FCC TEST REPORT (15.407)

REPORT NO.: RF930507H07X
MODEL NO.: AP5822, AP5822E

RECEIVED: Nov. 15, 2006
TESTED: Nov. 20, 2006 to March 08, 2007
ISSUED: March 22, 2007

APPLICANT: Microelectronics Technology Inc.

ADDRESS: 1, Innovation Road II,Hsinchu Science-based Industrial Park, Hsinchu, Taiwan, R.O.C.

ISSUED BY: Advance Data Technology Corporation

TEST LOCATION: No. 81-1, Lu Liao Keng, 9 Ling, Wu Lung Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien, Taiwan, R.O.C.

0536

No. 2177-01

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1. CERTIFICATION

PRODUCT:	802.11a+b/g Outdoor AP/Bridge With Internal Antenna, 802.11a+b/g Outdoor AP/Bridge With External Antenna
BRAND NAME:	MTI
MODEL NO.:	AP5822, AP5822E
TEST SAMPLE:	MASS-PRODUCTION
TESTED:	Nov. 20, 2006 to March 08, 2007
APPLICANT:	Microelectronics Technology Inc.
STANDARDS:	FCC Part 15, Subpart E (Section 15.407) ANSI C63.4-2003

The above equipment (Model: AP5822, AP5822E) have 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 : Carol Liao , **DATE:** March 22, 2007
(Carol Liao)

TECHNICAL ACCEPTANCE : Moris Lin , **DATE:** March 22, 2007
Responsible for RF
(Moris Lin)

APPROVED BY : Hank Chung , **DATE:** March 22, 2007
(Hank Chung, Deputy 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**	**Result**	**Remark**
15.407(b)(5)	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is –15.72dB at 0.209MHz
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 –0.5dB at 5460.00MHz
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.

NOTE:

1. The EUT was operating in 2.412 ~ 2.462GHz, 5.25~5.35GHz, 5.47~5.725GHz and 5.725~5.850GHz frequencies band. This report was recorded the RF parameters including 5.25~5.35GHz, 5.47~5.725GHz. For the 5.725 ~ 5.850GHz RF parameters was recorded in another test report.

2.1 MEASUREMENT UNCERTAINTY

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

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

Measurement	Value
Conducted emissions	2.41 dB
Radiated emissions (30MHz-1GHz)	3.89 dB
Radiated emissions (1GHz ~18GHz)	2.21 dB
Radiated emissions (18GHz ~40GHz)	1.88 dB

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

EUT	802.11a+b/g Outdoor AP/Bridge With Internal Antenna, 802.11a+b/g Outdoor AP/Bridge With External Antenna
MODEL NO.	AP5822, AP5822E
FCC ID	MAD-AP5822
POWER SUPPLY	48VDC from POE
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
MODULATION TECHNOLOGY	DSSS, OFDM
TRANSFER RATE	802.11b:11/5.5/2/1Mbps 802.11g: 54/48/36/24/18/12/9/6Mbps 802.11a: 54/48/36/24/18/12/9/6Mbps (Turbo mode: up to 108Mbps *see Note 1)
FREQUENCY RANGE	802.11b & 802.11g: 2412 ~ 2462MHz 802.11a: 5.25~5.35GHz, 5.47~5.725GHz and 5.725~5.850GHz
NUMBER OF CHANNEL	802.11b & 802.11g: 11 802.11a: 20
CHANNEL SPACING	802.11b & 802.11g: 5MHz 802.11a: 20MHz for Normal mode
OUTPUT POWER	For FCC15.247: 385.478mW For FCC15.407: 42.855mW
ANTENNA TYPE	Please see note 3 (on next page)

NOTE:

1. The EUT has two model names which are identical to each other in all aspects except for the followings:

Brand Name	Model Name	Product Name	Description
MTI	AP5822	802.11a+b/g Outdoor AP/Bridge With Internal Antenna	2.4G external antenna and 5G Internal Antenna
	AP5822E	802.11a+b/g Outdoor AP/Bridge With External Antenna	2.4G external antenna and 5G External Antenna

2. This report is prepared for FCC class II permissive change. The difference compared with the Report No.:RF930507H07 design is as the following:

   u Add one external antenna for AP5822E as below:

Original Report (Report No.:RF930507H07)				
For 2.4GHz				
No.	Model No.	Gain (dBi)	Antenna Type	Antenna Connector
1	R0305-164	8.0dBi	Dipole, Omni (External Antenna)	N (Plug)
For 5GHz				
No.	Model No.	Gain (dBi)	Antenna Type	Antenna Connector
1	ANT05535	17.0dBi	Directional, Patch Panel (Internal Antenna)	Probe Pin
2	R0420-058	8.0dBi	Dipole, Omni (External Antenna)	N (Plug)
3	MTI09009 (4C10021)	23.0dBi	Directional, Patch Panel (External Antenna)	N (Jack)
u Add one new antenna				
For 5GHz(5250~5850MHz):				
'No.	Model No.	Gain (dBi)	Antenna Type	Antenna Connector
A	1GP-51809	9.0dBi	Dipole, Omni (External Antenna)	N female(Plug)
u Add 5470~5725MHz (new band)				
'No.	Model No.	Gain (dBi)	Antenna Type	Antenna Connector
1	ANT05535	17.0dBi	Directional, Patch Panel (Internal Antenna)	Probe Pin

3. The EUT was tested with following modes:

Mode No.	Description
Mode 1	AP5822 test with 5GHz, antenna 1 (5470~5725MHz)
Mode 2	AP5822E test with new external antenna (5250~5850MHz)

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

3.2 DESCRIPTION OF TEST MODES

Operated in 5250MHz ~ 5350MHz bands:

Four channels are provided to this EUT.

Channel	Frequency
1	5260 MHz
2	5280 MHz
3	5300 MHz
4	5320 MHz

Operated in 5470MHz ~ 5725MHz bands:

Eleven channels are provided to this EUT.

Channel	Frequency
5	5500 MHz
6	5520 MHz
7	5540 MHz
8	5560 MHz
9	5580 MHz
10	5600 MHz
11	5620 MHz
12	5640 MHz
13	5660 MHz
14	5680 MHz
15	5700 MHz

3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL:

EUT configure mode	Applicable to				Description
	PLC	RE<1G	RE≥1G	APCM	
Mode 1	√	√	√	√	AP5822 test with 5GHz, antenna 1 (5470~5725MHz)
Mode 2	√	√	√	√	AP5822E test with new external antenna (5250~5850MHz)

Where PLC: Power Line Conducted Emission RE<1G RE: 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 15	15	OFDM	BPSK	6

Radiated Emission Test (Below 1 GHz):

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

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

Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11a	1 to 15	15	OFDM	BPSK	6

Radiated Emission Test (Above 1 GHz):

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

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

Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11a	1 to 15	1, 4, 5, 10, 15	OFDM	BPSK	6

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 15	1, 4, 5, 15	OFDM	BPSK	6

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 15	1, 4, 5, 10, 15	OFDM	BPSK	6

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is an 802.11a+b/g Outdoor AP/Bridge With Internal Antenna and 802.11a+b/g Outdoor AP/Bridge With External Antenna. 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.

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.

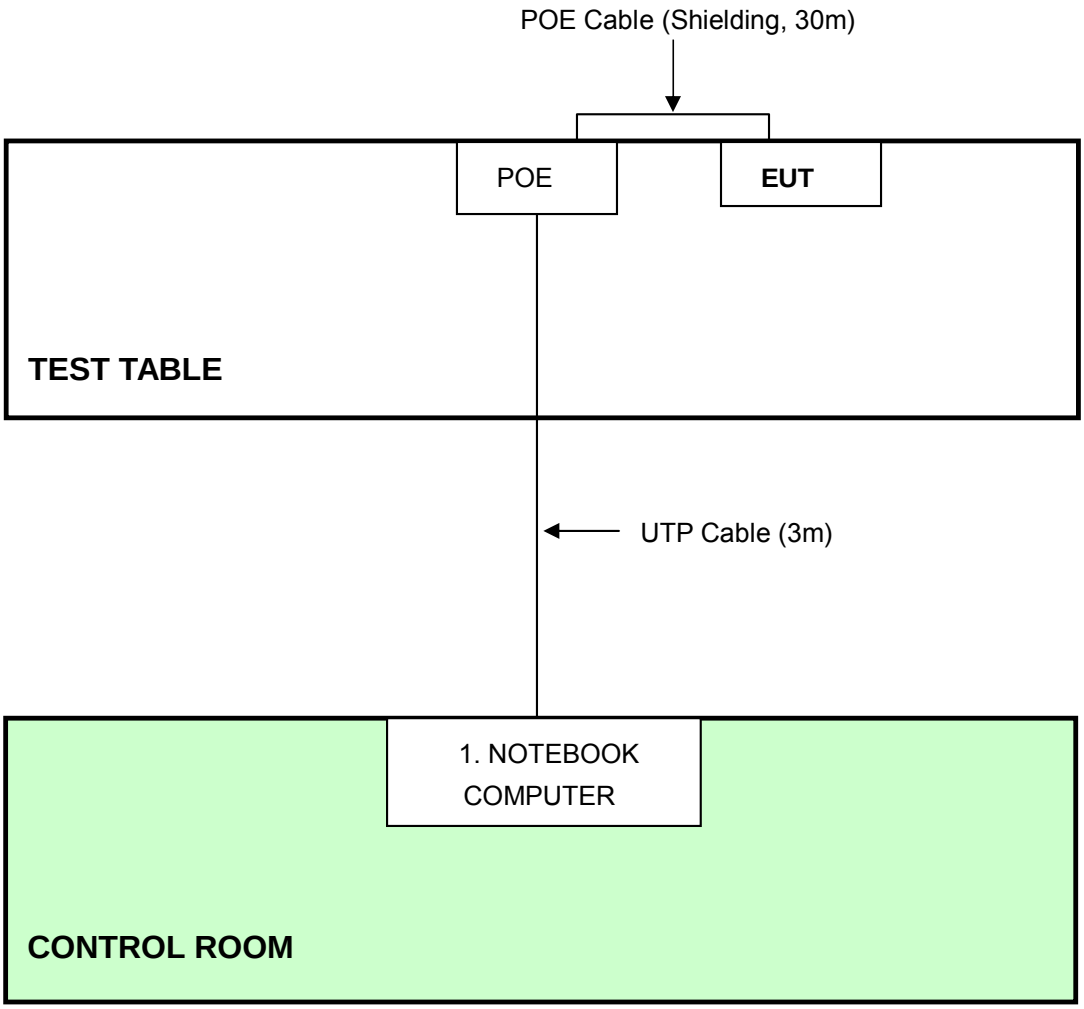
No.	Product	Brand	Model No.	Serial No.	FCC ID
1	NOTEBOOK COMPUTER	DELL	PP19L	CN-OHC416-70166-5CA-0448	PIW632500516610

No.	Signal cable description
1	NA

Note: 1. All power cords of the above support units are unshielded (1.8m).

