FCC Test Report

Report No.:	RF150420E01
FCC ID:	VW3FAST3486
Test Model:	F@ST 3486
S/N:	Test sample only
P/N:	253641590
Received Date:	Apr. 20, 2015
Test Date:	Apr. 21 to 29, 2015
Issued Date:	May 18, 2015
Applicant:	SAGEMCOM SAS
Address:	250 Route de l’ Empereur - 92848 RUEIL MALMAISON CEDEX- FRANCE
Manufacturer:	SAGEMCOM SAS
Address:	250 Route de l’ Empereur - 92848 RUEIL MALMAISON CEDEX- FRANCE
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory
Lab Address:	No. 81-1, Lu Liao Keng, 9th Ling,Wu Lung Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan R.O.C.
Test Location (1):	No. 81-1, Lu Liao Keng, 9th Ling,Wu Lung Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan R.O.C.
Test Location (2):	No. 49, Ln. 206, Wende Rd., Shangshan Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan R.O.C.

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Release Control Record

Issue No.	Description	Date Issued
RF150420E01	Original release.	May 18, 2015

1 Certificate of Conformity

Product:	Cable Gateway
Brand:	SAGEMCOM
Test Model:	F@ST 3486
S/N:	Test sample only
P/N:	253641590
Sample Status:	ENGINEERING SAMPLE
Applicant:	SAGEMCOM SAS
Test Date:	Apr. 21 to 29, 2015
Standards:	47 CFR FCC Part 15, Subpart C (Section 15.247) ANSI C63.10:2009

The above equipment 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:** May 18, 2015
Lori Chung / Specialist

Approved by : _____ , **Date:** May 18, 2015
May Chen / Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart C (SECTION 15.247)			
FCC Clause	Test Item	Result	Remarks
15.207	AC Power Conducted Emission	Pass	Meet the requirement of limit. Minimum passing margin is -3.14dB at 0.15000MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -0.1dB at 2390.00MHz & 2483.50MHz.
15.247(d)	Antenna Port Emission	Pass	Meet the requirement of limit.
15.247(a)(2)	6dB bandwidth	Pass	Meet the requirement of limit.
15.247(b)	Conducted 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 i-pex(MHF) not a standard connector.

NOTE: The EUT was operating in 2400 ~ 2483.5MHz, 5150~5250MHz and 5725~5850MHz frequencies band. This report was recorded the RF parameters including 2400 ~ 2483.5MHz and 5725~5850MHz. For the 5150~5250MHz 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:

Measurement	Frequency	Expended Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.86 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	5.43 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	3.65 dB
	6GHz ~ 18GHz	3.88 dB
	18GHz ~ 40GHz	4.11 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Cable Gateway
Brand	SAGEMCOM
Test Model	F@ST 3486
S/N	Test sample only
P/N	253641590
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	12Vdc from power adapter
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode
Modulation Technology	DSSS, OFDM
Transfer Rate	802.11b: up to 11Mbps 802.11a/g: up to 54Mbps 802.11n: up to 450Mbps 802.11ac: up to 1300Mbps
Operating Frequency	**For 15.407** **5GHz:** 5.18 ~ 5.24GHz
	For 15.247 **2.4GHz:** 2.412 ~ 2.462GHz **5GHz:** 5.745 ~ 5.825GHz
Number of Channel	**For 15.407** 4 for 802.11a, 802.11n (HT20), 802.11ac (VHT20) 2 for 802.11n (HT40), 802.11ac (VHT40) 1 for 802.11ac (VHT80)
	For 15.247 (2.4GHz) 11 for 802.11b, 802.11g, 802.11n (HT20), VHT20 7 for 802.11n (HT40), VHT40 **For 15.247 (5GHz)** 5 for 802.11a, 802.11n (HT20), 802.11ac (VHT20) 2 for 802.11n (HT40), 802.11ac (VHT40) 1 for 802.11ac (VHT80)

Output Power	**For 15.407** **CDD Mode:** 802.11a: 181.552mW 802.11ac (VHT20): 402.336mW 802.11ac (VHT40): 528.52mW 802.11ac (VHT80): 57.775mW **Beamforming Mode:** 802.11ac (VHT20): 134.999mW 802.11ac (VHT40): 185.281mW 802.11ac (VHT80): 45.689mW
	For 15.247 (2.4GHz) **CDD Mode:** 802.11b: 138.995mW 802.11g: 386.459mW 802.11n (HT20): 387.091mW 802.11n (HT40): 108.098mW **For 15.247 (5GHz)** **CDD Mode:** 802.11a: 270.396mW 802.11ac (VHT20): 789.256mW 802.11ac (VHT40): 862.64mW 802.11ac (VHT80): 291.867mW **Beamforming Mode:** 802.11ac (VHT20): 396.664mW 802.11ac (VHT40): 395.912mW 802.11ac (VHT80): 253.782mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter x 1
Data Cable Supplied	NA

Note:

1. The emission of the simultaneous operation (2.4GHz & 5GHz) has been evaluated and no non-compliance was found.
2. The antennas provided to the EUT, please refer to the following table:

2.4GHz Band								
Antenna No.	PCB Chain No.	Brand	Model	Ant. Gain(dBi) <Including cable loss>	Frequency range (GHz to GHz)	Antenna Type	Connecter Type	Cable Length (mm)
E	0	wanshih	NA	2.0979	2.4~2.4835	PIFA	None (like solder)	NA
B	1	wanshih	NA	2.9762	2.4~2.4835	PCB	i-pex(MHF)	160
F	2	wanshih	NA	2.51	2.4~2.4835	PIFA	None (like solder)	NA
5GHz Band								
Antenna No.	PCB Chain No.	Brand	Model	Ant. Gain(dBi) <Including cable loss>	Frequency range (GHz to GHz)	Antenna Type	Connecter Type	Cable Length (mm)
C	0	wanshih	NA	3.81	5.15~5.85	PIFA	None (like solder)	NA
D	1	wanshih	NA	3.92	5.15~5.85	PIFA	None (like solder)	NA
A	2	wanshih	NA	3.8509	5.15~5.85	PCB	i-pex(MHF)	75

3. The EUT must be supplied with power adapter as below table :

Brand	Model No.	Spec.
SAGEMCOM	NBS30B120250VU	AC Input: 100-120V, 0.9A, 60Hz DC Output: 12V, 2.5A DC output cable: Unshielded, 2.0m, without core

4. The EUT incorporates a MIMO function with beamforming.

2.4GHz Band			
MODULATION MODE	**DATA RATE (MCS)**	**TX & RX CONFIGURATION**	
802.11b	1 ~ 11Mbps	1TX (diversity)	1RX
802.11g	6 ~ 54Mbps	3TX	3RX
802.11n (HT20)	MCS 0~7	3TX	3RX
	MCS 8~15	3TX	3RX
	MCS 16~23	3TX	3RX
802.11n (HT40)	MCS 0~7	3TX	3RX
	MCS 8~15	3TX	3RX
	MCS 16~23	3TX	3RX
5GHz Band			
MODULATION MODE	**DATA RATE (MCS)**	**TX & RX CONFIGURATION**	
802.11a	6 ~ 54Mbps	1TX (diversity)	1RX
802.11n (HT20)	MCS 0~7	3TX	3RX
	MCS 8~15	3TX	3RX
	MCS 16~23	3TX	3RX
802.11n (HT40)	MCS 0~7	3TX	3RX
	MCS 8~15	3TX	3RX
	MCS 16~23	3TX	3RX
802.11ac (VHT20)	MCS 0~8, Nss=1	3TX	3RX
	MCS 0~8, Nss=2	3TX	3RX
	MCS 0~9, Nss=3	3TX	3RX
802.11ac (VHT40)	MCS 0~9, Nss=1	3TX	3RX
	MCS 0~9, Nss=2	3TX	3RX
	MCS 0~9, Nss=3	3TX	3RX
802.11ac (VHT80)	MCS 0~9, Nss=1	3TX	3RX
	MCS 0~9, Nss=2	3TX	3RX
	MCS 0~9, Nss=3	3TX	3RX
Note: 1. For 2.4GHz band and 5GHz band (802.11a), the EUT doesn't support beamforming mode.			

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)

5. The above EUT information is 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

For 2.4GHz:

11 channels are provided for 802.11b, 802.11g and 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		

For 5GHz (5745 ~ 5825MHz):

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

Channel	Frequency	Channel	Frequency
149	5745MHz	161	5805MHz
153	5765MHz	165	5825MHz
157	5785MHz		

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

Channel	Frequency	Channel	Frequency
151	5755MHz	159	5795MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
155	5775MHz

3.2.1 Test Mode Applicability and Tested Channel Detail

For 2.4GHz:

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

Where **RE≥1G:** Radiated Emission above 1GHz & Bandedge Measurement **RE<1G:** Radiated Emission below 1GHz

PLC: Power Line Conducted Emission **APCM:** Antenna Port Conducted Measurement

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

Radiated Emission Test (Above 1GHz):

☒ 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
CDD MODE					
MODE	**AVAILABLE CHANNEL**	**TESTED CHANNEL**	**MODULATION TECHNOLOGY**	**MODULATION TYPE**	**DATA RATE (Mbps)**
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

Radiated Emission Test (Below 1GHz):

☒ 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.

CDD MODE					
MODE	**AVAILABLE CHANNEL**	**TESTED CHANNEL**	**MODULATION TECHNOLOGY**	**MODULATION TYPE**	**DATA RATE (Mbps)**
802.11n (HT20)	1 to 11	6	OFDM	BPSK	6.5

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.

CDD MODE					
MODE	**AVAILABLE CHANNEL**	**TESTED CHANNEL**	**MODULATION TECHNOLOGY**	**MODULATION TYPE**	**DATA RATE (Mbps)**
802.11n (HT20)	1 to 11	6	OFDM	BPSK	6.5

Antenna Port Conducted Measurement:

☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.

☒ 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
CDD MODE					
MODE	**AVAILABLE CHANNEL**	**TESTED CHANNEL**	**MODULATION TECHNOLOGY**	**MODULATION TYPE**	**DATA RATE (Mbps)**
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	TESTED BY
RE≥1G	25deg. C, 69%RH	120Vac, 60Hz	Robert Cheng
RE<1G	25deg. C, 70%RH	120Vac, 60Hz	Robert Cheng
PLC	20deg. C, 70%RH	120Vac, 60Hz	Mike Hsieh
APCM	25deg. C, 60%RH	120Vac, 60Hz	Anderson Chen

For 5GHz:

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

Where **RE≥1G:** Radiated Emission above 1GHz & Bandedge Measurement **RE<1G:** Radiated Emission below 1GHz

PLC: Power Line Conducted Emission **APCM:** Antenna Port Conducted Measurement

NOTE: The EUT had been pre-tested on the positioned of each 2 axis. The worst case was found when positioned on **wall-mount type**.

Radiated Emission Test (Above 1GHz):

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

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6
CDD MODE					
MODE	**AVAILABLE CHANNEL**	**TESTED CHANNEL**	**MODULATION TECHNOLOGY**	**MODULATION TYPE**	**DATA RATE (Mbps)**
802.11ac (VHT20)	149 to 165	149, 157, 165	OFDM	BPSK	6.5
802.11ac (VHT40)	151 to 159	151, 159	OFDM	BPSK	13.5
802.11ac (VHT80)	155	155	OFDM	BPSK	29.3
Beamforming MODE					
MODE	**AVAILABLE CHANNEL**	**TESTED CHANNEL**	**MODULATION TECHNOLOGY**	**MODULATION TYPE**	**DATA RATE (Mbps)**
802.11ac (VHT20)	149 to 165	149, 157, 165	OFDM	BPSK	6.5
802.11ac (VHT40)	151 to 159	151, 159	OFDM	BPSK	13.5
802.11ac (VHT80)	155	155	OFDM	BPSK	29.3

Radiated Emission Test (Below 1GHz):

☒ 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.

CDD MODE					
MODE	**AVAILABLE CHANNEL**	**TESTED CHANNEL**	**MODULATION TECHNOLOGY**	**MODULATION TYPE**	**DATA RATE (Mbps)**
802.11ac (VHT40)	151 to 159	159	OFDM	BPSK	13.5

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.

CDD MODE					
MODE	**AVAILABLE CHANNEL**	**TESTED CHANNEL**	**MODULATION TECHNOLOGY**	**MODULATION TYPE**	**DATA RATE (Mbps)**
802.11ac (VHT40)	151 to 159	159	OFDM	BPSK	13.5

Antenna Port Conducted Measurement:

☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.

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

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6
CDD MODE					
MODE	**AVAILABLE CHANNEL**	**TESTED CHANNEL**	**MODULATION TECHNOLOGY**	**MODULATION TYPE**	**DATA RATE (Mbps)**
802.11ac (VHT20)	149 to 165	149, 157, 165	OFDM	BPSK	6.5
802.11ac (VHT40)	151 to 159	151, 159	OFDM	BPSK	13.5
802.11ac (VHT80)	155	155	OFDM	BPSK	29.3
Beamforming MODE					
MODE	**AVAILABLE CHANNEL**	**TESTED CHANNEL**	**MODULATION TECHNOLOGY**	**MODULATION TYPE**	**DATA RATE (Mbps)**
802.11ac (VHT20)	149 to 165	149, 157, 165	OFDM	BPSK	6.5
802.11ac (VHT40)	151 to 159	151, 159	OFDM	BPSK	13.5
802.11ac (VHT80)	155	155	OFDM	BPSK	29.3

Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	25deg. C, 69%RH 24deg. C, 69%RH	120Vac, 60Hz	Robert Cheng
RE<1G	25deg. C, 70%RH	120Vac, 60Hz	Robert Cheng
PLC	20deg. C, 70%RH	120Vac, 60Hz	Mike Hsieh
APCM	25deg. C, 60%RH	120Vac, 60Hz	Anderson Chen

3.3 Duty Cycle of Test Signal

2.4GHz Band:

If duty cycle of test signal is ≥ 98 %, duty factor is not required.

If duty cycle of test signal is < 98%, duty factor shall be considered.

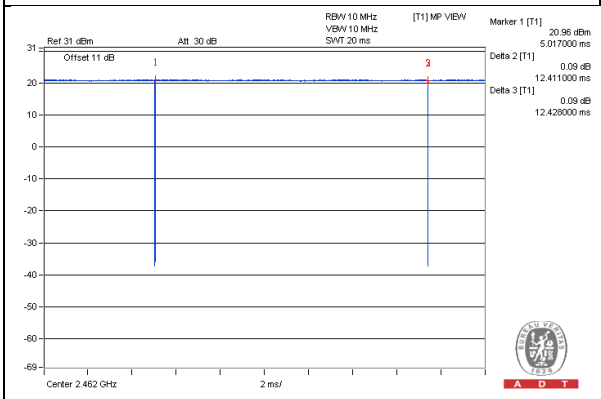
802.11b: Duty cycle = 12.411 ms/12.428 ms = 0.999

802.11g: Duty cycle = 2.062 ms/2.082 ms = 0.99

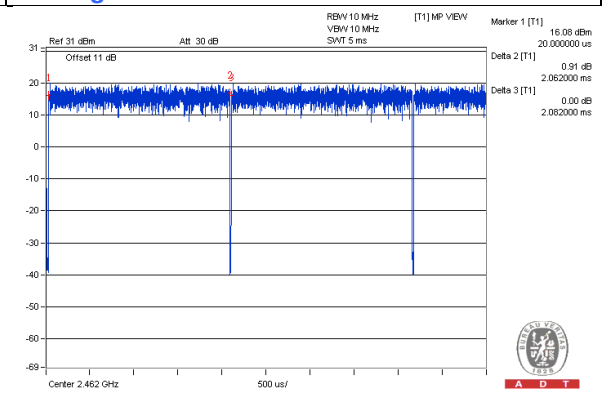
802.11n (HT20): Duty cycle = 1.917 ms/1.944 ms= 0.986

802.11n (HT40): Duty cycle = 0.941 ms/0.964 ms= 0.976, Duty factor = 10 * log(1/0.976) = 0.10

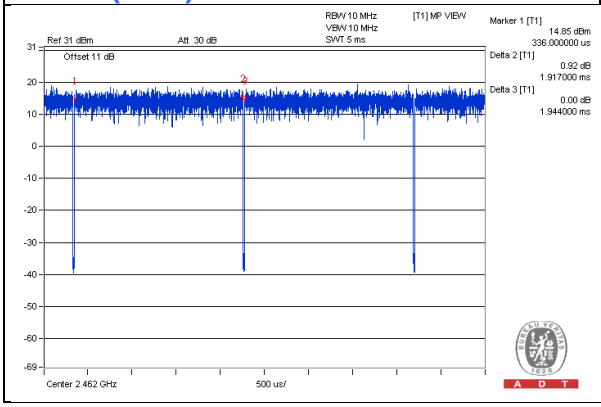
802.11b



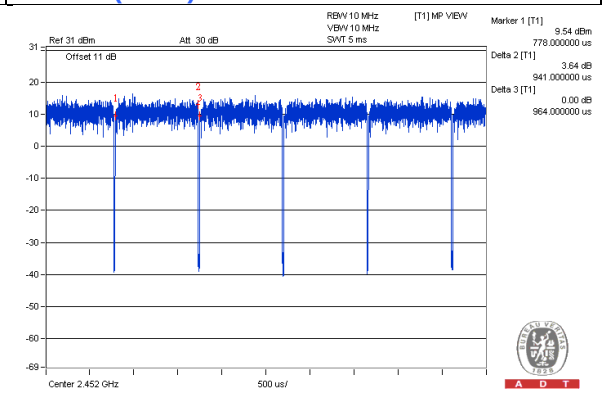
802.11g



802.11n (HT20)



802.11n (HT40)



5GHz Band:

If duty cycle of test signal is ≥ 98 %, duty factor is not required.

If duty cycle of test signal is < 98%, duty factor shall be considered.

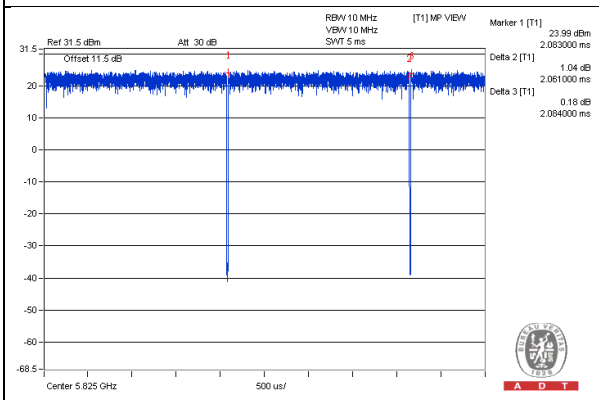
802.11a: Duty cycle = 2.061 ms/2.084 ms = 0.989

802.11ac (VHT20): Duty cycle = 1.918 ms/1.941 ms= 0.988

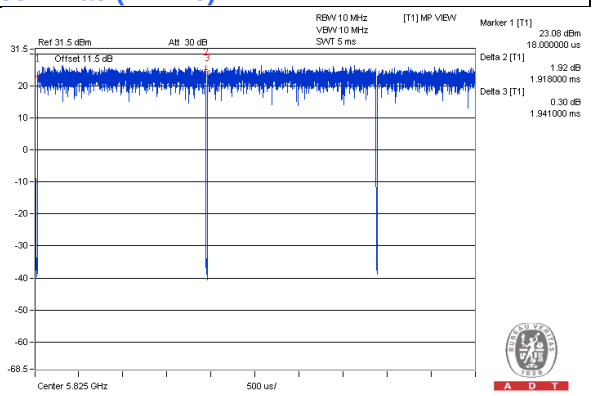
802.11ac (VHT40): Duty cycle = 0.943 ms/0.98 ms= 0.962, Duty factor = 10 * log(1/0.962) = 0.17

802.11ac (VHT80): Duty cycle = 0.458 ms/0.481 ms= 0.952, Duty factor = 10 * log(1/0.952) = 0.21

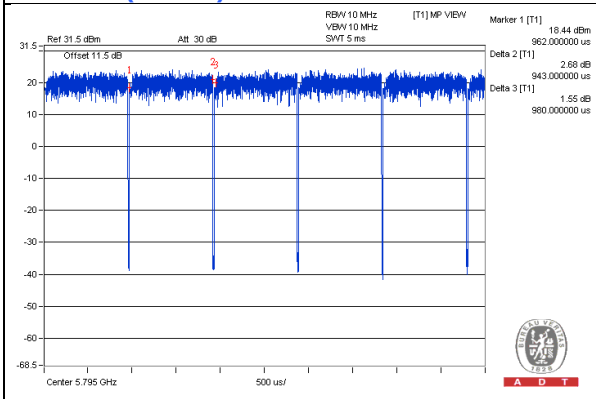
802.11a



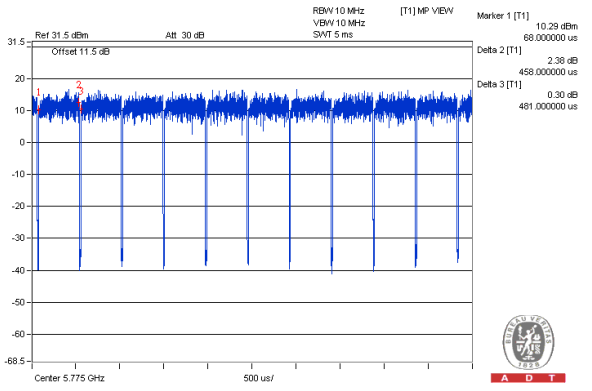
802.11ac (VHT20)



802.11ac (VHT40)



802.11ac (VHT80)



3.4 Description of Support Units

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

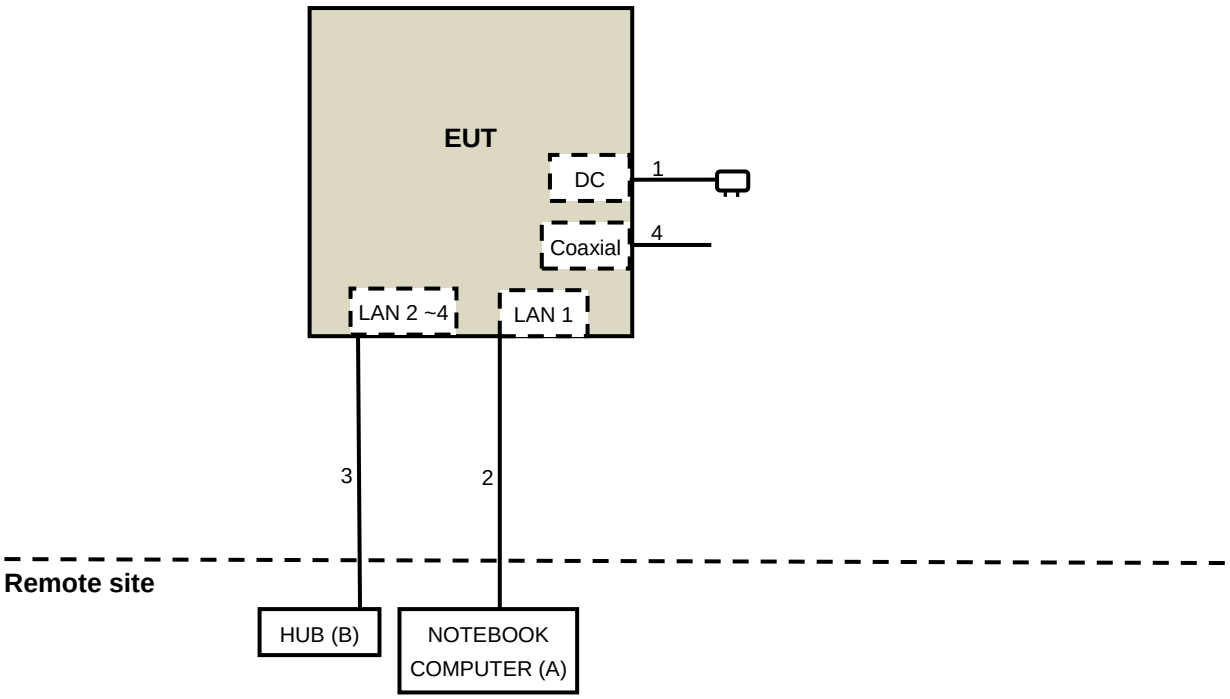
No.	Product	Brand	Model No.	Serial No.	FCC ID	Remark
A	NOTEBOOK COMPUTER	DELL	E5440	6FC7F12	FCC DoC	Provided by Lab
B	HUB	ZyXEL	ES-116P	S060H02000215	FCC DoC	Provided by Lab

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	DC	1	2	No	0	Supplied by Client
2	RJ45	1	10	No	0	Provided by Lab
3	RJ45	3	10	No	0	Provided by Lab
4	Coaxial	1	10	Yes	0	Provided by Lab

3.4.1 Configuration of System under Test



3.5 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 v03r02
662911 D01 Multiple Transmitter Output v02r01
ANSI C63.10-2009

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

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

4 Test Types and Results (For 2.4GHz Band)

4.1 Radiated Emission and Bandedge Measurement

4.1.1 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 30dB 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.

