Talon Communications, Inc.

Application
For
Certification
FCC ID: A7D-24NOD-PA100

Product Description: Radio Module

Model: **24HiMOD-RPSMA**
Additional Model: **24HiMOD-PCBANT**

2.4GHz Transceiver Module

Report No.: SZ12080136-1

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 [10-1-11]

Prepared and Checked by:	Approved by:
Sign on file	Digitally signed by Billy Li Location: Intertek Testing Services
Chris Chen Engineer	Billy Li Supervisor Date: 1 November 2012

TRF: No.: FCC 15C_TX_b

LIST OF EXHIBITS

INTERTEK TESTING SERVICES

MEASUREMENT/TECHNICAL REPORT

Talon Communications, Inc.

Model: **24HiMOD-RPSMA**
Additional Model: **24HiMOD-PCBANT**

FCC ID: A7D-24NOD-PA100

1 November 2012

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

Equipment Type: DXX - Part 15 Low Power Communication Device Transmitter

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 [10-1-11 Edition] provision.

Report prepared by:

Billy Li
Intertek Testing Services Shenzhen Ltd.
Kejiyuan Branch
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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
Test Report	20dB BW Plot	bw.pdf
Test Report	Bandedge Plot	bandedge.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	Letter of Agency	agency.pdf
Cover Letter	Certification Agreement	agreement.pdf
Cover Letter	Confidentiality Request	request.pdf
Cover Letter	Module Approval Letter	module approval letter.pdf

EXHIBIT 1

GENERAL DESCRIPTION

1.0 General Description

1.1 Product Description

The Equipment under Test (EUT) are Radio Module units, model: 24HiMOD-RPSMA and 24HiMOD-PCBANT operating at 2.4GHz band. The EUT is powered by USB Port.

The Model: 24HiMOD-PCBANT is only difference antenna type with Model: 24HiMOD-RPSMA. The others are the same.

Model	Antenna Gain (dBi)	Antenna Type
24HiMOD-RPSMA	2	Dedicated antenna with reverse SMA connector
24HiMOD-PCBANT	0	PCB antenna

Modulation Type: GFSK

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

1.2 Related Submittal(s) Grants

This is an application for certification of a transceiver for Module Approval, and there is no corresponding unit for certification.

1.3 Test Methodology

Both AC mains line-conducted and Radiated emission measurements were performed according to the procedures in ANSI C63.4 (2009). Radiated Emission measurement was performed in a Semi-anechoic chamber. Preliminary scans were performed in the Semi-anechoic chamber only to determine worst case modes. For each scan, the procedure for maximizing emissions in Appendices D and E were followed. All Radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the **"Justification Section"** of this Application.

1.4 Test Facility

The Semi-Anechoic chamber and shielding 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 2

SYSTEM TEST CONFIGURATION

2.0 System Test Configuration

2.1 Justification

The system was configured for testing in a typical fashion (as a customer would normally use it), and in the confines as outlined in ANSI C63.4: 2009.

The EUT was powered by USB Port through PC with 120V/60Hz during the testing.

For maximizing emissions, the EUT was rotated through 360°, the antenna height was varied from 1 meter to 4 meters above the ground plane, and the antenna polarization was changed. This step by step procedure for maximizing emissions led to the data reported in Exhibit 3.0.

The rear of unit shall be flushed with the rear of the table.

The equipment under test (EUT) was configured for testing in a typical fashion (as a customer would normally use it). The EUT was placed on a turn table, which enabled the engineer to maximize emissions through its placement in the three orthogonal axes.

2.2 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 19.5dBm for the setting of RF output power expected by the application and is going to be fixed on the firmware of the end product.

2.3 Special Accessories

No special accessories used.

2.4 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.

2.5 Measurement Uncertainty

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

2.6 Support Equipment List and Description

Description	Manufacturer	Model No.
Laptop	Lenovo	T420
Hard Disk	Smart	HD-003
USB Cable	N/A	Unshielded, 100cm
USB Cale	N/A	Unshielded, 155cm
1394 Cable	N/A	Unshielded, 180cm

EXHIBIT 3

EMISSION RESULTS

3.0 Emission Results

Data is included worst-case configuration (the configuration which resulted in the highest emission levels).