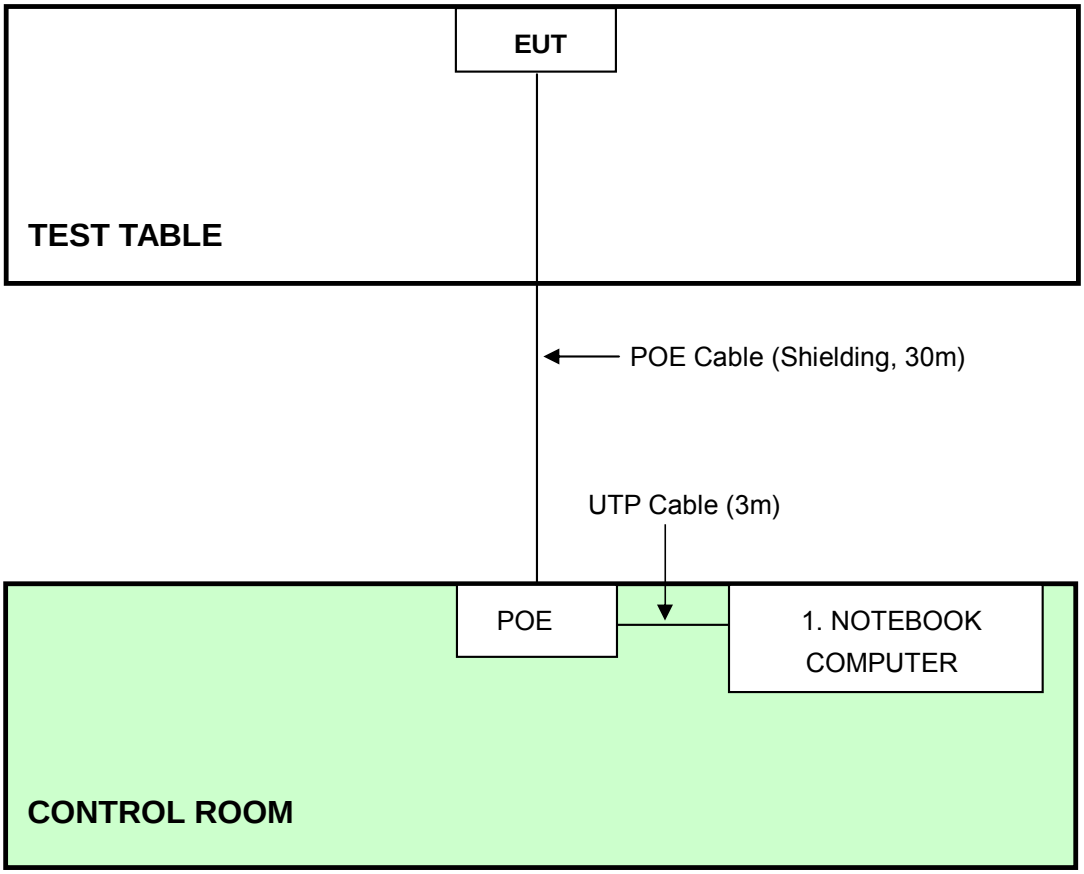
3.5 CONFIGURATION OF SYSTEM UNDER TEST

For Conducted Test:



NOTE: 1. Support unit 1 was kept in the control room during the test.
2. Please refer to the photos of test configuration.

For Radiated Test:



NOTE: 1. Support unit 1 was kept in the control room during the test.
2. Please refer to the photos of test configuration.

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 0.5-5 5-30	66 to 56 56 60	56 to 46 46 50

NOTE: 1. The lower limit shall apply at the transition frequencies.
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.
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
ROHDE & SCHWARZ Test Receiver	ESCS 30	100287	Mar. 06, 2008
Line-Impedance Stabilization Network(for EUT)	ENV-216	100072	Oct. 20, 2007
Line-Impedance Stabilization Network(for Peripheral)	KNW-407	8-1395-12	Aug. 15, 2007
RF Cable (JETBAO)	RG233/U	Cable_CA_01	Jul. 19, 2007
Terminator	50	1	Oct. 30, 2007
Software	ADT_Cond_V7.3.2	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 ADT Shielded Room No. A.
3. The VCCI Con A Registration No. is C-817.

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

b. provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.

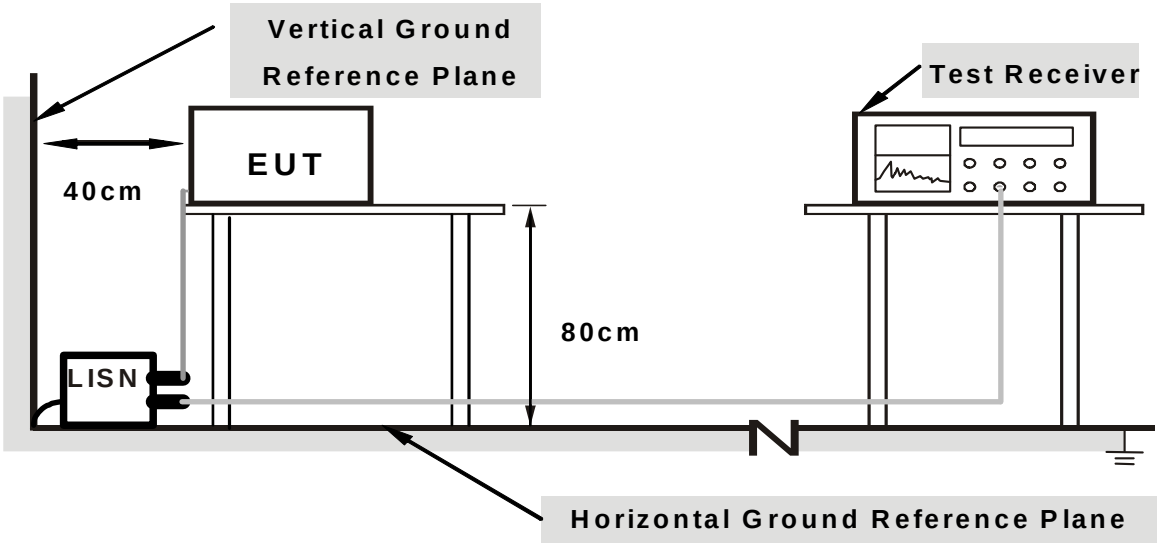
c. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

d. The frequency range from 150kHz to 30MHz was searched. Emission level 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 the testing table.

b. Prepared another computer system to act as a communication partner and placed it outside of testing area.

c. The communication partner run a test program “Art 48 b 5” to enable EUT under transmission/receiving condition continuously at specific channel frequency via RJ 45 cable and wireless.

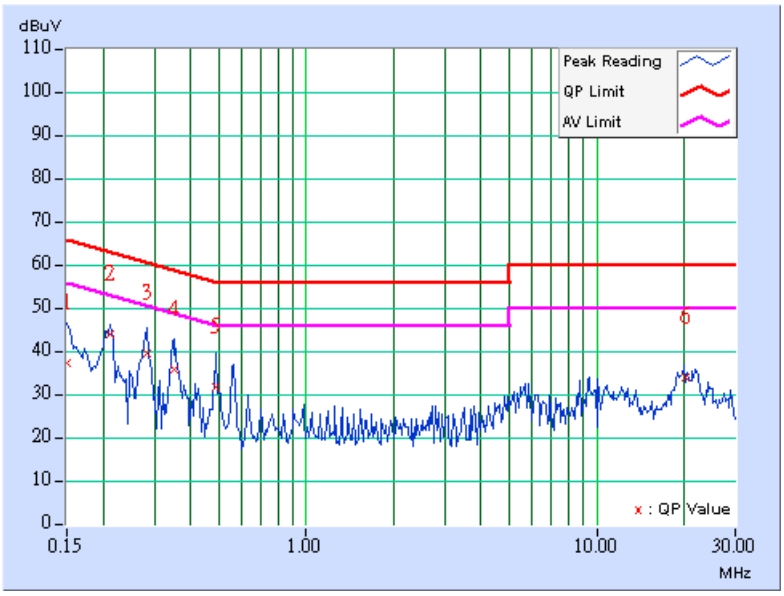
4.1.7 TEST RESULTS

Conducted Worst-Case Data

MODULATION TYPE	BPSK	**6dB BANDWIDTH**	9 kHz
TEST MODE	With Antenna 1	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Line (L)
ENVIRONMENTAL CONDITIONS	15deg. C, 60%RH, 972hPa	**TESTED BY**	Wen Yu

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.150	9.75	27.27	-	37.02	-	66.00	56.00	-28.98	-
2	0.213	9.80	34.10	-	43.90	-	63.11	53.11	-19.21	-
3	0.283	9.80	29.53	-	39.33	-	60.73	50.73	-21.40	-
4	0.353	9.80	25.72	-	35.52	-	58.89	48.89	-23.37	-
5	0.490	9.81	21.76	-	31.57	-	56.17	46.17	-24.60	-
6	20.107	10.10	24.12	-	34.22	-	60.00	50.00	-25.78	-

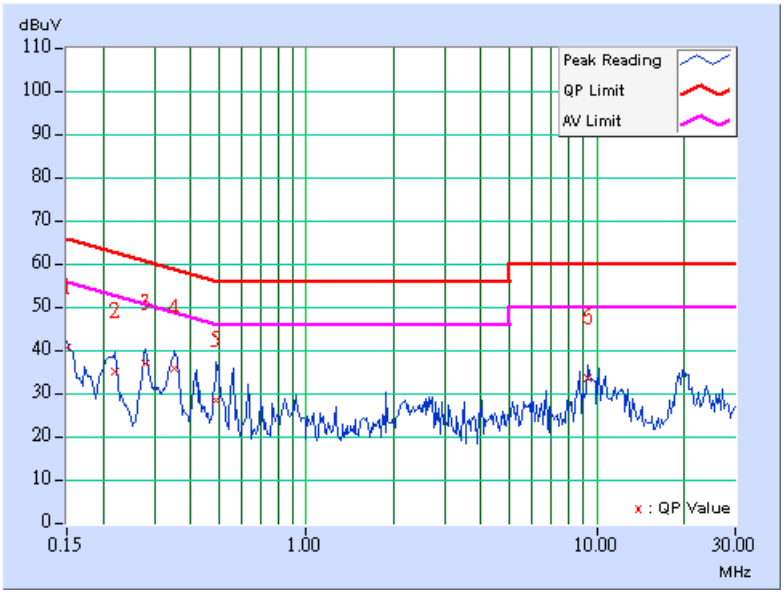
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



MODULATION TYPE	BPSK	**6dB BANDWIDTH**	9 kHz
TEST MODE	With Antenna 1	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Neutral (N)
ENVIRONMENTAL CONDITIONS	15deg. C, 60%RH, 972hPa	**TESTED BY**	Wen Yu

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.150	9.80	30.58	-	40.38	-	66.00	56.00	-25.62	-
2	0.220	9.80	25.16	-	34.96	-	62.81	52.81	-27.85	-
3	0.279	9.80	27.03	-	36.83	-	60.85	50.85	-24.02	-
4	0.353	9.80	25.94	-	35.74	-	58.89	48.89	-23.15	-
5	0.490	9.81	18.33	-	28.14	-	56.17	46.17	-28.03	-
6	9.359	10.09	23.71	-	33.80	-	60.00	50.00	-26.20	-

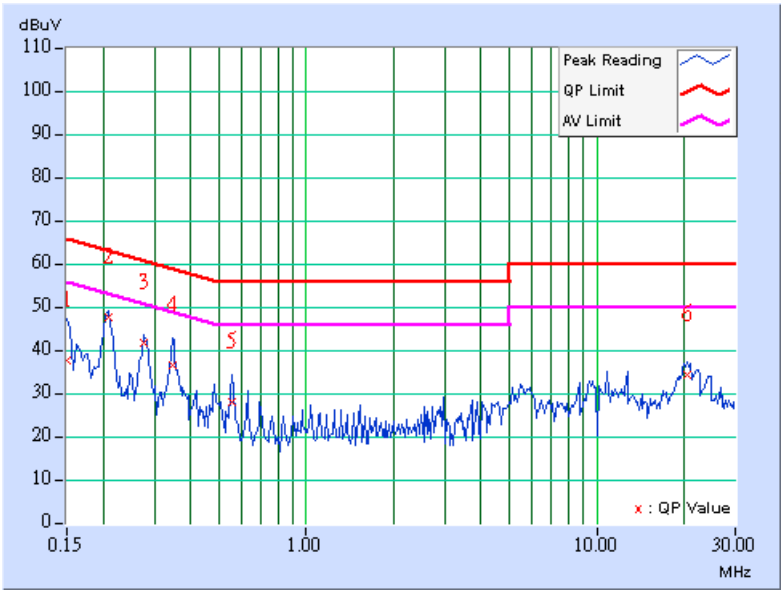
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



MODULATION TYPE	BPSK	**6dB BANDWIDTH**	9 kHz
TEST MODE	With Antenna A	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Line (L)
ENVIRONMENTAL CONDITIONS	15deg. C, 60%RH, 972hPa	**TESTED BY**	Wen Yu

