Nemko Korea CO., Ltd.

300-2, Osan-Ri, Mohyeon-Myeon, Cheoin-Gu, Yongin-City, Gyeonggi-Do, KOREA
TEL:+82 31 322 2333 FAX:+82 31 322 2332

FCC EVALUATION REPORT FOR CERTIFICATION

Applicant :
Kyocera Wireless Corp.
10300 Campus Point Drive San Diego,
CA 92121 USA

Dates of Issue : October, 31, 2008
Test Report No. : NK08R228
Test Site : Nemko Korea Co., Ltd.

FCC ID	*OVFKWC-C3900*
Brand Name	**Kyocera**
CONTACT PERSON	**Kyocera Wireless Corp.** **10300 Campus Point Drive San Diego,** **CA92121 USA** **Mr. C.K.Li** **Telephone No. : +1 858 882 3945**

Applied Standard: FCC 47 CFR Part 27 & 2
Equipment Class: Public Mobile Services
EUT Type: Wi-max USB MODEM

The device bearing the brand name and FCC ID specified above has been shown to comply with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.4-2003.
I attest to the accuracy of data and all measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

Tested By : Minchul Shin
Engineer

Reviewed By : H.H. Kim
Manager & Chief Engineer

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1. Scope

Measurement and determination of electromagnetic emissions (EME) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission under FCC Part 2 & Part 27.

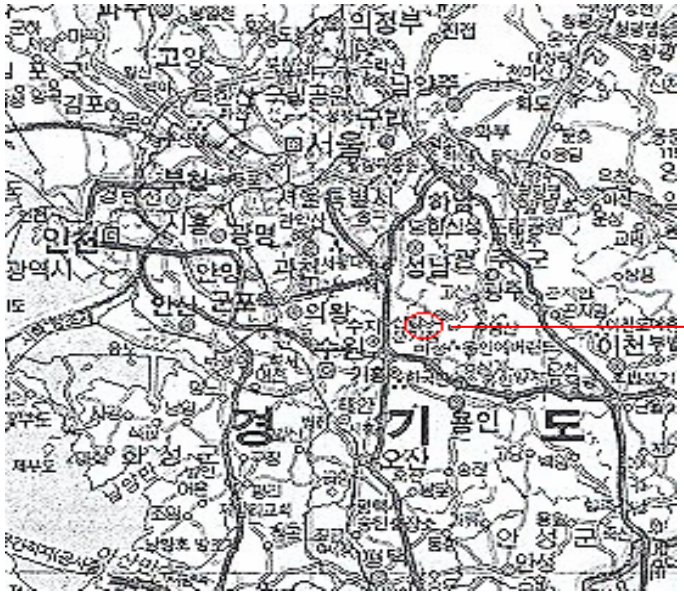
Responsible Party :	Kyocera Wireless Corp.
Contact Person :	Mr. C.K.Li Tel No. : +1 858 882 3945
Manufacturer :	Kyocera Wireless Corp. 10300 Campus Point Drive San Diego, CA 92121 USA

- FCC ID: OVFKWC-C3900
- Model: C3900
- Brand Name: Kyocera
- EUT Type: Wi-max USB MODEM
- Electric Rating: +5 Vdc from USB port
- Equipment Class: Public Mobile Service
- Applied Standard: FCC 47 CFR Part 2
FCC 47 CFR Part 27
- Test Procedure(s): ANSI C63.4 (2003), DA 02-2138(2002)
- Dates of Test: October 20, 2008 to October 30, 2008
- Place of Tests: Nemko Korea Co., Ltd.

2. Introduction (Site Description)

The measurement procedure described in American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9kHz to 40GHz (ANSI C63.4-2003) was used in determining radiated and conducted emissions emanating from **Kyocera Wireless Corp.**
FCC ID : **OVFKWC-C3900**

These measurement tests were conducted at ***Nemko Korea Co., Ltd.***
The site address is 300-2, Osan-Ri, Mohyeon-Myeon, Cheoin-Gu, Yongin-Si, Gyeonggi-Do, KOREA
The area of Nemko Korea Corporation Ltd. Test site is located in a mountain area at 80 kilometers (48 miles) southeast and Incheon International Airport (Incheon Airport), 30 kilometers (18miles) south-southeast from central Seoul.
It is located in the valley surrounded by mountains in all directions where ambient radio signal conditions are quiet and a favorable area to measure the radio frequency interference on open field test site for the computing and ISM devices manufactures.
The detailed description of the measurement facility was found to be in compliance with the requirements of § 2.948 according to ANSI C63.4 2003.



Nemko Korea Co., Ltd.
300-2,Osan-Ri,Mohyeon-Myeon,
Cheoin-Gu, Yongin-Si, Gyunggi-Do,
KOREA 449-852
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Fig. 1. The map above shows the Seoul in Korea vicinity area.
The map also shows Nemko Korea Corporation Ltd. and Incheon Airport.

3. Test Conditions & EUT Information

Operating During Test

The EUT was tested at the lowest channel, middle channel and the highest channel with maximum RF power and all data were recorded in the report.

Environmental Conditions

Temperature	20℃ ~ 25℃
Relative Humidity	40% ~ 65%

Description of EUT

Frequency Band	Tx	2501 MHz ~ 2685 MHz
	Rx	2501 MHz ~ 2685 MHz
Output Power	QPSK : EIRP 0.423 W(26.26 dBm) 16QAM : EIRP 0.381 W(25.81 dBm)	
Access / Duplex	OFDMA / TDD	
Interface	USB port	
Modulation	QPSK,16QAM	
Demodulation	QPSK,16QAM,64QAM	
Channel Bandwidth	10 MHz	
Data Throughput	Downlink : 30 Mbps, Uplink : 6 Mbps	
Antenna Type	PCB Pattern Antenna (Internal)	
Antenna Gain	2.76 dBi	
Dimensions	27 mm x 62mm x 11 mm	
Weight	Approx. 18 g	
Operating Conditions	-20°C ~ +60°C	

4. Measuring Instrument Calibration

All measurements were made with instruments calibrated according to the recommendation by manufacturer. Measurement of radiated emissions and conducted emissions were made with instruments conforming to American National Standards Institute, ANSI C63.4-2003.
The calibration of measuring instrument, including any accessories that may affect test results, were performed according to the recommendation by manufacturer.

- End of page -

5. Summary of Test Results

The EUT has been tested according to the following specification:

Description of Test	FCC Rule	Result
Occupied Bandwidth	§2.1049 §27.53(l)(6)	Complies
Band Edge	§2.1051 §27.53(l)(4)(6)	Complies
Conducted Spurious Emissions	§2.1051 §27.53(l)(4)(6)	Complies
Conducted Output Power and Equivalent Isotropic Radiated Power	§2.1051 §27.50(h)(2)	Complies
Radiated Spurious Emissions	§2.1053 §27.53(l)(4)	Complies
Frequency Stability / Temperature Variation	§2.1055 §27.54	Complies

6. Recommendation / Conclusion

The data collected shows that the **Kyocera Wireless Corp.**
FCC ID : **OVFKWC-C3900, Wi-max USB MODEM.**
The highest emission observed was at 479.99 MHz for conducted emissions with a Ave. margin of **3.5 dB,** at 7.779 GHz for radiated emissions with a margin of **2.66 dB.**

7. Sample Calculation

7.1 Radiation for Part 15

$$dB\,\mu N = 20 \log_{10}(\mu N/m)$$

$$\mu N = 10^{(dB\,\mu N/20)}$$

EX. 1.

@165.0 MHz Class B limit = 30.0 dB μN/m

Reading = 38.2 dB μN(calibrated level)
Antenna factor + Cable Loss + Amplifier Gain = -12.9 dB
Total = 25.30 dB μN/m
Margin = 30.0 – 25.30 = 4.70
4.70 dB below the limit

7.2 Radiation for Part 27

The formula below was used to calculate the ERP/EIRP of the EUT. $P_{subst\_TX[dBm]}$, $P_{subst\_RX[dBm]}$, $L_{Cable[dB]}$ and $G_{substitute\_antenna[dBd]/[dBi]}$ factors are combined in one correction factor.

$$P_{ERP[W]} = \frac{10^{(P_{sust\_Tx[dBm]}+P_{EUT[dBm]}-P_{subst\_Rx[dBm]})+G_{subst\_antenna[dBi]}-L_{cable[dB]})/10}}{1000}$$

Where the variables are as follows:

$P_{EUT\ [dBm]}$	Measured power level from the EUT
$P_{Subst\_TX\ [dBm]}$	Power fed to the substituting antenna
$P_{Subst\_RX\ [dBm]}$	Power received with the spectrum analyzer
$G_{Substitute\_antenna\ [dBi]}$	Gain of the substitutive antenna over dipole (dBi)
$L_{Cable\ [dB]}$	Loss of the cable between signal generator and the substituting antenna