3.1 Radiated Test Results

A sample calculation, configuration photographs and data tables of the emissions are included.

3.1.1 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(when specified limit is in average and measurements are made with peak detectors). A sample calculation is included below.

FS = RA + AF + CF - AG

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

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

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 net field strength for comparison to the appropriate emission limit is 42 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 = 42 dBµV/m

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

3.1.2 Radiated Emission Configuration Photograph

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

3.1.3 Radiated Emissions

The data on the following page lists the significant emission frequencies, the limit and the margin of compliance. Numbers with a minus sign are below the limit.

Worst Case Radiated Emission
at
269.996 MHz with model: 24HiMOD-RPSMA

Judgement: Passed by 4.8 dB

TEST PERSONNEL:

Sign on file

Chris Chen, Engineer
Typed/Printed Name

1 November 2012
Date

Applicant: Talon Communications, Inc. Date of Test: 1 November 2012
Model: 24HiMOD-RPSMA
Sample: 1/1
Worst Case Operating Mode: Transmit

Table 1

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	62.980	38.3	26.0	7.4	19.7	40.0	-20.3
Horizontal	246.011	52.5	26.0	12.0	38.5	46.0	-7.5
Horizontal	269.996	54.8	26.0	12.4	41.2	46.0	-4.8
Vertical	245.825	47.6	26.0	12.0	33.6	46.0	-12.4
Vertical	270.125	47.6	26.0	12.4	34.0	46.0	-12.0
Vertical	281.715	47.2	26.0	12.9	34.1	46.0	-11.9

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: Talon Communications, Inc. Date of Test: 1 November 2012
Model: 24HiMOD-PCBANT
Sample: 1/1
Worst Case Operating Mode: Transmit

Table 2

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	60.582	39.9	26.0	7.4	21.3	40.0	-18.7
Horizontal	243.584	51.9	26.0	12.0	37.9	46.0	-8.1
Horizontal	272.868	54.2	26.0	12.4	40.6	46.0	-5.4
Vertical	240.520	47.0	26.0	11.9	32.9	46.0	-13.1
Vertical	272.050	48.0	26.0	12.4	34.4	46.0	-11.6
Vertical	282.630	46.9	26.0	12.9	33.8	46.0	-12.2

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.

3.1.4 Transmitter Spurious Emissions (Radiated)

The data on the following page lists the significant emission frequencies, the limit and the margin of compliance. Numbers with a minus sign are below the limit.

Worst Case Radiated Emission
at
2402.000 MHz with model: 24HiMOD-RPSMA

Judgement: Passed by 1.1 dB

TEST PERSONNEL:

Sign on file

Chris Chen, Engineer
Typed/Printed Name

1 November 2012
Date

Applicant: Talon Communications, Inc. Date of Test: 1 November 2012
Model: 24HiMOD-RPSMA
Sample: 1/1
Mode: Transmit (2402MHz)

Table 3

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)
Vertical	2402.000	121.5	36.7	28.1	112.9	114.0	-1.1
Vertical	4804.000	67.8	36.1	32.8	64.5	74.0	-9.5
Vertical	7206.000	63.6	36.2	36.5	63.9	74.0	-10.1

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)
Vertical	2402.000	99.1	36.7	28.1	90.5	94.0	-3.5
Vertical	4804.000	54.2	36.1	32.8	50.9	54.0	-3.1
Vertical	7206.000	50.4	36.2	36.5	50.7	54.0	-3.3

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 meter. Harmonic 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 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. Horn antenna is used for the emission over 1000MHz.

Test Engineer: Chris Chen

Applicant: Talon Communications, Inc. Date of Test: 1 November 2012
Model: 24HiMOD-RPSMA
Sample: 1/1
Mode: Transmit (2441MHz)

Table 4

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)
Vertical	2441.000	121.0	36.7	28.1	112.4	114.0	-1.6
Vertical	4882.000	64.5	36.1	35.5	63.9	74.0	-10.1
Vertical	7323.000	61.8	36.3	37.2	62.7	74.0	-11.3

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)
Vertical	2441.000	98.3	36.7	28.1	89.7	94.0	-4.3
Vertical	4882.000	50.8	36.1	35.5	50.2	54.0	-3.8
Vertical	7323.000	49.2	36.3	37.2	50.1	54.0	-3.9

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 meter. Harmonic 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 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. Horn antenna is used for the emission over 1000MHz.

