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6660-B Dobbin Road, Columbia, MD 21045 USA
Tel. 410.290.6652 / Fax 410.290.6554
http://www.pctestlab.com

MEASUREMENT REPORT
FCC Part 90

Applicant Name:
IP Wireless
Unit 7 Greenways Business Park
Bellinger Close, Chippenham
Wiltshire SN15 1BN

Date of Testing:
Sep. 24-Oct.6, 2010
Test Site/Location:
PCTEST Lab., Columbia, MD, USA
Test Report Serial No.:
0Y1008301445.PKT

FCC ID:	**PKTUSBSTKAGJ**
APPLICANT:	**IP WIRELESS**

Application Type:	Certification
FCC Classification:	Licensed Non-Broadcast Station Transmitter (TNB)
FCC Rule Part(s):	§2; §90
EUT Type:	700MHz USB Stick Modem
Model(s):	AGJ
Tx Frequency Range:	793-798MHz
Max. RF Output Power:	0.103 W ERP (20.14 dBm)
Emission Designator(s):	4M14G7D(QPSK), 4M17W7D(16QAM), 4M18W7D(64QAM)
Test Device Serial No.:	*identical prototype* [S/N: AGJAA3200131A]

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in §2.947. Test results reported herein relate only to the item(s) tested.

I attest to the accuracy of data. 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.

Grant Conditions: Power output listed is ERP for Part 90.

PCTEST certifies that no party to this application has been subject to a denial of Federal benefits that includes FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C. 862.

Randy Ortanez
President

ACCREDITED
TESTING LABORATORY
CERTIFICATE #2041.01

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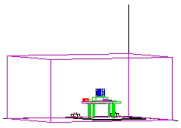
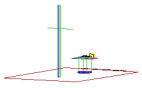


MEASUREMENT REPORT
FCC Part 90



§2.1033 General Information

APPLICANT:	IP Wireless
APPLICANT ADDRESS:	Unit 7 Greenways Business Park Bellinger Close, Chippenham, Wiltshire SN15 1BN
TEST SITE:	PCTEST ENGINEERING LABORATORY, INC.
TEST SITE ADDRESS:	6660-B Dobbin Road, Columbia, MD 21045 USA
FCC RULE PART(S):	§2; §90
BASE MODEL:	AGJ
FCC ID:	PKTUSBSTKAGJ
FCC CLASSIFICATION:	Licensed Non-Broadcast Station Transmitter (TNB)
EMISSION DESIGNATOR(S):	4M14G7D(QPSK), 4M17W7D(16QAM), 4M18W7D(64QAM)
MODULATIONS:	TD-CDMA
FREQUENCY TOLERANCE:	1.25ppm
Test Device Serial No.:	AGJAA3200131A ☐ Production ☒ Pre-Production ☐ Engineering
DATE(S) OF TEST:	Sep. 24-Oct.6, 2010
TEST REPORT S/N:	0Y1008301445.PKT

Test Facility / Accreditations

Measurements were performed at PCTEST Engineering Lab. located in Columbia, MD 21045, U.S.A.

- PCTEST facility is an FCC registered (PCTEST Reg. No. 90864) test facility with the site description report on file and has met all the requirements specified in Section 2.948 of the FCC Rules and Industry Canada (2451A-1).
- PCTEST Lab is accredited to ISO 17025 by U.S. National Institute of Standards and Technology (NIST) under the National Voluntary Laboratory Accreditation Program (NVLAP Lab code: 100431-0) in EMC, FCC and Telecommunications.
- PCTEST Lab is accredited to ISO 17025-2005 by the American Association for Laboratory Accreditation (A2LA) in Specific Absorption Rate (SAR) testing, Hearing Aid Compatibility (HAC) testing, CTIA Test Plans, and wireless testing for FCC and Industry Canada Rules.
- PCTEST Lab is a recognized U.S. Conformity Assessment Body (CAB) in EMC and R&TTE (n.b. 0982) under the U.S.-EU Mutual Recognition Agreement (MRA).
- PCTEST TCB is a Telecommunication Certification Body (TCB) accredited to ISO/IEC Guide 65 by the American National Standards Institute (ANSI) in all scopes of FCC Rules and Industry Canada Standards (RSS).
- PCTEST facility is an IC registered (2451A-1) test laboratory with the site description on file at Industry Canada.
- PCTEST is a CTIA Authorized Test Laboratory (CATL) for AMPS, CDMA, and EvDO wireless devices and for Over-the-Air (OTA) Antenna Performance testing for AMPS, CDMA, GSM, GPRS, EGPRS, UMTS (W-CDMA), CDMA 1xEVDO, and CDMA 1xRTT.

1.0 INTRODUCTION

1.1 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.

1.2 Testing Facility

The map below shows the location of the PCTEST LABORATORY, its proximity to the FCC Laboratory, the Columbia vicinity are, the Baltimore-Washington Internt'l (BWI) airport, the city of Baltimore and the Washington, DC area. (*See Figure 1-1*).

These measurement tests were conducted at the PCTEST Engineering Laboratory, Inc. facility in New Concept Business Park, Guilford Industrial Park, Columbia, Maryland. The site address is 6660-B Dobbin Road, Columbia, MD 21045. The test site is one of the highest points in the Columbia area with an elevation of 390 feet above mean sea level. The site coordinates are 39° 11'15" N latitude and 76° 49'38" W longitude. The facility is 1.5 miles North of the FCC laboratory, and the ambient signal and ambient signal strength are approximately equal to those of the FCC laboratory. There are no FM or TV transmitters within 15 miles of the site. 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 on January 28, 2009.

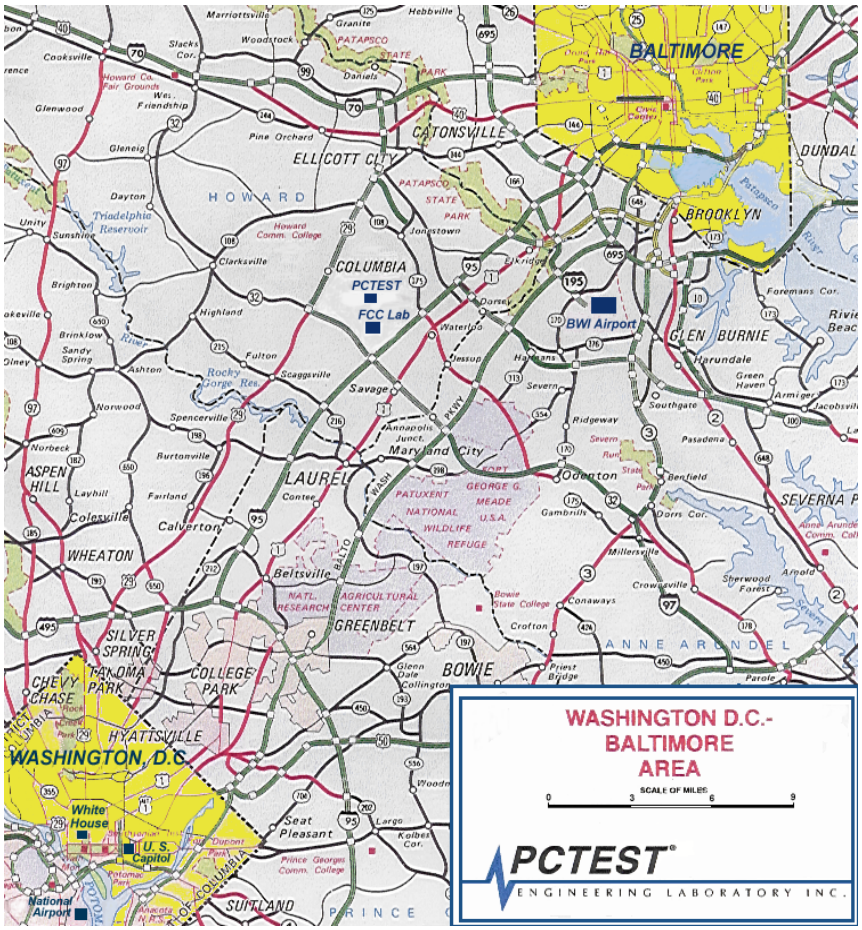


Figure 1-1. Map of the Greater Baltimore and Metropolitan Washington, D.C. area

2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **IP Wireless 700MHz USB Stick Modem FCC ID: PKTUSBSTKAGJ**. The test data contained in this report pertains only to the emissions due to the EUT's 700MHz band function. The EUT consisted of the following component(s):