4.1.2 Test Instruments

For above 1GHz test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
MXE EMI Receiver Agilent	N9038A	MY51210105	July 21, 2014	July 20, 2015
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-03	Nov. 12, 2014	Nov. 11, 2015
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-360	Feb. 09, 2015	Feb. 08, 2016
RF Cable	NA	CHGCAB_001	Oct. 04, 2014	Oct. 03, 2015
Horn_Antenna AISI	AIH.8018	0000320091110	Feb. 09, 2015	Feb. 08, 2016
Pre-Amplifier Agilent	8449B	3008A02578	June 24, 2014	June 23, 2015
RF Cable	NA	131205 131216 131217 SNMY23684/4	Jan. 16, 2015	Jan. 15, 2016
Spectrum Analyzer R&S	FSV40	100964	July 05, 2014	July 04, 2015
Pre-Amplifier SPACEK LABS	SLKKa-48-6	9K16	Dec. 12, 2014	Dec. 11, 2015
Horn_Antenna SCHWARZBECK	BBHA 9170	9170-424	Feb. 05, 2015	Feb. 04, 2016
RF Cable	NA	329751/4 RF104-204	Dec. 11, 2014	Dec. 10, 2015
Antenna Tower & Turn Table CT	NA	NA	NA	NA
SPECTRUM ANALYZER R&S	FSP 40	100060	May 08, 2014	May 07, 2015
Power Meter Anritsu	ML2495A	0824006	May 22, 2014	May 21, 2015
Power Sensor Anritsu	MA2411B	0738172	May 22, 2014	May 21, 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. 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: Apr. 22 to 29, 2015

For below 1GHz test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
MXE EMI Receiver Agilent	N9038A	MY50010156	Aug. 11, 2014	Aug. 10, 2015
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-04	Nov. 12, 2014	Nov. 11, 2015
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-361	Feb. 06, 2015	Feb. 05, 2016
RF Cable	NA	CHHCAB_001	Oct. 05, 2014	Oct. 04, 2015
Horn_Antenna AISI	AIH.8018	0000220091110	Feb. 06, 2015	Feb. 05, 2016
Pre-Amplifier Agilent	8449B	300801923	Oct. 28, 2014	Oct. 27, 2015
RF Cable	NA	131206 131213 131215 SNMY23685/4	Jan. 16, 2015	Jan. 15, 2016
Spectrum Analyzer R&S	FSV40	100964	July 05, 2014	July 04, 2015
Pre-Amplifier SPACEK LABS	SLKKa-48-6	9K16	Dec. 12, 2014	Dec. 11, 2015
Horn_Antenna SCHWARZBECK	BBHA 9170	9170-424	Feb. 05, 2015	Feb. 04, 2016
RF Cable	NA	329751/4 RF104-204	Dec. 11, 2014	Dec. 10, 2015
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. 21, 2015

4.1.3 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:

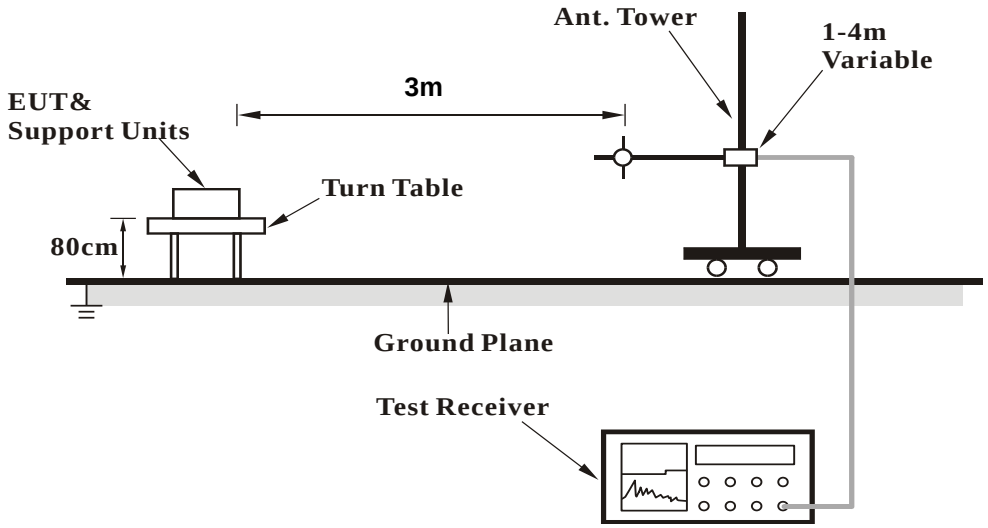
1. For emission measurements above 1 GHz, the EUT shall be placed at a height of 1.5 m above the ground at 3 meter chamber room for test
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
4. 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)).
5. 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.
6. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

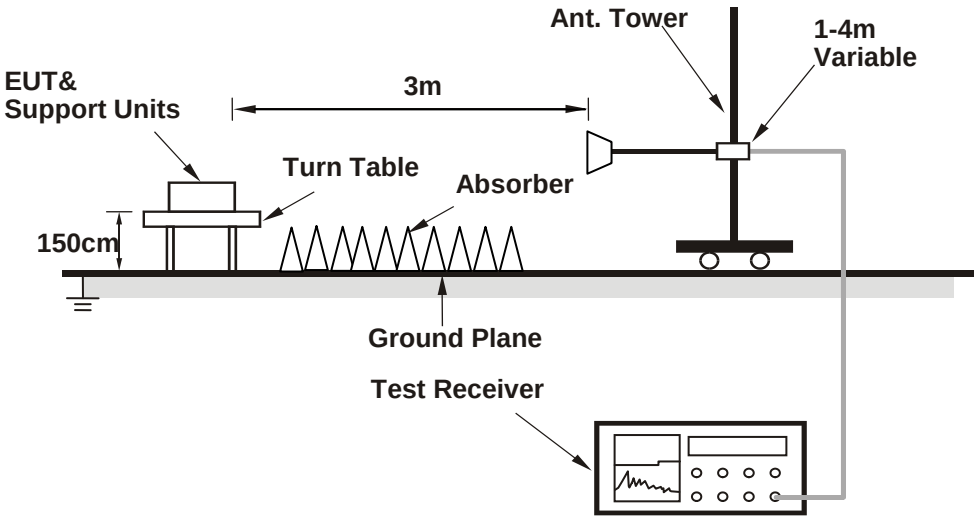
No deviation.

4.1.5 Test Set Up

<Frequency Range below 1GHz>



<Frequency Range above 1GHz>



For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.1.6 EUT Operating Conditions

1. Connect the EUT with the support unit A (NOTEBOOK COMPUTER) which is placed on remote site.
2. Controlling software (MTool 2.0.1.0.msi) has been activated to set the EUT on specific status.

4.1.7 Test Results

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	2390.00	52.4 PK	74.0	-21.6	1.78 H	139	58.25	-5.85
2	2390.00	43.1 AV	54.0	-10.9	1.78 H	139	48.95	-5.85
3	*2412.00	107.9 PK			1.78 H	139	113.65	-5.75
4	*2412.00	105.4 AV			1.78 H	139	111.15	-5.75
5	4824.00	56.5 PK	74.0	-17.5	1.35 H	216	54.58	1.92
6	4824.00	44.9 AV	54.0	-9.1	1.35 H	216	42.98	1.92
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	52.5 PK	74.0	-21.5	1.83 V	33	58.35	-5.85
2	2390.00	42.8 AV	54.0	-11.2	1.83 V	33	48.65	-5.85
3	*2412.00	107.6 PK			1.83 V	33	113.35	-5.75
4	*2412.00	105.0 AV			1.83 V	33	110.75	-5.75
5	4824.00	49.7 PK	74.0	-24.3	1.79 V	42	47.78	1.92
6	4824.00	39.5 AV	54.0	-14.5	1.79 V	42	37.58	1.92

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	*2437.00	107.6 PK			1.76 H	136	113.21	-5.61
2	*2437.00	104.9 AV			1.76 H	136	110.51	-5.61
3	4874.00	57.6 PK	74.0	-16.4	1.37 H	193	55.51	2.09
4	4874.00	45.5 AV	54.0	-8.5	1.37 H	193	43.41	2.09
5	7311.00	55.3 PK	74.0	-18.7	1.01 H	56	46.09	9.21
6	7311.00	44.5 AV	54.0	-9.5	1.01 H	56	35.29	9.21
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	*2437.00	107.1 PK			1.89 V	18	112.71	-5.61
2	*2437.00	104.5 AV			1.89 V	18	110.11	-5.61
3	4874.00	50.1 PK	74.0	-23.9	1.77 V	20	48.01	2.09
4	4874.00	39.5 AV	54.0	-14.5	1.77 V	20	37.41	2.09
5	7311.00	52.8 PK	74.0	-21.2	1.75 V	24	43.59	9.21
6	7311.00	43.0 AV	54.0	-11.0	1.75 V	24	33.79	9.21

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) 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	*2462.00	106.1 PK			1.72 H	125	111.57	-5.47
2	*2462.00	103.6 AV			1.72 H	125	109.07	-5.47
3	2483.50	53.8 PK	74.0	-20.2	1.72 H	125	59.14	-5.34
4	2483.50	45.9 AV	54.0	-8.1	1.72 H	125	51.24	-5.34
5	4924.00	57.7 PK	74.0	-16.3	1.38 H	208	55.42	2.28
6	4924.00	45.6 AV	54.0	-8.4	1.38 H	208	43.32	2.28
7	7386.00	55.1 PK	74.0	-18.9	1.02 H	79	45.79	9.31
8	7386.00	44.4 AV	54.0	-9.6	1.02 H	79	35.09	9.31
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	105.4 PK			1.80 V	20	110.87	-5.47
2	*2462.00	103.1 AV			1.80 V	20	108.57	-5.47
3	2483.50	53.2 PK	74.0	-20.8	1.80 V	20	58.54	-5.34
4	2483.50	45.1 AV	54.0	-8.9	1.80 V	20	50.44	-5.34
5	4924.00	50.1 PK	74.0	-23.9	1.77 V	45	47.82	2.28
6	4924.00	39.5 AV	54.0	-14.5	1.77 V	45	37.22	2.28
7	7386.00	52.7 PK	74.0	-21.3	1.80 V	22	43.39	9.31
8	7386.00	43.0 AV	54.0	-11.0	1.80 V	22	33.69	9.31

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) 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**	**73.9 PK**	**74.0**	**-0.1**	**1.81 H**	**220**	**79.75**	**-5.85**
2	**2390.00**	**53.9 AV**	**54.0**	**-0.1**	**1.81 H**	**220**	**59.75**	**-5.85**
3	*2412.00	113.4 PK			1.22 H	140	119.15	-5.75
4	*2412.00	102.9 AV			1.22 H	140	108.65	-5.75
5	4824.00	49.5 PK	74.0	-24.5	1.06 H	110	47.58	1.92
6	4824.00	38.1 AV	54.0	-15.9	1.06 H	110	36.18	1.92
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	67.8 PK	74.0	-6.2	1.46 V	173	73.65	-5.85
2	2390.00	47.6 AV	54.0	-6.4	1.46 V	173	53.45	-5.85
3	*2412.00	106.2 PK			1.00 V	29	111.95	-5.75
4	*2412.00	96.2 AV			1.00 V	29	101.95	-5.75
5	4824.00	49.2 PK	74.0	-24.8	1.80 V	19	47.28	1.92
6	4824.00	37.8 AV	54.0	-16.2	1.80 V	19	35.88	1.92

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	*2437.00	117.8 PK			1.28 H	125	123.41	-5.61
2	*2437.00	107.3 AV			1.28 H	125	112.91	-5.61
3	4874.00	49.3 PK	74.0	-24.7	1.05 H	115	47.21	2.09
4	4874.00	37.8 AV	54.0	-16.2	1.05 H	115	35.71	2.09
5	7311.00	62.1 PK	74.0	-11.9	1.36 H	227	52.89	9.21
6	7311.00	45.9 AV	54.0	-8.1	1.36 H	227	36.69	9.21
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	*2437.00	110.9 PK			1.05 V	18	116.51	-5.61
2	*2437.00	100.4 AV			1.05 V	18	106.01	-5.61
3	4874.00	48.5 PK	74.0	-25.5	1.79 V	43	46.41	2.09
4	4874.00	37.3 AV	54.0	-16.7	1.79 V	43	35.21	2.09
5	7311.00	57.1 PK	74.0	-16.9	1.81 V	32	47.89	9.21
6	7311.00	40.1 AV	54.0	-13.9	1.81 V	32	30.89	9.21

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) 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	*2462.00	112.5 PK			1.17 H	151	117.97	-5.47
2	*2462.00	102.1 AV			1.17 H	151	107.57	-5.47
3	**2483.50**	**73.9 PK**	**74.0**	**-0.1**	**1.33 H**	**210**	**79.24**	**-5.34**
4	2483.50	51.6 AV	54.0	-2.4	1.33 H	210	56.94	-5.34
5	4924.00	49.0 PK	74.0	-25.0	1.08 H	119	46.72	2.28
6	4924.00	37.8 AV	54.0	-16.2	1.08 H	119	35.52	2.28
7	7386.00	57.1 PK	74.0	-16.9	1.46 H	217	47.79	9.31
8	7386.00	40.2 AV	54.0	-13.8	1.46 H	217	30.89	9.31
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	105.9 PK			1.04 V	26	111.37	-5.47
2	*2462.00	95.7 AV			1.04 V	26	101.17	-5.47
3	2483.50	68.0 PK	74.0	-6.0	1.48 V	188	73.34	-5.34
4	2483.50	47.9 AV	54.0	-6.1	1.48 V	188	53.24	-5.34
5	4924.00	49.1 PK	74.0	-24.9	1.85 V	29	46.82	2.28
6	4924.00	37.6 AV	54.0	-16.4	1.85 V	29	35.32	2.28
7	7386.00	56.5 PK	74.0	-17.5	1.86 V	47	47.19	9.31
8	7386.00	39.6 AV	54.0	-14.4	1.86 V	47	30.29	9.31

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	73.8 PK	74.0	-0.2	1.54 H	221	79.65	-5.85
2	2390.00	51.0 AV	54.0	-3.0	1.54 H	221	56.85	-5.85
3	*2412.00	112.1 PK			1.26 H	148	117.85	-5.75
4	*2412.00	101.8 AV			1.26 H	148	107.55	-5.75
5	4824.00	49.7 PK	74.0	-24.3	1.07 H	120	47.78	1.92
6	4824.00	38.4 AV	54.0	-15.6	1.07 H	120	36.48	1.92
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	68.0 PK	74.0	-6.0	1.03 V	28	73.85	-5.85
2	2390.00	47.6 AV	54.0	-6.4	1.03 V	28	53.45	-5.85
3	*2412.00	105.8 PK			1.01 V	41	111.55	-5.75
4	*2412.00	95.6 AV			1.01 V	41	101.35	-5.75
5	4824.00	48.7 PK	74.0	-25.3	1.77 V	22	46.78	1.92
6	4824.00	37.4 AV	54.0	-16.6	1.77 V	22	35.48	1.92

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	*2437.00	117.9 PK			1.52 H	223	123.51	-5.61
2	*2437.00	107.5 AV			1.52 H	223	113.11	-5.61
3	4874.00	49.3 PK	74.0	-24.7	1.03 H	105	47.21	2.09
4	4874.00	37.7 AV	54.0	-16.3	1.03 H	105	35.61	2.09
5	7311.00	61.9 PK	74.0	-12.1	1.45 H	225	52.69	9.21
6	7311.00	45.3 AV	54.0	-8.7	1.45 H	225	36.09	9.21
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	*2437.00	110.6 PK			1.03 V	20	116.21	-5.61
2	*2437.00	100.0 AV			1.03 V	20	105.61	-5.61
3	4874.00	49.1 PK	74.0	-24.9	1.85 V	20	47.01	2.09
4	4874.00	37.6 AV	54.0	-16.4	1.85 V	20	35.51	2.09
5	7311.00	57.1 PK	74.0	-16.9	1.86 V	46	47.89	9.21
6	7311.00	40.4 AV	54.0	-13.6	1.86 V	46	31.19	9.21

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) 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	*2462.00	111.4 PK			1.27 H	148	116.87	-5.47
2	*2462.00	101.1 AV			1.27 H	148	106.57	-5.47
3	2483.50	73.8 PK	74.0	-0.2	1.60 H	218	79.14	-5.34
4	2483.50	50.6 AV	54.0	-3.4	1.60 H	218	55.94	-5.34
5	4924.00	49.3 PK	74.0	-24.7	1.01 H	105	47.02	2.28
6	4924.00	38.1 AV	54.0	-15.9	1.01 H	105	35.82	2.28
7	7386.00	56.6 PK	74.0	-17.4	1.39 H	230	47.29	9.31
8	7386.00	40.2 AV	54.0	-13.8	1.39 H	230	30.89	9.31
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	105.1 PK			1.00 V	19	110.57	-5.47
2	*2462.00	94.8 AV			1.00 V	19	100.27	-5.47
3	2483.50	68.1 PK	74.0	-5.9	1.02 V	38	73.44	-5.34
4	2483.50	48.3 AV	54.0	-5.7	1.02 V	38	53.64	-5.34
5	4924.00	49.5 PK	74.0	-24.5	1.79 V	33	47.22	2.28
6	4924.00	37.9 AV	54.0	-16.1	1.79 V	33	35.62	2.28
7	7386.00	56.8 PK	74.0	-17.2	1.83 V	47	47.49	9.31
8	7386.00	40.0 AV	54.0	-14.0	1.83 V	47	30.69	9.31

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 3	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	73.3 PK	74.0	-0.7	1.51 H	221	79.15	-5.85
2	2390.00	53.7 AV	54.0	-0.3	1.51 H	221	59.55	-5.85
3	*2422.00	107.1 PK			1.28 H	127	112.79	-5.69
4	*2422.00	96.2 AV			1.28 H	127	101.89	-5.69
5	4844.00	50.0 PK	74.0	-24.0	1.08 H	102	48.02	1.98
6	4844.00	38.6 AV	54.0	-15.4	1.08 H	102	36.62	1.98
7	7266.00	56.8 PK	74.0	-17.2	1.44 H	229	47.63	9.17
8	7266.00	40.3 AV	54.0	-13.7	1.44 H	229	31.13	9.17
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	68.0 PK	74.0	-6.0	1.00 V	15	73.85	-5.85
2	2390.00	43.5 AV	54.0	-10.5	1.00 V	15	49.35	-5.85
3	*2422.00	100.3 PK			1.02 V	28	105.99	-5.69
4	*2422.00	90.1 AV			1.02 V	28	95.79	-5.69
5	4844.00	49.3 PK	74.0	-24.7	1.77 V	9	47.32	1.98
6	4844.00	37.9 AV	54.0	-16.1	1.77 V	9	35.92	1.98
7	7266.00	57.2 PK	74.0	-16.8	1.78 V	29	48.03	9.17
8	7266.00	40.4 AV	54.0	-13.6	1.78 V	29	31.23	9.17

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 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**	**73.9 PK**	**74.0**	**-0.1**	**1.51 H**	**217**	**79.75**	**-5.85**
2	2390.00	49.6 AV	54.0	-4.4	1.51 H	217	55.45	-5.85
3	*2437.00	111.8 PK			1.51 H	223	117.41	-5.61
4	*2437.00	100.1 AV			1.51 H	223	105.71	-5.61
5	2483.50	72.6 PK	74.0	-1.4	1.51 H	217	77.94	-5.34
6	2483.50	49.4 AV	54.0	-4.6	1.51 H	217	54.74	-5.34
7	4874.00	49.3 PK	74.0	-24.7	1.09 H	110	47.21	2.09
8	4874.00	38.2 AV	54.0	-15.8	1.09 H	110	36.11	2.09
9	7311.00	56.7 PK	74.0	-17.3	1.41 H	228	47.49	9.21
10	7311.00	40.2 AV	54.0	-13.8	1.41 H	228	30.99	9.21
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	68.3 PK	74.0	-5.7	1.03 V	15	74.15	-5.85
2	2390.00	42.5 AV	54.0	-11.5	1.03 V	15	48.35	-5.85
3	*2437.00	103.5 PK			1.00 V	31	109.11	-5.61
4	*2437.00	93.8 AV			1.00 V	31	99.41	-5.61
5	2483.50	68.6 PK	74.0	-5.4	1.00 V	36	73.94	-5.34
6	2483.50	43.2 AV	54.0	-10.8	1.00 V	36	48.54	-5.34
7	4874.00	49.0 PK	74.0	-25.0	1.82 V	17	46.91	2.09
8	4874.00	37.4 AV	54.0	-16.6	1.82 V	17	35.31	2.09
9	7311.00	57.3 PK	74.0	-16.7	1.80 V	18	48.09	9.21
10	7311.00	40.2 AV	54.0	-13.8	1.80 V	18	30.99	9.21

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) 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	*2452.00	106.5 PK			1.24 H	140	112.02	-5.52
2	*2452.00	95.8 AV			1.24 H	140	101.32	-5.52
3	2483.50	70.8 PK	74.0	-3.2	1.51 H	221	76.14	-5.34
4	2483.50	53.7 AV	54.0	-0.3	1.51 H	221	59.04	-5.34
5	4904.00	49.8 PK	74.0	-24.2	1.05 H	116	47.60	2.20
6	4904.00	38.5 AV	54.0	-15.5	1.05 H	116	36.30	2.20
7	7356.00	56.8 PK	74.0	-17.2	1.40 H	212	47.53	9.27
8	7356.00	39.9 AV	54.0	-14.1	1.40 H	212	30.63	9.27
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	99.8 PK			1.04 V	29	105.32	-5.52
2	*2452.00	89.7 AV			1.04 V	29	95.22	-5.52
3	2483.50	67.7 PK	74.0	-6.3	1.05 V	25	73.04	-5.34
4	2483.50	47.5 AV	54.0	-6.5	1.05 V	25	52.84	-5.34
5	4904.00	49.0 PK	74.0	-25.0	1.84 V	13	46.80	2.20
6	4904.00	37.6 AV	54.0	-16.4	1.84 V	13	35.40	2.20
7	7356.00	57.2 PK	74.0	-16.8	1.80 V	32	47.93	9.27
8	7356.00	40.1 AV	54.0	-13.9	1.80 V	32	30.83	9.27

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.

Below 1GHz Data:

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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	148.44	32.7 QP	43.5	-10.8	1.50 H	92	45.46	-12.79
2	250.00	34.0 QP	46.0	-12.0	1.50 H	274	47.86	-13.87
3	375.03	36.8 QP	46.0	-9.2	1.50 H	321	47.06	-10.22
4	625.00	36.9 QP	46.0	-9.1	1.50 H	360	41.26	-4.33
5	799.99	33.7 QP	46.0	-12.3	1.50 H	86	35.22	-1.49
6	875.02	37.3 QP	46.0	-8.7	1.50 H	342	37.59	-0.33
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	36.21	36.2 QP	40.0	-3.9	1.00 V	138	50.42	-14.27
2	51.29	31.6 QP	40.0	-8.5	1.50 V	208	44.88	-13.33
3	375.03	36.4 QP	46.0	-9.7	1.00 V	360	46.57	-10.22
4	625.00	39.5 QP	46.0	-6.5	1.50 V	266	43.80	-4.33
5	801.01	36.1 QP	46.0	-9.9	1.50 V	268	37.56	-1.48
6	875.02	38.2 QP	46.0	-7.8	1.00 V	281	38.54	-0.33

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

4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15 - 0.5	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30.0	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 0.50MHz.

4.2.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESCS 30	847124/029	Oct. 22, 2014	Oct. 21, 2015
Line-Impedance Stabilization Network (for EUT) SCHWARZBECK	NSLK-8127	8127-522	Sep. 15, 2014	Sep. 14, 2015
Line-Impedance Stabilization Network (for Peripheral) ROHDE & SCHWARZ	ENV216	100071	Nov. 10, 2014	Nov. 09, 2015
RF Cable (JYEBAO)	5D-FB	COCCAB-001	Mar. 09, 2015	Mar. 08, 2016
50 ohms Terminator	N/A	EMC-03	Sep. 22, 2014	Sep. 21, 2015
50 ohms Terminator	N/A	EMC-02	Sep. 30, 2014	Sep. 29, 2015
Software ADT	BV ADT_Cond_V7.3.7.3	NA	NA	NA

Note:

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. 21, 2015

4.2.3 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. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.

b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

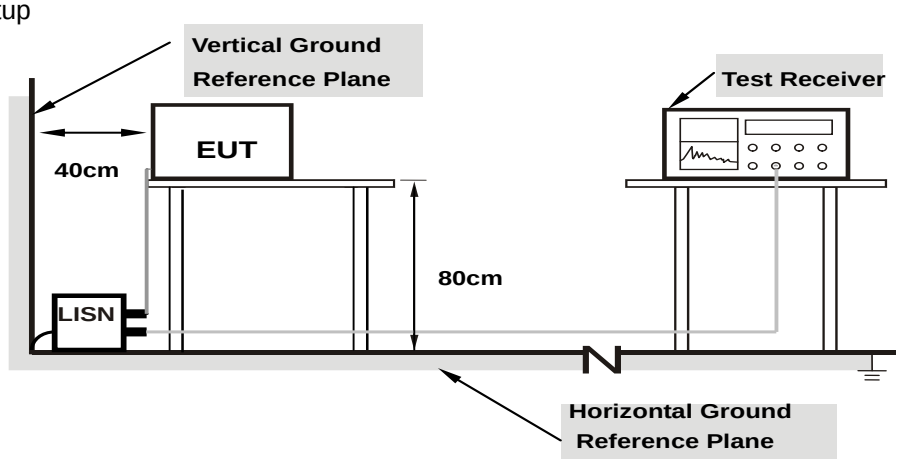
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

NOTE: The resolution bandwidth and video bandwidth of test receiver is 9kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15MHz-30MHz.

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



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

For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.2.6 EUT Operating Conditions

Same as 4.1.6.

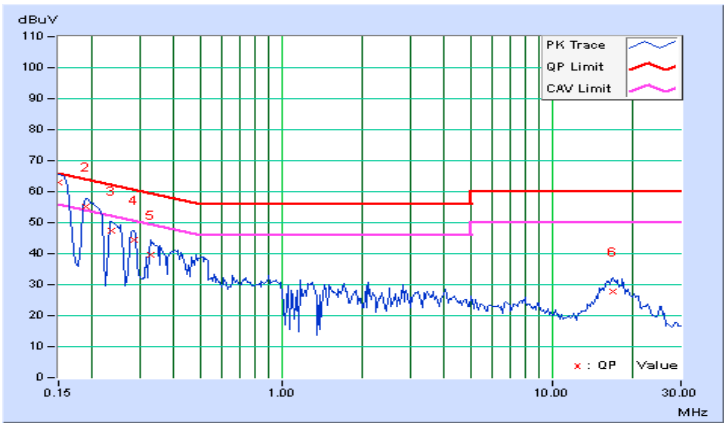
4.2.7 Test Results

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	**0.15000**	**0.08**	**62.78**	**49.46**	**62.86**	**49.54**	**66.00**	**56.00**	**-3.14**	**-6.46**
2	0.18906	0.09	55.16	44.48	55.25	44.57	64.08	54.08	-8.83	-9.51
3	0.23594	0.09	47.35	36.73	47.44	36.82	62.24	52.24	-14.80	-15.42
4	0.28672	0.09	44.19	33.76	44.28	33.85	60.62	50.62	-16.33	-16.76
5	0.32969	0.10	39.57	27.87	39.67	27.97	59.46	49.46	-19.79	-21.49
6	16.77734	0.62	27.03	21.55	27.65	22.17	60.00	50.00	-32.35	-27.83

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.

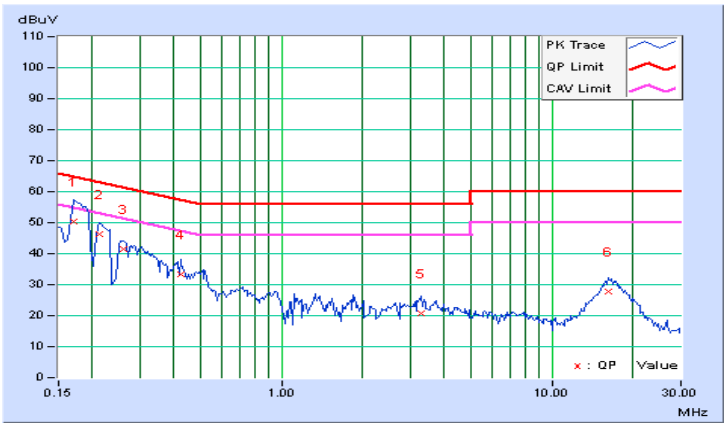


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16953	0.08	50.17	29.03	50.25	29.11	64.98	54.98	-14.73	-25.87
2	0.21250	0.08	46.40	29.92	46.48	30.00	63.11	53.11	-16.63	-23.11
3	0.25938	0.09	41.27	26.90	41.36	26.99	61.45	51.45	-20.10	-24.47
4	0.42344	0.10	33.34	25.08	33.44	25.18	57.38	47.38	-23.94	-22.20
5	3.27734	0.21	20.66	14.40	20.87	14.61	56.00	46.00	-35.13	-31.39
6	16.26953	0.64	27.02	21.94	27.66	22.58	60.00	50.00	-32.34	-27.42

REMARKS:

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

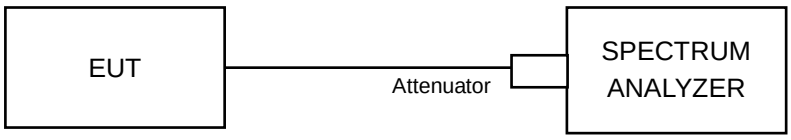


4.3 6dB Bandwidth Measurement

4.3.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.3.2 Test Setup



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

a. Set resolution bandwidth (RBW) = 100kHz
b. Set the video bandwidth (VBW) ≥ 3 x RBW, Detector = Peak.
c. Trace mode = max hold.
d. Sweep = auto couple.
e. 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

4.3.5 Deviation fromTest Standard

No deviation.

