SOLAR ARRAY EXPERTISE – FLIGHT MODELS

ORBITAL
ENGENHARIA

SOLAR ARRAY EXPERTISE

Design
Development
Manufacturing
Assembly
Integration (Equipment & Satellite Levels)
Test

TECHNOLOGICAL SATELLITE

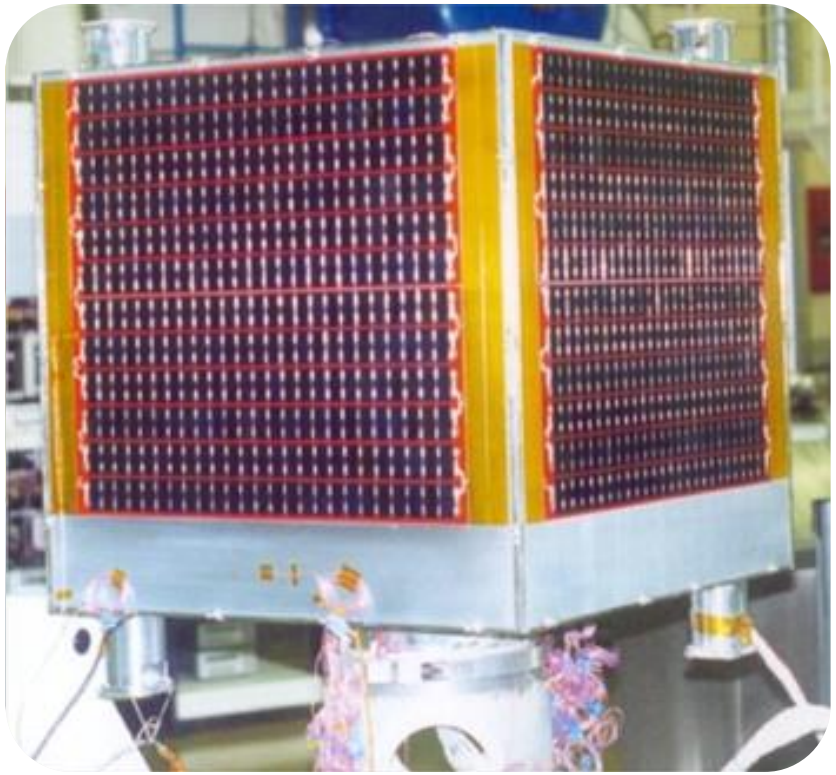
(SATEC)

2001 2009

Customer:

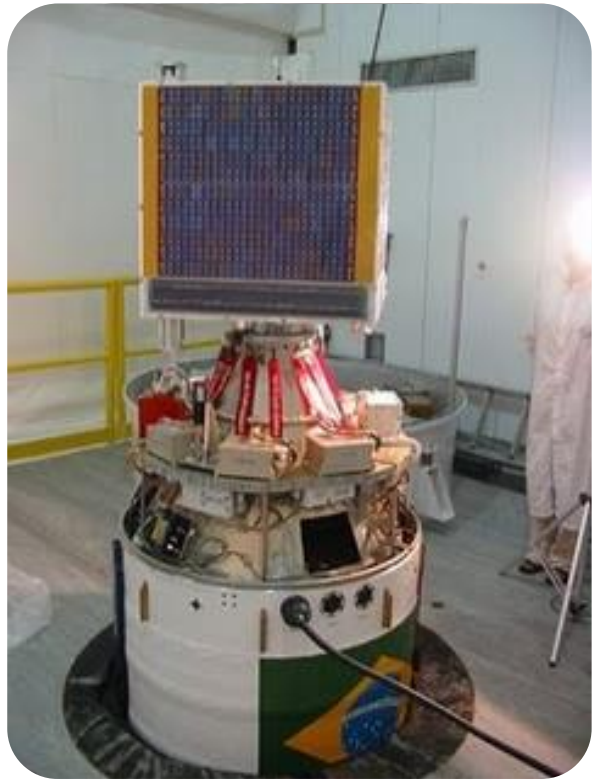
Design and Manufacturing of Solar Panels for **SATEC**

Mission: planned to test the technological equipment on board in the VLS-1 launch vehicle.



65 kg
20 W

Useful life of six months.



22nd Aug., 2003

VLS-1 V03
São Luís Operation

CHINA-BRAZIL EARTH RESOURES SATELLITE

(CBERS-2B)

2005 2006

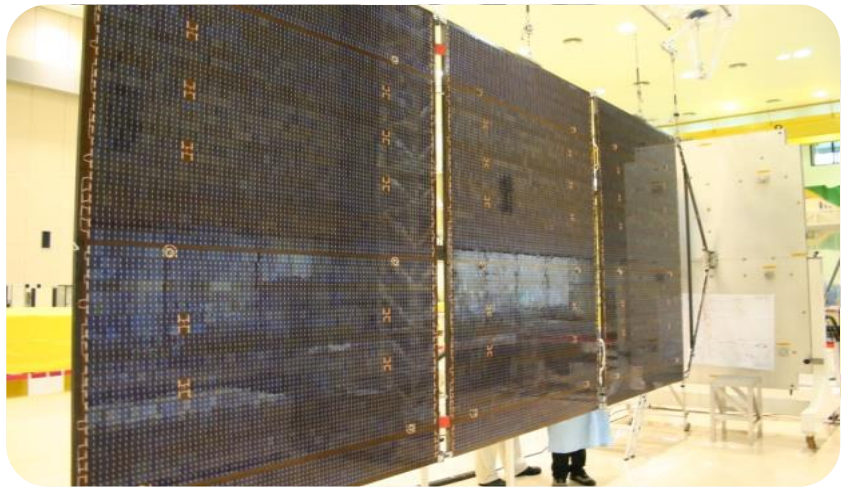
Customer:

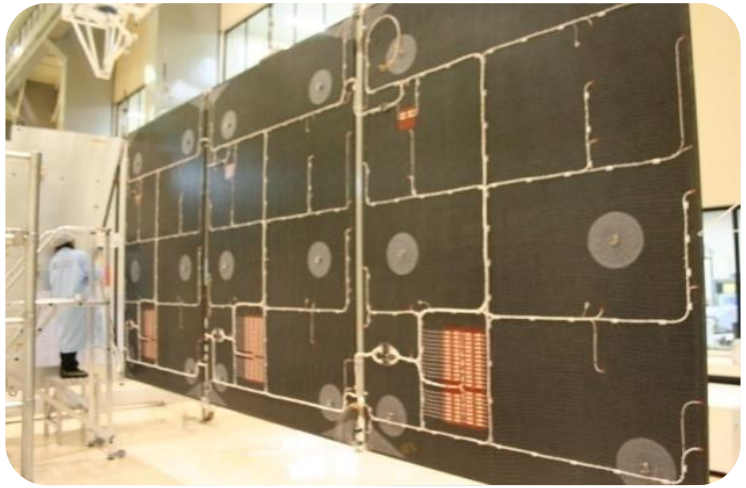
Solar Modules and Electrical Part Developments for the Solar Array Generator of the Power Supply Subsystem of the **CBERS-2B**

Launch: 19th Sep., 2007

EOL: 16th Apr., 2010

1.450 kg
1.100 W





Delivered to INPE: 5th Jan., 2007.

CHINA-BRAZIL EARTH RESOURES SATELLITE

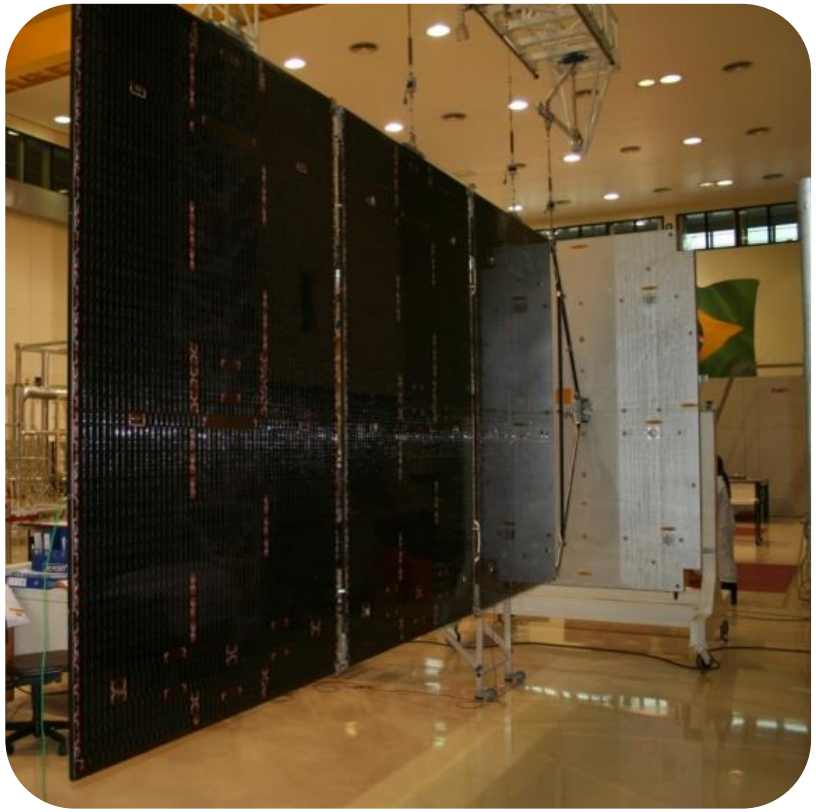
(CBERS-3)

