



# (DRAFT COPY - Not for submission) Schedule S

312 File Number:

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## Filing Description

Question	Response
Description	Galaxy 28 at 89 W.L., 271 E.L license renewal

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**Satellite  
Information**

Question	Response
Select Orbit Type	GSO
Space Station or Satellite Network Name	Galaxy 28
Estimated Lifetime of Satellite(s) From Date of Launch	20 Years
Will the space station(s) operate on a Common Carrier basis?	No

## Operating Frequency Bands (6)

Nature of service	Description	Frequency Band(s)	Mode Type
<b>Fixed-Satellite Service</b>		29500.0 MHz -30000.0 MHz	Receive
<b>Fixed-Satellite Service</b>		14000.0 MHz -14500.0 MHz	Receive
<b>Fixed-Satellite Service</b>		5925.0 MHz -6425.0 MHz	Receive
<b>Fixed-Satellite Service</b>		19700.0 MHz -20200.0 MHz	Transmit
<b>Fixed-Satellite Service</b>		11700.0 MHz -12200.0 MHz	Transmit
<b>Fixed-Satellite Service</b>		3700.0 MHz -4200.0 MHz	Transmit

# Orbital Information For Geostationary Satellites

Section	Question	Response
<b>Orbital Longitude Information</b>	Orbital Longitude	89.0 degrees
	Hemisphere of Orbital Longitude	W
<b>Longitudinal Tolerance or East /West Station-Keeping</b>	Toward West	0.05 degrees
	Toward East	0.05 degrees
<b>Inclination Excursion or North /South Station-Keeping Tolerance</b>	Inclination Excursion or North /South Station-Keeping Tolerance	0.1 degrees
<b>Antenna Axis Attitude Accuracy</b>	Roll	0.1 degrees
	Pitch	0.1 degrees
	Yaw	0.1 degrees

## Receiving Beams 1:

Question	Response
Beam ID	NCHU
Receive Beam Frequency	5925.0 MHz -6425.0 MHz
Beam Type	Fixed
Polarization	H
Peak Gain	31.5 dBi
Antenna Pointing Error	0.19 degrees
Antenna Rotational Error	0.34 degrees
Polarization Switchable	No
Polarization Alignment Relative to the Equatorial Plane	0.0 degrees
G/T at Max. Gain Point	3.3 dB/K
Min. Saturation Flux Density	-99.3 dBW/m2
Max. Saturation Flux Density	-78.3 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	North America

## Receiving Beams 2:

Question	Response
Beam ID	NCVU
Receive Beam Frequency	5925.0 MHz -6425.0 MHz
Beam Type	Fixed
Polarization	V
Peak Gain	31.5 dBi
Antenna Pointing Error	0.19 degrees
Antenna Rotational Error	0.34 degrees

Polarization Switchable	No
Polarization Alignment Relative to the Equatorial Plane	90.0 degrees
G/T at Max. Gain Point	3.5 dB/K
Min. Saturation Flux Density	-98.9 dBW/m2
Max. Saturation Flux Density	-77.9 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	North America Vertical up

**Receiving Beams 3:**

Question	Response
Beam ID	SCVU
Receive Beam Frequency	5925.0 MHz -6425.0 MHz
Beam Type	Fixed
Polarization	V
Peak Gain	31.4 dBi
Antenna Pointing Error	0.19 degrees
Antenna Rotational Error	0.34 degrees
Polarization Switchable	No
Polarization Alignment Relative to the Equatorial Plane	90.0 degrees
G/T at Max. Gain Point	3.2 dB/K
Min. Saturation Flux Density	-102.0 dBW/m2
Max. Saturation Flux Density	-86.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	South America C band

## Receiving Beams 4:

Question	Response
Beam ID	NHKU
Receive Beam Frequency	14000.0 MHz -14500.0 MHz
Beam Type	Fixed
Polarization	H
Peak Gain	33.1 dBi
Antenna Pointing Error	0.19 degrees
Antenna Rotational Error	0.34 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	0.0 degrees
G/T at Max. Gain Point	5.6 dB/K
Min. Saturation Flux Density	-102.0 dBW/m <sup>2</sup>
Max. Saturation Flux Density	-81.0 dBW/m <sup>2</sup>
Co- or Cross Polar Mode	C
Service Area Description	North America Ku Horizontal

## Receiving Beams 5:

Question	Response
Beam ID	NKVU
Receive Beam Frequency	14000.0 MHz -14500.0 MHz
Beam Type	Fixed
Polarization	V
Peak Gain	33.1 dBi
Antenna Pointing Error	0.19 degrees
Antenna Rotational Error	0.34 degrees

Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	90.0 degrees
G/T at Max. Gain Point	5.9 dB/K
Min. Saturation Flux Density	-102.8 dBW/m2
Max. Saturation Flux Density	-81.8 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	North America Ku Vertical

