



cleansat

BB27
EPS passivation
TAS-B

24/05/2016

Description of proposed technology Building Block

- Topics: electrical passivation of an Electrical Power System based on the MPPT concept requiring power converters between the SA interface and the main bus
- Trade offs to be performed between 3 passivation techniques
 - Electronic switch
 - Mechanical relays and
 - Galvanic isolation.
- To be analyzed and quantified in terms of : electrical (mainly efficiency and power transfer capability) and mechanical (mass, dimensions) performances; dependability aspect (mission reliability, FDIR ...), AIT constraint and passivation operation (criticality of this operation), cost impact

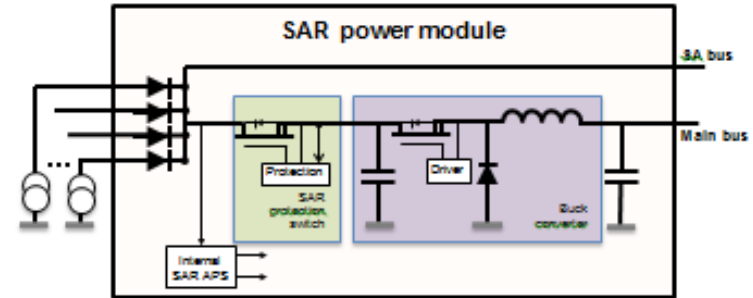


Figure 2-2: SAR with semi-conductor isolation block diagram

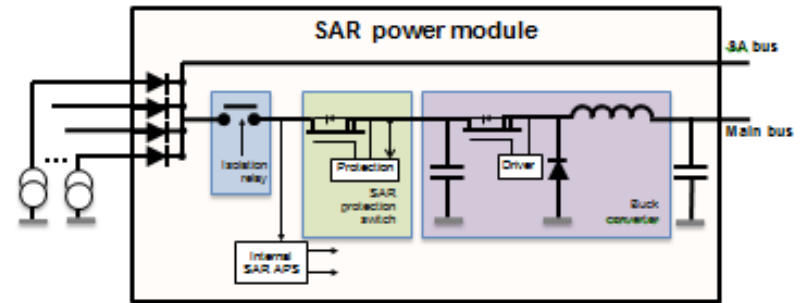
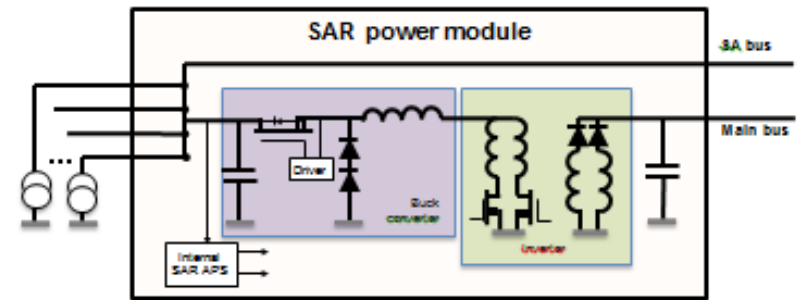


Figure 2-3: SAR with mechanical isolation block diagram



Description of proposed technology Building Block



- Applicability range : all LEO/MEO satellite from few hundreds of Watt to several kW applications
 - Extension to large GEO SATCOM S/C is pending system level impacts of centralized MPPT is acceptable => to be challenged vs. S3R solution (with its “individual” passivation technique)
- Discussion of the system level impacts: passivation shall not degrade Western S/C competitiveness in performances or costs ! This concerns
 - Added mass
 - Degradation of power conditioning efficiency
 - Degradation of power conditioning reliability
 - ...



— Main technical challenges

- Assessment of system reliability w.r.t. faulty actuation, ability to activate at the end of disposal phase and ability to sustain passivation period
- Assessment on BB ability to maintain its functionality in an uncontrolled thermal environment during several years (ageing and radiation being also key critical factors)
- Ability to find low “cost” solution compatible to large range of missions