

RENESAS SPACE PLASTIC SOLUTIONS A RELIABLE APPROACH FOR THE NEW SPACE

25TH - 27TH MARCH 2025

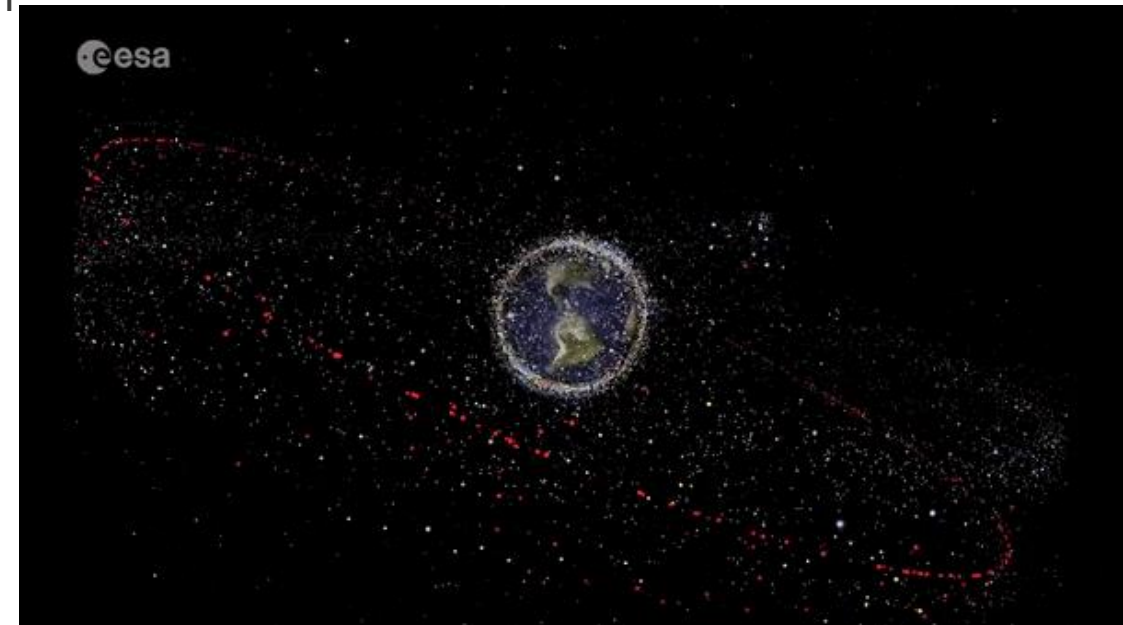
ACCEDE | ESCCON - SEVILLE, SPAIN

Michele Pergola - Business Development Specialist EMEA

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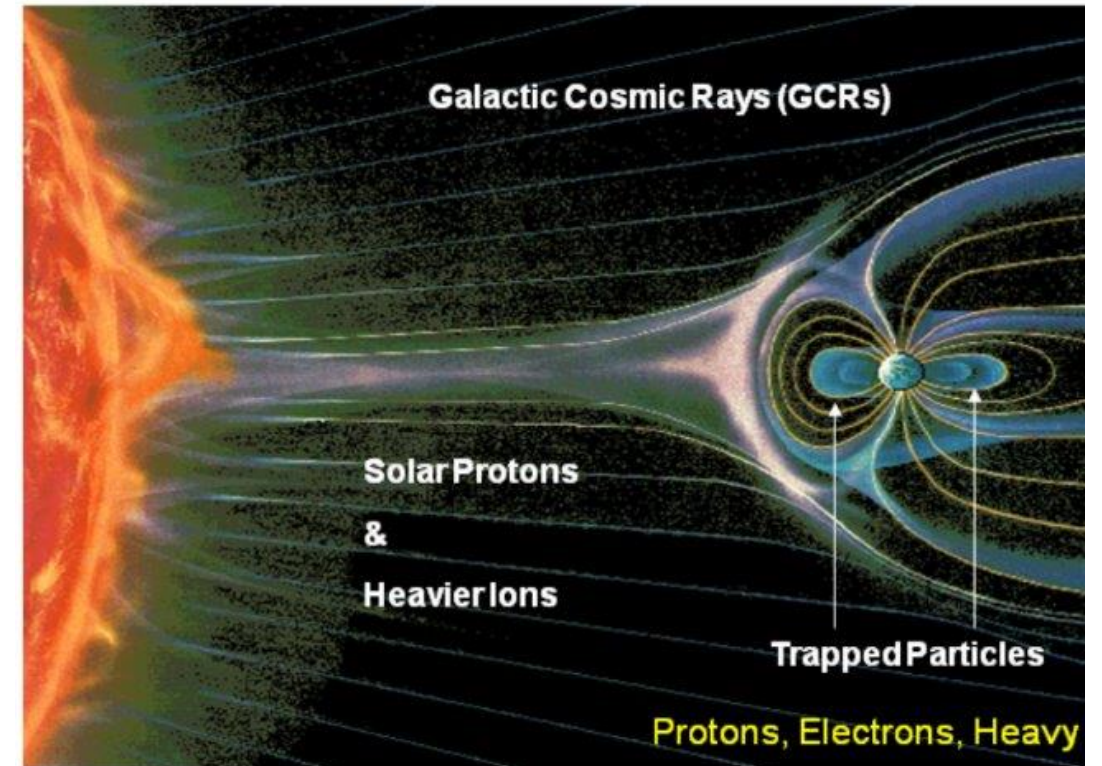
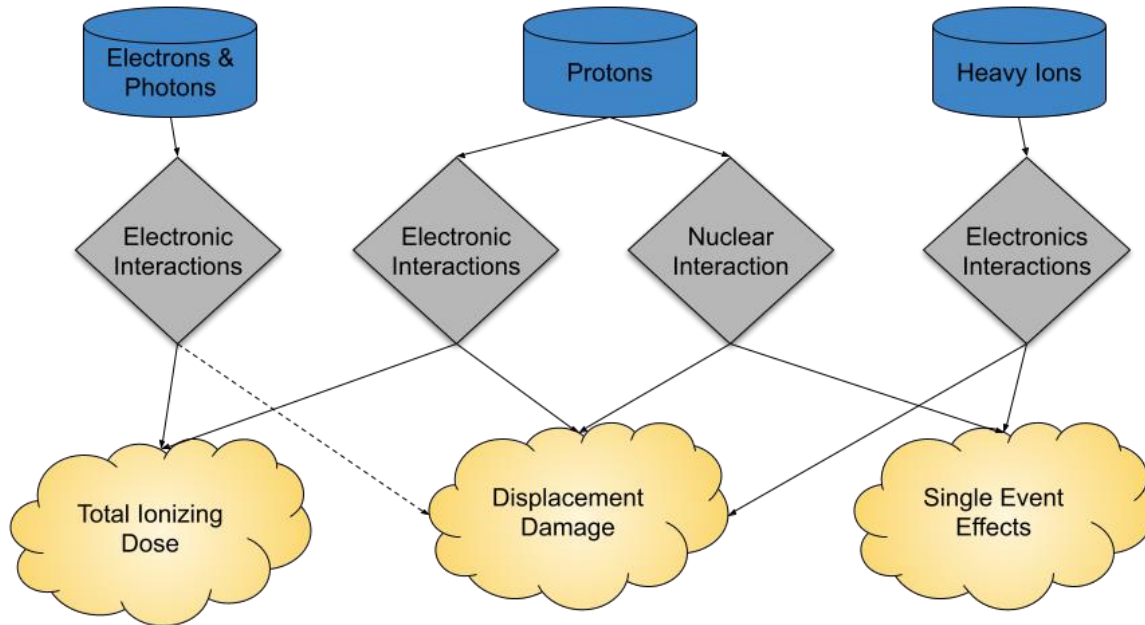
INTRODUCTION

- The rapid expansion of the space industry, particularly with the advent of New Space initiatives, has created a **paradigm shift** in how we approach satellite design and component selection.
- **Cost, weight, lead times** are crucial factors driving the adoption of plastic-packaged semiconductor solutions.
- However, the **reliability** of these components in radiation environments remains a primary concern.
- We will explore how Renesas plastic solutions can be leveraged to meet the reliability demands of space applications through rigorous qualification and testing approaches but keeping in focus lowering the cost and lead times with increase **flexibility** versus traditional space.



WHY WE NEED HIREL PARTS

The Natural Space Radiation Environment is challenging for its effects on electronics - The presence of energetic particles as Electrons, Photons, Protons and heavy Ion can affect the Electronics in 3 different ways: Total Ionizing Dose (TID), Displacement Damage (DD) and Single Event Effects (SEE).



