FCC TEST REPORT (15.407)

REPORT NO.: RF960807L13-1

MODEL NO.: DIR-855

RECEIVED: Aug. 08, 2007

TESTED: Aug. 09 ~ Aug. 15, 2007

ISSUED: Aug. 21, 2007

APPLICANT: D-Link Corporation

ADDRESS: 17595 Mt. Herrmann, Fountain Valley, CA 92708, U.S.A.

ISSUED BY: Advance Data Technology Corporation

LAB ADDRESS: No. 47, 14th Ling, Chia Pau Tsuen, Lin Kou Hsiang 244, Taipei Hsien, Taiwan, R.O.C.

TEST LOCATION: No. 19, Hwa Ya 2nd Rd., Kwei Shan Hsiang, Taoyuan Hsien 333, Taiwan, R.O.C.

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1. CERTIFICATION

PRODUCT: Xtreme N DUO Media Router
MODEL: DIR-855
BRAND: D-Link
APPLICANT: D-Link Corporation
TEST SAMPLE: ENGINEERING SAMPLE
TESTED: Aug. 09 ~ Aug. 15, 2007
STANDARDS: **FCC Part 15, Subpart E (Section 15.407)**
ANSI C63.4-2003

The above equipment (Model: DIR-855) has been tested by **Advance Data Technology Corporation,** 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 : Andrea Hsia , **DATE:** Aug. 21, 2007
Andrea Hsia / Specialist

TECHNICAL ACCEPTANCE : Long Chen , **DATE:** Aug. 21, 2007
Responsible for RF
Long Chen / Senior Engineer

APPROVED BY : Gary Chang , **DATE:** Aug. 21, 2007
Gary Chang / Assistant 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)			
STANDARD SECTION	**TEST TYPE AND LIMIT**	**RESULT**	**REMARK**
15.407(b)(5)	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -6.54dB at 0.198MHz.
15.407(b/1/2/3) (b)(5)	Electric Field Strength Spurious Emissions, 30MHz ~ 40000MHz	PASS	Meet the requirement of limit. Minimum passing margin is -1.25dB at 31.84MHz.
15.407(a/1/2/3)	Peak Transmit Power	PASS	Meet the requirement of limit.
15.407(a)(6)	Peak Power Excursion	PASS	Meet the requirement of limit.
15.407(a/1/2/3)	Peak Power Spectral Density	PASS	Meet the requirement of limit.
15.407(g)	Frequency Stability	PASS	Meet the requirement of limit.

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	UNCERTAINTY
Conducted emissions	9kHz~30MHz	2.44 dB
Radiated emissions	30MHz ~ 200MHz	3.34 dB
	200MHz ~1000MHz	3.35 dB
	1GHz ~ 18GHz	2.26 dB
	18GHz ~ 40GHz	1.94 dB

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

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

EUT	Xtreme N DUO Media Router
MODEL NO.	DIR-855
FCC ID	KA2DIR855A1
POWER SUPPLY	12Vdc from AC Adapter
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
MODULATION TECHNOLOGY	DSSS, OFDM
TRANSFER RATE	802.11b:11.0/ 5.5/ 2.0/ 1.0Mbps 802.11g: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0Mbps 802.11a: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0Mbps Draft 802.11n (20MHz): 130.0/ 117.0/ 104.0/ 78.0/ 52.0/ 39.0/ 26.0/ 13.0/ 65.0/ 58.5/ 52.0/ 29.0/ 26.0/ 19.5/ 13.0/ 6.5Mbps Draft 802.11n (40MHz): 270.0/ 243.0/ 216.0/ 162.0/ 108.0/ 81.0/ 54.0/ 27.0 /135.0/ 121.5/ 108.0/ 81.0/ 54.0/ 40.5/ 27.0/ 13.5Mbps
FREQUENCY RANGE	2.4GHz: 2400 ~ 2483.5MHz 5.0GHz: 5150 ~ 5250MHz, 5725 ~ 5850MHz
NUMBER OF CHANNEL	**2.4GHz:** 11 for 802.11b, 802.11g, draft 802.11n (20MHz) 7 for draft 802.11n (40MHz) **5.0GHz:** 5150 ~ 5250MHz: 4 for 802.11a, draft 802.11n (20MHz) 2 for draft 802.11n (40MHz) 5725 ~ 5850MHz: 5 for 802.11a, draft 802.11n (20MHz) 2 for draft 802.11n (40MHz)
OUTPUT POWER	98.015mW for 2400 ~ 2483.5MHz 41.489mW for 5150 ~ 5250MHz 147.892mW for 5725 ~ 5850MHz
ANTENNA TYPE	Dipole antenna with 2.0dBi gain
DATA CABLE	NA
I/O PORTS	RJ45, USB console port
ASSOCIATED DEVICES	Adapter

NOTE:

1. For this EUT with two antennas that was only different in color of appearance and manufacture. After pre-tested found black one was the worst and presented in the test report.
2. The EUT was operated with following adapter.

BRAND:	D-Link
MODEL:	AG2412-B
INPUT:	100-240Vac, 50-60Hz, 0.5A
OUTPUT:	12Vdc, 2A
POWER LINE:	1.8m non-shielded cable without core

3. The USB console port without any function.
4. The EUT incorporates a MIMO function. Physically, the card provides three completed transmitters and three receivers.
5. The EUT with following module cards:

MODULE CARDS	REMARKS
A	With 802.11b, 802.11g, and 802.11n function
B	With 802.11a, 802.11b, 802.11g and 802.11n function

**For the module cards B, all the function of 2.4GHz will be closed by software.

6. For the 802.11n, the EUT is 3 * 3 spatial MIMO (3Tx & 3Rx) without beam forming function.
7. When the EUT operating in 802.11b, 802.11g, 802.11a, the software operation, which is defined by manufacturer, only set single Tx.
8. When the EUT operating in draft 802.11n, the software operation, which is defined by manufacturer, only set 0 ~ 15 of “MCS” (MCS: Modulation and Coding Schemes) for Triple Tx.
9. The EUT complies with draft 802.11n standards and backwards compatible with 802.11b, 802.11g, 802.11a products.
10. The EUT operates in the 2.4GHz frequency spectrum with throughput of up to 270Mbps.
11. The above EUT information was declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

3.2 DESCRIPTION OF TEST MODES

Operated in 5150 ~ 5350MHz

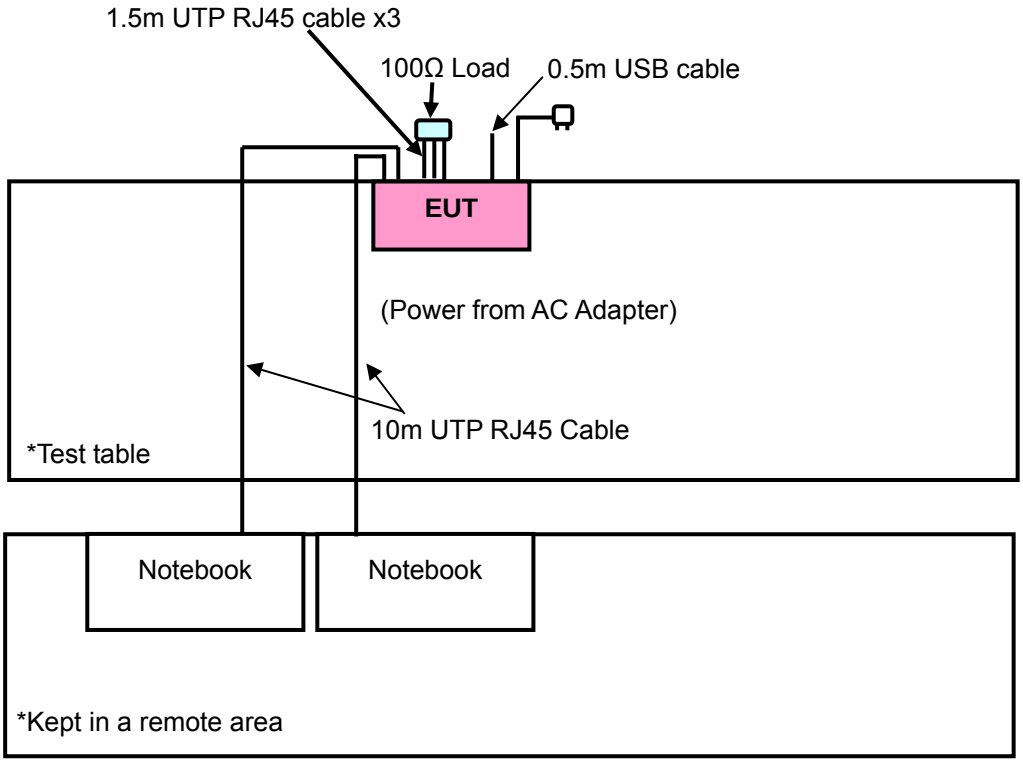
4 channels are provided for 802.11a, draft 802.11n (20MHz):

CHANNEL	FREQUENCY
1	5180 MHz
2	5200 MHz
3	5220 MHz
4	5240 MHz

2 channels are provided for draft 802.11n (40MHz):

CHANNEL	FREQUENCY
1	5190 MHz
2	5230 MHz

3.2.1 CONFIGURATION OF SYSTEM UNDER TEST



3.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

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

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

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

POWER LINE CONDUCTED EMISSION TEST:

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

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11a	1 to 4	1	OFDM	BPSK	6.0

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.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11a	1 to 4	1	OFDM	BPSK	6.0

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	1 to 4	1, 2, 4	OFDM	BPSK	6.0
Draft 802.11n (20MHz)	1 to 4	1, 2, 4	OFDM	BPSK	6.5
Draft 802.11n (40MHz)	1 to 2	1, 2	OFDM	BPSK	13.5

BANDEDGE MEASUREMENT:

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

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11a	1 to 4	1, 4	OFDM	BPSK	6.0
Draft 802.11n (20MHz)	1 to 4	1, 4	OFDM	BPSK	6.5
Draft 802.11n (40MHz)	1 to 2	1, 2	OFDM	BPSK	13.5

ANTENNA PORT CONDUCTED MEASUREMENT:

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

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11a	1 to 4	1, 2, 4	OFDM	BPSK	6.0
Draft 802.11n (20MHz)	1 to 4	1, 2, 4	OFDM	BPSK	6.5
Draft 802.11n (40MHz)	1 to 2	1, 2	OFDM	BPSK	13.5

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart E (15.407)
ANSI C63.4-2003

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

NOTE: The EUT is also considered as a kind of computer peripheral, because the connection to computer is necessary for typical use. It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.

3.4 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	PP05L	12130898320	E2K24CLNS
2	NOTEBOOK COMPUTER	DELL	PP05L	9954115984	E2K24CLNS

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	10m RJ45 cable
2	10m RJ45 cable

NOTE 1: All power cords of the above support units are non shielded (1.8m).
NOTE 2: Item 1 ~ 2 acted as communication partners to transfer data.

4. TEST TYPES AND RESULTS

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dBμV)	
	Quasi-peak	Average
0.15 ~ 0.5	66 to 56	56 to 46
0.5 ~ 5	56	46
5 ~ 30	60	50

NOTE: 1. The lower limit shall apply at the transition frequencies.

2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESCS30	100288	Sep. 25, 2007
RF signal cable Woken	5D-FB	Cable-HYCO3-01	Jan. 06, 2008
LISN ROHDE & SCHWARZ	ESH2-Z5	100100	Jan. 08, 2008
LISN ROHDE & SCHWARZ	ESH3-Z5	100311	Jan. 16, 2008
Software ADT	ADT_Cond_V3	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 HwaYa Shielded Room 2.

3. The VCCI Site Registration No. is C-2047.

4.1.3 TEST PROCEDURES

a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.

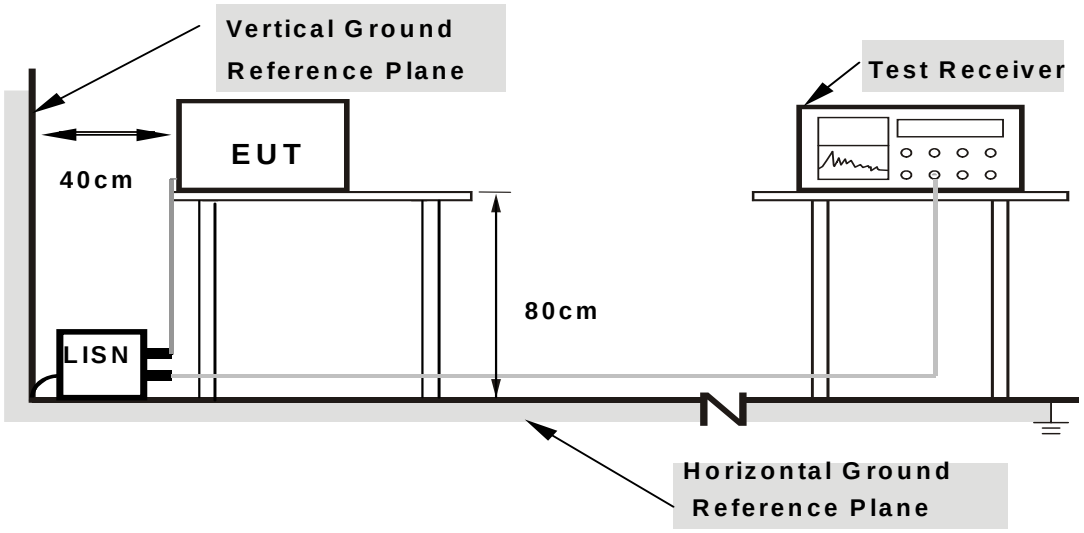
b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

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

4.1.4 DEVIATION FROM TEST STANDARD

No deviation

4.1.5 TEST SETUP



Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

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

4.1.6 EUT OPERATING CONDITIONS

a. Placed the EUT on a testing table.

b. Prepared notebook computer and placed it outside of testing area to act as communication partner for EUT.

c. The EUT ran a test program (provided by manufacturer) to enable all functions under transmission condition continuously at specific channel frequency.

d. The necessary accessories enable the EUT in full functions.

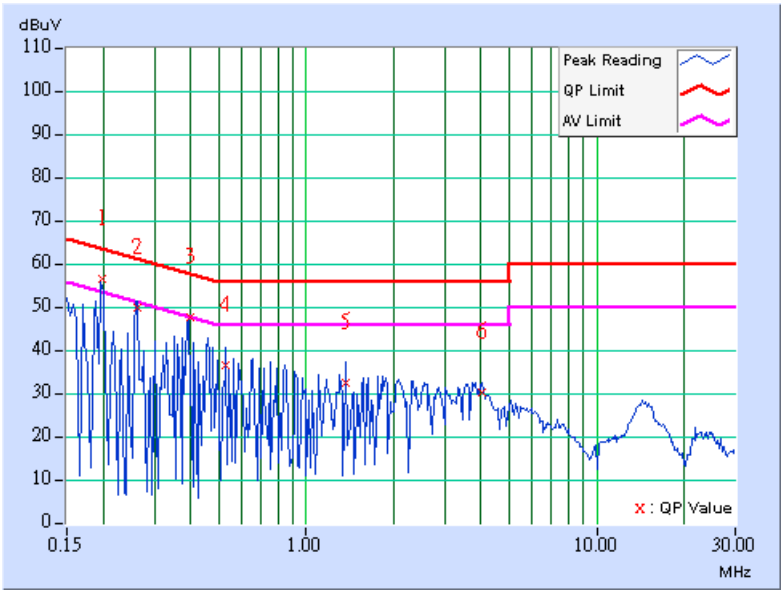
4.1.7 TEST RESULTS

CONDUCTED WORST-CASE DATA: 802.11a OFDM MODULATION:

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	**PHASE**	Line 1
MODULATION TYPE	BPSK	**INPUT POWER (SYSTEM)**	120Vac, 60Hz
TRANSFER RATE	6.0Mbps	**6dB BANDWIDTH**	9kHz
ENVIRONMENTAL CONDITIONS	26deg. C, 65%RH, 991hPa	**TESTED BY**	Kevin Chen

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.198	0.10	56.55	46.51	56.65	46.61	63.70	53.70	-7.05	-7.09
2	0.264	0.10	49.56	-	49.66	-	61.32	51.32	-11.66	-
3	0.399	0.10	47.68	-	47.78	-	57.88	47.88	-10.10	-
4	0.525	0.10	36.49	-	36.59	-	56.00	46.00	-19.41	-
5	1.377	0.15	32.46	-	32.61	-	56.00	46.00	-23.39	-
6	4.033	0.28	30.27	-	30.55	-	56.00	46.00	-25.45	-

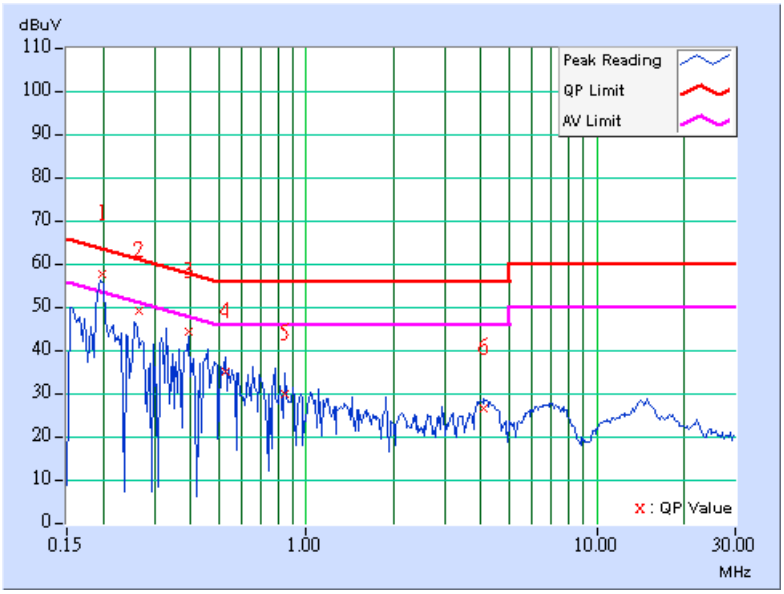
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	PHASE	Line 2
MODULATION TYPE	BPSK	INPUT POWER (SYSTEM)	120Vac, 60Hz
TRANSFER RATE	6.0Mbps	6dB BANDWIDTH	9kHz
ENVIRONMENTAL CONDITIONS	26deg. C, 65%RH, 991hPa	TESTED BY	Kevin Chen

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	**0.198**	**0.10**	**57.48**	**47.06**	**57.58**	**47.16**	**63.70**	**53.70**	**-6.12**	**-6.54**
2	0.266	0.10	49.15	-	49.25	-	61.25	51.25	-12.00	-
3	0.395	0.10	44.21	-	44.31	-	57.97	47.97	-13.66	-
4	0.527	0.12	34.88	-	35.00	-	56.00	46.00	-21.00	-
5	0.847	0.18	29.64	-	29.82	-	56.00	46.00	-26.18	-
6	4.063	0.28	26.53	-	26.81	-	56.00	46.00	-29.19	-

REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.



4.2 RADIATED EMISSION MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:

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. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

4.2.2 LIMITS OF UNWANTED EMISSION OUT OF THE RESTRICTED BANDS

FREQUENCIES (MHz)	EIRP LIMIT (dBm)	EQUIVALENT FIELD STRENGTH AT 3m (dBμV/m) *NOTE 3
5150 ~ 5250	-27	68.3
5250 ~ 5350	-27	68.3
5470 ~ 5725	-27	68.3

NOTE:

1. For frequencies 10MHz or greater above or below the band edge.
2. All emissions within the frequency range from the band edge to 10MHz above or below the band edge.
3. The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength:

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

4.2.3 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESCI	100424	Jul. 27, 2008
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100025	Oct. 05, 2007
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	May 31, 2008
HORN Antenna SCHWARZBECK	9120D	9120D-209	Jun. 28, 2008
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170243	Dec. 28, 2007
Preamplifier Agilent	8447D	2944A10633	Oct. 26, 2007
Preamplifier Agilent	8449B	3008A01964	Oct. 26, 2007
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	238137/4	Dec. 11, 2007
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	233233/4	Nov. 14, 2007
Software ADT.	ADT_Radiated_V7.6	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA
Antenna Tower Controller inn-co GmbH	CO2000	017303	NA
Turn Table ADT.	TT100.	TT93021703	NA
Turn Table Controller ADT.	SC100.	SC93021703	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 HwaYa Chamber 3.

3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.

4. The VCCI Site Registration No. is R-237.

5. The IC Site Registration No. is IC3789B-3.

4.2.4 TEST PROCEDURES

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. 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 antenna is a broadband antenna, and its height 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 Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

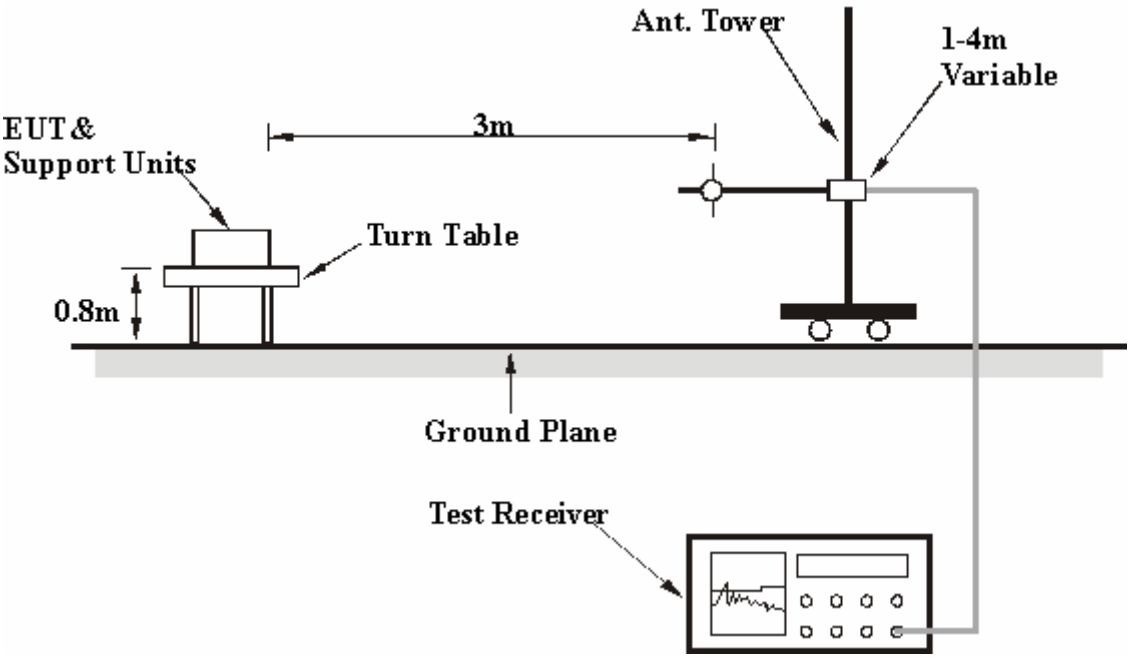
NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10Hz for Average detection (AV) at frequency above 1GHz.

4.2.5 DEVIATION FROM TEST STANDARD

No deviation

4.2.6 TEST SETUP



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

4.2.7 EUT OPERATING CONDITION

Same as 4.1.6

4.2.8 TEST RESULTS

BELOW 1GHz WORST-CASE DATA: 802.11a OFDM MODULATION:

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	**FREQUENCY RANGE**	Below 1000MHz
MODULATION TYPE	BPSK	**TRANSFER RATE**	6.0Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	**DETECTOR FUNCTION**	Quasi-Peak
ENVIRONMENTAL CONDITIONS	27deg. C, 68%RH, 991hPa	**TESTED BY**	Dean Wang

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	113.50	38.55 QP	43.50	-4.95	1.50 H	10	26.71	11.84
2	179.61	38.58 QP	43.50	-4.92	1.50 H	271	25.55	13.03
3	249.60	40.09 QP	46.00	-5.91	1.00 H	319	26.61	13.47
4	374.04	40.95 QP	46.00	-5.05	1.00 H	238	23.91	17.03
5	500.42	42.89 QP	46.00	-3.11	1.50 H	1	22.59	20.29
6	599.58	39.99 QP	46.00	-6.01	2.00 H	16	17.54	22.45
7	751.23	40.36 QP	46.00	-5.64	1.00 H	244	14.71	25.65
8	875.67	44.58 QP	46.00	-1.42	1.50 H	295	17.29	27.29

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	**31.84**	**38.75 QP**	**40.00**	**-1.25**	**1.00 V**	**169**	**25.21**	**13.54**
2	66.84	37.17 QP	40.00	-2.83	1.00 V	295	24.07	13.10
3	249.60	40.21 QP	46.00	-5.79	1.50 V	319	26.74	13.47
4	374.04	41.24 QP	46.00	-4.76	1.00 V	205	24.21	17.03
5	500.42	41.89 QP	46.00	-4.11	1.00 V	187	21.60	20.29
6	624.85	42.94 QP	46.00	-3.06	1.50 V	160	19.92	23.02
7	751.23	40.98 QP	46.00	-5.02	1.50 V	322	15.33	25.65
8	875.67	44.49 QP	46.00	-1.51	1.00 V	67	17.20	27.29

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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.

ABOVE 1GHz DATA: 802.11a OFDM MODULATION:

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 40GHz
MODULATION TYPE	BPSK	TRANSFER RATE	6.0Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH, 991hPa	TESTED BY	Brad Wu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5150.00	55.98 PK	74.00	-18.02	1.06 H	205	18.97	37.01
2	#5150.00	41.09 AV	54.00	-12.91	1.06 H	205	4.08	37.01
3	*5180.00	99.08 PK			1.06 H	205	62.04	37.04
4	*5180.00	88.50 AV			1.06 H	205	51.46	37.04
5	10360.00	55.21 PK	68.30	-13.09	1.01 H	192	8.69	46.52

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5150.00	67.99 PK	74.00	-6.01	1.19 V	160	30.98	37.01
2	#5150.00	47.04 AV	54.00	-6.96	1.19 V	160	10.03	37.01
3	*5180.00	109.15 PK			1.19 V	160	72.11	37.04
4	*5180.00	98.34 AV			1.19 V	160	61.30	37.04
5	10360.00	55.60 PK	68.30	-12.70	1.00 V	14	9.08	46.52

REMARKS: 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency falling in the restricted band.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 2	**FREQUENCY RANGE**	1 ~ 40GHz
MODULATION TYPE	BPSK	**TRANSFER RATE**	6.0Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	**DETECTOR FUNCTION**	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH, 991hPa	**TESTED BY**	Brad Wu

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	*5200.00	98.46 PK			1.08 H	210	61.39	37.07
2	*5200.00	88.02 AV			1.08 H	210	50.95	37.07
3	10400.00	56.34 PK	68.30	-11.96	1.18 H	221	9.75	46.59

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	*5200.00	108.50 PK			1.18 V	153	71.43	37.07
2	*5200.00	97.75 AV			1.18 V	153	60.68	37.07
3	10400.00	56.02 PK	68.30	-12.28	1.14 V	256	9.43	46.59

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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency falling in the restricted band.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 4	FREQUENCY RANGE	1 ~ 40GHz
MODULATION TYPE	BPSK	TRANSFER RATE	6.0Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH, 991hPa	TESTED BY	Brad Wu

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	*5240.00	98.25 PK			1.05 H	200	61.15	37.10
2	*5240.00	87.80 AV			1.05 H	200	50.70	37.10
3	#5350.00	50.42 PK	74.00	-23.58	1.05 H	200	13.23	37.19
4	#5350.00	38.50 AV	54.00	-15.50	1.05 H	200	1.31	37.19
5	10480.00	56.21 PK	68.30	-12.09	1.18 H	20	9.44	46.77

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	*5240.00	107.97 PK			1.16 V	154	70.87	37.10
2	*5240.00	98.05 AV			1.16 V	154	60.95	37.10
3	#5350.00	50.72 PK	74.00	-23.28	1.16 V	154	13.53	37.19
4	#5350.00	38.72 AV	54.00	-15.28	1.16 V	154	1.53	37.19
5	10480.00	54.96 PK	68.30	-13.34	1.11 V	245	8.19	46.77

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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency falling in the restricted band.

DRAFT 802.11n (20MHz) OFDM MODULATION:

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 40GHz
MODULATION TYPE	BPSK	TRANSFER RATE	6.5Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 66%RH, 991hPa	TESTED BY	Brad Wu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5150.00	49.88 PK	74.00	-24.12	1.20 H	213	12.87	37.01
2	#5150.00	34.44 AV	54.00	-19.56	1.20 H	213	-2.57	37.01
3	*5180.00	99.87 PK			1.20 H	213	62.83	37.04
4	*5180.00	89.55 AV			1.20 H	213	52.51	37.04
5	10360.00	56.10 PK	68.30	-12.20	1.00 H	315	9.58	46.52

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5150.00	58.96 PK	74.00	-15.04	1.27 V	117	21.95	37.01
2	#5150.00	42.10 AV	54.00	-11.90	1.27 V	117	5.09	37.01
3	*5180.00	109.38 PK			1.27 V	117	72.34	37.04
4	*5180.00	97.95 AV			1.27 V	117	60.91	37.04
5	10360.00	56.22 PK	68.30	-12.08	1.25 V	72	9.70	46.52

REMARKS: 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency falling in the restricted band.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 2	**FREQUENCY RANGE**	1 ~ 40GHz
MODULATION TYPE	BPSK	**TRANSFER RATE**	6.5Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	**DETECTOR FUNCTION**	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH, 991hPa	**TESTED BY**	Brad Wu

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	*5200.00	101.50 PK			1.06 H	138	64.43	37.07
2	*5200.00	91.07 AV			1.06 H	138	54.00	37.07
3	10400.00	54.65 PK	68.30	-13.65	1.02 H	100	8.06	46.59

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	*5200.00	109.16 PK			1.31 V	350	72.09	37.07
2	*5200.00	99.02 AV			1.31 V	350	61.95	37.07
3	10400.00	54.92 PK	68.30	-13.38	1.31 V	0	8.33	46.59

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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency falling in the restricted band.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 4	**FREQUENCY RANGE**	1 ~ 40GHz
MODULATION TYPE	BPSK	**TRANSFER RATE**	6.5Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	**DETECTOR FUNCTION**	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH, 991hPa	**TESTED BY**	Brad Wu

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	*5240.00	100.27 PK			1.08 H	146	63.17	37.10
2	*5240.00	90.55 AV			1.08 H	146	53.45	37.10
3	#5350.00	51.11 PK	74.00	-22.89	1.08 H	146	13.92	37.19
4	#5350.00	38.67 AV	54.00	-15.33	1.08 H	146	1.48	37.19
5	10480.00	54.30 PK	68.30	-14.00	1.00 H	28	7.53	46.77

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	*5240.00	109.32 PK			1.41 V	349	72.22	37.10
2	*5240.00	98.60 AV			1.41 V	349	61.50	37.10
3	#5350.00	51.20 PK	74.00	-22.80	1.41 V	349	14.01	37.19
4	#5350.00	38.89 AV	54.00	-15.11	1.41 V	349	1.70	37.19
5	10480.00	54.77 PK	68.30	-13.53	1.28 V	12	8.00	46.77

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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency falling in the restricted band.

DRAFT 802.11n (40MHz) OFDM MODULATION:

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 40GHz
MODULATION TYPE	BPSK	TRANSFER RATE	13.5Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 66%RH, 991hPa	TESTED BY	Brad Wu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5150.00	55.34 PK	74.00	-18.66	1.01 H	207	18.33	37.01
2	#5150.00	42.10 AV	54.00	-11.90	1.01 H	207	5.09	37.01
3	*5190.00	96.13 PK			1.01 H	207	59.07	37.06
4	*5190.00	86.17 AV			1.01 H	207	49.11	37.06
5	10380.00	55.04 PK	68.30	-13.26	1.01 H	3	8.49	46.55

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5150.00	67.72 PK	74.00	-6.28	1.34 V	33	30.71	37.01
2	#5150.00	52.34 AV	54.00	-1.66	1.34 V	33	15.33	37.01
3	*5190.00	107.43 PK			1.34 V	34	70.37	37.06
4	*5190.00	97.00 AV			1.34 V	34	59.94	37.06
5	10380.00	55.58 PK	68.30	-12.72	1.01 V	229	9.03	46.55

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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency falling in the restricted band.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 2	FREQUENCY RANGE	1 ~ 40GHz
MODULATION TYPE	BPSK	TRANSFER RATE	13.5Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 66%RH, 991hPa	TESTED BY	Brad Wu

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	*5230.00	96.24 PK			1.01 H	207	59.15	37.09
2	*5230.00	85.96 AV			1.01 H	207	48.87	37.09
3	#5350.00	49.44 PK	74.00	-24.56	1.01 H	207	12.25	37.19
4	#5350.00	37.44 AV	54.00	-16.56	1.01 H	207	0.25	37.19
5	10460.00	55.44 PK	68.30	-12.86	1.01 H	18	8.71	46.73

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	*5230.00	106.97 PK			1.44 V	33	69.88	37.09
2	*5230.00	96.80 AV			1.44 V	33	59.71	37.09
3	#5350.00	51.15 PK	74.00	-22.85	1.44 V	33	13.96	37.19
4	#5350.00	39.10 AV	54.00	-14.90	1.44 V	33	1.91	37.19
5	10460.00	55.57 PK	68.30	-12.73	1.01 V	15	8.84	46.73

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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency falling in the restricted band.

4.3 PEAK TRANSMIT POWER MEASUREMENT

4.3.1 LIMITS OF PEAK TRANSMIT POWER MEASUREMENT

FREQUENCY BAND	LIMIT
5.150 ~ 5.250GHz	The lesser of 50mW (17dBm) or 4dBm + 10logB
5.250 ~ 5.350GHz	The lesser of 250mW (24dBm) or 11dBm + 10logB
5.470 ~ 5.725GHz	The lesser of 250mW (24dBm) or 11dBm + 10logB

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

4.3.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
R&S SPECTRUM ANALYZER	FSP40	100040	Jun. 28, 2008

NOTE: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.3.3 TEST PROCEDURE

1. The transmitter output was connected to the spectrum analyzer.
2. Set span to encompass the entire emission bandwidth of the signal.
3. Set RBW to 1MHz, VBW to 300kHz.
4. Using the spectrum analyzer's channel power measurement function to measure the output power.

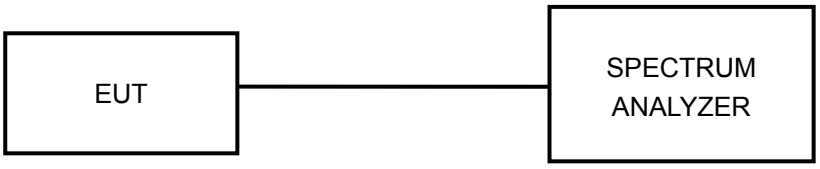
NOTE: The test is performed in accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E, August 2002.

The transmitter output operates continuously therefore Method # 1 is used.

4.3.4 DEVIATION FROM TEST STANDARD

No deviation

4.3.5 TEST SETUP



4.3.6 EUT OPERATING CONDITIONS

The software provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.

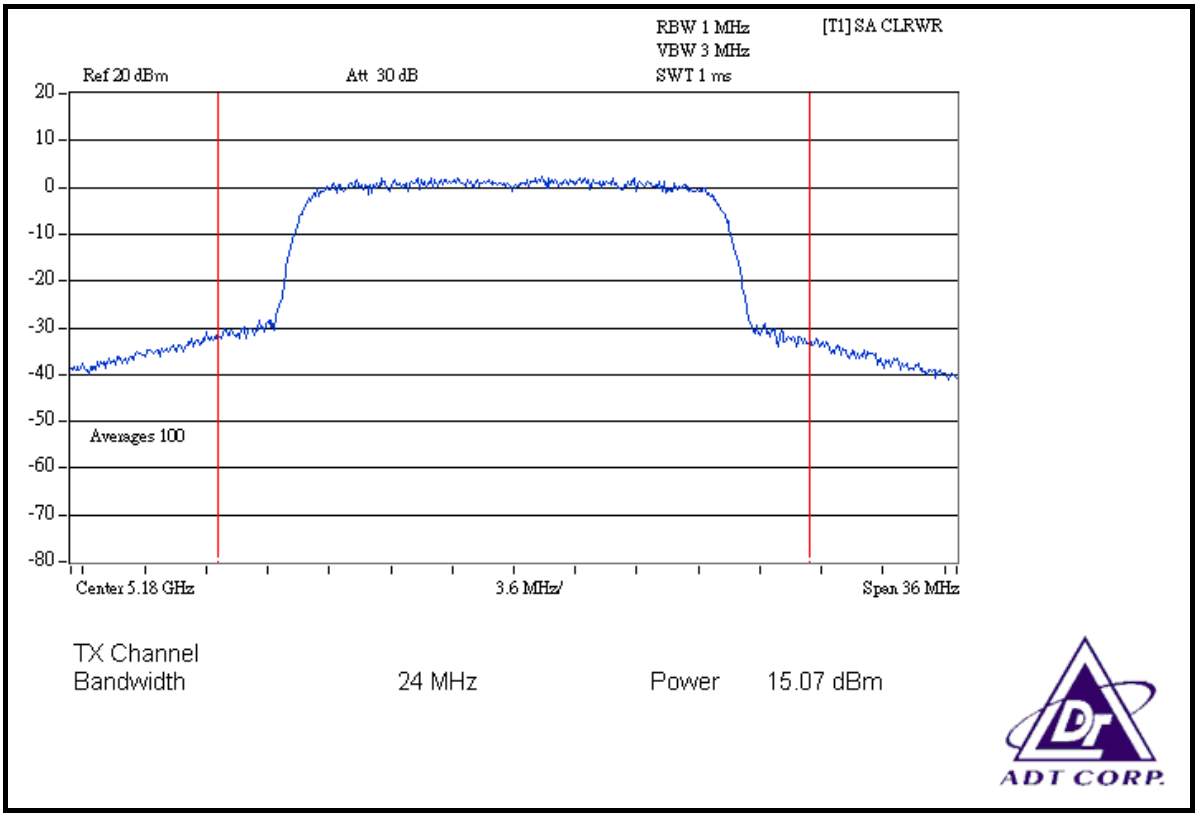
4.3.7 TEST RESULTS

PEAK POWER OUTPUT: 802.11a OFDM MODULATION:

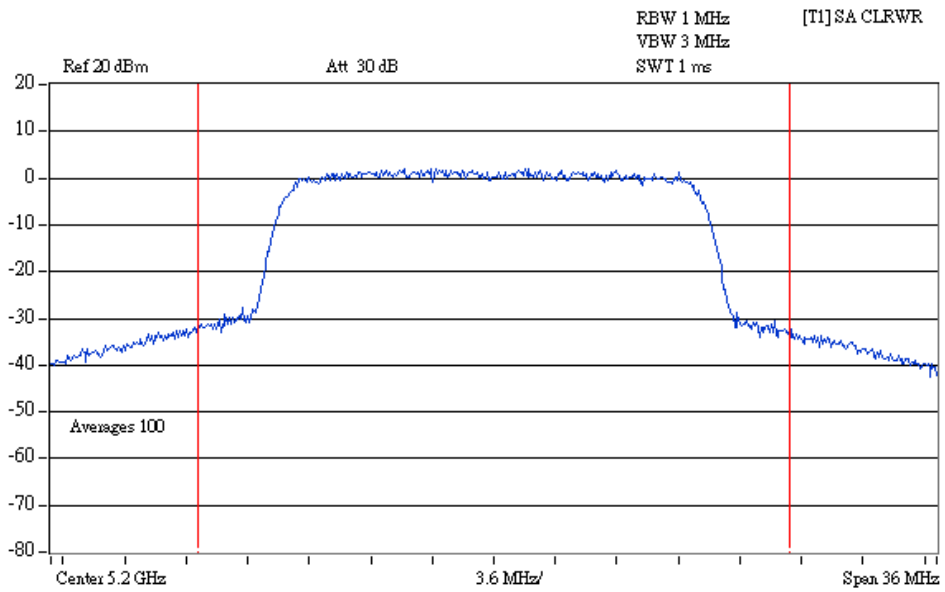
MODULATION TYPE	BPSK	**TRANSFER RATE**	6.0Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	**ENVIRONMENTAL CONDITIONS**	25deg.C, 65%RH, 991hPa
TESTED BY	Long Chen		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS / FAIL
1	5180	32.137	15.07	17.00	PASS
2	5200	31.623	15.00	17.00	PASS
4	5240	32.359	15.10	17.00	PASS

CH 1

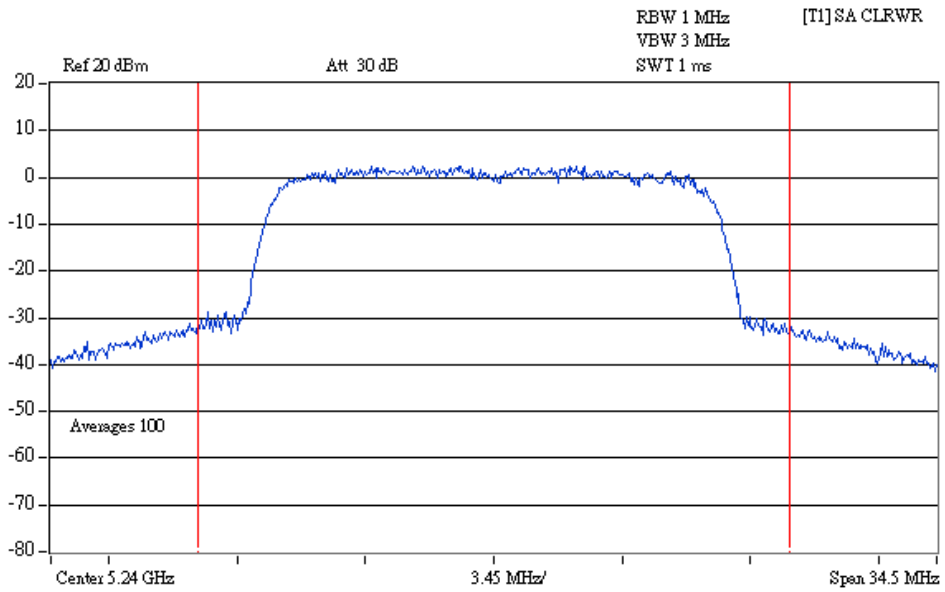


CH 2



TX Channel Bandwidth 24 MHz Power 15 dBm

CH 4



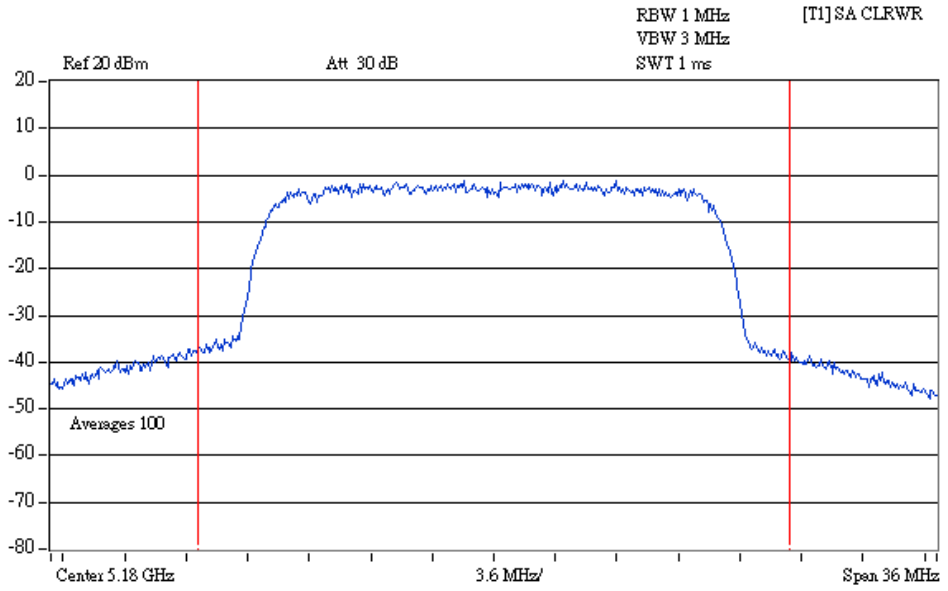
TX Channel Bandwidth 23 MHz Power 15.1 dBm

