



# SpaceANT-D Power Budget

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# Energy Generation Prediction

Parameters	Abbreviations/Units	Value
Solar cell efficiency	( $\eta_{pv}$ )	0.25
Solar constant	(sPower, [W/m <sup>2</sup> ])	1358
Number of solar cell on each side	(nPX, nPY, nMY, nPY, nMZ)	1,1,1,1,1
Solar cell effective area	(cArea,[m <sup>2</sup> ])	0.00576
Energy generation per one orbit	[Wh]	1.35
Efficiency of electronics devices (dc/dc)	( $\eta_1$ )	0.95
Total energy available per orbit	[Wh]	1.28

# Subsystem Power Consumption



Subsystem	Components	Maximum Allocated Power	Active Duty Cycle	Power consumption	Duty Cycle per Orbit	Average Energy
		mW	%	mW	hour	mWh
Payload	LoRa Rx	12.1	6.25	0.76	0.10	1.21
Telecommunications	Housekeeping Tx	120.0	31.25	37.50	0.50	60.00
	Command Rx	12.1	56.25	6.81	0.90	10.89
	Mission Tx	120.0	6.25	7.50	0.10	12.00
Power	EPS	89.0	100.00	89.00	1.60	142.40
On-board Computer	OBC	295.0	100.00	295.00	1.60	472.00
	Total					698.50
	20% margin					838.20

# Operation Modes Power Consumption



Subsystem	Components	Energy	Initial	Deployment	CW beacon	Uplink command	Rx Mission	Tx mission
		mWh	mWh	mWh	mWh	mWh	mWh	mWh
Payload	LoRa Rx	1.21	OFF	OFF	OFF	OFF	1.21	OFF
Telecommunications	Housekeeping Tx	60.00	OFF	OFF	60.00	OFF	OFF	OFF
	Command Rx	10.89	OFF	OFF	OFF	10.89	OFF	OFF
	Mission Tx	12.00	OFF	OFF	OFF	OFF	OFF	12.00
Power	EPS	142.40	142.40	142.40	142.40	142.40	142.40	142.40
On-board Computer	OBC	472.00	472.00	472.00	472.00	472.00	472.00	472.00
Mechanism	Antenna deployment	75.60	OFF	75.60	OFF	OFF	OFF	OFF
	Total	774.10	614.40	690.00	674.40	625.29	615.61	626.40