Trade Name / Base Model	FCC ID	Description
IP Wireless / Model: AGJ	PKTUSBSTKAGJ	700MHz USB Stick Modem

Table 2-1. EUT Equipment Description

The EUT was set to continuous transmission for all timeslots at full power (i.e 24dBm) through test software installed in the laptop computer provided. The chip rate is set to 3.84Mcps for a channel bandwidth of 5MHz. Each available modulation type (i.e. QPSK, 16-QAM, 64-QAM) was tested to determine the configuration producing the worst case emissions.

2.2 EMI Suppression Device(s)/Modifications

No EMI suppression device(s) were added and no modifications were made during testing.

2.3 Labeling Requirements

Per 2.925

The FCC identifier shall be permanently affixed to the equipment and shall be readily visible to the purchaser at the time of purchase.

Per 15.19; Docket 95-19

In addition to this requirement, a device subject to certification shall be labeled as follows:

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.

The label shall be permanently affixed at a conspicuous location on the device; instruction manual or pamphlet supplied to the user and be readily visible to the purchaser at the time of purchase. However, when the device is so small wherein placement of the label with specified statement is not practical, only the trade name and FCC ID must be displayed on the device per Section 15.19(b)(2).

Please see attachment for FCC ID label and label location.

3.0 DESCRIPTION OF TESTS

3.1 Measurement Procedure

The radiated spurious measurements were made outdoors at a 3-meter test range (See Figure 3-1). The equipment under test is placed on a wooden turntable 80cm above the ground plane and 3 meters from the receive antenna. The receive antenna height and turntable rotations were adjusted for the highest reading on the receive spectrum analyzer. This power level was recorded using a broadband average power meter. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This level is recorded with the power meter. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic antenna are taken into consideration.

Deviation from Measurement Procedure……..None

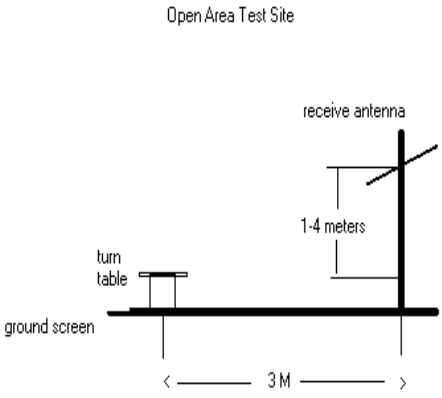


Figure 3-1. Diagram of 3-meter outdoor test range

3.2 Occupied Bandwidth Emission Limits

§2.1049

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 43 + 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 one percent 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.

3.3 Emissions Mask

§90.210(n)

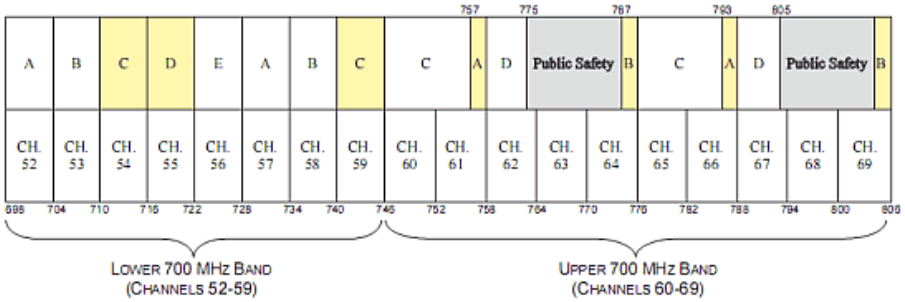
Transmitters designed for operation under this frequency band must meet the emission mask requirements of Emission Mask B. For transmitters that are equipped with an audio low-pass filter, the power of any emission must be attenuated below the unmodulated carrier power (P) as follows:

a. On any frequency removed from the assigned frequency by more than 50 percent, but not more than 100 percent of the authorized bandwidth: At least 25 dB.
b. On any frequency removed from the assigned frequency by more than 100 percent, but not more than 250 percent of the authorized bandwidth: At least 35 dB.
c. On any frequency removed from the assigned frequency by more than 250 percent of the authorized bandwidth: At least 43 + 10 log (P) dB.

3.4 793-798MHz Frequency Band

§90.528

The 793–798 MHz band is allocated on a nationwide basis for public safety broadband operations and licensed to a single Public Safety Broadband Licensee.



3.5 Spurious and Harmonic Emissions at Antenna Terminal

§2.1051, §90.543(c), §90.543(e)(2),

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th harmonic. 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 43 + 10 log(P) dB. Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz for frequencies greater than 1GHz and a resolution bandwidth of 100kHz bandwidth for frequencies less than 1GHz.

Additionally, the power of any emission outside the licensee's frequency band of operation shall be attenuated below the transmitted power (P) within the licensed band(s) of operation, measured in watts, for all frequencies between 769-775 and 799-805MHz, by a factor not less than 65+10log(P)dB in a 6.25kHz band segment.

3.6 Radiated Power and Radiated Spurious Emissions

§2.1053, §90.543(c), §90.543(e)(2), §90.543(f),

Radiated power and radiated spurious emissions are measured outdoors at our 3-meter test range. The equipment under test is placed on a wooden turntable 80cm above the ground plane and 3 meters from the receive antenna. The receive antenna height and turntable rotations were adjusted for the highest reading on the receive spectrum analyzer. This level is then measured with a broadband average power meter. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th harmonic. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator with the level of the signal generator being adjusted to obtain the same receive average power meter reading. This spurious level is recorded with the power meter. For readings above 1 GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration. This device was tested in all configurations and the highest power is reported as shown in the following test results tables with their respective modulation. 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 43 + 10 log(P) dB.

Additionally, all emissions including harmonics in the band 1559-1610MHz shall be limited to -70dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80dBW EIRP for discrete emissions of less than 700Hz bandwidth.

3.7 Frequency Stability / Temperature Variation

§2.1055, §90.539(e)

The frequency stability of the transmitter is measured by:

a.) **Temperature:** The temperature is varied from -30°C to +50°C in 10°C increments using an environmental chamber.

b.) **Primary Supply Voltage:** The primary supply voltage is varied from 85% to 115% of the nominal value for non hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

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 ±0.000125% (±1.25 ppm) of the center frequency.

Time Period and Procedure:

1. The carrier frequency of the transmitter is measured at room temperature (20°C to provide a reference).

2. 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 is made within one minute after applying power to the transmitter.

3. Frequency measurements are made at 10°C intervals ranging from -30°C to +50°C. A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.

4.0 TEST EQUIPMENT CALIBRATION DATA

Test Equipment Calibration is traceable to the National Institute of Standards and Technology (NIST).

