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Electromagnetic Emissions Test Report

Industry Canada RSS-Gen Issue 2 / RSS 210 Issue 7
FCC Part 15 Subpart C

on the
Juniper Systems, Inc.
Transmitter
Model: BC04 in TK6000

UPN:	TBD
FCC ID:	VSF19799AR
GRANTEE:	Juniper Systems, Inc. 1132 West 1700 North Logan, UT 84321
TEST SITE(S):	Elliott Laboratories 684 W. Maude Ave Sunnyvale, CA 94086 IC Site Registration #: IC 2845-1; IC 2845-2
REPORT DATE:	October 22, 2008
FINAL TEST DATE:	October 2, October 3 and October 7, 2008

AUTHORIZED SIGNATORY: Mark Briggs

Mark Briggs
Staff Engineer

ACCREDITED

Testing Cert #2016-01

REVISION HISTORY

Rev #	Date	Comments	Modified By
1	October 23, 2008	Report issued without Industry Canada Certification Number for the module as the application was still in progress when this report was released.	

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SCOPE

An electromagnetic emissions test has been performed on the Juniper Systems, Inc. model BC04 pursuant to the following rules:

Industry Canada RSS-Gen Issue 2
RSS 210 Issue 7 "Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment"
FCC Part 15 Subpart C

Conducted and radiated emissions data has been collected, reduced, and analyzed within this report in accordance with measurement guidelines set forth in the following reference standards and as outlined in Elliott Laboratories test procedures:

ANSI C63.4:2003
FCC DTS Measurement Procedure KDB558074, March 2005

The intentional radiator above has been tested in a simulated typical installation to demonstrate compliance with the relevant Industry Canada performance and procedural standards.

Final system data was gathered in a mode that tended to maximize emissions by varying orientation of EUT, orientation of power and I/O cabling, antenna search height, and antenna polarization.

Every practical effort was made to perform an impartial test using appropriate test equipment of known calibration. All pertinent factors have been applied to reach the determination of compliance.

The test results recorded herein are based on a single type test of the Juniper Systems, Inc. model BC04 installed in the Juniper Systems model TK6000 and therefore apply only to the tested sample. The sample was selected and prepared by Kent Campbell of Juniper Systems, Inc.

OBJECTIVE

The primary objective of the manufacturer is compliance with the regulations outlined in the previous section.

Prior to marketing in the USA, all unlicensed transmitters and transceivers require certification. Receive-only devices operating between 30 MHz and 960 MHz are subject to either certification or a manufacturer's declaration of conformity, with all other receive-only devices exempt from the technical requirements.

Prior to marketing in Canada, Class I transmitters, receivers and transceivers require certification. Class II devices are required to meet the appropriate technical requirements but are exempt from certification requirements.

Certification is a procedure where the manufacturer submits test data and technical information to a certification body and receives a certificate or grant of equipment authorization upon successful completion of the certification body's review of the submitted documents. Once the equipment authorization has been obtained, the label indicating compliance must be attached to all identical units, which are subsequently manufactured.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product which may result in increased emissions should be checked to ensure compliance has been maintained (i.e., printed circuit board layout changes, different line filter, different power supply, harnessing or I/O cable changes, etc.).

STATEMENT OF COMPLIANCE

The tested sample of Juniper Systems, Inc. model BC04 when installed in Juniper Systems model TK6000 complied with the requirements of the following regulations:

Industry Canada RSS-Gen Issue 2
RSS 210 Issue 7 "Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment"
FCC Part 15 Subpart C

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product which may result in increased emissions should be checked to ensure compliance has been maintained (i.e., printed circuit board layout changes, different line filter, different power supply, harnessing or I/O cable changes, etc.).

TEST RESULTS SUMMARY

DIGITAL TRANSMISSION SYSTEMS (2400 – 2483.5MHz)

FCC Rule Part	RSS Rule Part	Description	Measured Value / Comments	Limit / Requirement	Result
15.247(a)	RSS 210 A8.2	Digital Modulation	The proposed change is to allow use of the module in a new host system (the juniper Systems model TK6000). The module has not been modified to facilitate its use in this new host system, therefore the rf port measurements have not been repeated and the data contained in the original filing(s) remains unchanged.		
15.247 (a) (2)	RSS 210 A8.2 (1)	6dB Bandwidth			
	RSP100	99% Bandwidth			
15.247 (b) (3)	RSS 210 A8.2 (4)	Output Power (multipoint systems)			
15.247 (b)	RSS 210 A8.2 (4)	Output Power (point-point systems)			
15.247(d)	RSS 210 A8.2 (2)	Power Spectral Density			
15.247(c)	RSS 210 A8.5	Antenna Port Spurious Emissions 30MHz – 25 GHz			
15.247(c) / 15.209	RSS 210 A8.5	Radiated Spurious Emissions 30MHz – 25 GHz	69.2dBµV/m @ 4960.3MHz	15.207 in restricted bands, all others < -20dBc	Complies (-4.8dB)

GENERAL REQUIREMENTS APPLICABLE TO ALL BANDS

FCC Rule Part	RSS Rule part	Description	Measured Value / Comments	Limit / Requirement	Result (margin)
15.203	-	RF Connector	Integral Antenna	Integral antenna or unique connector	Complies
15.109	RSS GEN 7.2.3 Table 1	Receiver spurious emissions	48.9dBµV/m (278.6µV/m) @ 1989.0MHz	Refer to page 19	Complies (- 5.1 dB)
15.207	RSS GEN Table 2	AC Conducted Emissions	39.3dBµV (92.3µV) @ 0.926MHz	Refer to standard	Complies (-16.7dB)
15.247 (b) (5) 15.407 (f)	RSS 102	RF Exposure Requirements	Refer to RF exposure evaluation document.	Refer to OET 65, FCC Part 1 and RSS 102	Complies

MEASUREMENT UNCERTAINTIES

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level and were calculated in accordance with UKAS document LAB 34.

Measurement Type	Frequency Range (MHz)	Calculated Uncertainty (dB)
Conducted Emissions	0.15 to 30	± 2.4
Radiated Emissions	0.015 to 30	± 3.0
Radiated Emissions	30 to 1000	± 3.6
Radiated Emissions	1000 to 40000	± 6.0

EQUIPMENT UNDER TEST (EUT) DETAILS

GENERAL

The Juniper Systems, Inc. model BC04 is a Bluetooth module. The device has a limited modular approval with the FCC. Testing was being performed to evaluate the module in a new host device, co-located with the P700 802.11bg module. The new host device for the two modules is a TK6000.

The samples were received on October 2, 2008 and tested on October 2, October 3 and October 7, 2008. The EUT consisted of the following component(s):

Manufacturer	Model	Description	Serial Number	FCC ID
Juniper Systems	BC04 in TK6000	Bluetooth module	-	VSF19799AR
Juniper Systems	P700	802.11bg module	-	VSF19782MX
Ktec	KSAC1200100 W1UV-1	AC/DC adaptor	-	N/A
Juniper Systems	TK6000	Field PC	-	N/A

ANTENNA SYSTEM

The antenna is integral to the module.

ENCLOSURE

The host enclosure is primarily constructed of magnesium alloy and plastic. It measures approximately 13 cm wide by 4 cm deep by 27 cm high. The modules do not have an enclosure as it is designed to be installed within the enclosure of a host computer or system.

MODIFICATIONS

The module did not require modifications during testing in order to comply with emissions specifications.

The host system was modified to comply with the radiated spurious emissions limits. The host system slots for the Bluetooth and WiFi modules had the edges chamfered.

SUPPORT EQUIPMENT

The following equipment was used as local support equipment for emissions testing:

Manufacturer	Model	Description	Serial Number	FCC ID
DELL	Latitude	Laptop	P/N : 3J578A02	IMRMPCIDE3

No remote support equipment was used during emissions testing.

EUT INTERFACE PORTS

The I/O cabling configuration during emissions testing was as follows:

Port	Connected To	Cable(s)		
		Description	Shielded or Unshielded	Length(m)
Serial	Laptop	Serial	Shielded	1.5
DC Power	AC/DC adaptor	DC power cable	Un-shielded	1.5

EUT OPERATION

Transmit mode, Bluetooth module: The Bluetooth module was configured to operate at maximum output power in GFSKDH5 mode, the mode that had the highest fundamental, band edge and spurious emissions during the original module certification. The device was operating in TXDATA3 mode on either top, bottom or center channel.

Transmit mode, WiFi module: The WiFi module was configured to operate continuously at the stated data rate in each of the two different modes (802.11b and 802.11g) using a software tool called RFUTIL. The data rates were selected based on the original test report as representing the worst case data rates with respect to radiated emissions. Compliance with radiated spurious emissions limits at the 2390MHz and 2483.5MHz restricted band edges were demonstrated in both operating modes. Spurious emissions were evaluated in 802.11b mode as the original test report indicated that this mode had the highest spurious emissions. The spurious emissions at the band edges were evaluated on top and bottom channels, the other spurious were evaluated on top, bottom and center channels. During the test on the center channel the Bluetooth module was also configured to operate on its high channel to confirm that no significant inter-modulation products were created with both modules operating simultaneously.

