.07	-2.47
2	2390.00	42.6 AV	54.0	-11.4	1.00 H	357	45.07	-2.47
3	*2437.00	113.5 PK			1.00 H	357	115.75	-2.25
4	*2437.00	103.1 AV			1.00 H	357	105.35	-2.25
5	2483.50	71.6 PK	74.0	-2.4	1.00 H	357	73.63	-2.03
6	2483.50	46.5 AV	54.0	-7.5	1.00 H	357	48.53	-2.03
7	4874.00	57.1 PK	74.0	-16.9	1.08 H	231	51.20	5.90
8	4874.00	48.5 AV	54.0	-5.5	1.08 H	231	42.60	5.90
9	7311.00	50.8 PK	74.0	-23.2	1.31 H	265	37.63	13.17
10	7311.00	35.7 AV	54.0	-18.3	1.31 H	265	22.53	13.17
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	66.5 PK	74.0	-7.5	1.51 V	131	68.97	-2.47
2	2390.00	40.3 AV	54.0	-13.7	1.51 V	131	42.77	-2.47
3	*2437.00	107.4 PK			1.51 V	131	109.65	-2.25
4	*2437.00	97.4 AV			1.51 V	131	99.65	-2.25
5	2483.50	69.3 PK	74.0	-4.7	1.51 V	131	71.33	-2.03
6	2483.50	44.3 AV	54.0	-9.7	1.51 V	131	46.33	-2.03
7	4874.00	58.1 PK	74.0	-15.9	1.07 V	273	52.20	5.90
8	4874.00	49.4 AV	54.0	-4.6	1.07 V	273	43.50	5.90
9	7311.00	52.0 PK	74.0	-22.0	1.00 V	149	38.83	13.17
10	7311.00	41.5 AV	54.0	-12.5	1.00 V	149	28.33	13.17

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	108.4 PK			1.00 H	358	110.54	-2.14
2	*2462.00	98.6 AV			1.00 H	358	100.74	-2.14
3	2483.50	73.1 PK	74.0	-0.9	1.00 H	358	75.13	-2.03
4	2483.50	49.2 AV	54.0	-4.8	1.00 H	358	51.23	-2.03
5	4924.00	57.2 PK	74.0	-16.8	1.07 H	225	51.09	6.11
6	4924.00	48.4 AV	54.0	-5.6	1.07 H	225	42.29	6.11
7	7386.00	51.0 PK	74.0	-23.0	1.36 H	280	37.82	13.18
8	7386.00	35.8 AV	54.0	-18.2	1.36 H	280	22.62	13.18
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	102.3 PK			1.50 V	142	104.44	-2.14
2	*2462.00	92.4 AV			1.50 V	142	94.54	-2.14
3	2483.50	70.4 PK	74.0	-3.6	1.50 V	142	72.43	-2.03
4	2483.50	47.3 AV	54.0	-6.7	1.50 V	142	49.33	-2.03
5	4924.00	57.9 PK	74.0	-16.1	1.10 V	259	51.79	6.11
6	4924.00	49.2 AV	54.0	-4.8	1.10 V	259	43.09	6.11
7	7386.00	51.5 PK	74.0	-22.5	1.00 V	155	38.32	13.18
8	7386.00	41.1 AV	54.0	-12.9	1.00 V	155	27.92	13.18

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 3	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	70.2 PK	74.0	-3.8	1.00 H	360	72.67	-2.47
2	2390.00	52.0 AV	54.0	-2.0	1.00 H	360	54.47	-2.47
3	*2422.00	105.7 PK			1.00 H	360	108.02	-2.32
4	*2422.00	95.2 AV			1.00 H	360	97.52	-2.32
5	4844.00	57.1 PK	74.0	-16.9	1.01 H	221	51.32	5.78
6	4844.00	48.5 AV	54.0	-5.5	1.01 H	221	42.72	5.78
7	7266.00	50.2 PK	74.0	-23.8	1.35 H	271	37.00	13.20
8	7266.00	35.3 AV	54.0	-18.7	1.35 H	271	22.10	13.20
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	68.2 PK	74.0	-5.8	1.52 V	144	70.67	-2.47
2	2390.00	49.8 AV	54.0	-4.2	1.52 V	144	52.27	-2.47
3	*2422.00	99.6 PK			1.52 V	144	101.92	-2.32
4	*2422.00	89.7 AV			1.52 V	144	92.02	-2.32
5	4844.00	58.3 PK	74.0	-15.7	1.05 V	265	52.52	5.78
6	4844.00	49.5 AV	54.0	-4.5	1.05 V	265	43.72	5.78
7	7266.00	51.4 PK	74.0	-22.6	1.00 V	171	38.20	13.20
8	7266.00	41.3 AV	54.0	-12.7	1.00 V	171	28.10	13.20

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

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	73.1 PK	74.0	-0.9	1.00 H	354	75.57	-2.47
2	2390.00	53.1 AV	54.0	-0.9	1.00 H	354	55.57	-2.47
3	*2437.00	108.6 PK			1.00 H	354	110.85	-2.25
4	*2437.00	98.2 AV			1.00 H	354	100.45	-2.25
5	2483.50	72.5 PK	74.0	-1.5	1.00 H	354	74.53	-2.03
6	2483.50	50.2 AV	54.0	-3.8	1.00 H	354	52.23	-2.03
7	4874.00	57.4 PK	74.0	-16.6	1.13 H	225	51.50	5.90
8	4874.00	48.7 AV	54.0	-5.3	1.13 H	225	42.80	5.90
9	7311.00	51.0 PK	74.0	-23.0	1.37 H	294	37.83	13.17
10	7311.00	35.6 AV	54.0	-18.4	1.37 H	294	22.43	13.17
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	71.4 PK	74.0	-2.6	1.50 V	146	73.87	-2.47
2	2390.00	51.3 AV	54.0	-2.7	1.50 V	146	53.77	-2.47
3	*2437.00	100.3 PK			1.50 V	146	102.55	-2.25
4	*2437.00	92.4 AV			1.50 V	146	94.65	-2.25
5	2483.50	70.2 PK	74.0	-3.8	1.50 V	146	72.23	-2.03
6	2483.50	48.3 AV	54.0	-5.7	1.50 V	146	50.33	-2.03
7	4874.00	58.0 PK	74.0	-16.0	1.12 V	271	52.10	5.90
8	4874.00	49.1 AV	54.0	-4.9	1.12 V	271	43.20	5.90
9	7311.00	51.3 PK	74.0	-22.7	1.02 V	166	38.13	13.17
10	7311.00	41.0 AV	54.0	-13.0	1.02 V	166	27.83	13.17

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 9	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	*2452.00	105.9 PK			1.00 H	360	108.08	-2.18
2	*2452.00	95.5 AV			1.00 H	360	97.68	-2.18
3	2483.50	70.2 PK	74.0	-3.8	1.00 H	360	72.23	-2.03
4	2483.50	51.7 AV	54.0	-2.3	1.00 H	360	53.73	-2.03
5	4904.00	57.7 PK	74.0	-16.3	1.03 H	238	51.68	6.02
6	4904.00	48.7 AV	54.0	-5.3	1.03 H	238	42.68	6.02
7	7356.00	50.6 PK	74.0	-23.4	1.34 H	273	37.42	13.18
8	7356.00	35.4 AV	54.0	-18.6	1.34 H	273	22.22	13.18
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	*2452.00	99.7 PK			1.52 V	152	101.88	-2.18
2	*2452.00	89.6 AV			1.52 V	152	91.78	-2.18
3	2483.50	68.4 PK	74.0	-5.6	1.52 V	152	70.43	-2.03
4	2483.50	49.3 AV	54.0	-4.7	1.52 V	152	51.33	-2.03
5	4904.00	57.5 PK	74.0	-16.5	1.14 V	264	51.48	6.02
6	4904.00	48.7 AV	54.0	-5.3	1.14 V	264	42.68	6.02
7	7356.00	51.7 PK	74.0	-22.3	1.00 V	160	38.52	13.18
8	7356.00	41.4 AV	54.0	-12.6	1.00 V	160	28.22	13.18

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 6dB BANDWIDTH MEASUREMENT

4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.3.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
SPECTRUM ANALYZER R&S	FSV 40	100964	July 15, 2013	July 14, 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 : July 01, 2014

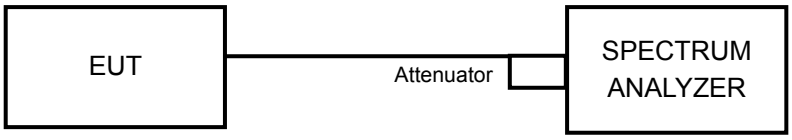
4.3.3 TEST PROCEDURE

1. Set resolution bandwidth (RBW) = 100kHz.
2. Set the video bandwidth (VBW) ≥ 3 x 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

4.3.4 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

802.11b

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
1	2412	10.13	10.12	0.5	PASS
6	2437	10.12	10.10	0.5	PASS
11	2462	10.10	10.09	0.5	PASS

