

FCC TEST REPORT (WLAN -15.407)

REPORT NO.: RF140313E05-1

MODEL NO.: QCNFA34AC

FCC ID: PPD-QCNFA34AC

IC: 4104A-QCNFA34AC

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ISSUED: May 20, 2014

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ISSUED BY: Bureau Veritas Consumer Products Services (H.K.)
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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF140313E05-1	Original release	May 20, 2014



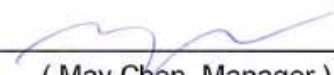
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1. CERTIFICATION

PRODUCT: 802.11 a/b/g/n/ac+ BT 4.1 M.2 Type Card
BRAND NAME: Qualcomm Atheros
MODEL NO.: QCNFA34AC
TEST SAMPLE: R&D SAMPLE
APPLICANT: Qualcomm Atheros, Inc.
TESTED: Mar. 26 to May 09, 2014
STANDARDS: FCC Part 15, Subpart E (Section 15.407)
ANSI C63.10-2009
Canada RSS-210 Issue 8 (2010-12)
Canada RSS-Gen Issue 3 (2010-12)

The above equipment (Model: QCNFA34AC) has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and was in 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 20, 2014
(Lori Chung, Specialist)

APPROVED BY : , **DATE:** May 20, 2014
(May Chen, Manager)

2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC PART 15, SUBPART E (SECTION 15.407) ; RSS-210; RSS-Gen				
STANDARD SECTION		TEST TYPE	RESULT	REMARK
FCC Part 15	RSS-210; RSS-Gen			
15.407(b)(6)	RSS-Gen 7.2.4	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -21.37dB at 1.72182MHz
15.407(b)(1/2/3) (b)(6)	RSS-210 A9.2	Spurious Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -2.5dB at 17160.00MHz
15.407 (a/1/2)	RSS-210 A9.2	Transmit Power	PASS	Meet the requirement of limit.
15.407(a)(6)	RSS-210 A9.2	Peak Power Excursion	PASS	Meet the requirement of limit.
15.407 (a/1/2)	RSS-210 A9.2 A9.4 (2)	Peak Power Spectral Density	PASS	Meet the requirement of limit.
15.407(g)	RSS-Gen 4.7	Frequency Stability	PASS	Meet the requirement of limit.
-	RSS-Gen 4.6	Occupied Bandwidth Measurement	-	Meet the requirement.
15.203	-	Antenna Requirement	PASS	Antenna connector is IPEX not a standard connector.

NOTE: 1. For WLAN: The EUT was operating in 2400 ~ 2483.5MHz, 5.15~5.35GHz, 5.47~5.6GHz & 5.65~5.725GHz and 5.725~5.850GHz frequencies band. This report was recorded the RF parameters including 5.15~5.35GHz, 5.47~5.6GHz & 5.65~5.725GHz. For the 2400 ~ 2483.5MHz and 5.725~5.850GHz RF parameters was recorded in another test report.

2. The DFS report was recorded in another test report.

2.1 MEASUREMENT UNCERTAINTY

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

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

Measurement	Value
Conducted emissions	2.86 dB
Radiated emissions (30MHz-1GHz)	5.37 dB
Radiated emissions (1GHz -6GHz) – Chamber G	3.65 dB
Radiated emissions (1GHz -6GHz) – Chamber H	3.72 dB
Radiated emissions (6GHz -18GHz) – Chamber G	3.88 dB
Radiated emissions (6GHz -18GHz) – Chamber H	4.00 dB
Radiated emissions (18GHz -40GHz)	4.11 dB

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT (WLAN)

PRODUCT	802.11 a/b/g/n/ac+ BT 4.1 M.2 Type Card
MODEL NO.	QCNFA34AC
POWER SUPPLY	DC 3.3V from host equipment
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM BT-LE (GFSK) for DTS 256QAM for OFDM in 11ac mode and 11n (HT20), 11n (HT40) mode of 2.4GHz Band
MODULATION TECHNOLOGY	DSSS, OFDM, DTS
TRANSFER RATE	802.11b: up to 11Mbps 802.11a/g: up to 54Mbps 802.11n : up to 400Mbps 802.11ac: up to 866.7Mbps BT-LE(GFSK): 1Mbps
OPERATING FREQUENCY	For 15.407 802.11a: 5.18 ~ 5.24GHz, 5.26 ~ 5.32GHz, 5.5~5.72GHz
	For 15.247 2.4GHz: 2.412 ~ 2.462GHz 5GHz: 5.745 ~ 5.825GHz BT-LE(GFSK): 2.402 ~ 2.480GHz
NUMBER OF CHANNEL	For 15.407 20 for 802.11a, 802.11n (HT20), 802.11ac (VHT20) 10 for 802.11n (HT40), 802.11ac (VHT40) 5 for 802.11ac (VHT80)
	For 15.247(2.4GHz) 11 for 802.11b, 802.11g, 802.11n (HT20), 802.11n_256QAM(BW20) 7 for 802.11n (HT40), 802.11n_256QAM(BW40) 40 for BT-LE(GFSK) For 15.247(5GHz) 5 for 802.11a, 802.11n (HT20), 802.11ac (VHT20) 2 for 802.11n (HT40), 802.11ac (VHT40) 1 for 802.11ac (VHT80)
MAXIMUM OUTPUT POWER	See Note
ANTENNA TYPE	See item 3.2
ANTENNA CONNECTOR	See item 3.2
DATA CABLE	NA
I/O PORTS	NA
ASSOCIATED DEVICES	NA

NOTE:

- There are Bluetooth technology and WLAN technology used for the EUT.
- The modular has two variant designs as following table:

Variant No.	Description
SKU #1	NFA344: This SKU supports 2T2R MIMO.
SKU #2	NFA345: This SKU supports 1T2R.

- The maximum output power(mW) table as below table:

15.247 (2.4GHz<WLAN>)			
SKU #2(NFA345) - 1Tx		SKU #1 (NFA344) - 2Tx	
802.11b	181.552	802.11b	390.963
802.11g	259.418	802.11g	500.770
802.11n (HT20)	273.527	802.11n (HT20)	589.439
802.11n (HT40)	250.035	802.11n (HT40)	326.780
802.11n_256QAM(BW20)	276.694	802.11n_256QAM(BW20)	593.015
802.11n_256QAM(BW40)	250.611	802.11n_256QAM(BW40)	478.987
15.247 (5GHz)			
SKU #2(NFA345) - 1Tx		SKU #1 (NFA344) - 2Tx	
802.11a	127.057	802.11a	264.540
802.11n (HT20)	138.357	802.11n (HT20)	286.951
802.11n (HT40)	107.647	802.11n (HT40)	213.817
802.11ac (VHT20)	146.218	802.11ac (VHT20)	298.623
802.11ac (VHT40)	105.682	802.11ac (VHT40)	208.958
802.11ac (VHT80)	106.414	802.11ac (VHT80)	208.743
15.407 (5GHz)			
SKU #2(NFA345) - 1Tx		SKU #1 (NFA344) - 2Tx	
802.11a	29.040	802.11a	67.322
802.11n (HT20)	28.445	802.11n (HT20)	66.029
802.11n (HT40)	22.182	802.11n (HT40)	46.275
802.11ac (VHT20)	28.642	802.11ac (VHT20)	66.924
802.11ac (VHT40)	22.233	802.11ac (VHT40)	46.228
802.11ac (VHT80)	18.365	802.11ac (VHT80)	21.767
15.247 (2.4GHz<BT-LE>)			
SKU #1 (NFA344)			
BT-LE(GFSK)	2.113		

4. The EUT incorporates a 2T2R function SKU #1 (NFA344), 1T2R function SKU #2 (NFA345).

SKU #1 (NFA344)			
MODULATION MODE	DATA RATE (MCS)	TX & RX CONFIGURATION	
802.11b	1 ~ 11Mbps	2Tx CDD	2Rx
802.11g	6 ~ 54Mbps	2Tx CDD	2Rx
802.11n (HT20) (2.4GHz)	MCS 0~7	2Tx CDD / beamforming	2Rx
	MCS 8~15	2Tx	2Rx
	MCS 0~8, Nss=1 (256QAM)	2Tx CDD / beamforming	2Rx
	MCS 0~8, Nss=2 (256QAM)	2Tx	2Rx
802.11n (HT40) (2.4GHz)	MCS 0~7	2Tx CDD / beamforming	2Rx
	MCS 8~15	2Tx	2Rx
	MCS 0~8, Nss=1 (256QAM)	2Tx CDD / beamforming	2Rx
	MCS 0~8, Nss=2 (256QAM)	2Tx	2Rx
802.11a	6 ~ 54Mbps	2Tx CDD / beamforming	2Rx
802.11n (HT20) (5GHz)	MCS 0~7	2Tx CDD / beamforming	2Rx
	MCS 8~15	2Tx	2Rx
802.11n (HT40) (5GHz)	MCS 0~7	2Tx CDD / beamforming	2Rx
	MCS 8~15	2Tx	2Rx
802.11ac (VHT20) (5GHz)	MCS 0~8, Nss=1	2Tx CDD / beamforming	2Rx
	MCS 0~8, Nss=2	2Tx	2Rx
802.11ac (VHT40) (5GHz)	MCS 0~8, Nss=1	2Tx CDD / beamforming	2Rx
	MCS 0~8, Nss=2	2Tx	2Rx
802.11ac (VHT80) (5GHz)	MCS 0~9, Nss=1	2Tx CDD / beamforming	2Rx
	MCS 0~9, Nss=2	2Tx	2Rx

SKU #2 (NFA345)			
MODULATION MODE	DATA RATE (MCS)	TX & RX CONFIGURATION	
802.11b	1 ~ 11Mbps	1Tx (Fix main port)	1Rx (Fix main port) or 2Rx
802.11g	6 ~ 54Mbps	1Tx (Fix main port)	1Rx (Fix main port) or 2Rx
802.11n (HT20) (2.4GHz)	MCS 0~7	1Tx (Fix main port)	1Rx (Fix main port) or 2Rx
	MCS 0~8, Nss=1 (256QAM)	1Tx (Fix main port)	1Rx (Fix main port) or 2Rx
802.11n (HT40) (2.4GHz)	MCS 0~7	1Tx (Fix main port)	1Rx (Fix main port) or 2Rx
	MCS 0~8, Nss=1 (256QAM)	1Tx (Fix main port)	1Rx (Fix main port) or 2Rx
802.11a	6 ~ 54Mbps	1Tx (Fix main port)	1Rx (Fix main port) or 2Rx
802.11n (HT20) (5GHz)	MCS 0~7	1Tx (Fix main port)	1Rx (Fix main port) or 2Rx
802.11n (HT40) (5GHz)	MCS 0~7	1Tx (Fix main port)	1Rx (Fix main port) or 2Rx
802.11ac (VHT20) (5GHz)	MCS 0~8, Nss=1	1Tx (Fix main port)	1Rx (Fix main port) or 2Rx
802.11ac (VHT40) (5GHz)	MCS 0~8, Nss=1	1Tx (Fix main port)	1Rx (Fix main port) or 2Rx
802.11ac (VHT80) (5GHz)	MCS 0~9, Nss=1	1Tx (Fix main port)	1Rx (Fix main port) or 2Rx

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

Test Mode	Data rate
Mode A	400ns GI
Mode B	800ns GI

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

6. Spurious Emission (radiated emission) of the simultaneous operation (WiFi & Bluetooth) have been evaluated and no non-compliance found. The detail combinations of transmitters / frequencies / modes as below table

Mode	Available Channel	Tested Channel	Modulation Technology
5 GHz (802.11ac(VHT20)) + Bluetooth (GFSK)	149 to 165	157	OFDM
	0 to 78	78	FHSS

7. WLAN/BT coexistence mode:

◆ **NFA344:**

2TX 5GHz WLAN (Main + Aux) + BT (Main) concurrent.

2TX 2.4GHz WLAN+ BT timely shared at Main antenna.

◆ **NFA345:**

1TX 2.4GHz WLAN+ BT timely shared at Main antenna.

1TX 5GHz WLAN+ BT concurrent

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

3.2 DESCRIPTION OF ANTENNA

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

Brand	Model	Antenna Type	2.4G Gain with cable loss (dBi)	5G Gain with cable loss (dBi)	2.4G Cable Loss (dBi)	5G Cable Loss (dBi)	Connector Type	Cable Length (mm)
WNC	81.EBJ15.005	PIFA	3.62	Band 1&2: 3.08 Band 3: 4.76 Band 4: 4.76	1.15	Band1&2: 1.70 Band 3: 1.74 Band 4: 1.79	IPEX	300

Note: 1. Above antenna gains of antenna are Total (H+V).

2. All of antenna can be application for WLAN and Bluetooth.

3.3 DESCRIPTION OF TEST MODES

Operated in 5150MHz ~ 5350MHz bands:

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

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
36	5180 MHz	52	5260 MHz
40	5200 MHz	56	5280 MHz
44	5220 MHz	60	5300 MHz
48	5240 MHz	64	5320 MHz

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

CHANNEL	FREQUENCY
38	5190 MHz
46	5230 MHz
54	5270 MHz
62	5310 MHz

2 channels are provided for 802.11ac (VHT80):

CHANNEL	FREQUENCY
42	5210 MHz
58	5290 MHz

Operated in 5470MHz ~ 5725MHz bands:

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

CHANNEL	FREQUENCY
100	5500 MHz
104	5520 MHz
108	5540 MHz
112	5560 MHz
116	5580 MHz
120	5600 MHz
124	5620 MHz
128	5640 MHz
132	5660 MHz
136	5680 MHz
140	5700 MHz
144	5720 MHz

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

CHANNEL	FREQUENCY
102	5510 MHz
110	5550 MHz
118	5590 MHz
126	5630 MHz
134	5670 MHz
142	5710 MHz

3 channel are provided for 802.11ac (VHT80):

CHANNEL	FREQUENCY
106	5530 MHz
122	5610 MHz
138	5690 MHz

- For FCC: The listed channels in the DFS band (5250~5350MHz and 5470~5725MHz) are passive scan only.
- For IC: The listed channels in the DFS band (5250~5350MHz and 5470~5725MHz) are passive scan only. The device will not operate in 5600~5650MHz band.

3.3.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	PLC	UE < 1G	UE ≥ 1G	APCM	
1	√	-	√	√	SKU #2(NFA345) - 1Tx
2	√	√	√	√	SKU #1(NFA344) - 2Tx

Where **PLC**: Power Line Conducted Emission

UE < 1G: Unwanted Emission below 1GHz

UE ≥ 1G: Unwanted Emission above 1GHz

APCM: Antenna Port Conducted Measurement

Note

1. The EUT's antenna had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **X-plane**.
2. For WLAN mode : In Unwanted Emission below 1GHz mode, Mode 2, the worse case one, was chosen for final test.

AC POWER LINE CONDUCTED EMISSION TEST:

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	DATA RATE (Mbps)
802.11a	36 to 144	116	OFDM	6

UNWANTED EMISSION TEST (BELOW 1 GHz):

- ☒ Radiated versus Conducted Measurements
- ☒ 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	DATA RATE (Mbps)
802.11a	36 to 144	116	OFDM	6

UNWANTED EMISSION TEST (ABOVE 1 GHz):

- ☒ Radiated versus Conducted Measurements
- ☒ 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	DATA RATE (Mbps)
802.11a	36 to 144	36, 40, 48, 52, 60, 64, 100, 116, 132, 140, 144	OFDM	6
802.11ac (VHT20)	36 to 144	36, 40, 48, 52, 60, 64, 100, 116, 132, 140, 144	OFDM	6.5
802.11ac (VHT40)	38 to 142	38, 46, 54, 62, 102, 110, 134, 142	OFDM	13.5
802.11ac (VHT80)	42 to 138	42, 58, 106, 138	OFDM	29.3

ANTENNA PORT CONDUCTED MEASUREMENT:

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	DATA RATE (Mbps)
802.11a	36 to 144	36, 40, 48, 52, 60, 64, 100, 116, 132, 140, 144	OFDM	6
802.11n (HT20)	36 to 144	36, 40, 48, 52, 60, 64, 100, 116, 132, 140, 144	OFDM	6.5
802.11n (HT40)	38 to 142	38, 46, 54, 62, 102, 110, 134, 142	OFDM	13.5
802.11ac (VHT20)	36 to 144	36, 40, 48, 52, 60, 64, 100, 116, 132, 140, 144	OFDM	6.5
802.11ac (VHT40)	38 to 142	38, 46, 54, 62, 102, 110, 134, 142	OFDM	13.5
802.11ac (VHT80)	42 to 138	42, 58, 106, 138	OFDM	29.3

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER (SYSTEM)	TESTED BY
PLC	28deg. C, 69%RH	120Vac, 60Hz	Bear Lee
RE<1G	22deg. C, 71%RH	120Vac, 60Hz	Chilin Lee
RE≥1G	22deg. C, 71%RH	120Vac, 60Hz	Chilin Lee
APCM	25deg. C, 60%RH	120Vac, 60Hz	James Chan

3.4 DUTY CYCLE OF TEST SIGNAL

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.

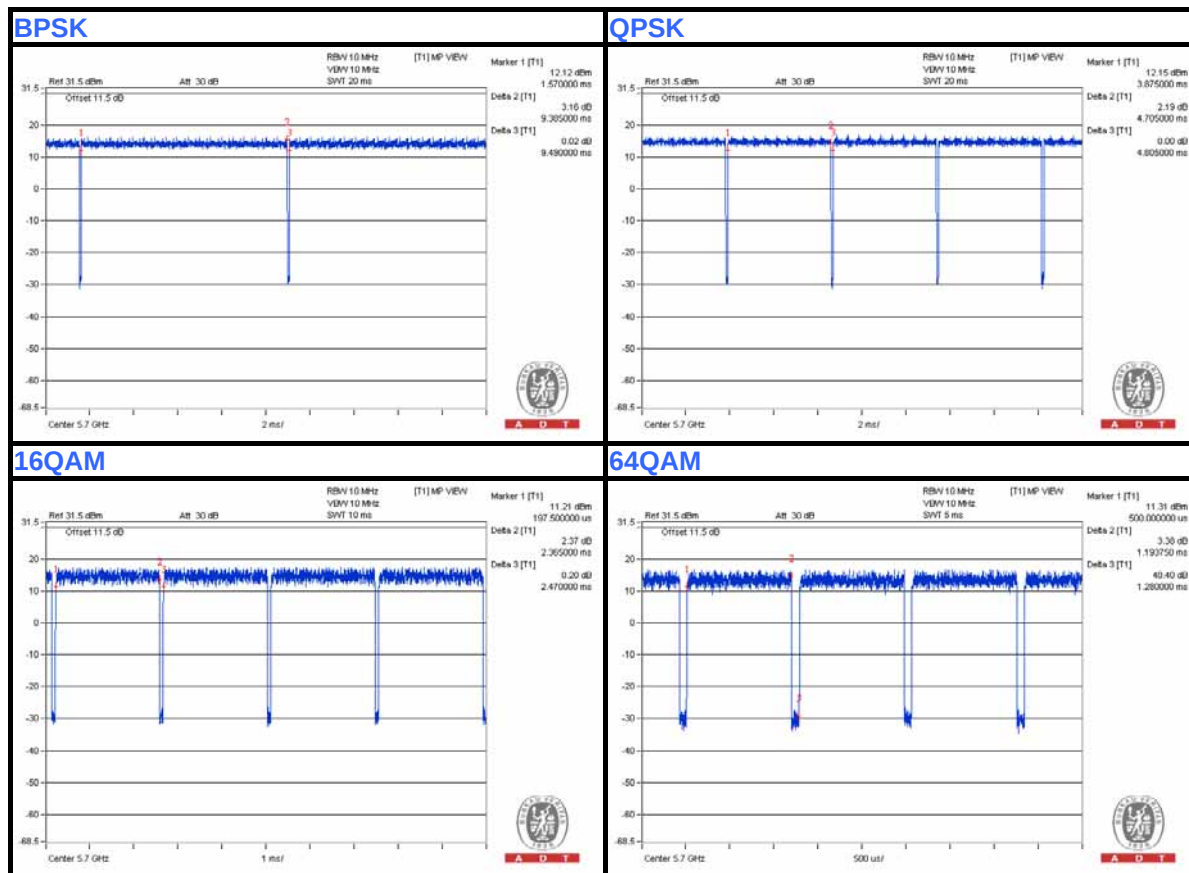
802.11a

BPSK: Duty cycle = 9.385 ms/9.49 ms = 0.989

QPSK: Duty cycle = 4.705 ms/4.805 ms = 0.979, Duty factor = $10 \cdot \log(1/0.979) = 0.09$

16QAM: Duty cycle = 2.365 ms/2.47 ms = 0.957, Duty factor = $10 \cdot \log(1/0.957) = 0.19$

64QAM: Duty cycle = 1.19375 ms/1.28 ms = 0.933, Duty factor = $10 \cdot \log(1/0.933) = 0.30$



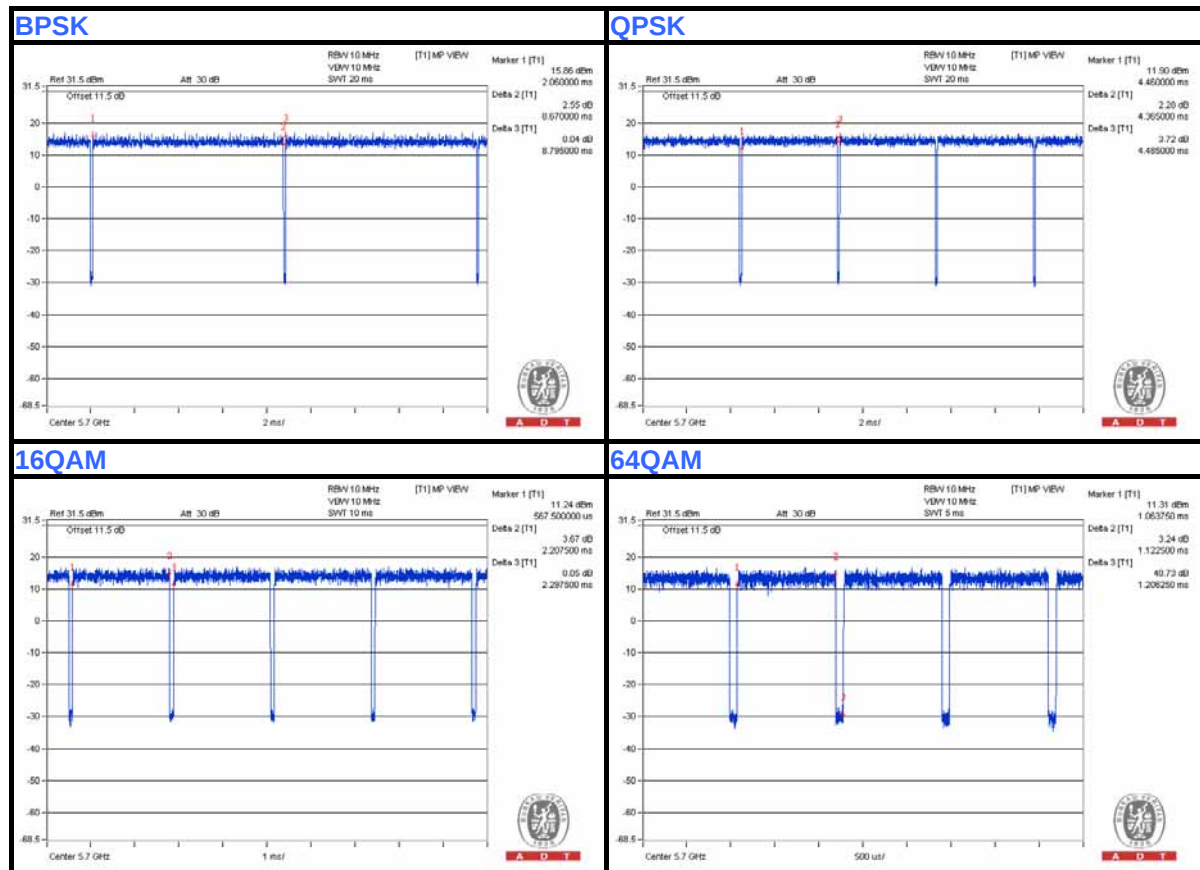
802.11n (HT20)

BPSK: Duty cycle = 8.67 ms/8.795 ms = 0.986

QPSK: Duty cycle = 4.365 ms/4.485 ms = 0.973, Duty factor = $10 \cdot \log(1/0.973) = 0.12$

16QAM: Duty cycle = 2.2075 ms/2.2975 ms = 0.961, Duty factor = $10 \cdot \log(1/0.961) = 0.17$

