

OMUSAT-III

NOTE:

Downlink Telemetry Budget: CW Datarate 100cpm

Frequency : 145.8MHz Elevation Angle :10 ° 500HA1A

Parameter: Value: Units:

Spacecraft:

Spacecraft Transmitter Power Output:	0.1 watts
In dBW:	-10.0 dBW
In dBm:	20.0 dBm
Spacecraft Total Transmission Line Losses:	0.6 dB
Spacecraft Antenna Gain:	1.97 dBi
Spacecraft EIRP:	-8.4 dBW

Downlink Path:

Spacecraft Antenna Pointing Loss:	1.5 dB
S/C-to-Ground Antenna Polarization Loss:	3.0 dB
Path Loss:	137.5 dB
Atmospheric Loss:	1.1 dB
Ionospheric Loss:	0.7 dB
Rain Loss:	0.0 dB
Isotropic Signal Level at Ground Station:	-149.0 dBW

Ground Station Alternative Signal Analysis Method (SNR Computation):

----- SNR Method -----

Ground Station Antenna Pointing Loss:	0.7 dB
Ground Station Antenna Gain:	18.5 dBi
Ground Station Total Transmission Line Losses:	2.0 dB
Ground Station Effective Noise Temperature:	396 K
Ground Station Figure of Merit (G/T):	-9.4 dB/K
Signal Power at Ground Station LNA Input:	-133.2 dBW
Ground Station Receiver Bandwidth (B):	2,300 Hz
G.S. Receiver Noise Power (Pn = kTB)	-169.0 dBW
Signal-to-Noise Power Ratio at G.S. Rcvr:	35.8 dB
Analog or Digital System Required S/N:	9.6 dB
System Link Margin	23.1 dB

OMUSAT-III**NOTE:****Downlink Telemetry Budget: GMSK**

Datarate 9600bps

Frequency : 145.8MHz Elevation Angle :10 ° 11K0F1D

Parameter: **Value:** **Units:****Spacecraft:**

Spacecraft Transmitter Power Output: 0.8 watts
 In dBW: **-1.0** dBW
 In dBm: **29.0** dBm
 Spacecraft Total Transmission Line Losses: 0.6 dB
 Spacecraft Antenna Gain: 1.97 dBi
 Spacecraft EIRP: **0.6** dBW

Downlink Path:

Spacecraft Antenna Pointing Loss: 1.5 dB
 S/C-to-Ground Antenna Polarization Loss: 3.0 dB
 Path Loss: 137.5 dB
 Atmospheric Loss: 1.1 dB
 Ionospheric Loss: 0.7 dB
 Rain Loss: 0.0 dB
 Isotropic Signal Level at Ground Station: **-140.0** dBW

Ground Station (EbNo Method):**----- Eb/No Method -----**

Ground Station Antenna Pointing Loss: 0.7 dB
 Ground Station Antenna Gain: 18.5 dBi
 Ground Station Total Transmission Line Losses: 2.0 dB
 Ground Station Effective Noise Temperature: 396 K
 Ground Station Figure of Merit (G/T): -9.4 dB/K
 G.S. Signal-to-Noise Power Density (S/No): **78.5** dBHz
 System Desired Data Rate: **9600** bps
 In dBHz: 39.8 dBHz
 Telemetry System Eb/No for the Downlink: **38.6** dB

Demodulation Method Seleted:

GMSK

Forward Error Correction Coding Used:

None

System Allowed or Specified Bit-Error-Rate:

1.00E-05

Demodulator Implementation Loss:

3.0 dB

Telemetry System Required Eb/No:

9.6 dB

Eb/No Threshold:

12.6 dB**System Link Margin:****26.0** dB

OMUSAT-III**NOTE:****Downlink Telemetry Budget:AFSK**

Frequency : 145.8MHz Elevation Angle :10 ° 13K0F2D

Parameter:	Value:	Units:
Spacecraft:		
Spacecraft Transmitter Power Output:	0.8	watts
In dBW:	-1.0	dBW
In dBm:	29.0	dBm
Spacecraft Total Transmission Line Losses:	0.6	dB
Spacecraft Antenna Gain:	1.97	dB _i
Spacecraft EIRP:	0.6	dBW
Downlink Path:		
Spacecraft Antenna Pointing Loss:	1.5	dB
S/C-to-Ground Antenna Polarization Loss:	3.0	dB
Path Loss:	137.5	dB
Atmospheric Loss:	1.1	dB
Ionospheric Loss:	0.7	dB
Rain Loss:	0.0	dB
Isotropic Signal Level at Ground Station:	-140.0	dBW
Ground Station (Eb/No Method):		
----- Eb/No Method -----		
Ground Station Antenna Pointing Loss:	0.7	dB
Ground Station Antenna Gain:	18.5	dB _i
Ground Station Total Transmission Line Losses:	2.0	dB
Ground Station Effective Noise Temperature:	396	K
Ground Station Figure of Merrit (G/T):	-9.4	dB/K
G.S. Signal-to-Noise Power Density (S/No):	78.5	dBHz
System Desired Data Rate:	1200	bps
In dBHz:	30.8	dBHz
Telemetry System Eb/No for the Downlink:	47.7	dB
Demodulation Method Seleted:	AFSK/FM	
Forward Error Correction Coding Used:	None	
System Allowed or Specified Bit-Error-Rate:	1.0E-05	
Demodulator Implementation Loss:	3.0	dB
Telemetry System Required Eb/No:	23.2	dB
Eb/No Threshold:	26.2	dB
System Link Margin:	21.5	dB

OMUSAT-III

NOTE:

Downlink Budget:SSTV

Frequency : 145.8MHz Elevation Angle :10 ° 16K0F3F

Parameter:	Value:	Units:
Spacecraft:		
Spacecraft Transmitter Power Output:	0.8 watts	
In dBW:	-1.0	dBW
In dBm:	29.0	dBm
Spacecraft Total Transmission Line Losses:	0.6 dB	
Spacecraft Antenna Gain:	1.97 dBi	
Spacecraft EIRP:	0.6	dBW
Downlink Path:		
Spacecraft Antenna Pointing Loss:	1.5 dB	
S/C-to-Ground Antenna Polarization Loss:	3.0 dB	
Path Loss:	137.5 dB	
Atmospheric Loss:	1.1 dB	
Ionospheric Loss:	0.7 dB	
Rain Loss:	0.0 dB	
Isotropic Signal Level at Ground Station:	-140.0	dBW
Ground Station Alternative Signal Analysis Method (SNR Computation):		
----- SNR Method -----		
Ground Station Antenna Pointing Loss:	0.7 dB	
Ground Station Antenna Gain:	18.5 dBi	
Ground Station Total Transmission Line Losses	2.0 dB	
Ground Station Effective Noise Temperature:	396 K	
Ground Station Figure of Merrit (G/T):	-9.4 dB/K	
Signal Power at Ground Station LNA Input:	-124.2	dBW
Ground Station Receiver Bandwidth (B):	15,000	Hz
G.S. Receiver Noise Power (Pn = kTB)	-160.9	dBW
Signal-to-Noise Power Ratio at G.S. Rcvr:	36.7	dB
Analog or Digital System Required S/N:	18.0	dB
System Link Margin	18.7	dB

OMUSAT-III**NOTE:****Uplink Command Budget:AFSK**

Frequency : 437MHz Elevation Angle :10 ° 13K0F2D

Parameter:	Value:	Units:
Ground Station:		
Ground Station Transmitter Power Output:	50.0	watts
In dBW:	17.0	dBW
In dBm:	47.0	dBm
Ground Stn. Total Transmission Line Losses:	6.6	dB
Antenna Gain:	21.0	dBi
Ground Station EIRP:	31.3	dBW
Uplink Path:		
Ground Station Antenna Pointing Loss:	1.5	dB
Gnd-to-S/C Antenna Polarization Losses:	3.0	dB
Path Loss:	147.0	dB
Atmospheric Losses:	1.1	dB
Ionospheric Losses:	0.4	dB
Rain Losses:	0.0	dB
Isotropic Signal Level at Spacecraft:	-118.5	dBW
Spacecraft (Eb/No Method):		
----- Eb/No Method -----		
Spacecraft Antenna Pointing Loss:	1.5	dB
Spacecraft Antenna Gain:	2.2	dBi
Spacecraft Total Transmission Line Losses:	0.4	dB
Spacecraft Effective Noise Temperature:	323	K
Spacecraft Figure of Merit (G/T):	-23.4	dB/K
S/C Signal-to-Noise Power Density (S/No):	85.3	dBHz
System Desired Data Rate:	1200	bps
In dBHz:	30.8	dBHz
Command System Eb/No:	54.5	dB
Demodulation Method Seleted:	AFSK/FM	
Forward Error Correction Coding Used:	None	
System Allowed or Specified Bit-Error-Rate:	1.0E-05	
Demodulator Implementation Loss:	3.0	dB
Telemetry System Required Eb/No:	23.2	dB
Eb/No Threshold:	26.2	dB
System Link Margin:	28.3	dB