A RELIABLE APPROACH FOR THE NEW SPACE

RH Hermetic

QML-V and QML-V Equivalent

Die manufactured on rad-tolerant process, design and layout use rad-hard techniques

Die is sealed in a ceramic package

Electrical performance over the military temperature range and radiation performance (*SEE and TID*) are characterized

Every IC undergoes a comprehensive production and quality screening procedure

Customer receives a data packet with screening information

**Traditional Rad-Hard
Space IC**

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Customers need a low-cost IC suited for the space environment to use in large satellite constellations

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Die is sealed in a **plastic** package

Electrical performance over the military temperature range and radiation performance (*SEE and TID 30krad/50krad*) are characterized

Every IC undergoes a **limited** production and quality screening procedure

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Advantages Over COTS

- **Customer doesn't have to deal with up screening commercial ICs**
 - *Rad-hard die with locked process*
 - *No hidden costs*
- **High reliability materials**
 - *Gold bond wires*
 - *NiPdAg or NiPdAg-Au plated lead frame*
 - *On demand Reliability Reports on website*
- **Known radiation performance**
 - *Rad testing performed for SEB/SEL/SEU/SET/SEFI and TID*
- **Applications support**
 - *Many years of supporting customers in space applications*
 - *Can assist with electrical and radiation related questions*

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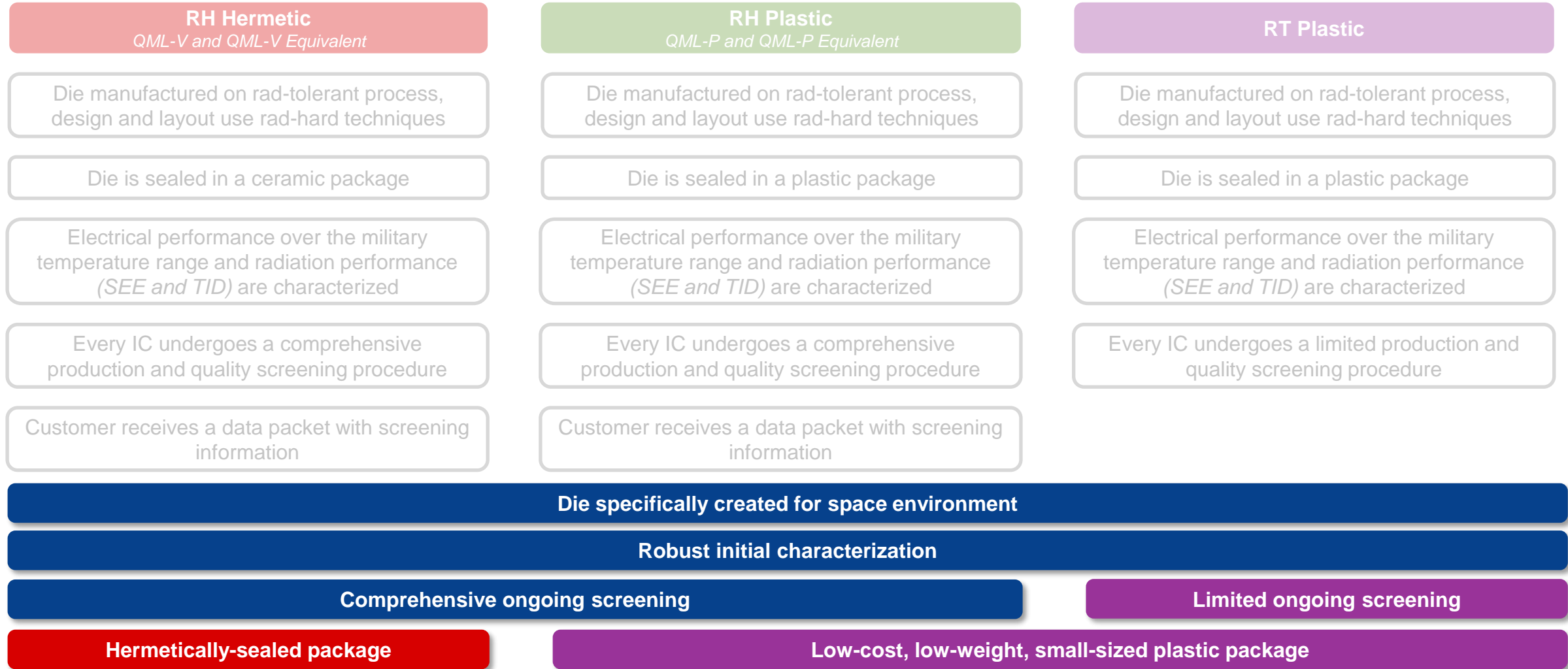
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One IC design on three production flows, all with identical wafer process!

