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
5.725 – 5.825 GHz	13dB

4.4.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
R&S SPECTRUM ANALYZER	FSP40	100036	Nov. 23, 2005

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.

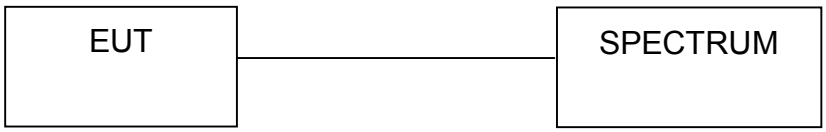
4.4.3 TEST PROCEDURE

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.

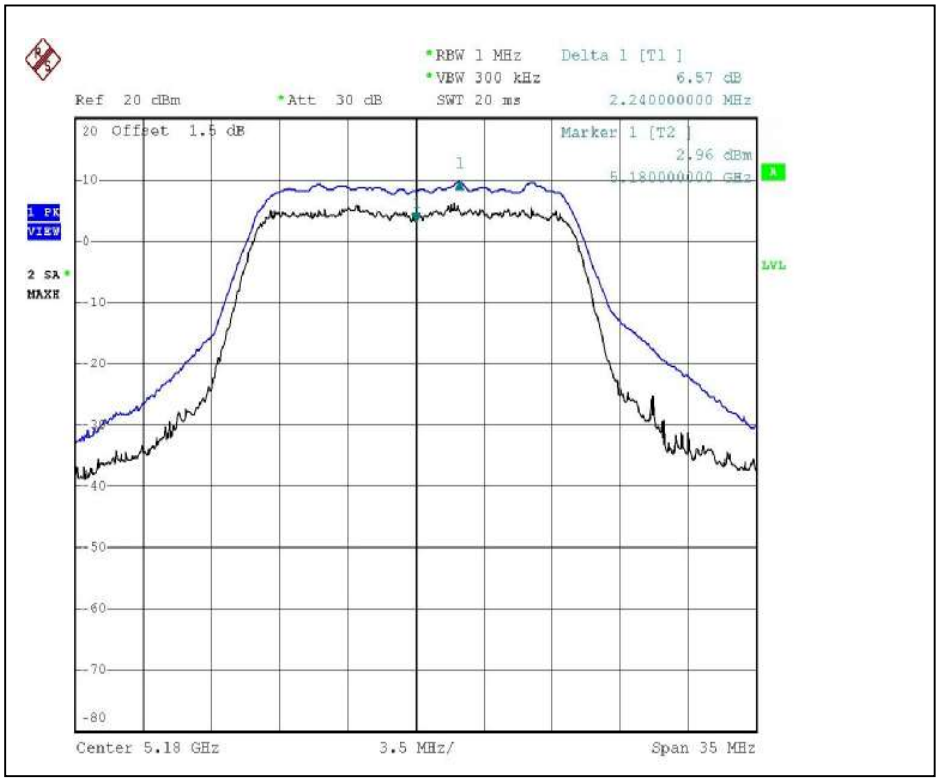
4.4.7 TEST RESULTS (ANTENNA 1)

802.11a OFDM modulation

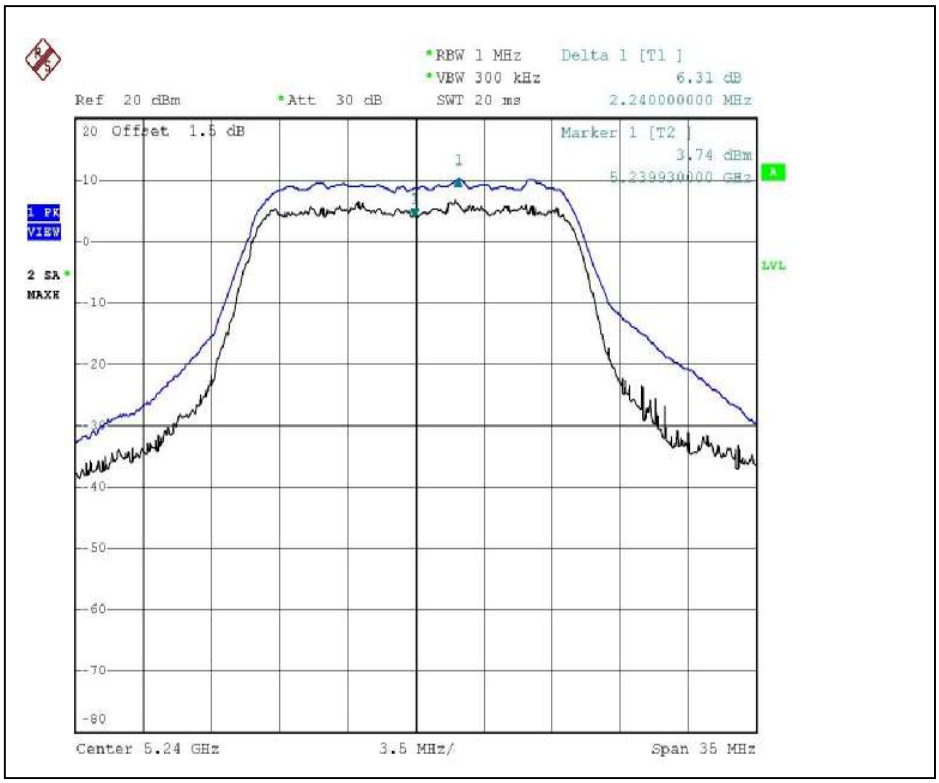
EUT	Symbol WLAN 802.11abg Access Point	**MODEL**	AP-5131
MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	27deg.C, 53%RH, 961hPa
TESTED BY	Rex Huang		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER EXCURSION (dB)	PEAK to AVERAGE EXCURSION LIMIT (dB)	PASS/FAIL
1	5180	6.57	13	PASS
4	5240	6.31	13	PASS
5	5260	6.51	13	PASS
8	5320	6.70	13	PASS
9	5745	6.69	13	PASS
12	5805	5.95	13	PASS

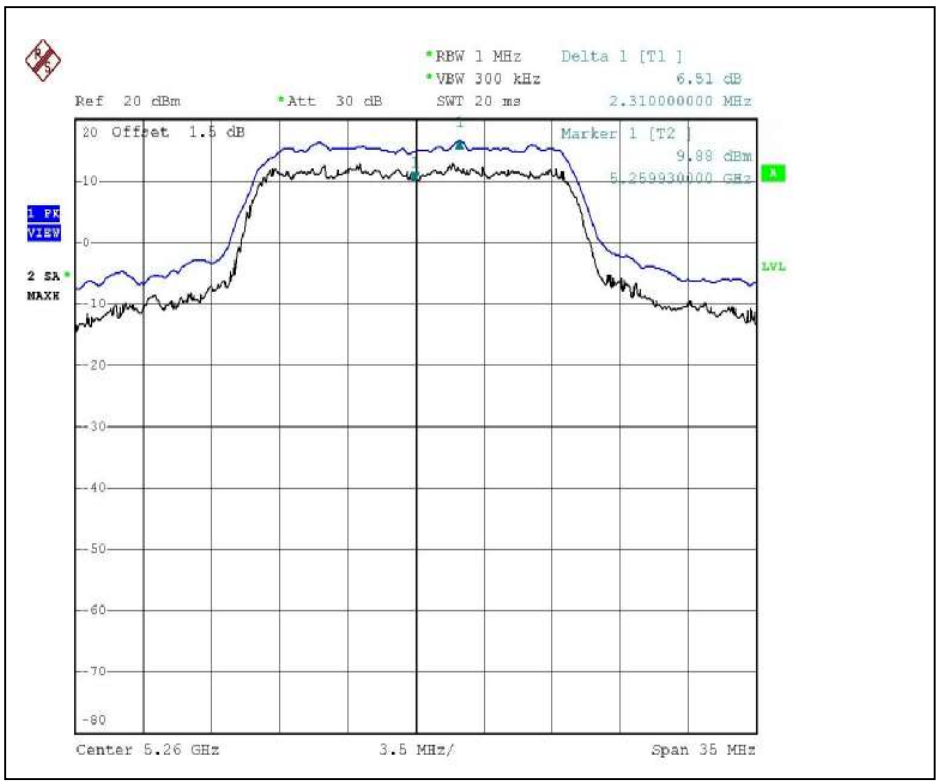
CH1


*RBW 1 MHz
*VBW 300 kHz
Delta 1 [T1]
6.57 dB
2.240000000 MHz
Ref 20 dBm
*Att 30 dB
SWT 20 ms
20 Offset 1.5 dB
Marker 1 [T2]
2.96 dBm
5.180000000 GHz
1 PK VIEW
2 SA * MAXH
LVL
Center 5.18 GHz
3.5 MHz/
Span 35 MHz

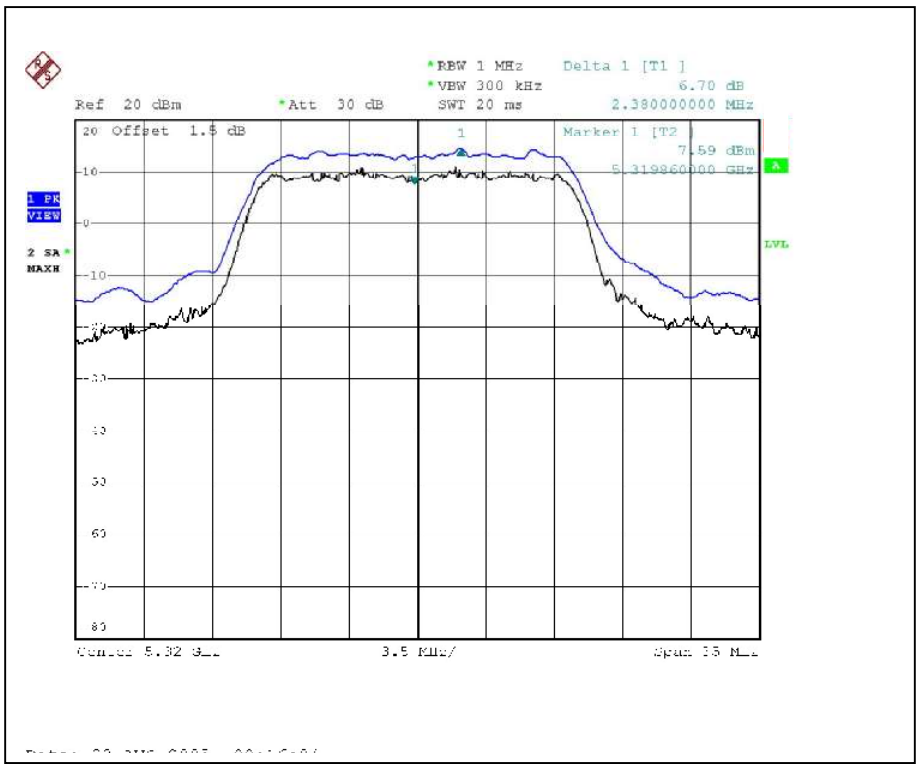
CH4


*RBW 1 MHz
*VBW 300 kHz
Delta 1 [T1]
6.31 dB
2.240000000 MHz
Ref 20 dBm
*Att 30 dB
SWT 20 ms
20 Offset 1.5 dB
Marker 1 [T2]
3.74 dBm
5.239930000 GHz
1 PK VIEW
2 SA * MAXH
LVL
Center 5.24 GHz
3.5 MHz/
Span 35 MHz

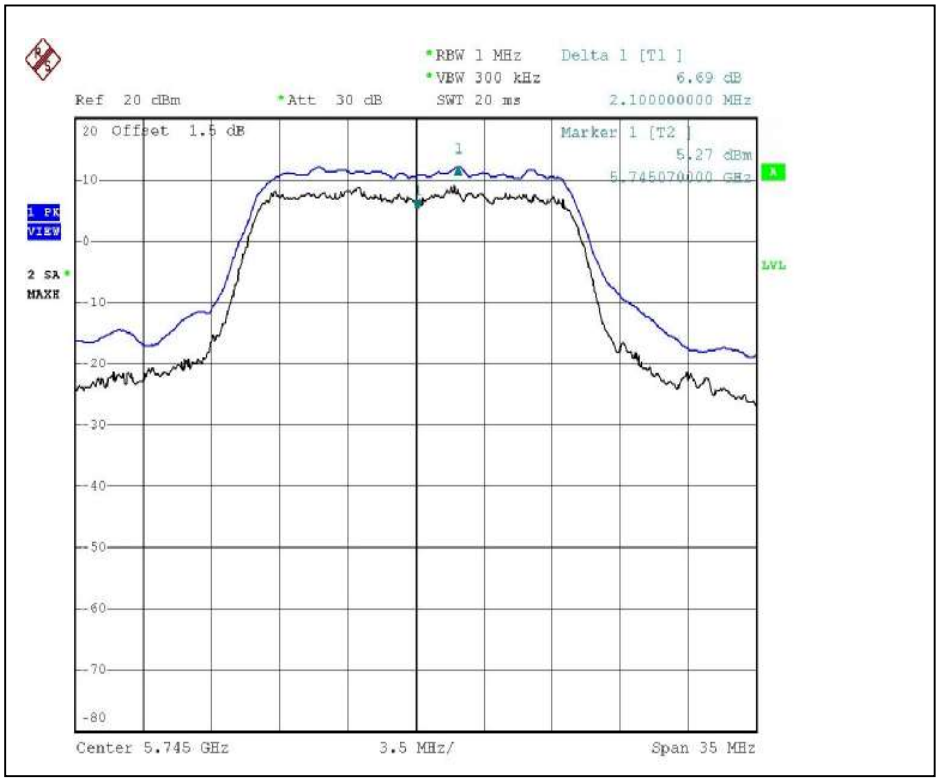
CH5


*RBW 1 MHz
Delta 1 [T1]
*VBW 300 kHz
6.51 dB
Ref 20 dBm
*Att 30 dB
SWT 20 ms
2.310000000 MHz
20 Offset 1.5 dB
Marker 1 [T2]
9.88 dBm
5.259930000 GHz
1 PK
VIEW
2 SA
MAXH
LVL
Center 5.26 GHz
3.5 MHz/
Span 35 MHz

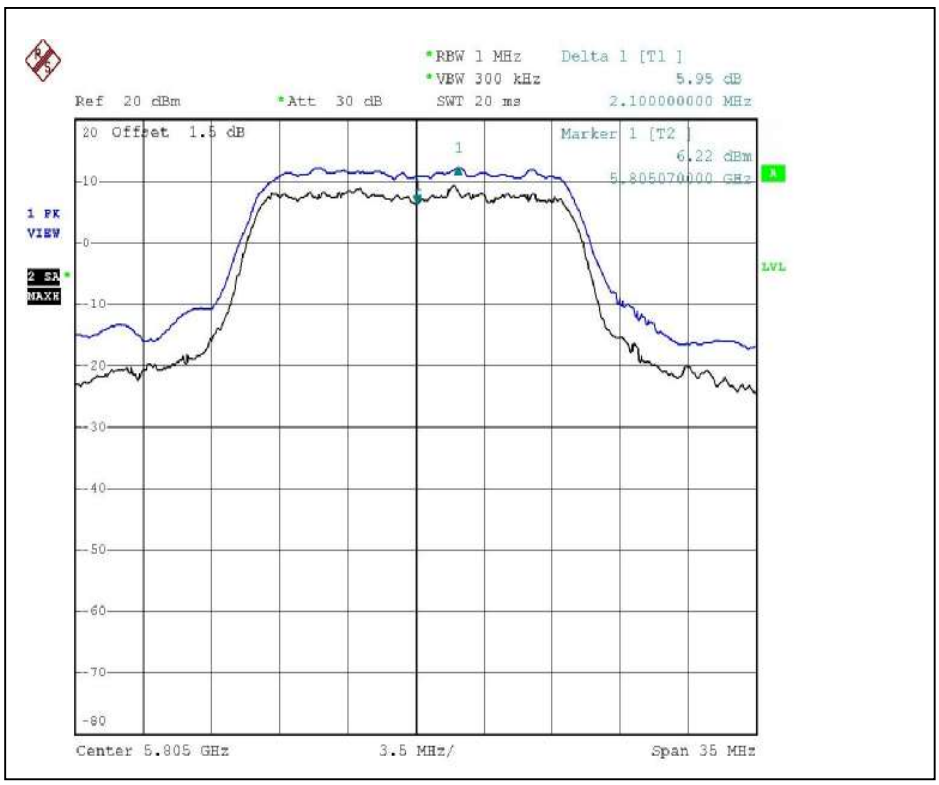
CH8


*RBW 1 MHz
Delta 1 [T1]
*VBW 300 kHz
6.70 dB
Ref 20 dBm
*Att 30 dB
SWT 20 ms
2.380000000 MHz
20 Offset 1.5 dB
Marker 1 [T2
7.59 dBm
1 PK
VIEW
2 SA
MAXH
LVL
3.5 MHz/

CH9


*RBW 1 MHz
*VBW 300 kHz
Delta 1 [T1]
6.69 dB
2.100000000 MHz
Ref 20 dBm
*Att 30 dB
SWT 20 ms
20 Offset 1.5 dB
Marker 1 [T2]
5.27 dBm
5.745070000 GHz
1 PK VIEW
2 SA MAXH
LVL
Center 5.745 GHz
3.5 MHz/
Span 35 MHz

CH12


*RBW 1 MHz
*VBW 300 kHz
Delta 1 [T1]
5.95 dB
2.100000000 MHz
Ref 20 dBm
*Att 30 dB
SWT 20 ms
20 Offset 1.5 dB
Marker 1 [T2]
6.22 dBm
5.805070000 GHz
1 PK VIEW
2 SA MAXH
LVL
Center 5.805 GHz
3.5 MHz/
Span 35 MHz

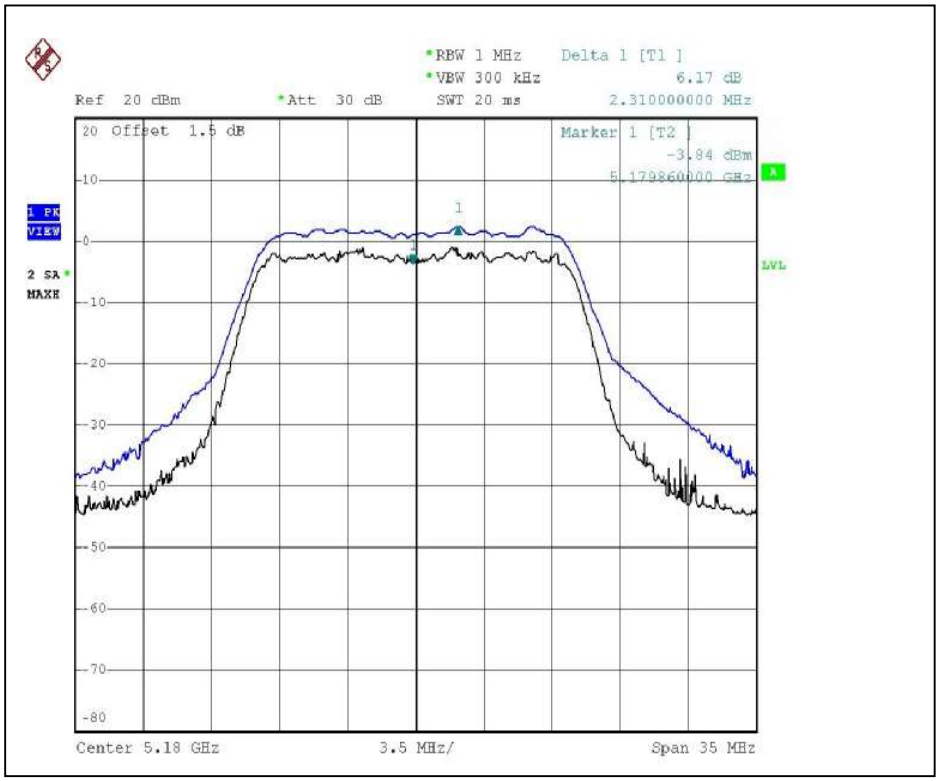
4.4.8 TEST RESULTS (ANTENNA 2)