**Receiving Beams 6:**

Question	Response
Beam ID	SKVU
Receive Beam Frequency	14000.0 MHz -14500.0 MHz
Beam Type	Fixed
Polarization	V
Peak Gain	33.7 dBi
Antenna Pointing Error	0.19 degrees
Antenna Rotational Error	0.34 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	90.0 degrees
G/T at Max. Gain Point	5.5 dB/K
Min. Saturation Flux Density	-103.7 dBW/m2
Max. Saturation Flux Density	-82.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	South America Ku Vertical

**Receiving**

## Beams 7:

Question	Response
Beam ID	01LU
Receive Beam Frequency	29509.0 MHz -29575.0 MHz
Beam Type	Spot
Polarization	LHCP
Peak Gain	dBi
Antenna Pointing Error	0.19 degrees
Antenna Rotational Error	0.34 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	-0.1 dB/K
Min. Saturation Flux Density	-103.0 dBW/m2
Max. Saturation Flux Density	-93.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Ka band L1

## Receiving Beams 8:

Question	Response
Beam ID	16LU
Receive Beam Frequency	29592.0 MHz -29658.0 MHz
Beam Type	Spot
Polarization	LHCP
Peak Gain	dBi
Antenna Pointing Error	0.19 degrees
Antenna Rotational Error	0.34 degrees
Polarization Switchable	

Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	-0.1 dB/K
Min. Saturation Flux Density	-103.0 dBW/m2
Max. Saturation Flux Density	-93.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Ka L16

**Receiving Beams 9:**

Question	Response
Beam ID	17RU
Receive Beam Frequency	29675.0 MHz -29741.0 MHz
Beam Type	Spot
Polarization	RHCP
Peak Gain	dBi
Antenna Pointing Error	0.19 degrees
Antenna Rotational Error	0.34 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	-0.1 dB/K
Min. Saturation Flux Density	-103.0 dBW/m2
Max. Saturation Flux Density	-93.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Ka Band 17RU

**Receiving Beams 10:**

Question	Response
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Beam ID	08RU
Receive Beam Frequency	29758.0 MHz -29824.0 MHz
Beam Type	Spot
Polarization	RHCP
Peak Gain	dBi
Antenna Pointing Error	0.19 degrees
Antenna Rotational Error	0.34 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	-0.1 dB/K
Min. Saturation Flux Density	-103.0 dBW/m2
Max. Saturation Flux Density	-93.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Ka band RU 08

**Receiving Beams 11:**

Question	Response
Beam ID	24RU
Receive Beam Frequency	29841.0 MHz -29907.0 MHz
Beam Type	Spot
Polarization	RHCP
Peak Gain	dBi
Antenna Pointing Error	0.19 degrees
Antenna Rotational Error	0.34 degrees
Polarization Switchable	

Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	-0.1 dB/K
Min. Saturation Flux Density	-103.0 dBW/m2
Max. Saturation Flux Density	-93.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Ka RU24

**Receiving  
Beams 12:**

Question	Response
Beam ID	15LU
Receive Beam Frequency	29924.0 MHz -29990.0 MHz
Beam Type	Spot
Polarization	LHCP
Peak Gain	dBi
Antenna Pointing Error	0.19 degrees
Antenna Rotational Error	0.34 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	-0.1 dB/K
Min. Saturation Flux Density	-103.0 dBW/m2
Max. Saturation Flux Density	-93.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Ka band 15LU

**Receiving  
Beams 13:**

Question	Response
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Beam ID	18LU
Receive Beam Frequency	29506.0 MHz -29575.0 MHz
Beam Type	Spot
Polarization	LHCP
Peak Gain	dBi
Antenna Pointing Error	0.19 degrees
Antenna Rotational Error	0.34 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	-0.1 dB/K
Min. Saturation Flux Density	-103.0 dBW/m2
Max. Saturation Flux Density	-93.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Ka band 18LU

**Receiving Beams 14:**

Question	Response
Beam ID	02RU
Receive Beam Frequency	29592.0 MHz -29658.0 MHz
Beam Type	Spot
Polarization	RHCP
Peak Gain	dBi
Antenna Pointing Error	0.19 degrees
Antenna Rotational Error	0.34 degrees
Polarization Switchable	

Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	-0.1 dB/K
Min. Saturation Flux Density	-103.0 dBW/m2
Max. Saturation Flux Density	-93.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Ka band 02RU

**Receiving Beams 15:**

Question	Response
Beam ID	03LU
Receive Beam Frequency	29675.0 MHz -29741.0 MHz
Beam Type	Spot
Polarization	LHCP
Peak Gain	dBi
Antenna Pointing Error	0.19 degrees
Antenna Rotational Error	0.34 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	-0.1 dB/K
Min. Saturation Flux Density	-103.0 dBW/m2
Max. Saturation Flux Density	-93.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Ka 03LU

