

## INM-KA RETURN LINK BUDGET (COMMS. HCP )

General	Unit	
User terminal type	-	Typ-150cm
Carrier designator	-	4M78G7W
Data rate (kbps)	(kbps)	6366
Coding rate	-	2/3
Modulation	-	8PSK
Occupied bandwidth	(kHz)	3981.1
Allocated bandwidth	(kHz)	4777.3
<b>Uplink</b>		
Beam		User-Spot (HCP)
Frequency	(GHz)	29.25
User Terminal EIRP	(dBW)	59.5
Antenna tx gain	dBi	51.4
Uplink power	(dBW)	8.1
<i>Uplink p.s.d.</i>	(dBW/Hz)	-57.9
Path loss	(dB)	213.5
Rain loss	(dB)	7.0
Mean Atmospheric loss	(dB)	1.7
Satellite G/T (EOC)	(dB/K)	11.0
Up-path C/No	(dBHz)	76.7
Up-path C/N	(dB)	10.7
<b>Downlink</b>		
Beam		Feeder
Frequency	(GHz)	18
<i>Max pfd per crx @ earth surface (beam peak)</i>	(dBW/m <sup>2</sup> /1MHz)	-135.9
Beam Peak to Edge of Coverage	(dB)	3.0
<i>Max pfd per crx @ earth surface (EOC)</i>	(dBW/m <sup>2</sup> /1MHz)	-138.9
Satellite EIRP (EOC)	(dBW)	29.1
Path loss	(dB)	209.3
Rain loss	(dB)	5.6
Mean Atmospheric loss	(dB)	0.7
Earth Station G/T	(dB/K)	42.0
G/T degradation due to rain	(dB)	2.6
Rx terminal Pointing loss	(dB)	0.1
Co-Channel / adj . beam interf. (dn)	(dBHz)	89.0
Down-path C/No	(dBHz)	80.8
Down-path C/N	(dB)	14.8
<b>Total</b>		
Mean satellite C/Imo	(dBHz)	86.1
Mean Overall C/No	(dBHz)	74.9
Total C/I (adjacent satellite interference)	(dB)	23.1
Mean Overall C/N (incl. a.s.i)	(dB)	8.7
<b>Margin</b>		
C/N required	(dB)	8.2

C/N margin	(dB)	0.5
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### **C/I calculations**

Orbital separation (interferor 1)	degree	2.0
Worst case topocentric angle (1)	degree	2.09

#### **Uplink C/I**

Interferor 1		
Max. uplink p.s.d	(dBW/Hz)	-56.0
Other's sidelobe at 2 deg. sep X-25log(t)		29.0
Tx Sidelobe gain at 2 deg sep	dBi	21.0
Inm-Ka C/I up1	dB	25.5

#### **Downlink C/I**

Interferor 1		
Max. ground PFD	(dBW/m2/MHz)	-121.1
Max. downlink EIRP s.d	(dBW/Hz)	-19.0
Inm Rx sidelobe gain at 2 deg sep	dBi	21.0
Inm-Ka C/I dn1	dB	26.9
<b>Total C/I (adjacent satellite interference)</b>	<b>dB</b>	<b>23.1</b>