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 Result

802.11b

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	9.09	0.5	PASS
6	2437	9.12	0.5	PASS
11	2462	9.10	0.5	PASS

802.11g

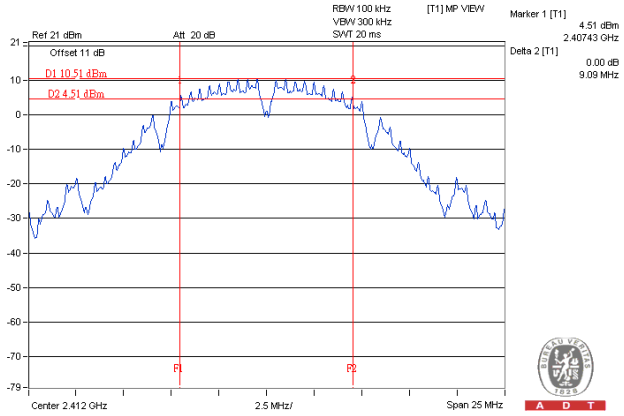
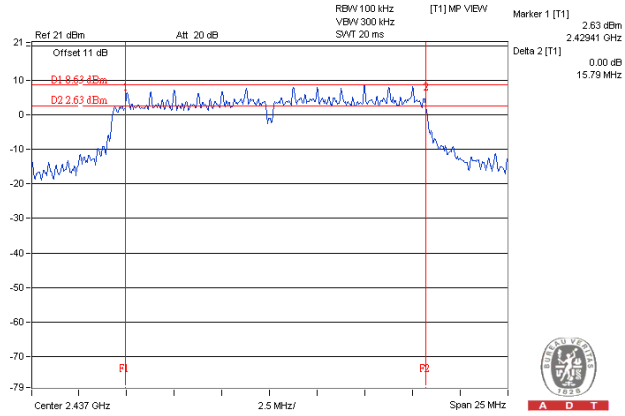
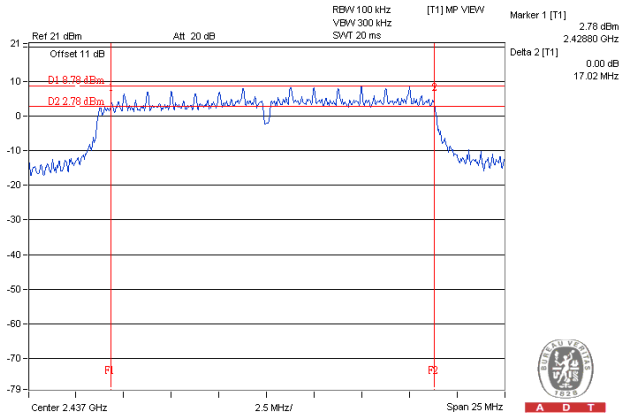
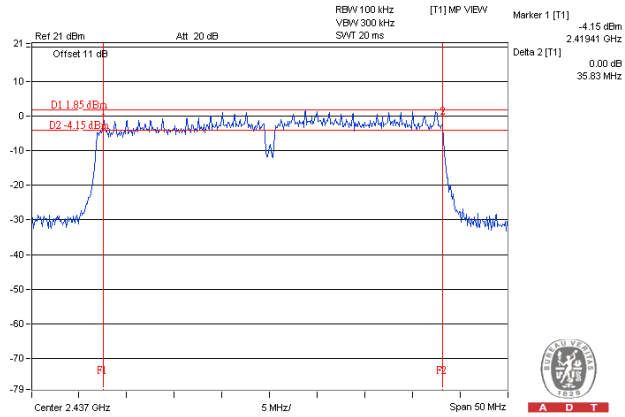
Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
1	2412	16.39	16.41	16.41	0.5	Pass
6	2437	15.82	15.81	15.79	0.5	Pass
11	2462	16.44	16.45	16.44	0.5	Pass

802.11n (HT20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
1	2412	17.66	17.65	17.64	0.5	Pass
6	2437	17.63	17.62	17.02	0.5	Pass
11	2462	17.67	17.67	17.67	0.5	Pass

802.11n (HT40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
3	2422	36.45	36.47	36.46	0.5	Pass
6	2437	35.83	35.90	35.90	0.5	Pass
9	2452	36.43	36.11	36.06	0.5	Pass

Spectrum Plot of Worst Value	
802.11b – CH 1	**802.11g – Chain 2: CH 6**
	
802.11n (HT20) – Chain 2: CH 6	**802.11n (HT40) – Chain 0: CH 6**
	

4.4 Conducted Output Power Measurement

4.4.1 Limits of Conducted Output Power Measurement

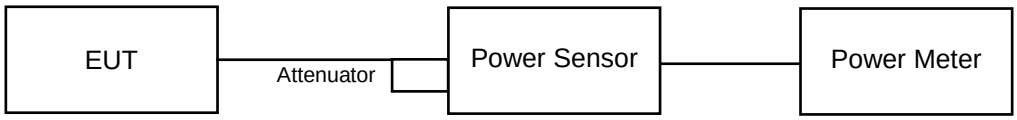
For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30dBm)

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 Setup



4.4.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.4 Test Procedures

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

4.4.5 Deviation from Test Standard

No deviation.

4.4.6 EUT Operating Conditions

Same as Item 4.3.6.

4.4.7 Test Results

802.11b

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)	Limit (dBm)	Pass/Fail
1	2412	138.995	21.43	30	Pass
6	2437	135.207	21.31	30	Pass
11	2462	132.434	21.22	30	Pass

802.11g

Chan.	Chan. Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
1	2412	16.11	17.25	15.63	130.479	21.16	30	Pass
6	2437	21.11	21.61	20.51	386.459	25.87	30	Pass
11	2462	15.11	16.01	14.59	101.11	20.05	30	Pass

802.11n (HT20)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
1	2412	15.11	16.13	14.56	102.03	20.09	30	Pass
6	2437	21.12	21.62	20.51	387.091	25.88	30	Pass
11	2462	14.42	15.11	13.87	84.481	19.27	30	Pass

802.11n (HT40)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
3	2422	12.91	13.94	12.37	61.575	17.89	30	Pass
6	2437	15.61	16.21	14.76	108.098	20.34	30	Pass
9	2452	12.95	13.85	11.95	59.658	17.76	30	Pass

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 Setup

4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedure

For 802.11b, 802.11g & 802.11n (HT20) test:

a) Set instrument center frequency to DTS channel center frequency.
b) Set span to at least 1.5 times the OBW.
c) Set RBW to: 3 kHz ≤ RBW ≤ 100 kHz. .
d) Set VBW ≥3 x RBW.
e) Detector = power averaging (RMS) or sample detector (when RMS not available).
f) Ensure that the number of measurement points in the sweep ≥ 2 x span/RBW.
g) Sweep time = auto couple.
h) Employ trace averaging (RMS) mode over a minimum of 100 traces.
i) Use the peak marker function to determine the maximum amplitude level.

For 802.11n (HT40) test:

a) Measure the duty cycle (x).
b) Set instrument center frequency to DTS channel center frequency.
c) Set span to at least 1.5 times the OBW.
d) Set RBW to: 3 kHz ≤ RBW ≤ 100 kHz..
e) Set VBW ≥3 x RBW.
f) Detector = power averaging (RMS) or sample detector (when RMS not available).
g) Ensure that the number of measurement points in the sweep ≥ 2 x span/RBW.
h) Sweep time = auto couple.
i) Do not use sweep triggering. Allow sweep to “free run”.
j) Employ trace averaging (RMS) mode over a minimum of 100 traces.
k) Use the peak marker function to determine the maximum amplitude level.
l) Add 10 log (1/x), where x is the duty cycle measured in step (a, to the measured PSD to compute the average PSD during the actual transmission time.

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

Same as Item 4.3.6

4.5.7 Test Results

802.11b

Channel	Freq. (MHz)	PSD (dBm)	Limit (dBm)	Pass /Fail
1	2412	-9.13	8	Pass
6	2437	-8.54	8	Pass
11	2462	-9.53	8	Pass

802.11g

TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=3) dB	Total PSD (dBm)	Limit (dBm)	Pass /Fail
0	1	2412	-11.74	4.77	-6.97	6.69	Pass
	6	2437	-7.95	4.77	-3.18	6.69	Pass
	11	2462	-14.06	4.77	-9.29	6.69	Pass
1	1	2412	-14.09	4.77	-9.32	6.69	Pass
	6	2437	-9.90	4.77	-5.13	6.69	Pass
	11	2462	-15.36	4.77	-10.59	6.69	Pass
2	1	2412	-14.24	4.77	-9.47	6.69	Pass
	6	2437	-9.92	4.77	-5.15	6.69	Pass
	11	2462	-15.42	4.77	-10.65	6.69	Pass

NOTE: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 3] = 7.31dBi > 6dBi , so the power density limit shall be reduced to 8-(7.31-6) = 6.69dBm.

802.11n (HT20)

TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=3) dB	Total PSD (dBm)	Limit (dBm)	Pass /Fail
0	1	2412	-14.15	4.77	-9.38	6.69	Pass
	6	2437	-8.92	4.77	-4.15	6.69	Pass
	11	2462	-16.21	4.77	-11.44	6.69	Pass
1	1	2412	-18.29	4.77	-13.52	6.69	Pass
	6	2437	-10.94	4.77	-6.17	6.69	Pass
	11	2462	-17.73	4.77	-12.96	6.69	Pass
2	1	2412	-17.72	4.77	-12.95	6.69	Pass
	6	2437	-11.39	4.77	-6.62	6.69	Pass
	11	2462	-18.27	4.77	-13.50	6.69	Pass

NOTE: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 3] = 7.31dBi > 6dBi , so the power density limit shall be reduced to 8-(7.31-6) = 6.69dBm.

802.11n (HT40)

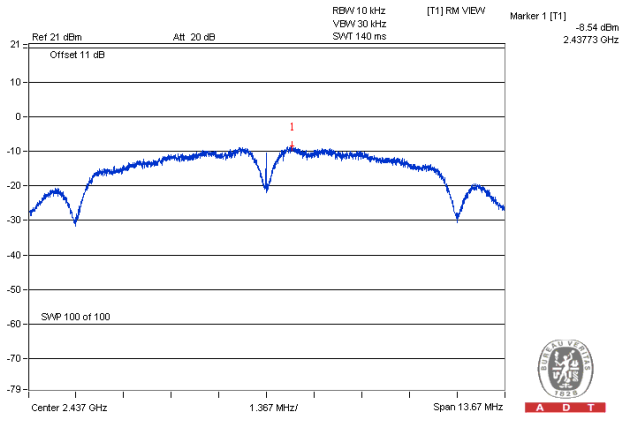
TX chain	Channel	Freq. (MHz)	PSD w/o Duty Factor (dBm)	10 log (N=3) dB	Duty Factor (dB)	Total PSD with Duty Factor (dBm)	Limit (dBm)	Pass /Fail
0	3	2422	-17.67	4.77	0.10	-12.80	6.69	PASS
	6	2437	-14.58	4.77	0.10	-9.71	6.69	PASS
	9	2452	-17.98	4.77	0.10	-13.11	6.69	PASS
1	3	2422	-21.15	4.77	0.10	-16.28	6.69	PASS
	6	2437	-18.09	4.77	0.10	-13.22	6.69	PASS
	9	2452	-19.06	4.77	0.10	-14.19	6.69	PASS
2	3	2422	-21.29	4.77	0.10	-16.42	6.69	PASS
	6	2437	-17.69	4.77	0.10	-12.82	6.69	PASS
	9	2452	-20.75	4.77	0.10	-15.88	6.69	PASS

NOTE: 1. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 3] = 7.31dBi > 6dBi , so the power density limit shall be reduced to 8-(7.31-6) = 6.69dBm.

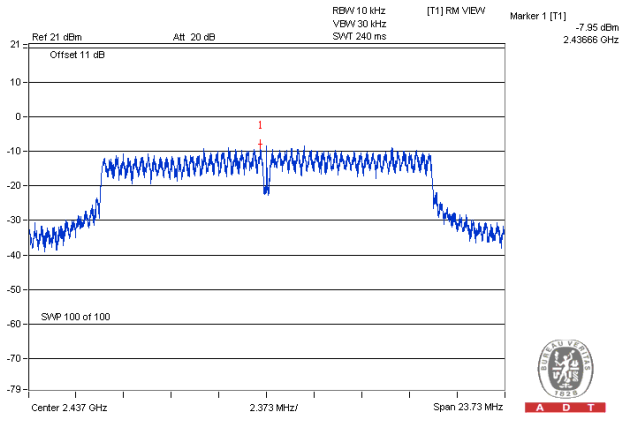
2. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

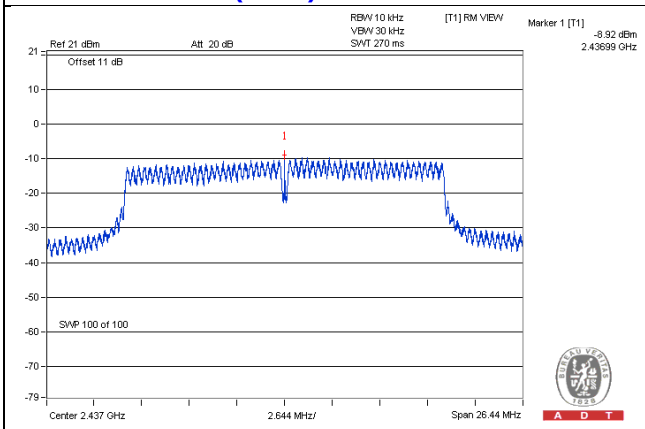
802.11b – CH 6



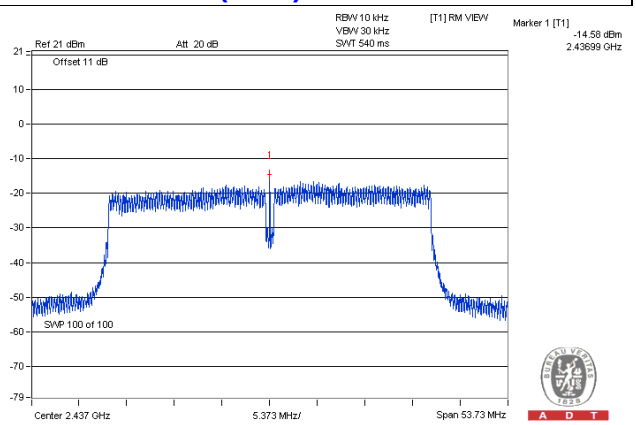
802.11g – Chain 0: CH 6



802.11n (HT20) – Chain 0: CH 6



802.11n (HT40) – Chain 0: CH 6

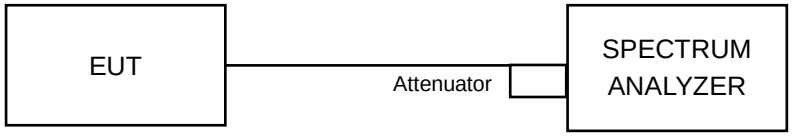


4.6 Conducted Out of Band Emission Measurement

4.6.1 Limits of Conducted Out of Band Emission Measurement

Below 30dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

MEASUREMENT PROCEDURE REF

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 OOBE

1. Set RBW = 100 kHz.
2. Set VBW ≥ 300 kHz.
3. Detector = peak.
4. Sweep = auto couple.
5. Trace Mode = max hold.
6. Allow trace to fully stabilize.
7. Use the peak marker function to determine the maximum amplitude level.

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

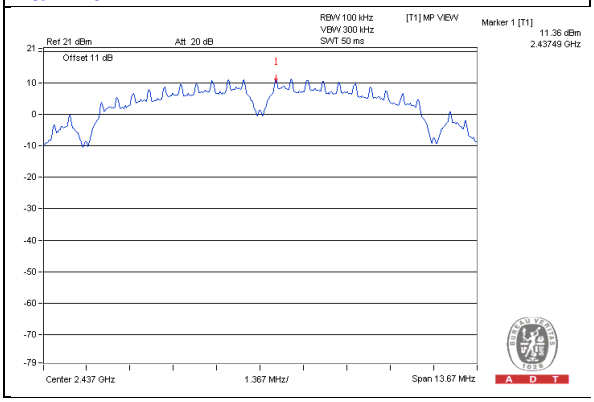
Same as Item 4.3.6

4.6.7 Test Results

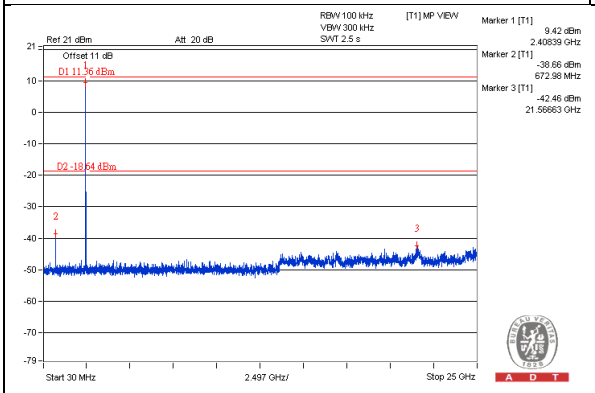
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 30dB offset below D1. It shows compliance with the requirement.