802.11g

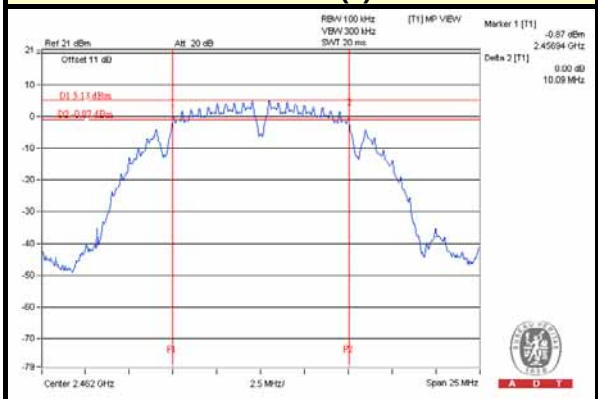
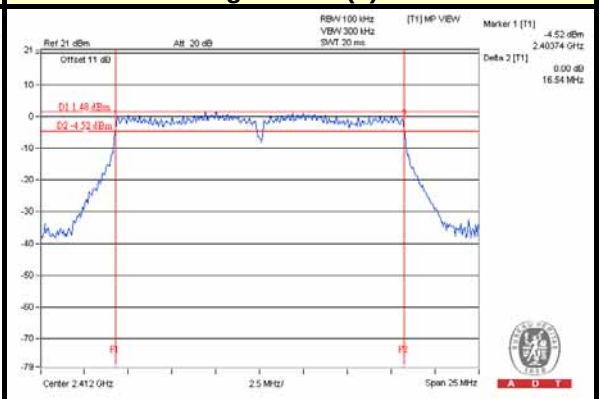
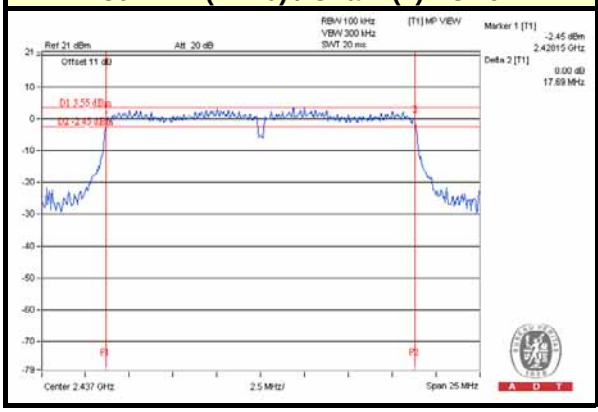
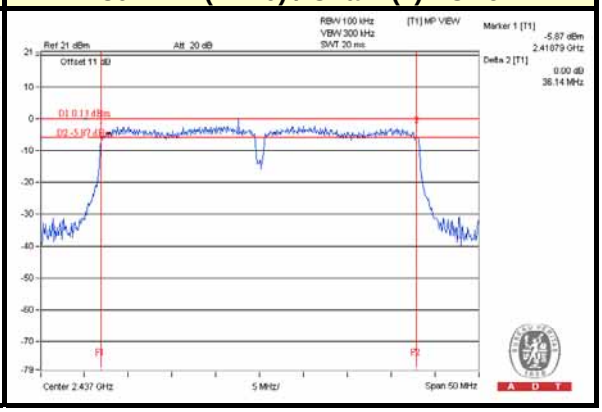
CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
1	2412	16.58	16.54	0.5	PASS
6	2437	16.59	16.57	0.5	PASS
11	2462	16.59	16.57	0.5	PASS

802.11n (HT20)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
1	2412	17.70	17.73	0.5	PASS
6	2437	17.70	17.69	0.5	PASS
11	2462	17.74	17.71	0.5	PASS

802.11n (HT40)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
3	2422	36.56	36.50	0.5	PASS
6	2437	36.52	36.14	0.5	PASS
9	2452	36.51	36.52	0.5	PASS

SPECTRUM PLOT OF WORST VALUE	
802.11b / Chain (1) : CH11	**802.11g / Chain (1) : CH1**
	
802.11n (HT20) / Chain (1) : CH6	**802.11n (HT40) / Chain (1) : CH6**
	

4.4 CONDUCTED OUTPUT POWER MEASUREMENT

4.4.1 LIMITS OF CONDUCTED 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 ≤ 4;

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

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

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

4.4.2 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 : July 01, 2014

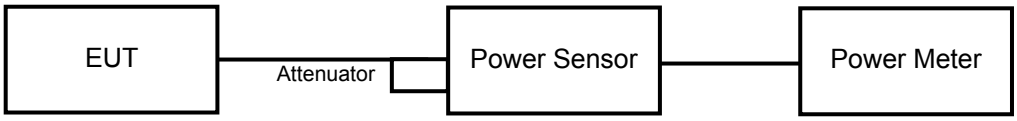
4.4.3 TEST PROCEDURES

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.

4.4.4 DEVIATION FROM TEST STANDARD

No deviation.

4.4.5 TEST SETUP



4.4.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6

4.4.7 TEST RESULTS

FOR PEAK POWER

802.11b

CHANNEL	FREQUENCY (MHz)	PEAK POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
1	2412	16.61	16.44	89.869	19.54	30	PASS
6	2437	16.53	15.98	84.606	19.27	30	PASS
11	2462	17.62	17.42	113.018	20.53	30	PASS

802.11g

CHANNEL	FREQUENCY (MHz)	PEAK POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
1	2412	23.85	24.21	506.294	27.04	30	PASS
6	2437	24.62	25.01	606.691	27.83	30	PASS
11	2462	22.85	23.33	408.03	26.11	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	22.76	23.01	388.785	25.90	30	PASS
6	2437	24.46	25.11	603.594	27.81	30	PASS
11	2462	21.66	22.85	339.307	25.31	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				
3	2422	20.76	21.61	264.001	24.22	30	PASS
6	2437	23.58	23.89	472.94	26.75	30	PASS
9	2452	21.01	21.84	278.94	24.46	30	PASS

FOR AVERAGE POWER

802.11b

CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)
		CHAIN 0	CHAIN 1		
1	2412	13.66	13.18	44.024	16.44
6	2437	13.57	12.89	42.205	16.25
11	2462	14.74	14.17	55.907	17.47

802.11g

CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)
		CHAIN 0	CHAIN 1		
1	2412	14.57	14.72	58.290	17.66
6	2437	16.63	17.22	98.749	19.95
11	2462	13.51	13.52	44.930	16.53

802.11n (HT20)

CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)
		CHAIN 0	CHAIN 1		
1	2412	13.59	13.74	46.515	16.68
6	2437	16.61	17.21	98.416	19.93
11	2462	12.45	13.27	38.811	15.89

802.11n (HT40)

CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)
		CHAIN 0	CHAIN 1		
3	2422	11.46	12.41	31.414	14.97
6	2437	14.48	14.83	58.463	17.67
9	2452	11.29	11.89	28.912	14.61

4.5 POWER SPECTRAL DENSITY MEASUREMENT

4.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

4.5.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
SPECTRUM ANALYZER R&S	FSV 40	100964	July 15, 2013	July 14, 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 : July 01, 2014

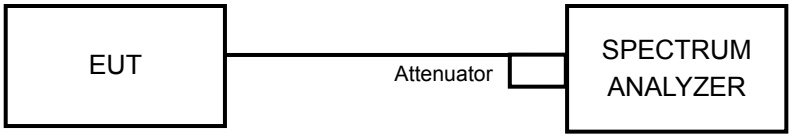
4.5.3 TEST PROCEDURE

1. Set the RBW = 3 kHz, VBW =10 kHz, Detector = peak.
2. Sweep time = auto couple, Trace mode = max hold, allow trace to fully stabilize.
3. Use the peak marker function to determine the maximum amplitude level.

4.5.4 DEVIATION FROM TEST STANDARD

No deviation

4.5.5 TEST SETUP



4.5.6 EUT OPERATING CONDITION

Same as Item 4.3.6

4.5.7 TEST RESULTS

802.11b

TX CHAIN	CHANNEL	FREQUENCY (MHz)	PSD (dBm)	10 log (N=2) dB	TOTAL PSD (dBm)	LIMIT (dBm)	PASS /FAIL
0	1	2412	-12.61	3.01	-9.60	8	PASS
	6	2437	-12.29	3.01	-9.28	8	PASS
	11	2462	-11.34	3.01	-8.33	8	PASS
1	1	2412	-11.04	3.01	-8.03	8	PASS
	6	2437	-10.61	3.01	-7.60	8	PASS
	11	2462	-10.24	3.01	-7.23	8	PASS

NOTE: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 4.11dBi < 6dBi , so the power limit shall not be reduced.

802.11g

TX CHAIN	CHANNEL	FREQUENCY (MHz)	PSD (dBm)	10 log (N=2) dB	TOTAL PSD (dBm)	LIMIT (dBm)	PASS /FAIL
0	1	2412	-12.62	3.01	-9.61	8	PASS
	6	2437	-10.87	3.01	-7.86	8	PASS
	11	2462	-14.32	3.01	-11.31	8	PASS
1	1	2412	-12.23	3.01	-9.22	8	PASS
	6	2437	-9.93	3.01	-6.92	8	PASS
	11	2462	-12.95	3.01	-9.94	8	PASS

NOTE: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 4.11dBi < 6dBi , so the power limit shall not be reduced.

