

Raytheon Technologies
Raytheon Intelligence & Space
6125 East 21st Street
Indianapolis, IN 46219
Attn: Brian R Kavalari

EXHIBIT 1
Conventional New License Form
405 File # 0745-EX-CN-2021

Overview

Raytheon Technologies (“Raytheon”) is filing this application to replace expired license WF2XTU the experimental license for continued use of a global positioning service (“GPS”) re-radiation system at its facilities at 23010 Ladbrook Drive Sterling, VA (“Facility”). Multiple products at the Facility utilize GPS for positioning information and timing technologies that are embedded into the wireless technologies under development. The GPS re-radiation system is required for the testing of GPS technologies that are embedded into the communications systems that Raytheon is developing in this lab/classroom.

Compliance with NTIA Manual Section 8.3.27

1. Individual authorization is for indoor use only and is required for each device at a specific site.

This GPS re-radiation system is installed indoors in a laboratory/classroom with access that is limited to authorized personnel only.

2. Applications for frequency assignment should be applied for as an XT station class with a note indicating the device is to be used as an “Experimental RNSS Test Equipment for the purpose of testing GPS receivers” and describing how the device will be used.

n/a

3. Approved application for frequency assignment will be entered in the GMF.

n/a

4. The Maximum length of the assignment will be two years, with possible renewal.

Raytheon requests a conventional new license to replace expired FCC license WF2XTU for two (2) years in order to continue product development and testing.

5. The area of potential interference to GPS reception (e.g., military or contractor facility) has to be under the control of the user.

The Facility is under the sole control of Raytheon with access only to authorized personnel.

6. The maximum equivalent isotropically radiated power (EIRP) must be such that the calculated emissions are no greater than -140 dBm/24 MHz as received by an isotropic

antenna at a distance of 100 feet (30 meters) from the building where the test is being conducted. The calculations showing compliance with this requirement must be provided with the application for frequency assignment and should be based on free space propagation with no allowance for additional attenuation (e.g., building attenuation.)

The GPS device is installed the Facility and far from any exterior walls. The attached link budget shows that the signal strength *at 100 feet from the re-radiating antenna* is below -140 dBm/24 MHz.

There have been no changes to the equipment from the prior application.

7. GPS users in the area of potential interference to GPS reception must be notified that GPS information may be impacted for periods of time.

Raytheon has posted signs in the lab where the re-radiation system is installed alerting those in the area that there are GPS re-radiation systems in use in that area.

8. The use is limited to activity for the purpose of testing RNSS equipment/systems.

Raytheon is requesting authorization to use a re-radiation system specifically for testing of GPS systems on its products.

9. A “Stop Buzzer” point of contact for the authorized device must be identified and available at all times during GPS re-radiation operation of the device under any condition.

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License Contact Information

For questions about this license, please contact:

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Raytheon

23010 Ladbroke Drive

Sterling, VA 20166

GPS Distribution system power calculation.

FPC Lab/Classrooms

GPS Signal Analysis FPC Classroom 1						
Frequency	1227.6	MHz	Signal Level			
Wavelength	0.2444	meters	dBm	Watts	picoWatts	
GPS Input Signal Level	-130	dBm	-130	1E-16	0.0001	
GPS Receive Antenna amplifier gain	37.7	dB	-92.3	6E-13	0.59	GPS Source L1 Active Antenna
GPS RF Amplifier gain	33	dB	-59.3	1E-09	1174.90	GPS Source A11 Amplifier
GPS RF Attenuator	-10	dB	-69.3	1E-10	117.49	10 dB attenuator at A11 Amp output
LMR-240-LLPL Coax loss per foot	-0.088	dB				Based upon loss at 1200MHz
Coax Length	100	feet				
Total Coax Loss	-8.8	dB	-78.1	6E-12	5.623	
GPS Transmitting Antenna Gain	3	dB	-75.1	1E-11	11.220	GPS Source L1P- Passive GPS Antenna
Distance from transmit antenna	0.01	meters				
Distance from transmit antenna	0.0328	feet				
Pathloss to unit under test	5.7771	dB	-69.32	4E-11	42.433588	
Signal level at unit under test ERIP to ERP			-71.46	3E-11	25.924462	
Distance from transmit antenna	30.48	meters				
Distance from transmit antenna	100	feet				
Pathloss to 100 ft	-63.9	dB	-139	1E-17	1.258E-05	
Signal level at 100 ft ERP			-141.1	8E-18	7.686E-06	<----Potential system exceeding limits
Compliant if signal level at 100 ft ERP is less than -140 dBm						

