Test Report No. 7191169210-EEC17/04
dated 23 Feb 2018

PSB Singapore

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FORMAL REPORT ON TESTING IN ACCORDANCE WITH
47 CFR FCC Parts 2, 15, and 25
OF A
Maritime Satellite Terminal
[Model : Atlas IP+]
[FCC ID : QO4-AVIAIPPLUS]

TEST FACILITY	TÜV SÜD PSB Pte Ltd Electrical & Electronics Centre (EEC), Product Services, No. 1 Science Park Drive, Singapore 118221
FCC REG. NO.	994109 (Test Firm Registration Number) SG0002 (Designation Number)
IND. CANADA REG. NO.	2932I-1 (3m and 10m Semi-Anechoic Chamber, Science Park)
PREPARED FOR	Addvalue Innovation Pte Ltd 8 Tai Seng Link #05-WING2 Singapore 534158
QUOTATION NUMBER	2191066006
JOB NUMBER	7191169210
TEST PERIOD	31 Aug 2017 – 17 Sep 2018

PREPARED BY	**APPROVED BY**
Quek Keng Huat	Foo Kai Maun
Higher Associate Engineer	Executive Engineer

TÜV SÜD PSB

ilac-MRA

ACCREDITED LABORATORY SAC-SINGLAS

LA-2007-0380-A LA-2007-0381-F LA-2007-0382-B LA-2007-0383-G	LA-2007-0384-G LA-2007-0385-E LA-2007-0386-C LA-2010-0464-D	The results reported herein have been performed in accordance with the terms of accreditation under the Singapore Accreditation Council. Inspections/Calibrations/Tests marked "Not SAC-SINGLAS Accredited" in this Report are not included in the SAC-SINGLAS Accreditation Schedule for our inspection body/laboratory.

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TEST SUMMARY

The product was tested in accordance with the customer's specifications.

Test Results Summary

Test Standard	Description	Pass / Fail
47 CFR FCC Parts 2, 15 and 25		
15.107(a), 15.207	Conducted Emissions	Not Applicable *See Note 3
15.109	Radiated Emissions (Class B)	Pass
2.1046(a), 25.204	RF Output Power	Not Tested *See Note 6
2.1051, 25.202(f)	Unwanted Emissions at Antenna Terminal	Not Tested *See Note 6
2.1053, 25.202(f)	Radiated Spurious Emissions	Pass
25.216(h)(i)(j)	Protection of Aeronautical Radio Navigation Satellite Service	Not Tested *See Note 6
2.1055, 25.202(d)	Frequency Stability (Temperature Variation)	Not Tested *See Note 6
2.1055, 25.202(d)	Frequency Stability (Voltage Variation)	Not Tested *See Note 6
1.1310	Maximum Permissible Exposure	Not Tested *See Note 6

Notes

1. Three channels as listed below, which respectively represent the lower, middle and upper channels (transmit and receive) of the Equipment Under Test (EUT) when it was configured to operate under test mode condition.

Transmit Channel	Frequency (GHz)	Receive Channel	Frequency (GHz)
Lower Channel	1.6265	Lower Channel	1.5250
Middle Channel	1.6435	Middle Channel	1.5421
Upper Channel	1.6605	Upper Channel	1.5590

2. The following tests were based on conducted measurement method:
   a. RF Output Power
   b. Unwanted Emissions at Antenna Terminal
   c. Frequency Stability (Temperature Variation)
   d. Frequency Stability (Voltage Variation)

3. The Equipment Under Test (EUT) is a DC operated device and contains no provision for public utility connections (for Conducted Emissions)

4. All test measurement procedures are according to ANSI/TIA-603-B-2002.

5. The EUT is a Class B device when in non-transmitting state and meets the FCC Part15B Class B requirements.

6. Refer to TÜV SÜD PSB Pte Ltd issued test report 7191091960-EEC14/05 dated 2 Oct 2014 for details.

7. Below are the differences between Altas IP (FCC ID : QO4-AVIATLASIP) and Atlas IP+ (FCC ID : QO4-AVIAIPPLUS) as per the declaration from Addvalue Innovation Pte Ltd.