802.11n (HT20)

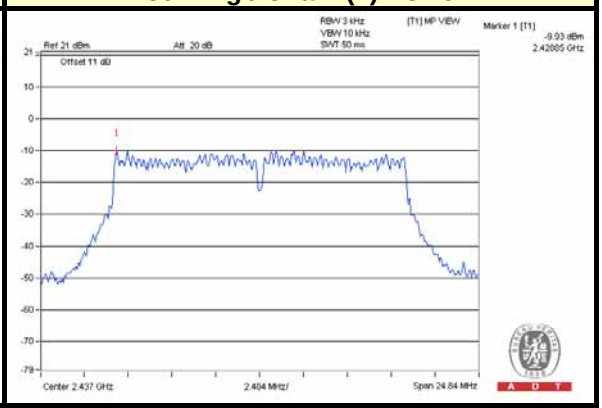
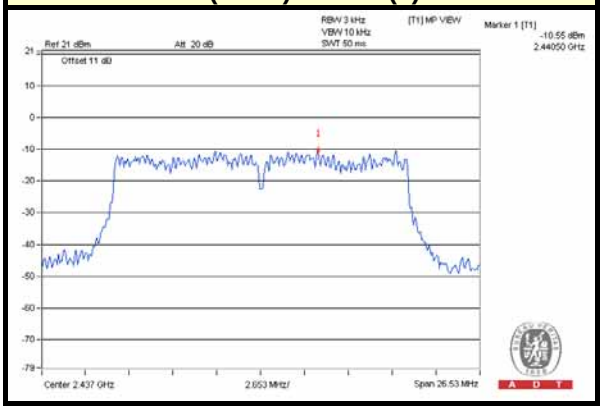
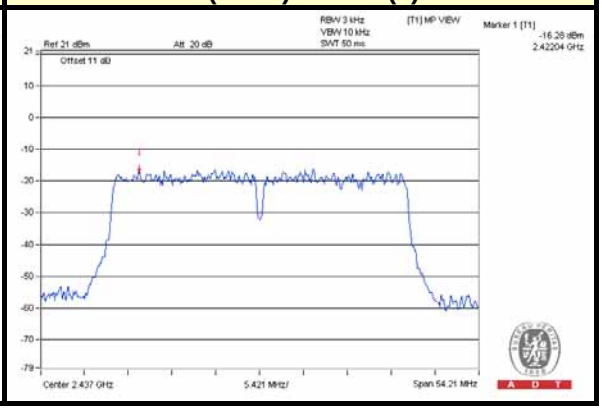
TX CHAIN	CHANNEL	FREQUENCY (MHz)	PSD (dBm)	10 log (N=2) dB	Total PSD (dBm)	Limit (dBm)	PASS /FAIL
0	1	2412	-13.80	3.01	-10.79	8	PASS
	6	2437	-10.58	3.01	-7.57	8	PASS
	11	2462	-14.09	3.01	-11.08	8	PASS
1	1	2412	-13.46	3.01	-10.45	8	PASS
	6	2437	-10.55	3.01	-7.54	8	PASS
	11	2462	-14.16	3.01	-11.15	8	PASS

NOTE: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 4.11dBi < 6dBi , so the power limit shall not be reduced.

802.11n (HT40)

TX CHAIN	CHANNEL	FREQUENCY (MHz)	PSD (dBm)	10 log (N=2) dB	TOTAL PSD (dBm)	LIMIT (dBm)	PASS /FAIL
0	3	2422	-19.24	3.01	-16.23	8	PASS
	6	2437	-16.86	3.01	-13.85	8	PASS
	9	2452	-20.00	3.01	-16.99	8	PASS
1	3	2422	-17.85	3.01	-14.84	8	PASS
	6	2437	-16.28	3.01	-13.27	8	PASS
	9	2452	-17.73	3.01	-14.72	8	PASS

NOTE: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 4.11dBi < 6dBi , so the power limit shall not be reduced.

SPECTRUM PLOT OF WORST VALUE	
802.11b / Chain (1) : CH11	**802.11g / Chain (1) : CH6**
	
802.11n (HT20) / Chain(1) : CH6	**802.11n (HT40) / Chain(1) : CH6**
	

4.6 CONDUCTED OUT-BAND EMISSION MEASUREMENT

4.6.1 LIMITS OF CONDUCTED OUT-BAND EMISSION MEASUREMENT

Below 20dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

4.6.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
SPECTRUM ANALYZER R&S	FSV 40	100964	July 15, 2013	July 14, 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 : July 01, 2014

4.6.3 TEST PROCEDURE

Measurement Procedure - Reference Level

1. Set the RBW = 100 kHz.
2. Set the VBW ≥ 300 kHz.
3. Detector = peak.
4. Sweep time = auto couple.
5. Trace mode = max hold.
6. Allow trace to fully stabilize.
7. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.

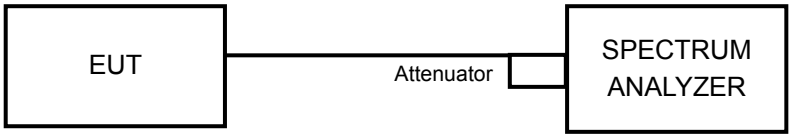
Measurement Procedure –Unwanted Emission Level

1. Set RBW = 100 kHz.
2. Set VBW ≥ 300 kHz.
3. Set span to encompass the spectrum to be examined
4. Detector = peak.
5. Trace Mode = max hold.
6. Sweep = auto couple.

4.6.4 DEVIATION FROM TEST STANDARD

No deviation

4.6.5 TEST SETUP



4.6.6 EUT OPERATING CONDITION

Same as Item 4.3.6

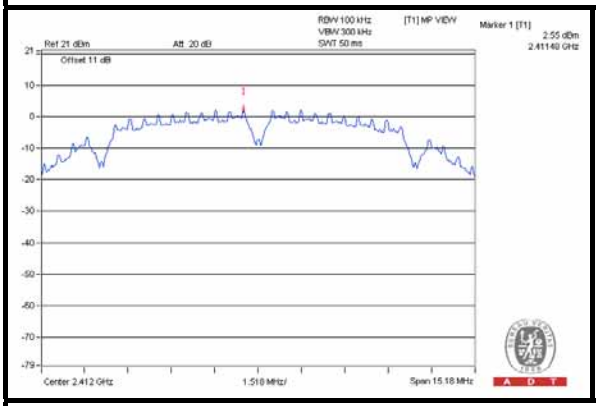
4.6.7 TEST RESULTS

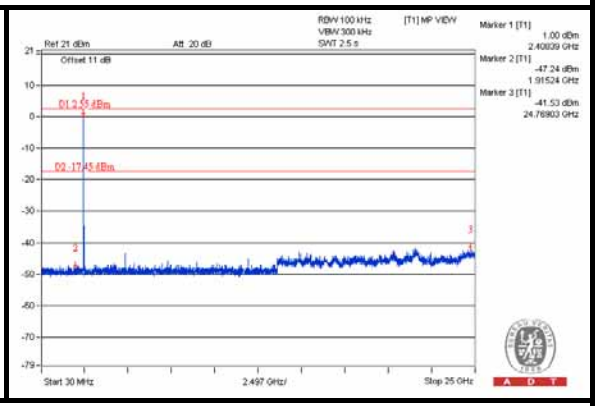
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.

802.11b

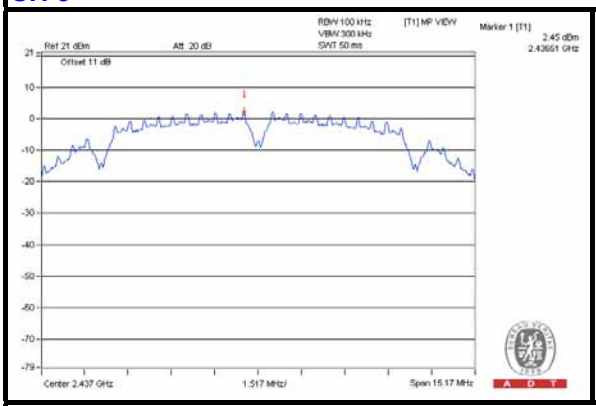
Chain (0)

