

# LignoSat Power Budget

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# Power Generation Prediction



Parameters	Abbreviations/Units	Values
Solar Cell Efficiency	(cEff)	0.293
Solar constant	(sPower, [W/m <sup>2</sup> ])	1366.1
Number of exposed panels for each side	(+X, +Y, -Y, +Z, -Z)	2
Area per panel of satellite	(cArea, [m <sup>2</sup> ])	0.003018
Generated Power	[mW]	1456
Energy available per Orbit	[mWh]	2184
Power loss in Blocking diode	[mWh]	360
Efficiency of Electronic devices(DC/DC Converters)	[ $\eta_1$ ]	0.8
Total Energy available per orbit	[Wh]	<b>1411</b>

# Power Budget



Subsystems/ Missions	Maximum Power Allocated (mW)	Safe Mode		Low Power mode	
		Duty Cycle(h) <sup>*2</sup>	Power(mWh) <sup>*3</sup>	Duty Cycle(h) <sup>*2</sup>	Power(mWh) <sup>*3</sup>
OBC/EPS	200	–	200	1.5	300
COM-RX	150	1.0	150	1.0	150
COM-TX-CW	280	0.5	140	0.5	140
COM-TX-MISSION	1000	OFF	OFF	OFF	OFF
AMATEUR MSN-RX	150	OFF	OFF	OFF	OFF
AMATEUR MSN-TX	280	OFF	OFF	OFF	OFF
STR&GM MEAS MSN <sup>*1</sup>	200	OFF	OFF	OFF	OFF
FAB Board	200	1.5	300	1.5	300
<b>TOTAL</b>			<b>790</b>		<b>890</b>

<sup>\*1</sup> Strain and Geomagnetism Measurement Mission (Main Mission) <sup>\*2</sup> Duration per Orbit (1 orbital period = 1.5 hour) <sup>\*3</sup> Energy per Orbit

# Mission Mode Power Budget



	Maximum Power Allocated (mW)	Duty Cycle(h)	Power Consumption(mWh)		
			Command Uplink and CW Beacon	Main Mission	Amateur Radio Mission
OBC/EPS	200	1.5	300	300	300
COM-RX	150	1.0	150	150	150
COM-TX-CW	280	0.5	140	140	140
COM-TX-MISSION	1000	0.2	OFF	200	OFF
AMATEUR MSN-RX	150	0.25	OFF	OFF	37.5
AMATEUR MSN-TX	280	0.25	OFF	OFF	70
STR&GM MEAS MSN	200	1.5	OFF	300	OFF
FAB Board	200	1.5	300	300	300
<b>TOTAL</b>			<b>890</b>	<b>1390</b>	<b>997.5</b>