

Radio Test Report 3650 MHz to 3700 MHz

RSS 197

Model: PowerBridgeM365

COMPANY: Ubiquiti Networks

91 E. Tasman Drive San Jose, CA 95134

TEST SITE(S): Elliott Laboratories

41039 Boyce Road.

Fremont, CA. 94538-2435

REPORT DATE: April 18, 2011

FINAL TEST DATES: March 5, 8, 11, 14, 18 and 23, 2011

AUTHORIZED SIGNATORY:

Chief Engineer Elliott Laboratories



Testing Cert #2016.01

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Test Report Report Date: April 18, 2011

REVISION HISTORY

Rev#	Date	Comments	Modified By
-	04-18-2011	First release	

TABLE OF CONTENTS

REVISION HISTORY	2
TABLE OF CONTENTS	3
SCOPE	4
OBJECTIVE	5
STATEMENT OF COMPLIANCE	
DEVIATIONS FROM THE STANDARDS	
TEST RESULTS	
RSS-197 – BASE AND FIXED STATIONS, 3650 – 3700 MHZ	
EXTREME CONDITIONS	
MEASUREMENT UNCERTAINTIES.	
EQUIPMENT UNDER TEST (EUT) DETAILS	
GENERAL	
OTHER EUT DETAILS.	
ENCLOSURE	
MODIFICATIONS	
SUPPORT EQUIPMENT	
EUT INTERFACE PORTS	
EUT OPERATION	
TESTING	
GENERAL INFORMATION	
RF PORT MEASUREMENT PROCEDURES	
OUTPUT POWER	
BANDWIDTH MEASUREMENTS	
CONDUCTED SPURIOUS EMISSIONS	
TRANSMITTER MASK MEASUREMENTS	
FREQUENCY STABILITYTRANSIENT FREQUENCY BEHAVIOR:	
RADIATED EMISSIONS MEASUREMENTS	
INSTRUMENTATIONINSTRUMENTATION	
FILTERS/ATTENUATORS	
ANTENNAS	
ANTENNA MAST AND EQUIPMENT TURNTABLE	15
SAMPLE CALCULATIONS	
SAMPLE CALCULATIONS - CONDUCTED SPURIOUS EMISSIONS	16
SAMPLE CALCULATIONS –RADIATED FIELD STRENGTH	
SAMPLE CALCULATIONS -RADIATED POWER	
RECEIVER RADIATED SPURIOUS EMISSIONS SPECIFICATION LIMITS	18
APPENDIX A TEST EQUIPMENT CALIBRATION DATA	
APPENDIX B TEST DATA	
END OF REPORT	
PART APP IN PART APP I	

SCOPE

Tests have been performed on the Ubiquiti Networks model PowerBridgeM365, pursuant to the relevant requirements of the following standard(s) in order to obtain device certification against the regulatory requirements of the Federal Communications Commission and Industry Canada.

- Industry Canada RSS-Gen Issue 3
- RSS-197 Issue 1, February 2010 Wireless Broadband Access Equipment Operating in the Band 3650-3700 MHz

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 ANSI TIA-603-C August 17, 2004

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

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 Ubiquiti Networks model PowerBridgeM365 and therefore apply only to the tested sample. The sample was selected and prepared by Jennifer Sanchez of Ubiquiti Networks.

OBJECTIVE

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

Prior to marketing in the USA, the device requires certification. Prior to marketing in Canada, Class I transmitters, receivers and transceivers require certification.

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 Ubiquiti Networks model PowerBridgeM365 complied with the requirements of the standards and frequency bands declared in the scope of this test report.

Maintenance of compliance is the responsibility of the manufacturer. Any modifications to the product should be assessed to determine their potential impact on the compliance status of the device with respect to the standards detailed in this test report.

DEVIATIONS FROM THE STANDARDS

No deviations were made from the published requirements listed in the scope of this report.

TEST RESULTS

RSS-197 - Base and Fixed Stations, 3650 - 3700 MHz

RSS-197	Description	N	1easured	Limit	Result
	Modulation, output power an			-	
1	Frequency ranges (Listed for each channel spacing)	5MHz 10MHz 20MHz 25MHz	3653-3697MHz 3655-3695MHz 3660-3690MHz 3662-3688MHz	3650-3700 MHz Note 1	Complies
5.6	EIRP – Total power (Maximum for each channel spacing)	10MH 20MH 25MH	Iz: 36.0dBm Hz: 38.6dBm Hz: 41.6dBm Hz: 43.1dBm	No limit, Radio must comply with PSD EIRP limit	Complies
5.0	EIRP – PSD (Maximum)	10MHz: 20MHz:	29.8dBm/MHz 29.8dBm/MHz 29.9dBm/MHz 29.8dBm/MHz	1 Watt/MHz	Complies
	Emission types		D7D	Must be Digital	-
5.1, 5.7	Emission mask	spectral t	complies with mask – refer to test data	Mask B	Complies
5.2	Occupied (99%) Bandwidth	10M 20M	Hz: 4.2 MHz IHz: 8.5 MHz Hz: 16.8 MHz Hz: 20.9 MHz	> 1 MHz	-
Transmitter	spurious emissions				
5.7	At the antenna terminals	-1	6.8 dBm	12 ID/MII	Complies
5.7	Radiated (eirp)	-46.8dBm		-13 dBm/MHz	Complies
Receiver spu	irious emissions				
5.8	Field strength	39.9 dBuV	V/m @ 3 m	RSS-GEN 7.2.3	Complies
Other details	s				
4.2	Policies of use	Refer to o descriptio the implementation	n for details of	Device must employ a contention-based protocol.	Complies
5.5	Restriction for Mobile/Portable		ixed Use	Station operates only when receiving enabling signal	N/A
5.3	Frequency stability	3650.29 N F _h + Frequ 3699.90 N	uency offset = MHz	F_1 – Frequency offset and F_h + Frequency offset remain in band	Complies
RSS-102 RF Exposure Although RF exposure compliance is addressed at the time of licensing an MPE calculation has been provided to demonstrate compliance with limits at distances of 22cm or more from the antennas.					
	Antenna Gain	This appli	cation is submitted	d for antennas of 23 dBi	gain.
Notes					

Notes

¹⁾ The upper part of the allocated band from 3675 – 3700 MHz requires the device to use an unrestricted contention-based protocol except in low population areas per SRSP 303.65. This system has a restricted contention based protocol.

EXTREME CONDITIONS

Frequency stability is determined over extremes of temperature and voltage. The extremes of voltage were 85 to 115 percent of the nominal value.

The extremes of temperature were -30°C to +50°C as specified in FCC §2.1055(a)(1).

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 (based on a coverage factor (k=2) and were calculated in accordance with NAMAS document NIS 81 and M3003.

Measurement Type	Measurement Unit	Frequency Range	Expanded Uncertainty
RF frequency	Hz	25 to 7,000 MHz	1.7 x 10 ⁻⁷
RF power, conducted	dBm	25 to 7,000 MHz	$\pm 0.52 \text{ dB}$
Conducted emission of transmitter	dBm	25 to 40,000 MHz	± 0.7 dB
Conducted emission of receiver	dBm	25 to 40,000 MHz	± 0.7 dB
Radiated emission (substitution method)	dBm	25 to 40,000 MHz	± 2.5 dB
Radiated emission (field strength)	dBμV/m	25 to 1,000 MHz 1 to 40 GHz	\pm 3.6 dB \pm 6.0 dB

EQUIPMENT UNDER TEST (EUT) DETAILS

GENERAL

The Ubiquiti Networks model PowerBridgeM365 is a Carrier Class 3.65GHz MIMO Bridging Station. Normally the EUT would be pole mounted. During testing the EUT was treated as table-top equipment during testing to simulate the end-user environment. The electrical rating of the EUT is 24V/1A POE.

The sample was received on March 5, 2011 and tested on March 5, 8, 11, 14, 18 and 23, 2011. The EUT consisted of the following component(s):

Comp	any	Model	Description	Serial Number	FCC ID
Ubiq	uiti	PowerBridge	MIMO Bridging	NA	SWX-M365P
Netwo	orks	M365 PCB	Station		
Ubiq	uiti	UBI-POE-24-1	PoE injector	NA	NA
Netwo	orks		-		

OTHER EUT DETAILS

The antenna is integral to the device and has a gain of 23dBi.

ENCLOSURE

The EUT enclosure is primarily constructed of plastic. It measures approximately 45 cm wide by 42 cm deep by 3.5 cm high.

MODIFICATIONS

No modifications were made to the EUT during the time the product was at Elliott.

SUPPORT EQUIPMENT

No local support equipment was used during emissions testing.

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

Company	Model	Description	Serial Number	FCC ID
HP	G42	Laptop	-	-

EUT INTERFACE PORTS

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

Por	t		Cable(s)	
From	To	Description	Shielded/Unshielded	Length(m)
Ethernet	PoE injector	Cat 5	Unshielded	1
Ethernet (PoE injector)	Laptop	Cat 5	Unshielded	10
AC Power (PoE injector)	AC Mains	3 wire	Unshielded	0.5

Note: The USB port was not connected during testing. The manufacturer stated that this is for setup purposes, and therefore would not normally be connected.

EUT OPERATION

During emissions testing the EUT was transmitting at various frequencies, bandwidths & data rates.

TESTING

GENERAL INFORMATION

Antenna port measurements were taken at the Elliott Laboratories test site located at 41039 Boyce Road, Fremont, CA 94538-2435.

Radiated spurious emissions measurements were taken at the Elliott Laboratories Anechoic Chambers and/or Open Area Test Site(s) listed below. The sites conform to the requirements of ANSI C63.4: 2003 American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz and CISPR 16-1-4:2007 - Specification for radio disturbance and immunity measuring apparatus and methods Part 1-4: Radio disturbance and immunity measuring apparatus Ancillary equipment Radiated disturbances. They are on file with the FCC and industry Canada.

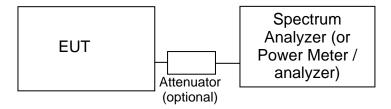
Site	Registratio	n Numbers	Location	
Site	FCC	Canada	Location	
Chamber 3	769238	IC 2845B-3	41039 Boyce Road	
Chamber 4	211948	IC 2845B-4	Fremont,	
Chamber 7	A2LA Accredited	IC 2845B-7	CA 94538-2435	

In the case of Open Area Test Sites, ambient levels are at least 6 dB below the specification limits with the exception of predictable local TV, radio, and mobile communications traffic.

Considerable engineering effort has been expended to ensure that the facilities conform to all pertinent requirements.

RF PORT MEASUREMENT PROCEDURES

Conducted measurements are performed with the EUT's rf input/output connected to the input of a spectrum analyzer, power meter or modulation analyzer. When required an attenuator, filter and/or dc block is placed between the EUT and the spectrum analyzer to avoid overloading the front end of the measurement device. Measurements are corrected for the insertion loss of the attenuators and cables inserted between the rf port of the EUT and the measurement equipment.



<u>Test Configuration for Antenna Port Measurements</u>

For devices with an integral antenna the output power and spurious emissions are measured as a field strength at a test distance of (typically) 3m and then converted to an eirp using a substitution measurement (refer to RADIATED EMISSIONS MEASUREMENTS). All other measurements are made as detailed below but with the test equipment connected to a measurement antenna directed at the EUT.

OUTPUT POWER

Output power is measured using a power meter and an average sensor head, a spectrum analyzer or a power meter and peak power sensor head as required by the relevant rule part(s). Where necessary measurements are gated to ensure power is only measured over periods that the device is transmitting.

Power measurements made directly on the rf power port are, when appropriate, converted to an EIRP by adding the gain of the highest gain antenna that can be used with the device under test, as specified by the manufacturer.

BANDWIDTH MEASUREMENTS

The 6dB, 20dB and/or 26dB signal bandwidth is measured in using the bandwidths recommended by ANSI C63.4. When required, the 99% bandwidth is measured using the methods detailed in RSS GEN. The measurement bandwidth is set to be at least 1% of the instrument's frequency span.

CONDUCTED SPURIOUS EMISSIONS

Initial scans are made using a peak detector (RBW=VBW) and using scan rates to ensure that the EUT transmits before the sweep moves out of each resolution bandwidth (for transmit mode measurements). Where the limits are expressed as an average power the spectrum analyzer is tunes to that frequency with a narrow span (wide enough to capture the emission and its sidebands) and the resolution and video bandwidths are adjusted as required by the reference measurement standards. For transmitter measurements the appropriate detector (average, peak, normal ,sample, quasi-peak) is used when making measurements for licensed devices. For receiver conducted spurious measurements the detector is set to peak.

TRANSMITTER MASK MEASUREMENTS

The transmitter mask measurements are made using resolution bandwidths as specified in the pertinent rule part(s). Where narrower bandwidths are used the measurement is corrected to account for the reduced bandwidth by either using the adjacent channel power function of the spectrum analyzer to sum the power across the required measurement bandwidth. The frequency span of the analyzer is set to ensure the fundamental signal and all significant sidebands are displayed.

The top of the mask may be set by the total output power of the signal, the power of the unmodulated signal or the peak value of the signal in the reference bandwidth being used for the mask measurement.

FREQUENCY STABILITY

The EUT is placed inside a temperature chamber with all support and test equipment located outside of the chamber. The temperature is varied across the specified frequency range in 10 degree increments with frequency measurements made at each temperature step. The EUT is allowed enough time to stabilize at each temperature variation.

The spectrum analyzer is configured to give a 5- or 6-digit display for the marker-frequency function. The spectrum analyzer's built-in frequency counter is used to measure the maximum deviation of the fundamental frequency at each temperature. Where possible the device is set to transmit an unmodulated signal. Where this is not possible the frequency drift is determined by finding a stable point on the signal (e.g. the null at the centre of an OFDM signal) or by calculating a centre frequency based on the upper and lower XdB points (where X is typically 6dB or 10dB) on the signal's skirts.

TRANSIENT FREQUENCY BEHAVIOR:

The TIA/EIA 603 procedure is used to determine compliance with transient frequency timing requirements as the radio is keyed on and off.

The EUTs rf output is connected via a combiner/splitter to the test receiver/spectrum analyzer and to a diode detector. The test receiver or spectrum analyzer video output is connected to an oscilloscope, which is triggered by the output from the diode detector.

Plots showing Ton, T1, and T2 are made when turning on the transmitter and showing T3 when turning off the transmitter.

RADIATED EMISSIONS MEASUREMENTS

Receiver radiated spurious emissions measurements are made in accordance with ANSI ANSI C63.4:2003 by measuring the field strength of the emissions from the device at a specific test distance and comparing them to a field strength limit. Where the field strength limit is specified at a longer distance than the measurement distance the measurement is extrapolated to the limit distance.

Transmitter radiated spurious emissions are initially measured as a field strength. The eirp or erp limit as specified in the relevant rule part(s) is converted to a field strength at the test distance and the emissions from the EUT are then compared to that limit. Emissions within 20dB of this limit are the subjected to a substitution measurement.

All radiated emissions measurements are performed in two phases. A preliminary scan of emissions is conducted in either an anechoic chamber or on an OATS during which all significant EUT frequencies are identified with the system in a nominal configuration. At least two scans are performed across the complete frequency range of interest and at each operating frequency identified in the reference standard. One or more of these is with the antenna polarized vertically while the one or more of these is with the antenna polarized horizontally. Initial scans are made using a peak detector (RBW=VBW) and using scan rates to ensure that the EUT transmits before the sweep moves out of each resolution bandwidth (for transmit mode).

During the preliminary scans, the EUT is rotated through 360°, the antenna height is varied and cable positions are varied to determine the highest emission relative to the limit. For transmitter spurious emissions, where the limit is expressed as an effective radiated power, the eirp or erp is converted to a field strength limit.

Final measurements are made on an OATS or in a semi-anechoic chamber at the significant frequencies observed during the preliminary scan(s) using the same process of rotating the EUT and raising/lowering the measurement antenna to find the highest level of the emission. The field strength is recorded and, for receiver spurious emissions, compared to the field strength limit. For the final measurement the appropriate detectors (average, peak, normal, sample, quasi-peak) are used. For receiver measurements below 1GHz the detector is a Quasi-Peak detector, above 1GHz a peak detector is used and the peak value (RB=VB=1MHz) and average value (RB=1MHz, VB=10Hz) are recorded.

For transmitter spurious emissions, the radiated power of all emissions within 20dB of the calculated field strength limit are determined using a substitution measurement. The substitution measurement is made by replacing the EUT with an antenna of known gain (typically a dipole antenna or a double-ridged horn antenna), connected to a signal source. The output power of the signal generator is adjusted until the maximum field strength from the substitution antenna is similar to the field strength recorded from the EUT. The erp of the EUT is then calculated.

INSTRUMENTATION

An EMI receiver as specified in CISPR 16-1-1 is used for radiated emissions measurements. The receivers used can measure over the frequency range of 9 kHz up to 7000 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.

For measurements above the frequency range of the receivers and for all conducted measurements a spectrum analyzer is utilized because it provides visibility of the entire spectrum along with the precision and versatility required to support engineering analysis.

Measurement bandwidths for the test instruments are set in accordance with the requirements of the standards referenced in this document.

Software control is used to correct the measurements for transducer factors (e.g. antenna) and the insertion loss of cables, attenuators and other series elements to obtain the final measurement value. This provides faster, more accurate readings by performing the conversions described under Sample Calculations within the Test Procedures section of this report. Results are exported in a graphic and/or tabular format, as appropriate.

FILTERS/ATTENUATORS

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

ANTENNAS

A combination of biconical, log periodic or bi-log antennas are used to cover the range from 30 MHz to 1000 MHz. Broadband antennas or tuned dipole antennas are used over the entire 25 to 1000 MHz frequency range as the reference antenna for substitution measurements.

Above 1000 MHz, a dual-ridge guide horn antenna or octave horn antenna are used as reference and measurement antennas.

The antenna calibration factors are included in site factors that are programmed into the test receivers and instrument control software when measuring the radiated field strength.

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.

Table mounted devices are placed on a non-conductive table at a height of 80 centimeters above the floor. Floor mounted equipment is 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. The EUT is positioned on a motorized turntable to allow it to be rotated during testing to determine the angel with the highest level of emissions.

SAMPLE CALCULATIONS

SAMPLE CALCULATIONS - CONDUCTED SPURIOUS EMISSIONS

Measurements are compared directly to the conducted emissions specification limit (decibel form). The calculation is as follows:

$$R_r - S = M$$

where:

 R_r = Measured value in dBm

S = Specification Limit in dBm

M = Margin to Specification in +/- dB

SAMPLE CALCULATIONS - RADIATED FIELD STRENGTH

Measurements of radiated field strength are compared directly to the specification limit (decibel form). The receiver and/or control software 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 is sued when measurements are made at a test distance that is different to the specified limit distance 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:

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

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 - RADIATED POWER

The erp/eirp limits for transmitter spurious measurements are converted to a field strength in free space using the following formula:

$$E = \frac{\sqrt{30 P G}}{d}$$

where:

E = Field Strength in V/m

P = Power in Watts

G = Gain of isotropic antenna (numeric gain) = 1

D = measurement distance in meters

The field strength limit is then converted to decibel form (dBuV/m) and the margin of a given emission peak relative to the limit is calculated (refer to *SAMPLE CALCULATIONS –RADIATED FIELD STRENGTH*).

When substitution measurements are required (all signals with less than 20dB of margin relative to the calculated field strength limit) the eirp of the spurious emission is calculated using:

$$P_{EUT} = P_{S-(E_S-E_{EUT})}$$

$$P_S = G + P_{in}$$

where:

and

P_S = effective isotropic radiated power of the substitution antenna (dBm)

Pin = power input to the substitution antenna (dBm)

G = gain of the substitution antenna (dBi)

 E_S = field strength the substitution antenna (dBm) at eirp P_S

 E_{EUT} = field strength measured from the EUT

Where necessary the effective isotropic radiated power is converted to effective radiated power by subtracting the gain of a dipole (2.2dBi) from the eirp value.

