

EMC Test Report

Application for Grant of Equipment Authorization

FCC Part 15 Subpart C (Modified for India's Allocation of 5825 - 5875 MHz

Model: AirGridM5 Hi-Power

MANUFACTURER:	Ubiquiti Networks
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	San Jose, CA 95134

TEST SITE(S): Elliott Laboratories 41039 Boyce Road. Fremont, CA. 94538-2435

IC SITE REGISTRATION #: 2845B-3; 2845B-4

REPORT DATE: March 10, 2011

FINAL TEST DATES: March 2 and 3, 2011

AUTHORIZED SIGNATORY:

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Testing Cert #2016.01

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REVISION HISTORY

Rev#	Date	Comments	Modified By
-	03-10-2011	First release	

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SCOPE

An electromagnetic emissions test has been performed on the Ubiquiti Networks model AirGridM5 Hi-Power, pursuant to FCC Part 15 Subpart C (modified to account for the Indian allocation of 5825 - 5875 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 FCC DTS Measurement Procedure KDB558074, March 2005

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

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

OBJECTIVE

The primary objective of the manufacturer is compliance with the regulations outlined in the previous section, modified to account for the Indian allocation of 5825 - 5875 MHz.

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 AirGridM5 Hi-Power complied with the requirements of FCC Part 15 Subpart C with respect to measurements at the rf port of the device under test and with the allocated frequency band modified to match the Indian allocation of 5825 - 5875 MHz.

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.

The test results recorded herein are based on a single type test of Ubiquiti Networks model AirGridM5 Hi-Power and therefore apply only to the tested sample. The sample was selected and prepared by Jennifer Sanchez of Ubiquiti Networks.

DEVIATIONS FROM THE STANDARDS

No deviations were made from the published requirements listed in the scope of this report other than the allocated frequency band was modified to match the allocation in India.

TEST RESULTS SUMMARY

DIGITAL TRANSMISSION SYSTEMS (5725 - 5850 MHz)

FCC Rule Part	RSS Rule Part	Description	Measured Value / Comments	Limit / Requirement	Result
15.247(a)	RSS 210 A8.2	Digital Modulation	Systems uses OFDM / techniques	System must utilize a digital transmission technology	Complies
15.247 (a) (2)	RSS 210 A8.2 (1)	6dB Bandwidth	> 16.6 MHz	>500kHz	Complies
15.247 (b)	RSS 210 A8.2 (4)	Output Power (antenna port) ^{Note 1}	HT40 12.75dBm / 7.64dBm HT20 12.91dBm / 7.98dBm Legacy 12.97dBm / 7.95dBm	1Watt (30dBm) EIRP limited to 4	Complies
15.247 (b)	RSS 210 A8.2 (4)	Output Power (eirp) ^{Note 2}	HT40 35.8 dBm (3.758W) HT20 36.0 dBm (4.0 W) Legacy 36.0 dBm (4.0 W)	Watts.	Complies
15.247(d)	RSS 210 A8.2 (2)	Power Spectral Density	-17.3 dBm / 3kHz	Maximum permitted is 8dBm/3kHz	Complies
15.247(c)	RSS 210 A8.5	Antenna Port Spurious Emissions – 30MHz – 40 GHz	All spurious emissions < -20dBc	< -30dBc ^{Note 3}	Complies
15.247(c) / 15.209	RSS 210 A8.5 Table 2, 3	Radiated Spurious Emissions 30MHz – 40 GHz Note 4	52.9dBµV/m @ 5405.6MHz (-1.1dB)	15.207 in restricted bands, all others <-30dBc ^{Note 3}	Complies

Note 1: Two output power levels were evaluated, the lower power level is used when the system employs an antenna with 28dBi gain, the higher power setting when the antenna gain is 23dBi or less.

Note 2: EIRP calculated is the worst case for both low power/high gain antenna configuration and high power/low gain configuration (see note 1).

Note 3: Limit of -30dBc used because the power was measured using the UNII test procedure (maximum power averaged over a transmission burst).

Note 4: Radiated emissions below 1GHz are covered by digital device measurements (CISPR 22 and/or FCC 15 Subpart B). No emissions from the radio circuitry were observed below 1GHz.

Note 5: The FCC's frequency allocation under 15.247 is 5725 to 5850 MHz. Testing in this report covers the Indian allocation of 5825 - 5875 MHz.

FCC Rule Part	RSS Rule part	Description	Measured Value / Comments	Limit / Requirement	Result (margin)
15.203	-	RF Connector	Antenna is integrated into the device	Unique or integral antenna required	Complies
15.207	RSS GEN Table 2	AC Conducted Emissions		e scope of this report. D ver Ethernet and not fro source.	
15.109	RSS GEN 7.2.3 Table 1	Receiver spurious emissions	Not applicable, de	vice operates above 960	MHz.
15.247 (b) (5) 15.407 (f)	RSS 102	RF Exposure Requirements	0.79mW/cm ² at 20cm separation Refer to MPE calculations in Appendix B. Power	1mW/cm ² Refer to OET 65, FCC Part 1 and RSS 102	Complies

GENERAL REQUIREMENTS APPLICABLE TO ALL BANDS

MEASUREMENT UNCERTAINTIES

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

density

Measurement Type	Measurement Unit	Frequency Range	Expanded Uncertainty
RF power, conducted (power meter)	dBm	25 to 7000 MHz	$\pm 0.52 \text{ dB}$
RF power, conducted (Spectrum analyzer)	dBm	25 to 7000 MHz	$\pm 0.7 \text{ dB}$
Conducted emission of transmitter	dBm	25 to 26500 MHz	$\pm 0.7 \text{ dB}$
Conducted emission of receiver	dBm	25 to 26500 MHz	$\pm 0.7 \text{ dB}$
Radiated emission (substitution method)	dBm	25 to 26500 MHz	± 2.5 dB
Radiated emission (field strength)	dBµV/m	25 to 1000 MHz 1000 to 40000 MHz	$\frac{\pm 3.6 \text{ dB}}{\pm 6.0 \text{ dB}}$
Conducted Emissions (AC Power)	dBµV	0.15 to 30 MHz	± 2.4 dB

EQUIPMENT UNDER TEST (EUT) DETAILS

GENERAL

The Ubiquiti Networks model AirGridM5 Hi-Power is an Outdoor 5GHz CPE device. Since the EUT would be pole-mounted during operation, the EUT was mounted on a tripod (non-conductive) and placed at a height of 1m above the floor during radiated emissions testing. The electrical rating of the EUT is 24V/0.5A POE.

The sample was received on March 2, 2011 and tested on March 2 and 3, 2011. The EUT consisted of the following component(s):

Company	Model	Description	Serial Number	FCC ID
Ubiquiti Networks	AirGridM5-HP	5GHz CPE		SWX-M5G

ANTENNA SYSTEM

The EUT antenna is a 28dBi grid antenna or 23dBi grid antenna. The antenna is integrated into the device.

ENCLOSURE

The AirGridM5-HP enclosure is primarily constructed of PC122 Plastic. It measures approximately 7 cm wide by 30 cm deep by 4.5 cm high.

During testing the AirGridM5-HP was attached to metal-wire antenna dish with dimensions approximately 46 cm wide by 15 cm deep by 62 cm high.

When the AirGridM5-HP is installed on the antenna dish, the dimensions of the assembly are approximately 46 cm wide by 31 cm deep by 62 cm high.

MODIFICATIONS

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

SUPPORT EQUIPMENT

The following equipment was used as support equipment for testing:

Company	Model	Description	Serial Number	FCC ID
Ubiquiti	2009-8-13	Grid Antenna	-	-
Networks				

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

Company	Model	Description	Serial Number	FCC ID
Dell	Vostro 3500	Laptop	F0YD5N1	None

EUT INTERFACE PORTS

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

Port	Connected	Cable(s)		
FOIL	То	Description	Shielded or Unshielded	Length(m)
1	EUT	CAT 5E	Shielded	3
2	EUT	CAT 5E	Shielded	3

EUT OPERATION

During emissions testing the EUT was in a continuous transmit mode, operating at the lowest data rate in 802.11a, HT20 or HT40 modes. For radiated spurious emissions tests the antenna connected was the higher gain (28dBi) grid antenna and the output power was set at, or above, the highest power setting. The data, therefore, covers the use of both the 28dBi grid antenna at the low power setting and the 23dBi antenna at the high power setting.

TEST SITE

GENERAL INFORMATION

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

Site	Registration Numbers		Location	
Site	FCC	Canada	Location	
Chamber 3	769238	2845B-3	41039 Boyce Road	
Chamber 4	211948	2845B-4	Fremont, CA 94538-2435	

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

CONDUCTED EMISSIONS CONSIDERATIONS

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

RADIATED EMISSIONS CONSIDERATIONS

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

MEASUREMENT INSTRUMENTATION

RECEIVER SYSTEM

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

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

INSTRUMENT CONTROL COMPUTER

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

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

LINE IMPEDANCE STABILIZATION NETWORK (LISN)

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

FILTERS/ATTENUATORS

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

ANTENNAS

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

ANTENNA MAST AND EQUIPMENT TURNTABLE

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

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

INSTRUMENT CALIBRATION

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

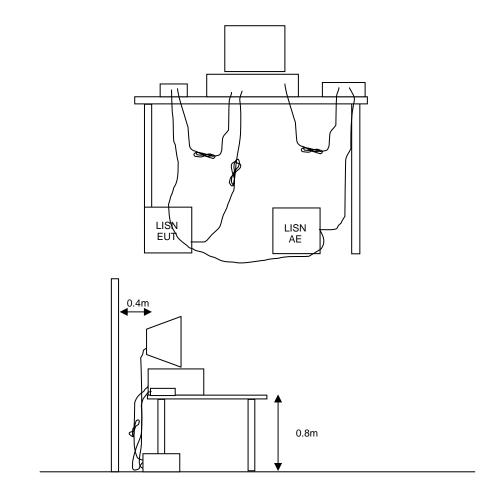
TEST PROCEDURES

EUT AND CABLE PLACEMENT

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

CONDUCTED EMISSIONS

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



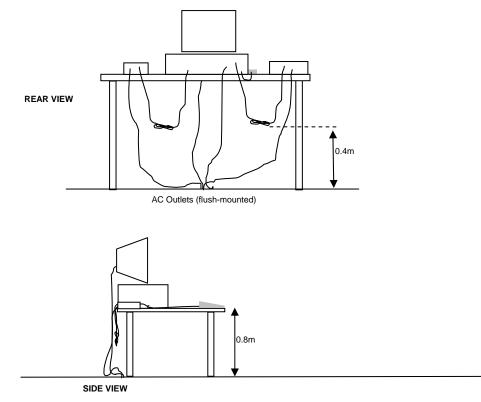
RADIATED EMISSIONS

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

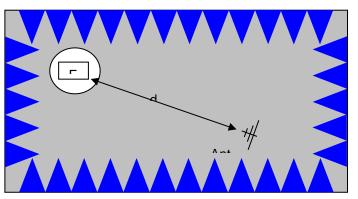
A speaker is provided in the receiver to aid in discriminating between EUT and ambient emissions. Other methods used during the preliminary scan for EUT emissions involve scanning with near field magnetic loops, monitoring I/O cables with RF current clamps, and cycling power to the EUT.

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

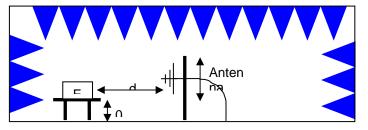
When testing above 18 GHz, the receive antenna is located at 1 meter from the EUT and the antenna height is restricted to a maximum of 2.5 meters.



Typical Test Configuration for Radiated Field Strength Measurements



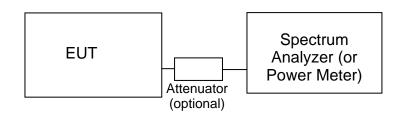
The anechoic materials on the walls and ceiling ensure compliance with the normalized site attenuation requirements of CISPR 16 / CISPR 22 / ANSI C63.4 for an alternate test site at the measurement distances used



<u>Test Configuration for Radiated Field Strength Measurements</u> <u>Semi-Anechoic Chamber, Plan and Side Views</u>

CONDUCTED EMISSIONS FROM ANTENNA PORT

Direct measurements of power, bandwidth and power spectral density are performed, where possible, with the antenna port of the EUT connected to either the power meter or spectrum analyzer via a suitable attenuator and/or filter. These are used to ensure that the front end of the measurement instrument is not overloaded by the fundamental transmission.



Test Configuration for Antenna Port Measurements

Measurement bandwidths (video and resolution) are set in accordance with the relevant standards and Elliott's test procedures for the type of radio being tested. When power measurements are made using a resolution bandwidth less than the signal bandwidth the power is calculated by summing the power across the signal bandwidth using either the analyzer channel power function or by capturing the trace data and calculating the power using software. In both cases the summed power is corrected to account for the equivalent noise bandwidth (ENBW) of the resolution bandwidth used.

If power averaging is used (typically for certain digital modulation techniques), the EUT is configured to transmit continuously. Power averaging is performed using either the built-in function of the analyzer or, if the analyzer does not feature power averaging, using external software. In both cases the average power is calculated over a number of sweeps (typically 100). When the EUT cannot be configured to continuously transmit then either the analyzer is configured to perform a gated sweep to ensure that the power is averaged over periods that the device is transmitting or power averaging is disabled and a max-hold feature is used.

If a power meter is used to make output power measurements the sensor head type (peak or average) is stated in the test data table.

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.

SPECIFICATION LIMITS AND SAMPLE CALCULATIONS

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

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

GENERAL TRANSMITTER RADIATED EMISSIONS SPECIFICATION LIMITS

The table below shows the limits for the spurious emissions from transmitters that fall in restricted bands¹ (with the exception of transmitters operating under FCC Part 15 Subpart D and RSS 210 Annex 9), the limits for all emissions from a low power device operating under the general rules of RSS 310 (tables 3 and 4), RSS 210 (table 2) and FCC Part 15 Subpart C section 15.209.

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

OUTPUT POWER LIMITS – DIGITAL TRANSMISSION SYSTEMS

The table below shows the limits for output power and output power density. Where the signal bandwidth is less than 20 MHz the maximum output power is reduced to the power spectral density limit plus 10 times the log of the bandwidth (in MHz).

Operating Frequency (MHz)	Output Power	Power Spectral Density		
902 - 928	1 Watt (30 dBm)	8 dBm/3kHz		
2400-2483.5	1 Watt (30 dBm)	8 dBm/3kHz		
5725 - 5850	1 Watt (30 dBm)	8 dBm/3kHz		

The maximum permitted output power is reduced by 1dB for every dB the antenna gain exceeds 6dBi. Fixed point-to-point applications using the 5725 - 5850 MHz band are not subject to this restriction.

TRANSMIT MODE SPURIOUS RADIATED EMISSIONS LIMITS – FHSS and DTS SYSTEMS

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

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

SAMPLE CALCULATIONS - CONDUCTED EMISSIONS

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

 $R_r - S = M$ where: $R_r =$ Receiver Reading in dBuV S = Specification Limit in dBuV M = Margin to Specification in +/- dB

SAMPLE CALCULATIONS - RADIATED EMISSIONS

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

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

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

where:

 F_d = Distance Factor in dB D_m = Measurement Distance in meters D_s = Specification Distance in meters

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

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

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

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

 $R_c = R_r + F_d$

and

 $M = R_c - L_s$

where:

 R_r = Receiver Reading in dBuV/m

 F_d = Distance Factor in dB

 R_c = Corrected Reading in dBuV/m

 L_{S} = Specification Limit in dBuV/m

M = Margin in dB Relative to Spec

SAMPLE CALCULATIONS - FIELD STRENGTH TO EIRP CONVERSION

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

$E = \frac{1000000 \sqrt{30 P}}{d}$ microvolts per meter

where P is the eirp (Watts)

For a measurement at 3m the conversion from a logarithmic value for field strength (dBuV/m) to an eirp power (dBm) is -95.3dB.