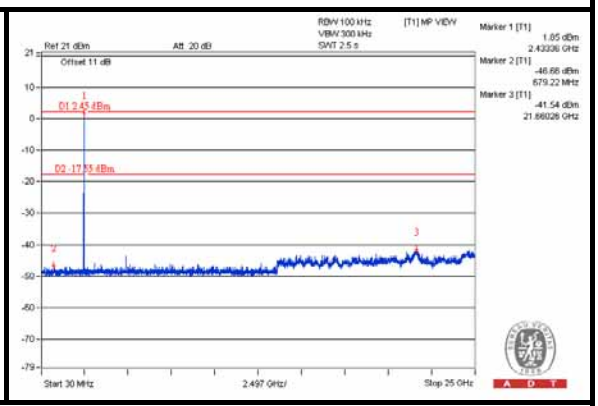
CH 1



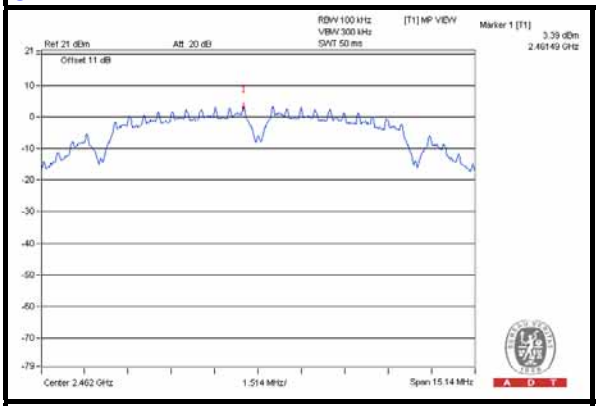


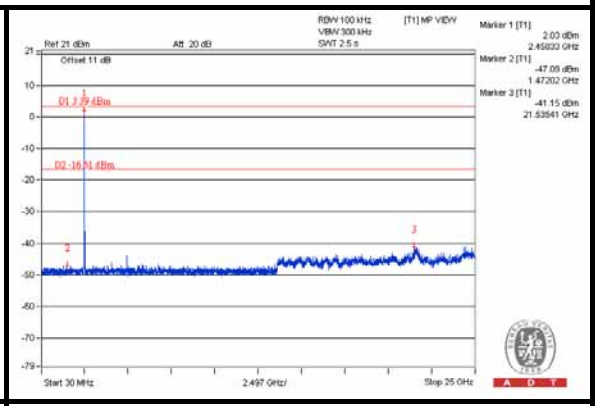
CH 6



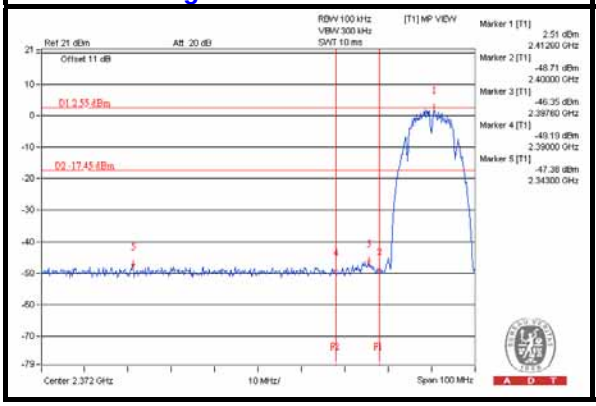


CH 11

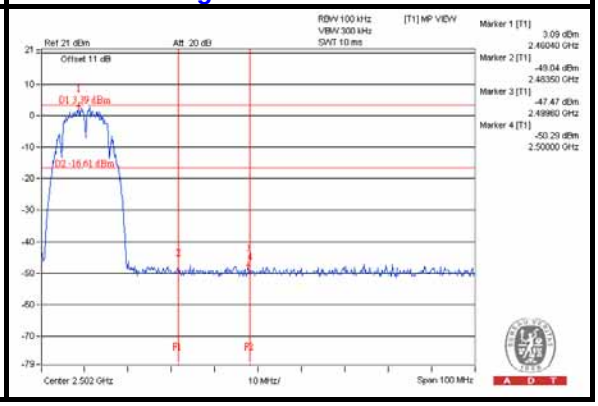




CH 1 Band edge

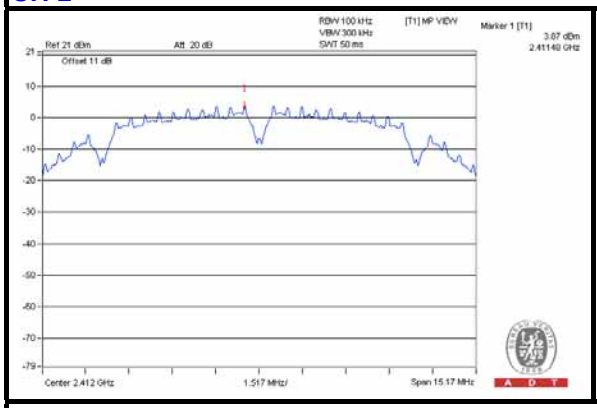


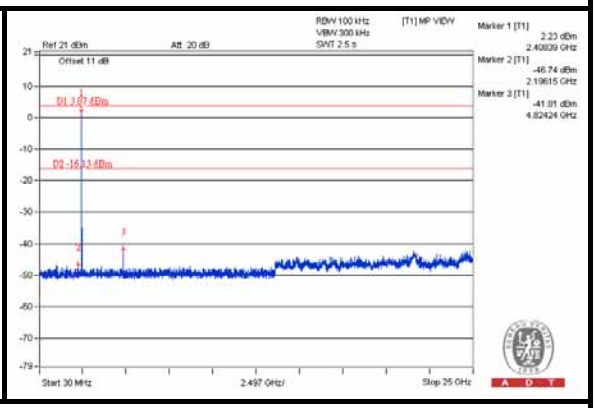
CH 11 Band edge



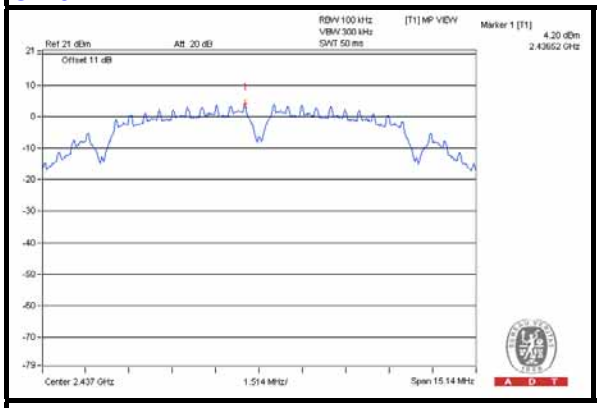
Chain (1)

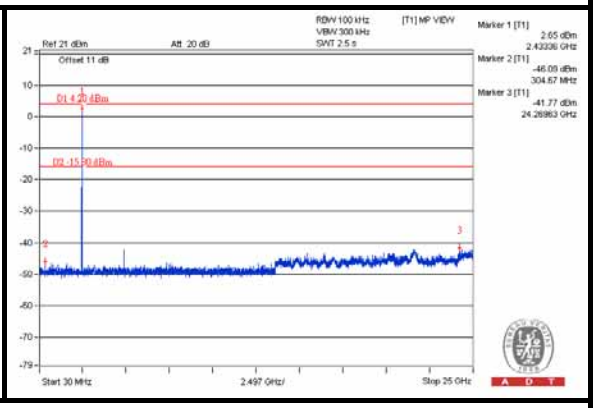
CH 1



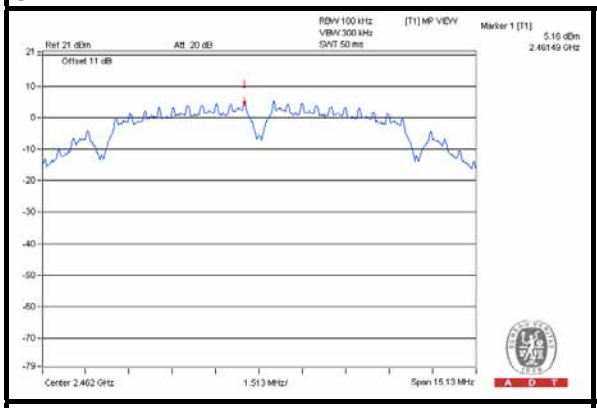


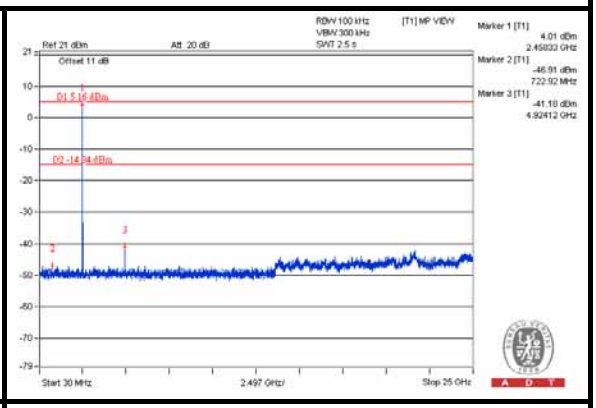
CH 6



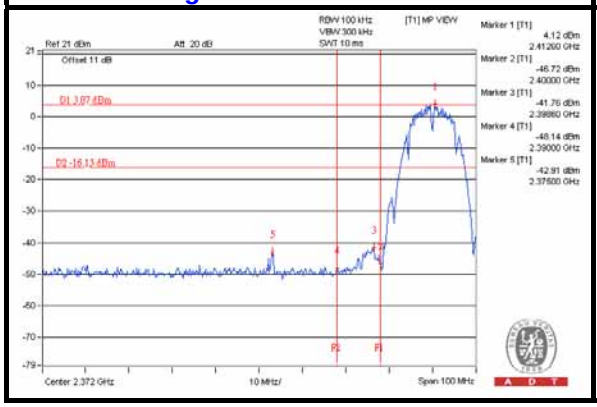


CH 11

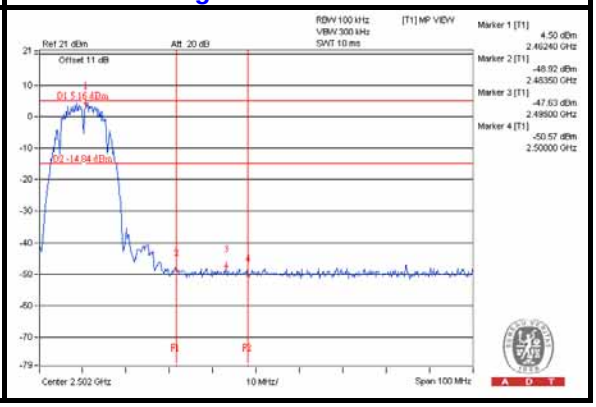




CH 1 Band edge



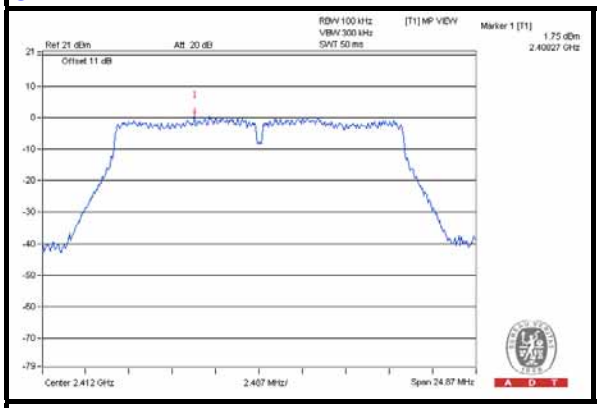
CH 11 Band edge

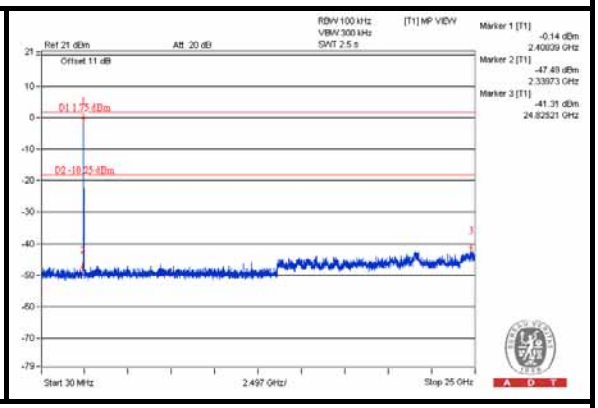


802.11g

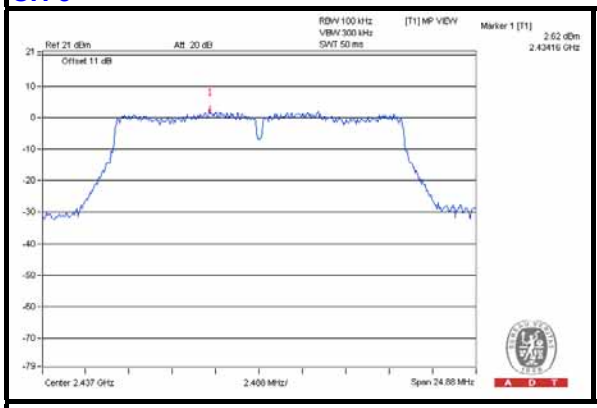
Chain (0)