DRAFT 802.11n (20MHz) OFDM MODULATION:

MODULATION TYPE	BPSK	**TRANSFER RATE**	6.5Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	**ENVIRONMENTAL CONDITIONS**	25deg.C, 65%RH, 991hPa
TESTED BY	Long Chen		

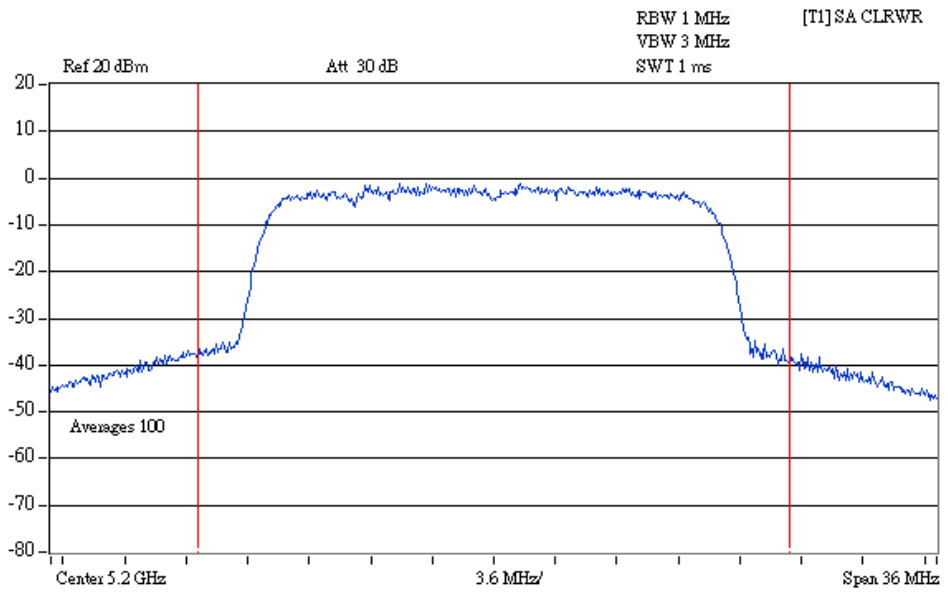
CHAN.	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)			PEAK POWER OUTPUT (dBm)			TOTAL PEAK POWER (mW)	TOTAL PEAK POWER (dBm)	PEAK POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2	CHAIN 0	CHAIN 1	CHAIN 2				
1	5180	14.355	14.289	12.388	11.57	11.55	10.93	41.032	16.13	17.00	PASS
2	5200	14.223	14.223	12.417	11.53	11.53	10.94	40.863	16.11	17.00	PASS
4	5240	14.158	14.125	12.331	11.51	11.50	10.91	40.614	16.09	17.00	PASS

FOR CHAIN 0: CH 1



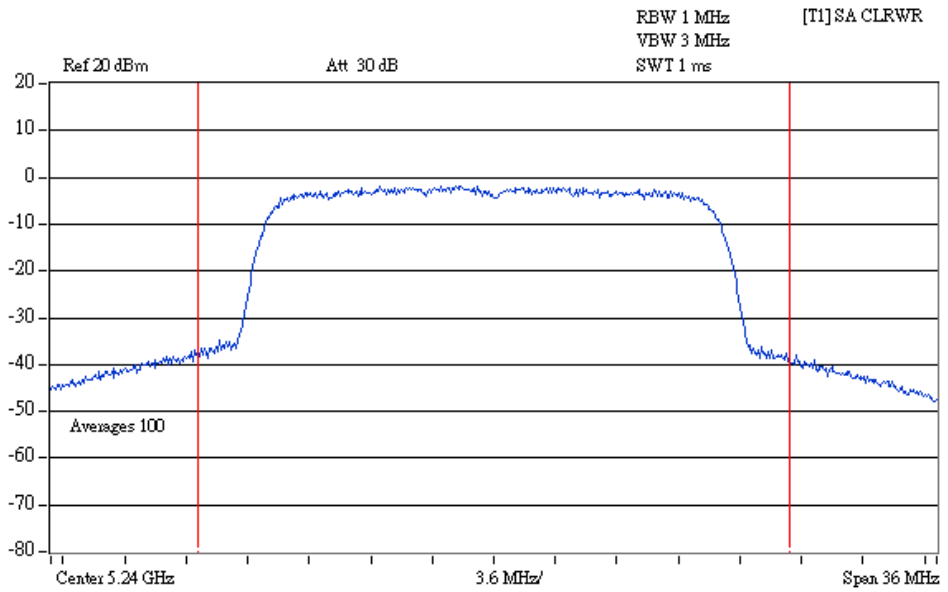
TX Channel Bandwidth 24 MHz Power 11.57 dBm

CH 2



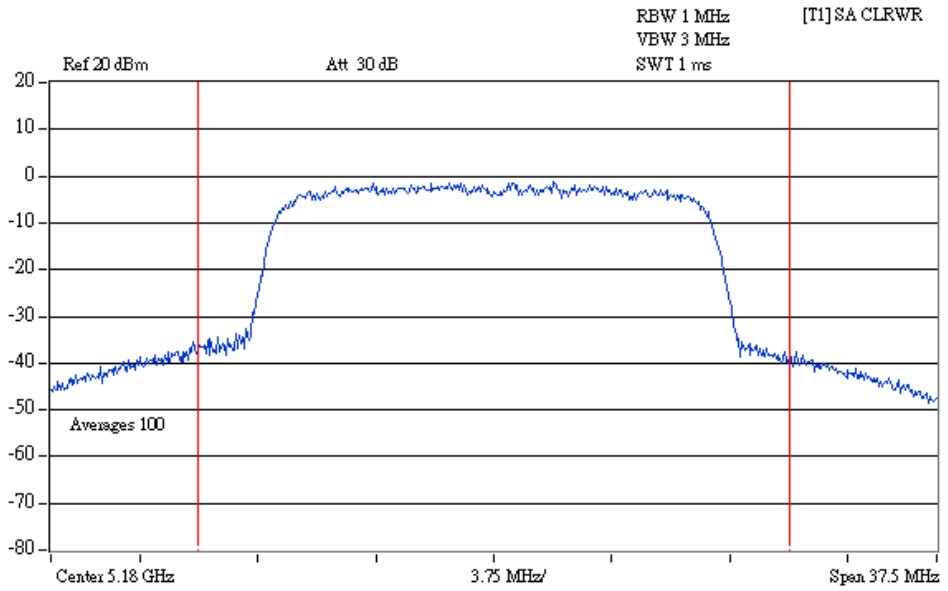
TX Channel Bandwidth 24 MHz Power 11.53 dBm

CH 4



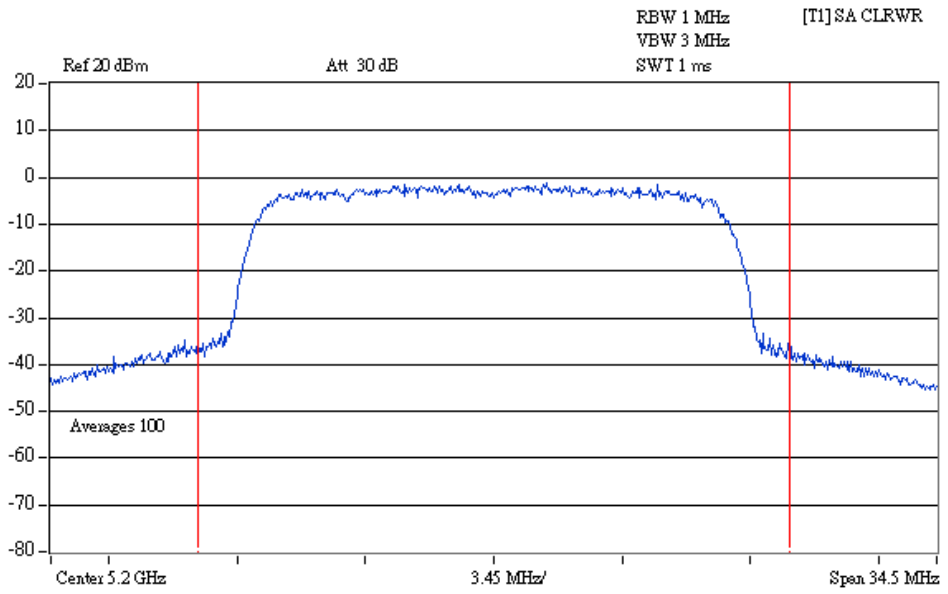
TX Channel Bandwidth 24 MHz Power 11.51 dBm

FOR CHAIN 1: CH 1



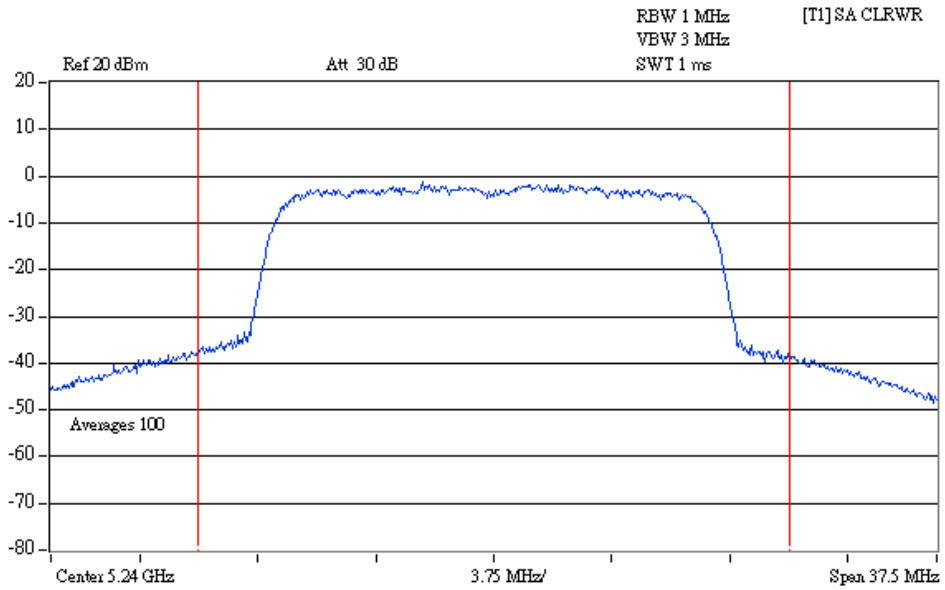
TX Channel Bandwidth 25 MHz Power 11.55 dBm

CH 2



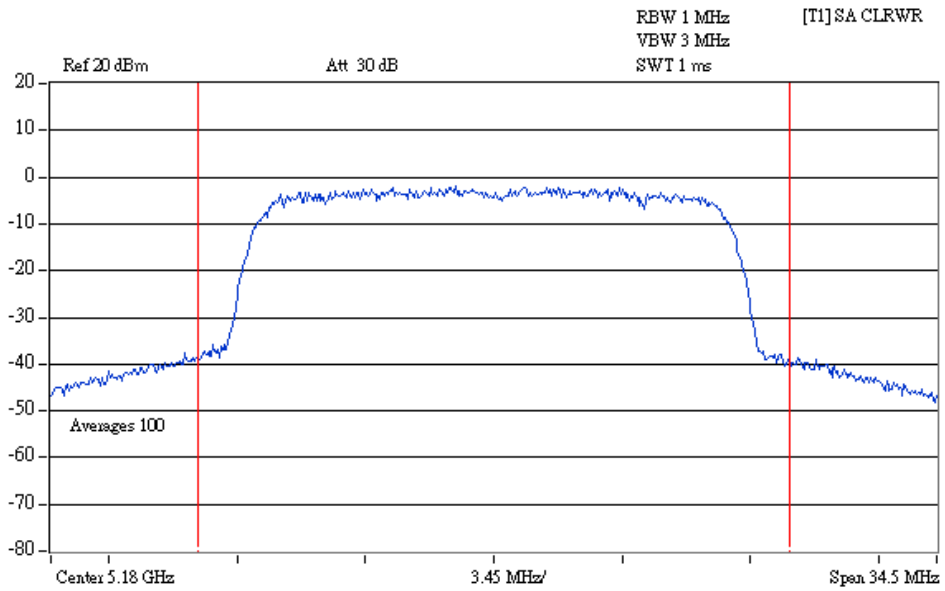
TX Channel Bandwidth 23 MHz Power 11.53 dBm

CH 4



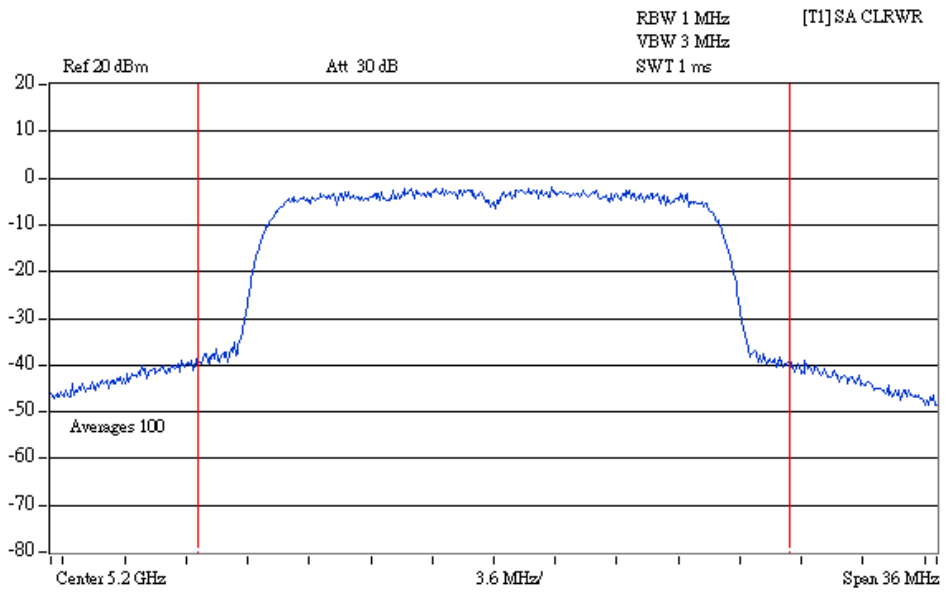
TX Channel Bandwidth 25 MHz Power 11.5 dBm

FOR CHAIN 2: CH 1



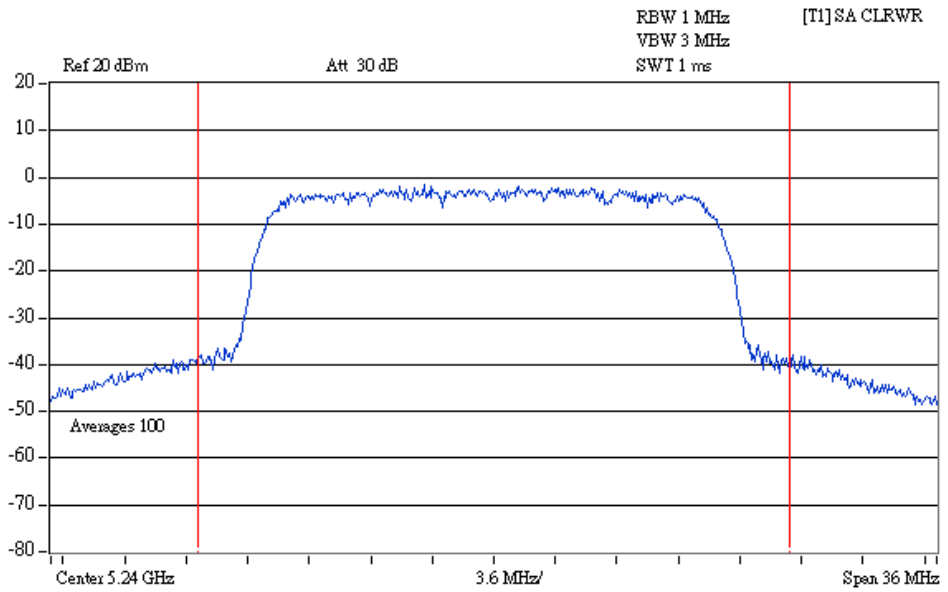
TX Channel Bandwidth 23 MHz Power 10.93 dBm

CH 2



TX Channel Bandwidth 24 MHz Power 10.94 dBm

CH 4



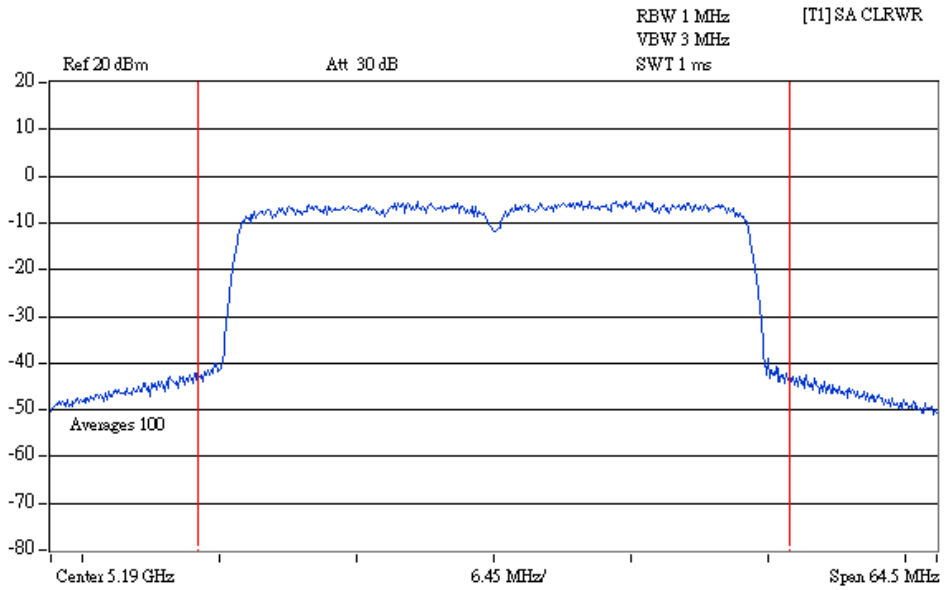
TX Channel Bandwidth 24 MHz Power 10.91 dBm

DRAFT 802.11n (40MHz) OFDM MODULATION:

MODULATION TYPE	BPSK	**TRANSFER RATE**	13.5Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	**ENVIRONMENTAL CONDITIONS**	25deg.C, 65%RH, 991hPa
TESTED BY	Long Chen		

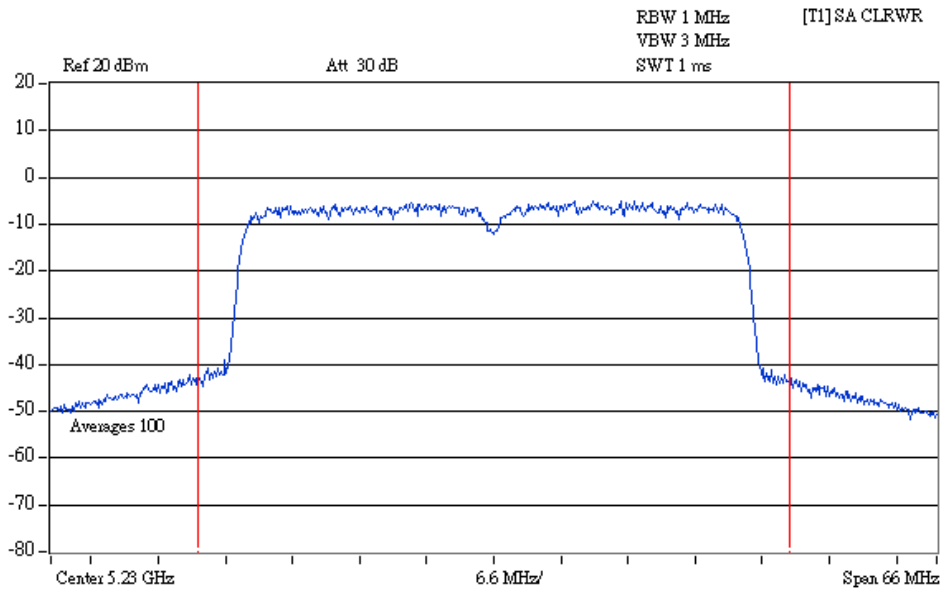
CHAN.	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)			PEAK POWER OUTPUT (dBm)			TOTAL PEAK POWER (mW)	TOTAL PEAK POWER (dBm)	PEAK POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2	CHAIN 0	CHAIN 1	CHAIN 2				
1	5190	12.503	12.794	16.181	10.97	11.07	12.09	41.477	16.18	17.00	PASS
2	5230	12.677	12.706	16.106	11.03	11.04	12.07	41.489	16.18	17.00	PASS

FOR CHAIN 0: CH 1



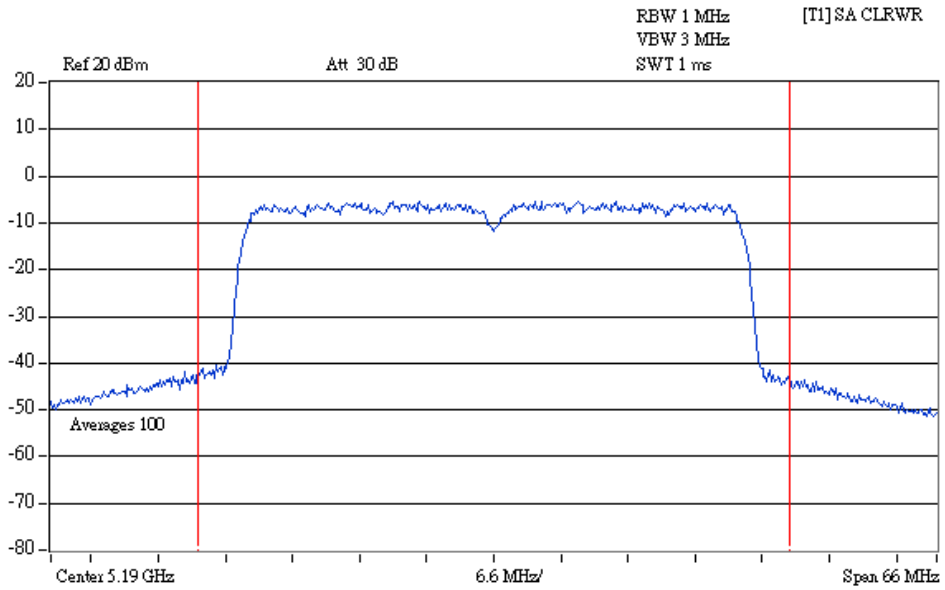
TX Channel Bandwidth 43 MHz Power 10.97 dBm

CH 2



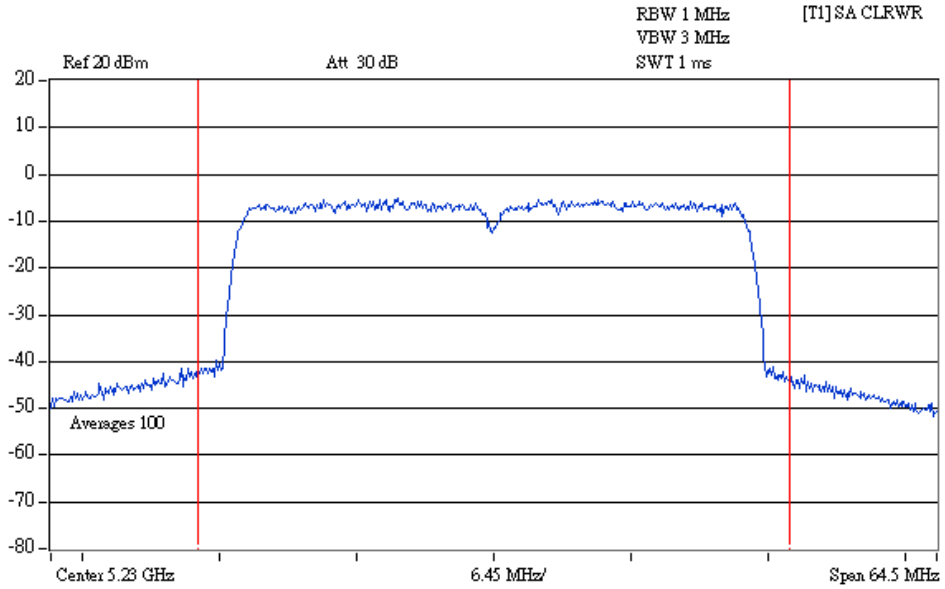
TX Channel Bandwidth 44 MHz Power 11.03 dBm

FOR CHAIN 1: CH 1



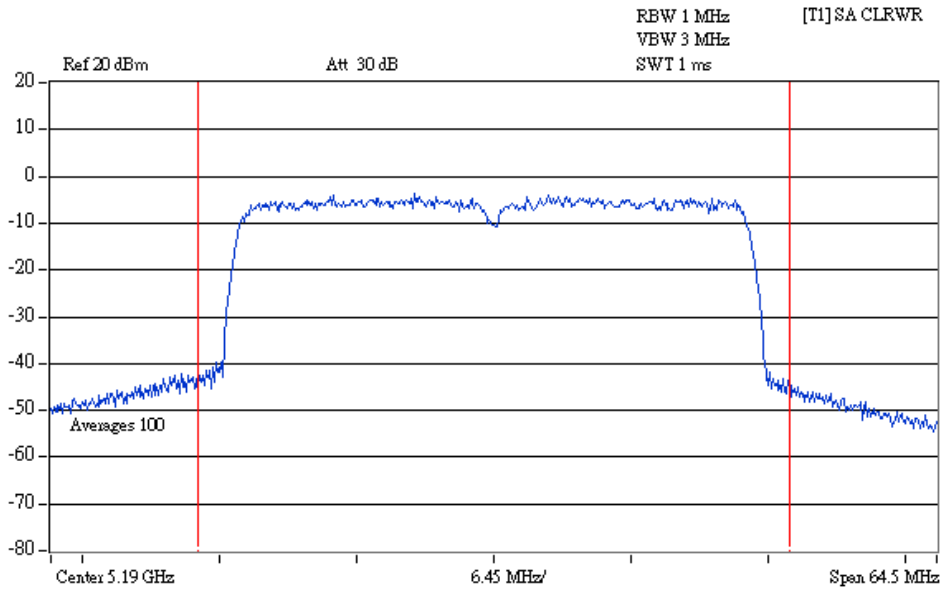
TX Channel Bandwidth 44 MHz Power 11.07 dBm

CH 2



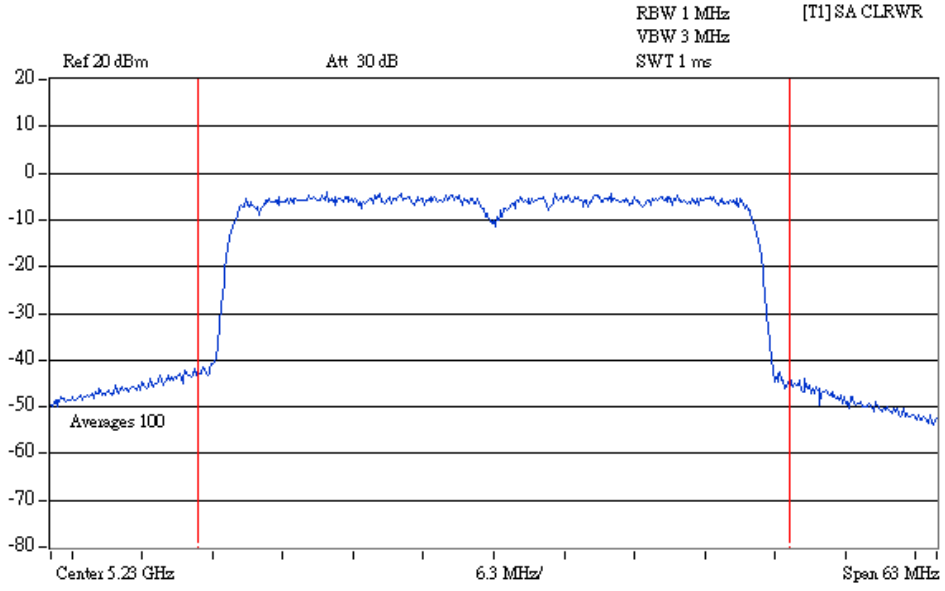
TX Channel Bandwidth 43 MHz Power 11.04 dBm

FOR CHAIN 2: CH 1



TX Channel Bandwidth	43 MHz	Power	12.09 dBm

CH 2



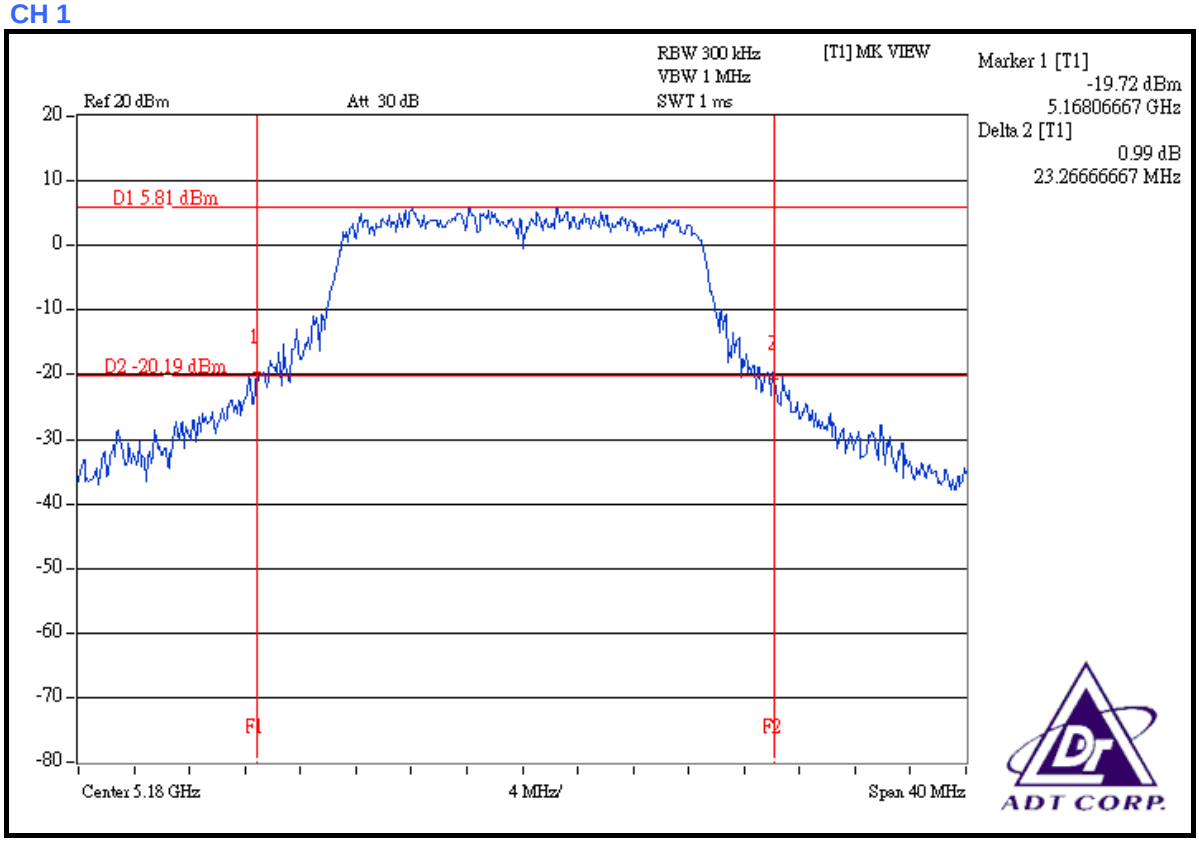
TX Channel Bandwidth	42 MHz	Power	12.07 dBm

26dB OCCUPIED BANDWIDTH: 802.11a OFDM MODULATION:

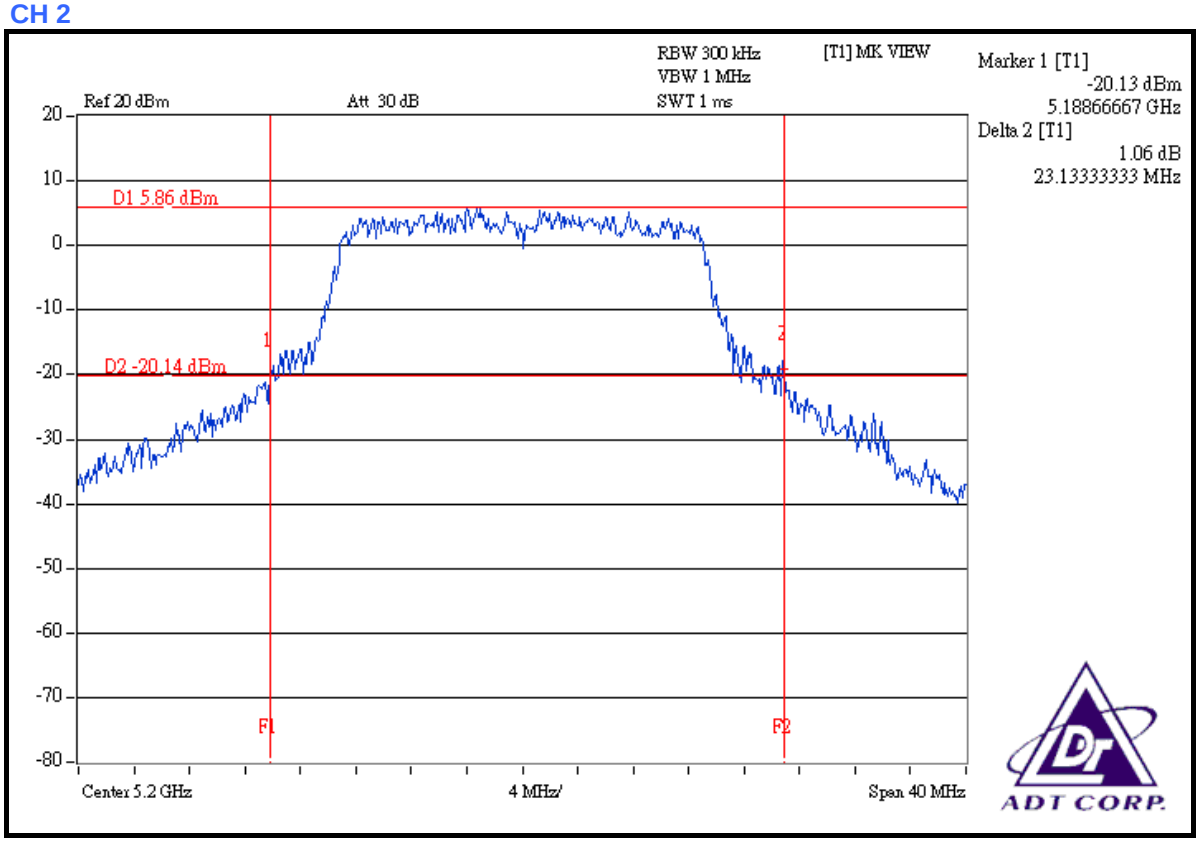
MODULATION TYPE	BPSK	**TRANSFER RATE**	6.0Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	**ENVIRONMENTAL CONDITIONS**	25deg.C, 65%RH, 991hPa
TESTED BY	Long Chen		

CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc OCCUPIED BANDWIDTH (MHz)	PASS / FAIL
1	5180	23.27	PASS
2	5200	23.13	PASS
4	5240	22.73	PASS

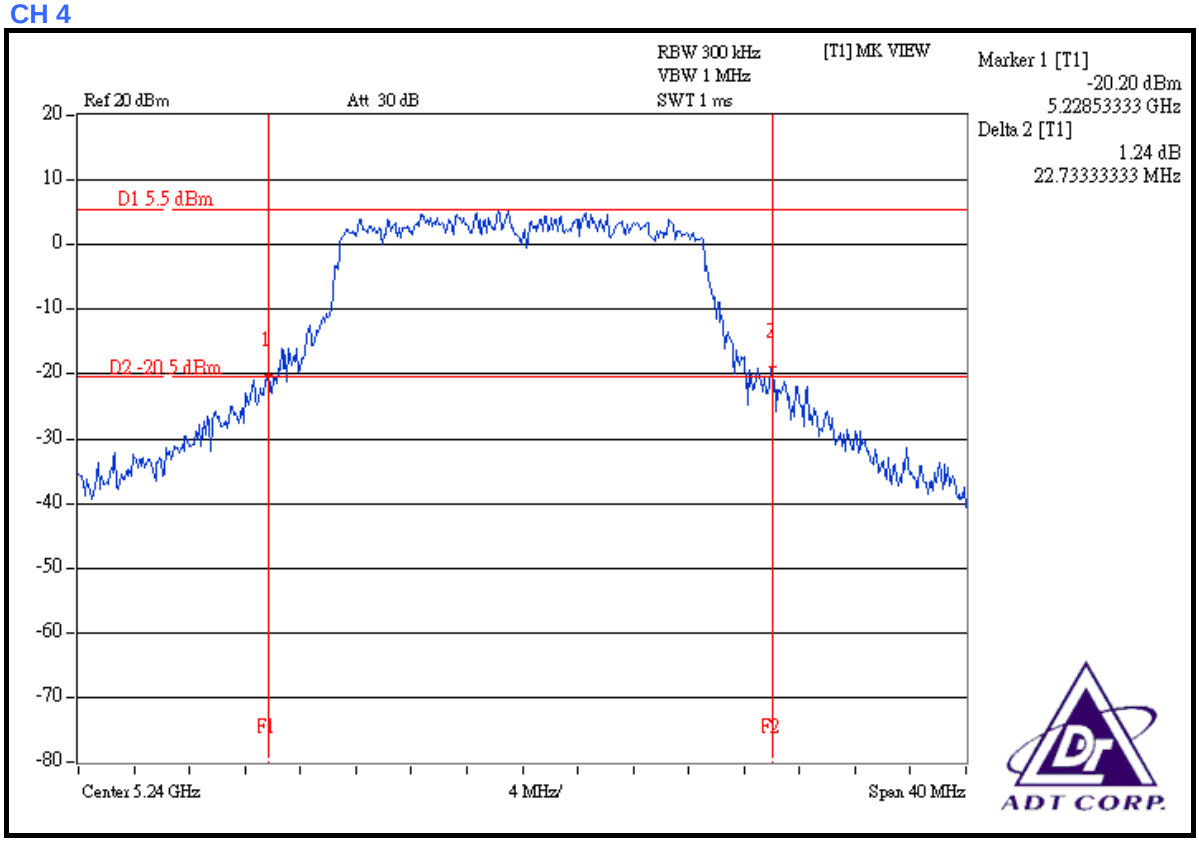
CH 1



CH 2


RBW 300 kHz
VBW 1 MHz
SWT 1 ms
[T1] MK VIEW
Marker 1 [T1]
-20.13 dBm
5.18866667 GHz
Delta 2 [T1]
1.06 dB
23.13333333 MHz
Ref 20 dBm
Att 30 dB
D1 5.86 dBm
D2 -20.14 dBm
F1
F2
Center 5.2 GHz
4 MHz/
Span 40 MHz

CH 4

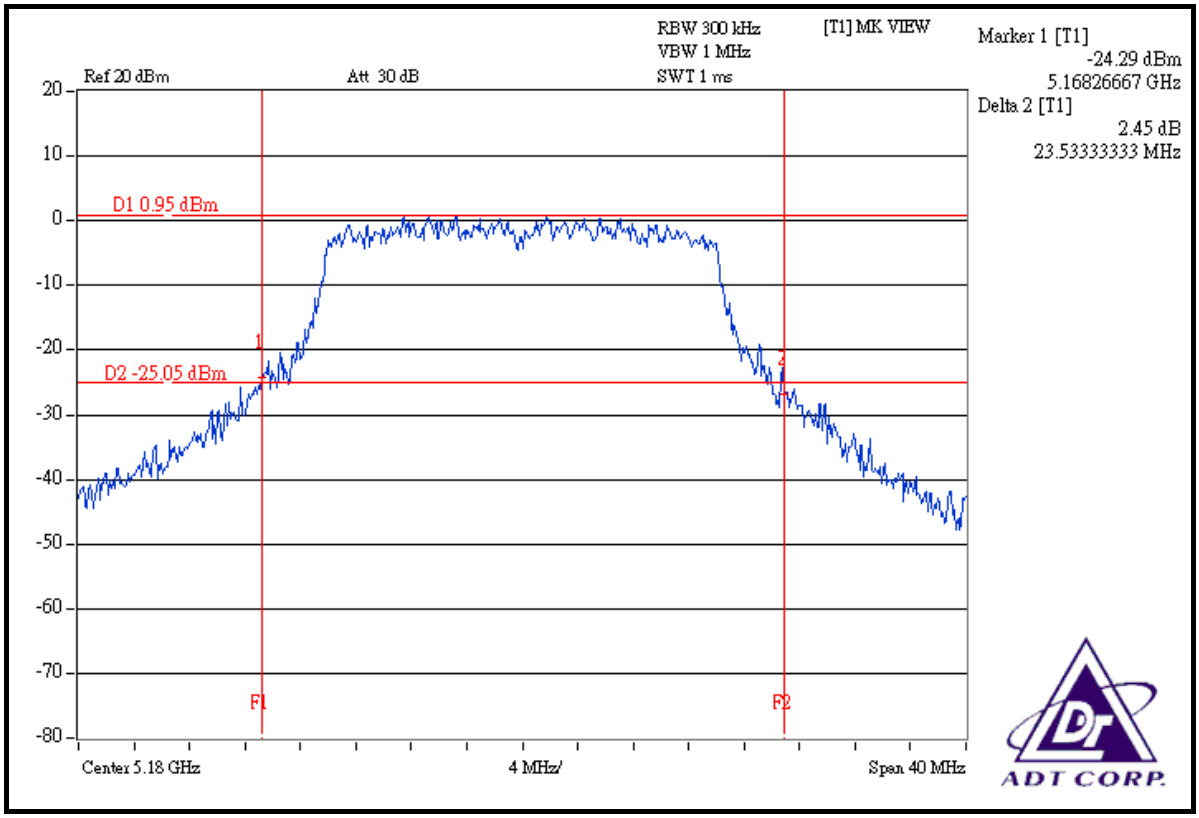

RBW 300 kHz
VBW 1 MHz
SWT 1 ms
[T1] MK VIEW
Marker 1 [T1]
-20.20 dBm
5.22853333 GHz
Delta 2 [T1]
1.24 dB
22.73333333 MHz
Ref 20 dBm
Att 30 dB
D1 5.5 dBm
D2 -20.5 dBm
F1
F2
Center 5.24 GHz
4 MHz/
Span 40 MHz

