



312 File Number: **SATMOD2023032200062**

Filing Description

Question	Response
Description	Modification of SpaceX V-Band Authorization

Satellite
Information

Question	Response
Select Orbit Type	NGSO
Space Station or Satellite Network Name	SpaceX V-Band Gen2
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
Fixed-Satellite Service		50400.0 MHz -51400.0 MHz	Receive
Fixed-Satellite Service		47200.0 MHz -50200.0 MHz	Receive
Fixed-Satellite Service		37500.0 MHz -42500.0 MHz	Transmit

**Orbital
Information For
Non-
Geostationary
Satellites**

Question	Response
Total Number of Satellites in the active constellation	3
Orbit Epoch Date	01/01/2023
Celestial Reference Body	Earth

Orbital Plane 1:

Question	Response
Number of Satellites in Plane	1
Inclination Angle	53.0 degrees
Right Ascension of Ascending Node	0.0 degrees
Argument of Perigee	0.0 degrees
Orbital Period	5700.0 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	0.0

Orbital Plane 2:

Question	Response
Number of Satellites in Plane	1
Inclination Angle	43.0 degrees
Right Ascension of Ascending Node	0.0 degrees
Argument of Perigee	0.0 degrees
Orbital Period	5700.0 seconds
Apogee	530.0 km
Perigee	530.0 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	0.0

Orbital Plane 3:

Question	Response
Number of Satellites in Plane	1
Inclination Angle	33.0 degrees
Right Ascension of Ascending Node	0.0 degrees
Argument of Perigee	0.0 degrees
Orbital Period	5700.0 seconds
Apogee	535.0 km
Perigee	535.0 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	0.0

Receiving Beams 1:

Question	Response
Beam ID	LUU1
Receive Beam Frequency	47200.0 MHz -50200.0 MHz
Beam Type	Steerable
Polarization	RHCP
Peak Gain	49.5 dBi
Antenna Pointing Error	0.1 degrees
Antenna Rotational Error	0.1 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	12.8 dB/K
Min. Saturation Flux Density	-0.1 dBW/m2
Max. Saturation Flux Density	0.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Global

Receiving Beams 2:

Question	Response
Beam ID	LUU3
Receive Beam Frequency	50400.0 MHz -51400.0 MHz
Beam Type	Steerable
Polarization	RHCP
Peak Gain	49.5 dBi
Antenna Pointing Error	0.1 degrees
Antenna Rotational Error	0.1 degrees

Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	12.8 dB/K
Min. Saturation Flux Density	-0.1 dBW/m2
Max. Saturation Flux Density	0.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Global

Receiving
Beams 3:

Question	Response
Beam ID	LGU1
Receive Beam Frequency	47200.0 MHz -50200.0 MHz
Beam Type	Steerable
Polarization	RHCP
Peak Gain	49.5 dBi
Antenna Pointing Error	0.1 degrees
Antenna Rotational Error	0.1 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	14.3 dB/K
Min. Saturation Flux Density	-0.1 dBW/m2
Max. Saturation Flux Density	0.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Global

Receiving

Beams 4:

Question	Response
Beam ID	LGU3
Receive Beam Frequency	50400.0 MHz -51400.0 MHz
Beam Type	Steerable
Polarization	RHCP
Peak Gain	49.5 dBi
Antenna Pointing Error	0.1 degrees
Antenna Rotational Error	0.1 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	14.3 dB/K
Min. Saturation Flux Density	-0.1 dBW/m2
Max. Saturation Flux Density	0.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Global

Receiving Beams 5:

Question	Response
Beam ID	LUU2
Receive Beam Frequency	47200.0 MHz -50200.0 MHz
Beam Type	Steerable
Polarization	LHCP
Peak Gain	49.5 dBi
Antenna Pointing Error	0.1 degrees
Antenna Rotational Error	0.1 degrees
Polarization Switchable	

Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	12.8 dB/K
Min. Saturation Flux Density	-0.1 dBW/m2
Max. Saturation Flux Density	0.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Global

Receiving Beams 6:

Question	Response
Beam ID	LUU4
Receive Beam Frequency	50400.0 MHz -51400.0 MHz
Beam Type	Steerable
Polarization	LHCP
Peak Gain	49.5 dBi
Antenna Pointing Error	0.1 degrees
Antenna Rotational Error	0.1 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	12.8 dB/K
Min. Saturation Flux Density	-0.1 dBW/m2
Max. Saturation Flux Density	0.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Global

Receiving Beams 7:

Question	Response
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Beam ID	LGU2
Receive Beam Frequency	47200.0 MHz -50200.0 MHz
Beam Type	Steerable
Polarization	LHCP
Peak Gain	49.5 dBi
Antenna Pointing Error	0.1 degrees
Antenna Rotational Error	0.1 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	14.3 dB/K
Min. Saturation Flux Density	-0.1 dBW/m2
Max. Saturation Flux Density	0.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Global

