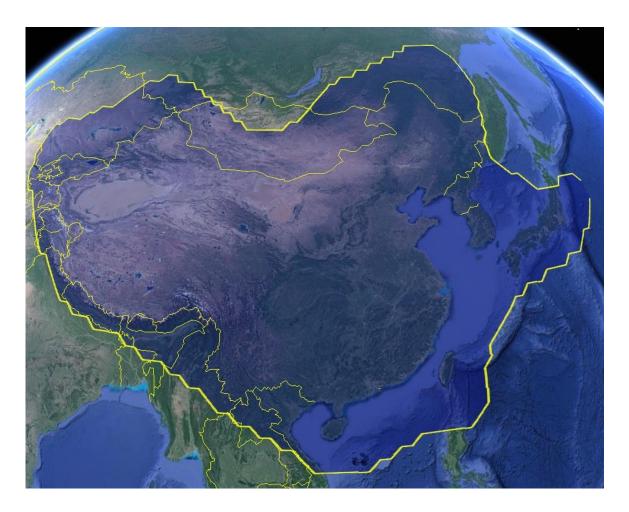
TECHNICAL APPENDIX

60-Day STA Request Panasonic Avionics Corporation

- I. PPA and SPA Proposed Satellite Points of Communication
 - 1. AsiaSat-7
 - i. Coverage Maps
 - ii. Satellite Operator Certification Letter iii. Links Budgets
 - 2. Galaxy 16
 - i. Coverage Maps
 - ii. Satellite Operator Certification Letter
 - iii. Links Budgets
 - 3. IS-33E
 - i. Coverage Maps
 - ii. Satellite Operator Certification Letter
 - iii. Links Budgets
 - 4. JCSAT-2B
 - i. Coverage Maps
 - ii. Satellite Operator Certification Letter
 - iii. Links Budgets
- II. TECOM 1000 Link Budgets
- III. TECOM 1000 Radiation Hazard Report
- IV. Updated Emission Designators Tables
- V. Updated Frequency Coordination Table
- VI. eXConnect System Satellite and Gateway Tables
- VII. FCC Section 25.227 Certifications
- VIII. FCC Section 25.227 Compliance Matrix
- IX. Technical Certification

I. <u>Proposed Satellite Points of Communication</u>

- 1. AsiaSat-7
 - i. Coverage Map



ii. Satellite Operator Certification Letter



TM21-281216-116

28 December 2016

Federal Communications Commission International Bureau 445 12th Street, S.W. Washington, D.C. 20554

Re: Engineering Certification of Asia Satellite Telecommunication Co. Ltd.

To Whom It May Concern:

This letter certifies that Asia Satellite Telecommunication Co. Ltd. (hereafter "AsiaSat") is aware that Panasonic Avionics Corporation ("Panasonic") is planning to seek authorization from the Federal Communications Commission ("FCC") to operate Ku-band transmit/receive earth stations aboard aircraft ("ESAA") terminals with the AsiaSat 7 satellite located at 105.5°E.L.. Specifically, we understand that in addition to the previously authorized Panasonic Single Panel Antenna ("SPA") and Panasonic Phased Array ("PPA") terminals (FCC Call Sign E100089) for AsiaSat 5 satellite located at 100.5°E.L., Panasonic seeks to operate the PPA and SPA terminals with AsiaSat 7 satellite for commercial purposes consistent with the FCC's ESAA rules, including Section 25.227.

Based on the information provided by Panasonic, AsiaSat understands the technical characteristics of the SPA and PPA terminals and AsiaSat

- recognizes that operation of these terminals at the power density levels provided to AsiaSat is consistent with existing coordination agreements with all adjacent satellite operators within +/- 6 degrees of orbital separation from AsiaSat 7;
- acknowledges that the proposed operation of these terminals has the potential to receive harmful interference from adjacent satellite networks that may be unacceptable; and
- (iii) if the FCC authorizes the operations proposed by Panasonic, AsiaSat will take into consideration the power density levels associated such operations in all future satellite network coordination with adjacent satellite operators.

Sincerely,

Yathung CHAN Spectrum Management



 12/F, Harbour Centre
 T
 (852) 2500 0888

 25 Harbour Road, Wanchai, Hong Kong
 F
 (852) 2576 4111
 www.asiasat.com

eXConnect Terminal Antenna Type		
	DPA	
Lat	22.9	deg
Lon	112.0	-
EIRP max		dBW
G/T		dB/K
Satellite	11.5	abyn
Name	A7	
Longitude	105.5	deg
Hub Earth Station	100.0	deg
Site	Beijing	
Lat	22.45	deg
Lon	114.18	-
EIRP max		dBW
G/T		dB/K
Signal	37.3	abyrt
Waveform	DVB-S2	
Modulation	8PSK	
Bits per symbol	3	
	1	
Spread Factor		
Coding Rate	0.67	
Overhead Rate	0.94	
Channel Spacing	1.20	h
Spectral Efficiency (Rate/Noise BW)		bps/Hz
Data Rate	8.46E+07	
Information Rate (Data + Overhead)	9.00E+07	
Symbol Rate	4.50E+07	
Chip Rate (Noise Bandwidth)	4.50E+07	
Occupied Bandwidth	5.40E+07	
Power Equivelent Bandwidth	5.40E+07	
C/N Threshold	7.4	dB
Uplink		
Frequency	14.330	
Back off	4.2	
EIRP Spectral Density	35.3	dBW/4kHz
Slant Range	36435	km
Space Loss, Ls	206.8	dB
Pointing Loss, Lpnt	0.0	dB
Atmosphere / Weather Loss, La	5.6	dB
Radome, Lr	0.0	dB
Transponder G/T @ Hub	7.0	dB/K
Thermal Noise, C/No	99.0	dBHz
C/(No+lo)	98.5	dBHz
Satellite		
Flux Density	-92.0	dBW/m2
SFD @ Hub	-89.0	dBW/m2
Small Signal Gain (IBO/OBO)	2.0	dB
ОВО	1.0	dB
Downlink		
Frequency	12.582	GHz
Transponder Sat. EIRP @ Beam Peak	53.6	dBW
Transponder Sat. EIRP @ Terminal	53.0	dBW
DL PSD Limit		dBW/4kHz
DL PSD @ Beam Peak		dBW/4kHz
Carrier EIRP @ Beam Peak		dBW
Carrier EIRP @ Terminal		dBW
Slant Range	36425	
	205.7	
Space Loss, Ls	0.1	dB
Space Loss, Ls Pointing Loss, Lpnt	0.1	
Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La	0.0	dB
Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr	0.0 0.5	dB dB
Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss	0.0 0.5 0.0	dB dB dB
Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No	0.0 0.5 0.0 85.8	dB dB dB dBHz
Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No C/(No+Io)	0.0 0.5 0.0 85.8	dB dB dB
Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No C/(No+Io) End to End	0.0 0.5 0.0 85.8 85.5	dB dB dB dBHz dBHz
Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No C/(No+Io) End to End End to End C/(No+Io)	0.0 0.5 0.0 85.8 85.5 85.3	dB dB dB dBHz dBHz dBHz
Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No C/(No+lo) End to End End to End C/(No+lo) Implementation Loss	0.0 0.5 0.0 85.8 85.5 85.3 1.0	dB dB dBHz dBHz dBHz dBHz dB
Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No C/(No+Io) End to End End to End C/(No+Io)	0.0 0.5 0.0 85.8 85.5 85.3	dB dB dBHz dBHz dBHz dBHz dB

eXConnect Terminal		
Antenna Type	DPA	
Lat	22.9	deg
Lon	112.0	
EIRP max	47.5	dBW
G/T	11.5	dB/K
Satellite		
Name	A7	
Longitude	105.5	deg
Hub Earth Station		
Site	Beijing	
Lat	22.45	-
Lon	114.18	-
EIRP max		dBW
G/T	37.3	dB/K
Signal Waveform	iDirect	1
Modulation	QPSK	
Bits per symbol	2	
Spread Factor	1	
Coding Rate	0.75	
Overhead Rate	0.82	
Channel Spacing	1.20	
Spectral Efficiency (Rate/Noise BW)		bps/Hz
Data Rate	8.20E+06	
Information Rate (Data + Overhead)	1.00E+07	
Symbol Rate	6.67E+06	
Chip Rate (Noise Bandwidth)	6.67E+06	
Occupied Bandwidth	8.00E+06	
Power Equivelent Bandwidth	1.00E+06	Hz
C/N Threshold	5.9	dB
Uplink		
Frequency	14.192	GHz
Back off	0.0	dB
EIRP Spectral Density	15.2	dBW/4kHz
Slant Range	36425	km
Space Loss, Ls	206.7	dB
Pointing Loss, Lpnt	0.1	
Atmosphere / Weather Loss, La	0.0	dB
Radome, Lr	0.5	dB
Transponder G/T @ Terminal		dB/K
Thermal Noise, C/No		dBHz
C/(No+lo)	75.2	dBHz
Satellite	115.4	1014/02
Flux Density		dBW/m2
SFD @ Terminal		dBW/m2
Small Signal Gain (IBO/OBO) OBO	3.0 20.3	
Downlink	20.5	ub
Frequency	12.444	GHz
Transponder Sat. EIRP @ Beam Peak		dBW
Transponder Sat. EIRP @ Hub		dBW
DL PSD Limit		dBW/4kHz
DL PSD @ Beam Peak		dBW/4kHz
Carrier EIRP @ Beam Peak		dBW
Carrier EIRP @ Hub		dBW
Slant Range	36435	
Space Loss, Ls	205.6	
Pointing Loss, Lpnt	0.0	dB
Atmosphere / Weather Loss, La	6.5	dB
Radome, Lr	0.0	dB
PCMA Loss	0.0	
Thermal Noise, C/No	86.5	dBHz
C/(No+Io)	82.9755	dBHz
End to End		
End to End C/(No+lo)		dBHz
Implementation Loss	0.0	
End to End C/N w/ Imp Loss	6.3	
Link Margin	0.4	dB

eXConnect Terminal	
Antenna Type	SPA
Lat	22.9 deg
Lon	112.0 deg
EIRP max	45.0 dBW
G/T	11.5 dB/K
Satellite	
Name	A7
Longitude	105.5 deg
Hub Earth Station	
Site	Beijing
Lat	22.45 deg
Lon	114.18 deg
EIRP max G/T	80.0 dBW 37.3 dB/K
Signal	57.5 UB/K
Waveform	DVB-S2
Modulation	8PSK
Bits per symbol	3
Spread Factor	1
Coding Rate	0.67
Overhead Rate	0.94
Channel Spacing	1.20
Spectral Efficiency (Rate/Noise BW)	1.88 bps/Hz
Data Rate	8.46E+07 bps
Information Rate (Data + Overhead)	9.00E+07 bps
Symbol Rate	4.50E+07 Hz
Chip Rate (Noise Bandwidth)	4.50E+07 Hz
Occupied Bandwidth	5.40E+07 Hz
Power Equivelent Bandwidth	5.40E+07 Hz
C/N Threshold	7.4 dB
Uplink	
Frequency	14.330 GHz
Back off	4.2 dB
EIRP Spectral Density	35.3 dBW/4kHz
Slant Range	36435 km
Space Loss, Ls	206.8 dB
Pointing Loss, Lpnt	0.0 dB
Atmosphere / Weather Loss, La	5.6 dB
Radome, Lr	0.0 dB
Transponder G/T @ Hub Thermal Noise, C/No	7.0 dB/K 99.0 dBHz
C/(No+lo)	98.5 dBHz
Satellite	50.5 db112
Flux Density	-92.0 dBW/m2
SFD @ Hub	-89.0 dBW/m2
Small Signal Gain (IBO/OBO)	2.0 dB
ОВО	1.0 dB
Downlink	
Frequency	12.582 GHz
Transponder Sat. EIRP @ Beam Peak	53.6 dBW
Transponder Sat. EIRP @ Terminal	53.0 dBW
DL PSD Limit	15.0 dBW/4kHz
DL PSD @ Beam Peak	12.0 dBW/4kHz
Carrier EIRP @ Beam Peak	52.5 dBW
Carrier EIRP @ Terminal	52.0 dBW
Slant Range	36425 km
Space Loss, Ls	205.7 dB
Pointing Loss, Lpnt	0.1 dB
Atmosphere / Weather Loss, La	0.0 dB
Radome, Lr	0.5 dB
PCMA Loss	0.0 dB
Thermal Noise, C/No	85.8 dBHz
C/(No+lo)	85.5 dBHz
End to End	05.2 1511
End to End End to End C/(No+lo)	85.3 dBHz
End to End End to End C/(No+Io) Implementation Loss	1.0 dB
End to End End to End C/(No+lo)	

eXConnect Terminal	
Antenna Type	SPA
Lat	22.9 deg
Lon	112.0 deg
EIRP max	45.0 dBW
G/T	11.5 dB/K
Satellite	
Name	A7
Longitude	105.5 deg
Hub Earth Station	
Site	Beijing
Lat	22.45 deg
Lon	114.18 deg
EIRP max	80.0 dBW
G/T Signal	37.3 dB/K
Signal Waveform	iDirect
Modulation	QPSK
Bits per symbol	2
Spread Factor	1
Coding Rate	0.50
Overhead Rate	0.83
Channel Spacing	1.20
Spectral Efficiency (Rate/Noise BW)	0.83 bps/Hz
Data Rate	5.55E+06 bps
Information Rate (Data + Overhead)	6.67E+06 bps
Symbol Rate	6.67E+06 Hz
Chip Rate (Noise Bandwidth)	6.67E+06 Hz
Occupied Bandwidth	8.00E+06 Hz
Power Equivelent Bandwidth	5.66E+05 Hz
C/N Threshold	3.6 dB
Uplink	
Frequency	14.192 GHz
Back off	0.0 dB
EIRP Spectral Density	12.8 dBW/4kHz
Slant Range	36425 km
Space Loss, Ls	206.7 dB
Pointing Loss, Lpnt	0.2 dB
Atmosphere / Weather Loss, La	0.0 dB
Radome, Lr	0.5 dB
Transponder G/T @ Terminal Thermal Noise, C/No	7.0 dB/K 73.2 dBHz
C/(No+lo)	73.2 dBHz 72.7 dBHz
Satellite	72.7 UD12
Flux Density	-117.9 dBW/m2
SFD @ Terminal	-92.1 dBW/m2
Small Signal Gain (IBO/OBO)	3.0 dB
OBO	22.8 dB
Downlink	
Frequency	12.444 GHz
Transponder Sat. EIRP @ Beam Peak	53.6 dBW
Transponder Sat. EIRP @ Hub	53.0 dBW
DL PSD Limit	15.0 dBW/4kHz
DL PSD @ Beam Peak	-1.5 dBW/4kHz
Carrier EIRP @ Beam Peak	30.8 dBW
Carrier EIRP @ Hub	30.2 dBW
Slant Range	36435 km
Space Loss, Ls	205.6 dB
Pointing Loss, Lpnt	0.0 dB
Atmosphere / Weather Loss, La	6.5 dB
Radome, Lr	0.0 dB
PCMA Loss	0.0 dB
Thermal Noise, C/No	84.0 dBHz
C/(No+lo)	80.4985 dBHz
End to End	70.0 1011
End to End C/(No+Io)	72.0 dBHz
Implementation Loss	0.0 dB
End to End C/N w/ Imp Loss	3.8 dB
Link Margin	0.2 dB

2. Galaxy 16 (SPA only)

i. Coverage Map





November 6, 2015

Federal Communications Commission International Bureau 445 12th Street, S.W. Washington, D.C. 20554

Re: Engineering Certification of Intelsat for G-16, G-17 and IS-29e Satellites

To Whom It May Concern:

This letter certify that Intelsat is aware that Panasonic Avionics Corporation ("Panasonic") is planning to seek a special temporary authorization ("STA") and modification to its blanket authorization from the Federal Communication Commission ("FCC"), Call Sign E100089, to operate a new Ku-band transmit/receive earth stations aboard aircraft ("ESAA") terminal type, the Panasonic Single Panel Antenna ("SPA"). The SPA will operate with the Galaxy 16 satellite at 99°W, the Galaxy 17 satellite at 91°W and the IS-29e satellite to be located at 50°W. Intelsat understands that Panasonic will file the applications pursuant to the FCC rules governing ESAA operations, including Section 25.227.

Intelsat confirms and hereby certifies that the power density levels of the proposed operations are consistent with existing satellite coordination agreements with the satellites with +/-6 degrees of the Galaxy 16, Galaxy 17 IS-29e satellites' orbit locations, and that the proposed operation of Panasonic's SPA ESAA terminal has the potential to create and receive harmful interference from adjacent satellite networks that may be unacceptable.

If the FCC authorizes the operation proposed by Panasonic, Intelsat will include the power density levels specified by Panasonic, defined within the satellite coordination agreements, in all future satellite network coordination with operators of satellite that are adjacent to the satellites addressed by this letter.

Sincerely,

Kald

Armand Kadrichu Senior Technical Advisor, Spectrum Strategy INTELSAT 7900 Tysons One Place, McLean, VA 22102-5972 T +1 703-559-7525 M +1 202-445-4377 armand.kadrichu@intelsat.com

Intelsat Corporation 7900 Tysons One Place, McLean, VA 22102-5972 USA www.intelsat.com T+1 703-559-6800

eXConnect Terminal		
Antenna Type	SPA	
Lat	27.9 deg	
Lon	-81.0 deg	
EIRP max	45.0 dBW	
G/T	11.5 dB/K	
Satellite		
Name	G-16	
Longitude	-99.0 deg	
Hub Earth Station		
Site	Brewster	
Lat	48.1 deg	
Lon	-119.8 deg	
EIRP max G/T	80.1 dBW	
Signal	33.4 dB/K	
Waveform	DVB-S2	
Modulation	8PSK	
Bits per symbol	3	
Spread Factor	1	
Coding Rate	0.67	
Overhead Rate	0.94	
Channel Spacing	1.20	
Spectral Efficiency (Rate/Noise BW)	1.88 bps/Hz	
Data Rate	5.64E+07 bps	
Information Rate (Data + Overhead)	6.00E+07 bps	
Symbol Rate	3.00E+07 Hz	
Chip Rate (Noise Bandwidth)	3.00E+07 Hz	
Occupied Bandwidth	3.60E+07 Hz	
Power Equivelent Bandwidth	3.60E+07 Hz	
C/N Threshold	7.4 dB	
Uplink		
Frequency	14.420 GHz	
Back off	3.2 dB	
EIRP Spectral Density	38.1 dBW/4kHz	
Slant Range	38509 km	
Space Loss, Ls	207.3 dB	
Pointing Loss, Lpnt	0.0 dB	
Atmosphere / Weather Loss, La	1.5 dB	
Radome, Lr	0.0 dB	
Transponder G/T @ Hub	2.9 dB/K 99.5 dBHz	
Thermal Noise, C/No C/(No+Io)	99.0 dBHz	
Satellite	55.0 UBHZ	
Flux Density	-87.4 dBW/m2	
SFD @ Hub	-84.9 dBW/m2	
Small Signal Gain (IBO/OBO)	1.5 dB	
ОВО		
	1.0 dB	
OBO Downlink Frequency		
Downlink	1.0 dB	
Downlink Frequency	1.0 dB 12.120 GHz	
Downlink Frequency Transponder Sat. EIRP @ Beam Peak	1.0 dB 12.120 GHz 52.3 dBW	
Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal	1.0 dB 12.120 GHz 52.3 dBW 51.3 dBW	
Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit	1.0 dB 12.120 GHz 52.3 dBW 51.3 dBW 13.0 dBW/4kHz	
Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak	1.0 dB 12.120 GHz 52.3 dBW 51.3 dBW 13.0 dBW/4kHz 12.5 dBW/4kHz	
Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range	1.0 dB 12.120 GHz 52.3 dBW 51.3 dBW 13.0 dBW/4kHz 12.5 dBW/4kHz 51.3 dBW	
Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls	1.0 dB 12.120 GHz 52.3 dBW 51.3 dBW 13.0 dBW/4kHz 12.5 dBW/4kHz 51.3 dBW 50.3 dBW	
Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt	1.0 dB 12.120 GHz 52.3 dBW 51.3 dBW 13.0 dBW/4kHz 12.5 dBW/4kHz 51.3 dBW 50.3 dBW 36971 km 205.5 dB 0.1 dB	
Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La	1.0 dB 12.120 GHz 52.3 dBW 51.3 dBW 13.0 dBW/4kHz 51.3 dBW 50.3 dBW 36971 km 205.5 dB 0.1 dB 0.0 dB	
Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr	1.0 dB 12.120 GHz 52.3 dBW 51.3 dBW 13.0 dBW/4kHz 51.3 dBW 50.3 dBW 36971 km 205.5 dB 0.1 dB 0.0 dB 0.5 dB	
Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss	1.0 dB 12.120 GHz 52.3 dBW 51.3 dBW/4kHz 12.5 dBW/4kHz 51.3 dBW 50.3 dBW 36971 km 205.5 dB 0.1 dB 0.0 dB 0.5 dB 0.0 dB	
Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No	1.0 dB 12.120 GHz 52.3 dBW 51.3 dBW 13.0 dBW/4kHz 12.5 dBW/4kHz 51.3 dBW 50.3 dBW 50.3 dBW 36971 km 205.5 dB 0.1 dB 0.0 dB 0.5 dB 0.0 dB 84.3 dBHz	
Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No C/(No+Io)	1.0 dB 12.120 GHz 52.3 dBW 51.3 dBW/4kHz 12.5 dBW/4kHz 51.3 dBW 50.3 dBW 36971 km 205.5 dB 0.1 dB 0.0 dB 0.5 dB 0.0 dB	
Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No C/(No+Io) End to End	1.0 dB 12.120 GHz 52.3 dBW 51.3 dBW 13.0 dBW/4kHz 51.3 dBW 50.3 dBW 36971 km 205.5 dB 0.1 dB 0.0 dB 0.5 dB 0.0 dB 84.3 dBHz 83.4 dBHz	
Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No C/(No+lo) End to End End to End C/(No+lo)	1.0 dB 52.3 dBW 51.3 dBW 13.0 dBW/4kHz 12.5 dBW/4kHz 51.3 dBW 50.3 dBW 36971 km 205.5 dB 0.1 dB 0.0 dB 0.5 dB 0.5 dB 0.0 dB 84.3 dBHz 83.4 dBHz	
Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No C/(No+lo) End to End C/(No+lo) Implementation Loss	1.0 dB 12.120 GHz 52.3 dBW 51.3 dBW 13.0 dBW/4kHz 12.5 dBW/4kHz 51.3 dBW 50.3 dBW 36971 km 205.5 dB 0.1 dB 0.0 dB 0.5 dB 0.0 dB 84.3 dBHz 83.4 dBHz 1.0 dB	
Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No C/(No+lo) End to End End to End C/(No+lo)	1.0 dB 52.3 dBW 51.3 dBW 13.0 dBW/4kHz 12.5 dBW/4kHz 51.3 dBW 50.3 dBW 36971 km 205.5 dB 0.1 dB 0.0 dB 0.5 dB 0.5 dB 0.0 dB 84.3 dBHz 83.4 dBHz	

eXConnect Terminal	
Antenna Type	SPA
Lat	27.9 deg
Lon	-81.0 deg
EIRP max	45.0 dBW
G/T	11.5 dB/K
Satellite	
Name	G-16
Longitude	-99.0 deg
Hub Earth Station	
Site	Brewster
Lat	48.1 deg
Lon	-119.8 deg
EIRP max	80.1 dBW
G/T	33.4 dB/K
Signal	
Waveform	iDirect
Modulation	BPSK
Bits per symbol	1
Spread Factor	1
Coding Rate	0.50
Overhead Rate	0.78
Channel Spacing Spectral Efficiency (Rate/Noise BW)	1.20 0.39 bps/Hz
Data Rate	
Data Rate Information Rate (Data + Overhead)	2.59E+06 bps 3.34E+06 bps
Symbol Rate	6.67E+06 Hz
Chip Rate (Noise Bandwidth)	6.67E+06 Hz
Occupied Bandwidth	8.00E+06 Hz
Power Equivelent Bandwidth	8.58E+05 Hz
C/N Threshold	1.2 dB
Uplink	1.2 00
Frequency	14.240 GHz
Back off	0.0 dB
EIRP Spectral Density	12.8 dBW/4kHz
Slant Range	36971 km
Space Loss, Ls	206.9 dB
Pointing Loss, Lpnt	0.2 dB
Atmosphere / Weather Loss, La	0.0 dB
Radome, Lr	0.5 dB
Transponder G/T @ Terminal	4.9 dB/K
Thermal Noise, C/No	71.0 dBHz
C/(No+lo)	70.5 dBHz
Satellite	
Flux Density	-118.0 dBW/m2
SFD @ Terminal	-95.8 dBW/m2
Small Signal Gain (IBO/OBO)	2.5 dB
OBO	19.7 dB
Downlink	
Frequency	11.940 GHz
Transponder Sat. EIRP @ Beam Peak	52.3 dBW
Transponder Sat. EIRP @ Hub	50.3 dBW
DL PSD Limit	13.0 dBW/4kHz
DL PSD @ Beam Peak	0.3 dBW/4kHz
Carrier EIRP @ Beam Peak	32.6 dBW
Carrier EIRP @ Hub	30.6 dBW
Slant Range Space Loss, Ls	38509 km 205.7 dB
Pointing Loss, Lont	205.7 dB 0.0 dB
Atmosphere / Weather Loss, La	1.7 dB
Radome, Lr	0.0 dB
PCMA Loss	0.0 dB
Thermal Noise, C/No	85.2 dBHz
C/(No+lo)	82.0063 dBHz
End to End	52.0003 GDH2
End to End C/(No+lo)	70.2 dBHz
Implementation Loss	0.0 dB
End to End C/N w/ Imp Loss	1.9 dB
Link Margin	0.7 dB

- 3. IS-33E
 - *i.* Coverage Maps



K31 Beam



K34 Beam



K41 Beam



K48 Beam

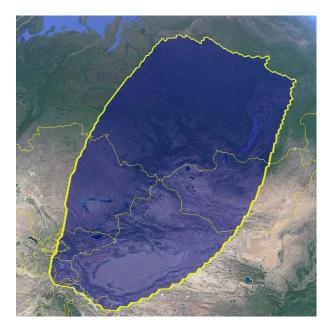
i. Coverage Maps (Cont.)





K49 Beam

K52 Beam



K53 Beam

K63 Beam



January 3, 2017

Federal Communication Commission International Bureau 445 12th Street SW Washington, DC 20554

Re: Engineering Certification of Intelsat for IS-33e Satellite

To Whom It May Concern:

This letter certifies that Intelsat is aware that Panasonic Avionics Corporation ("Panasonic") is planning to modify its blanket authorization from the Federal Communication Commission ("FCC), Call Sign E100089, to include IS-33e as a point of communication for its PPA and SPA Remotes. The PPA and SPA Remotes will operate in addition to the already authorized Galaxy 16 satellite at 99°W, the Galaxy 17 satellite at 91°W and the IS-29e satellite at 50°W also with IS-33e at 60°E. Intelsat understands that Panasonic will file the modification application pursuant to the FCC rules governing ESAA operations, including Section 25.227.

Intelsat confirms and hereby certifies that the power density levels of the proposed operations are consistent with existing satellite coordination agreements with the satellites with +/-6 degrees of the IS-33e satellite's orbit location, and that the proposed operation of Panasonic's PPA and SPA Remotes have the potential to create and receive harmful interference from adjacent satellite networks that may be unacceptable.

If the FCC authorizes the operation proposed by Panasonic, Intelsat will include the power density levels specified by Panasonic, defined within the satellite coordination agreements, in all future satellite network coordination with operators of satellite that are adjacent to the satellites addressed by this letter.

