



# Power Budget

19 July, 2018



# 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	(nPX, nPY, nMY, nPZ, nMZ)	2
Area per panel of satellite	(cArea, [m <sup>2</sup> ])	0.003039
Generated Power	[mW]	1490
Energy available per Orbit	[mWh]	2300
Power loss in Blocking diode	[mWh]	750
Efficiency of Electronic devices (DC/DC Converters)	[ $\eta_1$ ]	0.8
Total Energy available per orbit	[Wh]	<b>1240</b>



# Power Budget



Subsystems/ Missions	Maximum Power Allocated (mW)	Safe Mode		Low Power Mode	
		Duty Cycle	Power (mWh)	Duty Cycle	Power (mWh)
OBC/EPS	200	1.5	<b>200*</b>	1.5	<b>300</b>
COM-RX	160	1.05	<b>168</b>	1.05	<b>168</b>
COM-TX-CW	450	0.45	<b>202.5</b>	0.45	<b>202.5</b>
COM-TX_MISSION	4200	OFF	OFF	OFF	OFF
MTQ DRIVERS	300	OFF	OFF	OFF	OFF
CAM MSN	800	OFF	OFF	OFF	OFF
SoftCIB (CPLD)	40	OFF	OFF	OFF	OFF
GPS+ADCS Board	160	OFF	OFF	OFF	OFF
FAB Board	100	1.5	<b>150</b>	1.5	<b>150</b>
LoRa Transceiver Board	100	0	<b>0</b>	0	<b>0</b>
<b>TOTAL</b>			<b>720.5</b>		<b>820.5</b>



# Mission Mode Power Budget



	Maximum Power Allocated (mW)	Duty Cycle	Power Consumption (mWh)				LoRa Operation Test
			Command Uplink and CW Beacon	Image Downlink	Camera Mission	ADCS Mission	
OBC/EPS	200	1.5	<b>300</b>	<b>300</b>	<b>300</b>	<b>300</b>	<b>300</b>
COM-RX	160	1.05	<b>168</b>	<b>168</b>	<b>168</b>	<b>168</b>	<b>168</b>
COM-TX-CW	450	0.45	<b>202.5</b>	OFF	OFF	OFF	OFF
COM-TX_MISSION	4200	0.117	OFF	<b>490</b>	OFF	OFF	<b>OFF</b>
MTQ DRIVERS	300	1	OFF	OFF	OFF	<b>300</b>	OFF
CAM MSN	800	0.017	OFF	OFF	<b>53.33</b>	OFF	OFF
<u>SoftCIB</u> (CPLD)	40	1.5	<b>60</b>	<b>60</b>	<b>60</b>	<b>60</b>	<b>60</b>
GPS+ADCS Board	160	1.5	OFF	OFF	OFF	<b>240</b>	OFF
FAB Board	100	1.5	<b>150</b>	<b>150</b>	<b>150</b>	<b>150</b>	<b>150</b>
<u>LoRa</u> Transceiver Board	100	0.033	OFF	OFF	OFF	OFF	<b>3.3</b>
<b>TOTAL</b>			<b>880.5</b>	<b>1168</b>	<b>731.33</b>	<b>1218</b>	<b>681.3</b>