Item description	Altas IP	Atlas IP+
RF Module	Same	Same
Processor board	Same	Same
Alert board	Same	Same
Power Supply Board	Same	Same (with minor passive filtering on the Atlas IP+)
Mainboard	Without VOIP module	With VOIP module with supporting circuitry
Wi-Fi board	Tranet Wi-Fi module	Jinan Wi-Fi module
Above Deck Unit (ADU)Antenna	Same	Same
ADU Model Number	AD321	AD321
RF Power in EIRP	16 dBW	16 dBW

Modifications

No modifications were made.

PRODUCT DESCRIPTION

Description	:	The Equipment Under Test(s) (EUT(s)) is a **Maritime Satellite Terminal.**
Applicants	:	Addvalue Innovation Pte Ltd 8 Tai Seng Link #05-WING2 Singapore 534158
Manufacturers	:	Addvalue Innovation Pte Ltd 8 Tai Seng Link #05-WING2 Singapore 534158
Factor(Ies)	:	Addvalue Innovation Pte Ltd 8 Tai Seng Link #05-WING2 Singapore 534158
Model Number	:	Atlas IP+
FCC ID	:	QO4-AVIAIPPLUS
Serial Number	:	Nil
Microprocessor	:	Samsung S3C2410
Operating / Transmitting Frequency	:	1626.5MHz – 1660.5MHz 1525MHz – 1559MHz 15275MHz (GPS) 2412MHz – 2472MHz (WiFi)
Clock / Oscillator Frequency	:	200MHz, 266MHz (Voice Main Board) 25MHz, 12MHz, 3.686MHz, 32.768kHz (Interface, Core Module Board)
Modulation / Emissions Designator	:	16 Amplitude Phase-Shift Keying (APSK), π/4-Coherent Quadrature Phase- Shift Keying (CQPSK)
Antenna Gain	:	10.0dBi
Port / Connectors	:	3 x RJ 45 Ethernet 1 x RJ45 PoE 1 x RJ50 Handset 1 x DB9 Serial com 1 x 20-pin IO port 1 x Mini USB
Rated Input Power	:	12Vdc,10A / 24Vdc,5A (120W max)
Accessories	:	Refer to manufacturer

SUPPORTING EQUIPMENT DESCRIPTION

Equipment Description (Including Brand Name)	Model, Serial & FCC ID Number	Cable Description (List Length, Type & Purpose)
Panasonic landline telephone	M/N: KX-TS500MX8 S/N: 6LAFC597885 FCC ID: Nil	2.00m RJ11 cable
ACER Travel Mate 4750 Series Laptop	M/N: MS2335 S/N: LXV420302411500B232000 FCC ID: Nil	1.50m shielded RJ45 cable
Hiro AC Adapter	M/N: HP-A0652R3B S/N: F1-110324072304 FCC ID: Nil	1.00m 3-pin unshielded power cable

47 CFR FCC Parts 2, 15 and 25
1. Radiated Emissions (Class B) **2. Radiated Spurious Emissions**
The EUT was exercised by operating in following modes with the EUT simulating the transmission and reception using the client's provided test programs, "SIGTERM" <u>Satellite Transmission Mode</u> - Continuous RF transmission at lower channel at maximum RF power - Continuous maximum RF transmission at middle channel at maximum RF power - Continuous maximum RF transmission at upper channel at maximum RF power <u>Satellite Reception (Receive) Mode</u> - Continuous RF reception at lower channel - Continuous RF reception at middle channel - Continuous RF reception at upper channel <u>GPS Reception (Receive) Mode</u> - Continuous GPS signal reception

47 CFR FCC Part 15.109 Radiated Emission Limits (Class B)

Frequency Range (MHz)	Quasi-Peak Limit Values (dBµV/m) @ 3m
30 - 88	40.0
88 - 216	43.5
216 - 960	46.0
Above 960	54.0*
* Above 1GHz, average detector was used. A peak limit of 20dB above the average limit does apply.	