802.11a OFDM modulation

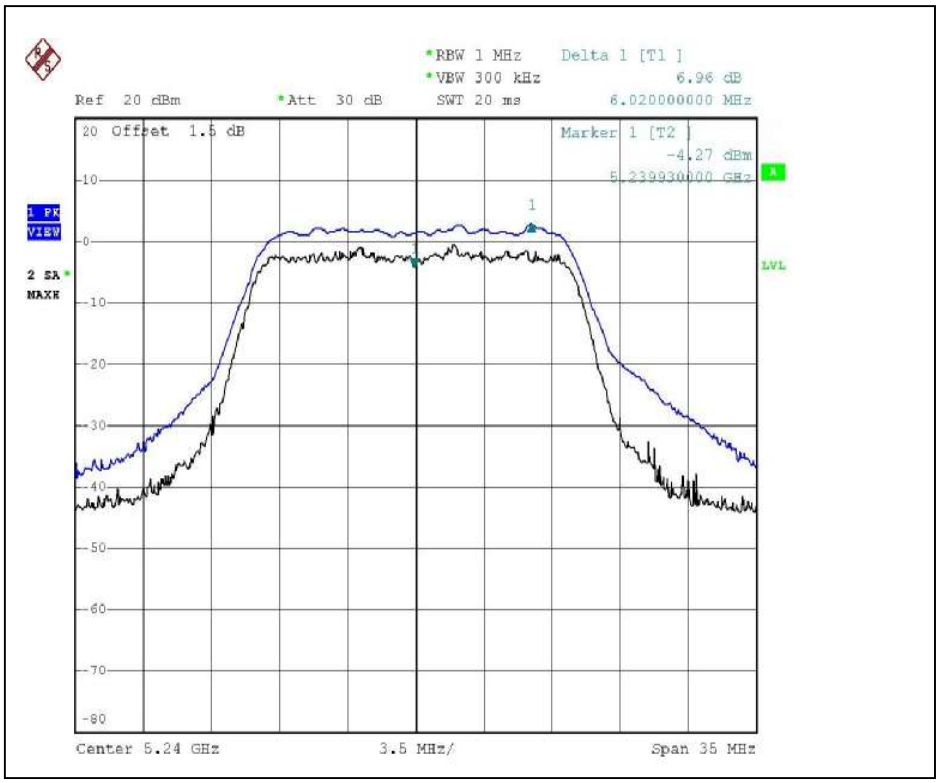
EUT	Symbol WLAN 802.11abg Access Point	**MODEL**	AP-5131
MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	27deg.C, 53%RH, 961hPa
TESTED BY	Rex Huang		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER EXCURSION (dB)	PEAK to AVERAGE EXCURSION LIMIT (dB)	PASS/FAIL
1	5180	6.17	13	PASS
4	5240	6.96	13	PASS
5	5260	6.27	13	PASS
8	5320	6.63	13	PASS
9	5745	6.05	13	PASS
12	5805	6.51	13	PASS

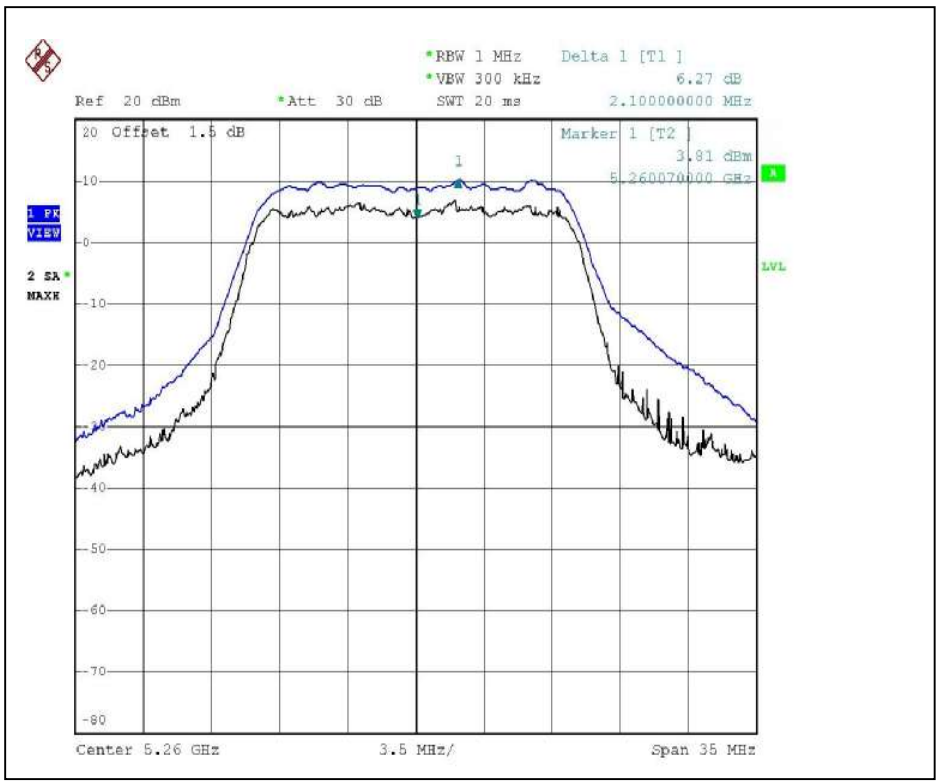
CH1


*RBW 1 MHz
*VBW 300 kHz
Delta 1 [T1]
6.17 dB
2.310000000 MHz
Ref 20 dBm
*Att 30 dB
SWT 20 ms
20 Offset 1.5 dB
Marker 1 [T2]
-3.84 dBm
5.179860000 GHz
1 PK VIEW
2 SA MAXH
LVL
Center 5.18 GHz
3.5 MHz/
Span 35 MHz

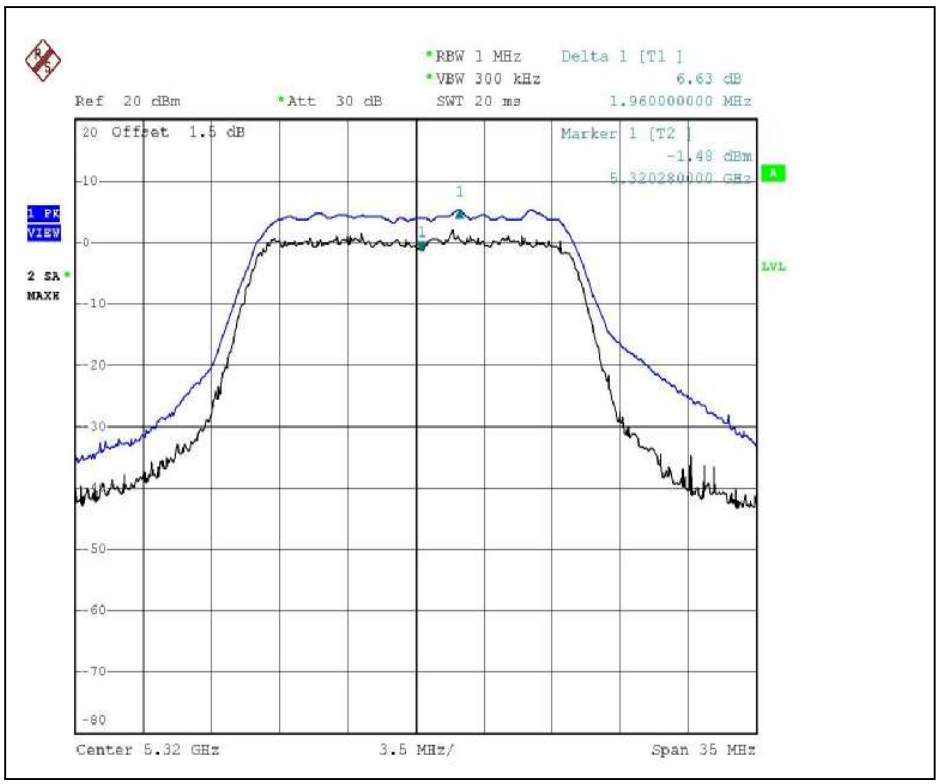
CH4


*RBW 1 MHz
*VBW 300 kHz
Delta 1 [T1]
6.96 dB
6.020000000 MHz
Ref 20 dBm
*Att 30 dB
SWT 20 ms
20 Offset 1.5 dB
Marker 1 [T2]
-4.27 dBm
5.239930000 GHz
1 PK VIEW
2 SA MAXH
LVL
Center 5.24 GHz
3.5 MHz/
Span 35 MHz

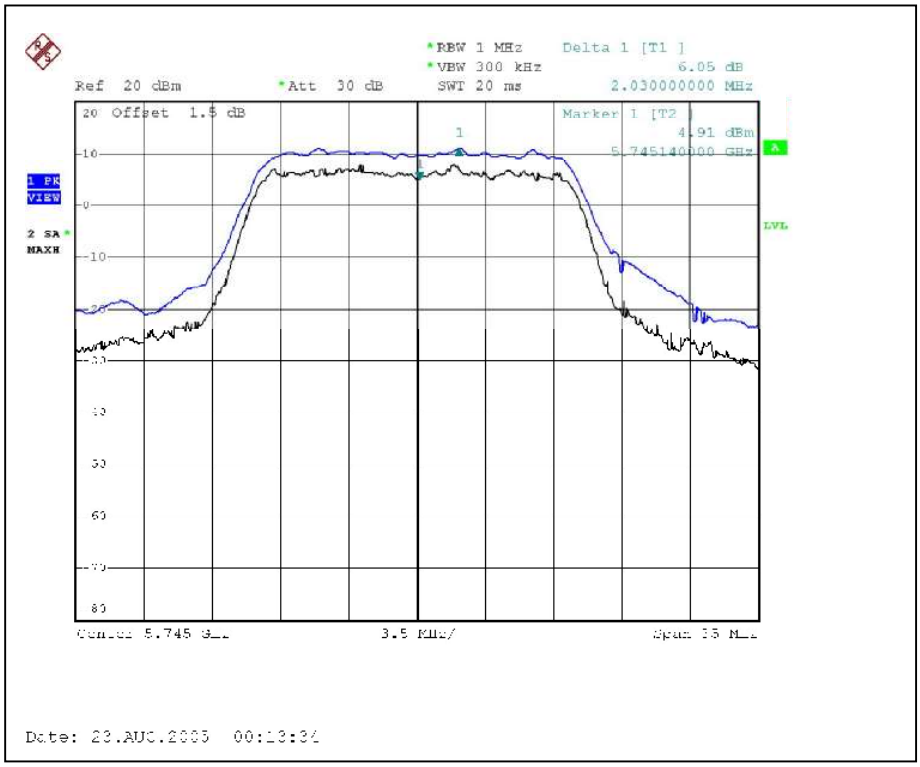
CH5


*RBW 1 MHz
*VBW 300 kHz
Delta 1 [T1]
6.27 dB
Ref 20 dBm
*Att 30 dB
SWT 20 ms
2.100000000 MHz
20 Offset 1.5 dB
Marker 1 [T2]
3.81 dBm
5.260070000 GHz
1 PK
VIEW
2 SA
MAXH
LVL
Center 5.26 GHz
3.5 MHz/
Span 35 MHz

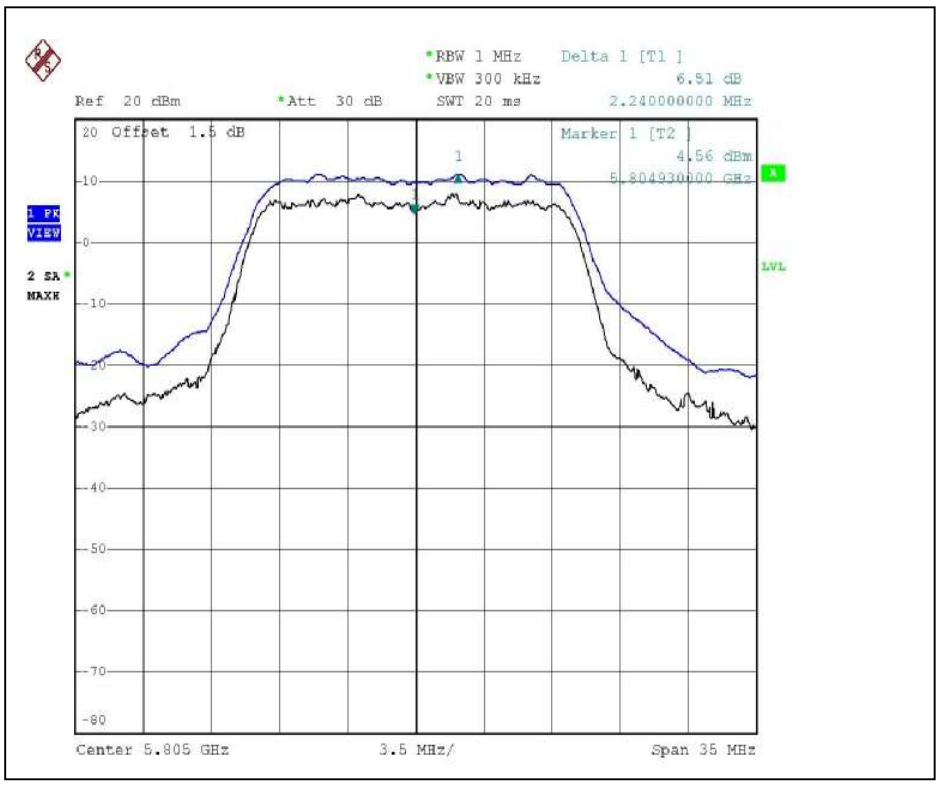
CH8


*RBW 1 MHz
*VBW 300 kHz
Delta 1 [T1]
6.63 dB
Ref 20 dBm
*Att 30 dB
SWT 20 ms
1.960000000 MHz
20 Offset 1.5 dB
Marker 1 [T2]
-1.48 dBm
5.320280000 GHz
1 PK
VIEW
2 SA
MAXH
LVL
Center 5.32 GHz
3.5 MHz/
Span 35 MHz

CH9


*RBW 1 MHz
Delta 1 [T1]
*VBW 300 kHz
6.05 dB
Ref 20 dBm
*Att 30 dB
SWT 20 ms
2.030000000 MHz
20 Offset 1.5 dB
Marker 1 [T2]
4.91 dBm
5.745140000 GHz
1 PK
VIEW
2 SA*
MAXH
LVL
3.5 MHz/
Date: 23.AUG.2005 00:13:34

CH12


*RBW 1 MHz
Delta 1 [T1]
*VBW 300 kHz
6.51 dB
Ref 20 dBm
*Att 30 dB
SWT 20 ms
2.240000000 MHz
20 Offset 1.5 dB
Marker 1 [T2]
4.56 dBm
5.804930000 GHz
1 PK
VIEW
2 SA*
MAXH
LVL
10
0
-10
-20
-30
-40
-50
-60
-70
-80
Center 5.805 GHz
3.5 MHz/
Span 35 MHz

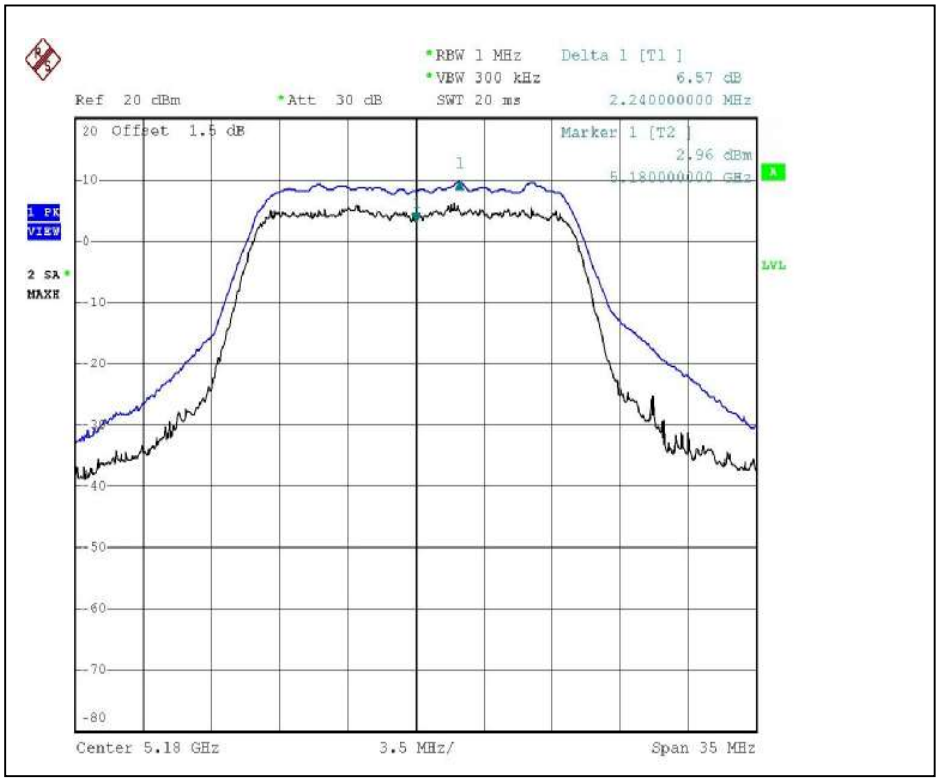
4.4.9 TEST RESULTS (ANTENNA 3)

802.11a OFDM modulation

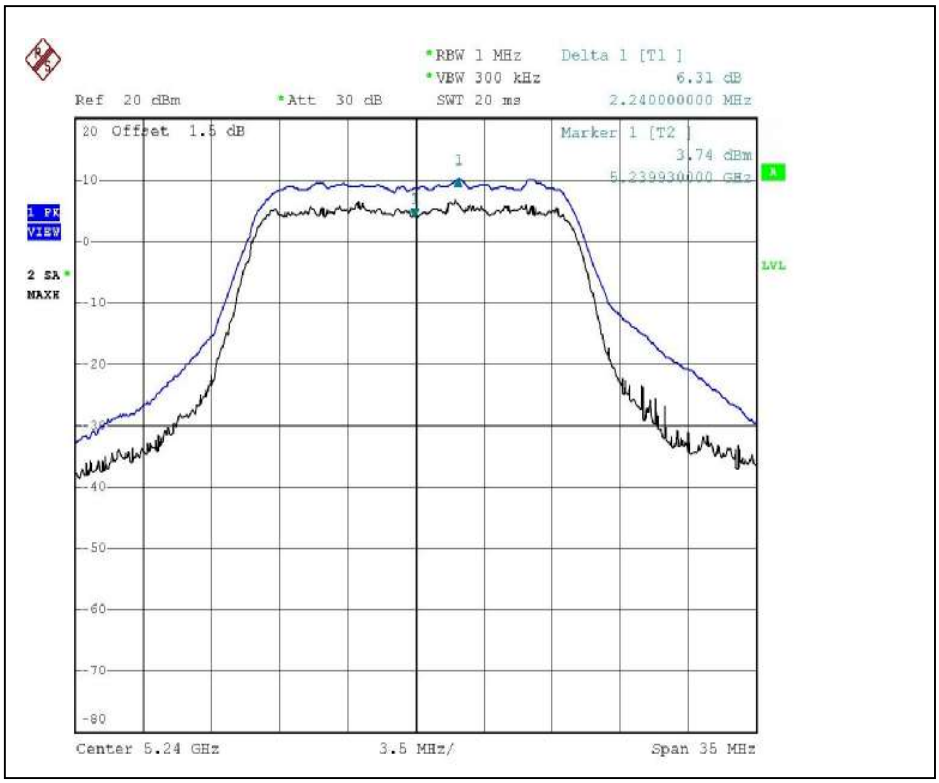
EUT	Symbol WLAN 802.11abg Access Point	**MODEL**	AP-5131
MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	27deg.C, 53%RH, 961hPa
TESTED BY	Rex Huang		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER EXCURSION (dB)	PEAK to AVERAGE EXCURSION LIMIT (dB)	PASS/FAIL
1	5180	6.57	13	PASS
4	5240	6.31	13	PASS
5	5260	6.51	13	PASS
8	5320	6.70	13	PASS
9	5745	6.69	13	PASS
12	5805	5.95	13	PASS

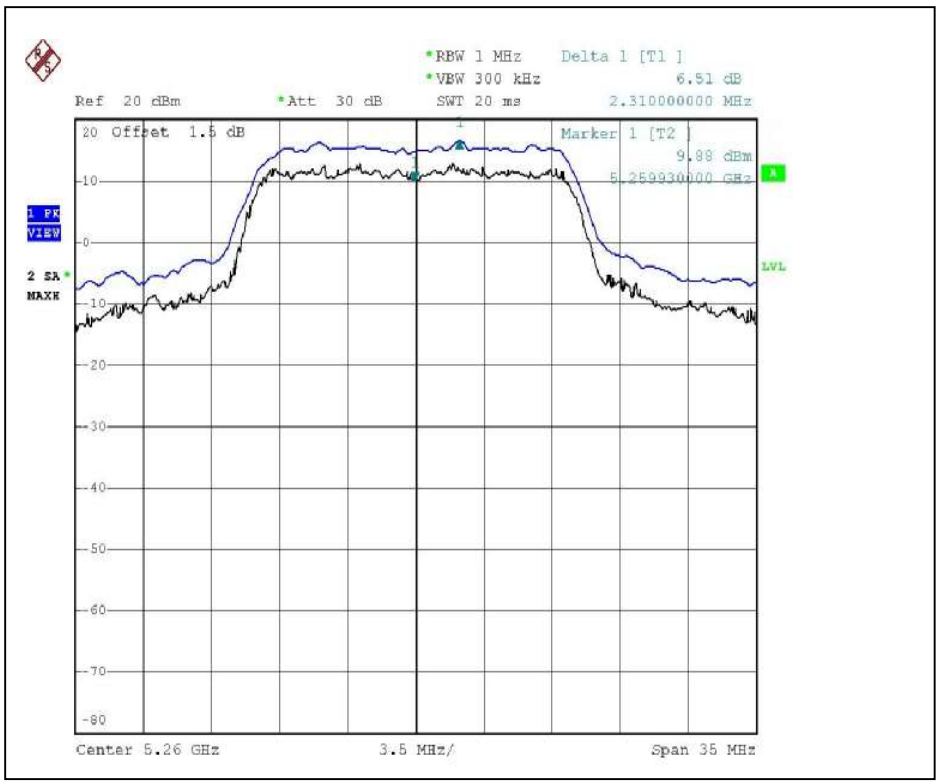
CH1


*RBW 1 MHz
*VBW 300 kHz
Delta 1 [T1]
6.57 dB
2.240000000 MHz
Ref 20 dBm
*Att 30 dB
SWT 20 ms
20 Offset 1.5 dB
Marker 1 [T2]
2.96 dBm
5.180000000 GHz
1 PK VIEW
2 SA * MAXH
LVL
Center 5.18 GHz
3.5 MHz/
Span 35 MHz