DRAFT 802.11n (20MHz) OFDM MODULATION:

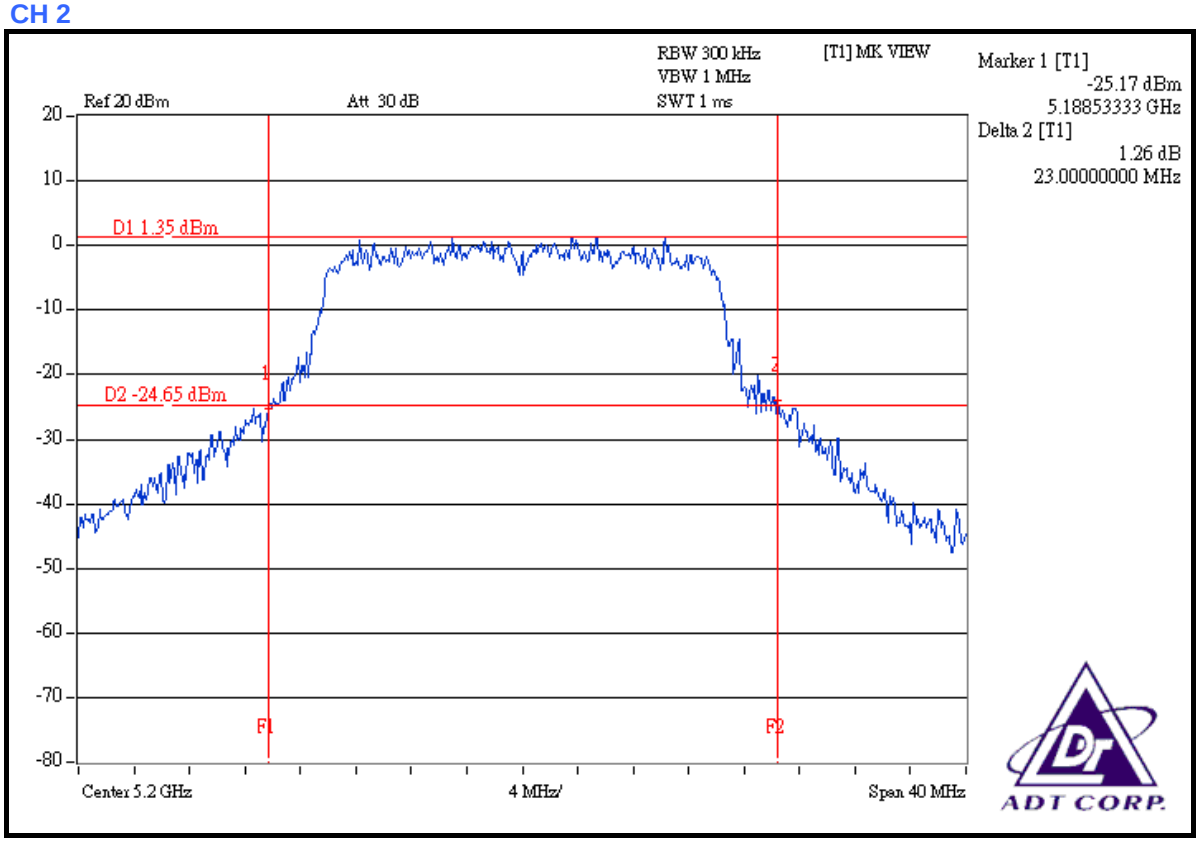
MODULATION TYPE	BPSK	**TRANSFER RATE**	6.5Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	**ENVIRONMENTAL CONDITIONS**	25deg.C, 65%RH, 991hPa
TESTED BY	Long Chen		

CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc OCCUPIED BANDWIDTH (MHz)			PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2	
1	5180	23.53	24.40	22.40	PASS
2	5200	23.00	22.73	23.47	PASS
4	5240	23.80	24.47	23.60	PASS

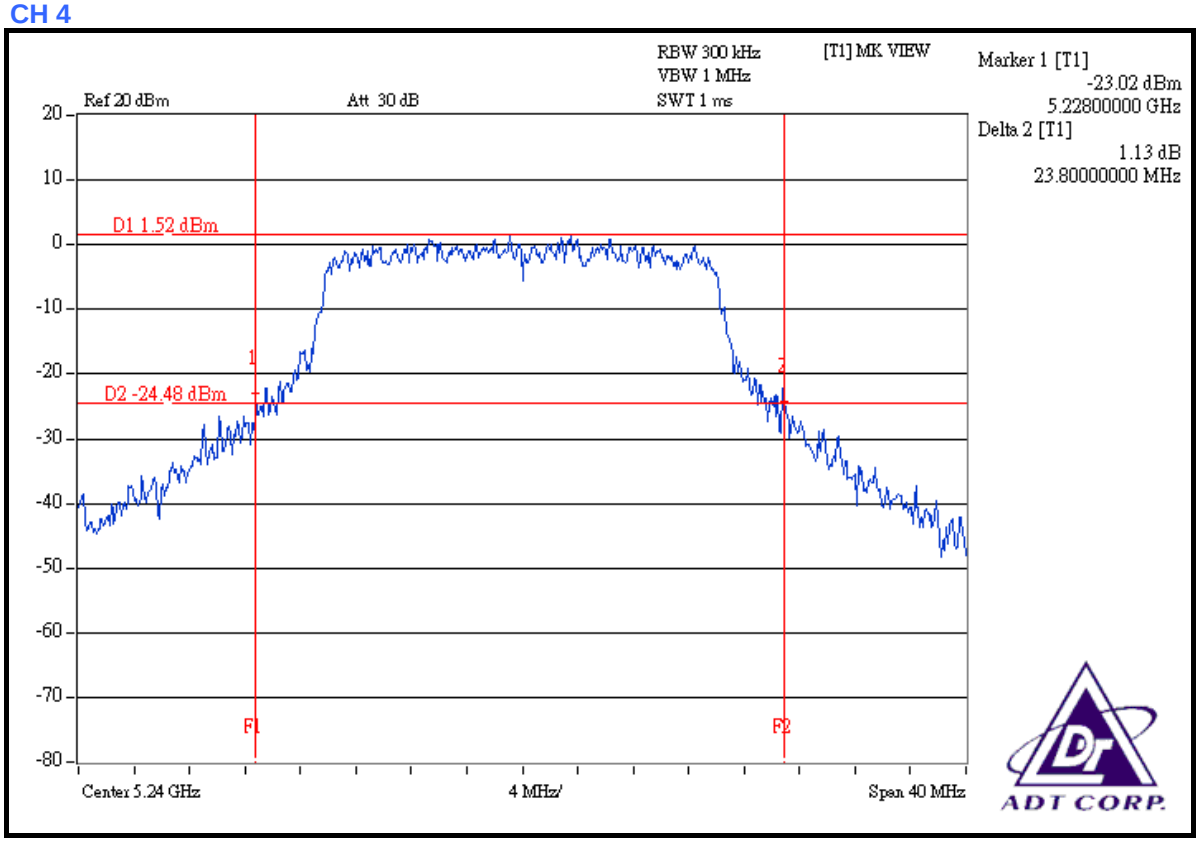
FOR CHAIN 0: CH 1



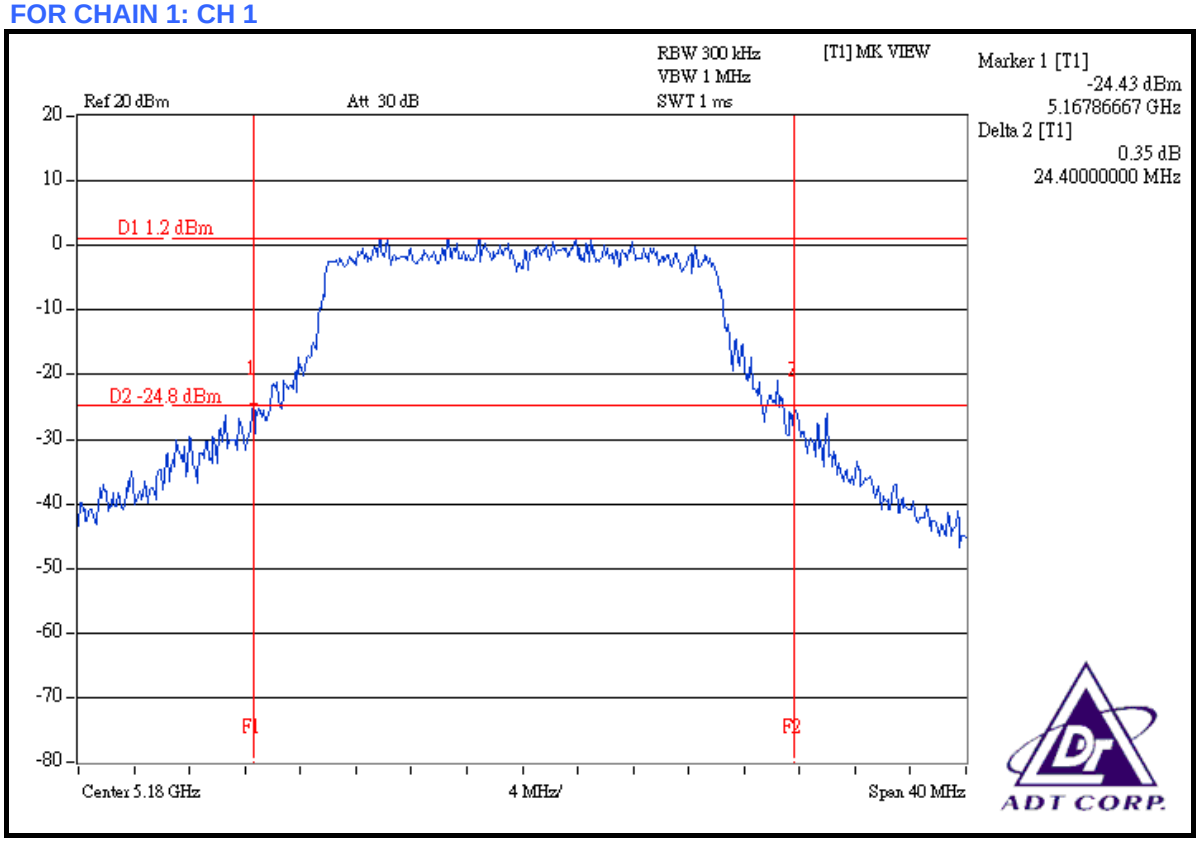
CH 2


RBW 300 kHz
VBW 1 MHz
SWT 1 ms
[T1] MK VIEW
Marker 1 [T1]
-25.17 dBm
5.18853333 GHz
Delta 2 [T1]
1.26 dB
23.00000000 MHz
Ref 20 dBm
Att 30 dB
D1 1.35 dBm
D2 -24.65 dBm
F1
F2
Center 5.2 GHz
4 MHz/
Span 40 MHz

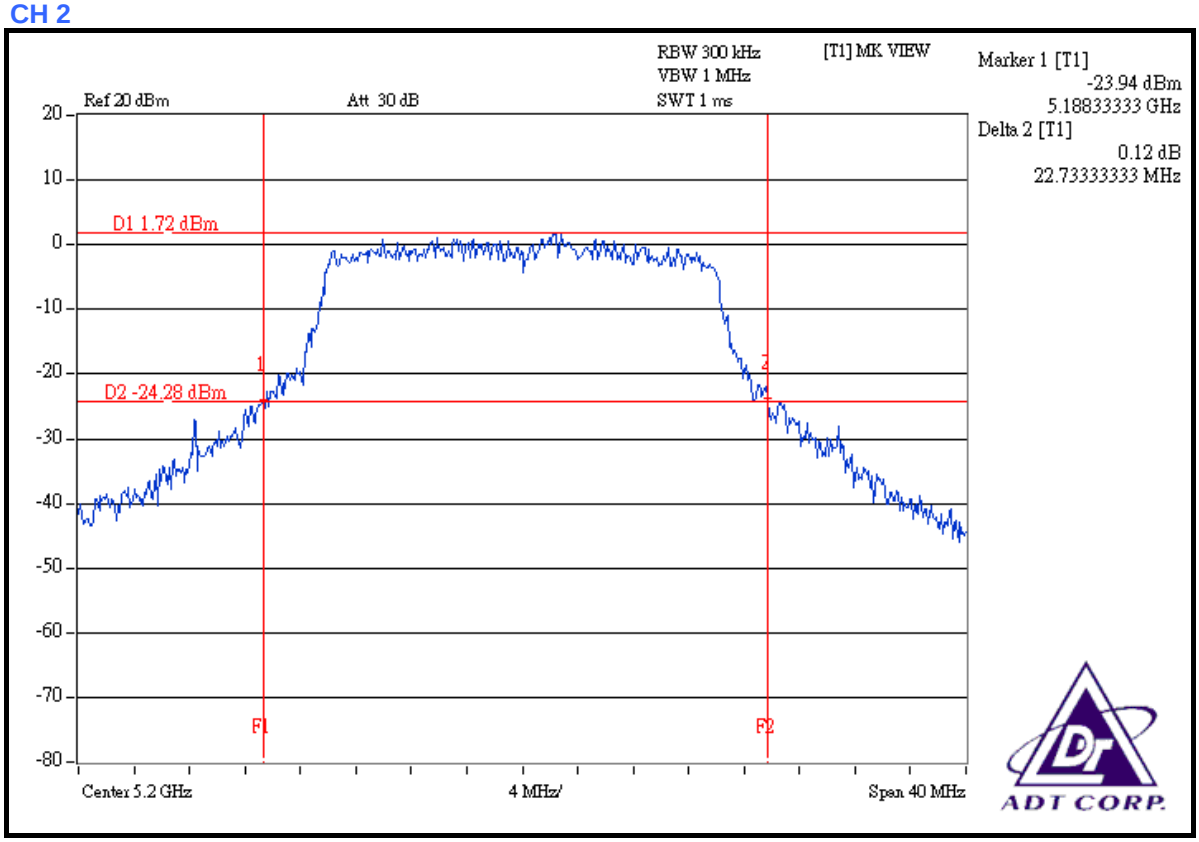
CH 4


RBW 300 kHz
VBW 1 MHz
SWT 1 ms
[T1] MK VIEW
Marker 1 [T1]
-23.02 dBm
5.22800000 GHz
Delta 2 [T1]
1.13 dB
23.80000000 MHz
Ref 20 dBm
Att 30 dB
D1 1.52 dBm
D2 -24.48 dBm
F1
F2
Center 5.24 GHz
4 MHz/
Span 40 MHz

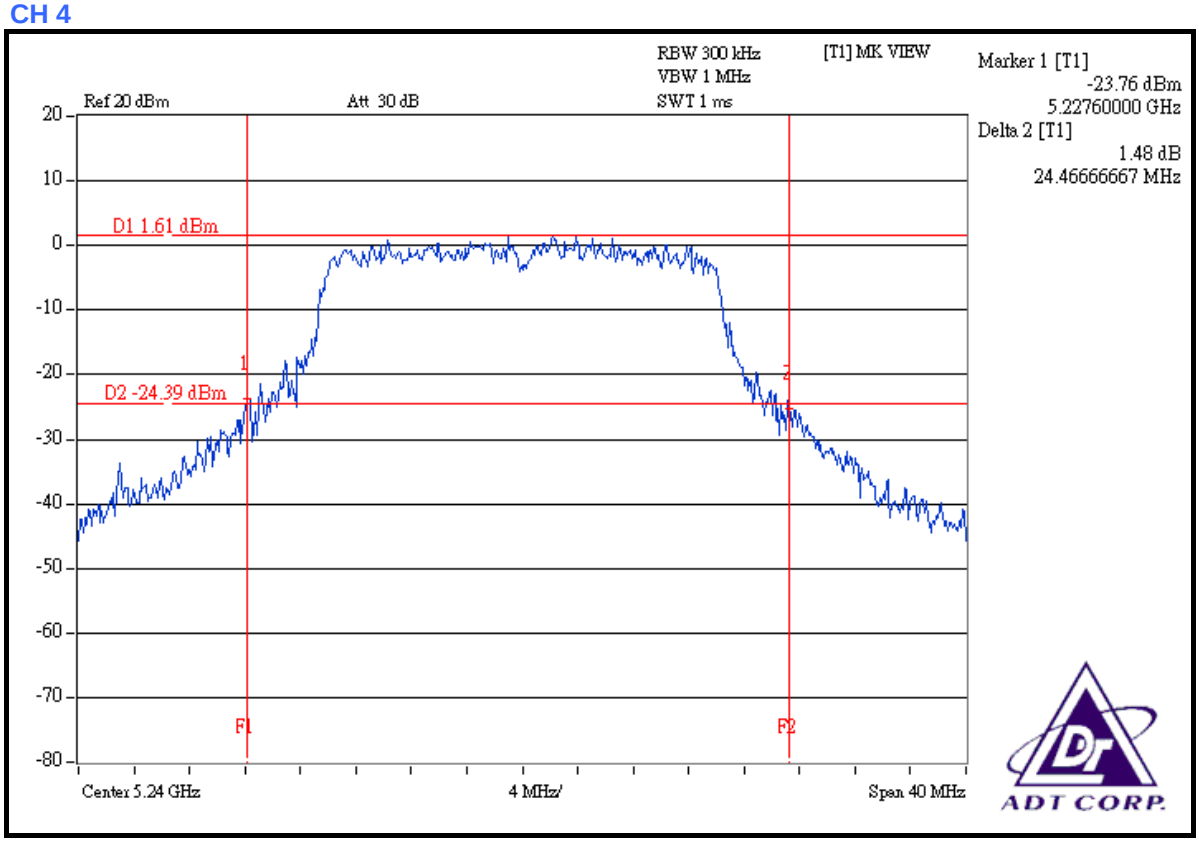
FOR CHAIN 1: CH 1



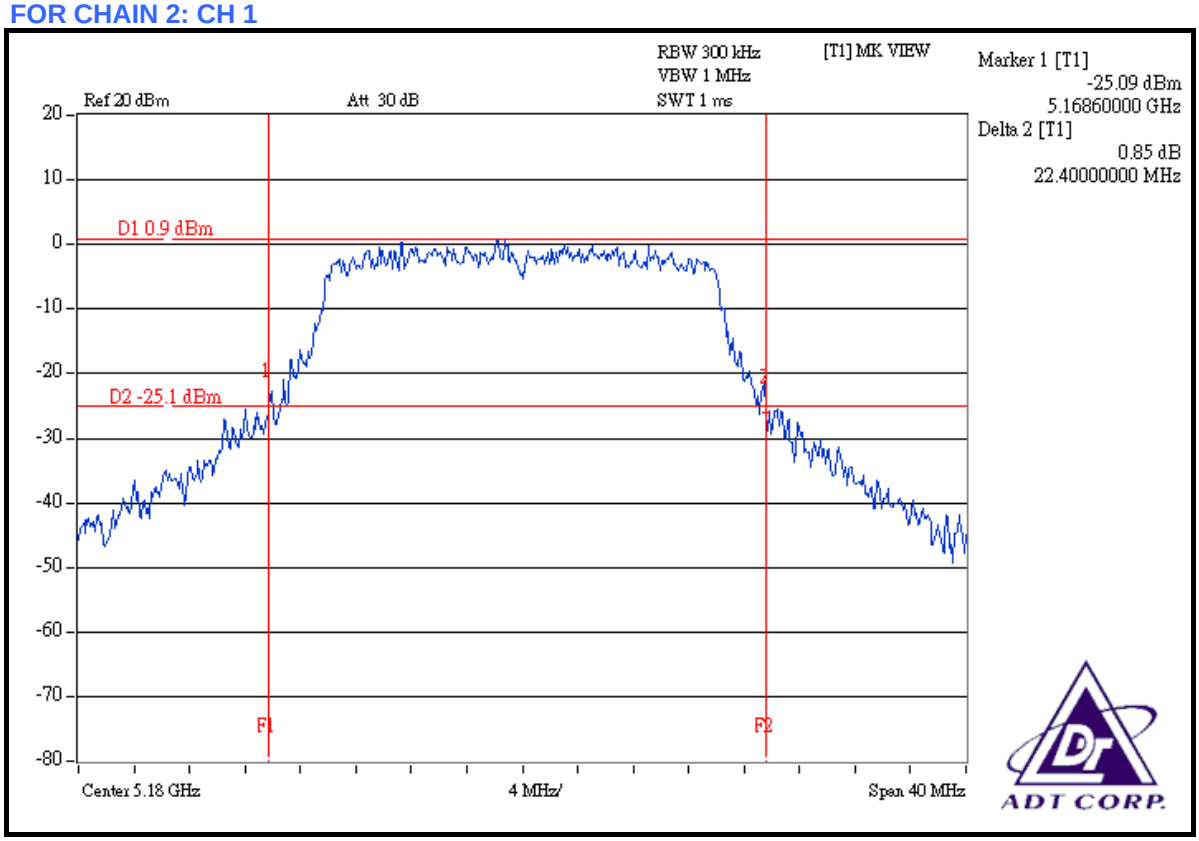
CH 2



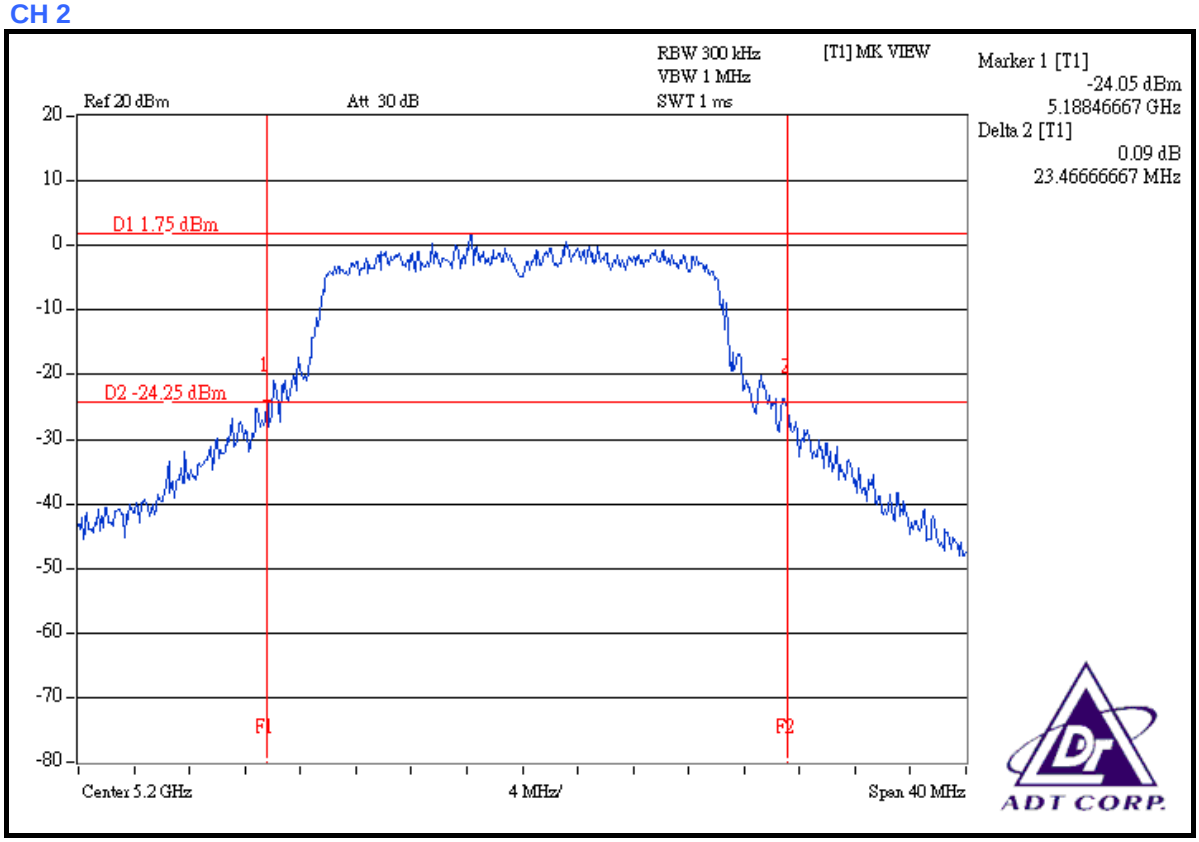
CH 4



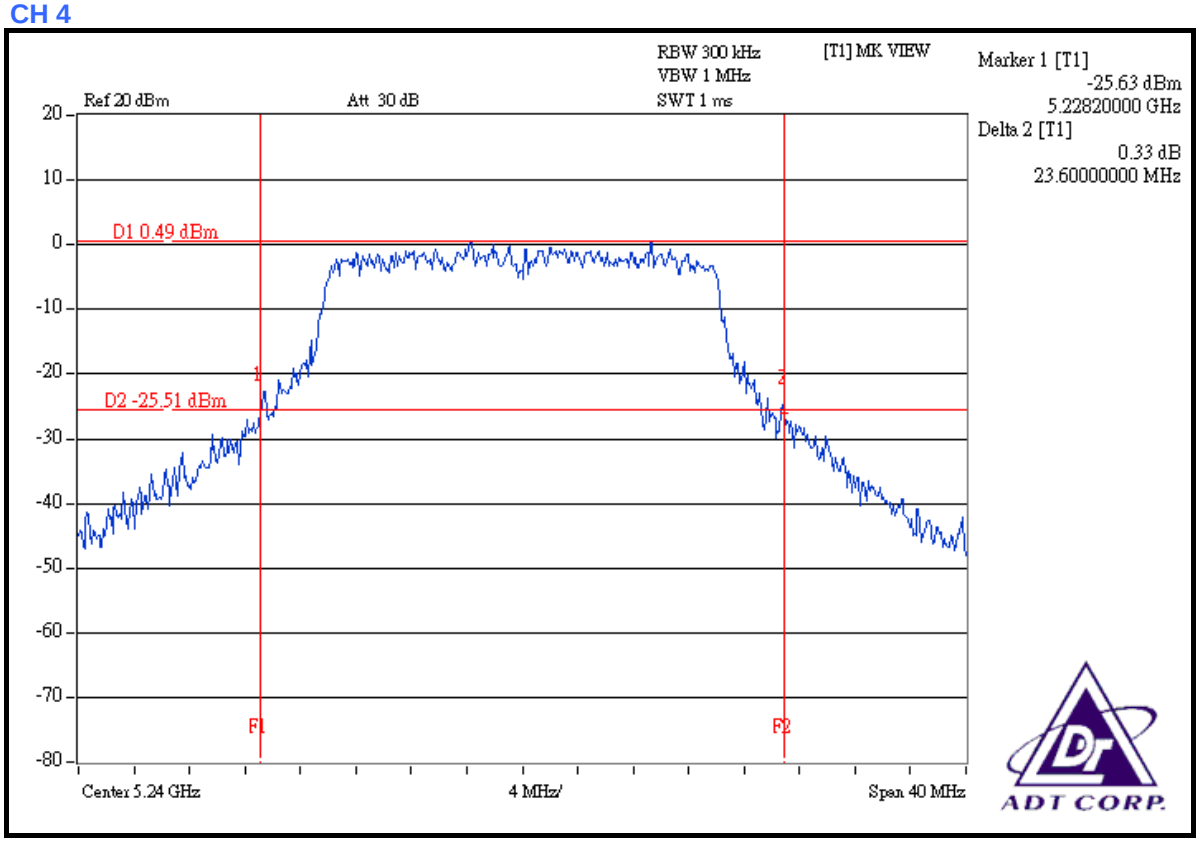
FOR CHAIN 2: CH 1



CH 2


RBW 300 kHz
VBW 1 MHz
SWT 1 ms
[T1] MK VIEW
Marker 1 [T1]
-24.05 dBm
5.18846667 GHz
Delta 2 [T1]
0.09 dB
23.46666667 MHz
Ref 20 dBm
Att 30 dB
D1 1.75 dBm
D2 -24.25 dBm
F1
F2
Center 5.2 GHz
4 MHz/
Span 40 MHz
ADT CORP.

CH 4

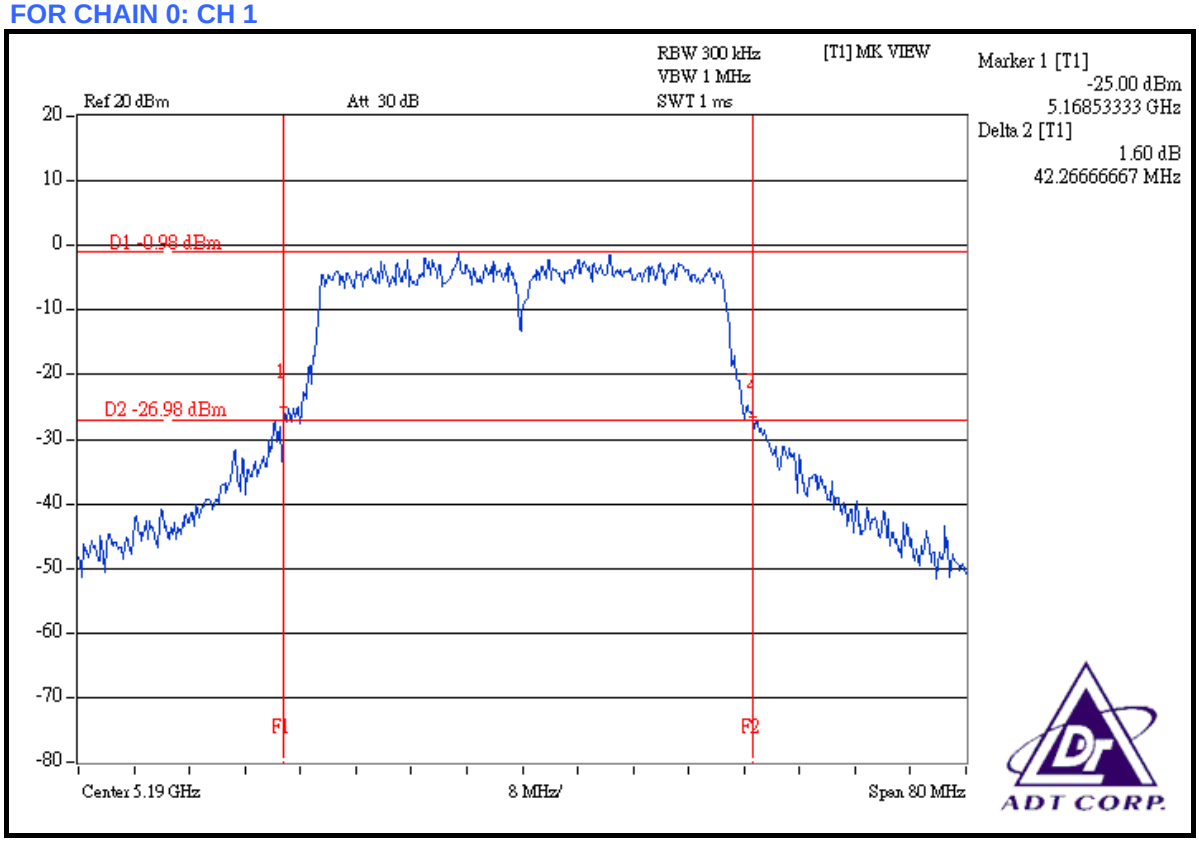

RBW 300 kHz
VBW 1 MHz
SWT 1 ms
[T1] MK VIEW
Marker 1 [T1]
-25.63 dBm
5.22820000 GHz
Delta 2 [T1]
0.33 dB
23.60000000 MHz
Ref 20 dBm
Att 30 dB
D1 0.49 dBm
D2 -25.51 dBm
F1
F2
Center 5.24 GHz
4 MHz/
Span 40 MHz
ADT CORP.

DRAFT 802.11n (40MHz) OFDM MODULATION:

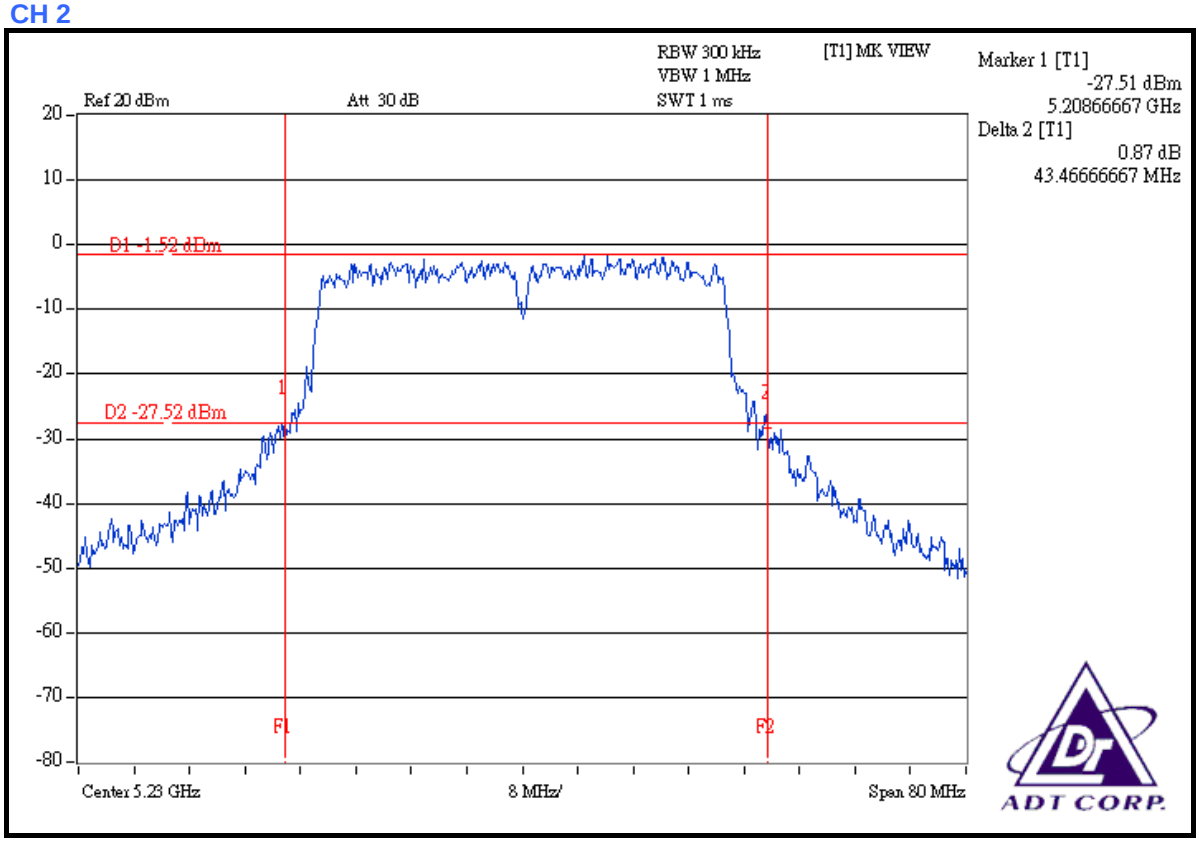
MODULATION TYPE	BPSK	**TRANSFER RATE**	13.5Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	**ENVIRONMENTAL CONDITIONS**	25deg.C, 65%RH, 991hPa
TESTED BY	Long Chen		

CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc OCCUPIED BANDWIDTH (MHz)			PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 3	
1	5190	42.27	43.07	42.13	PASS
2	5230	43.47	42.67	42.00	PASS