GPS Signal Analysis FPC Classroom 2

Frequency	1227.6	lvfHz	Signal Level		
Wavelength	0.2444	meters	dBm	Watts	picoWatts
GPS Input Signal Level	-130	dBm	-130	1 E-16	0.0001
GPS Receive Antenna amplifier gain	37.7	dB	-92.3	6E-13	0.59
GPS RF Amplifier gain	33	dB	-59.3	1 E-09	1174.90
GPS RF Attenuator	-10	dB	-69.3	1 E-10	117.49
LLvR -240-LLPL Coax loss per foot	-0.088	dB			
Coax Length	100	feet			
Total Coax Loss	-8.8	dB	-78.1	6E-12	5.623
GPS Transmitting Antenna Gain	3	dB	-75.1	1 E-11	11.220
Distance from transmit antenna	0.01	meters			
Distance from transmit antenna	0.0328	feet			
Pathloss to unit under test	5.7771	dB	-69.32	4E-11	42.433588
Signal level at unit under test ERIP to ERP			-71.46	3E-11	25.924462
Distance from transmit antenna	30.48	meters			
Distance from transmit antenna	100	feet			
Pathloss to 100 ft	-63.9	dB	-139	1 E-17	1.258E-05
Signal level at 100 ft ERP			-141.1	8E-18	7.686E-06

GPS Source LI Active Antenna

GPS Source All Amplifier

10 dB Attenuator at All Amp output

Based upon loss at 1200MHz

GPS Source LI P- Passive GPS Antenna

<-- Potentials system exceeding limits

Compliant if signal level at 100 ft ERP is less than -140 dBm

GPS Signal Analysis FPC Classroom 3

Frequency	1227.6	lvfHz	Signal Level		
Wavelength	0.2444	meters	dBm	Watts	picoWatts
GPS Input Signal Level	-130	dBm	-130	1 E-16	0.0001
GPS Receive Antenna amplifier gain	37.7	dB	-92.3	6E-13	0.59
GPS RF Amplifier gain	33	dB	-59.3	1 E-09	1174.90
GPS RF Attenuator	-10	dB	-69.3	1 E-10	117.49
LLvR -240-LLPL Coax loss per foot	-0.088	dB			
Coax Length	120	feet			
Total Coax Loss	-10.56	dB	-79.86	1 E-11	10.328
GPS Transmitting Antenna Gain	3	dB	-76.86	2E-11	20.606
Distance from transmit antenna	0.01	meters			
Distance from transmit antenna	0.0328	feet			
Pathloss to unit under test	5.7771	dB	-71.08	8E-11	77.930911
Signal level at unit under test ERIP to ERP			-73.22	5E-11	47.611269
Distance from transmit antenna	30.48	meters			
Distance from transmit antenna	100	feet			
Pathloss to 100 ft	-63.9	dB	-140.8	8E-18	8.388E-06
Signal level at 100 ft ERP			-142.9	5E-18	5.125E-06