802.11b

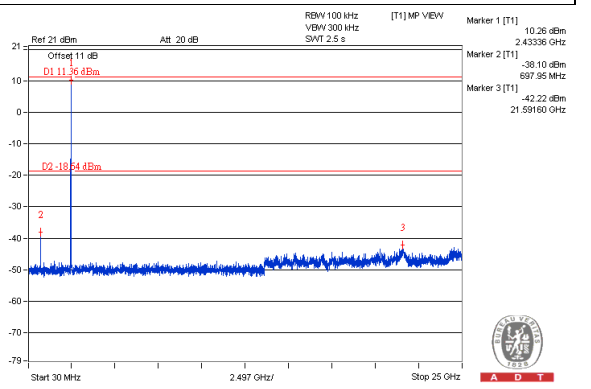
Maximum REF



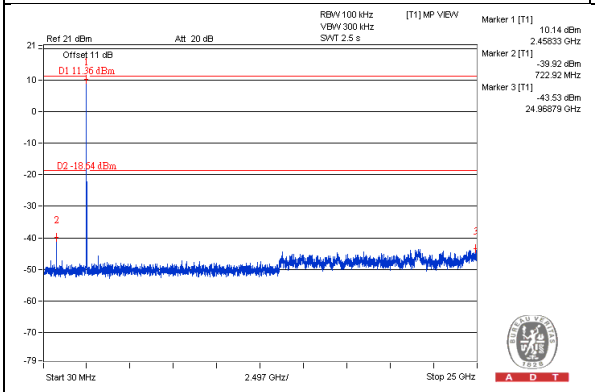
CH 1



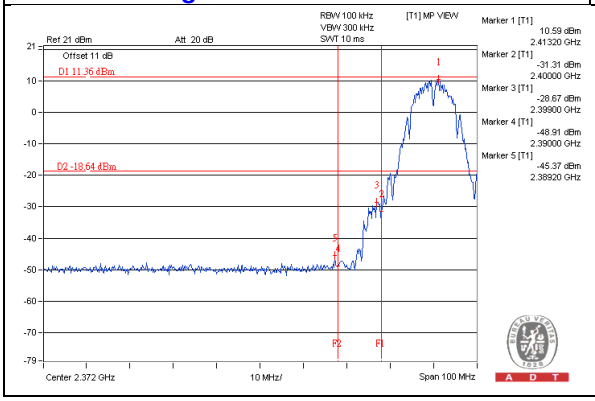
CH 6



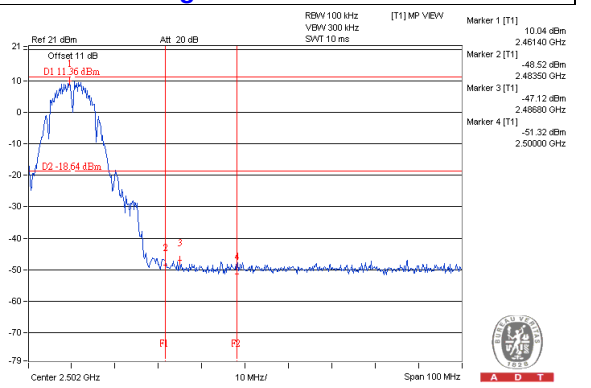
CH 11



CH 1 Band edge

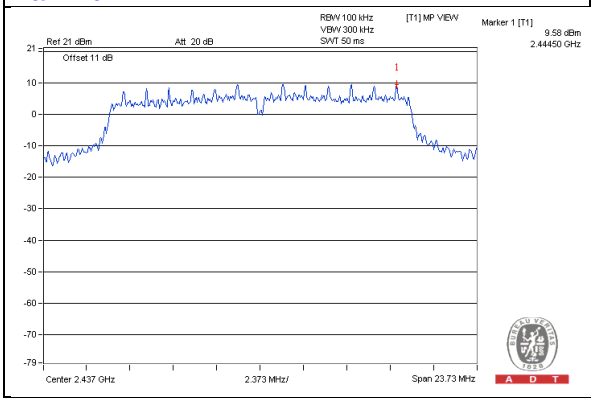


CH 11 Band edge



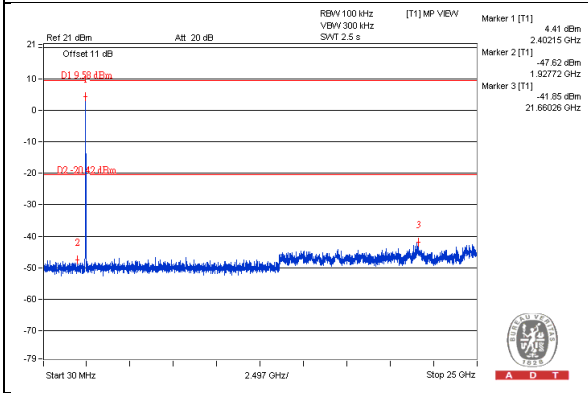
802.11g

Maximum REF

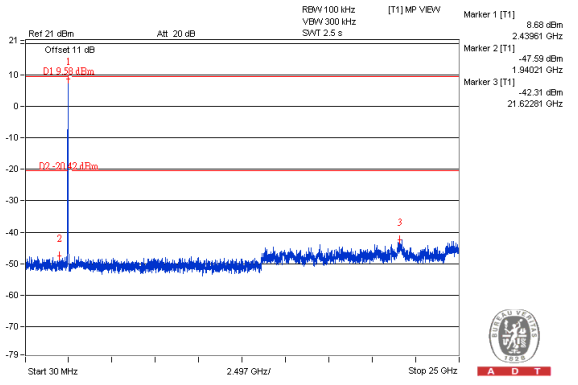


Chain 0

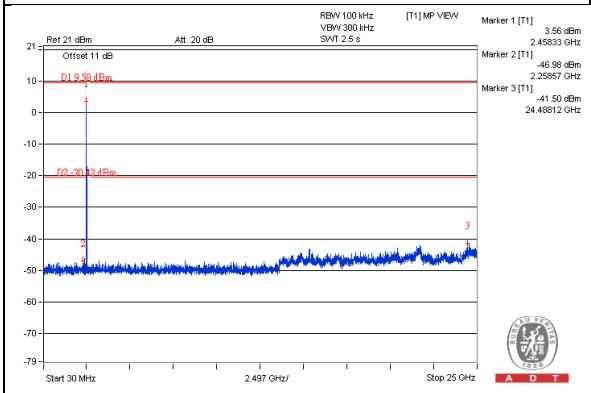
CH 1



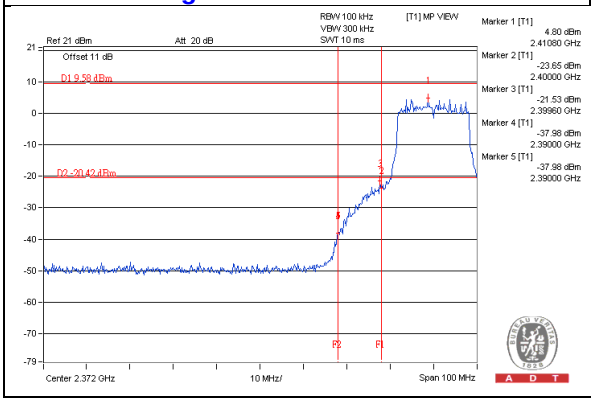
CH 6



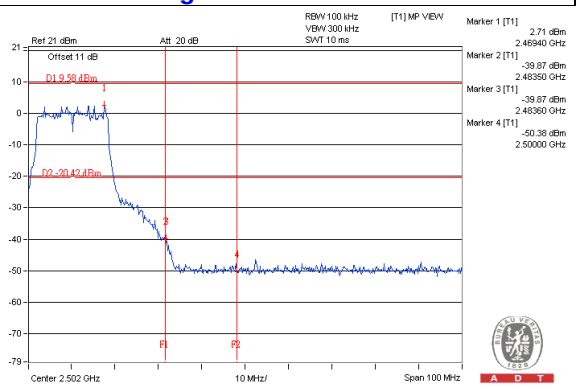
CH 11



CH 1 Band edge

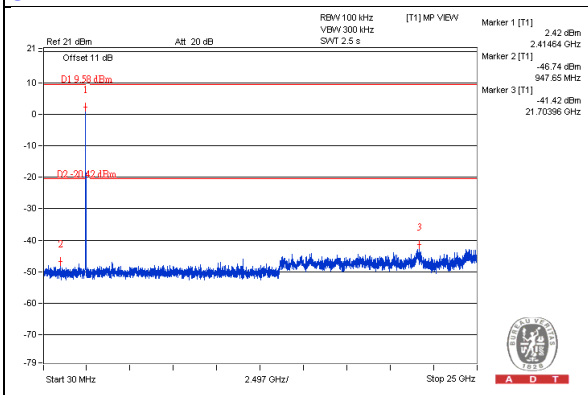


CH 11 Band edge

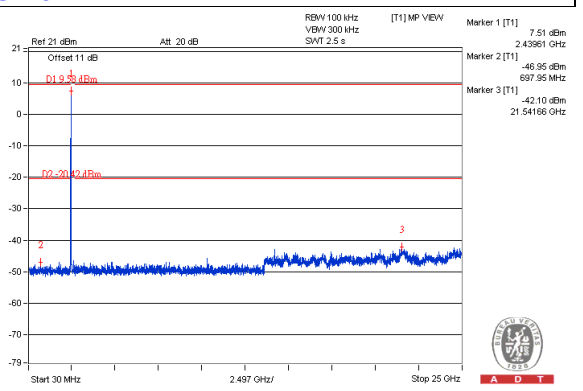


Chain 1

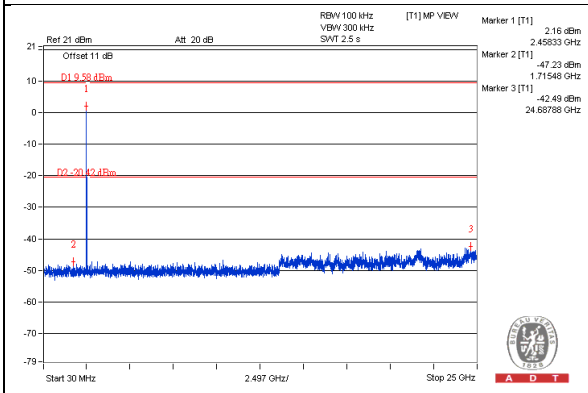
CH 1



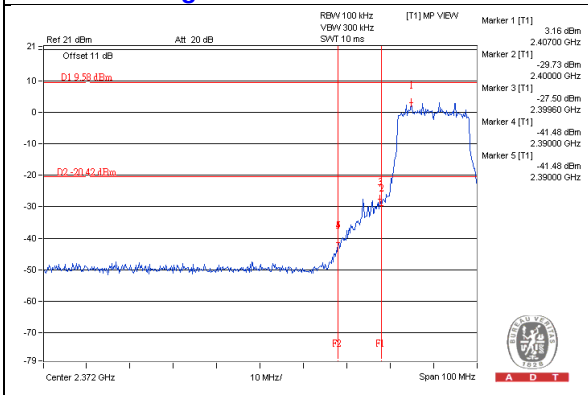
CH 6



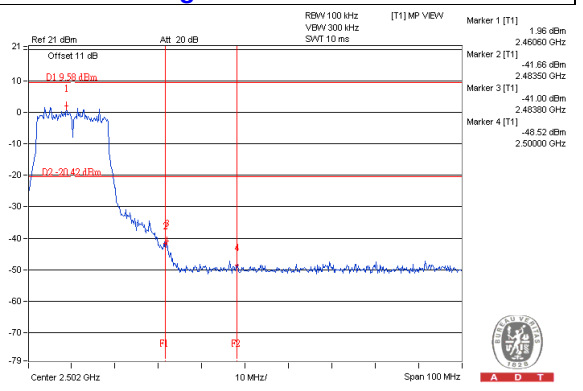
CH 11



CH 1 Band edge

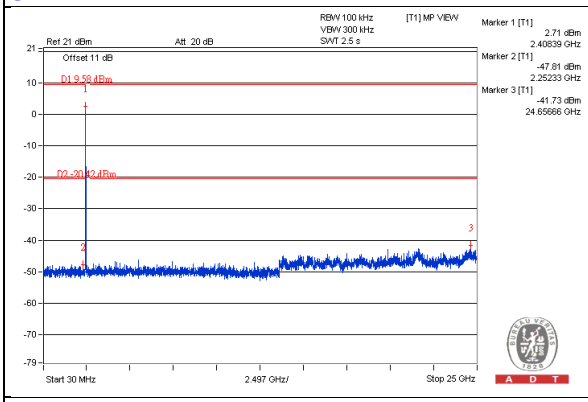


CH 11 Band edge

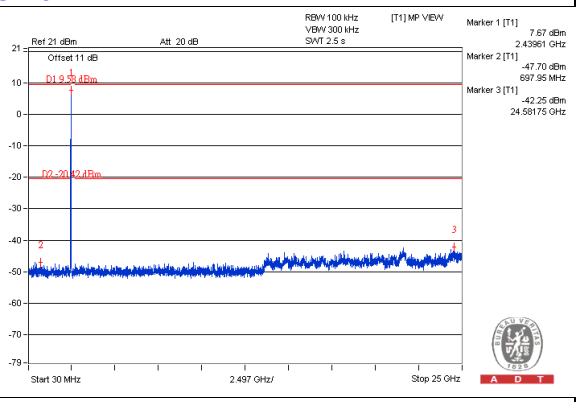


Chain 2

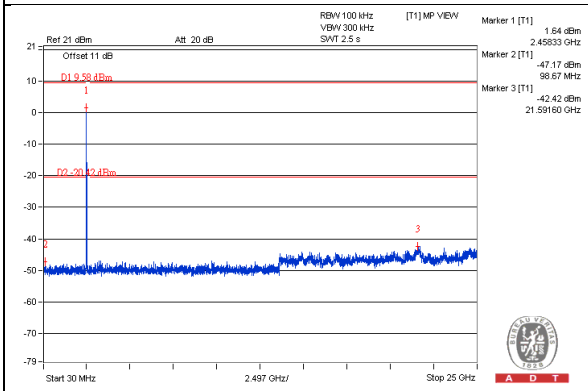
CH 1



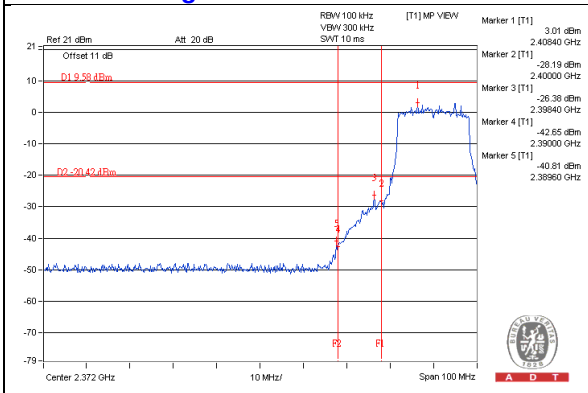
CH 6



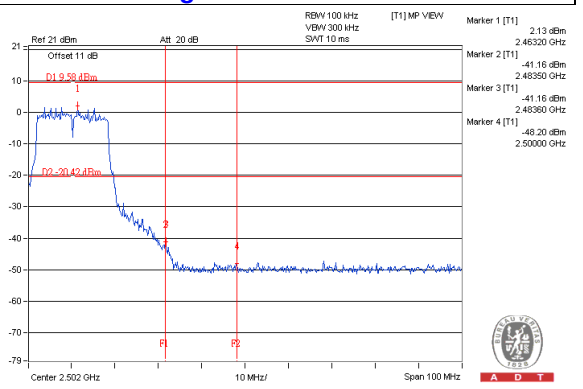
CH 11



CH 1 Band edge

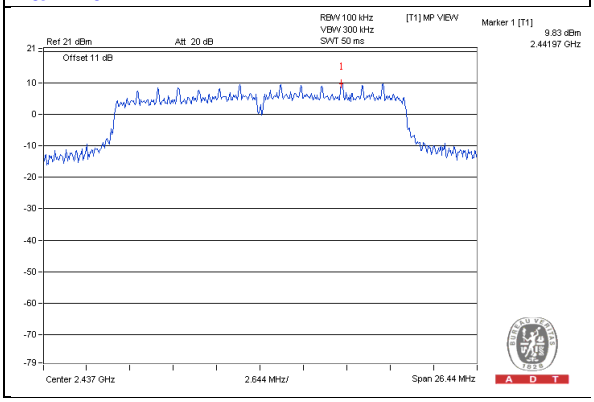


CH 11 Band edge



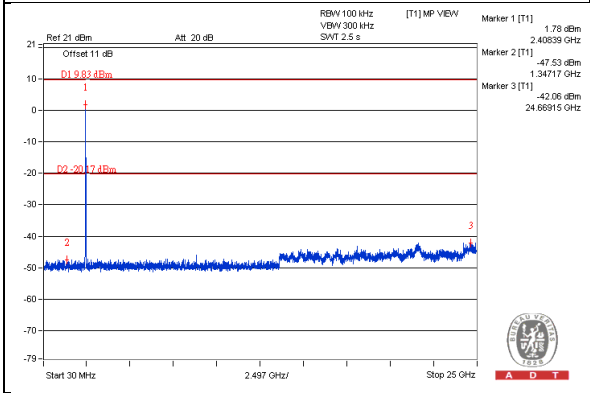
802.11n (HT20)

Maximum REF

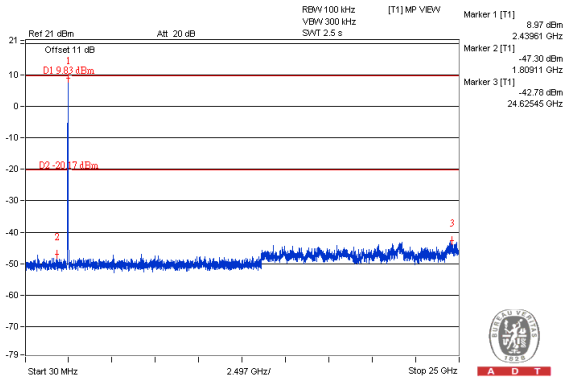


Chain 0

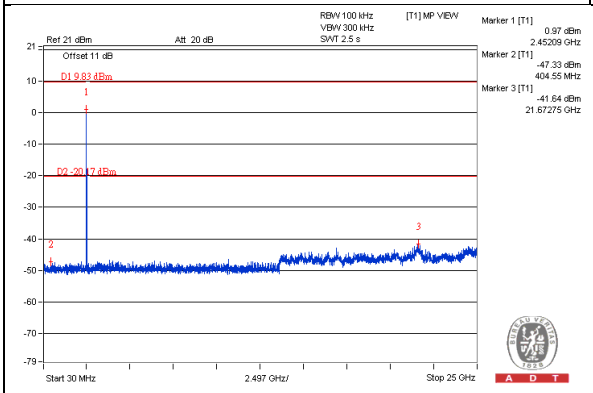
CH 1



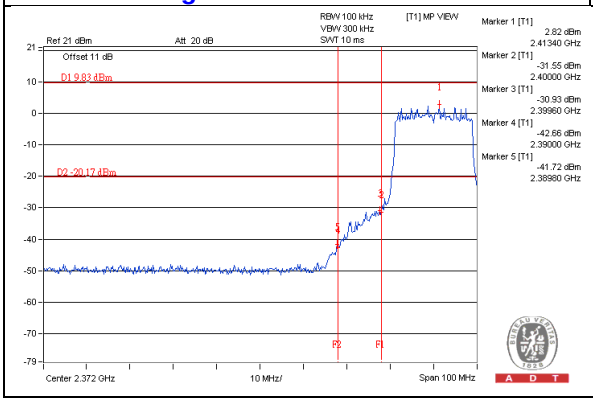
CH 6



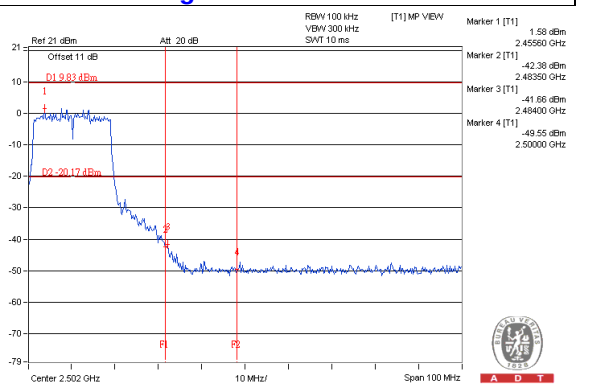
CH 11



CH 1 Band edge

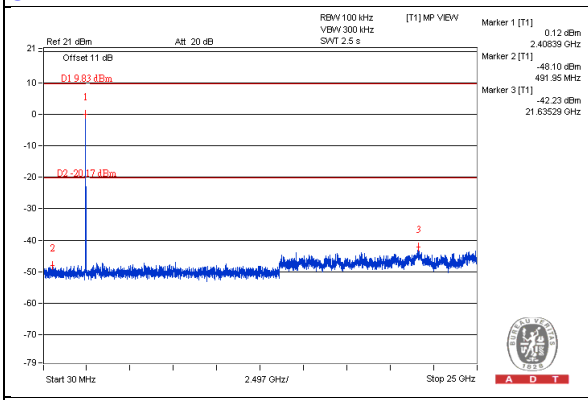


CH 11 Band edge

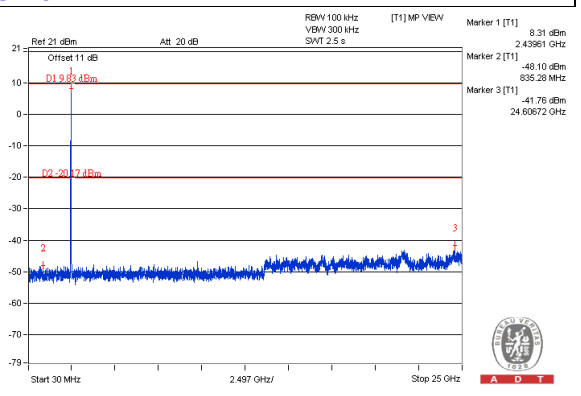


Chain 1

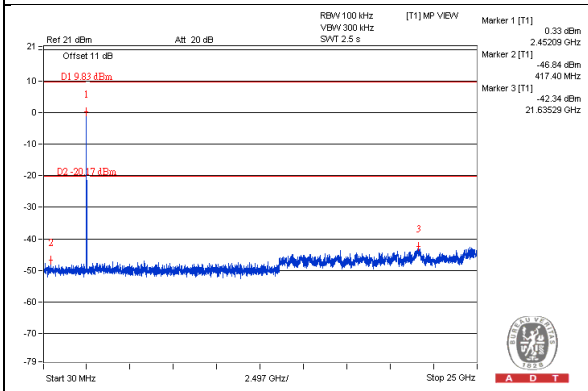
CH 1



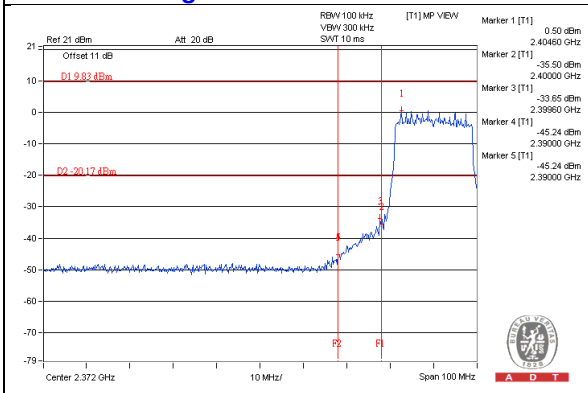
CH 6



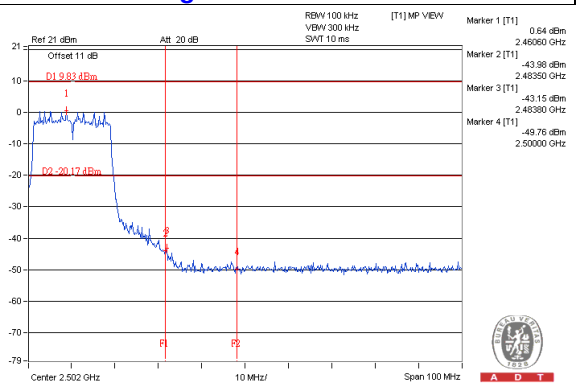
CH 11



CH 1 Band edge

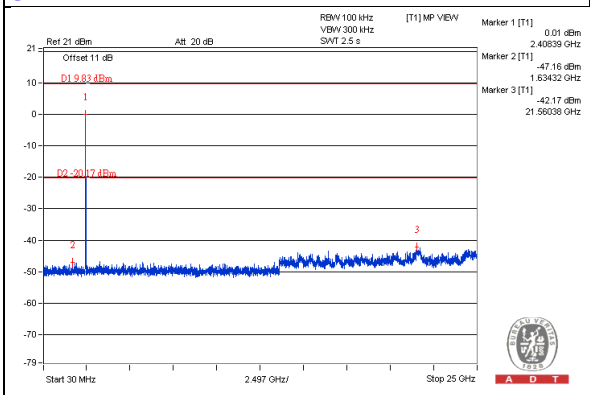


CH 11 Band edge

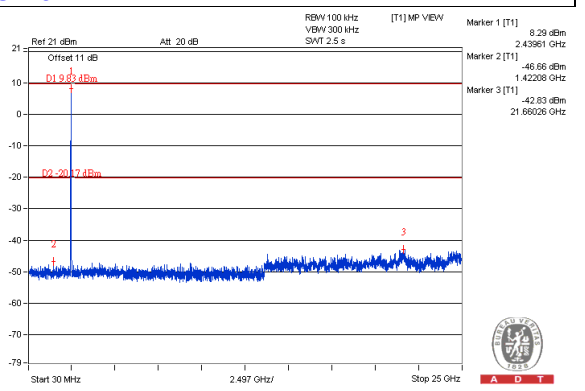


Chain 2

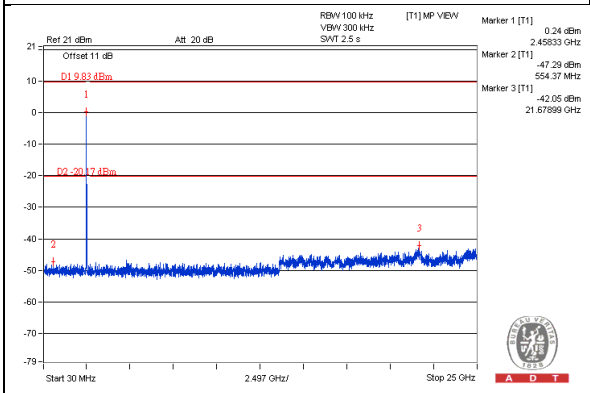
CH 1



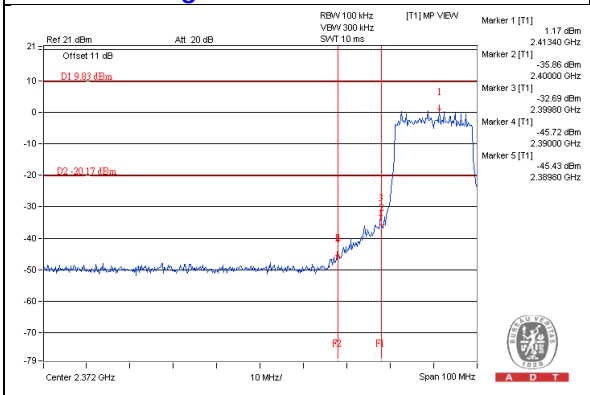
CH 6



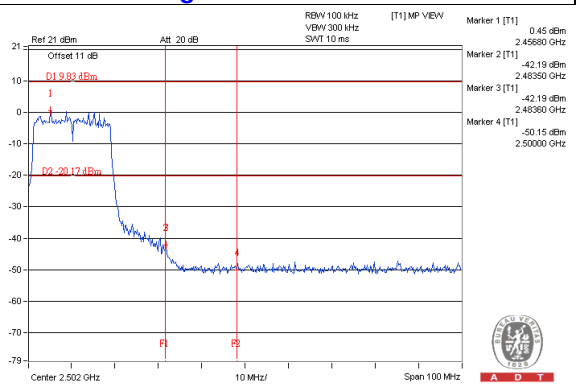
CH 11



CH 1 Band edge

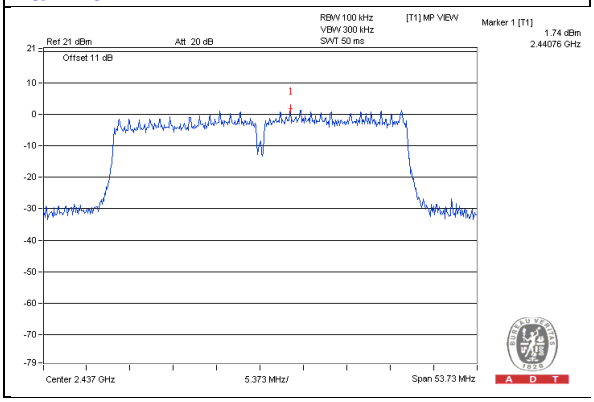


CH 11 Band edge



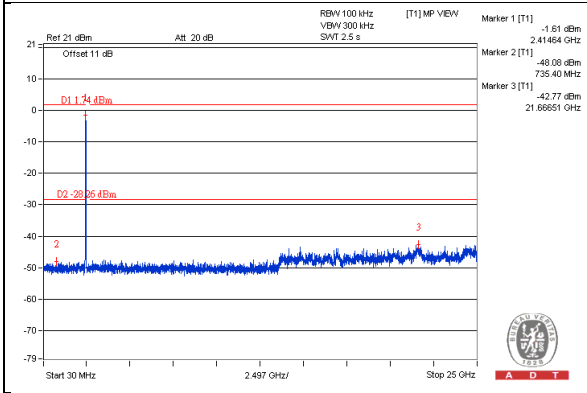
802.11n (HT40)

Maximum REF

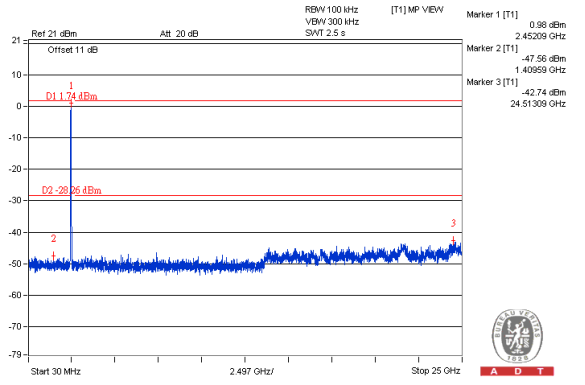


Chain 0

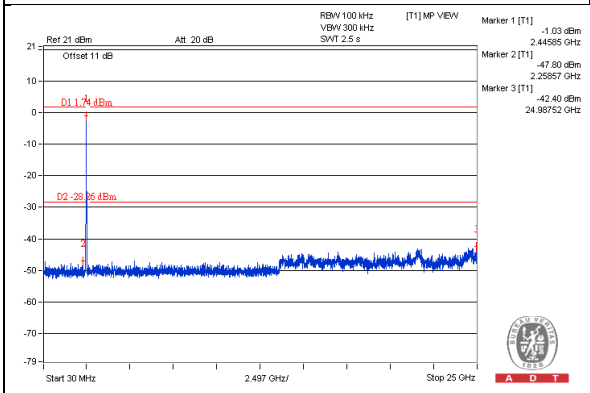
CH 3



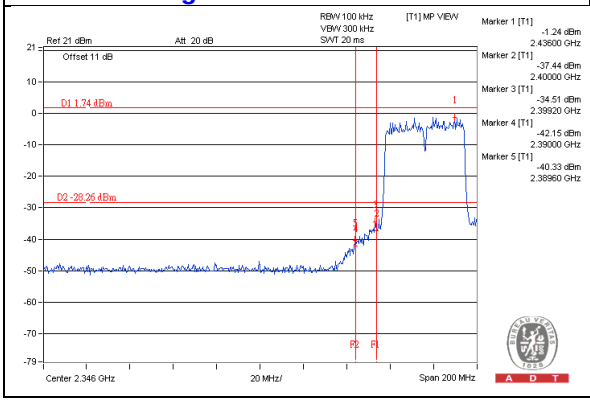
CH 6



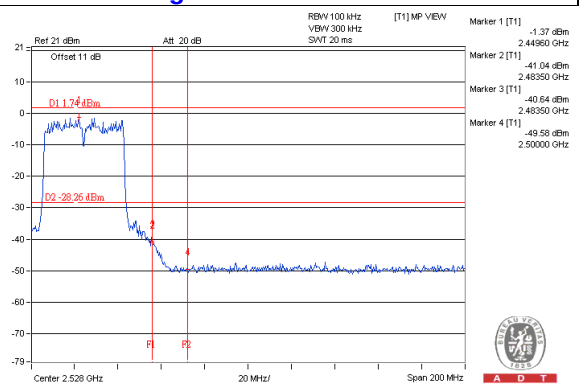
CH 9



CH 3 Band edge

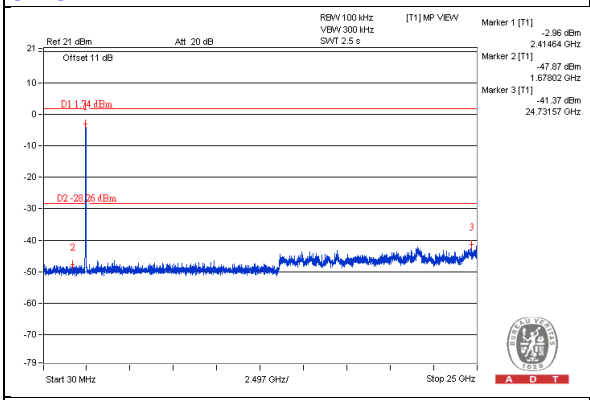


CH 9 Band edge

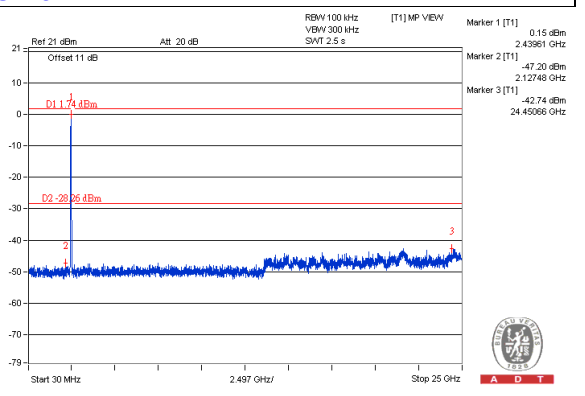


Chain 1

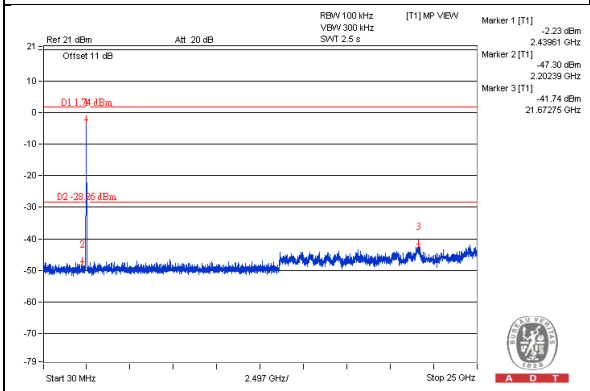
CH 3



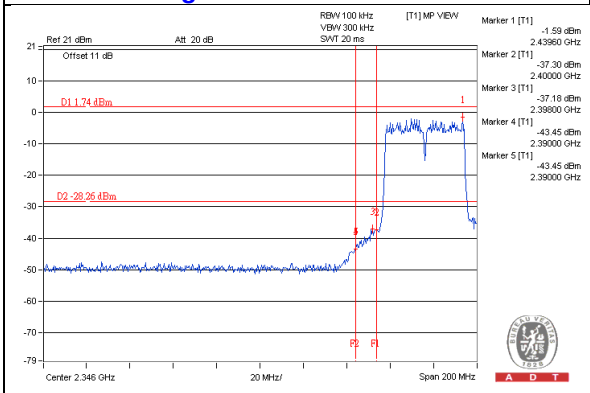
CH 6



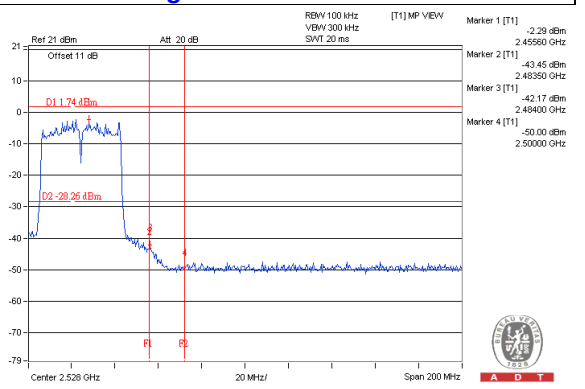
CH 9



CH 3 Band edge

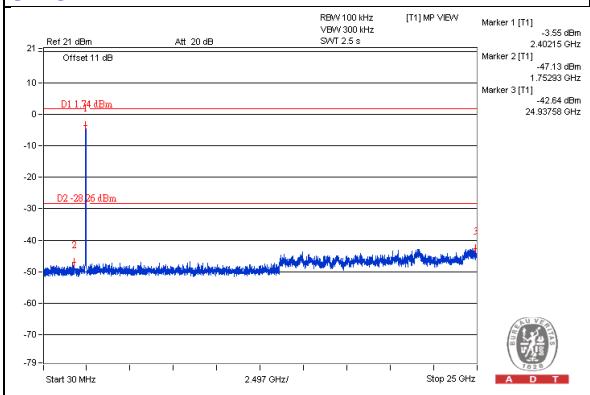


CH 9 Band edge

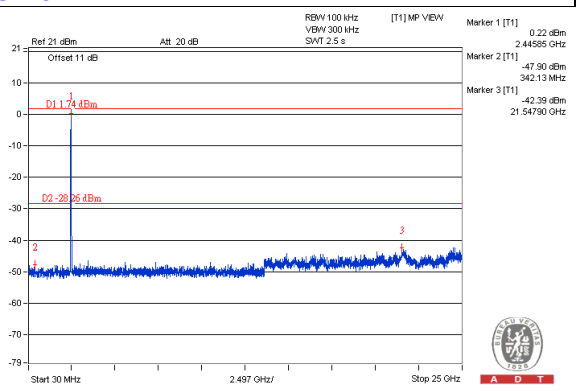


Chain 2

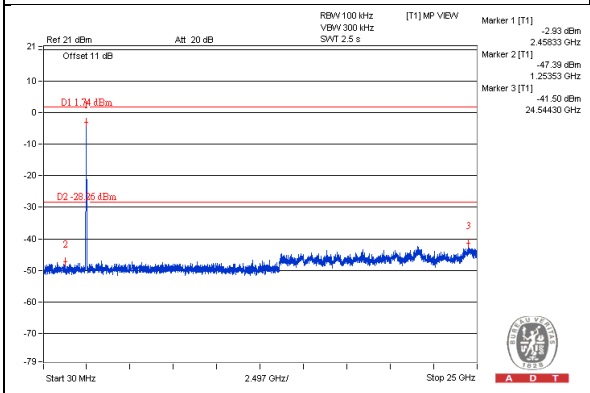
CH 3



CH 6



CH 9



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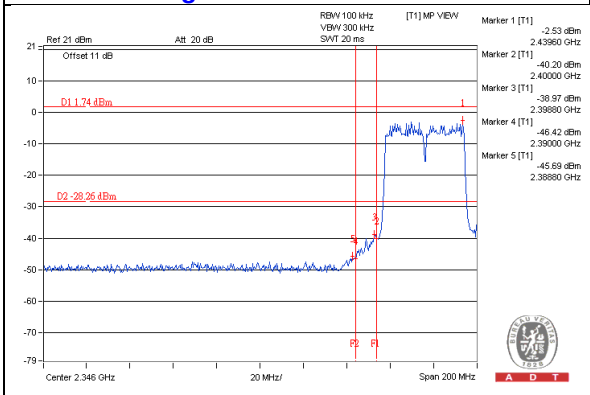
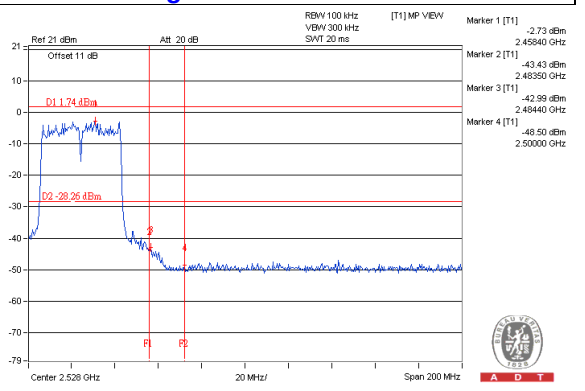


CH 9 Band edge



5 Test Types and Results (For 5GHz Band)

5.1 Radiated Emission and Bandedge Measurement

5.1.1 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 30dB 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.