2007 2011

Customer:

Development of the Solar Array Generators for the CBERS 3&4

Launch: 9th Dec, 2013



2080 kg
3000 W

Delivered to INPE: 25th Apr, 2011

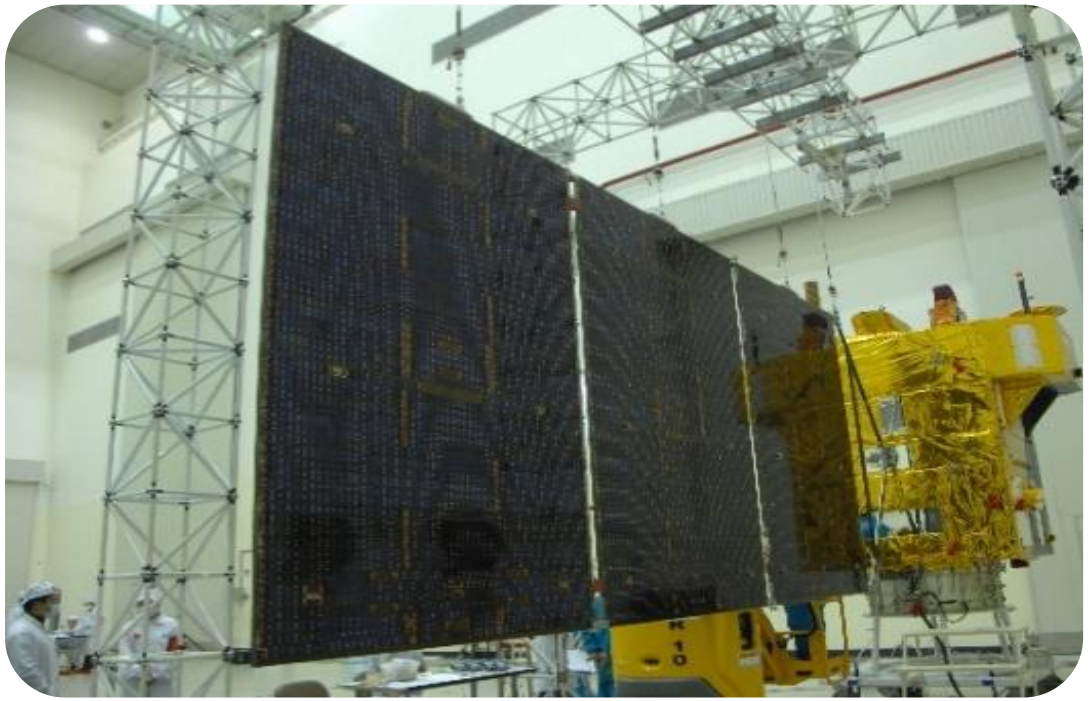
CHINA-BRAZIL EARTH RESOURES SATELLITE

(CBERS-4)

2013 2014

Customer:

Development of the Solar Array Generators for the CBERS 3&4

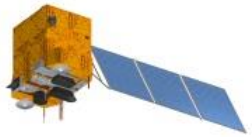


Launch: 7th Dec, 2014

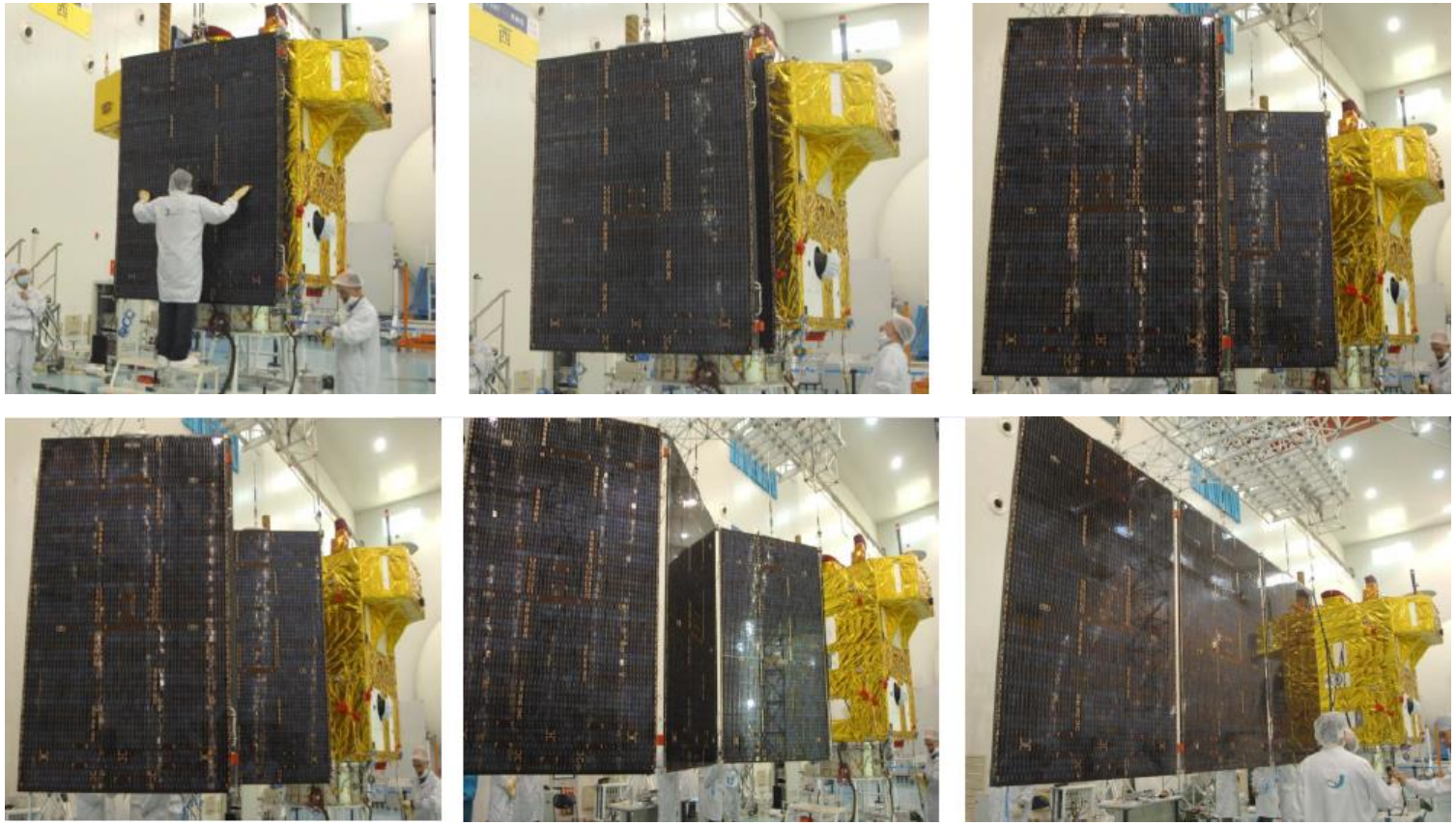
Status: Currently being flown

EOL: Dec, 2017

2080 kg
3000 W



SAG – DEPLOYMENT TEST



CAST – Chinese Academy of Space Technology
Beijing, China.

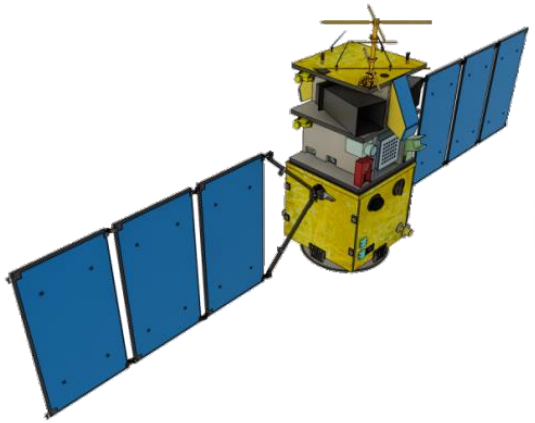
Brazilian Dual Mission Scientific Satellite

LATTES

2010 2012

Customer:

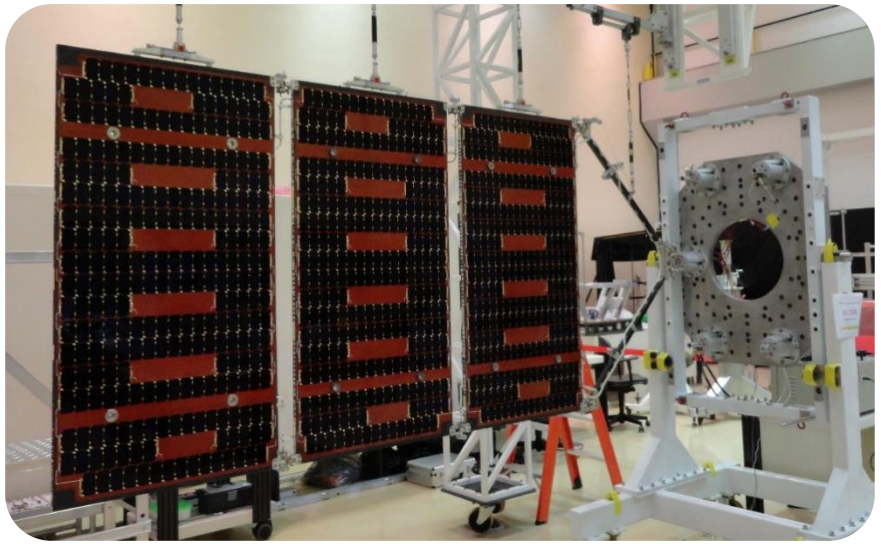
Supply of Solar Array Generator for the LATTES Satellite