Receive mode: Both the Bluetooth and 802.11 modules were configured to operate in receive-only mode with both modules tuned to the center channel (2441MHz for the Bluetooth module and 2437MHz for the 802.11 module).

TEST SITE

GENERAL INFORMATION

Final test measurements were taken on October 2, October 3 and October 7, 2008 at the test sites listed below. Pursuant to section 2.948 of the FCC's Rules and section 3.3 of RSP-100, construction, calibration, and equipment data has been filed with the Commission and with industry Canada.

Site	Registration Numbers		Location
	FCC	Canada	
SVOATS #1	90592	IC 2845-1	684 West Maude Ave, Sunnyvale CA 94085-3518
SVOATS #2	90593	IC 2845-2	

ANSI C63.4:2003 recommends that ambient noise at the test site be at least 6 dB below the allowable limits. Ambient levels are below this requirement with the exception, on OATS sites, of predictable local TV, radio, and mobile communications traffic. The test site(s) contain separate areas for radiated and conducted emissions testing. Considerable engineering effort has been expended to ensure that the facilities conform to all pertinent requirements of ANSI C63.4:2003.

CONDUCTED EMISSIONS CONSIDERATIONS

Conducted emissions testing is performed in conformance with ANSI C63.4:2003. Measurements are made with the EUT connected to the public power network through a nominal, standardized RF impedance, which is provided by a line impedance stabilization network, known as a LISN. A LISN is inserted in series with each current-carrying conductor in the EUT power cord.

RADIATED EMISSIONS CONSIDERATIONS

The FCC has determined that radiation measurements made in a shielded enclosure are not suitable for determining levels of radiated emissions. Radiated measurements are performed in an open field environment or in a semi-anechoic chamber. The test sites are maintained free of conductive objects within the CISPR defined elliptical area incorporated in ANSI C63.4:2003 guidelines and meet the Normalized Site Attenuation (NSA) requirements of ANSI C63.4:2003.

MEASUREMENT INSTRUMENTATION

RECEIVER SYSTEM

An EMI receiver as specified in CISPR 16-1 is used for emissions measurements. The receivers used can measure over the frequency range of 9 kHz up to 2000 MHz. These receivers allow both ease of measurement and high accuracy to be achieved. The receivers have Peak, Average, and CISPR (Quasi-peak) detectors built into their design so no external adapters are necessary. The receiver automatically sets the required bandwidth for the CISPR detector used during measurements. If the repetition frequency of the signal being measured is below 20Hz, peak measurements are made in lieu of Quasi-Peak measurements.

For measurements above the frequency range of the receivers, a spectrum analyzer is utilized because it provides visibility of the entire spectrum along with the precision and versatility required to support engineering analysis. Average measurements above 1000MHz are performed on the spectrum analyzer using the linear-average method with a resolution bandwidth of 1 MHz and a video bandwidth of 10 Hz, unless the signal is pulsed in which case the average (or video) bandwidth of the measuring instrument is reduced to onset of pulse desensitization and then increased.

INSTRUMENT CONTROL COMPUTER

The receivers utilize either a Rohde & Schwarz EZM Spectrum Monitor/Controller or contain an internal Spectrum Monitor/Controller to view and convert the receiver measurements to the field strength at an antenna or voltage developed at the LISN measurement port, which is then compared directly with the appropriate specification limit. This provides faster, more accurate readings by performing the conversions described under Sample Calculations within the Test Procedures section of this report. Results are printed in a graphic and/or tabular format, as appropriate. A personal computer is used to record all measurements made with the receivers.

The Spectrum Monitor provides a visual display of the signal being measured. In addition, the controller or a personal computer run automated data collection programs which control the receivers. This provides added accuracy since all site correction factors, such as cable loss and antenna factors are added automatically.

LINE IMPEDANCE STABILIZATION NETWORK (LISN)

Line conducted measurements utilize a fifty microhenry Line Impedance Stabilization Network as the monitoring point. The LISN used also contains a 250 uH CISPR adapter. This network provides for calibrated radio frequency noise measurements by the design of the internal low pass and high pass filters on the EUT and measurement ports, respectively.

FILTERS/ATTENUATORS

External filters and precision attenuators are often connected between the receiving antenna or LISN and the receiver. This eliminates saturation effects and non-linear operation due to high amplitude transient events.

ANTENNAS

A loop antenna is used below 30 MHz. For the measurement range 30 MHz to 1000 MHz either a combination of a biconical antenna and a log periodic or a bi-log antenna is used. Above 1000 MHz, horn antennas are used. The antenna calibration factors to convert the received voltage to an electric field strength are included with appropriate cable loss and amplifier gain factors to determine an overall site factor, which is then programmed into the test receivers or incorporated into the test software.

ANTENNA MAST AND EQUIPMENT TURNTABLE

The antennas used to measure the radiated electric field strength are mounted on a non-conductive antenna mast equipped with a motor-drive to vary the antenna height. Measurements below 30 MHz are made with the loop antenna at a fixed height of 1m above the ground plane.

ANSI C63.4:2003 specifies that the test height above ground for table mounted devices shall be 80 centimeters. Floor mounted equipment shall be placed on the ground plane if the device is normally used on a conductive floor or separated from the ground plane by insulating material from 3 to 12 mm if the device is normally used on a non-conductive floor. During radiated measurements, the EUT is positioned on a motorized turntable in conformance with this requirement.

INSTRUMENT CALIBRATION

All test equipment is regularly checked to ensure that performance is maintained in accordance with the manufacturer's specifications. All antennas are calibrated at regular intervals with respect to tuned half-wave dipoles. An exhibit of this report contains the list of test equipment used and calibration information.

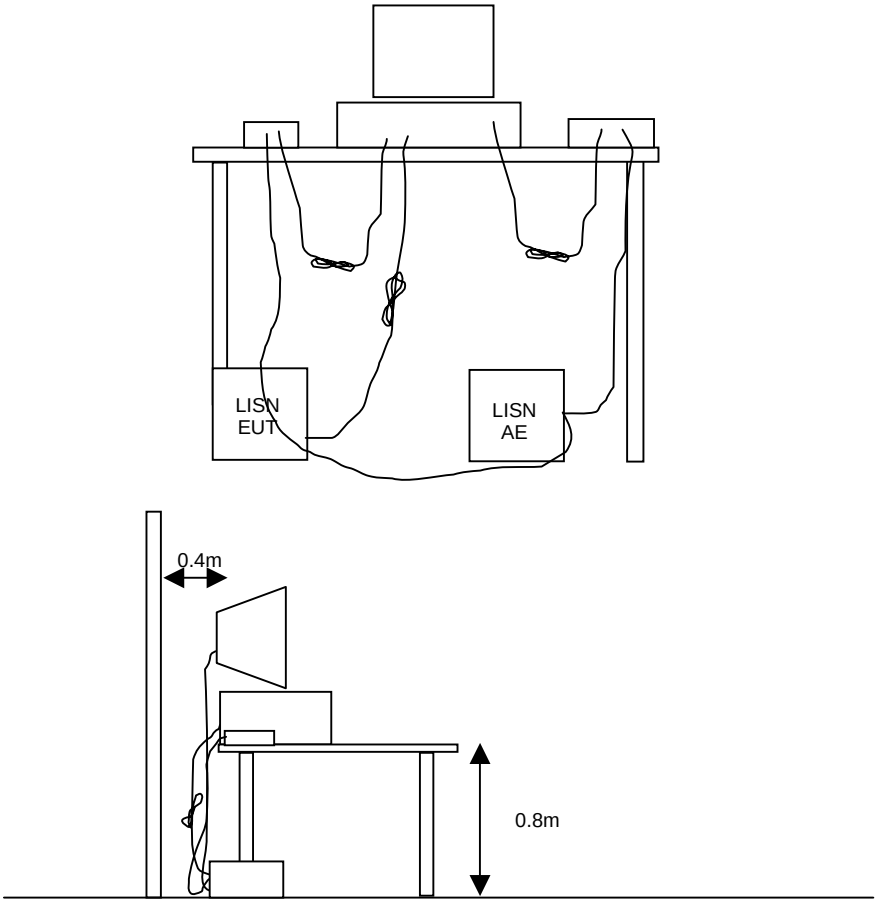
TEST PROCEDURES

EUT AND CABLE PLACEMENT

The regulations require that interconnecting cables be connected to the available ports of the unit and that the placement of the unit and the attached cables simulate the worst case orientation that can be expected from a typical installation, so far as practicable. To this end, the position of the unit and associated cabling is varied within the guidelines of ANSI C63.4:2003, and the worst-case orientation is used for final measurements.