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

Appendix A Test Equipment Calibration Data

Radiated Emissions, 3	80 - 2,000 MHz, 05-Mar-11			
Manufacturer Rohde & Schwarz EMCO	<u>Description</u> EMI Test Receiver, 20 Hz-7 GHz Antenna, Horn, 1-18 GHz	Model ESIB7 3115	<u>Asset #</u> 1538 1561	<u>Cal Due</u> 11/2/2011 6/22/2012
Com-Power Corp. Hewlett Packard	Preamplifier, 30-1000 MHz SpecAn 9 kHz - 40 GHz, (SA40) Purple	PA-103 8564E (84125C)	1632 1771	4/23/2011 8/26/2011
Hewlett Packard	Microwave Preamplifier, 1- 26.5GHz	8449B	1780	11/23/2011
Sunol Sciences	Biconilog, 30-3000 MHz	JB3	2197	12/29/2011
	- AC Power Ports, 05-Mar-11			0.15
Manufacturer EMCO	<u>Description</u> LISN, 10 kHz-100 MHz	<u>Model</u> 3825/2	<u>Asset #</u> 1293	<u>Cal Due</u> 3/12/2011
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1538	11/2/2011
Rohde & Schwarz	Pulse Limiter	ESH3 Z2	1594	5/27/2011
	Power and Spurious Emissions), 0			
Manufacturer Hewlett Packard	<u>Description</u> SpecAn 30 Hz -40 GHz, SV (SA40) Red	<u>Model</u> 8564E (84125C)	<u>Asset #</u> 1148	<u>Cal Due</u> 7/12/2011
Padio Antonna Port /P	ower and Spurious Emissions) R	SS 107 00-Mar-11		
Manufacturer	<u>Description</u>	Model	Asset #	Cal Due
Agilent	PSA, Spectrum Analyzer, (installed options, 111, 115, 123, 1DS, B7J, HYX,	E4446A	2139	1/26/2012
	ower and Spurious Emissions), 1			
Radio Antenna Port (F <u>Manufacturer</u> Agilent	Power and Spurious Emissions), 1 <u>Description</u> PSA, Spectrum Analyzer, (installed options, 111, 115, 123, 1DS, B7J, HYX,	1 1-Mar-11 <u>Model</u> E4446A	Asset # 2139	<u>Cal Due</u> 1/26/2012
Manufacturer Agilent Radiated Emissions, 3	Description PSA, Spectrum Analyzer, (installed options, 111, 115, 123, 1DS, B7J, HYX, 30 - 18,000 MHz, 11-Mar-11	<u>Model</u>		1/26/2012
Manufacturer Agilent	<u>Description</u> PSA, Spectrum Analyzer, (installed options, 111, 115, 123, 1DS, B7J, HYX,	<u>Model</u>		
Manufacturer Agilent Radiated Emissions, 3 Manufacturer	Description PSA, Spectrum Analyzer, (installed options, 111, 115, 123, 1DS, B7J, HYX, 80 - 18,000 MHz, 11-Mar-11 Description Microwave Preamplifier, 1-26.5GHz Antenna, Horn, 1-18 GHz	Model E4446A Model	2139 Asset #	1/26/2012 Cal Due
Manufacturer Agilent Radiated Emissions, 3 Manufacturer Hewlett Packard	Description PSA, Spectrum Analyzer, (installed options, 111, 115, 123, 1DS, B7J, HYX, 80 - 18,000 MHz, 11-Mar-11 Description Microwave Preamplifier, 1-26.5GHz Antenna, Horn, 1-18 GHz (SA40-Red) SpecAn 30 Hz -40 GHz, SV	<u>Model</u> E4446A <u>Model</u> 8449B	2139 <u>Asset #</u> 263	1/26/2012 <u>Cal Due</u> 12/8/2011
Manufacturer Agilent Radiated Emissions, 3 Manufacturer Hewlett Packard EMCO	Description PSA, Spectrum Analyzer, (installed options, 111, 115, 123, 1DS, B7J, HYX, 80 - 18,000 MHz, 11-Mar-11 Description Microwave Preamplifier, 1-26.5GHz Antenna, Horn, 1-18 GHz (SA40-Red)	Model E4446A Model 8449B 3115	2139 Asset # 263 1142	<u>Cal Due</u> 12/8/2011 8/2/2012
Manufacturer Agilent Radiated Emissions, 3 Manufacturer Hewlett Packard EMCO Hewlett Packard Hewlett Packard Sunol Sciences	Description PSA, Spectrum Analyzer, (installed options, 111, 115, 123, 1DS, B7J, HYX, 80 - 18,000 MHz, 11-Mar-11 Description Microwave Preamplifier, 1-26.5GHz Antenna, Horn, 1-18 GHz (SA40-Red) SpecAn 30 Hz -40 GHz, SV (SA40) Red EMC Spectrum Analyzer, 9 KHz - 22 GHz Biconilog, 30-3000 MHz	Model E4446A Model 8449B 3115 8564E (84125C) 8593EM JB3	2139 Asset # 263 1142 1148 1319 1548	T/26/2012 Cal Due 12/8/2011 8/2/2012 7/12/2011 11/22/2011 6/24/2012
Manufacturer Agilent Radiated Emissions, 3 Manufacturer Hewlett Packard EMCO Hewlett Packard Hewlett Packard	Description PSA, Spectrum Analyzer, (installed options, 111, 115, 123, 1DS, B7J, HYX, 80 - 18,000 MHz, 11-Mar-11 Description Microwave Preamplifier, 1-26.5GHz Antenna, Horn, 1-18 GHz (SA40-Red) SpecAn 30 Hz -40 GHz, SV (SA40) Red EMC Spectrum Analyzer, 9 KHz - 22 GHz	Model E4446A Model 8449B 3115 8564E (84125C) 8593EM	2139 Asset # 263 1142 1148 1319	T/26/2012 Cal Due 12/8/2011 8/2/2012 7/12/2011 11/22/2011
Manufacturer Agilent Radiated Emissions, 3 Manufacturer Hewlett Packard EMCO Hewlett Packard Hewlett Packard Sunol Sciences Com-Power Corp. Radiated Emissions, 3	Description PSA, Spectrum Analyzer, (installed options, 111, 115, 123, 1DS, B7J, HYX, 80 - 18,000 MHz, 11-Mar-11 Description Microwave Preamplifier, 1-26.5GHz Antenna, Horn, 1-18 GHz (SA40-Red) SpecAn 30 Hz -40 GHz, SV (SA40) Red EMC Spectrum Analyzer, 9 KHz - 22 GHz Biconilog, 30-3000 MHz Preamplifier, 30-1000 MHz 80 - 37,000 MHz, 14-Mar-11	Model E4446A Model 8449B 3115 8564E (84125C) 8593EM JB3 PA-103A	2139 Asset # 263 1142 1148 1319 1548 2359	T/26/2012 Cal Due 12/8/2011 8/2/2012 7/12/2011 11/22/2011 6/24/2012 2/15/2012
Manufacturer Agilent Radiated Emissions, 3 Manufacturer Hewlett Packard EMCO Hewlett Packard Hewlett Packard Sunol Sciences Com-Power Corp.	Description PSA, Spectrum Analyzer, (installed options, 111, 115, 123, 1DS, B7J, HYX, 80 - 18,000 MHz, 11-Mar-11 Description Microwave Preamplifier, 1-26.5GHz Antenna, Horn, 1-18 GHz (SA40-Red) SpecAn 30 Hz -40 GHz, SV (SA40) Red EMC Spectrum Analyzer, 9 KHz - 22 GHz Biconilog, 30-3000 MHz Preamplifier, 30-1000 MHz Preamplifier, 30-1000 MHz 80 - 37,000 MHz, 14-Mar-11 Description Microwave Preamplifier, 1-	Model E4446A Model 8449B 3115 8564E (84125C) 8593EM JB3	2139 Asset # 263 1142 1148 1319 1548	T/26/2012 Cal Due 12/8/2011 8/2/2012 7/12/2011 11/22/2011 6/24/2012
Manufacturer Agilent Radiated Emissions, 3 Manufacturer Hewlett Packard EMCO Hewlett Packard Hewlett Packard Sunol Sciences Com-Power Corp. Radiated Emissions, 3 Manufacturer	Description PSA, Spectrum Analyzer, (installed options, 111, 115, 123, 1DS, B7J, HYX, 30 - 18,000 MHz, 11-Mar-11 Description Microwave Preamplifier, 1-26.5GHz Antenna, Horn, 1-18 GHz (SA40-Red) SpecAn 30 Hz -40 GHz, SV (SA40) Red EMC Spectrum Analyzer, 9 KHz - 22 GHz Biconilog, 30-3000 MHz Preamplifier, 30-1000 MHz Preamplifier, 30-1000 MHz 30 - 37,000 MHz, 14-Mar-11 Description Microwave Preamplifier, 1-26.5GHz SpecAn 9 kHz - 40 GHz, FT	Model E4446A Model 8449B 3115 8564E (84125C) 8593EM JB3 PA-103A	2139 Asset # 263 1142 1148 1319 1548 2359 Asset #	T/26/2012 Cal Due 12/8/2011 8/2/2012 7/12/2011 11/22/2011 6/24/2012 2/15/2012 Cal Due
Manufacturer Agilent Radiated Emissions, 3 Manufacturer Hewlett Packard EMCO Hewlett Packard Hewlett Packard Sunol Sciences Com-Power Corp. Radiated Emissions, 3 Manufacturer Hewlett Packard	Description PSA, Spectrum Analyzer, (installed options, 111, 115, 123, 1DS, B7J, HYX, 80 - 18,000 MHz, 11-Mar-11 Description Microwave Preamplifier, 1-26.5GHz Antenna, Horn, 1-18 GHz (SA40-Red) SpecAn 30 Hz -40 GHz, SV (SA40) Red EMC Spectrum Analyzer, 9 KHz - 22 GHz Biconilog, 30-3000 MHz Preamplifier, 30-1000 MHz Preamplifier, 30-1000 MHz 80 - 37,000 MHz, 14-Mar-11 Description Microwave Preamplifier, 1-26.5GHz	Model E4446A Model 8449B 3115 8564E (84125C) 8593EM JB3 PA-103A Model 8449B	2139 Asset # 263 1142 1148 1319 1548 2359 Asset # 785	Cal Due 12/8/2011 8/2/2012 7/12/2011 11/22/2011 6/24/2012 2/15/2012 Cal Due 5/26/2011

Test Report Report Date: April 18, 2011

Radiated Emissions.	1000 - 11,000 MHz, 15-Mar-11			
Manufacturer	Description	Model	Asset #	Cal Due
Hewlett Packard	Microwave Preamplifier, 1- 26.5GHz	8449B	785	5/26/2011
Hewlett Packard	SpecAn 9 kHz - 40 GHz, FT (SA40) Blue	8564E (84125C)	1393	4/14/2011
EMCO	Antenna, Horn, 1-18 GHz	3115	1561	6/22/2012
Radiated Emissions,	30 - 11,000 MHz, 15-Mar-11			
<u>Manufacturer</u>	<u>Description</u>	<u>Model</u>	Asset #	Cal Due
EMCO	Antenna, Horn, 1-18 GHz	3115	487	7/6/2012
Hewlett Packard	SpecAn 9 kHz - 40 GHz, FT (SA40) Blue	8564E (84125C)	1393	4/14/2011
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1538	11/2/2011
Com-Power Corp.	Preamplifier, 30-1000 MHz	PA-103	1632	4/23/2011
Hewlett Packard	Microwave Preamplifier, 1- 26.5GHz	8449B	1780	11/23/2011
Sunol Sciences	Biconilog, 30-3000 MHz	JB3	2197	12/29/2011
Frequency Stability, 1	8-Mar-11			
<u>Manufacturer</u>	<u>Description</u>	<u>Model</u>	Asset #	Cal Due
Agilent	PSA, Spectrum Analyzer, (installed options, 111, 115, 123, 1DS, B7J, HYX,	E4446A	2139	1/26/2012
Thermotron	Temp Chamber (w/ F4 Watlow Controller)	S1.2	2170	7/1/2011
RSS 197 Tx Radiated	Spurious, 23-Mar-11			
<u>Manufacturer</u>	<u>Description</u>	<u>Model</u>	Asset #	Cal Due
EMCO	Antenna, Horn, 1-18 GHz	3115	487	7/6/2012
Hewlett Packard	SpecAn 9 kHz - 40 GHz, (SA40) Purple	8564E (84125C)	1771	8/26/2011
Hewlett Packard	Head (Inc W1-W4, 1946, 1947) Purple	84125C	1772	5/6/2011
Hewlett Packard	Microwave Preamplifier, 1- 26.5GHz	8449B	1780	11/23/2011
A.H. Systems	Spare System Horn, 18-40GHz	SAS-574, p/n: 2581	2162	3/3/2012

Appendix B Test Data

EMC Test Da				
Client:	Ubiquiti Networks	Job Number:	J82270	
Model:	PowerBridge M365	T-Log Number:	T82342	
		Account Manager:	Susan Pelzl	
Contact:	Jennifer Sanchez		-	
Emissions Standard(s):	FCC 15B, 90Z, RSS 197	Class:	-	
Immunity Standard(s):	-	Environment:	-	

For The

Ubiquiti Networks

Model

PowerBridge M365

Date of Last Test: 3/23/2011

	An ATAS company	EMC Test Data			
Client:	Ubiquiti Networks	Job Number:	J82270		
Model	DowarDridge M245	T-Log Number:	T82342		
Model:	PowerBridge M365	Account Manager:	Susan Pelzl		
Contact:	Jennifer Sanchez				

Radiated Emissions

Class:

Test Specific Details

Standard: FCC 15B, 90Z, RSS 197

~ FII:

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: 3/15/2011 Config. Used: 1
Test Engineer: Joseph Cadigal Config Change: none
Test Location: Fremont Chamber #4 EUT Voltage: 120V/60Hz

General Test Configuration

The EUT and any local support equipment were located on the turntable for radiated emissions testing. Any remote support equipment was located outside the semi-anechoic chamber. Any cables running to remote support equipment where routed through metal conduit and when possible passed through a ferrite clamp upon exiting the chamber.

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: 20-25 °C Rel. Humidity: 30-40 %

Summary of Results

Run #	Test Performed	Limit	Result	Margin	
1	Radiated Emissions	FCC B	Fval	Defends in dividual numb	
l	30 - 1000 MHz, Preliminary	30 - 1000 MHz, Preliminary		Refer to individual runs	
2	Radiated Emissions	FCC B	Doce	39.9dBµV/m @ 30.65MHz (-0.1dB)	
Z	30 - 1000 MHz, Maximized	FCC B	Pass		
2	Radiated Emissions	RSS GEN	Doce	50.7dBµV/m @ 1560.1MHz (-3.3dB)	
3	1 GHz - 11 GHz Maximized	NOO GEN	Pass		

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

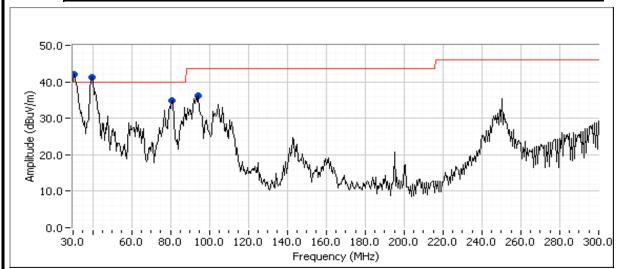
No deviations were made from the requirements of the standard.

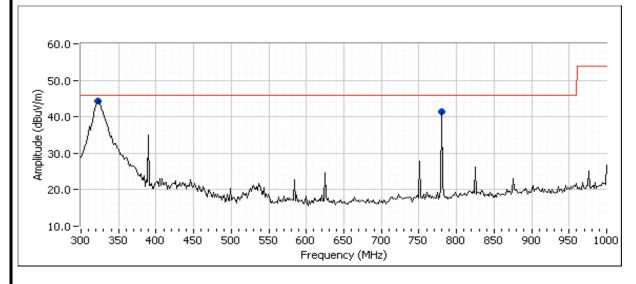


	Time de la company		
Client:	Ubiquiti Networks	Job Number:	J82270
Model:	PowerBridge M365	T-Log Number:	T82342
	Fower bridge 101303	Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15B, 90Z, RSS 197	Class:	-

Run #1: Preliminary Radiated Emissions, 30 - 1000 MHz

Frequency Range	Test Distance	Limit Distance	Extrapolation Factor
30 - 1000 MHz	3	3	0.0







	All Dell's Company		
Client:	Ubiquiti Networks	Job Number:	J82270
Model:	PowerBridge M365	T-Log Number:	T82342
	rowerbridge M303	Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15B, 90Z, RSS 197	Class:	-

Preliminary peak readings captured during pre-scan

Frequency	Level	Pol	RSS	GEN	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
780.004	41.5	Н	46.0	-4.5	Peak	157	1.0	
323.486	44.3	V	46.0	-1.7	Peak	185	1.5	
81.177	34.8	V	40.0	-5.2	Peak	17	1.0	
94.368	36.2	V	43.5	-7.3	Peak	64	1.0	
40.110	41.2	V	40.0	1.2	Peak	190	1.0	
30.646	42.1	V	40.0	2.1	Peak	200	1.0	

Preliminary quasi-peak readings (no manipulation of EUT interface cables)

· · · · · · · · · · · · · · · · · · ·	quae: pour rounings (no main punation of 201 internace causes)							
Frequency	Level	Pol	RSS	GEN	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
81.177	34.3	V	40.0	-5.7	QP	18	1.0	QP (1.00s)
94.368	37.2	V	43.5	-6.3	QP	66	1.0	QP (1.00s)
40.110	36.7	V	40.0	-3.3	QP	192	1.0	QP (1.00s)
30.646	39.9	V	40.0	-0.1	QP	202	1.0	QP (1.00s)
780.004	40.2	Н	46.0	-5.8	QP	159	1.0	QP (1.00s)
323.486	44.0	V	46.0	-2.0	QP	186	1.5	QP (1.00s)
	•	-	•	· · · · · · · · · · · · · · · · · · ·	•	•	•	_

Run #2: Maximized Readings From Run #1

Maximized quasi-peak readings (includes manipulation of EUT interface cables)

Frequency Range	Test Distance	Limit Distance	Extrapolation Factor
30 - 1000 MHz	3	3	0.0

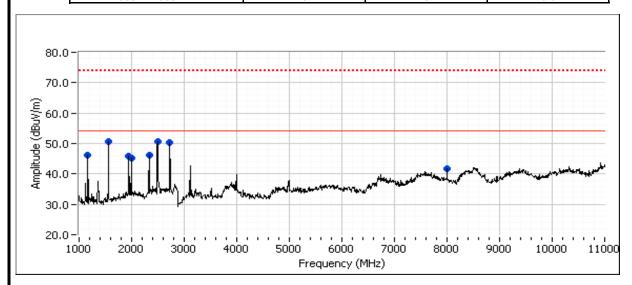
Frequency	Level	Pol	RSS	GEN	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
30.646	39.9	V	40.0	-0.1	QP	202	1.0	QP (1.00s)
323.486	44.0	V	46.0	-2.0	QP	186	1.5	QP (1.00s)
40.110	36.7	V	40.0	-3.3	QP	192	1.0	QP (1.00s)
81.177	34.3	V	40.0	-5.7	QP	18	1.0	QP (1.00s)
780.004	40.2	Н	46.0	-5.8	QP	159	1.0	QP (1.00s)
94.368	37.2	V	43.5	-6.3	QP	66	1.0	QP (1.00s)



	All Butter Company		
Client:	Ubiquiti Networks	Job Number:	J82270
Model:	DowarDridge M245	T-Log Number:	T82342
	PowerBridge M365	Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15B, 90Z, RSS 197	Class:	-

Run #3: Maximized Readings, 1000 - 11000 MHz

Frequency Range	Test Distance	Limit Distance	Extrapolation Factor
1000 - 11000 MHz	3	3	0.0



Preliminary peak readings captured during pre-scan (peak readings vs. average limit)

Frequency	Level	Pol	RSS	GEN	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1559.170	50.5	Н	54.0	-3.5	Peak	153	1.0	
1999.170	45.2	V	54.0	-8.8	Peak	169	1.0	
1944.170	46.0	Н	54.0	-8.0	Peak	181	2.2	
2494.170	50.6	V	54.0	-3.4	Peak	185	1.0	
2338.330	46.3	Н	54.0	-7.7	Peak	187	1.6	
1165.000	46.3	Н	54.0	-7.7	Peak	222	1.3	
2723.330	50.4	Н	54.0	-3.6	Peak	224	1.0	
8000.000	41.7	V	54.0	-12.3	Peak	224	1.3	·

Cliont	An AZZ							Joh Numbor	102270
Client:	Obiquiti Netv	VUIKS					Job Number: J82270		
Model:	PowerBridge	M365					T-Log Number: T82342		
							Acco	unt Manager:	Susan Pelzl
	Jennifer San								
Standard:	FCC 15B, 90)Z, RSS 19	97					Class:	-
inal peak	and average	readings							
Frequency	Level	Pol	RSS	GEN	Detector	Azimuth	Height	Comments	
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters		
1560.080	50.7	Н	54.0	-3.3	AVG	154	1.0	RB 1 MHz;\	/B 10 Hz;Pk
2000.040	44.3	V	54.0	-9.7	AVG	171	1.0	RB 1 MHz;\	/B 10 Hz;Pk
2339.830	42.1	Н	54.0	-11.9	AVG	186	1.6	RB 1 MHz;\	/B 10 Hz;Pk
2494.660	39.3	V	54.0	-14.7	AVG	186	1.0	RB 1 MHz;\	
7999.970	37.9	V	54.0	-16.1	AVG	224	1.3	RB 1 MHz;\	/B 10 Hz;Pk
2495.280	55.7	V	74.0	-18.3	PK	186	1.0	RB 1 MHz;\	/B 3 MHz;Pk
1560.030	51.8	Н	74.0	-22.2	PK	154	1.0	RB 1 MHz;\	/B 3 MHz;Pk
2724.570	29.6	Н	54.0	-24.4	AVG	224	1.0	RB 1 MHz;\	/B 10 Hz;Pk
1163.670	28.7	Н	54.0	-25.3	AVG	224	1.3	RB 1 MHz;\	/B 10 Hz;Pk
1942.820	28.2	Н	54.0	-25.8	AVG	182	2.2	RB 1 MHz;\	
1999.940	47.9	V	74.0	-26.1	PK	171	1.0		/B 3 MHz;Pk
2339.820	46.3	Н	74.0	-27.7	PK	186	1.6		/B 3 MHz;Pk
7999.690	45.1	V	74.0	-28.9	PK	224	1.3		/B 3 MHz;Pk
2724.310	40.6	Н	74.0	-33.4	PK	224	1.0		/B 3 MHz;Pk
1943.520	39.8	Н	74.0	-34.2	PK	182	2.2		/B 3 MHz;Pk
1164.610	38.7	Н	74.0	-35.3	PK	224	1.3	RB 1 MHz;\	/B 3 MHz;Pk

E E	Elliott An ATAS company	EM	C Test Data
Client:	Ubiquiti Networks	Job Number:	J82270
Model	PowerBridge M365	T-Log Number:	J82270 T82342
iviouei.	rowerbridge ivisos	Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15B, 90Z, RSS 197	Class:	N/A

RSS 197 and FCC Part 90 **Spurious Emissions**

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.

Config. Used: 1 Date of Test: 3/11, 14/2011 Config Change: None Test Engineer: R. Varelas, M. Birgani, J. Cadigal Test Location: Chamber #7 EUT Voltage: POE

General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated spurious emissions testing. All remote support equipment was located outside the chamber.

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

Ambient Conditions: Temperature: 20-25 °C

> Rel. Humidity: 30-40 %

Summary of Results

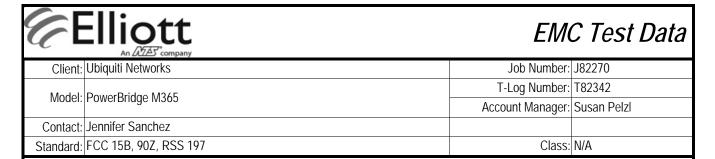
Run #	Mode	Channel	BW	Test Performed	Limit	Result / Margin
-	Data Rate 0	All	All	Radiated Emissions, 30 MHz-37GHz	FCC 90.210 Mask B	48.4dBµV/m @ 54.30MHz (-33.8dB)

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.