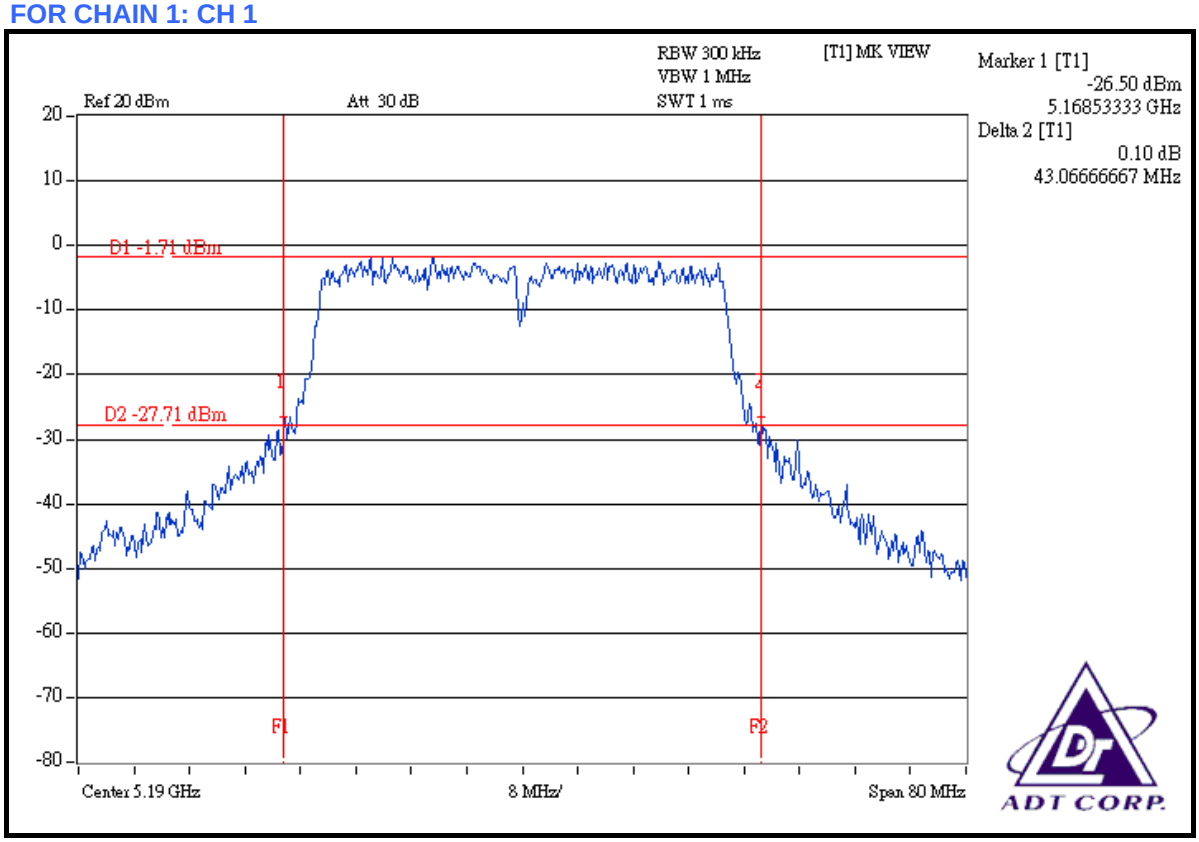
FOR CHAIN 0: CH 1



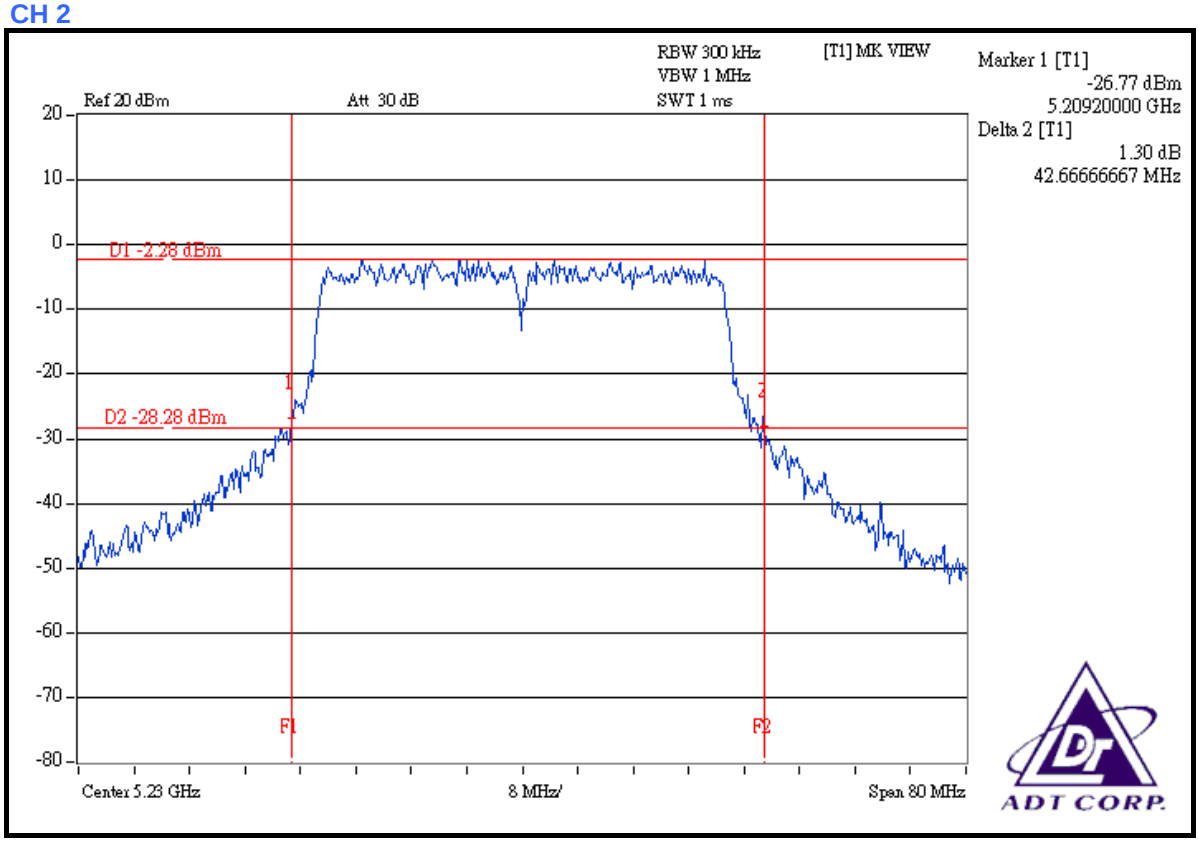
CH 2



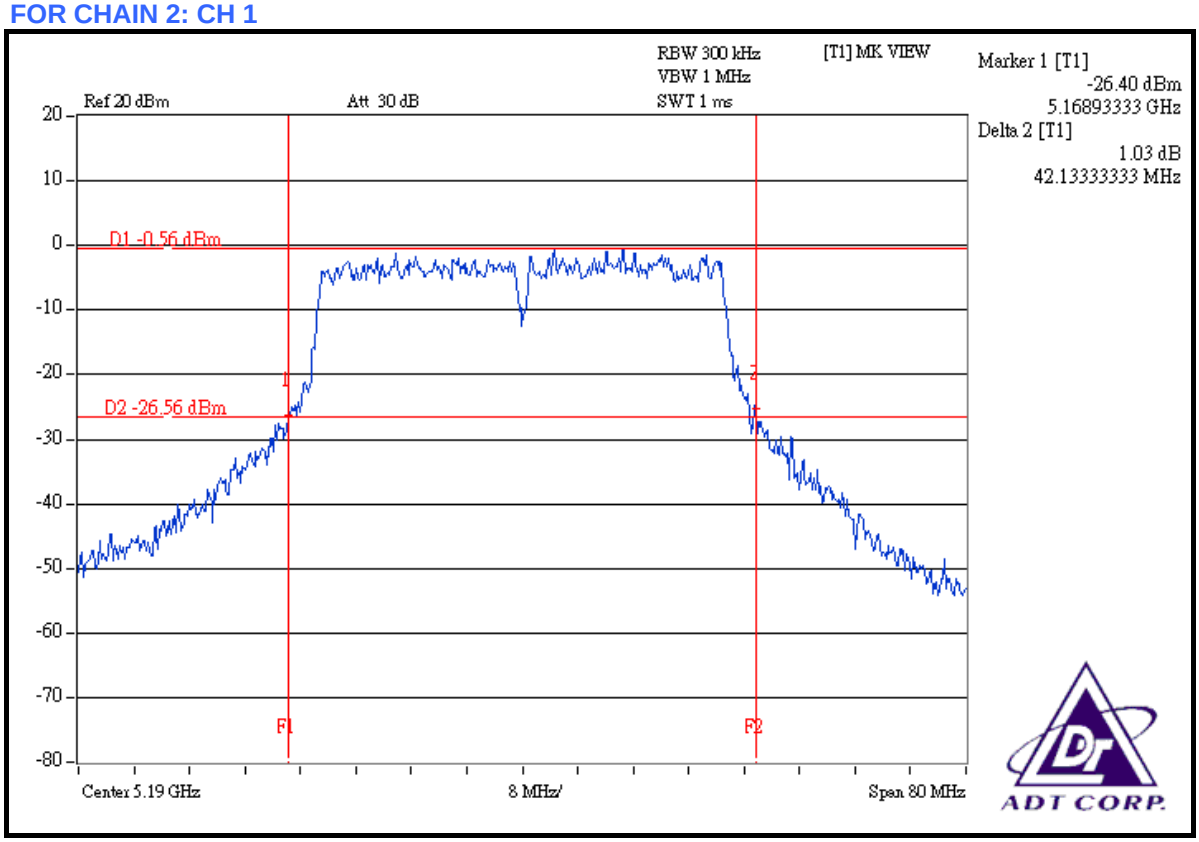
FOR CHAIN 1: CH 1



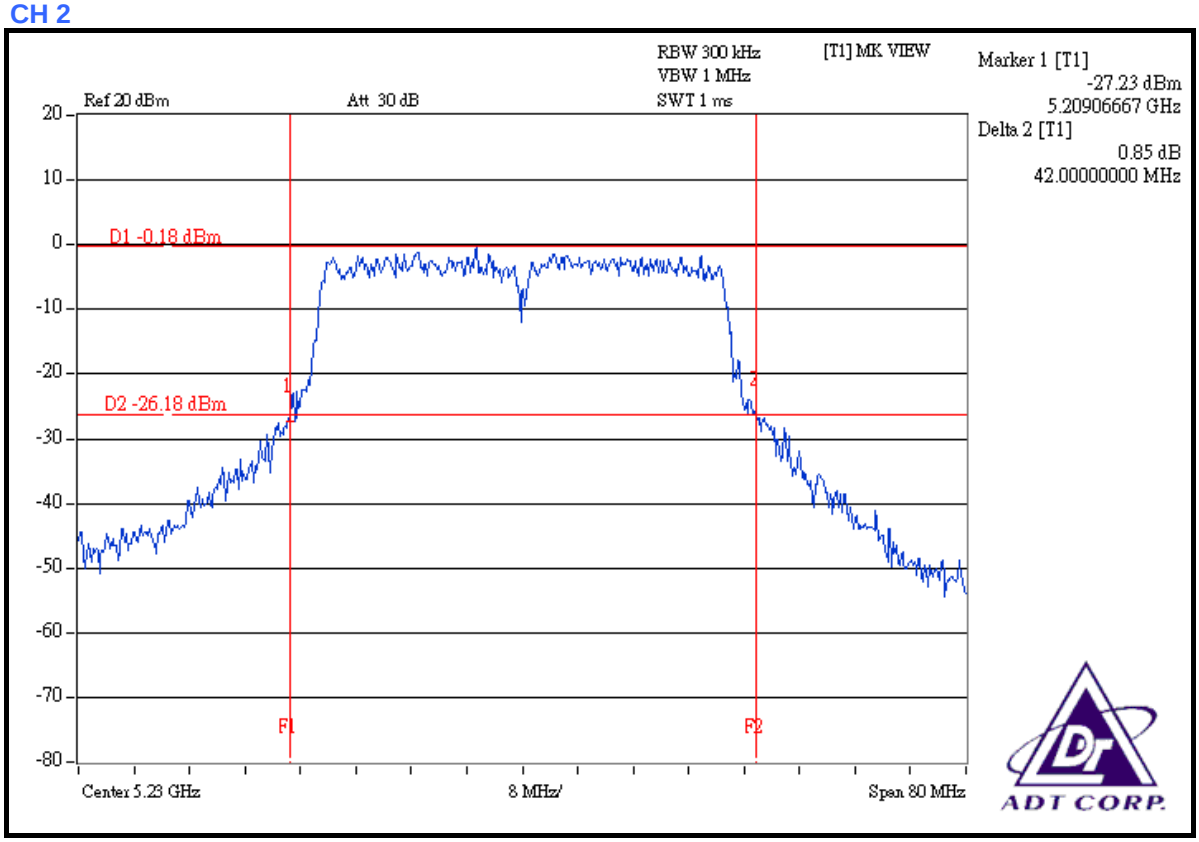
CH 2



FOR CHAIN 2: CH 1



CH 2



4.4 PEAK POWER EXCURSION MEASUREMENT

4.4.1 LIMITS OF PEAK POWER EXCURSION MEASUREMENT

FREQUENCY BAND	LIMIT
5.150 ~ 5.250GHz	13dB
5.250 ~ 5.350GHz	13dB
5.470 ~ 5.725GHz	13dB

4.4.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
R&S SPECTRUM ANALYZER	FSP40	100040	Jun. 28, 2008

NOTE: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

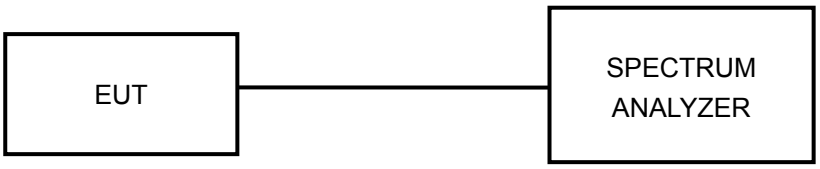
4.4.3 TEST PROCEDURE

1. The transmitter output was connected to the spectrum analyzer.
2. Set the spectrum bandwidth span to view the entire spectrum.
3. Using peak detector and Max-hold function for Trace 1 (RB = 1MHz, VB = 3MHz) and 2 (RB = 1MHz, VB = 300kHz).
4. The largest difference between Trace 1 and Trace 2 in any 1MHz band on any frequency was recorded.

4.4.4 DEVIATION FROM TEST STANDARD

No deviation

4.4.5 TEST SETUP



4.4.6 EUT OPERATING CONDITIONS

The software provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.

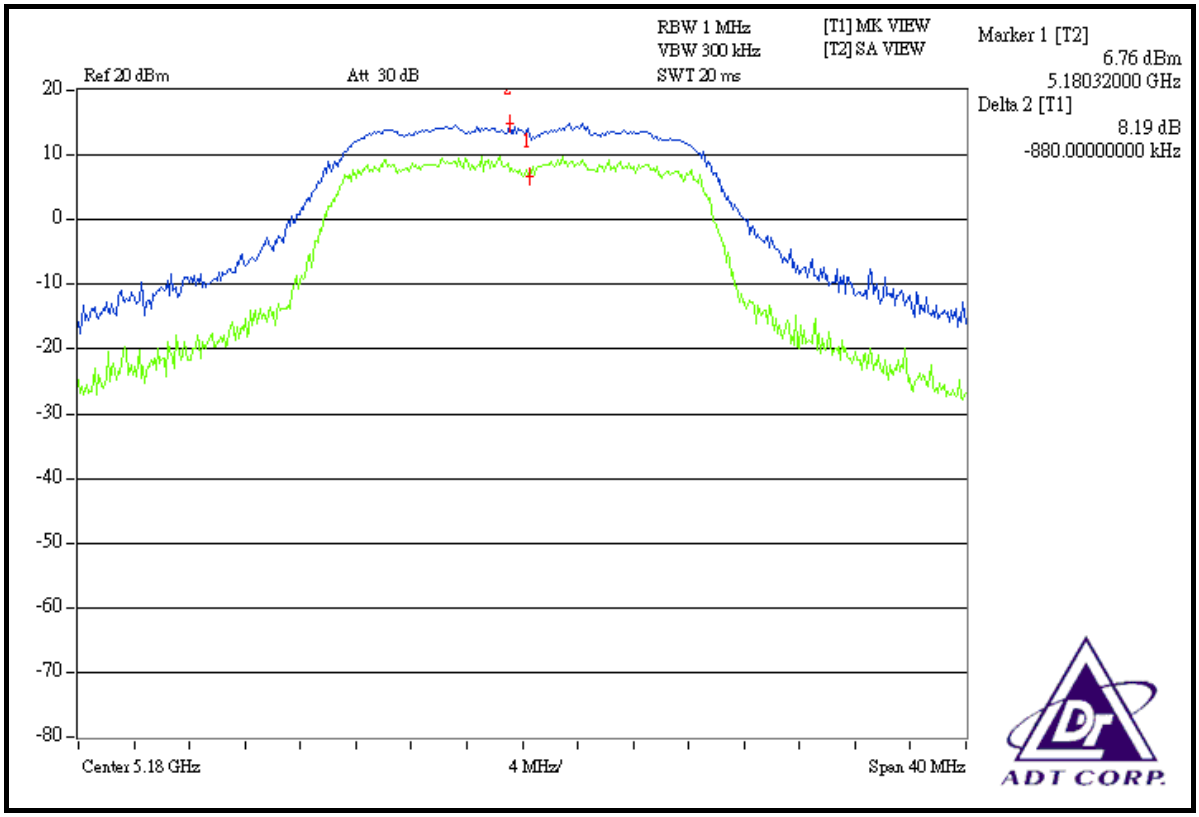
4.4.7 TEST RESULTS

802.11a OFDM MODULATION:

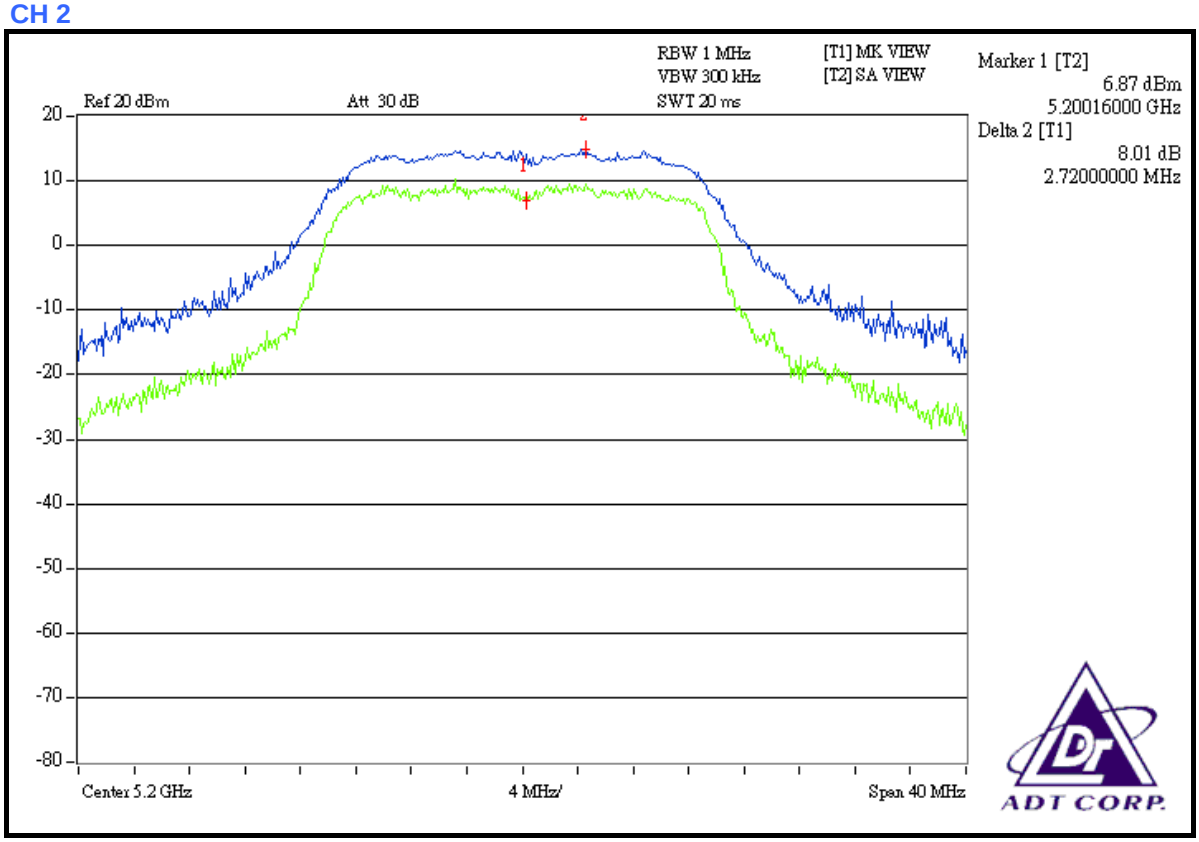
MODULATION TYPE	BPSK	**TRANSFER RATE**	6.0Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	**ENVIRONMENTAL CONDITIONS**	25deg.C, 65%RH, 991hPa
TESTED BY	Long Chen		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER EXCURSION (dB)	PEAK TO AVERAGE EXCURSION LIMIT (dB)	PASS / FAIL
1	5180	8.19	13	PASS
2	5200	8.01	13	PASS
4	5240	7.85	13	PASS

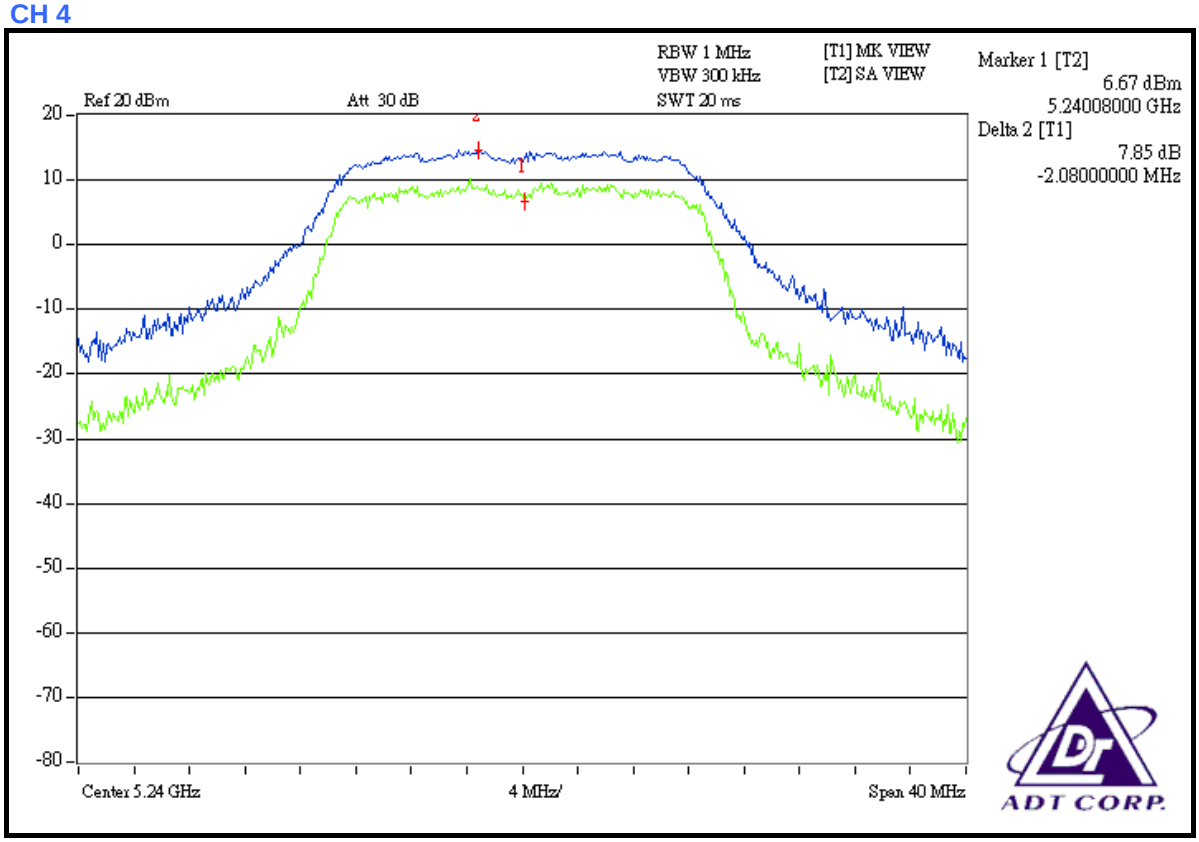
CH 1



CH 2


RBW 1 MHz
VBW 300 kHz
SWT 20 ms
[T1] MK VIEW
[T2] SA VIEW
Marker 1 [T2]
6.87 dBm
5.20016000 GHz
Delta 2 [T1]
8.01 dB
2.72000000 MHz
Ref 20 dBm
Att 30 dB
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
Center 5.2 GHz
4 MHz/
Span 40 MHz
ADT CORP.

CH 4

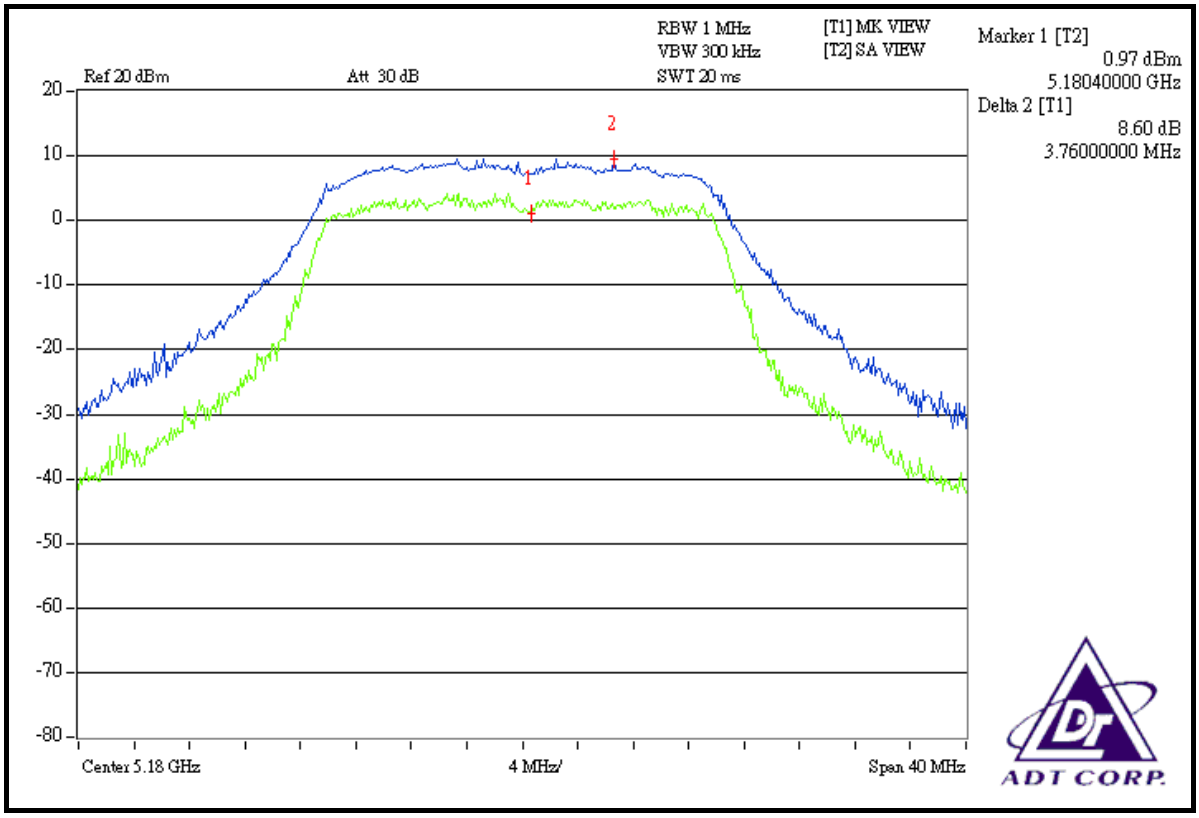

RBW 1 MHz
VBW 300 kHz
SWT 20 ms
[T1] MK VIEW
[T2] SA VIEW
Marker 1 [T2]
6.67 dBm
5.24008000 GHz
Delta 2 [T1]
7.85 dB
-2.08000000 MHz
Ref 20 dBm
Att 30 dB
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
Center 5.24 GHz
4 MHz/
Span 40 MHz
ADT CORP.

DRAFT 802.11n (20MHz) OFDM MODULATION:

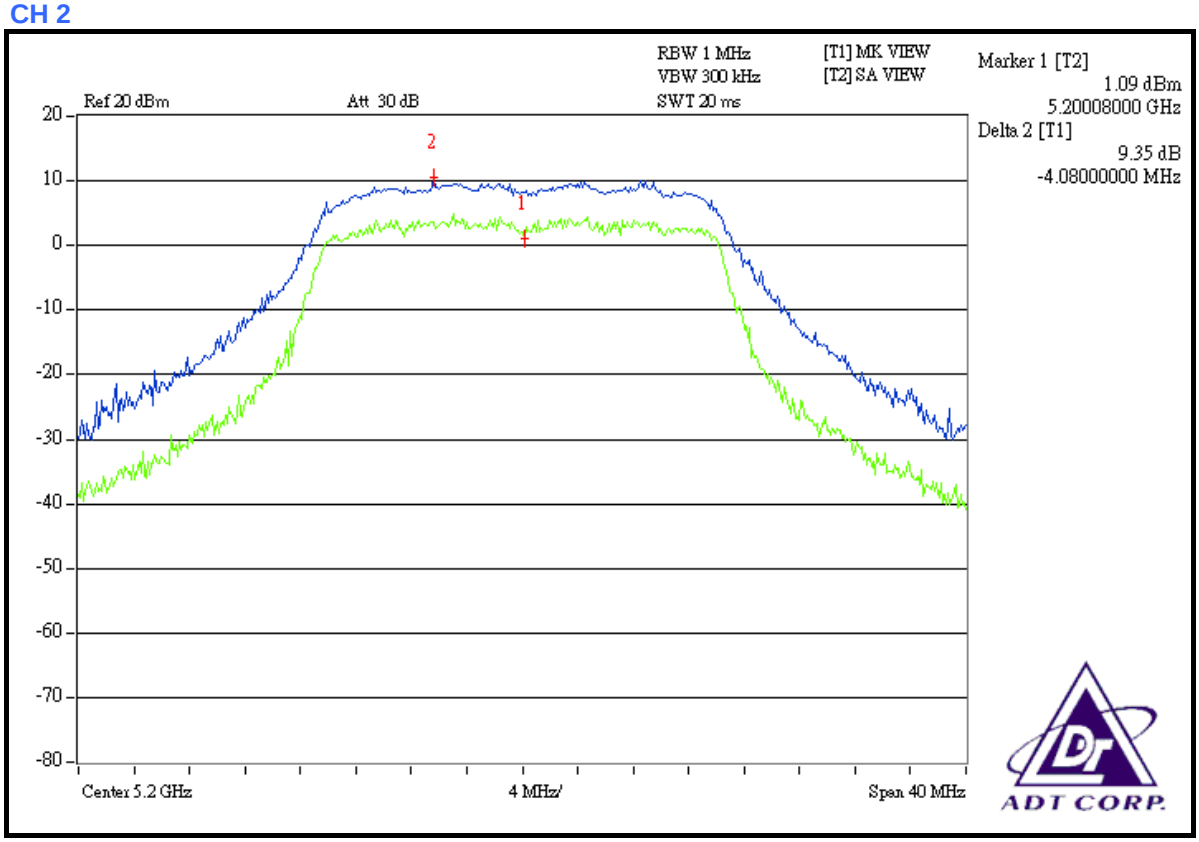
MODULATION TYPE	BPSK	**TRANSFER RATE**	6.5Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	**ENVIRONMENTAL CONDITIONS**	25deg.C, 65%RH, 991hPa
TESTED BY	Long Chen		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER EXCURSION (dB)			PEAK to AVERAGE EXCURSION LIMIT (dB)	PASS/FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
1	5180	8.60	9.45	7.87	13	PASS
2	5200	9.35	8.70	8.51	13	PASS
4	5240	8.56	8.75	8.55	13	PASS

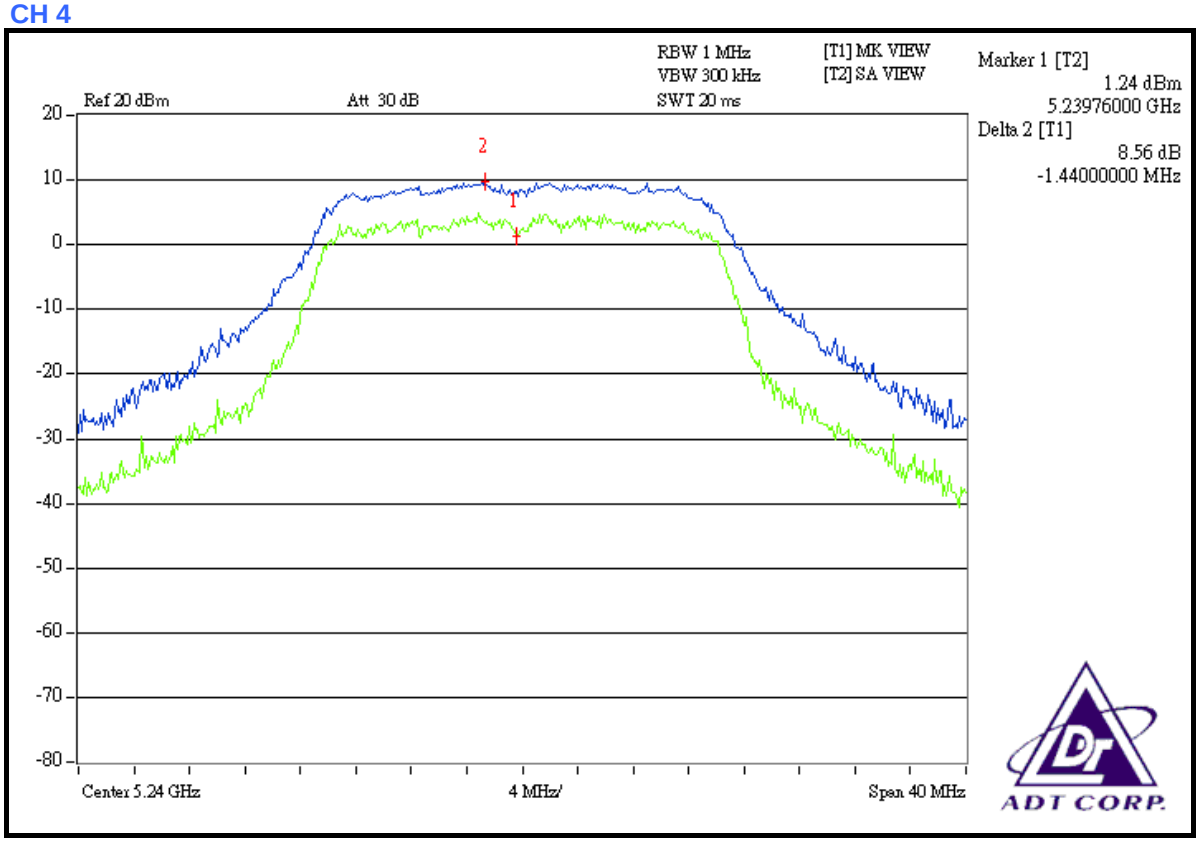
FOR CHAIN 0: CH 1



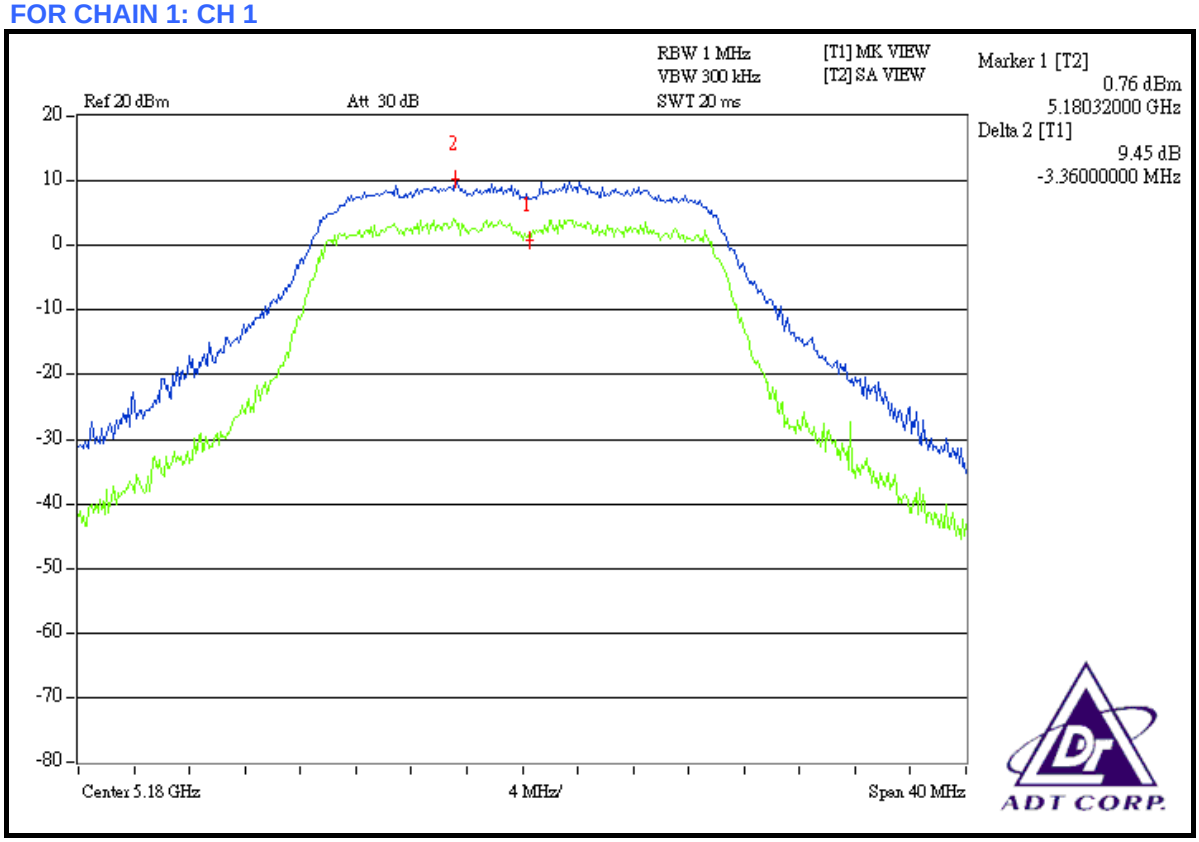
CH 2


RBW 1 MHz
VBW 300 kHz
SWT 20 ms
[T1] MK VIEW
[T2] SA VIEW
Marker 1 [T2]
1.09 dBm
5.20008000 GHz
Delta 2 [T1]
9.35 dB
-4.08000000 MHz
Ref 20 dBm
Att 30 dB
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
Center 5.2 GHz
4 MHz/
Span 40 MHz
ADT CORP.

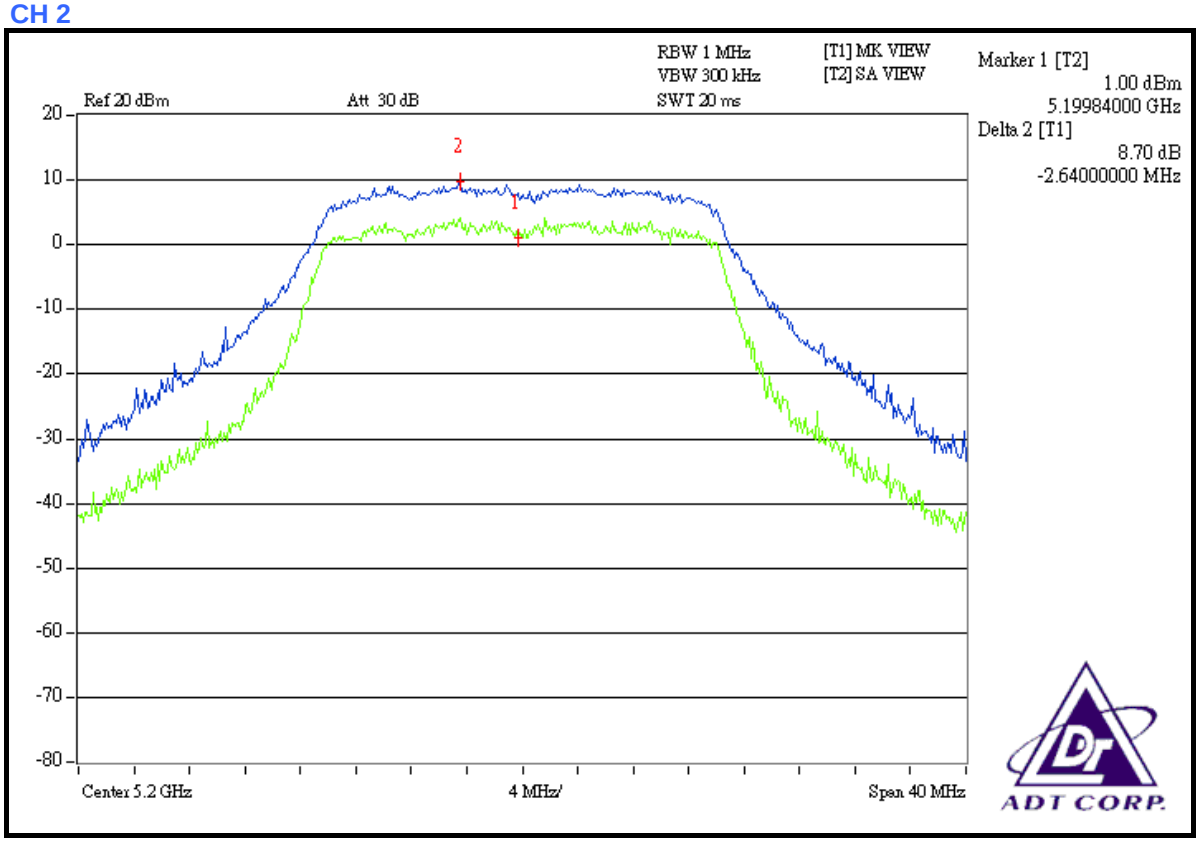
CH 4


RBW 1 MHz
VBW 300 kHz
SWT 20 ms
[T1] MK VIEW
[T2] SA VIEW
Marker 1 [T2]
1.24 dBm
5.23976000 GHz
Delta 2 [T1]
8.56 dB
-1.44000000 MHz
Ref 20 dBm
Att 30 dB
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
Center 5.24 GHz
4 MHz/
Span 40 MHz
ADT CORP.