Sincerely,

dui Alexan

Alexander Gerdehitsch Manager, Spectrum Policy, Americas Intelsat

<u>1/3/201</u> Date

Intelsat Corporation 7900 Tysons One Place, McLean, VA 22102-5972 USA www.intelsat.com T +1 703-559-6800

Return Link Budget	
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eXConnect Terminal		
Antenna Type	SPA	
Lat	26.0	-
Lon	52.0	-
EIRP max		dBW
G/T	11.5	dB/K
Satellite	16.22	
Name	IS-33e	
Longitude	60.0	deg
Hub Earth Station	6.1	
Site	Cologne	
Lat	50.9424	•
Lon	7.0292	0
EIRP max		dBW
G/T Signal	37.5	dB/K
Waveform	DVB-S2	
Modulation	8PSK	
	3	
Bits per symbol	5	
Spread Factor Coding Rate	0.75	
Overhead Rate	0.75	
	1.20	
Channel Spacing		hns/Hz
Spectral Efficiency (Rate/Noise BW) Data Rate	9.32E+07	bps/Hz bps
Information Rate (Data + Overhead)	9.32E+07 1.01E+08	•
Symbol Rate	4.50E+08	
Chip Rate (Noise Bandwidth)	4.50E+07 4.50E+07	
Occupied Bandwidth	4.30E+07 5.40E+07	
Power Equivelent Bandwidth	5.40E+07	
C/N Threshold	8.5	
Uplink	8.5	uв
Frequency	17.550	GH7
Back off	8.4	
EIRP Spectral Density		dBW/4kHz
Slant Range	40181	
Space Loss, Ls	209.4	
Pointing Loss, Lpnt	0.0	
Atmosphere / Weather Loss, La	6.1	
Radome, Lr	0.0	
Transponder G/T @ Hub		dB/K
Thermal Noise, C/No	100.7	
C/(No+lo)	100.2	
Satellite		
	-97.6	dBW/m2
Flux Density SFD @ Hub		dBW/m2 dBW/m2
Flux Density SFD @ Hub		dBW/m2
Flux Density	-89.0	dBW/m2 dB
Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO	-89.0 2.0	dBW/m2 dB
Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink	-89.0 2.0	dBW/m2 dB dB
Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency	-89.0 2.0 6.6 11.008	dBW/m2 dB dB
Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink	-89.0 2.0 6.6 11.008 60.4	dBW/m2 dB dB GHz
Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak	-89.0 2.0 6.6 11.008 60.4 59.4	dBW/m2 dB dB GHz dBW
Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal	-89.0 2.0 6.6 11.008 60.4 59.4 14.0	dBW/m2 dB dB GHz dBW dBW
Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit	-89.0 2.0 6.6 11.008 60.4 59.4 14.0 13.3	dBW/m2 dB dB GHz dBW dBW dBW/4kHz dBW/4kHz
Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak	89.0 2.0 6.6 11.008 60.4 59.4 14.0 13.3 53.9	dBW/m2 dB dB GHz dBW dBW dBW/4kHz
Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak	89.0 2.0 6.6 11.008 60.4 59.4 14.0 13.3 53.9	dBW/m2 dB dB GHz dBW dBW dBW dBW/4kHz dBW/4kHz dBW/4kHz dBW
Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal	89.0 2.0 6.6 11.008 60.4 59.4 14.0 13.3 53.9 52.9	dBW/m2 dB dB GHz dBW dBW dBW/4kHz dBW/4kHz dBW/4kHz dBW dBW km
Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls	89.0 2.0 66 111.008 60.4 59.4 14.0 13.3 53.9 52.9 36610	dBW/m2 dB dB GHz dBW dBW dBW dBW/4kHz dBW/4kHz dBW/4kHz dBW km dB
Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range	89.0 2.0 6.6 11.008 60.4 59.4 14.0 13.3 53.9 52.9 36610 204.6	dBW/m2 dB dB GHz dBW dBW dBW/4kHz dBW/4kHz dBW dBW km km dB dB
Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD Limit DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt	89.0 2.0 6.6 111.008 60.4 59.4 14.0 13.3 53.9 52.9 36610 204.6 0.1	dBW/m2 dB dB GHz dBW dBW dBW dBW/4kHz dBW/4kHz dBW/4kHz dBW dBW dBW dBW dBW dB dB dB
Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr	-89.0 2.0 6.6 11.008 60.4 59.4 14.0 13.3 53.9 52.9 36610 204.6 0.1 0.00	dBW/m2 dB dB GHz dBW dBW dBW dBW/4kHz dBW/4kHz dBW/4kHz dBW dB dB dB dB dB dB
Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss	89.0 2.0 6.6 9.4 59.4 11.008 60.4 14.0 13.3 53.9 52.9 36610 204.6 0.1 0.0 0.5 0.0	dBW/m2 dB dB GHz dBW dBW dBW dBW/4kHz dBW/4kHz dBW/4kHz dBW dB dB dB dB dB dB
Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No	89.0 2.0 6.6 11.008 60.4 59.4 14.0 13.3 53.9 52.9 36610 204.6 0.1 0.0 0.0 5 0.0 87.8	dBW/m2 dB dB GHz dBW dBW dBW/4kHz dBW/4kHz dBW/4kHz dBW dBW/4kHz dBW dBW dB dB dB dB dB dB dB
Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss	89.0 2.0 6.6 11.008 60.4 59.4 14.0 13.3 53.9 52.9 36610 204.6 0.1 0.0 0.0 5 0.0 87.8	dBW/m2 dB dB GHz dBW dBW dBW dBW/4kHz dBW/4kHz dBW/4kHz dBW dBW dB dB dB dB dB dB
Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No C/(No+Io) End to End	89.0 2.0 6.6 11.008 60.4 59.4 14.0 13.3 53.9 52.9 36610 204.6 0.1 0.0 0.05 0.0 87.8 87.1	dBW/m2 dB dB GHz dBW dBW dBW/4kHz dBW/4kHz dBW/4kHz dBW dBW/4kHz dBW dBW dB dB dB dB dB dB dB
Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No C/(No+Io) End to End End to End C/(No+Io)	89.0 2.0 6.6 11.008 60.4 59.4 14.0 13.3 53.9 52.9 36610 204.6 0.1 0.0 0.0 5 0.0 87.8 87.1	dBW/m2 dB dB GHz dBW dBW dBW dBW/4kHz dBW/4kHz dBW/4kHz dBW dBW dB dB dB dB dB dB dB dB dB dB
Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No C/(No+Io) End to End End to End C/(No+Io) Implementation Loss	89.0 2.0 6.6 11.008 60.4 59.4 14.0 13.3 53.9 52.9 36610 204.6 0.1 0.0 0.05 0.0 87.8 87.1	dBW/m2 dB dB GHz dBW dBW dBW dBW/4kHz dBW/4kHz dBW/4kHz dBW dBW dBW dB dB dB dB dB dB dB dB dB dB
Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No C/(No+Io) End to End End to End C/(No+Io)	89.0 2.0 6.6 111.008 60.4 59.4 14.0 13.3 53.9 52.9 36610 204.6 0.1 0.0 0.5 0.0 87.8 87.1 	dBW/m2 dB dB GHz dBW dBW dBW dBW/4kHz dBW/4kHz dBW dBW km dB dB dB dB dB dB dB dB dB dB dB dB dB

eXConnect Terminal		
Antenna Type	SPA	
Lat	26.0	deg
Lon	52.0	deg
EIRP max		dBW
G/T	11.5	dB/K
Satellite		
Name	IS-33e	
Longitude	60.0	deg
Hub Earth Station		
Site	Cologne	
Lat	50.9424	-
Lon	7.0292	deg dBW
EIRP max		
G/T Signal	37.5	dB/K
Signal Waveform	iDirect	
Modulation	QPSK	
Bits per symbol	QP3K 2	
Spread Factor	1	
Coding Rate	0.86	
Overhead Rate	0.87	
Channel Spacing	1.20	
Spectral Efficiency (Rate/Noise BW)		bps/Hz
Data Rate	9.94E+06	
Information Rate (Data + Overhead)	1.14E+07	
Symbol Rate	6.67E+06	
Chip Rate (Noise Bandwidth)	6.67E+06	Hz
Occupied Bandwidth	8.00E+06	Hz
Power Equivelent Bandwidth	2.94E+06	Hz
C/N Threshold	7.5	dB
Uplink		
Frequency	14.058	GHz
Back off	0.0	
EIRP Spectral Density		dBW/4kHz
Slant Range	36610	
Space Loss, Ls	206.7	
Pointing Loss, Lpnt	0.2	
Atmosphere / Weather Loss, La	0.0	
Radome, Lr	0.5	
Transponder G/T @ Terminal		dB/K
Thermal Noise, C/No		dBHz
C/(No+lo)	78.5	dBHz
Satellite Flux Density	117.0	dBW//m2
		dBW/m2 dBW/m2
SFD @ Terminal Small Signal Gain (IBO/OBO)	-90.2	
OBO	25.8	
Downlink	23.8	40
Frequency	11.450	GH7
Transponder Sat. EIRP @ Beam Peak		dBW
Transponder Sat. EIRP @ Hub		dBW
DL PSD Limit		dBW/4kHz
DL PSD @ Beam Peak		dBW/4kHz
Carrier EIRP @ Beam Peak		dBW
Carrier EIRP @ Hub		dBW
Slant Range	40181	
Space Loss, Ls	205.7	
Pointing Loss, Lpnt	0.0	dB
Atmosphere / Weather Loss, La	4.1	
Radome, Lr	0.0	dB
PCMA Loss	0.0	dB
Thermal Noise, C/No	90.6	dBHz
C/(No+lo)	81.9493	dBHz
End to End		
End to End C/(No+Io)	76.9	dBHz
Implementation Loss	0.0	
End to End C/N w/ Imp Loss	8.6	
Link Margin	1.1	dB

eXConnect Terminal	
Antenna Type	DPA
Lat	26.0 deg
Lon	52.0 deg
EIRP max	47.3 dBW
G/T	11.4 dB/K
Satellite	10.00
Name	IS-33e
Longitude	60.0 deg
Hub Earth Station	Cologne
Lat	50.9424 deg
Lon	7.0292 deg
EIRP max	80.0 dBW
G/T	37.5 dB/K
Signal	
Waveform	DVB-S2
Modulation	8PSK
Bits per symbol	3
Spread Factor	1
Coding Rate	0.75
Overhead Rate	0.92
Channel Spacing	1.20
Spectral Efficiency (Rate/Noise BW)	2.07 bps/Hz
Data Rate	9.32E+07 bps
Information Rate (Data + Overhead)	1.01E+08 bps
Symbol Rate	4.50E+07 Hz
Chip Rate (Noise Bandwidth)	4.50E+07 Hz
Occupied Bandwidth	5.40E+07 Hz
Power Equivelent Bandwidth	5.40E+07 Hz
C/N Threshold	8.5 dB
Uplink	47.550 OU
Frequency	17.550 GHz
Back off	8.4 dB
EIRP Spectral Density	31.1 dBW/4kHz 40181 km
Slant Range Space Loss, Ls	209.4 dB
Pointing Loss, Lpnt	0.0 dB
Atmosphere / Weather Loss, La	6.1 dB
Radome, Lr	0.0 dB
Transponder G/T @ Hub	16.0 dB/K
Thermal Noise, C/No	100.7 dBHz
C/(No+lo)	100.2 dBHz
Satellite	
Flux Density	-97.6 dBW/m2
SFD @ Hub	-89.0 dBW/m2
Small Signal Gain (IBO/OBO)	2.0 dB
ОВО	6.6 dB
Downlink	
Frequency	11.008 GHz
Transponder Sat. EIRP @ Beam Peak	60.4 dBW
Transponder Sat. EIRP @ Terminal	59.4 dBW
DL PSD Limit	14.0 dBW/4kHz
DL PSD @ Beam Peak	13.3 dBW/4kHz
Carrier EIRP @ Beam Peak	53.9 dBW
Carrier EIRP @ Terminal	52.9 dBW
Slant Range	
	36610 km
Space Loss, Ls	204.6 dB
Pointing Loss, Lpnt	204.6 dB 0.1 dB
Pointing Loss, Lpnt Atmosphere / Weather Loss, La	204.6 dB 0.1 dB 0.0 dB
Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr	204.6 dB 0.1 dB 0.0 dB 0.5 dB
Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss	204.6 dB 0.1 dB 0.0 dB 0.5 dB 0.0 dB
Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No	204.6 dB 0.1 dB 0.0 dB 0.5 dB 0.0 dB 87.7 dBHz
Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No C/(No+Io)	204.6 dB 0.1 dB 0.0 dB 0.5 dB 0.0 dB
Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No C/(No+Io) End to End	204.6 dB 0.1 dB 0.0 dB 0.5 dB 0.0 dB 87.7 dBHz 87.0 dBHz
Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No C/(No+Io) End to End End to End C/(No+Io)	204.6 dB 0.1 dB 0.0 dB 0.5 dB 0.0 dB 87.7 dBHz 87.0 dBHz 86.8 dBHz
Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No C/(No+Io) End to End End to End C/(No+Io) Implementation Loss	204.6 dB 0.1 dB 0.0 dB 0.5 dB 0.0 dB 87.7 dBHz 87.0 dBHz 86.8 dBHz 1.0 dB
Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No C/(No+Io) End to End End to End C/(No+Io)	204.6 dB 0.1 dB 0.0 dB 0.5 dB 0.0 dB 87.7 dBHz 87.0 dBHz 86.8 dBHz

eXConnect Terminal	
Antenna Type	DPA
Lat	26.0 deg
Lon	52.0 deg
EIRP max	47.3 dBW
G/T	11.4 dB/K
Satellite	
Name	IS-33e
Longitude	60.0 deg
Hub Earth Station	
Site	Cologne
Lat	50.9424 deg
Lon	7.0292 deg
EIRP max	80.0 dBW
G/T	37.5 dB/K
Signal	
Waveform	iDirect
Modulation	QPSK
Bits per symbol	2
Spread Factor	1
Coding Rate	0.86
Overhead Rate	0.87
Channel Spacing	1.20
Spectral Efficiency (Rate/Noise BW)	1.49 bps/Hz
Data Rate	9.94E+06 bps
Information Rate (Data + Overhead)	1.14E+07 bps
Symbol Rate	6.67E+06 Hz 6.67E+06 Hz
Chip Rate (Noise Bandwidth)	
Occupied Bandwidth	8.00E+06 Hz
Power Equivelent Bandwidth	5.05E+06 Hz
C/N Threshold	7.5 dB
Uplink	14.050 CH-
Frequency	14.058 GHz
Back off	0.0 dB
EIRP Spectral Density	15.1 dBW/4kHz
Slant Range	36610 km
Space Loss, Ls	206.7 dB
Pointing Loss, Lpnt	0.1 dB
Atmosphere / Weather Loss, La	0.0 dB
Radome, Lr	0.5 dB
Transponder G/T @ Terminal	12.7 dB/K 81.3 dBHz
Thermal Noise, C/No C/(No+Io)	80.8 dBHz
Satellite	80.8 UD112
Flux Density	-115.6 dBW/m2
SFD @ Terminal	-90.2 dBW/m2
Small Signal Gain (IBO/OBO)	2.0 dB
OBO	23.4 dB
Downlink	23.4 UD
Frequency	11.450 GHz
Transponder Sat. EIRP @ Beam Peak	60.0 dBW
Transponder Sat. EIRP @ Hub	60.0 dBW
DL PSD Limit	14.0 dBW/4kHz
DL PSD @ Beam Peak	4.3 dBW/4kHz
Carrier EIRP @ Beam Peak	36.6 dBW
Carrier EIRP @ Hub	36.6 dBW
Slant Range	40181 km
Space Loss, Ls	205.7 dB
Pointing Loss, Lpnt	0.0 dB
Atmosphere / Weather Loss, La	4.1 dB
Radome, Lr	4.1 dB 0.0 dB
PCMA Loss	0.0 dB
Thermal Noise, C/No	92.9 dBHz
C/(No+lo)	84.3058 dBHz
End to End	04.JUJ0 UDH2
End to End C/(No+Io)	79.2 dBHz
Implementation Loss	0.0 dB
-	
End to End C/N w/ Imp Loss	
End to End C/N w/ Imp Loss Link Margin	11.0 dB 3.5 dB

Antonna Typo		
Antenna Type	DPA	
Lat	43.9	deg
Lon	99.0	deg
EIRP max	46.0	dBW
G/T	10.0	dB/K
Satellite		
Name	IS-33e	
Longitude	60.0	deg
Hub Earth Station		
Site	Moscow	
Lat	55.9	•
Lon	37.9972	0
EIRP max		dBW
G/T Signal	34.5	dB/K
Waveform	DVB-S2	
Modulation	QPSK	
Bits per symbol	2	
Spread Factor	1	
Coding Rate	0.83	
Overhead Rate	0.93	
Channel Spacing	1.20	
Spectral Efficiency (Rate/Noise BW)		bps/Hz
Data Rate	3.34E+07	• •
Information Rate (Data + Overhead)	3.58E+07	-
Symbol Rate	2.15E+07	Hz
Chip Rate (Noise Bandwidth)	2.15E+07	Hz
Occupied Bandwidth	2.57E+07	Hz
Power Equivelent Bandwidth	2.57E+07	Hz
C/N Threshold	5.6	dB
Uplink		
Frequency	14.250	GHz
Back off	2.8	
EIRP Spectral Density		dBW/4kHz
Slant Range	39232	
Space Loss, Ls	207.4	
Pointing Loss, Lpnt	0.0	
Atmosphere / Weather Loss, La	2.6	-
Radome, Lr	0.0	-
Transponder G/T @ Hub		dB/K
Thermal Noise, C/No		dBHz
C/(No+lo) Satellite	92.3	dBHz
Flux Density	00 /	dBW/m2
SFD @ Hub		dBW/m2
51 D @ 1105	00.1	
Small Signal Gain (IBO/OBO)	2.0	-
Small Signal Gain (IBO/OBO) OBO	2.0 6.3	dB
Small Signal Gain (IBO/OBO) OBO Downlink	2.0 6.3	dB
ОВО		dB dB
OBO Downlink	6.3	dB dB
OBO Downlink Frequency	6.3 11.143 55.3	dB dB GHz
OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak	6.3 11.143 55.3 54.3	dB dB GHz dBW
OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal	6.3 11.143 55.3 54.3 14.0	dB dB GHz dBW dBW
OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit	6.3 11.143 55.3 54.3 14.0 11.7	dB dB GHz dBW dBW dBW/4kHz
OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak	6.3 11.143 55.3 54.3 14.0 11.7 49.0	dB dB GHz dBW dBW dBW/4kHz dBW/4kHz
OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak	6.3 11.143 55.3 54.3 14.0 11.7 49.0	dB dB GHz dBW dBW dBW/4kHz dBW/4kHz dBW dBW
OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal	6.3 11.143 55.3 54.3 14.0 11.7 49.0 48.0	dB dB GHz dBW dBW dBW/4kHz dBW/4kHz dBW dBW km
OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range	6.3 11.143 55.3 54.3 14.0 11.7 49.0 48.0 38958	dB dB GHz dBW dBW dBW/4kHz dBW/4kHz dBW dBW km dB
OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls	6.3 11.143 55.3 54.3 14.0 11.7 49.0 48.0 38958 205.2	dB dB GHz dBW dBW dBW/4kHz dBW/4kHz dBW dBW km dB dB dB
OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt	6.3 11.143 55.3 54.3 14.0 11.7 49.0 48.0 38958 205.2 0.1	dB dB GHz dBW dBW dBW/4kHz dBW/4kHz dBW dBW km dB dB dB dB
OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La	6.3 11.143 55.3 54.3 14.0 11.7 49.0 48.0 38958 205.2 0.1 0.0	dB dB GHz dBW dBW dBW/4kHz dBW/4kHz dBW dBW km dB dB dB dB dB dB
OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr	6.3 11.143 55.3 54.3 14.0 11.7 49.0 48.0 38958 205.2 0.1 0.0 0.5 0.0	dB dB GHz dBW dBW dBW/4kHz dBW/4kHz dBW dBW km dB dB dB dB dB dB
OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No C/(No+Io)	6.3 11.143 55.3 54.3 14.0 11.7 49.0 48.0 38958 205.2 0.1 0.0 0.5 0.0 80.9	dB dB GHz dBW dBW dBW/4kHz dBW/4kHz dBW dBW km dB dB dB dB dB dB dB dB
OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No C/(No+Io) End to End	6.3 11.143 55.3 54.3 14.0 11.7 49.0 48.0 38958 205.2 0.1 0.0 0.5 0.0 80.9 80.6	dB dB dB dBW dBW dBW/4kHz dBW/4kHz dBW/4kHz dBW dB dB dB dB dB dB dB dB dB dB dB dB dB
OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No C/(No+Io) End to End End to End C/(No+Io)	6.3 11.143 55.3 54.3 14.0 11.7 49.0 48.0 38958 205.2 0.1 0.0 0.5 0.0 80.9 80.6 80.3	dB dB dB GHz dBW dBW dBW/4kHz dBW/4kHz dBW/4kHz dBW dB dB dB dB dB dB dB dB dB dB dB dB dB
OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, LS Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No C/(No+Io) End to End End to End C/(No+Io) Implementation Loss	6.3 11.143 55.3 54.3 14.0 11.7 49.0 48.0 38958 205.2 0.1 0.0 0.5 0.0 80.9 80.6 	dB dB dB GHz dBW dBW dBW/4kHz dBW/4kHz dBW/4kHz dBW dB dB dB dB dB dB dB dB dB dB dB dB dB
OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, LS Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No C/(No+Io) End to End End to End C/(No+Io)	6.3 11.143 55.3 54.3 14.0 11.7 49.0 48.0 38958 205.2 0.1 0.0 0.5 0.0 80.9 80.6 80.3	dB dB dB GHz dBW dBW dBW/4kHz dBW/4kHz dBW/4kHz dBW dB dB dB dB dB dB dB dB dB dB

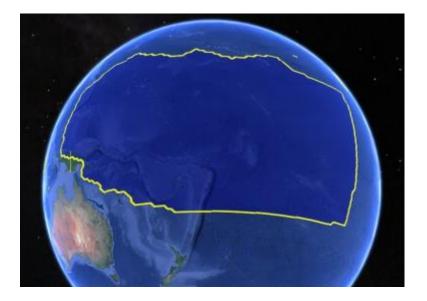
eXConnect Terminal		
Antenna Type	DPA	
Lat .	43.9	U
Lon	99.0	0
EIRP max G/T		dBW dB/K
Satellite	10.0	UD/N
Name	IS-33e	
Longitude	60.0	deg
Hub Earth Station		<u> </u>
Site	Moscow	
Lat	55.9	deg
Lon	37.9972	J
EIRP max		dBW
G/T Sizzal	34.5	dB/K
Signal Waveform	iDirect	
Modulation	QPSK	
Bits per symbol	2	
Spread Factor	1	
Coding Rate	0.86	
Overhead Rate	0.87	
Channel Spacing	1.20	
Spectral Efficiency (Rate/Noise BW)		bps/Hz
Data Rate	9.94E+06	
Information Rate (Data + Overhead)	1.14E+07	
Symbol Rate	6.67E+06 6.67E+06	
Chip Rate (Noise Bandwidth) Occupied Bandwidth	8.00E+06	
Power Equivelent Bandwidth	8.00E+06	
C/N Threshold	7.5	
Uplink		
Frequency	14.193	GHz
Back off	0.4	dB
EIRP Spectral Density		dBW/4kHz
Slant Range	38958	
Space Loss, Ls	207.3	
Pointing Loss, Lpnt Atmosphere / Weather Loss, La	0.1 0.0	-
Radome, Lr	0.0	-
Transponder G/T @ Terminal		dB/K
Thermal Noise, C/No		dBHz
C/(No+lo)	79.7	dBHz
Satellite		
Flux Density	-117.9	dBW/m2
SFD @ Terminal		dBW/m2
Small Signal Gain (IBO/OBO)	2.0	-
OBO	20.9	dB
Downlink	11.450	CH-
Frequency Transponder Sat. EIRP @ Beam Peak		dBW
Transponder Sat. EIRP @ Hub		dBW
DL PSD Limit		dBW/4kHz
DL PSD @ Beam Peak		dBW/4kHz
Carrier EIRP @ Beam Peak	32.6	dBW
Carrier EIRP @ Hub	32.6	dBW
Slant Range	39232	
Space Loss, Ls	205.5	
Pointing Loss, Lpnt	0.0	
Atmosphere / Weather Loss, La	2.6	
Radome, Lr	0.0	
PCMA Loss Thermal Noise, C/No	0.0 87.6	ав dBHz
C/(No+lo)	87.6 86.4438	
End to End	00.4430	50112
End to End C/(No+Io)	78.9	dBHz
Implementation Loss	0.0	dB
End to End C/N w/ Imp Loss	10.6	dB
Link Margin	3.1	dB

eXConnect Terminal		
Antenna Type	SPA	
Lat	43.9	deg
Lon	99.0	deg
EIRP max	45.0	dBW
G/T	11.5	dB/K
Satellite		
Name	IS-33e	
Longitude	60.0	deg
Hub Earth Station		
Site	Moscow	
Lat	55.9	•
Lon	37.9972	0
EIRP max		dBW
G/T Signal	34.5	dB/K
Signal Waveform	DVB-S2	
Modulation	QPSK	
Bits per symbol	QP3K 2	
Spread Factor	1	
Coding Rate	0.89	
Overhead Rate	0.95	
Channel Spacing	1.20	
Spectral Efficiency (Rate/Noise BW)		bps/Hz
Data Rate	3.62E+07	• •
Information Rate (Data + Overhead)	3.81E+07	•
Symbol Rate	2.15E+07	•
Chip Rate (Noise Bandwidth)	2.15E+07	Hz
Occupied Bandwidth	2.57E+07	Hz
Power Equivelent Bandwidth	2.57E+07	Hz
C/N Threshold	6.6	dB
Uplink		
Frequency	14.250	GHz
Back off	2.8	dB
EIRP Spectral Density	39.9	dBW/4kHz
Slant Range	39232	km
Space Loss, Ls	207.4	
Pointing Loss, Lpnt	0.0	
Atmosphere / Weather Loss, La	2.6	-
Radome, Lr	0.0	-
Transponder G/T @ Hub		dB/K
Thermal Noise, C/No		dBHz
C/(No+lo)	92.3	dBHz
Satellite	00 /	dDW/m2
Flux Density		dBW/m2
Flux Density SFD @ Hub	-80.1	dBW/m2
Flux Density SFD @ Hub Small Signal Gain (IBO/OBO)	-80.1 2.0	dBW/m2 dB
Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO	-80.1	dBW/m2 dB
Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink	-80.1 2.0 6.3	dBW/m2 dB dB
Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency	-80.1 2.0 6.3 11.143	dBW/m2 dB dB GHz
Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak	-80.1 2.0 6.3 11.143 55.3	dBW/m2 dB dB
Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency	-80.1 2.0 6.3 11.143 55.3 54.3	dBW/m2 dB dB GHz dBW
Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal	-80.1 2.0 6.3 11.143 55.3 54.3 14.0	dBW/m2 dB dB GHz dBW dBW
Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit	-80.1 2.0 6.3 11.143 55.3 54.3 14.0 11.7	dBW/m2 dB GHz dBW dBW dBW dBW/4kHz
Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak	-80.1 2.0 6.3 11.143 55.3 54.3 14.0 11.7 49.0	dBW/m2 dB dB GHz dBW dBW dBW/4kHz dBW/4kHz
Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak	-80.1 2.0 6.3 11.143 55.3 54.3 14.0 11.7 49.0	dBW/m2 dB dB GHz dBW dBW dBW/4kHz dBW/4kHz dBW/4kHz dBW
Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal	-80.1 2.0 6.3 11.143 55.3 54.3 14.0 11.7 49.0 48.0	dBW/m2 dB dB GHz dBW dBW dBW/4kHz dBW/4kHz dBW/4kHz dBW dBW km
Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range	-80.1 2.0 6.3 11.143 55.3 54.3 14.0 11.7 49.0 48.0 38958	dBW/m2 dB dB GHz dBW dBW dBW/4kHz dBW/4kHz dBW dBW km dB
Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls	-80.1 2.0 6.3 11.143 55.3 54.3 14.0 11.7 49.0 48.0 38958 205.2	dBW/m2 dB dB GHz dBW dBW dBW/4kHz dBW/4kHz dBW dBW km dB dB dB
Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt	-80.1 2.0 6.3 11.143 55.3 54.3 14.0 11.7 49.0 48.0 38958 205.2 0.1	dBW/m2 dB dB GHz dBW dBW dBW/4kHz dBW/4kHz dBW/4kHz dBW dBW km dB dB dB dB
Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La	-80.1 2.0 6.3 11.143 55.3 54.3 14.0 11.7 49.0 48.0 38958 205.2 0.1 0.0	dBW/m2 dB dB GHz dBW dBW dBW/4kHz dBW/4kHz dBW/4kHz dBW dBW km dB dB dB dB dB
Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr	-80.1 2.0 6.3 11.143 55.3 54.3 14.0 11.7 49.0 48.0 38958 205.2 0.1 0.0 0.5 0.0	dBW/m2 dB dB GHz dBW dBW dBW/4kHz dBW/4kHz dBW/4kHz dBW dBW km dB dB dB dB dB
Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss	-80.1 2.0 6.3 11.143 55.3 54.3 14.0 11.7 49.0 48.0 38958 205.2 0.1 0.0 0.5 0.0 82.3	dBW/m2 dB dB GHz dBW dBW dBW/4kHz dBW/4kHz dBW/4kHz dBW dBW km dB dB dB dB dB dB dB dB
Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No C/(No+Io) End to End	-80.1 2.0 6.3 11.143 55.3 54.3 14.0 11.7 49.0 48.0 38958 205.2 0.1 0.0 0.5 0.0 82.3 81.9	dBW/m2 dB dB dB dBW dBW dBW/4kHz dBW/4kHz dBW/4kHz dBW dB dB dB dB dB dB dB dB dB dB dB dB dB
Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No C/(No+Io) End to End End to End C/(No+Io)	-80.1 2.0 6.3 11.143 55.3 54.3 14.0 11.7 49.0 48.0 38958 205.2 0.1 0.0 0.5 0.0 82.3 81.9 81.5	dBW/m2 dB dB GHz dBW dBW dBW/4kHz dBW/4kHz dBW/4kHz dBW dBW km dB dB dB dB dB dB dB dB dB dB dB dB dB
Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No C/(No+Io) End to End End to End C/(No+Io) Implementation Loss	-80.1 2.0 6.3 11.143 55.3 54.3 14.0 11.7 49.0 48.0 38958 205.2 0.1 0.0 0.5 0.0 82.3 81.9 	dBW/m2 dB dB dB GHz dBW dBW dBW dBW/4kHz dBW/4kHz dBW/4kHz dBW dB dB dB dB dB dB dB dB dB dB dB dB dB
Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No C/(No+Io) End to End End to End C/(No+Io)	-80.1 2.0 6.3 11.143 55.3 54.3 14.0 11.7 49.0 48.0 38958 205.2 0.1 0.0 0.5 0.0 82.3 81.9 81.5	dBW/m2 dB dB dB GHz dBW dBW dBW dBW/4kHz dBW/4kHz dBW/4kHz dBW dB dB dB dB dB dB dB dB dB dB dB dB dB