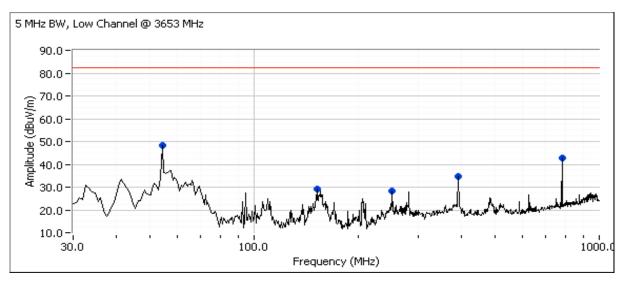


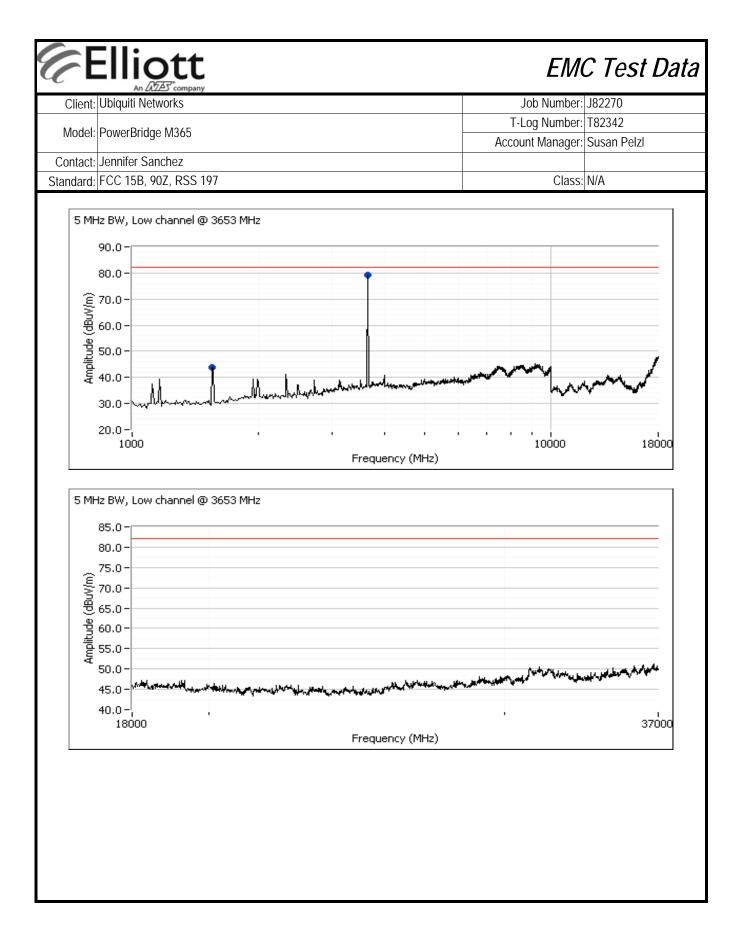
Run #1: Radiated Spurious Emissions, 30 - 37000 MHz. Operating Mode: 5 MHz BW

Level	Pol	FCC 9	90.210	Detector	Azimuth	Height	Comments	Channel
dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters		
48.4	V	82.2	-33.8	Peak	217	1.0		<i>3653</i>
29.0	Н	82.2	-53.2	Peak	103	2.0		<i>3653</i>
28.5	Н	82.2	-53.7	Peak	250	1.0		<i>3653</i>
34.7	V	82.2	-47.5	Peak	81	1.5		3653
42.8	V	82.2	-39.4	Peak	248	1.5		<i>3653</i>
43.8	V	82.2	-38.4	Peak	126	1.0		<i>3653</i>
79.2	Н	-	-	Peak	87	1.6	Fundamental	<i>3653</i>
42.7	V	82.2	-39.5	Peak	99	1.6		3662
44.0	V	82.2	-38.2	Peak	114	1.6		3662
<i>78.7</i>	Н	-	-	Peak	48	1.0	Fundamental	3662
43.0	V	82.2	-39.2	Peak	90	1.0		3672
77.9	Н	-	-	Peak	315	1.0	Fundamental	3672
	dBμV/m 48.4 29.0 28.5 34.7 42.8 43.8 79.2 42.7 44.0 78.7 43.0	dBμV/m v/h 48.4 V 29.0 H 28.5 H 34.7 V 42.8 V 43.8 V 79.2 H 42.7 V 44.0 V 78.7 H 43.0 V	dBμV/m v/h Limit 48.4 V 82.2 29.0 H 82.2 28.5 H 82.2 34.7 V 82.2 42.8 V 82.2 43.8 V 82.2 79.2 H - 42.7 V 82.2 44.0 V 82.2 78.7 H - 43.0 V 82.2	dBμV/m v/h Limit Margin 48.4 V 82.2 -33.8 29.0 H 82.2 -53.2 28.5 H 82.2 -53.7 34.7 V 82.2 -47.5 42.8 V 82.2 -39.4 43.8 V 82.2 -38.4 79.2 H - - 42.7 V 82.2 -39.5 44.0 V 82.2 -38.2 78.7 H - - 43.0 V 82.2 -39.2	dBμV/m v/h Limit Margin Pk/QP/Avg 48.4 V 82.2 -33.8 Peak 29.0 H 82.2 -53.2 Peak 28.5 H 82.2 -53.7 Peak 34.7 V 82.2 -47.5 Peak 42.8 V 82.2 -39.4 Peak 43.8 V 82.2 -38.4 Peak 79.2 H - - Peak 42.7 V 82.2 -39.5 Peak 44.0 V 82.2 -38.2 Peak 78.7 H - - Peak 43.0 V 82.2 -39.2 Peak	dBμV/m v/h Limit Margin Pk/QP/Avg degrees 48.4 V 82.2 -33.8 Peak 217 29.0 H 82.2 -53.2 Peak 103 28.5 H 82.2 -53.7 Peak 250 34.7 V 82.2 -47.5 Peak 81 42.8 V 82.2 -39.4 Peak 248 43.8 V 82.2 -38.4 Peak 126 79.2 H - - Peak 87 42.7 V 82.2 -39.5 Peak 99 44.0 V 82.2 -38.2 Peak 114 78.7 H - - Peak 48 43.0 V 82.2 -39.2 Peak 90	dBμV/m v/h Limit Margin Pk/QP/Avg degrees meters 48.4 V 82.2 -33.8 Peak 217 1.0 29.0 H 82.2 -53.2 Peak 103 2.0 28.5 H 82.2 -53.7 Peak 250 1.0 34.7 V 82.2 -47.5 Peak 81 1.5 42.8 V 82.2 -39.4 Peak 248 1.5 43.8 V 82.2 -39.4 Peak 126 1.0 79.2 H - - Peak 87 1.6 42.7 V 82.2 -39.5 Peak 99 1.6 44.0 V 82.2 -38.2 Peak 114 1.6 78.7 H - - Peak 48 1.0 43.0 V 82.2 -39.2 Peak 90 1.0	dBμV/m v/h Limit Margin Pk/QP/Avg degrees meters 48.4 V 82.2 -33.8 Peak 217 1.0 29.0 H 82.2 -53.2 Peak 103 2.0 28.5 H 82.2 -53.7 Peak 250 1.0 34.7 V 82.2 -47.5 Peak 81 1.5 42.8 V 82.2 -39.4 Peak 248 1.5 43.8 V 82.2 -38.4 Peak 126 1.0 79.2 H - - Peak 87 1.6 Fundamental 42.7 V 82.2 -39.5 Peak 99 1.6 44.0 V 82.2 -38.2 Peak 114 1.6 78.7 H - - Peak 48 1.0 Fundamental 43.0 V 82.2 -39.2 Peak <

Note 1: Based on the measurements at the 5MHz BW and 25MHz BW, 30-1000 MHz was not performed for this channel since changing BW and channel did not make any difference for radiated emissions.

Low Channel @ 3653.0 MHz





ntact: Jennife dard: FCC 1 Channel @ 5 MHz BW,	5B, 90Z, RSS 19							T82342 Susan Pelzl N/A
Channel @ 5 MHz BW,	5B, 90Z, RSS 19						Class:	N/A
Channel @ 5 MHz BW, 90.0 -	2 3662 MHz						Class:	N/A
5 MHz BW, 90.0-								<u> </u>
90.0-	Center Channel							
		I @ 3662 MHz						
80.0-				•				
<u> </u>								
왕 왕 60.0-								
) 9 50.0-								
-0.04 (Buv/m) -0.05 (Buv/m) -0.04 (Buv/m)	•	†					4	James J
30.0-	u_M	العالميسية الإسبيرالع	وموريات وسيال را	وودورين جريد أوالموا أريام	Printer of Printers of Street,			AND THE PARTY
	thehant kadahalmaket	, QWAY						
20.0 - 10	¦ 100					10	i 000	18
			F	requency (Mi	Hz)			
5 MHz BW,	Center channel	@ 3662 MHz						
85.0-								
80.0-								
ੂ 75.0 - ਵ								
75.0- 70.0- 70.0- 70.0- 70.0- 70.0-								
⊕ 65.0-								
<u>මූ</u> 60.0-								
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40.0 - 180	000		_	requency (Mi				٠.

Ciletit. C	ıupıdu	ti Networks								lumber:		
Model: F	ower	Bridge M365						A	ccount M		T82342 Susan F	
		er Sanchez	\								D1/0	
ndard: F	CCT	5B, 90Z, RSS 19) /							Class:	N/A	
Channe	@ 3	672.0 MHz										
5 MHz	BW,	High channel @	3672 MHz									
9	0.0-											
1	0.0-					•						
(E) 7	0.0-											
8 6	0.0-											
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	10	00			Fre	equency ((MHz)		10	000		18000
- MIL	DIII	15-b -b1 @	0470 MIL-									
		High channel @	3672 MHZ									
9	0.0-											
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Amplitude (dBuV/m)	0.0-											
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	Eliott An Miss company		
Client:	Ubiquiti Networks	Job Number:	J82270
Madal	PowerBridge M365	T-Log Number:	T82342
woder.	Power bridge 1/1303	Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15B, 90Z, RSS 197	Class:	N/A
		•	

Run #2: Radiated Spurious Emissions, 30 - 37000 MHz. Operating Mode: 10 MHz BW

Frequency	Level	Pol	15.209	/ 15.247	Detector	Azimuth	Height	Comments	Channel
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters		
1559.170	43.3	V	82.2	-38.9	Peak	83	1.0		<i>3655</i>
3649.170	77.7	Н	-	-	Peak	65	1.0	Fundamental	<i>3655</i>
1165.000	42.9	V	82.2	-39.3	Peak	<i>75</i>	1.6		3662
1559.170	44.3	V	82.2	-37.9	Peak	94	1.6		3662
3662.000	78.7	Н	-	-	Peak	<i>53</i>	1.0	Fundamental	3662
1559.170	43.0	V	82.2	-39.2	Peak	104	1.0		3670
3667.500	77.9	Н	-	-	Peak	312	1.0	Fundamental	3670

Noto 1.	Based on the measurements at the 5MHz BW and 25MHz BW, 30-1000 MHz was not performed for this channel since
Note 1:	changing BW and channel did not make any difference for radiated emissions.

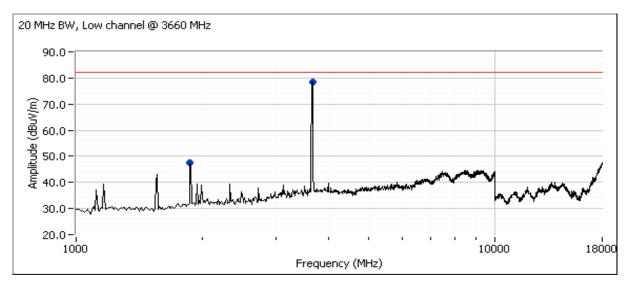
Client: Ubiquiti Netv	vorks			Job Numb			
lodel: PowerBridge	e M365		Ad	T-Log Number: T82342 Account Manager: Susan Pelzl			
ntact: Jennifer Sar							
dard: FCC 15B, 90)Z, RSS 197			Clas	ss: N/A		
hannel @ 3655 M	Hz						
10 MHz BW, Low	channel @ 3655 MHz						
90.0-							
80.0-		•					
70.0 - 60.0 - 50.0 - 40.0 -							
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<u>මී</u> 50.0-							
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		Frequency (M	nz)				
10 MHz BW, Low	channel @ 3655 MHz						
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80.0- <u>2</u>							
- 0.00							
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<u>교</u> 60.0-							
₹ 50.0-					· · · · · · · · · · · · · · · · · · ·		
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40.0 - 18000		a comment of the control of the cont			37000		
10000		Frequency (M	Hz)		3,330		

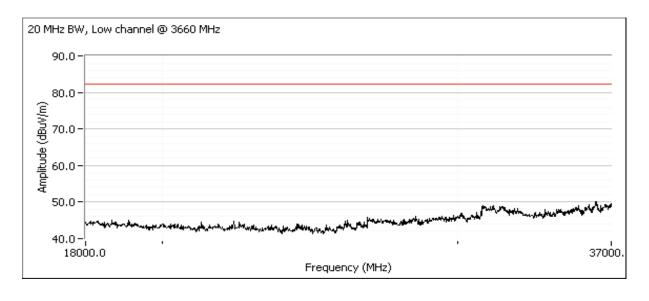
lient: Ubiquiti Networks			Job Number: Jog Number: 7	
lodel: PowerBridge M365			int Manager: S	
ntact: Jennifer Sanchez				
dard: FCC 15B, 90Z, RSS 197			Class: N	N/A
Channel @ 3662 MHz				
10 MHz BW, Center Channel @	3662 MHz			
90.0-				
80.0-	•			
<u>€</u> 70.0-				
曼 60.0-				
(w//n) 60.0 - 60.0 - 50.0 - 60				
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20.0-			15000	1000
1000	Frequenc	y (MHz)	10000	18000
10 MHz BW, Center channel @ :	3662 MHz			
90.0				
80.0-				
Amplitude (dBuV/m) - 0.00 - 0.00				
(Q B)				
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50.0-				
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40.0 - 18000	د. هدگاه ۱۹۹۸ این در دار ۱۹۹۸ سهه هدید در پورانه در سرکیمه بید.			3700
10000	Frequenc	y (MHz)		

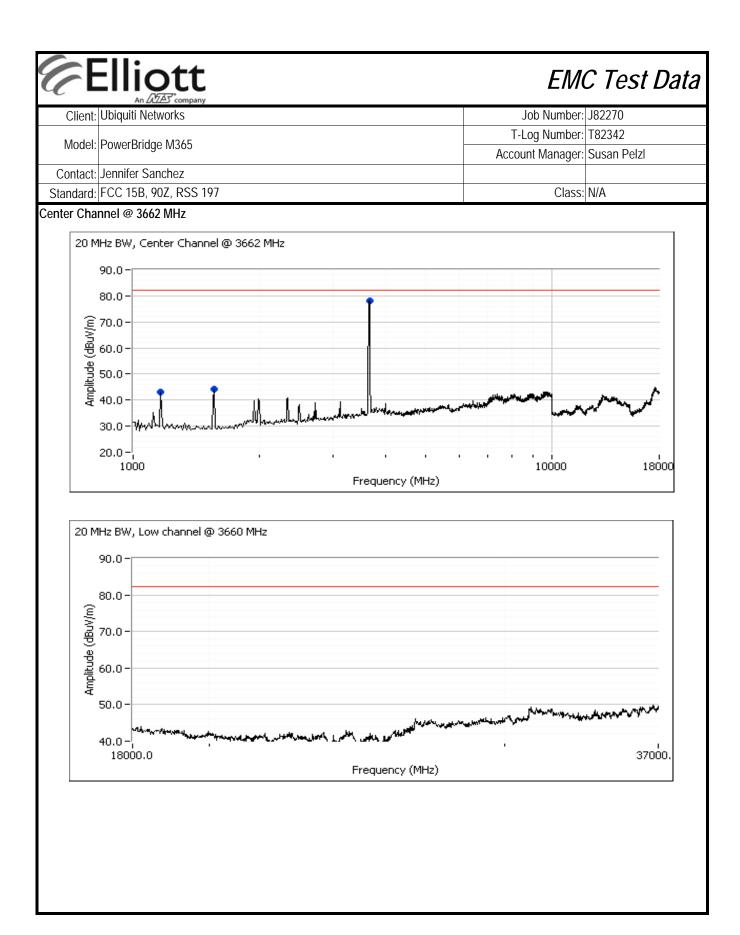
lient: Ubiquiti Netw	Orks		Number: J82270
odel: PowerBridge	M365		Number: T82342
ntact: Jennifer San		Account	Manager: Susan Pelzl
dard: FCC 15B, 90			Class: N/A
hannel @ 3670 M	Hz		
	channel @ 3670 MHz		
90.0-			
80.0-			
Wholkfude (dBuv/m) 60.0 - 0.00			
9 50.0-			
¥ 40.0-	•	The state of the s	V/
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	Fr	equency (MHz)	
10 MHz BW, High	channel @ 3670 MHz		
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g 70.0-			
m l			
<u>2</u> 60.0-			
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50.0 - پىيهاس 40.0 -	in and provided the second of	1	
50.0-	En.	equency (MHz)	3700

	Eliott An ATAS company	EMC Test Data
	Ubiquiti Networks	Job Number: J82270
Madalı	DowerPridge M24F	T-Log Number: T82342
woder:	PowerBridge M365	Account Manager: Susan Pelzl
Contact:	Jennifer Sanchez	
Standard:	FCC 15B, 90Z, RSS 197	Class: N/A
Run #3: Ra	diated Spurious Emissions, 30 - 37000 MHz. Operatin	g Mode: 20 MHz BW

Low Channel @ 3660 MHz

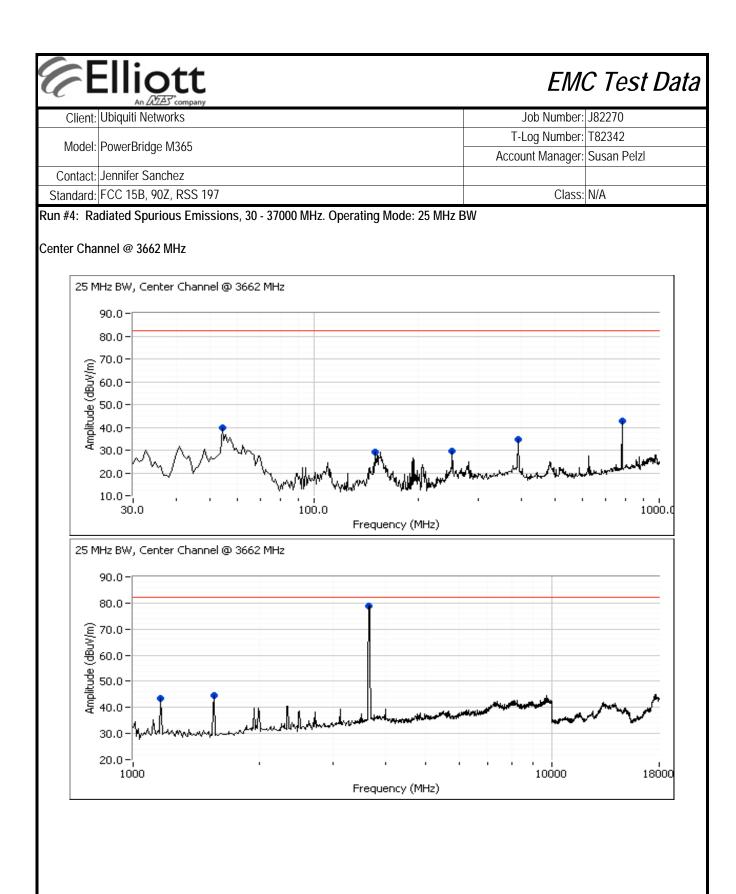


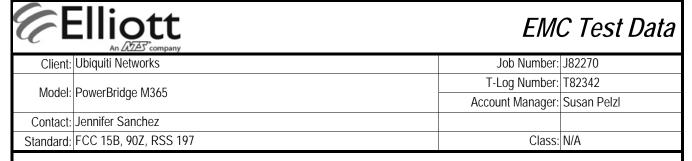


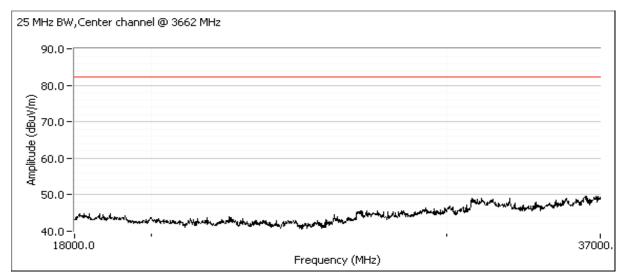


EMC Test Data Job Number: J82270 Client: Ubiquiti Networks T-Log Number: T82342 Model: PowerBridge M365 Account Manager: Susan Pelzl Contact: Jennifer Sanchez Standard: FCC 15B, 90Z, RSS 197 Class: N/A High Channel @ 3665 MHz 20 MHz BW, High channel @ 3665 MHz 90.0 80.0 Amplitude (dBuV/m) 60.05 50.06 40.09 30.0 20.0 -18000 1000 10000 Frequency (MHz) 20 MHz BW, High channel @ 3665 MHz 90.0 80.0 Amplitude (dBuV/m) 20.09 50.0 40.0 -18000.0 37000 Frequency (MHz)

		ott Ar company						EMO	C Test Data
Client:	Ubiquiti Netv	vorks						Job Number:	J82270
Model:	PowerBridge	M365					T-	Log Number:	T82342
Model.	i owerbridge	, INIOO					Acco	unt Manager:	Susan Pelzl
Contact:	Jennifer San	ıchez							
Standard:	FCC 15B, 90)Z, RSS 197	1					Class:	N/A
Frequency MHz	Level dBµV/m	Pol v/h	Limit	/ 15.247 Margin	Detector Pk/QP/Avg	Azimuth degrees	Height meters	Comments	Channel
1870.830	47.7	V	82.2	-34.5	Peak	46	2.5	<u></u>	3660
3667.500	78.4	Н	-	-	Peak	325	1.0	Fundamenta	al 3660
1165.000	42.9	V	82.2	-39.3	Peak	79	1.6		3662
1559.170	44.3	V	82.2	-37.9	Peak	67	1.6		3662
3662.000	78.1	Н	-	-	Peak	64	1.0	Fundamenta	al 3662
1880.000	45.7	V	82.2	-36.5	Peak	325	2.2		3665
3658.330	78.6	Н	-	-	Peak	319	1.0	Fundamenta	al 3665
-						-			
Note 1:					d 25MHz BW, rence for radia			erformed for	this channel since







Frequency	Level	Pol	15.209	/ 15.247	Detector	Azimuth	Height	Comments	Channel
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters		
54.300	39.8	V	82.2	-42.4	Peak	186	2.0		3662
150.150	29.3	Н	82.2	-52.9	Peak	302	2.5		3662
251.400	29.6	Н	82.2	-52.6	Peak	276	1.0		3662
391.000	34.7	V	82.2	-47.5	Peak	80	1.5		3662
781.250	42.6	V	82.2	-39.6	Peak	<i>251</i>	1.5		3662
1165.000	43.4	V	82.2	-38.8	Peak	100	1.6		3662
1559.170	44.5	V	82.2	-37.7	Peak	91	1.6		3662
3662.000	78.8	Н	-	-	Peak	41	1.0	Fundamental	3662

Client:	Ubiquiti Netv	works						Job Number:	J82270	
							T-	Log Number:	T82342	
iviodel:	PowerBridge	E IVI300					Accou	unt Manager:	Susan Pelzl	
	Jennifer Sar									
Standard:	FCC 15B, 90	0Z, RSS 197						Class:	N/A	
Run #5: Ra	adiated Spur	rious Emissi	ions, Transi	mit Mode: S	ubstitution N	leasuremen	ts			
Frequency	Level	Pol	FCC	90.210	Detector	Azimuth	Height	Comments		Channe
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters			
54.300	48.4	V	82.2	-33.8	Peak	217	1.0			3653
Horizontal	& Vertical									
Frequency		ution measur	ements	Site	EU	T measurem	ents	eirp Limit	erp Limit	Margir
MHz	Pin ¹	Gain ²	FS^3	Factor ⁴	FS ⁵	eirp (dBm)	erp (dBm)	dBm	dBm	dB
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters			
All signals	s were more	than 20dB be	elow the con			J				
Note 1:		out power (di					V ID'			
<i>Note 2:</i> <i>Note 3:</i>					. A dipole has the substitution		'aBı.			
Note 3:					a field strengt		to an eirn in	dRm		
Note 5:		ength as me			a neiu strengt	II III ubuviiii	to an enp in	ubili.		
1010 01	201 11010 011	origin do mo		.ga a						

E E	Eliott An MES company	EMO	C Test Data
Client:	Ubiquiti Networks	Job Number:	J82270
Model	PowerBridge M365	T-Log Number:	T82342
wouei.	rower bridge 10303	Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15B, 90Z, RSS 197	Class:	N/A

RSS 197 Spurious Emissions

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.