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
-	263-10dB	(DC-18GHz) 10 dB Attenuator	N/A		N/A	N/A
-	No.166	(1000-26500MHz) Microwave RF Cable	N/A		N/A	N/A
-	No.167	(100kHz - 100MHz) RG58 Coax Cable	N/A		N/A	N/A
Agilent	11713A	Attenuation/Switch Driver	12/2/2009	Annual	12/2/2010	3439A02645
Agilent	8449B	(1-26.5GHz) Pre-Amplifier	12/2/2009	Annual	12/2/2010	3008A00985
Agilent	85650A	Quasi-Peak Adapter	12/2/2009	Annual	12/2/2010	3303A01872
Agilent	85650A	Quasi-Peak Adapter	3/30/2010	Annual	3/30/2011	2043A00301
Agilent	8566B	(100Hz-22GHz) Spectrum Analyzer	12/2/2009	Annual	12/2/2010	3638A08713
Agilent	8648D	(9kHz-4GHz) Signal Generator	9/19/2009	Biennial	9/19/2011	3613A00315
Agilent	E4407B	ESA Spectrum Analyzer	3/30/2010	Annual	3/30/2011	US39210313
Agilent	E4448A	PSA (3Hz-50GHz) Spectrum Analyzer	11/1/2009	Annual	11/1/2010	US42510244
Agilent	E8257D	(250kHz-20GHz) Signal Generator	3/30/2010	Annual	3/30/2011	MY45470194
Agilent	E8267C	Vector Signal Generator	9/29/2009	Biennial	9/29/2011	US42340152
Agilent	N9020A	MXA Signal Analyzer	10/22/2009	Annual	10/22/2010	US46470561
Anritsu	ML2495A	Power Meter	10/12/2009	Annual	10/12/2010	941001
Compliance Design	Roberts	Dipole Set	4/7/2010	Biennial	4/7/2012	146
Compliance Design	Roberts	Dipole Set	4/7/2010	Biennial	4/7/2012	147
Emco	3115	Horn Antenna (1-18GHz)	10/14/2009	Biennial	10/14/2011	9704-5182
Emco	3115	Horn Antenna (1-18GHz)	4/8/2010	Biennial	4/8/2012	9205-3874
Espec	ESX-2CA	Environmental Chamber	4/1/2010	Annual	4/1/2011	17620
K & L	11SH10	Band Pass Filter	N/A	Annual	N/A	1300/4000
K & L	11SH10	Band Pass Filter	N/A	Annual	N/A	4000/12000
MiniCircuits	VHF-1300+	High Pass Filter	N/A		N/A	30716
MiniCircuits	VHF-3100+	High Pass Filter	N/A		N/A	30721
Pasternack	PE2208-6	Bidirectional Coupler	N/A		N/A	N/A
Rohde & Schwarz	CMU200	Base Station Simulator	11/11/2009	Annual	11/11/2010	836371/0079
Rohde & Schwarz	CMU200	Base Station Simulator	6/21/2010	Annual	6/21/2011	833855/0010
Rohde & Schwarz	CMU200	Base Station Simulator	11/4/2009	Annual	11/4/2010	109892
Rohde & Schwarz	CMU200	Base Station Simulator	6/17/2010	Annual	6/17/2011	836536/0005
Rohde & Schwarz	FSQ 26	Spectrum Analyzer	8/28/2010	Annual	8/28/2011	200452
Rohde & Schwarz	CMW500	LTE Radio Communication Tester	8/30/2010	Annual	8/30/2011	100976
Schwarzbeck	UHA9105	Dipole Antenna (400 - 1GHz) Rx	7/17/2009	Biennial	7/17/2011	9105-2404
Schwarzbeck	UHA9105	Dipole Antenna (400 - 1GHz) Tx	7/17/2009	Biennial	7/17/2011	9105-2403
Sunol	DRH-118	Horn Antenna (1 - 18GHz)	5/14/2009	Biennial	5/14/2011	A050307
Sunol	JB5	Bi-Log Antenna (30M - 5GHz)	7/17/2009	Biennial	7/17/2011	A051107

Table 4-1. Test Equipment

5.0 SAMPLE CALCULATIONS

Emission Designator

Emission Designator = 4M12G7D

TD-CDMA BW = 4.12 MHz
G = Phase Modulation
7 = Quantized/Digital Info
D = Amplitude/Angle Modulated

Spurious Radiated Emission – 700MHz Band

Example: 701 MHz Block Mode 2nd Harmonic (1402.0 MHz)

The average receive power meter reading at 3 meters with the EUT on the turntable was –81.0 dBm. The gain of the substituted antenna is 8.1 dBi. The signal generator connected to the substituted antenna terminal is adjusted to produce a reading of –81.0 dBm on the power meter. The loss of the cable between the signal generator and the terminals of the substituted antenna is 2.0 dB at 1402.0 MHz. So 6.1 dB is added to the signal generator reading of –30.9 dBm yielding –24.80 dBm. The fundamental EIRP was 25.501 dBm so this harmonic was 25.501 dBm – (-24.80) = 50.3 dBc.

6.0 TEST RESULTS

6.1 Summary

Company Name: IP Wireless

FCC ID: PKTUSBSTKAGJ

FCC Classification: Licensed Non-Broadcast Station Transmitter (TNB)

Mode(s): TD-CDMA

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
TRANSMITTER MODE (TX)					
2.1049	Occupied Bandwidth	N/A	CONDUCTED	PASS	Section 7.0
2.1051, 90.543(c), 90.543(e)(2)	Band Edge / Conducted Spurious Emissions	< 43 + 10log$_{10}$ (P[Watts]) at Band Edge and for all out-of-band emissions <65 + 10 log (P[Watts]) in a 6.25kHz bandwidth for emissions in the 769–775 MHz and 799-805 MHz bands		PASS	Section 7.0
90.210(n)	Emissions Mask	Emissions Mask B		PASS	Section 7.0
2.1046	Transmitter Conducted Output Power	N/A		PASS	Section 6.2
90.542(a)(7)	Effective Radiated Power	< 3 Watts max. ERP	RADIATED	PASS	Section 6.3
2.1053, 90.543(c), 90.543(e)(2)	Undesirable Emissions	< 43 + 10log$_{10}$ (P[Watts]) for all out-of-band emissions		PASS	Section 6.4
2.1053, 90.53(f)	Undesirable Emissions in the 1559-1610MHz band	< -40dBm/MHz EIRP (wideband) < -50dBm EIRP (narrowband)		PASS	Section 6.5
2.1055, 90.539(e)	Frequency Stability	< 1.25 ppm		PASS	Section 6.6

Table 6-1. Summary of Test Results

6.2 Transmitter Conducted Output Power

§2.1046

The **IP Wireless 700MHz USB Stick Modem FCC ID: PKTUSBSTKAGJ** was powered by the Toshiba Laptop provided and connected to an Agilent spectrum analyzer (Model: N9020A) through the Receive and Transmit antenna ports of the device. Software installed on the laptop was used to transmit power (24dBm) for all timeslots at a given frequency band and the EUT uplink power was measured using the channel power function of the spectrum analyzer. The modulation (QPSK, 16QAM, 64QAM) of the uplink waveform was also programmed by software and the powers corresponding to each modulation are listed below.

FCC Part	Part 90
700MHz Band Block	Public Safety
Frequency Band	**793-798**
Center Tx Frequency (MHz)	795.5
Rx Frequency (MHz)	765.5
Modulation	**Conducted Powers (dBm)**
QPSK	24.00
16QAM	23.90
64QAM	23.70

Table 6-2. Maximum Average Conducted Output Power

Figure 6-1. Conducted Output Power Test Setup Diagram

6.3 Effective Radiated Power Output Data

§90.542(a)(6);

Frequency [MHz]	Mode	Measured Level [dBm]	Substitute Level [dBm]	Antenna Gain [dBd]	Pol [H/V]	ERP [dBm]	ERP [Watts]
795.50	QPSK	-17.780	20.14	0.00	H	20.14	0.103
795.50	16QAM	-19.030	18.89	0.00	H	18.89	0.077
795.50	64QAM	-18.800	19.12	0.00	H	19.12	0.082

Table 6-3. Effective Radiated Power Output Data (793-798MHz Frequency Band)

NOTES:

Effective Radiated Power Measurements by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 80cm above the ground plane and 3 meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. Final power measurements are made with a broadband average power meter. A Horn antenna was substituted in place of the EUT. This Horn antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same spectrum analyzer reading. This level is recorded using the power meter. The conducted power at the terminals of the Horn antenna is measured. The difference between the gain of the horn and an isotropic antenna is taken into consideration and the ERP is recorded.