Appendix A Test Equipment Calibration Data

Radio Antenna Port (F	Power and Spurious Emissions), ()3-Mar-11		
<u>Manufacturer</u>	Description	Model	Asset #	Cal Due
Agilent	PSA, Spectrum Analyzer,	E4446A	2139	1/26/2012
	(installed options, 111, 115, 123,			
	1DS, B7J, HYX,			
Radiated Emissions	1000 - 18,000 MHz, 03-Mar-11			
Manufacturer	Description	Model	Asset #	Cal Due
Hewlett Packard	High Pass filter, 8.2 GHz (Blu	P/N 84300-80039	1392	5/17/2011
	System)	(84125C)		0,, _0
EMCO	Antenna, Horn, 1-18 GHz	3115 [′]	1561	6/22/2012
Hewlett Packard	SpecAn 9 kHz - 40 GHz, (SA40)	8564E (84125C)	1771	8/26/2011
	Purple			
Hewlett Packard	Head (Inc W1-W4, 1946, 1947)	84125C	1772	5/6/2011
	Purple	-		
Hewlett Packard	Microwave Preamplifier, 1-	8449B	1780	11/23/2011
	26.5GHz	010 574 - /- 0504	0450	0/40/0044
A.H. Systems	Blue System Horn, 18-40GHz	SAS-574, p/n: 2581	2159	3/18/2011
Micro-Tronics	Band Reject Filter, 5725-5875 MHz	BRC50705-02	2241	10/1/2011
	MHZ			
DTS Radiated Spuriou	us Emissions, 1000-40,000 MHz, 0	3-Mar-11		
Manufacturer	Description	Model	Asset #	Cal Due
EMCO	Antenna, Horn, 1-18 GHz	3115	1561	6/22/2012
Micro-Tronics	Band Reject Filter, 5725-5875	BRC50705-02	1682	3/29/2011
	MHz			
Hewlett Packard	SpecAn 9 kHz - 40 GHz, (SA40)	8564E (84125C)	1771	8/26/2011
	Purple			
Hewlett Packard	Microwave Preamplifier, 1-	8449B	1780	11/23/2011
	26.5GHz			

Appendix B Test Data

T82326



EMC Test Data

AN DALLE	5 company		
Client:	Ubiquiti	Job Number:	J82286
Model:	AirGridM5-HP	T-Log Number:	T82326
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		-
Emissions Standard(s):	India Radio	Class:	-
Immunity Standard(s):	-	Environment:	-

EMC Test Data

For The

Ubiquiti

Model

AirGridM5-HP

Date of Last Test: 3/3/2011

EMC Test Data

	An Dall Company		
Client:	Ubiquiti	Job Number:	J82286
Model: A		T-Log Number:	T82326
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	India Radio	Class:	N/A

RSS 210 and FCC 15.247 (DTS) Radiated Spurious Emissions

Test Specific Details

Elliott

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

General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated spurious emissions testing. All remote support equipment was located approximately 30 meters from the EUT with all I/O connections running on top of the groundplane or routed in overhead in the GR-1089 test configuration.

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

Ambient Conditions:

Temperature:	20.1 °C
Rel. Humidity:	35 %

Summary of Results - Device Operating in the 5725 - 5875 MHz Band

Run #	Mode	Channel	Power Setting	Measured Power	Test Performed	Limit	Result / Margin
1a	802.11a	low	17	-	Radiated Emissions, 1 - 40GHz	FCC Part 15.209 / 15.247(c)	52.9dBµV/m @ 5405.6MHz (-1.1dB)
1b	802.11a	center	17	-	Radiated Emissions, 1 - 40GHz	FCC Part 15.209 / 15.247(c)	52.8dBµV/m @ 5416.3MHz (-1.2dB)
1c	802.11n20	center	17	-	Radiated Emissions, 1 - 40GHz	FCC Part 15.209 / 15.247(c)	52.2dBµV/m @ 1560.1MHz (-1.8dB)
1d	802.11n40	center	16	-	Radiated Emissions, 1 - 40GHz	FCC Part 15.209 / 15.247(c)	52.3dBµV/m @ 5414.6MHz (-1.7dB)
1e	802.11a	high	17	-	Radiated Emissions, 1 - 40GHz	FCC Part 15.209 / 15.247(c)	52.5dBµV/m @ 4998.1MHz (-1.5dB)

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.

(FE		Ditt Ar company						EM	C Test Data	
Client:	Ubiquiti						Job Number: J82286			
Madal		D					T-	Log Number:	T82326	
Model:	AirGridM5-H	Р					Acco	unt Manager:	Susan Pelzl	
Contact:	Jennifer San	chez								
Standard:	India Radio				Class:	N/A				
Run #1: Ra	diated Spuri	ious Emissi	ons. 1000 - 4	40000 MHz.			1			
Te: Te	Date of Test: st Engineer: est Location:	Rafael Varel FT Chamber	r #3							
	ow Channel		Z							
Operating I	Mode: 802.1	1a								
Spurious Er	nissions									
Frequency	Level	Pol	15.209	/ 15.247	Detector	Azimuth	Height	Comments		
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	5011110110		
5405.640	52.9	V	54.0	-1.1	AVG	353	1.0	RB 1 MHz;V	/B 10 Hz;Pk	
5405.490	64.3	V	74.0	-9.7	PK	353	1.0	RB 1 MHz;V	/B 3 MHz;Pk	
3893.380	48.9	V	54.0	-5.1	AVG	0	1.0	RB 1 MHz;V	/B 10 Hz;Pk	
3893.210	51.4	V	74.0	-22.6	PK	0	1.0	RB 1 MHz;V	/B 3 MHz;Pk	
4992.460	51.8	V	54.0	-2.2	AVG	0	1.0	RB 1 MHz;∖	/B 10 Hz;Pk	
4991.250	66.4	V	74.0	-7.6	PK	0	1.0		/B 3 MHz;Pk	
1170.040	51.3	V	54.0	-2.7	AVG	358	1.6	RB 1 MHz;V		
1169.990	52.5	V	74.0	-21.5	PK	358	1.6		/B 3 MHz;Pk	
1560.030	51.2	V	54.0	-2.8	AVG	342	1.0	RB 1 MHz;V		
1559.930	52.4	V	74.0	-21.6	PK	342	1.0	RB 1 MHZ;V	/B 3 MHz;Pk	
Note 1:	level of the fu	undamental	and measure	ed in 100kHz				, the limit was	set 30dB below the	
120.0	0									
100.0 (W/\ngp 80.0 Philitinge (dgn/w) 40.0 40.0			and an all and a							
20.0	1000			' Fr	equency (MH	łz)	, , , , , , , , , , , , , , , , , , ,	0000	18000	

Clinet		≙ Company						Job Number:	182286
Client:									
Model:	AirGridM5-H	Р						Log Number:	
0	longiter Or	ahaz			ACCO	unt Manager:	Susan Pelzi		
	Jennifer San	cnez							N1/A
	India Radio							Class:	N/A
	Center Chann Mode: 802.11		VIHZ						
operating		Id							
I	Date of Test: 3	3/2/2011							
Te	est Engineer:	Rafael Varel	las						
T	est Location:	FT Chambe	r #4						
Spurious E		Dal	15 200	/ 15.247	Detector	ملد بموند ۸	Uninter	Commente	
Frequency MHz	Level dBµV/m	Pol v/h	Limit	Margin	Detector Pk/QP/Avg	Azimuth degrees	Height meters	Comments	
5416.260	52.8	V	54.0	-1.2	AVG	uegrees 1	1.0	RB 1 MHz;V	'B 10 Hz:Pk
5415.760	64.0	V	74.0	-10.0	PK	1	1.0	RB 1 MHz;V	
1170.030	50.7	V	54.0	-3.3	AVG	17	1.5	RB 1 MHz;V	,
1170.030	52.0	V	74.0	-22.0	PK	17	1.5	RB 1 MHz;V	
3900.040	49.0	V	54.0	-5.0	AVG	4	1.0	RB 1 MHz;V	′B 10 Hz;Pk
3899.840	52.6	V	74.0	-21.4	PK	4	1.0	RB 1 MHz;V	
4997.670	52.8	V	54.0	-1.2	AVG	1	1.0	RB 1 MHz;V	
4997.420	67.7	V	74.0	-6.3	PK	1	1.0	RB 1 MHz;V	
1560.050 1560.010	50.3 51.3	H H	54.0 74.0	-3.7 -22.7	AVG PK	65 65	1.0 1.0	RB 1 MHz;V	B 10 HZ;PK B 3 MHZ;Pk
1300.010	51.5	11	74.0	-22.1	ΓN	00	1.0		D 5 WII IZ,F K
	For emission	s in restricte	d bands, the	limit of 15.2	09 was used.	For all othe	r emissions.	, the limit was	set 30dB below the
Note 1:	level of the fu								
Note 2:	Signal is not	in a restricte	ed band but t	he more strir	ngent restricte	ed band limit	was used.		
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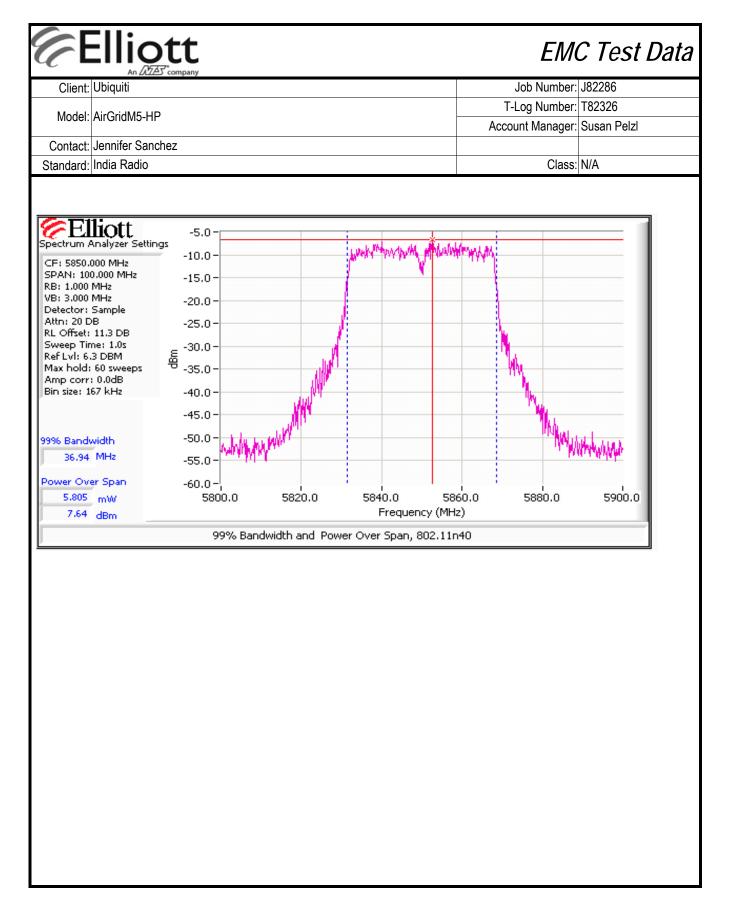
Client		Company						Job Number:	.182286
Olient.	Obiquiti							Log Number:	
Model:	AirGridM5-H	Р				unt Manager:			
Contact	Jennifer San	choz				unt manager.			
	India Radio	GIEZ						Class:	NI/A
Standard:	Inula Raulu							01855.	N/A
Run #1c+ C	enter Chann	nel @ 5850 M	//Hz						
	Mode: 802.1								
	Date of Test:								
	est Engineer: est Location:								
16	SI LUCATION.	гIJ							
ourious E	missions								
requency	Level	Pol	15.209	/ 15.247	Detector	Azimuth	Height	Comments	
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters		
560.070	52.2	V	54.0	-1.8	AVG	339	1.0	RB 1 MHz;V	
560.020	53.1	V	74.0	-20.9	PK	339	1.0	RB 1 MHz;V	,
170.070	51.7	V	54.0	-2.3	AVG	0	1.6	RB 1 MHz;V	
170.070	52.8	V	74.0	-21.2	PK	0	1.6	RB 1 MHz;V	
900.090	49.5	V	54.0	-4.5	AVG	351	1.0	RB 1 MHz;V	
900.050	51.9	V V	74.0	-22.1	PK	351	1.0	RB 1 MHz;V	
988.500	51.6 65.6	V V	54.0 74.0	-2.4	AVG PK	355 355	1.0 1.0	RB 1 MHz;V	
978.570 491.750	36.4	V V	74.0 54.0	-8.4 -17.6	AVG	355	1.0	RB 1 MHz;V RB 1 MHz;V	
2488.450	52.6	V	74.0	-17.0	PK	343	1.0	RB 1 MHz;V	
.+00.+00	52.0	v	74.0	-21.4		040	1.0		D 0 WHZ,1 K
	For emission	is in restricte	ed bands, the	limit of 15.2	09 was used.	For all othe	r emissions,	, the limit was	set 30dB below the
ote 1:	level of the fu								
ote 2:	Signal is not	in a restricte	ed band but t	he more strir	ngent restricte	ed band limit	was used.		
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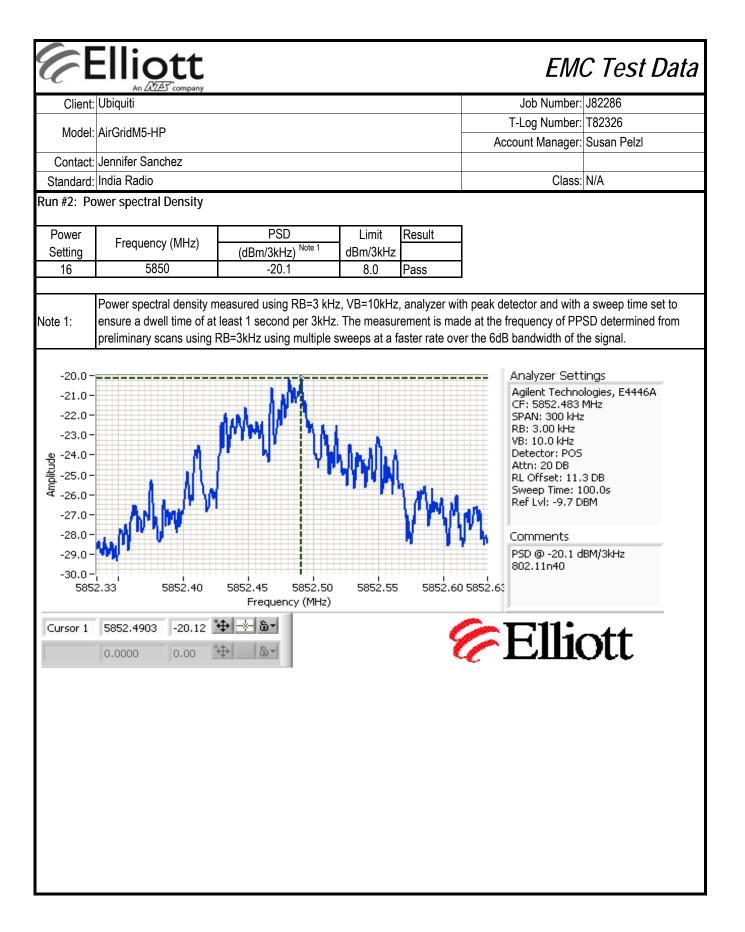
Client		▲ company						Job Number:	182286
Client:	Obiquiti								
Model:	AirGridM5-H	Р						Log Number:	
<u> </u>	1	.1			ACCO	unt Manager:	Susan Pelzi		
	Jennifer San	cnez						0	N1/A
	India Radio							Class:	N/A
	Center Chanr		ИНz						
Operating	Mode: 802.1	11140							
[Date of Test:	3/3/2011							
Te	est Engineer:	Rafael Vare	las						
T	est Location:	FT Chambe	r #3						
Spurious E		<u> </u>	45.000	145 047		A : (1			
Frequency MHz	Level dBµV/m	Pol v/h	Limit	/ 15.247 Margin	Detector Pk/QP/Avg	Azimuth degrees	Height meters	Comments	
5414.590	αθμν/m 52.3	V/II V	54.0	-1.7	AVG	0 0	1.0	RB 1 MHz;V	'R 10 Hz·Pk
5406.790	63.8	V	74.0	-10.2	PK	0	1.0		B 3 MHz;Pk
4979.930	51.6	V	54.0	-2.4	AVG	0	1.0	RB 1 MHz;V	,
4977.270	66.7	V	74.0	-7.3	PK	0	1.0		B 3 MHz;Pk
3900.050	49.7	V	54.0	-4.3	AVG	350	1.0	RB 1 MHz;V	′B 10 Hz;Pk
3900.140	52.7	V	74.0	-21.3	PK	350	1.0		′B 3 MHz;Pk
1560.060	50.7	V	54.0	-3.3	AVG	342	1.0	RB 1 MHz;V	
1559.950	51.8	V	74.0	-22.2	PK	342	1.0		B 3 MHz;Pk
1170.040	51.3 52.4	V V	54.0 74.0	-2.7	AVG PK	360 360	1.6 1.6	RB 1 MHz;V	
1170.060	32.4	V	74.0	-21.6	Ph	300	1.0	KD I IVINZ,V	'B 3 MHz;Pk
	For emissior	ns in restricte	d bands. the	limit of 15.2	09 was used.	For all othe	r emissions.	. the limit was	set 30dB below the
Note 1:	level of the f						,	,	
Note 2:	Signal is not	in a restricte	ed band but t	he more strir	ngent restricte	d band limit	was used.		
120.	0								
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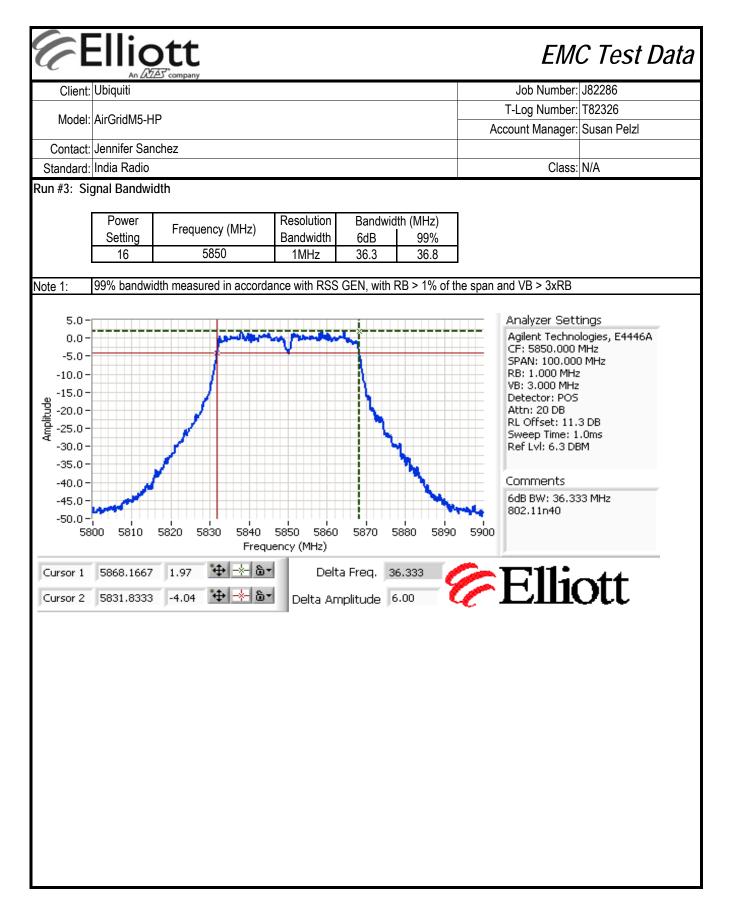
(7 E		ott							C Test Data	
Client:	Ubiquiti						Job Number			
Model	AirGridM5-H	P				Log Number:				
WOUEI.		ſ					Αссοι	unt Manager:	Susan Pelzl	
Contact:	Jennifer San	chez								
Standard:	India Radio				Class:	N/A				
Operating I	gh Channel Mode: 802.1 Date of Test:	1a	2							
Te Te	st Engineer: est Location: ous Emissio	Rafael Varel FT Chamber								
Frequency	Level	Pol	15.209/	15.247	Detector	Azimuth	Height	Comments		
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters			
4998.070	52.5	V	54.0	-1.5	AVG	0	1.0	RB 1 MHz;V	′B 10 Hz;Pk	
4997.430	66.7	V	74.0	-7.3	PK	0	1.0		/B 3 MHz;Pk	
5398.660	52.4	V	54.0	-1.6	AVG	0	1.0	RB 1 MHz;V		
5398.610	63.3	V	74.0	-10.7	PK	0	1.0	RB 1 MHz;V	/B 3 MHz;Pk	
3906.720	50.6	V	54.0	-3.4	AVG	0	1.0	RB 1 MHz;V	/B 10 Hz;Pk	
3906.800	53.0	V	74.0	-21.0	PK	0	1.0	RB 1 MHz;V	/B 3 MHz;Pk	
1560.050	50.4	V	54.0	-3.6	AVG	334	1.0	RB 1 MHz;V	′B 10 Hz;Pk	
1560.060	51.7	V	74.0	-22.3	PK	334	1.0	RB 1 MHz;VB 3 MHz;Pk		
1170.070	50.7	V	54.0	-3.3	AVG	360	1.6	RB 1 MHz;VB 10 Hz;Pk		
1170.050	51.8	V	74.0	-22.2	PK	360	1.6	RB 1 MHz;V	/B 3 MHz;Pk	
Note 1: Note 2:	level of the fu	undamental a	and measure	d in 100kHz				the limit was	set 30dB below the	
120.0 (W/\ngp) 80.0 60.0 40.0 20.0				July July The second se	equency (MH			000	18000	