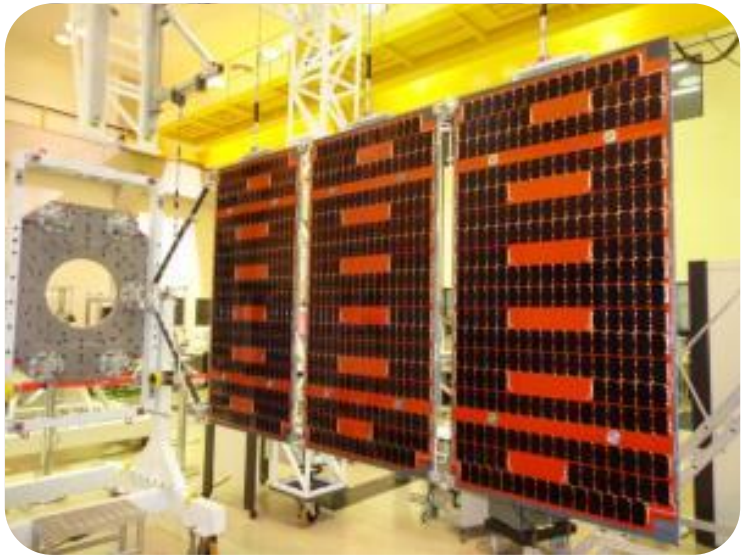


Launch: 2018

EOL: Dec, 2017

500 kg
1193 W





Delivered to INPE: 25th Aug, 2013.

SERPENS

2014 2014

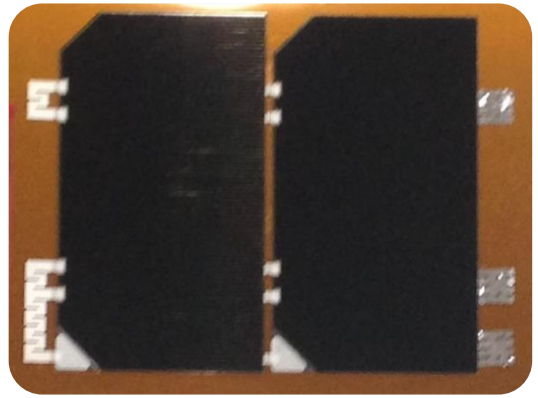
Customer:

Design and Manufacturing of Solar Panels for NanoSat SERPENS

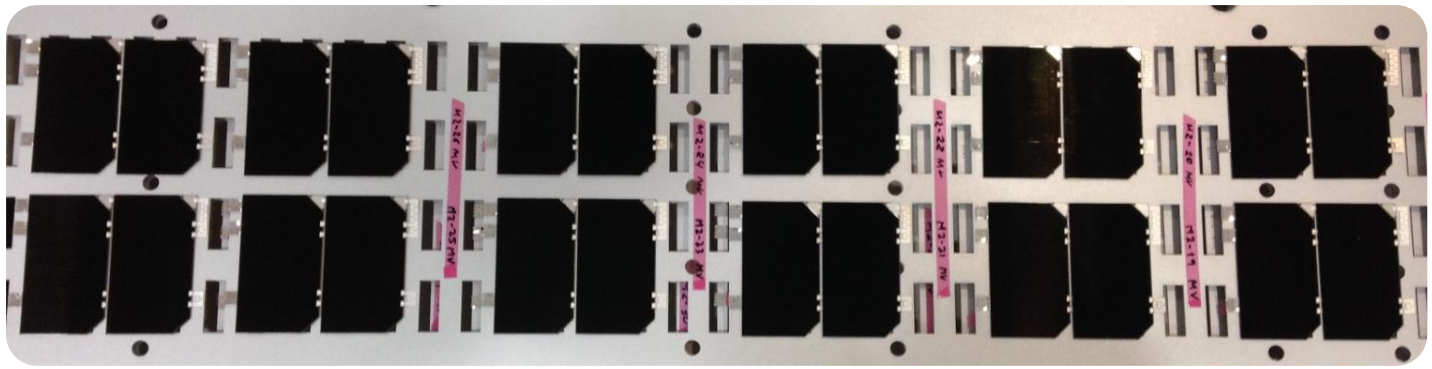
Launch: 17th Sep., 2015.

EOL: 2016.

SERPENS: Sistema Espacial para Realização de Pesquisa e Experimentos com Nanossatélites



Solar Module



TECHDEMOSAT-1

2012 2013

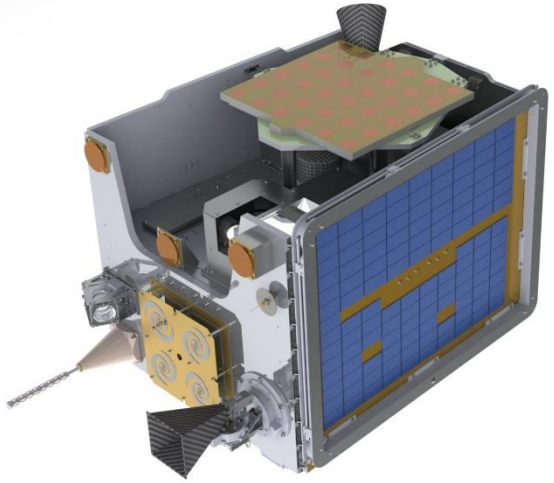
Customer: SURREY SATELLITE TECHNOLOGY LTD