64QAM: Duty cycle = 1.1225 ms/1.20625 ms = 0.931, Duty factor = $10 \cdot \log(1/0.931) = 0.31$



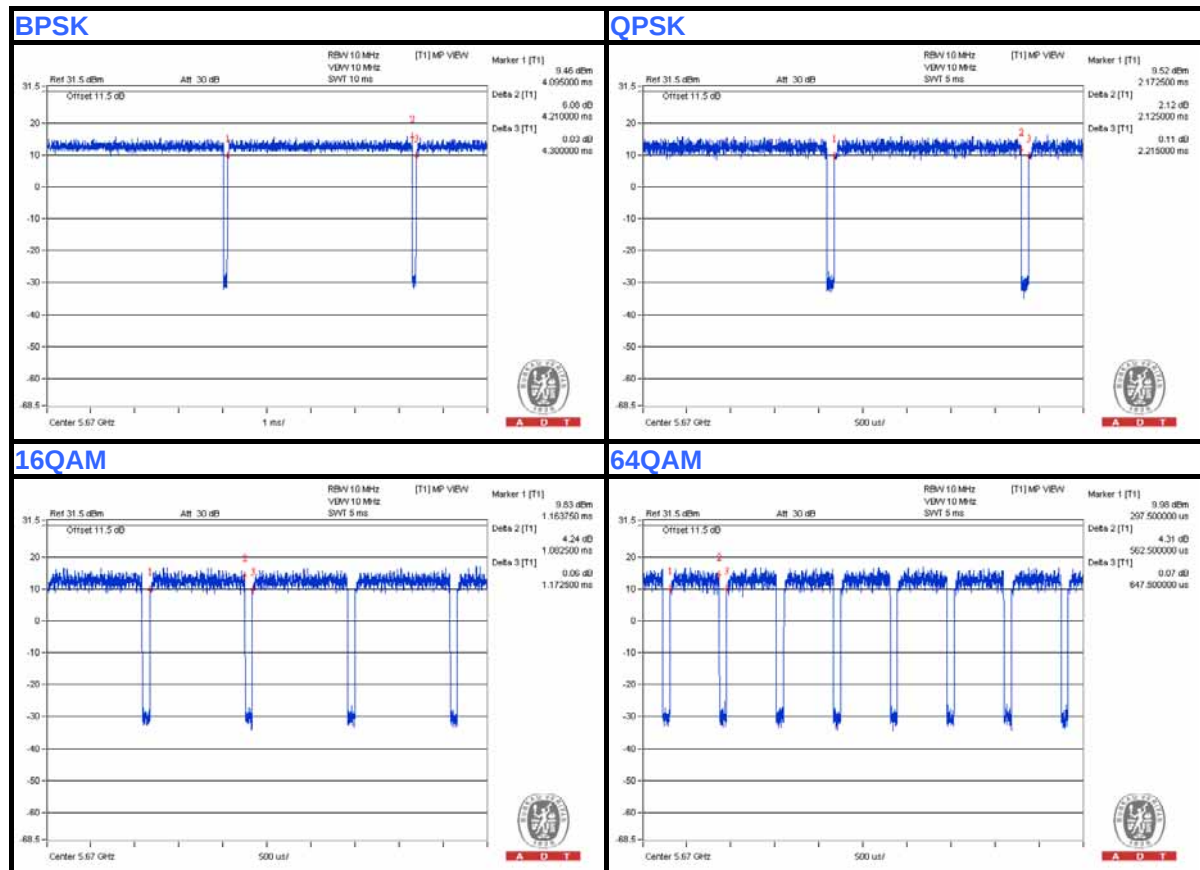
802.11n (HT40)

BPSK: Duty cycle = 4.21 ms/4.3 ms = 0.979, Duty factor = $10 * \log(1/0.979) = 0.09$

QPSK: Duty cycle = 2.125 ms/2.215 ms = 0.959, Duty factor = $10 * \log(1/0.959) = 0.18$

16QAM: Duty cycle = 1.0825 ms/1.1725 ms = 0.923, Duty factor = $10 * \log(1/0.923) = 0.35$

64QAM: Duty cycle = 0.5625 ms/0.6475 ms = 0.869, Duty factor = $10 * \log(1/0.869) = 0.61$



802.11ac (VHT20)

BPSK: Duty cycle = 8.67 ms/8.795 ms = 0.986

QPSK: Duty cycle = 4.365 ms/4.485 ms = 0.973, Duty factor = $10 \cdot \log(1/0.973) = 0.12$

16QAM: Duty cycle = 2.2075 ms/2.2975 ms = 0.961, Duty factor = $10 \cdot \log(1/0.961) = 0.17$

64QAM: Duty cycle = 1.1225 ms/1.20625 ms = 0.931, Duty factor = $10 \cdot \log(1/0.931) = 0.31$

256QAM: Duty cycle = 0.76375 ms/0.84875 ms = 0.90, Duty factor = $10 \cdot \log(1/0.90) = 0.46$



802.11ac (VHT40)

BPSK: Duty cycle = 4.21 ms/4.3 ms = 0.979, Duty factor = $10 \cdot \log(1/0.979) = 0.09$

QPSK: Duty cycle = 2.125 ms/2.215 ms = 0.959, Duty factor = $10 \cdot \log(1/0.959) = 0.18$

16QAM: Duty cycle = 1.0825 ms/1.1725 ms = 0.923, Duty factor = $10 \cdot \log(1/0.923) = 0.35$

64QAM: Duty cycle = 0.5625 ms/0.6475 ms = 0.869, Duty factor = $10 \cdot \log(1/0.869) = 0.61$

256QAM: Duty cycle = 0.38625 ms/0.47125 ms = 0.82, Duty factor = $10 \cdot \log(1/0.82) = 0.86$



802.11ac (VHT80)

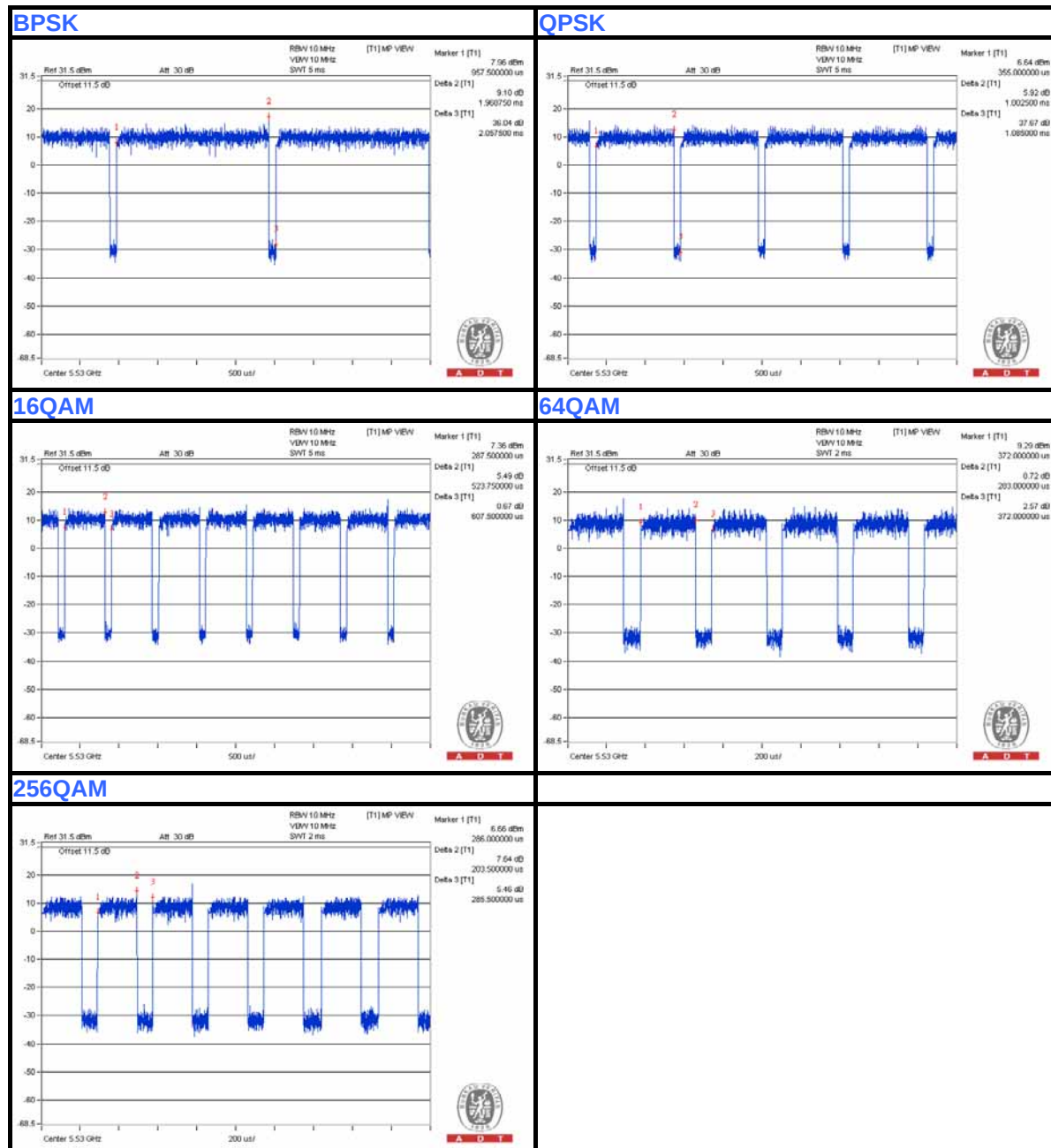
BPSK: Duty cycle = $1.96875 \text{ ms} / 2.0575 \text{ ms} = 0.957$, Duty factor = $10 * \log(1/0.957) = 0.19$

QPSK: Duty cycle = $1.0025 \text{ ms} / 1.085 \text{ ms} = 0.924$, Duty factor = $10 * \log(1/0.924) = 0.34$

16QAM: Duty cycle = $0.52375 \text{ ms} / 0.6075 \text{ ms} = 0.862$, Duty factor = $10 * \log(1/0.862) = 0.64$

64QAM: Duty cycle = $0.283 \text{ ms} / 0.372 \text{ ms} = 0.761$, Duty factor = $10 * \log(1/0.761) = 1.19$

256QAM: Duty cycle = $0.2035 \text{ ms} / 0.2855 \text{ ms} = 0.713$, Duty factor = $10 * \log(1/0.713) = 1.47$





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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 E (Section 15.407)

789033 D01 General UNII Test Procedures v01r03

662911 D01 Multiple Transmitter Output v02r01

644545 D01 Guidance for IEEE 802.11ac v01r02

ANSI C63.10-2009

Canada RSS-210 Issue 8 (2010-12)

Canada RSS-Gen Issue 3 (2010-12)

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

3.6 DESCRIPTION OF SUPPORT UNITS

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

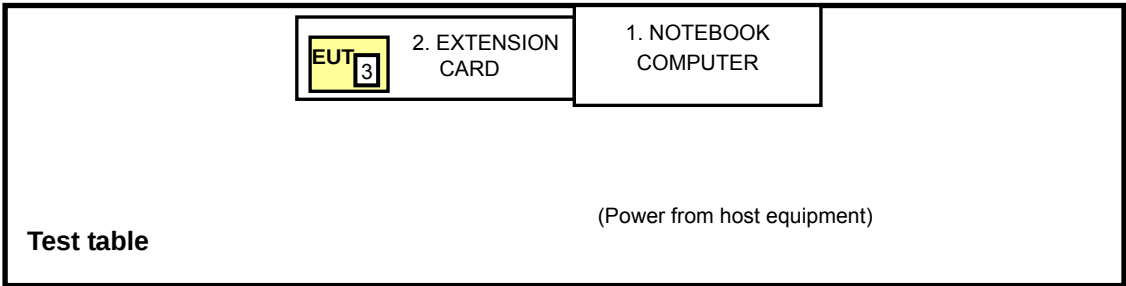
No.	Product	Brand	Model No.	Serial No.	FCC ID
1	NOTEBOOK COMPUTER	DELL	E6420	H62T3R1	FCC DoC
2	EXTENSION CARD	Qualcomm Atheros	HPCBM194-0	NA	NA
3	50ohm terminal resistor	NA	NA	NA	NA

No.	Signal cable description
1	NA
2	NA
3	NA

Note: The power cords of the above support units were unshielded (1.8m).

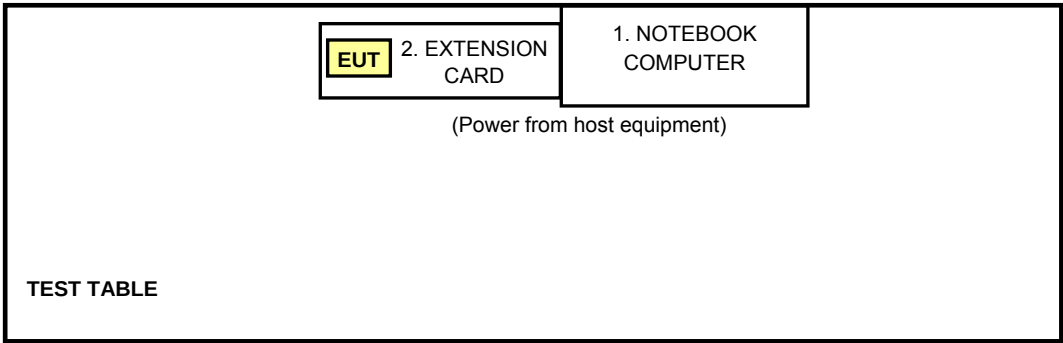
3.7 CONFIGURATION OF SYSTEM UNDER TEST

For Unwanted Emission test (Radiated Measurement)



Note: Support unit 3 is 50ohm terminal resistor.

For other test items:



4. TEST TYPES AND RESULTS

4.1 TRANSMIT POWER MEASUREMENT

4.1.1 LIMITS OF OUTPUT TRANSMIT POWER MEASUREMENT

For FCC 15.407

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

NOTE: 1. Where B is the 26dB emission bandwidth in MHz for FCC 15.407.

For RSS-210 A9.2

FREQUENCY BAND	LIMIT
5.150 ~ 5.250GHz	EIRP shall not exceed 200 mW or $10 + 10 \log_{10} B$
5.250 ~ 5.350GHz	Conducted output power shall not exceed 250 mW or $11 + 10 \log_{10} B$ EIRP shall not exceed 1.0 W or $17 + 10 \log_{10} B$, dBm
5.470 ~ 5.725GHz	Conducted output power shall not exceed 250 mW or $11 + 10 \log_{10} B$ EIRP shall not exceed 1.0 W or $17 + 10 \log_{10} B$

NOTE: 1. Where B is the 99% bandwidth in MHz for RSS-210 Annex 9.

Per KDB 662911 D01 Multiple Transmitter Output v02r01 Method of conducted output power measurement on IEEE 802.11 devices,

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

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

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

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

4.1.2 TEST INSTRUMENTS

FOR POWER OUTPUT MEASUREMENT

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Power Meter Anritsu	ML2495A	0824006	May 20, 2013	May 19, 2014
Power Sensor Anritsu	MA2411B	0738172	May 20, 2013	May 19, 2014

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. Tested date : May 09, 2014

FOR 26dB OCCUPIED BANDWIDTH / FOR 99% OCCUPIED BANDWIDTH

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

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. Tested date : May 09, 2014

4.1.3 TEST PROCEDURE

FOR AVERAGE POWER MEASUREMENT

For channel straddling 5725MHz:

Follow FCC KDB 789033 UNII test procedure:

Method SA-2 [For FCC 15.407](#)

1. Set span to encompass the emission bandwidth (EBW) of the signal.
2. Set RBW = 1MHz.
3. Set the VBW $\geq 3 \times$ RBW.
4. Number of points in sweep ≥ 2 Span / RBW.
5. Sweep time = auto.
6. Detector = RMS.
7. Trace average at least 100 traces in power averaging mode
8. Compute power by integrating the spectrum across the 26 dB EBW of the signal.
9. Duty factor need added to measured value (duty cycle < 98 percent).

Method SA-2 [For RSS-210 A9.2](#)

1. Set span to encompass the 99% occupied bandwidth of the signal.
2. Set RBW = 1MHz.
3. Set the VBW $\geq 3 \times$ RBW.
4. Number of points in sweep ≥ 2 Span / RBW.
5. Sweep time = auto.
6. Detector = RMS.
7. Trace average at least 100 traces in power averaging mode
8. Compute power by integrating the spectrum across the 99% occupied bandwidth of the signal.
9. Duty factor need added to measured value (duty cycle < 98 percent).

For other channels:

An 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. Duty factor is not added to measured value.

FOR 26dB BANDWIDTH

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

FOR 99% OCCUPIED BANDWIDTH

1. Set $RBW \geq 1\%$ of the emission bandwidth.
2. Set the $VBW \geq 3 \times RBW$.
3. Detector = Peak.
4. Trace mode = max hold.
5. Record the 99% emission bandwidth.

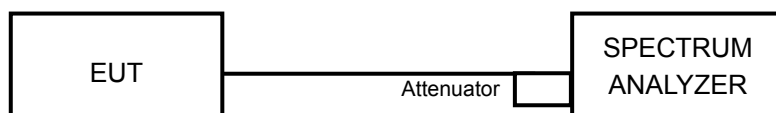
4.1.4 DEVIATION FROM TEST STANDARD

No deviation

4.1.5 TEST SETUP

FOR POWER OUTPUT MEASUREMENT

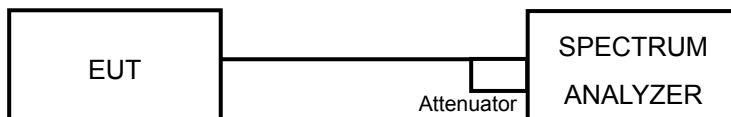
For channel straddling 5725MHz:



For other channels:



FOR 26dB OCCUPIED BANDWIDTH / FOR 99% OCCUPIED BANDWIDTH



4.1.6 EUT OPERATING CONDITIONS

The software (QCRT Version3.0 22.0) provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.

4.1.7 TEST RESULTS (MODE 1)

802.11a

POWER OUTPUT

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (mW)	AVERAGE POWER (dBm)	POWER LIMIT (dBm)	PASS/FAIL
36	5180	26.122	14.17	16.83	PASS
40	5200	26.853	14.29	16.86	PASS
48	5240	25.527	14.07	17.00	PASS
52	5260	27.040	14.32	23.81	PASS
60	5300	29.040	14.63	23.81	PASS
64	5320	25.293	14.03	23.81	PASS
100	5500	18.281	12.62	23.97	PASS
116	5580	28.907	14.61	23.81	PASS
132	5660	27.733	14.43	23.81	PASS
140	5700	12.531	10.98	23.80	PASS
144 (UNII-2c Band)	5720	16.106	12.07	22.66	PASS
144 (UNII-3 Band)	5720	3.090	4.90	23.39	PASS

802.11a 26dB OCCUPIED BANDWIDTH

CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)
36	5180	19.19
40	5200	19.33
48	5240	19.99
52	5260	19.12
60	5300	19.13
64	5320	19.11
100	5500	19.85
116	5580	19.10
132	5660	19.12
140	5700	19.07
144 (UNII-2c Band)	5720	14.66
144 (UNII-3 Band)	5720	4.36

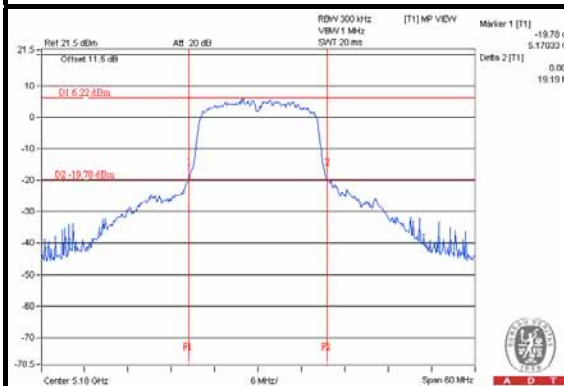
Note: For FCC output power limitation is determined based on 26dB bandwidth.

Power Limit = 4dBm + 10logB < Band 1>			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
36	5180	19.19	16.83 < 17
40	5200	19.33	16.86 < 17
48	5240	19.99	17 = 17
Power Limit = 11dBm + 10logB < Band 2~3>			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
52	5260	19.12	23.81 < 24
60	5300	19.13	23.81 < 24
64	5320	19.11	23.81 < 24
100	5500	19.85	23.97 < 24
116	5580	19.10	23.81 < 24
132	5660	19.12	23.81 < 24
140	5700	19.07	23.8 < 24
144 (UNII-2c Band)	5720	14.66	22.66 < 24
144 (UNII-3 Band)	5720	4.36	23.39 < 30

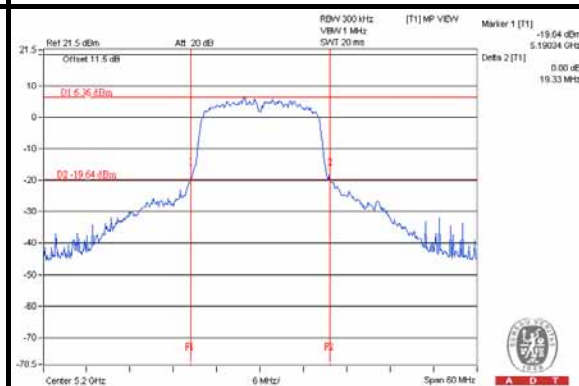


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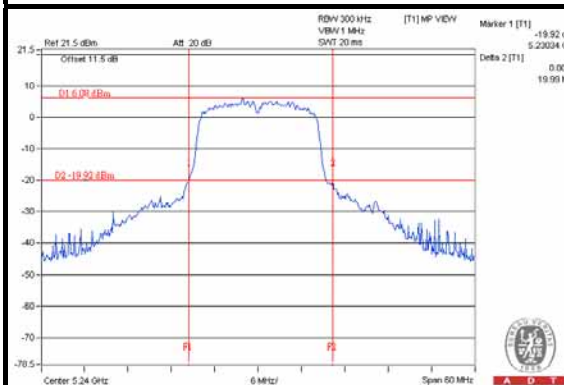
CH36



