Approved by OMB 3060-0678
Estimated Burden: up to 80 hours
April 2016

Federal Communications Commission

312 File Number: **SATMOD2018091800073**

Filing Description

Question	Response
Description	Modification to S2129 non-GSO satellite space station license

Satellite Information

Question	Response
Select Orbit Type	NGSO
Space Station or Satellite Network Name	USASAT-30A
Estimated Lifetime of Satellite(s) From Date of Launch	10 Years
Will the space station(s) operate on a Common Carrier basis?	No

Operating Frequency Bands (2)

Nature of service	Description	Frequency Band(s)	Mode Type
Earth Exploration-Satellite Service		8025.0 MHz -8400.0 MHz	Transmit
Earth Exploration-Satellite Service		2025.0 MHz -2110.0 MHz	Receive

Orbital Information For Non-Geostationary Satellites

Question	Response
Total Number of Satellites in the active constellation	12
Orbit Epoch Date	08/20/2021
Celestrial Reference Body	Earth

Orbital Plane 1:

Question	Response
Number of Satellites in Plane	2
Inclination Angle	98.48 degrees
Right Ascension of Ascending Node	152.7 degrees
Argument of Perigee	90.0 degrees
Orbital Period	6013.0 seconds
Apogee	777.4 km
Perigee	762.6 km
Active Service Arc Begin Angle with respect to Ascending Node	0.0 degrees
Active Service Arc End Angle with respect to Ascending Node	0.0 degrees

Mean Anomaly For Each Satellite

Satellite Number	Mean Anomaly (degrees) at the Orbit Epoch Date
1	0.0
2	0.0

Orbital Plane 2:

Question	Response
Number of Satellites in Plane	1
Inclination Angle	45.0 degrees
Right Ascension of Ascending Node	73.4 degrees
Argument of Perigee	90.0 degrees
Orbital Period	5698.0 seconds
Apogee	523.3 km
Perigee	512.7 km
Active Service Arc Begin Angle with respect to Ascending Node	0.0 degrees
Active Service Arc End Angle with respect to Ascending Node	0.0 degrees

Mean Anomaly For Each Satellite

Satellite Number	Mean Anomaly (degrees) at the Orbit Epoch Date
1	0.0

Orbital Plane 3:

Question	Response
Number of Satellites in Plane	1
Inclination Angle	45.0 degrees
Right Ascension of Ascending Node	163.4 degrees
Argument of Perigee	90.0 degrees
Orbital Period	5698.0 seconds
Apogee	523.3 km
Perigee	512.7 km
Active Service Arc Begin Angle with respect to Ascending Node	0.0 degrees
Active Service Arc End Angle with respect to Ascending Node	0.0 degrees

Mean Anomaly For Each Satellite

Satellite Number	Mean Anomaly (degrees) at the Orbit Epoch Date
1	0.0

Orbital Plane 4:

Question	Response
Number of Satellites in Plane	1
Inclination Angle	45.0 degrees
Right Ascension of Ascending Node	253.4 degrees
Argument of Perigee	90.0 degrees
Orbital Period	5698.0 seconds

Apogee	523.3 km
Perigee	512.7 km
Active Service Arc Begin Angle with respect to Ascending Node	0.0 degrees
Active Service Arc End Angle with respect to Ascending Node	0.0 degrees

Mean Anomaly For Each Satellite

Satellite Number	Mean Anomaly (degrees) at the Orbit Epoch Date
1	0.0

Orbital Plane 5:

Question	Response
Number of Satellites in Plane	1
Inclination Angle	45.0 degrees
Right Ascension of Ascending Node	343.4 degrees
Argument of Perigee	90.0 degrees
Orbital Period	5698.0 seconds
Apogee	523.3 km
Perigee	512.7 km
Active Service Arc Begin Angle with respect to Ascending Node	0.0 degrees
Active Service Arc End Angle with respect to Ascending Node	0.0 degrees

