IDEA PLANET LP

Application
For
Certification

FCC ID: 2ADJY49530CPTP

Borderlands CE: RC Claptrap

Model: 6485

WiFi Transceiver

Report No.: SZHH00918565-001

We hereby certify that the sample of the above item is considered to comply with the requirements of FCC Part 15, Subpart C for Intentional Radiator, mention 47 CFR [10-1-13]

Prepared and Checked by:	Approved by:
Sign on file	Digitally signed by Andy Yan Location: Intertek Testing Services
Jimmy Wen Engineer	Andy Yan Senior Project Engineer Date: December 24, 2014

TRF no.: FCC 15C_Tx_b

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LIST OF EXHIBITS

MEASUREMENT/TECHNICAL REPORT

IDEA PLANET LP
MODEL: 6485

FCC ID: 2ADJY49530CPTP

This report concerns (check one) Original Grant ___X___ Class II Change ____

Equipment Type: DTS - Part 15 Digital Transmission Systems (WiFi transmitter portion)

Deferred grant requested per 47 CFR 0.457(d)(1)(ii)? Yes _____ No ___X___

If yes, defer until : _____
date

Company Name agrees to notify the Commission by: _____
date

of the intended date of announcement of the product so that the grant can be issued on that date.

Transition Rules Request per 15.37? Yes _____ No ___X___

If no, assumed Part 15, Subpart C for intentional radiator - the new 47 CFR [10-01-13 Edition] provision.

Report prepared by:

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Exhibit type	File Description	Filename
Test Report	Test Report	report.pdf
Test Setup Photo	Radiated Emission	radiated photos.pdf
External Photo	External Photo	external photos.pdf
Internal Photo	Internal Photo	internal photos.pdf
Block Diagram	Block Diagram	block.pdf
Schematics	Circuit Diagram	circuit.pdf
Operation Description	Technical Description	descri.pdf
ID Label/Location	Label Artwork and Location	label.pdf
User Manual	User Manual	manual.pdf
Cover Letter	Confidentiality Letter	request.pdf
Cover Letter	Letter of Agency	agency.pdf
Cover Letter	Certification Agreement	agreement.pdf

EXHIBIT 1

SUMMARY OF TEST RESULTS

1. Summary of Test

IDEA PLANET LP
MODEL: 6485

FCC ID: 2ADJY49530CPTP

TEST	REFERENCE	RESULTS
Max. Output power	15.247(b)(3)	Pass
6 dB Bandwidth	15.247(a)(2)	Pass
Max. Power Density	15.247(e)	Pass
Out of Band Antenna Conducted Emission	15.247(d)	Pass
Radiated Emission in Restricted Bands	15.247(d)	Pass
Antenna Requirement	15.203	Pass (See Notes)

Notes: The EUT uses Integral Antenna which in accordance to Section 15.203 is considered sufficient to comply with the provisions of this section.

EXHIBIT 2

GENERAL DESCRIPTION

2.0 General Description

2.1 Product Description

The Equipment Under Test (EUT) is a Borderlands CE: RC Claptrap with internal WiFi function operating at 2412MHz for 802.11b/g. The EUT can be powered by DC 6.4V (1 x 6.4V rechargeable battery). For more detailed features description, please refer to the user's manual.

Type of Modulation: CCK/ BPSK/QPSK/16QAM
Antenna Type: Integral Antenna.

For electronic filing, the brief circuit description is saved with filename: descri.pdf.

2.2 Related Submittal(s) Grants

This is an application for certification of DTS- Part 15 Digital Transmission Systems and no other application together.

2.3 Test Methodology

Radiated emission measurements were performed according to the procedures in ANSI C63.4 (2009) and KDB 558074. Radiated emission measurement was performed in semi-anechoic chamber. For radiated emission measurement, preliminary scans were performed in the semi-anechoic chamber only to determine the worst case modes. All radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the "Justification Section" of this Application. All other measurements were made in accordance with the procedures in part 2 of CFR 47.

2.4 Test Facility

The Semi-Anechoic chamber used to collect the radiated data are **Intertek Testing Services Shenzhen Ltd. Kejiyuan Branch** and located at 6F, Block D, Huahan Building, Langshan Road, Nanshan District, Shenzhen, P. R. China. This test facility and site measurement data have been fully placed on file with the FCC (Registration Number: 242492).

EXHIBIT 3

SYSTEM TEST CONFIGURATION

3.0 System Test Configuration

3.1 Justification

For emissions testing, the equipment under test (EUT) setup to transmit continuously to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing. The EUT was powered by the new DC 6.4V (1 x 6.4V rechargeable battery) during the test. Only the worst case data was reported.

The signal is maximized through rotation and placement in the three orthogonal axes. The antenna height and polarization are varied during the search for maximum signal level. The antenna height is varied from 1 to 4 meters. Radiated emissions are taken at three meters unless the signal level is too low for measurement at that distance. If necessary, a pre-amplifier is used and/or the test is conducted at a closer distance.

All readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance. Analyzer resolution is 100 kHz or greater for frequencies below 1000 MHz. The resolution is 1 MHz or greater for frequencies above 1000 MHz. The spurious emissions more than 20 dB below the permissible value are not reported.

Radiated emission measurement were performed the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

3.2 EUT Exercising Software

The EUT exercise program (provided by client) used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use. The worst case configuration is used in all specified testing.

The parameters of test software setting:
During the test, Channel and power controlling software provided by the applicant was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the application and is going to be fixed on the firmware of the end product.