GPS Source LI Active Antenna

GPS Source All Amplifier

10 dB Attenuator at All Amp output

Based upon loss at 1200MHz

GPS Source LI P- Passive GPS Antenna

<-- Potentials system exceeding limits

Compliant if signal level at 100 ft ERP is Less than -140 dBm

GPS Signal Analysis FPC Rooms 1 and 2

Frequency	1227.6	lvfHz	Signal Level		
Wavelength	0.2444	meters	dBm	Watts	picoWatts
GPS Input Signal Level	-130	dBm	-130	1 E-16	0.0001
GPS Receive Antenna amplifier gain	37.7	dB	-92.3	6E-13	0.59
GPS RF Amplifier gain	33	dB	-59.3	1 E-09	1174.90
GPS RF Attenuator	-10	dB	-69.3	1 E-10	117.49
LLvR -240-LLPL Coax loss per foot	-0.088	dB			
Coax Length	110	feet			
Total Coax Loss	-9.68	dB	-78.98	1 E-11	12.647
GPS Transmitting Antenna Gain	3	dB	-75.98	3E-11	25.235
Distance from transmit antenna	0.01	meters			
Distance from transmit antenna	0.0328	feet			
Pathloss to unit under test	5.7771	dB	-70.2	1 E-10	95.435457
Signal level at unit under test ERIP to ERP			-72.34	6E-11	58.305531
Distance from transmit antenna	30.48	meters			
Distance from transmit antenna	100	feet			
Pathloss to 100 ft	-63.9	dB	-139.9	1 E-17	1.027E-05
Signal level at 100 ft ERP			-142	6E-18	6.276E-06

GPS Source LI Active Antenna

GPS Source All Amplifier

10 dB Attenuator at All Amp output

Based upon loss at 1200MHz

GPS Source LI P- Passive GPS Antenna

<-- Potentials system exceeding limits

Compliant if signal level at 100 ft ERP is less than -140 dBm

GPS Signal Analysis FPC Rooms 3 and 4

Frequency	1227.6	lvfHz	Signal Level		
Wavelength	0.2444	meters	dBm	Watts	picoWatts
GPS Input Signal Level	-130	dBm	-130	1 E-16	0.0001
GPS Receive Antenna amplifier gain	37.7	dB	-92.3	6E-13	0.59
GPS RF Amplifier gain	33	dB	-59.3	1 E-09	1174.90
GPS RF Attenuator	-10	dB	-69.3	1 E-10	117.49
LLvR -240-LLPL Coax loss per foot	-0.088	dB			
Coax Length	110	feet			
Total Coax Loss	-9.68	dB	-78.98	1 E-11	12.647
GPS Transmitting Antenna Gain	3	dB	-75.98	3E-11	25.235
Distance from transmit antenna	0.01	meters			
Distance from transmit antenna	0.0328	feet			
Pathloss to unit under test	5.7771	dB	-70.2	1 E-10	95.435457
Signal level at unit under test ERIP to ERP			-72.34	6E-11	58.305531
Distance from transmit antenna	30.48	meters			
Distance from transmit antenna	100	feet			
Pathloss to 100 ft	-63.9	dB	-139.9	1 E-17	1.027E-05
Signal level at 100 ft ERP			-142	6E-18	6.276E-06

GPS Source LI Active Antenna

GPS Source All Amplifier

10 dB Attenuator at All Amp output

Based upon loss at 1200MHz

GPS Source LI P- Passive GPS Antenna

<-- Potentials system exceeding limits

Compliant if signal level at 100 ft ERP is less than -140 dBm

GPS Signal Analysis FPC Classroom 1

Frequency	1575.4	lvfHz	Signal Level		
Wavelength	0.1904	meters	dBm	Watts	picoWatts
GPS Input Signal Level	-130	dBm	-130	1 E-16	0.0001
GPS Receive Antenna amplifier gain	37.7	dB	-92.3	6E-13	0.59
GPS RF Amplifier gain	33	dB	-59.3	1 E-09	1174.90
GPS RF Attenuator	-10	dB	-69.3	1 E-10	117.49
LlvfR -240-LLPL Coax loss per foot	-0.099	dB			
Coax Length	100	feet			
Total Coax Loss	-9.9	dB	-79.2	1 E-11	12.023
GPS Transmitting Antenna Gain	3	dB	-76.2	2E-11	23.988
Distance from transmit antenna	0.01	meters			
Distance from transmit antenna	0.0328	feet			
Pathloss to unit under tes t	3.6103	dB	-72.59	6E-11	55.084677
Signal level at unit under test ERIP to ERP			-74.73	3E-11	33.653544
Distance from transmit antemla	30.48	meters			
Distance from transmit antenna	100	feet			
Pathloss to 100 ft	-66.07	dB	-142.3	6E-18	5.929E-06
Signal level at 100 ft ERP			-144.4	4E-18	3.622E-06

