

Talon Communications, Inc.

Application
For
Certification

FCC ID: A7D-24ZB-PA100

Radio Module

Models: OASIS-24ZB-PIFA, OASIS-24ZB-UFL, OASIS-24ZB-MMCX

2.4GHz 802.15.4 Transceiver Module

Report No.: 150513001SZN-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 [10-1-14]

Prepared and Checked by:

Approved by:

Sign on file

Hardy Suo
Engineer

Andy Yan
Senior Project Engineer
Date: October 30, 2015

- The test results reported in this test report shall refer only to the sample actually tested and shall not refer or be deemed to refer to bulk from which such a sample may be said to have been obtained.
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TRF no.: FCC 15C_Tx_b

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MEASUREMENT/TECHNICAL REPORT

Radio Module

Model: OASIS-24ZB-PIFA, OASIS-24ZB-UFL, OASIS-24ZB-MMCX

FCC ID: A7D-24ZB-PA100

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

Equipment Type: DTS - Part 15 Digital Transmission Systems

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

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

If no, assumed Part 15, Subpart C for intentional radiator - the new 47 CFR [10-01-14] Edition] provision.

Report prepared by:

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List of attached file

Exhibit type	File Description	Filename
Test Report	Test Report	report.pdf
Test Setup Photo	Radiated Emission	radiated photos.pdf
Test Setup Photo	Conducted Emission	conducted 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	Modular Approval Checklist	checklist.pdf

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EXHIBIT 1

SUMMARY OF TEST RESULTS

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1.0 Summary of Test results

Radio Module

Model: OASIS-24ZB-PIFA, OASIS-24ZB-UFL, OASIS-24ZB-MMCX

FCC ID: A7D-24ZB-PA100

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
AC Conducted Emission	15.207	Pass
Antenna Requirement	15.203	Pass (See Notes)

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

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EXHIBIT 2

GENERAL DESCRIPTION

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2.0 General Description

2.1 Product Description

The Equipment Under Test (EUT) is a Radio Module with ZigBee (IEEE 802.15.4) function operating in 2405-2475 MHz for 15 channels with 5 MHz channel separation. The EUT is powered by fixed board, which supply by USB Port DC 5.0V. For more detail information pls. refer to the user manual.

The Model: OASIS-24ZB-PIFA and OASIS-24ZB-MMCX are the same as the Model: Oasis-24ZB-UFL in hardware aspect, the electrical parts is the same except the Model: OASIS-24ZB-UFL, OASIS-24ZB-MMCX can be equipped with detached Antenna rather than integral PCB Antenna, pls. refer the below list:

Model No.	Antenna Type	Antenna Gain	Impedance of Antenna Connector
OASIS-24ZB-PIFA	Integral Antenna (PCB PIFA ANT)	0 dBi	-
OASIS-24ZB-UFL	Detached Antenna with UFL	2 dBi	50 Ω
OASIS-24ZB-MMCX	Detached Antenna with MMCX	2 dBi	50 Ω

Abbreviation:

PIFA means Planar Inverted-F Antenna

MMCX means Miniature Microax RF Coaxial Connectors

UFL means Ultra-fine Linker

Detached Antenna with Reversed SMA Connector

Type of Modulation: GFSK.

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

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2.2 Related Submittal(s) Grants

This is an application for certification of:

DTS- Part 15 Digital Transmission Systems (ZigBee module), and there is no corresponding unit for certification.

2.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.10 (2013) and KDB 558074 v03r03. Radiated emission measurement was performed in semi-anechoic chamber and conducted emission measurement was performed in shield room. 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 and shield room used to collect the radiated data and conducted 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

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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. During testing, all cables were manipulated to produce worst case emissions. The EUT was powered by fixed board, which supplied by PC USB Port and the PC was powered by AC 120V/60Hz during the testing.

The EUT was equipped two antenna ports (ANT. 1 and ANT. 2) for each Antenna Types. It operating on SISO mode only that if the receiver sensitivity has meet the internal limit valve, the antenna of EUT will auto transfer to another antenna. All antenna port (including each Antenna Types) were tested and only the worst cast data was reported in this report.

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.

The rear of unit was flushed with the rear of the table when it was powered by PC up to 1GHz and placed in the centre of turntable above 1GHz.

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.

3.3 Special Accessories

N/A.

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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 Talon Communications, Inc. 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.
Laptop	Lenovo	T420
Antenna	N/A	W1030
USB Cable	N/A	Unshielded, 100cm

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EXHIBIT 4

MEASUREMENT RESULTS

INTERTEK TESTING SERVICES

Applicant: Talon Communications, Inc.

Date of Test: 06 August 2015

Model: OASIS-24ZB-UFL

4.0 Measurement Results

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

The antenna port of the EUT was connected to the input of a broadband peak RF power meter. The power meter have a Resolution bandwidth that is greater than OBW and utilize a fast-responding diode detector. Power was read directly at the EUT antenna terminals for using to OFFSET function of the power meter.

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

IEEE 802.15.4 (Antenna Gain: W1030=2dBi, PIFA=0dBi) (GFSK, 250kbps)		
Frequency (MHz)	Output in dBm	Output in mWatt
Low Channel: 2405	20.25	105.93
Middle Channel: 2440	19.67	92.68
High Channel: 2475	20.78	119.67

Cable loss: 0.6 dB External Attenuation: 0 dB

Cable loss, external attenuation has been included in OFFSET function

EUT max. output level = 20.78 dBm

For RF Exposure, the information is saved with filename: RF exposure.pdf.

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Applicant: Talon Communications, Inc.

Date of Test: 06 August 2015

Model: OASIS-24ZB-UFL

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 v03r03. 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.

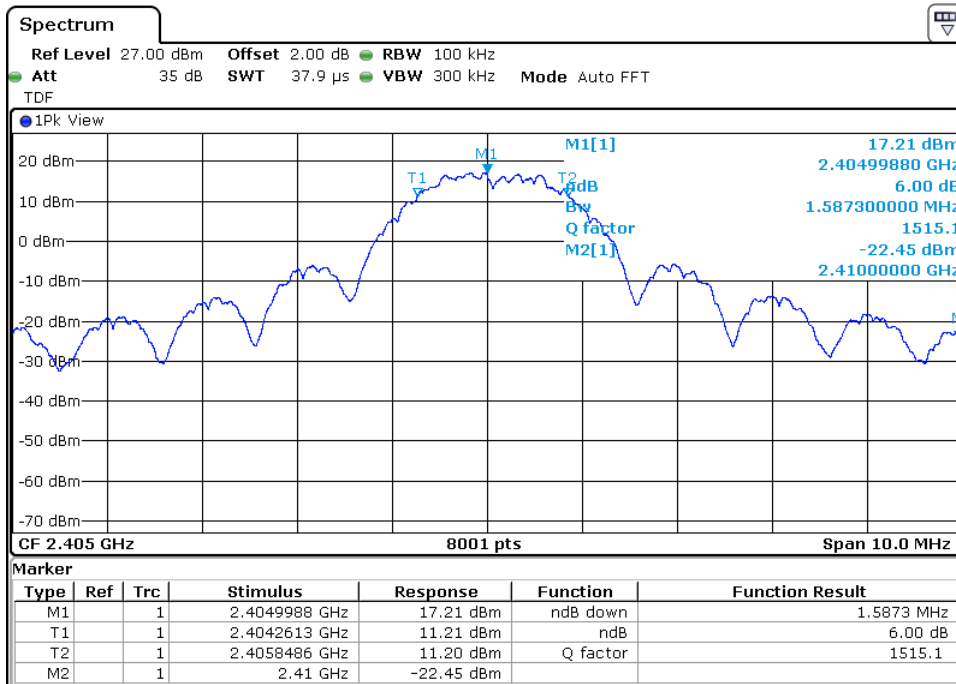
Limit: The 6 dB Bandwidth is at least 500 kHz.