Power Parameters of IEEE 802.11b/g

Test software setting of IEEE 802.11b/g			
Channel No.	Output Power Level	Data rate	Modulation type
1	17	802.11b: 1-11Mbps	802.11b: CCK
	17	802.11g: 6-54Mbps	802.11g: BPSK, QPSK, 16QAM

3.3 Special Accessories

N/A

3.4 Measurement Uncertainty

When determining of the test conclusion, the Measurement Uncertainty of test has been considered.

Uncertainty and Compliance – Unless the standard specifically states that measured values are to be extended by the measurement uncertainty in determining compliance, all compliance determinations are based on the actual measured value.

3.5 Equipment Modification

Any modifications installed previous to testing by IDEA PLANET LP will be incorporated in each production model sold / leased in the United States.

No modifications were installed by Intertek Testing Services Shenzhen Ltd. Kejiyuan Branch.

3.6 Support Equipment List and Description

This product was tested in the following configuration:

Refer List:

Description	Manufacturer	Model No.
Phone	Samsung	NOTE 2

EXHIBIT 4

MEASUREMENT RESULTS

Applicant: IDEA PLANET LP
Date of Test: December 01, 2014
Model: 6485

4.0 **Measurement Results**

4.1 Maximum Conducted Output Power at Antenna Terminals, FCC Rules 15.247(b)(3):

[×] The antenna power of the EUT was connected to the input of a broadband peak RF power meter. The power meter have a video bandwidth that is greater than DTS bandwidth and utilize a fast-responding diode detector. Power was read directly at the EUT antenna terminals.

For antennas with gains of 6 dBi or less, maximum allowed Transmitter output is 1 watt (+30 dBm).

IEEE 802.11b (Antenna Gain = 2dBi) (CCK, 1Mbps)		
Frequency (MHz)	Output in dBm	Output in mWatt
Channel: 2412	18.97	78.90

IEEE 802.11g (Antenna Gain = 2dBi) (16QAM, 6Mbps)		
Frequency (MHz)	Output in dBm	Output in mWatt
Channel: 2412	19.87	97.05

EUT max. output level = 19.87dBm

Cable Loss: 0.5dB

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Model: 6485

4.2 Minimum 6 dB RF Bandwidth, FCC Rule 15.247(a)(2):

The antenna port of the EUT was connected to the input of a spectrum analyzer. Analyzer RES BW was set to 100 KHz according to FCC KDB 558074. For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier. A PEAK output reading was taken, a DISPLAY line was drawn 6 dB lower than PEAK level. The 6dB bandwidth was determined from where the channel output spectrum intersected the display line.

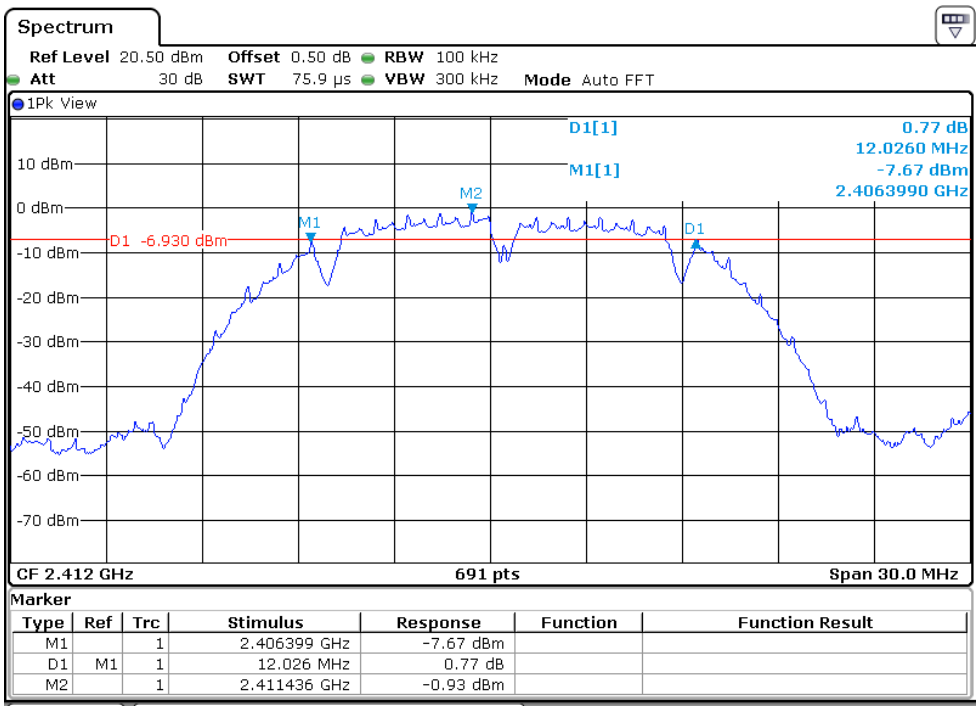
Limit: The 6 dB Bandwidth is at least 500 kHz.