47 CFR FCC Part 15.109 Radiated Emission Test Instrumentation

Instrument	Model	S/No	Cal Due Date
R&S Test Receiver – ESI1	ESI40	100010	25 Oct 2018
Schaffner Bilog Antenna –(30MHz-2GHz) BL4	CBL6112B	2593	18 Jan 2018
Com-Power Preamplifier (1MHz-1GHz)	PAM-103	441096	25 Sep 2018
EMCO Horn Antenna(1GHz-18GHz)	3115	0003-6088	24 Mar 2018
R&S Preamplifier (1GHz -18GHz)	SCU18	102191	10 Mar 2018
ETS Horn Antenna(18GHz-40GHz)(Ref)	3116	0004-2474	15 Nov 2018
Toyo Preamplifier (26.5GHz-40GHz)	HAP26-40W	00000005	18 Apr 2018
Agilent Preamplifier(1GHz-26.5GHz) (PA18)	8449D	3008A02305	02 Oct 2018
K&L Microwave Tunable Band Reject Filter	3TNF-1000/2000-N/N	436	Output Monitor
Micro-tronics Bandstop Filter (2.4GHz)	BRM50701-02	007	Output Monitor

47 CFR FCC Part 15.109 Radiated Emission Test Setup

1. The EUT and supporting equipment were set up in accordance with the requirements of the standard as shown in the setup photos.
2. The filtered power supply for the EUT and supporting equipment were tapped from the appropriate power sockets located on the turntable.
3. The relevant broadband antenna was set at the required test distance away from the EUT and supporting equipment boundary.

47 CFR FCC Part 15.109 Radiated Emission Test Method

1. The EUT was switched on and allowed to warm up to its normal operating condition.
2. A prescan was carried out to pick the worst emission frequencies from the EUT. For EUT which is a portable device, the prescan was carried out by rotating the EUT through three orthogonal axes to determine which altitude and equipment arrangement produces such emissions.
3. The test was carried out at the selected frequency points obtained from the prescan in step 2. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and adjusting the antenna height in the following manner:
   a. Vertical or horizontal polarisation (whichever gave the higher emission level over a full rotation of the EUT) was chosen.
   b. The EUT was then rotated to the direction that gave the maximum emission.
   c. Finally, the antenna height was adjusted to the height that gave the maximum emission.
4. A Quasi-peak measurement was made for that frequency point if it was less than or equal to 1GHz. For frequency point that above 1GHz, both Peak and Average measurements were carried out.
5. Steps 3 and 4 were repeated for the next frequency point, until all selected frequency points were measured.
6. The frequency range covered was from 30MHz to 10th harmonic of the highest frequency used or generated by the EUT, using the Bi-log antenna for frequencies from 30MHz up to 1GHz, and the Horn antenna above 1GHz.

Sample Calculation Example

At 300 MHz	Q-P limit = 37.0 dBμV/m
Log-periodic antenna factor & cable loss at 300 MHz = 18.5 dB	
Q-P reading obtained directly from EMI Receiver = 31.0 dBμV/m (Calibrated level including antenna factors & cable losses)	
Therefore, Q-P margin = 37.0 - 31.0 = 6.0	i.e. 6.0 dB below Q-P limit

47 CFR FCC Part 15.109 Radiated Emission Results

Operating Mode	Continuous Satellite Communication with WiFi Transmission & LAN ping	Temperature	23°C
Test Input Power	24Vdc (Worst)	Relative Humidity	60%
Test Distance	3m	Atmospheric Pressure	1030mbar
		Tested By	Lim Kay Tak

Spurious Emissions ranging from 30MHz – 1GHz

Frequency (MHz)	Q-P Value (dBµV/m)	Q-P Limit (dBµV/m)	Q-P Margin (dB)	Height (cm)	Azimuth (Degrees)	Pol (H/V)	Channel
76.5570	26.0	40.0	14.0	103	273	V	Low
91.8420	35.6	43.5	7.9	116	219	V	Low
265.9940	37.4	46.0	8.6	100	67	H	Low
722.0540	27.3	46.0	18.7	100	26	V	Low
912.5410	17.9	46.0	28.1	177	76	V	Low
949.9930	33.7	46.0	12.3	103	79	V	Low

Spurious Emissions above 1GHz – 18GHz

Freq (GHz)	Peak Value (dBµV/m)	Peak Limit (dBµV/m)	Peak Margin (dB)	AV Value (dBµV/m)	AV Limit (dBµV/m)	AV Margin (dB)	Height (cm)	Azimuth (Degrees)	Pol (H/V)	Ch
1.7676	37.6	74.0	36.4	35.6	54.0	18.4	400	291	H	Low
1.9191	38.1	74.0	35.9	35.4	54.0	18.6	200	133	V	Low
5.2649	41.3	74.0	32.7	38.2	54.0	15.8	400	338	V	Low
5.2952	41.3	74.0	32.7	38.6	54.0	15.4	400	291	V	Low
5.3028	40.4	74.0	33.6	42.5	54.0	11.5	400	291	V	Low
5.6437	41.7	74.0	32.3	43.1	54.0	10.9	400	159	V	Low