Test Engineer: Chris Chen

Applicant: Talon Communications, Inc. Date of Test: 1 November 2012
Model: 24HiMOD-RPSMA
Sample: 1/1
Mode: Transmit (2480MHz)

Table 5

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)
Vertical	2480.000	120.5	36.7	28.1	111.9	114.0	-2.1
Vertical	4960.000	63.3	36.1	35.5	62.7	74.0	-11.3
Vertical	7440.000	61.0	36.3	37.2	61.9	74.0	-12.1

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)
Vertical	2480.000	96.7	36.7	28.1	88.1	94.0	-5.9
Vertical	4960.000	50.0	36.1	35.5	49.4	54.0	-4.6
Vertical	7440.000	47.8	36.3	37.2	48.7	54.0	-5.3

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 meter. Harmonic 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 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. Horn antenna is used for the emission over 1000MHz.

Test Engineer: Chris Chen

Applicant: Talon Communications, Inc. Date of Test: 1 November 2012
Model: 24HiMOD-PCBANT
Sample: 1/1
Mode: Transmit (2402MHz)

Table 6

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)
Vertical	2402.000	121.3	36.7	28.1	112.7	114.0	-1.3
Vertical	4804.000	67.4	36.1	32.8	64.1	74.0	-9.9
Vertical	7206.000	62.7	36.2	36.5	63.0	74.0	-11.0

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)
Vertical	2402.000	98.5	36.7	28.1	89.9	94.0	-4.1
Vertical	4804.000	53.4	36.1	32.8	50.1	54.0	-3.9
Vertical	7206.000	49.9	36.2	36.5	50.2	54.0	-3.8

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 meter. Harmonic 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 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. Horn antenna is used for the emission over 1000MHz.

Test Engineer: Chris Chen

Applicant: Talon Communications, Inc. Date of Test: 1 November 2012
Model: 24HiMOD-PCBANT
Sample: 1/1
Mode: Transmit (2441MHz)

Table 7

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)
Vertical	2441.000	120.4	36.7	28.1	111.8	114.0	-2.2
Vertical	4882.000	63.7	36.1	35.5	63.1	74.0	-10.9
Vertical	7323.000	60.8	36.3	37.2	61.7	74.0	-12.3

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)
Vertical	2441.000	97.5	36.7	28.1	88.9	94.0	-5.1
Vertical	4882.000	50.1	36.1	35.5	49.5	54.0	-4.5
Vertical	7323.000	48.2	36.3	37.2	49.1	54.0	-4.9

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 meter. Harmonic 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 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. Horn antenna is used for the emission over 1000MHz.

Test Engineer: Chris Chen

Applicant: Talon Communications, Inc. Date of Test: 1 November 2012
Model: 24HiMOD-PCBANT
Sample: 1/1
Mode: Transmit (2480MHz)

Table 8

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)
Vertical	2480.000	119.4	36.7	28.1	110.8	114.0	-3.2
Vertical	4960.000	62.7	36.1	35.5	62.1	74.0	-11.9
Vertical	7440.000	60.1	36.3	37.2	61.0	74.0	-13.0

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)
Vertical	2480.000	95.8	36.7	28.1	87.2	94.0	-6.8
Vertical	4960.000	49.3	36.1	35.5	48.7	54.0	-5.3
Vertical	7440.000	47.0	36.3	37.2	47.9	54.0	-6.1

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 meter. Harmonic 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 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. Horn antenna is used for the emission over 1000MHz.