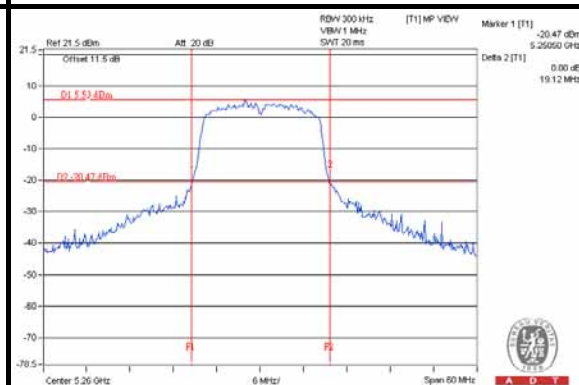
CH40



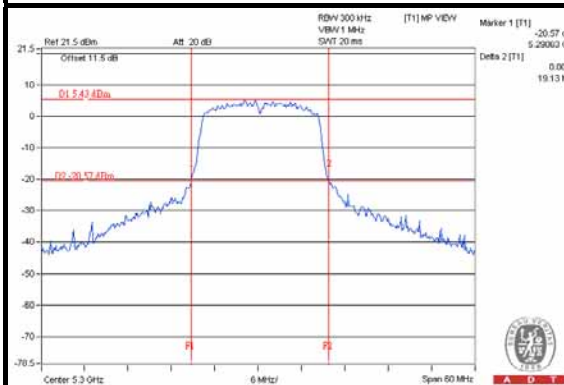
CH48



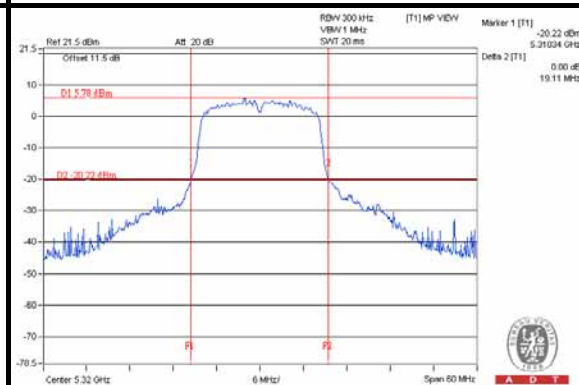
CH52



CH60



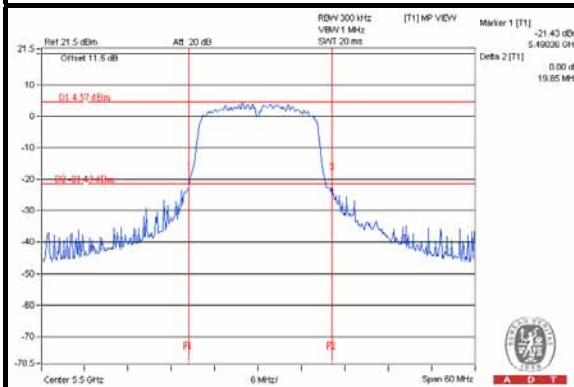
CH64



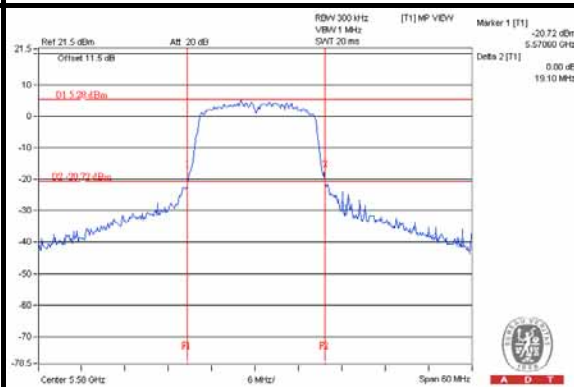


A D T

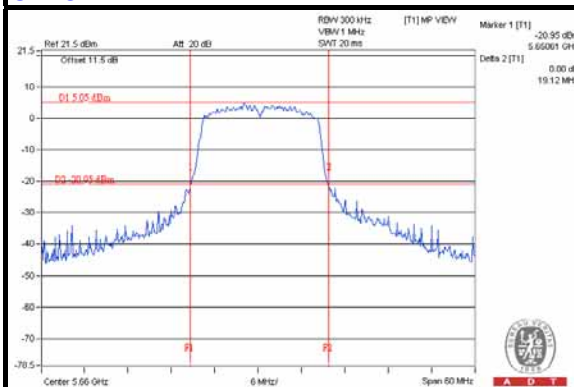
CH100



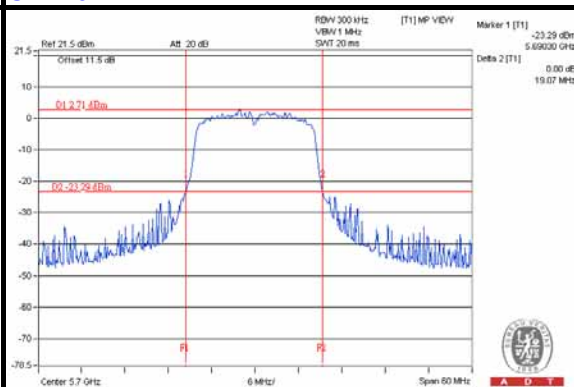
CH116



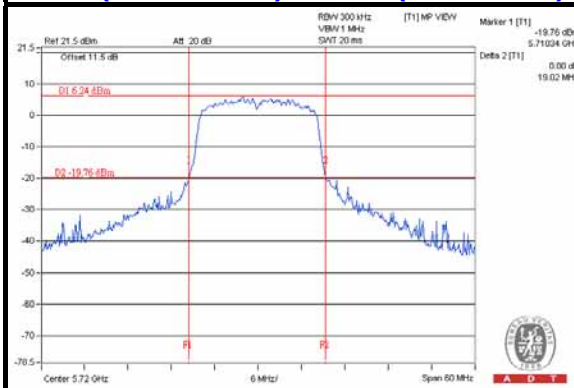
CH132



CH140



CH144 (UNII-2c Band) / CH144 (UNII-3 Band)



NOTE:

For CH144 (UNII-2c Band) = 5725 - Market 1

For CH144 (UNII-3 Band) = Delta 2 - CH144 (UNII-2c Band) BW

802.11n (HT20)

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (mW)	AVERAGE POWER (dBm)	POWER LIMIT (dBm)	PASS/FAIL
36	5180	25.763	14.11	17.00	PASS
40	5200	26.546	14.24	17.00	PASS
48	5240	25.177	14.01	17.00	PASS
52	5260	28.445	14.54	24.00	PASS
60	5300	28.379	14.53	24.00	PASS
64	5320	28.379	14.53	24.00	PASS
100	5500	18.072	12.57	24.00	PASS
116	5580	27.606	14.41	24.00	PASS
132	5660	27.733	14.43	24.00	PASS
140	5700	12.106	10.83	24.00	PASS
144 (UNII-2c Band)	5720	13.740	11.38	22.86	PASS
144 (UNII-3 Band)	5720	2.218	3.46	24.55	PASS

802.11n (HT20) 26dB OCCUPIED BANDWIDTH

CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)
36	5180	20.93
40	5200	20.51
48	5240	21.19
52	5260	21.17
60	5300	20.88
64	5320	20.91
100	5500	21.21
116	5580	20.51
132	5660	20.32
140	5700	20.36
144 (UNII-2c Band)	5720	15.36
144 (UNII-3 Band)	5720	5.70

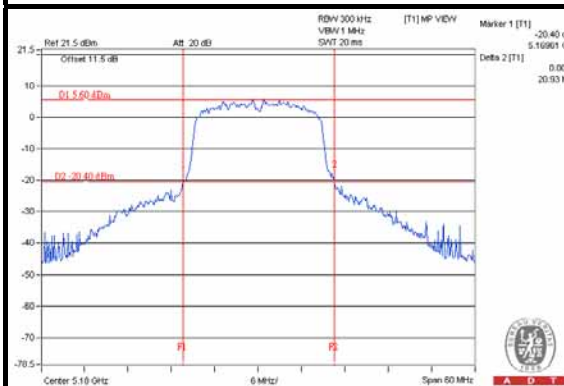
Note: For FCC output power limitation is determined based on 26dB bandwidth.

Power Limit = 4dBm + 10logB < Band 1>			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
36	5180	20.93	17.20 > 17
40	5200	20.51	17.11 > 17
48	5240	21.19	17.26 > 17
Power Limit = 11dBm + 10logB < Band 2~3>			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
52	5260	21.17	24.25 > 24
60	5300	20.88	24.19 > 24
64	5320	20.91	24.2 > 24
100	5500	21.21	24.26 > 24
116	5580	20.51	24.11 > 24
132	5660	20.32	24.07 > 24
140	5700	20.36	24.08 > 24
144 (UNII-2c Band)	5720	15.36	22.86 < 24
144 (UNII-3 Band)	5720	5.70	24.55 < 30

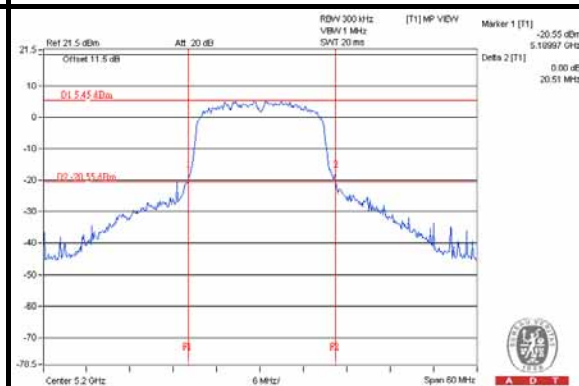


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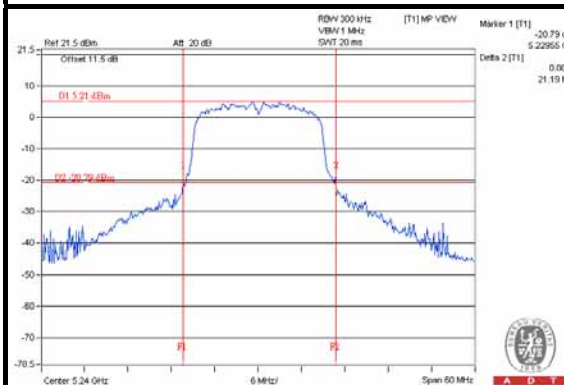
CH36



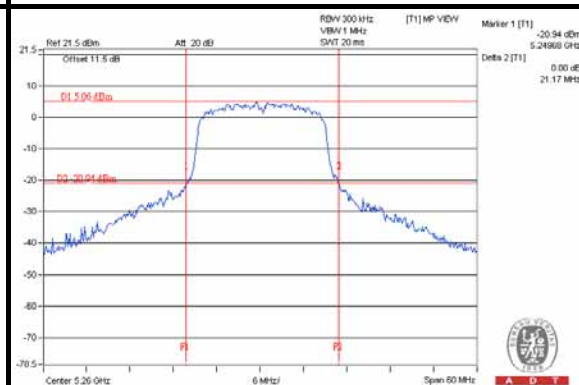
CH40



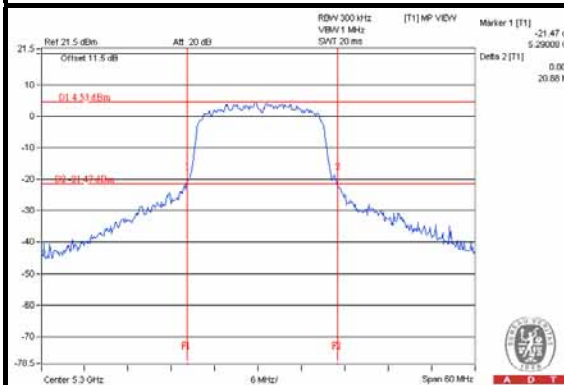
CH48



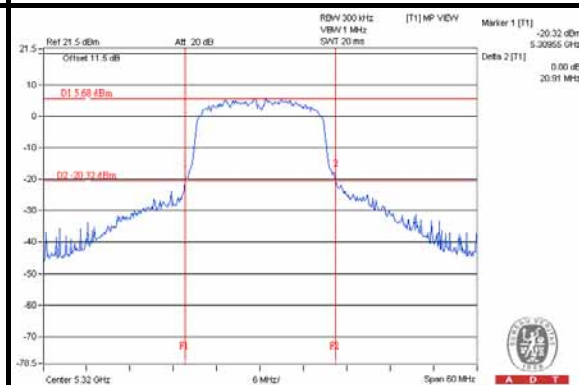
CH52



CH60



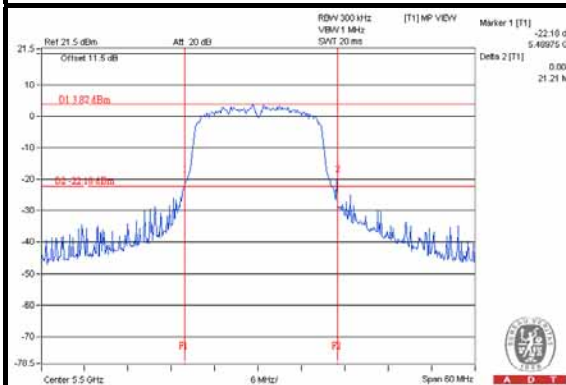
CH64



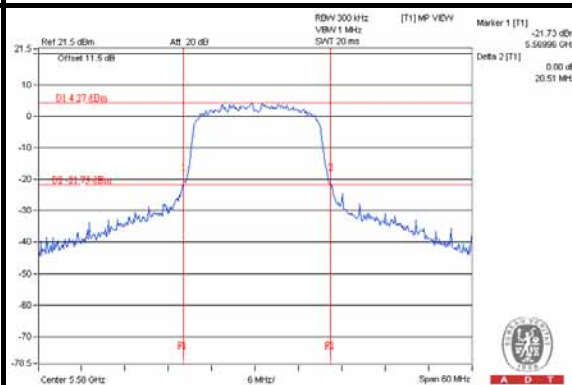


A D T

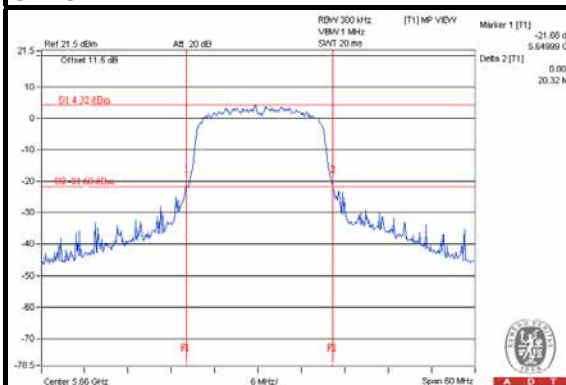
CH100



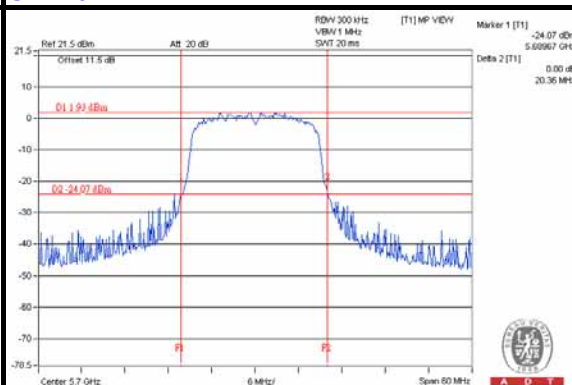
CH116



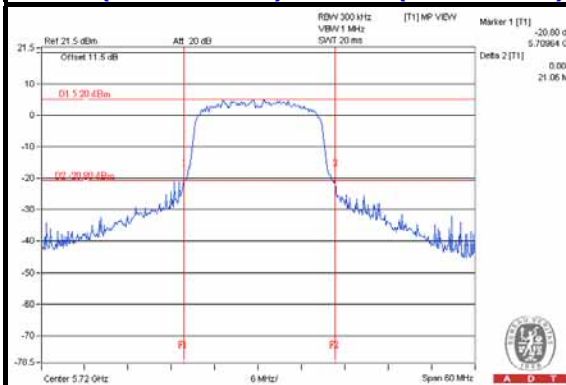
CH132



CH140



CH144 (UNII-2c Band) / CH144 (UNII-3 Band)



NOTE:

For CH144 (UNII-2c Band) = 5725 - Market 1

For CH144 (UNII-3 Band) = Delta 2 - CH144 (UNII-2c Band) BW

802.11n (HT40)

POWER OUTPUT

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (mW)	AVERAGE POWER (dBm)	POWER LIMIT (dBm)	PASS/FAIL
38	5190	12.942	11.12	17.00	PASS
46	5230	22.182	13.46	17.00	PASS
54	5270	20.512	13.12	24.00	PASS
62	5310	17.100	12.33	24.00	PASS
102	5510	17.061	12.32	24.00	PASS
110	5550	20.512	13.12	24.00	PASS
134	5670	20.230	13.06	24.00	PASS
142 (UNII-2c Band)	5710	11.647	10.66	24.00	PASS
142 (UNII-3 Band)	5710	0.5239	-2.81	24.64	PASS

For CH142 : Average Power (dBm)= measured value(dBm) + Duty Factor (0.09dB)

802.11n (HT40)

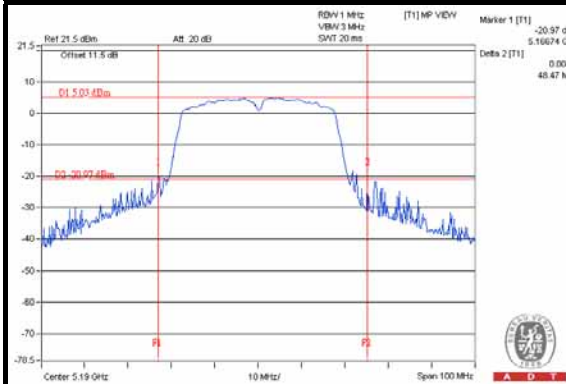
26dB OCCUPIED BANDWIDTH

CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)
38	5190	48.47
46	5230	44.69
54	5270	41.84
62	5310	41.78
102	5510	47.85
110	5550	51.05
134	5670	43.88
142 (UNII-2c Band)	5710	35.86
142 (UNII-3 Band)	5710	5.81

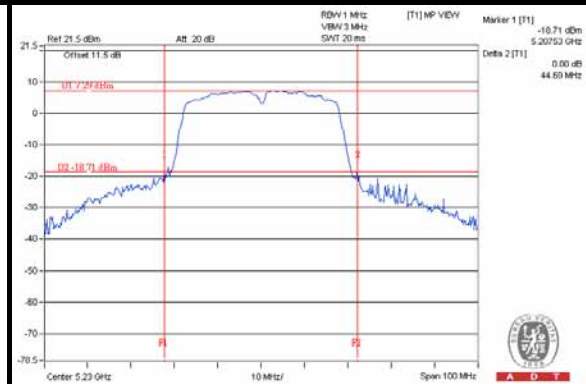
Note: For FCC output power limitation is determined based on 26dB bandwidth.

Power Limit = 4dBm + 10logB < Band 1>			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
38	5190	48.47	20.85 > 17
46	5230	44.69	20.5 > 17
Power Limit = 11dBm + 10logB < Band 2~3>			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
54	5270	41.84	27.21 > 24
62	5310	41.78	27.2 > 24
102	5510	47.85	27.79 > 24
110	5550	51.05	28.07 > 24
134	5670	43.88	27.42 > 24
142 (UNII-2c Band)	5710	35.86	26.54 > 24
142 (UNII-3 Band)	5710	5.81	24.64 < 30

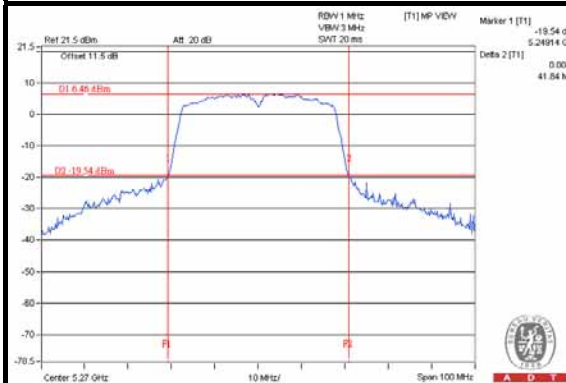
CH38



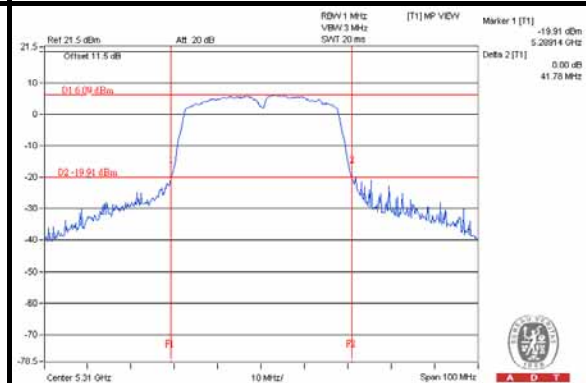
CH46



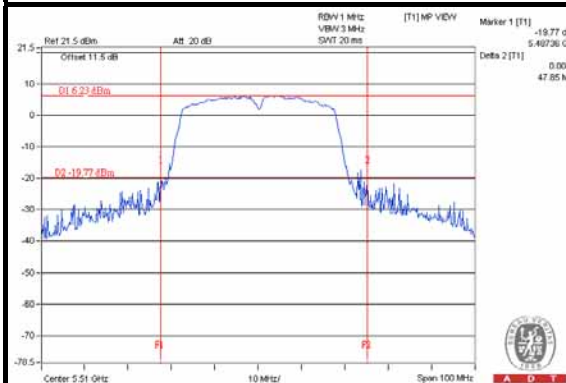
CH54



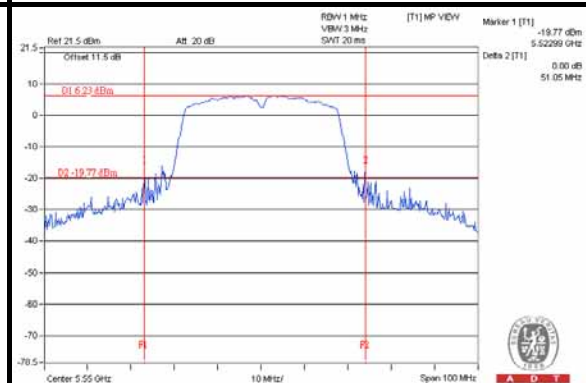
CH62



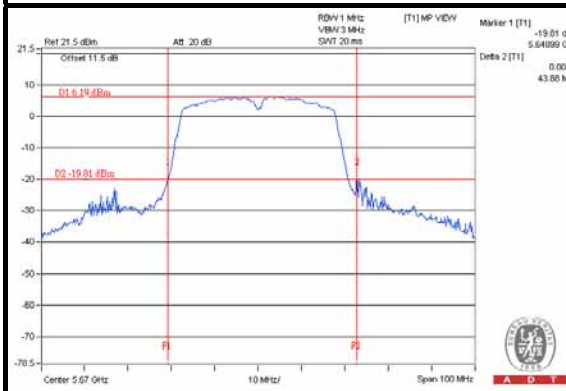
CH102



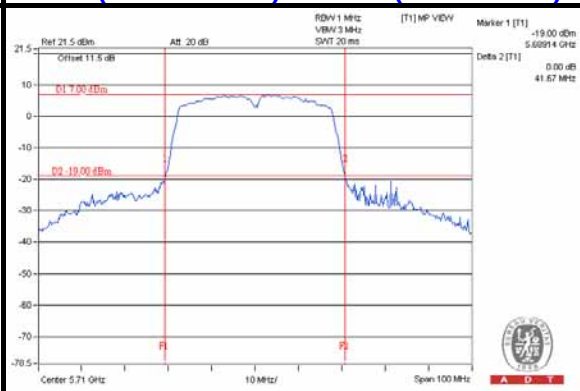
CH110



CH134



CH142 (UNII-2c Band) / CH142 (UNII-3 Band)



NOTE:

For CH142 (UNII-2c Band) = 5725 - Market 1

For CH142 (UNII-3 Band) = Delta 2 - CH142 (UNII-2c Band) BW

802.11ac (VHT20)

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (mW)	AVERAGE POWER (dBm)	POWER LIMIT (dBm)	PASS/FAIL
36	5180	25.882	14.13	17.00	PASS
40	5200	26.607	14.25	17.00	PASS
48	5240	25.468	14.06	17.00	PASS
52	5260	28.576	14.56	24.00	PASS
60	5300	28.642	14.57	24.00	PASS
64	5320	28.379	14.53	24.00	PASS
100	5500	18.113	12.58	24.00	PASS
116	5580	28.379	14.53	24.00	PASS
132	5660	27.861	14.45	24.00	PASS
140	5700	12.218	10.87	24.00	PASS
144 (UNII-2c Band)	5720	14.962	11.75	22.86	PASS
144 (UNII-3 Band)	5720	2.339	3.69	24.55	PASS

802.11ac (VHT20) 26dB OCCUPIED BANDWIDTH

CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)
36	5180	20.93
40	5200	20.51
48	5240	21.19
52	5260	21.17
60	5300	20.88
64	5320	20.91
100	5500	21.21
116	5580	20.51
132	5660	20.32
140	5700	20.36
144 (UNII-2c Band)	5720	15.36
144 (UNII-3 Band)	5720	5.70

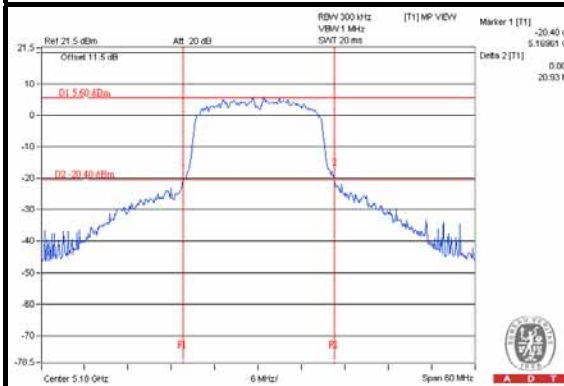
Note: For FCC output power limitation is determined based on 26dB bandwidth.

