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

Federal Communications Commission

312 File Number: **SATMOD2017062600099**

Filing Description

Question	Response
Description	ECHOSTAR-12 DBS Satellite Network

Satellite Information

Question	Response
Select Orbit Type	GSO
Space Station or Satellite Network Name	ECHOSTAR-12
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 (2)

Nature of service	Description	Frequency Band (s)	Mode Type
Fixed-Satellite Service		17300.0 MHz -17800.0 MHz	Receive
Direct Broadcast Satellite (DBS) Service		12200.0 MHz -12700.0 MHz	Transmit

Orbital Information For Geostationary Satellites

Section	Question	Response
Orbital Longitude Information	Orbital Longitude	86.0 degrees
	Hemisphere of Orbital Longitude	W
Longitudinal Tolerance or East /West Station-Keeping	Toward West	0.05 degrees
	Toward East	0.05 degrees
Inclination Excursion or North /South Station-Keeping Tolerance	Inclination Excursion or North /South Station-Keeping Tolerance	0.07 degrees
Eccentricity	Max. Eccentricity	4.6E-4
Antenna Axis Attitude Accuracy	Roll	0.12 degrees
	Pitch	0.12 degrees
	Yaw	0.12 degrees

Receiving Beams 1:

Question	Response
Beam ID	RX1
Receive Beam Frequency	17300.0 MHz -17800.0 MHz
Beam Type	Spot
Polarization	RHCP
Peak Gain	dBi
Antenna Pointing Error	0.12 degrees
Antenna Rotational Error	0.12 degrees
Min. Cross-Polar Isolation within Service Area	27.0 dB
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	10.0 dB/K
Min. Saturation Flux Density	-98.0 dBW/m2
Max. Saturation Flux Density	-76.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	-2 dB contour

Receiving Beams 2:

Question	Response
Beam ID	RX2
Receive Beam Frequency	17300.0 MHz -17800.0 MHz
Beam Type	Spot
Polarization	RHCP
Peak Gain	dBi
Antenna Pointing Error	0.12 degrees

Antenna Rotational Error	0.12 degrees
Min. Cross-Polar Isolation within Service Area	27.0 dB
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	10.0 dB/K
Min. Saturation Flux Density	-98.0 dBW/m2
Max. Saturation Flux Density	-76.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	-2 dB contour

Receiving Beams 3:

Question	Response
Beam ID	RX3
Receive Beam Frequency	17300.0 MHz -17800.0 MHz
Beam Type	Spot
Polarization	RHCP
Peak Gain	dBi
Antenna Pointing Error	0.12 degrees
Antenna Rotational Error	0.12 degrees
Min. Cross-Polar Isolation within Service Area	27.0 dB
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	10.0 dB/K
Min. Saturation Flux Density	-98.0 dBW/m2
Max. Saturation Flux Density	-76.0 dBW/m2
Co- or Cross Polar Mode	C

Service Area Description	-2 dB contour

Receiving Beams 4:

Question	Response
Beam ID	RX4
Receive Beam Frequency	17300.0 MHz -17800.0 MHz
Beam Type	Spot
Polarization	RHCP
Peak Gain	dBi
Antenna Pointing Error	0.12 degrees
Antenna Rotational Error	0.12 degrees
Min. Cross-Polar Isolation within Service Area	27.0 dB
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	10.0 dB/K
Min. Saturation Flux Density	-98.0 dBW/m2
Max. Saturation Flux Density	-76.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	-2 dB contour

Receiving Beams 5:

Question	Response
Beam ID	RX5
Receive Beam Frequency	17300.0 MHz -17800.0 MHz
Beam Type	Spot
Polarization	RHCP

Peak Gain	dBi
Antenna Pointing Error	0.12 degrees
Antenna Rotational Error	0.12 degrees
Min. Cross-Polar Isolation within Service Area	27.0 dB
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	10.0 dB/K
Min. Saturation Flux Density	-98.0 dBW/m2
Max. Saturation Flux Density	-76.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	-2 dB contour

Receiving Beams 6:

Question	Response
Beam ID	OMNR
Receive Beam Frequency	17303.5 MHz -17304.5 MHz
Beam Type	Fixed
Polarization	V
Peak Gain	dBi
Antenna Pointing Error	0.12 degrees
Antenna Rotational Error	0.12 degrees
Min. Cross-Polar Isolation within Service Area	30.0 dB
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	90.0 degrees
G/T at Max. Gain Point	-18.7 dB/K

Min. Saturation Flux Density	-80.0 dBW/m2
Max. Saturation Flux Density	-60.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Visible Earth. Near-Omni beam. Gain varies by less than 8 dB across surface of Earth.

Receiving Channels (7)

Channel ID	Channel Bandwidth (MHz)	Center Frequency s (MHz)	Feeder Link, Service Link or TT&C
CH1	24.0	17324.0	Feeder Link
CH9	24.0	17440.64	Feeder Link
CH5	24.0	17382.32	Feeder Link
OMNR	1.0	17304.0	TT&C
CH17	24.0	17557.28	Feeder Link
CH13	24.0	17498.96	Feeder Link
CH21	24.0	17615.6	Feeder Link

Transmitting Beams 1:

Question	Response
Beam ID	TX1
Transmit Beam Frequency	12200.0 MHz -12700.0 MHz
Beam Type	Spot
Polarization	RHCP
Peak Gain	dBi
Antenna Pointing Error	0.12 degrees
Antenna Rotational Error	0.12 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
Max. Transmit EIRP Density	-15.7 dBW/Hz
Max. Transmit EIRP	58.1 dBW
Co- or Cross Polar Mode	C
Service Area Description	Collectively, the Service Area of all downlink spot beams is Colombia