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.150	9.75	27.71	-	37.46	-	66.00	56.00	-28.54	-
2	**0.209**	**9.80**	**37.74**	**-**	**47.54**	**-**	**63.26**	**53.26**	**-15.72**	**-**
3	0.277	9.80	31.92	-	41.72	-	60.91	50.91	-19.19	-
4	0.345	9.80	26.58	-	36.38	-	59.07	49.07	-22.69	-
5	0.556	9.83	18.14	-	27.97	-	56.00	46.00	-28.03	-
6	20.523	10.11	24.30	-	34.41	-	60.00	50.00	-25.59	-

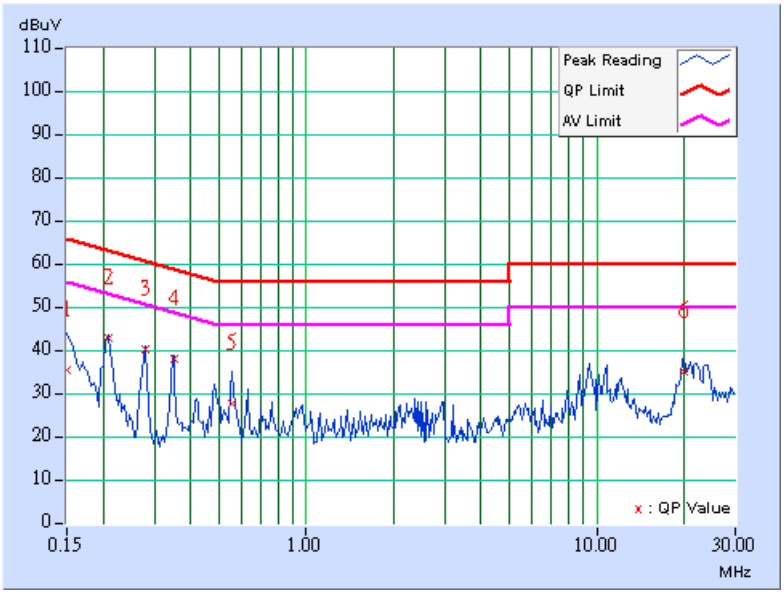
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



MODULATION TYPE	BPSK	**6dB BANDWIDTH**	9 kHz
TEST MODE	With Antenna A	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Neutral (N)
ENVIRONMENTAL CONDITIONS	15deg. C, 60%RH, 972hPa	**TESTED BY**	Wen Yu

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.150	9.80	25.00	-	34.80	-	66.00	56.00	-31.20	-
2	0.209	9.80	32.65	-	42.45	-	63.26	53.26	-20.81	-
3	0.279	9.80	29.87	-	39.67	-	60.85	50.85	-21.18	-
4	0.349	9.80	27.58	-	37.38	-	58.98	48.98	-21.60	-
5	0.552	9.83	17.26	-	27.09	-	56.00	46.00	-28.91	-
6	19.859	10.40	24.74	-	35.14	-	60.00	50.00	-24.86	-

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
5725~5825	-27 *note 1	68.3
	-17 *note 2	78.3

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
ADVANTEST Spectrum Analyzer	R3271A	85060311	July 03, 2007
HP Pre_Amplifier	8449B	3008A01922	Sep. 18, 2007
ROHDE & SCHWARZ Test Receiver	ESCS30	100375	Sep. 20, 2007
CHASE Broadband Antenna	VULB9168	138	Dec. 10, 2007
Schwarzbeck Horn_Antenna	BBHA9120	D124	Jan. 01, 2008
Schwarzbeck Horn_Antenna	BBHA 9170	BBHA9170153	Jan. 04, 2008
SCHWARZBECK Biconical Antenna	VHBA9123	459	Jun. 08, 2009
SCHWARZBECK Periodic Antenna	UPA6108	1148	Jun. 08, 2009
R&S Loop Antenna	HFH2-Z2	881058/15	Nov. 29, 2007
RF Switches (ARNITSU)	CS-201	1565157	NA
RF CABLE (Chaintek)	SF102	22054-2	Nov. 14. 2007
RF Cable(RICHTEC)	9913-30M N-N Cable	STCCAB-30M-1 GHz	Jul. 15, 2007
Software	ADT_Radiated_V 5.14	NA	NA
CHANCE MOST Antenna Tower	AT-100	0203	NA
CHANCE MOST Turn Table	TT-100	0203	NA

Note: 1. The calibration interval of the above test instruments is 12 months (36 months for Biconical and Periodic Antenna)and the calibrations are traceable to NML/ROC and NIST/USA.
2. The horn antenna, HP preamplifier (model: 8449B) and Spectrum Analyzer (model: R3271A) are used only for the measurement of emission frequency above 1GHz if tested.
3. The test was performed in ADT Open Site No. C.
4. The FCC Site Registration No. is 656396.
5. The VCCI Site Registration No. is R-1626.
6. The CANADA Site Registration No. is IC 4824A-3.
7. Loop antenna was used for all emissions below 30 MHz.

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.

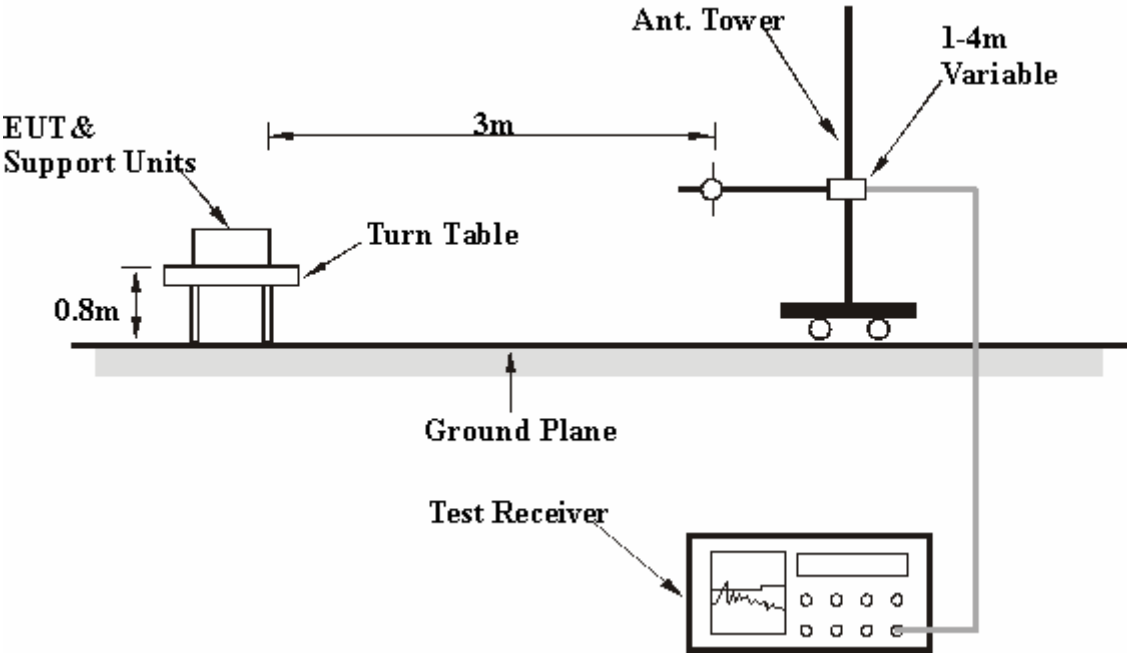
NOTE:

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 is 1MHz and video bandwidth of test receiver/spectrum analyzer is 3MHz for Peak detection at frequency above 1GHz. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz for Average detection (AV) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10 Hz 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 related item – Photographs of the Test Configuration.

4.2.7 EUT OPERATING CONDITION

a. Placed the EUT on the testing table.

b. Prepared another computer system to act as a communication partner and placed it outside of testing area.

c. The communication partner run a test program “Art 48 b 5” to enable EUT under transmission/receiving condition continuously at specific channel frequency via RJ 45 cable and wireless.

4.2.8 TEST RESULTS –ANTENNA 1

Below 1GHz Worst-Case Data

MODE	Channel 5	**FREQUENCY RANGE**	Below 1000MHz
MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Quasi-Peak
ENVIRONMENTAL CONDITIONS	20deg. C, 65%RH, 972hPa	**TESTED BY**	Phoenix Huang

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	46.82	26.20 QP	40.00	-13.80	1.52 H	18	11.50	14.80
2	122.99	28.50 QP	43.50	-15.00	1.51 H	99	16.40	12.10
3	187.50	30.00 QP	43.50	-13.50	1.45 H	168	17.60	12.50
4	330.20	28.30 QP	46.00	-17.70	1.30 H	21	11.20	17.20
5	550.00	44.80 QP	46.00	-1.20	1.33 H	6	21.60	23.20
6	660.10	29.60 QP	46.00	-16.40	1.21 H	90	4.40	25.20
7	770.10	33.10 QP	46.00	-12.90	1.18 H	248	5.60	27.40
8	880.10	34.20 QP	46.00	-11.80	1.00 H	76	5.50	28.70

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	49.15	38.00 QP	40.00	-2.00	1.00 V	269	23.00	15.00
2	133.62	33.20 QP	43.50	-10.30	1.00 V	195	20.30	12.90
3	250.06	33.40 QP	46.00	-12.60	1.00 V	89	19.70	13.80
4	440.20	31.90 QP	46.00	-14.10	1.00 V	142	11.70	20.20
5	550.00	45.20 QP	46.00	-0.80	1.00 V	147	22.00	23.20
6	660.10	33.80 QP	46.00	-12.20	1.27 V	19	8.70	25.20
7	770.00	33.20 QP	46.00	-12.80	1.00 V	344	5.80	27.40
8	880.00	35.80 QP	46.00	-10.20	1.53 V	120	7.10	28.70

REMARKS: 1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value

802.11a OFDM modulation

MODE	Channel 5	**FREQUENCY RANGE**	1 ~ 40 GHz
MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 56%RH, 972hPa	**TESTED BY**	Moris Lin

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	#5460.00	53.30 PK	74.00	-20.70	1.00 H	52	16.30	37.00
1	#5460.00	37.90 AV	54.00	-16.10	1.00 H	52	0.90	37.00
2	*5500.00	100.20 PK			1.00 H	52	63.20	37.00
2	*5500.00	88.40 AV			1.00 H	52	51.40	37.00
3	#11000.00	63.70 PK	74.00	-10.30	1.12 H	285	17.10	46.60
3	#11000.00	51.00 AV	54.00	-3.00	1.12 H	285	4.30	46.60

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5460.00	68.70 PK	74.00	-5.30	1.20 V	4	31.70	37.00
1	**#5460.00**	**53.50 AV**	**54.00**	**-0.50**	**1.20 V**	**4**	**16.50**	**37.00**
2	*5500.00	115.60 PK			1.20 V	4	78.60	37.00
2	*5500.00	104.00 AV			1.20 V	4	67.00	37.00
3	#11000.00	67.60 PK	74.00	-6.40	1.00 V	53	20.90	46.60
3	#11000.00	53.20 AV	54.00	-0.80	1.00 V	53	6.60	46.60

NOTE: 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.

MODE	Channel 10	**FREQUENCY RANGE**	1 ~ 40 GHz
MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 56%RH, 972hPa	**TESTED BY**	Moris Lin

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	*5600.00	101.40 PK			1.05 H	61	64.10	37.30
1	*5600.00	89.20 AV			1.05 H	61	51.90	37.30
2	#11200.00	60.80 PK	74.00	-13.20	1.25 H	84	14.00	46.80
2	#11200.00	48.50 AV	54.00	-5.50	1.25 H	84	1.70	46.80

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5600.00	116.20 PK			1.35 V	0	78.90	37.30
1	*5600.00	104.80 AV			1.35 V	0	67.50	37.30
2	#11200.00	64.00 PK	74.00	-10.00	1.00 V	55	17.20	46.80
2	#11200.00	50.80 AV	54.00	-3.20	1.00 V	55	4.00	46.80

NOTE: 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.

