

Test Report No. 7191032490-EEC12/11
dated 08 Jun 2012



PSB Singapore

Note: This report is issued subject to the Testing and Certification Regulations of the TÜV SÜD Group and the General Terms and Conditions of Business of TÜV SÜD PSB Pte Ltd. In addition, this report is governed by the terms set out within this report.

Choose certainty.
Add value.

FORMAL REPORT ON TESTING IN ACCORDANCE WITH
47 CFR FCC Parts 15B & C : 2011
OF AN
INMARSAT FLEETBROADBAND SYSTEM
[Model : FX 250]
[FCC ID : BJJ-STFX250BDE]

TEST FACILITY TÜV SÜD PSB Pte Ltd,
Electrical & Electronics Centre (EEC), Product Services,
No. 1 Science Park Drive, Singapore 118221

TÜV SÜD PSB Pte Ltd,
Electrical & Electronics Centre (EEC), Product Services,
13 International Business Park #01-01, Singapore 609932

FCC REG. NO. 99142 (3m and 10m Semi-Anechoic Chamber, Science Park)
160581 (3m and 10m Semi-Anechoic Chamber, International Business Park)

IND. CANADA REG. NO. 2932I-1 (3m and 10m Semi-Anechoic Chamber, Science Park)
2932N-1 (10m Semi-Anechoic Chamber, International Business Park)

PREPARED FOR Sea Tel Inc.
4030 Nelson Ave, Concord, California, 94520, USA

Tel : +1 925 798 7979 Tel : +1 925 798 7979

QUOTATION NUMBER 219146087 & 219150213

JOB NUMBER 7191027290 & 7191032490

TEST PERIOD 24 Feb 2012 – 08 Jun 2012

PREPARED BY

Quek Keng Huat
Higher Associate Engineer

APPROVED BY

Lim Cher Hwee
Assistance Vice President



Laboratory:
TUV SUD PSB Pte. Ltd.,
No.1 Science Park Drive
Singapore 118221



A 20070390 A
A 20070391
A 20070392
A 20070393
A 20070394
A 20070395
A 20070396
A 20070397

The results reported herein have been performed in accordance with the laboratory's terms of accreditation under the Singapore Accreditation Council - Singapore Laboratory Accreditation Scheme. Tests/Calibrations marked "Not SAC-SINGLAS Accredited" in this Report are not included in the SAC-SINGLAS Accreditation Schedule for our laboratory.

Phone : +65-6885 1333
Fax : +65-6776 8670
E-mail: testing@tuv-sud-psb.sg
www.tuv-sud-psb.sg
Co. Reg : 199002667R

Regional Head Office:
TUV SUD Asia Pacific Pte. Ltd.
3 Science Park Drive, #04-01/05
The Franklin, Singapore 118223
TUV®

TABLE OF CONTENTS

TEST SUMMARY	3
PRODUCT DESCRIPTION	6
SUPPORTING EQUIPMENT DESCRIPTION.....	7
EUT OPERATING CONDITIONS.....	8
RADIATED EMISSION TEST.....	9
SPECTRUM BANDWIDTH (6dB BANDWIDTH MEASUREMENT) TEST	14
MAXIMUM PEAK POWER TEST.....	29
RF CONDUCTED SPURIOUS EMISSIONS (NON-RESTRICTED BANDS) TEST.....	32
RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST.....	58
BAND EDGE COMPLIANCE (CONDUCTED) TEST.....	181
BAND EDGE COMPLIANCE (RADIATED) TEST.....	191
PEAK POWER SPECTRAL DENSITY TEST.....	196
MAXIMUM PERMISSIBLE EXPOSURE (MPE) TEST	211
ANNEX A EUT PHOTOGRAPHS / DIAGRAMS	213
ANNEX B USER MANUAL TECHNICAL DESCRIPTION BLOCK & CIRCUIT DIAGRAMS.....	238
ANNEX C FCC LABEL & POSITION.....	239

TEST SUMMARY

The product was tested in accordance with the customer's specifications.

Test Results Summary

Test Standard	Description	Pass / Fail
47 CFR FCC Part 15: 2011		
15.107(a), 15.207	Conducted Emissions	Not Applicable *See Note 6
15.109(a), 15.205, 15.209	Radiated Emissions (Spurious Emissions inclusive Restricted Bands Requirement)	Pass
15.247(a)(2)	Spectrum Bandwidth (6dB Bandwidth Measurement)	Pass
15.247(b)(3)	Maximum Peak Power	Pass
15.247(d)	RF Conducted Spurious Emissions (Non-Restricted Bands)	Pass
15.247(d)	RF Conducted Spurious Emissions (Restricted Bands)	Pass
15.247(d)	Band Edge Compliance (Conducted)	Pass
15.247(d)	Band Edge Compliance (Radiated)	Pass
15.247(e)	Peak Power Spectral Density	Pass
1.1310	Maximum Permissible Exposure	Refer to page 211 for details

TEST SUMMARY

Notes

1. The channels as listed below, under the different configurations were tested for 802.11b WLAN.

<u>Transmit Channel</u>	<u>Frequency (GHz)</u>	<u>Modulation</u>	<u>Data Rate</u>
Channel 1 Channel 6 Channel 11	2.412 2.437 2.462	DBPSK DBPSK DBPSK	1Mbps 1Mbps 1Mbps
Channel 1 Channel 6 Channel 11	2.412 2.437 2.462	DQPSK DQPSK DQPSK	2Mbps 2Mbps 2Mbps
Channel 1 Channel 6 Channel 11	2.412 2.437 2.462	CCK CCK CCK	5.5Mbps 5.5Mbps 5.5Mbps
Channel 1 Channel 6 Channel 11	2.412 2.437 2.462	CCK CCK CCK	11Mbps 11Mbps 11Mbps

2. The channels as listed below, under the different configurations were tested for 802.11g WLAN.

<u>Transmit Channel</u>	<u>Frequency (GHz)</u>	<u>Modulation</u>	<u>Data Rate</u>
Channel 1 Channel 6 Channel 11	2.412 2.437 2.462	BPSK BPSK BPSK	9Mbps 9Mbps 9Mbps
Channel 1 Channel 6 Channel 11	2.412 2.437 2.462	QPSK QPSK QPSK	18Mbps 18Mbps 18Mbps
Channel 1 Channel 6 Channel 11	2.412 2.437 2.462	16QAM 16QAM 16QAM	36Mbps 36Mbps 36Mbps
Channel 1 Channel 6 Channel 11	2.412 2.437 2.462	64QAM 64QAM 64QAM	54Mbps 54Mbps 54Mbps

3. All the measurements in section 15.247 were done based on conducted measurements except:
- Transmitter Radiated Emissions (Spurious Emissions inclusive Restricted Bands Requirement)
 - Band Edge Compliance (Radiated)
 - Maximum Permissible Exposure
4. The EUT is a Class B device when in non-transmitting state and meets the 47 CFR FCC Part15B Class B requirements.
5. All test measurement procedures are according to ANSI C63.4: 2003.
6. The Equipment Under Test (EUT) is a DC operated device and contains no provision for public utility connections.

TEST SUMMARY

Notes (continued)

7. The maximum measured RF power of the Equipment Under Test is 15.5dBm.
8. The Equipment Under Test (EUT) was configured to transmit in continuous mode, ie 0 duty cycle.

Modifications

No modifications were made.



PRODUCT DESCRIPTION

Description	: The Equipment Under Test (EUT) is an INMARSAT FLEETBROADBAND SYSTEM.
Manufacturer	: Sea Tel Inc. 4030 Nelson Ave, Concord, California, 94520, USA Telephone : +1 925 798 7979 Fax : +1 925 288 1420
Factor(ies)	: Beyonics Technology (Senai) Sdn Bhd Lot 3627, Jalan Harmoni 1, Batu 22 81000 Kulai, Johor, Malaysia
Model Number	: FX 250
FCC ID	: BJF-STFX250BDE
Serial Number	: MB2501A120800007
Microprocessor	: OMAP5912
Operating / Transmitting Frequency	: 2412GHz (lower channel) to 2462MHz (upper channel) 11 channels.
Clock / Oscillator Frequency	: 4.912 MHz , 12 MHz , 25 MHz , 16.384 MHz , 24.192 MHz , 32.768MHz
Modulation	: TYPE OF MODULATION: DBPSK, DQPSK, CCK, BPSK, QPSK, 16QAM, 64QAM (802.11b/g)
Antenna Gain	: 0.0 dBi
Port / Connectors	: 4 RJ 45 (2 PoE, 2 LAN) 2 RJ11 (1 FAX , 1 Phone) 1 Offset latch RJ11
Rated Input Power	: 12V, 15A / 24V, 7.5A (180W)
Accessories	: Primary Handset, 3m DC Power Cable.

SUPPORTING EQUIPMENT DESCRIPTION

Equipment Description (Including Brand Name)	Model, Serial & FCC ID Number	Cable Description (List Length, Type & Purpose)
Acer Laptop PC	M/N: Travelmate 2420 S/N: XTB205106613077CFKS00 FCC ID: DoC	2.00m unshielded power cable 2.00m communication cable
Delta Electronics Power Adapter (Laptop)	M/N: SADP-65KB D S/N: 94W0610190186 FCC ID: Verification	2.00m unshielded power cable
SeaTel Primary Handset	M/N: SAFARI-PH S/N: AVHSS1P113800071 FCC ID: Nil	1x 1m shielded telephone cord
Above Deck Unit Antenna	M/N: BGAN-FB500 S/N: 41104 FCC ID: Nil	1x 25m shielded RF cable 1x 15m shielded RF cable
Wideye Wired Telephone	M/N: SB/AH-100 S/N: Nil FCC ID: Nil	1x 1.5m telephone cable
2x 12V dc Battery	M/N: MF160G51 S/N: Nil FCC ID: Nil	2.00m unshielded battery cable

EUT OPERATING CONDITIONS

47 CFR FCC Part 15

1. Radiated Emissions (Spurious Emissions inclusive Restricted Bands Requirement)
2. Spectrum Bandwidth (6dB Bandwidth Measurement)
3. Maximum Peak Power
4. RF Conducted Spurious Emissions Emission (Non-Restricted Bands)
5. RF Conducted Spurious Emissions Emission (Restricted Bands)
6. Band Edge Compliance (Conducted)
7. Band Edge Compliance (Radiated)
8. Peak Power Spectral Density
9. Maximum Permissible Exposure

The EUT was exercised by operating in maximum continuous transmission in test mode, i.e transmitting at lower, middle and upper channels respectively at one time.



RADIATED EMISSION TEST

47 CFR FCC Part 15.205 Restricted Bands

MHz		MHz		MHz		GHz	
0.090	- 0.110	16.42	- 16.423	399.9	- 410	4.5	- 5.15
0.495	- 0.505	16.69475	- 16.69525	608	- 614	5.35	- 5.46
2.1735	- 2.1905	16.80425	- 16.80475	960	- 1240	7.25	- 7.75
4.125	- 4.128	25.5	- 25.67	1300	- 1427	8.025	- 8.5
4.17725	- 4.17775	37.5	- 38.25	1435	- 1626.5	9.0	- 9.2
4.20725	- 4.20775	73	- 74.6	1645.5	- 1646.5	9.3	- 9.5
6.215	- 6.218	74.8	- 75.2	1660	- 1710	10.6	- 12.7
6.26775	- 6.26825	108	- 121.94	1718.8	- 1722.2	13.25	- 13.4
6.31175	- 6.31225	123	- 138	2200	- 2300	14.47	- 14.5
8.291	- 8.294	149.9	- 150.05	2310	- 2390	15.35	- 16.2
8.362	- 8.366	156.52475	- 156.52525	2483.5	- 2500	17.7	- 21.4
8.37625	- 8.38675	156.7	- 156.9	2690	- 2900	22.01	- 23.12
8.41425	- 8.41475	162.0125	- 167.17	3260	- 3267	23.6	- 24.0
12.29	- 12.293	167.72	- 173.2	3332	- 3339	31.2	- 31.8
12.51975	- 12.52025	240	- 285	3345.8	- 3358	36.43	- 36.5
12.57675	- 12.57725	322	- 335.4	3600	- 4400	Above 38.6	
13.36	- 13.41						

47 CFR FCC Parts 15.109(a) and 15.209 Radiated Emission Limits

Frequency Range (MHz)	Quasi-Peak Limit Values (dBµV/m) @ 3m
30 - 88	40.0
88 - 216	43.5
216 - 960	46.0
Above 960	54.0*

* Above 1GHz, average detector was used. A peak limit of 20dB above the average limit does apply.

47 CFR FCC Parts 15.109(a) and 15.209 Radiated Emission Test Instrumentation

Test conducted on 09 – 16 May 2012

Instrument	Model	S/No	Cal Due Date
Rohde & Schwarz EMI Test Receiver (20Hz – 26.5GHz)	ESMI	849182/003 848926/007	16 Aug 2012
TDK RF Solutions Hybrid Log Periodic Antenna (30MHz-3GHz)	HLP-3003C	130238	19 Mar 2013
Sonoma Preamplifier (9kHz – 1GHz)	310N	270640	03 Jan 2013
Toyo MicroWave Preamplifier (1GHz - 18GHz)	TPA0188-36	1005	24 Jun 2012
EMCO Horn Antenna – H15	3115	0003-6088	20 May 2013
ETS Horn Antenna(18GHz-40GHz)(Ref)	3116	0004-2474	19 Apr 2013
Toyo Preamplifier (26.5GHz-40GHz)	HAP26-40W	00000005	19 Apr 2013
Micro-Tronics Bluetooth Notch Filter (Stopband 2.4 - 2.5GHz)	BRM507 01-02	007	13 Aug 2012

RADIATED EMISSION TEST

47 CFR FCC Parts 15.109(a) and 15.209 Radiated Emission Test Setup

1. The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m X 1.0m X 0.8m high, non-metallic table.
2. The filtered power supply for the EUT and supporting equipment were tapped from the appropriate power sockets located on the turntable.
3. The relevant broadband antenna was set at the required test distance away from the EUT and supporting equipment boundary.

47 CFR FCC Parts 15.109(a) and 15.209 Radiated Emission Test Method

1. The EUT was switched on and allowed to warm up to its normal operating condition.
2. A prescan was carried out to pick the worst emission frequencies from the EUT. For EUT which is a portable device, the prescan was carried out by rotating the EUT through three orthogonal axes to determine which altitude and equipment arrangement produces such emissions.
3. The test was carried out at the selected frequency points obtained from the prescan in step 2. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and adjusting the antenna height in the following manner:
 - a. Vertical or horizontal polarisation (whichever gave the higher emission level over a full rotation of the EUT) was chosen.
 - b. The EUT was then rotated to the direction that gave the maximum emission.
 - c. Finally, the antenna height was adjusted to the height that gave the maximum emission.
4. A Quasi-peak measurement was made for that frequency point if it was less than or equal to 1GHz. For frequency point that above 1GHz, both Peak and Average measurements were carried out.
5. Steps 3 and 4 were repeated for the next frequency point, until all selected frequency points were measured.
6. The frequency range covered was from 30MHz to 10th harmonics of the EUT fundamental frequency, using the Bi-log antenna for frequencies from 30MHz up to 1GHz, and the Horn antenna above 1GHz.

Sample Calculation Example

At 300 MHz Q-P limit (Class B) = 46.0 dB μ V/m

Log-periodic antenna factor & cable loss at 300 MHz = 18.5 dB

Q-P reading obtained directly from EMI Receiver = 40.0 dB μ V/m
(Calibrated level including antenna factors & cable losses)

Therefore, Q-P margin = 46.0 - 40.0 = 6.0 i.e. 6.0 dB below Q-P limit

RADIATED EMISSION TEST



Radiated Emissions Test Setup (Front View)



Radiated Emissions Test Setup (Rear View)

RADIATED EMISSION TEST

47 CFR FCC Parts 15.109(a), 15.205 and 15.209 Radiated Emission Results

Operating Mode	Continuous WIFI transmit	Temperature	18°C
Test Input Power	24Vdc (Worst Voltage)	Relative Humidity	58%
Test Distance	3m	Atmospheric Pressure	1030mbar
Data Rate	802.11g 54Mbps (Worst Rate)	Tested By	Kelvin Cheng, Jason Lai

Spurious Emissions ranging from 30MHz – 1GHz

Frequency (MHz)	Q-P Value (dBµV/m)	Q-P Limit (dBµV/m)	Q-P Margin (dB)	Height (cm)	Azimuth (Degrees)	PoI (H/V)	Channel
59.1350	31.7	40.0	8.3	104	20	V	1
84.0840	25.1	40.0	14.9	128	228	V	1
276.0020	35.4	46.0	10.6	102	332	H	1
327.5980	31.3	46.0	14.7	102	225	H	1
875.1070	24.4	46.0	21.6	113	325	V	1
968.7140	17.9	54.0	36.1	275	8	H	1

Spurious Emissions above 1GHz

Freq (GHz)	Peak Value (dBµV/m)	Peak Limit (dBµV/m)	Peak Margin (dB)	AV Value (dBµV/m)	AV Limit (dBµV/m)	AV Margin (dB)	Height (cm)	Azimuth (Degrees)	PoI (H/V)	Ch
8.8549	57.0	74.0	17.0	43.2	54.0	10.8	101	172	V	1
10.6729	56.4	74.0	17.6	43.0	54.0	11.0	398	13	V	1
13.5009	62.7	74.0	11.3	49.7	54.0	4.3	275	61	V	1
14.1069	63.1	74.0	10.9	49.8	54.0	4.2	101	304	H	1
16.5578	60.5	74.0	13.5	47.4	54.0	6.6	101	231	H	1
17.8910	66.9	74.0	7.1	53.8	54.0	0.2	399	28	V	1

Spurious Emissions above 1GHz

Freq (GHz)	Peak Value (dBµV/m)	Peak Limit (dBµV/m)	Peak Margin (dB)	AV Value (dBµV/m)	AV Limit (dBµV/m)	AV Margin (dB)	Height (cm)	Azimuth (Degrees)	PoI (H/V)	Ch
1.8403	45.9	74.0	28.1	35.9	54.0	18.1	137	195	V	6
1.8457	43.7	74.0	30.3	33.7	54.0	20.3	101	359	V	6
2.3326	46.6	74.0	27.4	36.6	54.0	17.4	370	336	V	6
2.5161	47.1	74.0	26.9	37.1	54.0	16.9	289	102	V	6
2.5768	48.2	74.0	25.8	38.2	54.0	15.8	203	149	V	6
4.2968	54.2	74.0	19.8	34.2	54.0	19.8	152	335	V	6

RADIATED EMISSION TEST

47 CFR FCC Parts 15.109(a), 15.205 and 15.209 Radiated Emission Results

Spurious Emissions above 1GHz

Freq (GHz)	Peak Value (dBµV/m)	Peak Limit (dBµV/m)	Peak Margin (dB)	AV Value (dBµV/m)	AV Limit (dBµV/m)	AV Margin (dB)	Height (cm)	Azimuth (Degrees)	PoI (H/V)	Ch
1.0110	41.1	74.0	32.9	31.1	54.0	22.9	101	102	H	11
1.8403	45.9	74.0	28.1	35.9	54.0	18.1	137	195	V	11
1.8457	43.7	74.0	30.3	33.7	54.0	20.3	101	359	V	11
2.3326	46.6	74.0	27.4	36.6	54.0	17.4	370	336	V	11
2.5161	47.1	74.0	26.9	37.1	54.0	16.9	289	102	V	11
2.5768	48.2	74.0	25.8	38.2	54.0	15.8	203	149	V	11

Notes

- All possible modes of operation were investigated. Only the worst case emissions measured, using the correct CISPR detectors, are reported. All other emissions were relatively insignificant.
- Quasi-peak measurement was used for frequency measurement up to 1GHz. Average and peak measurements were used for emissions above 1GHz. The average measurement was done by measuring the absolute voltage during a 0.1 second interval during which the field strength is at its maximum value.
- A "positive" margin indicates a PASS as it refers to the margin present below the limit line at the particular frequency. Conversely, a "negative" margin indicates a FAIL.
- EMI receiver Resolution Bandwidth (RBW) and Video Bandwidth (VBW) settings:
30MHz - 1GHz
RBW: 120kHz VBW: 1MHz
>1GHz
RBW: 1MHz VBW: 1MHz
- The upper frequency of radiated emission investigations was according to requirements stated in Section 15.33(a) for intentional radiators & Section 15.33(b) for unintentional radiators.
- The channel in the table refers to the transmit channel of the EUT.
- Radiated Emissions Measurement Uncertainty
All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95%, with a coverage factor of 2, in the range 30MHz – 25GHz is ±4.0dB.

SPECTRUM BANDWIDTH (6dB BANDWIDTH MEASUREMENT) TEST

47 CFR FCC Part 15.247(a)(2) Spectrum Bandwidth (6dB Bandwidth Measurement) Limits

The EUT shows compliance to the requirements of this section, which states that the minimum bandwidth of the EUT employing digital modulation techniques shall be at least 500kHz.

47 CFR FCC Part 15.247(a)(2) Spectrum Bandwidth (6dB Bandwidth Measurement) Test Instrumentation

Instrument	Model	S/No	Cal Due Date
Agilent EMC Analyzer (9kHz-26.5GHz)	E7405A	US40240195	16 Mar 2013
GW Instek Programmable Power Supply	PSH-3630A	RK200168	30 Jan 2013

47 CFR FCC Part 15.247(a)(2) Spectrum Bandwidth (6dB Bandwidth Measurement) Test Setup

1. The EUT and supporting equipment were set up as shown in the setup photo.
2. The power supply for the EUT was connected to a filtered mains.
3. The RF antenna connector was connected to the spectrum analyser via a low-loss coaxial cable.
4. The resolution bandwidth (RBW) and the video bandwidth (VBW) of the spectrum analyser were respectively set to the following:
RBW = 1% - 5% of emission bandwidth (EBW)
VBW = 3 times RBW
5. All other supporting equipment were powered separately from another filtered mains.

47 CFR FCC Part 15.247(a)(2) Spectrum Bandwidth (6dB Bandwidth Measurement) Test Method

1. The EUT was switched on and allowed to warm up to its normal operating condition. The EUT was then configured to operate in the test mode at lower channel with specified modulation and data rate.
2. The center frequency of the spectrum analyser was set to the transmitting frequency with the frequency span wide enough to capture the 6dB bandwidth of the transmitting frequency.
3. The spectrum analyser was set to max hold to capture the transmitting frequency. The signal capturing was continuous until no further changes were observed.
4. The peak of the transmitting frequency was detected with the marker peak function of the spectrum analyser. The frequencies below the 6dB peak frequency at lower (f_L) and upper (f_H) sides of the transmitting frequency were marked and measured by using the marker-delta function of the spectrum analyser.
5. The 6dB bandwidth of the transmitting frequency is the frequency difference between the marked lower and upper frequencies, $|f_H - f_L|$.
6. Repeat steps 1 to 5 with all possible modulations and data rates.
7. The steps 2 to 6 were repeated with the transmitting frequency was set to middle and upper channel respectively.

SPECTRUM BANDWIDTH (6dB BANDWIDTH MEASUREMENT) TEST



Spectrum Bandwidth (6dB Bandwidth Measurement) Test Setup



SPECTRUM BANDWIDTH (6dB BANDWIDTH MEASUREMENT) TEST

47 CFR FCC Part 15.247(a)(2) Spectrum Bandwidth (6dB Bandwidth Measurement) Results

Test Input Power	24Vdc (Worst Voltage)	Temperature	24°C
Attached Plots	1 – 12	Relative Humidity	54%
		Atmospheric Pressure	1027mbar
		Tested By	Kyaw Soe Hein

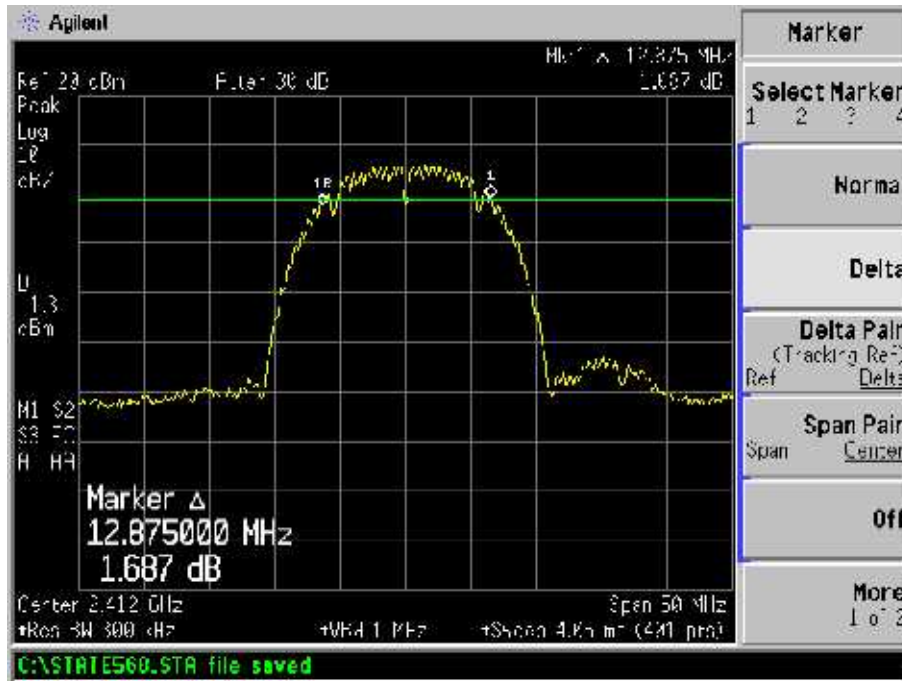
Channel	Channel Frequency (GHz)	6dB Bandwidth (MHz)	Modulation @ Data Rate
1	2.412	12.875	DBPSK @ 1Mbps
		13.125	DQPSK @ 2Mbps
		12.625	CCK @ 5.5Mbps
		12.125	CCK @ 11Mbps
6	2.437	12.875	DBPSK @ 1Mbps
		13.125	DQPSK @ 2Mbps
		12.500	CCK @ 5.5Mbps
		12.250	CCK @ 11Mbps
11	2.462	12.625	DBPSK @ 1Mbps
		12.875	DQPSK @ 2Mbps
		12.375	CCK @ 5.5Mbps
		12.375	CCK @ 11Mbps

Test Input Power	24Vdc (Worst Voltage)	Temperature	24°C
Attached Plots	13 – 24	Relative Humidity	54%
		Atmospheric Pressure	1027mbar
		Tested By	Kyaw Soe Hein

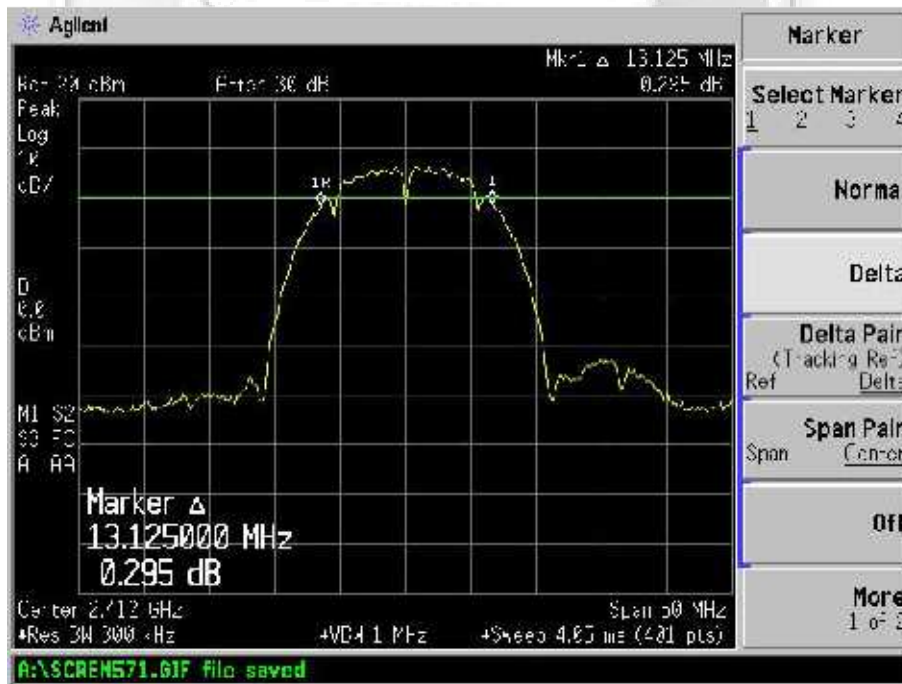
Channel	Channel Frequency (GHz)	6dB Bandwidth (MHz)	802.11g Modulation @ Data Rate
1	2.412	16.625	BPSK @ 9Mbps
		16.625	QPSK @ 18Mbps
		16.625	16QAM @ 36Mbps
		16.625	64QAM @ 54Mbps
6	2.437	16.750	BPSK @ 9Mbps
		16.625	QPSK @ 18Mbps
		16.750	16QAM @ 36Mbps
		16.875	64QAM @ 54Mbps
11	2.462	16.500	BPSK @ 9Mbps
		16.750	QPSK @ 18Mbps
		16.750	16QAM @ 36Mbps
		16.750	64QAM @ 54Mbps

SPECTRUM BANDWIDTH (6dB BANDWIDTH MEASUREMENT) TEST

Spectrum Bandwidth (6dB Bandwidth Measurement) Plots – 802.11b



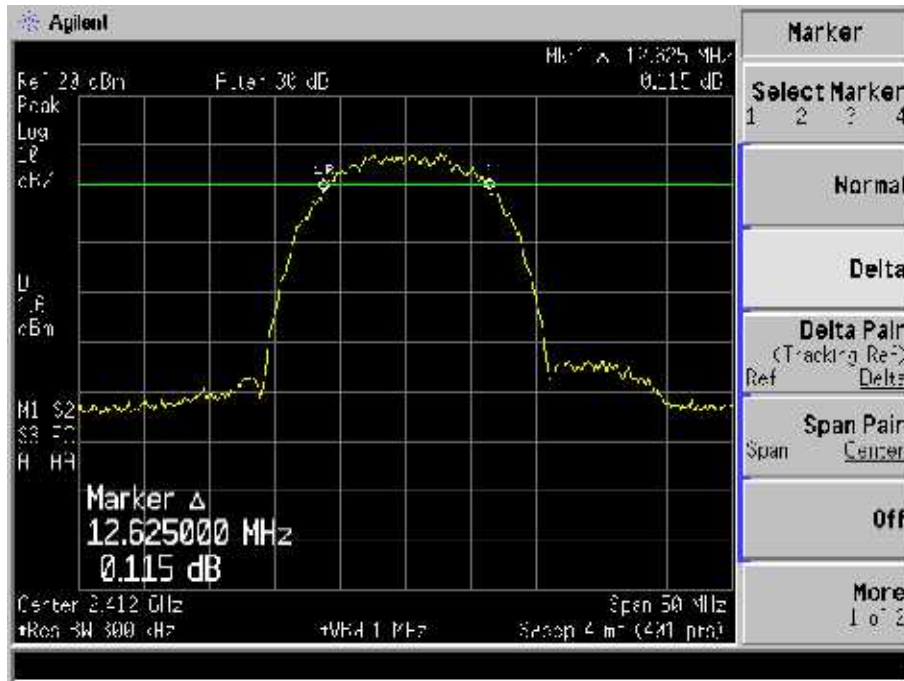
Plot 1 - Channel 1 @ DBPSK 1Mbps



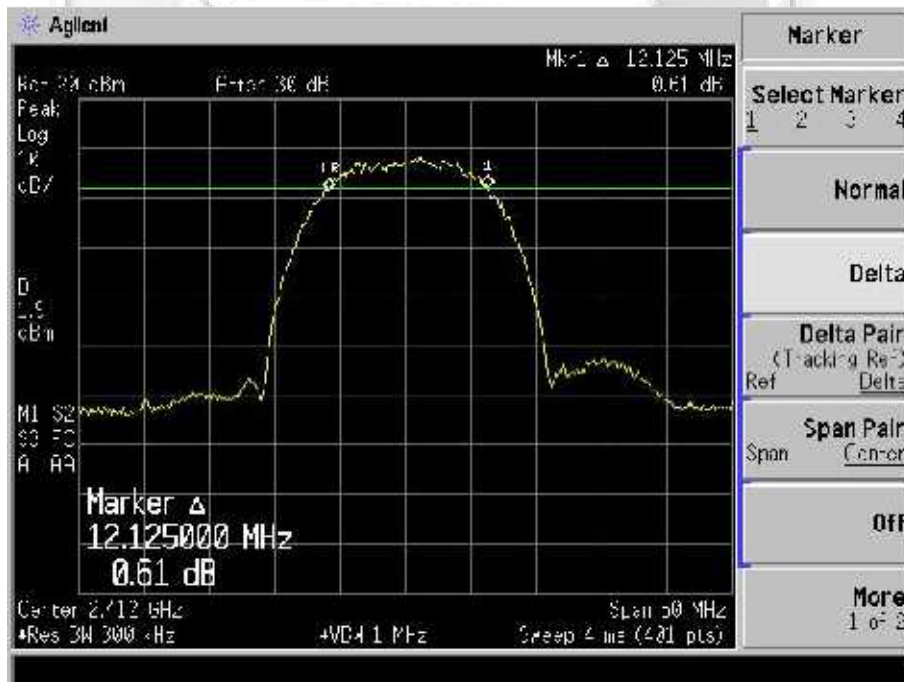
Plot 2 - Channel 1 @ DQPSK 2Mbps

SPECTRUM BANDWIDTH (6dB BANDWIDTH MEASUREMENT) TEST

Spectrum Bandwidth (6dB Bandwidth Measurement) Plots – 802.11b



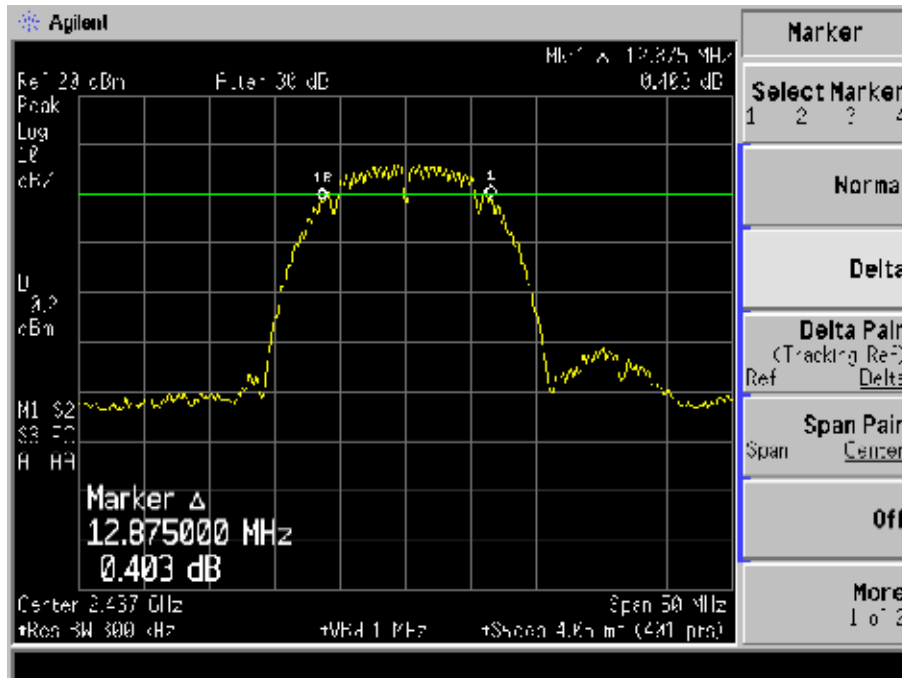
Plot 3 - Channel 1 @ CCK 5.5Mbps



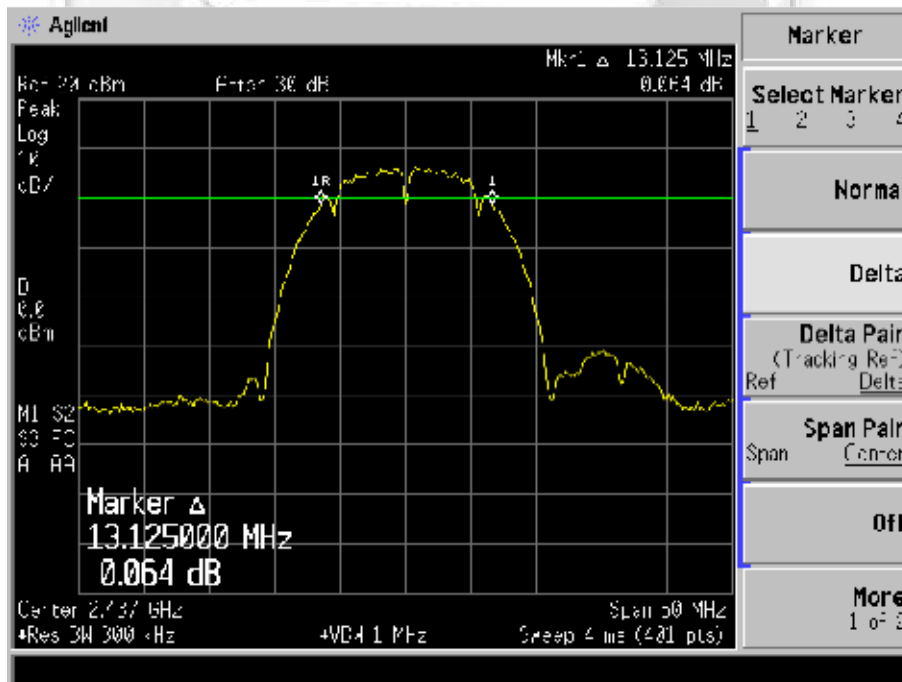
Plot 4 - Channel 1 @ CCK 11Mbps

SPECTRUM BANDWIDTH (6dB BANDWIDTH MEASUREMENT) TEST

Spectrum Bandwidth (6dB Bandwidth Measurement) Plots – 802.11b



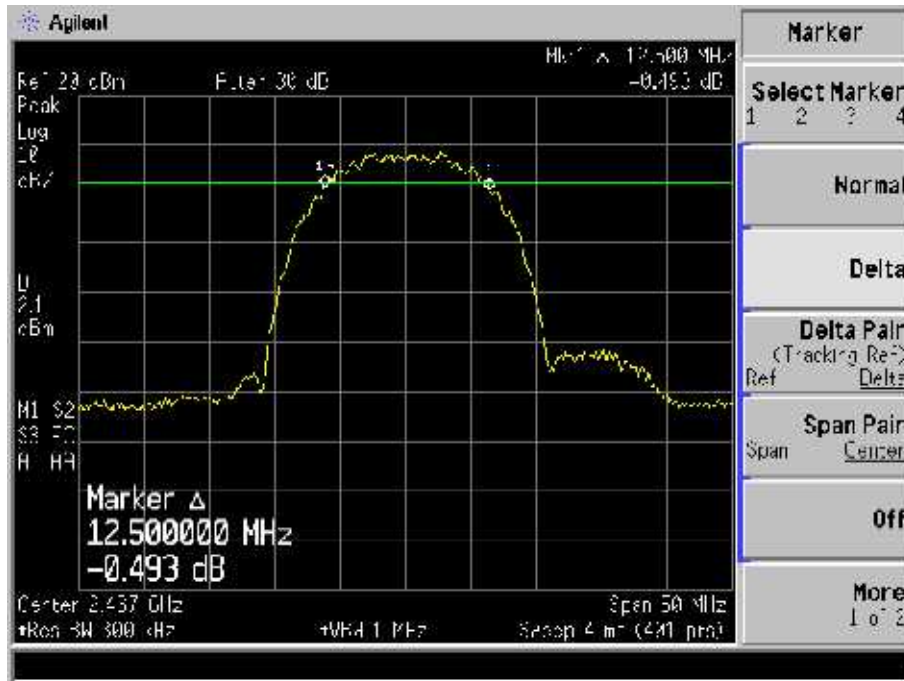
Plot 5 - Channel 6 @ DBPSK 1Mbps



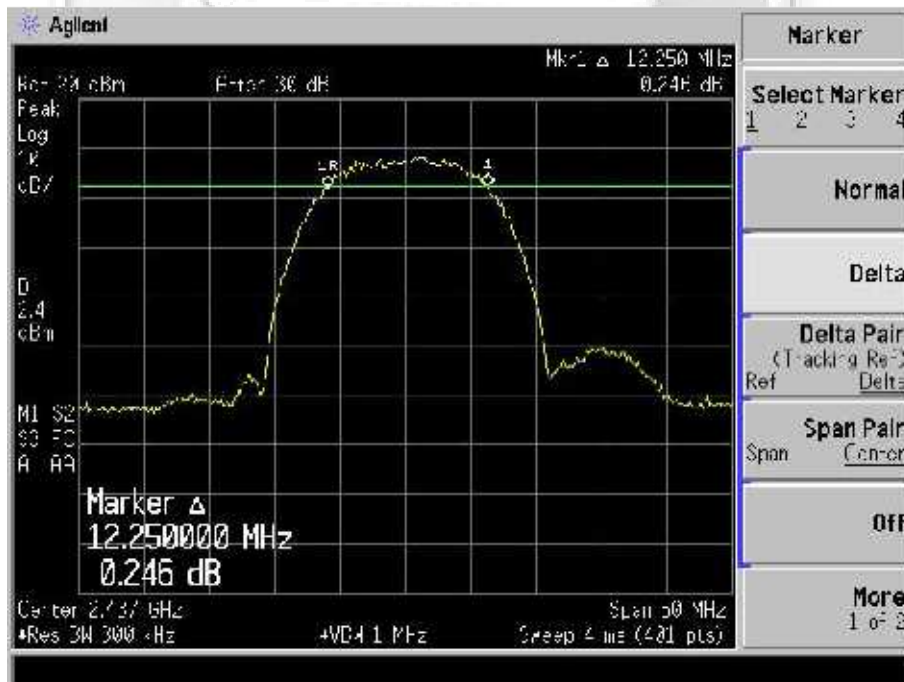
Plot 6 - Channel 6 @ DQPSK 2Mbps

SPECTRUM BANDWIDTH (6dB BANDWIDTH MEASUREMENT) TEST

Spectrum Bandwidth (6dB Bandwidth Measurement) Plots – 802.11b



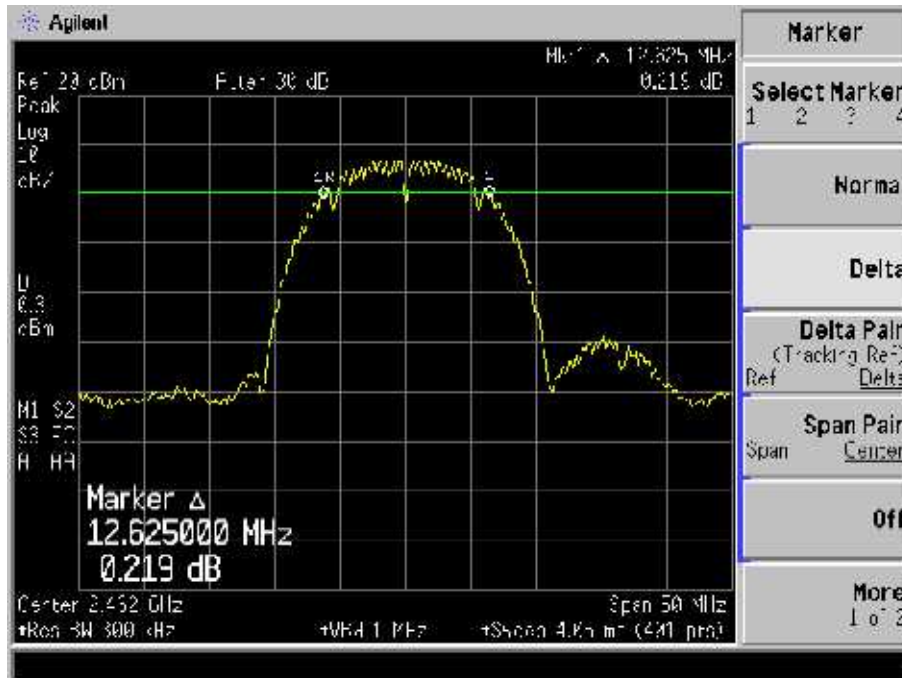
Plot 7 - Channel 6 @ CCK 5.5Mbps



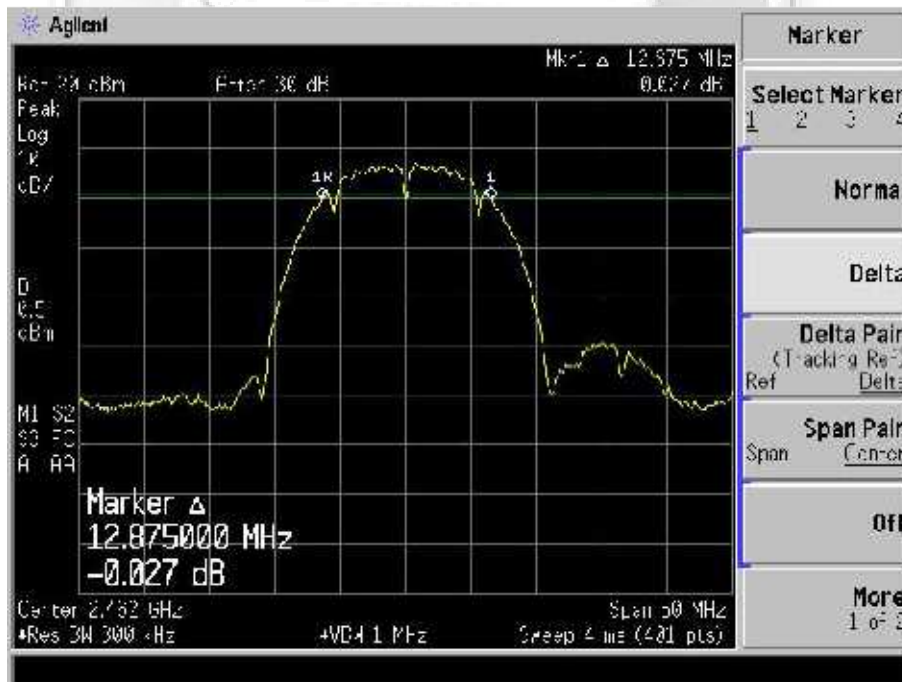
Plot 8 - Channel 6 @ CCK 11Mbps

SPECTRUM BANDWIDTH (6dB BANDWIDTH MEASUREMENT) TEST

Spectrum Bandwidth (6dB Bandwidth Measurement) Plots – 802.11b



Plot 9 - Channel 11 @ DBPSK 1Mbps

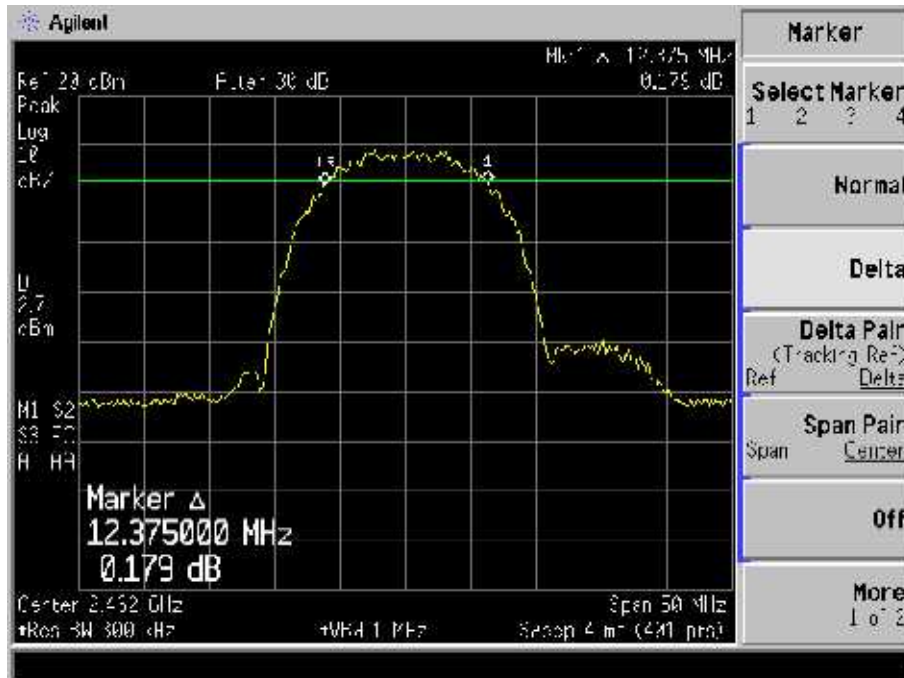


Plot 10 - Channel 11 @ DQPSK 2Mbps

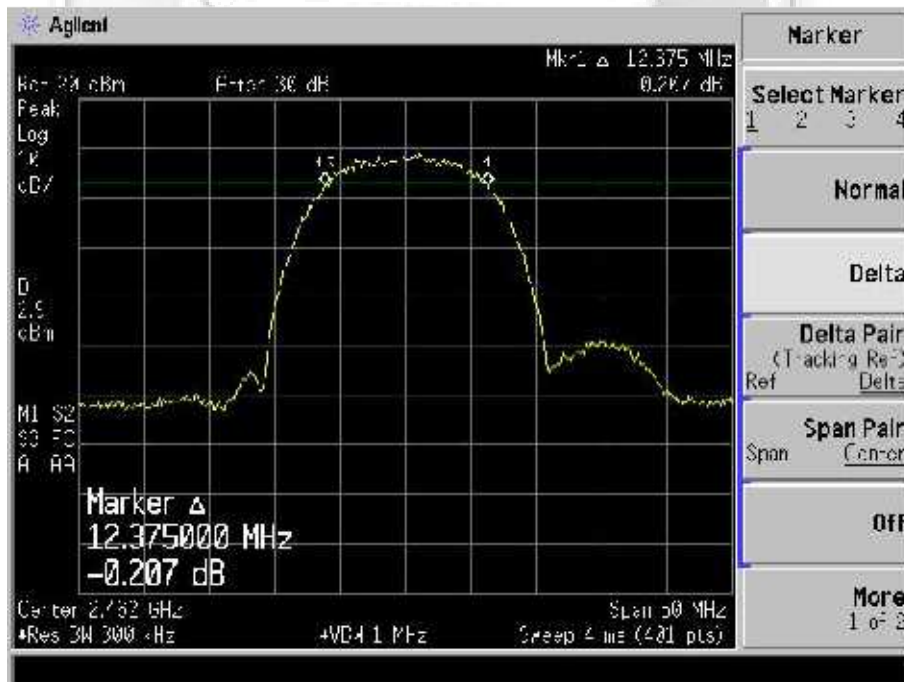


SPECTRUM BANDWIDTH (6dB BANDWIDTH MEASUREMENT) TEST

Spectrum Bandwidth (6dB Bandwidth Measurement) Plots – 802.11b



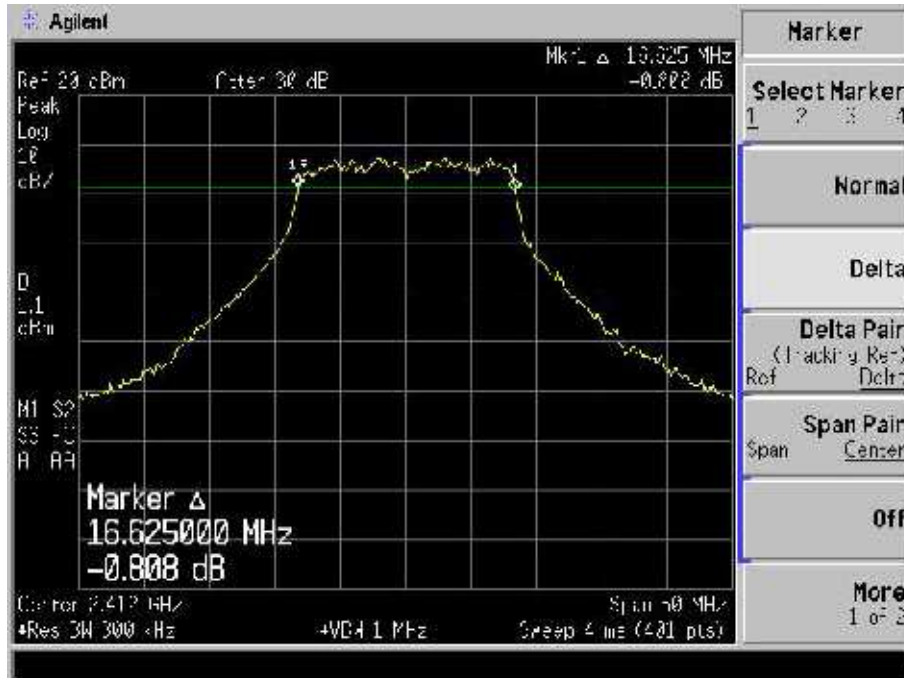
Plot 11 - Channel 11 @ CCK 5.5Mbps



Plot 12 - Channel 11 @ CCK 11Mbps

SPECTRUM BANDWIDTH (6dB BANDWIDTH MEASUREMENT) TEST

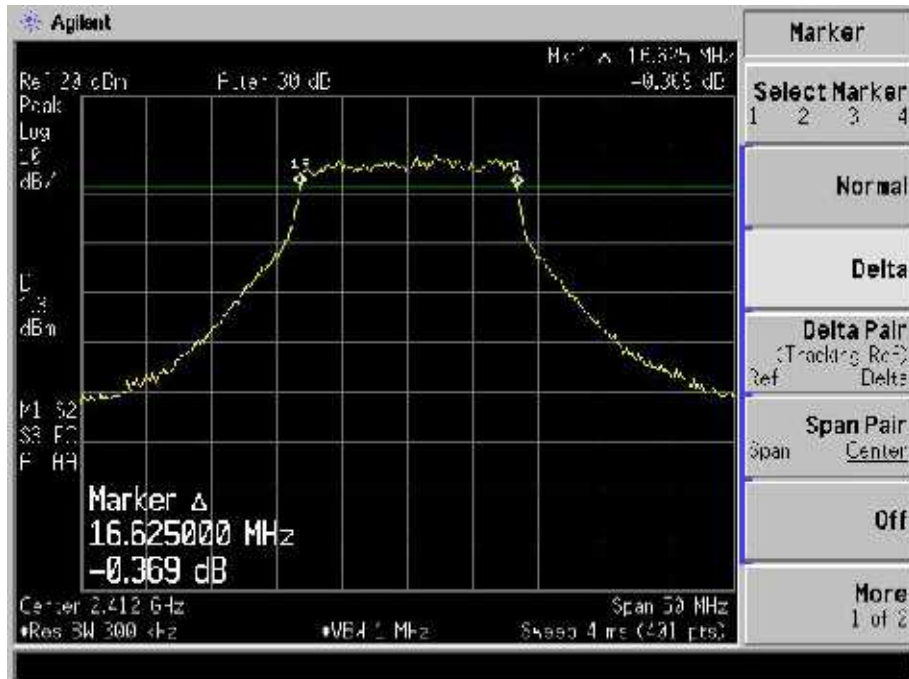
Spectrum Bandwidth (6dB Bandwidth Measurement) Plots – 802.11g



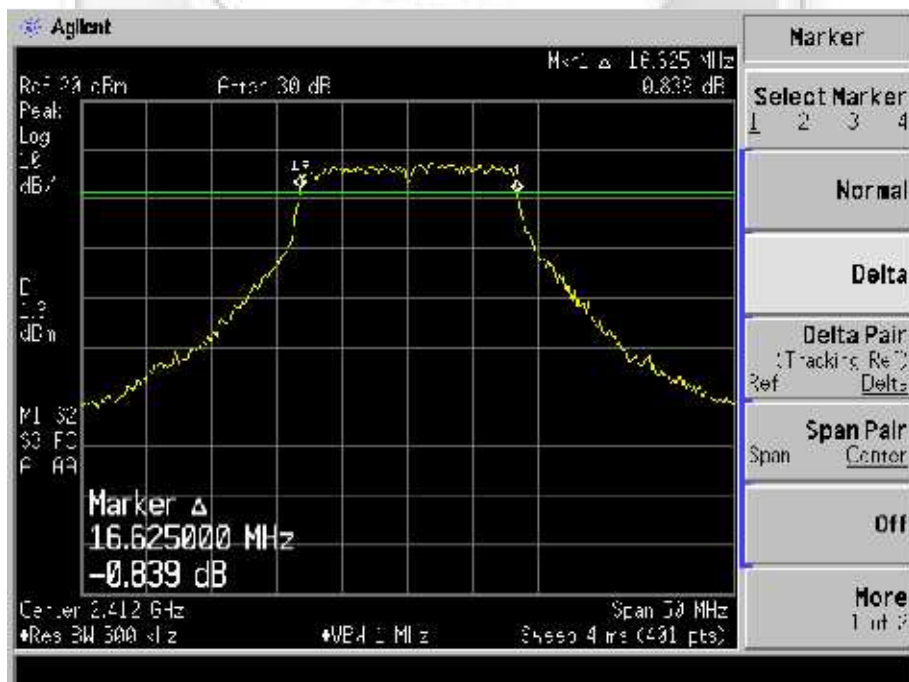


SPECTRUM BANDWIDTH (6dB BANDWIDTH MEASUREMENT) TEST

Spectrum Bandwidth (6dB Bandwidth Measurement) Plots – 802.11g



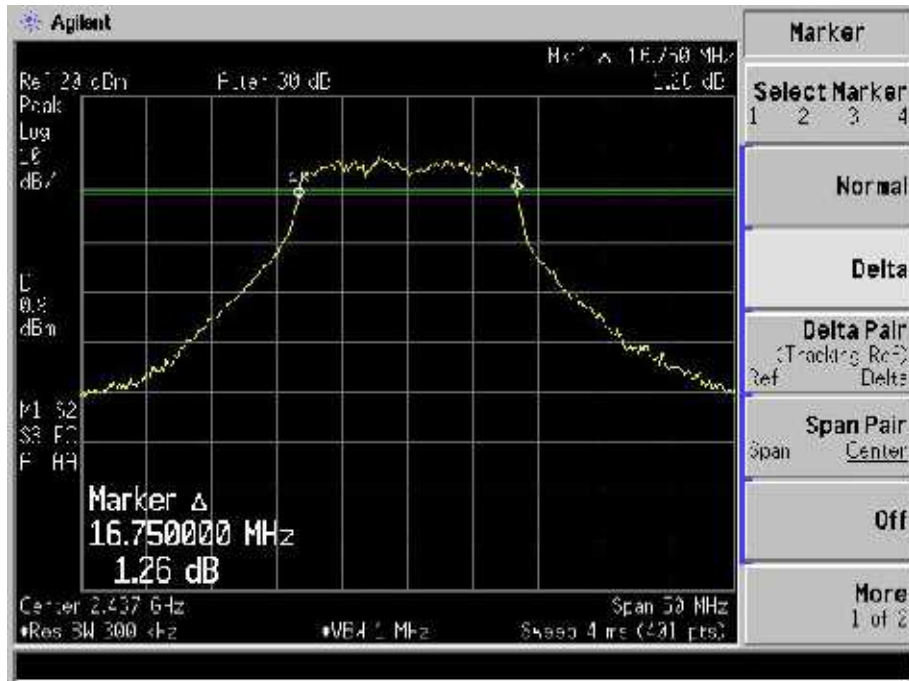
Plot 15 - Channel 1 @ 16QAM 36Mbps



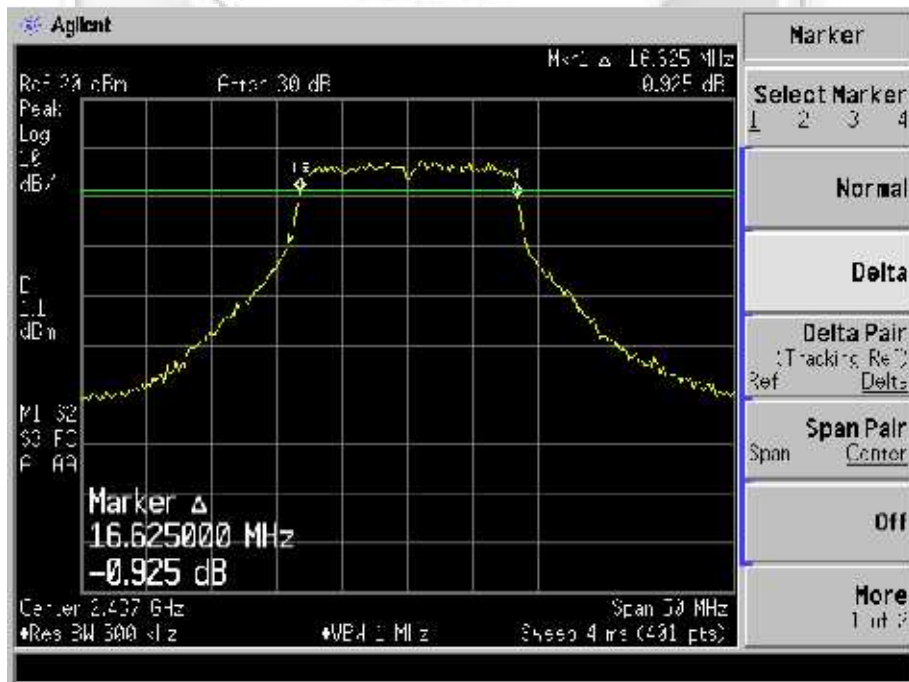
Plot 16 - Channel 1 @ 64QAM 54Mbps

SPECTRUM BANDWIDTH (6dB BANDWIDTH MEASUREMENT) TEST

Spectrum Bandwidth (6dB Bandwidth Measurement) Plots – 802.11g



Plot 17 - Channel 6 @ BPSK 9Mbps

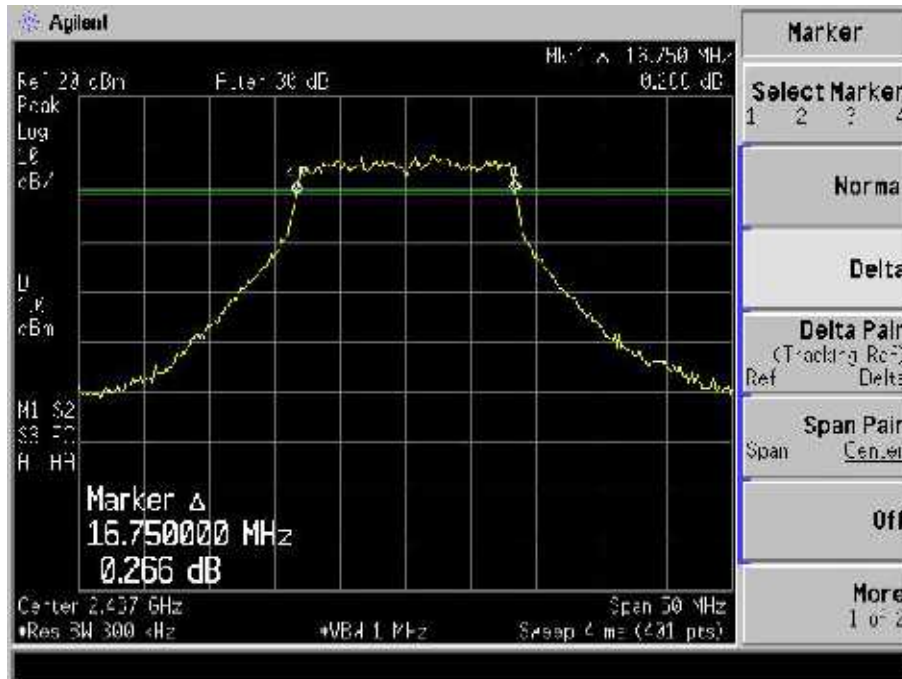


Plot 18 - Channel 6 @ QPSK 18Mbps

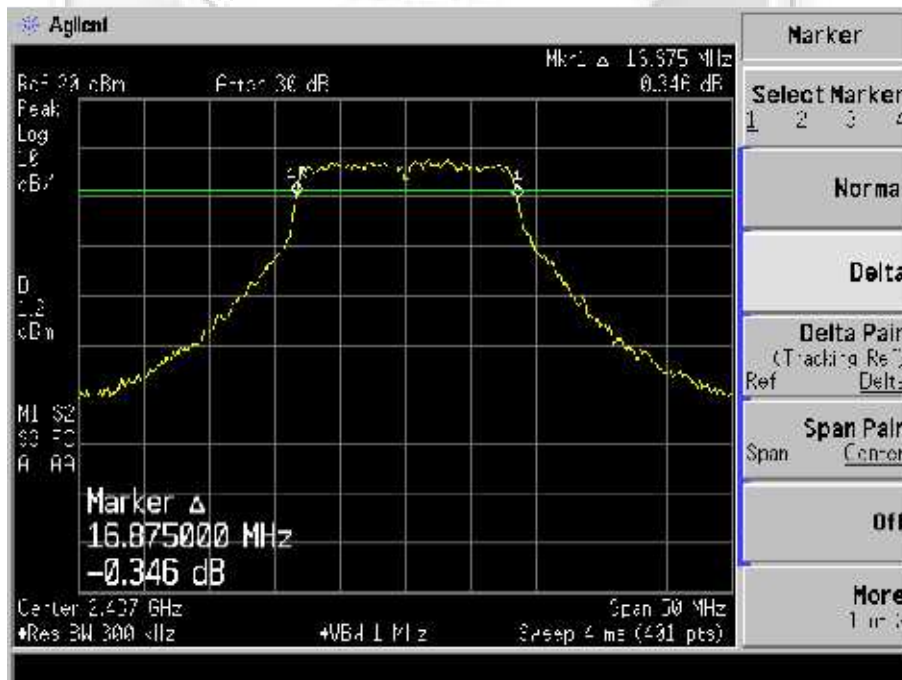


SPECTRUM BANDWIDTH (6dB BANDWIDTH MEASUREMENT) TEST

Spectrum Bandwidth (6dB Bandwidth Measurement) Plots – 802.11g



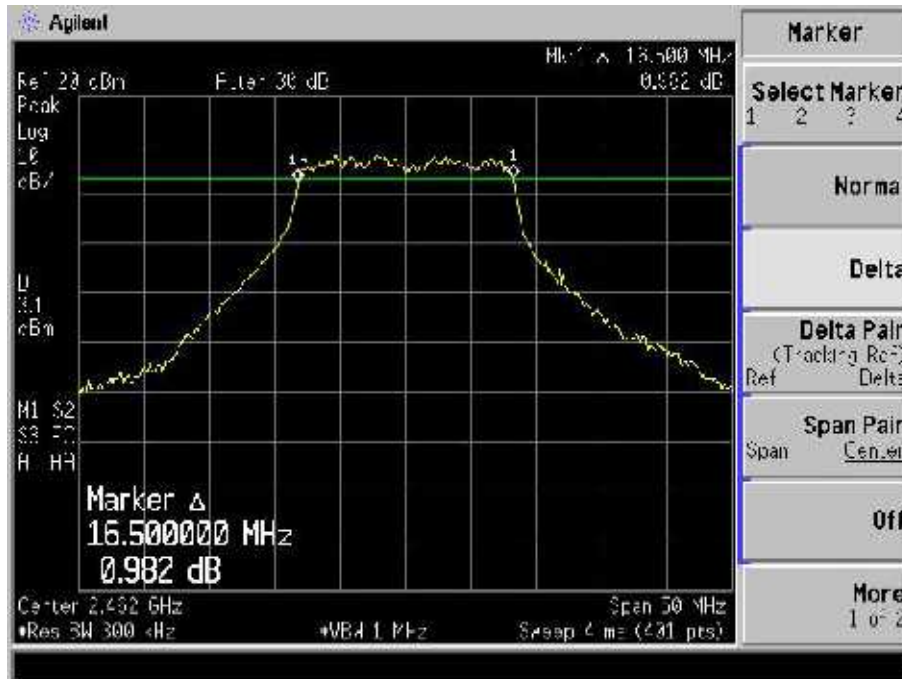
Plot 19 - Channel 6 @ 16QAM 36Mbps



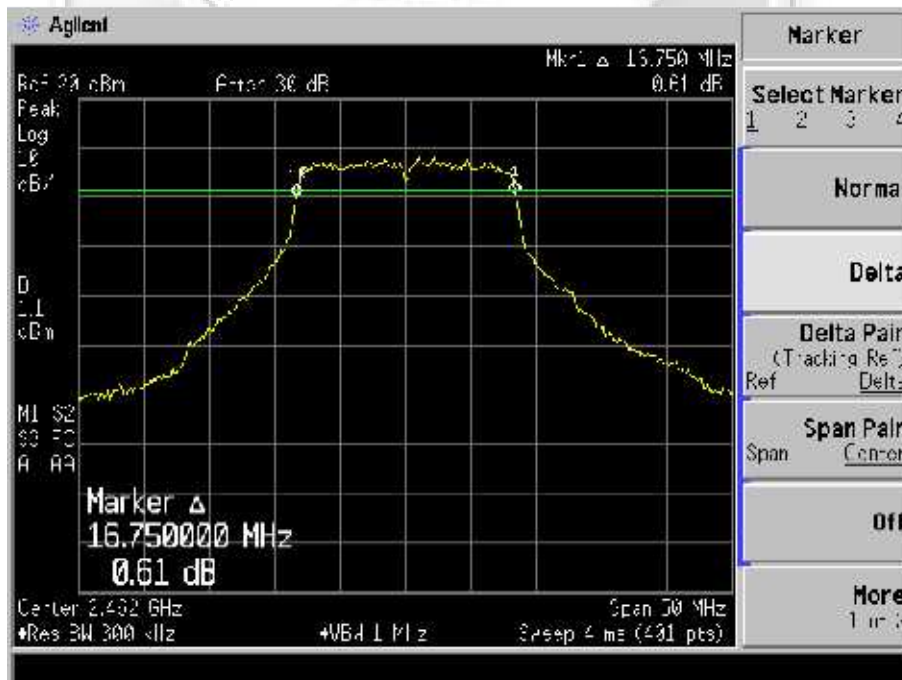
Plot 20 - Channel 6 @ 64QAM 54Mbps

SPECTRUM BANDWIDTH (6dB BANDWIDTH MEASUREMENT) TEST

Spectrum Bandwidth (6dB Bandwidth Measurement) Plots – 802.11g



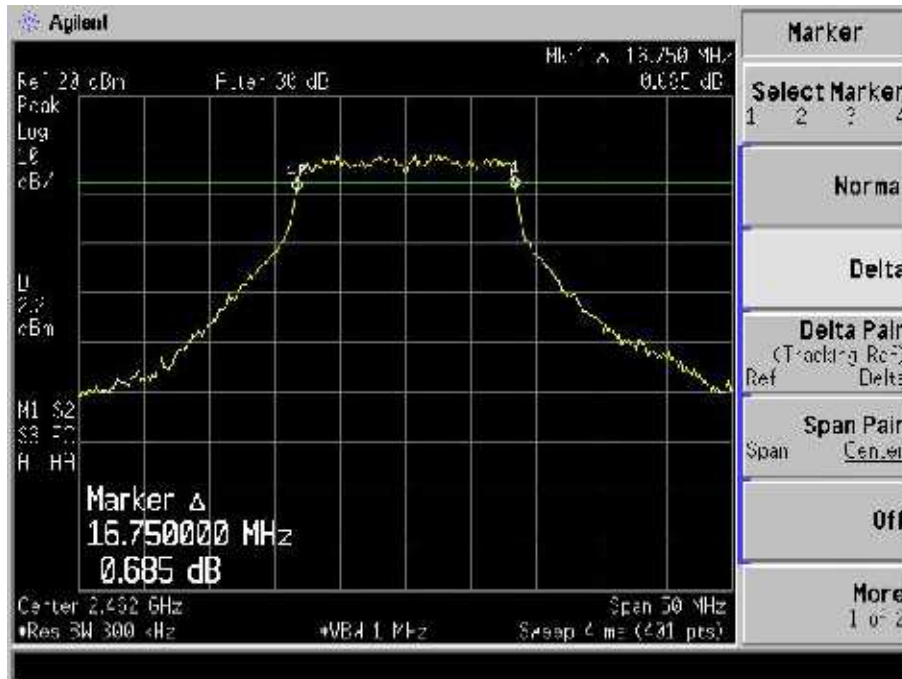
Plot 21 - Channel 11 @ BPSK 9Mbps



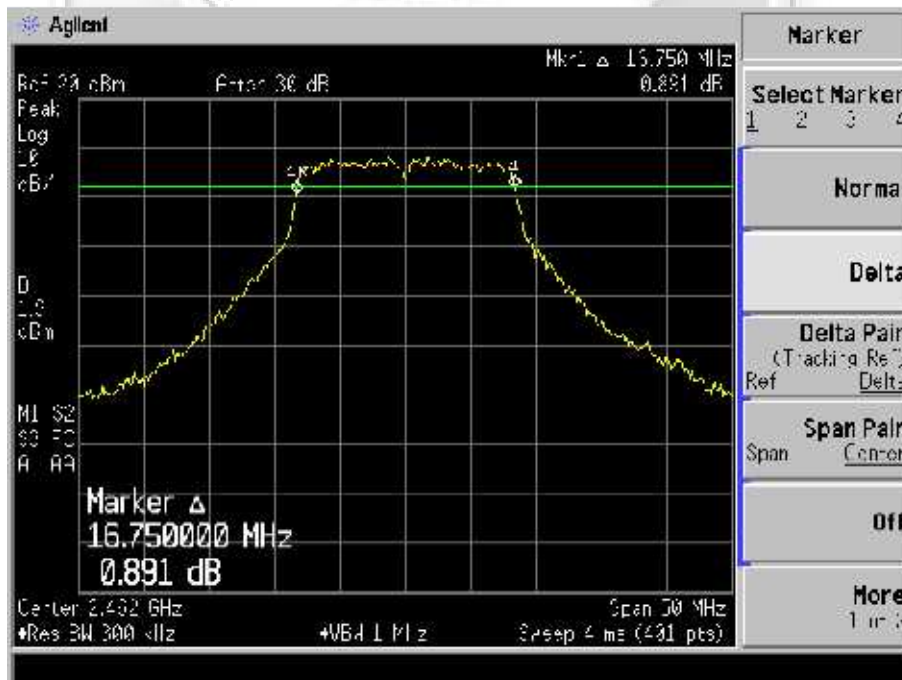
Plot 22 - Channel 11 @ QPSK 18Mbps

SPECTRUM BANDWIDTH (6dB BANDWIDTH MEASUREMENT) TEST

Spectrum Bandwidth (6dB Bandwidth Measurement) Plots – 802.11g



Plot 23 - Channel 11 @ 16QAM 36Mbps



Plot 24 - Channel 11 @ 64QAM 54Mbps

MAXIMUM PEAK POWER TEST

47 CFR FCC Part 15.247(b)(3) Maximum Peak Power Limits

The EUT shows compliance to the requirements of this section, which states the maximum peak power of the EUT employing digital modulation shall not exceed 1W (30dBm).

47 CFR FCC Part 15.247(b)(3) Maximum Peak Power Test Instrumentation

Instrument	Model	S/No	Cal Due Date
Boonton RF Power Meter	4532	72901	25 May 2013
Boonton Power Sensor	56218-S/1	1417	25 May 2013
GW Instek Programmable Power Supply	PSH-3630A	RK200168	30 Jan 2013

47 CFR FCC Part 15.247(b)(3) Maximum Peak Power Test Setup

1. The EUT and supporting equipment were set up as shown in the setup photo.
2. The power supply for the EUT was connected to a filtered mains.
3. The RF antenna connector was connected to the power meter.
4. All other supporting equipment were powered separately from another filtered mains.

47 CFR FCC Part 15.247(b)(3) Maximum Peak Power Test Method

1. The EUT was switched on and allowed to warm up to its normal operating condition. The EUT was then configured to operate in the test mode at lower channel with specified modulation and data rate.
2. The maximum peak power of the transmitting frequency was detected and recorded.
3. Repeat steps 1 to 2 with all possible modulations and data rates.
4. The steps 2 to 3 were repeated with the transmitting frequency was set to middle and upper respectively.

MAXIMUM PEAK POWER TEST



Maximum Peak Power Test Setup



MAXIMUM PEAK POWER TEST

47 CFR FCC Part 15.247(b)(3) Maximum Peak Power Results

Test Input Power	24Vdc (Worst Voltage)	Temperature	24°C
Antenna Gain	0.0 dBi	Relative Humidity	54%
		Atmospheric Pressure	1027mbar
		Tested By	Kyaw Soe Hein

Channel	Channel Frequency (GHz)	Maximum Peak Power (W)	Limit (W)	Modulation @ Data Rate
1	2.412	0.0340	1.0	DBPSK @ 1Mbps
		0.0325	1.0	DQPSK @ 2Mbps
		0.0323	1.0	CCK @ 5.5Mbps
		0.0327	1.0	CCK @ 11Mbps
6	2.437	0.0326	1.0	DBPSK @ 1Mbps
		0.0333	1.0	DQPSK @ 2Mbps
		0.0338	1.0	CCK @ 5.5Mbps
		0.0326	1.0	CCK @ 11Mbps
11	2.462	0.0305	1.0	DBPSK @ 1Mbps
		0.0312	1.0	DQPSK @ 2Mbps
		0.0331	1.0	CCK @ 5.5Mbps
		0.0320	1.0	CCK @ 11Mbps

Channel	Channel Frequency (GHz)	Maximum Peak Power (W)	Limit (W)	802.11g Modulation @ Data Rate
1	2.412	0.0340	1.0	BPSK @ 9Mbps
		0.0342	1.0	QPSK @ 18Mbps
		0.0336	1.0	16QAM @ 36Mbps
		0.0333	1.0	64QAM @ 54Mbps
6	2.437	0.0350	1.0	BPSK @ 9Mbps
		0.0347	1.0	QPSK @ 18Mbps
		0.0339	1.0	16QAM @ 36Mbps
		0.0340	1.0	64QAM @ 54Mbps
11	2.462	0.0344	1.0	BPSK @ 9Mbps
		0.0341	1.0	QPSK @ 18Mbps
		0.0333	1.0	16QAM @ 36Mbps
		0.0332	1.0	64QAM @ 54Mbps

Notes

1. Nil.

RF CONDUCTED SPURIOUS EMISSIONS (NON-RESTRICTED BANDS) TEST

47 CFR FCC Part 15.247(d) RF Conducted Spurious Emissions (Non-Restricted Bands) Limits

The EUT shows compliance to the requirements of this section, which states in any 100kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator (EUT) is operating, the radio frequency power that is produced by the EUT shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of desired power.

47 CFR FCC Part 15.247(d) RF Conducted Spurious Emissions (Non-Restricted Bands) Test Instrumentation

Instrument	Model	S/No	Cal Due Date
Agilent EMC Analyzer (9kHz-26.5GHz)	E7405A	US40240195	16 Mar 2013
GW Instek Programmable Power Supply	PSH-3630A	RK200168	30 Jan 2013

47 CFR FCC Part 15.247(d) RF Conducted Spurious Emissions (Non-Restricted Bands) Test Setup

1. The EUT and supporting equipment were set up as shown in the setup photo.
2. The power supply for the EUT was connected to a filtered mains.
3. The RF antenna connector was connected to the spectrum analyser via a low-loss coaxial cable.
4. The resolution bandwidth (RBW) and the video bandwidth (VBW) of the spectrum analyser were respectively set to 100kHz and 300kHz.
5. All other supporting equipment were powered separately from another filtered mains.

47 CFR FCC Part 15.247(d) RF Conducted Spurious Emissions (Non-Restricted Bands) Test Method

1. The EUT was switched on and allowed to warm up to its normal operating condition. The EUT was then configured to operate in the test mode, with the transmitting frequency was set to lower channel with specified modulation and data rate.
2. The start and stop frequencies of the spectrum analyser were set to 30MHz and 10GHz.
3. The spectrum analyser was set to max hold to capture any spurious emissions within the span. The signal capturing was continuous until no further spurious emissions were detected.
4. The steps 2 to 3 were repeated with frequency span was set from 10GHz to 25GHz.
5. Repeat steps 1 to 4 with all possible modulations and data rates.
6. The steps 2 to 5 were repeated with the transmitting frequency was set to middle and upper channel respectively.

RF CONDUCTED SPURIOUS EMISSIONS (NON-RESTRICTED BANDS) TEST



RF Conducted Spurious Emissions (Non-Restricted Bands) Test Setup

47 CFR FCC Part 15.247(d) RF Conducted Spurious Emissions (Non-Restricted Bands) Results

Test Input Power	24Vdc (Worst Voltage)	Temperature	24°C
Attached Plots	25 – 48 (802.11b)	Relative Humidity	54%
		Atmospheric Pressure	1027mbar
		Tested By	Kyaw Soe Hein

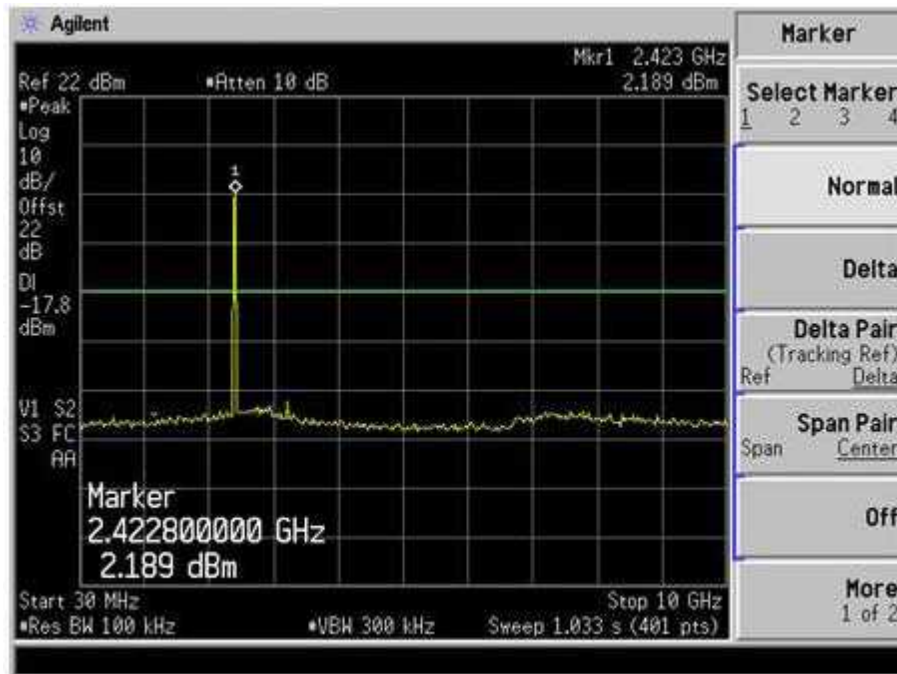
All spurious signals found were below the specified limit. Please refer to the attached plots.

Test Input Power	24Vdc (Worst Voltage)	Temperature	24°C
Attached Plots	49 – 72 (802.11g)	Relative Humidity	54%
		Atmospheric Pressure	1027mbar
		Tested By	Kyaw Soe Hein

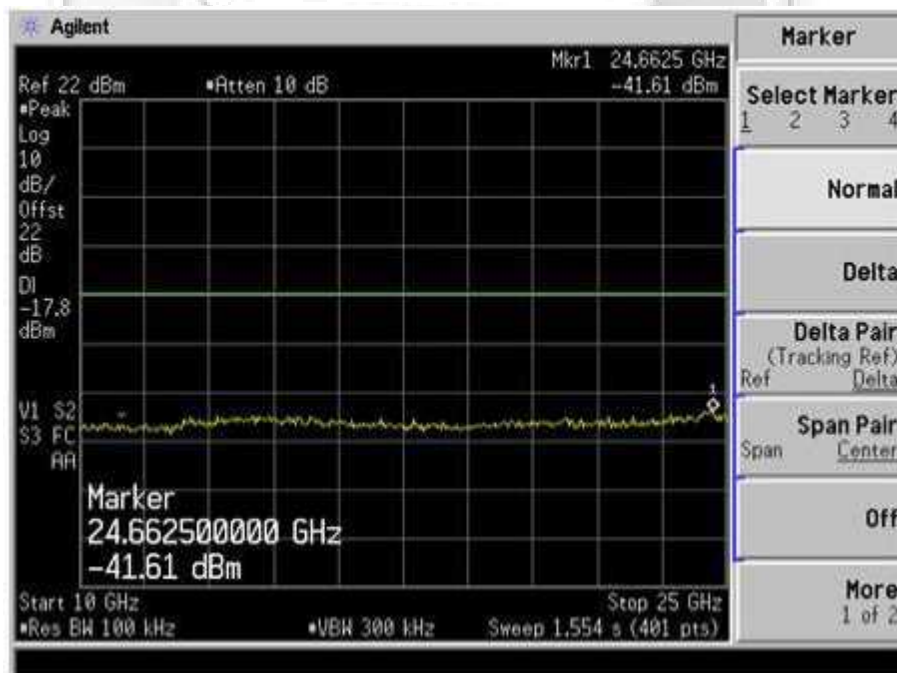
All spurious signals found were below the specified limit. Please refer to the attached plots.

