

King Fahd University of Petroleum & Minerals
 Electrical Engineering Department
 In Class Group Work
EE418 Satellite Communications
 Link Power Design Example

Given the following specifications of satellite communication link, find the carrier to noise ratio for the received signal at the output of the IF stage and find the C/N ratio margin:

Satellite Output Power	40.00	W
Satellite Output Backoff	3	dB
Satellite Antenna Gain	Antenna Efficiency	0.70
	Diameter	2.50 m
Edge of Beam Loss for Sat. Antenna	3	dB
Signal Bandwidth	20	MHz
Carrier Frequency of signal	12	GHz
Earth Station Antenna Gain	Antenna Efficiency	0.7
	Diameter	2.50 m
Receiver Noise Specifications	$T_{in} = 35$ K	
	$T_{RF} = 45$ K	$G_{RF} = 100$
	$T_M = 100$ K	$G_M = 0.1$
	$T_{IF} = 200$ K	$G_{IF} = 10$
Maximum Sat.-Earth Station Distance	40000	km
All Other Losses	12	dB
Minimum Permitted C/N ratio at receiver	16	dB