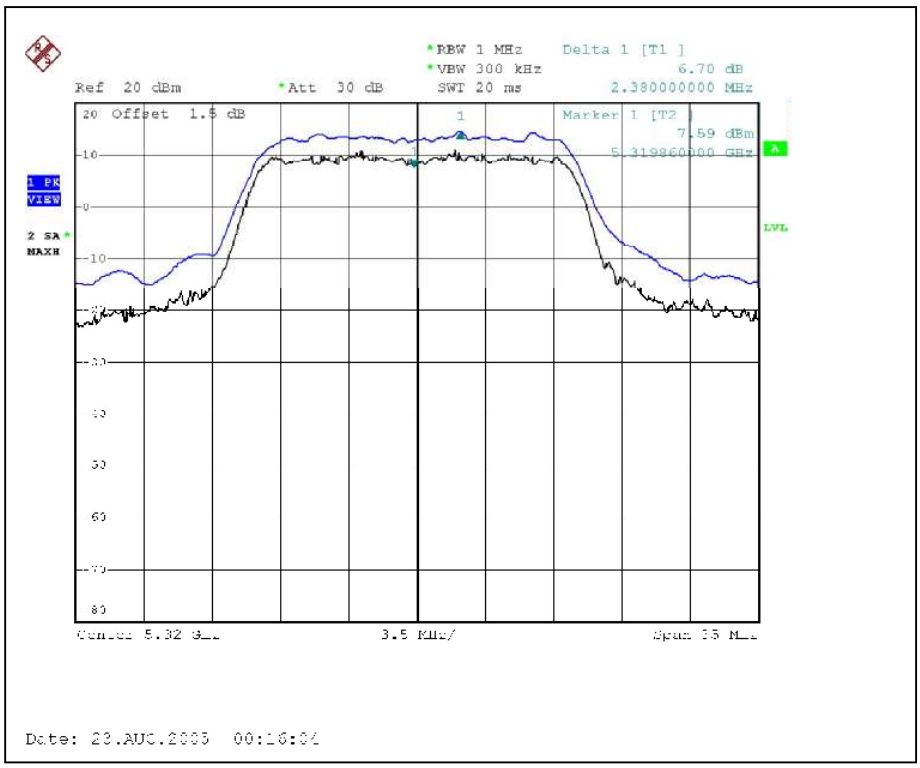
CH4


*RBW 1 MHz
*VBW 300 kHz
Delta 1 [T1]
6.31 dB
2.240000000 MHz
Ref 20 dBm
*Att 30 dB
SWT 20 ms
20 Offset 1.5 dB
Marker 1 [T2]
3.74 dBm
5.239930000 GHz
1 PK VIEW
2 SA * MAXH
LVL
Center 5.24 GHz
3.5 MHz/
Span 35 MHz

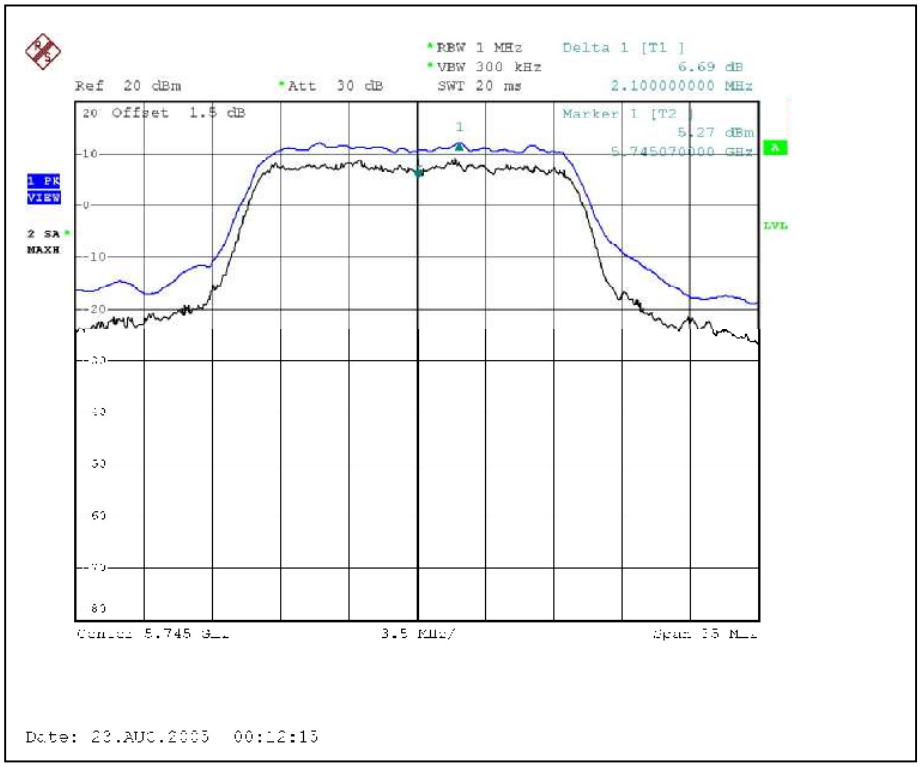
CH5


*RBW 1 MHz
Delta 1 [T1]
*VBW 300 kHz
6.51 dB
Ref 20 dBm
*Att 30 dB
SWT 20 ms
2.310000000 MHz
20 Offset 1.5 dB
Marker 1 [T2]
9.88 dBm
5.259930000 GHz
1 PK
VIEW
2 SA
MAXH
LVL
Center 5.26 GHz
3.5 MHz/
Span 35 MHz

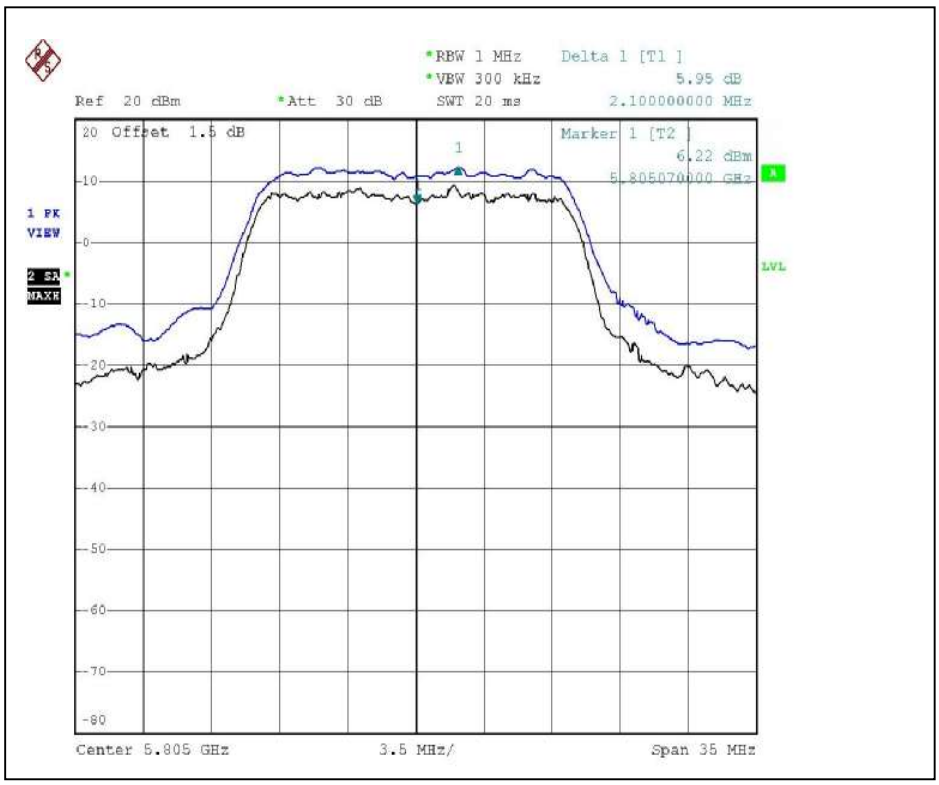
CH8


*RBW 1 MHz
Delta 1 [T1]
*VBW 300 kHz
6.70 dB
Ref 20 dBm
*Att 30 dB
SWT 20 ms
2.380000000 MHz
20 Offset 1.5 dB
Marker 1 [T2
7.59 dBm
1 PK
VIEW
2 SA
MAXH
LVL
3.5 MHz/
Date: 23.AUG.2005 00:16:04

CH9


*RBW 1 MHz
Delta 1 [T1]
*VBW 300 kHz
6.69 dB
Ref 20 dBm
*Att 30 dB
SWT 20 ms
2.100000000 MHz
20 Offset 1.5 dB
Marker 1 [T2
5.27 dBm
5.745070000 GHz
1 PK
VIEW
2 SA
MAXH
LVL
3.5 MHz/
Date: 23.AUG.2005 00:12:15

CH12


*RBW 1 MHz
Delta 1 [T1]
*VBW 300 kHz
5.95 dB
Ref 20 dBm
*Att 30 dB
SWT 20 ms
2.100000000 MHz
20 Offset 1.5 dB
Marker 1 [T2]
6.22 dBm
5.805070000 GHz
1 PK
VIEW
2 SA
MAXH
LVL
Center 5.805 GHz
3.5 MHz/
Span 35 MHz

4.5 PEAK POWER SPECTRAL DENSITY MEASUREMENT

4.5.1 LIMITS OF PEAK POWER SPECTRAL DENSITY MEASUREMENT

Frequency Band	Limit
5.15 ~ 5.25GHz	4dBm
5.25 ~ 5.35GHz	11dBm
5.725 ~ 5.825GHz	17dBm

4.5.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
R&S SPECTRUM ANALYZER	FSP40	100036	Nov. 23, 2005

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.

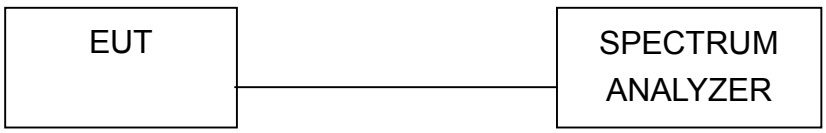
4.5.3 TEST PROCEDURES

1. The transmitter output was connected to the spectrum analyzer.
2. 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 4.3.6

4.5.7 TEST RESULTS (ANTENNA 1)

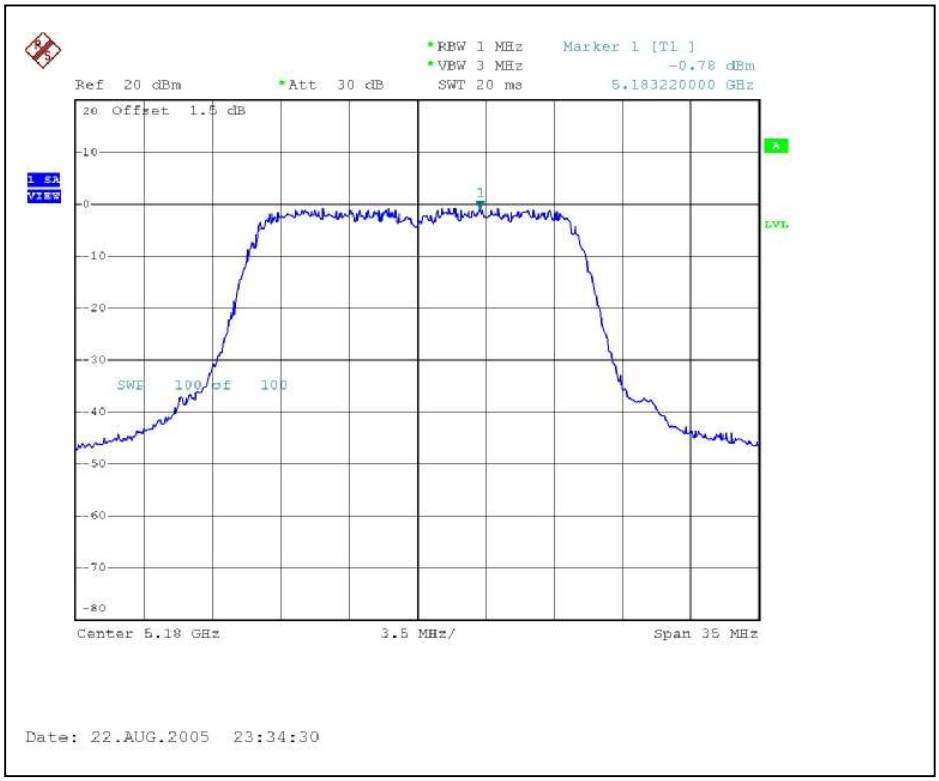
802.11a OFDM modulation

EUT	Symbol WLAN 802.11abg Access Point	**MODEL**	AP-5131
MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	27deg.C, 53%RH, 961hPa
TESTED BY	Rex Huang		

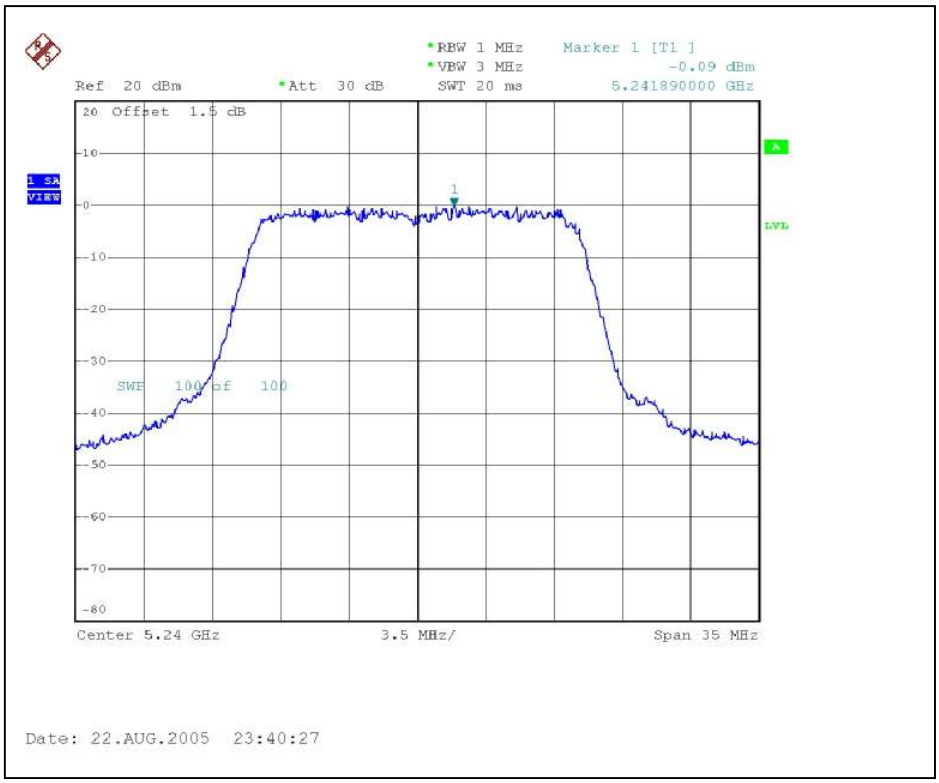
Antenna 1 (Gain : 4.0 dBi)

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 1MHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	5180	-0.78	4	PASS
4	5240	-0.09	4	PASS
5	5260	6.21	11	PASS
8	5320	4.80	11	PASS
9	5745	2.17	17	PASS
12	5805	2.46	17	PASS

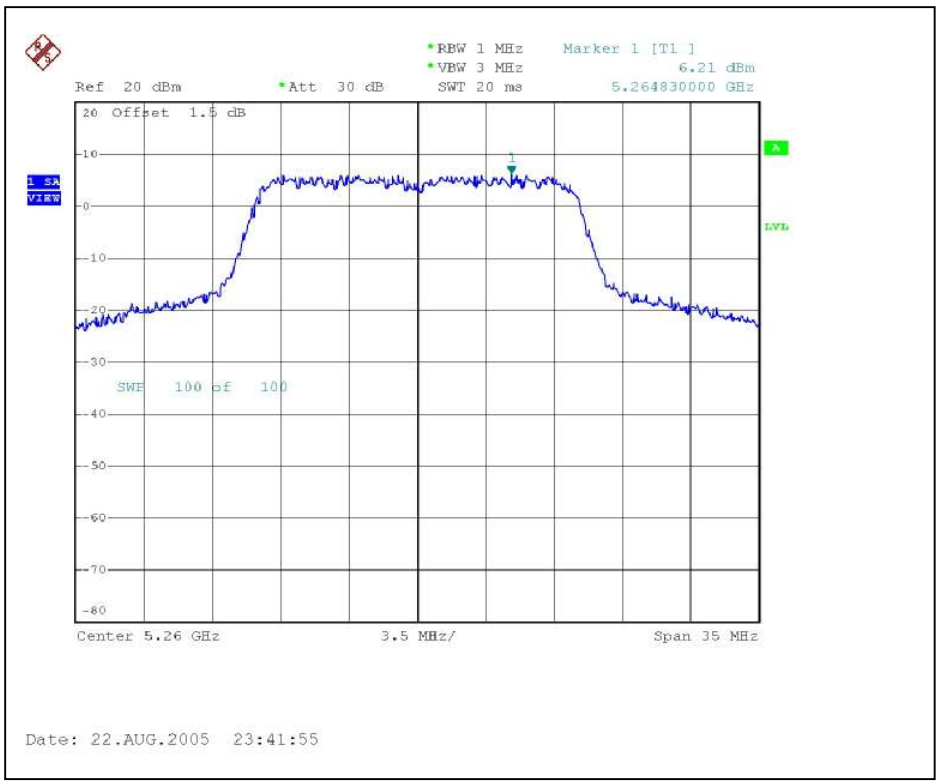
CH1


RBW 1 MHz
VBW 3 MHz
Marker 1 [T1]
-0.78 dBm
5.183220000 GHz
Ref 20 dBm
Att 30 dB
SWT 20 ms
20 Offset 1.5 dB
1 SA VIEW
A
LVL
SWP 100 of 100
Center 5.18 GHz
3.5 MHz/
Span 35 MHz
Date: 22.AUG.2005 23:34:30

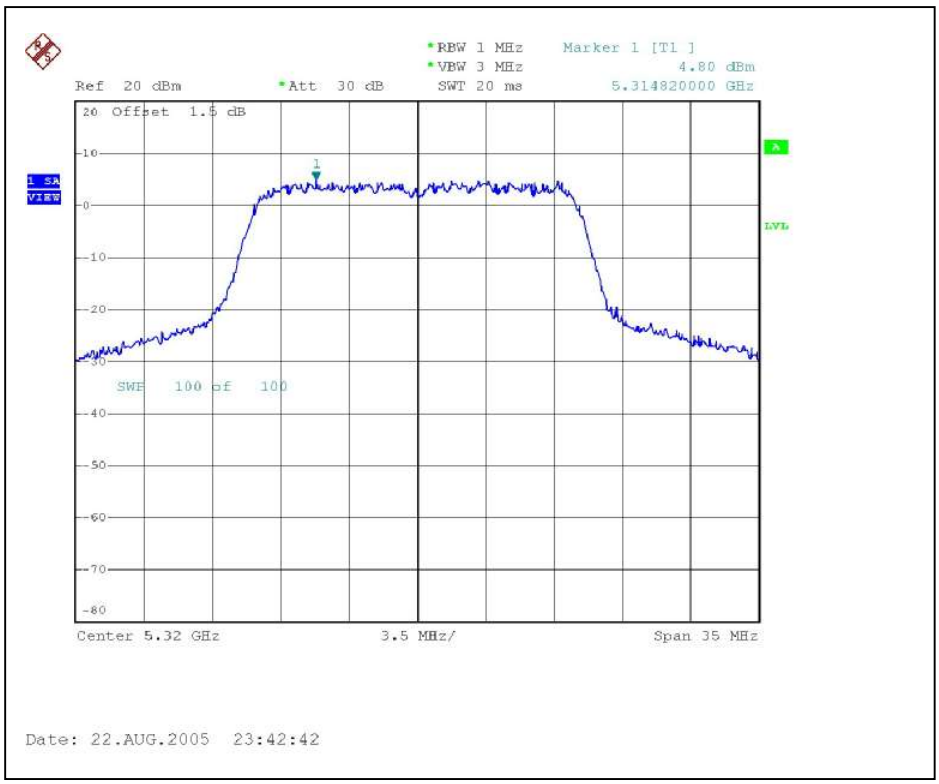
CH4


RBW 1 MHz
VBW 3 MHz
Marker 1 [T1]
-0.09 dBm
5.241890000 GHz
Ref 20 dBm
Att 30 dB
SWT 20 ms
20 Offset 1.5 dB
1 SA VIEW
A
LVL
SWP 100 of 100
Center 5.24 GHz
3.5 MHz/
Span 35 MHz
Date: 22.AUG.2005 23:40:27

