

**HISPASAT-LINK BUDGET**  
**DIGITAL SERVICES**

**REF. LINK**  
**TRANSPONDER N°**  
**SATELLITE**

AMAZONAS-3  
**Clear Sky**

**Rain**  
**up**

**Rain**  
**down**

**GENERAL DATA**

|                            |          |               |       |
|----------------------------|----------|---------------|-------|
| Transponder bandwidth(MHz) | 36       |               |       |
| carrier type               | outbound |               |       |
| Modulation                 | QPSK     |               |       |
| Information rate (Kb/s)    | 2048     | OVERHEAD      | 1     |
| FEC                        | 3/4      | Reed Solomon  | 1     |
| bandwidth occupied (KHz)   | 1638.40  |               |       |
| BER                        | 1.00E-07 |               |       |
| Eb/No (dB)                 | 8        | Nº portadoras |       |
| Nº of carriers             | 18.00    | 18.83         | 22.54 |
| IBO total (dB)             | 3.00     |               |       |
| OBO total (dB)             | 2.321    |               |       |
| C/I intermodulation        | 18.063   |               |       |
| Occupation factor          | 1.32     |               |       |
| availability (%)           | 99.50    |               |       |
| satellite longitude        | -61      |               |       |

**UPLINK**

|                              |              |
|------------------------------|--------------|
| E/T Tx Name                  | new York     |
| E/T Tx (degrees E) Longitude | -74.00       |
| E/T Tx (degrees N) latitude  | 40.75        |
| E/T Tx (m) Altitude          | 100.00       |
| Uplink Frequency (GHz)       | 14.00        |
| <b>EIRP E/T Tx.(dBW)</b>     | <b>62.50</b> |

**E/T Tx example**

|                      |       |                          |
|----------------------|-------|--------------------------|
| HPA (W)              | 10.00 |                          |
| HPA-antena (dB) loss | 0.20  | ES off axis psd (dBW/Hz) |
| Ant. gain (dB)       | 52.70 | -52.34                   |
| Ant. Diameter (m)    | 3.65  |                          |

|                                                  |         |         |
|--------------------------------------------------|---------|---------|
| Polarization discrim (dB)                        | 30.00   |         |
| Accuracy polarization(º)                         | 0.10    |         |
| % unavailability                                 |         | 0.12000 |
| Rain atten.                                      |         | 3.23    |
| Atmosp. Atten. loss (dB)                         | 0.20    |         |
| aiming error loss (dB)                           | 0.30    |         |
| sky loss (dB)                                    | 206.90  |         |
| D.F.P. (dBW/m2)                                  | -104.53 | -107.76 |
| saturation D.F.P.in the BEAM CENTER (dBW/m2)     | -88.00  |         |
| Back-off Input (dB)                              | 16.53   | 19.76   |
| Geogr. advantage (dB)                            | -4.00   |         |
| G/T satellite in the BEAM CENTER (dB/K)          | 4.70    |         |
| C/N up (dB)                                      | 22.25   | 19.03   |
| C/I cochannel up(dB)                             | 22.34   | 19.11   |
| C/(N+I without other interf. satellites up) (dB) | 17.42   | 14.19   |
| psd Interference from satellite 2º(dBW/Hz)       | -50.00  |         |
| C/I with other interf. Satellites 2º up (dB)     | 28.88   | 25.66   |
| c/(N+I) with other interf. Satellites up (dB)    | 17.12   | 13.89   |
| Xpolar Interference excess (dB)                  | 3.0     |         |

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**DOWNLINK**

|                                         |              |       |                    |
|-----------------------------------------|--------------|-------|--------------------|
| E/T Rx Name                             | MIAMI        |       |                    |
| E/T Rx (degrees E) Longitude            | -80.18       |       |                    |
| E/T Rx (degrees N) Latitude             | 25.77        |       |                    |
| E/T Rx (Km) Altitude                    | 100.00       |       |                    |
| Down Frequency (GHz)                    | 12.00        |       | SAT deirp (dBW/Hz) |
| EIRP satellite in the beam center (dBW) | 48.00        |       | -29.99             |
| Back-off output (dB)                    | 15.85        | 19.08 |                    |
| Geogr. advantage (dB)                   | -5.00        |       |                    |
| % unavailability                        |              |       | 0.38000            |
| Rain Atten.                             |              |       | 2.12               |
| Atmosp. Atten. loss (dB)                | 0.20         |       |                    |
| aiming error loss (dB)                  | 0.30         |       |                    |
| sky loss (dB)                           | 205.37       |       |                    |
| <b>G/T E/T Rx. (dB/K)</b>               | <b>30.00</b> |       | 26.04              |
| <b>E/T Rx Example</b>                   |              |       |                    |
| Ant. Gain(dB)                           | 48.78        |       |                    |
| antenna-receptor loss(dB)               | 0.20         |       |                    |
| Tina (ºK)                               | 40.00        |       |                    |
| Ta (ºK)                                 | 20.00        |       |                    |
| Tsyst. (ºK)                             | 72.15        |       |                    |
| Ant. Diameter (m)                       | 2.61         |       |                    |

|                                                    |        |       |       |
|----------------------------------------------------|--------|-------|-------|
| Polarization discrim.(dB)                          | 30.00  |       |       |
| C/N down (dB)                                      | 17.73  | 14.51 | 11.65 |
| C/I cochannel down(dB)                             | 22.52  | 22.52 | 22.52 |
| C/I channel adjacent (dB)                          | 24.70  | 24.70 | 24.70 |
| C/(N+I without other interf. satellites down) (dB) | 14.35  | 11.72 | 10.55 |
| deirp Interference from satellite 2º(dBW/Hz)       | -30.00 |       |       |
| C/I with other interf. Satellites 2º down (dB)     | 22.31  | 22.31 | 20.20 |
| c/(N+I) with other interf. Satellites up (dB)      | 13.71  | 11.36 | 10.10 |
| Xpolar Interference excess (dB)                    | 2.3    |       |       |

**GLOBAL RESULTS**

|                                                     |       |       |       |
|-----------------------------------------------------|-------|-------|-------|
| C/(N+I without other interf. satellites TOTAL) (dB) | 12.61 | 9.77  | 9.73  |
| C/(N+I with other interf. satellites) Total (dB)    | 12.08 | 9.43  | 9.31  |
| Excess margin (dB)                                  | 0.50  | 0.50  | 0.50  |
| Eb/No available (interf nominal)(dB)                | 10.61 | 7.96  | 7.84  |
| Eb/No request (dB)                                  | 8.00  | 8.00  | 8.00  |
| Margin (nominal)(dB)                                | 2.61  | -0.04 | -0.16 |