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Report On

Radio Frequency Exposure Evaluation of the
Hughes Network Systems
9105 Thuraya WLAN Satellite Terminal
IP Voyager and Orion IP

Title 47 Subpart J §2.1091 and KDB 447498 D01

Report No. SD72102234G March 2015

REPORT ON	Radio Frequency Exposure Testing of the Hughes Network Systems 9105 Thuraya WLAN Satellite Terminal IP Voyager and Orion IP
TEST REPORT NUMBER	SD72102234G
PREPARED FOR	Hughes Network Systems 9605 Scranton Road, Suite 500 San Diego, CA 92121
CONTACT PERSON	David Couchman Principal Engineer (858) 452-4648 Dave.Couchman@hughes.com
PREPARED BY	Alex Chang **Name** Title: EMC/Wireless Test Engineer
APPROVED BY	Juan Manuel Gonzalez **Name** Authorized Signatory Title: Commercial/Wireless EMC Lab Manager
DATED	March 17, 2015

TÜV SÜD AMERICA INC 10040 Mesa Rim Road San Diego, CA 92121-2912 Phone: 858 678 1400 FAX: 858 546 0364

Revision History

SD72102234G Hughes Network Systems 9105 Thuraya WLAN Satellite Terminal IP Voyager and Orion IP					
DATE	OLD REVISION	NEW REVISION	REASON	PAGES AFFECTED	APPROVED BY
03/17/2015	Initial Release				Juan M. Gonzalez

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SECTION 1

REPORT SUMMARY

Radio Frequency Exposure Testing of the
Hughes Network Systems
9105 Thuraya WLAN Satellite Terminal
IP Voyager and Orion IP

TÜV SÜD AMERICA INC 10040 Mesa Rim Road San Diego, CA 92121-2912 Phone: 858 678 1400 FAX: 858 546 0364

1.1 INTRODUCTION

The information contained in this report is intended to show verification of the 9105 IP Voyager and Orion IP Thuraya WLAN Satellite Terminal to the requirements of Title 47 Subpart J §2.1091 and KDB 447498 D01.

Objective	To verify compliance of the Equipment Under Test (EUT) with regards to radio frequency exposure hazard as defined under the test specification (Title 47 Subpart J §2.1091 and KDB 447498 D01).
Manufacturer	Hughes Network Systems
Model name(s)	IP Voyager and Orion IP
Model Number(s)	9105
FCC ID	K3YHNS9105
Serial Number(s)	357932-01-020007-2
Number of Samples Tested	1
Test Specification/Issue/Date	• FCC Part 2 Subchapter A §2.1091 (October 1, 2014). • KDB 447498 D01 General RF Exposure Guidance v05r02 February 07, 2014 (Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies)
Name of Engineer(s)	Alex Chang
Related Document(s)	• FCC Part 1 Subchapter I §1.1310 (October 1, 2014). • ICNIRP guidelines for limiting exposure to time-varying electric, magnetic and electromagnetic fields (up to 300 GHz) as published in: Health Physics 74(4):494-522;1998. • Council Recommendation of 12 July 1999 on the limitation of exposure of the general public to electromagnetic fields (0 Hz to 300 GHz)(1999/519/EC)

1.2 BRIEF SUMMARY OF RESULTS

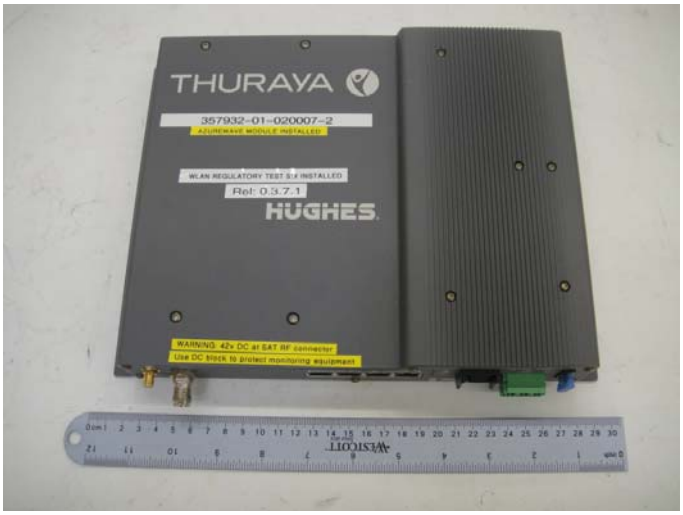
A brief summary of the tests carried out in accordance with EN 62311 January 2008 and Title 47 Subpart J §2.1091 and KDB 447498 D01 is shown below.