**Receiving Beams 16:**

Question	Response
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Beam ID	22LU
Receive Beam Frequency	29758.0 MHz -29824.0 MHz
Beam Type	Spot
Polarization	LHCP
Peak Gain	dBi
Antenna Pointing Error	0.19 degrees
Antenna Rotational Error	0.34 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	-0.1 dB/K
Min. Saturation Flux Density	-103.0 dBW/m2
Max. Saturation Flux Density	-93.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Ka band 22LU

**Receiving Beams 17:**

Question	Response
Beam ID	09LU
Receive Beam Frequency	29841.0 MHz -29907.0 MHz
Beam Type	Spot
Polarization	LHCP
Peak Gain	dBi
Antenna Pointing Error	0.19 degrees
Antenna Rotational Error	0.34 degrees
Polarization Switchable	

Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	-0.1 dB/K
Min. Saturation Flux Density	-103.0 dBW/m2
Max. Saturation Flux Density	-93.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Ka band 09LU

**Receiving  
Beams 18:**

Question	Response
Beam ID	10RU
Receive Beam Frequency	29924.0 MHz -29990.0 MHz
Beam Type	Spot
Polarization	RHCP
Peak Gain	dBi
Antenna Pointing Error	0.19 degrees
Antenna Rotational Error	0.34 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	-0.1 dB/K
Min. Saturation Flux Density	-103.0 dBW/m2
Max. Saturation Flux Density	-93.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Ka 10RU

**Receiving  
Beams 19:**

Question	Response
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Beam ID	04RU
Receive Beam Frequency	29509.0 MHz -29575.0 MHz
Beam Type	Spot
Polarization	RHCP
Peak Gain	dBi
Antenna Pointing Error	0.19 degrees
Antenna Rotational Error	0.34 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	-0.1 dB/K
Min. Saturation Flux Density	-103.0 dBW/m2
Max. Saturation Flux Density	-93.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Ka band 04RU

**Receiving Beams 20:**

Question	Response
Beam ID	05LU
Receive Beam Frequency	29592.0 MHz -29658.0 MHz
Beam Type	Spot
Polarization	LHCP
Peak Gain	dBi
Antenna Pointing Error	0.19 degrees
Antenna Rotational Error	0.34 degrees
Polarization Switchable	

Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	-0.1 dB/K
Min. Saturation Flux Density	-103.0 dBW/m2
Max. Saturation Flux Density	-93.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Ka band 05LU

**Receiving Beams 21:**

Question	Response
Beam ID	20LU
Receive Beam Frequency	29675.0 MHz -29741.0 MHz
Beam Type	Spot
Polarization	LHCP
Peak Gain	dBi
Antenna Pointing Error	0.19 degrees
Antenna Rotational Error	0.34 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	-0.1 dB/K
Min. Saturation Flux Density	-103.0 dBW/m2
Max. Saturation Flux Density	-93.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Ka band 20LU

**Receiving Beams 22:**

Question	Response
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Beam ID	11RU
Receive Beam Frequency	29758.0 MHz -29824.0 MHz
Beam Type	Spot
Polarization	RHCP
Peak Gain	dBi
Antenna Pointing Error	0.19 degrees
Antenna Rotational Error	0.34 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	-0.1 dB/K
Min. Saturation Flux Density	-103.0 dBW/m2
Max. Saturation Flux Density	-93.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Ka band 11RU

**Receiving Beams 23:**

Question	Response
Beam ID	12LU
Receive Beam Frequency	29841.0 MHz -29907.0 MHz
Beam Type	Spot
Polarization	RHCP
Peak Gain	dBi
Antenna Pointing Error	0.19 degrees
Antenna Rotational Error	0.34 degrees
Polarization Switchable	

Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	-0.1 dB/K
Min. Saturation Flux Density	-103.0 dBW/m2
Max. Saturation Flux Density	-93.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Ka 12LU

**Receiving Beams 24:**

Question	Response
Beam ID	23LU
Receive Beam Frequency	29924.0 MHz -29990.0 MHz
Beam Type	Spot
Polarization	LHCP
Peak Gain	dBi
Antenna Pointing Error	0.19 degrees
Antenna Rotational Error	0.34 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	-0.1 dB/K
Min. Saturation Flux Density	-103.0 dBW/m2
Max. Saturation Flux Density	-93.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Ka band 23LU

**Receiving Beams 25:**

Question	Response
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Beam ID	21RU
Receive Beam Frequency	29509.0 MHz -29575.0 MHz
Beam Type	Spot
Polarization	RHCP
Peak Gain	dBi
Antenna Pointing Error	0.19 degrees
Antenna Rotational Error	0.34 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	-0.1 dB/K
Min. Saturation Flux Density	-103.0 dBW/m2
Max. Saturation Flux Density	-93.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Ka band 21 RU