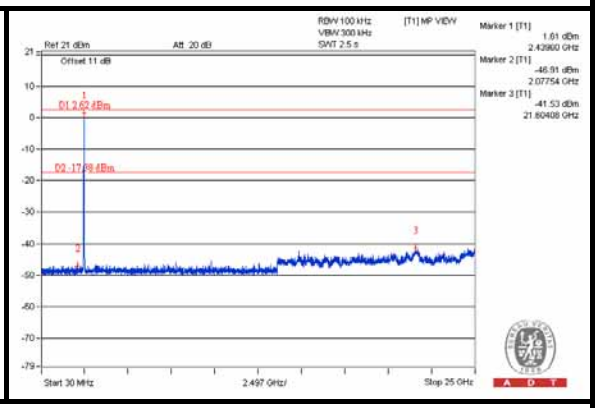
CH 1



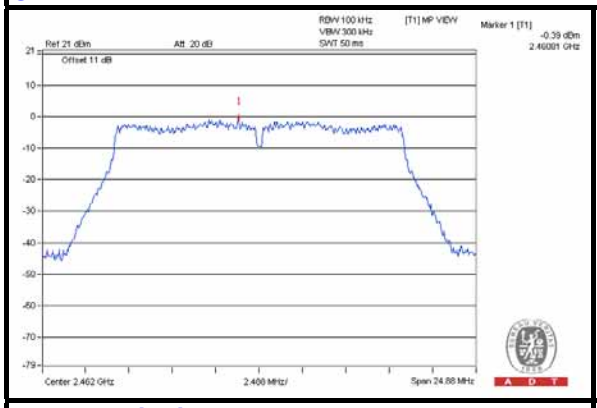


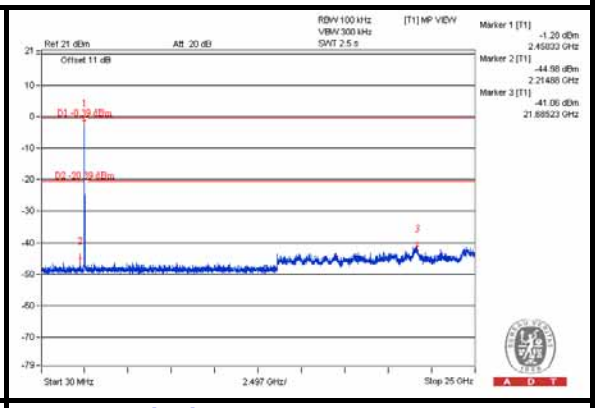
CH 6



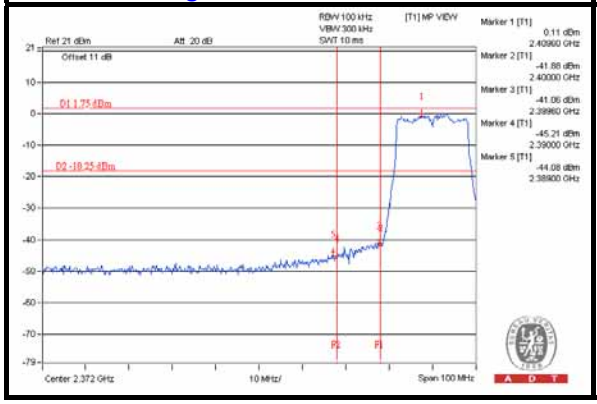


CH 11

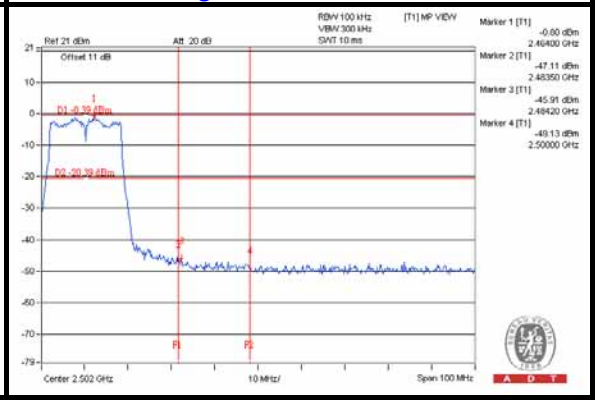




CH 1 Band edge

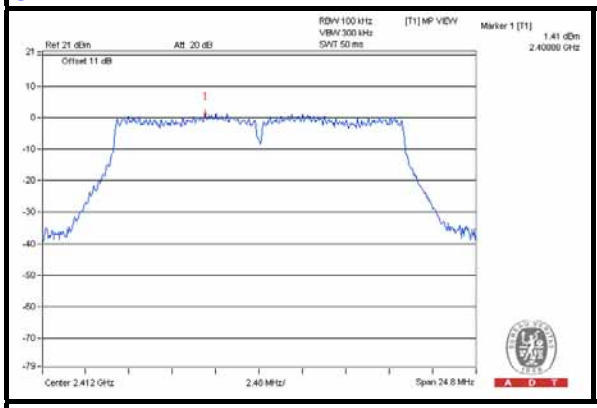


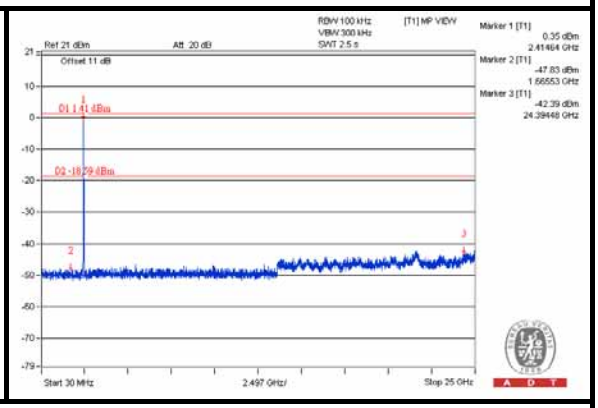
CH 11 Band edge



Chain (1)

CH 1





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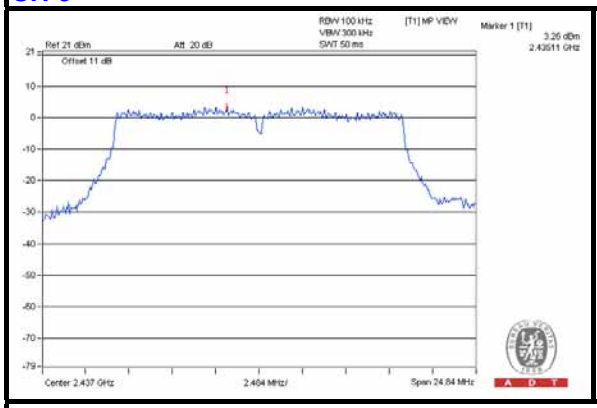

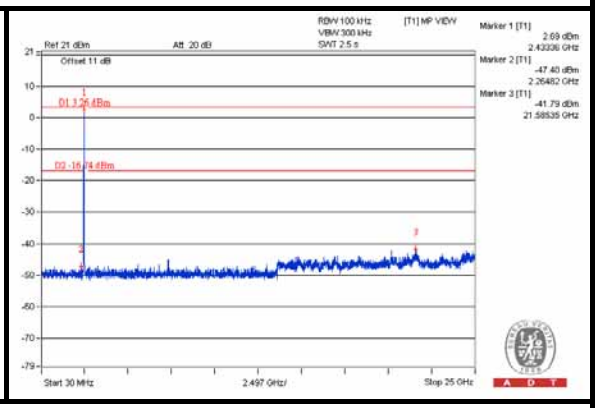

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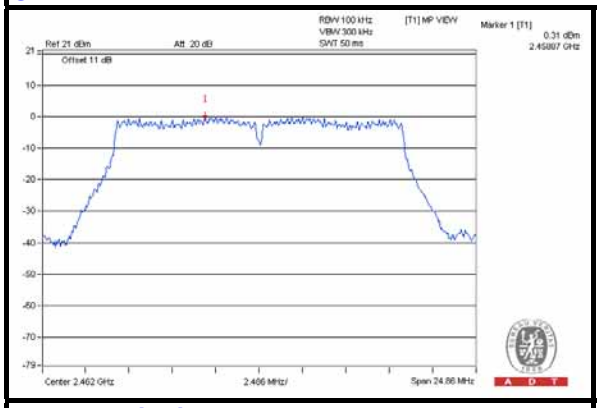