Config. Used: 1 Date of Test: 3/23/2011 Config Change: None Test Engineer: John Caizzi Test Location: FT3 EUT Voltage: POE

General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated spurious emissions testing. All remote support equipment was located outside the chamber.

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

Ambient Conditions: Temperature: 20-25 °C

> Rel. Humidity: 30-40 %

Summary of Results

Run #	Mode	Channel	BW	Test Performed	Limit	Result / Margin
1	Data Rate 0	High	All	Radiated Emissions, 30 MHz-37GHz	FCC 90.210 Mask B	44.7dBµV/m @ 1559.2MHz (-37.5dB)

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.

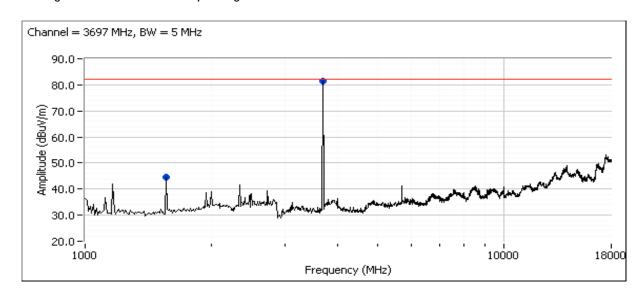


EMC Test Data

	An ZAZES company		
Client:	Ubiquiti Networks	Job Number:	J82270
Madalı	DowarDridgo M245	T-Log Number:	T82342
Model.	PowerBridge M365	Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15B, 90Z, RSS 197	Class:	N/A

Run #1: Radiated Spurious Emissions, 30 - 37000 MHz.

Run #1a: High Channel @ 3697 MHz. Operating Mode: 5 MHz BW

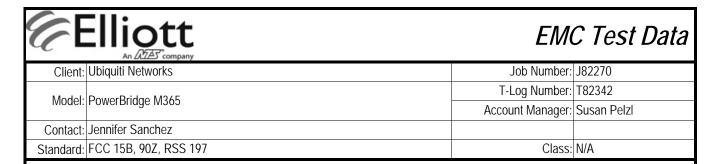


Frequency	Level	Pol	FCC 9	90.210	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
3695.000	81.3	Н	N/A	N/A	Peak	68	1.0	Fundamental
1559.170	44.4	V	82.2	-37.8	Peak	102	1.5	

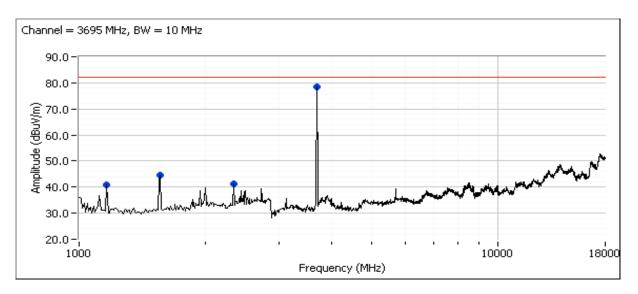
Note 1

Based on the measurements at the 5MHz BW and 25MHz BW for FCC Part 90, 30-1000 MHz was not performed for this channel since changing BW and channel did not make any difference for radiated emissions.

18-37 GHz scans for FCC Part 90 showed no emissions, regardless of channel or bandwidth. Therefore, this measurement was not repeated for this channel & bandwidth.



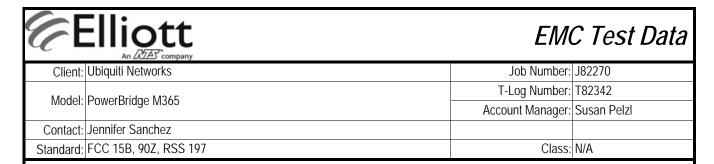
Run #1b: High Channel @ 3695 MHz. Operating Mode: 10 MHz BW



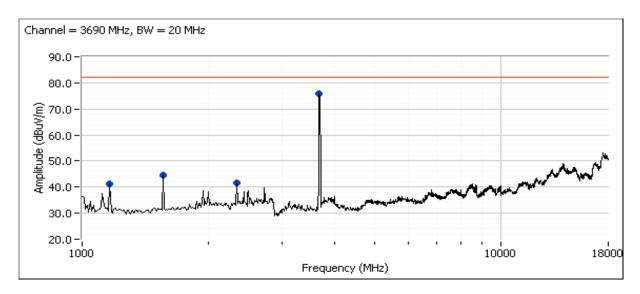
Frequency	Level	Pol	FCC 9	90.210	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
3685.830	78.6	Н	N/A	N/A	Peak	301	1.0	Fundamental
1559.170	44.5	V	82.2	-37.7	Peak	84	1.5	
2338.330	41.3	V	82.2	-40.9	Peak	259	1.0	
1165.000	41.0	V	82.2	-41.2	Peak	76	1.0	

Note 1 Based on the measurements at the 5MHz BW and 25MHz BW for FCC Part 90, 30-1000 MHz was not performed for this channel since changing BW and channel did not make any difference for radiated emissions.

18-37 GHz scans for FCC Part 90 showed no emissions, regardless of channel or bandwidth. Therefore, this measurement was not repeated for this channel & bandwidth.



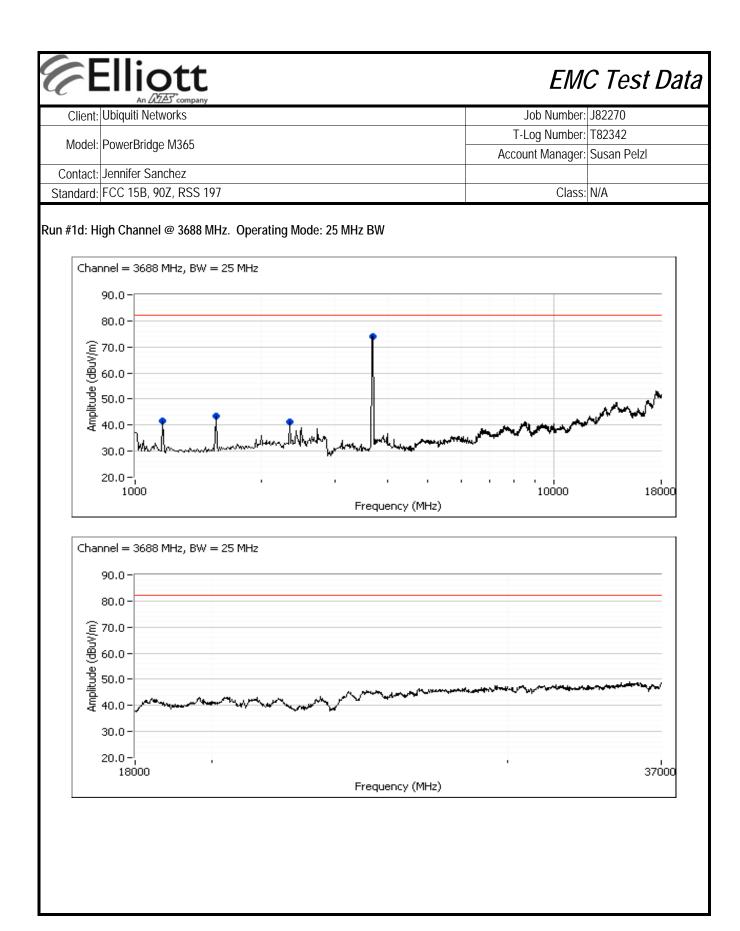
Run #1c: High Channel @ 3690 MHz. Operating Mode: 20 MHz BW



Frequency	Level	Pol	15.209	/ 15.247	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
3676.670	75.8	Н	N/A	N/A	Peak	73	1.0	Fundamental
1559.170	44.7	V	82.2	-37.5	Peak	90	1.5	
1165.000	41.1	V	82.2	-41.1	Peak	76	1.0	
2338.330	41.5	V	82.2	-40.7	Peak	259	1.0	

Note 1 Based on the measurements at the 5MHz BW and 25MHz BW for FCC Part 90, 30-1000 MHz was not performed for this channel since changing BW and channel did not make any difference for radiated emissions.

18-37 GHz scans for FCC Part 90 showed no emissions, regardless of channel or bandwidth. Therefore, this measurement was not repeated for this channel & bandwidth.



T-Log Number: T82342 Account Manager: Susan Pelz	T-Log Number: T82342 Account Manager: Susan Pelz	Client:	Ubiquiti Netw	Orks						Job Number:	J82270
Contact: Jennifer Sanchez Itandard: FCC 15B, 90Z, RSS 197 Class: N/A Requency Level Pol 15.209 / 15.247 Detector Azimuth Height Comments MHz dBμV/m V/h Limit Margin Pk/QP/Avg degrees meters 85.830 75.7 H N/A N/A Peak 314 1.0 Fundamental 559.170 44.7 V 82.2 -37.5 Peak 87 1.5 65.000 42.0 V 82.2 -40.2 Peak 72 1.0 838.330 42.0 V 82.2 -40.2 Peak 268 1.0 Based on the measurements at the 5MHz BW and 25MHz BW for FCC Part 90, 30-1000 MHz was not performed for the standard of the standard	Contact: Jennifer Sanchez Itandard: FCC 15B, 90Z, RSS 197 Class: N/A Requency Level Pol 15.209 / 15.247 Detector Azimuth Height Comments MHz dBμV/m V/h Limit Margin Pk/QP/Avg degrees meters 85.830 75.7 H N/A N/A Peak 314 1.0 Fundamental 559.170 44.7 V 82.2 -37.5 Peak 87 1.5 65.000 42.0 V 82.2 -40.2 Peak 72 1.0 838.330 42.0 V 82.2 -40.2 Peak 268 1.0 Based on the measurements at the 5MHz BW and 25MHz BW for FCC Part 90, 30-1000 MHz was not performed for the standard of the standard								T		
tandard: FCC 15B, 90Z, RSS 197 Class: N/A Equency Level Pol 15.209 / 15.247 Detector Azimuth Height Comments MHz dBμV/m v/h Limit Margin Pk/QP/Avg degrees meters 85.830 75.7 H N/A N/A Peak 314 1.0 Fundamental 59.170 44.7 V 82.2 -37.5 Peak 87 1.5 65.000 42.0 V 82.2 -40.2 Peak 72 1.0 38.330 42.0 V 82.2 -40.2 Peak 268 1.0 Based on the measurements at the 5MHz BW and 25MHz BW for FCC Part 90, 30-1000 MHz was not performed for the second of t	tandard: FCC 15B, 90Z, RSS 197 Class: N/A Equency Level Pol 15.209 / 15.247 Detector Azimuth Height Comments MHz dBμV/m v/h Limit Margin Pk/QP/Avg degrees meters 85.830 75.7 H N/A N/A Peak 314 1.0 Fundamental 59.170 44.7 V 82.2 -37.5 Peak 87 1.5 65.000 42.0 V 82.2 -40.2 Peak 72 1.0 38.330 42.0 V 82.2 -40.2 Peak 268 1.0 Based on the measurements at the 5MHz BW and 25MHz BW for FCC Part 90, 30-1000 MHz was not performed for the second of t	Model:	PowerBridge	M365					Acco	ount Manager:	Susan Pelzl
Equency Level Pol 15.209 / 15.247 Detector Azimuth Height Comments MHz dBμV/m v/h Limit Margin Pk/QP/Avg degrees meters 85.830 75.7 H N/A N/A Peak 314 1.0 Fundamental 659.170 44.7 V 82.2 -37.5 Peak 87 1.5 65.000 42.0 V 82.2 -40.2 Peak 72 1.0 838.330 42.0 V 82.2 -40.2 Peak 268 1.0 Based on the measurements at the 5MHz BW and 25MHz BW for FCC Part 90, 30-1000 MHz was not performed for the performance for the perfor	Equency Level Pol 15.209 / 15.247 Detector Azimuth Height Comments MHz dBμV/m v/h Limit Margin Pk/QP/Avg degrees meters 685.830 75.7 H N/A N/A Peak 314 1.0 Fundamental 659.170 44.7 V 82.2 -37.5 Peak 87 1.5 65.000 42.0 V 82.2 -40.2 Peak 72 1.0 838.330 42.0 V 82.2 -40.2 Peak 268 1.0 Based on the measurements at the 5MHz BW and 25MHz BW for FCC Part 90, 30-1000 MHz was not performed for the performance for the perfo										
MHz dBμV/m v/h Limit Margin Pk/QP/Avg degrees meters 85.830 75.7 H N/A N/A Peak 314 1.0 Fundamental 59.170 44.7 V 82.2 -37.5 Peak 87 1.5 65.000 42.0 V 82.2 -40.2 Peak 72 1.0 38.330 42.0 V 82.2 -40.2 Peak 268 1.0 Based on the measurements at the 5MHz BW and 25MHz BW for FCC Part 90, 30-1000 MHz was not performed for the state of t	MHz dBμV/m v/h Limit Margin Pk/QP/Avg degrees meters 85.830 75.7 H N/A N/A Peak 314 1.0 Fundamental 59.170 44.7 V 82.2 -37.5 Peak 87 1.5 65.000 42.0 V 82.2 -40.2 Peak 72 1.0 38.330 42.0 V 82.2 -40.2 Peak 268 1.0 Based on the measurements at the 5MHz BW and 25MHz BW for FCC Part 90, 30-1000 MHz was not performed for the state of t	tandard:	FCC 15B, 90	Z, RSS 197						Class:	N/A
MHz dBμV/m v/h Limit Margin Pk/QP/Avg degrees meters 85.830 75.7 H N/A N/A Peak 314 1.0 Fundamental 59.170 44.7 V 82.2 -37.5 Peak 87 1.5 65.000 42.0 V 82.2 -40.2 Peak 72 1.0 38.330 42.0 V 82.2 -40.2 Peak 268 1.0 Based on the measurements at the 5MHz BW and 25MHz BW for FCC Part 90, 30-1000 MHz was not performed for the state of t	MHz dBμV/m v/h Limit Margin Pk/QP/Avg degrees meters 85.830 75.7 H N/A N/A Peak 314 1.0 Fundamental 59.170 44.7 V 82.2 -37.5 Peak 87 1.5 65.000 42.0 V 82.2 -40.2 Peak 72 1.0 38.330 42.0 V 82.2 -40.2 Peak 268 1.0 Based on the measurements at the 5MHz BW and 25MHz BW for FCC Part 90, 30-1000 MHz was not performed for the state of t	allopoit	Lovel	Dal	15 200	/ 15 2/7	Detector	Λ zimuth	Holabt	Comments	
85.830 75.7 H N/A N/A Peak 314 1.0 Fundamental 659.170 44.7 V 82.2 -37.5 Peak 87 1.5 65.000 42.0 V 82.2 -40.2 Peak 72 1.0 38.330 42.0 V 82.2 -40.2 Peak 268 1.0 Based on the measurements at the 5MHz BW and 25MHz BW for FCC Part 90, 30-1000 MHz was not performed for the performance for th	685.830 75.7 H N/A N/A Peak 314 1.0 Fundamental 659.170 44.7 V 82.2 -37.5 Peak 87 1.5 65.000 42.0 V 82.2 -40.2 Peak 72 1.0 38.330 42.0 V 82.2 -40.2 Peak 268 1.0 Based on the measurements at the 5MHz BW and 25MHz BW for FCC Part 90, 30-1000 MHz was not performed for the performance for the performed for the performance for the per						_			Comments	
59.170 44.7 V 82.2 -37.5 Peak 87 1.5 65.000 42.0 V 82.2 -40.2 Peak 72 1.0 38.330 42.0 V 82.2 -40.2 Peak 268 1.0 Based on the measurements at the 5MHz BW and 25MHz BW for FCC Part 90, 30-1000 MHz was not performed for the second of the seco	59.170 44.7 V 82.2 -37.5 Peak 87 1.5 65.000 42.0 V 82.2 -40.2 Peak 72 1.0 38.330 42.0 V 82.2 -40.2 Peak 268 1.0 Based on the measurements at the 5MHz BW and 25MHz BW for FCC Part 90, 30-1000 MHz was not performed for the second of the seco									Fundament	<u> </u>
38.330 42.0 V 82.2 -40.2 Peak 268 1.0 Based on the measurements at the 5MHz BW and 25MHz BW for FCC Part 90, 30-1000 MHz was not performed for the second s	38.330 42.0 V 82.2 -40.2 Peak 268 1.0 Based on the measurements at the 5MHz BW and 25MHz BW for FCC Part 90, 30-1000 MHz was not performed for the second s						+				
Based on the measurements at the 5MHz BW and 25MHz BW for FCC Part 90, 30-1000 MHz was not performed for the	Based on the measurements at the 5MHz BW and 25MHz BW for FCC Part 90, 30-1000 MHz was not performed for the	65.000	42.0	V	82.2	-40.2	Peak	72	1.0		
Based on the measurements at the 5MHz BW and 25MHz BW for FCC Part 90, 30-1000 MHz was not performed for the channel since changing BW and channel did not make any difference for radiated emissions.	O(O(1))	38.330	42.0	V	82.2	-40.2	Peak	268	1.0		
				<u> </u>						30113.	
										30113.	
										30113.	

Olicita	Ubiquiti Net	works						Job Number:	J82270	
Model:	PowerBridge	M365					T-	Log Number:	T82342	
Model.	r ower bridge	5 IVI303					Accou	unt Manager:	Susan Pelzl	
	Jennifer Sar									
Standard:	FCC 15B, 90	DZ, RSS 197						Class:	N/A	
Run #2: Ra	idiated Spur	ious Emissi	ons, Transn	nit Mode: S	ubstitution M	leasuremen	ts			
Frequency	Level	Pol	15.209	/ 15.247	Detector	Azimuth	Height	Comments		BW
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters			MHz
<i>1559.170</i>	44.7	V	82.2	-37.5	Peak	90	1.5			20
/ertical										
Frequency	Substit	ution measur	ements	Site	EU ⁻	T measureme	ents	eirp Limit	erp Limit	Margii
MHZ	Pin ¹	Gain ²	FS^3	Factor ⁴	FS ⁵	eirp (dBm)	erp (dBm)	dBm	dBm	dB
All signals	s were more					1 \ /	1 \ /			
	In									
Vote 1:			Bm) to the su				J-ID:			
Vote 2: Vote 3:					. A dipole has the substitution		20BI.			
Vote 3:					a field strengt		to an eirn in	dRm		
Vote 5:			asured durin		a noia strongt	IIIII abaviiii	to arr cirp irr	dDill.		
Vote 6:					lated field stre	ength limit, si	ubstitution m	easurements	were not do	ne.

E E	Elliott An MAS company	EMC T	est Data
Client:	Ubiquiti Networks	Job Number: J8227	70
Model	PowerBridge M365	T-Log Number: T8234	42
woder.		Account Manager: Susar	n Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15B, 90Z, RSS 197	Class: N/A	

RSS-197 and FCC 90Z - Antenna Port Measurements Power, PSD, Bandwidth and Spurious Emissions

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: 3/5/2011 Config. Used: 1 Test Engineer: Rafael Varelas Config Change: None Test Location: FT Lab #4 EUT Voltage: POE

Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
				5 MHz: 35.6dBm
2	Power	Part 90	Doce	10 MHz: 38.6dBm
2	Power	Pail 90	Pass	20 MHz: 41.6dBm
				25 MHz: 42.4dBm
				5 MHz: 29.8dBm/MHz
2	PSD	1 Watt/MHz 90.1321(a)	Pass	10 MHz: 29.8dBm/MHz
2				20 MHz: 29.9dBm/MHz
				25 MHz: 29.8dBm/MHz
			N/A	5 MHz: 4.2 MHz
2	99% Bandwidth			10 MHz: 8.5 MHz
۷	77/0 Dariuwiuiii	-	IN/A	20 MHz: 16.8 MHz
				25 MHz: 20.9 MHz
3	Antenna Conducted	-13dBm/MHz	Pass	All emissions below the
3	Out of Band Spurious	- I JUDITI/IVII IZ	F 455	-13dBm/MHz limit

General Test Configuration

When measuring the conducted emissions from the EUT's antenna port, the antenna port of the EUT was connected to the spectrum analyzer or power meter via a suitable attenuator to prevent overloading the measurement system. All measurements are corrected to allow for the external attenuators and cables used.

Ambient Conditions: Temperature: 21.3 °C 37 % Rel. Humidity:

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	Ubiquiti Net	works						Job Number:	J82270	
Madal	Danna Balala	- M2/F					T-I	Log Number:	T82342	
Model	PowerBridg	e ivi3oo					Accou	unt Manager:	Susan Pelzl	
Contact	Jennifer Sai	nchez								
Standard	FCC 15B, 9	0Z, RSS 197						Class:	N/A	
Run #1: Ou Power	·	and Power Sp								
Frequency	Software	Modulation	Measure	ed Output Po	wer ² dBm	To	otal	Limit (dBm)	Max Power	Pass or F
(MHz)	Setting ¹	Woddiation	Chain 1	Chain 2	Chain 3	mW	dBm	Limit (abin)	(W)	1 033 01 1
5 MHz Mod	le									
3662	20	Data Rate 0	15.3	-5.5		34.2	15.3	-		-
3662	20	Data Rate 5	15.2	-5.6		33.4	15.2	-	-	-
3662	20	Data Rate10	14.7	-5.8		29.8	14.7	-		-
SD requency	99%4	Madalaka	PSD ³ dBm/MHz Tota		PSD	PSD Lim		D		
(MHz)	BW	Modulation	Chain 1	Chain 2	Chain 3	mW/MHz	dBm/MHz			Pass or F
MHz Mod	le	l l				I			I.	
3662	-	Data Rate 0	8.2	4.1		9.2	9.6	-	-	-
3662	-	Data Rate 5	7.8	4.0		8.5	9.3	-	-	-
3662	-	Data Rate10	7.5	3.9		8.1	9.1	-	-	-
Note 1:	Power setting is the software setting used to set the output power. Output power measured using RBW=100kHz VBW=300kHz, detector = rms, sweep time 10 seconds, max hold. The total power was integrated over the span (span > 2x channel bandwidth). Transmitted signal was not continuous but the analyze									
	was configured with a gated sweep such that the analyzer was only sweeping when the device was transmitting. The plot fo the channel with the highest power is provided below. The psd was measured using the following analyzer settings: RB=1MHz, VB=3MHz, detector = rms, sweep time 10									
Noto 2	seconds, max hold. Multiple sweeps were made until the display had no new "peaks". The plot for the channel with the highest power is provided below.									
	99% Bandwidth measured in accordance with RSS GEN - RB > 1% of span and VB >=3xRB For MIMO systems the total output power and total PSD are calculated form the sum of the powers of the individual chains									
						audated tarm	the cum of	+ to 0 0 1 1 0 FO 0	t the individu	IOI Chaine

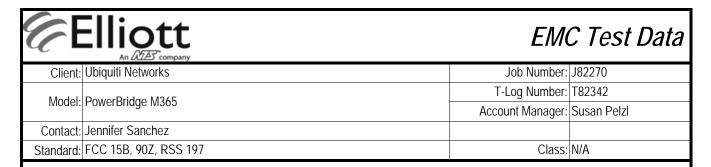
	Eliott An ATAS company	EMO	C Test Data
Client:	Ubiquiti Networks	Job Number:	J82270
Model	PowerBridge M365	T-Log Number:	T82342
woden.		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15B, 90Z, RSS 197	Class:	N/A

Run #2: Bandwidth, Output Power and Power Spectral Density - MIMO Systems

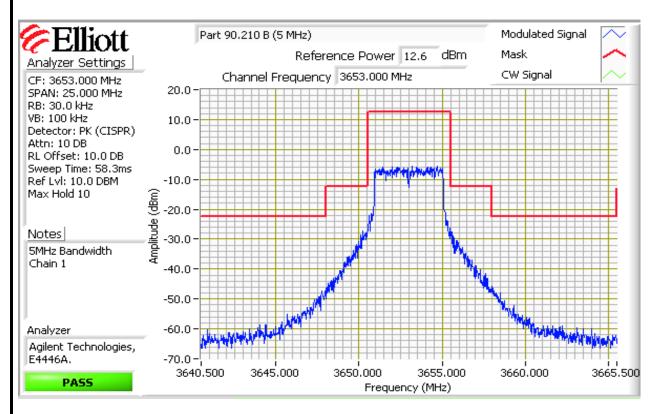
Limits from 90.321(a): Base and fixed stations are limited to 25 watts/25 MHz equivalent isotropically radiated power (EIRP). In any event, the peak EIRP power density shall not exceed 1 Watt in any one-megahertz slice of spectrum (30dBm/MHz).

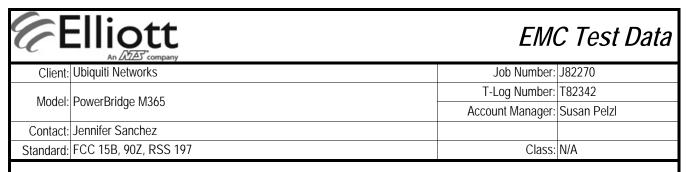
			Chain 1	Chain 2	Chain 3	Coherent	Effective ⁵	EIRP (mW)	EIRP (dBm)	
	Antenr	na Gain (dBi):	20	20		Yes	23.0	17576.5	42.4	
Power - Lim	nit accounts	for maximun	n antenna g	ain at this p	ower setting] .				
Frequency	Software	Modulation	Measure	d Output Po	wer² dBm	To	otal	EIRP	Limit (eirp)	Pass or Fail
(MHz)	Setting ¹	iviouulation	Chain 1	Chain 2	Chain 3	mW	dBm	dBm	dBm	rass of rail
5 MHz Mod	e									
3653	10,17	Data Rate 0	9.2	10.0		18.3	12.6	35.6	44.0	PASS
3662	11,16	Data Rate 0	9.8	9.4		18.3	12.6	35.6	44.0	PASS
3672	11,16	Data Rate 0	9.6	9.6		18.2	12.6	35.6	44.0	PASS
10 MHz Mod	10 MHz Mode									
3655	15,23	Data Rate 0	12.2	12.5		34.4	15.4	38.4	44.0	PASS
3662	15,23	Data Rate 0	12.6	12.5		36.0	15.6	38.6	44.0	PASS
3670	16,22	Data Rate 0	12.6	12.1		34.4	15.4	38.4	44.0	PASS
20 MHz Mod	de									
3660	23,29	Data Rate 0	15.4	15.8		72.7	18.6	41.6	44.0	PASS
3662	22,28	Data Rate 0	15.1	15.2		65.5	18.2	41.2	44.0	PASS
3665	22,29	Data Rate 0	15.0	15.7		68.8	18.4	41.4	44.0	PASS
25 MHz Mod	de									
3662	24,31	Data Rate 0	15.9	16.9		87.9	19.4	42.4	44.0	PASS

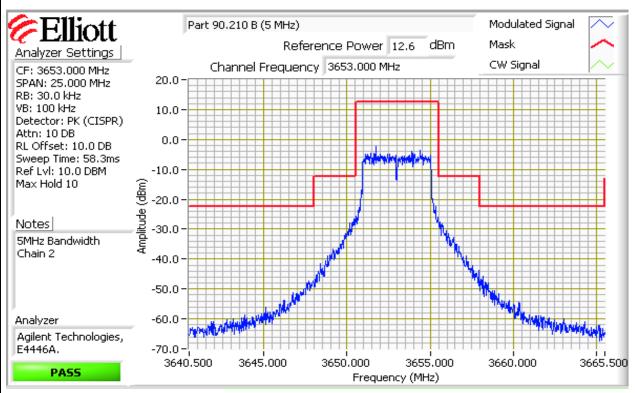
Client:	Ubiquiti Ne	etworks						Job Number:	J82270	
Madal	DoworDrid	ao M24E					T-	Log Number:	T82342	
wodei:	PowerBrid	ge ivi365					Accou	unt Manager:	Susan Pelz	
	Jennifer Sa									
Standard:	FCC 15B,	90Z, RSS 197						Class	: N/A	
PSD										
Frequency	99% ⁴		P	SD ² dBm/MI	————— Нz	Tota	al PSD	PSD EIRP	Limit (eirp)	
(MHz)	BW	Modulation	Chain 1	Chain 2	Chain 3	mW/MHz	dBm/MHz		dBm/MHz	Pass or Fa
5 MHz Mod	e				I		<u> </u>		l.	
3653	4.2	Data Rate 0	3.3	4.0		4.6	6.7	29.7	30.0	PASS
3662	4.2	Data Rate 0	3.9	3.7		4.8	6.8	29.8	30.0	PASS
3672	4.2	Data Rate 0	3.8	3.5		4.6	6.7	29.7	30.0	PASS
10 MHz Mo										
3655	8.5	Data Rate 0	3.7	3.8		4.7	6.8	29.8	30.0	PASS
3662	8.5	Data Rate 0	4.0	3.7		4.8	6.8	29.8	30.0	PASS
3670	8.5	Data Rate 0	3.9	3.6		4.7	6.8	29.8	30.0	PASS
20 MHz Mo	<i>ae</i> 16.8	Data Rate 0	3.8	4.0		4.0	6.9	29.9	30.0	DACC
3660 3662	16.8	Data Rate 0	3.8	3.7		4.9 4.7	6.7	29.9	30.0	PASS PASS
3665	16.8	Data Rate 0	3.5	4.0		4.7	6.8	29.8	30.0	PASS
25 MHz Mo		Data Nate 0	0.0	7.0		4.0	0.0	27.0	30.0	17133
3662	20.9	Data Rate 0	3.5	4.1		4.8	6.8	29.8	30.0	PASS
Note 1:		ing is the softwa								
Note 2:	Output power measured using RBW=100kHz VBW=300kHz, detector = rms, sweep time 10 seconds, max hold. The total									
	The psd was measured using the following analyzer settings: RB=1MHz, VB=3MHz, detector = rms, sweep time 10 seconds, max hold. Multiple sweeps were made until the display had no new "peaks". The plot for the channel with the highest power is provided below.									
Note 4:										
Note 5:	99% Bandwidth measured in accordance with RSS GEN - RB > 1% of span and VB >=3xRB For MIMO systems the total output power and total PSD are calculated form the sum of the powers of the individual chains (in linear terms). The antenna gain used to determine the EIRP and limits for PSD/Output power depends on the operating mode of the MIMO device. If the signals on the non-coherent between the transmit chains then the gain used to determine the limits is the highest gain of the individual chains and the EIRP is the sum of the products of gain and power on each chain. If the signals are coherent then the effective antenna gain is the sum (in linear terms) of the gains for each chain and the EIRP is the product of the effective gain and total power.									

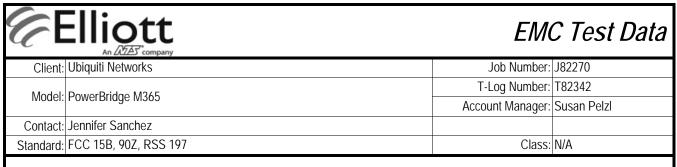


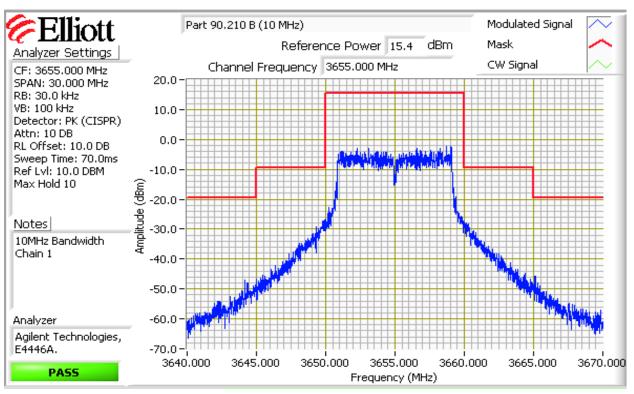
Run #3: Unwanted emissions (Mask), MCS 0 at power setting used for Power measurements

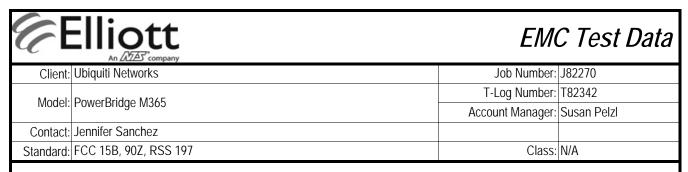


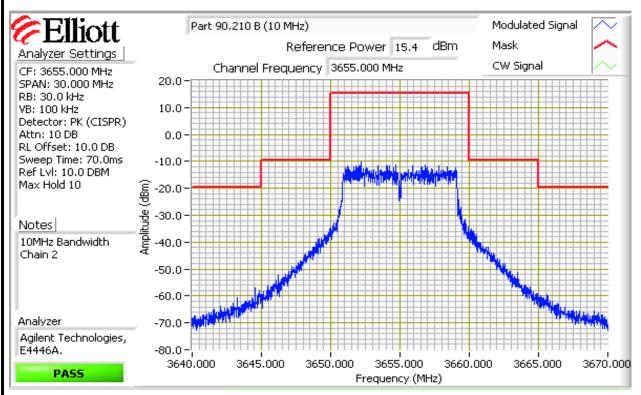


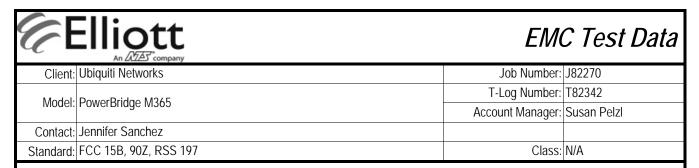


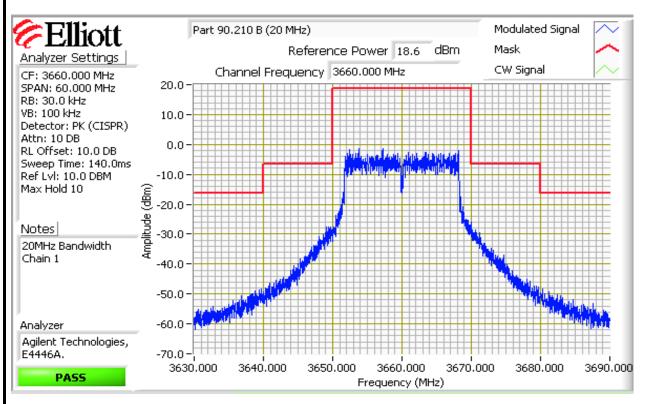


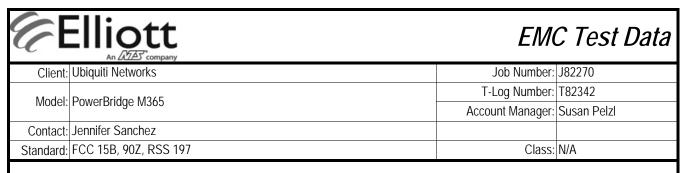


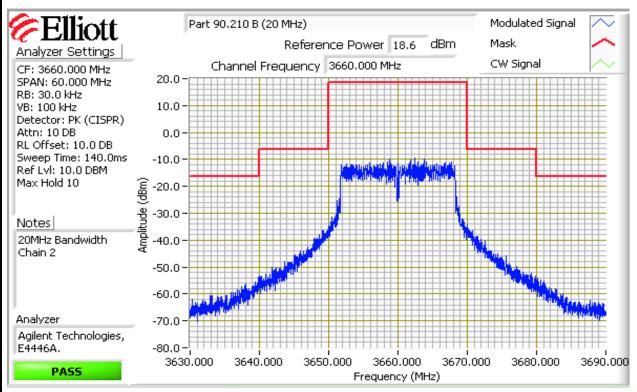


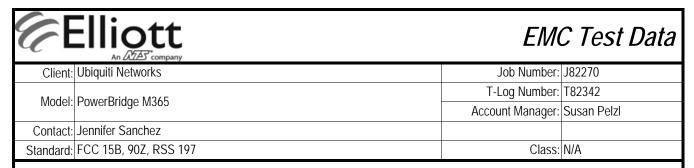


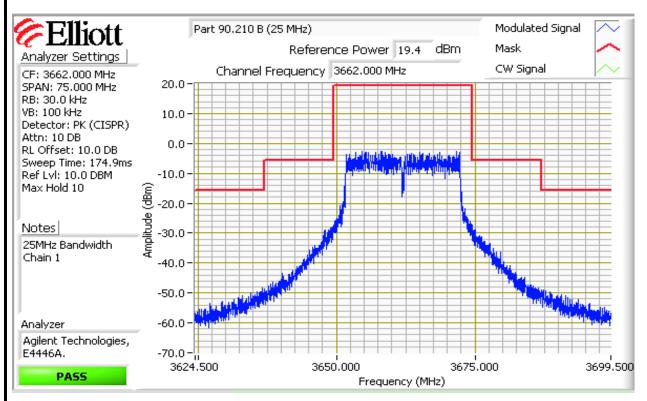


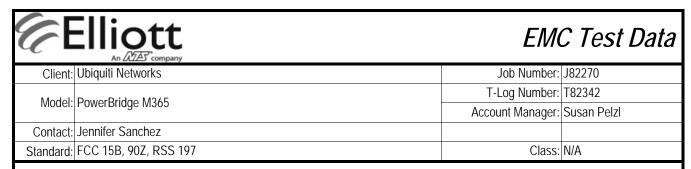


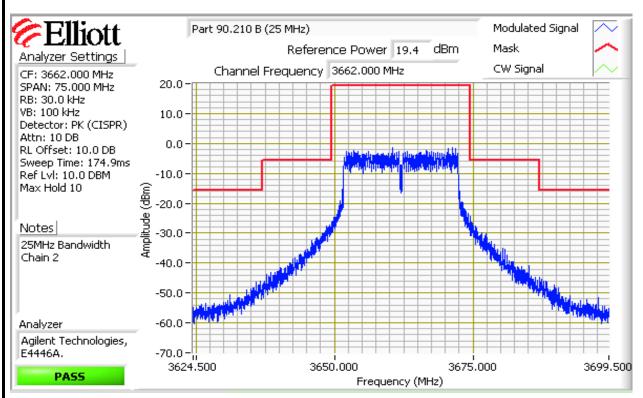


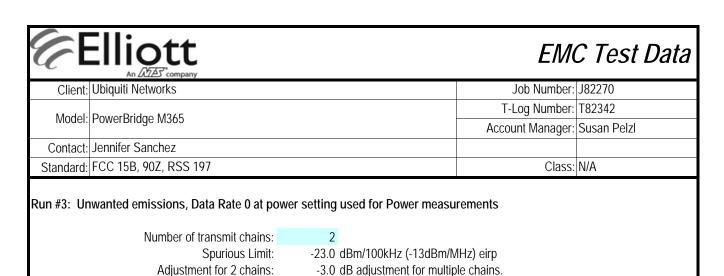










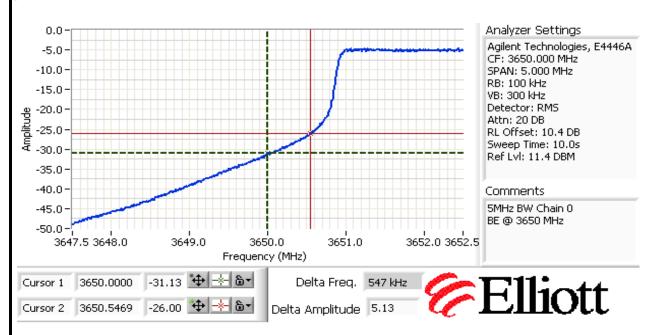


Limit Used On Plots -26.0 dBm/100 kHz

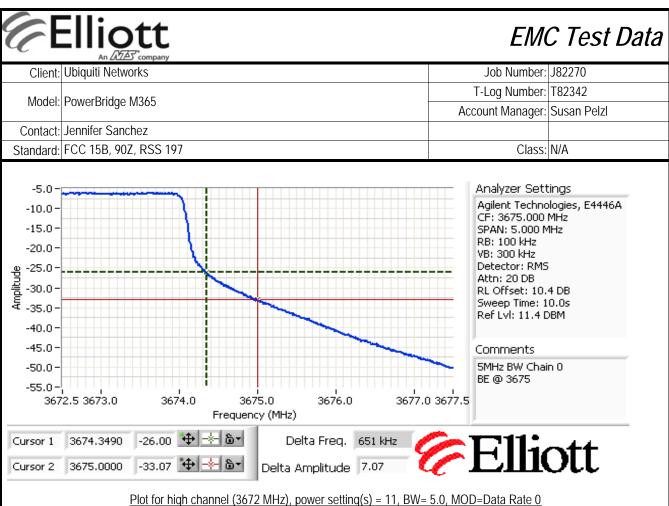
MIMO Devices: The plots were obtained for the chain with the highest PSD and the limit was adjusted to account for all chains transmitting simultaneously