Frequency (MHz)	6 dB Bandwidth (MHz)
2405	1.587
2440	1.627
2475	1.675

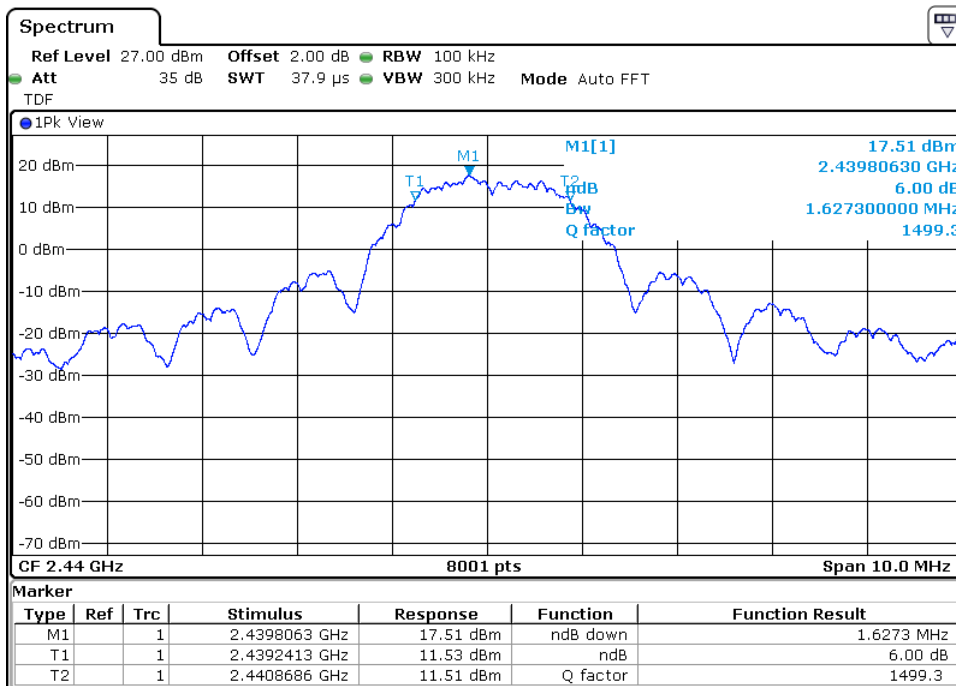
The test plots are attached as below.

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Channel 1 (2405MHz):

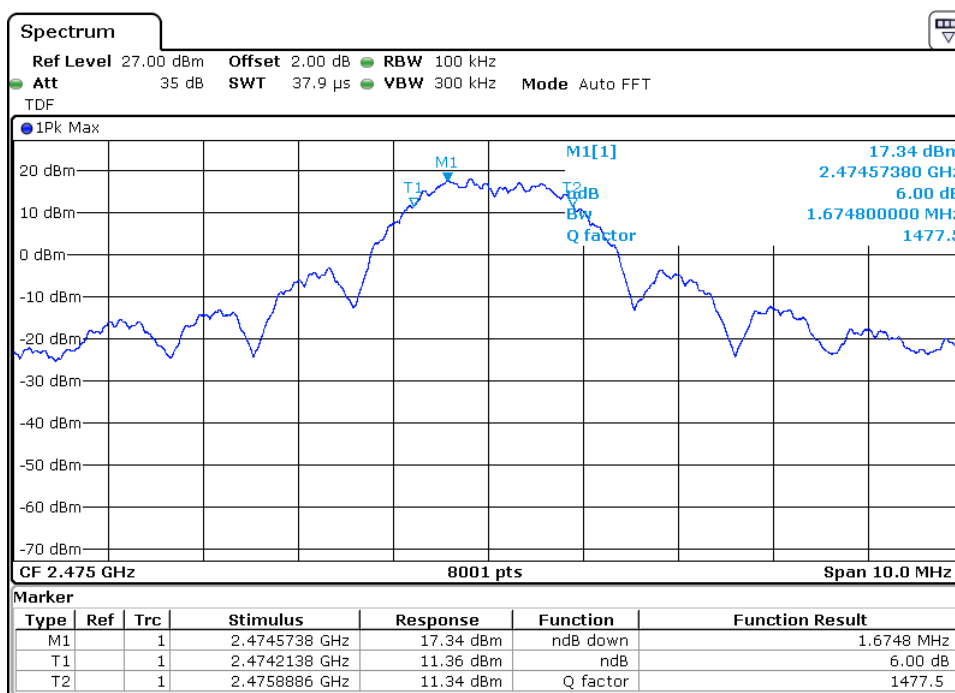


Channel 8 (2440MHz):



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Channel 15 (2475MHz):



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Applicant: Talon Communications, Inc.

Date of Test: 06 August 2015

Model: OASIS-24ZB-UFL

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

The Measurement Procedure PKPSD was set according to the FCC KDB 558074(2015).

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.

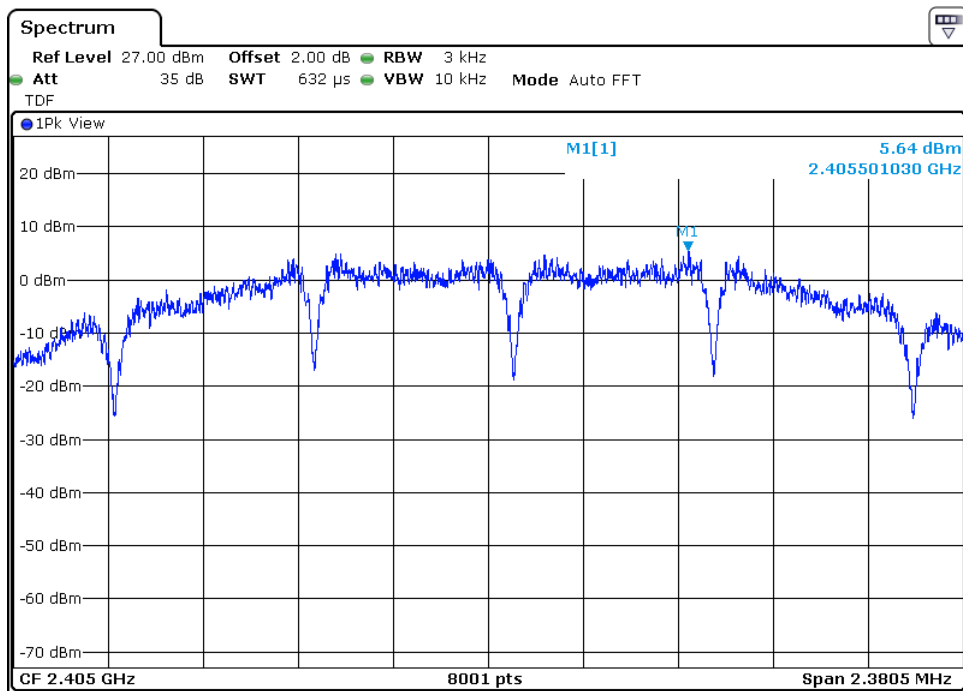
Limit: The Power Density does not exceed 8dBm/3 kHz.