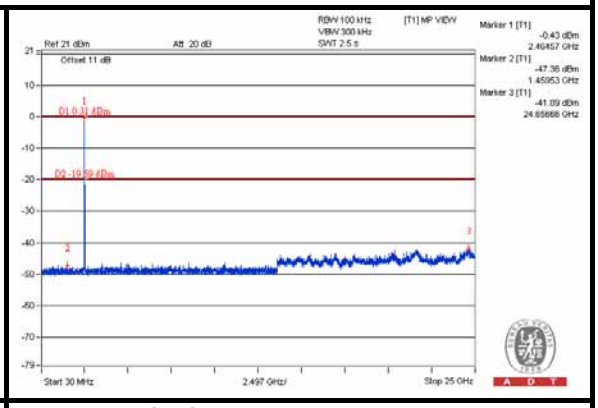

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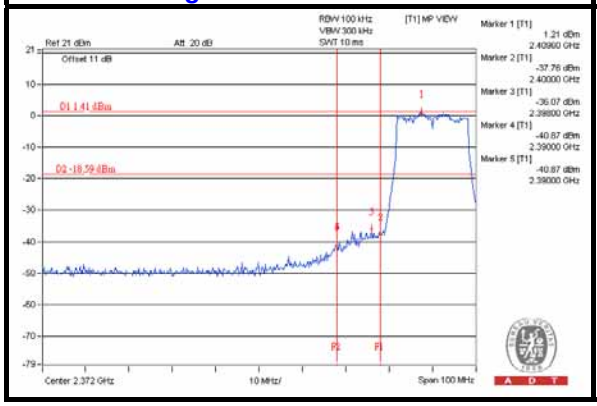

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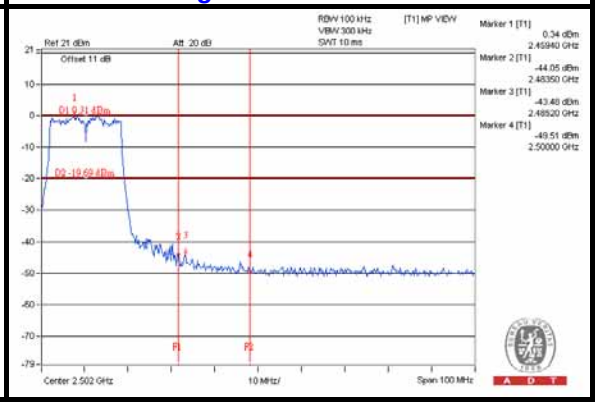

802.11n (HT20)

Chain (0)

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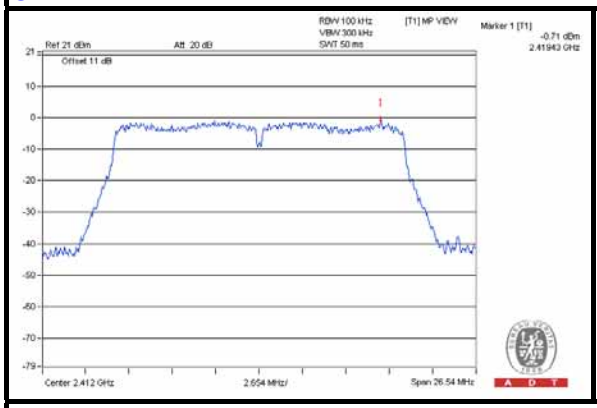

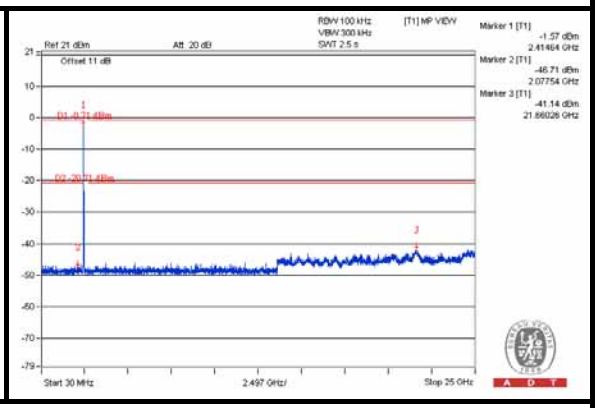

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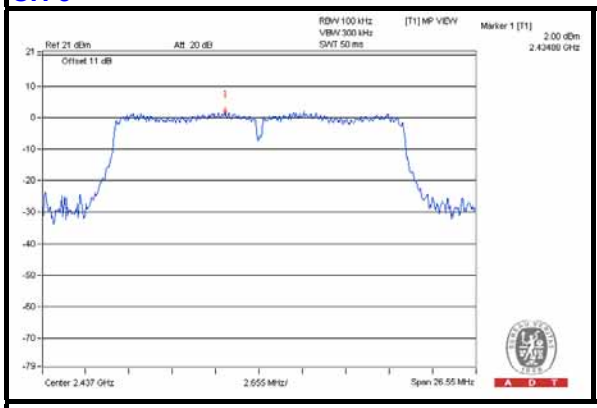

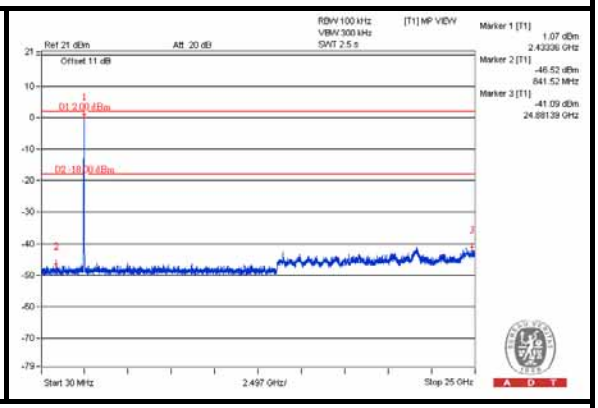

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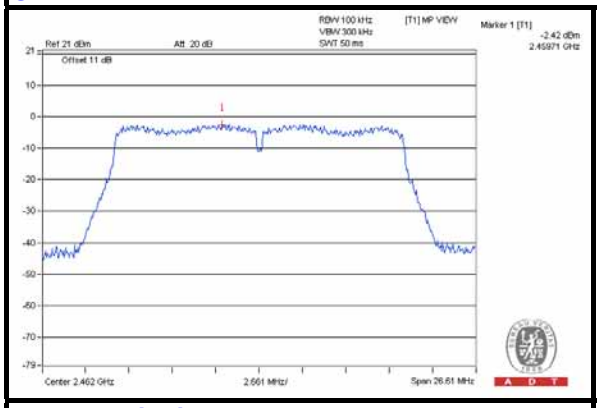

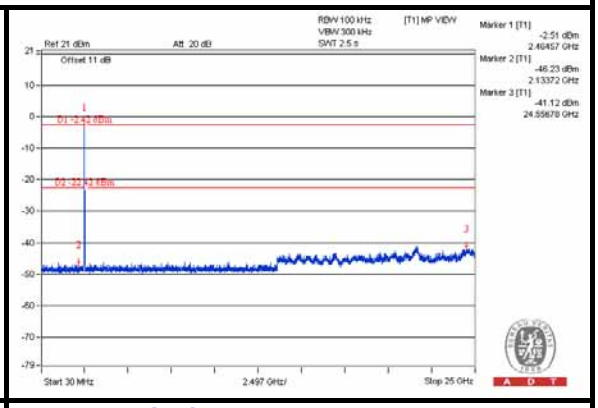

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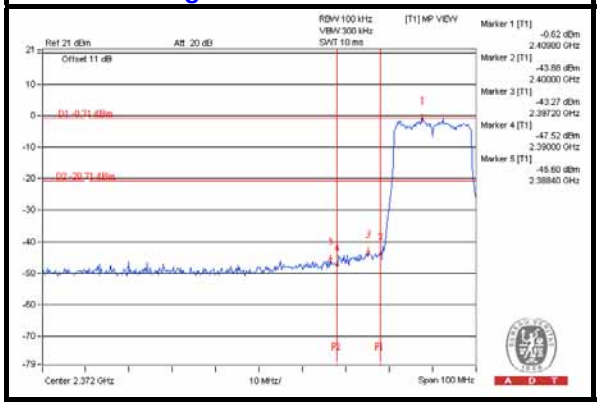

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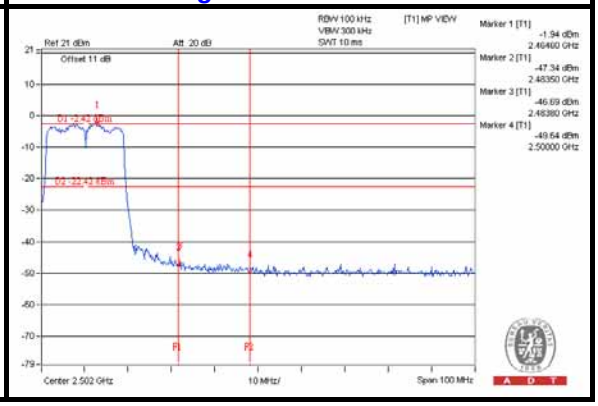
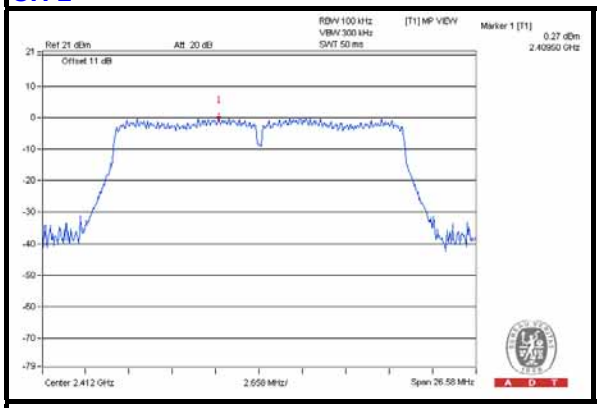
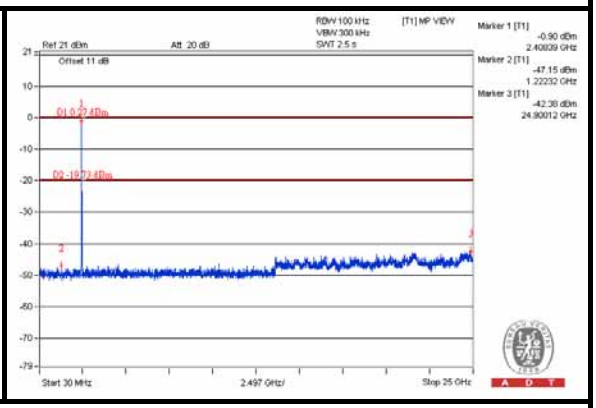