5.1.2 Test Instruments

Same as item 4.1.2.

5.1.3 Test Procedures

Same as item 4.1.3.

5.1.4 Deviation from Test Standard

No deviation.

5.1.5 Test Set Up

Same as item 4.1.5.

5.1.6 EUT Operating Conditions

Same as item 4.1.6.

5.1.7 Test Results

CDD MODE

Above 1GHz Data:

802.11a

CHANNEL	TX Channel 149	**DETECTOR FUNCTION**	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	*5745.00	116.1 PK			1.61 H	72	111.56	4.54
2	*5745.00	105.4 AV			1.61 H	72	100.86	4.54
3	11490.00	59.2 PK	74.0	-14.8	1.93 H	249	49.21	9.99
4	11490.00	49.3 AV	54.0	-4.7	1.93 H	249	39.31	9.99
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	*5745.00	117.4 PK			1.80 V	184	112.86	4.54
2	*5745.00	107.9 AV			1.80 V	184	103.36	4.54
3	11490.00	58.8 PK	74.0	-15.2	2.00 V	152	48.81	9.99
4	11490.00	48.1 AV	54.0	-5.9	2.00 V	152	38.11	9.99

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	116.0 PK			1.59 H	48	111.42	4.58
2	*5785.00	105.3 AV			1.59 H	48	100.72	4.58
3	11570.00	59.5 PK	74.0	-14.5	1.94 H	245	49.54	9.96
4	11570.00	49.4 AV	54.0	-4.6	1.94 H	245	39.44	9.96
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	*5785.00	117.3 PK			1.81 V	172	112.72	4.58
2	*5785.00	107.7 AV			1.81 V	172	103.12	4.58
3	11570.00	58.9 PK	74.0	-15.1	2.03 V	143	48.94	9.96
4	11570.00	47.8 AV	54.0	-6.2	2.03 V	143	37.84	9.96

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	115.5 PK			1.59 H	72	110.84	4.66
2	*5825.00	104.8 AV			1.59 H	72	100.14	4.66
3	11650.00	58.4 PK	74.0	-15.6	1.89 H	251	48.57	9.83
4	11650.00	48.6 AV	54.0	-5.4	1.89 H	251	38.77	9.83
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	118.2 PK			1.81 V	187	113.54	4.66
2	*5825.00	108.3 AV			1.81 V	187	103.64	4.66
3	11650.00	59.9 PK	74.0	-14.1	2.04 V	155	50.07	9.83
4	11650.00	48.6 AV	54.0	-5.4	2.04 V	155	38.77	9.83

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.

802.11ac (VHT20)

CHANNEL	TX Channel 149	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5745.00	119.0 PK			1.33 H	164	114.46	4.54
2	*5745.00	109.9 AV			1.33 H	164	105.36	4.54
3	11490.00	58.7 PK	74.0	-15.3	2.00 H	228	48.71	9.99
4	11490.00	48.4 AV	54.0	-5.6	2.00 H	228	38.41	9.99
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	*5745.00	120.0 PK			1.61 V	187	115.46	4.54
2	*5745.00	110.9 AV			1.61 V	187	106.36	4.54
3	11490.00	58.6 PK	74.0	-15.4	2.00 V	153	48.61	9.99
4	11490.00	47.9 AV	54.0	-6.1	2.00 V	153	37.91	9.99

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	121.2 PK			1.33 H	181	116.62	4.58
2	*5785.00	112.1 AV			1.33 H	181	107.52	4.58
3	11570.00	58.6 PK	74.0	-15.4	1.96 H	222	48.64	9.96
4	11570.00	48.6 AV	54.0	-5.4	1.96 H	222	38.64	9.96
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	*5785.00	121.7 PK			1.30 V	360	117.12	4.58
2	*5785.00	113.2 AV			1.30 V	360	108.62	4.58
3	11570.00	58.6 PK	74.0	-15.4	2.02 V	154	48.64	9.96
4	11570.00	47.9 AV	54.0	-6.1	2.02 V	154	37.94	9.96

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	120.8 PK			1.39 H	170	116.14	4.66
2	*5825.00	112.6 AV			1.39 H	170	107.94	4.66
3	11650.00	59.1 PK	74.0	-14.9	2.06 H	221	49.27	9.83
4	11650.00	48.7 AV	54.0	-5.3	2.06 H	221	38.87	9.83
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	121.6 PK			1.76 V	191	116.94	4.66
2	*5825.00	113.1 AV			1.76 V	191	108.44	4.66
3	11650.00	58.2 PK	74.0	-15.8	2.00 V	151	48.37	9.83
4	11650.00	47.6 AV	54.0	-6.4	2.00 V	151	37.77	9.83

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.

802.11ac (VHT40)

CHANNEL	TX Channel 151	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5755.00	114.1 PK			1.40 H	186	109.55	4.55
2	*5755.00	104.1 AV			1.40 H	186	99.55	4.55
3	11510.00	53.6 PK	74.0	-20.4	1.27 H	108	43.60	10.00
4	11510.00	44.0 AV	54.0	-10.0	1.27 H	108	34.00	10.00
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	*5755.00	114.8 PK			1.71 V	188	110.25	4.55
2	*5755.00	105.3 AV			1.71 V	188	100.75	4.55
3	11510.00	54.1 PK	74.0	-19.9	1.17 V	242	44.10	10.00
4	11510.00	44.4 AV	54.0	-9.6	1.17 V	242	34.40	10.00

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5795.00	117.2 PK			1.38 H	167	112.60	4.60
2	*5795.00	106.1 AV			1.38 H	167	101.50	4.60
3	11590.00	54.0 PK	74.0	-20.0	1.17 H	118	44.06	9.94
4	11590.00	43.4 AV	54.0	-10.6	1.17 H	118	33.46	9.94
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	118.5 PK			1.82 V	188	113.90	4.60
2	*5795.00	107.7 AV			1.82 V	188	103.10	4.60
3	11590.00	54.4 PK	74.0	-19.6	1.28 V	241	44.46	9.94
4	11590.00	44.7 AV	54.0	-9.3	1.28 V	241	34.76	9.94

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.

802.11ac (VHT80)

CHANNEL	TX Channel 155	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5775.00	108.6 PK			1.41 H	168	104.03	4.57
2	*5775.00	98.1 AV			1.41 H	168	93.53	4.57
3	11550.00	53.0 PK	74.0	-21.0	1.22 H	104	43.03	9.97
4	11550.00	40.9 AV	54.0	-13.1	1.22 H	104	30.93	9.97
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5775.00	109.6 PK			1.72 V	190	105.03	4.57
2	*5775.00	99.2 AV			1.72 V	190	94.63	4.57
3	11550.00	50.7 PK	74.0	-23.3	1.06 V	150	40.73	9.97
4	11550.00	41.5 AV	54.0	-12.5	1.06 V	150	31.53	9.97

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – 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.

Below 1GHz Data:

802.11ac (VHT40)

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	147.90	30.7 QP	43.5	-12.8	1.00 H	131	43.51	-12.78
2	250.00	34.3 QP	46.0	-11.7	1.00 H	85	48.19	-13.87
3	375.03	39.9 QP	46.0	-6.1	1.00 H	309	50.14	-10.22
4	625.00	40.0 QP	46.0	-6.0	1.00 H	344	44.35	-4.33
5	801.01	34.8 QP	46.0	-11.2	1.00 H	23	36.29	-1.48
6	875.02	36.0 QP	46.0	-10.0	1.00 H	347	36.36	-0.33
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	36.26	34.6 QP	40.0	-5.4	1.50 V	2	48.88	-14.25
2	51.39	31.6 QP	40.0	-8.5	1.50 V	166	44.89	-13.34
3	199.99	30.8 QP	43.5	-12.7	1.50 V	221	46.76	-15.98
4	374.98	33.0 QP	46.0	-13.0	1.50 V	286	43.19	-10.22
5	625.00	39.5 QP	46.0	-6.5	1.50 V	265	43.82	-4.33
6	801.01	37.1 QP	46.0	-9.0	1.50 V	265	38.53	-1.48

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

Beamforming MODE

Above 1GHz Data:

802.11ac (VHT20)

CHANNEL	TX Channel 149	**DETECTOR FUNCTION**	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	*5745.00	118.9 PK			1.76 H	166	114.36	4.54
2	*5745.00	108.7 AV			1.76 H	166	104.16	4.54
3	11490.00	59.6 PK	74.0	-14.4	1.96 H	206	49.61	9.99
4	11490.00	48.6 AV	54.0	-5.4	1.96 H	206	38.61	9.99
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	*5745.00	120.6 PK			1.71 V	179	116.06	4.54
2	*5745.00	110.4 AV			1.71 V	179	105.86	4.54
3	11490.00	60.0 PK	74.0	-14.0	2.09 V	143	50.01	9.99
4	11490.00	49.2 AV	54.0	-4.8	2.09 V	143	39.21	9.99

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	120.6 PK			1.68 H	172	116.02	4.58
2	*5785.00	101.6 AV			1.68 H	172	97.02	4.58
3	11570.00	59.0 PK	74.0	-15.0	2.11 H	164	49.04	9.96
4	11570.00	48.5 AV	54.0	-5.5	2.11 H	164	38.54	9.96
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	*5785.00	122.2 PK			1.68 V	174	117.62	4.58
2	*5785.00	112.2 AV			1.68 V	174	107.62	4.58
3	11570.00	59.5 PK	74.0	-14.5	2.05 V	146	49.54	9.96
4	11570.00	48.7 AV	54.0	-5.3	2.05 V	146	38.74	9.96

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	120.0 PK			1.65 H	176	115.34	4.66
2	*5825.00	101.2 AV			1.65 H	176	96.54	4.66
3	11650.00	59.2 PK	74.0	-14.8	2.14 H	171	49.37	9.83
4	11650.00	48.7 AV	54.0	-5.3	2.14 H	171	38.87	9.83
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	121.6 PK			1.78 V	176	116.94	4.66
2	*5825.00	111.6 AV			1.78 V	176	106.94	4.66
3	11650.00	59.7 PK	74.0	-14.3	2.07 V	155	49.87	9.83
4	11650.00	48.6 AV	54.0	-5.4	2.07 V	155	38.77	9.83

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.

802.11ac (VHT40)

CHANNEL	TX Channel 151	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5755.00	115.4 PK			1.67 H	190	110.85	4.55
2	*5755.00	102.1 AV			1.67 H	190	97.55	4.55
3	11510.00	53.7 PK	74.0	-20.3	1.28 H	117	43.70	10.00
4	11510.00	43.8 AV	54.0	-10.2	1.28 H	117	33.80	10.00
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	*5755.00	116.8 PK			1.60 V	360	112.25	4.55
2	*5755.00	103.1 AV			1.60 V	360	98.55	4.55
3	11510.00	54.2 PK	74.0	-19.8	1.11 V	229	44.20	10.00
4	11510.00	44.6 AV	54.0	-9.4	1.11 V	229	34.60	10.00

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5795.00	115.4 PK			1.68 H	189	110.80	4.60
2	*5795.00	104.9 AV			1.68 H	189	100.30	4.60
3	11590.00	54.2 PK	74.0	-19.8	1.15 H	123	44.26	9.94
4	11590.00	43.8 AV	54.0	-10.2	1.15 H	123	33.86	9.94
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	116.2 PK			1.59 V	174	111.60	4.60
2	*5795.00	106.9 AV			1.59 V	174	102.30	4.60
3	11590.00	54.2 PK	74.0	-19.8	1.29 V	243	44.26	9.94
4	11590.00	44.7 AV	54.0	-9.3	1.29 V	243	34.76	9.94

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.

802.11ac (VHT80)

CHANNEL	TX Channel 155	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5775.00	111.4 PK			1.66 H	177	106.83	4.57
2	*5775.00	91.3 AV			1.66 H	177	86.73	4.57
3	11550.00	50.3 PK	74.0	-23.7	1.04 H	165	40.33	9.97
4	11550.00	41.3 AV	54.0	-12.7	1.04 H	165	31.33	9.97
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5775.00	112.9 PK			1.68 V	174	108.33	4.57
2	*5775.00	92.7 AV			1.68 V	174	88.13	4.57
3	11550.00	50.5 PK	74.0	-23.5	1.03 V	147	40.53	9.97
4	11550.00	41.3 AV	54.0	-12.7	1.03 V	147	31.33	9.97

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – 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.

5.2 Conducted Emission Measurement

5.2.1 Limits of Conducted Emission Measurement

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15 - 0.5	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30.0	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 0.50MHz.

5.2.2 Test Instruments

Same as item 4.2.2.

5.2.3 Test Procedures

Same as item 4.2.3.

5.2.4 Deviation from Test Standard

No deviation.

5.2.5 Test Setup

Same as item 4.2.5

5.2.6 EUT Operating Conditions

Same as item 4.1.6.

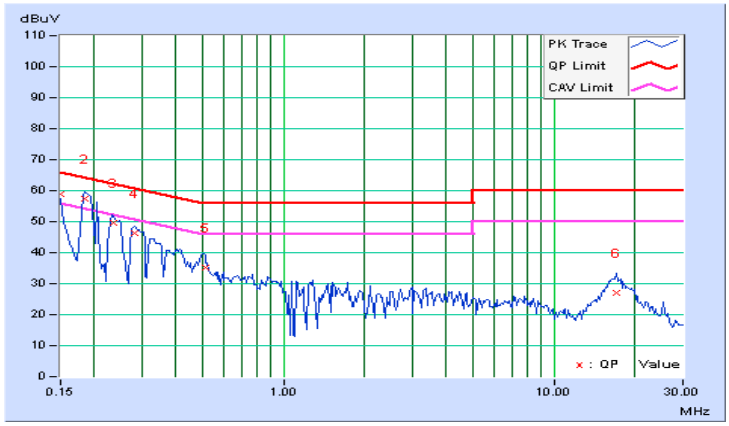
5.2.7 Test Results

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	0.08	58.64	46.10	58.72	46.18	66.00	56.00	-7.28	-9.82
2	0.18516	0.09	57.17	48.09	57.26	48.18	64.25	54.25	-6.99	-6.07
3	0.23594	0.09	49.50	40.70	49.59	40.79	62.24	52.24	-12.65	-11.45
4	0.28281	0.09	46.07	38.82	46.16	38.91	60.73	50.73	-14.57	-11.82
5	0.51328	0.11	34.99	27.51	35.10	27.62	56.00	46.00	-20.90	-18.38
6	17.10938	0.63	26.56	21.52	27.19	22.15	60.00	50.00	-32.81	-27.85

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.

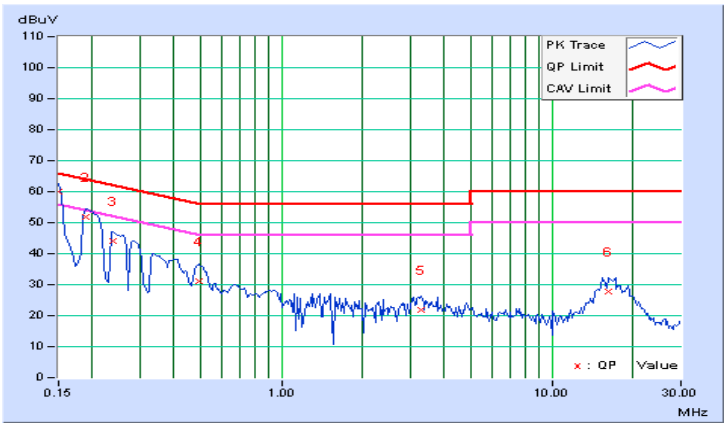


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	0.08	60.06	47.50	60.14	47.58	66.00	56.00	-5.86	-8.42
2	0.18906	0.08	51.91	39.49	51.99	39.57	64.08	54.08	-12.09	-14.51
3	0.23984	0.08	43.90	31.92	43.98	32.00	62.10	52.10	-18.12	-20.10
4	0.49766	0.10	31.00	17.12	31.10	17.22	56.04	46.04	-24.93	-28.81
5	3.28906	0.21	21.71	14.64	21.92	14.85	56.00	46.00	-34.08	-31.15
6	16.17188	0.63	27.03	21.67	27.66	22.30	60.00	50.00	-32.34	-27.70

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.



5.3 6dB Bandwidth Measurement

5.3.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

5.3.2 Test Setup

Same as item 4.3.2.

5.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

5.3.4 Test Procedure

Same as item 4.3.4.

5.3.5 Deviation fromTest Standard

No deviation.

5.3.6 EUT Operating Conditions

Same as item 4.3.6.

5.3.7 Test Result

CDD MODE

802.11a

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
149	5745	16.39	0.5	PASS
157	5785	16.36	0.5	PASS
165	5825	16.39	0.5	PASS

802.11ac (VHT20)

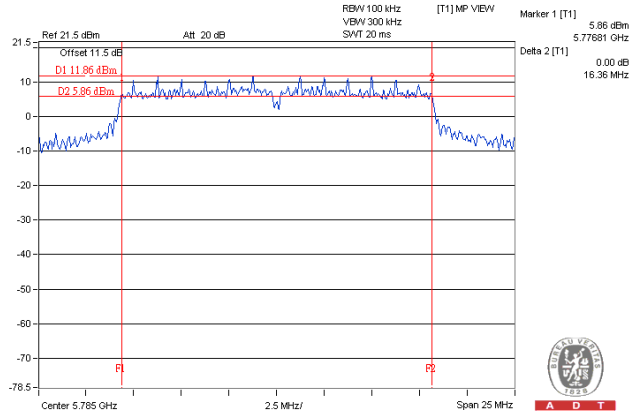
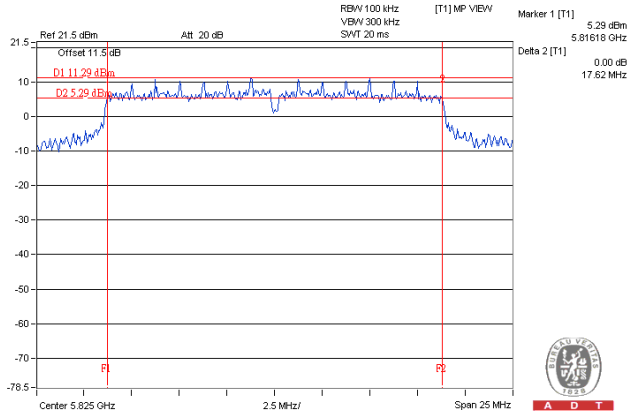
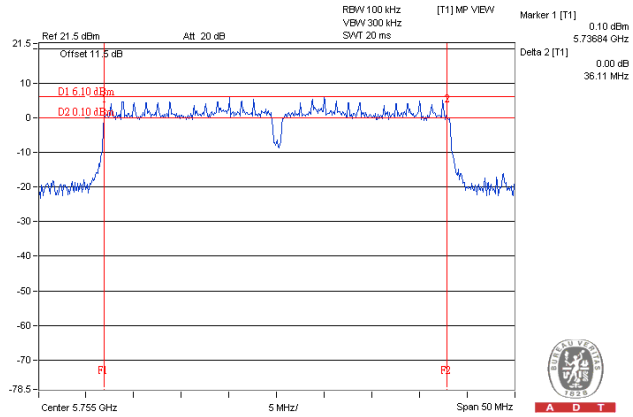
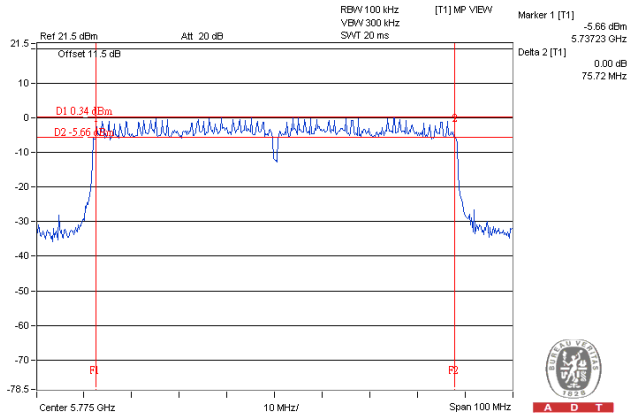
Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
149	5745	17.66	17.68	17.67	0.5	Pass
157	5785	17.66	17.66	17.63	0.5	Pass
165	5825	17.66	17.67	17.62	0.5	Pass

802.11ac (VHT40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
151	5755	36.43	36.49	36.11	0.5	Pass
159	5795	36.45	36.47	36.26	0.5	Pass

802.11ac (VHT80)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
155	5775	76.44	76.51	75.72	0.5	Pass

Spectrum Plot of Worst Value	
802.11a – CH 157	**802.11ac (VHT20) – Chain 2: CH 165**
	
802.11ac (VHT40) – Chain 2: CH 151	**802.11ac (VHT80) – Chain 2: CH 155**
	

Beamforming MODE

802.11ac (VHT20)

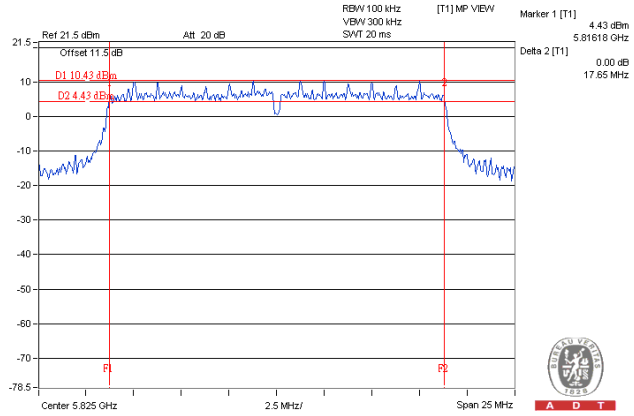
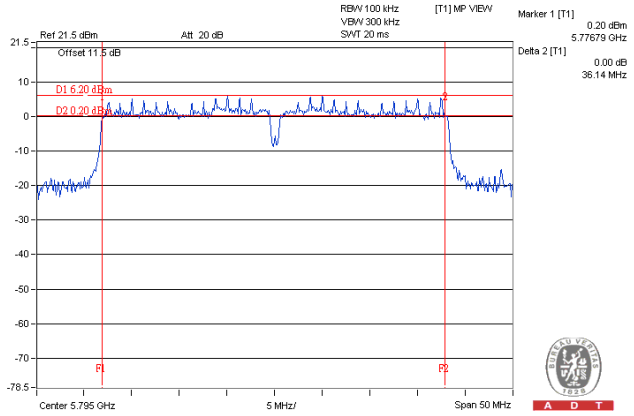
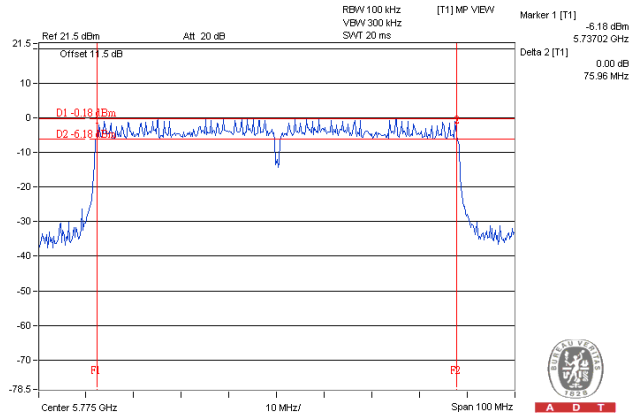
Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
149	5745	17.68	17.68	17.66	0.5	Pass
157	5785	17.66	17.69	17.66	0.5	Pass
165	5825	17.65	17.65	17.65	0.5	Pass

802.11ac (VHT40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
151	5755	36.17	36.48	36.44	0.5	Pass
159	5795	36.14	36.49	36.45	0.5	Pass

802.11ac (VHT80)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
155	5775	76.05	76.49	75.96	0.5	Pass

Spectrum Plot of Worst Value	
802.11ac (VHT20) – Chain 2: CH 165	**802.11ac (VHT40) – Chian 0: CH 159**
	
802.11ac (VHT80) – Chain 2: CH 155	
	

5.4 Conducted Output Power Measurement

5.4.1 Limits OF Conducted Output Power Measurement

For systems using digital modulation in the 5725 –5850 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.

