

## Ku-Band Spot Uplink/Ku-Band Spot Downlink 12.5-12.75 GHz

<b>UPLINK BEAM INFORMATION</b>						
Uplink Beam Name	KUSPOT	KUSPOT	KUSPOT	KUSPOT	KUSPOT	KUSPOT
Uplink Frequency (GHz)	14.25	14.25	14.25	14.25	14.25	14.25
Uplink Beam Polarization	LINEAR	LINEAR	LINEAR	LINEAR	LINEAR	LINEAR
Uplink Relative Contour Level (dB)	-4	-4	-4	-4	-4	-4
Uplink Contour G/T (dB/K)	5.8	5.8	5.8	5.8	5.8	5.8
Uplink SFD (dBW/m2)	-77.2	-89.2	-83.2	-83.2	-83.2	-83.2
Rain Rate (mm/hr)	42	42	42	42	42	42
<b>DOWNLINK BEAM INFORMATION</b>						
Downlink Beam Name	KUSPOT	KUSPOT	KUSPOT	KUSPOT	KUSPOT	KUSPOT
Downlink Frequency (GHz)	11.95	11.95	11.95	11.95	11.95	11.95
Downlink Beam Polarization	LINEAR	LINEAR	LINEAR	LINEAR	LINEAR	LINEAR
Downlink Relative Contour Level (dB)	-4	-4	-4	-4	-4	-4
Downlink Contour EIRP (dBW)	43.7	43.7	43.7	43.7	43.7	43.7
Rain Rate (mm/hr)	42	42	42	42	42	42
<b>ADJACENT SATELLITE 1</b>						
Satellite 1 Orbital Location	31.5E	31.5E	31.5E	31.5E	31.5E	31.5E
Uplink Power Density (dBW/Hz)	-45	-45	-45	-45	-45	-45
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-21.4	-21.4	-21.4	-21.4	-21.4	-21.4
Downlink Polarization Advantage (dB)	0	0	0	0	0	0
<b>ADJACENT SATELLITE 2</b>						
Satellite 1 Orbital Location	34.9E	34.9E	34.9E	34.9E	34.9E	34.9E
Uplink Power Density (dBW/Hz)	-45	-45	-45	-45	-45	-45
Uplink Polarization Advantage (dB)	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0
Downlink Polarization Advantage (dB)	0	0	0	0	0	0
<b>CARRIER INFORMATION</b>						
Carrier ID	36M0F3F	77M0G7W	10M3G7W	100KG7W	1M45G7W	400KG7W
Carrier Modulation	TV/FM	QPSK	QPSK	QPSK	BPSK	BPSK
Peak to Peak Bandwidth of EDS (MHz)	4	N/A	N/A	N/A	N/A	N/A
Information Rate(kbps)	N/A	52563	6000	64	512	128
Code Rate	N/A	1/2x188/204	1/2x188/204	1/2x239/256	R1/2	R1/2
Occupied Bandwidth(kHz)	36000	64451	6771.1	75.4	1229	307
Allocated Bandwidth(kHz)	36000	77000	10300	100	1450	400
Minimum C/N, Clear Sky (dB)	10	3.36	3.87	2.99	3.4	3.4
Minimum C/N, Rain (dB)	10	3.36	3.57	2.79	2.7	2.7
<b>UPLINK EARTH STATION</b>						
Earth Station Diameter (meters)	3.7	2.4	1.8	1.8	1.8	1.8
Earth Station Gain (dBi)	52.7	49	46.4	46.4	46.4	46.4
Earth Station Elevation Angle	20	20	20	20	20	20
<b>DOWNLINK EARTH STATION</b>						
Earth Station Diameter (meters)	11.0	3.0	6.1	6.1	7.0	6.1
Earth Station Gain (dBi)	60.4	49.2	55.5	55.5	57.0	55.5
Earth Station G/T (dB/K)	38.0	26.7	33.1	33.1	34.6	33.1
Earth Station Elevation Angle	20	20	20	20	20	20
<b>LINK FADE TYPE</b>						
LINK FADE TYPE	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky
<b>UPLINK PERFORMANCE</b>						
Uplink Earth Station EIRP (dBW)	75.2	73.7	61.2	40.7	52.3	46.7
Uplink Path Loss, Clear Sky (dB)	-207.5	-207.5	-207.5	-207.5	-207.5	-207.5
Uplink Rain Attenuation	0.0	0.0	0.0	0.0	0.0	0.0
Satellite G/T(dB/K)	5.8	5.8	5.8	5.8	5.8	5.8
Boltzman Constant(dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-75.6	-78.1	-68.3	-48.8	-60.9	-54.9
Uplink C/N(dB)	26.6	22.5	19.8	18.9	18.4	18.8
<b>DOWNLINK PERFORMANCE</b>						
Downlink EIRP per Carrier (dBW)	38.2	43.7	30.2	9.7	21.3	15.7
Antenna Pointing Error (dB)	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