MODE	Channel 15	**FREQUENCY RANGE**	1 ~ 40 GHz
MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 56%RH, 972hPa	**TESTED BY**	Moris Lin

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	*5700.00	101.10 PK			1.06 H	54	63.60	37.50
1	*5700.00	89.30 AV			1.06 H	54	51.80	37.50
2	#11400.00	62.80 PK	74.00	-11.20	1.06 H	201	15.90	47.00
2	#11400.00	49.00 AV	54.00	-5.00	1.06 H	201	2.00	47.00

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5700.00	115.40 PK			1.34 V	180	77.90	37.50
1	*5700.00	103.90 AV			1.34 V	180	66.40	37.50
2	#11400.00	59.50 PK	74.00	-14.50	1.69 V	359	12.60	47.00
2	#11400.00	45.90 AV	54.00	-8.10	1.69 V	359	-1.00	47.00

NOTE: 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.

4.2.9 TEST RESULTS –ANTENNA A

Below 1GHz Worst-Case Data

MODE	Channel 5	**FREQUENCY RANGE**	Below 1000MHz
MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Quasi-Peak
ENVIRONMENTAL CONDITIONS	20deg. C, 65%RH, 972hPa	**TESTED BY**	Phoenix Huang

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	125.02	21.40 QP	43.50	-22.10	1.00 H	21	9.10	12.20
2	187.56	26.60 QP	43.50	-16.90	1.00 H	21	14.20	12.50
3	250.06	33.40 QP	46.00	-12.60	1.30 H	286	19.60	13.80
4	440.20	31.80 QP	46.00	-14.20	1.45 H	31	11.60	20.20
5	550.00	45.10 QP	46.00	-0.90	1.68 H	345	21.80	23.20
6	660.00	34.10 QP	46.00	-11.90	1.15 H	335	8.90	25.20
7	770.00	34.10 QP	46.00	-11.90	1.01 H	342	6.70	27.40
8	880.00	33.20 QP	46.00	-12.80	1.00 H	51	4.50	28.70

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	60.39	32.00 QP	40.00	-8.00	1.00 V	220	18.40	13.70
2	125.11	29.80 QP	43.50	-13.70	1.00 V	270	17.60	12.20
3	187.50	27.80 QP	43.50	-15.70	1.00 V	331	15.30	12.50
4	439.90	32.00 QP	46.00	-14.00	1.00 V	1	11.80	20.20
5	550.00	42.20 QP	46.00	-3.80	1.35 V	266	18.90	23.20
6	660.00	33.90 QP	46.00	-12.10	1.00 V	1	8.70	25.20
7	770.10	36.30 QP	46.00	-9.70	1.20 V	262	8.80	27.40
8	880.10	37.80 QP	46.00	-8.20	1.17 V	68	9.10	28.70

REMARKS: 1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value

802.11a OFDM modulation

MODE	Channel 1	**FREQUENCY RANGE**	1 ~ 40 GHz
MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 56%RH, 972hPa	**TESTED BY**	Phoenix Huang

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	42.10 PK	74.00	-31.90	1.56 H	266	5.60	36.60
1	#5150.00	29.00 AV	54.00	-25.00	1.56 H	266	-7.60	36.60
2	*5260.00	100.00 PK			1.56 H	266	63.30	36.70
2	*5260.00	88.00 AV			1.56 H	266	51.30	36.70
3	10520.00	64.30 PK	68.30	-4.00	1.58 H	238	18.10	46.20

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5150.00	61.30 PK	74.00	-12.70	1.16 V	93	24.80	36.60
1	#5150.00	48.90 AV	54.00	-5.10	1.16 V	93	12.30	36.60
2	*5260.00	119.20 PK			1.16 V	93	82.50	36.70
2	*5260.00	107.90 AV			1.16 V	93	71.20	36.70
3	10520.00	55.10 PK	68.30	-13.20	1.37 V	254	8.90	46.20

NOTE: 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.

MODE	Channel 4	**FREQUENCY RANGE**	1 ~ 40 GHz
MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 56%RH, 972hPa	**TESTED BY**	Phoenix Huang

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	*5320.00	98.00 PK			1.31 H	243	61.20	36.80
1	*5320.00	86.50 AV			1.31 H	243	49.70	36.80
2	#5350.00	51.00 PK	74.00	-23.00	1.31 H	243	14.20	36.80
2	#5350.00	36.10 AV	54.00	-17.90	1.31 H	243	-0.70	36.80
3	#10640.00	59.20 PK	74.00	-14.80	1.33 H	335	12.90	46.30
3	#10640.00	45.10 AV	54.00	-8.90	1.33 H	335	-1.20	46.30

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5320.00	114.20 PK			1.16 V	99	77.40	36.80
1	*5320.00	102.90 AV			1.16 V	99	66.10	36.80
2	#5350.00	67.20 PK	74.00	-6.80	1.16 V	99	30.40	36.80
2	#5350.00	52.50 AV	54.00	-1.50	1.16 V	99	15.70	36.80
3	#10640.00	60.30 PK	74.00	-13.70	1.45 V	254	14.00	46.30
3	#10640.00	46.60 AV	54.00	-7.40	1.45 V	254	0.30	46.30

NOTE: 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.

MODE	Channel 5	**FREQUENCY RANGE**	1 ~ 40 GHz
MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 56%RH, 972hPa	**TESTED BY**	Phoenix Huang

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	#5460.00	53.80 PK	74.00	-20.20	1.03 H	49	16.80	37.00
1	#5460.00	33.40 AV	54.00	-20.60	1.03 H	49	-3.60	37.00
2	*5500.00	99.00 PK			1.03 H	49	62.00	37.00
2	*5500.00	87.20 AV			1.03 H	49	50.20	37.00
3	#11000.00	59.20 PK	74.00	-14.80	1.39 H	304	12.60	46.60
3	#11000.00	45.20 AV	54.00	-8.80	1.39 H	304	-1.40	46.60

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5460.00	69.20 PK	74.00	-4.80	1.19 V	5	32.20	37.00
1	#5460.00	49.00 AV	54.00	-5.00	1.19 V	5	12.00	37.00
2	*5500.00	114.40 PK			1.19 V	5	77.40	37.00
2	*5500.00	102.80 AV			1.19 V	5	65.80	37.00
3	#11000.00	59.50 PK	74.00	-14.50	1.45 V	314	12.90	46.60
3	#11000.00	45.50 AV	54.00	-8.50	1.45 V	314	-1.10	46.60

NOTE: 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.

MODE	Channel 10	**FREQUENCY RANGE**	1 ~ 40 GHz
MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 56%RH, 972hPa	**TESTED BY**	Phoenix Huang

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	*5600.00	101.70 PK			1.02 H	53	64.40	37.30
1	*5600.00	89.50 AV			1.02 H	53	52.20	37.30
2	#11200.00	58.90 PK	74.00	-15.10	1.40 H	311	12.10	46.80
2	#11200.00	45.60 AV	54.00	-8.40	1.40 H	311	-1.20	46.80

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5600.00	116.50 PK			1.36 V	5	79.30	37.30
1	*5600.00	105.00 AV			1.36 V	5	67.80	37.30
2	#11200.00	59.00 PK	74.00	-15.00	1.14 V	299	12.20	46.80
2	#11200.00	45.30 AV	54.00	-8.70	1.14 V	299	-1.50	46.80

NOTE: 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.

MODE	Channel 15	**FREQUENCY RANGE**	1 ~ 40 GHz
MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 56%RH, 972hPa	**TESTED BY**	Phoenix Huang

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	*5700.00	98.90 PK			1.00 H	35	61.40	37.50
1	*5700.00	87.00 AV			1.00 H	35	49.50	37.50
2	#11400.00	60.50 PK	74.00	-13.50	1.34 H	221	13.60	47.00
2	#11400.00	46.70 AV	54.00	-7.30	1.34 H	221	-0.20	47.00

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5700.00	113.20 PK			1.35 V	184	75.70	37.50
1	*5700.00	101.50 AV			1.35 V	184	64.00	37.50
2	#11400.00	58.10 PK	74.00	-15.90	1.29 V	319	11.20	47.00
2	#11400.00	45.00 AV	54.00	-9.00	1.29 V	319	-1.90	47.00

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

4.3.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
ADVANTEST SPECTRUM ANALYZER	U3772	160100280	April. 10.2007

NOTE:

1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

2. 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.

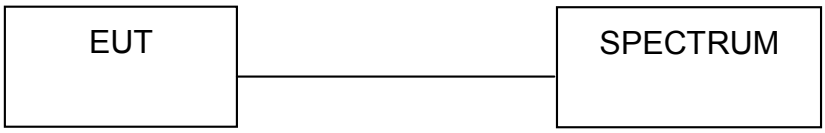
NOTE:
The test is performed in accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E, August 2002.

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 –ANTENNA 1

802.11a OFDM modulation

MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	23deg.C, 56%RH, 972hPa
TESTED BY	Wen Yu		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER OUTPUT (mW)	PEAK POWER LIMIT (dBm)	26dBc Occupied Bandwidth (MHz)	PASS/FAIL
5	5500	9.51	8.933	13	24.82	PASS
10	5600	8.51	7.096	13	25.09	PASS
15	5700	8.28	6.730	13	24.61	PASS

NOTE: The 26dBc Occupied Bandwidth plot, please refer to the following pages.

Peak Power Output:

CH5

CH10

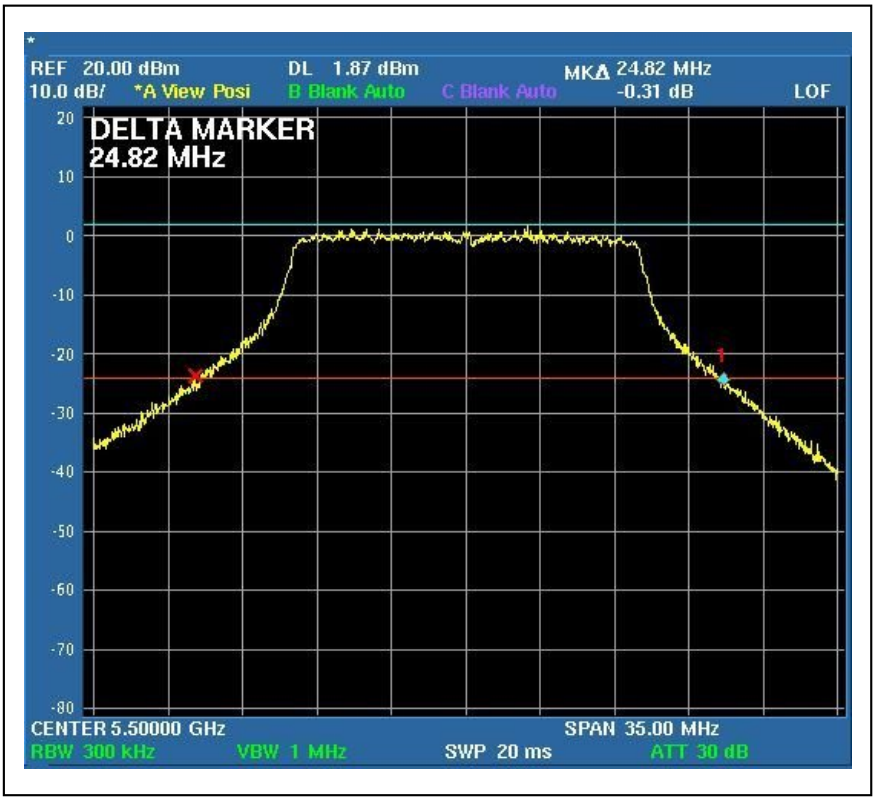

CHPOW
REF 20.00 dBm
DL 8.51 dBm
MKR 5.59471 GHz
10.0 dB/ *A PwAvg Smpl B Blank Auto C Blank Auto -2.87 dBm LOF
WIN WIDTH
25.09 MHz
CENTER 5.60000 GHz
SLIDE 100 / 100
SPAN 35.00 MHz
RBW 1 MHz
VBW 3 MHz
SWP 20 ms
ATT 30 dB
Channel Power
Channel Power 8.51 dBm