Power Limit = 4dBm + 10logB < Band 1>			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
36	5180	20.93	17.20 > 17
40	5200	20.51	17.11 > 17
48	5240	21.19	17.26 > 17
Power Limit = 11dBm + 10logB < Band 2~3>			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
52	5260	21.17	24.25 > 24
60	5300	20.88	24.19 > 24
64	5320	20.91	24.2 > 24
100	5500	21.21	24.26 > 24
116	5580	20.51	24.11 > 24
132	5660	20.32	24.07 > 24
140	5700	20.36	24.08 > 24
144 (UNII-2c Band)	5720	15.36	22.86 < 24
144 (UNII-3 Band)	5720	5.70	24.55 < 30

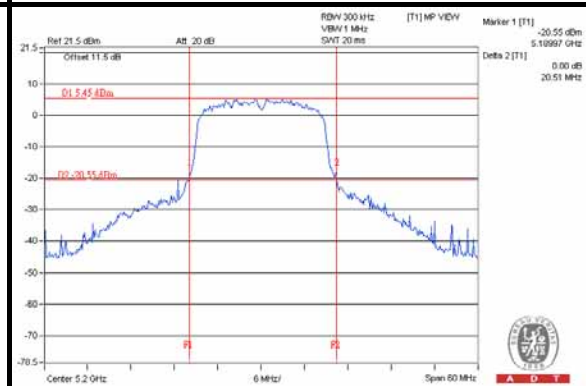


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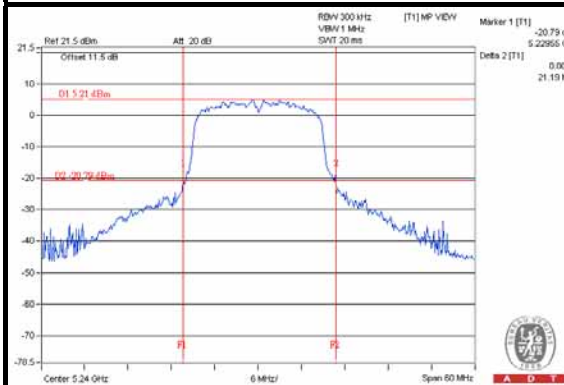
CH36



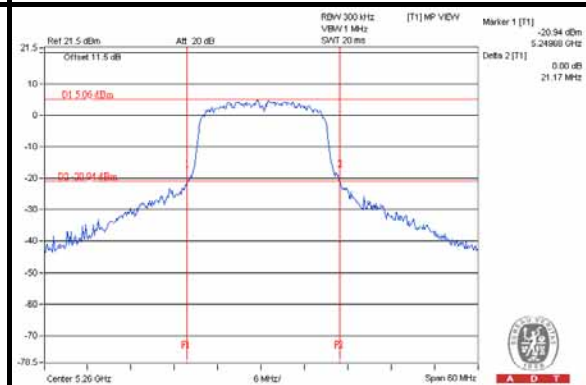
CH40



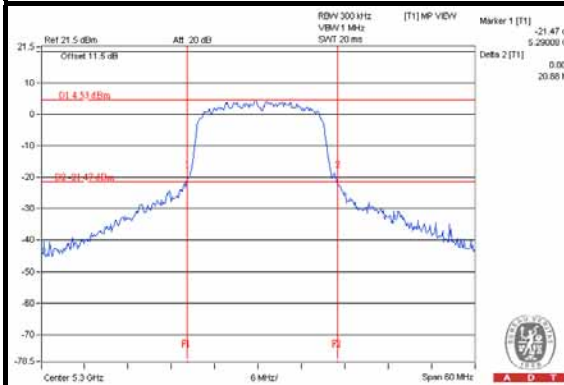
CH48



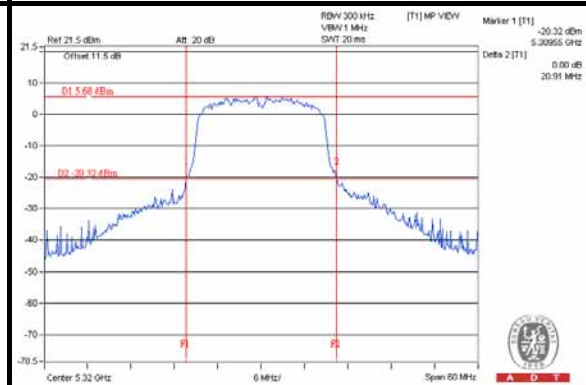
CH52



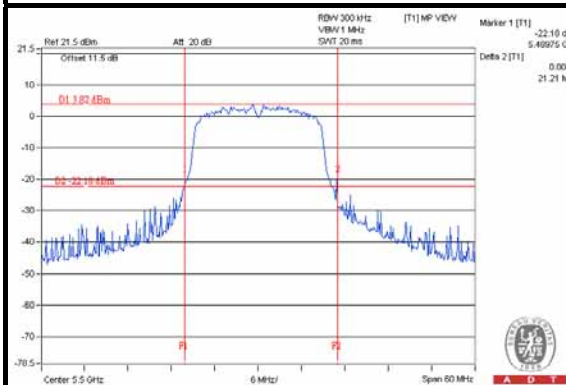
CH60



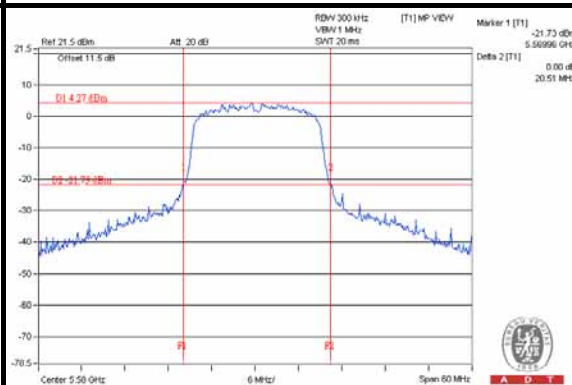
CH64



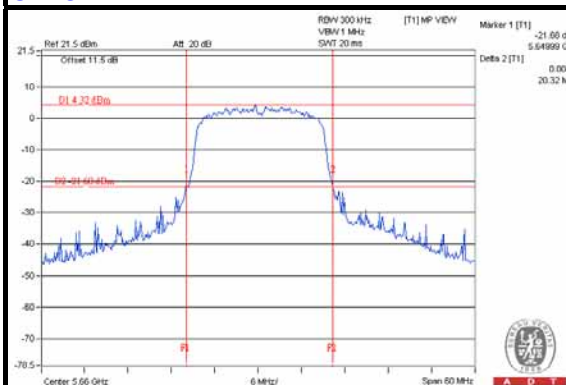
CH100



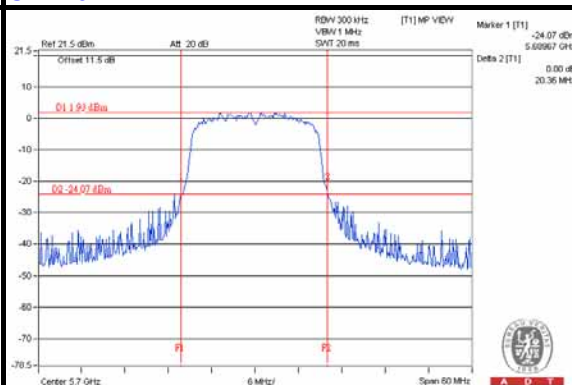
CH116



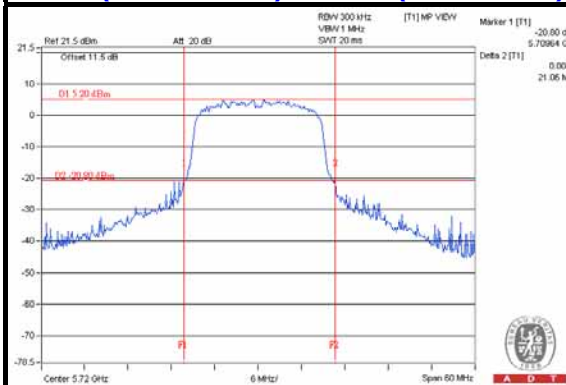
CH132



CH140



CH144 (UNII-2c Band) / CH144 (UNII-3 Band)



NOTE:

For CH144 (UNII-2c Band) = 5725 - Market 1

For CH144 (UNII-3 Band) = Delta 2 - CH144 (UNII-2c Band) BW

802.11ac (VHT40)

POWER OUTPUT

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (mW)	AVERAGE POWER (dBm)	POWER LIMIT (dBm)	PASS/FAIL
38	5190	13.305	11.24	17.00	PASS
46	5230	22.233	13.47	17.00	PASS
54	5270	20.701	13.16	24.00	PASS
62	5310	17.140	12.34	24.00	PASS
102	5510	17.298	12.38	24.00	PASS
110	5550	21.184	13.26	24.00	PASS
134	5670	20.654	13.15	24.00	PASS
142 (UNII-2c Band)	5710	12.742	11.05	24.00	PASS
142 (UNII-3 Band)	5710	0.802	-0.96	24.64	PASS

For CH142 : Average Power (dBm)= measured value(dBm) + Duty Factor (0.09dB)

802.11ac (VHT40)

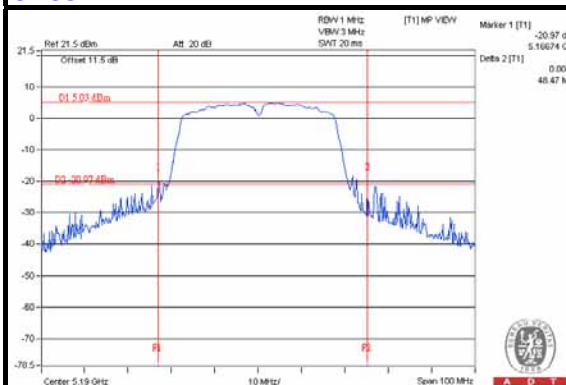
26dB OCCUPIED BANDWIDTH

CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)
38	5190	48.47
46	5230	44.69
54	5270	41.84
62	5310	41.78
102	5510	47.85
110	5550	51.05
134	5670	43.88
142 (UNII-2c Band)	5710	35.86
142 (UNII-3 Band)	5710	5.81

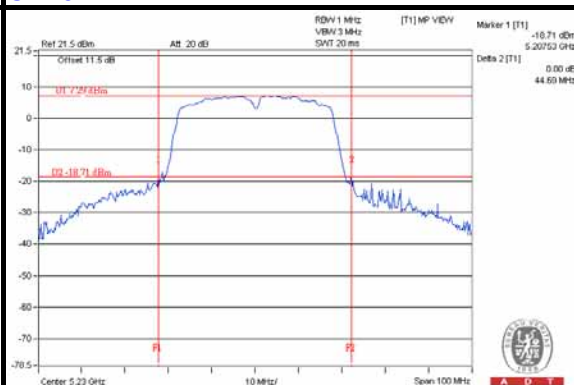
Note: For FCC output power limitation is determined based on 26dB bandwidth.

Power Limit = 4dBm + 10logB < Band 1>			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
38	5190	48.47	20.85 > 17
46	5230	44.69	20.5 > 17
Power Limit = 11dBm + 10logB < Band 2~3>			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
54	5270	41.84	27.21 > 24
62	5310	41.78	27.2 > 24
102	5510	47.85	27.79 > 24
110	5550	51.05	28.07 > 24
134	5670	43.88	27.42 > 24
142 (UNII-2c Band)	5710	35.86	26.54 > 24
142 (UNII-3 Band)	5710	5.81	24.64 < 30

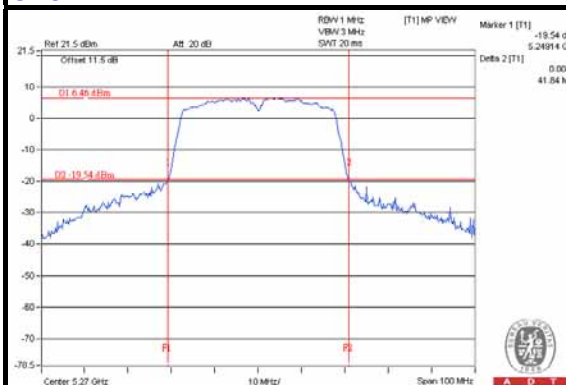
CH38



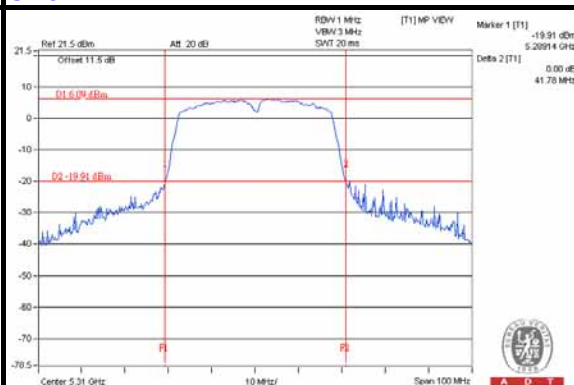
CH46



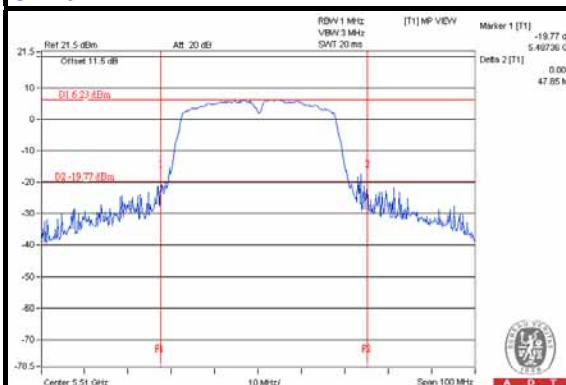
CH54



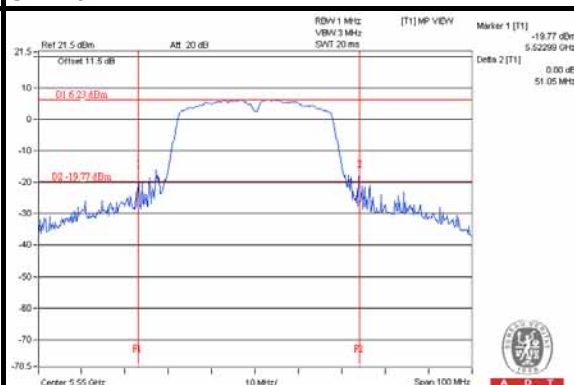
CH62



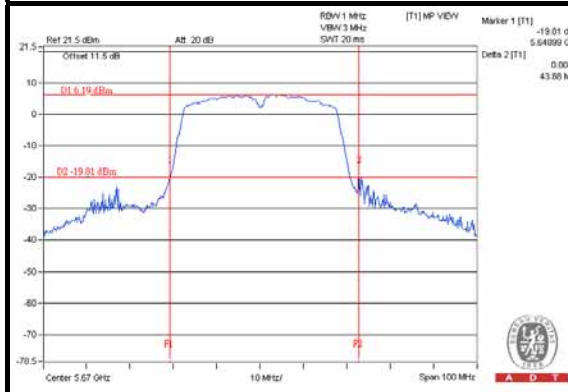
CH102



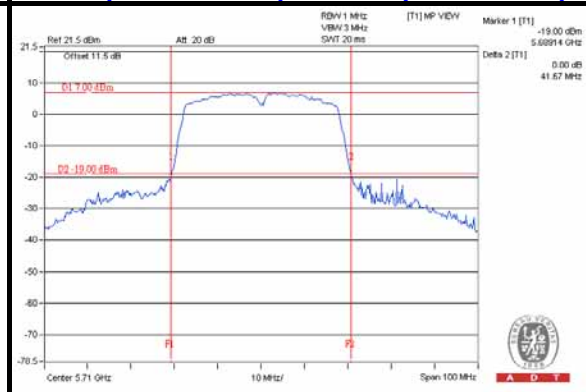
CH110



CH134



CH142 (UNII-2c Band) / CH142 (UNII-3 Band)



NOTE:

For CH142 (UNII-2c Band) = 5725 - Market 1

For CH142 (UNII-3 Band) = Delta 2 - CH142 (UNII-2c Band) BW

802.11ac (VHT80)

POWER OUTPUT

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (mW)	AVERAGE POWER (dBm)	POWER LIMIT (dBm)	PASS/FAIL
42	5210	18.365	12.64	17.00	PASS
58	5290	10.495	10.21	24.00	PASS
106	5530	17.906	12.53	24.00	PASS
138 (UNII-2c Band)	5690	7.517	8.76	24.00	PASS
138 (UNII-3 Band)	5690	0.1604	-7.95	25.1	PASS

For CH138 : Average Power (dBm)= measured value(dBm) + Duty Factor (0.19dB)

802.11ac (VHT80)

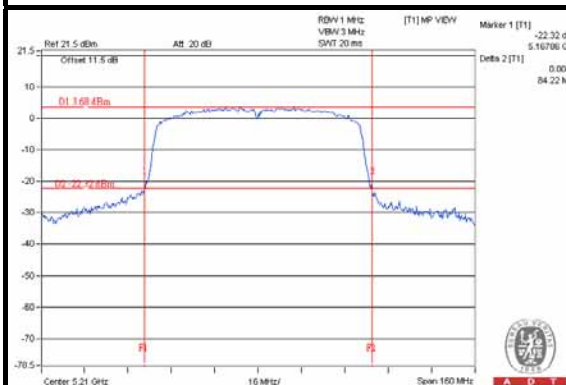
26dB OCCUPIED BANDWIDTH

CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)
42	5210	84.22
58	5290	83.40
106	5530	83.22
138 (UNII-2c Band)	5690	77.23
138 (UNII-3 Band)	5690	6.46

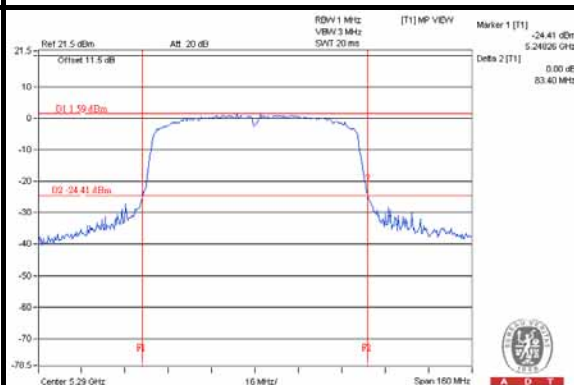
Note: For FCC output power limitation is determined based on 26dB bandwidth.

Power Limit = 4dBm + 10logB < Band 1>			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
42	5210	84.22	23.25 > 17
Power Limit = 11dBm + 10logB < Band 2~3>			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
58	5290	83.40	30.21 > 24
106	5530	83.22	30.2 > 24
138 (UNII-2c Band)	5690	77.23	29.87 > 24
138 (UNII-3 Band)	5690	6.46	25.1 < 30

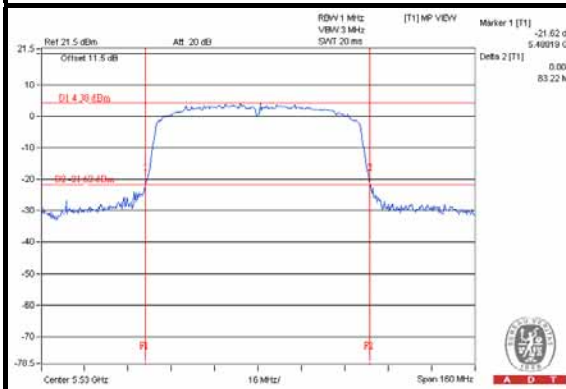
CH42



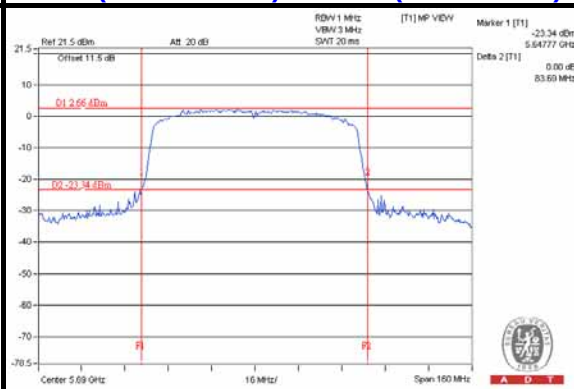
CH58



CH106



CH138 (UNII-2c Band) / CH138 (UNII-3 Band)



NOTE:

For CH138 (UNII-2c Band) = 5725 - Market 1

For CH138 (UNII-3 Band) = Delta 2 - CH138 (UNII-2c Band) BW



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For RSS-210 A9.2

5.18~5.24GHz

802.11a

CONDUCTED POWER:

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (mW)	AVERAGE POWER (dBm)
36	5180	26.122	14.17
40	5200	26.853	14.29
48	5240	25.527	14.07

EIRP POWER:

CHAN.	CHAN. FREQ. (MHz)	EIRP POWER (mW)	EIRP POWER (dBm)	EIRP POWER LIMIT (dBm)	PASS / FAIL
36	5180	53.089	17.25	22.12	PASS
40	5200	54.575	17.37	22.12	PASS
48	5240	51.880	17.15	22.12	PASS

802.11a

99% OCCUPIED BANDWIDTH

CHANNEL	CHANNEL FREQUENCY (MHz)	OCCUPIED BANDWIDTH (MHz)
36	5180	16.32
40	5200	16.32
48	5240	16.32

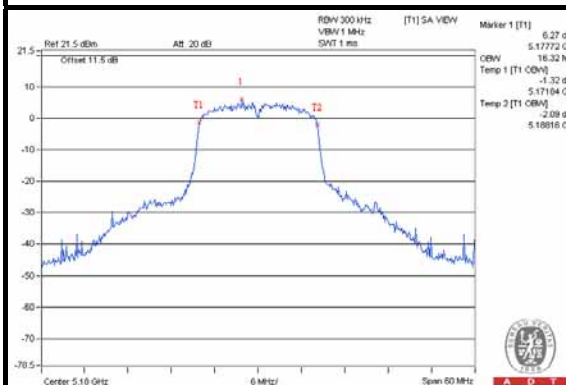
Note: For output power limitation is determined based on 99% bandwidth.

Power Limit = 10dBm + 10logB < UNII Band 1 >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined EIRP Limit (dBm)
36	5180	16.32	19.04 < 23
40	5200	16.32	19.04 < 23
48	5240	16.32	19.04 < 23

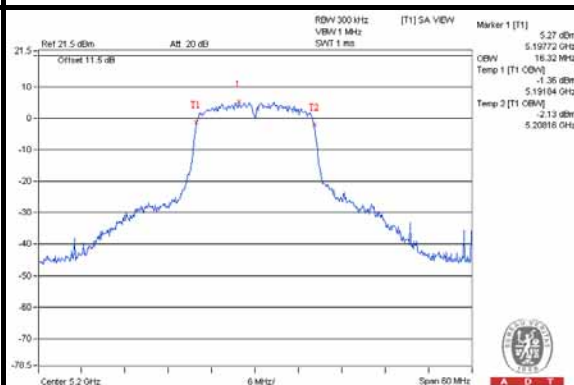


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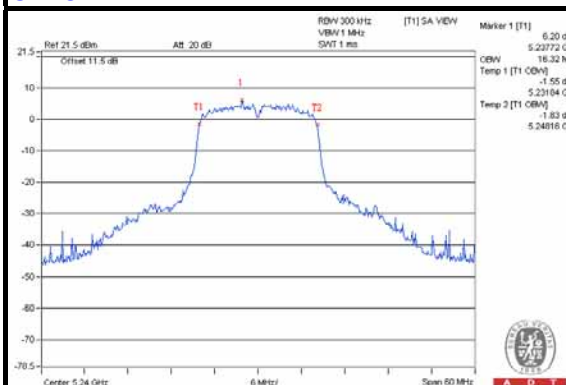
CH36



CH40



CH48



5.26~5.32GHz, 5.50~5.58GHz & 5.66GHz~5.70GHz

802.11a

CONDUCTED POWER:

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (mW)	AVERAGE POWER (dBm)	POWER LIMIT (dBm)	PASS/FAIL
52	5260	27.040	14.32	23.12	PASS
60	5300	29.040	14.63	23.18	PASS
64	5320	25.293	14.03	23.12	PASS
100	5500	18.281	12.62	23.28	PASS
116	5580	28.907	14.61	23.12	PASS
132	5660	27.733	14.43	23.12	PASS
140	5700	12.531	10.98	23.12	PASS
144 (UNII-2c Band)	5720	15.171	11.81	22.19	PASS
144 (UNII-3 Band)	5720	2.773	4.43	21.99	PASS

EIRP POWER:

CHAN.	CHAN. FREQ. (MHz)	EIRP POWER (mW)	EIRP POWER (dBm)	EIRP POWER LIMIT (dBm)	PASS / FAIL
52	5260	54.955	17.40	29.12	PASS
60	5300	59.020	17.71	29.18	PASS
64	5320	51.404	17.11	29.12	PASS
100	5500	54.702	17.38	29.28	PASS
116	5580	86.497	19.37	29.12	PASS
132	5660	82.984	19.19	29.12	PASS
140	5700	37.496	15.74	29.12	PASS
144 (UNII-2c Band)	5720	45.396	16.57	28.19	PASS
144 (UNII-3 Band)	5720	8.298	9.19	27.99	PASS

802.11a

99% OCCUPIED BANDWIDTH

CHANNEL	CHANNEL FREQUENCY (MHz)	OCCUPIED BANDWIDTH (MHz)
52	5260	16.32
60	5300	16.52
64	5320	16.32
100	5500	16.92
116	5580	16.32
132	5660	16.32
140	5700	16.32
144 (UNII-2c Band)	5720	13.16
144 (UNII-3 Band)	5720	3.16

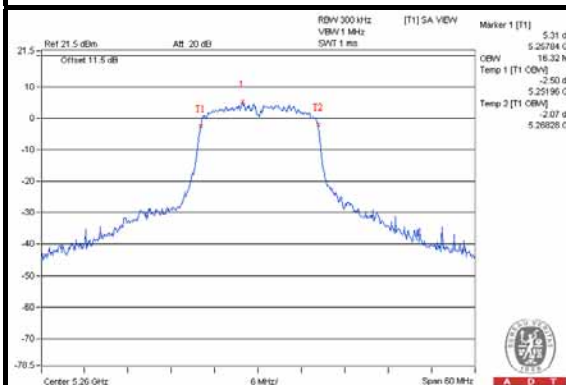
Note: For output power limitation is determined based on 99% bandwidth.