Downlink Path Loss, Clear Sky (dB)	-205.9	-205.9	-205.9	-205.9	-205.9	-205.9
Downlink Rain Attenuation	0.0	0.0	0.0	0.0	0	0
Earth Station G/T (dB/K)	38.0	26.7	33.1	33.1	34.6	33.1
Boltzman Constant(dBW / K - Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-75.6	-78.1	-68.3	-48.8	-60.9	-54.9
Downlink C / N(dB)	22.8	14.4	17.1	16.2	17.2	16.1
<b>COMPOSITE LINK PERFORMANCE</b>						
C/N Uplink (dB)	26.6	22.5	19.8	18.9	18.4	18.8
C/N Downlink (dB)	22.8	14.4	17.1	16.2	17.2	16.1
C/I Intermodulation (dB)	N/A	N/A	19.0	18.0	17.5	17.9
C/I Uplink Co-Channel (dB)*	28.9	28.6	27.4	27.0	27.0	27.0
C/I Downlink Co-Channel (dB)*	28.9	28.6	27.4	27.0	27.0	27.0
C/I Uplink Adjacent Satellite 1 (dB)	19.3	15.3	12.6	11.6	11.1	11.5
C/I Downlink Adjacent Satellite 1 (dB)	19.4	10.5	13.6	12.6	13.7	12.5
C/I Uplink Adjacent Satellite 2 (dB)	22.6	18.6	15.9	14.9	14.4	14.9
C/I Downlink Adjacent Satellite 2 (dB)	21.7	13.9	16.2	15.2	16.2	15.2
C/(N+I) Composite (dB)	13.4	6.6	7.1	6.1	6.3	6.1
Required System Margin (dB)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Net C/(N+I) Composite (dB)	12.4	5.6	6.1	5.1	5.3	5.1
Minimum Required C/N (dB)	-10.0	-3.4	-3.9	-3.0	-3.4	-3.4
Excess Link Margin (dB)	2.4	2.2	2.2	2.1	1.9	1.7
Number of Carriers	2	1	10	1120	77	280
<b>CARRIER DENSITY LEVELS</b>						
Uplink Power Density (dBW/Hz)	-53.1	-53.4	-53.5	-54.5	-55.0	-54.5
Downlink EIRP Density At Beam Peak (dBW/Hz)	-33.4	-30.4	-34.1	-35.1	-35.6	-35.1

## Ku-Band Spot Uplink/Ku-Band Spot Downlink 10.95-11.2 & 11.45-11.7 GHz

<b>UPLINK BEAM INFORMATION</b>							
Uplink Beam Name	KUSPOT	KUSPOT	KUSPOT	KUSPOT	KUSPOT	KUSPOT	KUSPOT
Uplink Frequency (GHz)	14.25	14.25	14.25	14.25	14.25	14.25	14.25
Uplink Beam Polarization	LINEAR	LINEAR	LINEAR	LINEAR	LINEAR	LINEAR	LINEAR
Uplink Relative Contour Level (dB)	-4	-4	-4	-4	-4	-4	-4
Uplink Contour G/T (dB/K)	5.8	5.8	5.8	5.8	5.8	5.8	5.8
Uplink SFD (dBW/m2)	-77.2	-89.2	-83.2	-83.2	-83.2	-83.2	-89.2
Rain Rate (mm/hr)	42	42	42	42	42	42	42
<b>DOWNLINK BEAM INFORMATION</b>							
Downlink Beam Name	KUSPOT	KUSPOT	KUSPOT	KUSPOT	KUSPOT	KUSPOT	KUSPOT
Downlink Frequency (GHz)	11.95	11.95	11.95	11.95	11.95	11.95	11.95
Downlink Beam Polarization	LINEAR	LINEAR	LINEAR	LINEAR	LINEAR	LINEAR	CIRCULAR
Downlink Relative Contour Level (dB)	-4	-4	-4	-4	-4	-4	-4
Downlink Contour EIRP (dBW)	43.7	43.7	43.7	43.7	43.7	43.7	43.7
Rain Rate (mm/hr)	42	42	42	42	42	42	42
<b>ADJACENT SATELLITE 1</b>							
Satellite 1 Orbital Location	31.5E	31.5E	31.5E	31.5E	31.5E	31.5E	31.5E
Uplink Power Density (dBW/Hz)	-45	-45	-45	-45	-45	-45	-45
Uplink Polarization Advantage (dB)	0	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0
Downlink Polarization Advantage (dB)	0	0	0	0	0	0	0
<b>ADJACENT SATELLITE 2</b>							
Satellite 1 Orbital Location	34.9E	34.9E	34.9E	34.9E	34.9E	34.9E	34.9E
Uplink Power Density (dBW/Hz)	-45	-45	-45	-45	-45	-45	-45
Uplink Polarization Advantage (dB)	0	0	0	0	0	0	0
Downlink EIRP Density (dBW/Hz)	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0
Downlink Polarization Advantage (dB)	0	0	0	0	0	0	0
<b>CARRIER INFORMATION</b>							
Carrier ID	36M0F3F	77M0G7W	10M3G7W	100K.G7W	1M45G7W	400K.G7W	112M0G7W