CH15

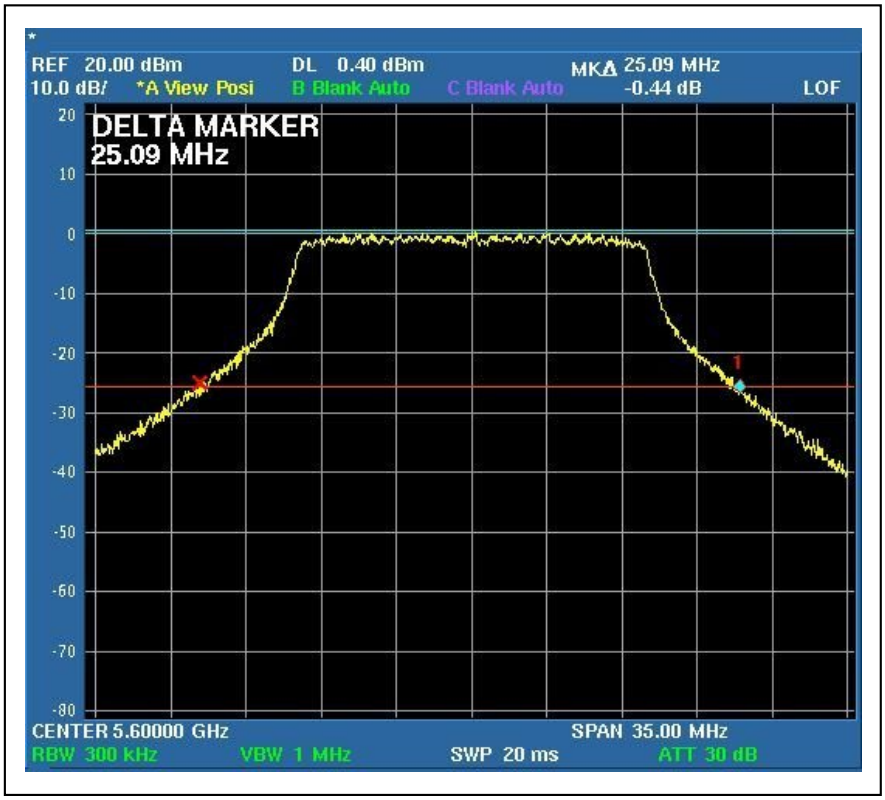

CHPOW
REF 20.00 dBm
DL 8.28 dBm
MKR 5.69878 GHz
10.0 dB/ *A PwAvg Smpl B Blank Auto C Blank Auto -3.17 dBm LOF
WIN WIDTH
24.61 MHz
CENTER 5.70000 GHz
SLIDE 100 / 100
SPAN 35.00 MHz
RBW 1 MHz
VBW 3 MHz
SWP 20 ms
ATT 30 dB
Channel Power
Channel Power 8.28 dBm

26dB Occupied Bandwidth:

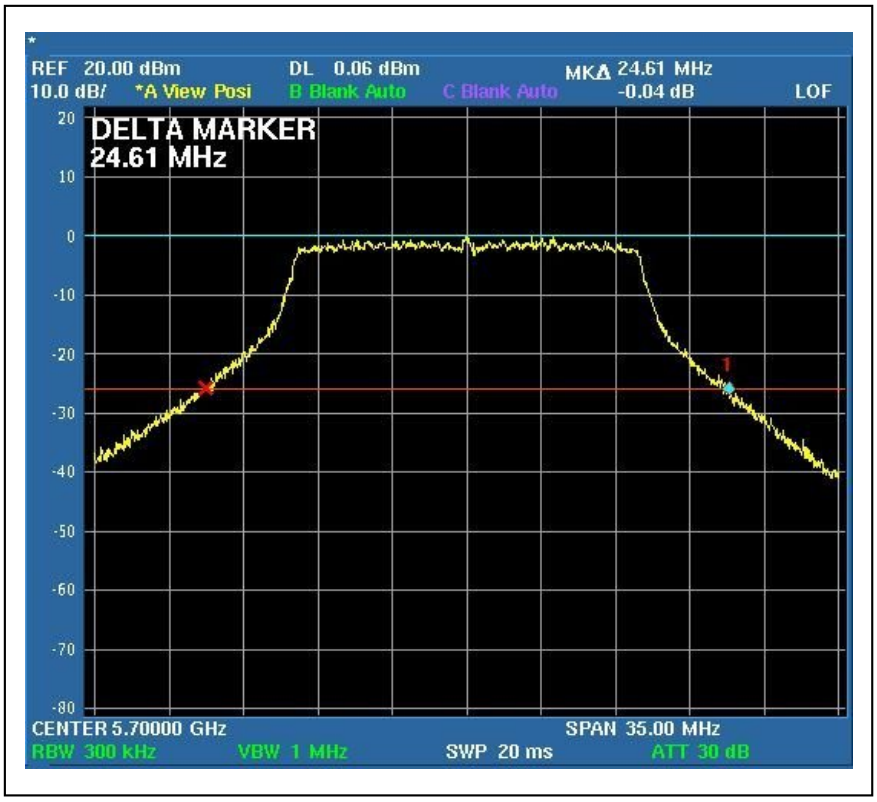
CH5



CH10



CH15


REF 20.00 dBm
DL 0.06 dBm
MKΔ 24.61 MHz
10.0 dB/ *A View Posi
B Blank Auto
C Blank Auto
-0.04 dB
LOF
DELTA MARKER
24.61 MHz
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
CENTER 5.70000 GHz
SPAN 35.00 MHz
RBW 300 kHz
VBW 1 MHz
SWP 20 ms
ATT 30 dB

4.3.8 TEST RESULTS –ANTENNA A

802.11a OFDM modulation

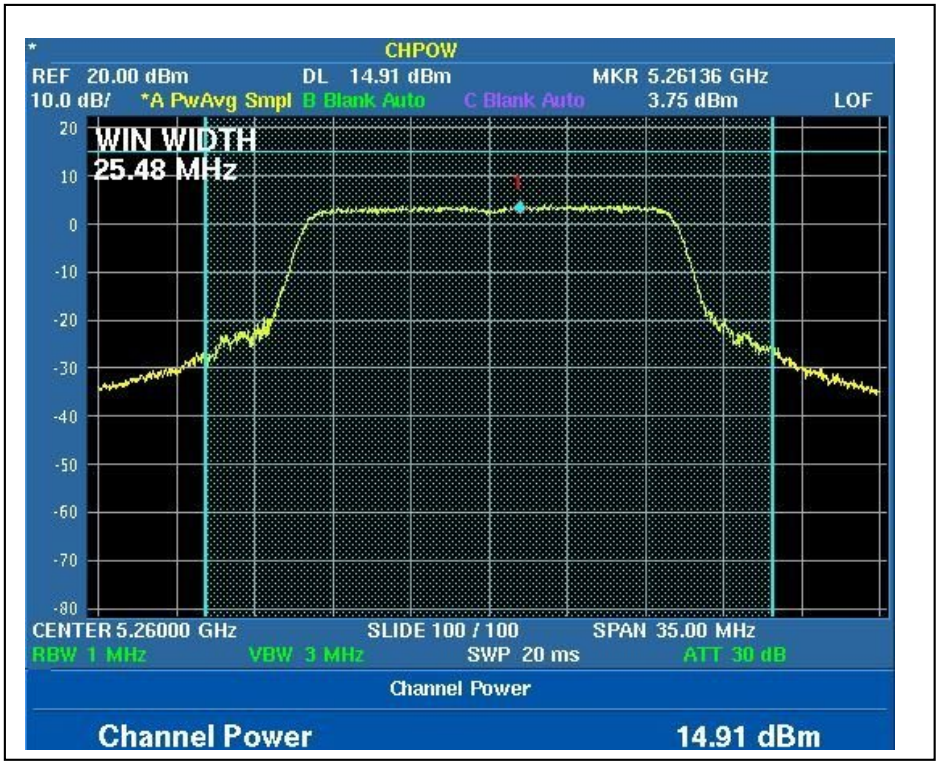
MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	23deg.C, 56%RH, 972hPa
TESTED BY	Wen Yu		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER OUTPUT (mW)	PEAK POWER LIMIT (dBm)	26dBc Occupied Bandwidth (MHz)	PASS/FAIL
1	5260	14.91	30.974	21	25.48	PASS
4	5320	13.59	22.856	21	24.85	PASS
5	5500	15.67	36.898	21	25.16	PASS
10	5600	16.32	42.855	21	25.62	PASS
15	5700	13.65	23.174	21	24.64	PASS

NOTE: The 26dBc Occupied Bandwidth plot, please refer to the following pages.

Peak Power Output:

CH1



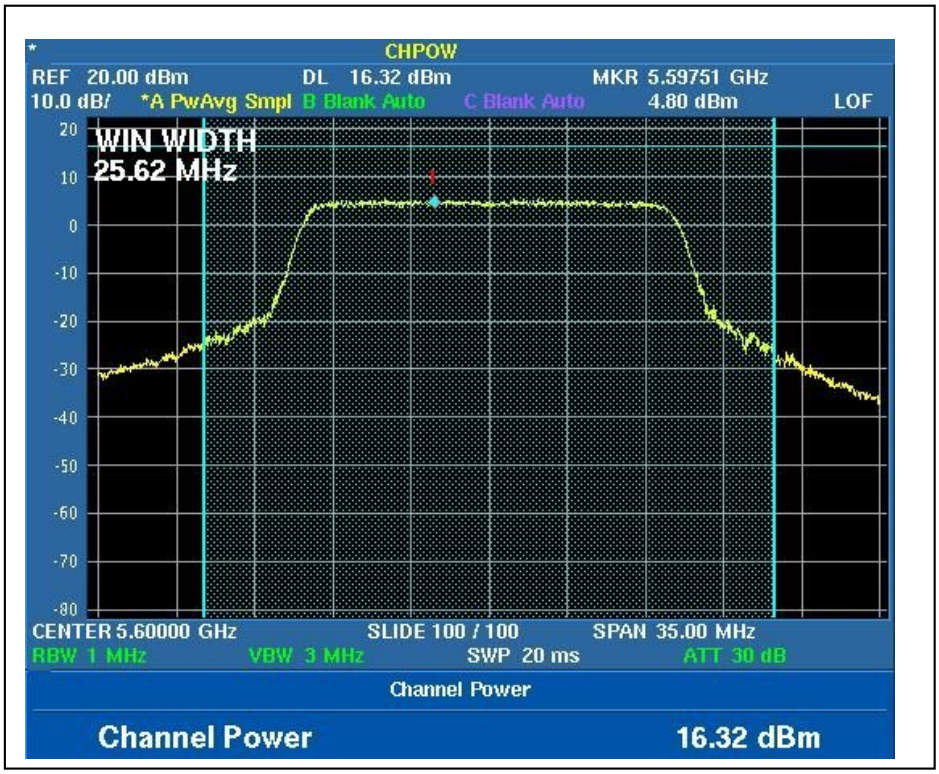
CH4


CHPOW
REF 20.00 dBm
DL 13.59 dBm
MKR 5.31664 GHz
10.0 dB/ *A PwAvg Smpl B Blank Auto C Blank Auto 2.00 dBm LOF
WIN WIDTH
24.85 MHz
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
CENTER 5.32000 GHz
SLIDE 100 / 100
SPAN 35.00 MHz
RBW 1 MHz
VBW 3 MHz
SWP 20 ms
ATT 30 dB
Channel Power
Channel Power
13.59 dBm

CH5


CHPOW
REF 20.00 dBm
DL 15.67 dBm
MKR 5.49486 GHz
10.0 dB/ *A PwAvg Smpl B Blank Auto C Blank Auto 4.31 dBm LOF
WIN WIDTH
25.16 MHz
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
CENTER 5.50000 GHz
SLIDE 100 / 100
SPAN 35.00 MHz
RBW 1 MHz
VBW 3 MHz
SWP 20 ms
ATT 30 dB
Channel Power
Channel Power
15.67 dBm