eXConnect Terminal SPA Lat 43.9 deg Lat 43.9 deg Lon 99.0 deg EIRP max 45.0 dBW G/T 11.5 dB/K Satellite Name Name 15-33e Longitude 60.0 deg Hub Earth Station Site Site Moscow Lat 55.9 deg Lon 37.9972 deg EIRP max 80.0 dBW G/T 34.5 dB/K Signal Vaveform Waveform IDirect Modulation QPSK Bits per symbol 2 Spread Factor 1 Coding Rate 0.86 Overhead Rate 0.87 Channel Spacing 1.20 Spectral Efficiency (Rate/Noise BW) 1.49 bps/Hz Data Rate 9.94E+06 bps Information Rate (Data + Overhead) 1.14E+07 bps Symbol Rate 6.67E+06 Hz Cocupied Bandwidth 8.00E+06 Hz
Lat 43.9 deg Lon 99.0 deg EIRP max 45.0 dBW G/T 11.5 dB/K Satellite Name IS-33e Longitude 60.0 deg Hub Earth Station Site Moscow Lat 55.9 deg Lon 37.9972 deg EIRP max 80.0 dBW G/T 34.5 dB/K Signal Waveform iDirect Modulation QPSK Bits per symbol 2 Spread Factor 1 Coding Rate 0.86 Overhead Rate 0.87 Channel Spacing 1.20 Spectral Efficiency (Rate/Noise BW) 1.49 bps/Hz Data Rate 9.94E+06 bps Information Rate (Data + Overhead) 1.14E+07 bps Symbol Rate 6.67E+06 Hz Occupied Bandwidth 8.00E+06 Hz Power Equivelent Bandwidth 7.02E+06 Hz Overhead Rate 0.7.5 dB
Lon 99.0 deg EIRP max 45.0 dBW G/T 11.5 dB/K Satellite Name IS-33e Longitude 60.0 deg Hub Earth Station Site Moscow Lat 55.9 deg Lon 37.9972 deg EIRP max 80.0 dBW G/T 34.5 dB/K Signal Waveform iDirect Modulation QPSK Bits per symbol 2 Spread Factor 1 Coding Rate 0.86 Overhead Rate 0.87 Channel Spacing 1.20 Spectral Efficiency (Rate/Noise BW) 1.49 bps/Hz Data Rate 9.94E+06 bps Information Rate (Data + Overhead) 1.14E+07 bps Symbol Rate 6.67E+06 Hz Chip Rate (Noise Bandwidth) 6.67E+06 Hz Occupied Bandwidth 7.02E+06 Hz C/N Threshold 7.5 dB Uplink 7.5 dB
EIRP max 45.0 dBW G/T 11.5 dB/K Satellite
SatelliteNameIS-33eLongitude60.0 degHub Earth StationSiteMoscowLat55.9 degLon37.9972 degEIRP max80.0 dBWG/T34.5 dB/KSignal2WaveformiDirectModulationQPSKBits per symbol2Spread Factor1Coding Rate0.86Overhead Rate0.87Channel Spacing1.20Spectral Efficiency (Rate/Noise BW)1.49 bps/HzData Rate9.94E+06 bpsInformation Rate (Data + Overhead)1.14E+07 bpsSymbol Rate6.67E+06 HzChip Rate (Noise Bandwidth)6.67E+06 HzOccupied Bandwidth8.00E+06 HzPower Equivelent Bandwidth7.02E+06 HzC/N Threshold7.5 dBUplink12.8 dBW/4kHShark Space Loss, Ls207.3 dB
SatelliteNameIS-33eLongitude60.0 degHub Earth StationSiteMoscowLat55.9 degLon37.9972 degEIRP max80.0 dBWG/T34.5 dB/KSignal2WaveformiDirectModulationQPSKBits per symbol2Spread Factor1Coding Rate0.86Overhead Rate0.87Channel Spacing1.20Spectral Efficiency (Rate/Noise BW)1.49 bps/HzData Rate9.94E+06 bpsInformation Rate (Data + Overhead)1.14E+07 bpsSymbol Rate6.67E+06 HzChip Rate (Noise Bandwidth)6.67E+06 HzOccupied Bandwidth8.00E+06 HzPower Equivelent Bandwidth7.02E+06 HzC/N Threshold7.5 dBUplink12.8 dBW/4kHShark Space Loss, Ls207.3 dB
NameIS-33eLongitude60.0 degHub Earth StationSiteMoscowLat55.9 degLon37.9972 degEIRP max80.0 dBWG/T34.5 dB/KSignal2WaveformiDirectModulationQPSKBits per symbol2Spread Factor1Coding Rate0.86Overhead Rate0.87Channel Spacing1.20Spectral Efficiency (Rate/Noise BW)1.49 bps/HzData Rate9.94E+06 bpsInformation Rate (Data + Overhead)1.14E+07 bpsSymbol Rate6.67E+06 HzChip Rate (Noise Bandwidth)6.67E+06 HzOccupied Bandwidth8.00E+06 HzPower Equivelent Bandwidth7.02E+06 HzC/N Threshold7.5 dBUplink14.193 GHzBack off0.0 dBEIRP Spectral Density12.8 dBW/4kHSlant Range38958 kmSpace Loss, Ls207.3 dB
Hub Earth StationSiteMoscowLat55.9 degLon37.9972 degEIRP max80.0 dBWG/T34.5 dB/KSignalVaveformWaveformiDirectModulationQPSKBits per symbol2Spread Factor1Coding Rate0.86Overhead Rate0.87Channel Spacing1.20Spectral Efficiency (Rate/Noise BW)1.49 bps/HzData Rate9.94E+06 bpsInformation Rate (Data + Overhead)1.14E+07 bpsSymbol Rate6.67E+06 HzChip Rate (Noise Bandwidth)6.67E+06 HzOccupied Bandwidth7.02E+06 HzC/N Threshold7.5 dBUplink14.193 GHzBack off0.0 dBEIRP Spectral Density12.8 dBW/4kHSlant Range38958 kmSpace Loss, Ls207.3 dB
SiteMoscowLat55.9 degLon37.9972 degEIRP max80.0 dBWG/T34.5 dB/KSignal39972 degWaveformiDirectModulationQPSKBits per symbol2Spread Factor1Coding Rate0.86Overhead Rate0.87Channel Spacing1.20Spectral Efficiency (Rate/Noise BW)1.49 bps/HzData Rate9.94E+06 bpsInformation Rate (Data + Overhead)1.14E+07 bpsSymbol Rate6.67E+06 HzChip Rate (Noise Bandwidth)6.67E+06 HzOccupied Bandwidth8.00E+06 HzPower Equivelent Bandwidth7.02E+06 HzC/N Threshold7.5 dBUplink14.193 GHzBack off0.0 dBEIRP Spectral Density12.8 dBW/4kHSlant Range38958 kmSpace Loss, Ls207.3 dB
Lat55.9 degLon37.9972 degEIRP max80.0 dBWG/T34.5 dB/KSignal37.9972 degWaveformiDirectModulationQPSKBits per symbol2Spread Factor1Coding Rate0.86Overhead Rate0.87Channel Spacing1.20Spectral Efficiency (Rate/Noise BW)1.49 bps/HzData Rate9.94E+06 bpsInformation Rate (Data + Overhead)1.14E+07 bpsSymbol Rate6.67E+06 HzChip Rate (Noise Bandwidth)6.67E+06 HzOccupied Bandwidth8.00E+06 HzPower Equivelent Bandwidth7.02E+06 HzC/N Threshold7.5 dBUplink14.193 GHzBack off0.0 dBEIRP Spectral Density12.8 dBW/4kHSlant Range38958 kmSpace Loss, Ls207.3 dB
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G/T34.5 dB/KSignaliDirectWaveformiDirectModulationQPSKBits per symbol2Spread Factor1Coding Rate0.86Overhead Rate0.87Channel Spacing1.20Spectral Efficiency (Rate/Noise BW)1.49 bps/HzData Rate9.94E+06 bpsInformation Rate (Data + Overhead)1.14E+07 bpsSymbol Rate6.67E+06 HzChip Rate (Noise Bandwidth)6.67E+06 HzOccupied Bandwidth8.00E+06 HzPower Equivelent Bandwidth7.02E+06 HzC/N Threshold7.5 dBUplinkErequencyFrequency14.193 GHzBack off0.0 dBEIRP Spectral Density12.8 dBW/4kHSlant Range38958 kmSpace Loss, Ls207.3 dB
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ModulationQPSKBits per symbol2Spread Factor1Coding Rate0.86Overhead Rate0.87Channel Spacing1.20Spectral Efficiency (Rate/Noise BW)1.49 bps/HzData Rate9.94E+06 bpsInformation Rate (Data + Overhead)1.14E+07 bpsSymbol Rate6.67E+06 HzChip Rate (Noise Bandwidth)6.67E+06 HzOccupied Bandwidth8.00E+06 HzPower Equivelent Bandwidth7.02E+06 HzC/N Threshold7.5 dBUplink14.193 GHzBack off0.0 dBEIRP Spectral Density12.8 dBW/4kHSlant Range38958 kmSpace Loss, Ls207.3 dB
Bits per symbol2Spread Factor1Coding Rate0.86Overhead Rate0.87Channel Spacing1.20Spectral Efficiency (Rate/Noise BW)1.49 bps/HzData Rate9.94E+06 bpsInformation Rate (Data + Overhead)1.14E+07 bpsSymbol Rate6.67E+06 HzChip Rate (Noise Bandwidth)6.67E+06 HzOccupied Bandwidth8.00E+06 HzPower Equivelent Bandwidth7.02E+06 HzC/N Threshold7.5 dBUplink14.193 GHzBack off0.0 dBEIRP Spectral Density12.8 dBW/4kHSlant Range38958 kmSpace Loss, Ls207.3 dB
Spread Factor1Coding Rate0.86Overhead Rate0.87Channel Spacing1.20Spectral Efficiency (Rate/Noise BW)1.49 bps/HzData Rate9.94E+06 bpsInformation Rate (Data + Overhead)1.14E+07 bpsSymbol Rate6.67E+06 HzChip Rate (Noise Bandwidth)6.67E+06 HzOccupied Bandwidth8.00E+06 HzPower Equivelent Bandwidth7.02E+06 HzC/N Threshold7.5 dBUplink14.193 GHzBack off0.0 dBEIRP Spectral Density12.8 dBW/4kHSlant Range38958 kmSpace Loss, Ls207.3 dB
Coding Rate0.86Overhead Rate0.87Channel Spacing1.20Spectral Efficiency (Rate/Noise BW)1.49 bps/HzData Rate9.94E+06 bpsInformation Rate (Data + Overhead)1.14E+07 bpsSymbol Rate6.67E+06 HzChip Rate (Noise Bandwidth)6.67E+06 HzOccupied Bandwidth8.00E+06 HzPower Equivelent Bandwidth7.02E+06 HzC/N Threshold7.5 dBUplink14.193 GHzBack off0.0 dBEIRP Spectral Density12.8 dBW/4kHShant Range38958 kmSpace Loss, Ls207.3 dB
Overhead Rate0.87Channel Spacing1.20Spectral Efficiency (Rate/Noise BW)1.49 bps/HzData Rate9.94E+06 bpsInformation Rate (Data + Overhead)1.14E+07 bpsSymbol Rate6.67E+06 HzChip Rate (Noise Bandwidth)6.67E+06 HzOccupied Bandwidth8.00E+06 HzPower Equivelent Bandwidth7.02E+06 HzC/N Threshold7.5 dBUplink14.193 GHzBack off0.0 dBEIRP Spectral Density12.8 dBW/4kHShange38958 kmSpace Loss, Ls207.3 dB
Channel Spacing1.20Spectral Efficiency (Rate/Noise BW)1.49 bps/HzData Rate9.94E+06 bpsInformation Rate (Data + Overhead)1.14E+07 bpsSymbol Rate6.67E+06 HzChip Rate (Noise Bandwidth)6.67E+06 HzOccupied Bandwidth8.00E+06 HzPower Equivelent Bandwidth7.02E+06 HzC/N Threshold7.5 dBUplink14.193 GHzBack off0.0 dBEIRP Spectral Density12.8 dBW/4kHSlant Range38958 kmSpace Loss, Ls207.3 dB
Spectral Efficiency (Rate/Noise BW)1.49 bps/HzData Rate9.94E+06 bpsInformation Rate (Data + Overhead)1.14E+07 bpsSymbol Rate6.67E+06 HzChip Rate (Noise Bandwidth)6.67E+06 HzOccupied Bandwidth8.00E+06 HzPower Equivelent Bandwidth7.02E+06 HzC/N Threshold7.5 dBUplinkFrequency14.193 GHzBack off0.0 dBEIRP Spectral Density12.8 dBW/4kHSlant Range38958 kmSpace Loss, Ls207.3 dB
Data Rate9.94E+06 bpsInformation Rate (Data + Overhead)1.14E+07 bpsSymbol Rate6.67E+06 HzChip Rate (Noise Bandwidth)6.67E+06 HzOccupied Bandwidth8.00E+06 HzPower Equivelent Bandwidth7.02E+06 HzC/N Threshold7.5 dBUplinkFrequency14.193 GHzBack off0.0 dBEIRP Spectral Density12.8 dBW/4kHSlant Range38958 kmSpace Loss, Ls207.3 dB
Information Rate (Data + Overhead)1.14E+07 bpsSymbol Rate6.67E+06 HzChip Rate (Noise Bandwidth)6.67E+06 HzOccupied Bandwidth8.00E+06 HzPower Equivelent Bandwidth7.02E+06 HzC/N Threshold7.5 dBUplink14.193 GHzFrequency14.193 GHzBack off0.0 dBEIRP Spectral Density12.8 dBW/4kHSlant Range38958 kmSpace Loss, Ls207.3 dB
Symbol Rate6.67E+06 HzChip Rate (Noise Bandwidth)6.67E+06 HzOccupied Bandwidth8.00E+06 HzPower Equivelent Bandwidth7.02E+06 HzC/N Threshold7.5 dBUplinkFrequency14.193 GHzBack off0.0 dBEIRP Spectral Density12.8 dBW/4kHSlant Range38958 kmSpace Loss, Ls207.3 dB
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Occupied Bandwidth8.00E+06 HzPower Equivelent Bandwidth7.02E+06 HzC/N Threshold7.5 dBUplink14.193 GHzBack off0.0 dBEIRP Spectral Density12.8 dBW/4kHSlant Range38958 kmSpace Loss, Ls207.3 dB
Power Equivelent Bandwidth7.02E+06 HzC/N Threshold7.5 dBUplink14.193 GHzFrequency14.193 GHzBack off0.0 dBEIRP Spectral Density12.8 dBW/4kHSlant Range38958 kmSpace Loss, Ls207.3 dB
C/N Threshold7.5 dBUplink14.193 GHzBack off0.0 dBEIRP Spectral Density12.8 dBW/4kHSlant Range38958 kmSpace Loss, Ls207.3 dB
UplinkFrequency14.193 GHzBack off0.0 dBEIRP Spectral Density12.8 dBW/4kHSlant Range38958 kmSpace Loss, Ls207.3 dB
Frequency 14.193 GHz Back off 0.0 dB EIRP Spectral Density 12.8 dBW/4kH Slant Range 38958 km Space Loss, Ls 207.3 dB
Back off0.0 dBEIRP Spectral Density12.8 dBW/4kHSlant Range38958 kmSpace Loss, Ls207.3 dB
EIRP Spectral Density12.8 dBW/4kHSlant Range38958 kmSpace Loss, Ls207.3 dB
Slant Range 38958 km Space Loss, Ls 207.3 dB
Space Loss, Ls 207.3 dB
Atmosphere / Weather Loss, La 0.0 dB
Radome, Lr 0.5 dB
Transponder G/T @ Terminal 14.0 dB/K
Thermal Noise, C/No 79.6 dBHz
C/(No+lo) 79.1 dBHz
Satellite
Flux Density -118.5 dBW/m2
SFD @ Terminal -95.0 dBW/m2
Small Signal Gain (IBO/OBO) 2.0 dB
OBO 21.5 dB
Downlink
Frequency 11.450 GHz
Transponder Sat. EIRP @ Beam Peak 53.5 dBW
Transponder Sat. EIRP @ Hub 53.5 dBW
DL PSD Limit 14.0 dBW/4kH
DL PSD @ Beam Peak -0.2 dBW/4kH
Carrier EIRP @ Beam Peak 32.0 dBW
Carrier EIRP @ Hub 32.0 dBW
Slant Range 39232 km
6
Space Loss, Ls 205.5 dB
Space Loss, Ls205.5 dBPointing Loss, Lpnt0.0 dB
Space Loss, Ls205.5 dBPointing Loss, Lpnt0.0 dBAtmosphere / Weather Loss, La2.6 dB
Space Loss, Ls205.5 dBPointing Loss, Lpnt0.0 dBAtmosphere / Weather Loss, La2.6 dBRadome, Lr0.0 dB
Space Loss, Ls205.5 dBPointing Loss, Lpnt0.0 dBAtmosphere / Weather Loss, La2.6 dBRadome, Lr0.0 dBPCMA Loss0.0 dB
Space Loss, Ls205.5 dBPointing Loss, Lpnt0.0 dBAtmosphere / Weather Loss, La2.6 dBRadome, Lr0.0 dBPCMA Loss0.0 dBThermal Noise, C/No87.0 dBHz
Space Loss, Ls205.5 dBPointing Loss, Lpnt0.0 dBAtmosphere / Weather Loss, La2.6 dBRadome, Lr0.0 dBPCMA Loss0.0 dBThermal Noise, C/No87.0 dBHzC/(No+lo)85.8770 dBHz
Space Loss, Ls205.5 dBPointing Loss, Lpnt0.0 dBAtmosphere / Weather Loss, La2.6 dBRadome, Lr0.0 dBPCMA Loss0.0 dBThermal Noise, C/No87.0 dBHzC/(No+lo)85.8770 dBHzEnd to End
Space Loss, Ls205.5 dBPointing Loss, Lpnt0.0 dBAtmosphere / Weather Loss, La2.6 dBRadome, Lr0.0 dBPCMA Loss0.0 dBThermal Noise, C/No87.0 dBHzC/(No+Io)85.8770 dBHzEnd to End78.3 dBHz
Space Loss, Ls205.5 dBPointing Loss, Lpnt0.0 dBAtmosphere / Weather Loss, La2.6 dBRadome, Lr0.0 dBPCMA Loss0.0 dBThermal Noise, C/No87.0 dBHzC/(No+Io)85.8770 dBHzEnd to End78.3 dBHzImplementation Loss0.0 dB
Space Loss, Ls205.5 dBPointing Loss, Lpnt0.0 dBAtmosphere / Weather Loss, La2.6 dBRadome, Lr0.0 dBPCMA Loss0.0 dBThermal Noise, C/No87.0 dBHzC/(No+Io)85.8770 dBHzEnd to End2000 End C/(No+Io)End to End C/(No+Io)78.3 dBHz

4. JCSAT-2B

i. Coverage Maps





ii. Satellite Operator Certification Letter

N/A. Panasonic has not provided an operator certification letter for JCSAT-2B because at all times Panasonic will operate the PPA and SPA terminals consistent with the off-axis ESD levels in Section 25.227(a)(1). *See* Narrative, Section II.A.2.

iii. JCSAT-2B Link Budgets

Forward Link Budget

eXConnect Terminal	
Antenna Type	DPA
Lat	-2.0 deg
Lon	147.9 deg
EIRP max	47.9 dBW
[G/Т	11.9 dB/K
Satellite	10.5
Name	J2B
Longitude	154.0 deg
Hub Earth Station	Honolulu
Lat	21.35 deg
Lon	-157.85 deg
EIRP max	80.0 dBW
G/T	37.2 dB/K
Signal	57.2 db/k
Waveform	DVB-S2
Modulation	QPSK
Bits per symbol	2
Spread Factor	1
Coding Rate	0.83
Overhead Rate	0.93
Channel Spacing	1.20
Spectral Efficiency (Rate/Noise BW)	1.56 bps/Hz
Data Rate	2.27E+07 bps
Information Rate (Data + Overhead)	2.43E+07 bps
Symbol Rate	1.46E+07 Hz
Chip Rate (Noise Bandwidth)	1.46E+07 Hz
Occupied Bandwidth	1.75E+07 Hz
Power Equivelent Bandwidth	3.55E+07 Hz
C/N Threshold	5.6 dB
Uplink	
Frequency	14.406 GHz
Back off	6.9 dB
EIRP Spectral Density	37.5 dBW/4kHz
Slant Range	38530 km
Space Loss, Ls	207.3 dB
Pointing Loss, Lpnt	0.0 dB
Atmosphere / Weather Loss, La	4.6 dB
Radome, Lr	0.0 dB -2.0 dB/K
Transponder G/T @ Hub Thermal Noise, C/No	87.7 dBHz
C/(No+lo)	87.2 dBHz
Satellite	07.2 UD112
Flux Density	-94.3 dBW/m2
SFD @ Hub	-86.0 dBW/m2
Small Signal Gain (IBO/OBO)	3.2 dB
ОВО	5.1 dB
Downlink	
Frequency	11.489 GHz
Transponder Sat. EIRP @ Beam Peak	51.5 dBW
Transponder Sat. EIRP @ Terminal	50.0 dBW
DL PSD Limit	11.0 dBW/4kHz
DL PSD @ Beam Peak	10.8 dBW/4kHz
Carrier EIRP @ Beam Peak	46.4 dBW
Carrier EIRP @ Terminal	44.9 dBW
Slant Range	35841 km
Space Loss, Ls	204.7 dB
Pointing Loss, Lpnt	0.1 dB
Atmosphere / Weather Loss, La	0.0 dB
Radome, Lr	0.5 dB
PCMA Loss	0.0 dB
PCMA Loss Thermal Noise, C/No	80.1 dBHz
PCMA Loss Thermal Noise, C/No C/(No+Io)	
PCMA Loss Thermal Noise, C/No C/(No+Io) End to End	80.1 dBHz 79.3 dBHz
PCMA Loss Thermal Noise, C/No C/(No+Io) End to End End to End C/(No+Io)	80.1 dBHz 79.3 dBHz 78.6 dBHz
PCMA Loss Thermal Noise, C/No C/(No+Io) End to End End to End C/(No+Io) Implementation Loss	80.1 dBHz 79.3 dBHz 78.6 dBHz 1.0 dB
PCMA Loss Thermal Noise, C/No C/(No+Io) End to End End to End C/(No+Io)	80.1 dBHz 79.3 dBHz 78.6 dBHz

eXConnect Terminal		
Antenna Type	DPA	
Lat .	-2.0	U
Lon	147.9	0
EIRP max G/T		dBW dB/K
Satellite	11.9	UD/K
Name	J2B	
Longitude	154.0	deg
Hub Earth Station		
Site	Honolulu	
Lat	21.35	0
Lon	-157.85	0
EIRP max G/T		dBW dB/K
Signal	57.2	UD/K
Waveform	iDirect	
Modulation	BPSK	
Bits per symbol	1	
Spread Factor	2	
Coding Rate	0.67	
Overhead Rate	0.72	
Channel Spacing	1.20	hns/U-
Spectral Efficiency (Rate/Noise BW) Data Rate	0.24 1.81E+06	bps/Hz bps
Information Rate (Data + Overhead)	2.50E+06	
Symbol Rate	2.30L+00 3.75E+06	
Chip Rate (Noise Bandwidth)	7.50E+06	
Occupied Bandwidth	9.00E+06	Hz
Power Equivelent Bandwidth	5.88E+05	Hz
C/N Threshold	-1.2	dB
Uplink		
Frequency	14.406	
Back off	1.2	-
EIRP Spectral Density Slant Range	35841	dBW/4kHz km
Space Loss, Ls	206.7	
Pointing Loss, Lpnt	0.1	-
Atmosphere / Weather Loss, La	0.0	dB
Radome, Lr	0.5	dB
Transponder G/T @ Terminal	2.0	dB/K
Thermal Noise, C/No		dBHz
C/(No+lo)	69.4	dBHz
Satellite	110 1	dD\\//m2
Flux Density SFD @ Terminal		dBW/m2 dBW/m2
Small Signal Gain (IBO/OBO)	-90.0	-
OBO	22.9	-
Downlink		
Frequency	11.489	GHz
Transponder Sat. EIRP @ Beam Peak	51.5	dBW
Transponder Sat. EIRP @ Hub		dBW
DL PSD Limit		dBW/4kHz
DL PSD @ Beam Peak		dBW/4kHz
Carrier EIRP @ Beam Peak Carrier EIRP @ Hub		dBW dBW
Slant Range	20.1 38530	-
Space Loss, Ls	205.4	
Pointing Loss, Lpnt	0.0	
Atmosphere / Weather Loss, La	4.8	
Radome, Lr	0.0	dB
PCMA Loss	0.0	dB
Thermal Noise, C/No		dBHz
C/(No+lo)	74.6661	dBHz
End to End	<u> </u>	dpu-
End to End C/(No+Io) Implementation Loss	68.3 0.0	dBHz dB
End to End C/N w/ Imp Loss	-0.5	
Link Margin	-0.3	-
	0.7	

A		
Antenna Type	SPA	
Lat	-2.0	deg
Lon	147.9	deg
EIRP max	45.0	dBW
G/T	11.5	dB/K
Satellite		
Name	J2B	
Longitude	154.0	deg
Hub Earth Station		
Site	Honolulu	
Lat	21.35	0
Lon	-157.85	0
EIRP max		dBW
G/T Signal	37.2	dB/K
Waveform	DVB-S2	
Modulation	QPSK	
Bits per symbol	2	
Spread Factor	1	
Coding Rate	0.80	
Overhead Rate	0.92	
Channel Spacing	1.20	
Spectral Efficiency (Rate/Noise BW)		bps/Hz
Data Rate	2.15E+07	1 /
Information Rate (Data + Overhead)	2.33E+07	bps
Symbol Rate	1.46E+07	•
Chip Rate (Noise Bandwidth)	1.46E+07	Hz
Occupied Bandwidth	1.75E+07	Hz
Power Equivelent Bandwidth	3.55E+07	Hz
C/N Threshold	5.1	dB
Uplink		
Frequency	14.406	GHz
Back off	6.9	dB
EIRP Spectral Density		dBW/4kHz
Slant Range	38530	
Space Loss, Ls	207.3	
Pointing Loss, Lpnt	0.0	
Atmosphere / Weather Loss, La	4.6	
Radome, Lr	0.0	
Transponder G/T @ Hub		dB/K
Thermal Noise, C/No		dBHz
C/(No+lo) Satellite	87.2	dBHz
Jalenne		
	-0/1 3	dB\W/m2
Flux Density		dBW/m2
Flux Density SFD @ Hub	-86.0	dBW/m2
Flux Density SFD @ Hub Small Signal Gain (IBO/OBO)	-86.0 3.2	dBW/m2 dB
Flux Density SFD @ Hub	-86.0	dBW/m2 dB
Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO	-86.0 3.2	dBW/m2 dB dB
Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink	-86.0 3.2 5.1 11.489	dBW/m2 dB dB
Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency	-86.0 3.2 5.1 11.489 51.5	dBW/m2 dB dB GHz
Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak	-86.0 3.2 5.1 11.489 51.5 50.0	dBW/m2 dB dB GHz dBW
Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal	-86.0 3.2 5.1 11.489 51.5 50.0 11.0	dBW/m2 dB dB GHz dBW dBW
Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit	-86.0 3.2 5.1 11.489 51.5 50.0 11.0 10.8	dBW/m2 dB GHz dBW dBW dBW dBW/4kHz
Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak	-86.0 3.2 5.1 11.489 51.5 50.0 11.0 10.8 46.4	dBW/m2 dB dB GHz dBW dBW dBW/4kHz dBW/4kHz
Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak	-86.0 3.2 5.1 11.489 51.5 50.0 11.0 10.8 46.4	dBW/m2 dB dB GHz dBW dBW dBW/4kHz dBW/4kHz dBW/4kHz dBW
Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal	-86.0 3.2 5.1 11.489 51.5 50.0 11.0 10.8 46.4 44.9	dBW/m2 dB dB GHz dBW dBW dBW/4kHz dBW/4kHz dBW/4kHz dBW dBW km
Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range	-86.0 3.2 5.1 11.489 51.5 50.0 11.0 10.8 46.4 44.9 35841	dBW/m2 dB dB GHz dBW dBW dBW/4kHz dBW/4kHz dBW dBW km dB
Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls	-86.0 3.2 5.1 11.489 51.5 50.0 11.0 10.8 46.4 44.9 35841 204.7	dBW/m2 dB dB GHz dBW dBW dBW/4kHz dBW/4kHz dBW/4kHz dBW km dB dB
Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt	-86.0 3.2 5.1 11.489 51.5 50.0 11.0 10.8 46.4 44.9 35841 204.7 0.1	dBW/m2 dB dB GHz dBW dBW dBW/4kHz dBW/4kHz dBW/4kHz dBW dBW km dB dB dB
Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La	-86.0 3.2 5.1 11.489 51.5 50.0 11.0 10.8 46.4 44.9 35841 204.7 0.1 0.0	dBW/m2 dB dB GHz dBW dBW dBW/4kHz dBW/4kHz dBW/4kHz dBW dBW km dB dB dB dB dB
Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr	-86.0 3.2 5.1 11.489 51.5 50.0 11.0 10.8 46.4 44.9 35841 204.7 0.1 0.0 0.5 0.0	dBW/m2 dB dB GHz dBW dBW dBW/4kHz dBW/4kHz dBW/4kHz dBW dBW km dB dB dB dB dB
Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No C/(No+Io)	-86.0 3.2 5.1 11.489 51.5 50.0 11.0 10.8 46.4 44.9 35841 204.7 0.1 0.0 0.5 0.0 79.7	dBW/m2 dB dB GHz dBW dBW dBW/4kHz dBW/4kHz dBW/4kHz dBW dBW km dB dB dB dB dB dB dB
Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No C/(No+Io) End to End	-86.0 3.2 5.1 11.489 51.5 50.0 11.0 10.8 46.4 44.9 35841 204.7 0.1 0.0 0.5 0.0 79.7 78.6	dBW/m2 dB dB GHz dBW dBW dBW/4kHz dBW/4kHz dBW/4kHz dBW dBW km dB dB dB dB dB dB dB dB dB dB dB dB dB
Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, LS Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No C/(No+Io) End to End End to End C/(No+Io)	-86.0 3.2 5.1 11.489 51.5 50.0 11.0 10.8 46.4 44.9 35841 204.7 0.1 0.0 0.5 0.0 79.7 78.6 78.0	dBW/m2 dB dB GHz dBW dBW dBW/4kHz dBW/4kHz dBW/4kHz dBW dBW km dB dB dB dB dB dB dB dB dB dB dB dB dB
Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, LS Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No C/(No+Io) End to End End to End C/(No+Io) Implementation Loss	-86.0 3.2 5.1 11.489 51.5 50.0 11.0 10.8 46.4 44.9 35841 204.7 0.1 0.0 0.5 0.0 79.7 78.6 78.0 1.0	dBW/m2 dB dB GHz dBW dBW dBW/4kHz dBW/4kHz dBW/4kHz dBW/4kHz dBW dBW km dB dB dB dB dB dB dB dB dB dB dB dB dB
Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, LS Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No C/(No+Io) End to End End to End C/(No+Io)	-86.0 3.2 5.1 11.489 51.5 50.0 11.0 10.8 46.4 44.9 35841 204.7 0.1 0.0 0.5 0.0 79.7 78.6 78.0	dBW/m2 dB dB GHz dBW dBW dBW/4kHz dBW/4kHz dBW/4kHz dBW/4kHz dBW dBW km dB dB dB dB dB dB dB dB dB dB dB dB dB