Power Limit = 11dBm + 10logB < UNII Band 2~3>				
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)	Determined EIRP Limit (dBm)
52	5260	16.32	23.12 < 24	29.12 < 30
60	5300	16.52	23.18 < 24	29.18 < 30
64	5320	16.32	23.12 < 24	29.12 < 30
100	5500	16.92	23.28 < 24	29.28 < 30
116	5580	16.32	23.12 < 24	29.12 < 30
132	5660	16.32	23.12 < 24	29.12 < 30
140	5700	16.32	23.12 < 24	29.12 < 30
144 (UNII-2c Band)	5720	13.16	22.19 < 24	28.19 < 30
144 (UNII-3 Band)	5720	3.16	21.99 < 30	27.99 < 36

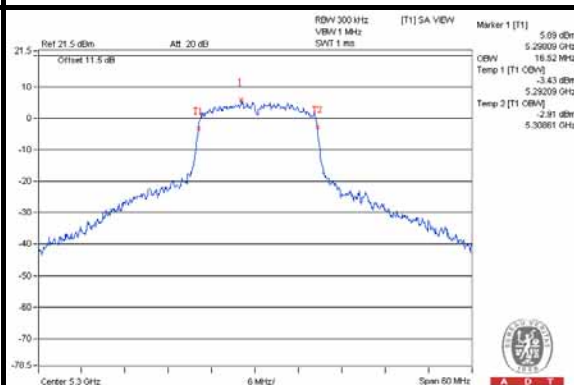


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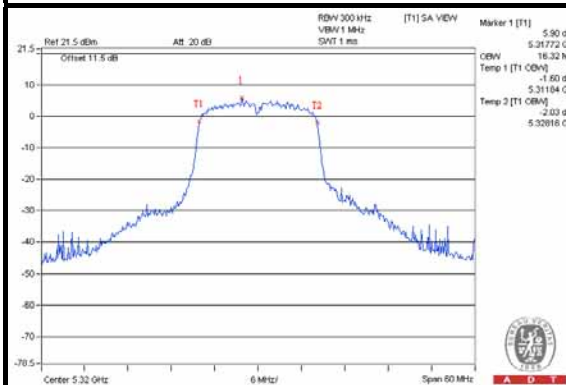
CH52



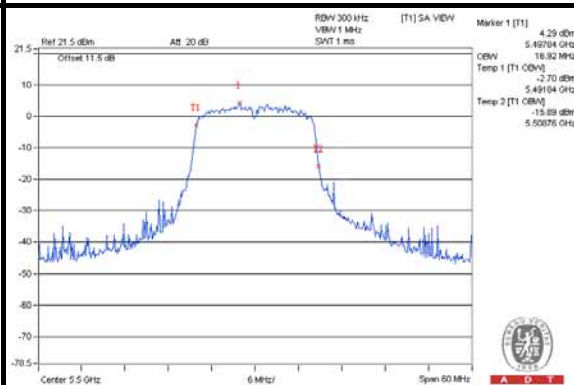
CH60



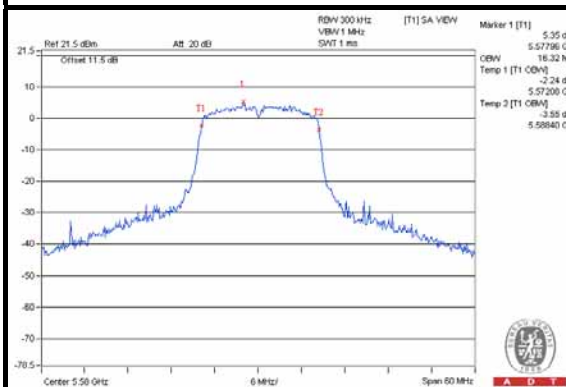
CH64



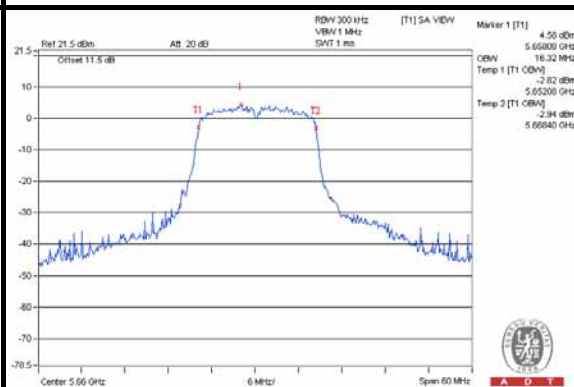
CH100



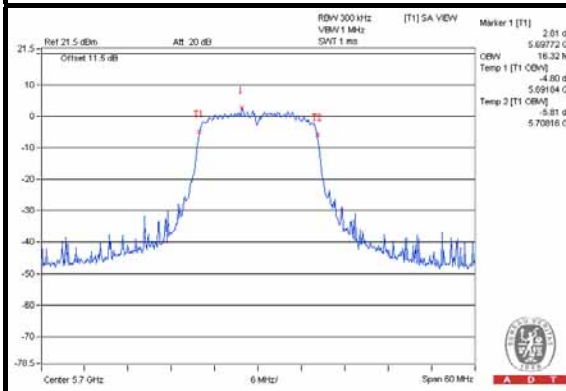
CH116



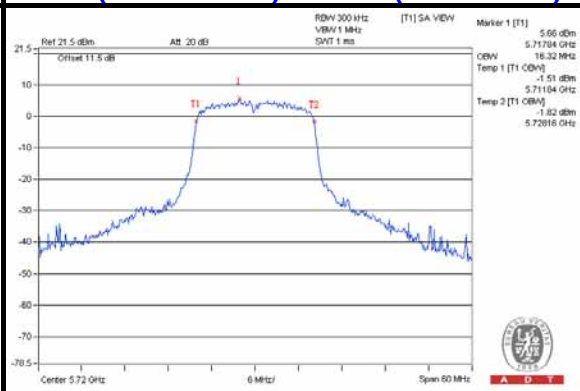
CH132



CH140



CH144 (UNII-2c Band) / CH144 (UNII-3 Band)



NOTE:

For CH144 (UNII-2c Band) = 5725 - Temp 1

For CH144 (UNII-3 Band) = 5725 + OBW - CH144 (UNII-2c Band) BW

802.11n (HT20)

CONDUCTED POWER:

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (mW)	AVERAGE POWER (dBm)
36	5180	25.763	14.11
40	5200	26.546	14.24
48	5240	25.177	14.01

EIRP POWER:

CHAN.	CHAN. FREQ. (MHz)	EIRP POWER (mW)	EIRP POWER (dBm)	EIRP POWER LIMIT (dBm)	PASS / FAIL
36	5180	52.360	17.19	22.43	PASS
40	5200	53.951	17.32	22.40	PASS
48	5240	51.169	17.09	22.40	PASS

802.11n (HT20)

99% OCCUPIED BANDWIDTH

CHANNEL	CHANNEL FREQUENCY (MHz)	OCCUPIED BANDWIDTH (MHz)
36	5180	17.52
40	5200	17.40
48	5240	17.40

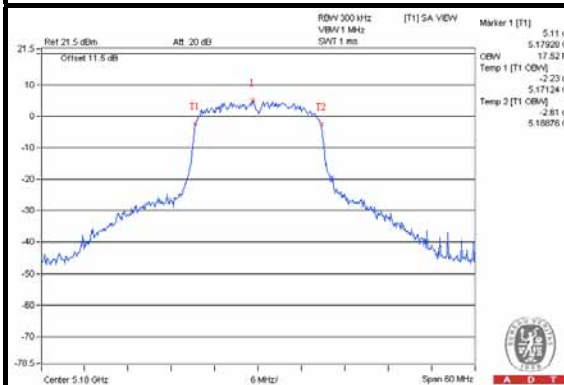
Note: For output power limitation is determined based on 99% bandwidth.

Power Limit = 10dBm + 10logB < UNII Band 1 >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined EIRP Limit (dBm)
36	5180	17.52	22.43 < 23
40	5200	17.40	22.40 < 23
48	5240	17.40	22.40 < 23

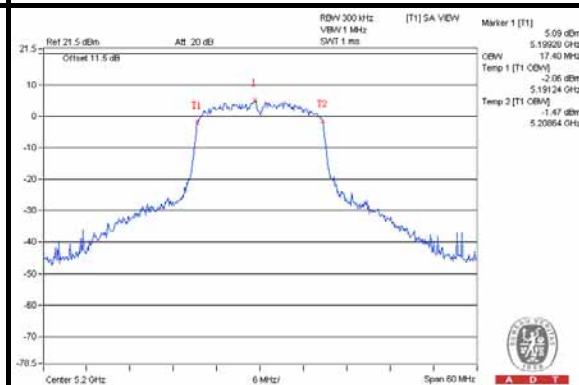


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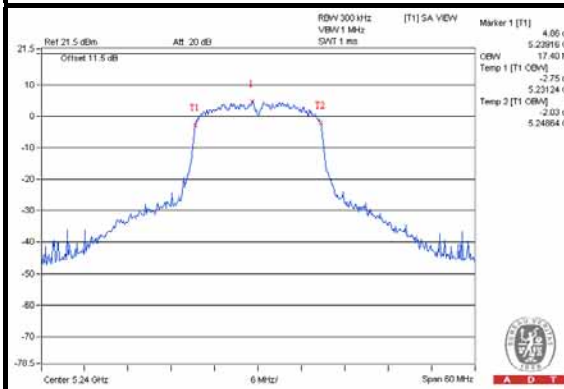
CH36



CH40



CH48



5.26~5.32GHz, 5.50~5.58GHz & 5.66GHz~5.70GHz

802.11n (HT20)

CONDUCTED POWER:

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (mW)	AVERAGE POWER (dBm)	POWER LIMIT (dBm)	PASS/FAIL
52	5260	28.445	14.54	23.40	PASS
60	5300	28.379	14.53	23.40	PASS
64	5320	28.379	14.53	23.43	PASS
100	5500	18.072	12.57	23.40	PASS
116	5580	27.606	14.41	23.43	PASS
132	5660	27.733	14.43	23.40	PASS
140	5700	12.106	10.83	23.40	PASS
144 (UNII-2c Band)	5720	13.092	11.17	22.34	PASS
144 (UNII-3 Band)	5720	2.958	4.71	22.75	PASS

EIRP POWER:

CHAN.	CHAN. FREQ. (MHz)	EIRP POWER (mW)	EIRP POWER (dBm)	EIRP POWER LIMIT (dBm)	PASS / FAIL
52	5260	57.810	17.62	29.40	PASS
60	5300	57.676	17.61	29.40	PASS
64	5320	57.676	17.61	29.43	PASS
100	5500	54.076	17.33	29.40	PASS
116	5580	82.604	19.17	29.43	PASS
132	5660	82.984	19.19	29.40	PASS
140	5700	36.224	15.59	29.40	PASS
144 (UNII-2c Band)	5720	39.175	15.93	28.34	PASS
144 (UNII-3 Band)	5720	8.851	9.47	28.75	PASS

802.11n (HT20)

99% OCCUPIED BANDWIDTH

CHANNEL	CHANNEL FREQUENCY (MHz)	OCCUPIED BANDWIDTH (MHz)
52	5260	17.40
60	5300	17.40
64	5320	17.52
100	5500	17.40
116	5580	17.52
132	5660	17.40
140	5700	17.40
144 (UNII-2c Band)	5720	13.64
144 (UNII-3 Band)	5720	3.76

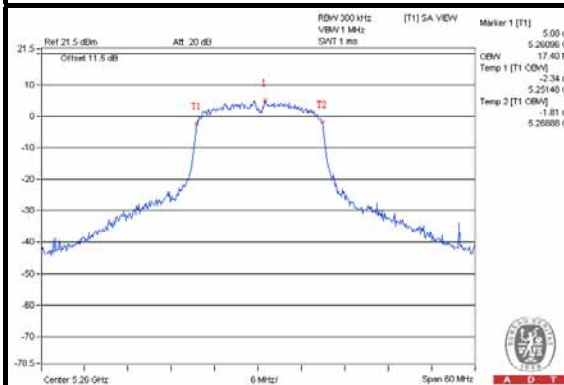
Note: For output power limitation is determined based on 99% bandwidth.

Power Limit = 11dBm + 10logB < UNII Band 2~3>				
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)	Determined EIRP Limit (dBm)
52	5260	17.40	23.40 < 24	29.40 < 30
60	5300	17.52	23.40 < 24	29.40 < 30
64	5320	17.40	23.43 < 24	29.43 < 30
100	5500	17.52	23.40 < 24	29.40 < 30
116	5580	17.40	23.43 < 24	29.43 < 30
132	5660	17.40	23.40 < 24	29.40 < 30
140	5700	13.64	23.40 < 24	29.40 < 30
144 (UNII-2c Band)	5720	3.76	22.34 < 24	28.34 < 30
144 (UNII-3 Band)	5720	17.40	22.75 < 30	28.75 < 36

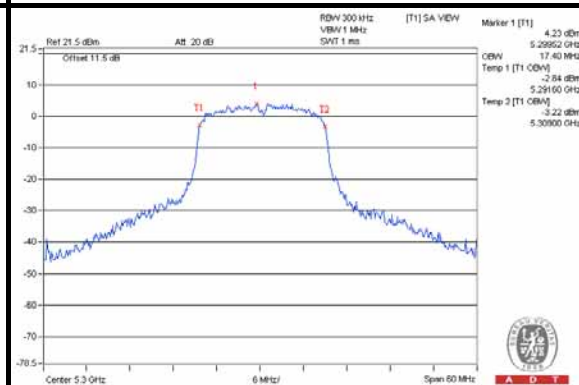


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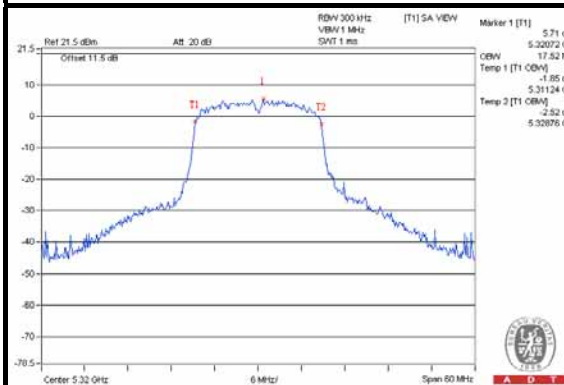
CH52



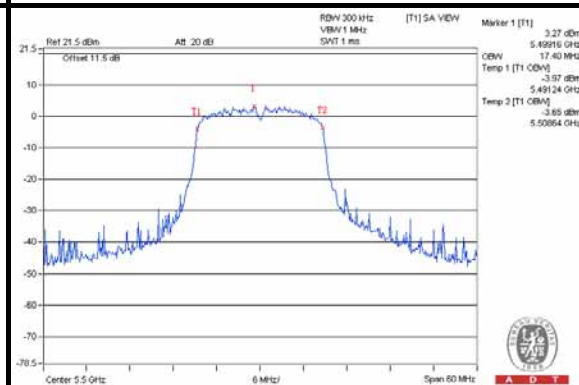
CH60



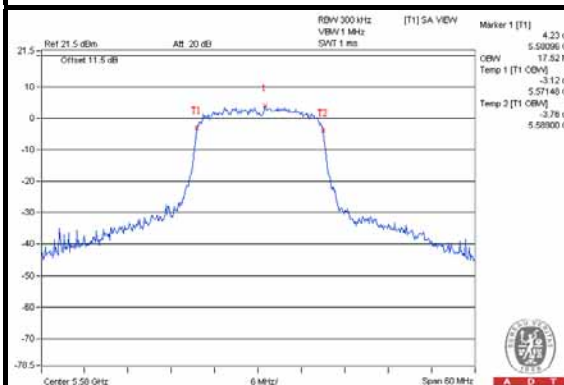
CH64



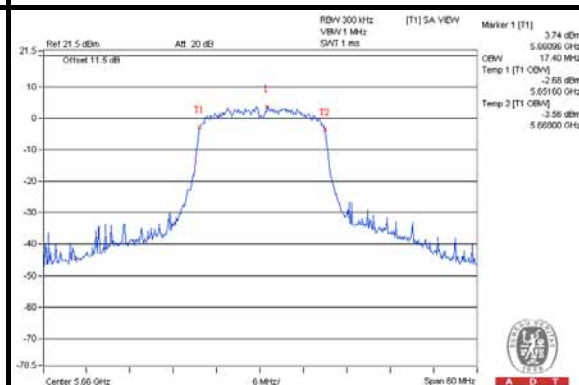
CH100



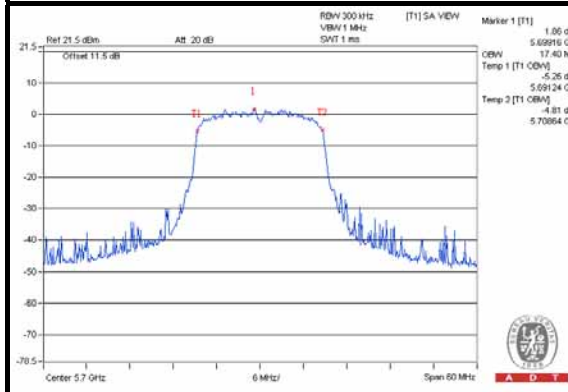
CH116



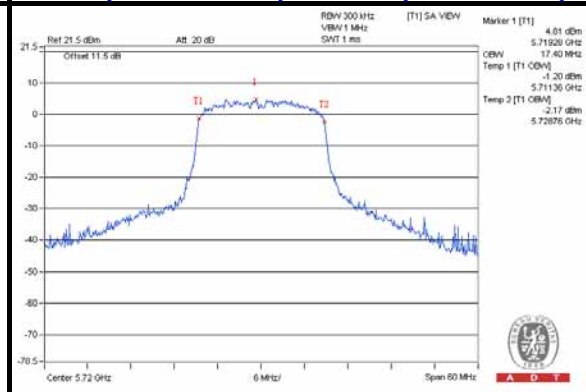
CH132



CH140



CH144 (UNII-2c Band) / CH144 (UNII-3 Band)



NOTE:

For CH144 (UNII-2c Band) = 5725 - Temp 1

For CH144 (UNII-3 Band) = 5725 + OBW - CH144 (UNII-2c Band) BW

802.11n (HT40)

CONDUCTED POWER:

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (mW)	AVERAGE POWER (dBm)
38	5190	12.942	11.12
46	5230	22.182	13.46

EIRP POWER:

CHAN.	CHAN. FREQ. (MHz)	EIRP POWER (mW)	EIRP POWER (dBm)	EIRP POWER LIMIT (dBm)	PASS / FAIL
38	5190	26.303	14.20	23.00	PASS
46	5230	45.082	16.54	23.00	PASS

802.11n (HT40)

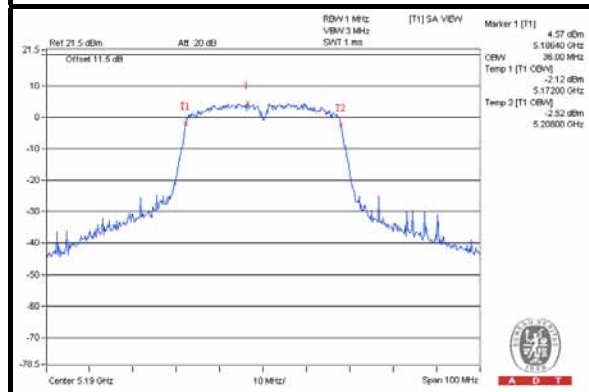
99% OCCUPIED BANDWIDTH

CHANNEL	CHANNEL FREQUENCY (MHz)	OCCUPIED BANDWIDTH (MHz)
38	5190	36.00
46	5230	36.00

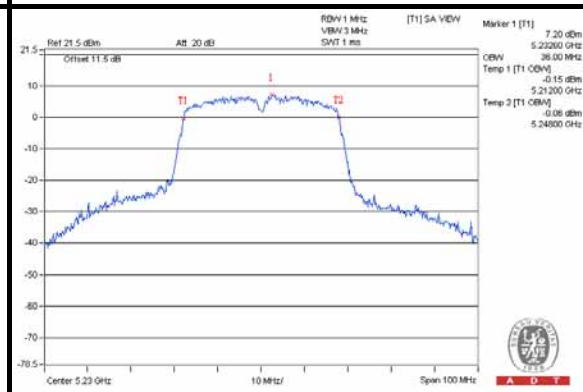
Note: For output power limitation is determined based on 99% bandwidth.

Power Limit = 10dBm + 10logB < UNII Band 1 >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined EIRP Limit (dBm)
38	5190	36.00	25.56 > 23
46	5230	36.00	25.56 > 23

CH38



CH46



5.26~5.32GHz, 5.50~5.58GHz & 5.66GHz~5.70GHz

802.11n (HT40)

CONDUCTED POWER:

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (mW)	AVERAGE POWER (dBm)	POWER LIMIT (dBm)	PASS/FAIL
54	5270	20.512	13.12	24.00	PASS
62	5310	17.100	12.33	24.00	PASS
102	5510	17.061	12.32	24.00	PASS
110	5550	20.512	13.12	24.00	PASS
134	5670	20.230	13.06	24.00	PASS
142 (UNII-2c Band)	5710	11.409	10.57	24.00	PASS
142 (UNII-3 Band)	5710	0.6371	-1.96	21.77	PASS

EIRP POWER:

CHAN.	CHAN. FREQ. (MHz)	EIRP POWER (mW)	EIRP POWER (dBm)	EIRP POWER LIMIT (dBm)	PASS / FAIL
54	5270	41.688	16.20	30.00	PASS
62	5310	34.753	15.41	30.00	PASS
102	5510	51.051	17.08	30.00	PASS
110	5550	61.377	17.88	30.00	PASS
134	5670	60.534	17.82	30.00	PASS
142 (UNII-2c Band)	5710	34.139	15.33	30.00	PASS
142 (UNII-3 Band)	5710	1.906	2.80	27.77	PASS

For CH142 : Average Power (dBm)= measured value(dBm) + Duty Factor (0.09dB)

802.11n (HT40)

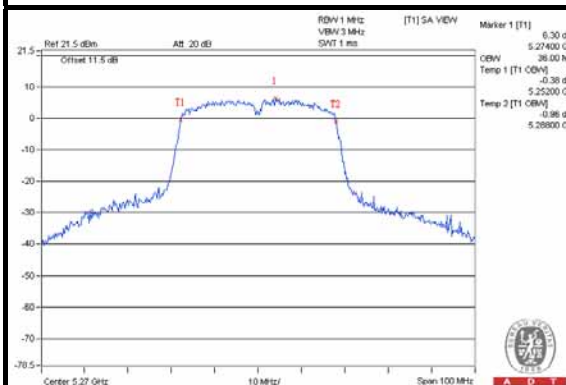
99% OCCUPIED BANDWIDTH

CHANNEL	CHANNEL FREQUENCY (MHz)	OCCUPIED BANDWIDTH (MHz)
54	5270	36.00
62	5310	36.00
102	5510	36.00
110	5550	36.00
134	5670	36.00
142 (UNII-2c Band)	5710	33.00
142 (UNII-3 Band)	5710	3.00

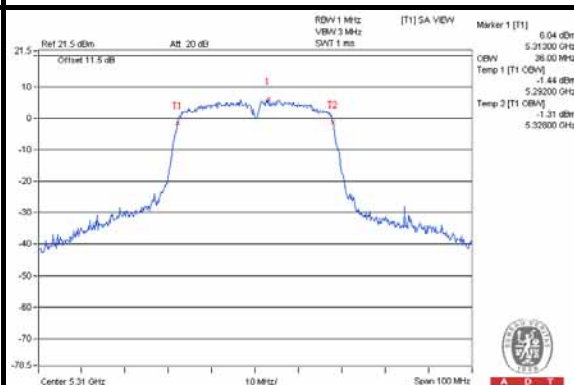
Note: For output power limitation is determined based on 99% bandwidth.

Power Limit = 11dBm + 10logB < UNII Band 2~3>				
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)	Determined EIRP Limit (dBm)
54	5270	36.00	26.56 > 24	32.56 > 30
62	5310	36.00	26.56 > 24	32.56 > 30
102	5510	36.00	26.56 > 24	32.56 > 30
110	5550	36.00	26.56 > 24	32.56 > 30
134	5670	36.00	26.56 > 24	32.56 > 30
142 (UNII-2c Band)	5710	33.00	26.18 > 24	32.18 > 30
142 (UNII-3 Band)	5710	3.00	21.77 < 24	33.77 < 36

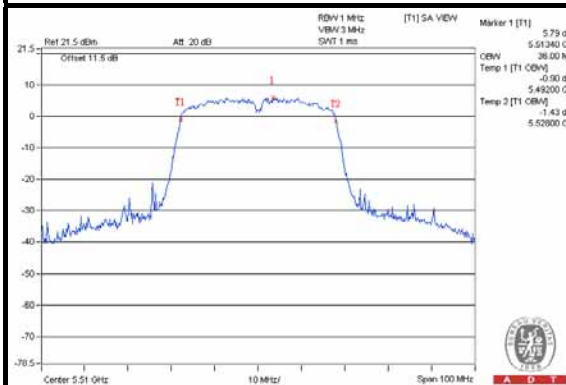
CH54



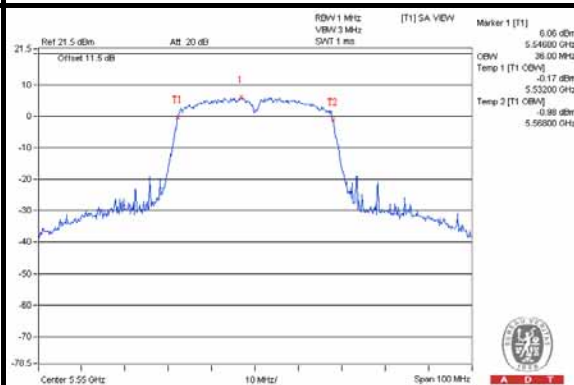
CH62



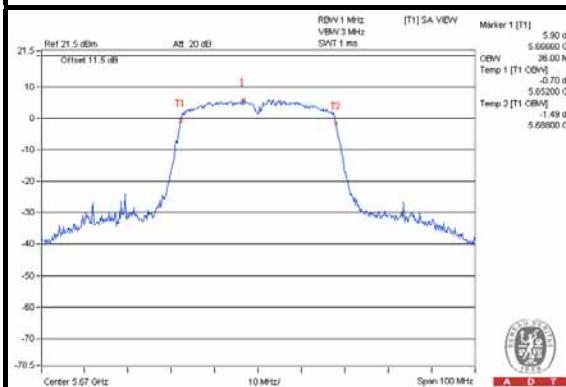
CH102



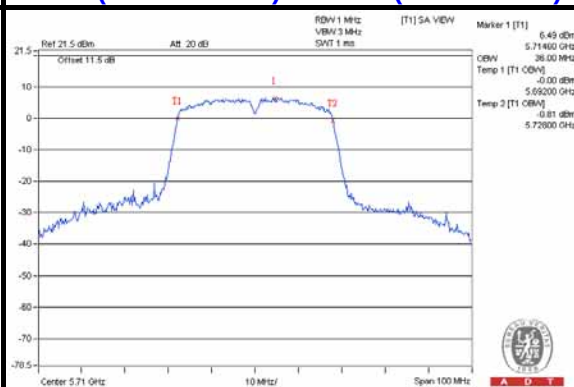
CH110



CH134



CH142 (UNII-2c Band) / CH142 (UNII-3 Band)



NOTE:

For CH142 (UNII-2c Band) = 5725 - Temp 1

For CH142 (UNII-3 Band) = 5725 + OBW - CH142 (UNII-2c Band) BW

802.11ac (VHT20)

CONDUCTED POWER:

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (mW)	AVERAGE POWER (dBm)
36	5180	25.882	14.13
40	5200	26.607	14.25
48	5240	25.468	14.06

EIRP POWER:

CHAN.	CHAN. FREQ. (MHz)	EIRP POWER (mW)	EIRP POWER (dBm)	EIRP POWER LIMIT (dBm)	PASS / FAIL
36	5180	52.601	17.21	22.43	PASS
40	5200	54.075	17.33	22.40	PASS
48	5240	51.760	17.14	22.40	PASS

802.11ac (VHT20)

99% OCCUPIED BANDWIDTH

CHANNEL	CHANNEL FREQUENCY (MHz)	OCCUPIED BANDWIDTH (MHz)
36	5180	17.52
40	5200	17.40
48	5240	17.40

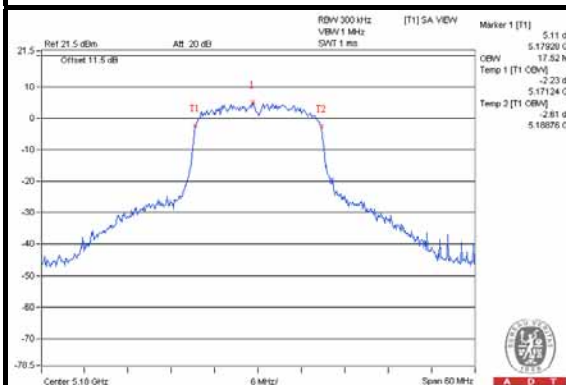
Note: For output power limitation is determined based on 99% bandwidth.

Power Limit = 10dBm + 10logB < UNII Band 1 >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined EIRP Limit (dBm)
36	5180	17.52	22.43 < 23
40	5200	17.40	22.40 < 23
48	5240	17.40	22.40 < 23

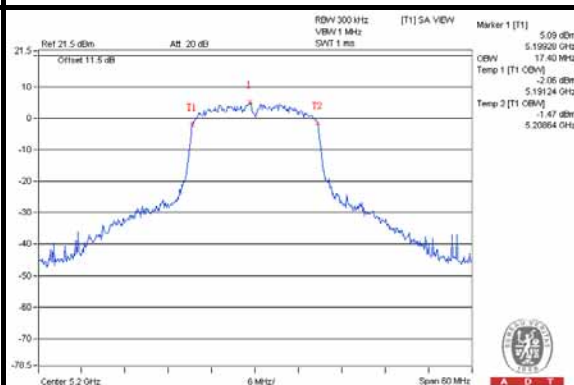


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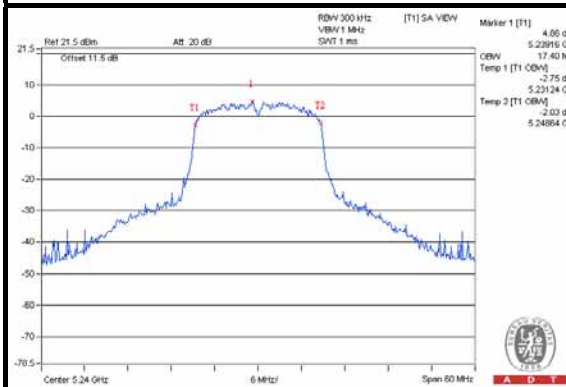
CH36



CH40



CH48



5.26~5.32GHz, 5.50~5.58GHz & 5.66GHz~5.70GHz

802.11ac (VHT20)

CONDUCTED POWER:

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (mW)	AVERAGE POWER (dBm)	POWER LIMIT (dBm)	PASS/FAIL
52	5260	28.576	14.56	23.40	PASS
60	5300	28.642	14.57	23.40	PASS
64	5320	28.379	14.53	23.43	PASS
100	5500	18.113	12.58	23.40	PASS
116	5580	28.379	14.53	23.43	PASS
132	5660	27.861	14.45	23.40	PASS
140	5700	12.218	10.87	23.40	PASS
144 (UNII-2c Band)	5720	15.417	11.88	22.34	PASS
144 (UNII-3 Band)	5720	2.924	4.66	22.75	PASS

EIRP POWER:

CHAN.	CHAN. FREQ. (MHz)	EIRP POWER (mW)	EIRP POWER (dBm)	EIRP POWER LIMIT (dBm)	PASS / FAIL
52	5260	58.077	17.64	29.40	PASS
60	5300	58.211	17.65	29.40	PASS
64	5320	57.676	17.61	29.43	PASS
100	5500	54.199	17.34	29.40	PASS
116	5580	84.917	19.29	29.43	PASS
132	5660	83.367	19.21	29.40	PASS
140	5700	36.559	15.63	29.40	PASS
144 (UNII-2c Band)	5720	46.132	16.64	28.34	PASS
144 (UNII-3 Band)	5720	8.749	9.42	28.75	PASS

802.11ac (VHT20)

99% OCCUPIED BANDWIDTH

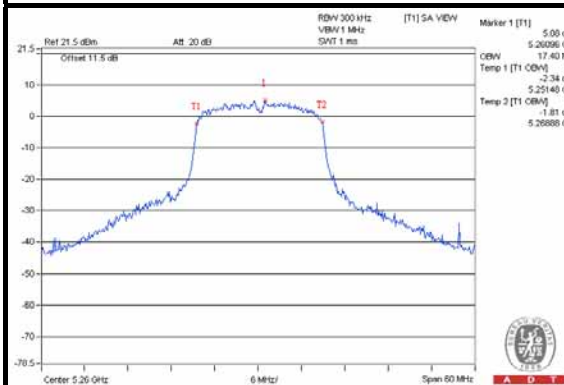
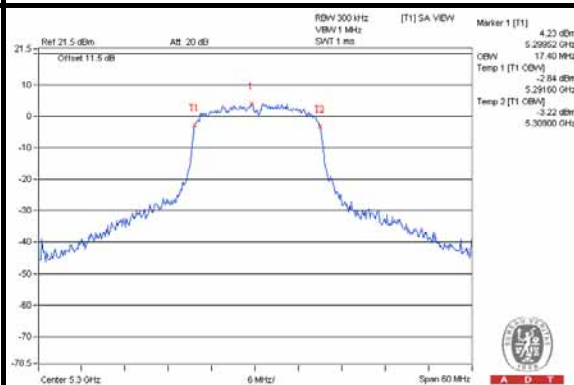
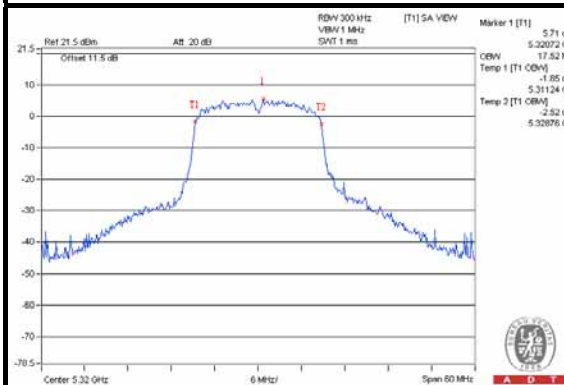
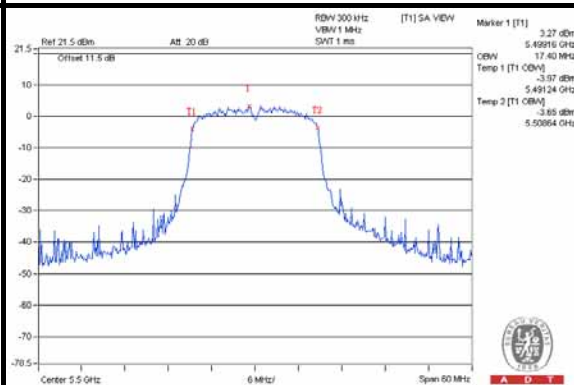
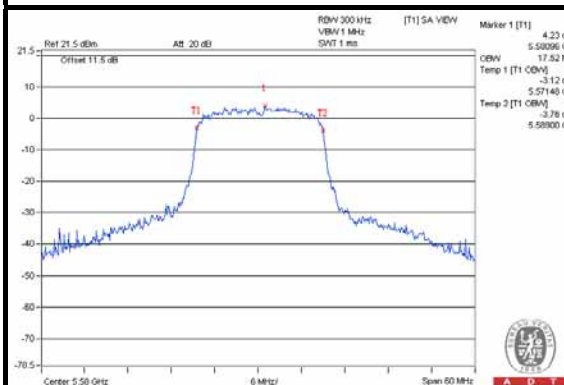
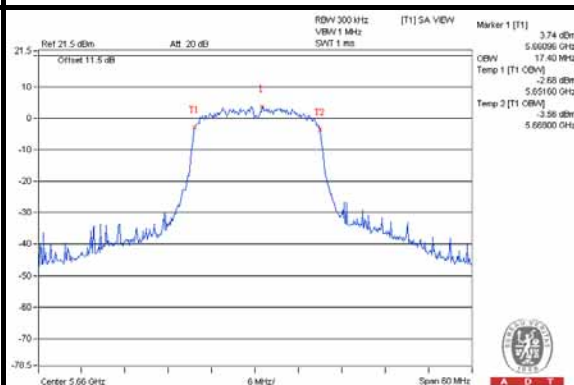
CHANNEL	CHANNEL FREQUENCY (MHz)	OCCUPIED BANDWIDTH (MHz)
52	5260	17.40
60	5300	17.40
64	5320	17.52
100	5500	17.40
116	5580	17.52
132	5660	17.40
140	5700	17.40
144 (UNII-2c Band)	5720	13.64
144 (UNII-3 Band)	5720	3.76

Note: For output power limitation is determined based on 99% bandwidth.

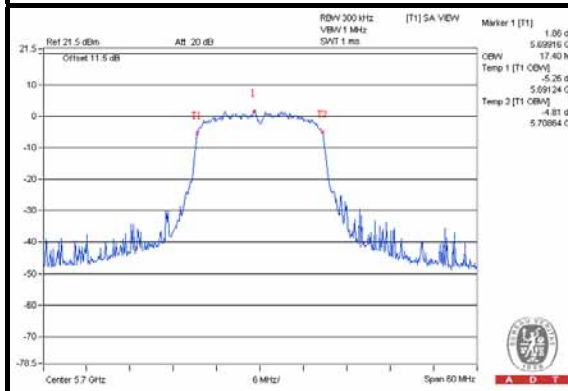
Power Limit = 11dBm + 10logB < UNII Band 2~3>				
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)	Determined EIRP Limit (dBm)
52	5260	17.40	23.40 < 24	29.40 < 30
60	5300	17.52	23.40 < 24	29.40 < 30
64	5320	17.40	23.43 < 24	29.43 < 30
100	5500	17.52	23.40 < 24	29.40 < 30
116	5580	17.40	23.43 < 24	29.43 < 30
132	5660	17.40	23.40 < 24	29.40 < 30
140	5700	13.64	23.40 < 24	29.40 < 30
144 (UNII-2c Band)	5720	3.76	22.34 < 24	28.34 < 30
144 (UNII-3 Band)	5720	17.40	22.75 < 30	28.75 < 36



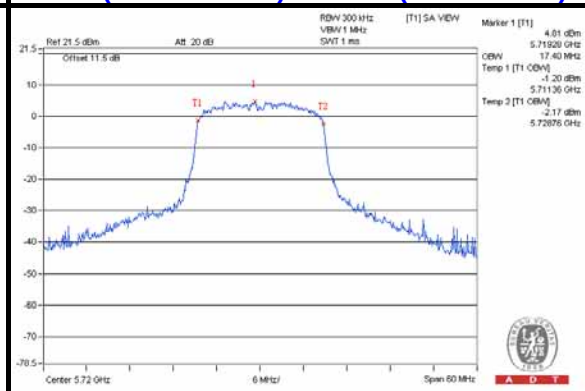
A D T

CH52**CH60****CH64****CH100****CH116****CH132**

CH140



CH144 (UNII-2c Band) / CH144 (UNII-3 Band)



NOTE:

For CH144 (UNII-2c Band) = 5725 - Temp 1

For CH144 (UNII-3 Band) = 5725 + OBW - CH144 (UNII-2c Band) BW

802.11ac (VHT40)

CONDUCTED POWER:

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (mW)	AVERAGE POWER (dBm)
38	5190	13.305	11.24
46	5230	22.233	13.47

EIRP POWER:

CHAN.	CHAN. FREQ. (MHz)	EIRP POWER (mW)	EIRP POWER (dBm)	EIRP POWER LIMIT (dBm)	PASS / FAIL
38	5190	27.041	14.32	23.00	PASS
46	5230	45.185	16.55	23.00	PASS

802.11ac (VHT40)

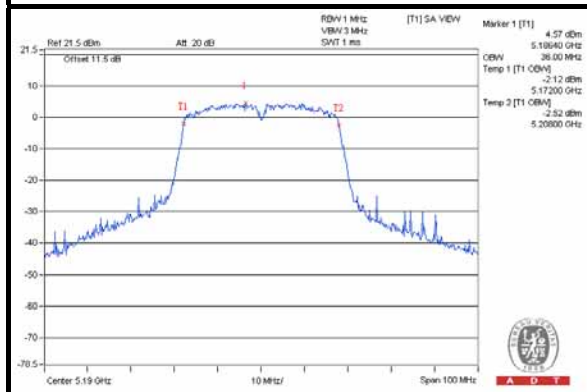
99% OCCUPIED BANDWIDTH

CHANNEL	CHANNEL FREQUENCY (MHz)	OCCUPIED BANDWIDTH (MHz)
38	5190	36.00
46	5230	36.00

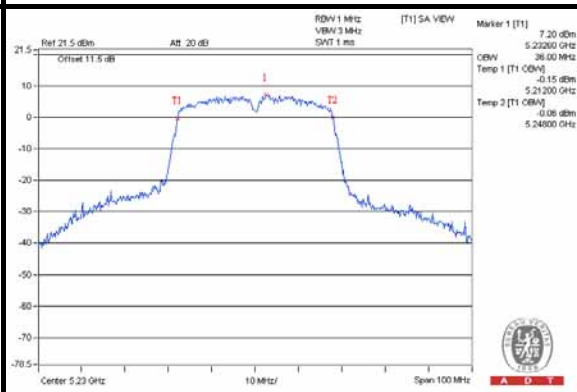
Note: For output power limitation is determined based on 99% bandwidth.

Power Limit = 10dBm + 10logB < UNII Band 1 >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined EIRP Limit (dBm)
38	5190	36.00	25.56 > 23
46	5230	36.00	25.56 > 23

CH38



CH46



5.26~5.32GHz, 5.50~5.58GHz & 5.66GHz~5.70GHz

802.11ac (VHT40)

CONDUCTED POWER:

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (mW)	AVERAGE POWER (dBm)	POWER LIMIT (dBm)	PASS/FAIL
54	5270	20.701	13.16	24.00	PASS
62	5310	17.140	12.34	24.00	PASS
102	5510	17.298	12.38	24.00	PASS
110	5550	21.184	13.26	24.00	PASS
134	5670	20.654	13.15	24.00	PASS
142 (UNII-2c Band)	5710	12.624	11.01	24.00	PASS
142 (UNII-3 Band)	5710	0.5705	-2.44	21.77	PASS

EIRP POWER:

CHAN.	CHAN. FREQ. (MHz)	EIRP POWER (mW)	EIRP POWER (dBm)	EIRP POWER LIMIT (dBm)	PASS / FAIL
54	5270	42.072	16.24	30.00	PASS
62	5310	34.835	15.42	30.00	PASS
102	5510	51.760	17.14	30.00	PASS
110	5550	63.388	18.02	30.00	PASS
134	5670	61.802	17.91	30.00	PASS
142 (UNII-2c Band)	5710	37.774	15.77	30.00	PASS
142 (UNII-3 Band)	5710	1.707	2.32	27.77	PASS

For CH142 : Average Power (dBm)= measured value(dBm) + Duty Factor (0.09dB)

802.11ac (VHT40)

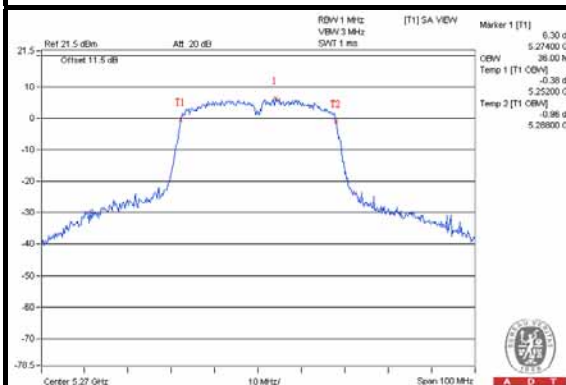
99% OCCUPIED BANDWIDTH

CHANNEL	CHANNEL FREQUENCY (MHz)	OCCUPIED BANDWIDTH (MHz)
54	5270	36.00
62	5310	36.00
102	5510	36.00
110	5550	36.00
134	5670	36.00
142 (UNII-2c Band)	5710	33.00
142 (UNII-3 Band)	5710	3.00

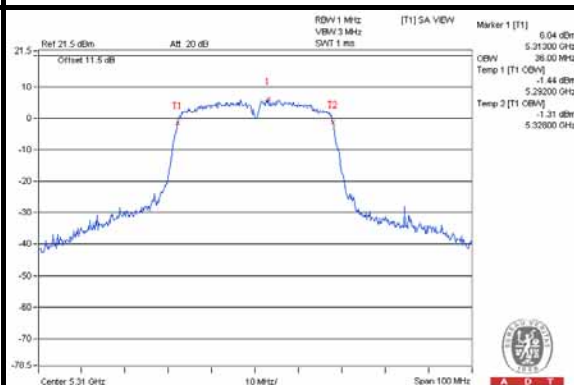
Note: For output power limitation is determined based on 99% bandwidth.

Power Limit = 11dBm + 10logB < UNII Band 2~3>				
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)	Determined EIRP Limit (dBm)
54	5270	36.00	26.56 > 24	32.56 > 30
62	5310	36.00	26.56 > 24	32.56 > 30
102	5510	36.00	26.56 > 24	32.56 > 30
110	5550	36.00	26.56 > 24	32.56 > 30
134	5670	36.00	26.56 > 24	32.56 > 30
142 (UNII-2c Band)	5710	33.00	26.18 > 24	32.18 > 30
142 (UNII-3 Band)	5710	3.00	21.77 < 24	33.77 < 36

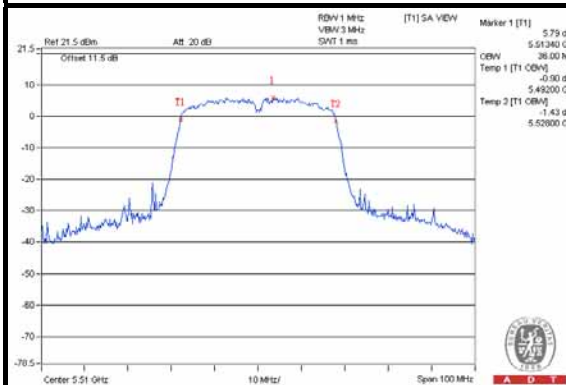
CH54



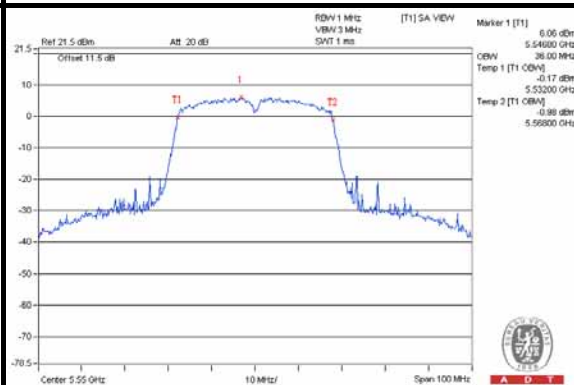
CH62



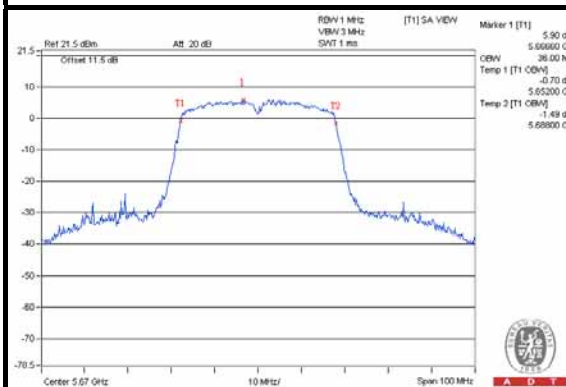
CH102



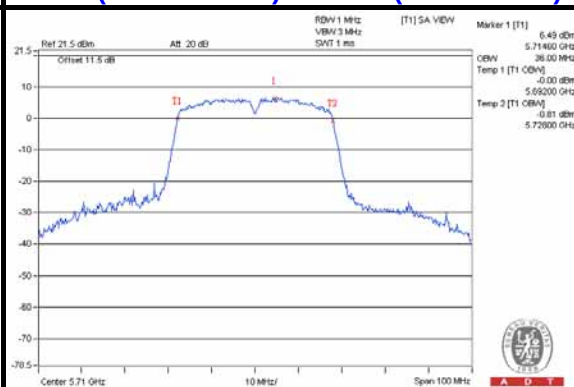
CH110



CH134



CH142 (UNII-2c Band) / CH142 (UNII-3 Band)



NOTE:

For CH142 (UNII-2c Band) = 5725 - Temp 1

For CH142 (UNII-3 Band) = 5725 + OBW - CH142 (UNII-2c Band) BW

802.11ac (VHT80)

CONDUCTED POWER:

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (mW)	AVERAGE POWER (dBm)
42	5210	18.365	12.64

EIRP POWER:

CHANNEL	CHANNEL FREQUENCY (MHz)	EIRP POWER (mW)	EIRP POWER (dBm)	EIRP POWER LIMIT (dBm)	PASS/FAIL
42	5210	37.324	15.72	23.00	PASS

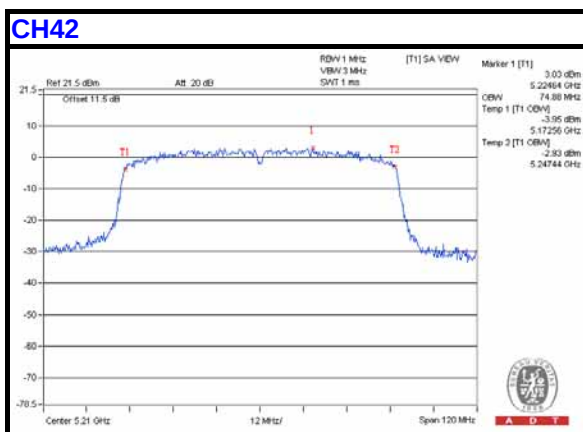
802.11ac (VHT80)

99% OCCUPIED BANDWIDTH

CHANNEL	CHANNEL FREQUENCY (MHz)	OCCUPIED BANDWIDTH (MHz)
42	5210	74.88

Note: For output power limitation is determined based on 99% bandwidth.