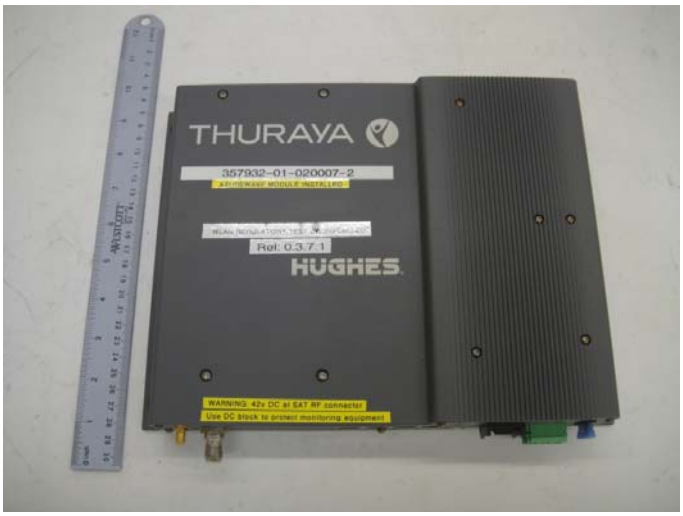
Section	Spec Clause	Test Description	Result	Comments/Base Standard
2.1	7.2	Generic Procedure for assessment of equipment	Minimum distance of exposure calculated	Annex IV of Council recommendation Title 47 Subpart J §2.1091 and KDB 447498 D01
2.2	-	Exposure from sources with multiple frequencies	Compliant	Council Recommendation of Title 47 Subpart J §2.1091 and KDB 447498 D01

1.3 PRODUCT INFORMATION

1.3.1 Technical Description

The Equipment Under Test (EUT) was a Hughes Network Systems Thuraya WLAN Satellite Terminal as shown in the photograph below. EUT in available in two configurations, IP Voyager (Land Mobile) and Orion IP (Maritime), the Thuraya WLAN Satellite Terminal, model 9105, allows the user to send and receive IP traffic via Ethernet and 802.11 b/g/n Wi-Fi interfaces over the Thuraya satellite network. The IP Voyager configuration is installed in a land mobile vehicle; the Orion IP configuration is installed in a maritime vessel, powered by 12/24VDC from the host vehicle or maritime vessel. The modem unit with WLAN antenna is common to both configurations, the difference being in the connected satellite antenna which is specific for the installed vehicle or maritime vessel purpose.

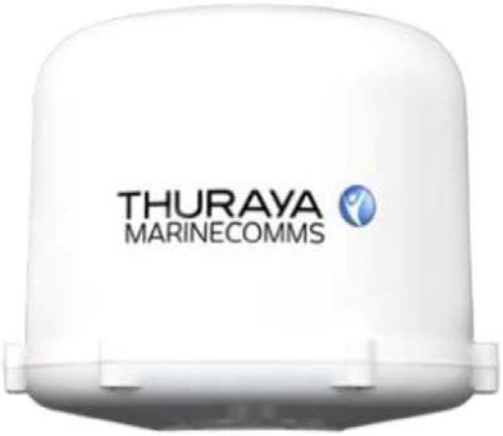




Equipment Unter Test, model 9105

WLAN Antenna

HN221 – Land Mobile
For Land Mobile operation, the 9105 is provided with HN221 and designated Thuraya IP Voyager



HN321 – Maritime
For Maritime operation, the 9105 is provided with HN321 and designated Thuraya Orion IP