GPS Source LI Active Antenna

GPS Source All Amplifier

10 dBattenuator at All Amp output

Base d upo n loss at 1500 MHz

GPS So urce LI P- Pass ive GPS An te nn a

<-- Po te ntia ls yste m e xceeding limits

Compliant if signal level at 100 ft ERP is Jess than -140 dBm

GPS Signal Analysis FPC Classroom 2

Frequency	1575.4	lvfHz	Signal Level		
Wavelength	0.1904	meters	dBm	Watts	picoWatts
GPS Input Signal Level	-130	dBm	-130	1 E-16	0.0001
GPS Receive Antenna amplifier gain	37.7	dB	-92.3	6E-13	0.59
GPS RF Amplifier gain	33	dB	-59.3	1 E-09	1174.90
GPS RF Attenuator	-10	dB	-69.3	1 E-10	117.49
LlvfR -240-LLPL Coax loss per foot	-0.099	dB			
Coax Length	100	feet			
Total Coax Loss	-9.9	dB	-79.2	1 E-11	12.023
GPS Transmitting Antenna Gain	3	dB	-76.2	2E-11	23.988
Distance from transmit antenna	0.01	meters			
Distance from transmit antenna	0.0328	feet			
Pathloss to unit under tes t	3.6103	dB	-72.59	6E-11	55.084677
Signal level at unit under test ERIP to ERP			-74.73	3E-11	33.653544
Distance from transmit antemla	30.48	meters			
Distance from transmit antenna	100	feet			
Pathloss to 100 ft	-66.07	dB	-142.3	6E-18	5.929E-06
Signal level at 100 ft ERP			-144.4	4E-18	3.622E-06

GPS Source LI Active Antenna

GPS Source All Amplifier

10 dBattenuator at All Amp output

Base d upo n loss at 1500 MHz

GPS So urce LI P- Pass ive GPS An te nn a

<-- Po te ntia ls yste m e xceeding limits

Compliant if signal level at 100 ft ERP is Jess than -140 dBm

GPS Signal Analysis FPC Classroom 3

Frequency	1575.4	lvfHz	Signal Level		
Wavelength	0.1904	meters	dBm	Watts	picoWatts
GPS Input Signal Level	-130	dBm	-130	1 E-16	0.0001
GPS Receive Antenna amplifier gain	37.7	dB	-92.3	6E-13	0.59
GPS RF Amplifier gain	33	dB	-59.3	1 E-09	1174.90
GPS RF Attenuator	-10	dB	-69.3	1 E-10	117.49
LLvR-240-LLPL Coax loss per foot	-0.099	dB			
Coax Length	120	feet			
Total Coax Loss	-11.88	dB	-81.18	4E-12	3.846
GPS Transmitting Antenna Gain	3	dB	-78.18	8E-12	7,674
Distance from transmit antenna	0.01	meters			
Distance from transmit antenna	0.0328	feet			
Pathloss to unit under tes t	3.6103	dB	-74.57	2E-11	17.62101
Signal level at unit under test ERIP to ERP			-76.71	1 E-11	10.765416
Distance from transmit antemla	30.48	meters			
Distance from transmit antenna	100	feet			
Pathloss to 100 ft	-66.07	dB	-144.2	4E-18	3.758E-06
Signal level at 100 ft ERP			-146.4	2E-18	2.296E-06

