

FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for
KVH Industries, Inc.
MIDDLETOWN, RI
Satellite Earth Station

Prepared By:
COMSEARCH
19700 Janelia Farm Boulevard
Ashburn, VA 20147
September 30, 2019

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1. CONCLUSIONS

An interference study considering all existing, proposed and prior coordinated microwave facilities within the coordination contours of the proposed earth station demonstrates that this site will operate satisfactorily with the common carrier microwave environment. Further, there will be no restrictions of its operation due to interference considerations.

2. SUMMARY OF RESULTS

A number of great circle interference cases were identified during the interference study of the proposed earth station. Each of the cases, which exceeded the interference objective on a line-of-sight basis, was profiled and the propagation losses estimated using NBS TN101 (Revised) techniques. The losses were found to be sufficient to reduce the signal levels to acceptable magnitudes in every case.

3. SUPPLEMENTAL SHOWING

Pursuant to Part 25.203(c) of the FCC Rules and Regulations, the satellite earth station proposed in this application was coordinated by Comsearch using computer techniques and in accordance with Part 25 of the FCC Rules and Regulations.

Coordination data for this earth station was sent to the below listed carriers with a letter dated 08/19/2019.

Company

AT&T Corp.
Algonquin Gas Transmission, LLC
Catholic Media, Inc
Cellco Partnership - E-MA, NH, RI
Connecticut, State of
Dukes County Sheriff's Office
East Hampton Town Police Department
Eversource Energy Service Company
Greater Boston Police Council
Higher Ground LLC
Industrial Tower and Wireless, LLC
Marcus Communications
Marcus Spectrum Holdings, LLC
Massachusetts Commonwealth of
Massachusetts, Commonwealth of
National Grid USA Service Company, Inc
New Cingular Wireless PCS LLC - CT
New Cingular Wireless PCS, LLC (NY)
Southampton, Town Of, Police Dept.
Southeastern Massachusetts Regional 911
State of Rhode Island
State of Rhode Island, EMA
Suffolk County Police Department
USAI.NET
Verizon New England Inc.
WGBH Educational Foundation
WHDH-TV

4. EARTH STATION COORDINATION DATA

This section presents the data pertinent to frequency coordination of the proposed earth station that was circulated to all carriers within its coordination contours.

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Earth Station Data Sheet

19700 Janelia Farm Boulevard, Ashburn, VA 20147
(703)726-5500 <http://www.comsearch.com>

Date: 09/30/2019
Job Number: 190819COMSGE03

Administrative Information

Status ENGINEER PROPOSAL
Call Sign E130226
Licensee Code KVHIND
Licensee Name KVH Industries, Inc.

Site Information MIDDLETOWN, RI

Venue Name
Latitude (NAD 83) 41° 31' 14.8" N
Longitude (NAD 83) 71° 17' 15.0" W
Climate Zone A
Rain Zone 2
Ground Elevation (AMSL) 44.2 m / 145.0 ft

Link Information

Satellite Type Geostationary
Mode TO - Transmit-Only
Modulation Digital
Satellite Arc 25° W to 135° West Longitude
Azimuth Range 122.4° to 251.9°
Corresponding Elevation Angles 23.2° / 10.8°
Antenna Centerline (AGL) 1.52 m / 5.0 ft

Antenna Information Transmit - FCC32

Manufacturer KVH
Model TracPhone V11
Gain / Diameter 34.5 dBi / 1.0 m
3-dB / 15-dB Beamwidth 1.50° / 2.95°

Max Available RF Power (dBW/4 kHz) -21.5
(dBW/MHz) 2.5

Maximum EIRP (dBW/4 kHz) 13.0
(dBW/MHz) 37.0

Interference Objectives: Long Term -154.0 dBW/4 kHz 20%
Short Term -131.0 dBW/4 kHz 0.0025%

Frequency Information Transmit 6.1 GHz

Emission / Frequency Range (MHz) 9M98G7D - 36M0F8W / 5925.0 - 6425.0

Max Great Circle Coordination Distance 158.3 km / 98.4 mi
Precipitation Scatter Contour Radius 100.0 km / 62.1 mi