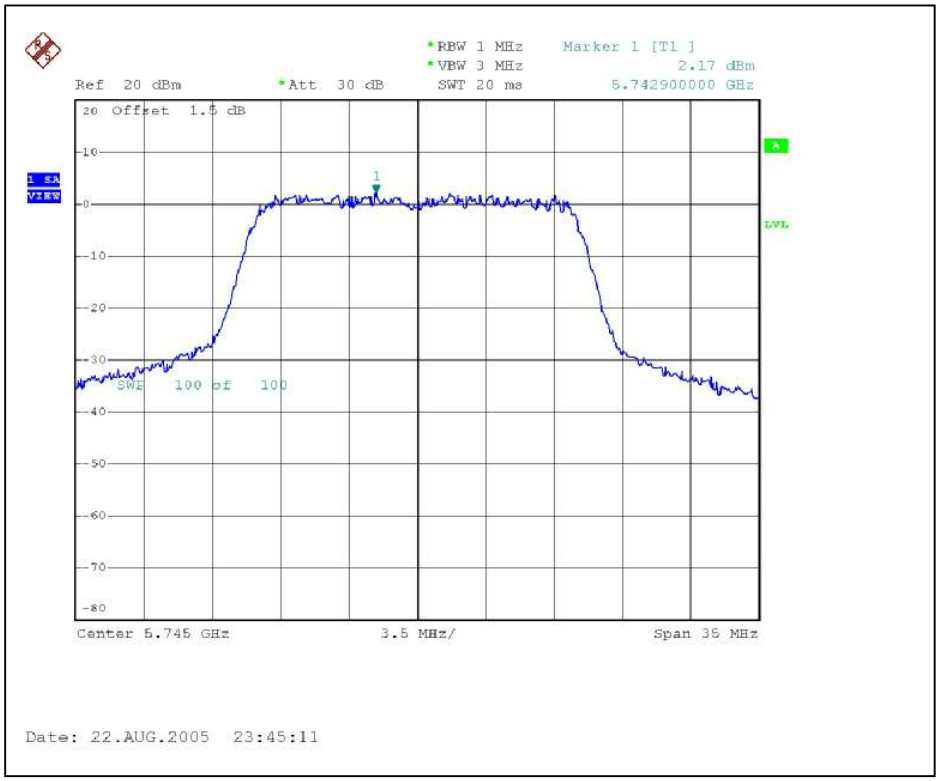
CH5


RBW 1 MHz
VBW 3 MHz
Marker 1 [T1]
6.21 dBm
5.264830000 GHz
Ref 20 dBm
Att 30 dB
SWT 20 ms
20 Offset 1.5 dB
SWP 100 of 100
Center 5.26 GHz
3.5 MHz/
Span 35 MHz
Date: 22.AUG.2005 23:41:55

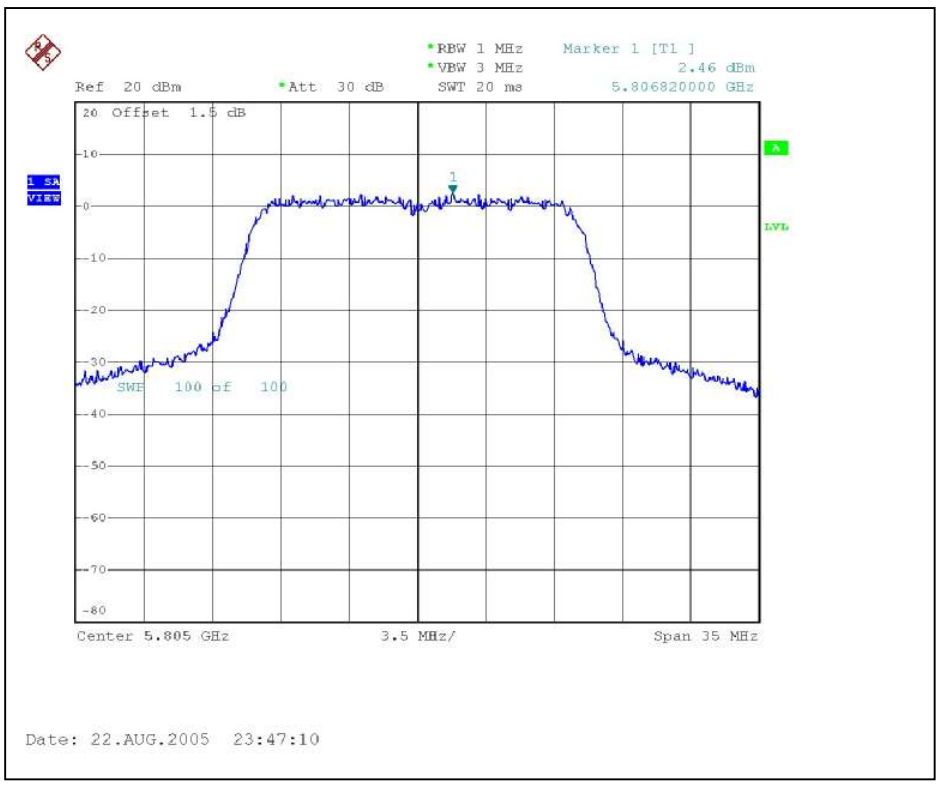
CH8


RBW 1 MHz
VBW 3 MHz
Marker 1 [T1]
4.80 dBm
5.314820000 GHz
Ref 20 dBm
Att 30 dB
SWT 20 ms
20 Offset 1.5 dB
SWP 100 of 100
Center 5.32 GHz
3.5 MHz/
Span 35 MHz
Date: 22.AUG.2005 23:42:42

CH9


RBW 1 MHz
VBW 3 MHz
Marker 1 [T1]
2.17 dBm
5.742900000 GHz
Ref 20 dBm
Att 30 dB
SWT 20 ms
20 Offset 1.5 dB
SWP 100 of 100
Center 5.745 GHz
3.5 MHz/
Span 35 MHz
Date: 22.AUG.2005 23:45:11

CH12


RBW 1 MHz
VBW 3 MHz
Marker 1 [T1]
2.46 dBm
5.806820000 GHz
Ref 20 dBm
Att 30 dB
SWT 20 ms
20 Offset 1.5 dB
SWP 100 of 100
Center 5.805 GHz
3.5 MHz/
Span 35 MHz
Date: 22.AUG.2005 23:47:10

4.5.8 TEST RESULTS (ANTENNA 2)

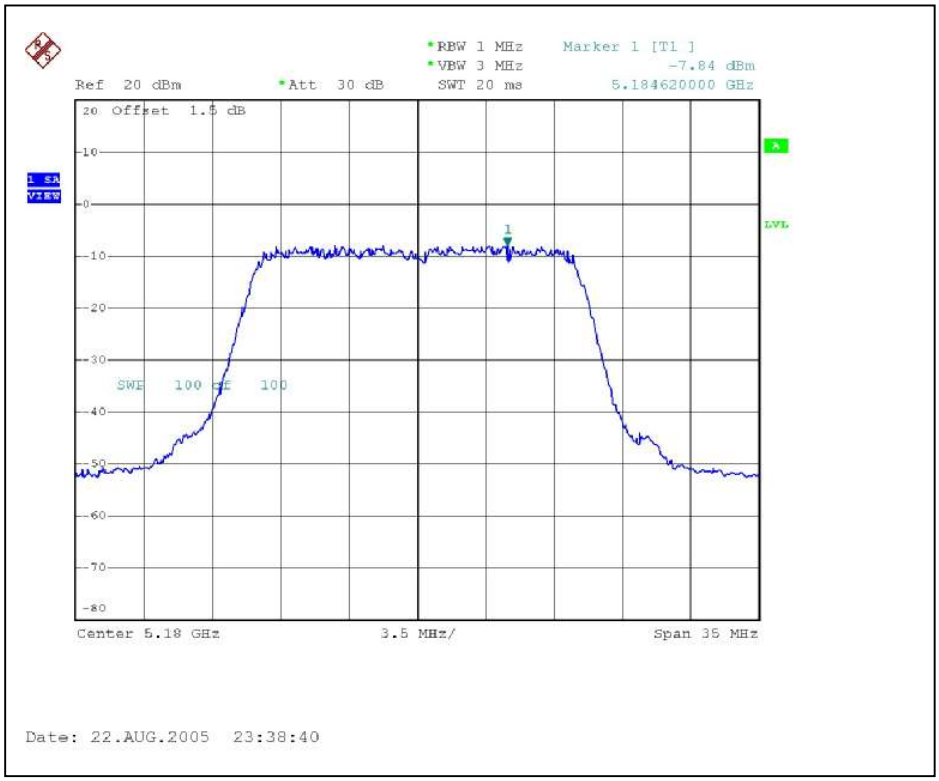
802.11a OFDM modulation

EUT	Symbol WLAN 802.11abg Access Point	**MODEL**	AP-5131
MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	27deg.C, 53%RH, 961hPa
TESTED BY	Rex Huang		

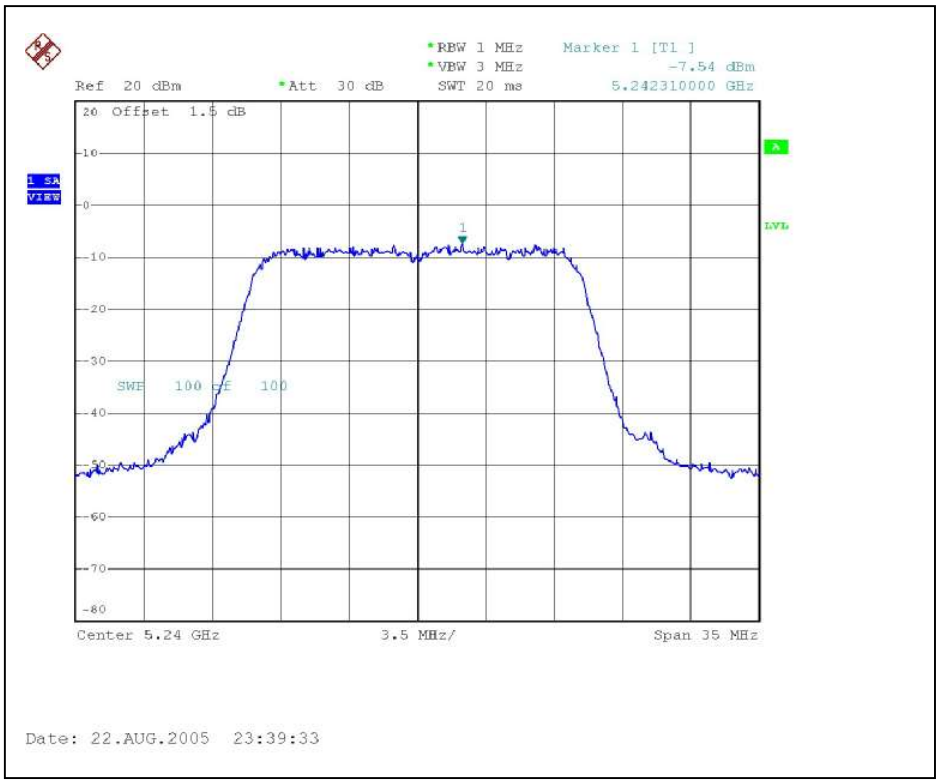
Antenna 2 (Gain : 14.2 dBi) +Cable loss (1.2dB)

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 1MHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	5180	-7.84	-3	PASS
4	5240	-7.54	-3	PASS
5	5260	0.03	4	PASS
8	5320	-5.10	4	PASS
9	5745	1.02	10	PASS
12	5805	1.28	10	PASS

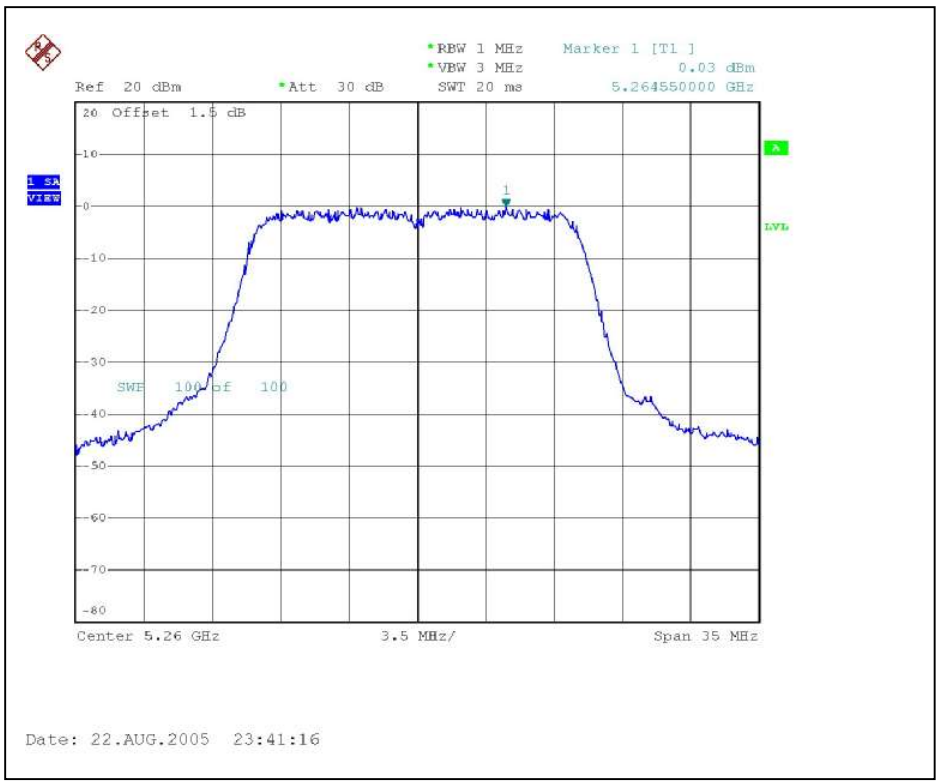
CH1


RBW 1 MHz
VBW 3 MHz
Marker 1 [T1]
-7.84 dBm
5.184620000 GHz
Ref 20 dBm
Att 30 dB
SWT 20 ms
20 Offset 1.5 dB
1 SA
VIEW
A
LVL
SWP 100 GF 100
Center 5.18 GHz
3.5 MHz/
Span 35 MHz
Date: 22.AUG.2005 23:38:40

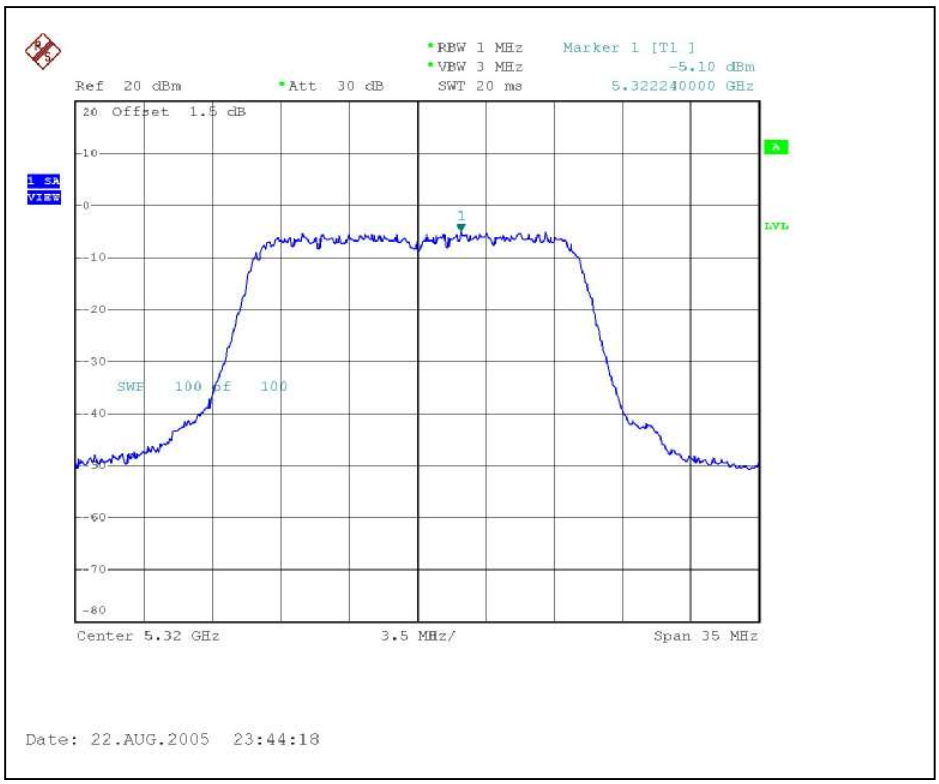
CH4


RBW 1 MHz
VBW 3 MHz
Marker 1 [T1]
-7.54 dBm
5.242310000 GHz
Ref 20 dBm
Att 30 dB
SWT 20 ms
20 Offset 1.5 dB
1 SA
VIEW
A
LVL
SWP 100 GF 100
Center 5.24 GHz
3.5 MHz/
Span 35 MHz
Date: 22.AUG.2005 23:39:33

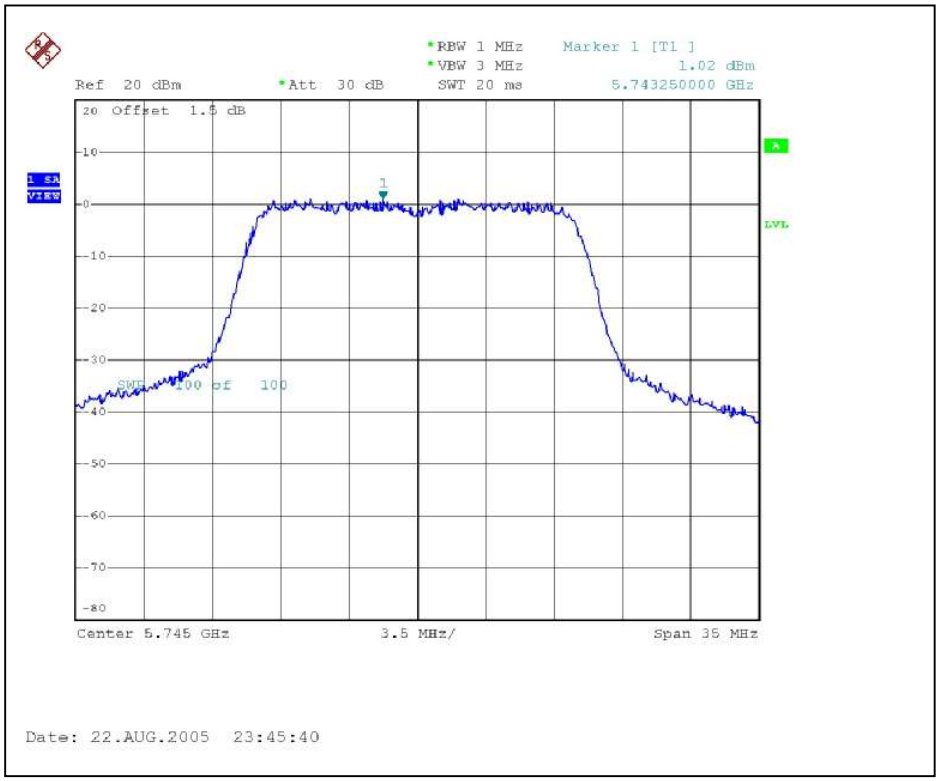
CH5


RBW 1 MHz
VBW 3 MHz
Marker 1 [T1]
0.03 dBm
5.264550000 GHz
Ref 20 dBm
Att 30 dB
SWT 20 ms
20 Offset 1.5 dB
SWP 100 Gf 100
Center 5.26 GHz
3.5 MHz/
Span 35 MHz
Date: 22.AUG.2005 23:41:16

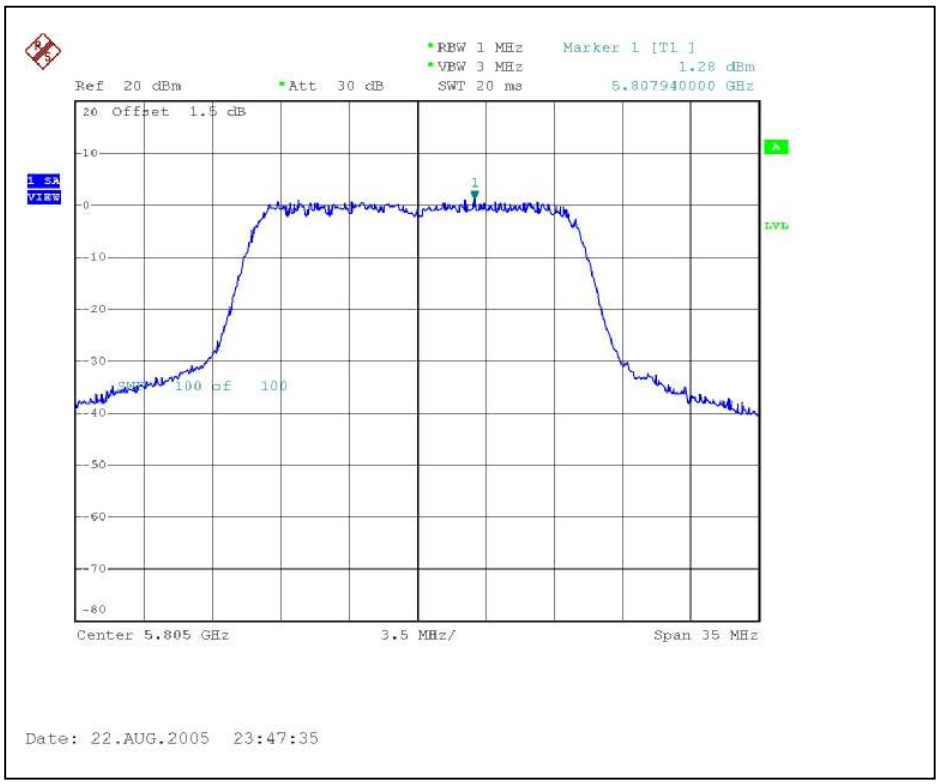
CH8


RBW 1 MHz
VBW 3 MHz
Marker 1 [T1]
-5.10 dBm
5.322240000 GHz
Ref 20 dBm
Att 30 dB
SWT 20 ms
20 Offset 1.5 dB
SWP 100 Gf 100
Center 5.32 GHz
3.5 MHz/
Span 35 MHz
Date: 22.AUG.2005 23:44:18

