Table 1 – General and Telecommunications Data

Parameter	*Unit*	Case 1 Earth LEO (Starlink)	Case 2 Moon (Chang'e 4)	Case 3 (Mars Odyssey)	Case 4 Mercury (Bepi C.)	Case 5 Saturn (Cassini)
Total spacecraft power	*W*	200	500	750	1000	900
Transmitter power (spacecraft)	*W*	50	200	50	200	100
Transmitter power (ground station)	*W*	400	400	1000	1000	1000
Loss factor transmitter	-	0.8	0.8	0.8	0.8	0.8
Loss factor receiver	-	0.7	0.7	0.7	0.7	0.7
Downlink frequency	*GHz*	2.2 (S-Band)	2.2 (S-Band)	8.4 (X-Band)	8.4 (X-Band)	8.5 (X-Band)
Turn around ratio (uplink/downlink frequency)	-	221/240	221/240	749/880	749/880	749/880
Antenna diameter spacecraft (parabolic antenna)	*m*	0.2	4.2	2	1	4
Antenna diameter ground station (parabolic antenna)	*m*	0.5	5	35	35	35
Orbit altitude	*km*	500	100	400	500	2000
Elongation angle (angle between spacecraft-Sun line and Earth-Sun line)	*deg*	N/A	N/A	20	10	10
Pointing offset angle (spacecraft)	*deg*	0.1	0.1	0.1	0.05	0.1
Required uplink data rate	*bit/s*	10^8	10^7	10^6	10^5	10^5
Payload swath width angle	*deg*	20	45	10	10	20
Payload pixel size	*arcmin*	0.1	0.1	0.05	0.05	0.2
Payload bits per pixel	-	8	8	8	8	8
Payload duty cycle	-	60%	80%	15%	40%	15%
Payload downlink time	-	3 hr/day*	4 hr/day*	12 hr/day*	18 hr/day*	24 hr/day*
Modulation/coding type	-	uncoded	uncoded	uncoded	uncoded	uncoded
Required BER	-	10^{-6}	10^{-6}	10^{-6}	10^{-6}	10^{-6}

**Note: "day" = "Earth's day" = 24 hours*