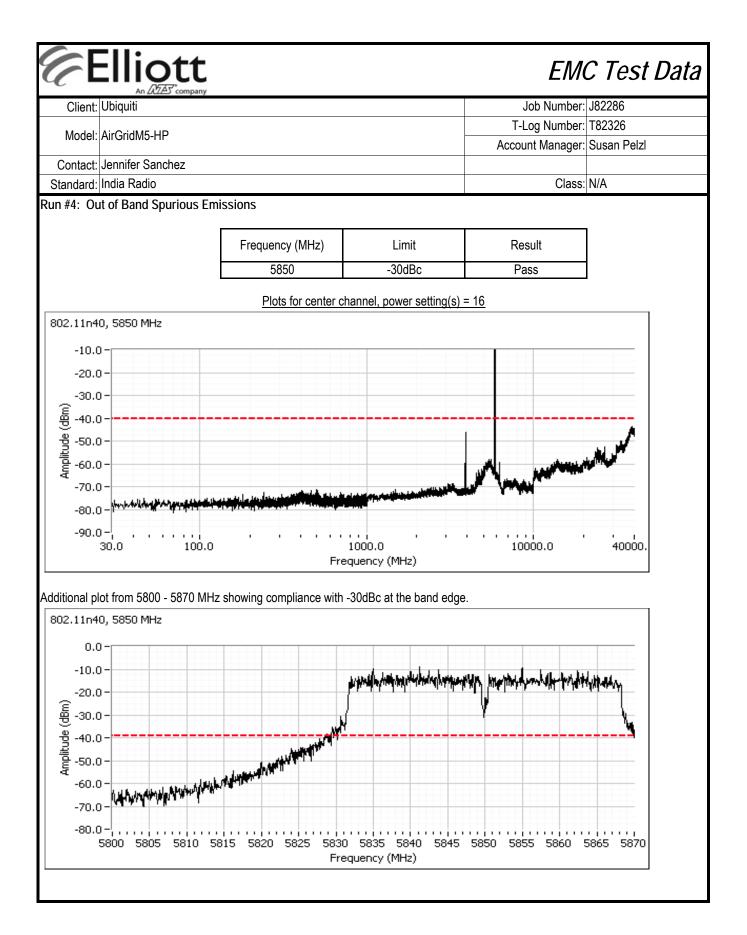
C E		Dtt Company					EMO	C Test Data	
Client:	Ubiquiti						Job Number:	J82286	
Model [.]	AirGridM5-H	P				T-Log Number: T82326			
				Αссοι	unt Manager:	Susan Pelzl			
	Jennifer San	chez							
Standard:	India Radio						Class:	N/A	
		I	•	6) Antenna Por Bandwidth and S			;		
Test Spec	cific Detail	s							
	Objective:			sion is to perform fina	l qualification t	esting of th	ie EUT with r	espect to the	
[Date of Test:	3/2/2011		С	onfig. Used: 1				
	st Engineer:		as	Cor	nfig Change: n	ione			
Te	est Location:	FT Lab #4		E	UT Voltage: F	POE			
Ambient	ments have b Conditions of Results	S: Te Re	d to allow for the emperature: I. Humidity:	e external attenuators 20.4 °C 36 %	used.				
Run #	Pwr setting	Avg Pwr		Performed	Lim	-	Pass / Fail	Result / Margin	
1	16			out Power	36dBm		Pass	35.8 dBm	
2 3	16 16			tral Density (PSD) 6dB Bandwidth	8dBm/3	SKHZ	Pass Pass	-20.1 dBm/3kHz 36.3 MHz	
3	16			Bandwidth			- F d 55	36.8 MHz	
4	16			us emissions	-30d	Bo	Pass	All emissions below the	
							1 035	limit	
No modifica	s From Th	ade to the EU	T during testing						

