

EchoStar 17/24 GHz Link Budget

Link Parameters	Clear Sky (Mexico City)	Faded D/L (Mexico City)
Link Geometry:		
Tx E/S Range to Satellite (km)	38,110	38,110
Rx E/S Range to Satellite (km)	36,627	36,627
Uplink:		
Carrier Frequency (MHz)	25,198	25,198
Tx E/S Antenna Diameter (m)	12.0	12.0
Max. Tx E/S Power to Antenna (W)	15.0	15.0
Max. Tx E/S Power Density to Antenna (dBW/MHz)	-7.1	-7.1
Tx E/S Antenna Gain (dB)	68.2	68.2
Tx E/S EIRP per Carrier (dBW)	80.0	80.0
Atmospheric and Other Losses (dB)	0.7	0.7
Free Space Loss (dB)	212.1	212.1
Satellite:		
G/T towards Tx E/S (dB/K)	17.3	17.3
EIRP per Carrier towards Rx E/S (dBW)	65.3	65.3
Downlink:		
Carrier Frequency (MHz)	17,748	17,748
Atmospheric and Other Losses (dB)	0.2	7.7
Free Space Loss (dB)	208.7	208.7
Rx E/S Antenna Diameter (m)	0.45	0.45
Rx E/S Antenna Gain (dB)	36.2	36.2
Pointing Error (dB)	0.5	0.5
Rx E/S G/T (dB/K)	13.2	9.9
System (LNA+Sky) Noise Temperature (K)	200	428
Total Link:		
Bandwidth (dB-Hz)	78.90	78.90
C/N - Thermal Uplink (dB)	34.2	34.2
C/N - Thermal Downlink (dB)	18.8	8.0
C/I - Aggregate uplink ASI (dB)	36.9	36.9
C/I - Aggregate downlink ASI (dB)	21.0	21.0
C/I - Other Link Degradations (dB)	22.0	22.0
C/(N+I) - Total, Actual (dB)	15.5	7.6
C/(N+I) - Total, Required (dB)	7.5	7.5
Excess Margin (dB)	8.0	0.1
Availability (%)	N/A	99.99
Aggregate Interference Assessment:		
(C/N) - no ASI (dB)	17.0	7.8
Degradation due to aggregate ASI (dB)	1.5	0.2