eXConnect Terminal Antenna Type	SPA	
Lat	-2.0 deg	
Lon	147.9 deg	
EIRP max	45.0 dBW	
G/T	11.5 dB/K	
Satellite	11.5 UD/K	
Name	J2B	
Longitude Hub Earth Station	154.0 deg	
Site	Honolulu	
Lat	Honolulu 21.35 deg	
Lon	-157.85 deg	
EIRP max	80.0 dBW	
G/T	37.2 dB/K	
Signal	iDine et	
Waveform	iDirect	
Modulation	BPSK	
Bits per symbol	1	
Spread Factor	2	
Coding Rate	0.50	
Overhead Rate	0.74	
Channel Spacing	1.20	
Spectral Efficiency (Rate/Noise BW)	0.18 bps/Hz	
Data Rate	1.38E+06 bps	
Information Rate (Data + Overhead)	1.88E+06 bps	
Symbol Rate	3.75E+06 Hz	
Chip Rate (Noise Bandwidth)	7.50E+06 Hz	
Occupied Bandwidth	9.00E+06 Hz	
Power Equivelent Bandwidth	3.98E+05 Hz	
C/N Threshold	-2.3 dB	
Uplink		
Frequency	14.406 GHz	
Back off	0.0 dB	
EIRP Spectral Density	12.3 dBW/4kH	Ηz
Slant Range	35841 km	
Space Loss, Ls	206.7 dB	
Pointing Loss, Lpnt	0.2 dB	
Atmosphere / Weather Loss, La	0.0 dB	
Radome, Lr	0.5 dB	
Transponder G/T @ Terminal	2.0 dB/K	
Thermal Noise, C/No	68.2 dBHz	
C/(No+Io)	67.7 dBHz	
Satellite	07.7 00112	
	117 9 dBW/m3	
Flux Density	-117.8 dBW/m2	
SFD @ Terminal	-90.0 dBW/m2	
SFD @ Terminal Small Signal Gain (IBO/OBO)	-90.0 dBW/m2 3.2 dB	
SFD @ Terminal Small Signal Gain (IBO/OBO) OBO	-90.0 dBW/m2	
SFD @ Terminal Small Signal Gain (IBO/OBO) OBO Downlink	-90.0 dBW/m2 3.2 dB 24.6 dB	
SFD @ Terminal Small Signal Gain (IBO/OBO) OBO Downlink Frequency	-90.0 dBW/m2 3.2 dB 24.6 dB 11.489 GHz	
SFD @ Terminal Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak	-90.0 dBW/m2 3.2 dB 24.6 dB 11.489 GHz 51.5 dBW	
SFD @ Terminal Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Hub	-90.0 dBW/m2 3.2 dB 24.6 dB 11.489 GHz 51.5 dBW 43.0 dBW	
SFD @ Terminal Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Hub DL PSD Limit	-90.0 dBW/m2 3.2 dB 24.6 dB 11.489 GHz 51.5 dBW 43.0 dBW 11.0 dBW/4kł	Hz
SFD @ Terminal Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Hub DL PSD Limit DL PSD @ Beam Peak	-90.0 dBW/m2 3.2 dB 24.6 dB 11.489 GHz 51.5 dBW 43.0 dBW 11.0 dBW/4kt -5.8 dBW/4kt	Hz
SFD @ Terminal Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Hub DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak	-90.0 dBW/m2 3.2 dB 24.6 dB 11.489 GHz 51.5 dBW 43.0 dBW 11.0 dBW/4kł -5.8 dBW/4kł 26.9 dBW	Hz
SFD @ Terminal Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Hub DL PSD Limit DL PSD @ Beam Peak	-90.0 dBW/m2 3.2 dB 24.6 dB 11.489 GHz 51.5 dBW 43.0 dBW 11.0 dBW/4kt -5.8 dBW/4kt	Hz
SFD @ Terminal Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Hub DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak	-90.0 dBW/m2 3.2 dB 24.6 dB 11.489 GHz 51.5 dBW 43.0 dBW 11.0 dBW/4kł -5.8 dBW/4kł 26.9 dBW	Hz
SFD @ Terminal Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Hub DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Hub	-90.0 dBW/m2 3.2 dB 24.6 dB 11.489 GHz 51.5 dBW 43.0 dBW 11.0 dBW/4kt -5.8 dBW/4kt 26.9 dBW 18.4 dBW	Hz
SFD @ Terminal Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Hub DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Hub Slant Range	-90.0 dBW/m2 3.2 dB 24.6 dB 11.489 GHz 51.5 dBW 43.0 dBW 11.0 dBW/4kł -5.8 dBW/4kł 26.9 dBW 18.4 dBW 38530 km	Hz
SFD @ Terminal Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Hub DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Hub Slant Range Space Loss, Ls	-90.0 dBW/m2 3.2 dB 24.6 dB 11.489 GHz 51.5 dBW 43.0 dBW 11.0 dBW/4kł -5.8 dBW/4kł 26.9 dBW 18.4 dBW 38530 km 205.4 dB	Hz
SFD @ Terminal Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Hub DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Hub Slant Range Space Loss, Ls Pointing Loss, Lpnt	-90.0 dBW/m2 3.2 dB 24.6 dB 11.489 GHz 51.5 dBW 43.0 dBW 11.0 dBW/4kł -5.8 dBW/4kł 26.9 dBW 18.4 dBW 38530 km 205.4 dB 0.0 dB	Hz
SFD @ Terminal Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Hub DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Hub Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La	-90.0 dBW/m2 3.2 dB 24.6 dB 11.489 GHz 51.5 dBW 43.0 dBW 11.0 dBW/4kł -5.8 dBW/4kł 26.9 dBW 18.4 dBW 38530 km 205.4 dB 0.0 dB 4.8 dB	Hz
SFD @ Terminal Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Hub DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Hub Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr	-90.0 dBW/m2 3.2 dB 24.6 dB 11.489 GHz 51.5 dBW 43.0 dBW 11.0 dBW/4kt -5.8 dBW/4kt 26.9 dBW 18.4 dBW 38530 km 205.4 dB 0.0 dB 4.8 dB 0.0 dB	Hz
SFD @ Terminal Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Hub DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Hub Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss	-90.0 dBW/m2 3.2 dB 24.6 dB 11.489 GHz 51.5 dBW 43.0 dBW 11.0 dBW/4kt -5.8 dBW/4kt 26.9 dBW 18.4 dBW 38530 km 205.4 dB 0.0 dB 4.8 dB 0.0 dB 0.0 dB	Hz
SFD @ Terminal Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Hub DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Hub Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No	-90.0 dBW/m2 3.2 dB 24.6 dB 11.489 GHz 51.5 dBW 43.0 dBW 11.0 dBW/4kt -5.8 dBW/4kt 26.9 dBW 18.4 dBW 38530 km 205.4 dB 0.0 dB 4.8 dB 0.0 dB 0.0 dB 74.1 dBHz	Hz
SFD @ Terminal Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Hub DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Hub Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No C/(No+Io)	-90.0 dBW/m2 3.2 dB 24.6 dB 11.489 GHz 51.5 dBW 43.0 dBW 11.0 dBW/4kt -5.8 dBW/4kt 26.9 dBW 18.4 dBW 38530 km 205.4 dB 0.0 dB 4.8 dB 0.0 dB 0.0 dB 74.1 dBHz	Hz
SFD @ Terminal Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Hub DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Hub Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No C/(No+Io) End to End End to End C/(No+Io)	-90.0 dBW/m2 3.2 dB 24.6 dB 11.489 GHz 51.5 dBW 43.0 dBW 11.0 dBW/4kt -5.8 dBW/4kt 26.9 dBW 18.4 dBW 38530 km 205.4 dB 0.0 dB 4.8 dB 0.0 dB 4.8 dB 0.0 dB 74.1 dBHz 72.9756 dBHz	Hz
SFD @ Terminal Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Hub DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Hub Slant Range Space Loss, LS Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No C/(No+Io) End to End End to End C/(No+Io) Implementation Loss	-90.0 dBW/m2 3.2 dB 24.6 dB 11.489 GHz 51.5 dBW 43.0 dBW 11.0 dBW/4kt -5.8 dBW/4kt 26.9 dBW 18.4 dBW 38530 km 205.4 dB 0.0 dB 4.8 dB 0.0 dB 4.8 dB 0.0 dB 74.1 dBHz 72.9756 dBHz 66.6 dBHz 0.0 dB	Hz
SFD @ Terminal Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Hub DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Hub Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No C/(No+Io) End to End End to End C/(No+Io)	-90.0 dBW/m2 3.2 dB 24.6 dB 11.489 GHz 51.5 dBW 43.0 dBW 11.0 dBW/4kt -5.8 dBW/4kt 26.9 dBW 18.4 dBW 38530 km 205.4 dB 0.0 dB 4.8 dB 0.0 dB 4.8 dB 0.0 dB 74.1 dBHz 72.9756 dBHz	Hz

II. TECOM 1000 Link Budgets

Forward Link Budget

eXConnect Terminal		
Antenna Type	TECOM	
Lat	5.8 c	•
Lon	-75.2 (•
EIRP max	42.4 0	
G/T Satellite	11.8 c	ЗВ/К
Name	Anik-G1	
Longitude	-107.3 c	deg
Hub Earth Station		-0
Site	Lima	
Lat	-12.092 0	leg
Lon	-77.027 (•
EIRP max	80.0 c	
G/T Signal	36.1 0	ав/к
Signal Waveform	DVB-S2	
Modulation	QPSK	
Bits per symbol	2	
Spread Factor	1	
Coding Rate	0.67	
Overhead Rate	0.94	
Channel Spacing	1.20	<i>i</i>
Spectral Efficiency (Rate/Noise BW)		ops/Hz
Data Rate	3.77E+07 k	
Information Rate (Data + Overhead) Symbol Rate	4.00E+07 k 3.00E+07 k	
Chip Rate (Noise Bandwidth)	3.00E+07 F	
Occupied Bandwidth	3.60E+07 H	
Power Equivelent Bandwidth	3.60E+07 H	
C/N Threshold	3.5 c	βB
Uplink		
Frequency	14.300 0	GHz
Back off	8.7 0	
EIRP Spectral Density		BW/4kHz
Slant Range	36942	
Space Loss, Ls Pointing Loss, Lpnt	206.9 c 0.0 c	
Atmosphere / Weather Loss, La	2.4 0	
Radome, Lr	0.0 0	
Transponder G/T @ Hub	2.0 c	в/к
Thermal Noise, C/No	92.5 c	BHz
C/(No+lo)	92.0 c	dBHz
Satellite		
Flux Density		BW/m2
SFD @ Hub		dBW/m2
Small Signal Gain (IBO/OBO) OBO	2.5 c 1.0 c	
Downlink	1.0 (Ы
Frequency	12.000 0	GHz
Transponder Sat. EIRP @ Beam Peak	51.0 0	
Transponder Sat. EIRP @ Terminal	50.0 c	BW
DL PSD Limit	13.2 0	BW/4kHz
DL PSD @ Beam Peak	11.2 c	BW/4kHz
		10111
Carrier EIRP @ Beam Peak	50.0 0	
Carrier EIRP @ Terminal	49.0 0	JBW
Carrier EIRP @ Terminal Slant Range	49.0 c 36956 k	JBW km
Carrier EIRP @ Terminal Slant Range Space Loss, Ls	49.0 c 36956 k 205.4 c	JBW km JB
Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt	49.0 c 36956 k 205.4 c 0.0 c	dBW km dB dB
Carrier EIRP @ Terminal Slant Range Space Loss, Ls	49.0 c 36956 k 205.4 c	IBW cm IB IB IB
Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La	49.0 c 36956 k 205.4 c 0.0 c	IBW km IB IB IB IB
Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr	49.0 c 36956 k 205.4 c 0.0 c 0.0 c 0.5 c	IBW cm IB IB IB IB IB
Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No C/(No+Io)	49.0 c 36956 k 205.4 c 0.0 c 0.5 c 0.5 c	IBW cm IB IB IB IB IB IBHz
Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No C/(No+Io) End to End	49.0 c 36956 k 205.4 c 0.0 c 0.5 c 0.0 c 83.5 c 80.0 c	IBW km IB IB IB IB IBHz IBHz IBHz
Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No C/(No+Io) End to End End to End C/(No+Io)	49.0 c 36956 c 205.4 c 0.0 c 0.0 c 0.5 c 0.0 c 83.5 c 80.0 c	IBW sm JB JB JB JB JB JBHz JBHz JBHz
Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No C/(No+Io) End to End End to End C/(No+Io) Implementation Loss	49.0 c 36956 c 205.4 c 0.0 c 0.0 c 0.5 c 0.0 c 83.5 c 80.0 c 79.7 c 1.0 c	IBW sm IB IB IB IB IBHz IBHz IBHz IBHz IBHz
Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No C/(No+Io) End to End End to End C/(No+Io)	49.0 c 36956 c 205.4 c 0.0 c 0.0 c 0.5 c 0.0 c 83.5 c 80.0 c	IBW sm IB IB IB IB IBHz IBHz IBHz IBHz IB

eXConnect Terminal		
Antenna Type	TECOM	
Lat	5.8	deg
Lon	-75.2	0
EIRP max		dBW
G/T	11.8	dB/K
Satellite Name	Anik-G1	
Longitude	-107.3	deg
Hub Earth Station	107.5	ucb
Site	Lima	
Lat	-12.092	deg
Lon	-77.027	deg
EIRP max	80.0	dBW
G/T	36.1	dB/K
Signal	iDias et	
Waveform Modulation	iDirect BPSK	
Bits per symbol	DP3K 1	
Spread Factor	4	
Coding Rate	0.67	
Overhead Rate	0.72	
Channel Spacing	1.20	
Spectral Efficiency (Rate/Noise BW)	0.12	bps/Hz
Data Rate	8.05E+05	
Information Rate (Data + Overhead)	1.11E+06	
Symbol Rate	1.67E+06	
Chip Rate (Noise Bandwidth) Occupied Bandwidth	6.67E+06 8.00E+06	
Power Equivelent Bandwidth	3.62E+05	
C/N Threshold	-4.2	
Uplink		
Frequency	14.140	GHz
Back off	0.0	dB
EIRP Spectral Density	10.2	dBW/4kHz
Slant Range	36956	
Space Loss, Ls	206.8	
Pointing Loss, Lpnt	0.0	
Atmosphere / Weather Loss, La Radome, Lr	0.0 0.5	
Transponder G/T @ Terminal		dB/K
Thermal Noise, C/No		dBHz
C/(No+lo)		dBHz
Satellite		
Flux Density	-120.5	dBW/m2
SFD @ Terminal	-94.0	dBW/m2
Small Signal Gain (IBO/OBO)	2.5	
OBO	24.0	dB
Downlink	14 0 4 0	CH-
Frequency Transponder Sat. EIRP @ Beam Peak	11.840 51.0	GHz dBW
Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Hub		dBW
DL PSD Limit		dBW/4kHz
DL PSD @ Beam Peak		dBW/4kHz
Carrier EIRP @ Beam Peak		dBW
Carrier EIRP @ Hub	23.0	dBW
Slant Range	36942	km
Space Loss, Ls	205.3	
Pointing Loss, Lpnt	0.0	
Atmosphere / Weather Loss, La	3.2	
Radome, Lr PCMA Loss	0.0	
Thermal Noise, C/No	0.0 79.2	dB dBHz
C/(No+lo)	76.9263	
End to End		
End to End C/(No+Io)	65.8	dBHz
Implementation Loss	0.0	dB
End to End C/N w/ Imp Loss	-2.4	dB
Link Margin	1.8	dB

Automa Tura		
Antenna Type	TECOM	
Lat	26.9	deg
Lon	-81.1	deg
EIRP max	42.4	dBW
G/T	11.8	dB/K
Satellite		
Name	G-16	
Longitude	-99.0	deg
Hub Earth Station		
Site	Brewster	
Lat	48.1	0
Lon	-119.8	•
EIRP max		dBW
G/T Signal	55.4	dB/K
Waveform	DVB-S2	
Modulation	QPSK	
Bits per symbol	2	
Spread Factor	1	
Coding Rate	0.80	
Overhead Rate	0.92	
Channel Spacing	1.20	
Spectral Efficiency (Rate/Noise BW)		bps/Hz
Data Rate	4.42E+07	-
Information Rate (Data + Overhead)	4.80E+07	•
Symbol Rate	3.00E+07	Hz
Chip Rate (Noise Bandwidth)	3.00E+07	Hz
Occupied Bandwidth	3.60E+07	Hz
Power Equivelent Bandwidth	3.60E+07	Hz
C/N Threshold	5.1	dB
Uplink		
Frequency	14.420	GHz
Back off	3.2	-
EIRP Spectral Density		dBW/4kHz
Slant Range	38509	
Space Loss, Ls	207.3	
Pointing Loss, Lpnt	0.0	
Atmosphere / Weather Loss, La	1.5	
Radome, Lr	0.0	
	2.9	dB/K
Transponder G/T @ Hub	00 F	
Thermal Noise, C/No	99.5	
Thermal Noise, C/No C/(No+Io)		dBHz dBHz
Thermal Noise, C/No C/(No+Io) Satellite	99.0	dBHz
Thermal Noise, C/No C/(No+Io) Satellite Flux Density	99.0 -87.4	dBHz dBW/m2
Thermal Noise, C/No C/(No+Io) Satellite Flux Density SFD @ Hub	99.0 -87.4 -84.9	dBHz dBW/m2 dBW/m2
Thermal Noise, C/No C/(No+Io) Satellite Flux Density SFD @ Hub Small Signal Gain (IBO/OBO)	99.0 -87.4 -84.9 1.5	dBHz dBW/m2 dBW/m2 dB
Thermal Noise, C/No C/(No+Io) Satellite Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO	99.0 -87.4 -84.9	dBHz dBW/m2 dBW/m2 dB
Thermal Noise, C/No C/(No+Io) Satellite Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink	99.0 -87.4 -84.9 1.5 1.0	dBHz dBW/m2 dBW/m2 dB dB
Thermal Noise, C/No C/(No+Io) Satellite Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO	99.0 -87.4 -84.9 1.5 1.0 	dBHz dBW/m2 dBW/m2 dB dB dB
Thermal Noise, C/No C/(No+Io) Satellite Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak	99.0 -87.4 -84.9 1.5 1.0 	dBHz dBW/m2 dBW/m2 dB dB
Thermal Noise, C/No C/(No+Io) Satellite Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency	99.0 -87.4 -84.9 1.5 1.0 12.120 52.3 51.3	dBHz dBW/m2 dBW/m2 dB dB dB GHz dBW dBW
Thermal Noise, C/No C/(No+Io) Satellite Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal	99.0 -87.4 -84.9 1.5 1.0 12.120 52.3 51.3 13.0	dBHz dBW/m2 dBW/m2 dB dB GHz dBW
Thermal Noise, C/No C/(No+Io) Satellite Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit	99.0 -87.4 -84.9 1.5 1.0 12.120 52.3 51.3 13.0 12.5	dBHz dBW/m2 dBW/m2 dB dB dB GHz dBW dBW dBW/4kHz
Thermal Noise, C/No C/(No+Io) Satellite Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak	99.0 -87.4 -84.9 1.5 1.0 12.120 52.3 51.3 13.0 12.5 51.3	dBHz dBW/m2 dBW/m2 dB dB dB GHz dBW dBW dBW/4kHz dBW/4kHz
Thermal Noise, C/No C/(No+Io) Satellite Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak	99.0 -87.4 -84.9 1.5 1.0 12.120 52.3 51.3 13.0 12.5 51.3	dBHz dBW/m2 dBW/m2 dB dB dB dB dB dB dB dB dB dB dB dB dB
Thermal Noise, C/No C/(No+Io) Satellite Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal	99.0 -87.4 -84.9 1.5 1.0 12.120 52.3 51.3 13.0 12.5 51.3 50.3	dBHz dBW/m2 dBW/m2 dB dB dB dB dB dB dB dB dB dB dB dB dB
Thermal Noise, C/No C/(No+Io) Satellite Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range	99.0 	dBHz dBW/m2 dB dB dB GHz dBW dBW dBW/4kHz dBW/4kHz dBW/4kHz dBW km dB
Thermal Noise, C/No C/(No+Io) Satellite Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls	99.0 -87.4 -84.9 1.5 1.0 12.120 52.3 51.3 13.0 12.5 51.3 50.3 36912 205.5	dBHz dBW/m2 dB dB dB GHz dBW dBW dBW/4kHz dBW/4kHz dBW/4kHz dBW dBW km dB dB
Thermal Noise, C/No C/(No+Io) Satellite Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt	99.0 -87.4 -84.9 1.5 1.0 52.3 51.3 13.0 12.5 51.3 50.3 36912 205.5 0.0	dBHz dBW/m2 dB dB dB GHz dBW dBW dBW/4kHz dBW/4kHz dBW/4kHz dBW dBW km dB dB dB dB
Thermal Noise, C/No C/(No+Io) Satellite Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La	99.0 -87.4 -84.9 1.5 1.0 52.3 51.3 13.0 12.5 51.3 50.3 36912 205.5 0.0 0.0	dBHz dBW/m2 dB dB dB GHz dBW dBW dBW/4kHz dBW/4kHz dBW/4kHz dBW dBW dBW km dB dB dB dB dB
Thermal Noise, C/No C/(No+Io) Satellite Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr	99.0 -87.4 -84.9 1.5 1.0 52.3 51.3 13.0 12.5 51.3 50.3 36912 205.5 0.0 0.0 0.5 0.0	dBHz dBW/m2 dB dB dB GHz dBW dBW dBW/4kHz dBW/4kHz dBW/4kHz dBW dBW dBW km dB dB dB dB dB
Thermal Noise, C/No C/(No+Io) Satellite Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss	99.0 	dBHz dBW/m2 dB dB dB GHz dBW dBW dBW/4kHz dBW/4kHz dBW/4kHz dBW dBW dB dB dB dB dB dB dB dB
Thermal Noise, C/No C/(No+Io) Satellite Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No C/(No+Io) End to End	99.0 	dBHz dBW/m2 dB dB dB GHz dBW dBW dBW/dkHz dBW/4kHz dBW/4kHz dBW/4kHz dBW dB dB dB dB dB dB dB dB dB dB dB dB
Thermal Noise, C/No C/(No+Io) Satellite Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No C/(No+Io) End to End End to End C/(No+Io)	99.0 	dBHz dBW/m2 dB dB dB GHz dBW dBW dBW dBW/4kHz dBW/4kHz dBW/4kHz dBW dB dB dB dB dB dB dB dB dB dB
Thermal Noise, C/No C/(No+Io) Satellite Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No C/(No+Io) End to End End to End C/(No+Io) Implementation Loss	99.0 	dBHz dBW/m2 dB dB dB GHz dBW dBW dBW dBW/4kHz dBW/4kHz dBW/4kHz dBW/4kHz dBW dB dB dB dB dB dB dB dB dB dB
Thermal Noise, C/No C/(No+Io) Satellite Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No C/(No+Io) End to End End to End C/(No+Io)	99.0 	dBHz dBW/m2 dB dB dB GHz dBW dBW dBW dBW/4kHz dBW/4kHz dBW/4kHz dBW/4kHz dBW dB dB dB dB dB dB dB dB dB dB

eXConnect Terminal	
Antenna Type	TECOM
Lat	26.9 deg
Lon	-81.1 deg
EIRP max	42.4 dBW
G/T	11.8 dB/K
Satellite	
Name	G-16
Longitude	-99.0 deg
Hub Earth Station	
Site	Brewster
Lat	48.1 deg
Lon EIRP max	-119.8 deg 80.1 dBW
G/T	33.4 dB/K
Signal	33.4 db/k
Waveform	iDirect
Modulation	BPSK
Bits per symbol	1
Spread Factor	2
Coding Rate	0.67
Overhead Rate	0.72
Channel Spacing	1.20
Spectral Efficiency (Rate/Noise BW)	0.24 bps/Hz
Data Rate	1.61E+06 bps
Information Rate (Data + Overhead)	2.22E+06 bps
Symbol Rate	3.34E+06 Hz
Chip Rate (Noise Bandwidth)	6.67E+06 Hz
Occupied Bandwidth	8.00E+06 Hz 4.89E+05 Hz
Power Equivelent Bandwidth C/N Threshold	4.89E+05 Hz -1.2 dB
Uplink	-1.2 UB
Frequency	14.240 GHz
Back off	0.0 dB
EIRP Spectral Density	10.2 dBW/4kHz
Slant Range	36912 km
Space Loss, Ls	206.9 dB
Pointing Loss, Lpnt	0.0 dB
Atmosphere / Weather Loss, La	0.0 dB
Radome, Lr	0.5 dB
Transponder G/T @ Terminal	4.9 dB/K
Thermal Noise, C/No	68.5 dBHz
C/(No+Io)	68.0 dBHz
Satellite	400 E IDW/ - 0
Flux Density	-120.5 dBW/m2
SFD @ Terminal Small Signal Gain (IBO/OBO)	-95.8 dBW/m2 2.5 dB
OBO	2.5 dB 22.2 dB
Downlink	22.2 40
Frequency	11.940 GHz
Transponder Sat. EIRP @ Beam Peak	52.3 dBW
Transponder Sat. EIRP @ Hub	50.3 dBW
DL PSD Limit	13.0 dBW/4kHz
DL PSD @ Beam Peak	-2.1 dBW/4kHz
Carrier EIRP @ Beam Peak	30.1 dBW
Carrier EIRP @ Hub	28.1 dBW
Slant Range	38509 km
Space Loss, Ls	205.7 dB
Pointing Loss, Lpnt	0.0 dB
Atmosphere / Weather Loss, La	1.7 dB
Radome, Lr	0.0 dB
PCMA Loss	0.0 dB
Thermal Noise, C/No	82.8 dBHz
C/(No+lo) End to End	79.5643 dBHz
	67.7 dBHz
End to End C/(No+lo)	07.7 00112
End to End C/(No+Io)	0.0 dB
Implementation Loss	0.0 dB -0.5 dB