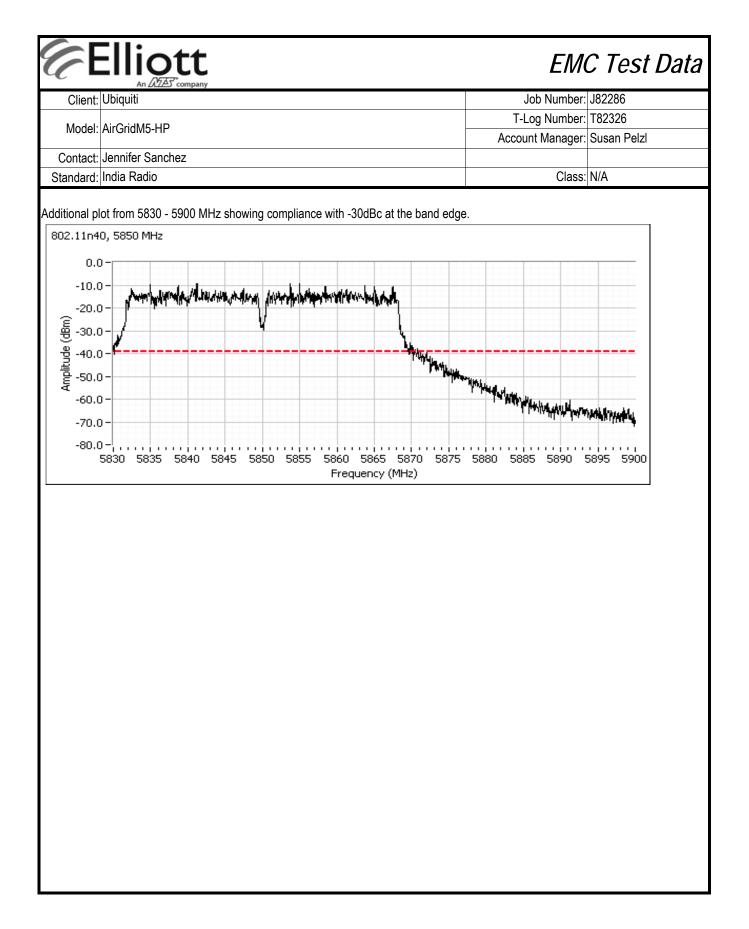
Model: ArGridM5-HP T-Log Number: T82326 Contact: Jennifer Sanchez Susan Pelzi Standard: Initial Radio Class: N/A Un #1: Output Power Antenna Bin W (dBm) 3 MW Power Frequency (MHz) Output Power Antenna Bin W (dBm) 3 MW Viternate Power settings for higher gain antenna Power Antenna Result dBm W (dBm) 3 mW 7 5850 7.64 5.81 28.0 Pass 36.6 3.664 Image: Setting 2 Output Power 7 5850 7.64 5.81 28.0 Pass 36.6 3.664 Image: Setting 2 Output power measured using a spectrum analyzer (see plots below) with RBW=1MHz, VB=3 MHz, sample detector, max hold and power integration over 50 MHz (option #2, method 3 in KDB 558074, equivalent to method 3 of DA-02-2138A1 for NI lodvices). Spurious limit becomes -30dBc. Note 1: Note 2: Power setting : the software power setting used during testing, included for reference only. Setting 2.00 Setting 2.00 Setting 2.00 Setin 0.00 MHz Se	Client:								Job Number:	J82286	
Account Manager; Susan Peizl Contact: Jennifer Sanchez Standard: India Radio Class: N/A Um #1: Output Power Power Frequency (MHz) (dBm) ¹ mW 16 5850 12.75 18.84 23.0 Pass Power Stating ² Frequency (MHz) Output Power Antenna Gain (dB) Result dBm Word Sating ² Frequency (MHz) Output Power (dBm) ¹ mW Gain (dB) Result dBm W (dBm) ³ 7 5850 7.64 5.81 28.0 Pass 35.6 3.64 Note 1: hold and power integration over 50 MHz (option #2, method 3 in KDB 558074, equivalent to method 3 of DA-02-2138A1 for NII devices). Spurious limit becomes -30dBc. Note 2: Power Setting Frequency Three setting: -5.0 -5.0 -5.0 -5.0	Model		D					T-	Log Number:	T82326	
Standard: India Radio Class: IVA Power Setting ² Frequency (MHz) Output Power (dBm) ¹ Antenna Gain (dBi) Result EIRP Mate 2 dBm Output Power (dBm) ³ Output Power (dBm) ³ MW 16 5850 12.75 18.84 23.0 Pass 35.8 3.758 Iternale Power settings for higher gain antenna Power Setting ² Frequency (MHz) Output Power (dBm) ¹ Antenna Gain (dBi) Result EIRP Mate 2 dBm Output Power (dBm) ³ Output Power (dBm) ³ MW 7 5850 7.64 5.81 28.0 Pass 35.6 3.664 Note 1: hold and power integration over 50 MHz (option #2, method 3 in KDB 558074, equivalent to method 3 of DA-02-2138A1 for NII devices). Spurious limit becomes -30dBc. Note 1: hold and power integration over 50 MHz (option #2, method 3 in KDB 558074, equivalent to method 3 of DA-02-2138A1 for NII devices). Spurious limit becomes -30dBc. Note 1: hold and power integration over 50 MHz (option #2, method 3 in KDB 558074, equivalent to method 3 of DA-02-2138A1 for NII devices). Spurious limit becomes -30dBc. Result is 2 De Sweep Time: 1.05 Sweep Time: 1.05 Sweep Time: 1.05 Sweep Time: 1.05 Sweep Time: 1.05 Sweep Time: 1.06 Sweep Time: 1.05 Sweep Time: 1.05 Sweep Time: 1.	Model.	All Ghuivio-Hi						Acco	unt Manager:	Susan Pelzl	
Power Setting ² Frequency (MHz) Output Power (dBm) ¹ MW Gain (dBi) Gain (dBi) Result EIRP Note 2 dBm Output Power (dBm) ³ Output Power (dBm) ³ 16 5850 12.75 18.84 23.0 Pass 35.8 3.768 Witernate Power settings for higher gain antenna Power Setting ² Frequency (MHz) Output Power (dBm) ¹ MW Gain (dBi) Result EIRP Note 2 dBm Output Power 7 5850 7.64 5.81 28.0 Pass 35.64 Image: Setting ² Output power 7 5850 7.64 5.81 28.0 Pass 35.64 Image: Setting ² Output power 8 0utput power measured using a spectrum analyzer (see plots below) with RBW=1MHz, VB=3 MHz, sample detector, max hold and power integration over 50 MHz (option #2, method 3 in KDB 558074, equivalent to method 3 of DA-02-2138A1 for NII devices). Spurious limit becomes -30dBc. Note 1: Power setting - the software power setting used during testing, included for reference only. -5.0 -5.0 -5.0 -5.0 -5.0 -5.0 -5.0 -5.0 -5.0 -5.0			chez								
Power Setting ² Frequency (MHz) Output Power (dBm) ¹ Antenna Gain (dBi) Result EIRP Met 2 dBm Output Power (dBm) ³ Output Power (dBm) ³ 16 5850 12.75 18.84 23.0 Pass 35.8 3.758 Miternate Power settings for higher gain antenna Power Setting ² Frequency (MHz) Output Power (dBm) ¹ Miternate EIRP Met 2 (dBm) ³ Output Power (dBm) ³ 7 5850 7.64 5.81 28.0 Pass 35.6 3.664 Note 1: Note 1: Output power measured using a spectrum analyzer (see plots below) with RBW=1MHz, VB=3 MHz, sample detector, max hold and power integration over 50 MHz (option #2, method 3 in RDB 558074, equivalent to method 3 of DA-02-2138A1 for NII devices). Sputious limit becomes -30dBc. Note 2: Power setting - the software power setting used during testing, included for reference only. Sector: Sample Attn: 200 MHz WB 3.000 MHz WB 3.000 MHz WB 3.000 MHz Bin size: 167 KHz -5.0 -0 -0 -0 -0 -0 -0 -0 -0 -0 -0 -0 -0 -0									Class:	N/A	
Setting ² Frequency (MHz) (dBm) ¹ mW Gain (dBi) Result dBm W (dBm) ³ mW 16 5850 12.75 18.84 23.0 Pass 35.8 3.758 Atternate Power settings for higher gain antenna Power Frequency (MHz) Output Power (dBm) ¹ MW Gain (dBi) Result EIRP Nee 2 dBm Output Power (dBm) ³ MW 7 5850 7.64 5.81 28.0 Pass 35.6 3.664 Output power measured using a spectrum analyzer (see plots below) with RBW=1MHz, VB=3 MHz, sample detector, max hold and power integration over 50 MHz (option #2, method 3 in KDB 558074, equivalent to method 3 of DA-02-2138A1 for NII devices). Spurious limit becomes -30dBc. Note 1: hold and power setting used during testing, included for reference only. Spectrum Analyzer Settings -5.0 -10.0 -5.0 -10.0 -5.0 -20.0 -20.0 -20.0 -20.0 -20.0 -25.0 -20.0 -25.0 -25.0 -25.0 -25.0 -25.0 -25.0 -25.0 -25.0 -25.0 -25.0		utput Power		Outout	Devier	Antonio			Note 2	Outeur	Deurer
16 5850 12.75 18.84 23.0 Pass 35.8 3.758 Alternate Power settings for higher gain antenna Output Power Antenna Result EIRP Nois 2 Output Power (dBm) 3 Output Power (dBm) 1 MW Gain (dBi) Result EIRP Nois 2 Output Power (dBm) 3 MW 7 5850 7.64 5.81 28.0 Pass 35.6 3.664 MW 7 5850 7.64 5.81 28.0 Pass 35.6 3.664 Output power measured using a spectrum analyzer (see plots below) with RBW=1MHz, VB=3 MHz, sample detector, max hold and power integration over 50 MHz (option #2, method 3 in KDB 558074, equivalent to method 3 of DA-02-2138A1 for NII devices). Spurious limit becomes -30dBc. Note 1: Note 2: Power setting - the software power setting used during testing, included for reference only. Spectrum Analyzer Setting: -50.0 -50.0 -50.0 -50.0 -50.0 -50.0 -50.0 -50.0 -50.0 -50.0 -50.0 -50.0 -50.0 -50.0 -50.0 -50.0		Frequency (MHz)					Result		1		1
Alternate Power settings for higher gain antenna Power Frequency (MHz) Output Power (dBm) ¹ Antenna Gain (dBi) Result EIRP Note 2 Output Power (dBm) ³ MW 7 5850 7.64 5.81 28.0 Pass 35.6 3.664 mW Output power measured using a spectrum analyzer (see plots below) with RBW=1MHz, VB=3 MHz, sample detector, max hold and power integration over 50 MHz (option #2, method 3 in KDB 558074, equivalent to method 3 of DA-02-2138A1 for NII devices). Spurious limit becomes -30dBc. Note 2: Power setting - the software power setting used during testing, included for reference only. Sepectrum Analyzer Setting: -5.0 -5.0 -5.0 -5.0 -5.0 -5.0 -5.0 -5.0 -5.0 -5.0 -5.0 -5.0 -5.0 -5.0 -5.0 -5.0 -5.0 -5.0 -5.0 <td></td> <td>585</td> <td>50</td> <td>· · /</td> <td></td> <td>()</td> <td>Pass</td> <td></td> <td></td> <td>(автт)</td> <td>11100</td>		585	50	· · /		()	Pass			(автт)	11100
Power Setting ² Frequency (MHz) Output Power (dBm) ¹ Antenna Gain (dBi) Result EIRP Note 2 dBm Output Power (dBm) ³ MW 7 5850 7.64 5.81 28.0 Pass 35.6 3.664 mW 7 5850 7.64 5.81 28.0 Pass 35.6 3.664 mW Output power measured using a spectrum analyzer (see plots below) with RBW=1MHz, VB=3 MHz, sample detector, max hold and power integration over 50 MHz (option #2, method 3 in KDB 558074, equivalent to method 3 of DA-02-2138A1 for NII devices). Spurious limit becomes -30dBc. Note 2: Power setting - the software power setting used during testing, included for reference only. Spectrum Analyzer Settings -5.0 -5.0 -10.0 -20.0 -20.0 -20.0 -25.0 -25.0 -25.0 -25.0 -25.0 -25.0 -25.0 -25.0 -25.0 </td <td>10</td> <td></td> <td></td> <td>12.75</td> <td>10.04</td> <td>20.0</td> <td>1 433</td> <td>00.0</td> <td>0.100</td> <td></td> <td></td>	10			12.75	10.04	20.0	1 433	00.0	0.100		
Setting ² Prequency (MHz) (dBm) ¹ mW Gain (dBi) Result dBm W (dBm) ³ mW 7 5850 7.64 5.81 28.0 Pass 35.6 3.664 Image: constraint of the second		Power setting:	s for higher								
Setting* CH: 10.10 (dbm) * mW Gain (dbl) dbm W (dbm) * mW 7 5850 7.64 5.81 28.0 Pass 35.6 3.64 Image: constraint of the set of the		Frequenc	v (MHz)				Result				1
Note 1: Output power measured using a spectrum analyzer (see plots below) with RBW=1MHz, VB=3 MHz, sample detector, max hold and power integration over 50 MHz (option #2, method 3 in KDB 558074, equivalent to method 3 of DA-02-2138A1 for NII devices). Spurious limit becomes -30dBc. Note 2: Power setting - the software power setting used during testing, included for reference only. Spectrum Analyzer Settings -5.0 -5.0 - -5.0 - Spectrum Analyzer Settings -5.0 - -5.0 - -5.0 - Spectrum Analyzer Settings -5.0 - -5.0 - -5.0 - -5.0 - -5.0 - -5.0 - -5.0 - -5.0 - -5.0 - -5.0 - -5.0 - -5.0 - -5.0 - -5.0 - -5.0 - -5.0 - -5.0 - -5.0 - -5.0 - -10.0 - - Bit 1.000 MHz -10.0 - -25.0 - -25.0 - -25.0 - -25.0 - -25.0 - -25.0 - -25.0 - -25.0 - -36.77 MHz -36.0 - 93% Bandwidth -50.0 - 38.77 MHz -56.0 -				· · /		· · · ·				(dBm) ³	mW
Note 1: hold and power integration over 50 MHz (option #2, method 3 in KDB 558074, equivalent to method 3 of DA-02-2138A1 for NII devices). Spurious limit becomes -30dBc. Note 2: Power setting - the software power setting used during testing, included for reference only. Spectrum Analyzer Settings 0.0 -5.0 -5.0 Spectrum Analyzer Settings -5.0 -10.0 -5.0 Spectrum Analyzer Settings -5.0 -10.0 -5.0 Spectrum Analyzer Settings -5.0 -10.0 -5.0 Spectrum Analyzer Settings -10.0 -10.0 -5.0 -20.00 -5.0 -20.01 -5.0 -20.02 -20.0 Attn: 20 DB -30.0 RL Offset: 11.3 DB -25.0 Sweep Time: 1.03 -30.0 Max hold: 60 sweeps -35.0 -35.0 -40.0 -45.0 -55.0 -60.0 -5820.0 5840.0 5860.0 5880.0 5900.0	1	585	50	7.64	5.81	28.0	Pass	35.6	3.664		
Max hold: 60 sweeps -35.0 Amp corr: 0.0dB -35.0 Bin size: 167 kHz -40.0 -45.0 -45.0 -45.0 -45.0 -36.77 MHz -55.0 Power Over Span -60.0 18.850 mW 5800.0 5820.0 5840.0 5860.0 5900.0	Spectrum /	Analyzer Settin	^{ngs} -5.0	-		Malproph	had prompt	nhympha.			
Bin size: 167 kHz -40.0 -45.0 -45.0 99% Bandwidth -50.0 36.77 MHz -55.0 Power Over Span -60.0 18.850 mW 5800.0 5820.0 5840.0 5860.0 5880.0 5900.0	Spectrum / SPAN: 10 RB: 1.000 VB: 3.000 Detector: Attn: 20 D RL Offset: Sweep Tir	Analyzer Settin 000 MHz MHz MHz Sample 28 : 11.3 DB me: 1.0s	-5.0 -10.0 -15.0 -20.0 -25.0	-		nil uproph	had young				
-40.0 - -45.0 - -45.0 - -45.0 - -45.0 - 	Spectrum / SPAN: 10 RB: 1.000 VB: 3.000 Detector: Attn: 20 E RL Offset: Sweep Tir Ref Lvl: 6	Analyzer Settin 000 MHz 0.000 MHz MHz Sample DB : 11.3 DB me: 1.0s .3 DBM	ාය -10.0 -15.0 -20.0 -25.0 සු -30.0			A A A A A A A A A A A A A A A A A A A	handly privately	manyan Ma			
99% Bandwidth -50.0 Image: Constraint of the second secon	Spectrum / CF: 5850. SPAN: 10 RB: 1.000 VB: 3.000 Detector: Attn: 20 E RL Offset: Sweep Tin Ref LvI: 6 Max hold: Amp corr	Analyzer Settin 000 MHz 0.000 MHz MHz Sample 28 11.3 DB me: 1.0s .3 DBM : 60 sweeps : 0.0dB	ාය -10.0 -15.0 -20.0 -25.0 සු -30.0				land ymmegy	mr mp	N		
36.77 MHz -55.0 Power Over Span -60.0 18.850 mW 5800.0 5820.0 5840.0 5860.0 5880.0 5900.0	Spectrum / CF: 5850. SPAN: 10 RB: 1.000 VB: 3.000 Detector: Attn: 20 E RL Offset: Sweep Tin Ref LvI: 6 Max hold: Amp corr	Analyzer Settin 000 MHz 0.000 MHz MHz Sample 28 11.3 DB me: 1.0s .3 DBM : 60 sweeps : 0.0dB	95 -5.0 -10.0 -15.0 -20.0 -25.0 ස් -30.0 -35.0				handly privately	mangha Ma			
Power Over Span -60.0 - 18.850 mW 5800.0 5820.0 5840.0 5860.0 5880.0 5900.0	Spectrum / CF: 5850, SPAN: 10 RB: 1.000 VB: 3.000 Detector: Attn: 20 E RL Offset: Sweep Tir Ref Lvl: 6 Max hold: Amp corr Bin size: 1	Analyzer Settin 000 MHz 0,000 MHz MHz Sample 28 11.3 DB 1.05 3 DBM 1.05 3 0.04B 60 sweeps 10.04B 667 KHz	195 -5.0 -10.0 -15.0 -20.0 -25.0 -25.0 -35.0 -35.0 -40.0				land yn maryfy				
18.850 mW 5800.0 5820.0 5840.0 5860.0 5880.0 5900.0	Spectrum / CF: 5850. SPAN: 10 RB: 1.000 VB: 3.000 Detector: Attn: 20 E RL Offset: Sweep Tin Ref LvI: 6 Max hold: Amp corr Bin size: 1	Analyzer Settin 000 MHz 0,000 MHz MHz Sample 28 : 11.3 DB me: 1.0s .3 DBM : 60 sweeps : 0.0dB 167 kHz	95 -5.0 -10.0 -15.0 -20.0 -25.0 ස් -30.0 -35.0 -40.0 -45.0				handly privately			Marylahara	
	Spectrum / CF: 5850, SPAN: 10 RB: 1.000 VB: 3.000 Detector: Attn: 20 E RL Offset: Sweep Tir Ref Lvl: 6 Max hold: Amp corr Bin size: 1 99% Band 36.77	Analyzer Settin 000 MHz 0.000 MHz MHz Sample 28 : 11.3 DB me: 1.0s .3 DBM : 60 sweeps : 0.0dB 167 kHz width MHz	195 -10.0 -15.0 -20.0 -25.0 -35.0 -35.0 -40.0 -45.0 -55.0				formely proversity			1 march 1 marc	
12.75 dBm	Spectrum / CF: 5850, SPAN: 10 RB: 1.000 VB: 3.000 Detector: Attn: 20 E RL Offset: Sweep Tim Ref Lvl: 6 Max hold: Amp corr Bin size: 1 99% Bandr 36.77 Power Ov	Analyzer Settir 000 MHz 0,000 MHz MHz Sample 28 : 11.3 DB me: 1.0s .3 DBM : 60 sweeps : 0.0dB 167 kHz width MHz er Span	195 -5.0 -10.0 -15.0 -20.0 -25.0 -35.0 -35.0 -40.0 -55.0 -55.0 -60.0		5820.0				5880.0		
99% Bandwidth and Power Over Span, 802.11n40	Spectrum / CF: 5850. SPAN: 10 RB: 1.000 VB: 3.000 Detector: Attn: 20 E RL Offset: Sweep Tin Ref Lvl: 6 Max hold: Amp corr Bin size: 1 99% Band 36.77 Power Ov 18.850	Analyzer Settir 000 MHz 0,000 MHz MHz Sample 28 11.3 DB me: 1.0s .3 DBM : 60 sweeps : 0.0dB 167 kHz width MHz er Span mW	195 -5.0 -10.0 -15.0 -20.0 -25.0 -35.0 -35.0 -40.0 -55.0 -55.0 -60.0		5820.0	5840.0) 58	60.0	5880.0	5900.0	