**Receiving Beams 26:**

Question	Response
Beam ID	19RU
Receive Beam Frequency	29592.0 MHz -29658.0 MHz
Beam Type	Spot
Polarization	RHCP
Peak Gain	dBi
Antenna Pointing Error	0.19 degrees
Antenna Rotational Error	0.34 degrees
Polarization Switchable	

Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	-0.1 dB/K
Min. Saturation Flux Density	-103.0 dBW/m2
Max. Saturation Flux Density	-93.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Ka band 19RU

**Receiving Beams 27:**

Question	Response
Beam ID	06RU
Receive Beam Frequency	29675.0 MHz -29741.0 MHz
Beam Type	Spot
Polarization	RHCP
Peak Gain	dBi
Antenna Pointing Error	0.19 degrees
Antenna Rotational Error	0.34 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	-0.1 dB/K
Min. Saturation Flux Density	-103.0 dBW/m2
Max. Saturation Flux Density	-93.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Ka band 06RU

**Receiving Beams 28:**

Question	Response
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Beam ID	14LU
Receive Beam Frequency	29758.0 MHz -29824.0 MHz
Beam Type	Spot
Polarization	LHCP
Peak Gain	dBi
Antenna Pointing Error	0.19 degrees
Antenna Rotational Error	0.34 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	-0.1 dB/K
Min. Saturation Flux Density	-103.0 dBW/m2
Max. Saturation Flux Density	-93.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Ka band 14LU

**Receiving Beams 29:**

Question	Response
Beam ID	07RU
Receive Beam Frequency	29841.0 MHz -29907.0 MHz
Beam Type	Spot
Polarization	RHCP
Peak Gain	dBi
Antenna Pointing Error	0.19 degrees
Antenna Rotational Error	0.34 degrees
Polarization Switchable	

Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	-0.1 dB/K
Min. Saturation Flux Density	-103.0 dBW/m2
Max. Saturation Flux Density	-93.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Ka band 07RU

**Receiving  
Beams 30:**

Question	Response
Beam ID	13RU
Receive Beam Frequency	29924.0 MHz -29990.0 MHz
Beam Type	Spot
Polarization	LHCP
Peak Gain	dBi
Antenna Pointing Error	0.19 degrees
Antenna Rotational Error	0.34 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	-0.1 dB/K
Min. Saturation Flux Density	-103.0 dBW/m2
Max. Saturation Flux Density	-93.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Ka bands 13RU

**Receiving  
Beams 31:**

Question	Response
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Beam ID	CMD1
Receive Beam Frequency	5926.02 MHz -5926.98 MHz
Beam Type	Fixed
Polarization	V
Peak Gain	dBi
Antenna Pointing Error	0.19 degrees
Antenna Rotational Error	0.34 degrees
Polarization Switchable	No
Polarization Alignment Relative to the Equatorial Plane	90.0 degrees
G/T at Max. Gain Point	-99.0 dB/K
Min. Saturation Flux Density	-91.6 dBW/m2
Max. Saturation Flux Density	-90.6 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	CMD

**Receiving Beams 32:**

Question	Response
Beam ID	CMD2
Receive Beam Frequency	6423.02 MHz -6423.98 MHz
Beam Type	Fixed
Polarization	H
Peak Gain	dBi
Antenna Pointing Error	0.19 degrees
Antenna Rotational Error	0.34 degrees
Polarization Switchable	No

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Polarization Alignment Relative to the Equatorial Plane	0.0 degrees
G/T at Max. Gain Point	-99.0 dB/K
Min. Saturation Flux Density	-91.6 dBW/m <sup>2</sup>
Max. Saturation Flux Density	-90.6 dBW/m <sup>2</sup>
Co- or Cross Polar Mode	C
Service Area Description	CMD2 Horizontal

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## Receiving Channels (60)

Channel ID	Channel Bandwidth (MHz)	Center Frequency s (MHz)	Feeder Link, Service Link or TT&C
C14U	36.0	6085.0	Service Link
C03U	36.0	6105.0	Service Link
CMD2	0.96	6423.5	Service Link
CMD1	0.96	5926.5	Service Link
KA06	66.0	29957.0	Service Link
C28U	72.0	6365.0	Service Link
KA05	66.0	29874.0	Service Link
KA04	66.0	29791.0	Service Link
KA03	66.0	29708.0	Service Link
KA02	66.0	29625.0	Service Link
KA01	66.0	29542.0	Service Link
K15U	36.0	14120.0	Service Link
K14U	36.0	14080.0	Service Link
K13U	36.0	14040.0	Service Link
K12U	36.0	14460.0	Service Link
K11U	36.0	14420.0	Service Link
K08U	36.0	14300.0	Service Link
K07U	36.0	14260.0	Service Link
K06U	36.0	14220.0	Service Link
K05U	36.0	14180.0	Service Link
K04U	36.0	14140.0	Service Link
K03U	36.0	14100.0	Service Link
K02U	36.0	14060.0	Service Link
C27U	72.0	6285.0	Service Link

