



312 File Number: **SATMOD2021061800082**

Filing Description

Question	Response
Description	Modify XM-5 satellite license Callsign S2786 to add WCS blocks C and D frequencies.

**Satellite
Information**

Question	Response
Select Orbit Type	GSO
Space Station or Satellite Network Name	XM-5
Estimated Lifetime of Satellite(s) From Date of Launch	16 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
Fixed-Satellite Service		7025.0 MHz -7075.0 MHz	Receive
Satellite Digital Audio Radio Service		2315.0 MHz -2350.0 MHz	Transmit

**Orbital
Information For
Geostationary
Satellites**

Section	Question	Response
Orbital Longitude Information	Orbital Longitude	85.0 degrees
	Hemisphere of Orbital Longitude	W
Longitudinal Tolerance or East /West Station-Keeping	Toward West	0.1 degrees
	Toward East	0.1 degrees
Inclination Excursion or North /South Station-Keeping Tolerance	Inclination Excursion or North /South Station-Keeping Tolerance	0.05 degrees
Antenna Axis Attitude Accuracy	Roll	0.1 degrees
	Pitch	0.1 degrees
	Yaw	0.1 degrees

Receiving Beams 1:

Question	Response
Beam ID	XM2
Receive Beam Frequency	7025.0 MHz -7075.0 MHz
Beam Type	Fixed
Polarization	RHCP
Peak Gain	18.61 dBi
Antenna Pointing Error	0.1 degrees
Antenna Rotational Error	0.1 degrees
Polarization Switchable	Yes
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	-5.3 dB/K
Min. Saturation Flux Density	-103.2 dBW/m2
Max. Saturation Flux Density	-90.2 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Program Uplink Service Coverage

Receiving Beams 2:

Question	Response
Beam ID	CMD
Receive Beam Frequency	7025.0 MHz -7075.0 MHz
Beam Type	Fixed
Polarization	LHCP
Peak Gain	21.45 dBi
Antenna Pointing Error	0.1 degrees
Antenna Rotational Error	0.1 degrees

Polarization Switchable	No
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	-24.6 dB/K
Min. Saturation Flux Density	-105.0 dBW/m2
Max. Saturation Flux Density	-60.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Command Omni antenna coverage

Receiving
Channels (11)

Channel ID	Channel Bandwidth (MHz)	Center Frequency s (MHz)	Feeder Link, Service Link or TT&C
S1R	4.5	7062.29	Service Link
5R	1.84	7058.521	Service Link
4R	1.84	7068.397	Service Link
3R	1.84	7065.965	Service Link
CMD1	0.8	7043.0	TT&C
WDR	4.0	7059.5	Service Link
WCR	4.0	7055.0	Service Link
1R	1.84	7063.993	Service Link
2R	1.84	7061.561	Service Link
CMD2	0.8	7074.0	TT&C
S2R	4.5	7056.207	Service Link

Transmitting
Beams 1:

Question	Response
Beam ID	TLM
Transmit Beam Frequency	2320.0 MHz -2345.0 MHz
Beam Type	Fixed
Polarization	RHCP
Peak Gain	34.62 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	-18.0 dBW/Hz
Max. Transmit EIRP	32.0 dBW
Co- or Cross Polar Mode	C
Service Area Description	Telemetry Contour Coverage Map

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):
Hz	-125.0	-125.0	-124.0	-123.0	-119.0	-119.0

Transmitting
Beams 2:

Question	Response
Beam ID	XM2T
Transmit Beam Frequency	2315.0 MHz -2350.0 MHz
Beam Type	Fixed

Polarization	LHCP
Peak Gain	34.6 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	-8.4 dBW/Hz
Max. Transmit EIRP	71.0 dBW
Co- or Cross Polar Mode	C
Service Area Description	SDARS Downlink Gain Contours

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):
Hz	-126.0	-126.0	-122.0	-119.0	-119.0	-119.0

**Transmitting
Channels (13)**

Channel ID	Channel Bandwidth (MHz)	Center Frequency s (MHz)	Feeder Link, Service Link or TT&C
TLM4	0.1	2342.5	TT&C
TLM3	0.1	2337.2	TT&C
TLM2	0.1	2334.0	TT&C
TLM1	0.1	2336.7	TT&C
S2	4.5	2330.21	Service Link
S1	4.5	2322.29	Service Link
5	1.84	2338.75	Service Link
4	1.84	2344.045	Service Link
3	1.84	2342.205	Service Link
2	1.84	2335.305	Service Link
1	1.84	2333.465	Service Link
WDT	4.0	2347.5	Service Link
WCT	4.0	2317.5	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?	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?	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>XM-5 BEAM XM2T Maps.pdf</u>	XM2T	GSO Antenna Gain Contour Data	PDF file (*.pdf)	Service Downlink Contour Map