

## INM-KA TEST RETURN LINK BUDGET (COMMS. GP)

<b>General</b>		Unit
User terminal type	-	Test return carrier GW-GW (GP)
Carrier designator	-	3M16G7W (TEST- R1)
Data rate (kbps)	(kbps)	1023
Coding rate	-	1/2
Modulation	-	BPSK
Occupied bandwidth	(kHz)	2630.3
Allocated bandwidth	(kHz)	3156.3
<b>Uplink</b>		
Beam		User-Spot
Frequency	(GHz)	29.75
EIRP	(dBW)	49.2
Antenna tx gain	dBi	69.3
Uplink power	(dBW)	-20.1
<i>Uplink p.s.d.</i>	<i>(dBW/Hz)</i>	<i>-84.3</i>
Path loss	(dB)	213.6
Rain loss	(dB)	7.0
Mean Atmospheric loss	(dB)	1.7
Satellite G/T (EOC)	(dB/K)	9.6
Up-path C/No	(dBHz)	65.0
Up-path C/N	(dB)	0.8
<b>Downlink</b>		
Beam		Feeder
Frequency	(GHz)	18.95
<i>Max pfd per crx @ earth surface (beam peak)</i>	<i>(dBW/m2/1MHz)</i>	<i>-144.0</i>
Beam Peak to Edge of Coverage	(dB)	3.0
<i>Max pfd per crx @ earth surface (EOC)</i>	<i>(dBW/m2/1MHz)</i>	<i>-147.0</i>
Satellite EIRP (EOC)	(dBW)	19.3
Path loss	(dB)	209.7
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)	2.4
Rx terminal Pointing loss	(dB)	0
Co-Channel / adj . beam interf. (dn)	(dBHz)	164.2
Down-path C/No	(dBHz)	71.5
Down-path C/N	(dB)	7.3
<b>Total</b>		
Mean satellite C/Imo	(dBHz)	76.2
Mean Overall C/No	(dBHz)	63.9
Total C/I (adjacent satellite interference)	(dB)	15.3
Mean Overall C/N (incl. a.s.i)	(dB)	-0.4
<b>Margin</b>		
C/N required	(dB)	-1.0
C/N margin	(dB)	0.6

## **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)	-56.5
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	<i>dB</i>	17.5

### **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 at 2 deg. sep		<b>29.0</b>
Inm Rx sidelobe gain at 2 deg sep	dBi	21.0
Inm-Ka C/I dn1	dB	19.3
<b>Total C/I (adjacent satellite interference)</b>	<b>dB</b>	<b>15.3</b>