CH9


RBW 1 MHz
VBW 3 MHz
Marker 1 [T1]
1.02 dBm
5.743250000 GHz
Ref 20 dBm
Att 30 dB
SWT 20 ms
20 Offset 1.5 dB
1 SA VIEW
A
LVL
SWP 100 of 100
Center 5.745 GHz
3.5 MHz/
Span 35 MHz
Date: 22.AUG.2005 23:45:40

CH12


RBW 1 MHz
VBW 3 MHz
Marker 1 [T1]
1.28 dBm
5.807940000 GHz
Ref 20 dBm
Att 30 dB
SWT 20 ms
20 Offset 1.5 dB
1 SA VIEW
A
LVL
SWP 100 of 100
Center 5.805 GHz
3.5 MHz/
Span 35 MHz
Date: 22.AUG.2005 23:47:35

4.5.9 TEST RESULTS (ANTENNA 3)

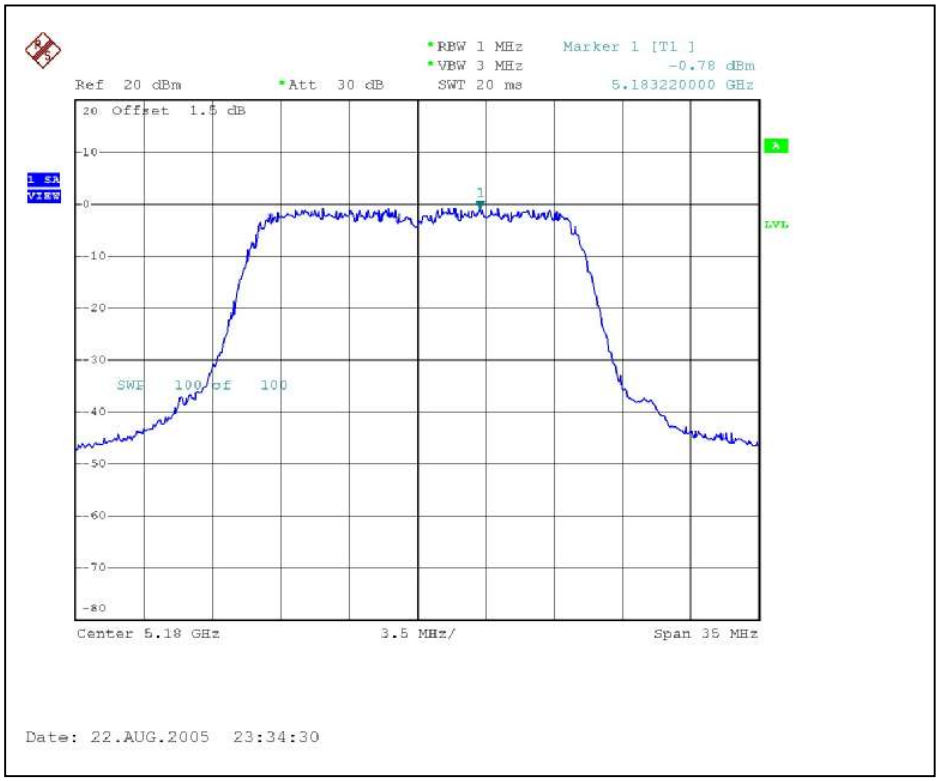
802.11a OFDM modulation

EUT	Symbol WLAN 802.11abg Access Point	**MODEL**	AP-5131
MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	27deg.C, 53%RH, 961hPa
TESTED BY	Rex Huang		

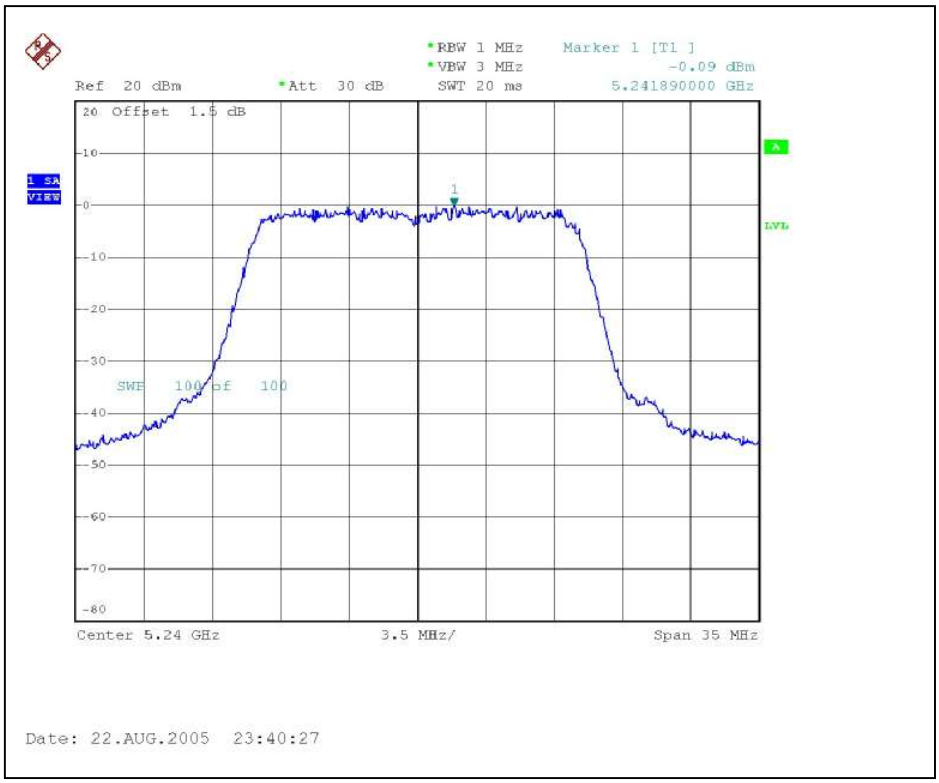
Antenna 3 (Gain : 5.9 dBi) +Cable loss (0.84dB)

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 1MHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	5180	-0.78	4	PASS
4	5240	-0.09	4	PASS
5	5260	6.21	11	PASS
8	5320	3.95	11	PASS
9	5745	2.17	17	PASS
12	5805	2.46	17	PASS

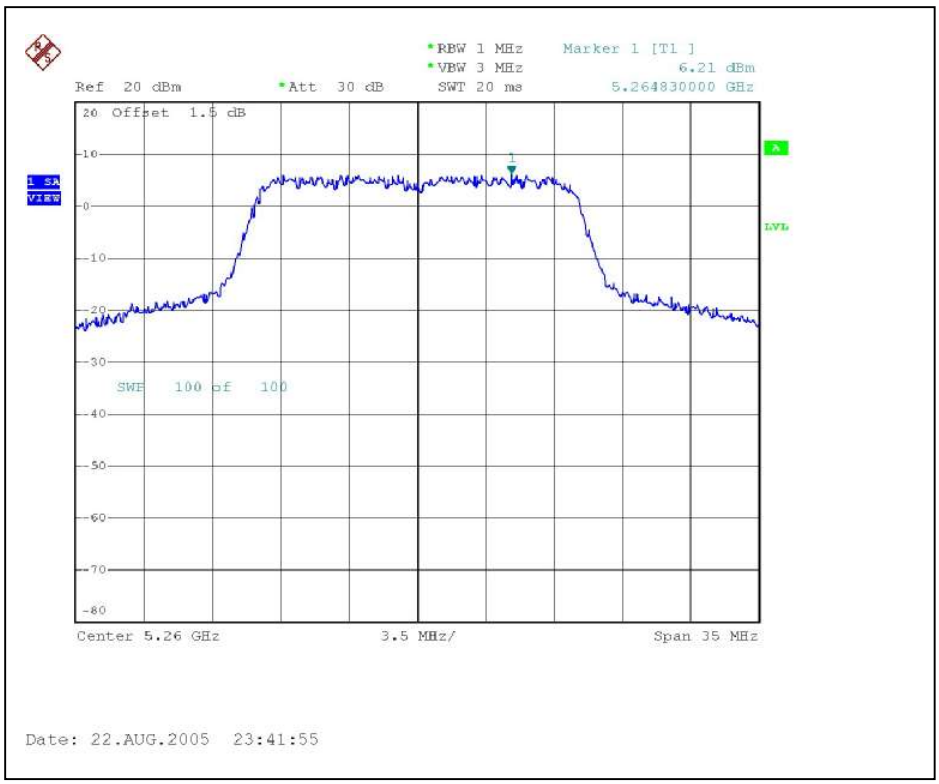
CH1


RBW 1 MHz
VBW 3 MHz
Marker 1 [T1]
-0.78 dBm
5.183220000 GHz
Ref 20 dBm
Att 30 dB
SWT 20 ms
20 Offset 1.5 dB
1 SA VIEW
A
LVL
SWP 100 of 100
Center 5.18 GHz
3.5 MHz/
Span 35 MHz
Date: 22.AUG.2005 23:34:30

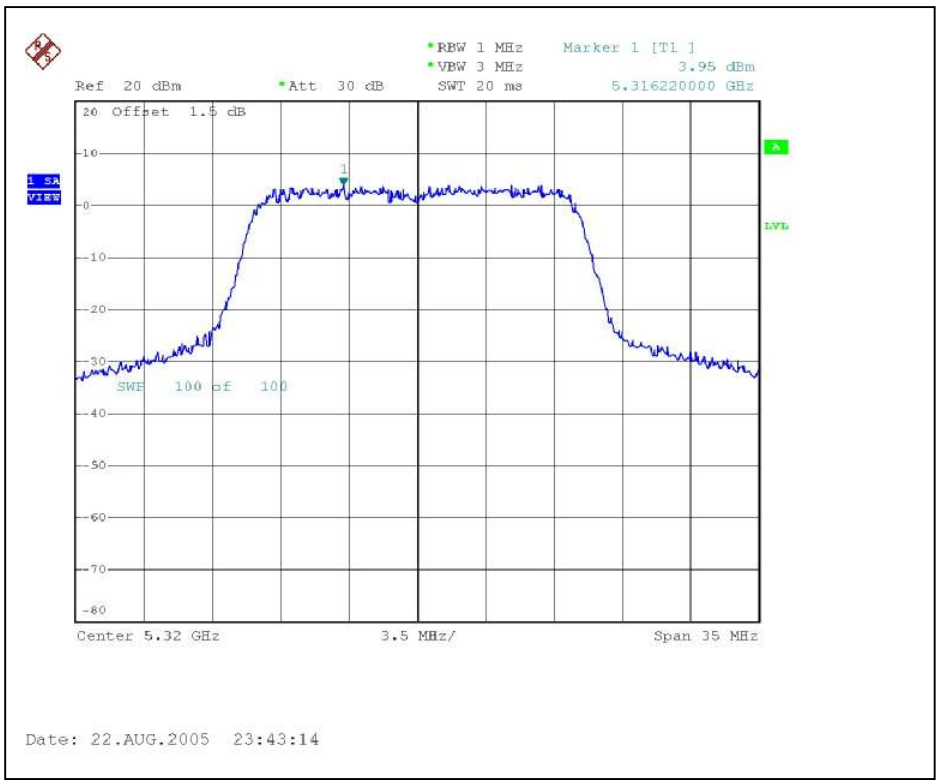
CH4


RBW 1 MHz
VBW 3 MHz
Marker 1 [T1]
-0.09 dBm
5.241890000 GHz
Ref 20 dBm
Att 30 dB
SWT 20 ms
20 Offset 1.5 dB
1 SA VIEW
A
LVL
SWP 100 of 100
Center 5.24 GHz
3.5 MHz/
Span 35 MHz
Date: 22.AUG.2005 23:40:27

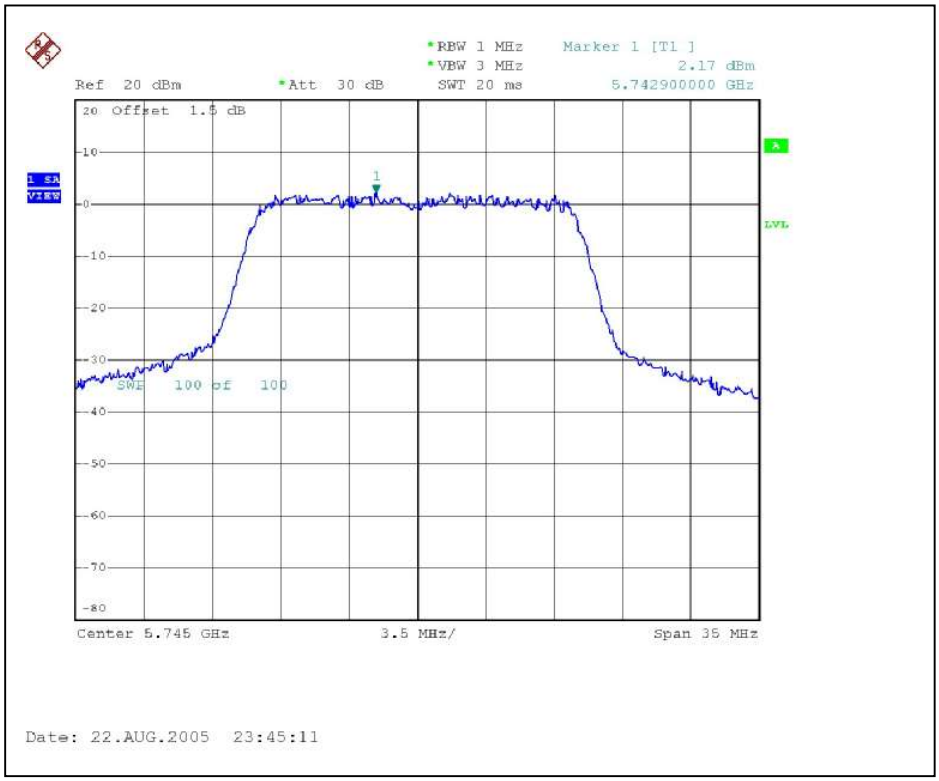
CH5


RBW 1 MHz
VBW 3 MHz
Marker 1 [T1]
6.21 dBm
5.264830000 GHz
Ref 20 dBm
Att 30 dB
SWT 20 ms
20 Offset 1.5 dB
SWP 100 of 100
Center 5.26 GHz
3.5 MHz/
Span 35 MHz
Date: 22.AUG.2005 23:41:55

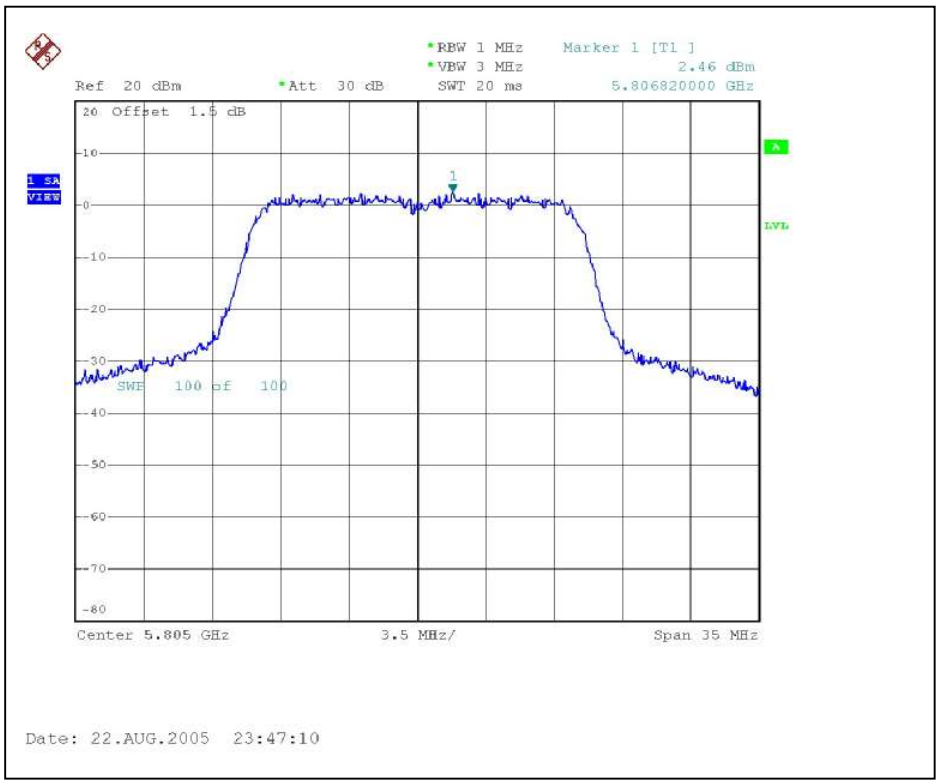
CH8


RBW 1 MHz
VBW 3 MHz
Marker 1 [T1]
3.95 dBm
5.316220000 GHz
Ref 20 dBm
Att 30 dB
SWT 20 ms
20 Offset 1.5 dB
SWP 100 of 100
Center 5.32 GHz
3.5 MHz/
Span 35 MHz
Date: 22.AUG.2005 23:43:14

CH9


RBW 1 MHz
VBW 3 MHz
Marker 1 [T1]
2.17 dBm
5.742900000 GHz
Ref 20 dBm
Att 30 dB
SWT 20 ms
20 Offset 1.5 dB
SWP 100 of 100
Center 5.745 GHz
3.5 MHz/
Span 35 MHz
Date: 22.AUG.2005 23:45:11

CH12


RBW 1 MHz
VBW 3 MHz
Marker 1 [T1]
2.46 dBm
5.806820000 GHz
Ref 20 dBm
Att 30 dB
SWT 20 ms
20 Offset 1.5 dB
SWP 100 of 100
Center 5.805 GHz
3.5 MHz/
Span 35 MHz
Date: 22.AUG.2005 23:47:10

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
R&S SPECTRUM ANALYZER	FSP40	100036	Nov. 23, 2005

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.