Notes

1. All possible modes of operation were investigated. Only the worst case emissions measured, using the correct CISPR detectors, are reported. All other emissions were relatively insignificant.
2. A "positive" margin indicates a PASS as it refers to the margin present below the limit line at the particular frequency. Conversely, a “negative” margin indicates a FAIL.
3. EMI receiver Resolution Bandwidth (RBW) and Video Bandwidth (VBW) settings:
   30MHz - 1GHz
   RBW: 120kHz VBW: 1MHz
   >1GHz
   RBW: 1MHz VBW: 3MHz
4. Radiated Emissions Measurement Uncertainty
   All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95%, with a coverage factor of 2, in the range 30MHz – 1GHz is ±3.8dB and >1GHz – 40GHz is ±4.5dB.

47 CFR FCC Parts 2.1053 and 25.202(f) Radiated Spurious Emission Limits

1. 25.202 Emissions Limitations
   - (f) The mean power of the emissions shall be attenuated below the mean output power of the transmitter in accordance with the following schedule:
   - (1) In any 4kHz band, the center frequency of which is removed from the assigned frequency by more than 50% up to and including 100% of the authorized bandwidth: 25 decibels;
   - (2) In any 4kHz band, the center frequency of which is removed from the assigned frequency by more than 100% up to and including 250% of the authorized bandwidth: 35 decibels;
   - (3) In any 4kHz band, the center frequency of which is removed from the assigned frequency by more than 250% of the authorized bandwidth: an amount equal to 43 decibels plus 10 times logarithm (to the base 10) of the transmitter power in watts.

2. 2.1053 Measurements Required: Field Strength of Spurious Emissions
   - (a) Measurement shall be made to detect spurious emissions that may be radiated directly from the cabinet, control circuits, power leads, or intermediate circuit elements under normal conditions of installation and operation. Curves or equivalent data shall be supplied showing the magnitude of each harmonic and other spurious emission. For this test, single sideband, independent sideband, and controlled carrier transmitters shall be modulated under the conditions specified in paragraph (c) of 2.1049, as appropriate. For equipment operating on frequencies below 890MHz, an open field test is normally required, with the measuring instrument antenna located in the far-field at all test frequencies. Information submitted shall include the relative radiated power of each spurious emission with reference to the rated power output of the transmitter, assuming all emissions are radiated from half-wave dipole antennas.
   - (b) The measurements specified in paragraph (a) of this section shall be made for the following equipment:
   - (1) Those in which the spurious emission are required to be 60dB or more below the mean power of the transmitter.
   - (2) All equipment operating on frequencies higher than 25MHz.
   - (3) All equipment where the antenna is an integral part of, and attached directly to the transmitter.
   - (4) Other types of equipment as required, when deemed necessary by the Commission.

47 CFR FCC Parts 2.1053 and 25.202(f) Radiated Spurious Emission Test Instrumentation

Instrument	Model	S/No	Cal Due Date
R&S Test Receiver – ESI1	ESI40	100010	25 Oct 2018
Schaffner Bilog Antenna –(30MHz-2GHz) BL4	CBL6112B	2593	18 Jan 2018
Com-Power Preamplifier (1MHz-1GHz)	PAM-103	441096	25 Sep 2018
EMCO Horn Antenna(1GHz-18GHz)	3115	0003-6088	24 Mar 2018
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Toyo Preamplifier (26.5GHz-40GHz)	HAP26-40W	00000005	18 Apr 2018
Agilent Preamplifier(1GHz-26.5GHz) (PA18)	8449D	3008A02305	02 Oct 2018
K&L Microwave Tunable Band Reject Filter	3TNF-1000/2000-N/N	436	Output Monitor
Micro-tronics Bandstop Filter (2.4GHz)	BRM50701-02	007	Output Monitor