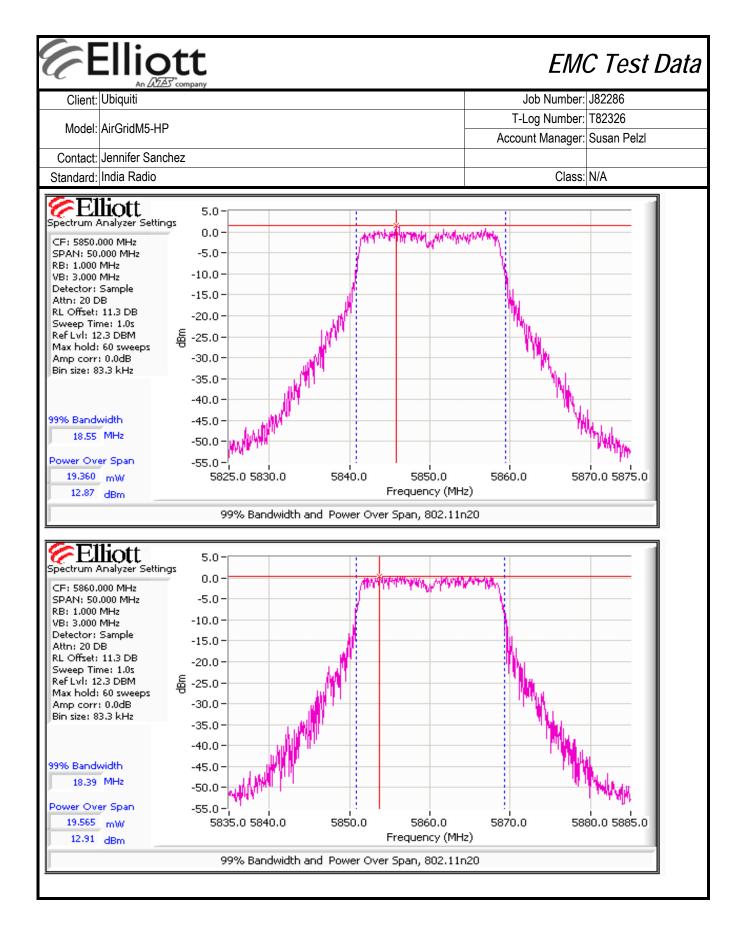


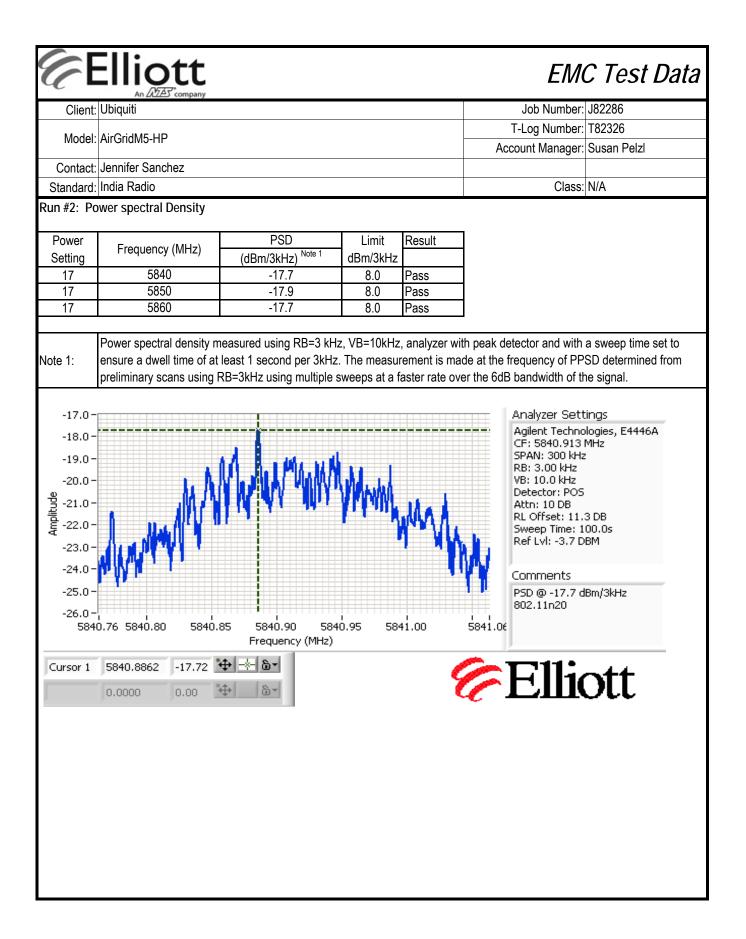


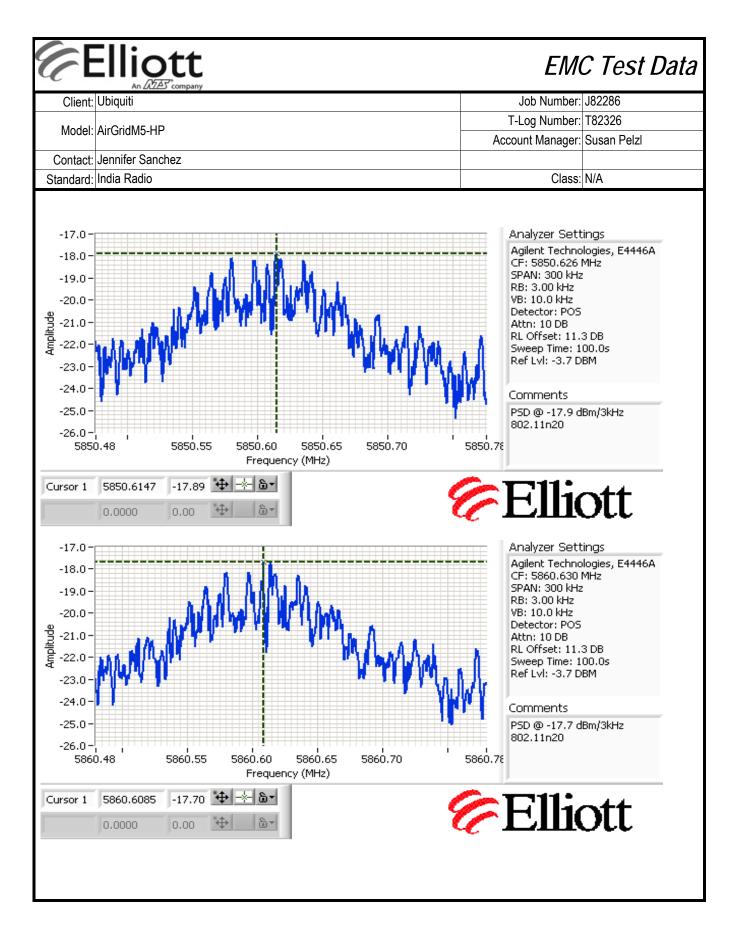


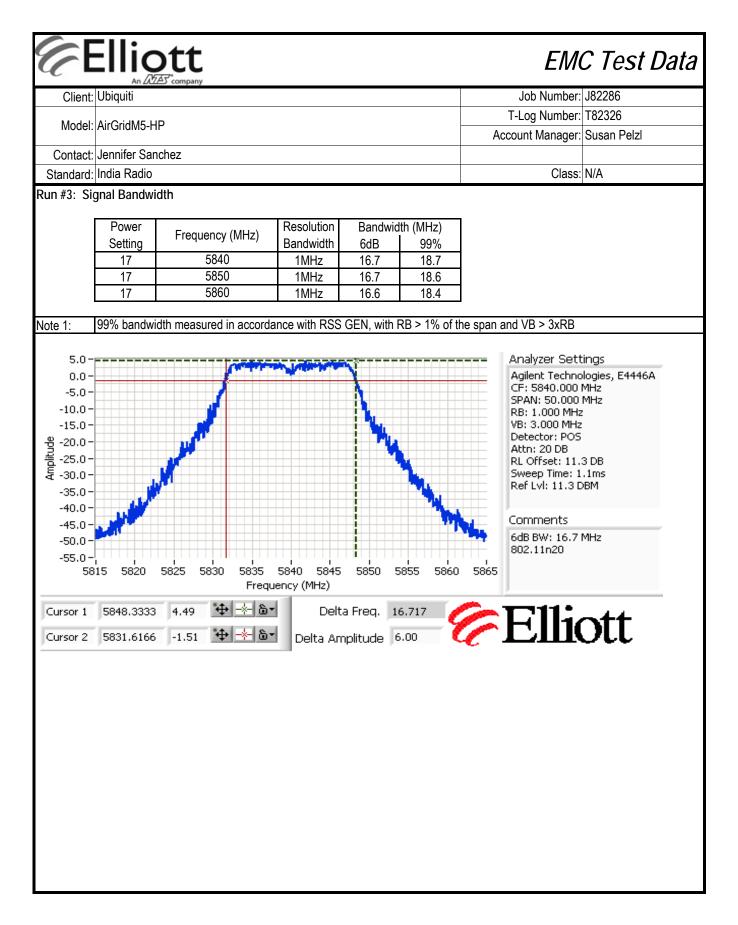
(7E	Ellic	ott					EM	C Test Data
Client:	Ubiquiti	ළ company				J	ob Number:	J82286
Model:	AirGridM5-H	D				T-L	og Number:	T82326
						Accour	nt Manager:	Susan Pelzl
	Jennifer San	chez					0	
Standard:	India Radio						Class:	N/A
		ſ	•	i) Antenna Po Bandwidth and				
Test Spec	ific Detail	s						
		The objective specification		sion is to perform fina	al qualification	testing of the	e EUT with r	espect to the
	Date of Test:				Config. Used:			
	st Engineer: est Location:		as		onfig Change:			
IE	est Location:	FT Lab #4			EUT Voltage:	PUE		
	ments have b	S: Te	d to allow for the emperature: I. Humidity:	e external attenuator: 20.4 °C 36 %	s used.			
Summary	of Result	S						
Run #	Pwr setting	Avg Pwr		Performed	Lin		Pass / Fail	Result / Margin
1	17			out Power	36dBm		Pass	35.9 dBm
2 3	17 17			ral Density (PSD) 6dB Bandwidth	8dBm/	JSKHZ	Pass Pass	-17.7 dBm/3kHz 16.6 MHz
3	17			Bandwidth			-	18.7 MHz
4	17			is emissions	-30	dBc	Pass	All emissions below the
No modifica Deviation	s From Th	ade to the EU e Standard	T during testing					

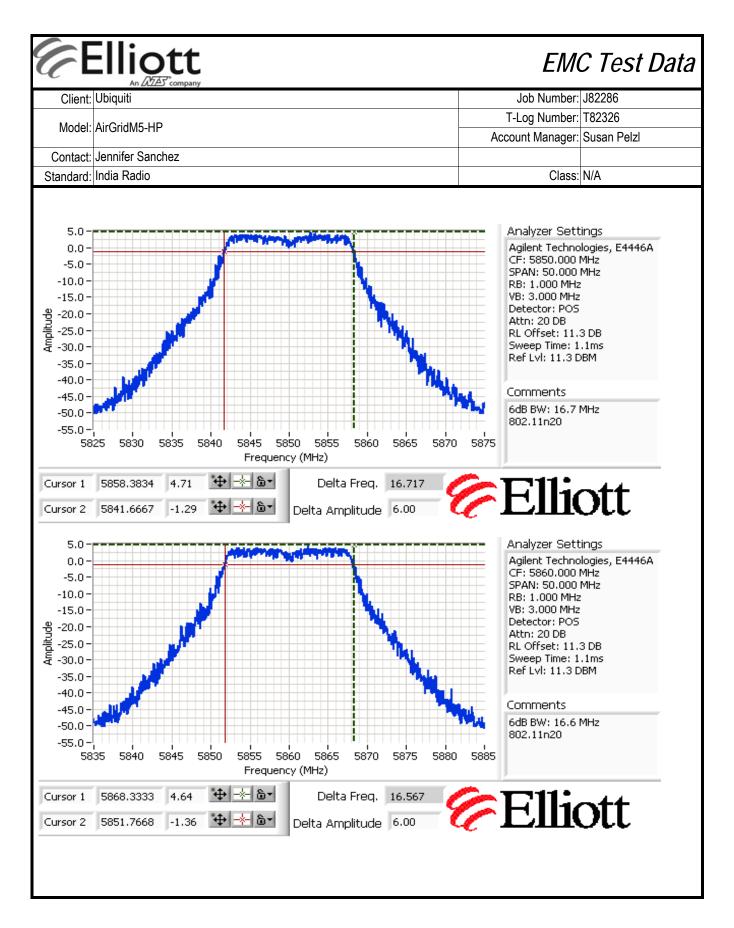
Client:		5 company						lob Number:	: J82286	
							T-Log Number: T82326			
Model:	AirGridM5-HF)					Account Manager: Susan Pelzi			
	Jennifer Sand	chez								
Standard:	India Radio							Class	: N/A	
	utput Power									
Power			<i>Ist power so that you are</i> Output Power		Antenna	EIRP Note 2		Output Power		
Setting ²	Frequency (MHz) 5840		(dBm) ¹	mW	Gain (dBi)	Result	dBm	W	(dBm) ³	mW
Setting 17			(dBill) 12.86	19.32	23.0	Pass	35.9	3.855	(автт)	11100
17	585		12.80	19.32	23.0	Pass	35.9	3.864		
17	586		12.07	19.50	23.0	Pass	35.9	3.899		
		•	12.71	10.01	20.0	1 400	00.0	0.000		
lternate P	Power settings	s for highei	r gain anteni	na						
Power	Frequenc	(MHz)	Output	Power	Antenna	Result	EIRP	Note 2	Output	Power
Setting ²	i requeric	y (11112)	(dBm) ¹	mW	Gain (dBi)	Result	dBm	W	(dBm) ³	mW
8	584		7.98	6.3	28.0	Pass	36.0	3.963		
0				• • •	00.0	Pass	35.9	2010		
8	585		7.85	6.1	28.0			3.846		
8 8 Note 1:	586 Output power hold and pow NII devices).	0 measured er integratic Spurious lir	7.87 using a spec on over 50 M mit becomes	6.1 trum analyz Hz (option # -30dBc.	28.0 er (see plots b 2, method 3 in	Pass pelow) with R n KDB 55807	35.9 BW=1MHz, ' '4, equivalen	3.864 VB=3 MHz, t to method		
8 8 Note 1: Note 2:	586 Output power hold and pow NII devices). Power setting	0 measured er integratic Spurious lin - the softw 5.0	7.87 using a spec on over 50 M mit becomes are power se	6.1 trum analyz Hz (option # -30dBc.	28.0 er (see plots b 2, method 3 in	Pass pelow) with R n KDB 55807	35.9 BW=1MHz, ' '4, equivalen	3.864 VB=3 MHz, t to method		
8 8 Note 1: Note 2:	586 Output power hold and pow NII devices). Power setting Analyzer Settin	0 measured er integratic Spurious lin - the softw 5.0	7.87 using a spec on over 50 M mit becomes are power se	6.1 trum analyz Hz (option # -30dBc.	28.0 er (see plots b t2, method 3 in uring testing,	Pass pelow) with R n KDB 55807 included for r	35.9 BW=1MHz, 7 74, equivalen reference on	3.864 VB=3 MHz, t to method		
8 8 Note 1: Note 2:	586 Output power hold and pow NII devices). Power setting Analyzer Settin 000 MHz	0 measured er integratic Spurious lir - the softw 5.0 gs 0.0	7.87 using a spec on over 50 M mit becomes are power se	6.1 trum analyz Hz (option # -30dBc.	28.0 er (see plots b t2, method 3 in uring testing,	Pass pelow) with R n KDB 55807	35.9 BW=1MHz, 7 74, equivalen reference on	3.864 VB=3 MHz, t to method		
8 8 Note 1: Note 2: Spectrum 7 CF: 5840, SPAN: 50 RB: 1.000	586 Output power hold and pow NII devices). Power setting Analyzer Settin .000 MHz .000 MHz MHz	0 measured er integratic Spurious lin - the softw 5.0 gs 0.0 -5.0	7.87 using a spec on over 50 M mit becomes are power se	6.1 trum analyz Hz (option # -30dBc.	28.0 er (see plots b t2, method 3 in uring testing,	Pass pelow) with R n KDB 55807 included for r	35.9 BW=1MHz, 7 74, equivalen reference on	3.864 VB=3 MHz, t to method		
8 8 Note 1: Note 2: Spectrum 7 CF: 5840, SPAN: 50	586 Output power hold and pow NII devices). Power setting Liott Analyzer Settin 000 MHz .000 MHz MHz MHz	0 measured er integratic Spurious lir - the softw 5.0 9 ⁵ 0.0 -5.0 -5.0	7.87 using a spec on over 50 M mit becomes are power se	6.1 trum analyz Hz (option # -30dBc.	28.0 er (see plots b t2, method 3 in uring testing,	Pass pelow) with R n KDB 55807 included for r	35.9 BW=1MHz, 7 74, equivalen reference on	3.864 VB=3 MHz, t to method		
8 8 Note 1: Note 2: Spectrum / CF: 5840. SPAN: 50 RB: 1.000 VB: 3.000 Detector: Attn: 20 D	586 Output power hold and pow NII devices). Power setting Dower setting Analyzer Settin 000 MHz MHz MHz Sample DB	0 measured er integratic Spurious lin - the softw 5.0 9 ⁵ 0.0 -5.0 -10.0 -15.0	7.87 using a spec on over 50 M mit becomes are power se	6.1 trum analyz Hz (option # -30dBc.	28.0 er (see plots b t2, method 3 in uring testing,	Pass pelow) with R n KDB 55807 included for r	35.9 BW=1MHz, 7 74, equivalen reference on	3.864 VB=3 MHz, t to method		
8 8 Note 1: Note 2: CF: 5840. SPAN: 50 RB: 1.000 VB: 3.000 Detector:	586 Output power hold and pow NII devices). Power setting Down Setting Analyzer Settin 000 MHz 000 MHz MHz Sample DB 11.3 DB	0 measured er integratic Spurious lir - the softw 5.0 9 ² 0.0 -5.0 -5.0 -10.0 -15.0 -20.0	7.87 using a spec on over 50 M mit becomes are power se	6.1 trum analyz Hz (option # -30dBc.	28.0 er (see plots b t2, method 3 in uring testing,	Pass pelow) with R n KDB 55807 included for r	35.9 BW=1MHz, 7 74, equivalen reference on	3.864 VB=3 MHz, t to method		
8 8 Note 1: Note 2: CF: 5840, SPAN: 50 RB: 1.000 VB: 3.000 Detector: Attn: 20 CF RL Offset: Sweep Tir Ref Lvl: 1:	586 Output power hold and pow NII devices). Power setting Itiott Analyzer Settin 000 MHz 000 MHz MHz Sample DB 11.3 DB me: 1.0s 2.3 DBM	0 measured er integratic Spurious lin - the softw 5.0 9 ⁵ 0.0 -5.0 -10.0 -15.0	7.87 using a spec on over 50 M mit becomes are power se	6.1 trum analyz Hz (option # -30dBc.	28.0 er (see plots b t2, method 3 in uring testing,	Pass pelow) with R n KDB 55807 included for r	35.9 BW=1MHz, 7 74, equivalen reference on	3.864 VB=3 MHz, t to method		
8 8 Note 1: Note 2: Espectrum 7 SPAN: 50 RB: 1.000 VB: 3.000 Detector: Attn: 20 E RL Offset: Sweep Tin Ref Lvl: 11 Max hold: Amp corr	586 Output power hold and pow NII devices). Power setting Diott Analyzer Settin 000 MHz .000 MHz MHz Sample Sample Sample SB 1.1.3 DB me: 1.0s 2.3 DBM : 60 sweeps : 0.0dB	0 measured er integratic Spurious lir - the softw 5.0 9 ² 0.0 -5.0 -5.0 -10.0 -15.0 -20.0	7.87 using a spec on over 50 M mit becomes are power se	6.1 trum analyz Hz (option # -30dBc.	28.0 er (see plots b t2, method 3 in uring testing,	Pass pelow) with R n KDB 55807 included for r	35.9 BW=1MHz, 7 74, equivalen reference on	3.864 VB=3 MHz, t to method		
8 8 Note 1: Note 2: Spectrum 7 CF: 5840. SPAN: 50 RB: 1.000 VB: 3.000 Detector: Attn: 20 CF RL Offset: Sweep Tin Ref LVI: 11 Max hold:	586 Output power hold and pow NII devices). Power setting Diott Analyzer Settin 000 MHz .000 MHz MHz Sample Sample Sample SB 1.1.3 DB me: 1.0s 2.3 DBM : 60 sweeps : 0.0dB	0 measured er integratic Spurious lin - the softw 5.0 9 ⁵ 0.0 -5.0 -5.0 -10.0 -15.0 -20.0 慶 -25.0	7.87 using a spec on over 50 M mit becomes are power se	6.1 trum analyz Hz (option # -30dBc.	28.0 er (see plots b t2, method 3 in uring testing,	Pass pelow) with R n KDB 55807 included for r	35.9 BW=1MHz, 7 74, equivalen reference on	3.864 VB=3 MHz, t to method		
8 8 Note 1: Note 2: Espectrum 7 SPAN: 50 RB: 1.000 VB: 3.000 Detector: Attn: 20 E RL Offset: Sweep Tin Ref Lvl: 11 Max hold: Amp corr	586 Output power hold and pow NII devices). Power setting Diott Analyzer Settin 000 MHz .000 MHz MHz Sample Sample Sample SB 1.1.3 DB me: 1.0s 2.3 DBM : 60 sweeps : 0.0dB	0 measured er integratic Spurious lin - the softw gs 0.0 -5.0 -10.0 -15.0 -15.0 -20.0 慶 -25.0 -30.0 -35.0	7.87 using a spec on over 50 M mit becomes are power se	6.1 trum analyz Hz (option # -30dBc.	28.0 er (see plots b t2, method 3 in uring testing,	Pass pelow) with R n KDB 55807 included for r	35.9 BW=1MHz, 7 74, equivalen reference on	3.864 VB=3 MHz, t to method		
8 8 Note 1: Note 2: Spectrum / CF: 5840, SPAN: 50 RB: 1.000 VB: 3.000 Detector: Attn: 20 E RL Offset: Sweep Tin Ref Lvl: 1 Max hold: Amp corr Bin size: 8	586 Output power hold and pow NII devices). Power setting Dower setting Analyzer Settin 000 MHz MHz Sample Sample SB 11.3 DB me: 1.0s 2.3 DBM : 60 sweeps : 0.0dB 33.3 kHz	0 measured er integratic Spurious lir - the softw -5.0 -5.0 -10.0 -15.0 -20.0 慶 -25.0 -30.0 -35.0 -35.0	7.87 using a spec on over 50 M mit becomes are power se	6.1 trum analyz Hz (option # -30dBc.	28.0 er (see plots b t2, method 3 in uring testing,	Pass pelow) with R n KDB 55807 included for r	35.9 BW=1MHz, 7 74, equivalen reference on	3.864 VB=3 MHz, t to method		
8 8 Note 1: Note 2: CF: 5840. SPAN: 50 RB: 1.000 VB: 3.000 Detector: Attn: 20 E RL Offset: Sweep Tir Ref Lvl: 1: Max hold: Max hold: Bin size: 8	586 Output power hold and pow NII devices). Power setting Dower setting Analyzer Settin 000 MHz MHz Sample Sample SB 11.3 DB me: 1.0s 2.3 DBM : 60 sweeps : 0.0dB 33.3 kHz	0 measured er integratic Spurious lir - the softw -5.0 -5.0 -10.0 -15.0 -20.0 慶 -25.0 -30.0 -35.0 -35.0 -40.0 -45.0	7.87 using a spec on over 50 M mit becomes are power se	6.1 trum analyz Hz (option # -30dBc.	28.0 er (see plots b t2, method 3 in uring testing,	Pass pelow) with R n KDB 55807 included for r	35.9 BW=1MHz, 7 74, equivalen reference on	3.864 VB=3 MHz, t to method		
8 8 Note 1: Note 2: Spectrum / CF: 5840, SPAN: 50 RB: 1,000 VB: 3,000 Detector: Attn: 20 E RL Offset: Sweep Tir Ref Lvl: 1: Max hold: Amp corr Bin size: 8 99% Band 18,72	586 Output power hold and pow NII devices). Power setting Dower setting Iliott Analyzer Settin 000 MHz MHz Sample Sample SB 11.3 DB me: 1.0s 2.3 DBM : 60 sweeps : 0.0dB 3.3 kHz width MHz	0 measured er integratic Spurious lir - the softw -5.0 -5.0 -10.0 -15.0 -20.0 価子 -25.0 -30.0 -35.0 -40.0 -40.0 -50.0	7.87 using a spec on over 50 M mit becomes are power se	6.1 trum analyz Hz (option # -30dBc.	28.0 er (see plots b t2, method 3 in uring testing,	Pass pelow) with R n KDB 55807 included for r	35.9 BW=1MHz, 7 74, equivalen reference on	3.864 VB=3 MHz, t to method		
8 8 Note 1: Note 2: Spectrum / CF: 5840, SPAN: 50 RB: 1.000 VB: 3.000 Detector: Attn: 20 E RL Offset: Sweep Tir Ref Lvl: 1: Max hold: Amp corr Bin size: 8 99% Band 18.72 Power Ov	586 Output power hold and pow NII devices). Power setting Dower setting Iliott Analyzer Settin 000 MHz MHz Sample Sample SB 11.3 DB me: 1.0s 2.3 DBM : 60 sweeps : 0.0dB 33.3 kHz width MHz sample	0 measured er integratic Spurious lir - the softw -5.0 -5.0 -10.0 -15.0 -20.0 優 -25.0 -30.0 -35.0 -40.0 -55.0	7.87 using a spec on over 50 M mit becomes are power se	6.1 trum analyze Hz (option # -30dBc. etting used d	28.0 er (see plots t 2, method 3 in uring testing,	Pass pelow) with R n KDB 55807 included for n	35.9 BW=1MHz, ' '4, equivalen	3.864 VB=3 MHz, t to method ly.	3 of DA-02-2	
8 8 Note 1: Note 2: Spectrum / CF: 5840, SPAN: 50 RB: 1.000 VB: 3.000 Detector: Attn: 20 E RL Offset: Sweep Tir Ref Lvl: 1 Max hold: Amp corr Bin size: 8 99% Band 18.72	586 Output power hold and pow NII devices). Power setting Dower setting Comment Analyzer Settin 000 MHz MHz Sample	0 measured er integratic Spurious lir - the softw -5.0 -5.0 -10.0 -15.0 -20.0 優 -25.0 -30.0 -35.0 -40.0 -55.0	7.87 using a spec on over 50 M mit becomes are power se	6.1 trum analyze Hz (option # -30dBc. etting used d	28.0 er (see plots t 2, method 3 in uring testing,	Pass pelow) with R n KDB 55807 included for r	35.9 BW=1MHz, ' '4, equivalen	3.864 VB=3 MHz, t to method ly.		

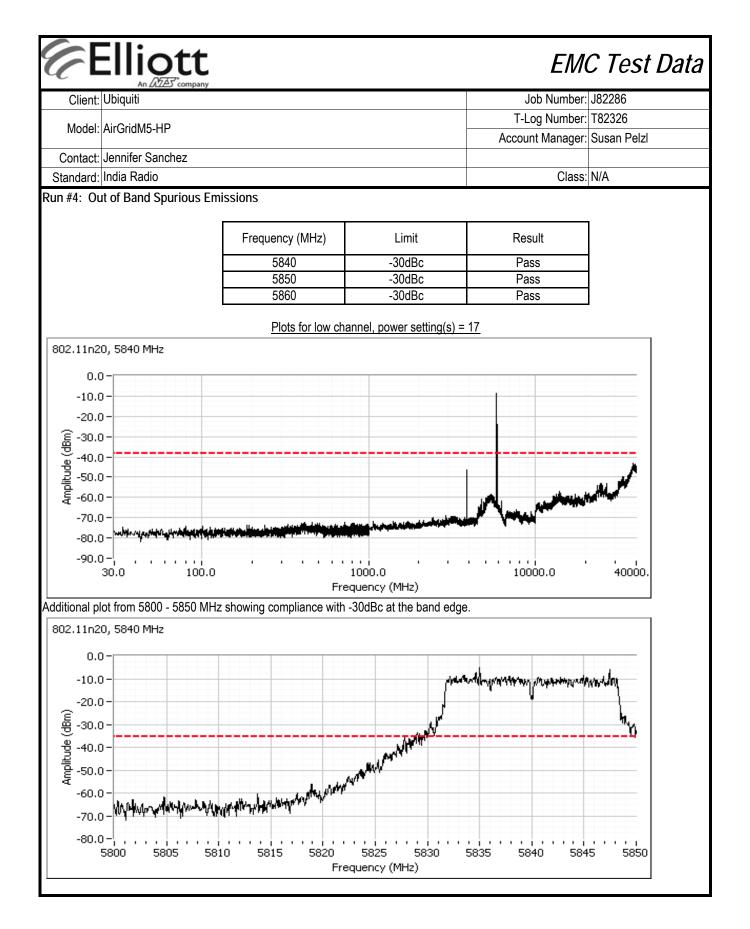


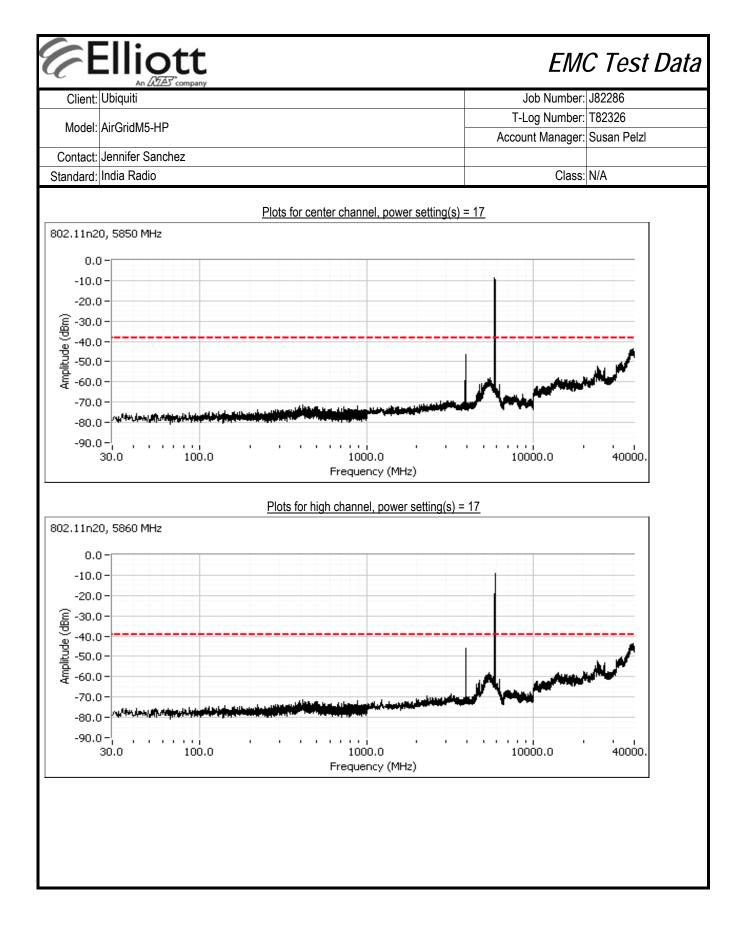


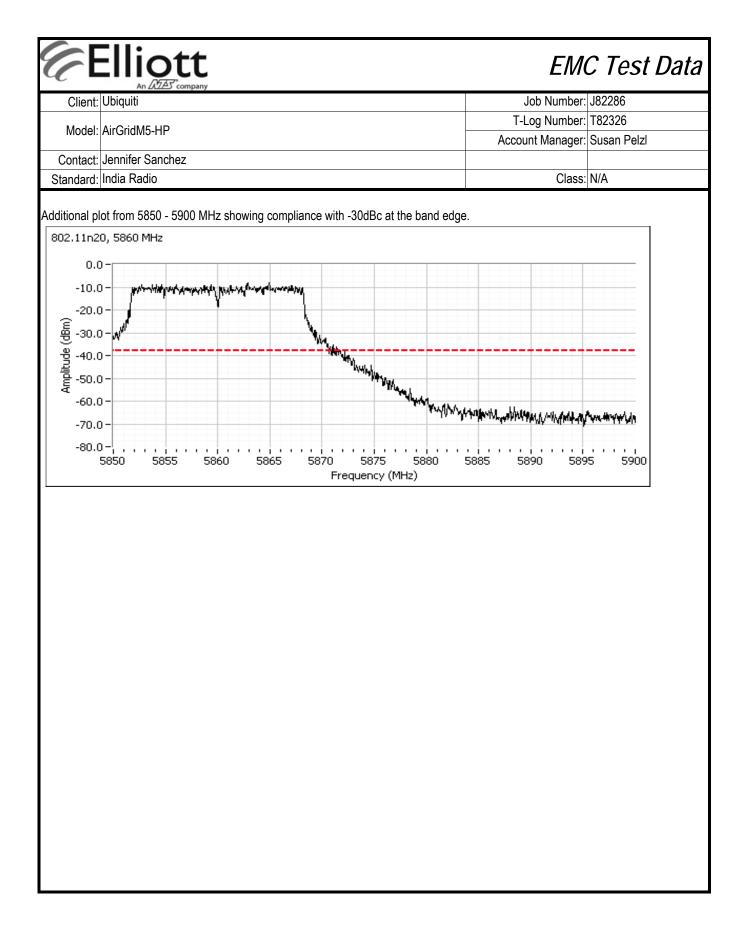






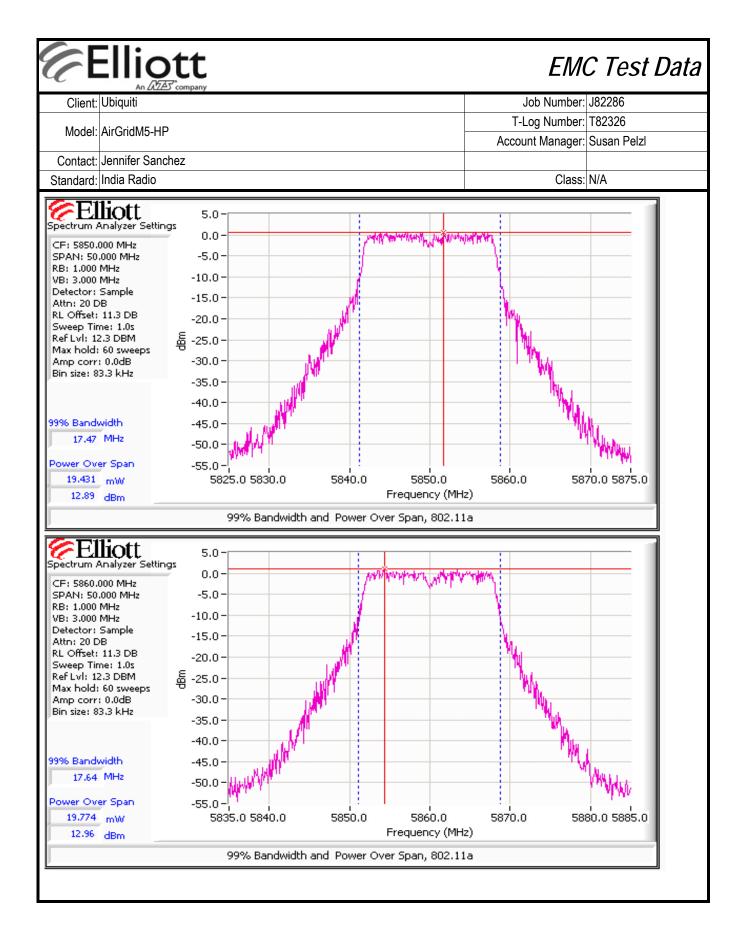


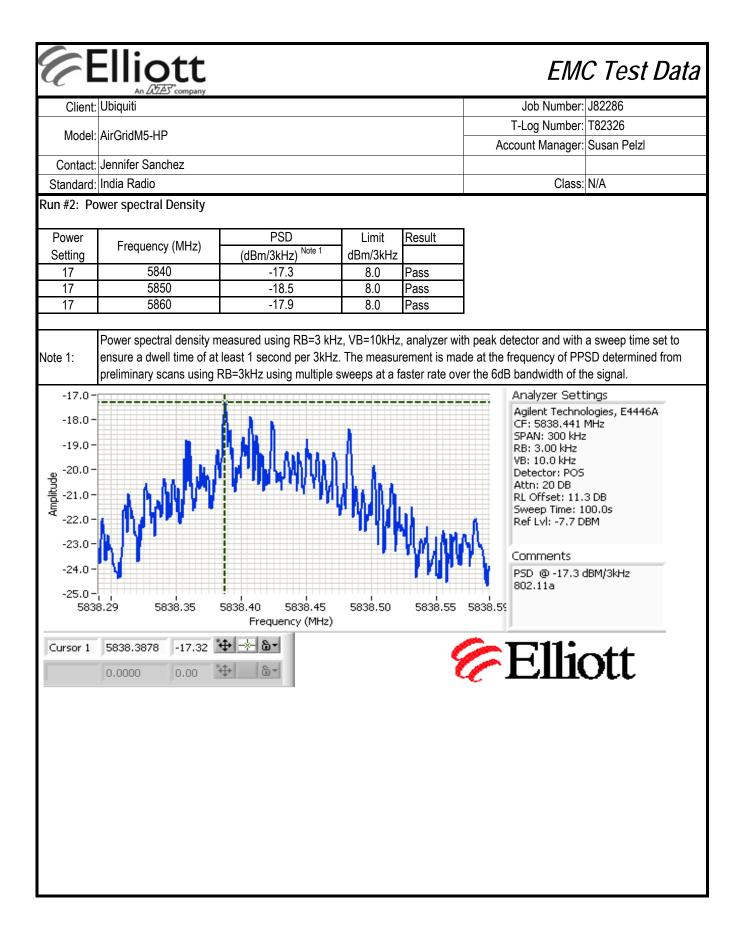


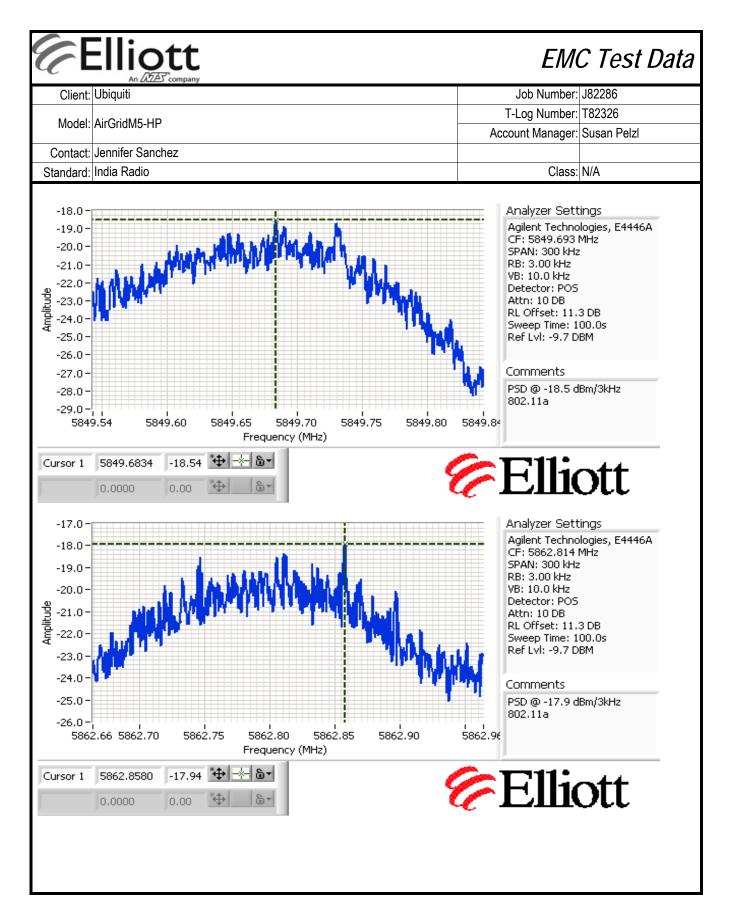


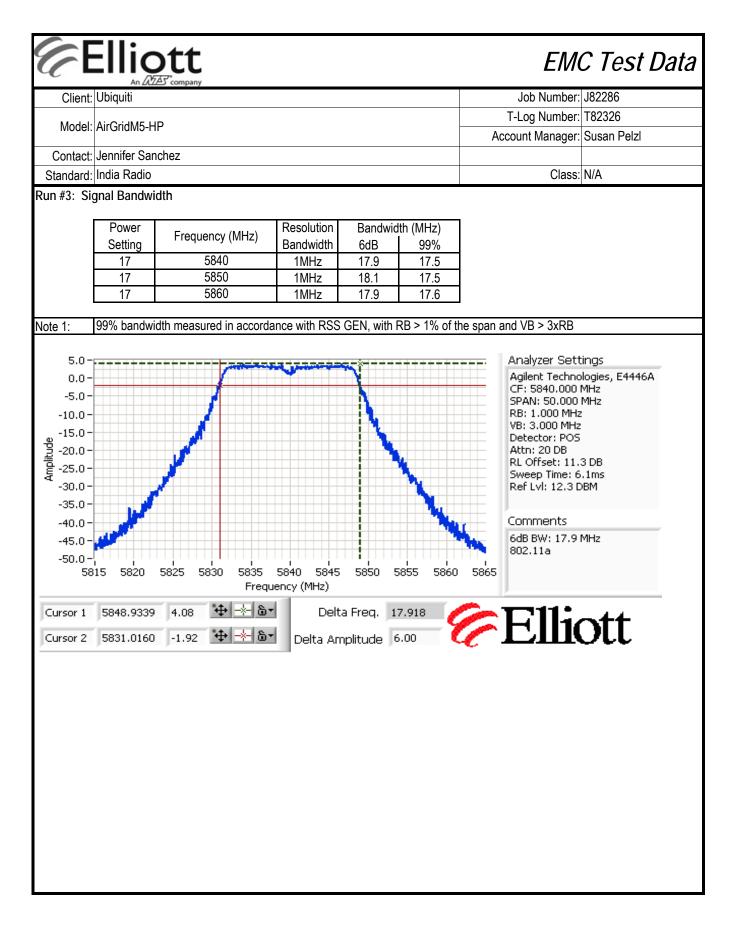
E	Ellic	ott			EM	C Test Data
	An AZ	AS company			Job Number:	J82286
Martal		D			T-Log Number:	T82326
Model:	AirGridM5-H	Р			Account Manager:	Susan Pelzl
Contact:	Jennifer San	chez				
Standard:	India Radio				Class:	N/A
		F	India (DTS) Antenna Por Power, PSD, Bandwidth and S			
Test Spec	cific Detail	S				
		The objective specification	of this test session is to perform finalisted above.	al qualification to	esting of the EUT with r	espect to the
	Date of Test:	3/2/2011	C	Config. Used: 1		
	-	Rafael Varela	as Co	nfig Change: n		
Te	est Location:	FT Lab #4	E	EUT Voltage: P	OE	
Ambient (ments have b Conditions	S: Te Re	d to allow for the external attenuators emperature: 20.4 °C I. Humidity: 36 %	s used.		
Sammary	ornesun	3				
Run #	Pwr setting	Avg Pwr	Test Performed	Limi		Result / Margin
1	17		Output Power	36dBm I		36 dBm
2	17 17		Power spectral Density (PSD) Minimum 6dB Bandwidth	8dBm/3		-17.3 dBm/3kHz
3	17		99% Bandwidth		Pass	17.9 MHz 17.5 MHz
4	17		Spurious emissions	-30dl	Bc Pass	All emissions below the limit
No modificat	tions were ma s From Th	e Standar	T during testing			

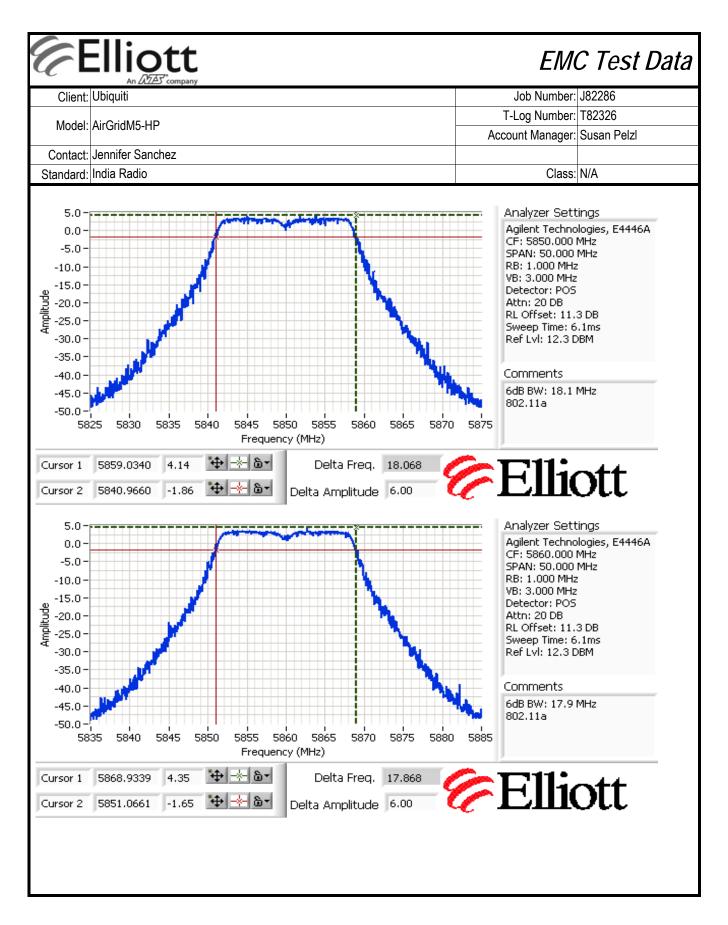
Cliant		company						lob Number:	182286	
Client.	Obiquiti						T-Log Number: Account Manager:			
Model:	AirGridM5-HF)								
Contact:	Jennifer Sand	hez								
Standard:	India Radio							Class	N/A	
	utput Power									
	ot exceed 36	dBm - adju				elow 36dBn	n EIRP. Red EIRP	Cord the PD		Davian
Power	Frequency (MHz)		•	Power	Antenna	Result			Output	
Setting ²			(dBm) ¹	mW	Gain (dBi)		dBm	W	(dBm) ³	mW
17	584		12.97	19.82	23.0	Pass	36.0	3.954		
17	585		12.89	19.45	23.0	Pass	35.9	3.882		
17	586	0	12.96	19.77	23.0	Pass	36.0	3.945		
lternate P	Power settings	s for higher	r gain anteni	na						
Power			× ·	Power	Antenna	<u>ь</u>	EIRP	Note 2	Output	Power
Setting ²	Frequency	y (MHz)	(dBm) ¹	mW	Gain (dBi)	Result	dBm	W	(dBm) ³	mW
8	584	0	7.89	6.2	28.0	Pass	35.9	3.882		
8	585		7.95	6.2	28.0	Pass	36.0	3.936		
		-	1.75	v. <u>~</u>	20.0			0.000		_
8 Note 1:	586 Output power hold and pow NII devices).	r measured er integratic Spurious lir	on over 50 M mit becomes	Hz (option # -30dBc.	2, method 3 ir	n KDB 55807	74, equivalen	t to method		
8 Note 1: Note 2:	586 Output power hold and pow NII devices). Power setting	measured er integratic Spurious lir - the softw 5.0	using a spec on over 50 M nit becomes are power se	trum analyz Hz (option # -30dBc.	er (see plots b 2, method 3 ir	pelow) with R n KDB 55807	BW=1MHz, ' 74, equivalen	VB=3 MHz, t to method		
8 Note 1: Note 2:	586 Output power hold and pow NII devices). Power setting Analyzer Settin	measured er integratic Spurious lir - the softw 5.0	using a spec on over 50 M nit becomes are power se	trum analyz Hz (option # -30dBc.	er (see plots b 2, method 3 ir uring testing,	below) with R n KDB 55807 included for i	BW=1MHz, ' 74, equivalen reference on	VB=3 MHz, t to method		
8 Note 1: Note 2:	586 Output power hold and pow NII devices). Power setting hoalyzer Settin 000 MHz	measured er integratic Spurious lir - the softw 5.0 gs 0.0	using a spec on over 50 M nit becomes are power se	trum analyz Hz (option # -30dBc.	er (see plots b 2, method 3 ir uring testing,	pelow) with R n KDB 55807	BW=1MHz, ' 74, equivalen reference on	VB=3 MHz, t to method		
8 Note 1: Note 2: Spectrum / CF: 5840, SPAN: 50 RB: 1.000	586 Output power hold and pow NII devices). Power setting Dower setting Analyzer Settin 000 MHz .000 MHz MHz	measured er integratic Spurious lir - the softw 5.0 9 ^s 0.0 -5.0	using a spec on over 50 M nit becomes are power se	trum analyz Hz (option # -30dBc.	er (see plots b 2, method 3 ir uring testing,	below) with R n KDB 55807 included for i	BW=1MHz, ' 74, equivalen reference on	VB=3 MHz, t to method		
8 Note 1: Note 2: Spectrum 7 CF: 5840. SPAN: 50 RB: 1.000 VB: 3.000	586 Output power hold and pow NII devices). Power setting Liott Analyzer Settin 000 MHz .000 MHz MHz MHz	measured er integratic Spurious lir - the softw 5.0 9 ⁵ 0.0 -5.0 -10.0	using a spec on over 50 M nit becomes are power se	trum analyz Hz (option # -30dBc.	er (see plots b 2, method 3 ir uring testing,	below) with R n KDB 55807 included for i	BW=1MHz, ' 74, equivalen reference on	VB=3 MHz, t to method		
8 Note 1: Note 2: Spectrum / CF: 5840. SPAN: 50 RB: 1.000 VB: 3.000 VB: 3.000 Detector: Attn: 20 D	586 Output power hold and pow NII devices). Power setting Dower setting Itott Analyzer Settin 000 MHz .000 MHz MHz Sample SB	measured er integratic Spurious lir - the softw 5.0 9 ^s 0.0 -5.0	using a spec on over 50 M nit becomes are power se	trum analyz Hz (option # -30dBc.	er (see plots b 2, method 3 ir uring testing,	below) with R n KDB 55807 included for i	BW=1MHz, ' 74, equivalen reference on	VB=3 MHz, t to method		
8 Note 1: Note 2: Spectrum / CF: 5840. SPAN: 50 RB: 1.000 VB: 3.000 Detector: Attn: 20 E RL Offset:	586 Output power hold and pow NII devices). Power setting Dower setting Analyzer Settin 000 MHz .000 MHz MHz MHz Sample B 11.3 DB	measured er integratic Spurious lir - the softw 5.0 9 ⁵ 0.0 -5.0 -10.0	using a spec on over 50 M nit becomes are power se	trum analyz Hz (option # -30dBc.	er (see plots b 2, method 3 ir uring testing,	below) with R n KDB 55807 included for i	BW=1MHz, ' 74, equivalen reference on	VB=3 MHz, t to method		
8 Note 1: Note 2: Spectrum / CF: 5840. SPAN: 50 RB: 1.000 VB: 3.000 Detector: Attn: 20 E	586 Output power hold and pow NII devices). Power setting Dower setting Analyzer Settin 000 MHz .000 MHz MHz Sample B 11.3 DB me: 1.0s	measured er integratic Spurious lin - the softw 5.0 9 ⁵ 0.0 -5.0 -5.0 -10.0 -15.0 -20.0	using a spec on over 50 M nit becomes are power se	trum analyz Hz (option # -30dBc.	er (see plots b 2, method 3 ir uring testing,	below) with R n KDB 55807 included for i	BW=1MHz, ' 74, equivalen reference on	VB=3 MHz, t to method		
8 Note 1: Spectrum / CF: 5840, SPAN: 50 RB: 1.000 VB: 3.000 Detector: Attn: 20 DE RL Offset: Sweep Tir Ref LVI: 11 Max hold:	586 Output power hold and pow NII devices). Power setting ILIOTT Analyzer Settin 000 MHz .000 MHz MHz Sample DB 11.3 DB me: 1.0s 6.3 DBM : 60 sweeps	measured er integratic Spurious lir - the softw 5.0 9 ⁵ 0.0 -5.0 -10.0 -15.0 -15.0 -20.0 출 -25.0	using a spec on over 50 M nit becomes are power se	trum analyz Hz (option # -30dBc.	er (see plots b 2, method 3 ir uring testing,	below) with R n KDB 55807 included for i	BW=1MHz, ' 74, equivalen reference on	VB=3 MHz, t to method		
8 Note 1: Spectrum / CF: 5840, SPAN: 50 RB: 1,000 VB: 3,000 Detector: Attn: 20 E RL Offset: Sweep Tir Ref Lvl: 1/	586 Output power hold and pow NII devices). Power setting Diott Analyzer Settin 000 MHz .000 MHz MHz Sample B 11.3 DB me: 1.05 6.3 DBM : 60 sweeps : 0.0dB	r measured er integratic Spurious lir - the softw 5.0 -5.0 -5.0 -10.0 -15.0 -20.0 慶 -25.0 -30.0	using a spec on over 50 M nit becomes are power se	trum analyz Hz (option # -30dBc.	er (see plots b 2, method 3 ir uring testing,	below) with R n KDB 55807 included for i	BW=1MHz, ' 74, equivalen reference on	VB=3 MHz, t to method		
8 Note 1: Note 2: Spectrum / CF: 5840, SPAN: 50 RB: 1.000 VB: 3.000 Detector: Attn: 20 E RL Offset: Sweep Tin Ref LvI: 11 Max hold: Amp corr	586 Output power hold and pow NII devices). Power setting Diott Analyzer Settin 000 MHz .000 MHz MHz Sample B 11.3 DB me: 1.05 6.3 DBM : 60 sweeps : 0.0dB	measured er integratic Spurious lir - the softw 5.0 9 ⁵ 0.0 -5.0 -10.0 -15.0 -15.0 -20.0 출 -25.0	using a spec on over 50 M nit becomes are power se	trum analyz Hz (option # -30dBc.	er (see plots b 2, method 3 ir uring testing,	below) with R n KDB 55807 included for i	BW=1MHz, ' 74, equivalen reference on	VB=3 MHz, t to method		
8 Note 1: Spectrum / CF: 5840. SPAN: 50 RB: 1.000 VB: 3.000 Detector: Attn: 20 E RL Offset: Sweep Tin Ref Lvl: 11 Max hold: Amp corr Bin size: 8	586 Output power hold and pow NII devices). Power setting Iliott Analyzer Settin 000 MHz .000 MHz MHz Sample B 11.3 DB me: 1.0s 6.3 DBM : 60 sweeps : 0.0dB :3.3 kHz	r measured er integratic Spurious lir - the softw 5.0 -5.0 -5.0 -10.0 -15.0 -20.0 慶 -25.0 -30.0	using a spec on over 50 M nit becomes are power se	trum analyz Hz (option # -30dBc.	er (see plots b 2, method 3 ir uring testing,	below) with R n KDB 55807 included for i	BW=1MHz, ' 74, equivalen reference on	VB=3 MHz, t to method		
8 Note 1: Note 2: Spectrum 7 CF: 5840, SPAN: 50 RB: 1.000 VB: 3.000 VB: 3.000 VB: 3.000 Detector: Attn: 20 E RL Offset: Sweep Tin Ref Lvl: 11 Max hold; Amp corr Bin size: 8	586 Output power hold and pow NII devices). Power setting Dower setting Contemporal Analyzer Settin 000 MHz MHz Sample Samble Sample Samble Sa	measured er integratic Spurious lir - the softw - 5.0 -5.0 -10.0 -15.0 -20.0 慶 -25.0 -30.0 -35.0	using a spec on over 50 M nit becomes are power se	trum analyz Hz (option # -30dBc.	er (see plots b 2, method 3 ir uring testing,	below) with R n KDB 55807 included for i	BW=1MHz, ' 74, equivalen reference on	VB=3 MHz, t to method		
8 Note 1: Note 2: Spectrum 7 CF: 5840, SPAN: 50 RB: 1.000 VB: 3.000 VB: 3.000 VB: 3.000 Detector: Attn: 20 E RL Offset: Sweep Tin Ref Lvl: 11 Max hold; Amp corr Bin size: 8	586 Output power hold and pow NII devices). Power setting Iliott Analyzer Settin 000 MHz .000 MHz MHz Sample B 11.3 DB me: 1.0s 6.3 DBM : 60 sweeps : 0.0dB :3.3 kHz	r measured er integratic Spurious lir - the softw 5.0 -5.0 -10.0 -15.0 -20.0 優 -25.0 -30.0 -35.0 -40.0	using a spec on over 50 M nit becomes are power se	trum analyz Hz (option # -30dBc.	er (see plots b 2, method 3 ir uring testing,	below) with R n KDB 55807 included for i	BW=1MHz, ' 74, equivalen reference on	VB=3 MHz, t to method		
8 Note 1: Note 2: Spectrum / CF: 5840. SPAN: 50 RB: 1.000 VB: 3.000 Detector: Attn: 20 E RL Offset: Sweep Tir Ref Lvl: 11 Max hold: Amp corr Bin size: 8 99% Band 17.47 Power Ov	586 Output power hold and pow NII devices). Power setting Dower setting Iliott Analyzer Settin 000 MHz MHz Sample B 11.3 DB me: 1.0s 6.3 DBM : 60 sweeps : 0.0dB :3.3 kHz width MHz er Span	measured er integratic Spurious lir - the softw 5.0 -5.0 -10.0 -10.0 -15.0 -20.0 極 -25.0 -30.0 -35.0 -40.0 -55.0	using a spec on over 50 M nit becomes are power se	trum analyz Hz (option # -30dBc. etting used d	er (see plots b 2, method 3 ir uring testing,	pelow) with R n KDB 55807 included for r	BW=1MHz, ' 74, equivalen	VB=3 MHz, t to method	3 of DA-02-21	
8 Note 1: Note 2: Espectrum 7 CF: 5840, SPAN: 50 RB: 1.000 VB: 3.000 VB: 3.000 Detector: Attn: 20 E RL Offset: Sweep Tir Ref Lvl: 11 Max hold; Amp corr Bin size: 8 99% Band 17.47 Power Ov 19.823	586 Output power hold and pow NII devices). Power setting Dower setting Contemporal Analyzer Settin 000 MHz MHz Sample Sa	measured er integratic Spurious lir - the softw 5.0 -5.0 -10.0 -10.0 -15.0 -20.0 極 -25.0 -30.0 -35.0 -40.0 -55.0	using a spec on over 50 M nit becomes are power se	trum analyz Hz (option # -30dBc. etting used d	er (see plots b 2, method 3 ir uring testing,	5840.0	BW=1MHz, ' 74, equivalen	VB=3 MHz, t to method		
8 Note 1: Note 2: Espectrum 7 CF: 5840, SPAN: 50 RB: 1.000 VB: 3.000 VB: 3.000 Detector: Attn: 20 E RL Offset: Sweep Tir Ref Lvl: 11 Max hold; Amp corr Bin size: 8 99% Band 17.47 Power Ov 19.823	586 Output power hold and pow NII devices). Power setting Dower setting Iliott Analyzer Settin 000 MHz MHz Sample B 11.3 DB me: 1.0s 6.3 DBM : 60 sweeps : 0.0dB :3.3 kHz width MHz er Span	measured er integratic Spurious lir - the softw 5.0 -5.0 -10.0 -10.0 -15.0 -20.0 極 -25.0 -30.0 -35.0 -40.0 -55.0	using a spec on over 50 M nit becomes are power se	trum analyz Hz (option # -30dBc. etting used d	er (see plots b 2, method 3 ir uring testing,	5840.0 quency (MHz	BW=1MHz, ' 74, equivalen reference on 1990 1990 1990 1990 1990 1990 1990 199	VB=3 MHz, t to method	3 of DA-02-21	

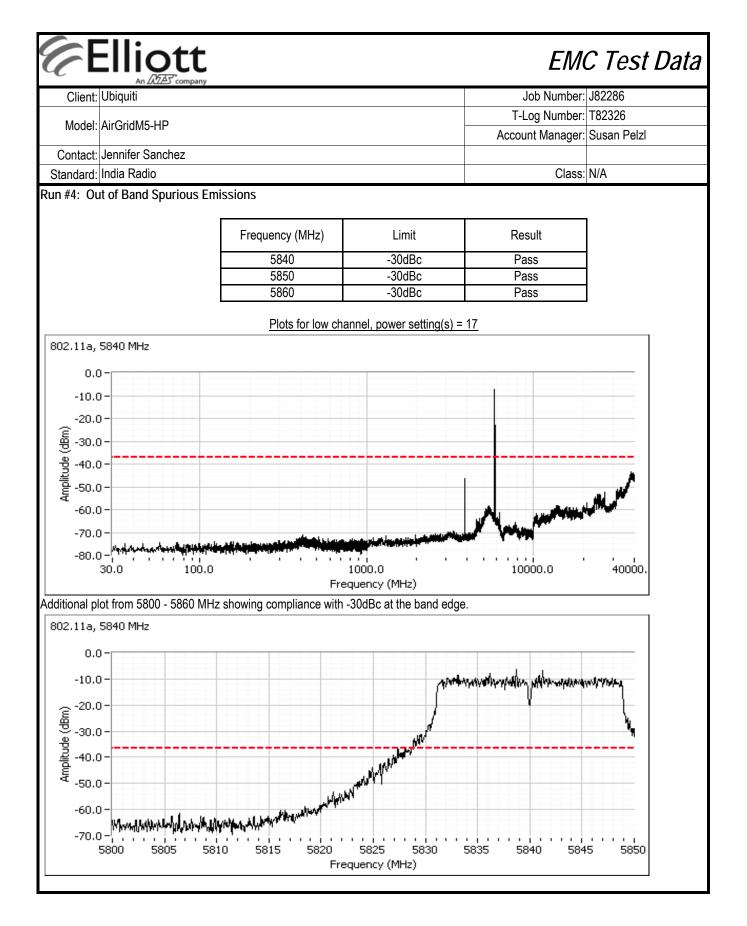


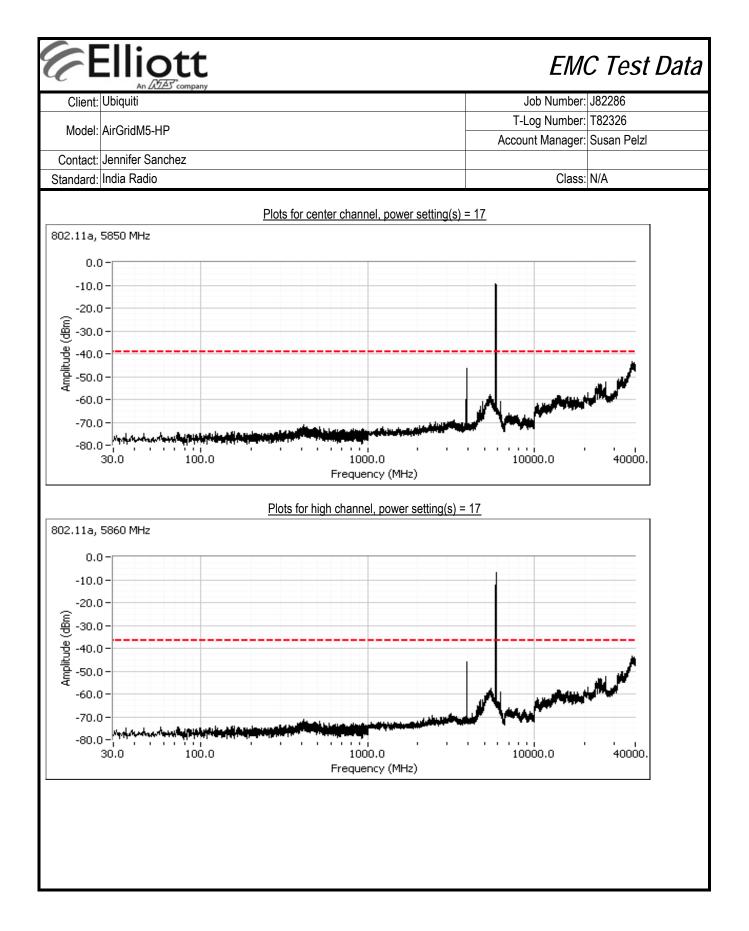


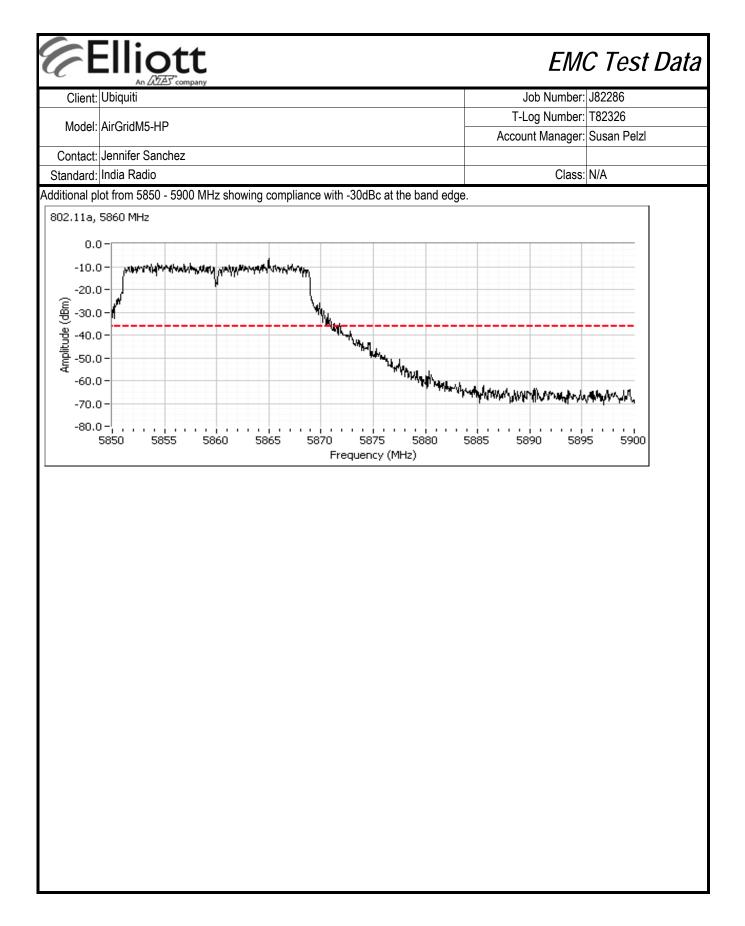




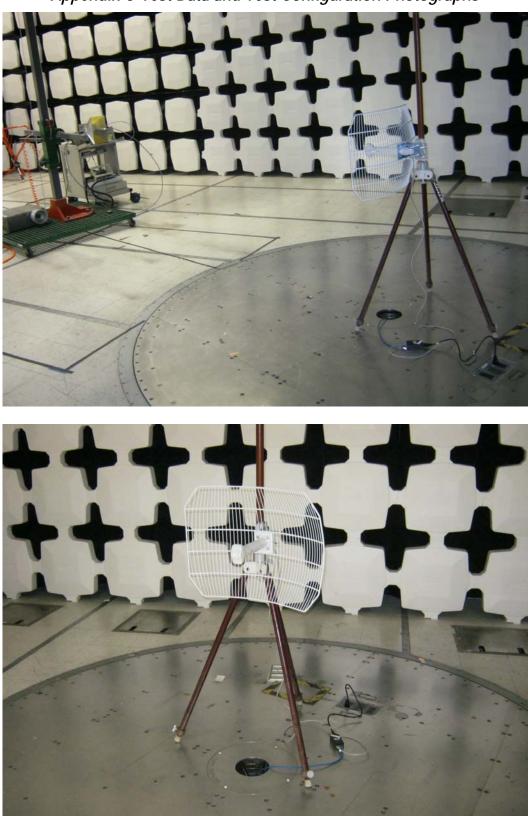








-	An		apany				EM	
Client	Ubiquiti						Job Number:	
Model	AirGridM5	5-HP					T-Log Number:	
<u> </u>		I					Account Manager:	Susan Pelzl
	Jennifer S India Rad						Class:	N/Δ
Stanuaru		10					01833.	N/A
			N	laximum	n Permis	sible Exp	posure	
Fest Spe	cific Det	ails						
	te of Test: Engineer:							
Calculation Where: S is		ree space S : nsity (W/i	e transmissi = (PG)/(4 πα	d ²)	W), G is ant	enna gain rel	ative to isotropic, d is se	paration distance from
	y of Res	()						
	Device c	omplies v	with Power I	• •	iirements at separation:	Y 60		
Jse: Antenna:			ax eirp in eit		3.96W			
ntenna:	23dBi or 2	5 GHz si	ngle transn	nitters		Γ	Power Density (S)	MPE Limit
ntenna: I <u>SE THIS</u> Freq.	23dBi or 2 FOR 1.5-1 EU Pow	<u>5 GHz si</u> IT ver	ngle transn Cable Loss	nitters Ant Gain	Power at Ant	EIRP	Power Density (S) at 20 cm	at 20 cm
Antenna:	23dBi or 2 FOR 1.5-11 EU	5 GHz si	ngle transn Cable	nitters Ant	Power	EIRP mW 3962.78		



Appendix C Test Data and Test Configuration Photographs

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