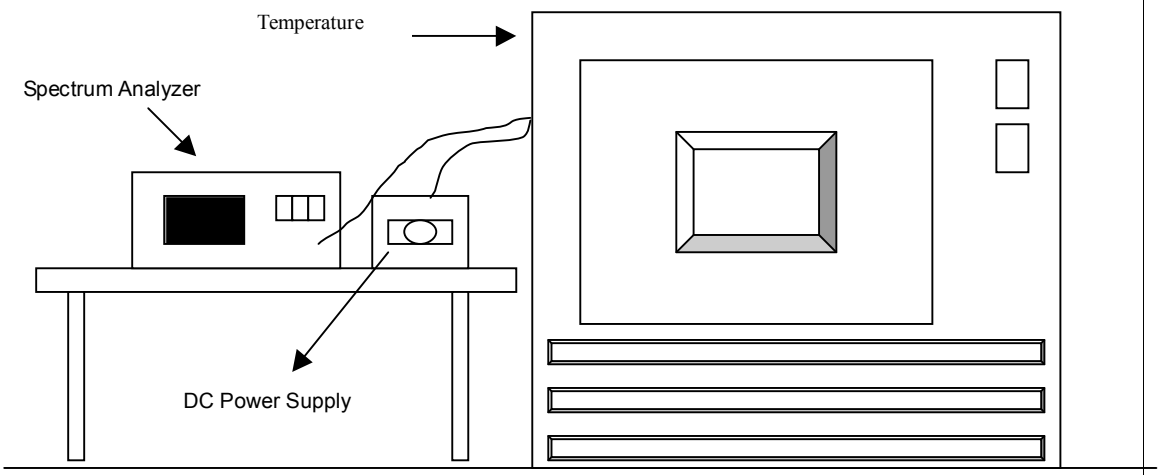
4.6.3 TEST PROCEDURE

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

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

4.6.7 TEST RESULTS (ANTENNA 1)

Operating frequency: 5320MHz						Limit : ± 0.02%	
Temp. (℃)	Power supply (VAC)	2 minute		5 minute		10 minute	
		(MHz)	(%)	(MHz)	(%)	(MHz)	(%)
50	126.5	5320.0264	0.000496	5320.0250	0.000470	5320.0232	0.000436
	110	5320.0248	0.000466	5320.0236	0.000444	5320.0204	0.000383
	93.5	5320.0244	0.000459	5320.0240	0.000451	5320.0212	0.000398
40	126.5	5320.0326	0.000613	5320.0322	0.000605	5320.0316	0.000594
	110	5320.0314	0.000590	5320.0326	0.000613	5320.0344	0.000647
	93.5	5320.0318	0.000598	5320.0324	0.000609	5320.0338	0.000635
30	126.5	5320.0126	0.000237	5320.0122	0.000229	5320.0109	0.000205
	110	5320.0114	0.000214	5320.0112	0.000211	5320.0103	0.000194
	93.5	5320.0122	0.000229	5320.0118	0.000222	5320.0106	0.000199
20	126.5	5319.9862	0.000259	5319.9886	0.000214	5319.9894	0.000199
	110	5319.9872	0.000241	5319.9886	0.000214	5319.9902	0.000184
	93.5	5319.9906	0.000177	5319.9924	0.000143	5319.9933	0.000126
10	126.5	5320.0237	0.000445	5320.0218	0.000410	5320.0184	0.000346
	110	5320.0223	0.000419	5320.0241	0.000453	5320.0234	0.000440
	93.5	5320.0231	0.000434	5320.0218	0.000410	5320.0188	0.000353
0	126.5	5320.0308	0.000579	5320.0299	0.000562	5320.0277	0.000521
	110	5320.0308	0.000579	5320.0301	0.000566	5320.0292	0.000549
	93.5	5320.0284	0.000534	5320.0280	0.000526	5320.0268	0.000504
-10	126.5	5319.9932	0.000128	5319.9926	0.000139	5319.9914	0.000162
	110	5319.9944	0.000105	5319.9936	0.000120	5319.9928	0.000135
	93.5	5319.9926	0.000139	5319.9931	0.000130	5319.9946	0.000102
-20	126.5	5320.0118	0.000222	5320.0111	0.000209	5320.0105	0.000197
	110	5320.0116	0.000218	5320.0112	0.000211	5320.0103	0.000194
	93.5	5320.0124	0.000233	5320.0131	0.000246	5320.0138	0.000259
-30	126.5	5320.0095	0.000179	5320.0102	0.000192	5320.0118	0.000222
	110	5320.0072	0.000135	5320.0082	0.000154	5320.0098	0.000184
	93.5	5320.0076	0.000143	5320.0088	0.000165	5320.0096	0.000180

4.6.8 TEST RESULTS (ANTENNA 2)

Operating frequency: 5320MHz						Limit : ± 0.02%	
Temp. (℃)	Power supply (VAC)	2 minute		5 minute		10 minute	
		(MHz)	(%)	(MHz)	(%)	(MHz)	(%)
50	126.5	5320.0264	0.000496	5320.0250	0.000470	5320.0232	0.000436
	110	5320.0248	0.000466	5320.0236	0.000444	5320.0204	0.000383
	93.5	5320.0244	0.000459	5320.0240	0.000451	5320.0212	0.000398
40	126.5	5320.0326	0.000613	5320.0322	0.000605	5320.0316	0.000594
	110	5320.0314	0.000590	5320.0326	0.000613	5320.0344	0.000647
	93.5	5320.0318	0.000598	5320.0324	0.000609	5320.0338	0.000635
30	126.5	5320.0126	0.000237	5320.0122	0.000229	5320.0109	0.000205
	110	5320.0114	0.000214	5320.0112	0.000211	5320.0103	0.000194
	93.5	5320.0122	0.000229	5320.0118	0.000222	5320.0106	0.000199
20	126.5	5319.9862	0.000259	5319.9886	0.000214	5319.9894	0.000199
	110	5319.9872	0.000241	5319.9886	0.000214	5319.9902	0.000184
	93.5	5319.9906	0.000177	5319.9924	0.000143	5319.9933	0.000126
10	126.5	5320.0237	0.000445	5320.0218	0.000410	5320.0184	0.000346
	110	5320.0223	0.000419	5320.0241	0.000453	5320.0234	0.000440
	93.5	5320.0231	0.000434	5320.0218	0.000410	5320.0188	0.000353
0	126.5	5320.0308	0.000579	5320.0299	0.000562	5320.0277	0.000521
	110	5320.0308	0.000579	5320.0301	0.000566	5320.0292	0.000549
	93.5	5320.0284	0.000534	5320.0280	0.000526	5320.0268	0.000504
-10	126.5	5319.9932	0.000128	5319.9926	0.000139	5319.9914	0.000162
	110	5319.9944	0.000105	5319.9936	0.000120	5319.9928	0.000135
	93.5	5319.9926	0.000139	5319.9931	0.000130	5319.9946	0.000102
-20	126.5	5320.0118	0.000222	5320.0111	0.000209	5320.0105	0.000197
	110	5320.0116	0.000218	5320.0112	0.000211	5320.0103	0.000194
	93.5	5320.0124	0.000233	5320.0131	0.000246	5320.0138	0.000259
-30	126.5	5320.0095	0.000179	5320.0102	0.000192	5320.0118	0.000222
	110	5320.0072	0.000135	5320.0082	0.000154	5320.0098	0.000184
	93.5	5320.0076	0.000143	5320.0088	0.000165	5320.0096	0.000180

4.6.9 TEST RESULTS (ANTENNA 3)

Operating frequency: 5320MHz						Limit : ± 0.02%	
Temp. (℃)	Power supply (VAC)	2 minute		5 minute		10 minute	
		(MHz)	(%)	(MHz)	(%)	(MHz)	(%)
50	126.5	5320.0264	0.000496	5320.0250	0.000470	5320.0232	0.000436
	110	5320.0248	0.000466	5320.0236	0.000444	5320.0204	0.000383
	93.5	5320.0244	0.000459	5320.0240	0.000451	5320.0212	0.000398
40	126.5	5320.0326	0.000613	5320.0322	0.000605	5320.0316	0.000594
	110	5320.0314	0.000590	5320.0326	0.000613	5320.0344	0.000647
	93.5	5320.0318	0.000598	5320.0324	0.000609	5320.0338	0.000635
30	126.5	5320.0126	0.000237	5320.0122	0.000229	5320.0109	0.000205
	110	5320.0114	0.000214	5320.0112	0.000211	5320.0103	0.000194
	93.5	5320.0122	0.000229	5320.0118	0.000222	5320.0106	0.000199
20	126.5	5319.9862	0.000259	5319.9886	0.000214	5319.9894	0.000199
	110	5319.9872	0.000241	5319.9886	0.000214	5319.9902	0.000184
	93.5	5319.9906	0.000177	5319.9924	0.000143	5319.9933	0.000126
10	126.5	5320.0237	0.000445	5320.0218	0.000410	5320.0184	0.000346
	110	5320.0223	0.000419	5320.0241	0.000453	5320.0234	0.000440
	93.5	5320.0231	0.000434	5320.0218	0.000410	5320.0188	0.000353
0	126.5	5320.0308	0.000579	5320.0299	0.000562	5320.0277	0.000521
	110	5320.0308	0.000579	5320.0301	0.000566	5320.0292	0.000549
	93.5	5320.0284	0.000534	5320.0280	0.000526	5320.0268	0.000504
-10	126.5	5319.9932	0.000128	5319.9926	0.000139	5319.9914	0.000162
	110	5319.9944	0.000105	5319.9936	0.000120	5319.9928	0.000135
	93.5	5319.9926	0.000139	5319.9931	0.000130	5319.9946	0.000102
-20	126.5	5320.0118	0.000222	5320.0111	0.000209	5320.0105	0.000197
	110	5320.0116	0.000218	5320.0112	0.000211	5320.0103	0.000194
	93.5	5320.0124	0.000233	5320.0131	0.000246	5320.0138	0.000259
-30	126.5	5320.0095	0.000179	5320.0102	0.000192	5320.0118	0.000222
	110	5320.0072	0.000135	5320.0082	0.000154	5320.0098	0.000184
	93.5	5320.0076	0.000143	5320.0088	0.000165	5320.0096	0.000180

4.7 BAND EDGES MEASUREMENT

4.7.1 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
R&S SPECTRUM ANALYZER	FSP40	100036	Nov. 23, 2005

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.

4.7.2 TEST PROCEDURE

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

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 (ANTENNA 1)

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=VBW=1MHz; Average RBW=1MHz, VBW=10Hz) are attached on the following pages.

802.11a OFDM modulation

NOTE (Peak):

The band edge emission plot on the following first page shows 46.9dBc 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 104.5dBuV/m (Peak), so the maximum field strength in restrict band is 104.5-46.9=57.6dBuV/m which is under 74dBuV/m limit.

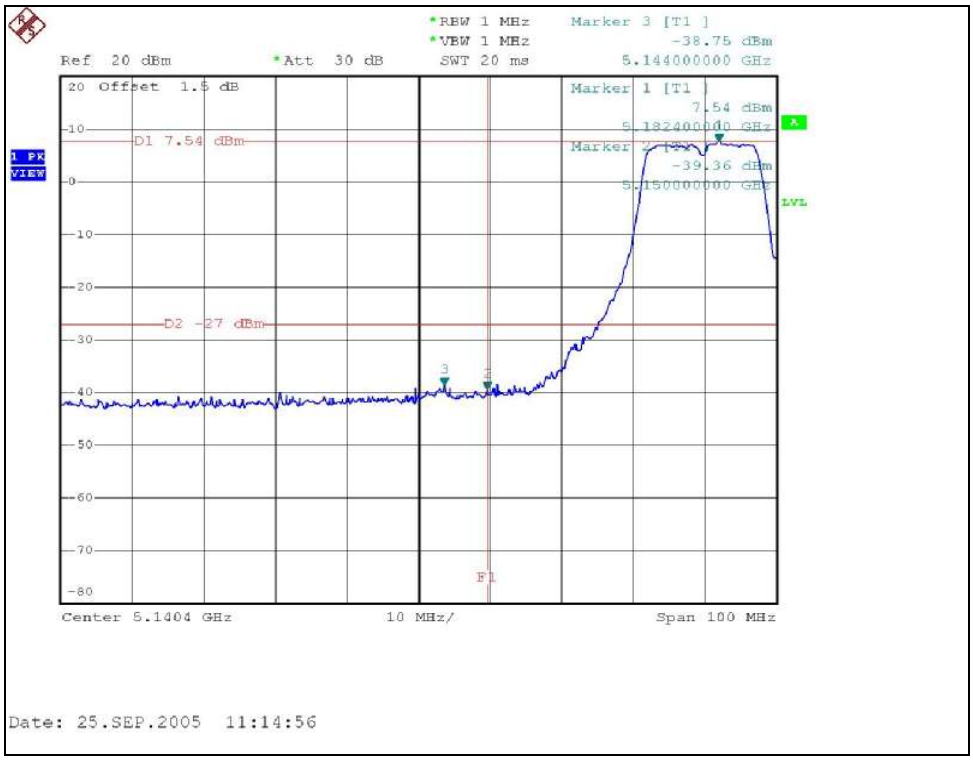
The band edge emission plot on the following first page shows 47.45dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 8 is 110.2dBuV/m (Peak), so the maximum field strength in restrict band is 110.2-47.45=62.75dBuV/m which is under 74dBuV/m limit.

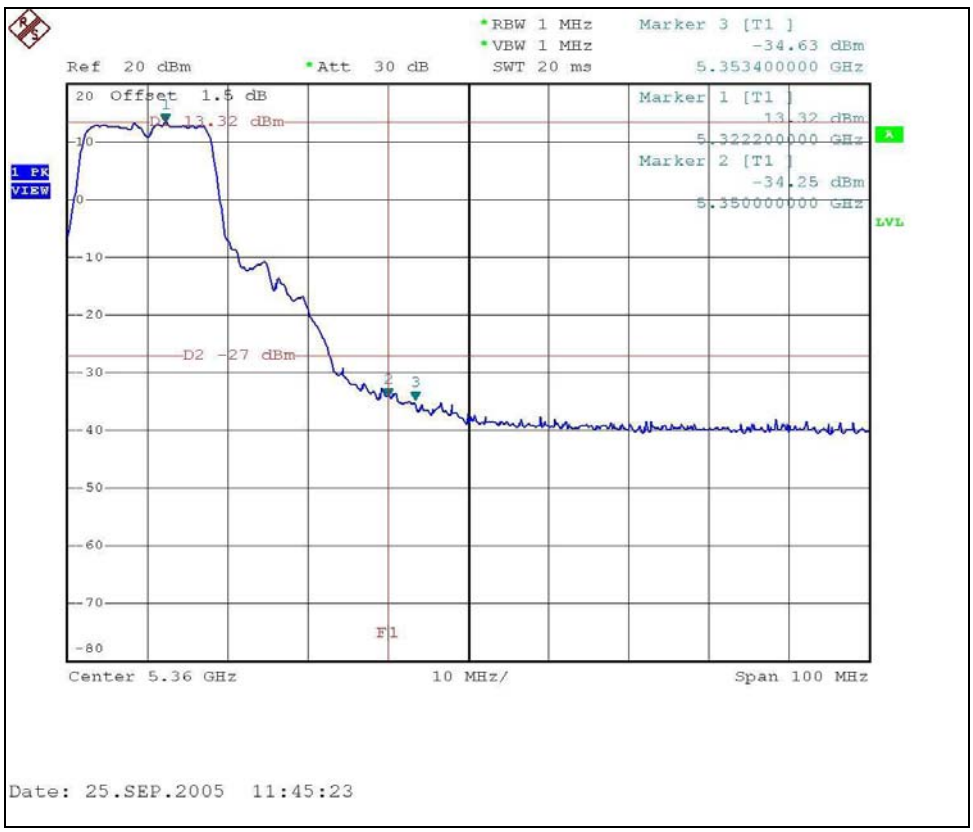
NOTE (Average):

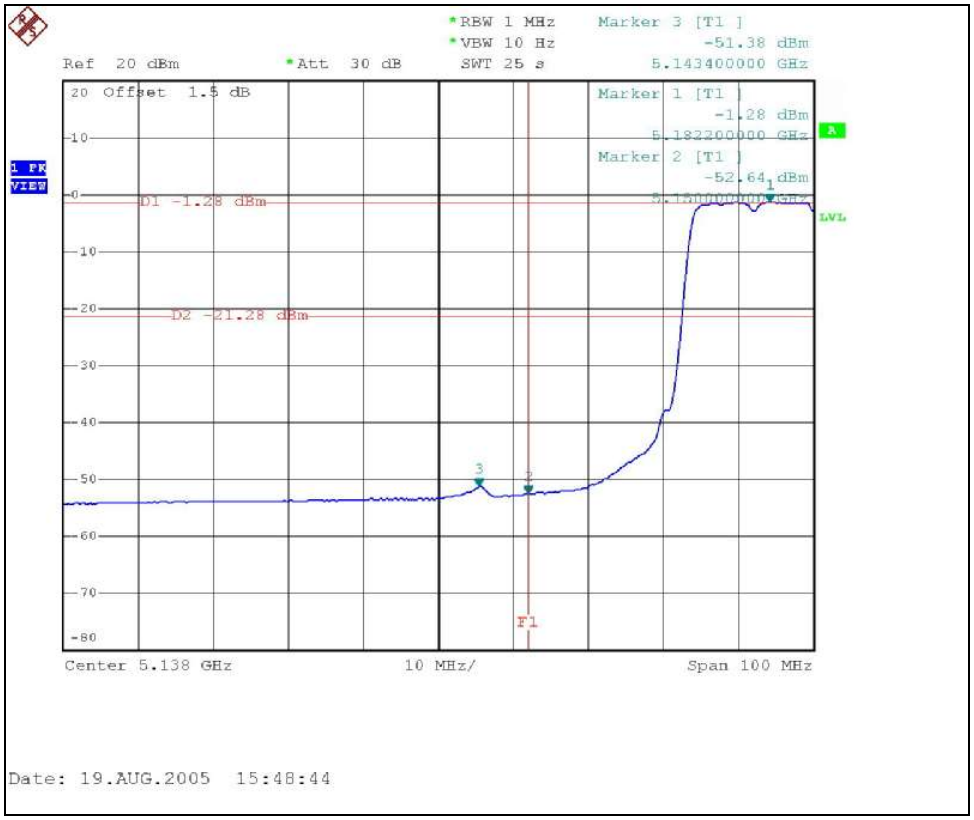
The band edge emission plot on the following second page shows 51.36dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 1 is 96.4dBuV/m (Average), so the maximum field strength in restrict band is 96.4-51.36=45.04dBuV/m which is under 54dBuV/m limit.

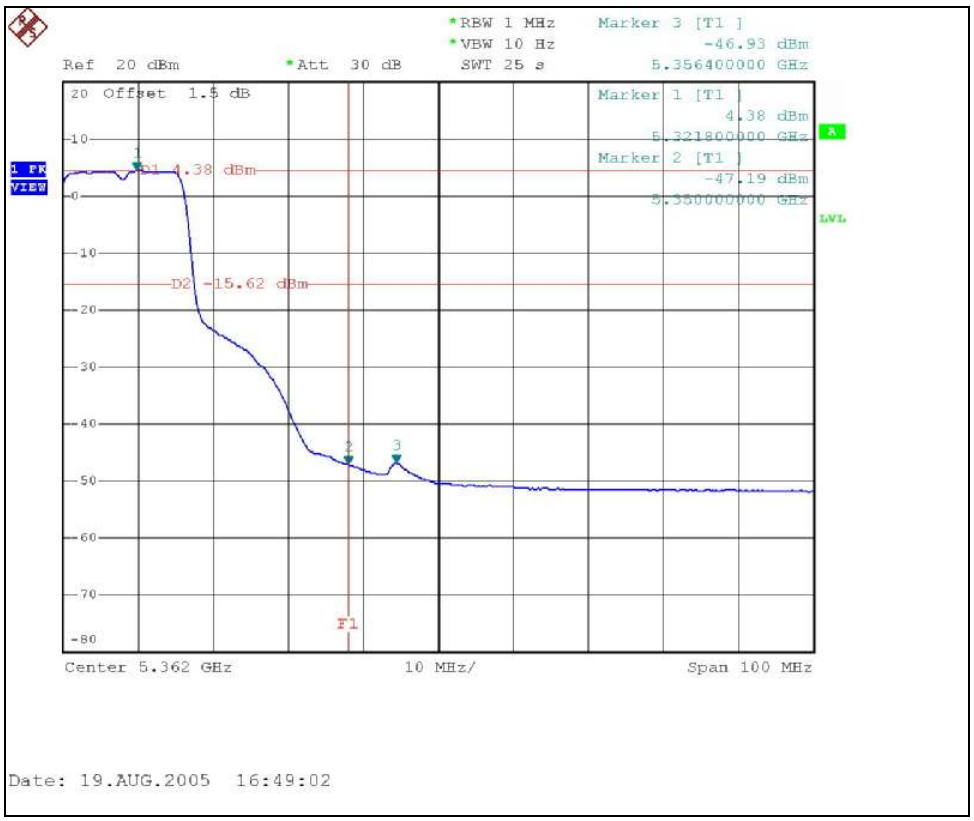
The band edge emission plot on the following second page shows 51.57dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 8 is 101.9dBuV/m (Average), so the maximum field strength in restrict band is 101.9-51.57=50.33dBuV/m which is under 54dBuV/m limit.