5.4.2 Test Setup

Same as Item 4.4.2.

5.4.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

5.4.4 Test Procedures

Same as Item 4.4.4.

5.4.5 Deviation from Test Standard

No deviation.

5.4.6 EUT Operating Conditions

Same as Item 4.3.6.

5.4.7 Test Results

CDD MODE

802.11a

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)	Limit (dBm)	Pass/Fail
149	5745	219.786	23.42	30	Pass
157	5785	270.396	24.32	30	Pass
165	5825	260.016	24.15	30	Pass

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
149	5745	23.47	22.31	23.30	606.343	27.83	30	Pass
157	5785	23.06	24.19	25.10	788.318	28.97	30	Pass
165	5825	23.15	24.02	25.19	789.256	28.97	30	Pass

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
151	5755	20.99	21.86	22.78	468.736	26.71	30	Pass
159	5795	23.62	24.56	25.40	862.64	29.36	30	Pass

802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
155	5775	19.22	19.72	20.59	291.867	24.65	30	Pass

Beamforming MODE

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
149	5745	20.43	20.83	22.18	396.664	25.98	27.37	Pass
157	5785	20.34	20.72	22.17	390.991	25.92	27.37	Pass
165	5825	20.15	20.62	22.12	381.789	25.82	27.37	Pass

NOTE: Directional gain = 10 log[($10^{G1/20}$ + $10^{G2/20}$ + $10^{G3/20}$)^2 / 3] = 8.63dBi > 6dBi , so the power limit shall be reduced to 30-(8.63-6) = 27.37dBm.

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
151	5755	19.94	20.35	21.89	361.546	25.58	27.37	Pass
159	5795	20.27	20.78	22.30	395.912	25.98	27.37	Pass

NOTE: Directional gain = 10 log[($10^{G1/20}$ + $10^{G2/20}$ + $10^{G3/20}$)^2 / 3] = 8.63dBi > 6dBi , so the power limit shall be reduced to 30-(8.63-6) = 27.37dBm.

802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
155	5775	18.36	18.87	20.34	253.782	24.04	27.37	Pass

NOTE: Directional gain = 10 log[($10^{G1/20}$ + $10^{G2/20}$ + $10^{G3/20}$)^2 / 3] = 8.63dBi > 6dBi , so the power limit shall be reduced to 30-(8.63-6) = 27.37dBm.

5.5 Power Spectral Density Measurement

5.5.1 Limits OF Power Spectral Density Measurement

Same as item 4.5.1.

5.5.2 Test Setup

Same as item 4.5.2.

5.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

5.5.4 Test Procedure

For 802.11a & 802.11ac (VHT20) test:

a) Set instrument center frequency to DTS channel center frequency.
b) Set span to at least 1.5 times the OBW.
c) Set RBW to: 3 kHz ≤ RBW ≤ 100 kHz. .
d) Set VBW ≥3 x RBW.
e) Detector = power averaging (RMS) or sample detector (when RMS not available).
f) Ensure that the number of measurement points in the sweep ≥ 2 x span/RBW.
g) Sweep time = auto couple.
h) Employ trace averaging (RMS) mode over a minimum of 100 traces.
i) Use the peak marker function to determine the maximum amplitude level.

For 802.11ac (VHT40) & 802.11ac (VHT80) test:

a) Measure the duty cycle (x).
b) Set instrument center frequency to DTS channel center frequency.
c) Set span to at least 1.5 times the OBW.
d) Set RBW to: 3 kHz ≤ RBW ≤ 100 kHz..
e) Set VBW ≥3 x RBW.
f) Detector = power averaging (RMS) or sample detector (when RMS not available).
g) Ensure that the number of measurement points in the sweep ≥ 2 x span/RBW.
h) Sweep time = auto couple.
i) Do not use sweep triggering. Allow sweep to “free run”.
j) Employ trace averaging (RMS) mode over a minimum of 100 traces.
k) Use the peak marker function to determine the maximum amplitude level.
l) Add 10 log (1/x), where x is the duty cycle measured in step (a, to the measured PSD to compute the average PSD during the actual transmission time.

5.5.5 Deviation from Test Standard

No deviation.

5.5.6 EUT Operating Condition

Same as Item 4.3.6

5.5.7 Test Results

CDD MODE

802.11a

Channel	Freq. (MHz)	PSD (dBm)	Limit (dBm)	Pass /Fail
149	5745	-6.40	8	Pass
157	5785	-7.49	8	Pass
165	5825	-7.23	8	Pass

802.11ac (VHT20)

TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=3) dB	Total PSD (dBm)	Limit (dBm)	Pass /Fail
0	149	5745	-7.34	4.77	-2.57	5.37	Pass
	157	5785	-8.21	4.77	-3.44	5.37	Pass
	165	5825	-8.08	4.77	-3.31	5.37	Pass
1	149	5745	-8.79	4.77	-4.02	5.37	Pass
	157	5785	-8.17	4.77	-3.40	5.37	Pass
	165	5825	-8.74	4.77	-3.97	5.37	Pass
2	149	5745	-9.57	4.77	-4.80	5.37	Pass
	157	5785	-8.17	4.77	-3.40	5.37	Pass
	165	5825	-8.82	4.77	-4.05	5.37	Pass

NOTE: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 3] = 8.63dBi > 6dBi , so the power density limit shall be reduced to 8-(8.63-6) = 5.37dBm.

802.11ac (VHT40)

TX chain	Channel	Freq. (MHz)	PSD w/o Duty Factor (dBm)	10 log (N=3) dB	Duty Factor (dB)	Total PSD with Duty Factor (dBm)	Limit (dBm)	Pass /Fail
0	151	5755	-10.19	4.77	0.17	-5.25	5.37	PASS
	159	5795	-9.76	4.77	0.17	-4.82	5.37	PASS
1	151	5755	-11.62	4.77	0.17	-6.68	5.37	PASS
	159	5795	-9.82	4.77	0.17	-4.88	5.37	PASS
2	151	5755	-12.66	4.77	0.17	-7.72	5.37	PASS
	159	5795	-10.33	4.77	0.17	-5.39	5.37	PASS

NOTE: 1. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 3] = 8.63dBi > 6dBi , so the power density limit shall be reduced to 8-(8.63-6) = 5.37dBm.

2. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80)

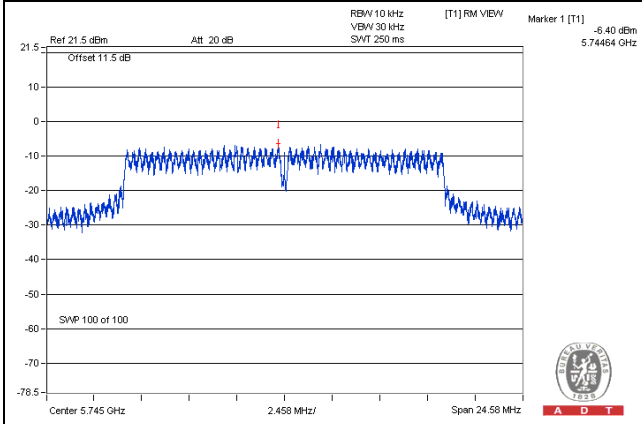
TX chain	Channel	Freq. (MHz)	PSD w/o Duty Factor (dBm)	10 log (N=3) dB	Duty Factor (dB)	Total PSD with Duty Factor (dBm)	Limit (dBm)	Pass /Fail
0	155	5775	-17.38	4.77	0.21	-12.40	5.37	PASS
1	155	5775	-16.54	4.77	0.21	-11.56	5.37	PASS
2	155	5775	-17.16	4.77	0.21	-12.18	5.37	PASS

NOTE: 1. Directional gain = 10 log[($10^{G1/20}$ + $10^{G2/20}$ + $10^{G3/20}$)^2 / 3] = 8.63dBi > 6dBi , so the power density limit shall be reduced to 8-(8.63-6) = 5.37dBm.

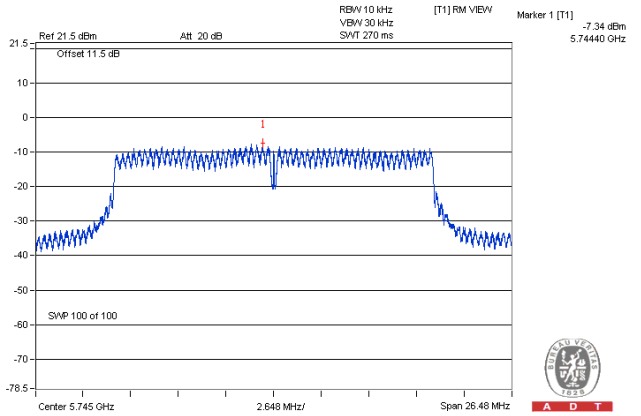
2. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

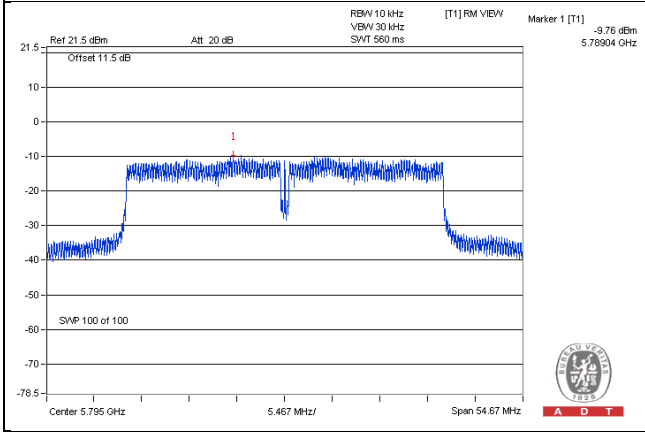
802.11a – CH 149



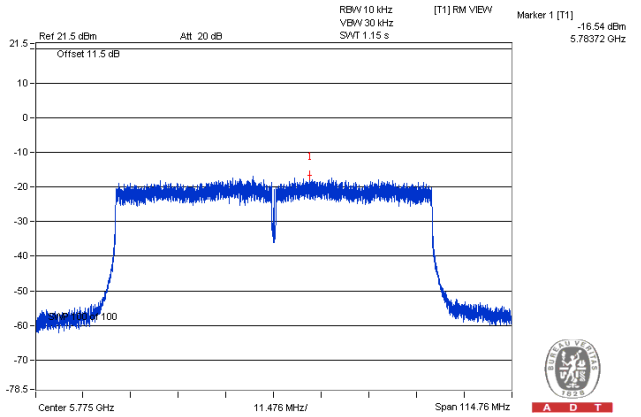
802.11ac (VHT20) – Chain 0: CH 149



802.11ac (VHT40) – Chain 0: CH 159



802.11ac (VHT80) – Chain 1: CH 155



Beamforming MODE

802.11ac (VHT20)

TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=3) dB	Total PSD (dBm)	Limit (dBm)	Pass /Fail
0	149	5745	-10.20	4.77	-5.43	5.37	Pass
	157	5785	-10.76	4.77	-5.99	5.37	Pass
	165	5825	-10.40	4.77	-5.63	5.37	Pass
1	149	5745	-9.85	4.77	-5.08	5.37	Pass
	157	5785	-9.98	4.77	-5.21	5.37	Pass
	165	5825	-9.95	4.77	-5.18	5.37	Pass
2	149	5745	-8.06	4.77	-3.29	5.37	Pass
	157	5785	-8.24	4.77	-3.47	5.37	Pass
	165	5825	-8.74	4.77	-3.97	5.37	Pass

NOTE: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 3] = 8.63dBi > 6dBi , so the power density limit shall be reduced to 8-(8.63-6) = 5.37dBm.

802.11ac (VHT40)

TX chain	Channel	Freq. (MHz)	PSD w/o Duty Factor (dBm)	10 log (N=3) dB	Duty Factor (dB)	Total PSD with Duty Factor (dBm)	Limit (dBm)	Pass /Fail
0	151	5755	-12.28	4.77	0.17	-7.34	5.37	PASS
	159	5795	-12.50	4.77	0.17	-7.56	5.37	PASS
1	151	5755	-12.97	4.77	0.17	-8.03	5.37	PASS
	159	5795	-11.89	4.77	0.17	-6.95	5.37	PASS
2	151	5755	-10.86	4.77	0.17	-5.92	5.37	PASS
	159	5795	-10.03	4.77	0.17	-5.09	5.37	PASS

NOTE: 1. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 3] = 8.63dBi > 6dBi , so the power density limit shall be reduced to 8-(8.63-6) = 5.37dBm.

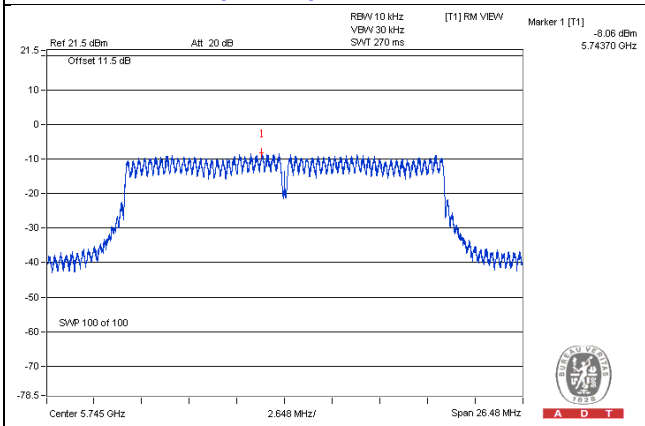
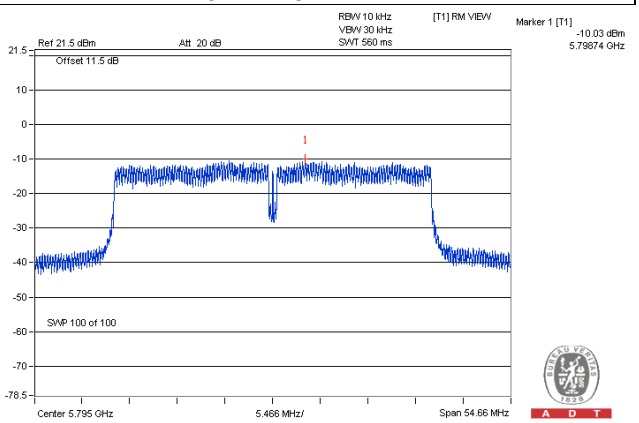
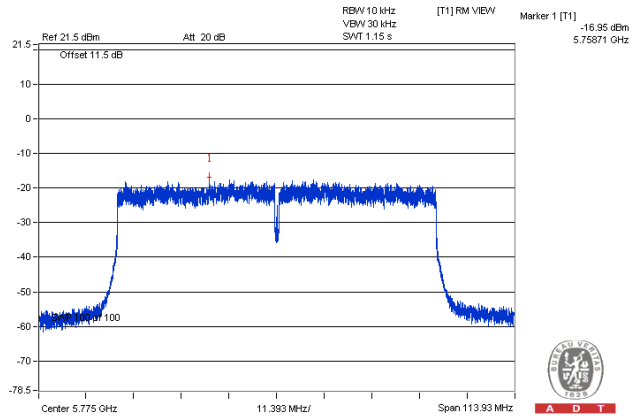
2. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80)

TX chain	Channel	Freq. (MHz)	PSD w/o Duty Factor (dBm)	10 log (N=3) dB	Duty Factor (dB)	Total PSD with Duty Factor (dBm)	Limit (dBm)	Pass /Fail
0	155	5775	-17.48	4.77	0.21	-12.50	5.37	PASS
1	155	5775	-17.80	4.77	0.21	-12.82	5.37	PASS
2	155	5775	-16.95	4.77	0.21	-11.97	5.37	PASS

NOTE: 1. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 3] = 8.63dBi > 6dBi , so the power density limit shall be reduced to 8-(8.63-6) = 5.37dBm.

2. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value	
802.11ac (VHT20) – Chain 2: CH 149	**802.11ac (VHT40) – Chain 2: CH 159**
	
802.11ac (VHT80) – Chain 2: CH 155	
	

5.6 Conducted Out of Band Emission Measurement

5.6.1 Limits of Conducted Out of Band Emission Measurement

Below –30dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

5.6.2 Test Setup

Same as Item 4.7.2

5.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

5.6.4 Test Procedure

Same as Item 4.7.4

5.6.5 Deviation from Test Standard

No deviation.

5.6.6 EUT Operating Condition

Same as Item 4.3.6

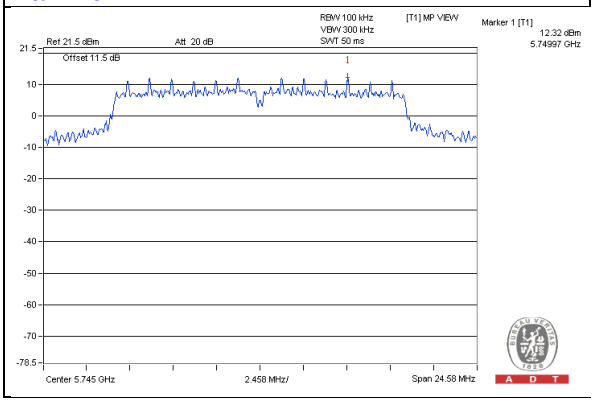
5.6.7 Test Results

The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 30dB offset below D1. It shows compliance with the requirement.

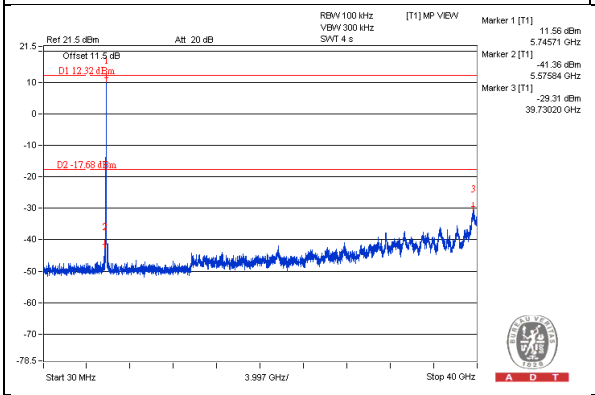
CDD MODE

802.11a

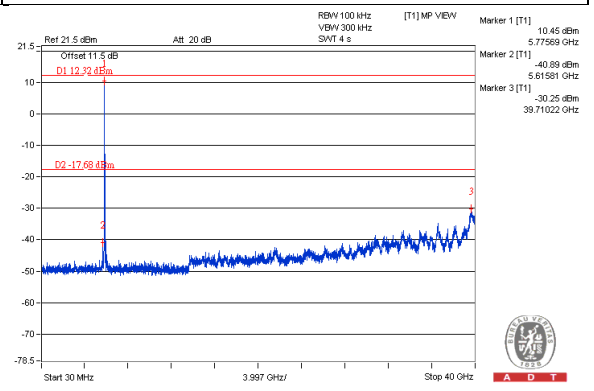
Maximum REF



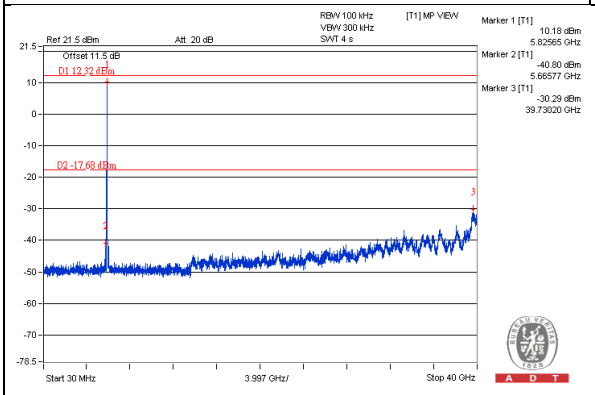
CH 149



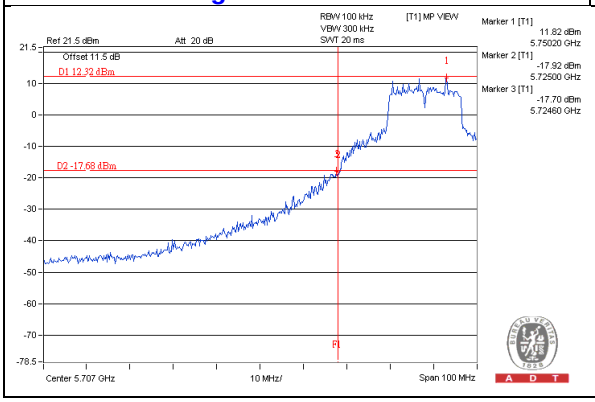
CH 157



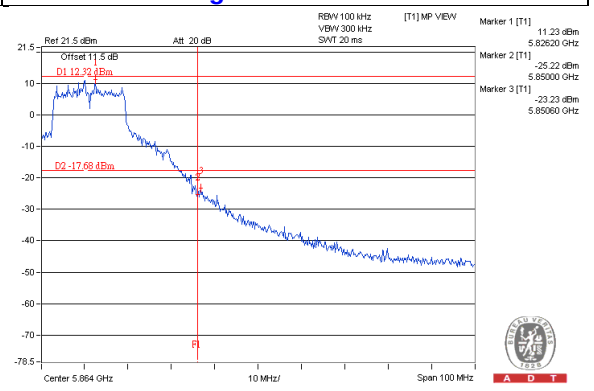
CH 165



CH 149 Band edge

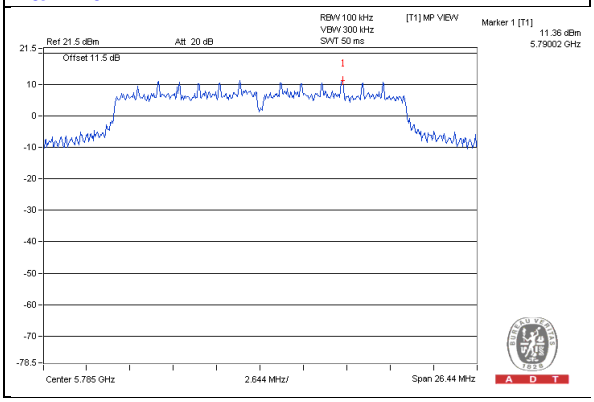


CH 165 Band edge



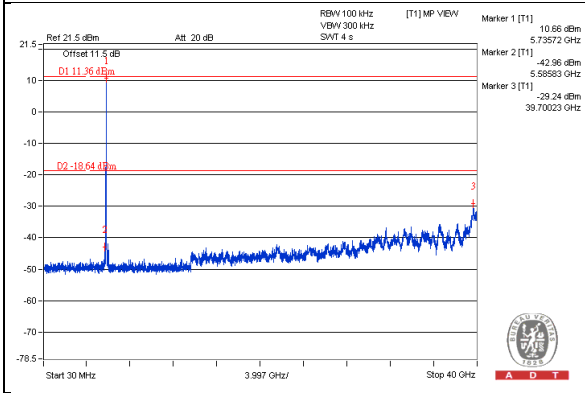
802.11ac (VHT20)