RF CONDUCTED SPURIOUS EMISSIONS (NON-RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Non-Restricted Bands) Plots – 802.11b



Plot 25 – Channel 1 @DBPSK 1Mbps

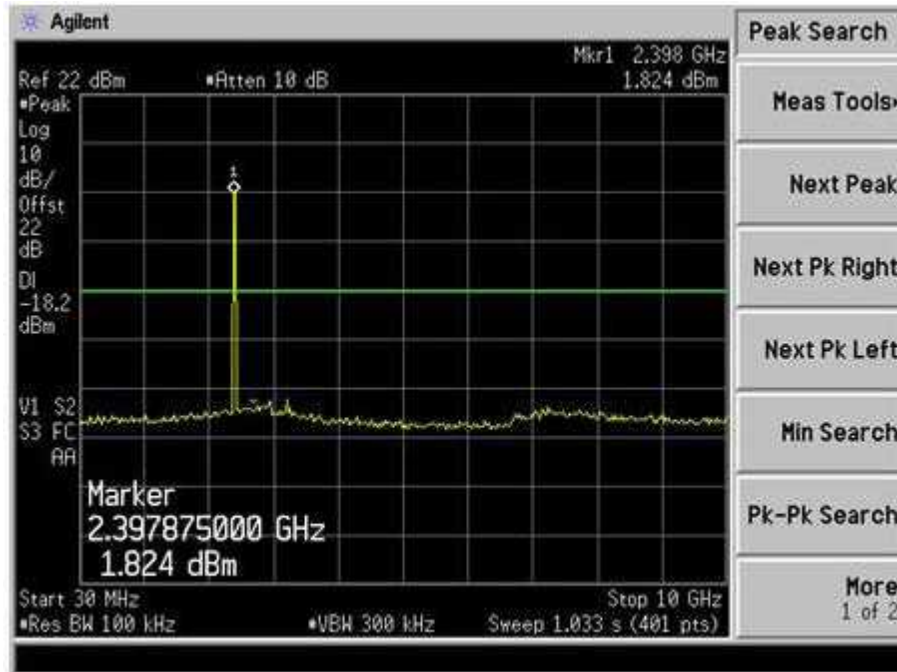


Plot 26 – Channel 1 @DBPSK 1Mbps

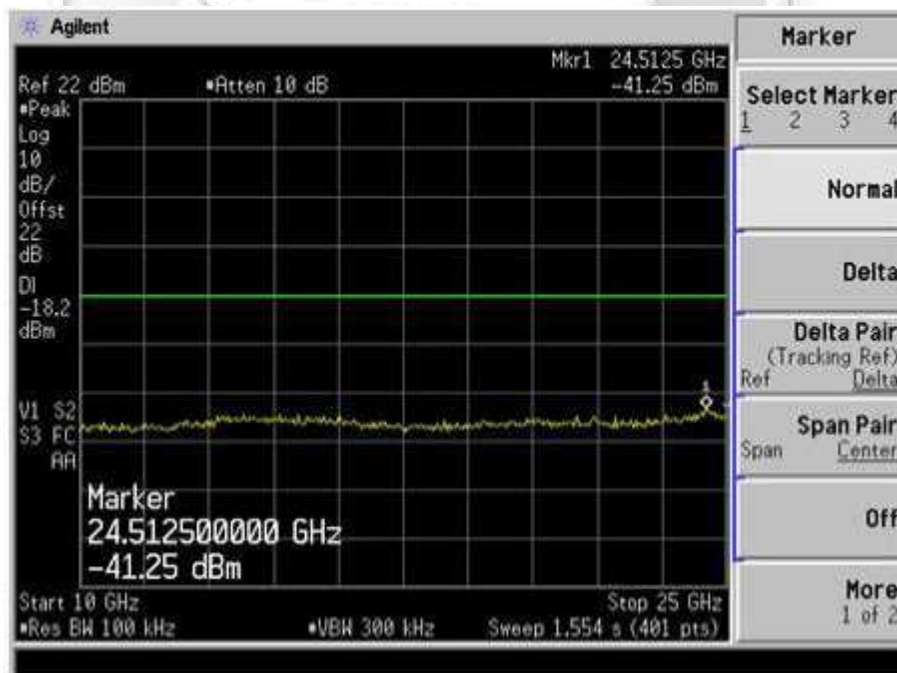


RF CONDUCTED SPURIOUS EMISSIONS (NON-RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Non-Restricted Bands) Plots – 802.11b



Plot 27 – Channel 1 @ DQPSK 2Mbps

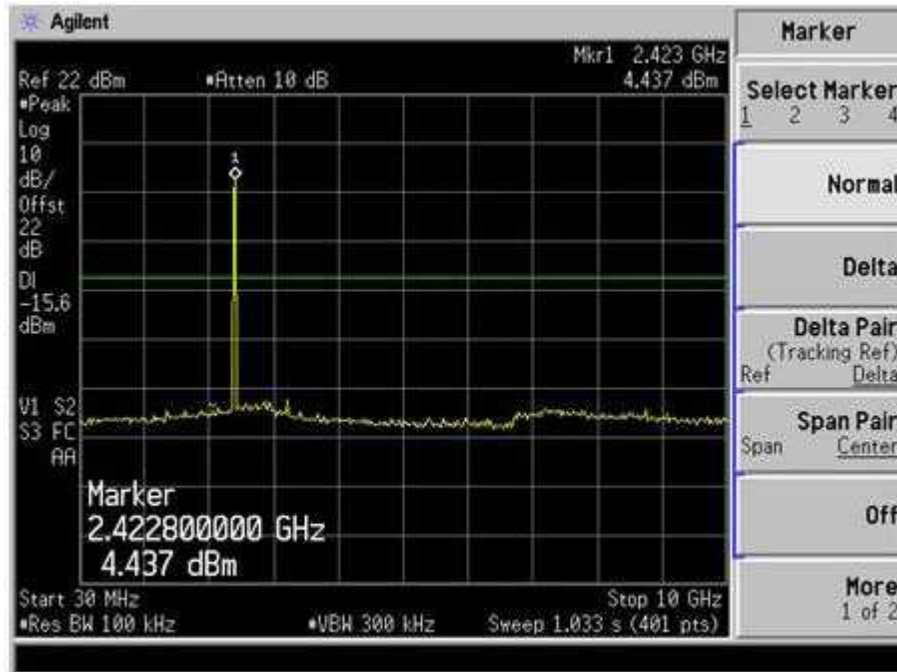


Plot 28 – Channel 1 @ DQPSK 2Mbps

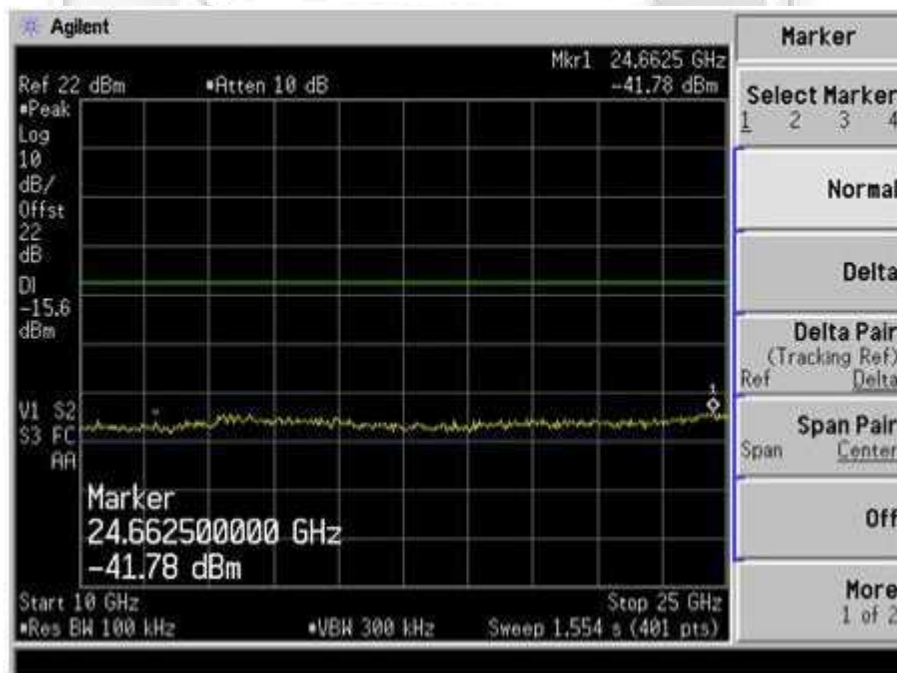


RF CONDUCTED SPURIOUS EMISSIONS (NON-RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Non-Restricted Bands) Plots – 802.11b



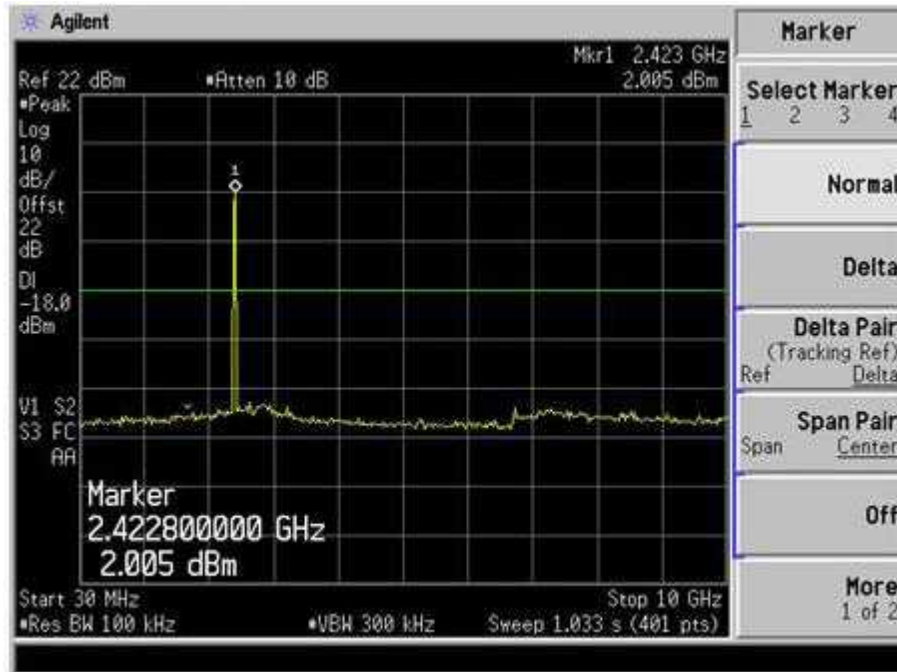
Plot 29 – Channel 1 @ CCK 5.5Mbps



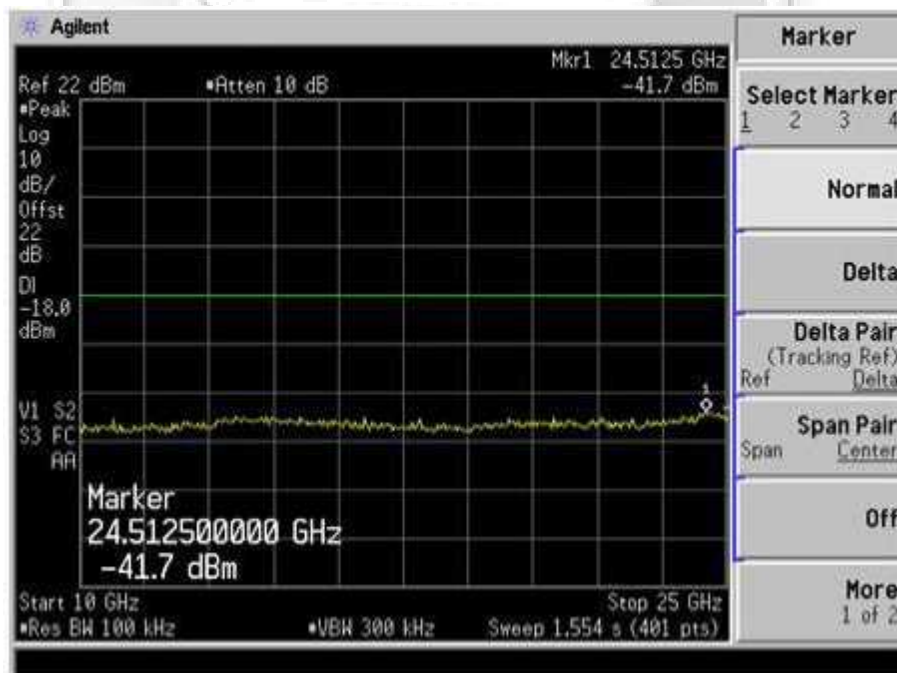
Plot 30 – Channel 1 @ CCK 5.5Mbps

RF CONDUCTED SPURIOUS EMISSIONS (NON-RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Non-Restricted Bands) Plots – 802.11b



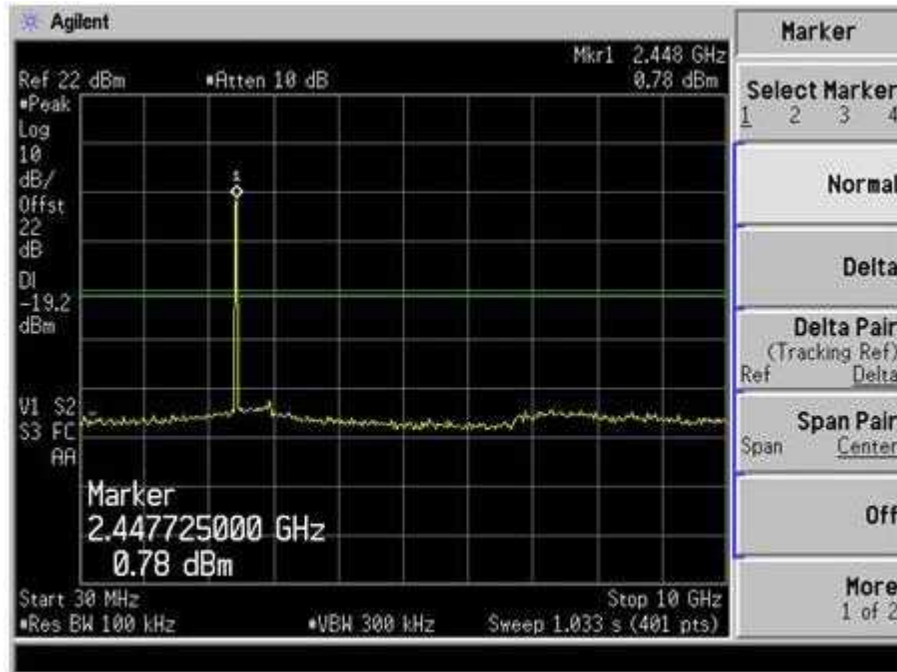
Plot 31 – Channel 1 @ CCK 11Mbps



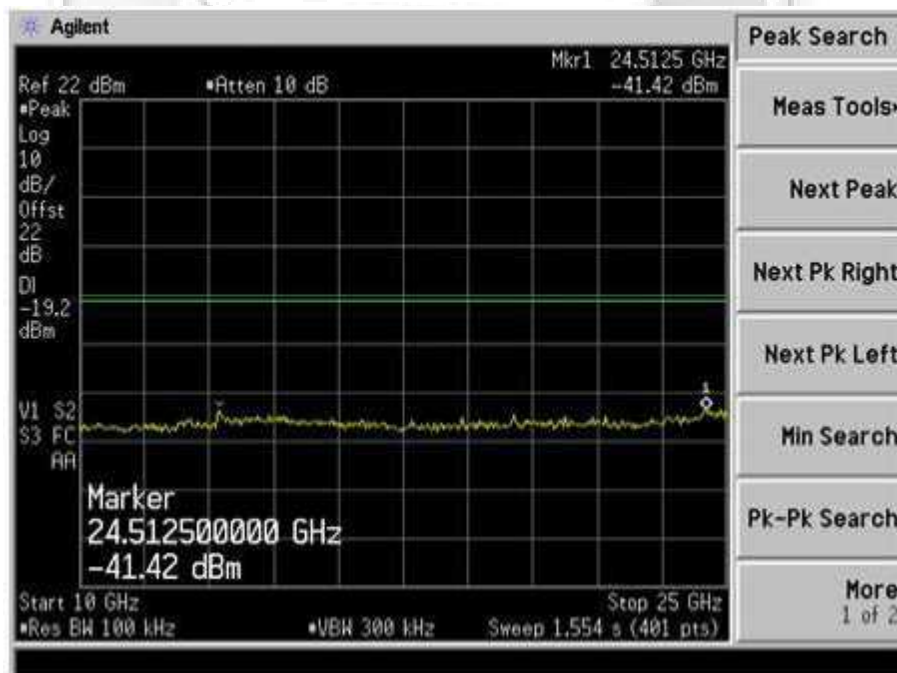
Plot 32 – Channel 1 @ CCK 11Mbps

RF CONDUCTED SPURIOUS EMISSIONS (NON-RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Non-Restricted Bands) Plots – 802.11b



Plot 33 – Channel 6 @ DBPSK 1Mbps

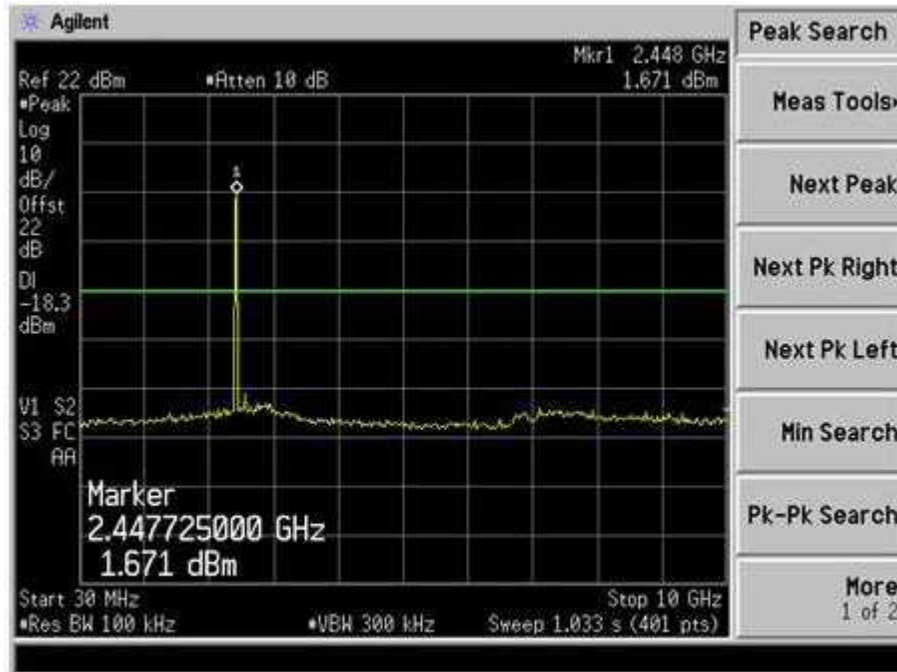


Plot 34 – Channel 6 @ DBPSK 1Mbps

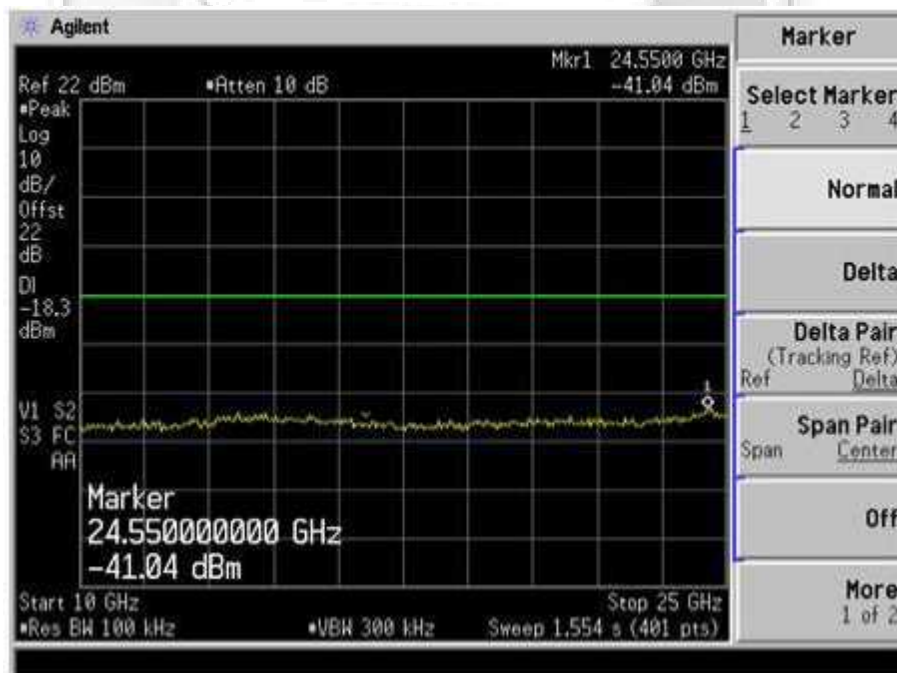


RF CONDUCTED SPURIOUS EMISSIONS (NON-RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Non-Restricted Bands) Plots – 802.11b



Plot 35 – Channel 6 @ DQPSK 2Mbps

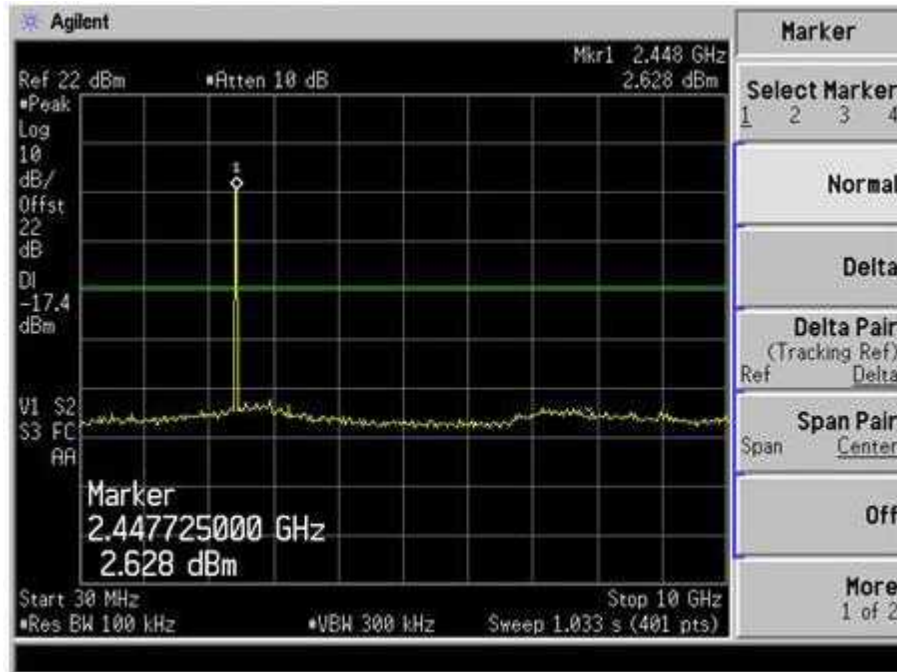


Plot 36 – Channel 6 @ DQPSK 2Mbps

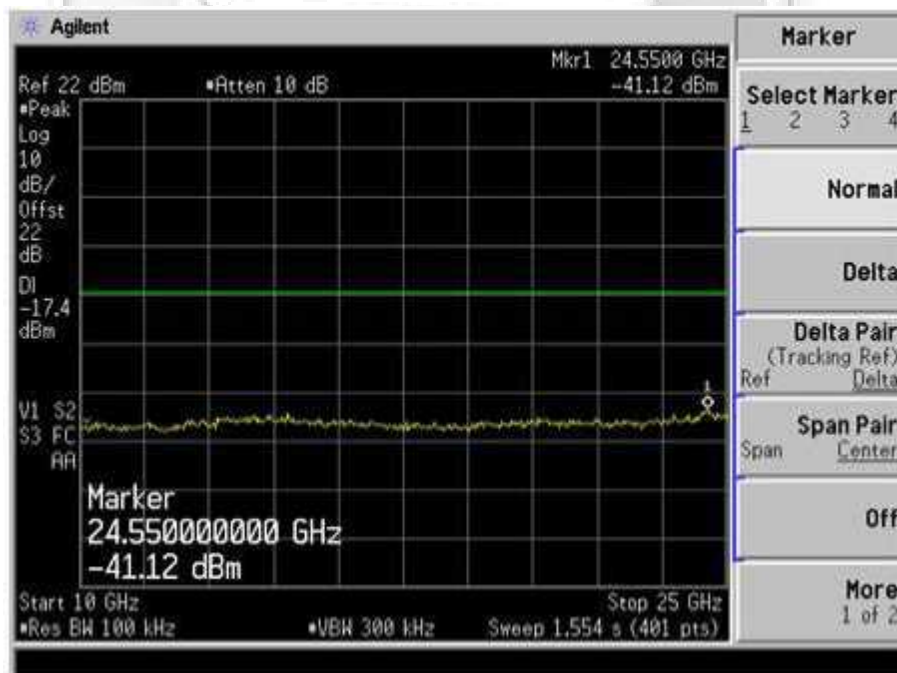


RF CONDUCTED SPURIOUS EMISSIONS (NON-RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Non-Restricted Bands) Plots – 802.11b



Plot 37 – Channel 6 @ CCK 5.5Mbps

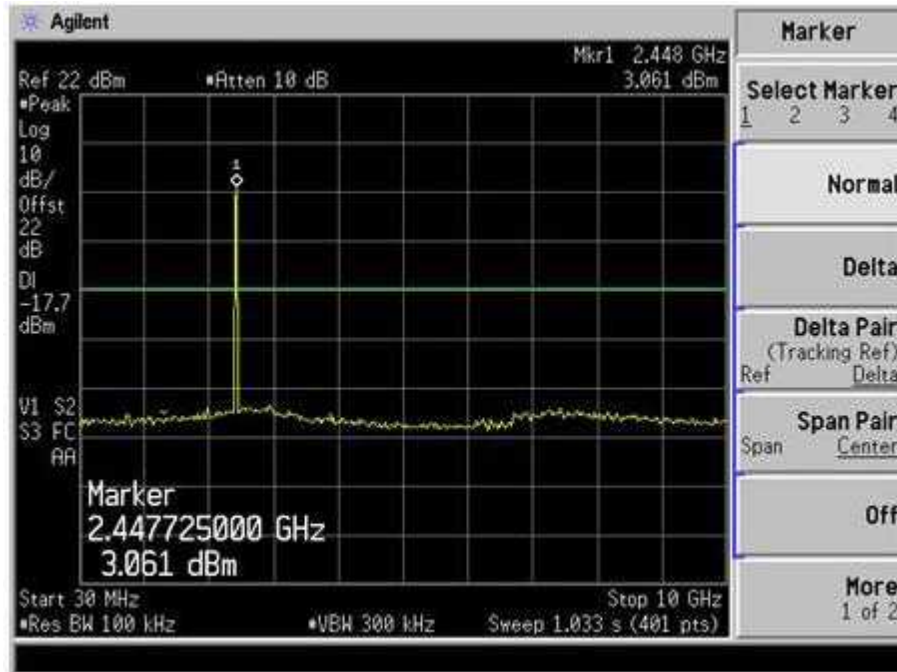


Plot 38 – Channel 6 @ CCK 5.5Mbps

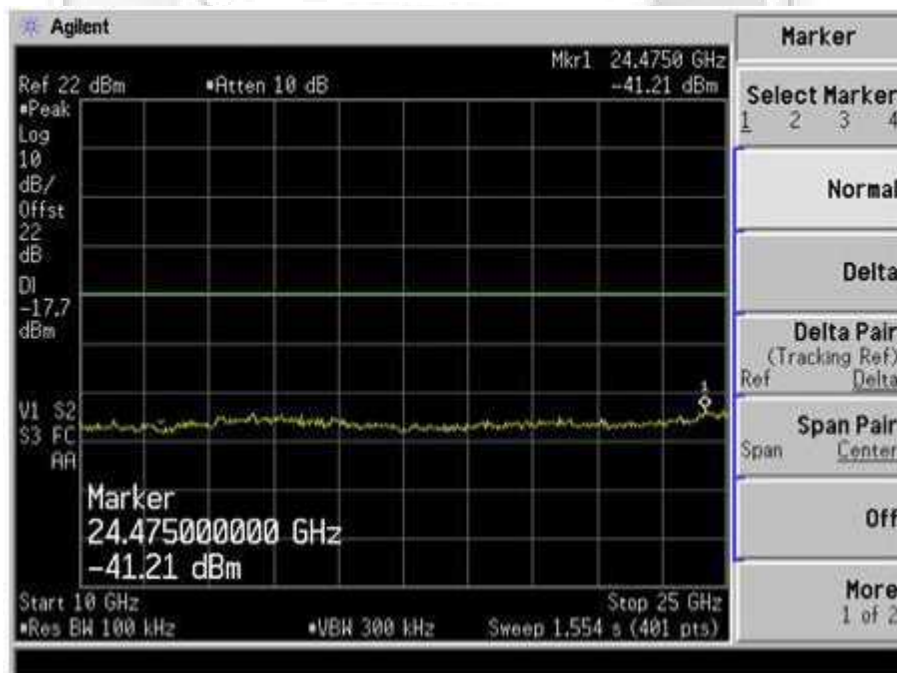


RF CONDUCTED SPURIOUS EMISSIONS (NON-RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Non-Restricted Bands) Plots – 802.11b



Plot 39 – Channel 6 @ CCK 11Mbps

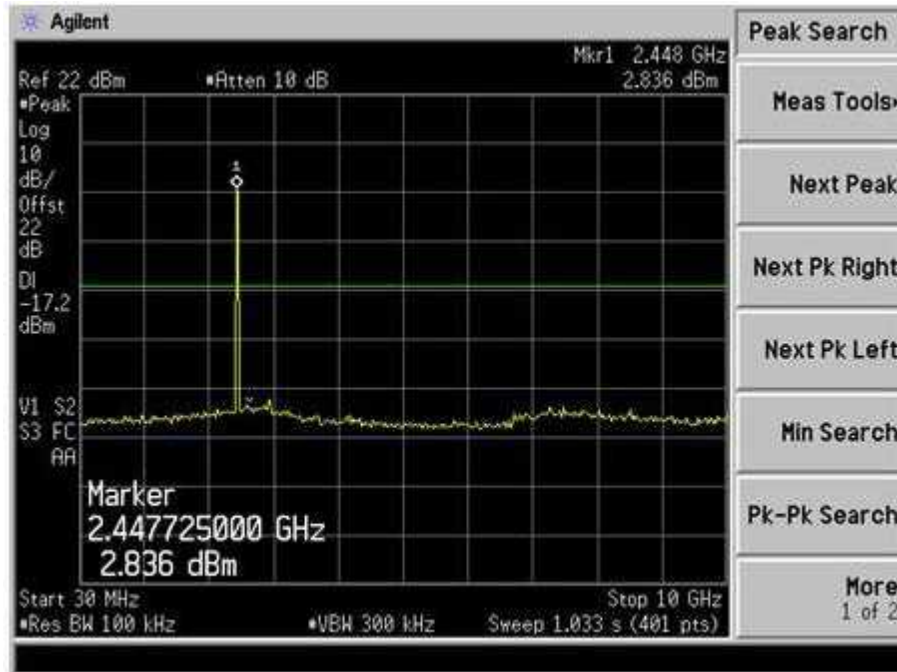


Plot 40 – Channel 6 @ CCK 11Mbps

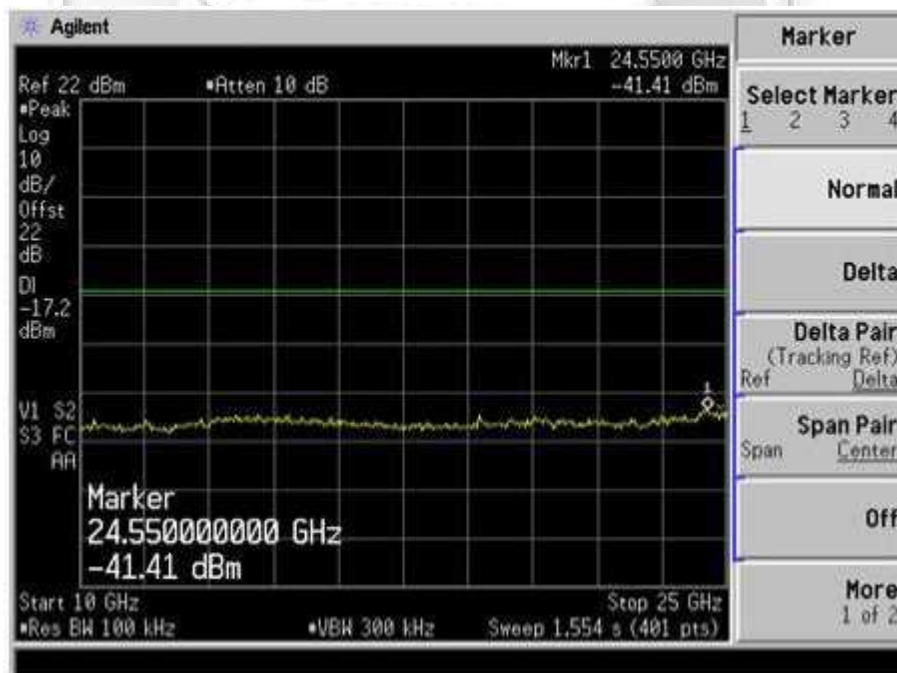


RF CONDUCTED SPURIOUS EMISSIONS (NON-RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Non-Restricted Bands) Plots – 802.11b



Plot 41 – Channel 11 @ DBPSK 1Mbps

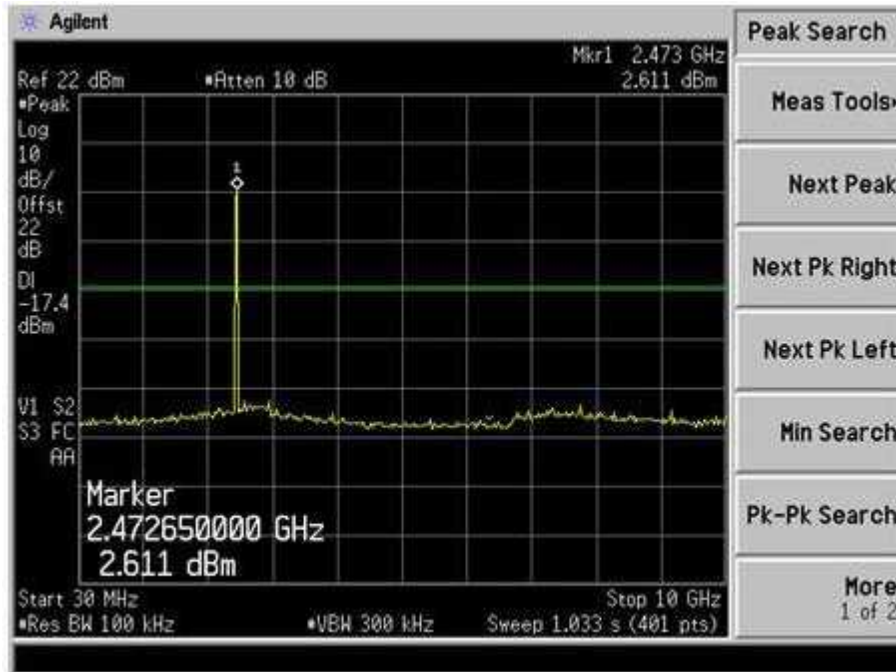


Plot 42 – Channel 11 @ DBPSK 1Mbps

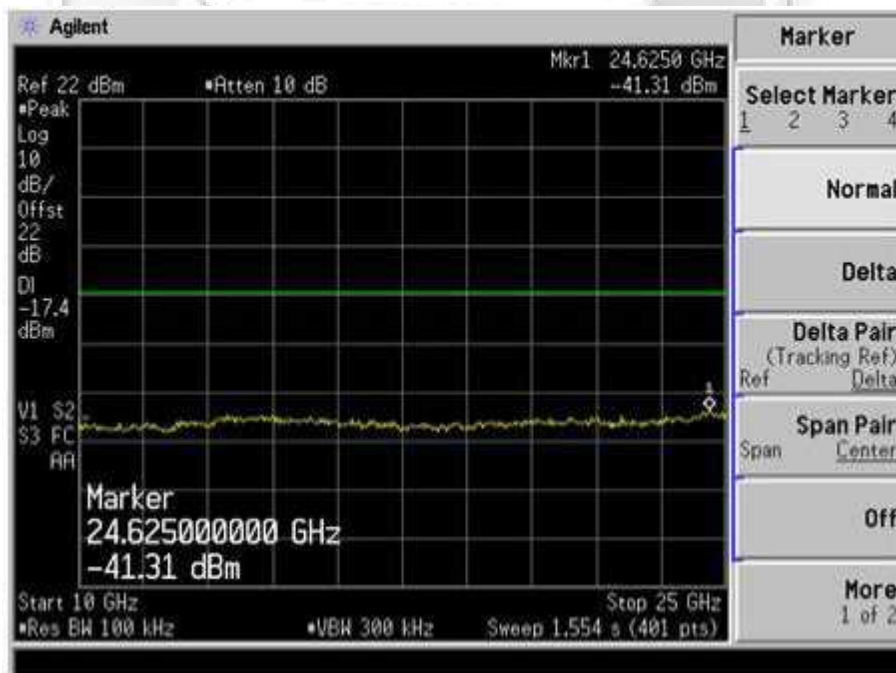


RF CONDUCTED SPURIOUS EMISSIONS (NON-RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Non-Restricted Bands) Plots – 802.11b



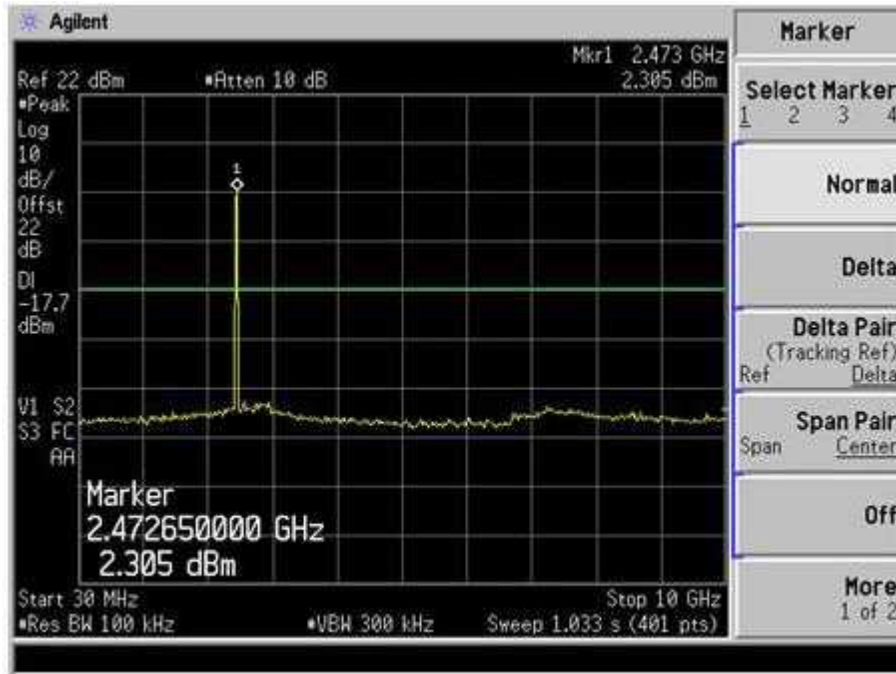
Plot 43 – Channel 11 @ DQPSK 2Mbps



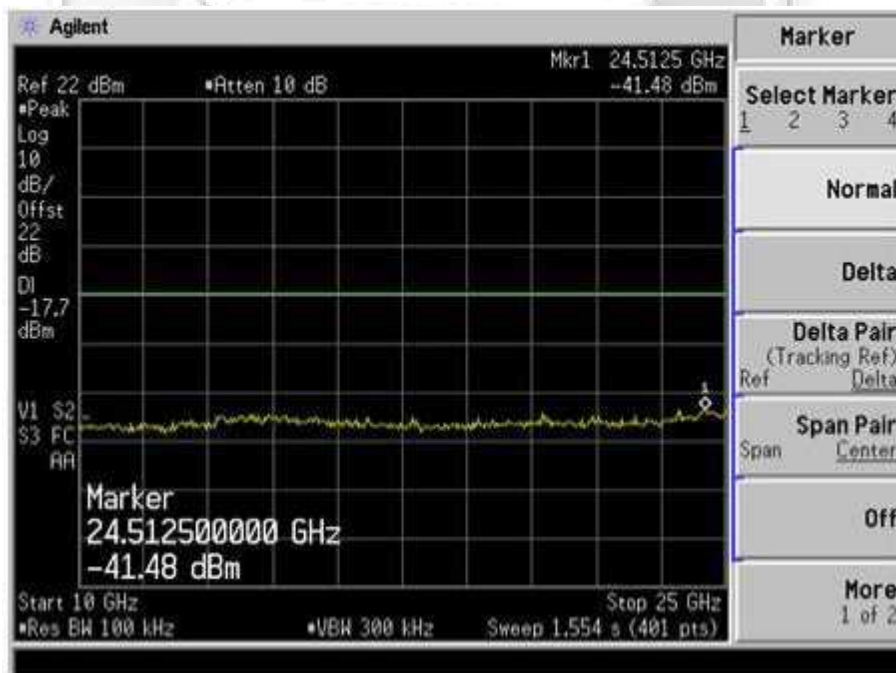
Plot 44 – Channel 11 @ DQPSK 2Mbps

RF CONDUCTED SPURIOUS EMISSIONS (NON-RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Non-Restricted Bands) Plots – 802.11b



Plot 45 – Channel 11 @ CCK 5.5Mbps

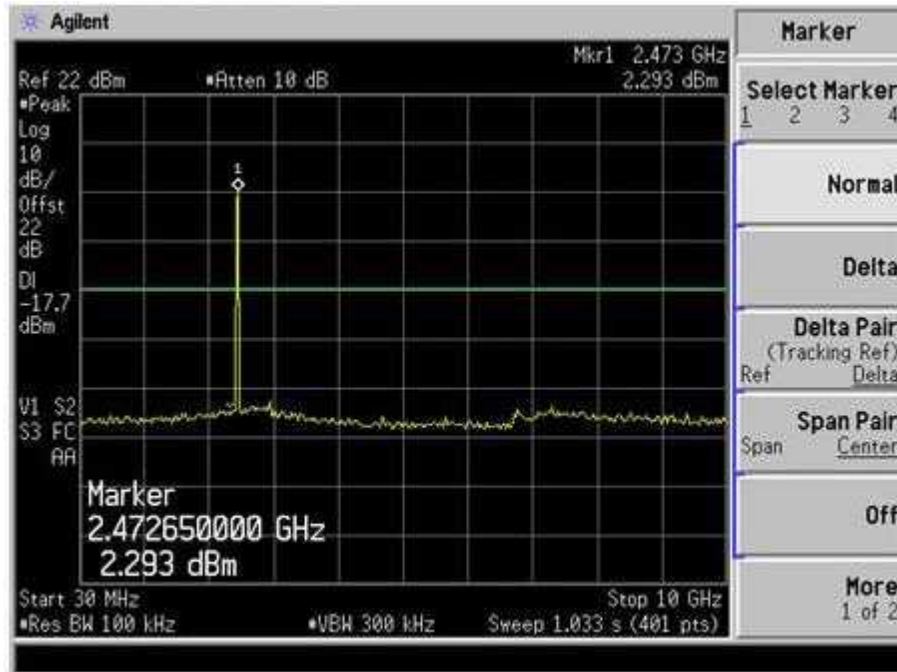


Plot 46 – Channel 11 @ CCK 5.5Mbps

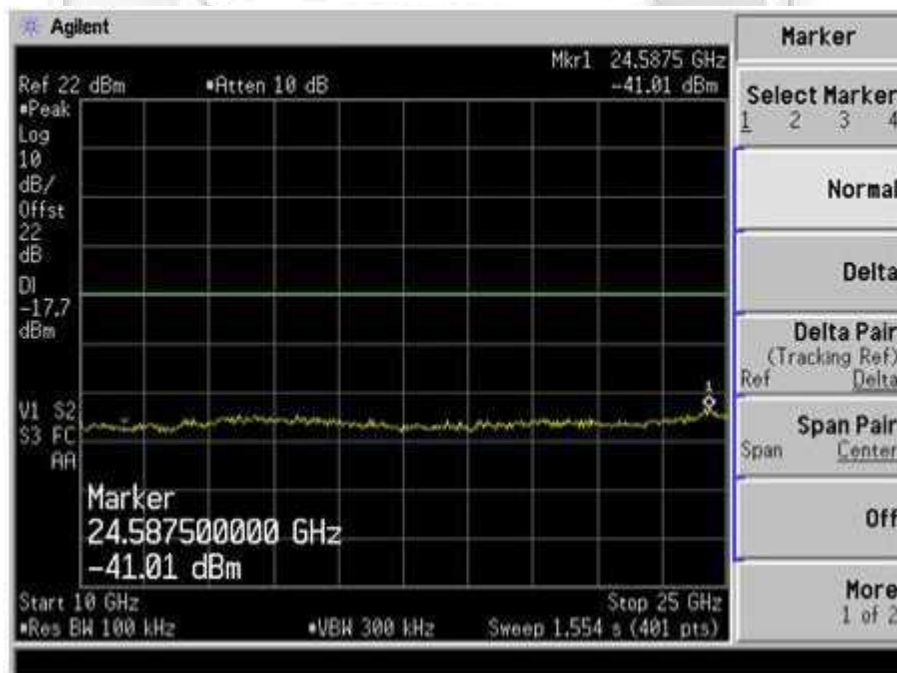


RF CONDUCTED SPURIOUS EMISSIONS (NON-RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Non-Restricted Bands) Plots – 802.11b



Plot 47 – Channel 11 @ CCK 11Mbps

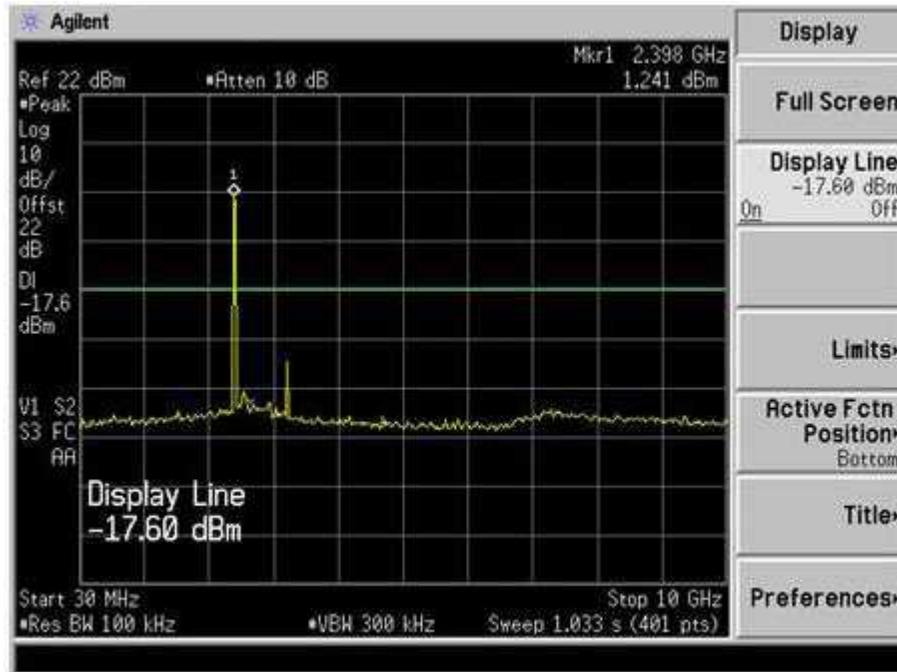


Plot 48 – Channel 11 @ CCK 11Mbps

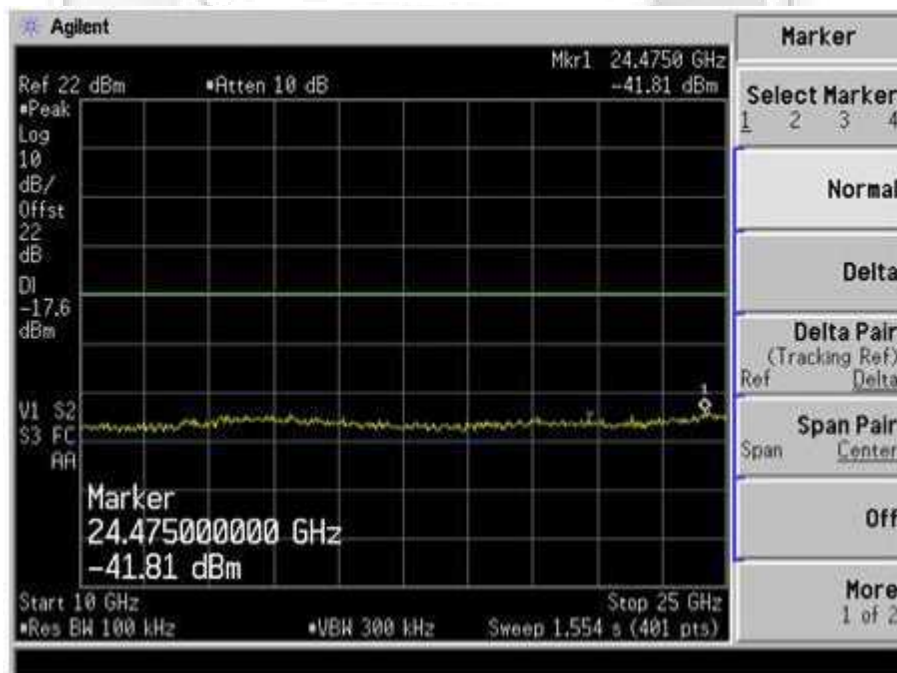


RF CONDUCTED SPURIOUS EMISSIONS (NON-RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Non-Restricted Bands) Plots – 802.11g



Plot 49 – Channel 1 @ BPSK 9Mbps

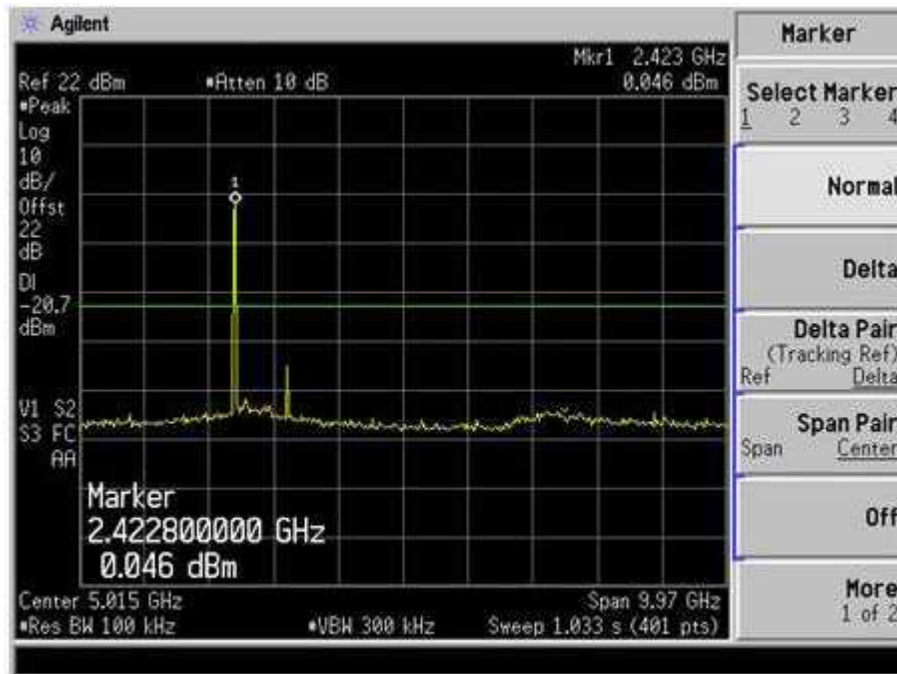


Plot 50 – Channel 1 @ BPSK 9Mbps

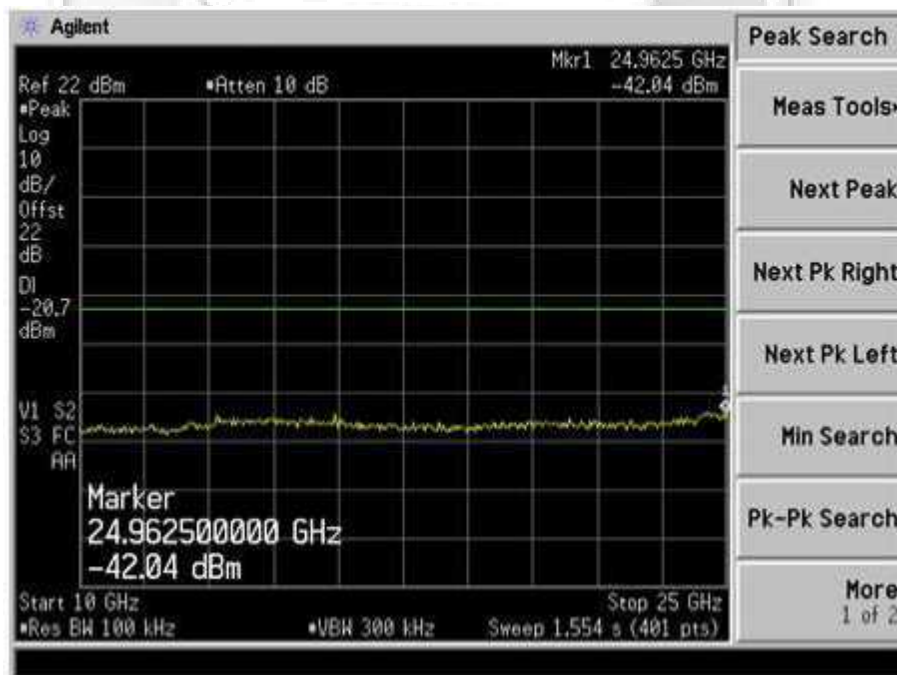


RF CONDUCTED SPURIOUS EMISSIONS (NON-RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Non-Restricted Bands) Plots – 802.11g



Plot 51 – Channel 1 @ QPSK 18Mbps

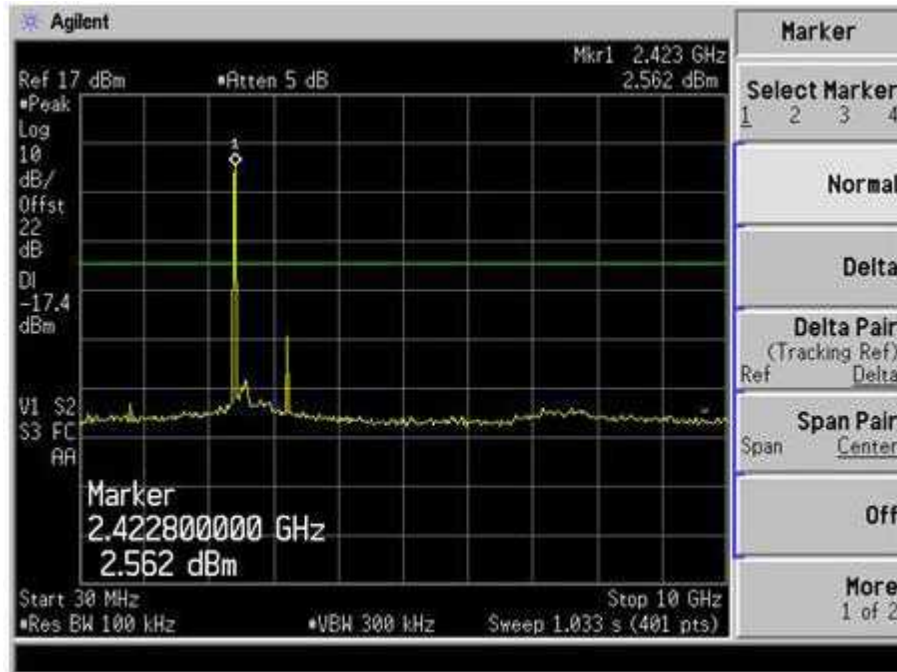


Plot 52 – Channel 1 @ QPSK 18Mbps

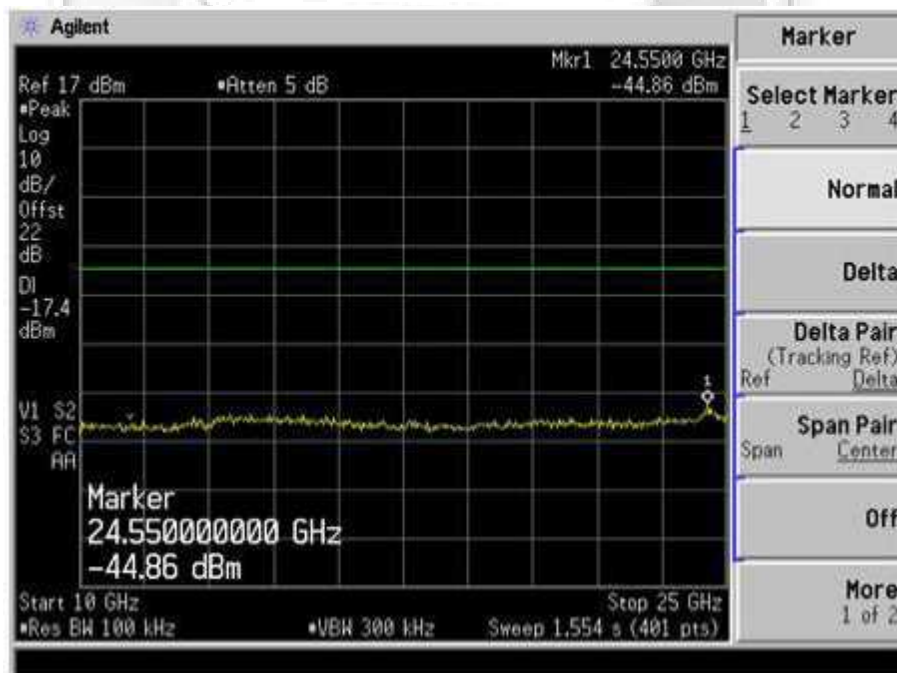


RF CONDUCTED SPURIOUS EMISSIONS (NON-RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Non-Restricted Bands) Plots – 802.11g



Plot 53 – Channel 1 @ 16QAM 36Mbps

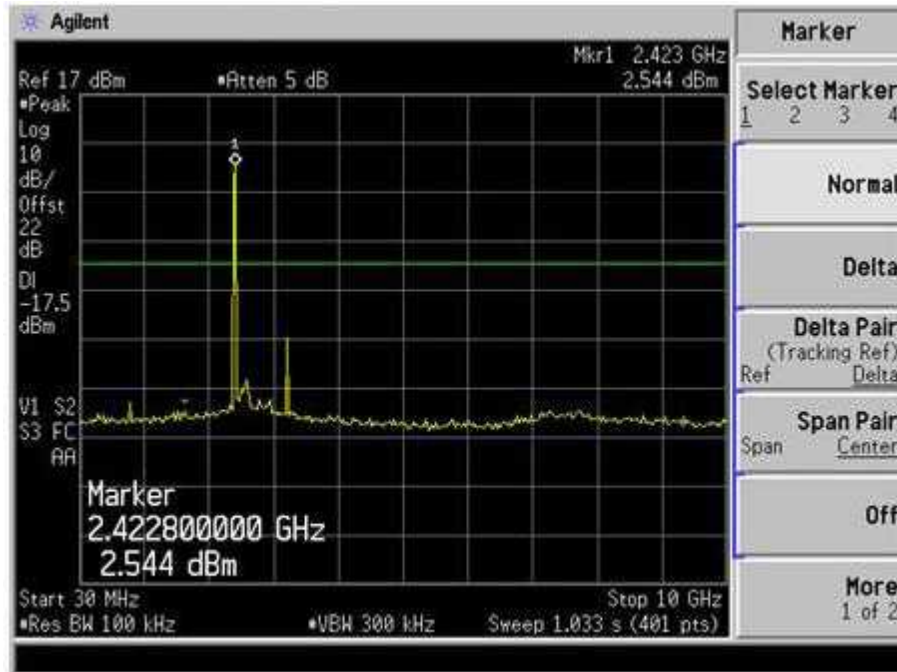


Plot 54 – Channel 1 @ 16QAM 36Mbps

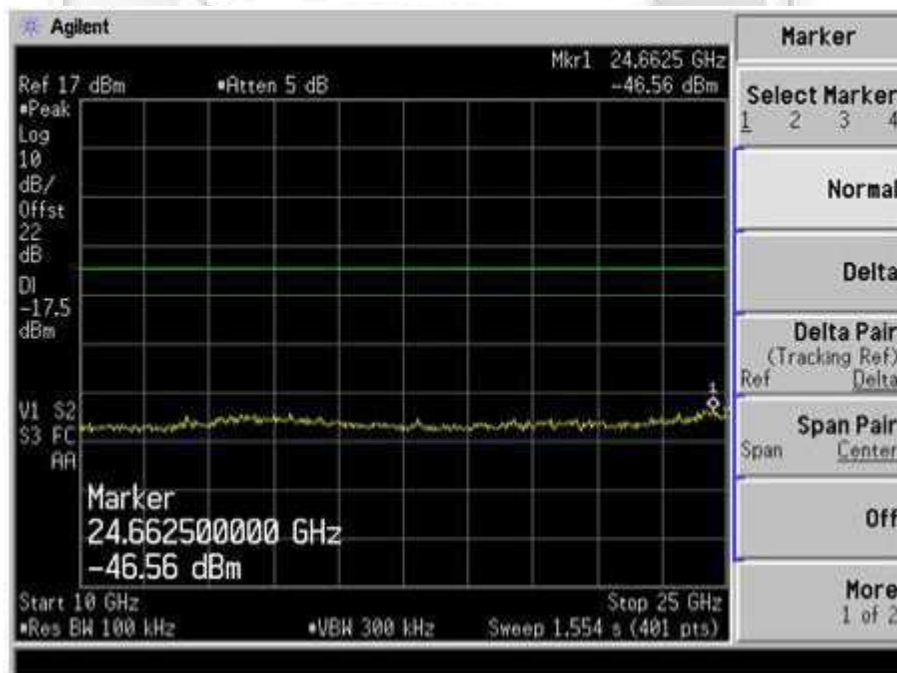


RF CONDUCTED SPURIOUS EMISSIONS (NON-RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Non-Restricted Bands) Plots – 802.11g



Plot 55 – Channel 1 @ 64QAM 54Mbps

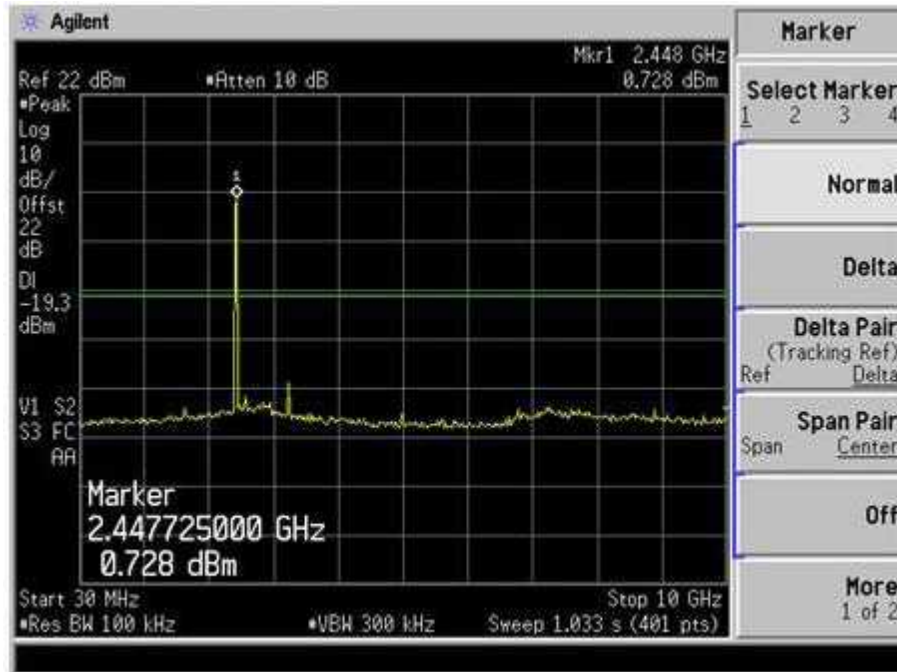


Plot 56 – Channel 1 @ 64QAM 54Mbps

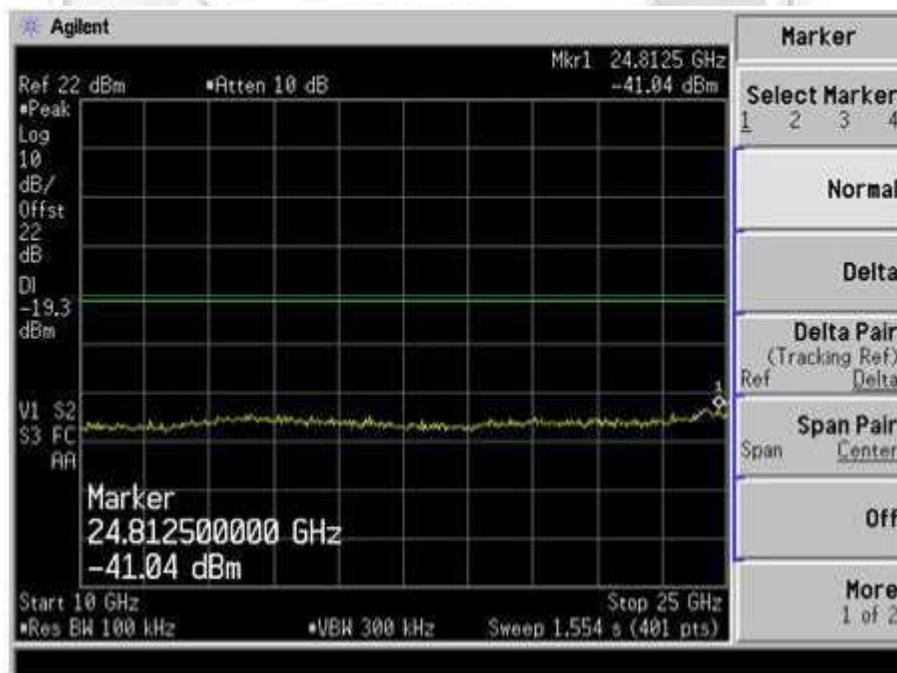


RF CONDUCTED SPURIOUS EMISSIONS (NON-RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Non-Restricted Bands) Plots – 802.11g



Plot 57 – Channel 6 @ BPSK 9Mbps

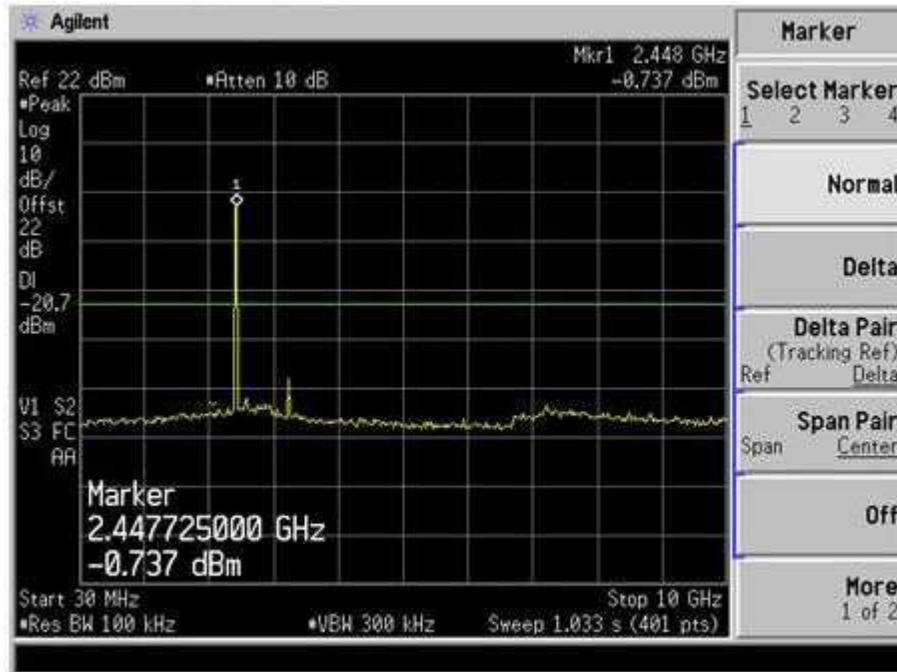


Plot 58 – Channel 6 @ BPSK 9Mbps

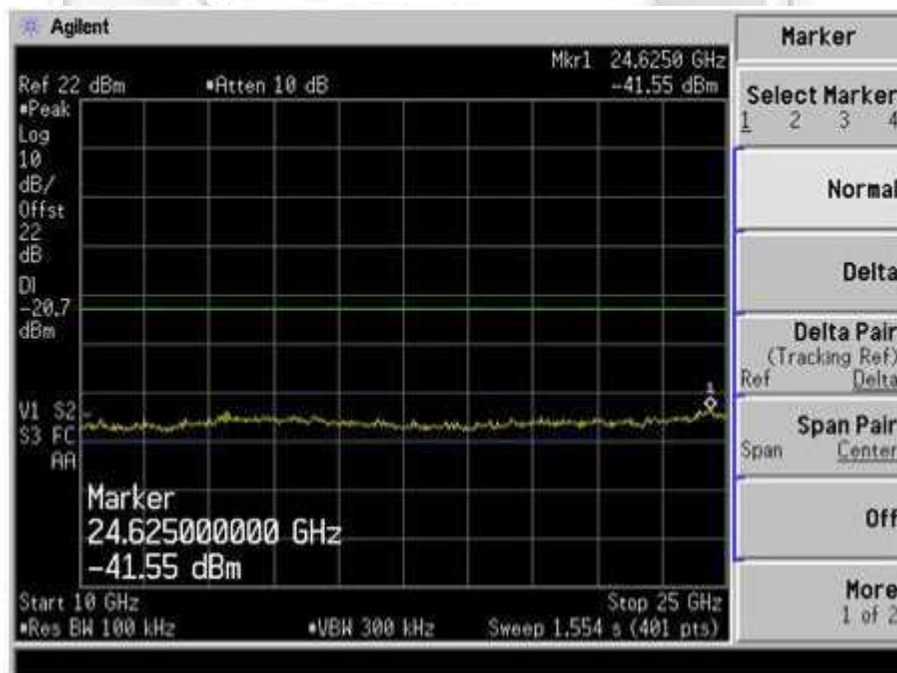


RF CONDUCTED SPURIOUS EMISSIONS (NON-RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Non-Restricted Bands) Plots – 802.11g



Plot 59 – Channel 6 @ QPSK 18Mbps

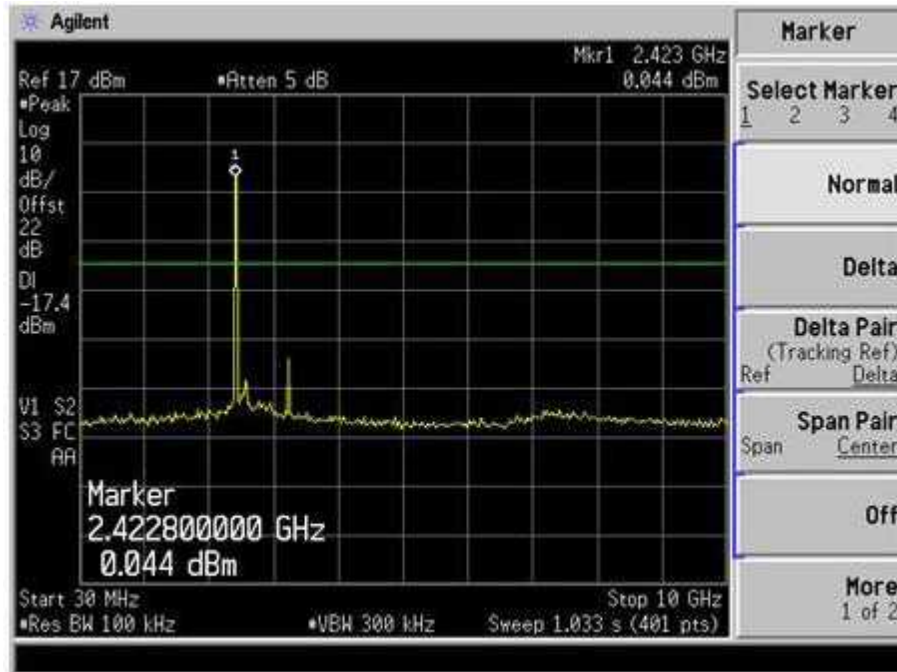


Plot 60 – Channel 6 @ QPSK 18Mbps

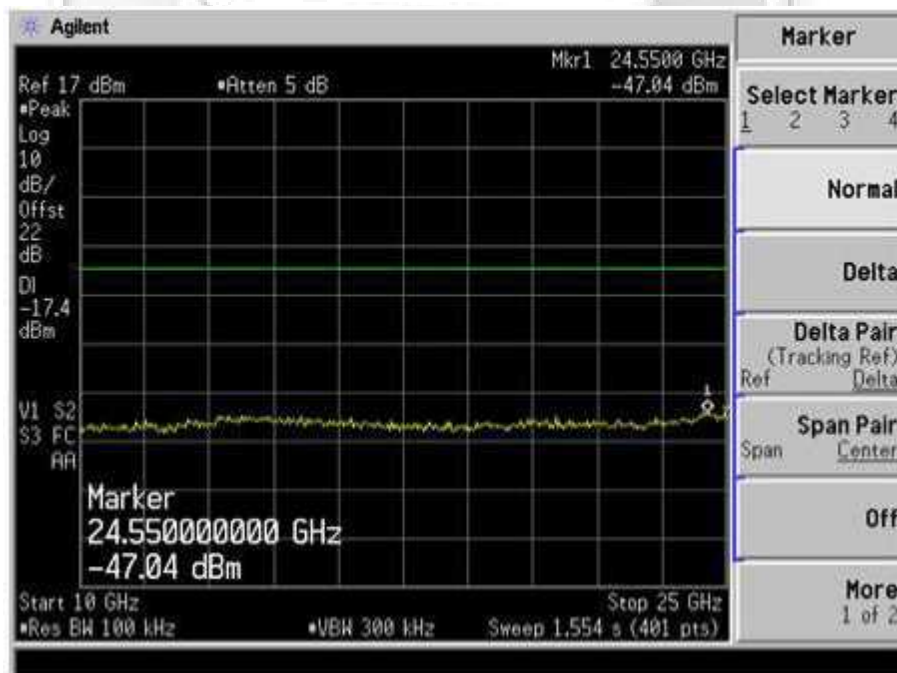


RF CONDUCTED SPURIOUS EMISSIONS (NON-RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Non-Restricted Bands) Plots – 802.11g



Plot 61 – Channel 6 @ 16QAM 36Mbps

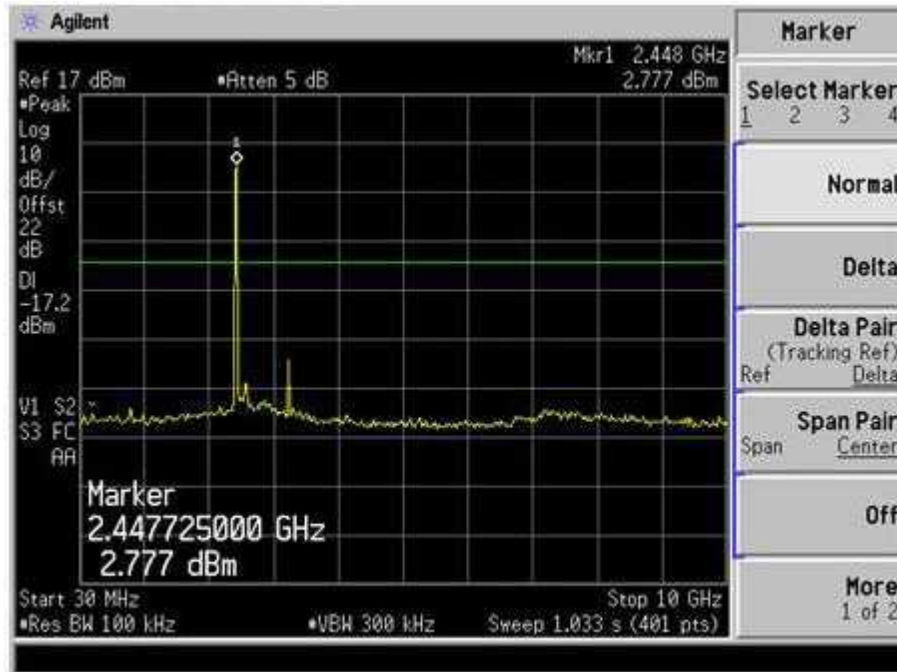


Plot 62 – Channel 6 @ 16QAM 36Mbps

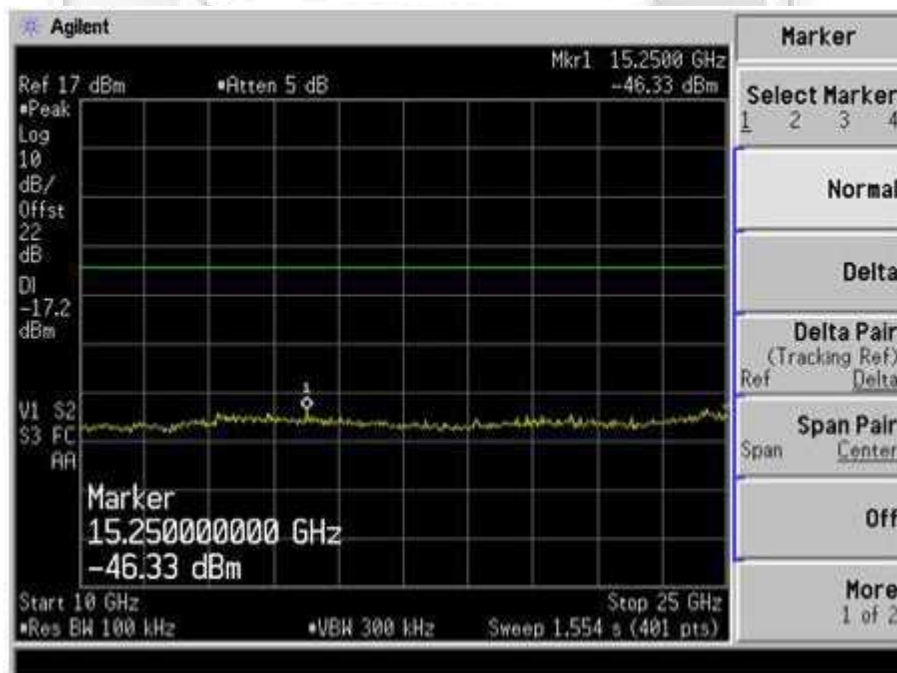


RF CONDUCTED SPURIOUS EMISSIONS (NON-RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Non-Restricted Bands) Plots – 802.11g



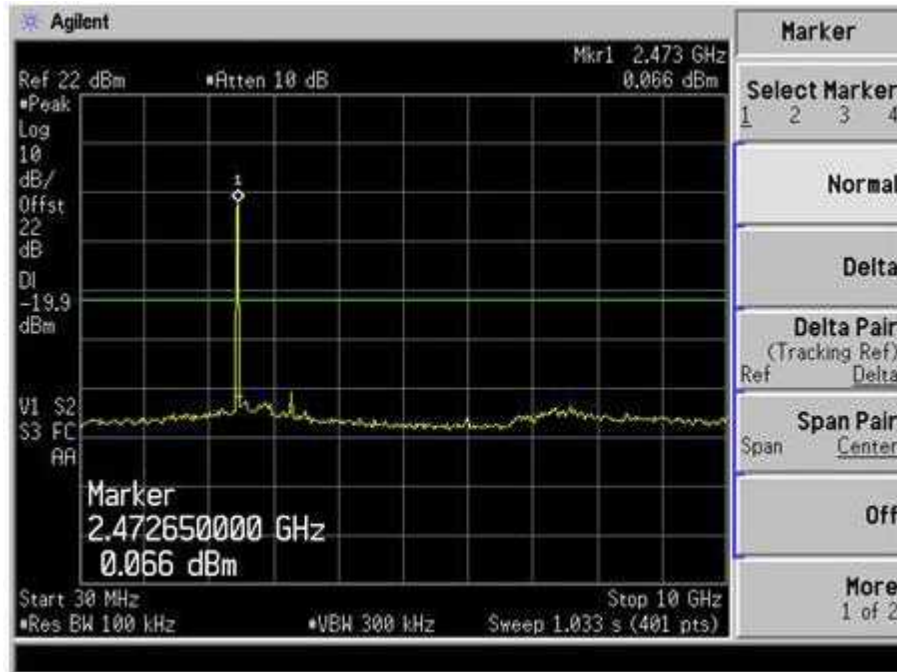
Plot 63 – Channel 6 @ 64QAM 54Mbps



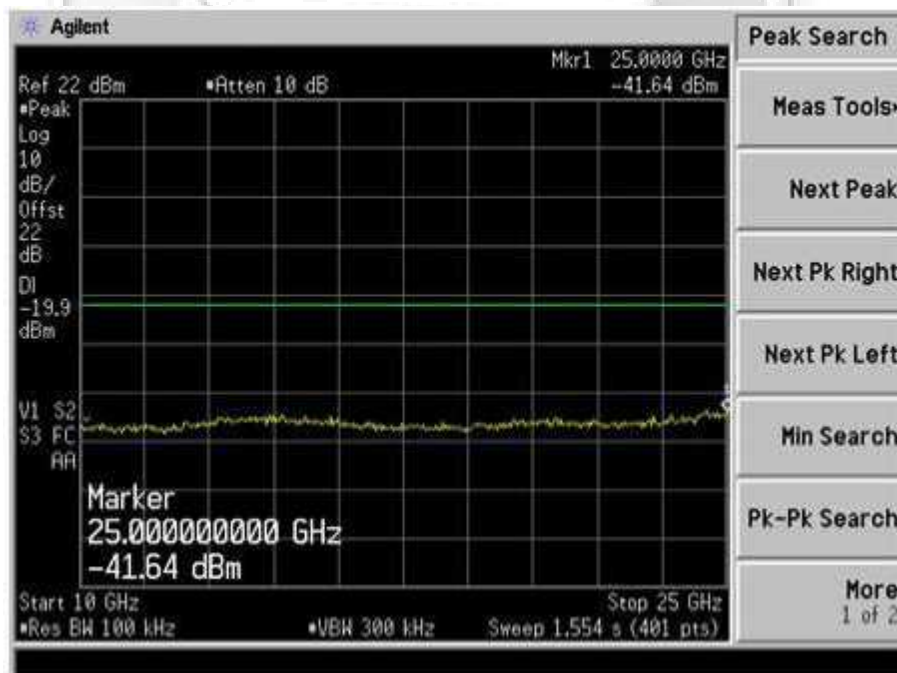
Plot 64 – Channel 6 @ 64QAM 54Mbps

RF CONDUCTED SPURIOUS EMISSIONS (NON-RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Non-Restricted Bands) Plots – 802.11g



Plot 65 – Channel 11 @ BPSK 9Mbps

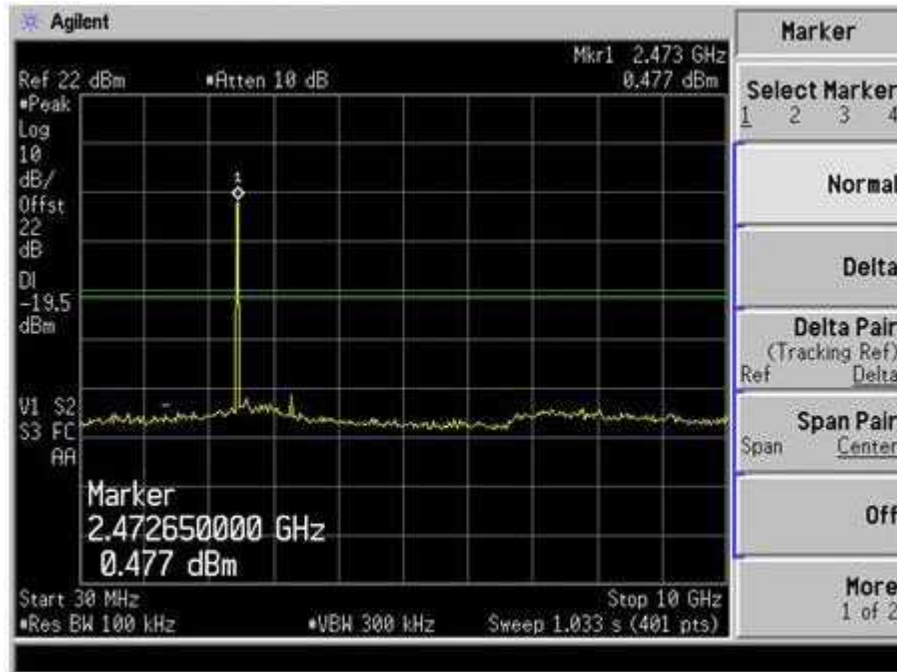


Plot 66 – Channel 11 @ BPSK 9Mbps

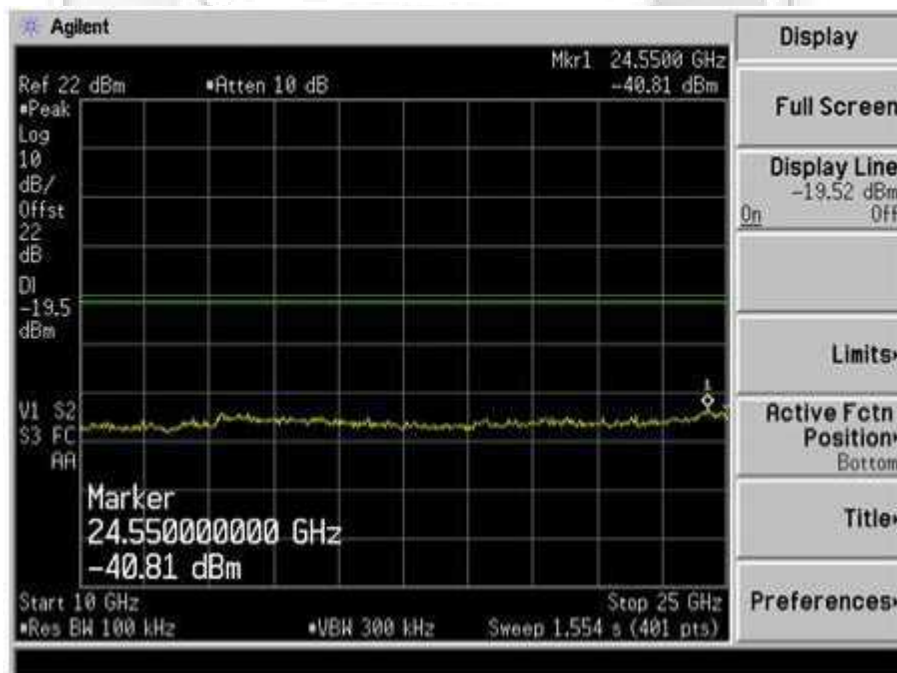


RF CONDUCTED SPURIOUS EMISSIONS (NON-RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Non-Restricted Bands) Plots – 802.11g



Plot 67 – Channel 11 @ QPSK 18Mbps

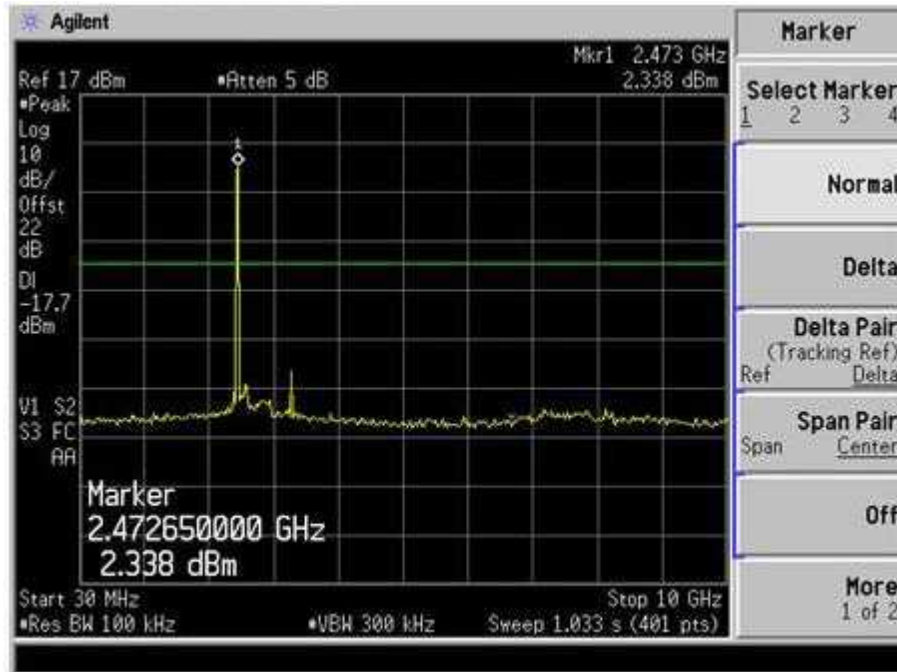


Plot 68 – Channel 11 @ QPSK 18Mbps

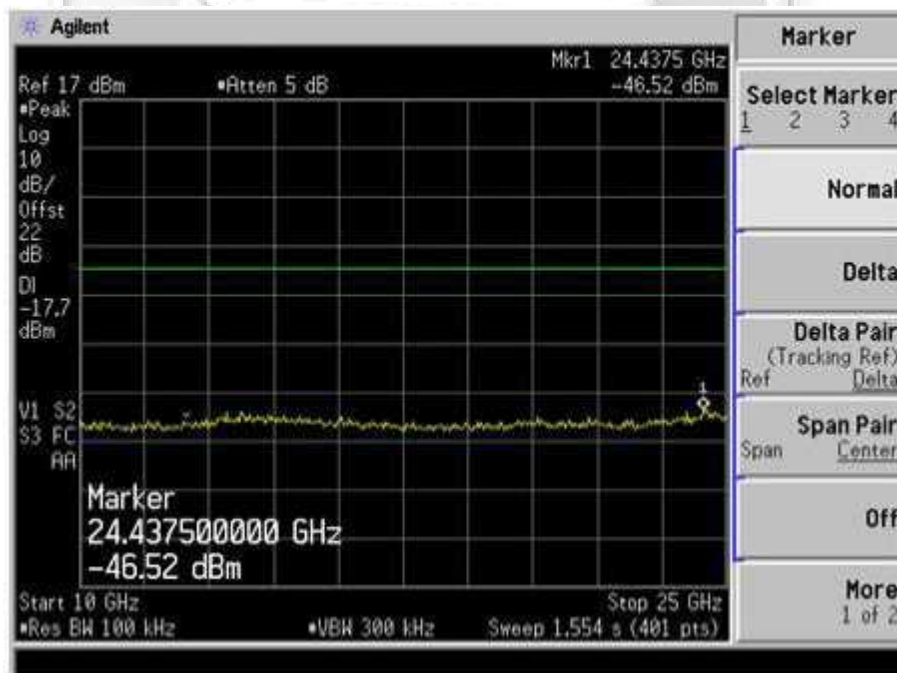


RF CONDUCTED SPURIOUS EMISSIONS (NON-RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Non-Restricted Bands) Plots – 802.11g



Plot 69 – Channel 11 @ 16QAM 36Mbps

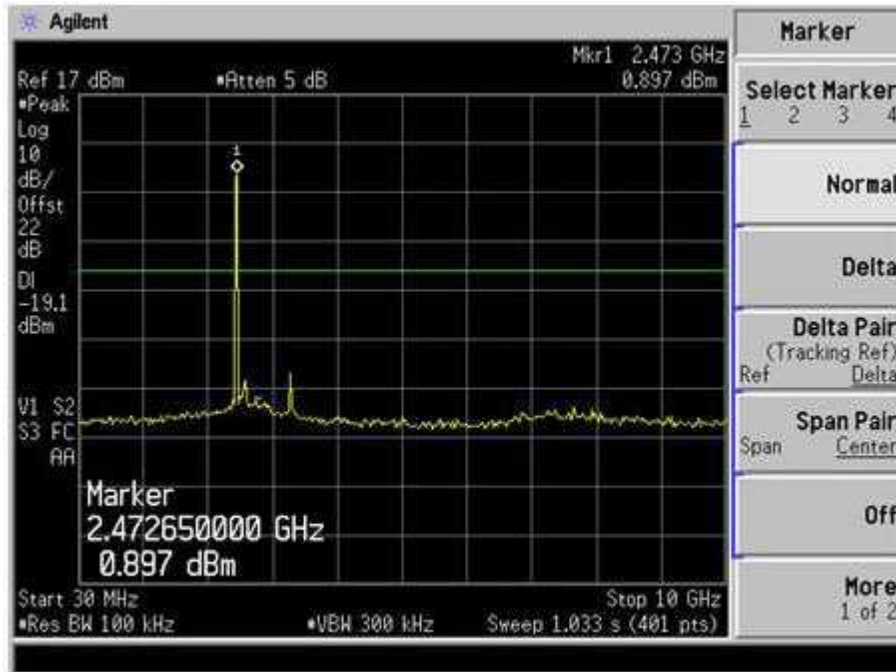


Plot 70 – Channel 11 @ 16QAM 36Mbps

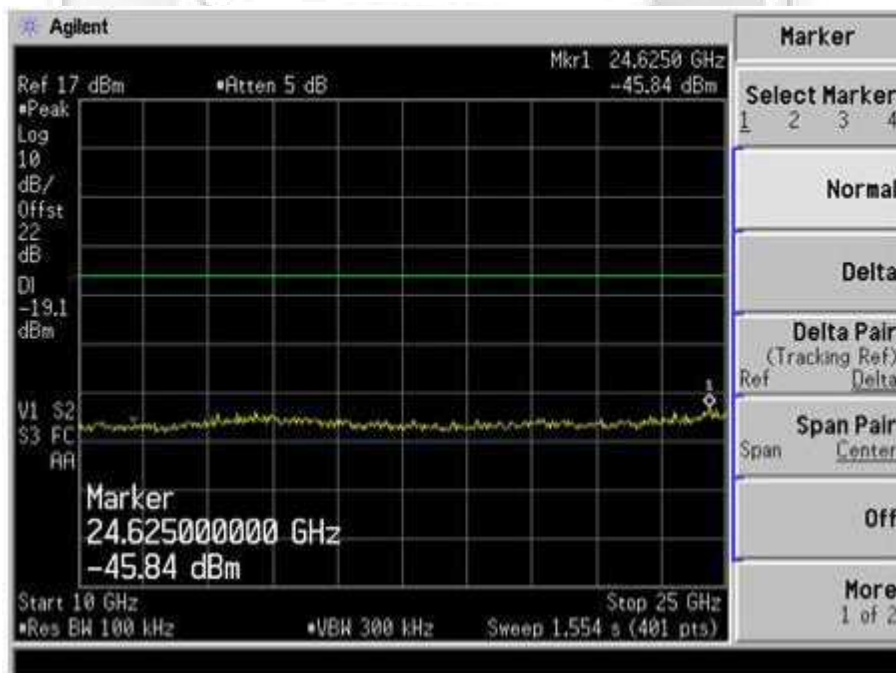


RF CONDUCTED SPURIOUS EMISSIONS (NON-RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Non-Restricted Bands) Plots – 802.11g



Plot 71 – Channel 11 @ 64QAM 54Mbps



Plot 72 – Channel 11 @ 64QAM 54Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

47 CFR FCC Part 15.205 Restricted Bands

MHz		MHz		MHz		GHz	
0.090	- 0.110	16.42	- 16.423	399.9	- 410	4.5	- 5.15
0.495	- 0.505	16.69475	- 16.69525	608	- 614	5.35	- 5.46
2.1735	- 2.1905	16.80425	- 16.80475	960	- 1240	7.25	- 7.75
4.125	- 4.128	25.5	- 25.67	1300	- 1427	8.025	- 8.5
4.17725	- 4.17775	37.5	- 38.25	1435	- 1626.5	9.0	- 9.2
4.20725	- 4.20775	73	- 74.6	1645.5	- 1646.5	9.3	- 9.5
6.215	- 6.218	74.8	- 75.2	1660	- 1710	10.6	- 12.7
6.26775	- 6.26825	108	- 121.94	1718.8	- 1722.2	13.25	- 13.4
6.31175	- 6.31225	123	- 138	2200	- 2300	14.47	- 14.5
8.291	- 8.294	149.9	- 150.05	2310	- 2390	15.35	- 16.2
8.362	- 8.366	156.52475	- 156.52525	2483.5	- 2500	17.7	- 21.4
8.37625	- 8.38675	156.7	- 156.9	2690	- 2900	22.01	- 23.12
8.41425	- 8.41475	162.0125	- 167.17	3260	- 3267	23.6	- 24.0
12.29	- 12.293	167.72	- 173.2	3332	- 3339	31.2	- 31.8
12.51975	- 12.52025	240	- 285	3345.8	- 3358	36.43	- 36.5
12.57675	- 12.57725	322	- 335.4	3600	- 4400	Above 38.6	
13.36	- 13.41						

47 CFR FCC Part 15.247(d) RF Conducted Spurious Emissions (Restricted Bands) Limits

The EUT shows compliance to the requirements of this section, which states that emissions which fall in the restricted bands must comply with the radiated emission limits specified in the table below:

Frequency Range (MHz)	EIRP (dBm)	Radiated Emissions (dBμV/m)
0.009 – 0.490	-6.7 – (-41.4) **	67.6 – 20logF* @ 300m **
0.490 – 1.705	-41.4 – (-52.3) **	87.6 – 20logF* @ 30m **
1.705 – 30	-45.7	29.5 @ 30m
30 - 88	-55.2	40.0 @ 3m
88 - 216	-51.7	43.5 @ 3m
216 - 960	-49.2	46.0 @ 3m
>960	-41.2 ***	54.0 @ 3m ***
* F is frequency in kHz.		
** Decreasing linearly with the logarithm of the frequency.		
*** Above 1GHz, a peak limit of 20dB above the average limit does apply.		

47 CFR FCC Part 15.247(d) RF Conducted Spurious Emissions (Restricted Bands) Test Instrumentation

Instrument	Model	S/No	Cal Due Date
Agilent EMC Analyzer (9kHz-26.5GHz)	E7405A	US40240195	16 Mar 2013
GW Instek Programmable Power Supply	PSH-3630A	RK200168	30 Jan 2013

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

47 CFR FCC Part 15.247(d) RF Conducted Spurious Emissions (Restricted Bands) Test Setup

1. The EUT and supporting equipment were set up as shown in the setup photo.
2. The power supply for the EUT was connected to a filtered mains.
3. The RF antenna connector was connected to the spectrum analyser via a low-loss coaxial cable.
4. The resolution bandwidth (RBW) of the spectrum analyser was set to the following settings. The video bandwidth (VBW) was set to at least three times of the RBW.

Frequency (MHz)	RBW (kHz)
0.009 – 0.150	0.2
0.150 – 30.0	9.0
30.0 – 1000	100.0
> 1000	1000.0

5. The detector of the spectrum analyser was set to peak detection mode.
6. All other supporting equipment were powered separately from another filtered mains.

47 CFR FCC Part 15.247(d) RF Conducted Spurious Emissions (Restricted Bands) Test Method

1. Measurement in the range 9kHz – 1000MHz
 - 1.1 The EUT was switched on and allowed to warm up to its normal operating condition. The EUT was then configured to operate in the test mode, with the transmitting frequency was set to lower channel with specified modulation and data rate.
 - 1.2 The start and stop frequencies of the spectrum analyser were set according to the supported RBW.
 - 1.3 The spectrum analyser was set to max hold to capture any spurious emissions within the span. The signal capturing was continuous until no further spurious emissions were detected.
 - 1.4 No further measurement was required if all the captured emissions complied to the limits. Else, the spectrum analyser was set to zoom to the captured emission with the detector of the spectrum analyser was set to quasi-peak. The emission level of the captured frequency was measured.
 - 1.5 The step 1.4 was repeated until all the captured emissions which exceeding the limits were measured.
 - 1.6 Repeat steps 1.1 to 1.5 with all possible modulations and data rates.
 - 1.7 The steps 1.2 to 1.6 were repeated with the transmitting frequency was set to middle and upper channel respectively.
2. Measurement above 1000MHz
 - 2.1 The EUT was switched on and allowed to warm up to its normal operating condition. The EUT was then configured to operate in the test mode, with the transmitting frequency was set to lower channel with specified modulation and data rate..
 - 2.2 The start and stop frequencies of the spectrum analyser were set according to the supported frequency band of the set RBW with the number of points in a sweep was set to equal or greater than 2 times of the ratio of span over RBW.
 - 2.3 The detector of the spectrum analyser was set to power average (RMS) mode with the sweep time was set to equal or greater than 10 times of the product of number of measurement points in a sweep and transmission symbol time.
 - 2.4 The spectrum analyser was then allowed to capture any spurious emissions within a single sweep. The peak marker function of the spectrum analyser was used to locate the highest power level.
 - 2.5 The steps 2.2 to 2.4 were repeated until all the required frequency bands were measured.
 - 2.6 Repeat steps 2.1 to 2.5 with all possible modulations and data rates.
 - 2.7 The steps 2.2 to 2.6 were repeated with the transmitting frequency was set to middle and upper channel respectively.
 - 2.8 The measurements were repeated with the detector of the spectrum analyser was set to peak detecting mode. The sweep time was set to auto coupler.

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST



RF Conducted Spurious Emissions (Restricted Bands) Test Setup

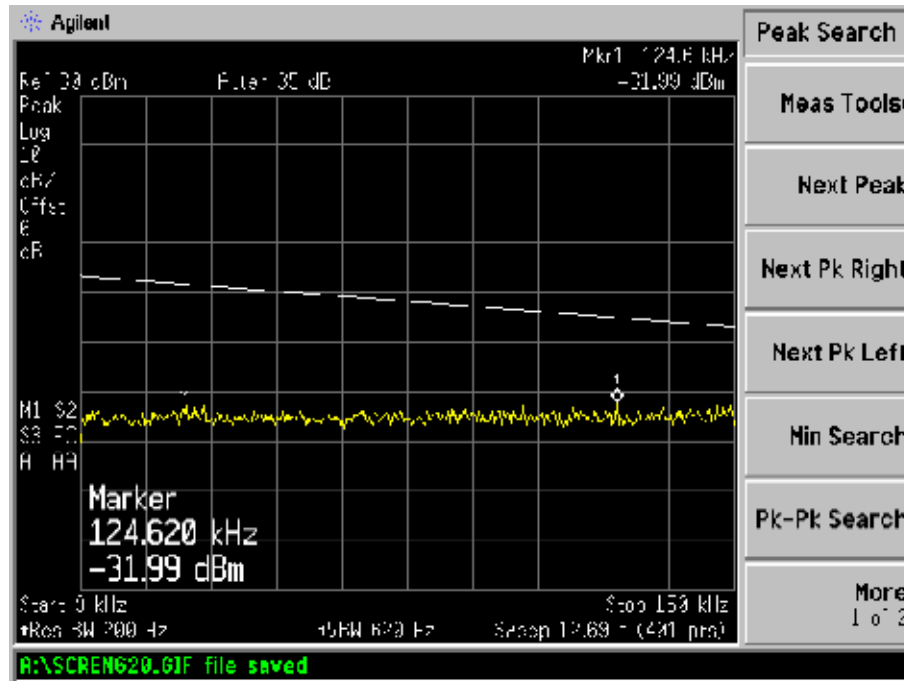
47 CFR FCC Part 15.247(d) RF Conducted Spurious Emissions (Restricted Bands) Results

Test Input Power	24Vdc (Worst Voltage)	Temperature	24°C
Attached Plots	73 – 180 (802.11b)	Relative Humidity	54%
	181 – 288 (802.11g)	Atmospheric Pressure	1027mbar
		Tested By	Kyaw Soe Hein

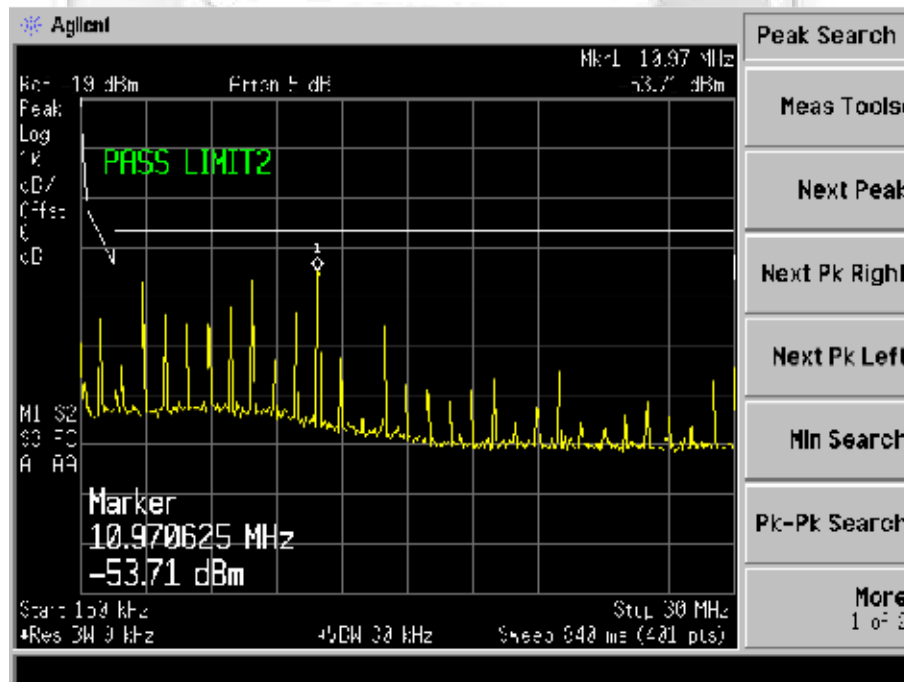
All spurious signals found were below the specified limit. Please refer to the attached plots.