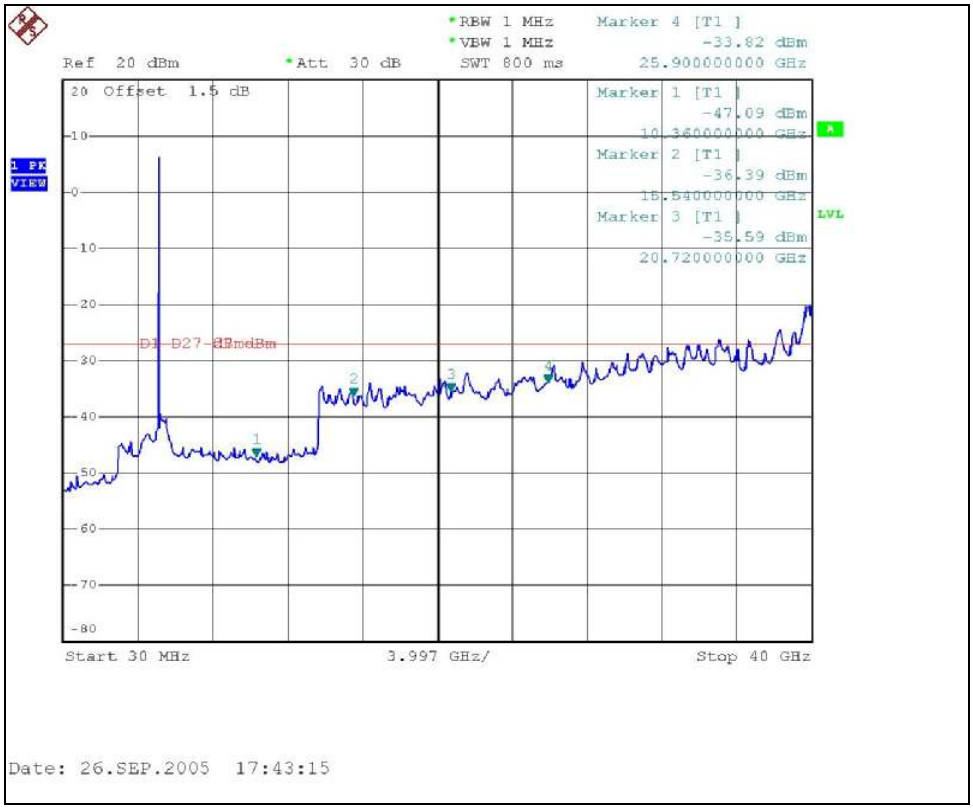
802.11a OFDM modulation

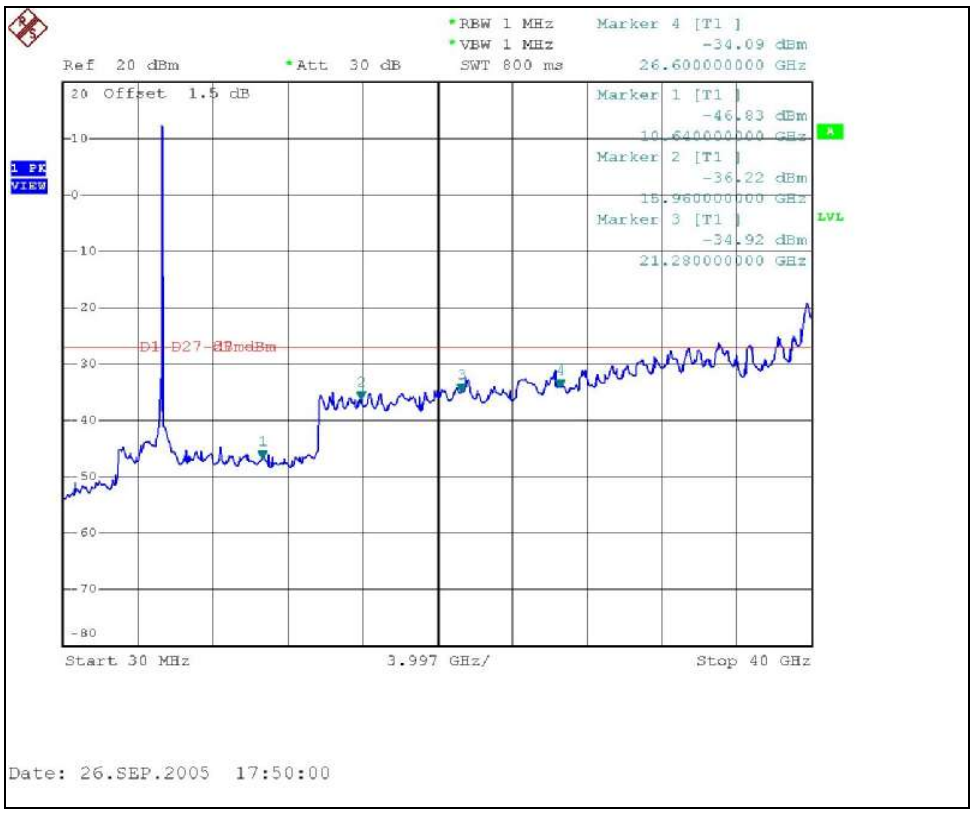





*RBW 1 MHz
*VBW 10 Hz
SWT 25 s
Marker 3 [T1]
-51.38 dBm
5.143400000 GHz
Ref 20 dBm
*Att 30 dB
20 Offset 1.5 dB
Marker 1 [T1]
-1.28 dBm
5.182200000 GHz
Marker 2 [T1]
-52.64 dBm
D1 -1.28 dBm
D2 -21.28 dBm
F1
Center 5.138 GHz
10 MHz/
Span 100 MHz
Date: 19.AUG.2005 15:48:44


*RBW 1 MHz
*VBW 10 Hz
SWT 25 s
Marker 3 [T1]
-46.93 dBm
5.356400000 GHz
Ref 20 dBm
*Att 30 dB
20 Offset 1.5 dB
Marker 1 [T1]
4.38 dBm
5.321800000 GHz
Marker 2 [T1]
-47.19 dBm
5.350000000 GHz
D1 4.38 dBm
D2 -15.62 dBm
F1
Center 5.362 GHz
10 MHz/
Span 100 MHz
Date: 19.AUG.2005 16:49:02


RBW 1 MHz
VBW 1 MHz
SWT 800 ms
Marker 4 [T1]
-33.82 dBm
25.900000000 GHz
Ref 20 dBm
Att 30 dB
Offset 1.5 dB
Marker 1 [T1]
-47.09 dBm
10.360000000 GHz
Marker 2 [T1]
-36.39 dBm
15.540000000 GHz
Marker 3 [T1]
-35.59 dBm
20.720000000 GHz
1 PK VIEW
LVL
Start 30 MHz
3.997 GHz/
Stop 40 GHz
Date: 26.SEP.2005 17:43:15


RBW 1 MHz
VBW 1 MHz
SWT 800 ms
Marker 4 [T1]
-34.09 dBm
26.600000000 GHz
Ref 20 dBm
Att 30 dB
Offset 1.5 dB
Marker 1 [T1]
-46.83 dBm
10.640000000 GHz
Marker 2 [T1]
-36.22 dBm
15.960000000 GHz
Marker 3 [T1]
-34.92 dBm
21.280000000 GHz
1 PK VIEW
LVL
Start 30 MHz
3.997 GHz/
Stop 40 GHz
Date: 26.SEP.2005 17:50:00

4.7.5 TEST RESULTS (ANTENNA 2)

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=VBW=1MHz; Average RBW=1MHz, VBW=10Hz) are attached on the following pages.

802.11a OFDM modulation

NOTE (Peak):

The band edge emission plot on the following first page shows 41.28dBc 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 105.2dBuV/m (Peak), so the maximum field strength in restrict band is 105.2-41.28=63.92dBuV/m which is under 74dBuV/m limit.

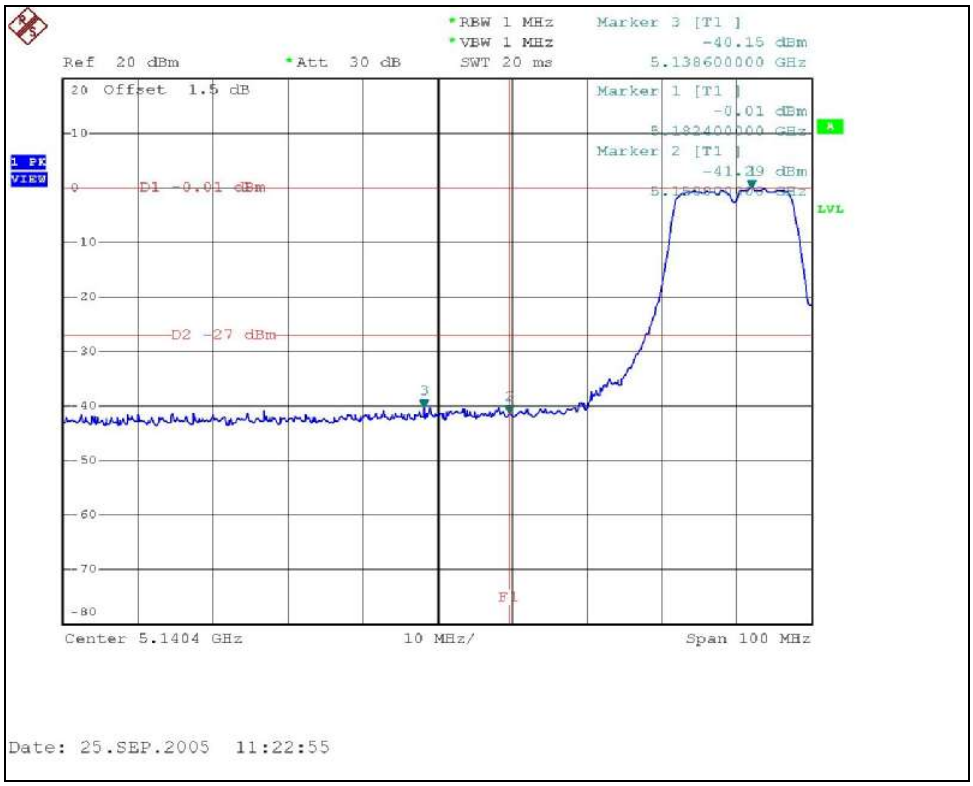
The band edge emission plot on the following first page shows 42.04dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 8 is 107.6dBuV/m (Peak), so the maximum field strength in restrict band is 107.6-42.04=65.56dBuV/m which is under 74dBuV/m limit.

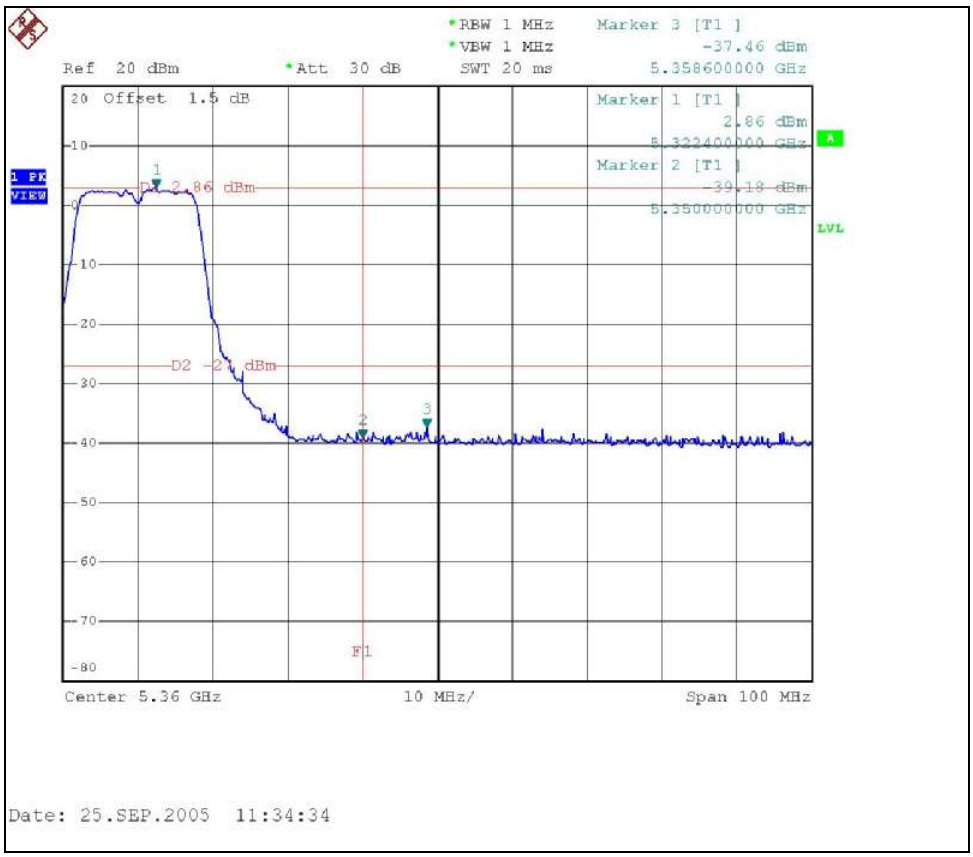
NOTE (Average):

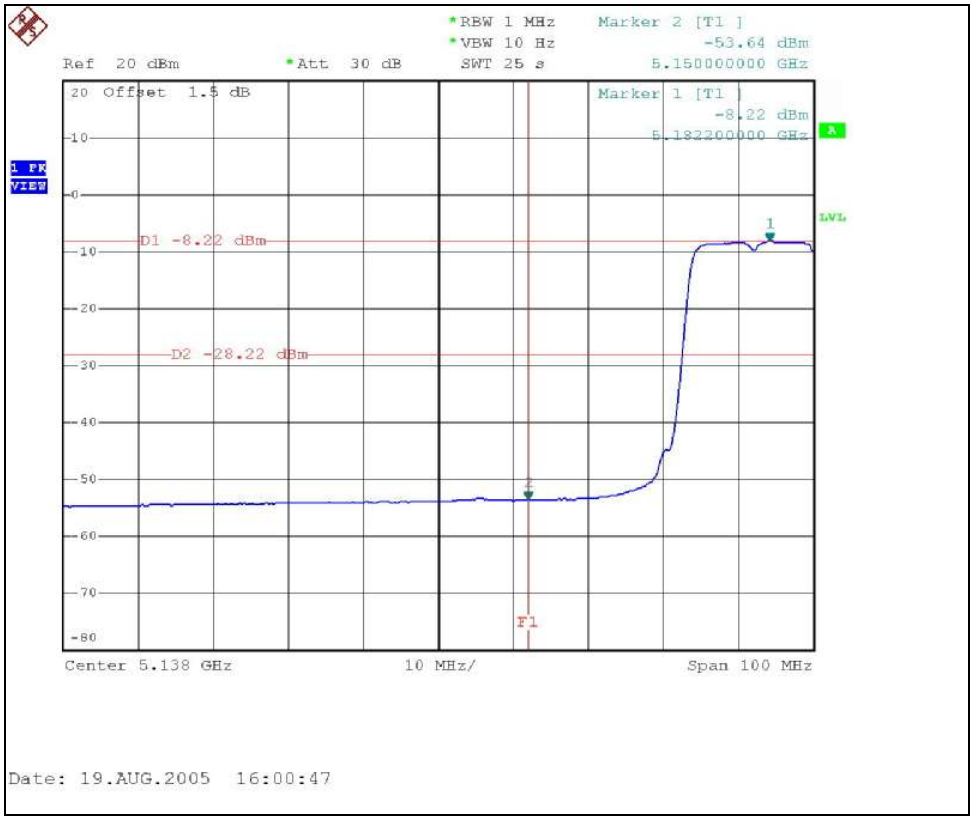
The band edge emission plot on the following second page shows 45.42dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 1 is 96.1dBuV/m (Average), so the maximum field strength in restrict band is 96.1-45.42=50.68dBuV/m which is under 54dBuV/m limit.

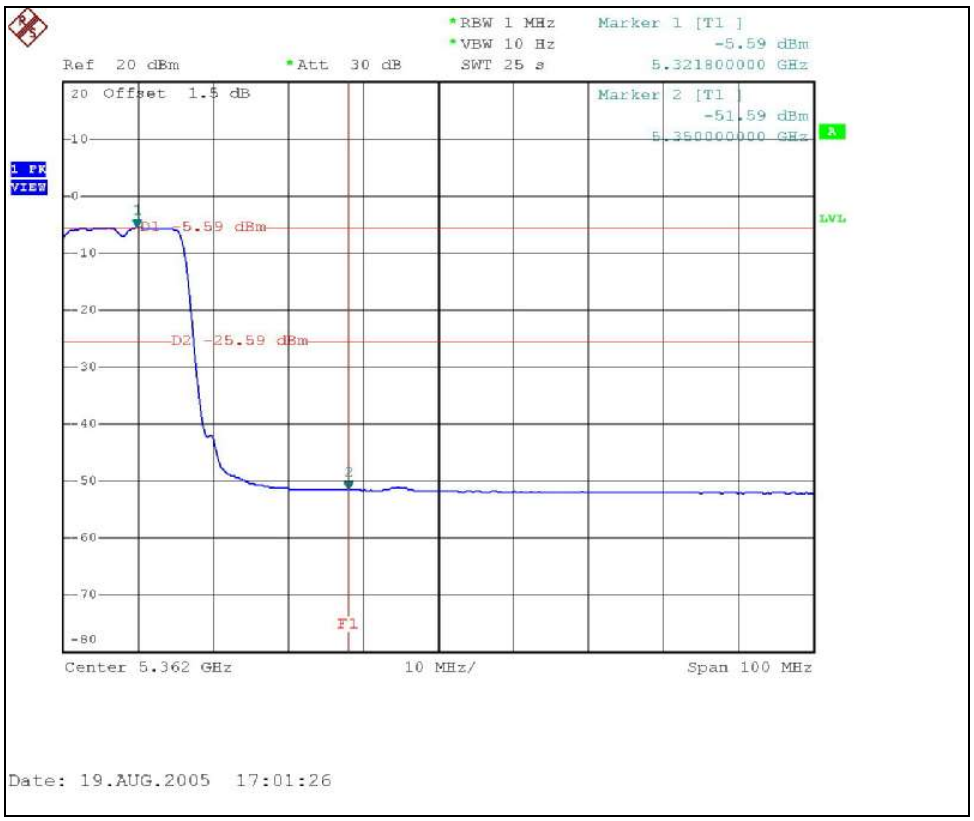
The band edge emission plot on the following second page shows 46.00dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 8 is 98.5dBuV/m (Average), so the maximum field strength in restrict band is 98.5-46.00=52.50dBuV/m which is under 54dBuV/m limit.

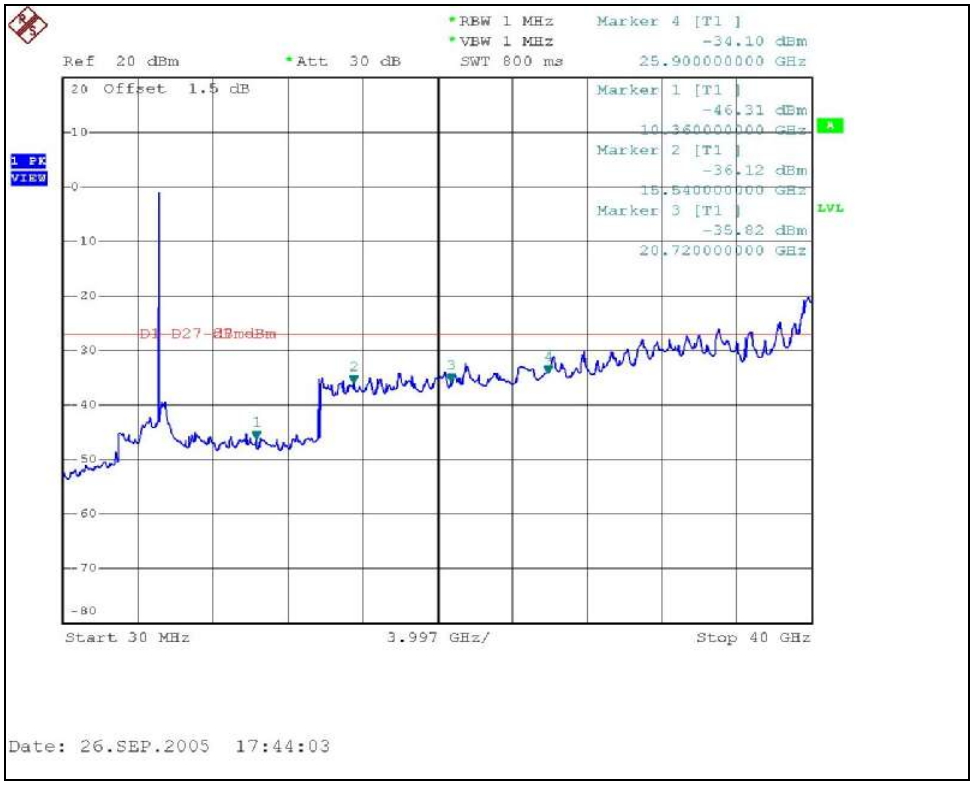
802.11a OFDM modulation

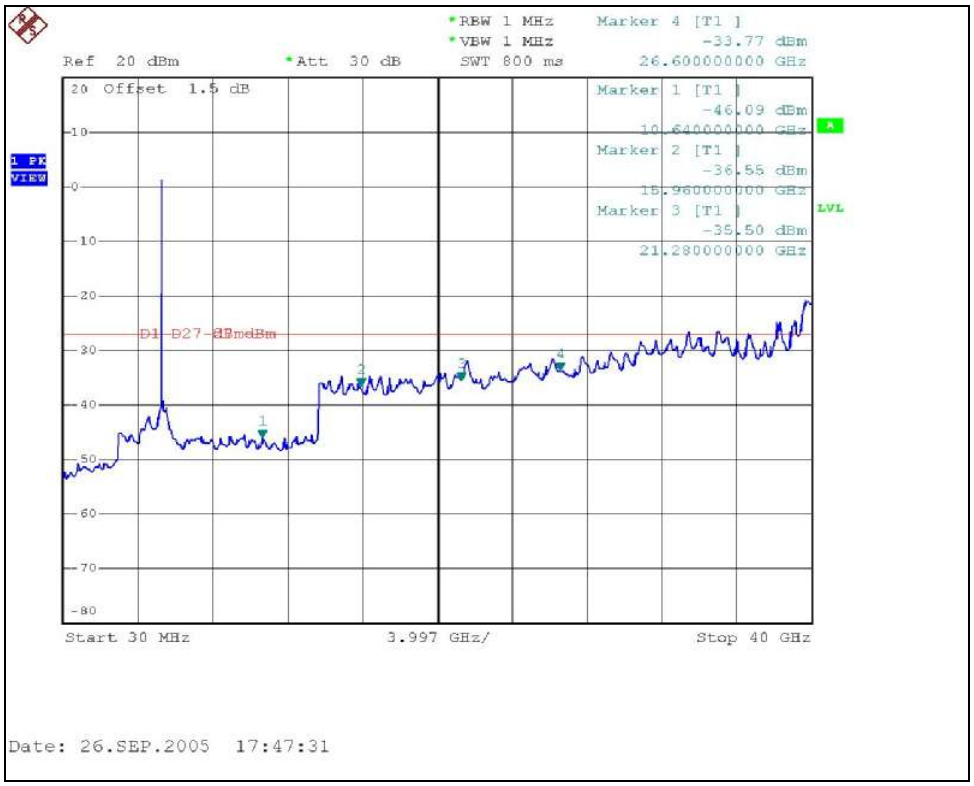





RBW 1 MHz
VBW 10 Hz
SWT 25 s
Marker 2 [T1]
-53.64 dBm
5.150000000 GHz
Ref 20 dBm
Att 30 dB
20 Offset 1.5 dB
Marker 1 [T1]
-8.22 dBm
5.182200000 GHz
D1 -8.22 dBm
D2 -28.22 dBm
F1
Center 5.138 GHz
10 MHz/
Span 100 MHz
Date: 19.AUG.2005 16:00:47


RBW 1 MHz
VBW 10 Hz
SWT 25 s
Marker 1 [T1]
-5.59 dBm
5.321800000 GHz
Ref 20 dBm
Att 30 dB
20 Offset 1.5 dB
Marker 2 [T1]
-51.59 dBm
5.350000000 GHz
D1 -5.59 dBm
D2 -25.59 dBm
F1
Center 5.362 GHz
10 MHz/
Span 100 MHz
Date: 19.AUG.2005 17:01:26


RBW 1 MHz
VBW 1 MHz
Ref 20 dBm
Att 30 dB
SWT 800 ms
Marker 4 [T1]
-34.10 dBm
25.900000000 GHz
20 Offset 1.5 dB
Marker 1 [T1]
-46.31 dBm
10.360000000 GHz
Marker 2 [T1]
-36.12 dBm
15.540000000 GHz
Marker 3 [T1]
-35.82 dBm
20.720000000 GHz
1 PK VIEW
LVL
Start 30 MHz
3.997 GHz/
Stop 40 GHz
Date: 26.SEP.2005 17:44:03


RBW 1 MHz
VBW 1 MHz
Ref 20 dBm
Att 30 dB
SWT 800 ms
Marker 4 [T1]
-33.77 dBm
26.600000000 GHz
20 Offset 1.5 dB
Marker 1 [T1]
-46.09 dBm
10.640000000 GHz
Marker 2 [T1]
-36.55 dBm
15.960000000 GHz
Marker 3 [T1]
-35.50 dBm
21.280000000 GHz
1 PK VIEW
LVL
Start 30 MHz
3.997 GHz/
Stop 40 GHz
Date: 26.SEP.2005 17:47:31

4.7.6 TEST RESULTS (ANTENNA 3)

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=VBW=1MHz; Average RBW=1MHz, VBW=10Hz) are attached on the following pages.