Mean Anomaly For Each Satellite

Satellite Number	Mean Anomaly (degrees) at the Orbit Epoch Date
1	0.0

Orbital Plane 6:

Question	Response
Number of Satellites in Plane	2

Inclination Angle	98.48 degrees
Right Ascension of Ascending Node	198.2 degrees
Argument of Perigee	90.0 degrees
Orbital Period	6013.0 seconds
Apogee	777.4 km
Perigee	762.6 km
Active Service Arc Begin Angle with respect to Ascending Node	0.0 degrees
Active Service Arc End Angle with respect to Ascending Node	0.0 degrees

Mean Anomaly For Each Satellite

Satellite Number	Mean Anomaly (degrees) at the Orbit Epoch Date
1	0.0
2	0.0

Orbital Plane 7:

Question	Response
Number of Satellites in Plane	1
Inclination Angle	45.0 degrees
Right Ascension of Ascending Node	119.9 degrees
Argument of Perigee	90.0 degrees
Orbital Period	5698.0 seconds
Apogee	523.3 km
Perigee	512.7 km
Active Service Arc Begin Angle with respect to Ascending Node	0.0 degrees
Active Service Arc End Angle with respect to Ascending Node	0.0 degrees

Mean Anomaly For Each Satellite

Satellite Number	Mean Anomaly (degrees) at the Orbit Epoch Date
1	0.0

Orbital Plane 8:

Question	Response
Number of Satellites in Plane	1
Inclination Angle	45.0 degrees
Right Ascension of Ascending Node	209.9 degrees
Argument of Perigee	90.0 degrees
Orbital Period	5698.0 seconds
Apogee	523.3 km
Perigee	512.7 km
Active Service Arc Begin Angle with respect to Ascending Node	0.0 degrees
Active Service Arc End Angle with respect to Ascending Node	0.0 degrees

Mean Anomaly For Each Satellite

Satellite Number	Mean Anomaly (degrees) at the Orbit Epoch Date
1	0.0

Orbital Plane 9:

Question	Response
Number of Satellites in Plane	1
Inclination Angle	45.0 degrees
Right Ascension of Ascending Node	299.9 degrees
Argument of Perigee	90.0 degrees
Orbital Period	5698.0 seconds
Apogee	523.3 km
Perigee	512.7 km

Active Service Arc Begin Angle with respect to Ascending Node	0.0 degrees
Active Service Arc End Angle with respect to Ascending Node	0.0 degrees

Mean Anomaly For Each Satellite

Satellite Number	Mean Anomaly (degrees) at the Orbit Epoch Date
1	0.0

Orbital Plane 10:

Question	Response
Number of Satellites in Plane	1
Inclination Angle	45.0 degrees
Right Ascension of Ascending Node	29.9 degrees
Argument of Perigee	90.0 degrees
Orbital Period	5698.0 seconds
Apogee	523.3 km
Perigee	512.7 km
Active Service Arc Begin Angle with respect to Ascending Node	0.0 degrees
Active Service Arc End Angle with respect to Ascending Node	0.0 degrees

Mean Anomaly For Each Satellite

Satellite Number	Mean Anomaly (degrees) at the Orbit Epoch Date
1	0.0

Receiving Beams 1:

Question	Response
Beam ID	CMD
Receive Beam Frequency	2085.02 MHz -2086.35 MHz
Beam Type	Steerable
Polarization	RHCP
Peak Gain	0.0 dBi
Antenna Pointing Error	0.25 degrees
Antenna Rotational Error	0.0 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	-28.1 dB/K
Min. Saturation Flux Density	-104.3 dBW/m2
Max. Saturation Flux Density	-87.3 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Earth coverage for uplink commanding

Receiving Channels (1)

Channel ID	Channel Bandwidth (MHz)	Center Frequency s (MHz)	Feeder Link, Service Link or TT&C
CMD	1.32	2085.6875	TT&C