Antenna Type TECOM Lat 33.8 deg Lon -118.2 deg EIRP max 42.4 dBW G/T 11.8 dB/K Satellite	eXConnect Terminal		
Lon -118.2 deg EIRP max 42.4 dBW G/T 11.8 dB/K Satellite 172.0 deg Name GE-23 Longitude 172.0 deg Hub Earth Station 118.3 deg Site Brewster Lat 48.1 deg Lon -119.8 deg EIRP max 80.0 dBW G/T 37.3 dB/K Signal 2 Waveform DVB-S2 Modulation QPSK Bits per symbol 2 Spread Factor 1 Coding Rate 0.92 Channel Spacing 1.20 Symbol Rate 1.50E+07 Hz Data Rate (Data + Overhead) 2.40E+07 bps Information Rate (Data + Overhead) 2.40E+07 brz Occupied Bandwidth 1.80E+07 Hz Occupied Bandwidth 1.80E+07 Hz Occupied Bandwidth 2.04E+07 bps Power Equivelent Bandwidth 2.04E+07 btz Dubink 200.0 dB EIRP Spectral De	Antenna Type	TECOM	
EIRP max 42.4 dBW G/T 11.8 dB/K Satellite	Lat	33.8	deg
G/T 11.8 dB/K Satellite	Lon	-118.2	deg
Satellite GE-23 Longitude 172.0 deg Hub Earth Station 372.0 deg Site Brewster Lat 48.1 deg Lon -119.8 deg EIRP max 80.0 dBW G/T 37.3 dB/k Signal UWaveform Waveform DVB-52 Modulation QPSK Bits per symbol 2 Spread Factor 1 Coding Rate 0.80 Overhead Rate 0.92 Channel Spacing 1.20 Spectral Efficiency (Rate/Noise BW) 1.47 bps/Hz Data Rate 2.21E+07 bps Information Rate (Data + Overhead) 2.40E+07 Hz Chip Rate (Noise Bandwidth) 1.50E+07 Hz Occupied Bandwidth 1.80E+07 Hz C/N Threshold 5.1 dB Uplink Frequency Reck off 0.8 dB Power Equivelent Bandwidth 2.70E+07 Hz C/N Threshold 5.1 dB Uplink 1.00 dB	EIRP max	42.4	dBW
Name GE-23 Longitude 172.0 deg Hub Earth Station 372.0 deg Site Brewster Lat 48.1 deg Lon -119.8 deg EIRP max 80.0 dBW G/T 37.3 dB/K Signal Waveform Waveform DVB-52 Modulation QPSK Bits per symbol 2 Spread Factor 1 Coding Rate 0.80 Overhead Rate 0.92 Channel Spacing 1.20 Spectral Efficiency (Rate/Noise BW) 1.47 bps/Hz Data Rate 1.50E+07 Hz Ospectral Efficiency (Rate/Noise BW) 1.47 bps/Hz Data Rate 1.50E+07 Hz Chip Rate (Noise Bandwidth) 1.50E+07 Hz Occupied Bandwidth 1.80E+07 Hz Power Equivelent Bandwidth 1.80E+07 Hz Power Equivelent Bandwidth 2.078 dB Space Loss, Ls 207.8 dB Pointing Loss, Lpnt 0.0 dB Radome, Lr 0.0 dB Radome, Lr 0.0 dB </td <td>G/T</td> <td>11.8</td> <td>dB/K</td>	G/T	11.8	dB/K
Longitude 172.0 deg Hub Earth Station Site Site Brewster Lat 48.1 deg Lon -119.8 deg EIRP max 80.0 dBW G/T 37.3 dB/K Signal Waveform Waveform DVB-S2 Modulation QPSK Bits per symbol 2 Spread Factor 1 Coding Rate 0.80 Overhead Rate 0.92 Channel Spacing 1.20 Spectral Efficiency (Rate/Noise BW) 1.47 bps/Hz Data Rate 2.21E+07 bps Information Rate (Data + Overhead) 2.40E+07 bps Symbol Rate 1.50E+07 Hz Occupied Bandwidth 1.80E+07 Hz Occupied Bandwidth 2.80E+07 Hz Occupied Bandwidth 2.80E+07 Hz Opwer Equivelent Bandwidth 2.80E+07 Hz Opwer Equivelent Bandwidth 2.80E+07 Hz Opwer Equivelent Bandwidth 2.80E+07 Hz Synabol Rate 1.00 dB Erequency			
Hub Earth Station Site Brewster Lat 48.1 deg Lon -119.8 deg EIRP max 80.0 dBW G/T 37.3 dB/K Signal	Name	GE-23	
Site Brewster Lat 48.1 deg Lon -119.8 deg EIR max 80.0 dBW G/T 37.3 dB/K Signal		172.0	deg
Lat 48.1 deg Lon -119.8 deg EIRP max 80.0 dBW G/T 37.3 dB/K Signal Waveform Waveform DVB-52 Modulation QPSK Bits per symbol 2 Spread Factor 1 Coding Rate 0.80 Overhead Rate 0.92 Channel Spacing 1.20 Spectral Efficiency (Rate/Noise BW) 1.47 bps/Hz Data Rate 2.21E+07 bps Information Rate (Data + Overhead) 2.40E+07 bps Symbol Rate 1.50E+07 Hz Chip Rate (Noise Bandwidth) 1.50E+07 Hz C/N Threshold 2.70E+07 Hz C/N Threshold 5.1 dB Uplin Frequency 14.303 GHz Back off 0.8 dB EIRP Spectral Density 43.4 dBW/4kHz Share Loss, Ls 207.8 dB Pointing Loss, Lpnt 0.0 dB Transponder G/T @ Hub 1.0 dB/K Thermal Noise, C/No 94.2 dBHz C/(No+lo			1
Lon -119.8 deg EIRP max 80.0 dBW G/T 37.3 dB/K Signal U Vaveform DVB-S2 Modulation QPSK Bits per symbol 2 Spread Factor 1 Coding Rate 0.80 Overhead Rate 0.92 Channel Spacing 1.20 Spetral Efficiency (Rate/Noise BW) 1.47 bps/Hz Data Rate 2.21E+07 bps Information Rate (Data + Overhead) 2.40E+07 Hz Symbol Rate 1.50E+07 Hz Chip Rate (Noise Bandwidth) 1.50E+07 Hz Occupied Bandwidth 1.80E+07 Hz Orbink 2.70E+07 Hz Power Equivelent Bandwidth 2.70E+07 Hz Symbol Rate 1.50E+07 Hz Power Equivelent Bandwidth 1.80B Hz Symbol Rate 2.70E+07 Hz Symbol Rate 0.0 dB Hamspine Power Equivelent Bandwidth 1.803 GHz			
EIRP max 80.0 dBW G/T 37.3 dB/K Signal			0
G/T 37.3 dB/k Signal UVaeGorm Waveform DVB-S2 Modulation QPSK Bits per symbol 2 Spread Factor 1 Coding Rate 0.80 Overhead Rate 0.92 Channel Spacing 1.20 Spectral Efficiency (Rate/Noise BW) 1.47 bps/Hz Data Rate 2.21E+07 bps Information Rate (Data + Overhead) 2.40E+07 bps Symbol Rate 1.50E+07 Hz Chip Rate (Noise Bandwidth) 1.50E+07 Hz Occupied Bandwidth 1.80E+07 Hz Power Equivelent Bandwidth 2.70E+07 Hz C/N Threshold 5.1 dB Uplink Frequency 14.303 GHz Frequency 14.303 GHZ Sack off 0.8 dB EIRP Spectral Density 43.4 dBW/J4KHz Slant Range 41051 km Space Loss, Ls 207.8 dB Pointing Loss, Lpnt 0.0 dB Transponder G/T @ Hub 1.0 dB/K Thermal Noise, C/No 94.2 dBHz <td></td> <td></td> <td>0</td>			0
Signal DVB-52 Modulation QPSK Bits per symbol 2 Spread Factor 1 Coding Rate 0.80 Overhead Rate 0.92 Channel Spacing 1.20 Spectral Efficiency (Rate/Noise BW) 1.47 bps/Hz Data Rate 2.21E+07 bps Information Rate (Data + Overhead) 2.40E+07 bps Symbol Rate 1.50E+07 Hz Chip Rate (Noise Bandwidth) 1.50E+07 Hz Occupied Bandwidth 1.80E+07 Hz Power Equivelent Bandwidth 2.70E+07 Hz C/N Threshold 5.1 dB Uplink 7 Frequency 14.303 GHz Back off 0.8 dB EIRP Spectral Density 43.4 dBW/4kHz Slant Range 41051 km Space Loss, Ls 207.8 dB Pointing Loss, Lpnt 0.0 dB Transponder G/T @ Hub 1.0 dB/K Thermal Noise, C/No 94.2 dBHz C/(No+lo) 93.7 dBHz Satellite 90.0 dB <			
Waveform DVB-S2 Modulation QPSK Bits per symbol 2 Spread Factor 1 Coding Rate 0.80 Overhead Rate 0.92 Channel Spacing 1.20 Spectral Efficiency (Rate/Noise BW) 1.47 bps/Hz Data Rate 2.21E+07 bps Information Rate (Data + Overhead) 2.40E+07 Hz Chip Rate (Noise Bandwidth) 1.50E+07 Hz Occupied Bandwidth 1.80E+07 Hz Power Equivelent Bandwidth 2.70E+07 Hz Occupied Bandwidth 1.80E+07 Hz Power Equivelent Bandwidth 2.70E+07 Hz Optimk Frequency 14.303 GHz Back off 0.8 dB EIRP Spectral Density 43.4 dBW/4kHz Slant Range 41051 km Space Loss, Ls 207.8 dB Pointing Loss, Lpnt 0.0 dB Atmosphere / Weather Loss, La 6.7 dB Radome, Lr 0.0 dB/K Thermal Noise, C/NO 94.2 dBHz C/(No+lo) 93.7 dBHz S		57.5	UD/ N
ModulationQPSKBits per symbol2Spread Factor1Coding Rate0.80Overhead Rate0.92Channel Spacing1.20Spectral Efficiency (Rate/Noise BW)1.47 bps/HzData Rate2.21E+07 bpsInformation Rate (Data + Overhead)2.40E+07 bpsSymbol Rate1.50E+07 HzChip Rate (Noise Bandwidth)1.50E+07 HzOccupied Bandwidth1.80E+07 HzPower Equivelent Bandwidth2.70E+07 HzC/N Threshold5.1 dBUplinkFrequency14.303 GHzBack off0.8 dBEIRP Spectral Density43.4 dBW/4kHzSlant Range41051 kmSpace Loss, Ls207.8 dBPointing Loss, Lpnt0.0 dBAtmosphere / Weather Loss, La6.7 dBRadome, Lr0.0 dB/KThernal Noise, C/No94.2 dBHzC/(No+lo)3.7 dBHzSatellite-90.8 dBW/m2SFD @ Hub-87.9 dBW/m2Small Signal Gain (IBO/OBO)1.9 dBObownlink1.0 dB/KTransponder Sat. EIRP @ Terminal46.0 dBWD LPSD Limit12.5 dBW/4kHzCarrier EIRP @ Beam Peak40.7 dBWShart Range400796 kmSpace Loss, Ls20.5 y dBPointing Loss, Lpnt0.0 dBAtmosphere / Weather Loss, La0.0 dBC/(No+lo)78.4 dBW/2Shart Bille @ Terminal45.0 dBWC/(No Hig Dess, LPN @ Desm Peak47.7 dBWTran		DVB-S2	
Bits per symbol 2 Spread Factor 1 Coding Rate 0.80 Overhead Rate 0.92 Channel Spacing 1.20 Spectral Efficiency (Rate/Noise BW) 1.47 bps/Hz Data Rate 2.21E+07 bps Information Rate (Dat + Overhead) 2.40E+07 bps Symbol Rate 1.50E+07 Hz Chip Rate (Noise Bandwidth) 1.50E+07 Hz Occupied Bandwidth 2.70E+07 Hz C/N Threshold 5.1 dB Uplink 77E Frequency 14.303 GHz Back off 0.8 dB EIRP Spectral Density 43.4 dBW/4kHz Slant Range 41051 km Space Loss, Ls 207.8 dB Pointing Loss, Lpnt 0.0 dB Atmosphere / Weather Loss, La 6.7 dB Radome, Lr 0.0 dB Transponder G/T @ Hub 1.0 dB/K Thermal Noise, C/No 94.2 dBHz C/(No+lo) 9.3 dBW/m2 SFD @ Hub -87.9 dBW/m2 SrD @ Hub -90.8 dBW/m2 SrD @ Hub -90.8 dBW/m2 Srd			
Spread Factor 1 Coding Rate 0.80 Overhead Rate 0.92 Channel Spacing 1.20 Spectral Efficiency (Rate/Noise BW) 1.47 bps/Hz Data Rate 2.21E+07 bps Information Rate (Data + Overhead) 2.40E+07 bps Symbol Rate 1.50E+07 Hz Occupied Bandwidth 1.80E+07 Hz Occupied Bandwidth 2.70E+07 Hz Occupied Bandwidth 2.70E+07 Hz Occupied Bandwidth 2.70E+07 Hz Occupied Bandwidth 2.70E+07 Hz Power Equivelent Bandwidth 2.70E+07 Hz C/N Threshold 5.1 dB Uplink Frequency Back off 0.8 dB EIRP Spectral Density 43.4 dBW/4kHz Slant Range 41051 km Spointing Loss, Lpnt 0.0 dB Atmosphere / Weather Loss, La 6.7 dB Radome, Lr 0.0 dB Transponder G/T @ Hub 1.0 dB/K Thermal Noise, C/NO 94.2 dBHz C/(No+lo) 9.37 dBHz Satellite <td></td> <td>-</td> <td></td>		-	
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DownlinkFrequency11.503 GHzTransponder Sat. EIRP @ Beam Peak47.7 dBWTransponder Sat. EIRP @ Terminal46.0 dBWDL PSD Limit12.5 dBW/4kHzDL PSD @ Beam Peak10.9 dBW/4kHzCarrier EIRP @ Beam Peak46.7 dBWCarrier EIRP @ Terminal45.0 dBWSlant Range40796 kmSpace Loss, Ls205.9 dBPointing Loss, Lpnt0.0 dBAtmosphere / Weather Loss, La0.0 dBRadome, Lr0.5 dBPCMA Loss0.0 dBThermal Noise, C/No79.0 dBHzC/(No+Io)78.4 dBHzEnd to End C/(No+Io)78.2 dBHzImplementation Loss1.0 dBEnd to End C/N w/ Imp Loss5.5 dB	e , , ,		
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Transponder Sat. EIRP @ Terminal46.0 dBWDL PSD Limit12.5 dBW/4kHzDL PSD @ Beam Peak10.9 dBW/4kHzCarrier EIRP @ Beam Peak46.7 dBWCarrier EIRP @ Terminal45.0 dBWSlant Range40796 kmSpace Loss, Ls205.9 dBPointing Loss, Lpnt0.0 dBAtmosphere / Weather Loss, La0.0 dBRadome, Lr0.5 dBPCMA Loss0.0 dBThermal Noise, C/No79.0 dBHzC/(No+Io)78.4 dBHzEnd to End C/(No+Io)78.2 dBHzImplementation Loss1.0 dBEnd to End C/N w/ Imp Loss5.5 dB			
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Carrier EIRP @ Beam Peak46.7 dBWCarrier EIRP @ Terminal45.0 dBWSlant Range40796 kmSpace Loss, Ls205.9 dBPointing Loss, Lpnt0.0 dBAtmosphere / Weather Loss, La0.0 dBRadome, Lr0.5 dBPCMA Loss0.0 dBThermal Noise, C/No79.0 dBHzC/(No+Io)78.4 dBHzEnd to End1.0 dBEnd to End C/(No+Io)1.0 dBEnd to End C/N w/ Imp Loss5.5 dB			-
Slant Range40796 kmSpace Loss, Ls205.9 dBPointing Loss, Lpnt0.0 dBAtmosphere / Weather Loss, La0.0 dBRadome, Lr0.5 dBPCMA Loss0.0 dBThermal Noise, C/No79.0 dBHzC/(No+Io)78.4 dBHzEnd to End C/(No+Io)Fnd to End C/(No+Io)78.2 dBHzImplementation Loss1.0 dBEnd to End C/N w/ Imp Loss5.5 dB	Carrier EIRP @ Beam Peak		
Space Loss, Ls205.9 dBPointing Loss, Lpnt0.0 dBAtmosphere / Weather Loss, La0.0 dBRadome, Lr0.5 dBPCMA Loss0.0 dBThermal Noise, C/No79.0 dBHzC/(No+Io)78.4 dBHzEnd to EndEnd to End C/(No+Io)78.2 dBHzImplementation Loss1.0 dBEnd to End C/N w/ Imp Loss5.5 dB	-	45.0	dBW
Pointing Loss, Lpnt0.0 dBAtmosphere / Weather Loss, La0.0 dBRadome, Lr0.5 dBPCMA Loss0.0 dBThermal Noise, C/No79.0 dBHzC/(No+Io)78.4 dBHzEnd to EndEnd to End C/(No+Io)78.2 dBHzImplementation Loss1.0 dBEnd to End C/N w/ Imp Loss5.5 dB	Slant Range	40796	km
Atmosphere / Weather Loss, La0.0 dBRadome, Lr0.5 dBPCMA Loss0.0 dBThermal Noise, C/No79.0 dBHzC/(No+Io)78.4 dBHzEnd to EndEnd to End C/(No+Io)78.2 dBHzImplementation Loss1.0 dBEnd to End C/N w/ Imp Loss5.5 dB	Space Loss, Ls	205.9	dB
Radome, Lr0.5 dBPCMA Loss0.0 dBThermal Noise, C/No79.0 dBHzC/(No+Io)78.4 dBHzEnd to EndEnd to End C/(No+Io)78.2 dBHzImplementation Loss1.0 dBEnd to End C/N w/ Imp Loss5.5 dB	Pointing Loss, Lpnt	0.0	dB
PCMA Loss0.0 dBThermal Noise, C/No79.0 dBHzC/(No+Io)78.4 dBHzEnd to EndEnd to End C/(No+Io)Implementation Loss1.0 dBEnd to End C/N w/ Imp Loss5.5 dB	Atmosphere / Weather Loss, La	0.0	dB
Thermal Noise, C/No79.0 dBHzC/(No+Io)78.4 dBHzEnd to End78.2 dBHzEnd to End C/(No+Io)78.2 dBHzImplementation Loss1.0 dBEnd to End C/N w/ Imp Loss5.5 dB	Radome, Lr	0.5	dB
C/(No+lo)78.4 dBHzEnd to End78.2 dBHzEnd to End C/(No+lo)78.2 dBHzImplementation Loss1.0 dBEnd to End C/N w/ Imp Loss5.5 dB	PCMA Loss	0.0	dB
End to EndEnd to End C/(No+Io)78.2 dBHzImplementation Loss1.0 dBEnd to End C/N w/ Imp Loss5.5 dB	Thermal Noise, C/No	79.0	dBHz
End to End C/(No+Io)78.2 dBHzImplementation Loss1.0 dBEnd to End C/N w/ Imp Loss5.5 dB	C/(No+Io)	78.4	dBHz
Implementation Loss1.0 dBEnd to End C/N w/ Imp Loss5.5 dB			
End to End C/N w/ Imp Loss 5.5 dB			
Link Margin 0.4 dB			
	Link Margin	0.4	dB

eXConnect Terminal Antenna Type	TECOM
Lat	33.8 deg
Lon	-118.2 deg
EIRP max	42.4 dBW
G/T	11.8 dB/K
Satellite	
Name	GE-23
Longitude	172.0 deg
Hub Earth Station	
Site	Brewster
Lat	48.1 deg
Lon EIRP max	-119.8 deg 80.0 dBW
G/T	37.3 dB/K
Signal	57.5 db/k
Waveform	iDirect
Modulation	BPSK
Bits per symbol	1
Spread Factor	8
Coding Rate	0.67
Overhead Rate	0.72
Channel Spacing	1.20
Spectral Efficiency (Rate/Noise BW)	0.06 bps/Hz
Data Rate	4.03E+05 bps
Information Rate (Data + Overhead)	5.56E+05 bps
Symbol Rate	8.34E+05 Hz
Chip Rate (Noise Bandwidth)	6.67E+06 Hz
Occupied Bandwidth	8.00E+06 Hz
Power Equivelent Bandwidth	1.58E+05 Hz
C/N Threshold	-7.2 dB
Uplink	14.039 GHz
Frequency Back off	0.0 dB
EIRP Spectral Density	10.2 dBW/4kHz
Slant Range	40796 km
Space Loss, Ls	207.6 dB
Pointing Loss, Lpnt	0.0 dB
Atmosphere / Weather Loss, La	0.0 dB
-	
Radome, Lr	0.5 dB
Radome, Lr Transponder G/T @ Terminal	0.5 dB 0.8 dB/K
Transponder G/T @ Terminal	0.8 dB/K
Transponder G/T @ Terminal Thermal Noise, C/No	0.8 dB/K 63.6 dBHz 63.1 dBHz
Transponder G/T @ Terminal Thermal Noise, C/No C/(No+Io) Satellite Flux Density	0.8 dB/K 63.6 dBHz 63.1 dBHz -121.3 dBW/m2
Transponder G/T @ Terminal Thermal Noise, C/No C/(No+Io) Satellite Flux Density SFD @ Terminal	0.8 dB/K 63.6 dBHz 63.1 dBHz -121.3 dBW/m2 -88.8 dBW/m2
Transponder G/T @ Terminal Thermal Noise, C/No C/(No+Io) Satellite Flux Density SFD @ Terminal Small Signal Gain (IBO/OBO)	0.8 dB/K 63.6 dBHz 63.1 dBHz -121.3 dBW/m2 -88.8 dBW/m2 1.9 dB
Transponder G/T @ Terminal Thermal Noise, C/No C/(No+Io) Satellite Flux Density SFD @ Terminal Small Signal Gain (IBO/OBO) OBO	0.8 dB/K 63.6 dBHz 63.1 dBHz -121.3 dBW/m2 -88.8 dBW/m2
Transponder G/T @ Terminal Thermal Noise, C/No C/(No+Io) Satellite Flux Density SFD @ Terminal Small Signal Gain (IBO/OBO) OBO Downlink	0.8 dB/K 63.6 dBHz 63.1 dBHz -121.3 dBW/m2 -88.8 dBW/m2 1.9 dB 30.7 dB
Transponder G/T @ Terminal Thermal Noise, C/No C/(No+Io) Satellite Flux Density SFD @ Terminal Small Signal Gain (IBO/OBO) OBO Downlink Frequency	0.8 dB/K 63.6 dBHz 63.1 dBHz -121.3 dBW/m2 -88.8 dBW/m2 1.9 dB 30.7 dB
Transponder G/T @ Terminal Thermal Noise, C/No C/(No+Io) Satellite Flux Density SFD @ Terminal Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak	0.8 dB/K 63.6 dBHz 63.1 dBHz -121.3 dBW/m2 -88.8 dBW/m2 1.9 dB 30.7 dB 10.989 GHz 47.7 dBW
Transponder G/T @ Terminal Thermal Noise, C/No C/(No+Io) Satellite Flux Density SFD @ Terminal Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Hub	0.8 dB/K 63.6 dBHz 63.1 dBHz -121.3 dBW/m2 -88.8 dBW/m2 1.9 dB 30.7 dB 10.989 GHz 47.7 dBW 45.0 dBW
Transponder G/T @ Terminal Thermal Noise, C/No C/(No+Io) Satellite Flux Density SFD @ Terminal Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Hub DL PSD Limit	0.8 dB/K 63.6 dBHz 63.1 dBHz -121.3 dBW/m2 -88.8 dBW/m2 1.9 dB 30.7 dB 10.989 GHz 47.7 dBW 45.0 dBW 12.5 dBW/4kHz
Transponder G/T @ Terminal Thermal Noise, C/No C/(No+Io) Satellite Flux Density SFD @ Terminal Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Hub DL PSD Limit DL PSD @ Beam Peak	0.8 dB/K 63.6 dBHz 63.1 dBHz -121.3 dBW/m2 -88.8 dBW/m2 1.9 dB 30.7 dB 10.989 GHz 47.7 dBW 45.0 dBW
Transponder G/T @ Terminal Thermal Noise, C/No C/(No+Io) Satellite Flux Density SFD @ Terminal Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Hub DL PSD Limit	0.8 dB/K 63.6 dBHz 63.1 dBHz -121.3 dBW/m2 -88.8 dBW/m2 1.9 dB 30.7 dB 10.989 GHz 47.7 dBW 45.0 dBW 12.5 dBW/4kHz -15.2 dBW/4kHz
Transponder G/T @ Terminal Thermal Noise, C/No C/(No+Io) Satellite Flux Density SFD @ Terminal Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Hub DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak	0.8 dB/K 63.6 dBHz 63.1 dBHz -121.3 dBW/m2 -88.8 dBW/m2 1.9 dB 30.7 dB 10.989 GHz 47.7 dBW 45.0 dBW 12.5 dBW/4kHz -15.2 dBW/4kHz 17.0 dBW
Transponder G/T @ Terminal Thermal Noise, C/No C/(No+Io) Satellite Flux Density SFD @ Terminal Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Hub DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Hub	0.8 dB/K 63.6 dBHz 63.1 dBHz -121.3 dBW/m2 -88.8 dBW/m2 1.9 dB 30.7 dB 10.989 GHz 47.7 dBW 45.0 dBW 12.5 dBW/4kHz -15.2 dBW/4kHz 17.0 dBW 14.3 dBW
Transponder G/T @ Terminal Thermal Noise, C/No C/(No+Io) Satellite Flux Density SFD @ Terminal Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Hub DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Hub Slant Range	0.8 dB/K 63.6 dBHz 63.1 dBHz -121.3 dBW/m2 -88.8 dBW/m2 1.9 dB 30.7 dB 10.989 GHz 47.7 dBW 45.0 dBW 12.5 dBW/4kHz -15.2 dBW/4kHz 17.0 dBW 14.3 dBW 41051 km
Transponder G/T @ Terminal Thermal Noise, C/No C/(No+Io) Satellite Flux Density SFD @ Terminal Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Hub DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Hub Slant Range Space Loss, Ls	0.8 dB/K 63.6 dBHz 63.1 dBHz -121.3 dBW/m2 -88.8 dBW/m2 1.9 dB 30.7 dB 10.989 GHz 47.7 dBW 45.0 dBW 12.5 dBW/4kHz -15.2 dBW/4kHz 17.0 dBW 14.3 dBW 41051 km 205.5 dB
Transponder G/T @ Terminal Thermal Noise, C/No C/(No+Io) Satellite Flux Density SFD @ Terminal Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Hub DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Hub Slant Range Space Loss, Ls Pointing Loss, Lpnt	0.8 dB/K 63.6 dBHz 63.1 dBHz -121.3 dBW/m2 -88.8 dBW/m2 1.9 dB 30.7 dB 10.989 GHz 47.7 dBW 45.0 dBW 12.5 dBW/4kHz -15.2 dBW/4kHz 17.0 dBW 14.3 dBW 41051 km 205.5 dB 0.0 dB
Transponder G/T @ Terminal Thermal Noise, C/No C/(No+Io) Satellite Flux Density SFD @ Terminal Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Hub DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Hub Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La	0.8 dB/K 63.6 dBHz 63.1 dBHz -121.3 dBW/m2 -88.8 dBW/m2 1.9 dB 30.7 dB 10.989 GHz 47.7 dBW 45.0 dBW 12.5 dBW/4kHz -15.2 dBW/4kHz 17.0 dBW 14.3 dBW 41051 km 205.5 dB 0.0 dB 6.1 dB
Transponder G/T @ Terminal Thermal Noise, C/No C/(No+Io) Satellite Flux Density SFD @ Terminal Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Hub DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Hub Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No	0.8 dB/K 63.6 dBHz 63.1 dBHz -121.3 dBW/m2 -88.8 dBW/m2 1.9 dB 30.7 dB -10.989 GHz 47.7 dBW 45.0 dBW 12.5 dBW/4kHz -15.2 dBW/4kHz 17.0 dBW 14.3 dBW 41051 km 205.5 dB 0.0 dB 6.1 dB 0.0 dB 6.1 dB
Transponder G/T @ Terminal Thermal Noise, C/No C/(No+Io) Satellite Flux Density SFD @ Terminal Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Hub DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Hub Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No C/(No+Io)	0.8 dB/K 63.6 dBHz 63.1 dBHz -121.3 dBW/m2 -88.8 dBW/m2 1.9 dB 30.7 dB 10.989 GHz 47.7 dBW 45.0 dBW 12.5 dBW/4kHz -15.2 dBW/4kHz 17.0 dBW 14.3 dBW 41051 km 205.5 dB 0.0 dB 6.1 dB 0.0 dB 0.0 dB
Transponder G/T @ Terminal Thermal Noise, C/No C/(No+Io) Satellite Flux Density SFD @ Terminal Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Hub DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Hub Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No C/(No+Io) End to End	0.8 dB/K 63.6 dBHz 63.1 dBHz -121.3 dBW/m2 -88.8 dBW/m2 1.9 dB 30.7 dB -10.989 GHz 47.7 dBW 45.0 dBW 12.5 dBW/4kHz -15.2 dBW/4kHz 17.0 dBW 14.3 dBW 41051 km 205.5 dB 0.0 dB 6.1 dB 0.0 dB 0.0 dB 6.1 dB 0.0
Transponder G/T @ Terminal Thermal Noise, C/No C/(No+Io) Satellite Flux Density SFD @ Terminal Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Hub DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Hub Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No C/(No+Io) End to End End to End C/(No+Io)	0.8 dB/K 63.6 dBHz 63.1 dBHz -121.3 dBW/m2 -88.8 dBW/m2 1.9 dB 30.7 dB -10.989 GHz 47.7 dBW 45.0 dBW 12.5 dBW/4kHz -15.2 dBW/4kHz 17.0 dBW 14.3 dBW 41051 km 205.5 dB 0.0 dB 6.1 dB 0.0 dB 0.0 dB 6.1 dB 0.0
Transponder G/T @ Terminal Thermal Noise, C/No C/(No+Io) Satellite Flux Density SFD @ Terminal Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Hub DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Hub Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No C/(No+Io) End to End End to End C/(No+Io) Implementation Loss	0.8 dB/K 63.6 dBHz 63.1 dBHz -121.3 dBW/m2 -88.8 dBW/m2 1.9 dB 30.7 dB -10.989 GHz 47.7 dBW 45.0 dBW 12.5 dBW/4kHz -15.2 dBW/4kHz 17.0 dBW 14.3 dBW 41051 km 205.5 dB 0.0 dB 6.1 dB 0.0 dB 0.0 dB 6.1 dB 0.0 dB0.0 dB
Transponder G/T @ Terminal Thermal Noise, C/No C/(No+Io) Satellite Flux Density SFD @ Terminal Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Hub DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Hub Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No C/(No+Io) End to End End to End C/(No+Io)	0.8 dB/K 63.6 dBHz 63.1 dBHz -121.3 dBW/m2 -88.8 dBW/m2 1.9 dB 30.7 dB -10.989 GHz 47.7 dBW 45.0 dBW 12.5 dBW/4kHz -15.2 dBW/4kHz 17.0 dBW 14.3 dBW 41051 km 205.5 dB 0.0 dB 6.1 dB 0.0 dB 0.0 dB 6.1 dB 0.0

eXConnect Terminal		
Antenna Type	TECOM	
Lat	43.8	deg
Lon	-91.0	deg
EIRP max	42.4	dBW
G/T	11.8	dB/K
Satellite		
Name	IS29e	
Longitude	-50.0	deg
Hub Earth Station		
Site	Mountainside	
Lat	39.6	0
Lon	-77.76	0
EIRP max		dBW
G/T Signal	40.5	dB/K
Signal Waveform		
Modulation	DVB-S2 8PSK	
Bits per symbol	3	
Spread Factor	1	
Coding Rate	0.75	
Overhead Rate	0.92	
Channel Spacing	1.20	
Spectral Efficiency (Rate/Noise BW)		bps/Hz
Data Rate	7.77E+07	• •
Information Rate (Data + Overhead)	8.44E+07	
Symbol Rate	3.75E+07	-
Chip Rate (Noise Bandwidth)	3.75E+07	Hz
Occupied Bandwidth	4.50E+07	Hz
Power Equivelent Bandwidth	4.08E+07	Hz
C/N Threshold	8.5	dB
Uplink		
Frequency	6.663	GHz
Back off	11.7	dB
EIRP Spectral Density	36.6	dBW/4kHz
Slant Range	38106	km
Space Loss, Ls	200.5	
Pointing Loss, Lpnt	0.0	
Atmosphere / Weather Loss, La	0.6	
Radome, Lr	0.0	-
Transponder G/T @ Hub		dB/K
Thermal Noise, C/No	107.8	-
C/(No+lo)	107.3	dBHZ
Satellite		
Elux Doncity	96.0	dDW//m2
Flux Density		dBW/m2
SFD @ Hub	-77.0	dBW/m2
SFD @ Hub Small Signal Gain (IBO/OBO)	-77.0 2.0	dBW/m2 dB
SFD @ Hub Small Signal Gain (IBO/OBO) OBO	-77.0	dBW/m2 dB
SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink	-77.0 2.0 7.9	dBW/m2 dB dB
SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency	-77.0 2.0 7.9 11.888	dBW/m2 dB dB GHz
SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink	-77.0 2.0 7.9 11.888 61.6	dBW/m2 dB dB
SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak	-77.0 2.0 7.9 11.888 61.6 60.6	dBW/m2 dB dB GHz dBW
SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal	-77.0 2.0 7.9 11.888 61.6 60.6 14.0	dBW/m2 dB dB GHz dBW dBW
SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit	-77.0 2.0 7.9 11.888 61.6 60.6 14.0 14.0	dBW/m2 dB GHz dBW dBW dBW dBW/4kHz
SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak	-77.0 2.0 7.9 11.888 61.6 60.6 14.0 14.0 53.7	dBW/m2 dB dB GHz dBW dBW dBW/4kHz dBW/4kHz
SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak	-77.0 2.0 7.9 11.888 61.6 60.6 14.0 14.0 53.7	dBW/m2 dB dB GHz dBW dBW dBW/4kHz dBW/4kHz dBW/4kHz dBW
SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal	-77.0 2.0 7.9 11.888 61.6 60.6 14.0 14.0 53.7 52.7	dBW/m2 dB dB GHz dBW dBW dBW/4kHz dBW/4kHz dBW/4kHz dBW dBW km
SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range	-77.0 2.0 7.9 11.888 61.6 60.6 14.0 14.0 53.7 52.7 39062	dBW/m2 dB dB GHz dBW dBW dBW/4kHz dBW/4kHz dBW dBW km dB
SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls	-77.0 2.0 7.9 11.888 61.6 60.6 14.0 14.0 53.7 52.7 39062 205.8	dBW/m2 dB dB GHz dBW dBW dBW/4kHz dBW/4kHz dBW dBW km dB dB dB
SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt	-77.0 2.0 7.9 11.888 61.6 60.6 14.0 14.0 53.7 52.7 39062 205.8 0.0	dBW/m2 dB dB GHz dBW dBW dBW/4kHz dBW/4kHz dBW/4kHz dBW dBW km dB dB dB
SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La	-77.0 2.0 7.9 11.888 61.6 60.6 14.0 14.0 53.7 52.7 39062 205.8 0.0 0.0	dBW/m2 dB dB GHz dBW dBW dBW/4kHz dBW/4kHz dBW/4kHz dBW dBW km dB dB dB dB dB
SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr	-77.0 2.0 7.9 11.888 61.6 60.6 14.0 14.0 53.7 52.7 39062 205.8 0.0 0.0 0.5 0.0	dBW/m2 dB dB GHz dBW dBW dBW/4kHz dBW/4kHz dBW/4kHz dBW dBW km dB dB dB dB dB
SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss	-77.0 2.0 7.9 11.888 61.6 60.6 14.0 14.0 53.7 52.7 39062 205.8 0.0 0.0 0.5 0.0 86.8	dBW/m2 dB dB GHz dBW dBW dBW/4kHz dBW/4kHz dBW/4kHz dBW dBW km dB dB dB dB dB dB dB
SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No C/(No+Io) End to End	-77.0 2.0 7.9 11.888 61.6 60.6 14.0 14.0 53.7 52.7 39062 205.8 0.0 0.0 0.0 0.5 0.0 86.8 85.7	dBW/m2 dB dB GHz dBW dBW dBW/4kHz dBW/4kHz dBW/4kHz dBW dBW km dB dB dB dB dB dB dB dB dB dB dB dB dB
SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No C/(No+Io) End to End End to End C/(No+Io)	-77.0 2.0 7.9 11.888 61.6 60.6 14.0 14.0 53.7 52.7 39062 205.8 0.0 0.0 0.0 0.5 0.0 86.8 85.7	dBW/m2 dB dB GHz dBW dBW dBW/4kHz dBW/4kHz dBW/4kHz dBW dBW km dB dB dB dB dB dB dB dB dB dB dB dB dB
SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No C/(No+Io) End to End End to End C/(No+Io) Implementation Loss	-77.0 2.0 7.9 11.888 61.6 60.6 14.0 14.0 53.7 52.7 39062 205.8 0.0 0.0 0.0 0.0 0.5 0.0 86.8 85.7 1.0	dBW/m2 dB dB GHz dBW dBW dBW/4kHz dBW/4kHz dBW/4kHz dBW dBW km dB dB dB dB dB dB dB dB dB dB dB dB dB
SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No C/(No+Io) End to End End to End C/(No+Io)	-77.0 2.0 7.9 11.888 61.6 60.6 14.0 14.0 53.7 52.7 39062 205.8 0.0 0.0 0.0 0.5 0.0 86.8 85.7	dBW/m2 dB dB GHz dBW dBW dBW dBW/4kHz dBW/4kHz dBW/4kHz dBW dBW dB dB dB dB dB dB dB dB dB dB dB dB dB