CONDUCTED EMISSIONS

Conducted emissions are measured at the plug end of the power cord supplied with the EUT. Excess power cord length is wrapped in a bundle between 30 and 40 centimeters in length near the center of the cord. Preliminary measurements are made to determine the highest amplitude emission relative to the specification limit for all the modes of operation. Placement of system components and varying of cable positions are performed in each mode. A final peak mode scan is then performed in the position and mode for which the highest emission was noted on all current carrying conductors of the power cord.

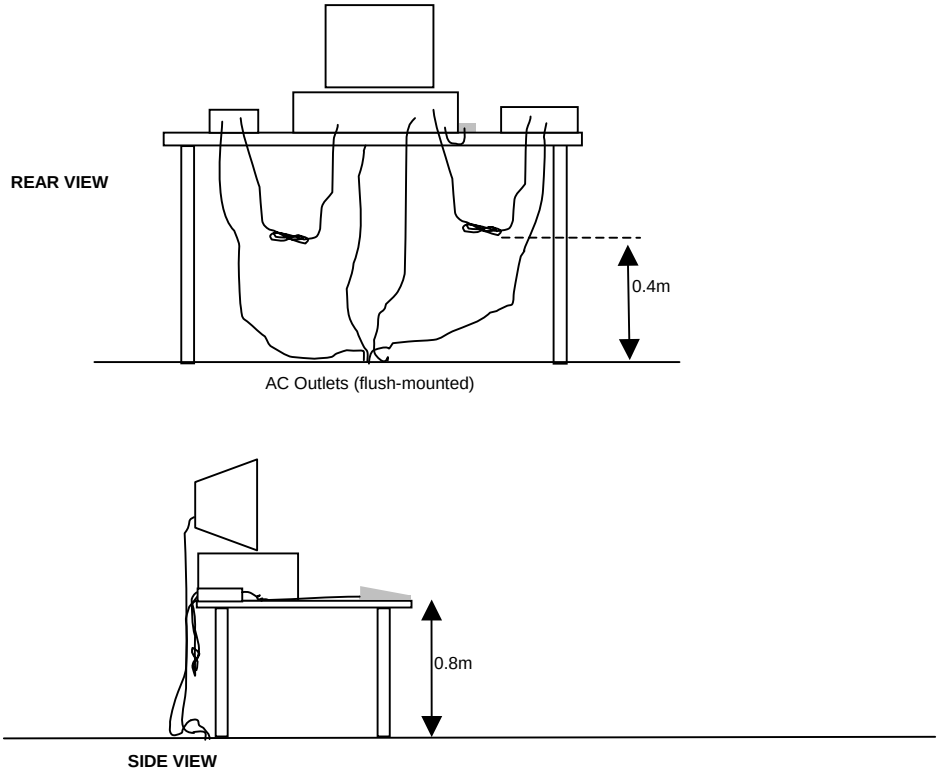


A preliminary scan of the radiated emissions is performed in which all significant EUT frequencies are identified with the system in a nominal configuration. At least two scans are performed, one scan for each antenna polarization (horizontal and vertical; loop parallel and perpendicular to the EUT). During the preliminary scans, the EUT is rotated through 360˚, the antenna height is varied (for measurements above 30 MHz) and cable positions are varied to determine the highest emission relative to the limit. Preliminary scans may be performed in a fully anechoic chamber for the purposes of identifying the frequencies of the highest emissions from the EUT.

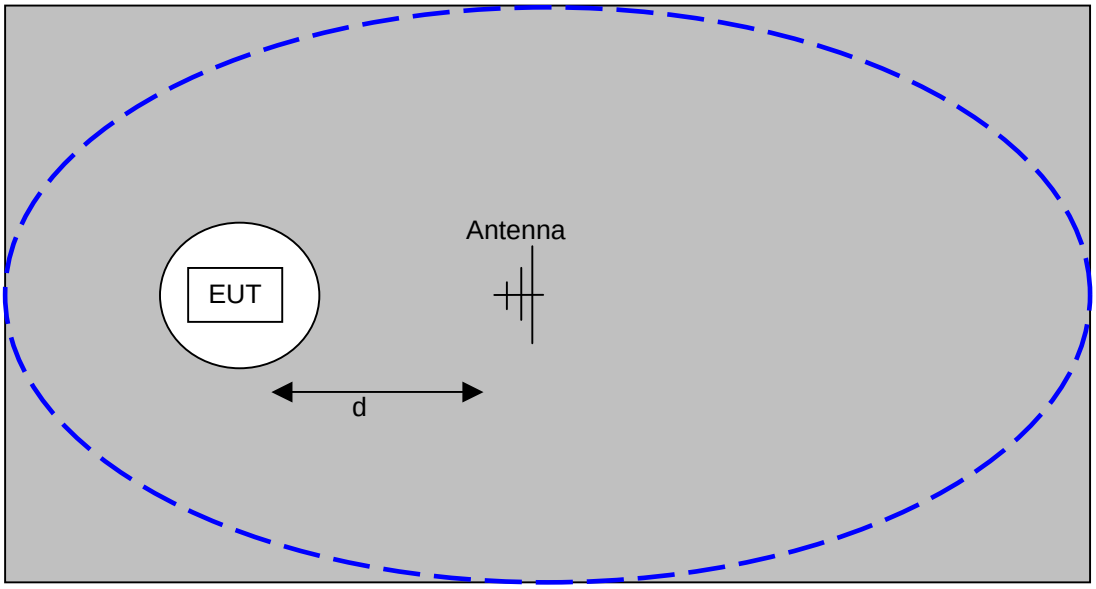
A speaker is provided in the receiver to aid in discriminating between EUT and ambient emissions. Other methods used during the preliminary scan for EUT emissions involve scanning with near field magnetic loops, monitoring I/O cables with RF current clamps, and cycling power to the EUT.

Final maximization is a phase in which the highest amplitude emissions identified in the spectral search are viewed while the EUT azimuth angle is varied from 0 to 360 degrees relative to the receiving antenna. The azimuth, which results in the highest emission is then maintained while varying the antenna height from one to four meters (for measurements above 30 MHz, measurements below 30 MHz are made with the loop antenna at a fixed height of 1m). The result is the identification of the highest amplitude for each of the highest peaks. Each recorded level is corrected in the receiver using appropriate factors for cables, connectors, antennas, and preamplifier gain.

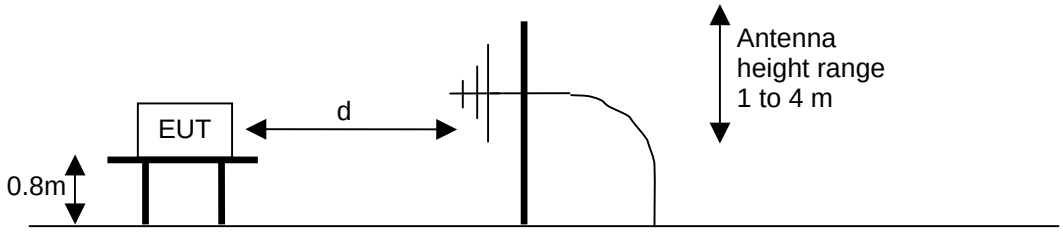
When testing above 18 GHz, the receive antenna is located at 1meter from the EUT and the antenna height is restricted to a maximum of 2.5 meters.



Typical Test Configuration for Radiated Field Strength Measurements



The ground plane extends beyond the ellipse defined in CISPR 16 / CISPR 22 / ANSI C63.4 and is large enough to accommodate test distances (d) of 3m and 10m. Refer to the test data tables for the actual measurement distance.



Test Configuration for Radiated Field Strength Measurements
OATS- Plan and Side Views

SPECIFICATION LIMITS AND SAMPLE CALCULATIONS

The limits for conducted emissions are given in units of microvolts, and the limits for radiated emissions are given in units of microvolts per meter at a specified test distance. Data is measured in the logarithmic form of decibels relative to one microvolt, or dB microvolts (dBuV). For radiated emissions, the measured data is converted to the field strength at the antenna in dB microvolts per meter (dBuV/m). The results are then converted to the linear forms of uV and uV/m for comparison to published specifications.

For reference, converting the specification limits from linear to decibel form is accomplished by taking the base ten logarithm, then multiplying by 20. These limits in both linear and logarithmic form are as follows:

CONDUCTED EMISSIONS SPECIFICATION LIMITS: FCC 15.207; FCC 15.107(a), RSS GEN

The table below shows the limits for the emissions on the AC power line from an intentional radiator and a receiver.

Frequency (MHz)	Average Limit (dBuV)	Quasi Peak Limit (dBuV)
0.150 to 0.500	Linear decrease on logarithmic frequency axis between 56.0 and 46.0	Linear decrease on logarithmic frequency axis between 66.0 and 56.0
0.500 to 5.000	46.0	56.0
5.000 to 30.000	50.0	60.0

GENERAL TRANSMITTER RADIATED EMISSIONS SPECIFICATION LIMITS

The table below shows the limits for the spurious emissions from transmitters that fall in restricted bands[1] (with the exception of transmitters operating under FCC Part 15 Subpart D and RSS 210 Annex 9), the limits for all emissions from a low power device operating under the general rules of RSS 310 (tables 3 and 4), RSS 210 (table 2) and FCC Part 15 Subpart C section 15.209.

