

## Return Link Budget GEN2 Voice 1.23 MHz

Return Link: 1.6 GHz up/7 GHz down				
	Inner	Outer		
<b>Uplink Analysis</b>				<b>Units</b>
Frequency	1.6	1.6		GHz
EIRP per user	-12.7	-12.7		dBW
Altitude	1414	1414		km
User elevation angle	70	25		deg
Slant Range	1486	2528		km
Path loss	-160.0	-164.7		dB
Polarization & Tracking loss	-1	-1		dB
S/C Rx Signal Strength	-173.7	-178.4		dB
Satellite antenna gain	13.09	17.78		dBi
Line loss	-2.00	-2.00		dB
User signal at transponder	-162.6	-162.6		dBW
System noise temperature	396.64	396.64		K
Thermal noise density, No	-202.6	-202.6		dBW/Hz
Average user data rate	2400	2400		bps
Uplink Eb/(No)	6.2	6.2		dB
Interference per channel	-137.72	-137.72		dBW
Spreading bandwidth	1.23	1.23		MHz
Interference density, Io	-198.6	-198.6		dBW/Hz
Uplink Eb/(No+Io)	0.7	0.7		dB
Nominal transponder gain	127.4	127.4		dB
<b>Downlink Analysis</b>				
Frequency	6.98	6.98		GHz
TX power per user	-31.1	-31.1		dBW
Transmit line loss	-2.2	-2.2		dB
Satellite antenna gain	7.10	7.10		dBi
EIRP per user	-26.1	-26.1		dBW
GW elevation angle	40	40		deg
Range	1969	1969		km
Free space loss (40 deg GW elev)	-175.2	-175.2		dB
Polarization & tracking loss	-0.1	-0.1		dB
Pointing loss	-1.0	-1.0		dB
RX signal/user/satellite	-202.4	-202.4		dBW
GW antenna gain (incl. line losses)	49.5	49.5		dBi
RX signal at antenna output/user/satellite	-152.9	-152.9		dBW
System noise temperature	127.7	127.7		K
Thermal noise density, No	-207.5	-207.5		dBW/Hz
Interference per channel	-143.21	-143.21		dBW
Spreading bandwidth	1.23	1.23		MHz
1/(10*LOG(spreading bandwidth))	-60.9	-60.9		dB/Hz
Interference Density, Io	-204.1	-204.1		dBW/Hz
Downlink Eb/(No+Io)	15.8	15.8		dB
Coherent Combining gain	2.2	2.2		dB
Overall (up&down) Eb/(No+Io)	2.8	2.8		dB
Required Eb/No w/ power control margin	2.8	2.8		dB
Available margin for propagation effects	16	16		dB