Maximum REF

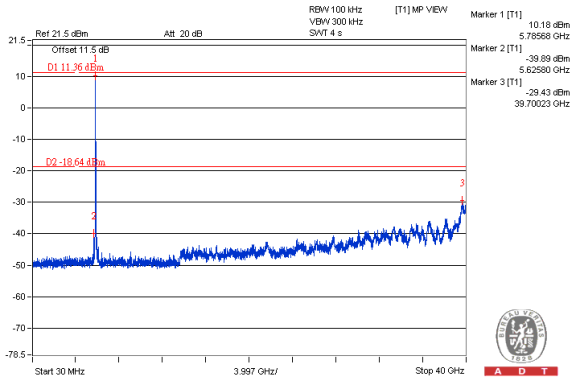


Chain 0

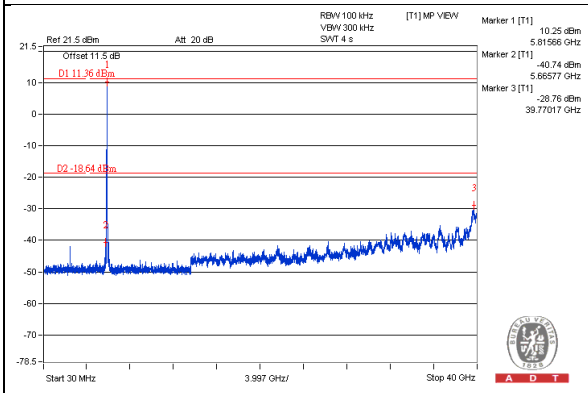
CH 149



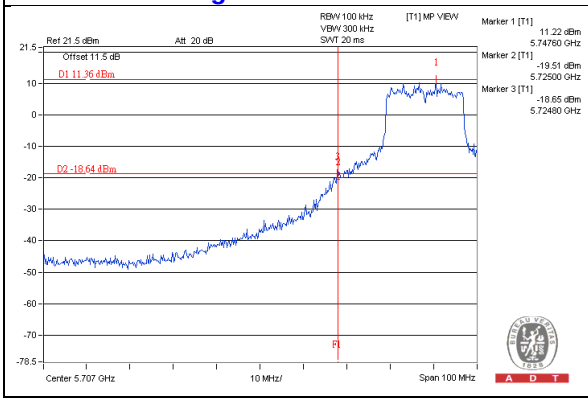
CH 157



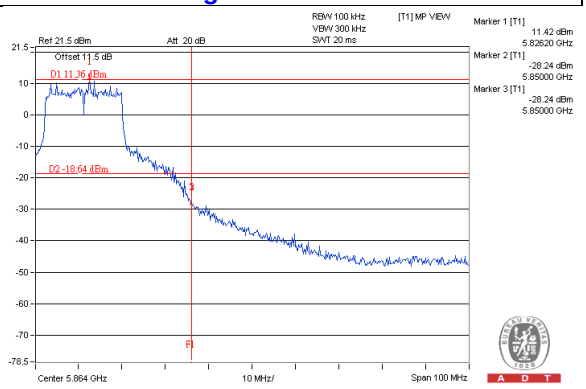
CH 165



CH 149 Band edge

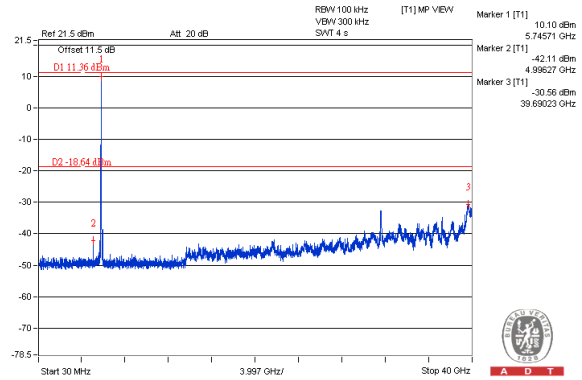


CH 165 Band edge

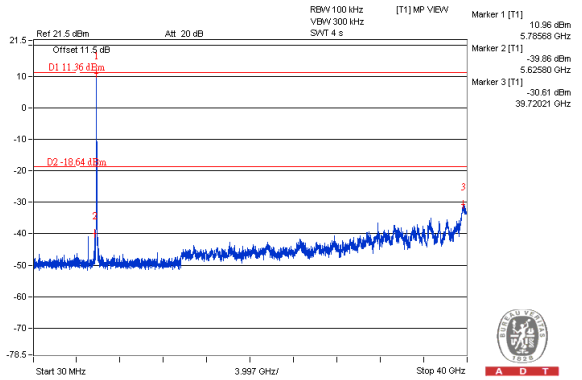


Chain 1

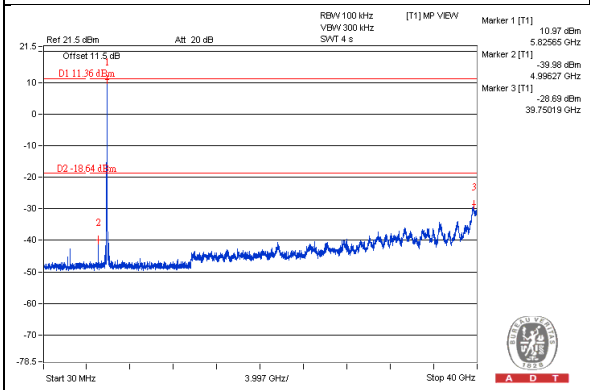
CH 149



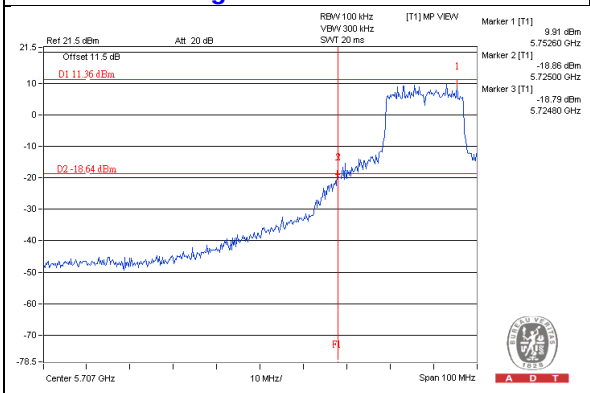
CH 157



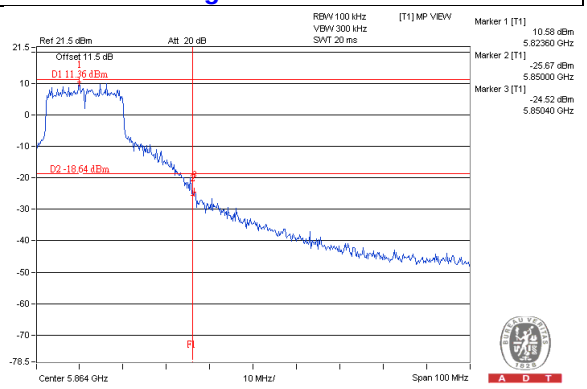
CH 165



CH 149 Band edge

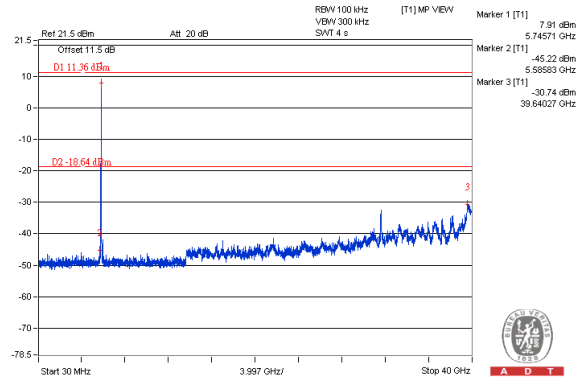


CH 165 Band edge

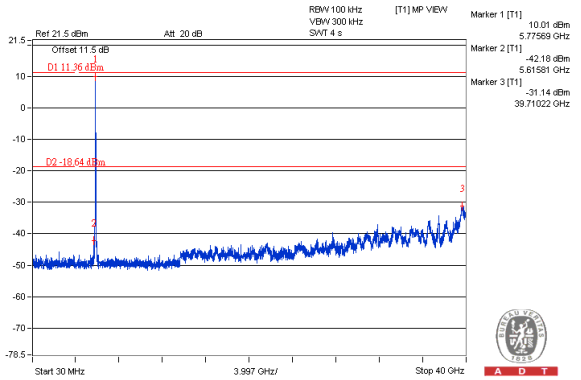


Chain 2

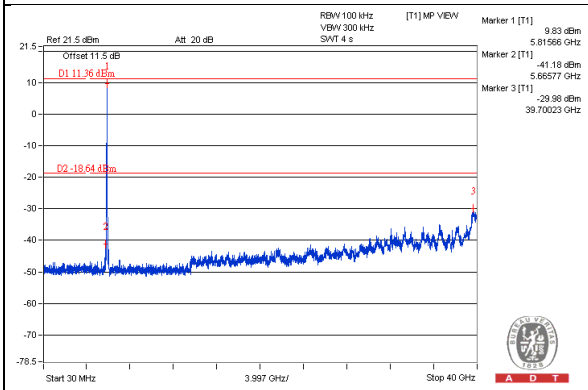
CH 149



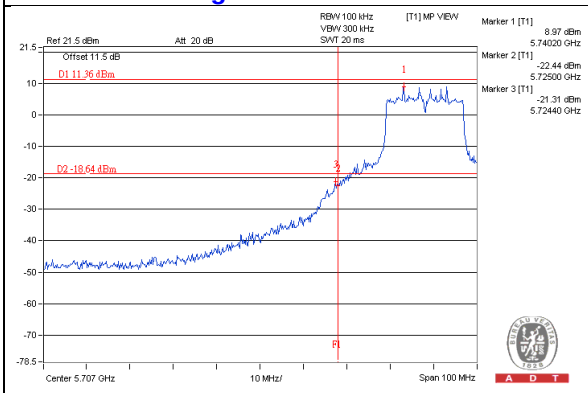
CH 157



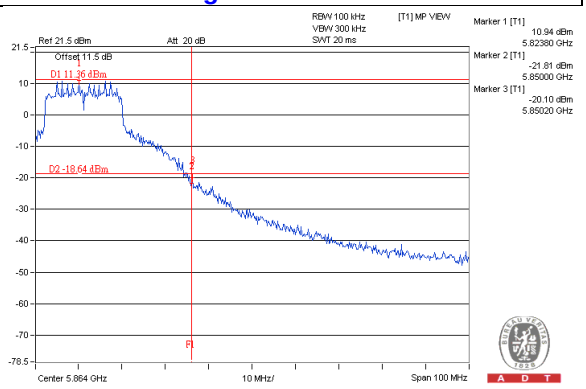
CH 165



CH 149 Band edge

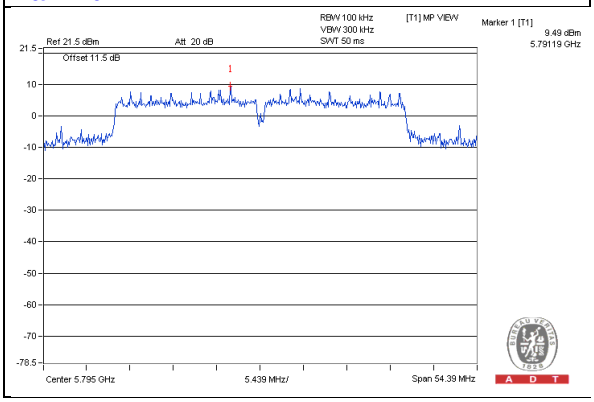


CH 165 Band edge



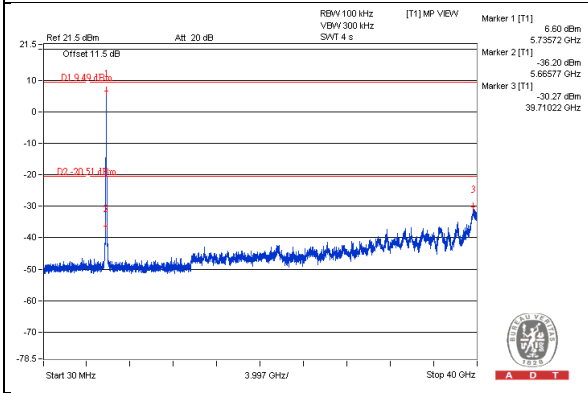
802.11ac (VHT40)

Maximum REF

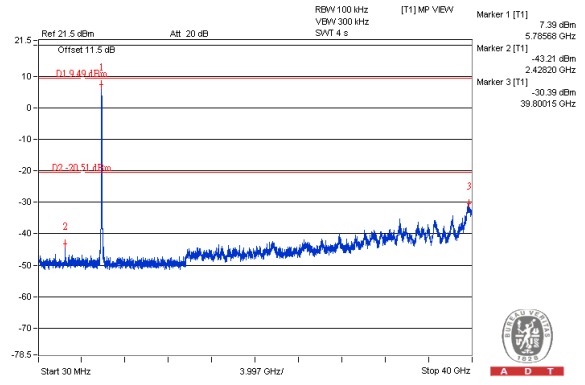


Chain 0

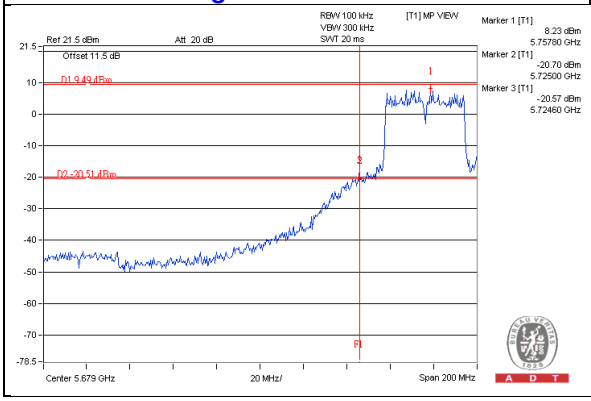
CH 151



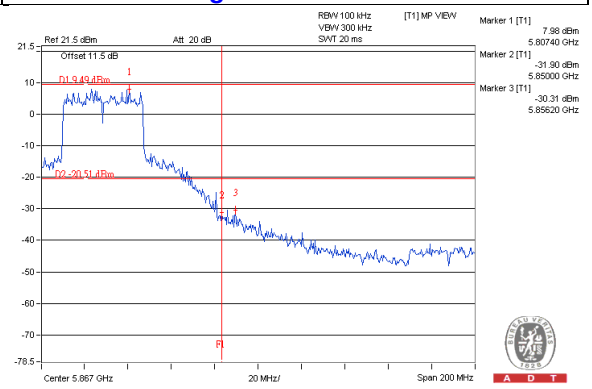
CH 159



CH 151 Band edge

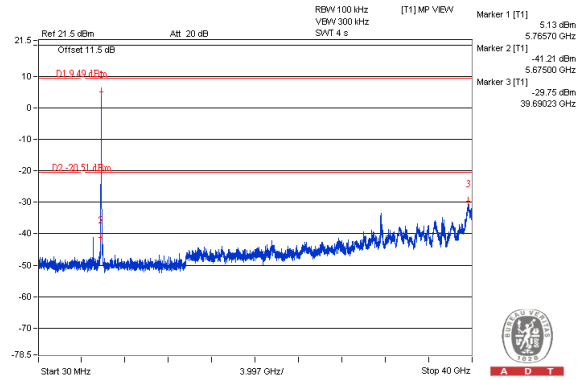


CH 159 Band edge

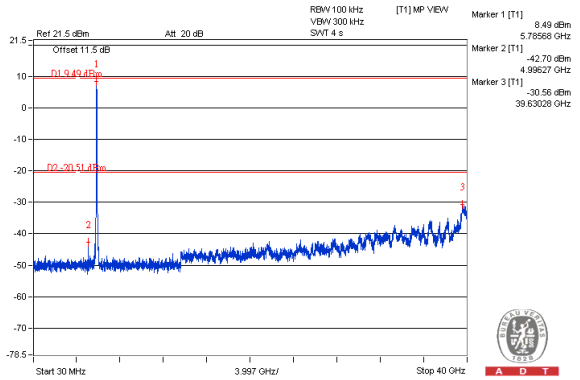


Chain 1

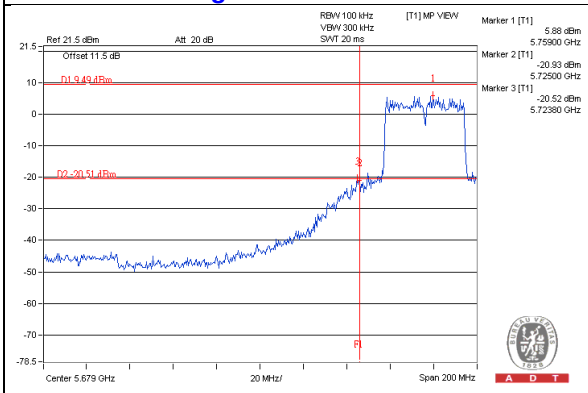
CH 151



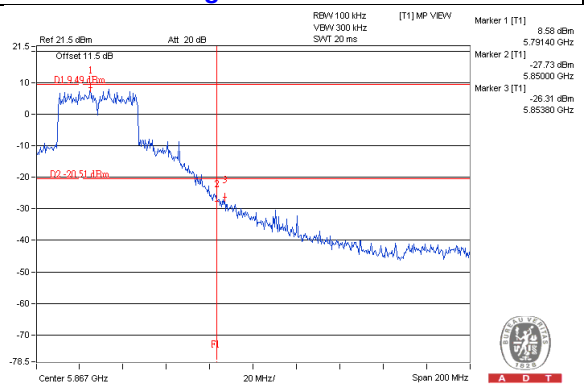
CH 159



CH 151 Band edge

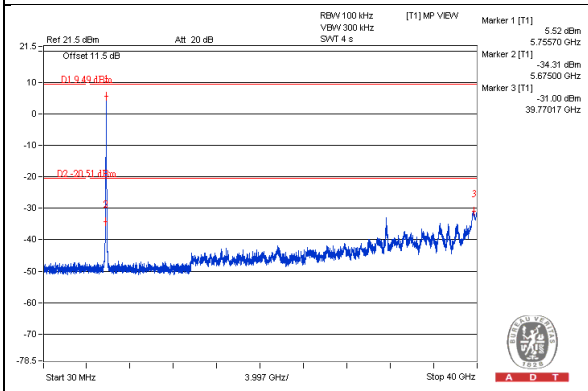


CH 159 Band edge

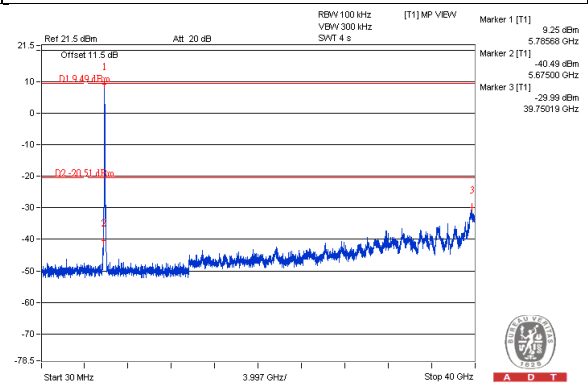


Chain 2

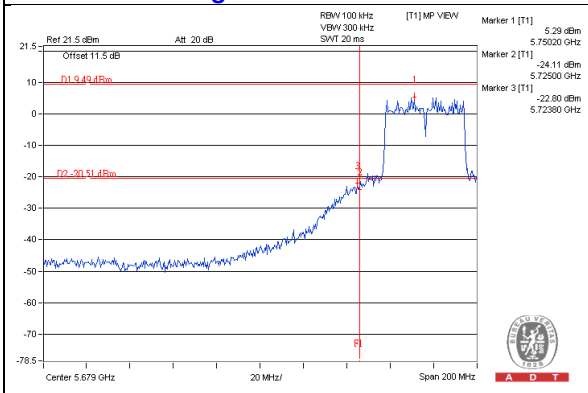
CH 151



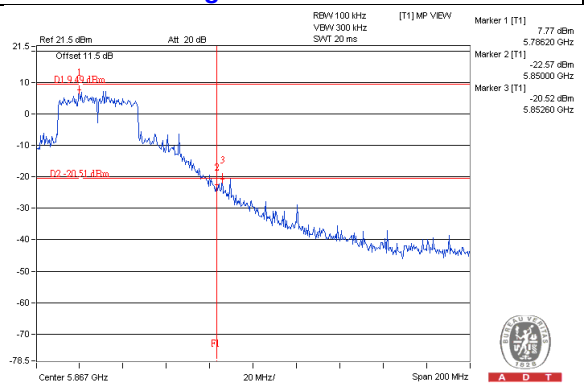
CH 159



CH 151 Band edge

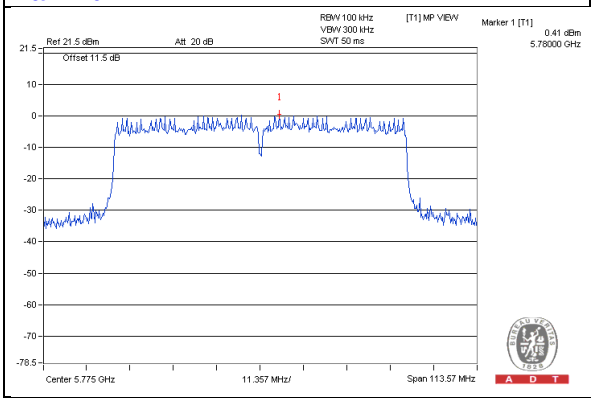


CH 159 Band edge



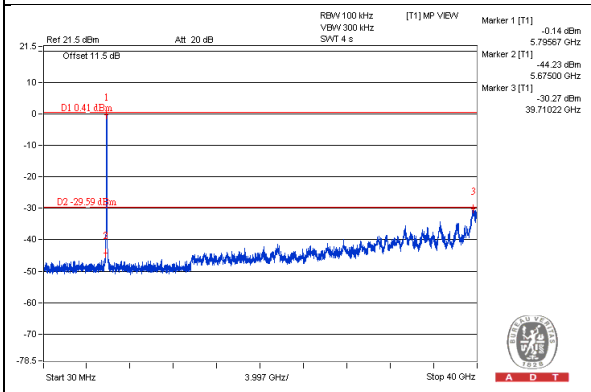
802.11ac (VHT80)

Maximum REF

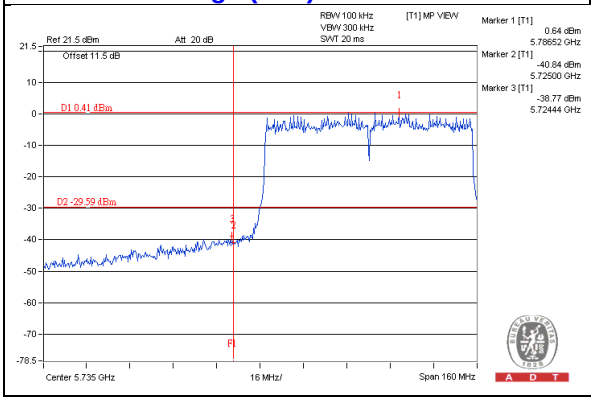


Chain 0

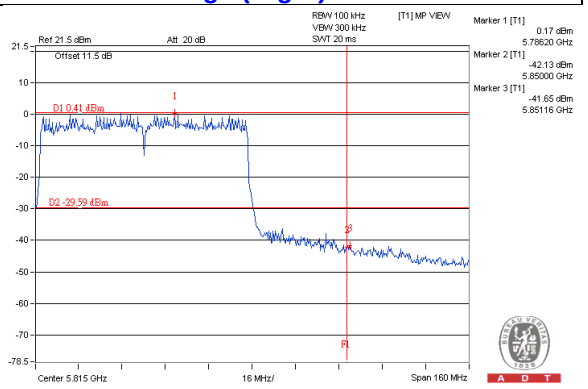
CH 155



CH 155 Band edge (Left)

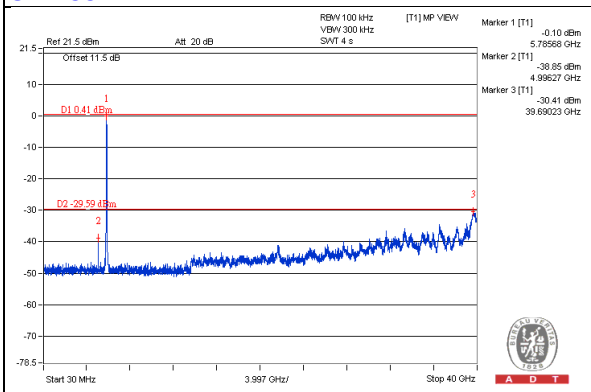


CH 155 Band edge (Right)

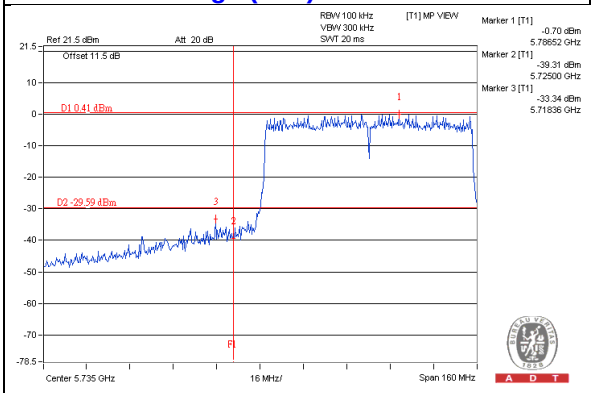


Chain 1

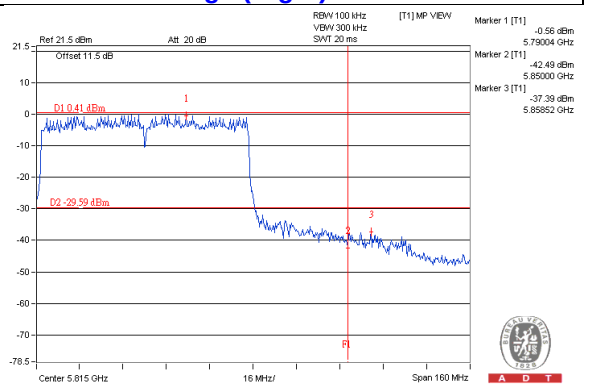
CH 155



CH 155 Band edge (Left)

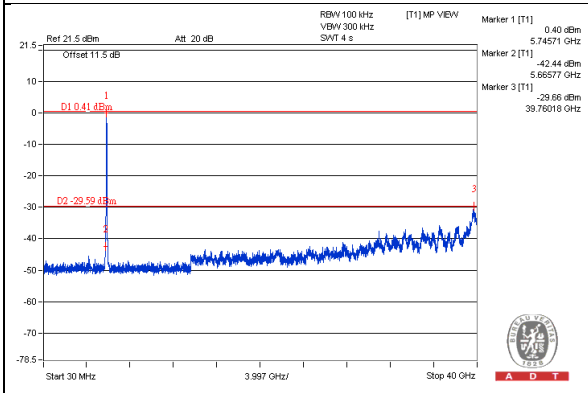


CH 155 Band edge (Right)

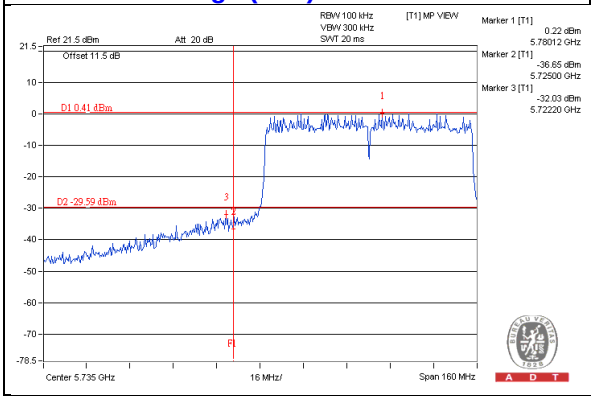


Chain 2

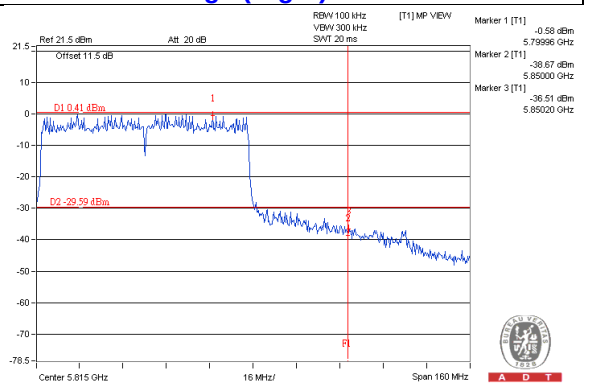
CH 155



CH 155 Band edge (Left)

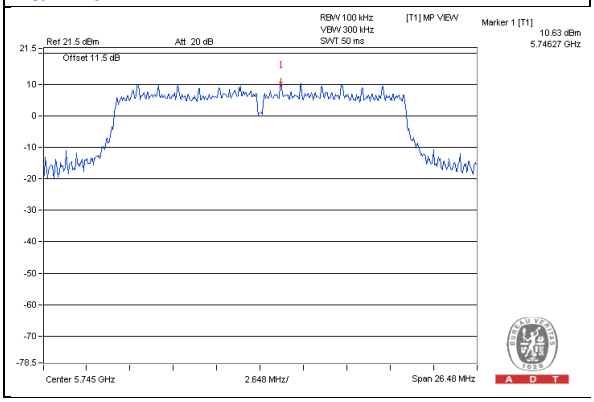


CH 155 Band edge (Right)



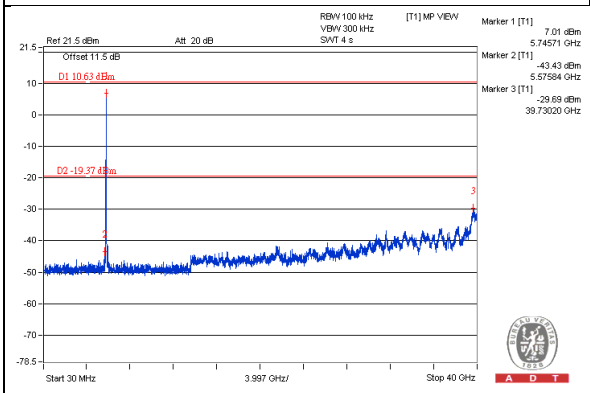
Beamforming MODE
802.11ac (VHT20)