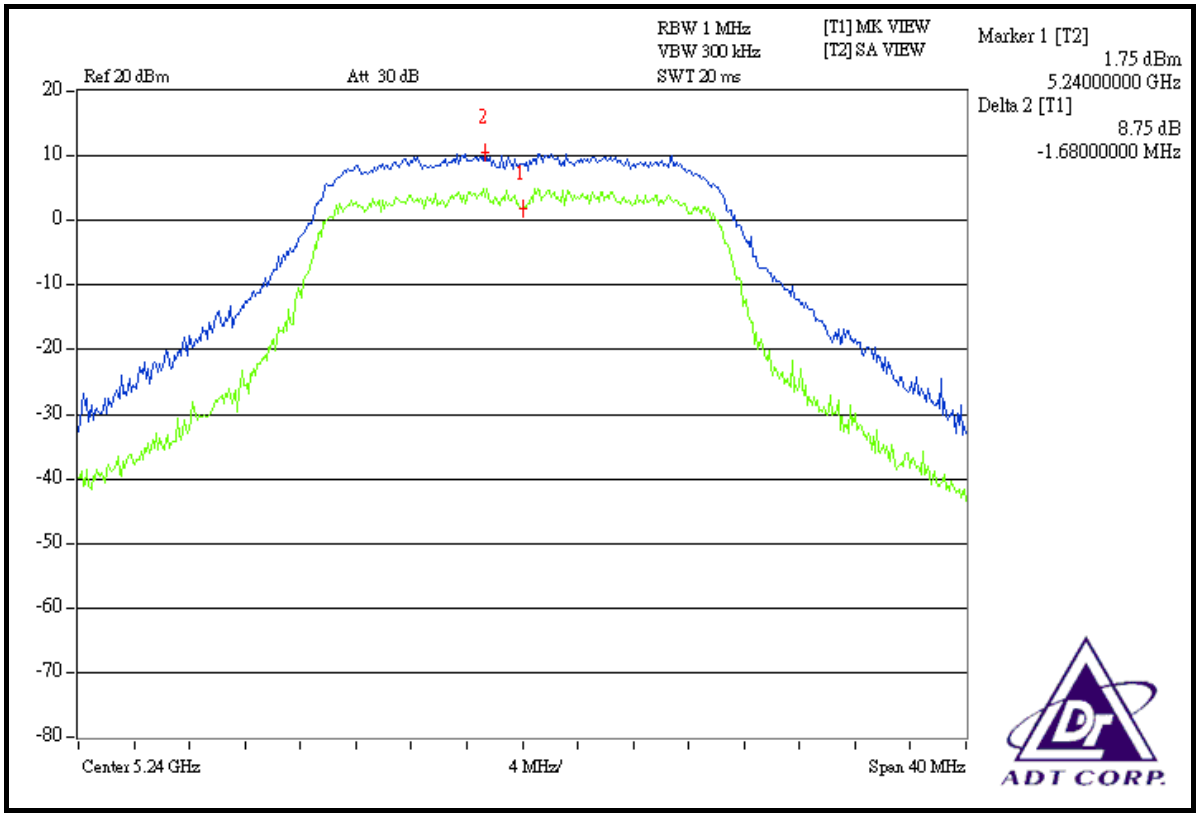
FOR CHAIN 1: CH 1



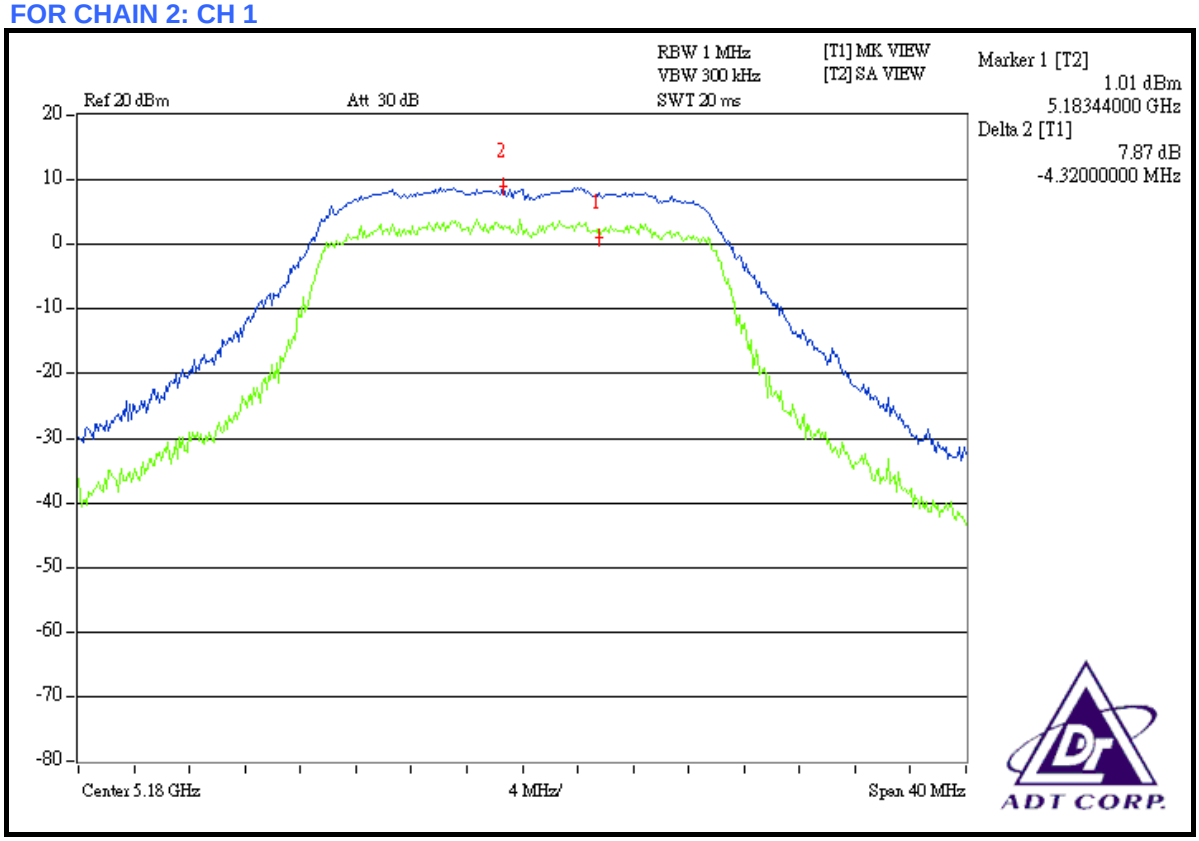
CH 2



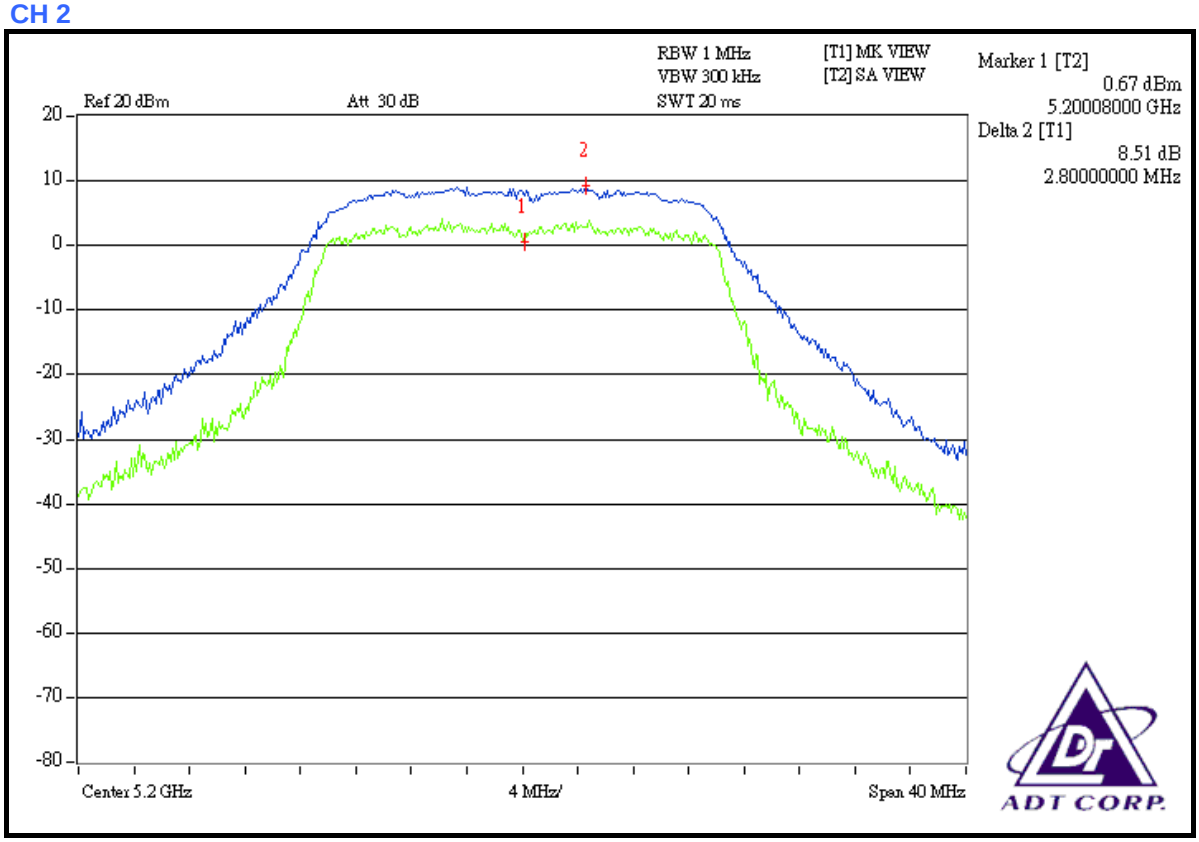
CH 4



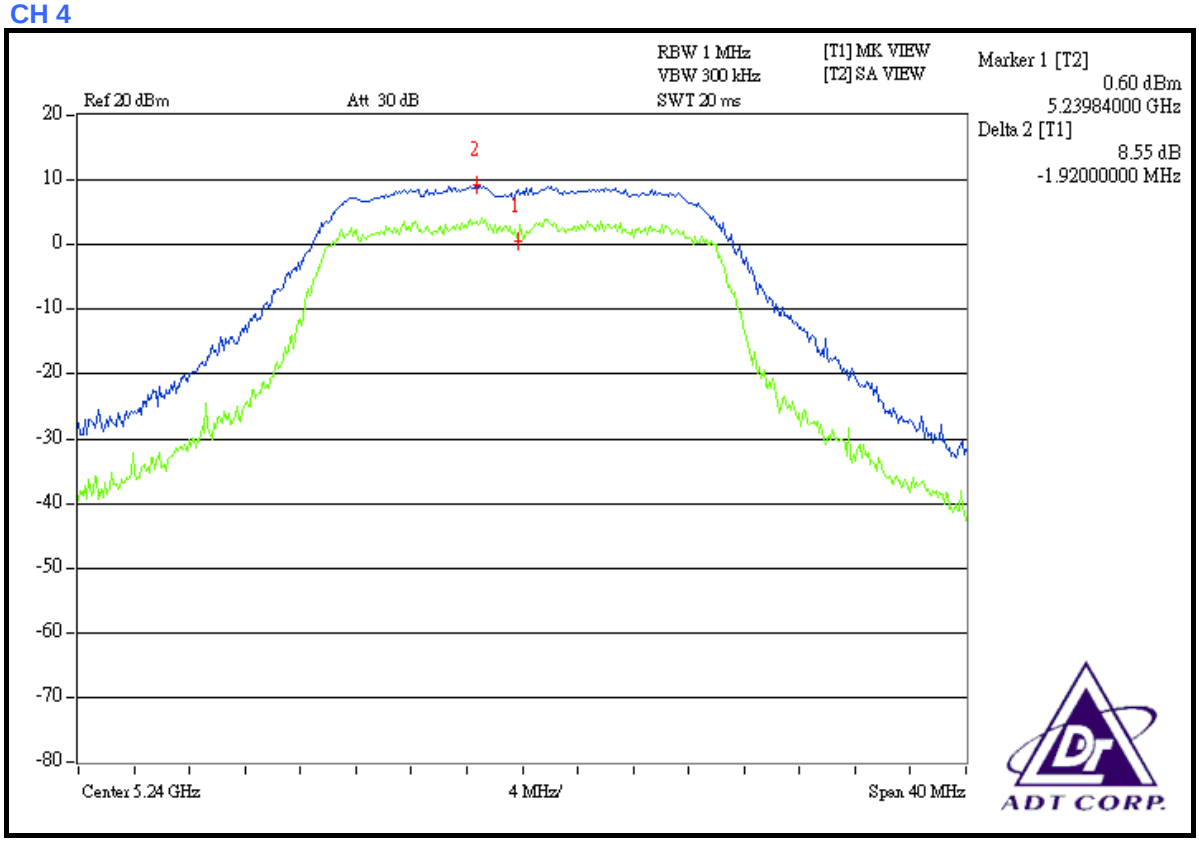
FOR CHAIN 2: CH 1



CH 2


RBW 1 MHz
VBW 300 kHz
SWT 20 ms
[T1] MK VIEW
[T2] SA VIEW
Marker 1 [T2]
0.67 dBm
5.20008000 GHz
Delta 2 [T1]
8.51 dB
2.80000000 MHz
Ref 20 dBm
Att 30 dB
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
Center 5.2 GHz
4 MHz/
Span 40 MHz
ADT CORP.

CH 4

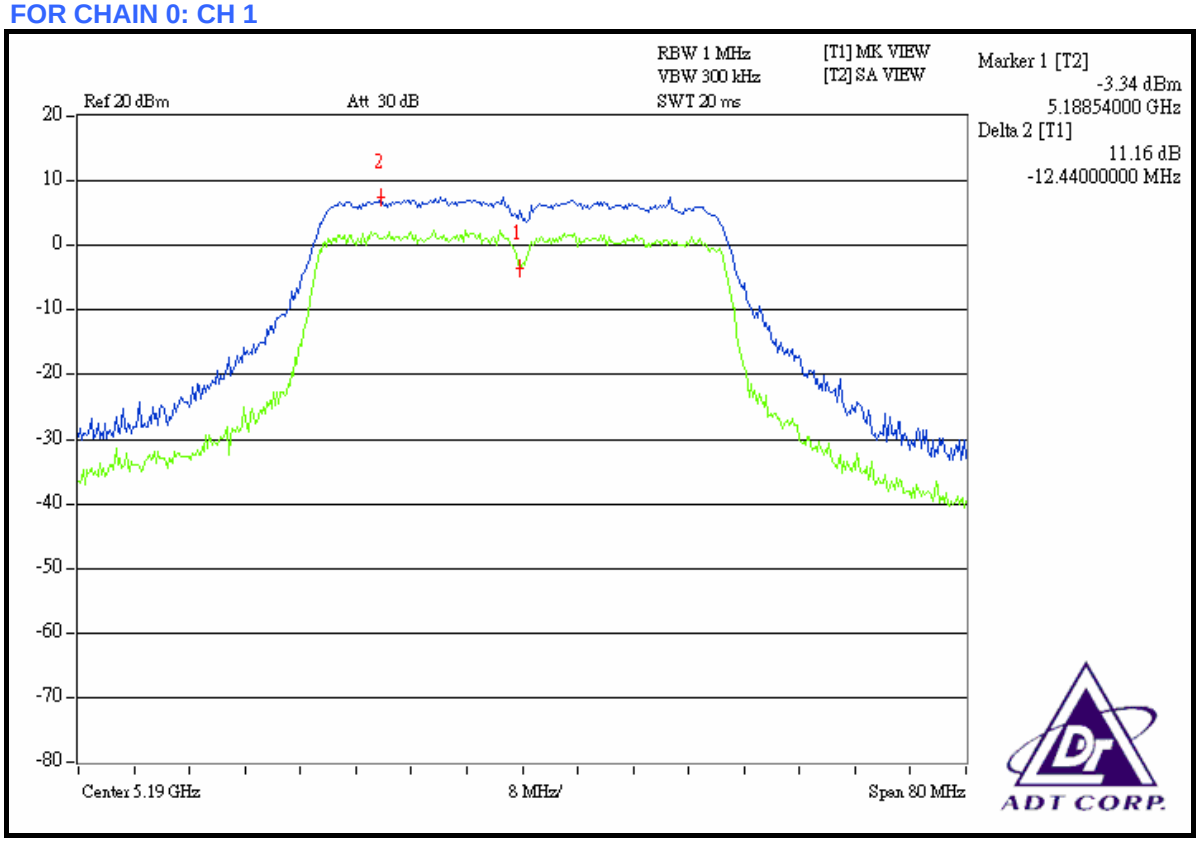

RBW 1 MHz
VBW 300 kHz
SWT 20 ms
[T1] MK VIEW
[T2] SA VIEW
Marker 1 [T2]
0.60 dBm
5.23984000 GHz
Delta 2 [T1]
8.55 dB
-1.92000000 MHz
Ref 20 dBm
Att 30 dB
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
Center 5.24 GHz
4 MHz/
Span 40 MHz
ADT CORP.

DRAFT 802.11n (40MHz) OFDM MODULATION:

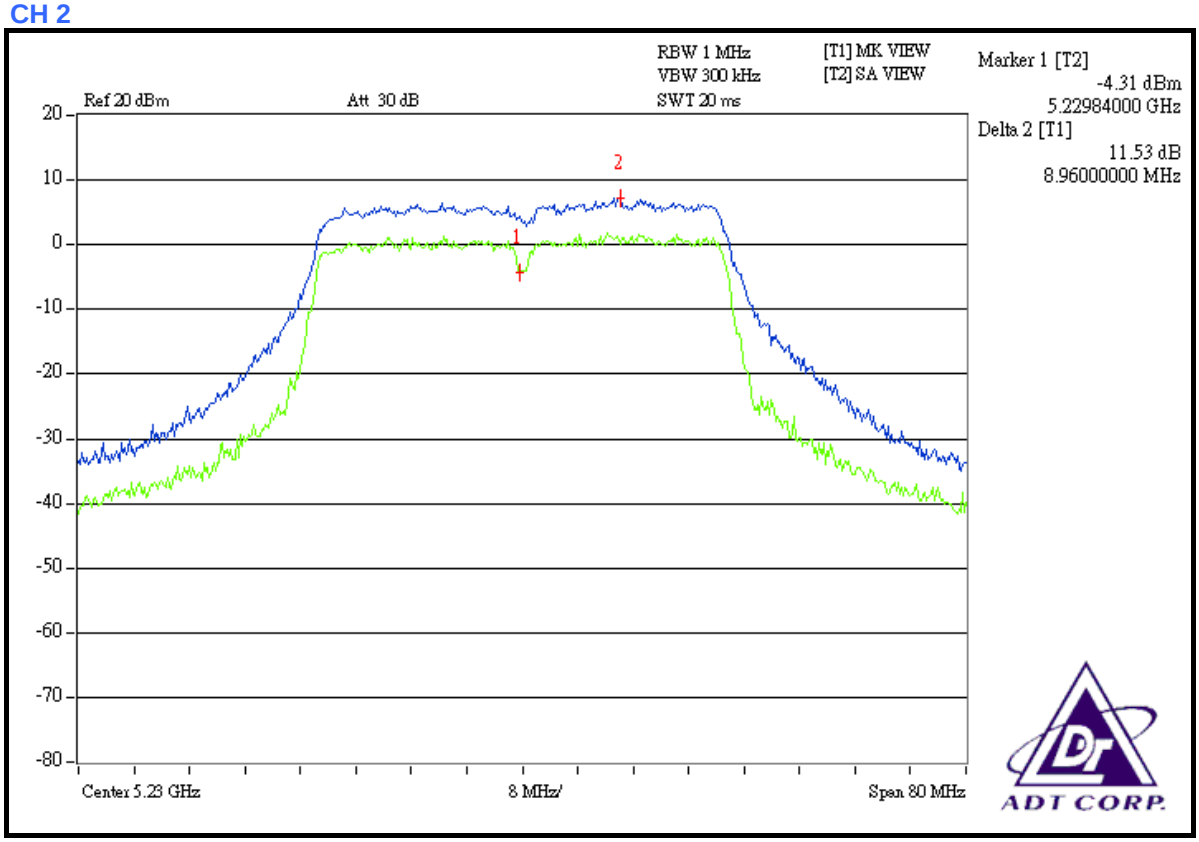
MODULATION TYPE	BPSK	**TRANSFER RATE**	13.5Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	**ENVIRONMENTAL CONDITIONS**	25deg.C, 65%RH, 991hPa
TESTED BY	Long Chen		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER EXCURSION (dB)			PEAK to AVERAGE EXCURSION LIMIT (dB)	PASS/FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
1	5190	11.16	12.10	11.06	13	PASS
2	5230	11.53	12.43	11.67	13	PASS

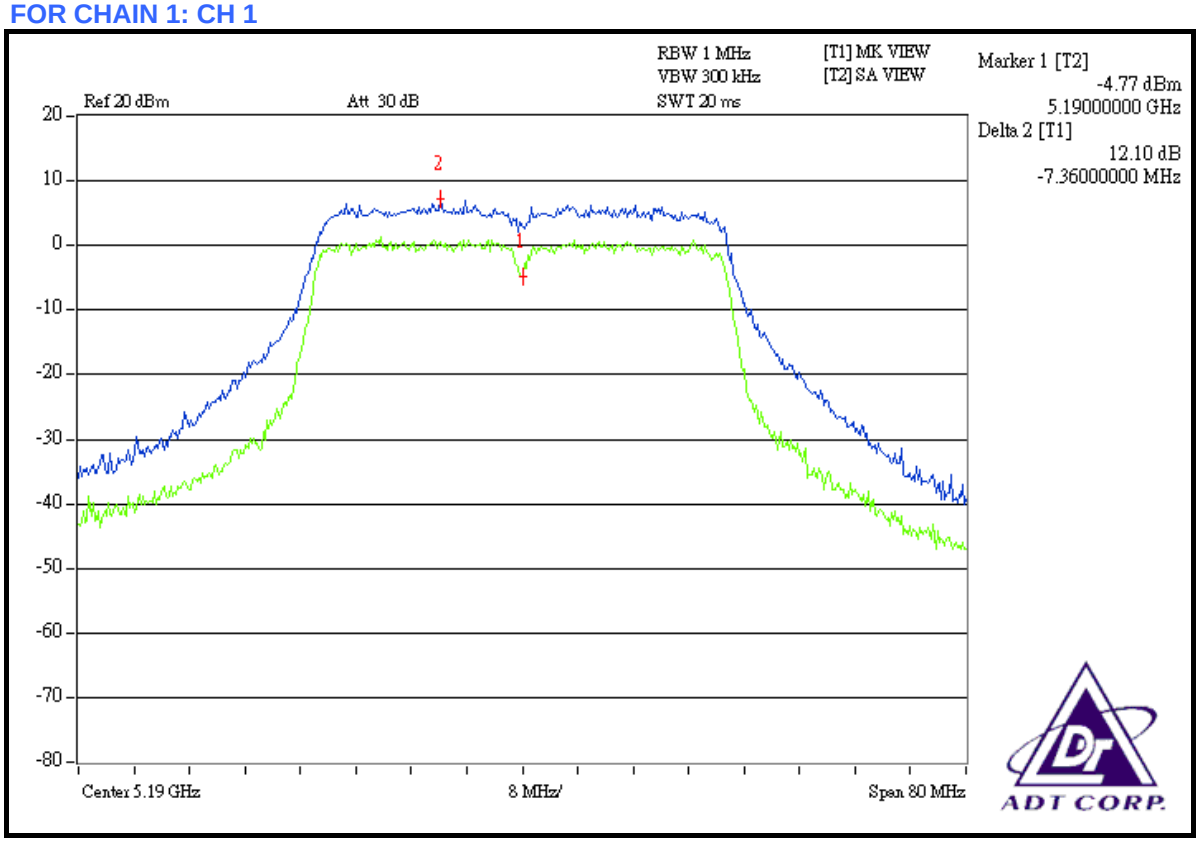
FOR CHAIN 0: CH 1



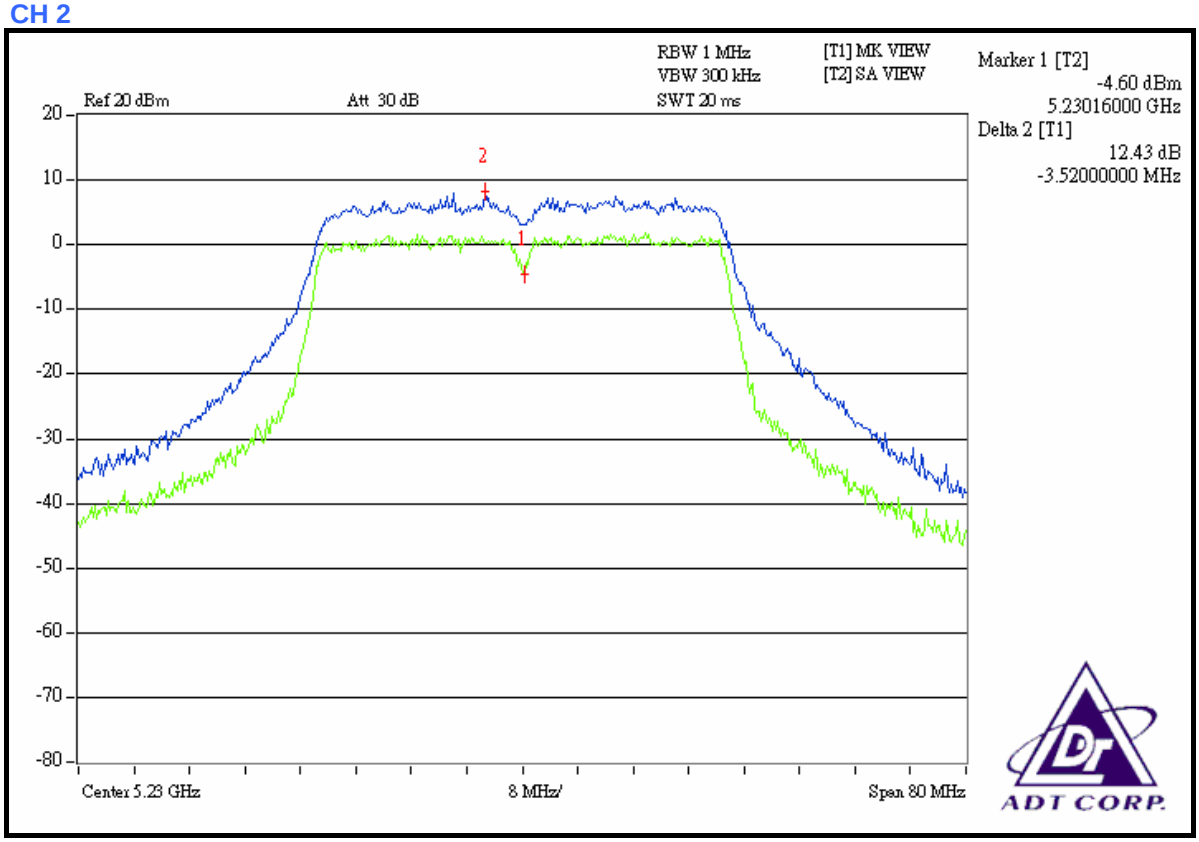
CH 2



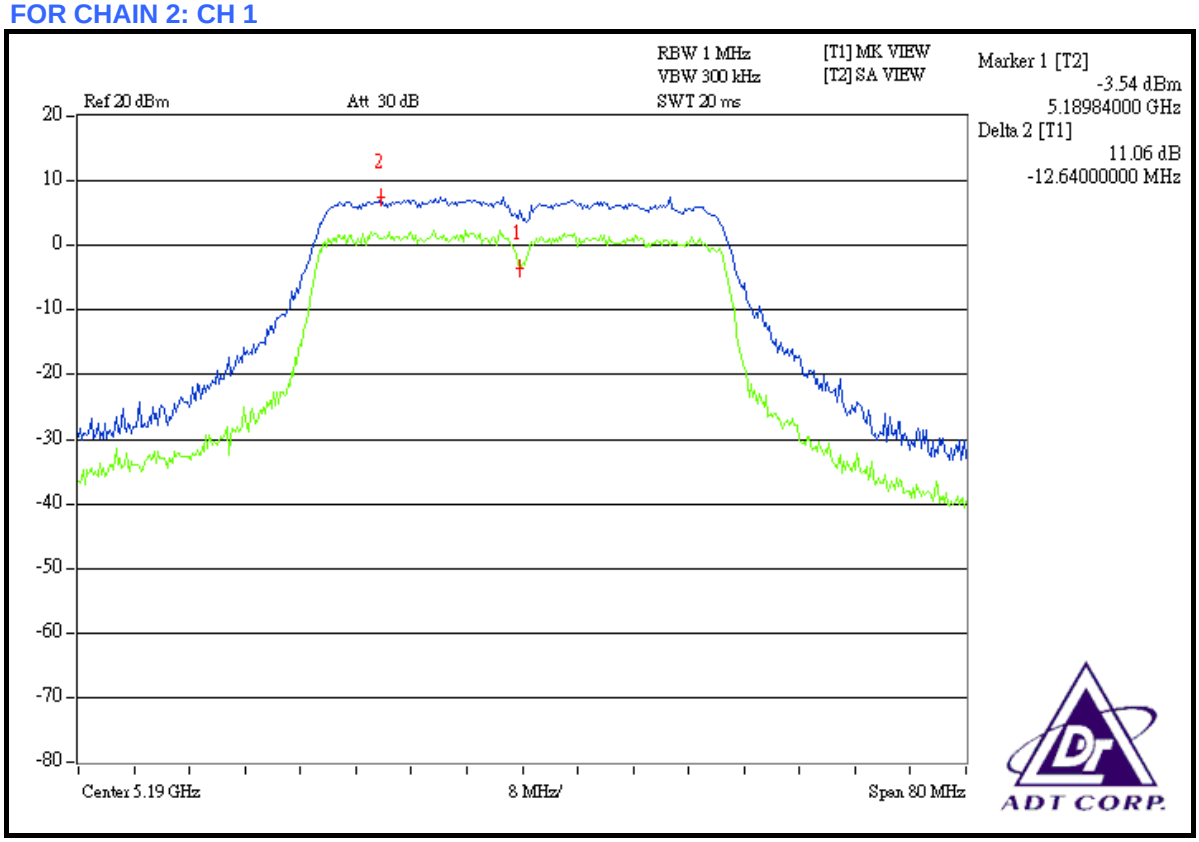
FOR CHAIN 1: CH 1



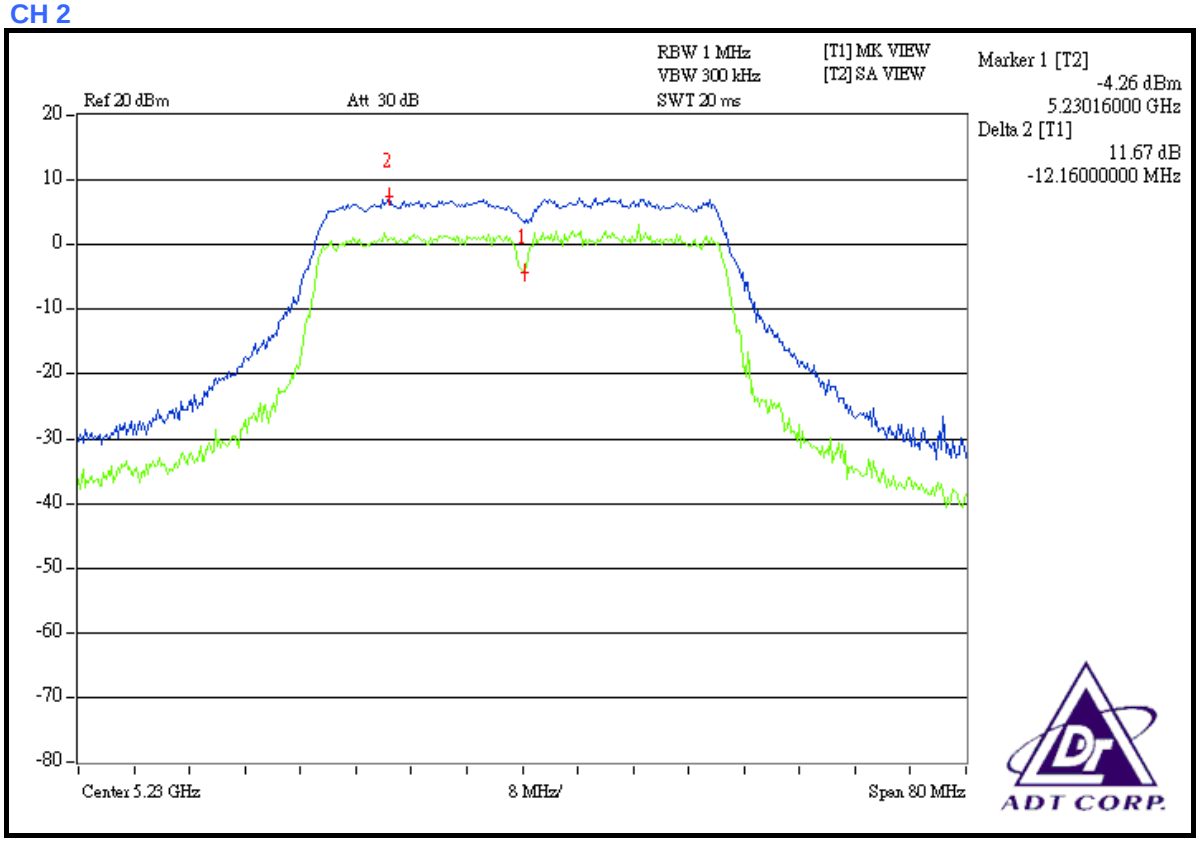
CH 2



FOR CHAIN 2: CH 1



CH 2



4.5 PEAK POWER SPECTRAL DENSITY MEASUREMENT

4.5.1 LIMITS OF PEAK POWER SPECTRAL DENSITY MEASUREMENT

FREQUENCY BAND	LIMIT
5.150 ~ 5.250GHz	4dBm
5.250 ~ 5.350GHz	11dBm
5.470 ~ 5.725GHz	11dBm

4.5.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
R&S SPECTRUM ANALYZER	FSP40	100040	Jun. 28, 2008

NOTE: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.5.3 TEST PROCEDURES

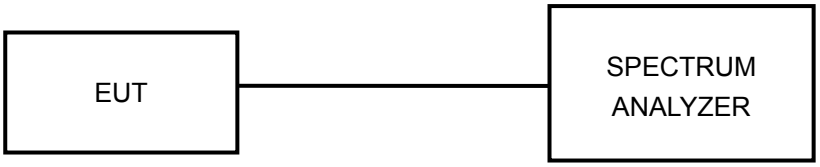
a. The transmitter output was connected to the spectrum analyzer.

b. Set RBW = 1MHz, VBW = 3MHz. The PPSD is the highest level found across the emission in any 1MHz band.

4.5.4 DEVIATION FROM TEST STANDARD

No deviation

4.5.5 TEST SETUP



4.5.6 EUT OPERATING CONDITIONS

Same as 5.3.6

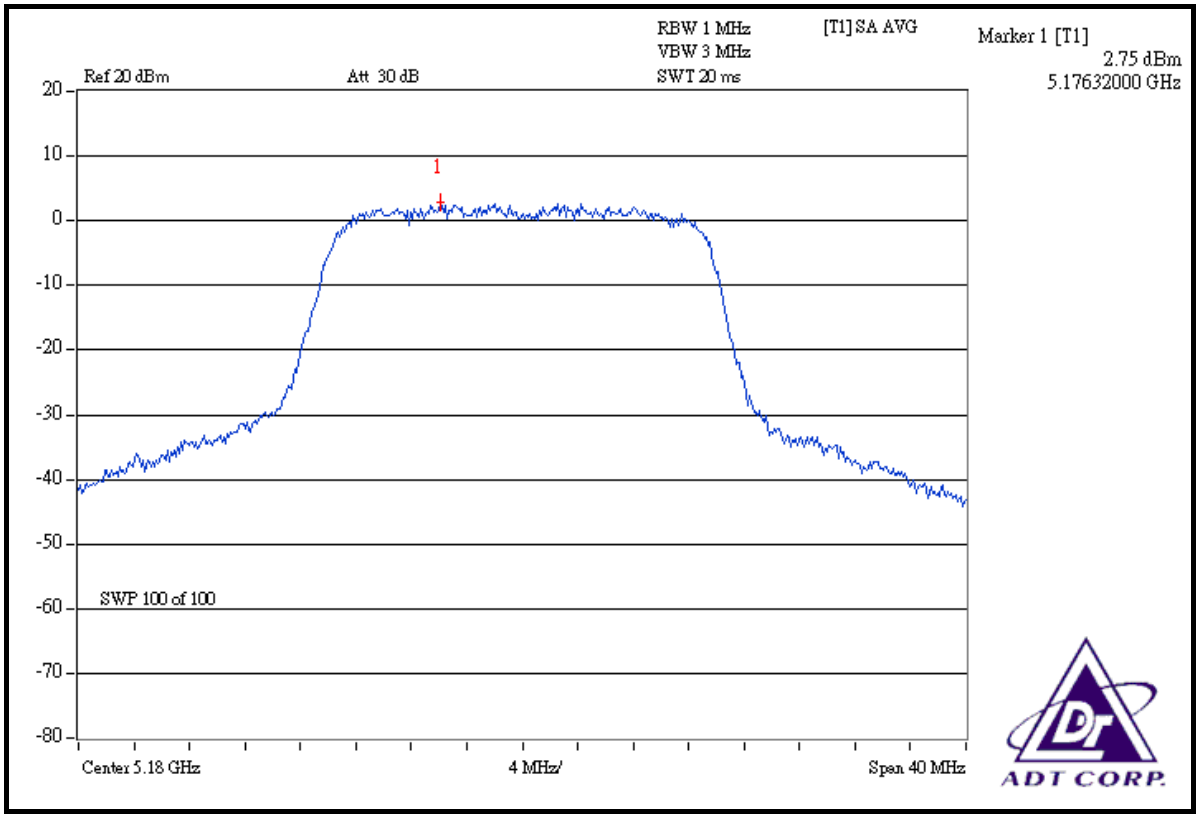
4.5.7 TEST RESULTS

802.11a OFDM MODULATION:

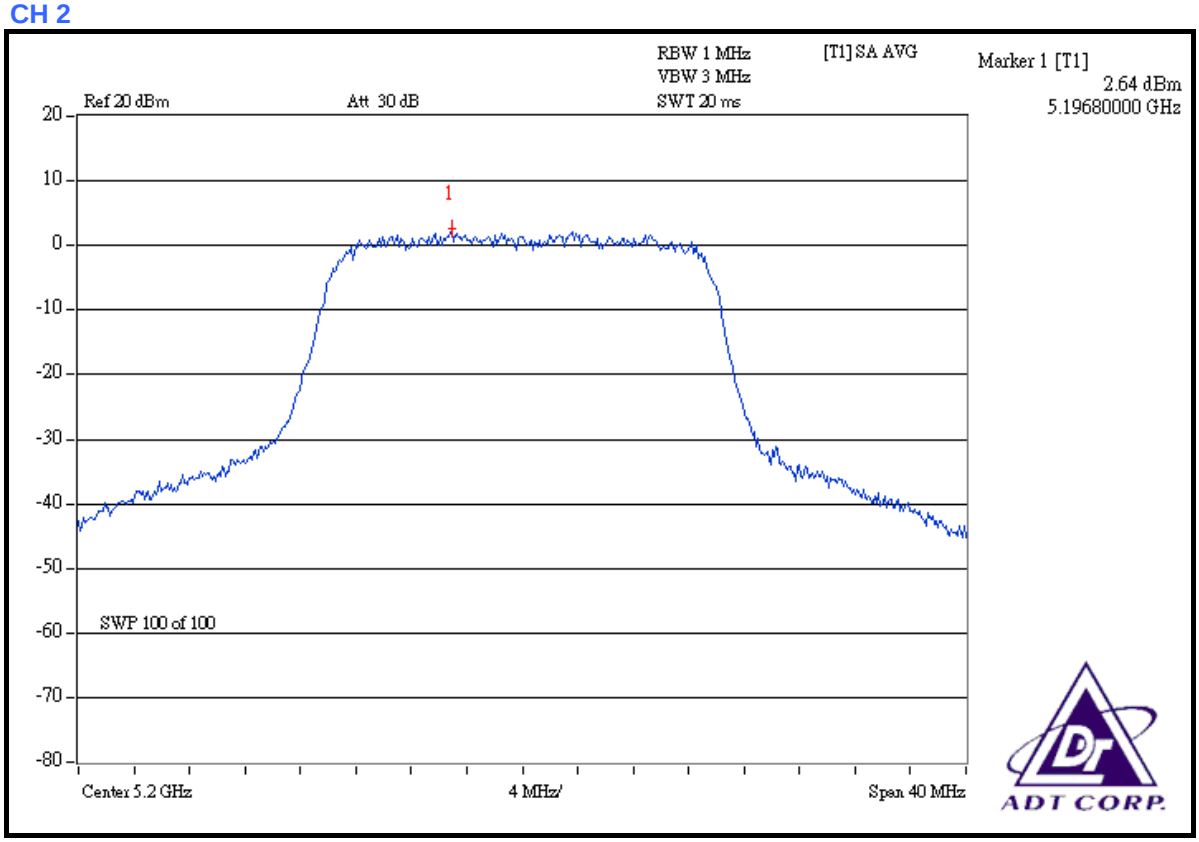
MODULATION TYPE	BPSK	**TRANSFER RATE**	6.0Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	**ENVIRONMENTAL CONDITIONS**	25deg.C, 65%RH, 991hPa
TESTED BY	Long Chen		

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 1MHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
1	5180	2.75	4	PASS
2	5200	2.64	4	PASS
4	5240	2.86	4	PASS

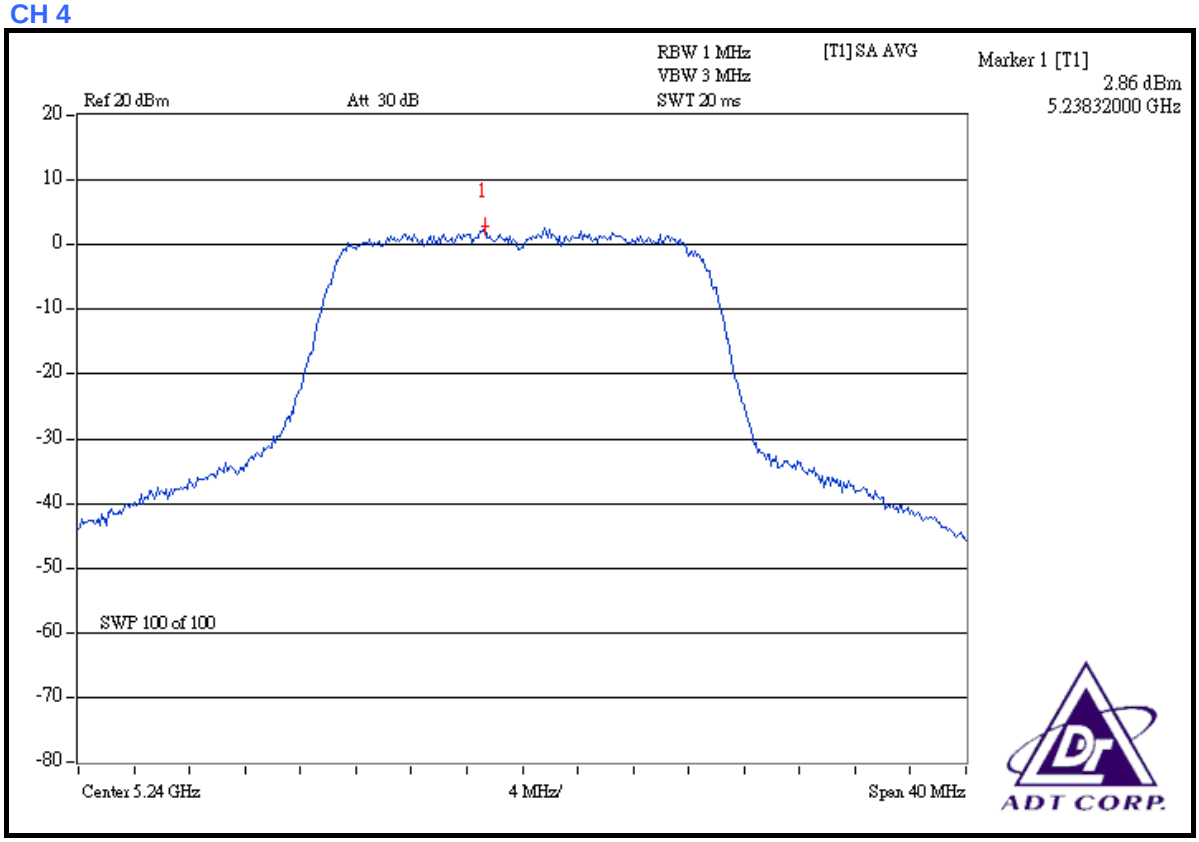
CH 1



CH 2


RBW 1 MHz
VBW 3 MHz
SWT 20 ms
[T1] SA AVG
Marker 1 [T1]
2.64 dBm
5.19680000 GHz
Ref 20 dBm
Att 30 dB
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
SWP 100 of 100
Center 5.2 GHz
4 MHz/
Span 40 MHz
ADT CORP.

CH 4

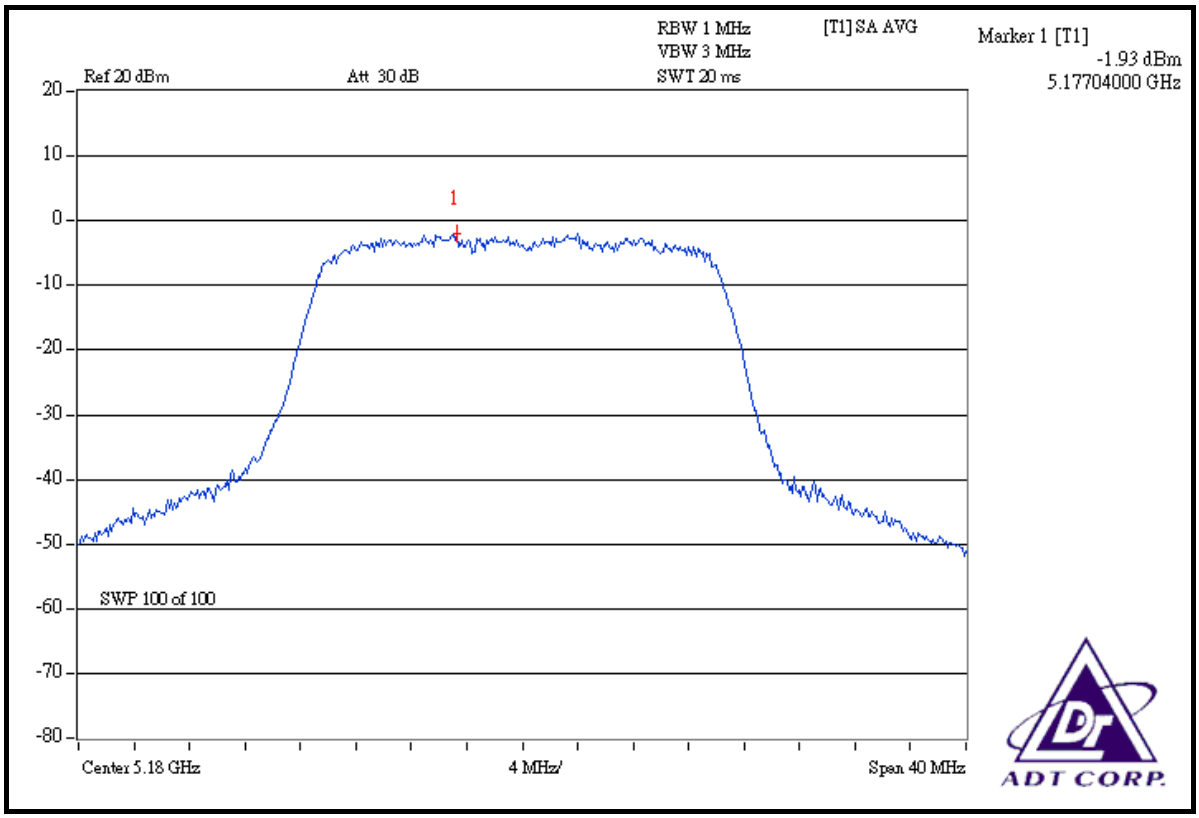

RBW 1 MHz
VBW 3 MHz
SWT 20 ms
[T1] SA AVG
Marker 1 [T1]
2.86 dBm
5.23832000 GHz
Ref 20 dBm
Att 30 dB
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
SWP 100 of 100
Center 5.24 GHz
4 MHz/
Span 40 MHz
ADT CORP.