Band edge Measurements

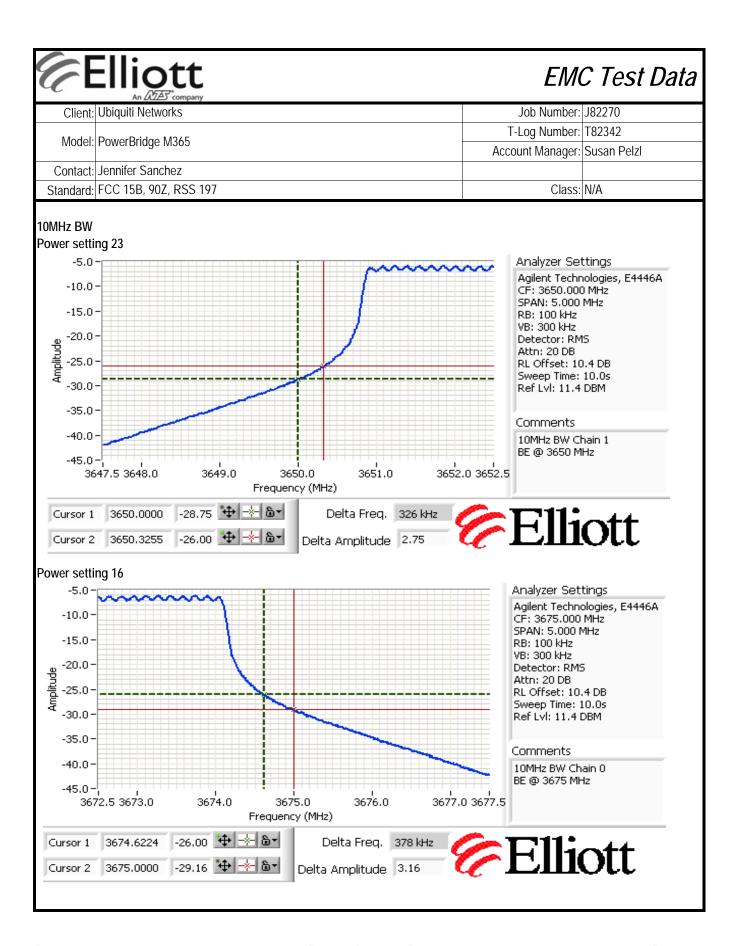
5MHz BW

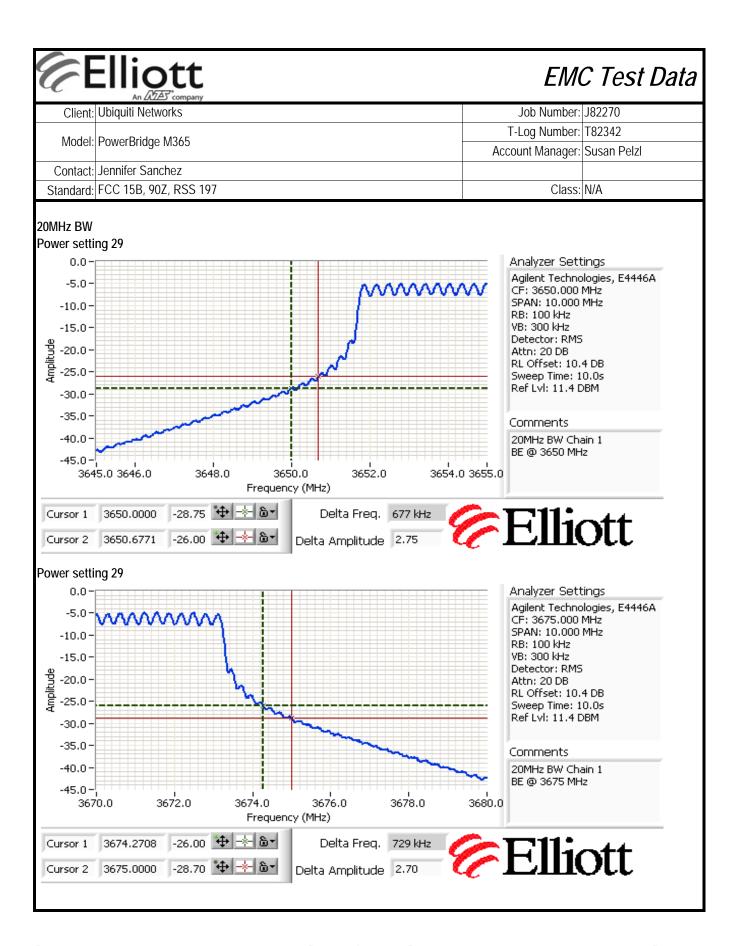


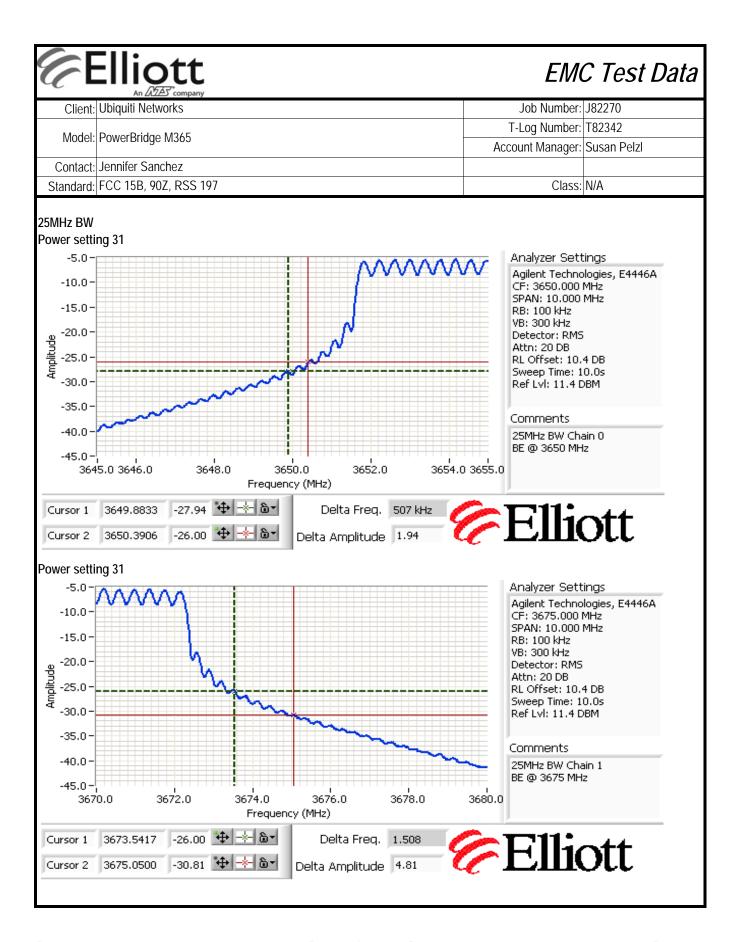
Plot for low channel (3653 MHz), power setting(s) = 17, BW= 5.0, MOD=Data Rate 0 -31.3dBm in 100 kHz (corrected by 10*log(100kHz/1MHz)) yeilds -21.3dBm in 1 MHz



Plot for high channel (3672 MHz), power setting(s) = 11, BW= 5.0, MOD=Data Rate 0 -33.1dBm in 100 kHz (corrected by 10*log(100kHz/1MHz)) yeilds -23.1dBm in 1 MHz







E	liott An MA company
Cliant, Libia	uiti Notworks

EMC Test Data

	All 2023 Company		
Client:	Ubiquiti Networks	Job Number:	J82270
Model:	PowerBridge M365	T-Log Number:	T82342
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15B, 90Z, RSS 197	Class:	N/A

Run #3: Unwanted emissions, Data Rate 0 at power setting used for Power measurements

Date of Test: 3/8/2011 Config. Used: 1
Test Engineer: Joseph Cadigal Config Change: none
Test Location: FT Chamber#7 EUT Voltage: POE

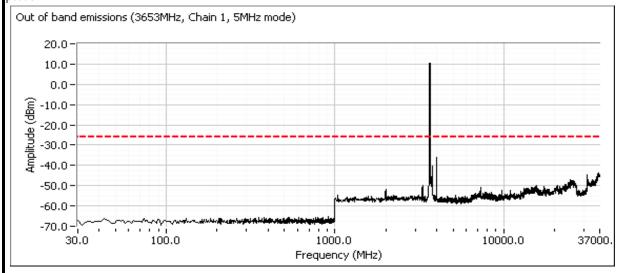
Number of transmit chains: 2

Spurious Limit: -13.0 dBm/MHz eirp = -23dBm/100kHz Adjustment for 2 chains: -3.0 dB adjustment for multiple chains.

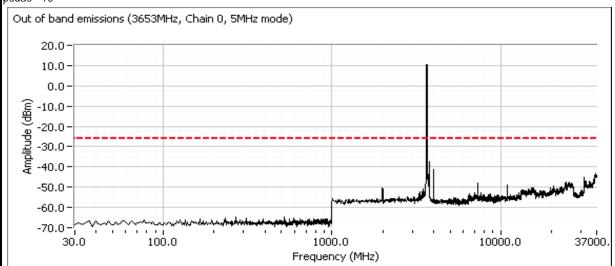
Limit Used On Plots -26.0 dBm/100 kHz

MIMO Devices: The plots were obtained for each chain individually and the limit was adjusted to account for all chains transmitting simultaneously, RBW=VBW=1MHz above 1 GHz and 100 kHz below 1 GHz.

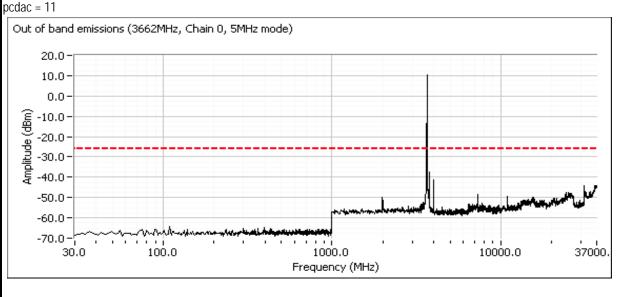
Low channel



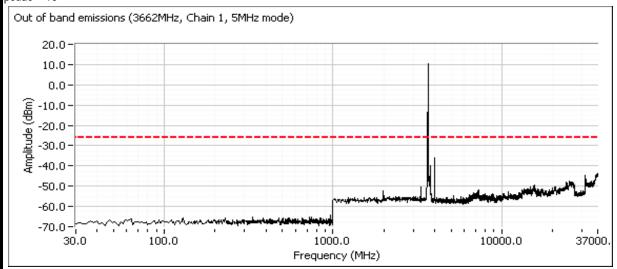
	liott An 必必。company	EMO	C Test Data
	Ubiquiti Networks	Job Number:	J82270
Madali	l: PowerBridge M365	T-Log Number:	T82342
wouei.		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15B, 90Z, RSS 197	Class:	N/A



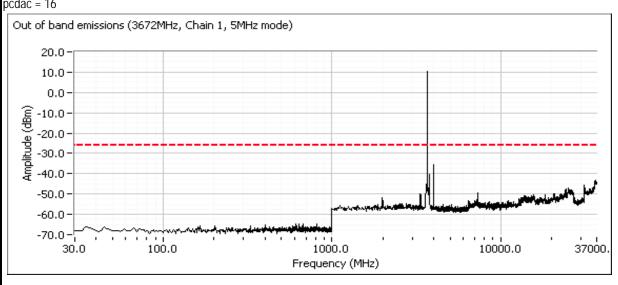
Center channel



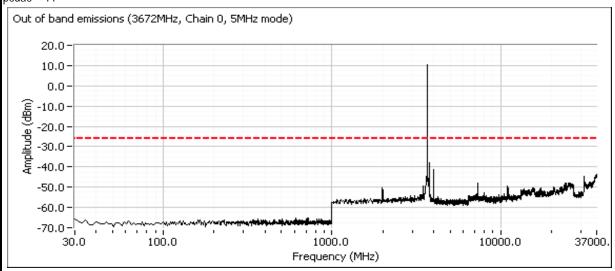
E E	liott An 必否"company	EMO	C Test Data
	Ubiquiti Networks	Job Number:	J82270
Model	PowerBridge M365	T-Log Number:	T82342
wouei.		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15B, 90Z, RSS 197	Class:	N/A



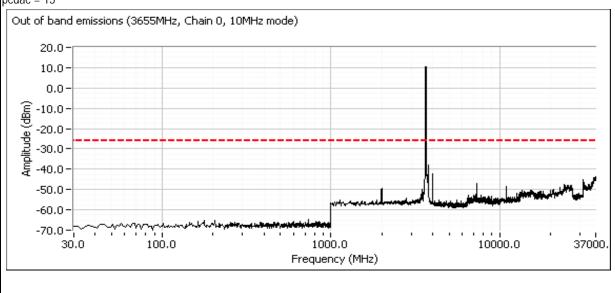
High channel



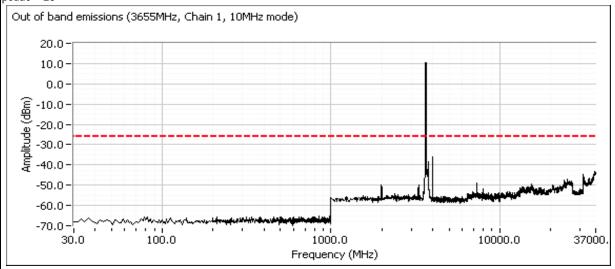
	lliott An 心态 company	EMO	C Test Data
	Ubiquiti Networks	Job Number:	J82270
Model	PowerBridge M365	T-Log Number:	T82342
Model.		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15B, 90Z, RSS 197	Class:	N/A



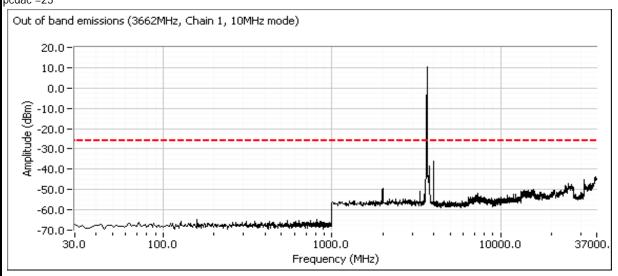
10 MHz Mode Low channel



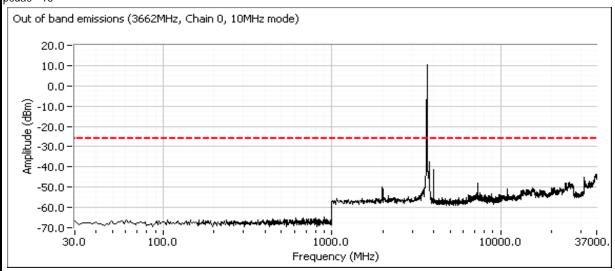
Elliott An Wild Company	EMC Test Data
Client: Ubiquiti Networks	Job Number: J82270
Model: DowerPridge M24F	T-Log Number: T82342
Model: PowerBridge M365	Account Manager: Susan Pelzl
Contact: Jennifer Sanchez	
Standard: FCC 15B, 90Z, RSS 197	Class: N/A



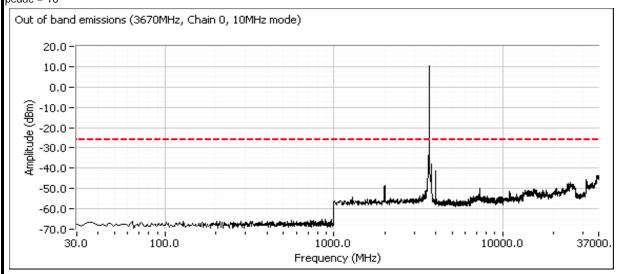
Center channel



Elliott An WIE Company	EMC Test Date
Client: Ubiquiti Networks	Job Number: J82270
Model: PowerBridge M365	T-Log Number: T82342
Wodel. Power Bridge Wisos	Account Manager: Susan Pelzl
Contact: Jennifer Sanchez	
Standard: FCC 15B, 90Z, RSS 197	Class: N/A
Standard: FCC 13B, 90Z, RSS 197	Class: N/A

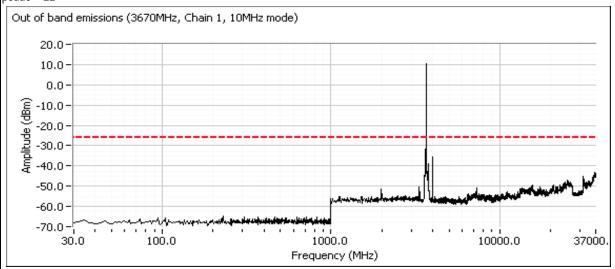


High channel

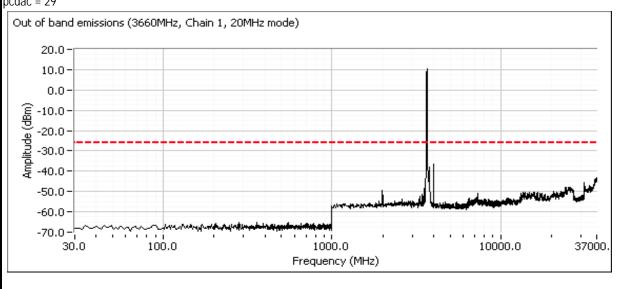


EMC Test Data Client: Ubiquiti Networks Job Number: J82270 T-Log Number: T82342 Model: PowerBridge M365 Account Manager: Susan Pelzl Contact: Jennifer Sanchez Standard: FCC 15B, 90Z, RSS 197 Class: N/A

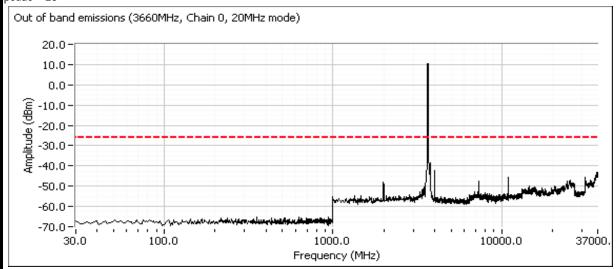
pcdac = 22



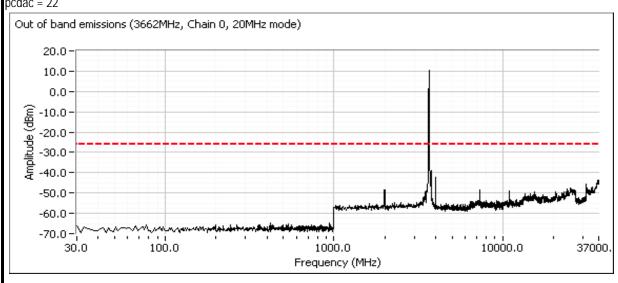
20 MHz Mode Low channel



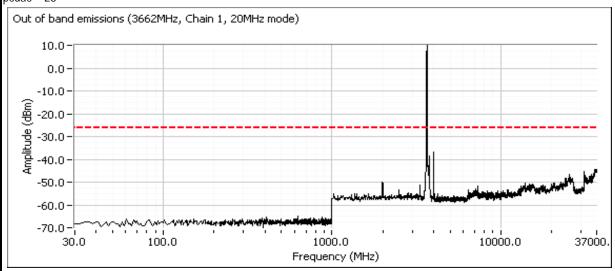
	liott An 必必。company	EMO	C Test Data
	Ubiquiti Networks	Job Number:	J82270
Madalı	DoworPridgo M245	T-Log Number:	T82342
woden.	PowerBridge M365	Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15B, 90Z, RSS 197	Class:	N/A



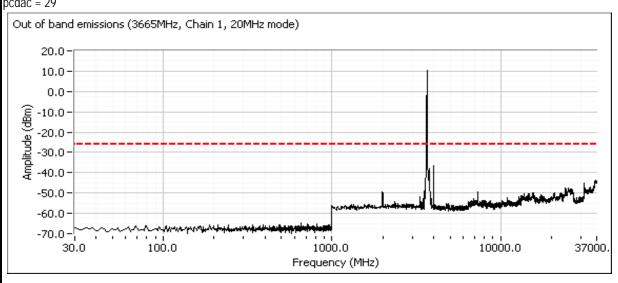
Center channel



	Eliott An (VZAS company	EMO	C Test Data
	Ubiquiti Networks	Job Number:	J82270
Madali	Dowar Dridgo M245	T-Log Number:	T82342
wouei.	PowerBridge M365	Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15B, 90Z, RSS 197	Class:	N/A

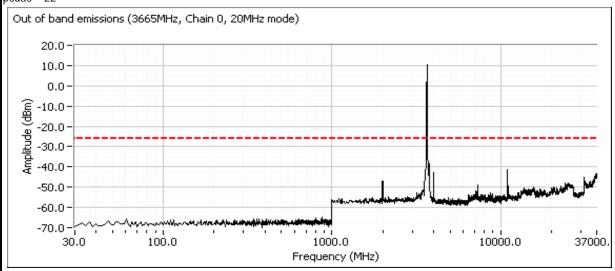


High channel

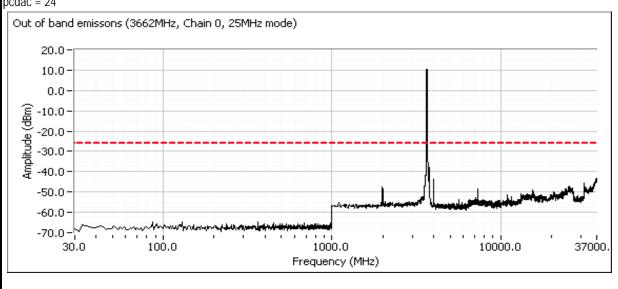


EMC Test DataClient:Ubiquiti NetworksJob Number:J82270Model:PowerBridge M365T-Log Number:T82342Contact:Jennifer SanchezAccount Manager:Susan PelzlStandard:FCC 15B, 90Z, RSS 197Class:N/A

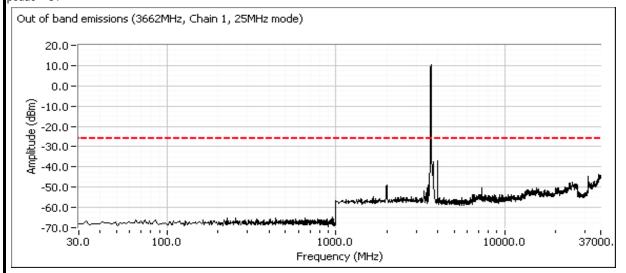
pcdac = 22



25 MHz Mode



	Elliott An DZES company	EMC Test Data
Client:	Ubiquiti Networks	Job Number: J82270
Madalı	Dowar Pridge M24 F	T-Log Number: T82342
woder:	PowerBridge M365	Account Manager: Susan Pelzl
Contact:	Jennifer Sanchez	
Standard:	FCC 15B, 90Z, RSS 197	Class: N/A



	Eliott An ATAS company	EMO	C Test Data
	Ubiquiti Networks	Job Number:	J82270
Model	DoworPridgo M245	T-Log Number:	T82342
wodei.	PowerBridge M365	Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15B, 90Z, RSS 197	Class:	N/A

RSS-197 - Antenna Port Measurements Power, PSD, Bandwidth and Spurious Emissions

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.

Config. Used: 1 Date of Test: 3/11/2011 Config Change: none Test Engineer: Rafael Varelas Test Location: FT Lab #4 EUT Voltage: POE

Summary of Results

j	**			
Run #	Test Performed	Limit	Pass / Fail	Result / Margin
				5 MHz: 36.0 dBm
2	Dower	RSS-197	Door	10 MHz: 38.3 dBm
Z	Power	K33-191	Pass	20 MHz: 41.3 dBm
				25 MHz: 43.1 dBm
				5 MHz: 29.8 dBm/MHz
2	PSD	1 Watt/MHz RSS-197	Doos	10 MHz: 29.7 dBm/MHz
Z			Pass	20 MHz: 29.7 dBm/MHz
				25 MHz: 29.8 dBm/MHz
2	Antenna Conducted	DCC 107	Docc	All emissions below the
3	Out of Band Spurious	RSS-197	Pass	-13dBm/MHz limit

General Test Configuration

When measuring the conducted emissions from the EUT's antenna port, the antenna port of the EUT was connected to the spectrum analyzer or power meter via a suitable attenuator to prevent overloading the measurement system. All measurements are corrected to allow for the external attenuators and cables used.