This device was tested in all configurations and the highest power is reported as shown in the following test results tables with their respective modulation. This unit was tested while powered by the laptop via USB port The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case test configuration was found in the horizontal setup for ERP measurements and vertical setup for radiated spurious emissions. Modes QPSK, 16QAM and 64QAM were evaluated and QPSK produced the worst case radiated spurious emissions. The data reported in the table above was measured in this test setup.

6.4 TD-CDMA Radiated Measurements

§2.1053, §90.543(c)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	795.50	MHz		
MEASURED OUTPUT POWER:	20.140	dBm	=	0.103 W
MODULATION SIGNAL:	QPSK			
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W) =	33.14	dBc	

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
2386.50	-53.74	6.71	-47.03	V	67.2
3182.00	-58.23	7.55	-50.68	V	70.8
3977.50	-56.49	7.07	-49.42	V	69.6
4773.00	-94.11	9.05	-85.06	V	105.2

Table 6-4. Radiated Spurious Data (793-798MHz Frequency Band)

NOTES:

Radiated Spurious Emission Measurements by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 80cm above the ground plane and 3 meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. Final power measurements are made with a broadband average power meter. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same spectrum analyzer reading. This spurious level is recorded using the power meter. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

This device was tested in all configurations and the highest power is reported as shown in the following test results tables with their respective modulation. This unit was tested while powered by the laptop via USB port The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case test configuration was found in the horizontal setup for ERP measurements and vertical setup for radiated spurious emissions. Modes QPSK, 16QAM and 64QAM were evaluated and QPSK produced the worst case radiated spurious emissions. The data reported in the table above was measured in this test setup.

6.5 TD-CDMA Radiated Measurements in 1559 – 1610MHz Band

§2.1053, §90.543(f)

All of the emissions found in the 1559-1610 MHz band were wideband emissions and the limit -40dBm/MHz was applied.

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	795.50	MHz
MODULATION SIGNAL:	QPSK	
DISTANCE:	3	meters
NARROWBAND LIMIT:	-50	dBm
WIDEBAND LIMIT:	-40	dBm/MHz

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	Margin (dB)
1591.00	-59.87	6.39	-53.48	V	-13.5
1594.45	-62.18	6.71	-55.47	V	-15.5
1599.93	-62.15	7.55	-54.60	V	-14.6

Table 6-5. Radiated Spurious Data (793-798MHz Frequency Band)

NOTES:

Radiated Spurious Emission Measurements by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 80cm above the ground plane and 3 meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. Final power measurements are made with a broadband average power meter. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same spectrum analyzer reading. This spurious level is recorded using the power meter. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

This device was tested in all configurations and the highest power is reported as shown in the following test results tables with their respective modulation. This unit was tested while powered by the laptop via USB port The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case test configuration was found with the EUT in the polarity as indicated in the above tables while connected to the USB port of the laptop PC through a short USB extension cable. The data reported in the table above was measured in this test setup.

6.6 TD-CDMA Frequency Stability Measurements

§2.1055, §90.539(e)

Note: The EUT is operable from 4.75VDC to 5.25VDC. The EUT was not tested outside that voltage range.

OPERATING FREQUENCY: 795,500,000 Hz

REFERENCE VOLTAGE: 5 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	5.00	+ 20 (Ref)	795,500,113	113	0.000014
100 %		- 30	795,500,228	228	0.000029
100 %		- 20	795,499,935	-65	-0.000008
100 %		- 10	795,500,222	222	0.000028
100 %		0	795,499,816	-184	-0.000023
100 %		+ 10	795,499,635	-365	-0.000046
100 %		+ 20	795,500,295	295	0.000037
100 %		+ 30	795,500,605	605	0.000076
100 %		+ 40	795,499,226	-774	-0.000097
100 %		+ 50	795,499,844	-156	-0.000020
105 %	5.25	+ 20	795,500,206	206	0.000026
BATT. ENDPOINT	4.75	+ 20	795,500,095	95	0.000012

Table 6-6. Frequency Stability Data (TD-CDMA Mode)

TD-CDMA Frequency Stability Measurements (Cont'd)