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):
Hz	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0

Transmitting Beams 2:

Question	Response
Beam ID	TX2
Transmit Beam Frequency	12200.0 MHz -12700.0 MHz
Beam Type	Spot

Polarization	RHCP
Peak Gain	dBi
Antenna Pointing Error	0.12 degrees
Antenna Rotational Error	0.12 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
Max. Transmit EIRP Density	-16.9 dBW/Hz
Max. Transmit EIRP	56.9 dBW
Co- or Cross Polar Mode	C
Service Area Description	Collectively, the Service Area of all downlink spot beams is Colombia

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):
Hz	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0

Transmitting Beams 3:

Question	Response
Beam ID	TX3
Transmit Beam Frequency	12200.0 MHz -12700.0 MHz
Beam Type	Spot
Polarization	RHCP
Peak Gain	dBi
Antenna Pointing Error	0.12 degrees
Antenna Rotational Error	0.12 degrees
Polarization Switchable	

Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
Max. Transmit EIRP Density	-16.8 dBW/Hz
Max. Transmit EIRP	57.0 dBW
Co- or Cross Polar Mode	C
Service Area Description	Collectively, the Service Area of all downlink spot beams is Colombia

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):
Hz	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0

Transmitting Beams 4:

Question	Response
Beam ID	TX4
Transmit Beam Frequency	12200.0 MHz -12700.0 MHz
Beam Type	Spot
Polarization	RHCP
Peak Gain	dBi
Antenna Pointing Error	0.12 degrees
Antenna Rotational Error	0.12 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
Max. Transmit EIRP Density	-16.6 dBW/Hz
Max. Transmit EIRP	57.2 dBW
Co- or Cross Polar Mode	C

Service Area Description	Collectively, the Service Area of all downlink spot beams is Colombia

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):
Hz	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0

Transmitting Beams 5:

Question	Response
Beam ID	TX5
Transmit Beam Frequency	12200.0 MHz -12700.0 MHz
Beam Type	Spot
Polarization	RHCP
Peak Gain	dBi
Antenna Pointing Error	0.12 degrees
Antenna Rotational Error	0.12 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
Max. Transmit EIRP Density	-15.3 dBW/Hz
Max. Transmit EIRP	58.5 dBW
Co- or Cross Polar Mode	C
Service Area Description	Collectively, the Service Area of all downlink spot beams is Colombia

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):
Hz	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0

Transmitting Beams 6:

Question	Response
Beam ID	TX6
Transmit Beam Frequency	12200.0 MHz -12700.0 MHz
Beam Type	Spot
Polarization	RHCP
Peak Gain	dBi
Antenna Pointing Error	0.12 degrees
Antenna Rotational Error	0.12 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
Max. Transmit EIRP Density	-17.0 dBW/Hz
Max. Transmit EIRP	56.8 dBW
Co- or Cross Polar Mode	C
Service Area Description	Collectively, the Service Area of all downlink spot beams is Colombia

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):
Hz	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0

Transmitting Beams 7:

Question	Response
Beam ID	TX7
Transmit Beam Frequency	12200.0 MHz -12700.0 MHz
Beam Type	Spot
Polarization	RHCP
Peak Gain	dBi
Antenna Pointing Error	0.12 degrees
Antenna Rotational Error	0.12 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
Max. Transmit EIRP Density	-16.3 dBW/Hz
Max. Transmit EIRP	57.5 dBW
Co- or Cross Polar Mode	C
Service Area Description	Collectively, the Service Area of all downlink spot beams is Colombia

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):
Hz	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0

Transmitting Beams 8:

Question	Response
Beam ID	TX8
Transmit Beam Frequency	12200.0 MHz -12700.0 MHz
Beam Type	Spot
Polarization	RHCP

Peak Gain	dBi
Antenna Pointing Error	0.12 degrees
Antenna Rotational Error	0.12 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
Max. Transmit EIRP Density	-16.6 dBW/Hz
Max. Transmit EIRP	57.2 dBW
Co- or Cross Polar Mode	C
Service Area Description	Collectively, the Service Area of all downlink spot beams is Colombia

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):
Hz	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0

Transmitting Beams 9:

Question	Response
Beam ID	OMNT
Transmit Beam Frequency	12200.0 MHz -12700.0 MHz
Beam Type	Fixed
Polarization	V
Peak Gain	dBi
Antenna Pointing Error	0.12 degrees
Antenna Rotational Error	0.12 degrees
Polarization Switchable	

Polarization Alignment Relative to the Equatorial Plane	90.0 degrees
Max. Transmit EIRP Density	-50.8 dBW/Hz
Max. Transmit EIRP	1.0 dBW
Co- or Cross Polar Mode	C
Service Area Description	Visible Earth. Near-Omni beam. Gain varies by less than 8 dB across surface of Earth.

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):
Hz	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0

Transmitting Channels (6)

Channel ID	Channel Bandwidth (MHz)	Center Frequency s (MHz)	Feeder Link, Service Link or TT&C
CH9	24.0	12340.64	Service Link
CH5	24.0	12282.32	Service Link
CH17	24.0	12457.28	Service Link
CH13	24.0	12398.96	Service Link
CH1	24.0	12224.0	Service Link
CH21	24.0	12515.6	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?	
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
ECHOSTAR-12 GIMS Database.mdb		GSO Antenna Gain Contour Data	GIMS file (*.mdb)	