Frequency (MHz)	Power Density with RBW 3KHz (dBm)
2405	5.64
2440	6.01
2475	6.06

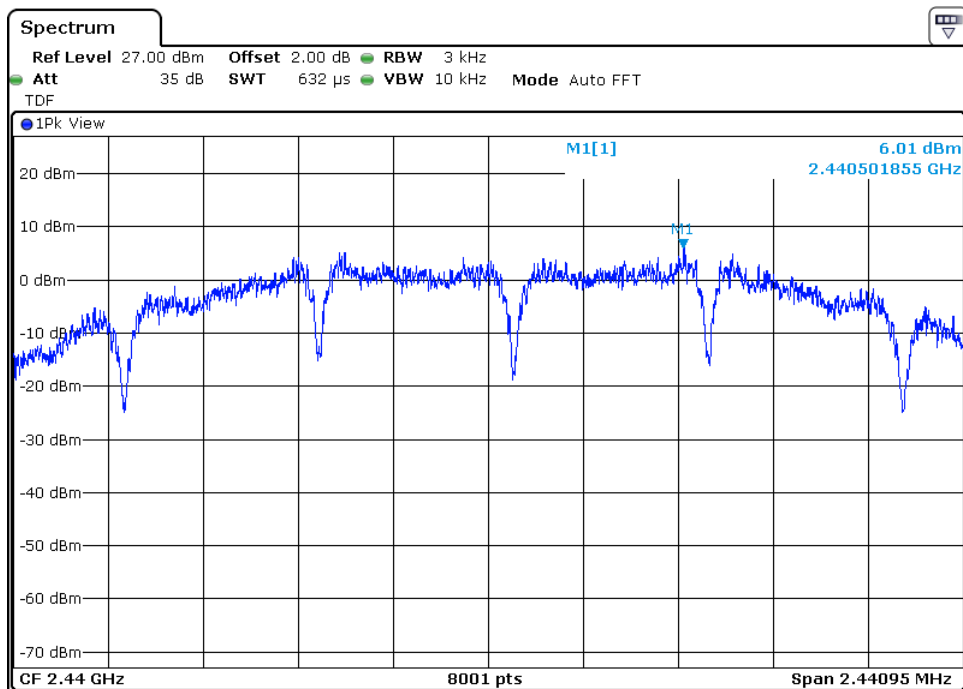
The test plots are attached as below.

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Channel 1 (2405MHz):



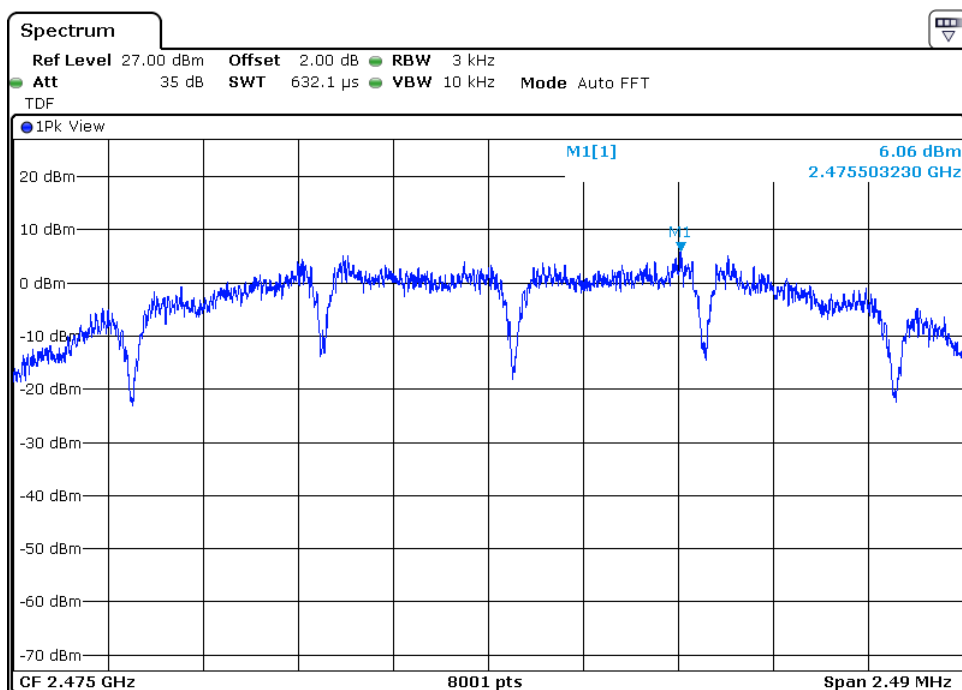
Channel 8 (2440MHz):



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Channel 15(2475MHz):



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Applicant: Talon Communications, Inc.
Date of Test: 06 August 2015
Model: OASIS-24ZB-UFL

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 v03r03.

All other types of emissions from the EUT shall meet the general limits for radiated frequencies outside the passband.

Refer to the attached test plots for out of band conducted emissions data with rate of 250kbps.

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

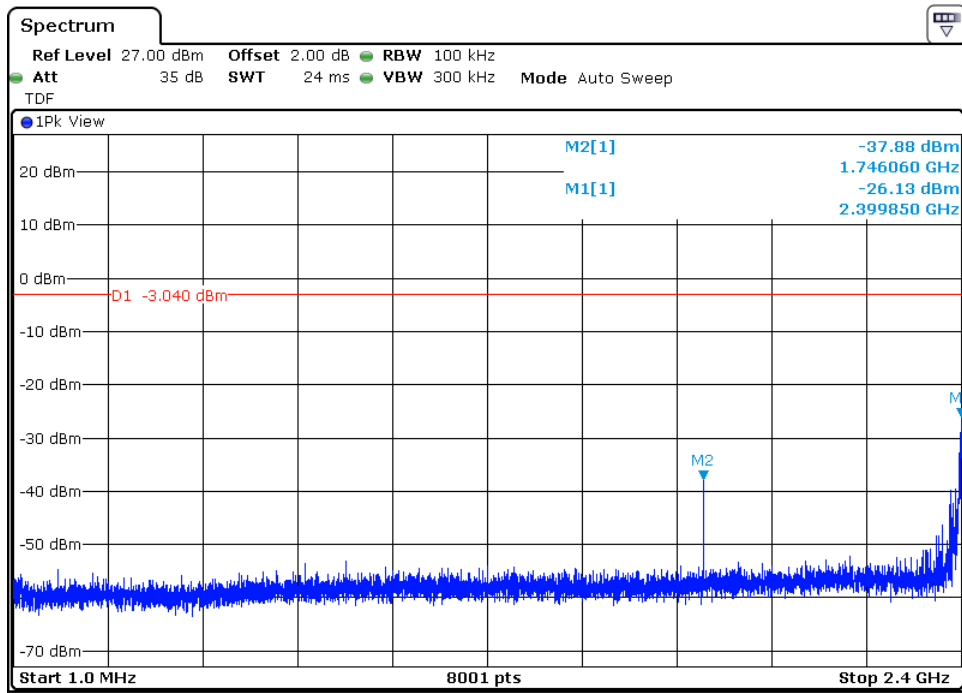
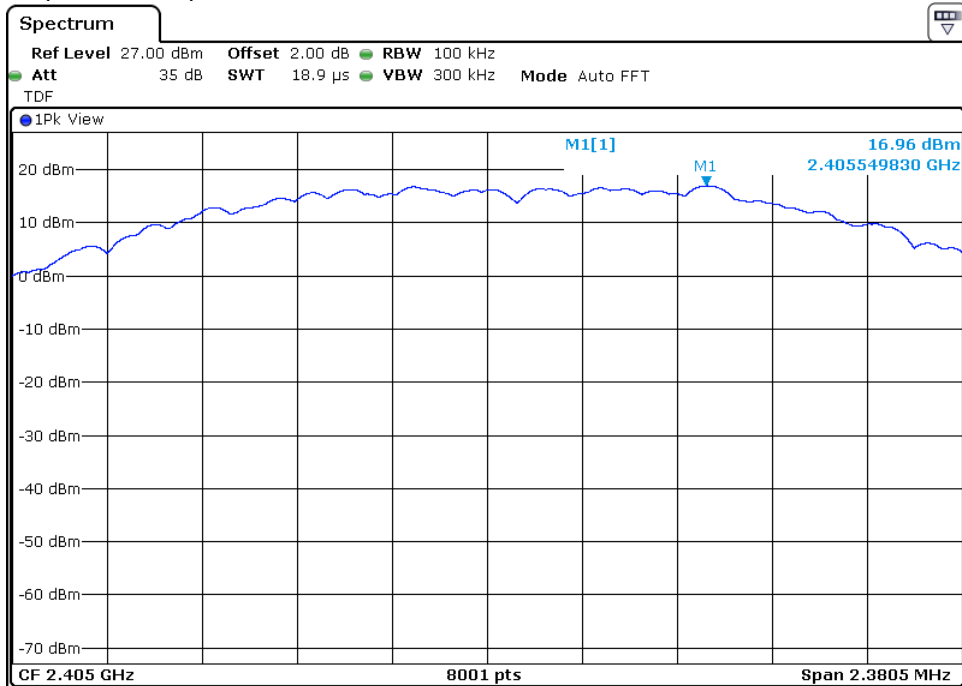
Cable loss: 0.6 dB External Attenuation: 1.4 dB