47 CFR FCC Parts 2.1053 and 25.202(f) Radiated Spurious Emission Test Setup

1. The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m X 1.0m X 0.8m high, non-metallic table.
2. The filtered power supply for the EUT and supporting equipment were tapped from the appropriate power sockets located on the turntable.
3. The relevant antenna was set at the required test distance away from the EUT and supporting equipment boundary

47 CFR FCC Parts 2.1053 and 25.202(f) Radiated Spurious Emission Test Method

1. The EUT was set to transmit at the maximum power at the lower channel with the modulation on at normal test condition.
2. The receiving antenna (test antenna) was set at vertical polarization with the height of 1m.
3. With the spectrum analyser was set to max hold enabled (peak detector mode), the spurious emissions were searched and recorded. For EUT which is a portable device, the spurious emission search was carried out by rotating the EUT through three orthogonal axes to determine which attitude and equipment arrangement produces worst emissions.
4. For each spurious emission found, the test antenna was raised or lowered through the specified range of heights (1m – 4m) until a maximum signal level was detected on the test receiver.
5. The EUT was then rotated through 360º in the horizontal plane until the maximum signal was received. The maximum received signal level was recorded as A (in dBm).
6. The EUT was replaced with the substitution antenna with the antenna input was connected to the signal generator via a 10dB attenuator (if required).
7. The signal generator was set to the found spurious frequency. The output level of the signal generator was adjusted until the test receiver was at least 20dB above the level when the signal generator was switched off.
8. The test antenna was raised and lowered through the specified range of heights (1m – 4m) until the maximum signal level was received on the test receiver.
9. The substitution antenna was rotated until the maximum level was detected on the test receiver.
10. The output level of the signal generator was adjusted until the received signal level at the test receiver was equal to the level recorded in step 5 (A dBm). The signal generator output level was recorded as B (in dBm).
11. The spurious emission level, P (e.i.r.p) was computed as followed:

P (e.i.r.p)		=	B – C – D + E
where	C	=	cable loss between the signal generator and the substitution
	D	=	attenuation level if attenuator is used
	E	=	substitution antenna gain

12. The steps 2 to 11 were repeated with the receiving antenna was set to horizontal polarization.
13. Comparison was made on both measured results with vertical and horizontal polarizations. The highest value out of vertical and horizontal polarizations was recorded.
14. The steps 2 to 13 were repeated until all the spurious emissions (up to 10th harmonics of the carrier frequency) were measured.
15. The steps 1 to 14 were repeated with the EUT was set to operate at the middle and upper channels respectively.

47 CFR FCC Parts 2.1053 and 25.202(f) Radiated Spurious Emission Results

Operating Mode	Continuous Satellite Communication with WiFi Transmission & LAN ping	Temperature	23°C
Test Input Power	24Vdc (Worst)	Relative Humidity	60%
Test Distance	3m	Atmospheric Pressure	1030mbar
Type Bearer	PNB512_23_16APSK (Worst)	Tested By	Lim Kay Tak

30MHz – 1GHz

Lower Channel

Frequency (GHz)	Amplitude (dBm)	Limit (dBm)
53.5600	-59.1	-13.0
92.8260	-58.6	-13.0
110.4960	-64.4	-13.0
265.5990	-59.3	-13.0
723.0540	-63.9	-13.0
950.8000	-57.4	-13.0

Middle Channel

Frequency (GHz)	Amplitude (dBm)	Limit (dBm)
49.6330	-61.9	-13.0
77.1200	-65.2	-13.0
92.8260	-55.8	-13.0
499.2350	-65.0	-13.0
723.0540	-56.3	-13.0
913.4970	-62.2	-13.0

Upper Channel

Frequency (GHz)	Amplitude (dBm)	Limit (dBm)
55.5230	-63.9	-13.0
75.1570	-61.7	-13.0
88.9000	-63.5	-13.0
265.5990	-53.8	-13.0
913.4970	-56.8	-13.0
950.8000	-62.2	-13.0

1GHz – 17GHz

Lower Channel

Frequency (GHz)	Amplitude (dBm)	Limit (dBm)
1883.7500	-62.3	-13.0
2934.1500	-61.9	-13.0
3530.2500	-62.0	-13.0
5643.6750	-53.5	-13.0
7545.3000	-59.8	-13.0
13924.0500	-50.5	-13.0