GPS Source LI Active Antenna

GPS Source All Amplifier

10 dBattenuator at All Amp output

Base d upo n loss at 1500 MHz

GPS So urce LI P- Pass ive GPS An te nn a

<-- Po te ntia ls yste m e xceeding limits

Compliant if signal level at 100 ft ERP is Jess than -140 dBm

GPS Signal Analysis FPC Rooms 1 and 2

Frequency	1575.4	lvfHz	Signal Level		
Wavelength	0.1904	meters	dBm	Watts	picoWatts
GPS Input Signal Level	-130	dBm	-130	1 E-16	0.0001
GPS Receive Antenna amplifier gain	37.7	dB	-92.3	6E-13	0.59
GPS RF Amplifier gain	33	dB	-59.3	1 E-09	1174.90
GPS RF Attenuator	-10	dB	-69.3	1 E-10	117.49
LlvfR-240-LLPL Coax loss per foot	-0.099	dB			
Coax Length	110	feet			
Total Coax Loss	-10.89	dB	-80.19	4E-12	3.846
GPS Transmitting Antenna Gain	3	dB	-77.19	8E-12	7,674
Distance from transmit antenna	0.01	meters			
Distance from transmit antenna	0.0328	feet			
Pathloss to unit under test	3.6103	dB	-73.58	2E-11	17.62101
Signal level at unit under test ERIP to ERP			-75.72	1 E-11	10.765416
Distance from transmit antenna	30.48	meters			
Distance from transmit antenna	100	feet			
Pathloss to 100 ft	-66.07	dB	-143.3	5E-18	4.721E-06
Signal level at 100 ft ERP			-145.4	3E-18	2.884E-06

GPS Source LI Active Antenna

GPS Source All Amplifier

10 dB Attenuator at All Amp output

Based upon loss at 1500 MHz

GPS Source LI P- Passive GPS Antenna

<-- Potentials system exceeding limits

Compliant if signal level at 100 ft ERP is less than -140 dBm

GPS Signal Analysis FPC Rooms 3 and 4

Frequency	1575.4	lvfHz	Signal Level		
Wavelength	0.1904	meters	dBm	Watts	picoWatts
GPS Input Signal Level	-130	dBm	-130	1 E-16	0.0001
GPS Receive Antenna amplifier gain	37.7	dB	-92.3	6E-13	0.59
GPS RF Amplifier gain	33	dB	-59.3	1 E-09	1174.90
GPS RF Attenuator	-10	dB	-69.3	1 E-10	117.49
LLvR-240-LLPL Coax loss per foot	-0.099	dB			
Coax Length	110	feet			
Total Coax Loss	-10.89	dB	-80.19	4E-12	3.846
GPS Transmitting Antenna Gain	3	dB	-77.19	8E-12	7,674
Distance from transmit antenna	0.01	meters			
Distance from transmit antenna	0.0328	feet			
Pathloss to unit under test	3.6103	dB	-73.58	2E-11	17.62101
Signal level at unit under test ERIP to ERP			-75.72	1 E-11	10.765416
Distance from transmit antenna	30.48	meters			
Distance from transmit antenna	100	feet			
Pathloss to 100 ft	-66.07	dB	-143.3	5E-18	4.721E-06
Signal level at 100 ft ERP			-145.4	3E-18	2.884E-06

GPS Source LI Active Antenna

GPS Source All Amplifier

10 dB Attenuator at All Amp output

Based upon loss at 1500 MHz

GPS Source LI P- Passive GPS Antenna

<-- Potentials system exceeding limits

Compliant if signal level at 100 ft ERP is less than -140 dBm

Area C Lab

GPS Signal Analysis Area C Port 1						
Frequency	1227.6	MHz	Signal Level			
Wavelength	0.2444	meters	dBm	Watts	picoWatts	
GPS Input Signal Level	-130	dBm	-130	1E-16	0.0001	
GPS Receive Antenna amplifier gain	37.7	dB	-92.3	6E-13	0.59	GPS Source L1 Active Antenna
GPS RF Amplifier gain	33	dB	-59.3	1E-09	1174.90	GPS Source A11 Amplifier
GPS RF Attenuator	-10	dB	-69.3	1E-10	117.49	10 dB attenuator at A11 Amp output
LMR-240-LLPL Coax loss per foot	-0.088	dB				Based upon loss at 1200MHz
Coax Length	150	feet				
Total Coax Loss	-13.2	dB	-82.5	6E-12	5.623	
GPS Transmitting Antenna Gain	3	dB	-79.5	1E-11	11.220	GPS Source L1P- Passive GPS Antenna
Distance from transmit antenna	0.01	meters				
Distance from transmit antenna	0.0328	feet				
Pathloss to unit under test	5.7771	dB	-73.72	4E-11	42.433588	
Signal level at unit under test ERIP to ERP			-75.86	3E-11	25.924462	
Distance from transmit antenna	30.48	meters				
Distance from transmit antenna	100	feet				
Pathloss to 100 ft	-63.9	dB	-143.4	5E-18	4.568E-06	
Signal level at 100 ft ERP			-145.5	3E-18	2.79E-06	<----Potential system exceeding limits
Compliant if signal level at 100 ft ERP is less than -140 dBm						