Cable loss, external attenuation has been included in OFFSET function

The test plots are attached as below.

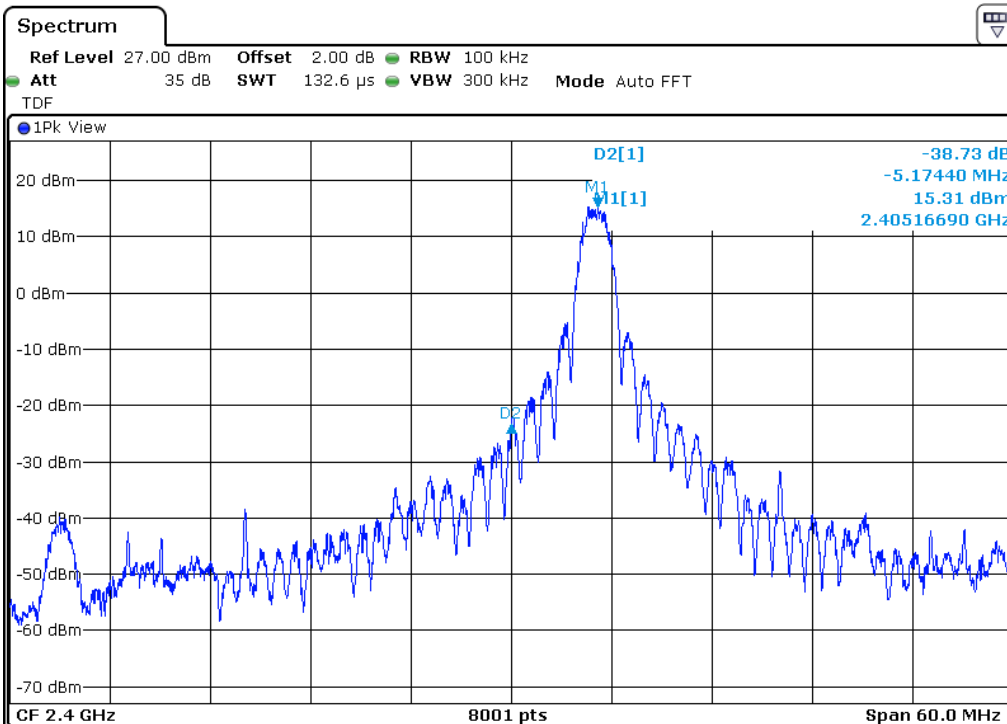
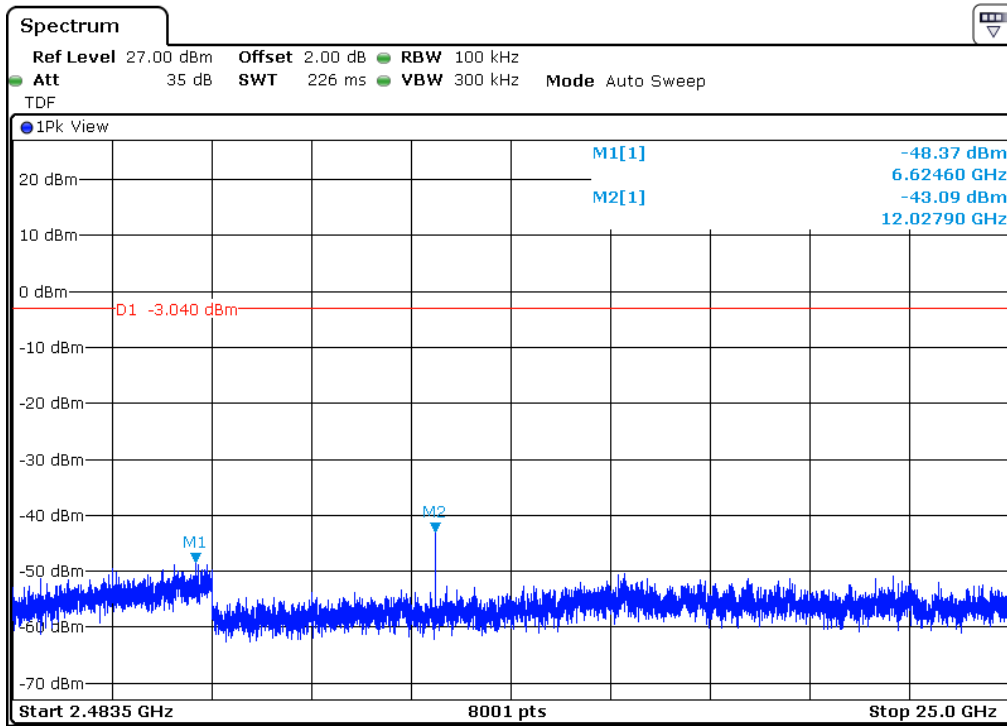
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Channel 1 (2405MHz) Reference Level: 16.96dBm