eXConnect Terminal		
Antenna Type	TECOM	
Lat	43.8	deg
Lon	-91.0	0
EIRP max		dBW
G/T		dB/K
Satellite		<i>+=1</i>
Name	IS29e	
Longitude	-50.0	deg
Hub Earth Station		
Site	Mountainside	
Lat	39.6	deg
Lon	-77.76	deg
EIRP max	88.0	dBW
G/T	40.5	dB/K
Signal		
Waveform	iDirect	
Modulation	QPSK	
Bits per symbol	2	
Spread Factor	1	
Coding Rate	0.86	
Overhead Rate	0.87	
Channel Spacing	1.20	
Spectral Efficiency (Rate/Noise BW)		bps/Hz
Data Rate	9.94E+06	
Information Rate (Data + Overhead)	1.14E+07	•
Symbol Rate	6.67E+06	
Chip Rate (Noise Bandwidth)	6.67E+06	Hz
Occupied Bandwidth	8.00E+06	Hz
Power Equivelent Bandwidth	2.17E+06	Hz
C/N Threshold	7.5	dB
Uplink		
Frequency	14.363	GHz
Back off	0.0	-
EIRP Spectral Density		dBW/4kHz
Slant Range	39062	
Space Loss, Ls	207.4	
Pointing Loss, Lpnt	0.0	
Atmosphere / Weather Loss, La	0.0	
Radome, Lr	0.5	
Transponder G/T @ Terminal		dB/K
Thermal Noise, C/No		dBHz
C/(No+Io)	77.8	dBHz
Satellite		1011/ 0
Flux Density		dBW/m2
SFD @ Terminal		dBW/m2
Small Signal Gain (IBO/OBO)	2.0	
OBO Downlink	26.7	uB
Downlink Frequency	12.224	CH1
Frequency Transponder Sat. EIRP @ Beam Peak		dBW
Transponder Sat. EIRP @ Hub DL PSD Limit		dBW dBW/4kHz
DL PSD Limit DL PSD @ Beam Peak		dBW/4kHz dBW/4kHz
Carrier EIRP @ Beam Peak		dBW/4KHZ dBW
Carrier EIRP @ Beam Peak Carrier EIRP @ Hub		dBW dBW
Slant Range	38106	
Space Loss, Ls	205.8	
Pointing Loss, Lpnt	205.8	
Atmosphere / Weather Loss, La	0.0 4.1	
Radome, Lr	4.1 0.0	
PCMA Loss	0.0	
Thermal Noise, C/No		ав dBHz
C/(No+lo)		
End to End	83.4665	uDHZ
End to End C/(No+Io)	76 ହ	dBHz
Implementation Loss	0.0	
End to End C/N w/ Imp Loss	8.6	
to End of 1 w/ mp E033		
Link Margin	1.1	dB I

Antenna Type TECOM Lat 9.9 deg Lon -79.1 deg EIRP max 42.4 dBW G/T 11.8 dB/K Satellite	eXConnect Terminal		
Lon -79.1 deg EIRP max 42.4 dBW G/T 11.8 dB/K Satellite -37.6 deg Name Telstar 11N Longitude -37.6 deg Lat 50.94 deg Lon 6.96 deg EIRP max 80.0 dBW G/T 34.4 dB/K Signal VV8-52 Modulation QPSK Bits per symbol 2 Spread Factor 1 Coding Rate 0.60 Overhead Rate 0.94 Chip Rate (Data + Overhead) 3.60E+07 Hz Data Rate 3.38E+07 bps Information Rate (Data + Overhead) 3.60E+07 Hz Overhead Rate 0.94 Chip Rate (Noise Bandwidth) 3.00E+07 Hz Power Equivelent Bandwidth 3.00E+07 Hz Spread Cos, Is	Antenna Type	TECOM	
EIRP max 42.4 dBW G/T 11.8 dB/k Satellite	Lat	9.9	deg
G/T 11.8 dB/K Satellite	Lon	-79.1	deg
SatelliteNameTelstar 11NLongitude-37.6 degHub Earth StationSiteSiteCologneLat50.94 degLon6.96 degEIRP max80.0 dBWG/T34.4 dB/KSignalWaveformWaveformDVB-S2ModulationQPSKBits per symbol2Spread Factor1Coding Rate0.60Overhead Rate0.94Channel Spacing1.20Spectral Efficiency (Rate/Noise BW)1.13 bps/HzData Rate3.360E+07 bpsInformation Rate (Data + Overhead)3.60E+07 HzCoccupied Bandwidth)3.00E+07 HzOccupied Bandwidth3.60E+07 HzOccupied Bandwidth3.60E+07 HzPower Equivelent Bandwidth5.40E+07 HzCyn Threshold2.7 dBUplinkTequencyFrequency14.090 GHzBack off7.9 dBEIRP Spectral Density3.3.4 dBW/4kHzSlant Range39711 kmSpace Loss, L5207.4 dBPointing Loss, L010.0 dB/KTransponder G/T @ Hub7.0 dB/KTransponder Sat. EIRP @ Terminal50.0 dBWShall Signal Gain (IBO/OBO)2.0 dBOBO0.5 dBDownlink11.790 GHzFrequency11.790 GHzTransponder Sat. EIRP @ Terminal50.0 dBWShall Signal Gain (IBO/OBO)2.0 dBOBO0.5 dBDownlink11.790 GHz <td>EIRP max</td> <td>42.4</td> <td>dBW</td>	EIRP max	42.4	dBW
NameTelstar 11NLongitude-37.6 degHub Earth StationSiteLat50.94 degLan6.96 degEIRP max80.0 dBWG/T34.4 dB/KSignalWaveformWaveformDVB-52ModulationQPSKBits per symbol2Spread Factor1Coding Rate0.60Overhead Rate0.94Channel Spacing1.20Spectral Efficiency (Rate/Noise BW)1.13 bps/HzData Rate3.00E+07 bpsInformation Rate (Data + Overhead)3.60E+07 bpsSymbol Rate3.00E+07 HzChip Rate (Noise Bandwidth)3.00E+07 HzOccupied Bandwidth3.00E+07 HzPower Equivelent Bandwidth2.7 dBUplinkTerequencyFrequency14.090 GHzBack off7.9 dBEIRP Spectral Density33.4 dBW/4kHzSlant Range39711 kmSpace Loss, Ls207.4 dBPointing Loss, Lpnt0.0 dBAtmosphere / Weather Loss, La3.2 dBRadome, Lr0.0 dB/KTransponder Sat. EIRP @ Beam Peak51.0 dBW/m2Sradille11.790 GHzFrequency11.790 GHzTransponder Sat. EIRP @ Terminal50.0 dBWDL PSD Emmal50.0 dBWDL PSD Emmal50.0 dBWCrive P @ Beam Peak51.0 dBWTransponder Sat. EIRP @ Terminal50.0 dBWDL PSD Emmal50.0 dBWCarrier EIRP @ Beam Peak51.0	G/T	11.8	dB/K
Longitude -37.6 deg Hub Earth Station Site Site Cologne Lat 50.94 deg Lon 6.96 deg EIRP max 80.0 dBW G/T 34.4 dB/K Signal Waveform Waveform DVB-52 Modulation QPSK Bits per symbol 2 Spread Factor 1 Coding Rate 0.60 Overhead Rate 0.94 Channel Spacing 1.20 Spectral Efficiency (Rate/Noise BW) 1.13 bps/Hz Data Rate 3.36E+07 bps Information Rate (Data + Overhead) 3.60E+07 Hz Chip Rate (Noise Bandwidth) 3.00E+07 Hz Occupied Bandwidth 5.40E+07 Hz Power Equivelent Bandwidth 5.40E+07 Hz Power Equivelent Bandwidth 5.40E+07 Hz C/N Threshold 2.7 dB Uplink Frequency Frequency 14.090 GHz Back off 7.9 dB EIR Spectral Density 33.4 dBW/4k	Satellite		
Hub Earth Station Site Cologne Lat 50.94 deg Lon 6.96 deg EIRP max 80.0 dBW G/T 34.4 dB/K Signal Waveform Waveform DVB-S2 Modulation QPSK Bits per symbol 2 Spread Factor 1 Coding Rate 0.60 Overhead Rate 0.94 Channel Spacing 1.20 Spectral Efficiency (Rate/Noise BW) 1.13 bps/Hz Data Rate 3.00E+07 Hz Chip Rate (Noise Bandwidth) 3.00E+07 Hz Occupied Bandwidth 5.40E+07 Hz Occupied Bandwidth 5.40E+07 Hz Orkink T42 Power Equivelent Bandwidth 5.40E+07 Hz Orkink T42 Power Equivelent Bandwidth 5.40E+07 Hz Spectral Density 33.4 dBW/4kHz Slant Range 39711 km Space Loss, Ls 207.4 dB Pointing Loss, Lpnt 0.0 dB Trans	Name	Telstar 11N	
Site Cologne Lat 50.94 deg Lon 6.96 deg EIRP max 80.0 dBW G/T 34.4 dB/K Signal DVB-52 Modulation QPSK Bits per symbol 2 Spread Factor 1 Coding Rate 0.60 Overhead Rate 0.94 Channel Spacing 1.20 Spectral Efficiency (Rate/Noise BW) 1.13 bps/Hz Data Rate 3.30E+07 bps Information Rate (Data + Overhead) 3.60E+07 Ps Symbol Rate 3.00E+07 Hz Occupied Bandwidth 3.60E+07 Hz Occupied Bandwidth 5.40E+07 Hz Orwer Equivelent Bandwidth 5.40E+07 Hz Ozcupied Bandwidth 5.40E+07 Hz Orwer Equivelent Bandwidth 5.40E+07 Hz Ozcupied Bandwidth 5.40E+07 Hz Ozcupied Bandwidth 5.40E+07 Hz Ozcupied Bandwidth 5.40E+07 Hz Sate IRP Spectral Density 33.4 dBW/4kHz Slant Range 39711 km <t< td=""><td></td><td>-37.6</td><td>deg</td></t<>		-37.6	deg
Lat 50.94 deg Lon 6.96 deg EIRP max 80.0 dBW G/T 34.4 dB/K Signal DVB-52 Modulation QPSK Bits per symbol 2 Spread Factor 1 Coding Rate 0.60 Overhead Rate 0.94 Channel Spacing 1.20 Spectral Efficiency (Rate/Noise BW) 1.13 bps/Hz Data Rate 3.38E+07 bps Information Rate (Data + Overhead) 3.60E+07 Hz Chip Rate (Noise Bandwidth) 3.00E+07 Hz Occupied Bandwidth 5.40E+07 Hz C/N Threshold 2.7 dB Uplink Frequency Frequency 14.090 GHz Back off 7.9 dB EIRP Spectral Density 33.4 dBW/4kHz Slant Range 39711 km Space Loss, Ls 207.4 dB Pointing Loss, Lpnt 0.0 dB Transponder SAt. EIRP @ Hub 7.0 dB/K Thermal Noise, C/No 97.1 dBHz C/(No+lo) <td< td=""><td></td><td></td><td></td></td<>			
Lon 6.96 deg EIRP max 80.0 dBW G/T 34.4 dB/K Signal Waveform DVB-S2 Modulation QP5K Bits per symbol 2 Spread Factor 1 Coding Rate 0.60 Overhead Rate 0.94 Channel Spacing 1.20 Spectral Efficiency (Rate/Noise BW) 1.13 bps/Hz Data Rate 3.38E+07 bps Information Rate (Data + Overhead) 3.60E+07 bps Symbol Rate 3.00E+07 Hz Chip Rate (Noise Bandwidth) 3.00E+07 Hz Occupied Bandwidth 3.60E+07 Hz Occupied Bandwidth 3.60E+07 Hz C/N Threshold 2.7 dB Uplink Frequency 14.090 GHz Back off 7.9 dB EIRP Spectral Density 33.4 dBW/4kHz Slant Range 39711 km Space Loss, Ls 2.0 dB Pointing Loss, Lpnt 0.0 dB Atmosphere / Weather Loss, La 3.2 dB <td< td=""><td></td><td></td><td></td></td<>			
EIRP max 80.0 dBW G/T 34.4 dB/K Signal Vaveform Waveform DVB-52 Modulation QPSK Bits per symbol 2 Spread Factor 1 Coding Rate 0.60 Overhead Rate 0.94 Channel Spacing 1.20 Spectral Efficiency (Rate/Noise BW) 1.13 bps/Hz Data Rate 3.38E+07 bps Information Rate (Data + Overhead) 3.60E+07 Hz Chip Rate (Noise Bandwidth) 3.00E+07 Hz Occupied Bandwidth 3.60E+07 Hz Power Equivelent Bandwidth 5.40E+07 Hz C/N Threshold 2.7 dB Uplink Prequency Frequency 14.090 GHz Back off 7.9 dB EIRP Spectral Density 33.4 dBW/4kHz Slant Range 39711 km Space Loss, Ls 207.4 dB Pointing Loss, Lpnt 0.0 dB Transponder G/T @ Hub 7.0 dB/K Thermal Noise, C/No 97.1 dBHz C/			-
G/T 34.4 dB/K Signal Vieweform Waveform QPSK Bits per symbol 2 Spread Factor 1 Coding Rate 0.60 Overhead Rate 0.94 Channel Spacing 1.20 Spectral Efficiency (Rate/Noise BW) 1.13 bps/Hz Data Rate 3.38E+07 bps Information Rate (Data + Overhead) 3.60E+07 bps Symbol Rate 3.00E+07 Hz Chip Rate (Noise Bandwidth) 3.00E+07 Hz Occupied Bandwidth 3.60E+07 Hz C/In Threshold 2.7 dB Uplink Frequency 14.090 GHz Frequency 14.090 GHz Back off 7.9 dB EIRP Spectral Density 33.4 dBW/4kHz Slant Range 39711 km Space Loss, Ls 207.4 dB Pointing Loss, Lpnt 0.0 dB Atmosphere / Weather Loss, La 3.2 dB Radome, Lr 0.0 dB Thermal Noise, C/No 97.1 dBHz C/(No+lo) 96.6 dBHz			0
Signal DVB-S2 Modulation QPSK Bits per symbol 2 Spread Factor 1 Coding Rate 0.60 Overhead Rate 0.94 Channel Spacing 1.20 Spectral Efficiency (Rate/Noise BW) 1.13 bps/Hz Data Rate 3.38E+07 bps Information Rate (Data + Overhead) 3.00E+07 Hz Chip Rate (Noise Bandwidth) 3.00E+07 Hz Coupied Bandwidth 3.60E+07 Hz Occupied Bandwidth 5.40E+07 Hz C/N Threshold 2.7 dB Uplink Tequency Frequency 14.090 GHz Back off 7.9 dB EIRP Spectral Density 33.4 dBW/4kHz Slant Range 39711 km Space Loss, Ls 207.4 dB Pointing Loss, Lpnt 0.0 dB Atmosphere / Weather Loss, La 3.2 dB Radome, Lr 0.0 dB Thermal Noise, C/No 97.1 dBHz C/(No+lo) 96.6 dBHz Shallignal Gain (IBO/OBO) 2.0 dB <t< td=""><td></td><td></td><td></td></t<>			
Waveform DVB-S2 Modulation QPSK Bits per symbol 2 Spread Factor 1 Coding Rate 0.60 Overhead Rate 0.94 Channel Spacing 1.20 Spectral Efficiency (Rate/Noise BW) 1.13 bps/Hz Data Rate 3.38E+07 bps Information Rate (Data + Overhead) 3.60E+07 Hz Chip Rate (Noise Bandwidth) 3.00E+07 Hz Occupied Bandwidth 3.60E+07 Hz Power Equivelent Bandwidth 5.40E+07 Hz C/N Threshold 2.7 dB Uplink Frequency Frequency 14.090 GHz Back off 7.9 dB EIRP Spectral Density 33.4 dBW/4kHz Slant Range 39711 km Space Loss, Ls 207.4 dB Pointing Loss, Lpnt 0.0 dB Atmosphere / Weather Loss, La 3.2 dB Radome, Lr 0.0 dB/K Thermal Noise, C/No 97.1 dBHz C/(No+lo) 96.6 dBHz Satelite 11.790 GHz <		34.4	dB/K
ModulationQPSKBits per symbol2Spread Factor1Coding Rate0.60Overhead Rate0.94Channel Spacing1.20Spectral Efficiency (Rate/Noise BW)1.13 bps/HzData Rate3.38E+07 bpsInformation Rate (Data + Overhead)3.60E+07 bpsSymbol Rate3.00E+07 HzChip Rate (Noise Bandwidth)3.00E+07 HzOccupied Bandwidth3.60E+07 HzPower Equivelent Bandwidth5.40E+07 HzC/N Threshold2.7 dBUplinkFrequency14.090 GHzBack off7.9 dBEIRP Spectral Density33.4 dBW/4kHzSlant Range39711 kmSpace Loss, Ls207.4 dBPointing Loss, Lpnt0.0 dBTransponder G/T @ Hub7.0 dB/KThermal Noise, C/No97.1 dBHzStelliteFlux Density-94.0 dBW/m2SFD @ Hub-91.5 dBW/m2Small Signal Gain (IBO/OBO)2.0 dBOBO0.5 dBDownlink11.790 GHzTransponder Sat. EIRP @ Beam Peak51.0 dBWTransponder Sat. EIRP @ Terminal50.0 dBWDL PSD @ Beam Peak11.7 dBW/4kHzCarrier EIRP @ Beam Peak50.5 dBWSlant Range37711 kmSpace Loss, Ls20.5 dBDownlink0.0 dBTransponder Sat. EIRP @ Terminal50.0 dBWDL PSD @ Beam Peak50.5 dBWSlant Range37711 kmSpace Loss, Ls20.5 dBPO	-		
Bits per symbol 2 Spread Factor 1 Coding Rate 0.60 Overhead Rate 0.94 Channel Spacing 1.20 Spectral Efficiency (Rate/Noise BW) 1.13 bps/Hz Data Rate 3.38E+07 bps Information Rate (Data + Overhead) 3.60E+07 Hz Chip Rate 3.00E+07 Hz Chip Rate (Noise Bandwidth) 3.00E+07 Hz Power Equivelent Bandwidth 5.40E+07 Hz C/N Threshold 2.7 dB Uplink Trequency Frequency 14.090 GHz Back off 7.9 dB EIRP Spectral Density 33.4 dBW/4kHz Slant Range 39711 km Space Loss, Ls 207.4 dB Pointing Loss, Lpnt 0.0 dB Atmosphere / Weather Loss, La 3.2 dB Radome, Lr 0.0 dB/K Thermal Noise, C/No 97.1 dBHz C/(No+to) 96.6 dBHz SFD @ Hub -91.5 dBW/m2 SFD @ Hub -91.5 dBW/m2 Small Signal Gain (IBO/OBO) 2.0 d			
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Transponder Sat. EIRP @ Terminal50.0 dBWDL PSD Limit13.0 dBW/4kHzDL PSD @ Beam Peak11.7 dBW/4kHzCarrier EIRP @ Beam Peak50.5 dBWCarrier EIRP @ Terminal49.5 dBWSlant Range37711 kmSpace Loss, Ls205.4 dBPointing Loss, Lpnt0.0 dBAtmosphere / Weather Loss, La0.0 dBRadome, Lr0.5 dBPCMA Loss0.0 dBThermal Noise, C/No84.0 dBHzC/(No+Io)79.1 dBHzEnd to End C/(No+Io)79.1 dBHzImplementation Loss1.0 dBEnd to End C/N w/ Imp Loss3.3 dB			
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Carrier EIRP @ Terminal49.5 dBWSlant Range37711 kmSpace Loss, Ls205.4 dBPointing Loss, Lpnt0.0 dBAtmosphere / Weather Loss, La0.0 dBRadome, Lr0.5 dBPCMA Loss0.0 dBThermal Noise, C/No84.0 dBHzC/(No+lo)79.1 dBHzEnd to End C/(No+lo)79.1 dBHzImplementation Loss1.0 dBEnd to End C/N w/ Imp Loss3.3 dB			
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Space Loss, Ls205.4 dBPointing Loss, Lpnt0.0 dBAtmosphere / Weather Loss, La0.0 dBRadome, Lr0.5 dBPCMA Loss0.0 dBThermal Noise, C/No84.0 dBHzC/(No+lo)79.1 dBHzEnd to EndEnd to End C/(No+lo)Thermation Loss1.0 dBEnd to End C/N w/ Imp Loss3.3 dB			-
Pointing Loss, Lpnt0.0 dBAtmosphere / Weather Loss, La0.0 dBRadome, Lr0.5 dBPCMA Loss0.0 dBThermal Noise, C/No84.0 dBHzC/(No+lo)79.1 dBHzEnd to EndEnd to End C/(No+lo)Tend to End C/(No+lo)79.1 dBHzImplementation Loss1.0 dBEnd to End C/N w/ Imp Loss3.3 dB	_		
Atmosphere / Weather Loss, La0.0 dBRadome, Lr0.5 dBPCMA Loss0.0 dBThermal Noise, C/No84.0 dBHzC/(No+Io)79.1 dBHzEnd to EndEnd to End C/(No+Io)79.1 dBHzImplementation Loss1.0 dBEnd to End C/N w/ Imp Loss3.3 dB		0.0	dB
Radome, Lr 0.5 dB PCMA Loss 0.0 dB Thermal Noise, C/No 84.0 dBHz C/(No+lo) 79.1 dBHz End to End 79.1 dBHz End to End C/(No+lo) 79.1 dBHz Implementation Loss 1.0 dB End to End C/N w/ Imp Loss 3.3 dB			
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End to End End to End C/(No+Io) 79.1 dBHz Implementation Loss 1.0 dB End to End C/N w/ Imp Loss 3.3 dB	Thermal Noise, C/No	84.0	dBHz
End to End C/(No+Io)79.1 dBHzImplementation Loss1.0 dBEnd to End C/N w/ Imp Loss3.3 dB	C/(No+lo)	79.1	dBHz
Implementation Loss1.0 dBEnd to End C/N w/ Imp Loss3.3 dB	End to End		
End to End C/N w/ Imp Loss 3.3 dB	End to End C/(No+lo)	79.1	dBHz
	Implementation Loss	1.0	dB
Link Margin 0.6 dB	End to End C/N w/ Imp Loss	3.3	dB
	Link Margin	0.6	dB

eXConnect Terminal		
Antenna Type	TECOM	
Lat		deg
Lon	-79.1	0
EIRP max		dBW
G/T	11.8	dB/K
Satellite Name	Telstar 11N	
Longitude	-37.6	dea
Hub Earth Station	57.0	ucb
Site	Cologne	
Lat	50.94	deg
Lon	6.96	deg
EIRP max	80.0	dBW
G/T	34.4	dB/K
Signal		
Waveform Modulation	iDirect BPSK	
Bits per symbol	брэк 1	
Spread Factor	2	
Coding Rate	0.67	
Overhead Rate	0.72	
Channel Spacing	1.20	
Spectral Efficiency (Rate/Noise BW)	0.24	bps/Hz
Data Rate	1.61E+06	bps
Information Rate (Data + Overhead)	2.22E+06	bps
Symbol Rate	3.33E+06	
Chip Rate (Noise Bandwidth)	6.67E+06	
Occupied Bandwidth	8.00E+06	
Power Equivelent Bandwidth	2.66E+05	
C/N Threshold Uplink	-1.2	aв
Frequency	14.090	GH7
Back off	0.0	
EIRP Spectral Density		dBW/4kHz
Slant Range	37711	
Space Loss, Ls	207.0	dB
Pointing Loss, Lpnt	0.0	dB
Atmosphere / Weather Loss, La	0.0	dB
Radome, Lr	0.5	dB
Transponder G/T @ Terminal		dB/K
Thermal Noise, C/No		dBHz
C/(No+lo)	69.0	dBHz
Satellite Flux Density	-120.7	dBW/m2
SFD @ Terminal		dBW/m2
Small Signal Gain (IBO/OBO)	2.0	-
ОВО	26.1	dB
Downlink		
Frequency	12.590	GHz
Transponder Sat. EIRP @ Beam Peak	52.0	dBW
Transponder Sat. EIRP @ Hub		dBW
DL PSD Limit		dBW/4kHz
DL PSD @ Beam Peak		dBW/4kHz
Carrier EIRP @ Beam Peak		dBW
Carrier EIRP @ Hub Slant Range	25.9 39711	dBW km
Space Loss, Ls	206.4	
Pointing Loss, Lpnt	200.4	
Atmosphere / Weather Loss, La	4.1	
Radome, Lr	0.0	
PCMA Loss	0.0	
Thermal Noise, C/No		dBHz
merma noise, C/NO		-IDU-
C/(No+lo)	75.9342	abhz
C/(No+lo) End to End		
C/(No+lo) End to End End to End C/(No+lo)	68.2	dBHz
C/(No+lo) End to End End to End C/(No+lo) Implementation Loss	68.2 0.0	dBHz dB
C/(No+lo) End to End End to End C/(No+lo)	68.2	dBHz dB dB