Frequency Range (MHz)	Limit (uV/m)	Limit (dBuV/m @ 3m)
0.009-0.490	$2400/F_{KHz}$ @ 300m	$67.6-20*\log_{10}(F_{KHz})$ @ 300m
0.490-1.705	$24000/F_{KHz}$ @ 30m	$87.6-20*\log_{10}(F_{KHz})$ @ 30m
1.705 to 30	30 @ 30m	29.5 @ 30m
30 to 88	100 @ 3m	40 @ 3m
88 to 216	150 @ 3m	43.5 @ 3m
216 to 960	200 @ 3m	46.0 @ 3m
Above 960	500 @ 3m	54.0 @ 3m

RECEIVER RADIATED SPURIOUS EMISSIONS SPECIFICATION LIMITS

The table below shows the limits for the spurious emissions from receivers as detailed in FCC Part 15.109, RSS 210 Table 2, RSS GEN Table 1 and RSS 310 Table 3. Note that receivers operating outside of the frequency range 30 MHz – 960 MHz are exempt from the requirements of 15.109.

Frequency Range (MHz)	Limit (uV/m @ 3m)	Limit (dBuV/m @ 3m)
30 to 88	100	40
88 to 216	150	43.5
216 to 960	200	46.0
Above 960	500	54.0

TRANSMIT MODE SPURIOUS RADIATED EMISSIONS LIMITS – FHSS and DTS SYSTEMS

The limits for unwanted (spurious) emissions from the transmitter falling in the restricted bands are those specified in the general limits sections of FCC Part 15 and RSS 210. All other unwanted (spurious) emissions shall be at least 20dB below the level of the highest in-band signal level (30dB if the power is measured using the sample detector/power averaging method).

[1] The restricted bands are detailed in FCC 15.203, RSS 210 Table 1 and RSS 310 Table 2

SAMPLE CALCULATIONS - CONDUCTED EMISSIONS

Receiver readings are compared directly to the conducted emissions specification limit (decibel form) as follows:

$$R_r - S = M$$

where:

R_r = Receiver Reading in dBuV

S = Specification Limit in dBuV

M = Margin to Specification in +/- dB

SAMPLE CALCULATIONS - RADIATED EMISSIONS

Receiver readings are compared directly to the specification limit (decibel form). The receiver internally corrects for cable loss, preamplifier gain, and antenna factor. The calculations are in the reverse direction of the actual signal flow, thus cable loss is added and the amplifier gain is subtracted. The Antenna Factor converts the voltage at the antenna coaxial connector to the field strength at the antenna elements.

A distance factor, when used for electric field measurements above 30MHz, is calculated by using the following formula:

$$F_d = 20*LOG_{10} (D_m/D_s)$$

where:

F_d = Distance Factor in dB

D_m = Measurement Distance in meters

D_s = Specification Distance in meters

For electric field measurements below 30MHz the extrapolation factor is either determined by making measurements at multiple distances or a theoretical value is calculated using the formula:

$$F_d = 40*LOG_{10} (D_m/D_s)$$

Measurement Distance is the distance at which the measurements were taken and Specification Distance is the distance at which the specification limits are based. The antenna factor converts the voltage at the antenna coaxial connector to the field strength at the antenna elements.

The margin of a given emission peak relative to the limit is calculated as follows:

$$R_c = R_r + F_d$$

and

$$M = R_c - L_s$$

where:

R_r = Receiver Reading in dBuV/m

F_d = Distance Factor in dB

R_c = Corrected Reading in dBuV/m

L_s = Specification Limit in dBuV/m

M = Margin in dB Relative to Spec

SAMPLE CALCULATIONS - FIELD STRENGTH TO EIRP CONVERSION

Where the radiated electric field strength is expressed in terms of the equivalent isotropic radiated power (eirp), or where a field strength measurement of output power is made in lieu of a direct measurement, the following formula is used to convert between eirp and field strength at a distance of 3m from the equipment under test:

$$E = \frac{1000000 \sqrt{30 P}}{3} \quad \text{microvolts per meter}$$

where P is the eirp (Watts)

EXHIBIT 1: Test Equipment Calibration Data

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Radiated Emissions, 30 - 26,500 MHz, 12-Sep-08
Engineer: Rafael Varelas

Manufacturer	Description	Model #	Asset #	Cal Due
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	785	06-Jun-09
EMCO	Antenna, Horn, 1-18 GHz (SA40-Red)	3115	1142	15-Jul-10
Hewlett Packard	SpecAn 30 Hz -40 GHz, SV (SA40) Red	8564E (84125C)	1148	24-Sep-08
Hewlett Packard	High Pass filter, 3.5 GHz	P/N 84300-80038	1157	15-Oct-08

Radiated Emissions, 1000 - 6,500 MHz, 19-Sep-08
Engineer: Mehran Birgani

Manufacturer	Description	Model #	Asset #	Cal Due
EMCO	Antenna, Horn, 1-18 GHz	3115	487	15-Jul-10
Hewlett Packard	EMC Spectrum Analyzer, 9 kHz - 6.5 GHz	8595EM	787	19-Feb-09
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	870	08-Nov-08
Hewlett Packard	High Pass filter, 3.5 GHz (Red System)	P/N 84300-80038 (84125C)	1403	28-Aug-09

Radiated Emissions, 1,000 - 26,500 MHz, 02 and 03-Oct-08
Engineer: Mehran Birgani

Manufacturer	Description	Model #	Asset #	Cal Due
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	785	06-Jun-09
EMCO	Antenna, Horn, 1-18 GHz (SA40-Red)	3115	1142	15-Jul-10
Hewlett Packard	SpecAn 30 Hz -40 GHz, SV (SA40) Red	8564E (84125C)	1148	24-Oct-08
Hewlett Packard	High Pass filter, 3.5 GHz	P/N 84300-80038	1157	15-Oct-08

Radiated Emissions, 30 - 7,500 MHz, 07-Oct-08
Engineer: Mehran Birgani

Manufacturer	Description	Model #	Asset #	Cal Due
Elliott Laboratories	Biconical Antenna, 30-300 MHz	EL30.300	54	26-Mar-09
EMCO	Log Periodic Antenna, 0.3-1 GHz	3146A	364	13-Dec-08
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	785	06-Jun-09
Hewlett Packard	SpecAn 30 Hz -40 GHz, SV (SA40) Red	8564E (84125C)	1148	24-Oct-08
EMCO	Antenna, Horn, 1-18 GHz	3117	1662	11-Apr-10
Hewlett Packard	Preamplifier, 100 kHz - 1.3 GHz	8447D OPT 010	1826	29-May-09

Conducted Emissions - AC Power Ports, 07-Oct-08
Engineer: Mehran Birgani

Manufacturer	Description	Model #	Asset #	Cal Due
Elliott Laboratories	LISN, FCC / CISPR	LISN-3, OATS	304	31-Jul-09
Hewlett Packard	EMC Spectrum Analyzer, 9 kHz - 6.5 GHz	8595EM	787	19-Feb-09
Fischer Custom Comm.	Calibration Fixture - BCI	FCC-BCICF-1	1298	17-Oct-08
Rohde & Schwarz	Test Receiver, 0.009-2750 MHz	ESN	1332	29-Jan-09

Radiated Emissions, 30 - 26,500 MHz, 07-Oct-08
Engineer: Mehran Birgani

Manufacturer	Description	Model #	Asset #	Cal Due
Elliott Laboratories	Log Periodic Antenna 300-1000 MHz	EL300.1000	55	27-Feb-09
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	785	06-Jun-09
EMCO	Biconical Antenna, 30-300 MHz	3110B	801	19-Sep-09
EMCO	Antenna, Horn, 1-18 GHz (SA40-Red)	3115	1142	15-Jul-10
Hewlett Packard	SpecAn 30 Hz -40 GHz, SV (SA40) Red	8564E (84125C)	1148	24-Oct-08
Hewlett Packard	High Pass filter, 3.5 GHz	P/N 84300-80038	1157	15-Oct-08
Rohde & Schwarz	Test Receiver, 0.009-2750 MHz	ESN	1332	29-Jan-09

Radiated Emissions, 30 - 25000 MHz, 19-Oct-08
Engineer: Rafael Varelas

Manufacturer	Description	Model #	Asset #	Cal Due
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	785	06-Jun-09
Hewlett Packard	SpecAn 30 Hz -40 GHz, SV (SA40) Red	8564E (84125C)	1148	24-Oct-08
EMCO	Antenna, Horn, 1-18 GHz	3115	1561	10-Jun-10
Micro-Tronics	Band Reject Filter, 2400-2500 MHz	BRM50702-02	1683	05-Aug-09

EXHIBIT 2: Test Measurement Data

13 Pages

Client:	Juniper Systems	Job Number:	J72953
Model:	BC04 Bluetooth module and P700 WiFi module in TK6000	T-Log Number:	T72992
		Account Manager:	Mark Briggs
Contact:	Kent Campbell		-
Emissions Standard(s):	FCC Part 15.247 / RSS 210 Issue 7	Class:	N/A
Immunity Standard(s):	-	Environment:	-

EMC Test Data

For The

Juniper Systems

Model

BC04 Bluetooth module and P700 WiFi module in TK6000

Date of Last Test: 10/20/2008

Client:	Juniper Systems	Job Number:	J72953
Model:	BC04 Bluetooth module and P700 WiFi module in TK6000	T-Log Number:	T72992
		Account Manager:	Mark Briggs
Contact:	Kent Campbell		
Standard:	FCC Part 15.247 / RSS 210 Issue 7	Class:	N/A

Conducted Emissions - Power Ports

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 7-Oct
Test Engineer: Mehran Birgani
Test Location: SV OATS #1

Config. Used: Bluetooth and 802.11 in transmit mode
Config Change: No local support equipment
Host Unit Voltage 120V/60Hz

General Test Configuration

The EUT was located on a wooden table, 40 cm from a vertical coupling plane and 80cm from the LISN.

Ambient Conditions:

Temperature: 24 °C
Rel. Humidity: 53 %

Summary of Results

Run #	Test Performed	Limit	Result	Margin
1	CE, AC Power,120V/60Hz	FCC 15.209 RSS GEN	Pass	39.3dBµV (92.3µV) @ 0.926MHz (-16.7dB)

Modifications Made During Testing

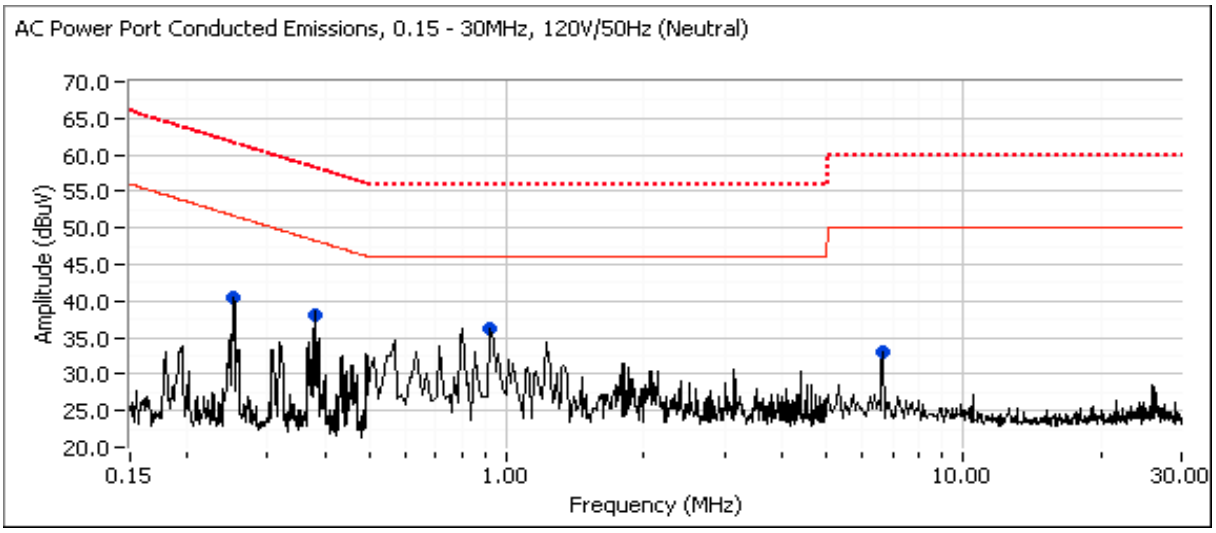
No modifications were made to the EUT during testing

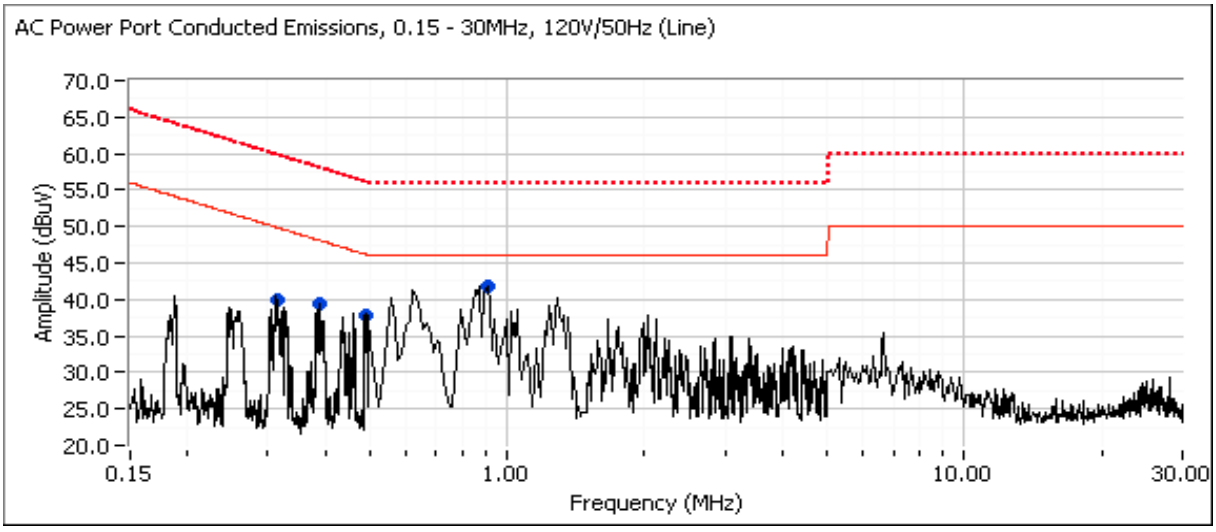
Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Juniper Systems	Job Number:	J72953
Model:	BC04 Bluetooth module and P700 WiFi module in TK6000	T-Log Number:	T72992
		Account Manager:	Mark Briggs
Contact:	Kent Campbell		
Standard:	FCC Part 15.247 / RSS 210 Issue 7	Class:	N/A

Run #1: AC Power Port Conducted Emissions, 0.15 - 30MHz, 120V/50Hz





Client:	Juniper Systems	Job Number:	J72953
Model:	BC04 Bluetooth module and P700 WiFi module in TK6000	T-Log Number:	T72992
		Account Manager:	Mark Briggs
Contact:	Kent Campbell		
Standard:	FCC Part 15.247 / RSS 210 Issue 7	Class:	N/A

Run #1: AC Power Port Conducted Emissions, 0.15 - 30MHz, 120V/50Hz

Frequency	Level	AC	FCC 15.109/5.209		Detector	Comments
MHz	dBµV	Line	Limit	Margin	QP/Ave	
0.253	21.2	Neutral	51.7	-30.5	AVG	AVG (0.10s)
0.315	27.1	Line	49.8	-22.7	AVG	AVG (0.10s)
0.378	19.1	Neutral	48.3	-29.2	AVG	AVG (0.10s)
0.387	23.1	Line	48.1	-25.0	AVG	AVG (0.10s)
0.490	23.4	Line	46.2	-22.8	AVG	AVG (0.10s)
0.919	19.4	Neutral	46.0	-26.6	AVG	AVG (0.10s)
0.926	25.6	Line	46.0	-20.4	AVG	AVG (0.10s)
6.614	11.5	Neutral	50.0	-38.5	AVG	AVG (0.10s)
0.253	36.2	Neutral	61.7	-25.5	QP	QP (1.00s)
0.315	38.5	Line	59.8	-21.3	QP	QP (1.00s)
0.378	33.3	Neutral	58.3	-25.0	QP	QP (1.00s)
0.387	35.7	Line	58.1	-22.4	QP	QP (1.00s)
0.490	37.7	Line	56.2	-18.5	QP	QP (1.00s)
0.919	32.2	Neutral	56.0	-23.8	QP	QP (1.00s)
0.926	**39.3**	**Line**	**56.0**	**-16.7**	QP	QP (1.00s)
6.614	19.6	Neutral	60.0	-40.4	QP	QP (1.00s)

Client:	Juniper Systems	Job Number:	J72953
Model:	BC04 Bluetooth Module in TK6000	T-Log Number:	T72992
		Account Manager:	Mark Briggs
Contact:	Kent Campbell		
Standard:	FCC Part 15.247 / RSS 210 Issue 7	Class:	N/A

RSS 210 and FCC 15.247 (DTS) Radiated Spurious Emissions
Bluetooth Module BC02 in TK6000

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated spurious emissions testing.

For radiated emissions testing the measurement antenna was located 3 meters from the EUT.

Ambient Conditions:

Temperature: 14 °C
Rel. Humidity: 95 %

Summary of Results - Device Operating in the 2400-2483.5 MHz Band

Run #	Mode	Channel	Power Setting	Measured Power	Test Performed	Limit	Result / Margin
1a	-	2402 MHz	255/40	-	Restricted Band Edge (2390 MHz)	FCC Part 15.209 / 15.247(c)	45.8dBµV/m @ 2386.1MHz (-8.2dB)
			255/40	-	Radiated Emissions, 1 - 26 GHz	FCC Part 15.209 / 15.247(c)	67.5dBµV/m @ 4804.0MHz (-6.5dB)
1b	-	2441 MHz	255/40	-	Radiated Emissions, 1 - 26 GHz	FCC Part 15.209 / 15.247(c)	65.6dBµV/m @ 4881.8MHz (-8.4dB)
1c	-	2480 MHz	255/40	-	Restricted Band Edge (2483.5 MHz)	FCC Part 15.209 / 15.247(c)	47.7dBµV/m @ 2483.5MHz (-6.3dB)
			255/40	-	Radiated Emissions, 1 - 26 GHz	FCC Part 15.209 / 15.247(c)	**69.2dBµV/m @ 4960.3MHz (-4.8dB)**

Modifications Made During Testing

The host system slots for the Bluetooth and WiFi moduleshad the edges chamfered.

Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Juniper Systems	Job Number:	J72953
Model:	BC04 Bluetooth Module in TK6000	T-Log Number:	T72992
		Account Manager:	Mark Briggs
Contact:	Kent Campbell		
Standard:	FCC Part 15.247 / RSS 210 Issue 7	Class:	N/A

Run #1: Radiated Spurious Emissions, 30 - 25,000 MHz. Operating Mode: GFSKDH5

Note: Output power for the device is 10mW. With a 0dBi antenna the expected field strength would be 105.3dBuV/m. The field strength of the fundamental signal was verified to be within 3dB of this value (measured 102.6dBuV/m in 3MHz measurement bandwidth for top and bottom channels) prior to making modifications to the host enclosure and the band-edge and other spurious measurements.

Run #1a: Low Channel @ 2402 MHz

Fundamental Signal Field Strength: Peak measurement made with RB=2MHz, VB=3MHz to verify output power.

Date of Test: 10/3/2008 Config. Used: 1

Test Engineer: Mehran Birgani Config Change: None

Test Location: SVOATS #1 Host Unit Voltage 120V/60Hz

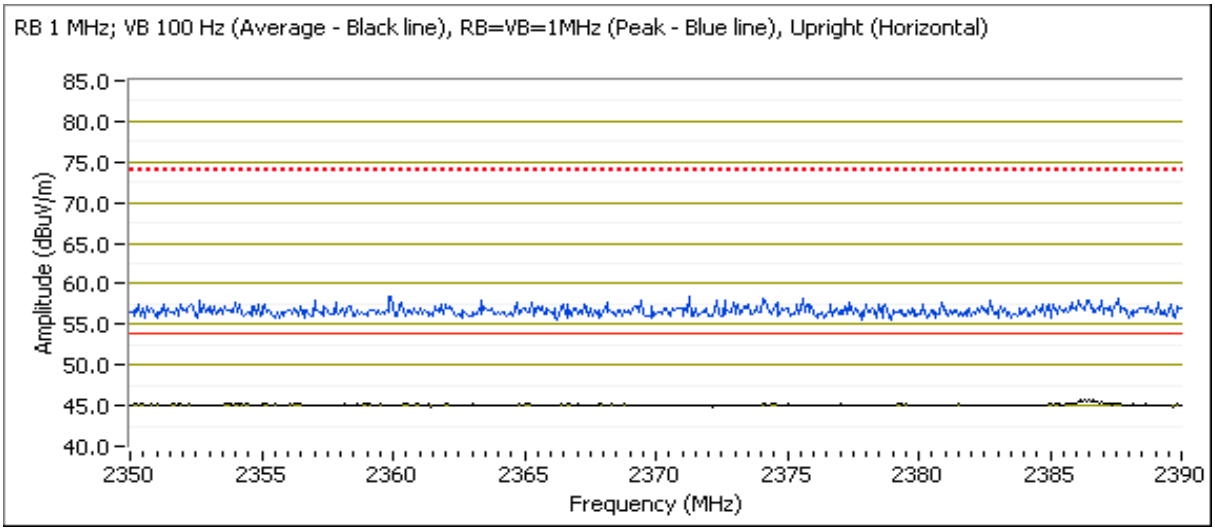
Orientation with highest fundamental field strength also used for band-edge measurement and 100kHz reference measurement

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments	EUT
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters		
2401.870	101.7	H	-	-	PK	157	1.2	RB=2MHz, VB=3MHz	Upright
2402.010	97.3	V	-	-	PK	166	1.0	RB=2MHz, VB=3MHz	Upright
2402.070	96.1	V	-	-	PK	224	1.0	RB=2MHz, VB=3MHz	Flat
2402.080	94.4	H	-	-	PK	164	1.1	RB=2MHz, VB=3MHz	Flat
2401.990	99.1	H	-	-	PK	93	1.6	RB=2MHz, VB=3MHz	Side
2402.080	99.3	V	-	-	PK	86	1.5	RB=2MHz, VB=3MHz	Side
2402.040	101.4	H	-	-	-	157	1.2	RB=VB=100kHz	Upright

Band Edge Signal Field Strength - EUT Upright (worst case orientation)

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
2386.070	**45.8**	**H**	**54.0**	**-8.2**	AVG	157	1.2	RB=1MHz, VB=100Hz
2374.000	58.4	H	74.0	-15.6	PK	157	1.2	RB = VB = 1MHz

Note 1:	Average measurements made with RB=1MHz, VB=100Hz and do not include any duty cycle correction for the hopping mode of operation.



Client:	Juniper Systems	Job Number:	J72953
Model:	BC04 Bluetooth Module in TK6000	T-Log Number:	T72992
		Account Manager:	Mark Briggs
Contact:	Kent Campbell		
Standard:	FCC Part 15.247 / RSS 210 Issue 7	Class:	N/A

Other Spurious Emissions

Date of Test: 10/2/2008 Config. Used: 1
Test Engineer: Mehran Birgani Config Change: None
Test Location: SV OATS #1 Host Unit Voltage 120V/60Hz

Average duty cycle correction (based on each hopping channel used 5%): 26.0 dB

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments	EUT
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters		
4803.700	37.2	V	54.0	-16.8	AVG	116	1.3	Note 3	Flat
4803.750	38.6	H	54.0	-15.4	AVG	213	1.0	Note 3	Upright
4803.790	30.8	H	54.0	-23.2	AVG	232	1.0	Note 3	Side
4803.850	39.4	V	54.0	-14.6	AVG	160	1.0	Note 3	Upright
4803.980	41.5	H	54.0	-12.5	AVG	92	1.1	Note 3	Flat
4804.170	34.2	V	54.0	-19.8	AVG	89	1.0	Note 3	Side
4803.700	63.2	V	74.0	-10.8	PK	116	1.3	RB 1 MHz; VB: 1 MHz	Flat
4803.750	64.6	H	74.0	-9.4	PK	213	1.0	RB 1 MHz; VB: 1 MHz	Upright
4803.790	56.8	H	74.0	-17.2	PK	232	1.0	RB 1 MHz; VB: 1 MHz	Side
4803.850	65.4	V	74.0	-8.6	PK	160	1.0	RB 1 MHz; VB: 1 MHz	Upright
4803.980	**67.5**	**H**	**74.0**	**-6.5**	PK	92	1.1	RB 1 MHz; VB: 1 MHz	Flat
4804.170	60.2	V	74.0	-13.8	PK	89	1.0	RB 1 MHz; VB: 1 MHz	Side

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 20dB below the level of the fundamental and measured in 100kHz.
Note 2:	Signal is not in a restricted band .
Note 3:	Average value calculated from peak value by subtracting the duty cycle correction factor.

Client:	Juniper Systems	Job Number:	J72953
Model:	BC04 Bluetooth Module in TK6000	T-Log Number:	T72992
		Account Manager:	Mark Briggs
Contact:	Kent Campbell		
Standard:	FCC Part 15.247 / RSS 210 Issue 7	Class:	N/A

Run #1b: Center Channel @ 2441 MHz

Date of Test: 10/2/2008 — Config. Used: 1
Test Engineer: Mehran Birgani — Config Change: None
Test Location: SV OATS #1 — Host Unit Voltage 120V/60Hz

Average duty cycle correction (based on each hopping channel used 5%): 26.0 dB

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments	EUT
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters		
4881.750	39.6	H	54.0	-14.4	AVG	235	1.7	Note 3	Upright
4881.800	39.3	V	54.0	-14.7	AVG	210	1.0	Note 3	Upright
4881.900	35.1	H	54.0	-18.9	AVG	238	1.5	Note 3	Side
4881.930	31.4	H	54.0	-22.6	AVG	180	1.0	Note 3	Flat
4882.330	36.9	V	54.0	-17.1	AVG	248	1.3	Note 3	Side
4882.400	36.5	V	54.0	-17.5	AVG	280	1.0	Note 3	Flat
7322.700	28.6	H	54.0	-25.4	AVG	273	1.0	Note 3	Flat
7322.750	27.5	V	54.0	-26.5	AVG	298	1.0	Note 3	Side
7322.920	31.0	H	54.0	-23.0	AVG	233	1.4	Note 3	Side
7323.060	28.2	V	54.0	-25.8	AVG	249	1.1	Note 3	Flat
7323.530	34.0	V	54.0	-20.0	AVG	255	1.3	Note 3	Upright
7323.570	34.8	H	54.0	-19.2	AVG	252	1.0	Note 3	Upright
4881.750	**65.6**	**H**	**74.0**	**-8.4**	PK	235	1.7	RB 1 MHz; VB: 1 MHz	Upright
4881.800	65.3	V	74.0	-8.7	PK	210	1.0	RB 1 MHz; VB: 1 MHz	Upright
4881.900	61.1	H	74.0	-12.9	PK	238	1.5	RB 1 MHz; VB: 1 MHz	Side
4881.930	57.4	H	74.0	-16.6	PK	180	1.0	RB 1 MHz; VB: 1 MHz	Flat
4882.330	62.9	V	74.0	-11.1	PK	248	1.3	RB 1 MHz; VB: 1 MHz	Side
4882.400	62.5	V	74.0	-11.5	PK	280	1.0	RB 1 MHz; VB: 1 MHz	Flat
7322.700	54.6	H	74.0	-19.4	PK	273	1.0	RB 1 MHz; VB: 1 MHz	Flat
7322.750	53.5	V	74.0	-20.5	PK	298	1.0	RB 1 MHz; VB: 1 MHz	Side
7322.920	57.0	H	74.0	-17.0	PK	233	1.4	RB 1 MHz; VB: 1 MHz	Side
7323.060	54.2	V	74.0	-19.8	PK	249	1.1	RB 1 MHz; VB: 1 MHz	Flat
7323.530	60.0	V	74.0	-14.0	PK	255	1.3	RB 1 MHz; VB: 1 MHz	Upright
7323.570	60.8	H	74.0	-13.2	PK	252	1.0	RB 1 MHz; VB: 1 MHz	Upright

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 20dB below the level of the fundamental and measured in 100kHz.
Note 2:	Signal is not in a restricted band but the more stringent restricted band limit was used.
Note 3:	Average value calculated from peak value by subtracting the duty cycle correction factor.

Client:	Juniper Systems	Job Number:	J72953
Model:	BC04 Bluetooth Module in TK6000	T-Log Number:	T72992
		Account Manager:	Mark Briggs
Contact:	Kent Campbell		
Standard:	FCC Part 15.247 / RSS 210 Issue 7	Class:	N/A

Run #1c: High Channel @ 2480 MHz

Date of Test: 10/2/2008 Config. Used: 1
Test Engineer: Mehran Birgani Config Change: None
Test Location: SV OATS #1 Host Unit Voltage 120V/60Hz

Fundamental Signal Field Strength: Peak measurement made with RB=2MHz, VB=3MHz to verify output power.
Orientation with highest fundamental field strength also used for band-edge measurement and 100kHz reference measurement

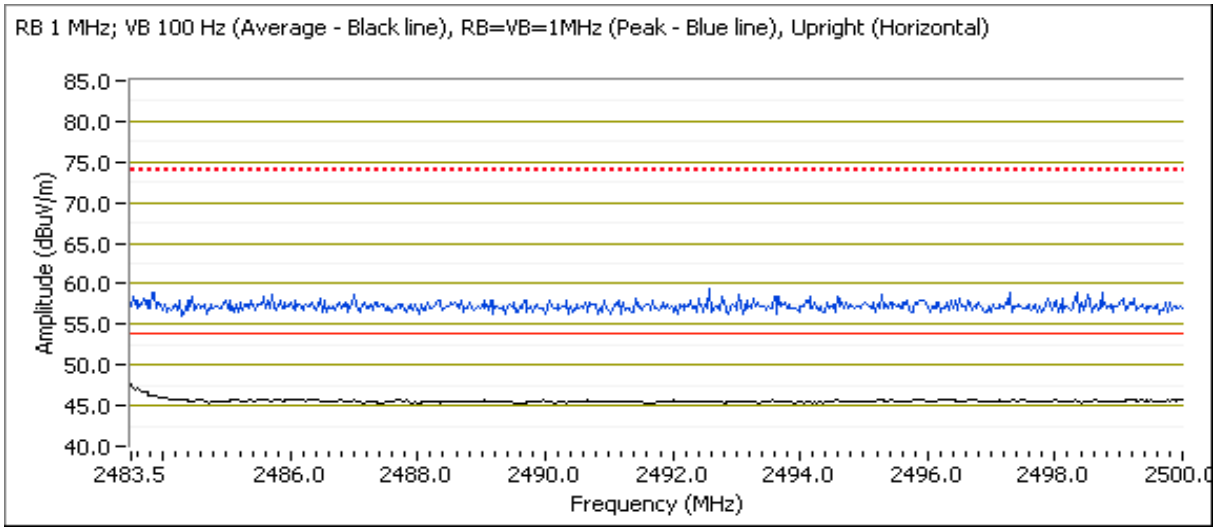
Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments	EUT
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters		
2480.140	96.6	V	-	-	PK	196	1.2	RB=2MHz, VB=3MHz	Upright
2479.950	100.0	H	-	-	PK	182	1.4	RB=2MHz, VB=3MHz	Upright
2479.950	99.2	H	-	-	PK	182	1.4	RB=VB=100kHz	Upright
2479.930	91.0	H	-	-	PK	35	1.1	RB=2MHz, VB=3MHz	Flat
2480.040	97.2	V	-	-	PK	351	1.2	RB=2MHz, VB=3MHz	Flat
2480.010	96.9	V	-	-	PK	10	1.2	RB=2MHz, VB=3MHz	Side
2479.930	98.4	H	-	-	PK	332	1.9	RB=2MHz, VB=3MHz	Side

Band Edge Signal Field Strength - EUT Upright (worst case orientation)

Date of Test: 10/3/2008 Config. Used: 1
Test Engineer: Mehran Birgani Config Change: None
Test Location: SV OATS #1 Host Unit Voltage 120V/60Hz

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments	EUT
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters		
2483.500	**47.7**	**H**	**54.0**	**-6.3**	AVG	270	1.2	RB=1MHz, VB=100Hz	
2499.200	58.1	H	74.0	-15.9	PK	270	1.2	RB = VB = 1MHz	

Note 1:	Average measurements made with RB=1MHz, VB=100Hz and do not include any duty cycle correction for the hopping mode of operation.



Client:	Juniper Systems	Job Number:	J72953
Model:	BC04 Bluetooth Module in TK6000	T-Log Number:	T72992
		Account Manager:	Mark Briggs
Contact:	Kent Campbell		
Standard:	FCC Part 15.247 / RSS 210 Issue 7	Class:	N/A

Other Spurious Emissions

Date of Test: 10/2/2008 Config. Used: 1
Test Engineer: Mehran Birgani Config Change: None
Test Location: SV OATS #1 Host Unit Voltage 120V/60Hz

Average duty cycle correction (based on each hopping channel used 5%): 26.0 dB

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments	EUT
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters		
4959.920	40.9	V	54.0	-13.1	AVG	79	1.0	Note 3	Side
4959.950	39.3	V	54.0	-14.7	AVG	70	1.1	Note 3	Flat
4959.980	40.9	H	54.0	-13.1	AVG	298	1.0	Note 3	Upright
4960.150	32.8	H	54.0	-21.2	AVG	72	1.0	Note 3	Flat
4960.320	43.2	H	54.0	-10.8	AVG	147	1.0	Note 3	Side
4960.390	41.2	V	54.0	-12.8	AVG	351	1.1	Note 3	Upright
7439.540	38.5	V	54.0	-15.5	AVG	101	1.0	Note 3	Side
7439.750	33.4	V	54.0	-20.6	AVG	21	1.4	Note 3	Flat
7439.770	34.2	H	54.0	-19.8	AVG	2	1.6	Note 3	Upright
7440.060	38.8	H	54.0	-15.2	AVG	60	1.0	Note 3	Side
7440.080	36.5	V	54.0	-17.5	AVG	13	1.0	Note 3	Upright
7440.380	28.8	H	54.0	-25.2	AVG	255	1.3	Note 3	Flat
4959.920	66.9	V	74.0	-7.1	PK	79	1.0	RB 1 MHz; VB: 1 MHz	Side
4959.950	65.3	V	74.0	-8.7	PK	70	1.1	RB 1 MHz; VB: 1 MHz	Flat
4959.980	66.9	H	74.0	-7.1	PK	298	1.0	RB 1 MHz; VB: 1 MHz	Upright
4960.150	58.8	H	74.0	-15.2	PK	72	1.0	RB 1 MHz; VB: 1 MHz	Flat
4960.320	**69.2**	**H**	**74.0**	**-4.8**	PK	147	1.0	RB 1 MHz; VB: 1 MHz	Side
4960.390	67.2	V	74.0	-6.8	PK	351	1.1	RB 1 MHz; VB: 1 MHz	Upright
7439.540	64.5	V	74.0	-9.5	PK	101	1.0	RB 1 MHz; VB: 1 MHz	Side
7439.750	59.4	V	74.0	-14.6	PK	21	1.4	RB 1 MHz; VB: 1 MHz	Flat
7439.770	60.2	H	74.0	-13.8	PK	2	1.6	RB 1 MHz; VB: 1 MHz	Upright
7440.060	64.8	H	74.0	-9.2	PK	60	1.0	RB 1 MHz; VB: 1 MHz	Side
7440.080	62.5	V	74.0	-11.5	PK	13	1.0	RB 1 MHz; VB: 1 MHz	Upright
7440.380	54.8	H	74.0	-19.2	PK	255	1.3	RB 1 MHz; VB: 1 MHz	Flat

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 20dB below the level of the fundamental and measured in 100kHz.
Note 2:	Signal is not in a restricted band.
Note 3:	Average value calculated from peak value by subtracting the duty cycle correction factor.

Client:	Juniper Systems	Job Number:	J72953
Model:	BC04 Bluetooth module and P700 WiFi module in TK6000	T-Log Number:	T72992
		Account Manager:	Mark Briggs
Contact:	Kent Campbell		
Standard:	FCC Part 15.247 / RSS 210 Issue 7	Class:	N/A

Radiated Emissions - Receiver Spurious (Bluetooth and 802.11 Modules)

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

General Test Configuration

The EUT was located on the turntable for radiated emissions testing. The EUT was tested in all three orthogonal orientations.

The test distance and extrapolation factor (if applicable) are detailed under each run description.

Note, **preliminary** testing indicates that the emissions were maximized by orientation of the EUT and elevation of the measurement antenna. **Maximized** testing indicated that the emissions were maximized by orientation of the EUT, elevation of the measurement antenna, and manipulation of the EUT's interface cables.

Ambient Conditions:

Temperature: 24 °C

Rel. Humidity: 53 %

Summary of Results

Run #	Test Performed	Limit	Result	Value / Margin
1	Receiver Radiated Spurious Emissions, 30 - 7,500 MHz	RSS 210/RSS GEN	Pass	48.9dBµV/m (278.6µV/m) @ 1989.0MHz (-5.1dB)

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

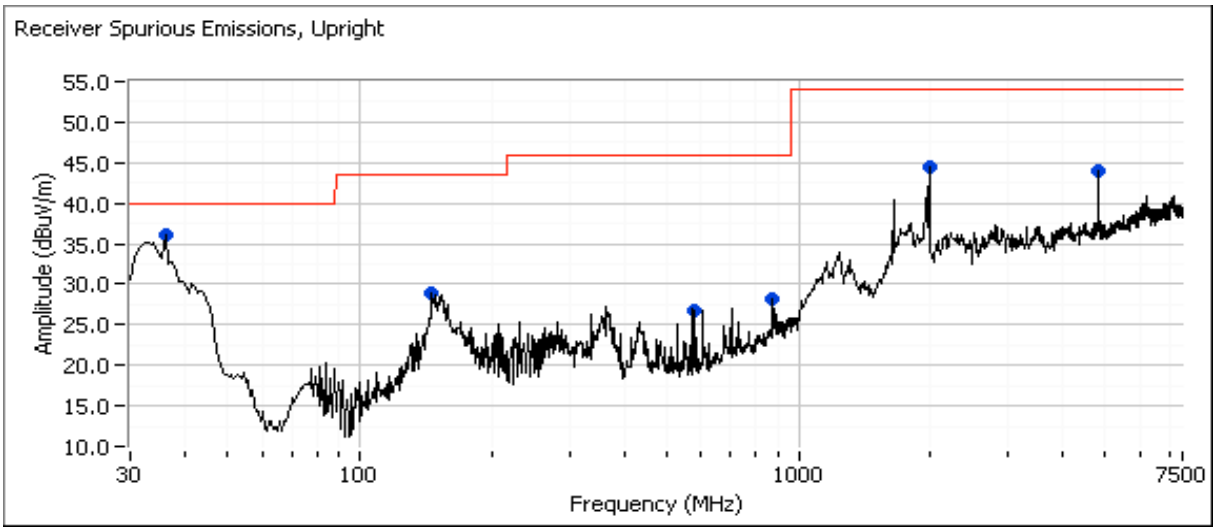
Frequency Range	Test Distance	Limit Distance	Extrapolation Factor
30 - 7,500 MHz	3	3	0.0

Client:	Juniper Systems	Job Number:	J72953
Model:	BC04 Bluetooth module and P700 WiFi module in TK6000	T-Log Number:	T72992
		Account Manager:	Mark Briggs
Contact:	Kent Campbell		
Standard:	FCC Part 15.247 / RSS 210 Issue 7	Class:	N/A

Run #1: Receiver Spurious Emissions

Date of Test: 10/07/08
Test Engineer: Mehran Birgani
Test Location: Chamber #2

Config. Used: Bluetooth and 802.11bg in receive mode
Config Change: No local support equipment
EUT Voltage: 120V/ 60Hz



Center Channel (2441 MHz for Bluetooth module and 2437MHz for 802.11bg module)

Frequency	Level	Pol	RSS GEN		Detector	Azimuth	Height	Comments	EUT
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters		
36.400	34.1	V	40.0	-5.9	Peak	181	1.7		Flat
1985.830	44.3	V	54.0	-9.7	Peak	269	1.7		Flat
1650.000	40.3	H	54.0	-13.7	Peak	360	1.7		Flat
159.600	27.8	H	43.5	-15.7	Peak	59	1.7		Flat
872.250	29.1	V	46.0	-16.9	Peak	353	1.7		Flat
300.000	27.3	V	46.0	-18.7	Peak	268	1.7		Flat
36.075	34.8	V	40.0	-5.2	Peak	178	1.7		Side
1985.830	45.3	H	54.0	-8.7	Peak	198	1.7		Side
153.525	28.6	H	43.5	-14.9	Peak	61	1.7		Side
872.250	28.2	V	46.0	-17.8	Peak	103	1.7		Side
581.750	26.8	V	46.0	-19.2	Peak	29	1.7		Side
36.075	36.0	V	40.0	-4.0	Peak	211	1.7		Upright
1989.020	44.4	V	54.0	-9.6	Peak	325	1.7		Upright
4824.010	44.0	H	54.0	-10.0	Peak	196	1.7		Upright
146.100	29.0	H	43.5	-14.5	Peak	89	1.7		Upright
872.250	28.7	V	46.0	-17.3	Peak	352	1.7		Upright
604.500	27.2	V	46.0	-18.8	Peak	202	1.7		Upright

Note 1:	As the host device may be hand-held it was tested in all three orientations

Client:	Juniper Systems	Job Number:	J72953
Model:	BC04 Bluetooth module and P700 WiFi module in TK6000	T-Log Number:	T72992
		Account Manager:	Mark Briggs
Contact:	Kent Campbell		
Standard:	FCC Part 15.247 / RSS 210 Issue 7	Class:	N/A

Date of Test: 10/07/08
Test Engineer: Mehran Birgani
Test Location: SV OATS #2

Config. Used: Bluetooth and 802.11bg in receive mode
Config Change: No local support equipment
EUT Voltage: 120V/ 60Hz

Center Channel (2441 MHz for Bluetooth module and 2437MHz for 802.11bg module)

Frequency	Level	Pol	RSS GEN		Detector	Azimuth	Height	Comments	EUT
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters		
1650.000	37.9	H	54.0	-16.1	PK	46	1.0	Pk reading w/ Avg limit	Flat
1989.020	**48.9**	**H**	**54.0**	**-5.1**	PK	10	1.2	Pk reading w/ Avg limit	Side
4824.010	44.5	H	54.0	-9.5	PK	16	1.0	Pk reading w/ Avg limit	Upright
36.075	22.6	V	40.0	-17.4	QP	38	1.0	QP (1.00s)	Upright
145.994	20.0	H	43.5	-23.5	QP	128	1.2	QP (1.00s)	Upright
153.625	17.9	H	43.5	-25.6	QP	113	1.0	QP (1.00s)	Side
300.007	22.7	V	46.0	-23.3	QP	100	1.0	QP (1.00s)	Flat
604.500	24.1	V	46.0	-21.9	QP	30	1.0	QP (1.00s)	Upright
872.250	31.2	V	46.0	-14.8	QP	0	1.0	QP (1.00s)	Flat

Note 1:	Prescan at chamber showed all three orientations were almost the same. Worse signal level of three orientation was selected and measured at open test site.

EXHIBIT 3: Photographs of Test Configurations

EXHIBIT 4: Proposed FCC ID Label & Label Location

EXHIBIT 5: Detailed Photographs, Host System Internal and External

EXHIBIT 6: Operator's Manual

EXHIBIT 7: Block Diagram

EXHIBIT 8: RF Exposure Information