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



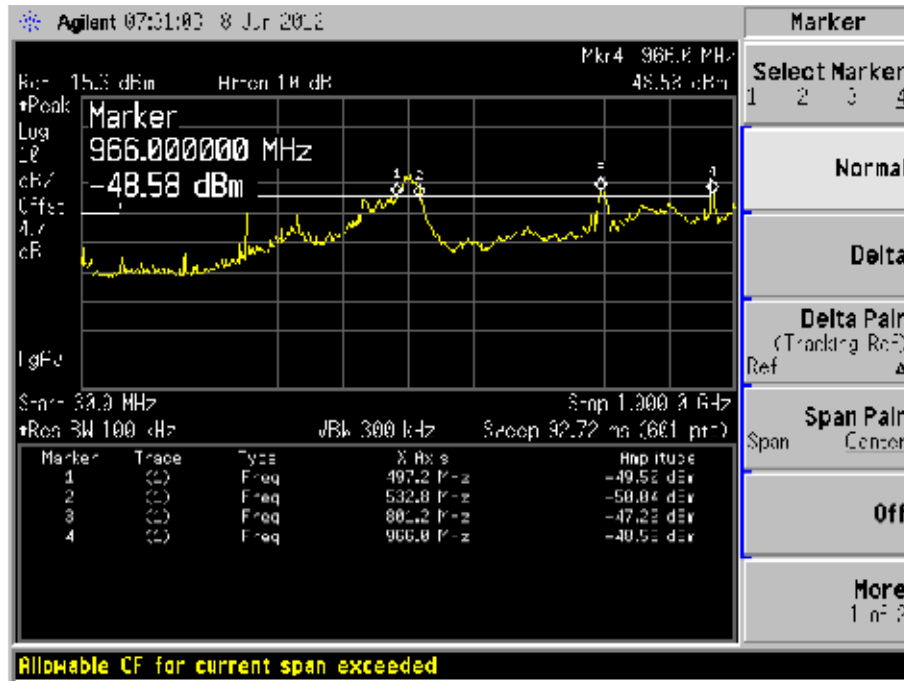
Plot 73 – Channel 1 @ DBPSK 1Mbps



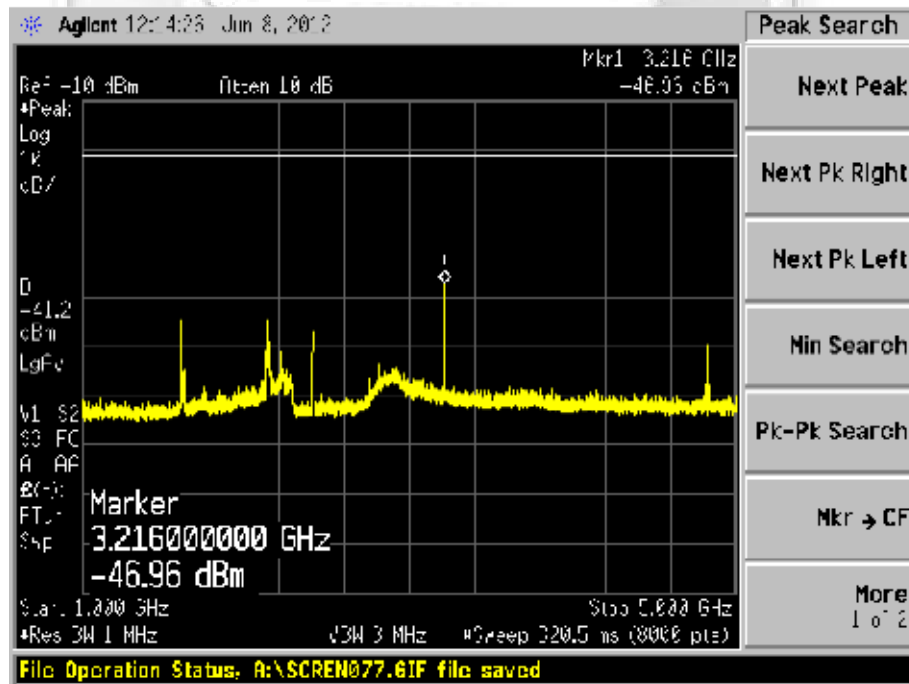
Plot 74 – Channel 1 @ DBPSK 1Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



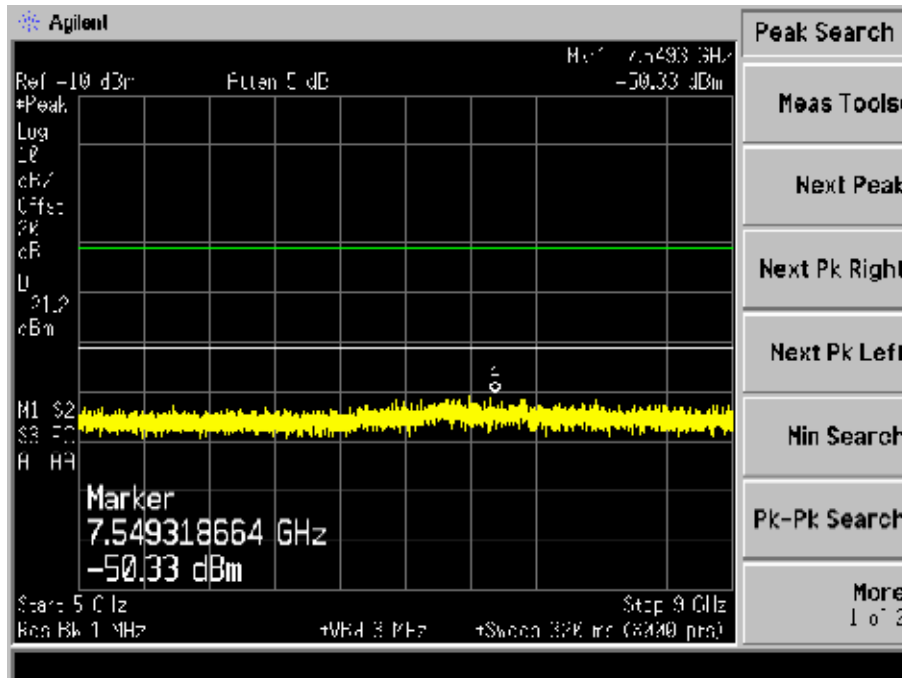
Plot 75 – Channel 1 @ DBPSK 1Mbps



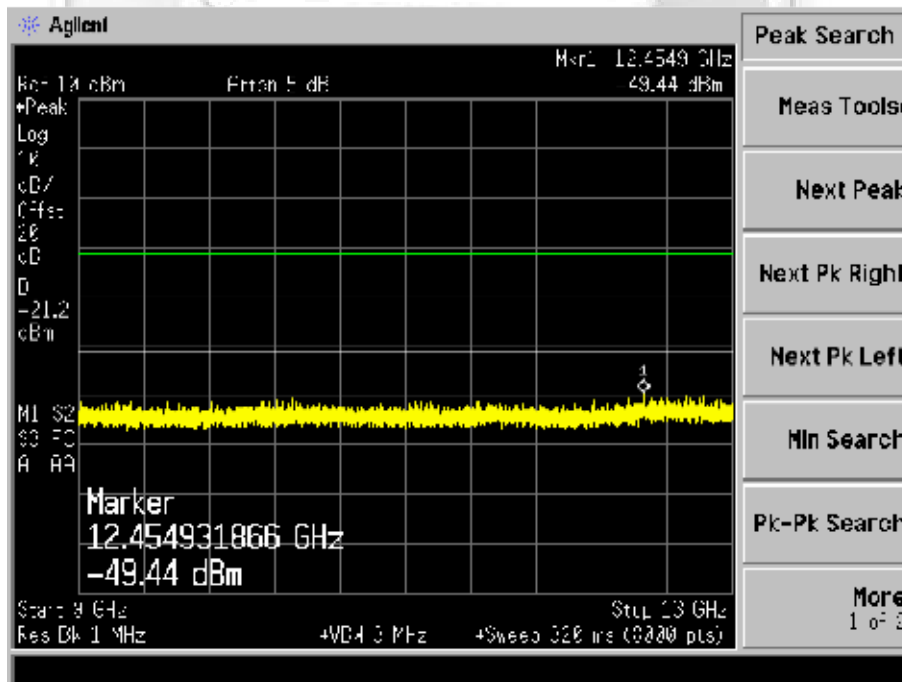
Plot 76 – Channel 1 @ DBPSK 1Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



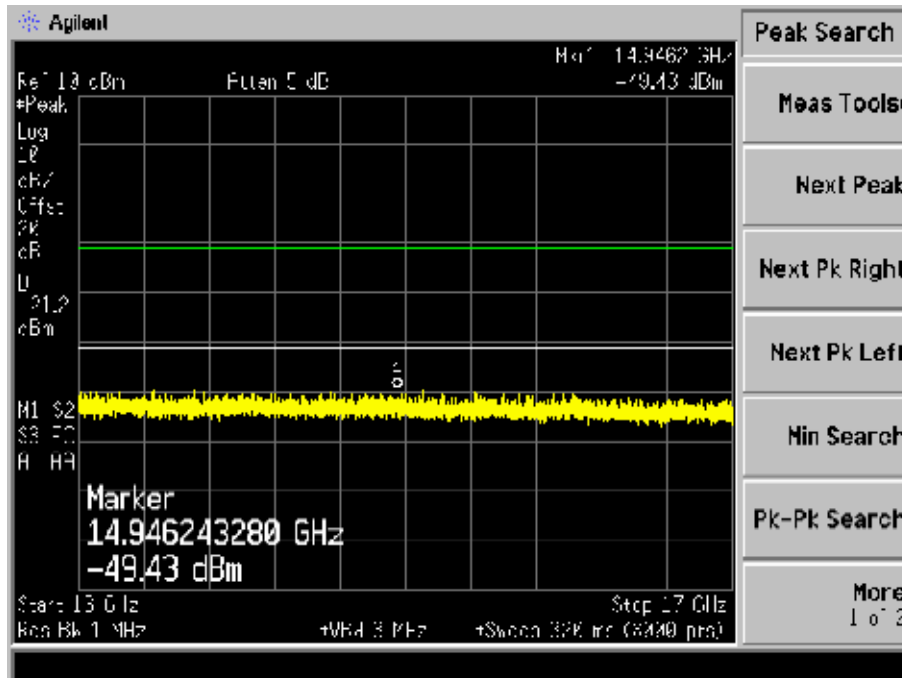
Plot 77 – Channel 1 @ DBPSK 1Mbps



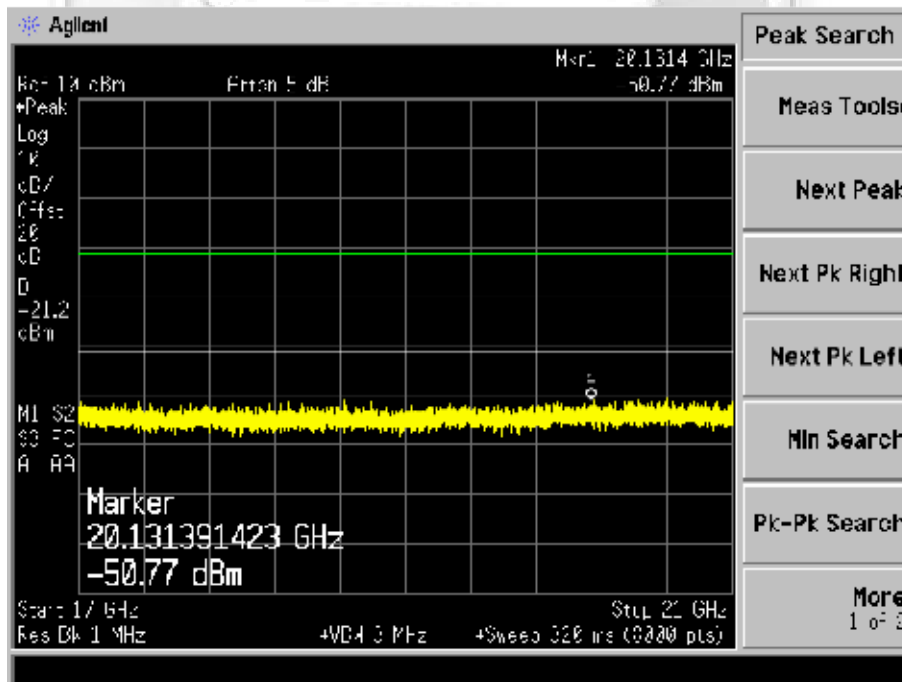
Plot 78 – Channel 1 @ DBPSK 1Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



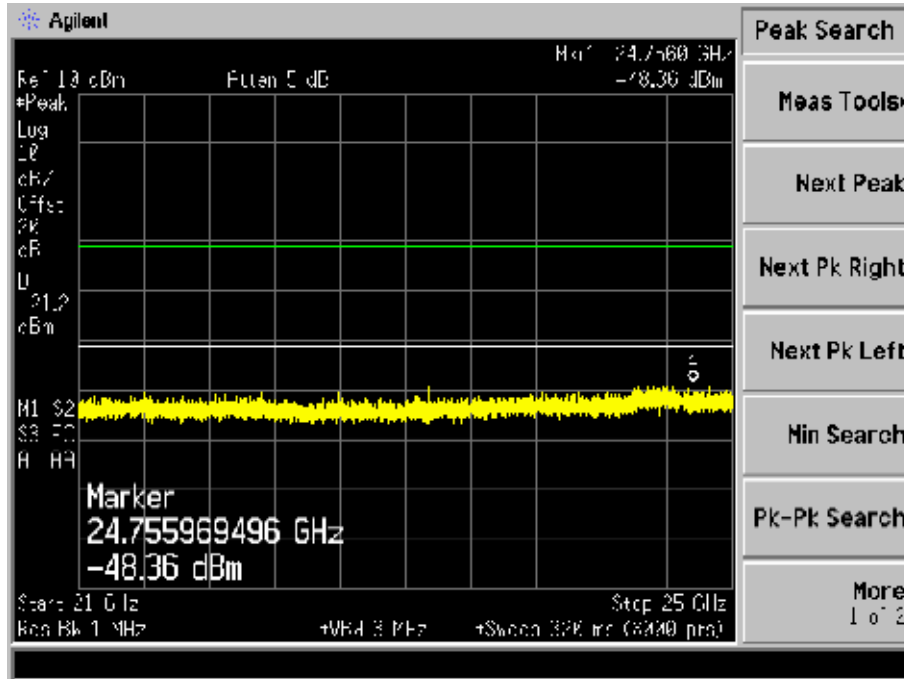
Plot 79 – Channel 1 @ DBPSK 1Mbps



Plot 80 – Channel 1 @ DBPSK 1Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak

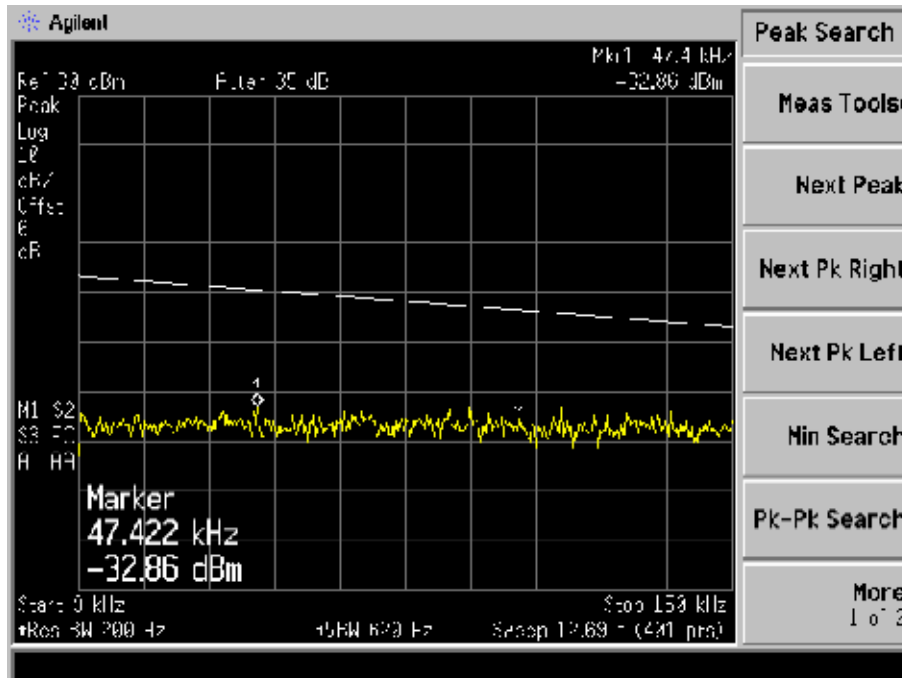


Plot 81 – Channel 1 @ DBPSK 1Mbps

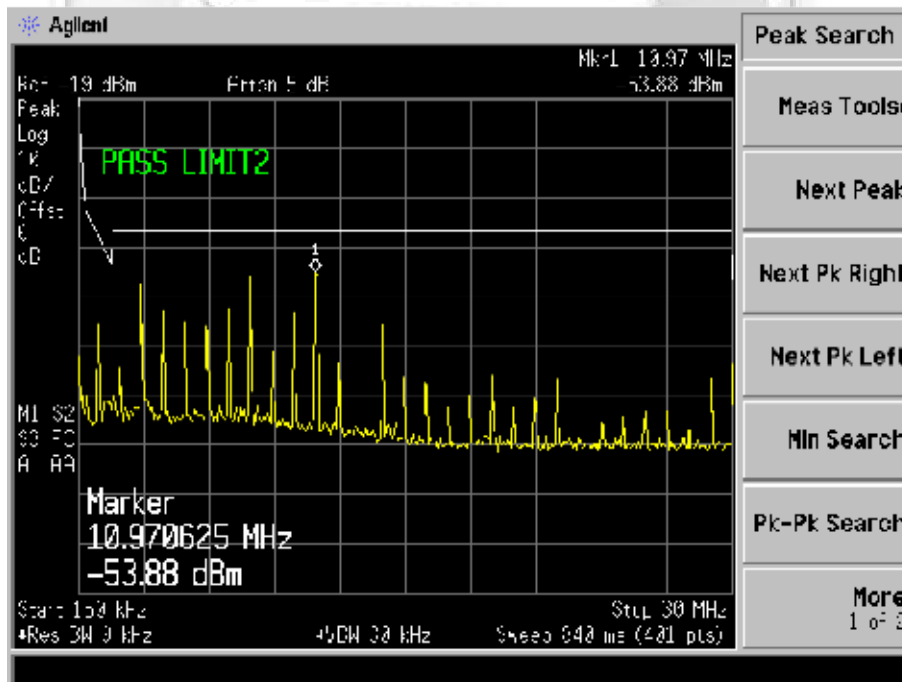


RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



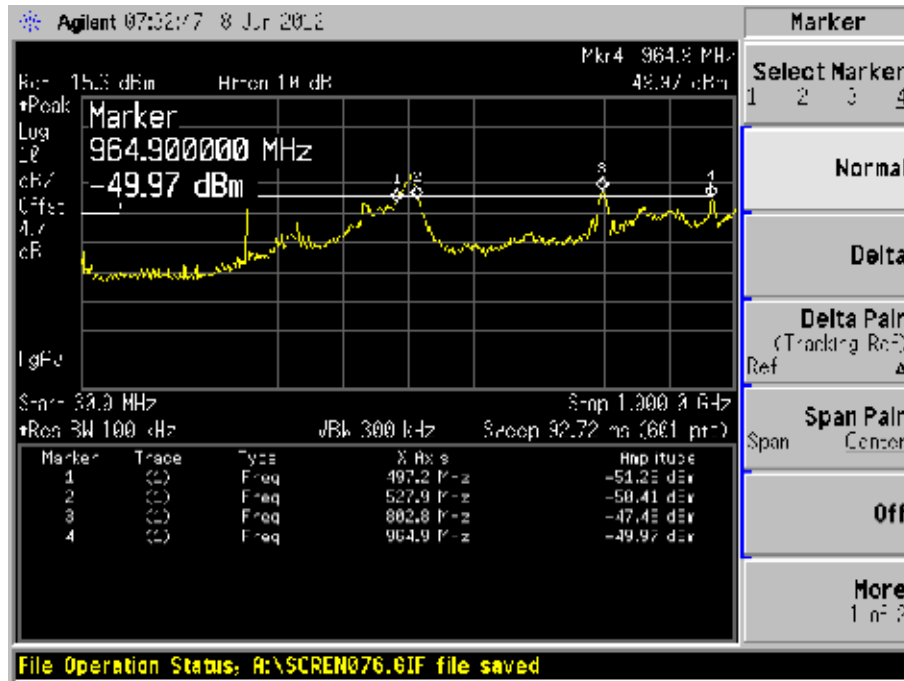
Plot 82 – Channel 1 @ DQPSK 2Mbps



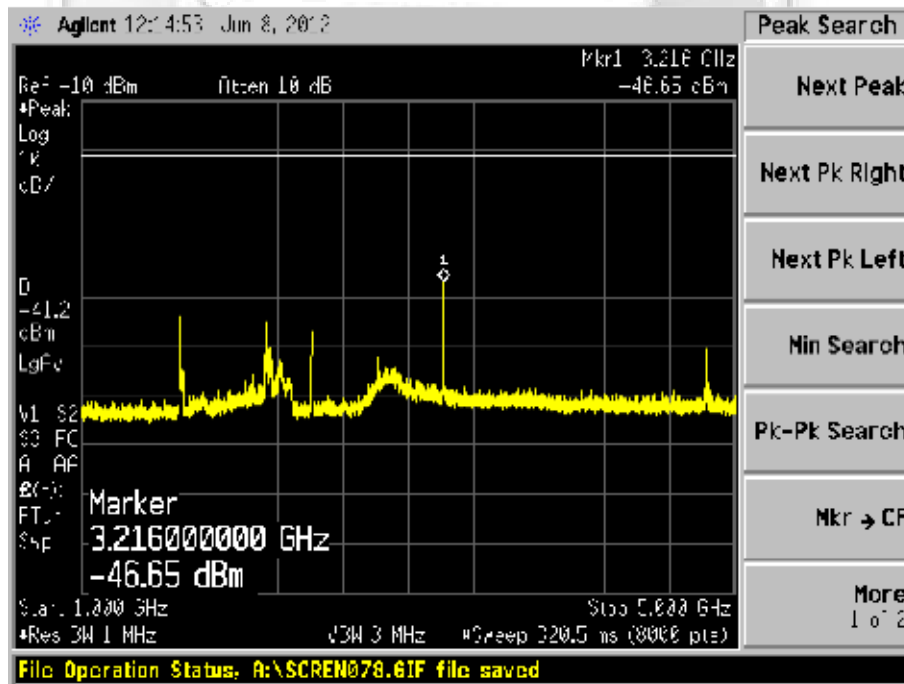
Plot 83 – Channel 1 @ DQPSK 2Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



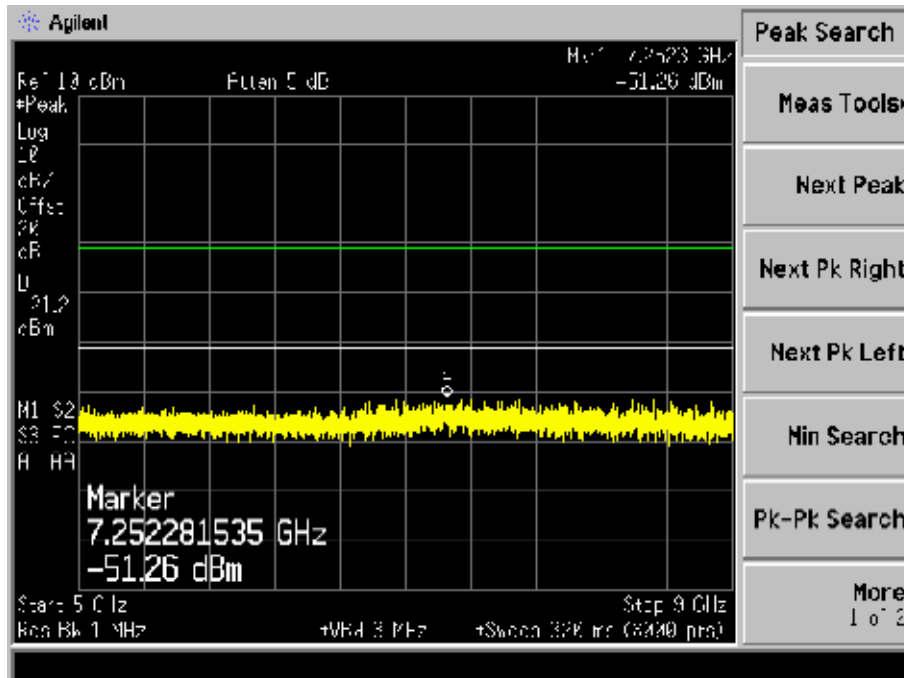
Plot 84 – Channel 1 @ DQPSK 2Mbps



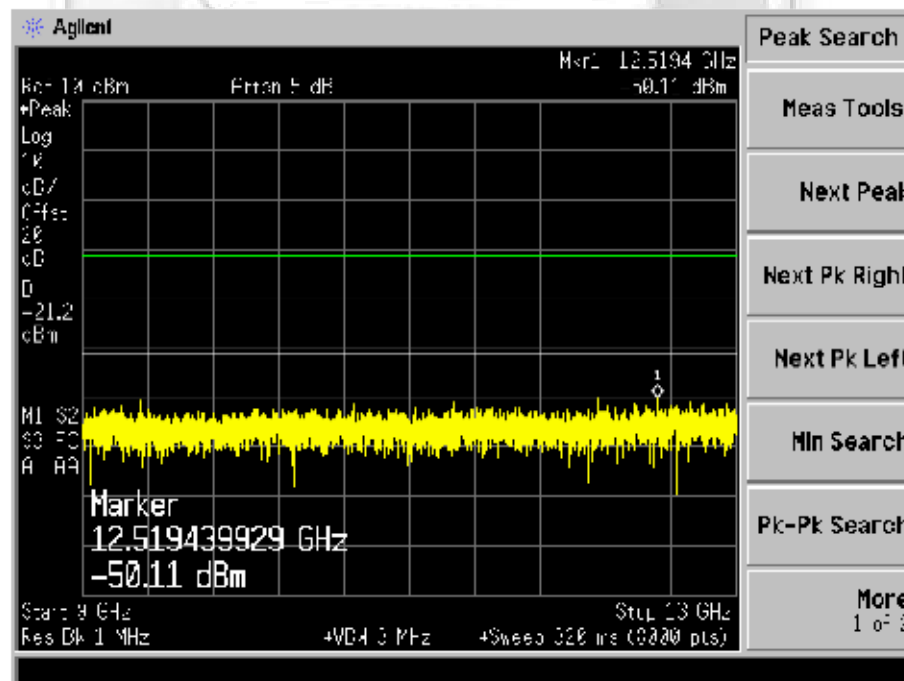
Plot 85 – Channel 1 @ DQPSK 2Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



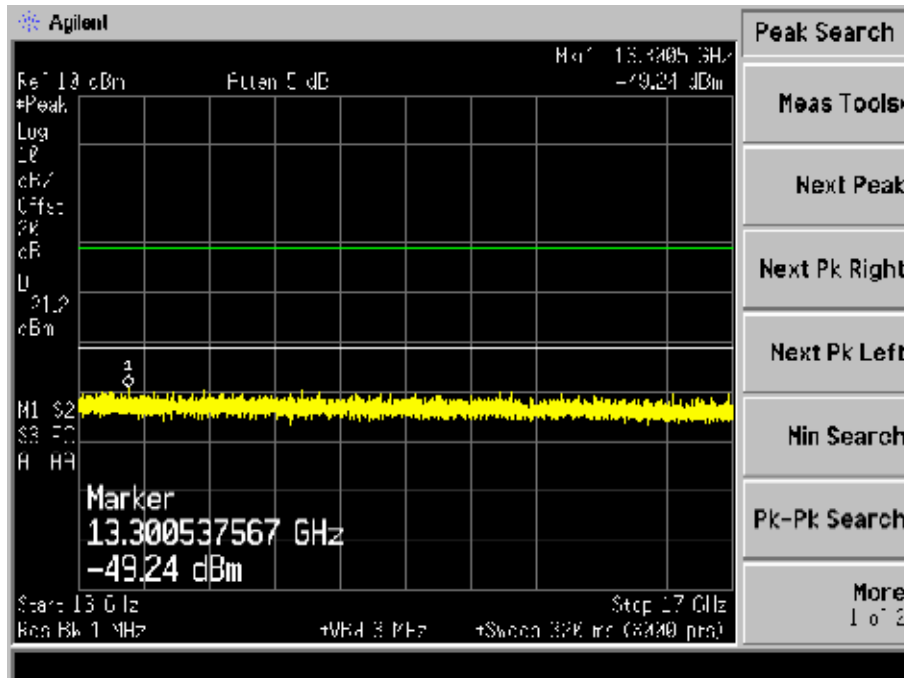
Plot 86 – Channel 1 @ DQPSK 2Mbps



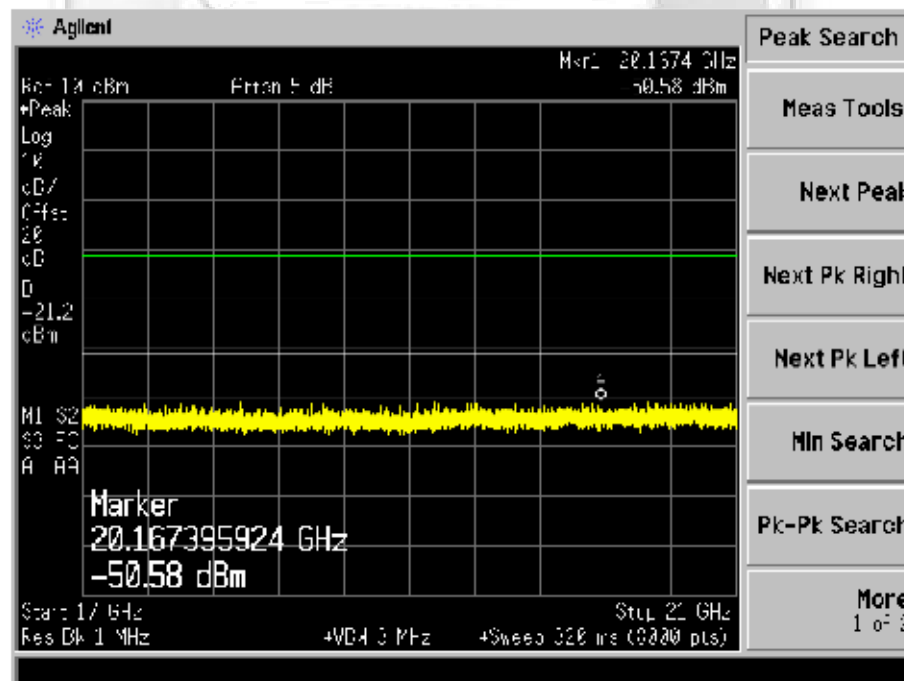
Plot 87 – Channel 1 @ DQPSK 2Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



Plot 88 – Channel 1 @ DQPSK 2Mbps

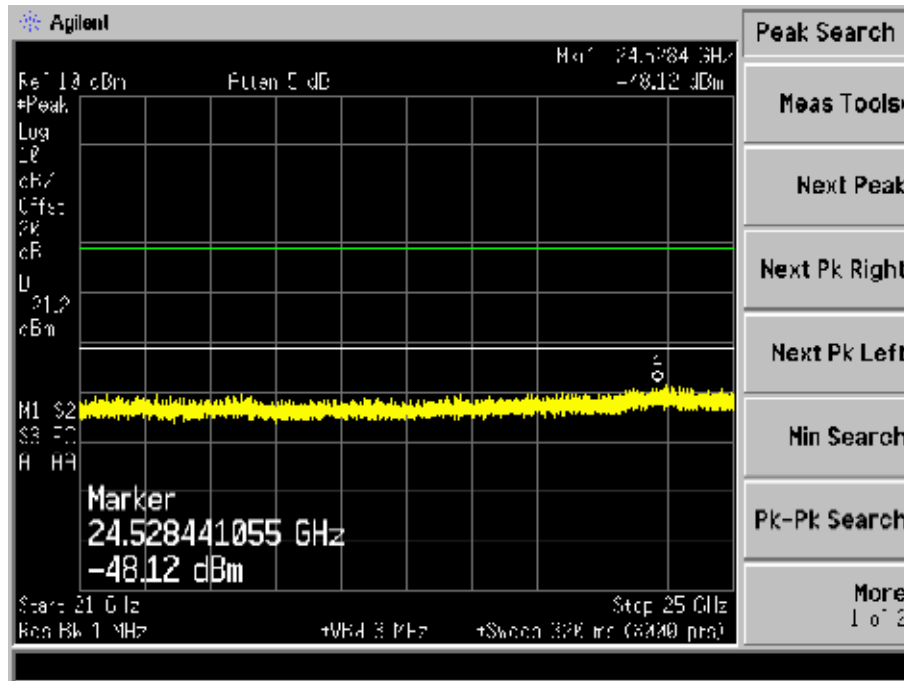


Plot 89 – Channel 1 @ DQPSK 2Mbps



RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak

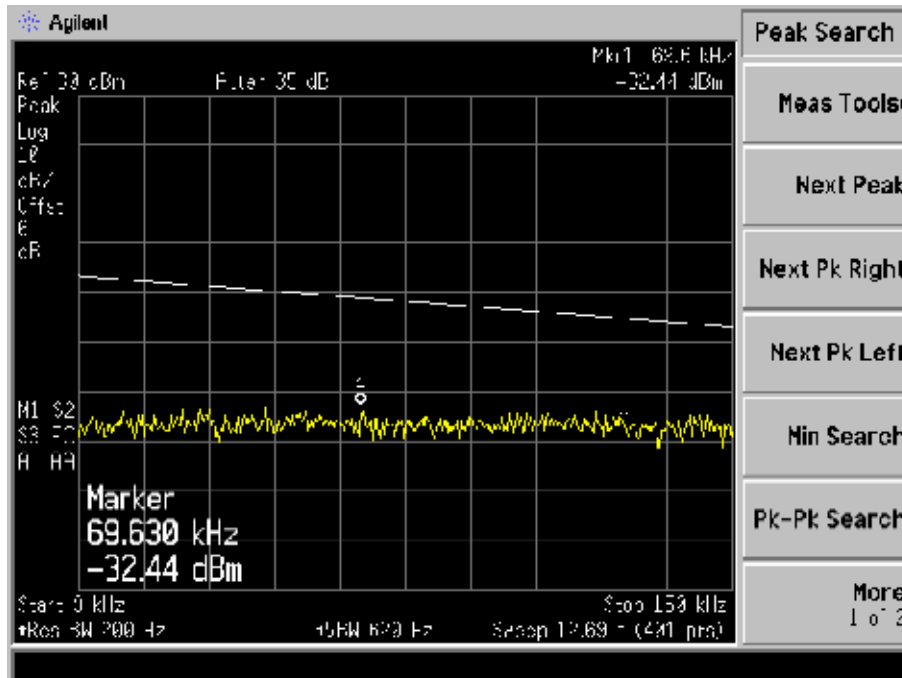


Plot 90 - Channel 1 @ DQPSK 2Mbps

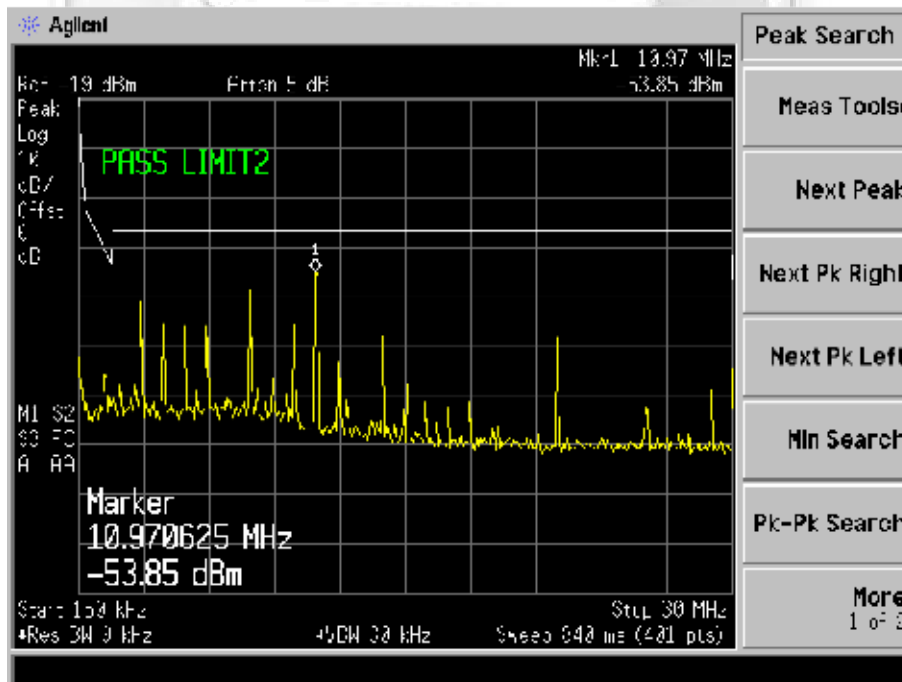


RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



Plot 91 – Channel 1 @ CCK 5.5Mbps

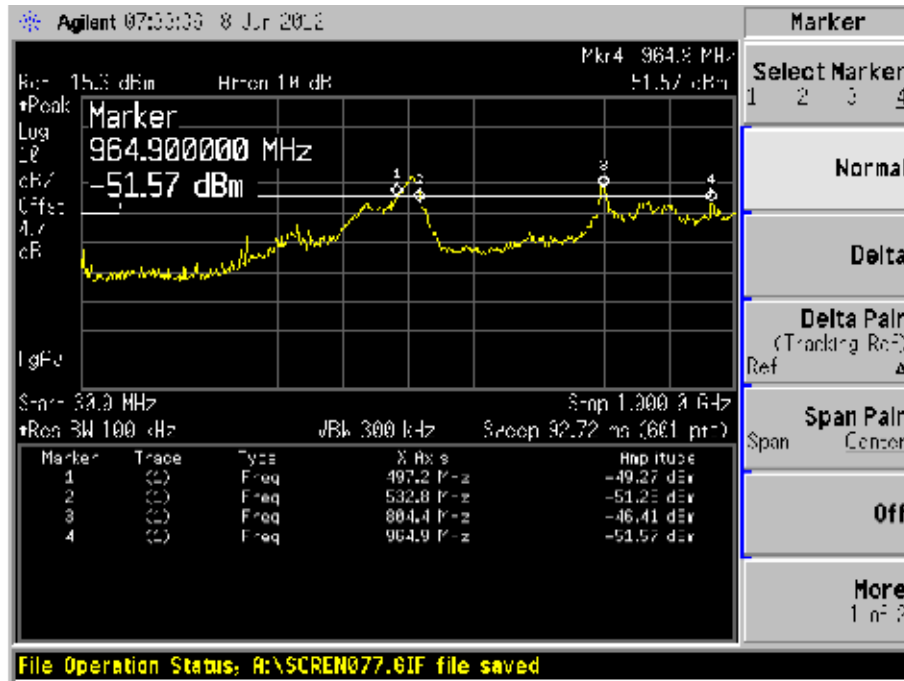


Plot 92 – Channel 1 @ CCK 5.5Mbps



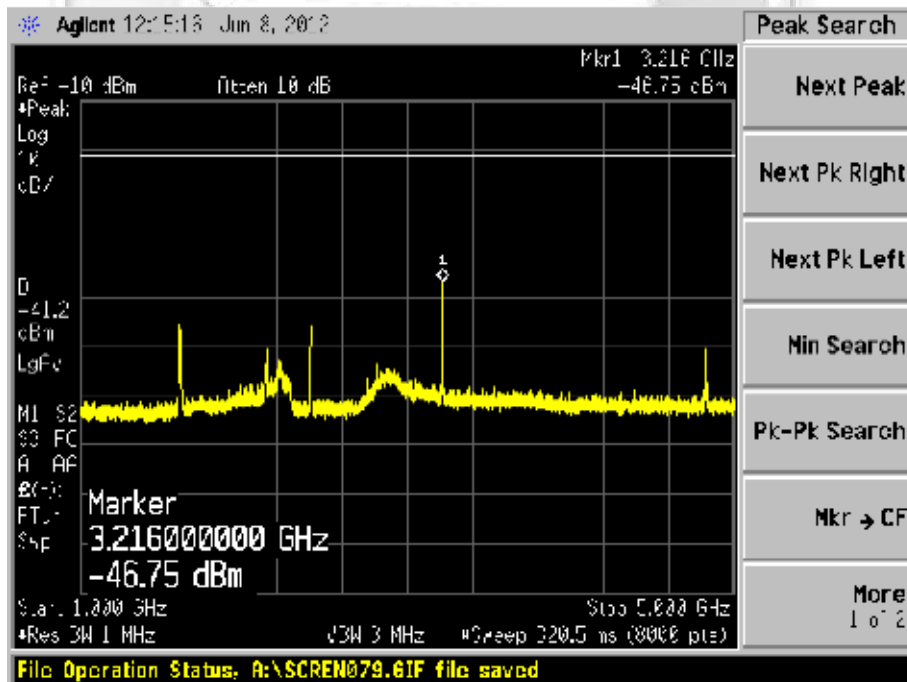
RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



File Operation Status: A:\SCREEN077.6IF file saved

Plot 93 – Channel 1 @ CCK 5.5Mbps

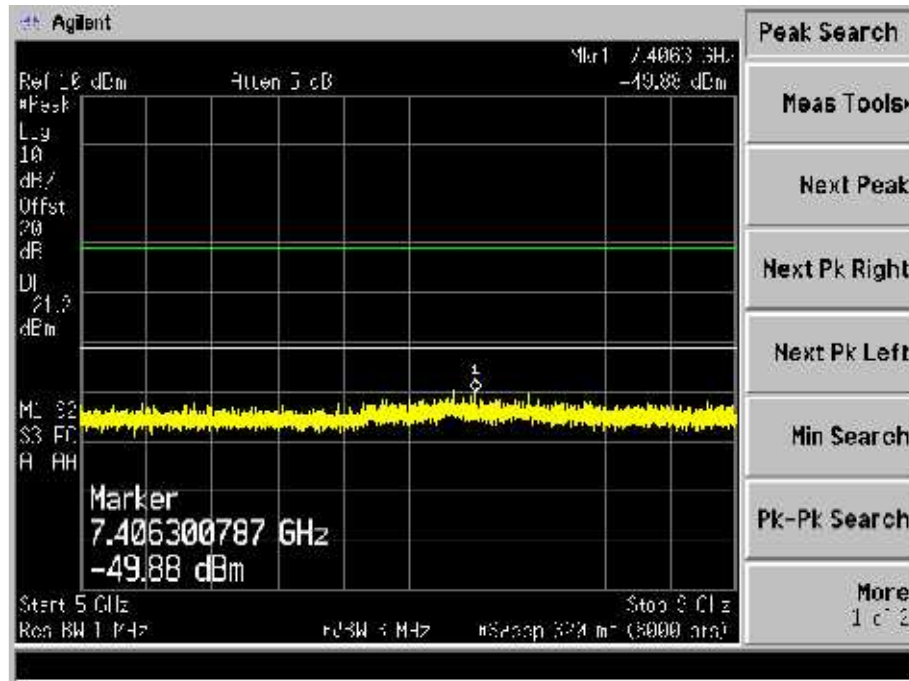


File Operation Status: A:\SCREEN079.6IF file saved

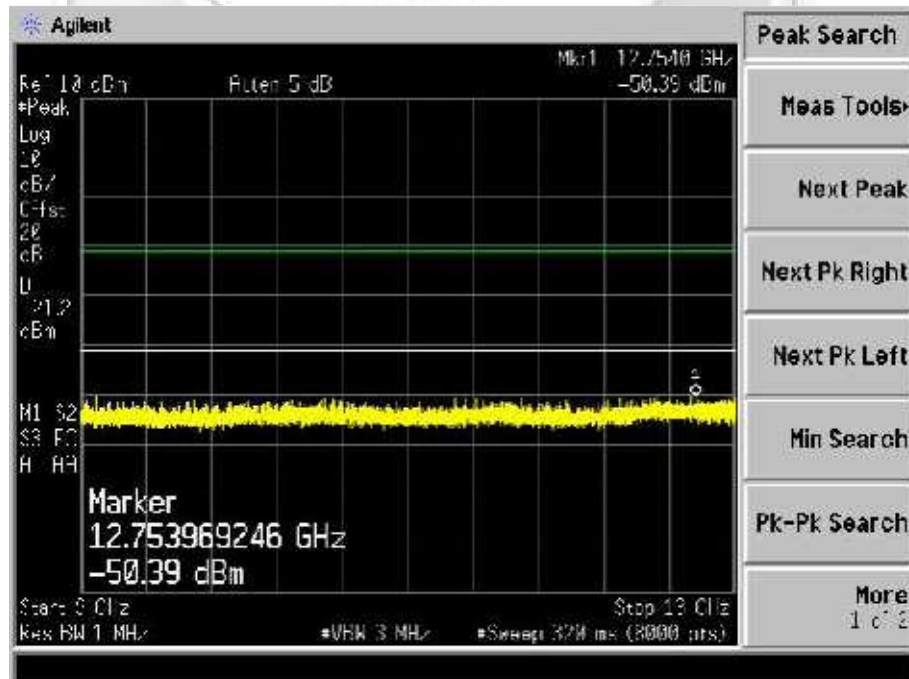
Plot 94 – Channel 1 @ CCK 5.5Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



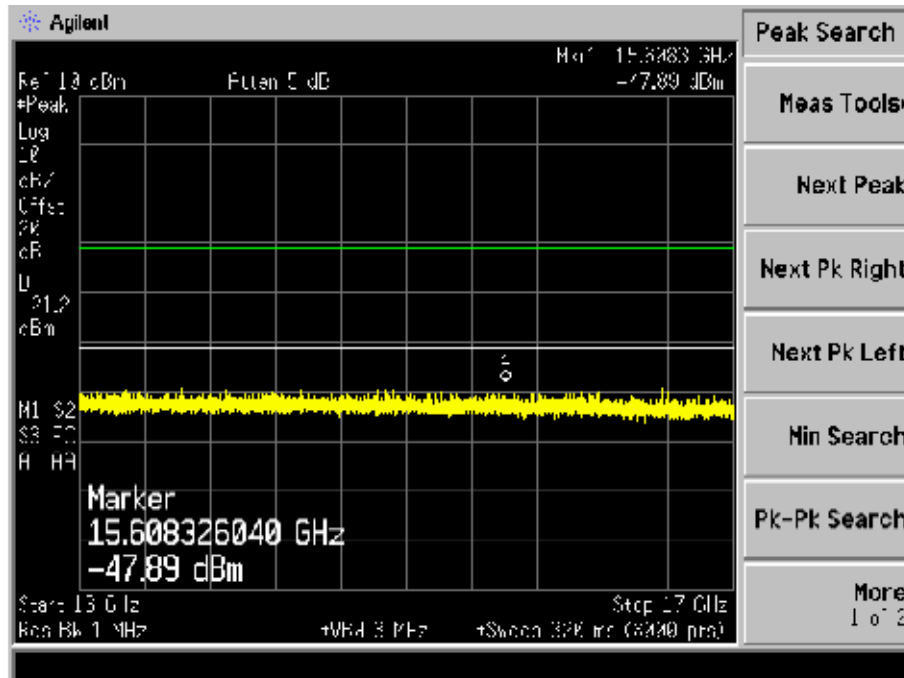
Plot 95 – Channel 1 @ CCK 5.5Mbps



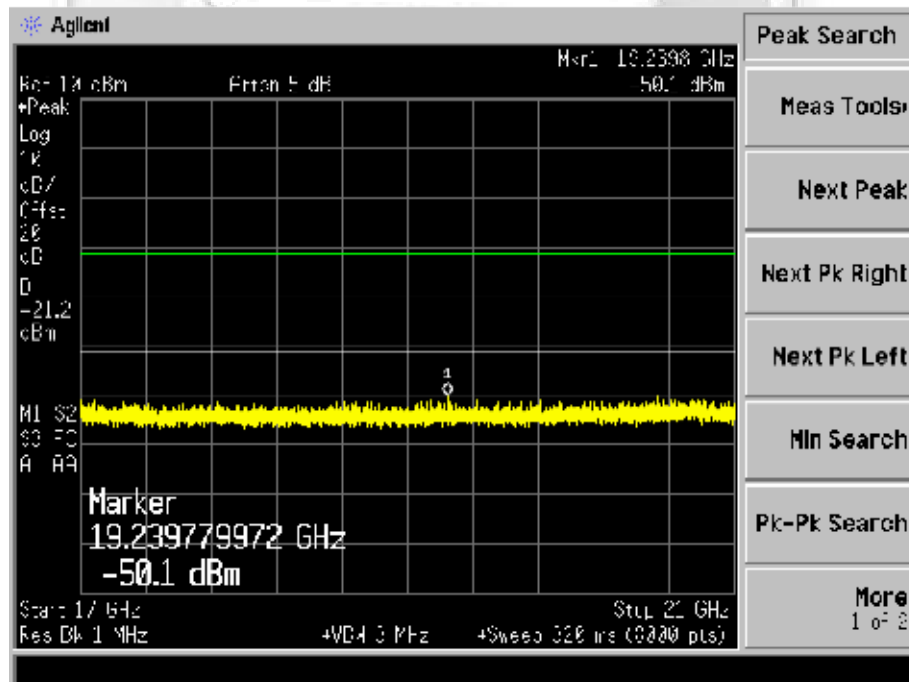
Plot 96 – Channel 1 @ CCK 5.5Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



Plot 97 – Channel 1 @ CCK 5.5Mbps

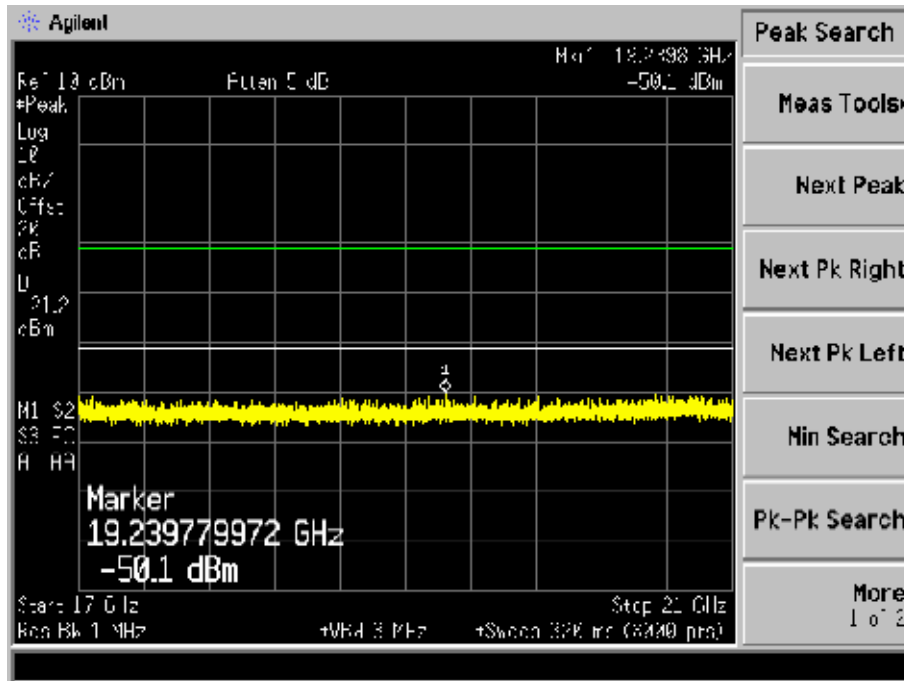


Plot 98 – Channel 1 @ CCK 5.5Mbps



RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots – Peak

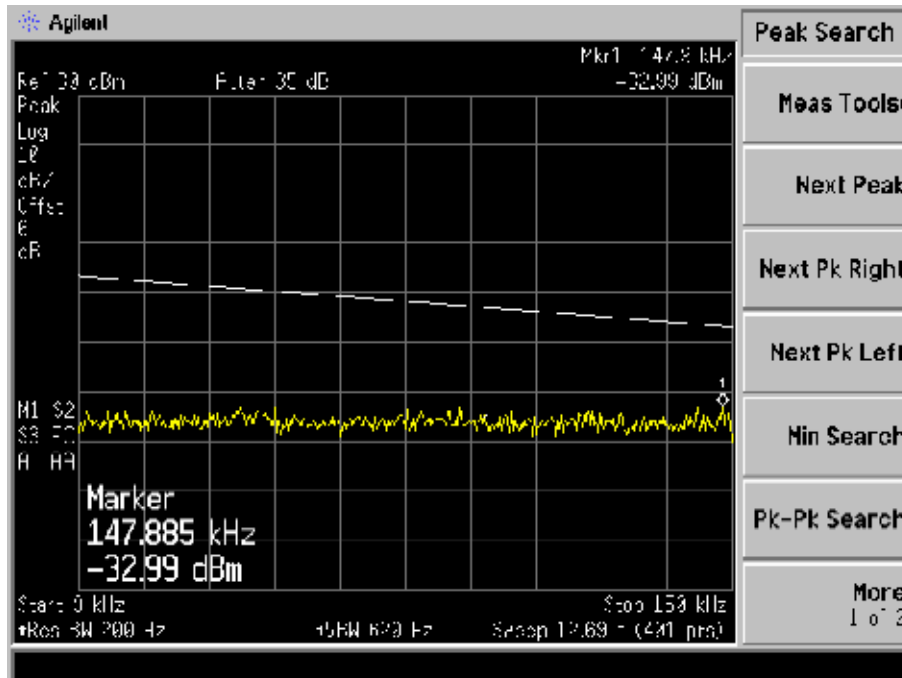


Plot 99 – Channel 1 @ CCK 5.5Mbps

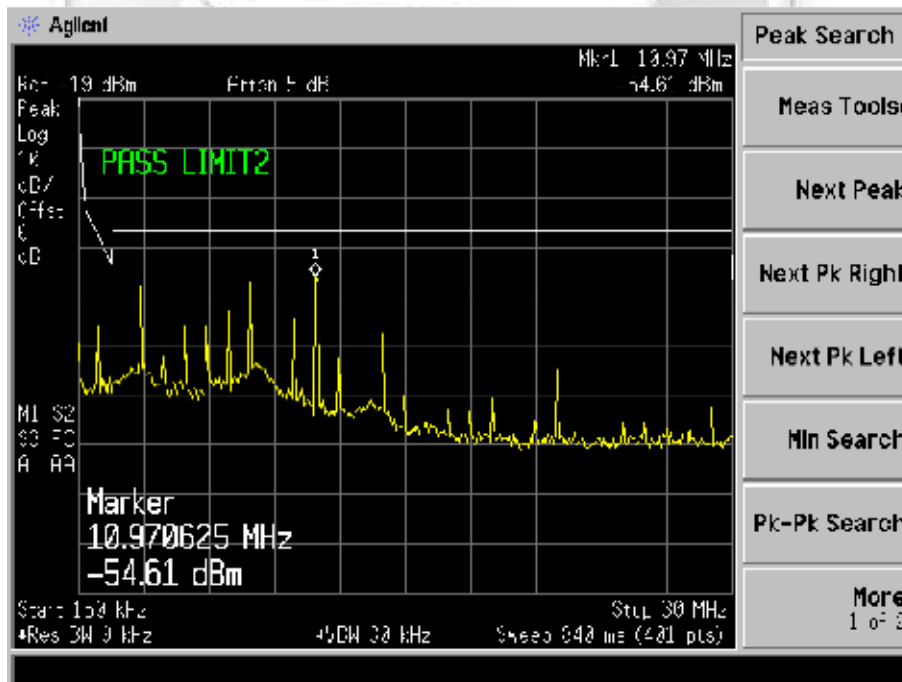


RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



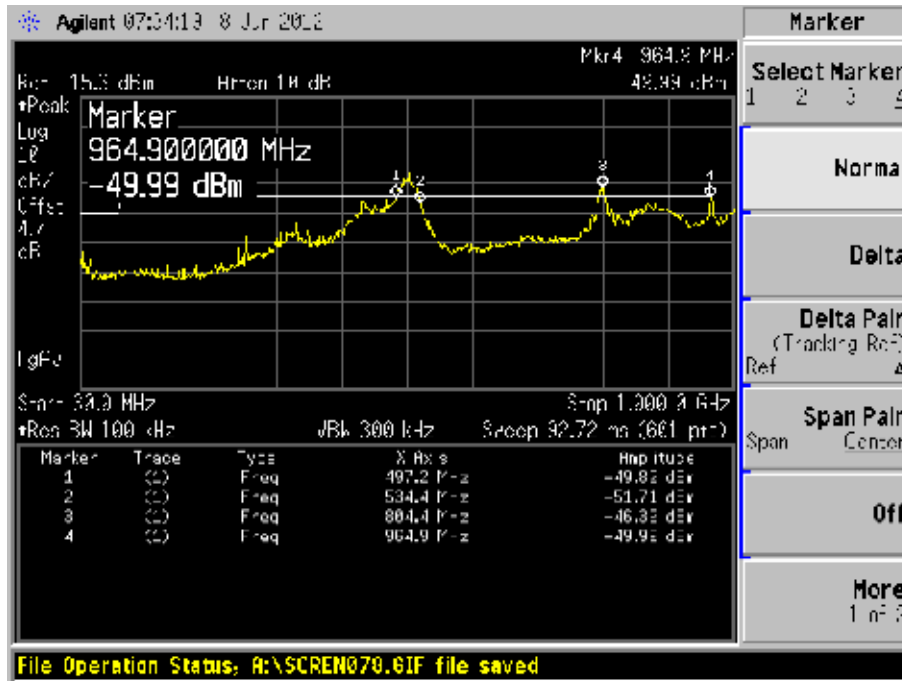
Plot 100 – Channel 1 @ CCK 11Mbps



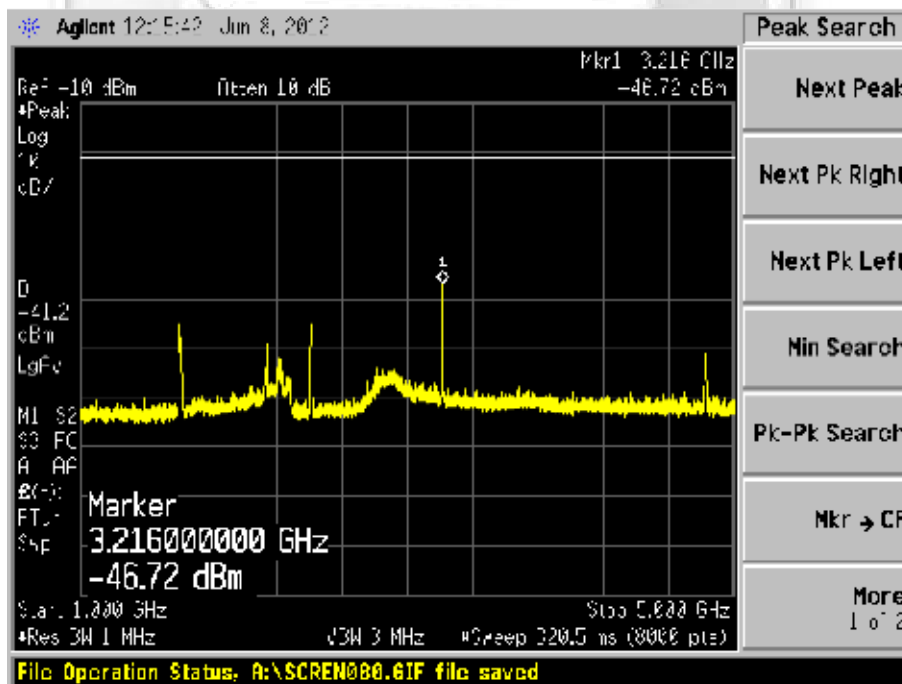
Plot 101 – Channel 1 @ CCK 11Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



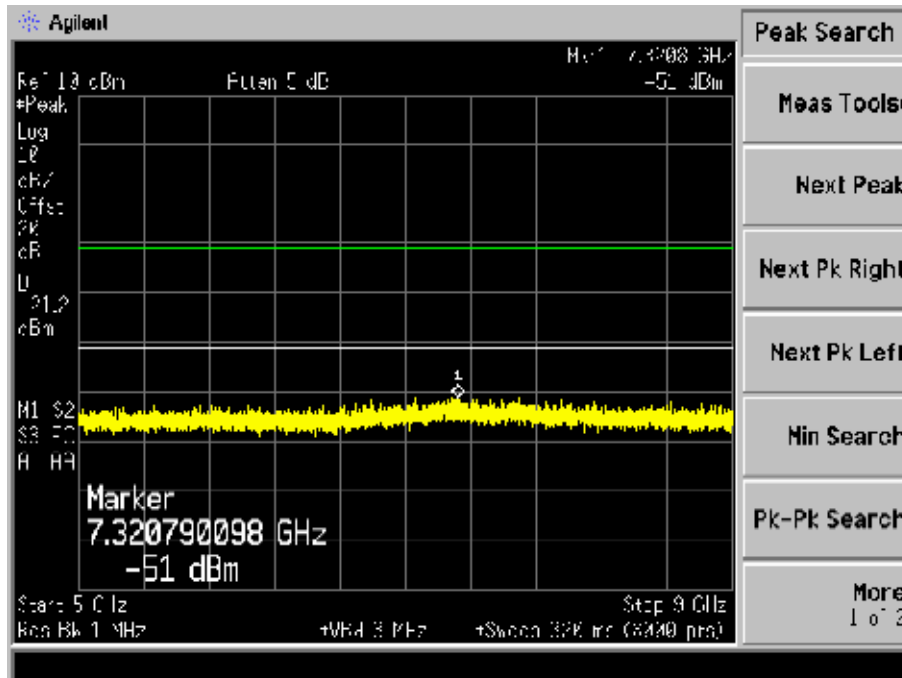
Plot 102 – Channel 1 @ CCK 11Mbps



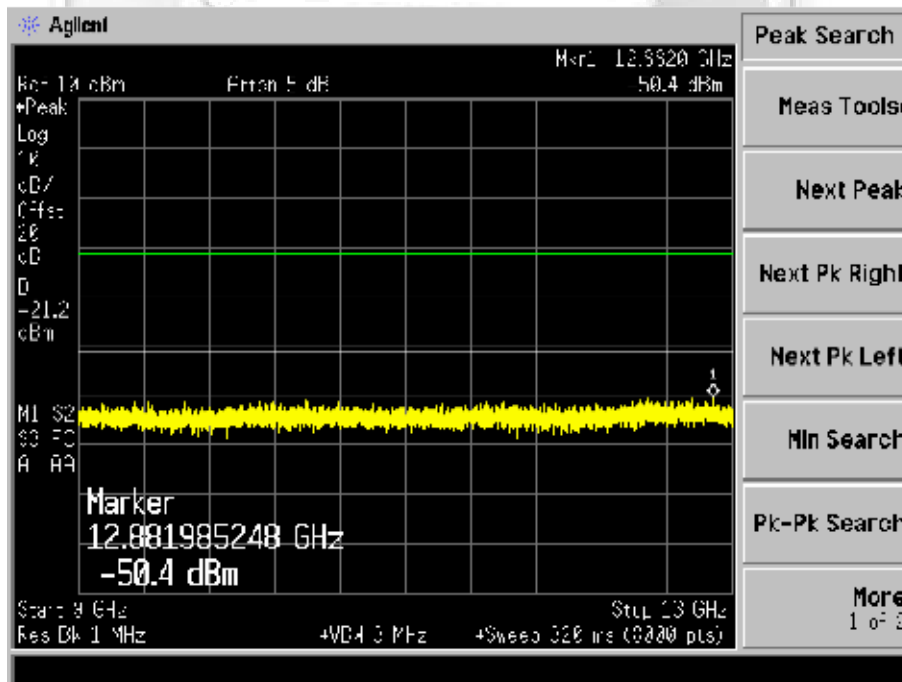
Plot 103 – Channel 1 @ CCK 11Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



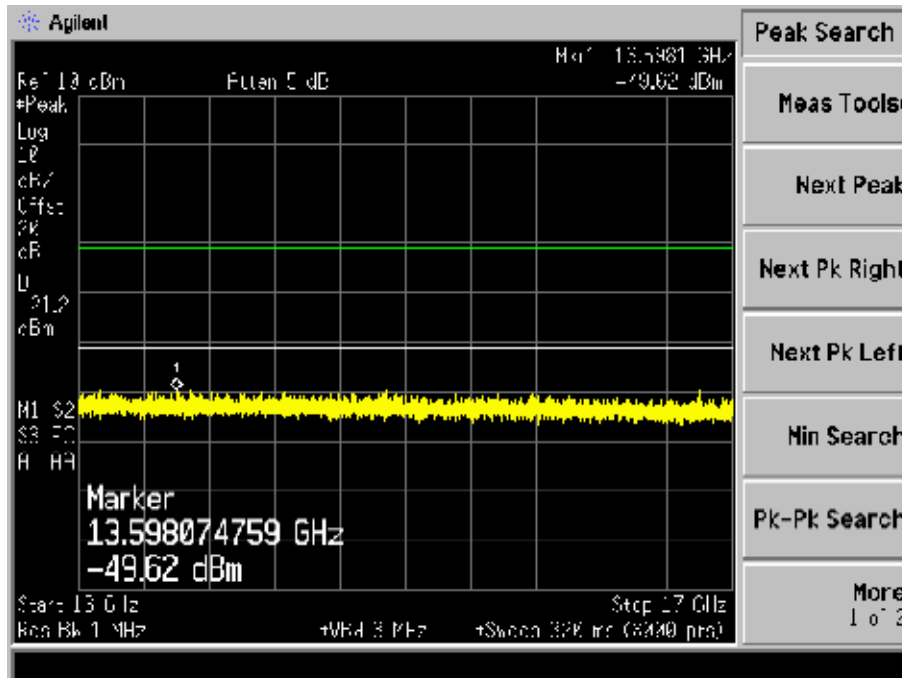
Plot 104 – Channel 1 @ CCK 11Mbps



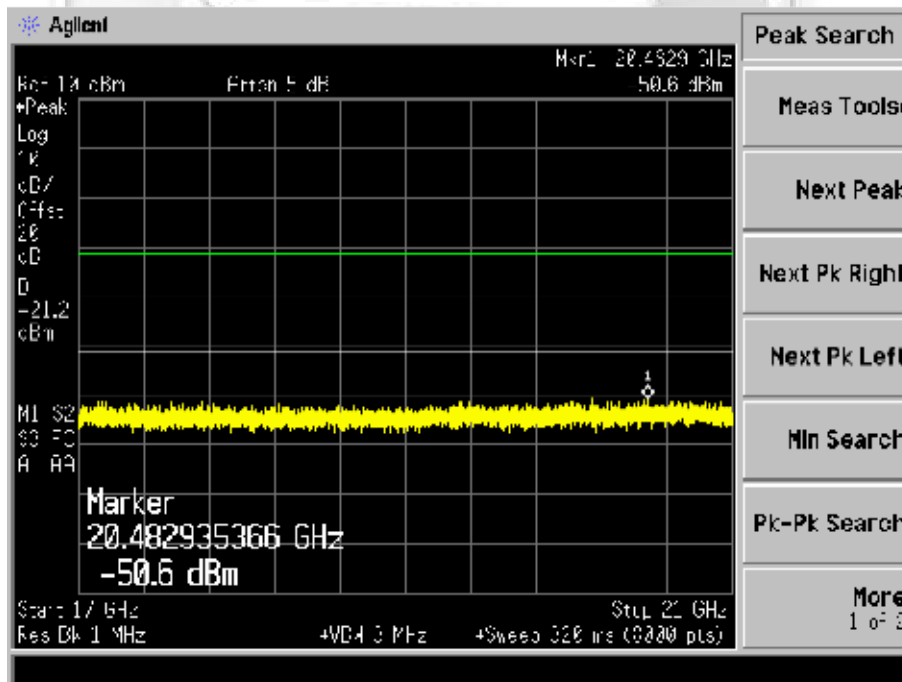
Plot 105 – Channel 1 @ CCK 11Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



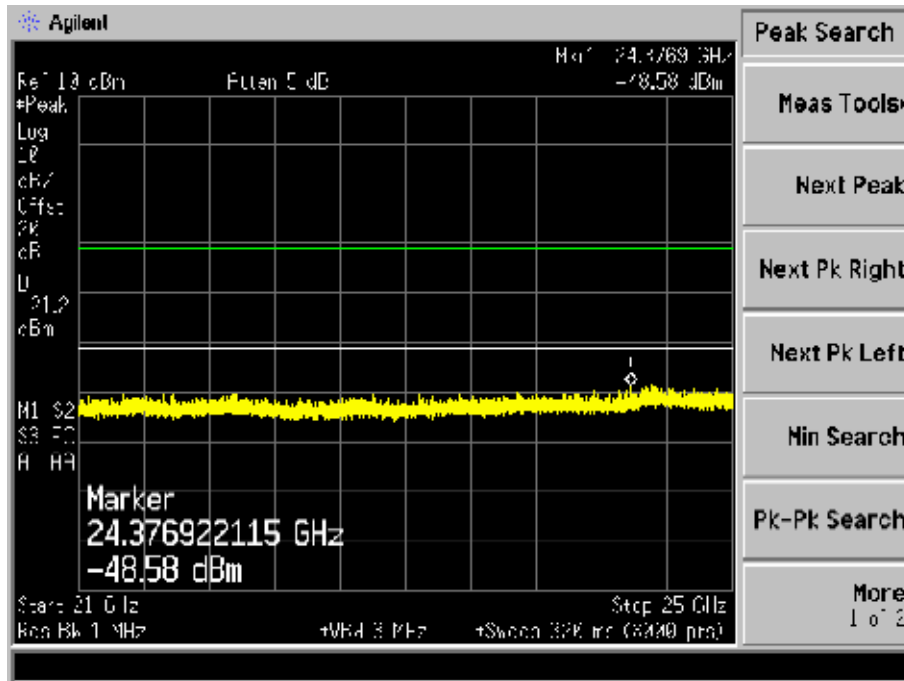
Plot 106 – Channel 1 @ CCK 11Mbps



Plot 107 – Channel 1 @ CCK 11Mbps

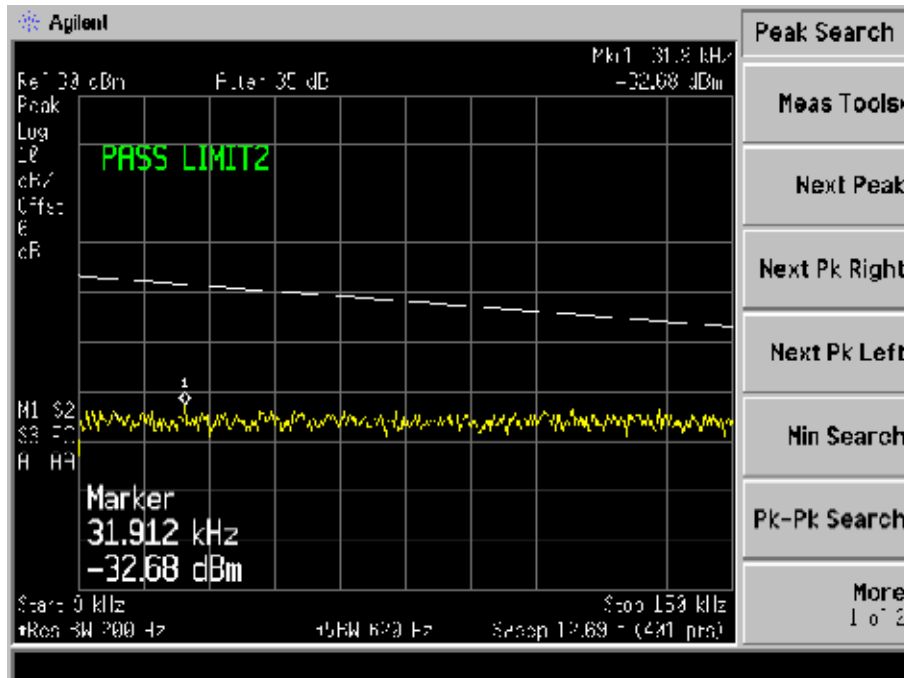
RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak

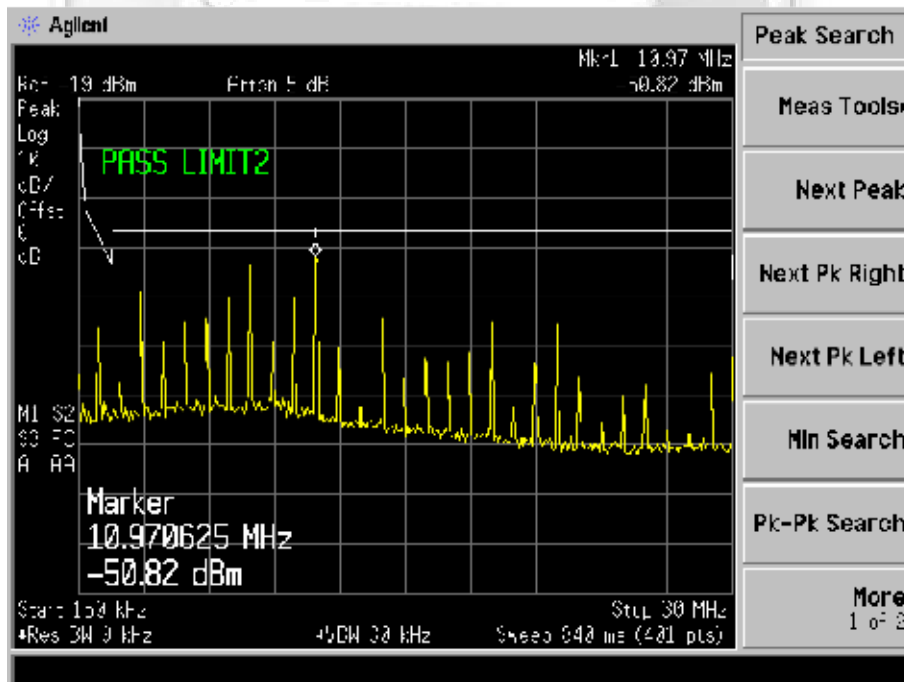


RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



Plot 109 – Channel 6 @DBPSK 1Mbps



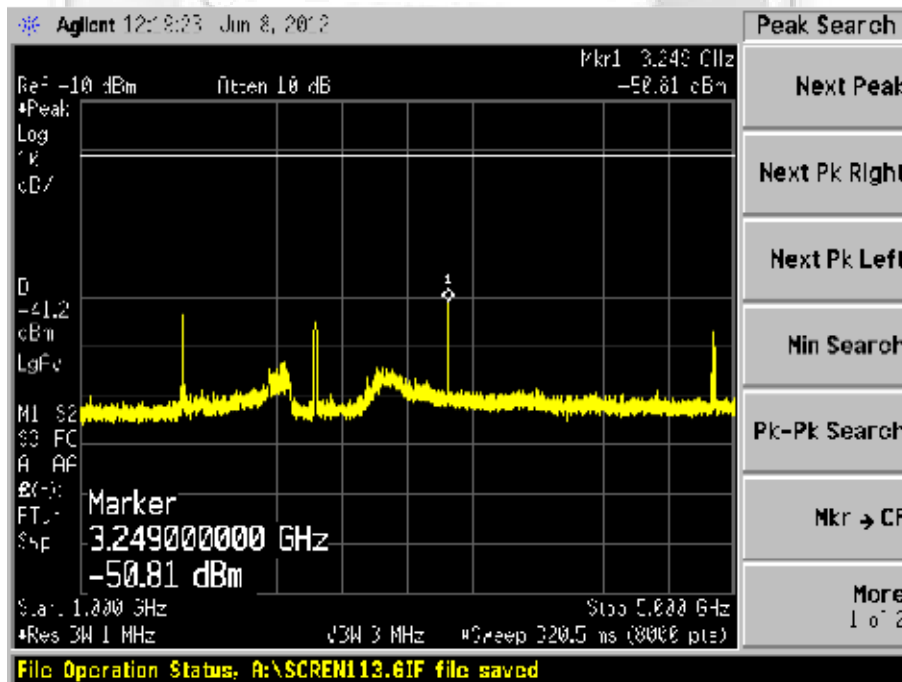
Plot 110 – Channel 6 @DBPSK 1Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



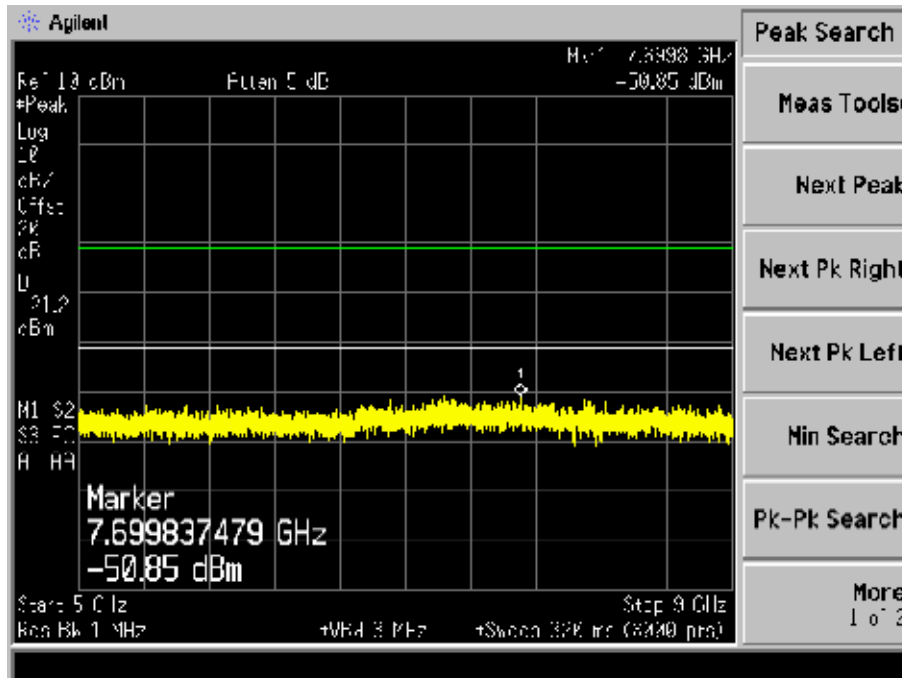
Plot 111 – Channel 6 @ DBPSK 1Mbps



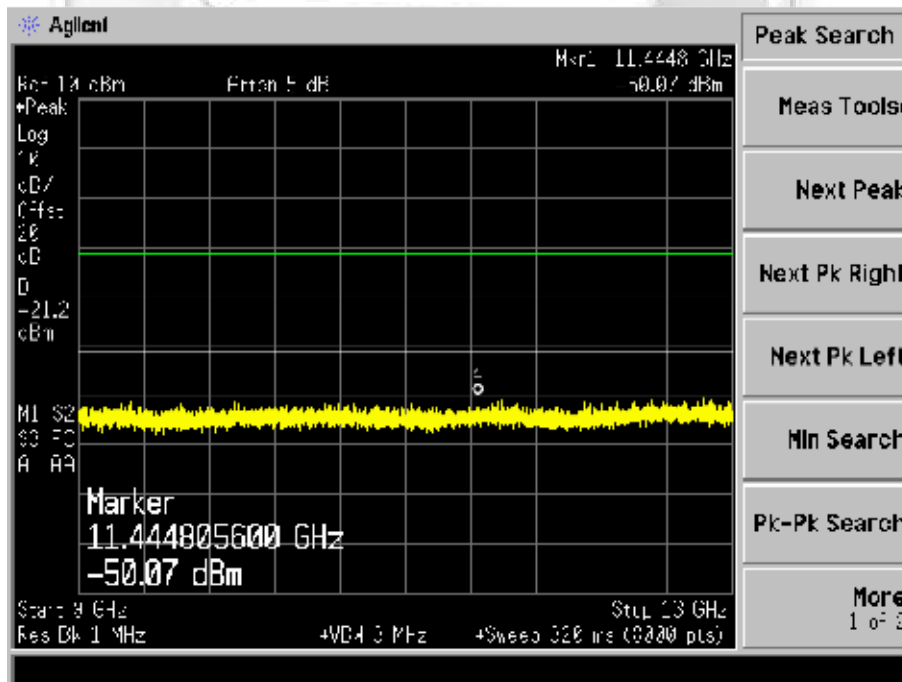
Plot 112 – Channel 6 @ DBPSK 1Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots – Peak



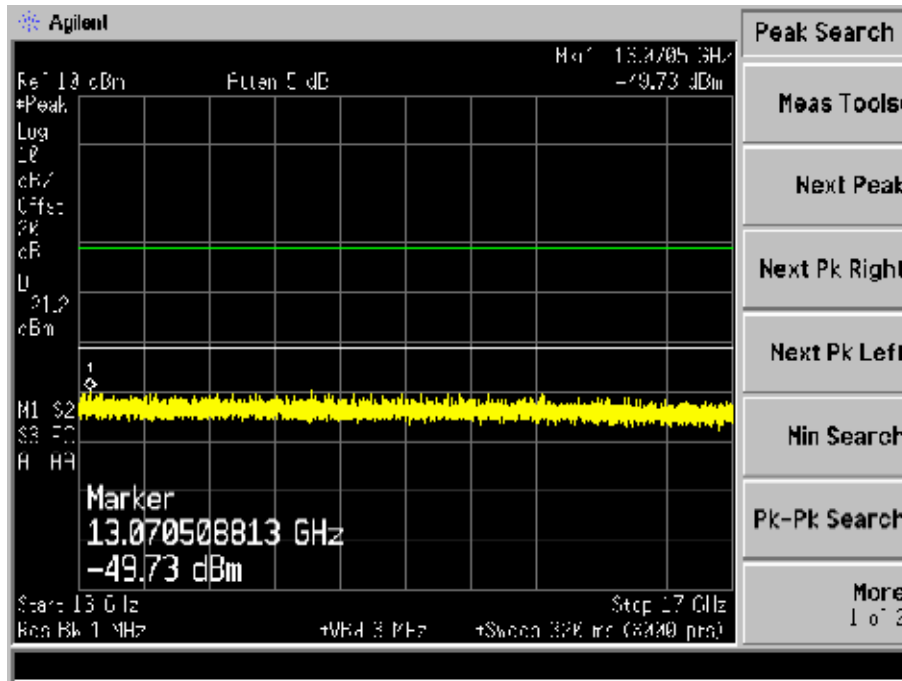
Plot 113 – Channel 6 @ DBPSK 1Mbps



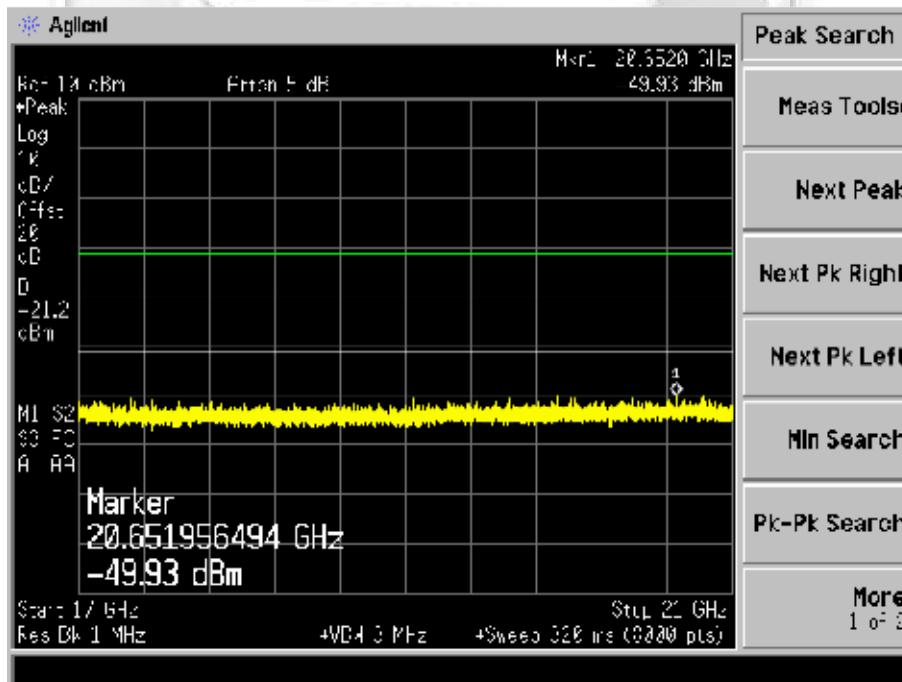
Plot 114 – Channel 6 @ DBPSK 1Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



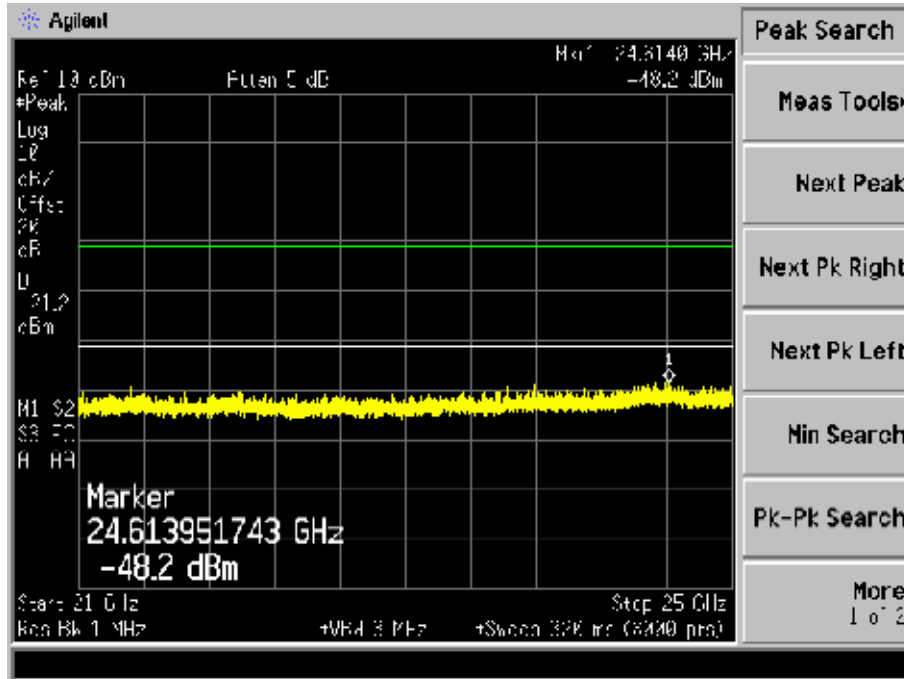
Plot 115 – Channel 6 @ DBPSK 1Mbps



Plot 116 – Channel 6 @ DBPSK 1Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak

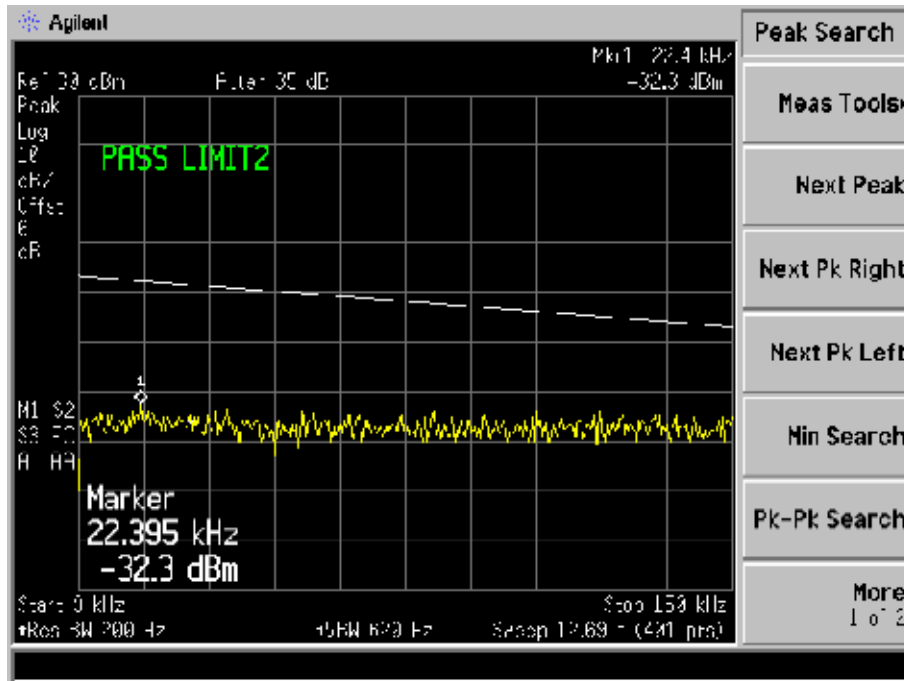


Plot 117 - Channel 6 @ DBPSK 1Mbps

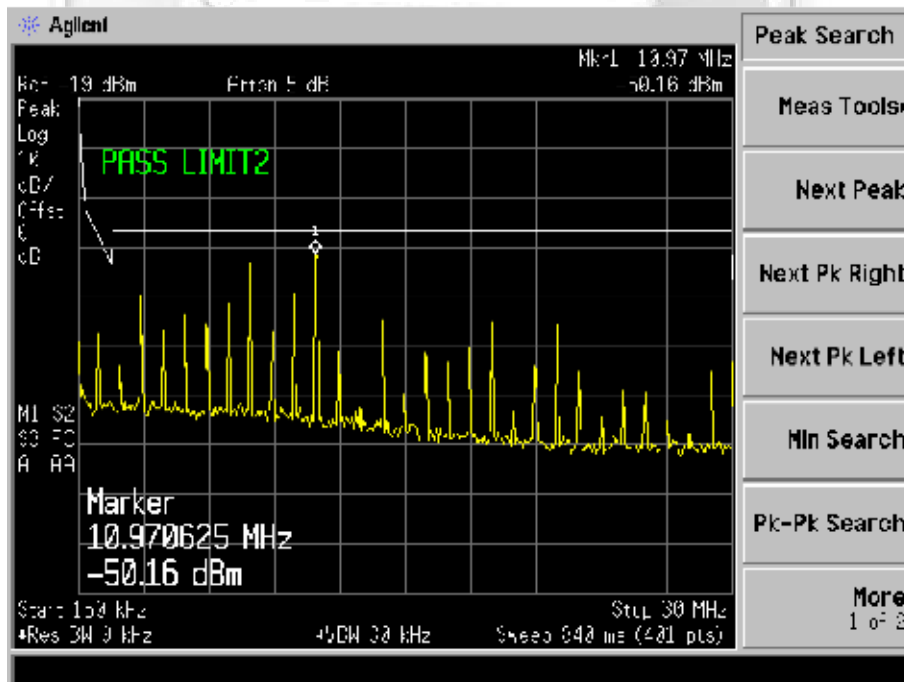


RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



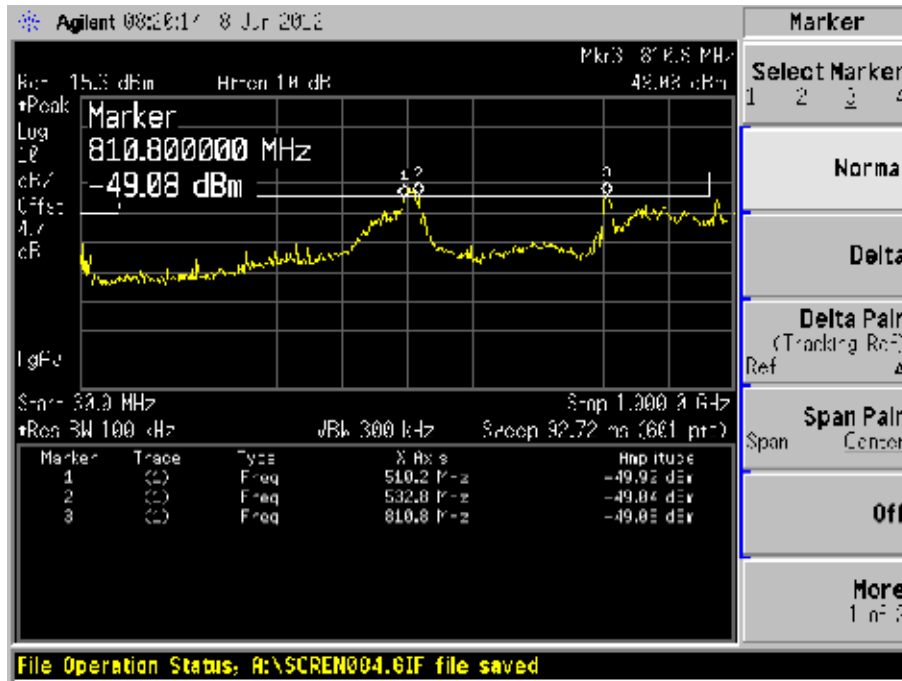
Plot 118 – Channel 6 @ DQPSK 2Mbps



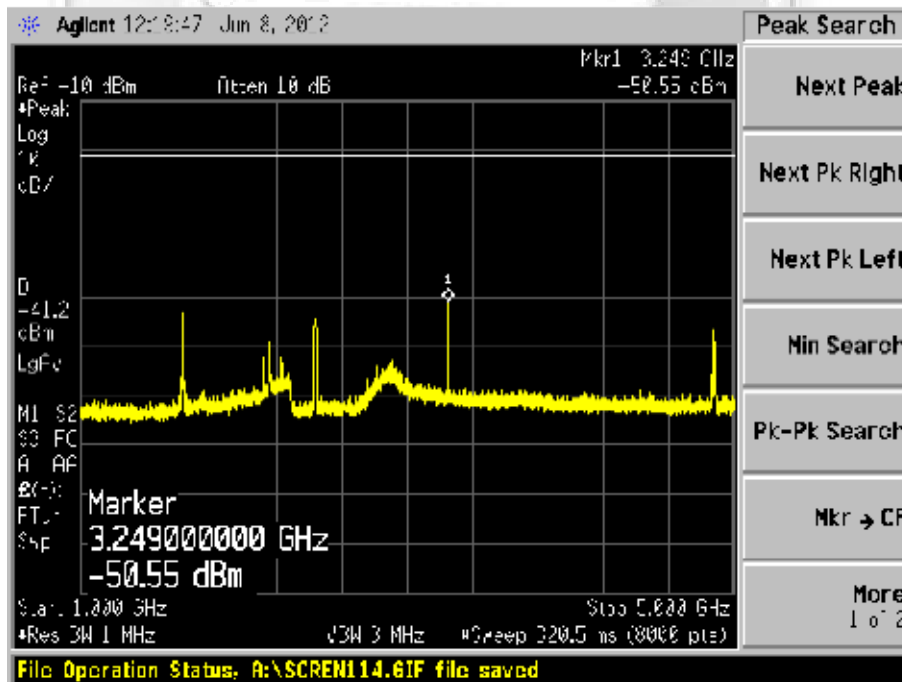
Plot 119 – Channel 6 @ DQPSK 2Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



Plot 120 – Channel 6 @ DQPSK 2Mbps

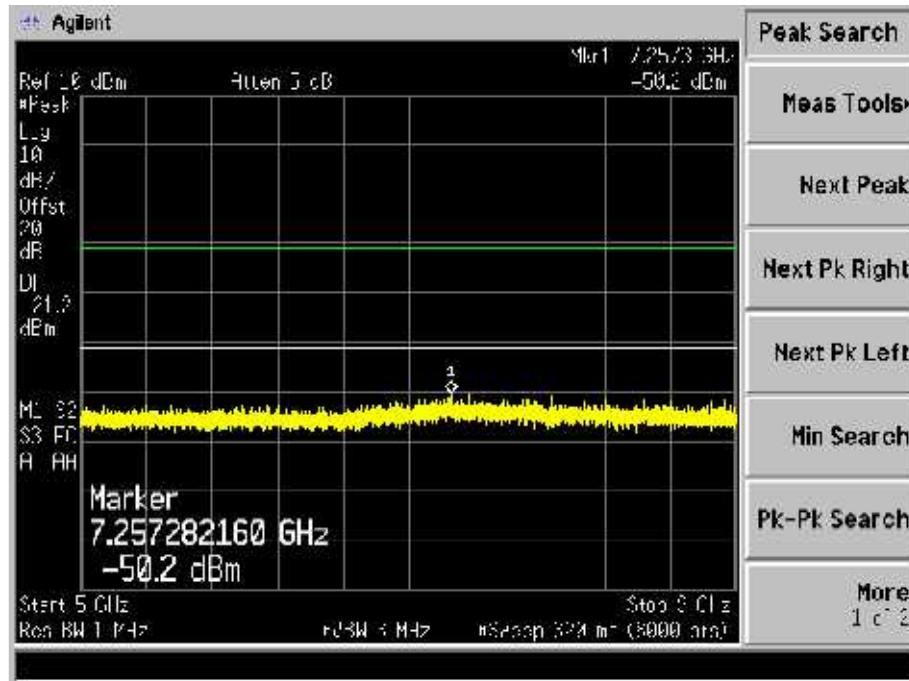


Plot 121 – Channel 6 @ DQPSK 2Mbps

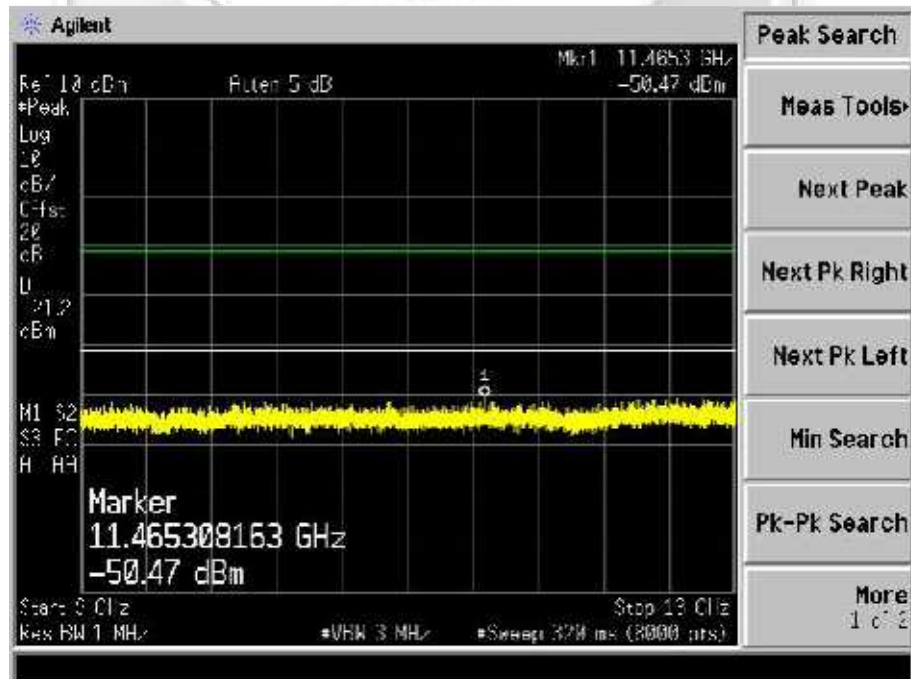


RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



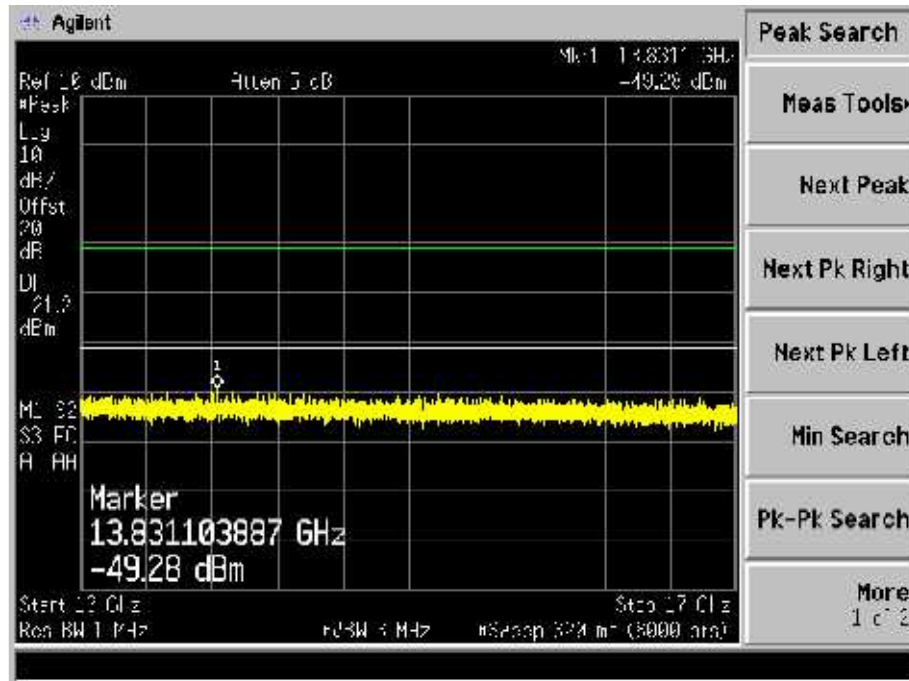
Plot 122 – Channel 6 @ DQPSK 2Mbps



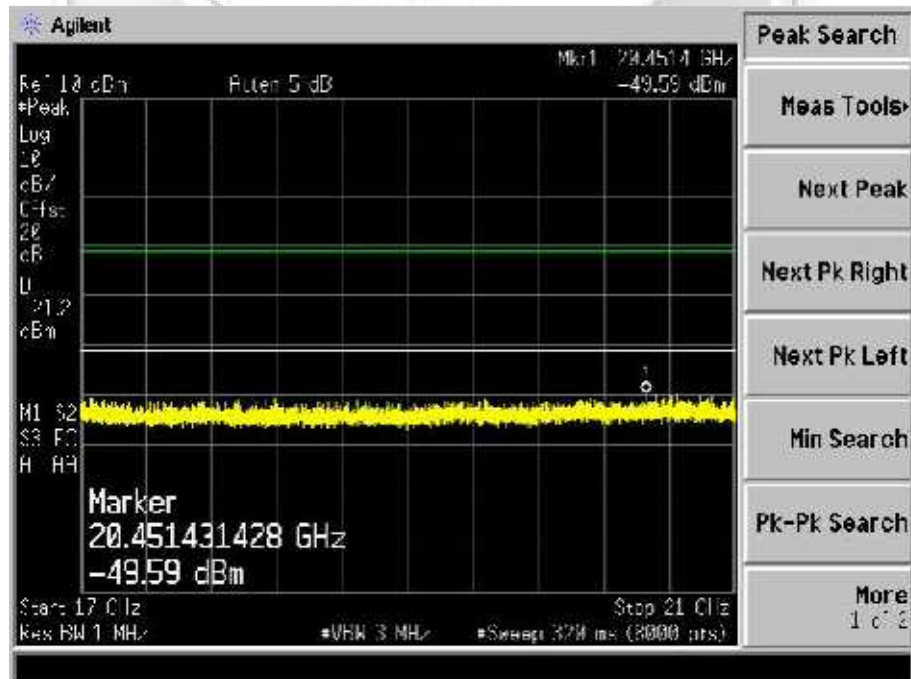
Plot 123 – Channel 6 @ DQPSK 2Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



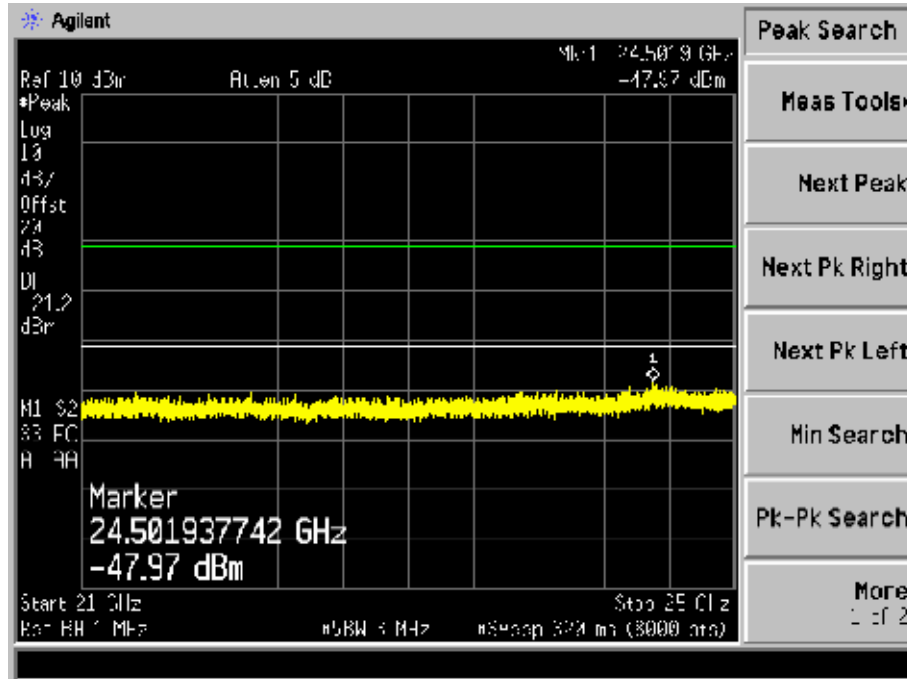
Plot 124 – Channel 6 @ DQPSK 2Mbps



Plot 125 – Channel 6 @ DQPSK 2Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak

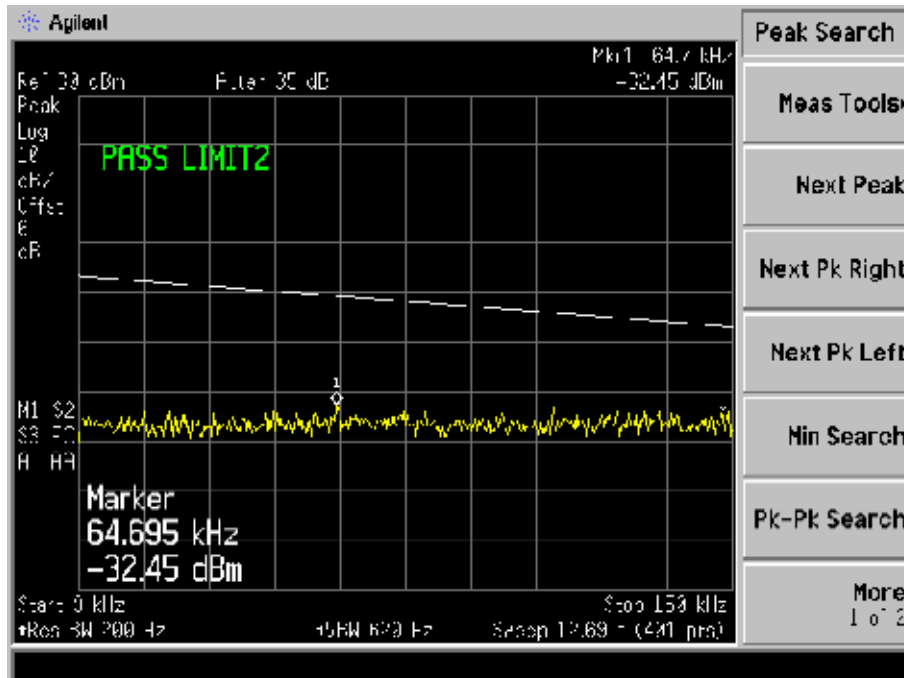


Plot 126 – Channel 6 @ DQPSK 2Mbps

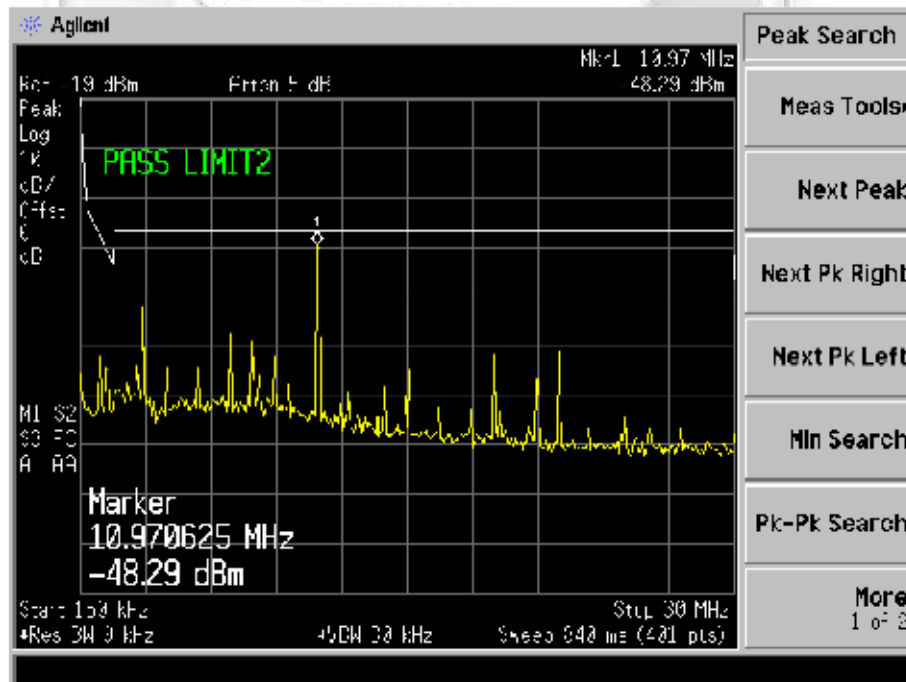


RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



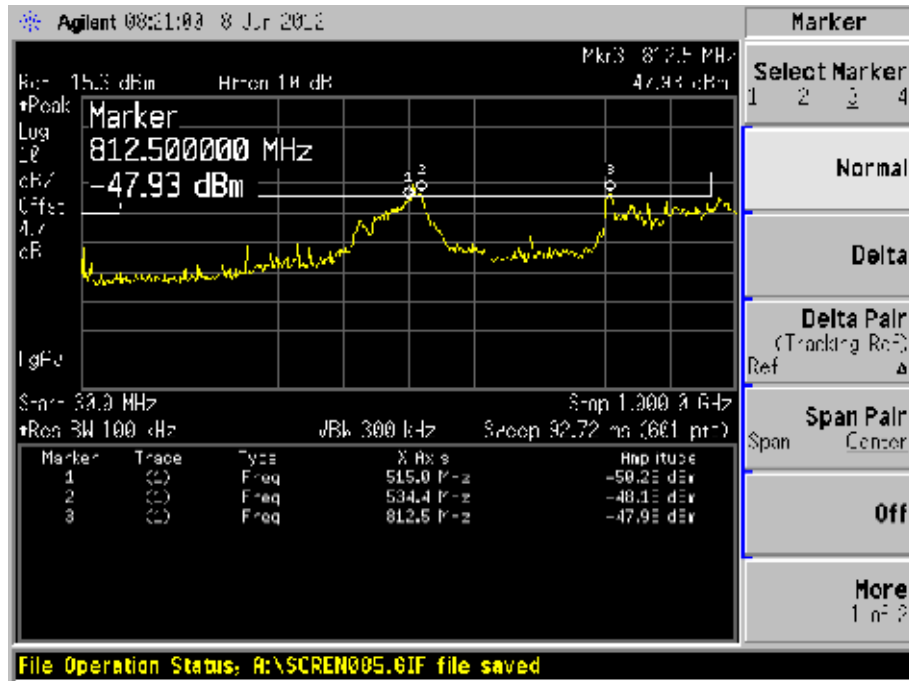
Plot 127 – Channel 6 @ CCK 5.5Mbps



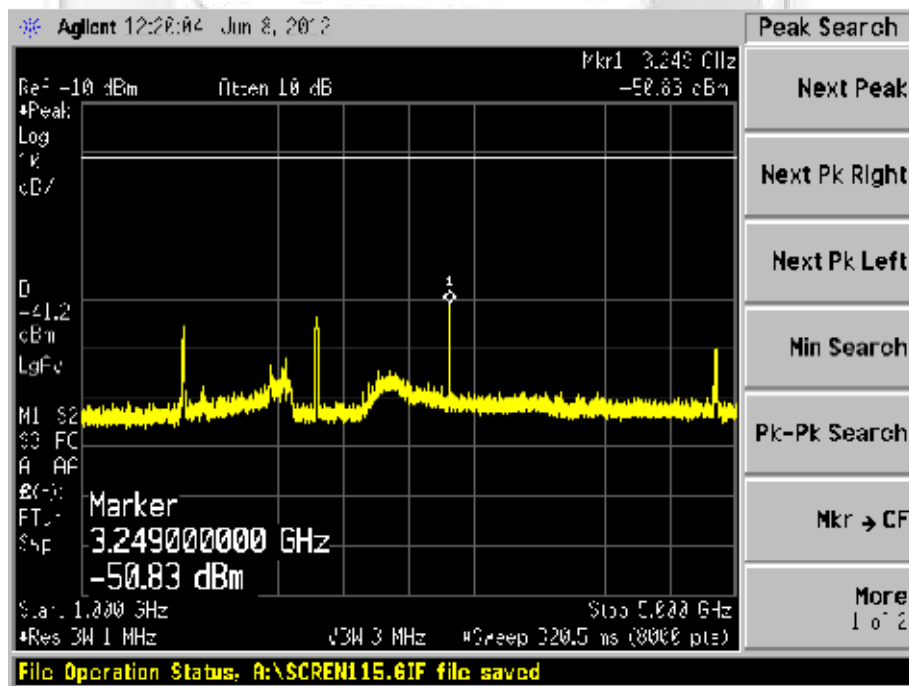
Plot 128 – Channel 6 @ CCK 5.5Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



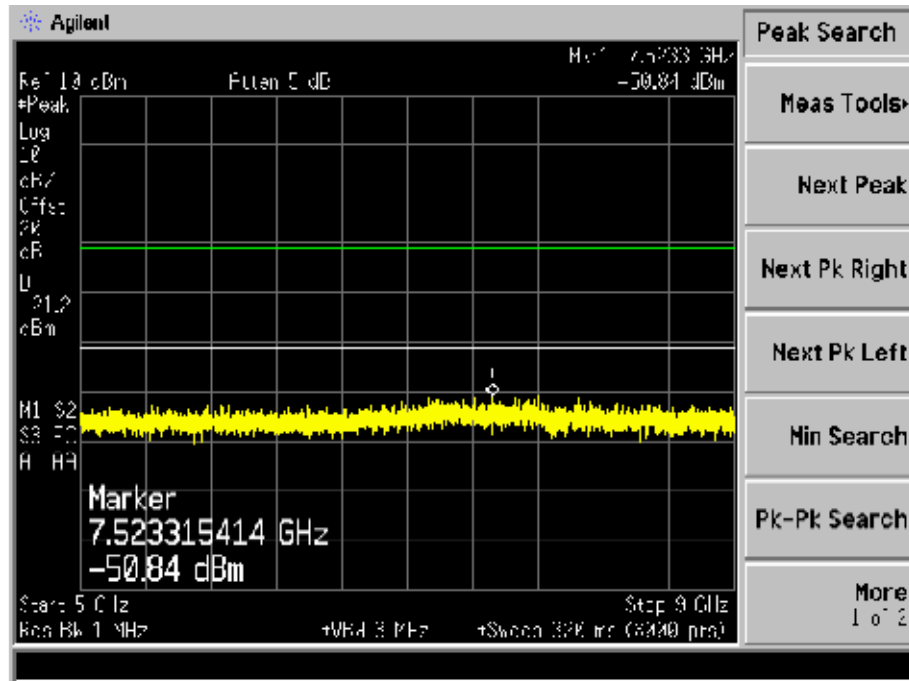
Plot 129 – Channel 6 @ CCK 5.5Mbps



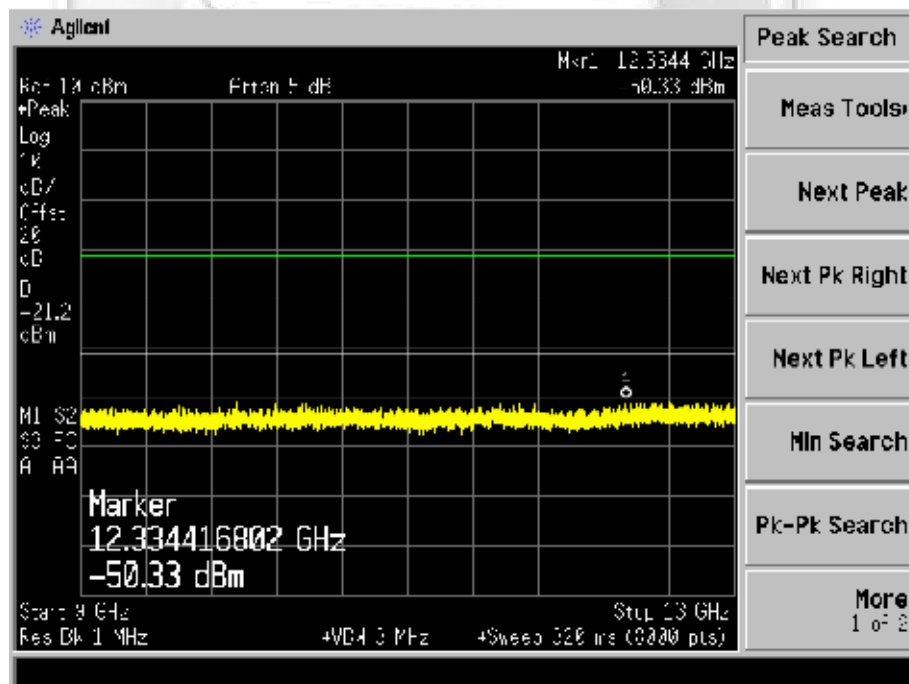
Plot 130 – Channel 6 @ CCK 5.5Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



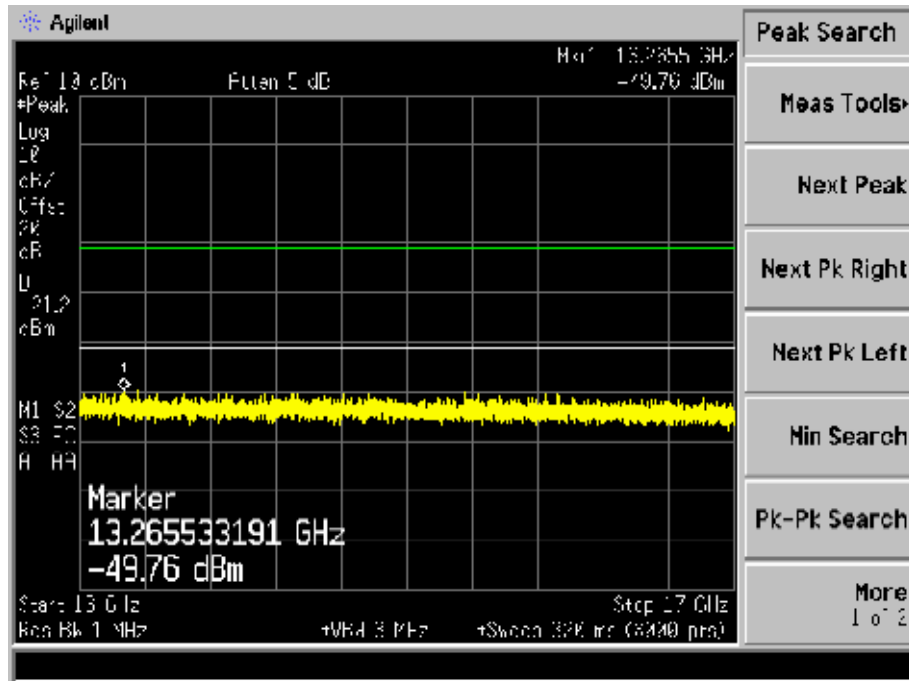
Plot 131 – Channel 6 @ CCK 5.5Mbps



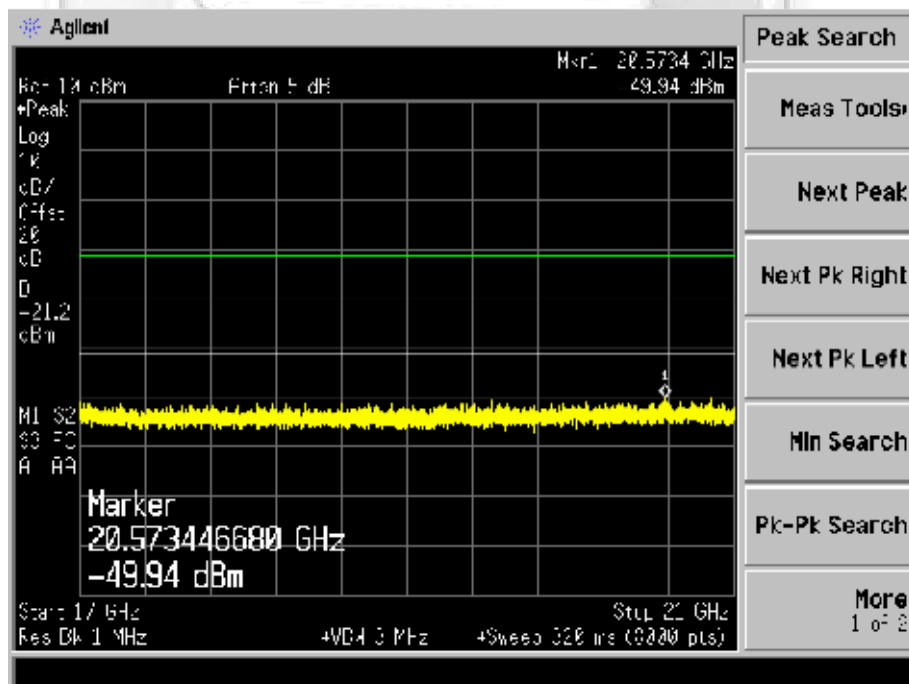
Plot 132 – Channel 6 @ CCK 5.5Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



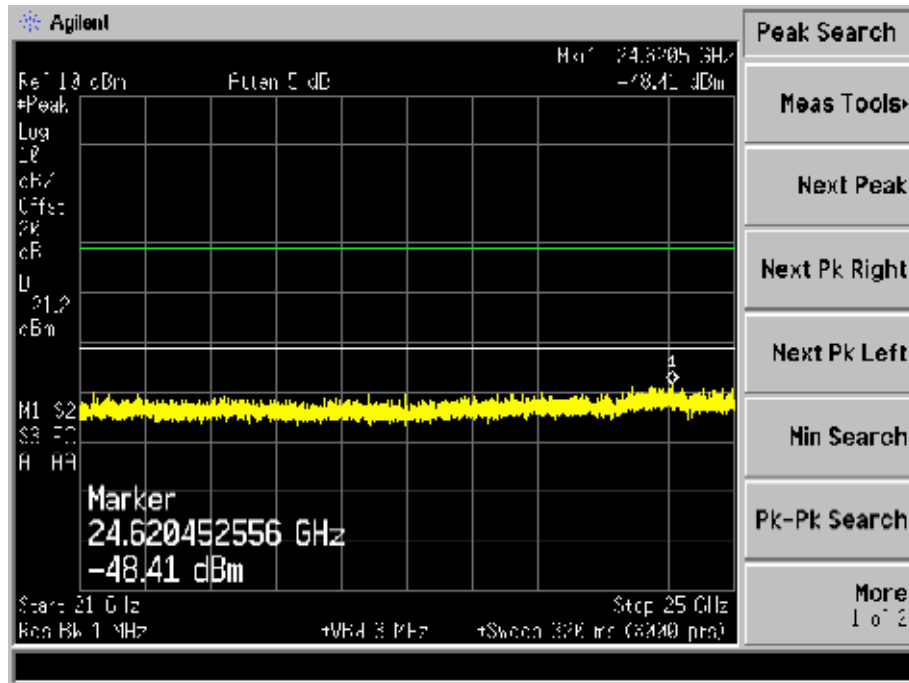
Plot 133 – Channel 6 @ CCK 5.5Mbps



Plot 134 – Channel 6 @ CCK 5.5Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak

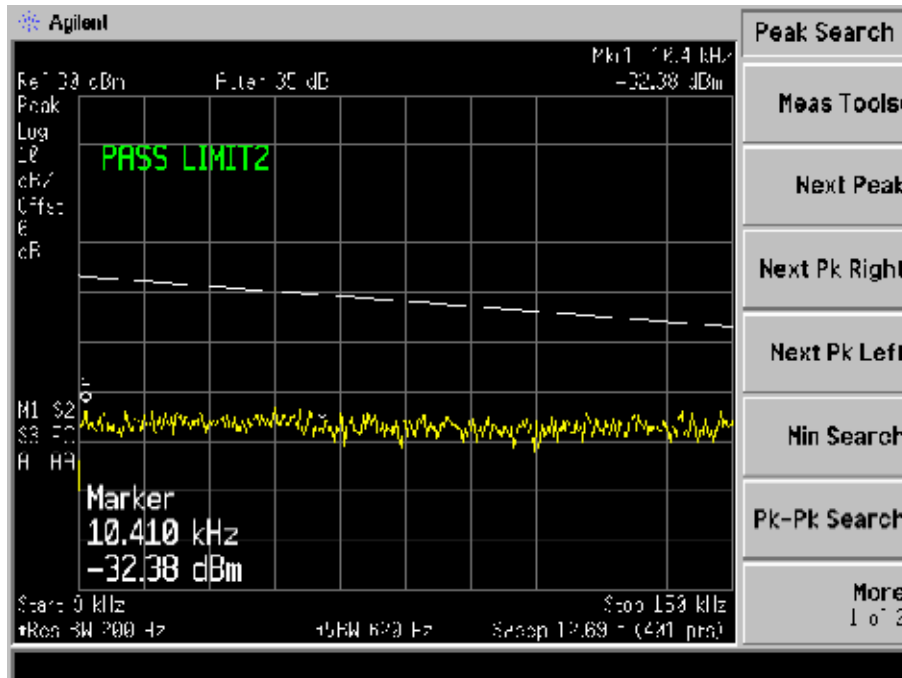


Plot 135 – Channel 6 @ CCK 5.5Mbps

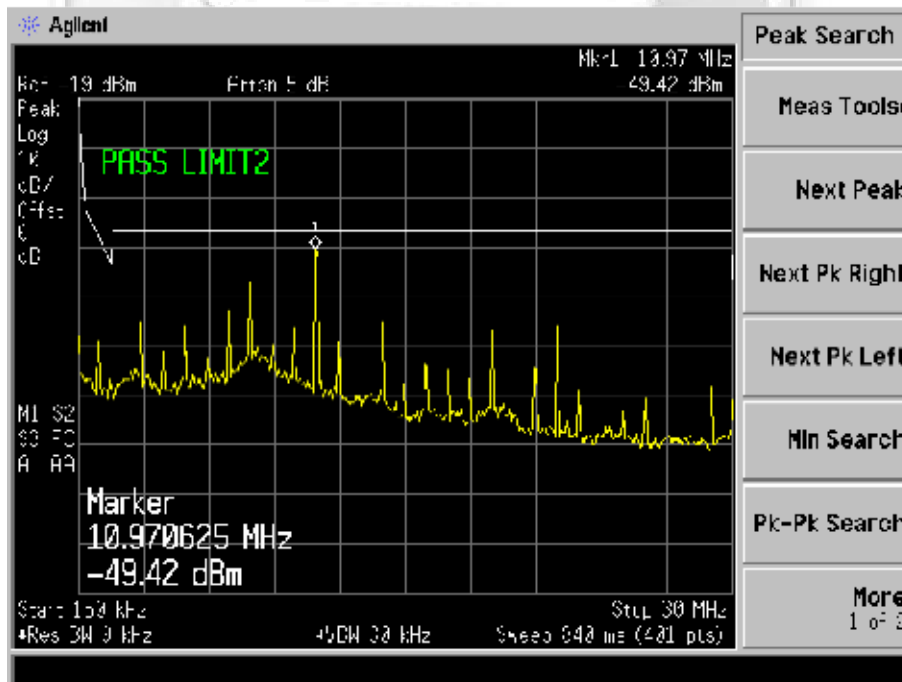


RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots – Peak



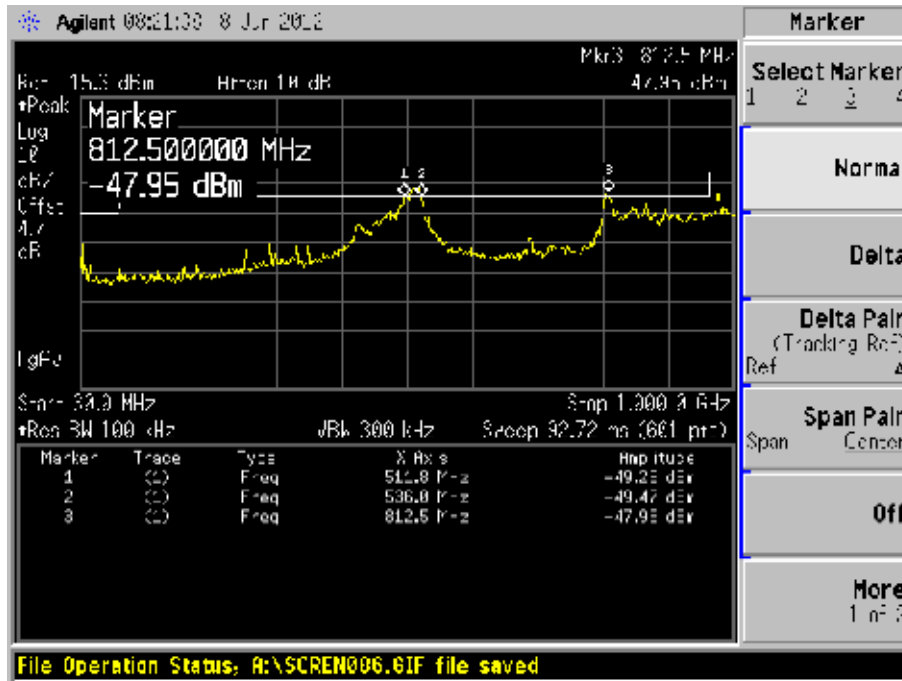
Plot 136 – Channel 6 @ CCK 11Mbps



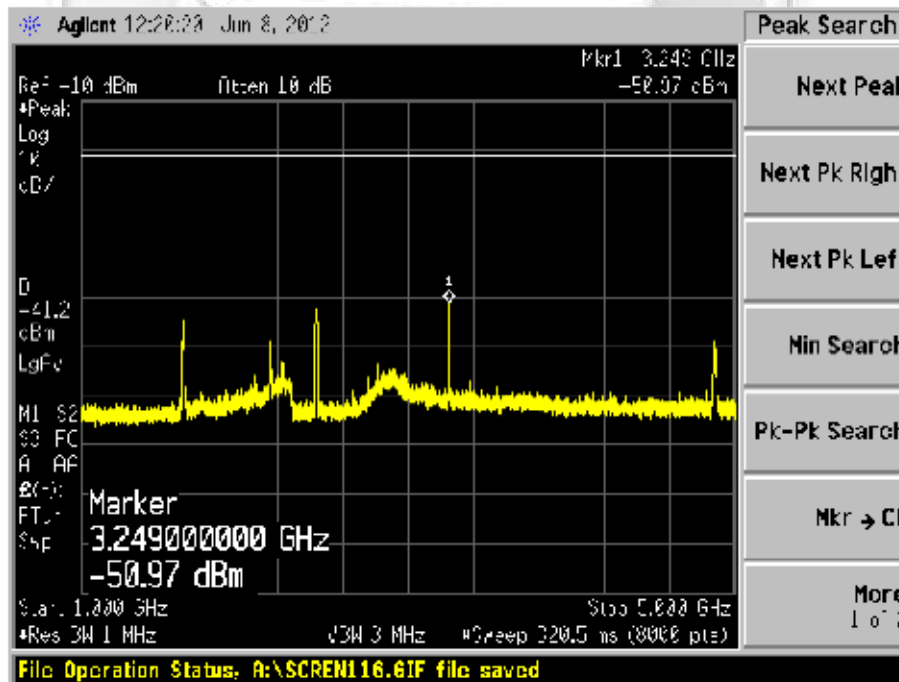
Plot 137 – Channel 6 @ CCK 11Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



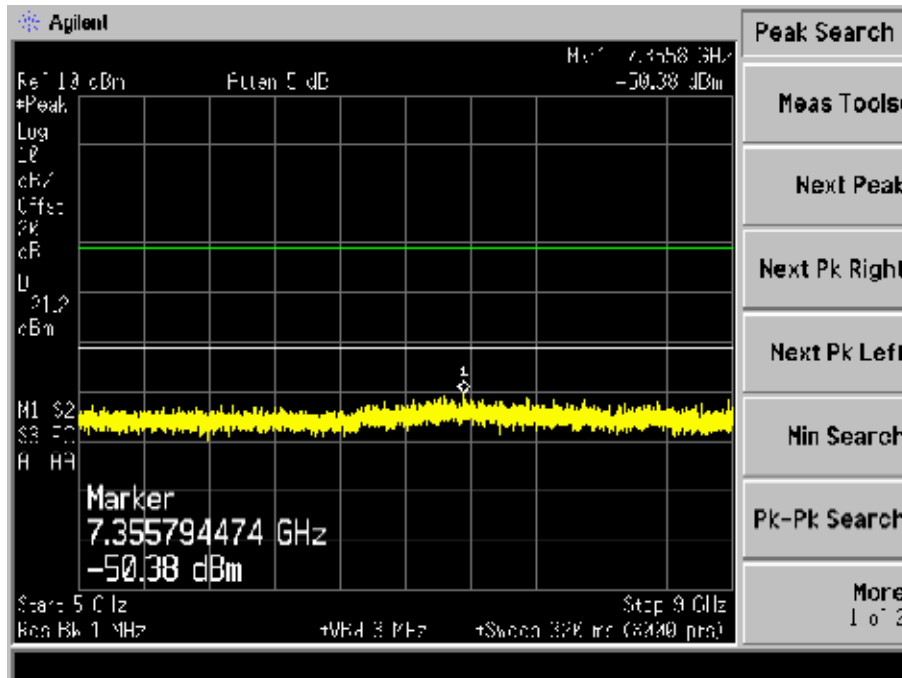
Plot 138 – Channel 6 @ CCK 11Mbps



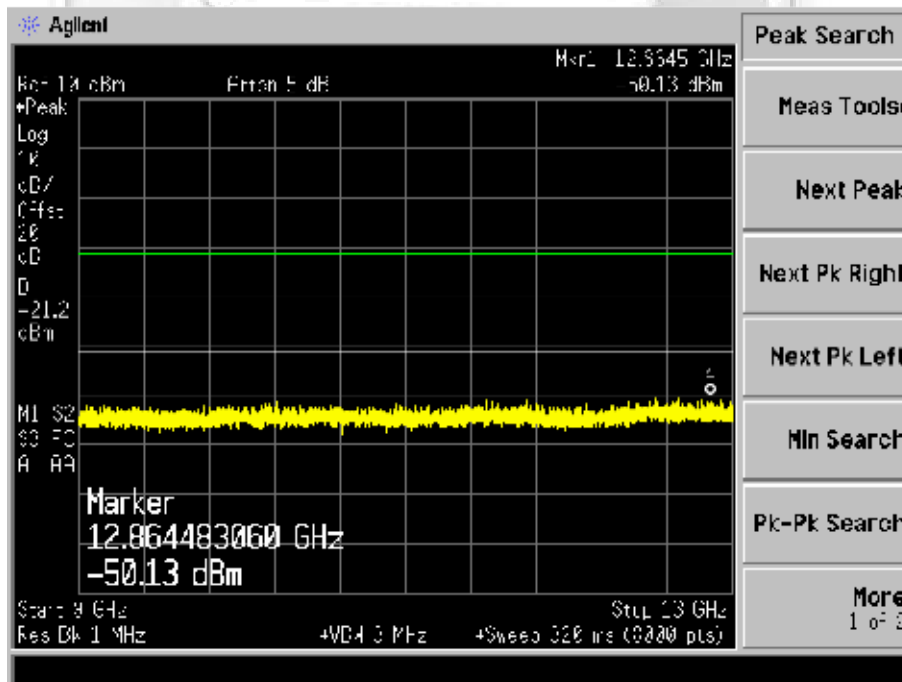
Plot 139 – Channel 6 @ CCK 11Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



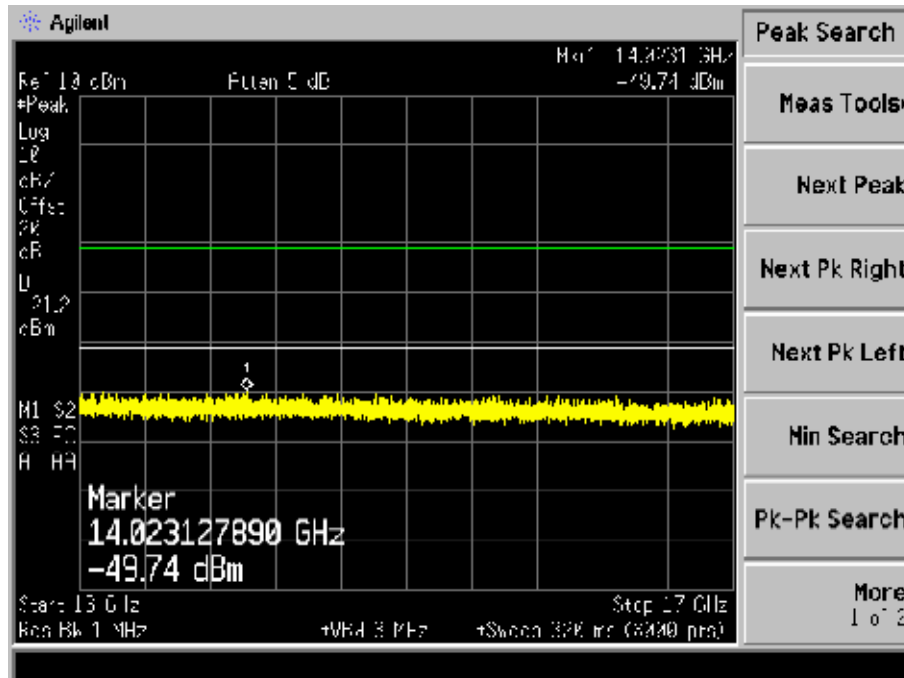
Plot 140 – Channel 6 @ CCK 11Mbps



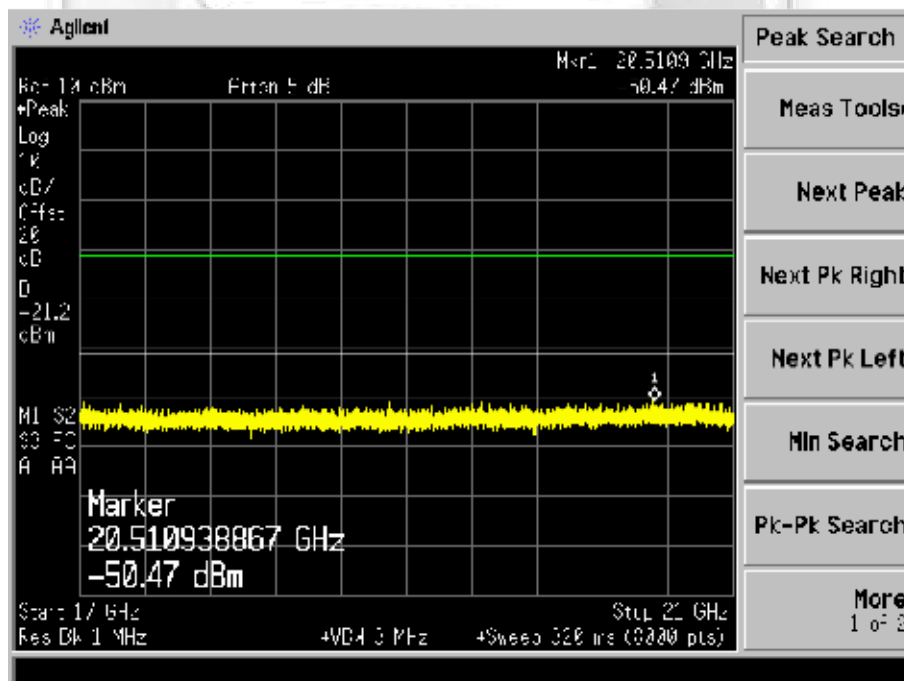
Plot 141 – Channel 6 @ CCK 11Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



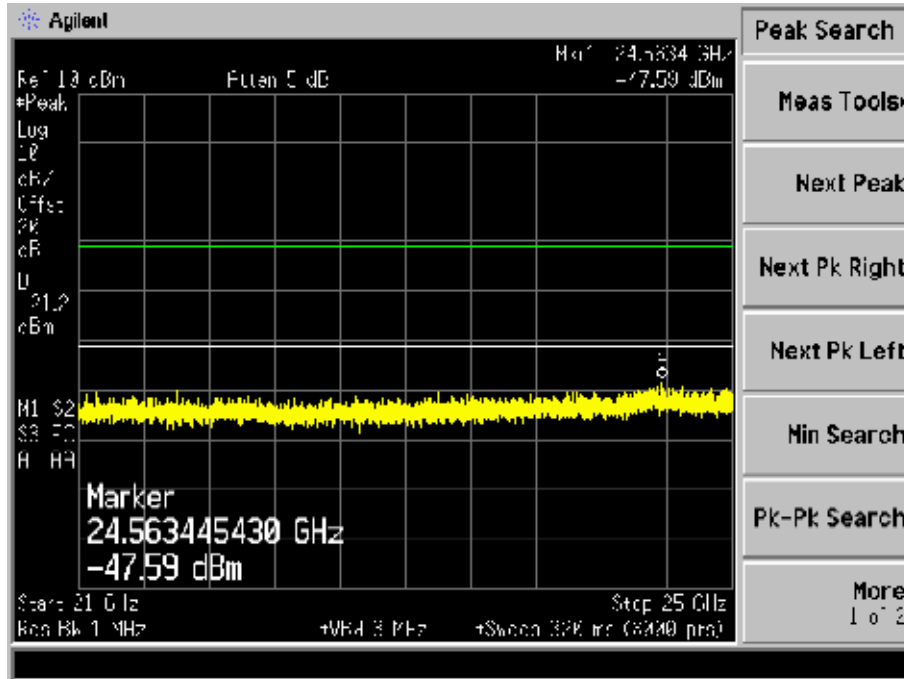
Plot 142 – Channel 6 @ CCK 11Mbps



Plot 143 – Channel 6 @ CCK 11Mbps

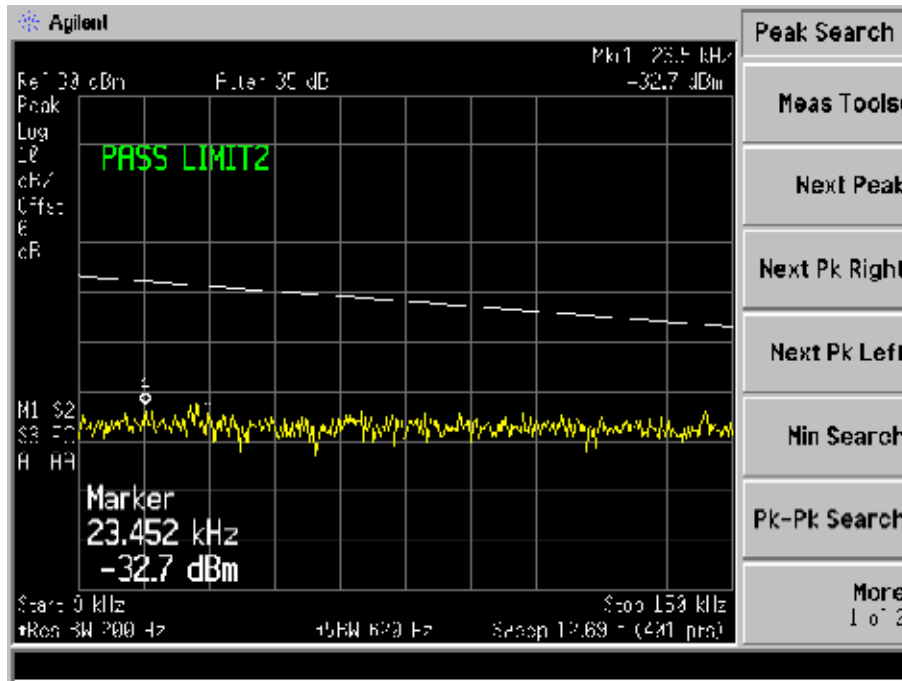
RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots – Peak

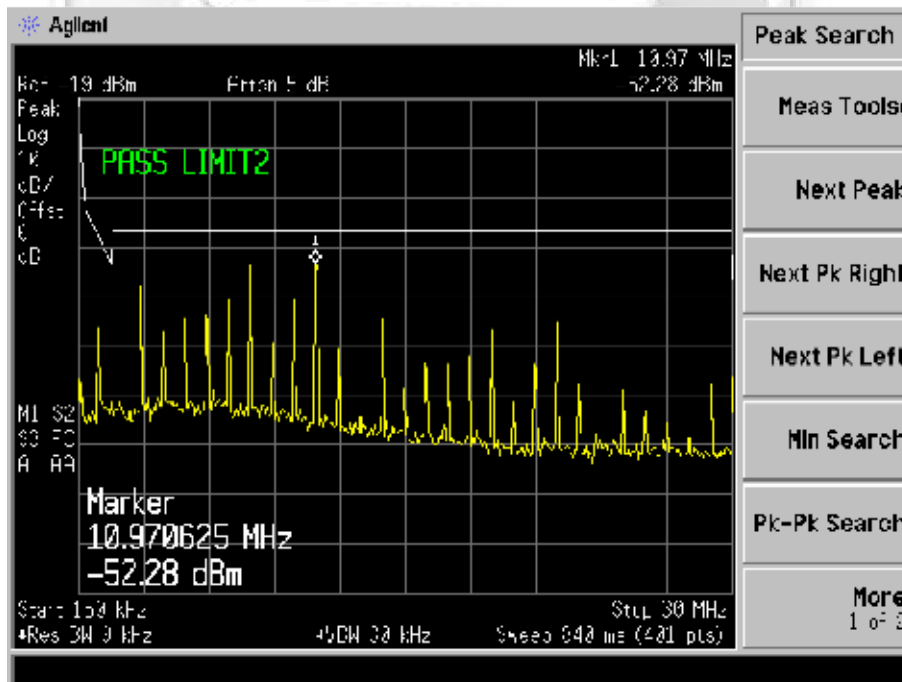


RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



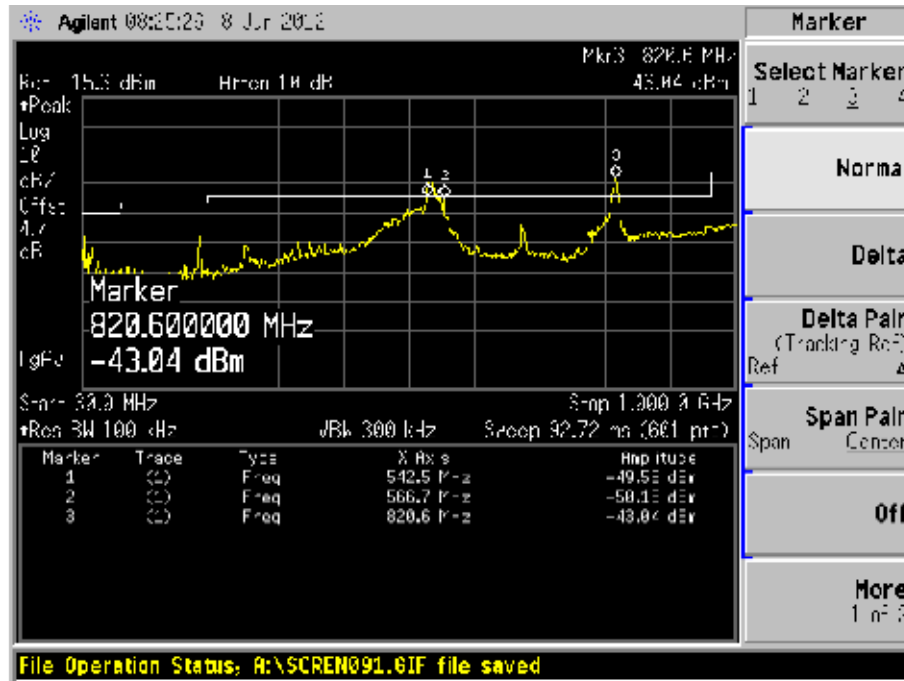
Plot 145 – Channel 11 @ DBPSK 1Mbps



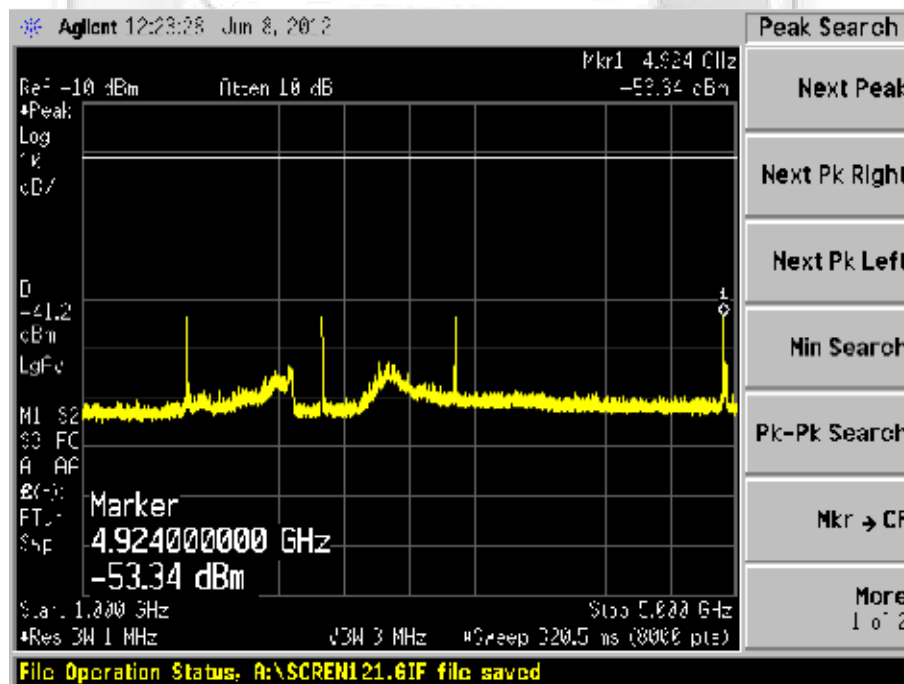
Plot 146 – Channel 11 @ DBPSK 1Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



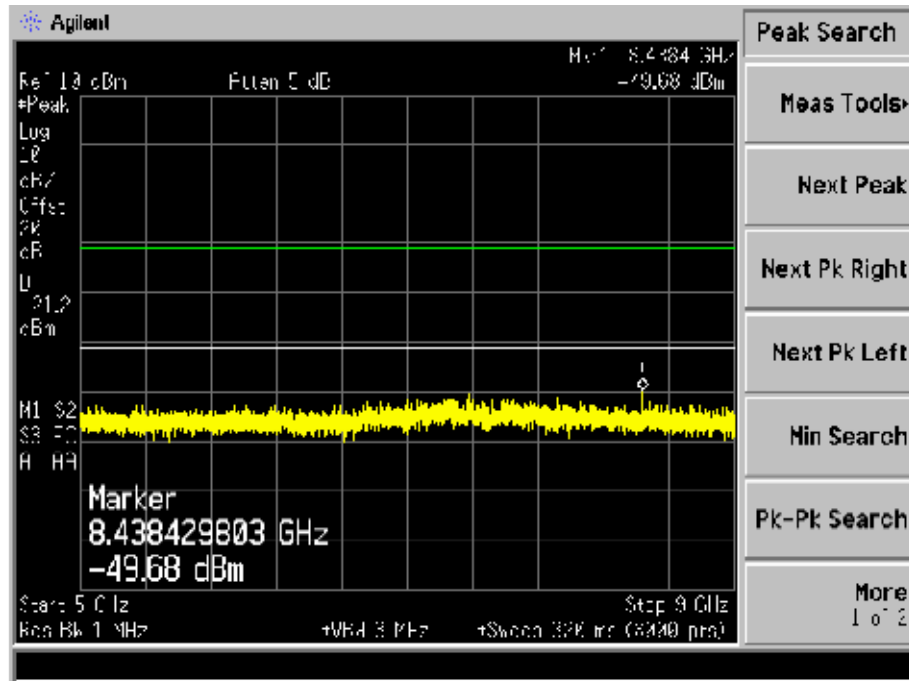
Plot 147 – Channel 11 @ DBPSK 1Mbps



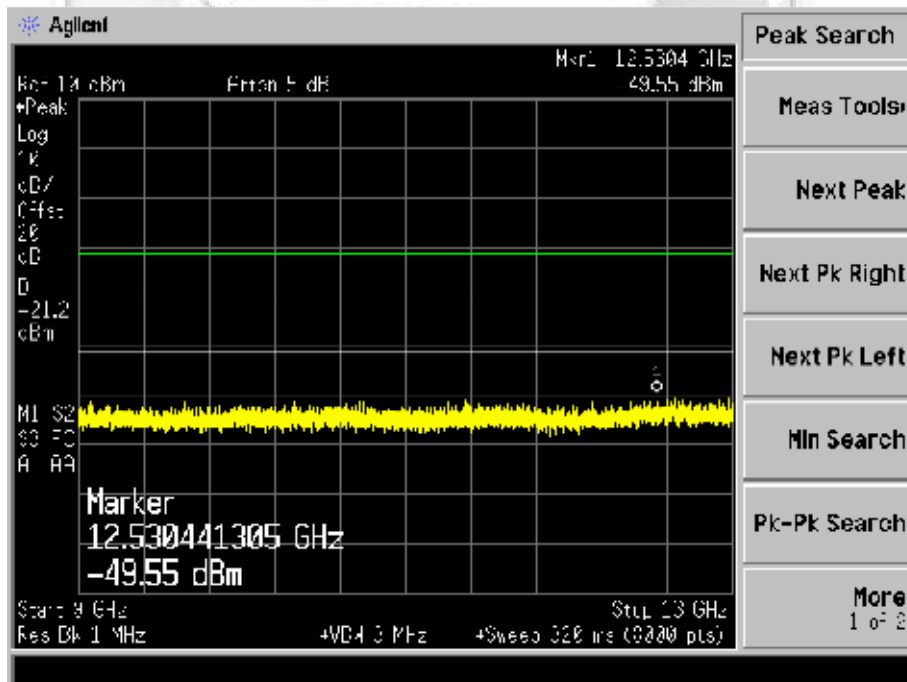
Plot 148 – Channel 11 @ DBPSK 1Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



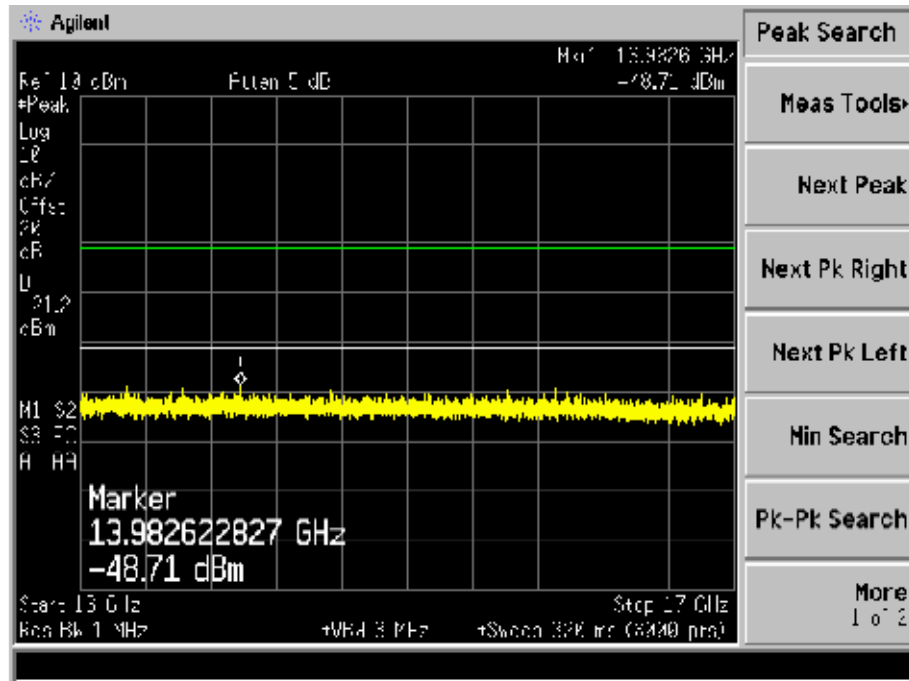
Plot 149 – Channel 11 @ DBPSK 1Mbps



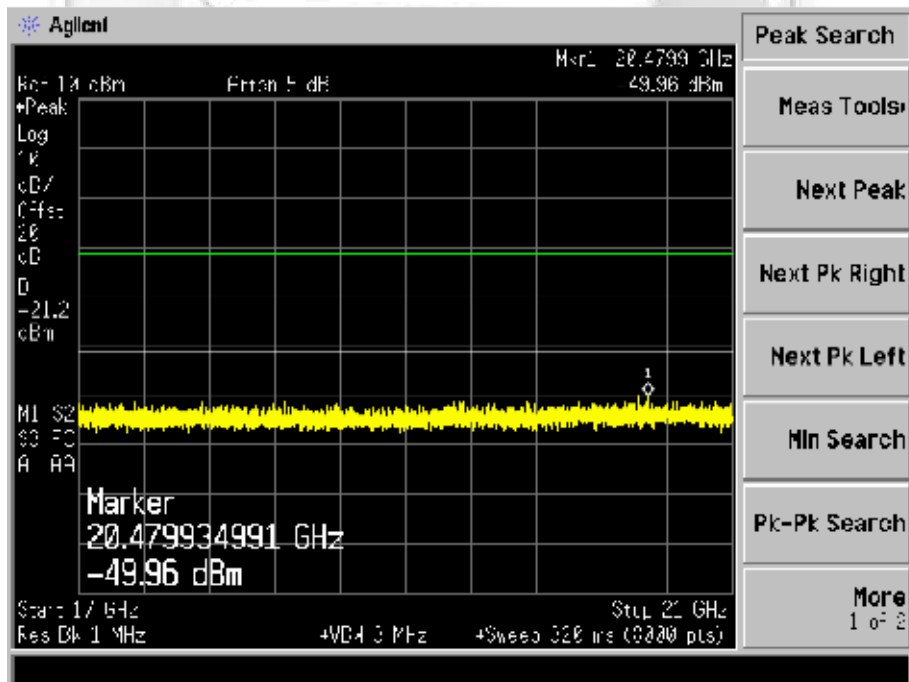
Plot 150 – Channel 11 @ DBPSK 1Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



Plot 151 – Channel 11 @ DBPSK 1Mbps

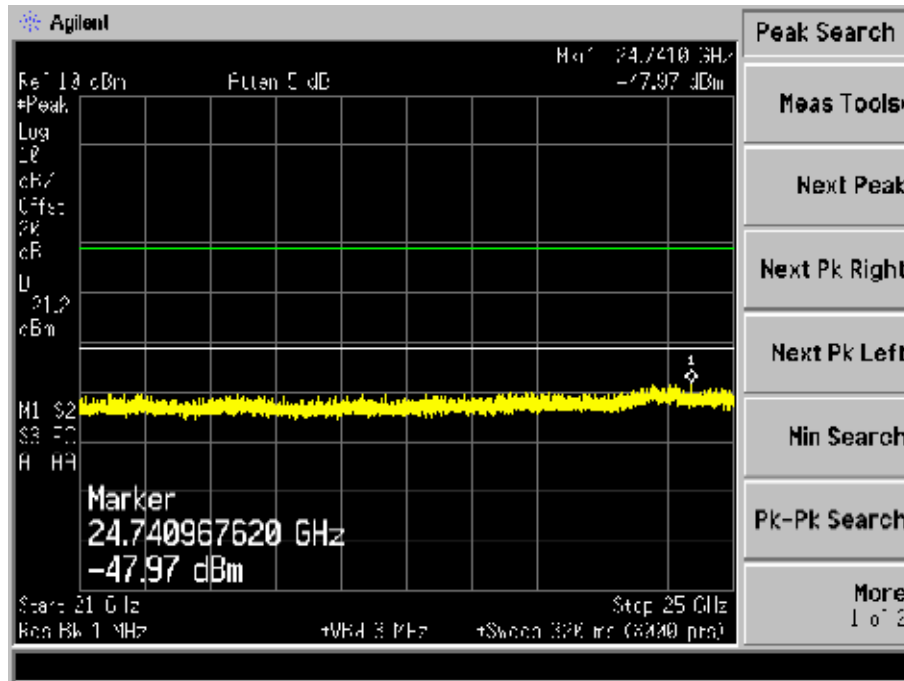


Plot 152 – Channel 11 @ DBPSK 1Mbps



RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak

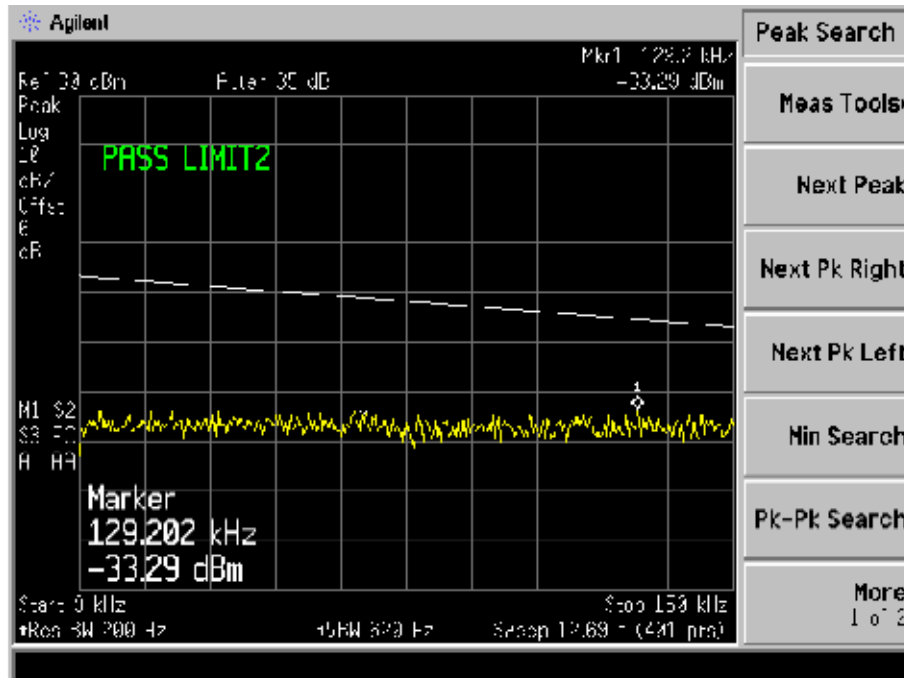


Plot 153 – Channel 11 @ DBPSK 1Mbps

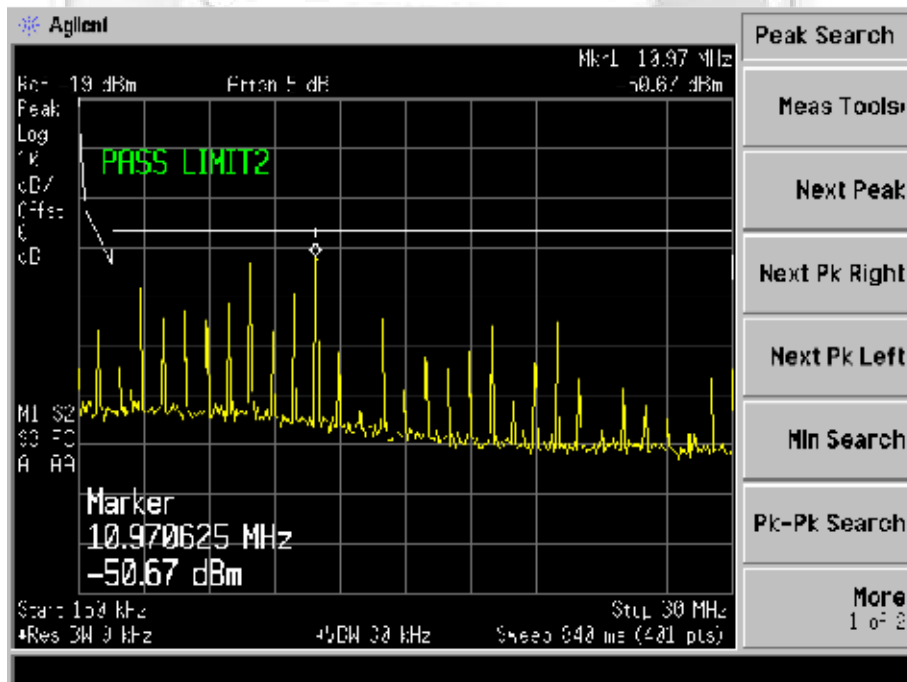


RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



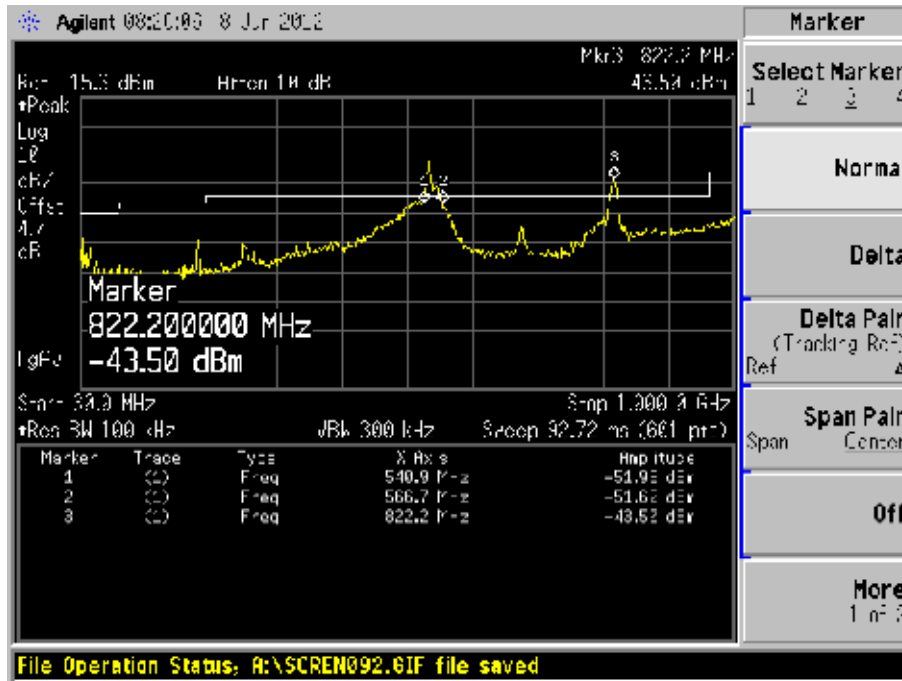
Plot 154 – Channel 11 @ DQPSK 2Mbps



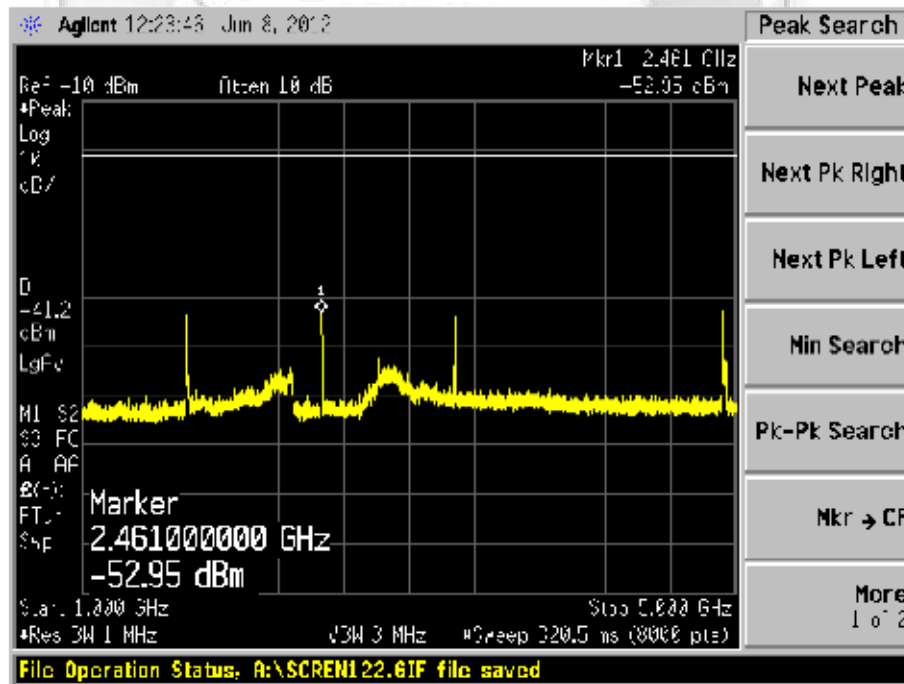
Plot 155 – Channel 11 @ DQPSK 2Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



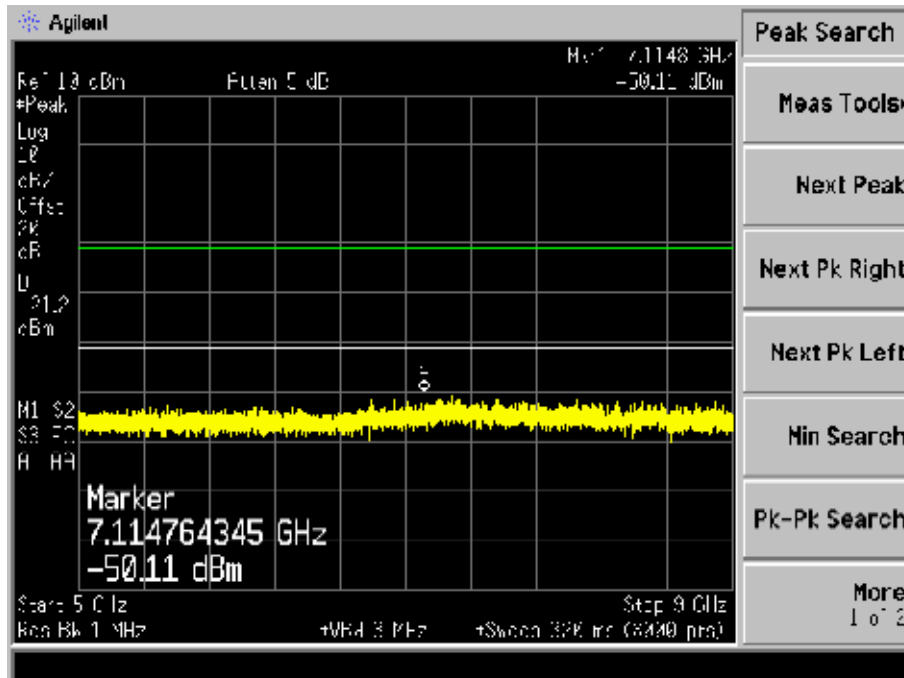
Plot 156 – Channel 11 @ DQPSK 2Mbps



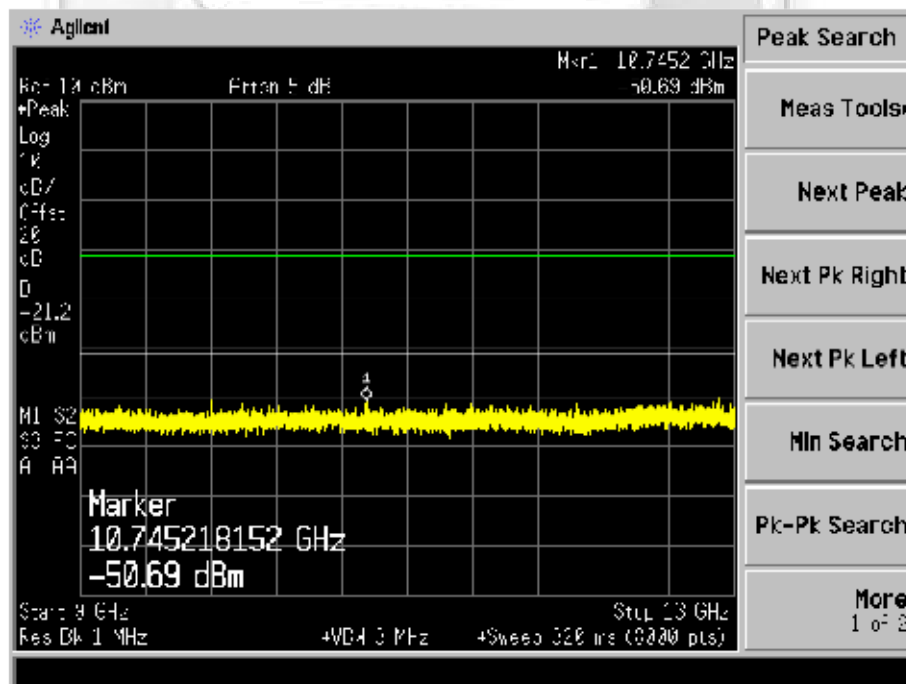
Plot 157 – Channel 11 @ DQPSK 2Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



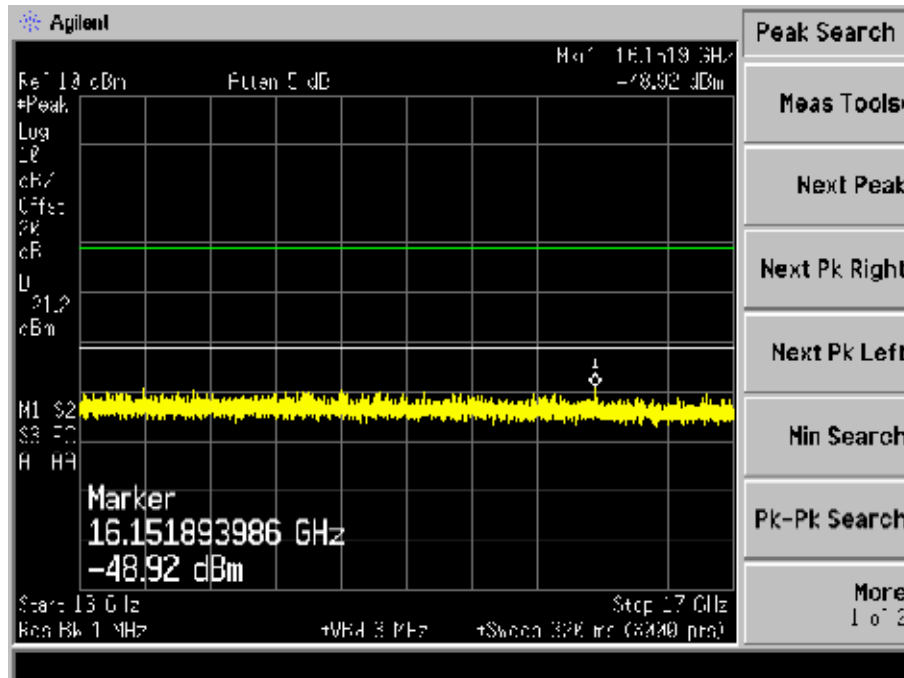
Plot 158 – Channel 11 @ DQPSK 2Mbps



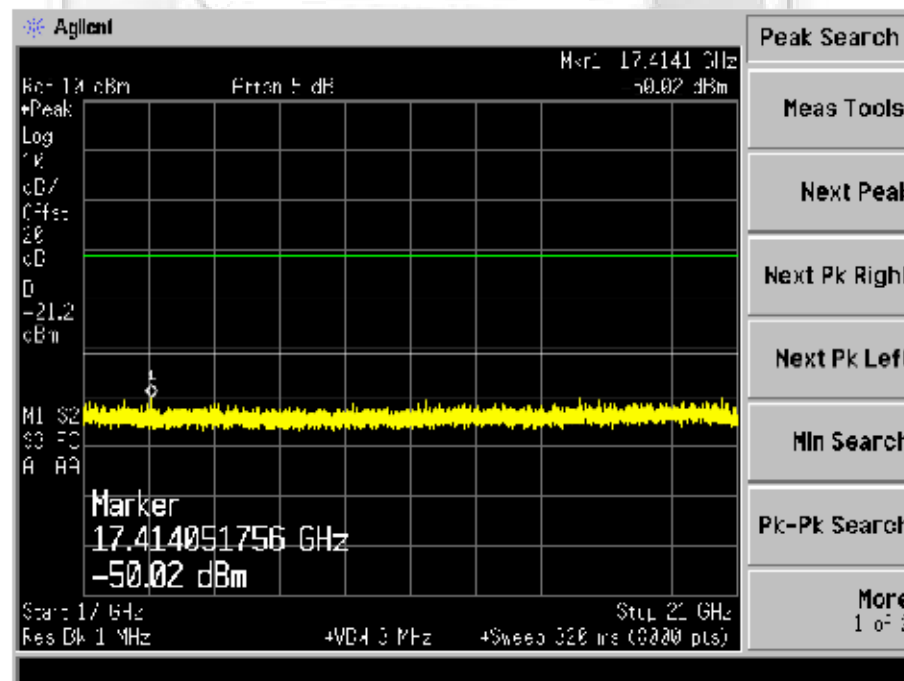
Plot 159 – Channel 11 @ DQPSK 2Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



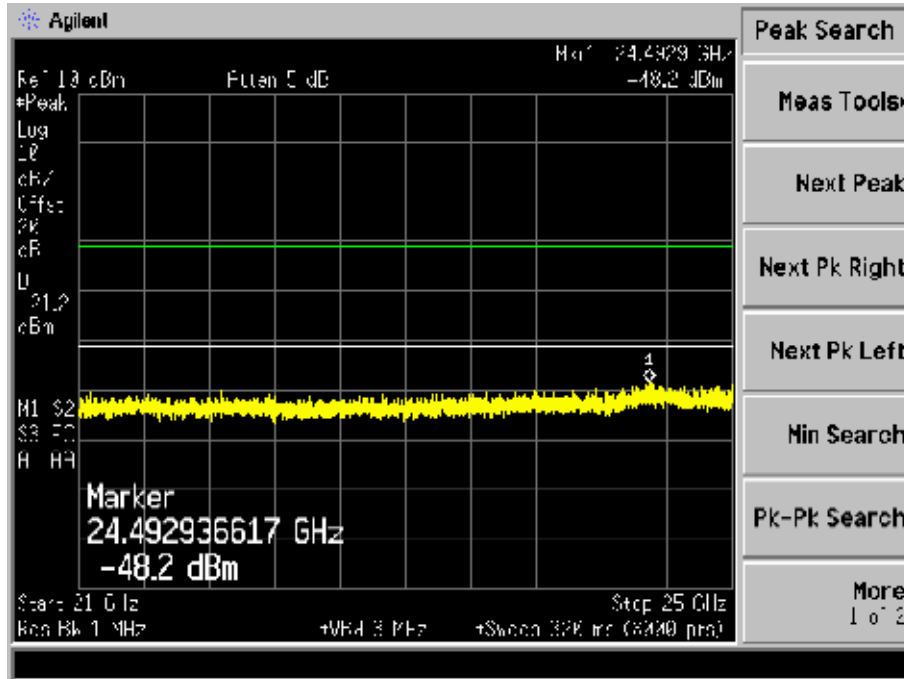
Plot 160 – Channel 11 @ DQPSK 2Mbps



Plot 161 – Channel 11 @ DQPSK 2Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak

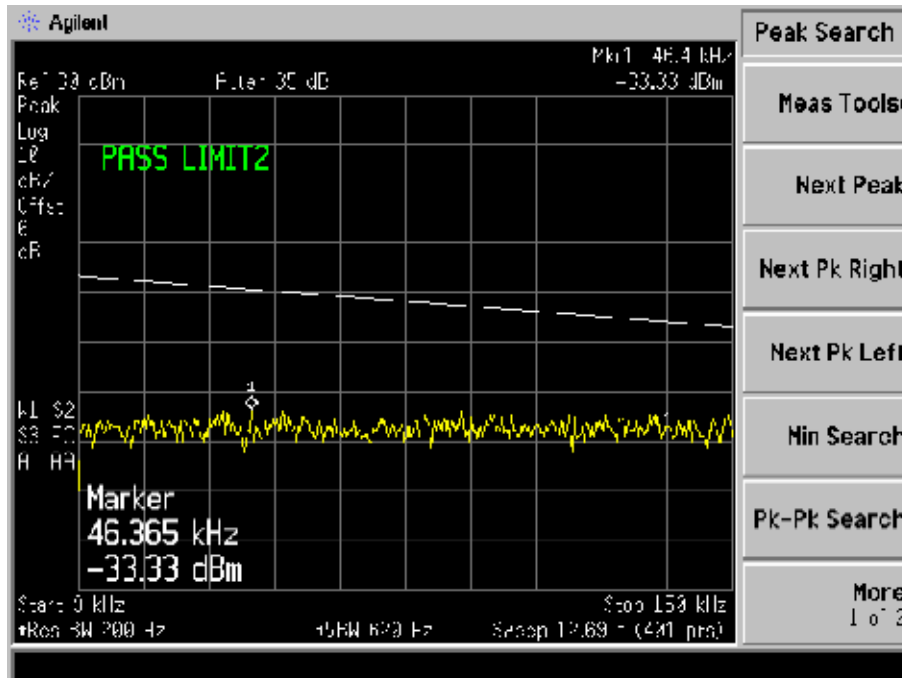


Plot 162 - Channel 11 @ DQPSK 2Mbps

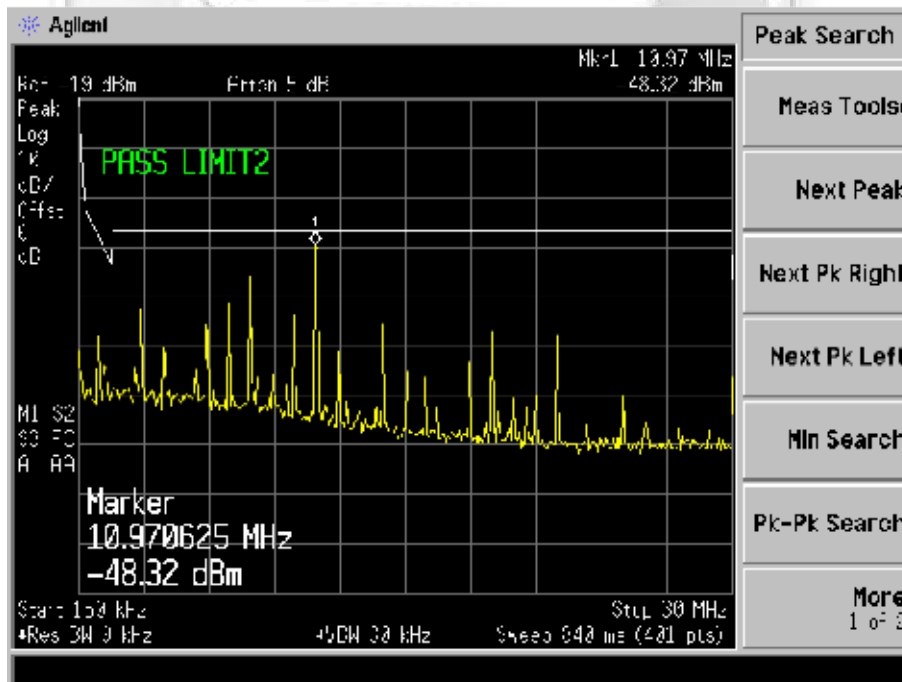


RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots – Peak



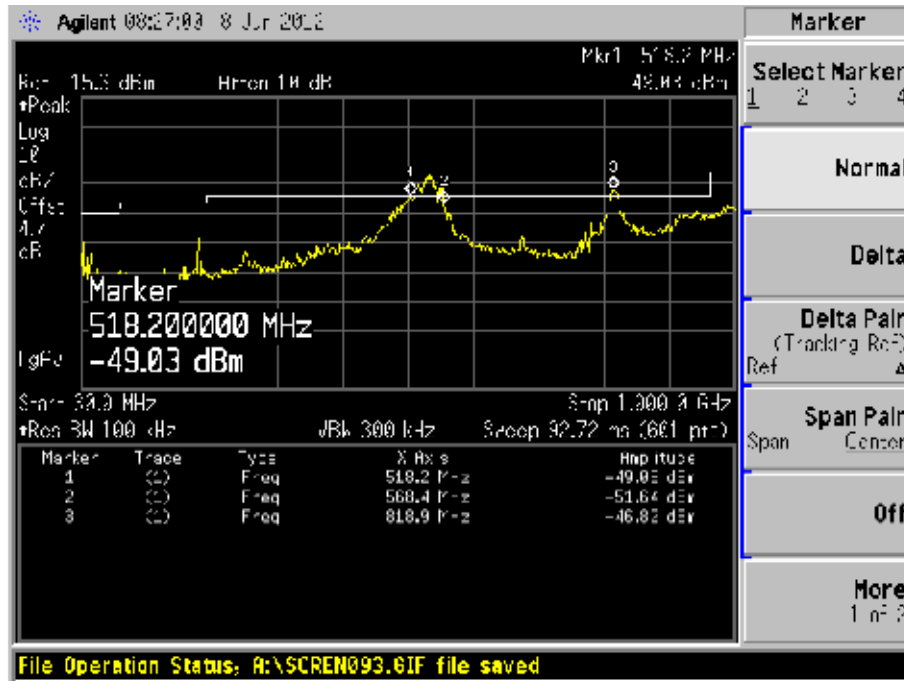
Plot 163 – Channel 11 @ CCK 5.5Mbps



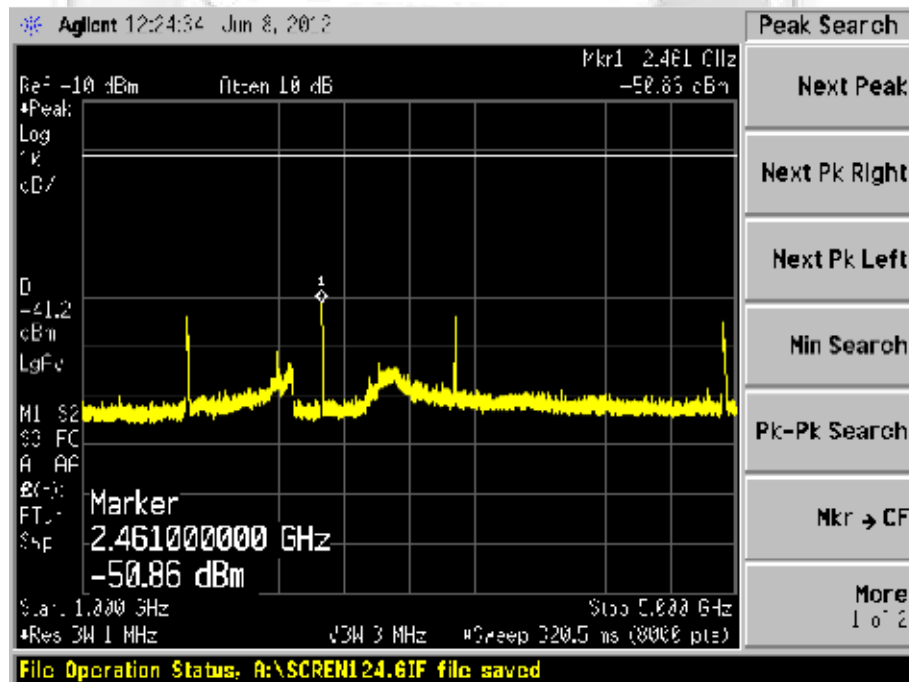
Plot 164 – Channel 11 @ CCK 5.5Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



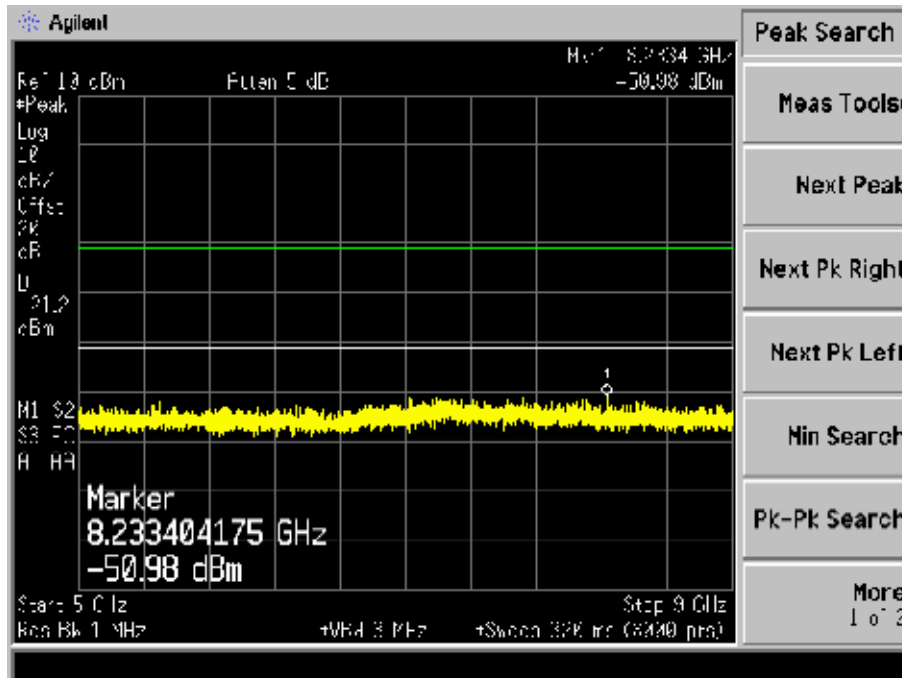
Plot 165 – Channel 11 @ CCK 5.5Mbps



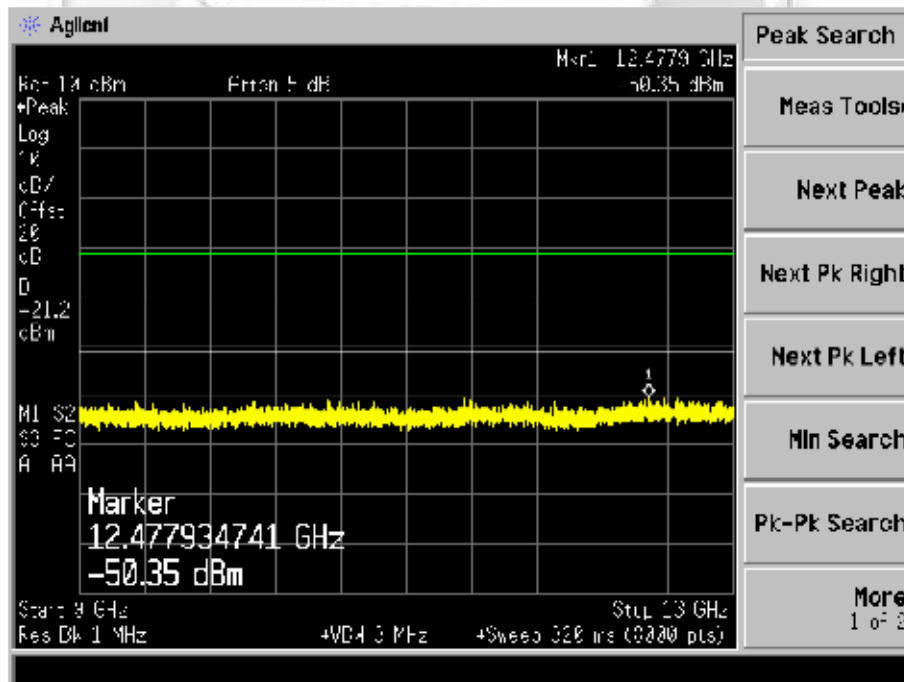
Plot 166 – Channel 11 @ CCK 5.5Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots – Peak



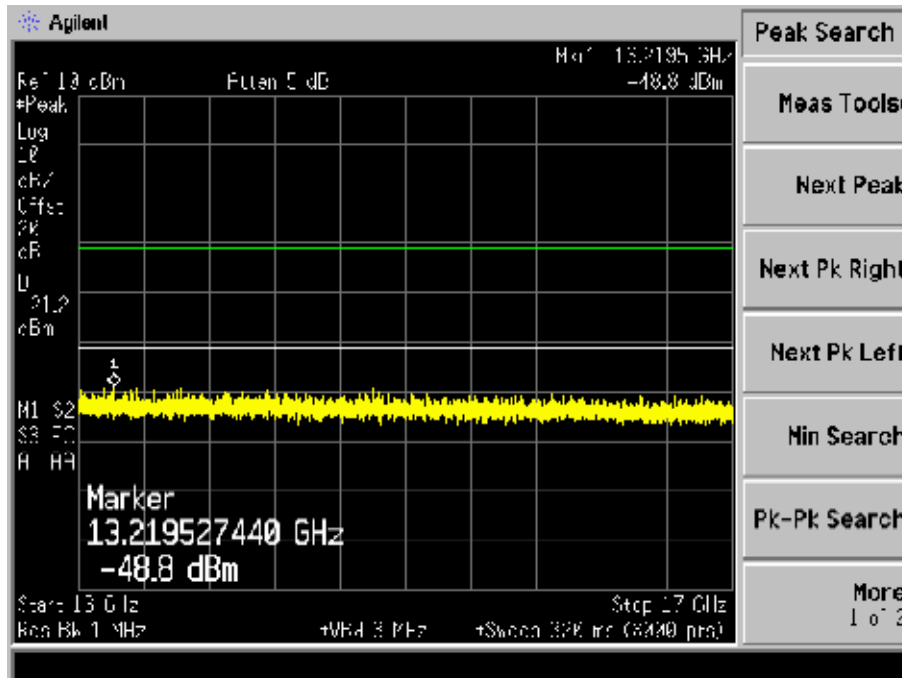
Plot 167 – Channel 11 @ CCK 5.5Mbps



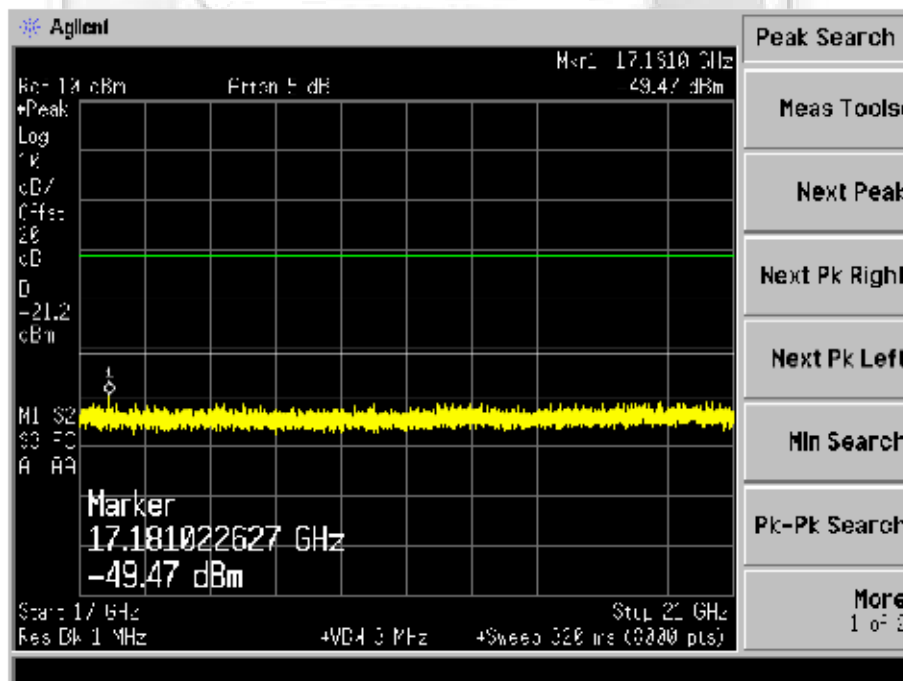
Plot 168 – Channel 11 @ CCK 5.5Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



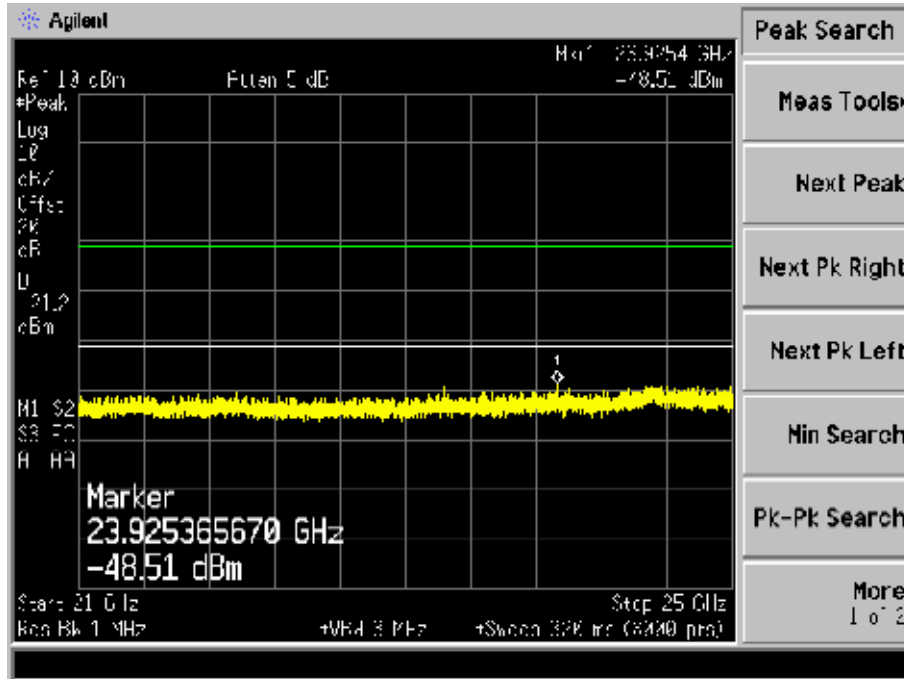
Plot 169 – Channel 11 @ CCK 5.5Mbps



Plot 170 – Channel 11 @ CCK 5.5Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak

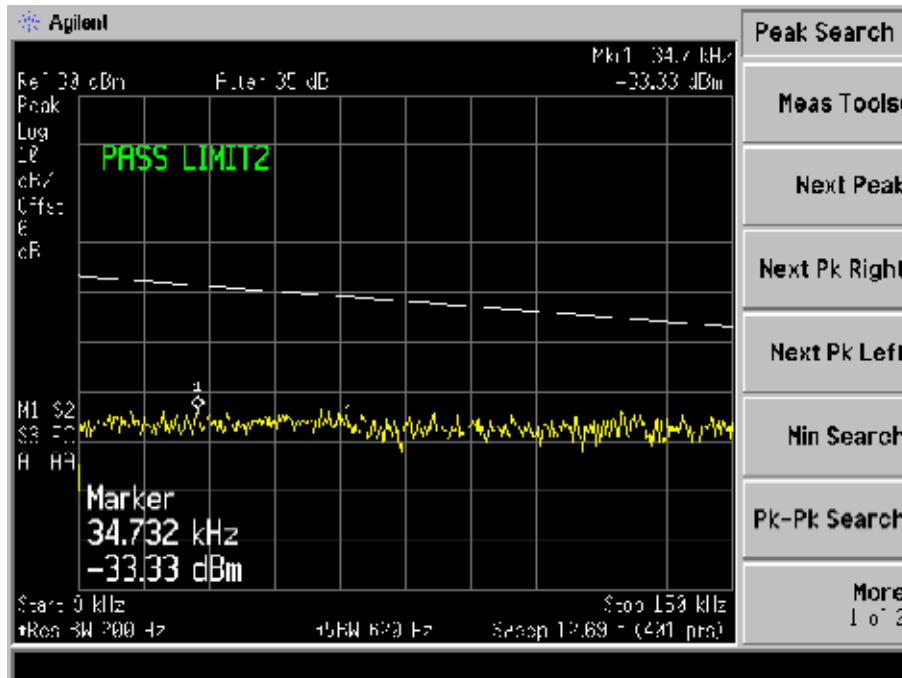


Plot 171 - Channel 11 @ CCK 5.5Mbps

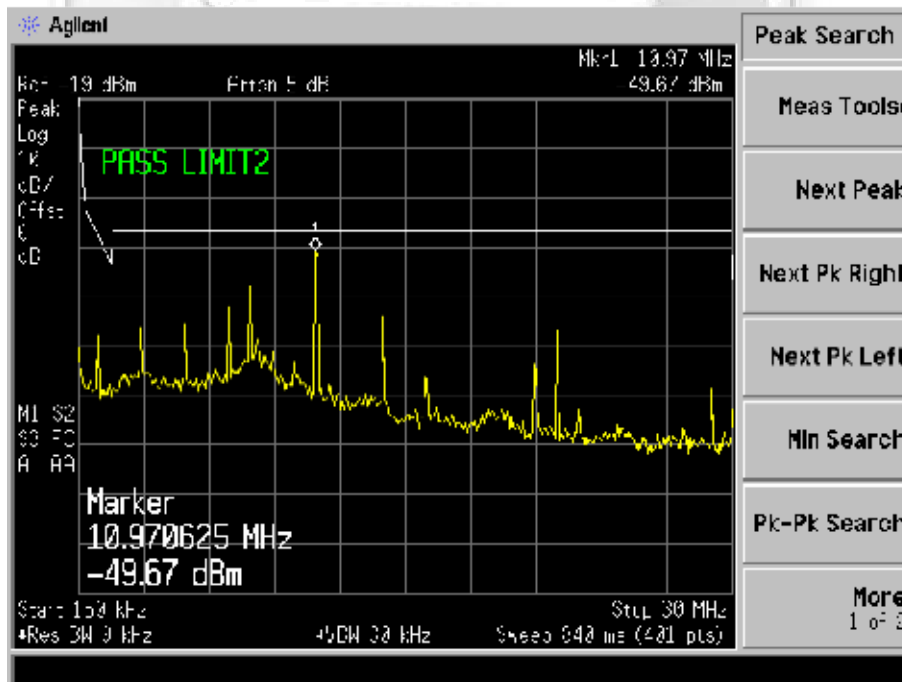


RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



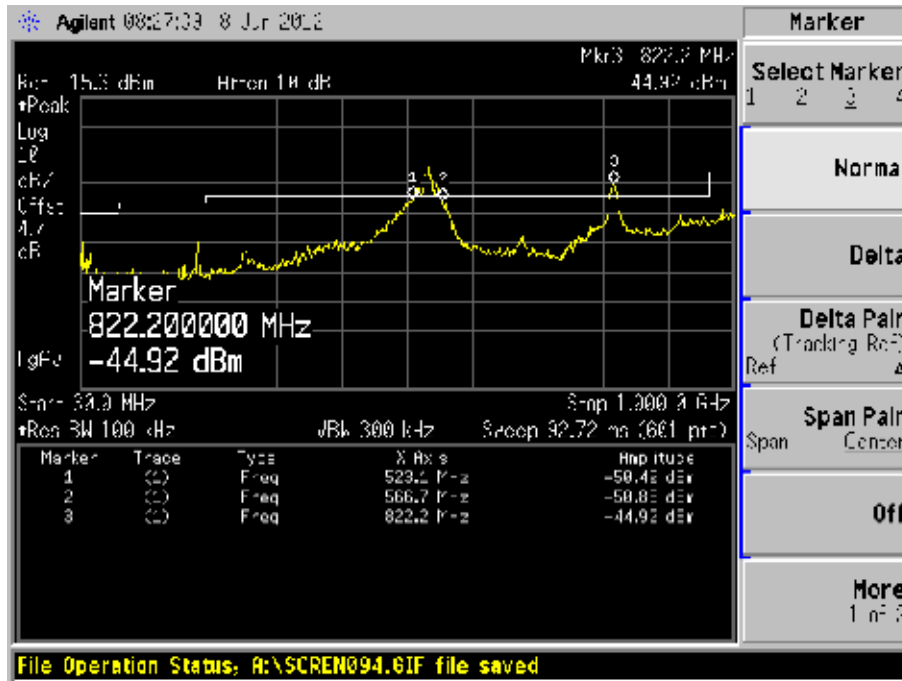
Plot 172 – Channel 11 @ CCK 11Mbps



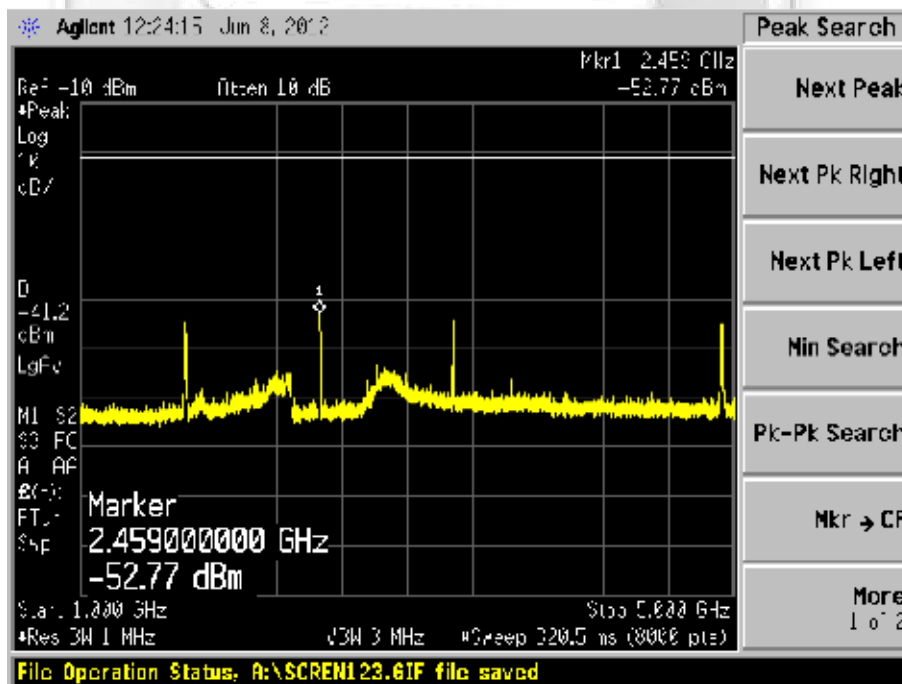
Plot 173 – Channel 11 @ CCK 11Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots – Peak