Test Engineer: Chris Chen

3.2 Conducted Emission at Mains Terminal

3.2.1 Conducted Emissions Configuration Photograph

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

3.2.2 Conducted Emissions

Worst Case Conducted Configuration
at
20.746 MHz

Judgement: Passed by 13.6 dB margin

TEST PERSONNEL:

Sign on file

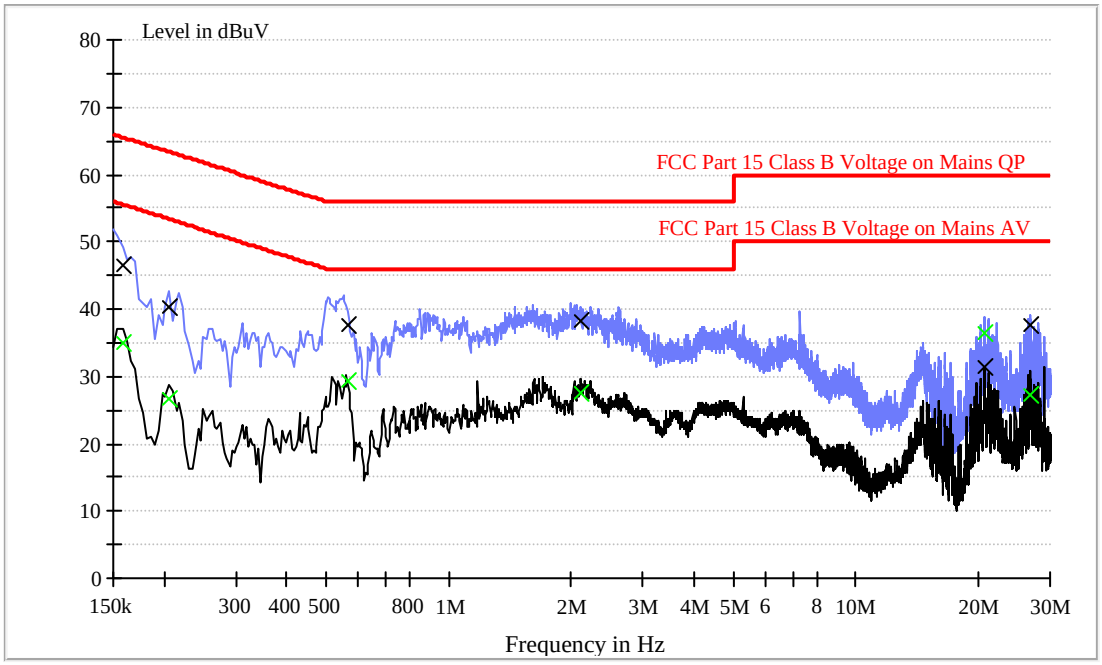
Chris Chen, Engineer
Typed/Printed Name

1 November 2012
Date

Applicant: Talon Communications, Inc. Date of Test: 1 November 2012
Model: 24HIMOD-RPSMA
Sample: 1/1
Worst Case Operating Mode: Transmit

Conducted Emission Test - FCC

Pursuant to 15.207 Emissions Requirement



Result Table QP

Frequency (MHz)	QuasiPeak (dB µ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.159	46.6	L1	9.6	18.9	65.5
0.206	40.4	L1	6.5	23.0	63.4
0.564	37.5	L1	9.6	18.5	56.0
2.114	38.3	L1	6.5	17.7	56.0
20.746	31.3	L1	10.1	28.7	60.0
26.834	37.5	L1	4.5	22.5	60.0

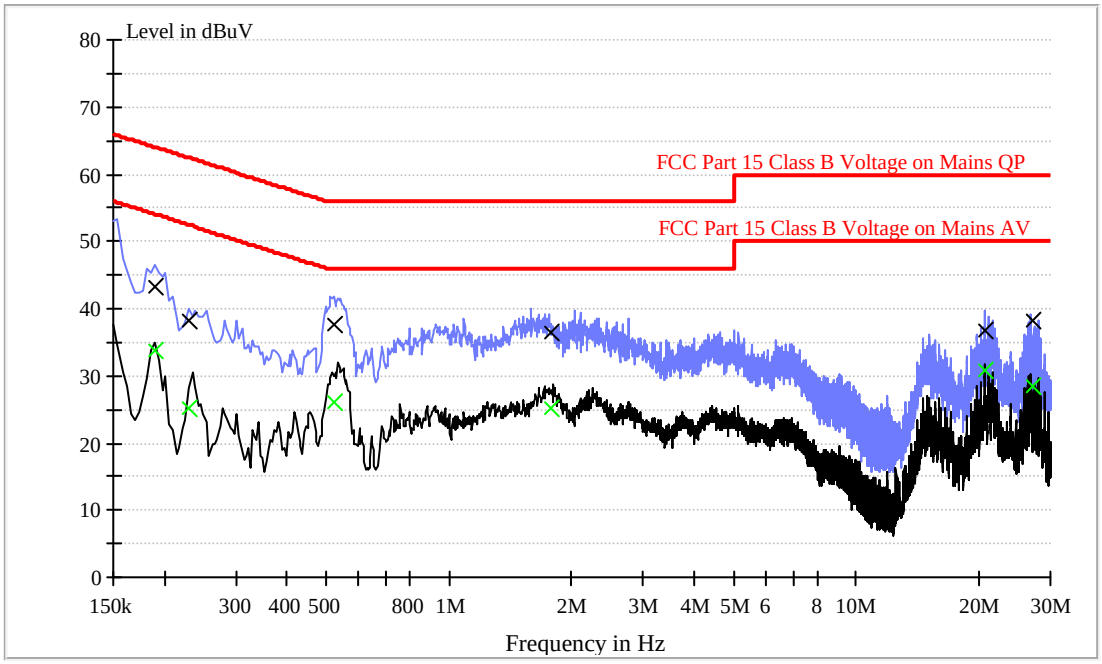
Result Table AV

Frequency (MHz)	Average (dB µ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.159	35.0	L1	9.6	20.5	55.5
0.206	26.7	L1	6.5	26.7	53.4
0.564	29.5	L1	9.6	16.5	46.0
2.114	27.5	L1	6.5	18.5	46.0
20.746	36.4	L1	10.1	13.6	50.0
26.834	27.3	L1	4.5	22.7	50.0

Applicant: Talon Communications, Inc. Date of Test: 1 November 2012
Model: 24HIMOD-RPSMA
Sample: 1/1
Worst Case Operating Mode: Transmit

Conducted Emission Test - FCC

Pursuant to 15.207 Emissions Requirement



Result Table QP

Frequency (MHz)	QuasiPeak (dB µ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.190	43.3	N	9.6	20.7	64.0
0.231	38.3	N	3.8	24.1	62.4
0.522	37.5	N	5.8	18.5	56.0
1.784	36.5	N	9.6	19.5	56.0
20.742	36.7	N	10.1	23.3	60.0
27.120	38.2	N	6.8	21.8	60.0

Result Table AV

Frequency (MHz)	Average (dB µ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.190	33.8	N	9.6	20.2	54.0
0.231	25.1	N	3.8	27.3	52.4
0.522	26.1	N	5.8	19.9	46.0
1.784	25.3	N	9.6	20.7	46.0
20.742	30.8	N	10.1	19.2	50.0
27.120	28.4	N	6.8	21.6	50.0

EXHIBIT 4

EQUIPMENT PHOTOGRAPHS

4.0 Equipment Photographs

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

EXHIBIT 5

PRODUCT LABELLING

5.0 Product Labelling

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

EXHIBIT 6

TECHNICAL SPECIFICATIONS

6.0 Technical Specifications

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

EXHIBIT 7

INSTRUCTION MANUAL

7.0 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 8

MISCELLANEOUS INFORMATION

8.0 Miscellaneous Information

This miscellaneous information includes details of the measured Bandwidth, the test procedure and calculation of factor such as pulse desensitization.

8.1 Bandedge Plot

For electronic filing, the plot shows the fundamental emission when modulated is saved with filename: be.pdf. From the plot, the field strength of any emissions outside of the specified frequency band are attenuated to the general radiated emission limits in section 15.209. It fulfils the requirement of 15.249(d).

Peak Measurement

Bandedge compliance is determined by applying marker-delta method, i.e (Bandedge Plot).

(i) Lower channel 2402MHz:

Peak Resultant field strength = Fundamental emissions (peak value) – delta from the bandedge plot

= 112.90dBµv/m - 52.93dB
= 59.97dBµv/m

Average Resultant field strength = Fundamental emissions (Average value) – delta from the bandedge plot

= 90.50dBµv/m - 52.93dB
= 37.57dBµv/m

(ii) Upper channel 2480MHz:

Peak Resultant field strength = Fundamental emissions (peak value) – delta from the bandedge plot

= 111.90dBµv/m – 59.69dB
= 52.21dBµv/m

Average Resultant field strength = Fundamental emissions (Average value) – delta from the bandedge plot

= 88.10dBµv/m - 59.69dB
= 28.41dBµv/m

The resultant field strength meets the general radiated emission limit in section 15.209, which does not exceed 74dBµv/m (Peak Limit) and 54dBµv/m (Average Limit).

8.1 Bandedge Plot (cont'd)

Pursuant to FCC part 15 Section 15.215(c), the 20dB bandwidth of the emission was contained within the frequency band designated (mentioned as above) which the EUT operated. The effects, if any, from frequency sweeping, frequency hopping, other modulation techniques and frequency stability over excepted variations in temperature and supply voltage were considered.

Figure 8.1 Bandwidth

8.2 Emissions Test Procedures

The following is a description of the test procedure used by Intertek Testing Services in the measurements of transmitters operating under Part 15, Subpart C rules.

The test set-up and procedures described below are designed to meet the requirements of ANSI C63.4 - 2009.

The transmitting equipment under test (EUT) is placed on a wooden turntable which is four feet in diameter and approximately one meter in height above the ground plane. During the radiated emissions test, the turntable is rotated and any cables leaving the EUT are manipulated to find the configuration resulting in maximum emissions. The EUT is adjusted through all three orthogonal axes to obtain maximum emission levels. The antenna height and polarization are varied during the testing to search for maximum signal levels.

Detector function for radiated emissions above 1GHz is in peak mode and Quasi-Peak mode is used below 1GHz.

The frequency range scanned is from 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 40 GHz, whichever is lower.

8.2 Emissions Test Procedures (cont'd)

The EUT is warmed up for 15 minutes prior to the test.

AC power to the unit is varied from 85% to 115% nominal and variation in the fundamental emission field strength is recorded. If battery powered, a new, fully charged battery is used.

Conducted measurements are made as described in ANSI C63.4 - 2009.

The IF bandwidth used for measurement of radiated signal strength was 10 kHz for emission below 30 MHz and 120 kHz for emission from 30 MHz to 1000 MHz. Above 1000 MHz, a resolution bandwidth of 1 MHz is used.

Transmitter measurements are normally conducted at a measurement distance of three meters. However, to assure low enough noise floor in the restricted bands and above 1 GHz, signals are acquired at a distance of one meter or less. All measurements are extrapolated to three meters using inverse scaling, but those measurements taken at a closer distance are so marked.

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

TEST EQUIPMENT LIST

10.0 Test Equipment List

Equipment No.	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due Date
SZ061-03	BiConiLog Antenna	ETS	3142C	00066460	11-Mar-12	11-Mar-13
SZ185-01	EMI Receiver	R&S	ESCI	100547	11-Mar-12	11-Mar-13
SZ061-08	Horn Antenna	ETS	3115	00092346	15-Jul-12	15-Jul-13
SZ061-06	Active Loop Antenna	Electro-Metrics	EM-6876	217	11-Mar-12	11-Mar-13
SZ056-03	Spectrum Analyzer	R&S	FSP 30	101148	11-Mar-12	11-Mar-13
SZ181-04	Preamplifier	Agilent	8449B	3008A02474	11-Mar-12	11-Mar-13
SZ188-01	Anechoic Chamber	ETS	RFD-F/A-100	4102	03-Mar-12	03-Mar-13
SZ062-02	RF Cable	RADIALL	RG 213U	--	17-Sep-12	17-Mar-13
SZ062-06	RF Cable	RADIALL	0.04-26.5GHz	--	17-Sep-12	17-Mar-13
SZ062-12	RF Cable	RADIALL	0.04-26.5GHz	--	17-Sep-12	17-Mar-13
SZ067-04	Notch Filter	Micro-Tronics	BRM50702-02	--	15-Jul-12	15-Jul-13
SZ185-02	EMI Test Receiver	R&S	ESCI	100692	05-Nov-11	05-Nov-12
SZ187-01	Two-Line V-Network	R&S	ENV216	100072	05-Nov-11	05-Nov-12
SZ187-02	Two-Line V-Network	R&S	ENV216	100073	05-Nov-11	05-Nov-12
SZ188-03	Shielding Room	ETS	RFD-100	4100	16-Sep-10	16-Sep-13