GPS Signal Analysis Area C Polt2

Frequency	1227.6	lvHz	Signal Level		
Wavelength	0.2444	meters	dBm	Watts	picoWatts
GPS Input Signal Level	-130	dBm	-130	1 E-16	0.0001
GPS Receive Antenna amplifier gain	37.7	dB	-92.3	6E-13	0.59
GPS RF Amplifier gain	33	dB	-59.3	1 E-09	1174.90
GPS RF Attenuator	-10	dB	-69.3	1 E-10	117.49
LLvR-240-LL PL Coax loss per foot	-0.088	dB			
Coax Length	150	feet			
Total Coax Loss	-13.2	dB	-82.5	6E-12	5.623
GPS Transmitting Antenna Gain	3	dB	-79.5	1 E-11	11.220
Distance from transmit antenna	0.01	meters			
Distance from transmit antenna	0.0328	feet			
Pathloss to unit under test	5.7771	dB	-73.72	4E-11	42.433588
Signal level at unit under test ERIP to ERP			-75.86	3E-11	25.924462
Distance from transmit antenna	30.48	meters			
Distance from transmit antenna	100	feet			
Pathloss to 100 ft	-63.9	dB	-143.4	5E-18	4.568E-06
Signal level at 100 ft ERP			-145.5	3E-18	2.79E-06

GPS Source LI Active Antenna

GPS Source All Amplifier

10 dB Attenuator at All Amp output

Based upon loss at 1200MHz

GPS Source LI P Passive GPS Antenna

<...> Potentials system exceeding limits

Compliant if signal level at 100 ft ERP is less than -140 dBm

GPS Signal Analysis Area C Polt1

Frequency	1575.4	lvfHz	Signal Level		
Wavelength	0.1904	meters	dBm	Watts	picoWatts
GPS Input Signal Level	-130	dBm	-130	1 E-16	0.0001
GPS Receive Antenna amplifier gain	37.7	dB	-92.3	6E-13	0.59
GPS RF Amplifier gain	33	dB	-59.3	1 E-09	1174.90
GPS RF Attenuator	-10	dB	-69.3	1 E-10	117.49
LlvfR -240-LLPL Coax loss per foot	-0.099	dB			
Coax Length	150	feet			
Total Coax Loss	-14.85	dB	-84.15	4E-12	3.846
GPS Transmitting Antenna Gain	3	dB	-81.15	8E-12	7,674
Distance from transmit antenna	0.01	meters			
Distance from transmit antenna	0.0328	feet			
Pathloss to unit under tes t	3.6103	dB	-77.54	2E-11	17.62101
Signal level at unit under test ERIP to ERP			-79.68	1 E-11	10.765416
Distance from transmit antemla	30.48	meters			
Distance from transmit antenna	100	feet			
Pathloss to 100 ft	-66.07	dB	-147.2	2E-18	1.897E-06
Signal level at 100 ft ERP			-149.4	1E-18	1.159E-06

