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

Federal Communications Commission

312 File Number: **SATLOA2022121900176**

Filing Description

Question	Response
Description	The purpose of the MethaneSAT NGSO satellite network is to quantify global emissions of methane.

Satellite Information

Question	Response
Select Orbit Type	NGSO
Space Station or Satellite Network Name	MethaneSAT-1
Estimated Lifetime of Satellite(s) From Date of Launch	5 Years
Will the space station(s) operate on a Common Carrier basis?	No

Operating Frequency Bands (3)

Nature of service	Description	Frequency Band(s)	Mode Type
Earth Exploration-Satellite Service		8025.0 MHz -8400.0 MHz	Transmit
Space Operation Service		2200.0 MHz -2290.0 MHz	Transmit
Space Operation Service		2025.0 MHz -2110.0 MHz	Receive

Orbital Information For Non-Geostationary Satellites

Question	Response
Total Number of Satellites in the active constellation	1
Orbit Epoch Date	06/01/2024
Celestrial Reference Body	Earth

Orbital Plane 1:

Question	Response
Number of Satellites in Plane	1
Inclination Angle	97.47 degrees
Right Ascension of Ascending Node	174.9 degrees
Argument of Perigee	198.0 degrees
Orbital Period	5704.0 seconds
Apogee	525.0 km
Perigee	525.0 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	332.7

Receiving Beams 1:

Question	Response
Beam ID	SBRX
Receive Beam Frequency	2034.4 MHz -2034.6 MHz
Beam Type	Fixed
Polarization	RHCP
Peak Gain	3.0 dBi
Antenna Pointing Error	0.0 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	-30.9 dB/K
Min. Saturation Flux Density	-108.4 dBW/m2
Max. Saturation Flux Density	-58.4 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	

Receiving Channels (1)

Channel ID	Channel Bandwidth (MHz)	Center Frequency s (MHz)	Feeder Link, Service Link or TT&C
SBRX	0.2	2034.5	TT&C

Transmitting Beams 1:

Question	Response
Beam ID	SBTX
Transmit Beam Frequency	2233.5 MHz -2235.5 MHz
Beam Type	Fixed
Polarization	RHCP
Peak Gain	3.0 dBi
Antenna Pointing Error	0.0 degrees
Antenna Rotational Error	0.0 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
Max. Transmit EIRP Density	-58.9 dBW/Hz
Max. Transmit EIRP	2.7 dBW
Co- or Cross Polar Mode	C
Service Area Description	

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	-158.1	-156.4	-154.9	-153.5	-152.3	-146.2

Transmitting Beams 2:

Question	Response
Beam ID	XBTX
Transmit Beam Frequency	8040.0 MHz -8310.0 MHz

Beam Type	Fixed
Polarization	RHCP
Peak Gain	21.7 dBi
Antenna Pointing Error	1.0 degrees
Antenna Rotational Error	0.0 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
Max. Transmit EIRP Density	-63.2 dBW/Hz
Max. Transmit EIRP	19.8 dBW
Co- or Cross Polar Mode	C
Service Area Description	

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	-162.8	-161.1	-159.5	-158.0	-156.8	-150.5

Transmitting Channels (2)

Channel ID	Channel Bandwidth (MHz)	Center Frequency s (MHz)	Feeder Link, Service Link or TT&C
SBTX	2.0	2234.5	TT&C
XBTX	270.0	8175.0	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?	Yes
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	Description
SB_antenna_gain.pdf	SBRX	NGSO Antenna Gain Data	PDF file (*.pdf)	S-Band Antenna Gain Plot
MethaneSAT Antenna Plots.pdf	SBRX	Service Area Diagram	PDF file (*.pdf)	S-band Service Area Plots
SB_antenna_gain.pdf	SBTX	NGSO Antenna Gain Data	PDF file (*.pdf)	S-Band Antenna Gain Plot
XBTX_antenna_gain.pdf	XBTX	NGSO Antenna Gain Data	PDF file (*.pdf)	X-Band Antenna Gain
MethaneSAT Antenna Plots.pdf	XBTX	Service Area Diagram	PDF file (*.pdf)	X-Band Service Area Plots
MethaneSAT Antenna Plots.pdf	SBTX	Service Area Diagram	PDF file (*.pdf)	S-band Service Area Plots