

Foras Promineo
Uplink Budget

Constants	Standard		Decibels	
Boltzmann Constant, k	1.381E-23	J/K	-228.60	dB
Speed of Light in Vacuum, c	3.00E+08	m/s		
Earth Radius, RE	6378	km		
Earth Mu	3.99E+05	km^3/s^2		
Frequency				
Frequency of Signal, f	435	MHz		
Wavelength of Signal, λ	0.690	m		
Orbit				
Altitude, h	420	km		
Elevation Angle of Receiver from Horizon, φ	20	deg		
Line of Sight Range, S	1027	km		
Orbital Period, T	93.0	min		
S/C Velocity in Circular Orbit, v	7.7	km/s		
S/C Velocity Relative to Ground Station, vr	7.2	km/s		
Maximum Estimated Doppler Shift, df	10.4	kHz		
Path Losses				
Link Loss (or free-space loss), Ls	2.9E-15		-145.5	dB
Atmospheric Attenuation, La	0.631		-2.0	dB
Receiver				
Gain of Receiving Antenna, Gr	0.90		0.0	dBi
Receiver System Temperature, Ts	700.0	K	28.5	dBK
Polarization Losses, Lp	0.50		-3.0	dB
Bandwidth, B	125.0	kHz	51.0	dBHz
System Noise, N	1.21E-15	W	-149.2	dBW
Transmitter				
Transmitting Antenna Gain, Gt	10.00		10.00	dB
Transmitter Power, P	1.00	W	0.00	dBW
EIRP, W	10.00	W	10.00	dBW
Signal Encoding				
Spreading Factor	6			
Receiver Sensitivity (from Datasheet)			-118.00	dBm
Error Correction Factor	0.67			
Bit Rate	15625	bps		
Link Quality				
Received Power, S	8.13E-15	W	-140.5	dBW
Signal to Noise, S/N	6.73		8.28	dB
Margin, M			7.54	dB

Foras Promineo
Downlink Budget

Constants	Standard		Decibels	
Boltzmann Constant, k	1.381E-23	J/K	-228.60	dB
Speed of Light in Vacuum, c	3.00E+08	m/s		
Earth Radius, RE	6378	km		
Earth Mu	3.99E+05	km^3/s^2		
Frequency				
Frequency of Signal, f	435	MHz		
Wavelength of Signal, λ	0.690	m		
Orbit				
Altitude, h	420	km		
Elevation Angle of Receiver from Horizon, φ	20	deg		
Line of Sight Range, S	1027	km		
Orbital Period, T	93.0	min		
S/C Velocity in Circular Orbit, v	7.7	km/s		
S/C Velocity Relative to Ground Station, vr	7.2	km/s		
Maximum Estimated Doppler Shift, df	10.4	kHz		
Path Losses				
Link Loss (or free-space loss), Ls	2.9E-15		-145.5	dB
Atmospheric Attenuation, La	0.631		-2.0	dB
Receiver				
Gain of Receiving Antenna, Gr	10.0		10.0	dBi
Receiver System Temperature, Ts	700.0	K	28.5	dBK
Polarization Losses, Lp	0.5		-3.0	dB
Bandwidth, B	125.0	kHz	51.0	dBHz
System Noise, N	1.21E-15	W	-149.2	dBW
Transmitter				
Transmitting Antenna Gain, Gt	0.90		0.00	dB
Transmitter Power, P	1.00	W	0	dBW
EIRP, W	0.90	W	0.00	dBW
Signal Encoding				
Spreading Factor	6			
Receiver Sensitivity (from Datasheet)			-118.00	dBm
Error Correction Factor	0.67			
Bit Rate	15625	bps		
Link Quality				
Received Power, S	8.13E-15	W	-140.5	dBW
Signal to Noise, S/N	6.73		8.28	dB
Margin, M			7.54	dB