Design and Manufacturing of Strings for CubeSat TECHDEMOSAT-1

Mission:
Science/Technology Demonstrator

Orbit: ~635km sun-synchronous

Launch: 8th July 2014



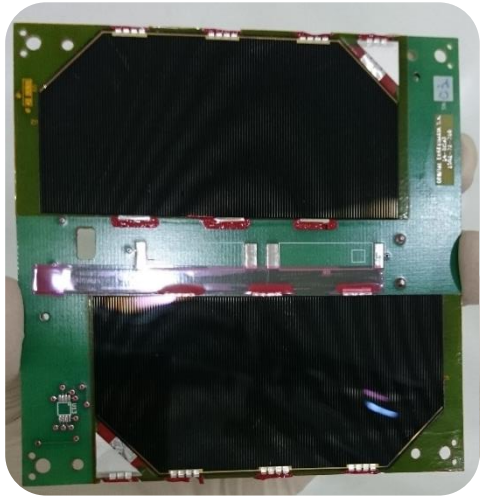
14BISat

2U

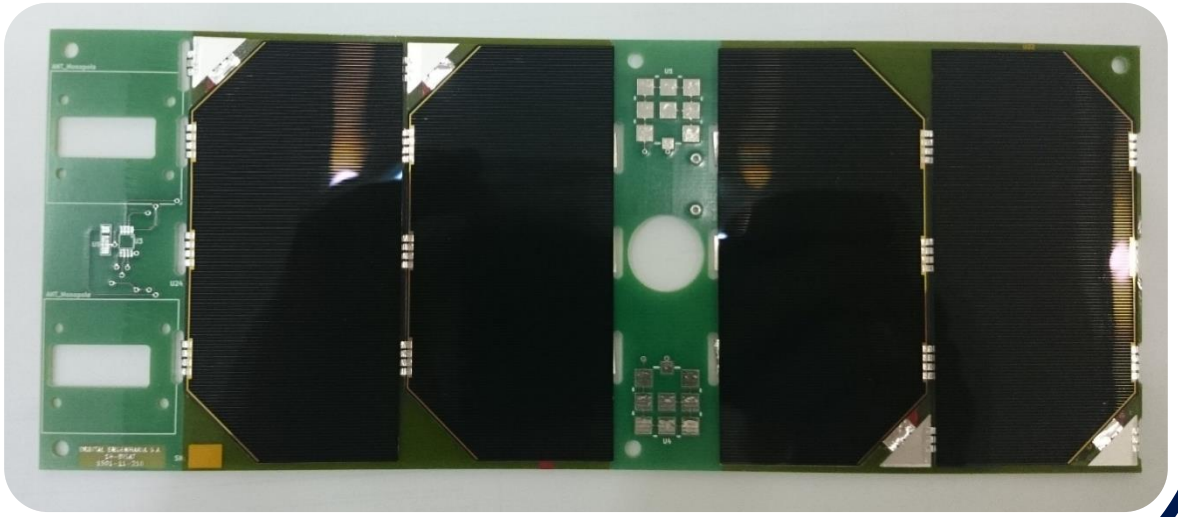
2015 2016

Customer: INSTITUTO FEDERAL DE EDUCAÇÃO, CIÊNCIA E TECNOLOGIA FLUMINENSE

Design and Manufacturing of Solar Panels for CubeSat 14BISat



Top Panel

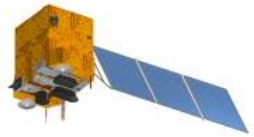


Qty: 04

Misson: QB50 Cubesat Constellation

DEVELOPMENT AND QUALIFICATION MODELS

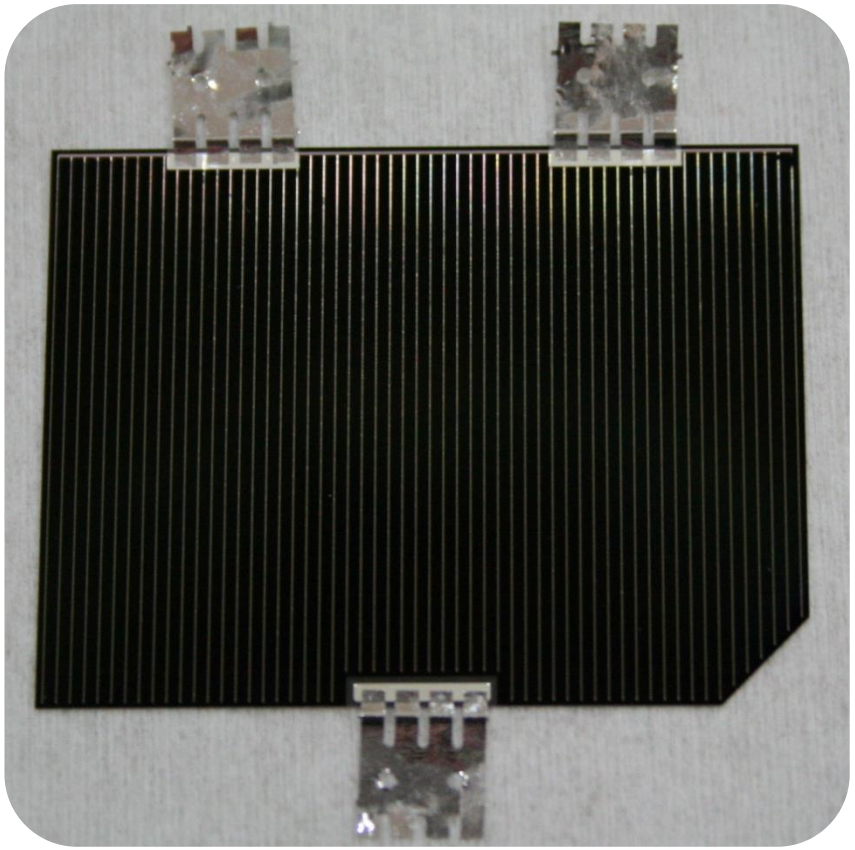
ORBITAL
ENGENHARIA

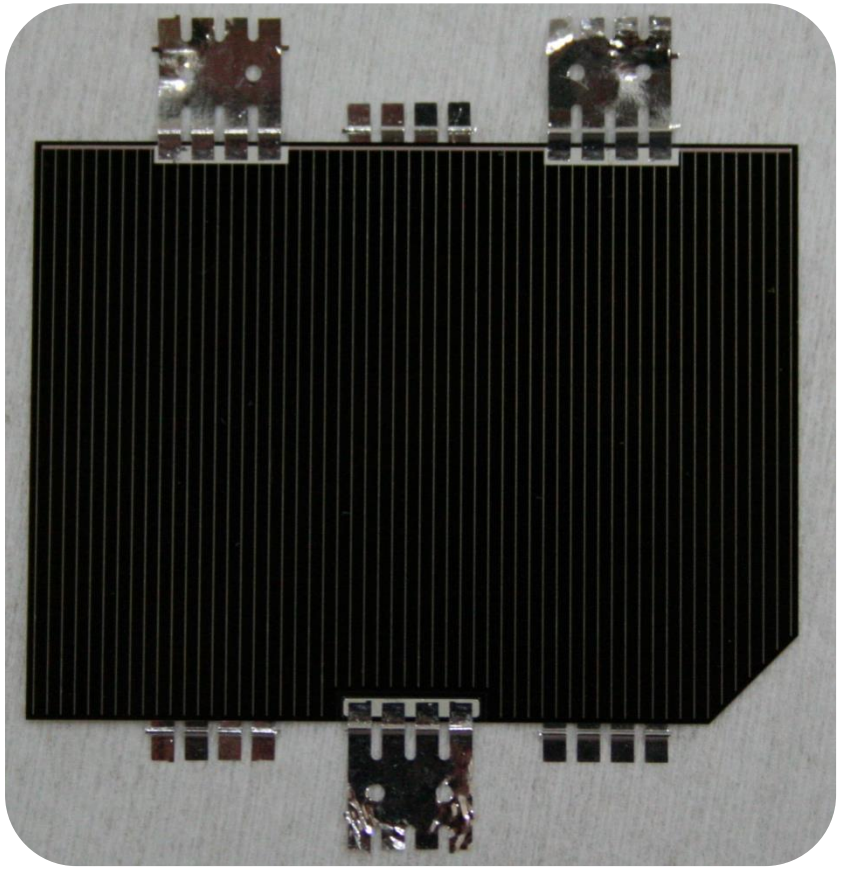


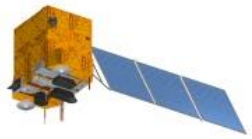
SAG - CBERS 3&4

DEVELOPMENT MODELS

Solar Cells Assemblies (SCAs)