GPS Source LI Active Antenna

GPS Source All Amplifier

10 dBattenuator at All Amp output

Base d upo n loss at 1500 MHz

GPS So urce LI P- Pass ive GPS An te nn a

<-- Po te ntia ls yste m e xceeding limits

Compliant if signal level at 100 ft ERP is Jess than -140 dBm

GPS Signal Analysis Area C Polt2

Frequency	1575.4	lvfHz	Signal Level		
Wavelength	0.1904	meters	dBm	Watts	picoWatts
GPS Input Signal Level	-130	dBm	-130	1 E-16	0.0001
GPS Receive Antenna amplifier gain	37.7	dB	-92.3	6E-13	0.59
GPS RF Amplifier gain	33	dB	-59.3	1 E-09	1174.90
GPS RF Attenuator	-10	dB	-69.3	1 E-10	117.49
LlvfR -240-LLPL Coax loss per foot	-0.099	dB			
Coax Length	150	feet			
Total Coax Loss	-14.85	dB	-84.15	4E-12	3.846
GPS Transmitting Antenna Gain	3	dB	-81.15	8E-12	7,674
Distance from transmit antenna	0.01	meters			
Distance from transmit antenna	0.0328	feet			
Pathloss to unit under tes t	3.6103	dB	-77.54	2E-11	17.62101
Signal level at unit under test ERIP to ERP			-79.68	1 E-11	10.765416
Distance from transmit antemla	30.48	meters			
Distance from transmit antenna	100	feet			
Pathloss to 100 ft	-66.07	dB	-147.2	2E-18	1.897E-06
Signal level at 100 ft ERP			-149.4	1E-18	1.159E-06

GPS Source LI Active Antenna

GPS Source All Amplifier

10 dBattenuator at All Amp output

Base d upo n loss at 1500 MHz

GPS So urce LI P- Pass ive GPS An te nn a

<-- Po te ntia ls yste m e xceeding limits

Compliant if signal level at 100 ft ERP is Jess than -140 dBm

Area X Lab

GPS Signal Analysis Area X Port 1						
Frequency	1227.6	MHz	Signal Level			
Wavelength	0.2444	meters	dBm	Watts	picoWatts	
GPS Input Signal Level	-130	dBm	-130	1E-16	0.0001	
GPS Receive Antenna amplifier gain	37.7	dB	-92.3	6E-13	0.59	GPS Source L1 Active Antenna
GPS RF Amplifier gain	33	dB	-59.3	1E-09	1174.90	GPS Source A11 Amplifier
GPS RF Attenuator	0	dB	-59.3	1E-09	1174.90	No attenuator needed with longer cable
LMR-240-LLPL Coax loss per foot	-0.088	dB				Based upon loss at 1200MHz
Coax Length	230	feet				
Total Coax Loss	-20.24	dB	-79.54	1E-11	11.117	
GPS Transmitting Antenna Gain	3	dB	-76.54	2E-11	22.182	GPS Source L1P- Passive GPS Antenna
Distance from transmit antenna	0.01	meters				
Distance from transmit antenna	0.0328	feet				
Pathloss to unit under test	5.7771	dB	-70.76	8E-11	83.889915	
Signal level at unit under test ERIP to ERP			-72.9	5E-11	51.251875	
Distance from transmit antenna	30.48	meters				
Distance from transmit antenna	100	feet				
Pathloss to 100 ft	-63.9	dB	-140.4	9E-18	9.03E-06	
Signal level at 100 ft ERP			-142.6	6E-18	5.517E-06	<----Potential system exceeding limits
Compliant if signal level at 100 ft ERP is less than -140 dBm						

GPS Signal Analysis Area XPo1t2

Frequency	1227.6	lvfHz	Signal Level		
Wavelength	0.2444	meters	dBm	Watts	picoWatts
GPS Input Signal Level	-130	dBm	-130	1 E-16	0.0001
GPS Receive Antenna amplifier gain	37.7	dB	-92.3	6E-13	0.59
GPS RF Amplifier gain	33	dB	-59.3	1 E-09	1174.90
GPS RF Attenuator	0	dB	-59.3	1E-09	1174.90
LlvfR -240-LLPL Coax loss per foot	-0.088	dB			
Coax Length	230	feet			
Total Coax Loss	-20.24	dB	-79.54	1E-11	11.117
GPS Transmitting Antenna Gain	3	dB	-76.54	2E-11	22.182
Distance from transmit antenna	0.01	meters			
Distance from transmit antenna	0.0328	feet			
Pathloss to unit under tes t	5.7771	dB	-70.76	8E-11	83.889915
Signal level at unit under test ERIP to ERP			-72.9	5E-11	51.251875
Distance from transmit antemla	30.48	meters			
Distance from transmit antenna	100	feet			
Pathloss to 100 ft	-63.9	dB	-140.4	9E-18	9.03E-06
Signal level at 100 ft ERP			-142.6	6E-18	5.517E-06

GPS Source LI Active Antenna

GPS Source All Amplifier

No attenuator needed with longer cable

Based upon loss at 1200MHz

GPS Source LI P- Passive GPS Antenna

<-- Potentials system exceeding limits

Compliant if signal level at 100 ft ERP is less than -140 dBm

GPS Signal Analysis Area X Polt 1

Frequency	1575.4	lvfHz	Signal Level		
Wavelength	0.1904	meters	dBm	Watts	picoWatts
GPS Input Signal Level	-130	dBm	-130	1 E-16	0.0001
GPS Receive Antenna amplifier gain	37.7	dB	-92.3	6E-13	0.59
GPS RF Amplifier gain	33	dB	-59.3	1 E-09	1174.90
GPS RF Attenuator	0	dB	-59.3	1E-09	1174.90
LlvfR-240-LLPL Coax loss per foot	-0.099	dB			
Coax Length	230	feet			
Total Coax Loss	-22.77	dB	-82.07	6E-12	6.209
GPS Transmitting Antenna Gain	3	dB	-79.07	1E-11	12.388
Distance from transmit antenna	0.01	meters			
Distance from transmit antenna	0.0328	feet			
Pathloss to unit under tes t	3.6103	dB	-75.46	3E-11	28.446629
Signal level at unit under test ERIP to ERP			-77.6	2E-11	17.379241
Distance from transmit antemla	30.48	meters			
Distance from transmit antenna	100	feet			
Pathloss to 100 ft	-66.07	dB	-145.1	3E-18	3.062E-06
Signal level at 100 ft ERP			-147.3	2E-18	1.871E-06

GPS Sou rce LI Active Antenn a
 GPS Sou rce All Amp li f ier
 No att enuator needed with longer cable
 Based upon lossat 1500MHz
 GPS Sou rce LI P· Passive GPS Antenn a
 <...•Potential system exceeding limits

Compliant if signal level at 100 ft ERP is Jess than -14 0 dBm

GPS Signal Analysis Area X Polt 2

Frequency	1575.4	lvfHz	Signal Level		
Wavelength	0.1904	meters	dBm	Watts	picoWatts
GPS Input Signal Level	-130	dBm	-130	1 E-16	0.0001
GPS Receive Antenna amplifier gain	37.7	dB	-92.3	6E-13	0.59
GPS RF Amplifier gain	33	dB	-59.3	1 E-09	1174.90
GPS RF Attenuator	0	dB	-59.3	1E-09	1174.90
LlvfR -240-LLPL Coax loss per foot	-0.099	dB			
Coax Length	230	feet			
Total Coax Loss	-22.77	dB	-82.07	6E-12	6.209
GPS Transmitting Antenna Gain	3	dB	-79.07	1 E-11	12.388
Distance from transmit antenna	0.01	meters			
Distance from transmit antenna	0.0328	feet			
Pathloss to unit under tes t	3.6103	dB	-75.46	3E-11	28.446629
Signal level at unit under test ERIP to ERP			-77.6	2E-11	17.379241
Distance from transmit antemla	30.48	meters			
Distance from transmit antenna	100	feet			
Pathloss to 100 ft	-66.07	dB	-145.1	3E-18	3.062E-06
Signal level at 100 ft ERP			-147.3	2E-18	1.871E-06

GPS Sou rce LI Active Antenn a

GPS Sou rce All Amp li f ier

No att enuator needed with longer cable

Based upon lossat 1500MHz

GPS Sou rce LI P· Passive GPS Antenn a

<...•Potential system exceeding limits

Compliant if signal level at 100 ft ERP is Jess than -14 0 dBm