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| | |
|------------------------------------|--------------------------|
| Coordination Values | MIDDLETOWN, RI |
| Licensee Name | KVH Industries, Inc. |
| Latitude (NAD 83) | 41° 31' 14.8" N |
| Longitude (NAD 83) | 71° 17' 15.0" W |
| Ground Elevation (AMSL) | 44.2 m / 145.0 ft |
| Antenna Centerline (AGL) | 1.52 m / 5.0 ft |
| Antenna Model | KVH 1.0 meter |
| Antenna Mode | Transmit 6.1 GHz |
| Interference Objectives: Long Term | -154.0 dBW/4 kHz 20% |
| Short Term | -131.0 dBW/4 kHz 0.0025% |
| Max Available RF Power | -21.5 (dBW/4 kHz) |

| Azimuth (°) | Horizon Elevation (°) | Antenna Discrimination (°) | Transmit 6.1 GHz | |
|-------------|-----------------------|----------------------------|--------------------|----------------------------|
| | | | Horizon Gain (dBi) | Coordination Distance (km) |
| 0 | 1.55 | 107.89 | -10.00 | 100.00 |
| 5 | 1.93 | 112.84 | -10.00 | 100.00 |
| 10 | 1.67 | 110.74 | -10.00 | 100.00 |
| 15 | 1.78 | 106.14 | -10.00 | 100.00 |
| 20 | 1.93 | 101.52 | -10.00 | 100.00 |
| 25 | 1.98 | 96.87 | -10.00 | 100.00 |
| 30 | 2.12 | 92.21 | -10.00 | 100.00 |
| 35 | 2.59 | 87.54 | -10.00 | 100.00 |
| 40 | 3.15 | 82.83 | -10.00 | 100.00 |
| 45 | 3.25 | 78.13 | -10.00 | 100.00 |
| 50 | 3.76 | 73.40 | -10.00 | 100.00 |
| 55 | 4.20 | 68.66 | -10.00 | 100.00 |
| 60 | 4.53 | 63.93 | -10.00 | 100.00 |
| 65 | 4.49 | 59.28 | -10.00 | 100.00 |
| 70 | 4.14 | 54.74 | -10.00 | 100.00 |
| 75 | 3.89 | 50.26 | -10.00 | 100.00 |
| 80 | 3.59 | 45.88 | -9.54 | 100.00 |
| 85 | 3.36 | 41.61 | -8.48 | 100.00 |
| 90 | 3.44 | 37.34 | -7.30 | 100.00 |
| 95 | 3.66 | 33.16 | -6.02 | 100.00 |
| 100 | 3.45 | 29.47 | -4.74 | 100.00 |
| 105 | 2.79 | 26.53 | -3.59 | 100.00 |
| 110 | 2.49 | 23.95 | -2.48 | 100.00 |
| 115 | 2.40 | 21.97 | -1.55 | 100.00 |
| 120 | 2.42 | 20.87 | -0.99 | 100.00 |
| 125 | 2.46 | 20.86 | -0.98 | 100.00 |
| 130 | 2.35 | 22.11 | -1.62 | 100.00 |
| 135 | 2.10 | 24.42 | -2.69 | 100.00 |
| 140 | 1.75 | 27.45 | -3.96 | 100.00 |
| 145 | 1.56 | 30.34 | -5.05 | 100.00 |
| 150 | 1.33 | 33.03 | -5.97 | 100.00 |
| 155 | 1.25 | 35.32 | -6.70 | 100.00 |
| 160 | 1.18 | 37.29 | -7.29 | 100.00 |
| 165 | 0.97 | 39.01 | -7.78 | 100.00 |
| 170 | 0.64 | 40.46 | -8.18 | 100.00 |
| 175 | 0.00 | 41.79 | -8.53 | 117.00 |
| 180 | 0.00 | 42.03 | -8.59 | 116.84 |
| 185 | 0.00 | 41.79 | -8.53 | 117.00 |