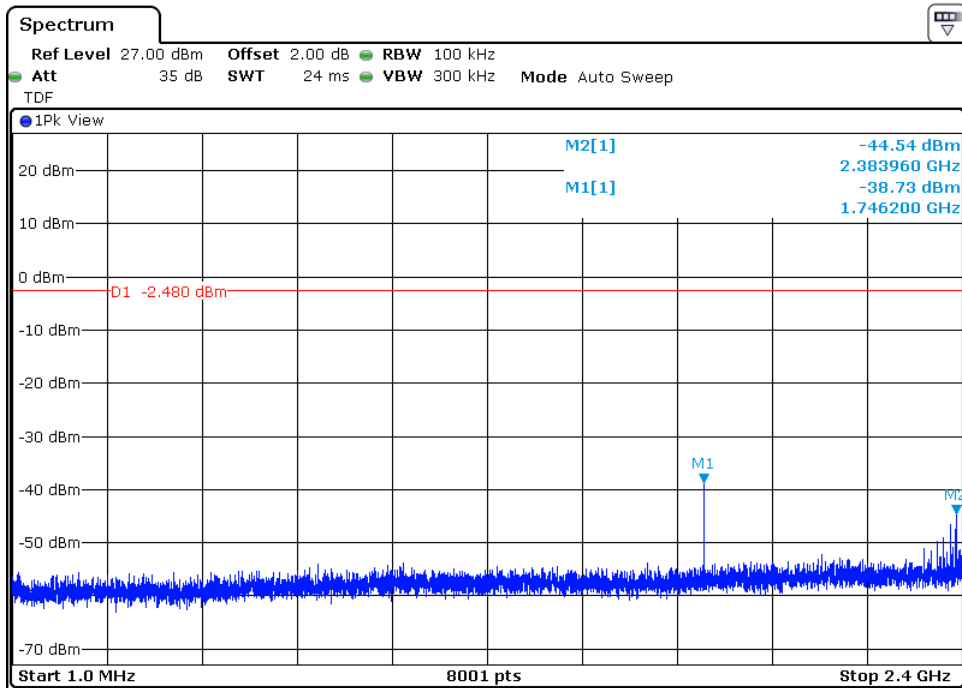
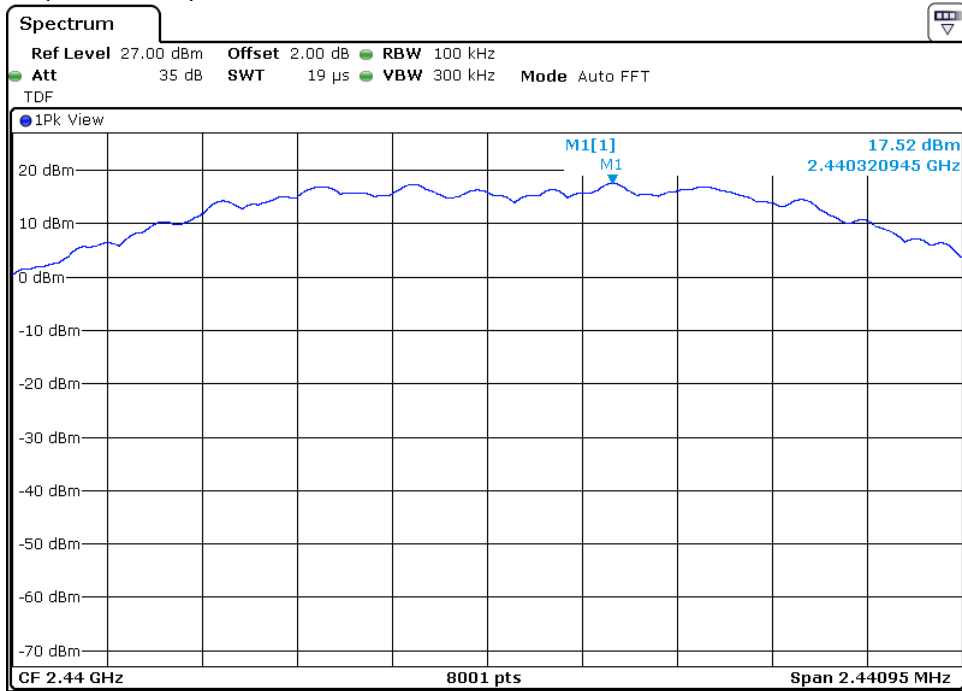
TRF no.: FCC 15C_TX_b
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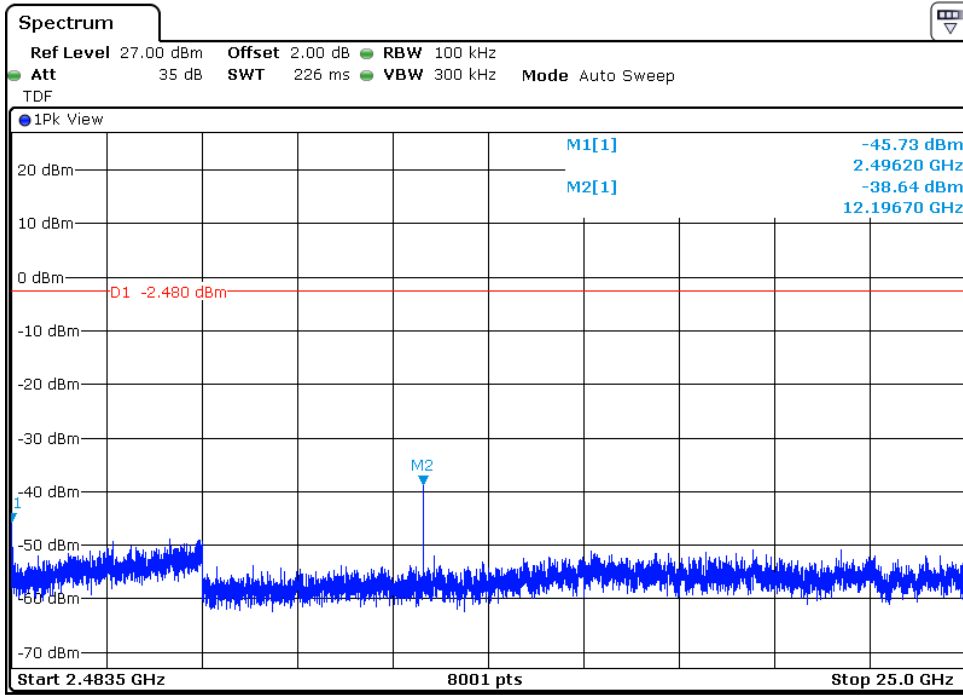
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Channel 8 (2440MHz) Reference Level: 17.520dBm