8. Test Equipment List

No.	Instrument	Manufacturer	Model	Serial No.	Calibration Date	Calibration Interval
1	Test Receiver	R & S	ESCS 30	833364/020	Apr. 01.2008	1year
2	Test Receiver	R & S	ESCS 30	100302	Dec. 04.2008	1year
3	Amplifier	HP	8447F	2805A03427	Jul. 21 2008	1year
4	Amplifier	HP	8447F	2805A03351	Oct. 23 2008	1year
5	Amplifier	HP	8449B	3008A00107	Feb. 27 2008	1year
6	Spectrum Analyzer	Advantest	R3265A	45060401	Nov. 12 2008	1year
7	Spectrum Analyzer	Agilent	E4440A	MY44303257	Sep. 03 2008	1year
8	Biconical Log Antenna	ARA	LBP-2520/A	1209	Dec. 08 2008	1year
9	Double Ridged Broadband Horn Antenna	Schwarzbeck	BBHA 9120 D	9120D-474	Jun. 13 2008	1year
10	Biconical Log Anten	ARA	LPB-2520/A	1180	Apr. 21 2008	1year
11	MXG Vector SG	Agilent	N5182A	MY48180482	Sep. 22 2008	1year
12	LISN	R & S	ESH2-Z5	100227	Sep. 02 2008	1year
13	Position Controller	DAEIL EMC	N/A	N/A	N/A	N/A
14	Turn Table	DAEIL EMC	N/A	N/A	N/A	N/A
15	Antenna Mast	DAEIL EMC	N/A	N/A	N/A	N/A
16	Anechoic Chamber	EM Eng.	N/A	N/A	N/A	N/A
17	Shielded Room	EM Eng.	N/A	N/A	N/A	N/A
18	Position Controller	Inn-co	CO2000	N/A	N/A	N/A
19	Turn Table	Inn-co	DS1200S	N/A	N/A	N/A
20	Antenna Mast	Inn-co	AS2000P	N/A	N/A	N/A
21	Anechoic Chamber	Seo-Young EMC	N/A	N/A	N/A	N/A
22	Double Ridged Broadband Horn Antenna	Schwarzbeck	BBHA 9120 D	9120D-508	Dec. 27 2007	1year
23	MXA Signal Analyzer	Agilent	N9020A	MY481010788	May. 30 2008	1year
24	Spectrum Analyzer	Agilent	E4440A	MY44022567	Sep. 09 2008	1year
25	Spectrum Analyzer	Agilent	E4440A	MY440303257	Sep. 03 2008	1year
26	Signal Generator	Agilent	E4438C	MY45092564	Feb.27.2008	1year

9. Description of Tests

9.1 Radiated Emissions

Preliminary measurements were made indoors at 3 meter using broad band antennas, broadband amplifier, and spectrum analyzer to determine the frequency producing the maximum EME. Appropriate precaution was taken to ensure that all EME from the EUT were maximized and investigated. The Technology configuration, clock speed, mode of operation or video resolution, turntable azimuth with respect to the antenna was note for each frequency found. The spectrum was scanned from 30 to 1000MHz using Biconical log Antenna (ARA, LPB-2520/A).
Final Measurements were made outdoors at 3 or 10m test range using Logbicon Super Antenna (Schwarzbeck, VULB 9166).
The test equipment was placed on a wooden table.
Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition.
Each frequency found during pre-scan measurements was reexamined and investigated using EMI test receiver (ESCS30).
The detector functions were set to CISPR quasi-peak and peak mode and the bandwidth of the receiver were set to 120 kHz and 1 MHz depending on the frequency or type of signal.
The half wave dipole antenna was tuned to the frequency found during preliminary radiated measurements.
The EUT support equipment and interconnecting cables were reconfigured to the setup producing the maximum emission for the frequency and were placed on top of a 0.8m high non- metallic 1.0X 1.5 meter table.
The EUT, support equipment and interconnecting cables were re-arranged and manipulated to maximize each EME emission.
The turn table containing the Technology was rotated; the antenna height was varied 1 to 4 meter and stopped at the azimuth or height producing the maximum emission. Each emission was maximized by : switching power lines; varying the mode of operation or resolution; clock or data exchange speed; scrolling H pattern to the EUT and of support equipment, and powering the monitor from the floor mounted outlet box and computer aux AC outlet, if applicable; which ever determined the worst case emission.
Each EME reported was calibrated using the R/S signal generator.

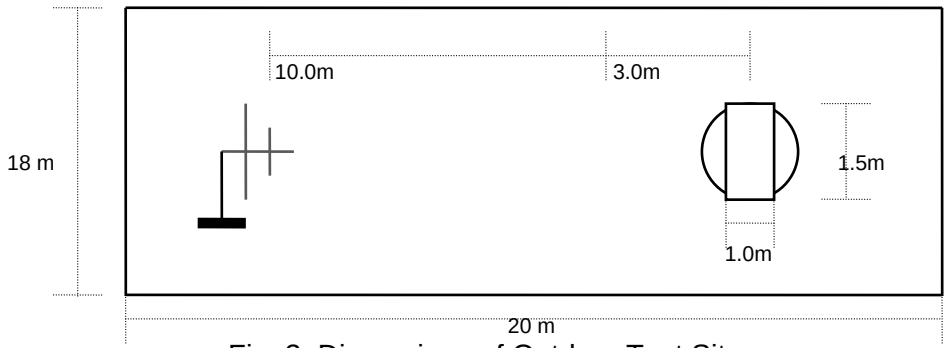


Fig. 3. Dimensions of Outdoor Test Site

9.2 Radiated Spurious & Harmonic Emission

Test Set-up

Effective Radiated Power Output and Equivalent Isotropic Radiated Power output Measurements by Substitution Method according to ANSI/TIA/EIA-603-A-2003.

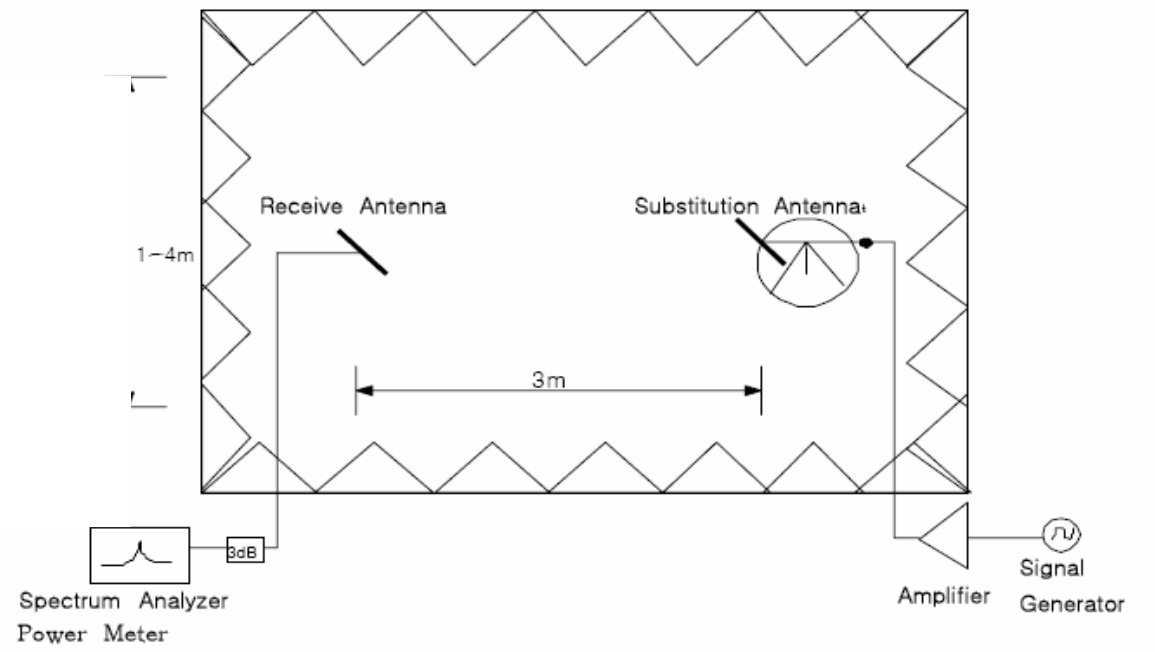


Figure 5. Diagram of Radiated Spurious & Harmonic test Set-up

The EUT was set on a non-conductive turntable in a semi anechoic chamber. In the corner of the chamber there was a communication antenna, which was connected to the BS simulator located outside the chamber. The radiated power from the EUT was measured with an antenna fixed to a antenna tower. The tower and turn table were remotely controlled to turn the EUT and change the antenna polarization. The measured signal was routed from the measuring antenna to the spectrum analyzer. The BS simulator was used to set the TX channel and power level and modulate the TX signal with different bit patterns.

Test Method

a) The maximum power level was searched by moving the turn table and measuring antenna and manipulating the EUT. This level (P_{EUT}) was recorded.
b) For measurements the resolution bandwidth and video bandwidth were set to 100 kHz for emissions below 1GHz and 1 MHz for emissions over 1GHz
c) The peak detection was used.
d) The EUT was replaced with a substituting antenna.
e) The substituting antenna was fed with the power (P_{Subst_TX}) giving a convenient reading on the spectrum analyzer. That reading (P_{Subst_RX}) on spectrum analyzer was recorded.

9.3 Occupied Bandwidth / 26dB Emission Bandwidth

Occupied Bandwidth

The EUT was setup to maximum output power at its lowest channel. The occupied bandwidth was measured using a spectrum analyzer. The measurements are repeated for the highest and a middle channel.
The EUT's occupied bandwidth is measured as the width of the signal between two points, one below the carrier center frequency and one above the carrier frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.
Plots of the EUT's occupied bandwidth are shown herein.

26dB Emission Bandwidth

The transmitter output is connected to the spectrum analyzer.
The RBW of spectrum analyzer is set to approximately 1% of the emission bandwidth And peak detection is used. The emission bandwidth is defined as the total spectrum over which the power is higher than the peak power minus 26 dB.

9.4 Spurious and Harmonic Emissions at Antenna Terminal

9.4.1 Occupied Bandwidth Emission Limits

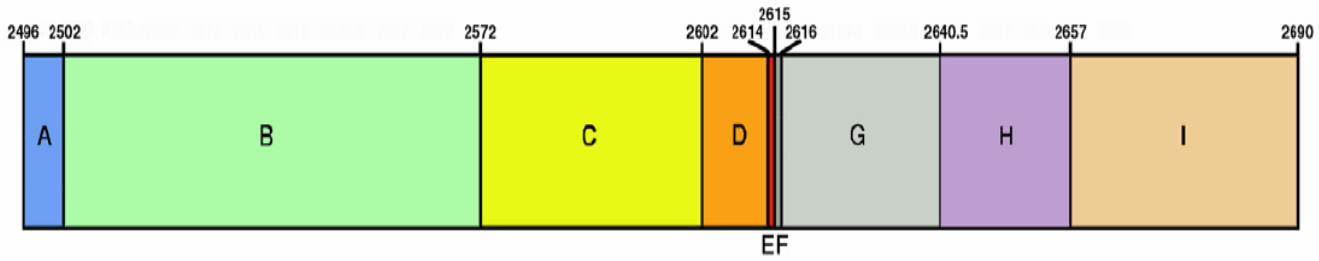
(a) On any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least 55 + 10 log (P) dB.