1.3.2 EUT General Description

EUT Description	Thuraya WLAN Satellite Terminal
Model Name	IP Voyager and Orion IP
Model Number(s)	9105
Serial Number	357932-01-020007-2
Capability	802.11 b/g/n WLAN 2.4GHz band (20MHz/40MHz for 802.11 n) and 1.6GHz Mobile Satellite Service
Rated Voltage	12/24VDC from vehicle or maritime vessel battery
Output RF Power (MSS)	-0.9 dBW EIRP
Frequency Range (TX for MSS)	1626.5– 1660.5MHz
Antenna Type	External Antennas (HN221 and HN321)
Modulation	QPSK and APSK
Antenna gain	10 dBi
Output RF Power (WLAN)	12.55 dBm (Conducted)
Frequency Range (TX for WLAN)	2412 – 2462MHz
Antenna Type	Rubber Duck Antenna
Radio Mode	802.11b, 802.11g, 802.11n HT20 and 802.11n in HT40 (2.4GHz)
Antenna gain	3.0 dBi
Primary Unit (EUT)	☐ Production ☒ Pre-Production ☐ Engineering

1.3.3 Antenna Details

- Satellite antenna: Technical specification for Thuraya HN321 and HN221 Satellite Antenna, Hughes PTF 2B4A
- WLAN antenna: WLAN antenna Model HG2403RD-RSF, Hughes PTF 2B5A.
  (Please refer to the manufacturer documentation in detail for Mobile Satellite Service and WLAN)

1.4 GENERAL RF EXPOSURE POLICIES FOR EQUIPMENT AUTHORIZATION (TITLE 47 SUBPART J §2.1091 AND KDB 447498 D01)

1) The RF exposure requirements for devices operating in mobile and portable exposure conditions are different. When both exposure conditions apply to a device, compliance is determined according to the rules and policies established for both exposure conditions. Equipment authorization for devices that are categorically excluded from routine RF exposure evaluation according to §2.1091(c) and §2.1093(c), when filed directly with the FCC, are generally not required to include RF exposure test results to demonstrate compliance. In some cases, the FCC may require RF exposure testing or analysis to be performed with respect to the conditions stated in §1.1307(c) and (d).

2) Standalone and simultaneous transmission use conditions for mobile and portable exposure conditions must be determined according to the host platform and product operating configuration requirements. Transmitters approved only for use in standalone operations cannot be used in simultaneous transmission operations without further evaluation; this may be through test exclusion provisions or specific equipment approval. Except for transmitters that cannot operate in standalone configurations, when SAR measurement is required for simultaneous transmission conditions approval for standalone use is required for each individual transmitter. For devices that do not support standalone transmission, there is no measured or estimated standalone SAR result to determine simultaneous transmission SAR test exclusion. The enhanced zoom scan measurement and volume scan post-processing procedures in KDB 865664 are required to determine SAR compliance. When transmitters are approved for use in dedicated host or product configurations, according to the specific standalone and simultaneous transmission conditions tested for compliance, additional approvals are normally required for the transmitters to be used in other host and product configurations.

3) Transmitter modules must be approved according to one of the following host platform exposure conditions, with respect to the product configurations tested or evaluated for equipment approval for incorporation in qualified host products. The approved host platform exposure condition(s) must be identified on the grant of equipment certification. When transmitter modules are incorporated in host devices that qualify for RF exposure test exclusion and no other testing or equipment approval is required, the standalone and simultaneous transmission configurations and test exclusion conditions must be fully documented in the grantee's records according to Class I permissive change requirements

. a) ***Mobile exposure host*** platform evaluation procedures can only be applied if all transmitters in the host devices support mobile exposure conditions. Transmitters and modules approved only for use in the mobile exposure host platform cannot operate in hosts and product configurations that require standalone or simultaneous transmission operations in portable exposure conditions. The portable exposure host platform or the mixed mobile and portable exposure platform is required to support portable exposure conditions in qualified host configurations.