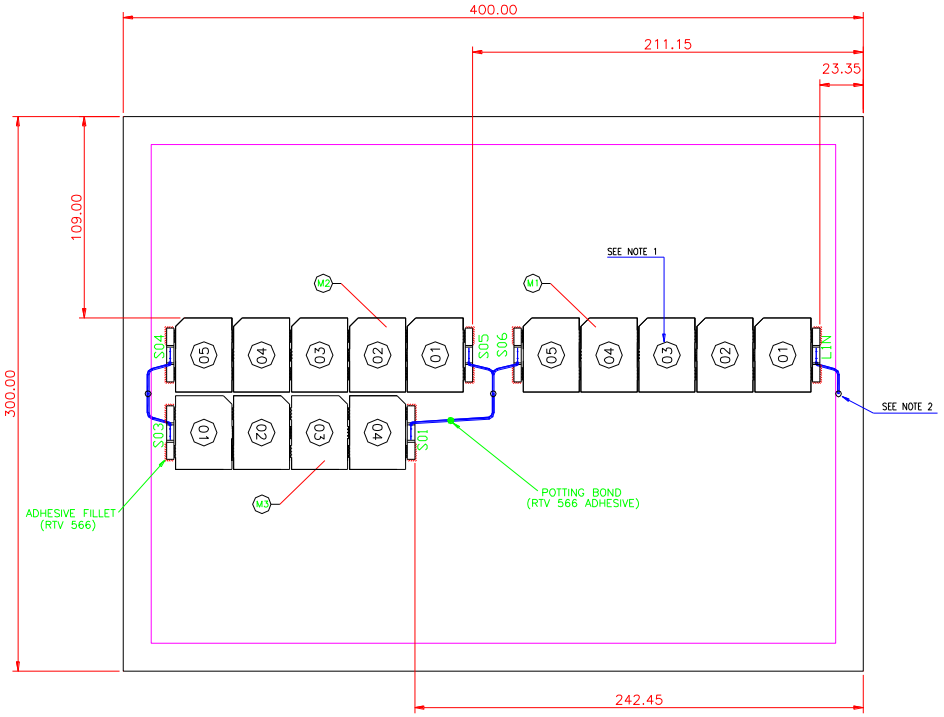




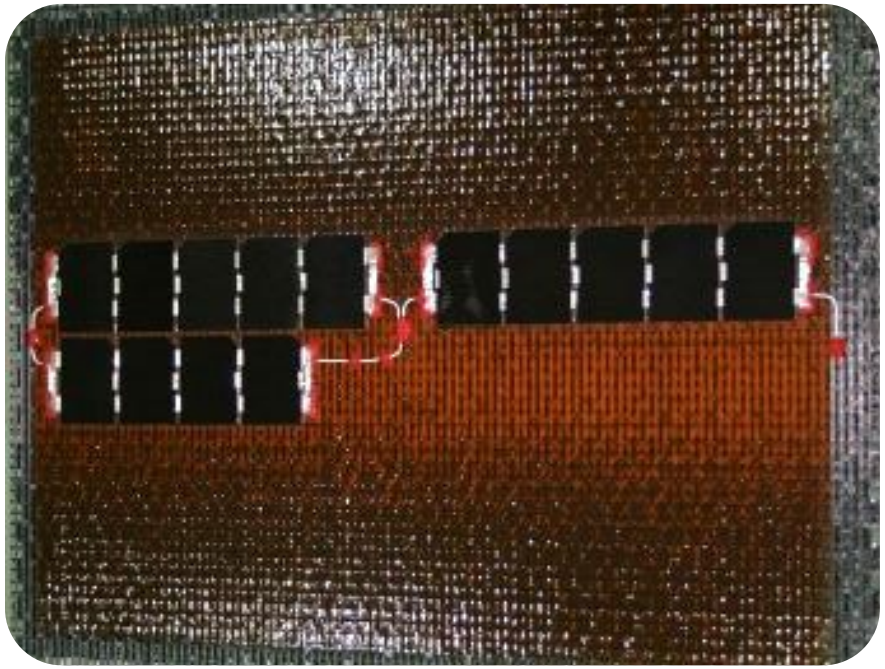


QUALIFICATION MODEL
Test Coupon

SAG - CBERS 3&4



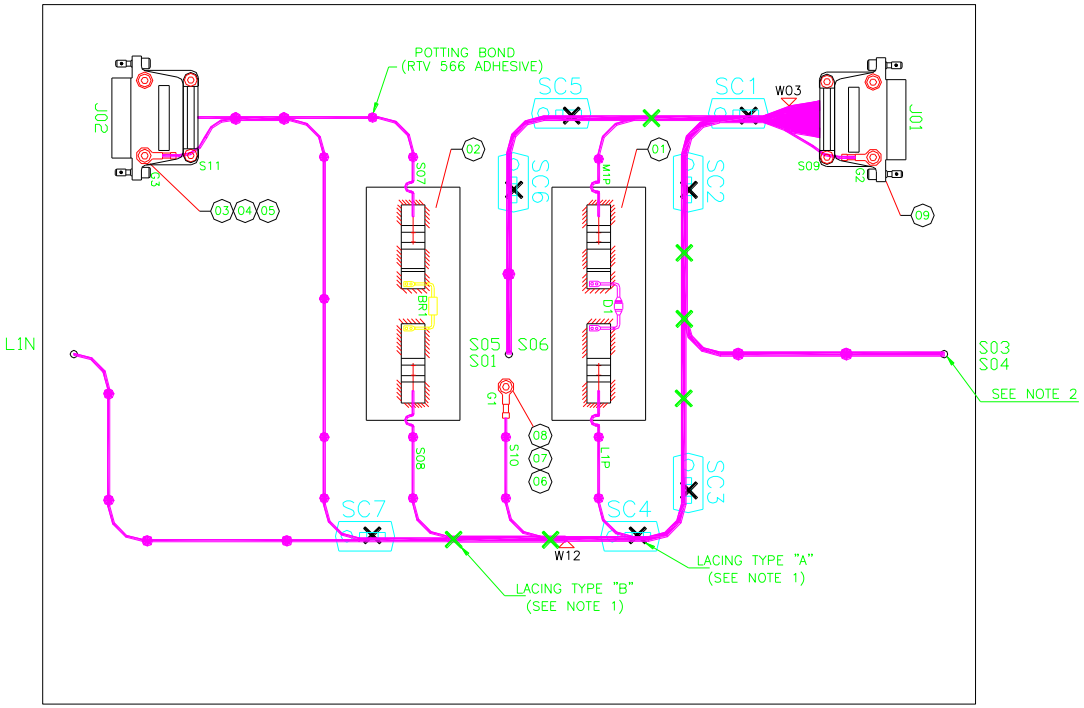
Test Coupon – Front Side Design



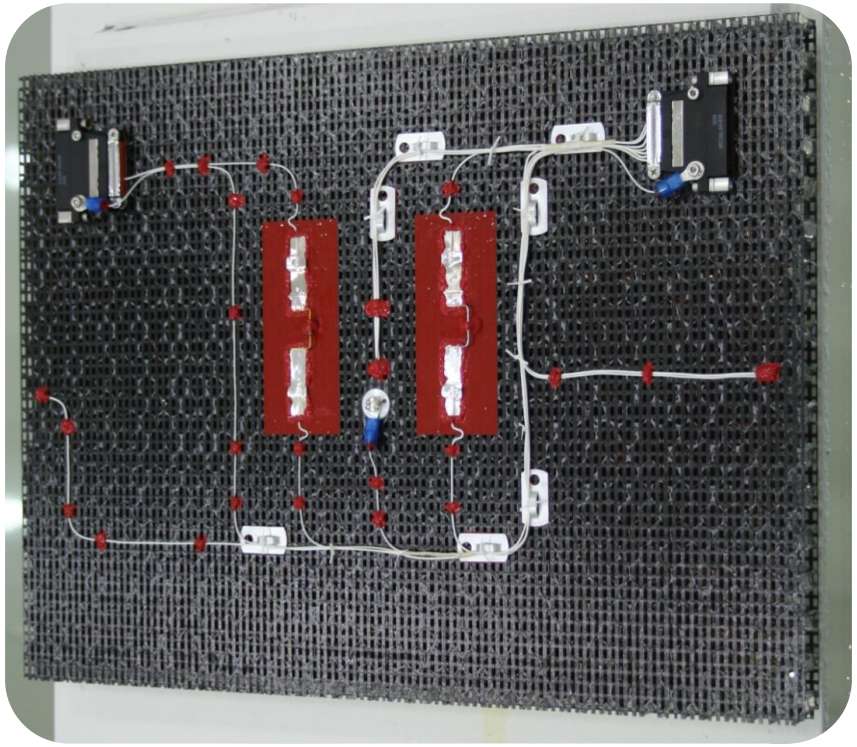
Test Coupon

SAG - CBERS 3&4

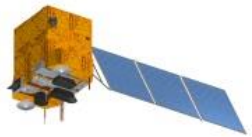
QUALIFICATION MODEL
Test Coupon



Test Coupon – Rear Side Design



Test Coupon

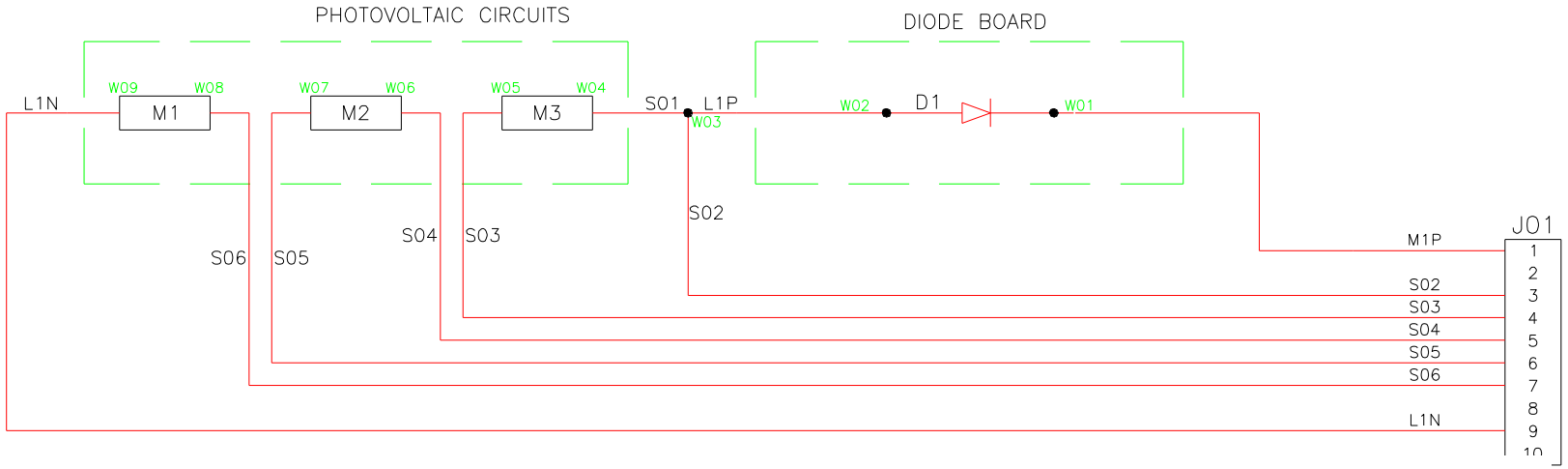


SAG - CBERS 3&4

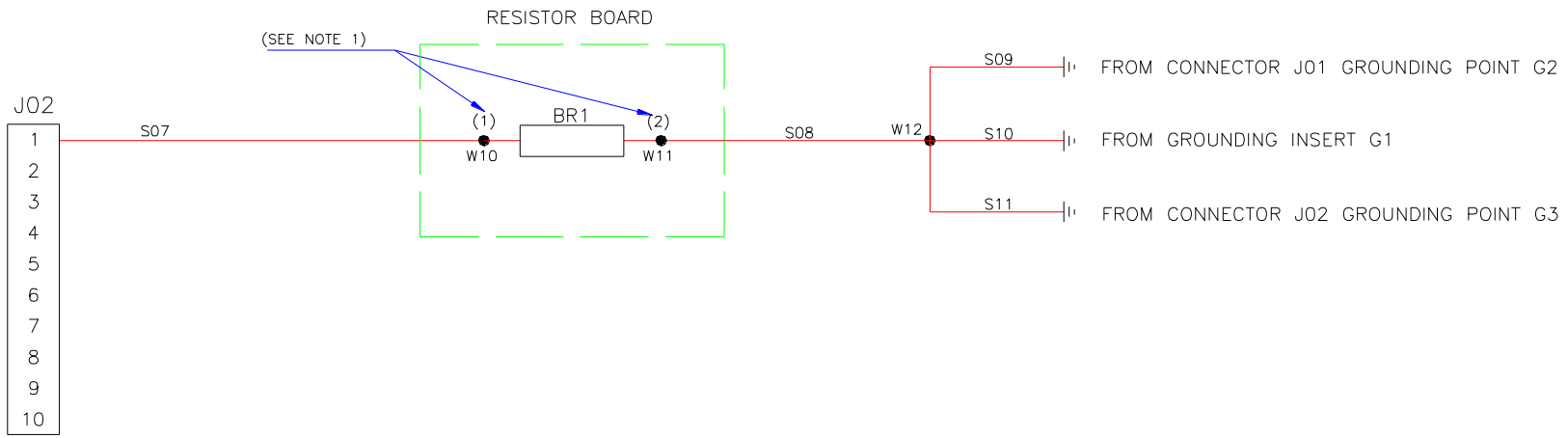
QUALIFICATION MODEL

Test Coupon

Electrical Power Diagram