CH10

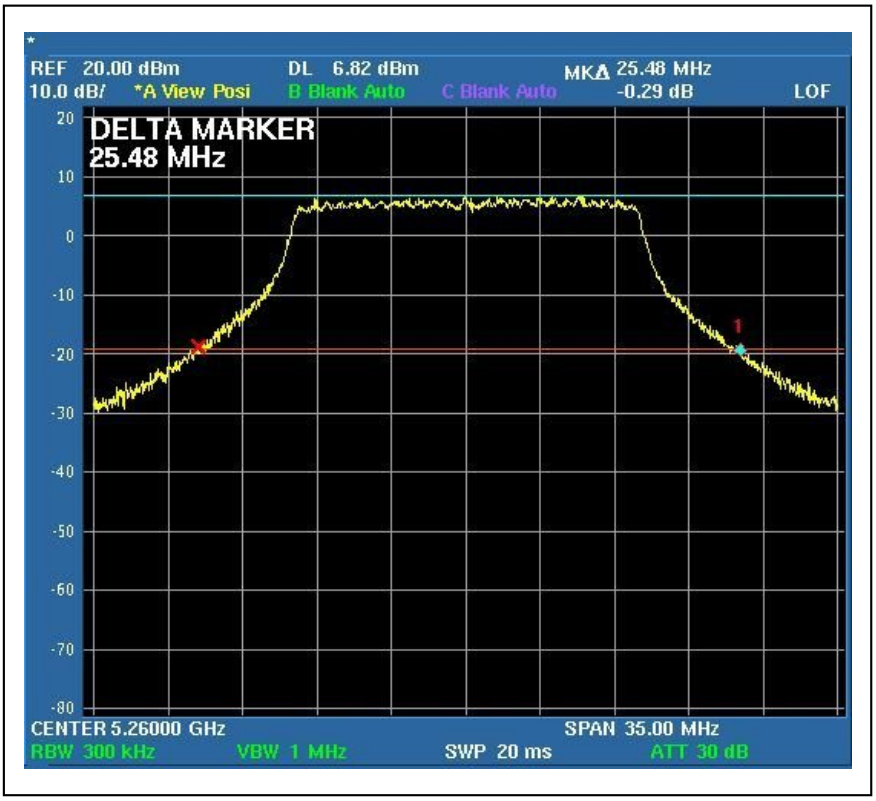

CHPOW
REF 20.00 dBm
DL 16.32 dBm
MKR 5.59751 GHz
10.0 dB/ *A PwAvg Smpl B Blank Auto C Blank Auto 4.80 dBm LOF
WIN WIDTH
25.62 MHz
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
CENTER 5.60000 GHz
SLIDE 100 / 100
SPAN 35.00 MHz
RBW 1 MHz
VBW 3 MHz
SWP 20 ms
ATT 30 dB
Channel Power
Channel Power
16.32 dBm

CH15

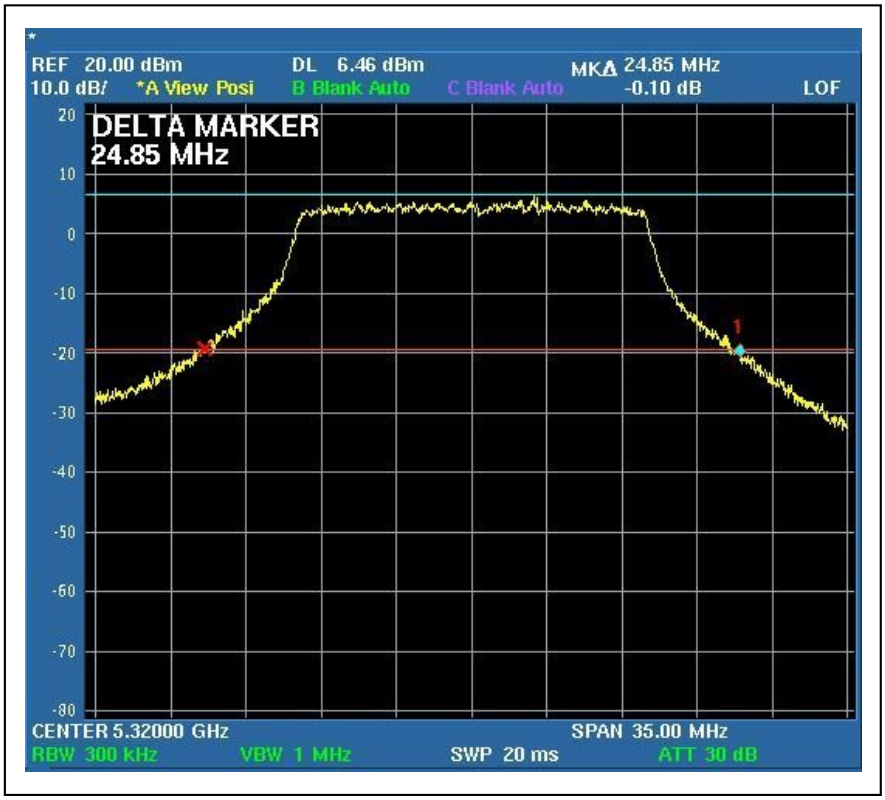

CHPOW
REF 20.00 dBm
DL 13.65 dBm
MKR 5.70336 GHz
10.0 dB/ *A PwAvg Smpl B Blank Auto C Blank Auto 2.05 dBm LOF
WIN WIDTH
24.64 MHz
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
CENTER 5.70000 GHz
SLIDE 100 / 100
SPAN 35.00 MHz
RBW 1 MHz
VBW 3 MHz
SWP 20 ms
ATT 30 dB
Channel Power
Channel Power
13.65 dBm

26dB Occupied Bandwidth:

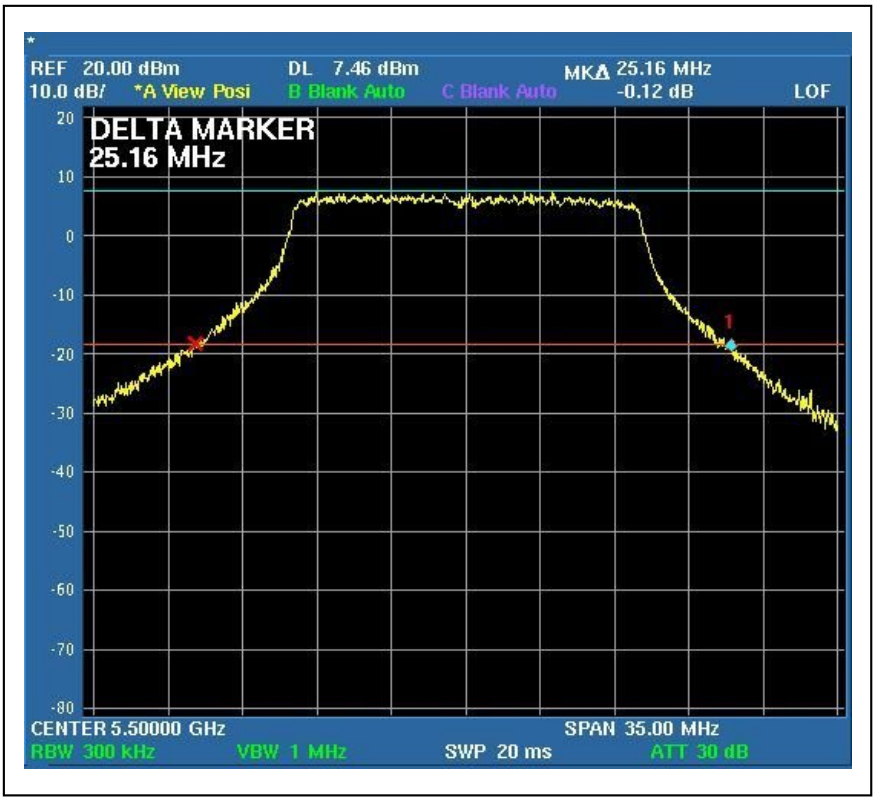
CH1



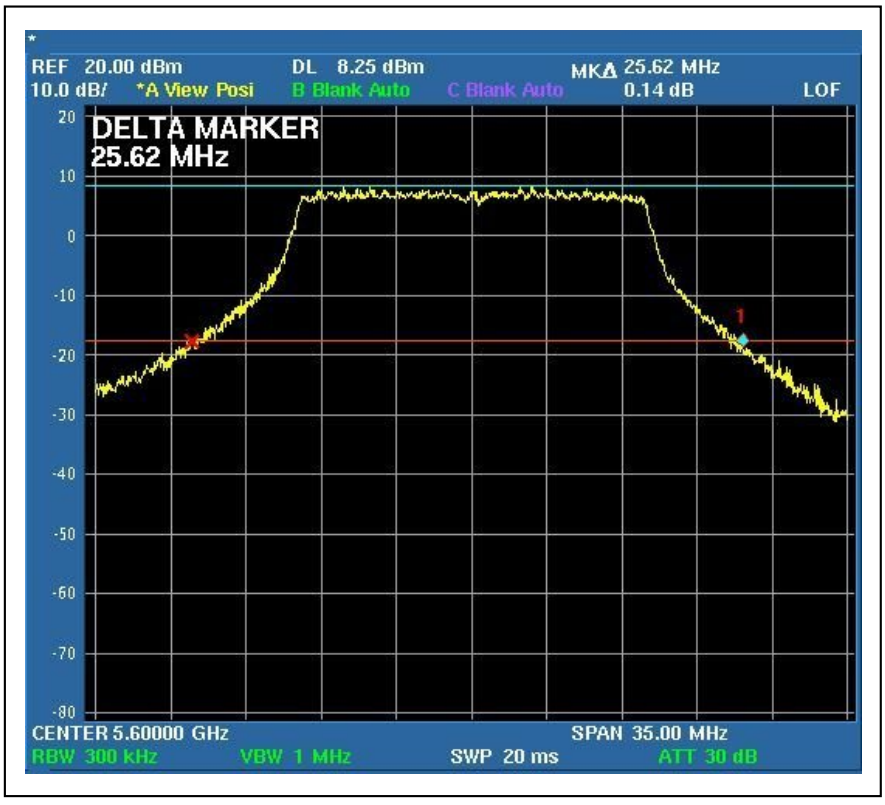
CH4



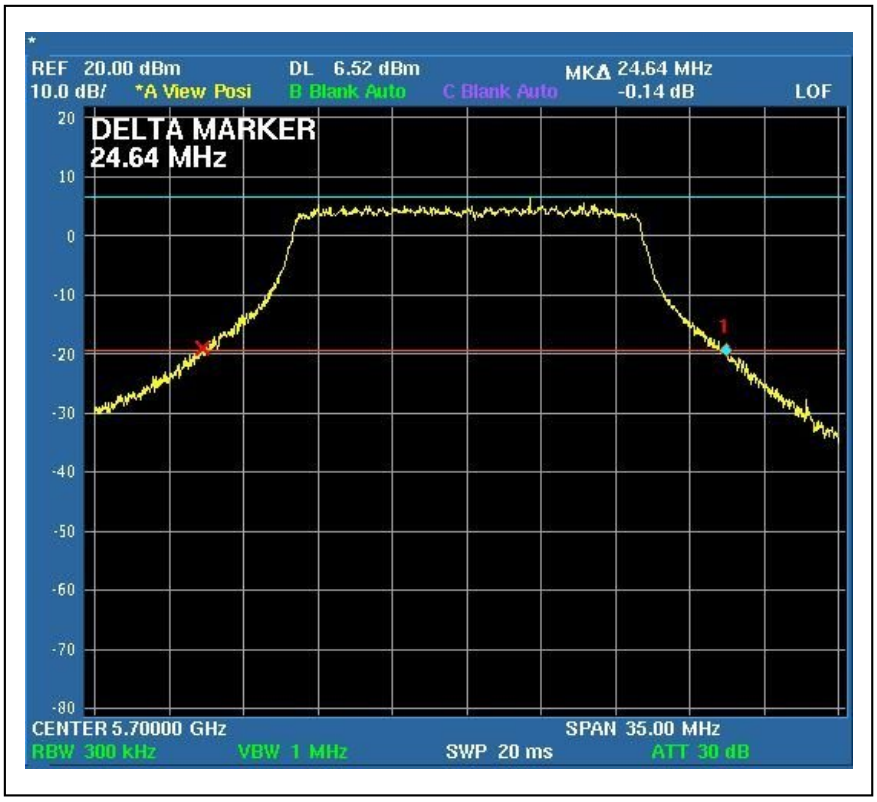
CH5


REF 20.00 dBm
DL 7.46 dBm
MKΔ 25.16 MHz
10.0 dB/ *A View Posi
B Blank Auto
C Blank Auto
-0.12 dB
LOF
DELTA MARKER
25.16 MHz
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
CENTER 5.50000 GHz
SPAN 35.00 MHz
RBW 300 kHz
VBW 1 MHz
SWP 20 ms
ATT 30 dB