<b>C26U</b>	72.0	6205.0	Service Link
<b>C25U</b>	72.0	6125.0	Service Link
<b>C24U</b>	72.0	6045.0	Service Link
<b>C23U</b>	72.0	5965.0	Service Link
<b>C22U</b>	36.0	6405.0	Service Link
<b>C21U</b>	36.0	6365.0	Service Link
<b>C20U</b>	36.0	6325.0	Service Link
<b>C19U</b>	36.0	6285.0	Service Link
<b>C18U</b>	36.0	6245.0	Service Link
<b>C13U</b>	36.0	6045.0	Service Link
<b>C12U</b>	36.0	6005.0	Service Link
<b>C11U</b>	36.0	5965.0	Service Link
<b>C10U</b>	36.0	6385.0	Service Link
<b>C09U</b>	36.0	6345.0	Service Link
<b>C08U</b>	36.0	6305.0	Service Link
<b>C07U</b>	36.0	6265.0	Service Link
<b>C06U</b>	36.0	6225.0	Service Link
<b>C05U</b>	36.0	6185.0	Service Link
<b>C04U</b>	36.0	6145.0	Service Link
<b>K20U</b>	36.0	14342.0	Service Link
<b>C02U</b>	72.0	6045.0	Service Link
<b>C01U</b>	72.0	5965.0	Service Link
<b>K24U</b>	36.0	14480.0	Service Link
<b>K23U</b>	36.0	14440.0	Service Link
<b>K22U</b>	36.0	14400.0	Service Link
<b>K21U</b>	36.0	14360.0	Service Link

<b>KO1U</b>	36.0	14020.0	Service Link
<b>K19U</b>	36.0	14280.0	Service Link
<b>K18U</b>	36.0	14240.0	Service Link
<b>K17U</b>	36.0	14200.0	Service Link
<b>K16U</b>	36.0	14160.0	Service Link
<b>K10U</b>	36.0	14380.0	Service Link
<b>K09U</b>	36.0	14340.0	Service Link
<b>C17U</b>	36.0	6205.0	Service Link
<b>C16U</b>	36.0	6165.0	Service Link
<b>C15U</b>	36.0	6125.0	Service Link

## Transmitting Beams 1:

Question	Response
Beam ID	NCVD
Transmit Beam Frequency	3700.0 MHz -4200.0 MHz
Beam Type	Fixed
Polarization	V
Peak Gain	29.6 dBi
Antenna Pointing Error	0.19 degrees
Antenna Rotational Error	0.34 degrees
Polarization Switchable	No
Polarization Alignment Relative to the Equatorial Plane	90.0 degrees
Max. Transmit EIRP Density	-32.0 dBW/Hz
Max. Transmit EIRP	43.6 dBW
Co- or Cross Polar Mode	C
Service Area Description	North America C band DN

### Max. Power Flux Density

	* 0° - 5°	* 5° - 10°	* 10° - 15°	* 15° - 20°	* 20° - 25°	* 25° - 90°
*	(dBW/m <sup>2</sup>					
BW:	/BW):	/BW):	/BW):	/BW):	/BW):	/BW):
<b>4.0 kHz</b>	-159.2	-159.1	-159.0	-158.9	-158.8	-158.0

## Transmitting Beams 2:

Question	Response
Beam ID	NCHD
Transmit Beam Frequency	3700.0 MHz -4200.0 MHz

Beam Type	Fixed
Polarization	H
Peak Gain	29.7 dBi
Antenna Pointing Error	0.19 degrees
Antenna Rotational Error	0.34 degrees
Polarization Switchable	No
Polarization Alignment Relative to the Equatorial Plane	0.0 degrees
Max. Transmit EIRP Density	-32.3 dBW/Hz
Max. Transmit EIRP	43.3 dBW
Co- or Cross Polar Mode	C
Service Area Description	North America H DN

### Max. Power Flux Density

	* 0° - 5°	* 5° - 10°	* 10° - 15°	* 15° - 20°	* 20° - 25°	* 25° - 90°
*	(dBW/m <sup>2</sup>					
BW:	/BW):	/BW):	/BW):	/BW):	/BW):	/BW):
<b>4.0 kHz</b>	-159.6	-159.4	-159.3	-159.2	-159.1	-158.3

### Transmitting Beams 3:

Question	Response
Beam ID	TLMC
Transmit Beam Frequency	4194.825 MHz -4195.175 MHz
Beam Type	Fixed
Polarization	V
Peak Gain	dBi
Antenna Pointing Error	0.19 degrees