b) ***Portable exposure host*** platform evaluation procedures can only be applied if all transmitters in the host devices support portable exposure conditions. Transmitters and modules approved for use in the portable exposure host platform may be used for standalone operations in mobile exposure host platforms, without further equipment approval, only when the same identical transmitter and antenna required for portable exposure conditions are used.2

c) ***The mixed mobile and portable exposure host platform*** enables host devices to incorporate transmitters in qualified mobile and portable exposure conditions, for standalone and simultaneous transmission operations, by applying the published RF exposure KDB procedures required for the host product to address RF exposure compliance. Transmitters and modules approved for use in mixed mobile and portable exposure host platform may be used for standalone and simultaneous transmission operations in mobile and/or portable exposure conditions according to the approved operating configurations and exposure conditions in

qualified host configurations supported by the test results and exclusion conditions. When the mobile exposure simultaneous transmission test exclusion in section 7.2 applies, a transmitter or module approved for use in the portable exposure host platform may be used for simultaneous transmission operations in the mixed mobile and portable exposure host platform according to Class I permissive change requirements without further equipment approval. When tests are required to support additional antenna or host configurations, the results must be sufficiently conservative to demonstrate compliance for all standalone and simultaneous transmission operations required by the hosts and product configurations through subsequent Class II permissive changes.

4) Transmitters operating in consumer products must satisfy the general population exposure limits required for either mobile or portable RF exposure conditions as appropriate. The test configurations used to qualify for test exclusion or used for compliance testing must be sufficiently conservative for all required operations to demonstrate compliance. The devices and accessories should be tested for normal use without requiring specific user intervention to maintain compliance. All device operating instructions and installation requirements must be supported by the test configurations and results. It is unacceptable to apply instructions as a substitute for providing test data. Caution statements or warning labels are only acceptable for alerting users to avoid exposures in certain unintended use conditions that are not required for normal operations.

5) Occupational exposure limits only apply to “work-related” use conditions. Users must be “fully aware of” and be able to “exercise control over” their exposure to qualify for the higher occupational exposure limits. Occupational exposure limits do not apply to consumer devices and radio services supporting public networks and Part 15 unlicensed operations. When devices are authorized in accordance with the general population exposure limits, additional equipment approval is not required to satisfy occupational exposure requirements. Mandatory RF exposure training is required for workers to qualify for occupational exposure limits. When it can be demonstrated that users are required to adhere to the training instructions and are able to mitigate compliance concerns by applying the instructions, detailed training instructions incorporated in manuals, in conjunction with conspicuous permanent labeling on the device, may be considered as acceptable training to qualify workers to operate a device according to occupational exposure limits. The training information must be included in the equipment authorization application.

6) As required by §§ 2.1033(b)(3) and 2.1033(c)(3), users and installers shall be furnished with the required operating and installation instructions. These are reviewed for acceptance during equipment approval. The applicable instructions must be provided to installers, integrators and end users to ensure proper installation and operation of the devices for meeting compliance.

a) The instructions required for standalone products and modular transmitters are generally different due to varying host configurations; therefore, these must be considered differently to ensure RF exposure compliance for both standalone and simultaneous transmission operations. User instructions must be sufficient for the typical consumers, who are generally unskilled, to install and operate the equipment to ensure RF exposure compliance. The acceptable host platform configurations and exposure conditions approved for a modular transmitter, including any restrictions, must be fully described in the equipment approval and required OEM integration instructions.

b) When professional installation, OEM integration or assembly by a third-party is expected, the installation instructions and assembly requirements approved for equipment approval must be provided to the integrators to clearly identify the specific requirements necessary to maintain RF exposure compliance. The grantee of a transmitter, typically the manufacturer, is responsible for ensuring installers and integrators have a clear understanding of the compliance requirements by

including the required instructions and documentation with the product and, if necessary, to provide further support to fulfill grantee responsibilities for ensuring compliance. The integrators must be fully informed of their obligations and verify the resolution of any issues and concerns with each transmitter manufacturer or grantee. For transmitter modules, the different disclosures required for the entire supply chain to ensure compliance, including grantees of individual transmitters, host manufacturers and OEM/ODM integrators, and the end users, must be fully documented during equipment approval.