Receiving Beams 8:

Question	Response
Beam ID	LGU4
Receive Beam Frequency	50400.0 MHz -51400.0 MHz
Beam Type	Steerable
Polarization	LHCP
Peak Gain	49.5 dBi
Antenna Pointing Error	0.1 degrees
Antenna Rotational Error	0.1 degrees
Polarization Switchable	

Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	14.3 dB/K
Min. Saturation Flux Density	-0.1 dBW/m2
Max. Saturation Flux Density	0.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Global

Receiving
Channels (4)

Channel ID	Channel Bandwidth (MHz)	Center Frequency s (MHz)	Feeder Link, Service Link or TT&C
UL4	1000.0	50900.0	Service Link
UL1	1000.0	47700.0	Service Link
UL2	1000.0	48700.0	Service Link
UL3	1000.0	49700.0	Service Link

**Transmitting
Beams 1:**

Question	Response
Beam ID	LUD1
Transmit Beam Frequency	37500.0 MHz -40000.0 MHz
Beam Type	Steerable
Polarization	RHCP
Peak Gain	47.5 dBi
Antenna Pointing Error	0.1 degrees
Antenna Rotational Error	0.1 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
Max. Transmit EIRP Density	-47.2 dBW/Hz
Max. Transmit EIRP	42.8 dBW
Co- or Cross Polar Mode	C
Service Area Description	Global

Max. Power Flux Density

	* 0° - 5°	* 5° - 10°	* 10° - 15°	* 15° - 20°	* 20° - 25°	* 25° - 90°
* (dBW/m ² /BW):	(dBW/m ² /BW):	(dBW/m ² /BW):	(dBW/m ² /BW):	(dBW/m ² /BW):	(dBW/m ² /BW):	(dBW/m ² /BW):
1.0 MHz	-150.8	-149.1	-147.5	-146.1	-144.8	-117.0

**Transmitting
Beams 2:**

Question	Response
Beam ID	LGD1
Transmit Beam Frequency	37500.0 MHz -40000.0 MHz

Beam Type	Steerable
Polarization	RHCP
Peak Gain	47.5 dBi
Antenna Pointing Error	0.1 degrees
Antenna Rotational Error	0.1 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
Max. Transmit EIRP Density	-47.2 dBW/Hz
Max. Transmit EIRP	42.8 dBW
Co- or Cross Polar Mode	C
Service Area Description	Global

Max. Power Flux Density

	* 0° - 5°	* 5° - 10°	* 10° - 15°	* 15° - 20°	* 20° - 25°	* 25° - 90°
	(dBW/m ²	(dBW/m ²	(dBW/m ²	(dBW/m ²	(dBW/m ²	(dBW/m ²
	/BW):	/BW):	/BW):	/BW):	/BW):	/BW):
1.0 MHz	-150.8	-149.1	-147.5	-146.1	-144.8	-117.0

Transmitting Beams 3:

Question	Response
Beam ID	LUD2
Transmit Beam Frequency	37500.0 MHz -40000.0 MHz
Beam Type	Steerable
Polarization	LHCP
Peak Gain	47.5 dBi
Antenna Pointing Error	0.1 degrees

Antenna Rotational Error	0.1 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
Max. Transmit EIRP Density	-47.2 dBW/Hz
Max. Transmit EIRP	42.8 dBW
Co- or Cross Polar Mode	C
Service Area Description	Global

Max. Power Flux Density

	* 0° - 5°	* 5° - 10°	* 10° - 15°	* 15° - 20°	* 20° - 25°	* 25° - 90°
	(dBW/m ²	(dBW/m ²	(dBW/m ²	(dBW/m ²	(dBW/m ²	(dBW/m ²
	/BW):	/BW):	/BW):	/BW):	/BW):	/BW):
1.0 MHz	-150.8	-149.1	-147.5	-146.1	-144.8	-117.0

Transmitting Beams 4:

Question	Response
Beam ID	LGD2
Transmit Beam Frequency	37500.0 MHz -40000.0 MHz
Beam Type	Steerable
Polarization	LHCP
Peak Gain	47.5 dBi
Antenna Pointing Error	0.1 degrees
Antenna Rotational Error	0.1 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
Max. Transmit EIRP Density	-47.2 dBW/Hz

Max. Transmit EIRP	42.8 dBW
Co- or Cross Polar Mode	C
Service Area Description	Global

Max. Power Flux Density

	* 0° - 5°	* 5° - 10°	* 10° - 15°	* 15° - 20°	* 20° - 25°	* 25° - 90°
	(dBW/m ²	(dBW/m ²	(dBW/m ²	(dBW/m ²	(dBW/m ²	(dBW/m ²
* BW:	/BW):	/BW):	/BW):	/BW):	/BW):	/BW):
1.0 MHz	-150.8	-149.1	-147.5	-146.1	-144.8	-117.0

Transmitting Beams 5:

Question	Response
Beam ID	LUD3
Transmit Beam Frequency	40000.0 MHz -42500.0 MHz
Beam Type	Steerable
Polarization	RHCP
Peak Gain	47.5 dBi
Antenna Pointing Error	0.1 degrees
Antenna Rotational Error	0.1 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
Max. Transmit EIRP Density	-42.2 dBW/Hz
Max. Transmit EIRP	47.8 dBW
Co- or Cross Polar Mode	C
Service Area Description	Global

Max. Power Flux Density

Transmitting
Beams 6:

	* 0° - 5°	* 5° - 10°	* 10° - 15°	* 15° - 20°	* 20° - 25°	* 25° - 90°
* BW:	(dbW/m ² /BW):	(dbW/m ² /BW):	(dbW/m ² /BW):	(dbW/m ² /BW):	(dbW/m ² /BW):	(dbW/m ² /BW):
1.0 MHz	-144.9	-143.2	-141.7	-140.3	-139.2	-114.0

Question	Response
Beam ID	LGD3
Transmit Beam Frequency	40000.0 MHz -42500.0 MHz
Beam Type	Steerable
Polarization	RHCP
Peak Gain	47.5 dBi
Antenna Pointing Error	0.1 degrees
Antenna Rotational Error	0.1 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
Max. Transmit EIRP Density	-42.2 dBW/Hz
Max. Transmit EIRP	47.8 dBW
Co- or Cross Polar Mode	C
Service Area Description	Global

Max. Power Flux Density

	* 0° - 5°	* 5° - 10°	* 10° - 15°	* 15° - 20°	* 20° - 25°	* 25° - 90°
* BW:	(dbW/m ² /BW):	(dbW/m ² /BW):	(dbW/m ² /BW):	(dbW/m ² /BW):	(dbW/m ² /BW):	(dbW/m ² /BW):
1.0 MHz	-144.9	-143.2	-141.7	-140.3	-139.2	-114.0

Transmitting
Beams 7:

Question	Response
Beam ID	LUD4
Transmit Beam Frequency	40000.0 MHz -42500.0 MHz
Beam Type	Steerable
Polarization	LHCP
Peak Gain	47.5 dBi
Antenna Pointing Error	0.1 degrees
Antenna Rotational Error	0.1 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
Max. Transmit EIRP Density	-42.2 dBW/Hz
Max. Transmit EIRP	47.8 dBW
Co- or Cross Polar Mode	C
Service Area Description	Global

Max. Power Flux Density

	* 0° - 5°	* 5° - 10°	* 10° - 15°	* 15° - 20°	* 20° - 25°	* 25° - 90°
* BW:	(dBW/m ² /BW):	(dBW/m ² /BW):	(dBW/m ² /BW):	(dBW/m ² /BW):	(dBW/m ² /BW):	(dBW/m ² /BW):
1.0 MHz	-144.9	-143.2	-141.7	-140.3	-139.2	-114.0

Transmitting
Beams 8:

Question	Response
Beam ID	LGD4
Transmit Beam Frequency	40000.0 MHz -42500.0 MHz

Beam Type	Steerable
Polarization	LHCP
Peak Gain	47.5 dBi
Antenna Pointing Error	0.1 degrees
Antenna Rotational Error	0.1 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
Max. Transmit EIRP Density	-42.2 dBW/Hz
Max. Transmit EIRP	47.8 dBW
Co- or Cross Polar Mode	C
Service Area Description	Global

Max. Power Flux Density

	* 0° - 5°	* 5° - 10°	* 10° - 15°	* 15° - 20°	* 20° - 25°	* 25° - 90°
	(dBW/m ²	(dBW/m ²	(dBW/m ²	(dBW/m ²	(dBW/m ²	(dBW/m ²
	/BW):	/BW):	/BW):	/BW):	/BW):	/BW):
1.0 MHz	-144.9	-143.2	-141.7	-140.3	-139.2	-114.0

Transmitting
Channels (6)

Channel ID	Channel Bandwidth (MHz)	Center Frequency s (MHz)	Feeder Link, Service Link or TT&C
DL5	1000.0	41500.0	Service Link
DL4	1000.0	40500.0	Service Link
DL3	500.0	39750.0	Service Link
DL2	1000.0	39000.0	Service Link
DL6	500.0	42250.0	Service Link
DL1	1000.0	38000.0	Service Link

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?	N/A
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
<u>SPACEX-NGSO-V-BAND-PHI0.gxt</u>		NGSO Antenna Gain Data	GXT file (*.gxt)	
<u>SPACEX-NGSO-V-BAND-PHI20.gxt</u>		NGSO Antenna Gain Data	GXT file (*.gxt)	
<u>SPACEX-NGSO-V-BAND-PHI45.gxt</u>		NGSO Antenna Gain Data	GXT file (*.gxt)	
<u>SPACEX-NGSO-V-BAND-PHI57.gxt</u>		NGSO Antenna Gain Data	GXT file (*.gxt)	