Power Limit = 10dBm + 10logB < UNII Band 1 >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined EIRP Limit (dBm)
42	5210	74.88	25.66 > 23



5.26~5.32GHz, 5.50~5.58GHz & 5.66GHz~5.70GHz

802.11ac (VHT80)

CONDUCTED POWER:

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (mW)	AVERAGE POWER (dBm)	POWER LIMIT (dBm)	PASS/FAIL
58	5290	10.495	10.21	24.00	PASS
106	5530	17.906	12.53	24.00	PASS
138 (UNII-2c Band)	5690	8.019	9.04	24.00	PASS
138 (UNII-3 Band)	5690	0.128	-8.93	20.87	PASS

EIRP POWER:

CHAN.	CHAN. FREQ. (MHz)	EIRP POWER (mW)	EIRP POWER (dBm)	EIRP POWER LIMIT (dBm)	PASS / FAIL
58	5290	21.330	13.29	30.00	PASS
106	5530	53.579	17.29	30.00	PASS
138 (UNII-2c Band)	5690	23.995	13.80	30.00	PASS
138 (UNII-3 Band)	5690	0.383	-4.17	26.87	PASS

For CH138 : Average Power (dBm)= measured value(dBm) + Duty Factor (0.19dB)

802.11ac (VHT80)

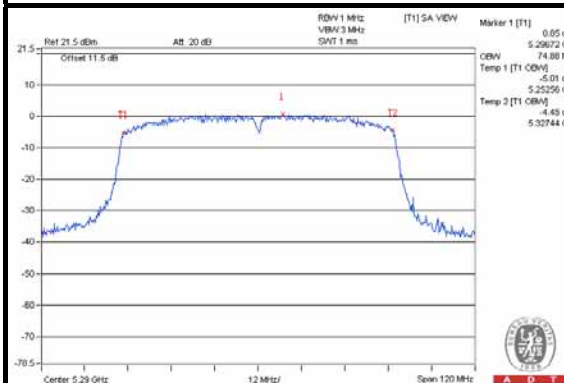
99% OCCUPIED BANDWIDTH

CHANNEL	CHANNEL FREQUENCY (MHz)	OCCUPIED BANDWIDTH (MHz)
58	5290	74.88
106	5530	74.88
138 (UNII-2c Band)	5690	72.76
138 (UNII-3 Band)	5690	2.44

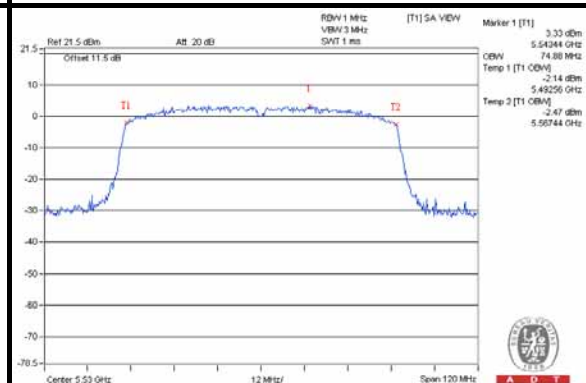
Note: For output power limitation is determined based on 99% bandwidth.

Power Limit = 11dBm + 10logB < UNII Band 2~3>				
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)	Determined EIRP Limit (dBm)
58	5290	74.88	29.74 > 24	35.74 > 30
106	5530	74.88	29.74 > 24	35.74 > 30
138 (UNII-2c Band)	5690	72.76	29.61 > 24	35.61 > 30
138 (UNII-3 Band)	5690	2.44	20.87 < 24	26.87 < 30

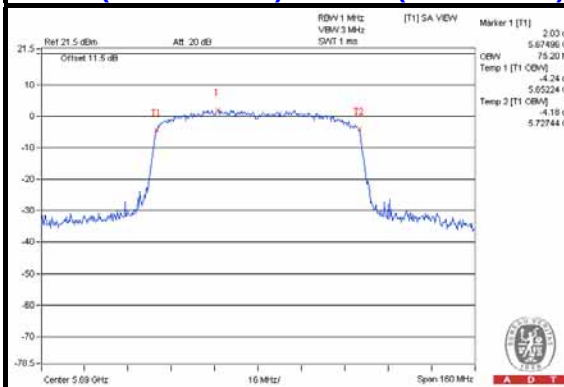
CH58



CH106



CH138 (UNII-2c Band) / CH138 (UNII-3 Band)



NOTE:

For CH138 (UNII-2c Band) = 5725 - Temp 1

For CH138 (UNII-3 Band) = 5725 + OBW - CH138 (UNII-2c Band) BW

4.1.8 TEST RESULTS (MODE 2)

802.11a

POWER OUTPUT

CHAN.	CHAN. FREQ. (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
36	5180	9.83	11.24	22.921	13.60	16.68	PASS
40	5200	12.13	13.51	38.770	15.88	16.70	PASS
48	5240	12.24	13.54	39.343	15.95	16.68	PASS
52	5260	14.32	15.72	64.365	18.09	23.72	PASS
60	5300	14.63	15.83	67.322	18.28	23.72	PASS
64	5320	8.94	9.93	17.674	12.47	23.66	PASS
100	5500	8.14	8.23	13.169	11.20	22.01	PASS
116	5580	14.61	14.92	59.953	17.78	22.04	PASS
132	5660	14.43	14.82	58.072	17.64	22.04	PASS
140	5700	6.93	7.04	9.990	10.00	21.98	PASS
144 (UNII-2c Band)	5720	12.07	12.44	33.645	15.27	20.89	PASS
144 (UNII-3 Band)	5720	4.90	5.56	6.687	8.25	21.62	PASS

Note:

5150~5250MHz: The directional gain is 6.09dBi > 6dBi, therefore the limit needs to reduce, so the power limit shall be reduced to "Determined Conducted Limit-(6.09-6)".

5250~5350MHz: The directional gain is 6.09dBi > 6dBi, therefore the limit needs to reduce, so the power limit shall be reduced to "Determined Conducted Limit-(6.09-6)".

5470~5725MHz (Except for UNII-3 Band): The directional gain is 7.77dBi > 6dBi, therefore the limit needs to reduce, so the power limit shall be reduced to "Determined Conducted Limit-(7.77-6)".

5725~5825MHz (For UNII-3 Band): The directional gain is 7.77dBi > 6dBi, therefore the limit needs to reduce, so the power limit shall be reduced to "Determined Conducted Limit-(7.77-6)".

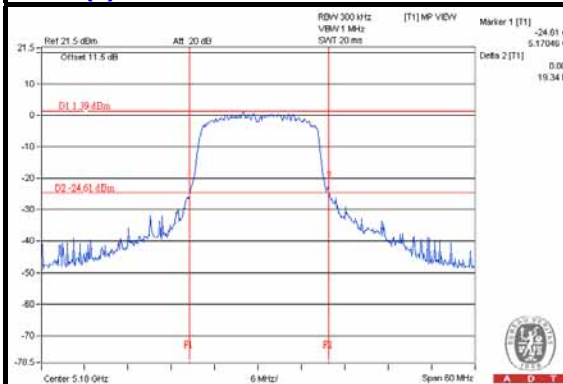
802.11a 26dB OCCUPIED BANDWIDTH

CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)	
		CHAIN 0	CHAIN 1
36	5180	19.34	18.96
40	5200	19.04	19.18
48	5240	18.97	18.96
52	5260	19.12	19.47
60	5300	19.13	19.61
64	5320	18.84	19.01
100	5500	19.00	20.90
116	5580	19.10	21.18
132	5660	19.12	21.53
140	5700	19.13	18.85
144 (UNII-2c Band)	5720	14.66	15.95
144 (UNII-3 Band)	5720	4.36	4.48

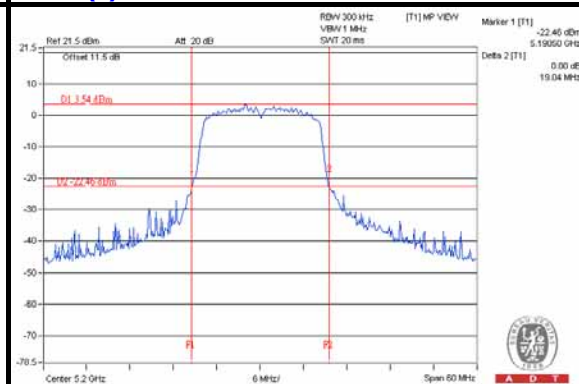
Note: For FCC output power limitation is determined based on 26dB bandwidth.

Power Limit = 4dBm + 10logB < Band 1>			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
36	5180	18.96	16.77 < 17
40	5200	19.04	16.79 < 17
48	5240	18.96	16.77 < 17
Power Limit = 11dBm + 10logB < Band 2~3>			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
52	5260	19.12	23.81 < 24
60	5300	19.13	23.81 < 24
64	5320	18.84	23.75 < 24
100	5500	19.00	23.78 < 24
116	5580	19.10	23.81 < 24
132	5660	19.12	23.81 < 24
140	5700	18.85	23.75 < 24
144 (UNII-2c Band)	5720	14.66	22.66 < 24
144 (UNII-3 Band)	5720	4.36	23.39 < 30

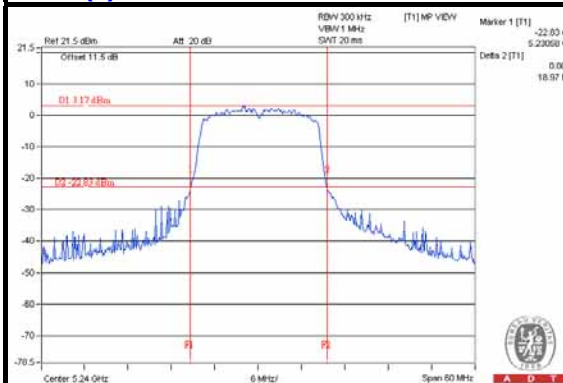
Chain(0) : CH36



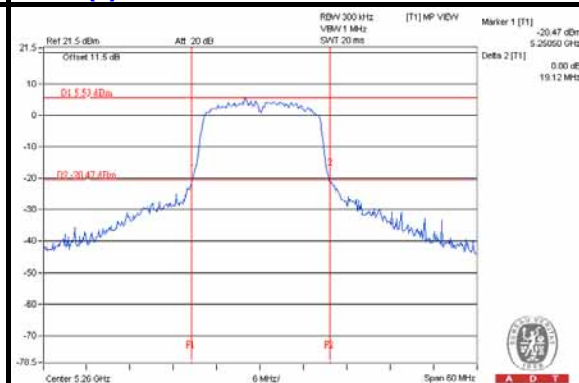
Chain(0) : CH40



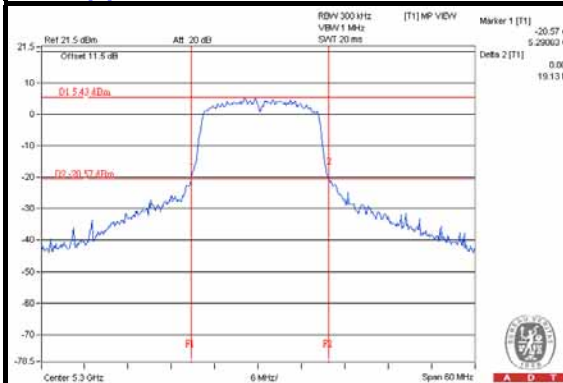
Chain(0) : CH48



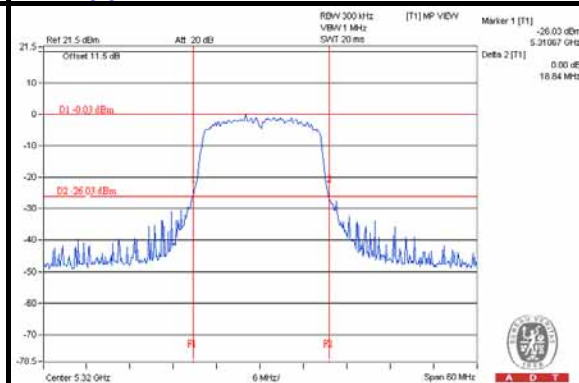
Chain(0) : CH52



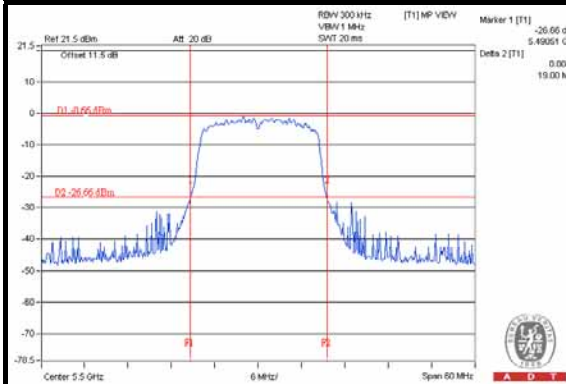
Chain(0) : CH60



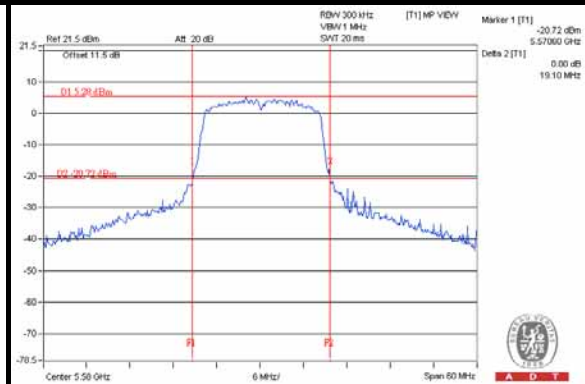
Chain(0) : CH64



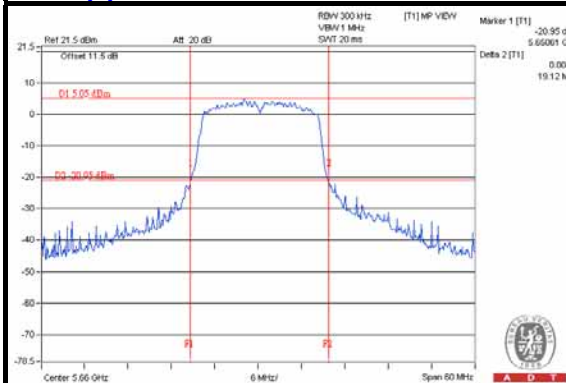
Chain(0) : CH100



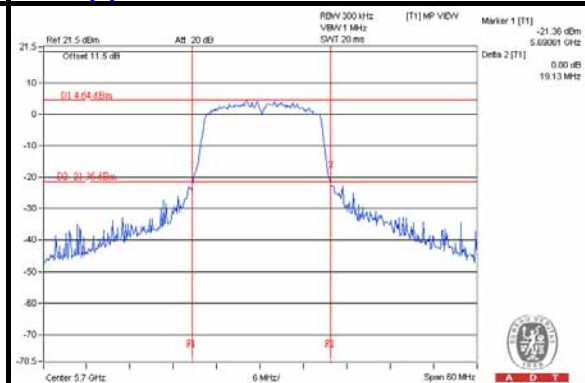
Chain(0) : CH116



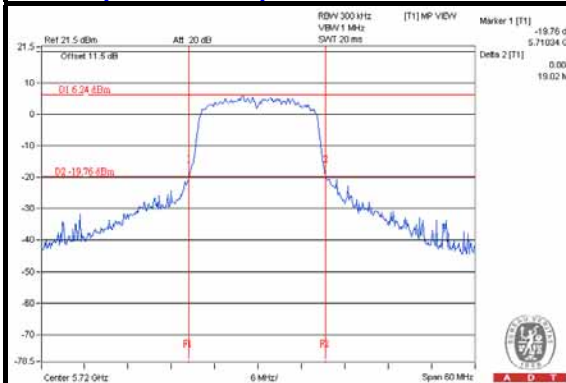
Chain(0) : CH132



Chain(0) : CH140



Chain(0) : CH144 (UNII-2c Band) / Chain(0) : CH144 (UNII-3 Band)

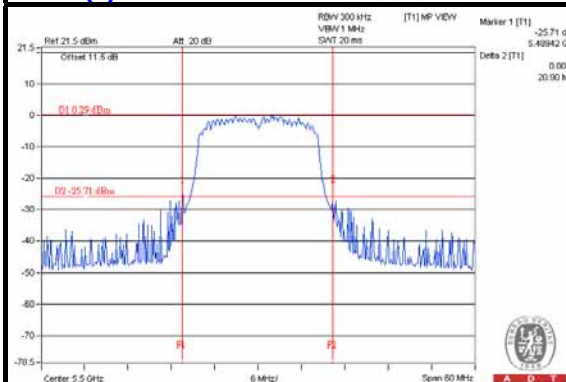


NOTE:

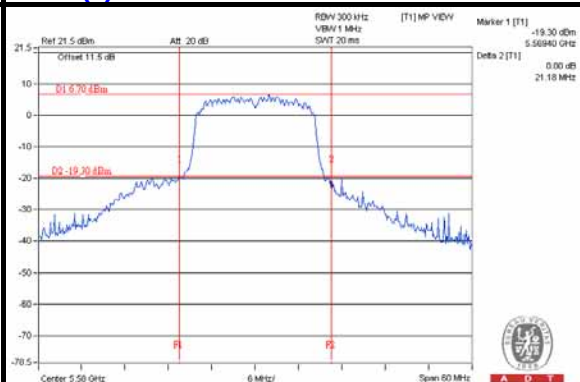
For CH144 (UNII-2c Band) = 5725 - Market 1

For CH144 (UNII-3 Band) = Delta 2 - CH144 (UNII-2c Band) BW

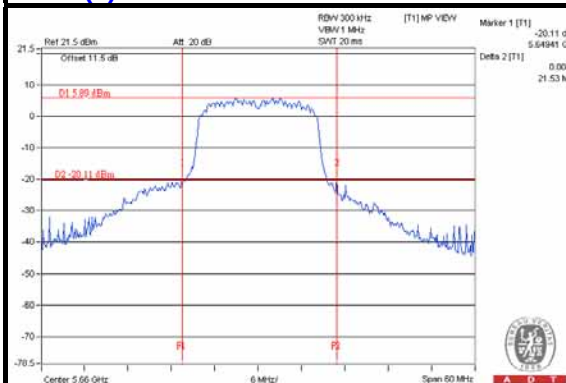
Chain(1) : CH100



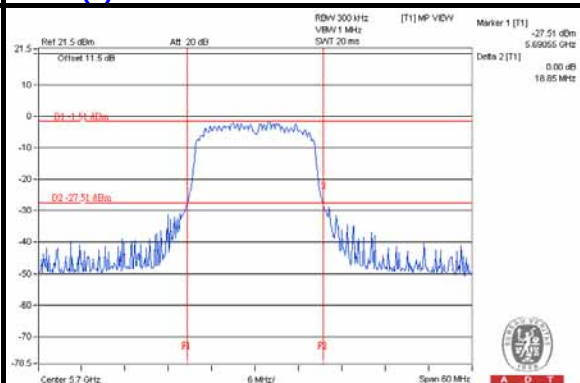
Chain(1) : CH116



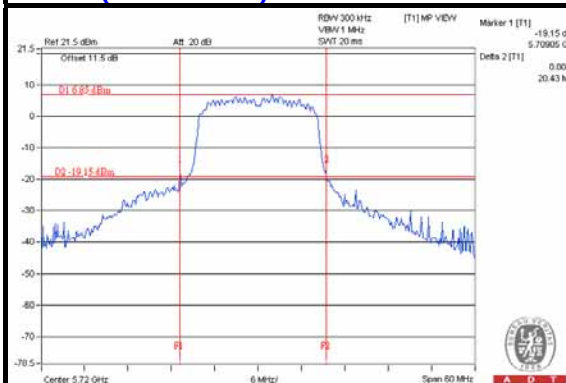
Chain(1) : CH132



Chain(1) : CH140



Chain(1) : CH144 (UNII-2c Band) / Chain(1) : CH144 (UNII-3 Band)



NOTE:

For CH144 (UNII-2c Band) = 5725 - Market 1

For CH144 (UNII-3 Band) = Delta 2 - CH144 (UNII-2c Band) BW

802.11n (HT20)

CHAN.	CHAN. FREQ. (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
36	5180	10.83	12.24	28.855	14.60	16.91	PASS
40	5200	12.14	13.41	38.296	15.83	16.91	PASS
48	5240	12.23	13.32	38.189	15.82	16.91	PASS
52	5260	14.54	15.75	66.029	18.20	23.91	PASS
60	5300	14.53	15.71	65.618	18.17	23.91	PASS
64	5320	9.83	10.42	20.631	13.15	23.91	PASS
100	5500	7.22	7.34	10.692	10.29	22.23	PASS
116	5580	14.41	14.83	58.015	17.64	22.23	PASS
132	5660	14.43	14.84	58.212	17.65	22.23	PASS
140	5700	6.70	6.94	9.620	9.83	22.23	PASS
144 (UNII-2c Band)	5720	11.38	11.95	29.408	14.68	21.06	PASS
144 (UNII-3 Band)	5720	3.46	5.67	5.908	7.71	22.28	PASS

Note:

5150~5250MHz: The directional gain is 6.09dBi > 6dBi, therefore the limit needs to reduce, so the power limit shall be reduced to "Determined Conducted Limit-(6.09-6)".

5250~5350MHz: The directional gain is 6.09dBi > 6dBi, therefore the limit needs to reduce, so the power limit shall be reduced to "Determined Conducted Limit-(6.09-6)".

5470~5725MHz (Except for UNII-3 Band): The directional gain is 7.77dBi > 6dBi, therefore the limit needs to reduce, so the power limit shall be reduced to "Determined Conducted Limit-(7.77-6)".

5725~5825MHz (For UNII-3 Band): The directional gain is 7.77dBi > 6dBi, therefore the limit needs to reduce, so the power limit shall be reduced to "Determined Conducted Limit-(7.77-6)".