Ambient Conditions: Temperature: 21 °C

> Rel. Humidity: 37 %

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:	Ubiquiti Networks							Job Number:	J82270	
Model:	PowerBridg	n 1/1265					T-	Log Number:	T82342	
							Accou	unt Manager:	Susan Pelzl	
	Jennifer Sa							01	21/0	
Standard:	FCC 15B, 9	0Z, RSS 197						Class:	N/A	
Run #1: Ou Power	tput Power	and Power S _l	pectral Den	sity - MIMO	Systems					
Frequency	Software		Measure	d Output Po	wer ² dBm	To	otal		Max Power	
(MHz)	Setting ¹	Modulation	Chain 1	Chain 2	Chain 3	mW	dBm	Limit (dBm)	(W)	Pass or Fa
5 MHz Mod	ŭ	<u> </u>					-	1	, .	<u> </u>
3662	20	Data Rate 0	15.3	-5.5		34.2	15.3	_		-
3662	20	Data Rate 5	15.2	-5.6		33.4	15.2	-	-	-
3662	20	Data Rate10	14.7	-5.8		29.8	14.7	-		-
PSD										
Frequency	99% ⁴	99% ⁴ PSD ³ dBm/MHz		Tota	I PSD	Li	Limit			
(MHz)	BW	Modulation	Chain 1	Chain 2	Chain 3	mW/MHz	dBm/MHz			Pass or Fa
5 MHz Mod	le	•		•			•	•		•
3662	-	Data Rate 0	8.2	4.1		9.2	9.6	-	-	-
3662	-	Data Rate 5	7.8	4.0		8.5	9.3	-	-	-
3662	-	Data Rate10	7.5	3.9		8.1	9.1	-	-	-
Note 1:	Power setti	ng is the softw	are setting i	used to set th	ne output pov	ver.				
Note 2:	Output pow power was was configu the channel	er measured uintegrated ove Ired with a gat with the highe	using RBW= r the span (ed sweep su est power is	100kHz VBV span > 2x ch uch that the a provided bel	V=300kHz , c annel bandw analyzer was ow.	letector = rm idth). Trans only sweepi	mitted signal ng when the	was not con device was t	tinuous but tl ransmitting. ⁻	ne analyzer The plot for
Note 3:		s measured us Multiple sweep below.								
Note 4:		vidth measured								
Note 5:	For MIMO s linear terms	systems the to s).	tal output po	ower and tota	al PSD are ca	lculated forn	n the sum of	the powers o	f the individu	ıal chains (i
Note 6:		bove results, F		٠.			,	ghest PSD ar erformed usir		•

	Eliott An ATA Company	EMO	C Test Data
	Ubiquiti Networks	Job Number:	J82270
Madali	DowerPridge M245	T-Log Number:	T82342
woder.	PowerBridge M365	Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15B, 90Z, RSS 197	Class:	N/A
Dun #2. Dos	adwidth Output Dower and Dower Spectral Doneity, MIMO Syst	ame.	

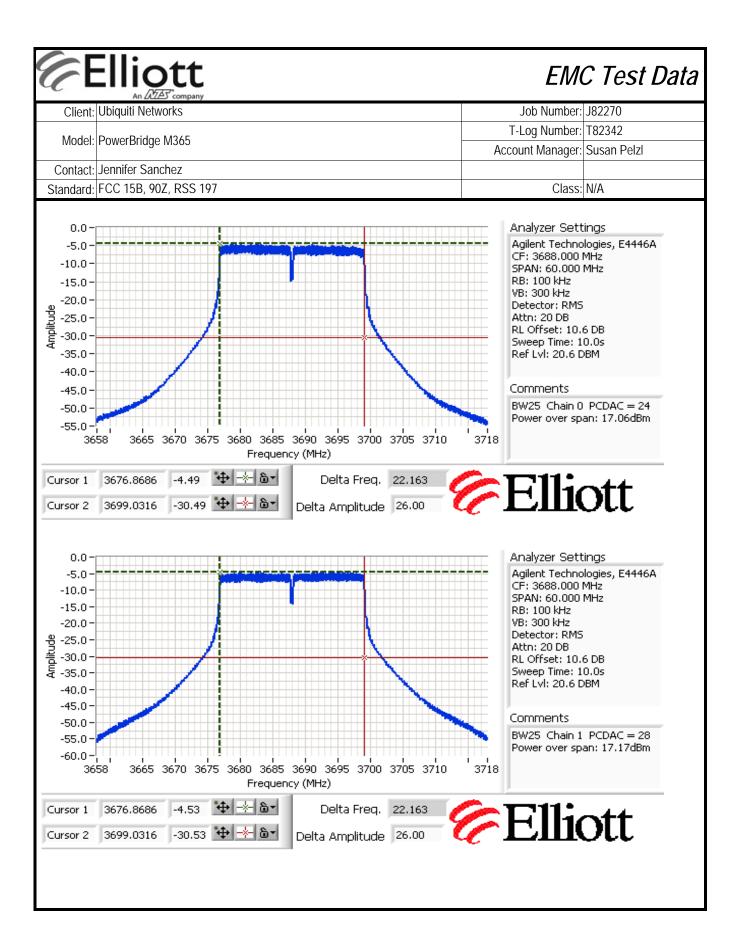
Run #2: Bandwidth, Output Power and Power Spectral Density - MIMO Systems

Limits from 90.321(a): Base and fixed stations are limited to 25 watts/25 MHz equivalent isotropically radiated power (EIRP). In any event, the peak EIRP power density shall not exceed 1 Watt in any one-megahertz slice of spectrum (30dBm/MHz).

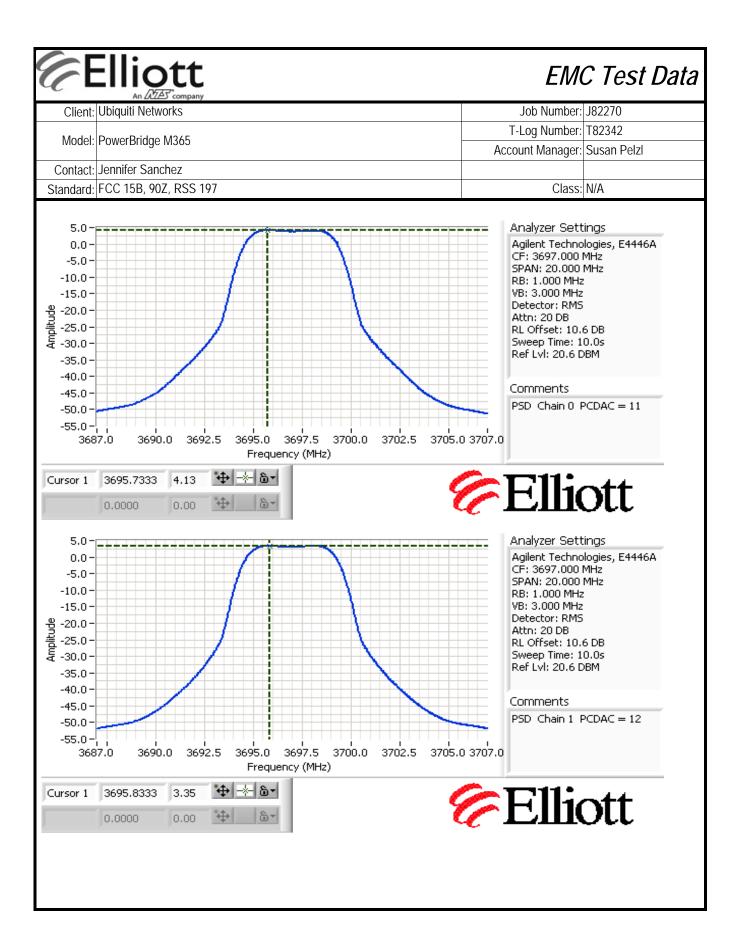
	Chain 1	Chain 2	Chain 3	Coherent	Effective ⁵	EIRP (mW)	EIRP (dBm)
Antenna Gain (dBi):	20	20		Yes	23.0	20587.1	43.1

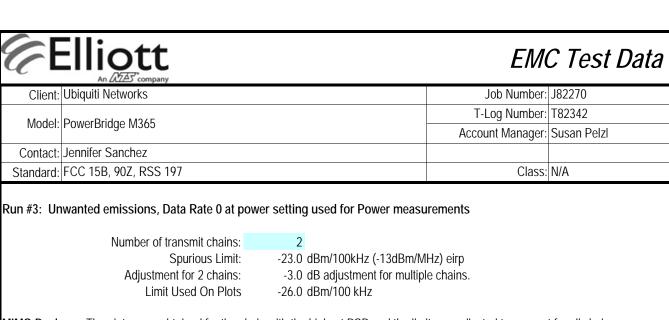
Power - Limit accounts for maximum antenna gain at this power setting.

. 01101 =1111		, 101 111a,	···· a·····a·	jam at time		J.				
Frequency	Software	Modulation	Measure	d Output Po	wer²dBm	To	otal	EIRP	Limit (eirp)	Pass or Fail
(MHz)	Setting ¹	iviouulation	Chain 0	Chain 1	Chain 2	mW	dBm	dBm	dBm	rass of rail
5 MHz Mode	,									
3697	11, 12	Data Rate 0	10.5	9.4		19.9	13.0	36.0	44.0	PASS
10 MHz Mod	de									
3695	14, 19	Data Rate 0	12.3	12.2		33.6	15.3	38.3	44.0	PASS
20 MHz Mod	de .									
3690	21, 25	Data Rate 0	15.2	15.4		68.1	18.3	41.3	44.0	PASS
25 MHz Mod	de									
3688	24, 28	Data Rate 0	17.1	17.2		102.9	20.1	43.1	44.0	PASS



Client:	t: Ubiquiti Networks							Job Number:	J82270	
Model	PowerBridge M365							Log Number:		
							Accou	unt Manager:	Susan Pelz	
	Jennifer Sa									
Standard:	FCC 15B, 9	90Z, RSS 197						Class:	N/A	
PSD										
Frequency	99%4	Modulation	Р	SD ² dBm/Ml	Нz	Total	PSD	PSD EIRP	Limit (eirp)	Pass or Fail
(MHz)	I Modulation I				mW/MHz	dBm/MHz	dBm/MHz	dBm/MHz	Pass of Fa	
MHz Moa		, ,			1		1	ī	1	1
3697	4.2	Data Rate 0	4.1	3.4		4.8	6.8	29.8	30.0	PASS
10 MHz Mo 3695	<i>ae</i> 8.5	Data Rate 0	3.8	3.6		4.7	6.7	29.7	30.0	PASS
20 MHz Mo		Data Nate o	3.0	3.0		7.7	0.1	27.1	30.0	17.00
3690	16.8	Data Rate 0	4.1	3.3		4.7	6.7	29.7	30.0	PASS
25 MHz Mo		T					T	T	T	T
3688	20.9	Data Rate 0	4.0	3.5		4.7	6.8	29.8	30.0	PASS
Note 2:	power was was configu	ver measured unitegrated over ured with a gate with the bight.	er the span (ed sweep si	span > 2x ch	annel bandw analyzer was	vidth). Transı	mitted signal	was not con	tinuous but t	ne analyze
Note 3: Note 4: Note 5:	The psd wa max hold. is provided 99% Bandy For MIMO: linear terms mode of the limits is the	as measured u Multiple sweep below. width measured systems the to s). The antenr e MIMO deviced highest gain of	sing the follows were made in accordatal output point gain used e. If the sign of the individ	owing analyz le until the di nce with RS: ower and tota to determinals are non- ual chains ar	er settings: splay had no S GEN - RB II PSD are ca e the EIRP a coherent betond the EIRP	> 1% of span > 1% of span alculated form nd limits for F ween the tran is the sum of	and VB >=3 the sum of PSD/Output pasmit chains the products	or the channed axRB the powers of then the gain and	f the individuds on the open used to delepower on ea	hest powe al chains (erating ermine the ch chain.
Note 4:	The psd wa max hold. is provided 99% Bandy For MIMO: linear terms mode of the limits is the the signals is the produ	as measured u Multiple sweep below. width measure systems the to s). The antenr e MIMO device	sing the follops were made in accordantal output penagain used e. If the sign of the individing the gain and the effective gain and the sign of the gain and the following the gain and the sign of the gain and the effective gain and the sign of the sign of the gain and the sign of t	owing analyz le until the di nce with RS ower and tota to determine als are non- ual chains ar ctive antenna	er settings: splay had no S GEN - RB all PSD are ca the EIRP a coherent between the EIRP is a gain is the	> 1% of span > 1% of span alculated form nd limits for F ween the tran is the sum of	and VB >=3 the sum of PSD/Output pasmit chains the products	or the channed axRB the powers of then the gain and	f the individuds on the open used to delepower on ea	hest poveral chains erating ermine to chain

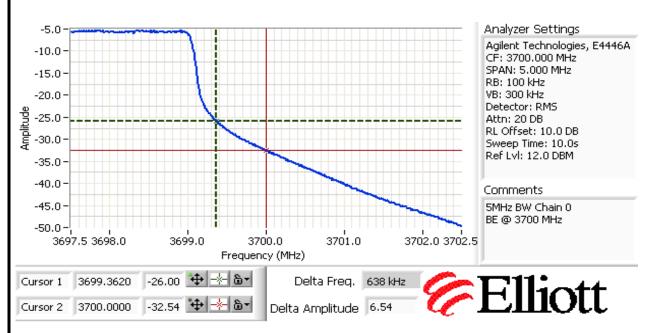




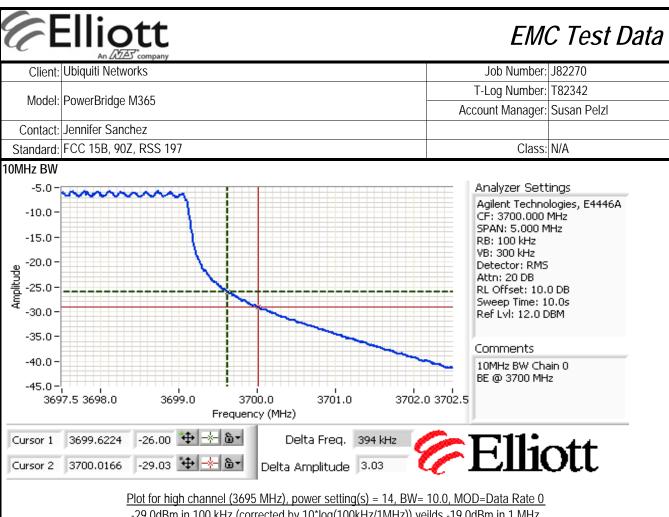
MIMO Devices: The plots were obtained for the chain with the highest PSD and the limit was adjusted to account for all chains transmitting simultaneously

Band edge Measurements

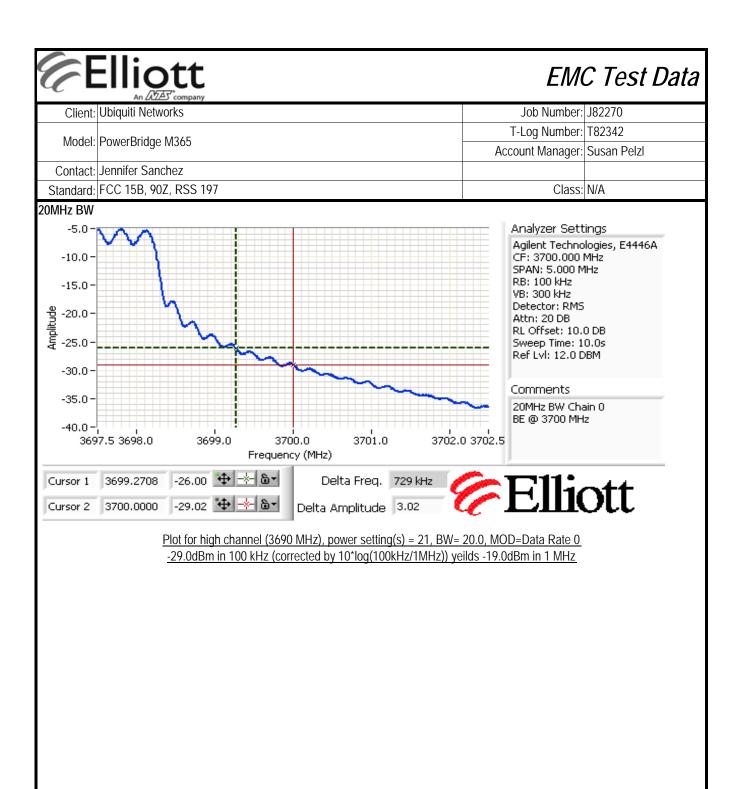
5MHz BW

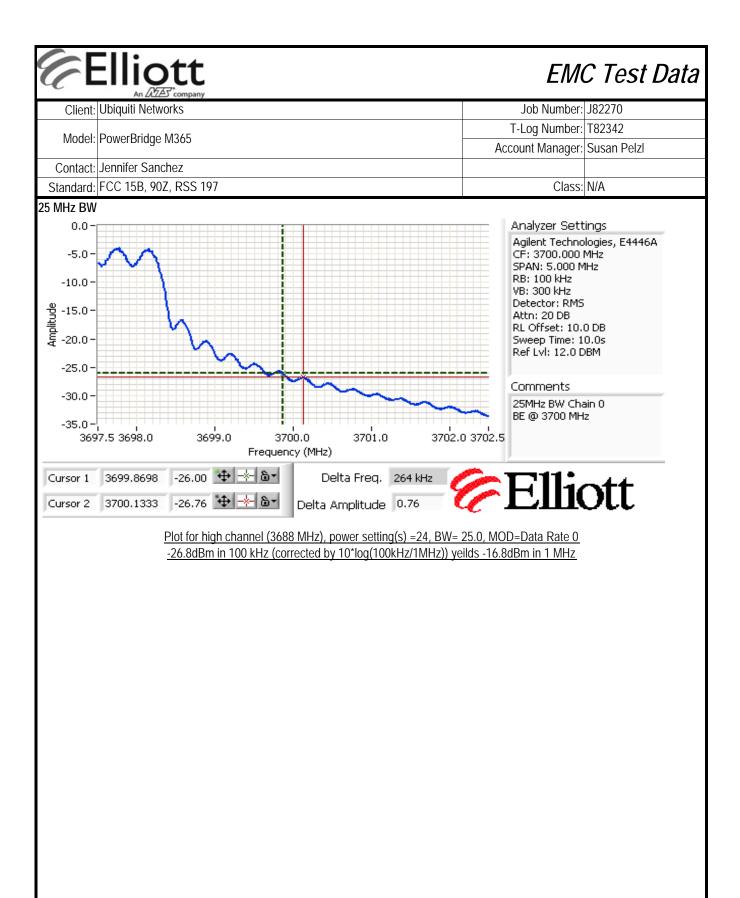


Plot for high channel (3697 MHz), power setting(s) = 11, BW= 5.0, MOD=Data Rate 0 -32.5dBm in 100 kHz (corrected by 10*log(100kHz/1MHz)) yeilds -22.5dBm in 1 MHz



-29.0dBm in 100 kHz (corrected by 10*log(100kHz/1MHz)) yeilds -19.0dBm in 1 MHz





	Elliott An AZES company	EMO	C Test Data
Client:	Ubiquiti Networks	Job Number:	J82270
Madalı	Dougr Pridge M245	T-Log Number:	T82342
Model.	PowerBridge M365	Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15B, 90Z, RSS 197	Class:	N/A

Run #3: Unwanted emissions, Data Rate 0 at power setting used for Power measurements

Number of transmit chains:

Spurious Limit: -13.0 dBm/MHz eirp

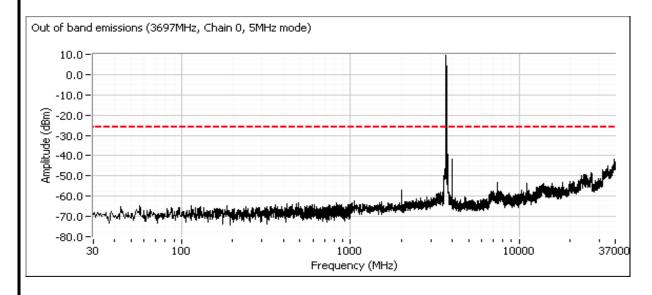
Adjustment for 2 chains: -3.0 dB adjustment for multiple chains.

2

Limit Used On Plots -26.0 dBm/MHz

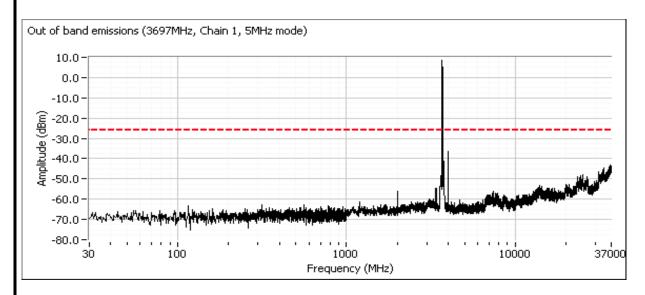
MIMO Devices: The plots were obtained for each chain individually and the limit was adjusted to account for all chains transmitting simultaneously, RBW=VBW=1 MHz for all out of band plots except for band edge plots.