CH10


REF 20.00 dBm
DL 8.25 dBm
MKΔ 25.62 MHz
10.0 dB/ *A View Posi
B Blank Auto
C Blank Auto
0.14 dB
LOF
DELTA MARKER
25.62 MHz
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
CENTER 5.60000 GHz
SPAN 35.00 MHz
RBW 300 kHz
VBW 1 MHz
SWP 20 ms
ATT 30 dB

CH15


REF 20.00 dBm
DL 6.52 dBm
MKΔ 24.64 MHz
10.0 dB/ *A View Posi
B Blank Auto
C Blank Auto
-0.14 dB
LOF
DELTA MARKER
24.64 MHz
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
CENTER 5.70000 GHz
SPAN 35.00 MHz
RBW 300 kHz
VBW 1 MHz
SWP 20 ms
ATT 30 dB

4.4 PEAK POWER EXCURSION MEASUREMENT

4.4.1 LIMITS OF PEAK POWER EXCURSION MEASUREMENT

Frequency Band	Limit
5.15 – 5.25 GHz	13dB
5.25 – 5.35 GHz	13dB
5.47 – 5.725 GHz	13dB
5.725 – 5.825 GHz	13dB

4.4.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
ADVANTEST SPECTRUM ANALYZER	U3772	160100280	April. 10.2007

NOTE:

1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

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

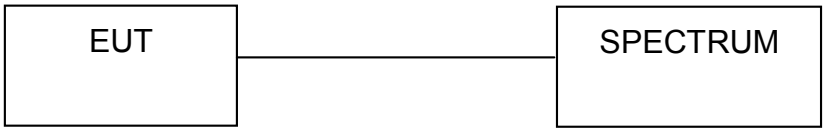
4.4.3 TEST PROCEDURE

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.

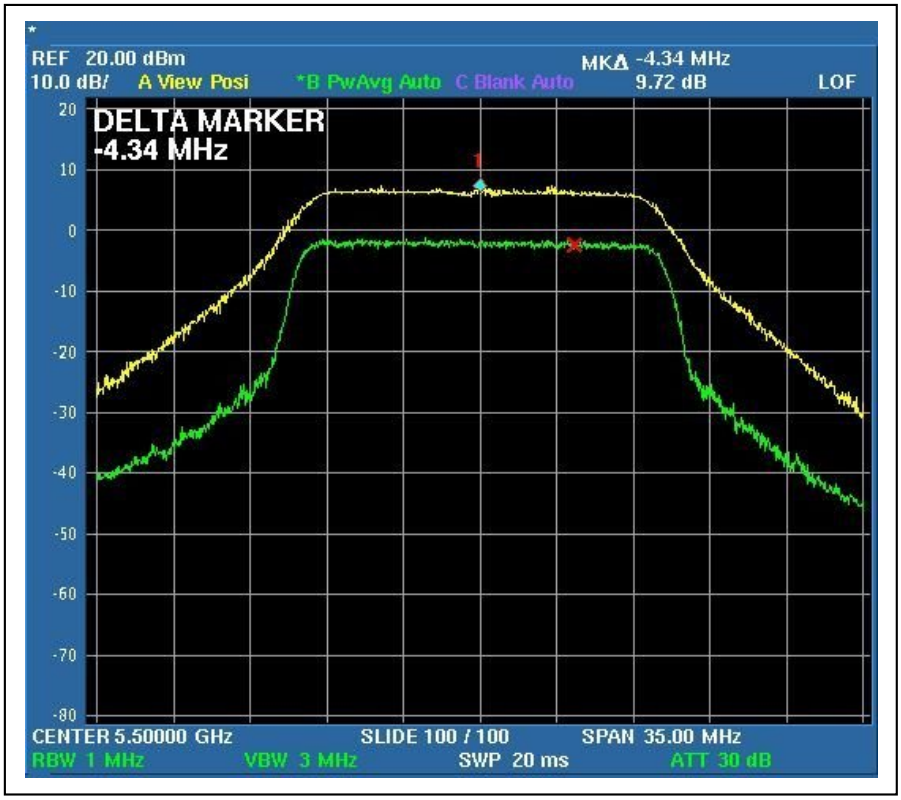
4.4.7 TEST RESULTS –ANTENNA 1

802.11a OFDM modulation

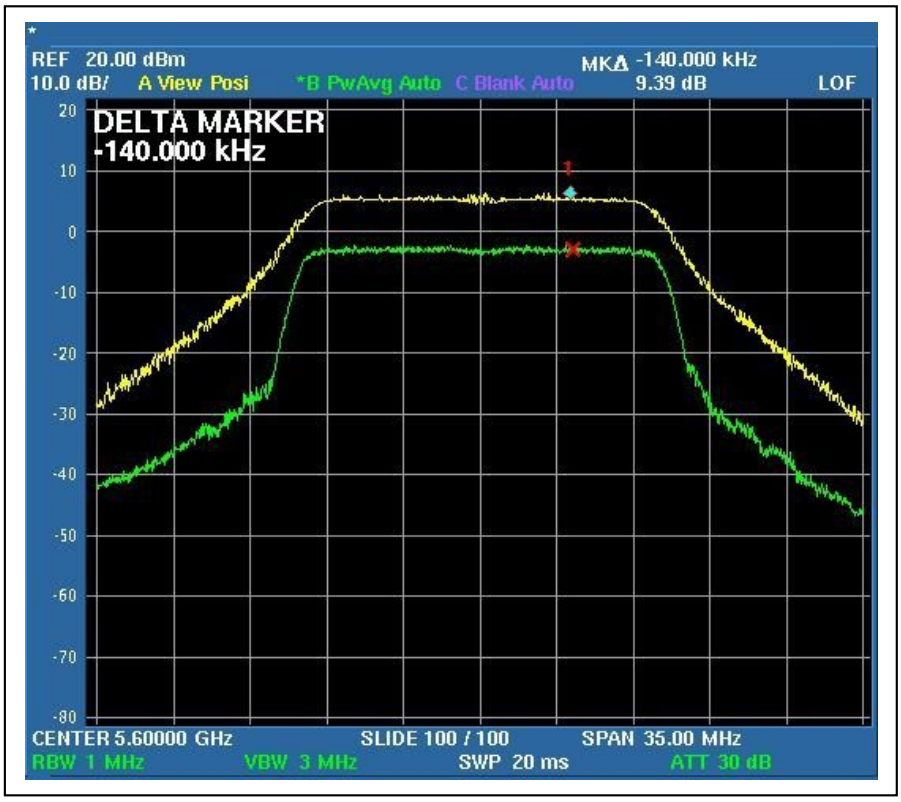
MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	23deg.C, 56%RH, 972hPa
TESTED BY	Wen Yu		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER EXCURSION (dB)	PEAK to AVERAGE EXCURSION LIMIT (dB)	PASS/FAIL
5	5500	9.72	13	PASS
10	5600	9.39	13	PASS
15	5700	9.87	13	PASS

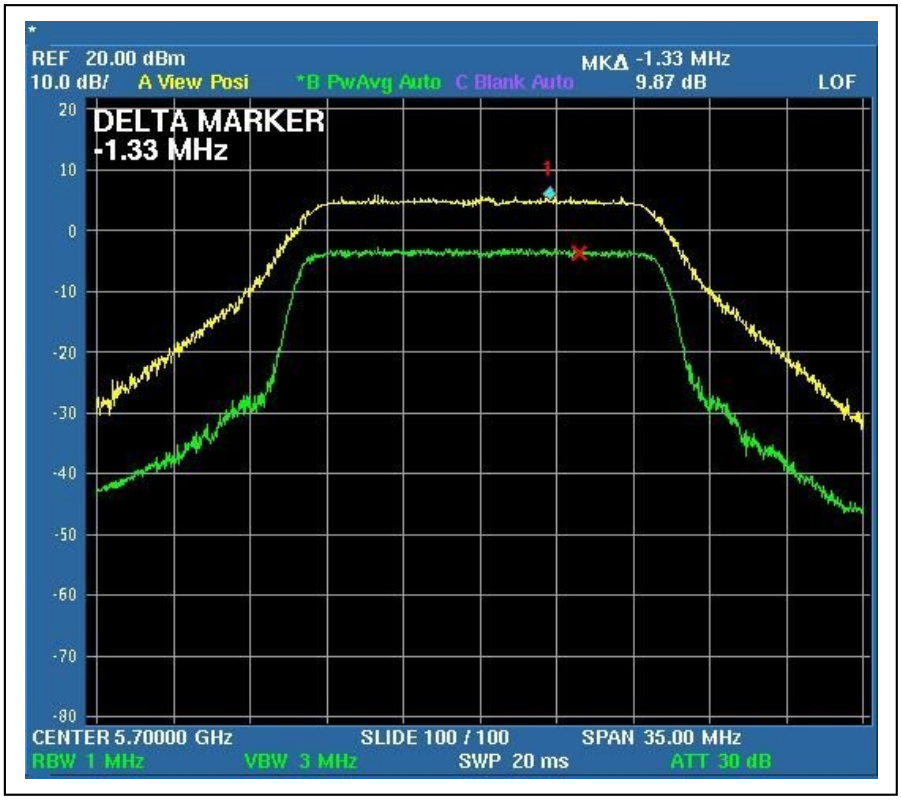
CH5



CH10


REF 20.00 dBm
MKΔ -140.000 kHz
10.0 dB/ A View Posi *B PwAvg Auto C Blank Auto 9.39 dB LOF
DELTA MARKER
-140.000 kHz
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
CENTER 5.60000 GHz SLIDE 100 / 100 SPAN 35.00 MHz
RBW 1 MHz VBW 3 MHz SWP 20 ms ATT 30 dB

CH15


REF 20.00 dBm
MKΔ -1.33 MHz
10.0 dB/ A View Posi *B PwAvg Auto C Blank Auto 9.87 dB LOF
DELTA MARKER
-1.33 MHz
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
CENTER 5.70000 GHz SLIDE 100 / 100 SPAN 35.00 MHz
RBW 1 MHz VBW 3 MHz SWP 20 ms ATT 30 dB