(b) Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater.
However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least 1 % of the emission bandwidth of the fundamental emission of the transmitter may be employed.
The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emission are attenuated at least 26 dB below the transmitter power.

(c) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the licensee's frequency block edges, both upper and lower, as the design permits.

(d) The measurement of emission power can be expressed in peak or average values, provided they are expressed in the same parameters as the transmitter power.

9.4.2 EBS/BRS – Frequency Band Blocks



BLOCK A: 2496MHz – 2502MHz (BRS)	BLOCK B: 2502MHz – 2572MHz (EBS)	BLOCK C: 2572MHz – 2602MHz (EBS)
BLOCK D: 2602MHz – 2614MHz (BRS)	BLOCK E: 2614MHz – 2615MHz (BRS)	BLOCK F: 2615MHz – 2616MHz (EBS)
BLOCK G: 2616MHz – 2640.5MHz (BRS)	BLOCK H: 2640.5MHz – 2657MHz (EBS)	BLOCK A: 2657MHz – 2690MHz (BRS)

9.4.3 Conducted Spurious Emission

Minimum standard:

On any frequency outside a license frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least 55+10log (P) dB.
Limit equivalent to -25 dBm, calculation shown below.
55 + 10log (0.310 W) = 49.92 dB
24.92 dBm – 49.92 dB = -25 dBm

Compliance with the out-of-band emissions requirement is based on test being performed with an analyzer resolution bandwidth of 1 MHz. However in the 1 MHz band immediately outside and adjacent to the frequency block a resolution bandwidth of at least 1 % of the fundamental emissions bandwidth may be employed.

Test Procedure:

The EUT was setup to maximum output power at its lowest channel.
The Resolution BW of the analyzer is set to 1 % of the emission bandwidth to show compliance with the -13 dBm limit, in the 1 MHz bands immediately outside and adjacent to the edge of the frequency block.
The measurements are repeated for the EUT's highest channel. For the Out-of-Band measurements a 1 MHz RBW was used to scan from 10 MHz to 26.5 GHz.
A display line was placed at -25 dBm to show compliance. The high, lowest and middle channels were tested for out of band measurements.
Plots are shown.

9.5 Frequency Stability / Temperature Variation

The frequency stability of the transmitter is measured by:

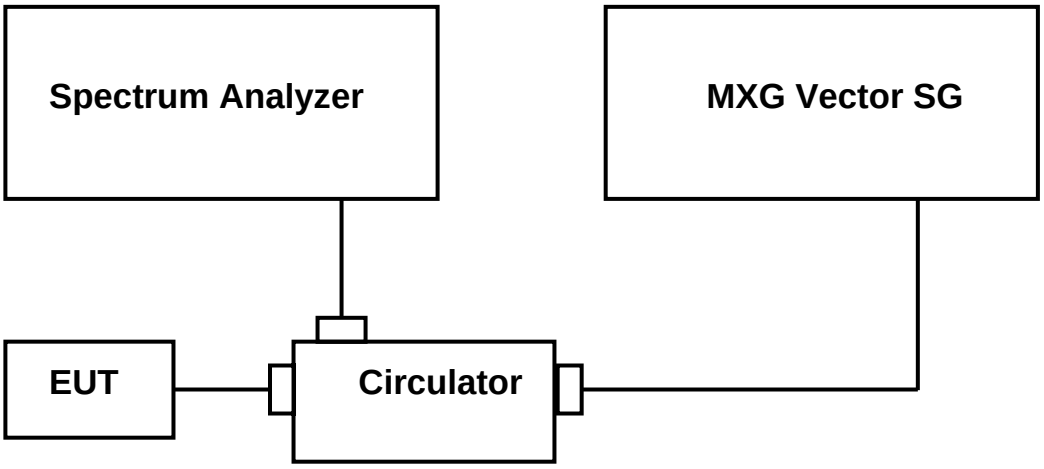
a.) Temperature: The temperature is carried from -30 °C to + 60 °C using an environmental chamber.
b.) Primary Supply Voltage: The primary supply voltage is varied from 85 % to 115 % of the voltage normally at the input to the device or at the power supply terminals if cables are not normally supplied.

Specification - The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within ±0.00025 % (± 2.5ppm) of the center frequency.

Time Period and Procedure:
1. The carrier frequency of the transmitter and the individual oscillators is measured at room temperature(20 °C to 25 °C to provide a reference).
2. The equipment is subjected to an overnight “soak” at -30 °C without any power applied.
3. After the overnight “soak” at -30 °C (Usually 14 ~ 16 hours), the equipment is turned on in a “standby” condition for one minute before applying power to the transmitter. Measurement of the carrier frequency of the transmitter and the individual oscillators is made within a three minute interval after applying power to the transmitter.
4. Frequency measurements are made at 10 °C interval up to room temperature. At least a period of one and one half-hour is provided to allow stabilization of the equipment at each temperature level.
5. Again the transmitter carrier frequency and the individual oscillators is measured at room temperature to begin measurement of the upper temperature levels.
6. Frequency measurements are at 10 intervals starting at – 30 °C up to + 60 °C allowing at least two hours at each temperature for stabilization. In all measurements the frequency is measured within three minutes after re-applying power to the transmitter.
7. The artificial load is mounted external to the temperature chamber.

9.6 Conducted Output Power and Equivalent Isotropic Radiated Power

Test Set-up:



Test Procedure:

Setup the EUT like test Set-up diagram.

a. Load the QPSK 1/2 test signal to the MXG Vector Signal Generator.
b. Set the gate parameter according to the specific test Vector.
c. Set the MXG / EUT software (Wibro DM tool v1.92) / SA analyzer frequency to Low, Middle, High.
d. Set the EUT transmitted output power to the maximum allowed output power.
e. For measurements the resolution bandwidth was set to 100 kHz and video bandwidth was set to 100kHz.
f. The RMS detection was used.
g. Measure the channel power in the 10 MHz channel bandwidth.
h. EIRP = Conducted power + Antenna Gain(dBi)

10. Test Data

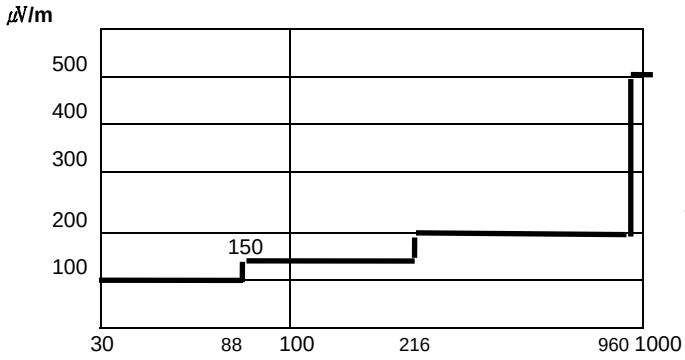
10.1 Field Strength of Radiated Emissions (30MHz ~ 1GHz)

FCC ID : OVFKWC-C3900

▶ **Wi-max TCH mode**

Frequency (MHz)	Reading (dBμV/m)	Pol* (H/V)	AF+CL+Amp (dB)**	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
479.99	48.4	H	-5.9	42.5	46.0	3.5
660.00	41.3	H	-1.5	39.8	46.0	6.2
720.00	41.2	H	-0.5	40.7	46.0	5.3
780.00	38.0	H	0.4	38.4	46.0	7.6
960.00	37.3	H	3.8	41.1	46.0	4.9
992.00	36.2	V	4.1	40.3	46.0	5.7

Radiated Measurements at 3 meters



NOTES:

1. All modes were measured and the worst-case emission was reported.

2 The radiated limits are shown on Figure 4.

Above 1GHz the limit is 500 μV/m.

Limits at 3 meters

NOTES:

1. *Pol. H =Horizontal V=Vertical

2. **AF+CL+Amp. = Antenna Factor + Cable Loss + Amplifier.

3. Measurements using CISPR quasi-peak mode.

4. The limit is on the FCC Part section 15.109(a).

10.2 Conducted Output Power and Equivalent Isotropic Radiated Power

Measurement Results:

PUSC, QPSK

Frequency (MHz)	Coding Rate	Conducted Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)
2501	1/2	22.15	2.76	24.91	33
	3/4	22.20	2.76	24.96	33
2593	1/2	22.28	2.76	25.04	33
	3/4	22.33	2.76	25.09	33
2685	1/2	22.85	2.76	25.61	33
	3/4	22.94	2.76	25.70	33

PUSC, 16QAM

Frequency (MHz)	Coding Rate	Conducted Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)
2501	1/2	22.02	2.76	24.78	33
	3/4	22.03	2.76	24.79	33
2593	1/2	22.15	2.76	24.91	33
	3/4	22.15	2.76	24.91	33
2685	1/2	22.83	2.76	25.59	33
	3/4	22.85	2.76	25.61	33

AMC, QPSK

Frequency (MHz)	Coding Rate	Conducted Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)
2501	1/2	22.58	2.76	25.34	33
	3/4	22.25	2.76	25.01	33
2593	1/2	22.75	2.76	25.51	33
	3/4	22.40	2.76	25.16	33
2685	1/2	23.50	2.76	**26.26**	33
	3/4	23.12	2.76	25.88	33

AMC, 16QAM

Frequency (MHz)	Coding Rate	Conducted Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)
2501	1/2	22.23	2.76	24.99	33
	3/4	22.23	2.76	24.99	33
2593	1/2	22.35	2.76	25.11	33
	3/4	22.31	2.76	25.07	33
2685	1/2	23.05	2.76	**25.81**	33
	3/4	23.02	2.76	25.78	33

10.3 Occupied Bandwidth / 26dB Emission Bandwidth

Measurement Results : QPSK

Frequency (MHz)	Occupied BW (MHz)	26dB Emission BW (MHz)
2501	9.354	9.681
2593	9.340	9.681
2685	9.348	9.684