eXConnect Terminal		
Antenna Type	TECOM	
Lat	47.8	deg
Lon	-129.2	deg
EIRP max	42.4	dBW
G/T	11.8	dB/K
Satellite		
Name	Yamal-300K	
Longitude	183.0	deg
Hub Earth Station		
Site	Brewster	
Lat	48.1	0
Lon EIRP max	-119.8	deg dBW
G/T		dB/K
Signal	50.8	UB/K
Waveform	DVB-S2	
Modulation	16APSK	
Bits per symbol	10/11 5/1	
Spread Factor	1	
Coding Rate	0.67	
Overhead Rate	0.94	
Channel Spacing	1.20	
Spectral Efficiency (Rate/Noise BW)	2.50	bps/Hz
Data Rate	6.49E+07	bps
Information Rate (Data + Overhead)	6.93E+07	bps
Symbol Rate	2.60E+07	Hz
Chip Rate (Noise Bandwidth)	2.60E+07	Hz
Occupied Bandwidth	3.12E+07	Hz
Power Equivelent Bandwidth	6.46E+07	Hz
C/N Threshold	9.6	dB
Uplink		
Frequency	14.380	
Back off	5.1	
EIRP Spectral Density		dBW/4kHz
Slant Range	40299	
Space Loss, Ls	207.7	
Pointing Loss, Lpnt	0.0	aB
Atmosphere / Masther Less La	2.2	dD
Atmosphere / Weather Loss, La	3.2	-
Radome, Lr	0.0	dB
Radome, Lr Transponder G/T @ Hub	0.0 5.0	dB dB/K
Radome, Lr Transponder G/T @ Hub Thermal Noise, C/No	0.0 5.0 97.5	dB dB/K dBHz
Radome, Lr Transponder G/T @ Hub Thermal Noise, C/No C/(No+Io)	0.0 5.0 97.5	dB dB/K
Radome, Lr Transponder G/T @ Hub Thermal Noise, C/No C/(No+Io) Satellite	0.0 5.0 97.5 97.0	dB dB/K dBHz dBHz
Radome, Lr Transponder G/T @ Hub Thermal Noise, C/No C/(No+Io) Satellite Flux Density	0.0 5.0 97.5 97.0 -91.5	dB dB/K dBHz dBHz dBW/m2
Radome, Lr Transponder G/T @ Hub Thermal Noise, C/No C/(No+Io) Satellite Flux Density SFD @ Hub	0.0 5.0 97.5 97.0 -91.5	dB dB/K dBHz dBHz dBW/m2 dBW/m2
Radome, Lr Transponder G/T @ Hub Thermal Noise, C/No C/(No+Io) Satellite Flux Density	0.0 5.0 97.5 97.0 -91.5 -87.0	dB dB/K dBHz dBHz dBW/m2 dBW/m2 dB
Radome, Lr Transponder G/T @ Hub Thermal Noise, C/No C/(No+Io) Satellite Flux Density SFD @ Hub Small Signal Gain (IBO/OBO)	0.0 5.0 97.5 97.0 -91.5 -87.0 3.0	dB dB/K dBHz dBHz dBW/m2 dBW/m2 dB
Radome, Lr Transponder G/T @ Hub Thermal Noise, C/No C/(No+Io) Satellite Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO	0.0 5.0 97.5 97.0 -91.5 -87.0 3.0	dB dB/K dBHz dBHz dBW/m2 dBW/m2 dB dB
Radome, Lr Transponder G/T @ Hub Thermal Noise, C/No C/(No+Io) Satellite Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink	0.0 5.0 97.5 97.0 -91.5 -87.0 3.0 1.5 -11.580	dB dB/K dBHz dBHz dBW/m2 dBW/m2 dB dB
Radome, Lr Transponder G/T @ Hub Thermal Noise, C/No C/(No+Io) Satellite Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency	0.0 5.0 97.5 97.0 -91.5 -87.0 3.0 1.5 -11.580 53.6	dB dB/K dBHz dBHz dBW/m2 dB dB dB GHz
Radome, Lr Transponder G/T @ Hub Thermal Noise, C/No C/(No+Io) Satellite Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak	0.0 5.0 97.5 97.0 -91.5 -87.0 3.0 1.5 -87.0 3.0 1.5 -87.0 5.6 53.6	dB dB/K dBHz dBHz dBW/m2 dB dB dB GHz dBW
Radome, Lr Transponder G/T @ Hub Thermal Noise, C/No C/(No+Io) Satellite Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal	0.0 5.0 97.5 97.0 -91.5 -87.0 3.0 1.5 11.580 53.6 53.5 14.0 14.0	dB dB/K dBHz dBHz dBW/m2 dB dB dB GHz dBW dBW dBW/4kHz dBW/4kHz
Radome, Lr Transponder G/T @ Hub Thermal Noise, C/No C/(No+Io) Satellite Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak	0.0 5.0 97.5 97.0 -91.5 -87.0 3.0 1.5 11.580 53.6 53.5 14.0 14.0 52.1	dB dB/K dBHz dBHz dBW/m2 dB dB dB GHz dBW dBW dBW dBW/4kHz dBW/4kHz dBW/4kHz
Radome, Lr Transponder G/T @ Hub Thermal Noise, C/No C/(No+Io) Satellite Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal	0.0 5.0 97.5 97.0 -91.5 -87.0 3.0 1.5 11.580 53.6 53.5 14.0 14.0 14.0 52.1 52.0	dB dB/K dBHz dBHz dBW/m2 dB dB dB GHz dBW dBW dBW/4kHz dBW/4kHz dBW/4kHz dBW/4kHz
Radome, Lr Transponder G/T @ Hub Thermal Noise, C/No C/(No+Io) Satellite Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range	0.0 5.0 97.5 97.0 -91.5 -87.0 3.0 1.5 11.580 53.6 53.5 14.0 14.0 52.1 52.0 39702	dB dB/K dBHz dBHz dBW/m2 dB dB dB dB dB dB dB dB dB dB dB dB dB
Radome, Lr Transponder G/T @ Hub Thermal Noise, C/No C/(No+Io) Satellite Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls	0.0 5.0 97.5 97.0 -91.5 -87.0 3.0 1.5 11.580 53.6 53.5 14.0 14.0 52.1 52.0 39702 205.7	dB dB/K dBHz dBHz dBW/m2 dB dB dB dB dB dB dB dB dB dB dB dB dB
Radome, Lr Transponder G/T @ Hub Thermal Noise, C/No C/(No+Io) Satellite Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt	0.0 5.0 97.5 97.0 -91.5 -87.0 3.0 1.5 11.580 53.6 53.5 14.0 14.0 52.1 52.0 39702 205.7 0.0	dB dB/K dBHz dBHz dBW/m2 dB dB dB dB dB dB dB dB dB dB dB dB dB
Radome, Lr Transponder G/T @ Hub Thermal Noise, C/No C/(No+Io) Satellite Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La	0.0 5.0 97.5 97.0 -91.5 -87.0 3.0 1.5 11.580 53.6 53.5 14.0 14.0 52.1 52.0 39702 205.7 0.0 0.0	dB dB/K dBHz dBHz dBW/m2 dB dB dB dB dB dB dB dB dB dB dB dB dB
Radome, Lr Transponder G/T @ Hub Thermal Noise, C/No C/(No+Io) Satellite Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr	0.0 5.0 97.5 97.0 -91.5 -87.0 3.0 1.5 11.580 53.6 53.5 14.0 14.0 52.1 52.0 39702 205.7 0.0 0.0 0.0	dB dB/K dBHz dBHz dBW/m2 dB dB dB dB dB dB dB dB dB dB dB dB dB
Radome, Lr Transponder G/T @ Hub Thermal Noise, C/No C/(No+Io) Satellite Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss	0.0 5.0 97.5 97.0 -91.5 -87.0 3.0 1.5 11.580 53.6 53.5 14.0 14.0 52.1 52.0 39702 205.7 0.0 0.0 0.5 0.0	dB dB/K dBHz dBHz dBW/m2 dB dB dB dB dB dB dB dB dB dB dB dB dB
Radome, Lr Transponder G/T @ Hub Thermal Noise, C/No C/(No+Io) Satellite Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No	0.0 5.0 97.5 97.0 -91.5 -87.0 3.0 1.5 11.580 53.6 53.5 14.0 14.0 52.1 52.0 39702 205.7 0.0 0.0 0.5 0.0 86.2	dB dB/K dBHz dBHz dBW/m2 dB dB dB dB dB dB dB dB dB dB dB dB dB
Radome, Lr Transponder G/T @ Hub Thermal Noise, C/No C/(No+Io) Satellite Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No C/(No+Io)	0.0 5.0 97.5 97.0 -91.5 -87.0 3.0 1.5 11.580 53.6 53.5 14.0 14.0 52.1 52.0 39702 205.7 0.0 0.0 0.5 0.0 86.2	dB dB/K dBHz dBHz dBW/m2 dB dB dB dB dB dB dB dB dB dB dB dB dB
Radome, Lr Transponder G/T @ Hub Thermal Noise, C/No C/(No+Io) Satellite Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No C/(No+Io) End to End	0.0 5.0 97.5 97.0 -91.5 -87.0 3.0 1.5 11.580 53.6 53.5 14.0 14.0 52.1 52.0 39702 205.7 0.0 0.0 0.0 0.5 0.0 86.2 86.0	dB dB/K dBHz dBHz dBW/m2 dB dB dB dB dB dB dB dB dB dB dB dB dB
Radome, Lr Transponder G/T @ Hub Thermal Noise, C/No C/(No+Io) Satellite Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No C/(No+Io) End to End End to End C/(No+Io)	0.0 5.0 97.5 97.0 -91.5 -87.0 3.0 1.5 11.580 53.6 53.5 14.0 14.0 52.1 52.0 39702 205.7 0.0 0.0 0.0 0.5 0.0 86.2 86.0	dB dB/K dBHz dBHz dBW/m2 dB dB dB dB dB dB dB dB dB dB dB dB dB
Radome, Lr Transponder G/T @ Hub Thermal Noise, C/No C/(No+Io) Satellite Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No C/(No+Io) End to End C/(No+Io) Implementation Loss	0.0 5.0 97.5 97.0 -91.5 -87.0 3.0 1.5 11.580 53.6 53.5 14.0 14.0 52.1 52.0 39702 205.7 0.0 0.0 0.0 0.5 0.0 86.2 86.0	dB dB/K dBHz dBHz dBW/m2 dB dB dB dB dB dB dB dB dB dB dB dB dB
Radome, Lr Transponder G/T @ Hub Thermal Noise, C/No C/(No+Io) Satellite Flux Density SFD @ Hub Small Signal Gain (IBO/OBO) OBO Downlink Frequency Transponder Sat. EIRP @ Beam Peak Transponder Sat. EIRP @ Terminal DL PSD Limit DL PSD @ Beam Peak Carrier EIRP @ Beam Peak Carrier EIRP @ Terminal Slant Range Space Loss, Ls Pointing Loss, Lpnt Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No C/(No+Io) End to End End to End C/(No+Io)	0.0 5.0 97.5 97.0 -91.5 -87.0 3.0 1.5 11.580 53.6 53.5 14.0 14.0 52.1 52.0 39702 205.7 0.0 0.0 0.0 0.5 0.0 86.2 86.0	dB dB/K dBHz dBHz dBW/m2 dB dB dB dB dB dB dB dB dB dB dB dB dB

eXConnect Terminal	
Antenna Type	TECOM
Lat	47.8 deg
Lon	-129.2 deg
EIRP max	42.4 dBW
G/T	11.8 dB/K
Satellite	,
Name	Yamal-300K
Longitude	183.0 deg
Hub Earth Station	
Site	Brewster
Lat	48.1 deg
Lon	-119.8 deg
EIRP max	80.0 dBW
G/T	36.8 dB/K
Signal	
Waveform	iDirect
Modulation	BPSK
Bits per symbol	1
Spread Factor	2
Coding Rate	0.67
Overhead Rate	0.72
Channel Spacing	1.20 0.24 bps/Hz
Spectral Efficiency (Rate/Noise BW)	0.24 bps/Hz
Data Rate Information Rate (Data + Overhead)	1.61E+06 bps
Symbol Rate (Data + Overnead)	2.22E+06 bps 3.34E+06 Hz
-	3.34E+06 Hz 6.67E+06 Hz
Chip Rate (Noise Bandwidth) Occupied Bandwidth	8.00E+06 Hz
Power Equivelent Bandwidth	2.74E+05 Hz
C/N Threshold	-1.2 dB
Uplink	-1.2 UB
Frequency	14.210 GHz
Back off	0.0 dB
EIRP Spectral Density	10.2 dBW/4kHz
Slant Range	39702 km
Space Loss, Ls	207.5 dB
Pointing Loss, Lpnt	0.0 dB
Atmosphere / Weather Loss, La	0.0 dB
Radome, Lr	0.5 dB
Transponder G/T @ Terminal	6.5 dB/K
Thermal Noise, C/No	69.5 dBHz
C/(No+lo)	69.0 dBHz
Satellite	
Flux Density	-121.1 dBW/m2
SFD @ Terminal	-90.9 dBW/m2
Small Signal Gain (IBO/OBO)	3.0 dB
ОВО	27.2 dB
Downlink	
Frequency	11.160 GHz
Transponder Sat. EIRP @ Beam Peak	53.6 dBW
Transponder Sat. EIRP @ Hub	52.0 dBW
DL PSD Limit	14.0 dBW/4kHz
DL PSD @ Beam Peak	-5.8 dBW/4kHz
Carrier EIRP @ Beam Peak	26.4 dBW
Carrier EIRP @ Hub	24.8 dBW
Slant Range	40299 km
Space Loss, Ls	205.5 dB
Dointing Loca Last	0.0 dB 3.3 dB
Pointing Loss, Lpnt	< < dR
Atmosphere / Weather Loss, La	
Atmosphere / Weather Loss, La Radome, Lr	0.0 dB
Atmosphere / Weather Loss, La Radome, Lr PCMA Loss	0.0 dB 0.0 dB
Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No	0.0 dB 0.0 dB 81.4 dBHz
Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No C/(No+lo)	0.0 dB 0.0 dB
Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No C/(No+Io) End to End	0.0 dB 0.0 dB 81.4 dBHz 77.6249 dBHz
Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No C/(No+Io) End to End End to End C/(No+Io)	0.0 dB 0.0 dB 81.4 dBHz 77.6249 dBHz 68.4 dBHz
Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No C/(No+Io) End to End End to End C/(No+Io) Implementation Loss	0.0 dB 0.0 dB 81.4 dBHz 77.6249 dBHz 68.4 dBHz 0.0 dB
Atmosphere / Weather Loss, La Radome, Lr PCMA Loss Thermal Noise, C/No C/(No+Io) End to End End to End C/(No+Io)	0.0 dB 0.0 dB 81.4 dBHz 77.6249 dBHz 68.4 dBHz

III. Radiation Hazard Analysis TECOM 1000

This exhibit presents the radiation hazard analysis for Panasonic Avionics Corporation ("Panasonic") using the FCC procedure outlined in FCC Bulletin #65. The limit for exposure to RF energy, for frequencies greater than 1.5 GHz, is 5 mW/cm^2 for up to a 6 minute duration (occupational/controlled exposure) and 1 mW/cm² for up to a 30 minute duration (general population/uncontrolled exposure).¹

Analysis for exposure to radiation is presented for the near field, far field and the transition region. Safe limits are computed for the controlled and uncontrolled exposure for both the antenna main beam and sidelobes.

The near field region for the main beam is defined in terms of the radius R_{nf} according to the relation

$$R_{nf} = D^2/4\lambda$$

where D is the antenna panel width and λ is the transmit wavelength. The near field maximum power density, S_{nf} , is determined from

 $S_{nf} = 0.1 \eta P_{PA}/A (in mW/cm^2)$

where P_{PA} is the transmit power (after cable losses are accounted for) and A is the surface area of the antenna panel. With an antenna height h, the surface area A=Dh

The far field region for the main beam is defined in terms of the radius $R_{\rm ff}$ given by

$$R_{\rm ff} = 0.60 \ \mathrm{D}^2 / \lambda$$

The far field power density $S_{\rm ff}$ at the minimum far field radius is given in terms of the EIRP denoted by $P_{\rm EIRP}$ according to

 $S_{\rm ff} = P_{\rm EIRP}/4\pi R_{\rm ff}^2 ({\rm in \ mW/cm}^2)$

When the radius is expressed in meters, the power densities are w/m^2 . The results are converted to mW/cm^2 by multiplying the power densities in w/m^2 by 0.1.

Near Field Exposure from Main Antenna Beam

¹ "Questions and Answers about Biological Effects and Potential Hazards of Radiofrequency Electromagnetic Fields," Federal Communications Commission, Office of Engineering and Technology, Bulletin 65, Fourth Edition, August, 1999, p.15.

http://www.fcc.gov/Bureaus/Engineering_Technology/Documents/bulletins/oet56/oet56e4.pdf

The TECOM antenna has dimensions D=0.625 m (24.6") and h=0.157 m (6.2") and a surface area A= $0.098m^2$. At the highest transmit frequency of 14.5 GHz, the wavelength is 0.0207 m. The near field radius is then

$$R_{nf} = 4.72 m$$

Since the maximum transmit power is $P_{PA}=20$ watts and the antenna efficiency =0.93, the maximum power density in the near field with 4.58 dB cable losses is

 $S_{nf} = 6.61 \text{ mW/cm}^2$

Far Field Exposure from Main Antenna Beam

Based on the wavelength and panel width given above, the far field radius is then

$$R_{\rm ff} = 11.3 \, {\rm m}$$

The maximum EIRP is 41.8 dBW resulting in a far field power density of

 $S_{\rm ff} = 0.94 \ mW/cm^2$

Transition Region Exposure from Main Antenna Beam

Assuming that the field density decrease linearly from $S_{nf} = 6.61 \text{ mW/cm}^2$ to $S_{ff} = 0.94 \text{ mW/cm}^2$, then the 5 mW/cm² power density for controlled exposure occurs at a distance of 6.6 meters.

For the case of the 1 mW/cm² power density for uncontrolled exposure the safe distance is 11.26 meters.

Based on antenna sidelobes with 12 dB reduction from the main beam, no individual in a controlled exposure should be within 6.35 meters (~21 feet) of the antenna while it is transmitting and for no longer than 6 minutes. The 30 minute exposure range for an uncontrolled exposure due to sidelobes is 10.4 meters (~34 feet).

Summary

This document presents the radiation hazard analysis for Panasonic's system incorporating the TECOM antenna and the maximum EIRP of 41.8 dBW. Individuals in a controlled exposure should be at least 6.6 meters (22 feet) away from the antenna and for no more than 6 minutes and in an uncontrolled exposure should be at least 11.26 meters (37 feet) away for 30 minutes, if they are in the main beam of the antenna.

IV. Updated Emission Designators

1. MELCO

Frequency Band (MHz)	Existing Emission Designators	Updated Emission Designators
10950 - 12500	1M20KG7D	are Arriter
	36M0KG7D	Removed
	54M0KG7D	
1700 - 12200	1M20KG7D	1M20G7D
	36M0KG7D	54M0G7D
	54M0KG7D	
	9M00G7D	
	160KG7D	
	2M56G7D	
10700 - 12750	1M20G7D	Removed
	36M0G7D	
0950-11200	New	1M20G7D
		27M0G7D
		54M0G7D
1450-12200	New	1M20G7D
		27M0G7D
		54M0G7D
0950 - 12750	54M0G7D	Removed
4000 - 14500	9M00KG7D	Removed
	500KG7D	
4000 - 14400	9M00G7D	9M00G7D
	500KG7D	500KG7D
	2M56G7D	
	160KG7D	

2. <u>PPA</u>

Frequency Band (MHz)	Existing Emission	Updated Emission
	Designators	Designators
10950 - 11200	27M0KG7D	27M0G7D
	1M20KG7D	1M20G7D
10950 - 11700	54M0KG7D	54M0G7D
	1M20KG7D	1M20G7D
10950 - 12200	54M0KG7D	54M0G7D
	1M20KG7D	1M20G7D
10950 - 12500	54M0KG7D	54M0G7D
	36M0KG7D	36M0G7D
	1M20KG7D	1M20G7D
11450 - 12750	27M0KG7D	27M0G7D
	1M20KG7D	1M20G7D
11700 - 12200	54M0KG7D	54M0G7D
	1M20KG7D	1M20G7D
	36M0KG7D	36M0G7D
12250 - 12750	54M0KG7D	54M0G7D
	1M20KG7D	1M20G7D
12500 - 12750	54M0KG7D	54M0G7D
	1M20KG7D	1M20G7D
14000 - 14500	9M00KG7D	9M00G7D

3.	<u>SPA</u>
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Frequency Band	Existing	Updated
(MHz)	Emission	Emission
	Designators	Designators
10700 - 12750	1M20KG7D	1M20G7D
	36M0KG7D	36M0G7D
10950 - 11200	1M20KG7D	1M20G7D
	54M0KG7D	54M0G7D
10950 - 11700	1M20KG7D	1M20G7D
	54M0KG7D	54M0G7D
10950 - 12500	1M20KG7D	1M20G7D
	54M0KG7D	54M0G7D
11450 - 11700	1M20KG7D	1M20G7D
	54M0KG7D	54M0G7D
11450 - 11950	1M20KG7D	1M20G7D
	54M0KG7D	54M0G7D
11450 - 12200	1M20KG7D	1M20G7D
	27M0KG7D	27M0G7D
	54M0KG7D	54M0G7D
11450 - 12750	1M20KG7D	1M20G7D
	36M0KG7D	36M0G7D
	54M0KG7D	54M0G7D
11700 - 12200	1M20KG7D	1M20G7D
	36M0KG7D	36M0G7D
	54M0KG7D	54M0G7D
12200 - 12750	1M20KG7D	1M20G7D
	36M0KG7D	36M0G7D
12250 - 12750	1M20KG7D	1M20G7D
	54M0KG7D	54M0G7D
12500 - 12750	1M20KG7D	1M20G7D
	36M0KG7D	36M0G7D
	54M0KG7D	54M0G7D
14000 - 14500	9M00KG7D	9M00G7D

Antenna	Satellite Orbit Type	Frequency Limits (GHz)	Range of Satellite Arc (Degrees)	Earth Station Azimuth Angle (East Limit)	Antenna Elevation Limit (East Limit)	Earth Station Azimuth Angle (West Limit)	Antenna Elevation Angle (West Limit)	Max. EIRP Towards the Horizon (dBW/4kHz)
MELCO	GSO	11.45-12.2	63W-63W	0.0	5.0	360	5.0	0.0
T14R								
	GSO	14.0-14.4	63W-63W	0.0	5.0	360	5.0	-5.80
T11N	GSO	10.95-11.2	37.5W- 37.5W	0.0	5.0	360	5.0	0.0
	GSO	11.45-12.2	37.5W- 37.5W	0.0	5.0	360	5.0	0.0
	GSO	14.0-14.4	37.5W- 37.5W	0.0	5.0	360	5.0	-8.62
<u>PPA</u> Anik G1	GSO	11.7-12.2	107.3W- 107.3W	0.0	5.0	360	5.0	0.0
	GSO	14.0-14.5	107.3W- 107.3W	0.0	5.0	360	5.0	-11.10
Apstar 6	GSO	10.7-12.75	134E- 134E	0.0	5.0	360	5.0	0.0
	GSO	14.0-14.5	134E- 134E	0.0	5.0	360	5.0	-1.63
Apstar 7	GSO	10.7-12.75	76.5E- 76.5E	0.0	5.0	360	5.0	0.0
	GSO	14.0-14.5	76.5E- 76.5E	0.0	5.0	360	5.0	-9.91
AsiaSat5	GSO	11.45-12.2	100.5E- 100.5E	0.0	5.0	360	5.0	0.0
	GSO	14.0-14.5	100.5E- 100.5E	0.0	5.0	360	5.0	-3.39
AsiaSat7	GSO	12.25- 12.75	105.5E- 105.5E	0.0	5.0	360	5.0	0.0
	GSO	14.0-14.5	105.5E- 105.5E	0.0	5.0	360	5.0	1.37
Satmex 8	GSO	11.7-12.2	116.8W- 116.8W	0.0	5.0	360	5.0	0.0
	GSO	14.0-14.5	116.8W- 116.8W	0.0	5.0	360	5.0	-6.38
E10A	GSO	10.95-11.7	10E-10E	0.0	5.0	360	5.0	0.0
	GSO GSO	12.5-12.75 14.0-14.5	10E-10E 10E-10E	0.0	5.0 5.0	360 360	5.0 5.0	0.0 0.43
E172A	GSO	10.95-11.2	172E-	0.0	5.0	360	5.0	0.43
	GSO	11.45-11.7	172E 172E- 172E	0.0	5.0	360	5.0	0.0
	GSO	12.2-12.75	172E- 172E	0.0	5.0	360	5.0	0.0
	GSO	14.0-14.5	172E- 172E	0.0	5.0	360	5.0	0.47
E115WB	GSO	11.7-12.2	114.9W- 114.9W	0.0	5.0	360	5.0	0.0
	GSO	14.0-14.5	114.9W- 114.9W	0.0	5.0	360	5.0	-3.20

V. Updated Frequency Coordination Table for MELCO, PPA and SPA ESAA Terminals

Galaxy 16	GSO	11.7-12.2	99W-99W	0.0	5.0	360	5.0	0.0
Sulling 10	GSO	14.0-14.5	99W-99W	0.0	5.0	360	5.0	-5.59
IS-15	GSO	12.5-12.75	85E-85E	0.0	5.0	360	5.0	0.0
	GSO	14.0-14.5	85E-85E	0.0	5.0	360	5.0	-5.80
IS-14	GSO	12.25- 12.75	45W-45W	0.0	5.0	360	5.0	0.0
	GSO	14.0-14.5	45W-45W	0.0	5.0	360	5.0	-8.65
IS-29E	GSO	10.95-11.7	50W-50W	0.0	5.0	360	5.0	0.0
	GSO	14.0-14.5	50W-50W	0.0	5.0	360	5.0	0.17
IS33E	GSO	10.95-11.2	60E-60E	0.0	5.0	360	5.0	0.0
	GSO	11.45-12.2	60E-60E	0.0	5.0	360	5.0	0.0
	GSO	12.5-12.6	60E-60E	0.0	5.0	360	5.0	0.0
	GSO	14.0-14.5	60E-60E	0.0	5.0	360	5.0	-0.58
JCSAT5A	GSO	12.25- 12.75	132E- 132E	0.0	5.0	360	5.0	0.0
	GSO	14.0-14.5	132E- 132E	0.0	5.0	360	5.0	-3.78
JCSAT- 2B	GSO	11.45-11.7	154E- 154E	0.0	5.0	360	5.0	0.0
	GSO	14.0-14.5	154E- 154E	0.0	5.0	360	5.0	-8.33
NSS-6	GSO	11.45-11.7; 12.5-12.75	95E-95E	0.0	5.0	360	5.0	0.0
	GSO	12.5-12.75	95E-95E	0.0	5.0	360	5.0	0.0
	GSO	14.0-14.5	95E-95E	0.0	5.0	360	5.0	-3.40
T11N	GSO	11.45-12.2	37.5W- 37.5W	0.0	5.0	360	5.0	0.0
	GSO	14.0-14.5	37.5W- 37.5W	0.0	5.0	360	5.0	-7.88
T14R	GSO	11.45-12.2	63W-63W	0.0	5.0	360	5.0	0.0
	GSO	14.0-14.5	63W-63W	0.0	5.0	360	5.0	0.44
SB2	GSO	12.2-12.75	144E- 144E	0.0	5.0	360	5.0	0.0
	GSO	14.0-14.5	144E- 144E	0.0	5.0	360	5.0	-9.33
T12V	GSO	10.95-12.2	15W-15W	0.0	5.0	360	5.0	0.0
	GSO	14.0-14.5	15W-15W	0.0	5.0	360	5.0	-2.59
Y401	GSO	10.95-11.2	90E-90E	0.0	5.0	360	5.0	0.0
	GSO	11.45- 12.75	90E-90E	0.0	5.0	360	5.0	0.0
	GSO	14.0-14.5	90E-90E	0.0	5.0	360	5.0	1.42
Y300K	GSO	10.95-11.7	183E- 183E	0.0	5.0	360	5.0	0.0
	GSO	14.0-14.5	183E- 183E	0.0	5.0	360	5.0	2.41
E70B	GSO	10.95-11.7	70.5E- 70.5E	0.0	5.0	360	5.0	0.0
	GSO	12.5-12.75	70.5E- 70.5E	0.0	5.0	360	5.0	0.0
	GSO	14.0-14.5	70.5E- 70.5E	0.0	5.0	360	5.0	-2.86

SPA	GSO	11.7-12.2	107.3W-	0.0	5.0	360	5.0	0.0
<u></u>		11.7 12.2	107.3W	5.0	5.0	200	5.0	0.0
Anik G1								
	GSO	14.0-14.5	107.3W- 107.3W	0.0	5.0	360	5.0	-10.45
Apstar 6	GSO	10.7-12.75	134E- 134E	0.0	5.0	360	5.0	0.0
	GSO	14.0-14.5	134E- 134E	0.0	5.0	360	5.0	-3.59
Apstar 7	GSO	10.7-12.75	76.5E- 76.5E	0.0	5.0	360	5.0	0.0
	GSO	14.0-14.5	76.5E- 76.5E	0.0	5.0	360	5.0	-11.50
AsiaSat5	GSO	11.45-12.2	100.5E- 100.5E	0.0	5.0	360	5.0	0.0
	GSO	14.0-14.5	100.5E- 100.5E	0.0	5.0	360	5.0	-7.76
AsiaSat7	GSO	12.25- 12.75	105.5E- 105.5E	0.0	5.0	360	5.0	0.0
		14.0-14.5	105.5E- 105.5E	0.0	5.0	360	5.0	-0.28
Satmex 8	GSO	11.7-12.2	116.8W- 116.8W	0.0	5.0	360	5.0	0.0
	GSO	14.0-14.5	116.8W- 116.8W	0.0	5.0	360	5.0	-9.16
E10A	GSO	11.7-12.2	10E-10E	0.0	5.0	360	5.0	0.0
	GSO	14.0-14.5	10E-10E	0.0	5.0	360	5.0	-1.65
E172A	GSO	10.95-11.2	172E- 172E	0.0	5.0	360	5.0	0.0
	GSO	11.45-11.7	172E- 172E	0.0	5.0	360	5.0	0.0
	GSO	14.0-14.5	172E- 172E	0.0	5.0	360	5.0	-0.55
E115WB	GSO	11.7-12.2	114.9W- 114.9W	0.0	5.0	360	5.0	0.0
	GSO	14.0-14.5	114.9W- 114.9W	0.0	5.0	360	5.0	-4.01
Galaxy 16	GSO	11.7-12.2	99W-99W	0.0	5.0	360	5.0	0.0
	GSO	14.0-14.5	99W-99W	0.0	5.0	360	5.0	-5.85
IS-15	GSO	12.25- 12.75	85E-85E	0.0	5.0	360	5.0	0.0
	GSO	14.0-14.5	85E-85E	0.0	5.0	360	5.0	-11.49
IS-14	GSO	11.45- 11.95	45W-45W	0.0	5.0	360	5.0	0.0
	GSO	14.0-14.5	45W-45W	0.0	5.0	360	5.0	-11.38
IS-29E	GSO	10.95-12.2	50W-50W	0.0	5.0	360	5.0	0.0
	GSO	14.0-14.5	50W-50W	0.0	5.0	360	5.0	-1.43
IS33E	GSO	10.95-11.2	60E-60E	0.0	5.0	360	5.0	0.0
	GSO	11.45-12.2	60E-60E	0.0	5.0	360	5.0	0.0
	GSO	12.5-12.6	60E-60E	0.0	5.0	360	5.0	0.0
	GSO	14.0-14.5	60E-60E	0.0	5.0	360	5.0	-0.28
JCSAT5A	GSO	12.25- 12.75	132E- 132E	0.0	5.0	360	5.0	0.0
	GSO	14.0-14.5	132E- 132E	0.0	5.0	360	5.0	-4.62
JCSAT- 2B	GSO	11.45-11.7	154E- 154E	0.0	5.0	360	5.0	0.0
	GSO	14.0-14.5	154E- 154E	0.0	5.0	360	5.0	-12.48

NSS-6	GSO	11.45-	95E-95E	0.0	5.0	360	5.0	0.0
		12.75						
	GSO	12.5-12.75	95E-95E	0.0	5.0	360	5.0	0.0
	GSO	14.0-14.5	95E-95E	0.0	5.0	360	5.0	-7.33
T11N	GSO	11.45-12.2	37.5W- 37.5W	0.0	5.0	360	5.0	0.0
	GSO	14.0-14.5	37.5W- 37.5W	0.0	5.0	360	5.0	-12.84
T14R	GSO	11.7-12.2	63W-63W	0.0	5.0	360	5.0	0.0
	GSO	14.0-14.5	63W-63W	0.0	5.0	360	5.0	-5.34
SB2	GSO	12.2-12.75	144E- 144E	0.0	5.0	360	5.0	0.0
	GSO	14.0-14.5	144E- 144E	0.0	5.0	360	5.0	-11.92
T12V	GSO	10.95-12.2	15W-15W	0.0	5.0	360	5.0	0.0
	GSO	14.0-14.5	15W-15W	0.0	5.0	360	5.0	-1.99
Y401	GSO	10.95-11.2	90E-90E	0.0	5.0	360	5.0	0.0
	GSO	11.45- 12.75	90E-90E	0.0	5.0	360	5.0	0.0
	GSO	14.0-14.5	90E-90E	0.0	5.0	360	5.0	-0.37
Y300K	GSO	10.95-11.7	183E- 183E	0.0	5.0	360	5.0	0.0
	GSO	14.0-14.5	183E- 183E	0.0	5.0	360	5.0	-0.28
E70B	GSO	10.95-11.7	70.5E- 70.5E	0.0	5.0	360	5.0	0.0
	GSO	12.5-12.75	70.5E- 70.5E	0.0	5.0	360	5.0	0.0
	GSO	14.0-14.5	70.5E- 70.5E	0.0	5.0	360	5.0	-5.85