DRAFT 802.11n (20MHz) OFDM MODULATION:

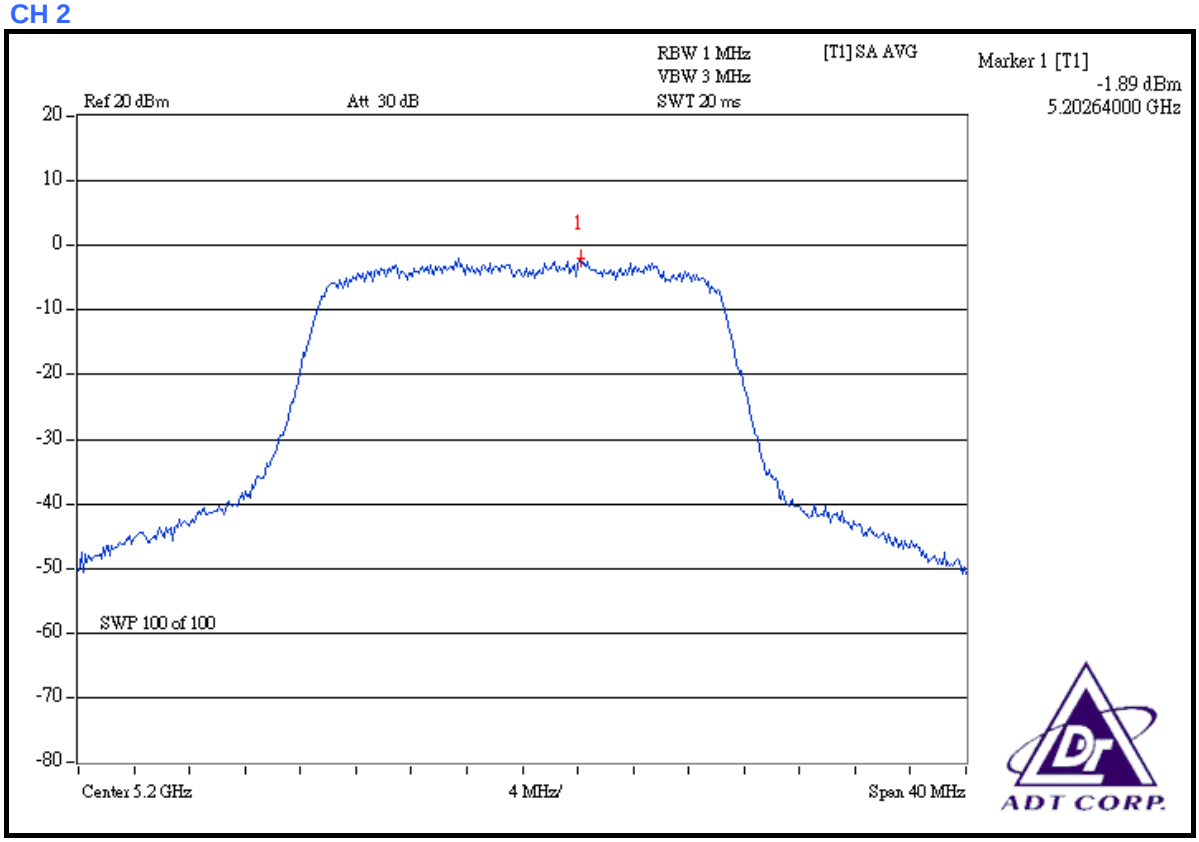
MODULATION TYPE	BPSK	TRANSFER RATE	6.5Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	25deg.C, 65%RH, 991hPa
TESTED BY	Long Chen		

CHAN.	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (mW)			RF POWER LEVEL IN 3kHz BW (dBm)			TOTAL POWER DENSITY (mW)	TOTAL POWER DENSITY (dBm)	MAX. LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2	CHAIN 0	CHAIN 1	CHAIN 2				
1	5180	0.641	0.647	0.604	-1.93	-1.89	-2.19	1.892	2.77	4	PASS
2	5200	0.647	0.627	0.614	-1.89	-2.03	-2.12	1.888	2.76	4	PASS
4	5240	0.656	0.647	0.627	-1.83	-1.89	-2.03	1.930	2.86	4	PASS

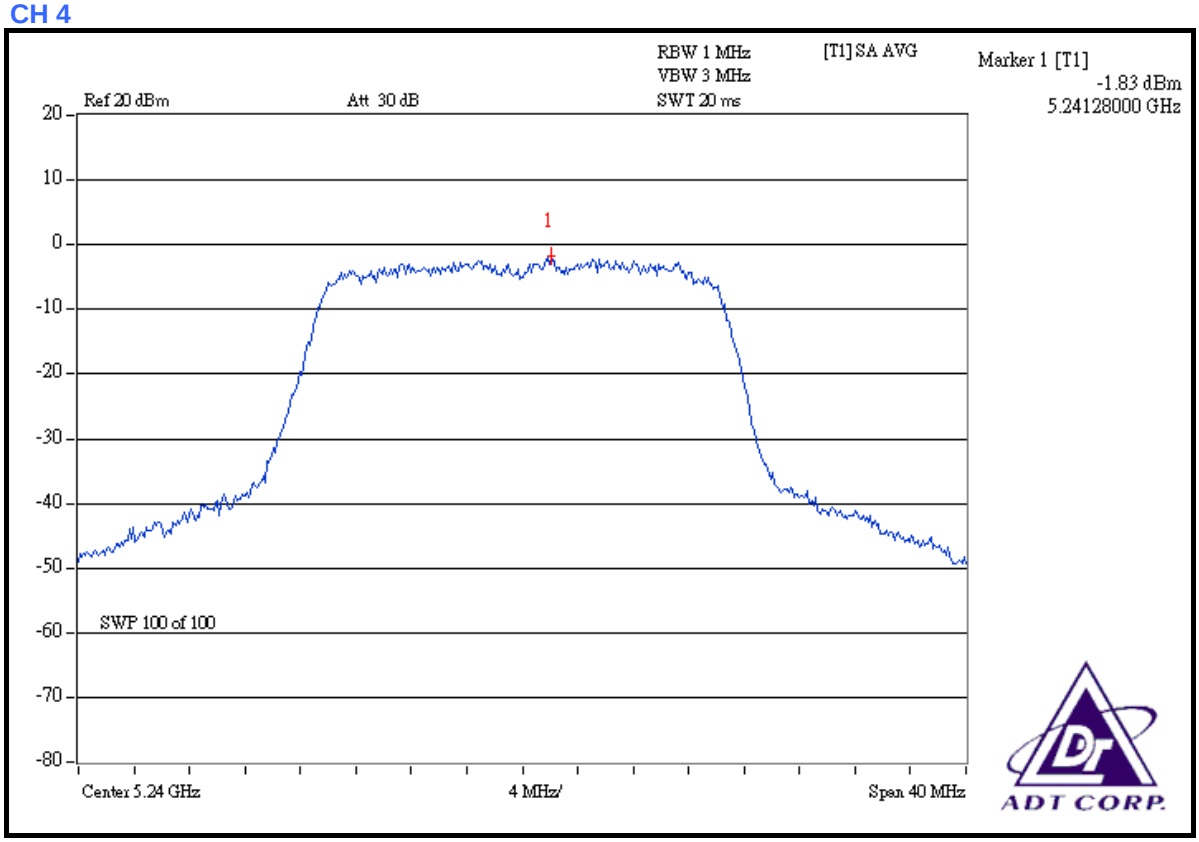
FOR CHAIN 0: CH 1



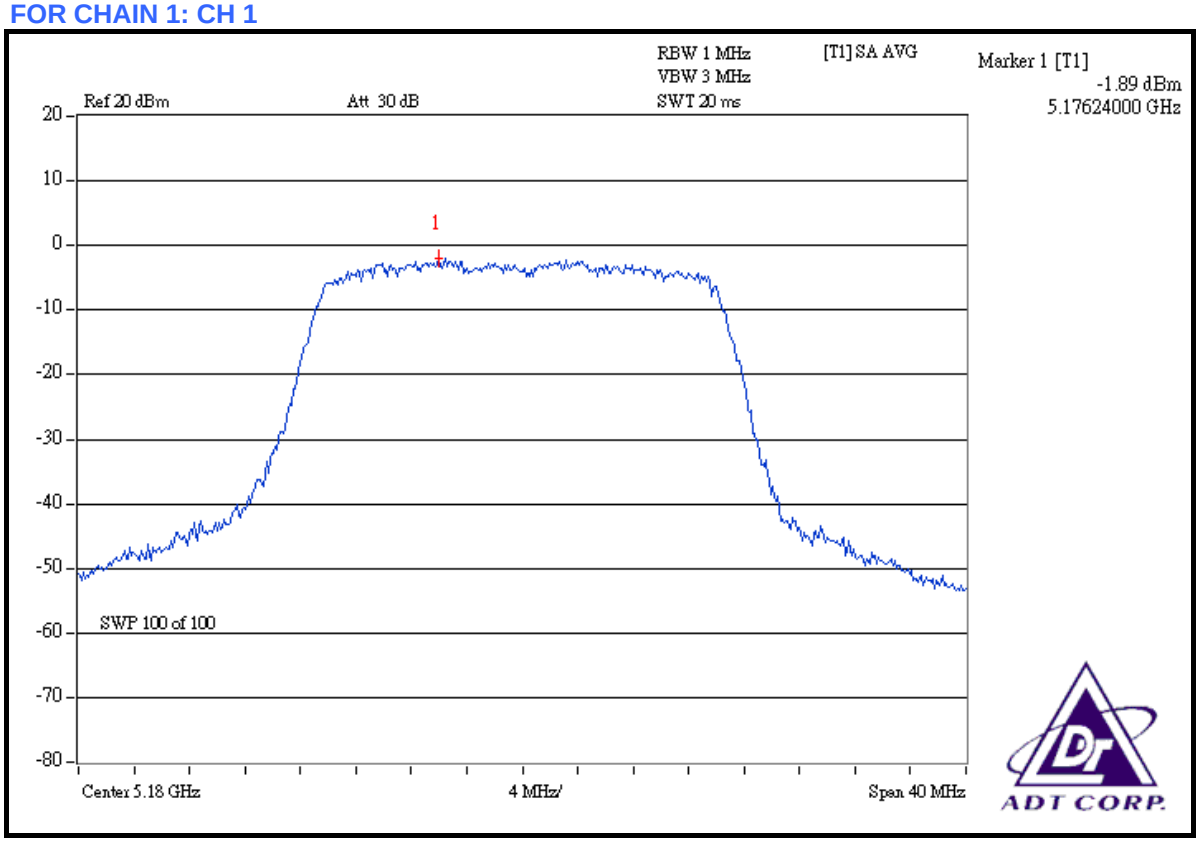
CH 2


RBW 1 MHz
VBW 3 MHz
SWT 20 ms
[T1] SA AVG
Marker 1 [T1]
-1.89 dBm
5.20264000 GHz
Ref 20 dBm
Att 30 dB
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
1
SWP 100 of 100
Center 5.2 GHz
4 MHz/
Span 40 MHz
ADT CORP.

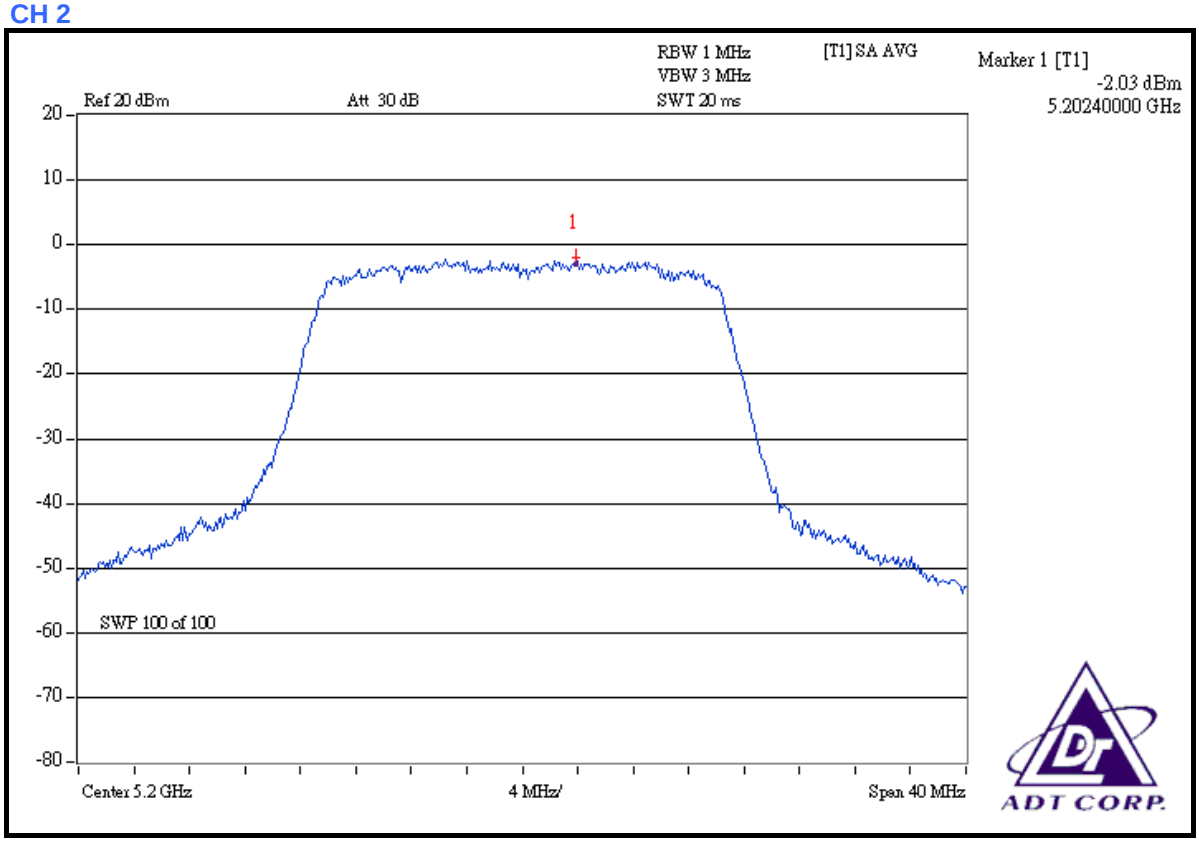
CH 4


RBW 1 MHz
VBW 3 MHz
SWT 20 ms
[T1] SA AVG
Marker 1 [T1]
-1.83 dBm
5.24128000 GHz
Ref 20 dBm
Att 30 dB
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
1
SWP 100 of 100
Center 5.24 GHz
4 MHz/
Span 40 MHz
ADT CORP.

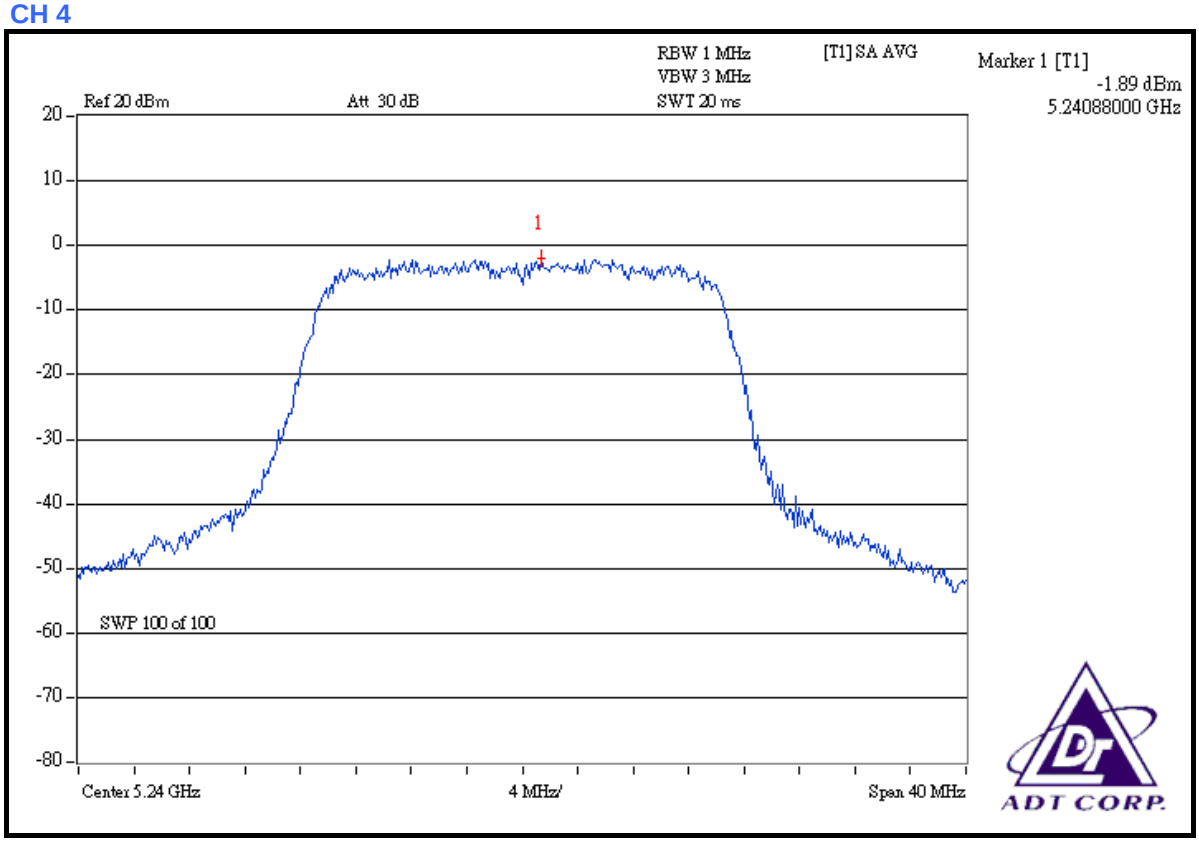
FOR CHAIN 1: CH 1



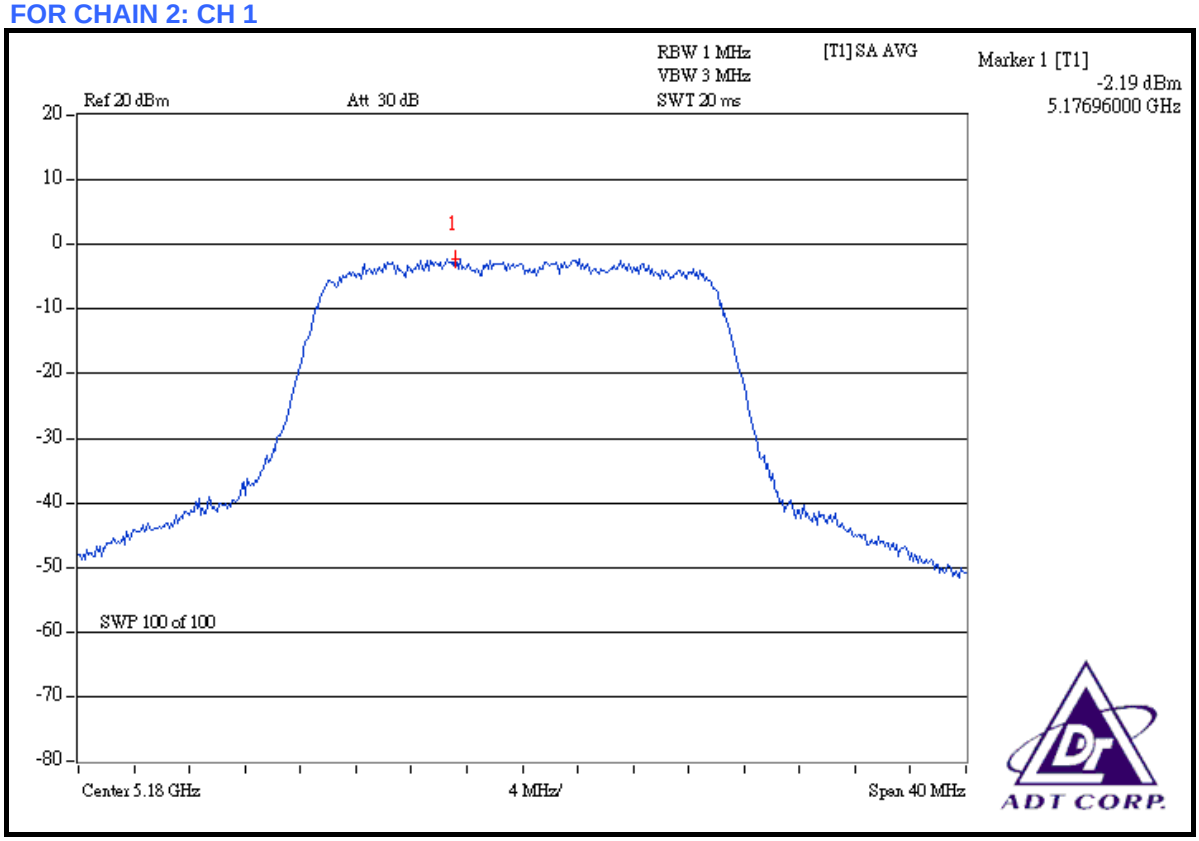
CH 2



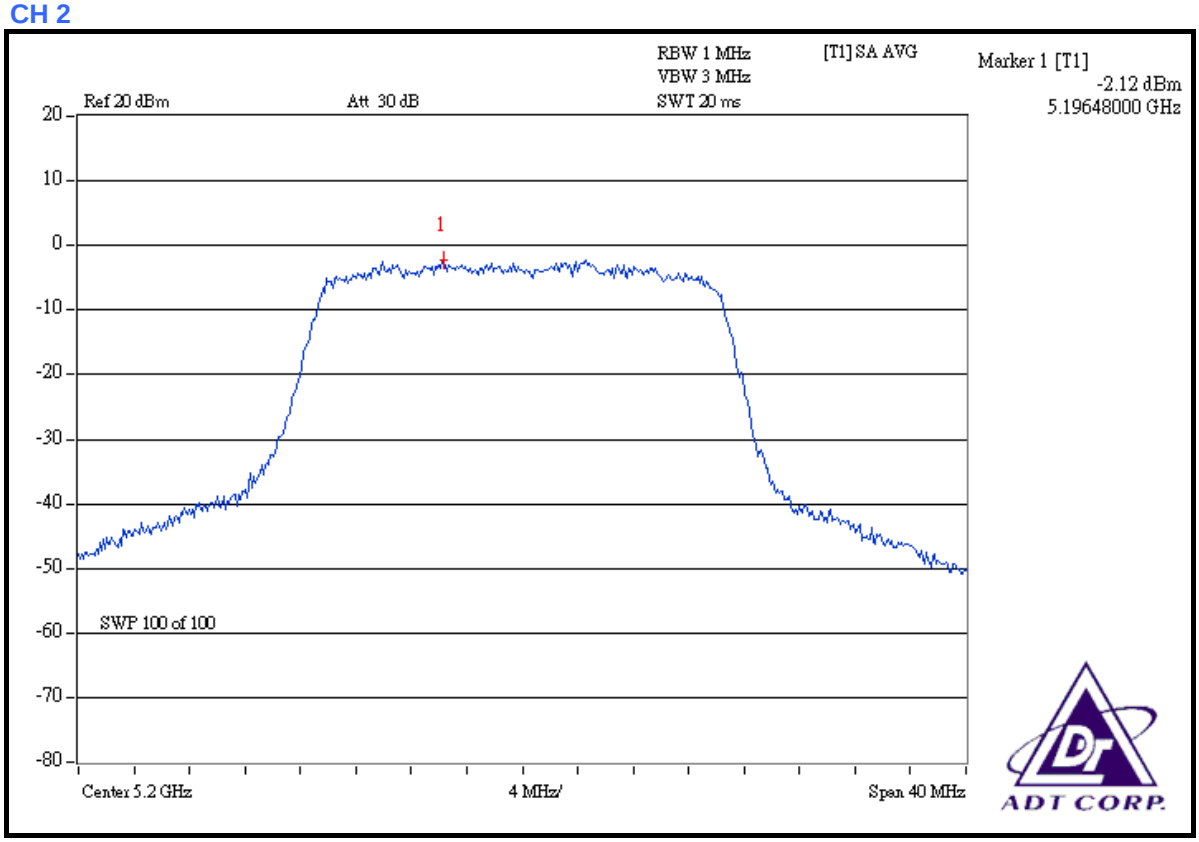
CH 4



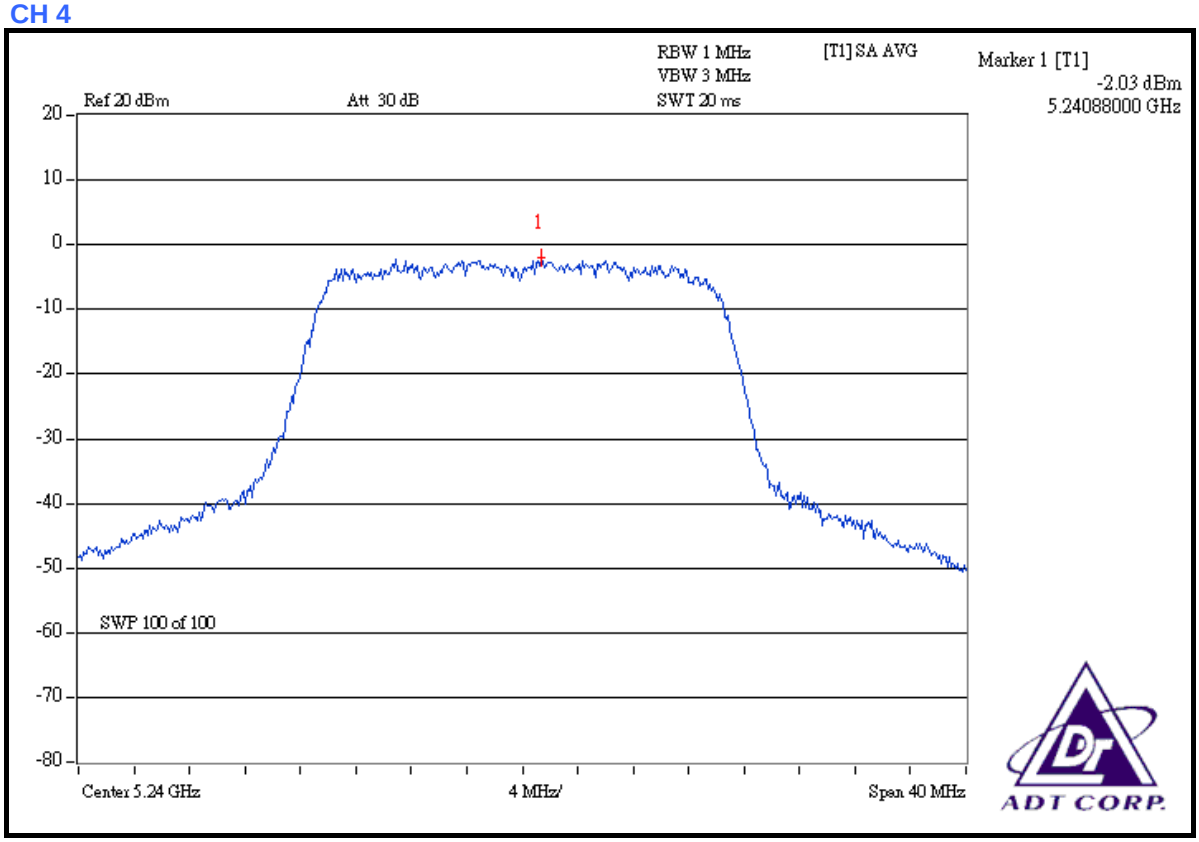
FOR CHAIN 2: CH 1



CH 2


RBW 1 MHz
VBW 3 MHz
SWT 20 ms
[T1] SA AVG
Marker 1 [T1]
-2.12 dBm
5.19648000 GHz
Ref 20 dBm
Att 30 dB
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
1
SWP 100 of 100
Center 5.2 GHz
4 MHz/
Span 40 MHz
ADT CORP.

CH 4

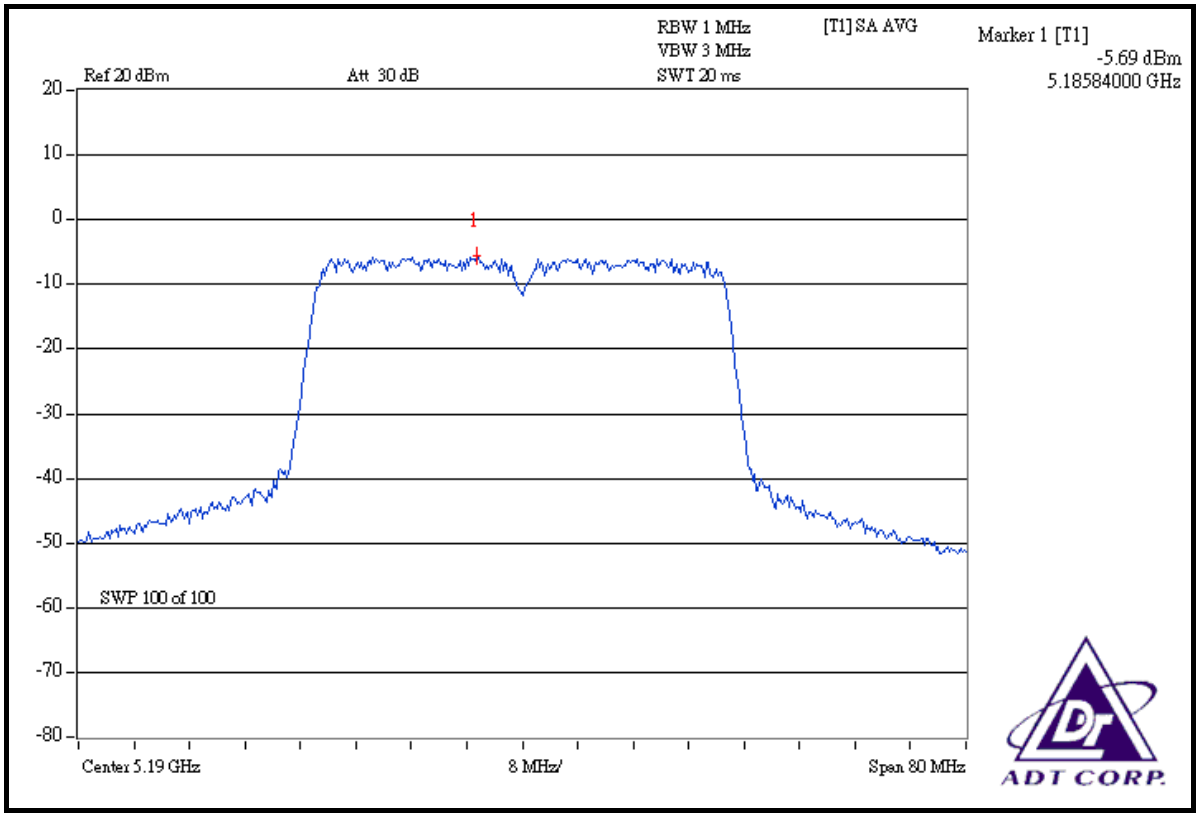

RBW 1 MHz
VBW 3 MHz
SWT 20 ms
[T1] SA AVG
Marker 1 [T1]
-2.03 dBm
5.24088000 GHz
Ref 20 dBm
Att 30 dB
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
1
SWP 100 of 100
Center 5.24 GHz
4 MHz/
Span 40 MHz
ADT CORP.

DRAFT 802.11n (40MHz) OFDM MODULATION:

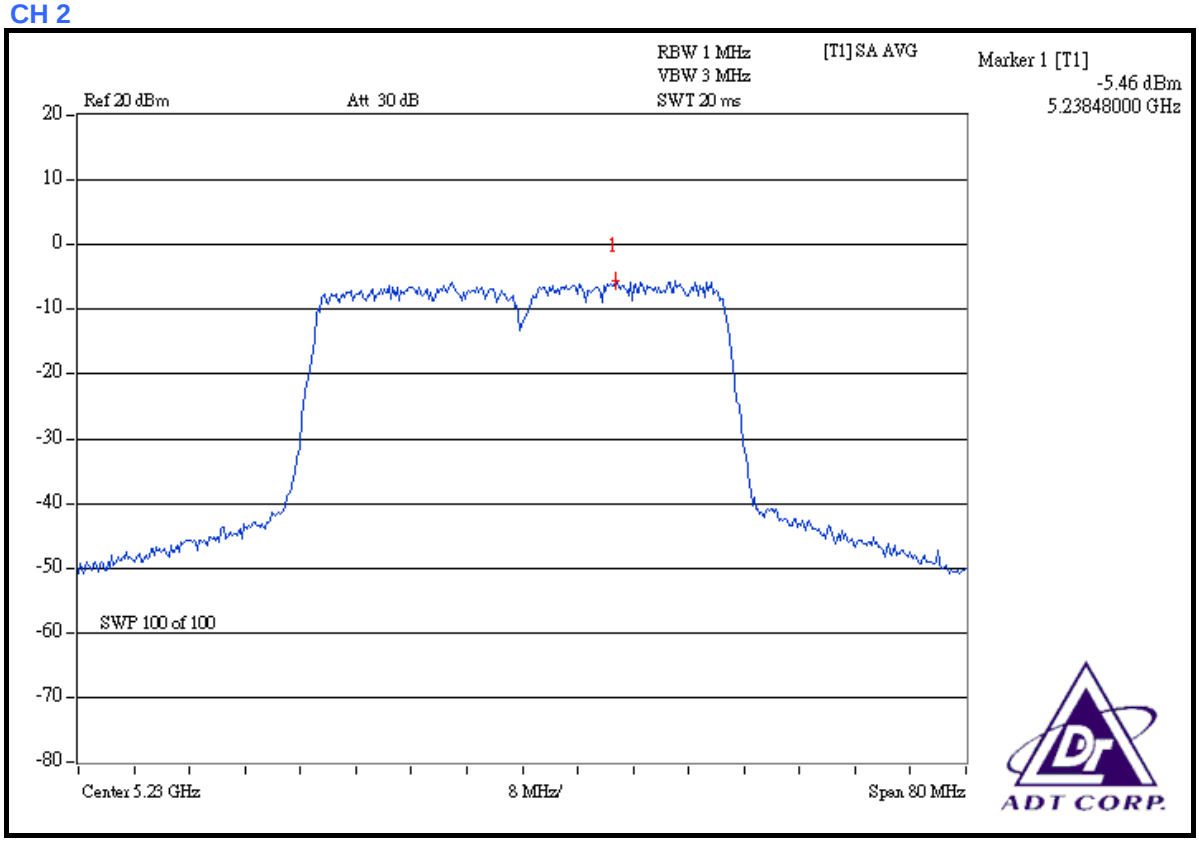
MODULATION TYPE	BPSK	**TRANSFER RATE**	13.5Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	**ENVIRONMENTAL CONDITIONS**	25deg.C, 65%RH, 991hPa
TESTED BY	Long Chen		

CHAN.	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (mW)			RF POWER LEVEL IN 3kHz BW (dBm)			TOTAL POWER DENSITY (mW)	TOTAL POWER DENSITY (dBm)	MAX. LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2	CHAIN 0	CHAIN 1	CHAIN 2				
1	5190	0.270	0.305	0.442	-5.69	-5.15	-3.55	1.017	0.07	4	PASS
2	5230	0.284	0.316	0.422	-5.46	-5.00	-3.75	1.022	0.09	4	PASS