§2.1055, §27.54

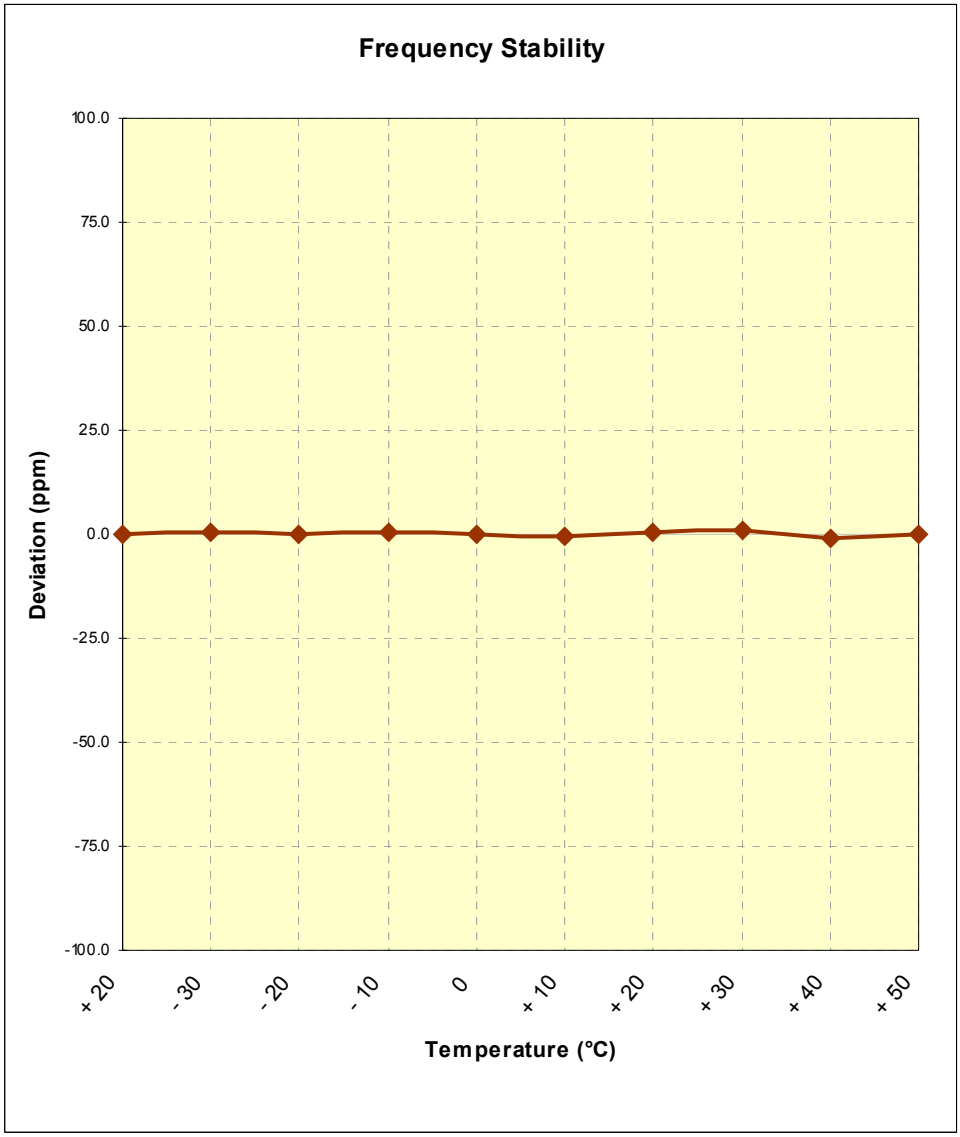


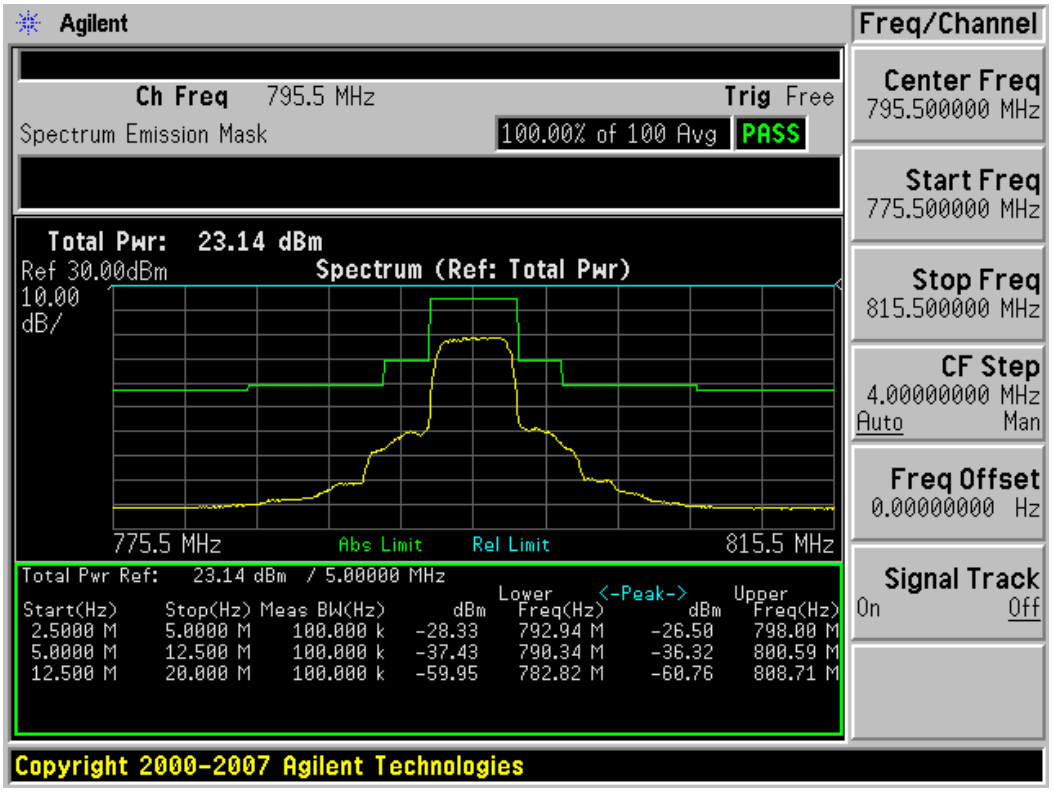
Figure 6-2. Frequency Stability Graph (TD-CDMA Mode)

7.0 PLOT(S) OF EMISSIONS

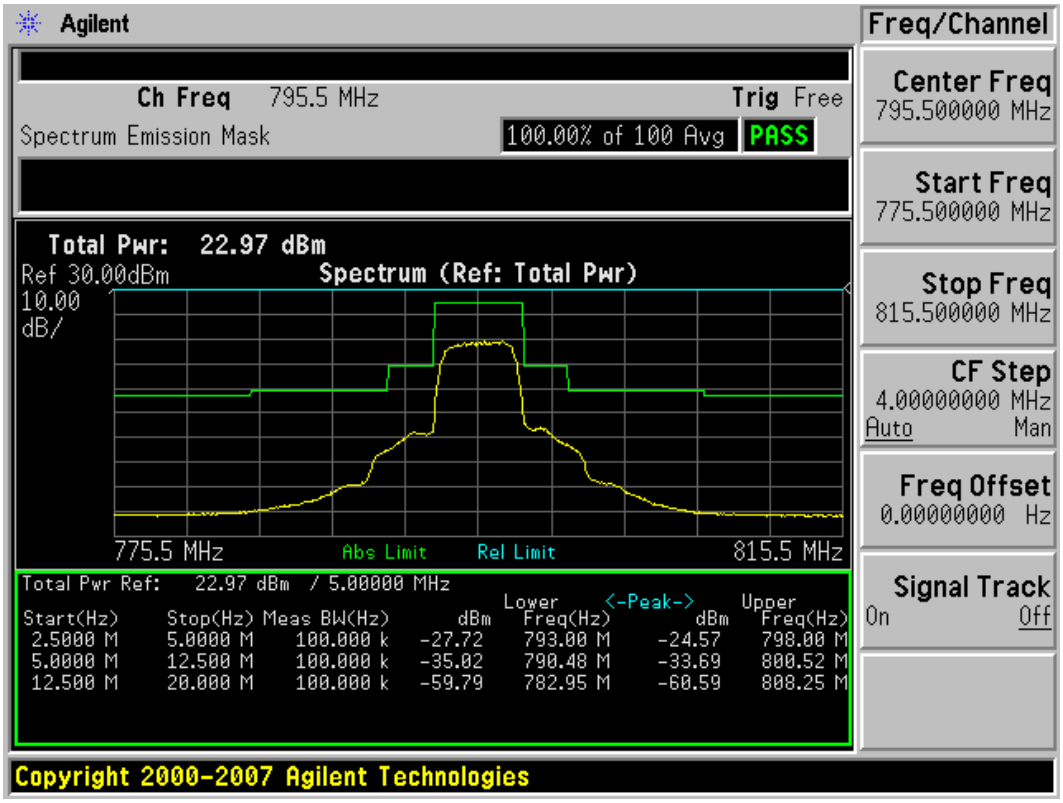
Plot 7-1. Band Edge Plot (QPSK)

Plot 7-2. Band Edge Plot (16QAM)

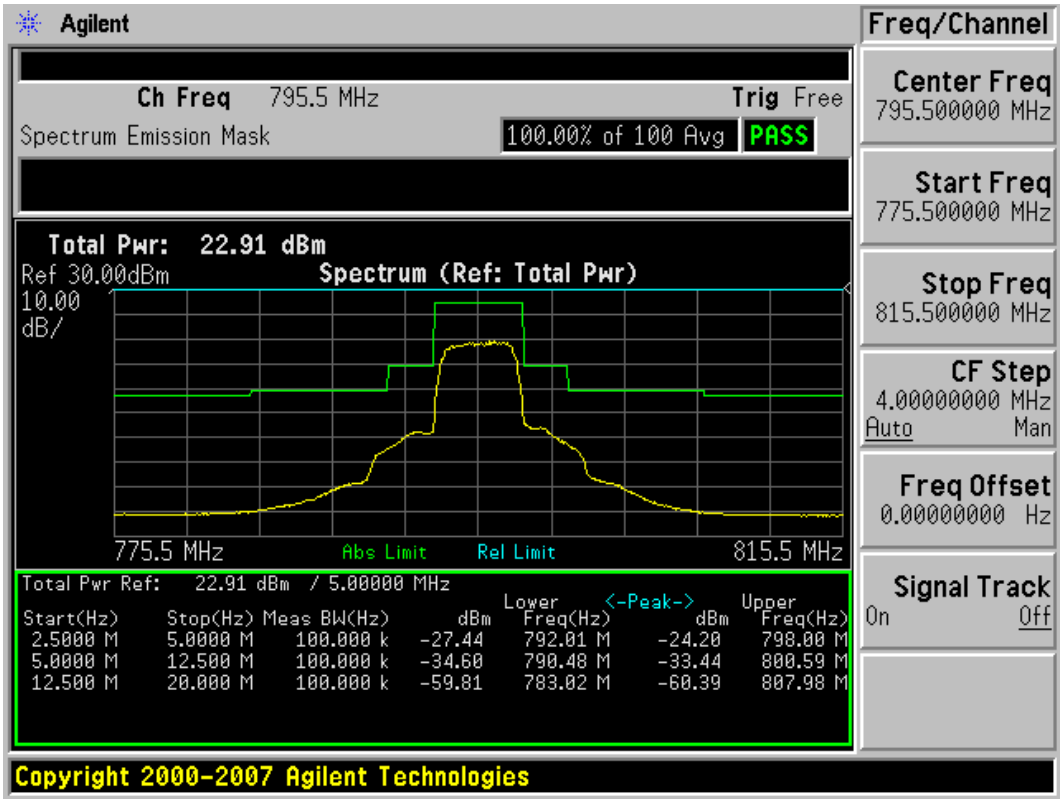
Plot 7-3. Band Edge Plot (64QAM)