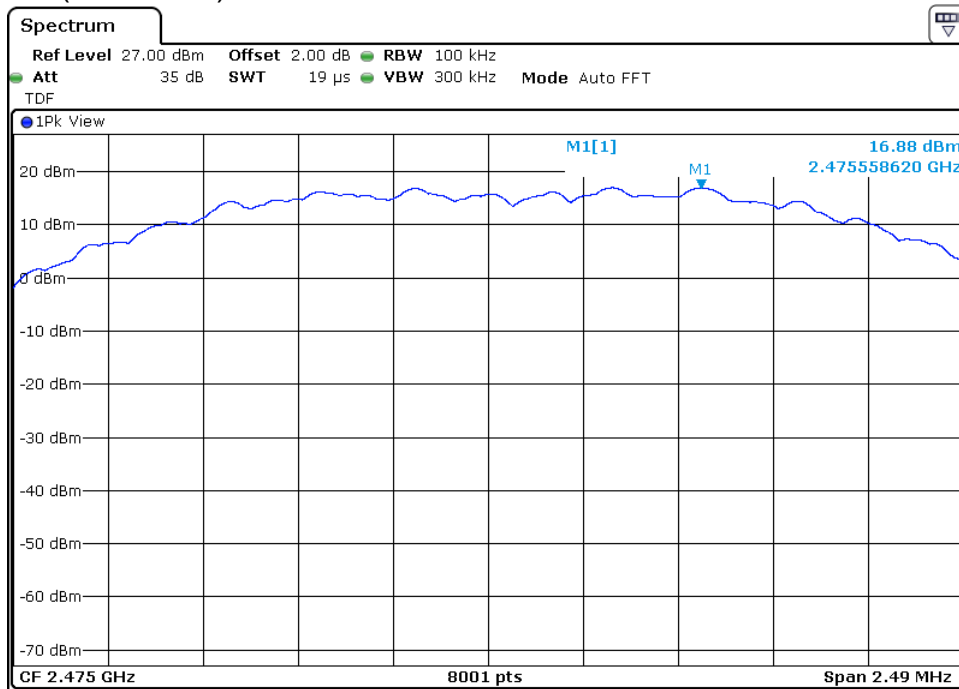


TRF no.: FCC 15C_TX_b
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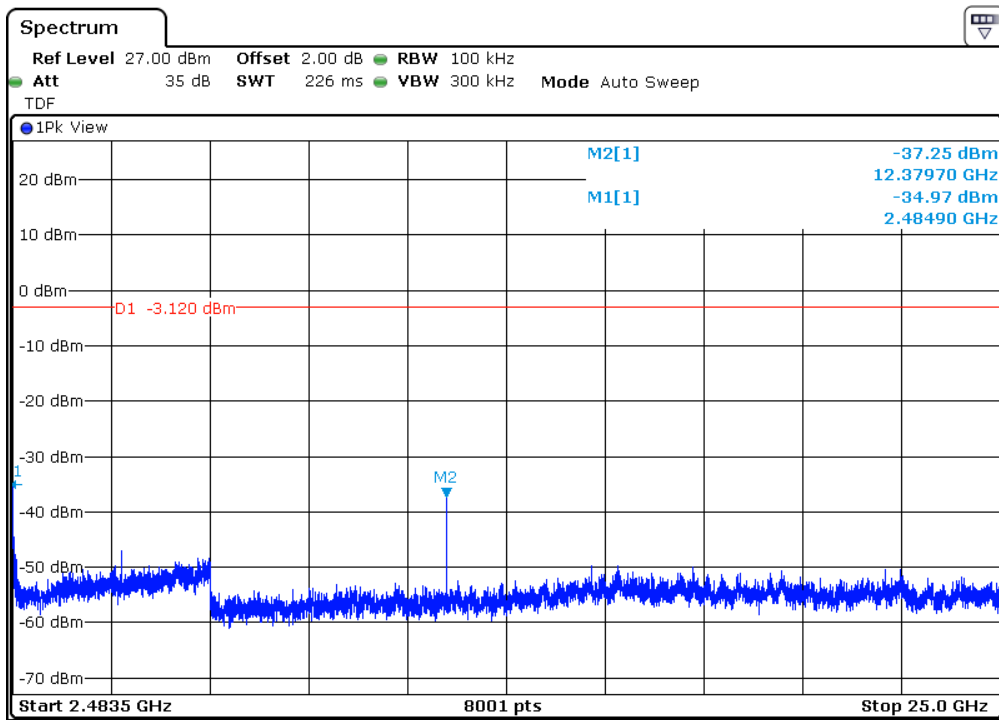
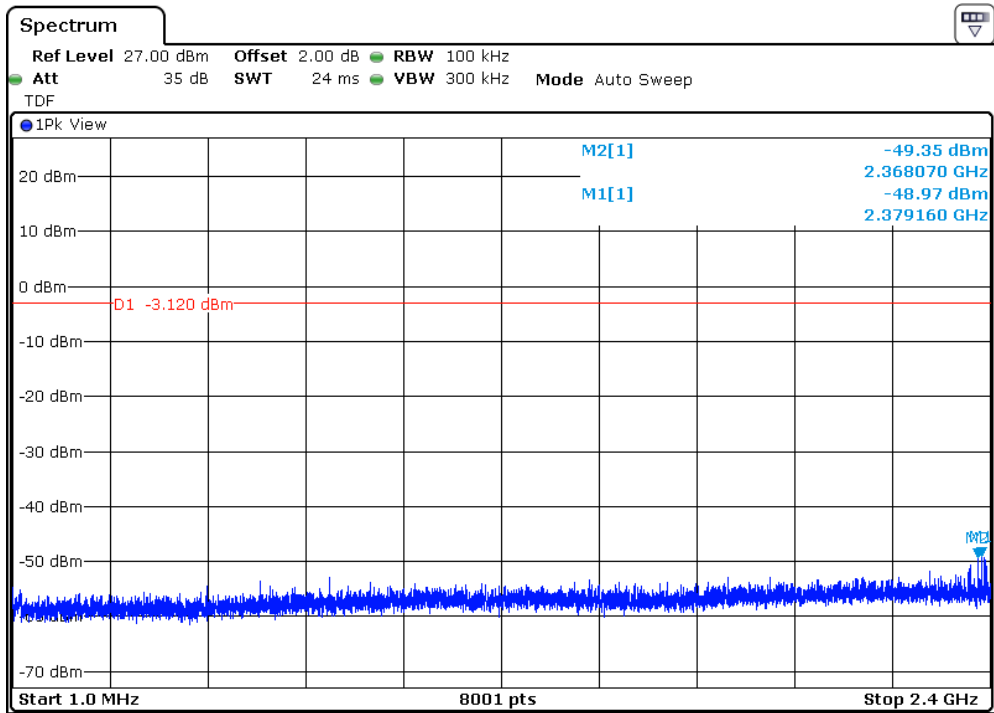
INTERTEK TESTING SERVICES



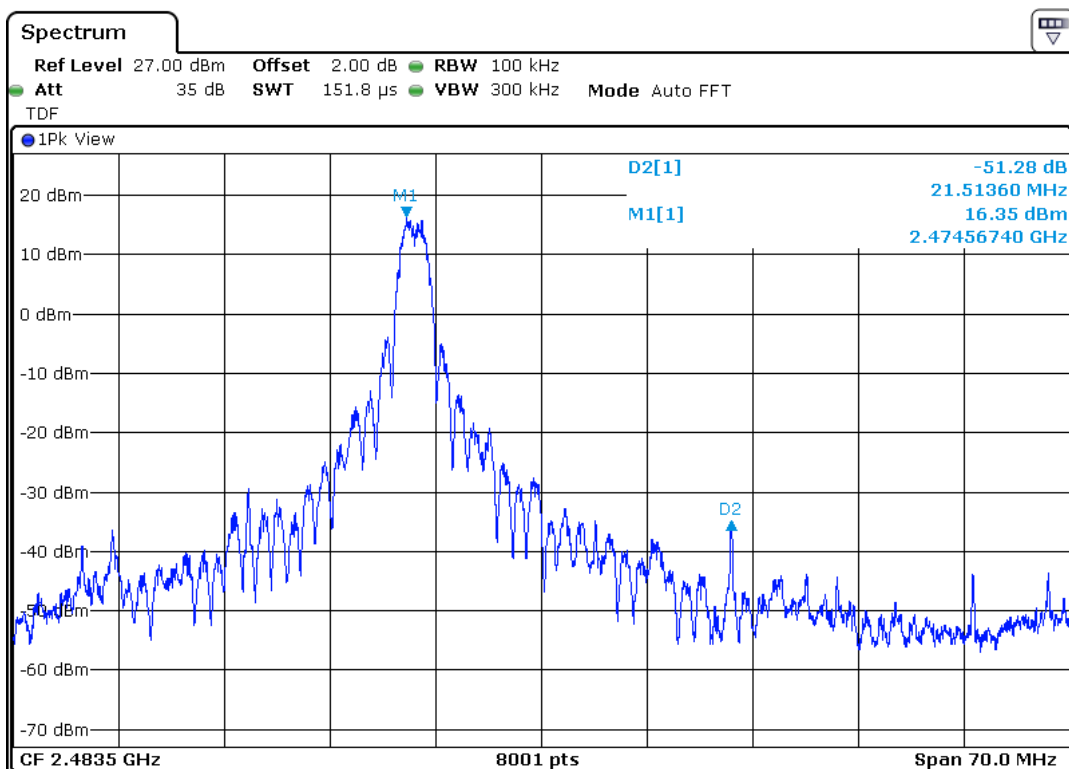
Channel 15 (2475 MHz) Reference Level: 16.880dBm



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Applicant: Talon Communications, Inc.

Date of Test: 06 August 2015

Model: OASIS-24ZB-UFL

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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Applicant: Talon Communications, Inc.

Date of Test: 06 August 2015

Model: OASIS-24ZB-UFL

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.

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Applicant: Talon Communications, Inc.