IEEE 802.11b (CCK, 1Mbps)	
Frequency (MHz)	6 dB Bandwidth (MHz)
2412	12.026

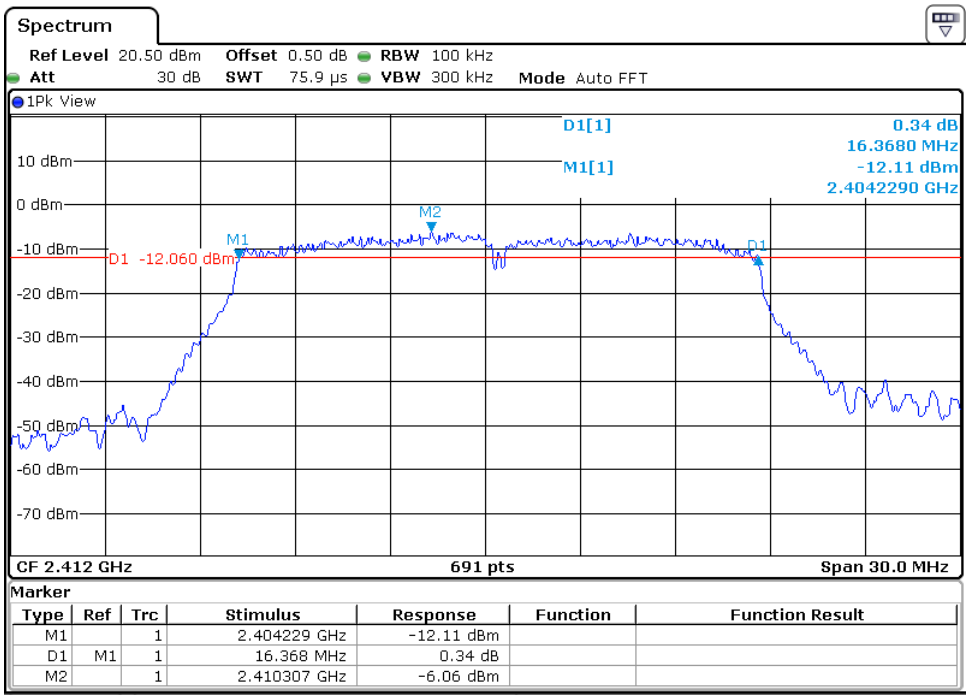
IEEE 802.11g (16QAM, 6Mbps)	
Frequency (MHz)	6 dB Bandwidth (MHz)
2412	16.368

The test plots are attached as below.

802.11b



802.11g



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Model: 6485

4.3 Maximum Power Density Reading, FCC Rule 15.247(e):

The Measurement Procedure PKPSD was set according to the FCC KDB 558074.

Antenna output of the EUT was coupled directly to spectrum analyzer; if an external attenuator and/or cable was used, these losses are compensated for with the analyzer OFFSET function.

Limit: The Power Density does not exceed 8dBm/ 3 kHz.

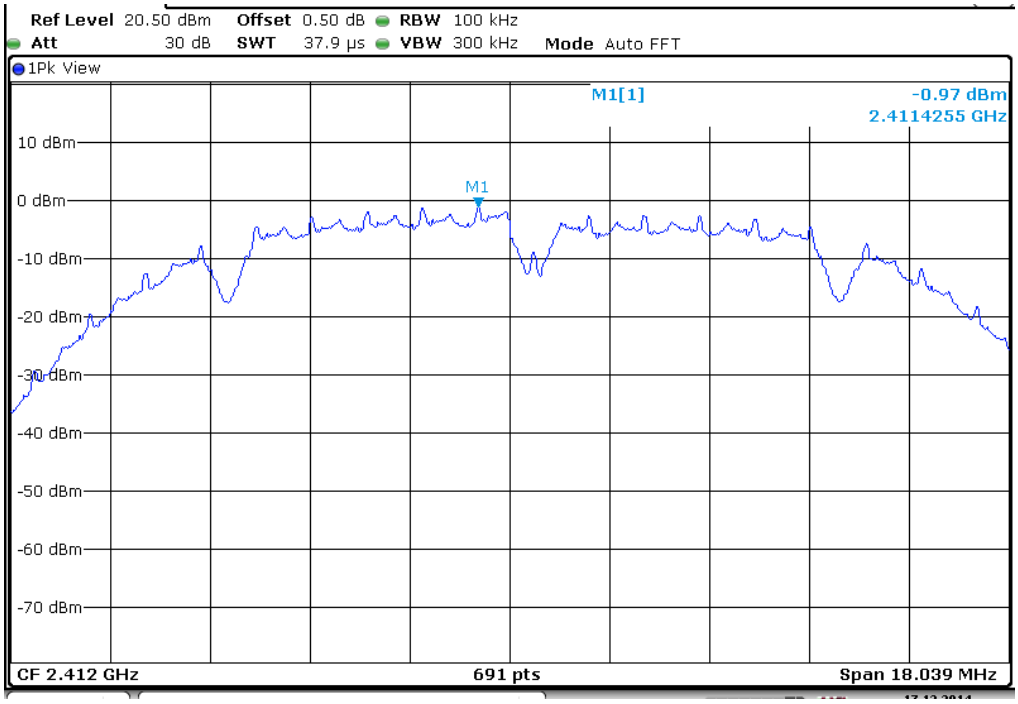
IEEE 802.11b (CCK, 1Mbps)	
Frequency (MHz)	Power Density with RBW 100KHz
2412	-0.97

IEEE 802.11g (16QAM, 6Mbps)	
Frequency (MHz)	Power Density with RBW 100KHz
2412	-6.80