1.5 DEVIATIONS FROM THE STANDARD

No deviations from the applicable test standards or test plan were made during testing.

1.6 MODIFICATION RECORD

Description of Modification	Modification Fitted By	Date Modification Fitted
Serial Number 357932-01-020007-2		
N/A	—	—

The table above details modifications made to the EUT during the test programme. The modifications incorporated during each test (if relevant) are recorded on the appropriate test pages.

1.7 TEST METHODOLOGY

All calculations contained in this report were conducted with EN 62311 January 2008. Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz – 300 GHz) (IEC 62311:2007, modified) ,Title 47 Subpart J §2.1091 and KDB 447498 D01 (Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies).

1.8 TEST FACILITY LOCATION

1.8.1 TÜV SÜD America Inc. (Mira Mesa)

10040 Mesa Rim Road, San Diego, CA 92121-2912 (32.901268,-117.177681). Phone: 858 678 1400 FAX: 858-546 0364

1.8.2 TÜV SÜD America Inc. (Rancho Bernardo)

Sony Electronics Inc., Building #8 16530 Via Esprillo, San Diego, CA 92127-1708 (33.018644,-117.092409). Phone: 858 942 5542 FAX: 858-546 0364

1.9 TEST FACILITY REGISTRATION

1.9.1 FCC – Registration No.: US1146

TUV SUD America Inc. (San Diego), is an accredited test facility with the site description report on file and has met all the requirements specified in §2.948 of the FCC rules. The acceptance letter from the FCC is maintained in our files and the Registration is US1146.

1.9.2 Industry Canada (IC) Registration No.: 3067A

The 10m Semi-anechoic chamber of TUV SUD America Inc. (San Diego) has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No. 3067A.

1.9.3 BSMI – Laboratory Code: SL2-IN-E-028R (US0102)

TUV Product Service Inc. (San Diego) is a recognized EMC testing laboratory by the BSMI under the MRA (Mutual Recognition Arrangement) with the United States. Accreditation includes CNS 13438 up to 6GHz.

1.9.4 VCCI – Registration No. A-0132

TUV SUD America Inc. (San Diego) is a VCCI registered measurement facility which includes radiated field strength measurement, radiated field strength measurement above 1GHz, mains port interference measurement and telecommunication port interference measurement.

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SECTION 2

TEST DETAILS

Radio Frequency Exposure Evaluation of the
Hughes Network Systems
9105 Thuraya WLAN Satellite Terminal
IP Voyager and Orion IP

2.1.1 Assessment Procedure

Verification is based from power levels and declared antenna gains (for multi co-located transmitters type EUT) detailed in this test report and are taken from the following test report(s):

Test Report	Radio Standard	Issued by:
2013 11246221 EVA	EN 62311 (2008-01) OET BULLETIN 65, Edition 97-01 (1997-08)	Nemko USA, Inc. 2210 Faraday Avenue, Suite 150, Carlsbad, CA 92008 (November 05, 2013)
SD72102234B	FCC Part 15 Subpart C §15.247	TÜV SÜD America Inc. 10040 Mesa Rim Road, San Diego, CA 92121-2912 (February 23, 2015))

Equation for predicting RF field is then used to determine the minimum distance that will comply with the requirements. The equation is from Section 8.3.2 of EN 50383:2002. The model where the formula was derived is applicable in the far-field region and over-estimates in the radiating near-field region:

$$S = \frac{PG}{4\pi r^2}$$

Where: S=the power flux
P=input power of the antenna
G=antenna gain relative to an isotropic antenna
r=distance from the antenna to the point of investigation

2.1.2 Limits

Limits for General Population/Uncontrolled Exposure (Title 47 Subpart J §2.1091 and KDB 447498 D01 referring to limits under §1.1310)

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Electric Field Strength (H) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $[E]^2$,$[H]^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500	-	-	f/1500	30
1500-100,000	-	-	1.0	30

*f = frequency in MHz *Plane-wave equivalent power density*

NOTE : The averaging time for General Population/Uncontrolled exposure to fixed transmitters is not applicable for mobile and portable transmitters. See 47 CFR §§2.1091 and 2.1093 on source-based time-averaging requirements for mobile and portable transmitters.