Maximum REF

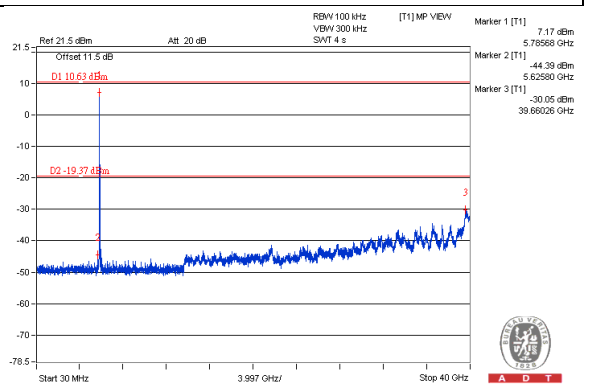


Chain 0

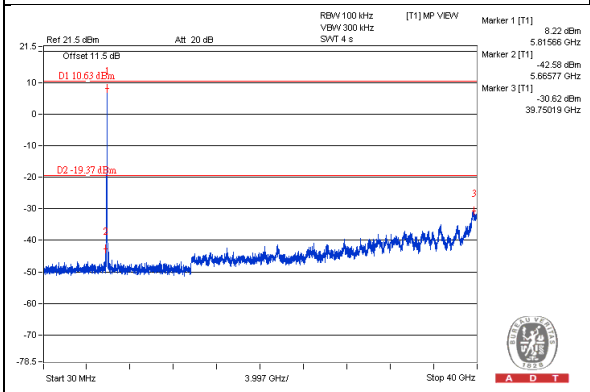
CH 149



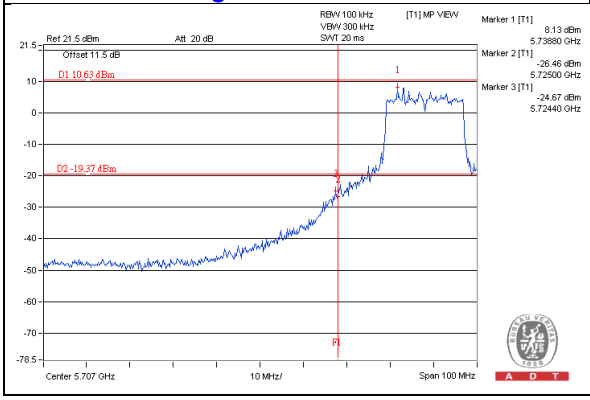
CH 157



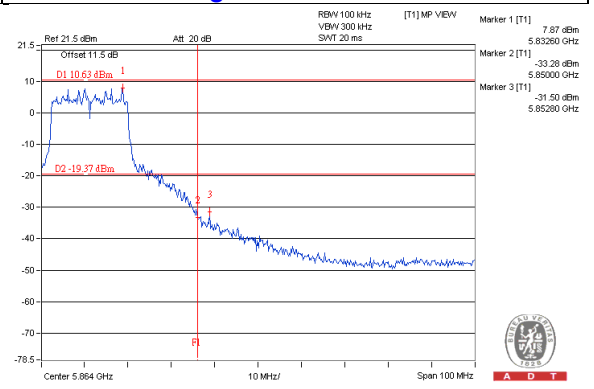
CH 165



CH 149 Band edge

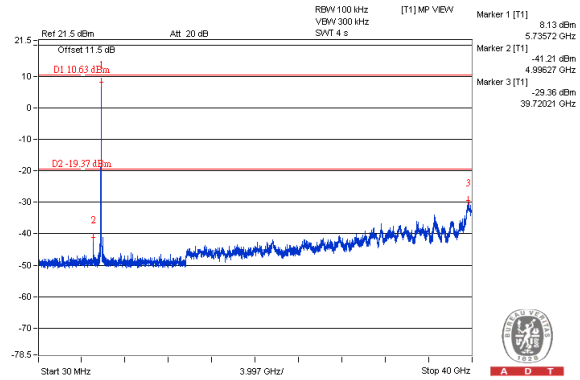


CH 165 Band edge

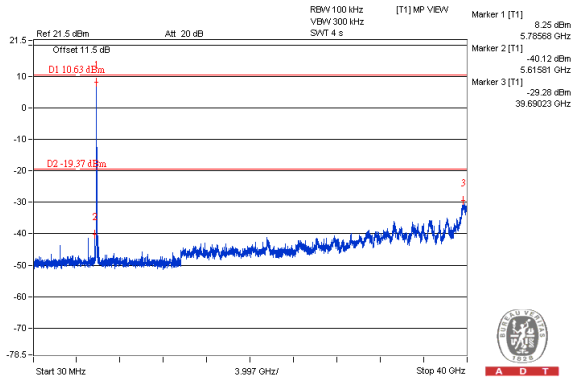


Chain 1

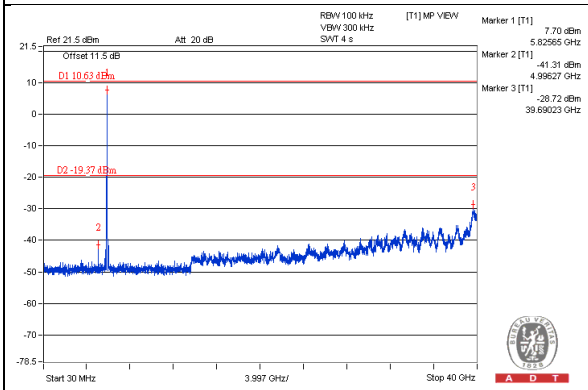
CH 149



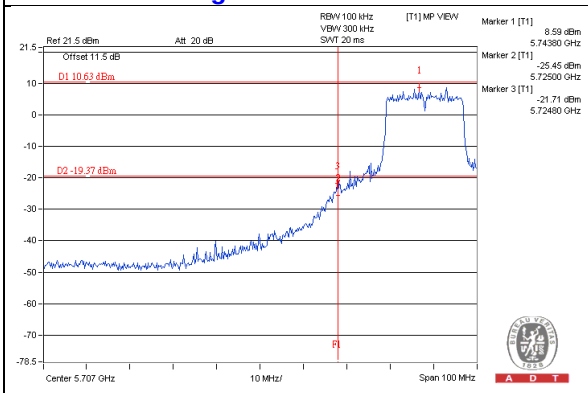
CH 157



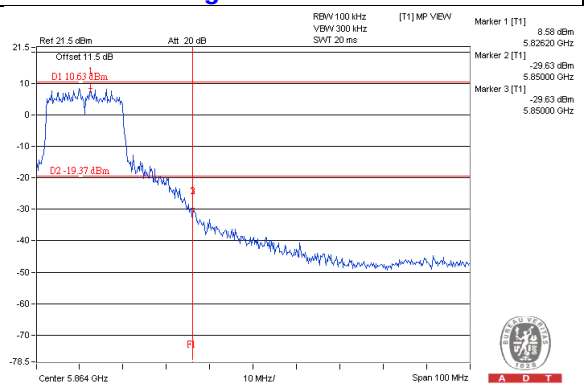
CH 165



CH 149 Band edge

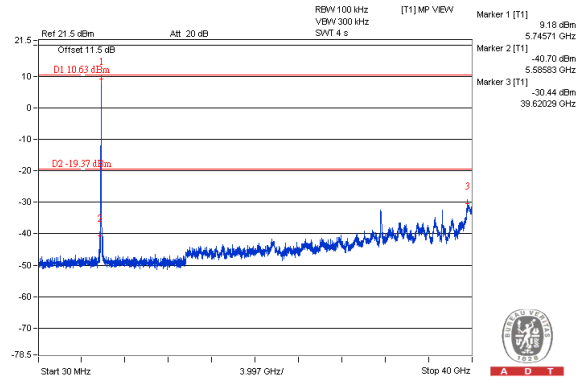


CH 165 Band edge

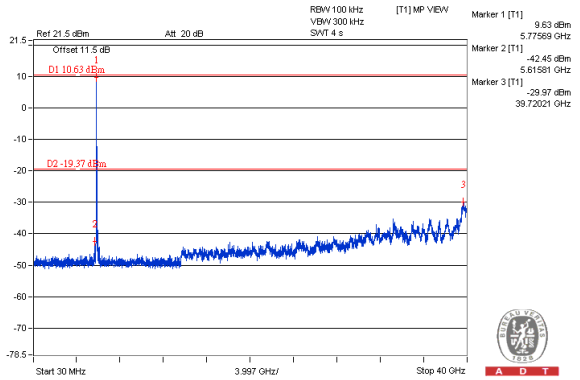


Chain 2

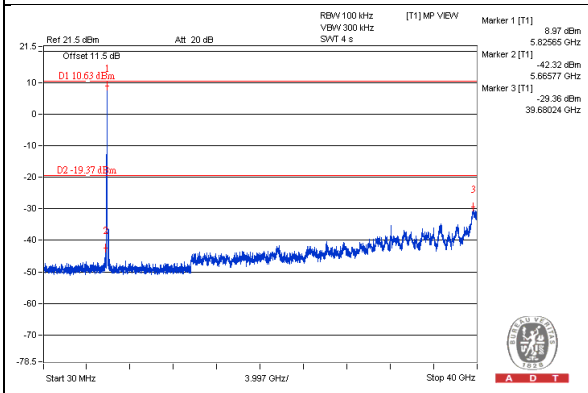
CH 149



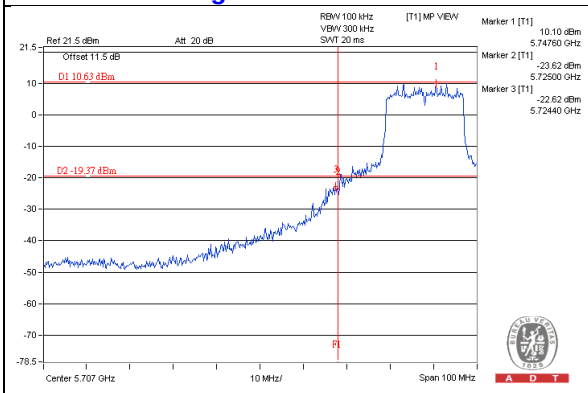
CH 157



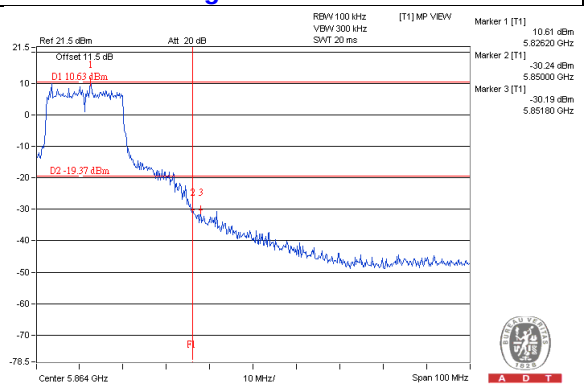
CH 165



CH 149 Band edge

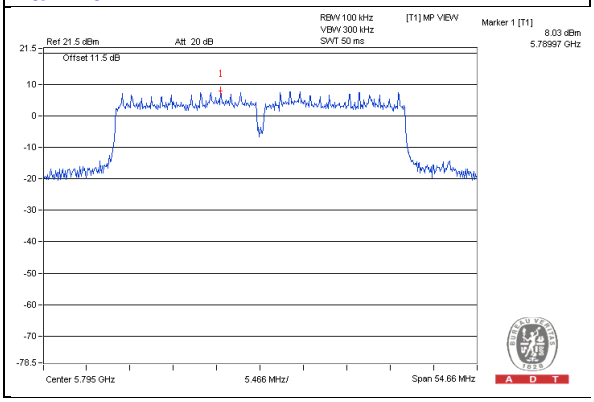


CH 165 Band edge



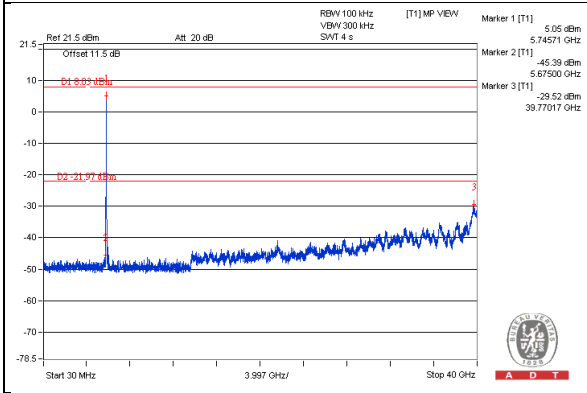
802.11ac (VHT40)

Maximum REF

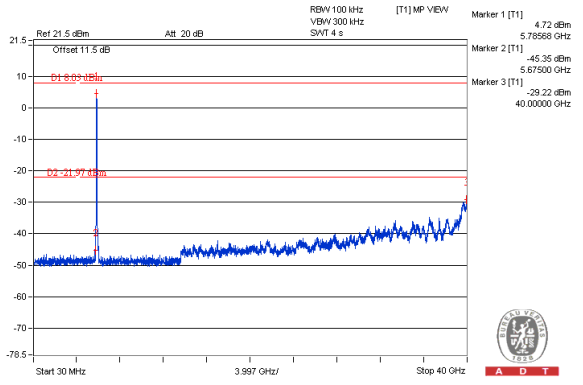


Chain 0

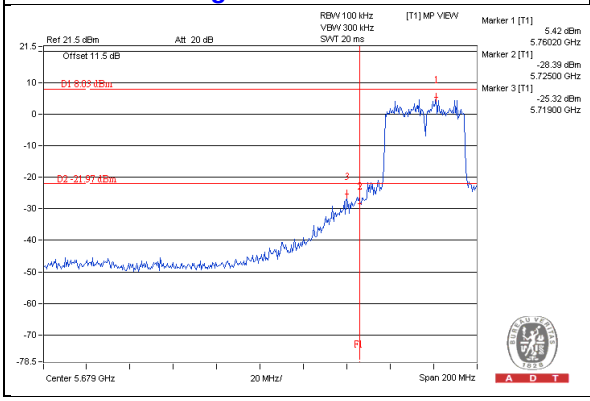
CH 151



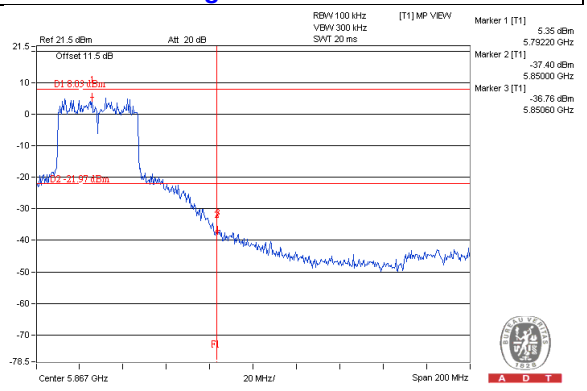
CH 159



CH 151 Band edge

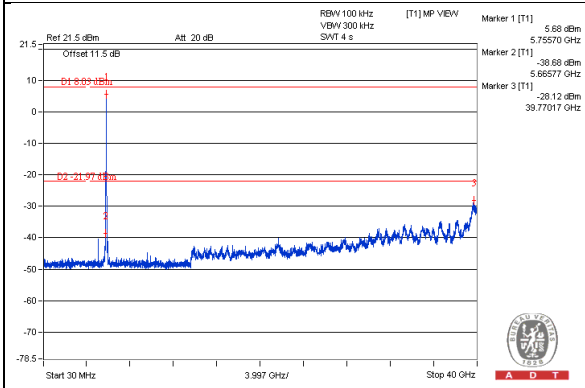


CH 159 Band edge

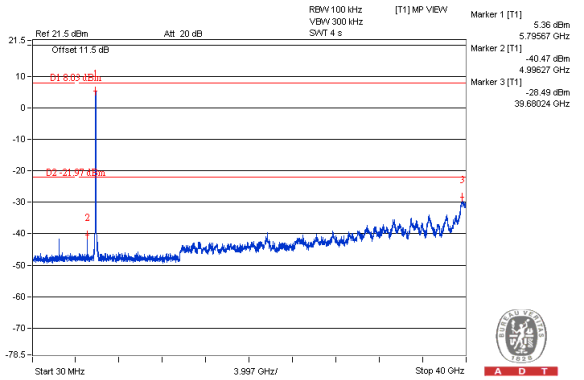


Chain 1

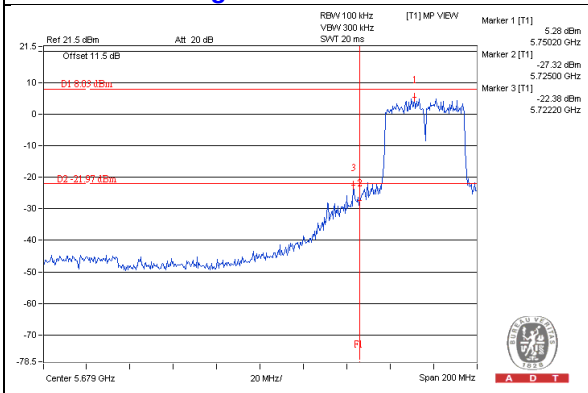
CH 151



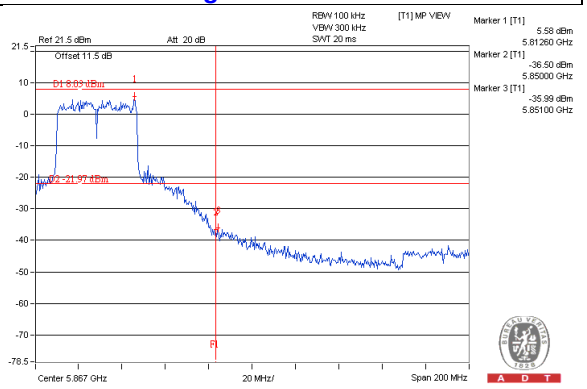
CH 159



CH 151 Band edge

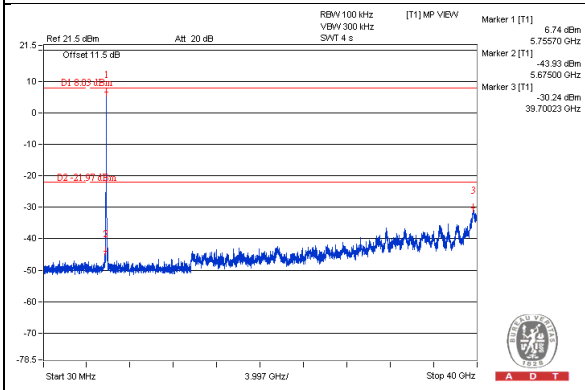


CH 159 Band edge

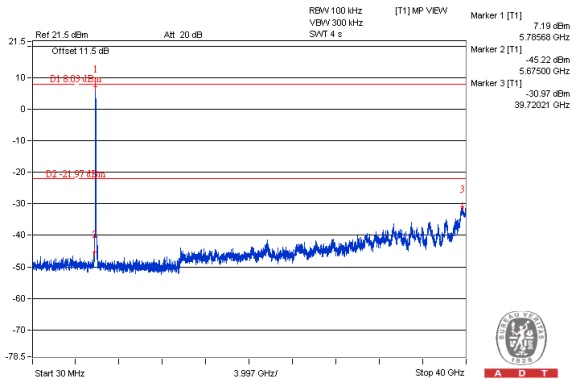


Chain 2

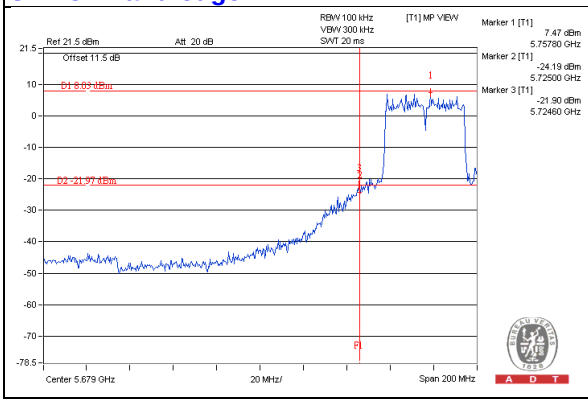
CH 151



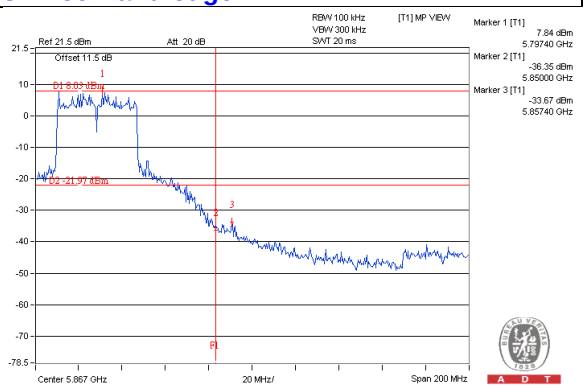
CH 159



CH 151 Band edge

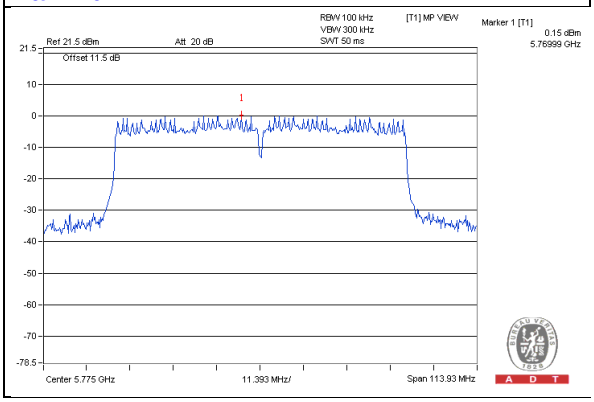


CH 159 Band edge



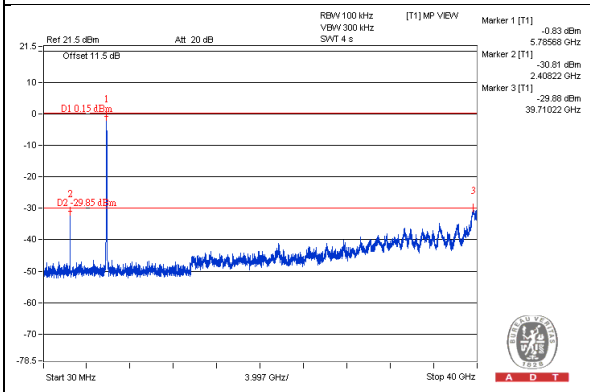
802.11ac (VHT80)

Maximum REF

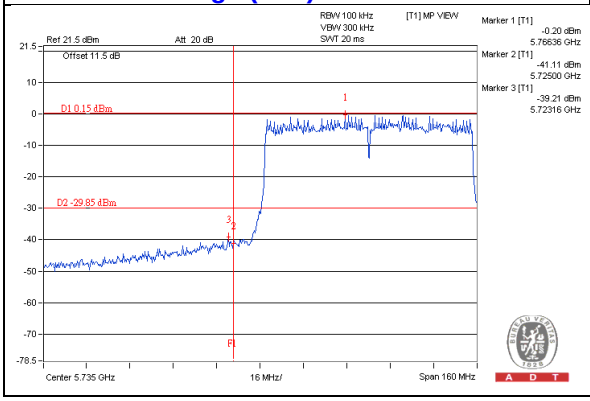


Chain 0

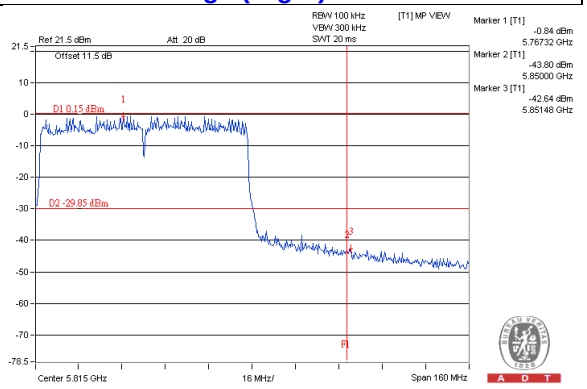
CH 155



CH 155 Band edge (Left)

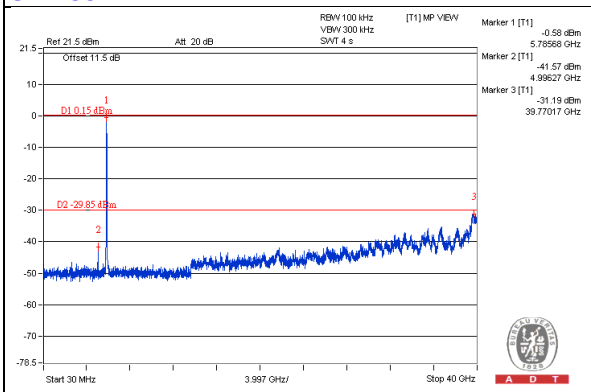


CH 155 Band edge (Right)

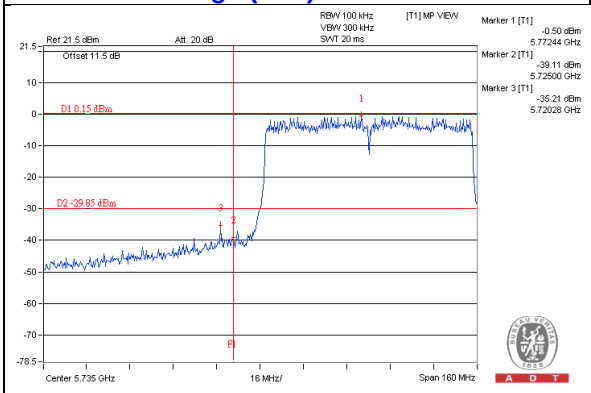


Chain 1

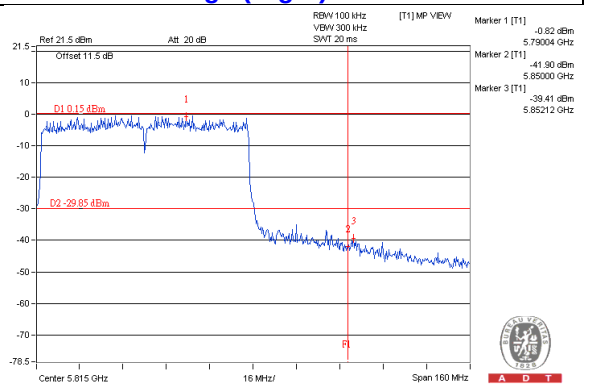
CH 155



CH 155 Band edge (Left)

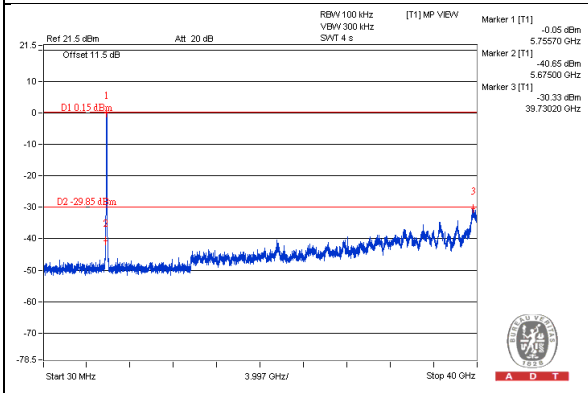


CH 155 Band edge (Right)

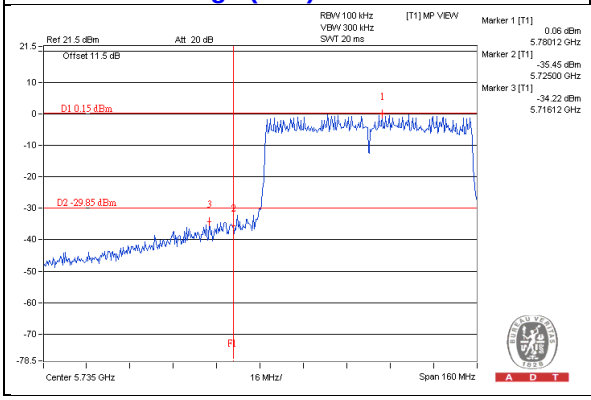


Chain 2

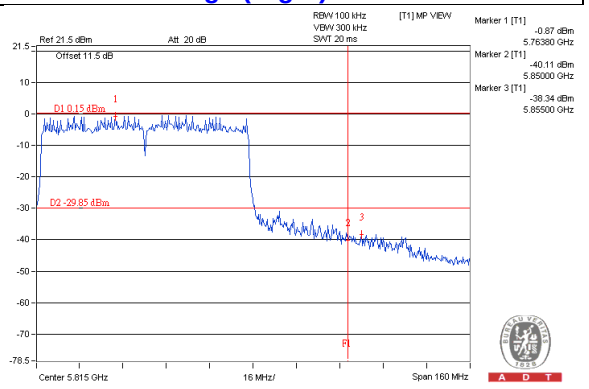
CH 155



CH 155 Band edge (Left)



CH 155 Band edge (Right)



6 Pictures of Test Arrangements

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

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

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

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