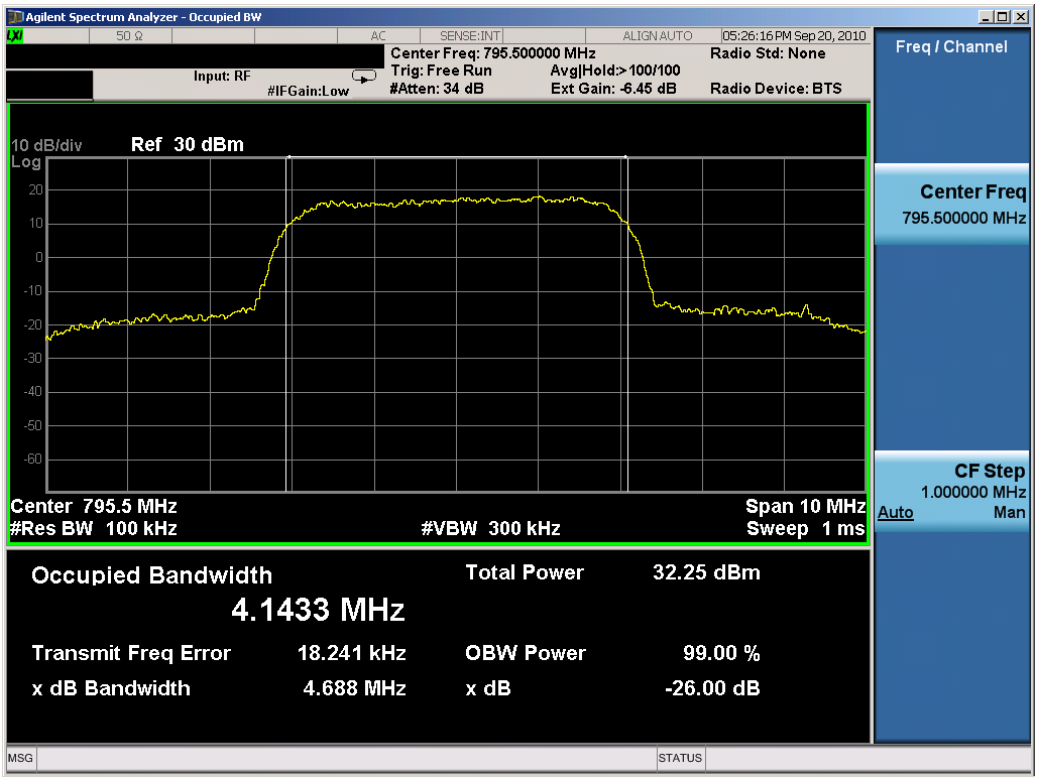
Plot 7-4. Emission Mask (QPSK)



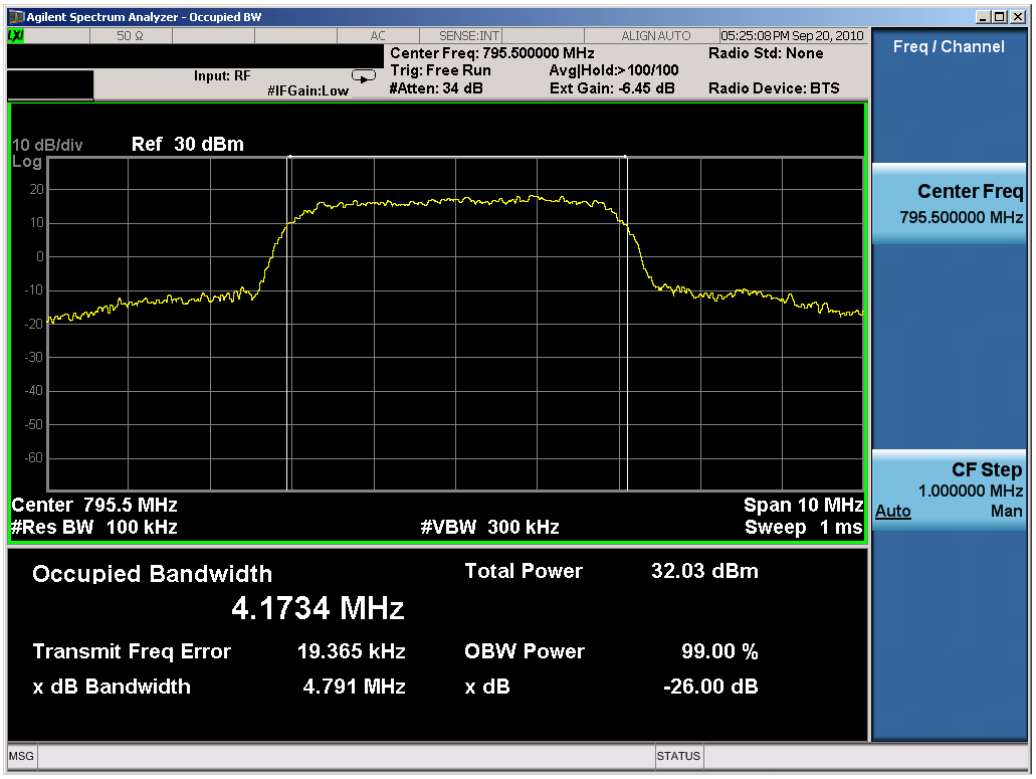
Plot 7-5. Emission Mask (16QAM)