Measurement Results : 16QAM

Frequency (MHz)	Occupied BW (MHz)	26dB Emission BW (MHz)
2501	9.346	9.688
2593	9.331	9.694
2685	9.339	9.692

10.4 Radiated Spurious & Harmonic Emission

Measurement Results:

Low Channel (2501 MHz) : QPSK Mode

Freq. (MHz)	EUT Pol	Ant. Pol.	P_{EUT} (dBm)	P_{TX} (dBm)	P_{RX} (dBm)	$G_{antenna}$ (dBi)	L_{Cable} (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
5002	E1	H	-57.14	0.00	-10.03	12.65	4.47	-38.93	-25	13.93
	E2	V	-59.56	0.00	-9.34	12.65	4.47	-42.04		17.04
7503	E1	H	-55.40	0.00	-17.75	11.24	5.53	-31.94	-25	6.94
	E2	V	-56.85	0.00	-17.43	11.24	5.53	-33.71		8.71
10004	E1	H	-63.86	0.00	-19.98	12.09	6.15	-37.94	-25	12.94
	E1	V	-63.27	0.00	-20.35	12.09	6.15	-36.98		11.98

Low Channel (2501 MHz) : 16QAM Mode

Freq. (MHz)	EUT Pol	Ant. Pol.	P_{EUT} (dBm)	P_{TX} (dBm)	P_{RX} (dBm)	$G_{antenna}$ (dBi)	L_{Cable} (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
5002	E1	H	-58.61	0.00	-10.00	12.67	4.46	-40.40	-25	15.40
	E2	V	-58.45	0.00	-9.31	12.67	4.46	-40.93		15.93
7503	E1	H	-55.73	0.00	-17.77	11.29	5.55	-32.22	-25	7.22
	E2	V	-56.37	0.00	-17.45	11.29	5.55	-33.18		8.18
10004	E1	H	-64.46	0.00	-20.17	12.06	6.17	-38.40	-25	13.40
	E2	V	-64.39	0.00	-20.52	12.06	6.17	-37.98		12.98

Middle Channel (2593 MHz) : QPSK Mode

Freq. (MHz)	EUT Pol	Ant. Pol.	P_{EUT} (dBm)	P_{TX} (dBm)	P_{RX} (dBm)	$G_{antenna}$ (dBi)	L_{Cable} (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
5186	E1	H	-59.80	0.00	-9.55	12.85	4.38	-41.78	-25	16.78
	E2	V	-60.21	0.00	-9.02	12.85	4.38	-42.72		17.72
7779	E1	H	-51.38	0.00	-17.84	11.44	5.56	-27.66	-25	2.66
	E2	V	-54.38	0.00	-17.49	11.44	5.56	-31.01		6.01
10372	E1	H	-59.71	0.00	-22.79	11.77	5.97	-31.12	-25	6.12
	E1	V	-62.35	0.00	-22.94	11.77	5.97	-33.61		8.61

Middle Channel (2593 MHz) : 16QAM Mode

Freq. (MHz)	EUT Pol	Ant. Pol.	P_{EUT} (dBm)	P_{TX} (dBm)	P_{RX} (dBm)	$G_{antenna}$ (dBi)	L_{Cable} (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
5186	E1	H	-60.56	0.00	-9.52	12.86	4.37	-42.55	-25	17.55
	E2	V	-59.80	0.00	-9.00	12.86	4.37	-42.31		17.31
7779	E1	H	-51.99	0.00	-17.84	11.44	5.55	-28.26	-25	3.26
	E2	V	-55.47	0.00	-17.48	11.44	5.55	-32.10		7.10
10372	E1	H	-60.15	0.00	-22.98	11.75	5.93	-31.35	-25	6.35
	E1	V	-63.81	0.00	-23.13	11.75	5.93	-34.86		9.86

High Channel (2685 MHz) : QPSK Mode

Freq. (MHz)	EUT Pol	Ant. Pol.	P_{EUT} (dBm)	P_{TX} (dBm)	P_{RX} (dBm)	$G_{antenna}$ (dBi)	L_{Cable} (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
5370	E1	H	-59.00	0.00	-9.59	13.09	4.72	-41.04	-25	16.04
	E2	V	-60.24	0.00	-9.01	13.09	4.72	-42.86		17.86
8055	E1	H	-52.43	0.00	-18.70	11.41	5.85	-28.17	-25	3.17
	E1	V	-54.19	0.00	-18.73	11.41	5.85	-29.90		4.90
10740	E1	H	-58.57	0.00	-23.83	11.60	6.70	-29.84	-25	4.84
	E1	V	-58.25	0.00	-24.14	11.60	6.70	-29.21		4.21

High Channel (2685 MHz) : 16QAM Mode

Freq. (MHz)	EUT Pol	Ant. Pol.	P_{EUT} (dBm)	P_{TX} (dBm)	P_{RX} (dBm)	$G_{antenna}$ (dBi)	L_{Cable} (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
5370	E1	H	-58.46	0.00	-9.59	13.09	4.72	-40.50	-25	15.50
	E2	V	-62.58	0.00	-9.01	13.09	4.72	-45.20		20.20
8055	E1	H	-52.33	0.00	-18.69	11.41	5.85	-28.08	-25	3.08
	E2	V	-56.57	0.00	-18.72	11.41	5.85	-32.29		7.29
10740	E1	H	-57.91	0.00	-23.84	11.60	6.70	-29.17	-25	4.17
	E1	V	-59.38	0.00	-24.14	11.60	6.70	-30.34		5.34

Note: The test data show the worst emission level from the three-azimuth

10.5 Frequency Stability / Temperature Variation

Test Mode : Set to Middle channel (2593 MHz)

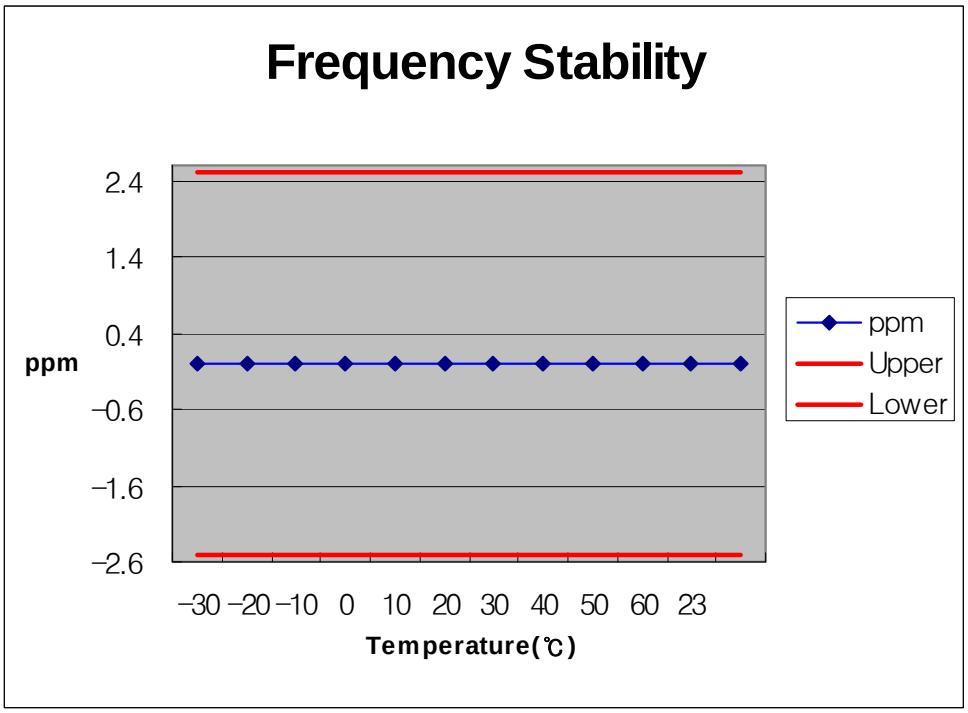
Deviation Limit : ±2.5ppm

Measurement Result :

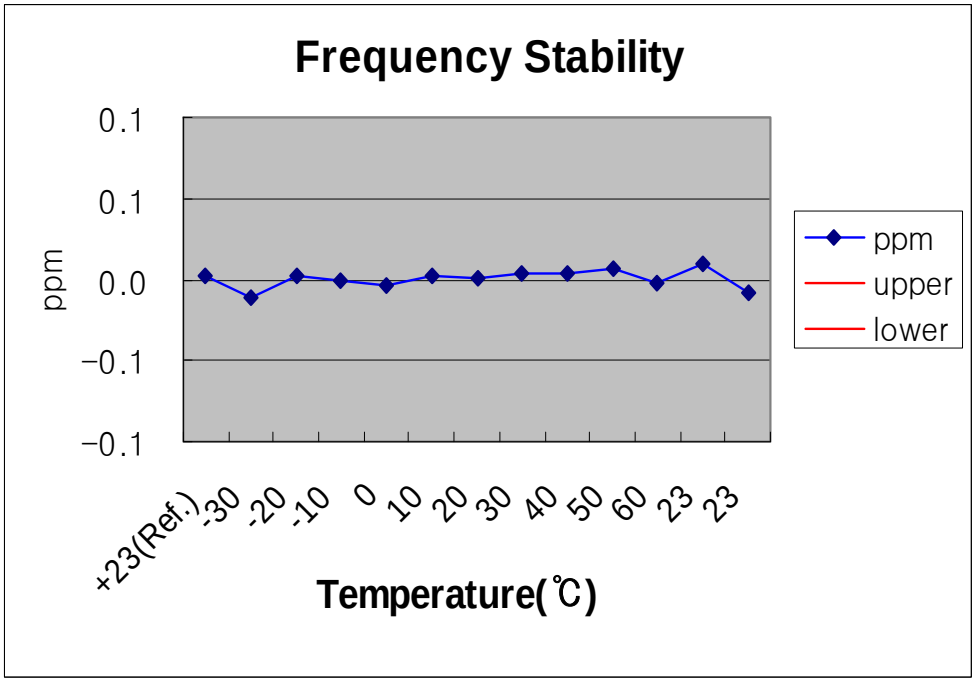
Voltage (%)	Power (Vdc)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	ppm
100%	5.0	+23(Ref.)	2,593,000,005	5	0.0019
100%		-30	2,592,999,970	-30	-0.0116
100%		-20	2,593,000,005	5	0.0019
100%		-10	2,592,999,997	-3	-0.0012
100%		0	2,592,999,990	-10	-0.0039
100%		10	2,593,000,005	5	0.0019
100%		20	2,593,000,003	3	0.0012
100%		30	2,593,000,010	10	0.0039
100%		40	2,593,000,011	11	0.0042
100%		50	2,593,000,018	18	0.0069
100%		60	2,592,999,995	-5	-0.0019
85%	4.25	23	2,593,000,026	26	0.0100
115%	5.75	23	2,592,999,977	-23	-0.0089