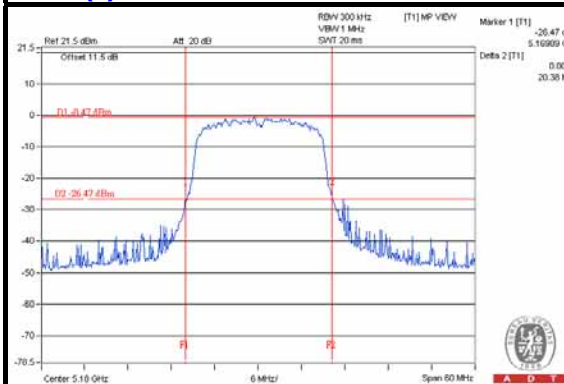
802.11n (HT20) 26dB OCCUPIED BANDWIDTH

CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)	
		CHAIN 0	CHAIN 1
36	5180	20.38	21.06
40	5200	20.04	20.47
48	5240	20.01	20.40
52	5260	21.17	21.82
60	5300	20.88	21.45
64	5320	20.03	20.29
100	5500	20.02	21.64
116	5580	20.51	21.11
132	5660	20.32	20.92
140	5700	19.98	20.75
144 (UNII-2c Band)	5720	15.36	15.26
144 (UNII-3 Band)	5720	5.70	5.07

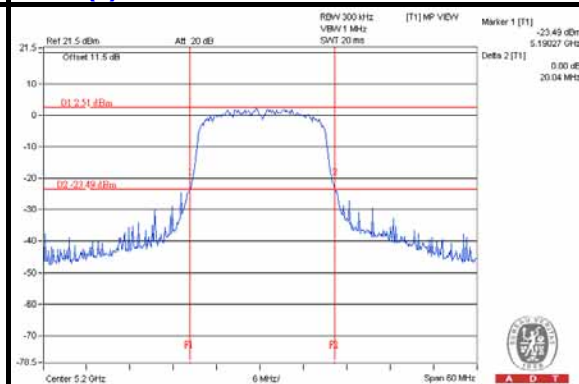
Note: For FCC output power limitation is determined based on 26dB bandwidth.

Power Limit = 4dBm + 10logB < Band 1>			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
36	5180	20.38	17.09 > 17
40	5200	20.04	17.01 > 17
48	5240	20.01	17.01 > 17
Power Limit = 11dBm + 10logB < Band 2~3>			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
52	5260	21.17	24.25 > 24
60	5300	20.88	24.19 > 24
64	5320	20.03	24.01 > 24
100	5500	20.02	24.01 > 24
116	5580	20.51	24.11 > 24
132	5660	20.32	24.07 > 24
140	5700	19.98	24 = 24
144 (UNII-2c Band)	5720	15.26	22.83 < 24
144 (UNII-3 Band)	5720	5.07	24.05 > 30

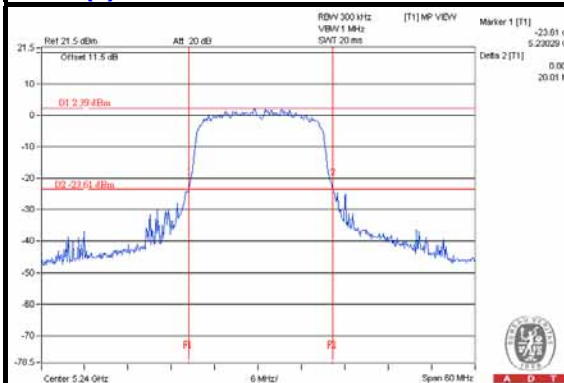
Chain(0) : CH36



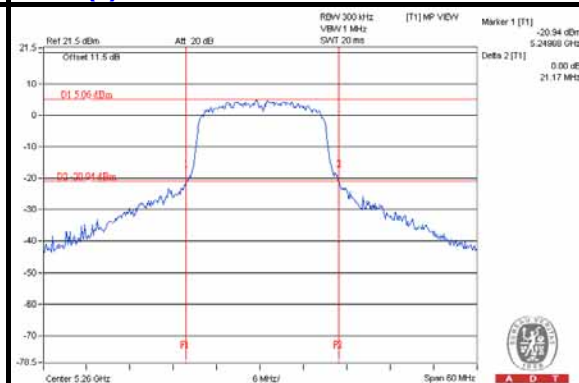
Chain(0) : CH40



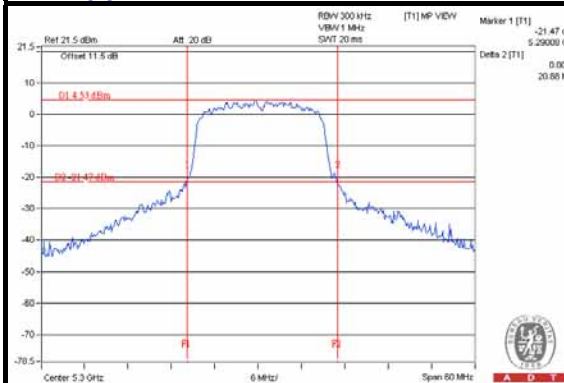
Chain(0) : CH48



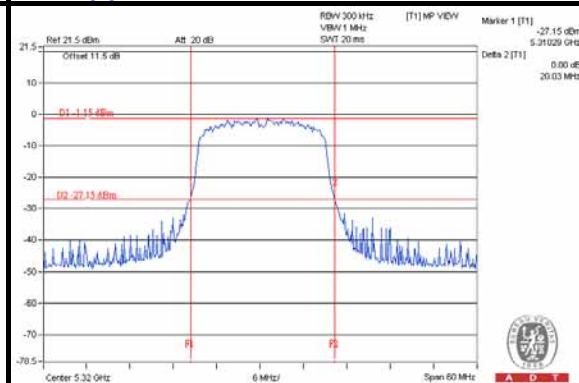
Chain(0) : CH52



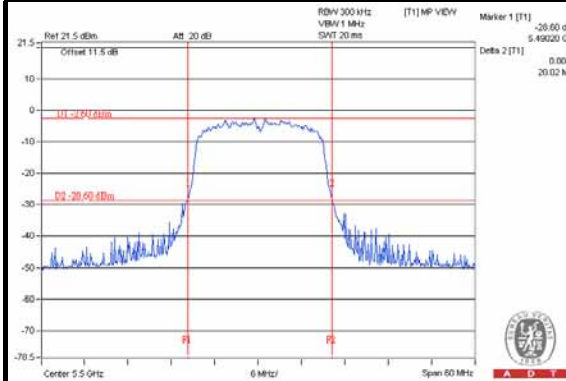
Chain(0) : CH60



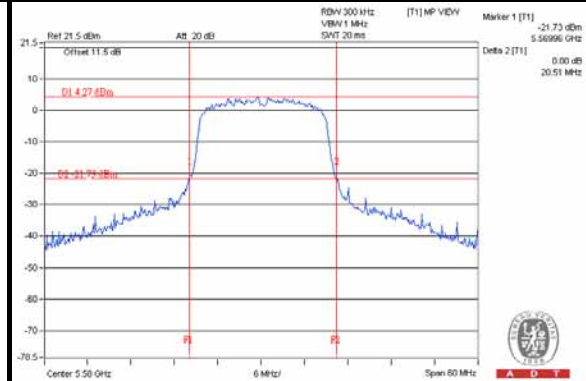
Chain(0) : CH64



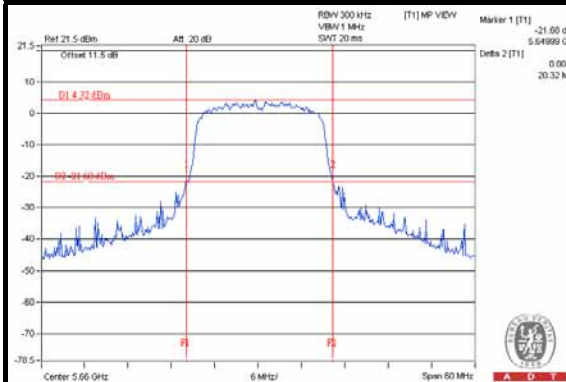
Chain(0) : CH100



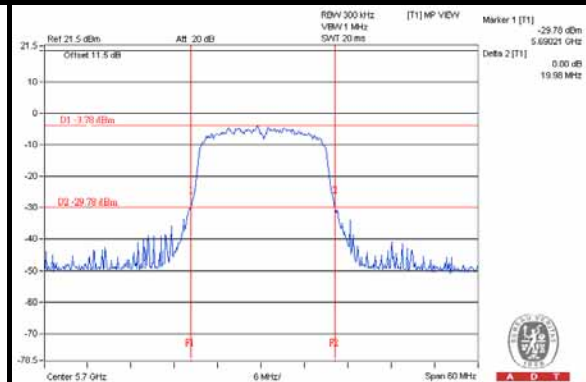
Chain(0) : CH116



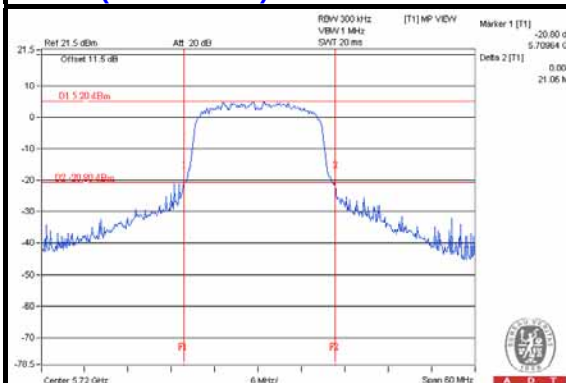
Chain(0) : CH132



Chain(0) : CH140



Chain(0) : CH144 (UNII-2c Band) / Chain(0) : CH144 (UNII-3 Band)

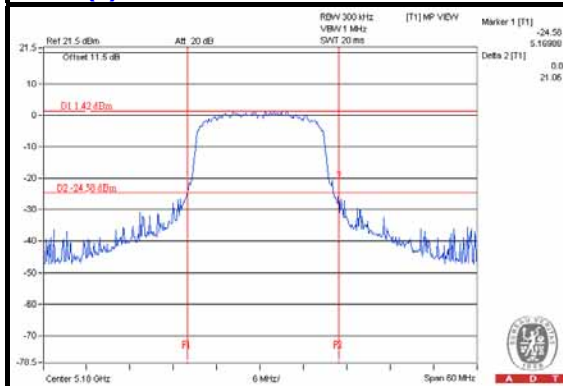


NOTE:

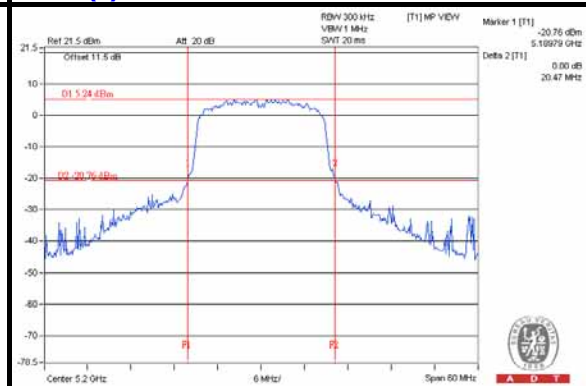
For CH144 (UNII-2c Band) = 5725 - Market 1

For CH144 (UNII-3 Band) = Delta 2 - CH144 (UNII-2c Band) BW

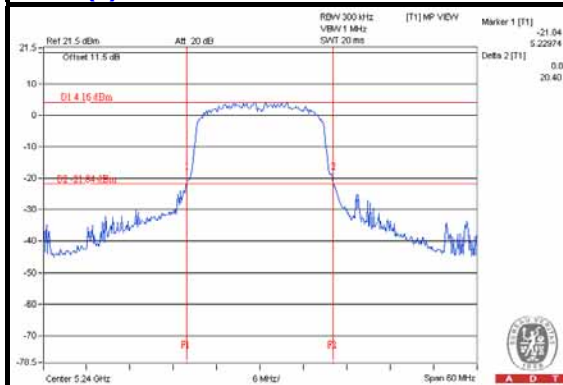
Chain(1) : CH36



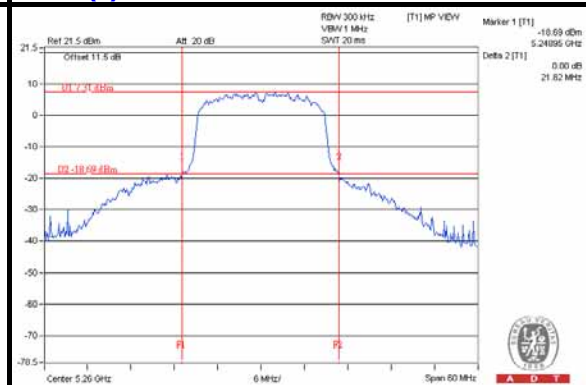
Chain(1) : CH40



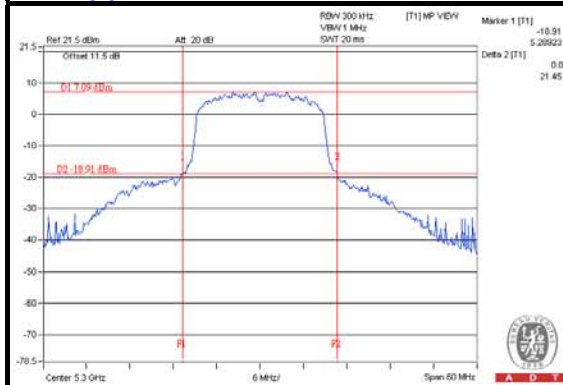
Chain(1) : CH48



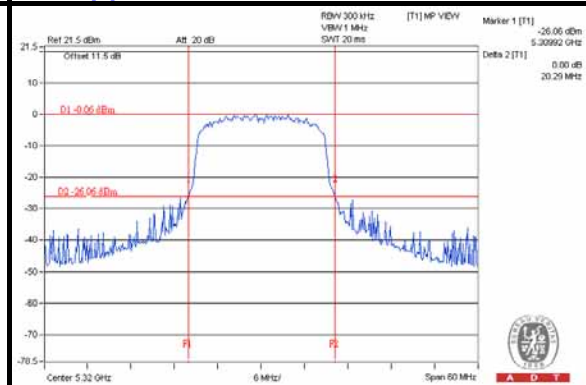
Chain(1) : CH52



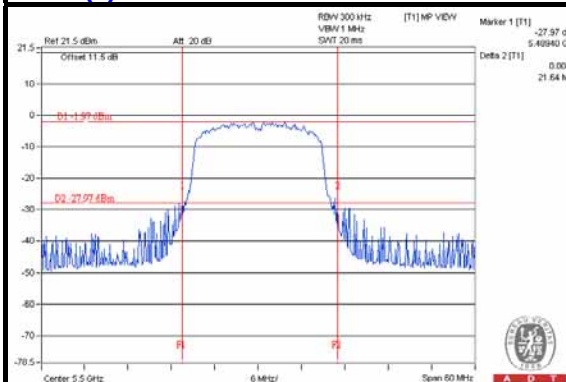
Chain(1) : CH60



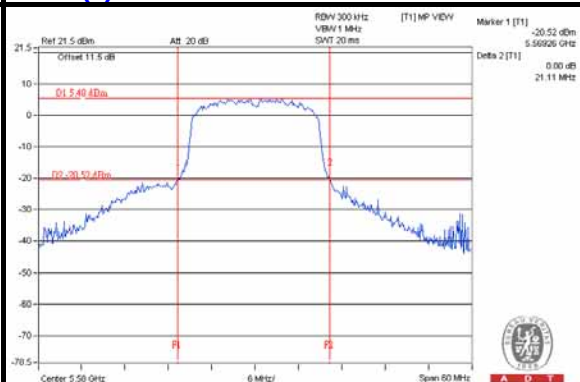
Chain(1) : CH64



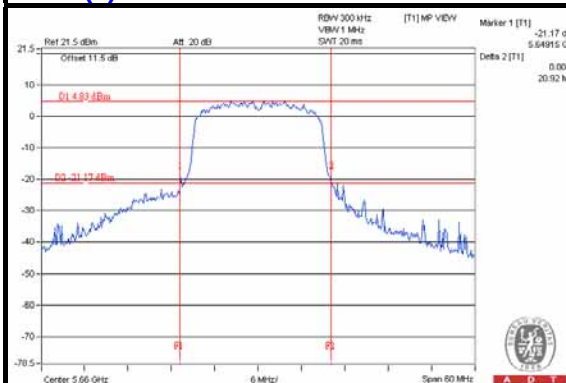
Chain(1) : CH100



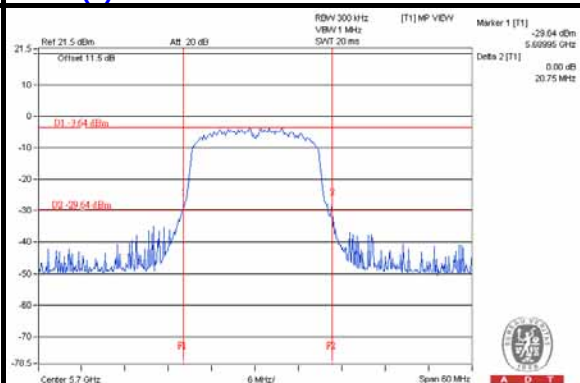
Chain(1) : CH116



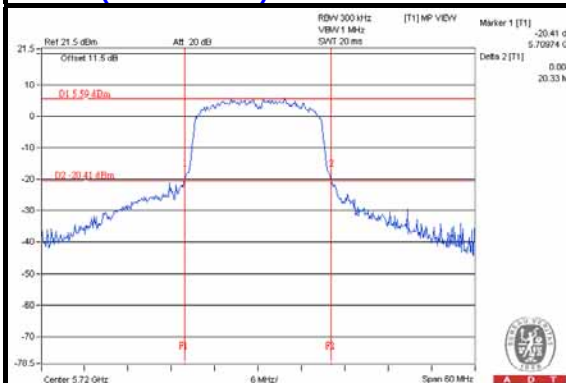
Chain(1) : CH132



Chain(1) : CH140



Chain(1) : CH144 (UNII-2c Band) / Chain(1) : CH144 (UNII-3 Band)



NOTE:

For CH144 (UNII-2c Band) = 5725 - Market 1

For CH144 (UNII-3 Band) = Delta 2 - CH144 (UNII-2c Band) BW

802.11n (HT40)

POWER OUTPUT

CHAN.	CHAN. FREQ. (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
38	5190	9.34	10.83	20.696	13.16	16.91	PASS
46	5230	12.02	13.53	38.464	15.85	16.91	PASS
54	5270	13.12	14.11	46.275	16.65	23.91	PASS
62	5310	9.42	10.24	19.318	12.86	23.91	PASS
102	5510	8.33	8.74	14.290	11.55	22.23	PASS
110	5550	13.12	13.51	42.951	16.33	22.23	PASS
134	5670	13.06	13.27	41.462	16.18	22.23	PASS
142 (UNII-2c Band)	5710	10.57	11.38	25.681	14.10	22.23	PASS
142 (UNII-3 Band)	5710	-2.90	-2.30	1.1253	0.51	22.87	PASS

Note:

5150~5250MHz: The directional gain is 6.09dBi > 6dBi, therefore the limit needs to reduce, so the power limit shall be reduced to "Determined Conducted Limit-(6.09-6)".

5250~5350MHz: The directional gain is 6.09dBi > 6dBi, therefore the limit needs to reduce, so the power limit shall be reduced to "Determined Conducted Limit-(6.09-6)".

5470~5725MHz (Except for UNII-3 Band): The directional gain is 7.77dBi > 6dBi, therefore the limit needs to reduce, so the power limit shall be reduced to "Determined Conducted Limit-(7.77-6)".

5725~5825MHz (For UNII-3 Band): The directional gain is 7.77dBi > 6dBi, therefore the limit needs to reduce, so the power limit shall be reduced to "Determined Conducted Limit-(7.77-6)".

For CH142: Total power (dBm)= Average power <Chain 0 +1>(dBm) + Duty Factor (0.09dB)

802.11n (HT40)

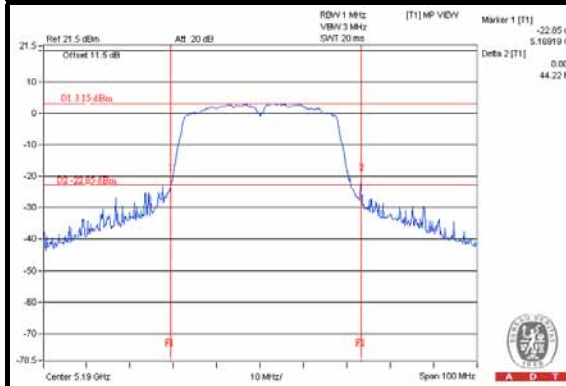
26dB OCCUPIED BANDWIDTH

CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)	
		CHAIN 0	CHAIN 1
38	5190	44.22	44.75
46	5230	41.98	51.58
54	5270	41.84	51.85
62	5310	48.87	41.67
102	5510	41.86	41.64
110	5550	51.05	43.52
134	5670	43.88	45.03
142 (UNII-2c Band)	5710	35.86	36.84
142 (UNII-3 Band)	5710	5.81	11.60

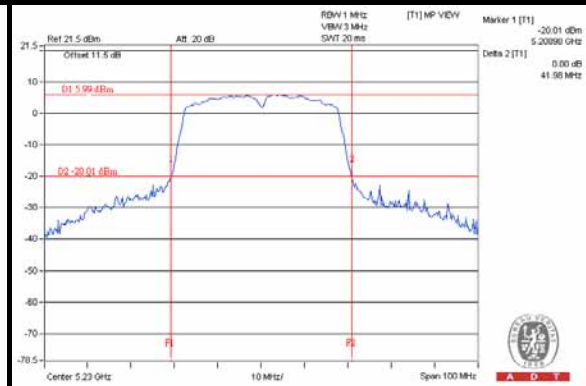
Note: For FCC output power limitation is determined based on 26dB bandwidth.

Power Limit = 4dBm + 10logB < Band 1>			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
38	5190	44.22	21.11 > 17
46	5230	41.98	21.43 > 17
Power Limit = 11dBm + 10logB < Band 2~3>			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
54	5270	41.84	27.21 > 24
62	5310	41.67	27.19 > 24
102	5510	41.64	27.19 > 24
110	5550	43.52	27.38 > 24
134	5670	43.88	27.42 > 24
142 (UNII-2c Band)	5710	35.86	26.54 > 24
142 (UNII-3 Band)	5710	5.81	24.64 < 30

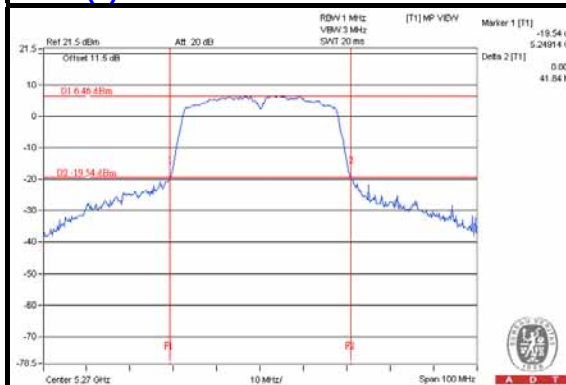
Chain(0) : CH38



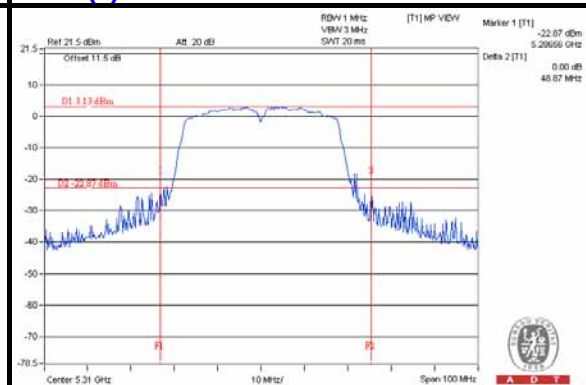
Chain(0) : CH46



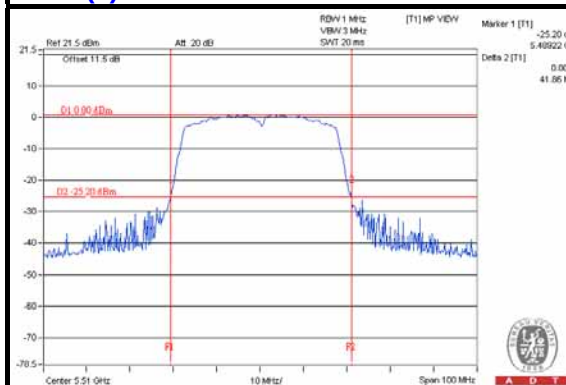
Chain(0) : CH54



Chain(0) : CH62



Chain(0) : CH102



Chain(0) : CH110