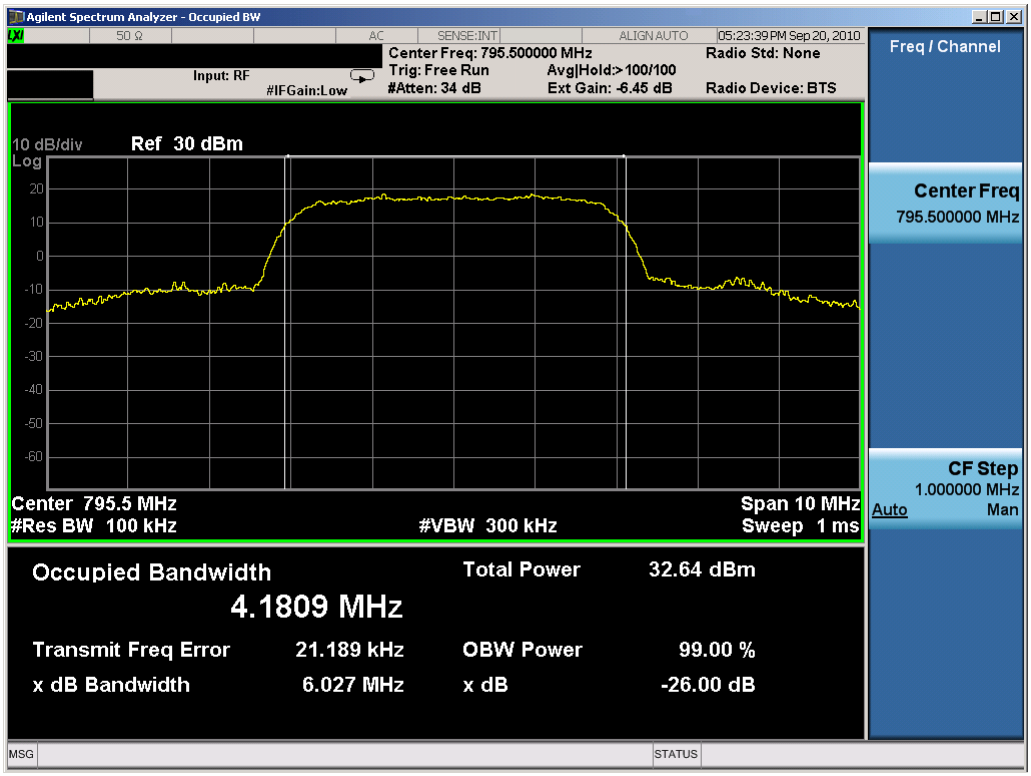
Plot 7-6. Emission Mask (64QAM)



Plot 7-7. Occupied Bandwidth Plot (QPSK)



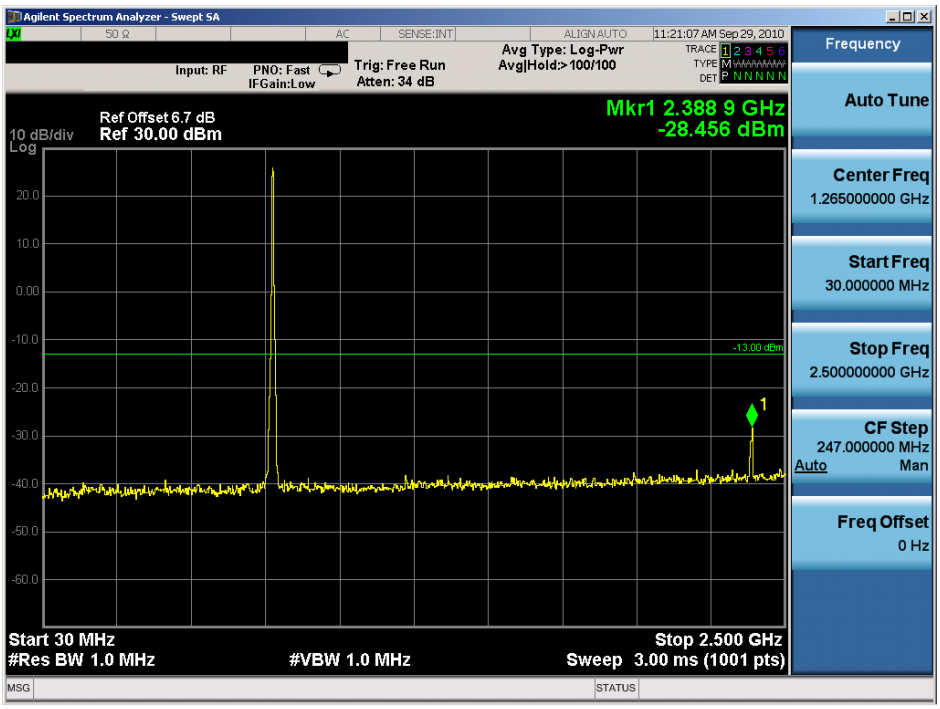
Plot 7-8. Occupied Bandwidth Plot (16QAM)



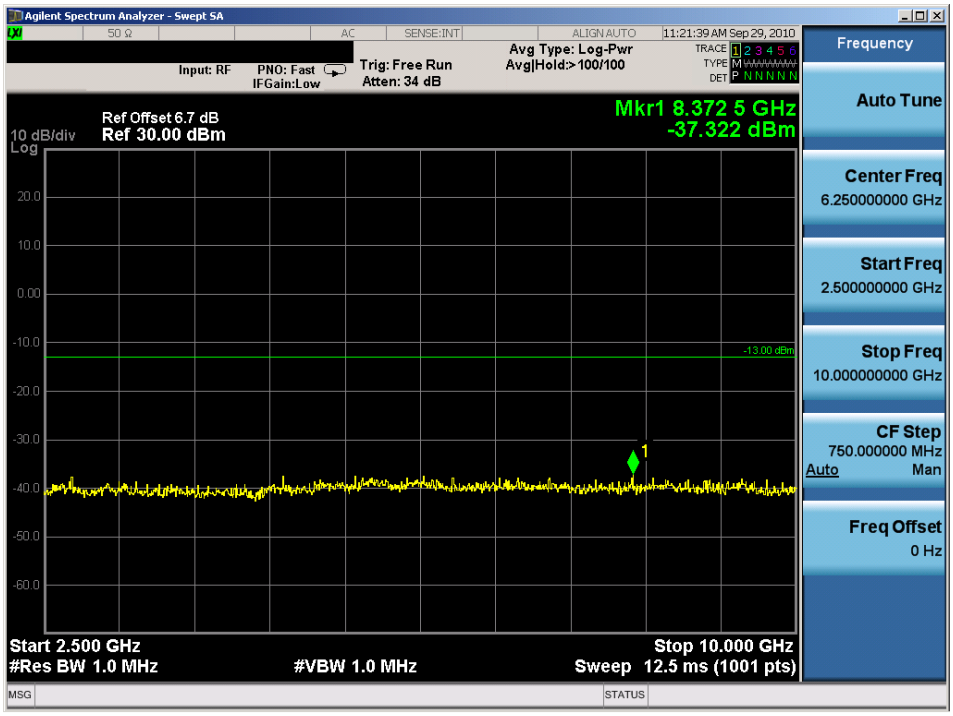
Plot 7-9. Occupied Bandwidth Plot (64QAM)

Out-of-Band Spurious Emissions

For the following conducted spurious emission plots, all modulations were tested and 64QAM mode exhibited the worst case emissions.

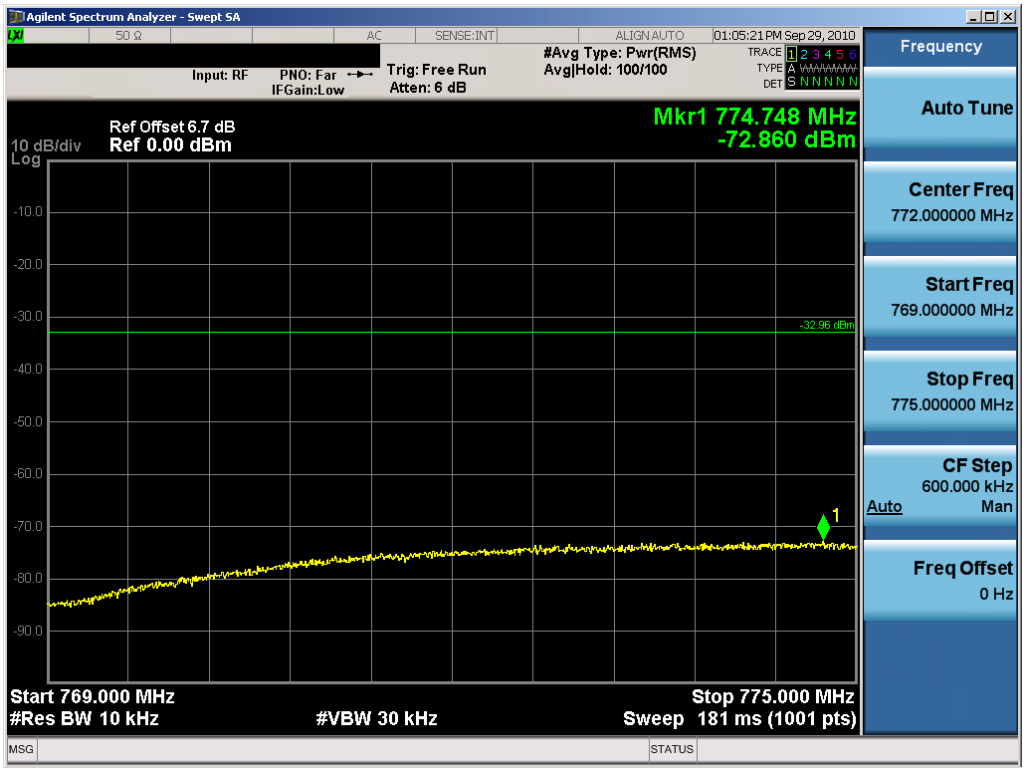


Plot 7-10. Conducted Spurious Plot (64QAM)