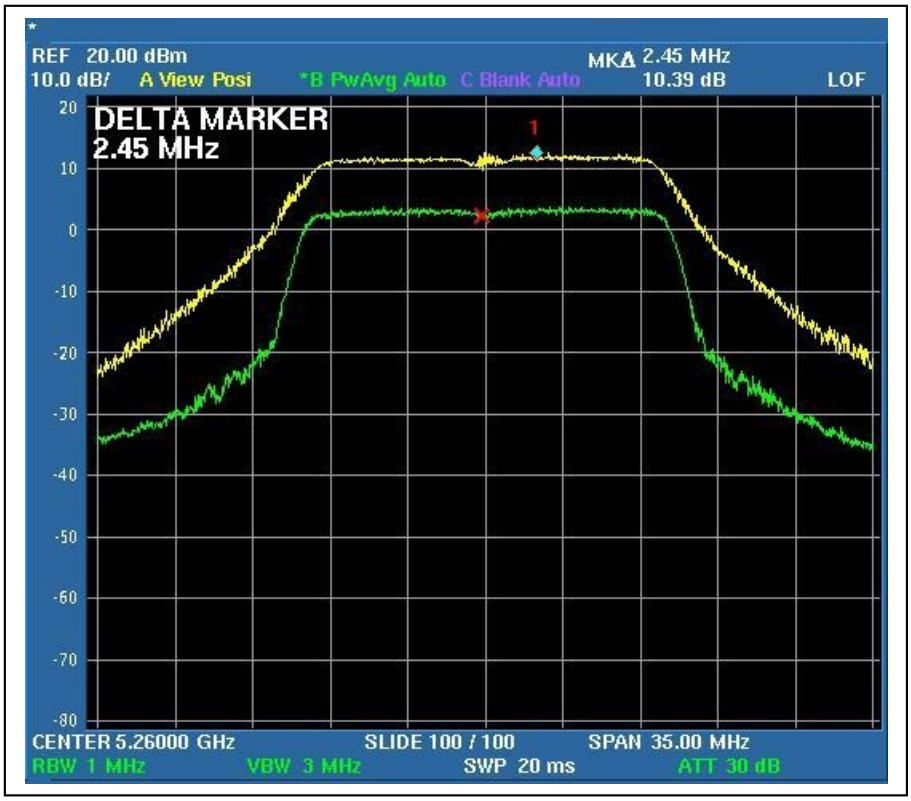
4.4.8 TEST RESULTS –ANTENNA A

802.11a OFDM modulation

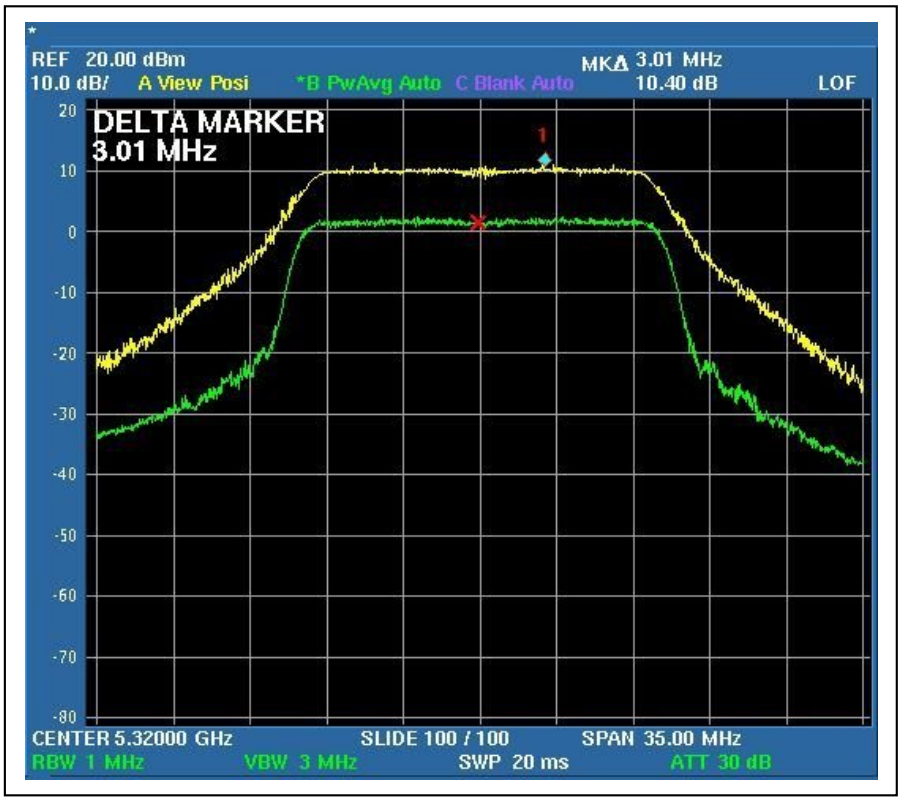
MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	23deg.C, 56%RH, 972hPa
TESTED BY	Wen Yu		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER EXCURSION (dB)	PEAK to AVERAGE EXCURSION LIMIT (dB)	PASS/FAIL
1	5260	10.39	13	PASS
4	5320	10.40	13	PASS
5	5500	10.25	13	PASS
10	5600	10.52	13	PASS
15	5700	10.54	13	PASS

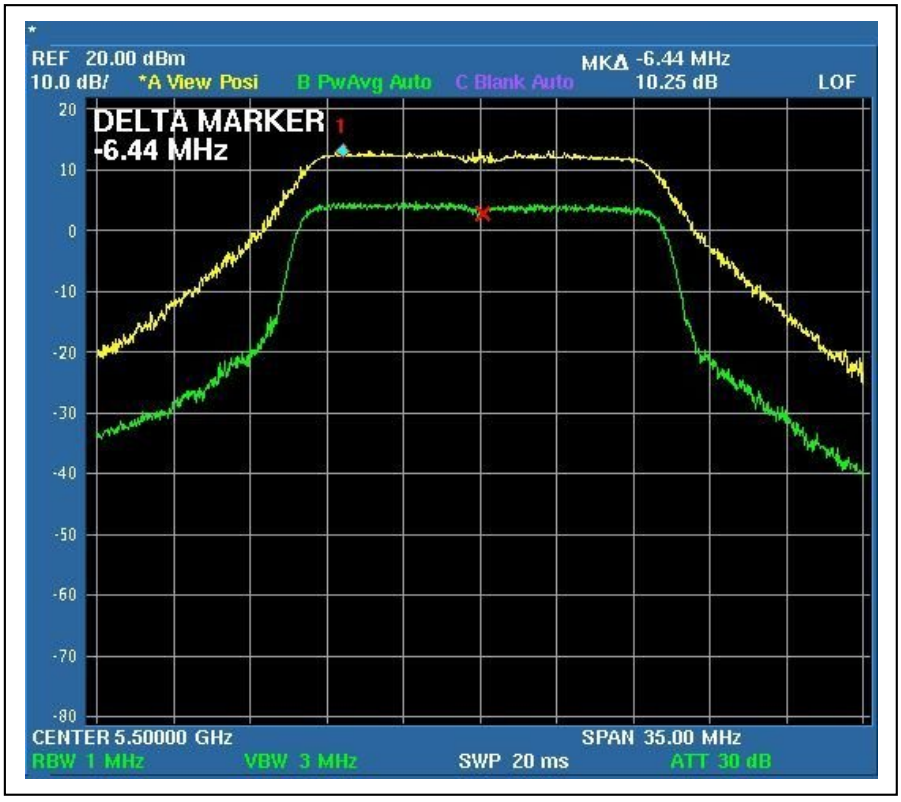
CH1



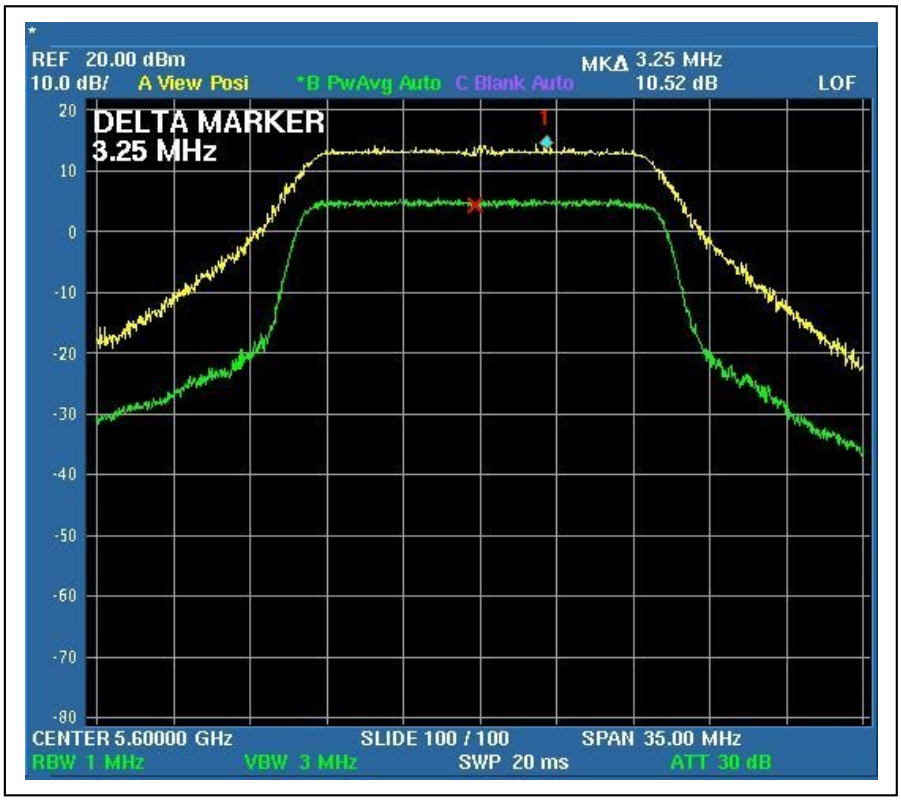
CH4


REF 20.00 dBm
MKΔ 3.01 MHz
10.0 dB/ A View Posi *B PwAvg Auto C Blank Auto 10.40 dB LOF
DELTA MARKER
3.01 MHz
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
CENTER 5.32000 GHz SLIDE 100 / 100 SPAN 35.00 MHz
RBW 1 MHz VBW 3 MHz SWP 20 ms ATT 30 dB

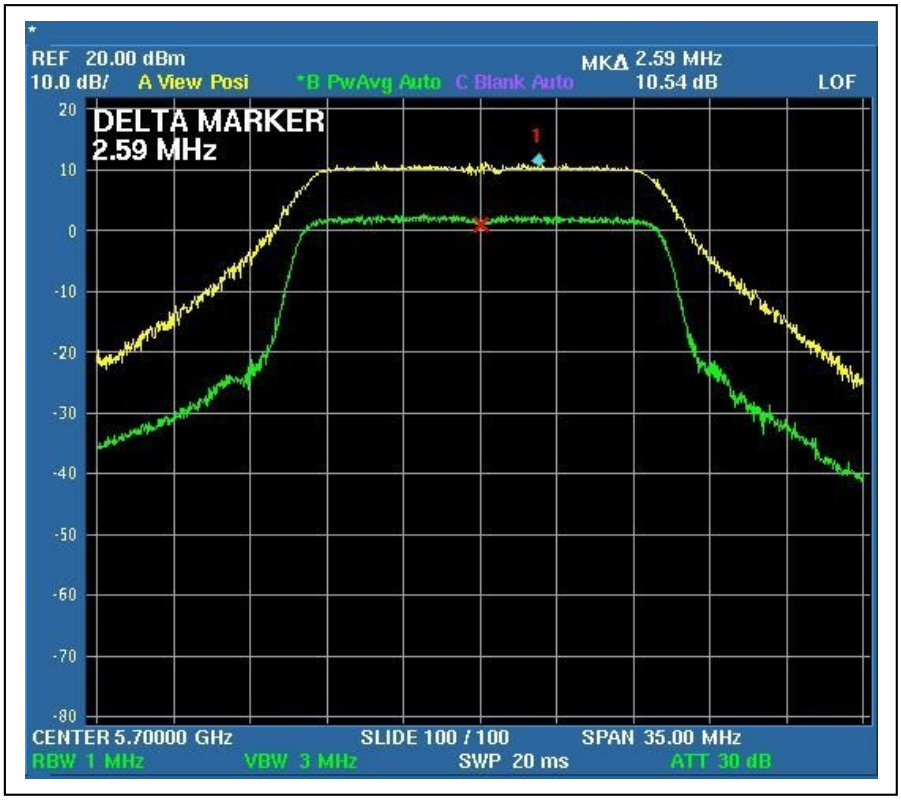
CH5


REF 20.00 dBm
MKΔ -6.44 MHz
10.0 dB/ *A View Posi B PwAvg Auto C Blank Auto 10.25 dB LOF
DELTA MARKER
-6.44 MHz
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
CENTER 5.50000 GHz SPAN 35.00 MHz
RBW 1 MHz VBW 3 MHz SWP 20 ms ATT 30 dB

CH10


REF 20.00 dBm
MKΔ 3.25 MHz
10.0 dB/ A View Posi *B PwAvg Auto C Blank Auto 10.52 dB LOF
DELTA MARKER
3.25 MHz
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
CENTER 5.60000 GHz SLIDE 100 / 100 SPAN 35.00 MHz
RBW 1 MHz VBW 3 MHz SWP 20 ms ATT 30 dB

CH15


REF 20.00 dBm
MKΔ 2.59 MHz
10.0 dB/ A View Posi *B PwAvg Auto C Blank Auto 10.54 dB LOF
DELTA MARKER
2.59 MHz
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
CENTER 5.70000 GHz SLIDE 100 / 100 SPAN 35.00 MHz
RBW 1 MHz VBW 3 MHz SWP 20 ms ATT 30 dB