Carrier Modulation	TV/FM	QPSK	QPSK	QPSK	BPSK	BPSK	QPSK
Peak to Peak Bandwidth of EDS (MHz)	4	N/A	N/A	N/A	N/A	N/A	N/A
Information Rate(kbps)	N/A	52563	6000	64	512	128	86015
Code Rate	N/A	1/2x188/204	1/2x188/204	1/2x239/256	R1/2	R1/2	1/2x188/204
Occupied Bandwidth(kHz)	36000	64451	6771.1	75.4	1229	307	93335
Allocated Bandwidth(kHz)	36000	77000	10300	100	1450	400	112000
Minimum C/N, Clear Sky (dB)	10	3.36	3.87	2.99	3.4	3.4	3.36
Minimum C/N, Rain (dB)	10	3.36	3.57	2.79	2.7	2.7	3.36
<b>UPLINK EARTH STATION</b>							
Earth Station Diameter (meters)	3.7	2.4	1.8	1.8	1.8	1.8	3.0
Earth Station Gain (dBi)	52.7	49	46.4	46.4	46.4	46.4	49.7
Earth Station Elevation Angle	20	20	20	20	20	20	20
<b>DOWNLINK EARTH STATION</b>							
Earth Station Diameter (meters)	11.0	3.0	6.1	7.0	7.0	7.0	3.7
Earth Station Gain (dBi)	60.4	49.2	55.5	57.0	57.0	57.0	51.1
Earth Station G/T (dB/K)	38.0	26.7	33.1	34.6	34.6	34.6	28.6
Earth Station Elevation Angle	20	20	20	20	20	20	20
<b>LINK FADE TYPE</b>							
Uplink Earth Station EIRP (dBW)	75.2	73.7	61.2	40.7	52.3	46.7	73.7
Uplink Path Loss, Clear Sky (dB)	-207.5	-207.5	-207.5	-207.5	-207.5	-207.5	-207.5
Uplink Rain Attenuation	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Satellite G/T(dB/K)	5.8	5.8	5.8	5.8	5.8	5.8	5.8
Boltzman Constant(dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-75.6	-78.1	-68.3	-48.8	-60.9	-54.9	-79.7
Uplink C/N(dB)	26.6	22.5	19.8	18.9	18.4	18.8	20.9
<b>DOWNLINK PERFORMANCE</b>							
Downlink EIRP per Carrier (dBW)	38.2	43.7	30.2	9.7	21.3	15.7	43.7
Antenna Pointing Error (dB)	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
Downlink Path Loss, Clear Sky (dB)	-205.9	-205.9	-205.9	-205.9	-205.9	-205.9	-205.9
Downlink Rain Attenuation	0.0	0.0	0.0	0.0	0	0	0.0
Earth Station G/T (dB/K)	38.0	26.7	33.1	34.6	34.6	34.6	28.6
Boltzman Constant(dBW / K - Hz)	228.6	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-75.6	-78.1	-68.3	-48.8	-60.9	-54.9	-79.7
Downlink C / N(dB)	22.8	14.4	17.1	17.7	17.2	17.6	14.7
<b>COMPOSITE LINK PERFORMANCE</b>							
C/N Uplink (dB)	26.6	22.5	19.8	18.9	18.4	18.8	20.9
C/N Downlink (dB)	22.8	14.4	17.1	17.7	17.2	17.6	14.7
C/I Intermodulation (dB)	N/A	N/A	19.0	18.0	17.5	17.9	N/A
C/I Uplink Co-Channel (dB)*	28.9	28.6	27.4	27.0	27.0	27.0	27.0
C/I Downlink Co-Channel (dB)*	28.9	28.6	27.4	27.0	27.0	27.0	27.0
C/I Uplink Adjacent Satellite 1 (dB)	19.3	15.3	12.6	11.6	11.1	11.5	13.7
C/I Downlink Adjacent Satellite 1 (dB)	18.0	9.1	12.2	12.8	12.3	12.7	9.6
C/I Uplink Adjacent Satellite 2 (dB)	22.6	18.6	15.9	14.9	14.4	14.9	17.0
C/I Downlink Adjacent Satellite 2 (dB)	21.7	13.9	16.2	16.7	16.2	16.6	14.1
C/(N+I) Composite (dB)	13.0	6.0	6.7	6.5	6.0	6.4	5.9
Required System Margin (dB)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Net C/(N+I) Composite (dB)	12.0	5.0	5.7	5.5	5.0	5.4	4.9
Minimum Required C/N (dB)	-10.0	-3.4	-3.9	-3.0	-3.4	-3.4	-3.4
Excess Link Margin (dB)	2.0	1.6	1.8	2.5	1.6	2.0	1.5
Number of Carriers	2	1	10	1120	77	280	1
<b>CARRIER DENSITY LEVELS</b>							
Uplink Power Density (dBW/Hz)	-53.1	-53.4	-53.5	-54.5	-55.0	-54.5	-55.7
Downlink EIRP Density At Beam Peak (dBW/Hz)	-33.4	-30.4	-34.1	-35.1	-35.6	-35.1	-32.0