***The temperature is varied from -30°C to +60°C using an environmental chamber.**

Frequency Stability Graph



Zoom In



11. ACCURACY OF MEASUREMENT

The Measurement Uncertainties stated were calculated in accordance with the requirements of NIST Technical Note 1297 with the confidence level of 95%

1. Radiation Uncertainty Calculation

Contribution	*Probability Distribution*	*Uncertainty(+/-dB)*
Antenna Factor	Normal (k=2)	± 0.5
Cable Loss	Normal (k=2)	± 0.04
Receiver Specification	Rectangular	± 2.0
Antenna directivity	Rectangular	± 1.0
Antenna Factor variation with Height		
Antenna Phase Center Variation		
Antenna Factor Frequency Interpolation		
Measurement Distance Variation		
Site Inperfections	Rectangular	± 2.0
Mismatch:Receiver VRC ri=0.3 Antenna VRC rR=0.1(Bi)0.4(Lp) Uncertainty Limits 20Log(1+/-ri rR)	U-Shaped	+ 0.25 / - 0.26
System Repeatibilty	Std.deviation	± 0.05
Repeatability of EUT	-	-
Combined Standard Uncertainty	Normal	± 1.77
Expended Uncertainty U	Normal (k=2)	± 3.5

2. Conducted Uncertainty Calculation

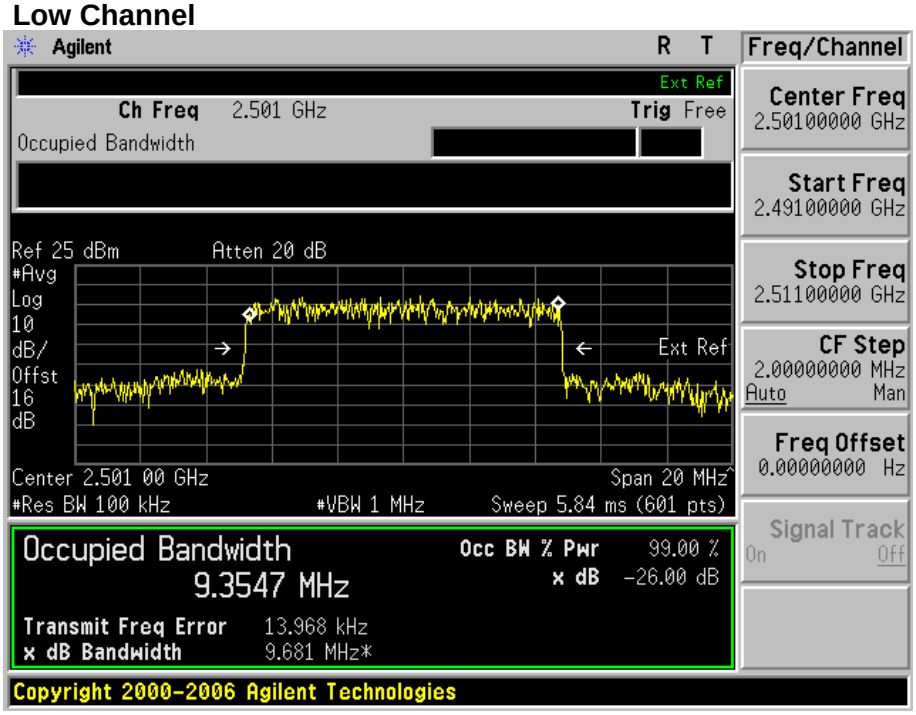
Contribution	*Probability Distribution*	*Uncertainty(+/-dB)*
Receiver Specification	Normal (k=2)	± 2.0
LISN coupling spec.	Normal (k=2)	± 0.4
Cable and input attenuator cal.	Rectangular	± 0.4
Mismatch:Receiver VRC ri=0.3 LISN vrc rg=0.1 Uncertainty Limits 20Log(1+/-ri rR)	U-Shaped	± 0.26
System Repeatibilty	Std.deviation	± 0.68
Repeatability of EUT	-	-
Combined Standard Uncertainty	Normal	± 1.18
Expended Uncertainty U	Normal (k=2)	± 2.4

12. Test Plots

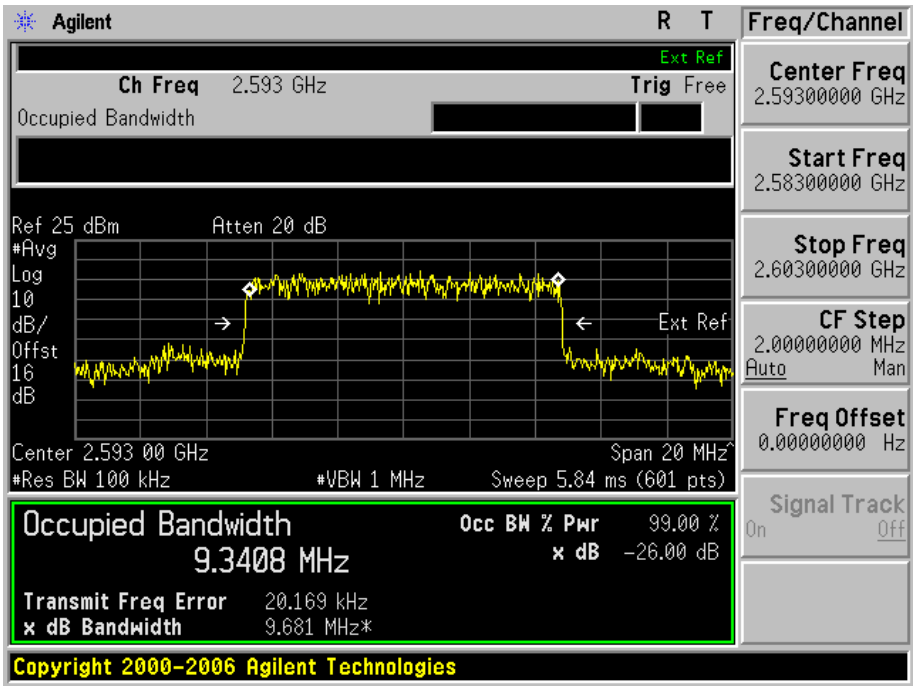
● **Occupied Bandwidth / 26dB Bandwidth**

QPSK mode

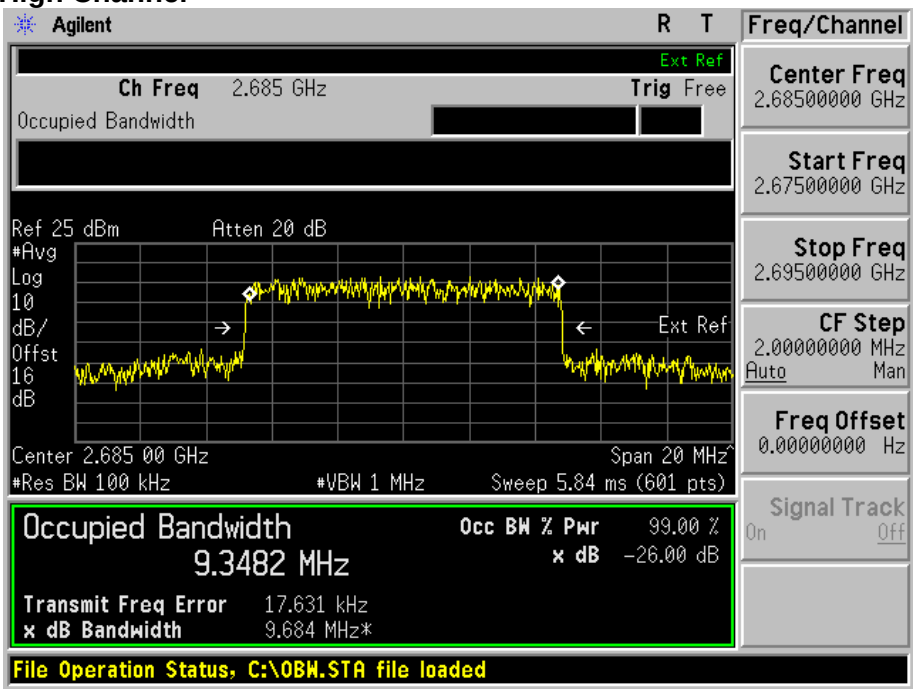
Low Channel



Middle Channel

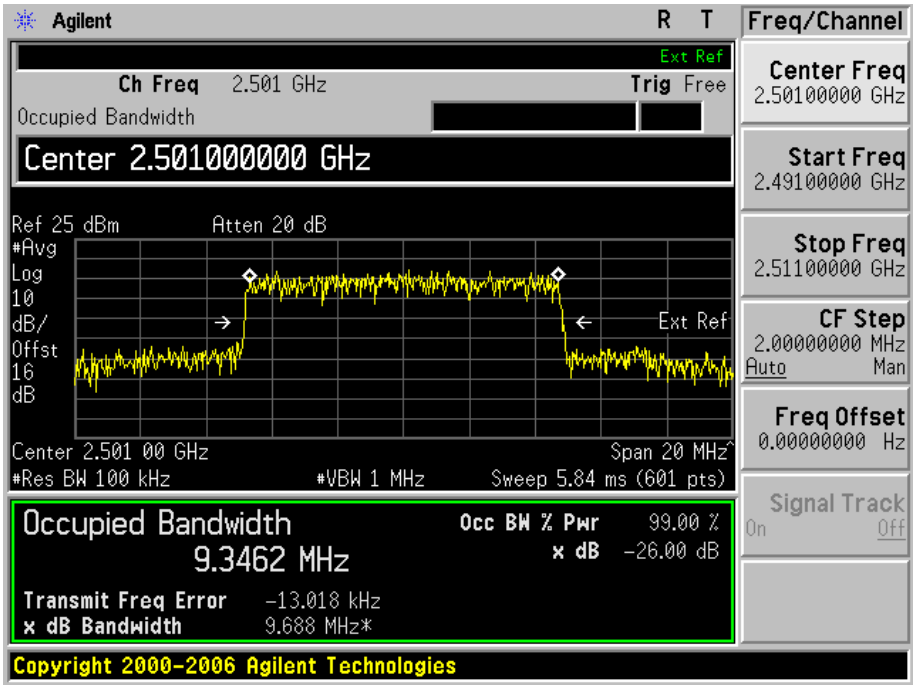


High Channel

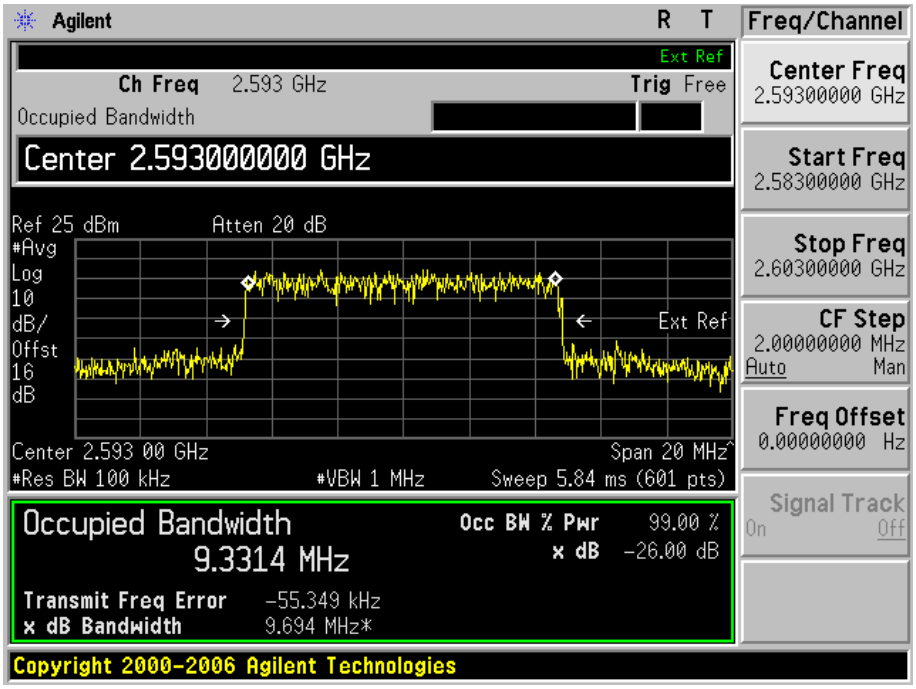


16QAM mode

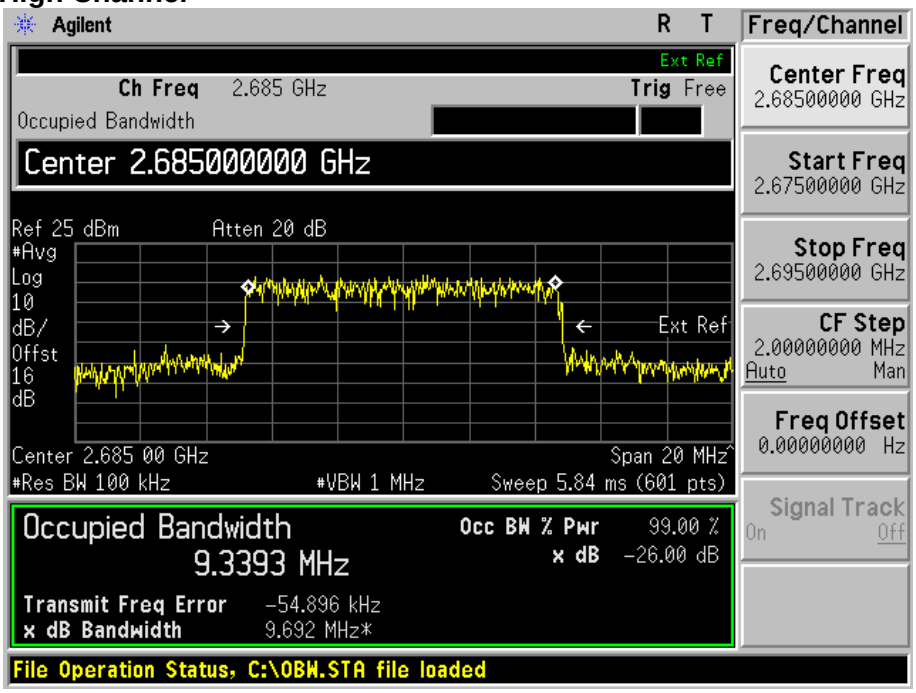
Low Channel



Middle Channel



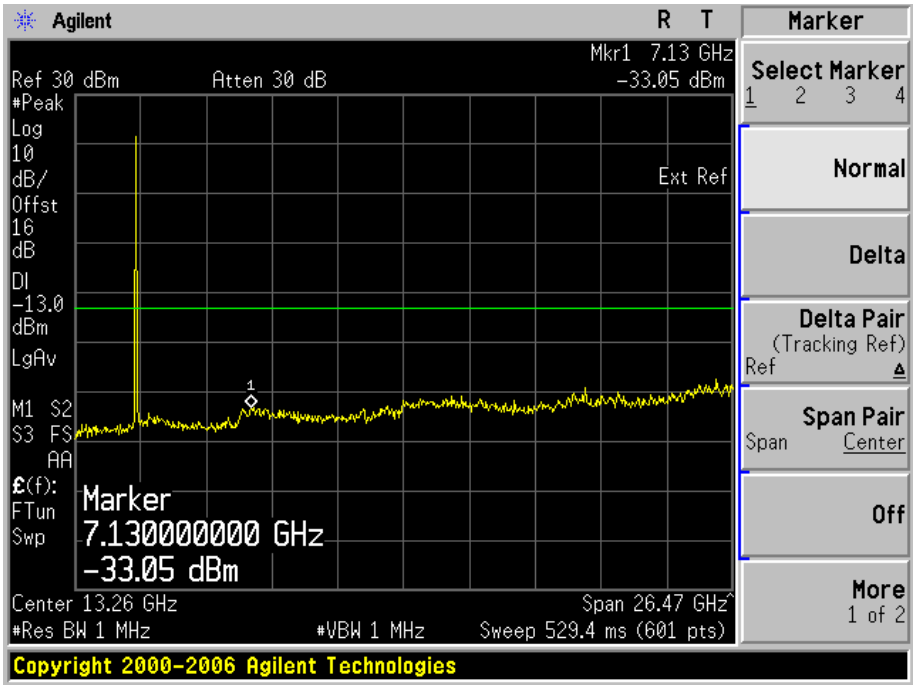
High Channel



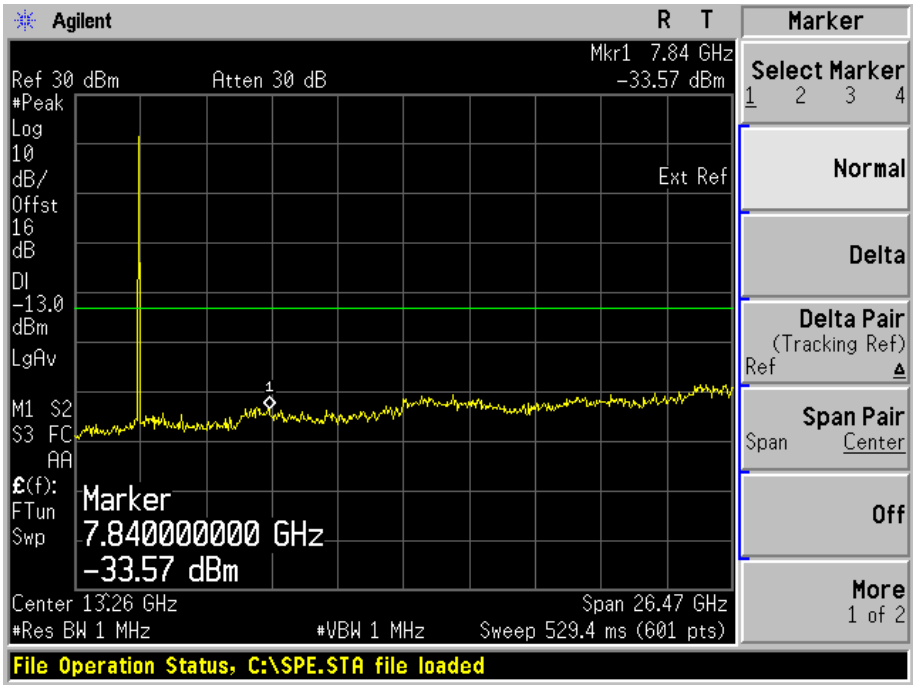
● **Spurious Emission at antenna Terminals**

QPSK mode

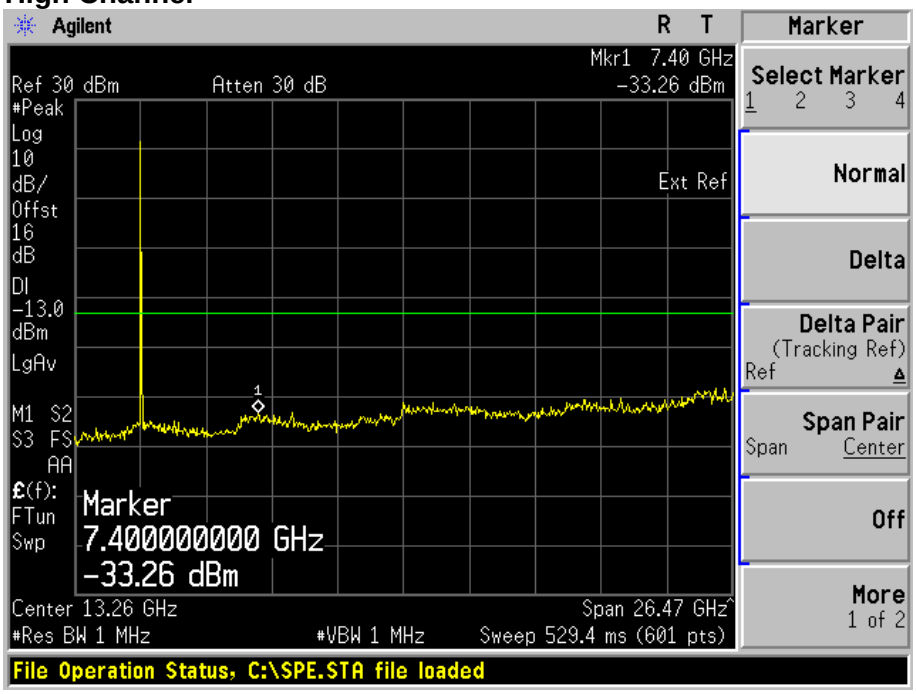
Low Channel



Middle Channel

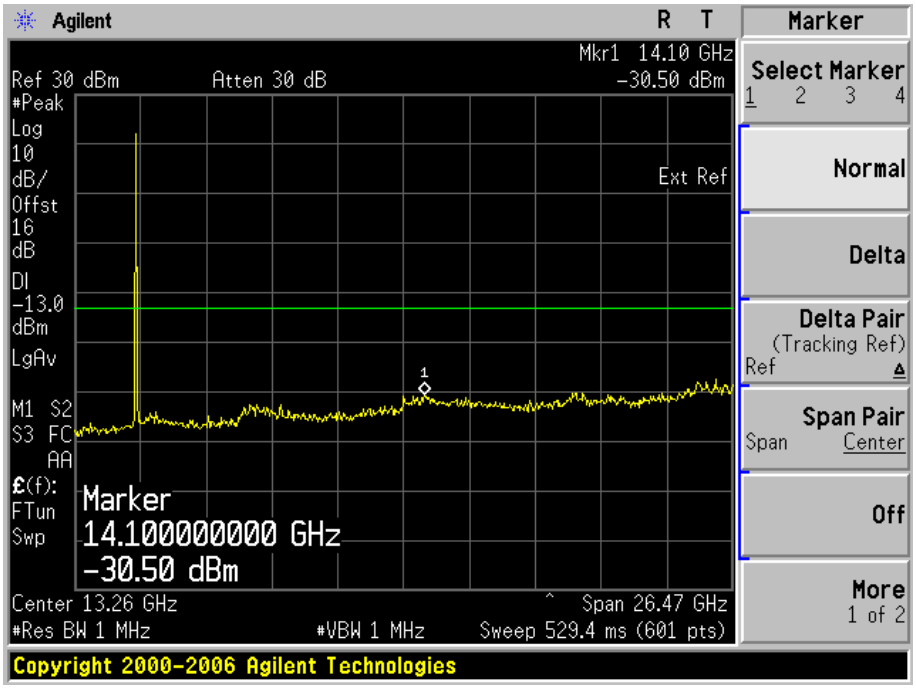


High Channel

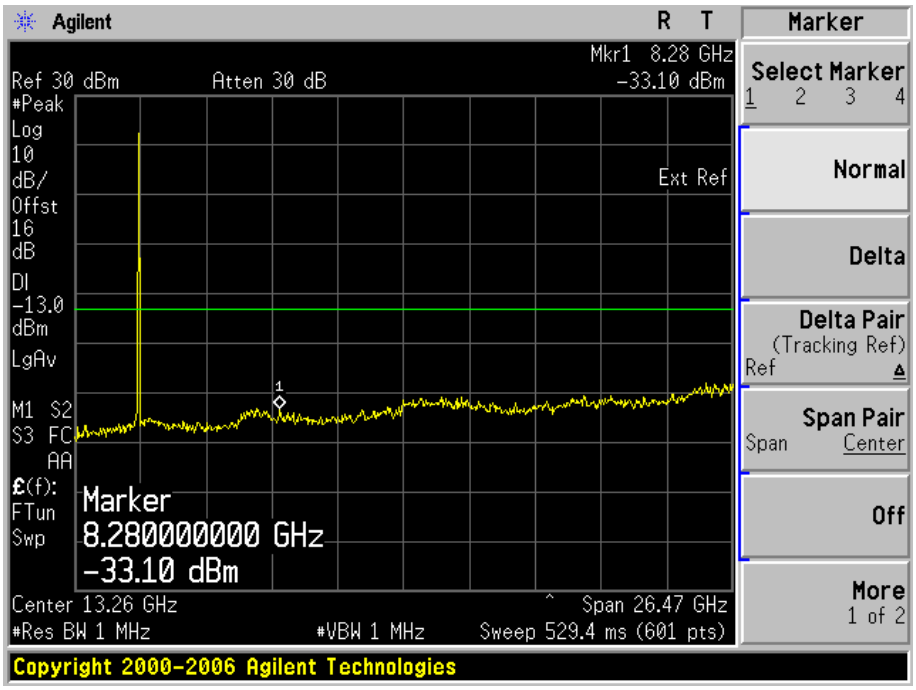


16QAM mode

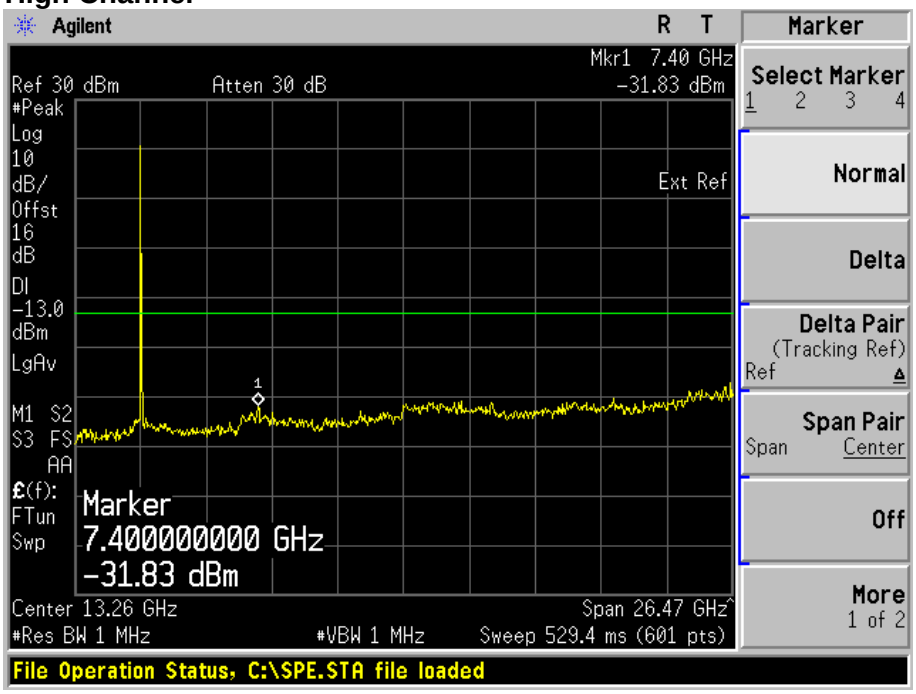
Low Channel



Middle Channel



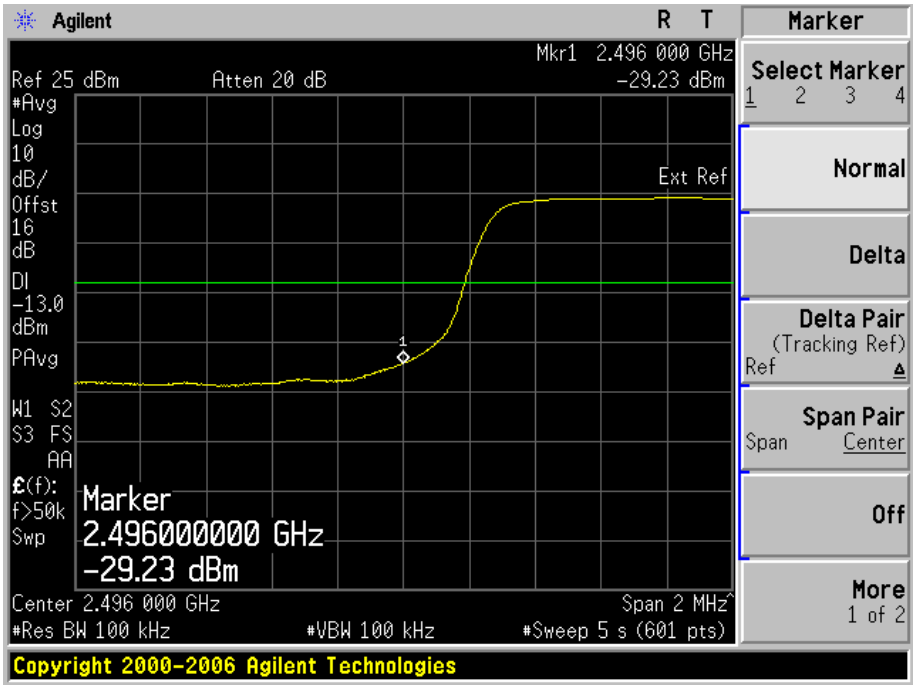
High Channel

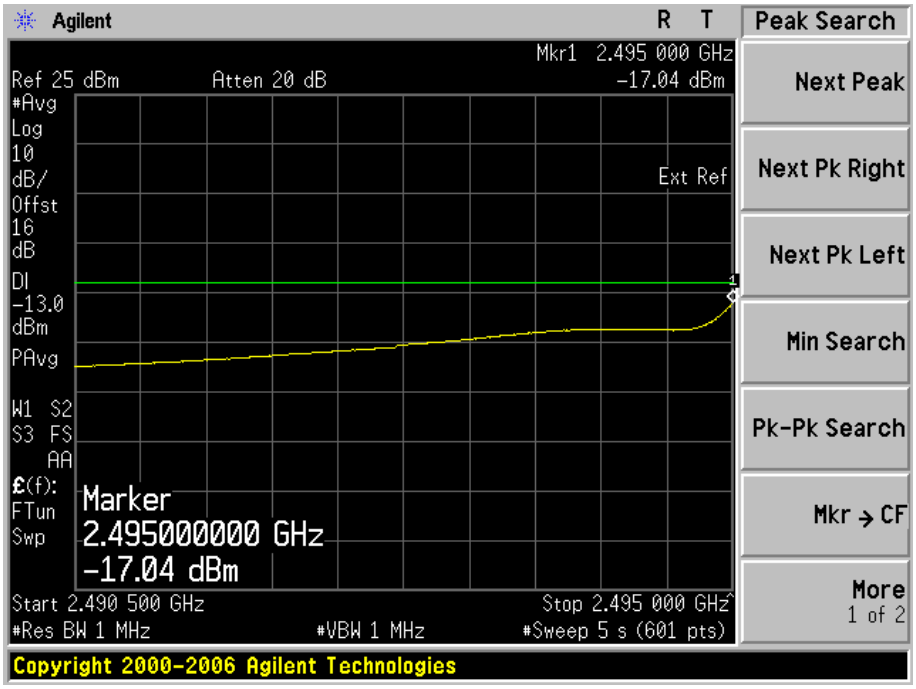


● **Band Edge**

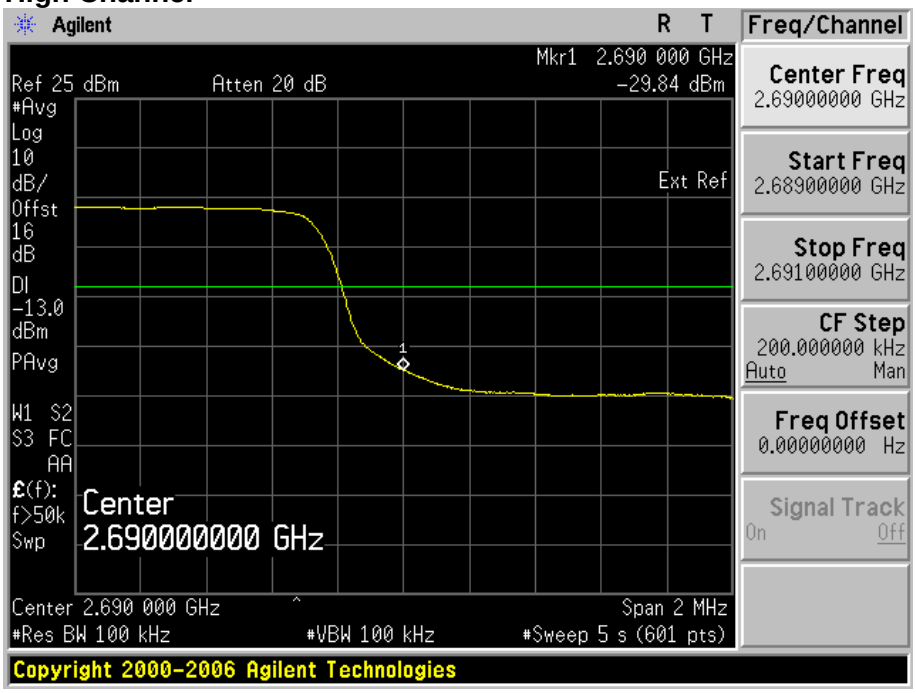
QPSK mode

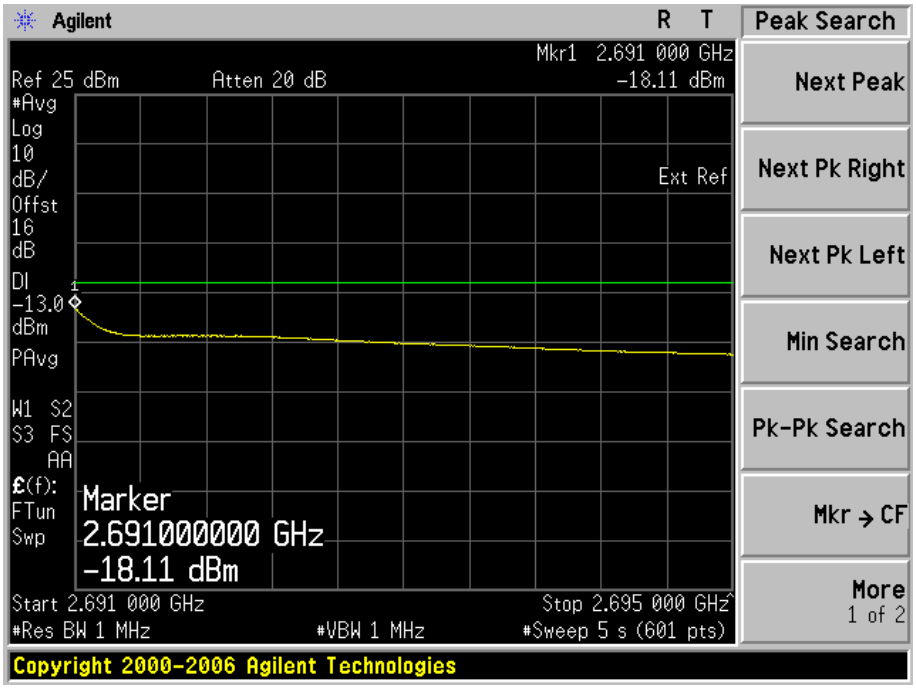
Low Channel





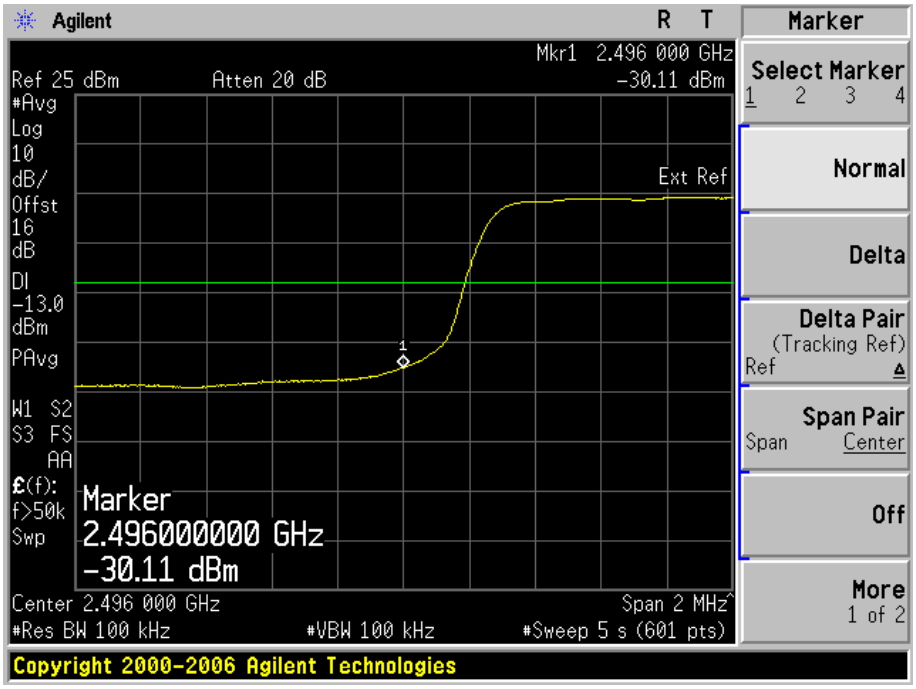
High Channel

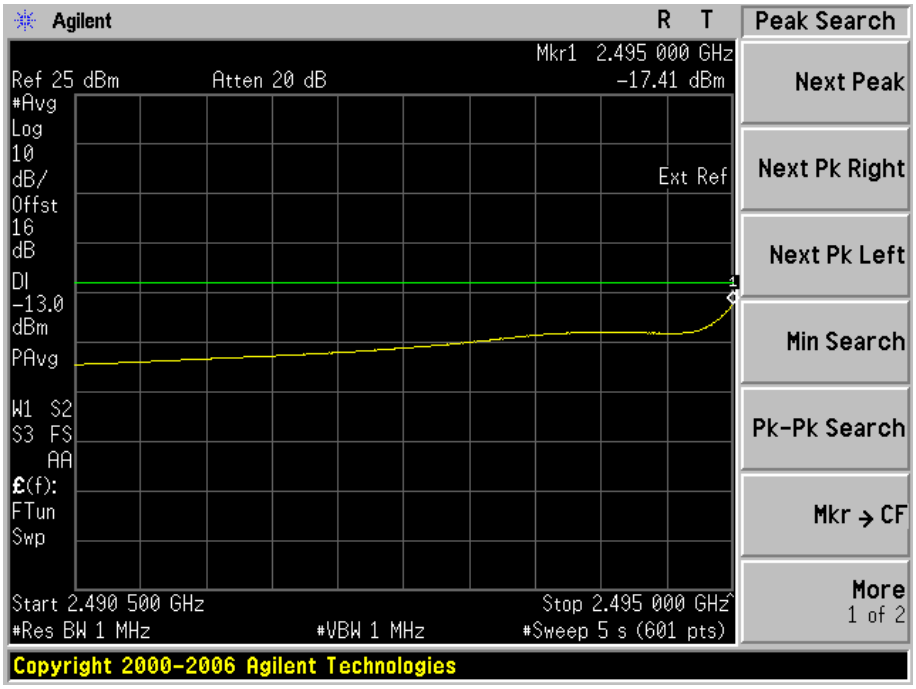




16QAM mode

Low Channel





High Channel