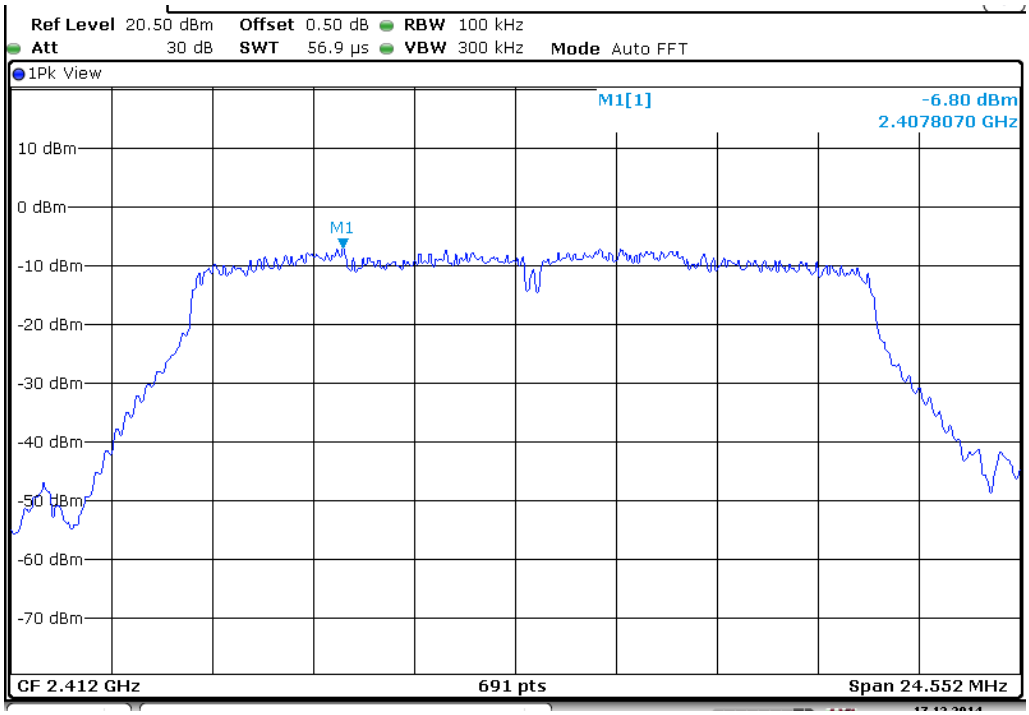
Cable Loss: 0.5dB

The test plots are attached as below.

802.11b



802.11g



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Model: 6485

4.4 Out of Band Conducted Emissions, FCC Rule 15.247(d)

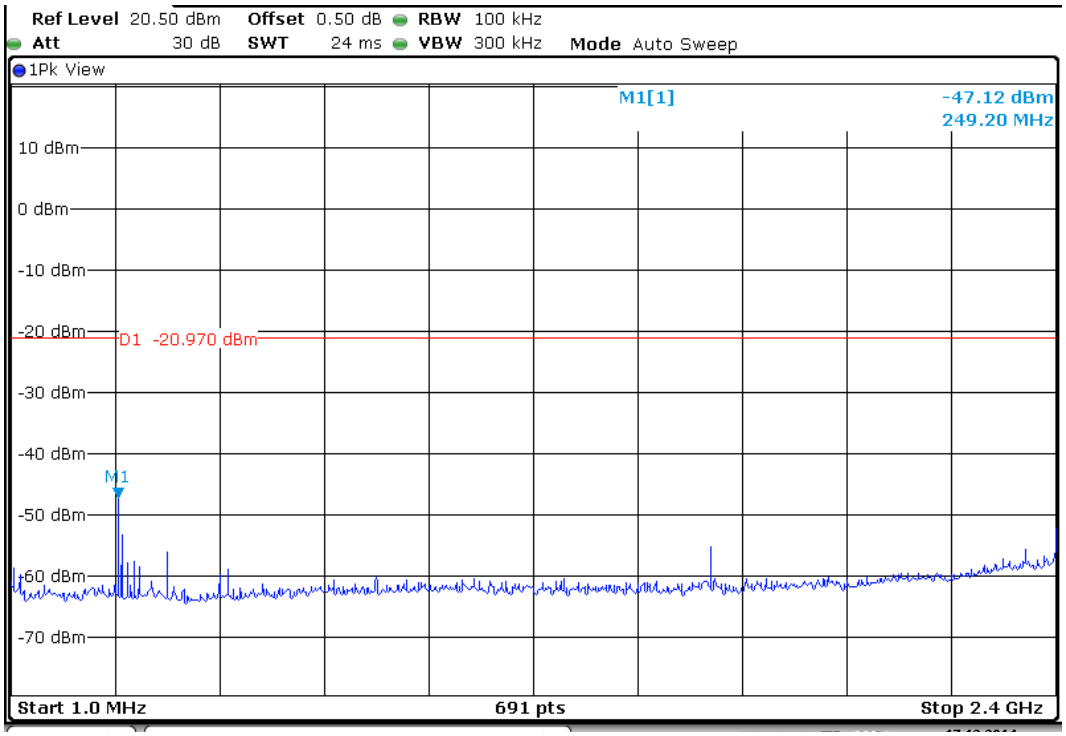
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. The Measurement Procedure was set according to the FCC KDB 558074.