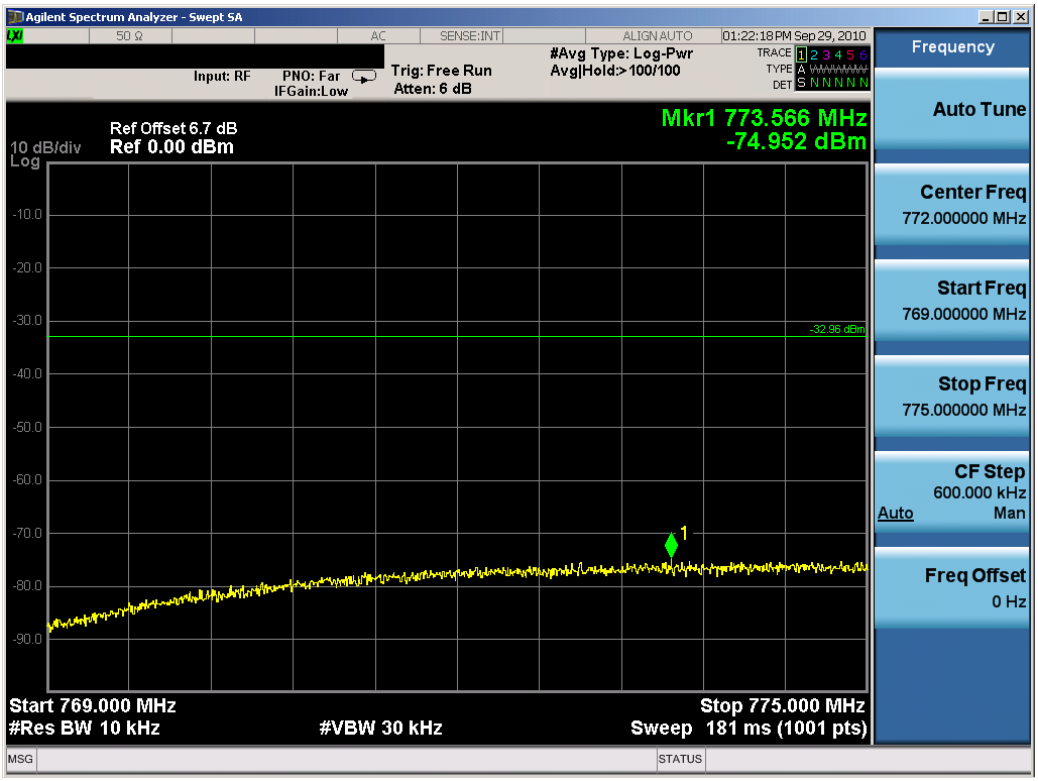


Plot 7-11. Conducted Spurious Plot (64QAM)

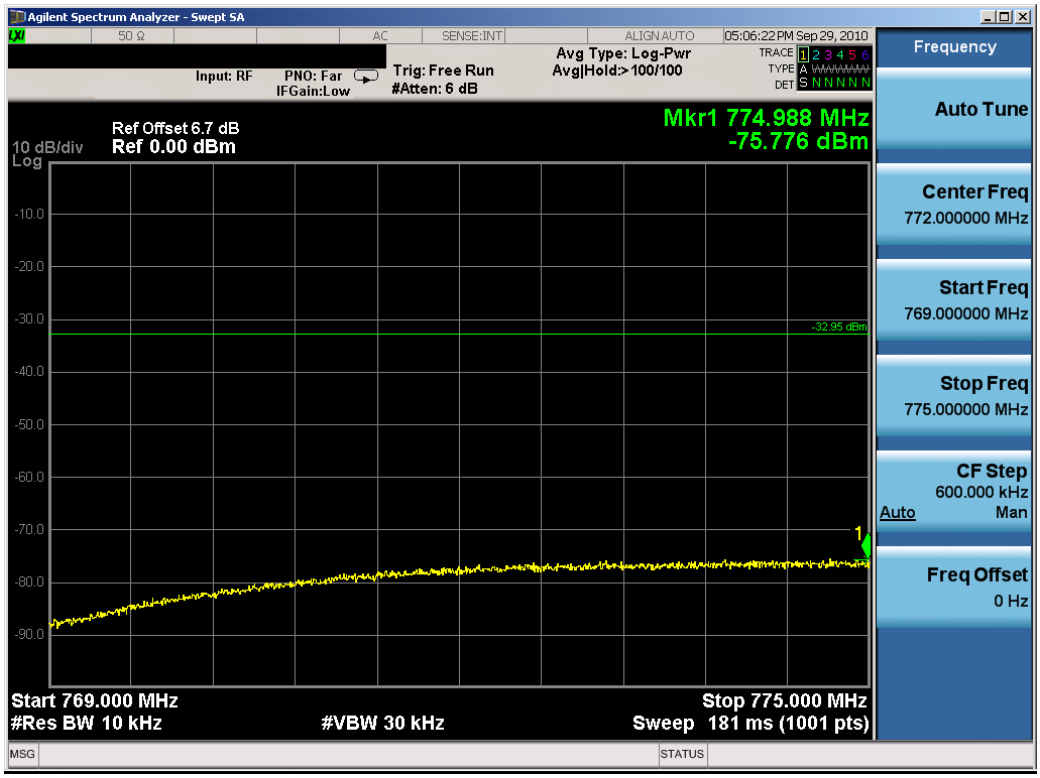
For the following conducted emissions plots in the 799 – 805MHz band, the FCC limit is 65 + $10\log_{10}(P_{[Watts]})$ = -35dBm in a 6.25kHz bandwidth. Since it was not possible to set the resolution bandwidth to 6.25kHz with the available equipment, a bandwidth of 10kHz was used instead to show compliance. By using a 10kHz bandwidth, the limit was adjusted by $10\log_{10}(10kHz/6.25kHz)$ = 2.04dB. Thus, the limit shown in all plots in the 799 – 805MHz band for all available modulation types was -35dBm + 2.04dB = -32.96dBm.



Plot 7-12. Conducted Emissions (769-775MHz) Plot (QPSK)



Plot 7-13. Conducted Emissions (769-775MHz) Plot (16QAM)



Plot 7-14. Conducted Emissions (769-775MHz) Plot (64QAM)

Plot 7-15. Conducted Emissions (799-805MHz) Plot (QPSK)

Plot 7-16. Conducted Emissions (799-805MHz) Plot (16QAM)

Plot 7-17. Conducted Emissions (799-805MHz) Plot (64QAM)

8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **IP Wireless 700MHz USB Stick Modem FCC ID: PKTUSBSTKAGJ** complies with all the requirements of Parts 2 and 90 of the FCC rules.