Transmitting Beams 1:

Question	Response
Beam ID	WB
Transmit Beam Frequency	8025.0 MHz -8400.0 MHz
Beam Type	Steerable
Polarization	RHCP
Peak Gain	24.5 dBi
Antenna Pointing Error	0.25 degrees
Antenna Rotational Error	0.0 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
Max. Transmit EIRP Density	-52.5 dBW/Hz
Max. Transmit EIRP	30.5 dBW
Co- or Cross Polar Mode	C
Service Area Description	Steerable beam to point at earth station for downlinking image data

Max. Power Flux Density

* BW:	* 0° - 5° (dbW/m^2 /BW):	* 5° - 10° (dbW/m^2 /BW):	* 10° - 15° (dbW/m^2 /BW):	* 15° - 20° (dbW/m^2 /BW):	* 20° - 25° (dbW/m^2 /BW):	* 25° - 90° (dbW/m^2 /BW):
4.0 kHz	-153.2	-151.4	-149.7	-148.2	-147.0	-140.6

Transmitting Beams 2:

Question	Response
Beam ID	NB
Transmit Beam Frequency	8379.68 MHz -8380.32 MHz

Beam Type	Steerable
Polarization	RHCP
Peak Gain	0.0 dBi
Antenna Pointing Error	0.25 degrees
Antenna Rotational Error	0.0 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
Max. Transmit EIRP Density	-58.6 dBW/Hz
Max. Transmit EIRP	0.0 dBW
Co- or Cross Polar Mode	C
Service Area Description	Earth coverage for downlink of spacecraft health and status telemetry to earth station

Max. Power Flux Density

* BW:	* 0° - 5° (dbW/m^2 /BW):	* 5° - 10° (dbW/m^2 /BW):	* 10° - 15° (dbW/m^2 /BW):	* 15° - 20° (dbW/m^2 /BW):	* 20° - 25° (dbW/m^2 /BW):	* 25° - 90° (dbW/m^2 /BW):
4.0 kHz	-152.8	-151.1	-149.5	-148.1	-146.8	-140.6

Transmitting Channels (2)

Channel ID	Channel Bandwidth (MHz)	Center Frequency s (MHz)	Feeder Link, Service Link or TT&C
NB	0.625	8380.0	TT&C
WB	150.0	8185.0	TT&C

Certification Questions

Question	Response
Are the applicable service area coverage requirements of 25.143(b)(2)(ii) and (iii), or 25.144(a)(3)(i), or 25.145(c)(1) and (2), or 25.146(i)(1) and (2), or 25.148(c), or 25.225 met?	N/A
Are the applicable frequency tolerances of 25.202(e) and out-of-band emission limits of 25.202(f)(1),(2), and (3) met?	Yes
Are the cessation of emissions requirements of 25.207 met?	Yes
Are the applicable power-flux-density limits of 25.208 met, and is the appropriate technical showing provided within the application?	Yes
For NGSO applications, are the applicable equivalent-power-flux-density limits of 25.208 met, and is the appropriate technical showing provided within the application?	Yes
Are the applicable full-frequency-reuse requirements of 25.210 met?	Yes
If the application is for a 17/24 GHz BSS space station, will it be operated at an offset location with full power and interference protection in accordance with 25.262(b)?	

Attachments

File Name	Beam	Field	Attachment Type	Descriptic
WVL-Narrownband_antenna_gain_pattern.pdf	NB	NGSO Antenna Gain Data	PDF file (*.pdf)	Narrowbar downlink antenna gain patter
WVL-Wideband_antenna_gain_pattern.pdf	WB	NGSO Antenna Gain Data	PDF file (*.pdf)	Wideband downlink antenna gain patter
WVL-Command_antenna_gain_pattern.pdf	CMD	NGSO Antenna Gain Data	PDF file (*.pdf)	Command uplink antenna gain patter