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Earth Station Data Sheet

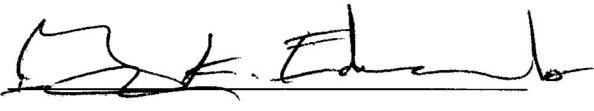
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| Interference Objectives: Long Term | -154.0 dBW/4 kHz 20% |
| Short Term | -131.0 dBW/4 kHz 0.0025% |
| Max Available RF Power | -21.5 (dBW/4 kHz) |

| Azimuth (°) | Horizon Elevation (°) | Antenna Discrimination (°) | Transmit 6.1 GHz | |
|-------------|-----------------------|----------------------------|--------------------|----------------------------|
| | | | Horizon Gain (dBi) | Coordination Distance (km) |
| 190 | 0.00 | 41.08 | -8.34 | 117.48 |
| 195 | 0.00 | 39.92 | -8.03 | 118.27 |
| 200 | 0.00 | 38.35 | -7.59 | 119.40 |
| 205 | 0.00 | 36.41 | -7.03 | 120.86 |
| 210 | 0.00 | 34.15 | -6.33 | 122.68 |
| 215 | 0.00 | 31.60 | -5.49 | 124.89 |
| 220 | 0.00 | 28.82 | -4.49 | 127.53 |
| 225 | 0.00 | 25.83 | -3.30 | 130.69 |
| 230 | 0.00 | 22.68 | -1.89 | 133.24 |
| 235 | 0.00 | 19.39 | -0.19 | 138.02 |
| 240 | 0.00 | 15.98 | 1.91 | 144.40 |
| 245 | 0.00 | 12.80 | 4.32 | 152.40 |
| 250 | 0.00 | 10.98 | 5.98 | 158.30 |
| 255 | 0.00 | 11.26 | 5.71 | 157.30 |
| 260 | 0.00 | 13.51 | 3.73 | 150.38 |
| 265 | 0.00 | 16.96 | 1.27 | 142.39 |
| 270 | 0.00 | 21.02 | -1.07 | 135.51 |
| 275 | 0.00 | 25.41 | -3.13 | 131.16 |
| 280 | 0.00 | 29.98 | -4.92 | 126.39 |
| 285 | 0.00 | 34.66 | -6.50 | 122.25 |
| 290 | 0.00 | 39.41 | -7.89 | 118.64 |
| 295 | 0.00 | 44.21 | -9.14 | 115.43 |
| 300 | 0.00 | 49.04 | -10.00 | 113.23 |
| 305 | 0.00 | 53.89 | -10.00 | 113.23 |
| 310 | 0.00 | 58.76 | -10.00 | 113.23 |
| 315 | 0.00 | 63.65 | -10.00 | 113.23 |
| 320 | 0.38 | 68.51 | -10.00 | 100.00 |
| 325 | 0.34 | 73.42 | -10.00 | 101.81 |
| 330 | 0.45 | 78.33 | -10.00 | 100.00 |
| 335 | 0.52 | 83.24 | -10.00 | 100.00 |
| 340 | 0.45 | 88.16 | -10.00 | 100.00 |
| 345 | 0.69 | 93.08 | -10.00 | 100.00 |
| 350 | 0.79 | 98.01 | -10.00 | 100.00 |
| 355 | 1.15 | 102.94 | -10.00 | 100.00 |

5. CERTIFICATION

I HEREBY CERTIFY THAT I AM THE TECHNICALLY QUALIFIED PERSON RESPONSIBLE FOR THE PREPARATION OF THE FREQUENCY COORDINATION DATA CONTAINED IN THIS APPLICATION, THAT I AM FAMILIAR WITH PARTS 101 AND 25 OF THE FCC RULES AND REGULATIONS, THAT I HAVE EITHER PREPARED OR REVIEWED THE FREQUENCY COORDINATION DATA SUBMITTED WITH THIS APPLICATION, AND THAT IT IS COMPLETE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

BY: 

Gary K. Edwards
Senior Manager
COMSEARCH
19700 Janelia Farm Boulevard
Ashburn, VA 20147

DATED: September 30, 2019