Middle Channel

Frequency (GHz)	Amplitude (dBm)	Limit (dBm)
1035.3500	-65.4	-13.0
1505.0000	-69.0	-13.0
3136.3500	-66.0	-13.0
5302.8000	-54.8	-13.0
7908.9000	-59.7	-13.0
13924.0500	-40.1	-13.0

Upper Channel

Frequency (GHz)	Amplitude (dBm)	Limit (dBm)
1050.5000	-68.6	-13.0
1818.1000	-67.7	-13.0
3310.5750	-65.7	-13.0
5264.9250	-57.0	-13.0
7545.3000	-50.0	-13.0
13924.0500	-29.7	-13.0

Notes

1. All possible modes of operation were investigated. Only the worst case emissions measured. All other emissions were relatively insignificant.
2. A "positive" margin indicates a PASS as it refers to the margin present below the limit line at the particular frequency. Conversely, a “negative” margin indicates a FAIL.
3. The Resolution Bandwidth (RBW) was corrected from 4kHz by 10log10 [(used RBW) / 4kHz].
4. EMI receiver Resolution Bandwidth (RBW) and Video Bandwidth (VBW) settings:
   30MHz - 20GHz
   RBW: 100kHz VBW: 300kHz
5. Emission limits are computed based on following:
   a. Emissions Limits (dBm) (50% - 100% authorised bandwidth) = P - 25 + CF
   b. Emissions Limits (dBm) (100% - 250% authorised bandwidth) = P - 35 + CF
   c. Emissions Limits (dBm) (> 250% authorised bandwidth) = $P - [43 + 10 \log_{10} P_W] + 30 + CF$

   where P = Measured mean power in dBm
   P_W = Measured mean power in W
   CF = RBW correction factor (see Note 4)
6. Radiated Spurious Emissions Measurement Uncertainty
   All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95%, with a coverage factor of 2, in the range 30MHz – 1GHz is ±3.8dB and >1GHz – 40GHz is ±4.5dB.

Please note that this Report is issued under the following terms :

1. This report applies to the sample of the specific product/equipment given at the time of its testing/calibration. The results are not used to indicate or imply that they are applicable to other similar items. In addition, such results must not be used to indicate or imply that TÜV SÜD PSB approves, recommends or endorses the manufacturer, supplier or user of such product/equipment, or that TÜV SÜD PSB in any way "guarantees" the later performance of the product/equipment. Unless otherwise stated in this report, no tests were conducted to determine long term effects of using the specific product/equipment.

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5. Unless otherwise stated, the tests were carried out in TÜV SÜD PSB Pte Ltd, No.1 Science Park Drive Singapore 118221.

July 2011

TCB

GRANT OF EQUIPMENT AUTHORIZATION

TCB

Certification
Issued Under the Authority of the
Federal Communications Commission
By:

TUV SUD PSB Pte Ltd
Certification and Inspection No.1
Science Park Drive
Singapore, 118221
Singapore

Date of Grant: 10/21/2014

Application Dated: 10/21/2014

ADDVALUE INNOVATION PTE LTD
8 TAI SENG LINK, LEVEL 5(WING 2)
SINGAPORE, 534158
Singapore

Attention: PRABAKAR KUTTANISEERI , MANAGER-QUALITY MANAGEMENT

NOT TRANSFERABLE

EQUIPMENT AUTHORIZATION is hereby issued to the named GRANTEE, and is VALID ONLY for the equipment identified hereon for use under the Commission's Rules and Regulations listed below.

FCC IDENTIFIER: QO4-AVIATLASIP
Name of Grantee: ADDVALUE INNOVATION PTE LTD
Equipment Class: Licensed Non-Broadcast Station Transmitter
Notes: Maritime Satellite Terminal

Grant Notes	FCC Rule Parts	Frequency Range (MHZ)	Output Watts	Frequency Tolerance	Emission Designator
	25	1626.5 - 1660.5	10.94	0.001 %	138KG1D

Output Power listed is EIRP. The Antenna installation and operating configurations of this transmitter, including antenna gain and cable loss must satisfy MPE Categorical Exclusion Requirements of§2.1091. The antenna used for this transmitter must be installed to provide a separation distance of at least 100 cm from all persons and must not be collocated or operating in conjunction with any other antenna or transmitter except as documented in this application. Users and installers must be provided with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance.