



312 File Number: **SATRPL2023040600074**

Filing Description

Question	Response
Description	SXM-10 SDARS Replacement Geostationary Satellite located at 85.15 degrees W.L.

**Satellite
Information**

Question	Response
Select Orbit Type	GSO
Space Station or Satellite Network Name	SXM-10
Estimated Lifetime of Satellite(s) From Date of Launch	15 Years
Will the space station(s) operate on a Common Carrier basis?	No

**Operating
Frequency
Bands (4)**

Nature of service	Description	Frequency Band (s)	Mode Type
Fixed-Satellite Service		6422.0 MHz -6425.0 MHz	Receive
Fixed-Satellite Service		4196.0 MHz -4198.5 MHz	Transmit
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	0.1 degrees
Antenna Axis Attitude Accuracy	Roll	0.11 degrees
	Pitch	0.11 degrees
	Yaw	0.11 degrees

Receiving Beams 1:

Question	Response
Beam ID	XU1
Receive Beam Frequency	7025.0 MHz -7075.0 MHz
Beam Type	Fixed
Polarization	RHCP
Peak Gain	29.65 dBi
Antenna Pointing Error	0.12 degrees
Antenna Rotational Error	0.0 degrees
Polarization Switchable	No
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	0.85 dB/K
Min. Saturation Flux Density	-108.0 dBW/m2
Max. Saturation Flux Density	-88.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Feeder Uplink Beam Gain Contour

Receiving Beams 2:

Question	Response
Beam ID	OMC1
Receive Beam Frequency	6422.0 MHz -6425.0 MHz
Beam Type	Fixed
Polarization	LHCP
Peak Gain	3.0 dBi
Antenna Pointing Error	0.12 degrees
Antenna Rotational Error	0.0 degrees

Polarization Switchable	No
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	-36.1 dB/K
Min. Saturation Flux Density	-81.0 dBW/m2
Max. Saturation Flux Density	-50.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	C-Band Command Omni Coverage

Receiving Beams 3:

Question	Response
Beam ID	OSC1
Receive Beam Frequency	7025.0 MHz -7075.0 MHz
Beam Type	Fixed
Polarization	LHCP
Peak Gain	22.0 dBi
Antenna Pointing Error	0.12 degrees
Antenna Rotational Error	0.0 degrees
Polarization Switchable	No
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	-21.2 dB/K
Min. Saturation Flux Density	-100.0 dBW/m2
Max. Saturation Flux Density	-50.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	S-Band Global Command Antenna Coverage

Receiving Beams 4:

Question	Response
Beam ID	OMX1
Receive Beam Frequency	7025.0 MHz -7075.0 MHz
Beam Type	Fixed
Polarization	LHCP
Peak Gain	3.0 dBi
Antenna Pointing Error	0.12 degrees
Antenna Rotational Error	0.0 degrees
Polarization Switchable	No
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	-36.3 dB/K
Min. Saturation Flux Density	-81.0 dBW/m2
Max. Saturation Flux Density	-50.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	X-Band Omni Command Antenna Coverage

Receiving
Channels (12)

Channel ID	Channel Bandwidth (MHz)	Center Frequency s (MHz)	Feeder Link, Service Link or TT&C
CMX3	1.0	7072.0	TT&C
CMC1	1.0	6422.5	TT&C
CMC2	1.0	6424.5	TT&C
CMX1	1.0	7041.0	TT&C
CMX2	1.0	7047.0	TT&C
U001	1.84	7061.561	Feeder Link
U002	1.84	7063.993	Feeder Link
U003	1.84	7065.965	Feeder Link
U004	1.84	7068.397	Feeder Link
U005	4.5	7062.293	Feeder Link
U006	4.5	7070.207	Feeder Link
U007	12.5	7066.25	Feeder Link

**Transmitting
Beams 1:**

Question	Response
Beam ID	SD1
Transmit Beam Frequency	2315.0 MHz -2350.0 MHz
Beam Type	Fixed
Polarization	LHCP
Peak Gain	35.44 dBi
Antenna Pointing Error	0.11 degrees
Antenna Rotational Error	0.0 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
Max. Transmit EIRP Density	-8.3 dBW/Hz
Max. Transmit EIRP	70.96 dBW
Co- or Cross Polar Mode	C
Service Area Description	SDARS Downlink Beam Gain Contour

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):
4.0 kHz	-129.1	-129.3	-127.1	-133.9	-118.7	-119.1

**Transmitting
Beams 2:**

Question	Response
Beam ID	OMC2
Transmit Beam Frequency	4196.0 MHz -4198.5 MHz

Beam Type	Fixed
Polarization	RHCP
Peak Gain	3.0 dBi
Antenna Pointing Error	0.12 degrees
Antenna Rotational Error	0.0 degrees
Polarization Switchable	No
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
Max. Transmit EIRP Density	-42.7 dBW/Hz
Max. Transmit EIRP	14.4 dBW
Co- or Cross Polar Mode	C
Service Area Description	C-Band Omni Antenna Coverage

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):
4.0 kHz	-169.8	-169.8	-169.8	-169.8	-169.8	-169.8

Transmitting Beams 3:

Question	Response
Beam ID	OST1
Transmit Beam Frequency	2320.0 MHz -2345.0 MHz
Beam Type	Fixed
Polarization	RHCP
Peak Gain	33.83 dBi
Antenna Pointing Error	0.12 degrees

Antenna Rotational Error	0.0 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
Max. Transmit EIRP Density	-16.4 dBW/Hz
Max. Transmit EIRP	40.67 dBW
Co- or Cross Polar Mode	C
Service Area Description	On-Station Telemetry Beam Gain Contour

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):
4.0 kHz	-147.6	-148.9	-147.1	-148.2	-150.5	-142.9

Transmitting Beams 4:

Question	Response
Beam ID	OMS1
Transmit Beam Frequency	2320.0 MHz -2345.0 MHz
Beam Type	Fixed
Polarization	RHCP
Peak Gain	3.0 dBi
Antenna Pointing Error	0.12 degrees
Antenna Rotational Error	0.0 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
Max. Transmit EIRP Density	-44.3 dBW/Hz

Max. Transmit EIRP	12.8 dBW
Co- or Cross Polar Mode	C
Service Area Description	S-Band Omni Telemetry Coverage

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):
4.0 kHz	-171.9	-171.9	-171.9	-171.9	-171.9	-171.9

Transmitting
Channels (13)

Channel ID	Channel Bandwidth (MHz)	Center Frequency s (MHz)	Feeder Link, Service Link or TT&C
TMS3	0.512	2338.2	TT&C
TMS2	0.512	2329.1	TT&C
TMS1	0.512	2326.2	TT&C
TMC2	0.512	4198.0	TT&C
TMC1	0.512	4197.5	TT&C
D007	12.5	2326.25	Service Link
D006	4.5	2330.207	Service Link
D005	4.5	2322.293	Service Link
D004	1.84	2344.045	Service Link
D003	1.84	2342.205	Service Link
D002	1.84	2335.305	Service Link
D001	1.84	2333.465	Service Link
TMS4	0.512	2344.2	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?	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>OST1-85W.gxt</u>	OST1	GSO Antenna Gain Contour Data	GXT file (*.gxt)	Telemetry Beam Contour
<u>SD1-85W.gxt</u>	SD1	GSO Antenna Gain Contour Data	GXT file (*.gxt)	Transmit Service Beam Contour
<u>XU1-85W.gxt</u>	XU1	GSO Antenna Gain Contour Data	GXT file (*.gxt)	Receive Service Beam Contour