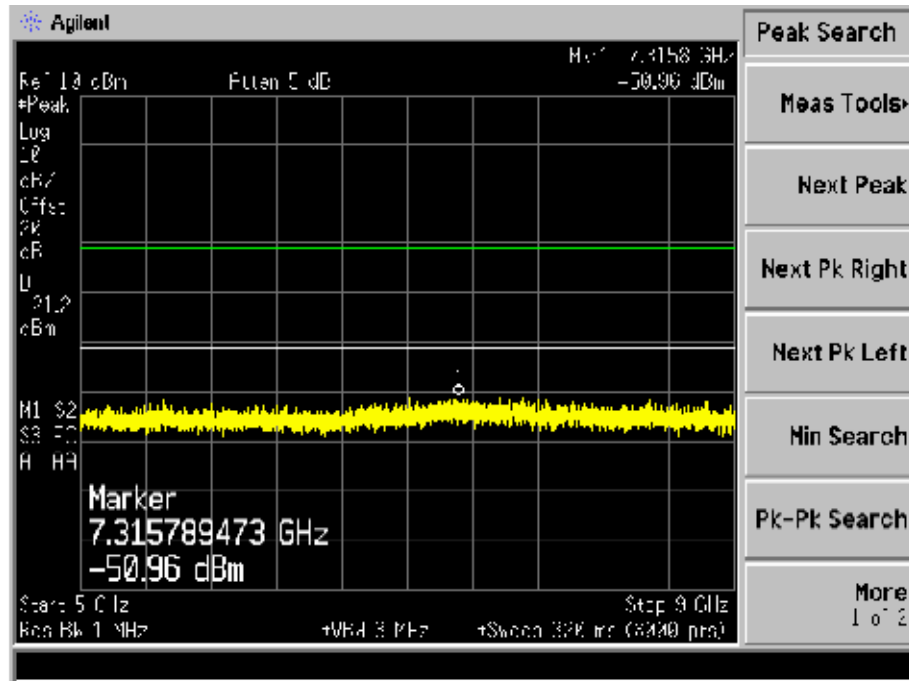
Plot 174 – Channel 11 @ CCK 11Mbps



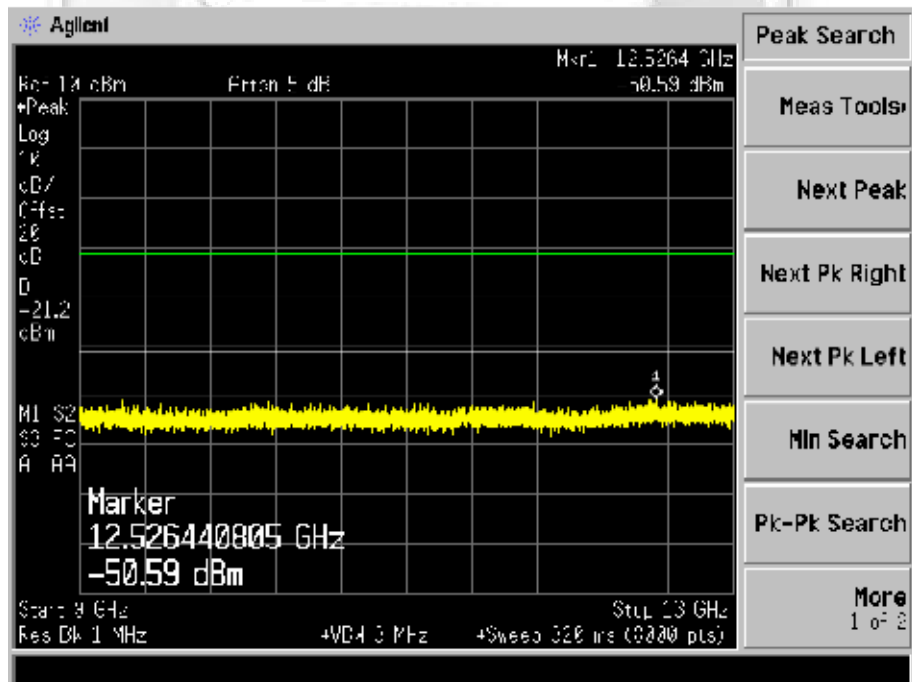
Plot 175 – Channel 11 @ CCK 11Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



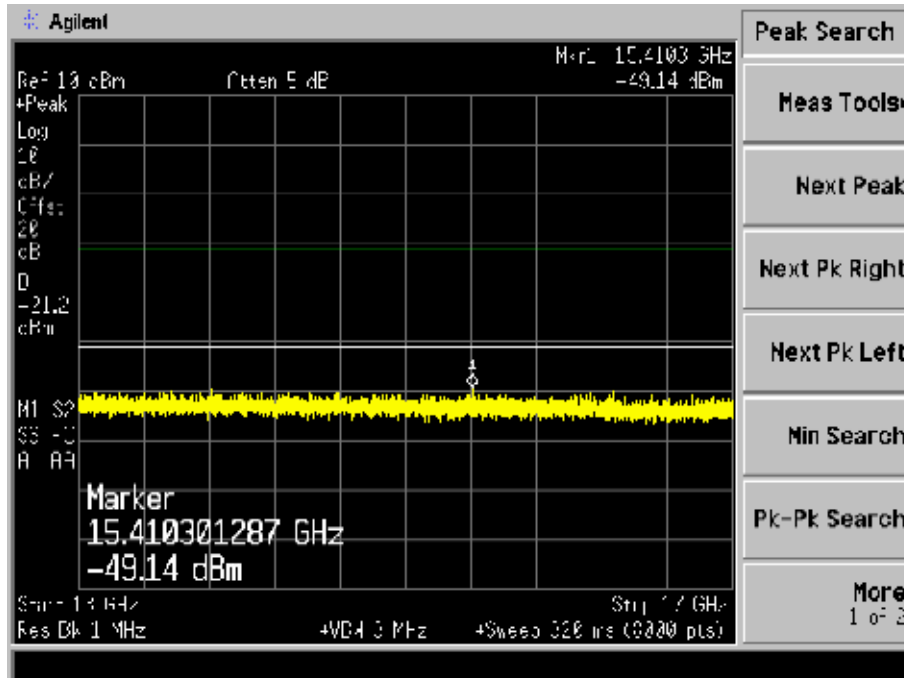
Plot 176 – Channel 11 @ CCK 11Mbps



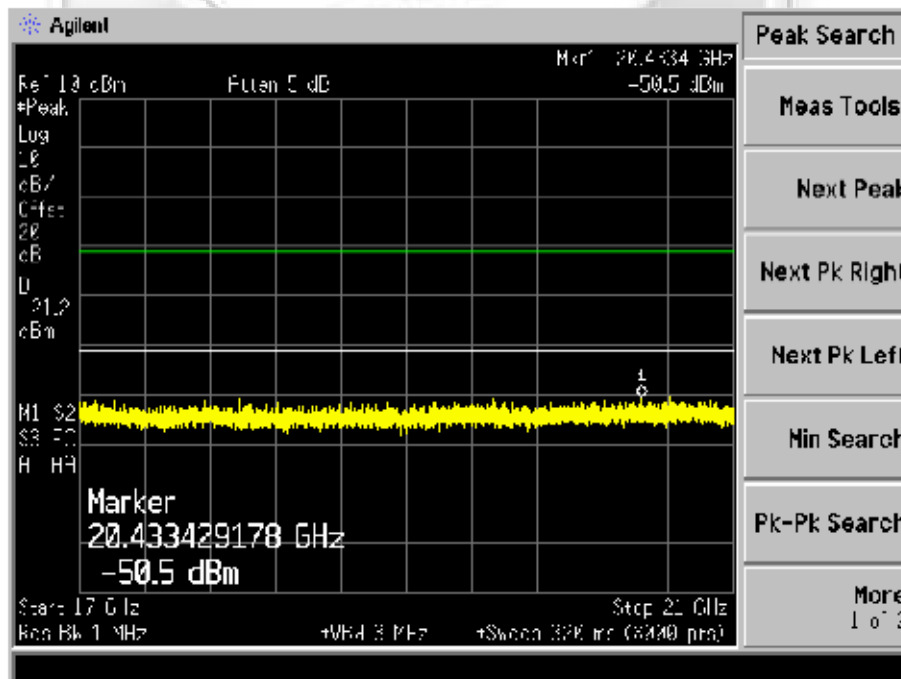
Plot 177 – Channel 11 @ CCK 11Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots – Peak



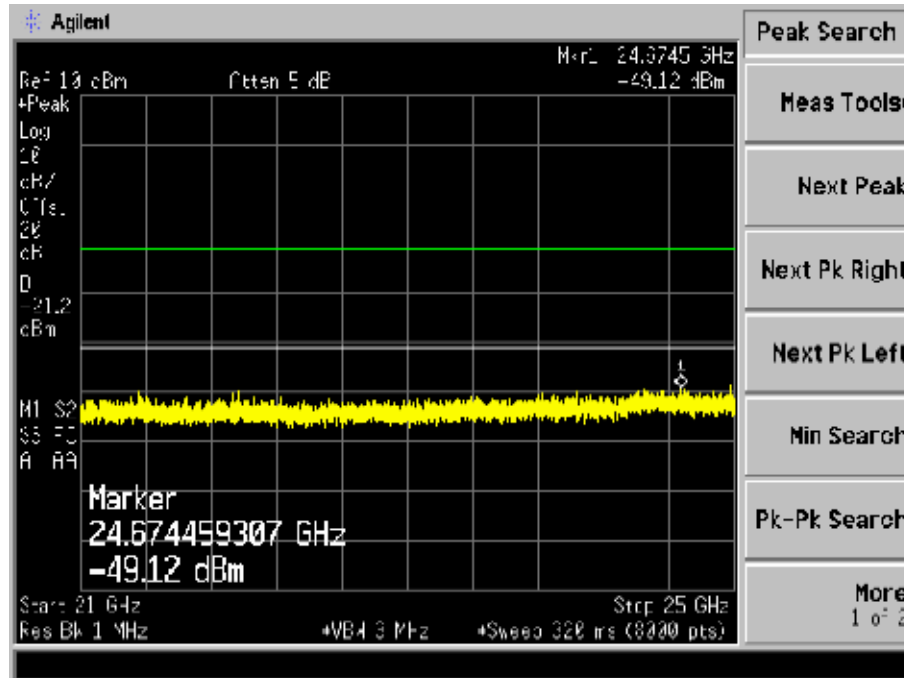
Plot 178 – Channel 11 @ CCK 11Mbps



Plot 179 – Channel 11 @ CCK 11Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots – Peak

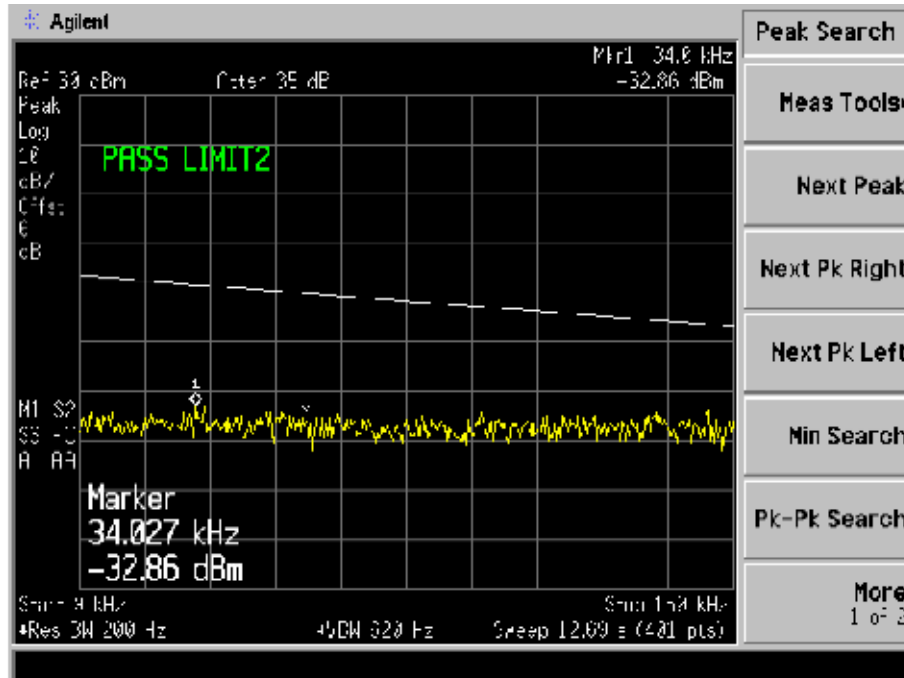


Plot 180 – Channel 11 @ CCK 11Mbps

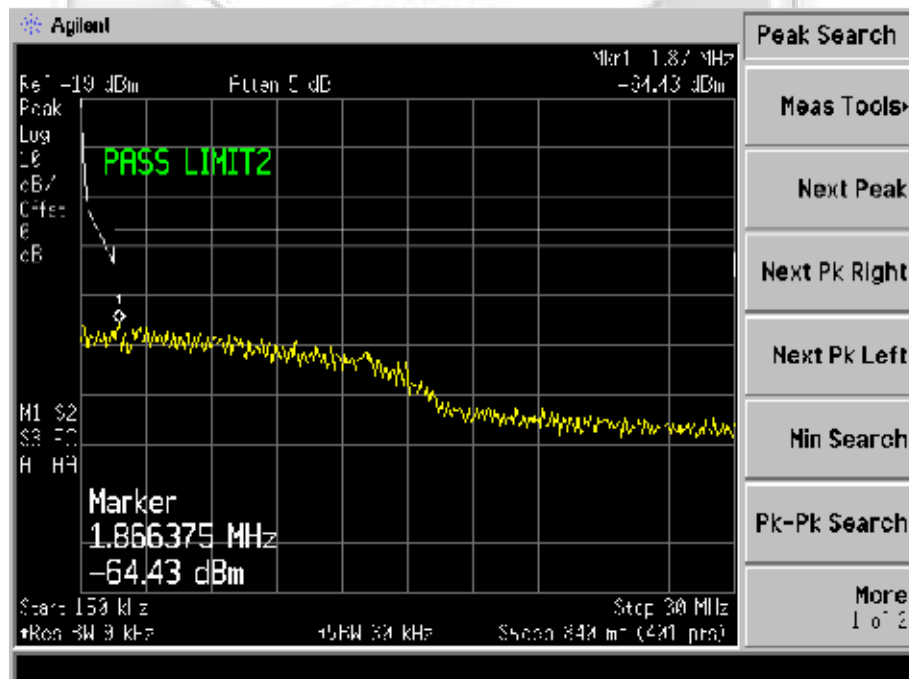


RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



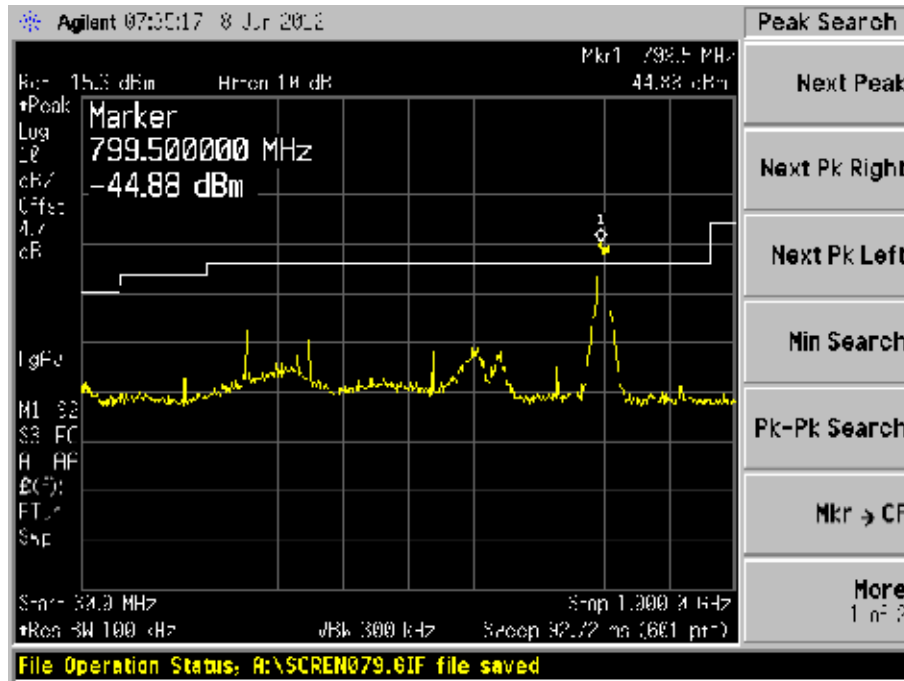
Plot 181 – Channel 1 @DBPSK 9Mbps



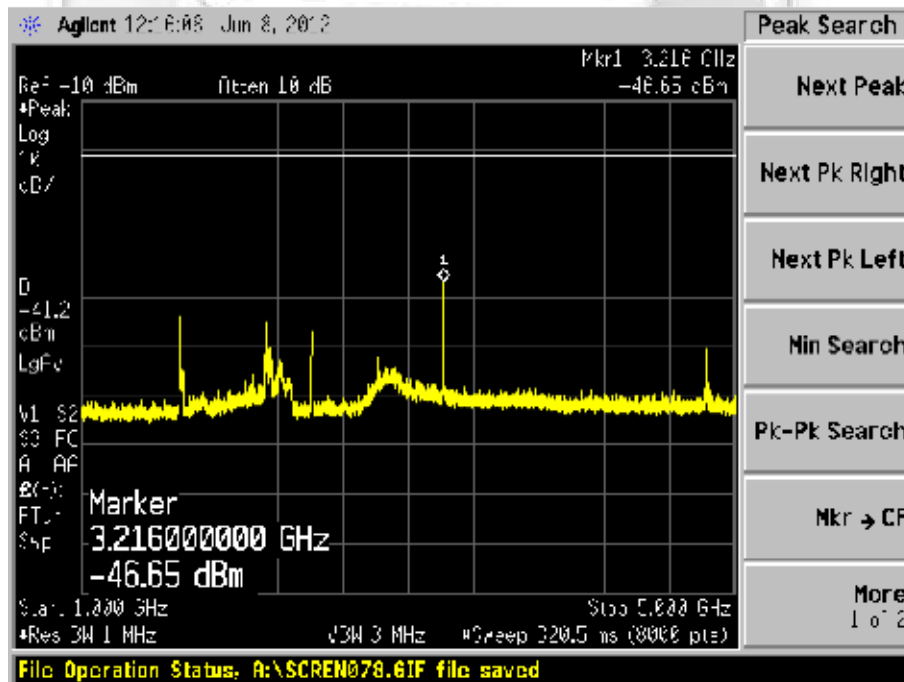
Plot 182 – Channel 1 @DBPSK 9Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



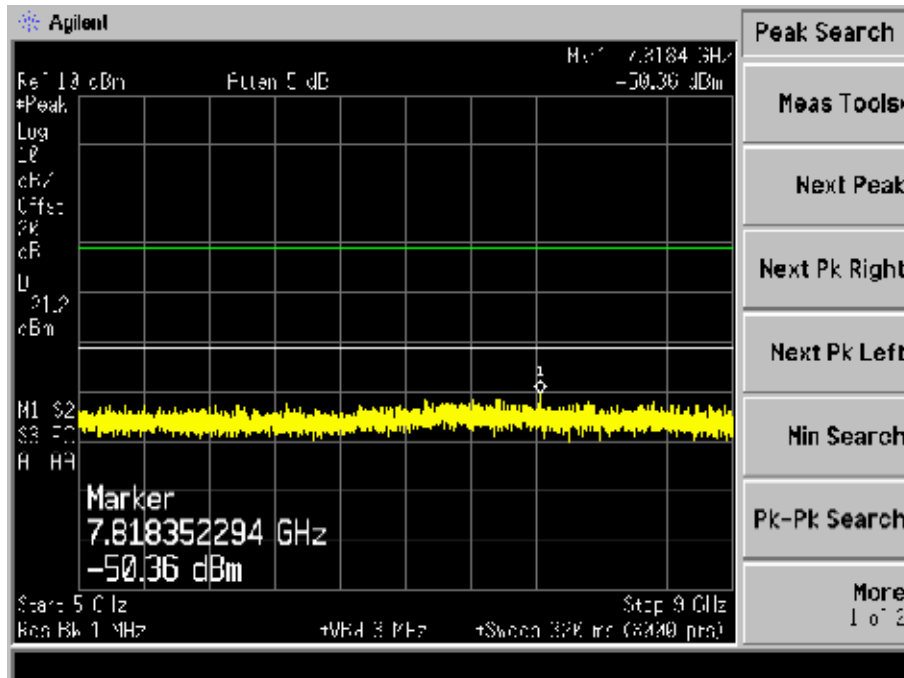
Plot 183 – Channel 1 @ DBPSK 9Mbps



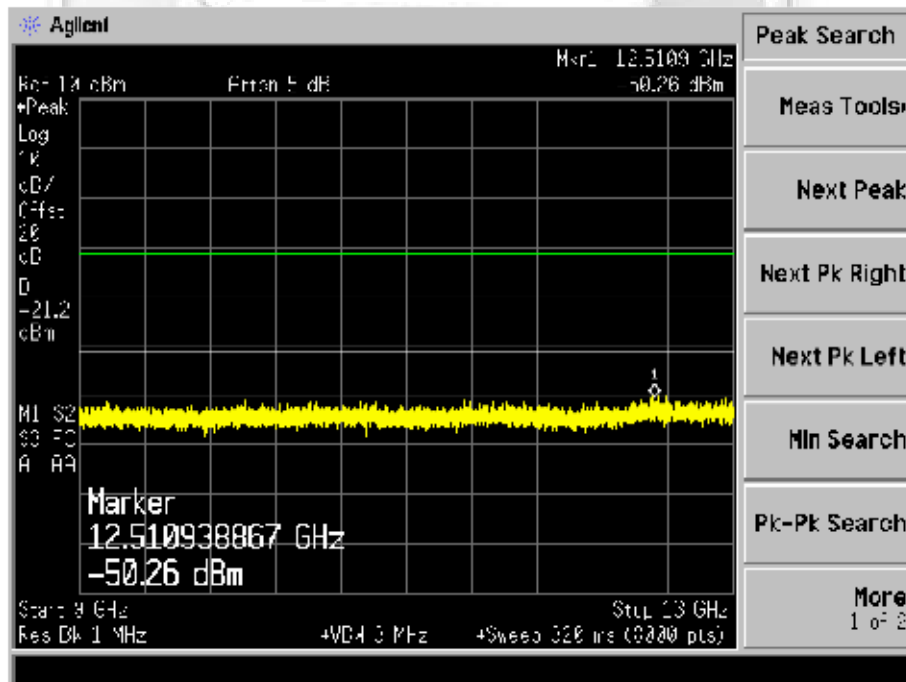
Plot 184 – Channel 1 @ DBPSK 9Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



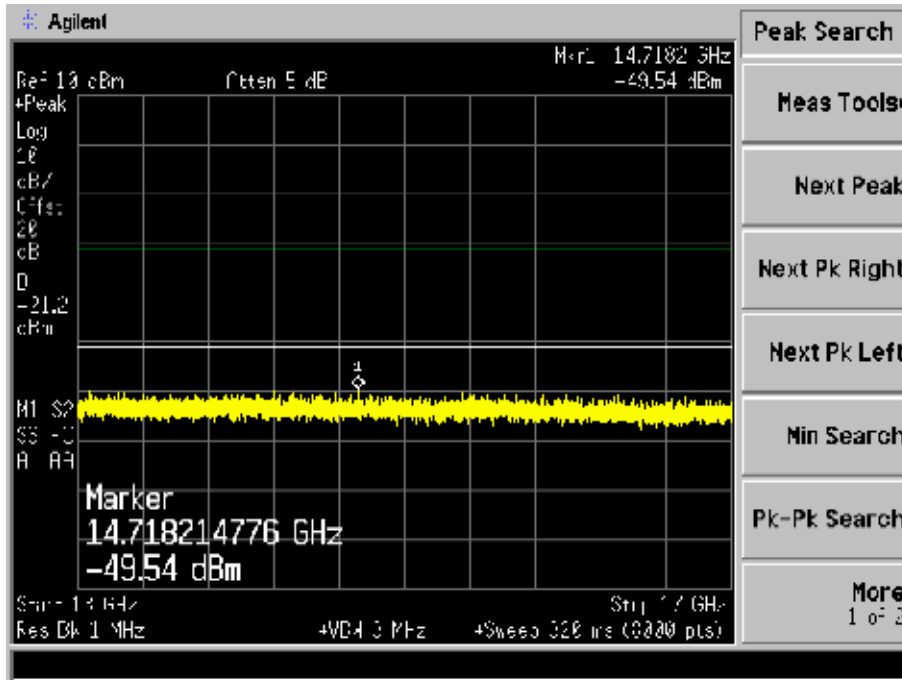
Plot 185 – Channel 1 @ DBPSK 9Mbps



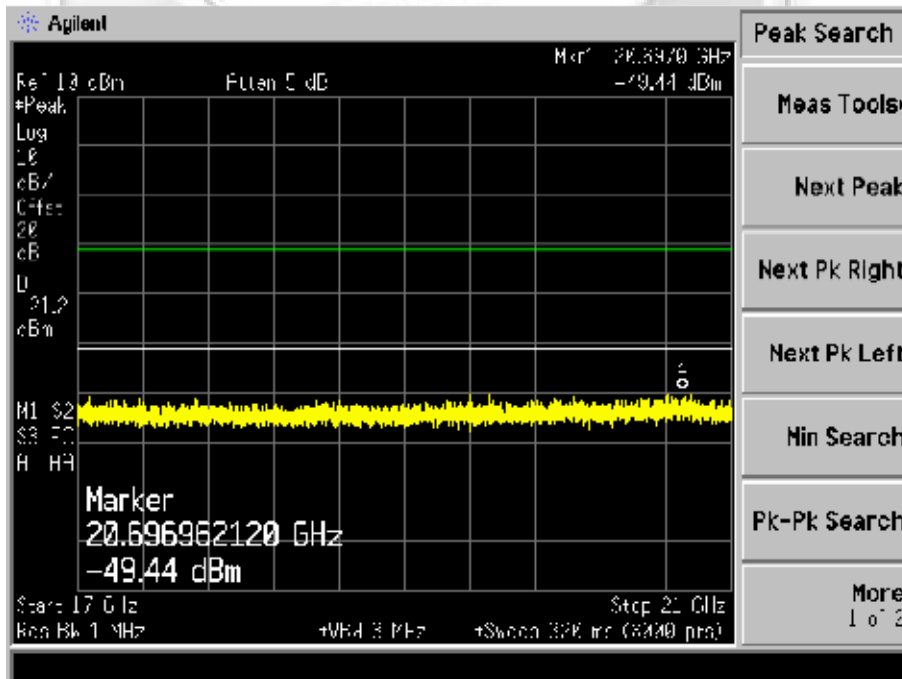
Plot 186 – Channel 1 @ DBPSK 9Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



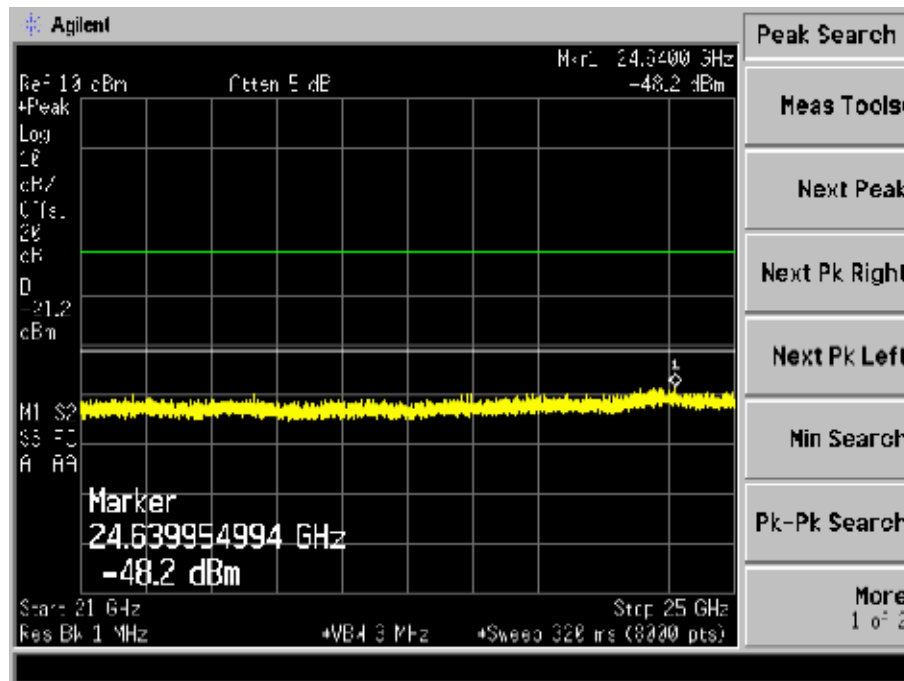
Plot 187 - Channel 1 @ DBPSK 9Mbps



Plot 188 - Channel 1 @ DBPSK 9Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak

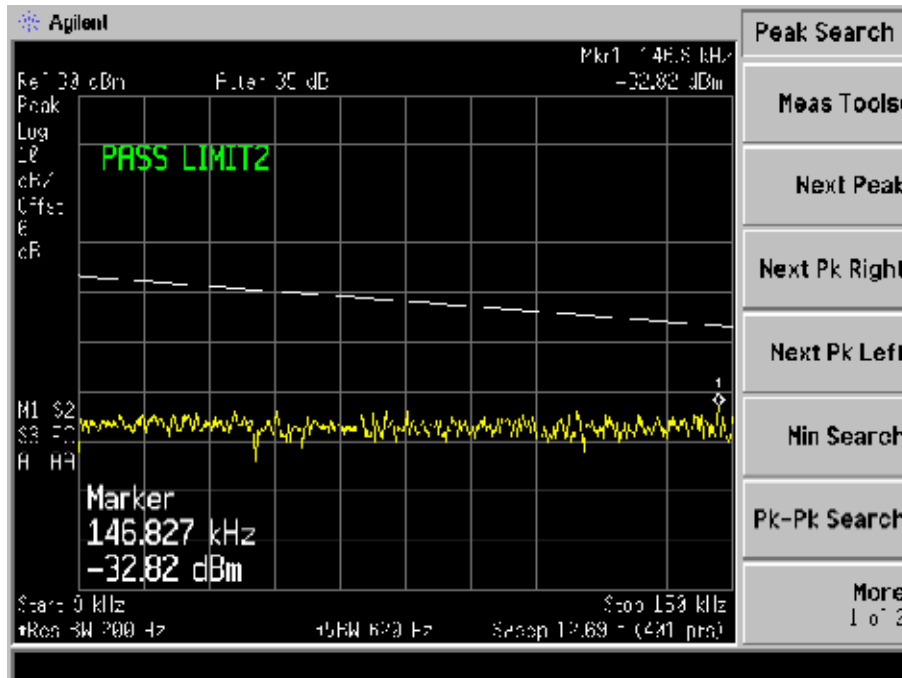


Plot 189 - Channel 1 @ DBPSK 9Mbps

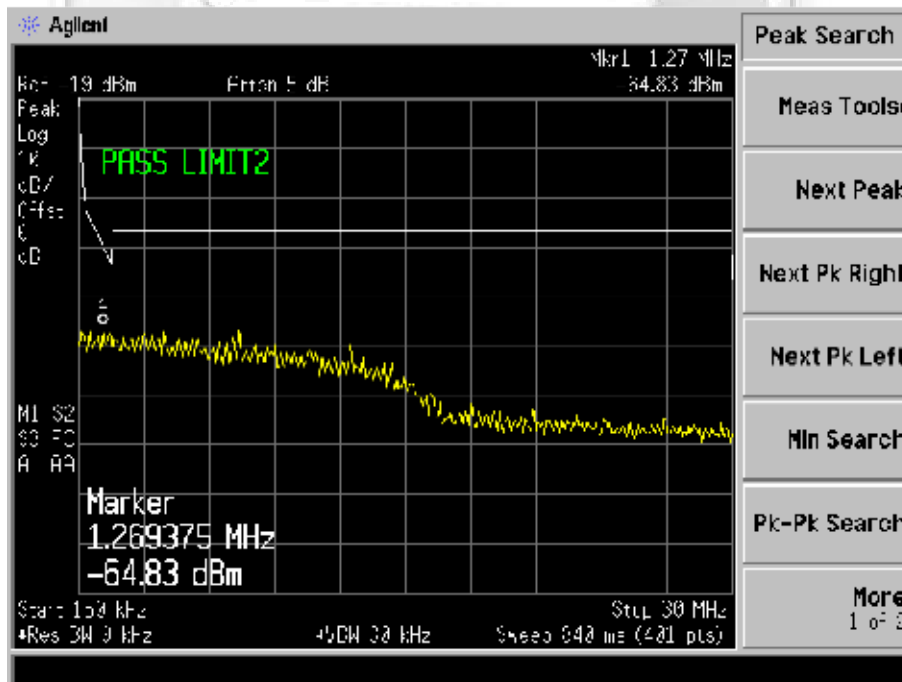


RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



Plot 190 – Channel 1 @ DQPSK 18Mbps

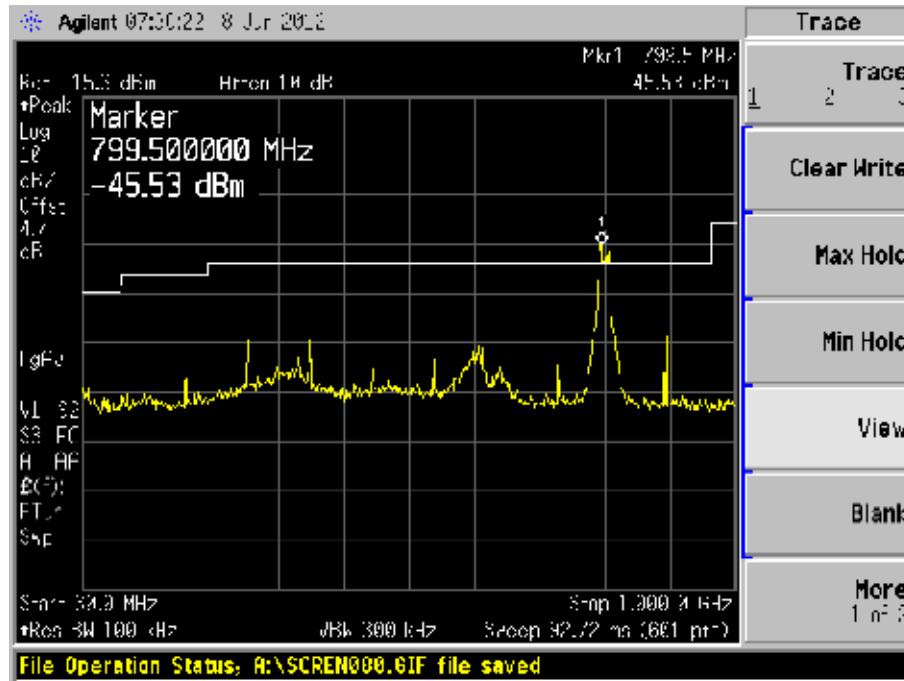


Plot 191 – Channel 1 @ DQPSK 18Mbps

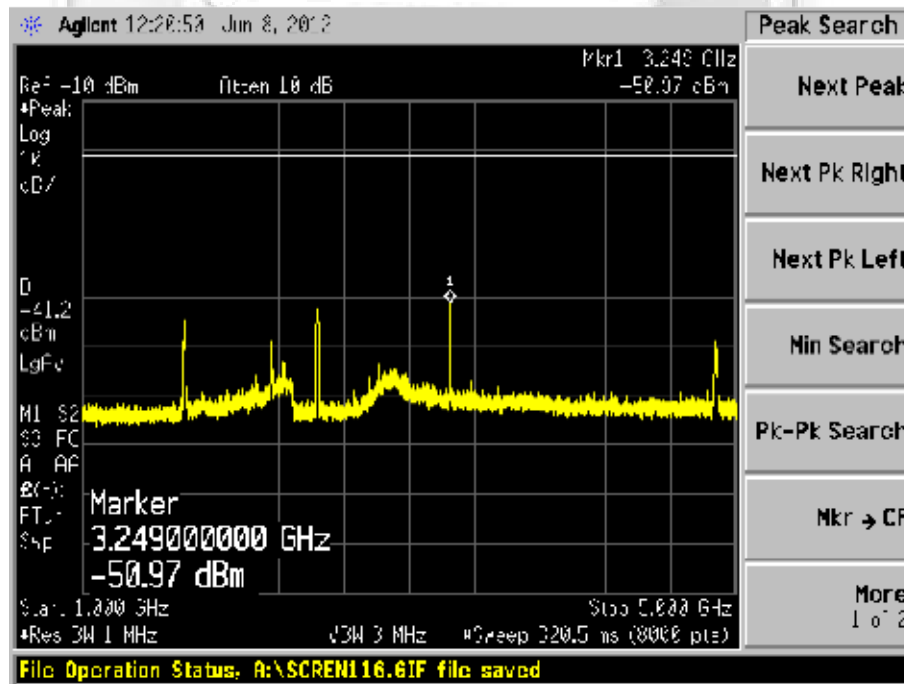


RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



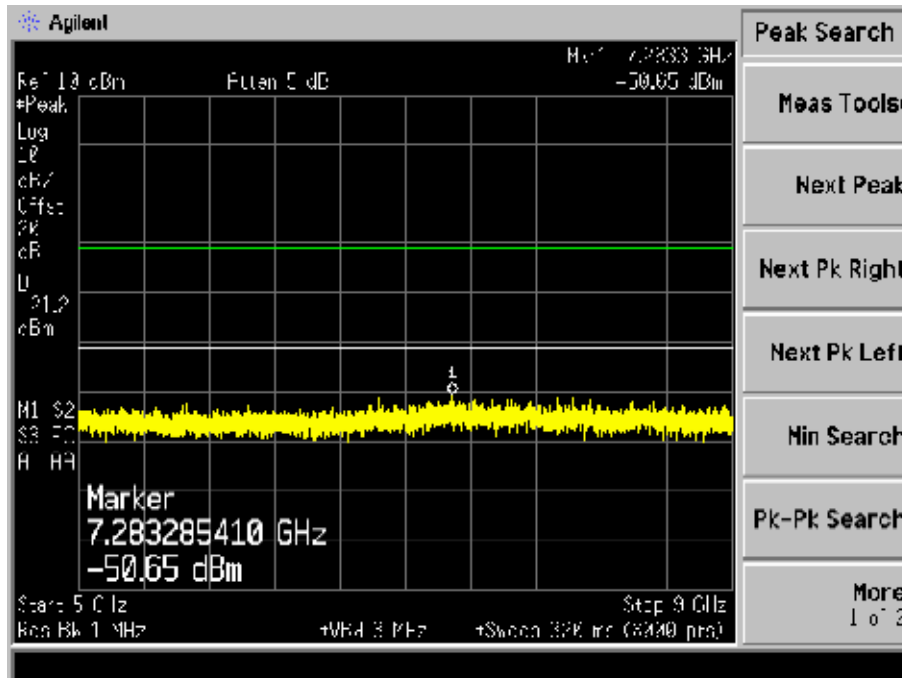
Plot 192 – Channel 1 @ DQPSK 18Mbps



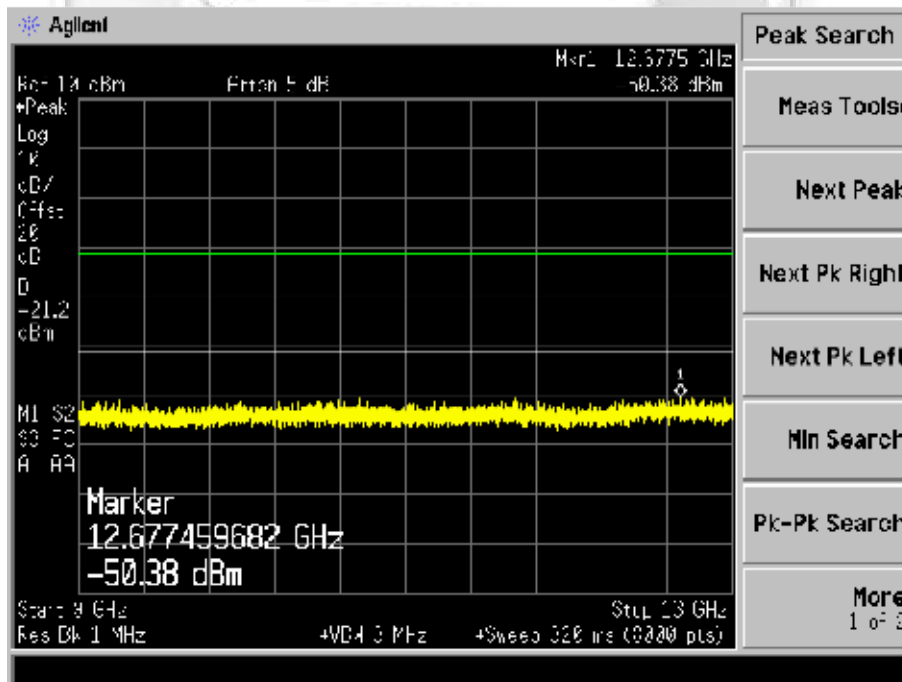
Plot 193 – Channel 1 @ DQPSK 18Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



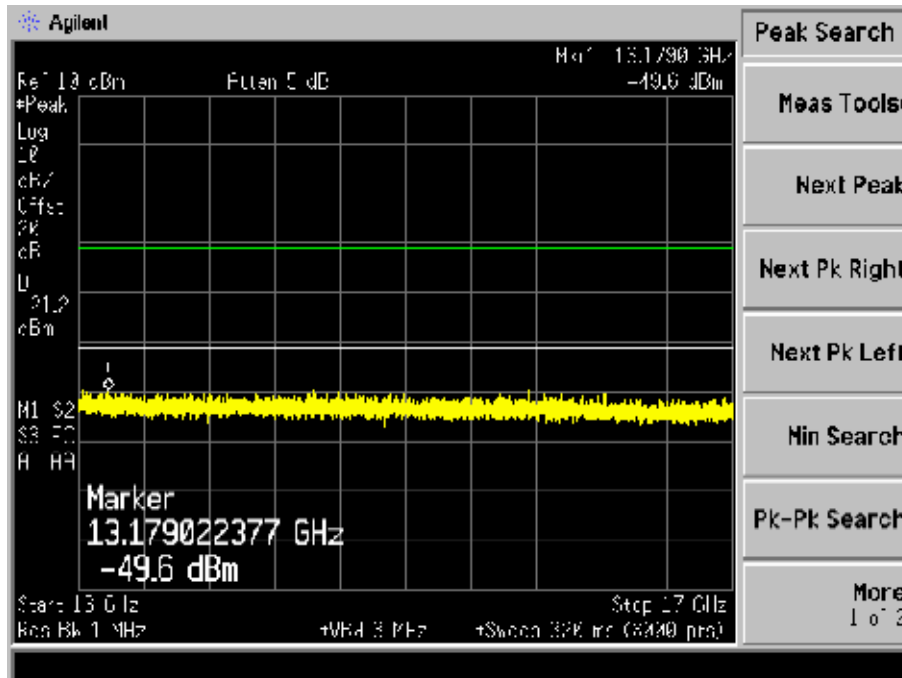
Plot 194 – Channel 1 @ DQPSK 18Mbps



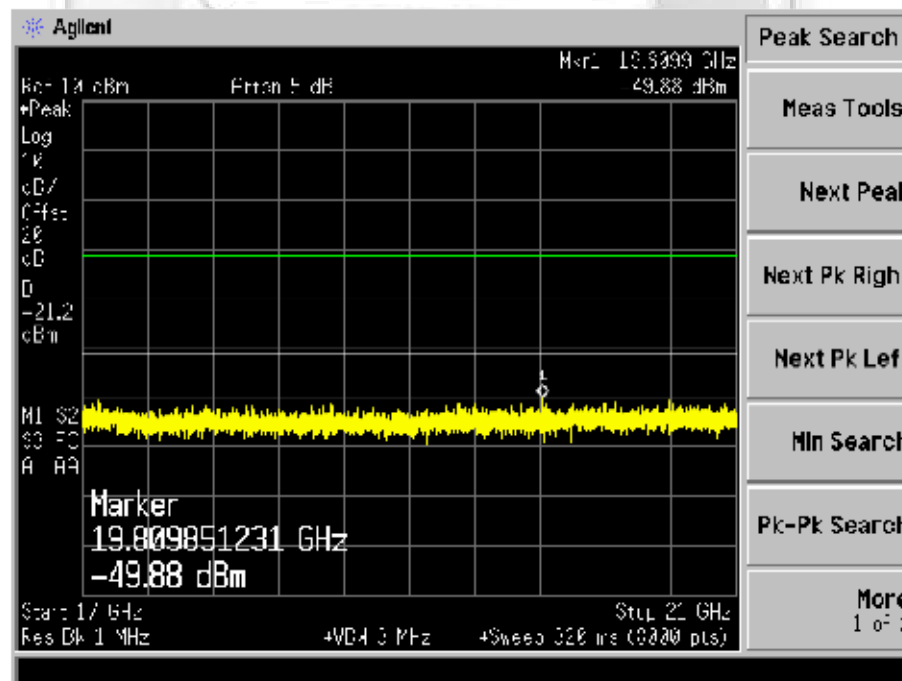
Plot 195 – Channel 1 @ DQPSK 18Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



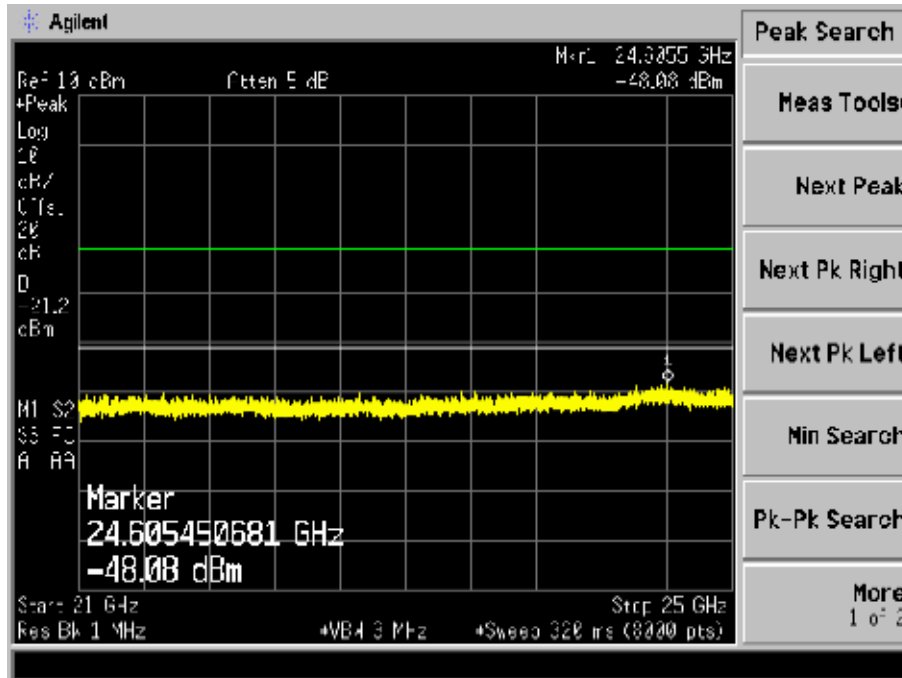
Plot 196 – Channel 1 @ DQPSK 18Mbps



Plot 197 – Channel 1 @ DQPSK 18Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak

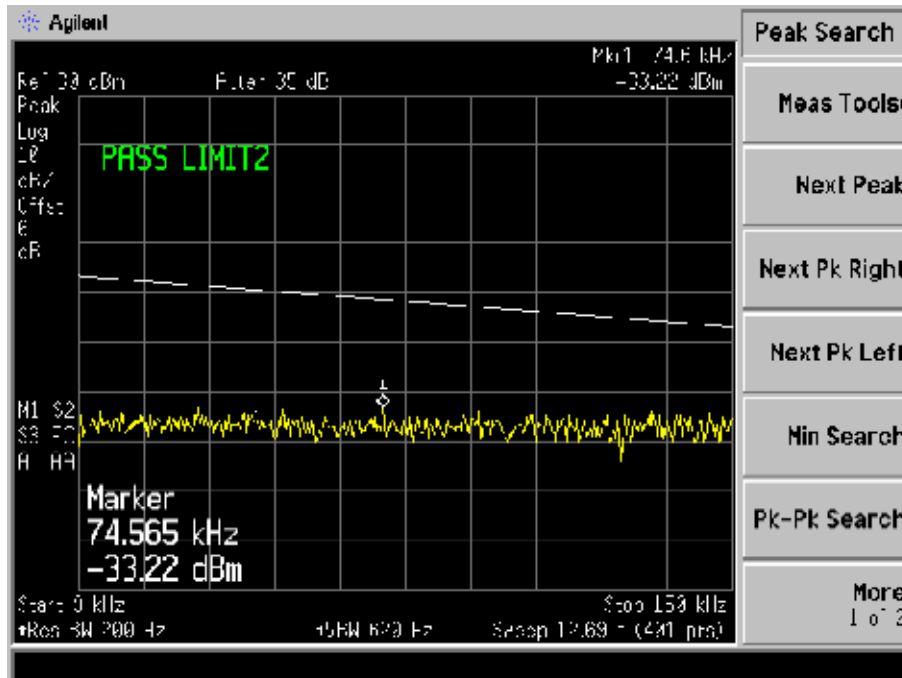


Plot 198 – Channel 1 @ DQPSK 18Mbps

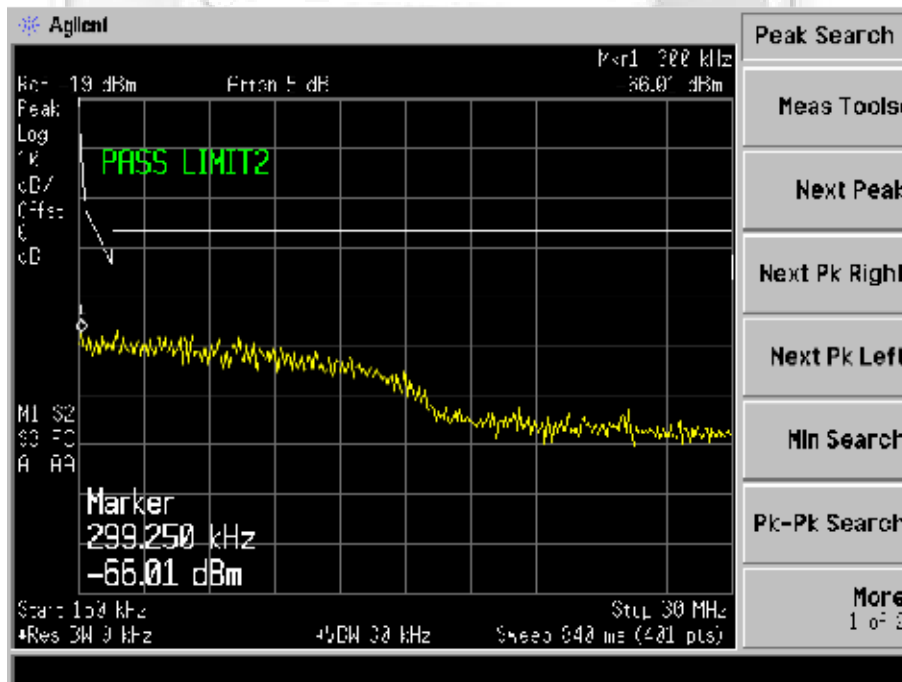


RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



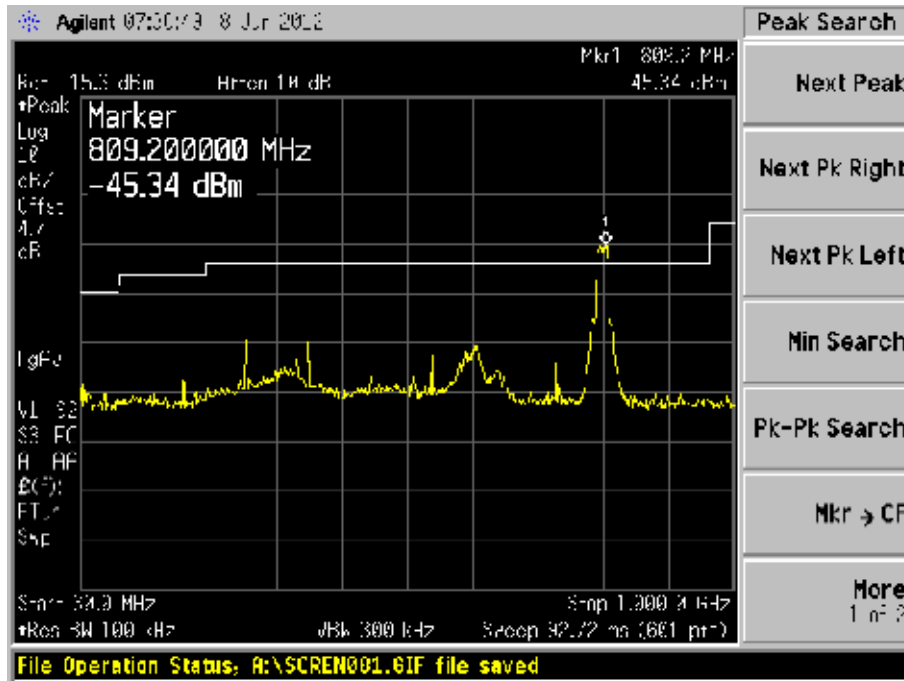
Plot 199 – Channel 1 @ CCK 36Mbps



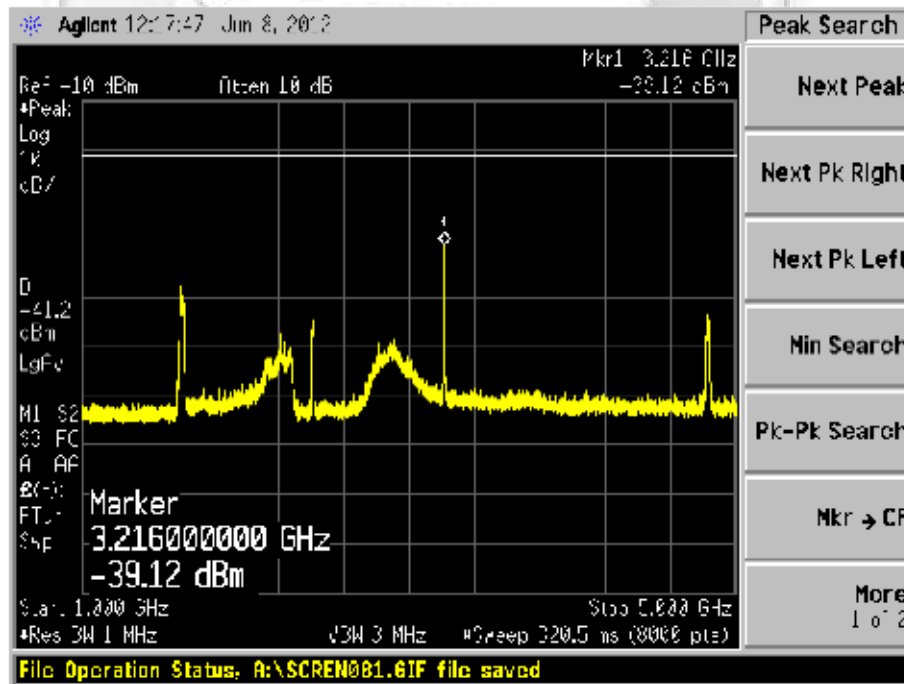
Plot 200 – Channel 1 @ CCK 36Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



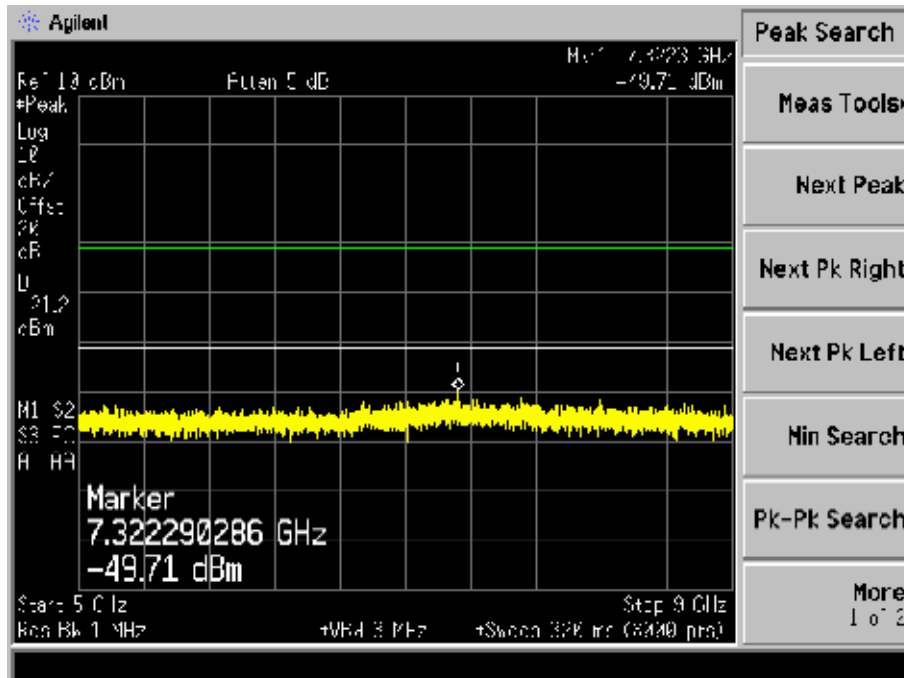
Plot 201 – Channel 1 @ CCK 36Mbps



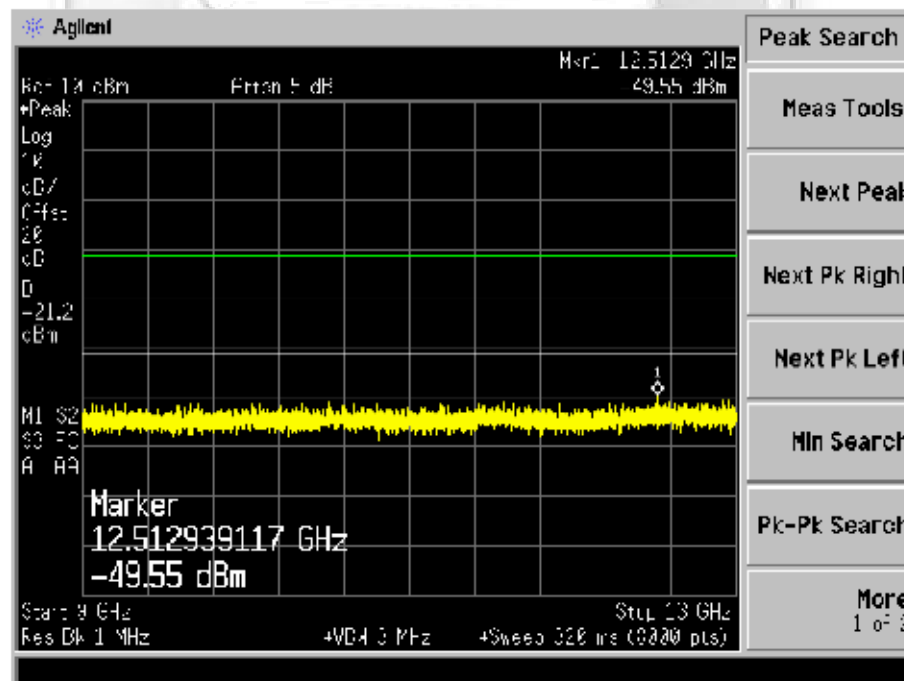
Plot 202 – Channel 1 @ CCK 36Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



Plot 203 – Channel 1 @ CCK 36Mbps

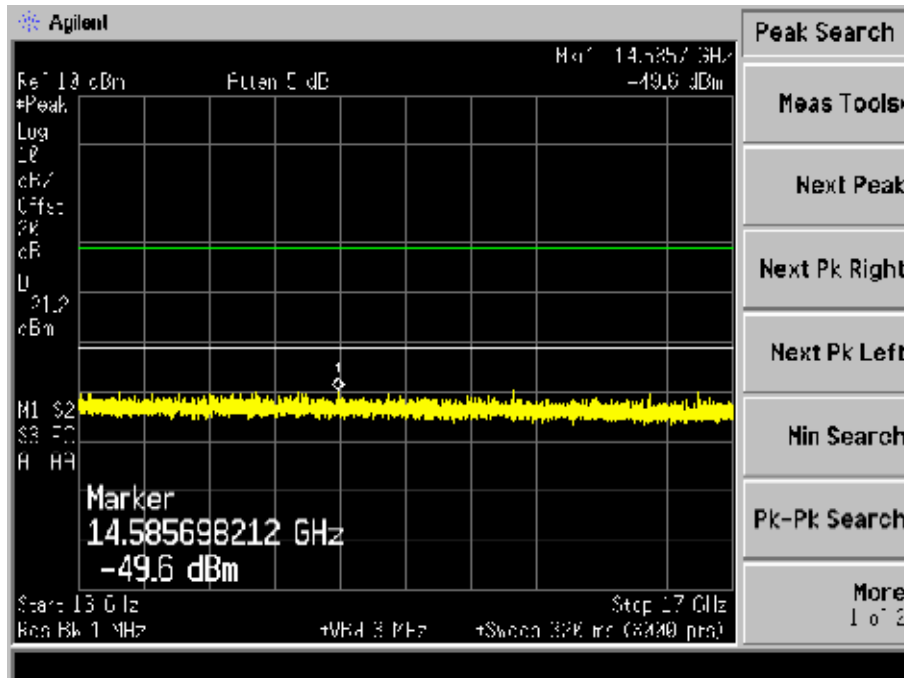


Plot 204 – Channel 1 @ CCK 36Mbps

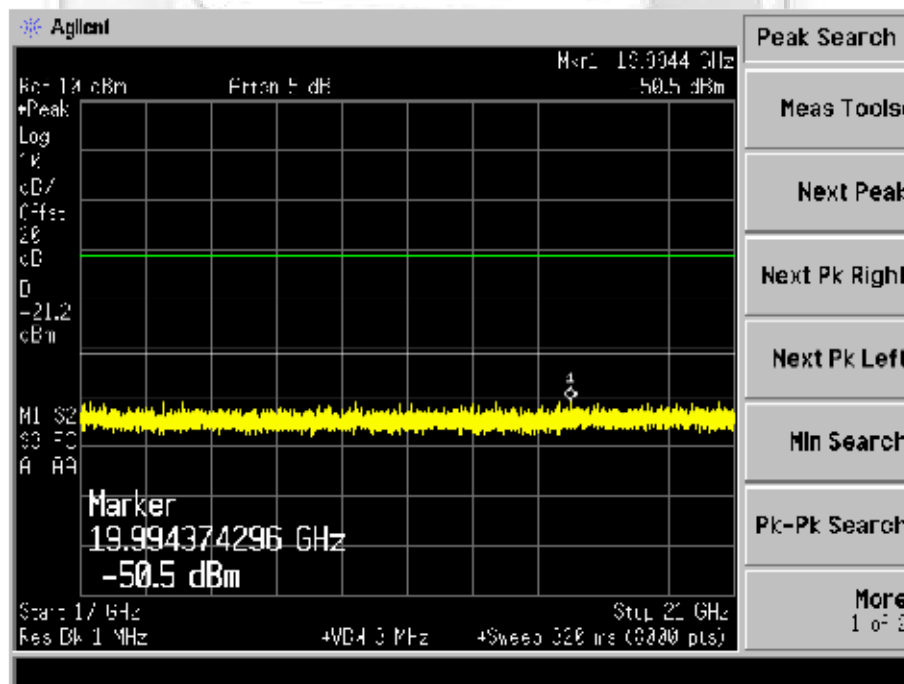


RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



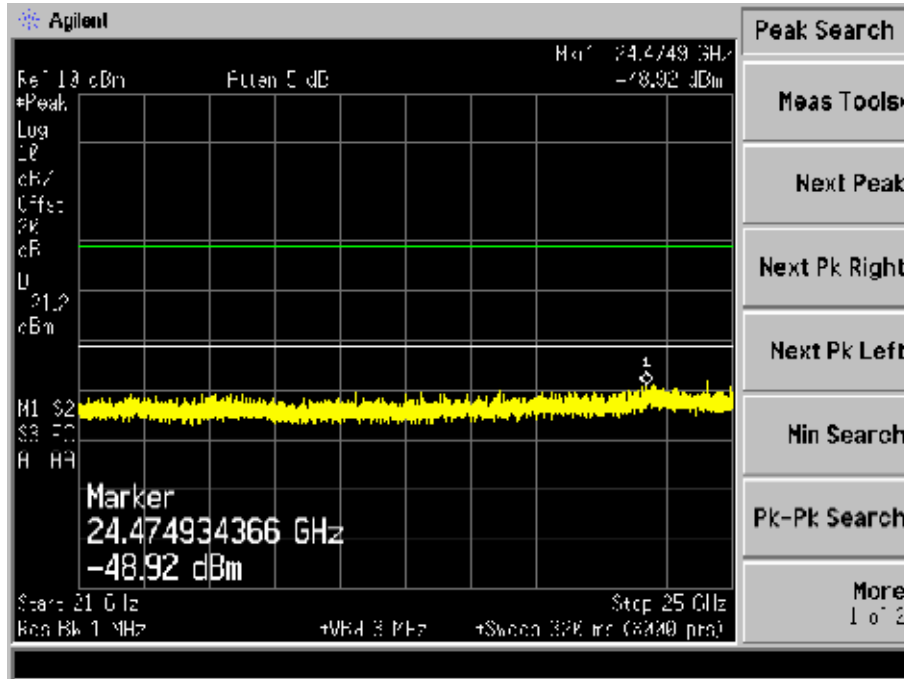
Plot 205 – Channel 1 @ CCK 36Mbps



Plot 206 – Channel 1 @ CCK 36Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak

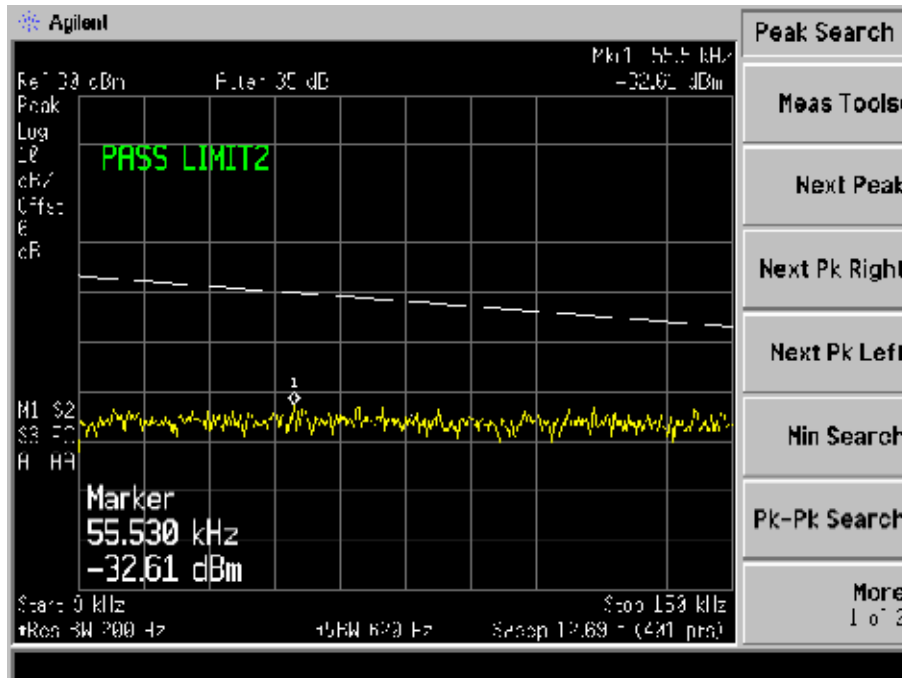


Plot 207 – Channel 1 @ CCK 36Mbps

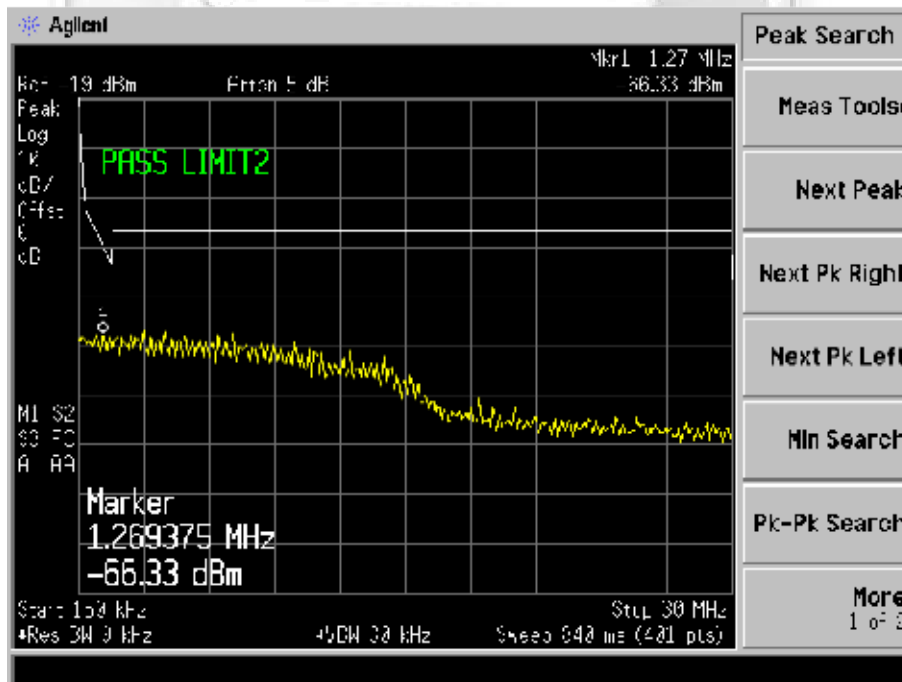


RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



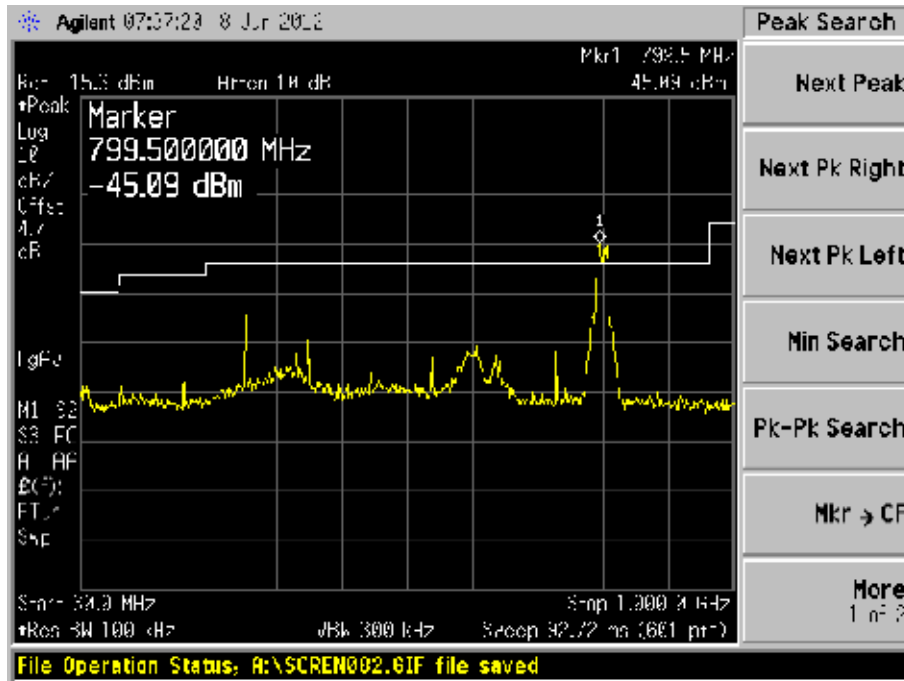
Plot 208 – Channel 1 @ CCK 54Mbps



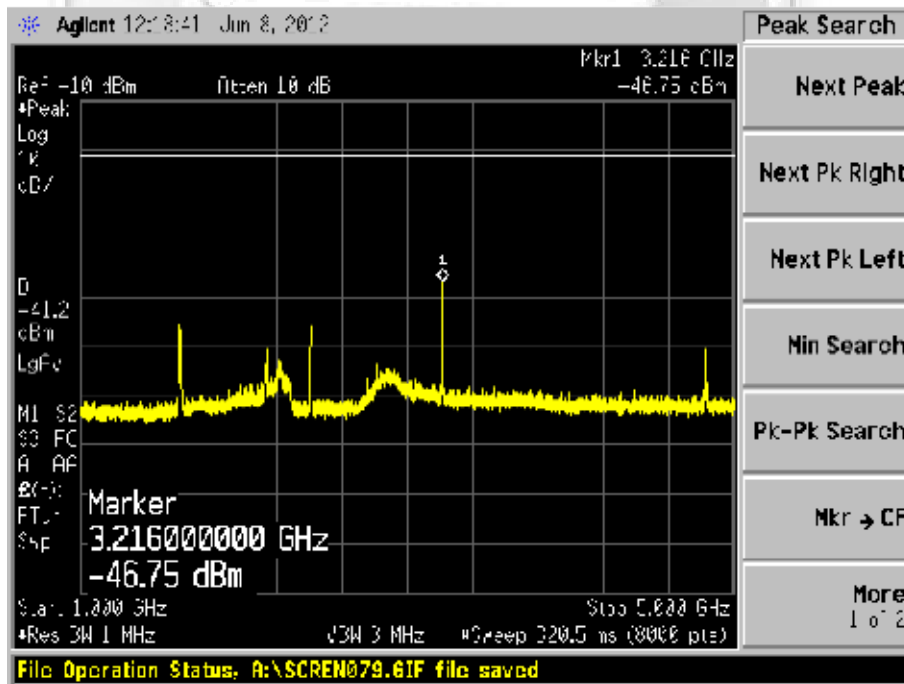
Plot 209 – Channel 1 @ CCK 54Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



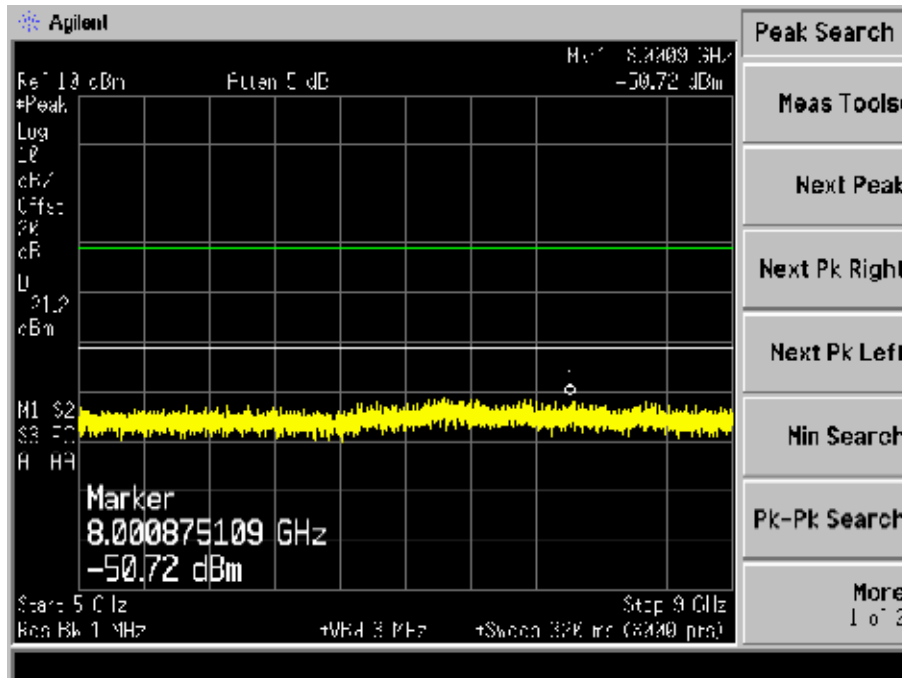
Plot 210 – Channel 1 @ CCK 54Mbps



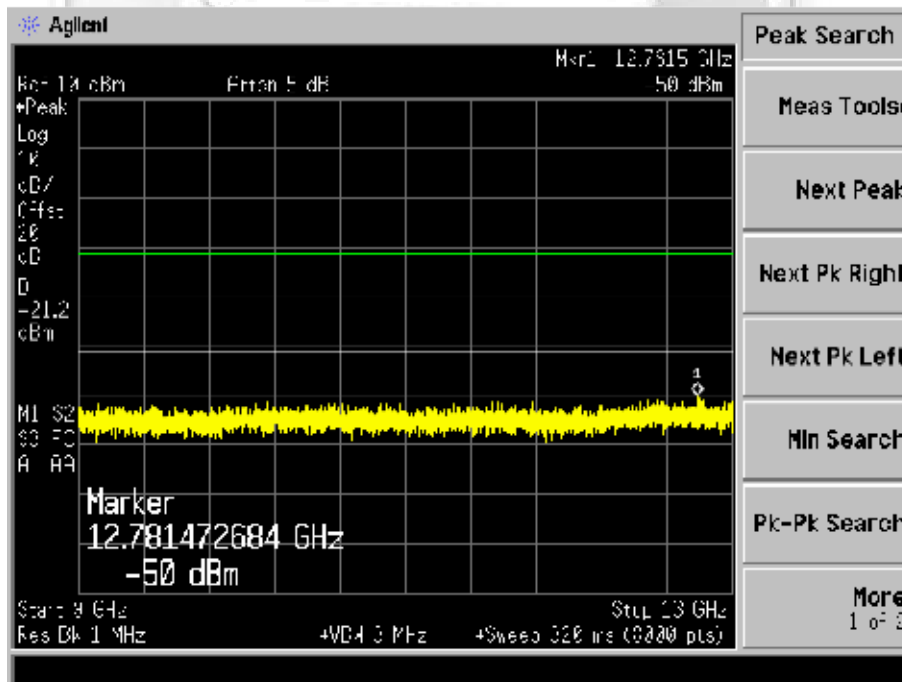
Plot 211 – Channel 1 @ CCK 54Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



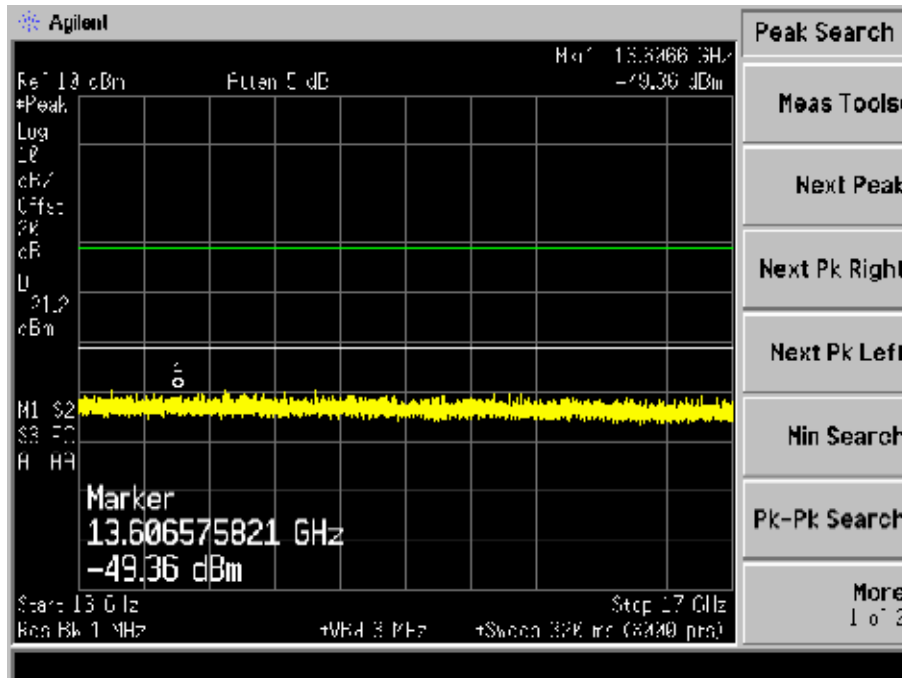
Plot 212 – Channel 1 @ CCK 54Mbps



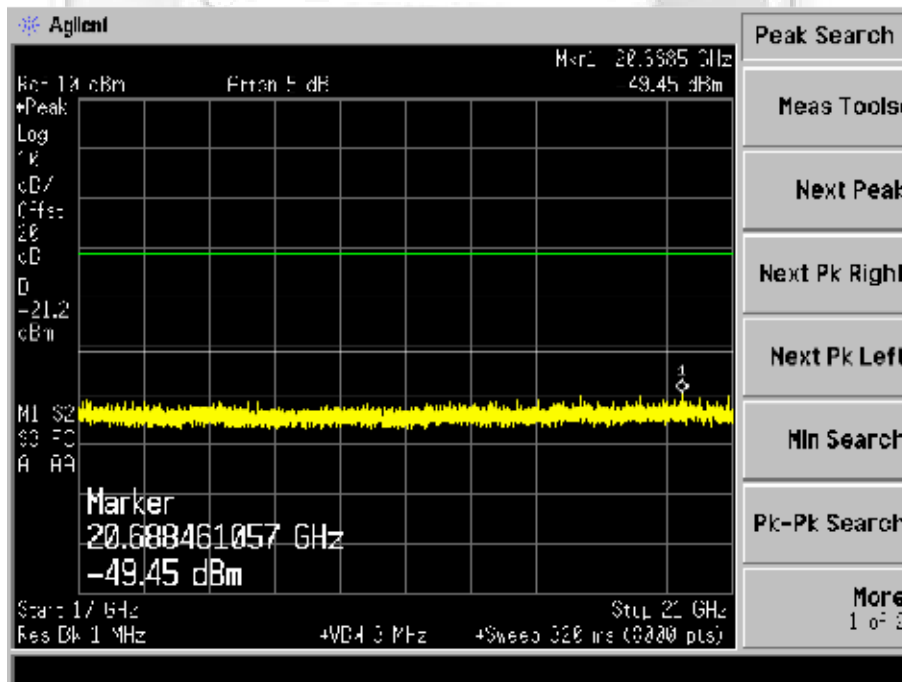
Plot 213 – Channel 1 @ CCK 54Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



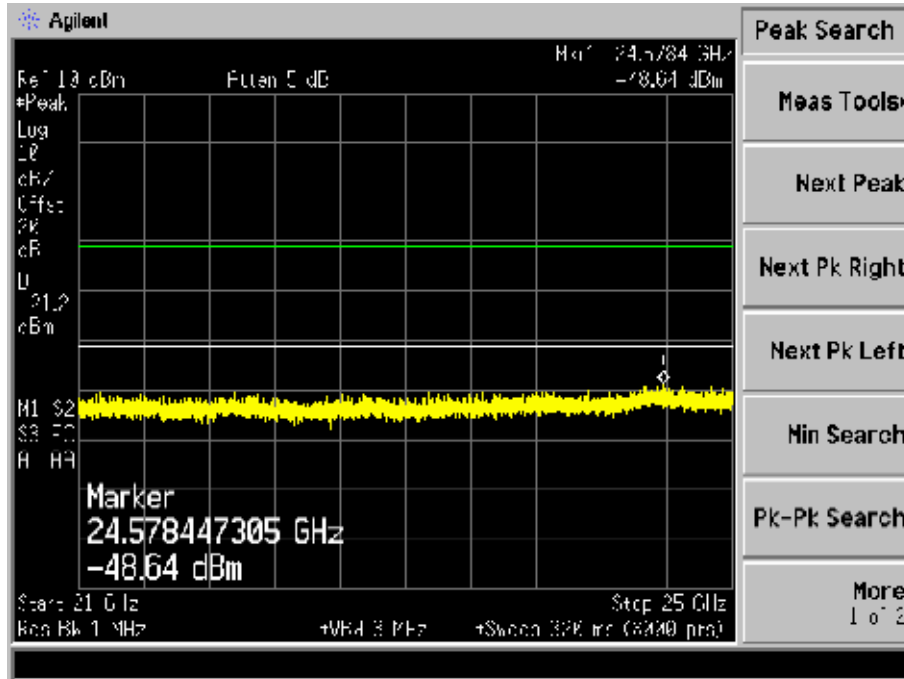
Plot 214 – Channel 1 @ CCK 54Mbps



Plot 215 – Channel 1 @ CCK 54Mbps

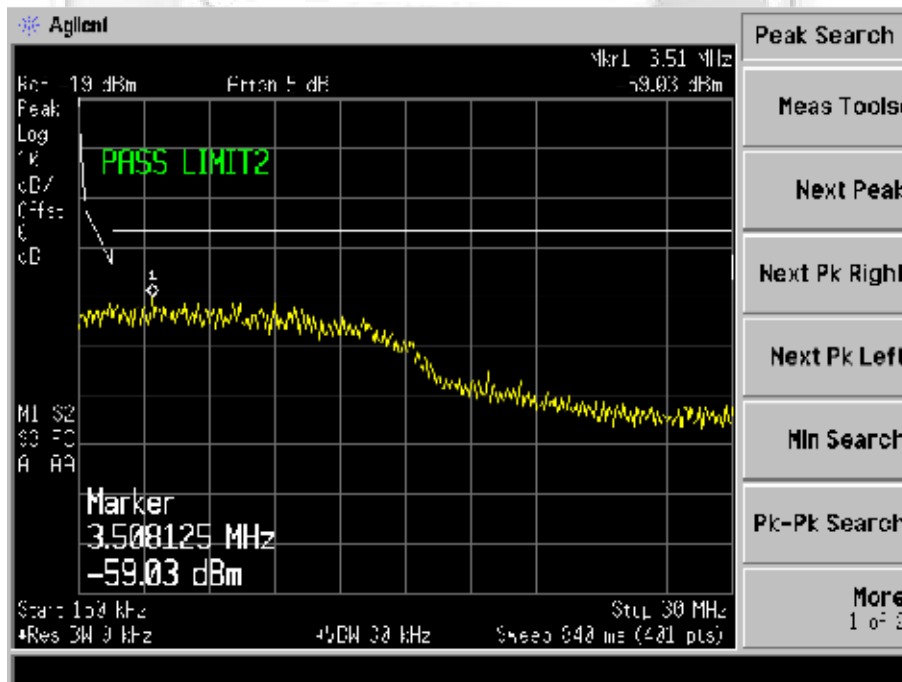
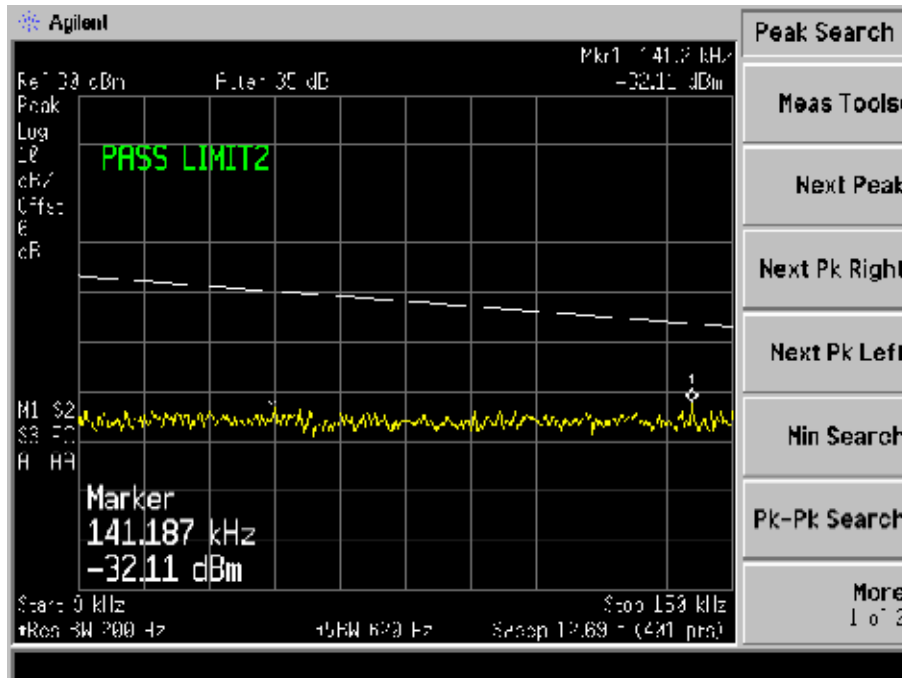
RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



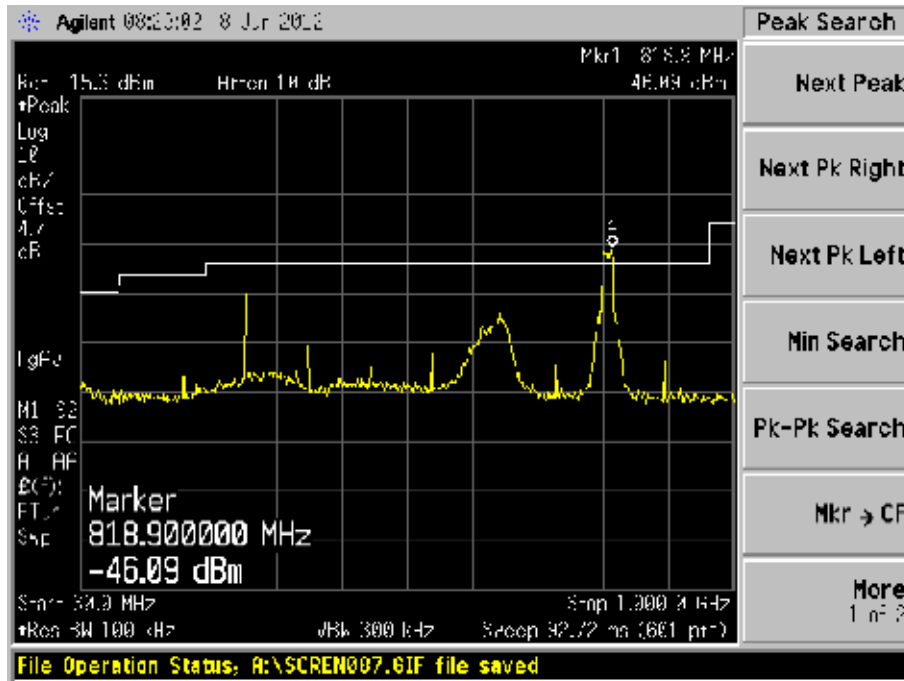
RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak

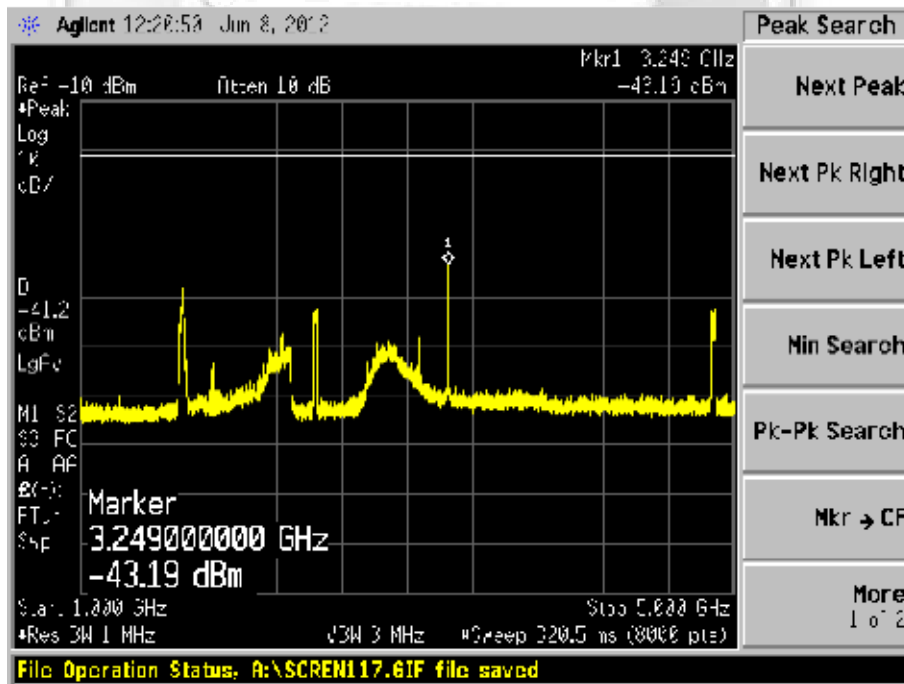


RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



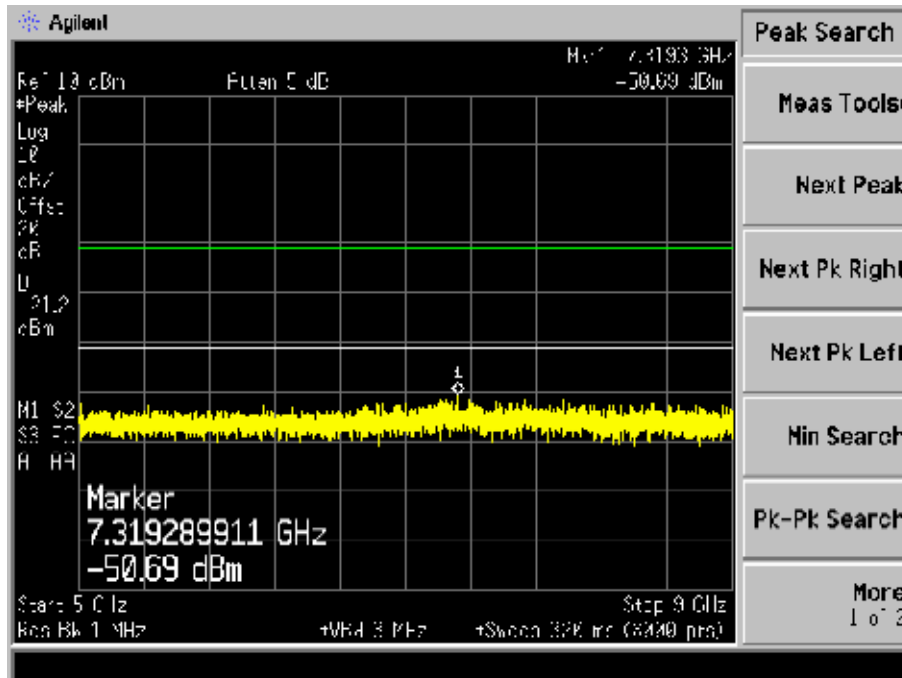
Plot 219 – Channel 6 @ DBPSK 9Mbps



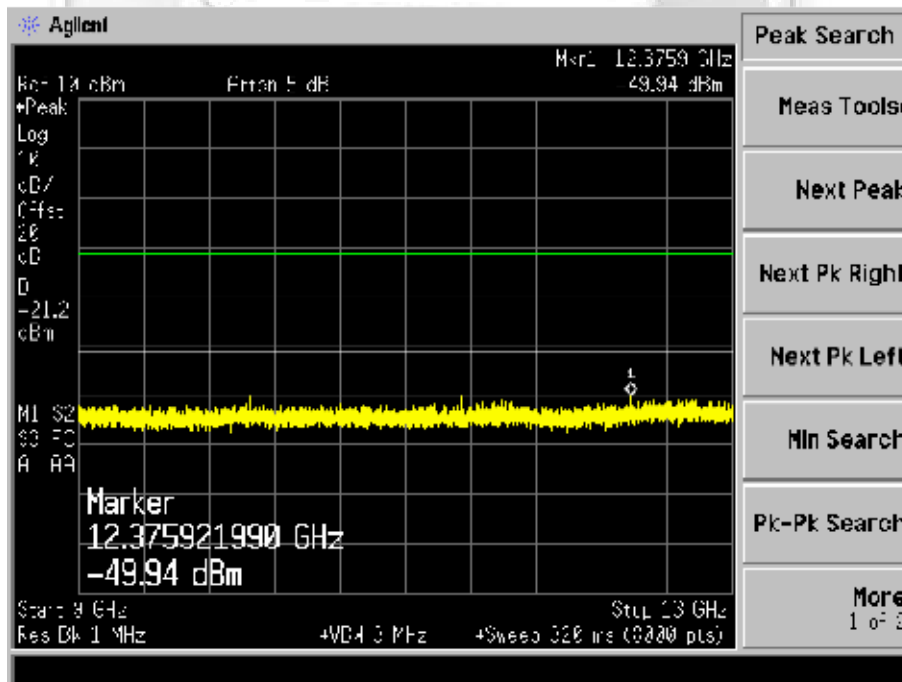
Plot 220 – Channel 6 @ DBPSK 9Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



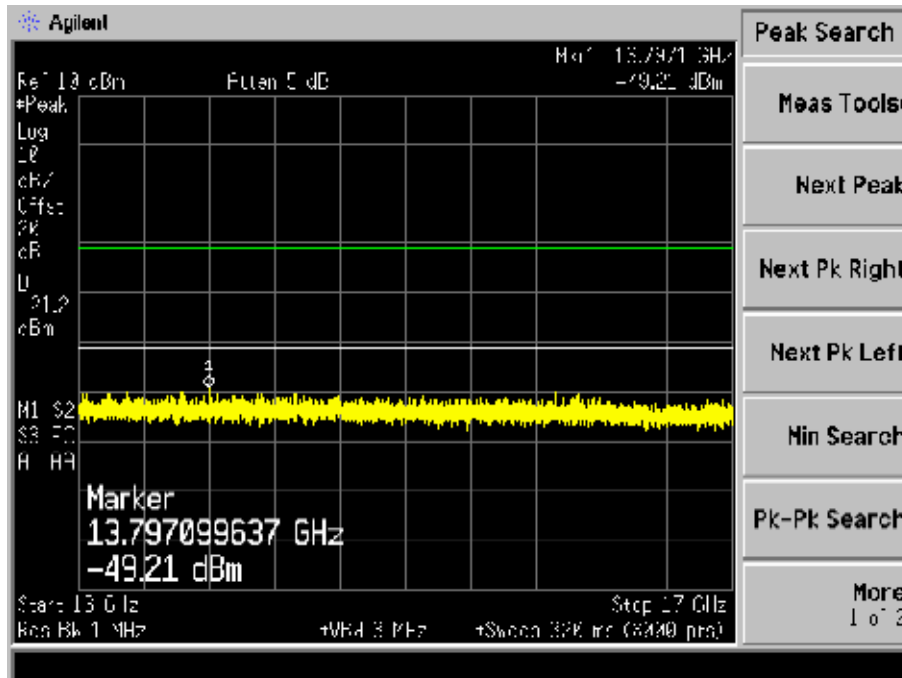
Plot 221 – Channel 6 @ DBPSK 9Mbps



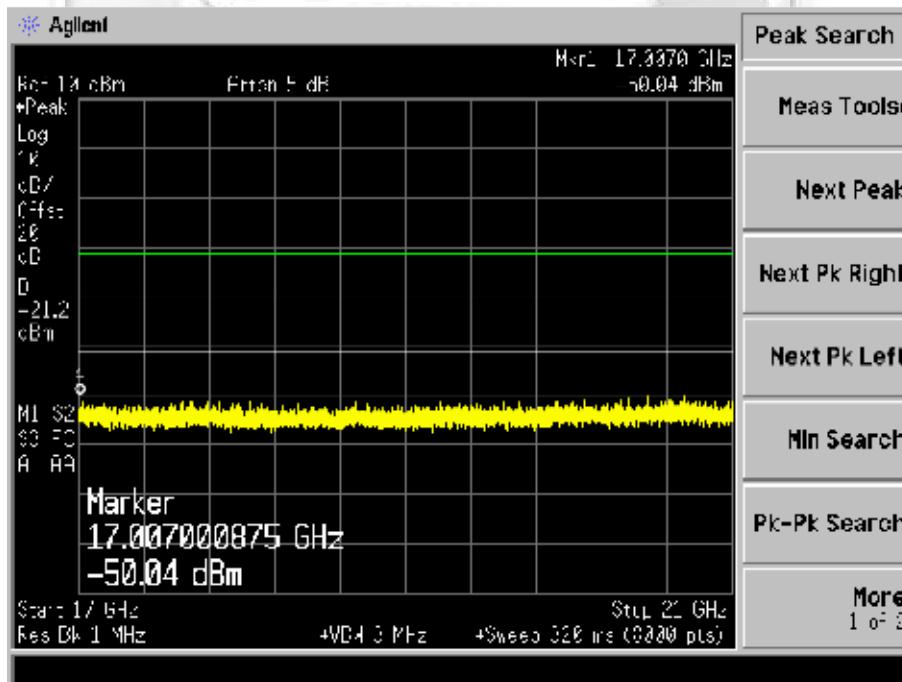
Plot 222 – Channel 6 @ DBPSK 9Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



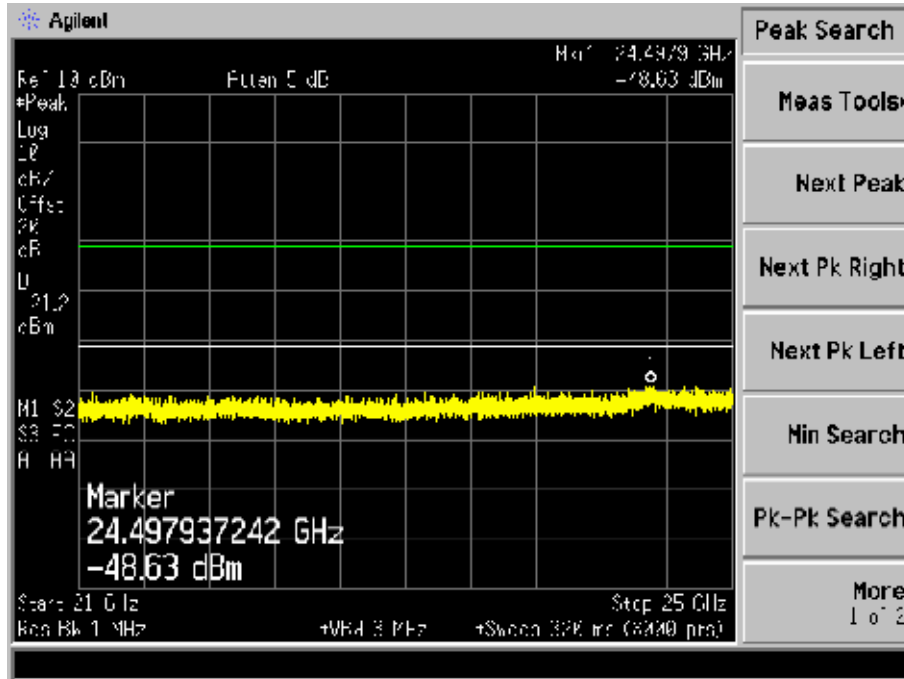
Plot 223 – Channel 6 @ DBPSK 9Mbps



Plot 224 – Channel 6 @ DBPSK 9Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak

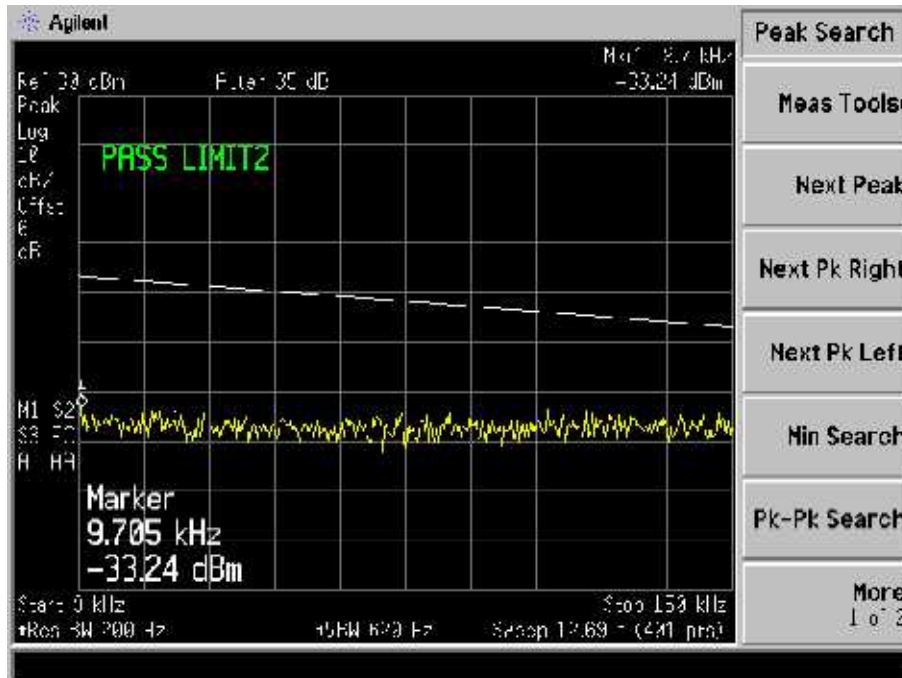


Plot 225 – Channel 6 @ DBPSK 9Mbps

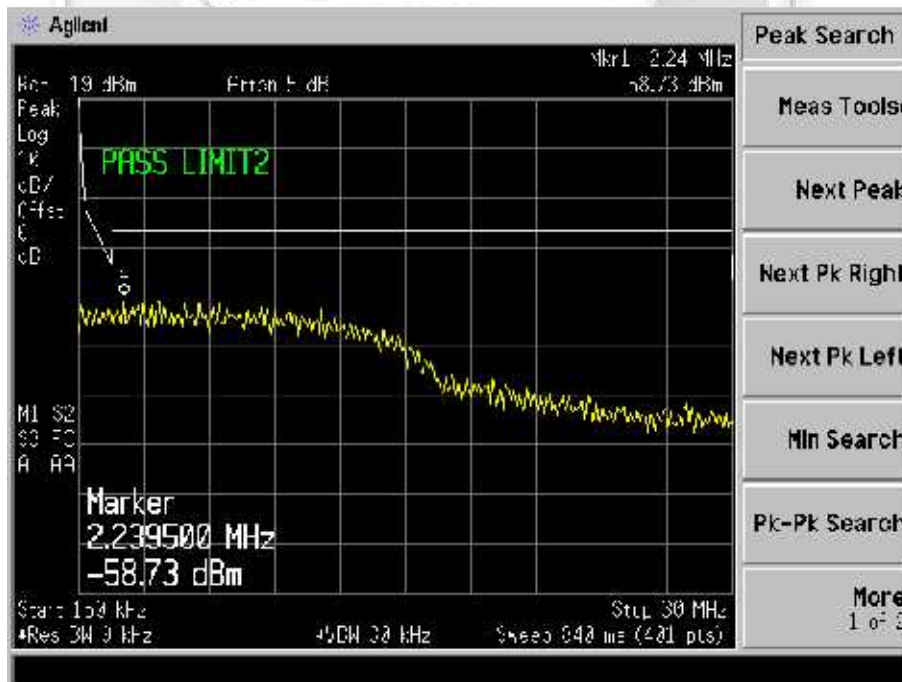


RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



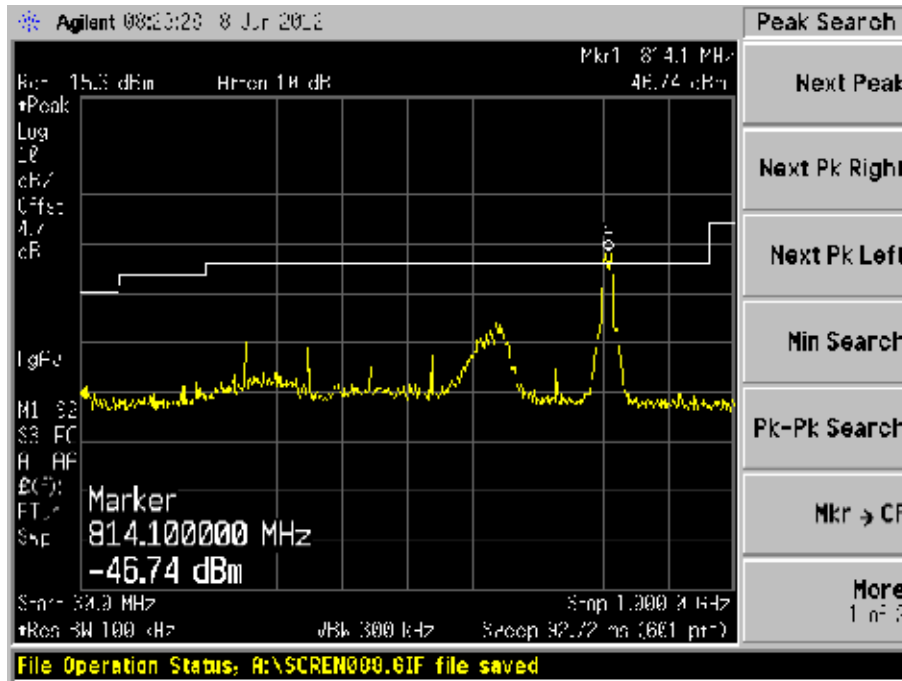
Plot 226 – Channel 6 @ DQPSK 18Mbps



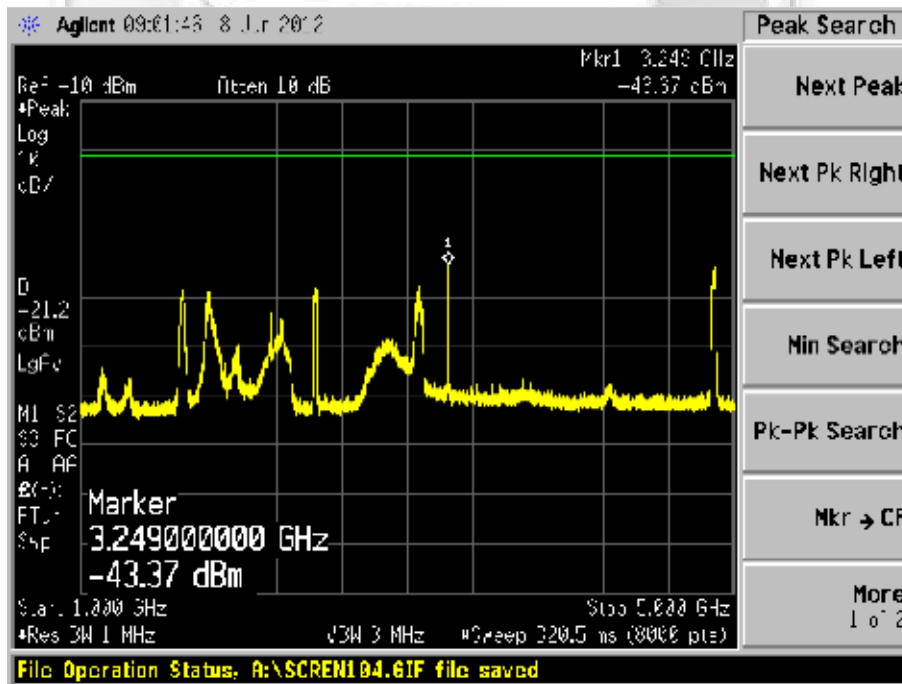
Plot 227 – Channel 6 @ DQPSK 18Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



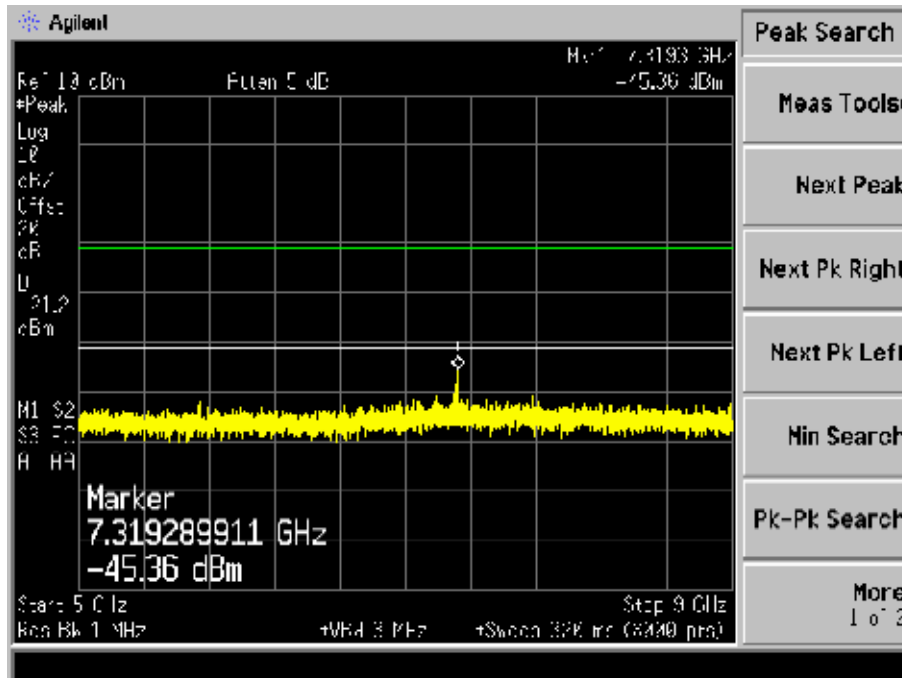
Plot 228 – Channel 6 @ DQPSK 18Mbps



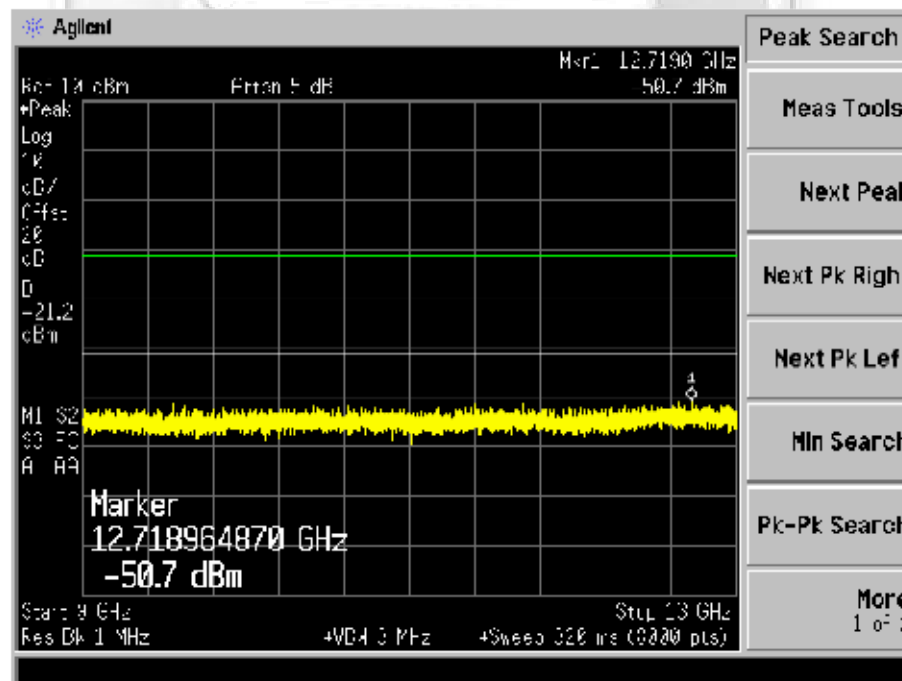
Plot 229 – Channel 6 @ DQPSK 18Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



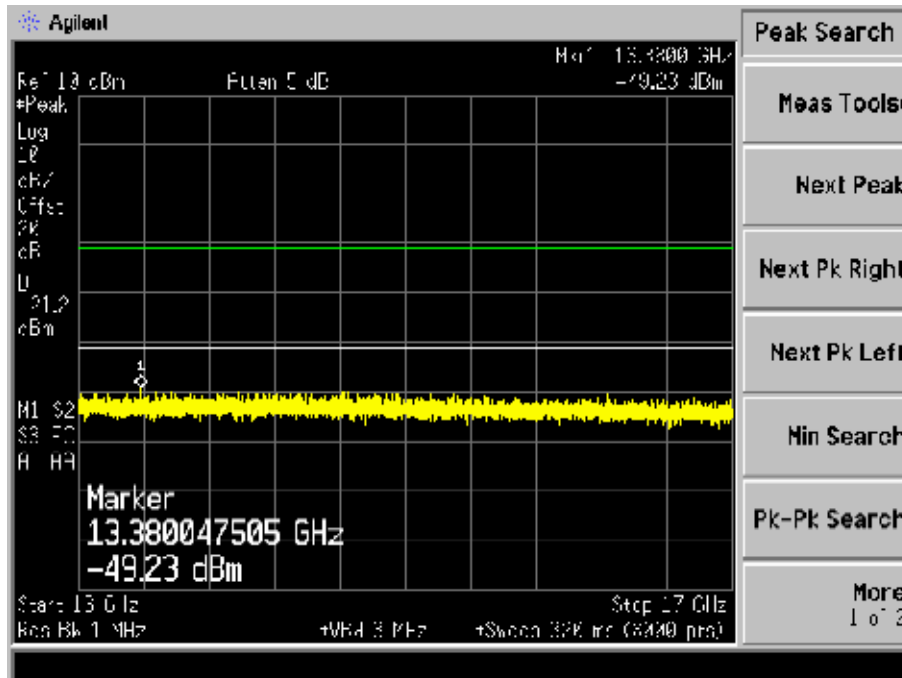
Plot 230 – Channel 6 @ DQPSK 18Mbps



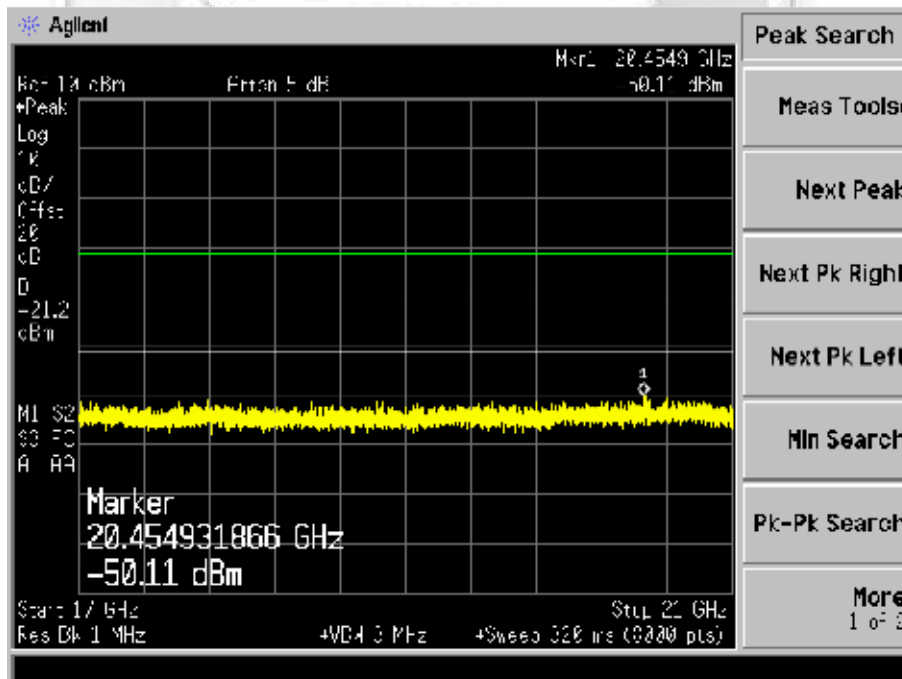
Plot 231 – Channel 6 @ DQPSK 18Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



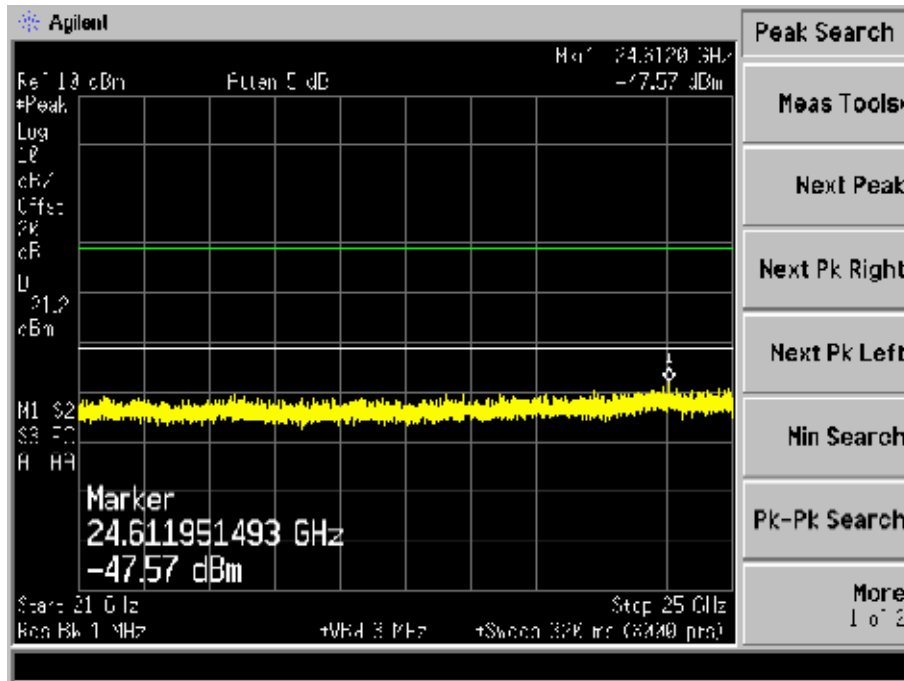
Plot 232 – Channel 6 @ DQPSK 18Mbps



Plot 233 – Channel 6 @ DQPSK 18Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak

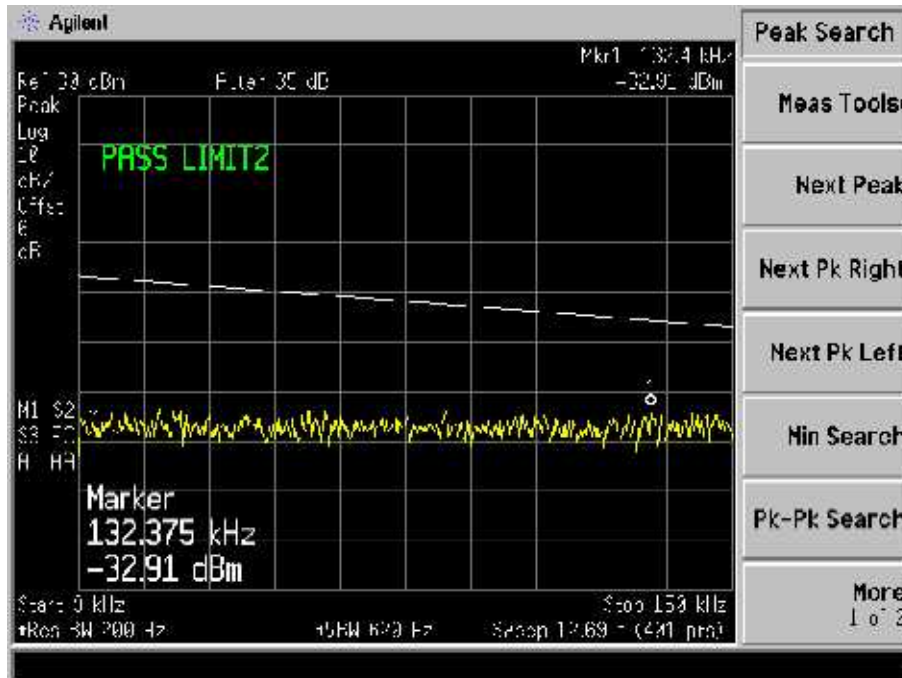


Plot 234 - Channel 6 @ DQPSK 18Mbps

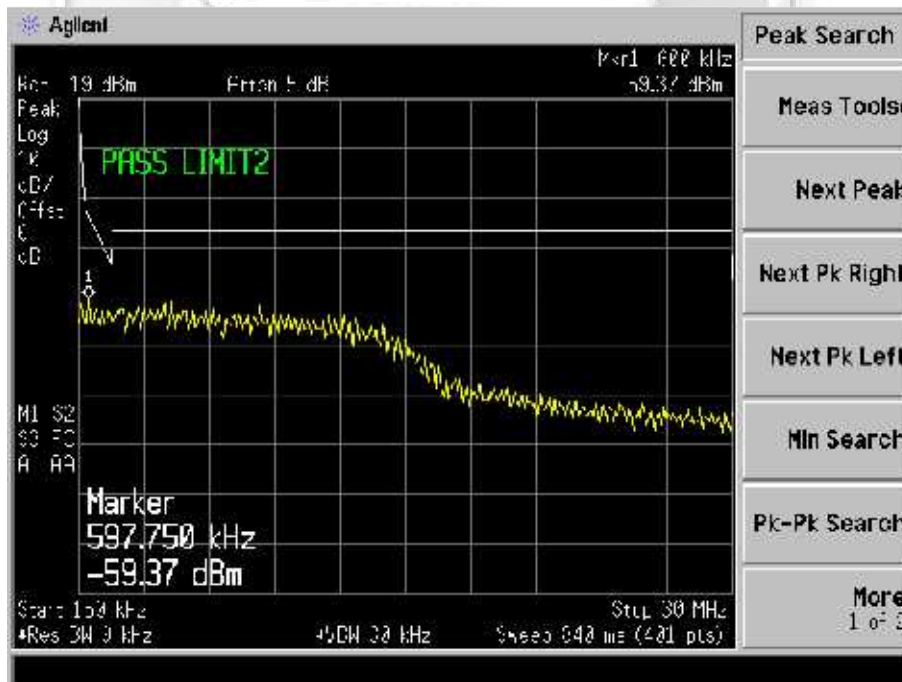


RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



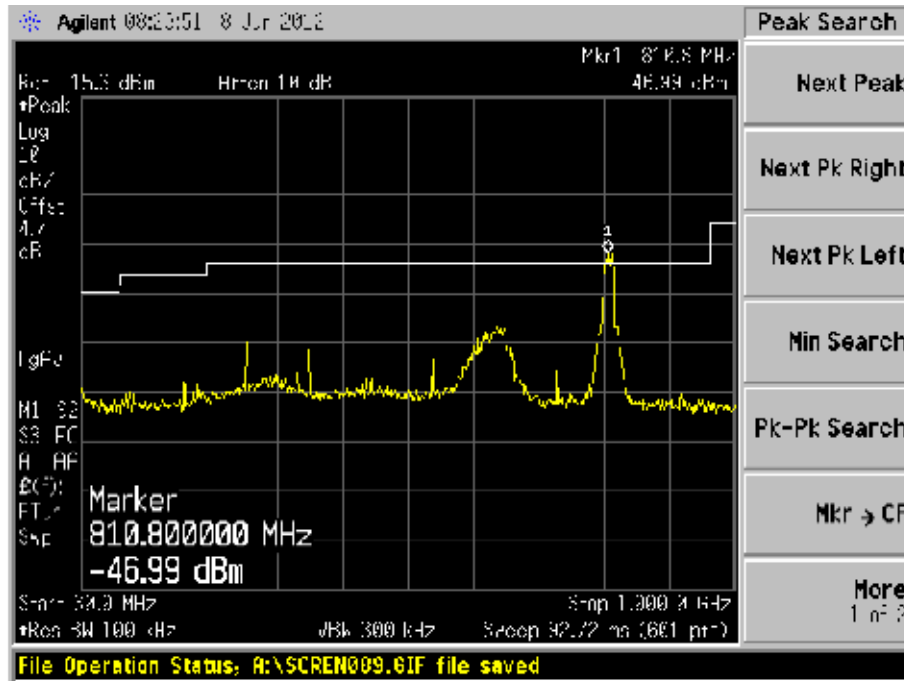
Plot 235 – Channel 6 @ CCK 36Mbps



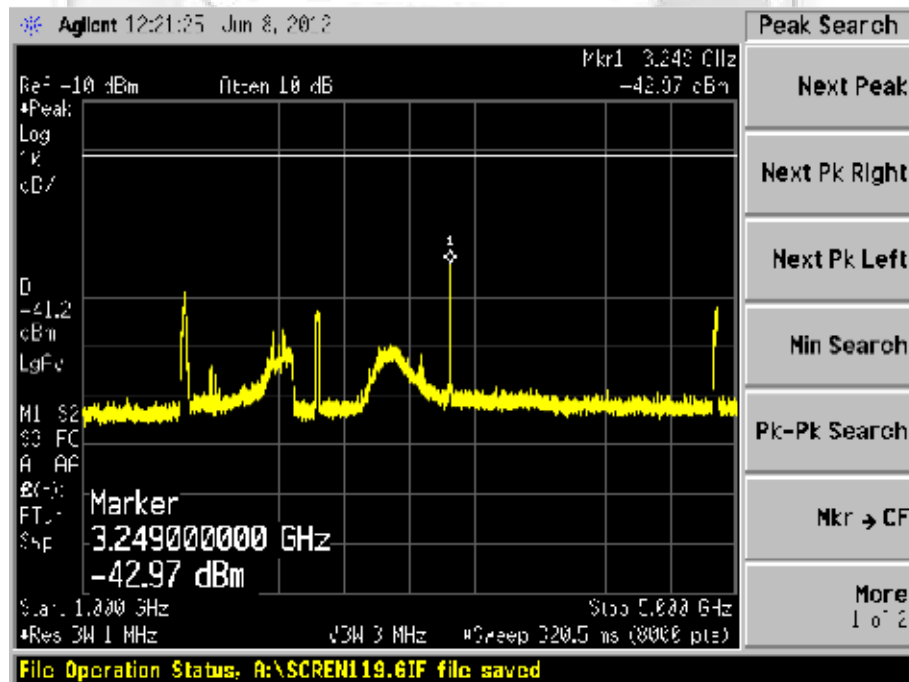
Plot 236 – Channel 6 @ CCK 36Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



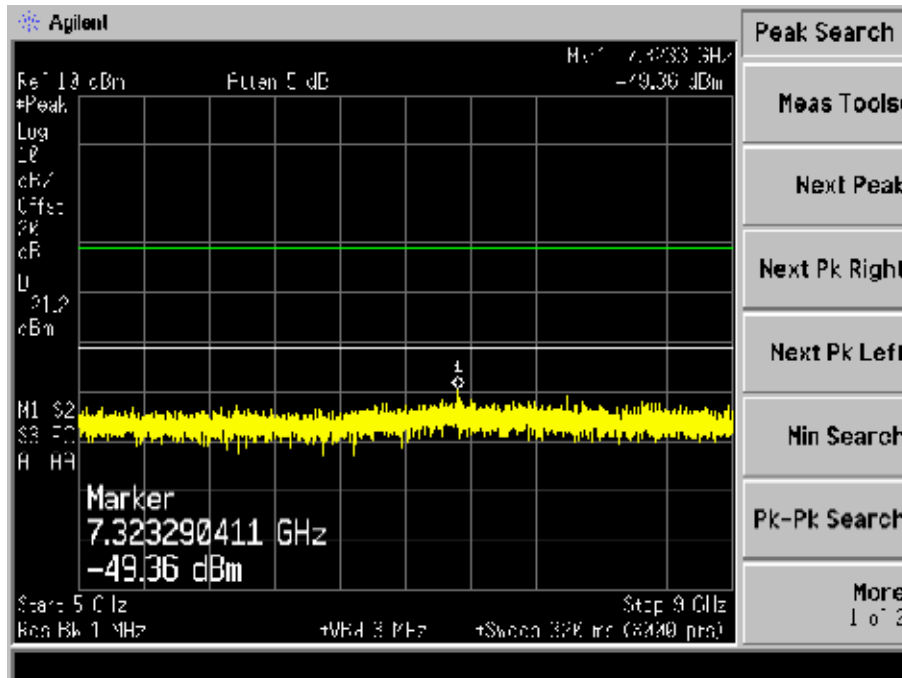
Plot 237 – Channel 6 @ CCK 36Mbps



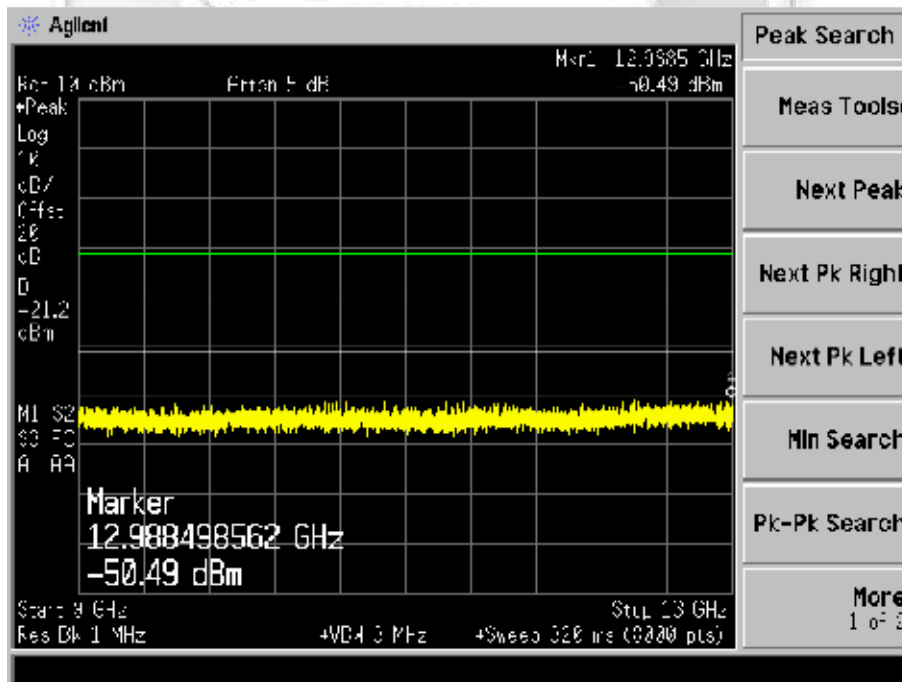
Plot 238 – Channel 6 @ CCK 36Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



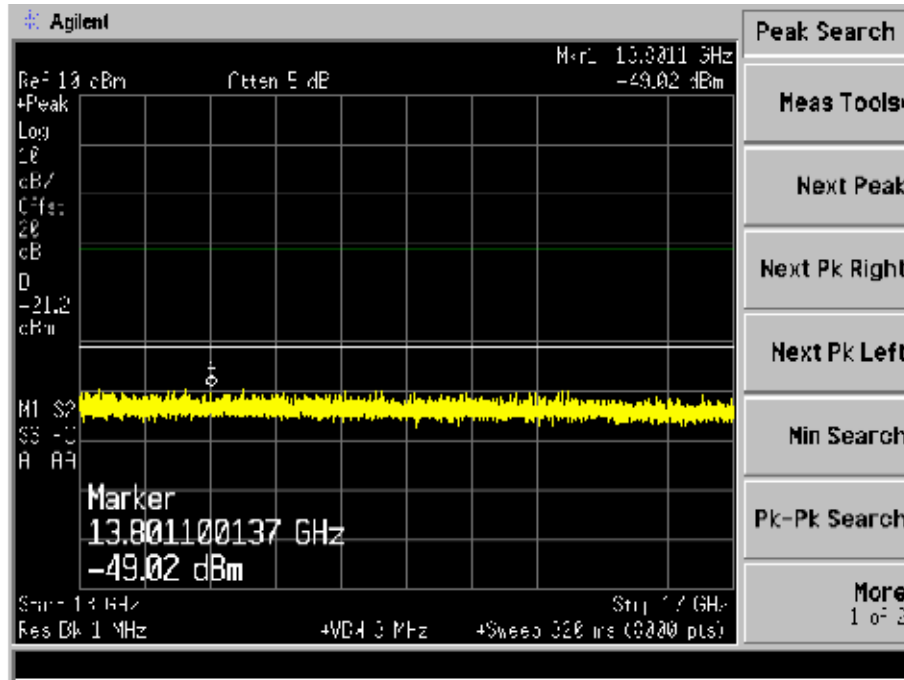
Plot 239 – Channel 6 @ CCK 36Mbps



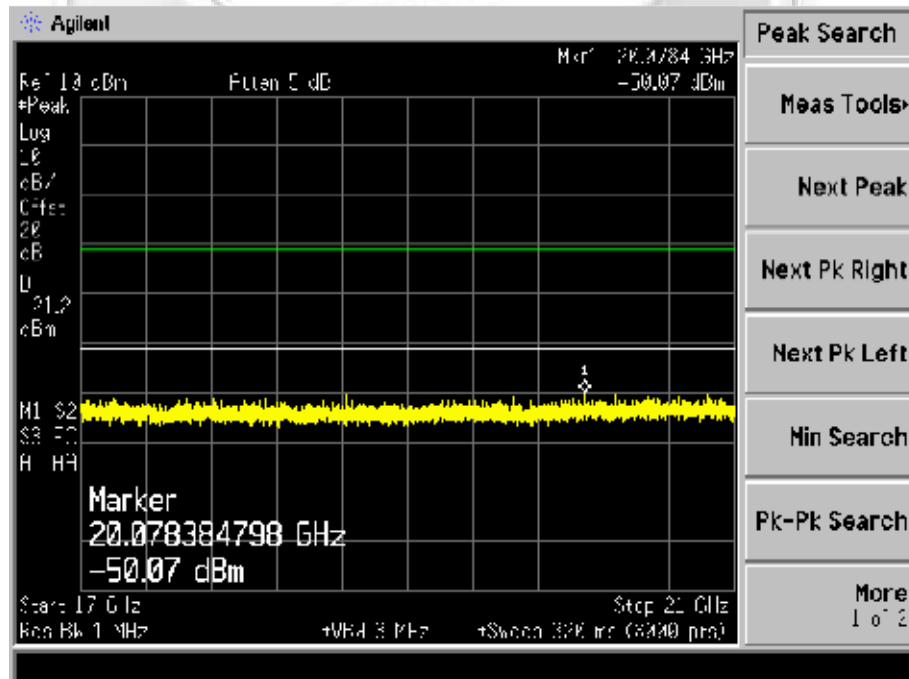
Plot 240 – Channel 6 @ CCK 36Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



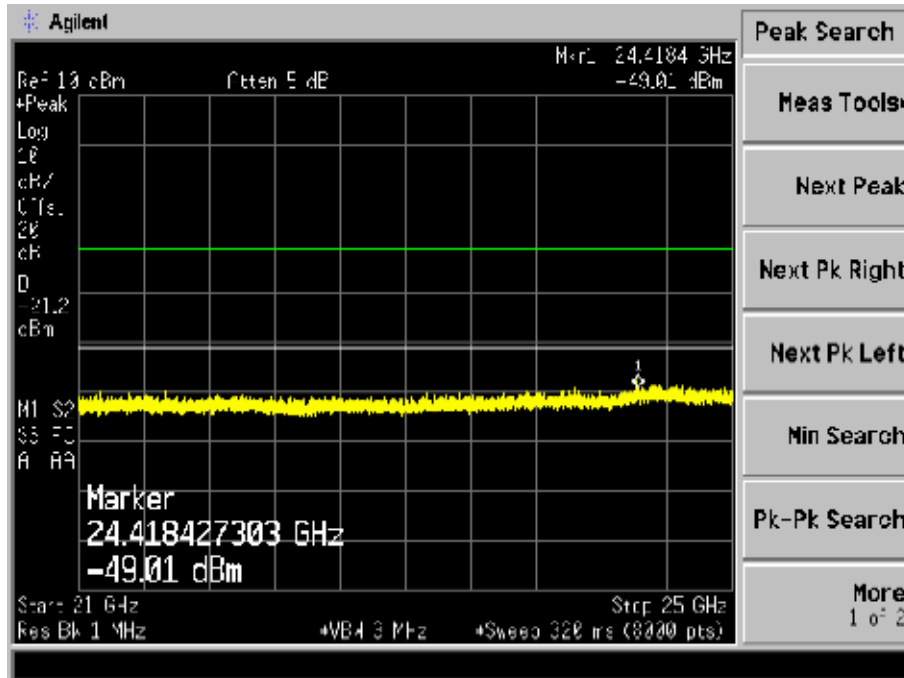
Plot 241 – Channel 6 @ CCK 36Mbps



Plot 242 – Channel 6 @ CCK 36Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak

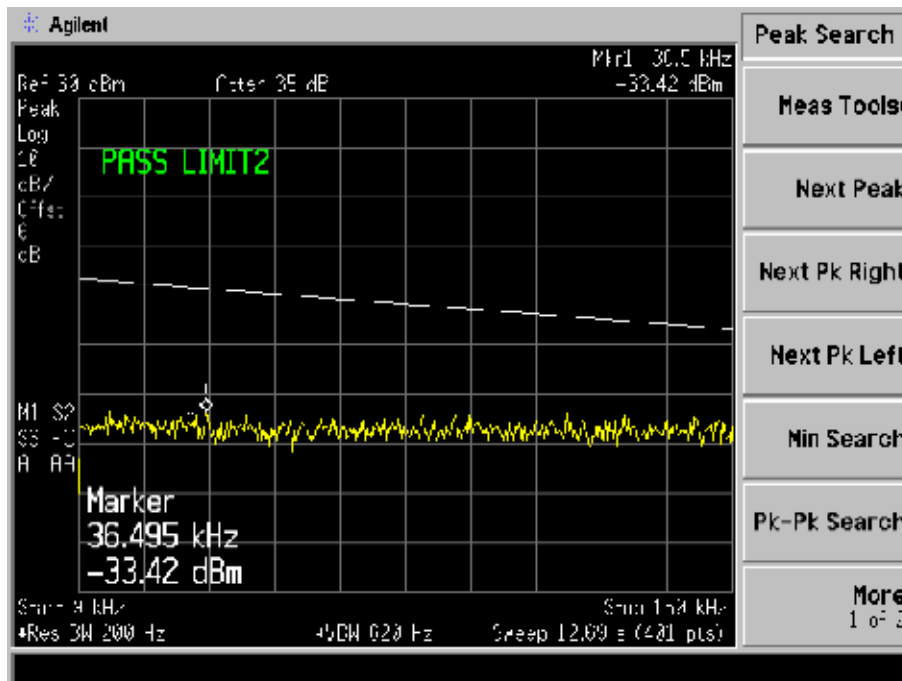


Plot 243 - Channel 6 @ CCK 36Mbps

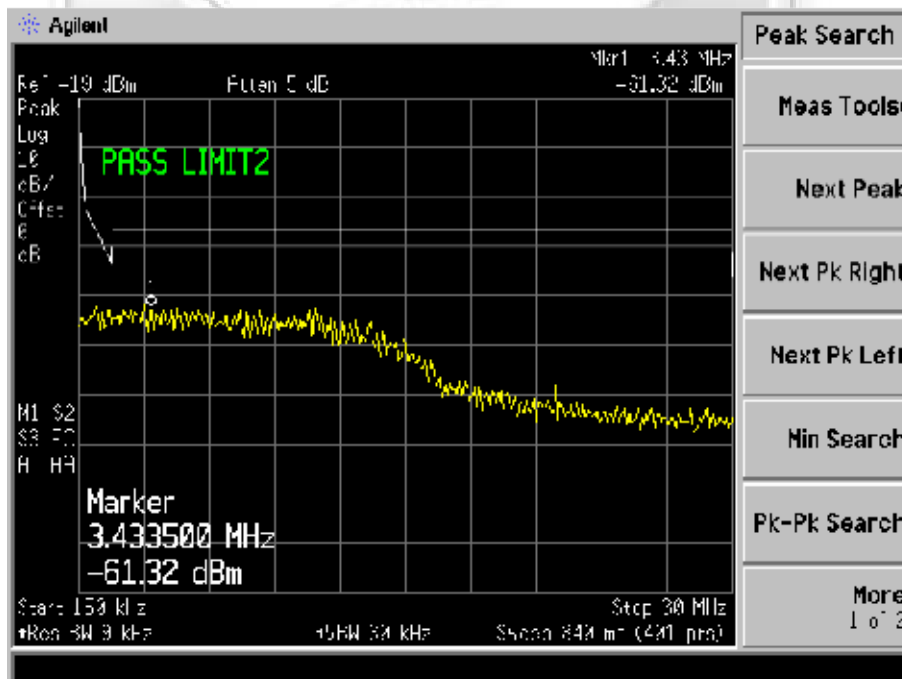


RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



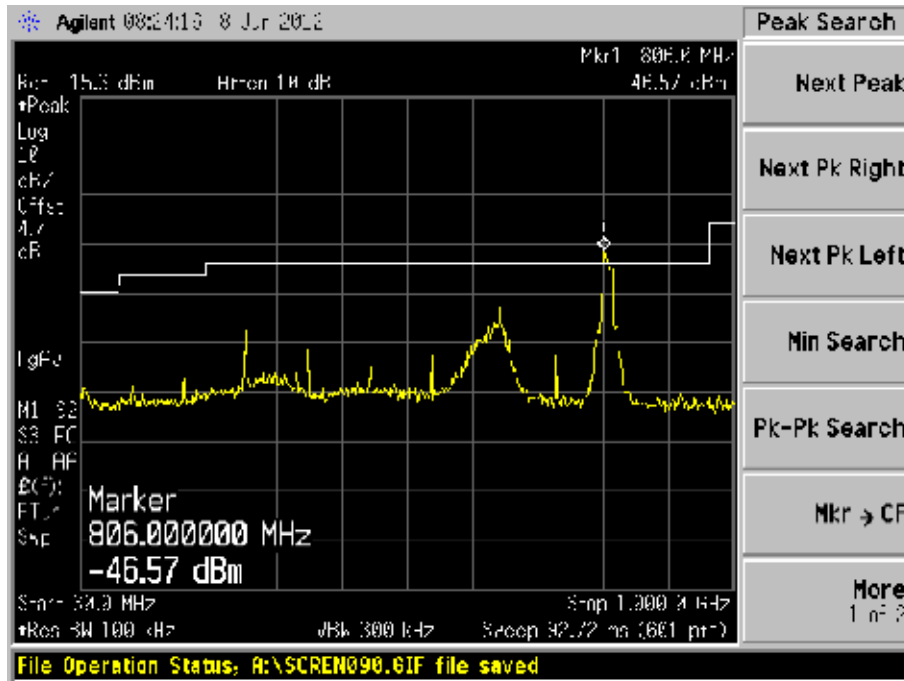
Plot 244 – Channel 6 @ CCK 54Mbps



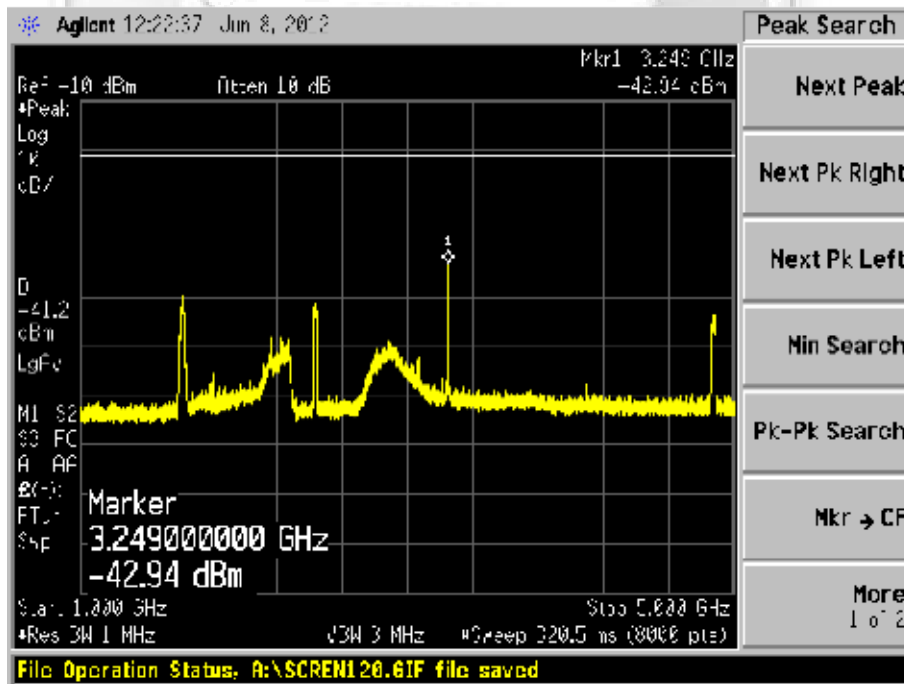
Plot 245 – Channel 6 @ CCK 54Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



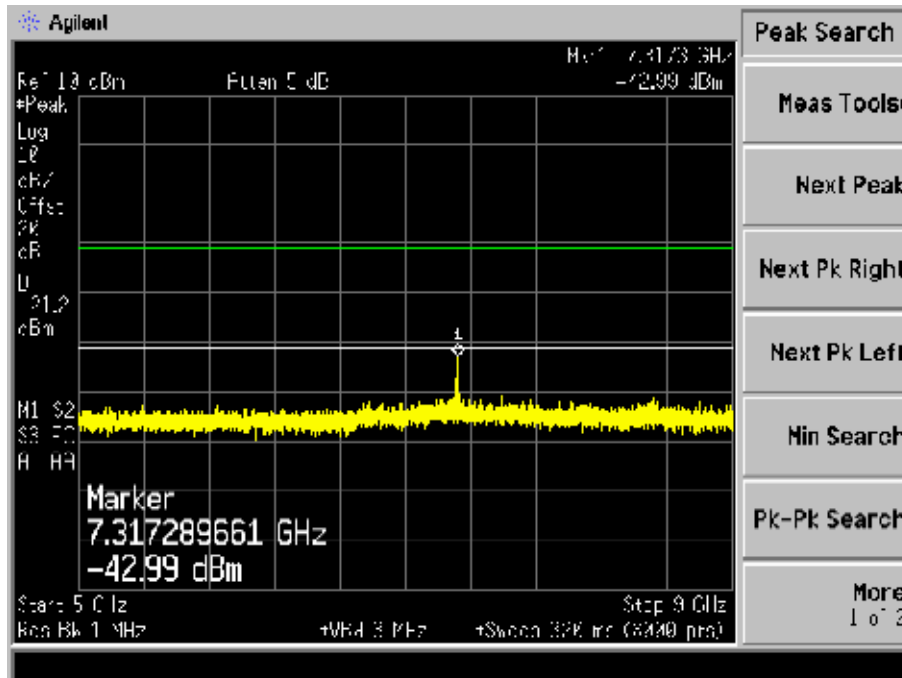
Plot 246 – Channel 6 @ CCK 54Mbps



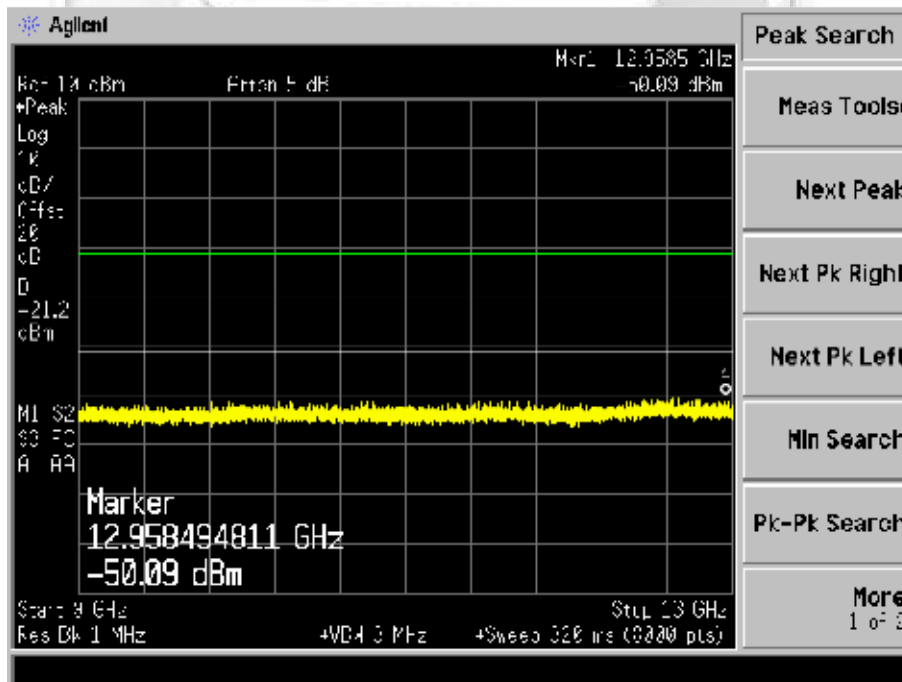
Plot 247 – Channel 6 @ CCK 54Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



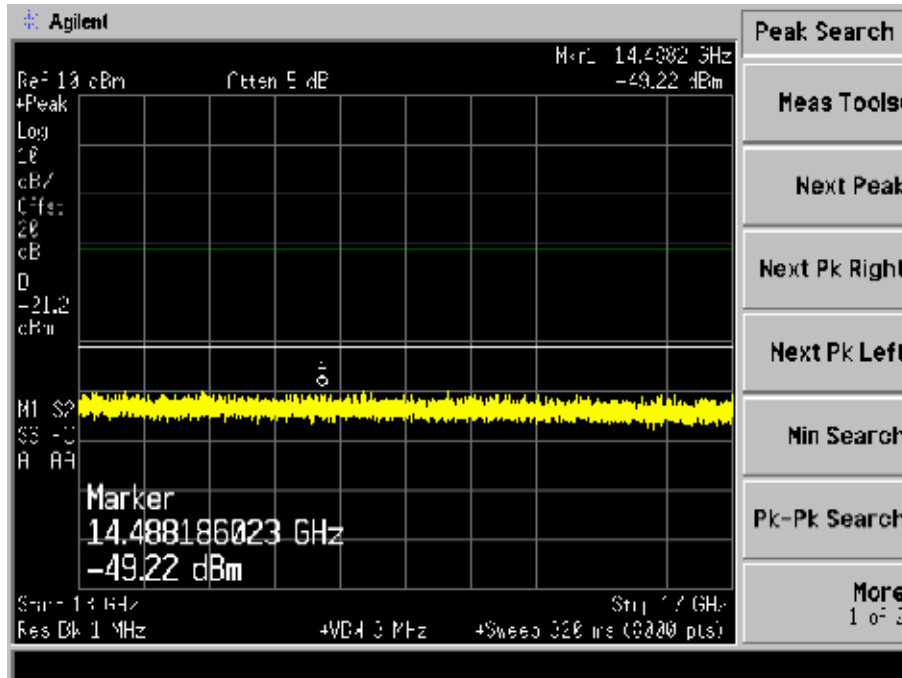
Plot 248 – Channel 6 @ CCK 54Mbps



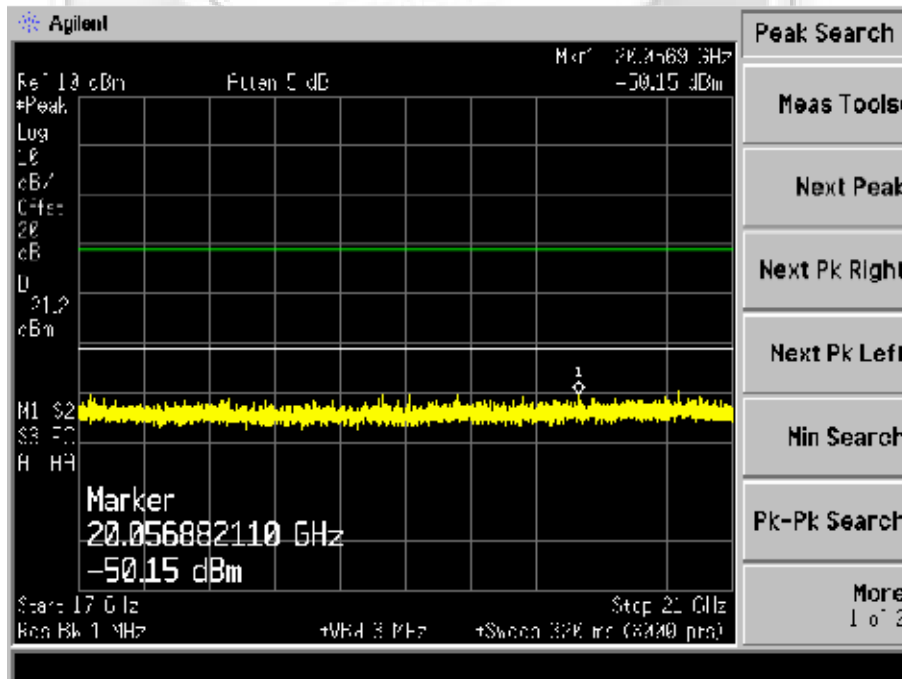
Plot 249 – Channel 6 @ CCK 54Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



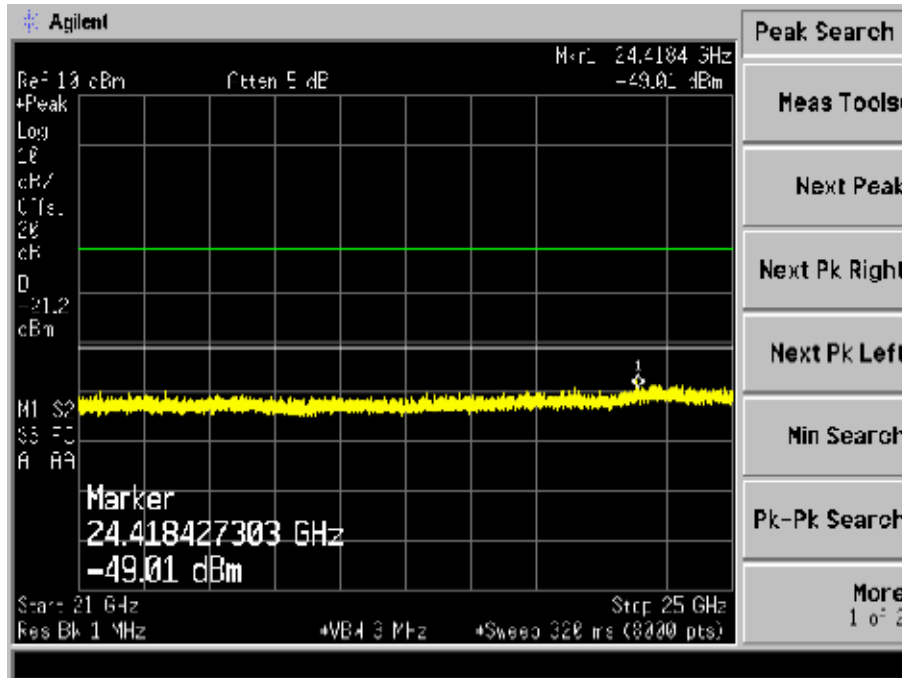
Plot 250 – Channel 6 @ CCK 54Mbps



Plot 251 – Channel 6 @ CCK 54Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak

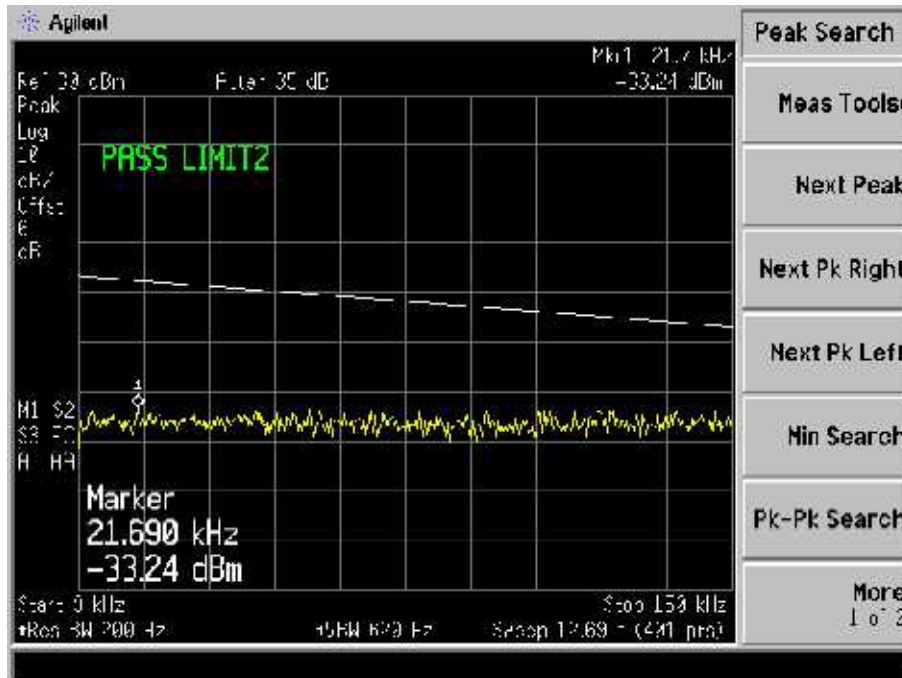


Plot 252 – Channel 6 @ CCK 54Mbps

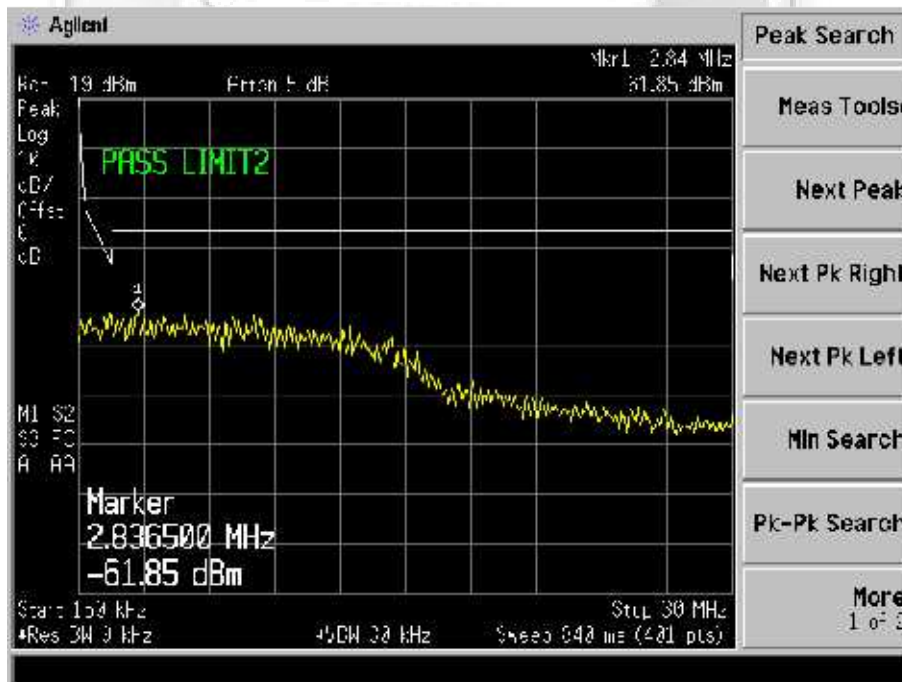


RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



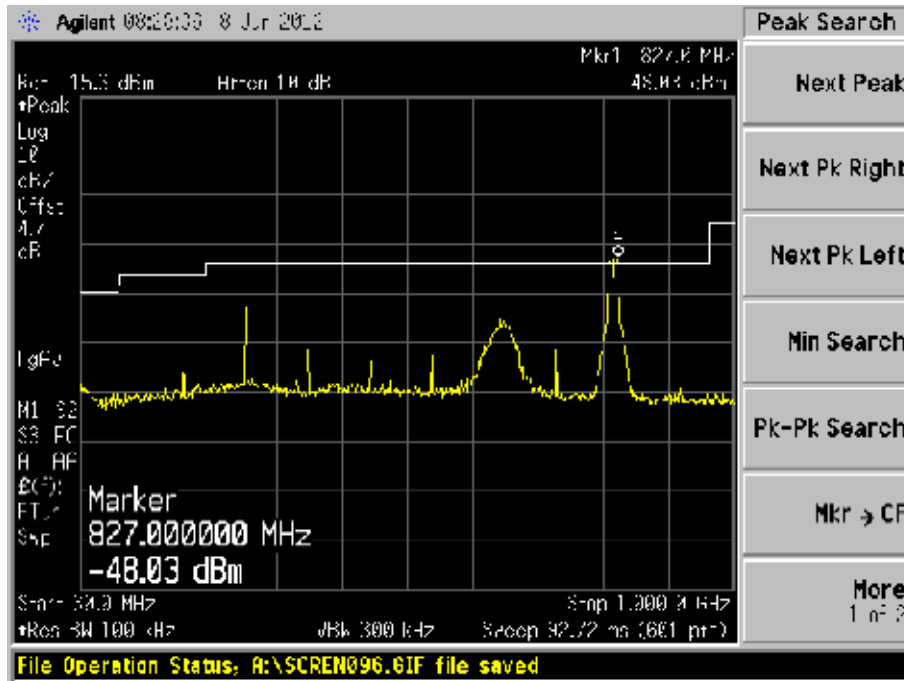
Plot 253 – Channel 11 @ DBPSK 9Mbps



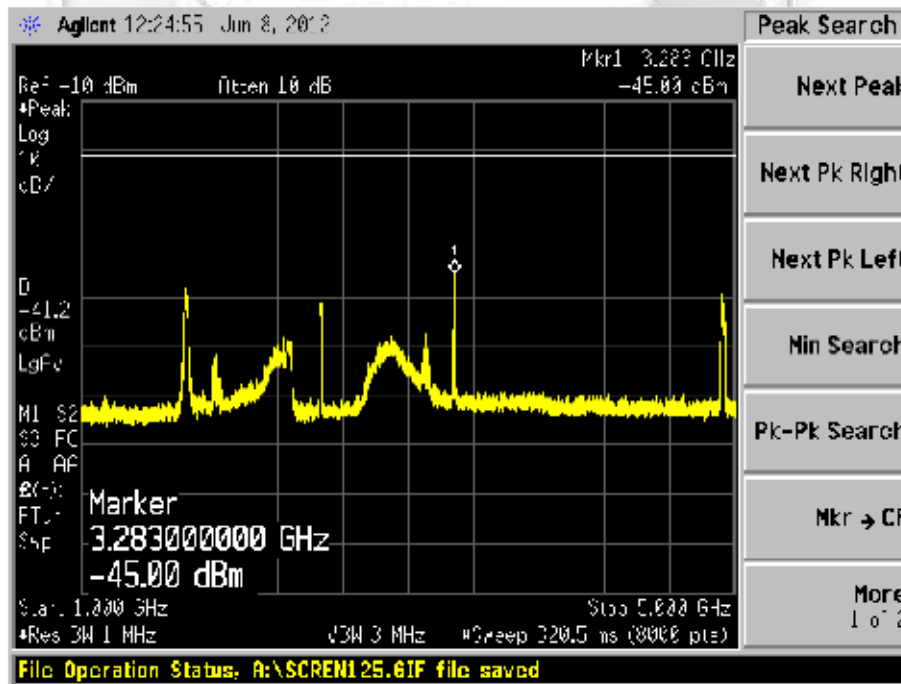
Plot 254 – Channel 11 @ DBPSK 9Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



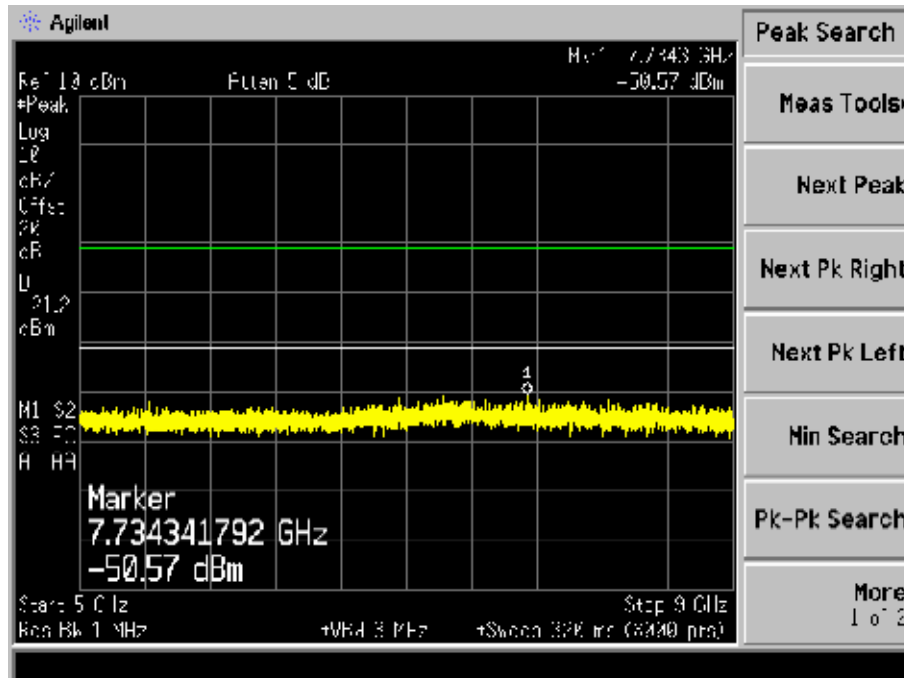
Plot 255 – Channel 11 @ DBPSK 9Mbps



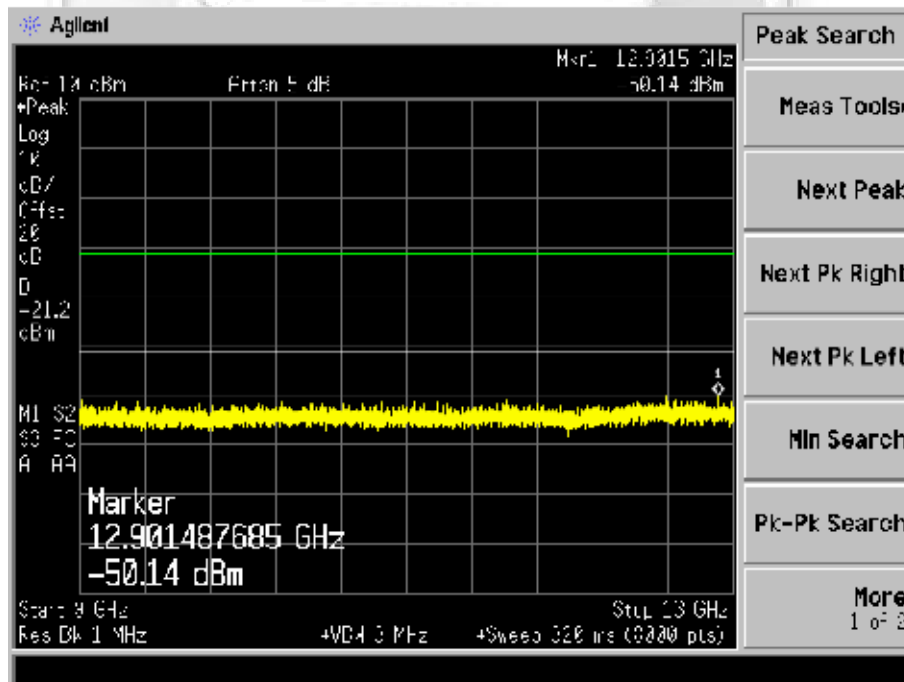
Plot 256 – Channel 11 @ DBPSK 9Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



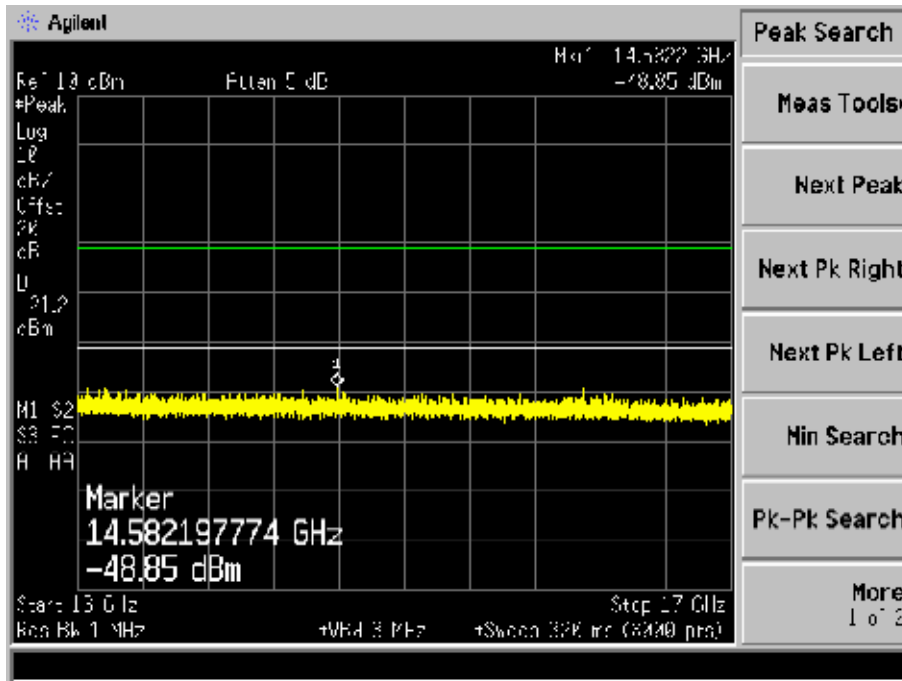
Plot 257 – Channel 11 @ DBPSK 9Mbps



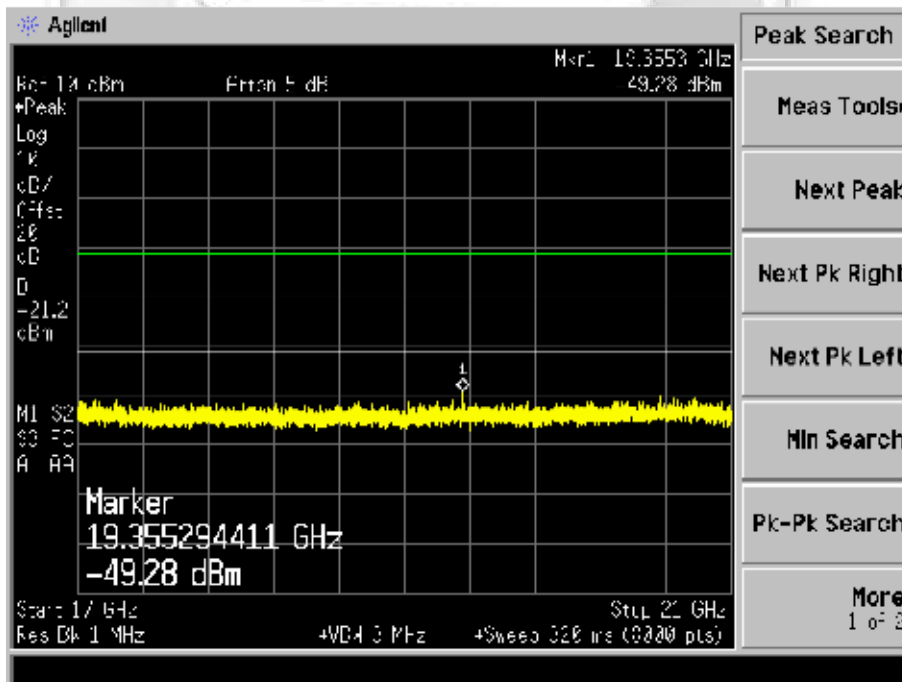
Plot 258 – Channel 11 @ DBPSK 9Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



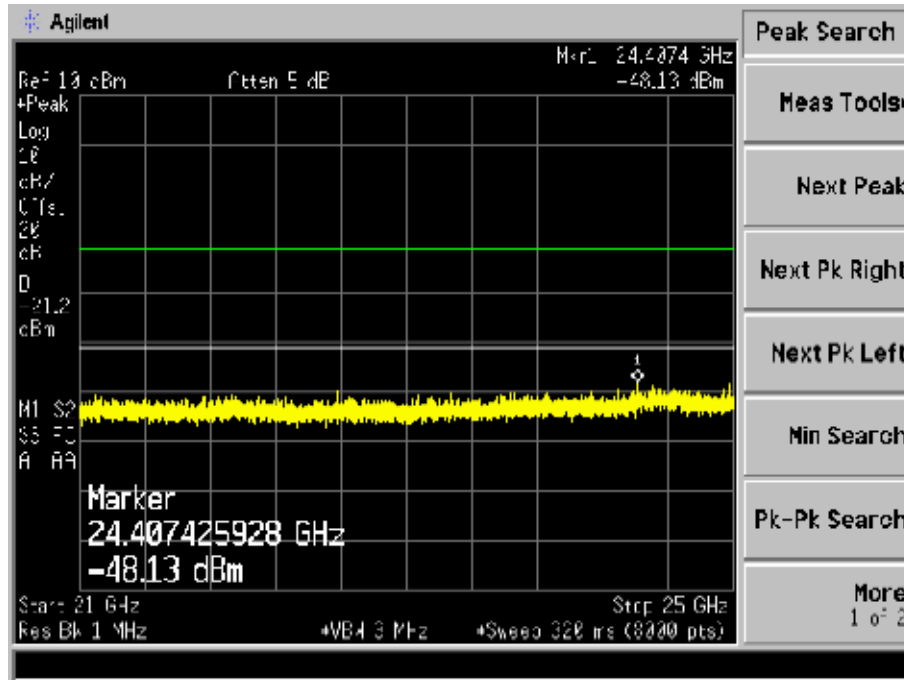
Plot 259 – Channel 11 @ DBPSK 9Mbps



Plot 260 – Channel 11 @ DBPSK 9Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak

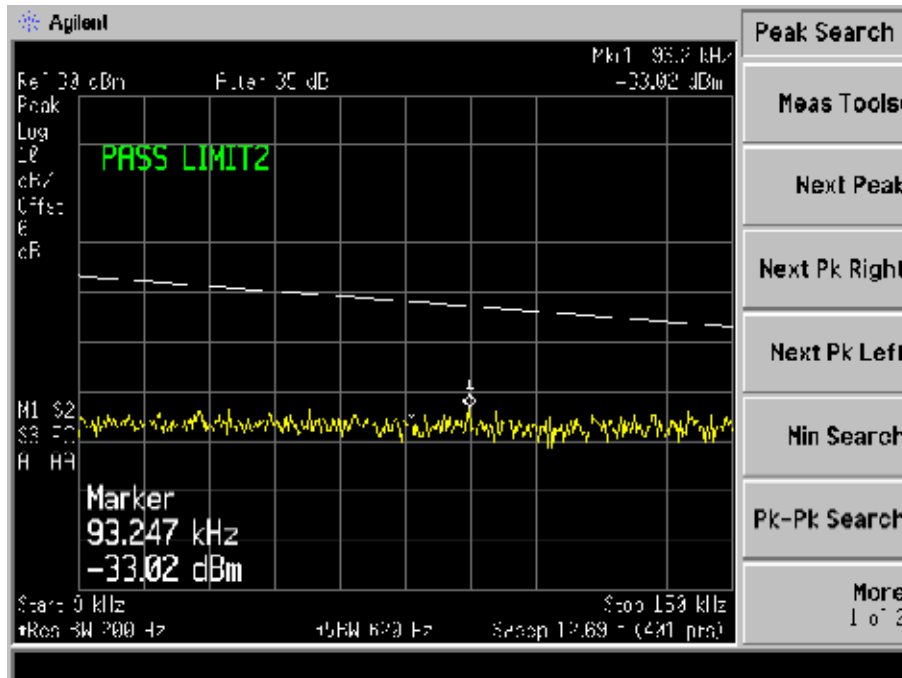


Plot 261 – Channel 11 @ DBPSK 9Mbps

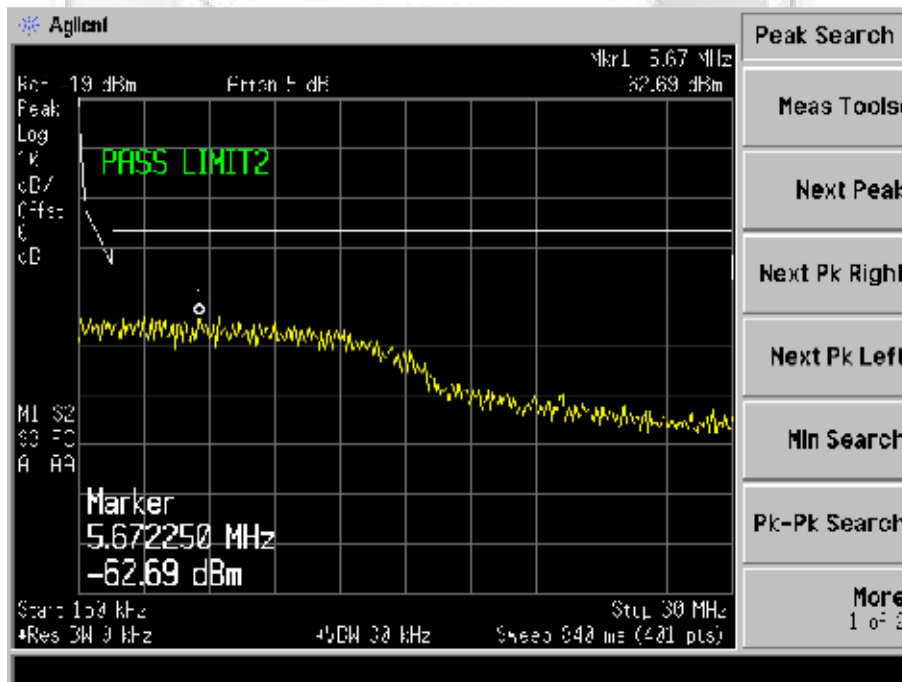


RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



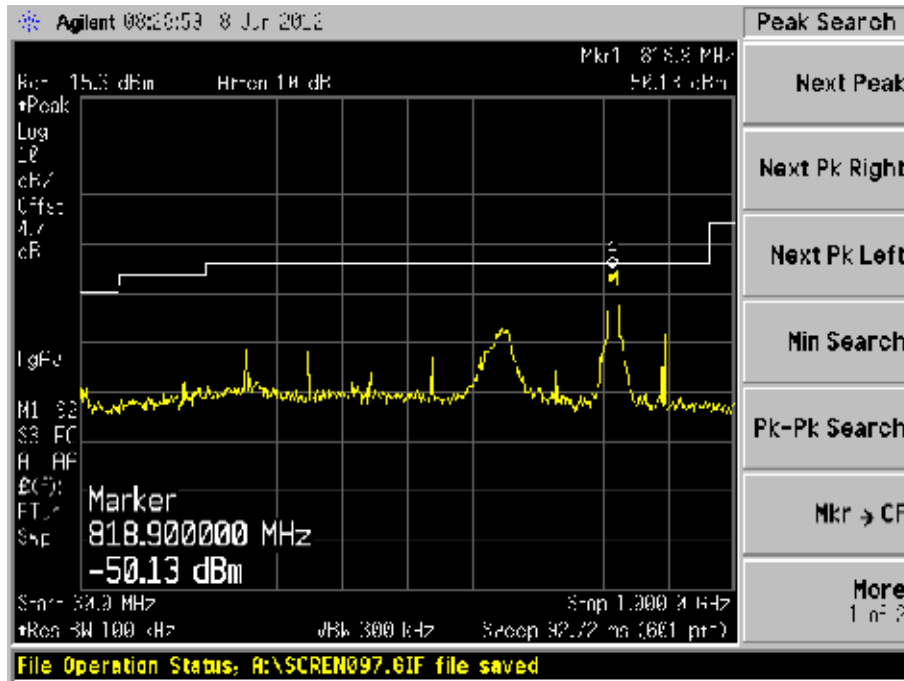
Plot 262 – Channel 11 @ DQPSK 18Mbps



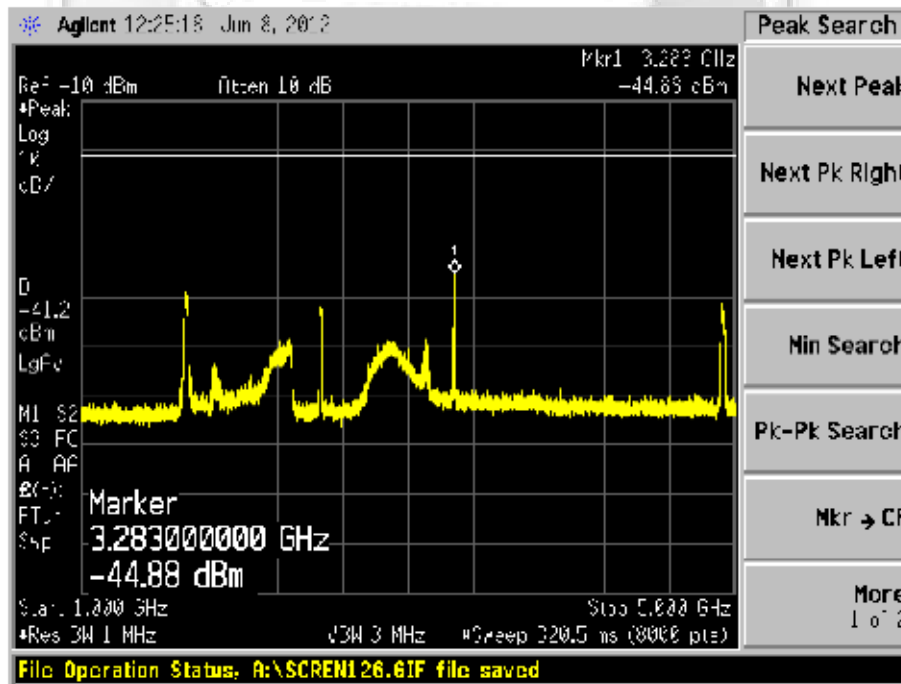
Plot 263 – Channel 11 @ DQPSK 18Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



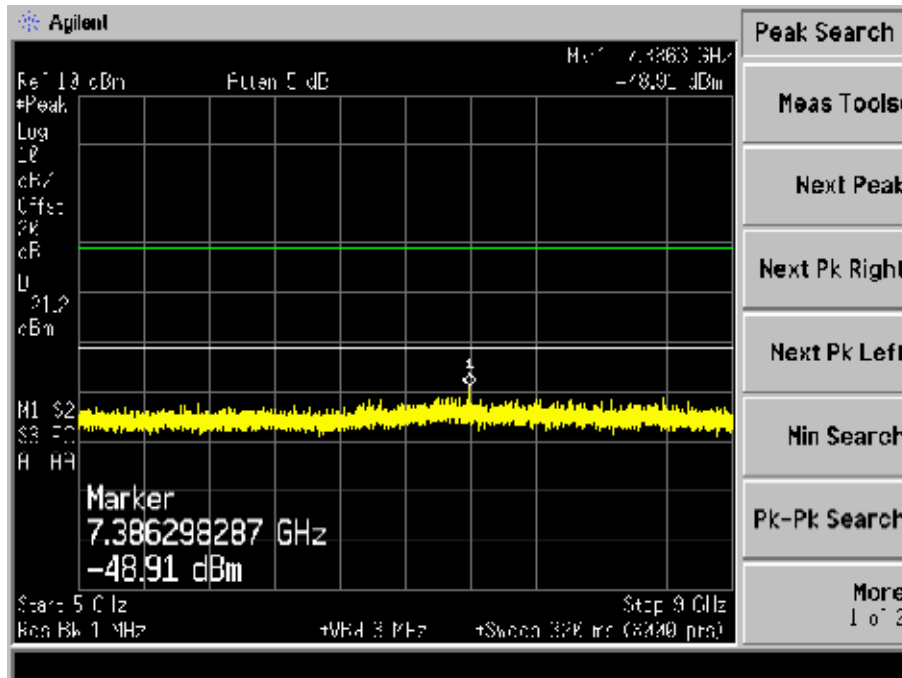
Plot 264 – Channel 11 @DBPSK 18Mbps



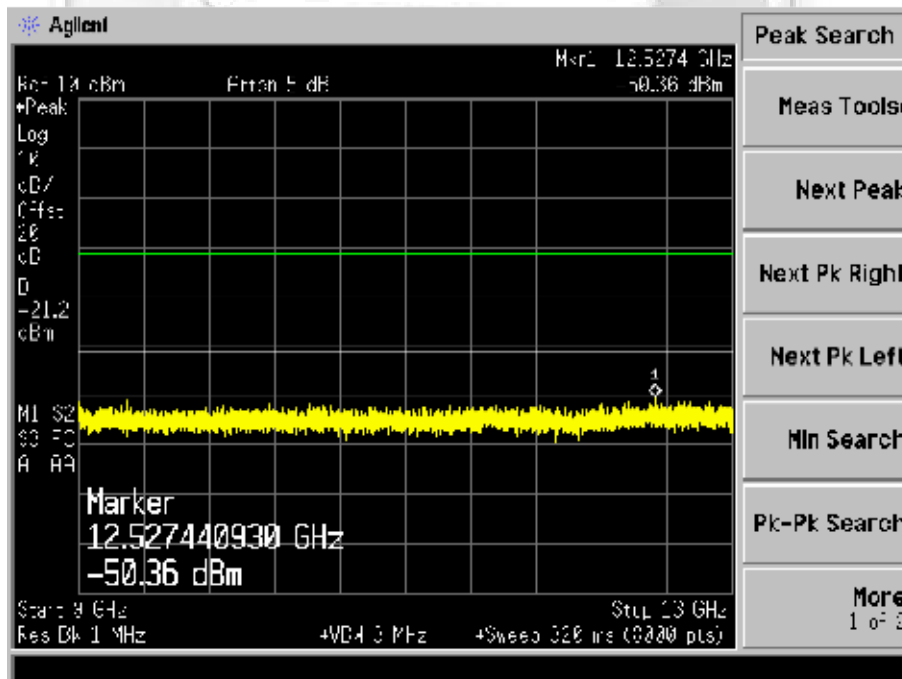
Plot 265 – Channel 11 @DBPSK 18Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



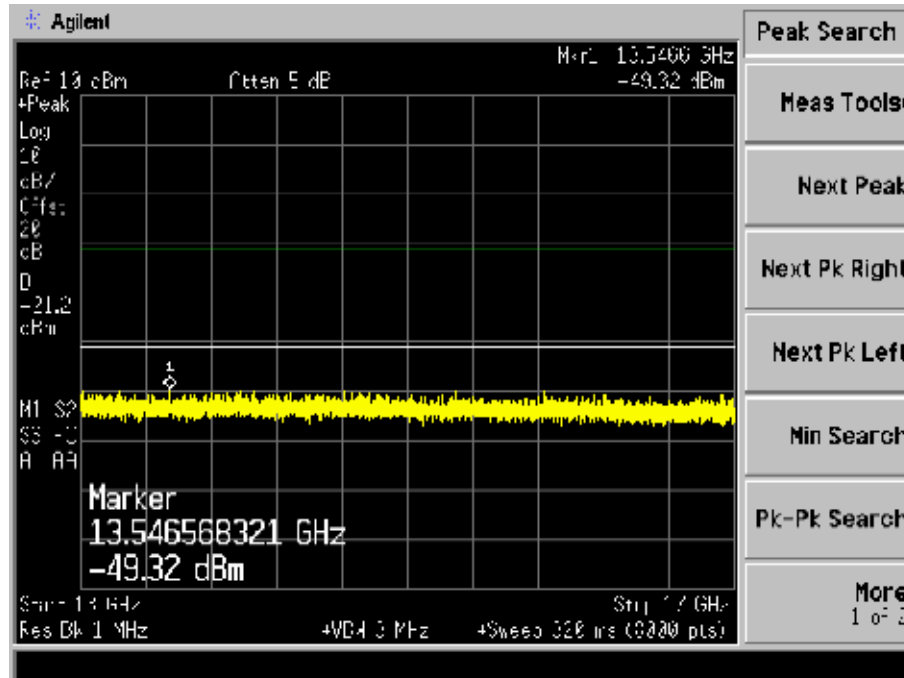
Plot 266 – Channel 11 @ DQPSK 18Mbps



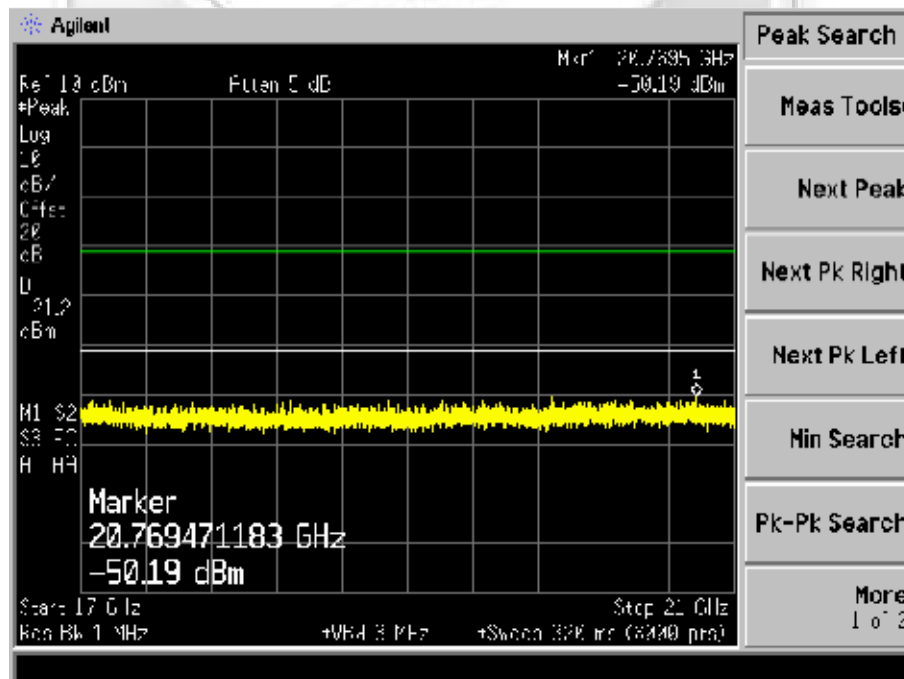
Plot 267 – Channel 11 @ DQPSK 18Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



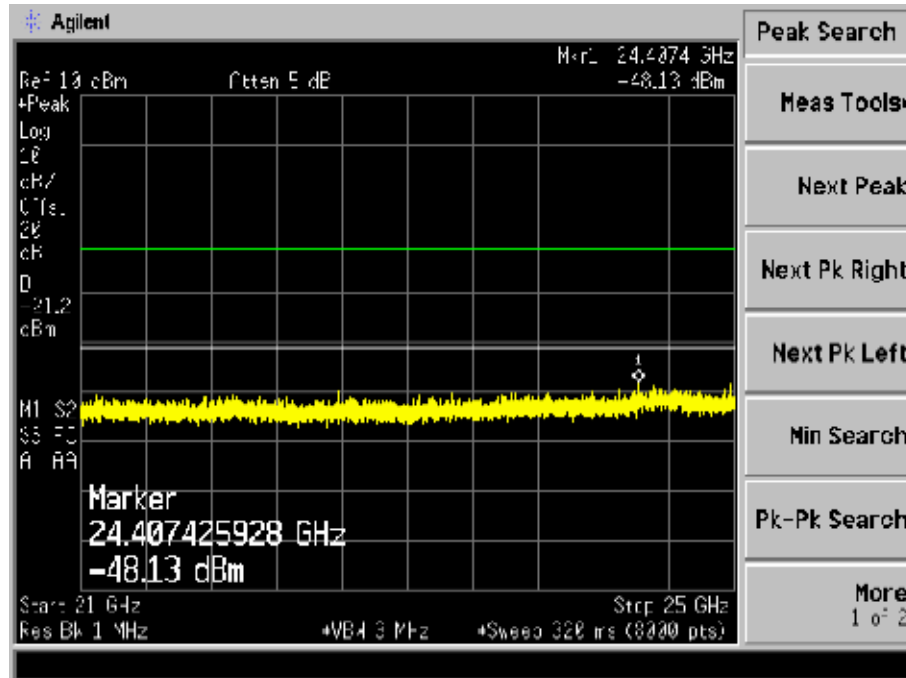
Plot 268 – Channel 11 @ DQPSK 18Mbps



Plot 269 – Channel 11 @ DQPSK 18Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak

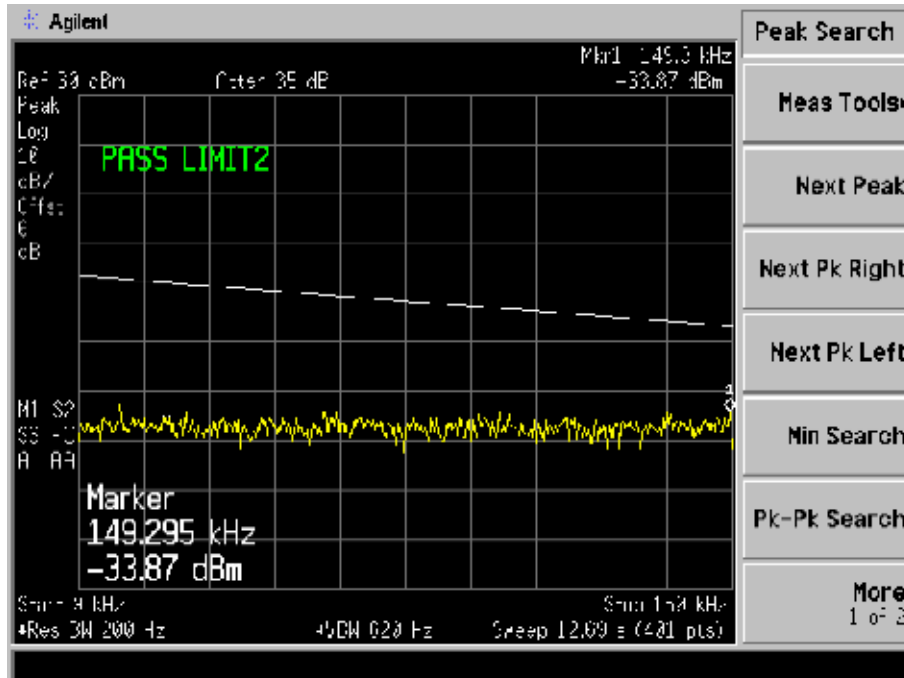


Plot 270 – Channel 11 @ DQPSK 18Mbps

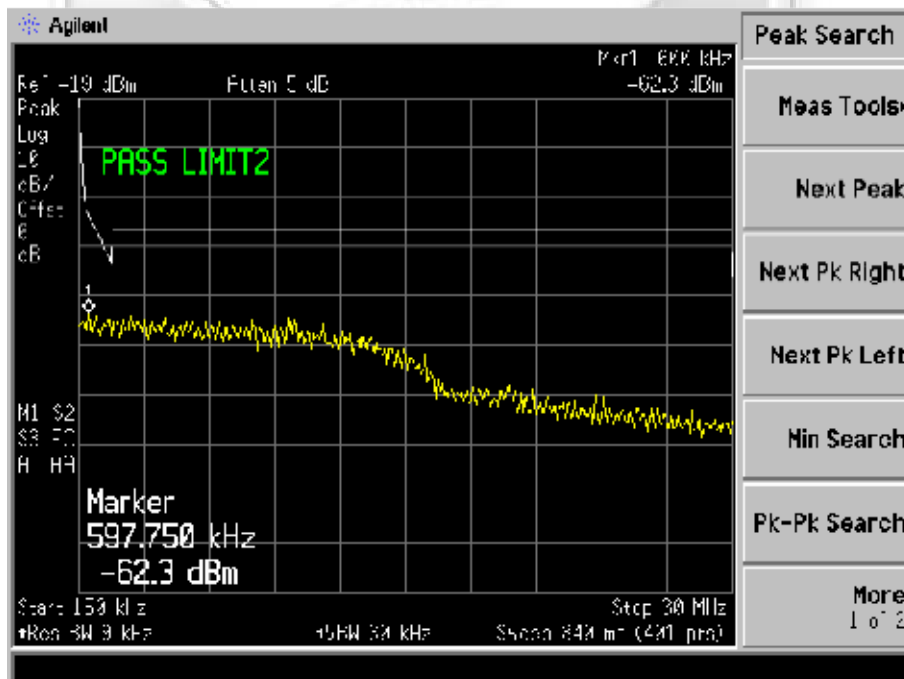


RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



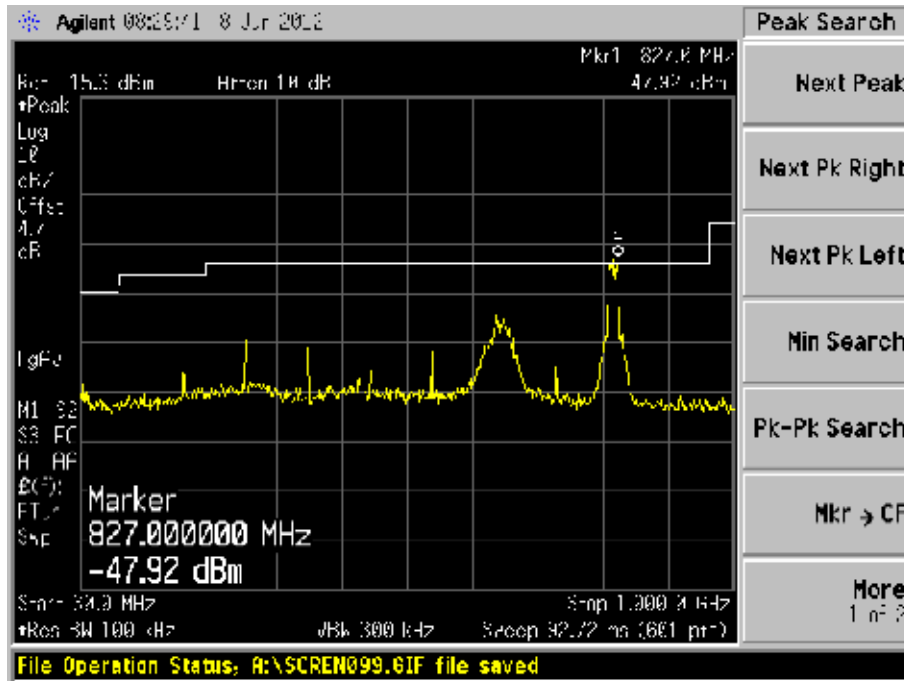
Plot 271 – Channel 11 @ CCK 36Mbps



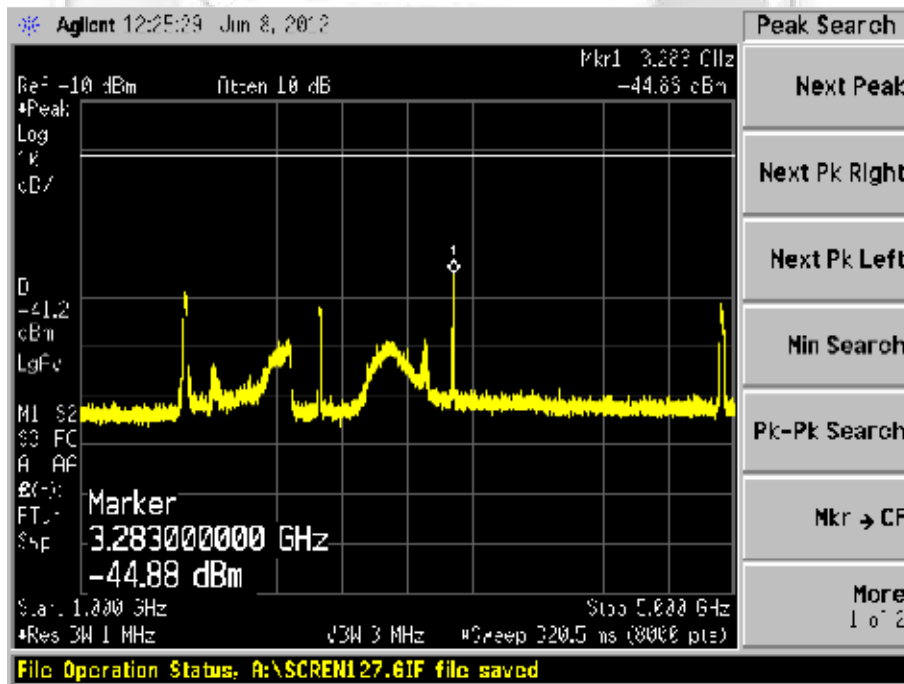
Plot 272 – Channel 11 @ CCK 36Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



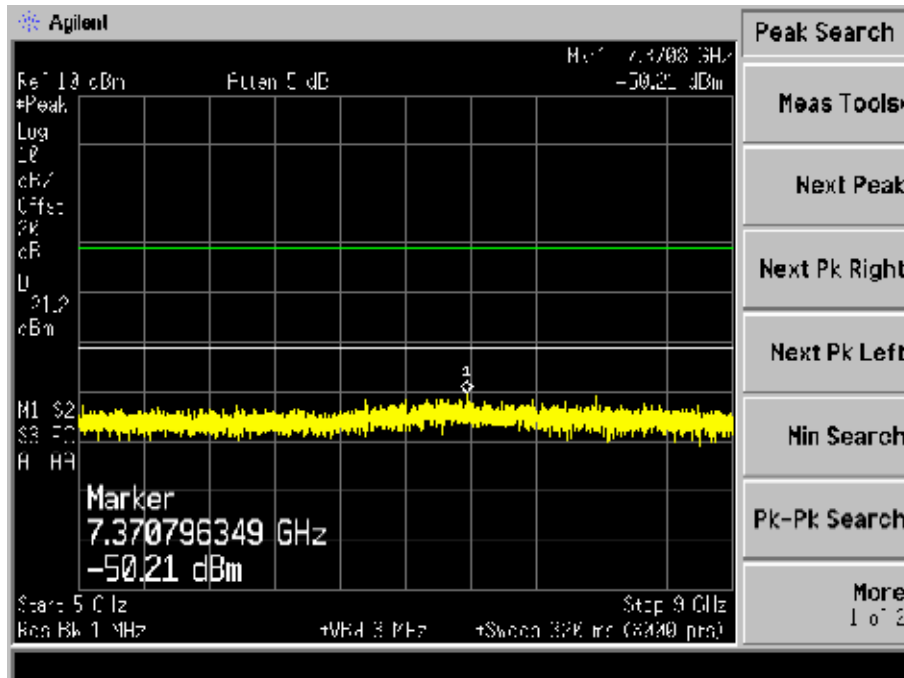
Plot 273 – Channel 11 @ CCK 36Mbps



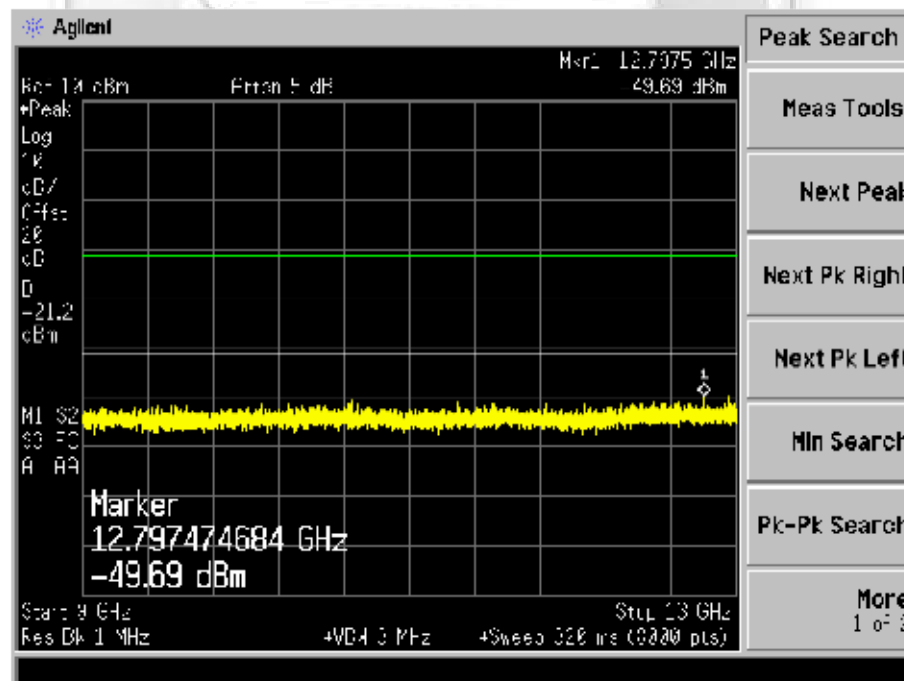
Plot 274 – Channel 11 @ CCK 36Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



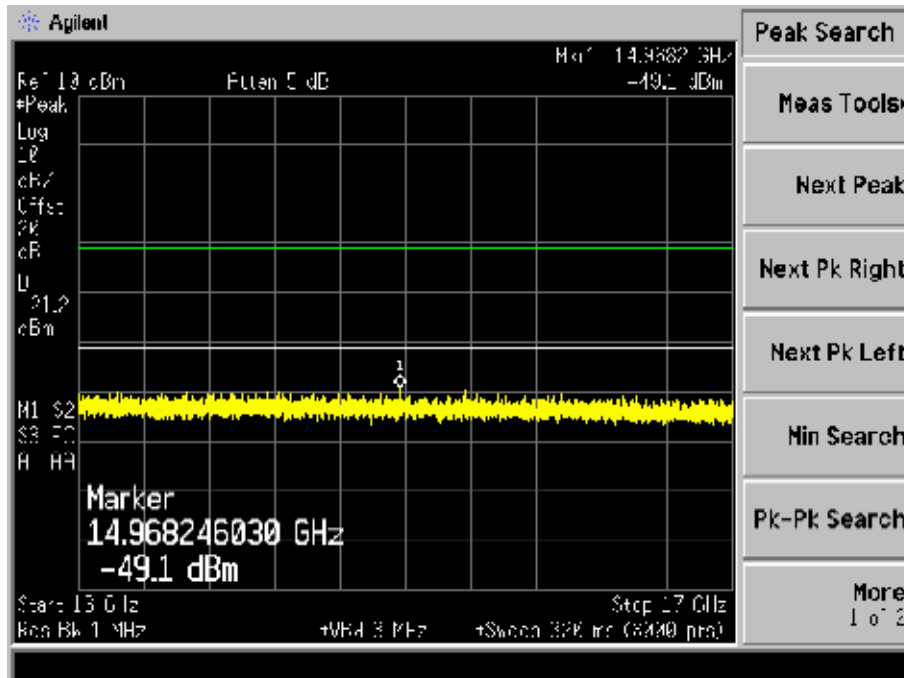
Plot 275 – Channel 11 @ CCK 36Mbps



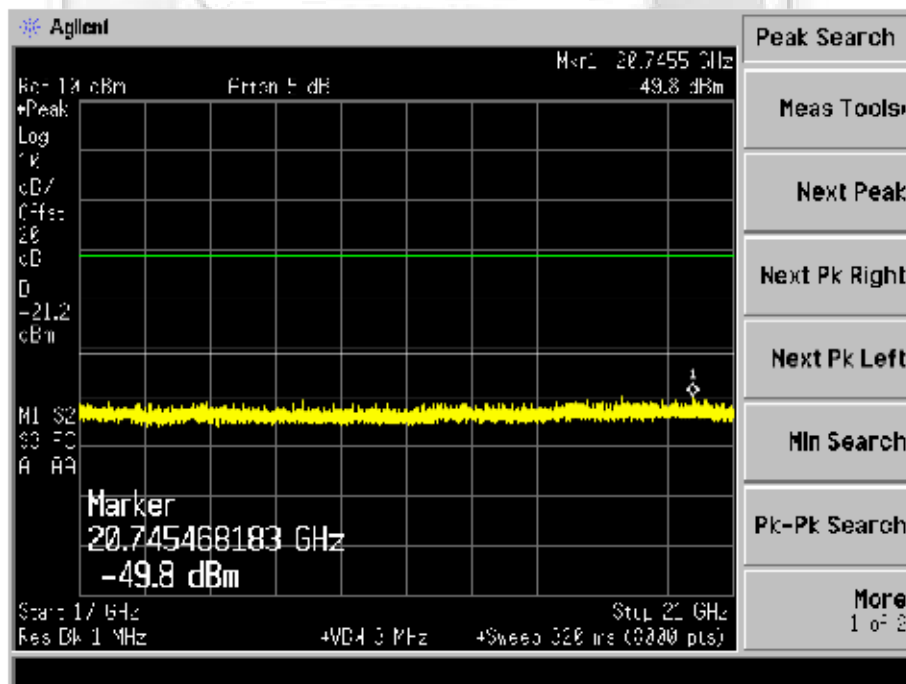
Plot 276 – Channel 11 @ CCK 36Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



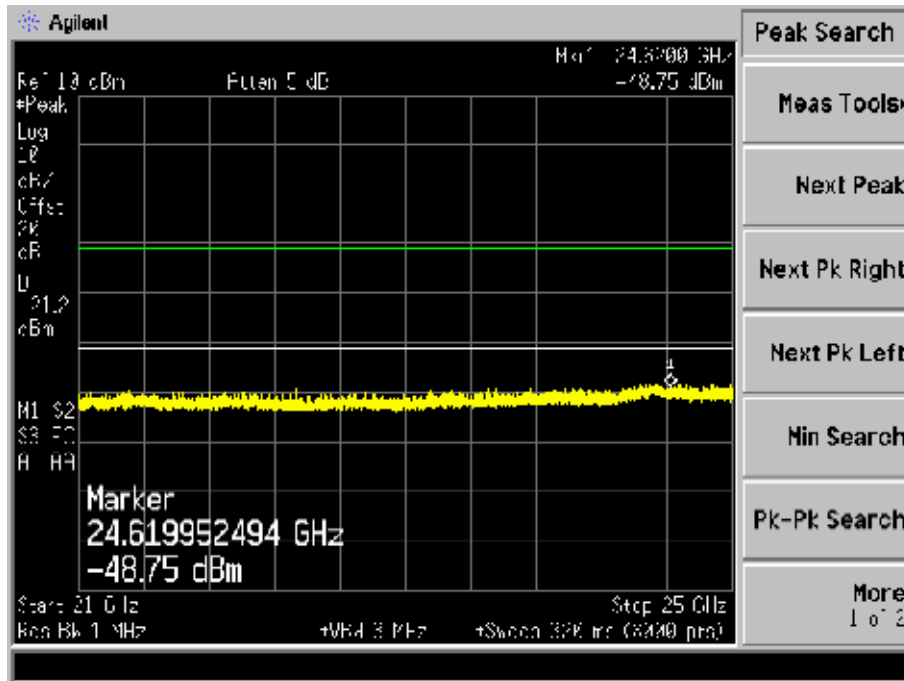
Plot 277 – Channel 11 @ CCK 36Mbps



Plot 278 – Channel 11 @ CCK 36Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



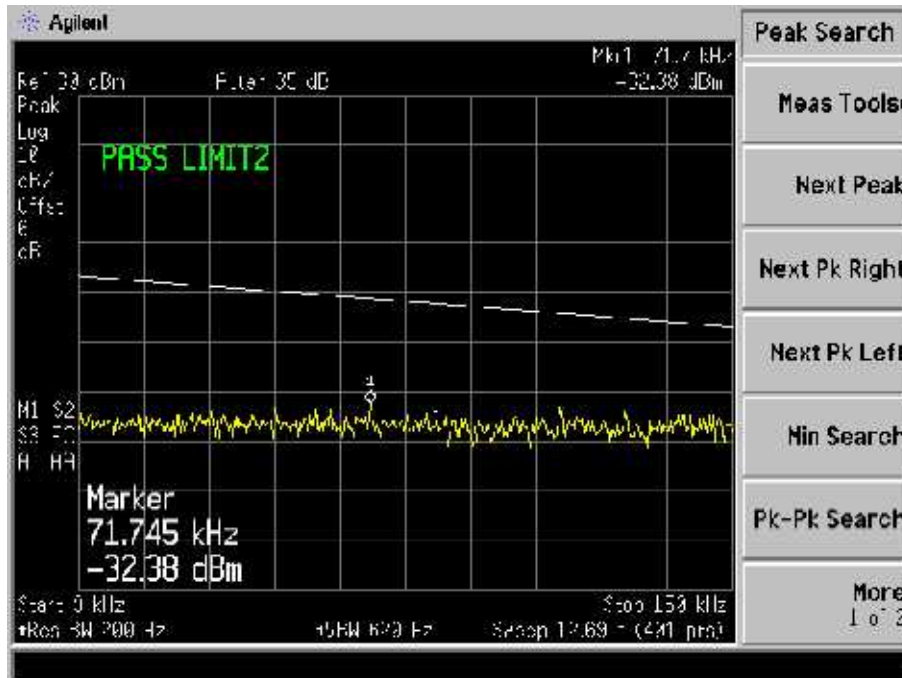
Plot 279 – Channel 11 @ CCK 36Mbps



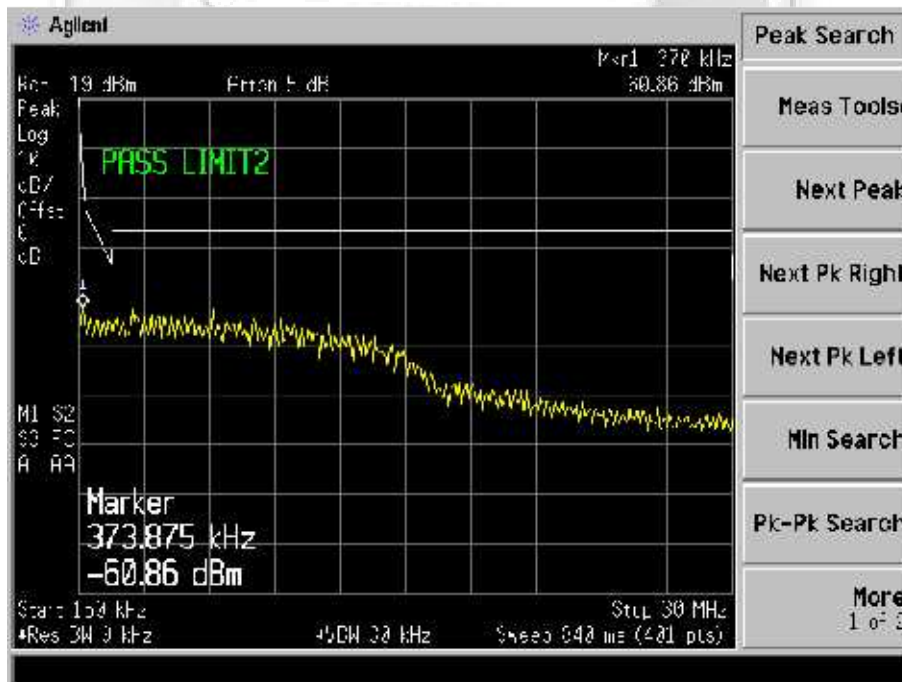


RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



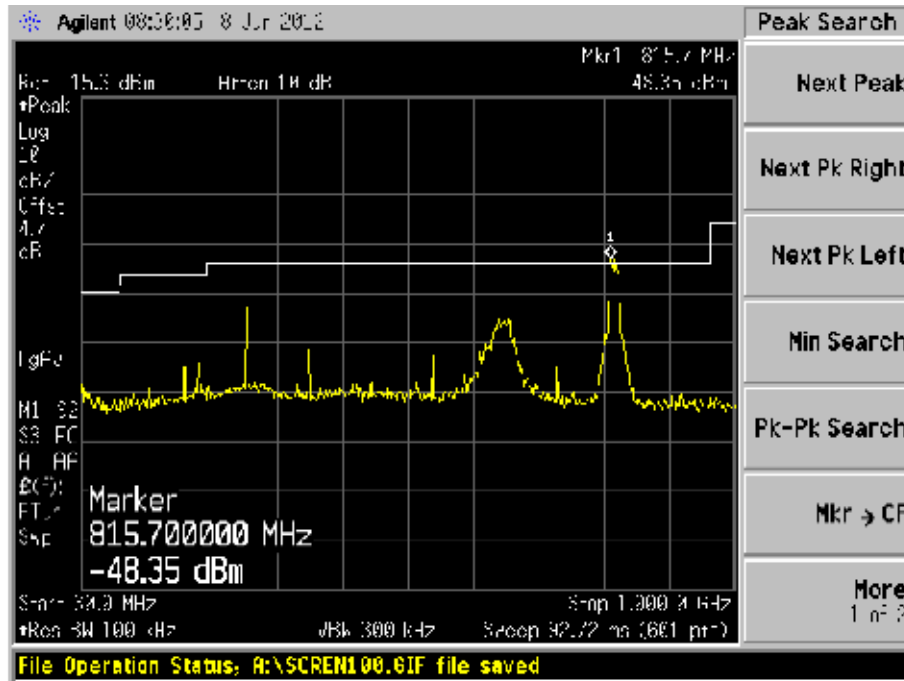
Plot 280 – Channel 11 @ CCK 54Mbps



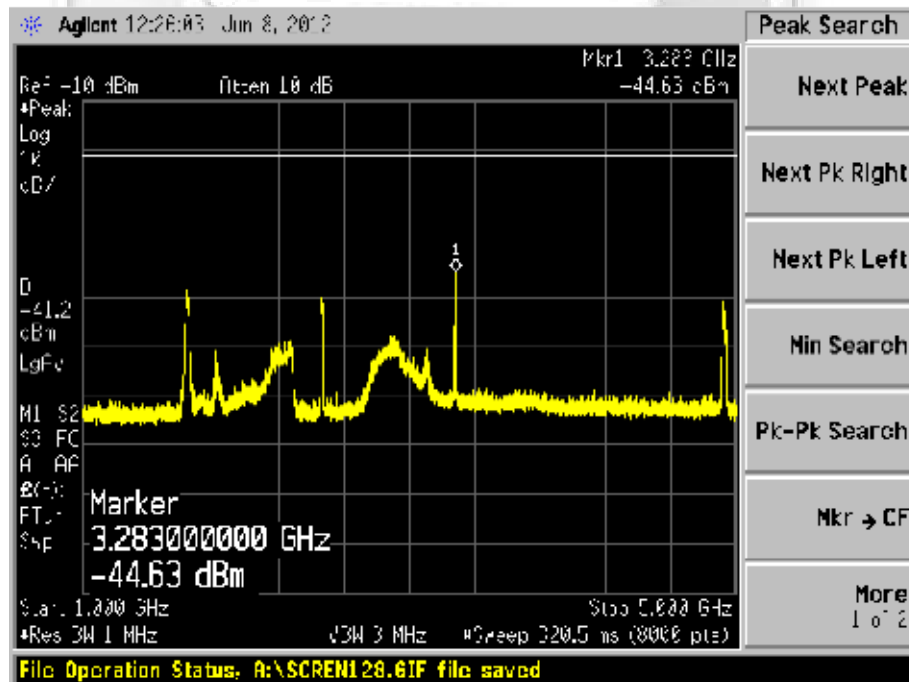
Plot 281 – Channel 11 @ CCK 54Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



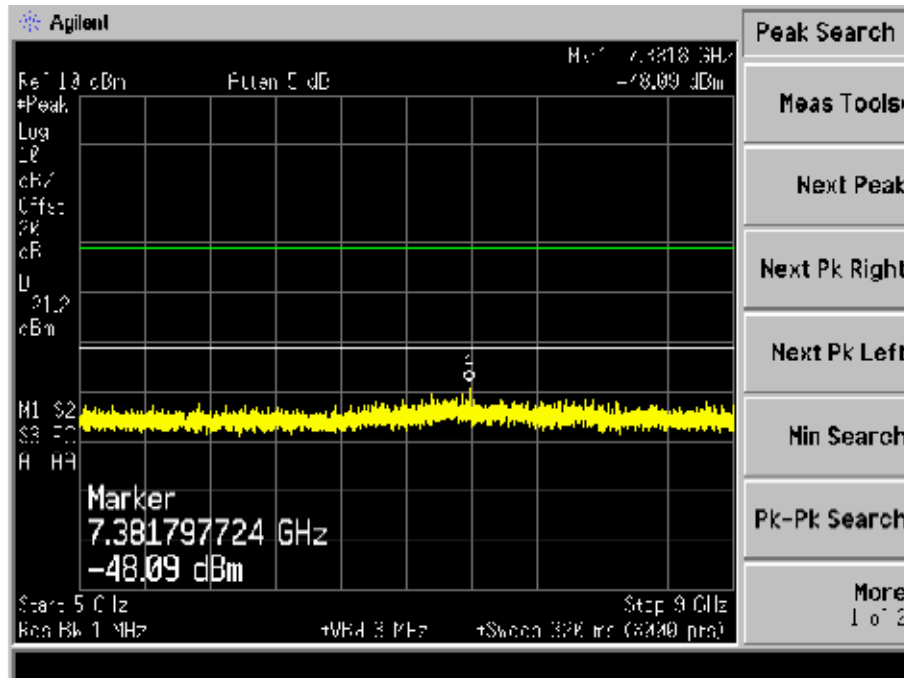
Plot 282 – Channel 11 @ CCK 54Mbps



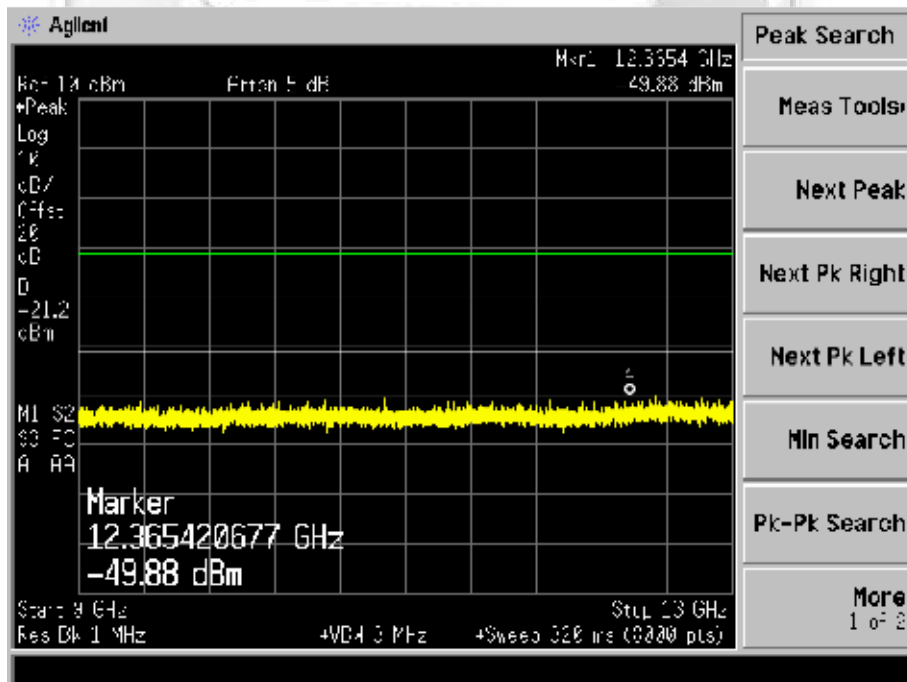
Plot 283 – Channel 11 @ CCK 54Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



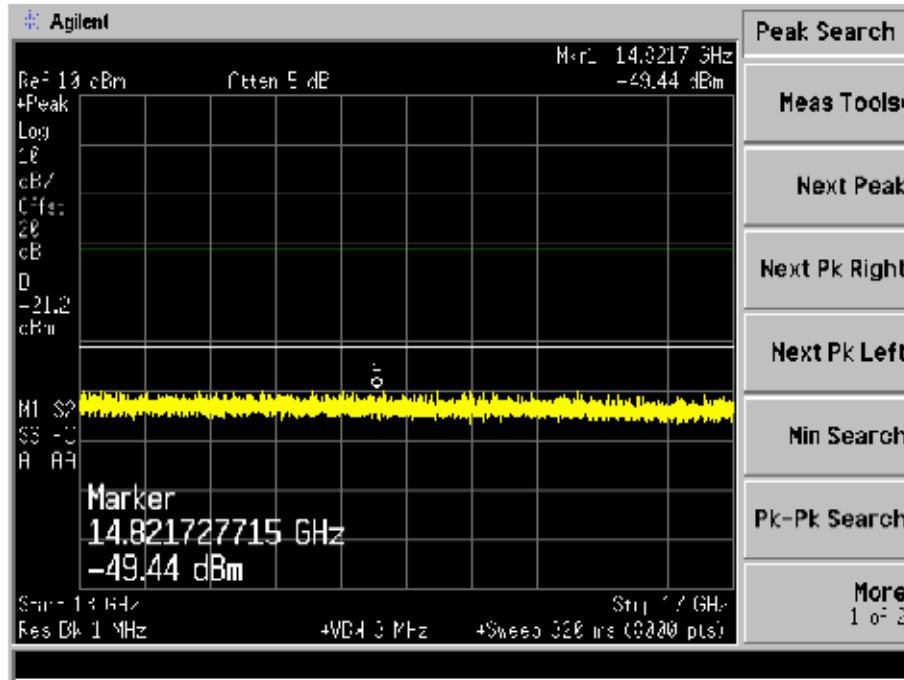
Plot 284 – Channel 11 @ CCK 54Mbps



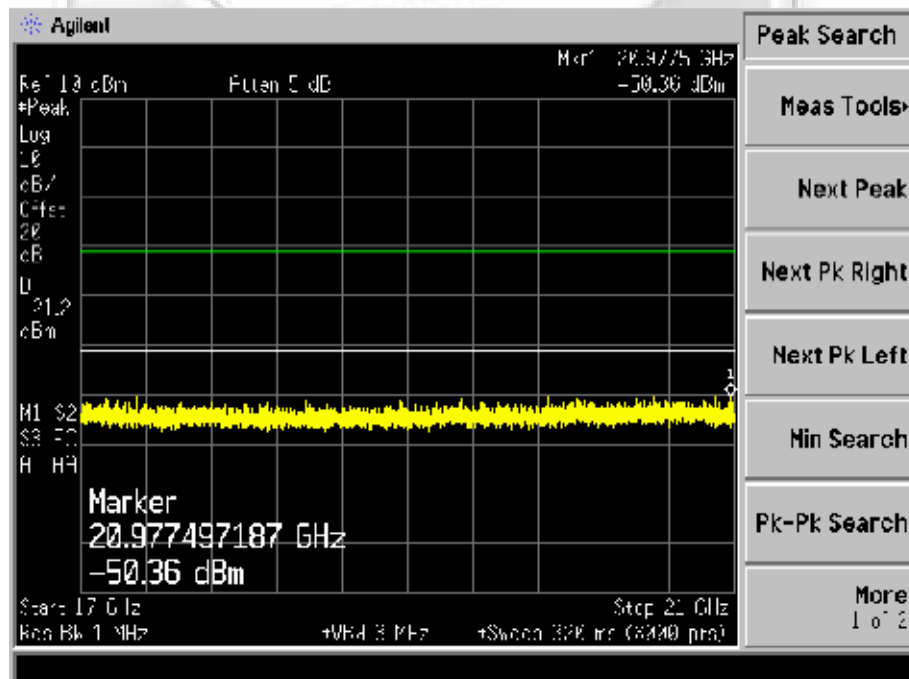
Plot 285 – Channel 11 @ CCK 54Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



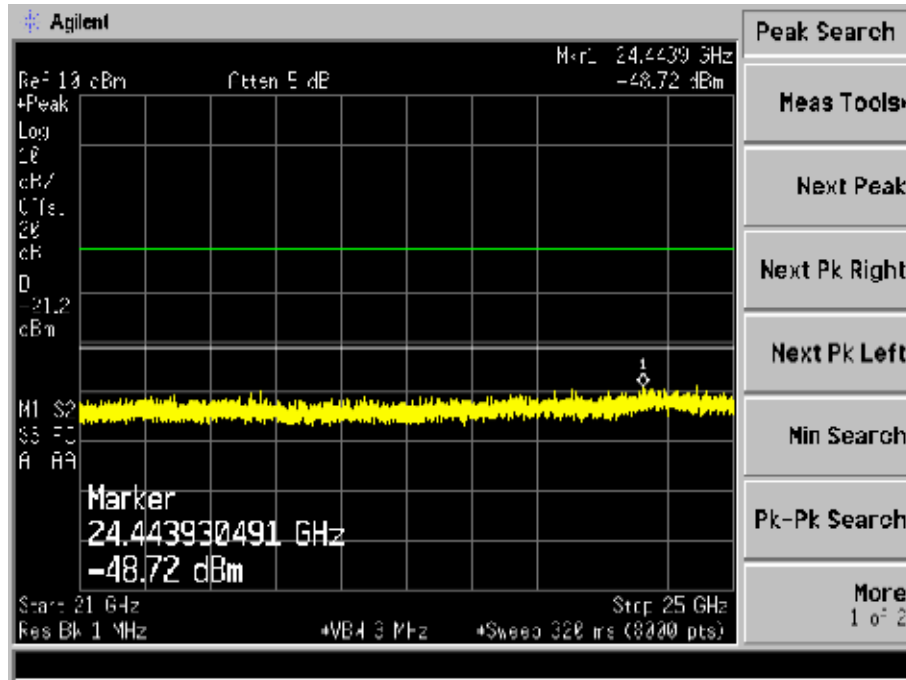
Plot 286 – Channel 11 @ CCK 54Mbps



Plot 287 – Channel 11 @ CCK 54Mbps

RF CONDUCTED SPURIOUS EMISSIONS (RESTRICTED BANDS) TEST

RF Conducted Spurious Emissions (Restricted) Plots - Peak



Plot 288 – Channel 11 @ CCK 54Mbps

SUD

BAND EDGE COMPLIANCE (CONDUCTED) TEST

47 CFR FCC Part 15.247(d) Band Edge Compliance (Conducted) Limits

The EUT shows compliance to the requirements of this section, which states in any 100kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator (EUT) is operating, the radio frequency power that is produced by the EUT shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of desired power.

47 CFR FCC Part 15.247(d) Band Edge Compliance (Conducted) Test Instrumentation

Instrument	Model	S/No	Cal Due Date
Agilent EMC Analyzer (9kHz-26.5GHz)	E7405A	US40240195	16 Mar 2013
GW Instek Programmable Power Supply	PSH-3630A	RK200168	30 Jan 2013

47 CFR FCC Part 15.247(d) Band Edge Compliance (Conducted) Test Setup

1. The EUT and supporting equipment were set up as shown in the setup photo.
2. The power supply for the EUT was connected to a filtered mains.
3. The RF antenna connector was connected to the spectrum analyser via a low-loss coaxial cable.
4. The resolution bandwidth (RBW) and the video bandwidth (VBW) of the spectrum analyser were respectively set to 100kHz and 300kHz.
5. All other supporting equipment were powered separately from another filtered mains.

47 CFR FCC Part 15.247(d) Band Edge Compliance (Conducted) Test Method

1. The EUT was switched on and allowed to warm up to its normal operating condition. The EUT was then configured to operate in the test mode with specified modulation and data rate.
2. The frequency span of the spectrum analyser was set to wide enough to capture the lower band edge of the transmission band, 2.400GHz and any spurious emissions at the band edge.
3. The spectrum analyser was set to max hold to capture any spurious emissions within the span. The signal capturing was continuous until no further spurious emissions were detected.
4. Repeat steps 1 to 3 with all possible modulations and data rates.
5. The steps 2 to 4 were repeated with the frequency span of the spectrum analyser was set to wide enough to capture the upper band edge frequency of the transmission band, 2.4835GHz and the any spurious emissions at the band-edge.

BAND EDGE COMPLIANCE (CONDUCTED) TEST



Band Edge Compliance (Conducted) Test Setup

47 CFR FCC Part 15.247(d) Band Edge Compliance (Conducted) Results

Test Input Power	24Vdc (Worst Voltage)	Temperature	24°C
Attached Plots	289 – 296 (802.11b)	Relative Humidity	54%
		Atmospheric Pressure	1027mbar
		Tested By	Kyaw Soe Hein

No significant signal was found and they were below the specified limit.

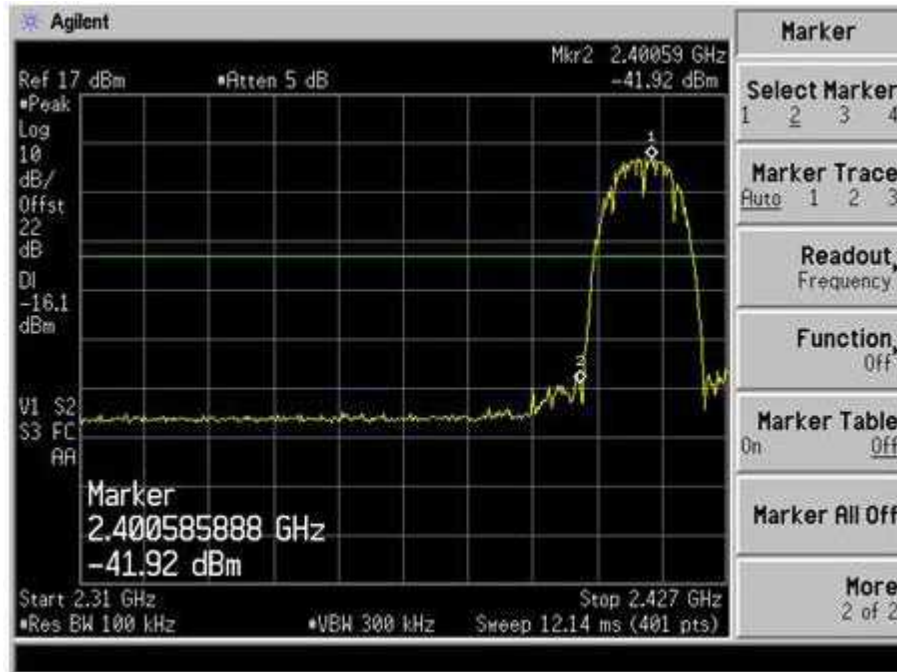
Test Input Power	24Vdc (Worst Voltage)	Temperature	24°C
Attached Plots	297 – 304 (802.11g)	Relative Humidity	54%
		Atmospheric Pressure	1027mbar
		Tested By	Kyaw Soe Hein

No significant signal was found and they were below the specified limit.

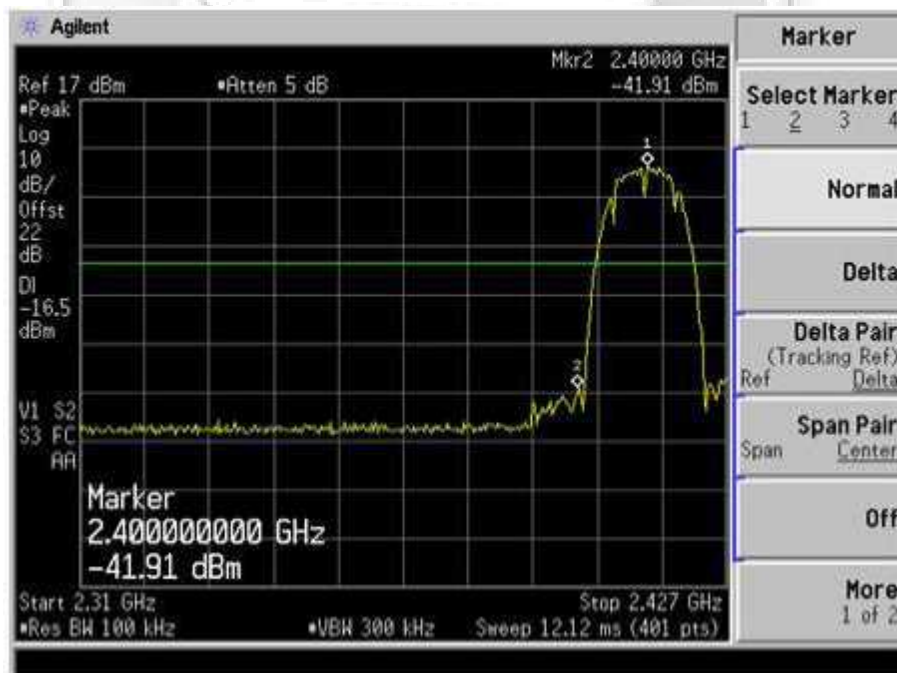


BAND EDGE COMPLIANCE (CONDUCTED) TEST

Band Edge Compliance (Conducted) Plots – 802.11b



Plot 289 – Lower Band Edge at 2.4000GHz @ DBPSK 1Mbps

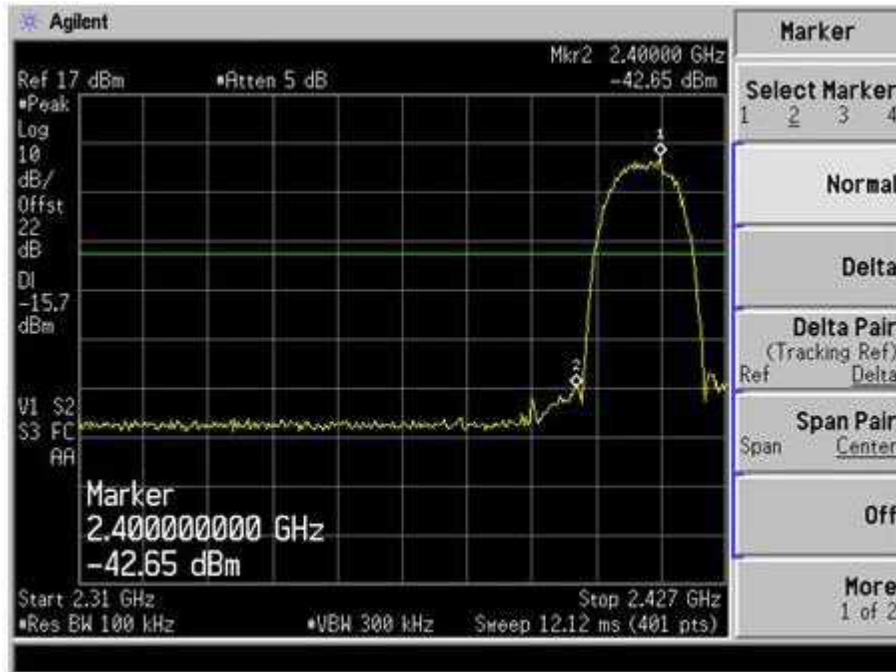


Plot 290 – Lower Band Edge at 2.4000GHz @ DQPSK 2Mbps

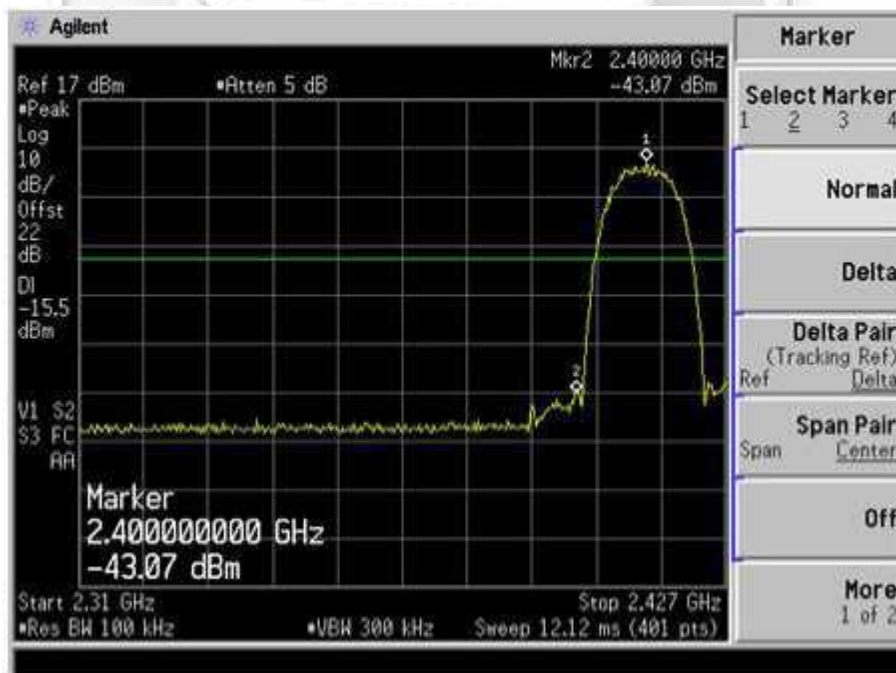


BAND EDGE COMPLIANCE (CONDUCTED) TEST

Band Edge Compliance (Conducted) Plots – 802.11b



Plot 291 – Lower Band Edge at 2.4000GHz @ CCK 5.5Mbps

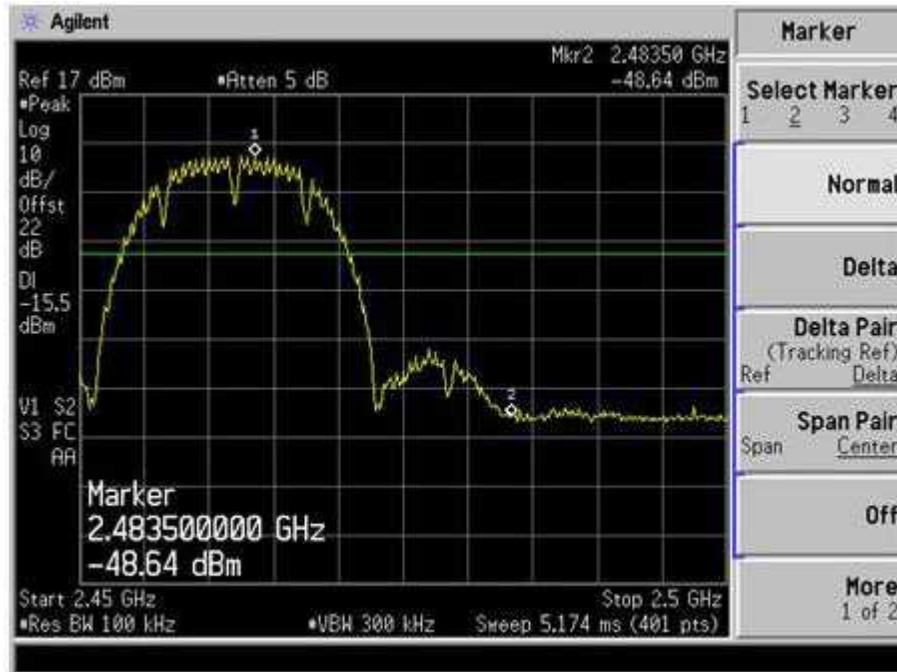


Plot 292 – Lower Band Edge at 2.4000GHz @ CCK 11Mbps

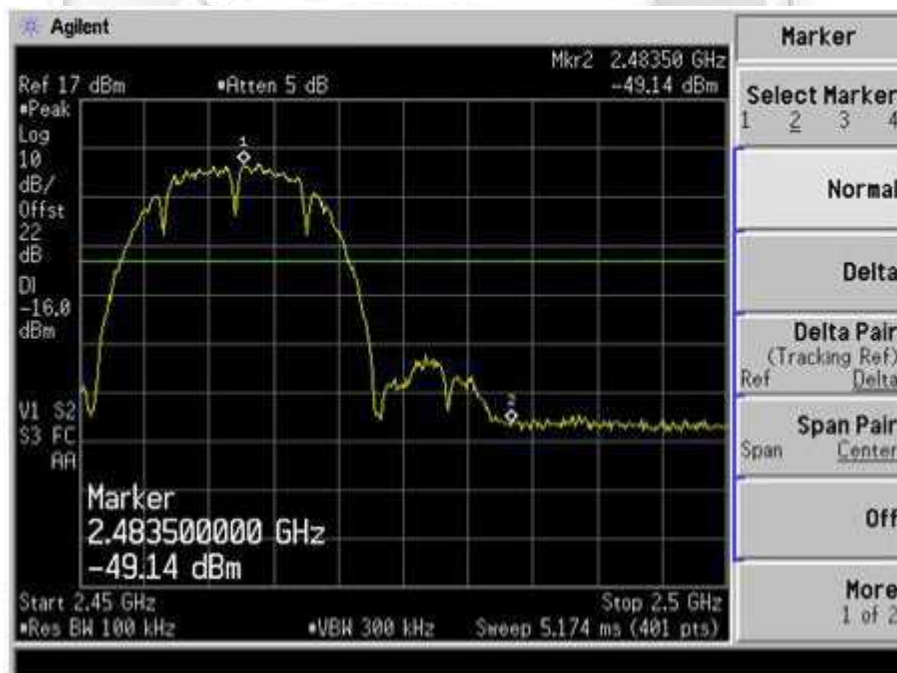


BAND EDGE COMPLIANCE (CONDUCTED) TEST

Band Edge Compliance (Conducted) Plots – 802.11b



Plot 293 – Upper Band Edge at 2.4835GHz @ DBPSK 1Mbps

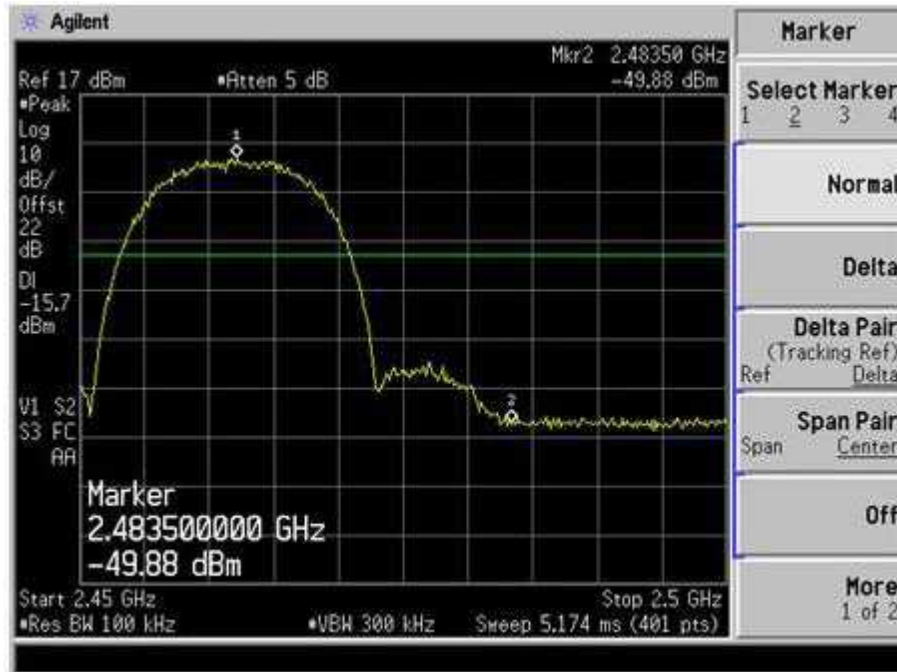


Plot 294 – Upper Band Edge at 2.4835GHz @ DQPSK 2Mbps

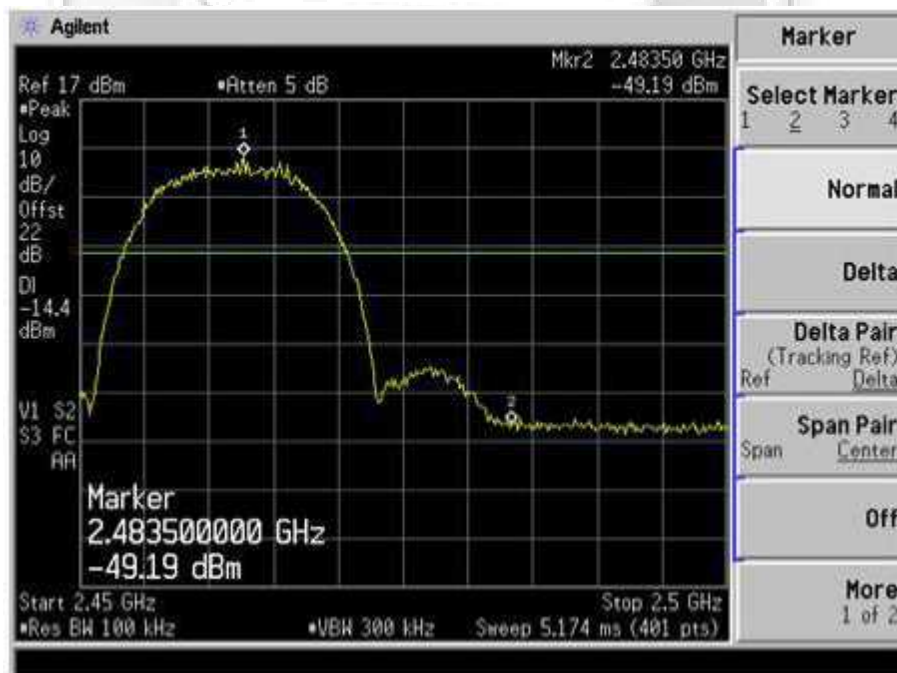


BAND EDGE COMPLIANCE (CONDUCTED) TEST

Band Edge Compliance (Conducted) Plots – 802.11b



Plot 295 – Upper Band Edge at 2.4835GHz @ CCK 5.5Mbps

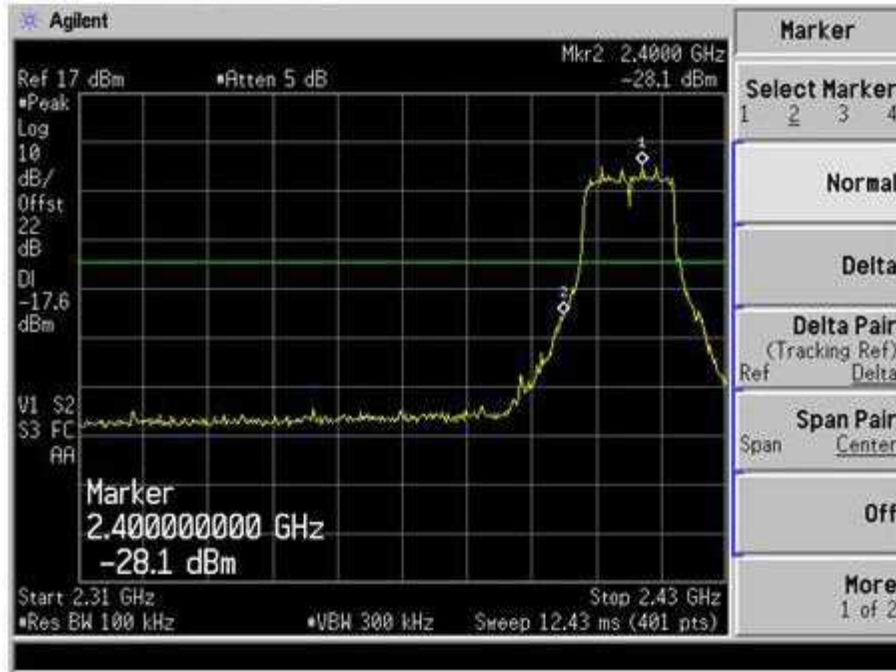


Plot 296 – Upper Band Edge at 2.4835GHz @ CCK 11Mbps

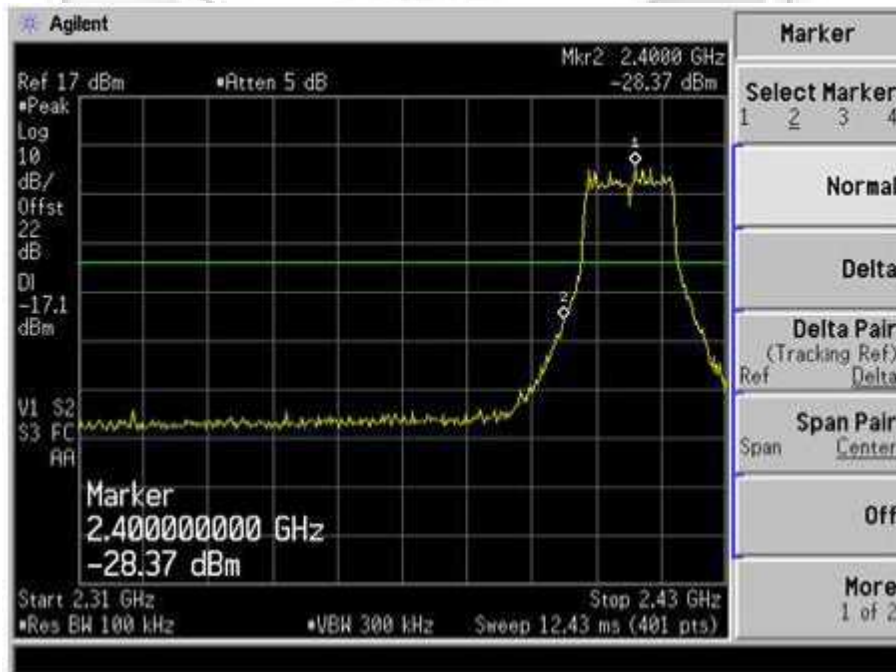


BAND EDGE COMPLIANCE (CONDUCTED) TEST

Band Edge Compliance (Conducted) Plots – 802.11g



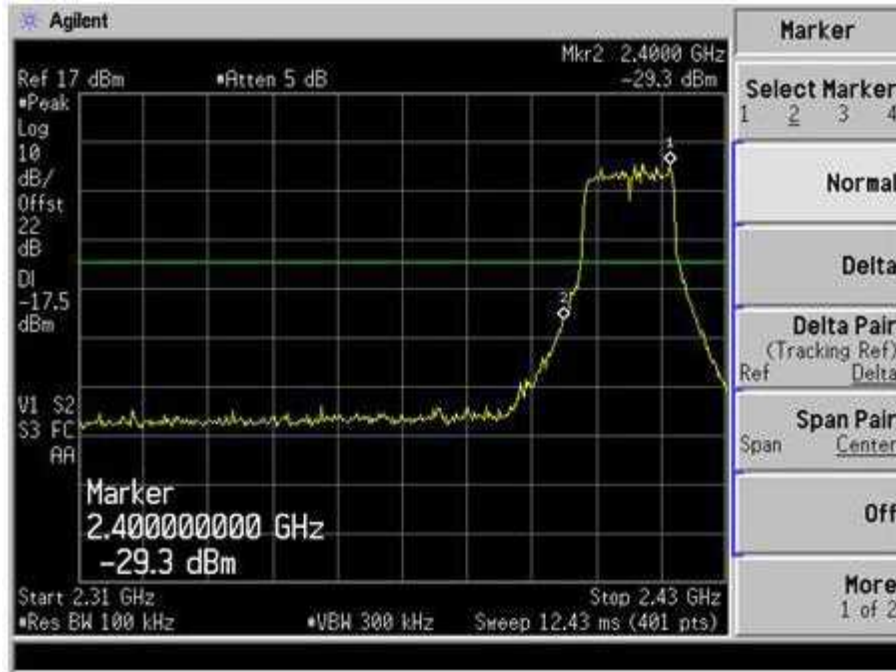
Plot 297 – Lower Band Edge at 2.4000GHz @ BPSK 9Mbps



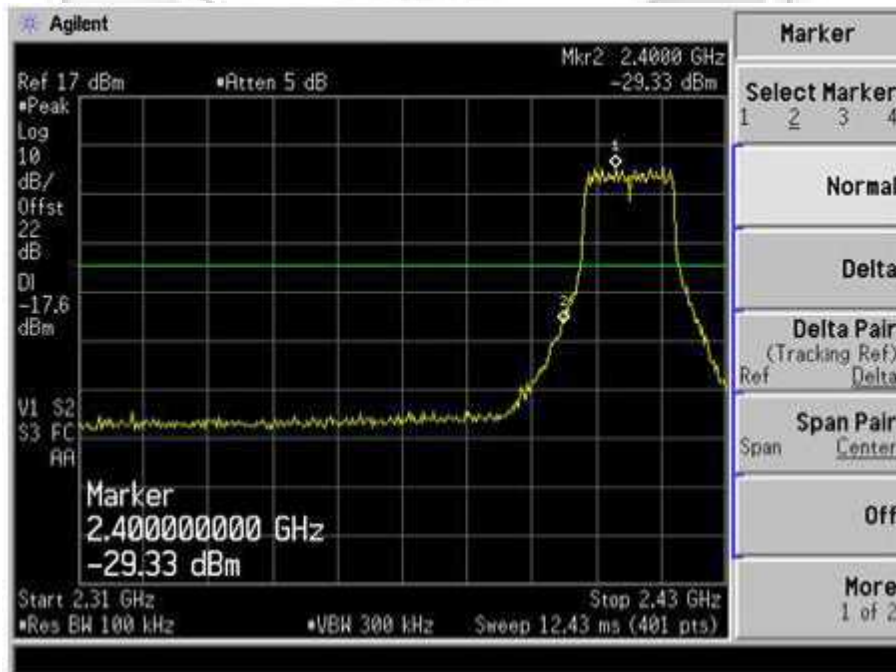
Plot 298 – Lower Band Edge at 2.4000GHz @ QPSK 18Mbps

BAND EDGE COMPLIANCE (CONDUCTED) TEST

Band Edge Compliance (Conducted) Plots – 802.11g



Plot 299 – Lower Band Edge at 2.4000GHz @ 16QAM 36Mbps

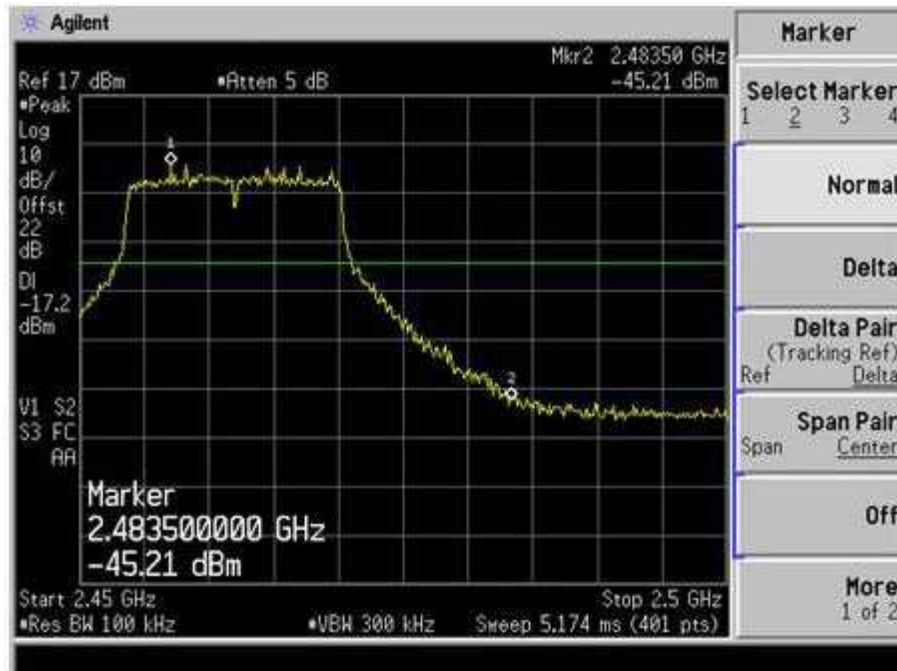


Plot 300 – Lower Band Edge at 2.4000GHz @ 64QAM 54Mbps

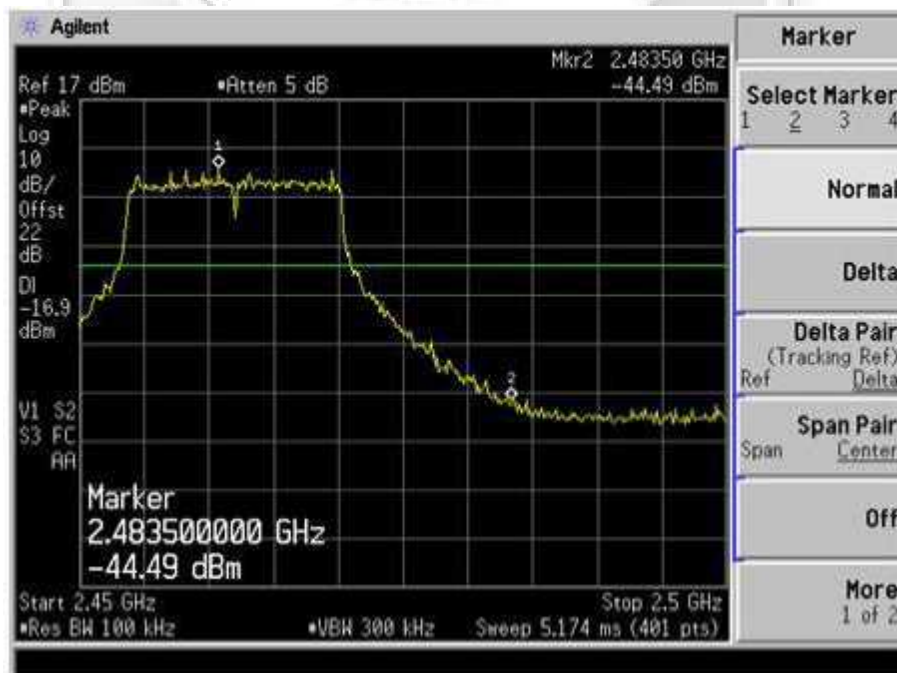


BAND EDGE COMPLIANCE (CONDUCTED) TEST

Band Edge Compliance (Conducted) Plots – 802.11g



Plot 301 – Upper Band Edge at 2.4835GHz @ BPSK 9Mbps

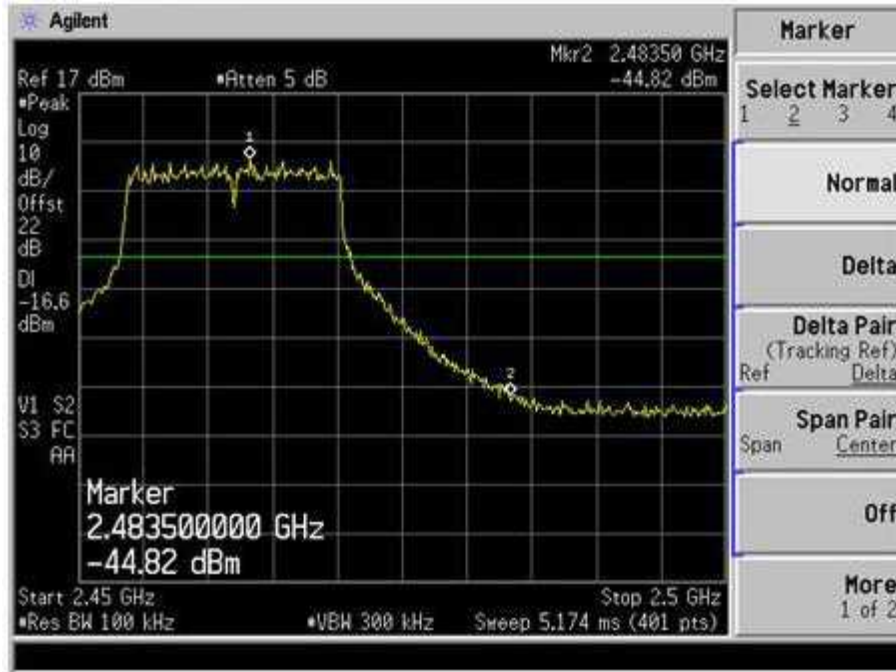


Plot 302 – Upper Band Edge at 2.4835GHz @ QPSK 18Mbps

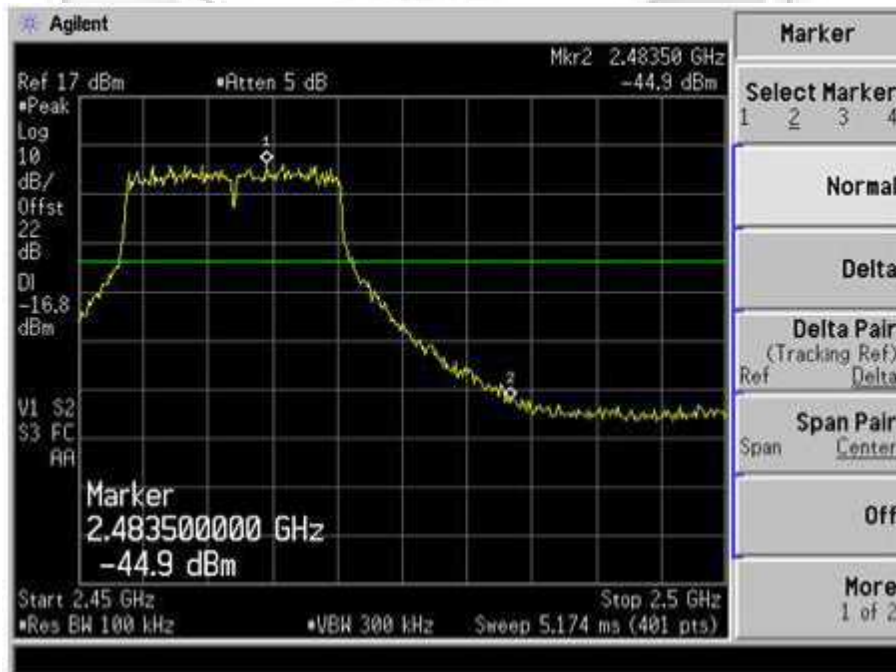


BAND EDGE COMPLIANCE (CONDUCTED) TEST

Band Edge Compliance (Conducted) Plots – 802.11g



Plot 303 – Upper Band Edge at 2.4835GHz @ 16QAM 36Mbps



Plot 304 – Upper Band Edge at 2.4835GHz @ 64QAM 54Mbps

BAND EDGE COMPLIANCE (RADIATED) TEST

47 CFR FCC Part 15.247(d) Band Edge Compliance (Radiated) Limits

The EUT shows compliance to the requirements of this section, which states in any 100kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator (EUT) is operating, the radio frequency power that is produced by the EUT shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of desired power. In addition, radiated emissions which fall in the restricted bands shall comply to the radiated emission limits specified in 15.209.

47 CFR FCC Part 15.247(d) Band Edge Compliance (Radiated) Test Instrumentation

Instrument	Model	S/No	Cal Due Date
Agilent EMC Analyzer	E7403A	US41160165	04 Nov 2012
TDK RF Solutions Hybrid Log Periodic Antenna (30MHz-3GHz)	HLP-3003C	130238	19 Mar 2013
Sonoma Preamplifier (9kHz – 1GHz)	310N	270640	03 Jan 2013
Toyo MicroWave Preamplifier (1GHz - 18GHz)	TPA0188-36	1005	24 Jun 2012
EMCO Horn Antenna – H15	3115	0003-6088	20 May 2013

47 CFR FCC Part 15.247(d) Band Edge Compliance (Radiated) Test Setup

1. The EUT and supporting equipment were set up as shown in the setup photo.
2. The power supply for the EUT was connected to a filtered mains.
3. The resolution bandwidth (RBW) and the video bandwidth (VBW) of the spectrum analyser were respectively set to 100kHz and 300kHz to show compliance of spurious at band edges are at least 20dB below the carriers. For restricted band spurious at band edges, peak and average measurement plots were taken using the following setting:
 - a. Peak Plot:
RBW = VBW = 1MHz
 - b. Average Plot
RBW = 1MHz, VBW = 10Hz
4. All other supporting equipment were powered separately from another filtered mains.

47 CFR FCC Part 15.247(d) Band Edge Compliance (Radiated) Test Method

1. The EUT was switched on and allowed to warm up to its normal operating condition. The EUT was then configured to operate in the test mode with specified modulation and data rate.
2. The frequency span of the spectrum analyser was set to wide enough to capture the lower band edge of the transmission band, 2.400GHz and any spurious emissions at the band edge.
3. The spectrum analyser was set to max hold to capture any spurious emissions within the span. The signal capturing was continuous until no further spurious emissions were detected.
4. Repeat steps 1 to 3 with all possible modulations and data rates.
5. The steps 2 to 4 were repeated with the frequency span of the spectrum analyser was set to wide enough to capture the upper band edge frequency of the transmission band, 2.4835GHz and the any spurious emissions at the band-edge.

BAND EDGE COMPLIANCE (RADIATED) TEST



Band Edge Compliance (Radiated) Test Setup

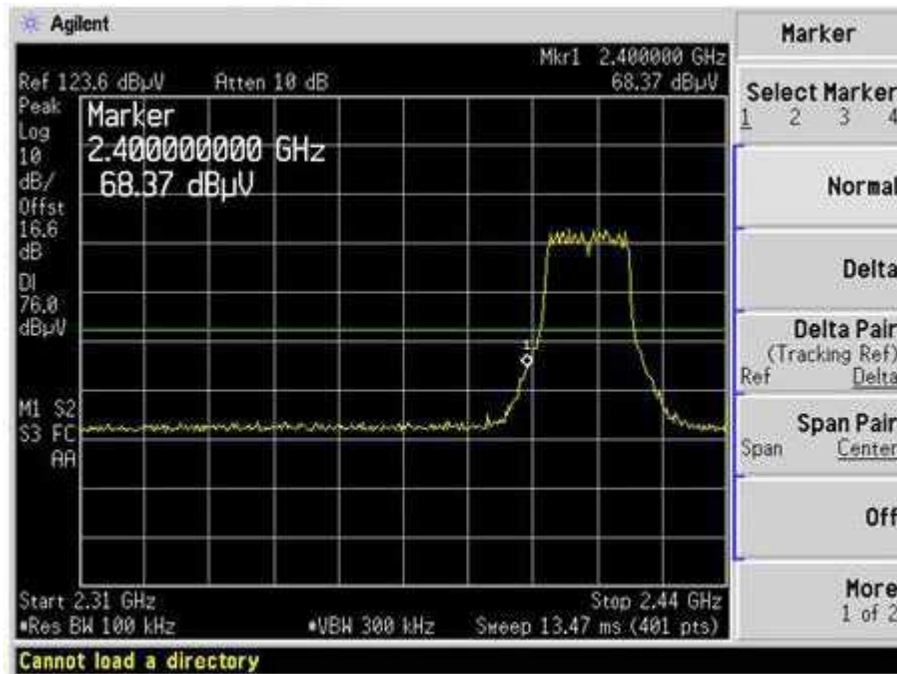
47 CFR FCC Part 15.247(d) Band Edge Compliance (Radiated) Results

Test Input Power	24Vdc (Worst Voltage)	Temperature	22°C
Attached Plots	305 – 310	Relative Humidity	52%
		Atmospheric Pressure	1028mbar
		Tested By	Jason Lai

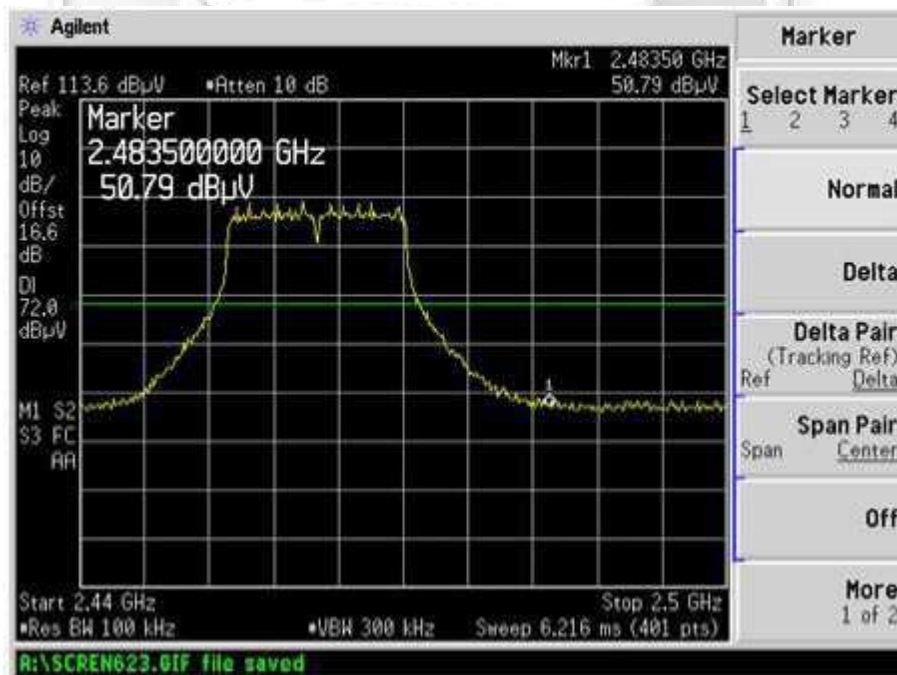
No significant signal was found and they were below the specified limit.

BAND EDGE COMPLIANCE (RADIATED) TEST

Band Edge Compliance (Radiated) Plots (20dB Delta from Carrier at Band Edge)



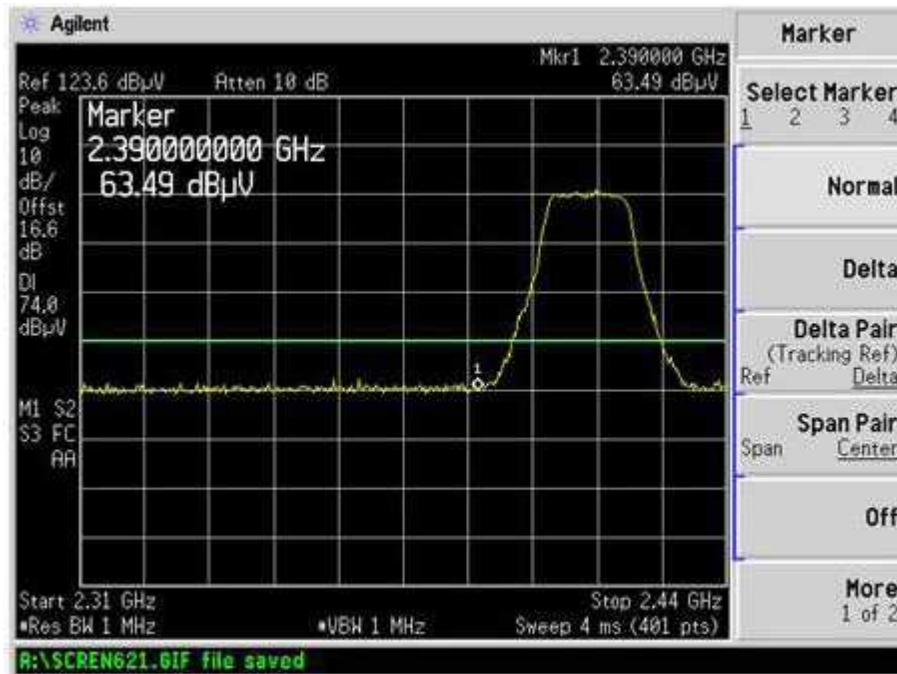
Plot 305 – Lower Band Edge at 2.400GHz @ 64QAM 54Mbps (Worst Case)



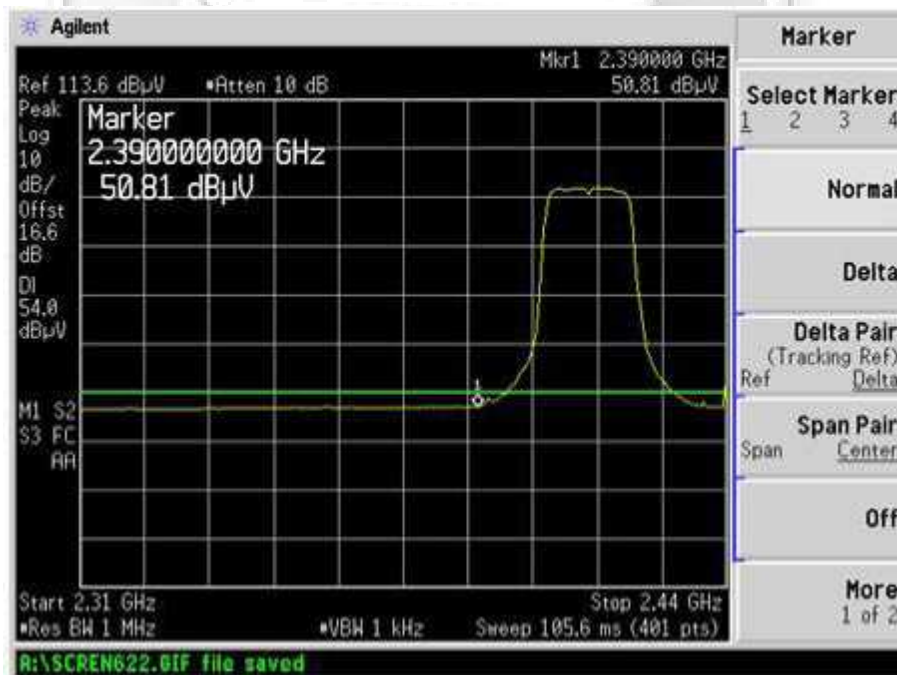
Plot 306 – Lower Band Edge at 2.400GHz @ 64QAM 54Mbps (Worst Case)

BAND EDGE COMPLIANCE (RADIATED) TEST

Band Edge Compliance (Radiated) Plots (20dB Delta from Carrier at Band Edge)



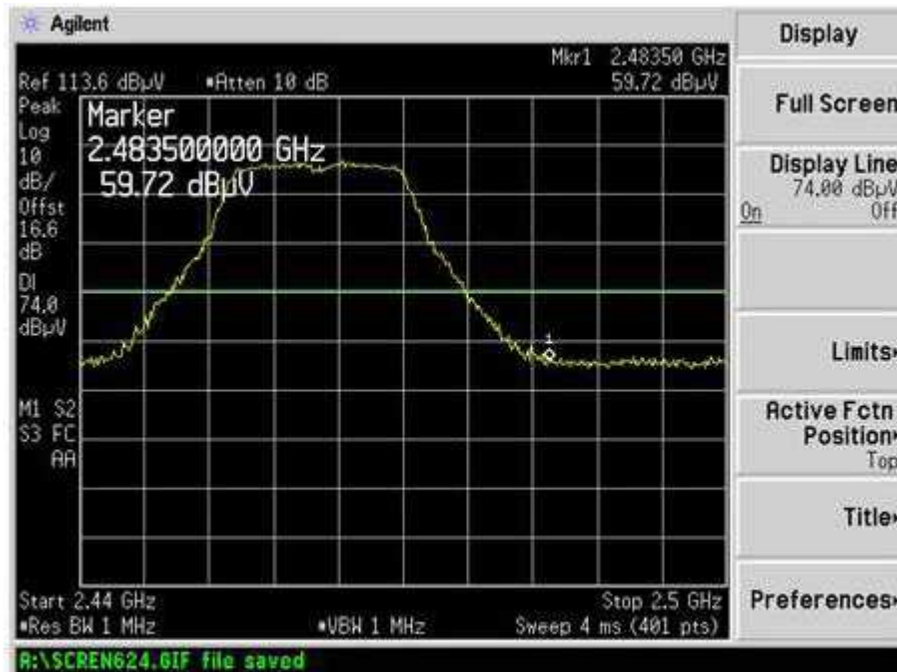
Plot 307 – Lower Band Edge at 2.400GHz @ 64QAM 54Mbps (Worst Case)



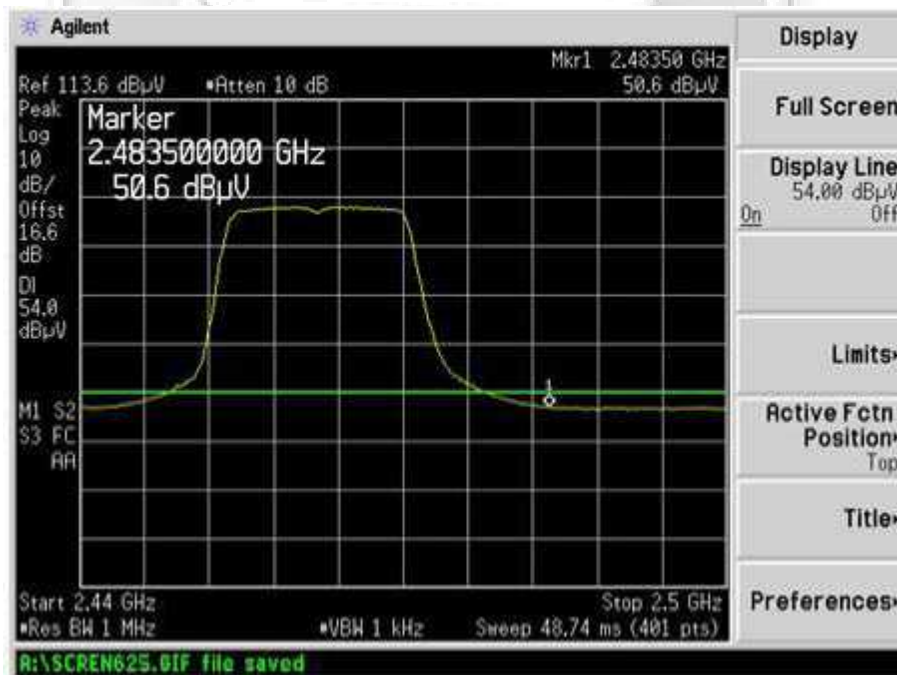
Plot 308 – Lower Band Edge at 2.400GHz @ 64QAM 54Mbps (Worst Case)

BAND EDGE COMPLIANCE (RADIATED) TEST

Band Edge Compliance (Radiated) Plots (20dB Delta from Carrier at Band Edge)



Plot 309 – Upper Band Edge at 2.4835GHz @ 64QAM 54Mbps (Worst Case)



Plot 310 – Upper Band Edge at 2.4835GHz @ 64QAM 54Mbps (Worst Case)

PEAK POWER SPECTRAL DENSITY TEST

47 CFR FCC Part 15.247(e) Peak Power Spectral Density Limits

The EUT shows compliance to the requirements of this section, which states the peak power spectral density conducted from the intentional radiator (EUT) to the antenna shall not be greater than 8dBm (6.3mW) in any 3kHz band during any time interval of continuous transmission.

47 CFR FCC Part 15.247(e) Peak Power Spectral Density Test Instrumentation

Instrument	Model	S/No	Cal Due Date
Agilent EMC Analyzer (9kHz-26.5GHz)	E7405A	US40240195	16 Mar 2013
GW Instek Programmable Power Supply	PSH-3630A	RK200168	30 Jan 2013

47 CFR FCC Part 15.247(e) Peak Power Spectral Density Test Setup

1. The EUT and supporting equipment were set up as shown in the setup photo.
2. The power supply for the EUT was connected to a filtered mains.
3. The RF antenna connector was connected to the spectrum via a low-loss coaxial cable.
4. The resolution bandwidth (RBW), video bandwidth (VBW) and span of the spectrum analyser were set to the following:
RBW = 100kHz
VBW = 300kHz
Span = 5% to 30% greater than EBW
Sweep time = auto couple
5. All other supporting equipment were powered separately from another filtered mains.

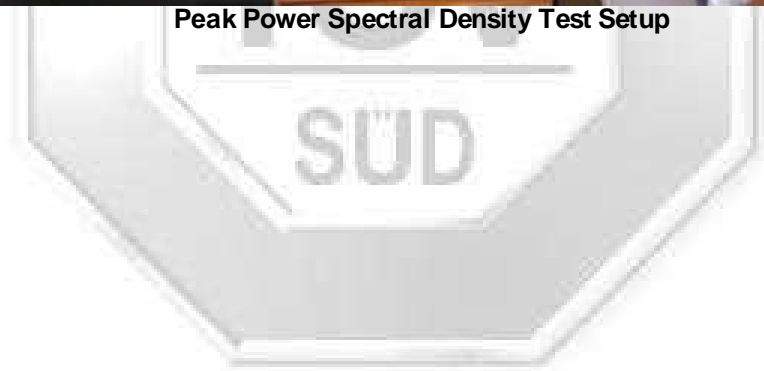
47 CFR FCC Part 15.247(e) Peak Power Spectral Density Test Method

1. The EUT was switched on and allowed to warm up to its normal operating condition. The EUT was then configured to operate in the test mode at lower channel with specified modulation and data rate.
2. The peak of the transmitting frequency was detected with the marker peak function of the spectrum analyser.
3. The detected power level was scaled to an equivalent 3kHz by adding a bandwidth correction factor (BWCF) of $10 \log (3\text{kHz} / 100\text{kHz})$; ie -15.2dB.
4. The peak power density of the transmitting frequency was plotted and recorded.
5. Repeat steps 1 to 4 with all possible modulations and data rates.
6. The steps 2 to 5 were repeated with the transmitting frequency was set to middle and upper channel respectively.