Chain (1)

CH 1





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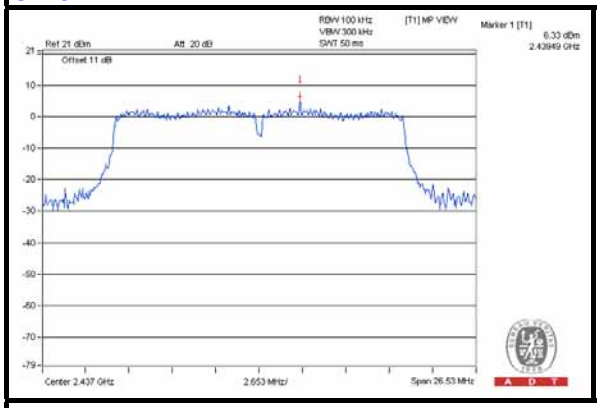

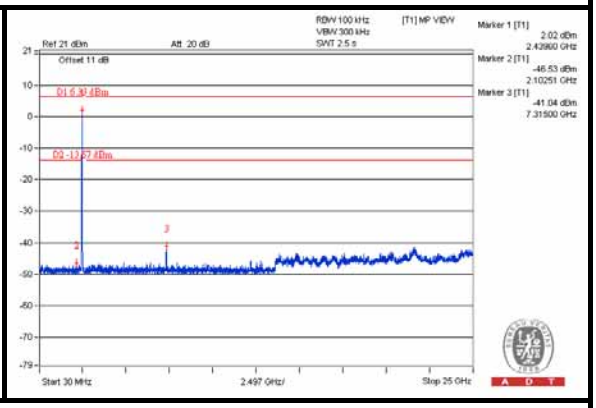

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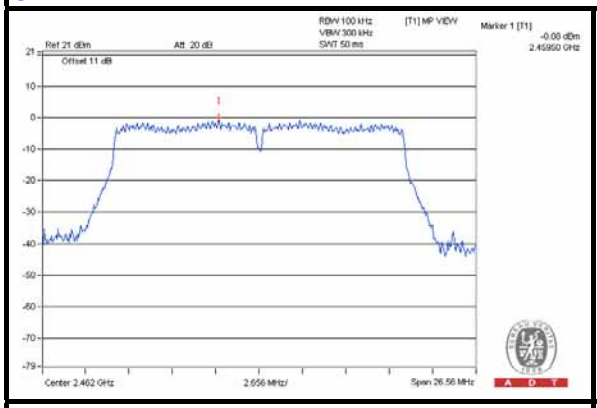

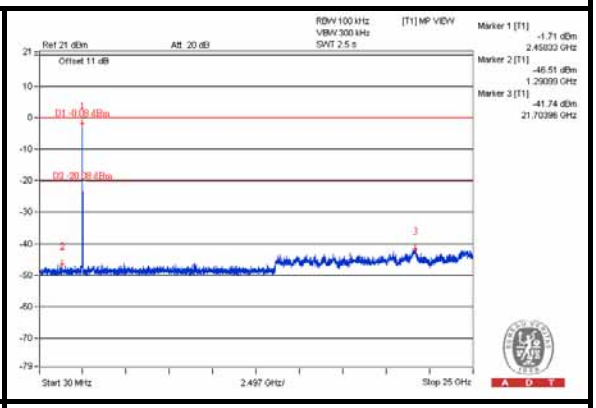

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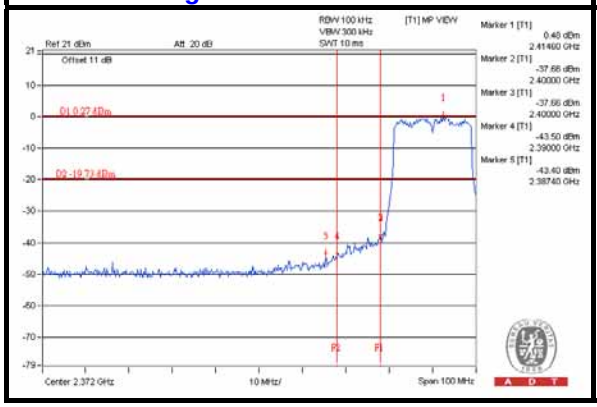

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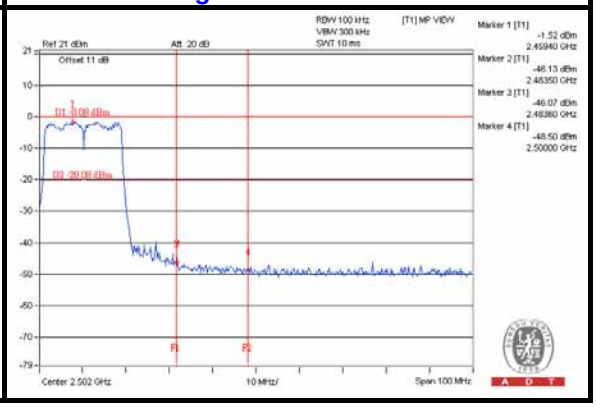

802.11n (HT40)

Chain (0)

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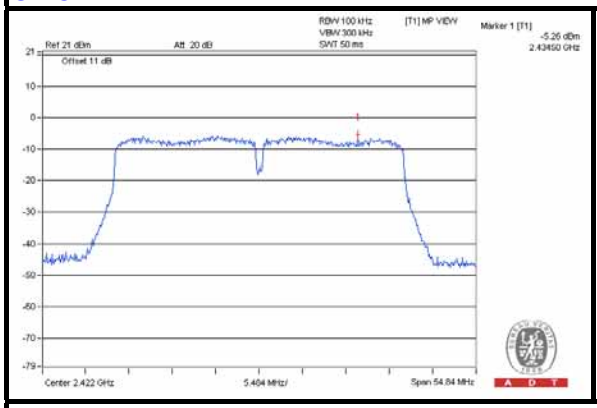
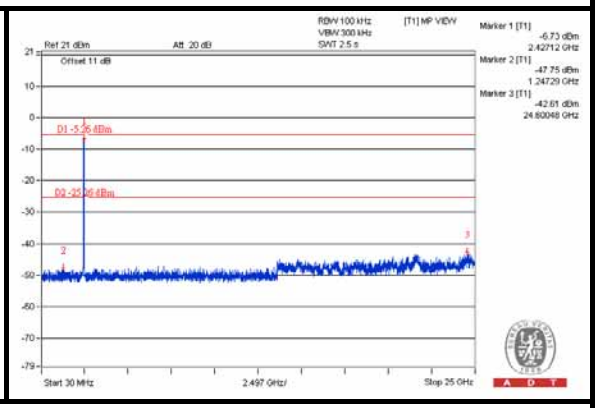
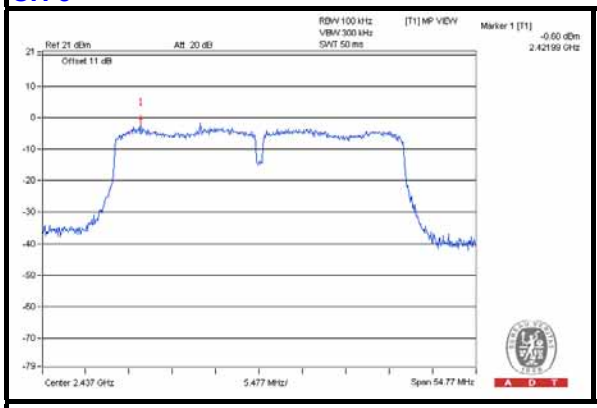
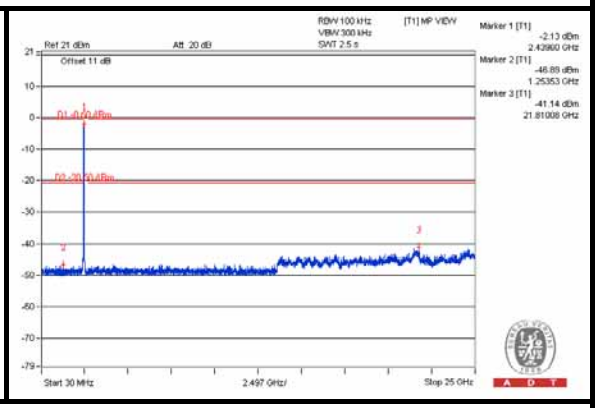