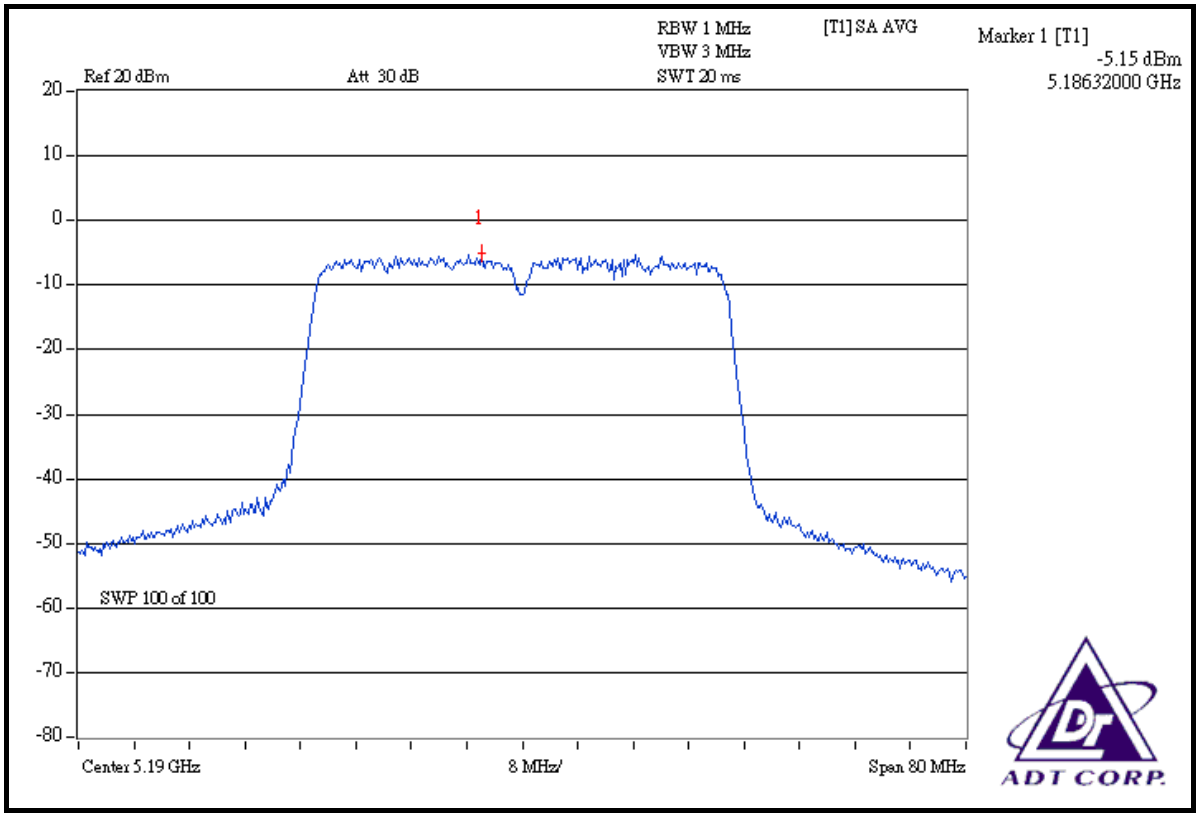
FOR CHAIN 0: CH 1



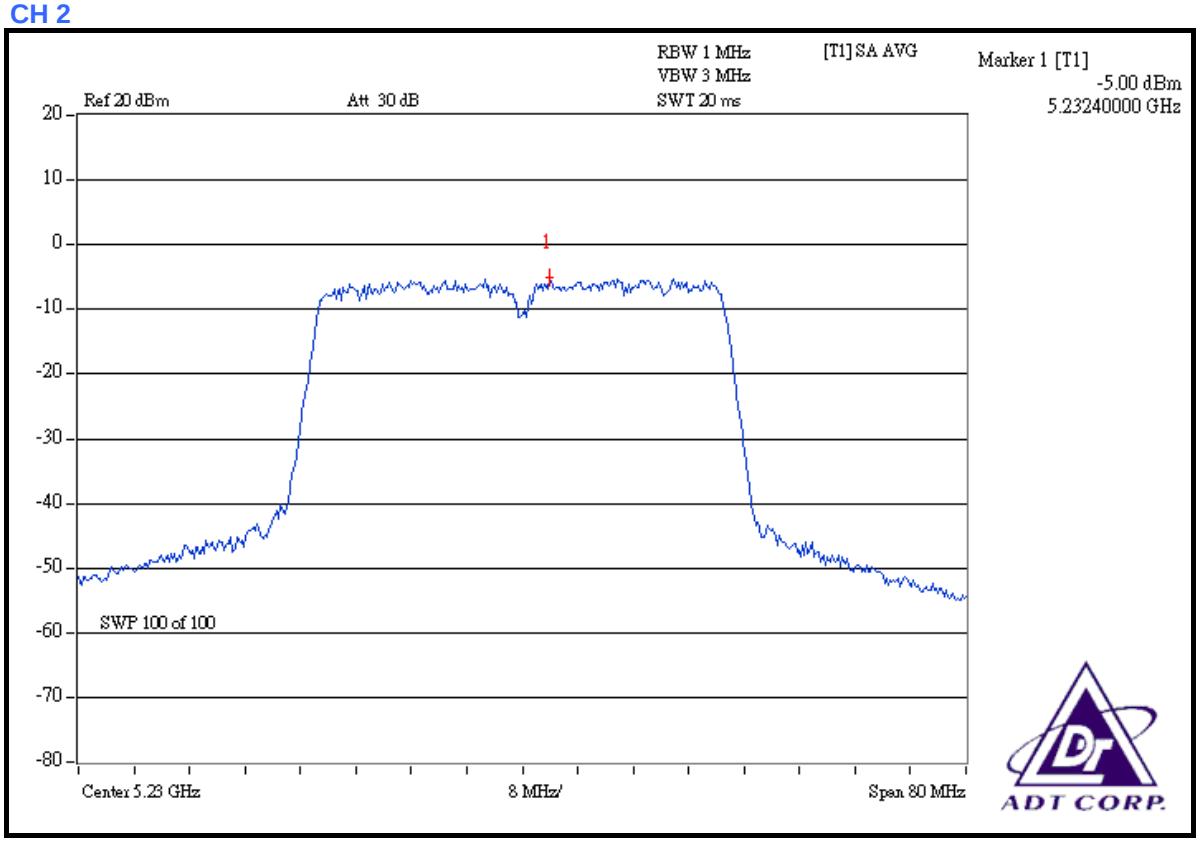
CH 2



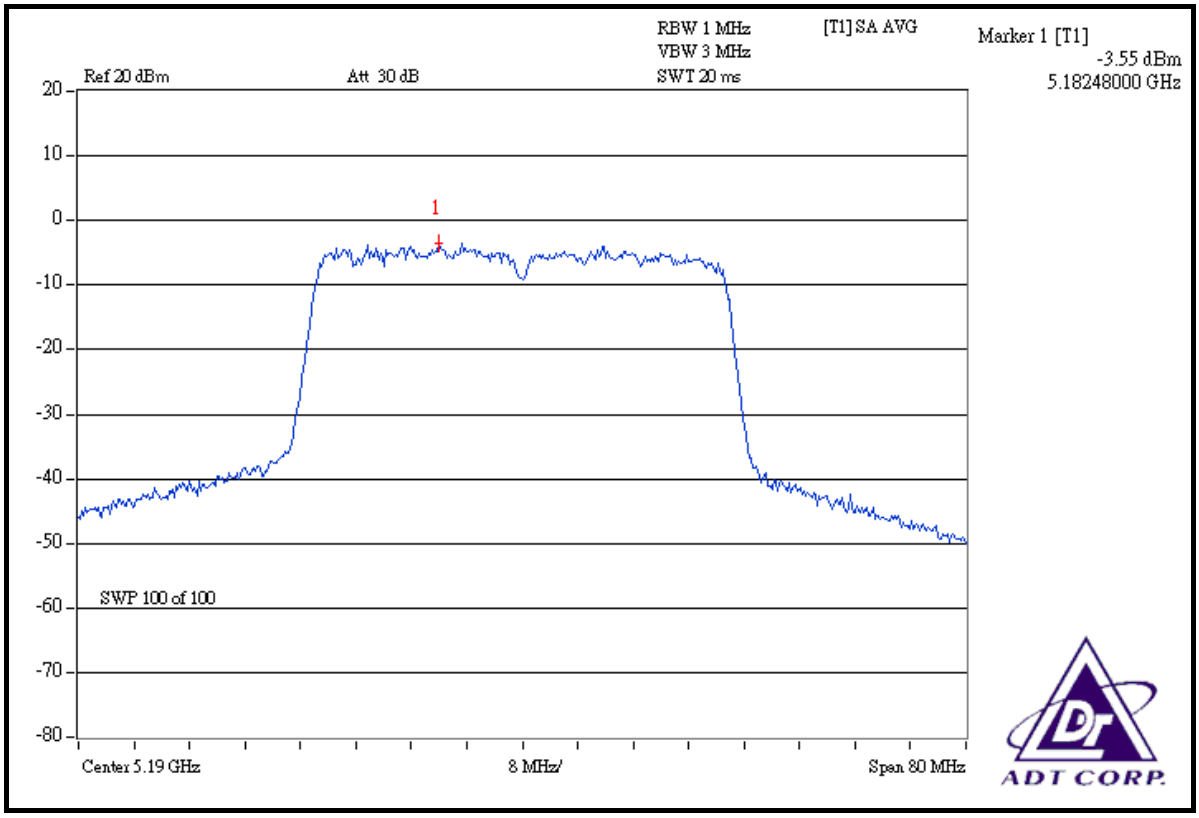
FOR CHAIN 1: CH 1



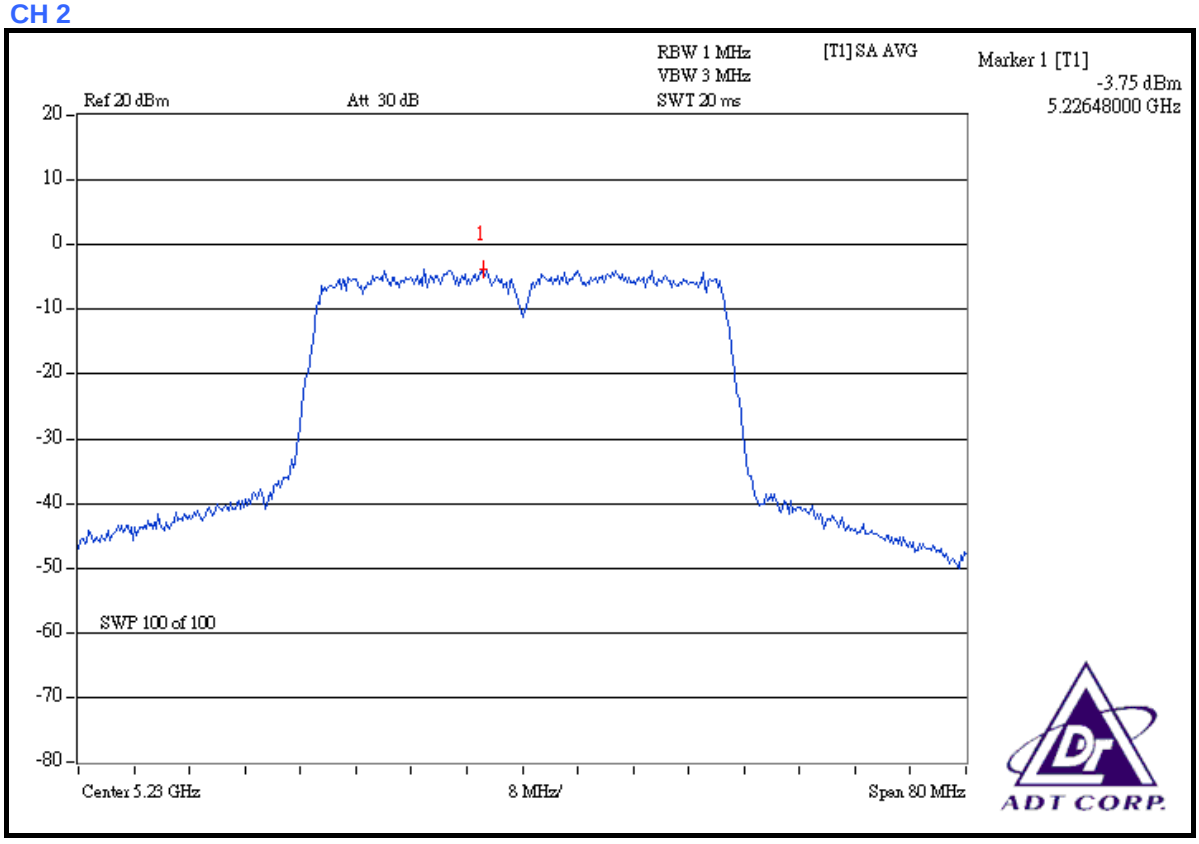
CH 2



FOR CHAIN 2: CH 1



CH 2



4.6 FREQUENCY STABILITY

4.6.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT

The frequency tolerance of the carrier signal shall be maintained within +/- 0.02% of the operating frequency over a temperature variation of –30 degrees to 50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C.

4.6.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
ANRITSU SPECTRUM ANALYZER	MS2667C	M10281	Mar. 07, 2008
WIT STANDARD TEMPERATURE AND HUMIDITY CHAMBER	TH-4S-C	W981030	Jun. 28, 2008

NOTE: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

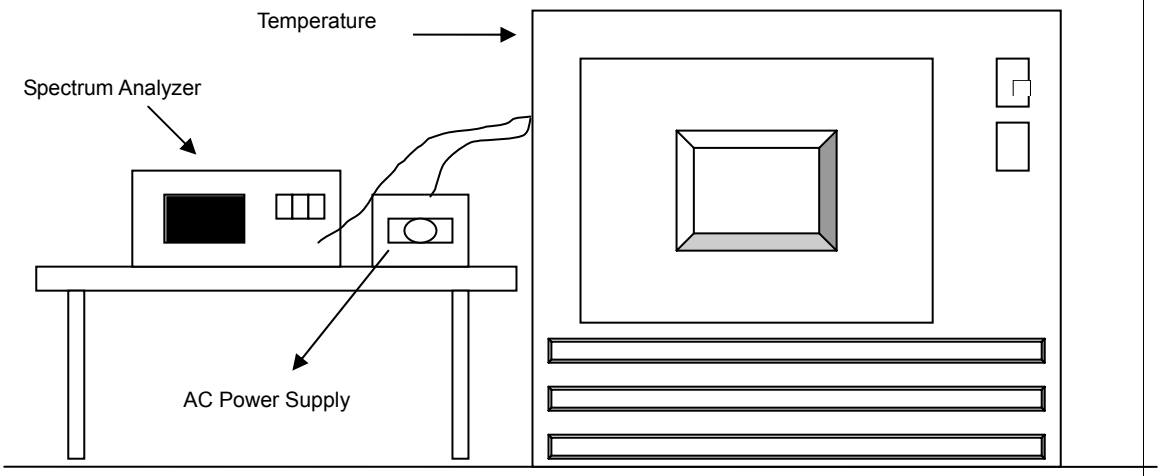
4.6.3 TEST PROCEDURE

1. The EUT was placed inside the environmental test chamber and powered by nominal DC voltage.
2. Turn the EUT on and couple its output to a spectrum analyzer.
3. Turn the EUT off and set the chamber to the highest temperature specified.
4. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 minutes.
5. Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.
6. The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.

4.6.4 DEVIATION FROM TEST STANDARD

No deviation

4.6.5 TEST SETUP



4.6.6 EUT OPERATING CONDITION

Same as Item 4.1.6

4.6.7 TEST RESULTS

OPERATING FREQUENCY: 5200MHz						LIMIT: ± 0.01%			
TEMP. (℃)	POWER SUPPLY (Vac)	0 MINUTE		2 MINUTE		5 MINUTE		10 MINUTE	
		(MHz)	(%)	(MHz)	(%)	(MHz)	(%)	(MHz)	(%)
50	126.5	5199.885403	-0.0022038	5199.888831	-0.0021379	5199.924247	-0.0014568	5199.927257	-0.0013989
	110.0	5199.901403	-0.0018961	5199.900831	-0.0019071	5199.927647	-0.0013914	5199.931157	-0.0013239
	93.5	5199.904203	-0.0018423	5199.901231	-0.0018994	5199.932847	-0.0012914	5199.938357	-0.0011854
40	126.5	5199.896503	-0.0019903	5199.897831	-0.0019648	5199.928647	-0.0013722	5199.932157	-0.0013047
	110.0	5199.902703	-0.0018711	5199.906631	-0.0017956	5199.933447	-0.0012799	5199.936257	-0.0012258
	93.5	5199.914303	-0.0016480	5199.914531	-0.0016436	5199.936347	-0.0012241	5199.942857	-0.0010989
30	126.5	5199.897803	-0.0019653	5199.903931	-0.0018475	5199.934347	-0.0012626	5199.938357	-0.0011854
	110.0	5199.903603	-0.0018538	5199.919531	-0.0015475	5199.941947	-0.0011164	5199.938357	-0.0011854
	93.5	5199.921703	-0.0015057	5199.927931	-0.0013859	5199.943047	-0.0010953	5199.948557	-0.0009893
20	126.5	5199.904803	-0.0018307	5199.907831	-0.0017725	5199.937647	-0.0011991	5199.943457	-0.0010874
	110.0	5199.905103	-0.0018250	5199.925231	-0.0014379	5199.945447	-0.0010491	5199.947857	-0.0010028
	93.5	5199.929403	-0.0013576	5199.936431	-0.0012225	5199.946947	-0.0010203	5199.951257	-0.0009374
10	126.5	5199.912003	-0.0016923	5199.918631	-0.0015648	5199.945047	-0.0010568	5199.949857	-0.0009643
	110.0	5199.920603	-0.0015269	5199.929531	-0.0013552	5199.947347	-0.0010126	5199.951257	-0.0009374
	93.5	5199.935503	-0.0012403	5199.941231	-0.0011302	5199.955047	-0.0008645	5199.961257	-0.0007451
0	126.5	5199.915703	-0.0016211	5199.925631	-0.0014302	5199.948647	-0.0009876	5199.955257	-0.0008604
	110.0	5199.927203	-0.0014000	5199.935031	-0.0012494	5199.955447	-0.0008568	5199.958357	-0.0008008
	93.5	5199.941803	-0.0011192	5199.944331	-0.0010706	5199.957447	-0.0008183	5199.963957	-0.0006931
-10	126.5	5199.927803	-0.0013884	5199.931131	-0.0013244	5199.955447	-0.0008568	5199.960157	-0.0007662
	110.0	5199.934303	-0.0012634	5199.941131	-0.0011321	5199.958647	-0.0007953	5199.965057	-0.0006720
	93.5	5199.948903	-0.0009826	5199.947531	-0.0010090	5199.962347	-0.0007241	5199.968357	-0.0006085
-20	126.5	5199.932703	-0.0012942	5199.937531	-0.0012013	5199.958947	-0.0007895	5199.965257	-0.0006681
	110.0	5199.938103	-0.0011903	5199.945531	-0.0010475	5199.965147	-0.0006703	5199.968257	-0.0006104
	93.5	5199.952903	-0.0009057	5199.954931	-0.0008667	5199.966347	-0.0006472	5199.969257	-0.0005912
-30	126.5	5199.938003	-0.0011923	5199.944331	-0.0010706	5199.965247	-0.0006683	5199.967657	-0.0006220
	110.0	5199.952403	-0.0009153	5199.950631	-0.0009494	5199.967647	-0.0006222	5199.972257	-0.0005335
	93.5	5199.955503	-0.0008557	5199.960131	-0.0007667	5199.971747	-0.0005433	5199.975457	-0.0004720

4.7 BAND EDGES MEASUREMENT

4.7.1 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
802.11a:			
R&S SPECTRUM ANALYZER	FSP40	100040	Jun. 28, 2008
DRAFT 802.11n (20MHz), DRAFT 802.11n (40MHz):			
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100025	Oct. 05, 2007
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	May 31, 2008
HORN Antenna SCHWARZBECK	9120D	9120D-209	Jun. 28, 2008
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170243	Dec. 28, 2007
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	238137/4	Dec. 11, 2007
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	233233/4	Nov. 14, 2007
Software ADT.	ADT_Radiated_V7.6	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA
Antenna Tower Controller inn-co GmbH	CO2000	017303	NA
Turn Table ADT.	TT100.	TT93021703	NA
Turn Table Controller ADT.	SC100.	SC93021703	NA

NOTE: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA

4.7.2 TEST PROCEDURE

802.11a:

The transmitter output was connected to the spectrum analyzer via a low lose cable. Set both RBW and VBW of spectrum analyzer to 1MHz / 3MHz with suitable frequency span including 100MHz bandwidth from band edge. The band edges was measured and recorded.

DRAFT 802.11n (20MHz), DRAFT 802.11n (40MHz):

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. 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 antenna is a broadband antenna, and its height 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. Set both RBW and VBW of spectrum analyzer to 1MHz / 3MHz with suitable frequency span including 100MHz bandwidth from band edge. The band edges was measured and recorded.

NOTE: The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz for Average detection (AV) at frequency above 1GHz

4.7.3 EUT OPERATING CONDITION

The software provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.

4.7.4 TEST RESULTS

For signals in the restricted bands above and below the 5.15 to 5.35GHz allocated band a measurement was made of the amplitude of the spurious emissions with respect to the intentional signals. The relative amplitude, in dBc, was applied to the average and peak filed strength of the intentional signal made on the OATS to calculate the field strength of the unintentional signals.

The spectrum plots (Peak RBW = 1MHz, VBW = 3MHz) are attached on the following pages.

802.11a OFDM MODULATION:

Channel 1 (5180MHz)

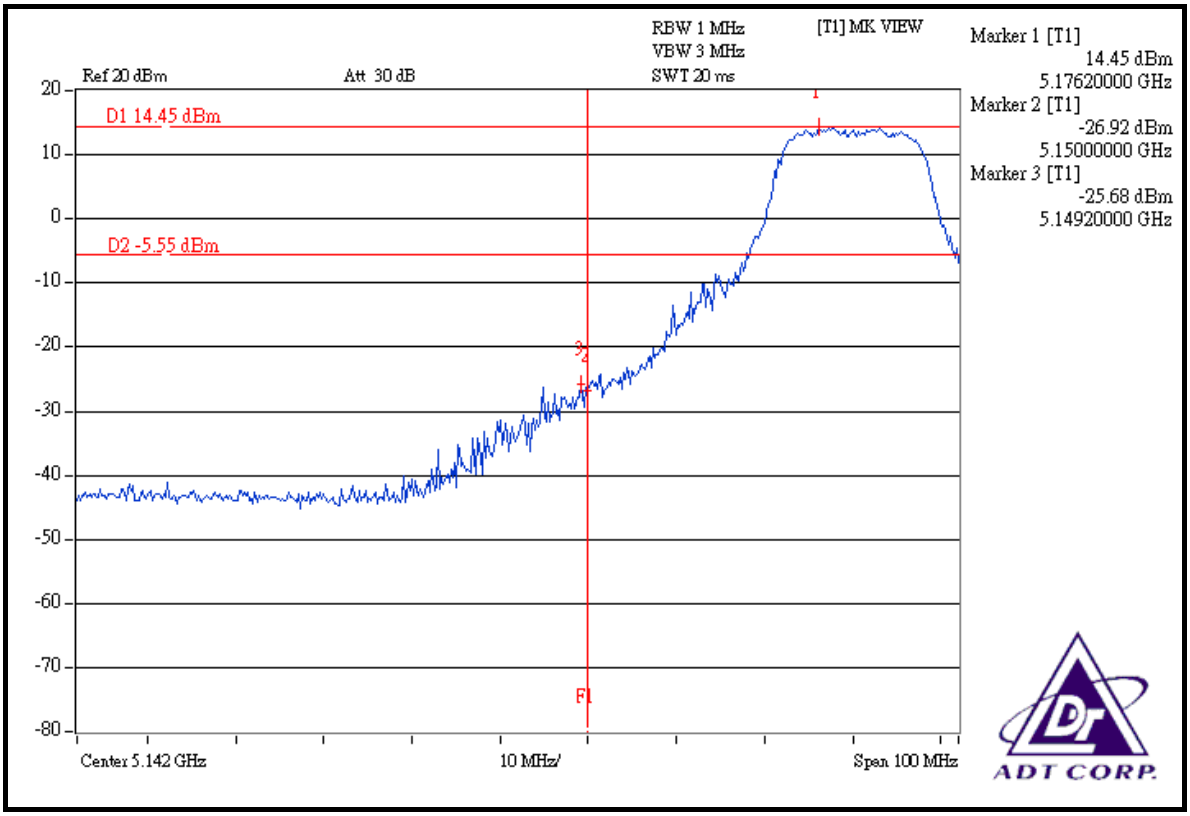
The band edge emission plot on the next page shows 40.13dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 1 is 109.15dBuV/m (Peak), so the maximum field strength in restrict band is 109.15 – 40.13 = 69.02dBuV/m which is under 74dBuV/m limit.

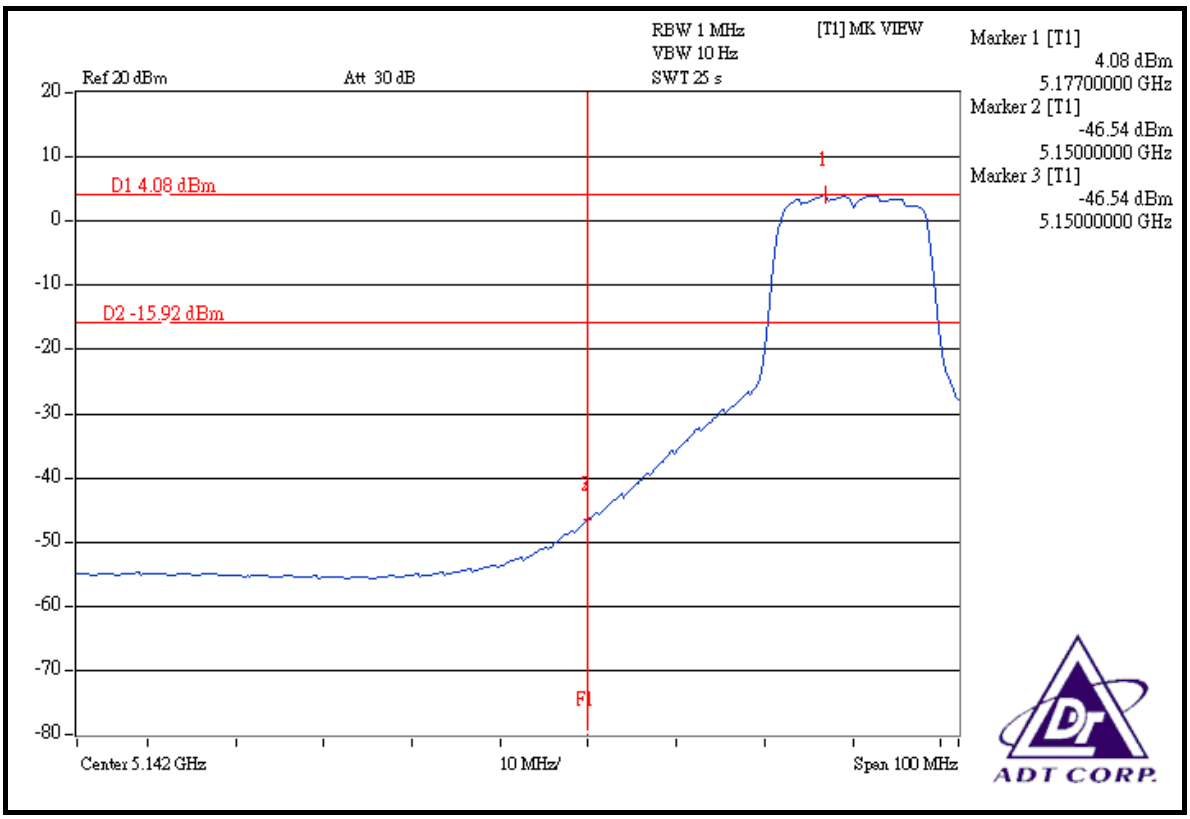
The band edge emission plot on the next page shows 50.62dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 1 is 98.34dBuV/m (Average), so the maximum field strength in restrict band is 98.34 – 50.62 = 47.72dBuV/m which is under 54dBuV/m limit.

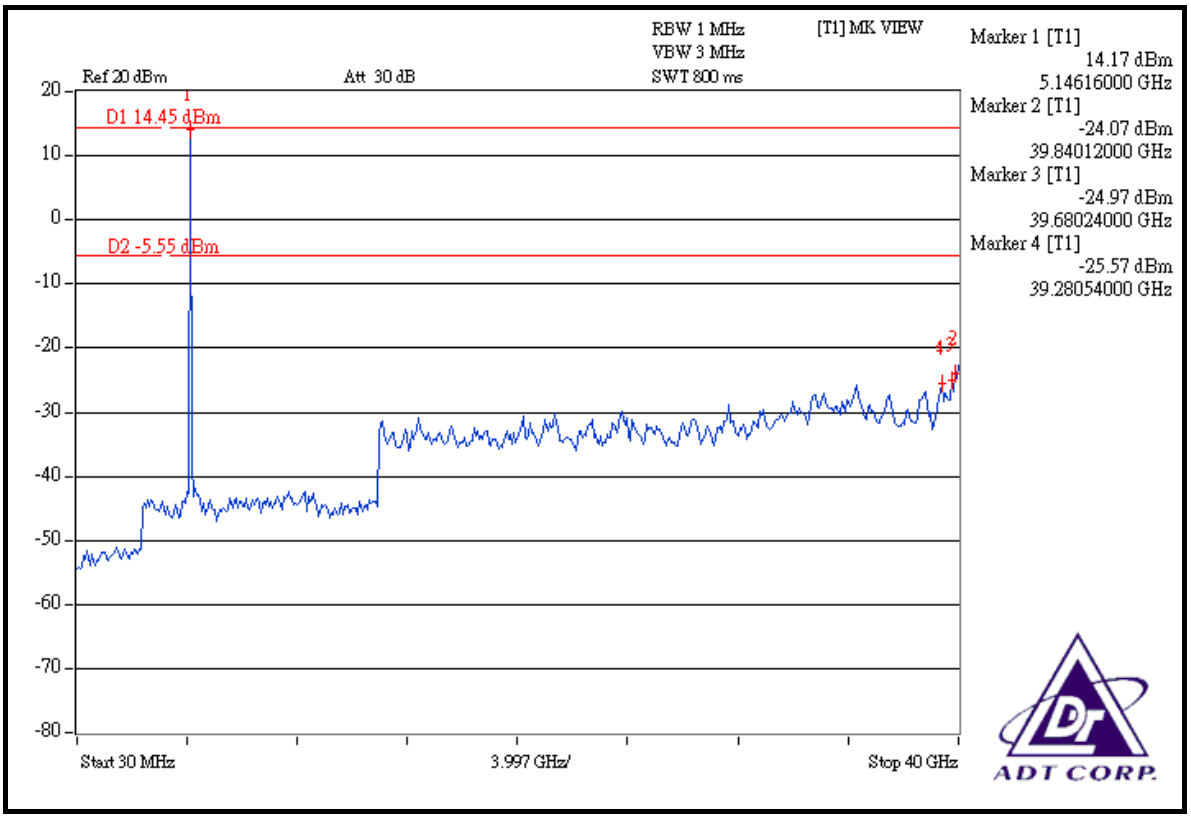
Channel 4 (5240MHz)

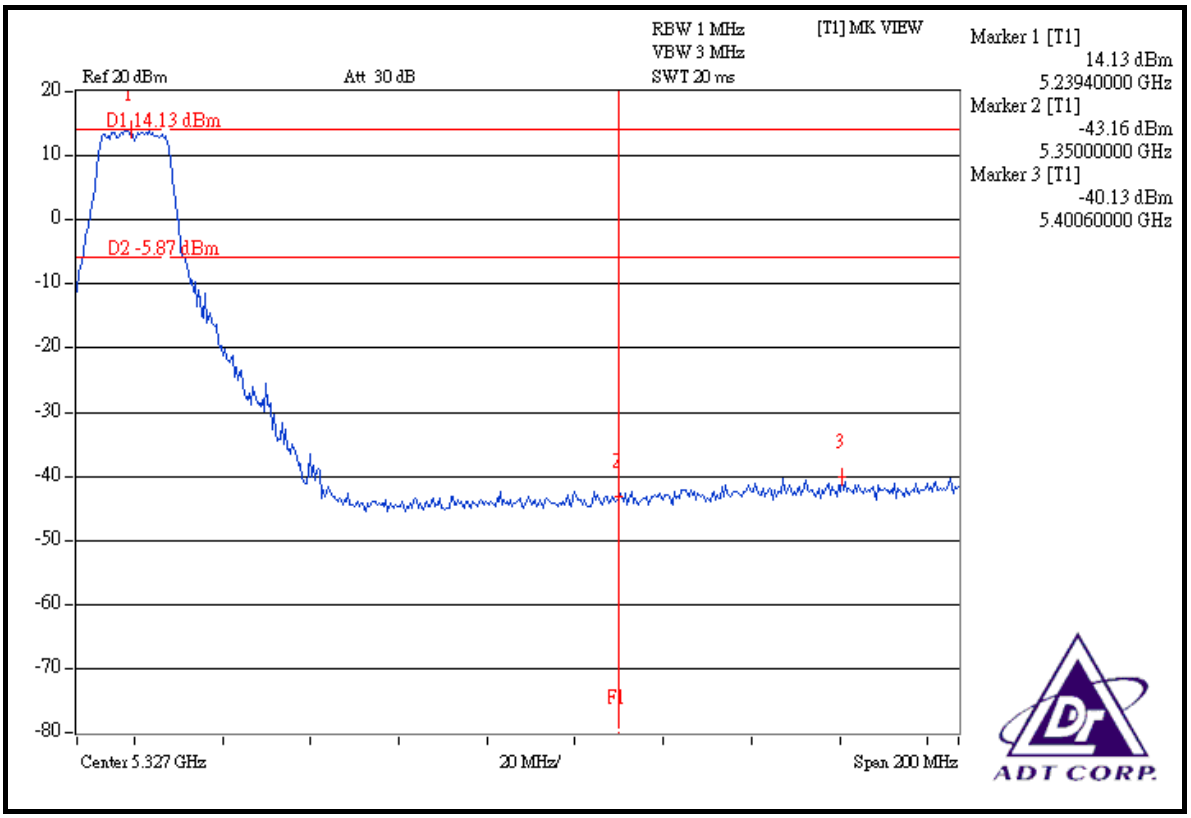
The band edge emission plot on the next second page shows 54.26dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 4 is 107.97dBuV/m (Peak), so the maximum field strength in restrict band is 107.97 – 54.26 = 53.71dBuV/m which is under 74dBuV/m limit.

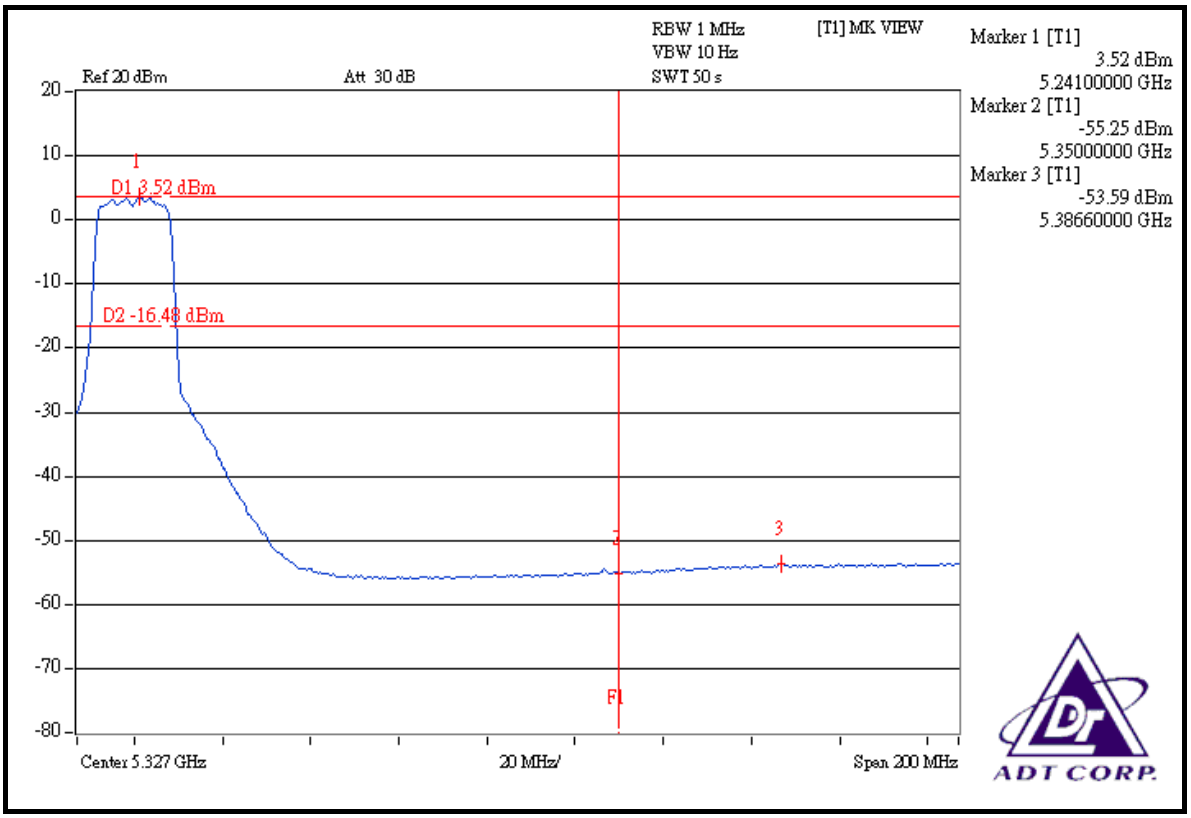
The band edge emission plot on the next third page shows 57.11dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 4 is 98.05dBuV/m (Average), so the maximum field strength in restrict band is 98.05 – 57.11 = 40.94dBuV/m which is under 54dBuV/m limit.

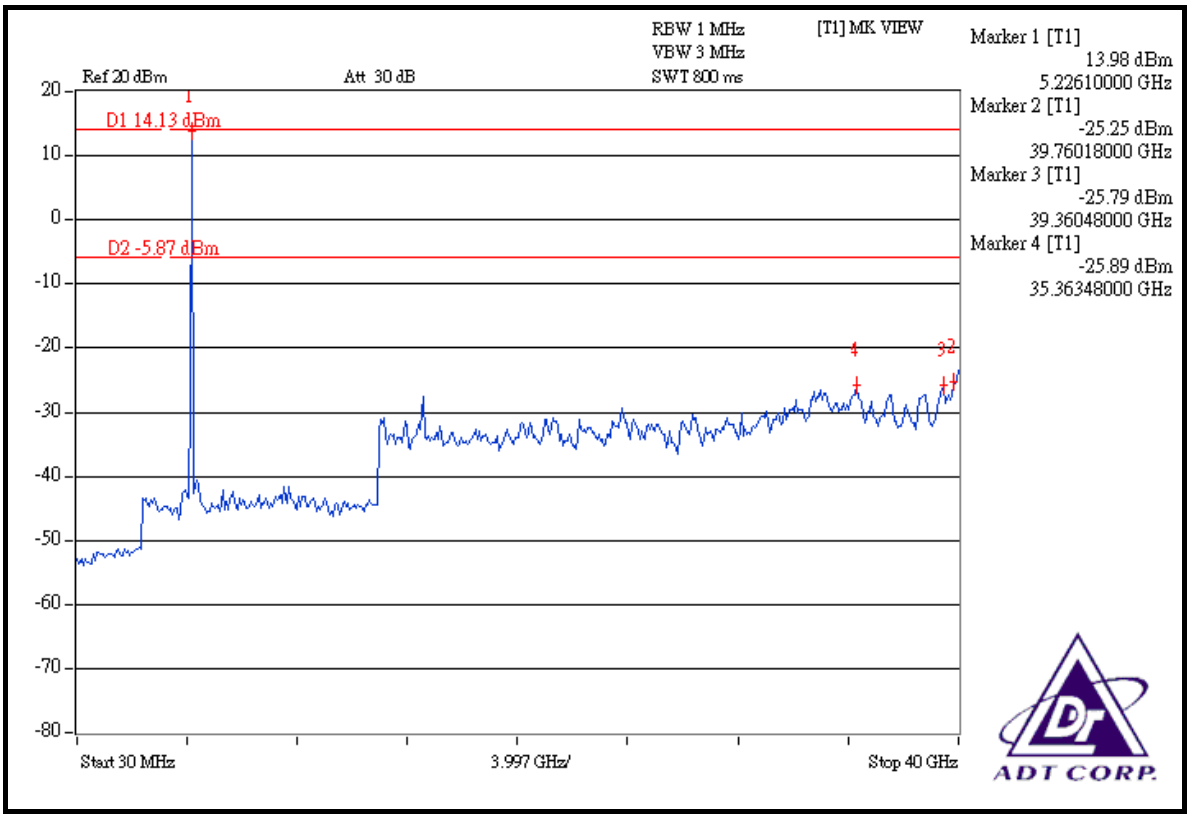

RBW 1 MHz
VBW 3 MHz
SWT 20 ms
[T1] MK VIEW
Ref 20 dBm
Att 30 dB
D1 14.45 dBm
D2 -5.55 dBm
Marker 1 [T1]
14.45 dBm
5.17620000 GHz
Marker 2 [T1]
-26.92 dBm
5.15000000 GHz
Marker 3 [T1]
-25.68 dBm
5.14920000 GHz
Center 5.142 GHz
10 MHz/
Span 100 MHz


RBW 1 MHz
VBW 10 Hz
SWT 25 s
[T1] MK VIEW
Ref 20 dBm
Att 30 dB
D1 4.08 dBm
D2 -15.92 dBm
Marker 1 [T1]
4.08 dBm
5.17700000 GHz
Marker 2 [T1]
-46.54 dBm
5.15000000 GHz
Marker 3 [T1]
-46.54 dBm
5.15000000 GHz
Center 5.142 GHz
10 MHz/
Span 100 MHz


RBW 1 MHz
VBW 3 MHz
SWT 800 ms
[T1] MK VIEW
Ref 20 dBm
Att 30 dB
D1 14.45 dBm
D2 -5.55 dBm
Marker 1 [T1]
14.17 dBm
5.14616000 GHz
Marker 2 [T1]
-24.07 dBm
39.84012000 GHz
Marker 3 [T1]
-24.97 dBm
39.68024000 GHz
Marker 4 [T1]
-25.57 dBm
39.28054000 GHz
Start 30 MHz
3.997 GHz/
Stop 40 GHz


RBW 1 MHz
VBW 3 MHz
SWT 20 ms
[T1] MK VIEW
Ref 20 dBm
Att 30 dB
D1 14.13 dBm
D2 -5.87 dBm
Marker 1 [T1]
14.13 dBm
5.23940000 GHz
Marker 2 [T1]
-43.16 dBm
5.35000000 GHz
Marker 3 [T1]
-40.13 dBm
5.40060000 GHz
Center 5.327 GHz
20 MHz/
Span 200 MHz


RBW 1 MHz
VBW 10 Hz
SWT 50 s
[T1] MK VIEW
Ref 20 dBm
Att 30 dB
D1 3.52 dBm
D2 -16.48 dBm
Center 5.327 GHz
20 MHz/
Span 200 MHz
Marker 1 [T1]
3.52 dBm
5.24100000 GHz
Marker 2 [T1]
-55.25 dBm
5.35000000 GHz
Marker 3 [T1]
-53.59 dBm
5.38660000 GHz


RBW 1 MHz
VBW 3 MHz
SWT 800 ms
[T1] MK VIEW
Ref 20 dBm
Att 30 dB
D1 14.13 dBm
D2 -5.87 dBm
Start 30 MHz
3.997 GHz/
Stop 40 GHz
Marker 1 [T1]
13.98 dBm
5.22610000 GHz
Marker 2 [T1]
-25.25 dBm
39.76018000 GHz
Marker 3 [T1]
-25.79 dBm
39.36048000 GHz
Marker 4 [T1]
-25.89 dBm
35.36348000 GHz

DRAFT 802.11n (20MHz) OFDM MODULATION:

Channel 1 (5180MHz)

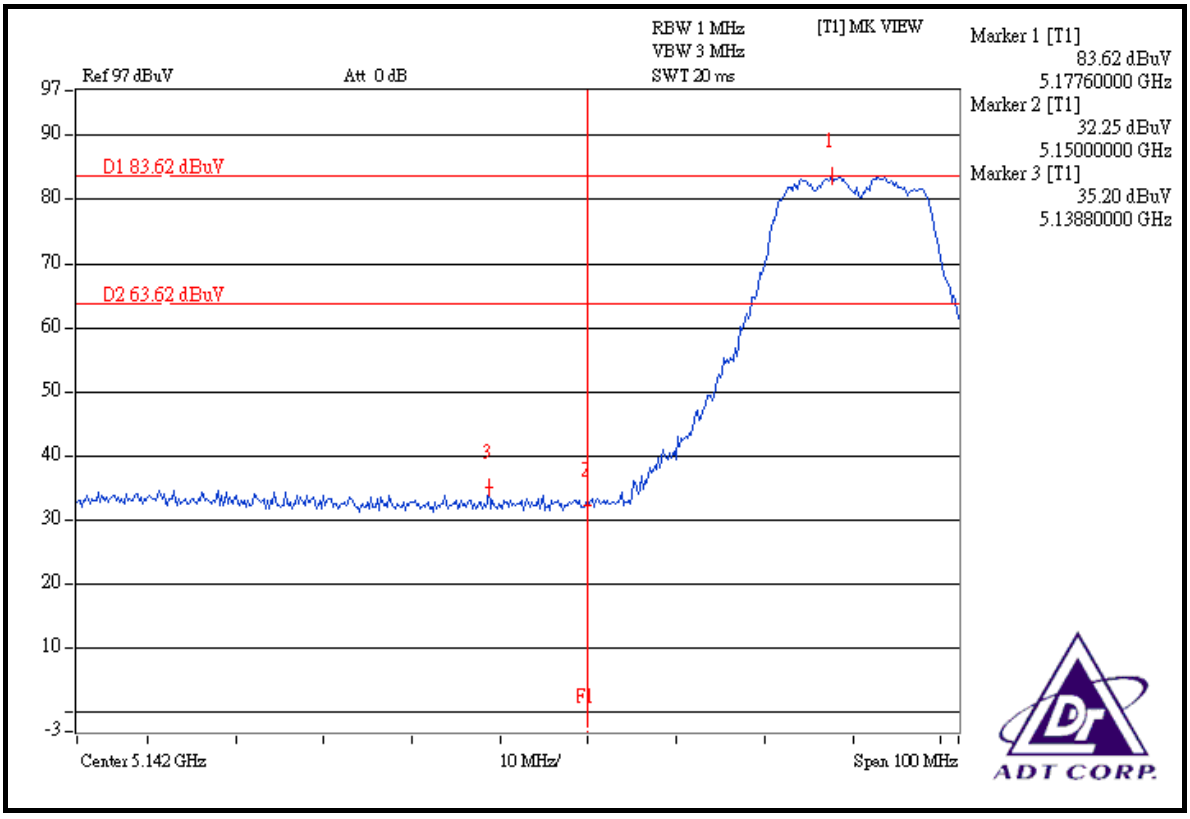
The band edge emission plot on the next page shows 48.42dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 1 is 109.38dBuV/m (Peak), so the maximum field strength in restrict band is 109.38 – 48.42 = 60.69dBuV/m which is under 74dBuV/m limit.