Date of Test: 06 August 2015

Model: OASIS-24ZB-UFL

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 dB μ V/m
- RA = Receiver Amplitude (including preamplifier) in dB μ V
- 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 dB μ V 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 42 dB μ V/m. This value in dB μ V/m was converted to its corresponding level in μ V/m.

$$RA = 62.0 \text{ dB}\mu\text{V}$$

$$AF = 7.4 \text{ dB}$$

$$CF = 1.6 \text{ dB}$$

$$AG = 29.0 \text{ dB}$$

$$PD = 0 \text{ dB}$$

$$FS = 62 + 7.4 + 1.6 - 29 + 0 = 42 \text{ dB}\mu\text{V/m}$$

$$\text{Level in mV/m} = \text{Common Antilogarithm} [(42 \text{ dB}\mu\text{V/m})/20] = 125.9 \mu\text{V/m}$$

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4.8 Radiated Spurious Emission

Worst Case Radiated Spurious Emission at 4950.000MHz and 64.578MHz were passed by 1.9dB margin.

All antennas was tested but only worst case was recorded in this report. For the electronic filing, the worst case radiated emission configuration photographs are saved with filename: radiated photos.pdf.

TEST PERSONNEL:

Sign on file

Hardy Suo, Engineer
Typed / Printed Name

August 06, 2015
Date

INTERTEK TESTING SERVICES

Applicant: Talon Communications, Inc.

Date of Test: 06 August 2015

Model: OASIS-24ZB-UFL

Worst Case Operating Mode: Transmitting (2405MHz)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	64.578	50.5	20.0	7.6	38.1	40.0	-1.9
Horizontal	155.615	42.7	20.0	11.1	33.8	43.5	-9.7
Horizontal	480.080	36.9	20.0	20.4	37.3	46.0	-8.7
Vertical	62.693	49.7	20.0	7.5	37.2	40.0	-2.8
Vertical	71.710	46.8	20.0	8.1	34.9	40.0	-5.1
Vertical	479.998	40.6	20.0	20.4	41.0	46.0	-5.0

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.

INTERTEK TESTING SERVICES

Applicant: Talon Communications, Inc.
 Date of Test: 06 August 2015
 Model: OASIS-24ZB-UFL
 Mode: Transmitting (2405MHz)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4810.000	61.9	36.1	34.2	60.0	74.0	-14.0
Horizontal	*2388.175	34.0	20.0	28.2	42.2	74.0	-31.8

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4810.000	51.7	36.1	34.2	49.8	54.0	-4.2
Horizontal	*2388.175	22.9	20.0	28.2	31.1	54.0	-22.9

- NOTES:
1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.
 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.
- * 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.

INTERTEK TESTING SERVICES

Applicant: Talon Communications, Inc.
 Date of Test: 06 August 2015
 Model: OASIS-24ZB-UFL
 Mode: Transmitting (2440MHz)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4880.000	63.6	36.1	34.6	62.1	74.0	-11.9
Horizontal	*7320.000	60.9	35.6	37.1	62.4	74.0	-11.6

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4880.000	52.6	36.1	34.6	51.1	54.0	-2.9
Horizontal	*7320.000	49.6	35.6	37.1	51.1	54.0	-2.9

- NOTES:
1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.
 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.
- * 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.

INTERTEK TESTING SERVICES

Applicant: Talon Communications, Inc.
 Date of Test: 06 August 2015
 Model: OASIS-24ZB-UFL
 Mode: Transmitting (2475MHz)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4950.000	65.3	36.1	34.6	63.8	74.0	-10.2
Horizontal	*7425.000	61.8	35.6	37.2	63.4	74.0	-10.6
Horizontal	*2485.208	36.2	20.0	28.0	44.2	74.0	-29.8

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4950.000	53.6	36.1	34.6	52.1	54.0	-1.9
Horizontal	*7425.000	50.4	35.6	37.2	52.0	54.0	-2.0
Horizontal	*2485.208	27.6	20.0	28.0	35.6	54.0	-18.4

- NOTES: 1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.
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.
- * 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.

INTERTEK TESTING SERVICES

4.9 Conducted Emission

Worst Case Conducted emission at 0.226MHz is Passed by 16.7dB margin

For electronic filing, the worst case conducted emission configuration photograph is saved with filename: conducted photos.pdf.

TEST PERSONNEL:

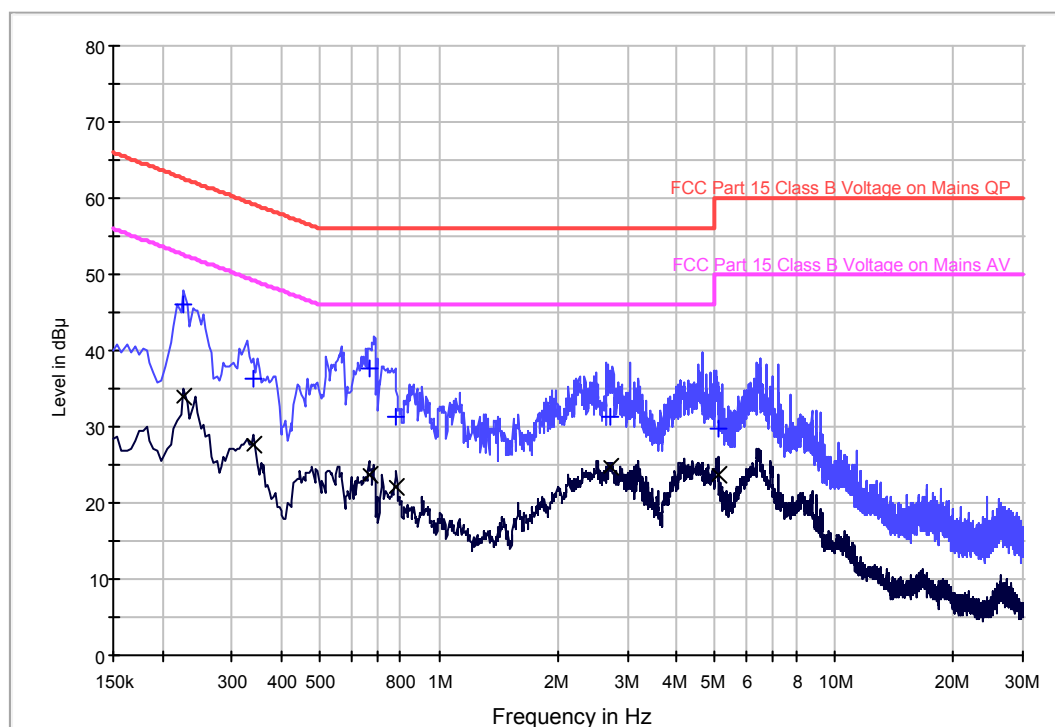
Sign on file

Hardy Suo, Engineer
Typed / Printed Name

August 06, 2015
Date

INTERTEK TESTING SERVICES

Applicant: Talon Communications, Inc.
 Date of Test: 06 August 2015
 Model: OASIS-24ZB-UFL
 Worst Case Operating Mode: Transmitting
 Line: Live
Conducted Emission Test - FCC



Limit and Margin QP

Frequency (MHz)	QuasiPeak (dB µV)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.226	45.9	L	9.9	16.7	62.6
0.338	36.3	L	9.9	23.0	59.3
0.666	37.7	L	10.1	18.3	56.0
0.782	31.4	L	10.0	24.6	56.0
2.718	31.4	L	10.0	24.6	56.0
5.070	29.6	L	10.0	30.4	60.0