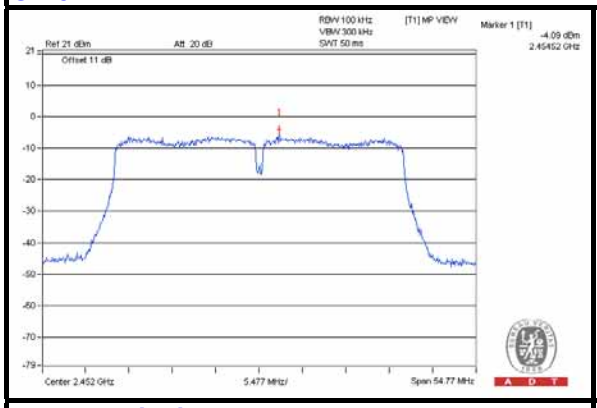


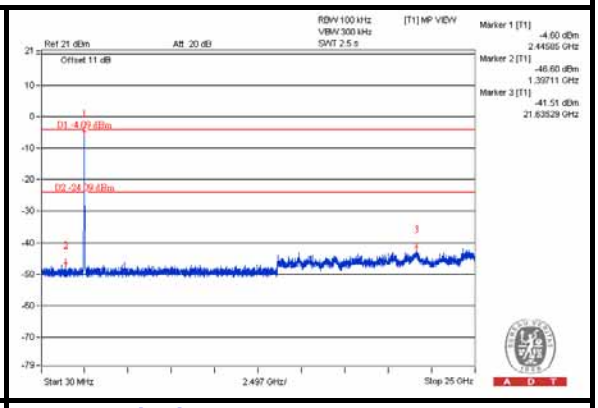
CH 6



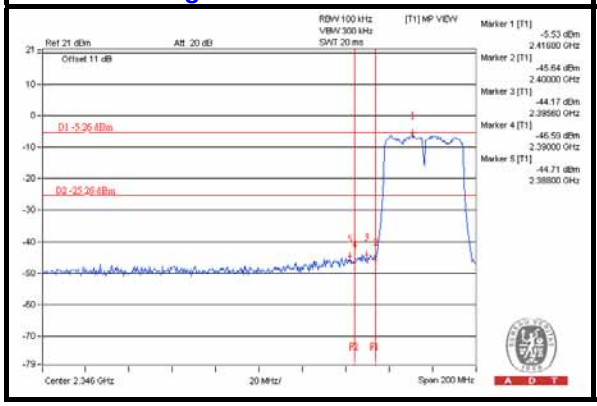


CH 9

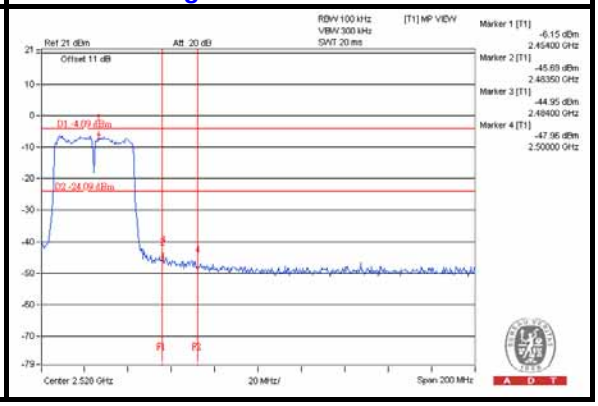




CH 3 Band edge

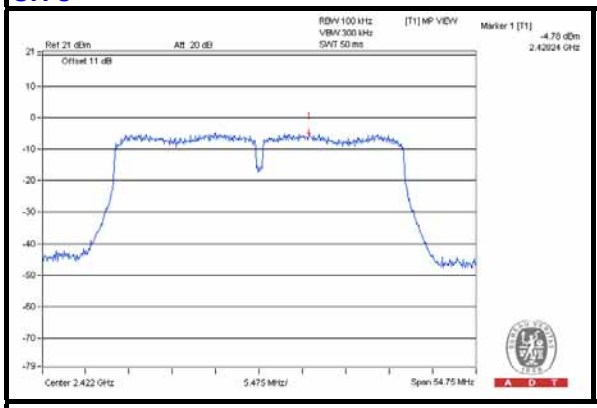


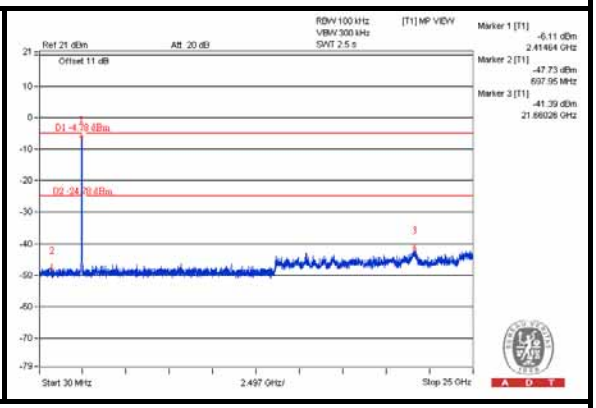
CH 9 Band edge



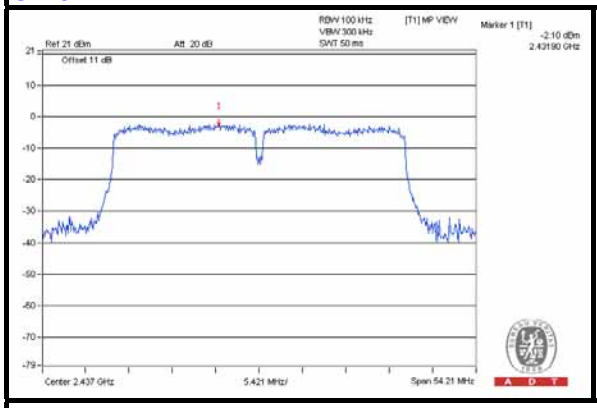
Chain (1)

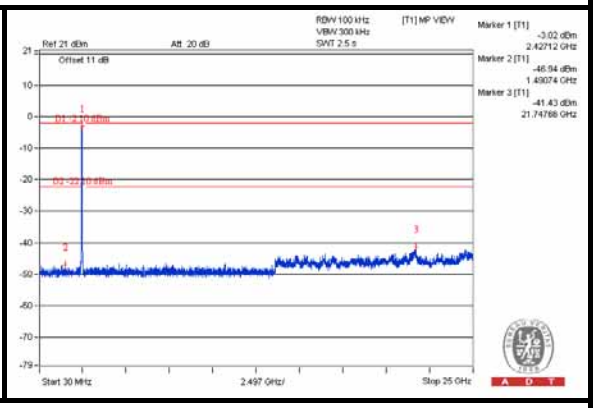
CH 3





CH 6





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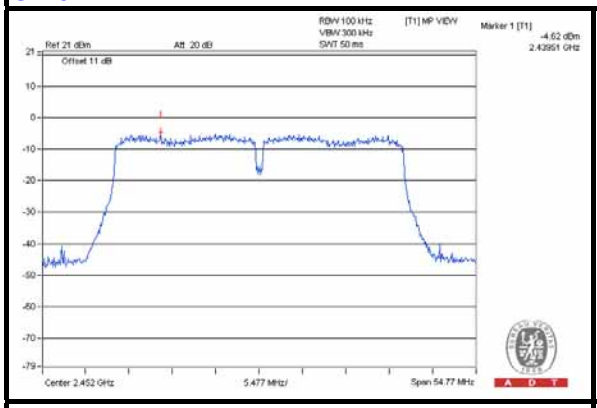
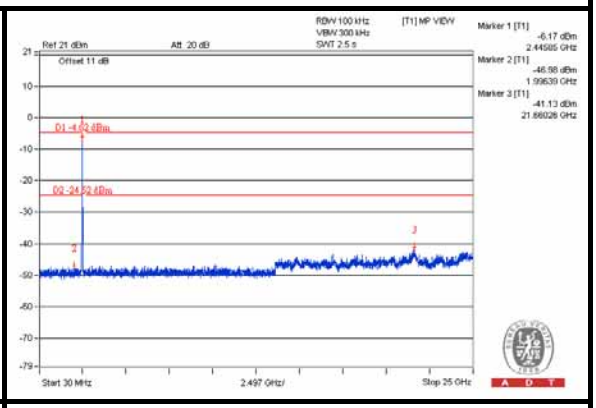
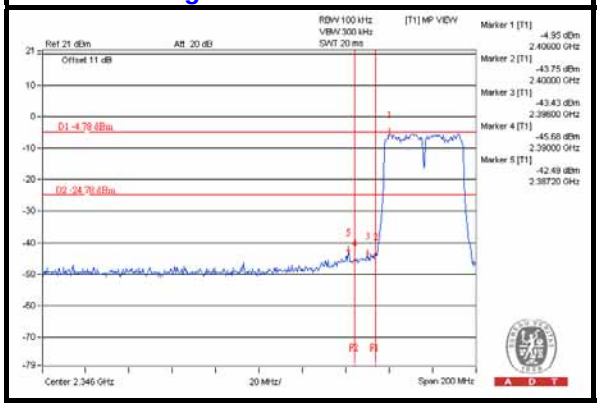
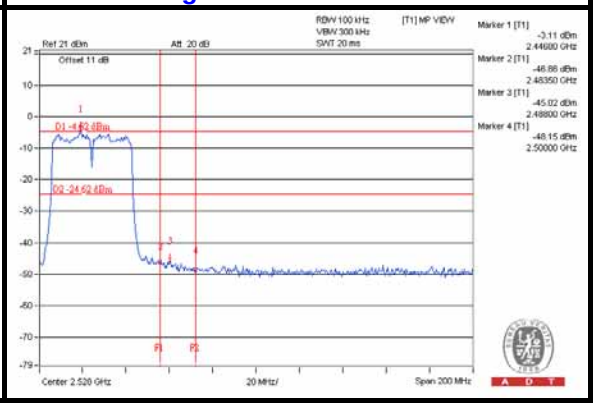




CH 3 Band edge



CH 9 Band edge



5. PHOTOGRAPHS OF THE TEST CONFIGURATION

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

6. INFORMATION ON THE TESTING LABORATORIES

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

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

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

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

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

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

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

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

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

--- END ---