VI. eXConnect System Satellites and Gateways

Table 1. Satellite Points of Commu	unication
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Satellite	Licensing Admin.	Orbital Location	Downlink Freq. (GHz)	ITU Satellite Network	ITU Region	Service to U.S.
Anik G1	Canada	107.3° W	11.7-12.2	CANSAT-34	2	No
Apstar 6	China	134° E	10.7-12.75	APSTAR-2	3	No
Apstar 7	China	76.5° E	10.7-12.75	APSTAR-4	1, 3	No
AsiaSat 5	China	100.5° E	11.45-12.2	ASIASAT-	1	No
				EKX		
AsiaSat 7	China	105.5° E	12.25-12.75	ASIASAT-	3	No
				CKX		
Eutelsat	France	10° E	11.7-12.2;	EUTELSAT 2-	1, 3	No
10A			10.95-11.7;	10E /		
			12.5-12.75	EUTELSAT 3-		
			10.05.11.5	10E		
Eutelsat	France	70.5° E	10.95-11.7;	EUTELSAT 3-	1, 3	No
70B			12.5-12.75	70.5E		
Eutelsat	Mexico	114.9° W	11.7-12.2	Permitted List	2	Yes
115WB						
Eutelsat	Mexico	116.8° W	11.7-12.2	Permitted List	2	Yes
117WA						
Eutelsat	U.S.	172° E	10.95-11.2;	U.Slicensed	2	Yes
172A			11.45-11.7			
Galaxy	U.S.	99° W	11.7-12.2	U.Slicensed	2	Yes
16						
IS-14	U.S.	45° W	11.45-11.95;	U.Slicensed	1, 2	No
			12.5-12.75			
IS-15	U.S.	85° E	12.25-12.75	U.Slicensed	3	No
IS-29E	U.S.	50° W	10.95-11.7	U.Slicensed	1, 2	Yes
IS-33E	U.S.	60° E	10.95-11.2;	U.Slicensed	1, 3	No
			11.45-12.2;			
			12.5-12.6			
JCSAT-	Japan	154° E	11.45-11.7	N-SAT-154E	3	No
2B						
JCSAT-	Japan	132° E	12.25-12.75	N-STAR-A	1	No
5A						
NSS-6	Netherlands	95° E	11.45-12.75	NSS-9	3	No

Superbird C2	Japan	144° E	12.2-12.75	N-SAT2-144E	3	No
Telstar 11N	U.S.	37.5° W	11.45-12.2	U.Slicensed	1, 2	Yes
Telstar 12V	U.S.	15° W	10.95-12.2	U.Slicensed	1	No
Telstar 14R	Brazil	63° W	11.45-12.2	Permitted List	2	Yes
Yamal 300K	Netherlands	183° E	10.95-11.7	NSS-19	1, 2	Yes
Yamal 401	Russia	90° E	10.95-11.2; 11.45-12.75	EXPRESS-7C	1, 3	No

Table 2. Gateway Earth Stations Table

Satellite	Satellite Operator	Gateway Earth Station Location	Country	Gateway Operator	FCC Call Sign
Anik G1	Telesat	Lima	Peru	NewCom	N/A
Apstar 6	APT	Beijing	China	ChinaTelecom Satellite	N/A
Apstar 7	APT	Kofinou	Cyprus	Stellar	N/A
Asiasat 5	Asiasat	Kofinou	Cyprus	Stellar	N/A
AsiaSat-7	AsiaSat	Beijing	China	China Telecom Satellite	N/A
Eutelsat 10A	Eutelsat	Cologne	Germany	Stellar	N/A
Eutelsat 70B	Eutelsat	Kofinou	Cyprus	Stellar	N/A
Eutelsat 115WB	Eutelsat Americas	Brewster, WA	U.S.	USEI	E120043
Eutelsat 117WA	Eutelsat Americas	Brewster, WA	U.S.	USEI	E120043
Eutelsat 172A (NP/SEP/SWP)	Eutelsat	Brewster, WA	U.S.	USEI	E120043

Satellite	Satellite Operator	Gateway Earth Station Location	Country	Gateway Operator	FCC Call Sign
Eutelsat 172A (SP)	Eutelsat	Adelaide	Australia	SpeedCast	N/A
Galaxy 16	Intelsat	Brewster, WA	U.S.	U.S. Electrodyna mics	E120043
IS-14	Intelsat	Cologne	Germany	Stellar	N/A
IS-15	Intelsat	Kofinou	Cyprus	Stellar	N/A
IS-29E	Intelsat	Hagerstown, MD	U.S.	Intelsat	E140121
IS-33E	Intelsat	Cologne	Germany	Stellar	N/A
IS-33E ¹	Intelsat	Moscow	Russia	Gazprom	N/A
JCSAT-2B	SKY Perfect JSAT	Kapolei, HI	U.S.	Hawaii Pacific Teleport LP	E010236
JCSAT-5A	SPJSAT	Yokohama	Japan	SPJSAT	N/A
NSS-6	SES	Kofinou	Cyprus	Stellar	N/A
Superbird C2	SPJSAT	Hong Kong	China	PCCW	N/A
Telstar 11N – (CA/US)	Skynet	Cologne	Germany	Stellar	N/A
Telstar 11N (AO)	Skynet	Ellenwood, GA	U.S.	Intelsat	E990365
Telstar 12V (MW, MC, ME, MN)	Skynet	Mt. Jackson, VA	U.S.	Telesat	E030029

¹ Effective November 2017, the gateway earth station in Moscow, Russia will no longer support IS-33E satellite operations. Panasonic includes representative link budgets for IS-33E with both gateway earth station locations.

Satellite	Satellite Operator	Gateway Earth Station Location	Country	Gateway Operator	FCC Call Sign
Telstar 12V (NS)	Skynet	Chalfont	U.K.	Arqiva	N/A
Telstar 14R	Telesat	Mt. Jackson, VA	U.S.	Telesat	E030029
Yamal 300K	Gazprom	Brewster, WA	U.S.	USEI	E120043
Yamal 401	Gazprom	Moscow	Russia	RuSat	N/A

VII. Section 25.227 Certifications

Panasonic Avionics Corporation ("Panasonic"), pursuant to Section 25.227 of the FCC's Rules, hereby certifies the following:

- 1. In accordance with Section 25.227(a)(15), as the operator of an ESAA system operating over international waters, Panasonic has confirmed with its target space station operators that its existing and proposed operations are within coordinated parameters for adjacent satellites up to six degrees away (+/- 6°) on the geostationary arc.
- 2. In accordance with Section 25.227(b)(7), Panasonic certifies that its existing and proposed operations comply with the following requirements of Section 25.227:
 - Per Section 25.227(a)(6), for each ESAA transmitter, Panasonic will time annotate and maintain a record for a period of not less than one year of the vehicle location (i.e., latitude/longitude/altitude), transmit frequency, channel bandwidth and satellite used. Records will be recorded at time intervals no greater than one (1) minute while the ESAA is transmitting. Panasonic will make this data available in the requisite format within 24 hours of a request from the Commission, NTIA, or a frequency coordinator for purposes of resolving harmful interference events.
 - Per Section 25.227(a)(9), each ESAA terminal will automatically cease transmitting within 100 milliseconds upon loss of reception of the satellite downlink signal or when it detects that unintended satellite tracking has happened or is about to happen.
 - Per Section 25.227(a)(10), each ESAA terminal will be subject to the monitoring and control by an NCMC. Each terminal will be able to receive "enable transmission" and "disable transmission" commands from the NCMC and must automatically cease transmissions immediately on receiving any "parameter change command", which may cause harmful interference during the change, until it receives an "enable transmission" command from its NCMC. In addition, the NCMC will be able to monitor the operation of an ESAA terminal to determine if it is malfunctioning.
 - Per Section 25.227(a)(11), each ESAA terminal shall be self-monitoring and, should a fault which can cause harmful interference to FSS networks be detected, the terminal will automatically cease transmissions.

By:

Mark DeFazio

Mark DeFazio Manager, GCS Regulatory and Business Operations Panasonic Avionics Corporation

March 8, 2017

VIII. FCC § 25.227 Compliance Matrix

Rule	Text	Application Citation
§ 25.227	§25.227 Blanket licensing provisions for ESAAs operating with GSO FSS space stations in the 10.95- 11.2 GHz, 11.45-11.7 GHz, 11.7-12.2 GHz, and 14.0-14.5 GHz bands.	See Application
§ 25.227(a)	(a) The following ongoing requirements govern all ESAA licensees and operations in the 10.95-11.2 GHz (space-to-Earth), 11.45-11.7 GHz (space-to-Earth), 11.7-12.2 GHz (space-to-Earth) and 14.0-14.5 GHz (Earth-to-space) frequency bands receiving from and transmitting to geostationary orbit satellites in the Fixed-Satellite Service. ESAA licensees shall comply with the requirements in either paragraph (a)(1), (a)(2) or (a)(3) of this section and all of the requirements set forth in paragraphs (a)(4) through (a)(16) and paragraphs (c), (d), and (e) of this section. Paragraph (b) of this section identifies items that shall be included in the application for ESAA operations to demonstrate that these ongoing requirements will be met.	Narrative, Section II and Technical Appendix; File No. SES- LIC-20100805-00992 (MELCO); File No. SES- MFS-20120913-00818 (PPA); File No. SES- MFS- 20160819-00730 (SPA).
§ 25.227(a)(1)	(1) The following requirements shall apply to an ESAA that uses transmitters with off-axis EIRP spectral- densities lower than or equal to the levels in paragraph (a)(1)(i) of this section. ESAA licensees operating under this section shall provide a detailed demonstration as described in paragraph (b)(1) of this section. The ESAA transmitter also shall comply with the antenna pointing and cessation of emission requirements in paragraphs (a)(1)(ii) and (iii) of this section.	Panasonic complies for SPA, PPA and TECOM operations with two- degree spaced/Permitted List satellites within the U.S. <i>See</i> Application Narrative, Section II and Technical Appendix, Sections I & II.
§ 25.227(a)(1)(i)(A)	(A) EIRP spectral density emitted in the plane tangent to the GSO arc, as defined in §25.103, must not exceed the following values: 15 - 25 log10(θ) dBW/4 kHz For 1.5° $\leq \theta \leq 7^{\circ}$ -6 dBW/4 kHz For 7° $< \theta \leq 9.2^{\circ}$ 18 - 25 log10(θ) dBW/4 kHz For 9.2° $< \theta \leq 19.1^{\circ}$ -14 dBW/4 kHz For 19.1° $< \theta \leq 180^{\circ}$ Where theta (θ) is the angle in degrees from a line from the earth station antenna to the assigned orbital location of the target satellite. The EIRP density levels specified for $\theta > 7^{\circ}$ may be exceeded by up to 3 dB in up to 10% of the range of theta (θ) angles from $\pm 7-180^{\circ}$, and by up to 6 dB in the region of main reflector spillover energy.	Id.

§ 25.227(a)(1)(i)(B)	(B) The EIRP spectral density of co-polarized signals must not exceed the following values in the plane perpendicular to the GSO arc, as defined in §25.103:	Id.
	18 - 25 log(θ) dBW/4 kHz For 3° $\leq \theta \leq$ 19.1° -14 dBW/4 kHz For 19.1° $\leq \theta \leq$ 180°	
	Where θ is as defined in paragraph (a)(1)(i)(A) of this section. These EIRP density levels may be exceeded by up to 6 dB in the region of main reflector spillover energy and in up to 10% of the range of θ angles not included in that region, on each side of the line from the earth station to the target satellite.	

§ 25.227(a)(1)(i)(C)	(C) The off-axis EIRP spectral-density of cross-polarized signals must not exceed the following values in the plane tangent to the GSO arc or in the plane perpendicular to the GSO arc $5 - 25 \log 10(\theta) \text{ dBW/4 kHz For } 1.8^{\circ} \le \theta \le 7^{\circ}$ Where θ is as defined in paragraph (a)(1)(i)(A) of this section.	Id.
§ 25.227(a)(1)(ii)	 (ii) Each ESAA transmitter shall meet one of the following antenna pointing requirements: (A) Each ESAA transmitter shall maintain a pointing error of less than or equal to 0.2° between the orbital location of the target satellite and the axis of the main lobe of the ESAA antenna; or (B) Each ESAA transmitter shall declare a maximum antenna pointing error that may be greater than 0.2° provided that the ESAA does not exceed the off-axis EIRP spectral-density limits in paragraph (a)(1)(i) of this section, taking into account the antenna pointing error. 	Id. (ESAAs comply)
§ 25.227(a)(1)(iii)	 (iii) Each ESAA transmitter shall meet one of the following cessation of emission requirements: (A) For ESAAs operating under paragraph (a)(1)(ii)(A) of this section, all emissions from the ESAA shall automatically cease within 100 milliseconds if the angle between the orbital location of the target satellite and the axis of the main lobe of the ESAA antenna exceeds 0.5°, and transmission shall not resume until such angle is less than or equal to 0.2°, or (B) For ESAA transmitters operating under paragraph (a)(1)(ii)(B) of this section, all emissions from the ESAA shall automatically cease within 100 milliseconds if the angle between the orbital location of the target satellite and the axis of the main lobe of the ESAA antenna exceeds 0.10(ii)(B) of this section, all emissions from the ESAA shall automatically cease within 100 milliseconds if the angle between the orbital location of the target satellite and the axis of the main lobe of the ESAA antenna exceeds the declared maximum antenna pointing error and shall not resume transmissions until such angle is less than or equal to the declared maximum antenna pointing error. 	Id.

25.227(a)(2)	 (2) The following requirements apply to ESAA systems that operate with off-axis EIRP spectral-densities in excess of the levels in paragraph (a)(1)(i) or (a)(3)(i) of this section under licenses granted based on certifications filed pursuant to paragraph (b)(2) of this section. (i) An ESAA or ESAA system licensed based on certifications filed pursuant to paragraph (b)(2) of this section must operate in accordance with the off-axis EIRP density specifications provided to the target satellite operator in order to obtain the certifications. (ii) Any ESAA transmitter operating under a license granted based on certifications filed pursuant to paragraph (b)(2) of this section must be self-monitoring and capable of shutting itself off and must cease or reduce emissions within 100 milliseconds after generating off-axis EIRP-density in excess of the specifications supplied to the target satellite operator. (iii) A system with variable power control of individual ESAA transmitters must monitor the aggregate off-axis EIRP density from simultaneously transmitting ESAA transmitters causes aggregate off-axis EIRP density to exceed the off-axis EIRP density specifications supplied to the target satellite operator, the network control and monitoring center must command those transmitters to cease emissions or reduce the aggregate EIRP density to a level at or below those specifications, and the transmitters must comply within 100 milliseconds of receiving the command. 	Panasonic complies, as applicable. <i>See</i> Application Technical Appendix, Section I; <i>see also</i> Section 25.227(b)(2).
§ 25.227(a)(3)	 (3) The following requirements apply to an ESAA system that uses variable power-density control of individual ESAA earth stations transmitting simultaneously in the same frequencies to the same target satellite, unless the system operates pursuant to paragraph (a)(2) of this section. (i) Aggregate EIRP density from co-frequency earth stations in each target satellite receiving beam, not resulting from colliding data bursts transmitted pursuant to a contention protocol, will not exceed the limits specified in paragraph (a)(1)(i) of this section. (ii) Each ESAA transmitter must be self-monitoring and capable of shutting itself off and must cease or reduce emissions within 100 milliseconds after generating off-axis EIRP density in excess of the limit in paragraph (a)(3)(i) of this section. (iii) A system with variable power control of individual ESAA transmitters must monitor aggregate power density from simultaneously transmitting ESAA transmitters at the network control and monitoring center. If simultaneous operation of two or more transmitters causes aggregate off-axis EIRP density to exceed the off-axis EIRP density limit in paragraph (a)(3)(i) of this section, the network control and monitoring center must command those transmitters to cease emissions or reduce the aggregate EIRP density to a level at or below 	N/A

	that limit, and those transmitters must comply within 100 milliseconds of receiving the command.	
§ 25.227(a)(4)	(4) An applicant filing to operate an ESAA terminal or system and planning to use a contention protocol shall certify that its contention protocol use will be reasonable.	Id.
§ 25.227(a)(5)	(5) There shall be a point of contact in the United States, with phone number and address, available 24 hours a day, seven days a week, with authority and ability to cease all emissions from the ESAA.	See File No. SES-MFS- 20160819-00730, Technical Appendix.
§ 25.227(a)(6)	(6) For each ESAA transmitter, a record of the vehicle location (i.e., latitude/longitude/altitude), transmit frequency, channel bandwidth and satellite used shall be time annotated and maintained for a period of not less than one year. Records shall be recorded at time intervals no greater than one (1) minute while the ESAA is transmitting. The ESAA operator shall make this data available, in the form of a comma delimited electronic spreadsheet, within 24 hours of a request from the Commission, NTIA, or a frequency coordinator for purposes of resolving harmful interference events. A description of the units (i.e., degrees, minutes, MHz) in which the records values are recorded will be supplied along with the records.	Id.
§ 25.227(a)(7)	(7) In the 10.95-11.2 GHz (space-to-Earth) and 11.45-11.7 GHz (space-to-Earth) frequency bands ESAAs shall not claim protection from interference from any authorized terrestrial stations to which frequencies are either already assigned, or may be assigned in the future.	Applicable regulatory status and protection provision. Panasonic complies.
§ 25.227(a)(8)	(8) An ESAA terminal receiving in the 11.7-12.2 GHz (space-to-Earth) bands shall receive protection from interference caused by space stations other than the target space station only to the degree to which harmful interference would not be expected to be caused to an earth station employing an antenna conforming to the referenced patterns defined in paragraphs (a) and (b) of section 25.209 and stationary at the location at which any interference occurred.	Applicable regulatory status and protection provision. Panasonic complies.
§ 25.227(a)(9)	(9) Each ESAA terminal shall automatically cease transmitting within 100 milliseconds upon loss of reception of the satellite downlink signal or when it detects that unintended satellite tracking has happened or is about to happen.	See File No. SES- MFS-20160819-00730, Technical Appendix; See Application Narrative, Section II
§ 25.227(a)(10)	(10) Each ESAA terminal should be subject to the monitoring and control by an NCMC or equivalent facility. Each terminal must be able to receive at least "enable transmission" and "disable transmission" commands from the NCMC and must automatically cease transmissions immediately on receiving any "parameter change command", which may cause harmful interference during the change, until it receives an "enable transmission" command from its NCMC. In addition, the NCMC must be able to monitor the operation of an ESAA terminal to determine if it is malfunctioning.	Id.

§ 25.227(a)(11)	(11) Each ESAA terminal shall be self-monitoring and, should a fault which can cause harmful interference to FSS networks be detected, the terminal must automatically cease transmissions.	Id.
§ 25.227(a)(12)	(12) Unless otherwise stated all ESAA system that comply with the off-axis EIRP spectral-density limits in paragraph (a)(1)(i) of this section may request Permitted List authority.	Applicable regulatory status and protection provision.
§ 25.227(a)(13)	(13) ESAA providers operating in the international airspace within line-of-sight of the territory of a foreign administration where fixed service networks have primary allocation in this band, the maximum power flux density (pfd) produced at the surface of the Earth by emissions from a single aircraft carrying an ESAA terminal should not exceed the following values unless the foreign Administration has imposed other conditions for protecting its fixed service stations: -132+0.5 $\cdot \theta$ dB(W/(m2 \cdot MHz)) For $\theta \le 40^{\circ}$ -112 dB(W/(m2 \cdot MHz)) For $40^{\circ} < \theta \le 90^{\circ}$ Where: θ is the angle of arrival of the radio-frequency wave (degrees above the horizontal) and the aforementioned limits relate to the pfd and angles of arrival would be obtained under free-space propagation conditions.	Applicable regulatory status and protection provision.
§ 25.227(a)(14)	(14) All ESAA terminals operated in U.S. airspace, whether on U.Sregistered civil aircraft or non-U.S registered civil aircraft, must be licensed by the Commission. All ESAA terminals on U.Sregistered civil aircraft operating outside of U.S. airspace must be licensed by the Commission, except as provided by Section 303(t) of the Communications Act.	Applicable regulatory status and protection provision.
§ 25.227(a)(15)	(15) For ESAA systems operating over international waters, ESAA operators will certify that their target space station operators have confirmed that proposed ESAA operations are within coordinated parameters for adjacent satellites up to 6 degrees away on the geostationary arc.	<i>See</i> Technical Appendix, Section I.
§ 25.227(a)(16)	(16) Prior to operations within the foreign nation's airspace, the ESAA operator will ascertain whether the relevant administration has operations that could be affected by ESAA terminals, and will determine whether that administration has adopted specific requirements concerning ESAA operations. When the aircraft enters foreign airspace, the ESAA terminal would be required to operate under the Commission's rules, or those of the foreign administration, whichever is more constraining. To the extent that all relevant administrations have identified geographic areas from which ESAA operations would not affect their radio operations, ESAA operators would be free to operate within those identified areas without further action. To the extent that the foreign administration has not adopted requirements regarding ESAA operations, ESAA operators would be required to coordinate their operations with any potentially affected operations.	Panasonic complies (no specific certification required).
§ 25.227(b)	(b) Applications for ESAA operation in the 14.0-14.5 GHz (Earth-to-space) band to GSO satellites in the FSS shall include, in addition to the particulars of operation identified on FCC Form 312, and associated Schedule B, the applicable technical demonstrations in paragraphs (b)(1), (b)(2), or (b)(3), and the documentation identified in paragraphs (b)(4) through (b)(8) of this section.	
§ 25.227(b)(1)	(1) An ESAA applicant proposing to implement a transmitter under paragraph (a)(1) of this section must	

 (i)-(ii) [Reserved] (iii) An ESAA applicant proposing to implement a transmitter under paragraph (a)(1)(ii)(A) of this section shall: 	See Application Narrative, Section II and Technical Appendix, Section II; File No. SES- MFS-20120913-00818 (PPA); File No. SES- MFS- 20160819-00730 (SPA).
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§ 25.227(b)(2)	 (2) An ESAA applicant proposing to operate with off-axis EIRP density in excess of the levels in paragraph (a)(1)(i) or (a)(3)(i) of this section must provide the following in exhibits to its earth station application: (i) Off-axis EIRP density data pursuant to \$25.115(g)(1); (ii) The certifications required by \$25.220(d); and (iii) A detailed showing that each ESAA transmitter in the system will automatically cease or reduce emissions within 100 milliseconds after generating EIRP density exceeding specifications provided to the target satellite operator; and (iv) A detailed showing that the aggregate power density from simultaneously transmitting ESAA transmitters will be monitored at the system's network control and monitoring center; that if simultaneous operation of two or more ESAA transmitters causes the aggregate off-axis EIRP density to exceed the off-axis EIRP density specifications supplied to the target satellite operator, the network control and monitoring center will command those transmitters to cease emissions or reduce the aggregate EIRP density to a level at or below those specifications; and that those transmitters will comply within 100 milliseconds of receiving the command. 	See Application Narrative, Section II and Technical Appendix, Section I; File No. SES- MFS-20120913-00818 (PPA); File No. SES- MFS- 20160819-00730 (SPA)
§ 25.227(b)(3)	 (3) An applicant proposing to implement an ESAA system subject to paragraph (a)(3) of this section must provide the following information in exhibits to its earth station application: (i) Off-axis EIRP density data pursuant to §25.115(g)(1); (ii) A detailed showing of the measures that will be employed to maintain aggregate EIRP density at or below the limit in paragraph (a)(3)(i) of this section; (iii) A detailed showing that each ESAA terminal will automatically cease or reduce emissions within 100 milliseconds after generating off-axis EIRP density exceeding the limit in paragraph (a)(3)(i) of this section; and (iv) A detailed showing that the aggregate power density from simultaneously transmitting ESAA transmitters will be monitored at the system's network control and monitoring center; that if simultaneous operation of two or more transmitters in the ESAA network causes aggregate off-axis EIRP density to exceed the off-axis density limit in paragraph (a)(3)(i) of this section, the network control and monitoring center will command those transmitters to cease emissions or reduce the aggregate EIRP density to a level at or below that limit; and that those transmitters will comply within 100 milliseconds of receiving the command. 	N/A

§ 25.227(b)(4)	(4) There shall be an exhibit included with the application describing the geographic area(s) in which the ESAA will operate.	<i>See</i> Application Technica Appendix, Section I.
§ 25.227(b)(5)	(5) Any ESAA applicant filing for an ESAA terminal or system and planning to use a contention protocol shall include in its application a certification that will comply with the requirements of paragraph (a)(4) of this section.	N/A
§ 25.227(b)(6)	(6) The point of contact referred to in paragraph (a)(5) of this section shall be included in the application.	See File No. SES-MFS- 20160819-00730, Technical Appendix.
§ 25.227(b)(7)	(7) Any ESAA applicant filing for an ESAA terminal or system shall include in its application a certification that will comply with the requirements of paragraph (a)(6), (a)(9), (a)(10), (a)(11) of this section.	<i>See</i> Application Technical Appendix, Section VII.
§ 25.227(b)(8)	(8) All ESAA applicants shall submit a radio frequency hazard analysis determining via calculation, simulation, or field measurement whether ESAA terminals, or classes of terminals, will produce power densities that will exceed the Commission's radio frequency exposure criteria. ESAA applicants with ESAA terminals that will exceed the guidelines in Section 1.1310 for radio frequency radiation exposure shall provide, with their environmental assessment, a plan for mitigation of radiation exposure to the extent required to meet those guidelines. All ESAA licensees shall ensure installation of ESAA terminals on aircraft by qualified installers who have an understanding of the antenna's radiation environment and the measures best suited to maximize protection of the general public and persons operating the vehicle and equipment. An ESAA terminal exhibiting radiation exposure levels exceeding 1.0 mW/cm ² in accessible areas, such as at the exterior surface of the radome, shall have a label attached to the surface of the terminal where the radiation hazard and shall include thereon a diagram showing the regions around the terminal where the radiation levels could exceed 1.0 mW/cm ² .	See Application Technical Appendix, Section III.

§ 25.227(c)	 (c)(1) Operations of ESAAs in the 14.0-14.2 GHz (Earth-to-space) frequency band in the radio line-of- sight of the NASA TDRSS facilities on Guam (latitude 13° 36' 55" N, longitude 144° 51' 22" E) or White Sands, New Mexico (latitude 32° 20' 59" N, longitude 106° 36' 31" W and latitude 32° 32' 40" N, longitude 106° 36' 48" W) are subject to coordination with the National Aeronautics and Space Administration (NASA) through the National Telecommunications and Information Administration (NTIA) Interdepartment Radio Advisory Committee (IRAC). Licensees shall notify the International Bureau once they have completed coordination. Upon receipt of such notification from a licensee, the International Bureau will issue a public notice stating that the licensee may commence operations within the coordination zone in 30 days if no party has opposed the operations. (2) When NTIA seeks to provide similar protection to future TDRSS sites that have been coordinated through the IRAC Frequency Assignment Subcommittee process, NTIA will notify the Commission's International Bureau that the site is nearing operational status. Upon public notice from the International Bureau, all Kuband ESAA licensees shall cease operations in the 14.0-14.2 GHz band within radio line-of-sight of the new TDRSS site. Upon receipt of such notification from a licensee, the International Bureau will issue a public notice stating that the licensees complete coordination to inthe NTIA/IRAC for the new TDRSS site. Upon receipt of such notification al licensee, the International Bureau will issue a public notice stating that the licensees the the will be permitted to commence operations in the 14.0-14.2 GHz band within radio line-of-sight of the new TDRSS site. Upon receipt of such notification from a licensee, the International Bureau will issue a public notice stating that the licensee may commence operations within the coordination zone in 30 days if no party has opposed the operations. The ESAA licensee then will be permitted to commenc	See Section 1.65 Letter, File Nos. SES-LIC- 20100805-00992, SES- AMD-20100914-01163 and SES-AMD- 20101115-01432 (Call Sign E100089) (Notice of NASA Coordination Agreement dated Feb. 1, 2011).
§ 25.227(d)	 (d)(1) Operations of ESAA in the 14.47-14.5 GHz (Earth-to-space) frequency band in the radio line-of- sight of radio astronomy service (RAS) observatories observing in the 14.47-14.5 GHz band are subject to coordination with the National Science Foundation (NSF). The appropriate NSF contact point to initiate coordination is Electromagnetic Spectrum Manager, NSF, 4201 Wilson Blvd., Suite 1045, Arlington VA 22203, fax 703-292-9034, email esm@nsf.gov. Licensees shall notify the International Bureau once they have completed coordination. Upon receipt of the coordination agreement from a licensee, the International Bureau will issue a public notice stating that the licensee may commence operations within the coordination zone in 30 days if no party has opposed the operations. (2) A list of applicable RAS sites and their locations can be found in 25.226(d)(2) Table 1. (3) When NTIA seeks to provide similar protection to future RAS sites that have been coordinated through the IRAC Frequency Assignment Subcommittee process, NTIA will notify the Commission's International Bureau, all Kuband ESAA licensees shall cease operations in the 14.47-14.5 GHz band within the relevant geographic zone of the new RAS site until the licensees complete coordination for the new RAS site and shall submit the coordination for the new RAS site and shall submit the coordination for the new RAS site and shall submit the coordination for the new RAS site and shall submit the coordination agreement to the Commission. Upon receipt of such notification from a licensee, the International Bureau will issue a public notice stating that the licensee may commence operations within the coordination zone in 30 days if no party has opposed the operations. The ESAA licensee then will be permitted to commence operations in the 14.47-14.5 GHz band within the relevant geographic zone of in 30 days if no party has opposed the operations. The ESAA licensee then will be permitted to commence operations in the 14.47-14.5 GHz band wit	See Application, File No. SES-LIC- 20100805-00992, Technical Appendix at Att. C.

IX. Technical Certification

I, Paul Sarraffe, hereby certify that I am the technically qualified person responsible for the preparation of the technical information contained in the Panasonic Avionics Corporation request for special temporary authorization ("STA") for ESAA operating authority and the accompanying Technical Appendix, that I am familiar with Part 25 of the Commission's Rules (47 C.F.R. Part 25), and that I have either prepared or reviewed the technical information submitted in this application and found it to be complete and accurate to the best of my knowledge and belief.

Poul R. Sanaffe

Paul Sarraffe Senior Technical Lead, eXConnect Program Panasonic Avionics Corporation

March 8, 2017

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