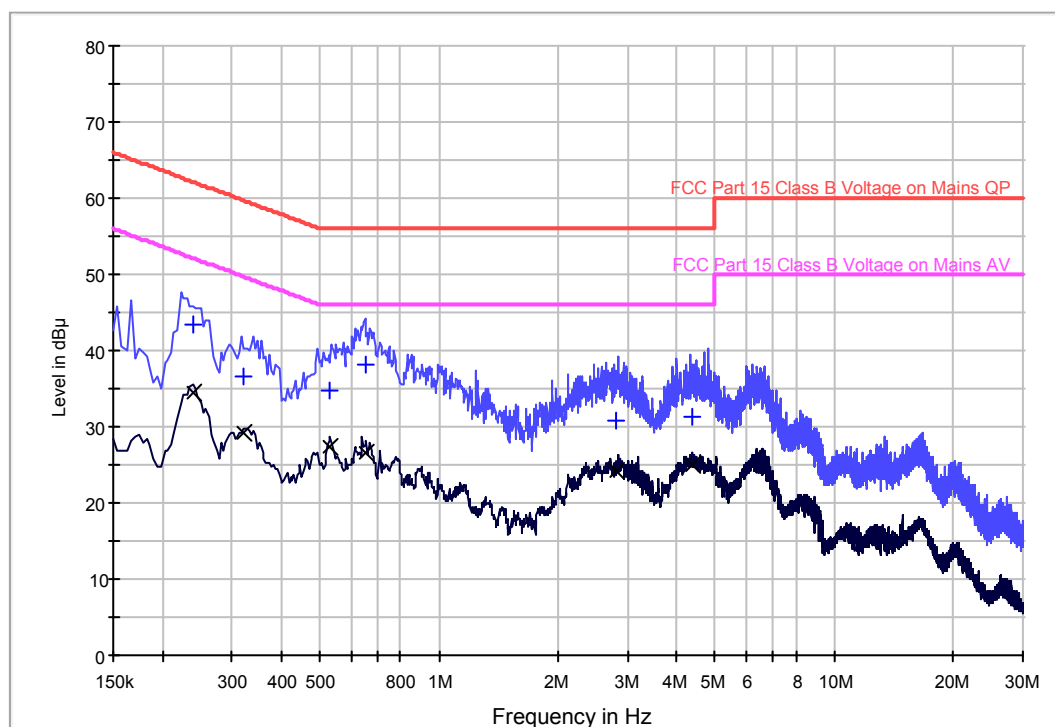
Limit and Margin AV

Frequency (MHz)	Average (dBµV)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.226	34.0	L	9.9	18.6	52.6
0.338	27.5	L	9.9	21.8	49.3
0.666	23.8	L	10.1	22.2	46.0
0.782	22.1	L	10.0	23.9	46.0
2.718	24.7	L	10.0	21.3	46.0
5.070	23.6	L	10.0	26.4	50.0

TRF no.: FCC 15C_TX_b
 FCC ID: A7D-24ZB-PA100
 Report No.: 150513001SZN-001

INTERTEK TESTING SERVICES

Applicant: Talon Communications, Inc.
 Date of Test: 06 August 2015
 Model: OASIS-24ZB-UFL
 Worst Case Operating Mode: Transmitting
 Line: Neutral
Conducted Emission Test - FCC



Limit and Margin QP

Frequency (MHz)	QuasiPeak (dBµV)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.238	43.4	N	10.2	18.8	62.2
0.322	36.7	N	10.2	23.0	59.7
0.530	34.8	N	10.2	21.2	56.0
0.654	38.2	N	10.3	17.8	56.0
2.822	30.8	N	10.3	25.2	56.0
4.370	31.2	N	10.3	24.8	56.0

Limit and Margin AV

Frequency (MHz)	Average (dBµV)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.238	34.6	N	10.2	17.6	52.2
0.322	29.2	N	10.2	20.5	49.7
0.530	27.5	N	10.2	18.5	46.0
0.654	26.6	N	10.3	19.4	46.0
2.822	24.1	N	10.3	21.9	46.0
4.370	25.1	N	10.3	20.9	46.0

TRF no.: FCC 15C_TX_b
 FCC ID: A7D-24ZB-PA100
 Report No.: 150513001SZN-001

INTERTEK TESTING SERVICES

Applicant: Talon Communications, Inc.

Date of Test: 06 August 2015

Model: OASIS-24ZB-UFL

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

Not required - No digital part

Test results are attached

Included in the separated report.

INTERTEK TESTING SERVICES

Applicant: Talon Communications, Inc.

Date of Test: 06 August 2015

Model: OASIS-24ZB-UFL

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.

INTERTEK TESTING SERVICES

EXHIBIT 5

EQUIPMENT PHOTOGRAPHS

INTERTEK TESTING SERVICES

5.0 Equipment Photographs

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

INTERTEK TESTING SERVICES

EXHIBIT 6

PRODUCT LABELLING

INTERTEK TESTING SERVICES

6.0 Product Labeling

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

INTERTEK TESTING SERVICES

EXHIBIT 7

TECHNICAL SPECIFICATIONS

INTERTEK TESTING SERVICES

7.0 Technical Specifications

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

INTERTEK TESTING SERVICES

EXHIBIT 8

INSTRUCTION MANUAL

INTERTEK TESTING SERVICES

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.

INTERTEK TESTING SERVICES

EXHIBIT 9

CONFIDENTIALITY REQUEST

INTERTEK TESTING SERVICES

9.0 Confidentiality Request

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

INTERTEK TESTING SERVICES

EXHIBIT 10

MISCELLANEOUS INFORMATION

INTERTEK TESTING SERVICES

10.0 **Discussion of Pulse Desensitization**

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.

INTERTEK TESTING SERVICES

EXHIBIT 11

TEST EQUIPMENT LIST

INTERTEK TESTING SERVICES

11.0 Test Equipment List

Equipment No.	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due Date
SZ061-06	Active Loop Antenna	Electro-Metrics	EM-6876	217	29-Apr-2015	29-Apr-2016
SZ061-03	BiConiLog Antenna	ETS	3142C	0078828	14-Jun-2015	14-Jun-2016
SZ061-08	Horn Antenna	ETS	3115	00092346	19-Oct-2014	19-Oct-2015
SZ185-01	EMI Test Receiver	R&S	ESCI	100547	7-Feb-2015	7-Feb-2016
SZ185-02	EMI Test Receiver	R&S	ESCI	100692	1-Nov-2014	1-Nov-2015
SZ056-03	Spectrum Analyzer	R&S	FSP 30	101148	8-Jun-2015	8-Jun-2016
EM031-03	Signal and Spectrum	R&S	FSV 40	101506	6-Jun-2015	6-Jun-2016
SZ181-04	Preamplifier	Agilent	8449B	3008A02474	7-Feb-2015	7-Feb-2016
SZ187-01	Two-Line V-Network	R&S	ENV216	100072	1-Nov-2014	1-Nov-2015
SZ187-02	Two-Line V-Network	R&S	ENV216	100073	24-Jun-2015	24-Jun-2016
SZ182-02	RF Power Meter	Anritsu	ML2496A	1302005	20-May-2015	20-May-2016
SZ182-02-01	Pulse Power Sensor	Anritsu	MA2411B	1207429	20-May-2015	20-May-2016
SZ062-04	RF Cable	RADIALL	RG 213U	--	27-Jun-2015	27-Dec-2015
SZ062-05	RF Cable	RADIALL	0.04-26.5GHz	--	7-Apr-2015	7-Oct-2015
SZ062-12	RF Cable	RADIALL	0.04-26.5GHz	--	7-Apr-2015	7-Oct-2015
SZ188-01	Anechoic Chamber	ETS	RFD-F/A-100	4102	19-Apr-2014	19-Apr-2016
SZ188-03	Shielding Room	ETS	RFD-100	4100	23-Aug-2014	23-Aug-2016