802.11a OFDM modulation

NOTE (Peak):

The band edge emission plot on the following first page shows 46.9dBc 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 107.2dBuV/m (Peak), so the maximum field strength in restrict band is 107.2-46.90=60.30dBuV/m which is under 74dBuV/m limit.

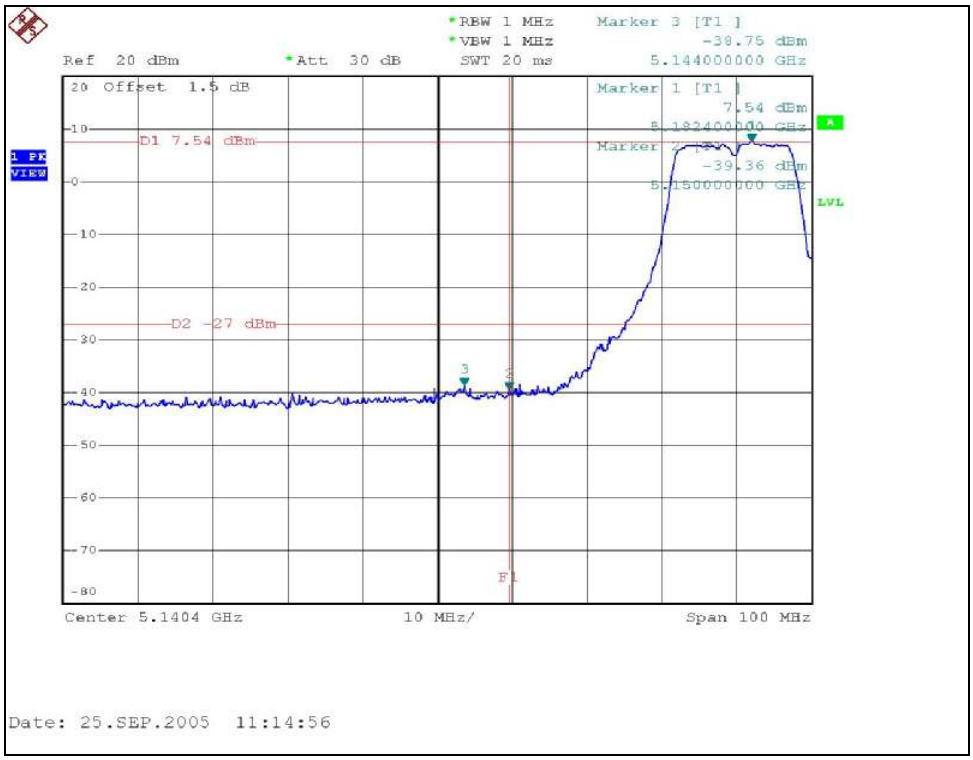
The band edge emission plot on the following first page shows 48.84dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 8 is 111.3dBuV/m (Peak), so the maximum field strength in restrict band is 111.3-48.84=62.46dBuV/m which is under 74dBuV/m limit.

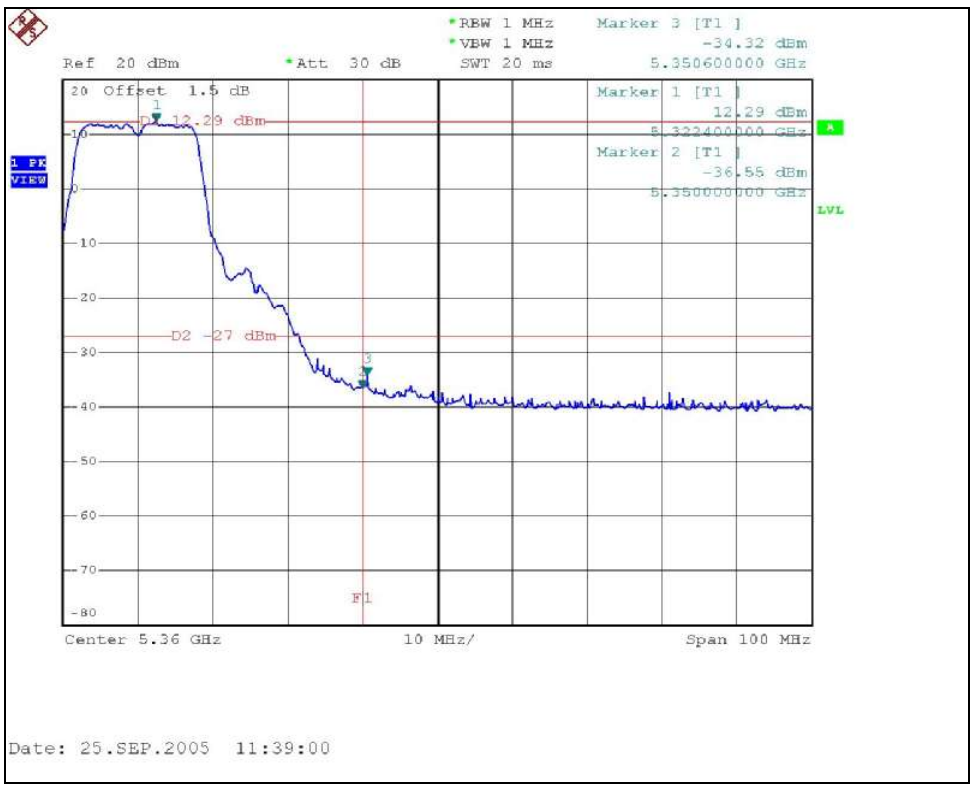
NOTE (Average):

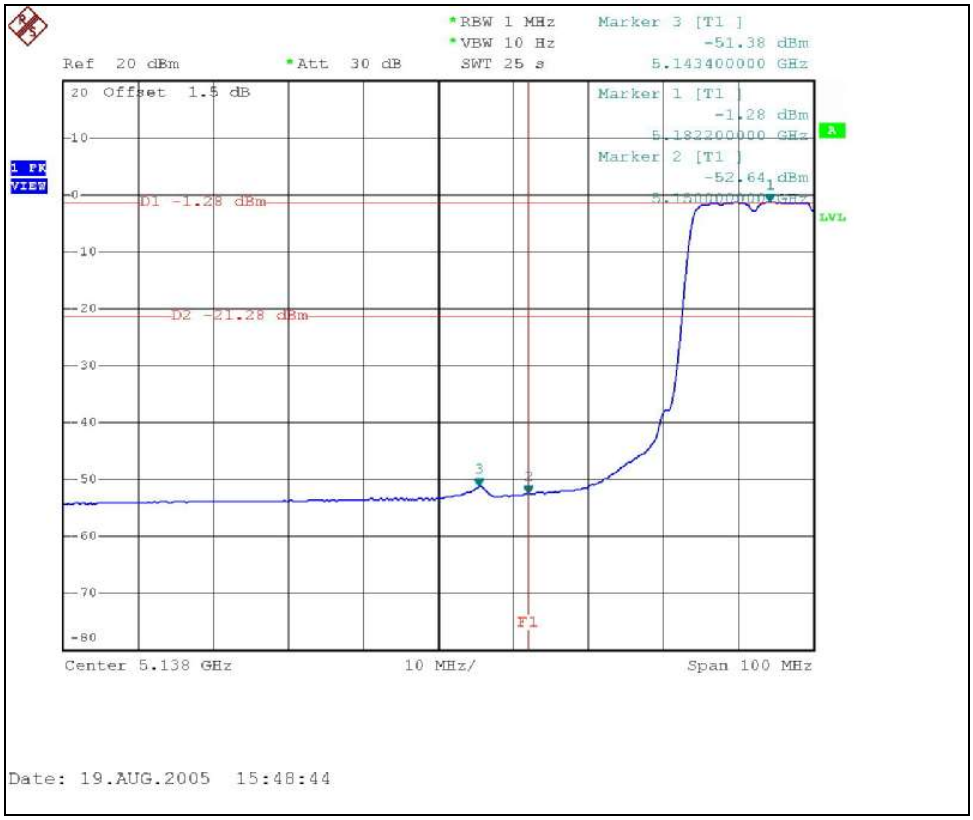
The band edge emission plot on the following second page shows 51.36dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 1 is 98.30dBuV/m (Average), so the maximum field strength in restrict band is 98.30-51.36=46.94dBuV/m which is under 54dBuV/m limit.

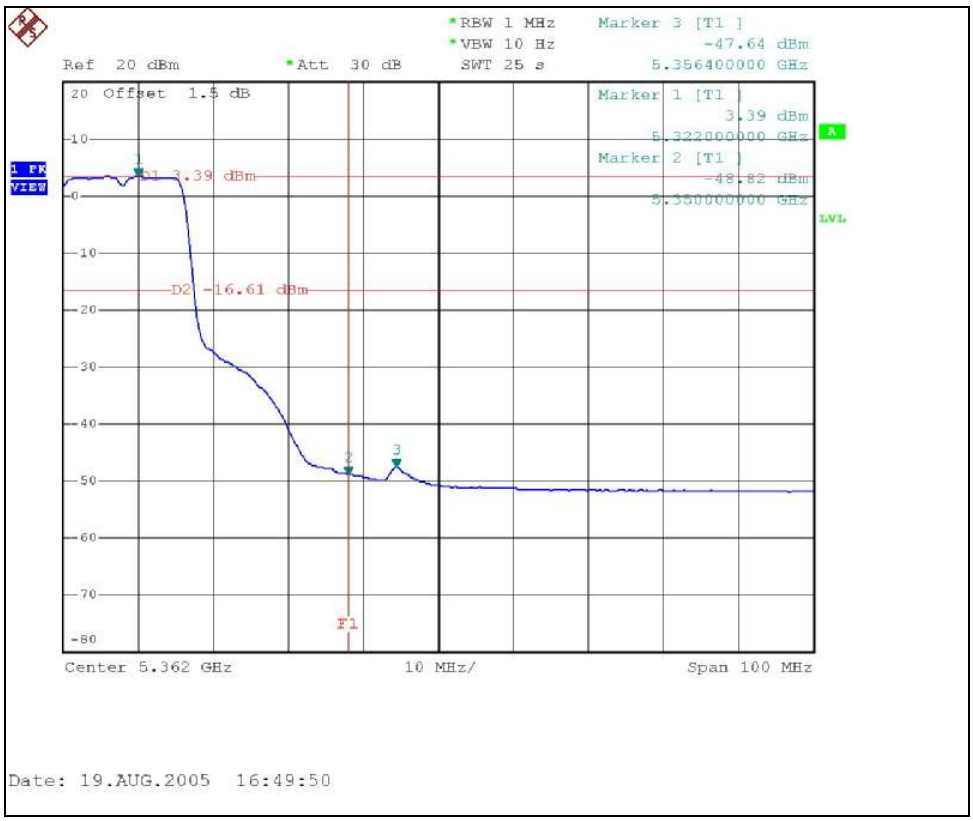
The band edge emission plot on the following second page shows 52.21dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 8 is 90.0dBuV/m (Average), so the maximum field strength in restrict band is 90.0-52.21=37.79dBuV/m which is under 54dBuV/m limit.

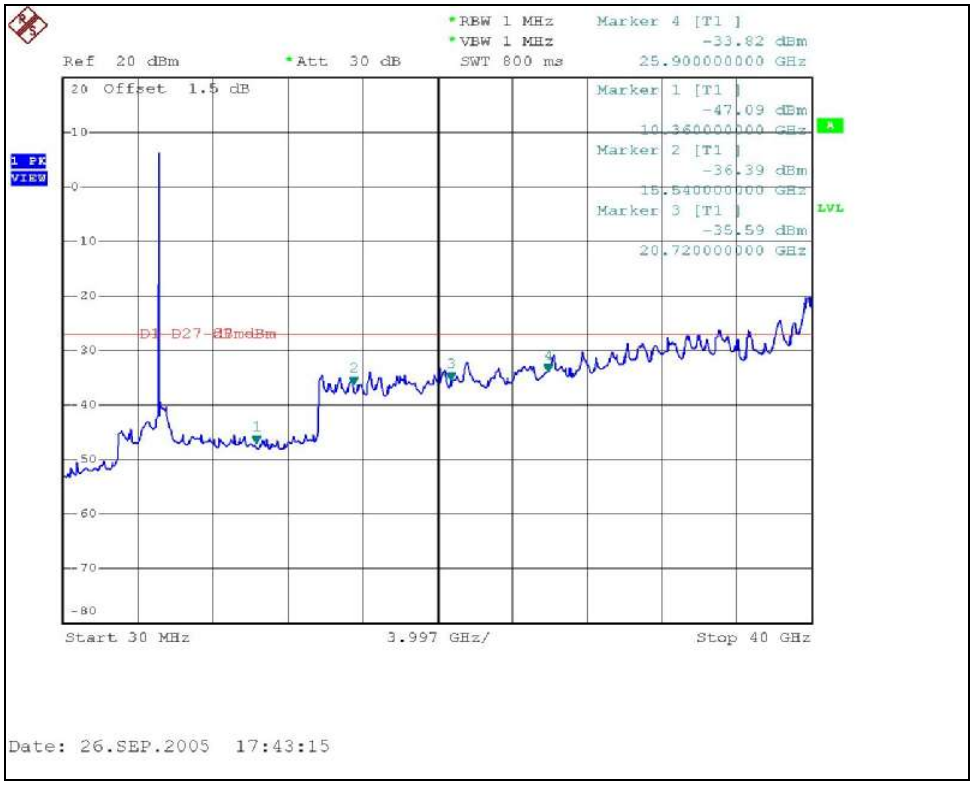
802.11a OFDM modulation

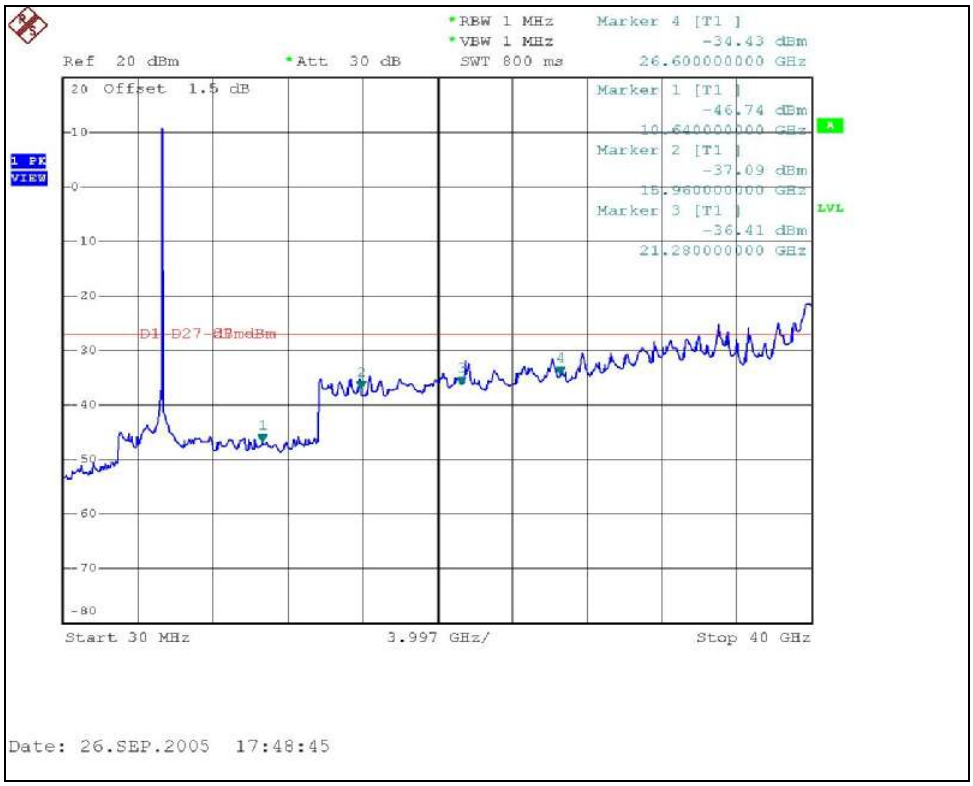





RBW 1 MHz
VBW 10 Hz
SWT 25 s
Marker 3 [T1]
-51.38 dBm
5.143400000 GHz
Ref 20 dBm
Att 30 dB
20 Offset 1.5 dB
Marker 1 [T1]
-1.28 dBm
5.182200000 GHz
Marker 2 [T1]
-52.64 dBm
D1 -1.28 dBm
D2 -21.28 dBm
F1
Center 5.138 GHz
10 MHz/
Span 100 MHz
Date: 19.AUG.2005 15:48:44


RBW 1 MHz
VBW 10 Hz
SWT 25 s
Marker 3 [T1]
-47.64 dBm
5.356400000 GHz
Ref 20 dBm
Att 30 dB
20 Offset 1.5 dB
Marker 1 [T1]
3.39 dBm
5.322000000 GHz
Marker 2 [T1]
-48.82 dBm
5.350000000 GHz
D1 3.39 dBm
D2 -16.61 dBm
F1
Center 5.362 GHz
10 MHz/
Span 100 MHz
Date: 19.AUG.2005 16:49:50


RBW 1 MHz
VBW 1 MHz
SWT 800 ms
Marker 4 [T1]
-33.82 dBm
25.900000000 GHz
Ref 20 dBm
Att 30 dB
Offset 1.5 dB
Marker 1 [T1]
-47.09 dBm
10.360000000 GHz
Marker 2 [T1]
-36.39 dBm
15.540000000 GHz
Marker 3 [T1]
-35.59 dBm
20.720000000 GHz
1 PK VIEW
LVL
Start 30 MHz
3.997 GHz/
Stop 40 GHz
Date: 26.SEP.2005 17:43:15


RBW 1 MHz
VBW 1 MHz
SWT 800 ms
Marker 4 [T1]
-34.43 dBm
26.600000000 GHz
Ref 20 dBm
Att 30 dB
Offset 1.5 dB
Marker 1 [T1]
-46.74 dBm
10.640000000 GHz
Marker 2 [T1]
-37.09 dBm
15.960000000 GHz
Marker 3 [T1]
-36.41 dBm
21.280000000 GHz
1 PK VIEW
LVL
Start 30 MHz
3.997 GHz/
Stop 40 GHz
Date: 26.SEP.2005 17:48:45

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 antennas used in this product are as following:

For 5GHz							
No.	Symbol P/N	Gain (dBi)	Cable Loss (dB)	Net Gain (dB)	Antenna Type	Connector	Remark
1	ML-2452-APA2-01	4.0	0	4.0	Dipole	RP SMA	Omni
2	ML-5299-WPNA1-01	14.2	1.2	13.0	Patch	RP SMA	Directional
3	ML-5299-HPA1-01	5.9	0.84	5.0	Omni	RP SMA	Omni

5. 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, NVLAP, UL, A2LA
Germany	TUV Rheinland
Japan	VCCI
Norway	NEMKO
Canada	INDUSTRY CANADA , CSA
R.O.C.	CNLA, BSMI, DGT
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: 886-2-26052943

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

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

Web Site: www.adt.com.tw

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

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.