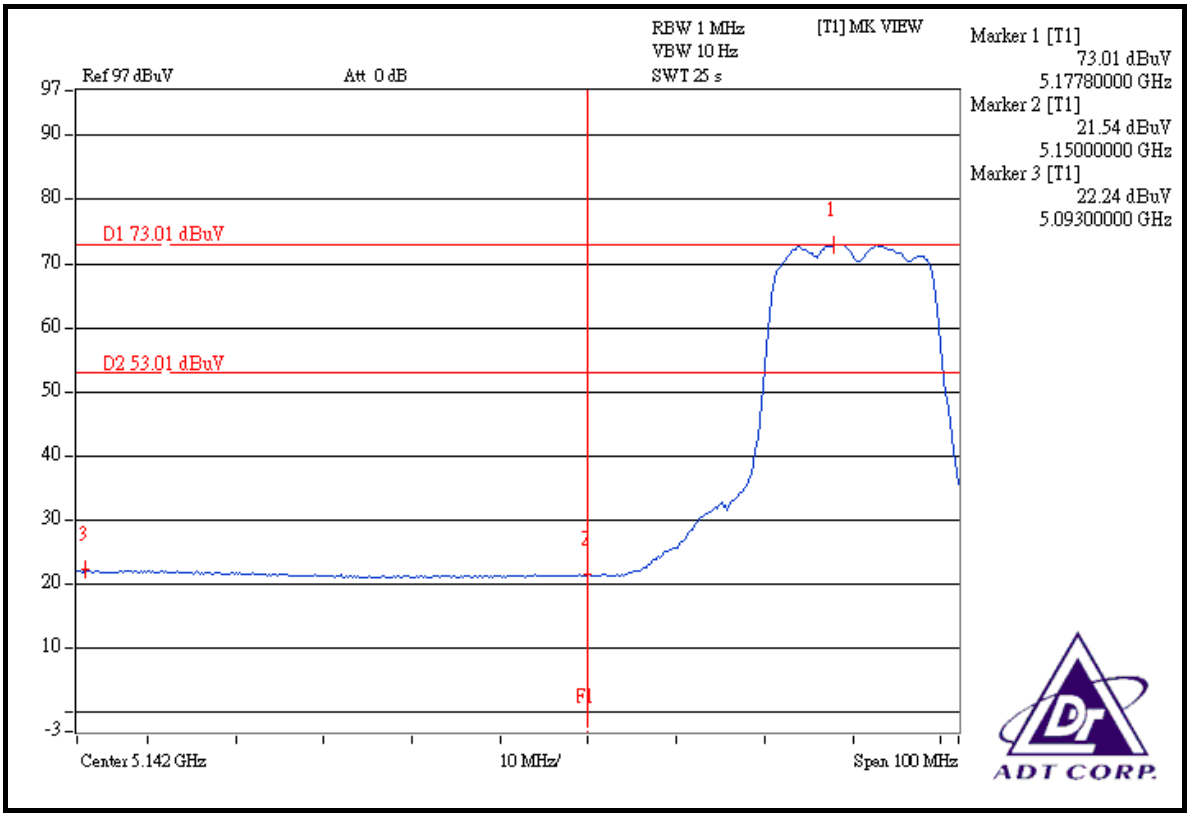
The band edge emission plot on the next page shows 50.77dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 1 is 97.95dBuV/m (Average), so the maximum field strength in restrict band is 97.95 – 50.77 = 47.18dBuV/m which is under 54dBuV/m limit.

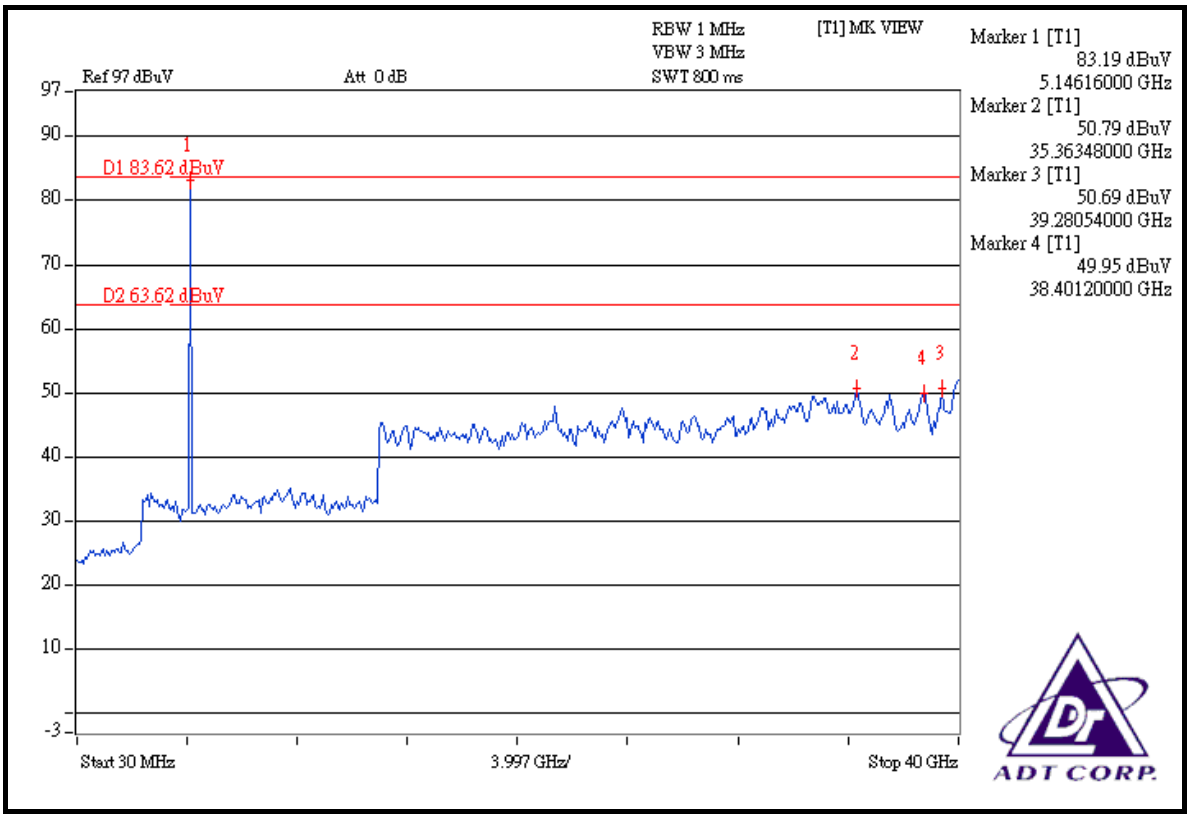
Channel 4 (5240MHz)

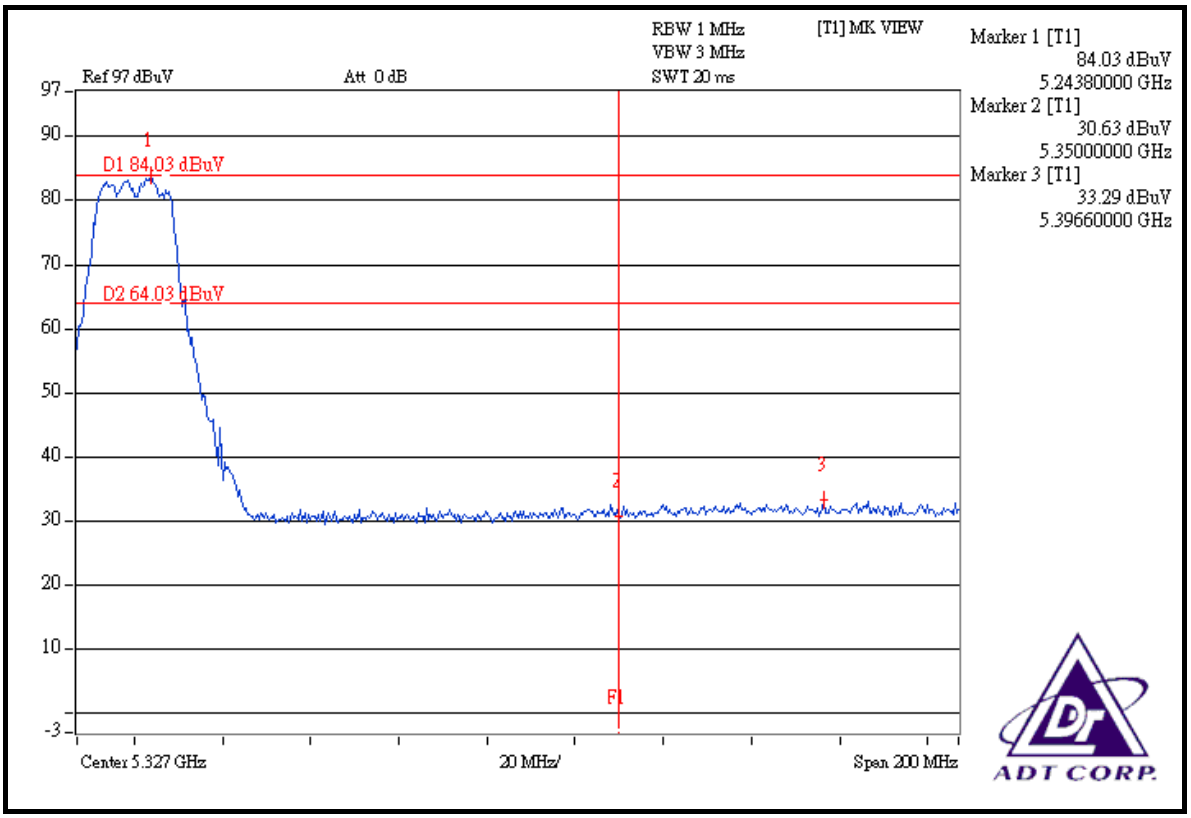
The band edge emission plot on the next second page shows 50.74dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 4 is 109.32dBuV/m (Peak), so the maximum field strength in restrict band is 109.32 – 50.74 = 58.58dBuV/m which is under 74dBuV/m limit.

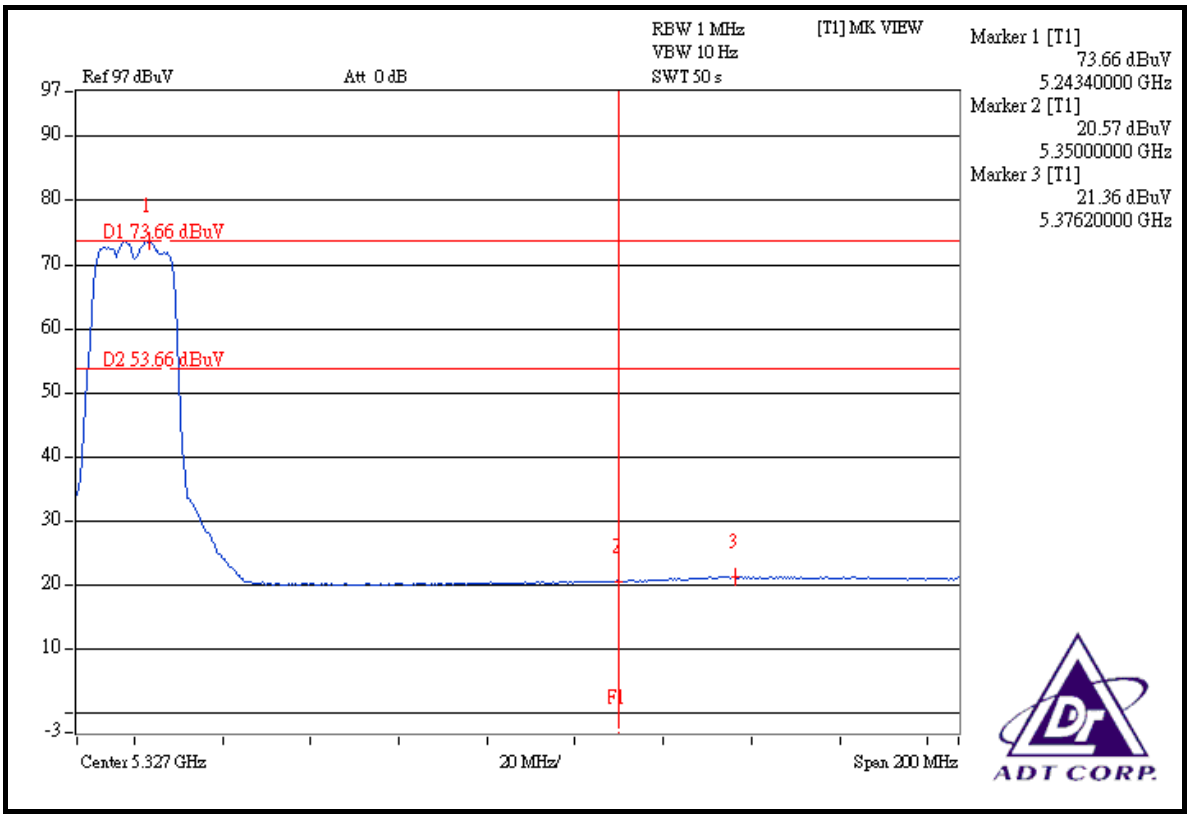
The band edge emission plot on the next third page shows 52.30dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 4 is 98.60dBuV/m (Average), so the maximum field strength in restrict band is 98.60 - 52.30 = 46.30dBuV/m which is under 54dBuV/m limit.

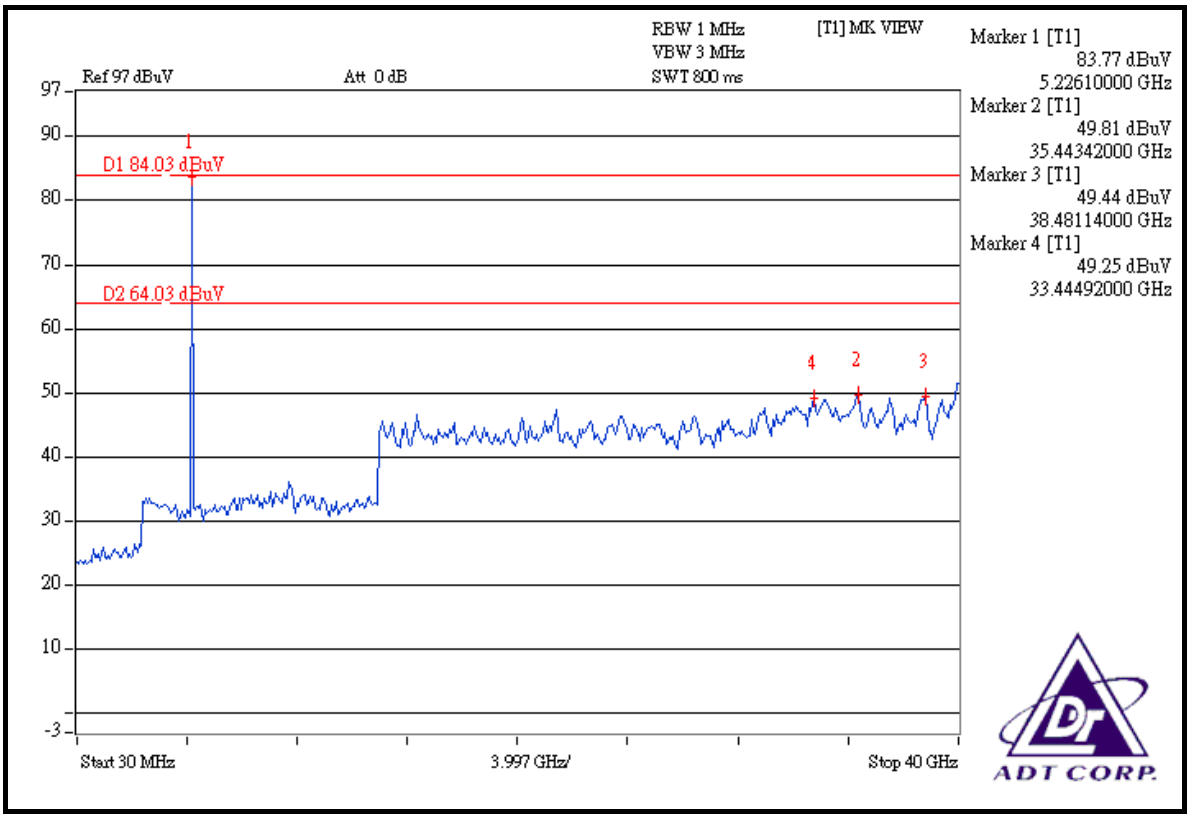

RBW 1 MHz
VBW 3 MHz
SWT 20 ms
[T1] MK VIEW
Ref 97 dBuV
Att 0 dB
D1 83.62 dBuV
D2 63.62 dBuV
Marker 1 [T1]
83.62 dBuV
5.17760000 GHz
Marker 2 [T1]
32.25 dBuV
5.15000000 GHz
Marker 3 [T1]
35.20 dBuV
5.13880000 GHz
Center 5.142 GHz
10 MHz/
Span 100 MHz
ADT CORP.


RBW 1 MHz
VBW 10 Hz
SWT 25 s
[T1] MK VIEW
Ref 97 dBuV
Att 0 dB
D1 73.01 dBuV
D2 53.01 dBuV
Marker 1 [T1]
73.01 dBuV
5.17780000 GHz
Marker 2 [T1]
21.54 dBuV
5.15000000 GHz
Marker 3 [T1]
22.24 dBuV
5.09300000 GHz
Center 5.142 GHz
10 MHz/
Span 100 MHz
ADT CORP.


RBW 1 MHz
VBW 3 MHz
SWT 800 ms
[T1] MK VIEW
Ref 97 dBuV
Att 0 dB
D1 83.62 dBuV
D2 63.62 dBuV
Marker 1 [T1]
83.19 dBuV
5.14616000 GHz
Marker 2 [T1]
50.79 dBuV
35.36348000 GHz
Marker 3 [T1]
50.69 dBuV
39.28054000 GHz
Marker 4 [T1]
49.95 dBuV
38.40120000 GHz
Start 30 MHz
3.997 GHz/
Stop 40 GHz
ADT CORP.


RBW 1 MHz
VBW 3 MHz
SWT 20 ms
[T1] MK VIEW
Ref 97 dBuV
Att 0 dB
D1 84.03 dBuV
D2 64.03 dBuV
Marker 1 [T1]
84.03 dBuV
5.24380000 GHz
Marker 2 [T1]
30.63 dBuV
5.35000000 GHz
Marker 3 [T1]
33.29 dBuV
5.39660000 GHz
Center 5.327 GHz
20 MHz/
Span 200 MHz
ADT CORP.


RBW 1 MHz
VBW 10 Hz
SWT 50 s
[T1] MK VIEW
Ref 97 dBuV
Att 0 dB
D1 73.66 dBuV
D2 53.66 dBuV
Marker 1 [T1]
73.66 dBuV
5.24340000 GHz
Marker 2 [T1]
20.57 dBuV
5.35000000 GHz
Marker 3 [T1]
21.36 dBuV
5.37620000 GHz
Center 5.327 GHz
20 MHz/
Span 200 MHz


RBW 1 MHz
VBW 3 MHz
SWT 800 ms
[T1] MK VIEW
Ref 97 dBuV
Att 0 dB
D1 84.03 dBuV
D2 64.03 dBuV
Marker 1 [T1]
83.77 dBuV
5.22610000 GHz
Marker 2 [T1]
49.81 dBuV
35.44342000 GHz
Marker 3 [T1]
49.44 dBuV
38.48114000 GHz
Marker 4 [T1]
49.25 dBuV
33.44492000 GHz
Start 30 MHz
3.997 GHz/
Stop 40 GHz

DRAFT 802.11n (40MHz) OFDM MODULATION:

Channel 1 (5190MHz)

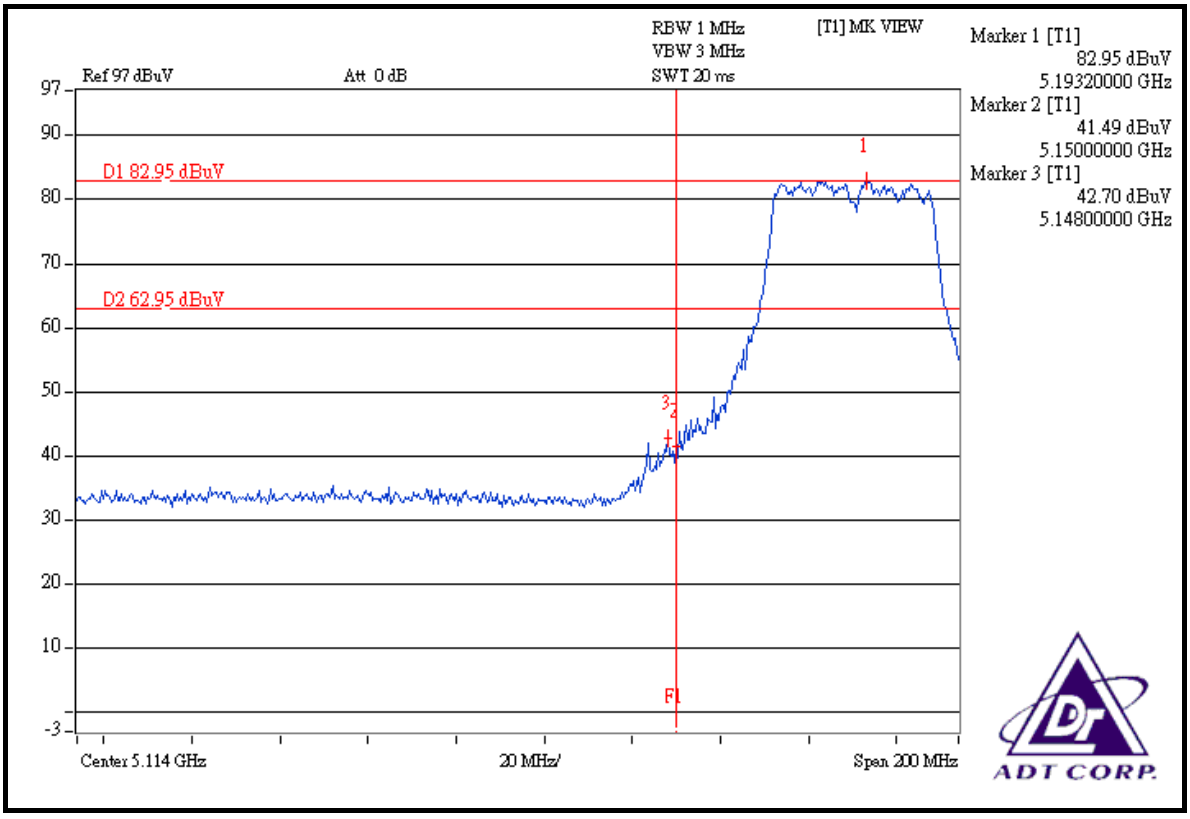
The band edge emission plot on the next page shows 40.25dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 1 is 107.43dBuV/m (Peak), so the maximum field strength in restrict band is 107.43 – 40.25 = 67.18dBuV/m which is under 74dBuV/m limit.

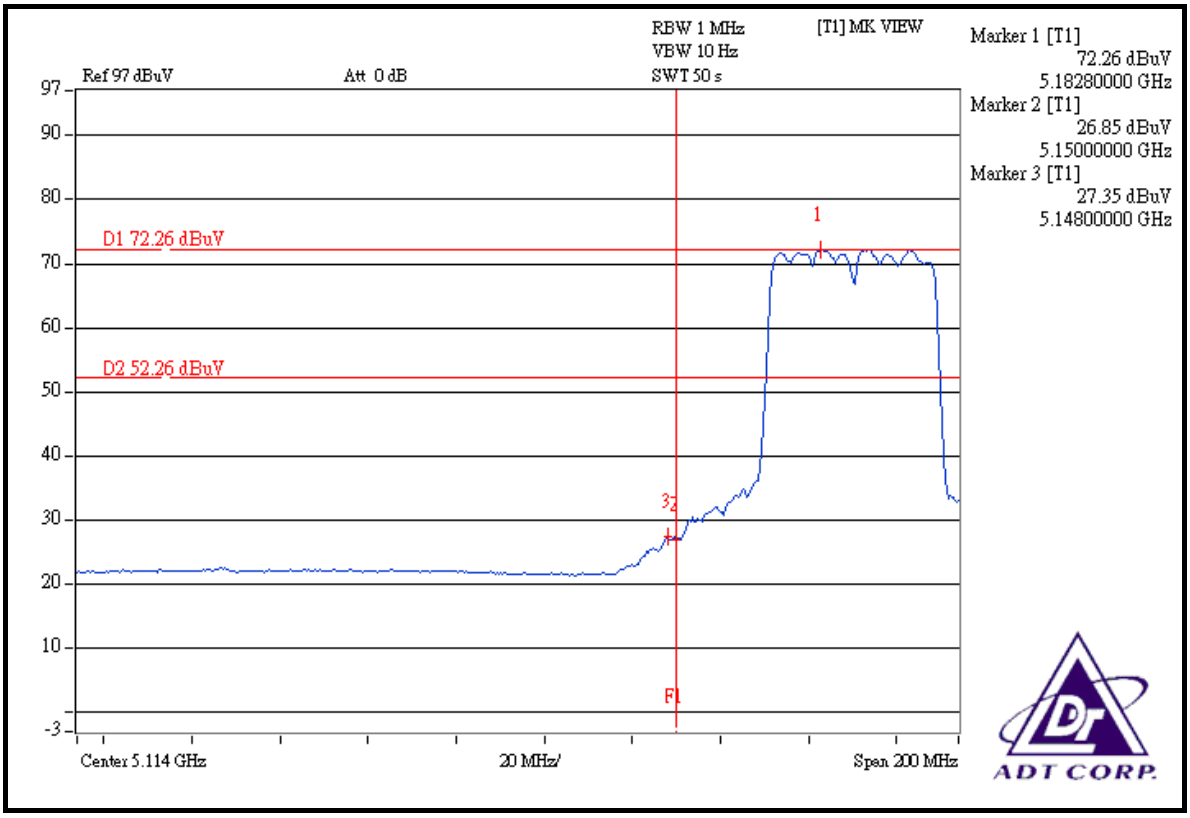
The band edge emission plot on the next page shows 44.91dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 1 is 97.00dBuV/m (Average), so the maximum field strength in restrict band is 97.00 – 44.91 = 52.09dBuV/m which is under 54dBuV/m limit.

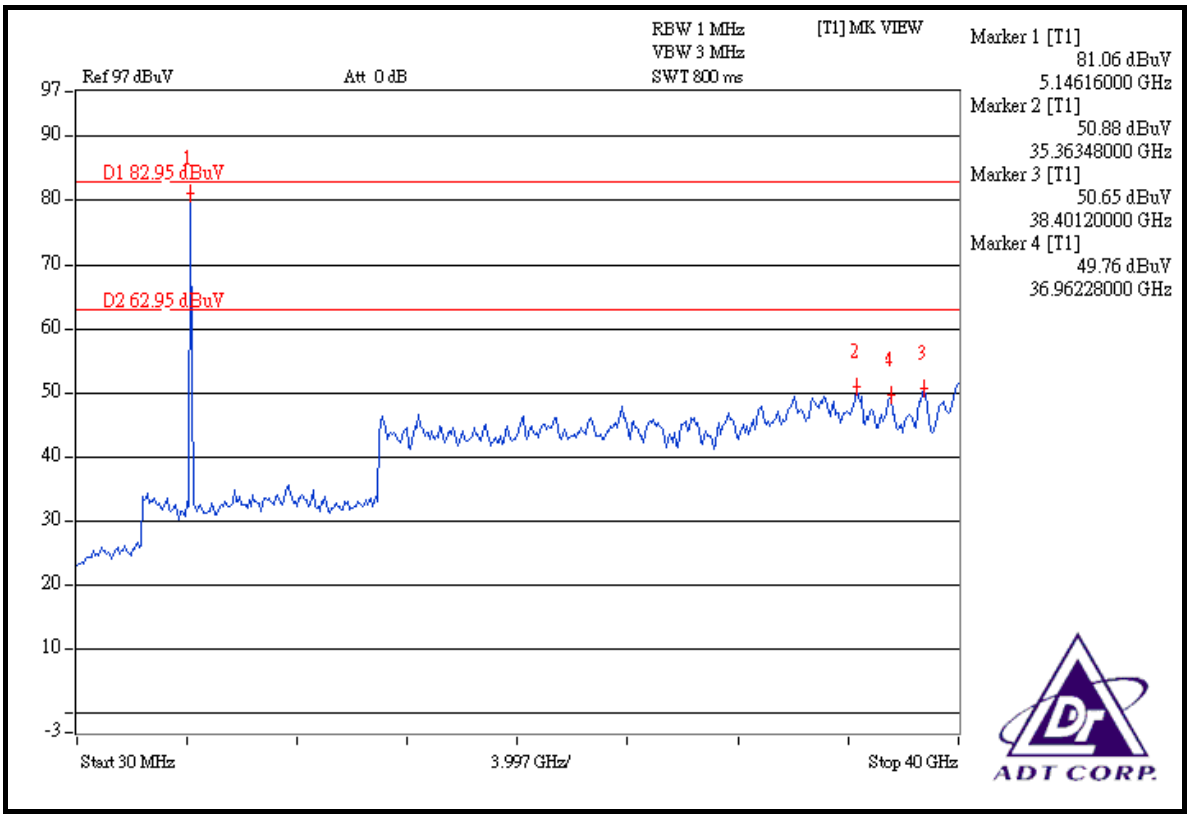
Channel 2 (5230MHz)

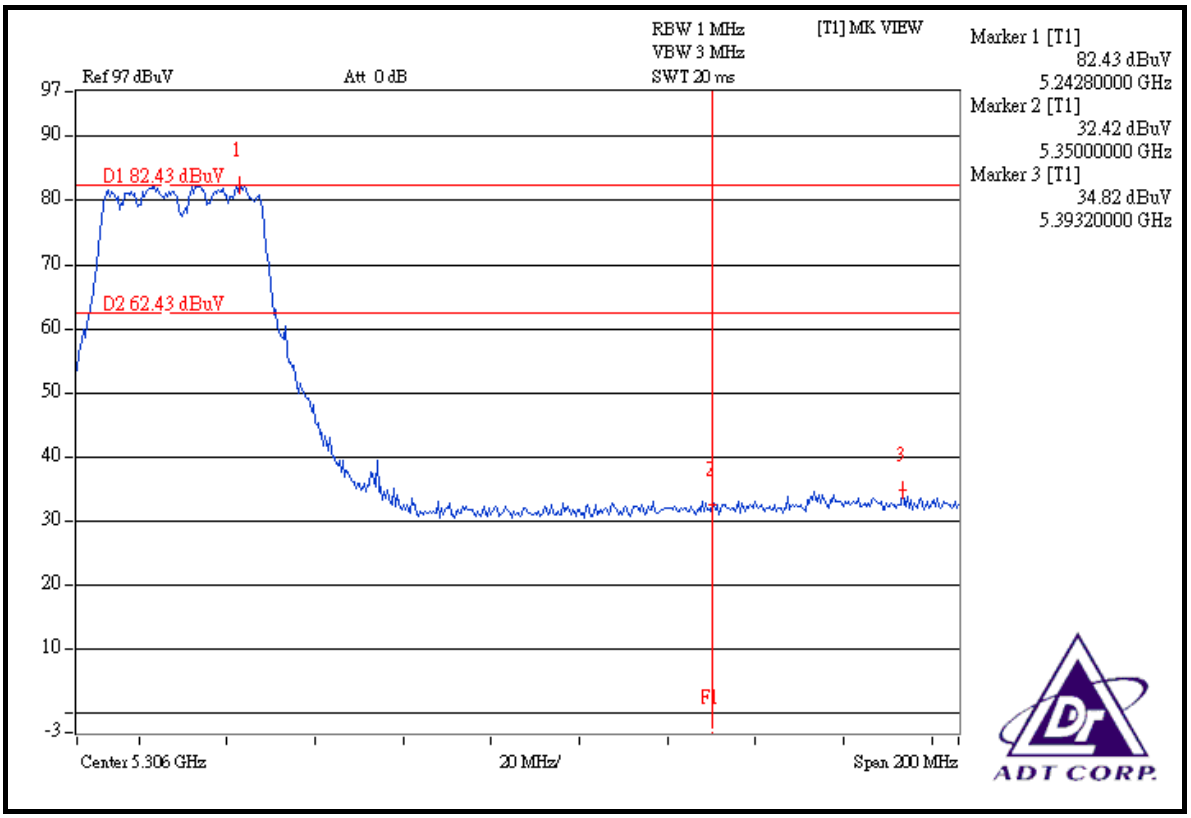
The band edge emission plot on the next second page shows 47.61dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 2 is 106.97dBuV/m (Peak), so the maximum field strength in restrict band is 106.97 – 47.61 = 59.36dBuV/m which is under 74dBuV/m limit.

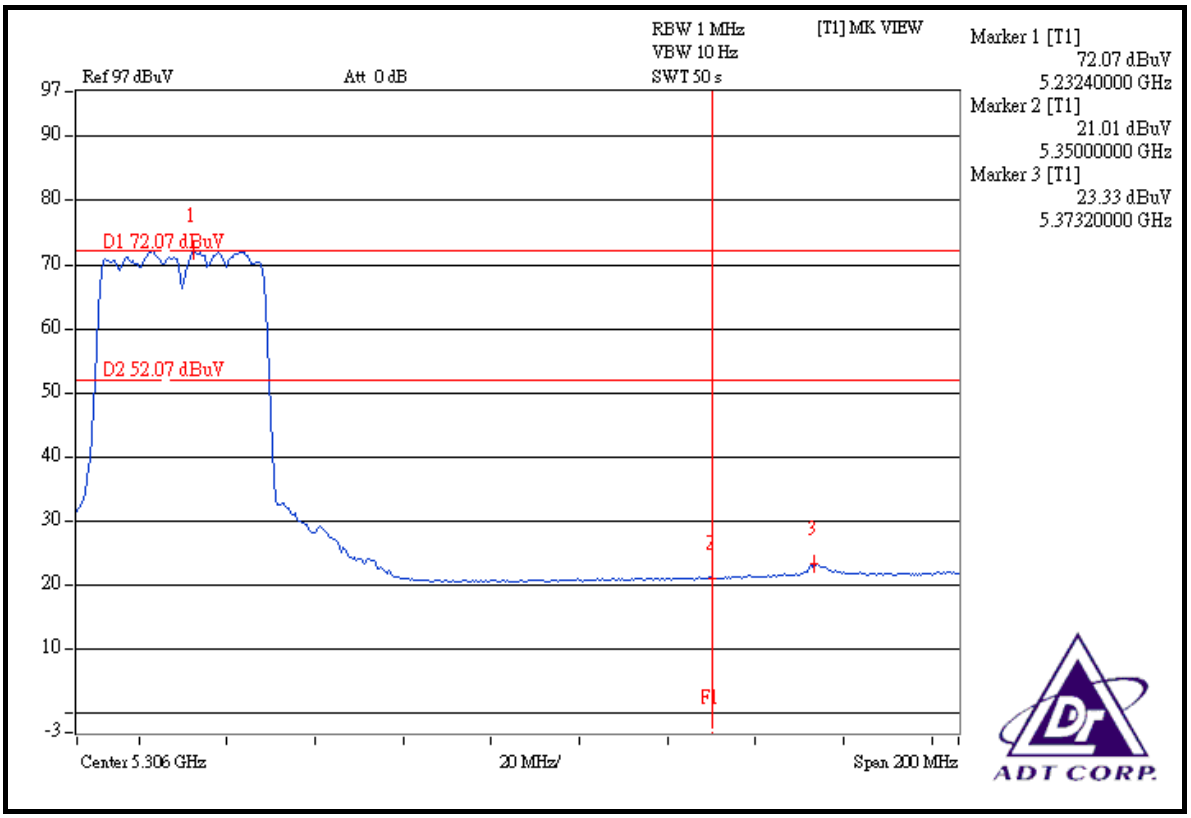
The band edge emission plot on the next third page shows 48.74dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 2 is 96.80dBuV/m (Average), so the maximum field strength in restrict band is 96.80 – 48.74 = 48.06dBuV/m which is under 54dBuV/m limit.

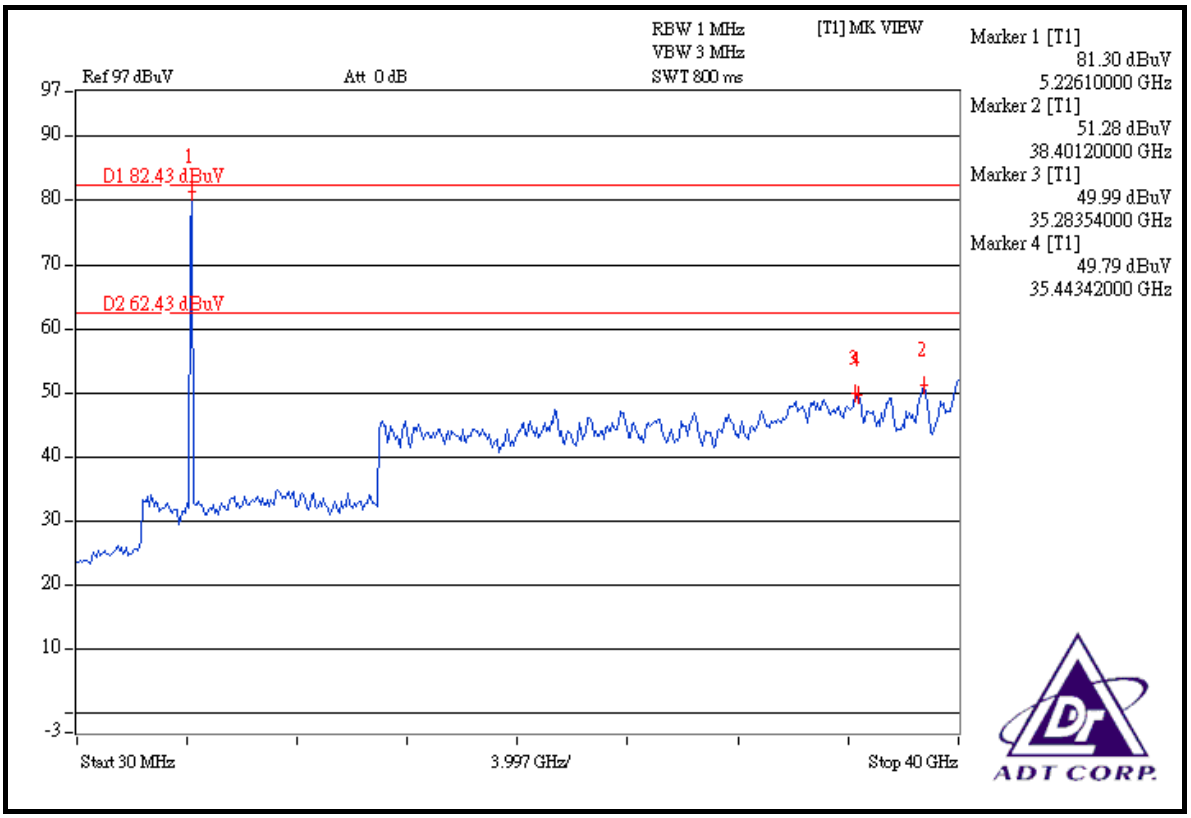

RBW 1 MHz
VBW 3 MHz
SWT 20 ms
[T1] MK VIEW
Ref 97 dBuV
Att 0 dB
Marker 1 [T1]
82.95 dBuV
5.19320000 GHz
Marker 2 [T1]
41.49 dBuV
5.15000000 GHz
Marker 3 [T1]
42.70 dBuV
5.14800000 GHz
D1 82.95 dBuV
D2 62.95 dBuV
97
90
80
70
60
50
40
30
20
10
-3
Center 5.114 GHz
20 MHz/
Span 200 MHz
ADT CORP.


RBW 1 MHz
VBW 10 Hz
SWT 50 s
[T1] MK VIEW
Ref 97 dBuV
Att 0 dB
Marker 1 [T1]
72.26 dBuV
5.18280000 GHz
Marker 2 [T1]
26.85 dBuV
5.15000000 GHz
Marker 3 [T1]
27.35 dBuV
5.14800000 GHz
D1 72.26 dBuV
D2 52.26 dBuV
97
90
80
70
60
50
40
30
20
10
-3
Center 5.114 GHz
20 MHz/
Span 200 MHz
ADT CORP.


RBW 1 MHz
VBW 3 MHz
SWT 800 ms
[T1] MK VIEW
Ref 97 dBuV
Att 0 dB
D1 82.95 dBuV
D2 62.95 dBuV
Marker 1 [T1]
81.06 dBuV
5.14616000 GHz
Marker 2 [T1]
50.88 dBuV
35.36348000 GHz
Marker 3 [T1]
50.65 dBuV
38.40120000 GHz
Marker 4 [T1]
49.76 dBuV
36.96228000 GHz
Start 30 MHz
3.997 GHz/
Stop 40 GHz
ADT CORP.


RBW 1 MHz
VBW 3 MHz
SWT 20 ms
[T1] MK VIEW
Ref 97 dBuV
Att 0 dB
D1 82.43 dBuV
D2 62.43 dBuV
Marker 1 [T1]
82.43 dBuV
5.24280000 GHz
Marker 2 [T1]
32.42 dBuV
5.35000000 GHz
Marker 3 [T1]
34.82 dBuV
5.39320000 GHz
Center 5.306 GHz
20 MHz/
Span 200 MHz
ADT CORP.


RBW 1 MHz
VBW 10 Hz
SWT 50 s
[T1] MK VIEW
Ref 97 dBuV
Att 0 dB
D1 72.07 dBuV
D2 52.07 dBuV
Marker 1 [T1]
72.07 dBuV
5.23240000 GHz
Marker 2 [T1]
21.01 dBuV
5.35000000 GHz
Marker 3 [T1]
23.33 dBuV
5.37320000 GHz
Center 5.306 GHz
20 MHz/
Span 200 MHz


RBW 1 MHz
VBW 3 MHz
SWT 800 ms
[T1] MK VIEW
Ref 97 dBuV
Att 0 dB
D1 82.43 dBuV
D2 62.43 dBuV
Marker 1 [T1]
81.30 dBuV
5.22610000 GHz
Marker 2 [T1]
51.28 dBuV
38.40120000 GHz
Marker 3 [T1]
49.99 dBuV
35.28354000 GHz
Marker 4 [T1]
49.79 dBuV
35.44342000 GHz
Start 30 MHz
3.997 GHz/
Stop 40 GHz

4.8 ANTENNA REQUIREMENT

4.8.1 STANDARD APPLICABLE

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And according to FCC 47 CFR Section 15.407(a), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

4.8.2 ANTENNA CONNECTED CONSTRUCTION

The antenna used in this product is Dipole antenna with RSMA connector. The maximum Gain of the antenna is 2.0dBi.

5. PHOTOGRAPHS OF THE TEST CONFIGURATION

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

6. INFORMATION ON THE TESTING LABORATORIES

We, ADT Corp., were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025.

USA	FCC, UL, A2LA
Germany	TUV Rheinland
Japan	VCCI
Norway	NEMKO
Canada	INDUSTRY CANADA , CSA
R.O.C.	TAF, BSMI, NCC
Netherlands	Telefication
Singapore	PSB , GOST-ASIA(MOU)
Russia	CERTIS(MOU)

Copies of accreditation certificates of our laboratories obtained from approval agencies can be downloaded from our web site: www.adt.com.tw/index.5/phtml. If you have any comments, please feel free to contact us at the following:

Linko EMC/RF Lab:
Tel: 886-2-26052180
Fax: 886-2-26051924

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

Hwa Ya EMC/RF/Safety Telecom Lab:
Tel: 886-3-3183232
Fax: 886-3-3185050

Web Site: www.adt.com.tw

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

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

No any modifications are made to the EUT by the lab during the test.