2.1.3 Equipment Under Test and Modification State

Serial No: 357932-01-020007-2 / See individual test report for details (see Section 2.1.1 for details)

2.1.4 Date of Test/Initial of test personnel who performed the test

See individual test report for details (see Section 2.1.1 for details)

2.1.5 Test Equipment Used

See individual test report for details (see Section 2.1.1 for details).

2.1.6 Environmental Conditions/ Test Location

See individual test report for details (see Section 2.1.1 for details).

2.1.7 Measurement Uncertainty

See individual test report for details (see Section 2.1.1 for details).

2.1.8 Test Results for MSS (Mobile Satellite Service)

There is no conformance test defined for maximum EIRP requirement under ETSI EN 301 444. Maximum EIRP declared by the applicant is 20 dBW (the maximum EIRP restriction for MSS covered by ETSI EN 301 444 shall not exceed 33 dBW).

Frequency (MHz)	Measured Maximum EIRP (dBW)	Antenna Gain (dBi)	Reported Maximum EIRP (dBm)	Antenna Conducted Port Power (Watts)
1643.700	-0.9	10	29.1	0.813

From the formula under Section 2.1.1, using 1 mW/cm2 or 10 W/m^2 as *"S"*, the distance *r* is then calculated. This is the minimum distance of compliance with the power density requirements.

$$r = \sqrt{\frac{PG}{4\pi S}}$$

$$r = \sqrt{\frac{(0.813\ watts)(10\ numeric\ antenna\ gain)}{4\pi\ (10\frac{W}{m^2})}}$$

$$r = \sqrt{\frac{8.130W}{125.6\frac{W}{m^2}}}$$

Using 10 W/m^2 as S, *r* = **0.25 meter**

2.1.9 Test Results for WLAN

The maximum reported conducted RF power is 12.55 dBm. This is low channel (2412 MHz) in 802.11b mode. Data rate used is 5.5 Mbps. This is converted to 0.0180 watt in order use the formula under Section 2.1.11. Limit used is 10 W/m^2.

Frequency (MHz)	Radio Mode	Antenna Conducted Port Power (dBm)	Antenna Conducted Port Power (Watts)	Antenna Gain (dBi)
2412	802.11b	12.55	0.0180	3.0

From the formula under Section 2.1.1, using 10 W/m2 as *S*, the distance *r* is then calculated. This is the minimum distance of compliance with the power density requirements.

$$r = \sqrt{\frac{PG}{4\pi S}}$$

$$r = \sqrt{\frac{(0.0180\ watts)(3.0\ numeric\ antenna\ gain)}{4\pi\ (10\ \frac{W}{m^2})}}$$

$$r = \sqrt{\frac{0.054}{125.664}}$$

Therefore *r* = **0.0207 meter (Calculated WLAN results - WLAN only not considering MSSradio)**

2.2 EXPOSURE FROM SOURCES WITH MULTIPLE FREQUENCIES

2.2.1 Specification Reference

Annex IV of Council recommendation 1999/519/EC (limits) and EN 62311 January 2008 (methods) and Title 47 Subpart J §2.1091 and KDB 447498 D01.

When the evaluation has to account for simultaneous transmissions from co-located devices. Each individual transmitter are evaluated separately. The sum of the individual ratios of measured/calculated value to the basic restriction/reference level has to be < 1.

The FCC's MPE limits vary with frequency. Therefore, in mixed or broadband RF fields where several sources and frequencies are involved, the fraction of the recommended limit (in terms of power density or square of the electric or magnetic field strength) incurred within each frequency interval should be determined, and the sum of all fractional contributions should not exceed 1.0, or 100% in terms of percentage.