Antenna Rotational Error	0.34 degrees
Polarization Switchable	No
Polarization Alignment Relative to the Equatorial Plane	90.0 degrees
Max. Transmit EIRP Density	-36.9 dBW/Hz
Max. Transmit EIRP	18.5 dBW
Co- or Cross Polar Mode	C
Service Area Description	TLMC

### Max. Power Flux Density

	* 0° - 5°	* 5° - 10°	* 10° - 15°	* 15° - 20°	* 20° - 25°	* 25° - 90°
*	(dBW/m <sup>2</sup>					
BW:	/BW):	/BW):	/BW):	/BW):	/BW):	/BW):
<b>4.0 kHz</b>	-164.2	-164.1	-164.0	-163.9	-163.7	-163.0

### Transmitting Beams 4:

Question	Response
Beam ID	TLMB
Transmit Beam Frequency	4199.325 MHz -4199.675 MHz
Beam Type	Fixed
Polarization	V
Peak Gain	dBi
Antenna Pointing Error	0.19 degrees
Antenna Rotational Error	0.34 degrees
Polarization Switchable	No
Polarization Alignment Relative to the Equatorial Plane	90.0 degrees
Max. Transmit EIRP Density	-40.3 dBW/Hz

Max. Transmit EIRP	15.1 dBW
Co- or Cross Polar Mode	C
Service Area Description	TLMB

### Max. Power Flux Density

	* 0° - 5° (dBW/m <sup>2</sup> /BW):	* 5° - 10° (dBW/m <sup>2</sup> /BW):	* 10° - 15° (dBW/m <sup>2</sup> /BW):	* 15° - 20° (dBW/m <sup>2</sup> /BW):	* 20° - 25° (dBW/m <sup>2</sup> /BW):	* 25° - 90° (dBW/m <sup>2</sup> /BW):
<b>4.0 kHz</b>	-167.6	-167.4	-167.4	-167.3	-167.1	-166.4

### Transmitting Beams 5:

Question	Response
Beam ID	TLMD
Transmit Beam Frequency	4199.325 MHz -4199.675 MHz
Beam Type	Fixed
Polarization	H
Peak Gain	dBi
Antenna Pointing Error	0.19 degrees
Antenna Rotational Error	0.34 degrees
Polarization Switchable	No
Polarization Alignment Relative to the Equatorial Plane	0.0 degrees
Max. Transmit EIRP Density	-36.9 dBW/Hz
Max. Transmit EIRP	18.5 dBW
Co- or Cross Polar Mode	C
Service Area Description	TLMD

### Max. Power Flux Density

	* 0° - 5°	* 5° - 10°	* 10° - 15°	* 15° - 20°	* 20° - 25°	* 25° - 90°
*	(dBW/m <sup>2</sup> )					
BW:	/BW):	/BW):	/BW):	/BW):	/BW):	/BW):
<b>4.0 kHz</b>	-164.2	-164.1	-164.0	-163.9	-163.7	-163.0

## Transmitting Beams 6:

Question	Response
Beam ID	ULPA
Transmit Beam Frequency	11701.988 MHz -11702.013 MHz
Beam Type	Fixed
Polarization	H
Peak Gain	dBi
Antenna Pointing Error	0.19 degrees
Antenna Rotational Error	0.34 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	0.0 degrees
Max. Transmit EIRP Density	-22.9 dBW/Hz
Max. Transmit EIRP	21.1 dBW
Co- or Cross Polar Mode	C
Service Area Description	ULPC1

## Max. Power Flux Density

Information not provided.

## Transmitting Beams 7:

Question	Response
Beam ID	SCHD
Transmit Beam Frequency	3700.0 MHz -4200.0 MHz

Beam Type	Fixed
Polarization	H
Peak Gain	30.3 dBi
Antenna Pointing Error	0.19 degrees
Antenna Rotational Error	0.34 degrees
Polarization Switchable	No
Polarization Alignment Relative to the Equatorial Plane	0.0 degrees
Max. Transmit EIRP Density	-27.5 dBW/Hz
Max. Transmit EIRP	48.1 dBW
Co- or Cross Polar Mode	C
Service Area Description	South America C band H DN

### Max. Power Flux Density

	* 0° - 5°	* 5° - 10°	* 10° - 15°	* 15° - 20°	* 20° - 25°	* 25° - 90°
*	(dBW/m <sup>2</sup>					
BW:	/BW):	/BW):	/BW):	/BW):	/BW):	/BW):
<b>4.0 kHz</b>	-154.8	-154.6	-154.5	-154.4	-154.3	-153.5

### Transmitting Beams 8:

Question	Response
Beam ID	NKVD
Transmit Beam Frequency	11700.0 MHz -12200.0 MHz
Beam Type	Fixed
Polarization	V
Peak Gain	32.3 dBi
Antenna Pointing Error	0.19 degrees

Antenna Rotational Error	0.34 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	90.0 degrees
Max. Transmit EIRP Density	-23.9 dBW/Hz
Max. Transmit EIRP	51.7 dBW
Co- or Cross Polar Mode	C
Service Area Description	North America Ku V dn

### Max. Power Flux Density

Information not provided.