PEAK POWER SPECTRAL DENSITY TEST



Peak Power Spectral Density Test Setup



PEAK POWER SPECTRAL DENSITY TEST

47 CFR FCC Part 15.247(e) Peak Power Spectral Density Results

Test Input Power	24Vdc (Worst Voltage)	Temperature	24°C
Attached Plots	311 – 322 (802.11b)	Relative Humidity	54%
		Atmospheric Pressure	1027mbar
		Tested By	Kyaw Soe Hein

Channel	Channel Frequency (GHz)	Peak Power Spectral Density (mW)	Limit (mW)	Modulation @ Data Rate
1	2.412	0.1039	6.3	DBPSK @ 1Mbps
		0.0857	6.3	DQPSK @ 2Mbps
		0.0861	6.3	CCK @ 5.5Mbps
		0.1216	6.3	CCK @ 11Mbps
6	2.437	0.0800	6.3	DBPSK @ 1Mbps
		0.0964	6.3	DQPSK @ 2Mbps
		0.0918	6.3	CCK @ 5.5Mbps
		0.0863	6.3	CCK @ 11Mbps
11	2.462	0.0843	6.3	DBPSK @ 1Mbps
		0.0822	6.3	DQPSK @ 2Mbps
		0.0989	6.3	CCK @ 5.5Mbps
		0.0843	6.3	CCK @ 11Mbps

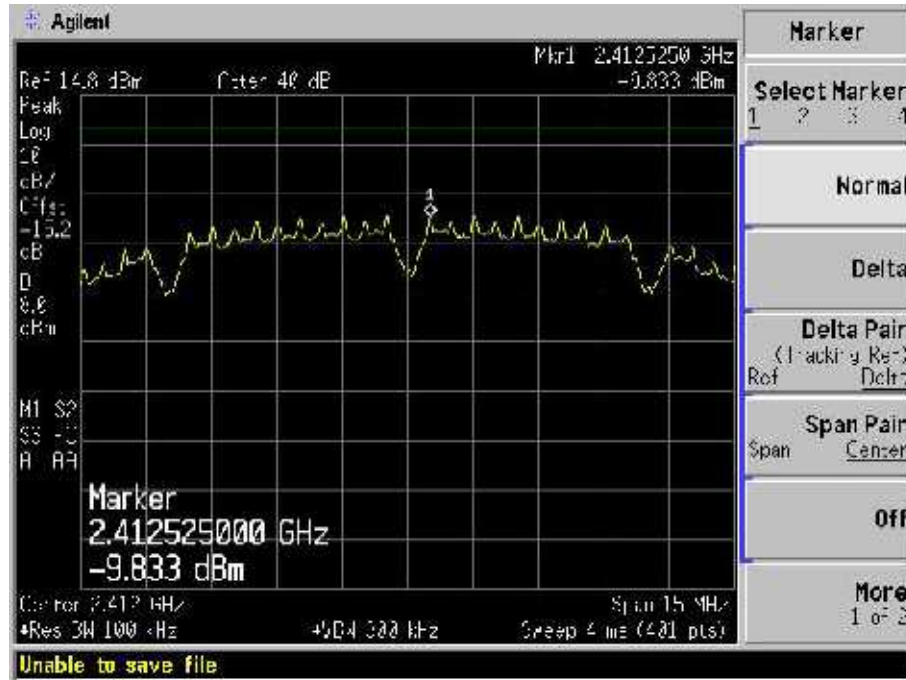
Test Input Power	24Vdc (Worst Voltage)	Temperature	24°C
Attached Plots	323 – 334 (802.11g)	Relative Humidity	54%
		Atmospheric Pressure	1027mbar
		Tested By	Kyaw Soe Hein

Channel	Channel Frequency (GHz)	Peak Power Spectral Density (mW)	Limit (mW)	Modulation @ Data Rate
1	2.412	0.0733	6.3	BPSK @ 9Mbps
		0.0843	6.3	QPSK @ 18Mbps
		0.0838	6.3	16QAM @ 36Mbps
		0.0773	6.3	64QAM @ 54Mbps
6	2.437	0.0736	6.3	BPSK @ 9Mbps
		0.0705	6.3	QPSK @ 18Mbps
		0.0753	6.3	16QAM @ 36Mbps
		0.0731	6.3	64QAM @ 54Mbps
11	2.462	0.0828	6.3	BPSK @ 9Mbps
		0.0836	6.3	QPSK @ 18Mbps
		0.0820	6.3	16QAM @ 36Mbps
		0.0931	6.3	64QAM @ 54Mbps

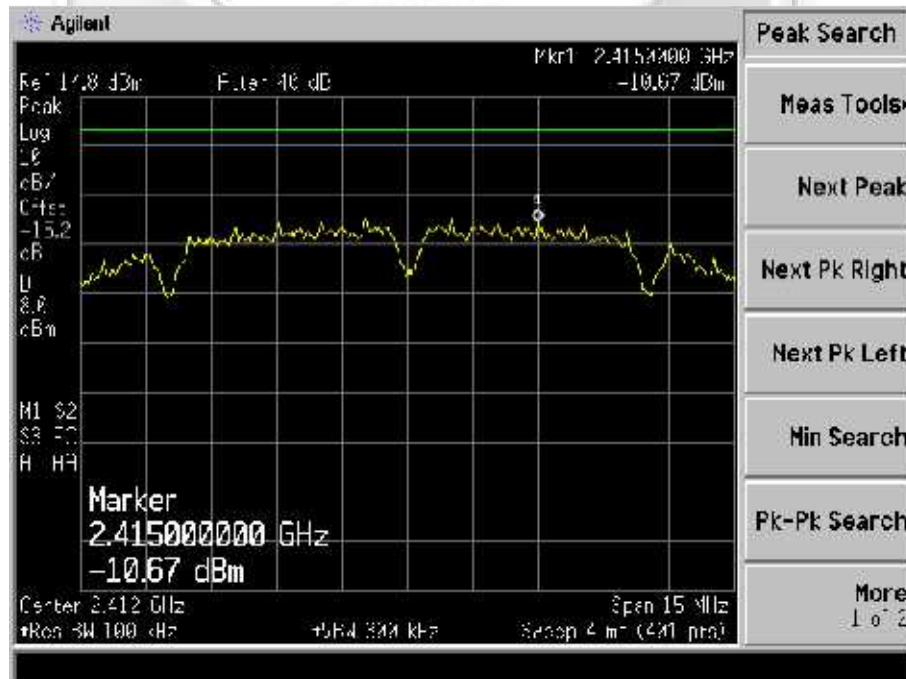


PEAK POWER SPECTRAL DENSITY TEST

Peak Power Spectral Density Plots – 802.11b



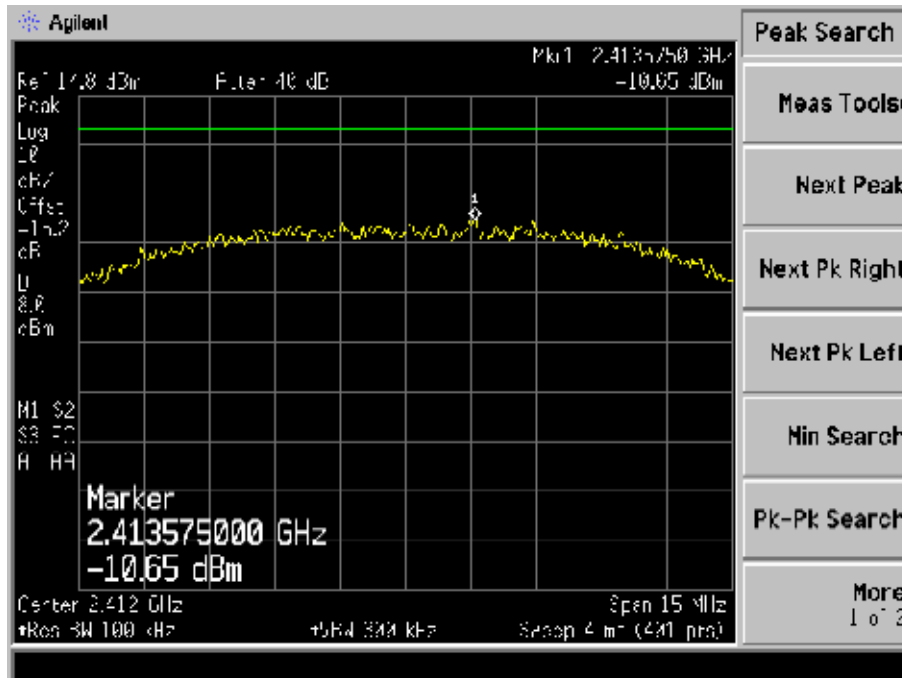
Plot 311 – Channel 1 @ DBPSK 1Mbps



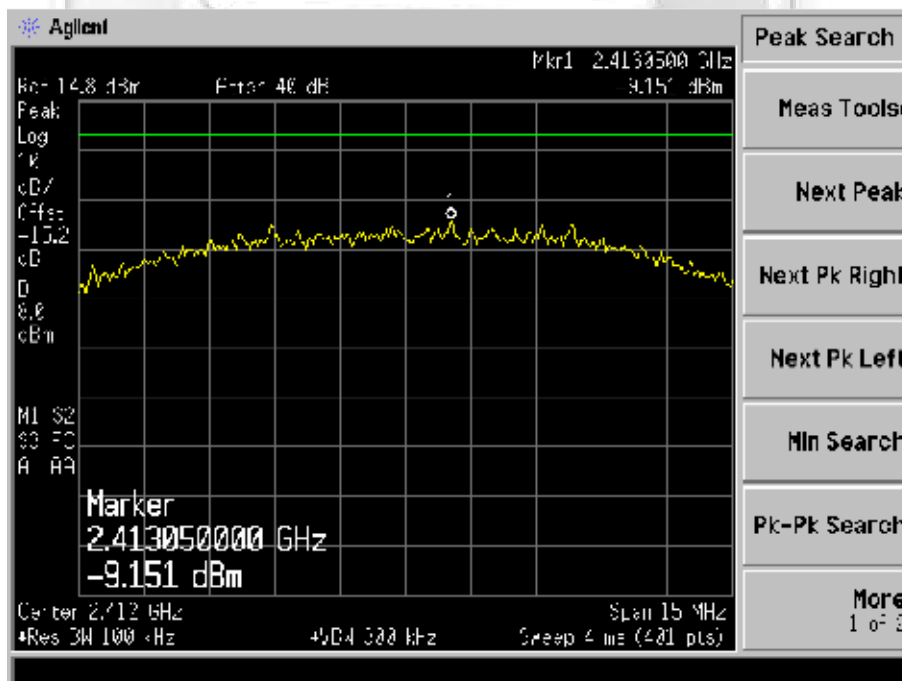
Plot 312 – Channel 1 @ DQPSK 2Mbps

PEAK POWER SPECTRAL DENSITY TEST

Peak Power Spectral Density Plots - 802.11b



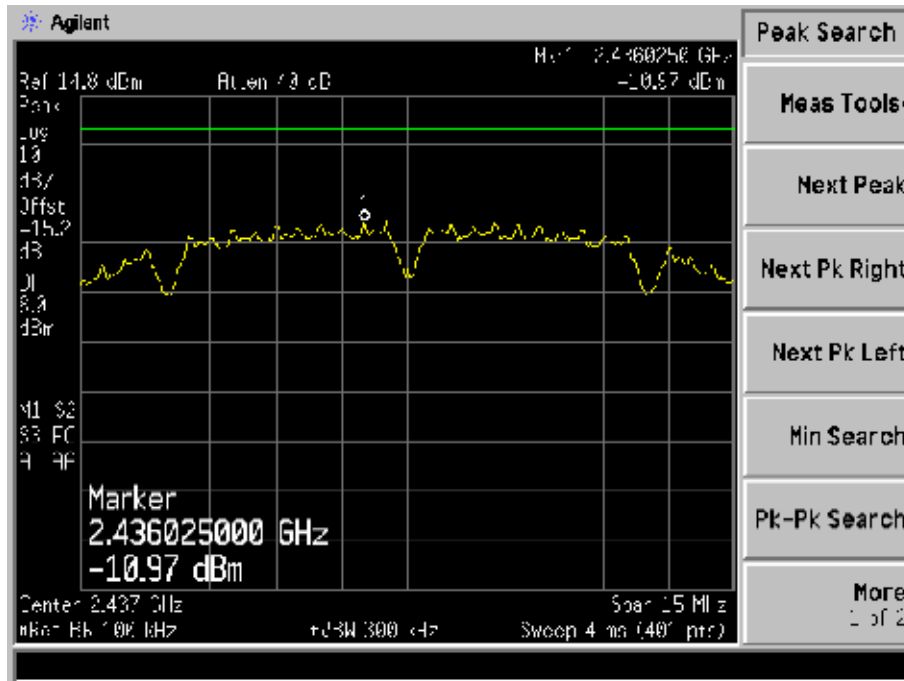
Plot 313 – Channel 1 @ CCK 5.5Mbps



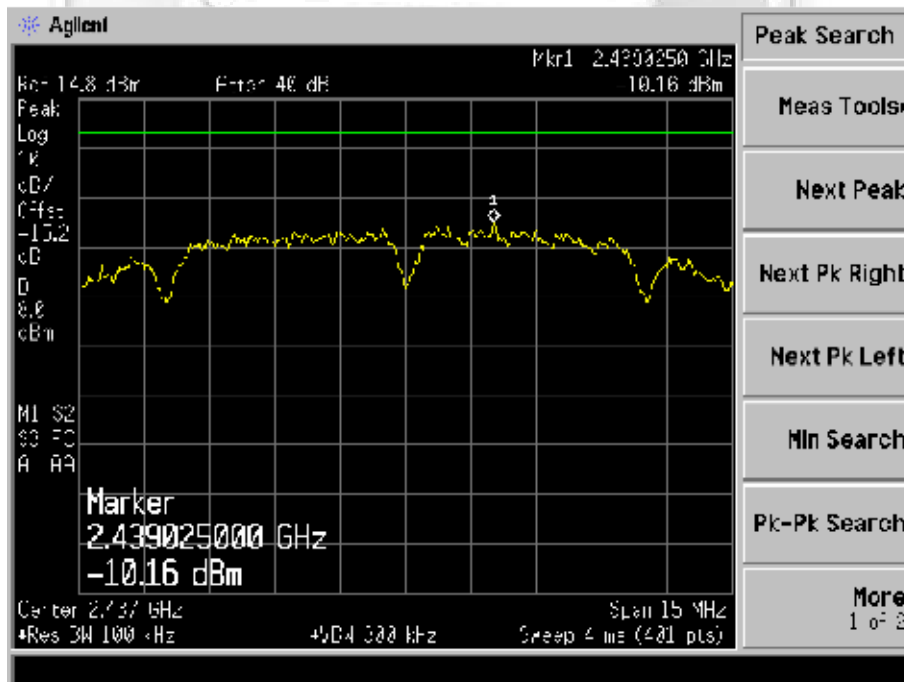
Plot 314 – Channel 1 @ CCK 11Mbps

PEAK POWER SPECTRAL DENSITY TEST

Peak Power Spectral Density Plots - 802.11b



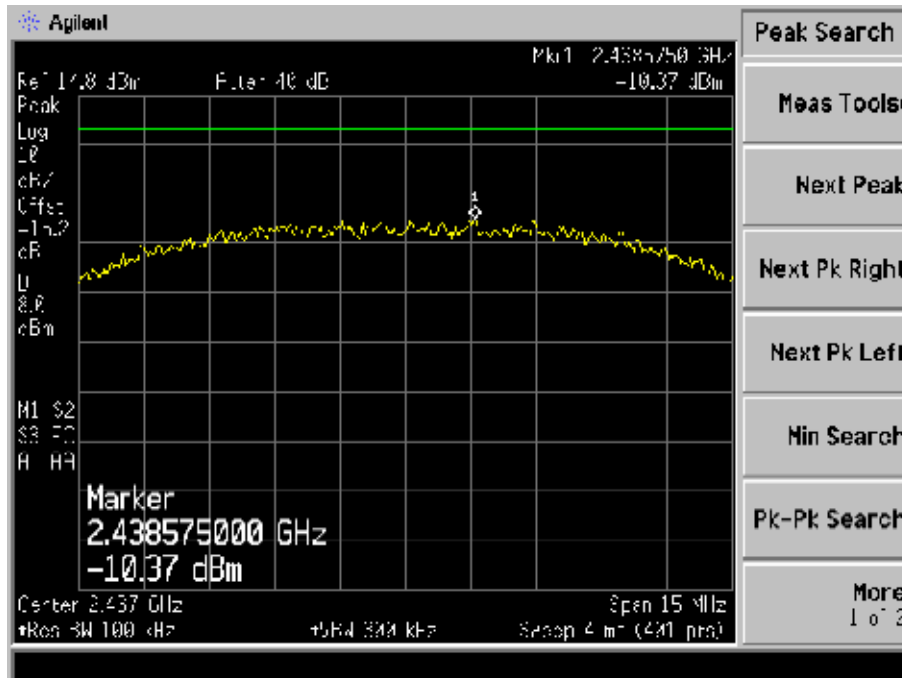
Plot 315 – Channel 6 @ DBPSK 1Mbps



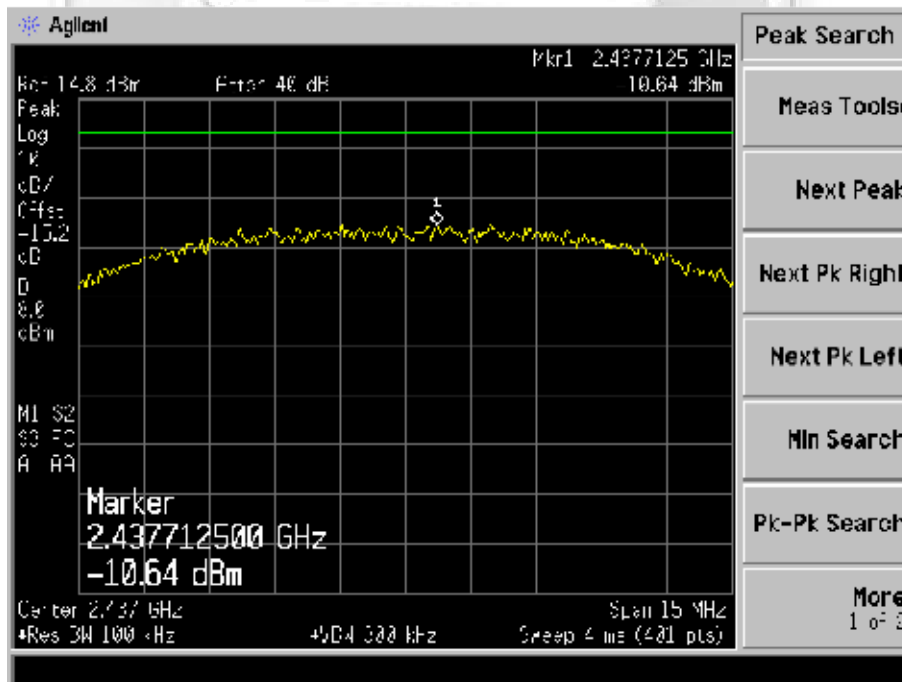
Plot 316 – Channel 6 @ DQPSK 2Mbps

PEAK POWER SPECTRAL DENSITY TEST

Peak Power Spectral Density Plots - 802.11b



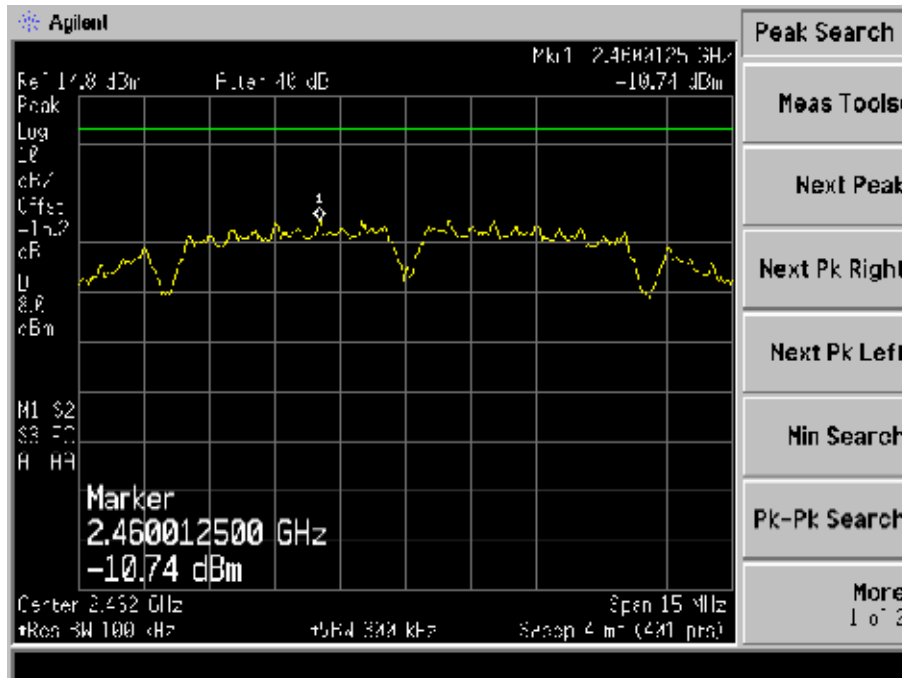
Plot 317 – Channel 6 @ CCK 5.5Mbps



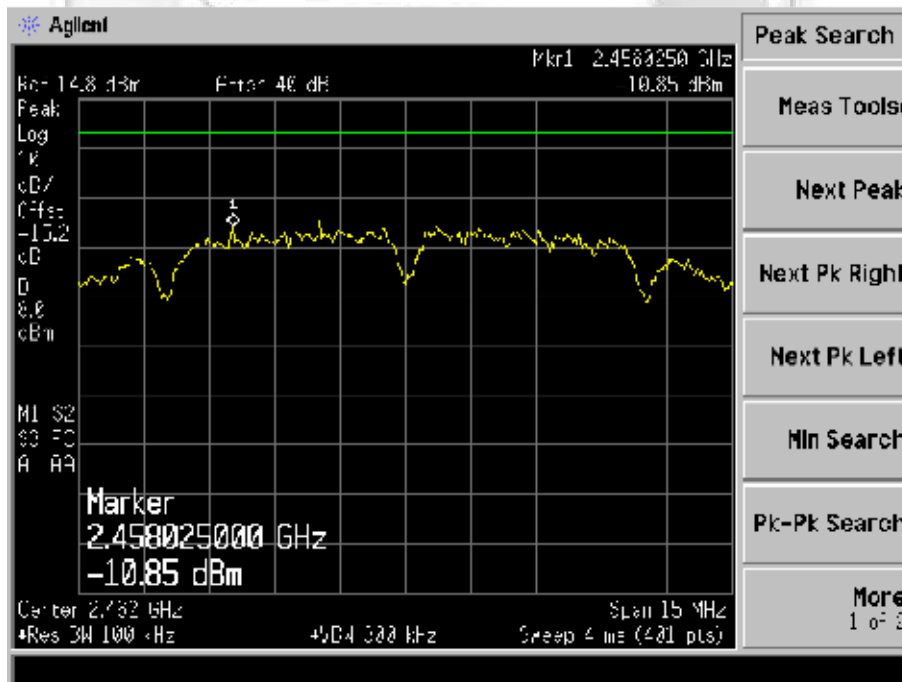
Plot 318 – Channel 6 @ CCK 11Mbps

PEAK POWER SPECTRAL DENSITY TEST

Peak Power Spectral Density Plots - 802.11b



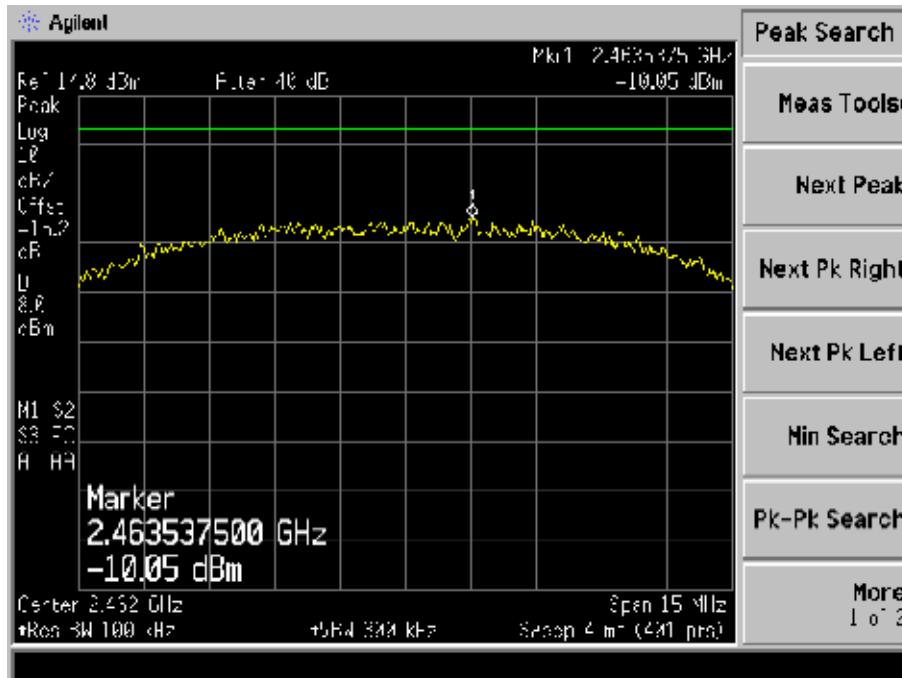
Plot 319 – Channel 11 @ DBPSK 1Mbps



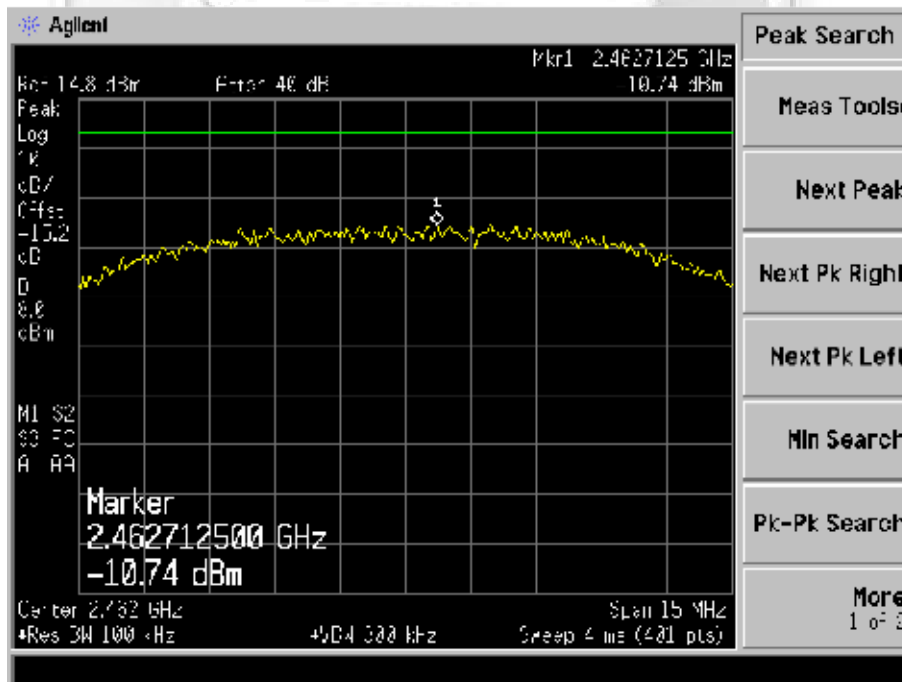
Plot 320 – Channel 11 @ DQPSK 2Mbps

PEAK POWER SPECTRAL DENSITY TEST

Peak Power Spectral Density Plots - 802.11b



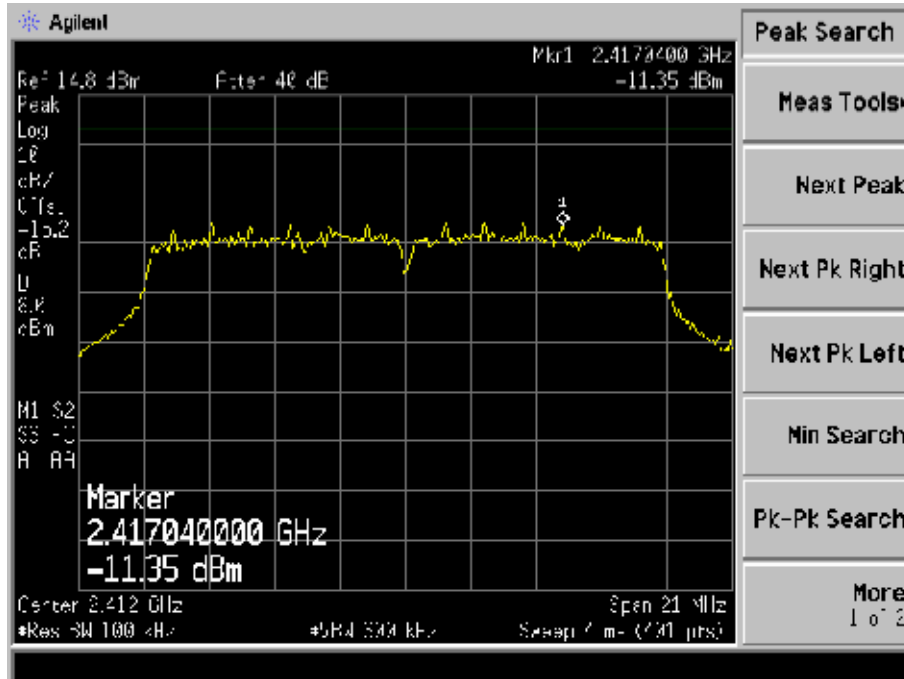
Plot 321 - Channel 11 @ CCK 5.5Mbps



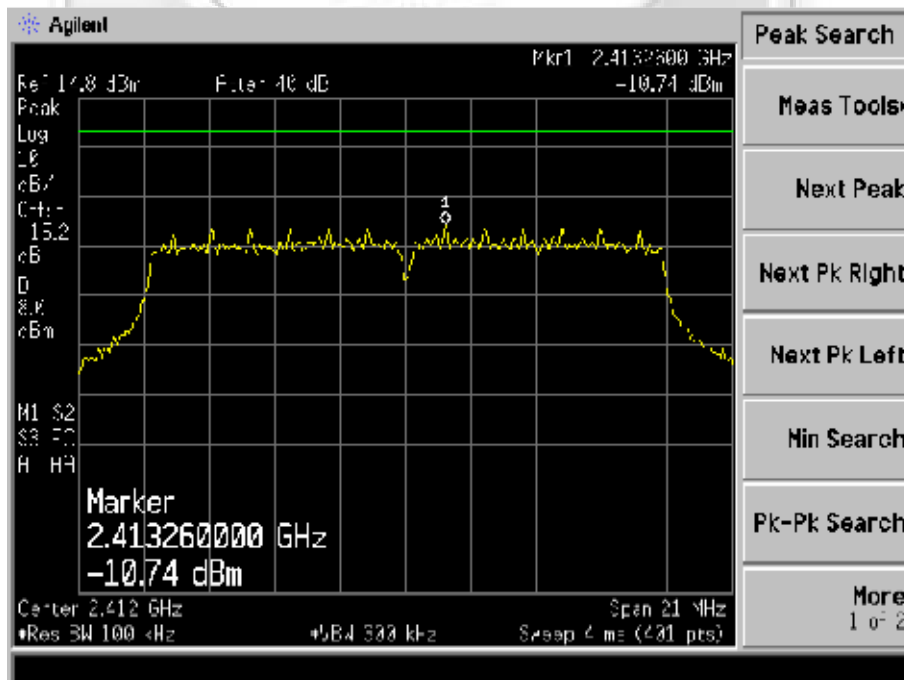
Plot 322 - Channel 11 @ CCK 11Mbps

PEAK POWER SPECTRAL DENSITY TEST

Peak Power Spectral Density Plots – 802.11g



Plot 323 – Channel 1 @ BPSK 9Mbps

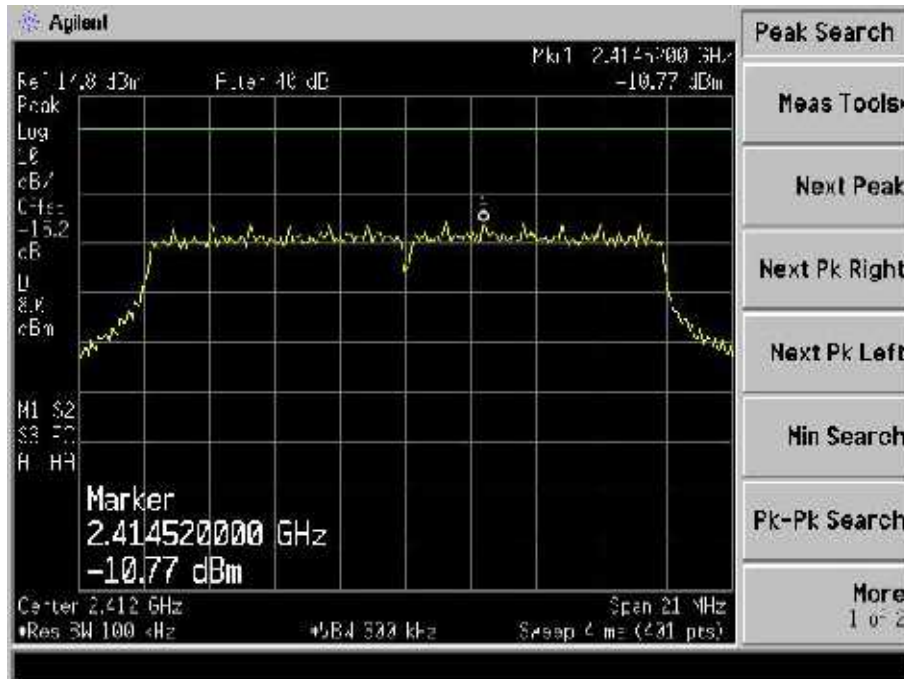


Plot 324 – Channel 1 @ QPSK 18Mbps

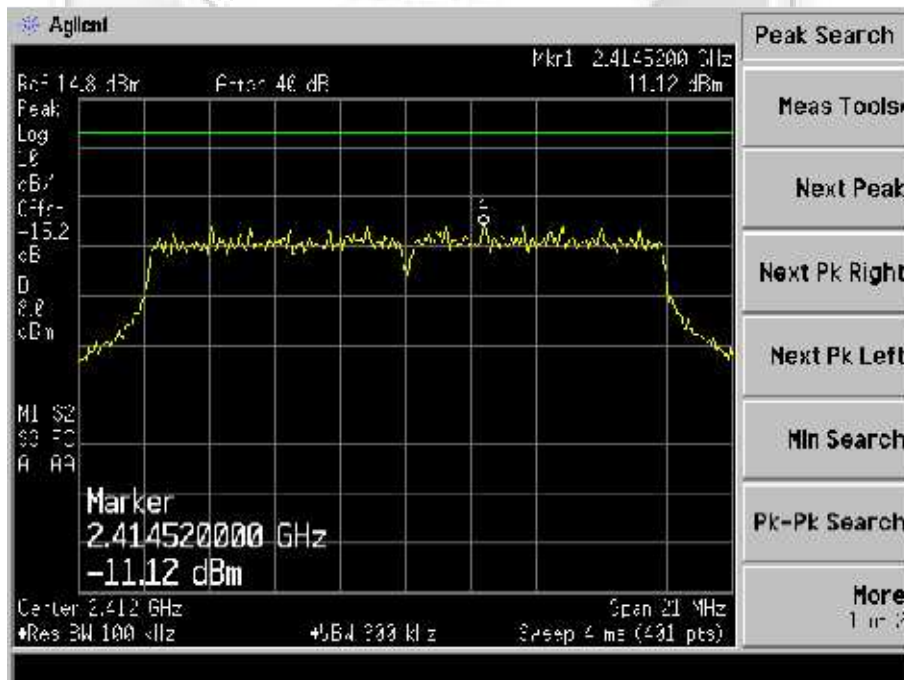


PEAK POWER SPECTRAL DENSITY TEST

Peak Power Spectral Density Plots – 802.11g



Plot 325 – Channel 1 @ 16QAM 36Mbps

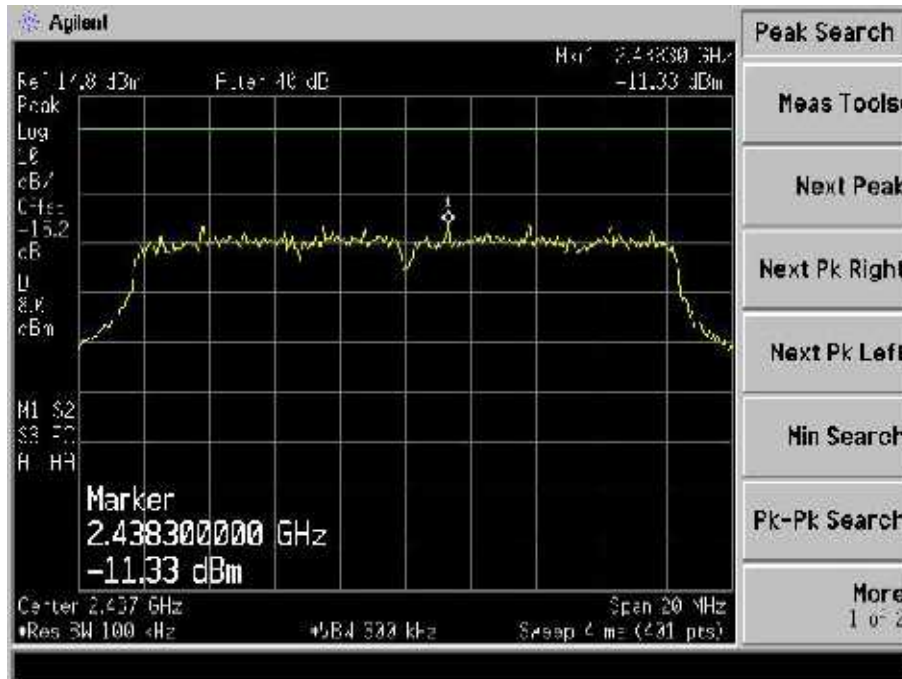


Plot 326 – Channel 1 @ 64QAM 54Mbps

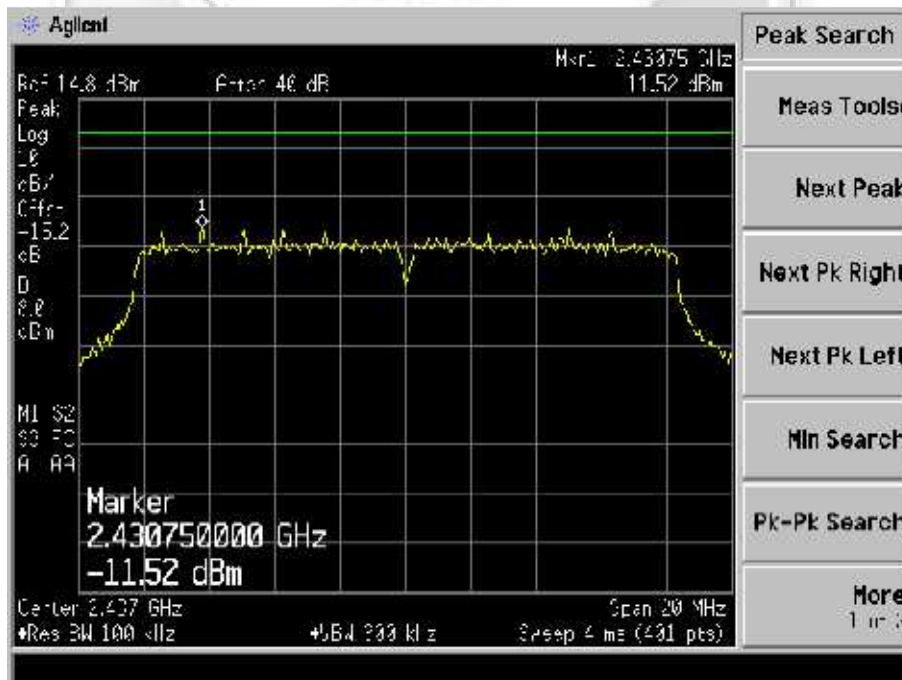


PEAK POWER SPECTRAL DENSITY TEST

Peak Power Spectral Density Plots – 802.11g



Plot 327 – Channel 6 @ BPSK 9Mbps

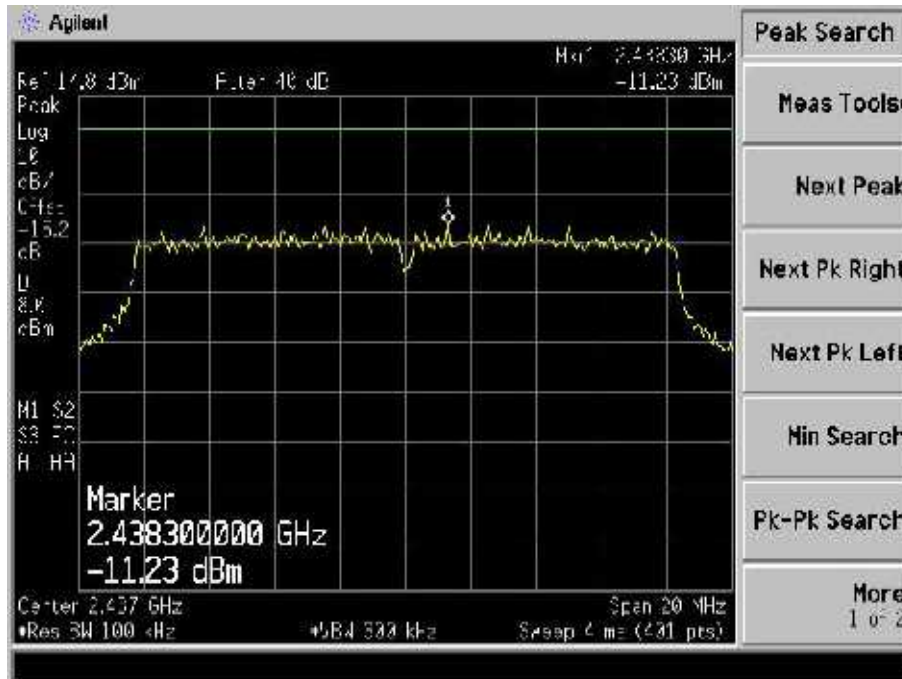


Plot 328 – Channel 6 @ QPSK 18Mbps

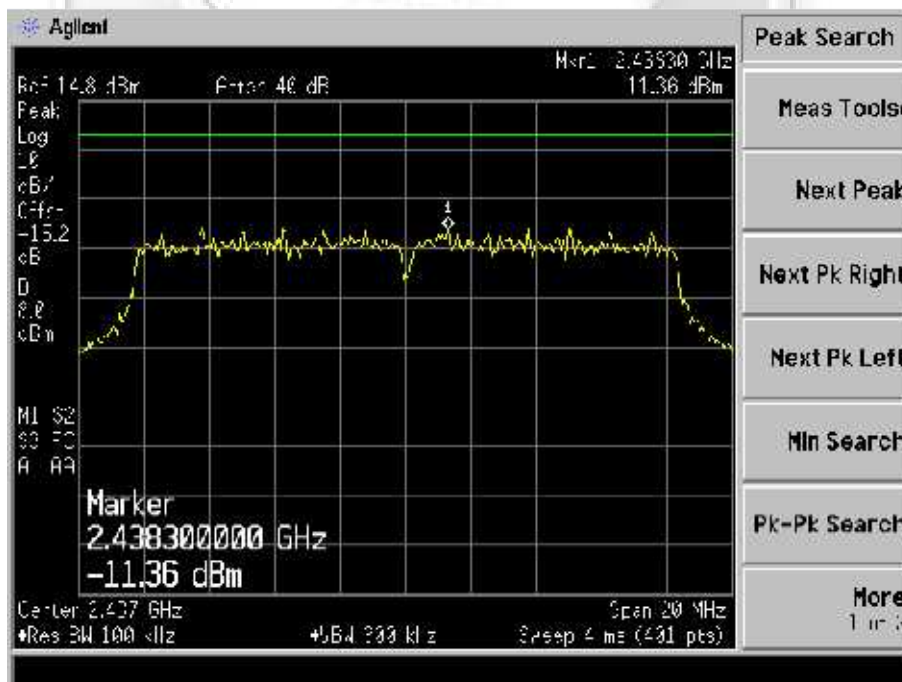


PEAK POWER SPECTRAL DENSITY TEST

Peak Power Spectral Density Plots – 802.11g



Plot 329 – Channel 6 @ 16QAM 36Mbps

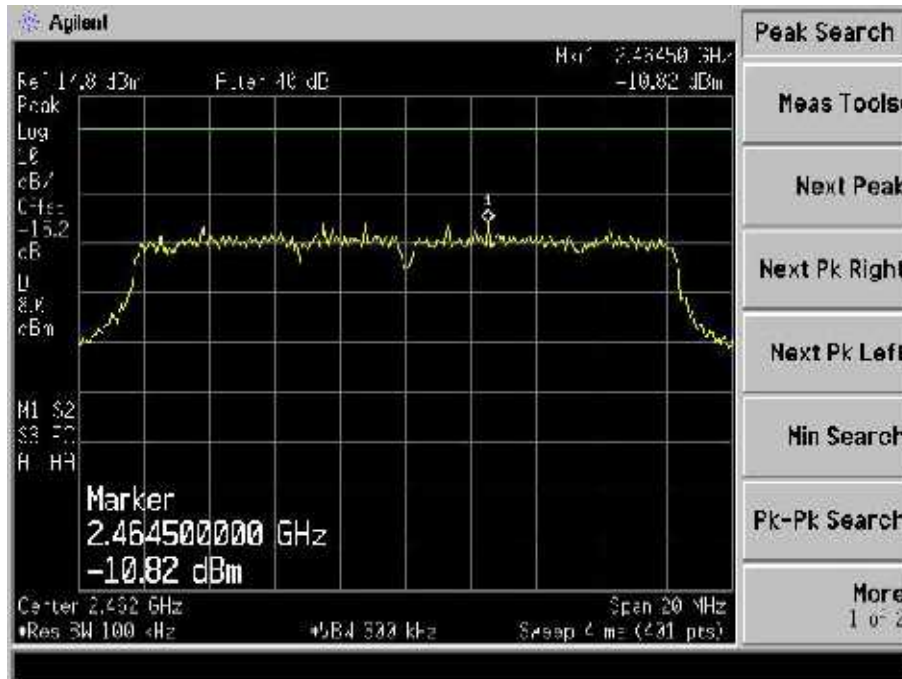


Plot 330 – Channel 6 @ 64QAM 54Mbps

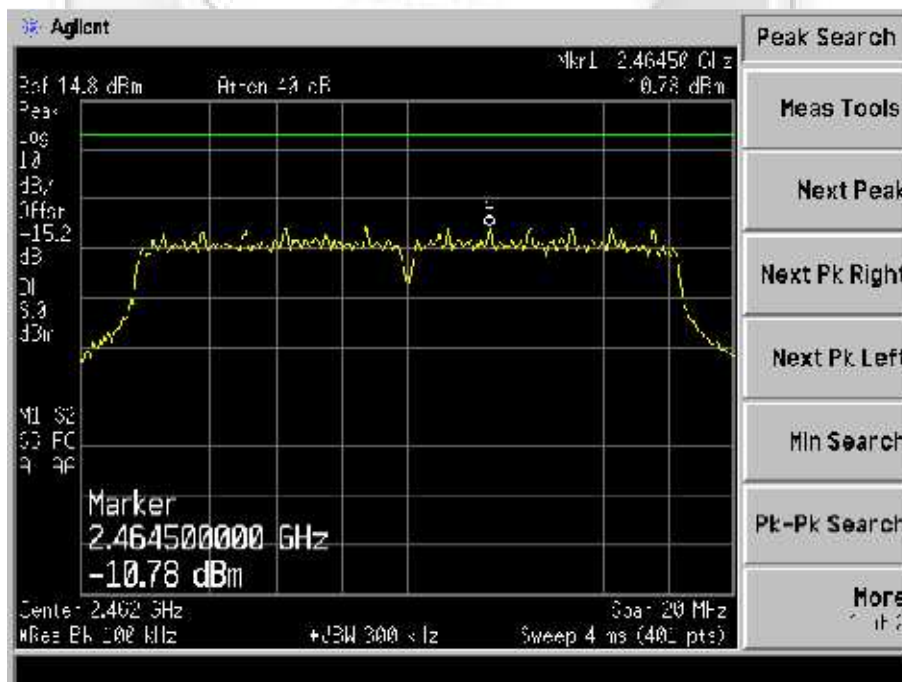


PEAK POWER SPECTRAL DENSITY TEST

Peak Power Spectral Density Plots – 802.11g



Plot 331 – Channel 11 @ BPSK 9Mbps

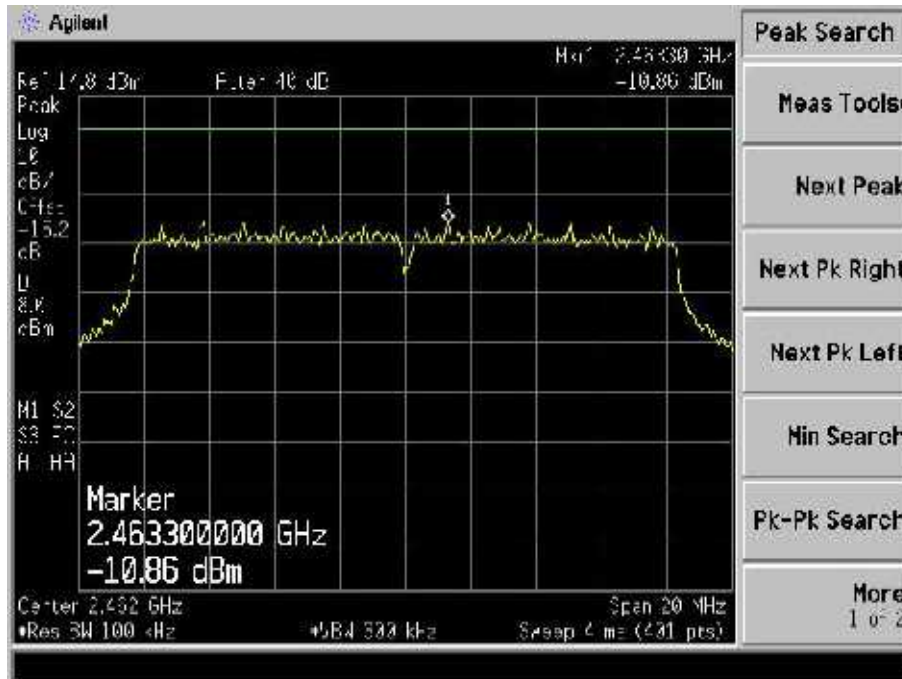


Plot 332 – Channel 11 @ QPSK 18Mbps

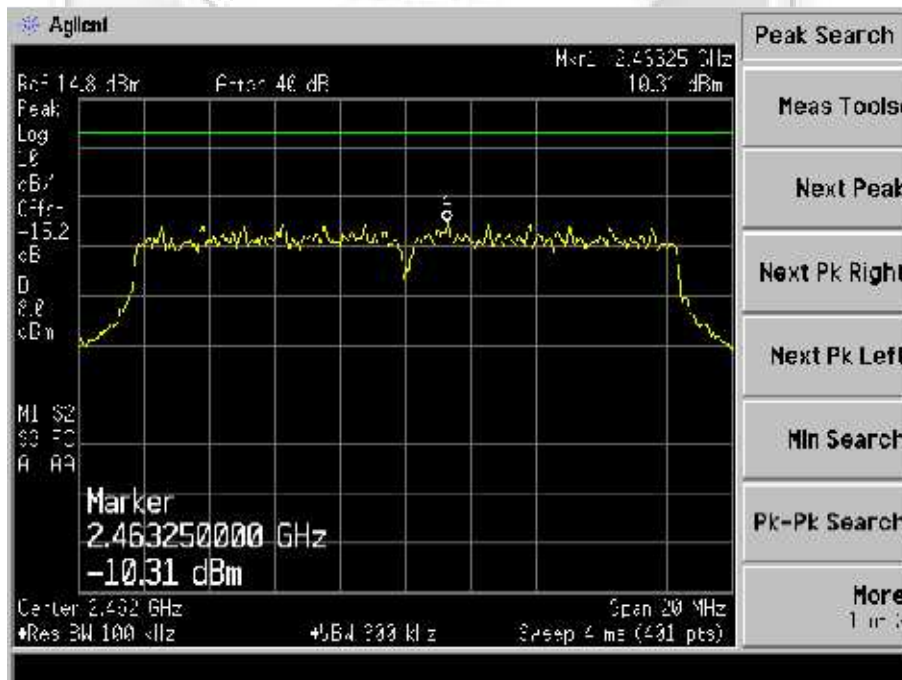


PEAK POWER SPECTRAL DENSITY TEST

Peak Power Spectral Density Plots – 802.11g



Plot 333 – Channel 11 @ 16QAM 36Mbps



Plot 334 – Channel 11 @ 64QAM 54Mbps

MAXIMUM PERMISSIBLE EXPOSURE (MPE) TEST

47 CFR FCC Part 1.1310 Maximum Permissible Exposure (MPE) Limits

The EUT shows compliance to the requirements of this section, which states the MPE limits for general population / uncontrolled exposure are as shown below:

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Average Time (min)
0.3 - 1.34	614	1.63	100 ^{Note 2}	30
1.34 - 30	824 / f	2.19 / f	180 / f ² ^{Note 2}	30
30 - 300	27.5	0.073	0.2	30
300 - 1500	-	-	f / 1500	30
1500 - 100000	-	-	1.0	30
Notes				
1.	f = frequency in MHz			
2.	Plane wave equivalent power density			

47 CFR FCC Part 1.1310 Maximum Permissible Exposure Computation

The power density at 20cm distance was computed from the following formula:

$$S = \frac{(30GP)}{(377d^2)}$$

where

- S = Power density in W/m²
- P = 0.0350W
- d = Test distance at 0.2m
- G = Numerical isotropic gain, 1.00 (0.0dBi)

Substituting the relevant parameters into the formula:

$$S = \frac{[(30GP)]}{377d^2}$$

$$= 0.0811 \text{ W/m}^2$$

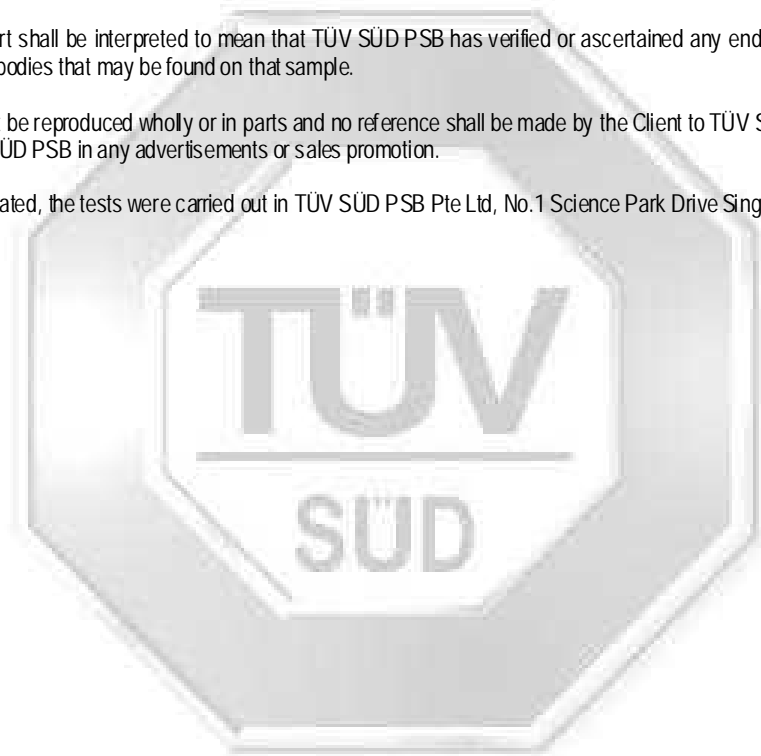
$$= 0.0082 \text{ mW/cm}^2$$

∴ The power density of the EUT at 20cm distance is 0.0082mW/cm² based on the above computation and found to be lower than the power density limit of 1.0mW/cm².

Please note that this Report is issued under the following terms :

1. This report applies to the sample of the specific product/equipment given at the time of its testing/calibration. The results are not used to indicate or imply that they are applicable to other similar items. In addition, such results must not be used to indicate or imply that TÜV SÜD PSB approves, recommends or endorses the manufacturer, supplier or user of such product/equipment, or that TÜV SÜD PSB in any way "guarantees" the later performance of the product/equipment. Unless otherwise stated in this report, no tests were conducted to determine long term effects of using the specific product/equipment.
2. The sample/s mentioned in this report is/are submitted/supplied/manufactured by the Client. TÜV SÜD PSB therefore assumes no responsibility for the accuracy of information on the brand name, model number, origin of manufacture, consignment or any information supplied.
3. Nothing in this report shall be interpreted to mean that TÜV SÜD PSB has verified or ascertained any endorsement or marks from any other testing authority or bodies that may be found on that sample.
4. This report shall not be reproduced wholly or in parts and no reference shall be made by the Client to TÜV SÜD PSB or to the report or results furnished by TÜV SÜD PSB in any advertisements or sales promotion.
5. Unless otherwise stated, the tests were carried out in TÜV SÜD PSB Pte Ltd, No.1 Science Park Drive Singapore 118221.

July 2011



ANNEX A EUT PHOTOGRAPHS / DIAGRAMS



ANNEX A EUT PHOTOGRAPHS / DIAGRAMS

EUT PHOTOGRAPHS – MAIN UNIT



Front View



Rear View

ANNEX A EUT PHOTOGRAPHS / DIAGRAMS

EUT PHOTOGRAPHS – HANDSET



Front View



Rear View

ANNEX A EUT PHOTOGRAPHS / DIAGRAMS

EUT PHOTOGRAPHS – ANTENNA UNIT



Front View



Internal View

ANNEX A EUT PHOTOGRAPHS / DIAGRAMS

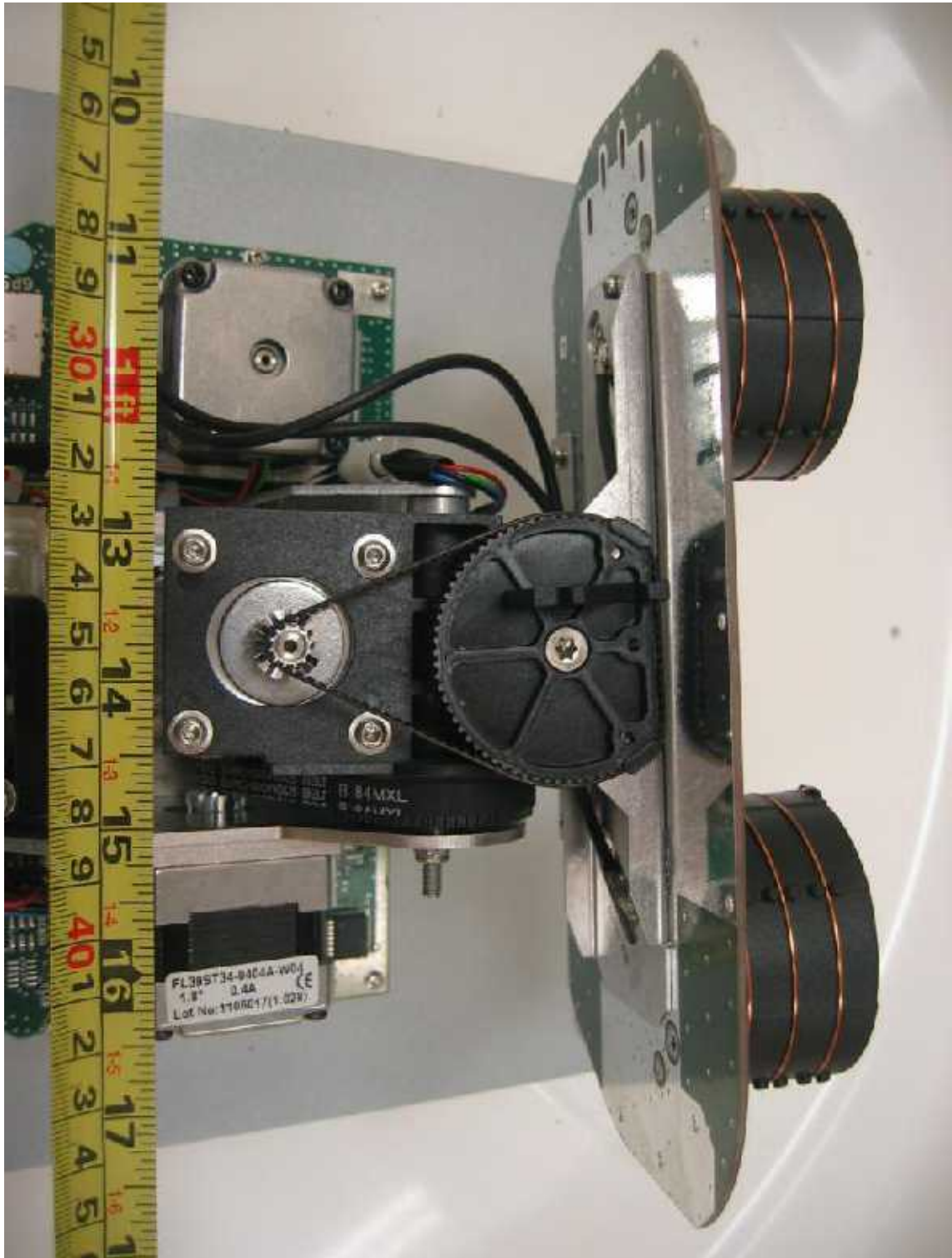
EUT PHOTOGRAPHS – ANTENNA UNIT



Antenna Component View

ANNEX A EUT PHOTOGRAPHS / DIAGRAMS

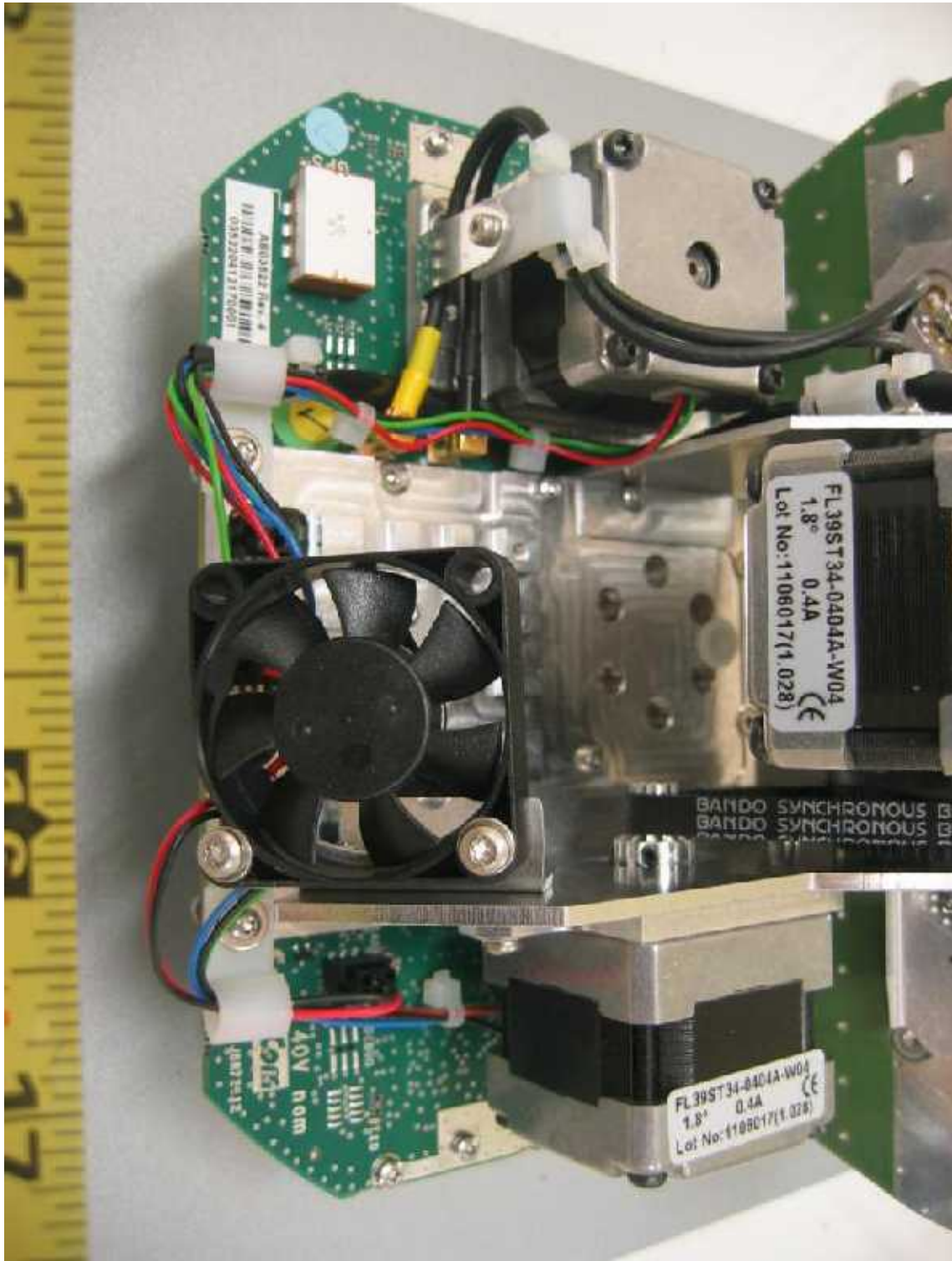
EUT PHOTOGRAPHS – ANTENNA UNIT



Antenna Trace View

ANNEX A EUT PHOTOGRAPHS / DIAGRAMS

EUT PHOTOGRAPHS – ANTENNA UNIT



RF ATC Board PCB Component Side

ANNEX A EUT PHOTOGRAPHS / DIAGRAMS

EUT PHOTOGRAPHS – MAIN UNIT



Internal View

ANNEX A EUT PHOTOGRAPHS / DIAGRAMS

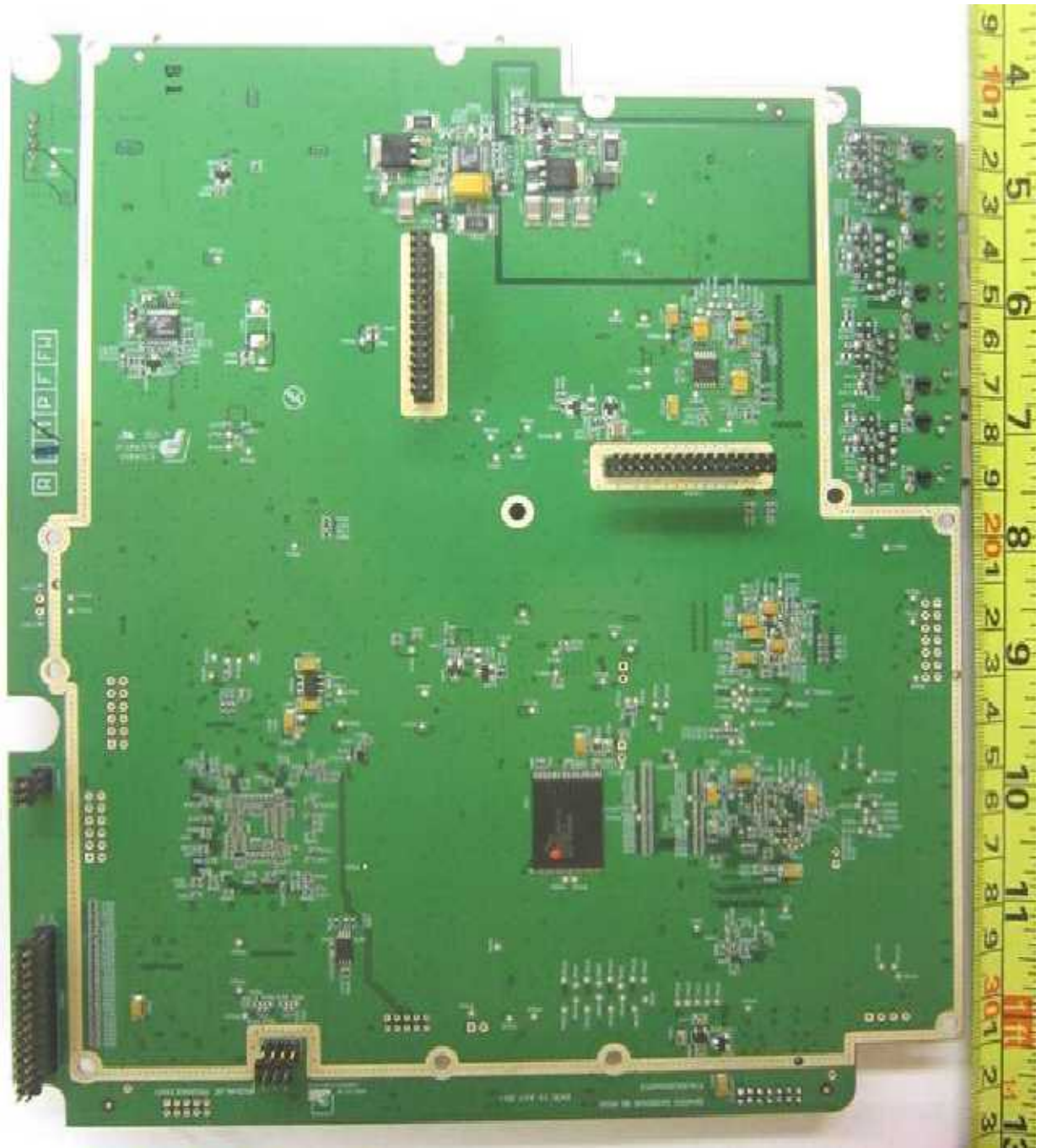
EUT PHOTOGRAPHS – MAIN UNIT



BaseBand PCB Component Side

ANNEX A EUT PHOTOGRAPHS / DIAGRAMS

EUT PHOTOGRAPHS – MAIN UNIT



BaseBand PCB Trace Side

ANNEX A EUT PHOTOGRAPHS / DIAGRAMS

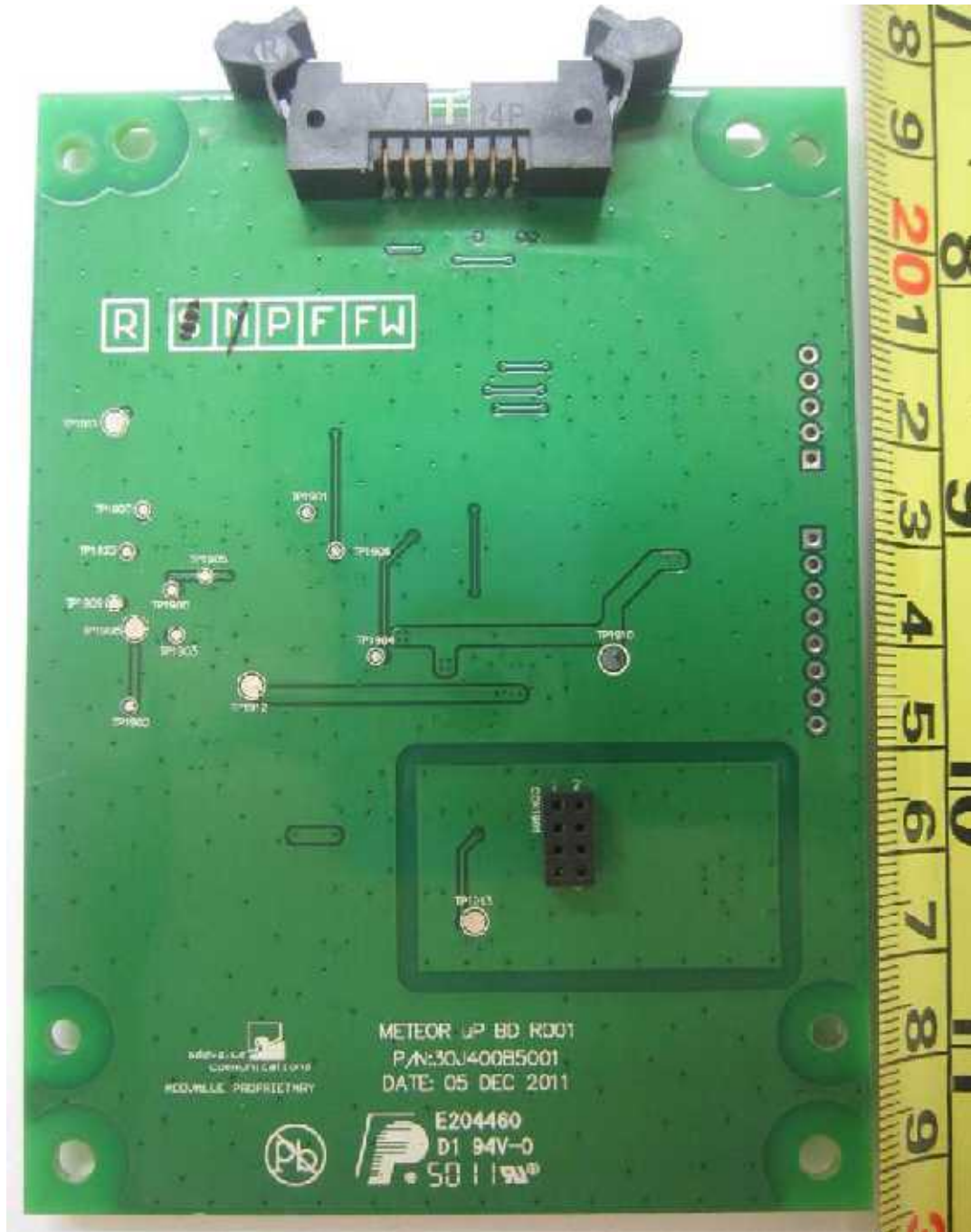
EUT PHOTOGRAPHS – MAIN UNIT



Microprocessor Board PCB Component Side

ANNEX A EUT PHOTOGRAPHS / DIAGRAMS

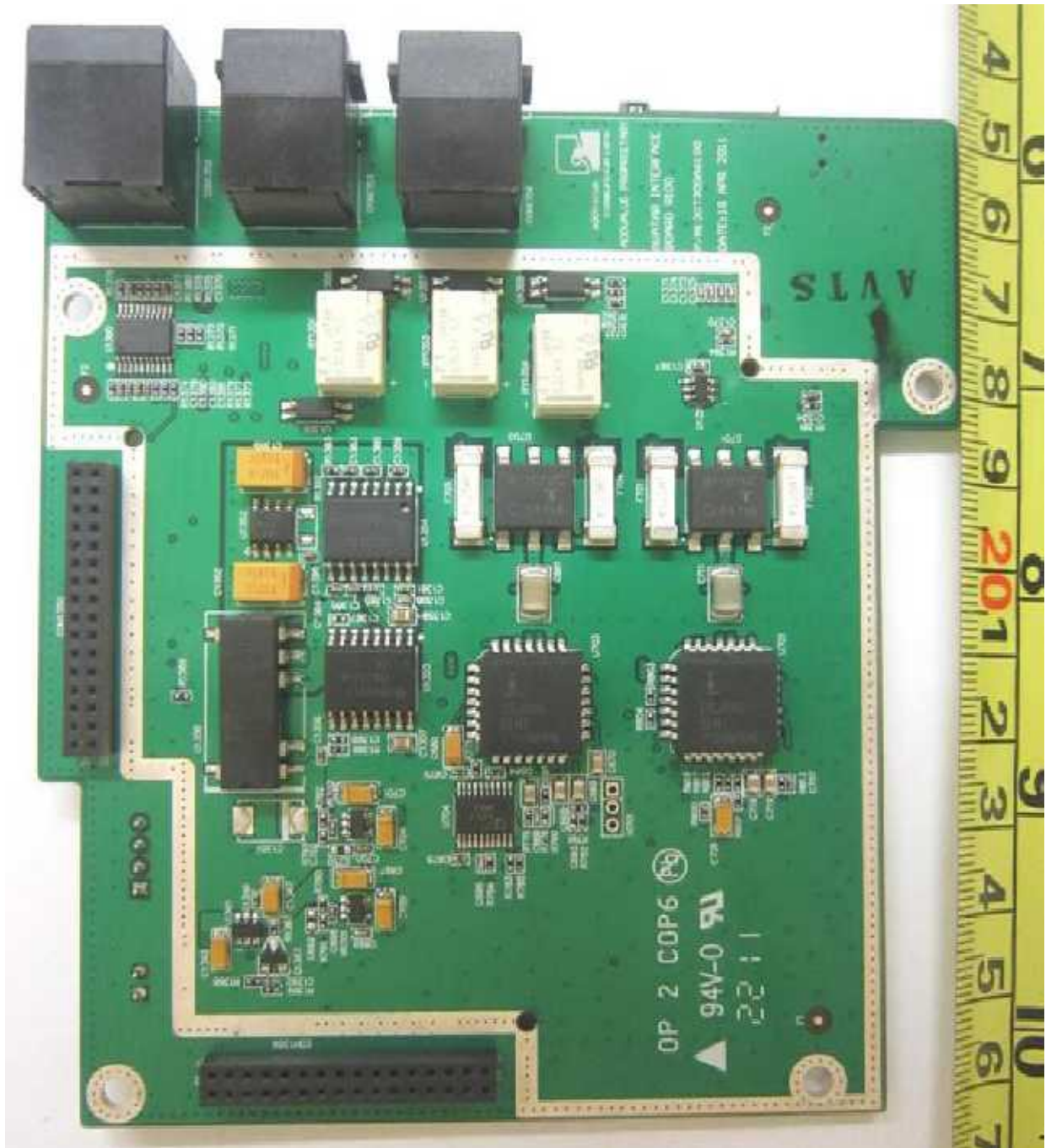
EUT PHOTOGRAPHS – MAIN UNIT



Microprocessor Board PCB Trace Side

ANNEX A EUT PHOTOGRAPHS / DIAGRAMS

EUT PHOTOGRAPHS – MAIN UNIT



Interface Board PCB Component Side

ANNEX A EUT PHOTOGRAPHS / DIAGRAMS

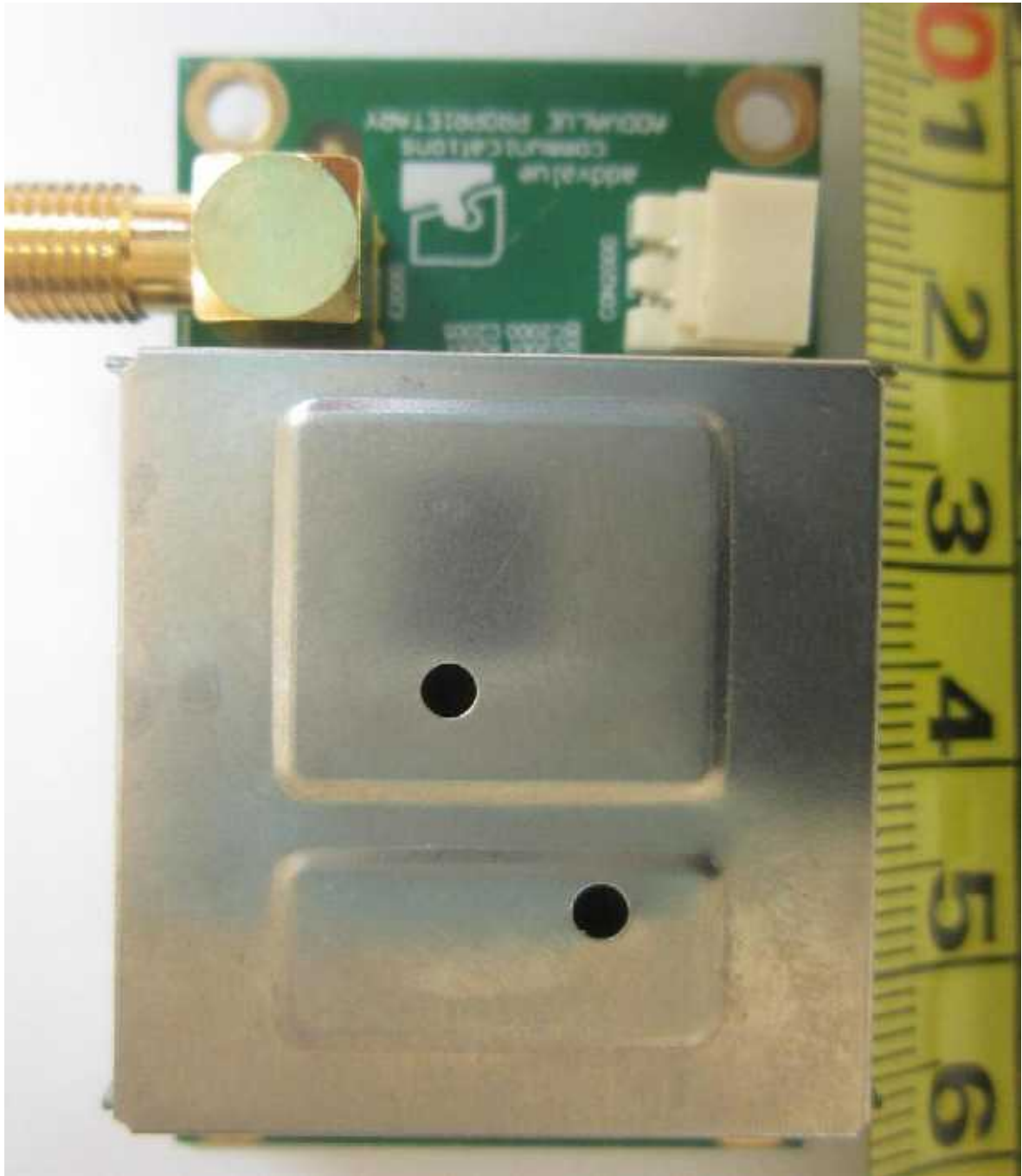
EUT PHOTOGRAPHS – MAIN UNIT



Interface Board PCB Trace Side

ANNEX A EUT PHOTOGRAPHS / DIAGRAMS

EUT PHOTOGRAPHS – MAIN UNIT



Crystal Board PCB Component Side

ANNEX A EUT PHOTOGRAPHS / DIAGRAMS

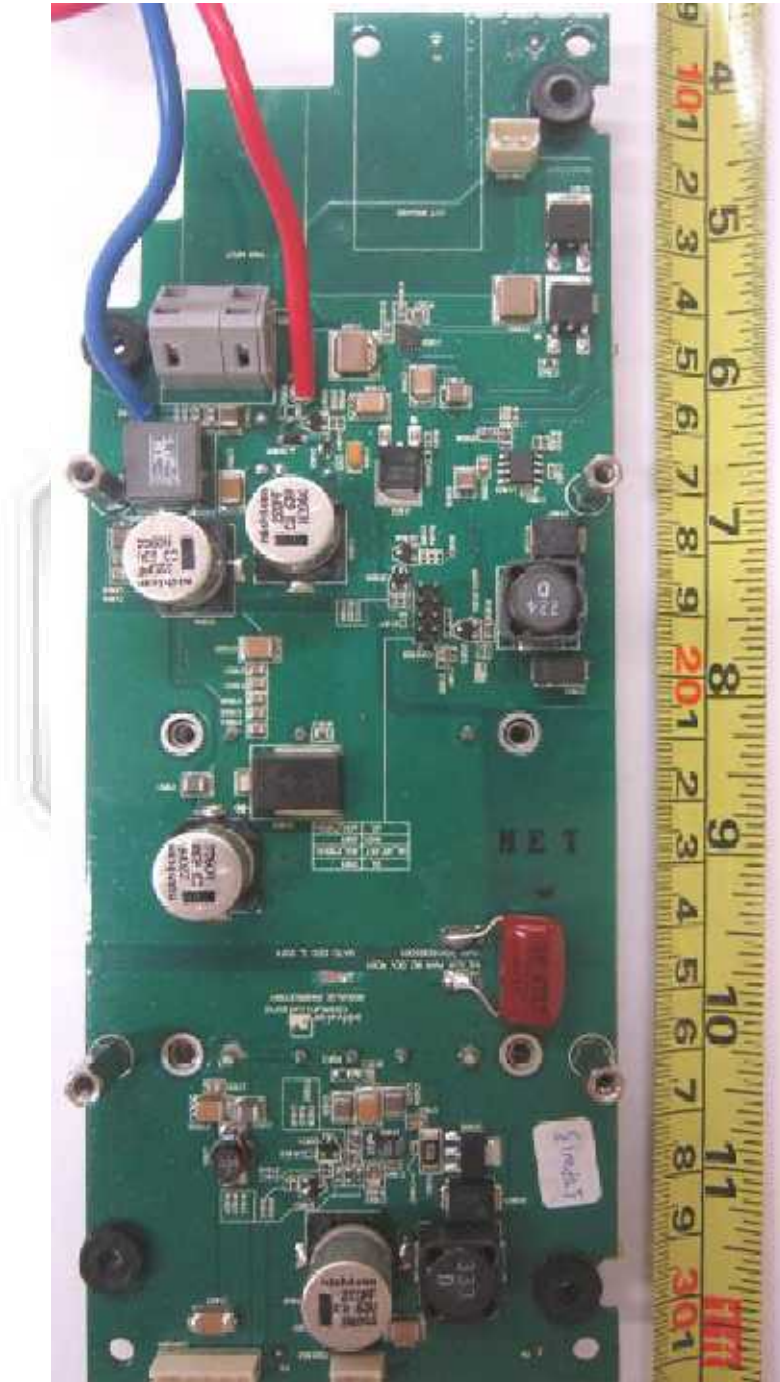
EUT PHOTOGRAPHS – MAIN UNIT



Crystal Board PCB Trace Side

ANNEX A EUT PHOTOGRAPHS / DIAGRAMS

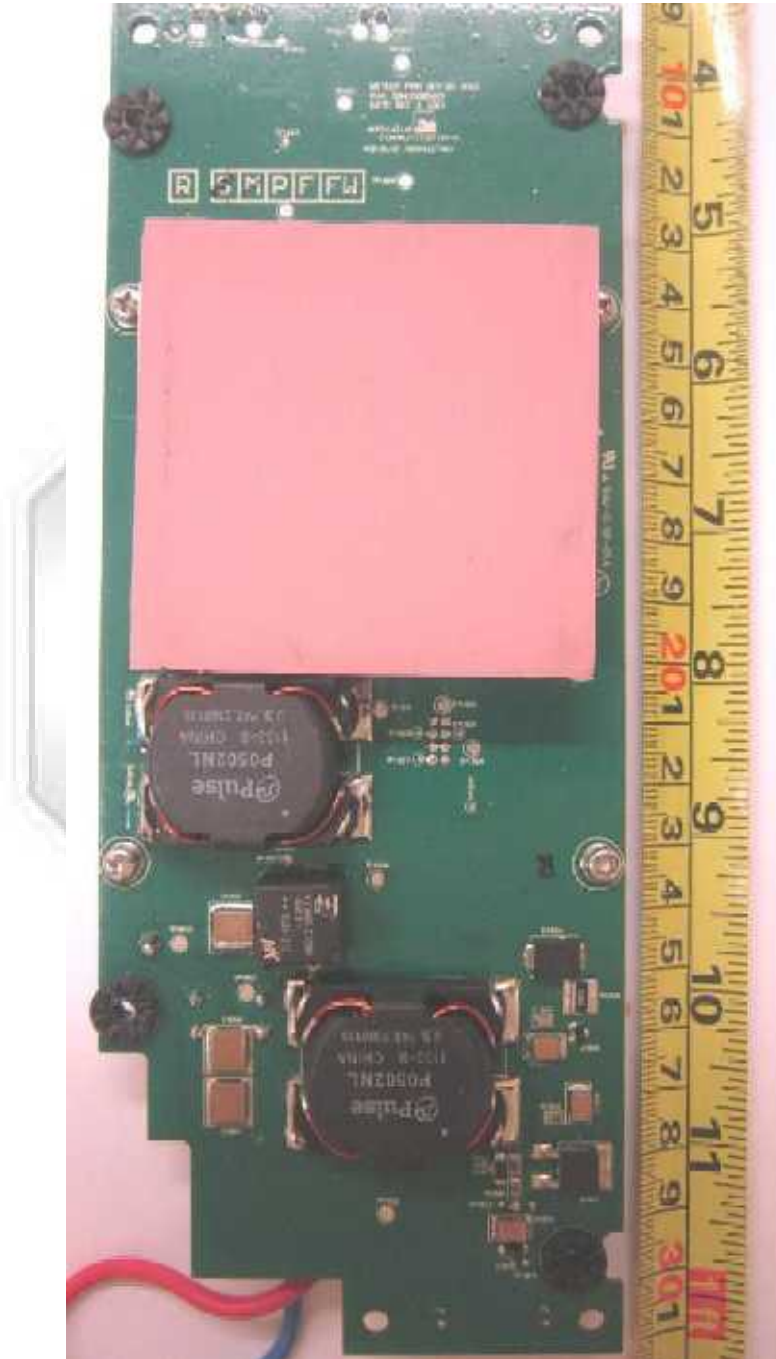
EUT PHOTOGRAPHS – MAIN UNIT



Power Supply PCB Component Side

ANNEX A EUT PHOTOGRAPHS / DIAGRAMS

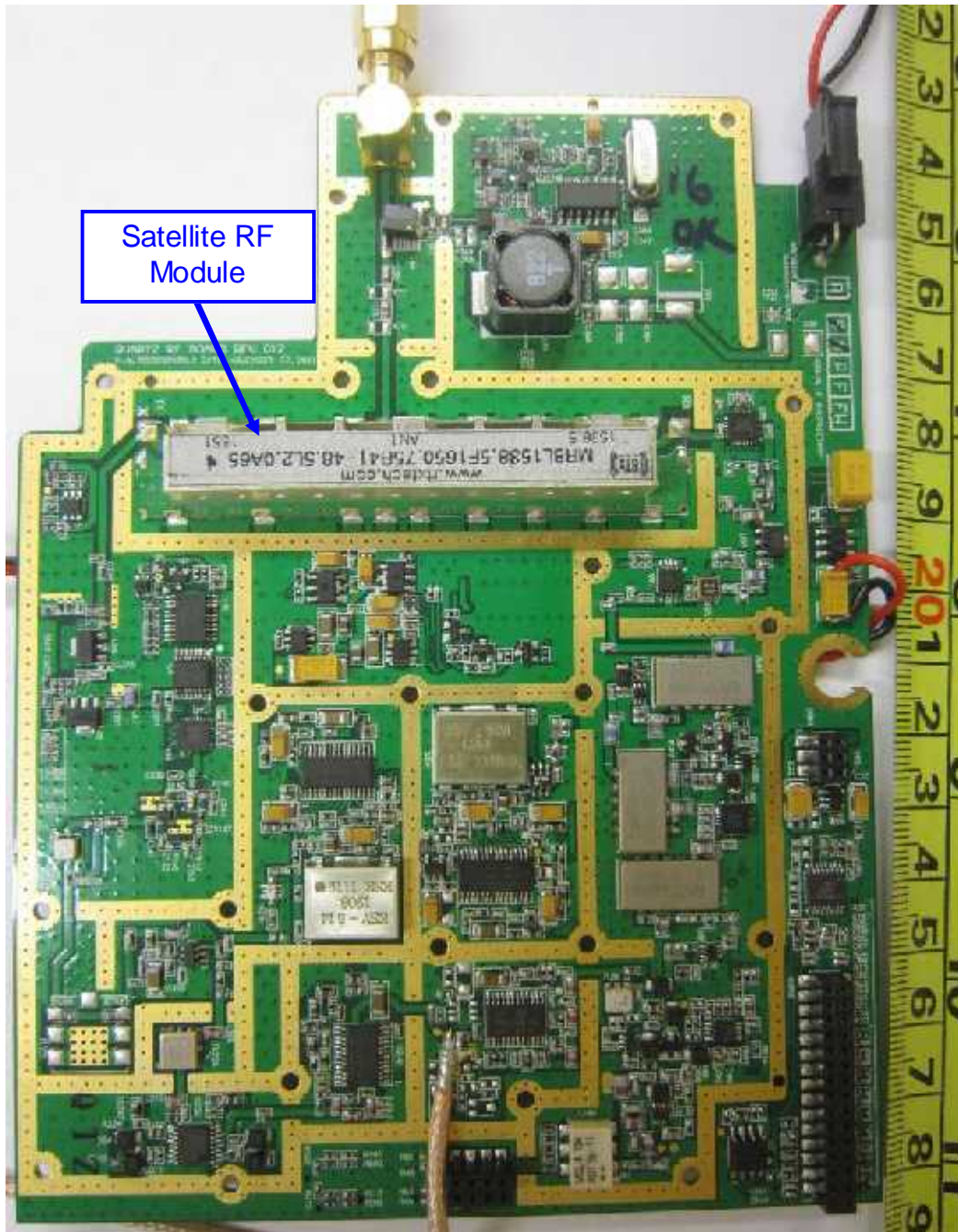
EUT PHOTOGRAPHS – MAIN UNIT



Power Supply PCB Trace Side

ANNEX A EUT PHOTOGRAPHS / DIAGRAMS

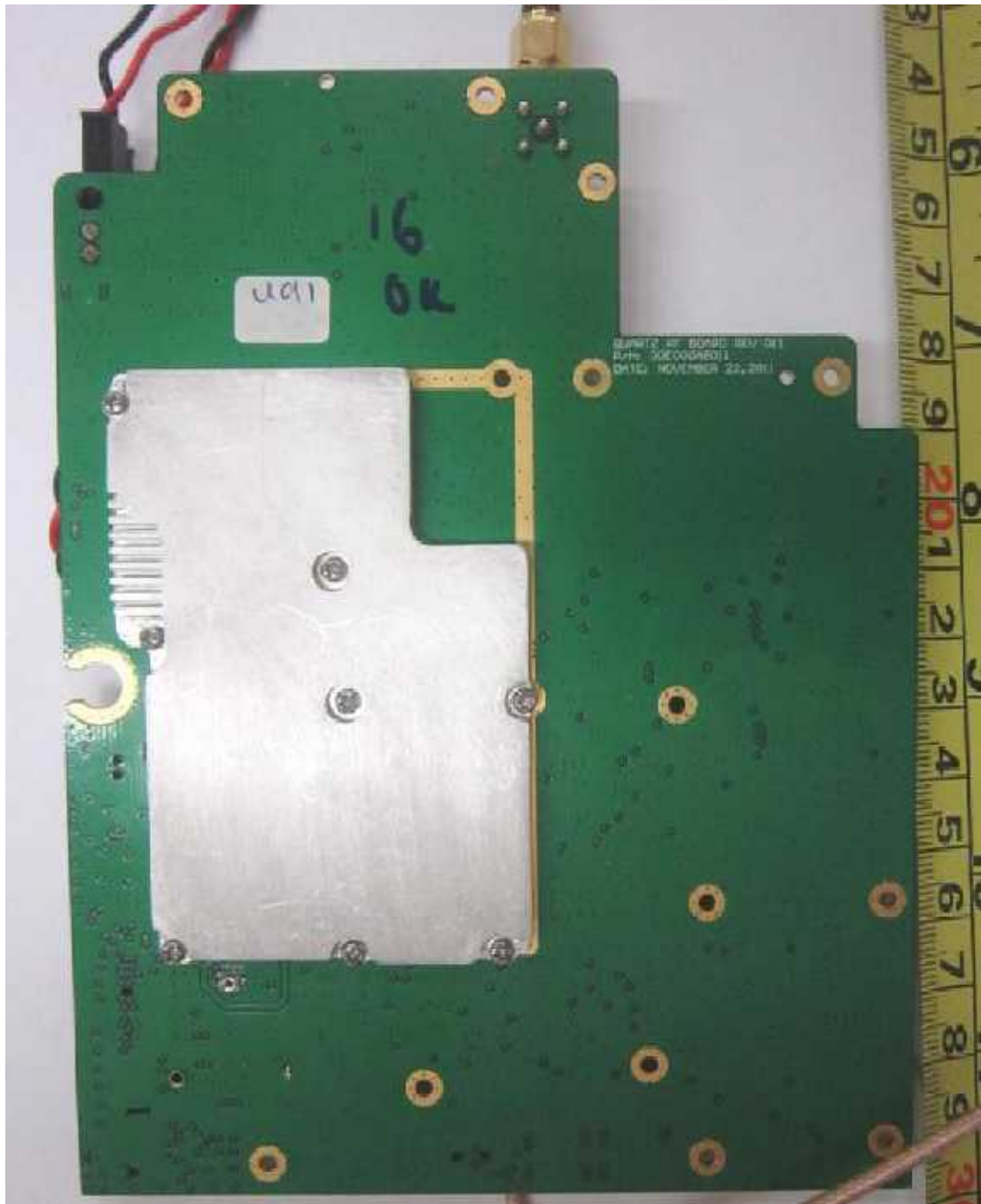
EUT PHOTOGRAPHS – MAIN UNIT



RF Module PCB Component Side

ANNEX A EUT PHOTOGRAPHS / DIAGRAMS

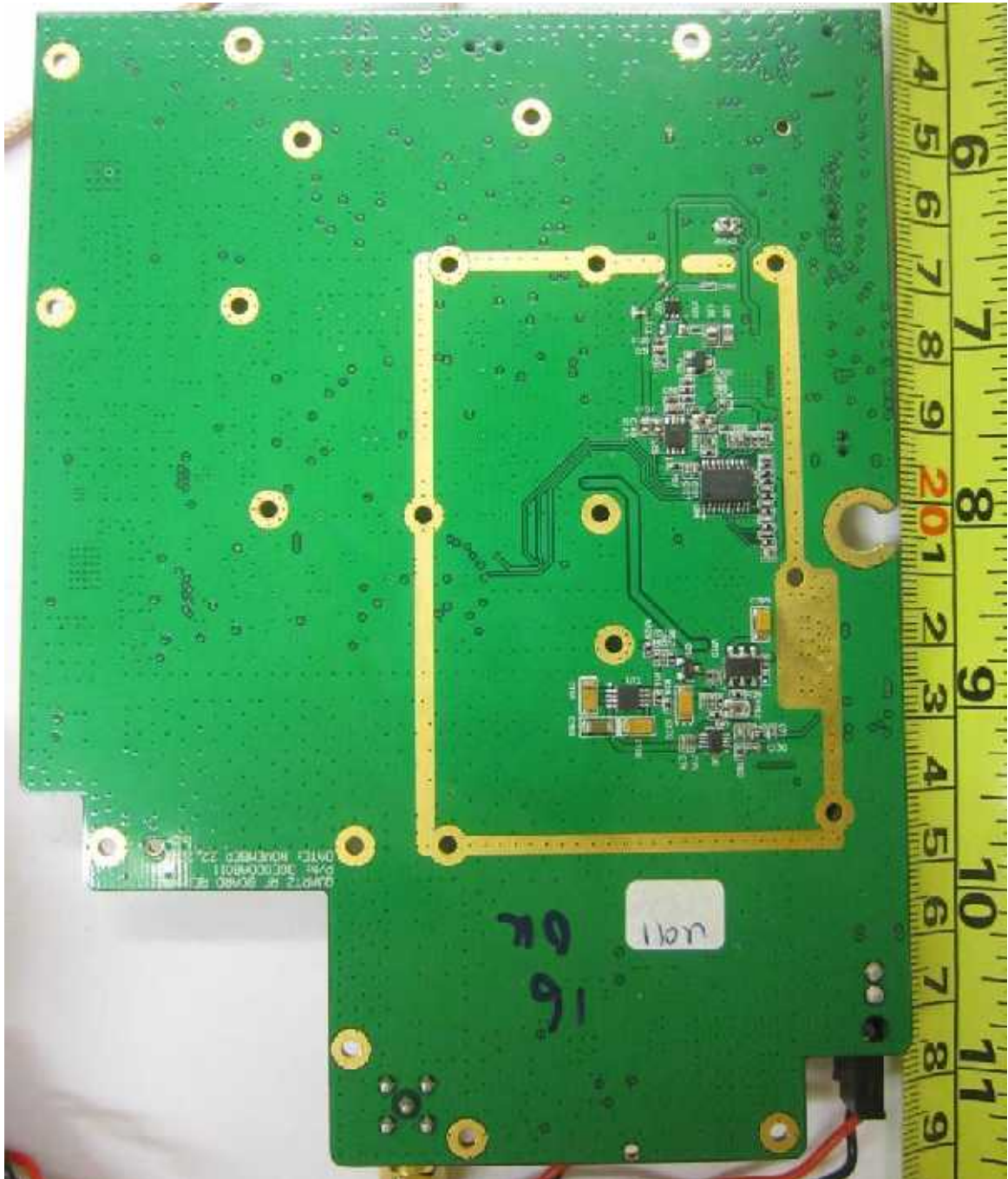
EUT PHOTOGRAPHS – MAIN UNIT



RF Module PCB Trace Side

ANNEX A EUT PHOTOGRAPHS / DIAGRAMS

EUT PHOTOGRAPHS



RF Module Circuit with RF Shield Removed

ANNEX A EUT PHOTOGRAPHS / DIAGRAMS

EUT PHOTOGRAPHS – MAIN UNIT



WiFi Module PCB Component Side

ANNEX A EUT PHOTOGRAPHS / DIAGRAMS

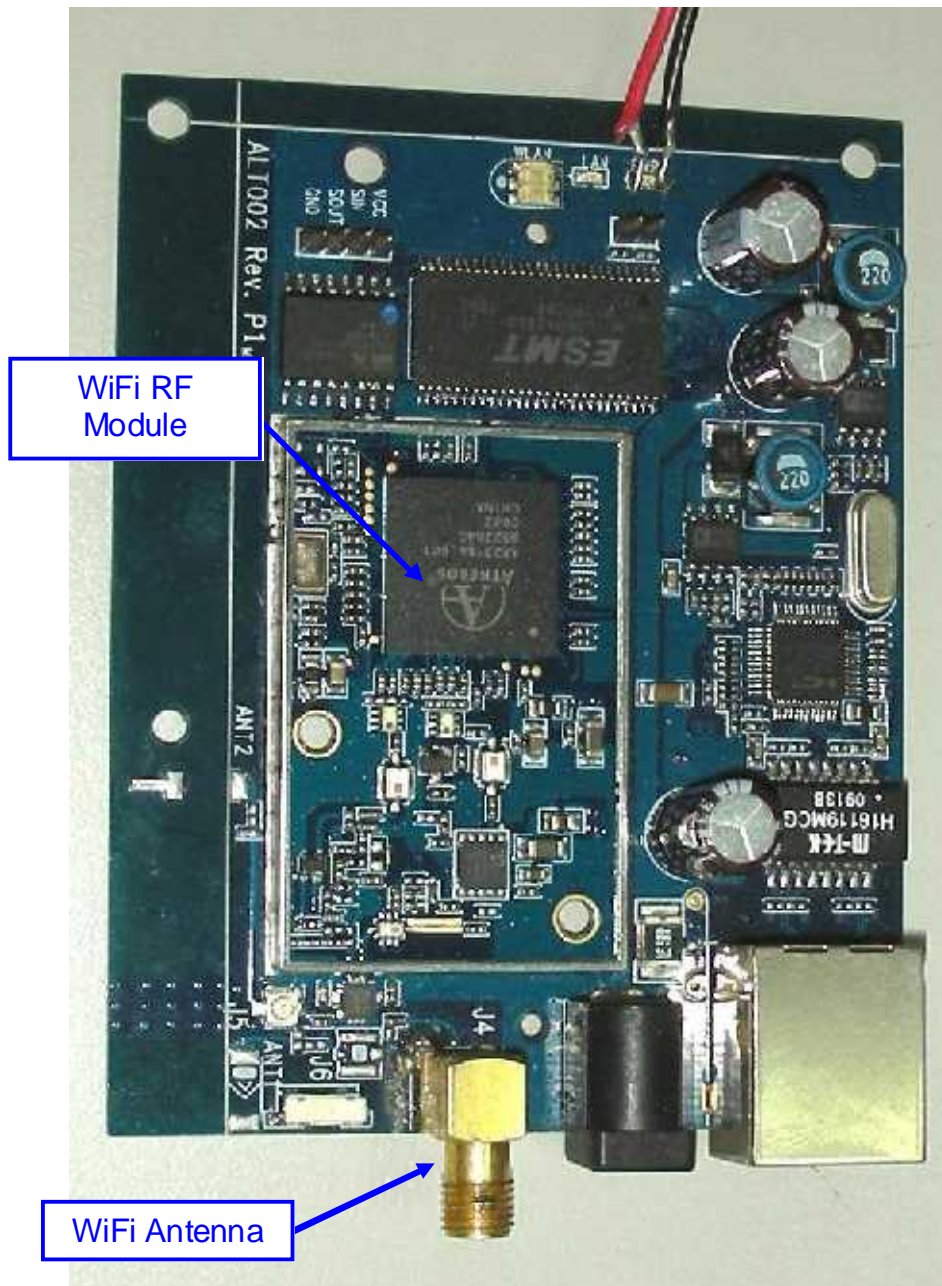
EUT PHOTOGRAPHS – MAIN UNIT



WiFi Module PCB Trace Side

ANNEX A EUT PHOTOGRAPHS / DIAGRAMS

EUT PHOTOGRAPHS



WiFi Module Circuit with RF Shield Removed Component Side

ANNEX A EUT PHOTOGRAPHS / DIAGRAMS

EUT PHOTOGRAPHS



WiFi Module Circuit with RF Shield Removed Trace Side

ANNEX B USER MANUAL TECHNICAL DESCRIPTION BLOCK & CIRCUIT DIAGRAMS



ANNEX C FCC LABEL & POSITION



ANNEX C FCC LABEL & POSITION

Labelling requirements per Section 2.925 & 15.19

The label shown will be permanently affixed at a conspicuous location on the device and be readily visible to the user at the time of purchase.



MODEL: FX 250
PART NUMBER: 136550
POWER: DC 12V, 15A / 24V, 7.5A (180W MAX)

Sea Tel
COBHAM

FCC **C** **€** **1177** **!** **RoHS** **2002/95/EC**

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC ID:BJF-STFX250BDE
IC:10236A-FX250BDE

Made in Malaysia Designed in Singapore

addvalue
enabled

Sample Label



Physical Location of FCC Label on EUT