

Table A-3: EVDO Forward Data Link Budget

Satellite and Earth Station Information		
Uplink Name	Las Vegas (6.3 m)	Las Vegas (9.3 m)
Satellite Longitude (degrees) (- = West)	-111.1	-111.1
Downlink Elevation Angle (degrees)	36.10	36.10
Carrier Information		
Reuse Plan	4	4
Beam Pitch (deg)	0.25	0.25
Number of beams	280	280
Number of CDMA carriers per beam	1	1
Number of users per carrier	1	1
CDMA Carrier Bandwidth (MHz)	1.25	1.25
Information Rate (including overhead) (kbps)	964	964
Modulation	QPSK	QPSK
FEC Code Rate	0.5	0.5
Required Total C/N with Margin (dB)	1.51	1.51
Uplink		
Uplink Frequency (GHz)	12.88	12.88
Uplink EIRP (on-axis) (dBW)	51.93	55.13
Uplink Atmospheric Loss (dB)	0.11	0.11
Rain Availability (%)	99.99	99.99
Uplink Rain Fade (dB)	3.37	3.37
Uplink Free Space Pathloss (dB)	206.05	206.05
Transponder G/T dBi/K	15.06	15.06
Uplink C/N (dB)	26.22	29.42
C/I adj-channel	23.13	23.13
C/I Crosspole Isolation (including rain depole) (dB)	23.01	23.01
Composite Uplink C/I (dB)	20.06	20.06
Satellite Transponder		
Power Control Error (dB)-per user	0.50	0.50
Power Control Error (dB)-per uplink	1.00	1.00
Per Carrier Output Backoff (dB)	27.47	27.47
Expected C/IM in Digital Carrier Bandwidth at Satellite (dB)	12.50	12.50
Downlink		
Downlink Frequency (GHz)	2.19	2.19
Satellite EIRP per carrier (dBW)	72.10	72.10
Downlink Free Space Pathloss (dB)	190.87	190.87
Downlink Atmospheric Loss (dB)	0.06	0.06
Shadowing + Fading (dB)	3.00	3.00
Earth Station On-axis G/T (with downlink rain fade) (dBi/K)	-28.00	-28.00
Polarization Loss (dB)	3.00	3.00
Downlink C/N (dB)	15.94	15.94
C/I Intra-Beam (dB)	100.00	100.00
C/I Inter-Beam (dB)	2.16	2.16
C/I adjacent satellite (dB)	100.00	100.00
C/I adj-channel	100.00	100.00
Expected Composite Downlink C/I (dB)	2.16	2.16

Overall Performance Summary		
Computed Uplink or System Margin (dB)	0.03	0.04
Downlink Margin (dB)	0.76	0.93

Table A-4: EVDO Forward Voice Link Budget

Satellite and Earth Station Information		
Uplink Name	Las Vegas (6.3 m)	Las Vegas (9.3 m)
Satellite Longitude (degrees) (- = West)	-111.1	-111.1
Downlink Elevation Angle (degrees)	36.10	36.10
Carrier Information		
Frequency reuse pattern	4	4
Beam Pitch (deg)	0.25	0.25
Number of beams	280	280
Number of CDMA carriers per beam	2	2
Number of users per carrier	1	1
CDMA carrier bandwidth (MHz)	1.25	1.25
Information Rate (including overhead) (kbps)	304.56	304.56
Activity factor	0.4	0.4
Voice rate (including overhead) (kbps)	5.64	5.64
Number of voice channels per beam	270.00	270.00
Modulation	QPSK	QPSK
FEC code rate	0.2	0.2
Required Total C/N with Margin (dB)	-3.53	-3.53
Uplink		
Uplink frequency (GHz)	12.88	12.88
Uplink EIRP (on-axis) (dBW)	48.92	52.12
Uplink atmospheric Loss (dB)	0.11	0.11
Rain availability (%)	99.99	99.99
Uplink rain fade (dB)	3.37	3.37
Uplink Free Space Pathloss (dB)	206.05	206.05
Transponder G/T dBi/K	15.06	15.06
Uplink C/N (dB)	24.23	27.43
C/I adj-channel (dB)	28.13	28.13
C/I Crosspole Isolation (including rain depole) (dB)	23.01	23.01
Composite Uplink C/I (dB)	21.85	21.85
Satellite Transponder		
Power Control Error (dB)-per user	0.50	0.50
Power Control Error (dB)-per uplink	1.00	1.00
Per Carrier Output Backoff (dB)	30.48	30.48
Expected C/IM in Digital Carrier Bandwidth at Satellite (dB)	12.50	12.50
Downlink		
Downlink Frequency (GHz)	2.19	2.19
Satellite EIRP per carrier (dBW)	52.86	52.86
Downlink Free Space Pathloss (dB)	190.87	190.87
Downlink Atmospheric Loss (dB)	0.06	0.06
Shadowing + Fading (dB)	3.00	3.00
Earth Station On-axis G/T (with downlink rain fade)	-28.00	-28.00

(dBi/K)		
Polarization Loss (dB)	3.00	3.00
Downlink C/N (dB)	-2.28	-2.28
C/I Intra-Beam (dB)	100.00	100.00
C/I Inter-Beam (dB)	3.19	3.19
C/I adjacent satellite (dB)	100.00	100.00
C/I adj-channel	100.00	100.00
Expected Composite Downlink C/I (dB)	3.19	3.19
Overall Performance Summary		
Computed Uplink or System Margin (dB)	0.03	0.04
Downlink Margin (dB)	0.04	0.05