

EPS Requirements:

PV requirements

RQ CODE	Requirement name	Details	Level
RQ01-PV	PV modules shall provide electricity to the PCC.	Photovoltaic effect transforms solar energy into electrical energy.	Shall
RQ02-PV	PV modules shall be protected from overheating.	Long exposition to solar irradiation lowers their efficiency. This must be taken into account in the technical specifications.	Shall
RQ03-PV	PV modules shall deal with the partial/total shading.	When a part of PV module is not illuminated it can be seen as a load for the other PV module.	Shall
RQ04-PV	PV modules shall not be affected by particles or external magnetic field. The size of solar panels shall account a margin to prevent debris impact damages	Since the panels are directly exposed to harsh space conditions, they must be protected to ensure proper performance.	Shall
RQ05-PV	PV modules shall be light to respect CubeSat mass requirements.	The CubeSat mass has to be lower than 1.33 kg.	Shall

BAT Requirements

RQ CODE	Requirement name	Details	Level
RQ01-BAT	The battery shall be rechargeable.	When in eclipse, the CubeSat will not receive any power on the solar panels. Therefore the batteries will have to be charged while the CubeSat is facing the Sun, and discharged when no power is available.	Shall
RQ02-BAT	The battery shall provide enough power for the on-board modules.	The battery supplies the entire CubeSat in coordination with PV modules.	Shall
RQ03-BAT	The battery capacity shall be sufficient to supply critical modules during an eclipse. The battery capacity shall supply critical modules.	The battery must supply essential modules while in eclipse, because PV modules receive no energy from the sun.	Shall
RQ04-BAT	The battery must be protected from the surcharge.	Surcharges can greatly diminish the performance and lead to an explosion.	Shall
RQ05-BAT	The battery capacity should have a 20% margin.	Overusing the capacity can account for calculation errors, hardware degradation and battery performance decrease.	Shall
RQ06-BAT	The battery must be protected from the surcharge.	Surcharges can greatly diminish the performance and lead to an explosion.	Shall
RQ07-BAT	A system margin of no less than 5 % at launch on available power and energy shall be included in the budgets	ECSS-E-20A	Shall
RQ08-BAT	The battery shall recover during sunlight period at least the energy lost during the last period without sunlight	ECSS - E - 20B	Shall

PCC Requirements

RQ CODE	Requirement name	Details	Level
RQ01-PCC	PCC shall determine the total amount of energy required by the subsystems and distribute it.	The distribution of the energy will ensure the CubeSat won't run out of energy.	Shall
RQ02-PCC	PCC shall manage the energy by distributing it to determined modules according to the BAT charge and OBC orders.	This requirement will imply turning off/on some high/low energy consumption features.	Shall
RQ03-PCC	PCC shall receive instruction from the OBC.	PCC must receive instructions about which modules to power.	Shall
RQ04-PCC	PCC shall transmit data to the OBC.	Data about the energy consumption and the battery charge levels must be shared with the OBC.	Shall
RQ05-PCC	PCC shall protect the hardware.	When distributing power on board, the PCC must ensure that the electrical properties (current, voltage) of the receiving modules are respected.	Shall
RQ06-PCC	PCC should manage the BAT's state of charge.	PCC should ensure the longest life cycle and the longest standby time.	Shall