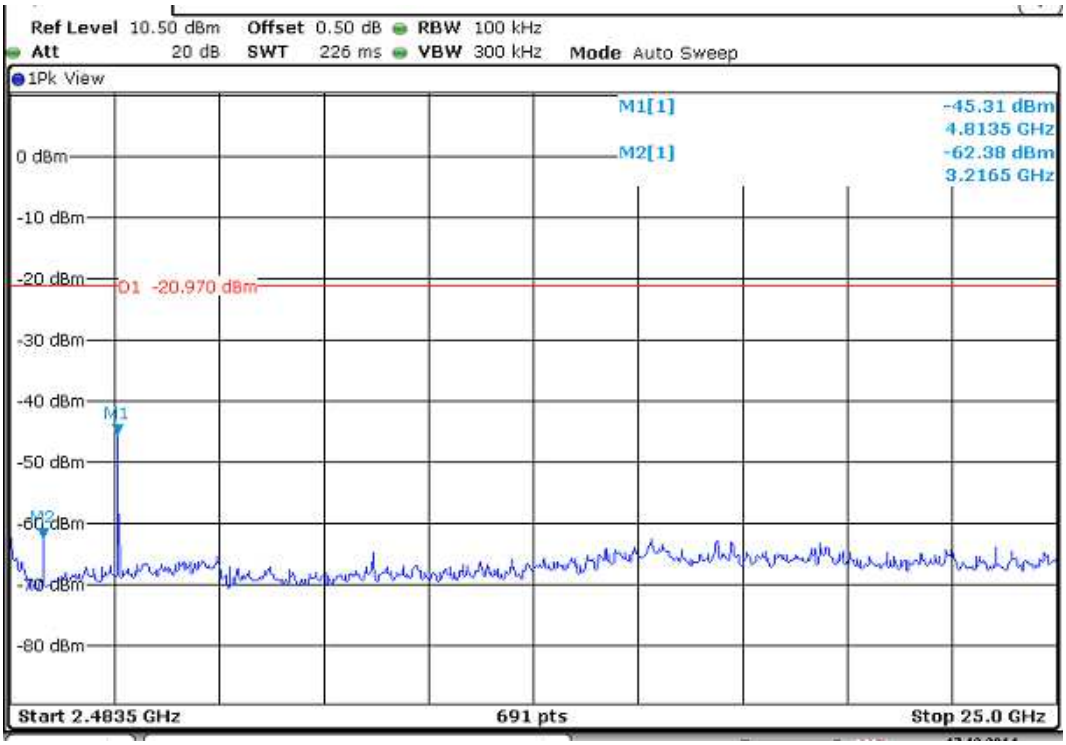
Refer to the attached test plots for out of band conducted emissions data with rate of 1Mbps for 802.11b, 6Mbps for 802.11g.

The test plots showed all spurious emission up to the tenth harmonic was measured and they were found to be at least 20 dB below the highest level of the desired power in the passband.

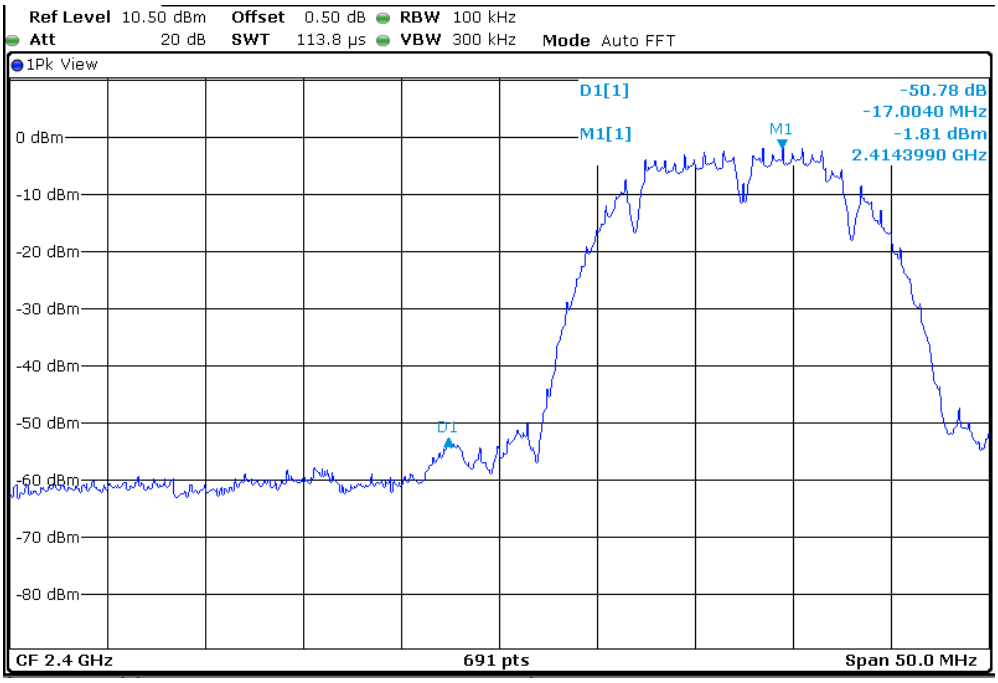
The test plots are attached as below.