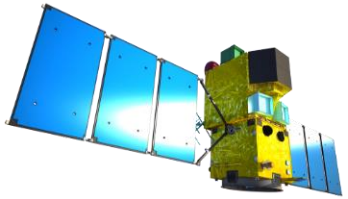


Electrical Signal Diagram

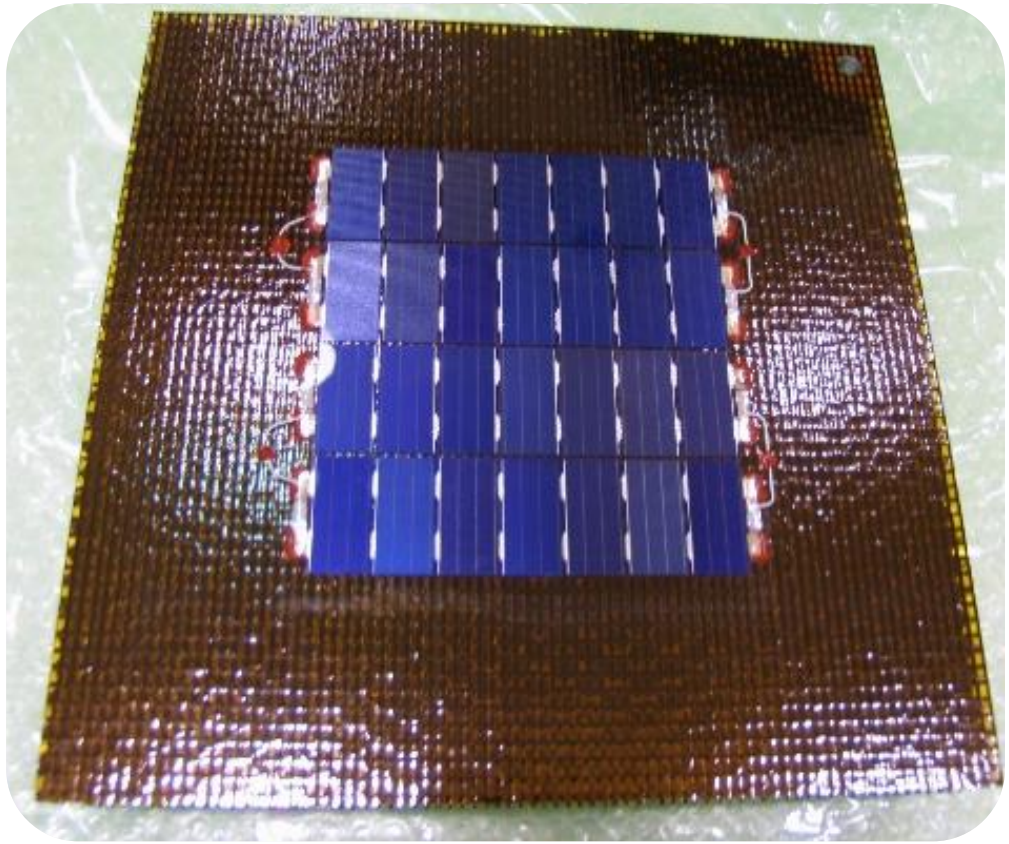


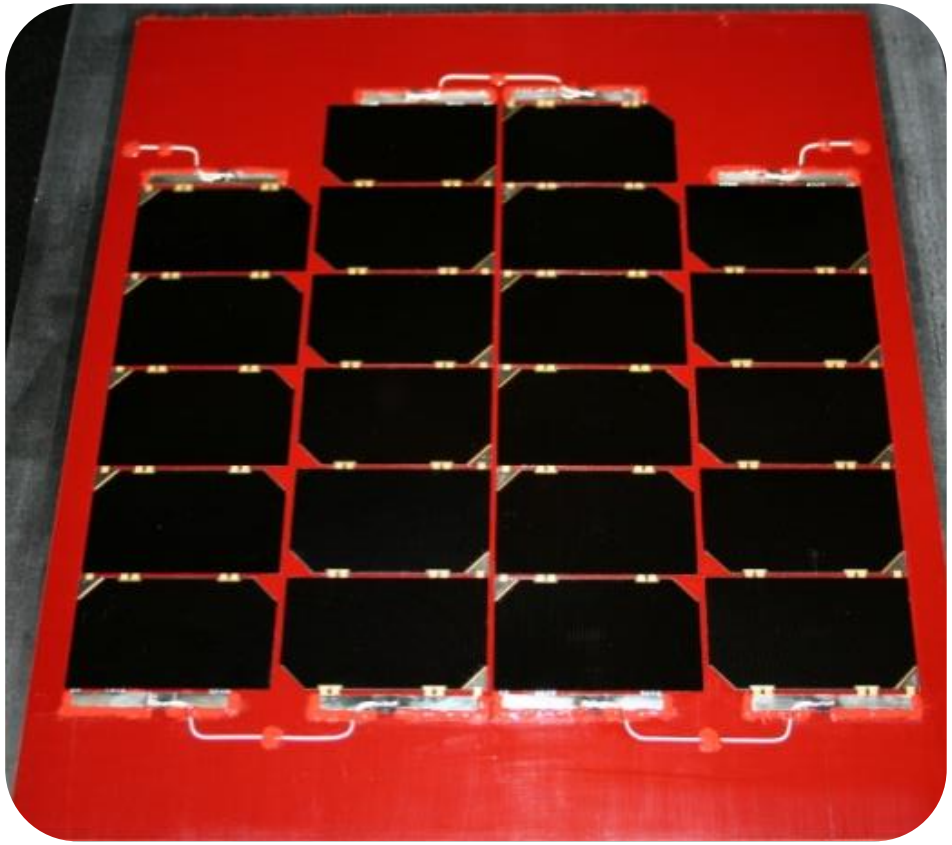
OTHERS QUALIFICATION MODELS

Test Coupon
SAG - CBERS 2B



Test Coupon
SAG - LATTES





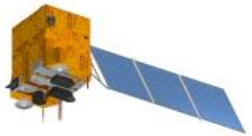
CHINA-BRAZIL EARTH RESOURES SATELLITE

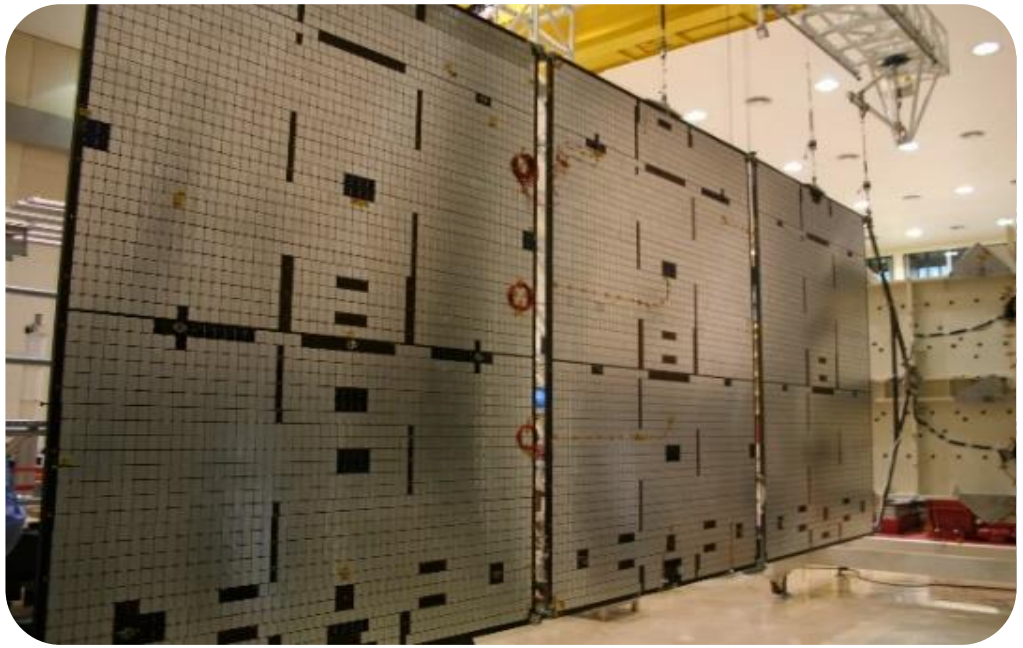
(CBERS-4)

2011 2011

Customer:

Electrical Part of **Structural Qualfication Model** for CBERS 4





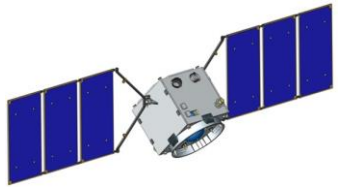
Multi-Mission Platform

PMM

2006

Customer:

Electrical Part of Structural Qualfication Model for PMM

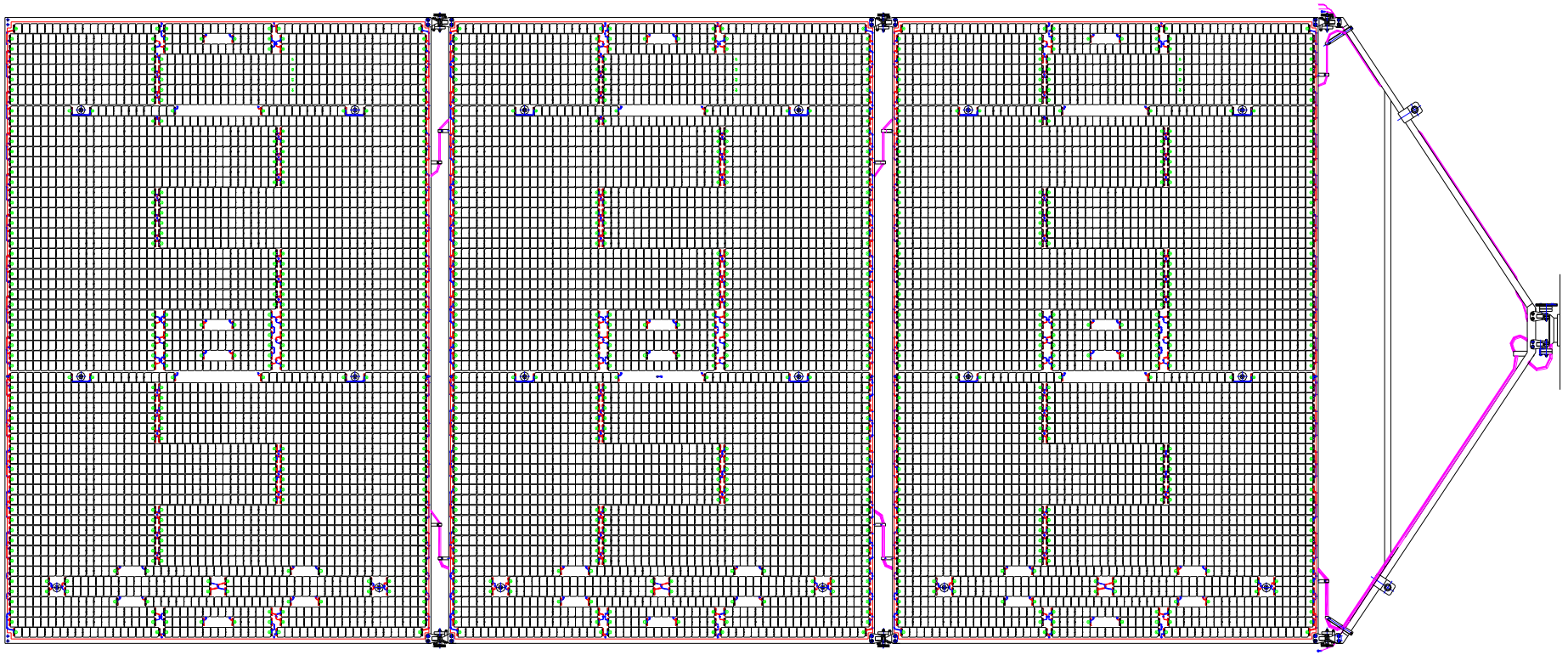


Delivered to INPE: 2006

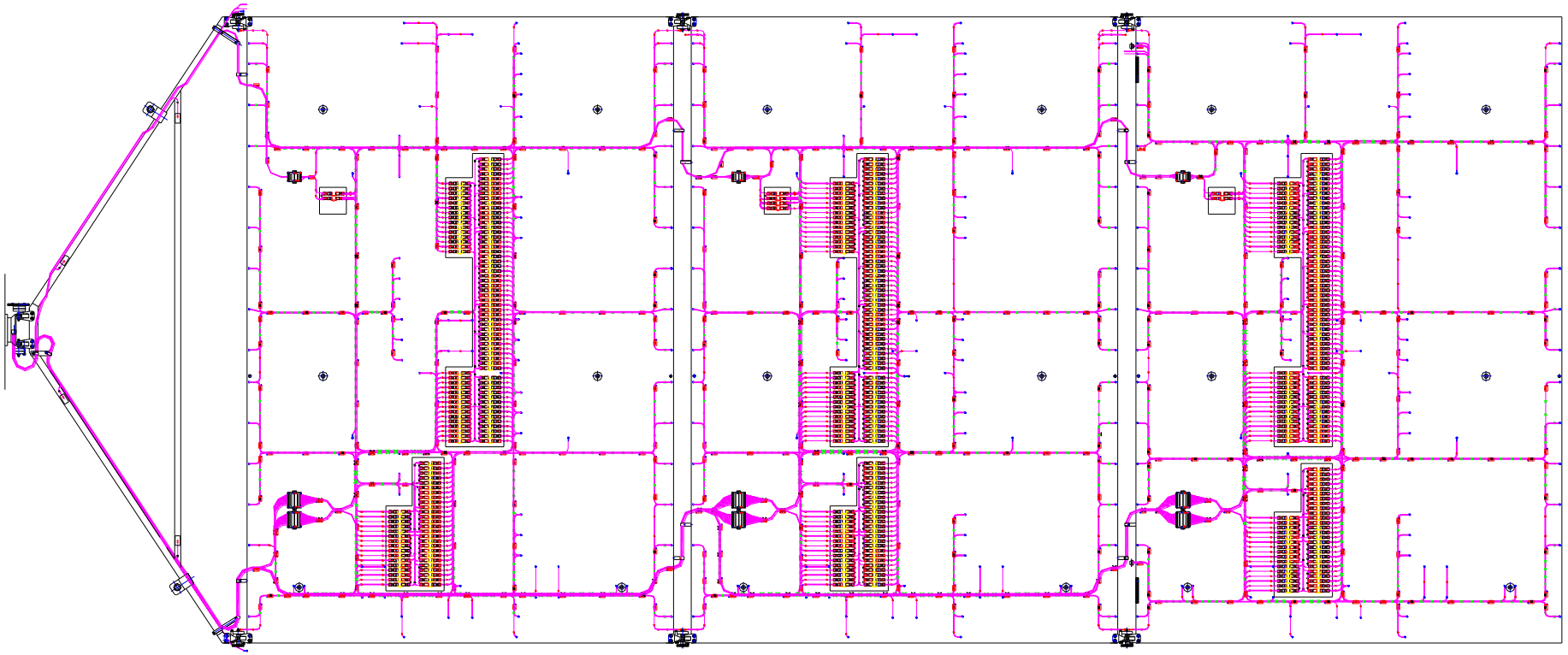
SOLAR ARRAY DESIGN

ORBITAL
ENGENHARIA

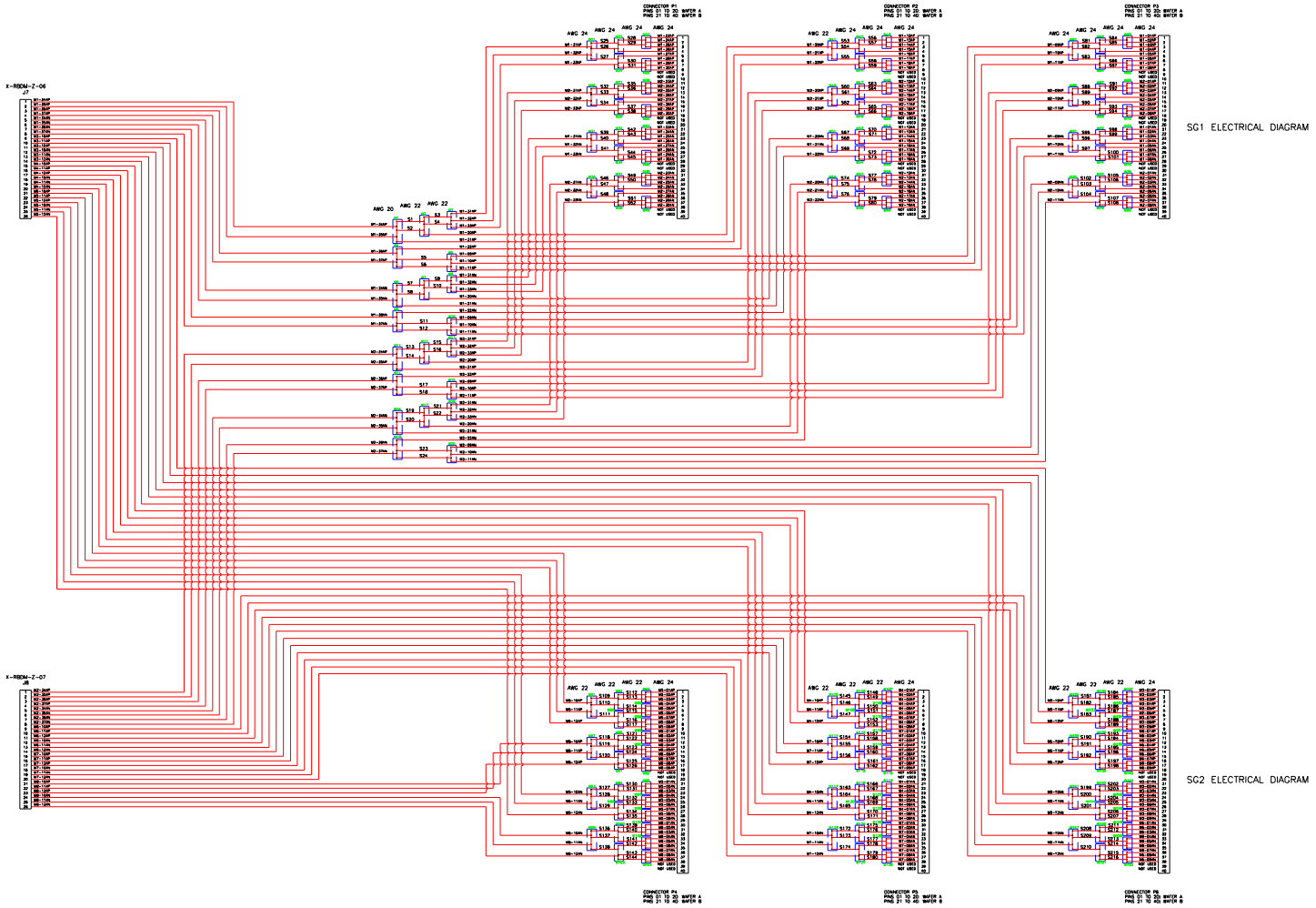
CBERS SAG – Front Side



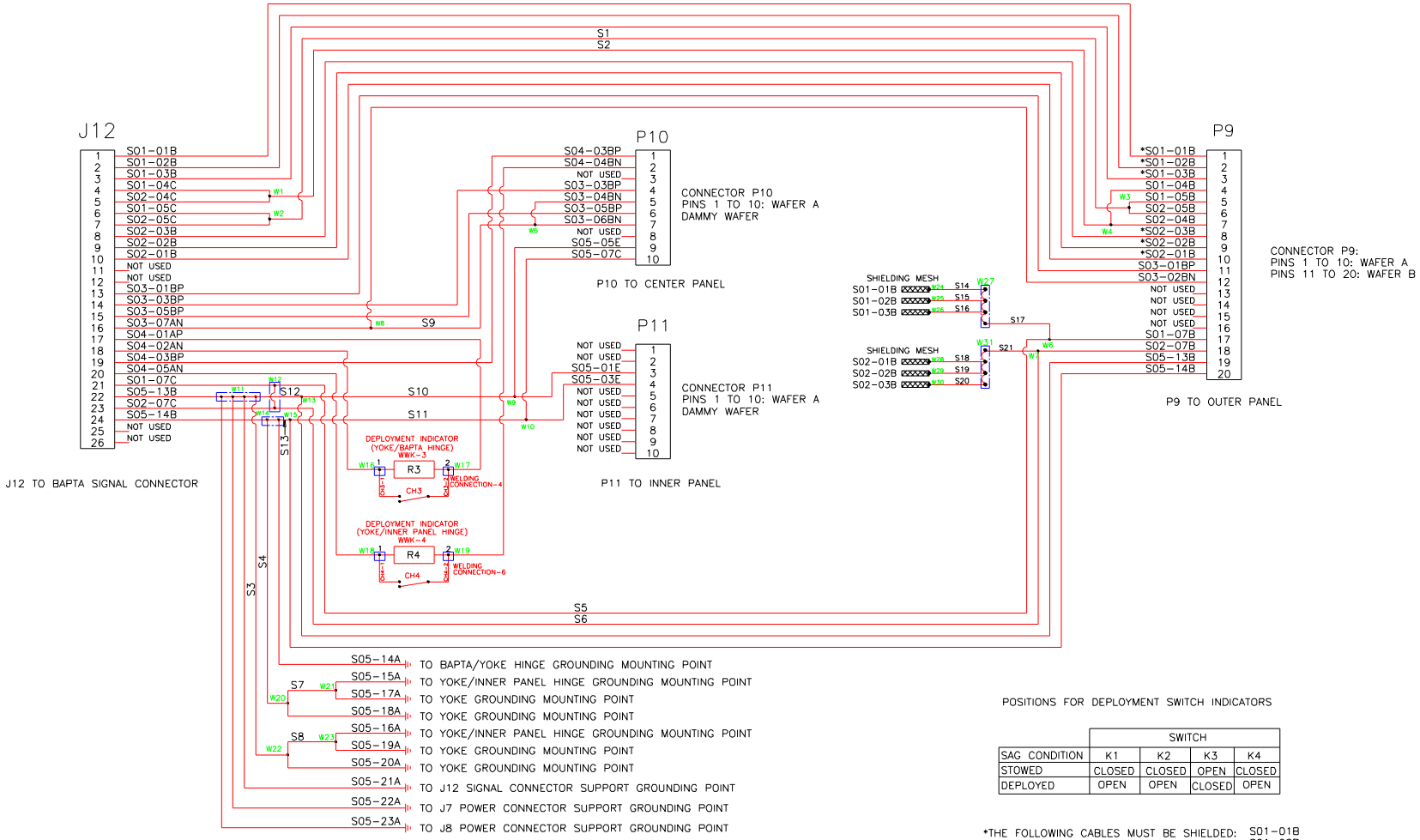
CBERS SAG – Rear Side



Wing Power Electrical Diagram



Wing Electrical Signal Harness Diagram



POSITIONS FOR DEPLOYMENT SWITCH INDICATORS

	SWITCH			
SAG CONDITION	K1	K2	K3	K4
STOWED	CLOSED	CLOSED	OPEN	CLOSED
DEPLOYED	OPEN	OPEN	CLOSED	OPEN

*THE FOLLOWING CABLES MUST BE SHIELDED: S01-01B
S01-02B
S01-03B
S02-01B
S02-02B