### Transmitting Beams 9:

Question	Response
Beam ID	NKHD
Transmit Beam Frequency	11700.0 MHz -12200.0 MHz
Beam Type	Fixed
Polarization	H
Peak Gain	32.2 dBi
Antenna Pointing Error	0.19 degrees
Antenna Rotational Error	0.34 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	0.0 degrees
Max. Transmit EIRP Density	-24.0 dBW/Hz
Max. Transmit EIRP	51.6 dBW
Co- or Cross Polar Mode	C
Service Area Description	North America Ku H dn

### Max. Power Flux Density

Information not provided.

#### Transmitting Beams 10:

Question	Response
Beam ID	SKHD
Transmit Beam Frequency	11700.0 MHz -12200.0 MHz
Beam Type	Fixed
Polarization	H
Peak Gain	32.8 dBi
Antenna Pointing Error	0.19 degrees
Antenna Rotational Error	0.34 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	0.0 degrees
Max. Transmit EIRP Density	-23.9 dBW/Hz
Max. Transmit EIRP	51.7 dBW
Co- or Cross Polar Mode	C
Service Area Description	South America Ku H dn

### Max. Power Flux Density

Information not provided.

#### Transmitting Beams 11:

Question	Response
Beam ID	LALD
Transmit Beam Frequency	19700.0 MHz -20200.0 MHz
Beam Type	Spot
Polarization	LHCP
Peak Gain	dBi

Antenna Pointing Error	0.19 degrees
Antenna Rotational Error	0.34 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
Max. Transmit EIRP Density	-32.7 dBW/Hz
Max. Transmit EIRP	45.5 dBW
Co- or Cross Polar Mode	C
Service Area Description	Ka band LCHP DN LA

### Max. Power Flux Density

	* 0° - 5°	* 5° - 10°	* 10° - 15°	* 15° - 20°	* 20° - 25°	* 25° - 90°
	(dBW/m <sup>2</sup>					
*	/BW):	/BW):	/BW):	/BW):	/BW):	/BW):
<b>1.0 MHz</b>	-136.0	-135.9	-135.7	-135.6	-135.5	-134.8

### Transmitting Beams 12:

Question	Response
Beam ID	DARD
Transmit Beam Frequency	19700.0 MHz -20200.0 MHz
Beam Type	Spot
Polarization	RHCP
Peak Gain	dBi
Antenna Pointing Error	0.19 degrees
Antenna Rotational Error	0.34 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees

Max. Transmit EIRP Density	-32.7 dBW/Hz
Max. Transmit EIRP	45.5 dBW
Co- or Cross Polar Mode	C
Service Area Description	Ka Band Denver DN LHCP

### Max. Power Flux Density

	* 0° - 5°	* 5° - 10°	* 10° - 15°	* 15° - 20°	* 20° - 25°	* 25° - 90°
	(dBW/m <sup>2</sup>					
* BW:	/BW):	/BW):	/BW):	/BW):	/BW):	/BW):
<b>1.0 MHz</b>	-136.0	-135.9	-135.7	-135.6	-135.5	-134.8

### Transmitting Beams 13:

Question	Response
Beam ID	CALD
Transmit Beam Frequency	19700.0 MHz -20200.0 MHz
Beam Type	Spot
Polarization	LHCP
Peak Gain	dBi
Antenna Pointing Error	0.19 degrees
Antenna Rotational Error	0.34 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
Max. Transmit EIRP Density	-32.7 dBW/Hz
Max. Transmit EIRP	45.5 dBW
Co- or Cross Polar Mode	C
Service Area Description	Ka band Chicago LHCP DN



<b>1.0</b>	-136.0	-135.9	-135.7	-135.6	-135.5	-134.8
<b>MHz</b>						

## Transmitting Beams 15:

Question	Response
Beam ID	TLMA
Transmit Beam Frequency	4194.825 MHz -4195.175 MHz
Beam Type	Fixed
Polarization	H
Peak Gain	dBi
Antenna Pointing Error	0.19 degrees
Antenna Rotational Error	0.34 degrees
Polarization Switchable	No
Polarization Alignment Relative to the Equatorial Plane	0.0 degrees
Max. Transmit EIRP Density	-40.8 dBW/Hz
Max. Transmit EIRP	14.6 dBW
Co- or Cross Polar Mode	C
Service Area Description	TLMA