802.11b
Channel 01 (2412MHz) Reference Level: -0.97 dBm

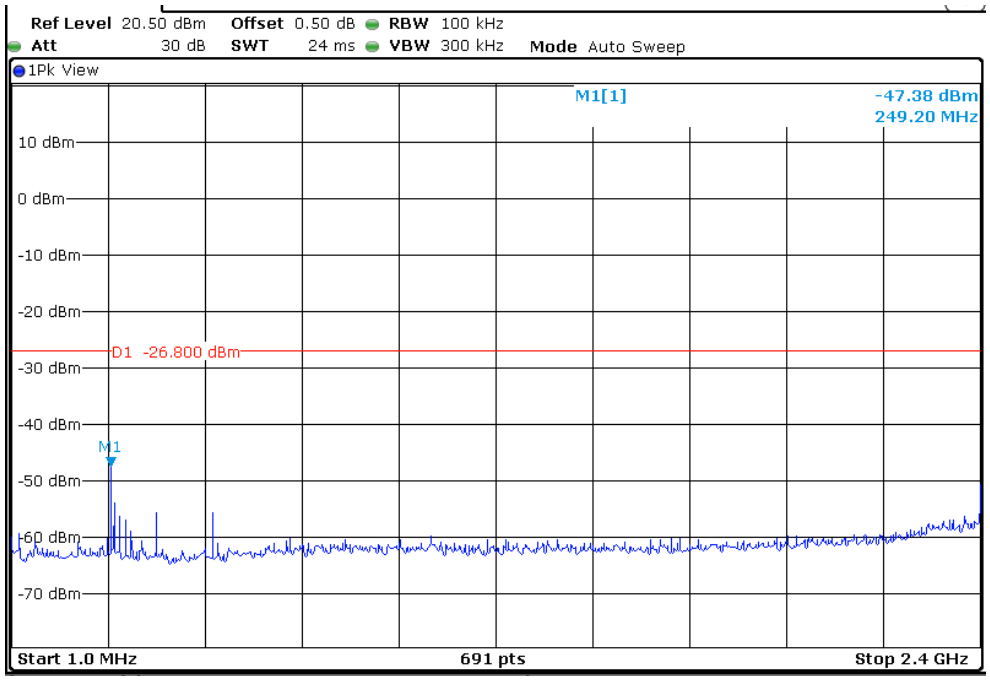


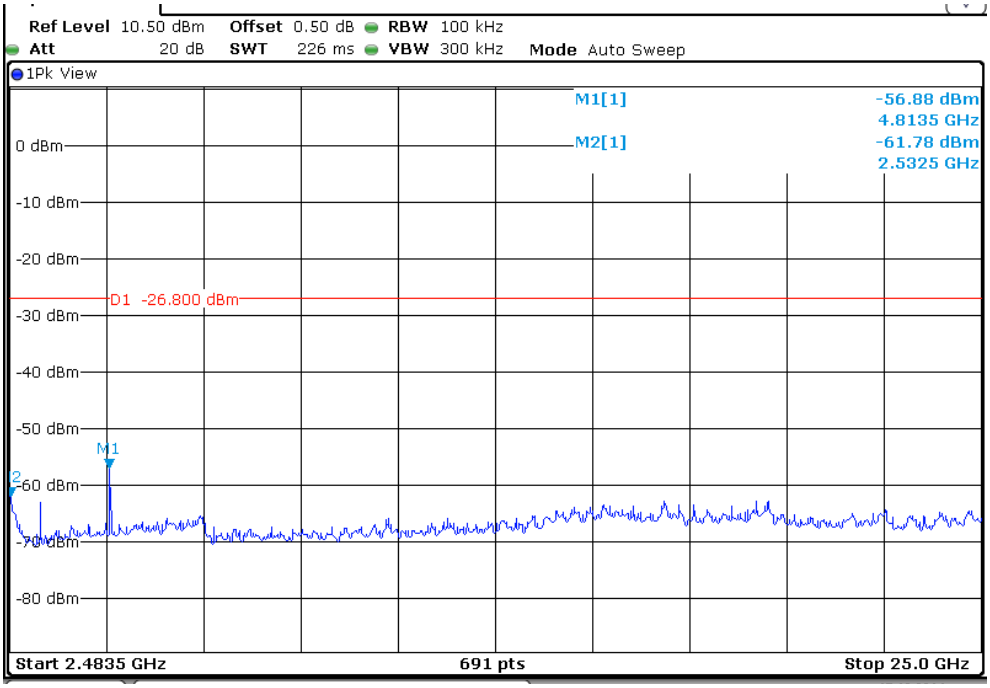


802.11b

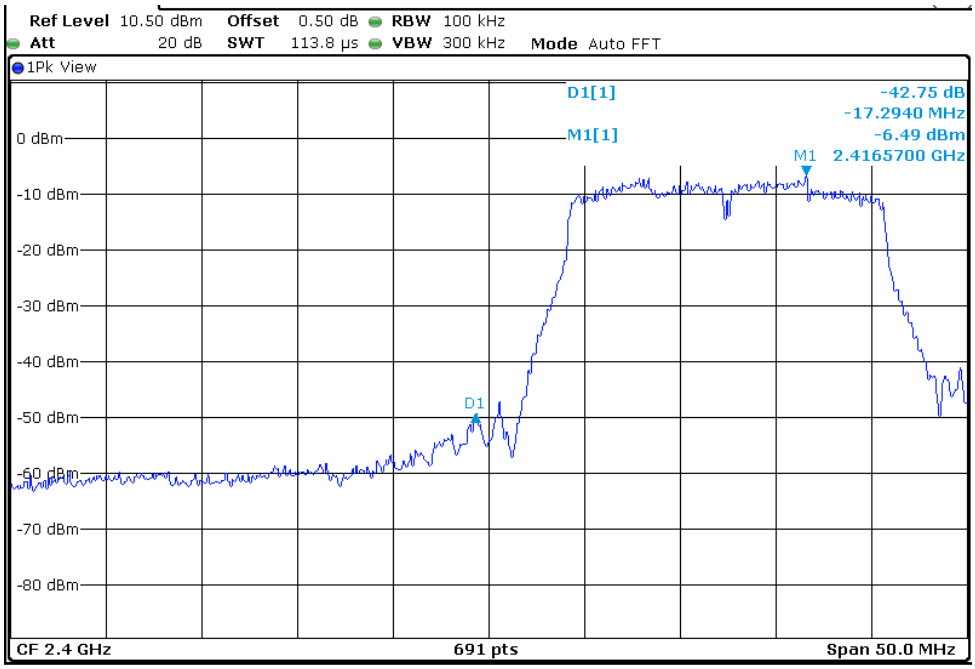

Ref Level 10.50 dBm Offset 0.50 dB RBW 100 kHz
Att 20 dB SWT 113.8 µs VBW 300 kHz Mode Auto FFT
1Pk View
D1[1] -50.78 dB
-17.0040 MHz
M1[1] -1.81 dBm
2.4143990 GHz
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
D1
M1
CF 2.4 GHz
691 pts
Span 50.0 MHz

802.11g
Channel 01 (2412MHz) Reference Level: -6.8 dBm





802.11g


Ref Level 10.50 dBm Offset 0.50 dB RBW 100 kHz
Att 20 dB SWT 113.8 µs VBW 300 kHz Mode Auto FFT
1Pk View
D1[1] -42.75 dB
-17.2940 MHz
M1[1] -6.49 dBm
M1 2.4165700 GHz
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
D1
CF 2.4 GHz
691 pts
Span 50.0 MHz

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4.5 Out of Band Radiated Emissions (for emissions in 4.4 above that are less than 20dB below carrier), FCC Rule 15.247(d):

For out of band emissions that are close to or that exceed the 20dB attenuation requirement described in the specification, radiated measurements were performed at a 3m separation distance to determine whether these emissions complied with the general radiated emission requirement.

[ ] Not required, since all emissions are more than 20dB below fundamental
[×] See attached data sheet

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4.6 Transmitter Radiated Emissions in Restricted Bands, FCC Rule 15.35(b), (c):

Data is included of the worst case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs and data tables of the emissions are included. All measurements were performed with peak detection unless otherwise specified.

The data on the following pages list the significant emission frequencies, the limit and the margin of compliance.

4.7 Field Strength Calculation

The field strength is calculated by adding the reading on the Spectrum Analyzer to the factors associated with preamplifiers (if any), antennas, cables, pulse desensitization and average factors (when specified limit is in average and measurements are made with peak detectors). A sample calculation is included below.

FS = RA + AF + CF - AG + PD

Where FS = Field Strength in dBμV/m
RA = Receiver Amplitude (including preamplifier) in dBμV
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB
AG = Amplifier Gain in dB
PD = Pulse Desensitization in dB

In the radiated emission table which follows, the reading shown on the data table may reflect the preamplifier gain. An example of the calculations, where the reading does not reflect the preamplifier gain, follows:

FS = RA + AF + CF - AG + PD

Example
Assume a receiver reading of 62.0 dBμV is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted. The pulse desensitization factor of the spectrum analyzer was 0 dB. The net field strength for comparison to the appropriate emission limit is 32 dBμV/m. This value in dBμV/m was converted to its corresponding level in μV/m.

RA = 62.0 dBμV
AF = 7.4 dB
CF = 1.6 dB
AG = 29.0 dB
PD = 0 dB
FS = 62 + 7.4 + 1.6 - 29 + 0 = 42 dBμV/m

Level in mV/m = Common Antilogarithm [(42 dBμV/m)/20] = 125.9 μV/m

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4.8 Radiated Spurious Emission

Worst Case Radiated Spurious Emission (802.11b) at 480.060MHz is passed by 0.4dB margin.

For the electronic filing, the worst case radiated emission configuration photographs are saved with filename: radiated photos.pdf.

Applicant: IDEA PLANET LP
Date of Test: December 01, 2014
Model: 6485
Worst Case Operating Mode: 802.11b (TX-Channel 01)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	193.445	49.1	20.0	9.1	38.2	43.5	-5.3
Horizontal	210.420	36.2	20.0	20.8	37.0	43.5	-6.5
Horizontal	250.190	40.4	20.0	24.0	44.4	46.0	-1.6
Vertical	190.050	45.4	20.0	9.4	34.8	43.5	-8.7
Vertical	250.190	52.8	20.0	9.1	41.9	46.0	-4.1
Vertical	480.060	56.6	20.0	9.0	45.6	46.0	-0.4

NOTES: 1. Quasi-Peak detector is used except for others stated.

2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distances were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. All emissions are below the QP limit.

Applicant: IDEA PLANET LP
Date of Test: December 01, 2014
Model: 6485
Mode: 802.11b (TX-Channel 01)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	4824.000	70.5	36.7	34.2	68.0	74.0	-6.0
Horizontal	7236.000	61.2	36.7	36.9	61.4	74.0	-12.6
Horizontal	9648.000	59.8	36.1	37.1	60.8	74.0	-13.2
Horizontal	2388.450	49.4	36.2	28.2	41.4	74.0	-32.6
Horizontal	2483.500	51.7	36.2	28.2	43.7	74.0	-30.3

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	4824.000	55.4	36.7	34.2	52.9	54.0	-1.1
Horizontal	7236.000	45.0	36.7	36.9	45.2	54.0	-8.8
Horizontal	9648.000	45.7	36.1	37.1	46.7	54.0	-7.3
Horizontal	2388.450	37.0	36.2	28.2	29.0	54.0	-25.0
Horizontal	2483.500	38.4	36.2	28.2	30.4	54.0	-23.6

NOTES: 1. Peak detector Data unless otherwise stated. Above 1000 MHz, RBW=1MHz, VBW=3MHz is used for Peak measurement, RBW=1MHz, VBW=10Hz is used for Average measurement.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna used for the emission over 1000MHz.

5. Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

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Model: 6485
Mode: 802.11g (TX-Channel 01)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	4824.000	66.4	36.7	34.2	63.9	74.0	-10.1
Horizontal	7236.000	60.1	36.7	36.9	60.3	74.0	-13.7
Horizontal	9648.000	60.5	36.1	36.5	60.9	74.0	-13.1
Horizontal	2388.710	47.9	36.2	28.2	39.9	74.0	-34.1
Horizontal	2483.500	50.6	36.2	28.2	42.6	74.0	-31.4

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	4824.000	46.5	36.7	34.2	44.0	54.0	-10.0
Horizontal	7236.000	42.9	36.7	36.9	43.2	54.0	-10.8
Horizontal	9648.000	46.3	36.1	36.5	46.7	54.0	-7.3
Horizontal	2388.710	36.9	36.2	28.2	28.9	54.0	-25.1
Horizontal	2483.500	40.5	36.2	28.2	32.5	54.0	-21.5

NOTES: 1. Peak detector Data unless otherwise stated. Above 1000 MHz, RBW=1MHz, VBW=3MHz is used for Peak measurement, RBW=1MHz, VBW=10Hz is used for Average measurement.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna used for the emission over 1000MHz.

5. Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

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4.9 Conducted Emission, FCC Ref: 15.207

[x] Not required

[ ] Test results are attached

[ ] Included in the separated report.

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4.10 Radiated Emissions from Digital Section of Transceiver, FCC Ref: 15.109

[ ] Not required

[ ] Test results are attached

[x] Included in the separated report.

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4.11 Transmitter Duty Cycle Calculation and Measurements, FCC Rule 15.35(b), (c)

The EUT antenna output port was connected to the input of the spectrum analyzer. The analyzer center frequency was set to EUT RF channel carrier. The SWEP function on the analyzer was set to ZERO SPAN. The Transmitter ON time was determined from the resultant time-amplitude display:

	See attached spectrum analyzer chart (s) for Transmitter timing
	See Transmitter timing diagram provided by manufacturer
x	Not applicable, duty cycle was not used.

EXHIBIT 5

EQUIPMENT PHOTOGRAPHS

5.0 Equipment Photographs

For electronic filing, the photographs are saved with filename: external photos.doc & internal photos.pdf.

EXHIBIT 6

PRODUCT LABELLING

6.0 **Product Labeling**

For electronic filing, the FCC ID label artwork and location is saved with filename: label.pdf.

EXHIBIT 7

TECHNICAL SPECIFICATIONS

7.0 Technical Specifications

For electronic filing, the block diagram and circuit diagram are saved with filename: block.pdf and circuit.pdf respectively.

EXHIBIT 8

INSTRUCTION MANUAL

8.0 Instruction Manual

For electronic filing, a preliminary copy of the Instruction Manual is saved with filename: manual.pdf.

This manual will be provided to the end-user with each unit sold/leased in the United States.

EXHIBIT 9

CONFIDENTIALITY REQUEST

9.0 Confidentiality Request

For electronic filing, the confidentiality request of the tested EUT is saved with filename: request.pdf.

.

EXHIBIT 10

MISCELLANEOUS INFORMATION

10.0 **Miscellaneous Information**

The determination of pulse desensitivity was made in accordance with Hewlett Packard Application Note 150-2, *Spectrum Analysis ... Pulsed RF.*

Pulse desensitivity is not applicable for this device since the transmitter transmits the RF signal continuously.

EXHIBIT 11

TEST EQUIPMENT LIST

11.0 Test Equipment List

Equipment No.	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due Date
SZ061-03	BiConiLog Antenna	ETS	3142C	00066460	28-Jun-14	28-Jun-15
SZ185-01	EMI Receiver	R&S	ESCI	100547	10-Mar-14	10-Mar-15
SZ061-08	Horn Antenna	ETS	3115	00092346	9-Oct-14	9-Oct-15
SZ061-07	Horn Antenna	ETS	3160-09	00083067	3-Jul-14	3-Jan-15
SZ061-06	Active Loop Antenna	Electro-Metrics	EM-6876	217	29-Apr-14	29-Apr-15
SZ056-03	Spectrum Analyzer	R&S	FSP 30	101148	10-Mar-14	10-Mar-15
SZ181-04	Preamplifier	Agilent	8449B	3008A02474	10-Mar-14	10-Mar-15
SZ182-02	RF Power Meter	Anritsu	ML2496A	1302005	20-Apr-14	20- Apr--15
SZ182-02-01	Pulse Power Sensor	Anritsu	MA2411B	1207429	28-Feb-14	28-Feb-15
SZ188-01	Anechoic Chamber	ETS	RFD-F/A-100	4102	20-Apr-14	20- Apr--15
SZ062-02	RF Cable	RADIALL	RG 213U	--	3-Jul-14	3-Jan-15
SZ062-05	RF Cable	RADIALL	0.04-26.5GHz	--	3-Jul-14	3-Jan-15
SZ062-12	RF Cable	RADIALL	0.04-26.5GHz	--	9-Oct-14	9- Apr -15
SZ067-04	Notch Filter	Micro-Tronics	BRM50702-02	--	21-May-14	21-May-15