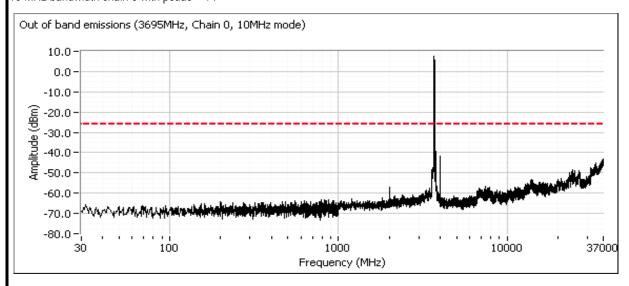
Plots Showing Out-Of-Band Emissions (RBW=VBW=1MHz)



Client: Ubiquiti Networks Model: PowerBridge M365 Contact: Jennifer Sanchez Standard: FCC 15B, 90Z, RSS 197 EMC Test Data Job Number: J82270 T-Log Number: T82342 Account Manager: Susan Pelzl Class: N/A

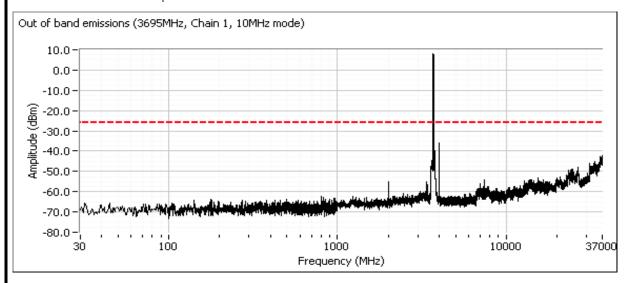
5 MHz bandwidth chain 1 with pcdac = 12

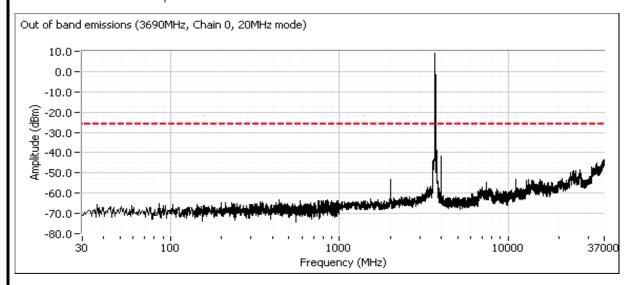




EMC Test DataClient:Ubiquiti NetworksJob Number:J82270Model:PowerBridge M365T-Log Number:T82342Contact:Jennifer SanchezStandard:FCC 15B, 90Z, RSS 197Class:N/A

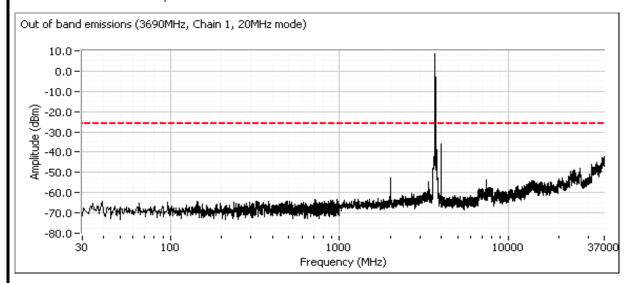
10 MHz bandwidth chain 1 with pcdac = 19

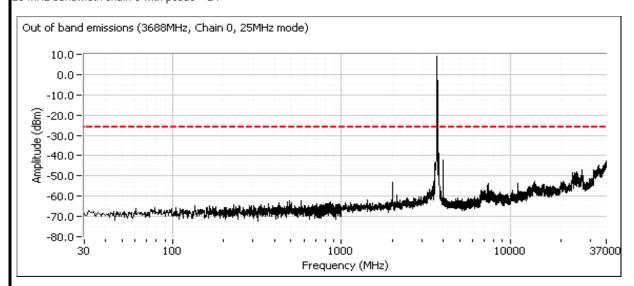




Client: Ubiquiti Networks Model: PowerBridge M365 Contact: Jennifer Sanchez Standard: FCC 15B, 90Z, RSS 197 EMC Test Data Job Number: J82270 T-Log Number: T82342 Account Manager: Susan Pelzl Class: N/A

20 MHz bandwidth chain 1 with pcdac = 25





Client: Ubi Model: Pov Contact: Jer	Diquiti Networks	у						EM	C Test D
Contact: Jer	werBridge M365							Job Number:	J82270
Contact: Jer	wei briuge wisos						-	Γ-Log Number:	T82342
							Acc	ount Manager:	Susan Pelzl
	nnifer Sanchez								
	CC 15B, 90Z, RSS							Class	: N/A
MHz bandwi	idth chain 1 with po	:dac = 28							
Out of band	emissions (3688M	Hz, Chain 1,	25MHz mo	ode)					
20.0-									
20.0									
0.0-									
Ê									
-0.00 Amplitude (dBm)									
ğ									
돌-40.0-						,			
-60.0						للمارا		A PROPERTY OF	HAPPING TO SERVICE
	^_q,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,					No. of Lot,	ALC: NAME OF TAXABLE PARTY.		
-80.0-									
30	0 10	0			oòo ency (MHz)			10000	37000
				rrequ	ancy (Mnz)				

E E	Elliott An MIAS company	Radi	Radio Test Data		
Client:	Ubiquiti Networks	Job Number:	J82270		
Madal	PowerBridge M365	T-Log Number:	T82342		
wodel.		Account Manager:	Susan Pelzl		
Contact:	Jennifer Sanchez				
Standard:	FCC 15B, 90Z, RSS 197	Class	N/A		

RSS 197 and FCC Part 90 **Frequency Stability**

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: 3/18/11 Config. Used: 1 Test Engineer: Mark Hill Config Change: None Test Location: FT Lab#4 EUT Voltage: POE

General Test Configuration

The EUT's RF port was connected to the measurement instrument's RF port, via an attenuator or dc-block if necessary. The EUT was placed inside an environmental chamber.

Ambient Conditions: Temperature: - °C

> Rel. Humidity: - %

Summary of Results

Run #	Test Performed	Limit		Value / Margin
1-2	Frequency and Voltage Stability	Part 90.213	Pass	26080 Hz / 7.12 ppm

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.



Radio Test Data

Client:	Ubiquiti Networks	Job Number:	J82270
Model:	DowerPridge M24F	T-Log Number:	T82342
	PowerBridge M365	Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15B, 90Z, RSS 197	Class:	N/A

Run #1: Temperature Vs. Frequency (Fixed stations in the 3650-3675 MHz band)

Note 1: For all tests: Measurements performed on the un-suppressed carrier in the modulated emissions envelope. Analyzer settings were as follow: RBW=VBW= 1kHz and Span=50kHz.

Note 2: Frequency stability is to be specified in the station authorization.

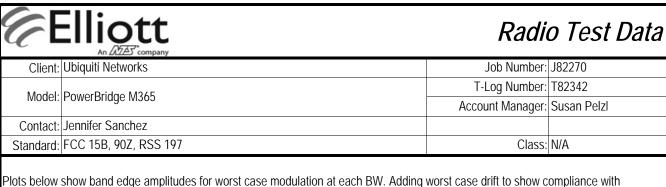
<u>Temperature</u>	Reference Frequency	Measured frequency	<u>Drift</u>	<u>Limit</u>
(Celsius)	(MHz)	(MHz)	(Hz)	(Hz)
-30	3661.99049	3662.01516	24670	Note 2
-20	3661.99049	3662.01657	26080	Note 2
-10	3661.99049	3662.01307	22580	Note 2
0	3661.99049	3662.00623	15740	Note 2
10	3661.99049	3661.99814	7650	Note 2
20	3661.99049	3661.99049	0	Note 2
30	3661.99049	3661.98580	4690	Note 2
40	3661.99049	3661.98505	5440	Note 2
50	3661.99049	3661.99013	360	Note 2

Run #2: Voltage Vs. Frequency

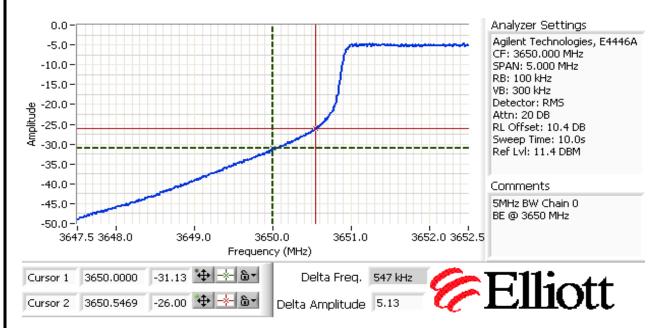
Nominal Voltage is 120Vac.

<u>Voltage</u>	Reference Frequency	Frequency Drift	<u>Drift</u>	<u>Limit</u>
(AC)	(MHz)	(MHz)	(Hz)	(Hz)
85%	3661.99049	3661.99007	420	Note 2
115%	3661.99049	3661.99016	330	Note 2

Worst case drift: 26080 Hz 7.12 ppm



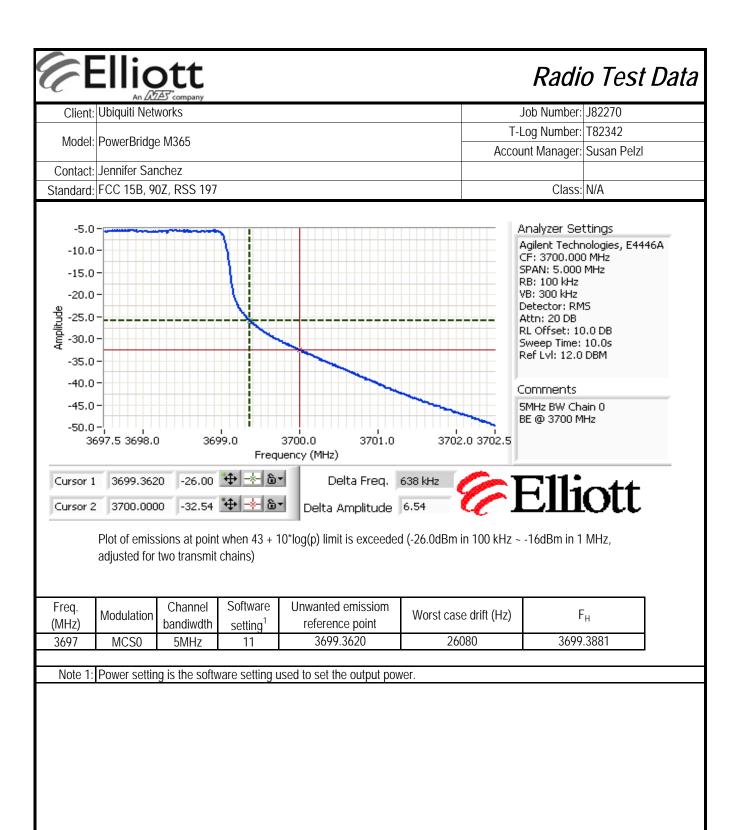
Plots below show band edge amplitudes for worst case modulation at each BW. Adding worst case drift to show compliance with frequency stability requirements.

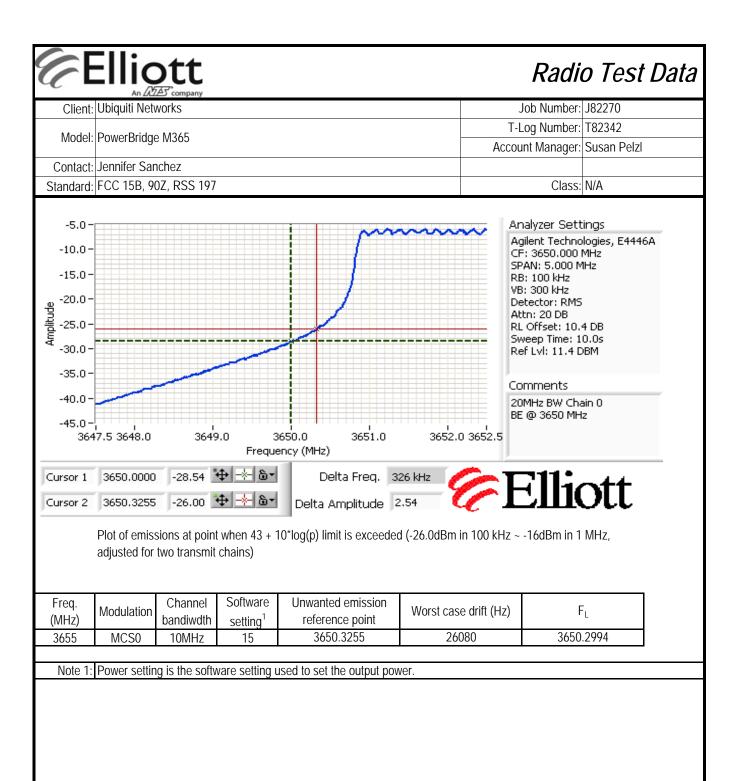


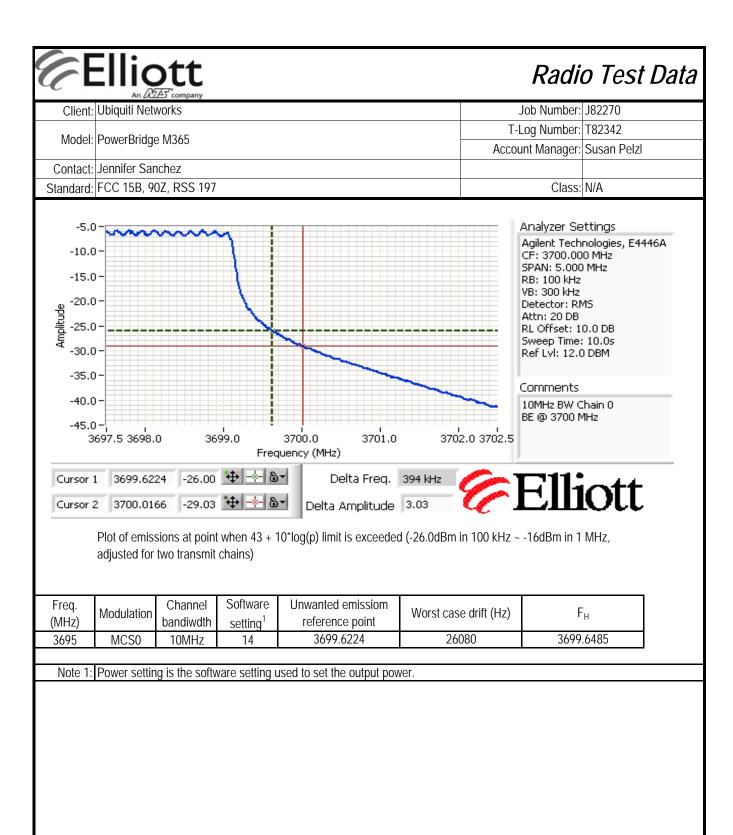
Plot of emissions at point when 43 + 10*log(p) limit is exceeded (-26.0dBm in 100 kHz ~ -16dBm in 1 MHz, adjusted for two transmit chains)

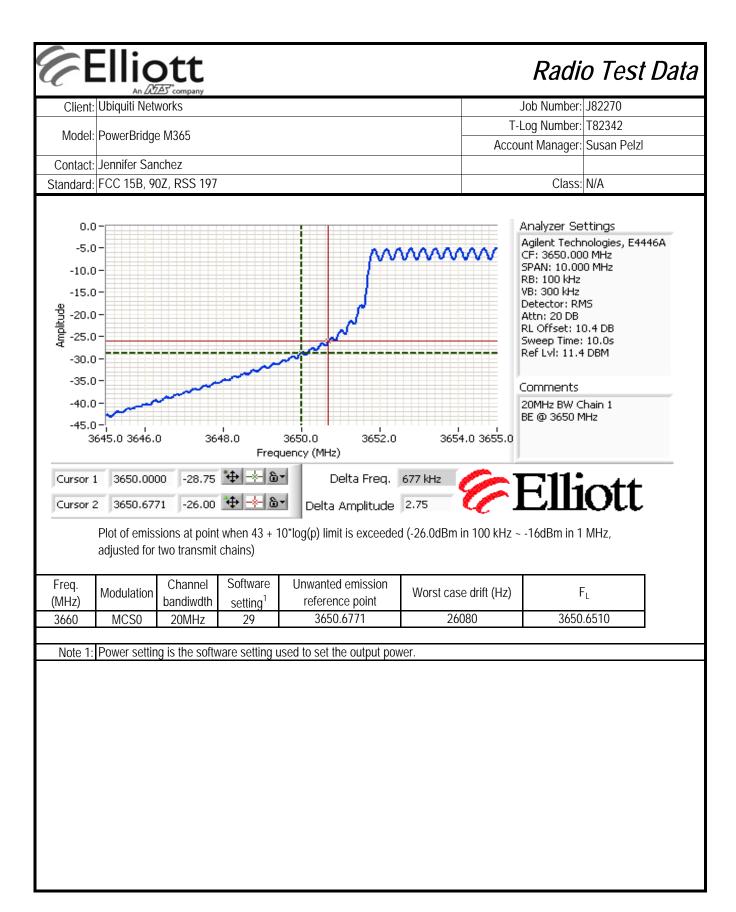
Freq.	Modulation	Channel	Software	Unwanted emission	Worst case drift (Hz)	F.
(MHz)	Modulation	bandiwdth	setting ¹	reference point	Worst case unit (HZ)	' <u>L</u>
3653	MCS0	5MHz	10	3650.5469	26080	3650.5208

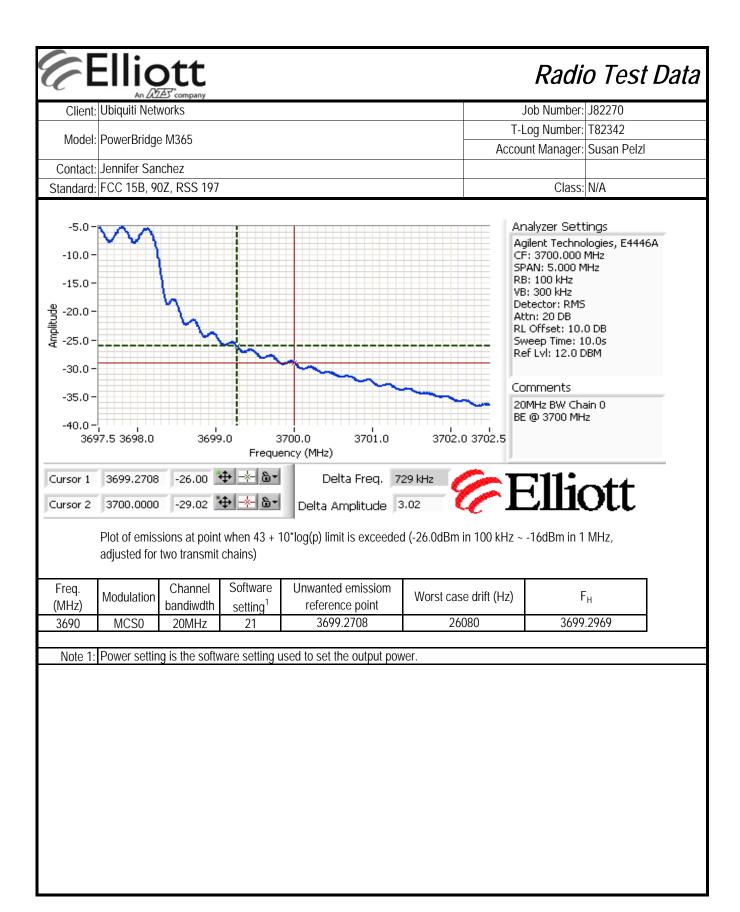
Note 1: Power setting is the software setting used to set the output power.

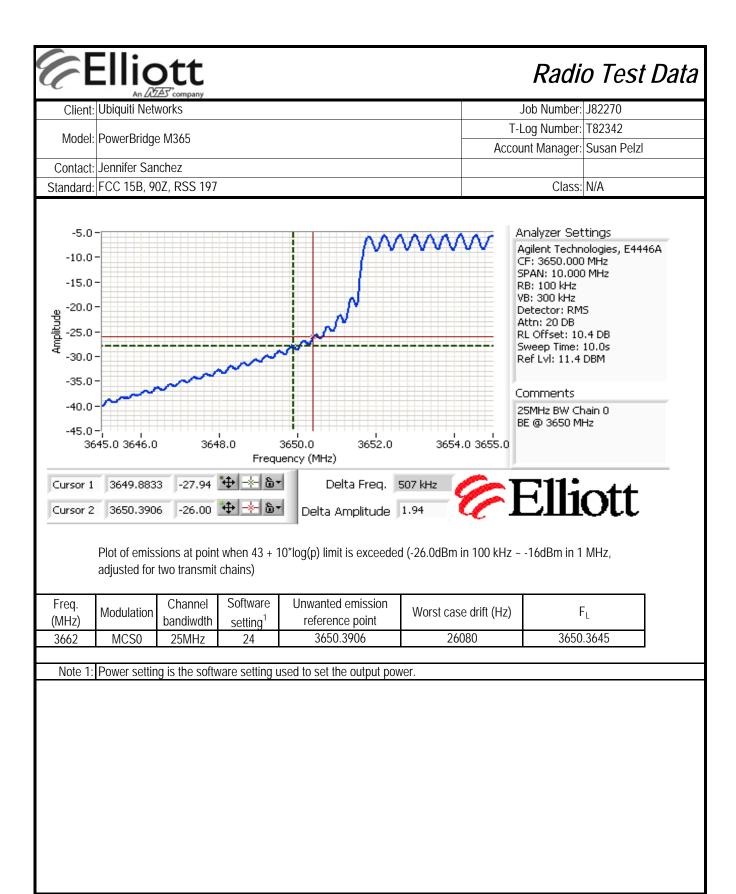


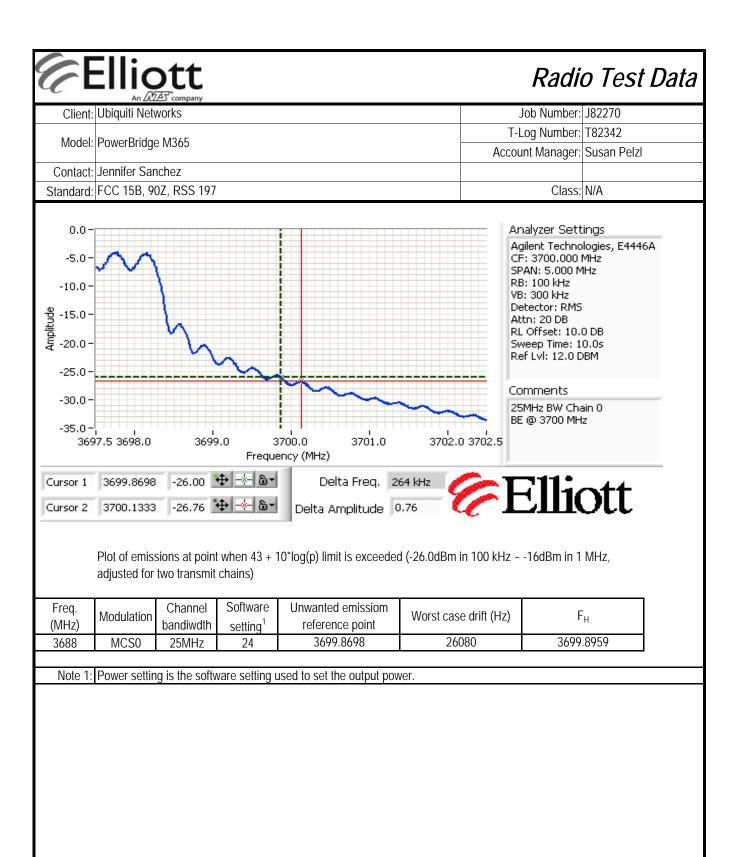












END OF REPORT

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File: R82783 Page 104