## Max. Power Flux Density

	* 0° - 5°	* 5° - 10°	* 10° - 15°	* 15° - 20°	* 20° - 25°	* 25° - 90°
*	(dBW/m <sup>2</sup> )					
BW:	/BW):	/BW):	/BW):	/BW):	/BW):	/BW):
<b>4.0</b>	-168.1	-168.0	-167.9	-167.8	-167.6	-166.9
<b>kHz</b>						

## Transmitting Channels (63)

Channel ID	Channel Bandwidth (MHz)	Center Frequency s (MHz)	Feeder Link, Service Link or TT&C
C16D	36.0	3940.0	Service Link
C17D	36.0	3980.0	Service Link
C18D	36.0	4020.0	Service Link
C19D	36.0	4060.0	Service Link
C20D	36.0	4100.0	Service Link
C21D	36.0	4140.0	Service Link
C22D	36.0	4180.0	Service Link
C23D	72.0	3740.0	Service Link
C24D	72.0	3820.0	Service Link
C25D	72.0	3900.0	Service Link
C26D	72.0	3980.0	Service Link
C27D	72.0	4060.0	Service Link
C28D	72.0	4140.0	Service Link
K01D	36.0	11720.0	Service Link
K02D	36.0	11760.0	Service Link
K05D	36.0	11880.0	Service Link
K06D	36.0	11920.0	Service Link
K07D	36.0	11960.0	Service Link
K08D	36.0	12000.0	Service Link
K09D	36.0	12040.0	Service Link
K10D	36.0	12080.0	Service Link
K11D	36.0	12120.0	Service Link
K12D	36.0	12160.0	Service Link
K13D	36.0	11740.0	Service Link

<b>K14D</b>	36.0	11780.0	Service Link
<b>K03D</b>	36.0	11800.0	Service Link
<b>K16D</b>	36.0	11860.0	Service Link
<b>K17D</b>	36.0	11900.0	Service Link
<b>K15D</b>	36.0	11820.0	Service Link
<b>TLMB</b>	0.35	4199.5	TT&C
<b>TLMA</b>	0.35	4195.0	TT&C
<b>ULP3</b>	0.025	20199.8	TT&C
<b>ULP2</b>	0.025	12198.0	TT&C
<b>ULP1</b>	0.025	11702.0	TT&C
<b>C06D</b>	36.0	4000.0	Service Link
<b>C07D</b>	36.0	4040.0	Service Link
<b>C08D</b>	36.0	4080.0	Service Link
<b>C09D</b>	36.0	4120.0	Service Link
<b>C10D</b>	36.0	4160.0	Service Link
<b>C11D</b>	36.0	3740.0	Service Link
<b>C12D</b>	36.0	3780.0	Service Link
<b>C13D</b>	36.0	3820.0	Service Link
<b>C14D</b>	36.0	3860.0	Service Link
<b>C15D</b>	36.0	3900.0	Service Link
<b>K04D</b>	36.0	11840.0	Service Link
<b>K18D</b>	36.0	11940.0	Service Link
<b>K19D</b>	36.0	11980.0	Service Link
<b>K20D</b>	36.0	12020.0	Service Link
<b>K21D</b>	36.0	12060.0	Service Link
<b>K22D</b>	36.0	12100.0	Service Link

<b>K23D</b>	36.0	12140.0	Service Link
<b>K24D</b>	36.0	12180.0	Service Link
<b>KA1D</b>	66.0	19742.0	Service Link
<b>KA2D</b>	66.0	19825.0	Service Link
<b>KA3D</b>	66.0	19908.0	Service Link
<b>KA4D</b>	66.0	19991.0	Service Link
<b>KA5D</b>	66.0	20074.0	Service Link
<b>KA6D</b>	66.0	20157.0	Service Link
<b>C01D</b>	72.0	3740.0	Service Link
<b>C02D</b>	72.0	3820.0	Service Link
<b>C03D</b>	36.0	3880.0	Service Link
<b>C04D</b>	36.0	3920.0	Service Link
<b>C05D</b>	36.0	3960.0	Service Link

## Certification Questions

Question	Response
<p>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?</p>	<p>N/A</p>
<p>Are the applicable frequency tolerances of 25.202(e) and out-of-band emission limits of 25.202(f)(1),(2), and (3) met?</p>	<p>Yes</p>
<p>Are the cessation of emissions requirements of 25.207 met?</p>	<p>Yes</p>
<p>Are the applicable power-flux-density limits of 25.208 met, and is the appropriate technical showing provided within the application?</p>	<p>Yes</p>
<p>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?</p>	<p>N/A</p>
<p>Are the applicable full-frequency-reuse requirements of 25.210 met?</p>	<p>Yes</p>
<p>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)?</p>	

## Attachments

File Name	Beam	Field	Attachment Type	Description
<u>G28.mdb</u>		GSO Antenna Gain Contour Data	GIMS file (*.mdb)	

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