S02-03B

R3 = 510 kΩ e R4 = 39 kΩ

2018 MAIN SOLAR ARRAY AND OTHERS STATUS

ORBITAL
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SOLAR ARRAY GENERATOR FOR CBERS-4A

Sun Simulator developed by Orbital

Solar Module

Geostationary Defense and Strategic Communications Satellite - SGDC

Thales Alenia Space

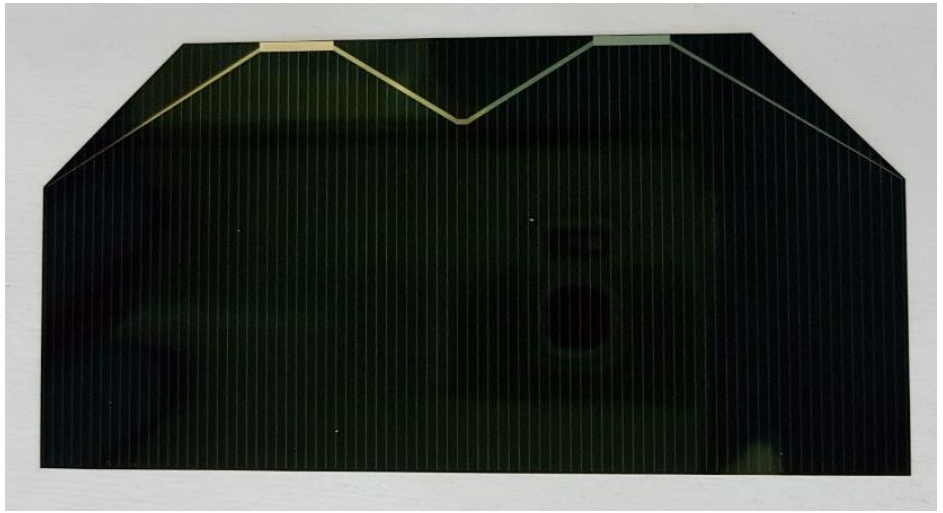
TRANSFER OF TECHNOLOGY

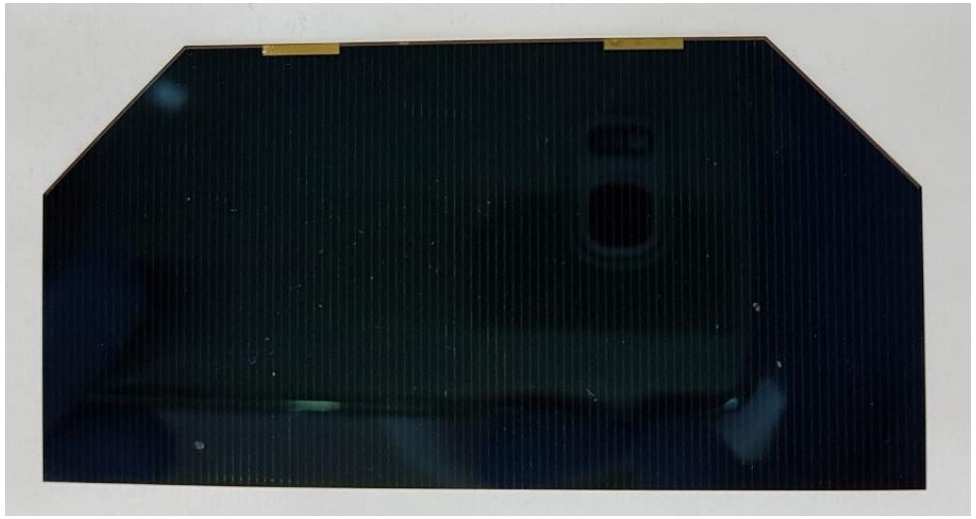
Electrical Power Subsystem(EPS)
&
Solar Array Generators

TRANSFER OF TECHNOLOGY - SGDC

TESTS COUPONS

- LEO (7-10 years life cycle)





- GEO (>15 years life cycle)

ORBITAL
ENGENHARIA

celiovaz@orbitalengenharia.com.br