2.2.2 Limit Applicable

Annex III of Council recommendation 1999/519/EC (limits) and Title 47 Subpart J §2.1091 and KDB 447498 D01

2.2.3 MPE Assessment Procedure

Verification is based from power levels and declared antenna gains (for multi co-located transmitters type EUT) detailed in this test report and are taken from the following test report(s):

Test Report	Radio Standard	Issued by:
2013 11246221 EVA	EN 62311 (2008-01) OET BULLETIN 65, Edition 97-01 (1997-08)	Nemko USA, Inc. 2210 Faraday Avenue, Suite 150, Carlsbad, CA 92008 (November 05, 2013)
SD72102234B	FCC Part 15 Subpart C §15.247	TÜV SÜD America Inc. 10040 Mesa Rim Road, San Diego, CA 92121-2912 (February 23, 2015))

Equation for predicting RF field is then performed. The equation is from Section 8.3.2 of EN 50383:2002. The model where the formula was derived is applicable in the far-field region and over-estimates in the radiating near-field region:

$$S = \frac{PG}{4\pi r^2}$$

Where: S=the power flux
P=input power of the antenna
G=antenna gain relative to an isotropic antenna
r=distance from the antenna to the point of investigation

2.2.4 Equipment Under Test and Modification State

Serial No: 357932-01-020007-2 / See individual test report for details (see Section 2.2.3 for details)

2.2.5 Date of Test/Initial of test personnel who performed the test

See individual test report for details (see Section 2.2.3 for details)

2.2.6 Test Equipment Used

See individual test report for details (see Section 2.2.3 for details).

2.2.7 Environmental Conditions/ Test Location

See individual test report for details (see Section 2.2.3 for details).

2.2.8 Measurement Uncertainty

See individual test report for details (see Section 2.2.3 for details).

2.2.9 MPE Calculation for Mobile Satellite Service (Earth Station - FCC) @ 1 meter distance

1 meter is the declared recommended distance between the EUT and user/operator as stipulated under the User Guide. This is the distance where co-located transmitter exposure calculation will be based.

Maximum peak output power at antenna input terminal:	29.1	(dBm)
Maximum peak output power at antenna input terminal:	812.83	(mW)
Antenna gain (typical):	10	(dBi)
Maximum antenna gain:	10	(numeric)
Prediction distance:	100	(cm)
Source Based Time Average Duty Cycle:	100	(%)
Prediction frequency:	1643.7	(MHz)
MPE limit for uncontrolled exposure at prediction frequency:	1.0	(mW/cm^2)
Power density at prediction frequency:	**0.0647**	(mW/cm^2)
Power density at prediction frequency:	0.647	(W/m^2)
Margin of Compliance:	-11.89	(dB)

2.2.10 MPE Calculation for WLAN @ 0.2 meter distance

0.2 meter is the declared recommended distance between the EUT and user/operator as stipulated under the User Guide. This is the distance where co-located transmitter exposure calculation will be based.

Maximum peak output power at antenna input terminal:	12.55	(dBm)
Maximum peak output power at antenna input terminal:	17.99	(mW)
Antenna gain (typical):	3.0	(dBi)
Maximum antenna gain:	1.995	(numeric)
Prediction distance:	20	(cm)
Source Based Time Average Duty Cycle:	100	(%)
Prediction frequency:	2412	(MHz)
MPE limit for uncontrolled exposure at prediction frequency:	1.0	(mW/cm^2)
Power density at prediction frequency:	**0.0071**	(mW/cm^2)
Power density at prediction frequency:	0.071	(W/m^2)
Margin of Compliance:	-21.46	(dB)

2.2.11 Test Results

Title 47 Subpart J §2.1091 and KDB 447498 D01				
Transmitter	**MPE (mW/cm^2)**	**Evaluation Distance (cm)**	**Limit (mW/cm^2)**	**MPE ratio (MPE/Limit)**
Earth Station (Satellite)	0.0647	100	1.0	0.0647
WLAN (WiFi)	0.0071	20	1.0	0.0071
			Sum of the ratios (should be <1.0)	**0.0718**

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SECTION 3

ACCREDITATION, DISCLAIMERS AND COPYRIGHT

3.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT

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