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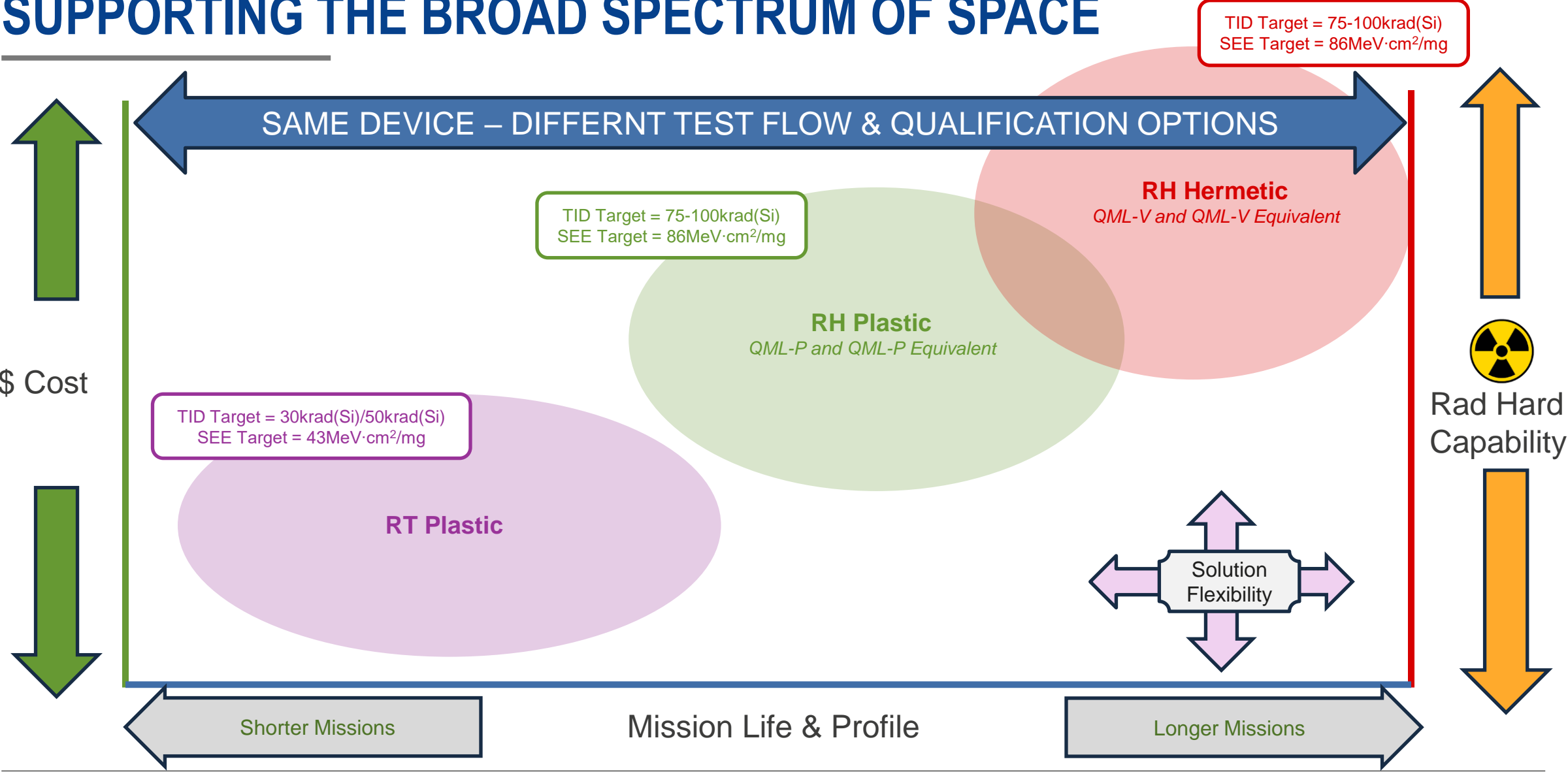
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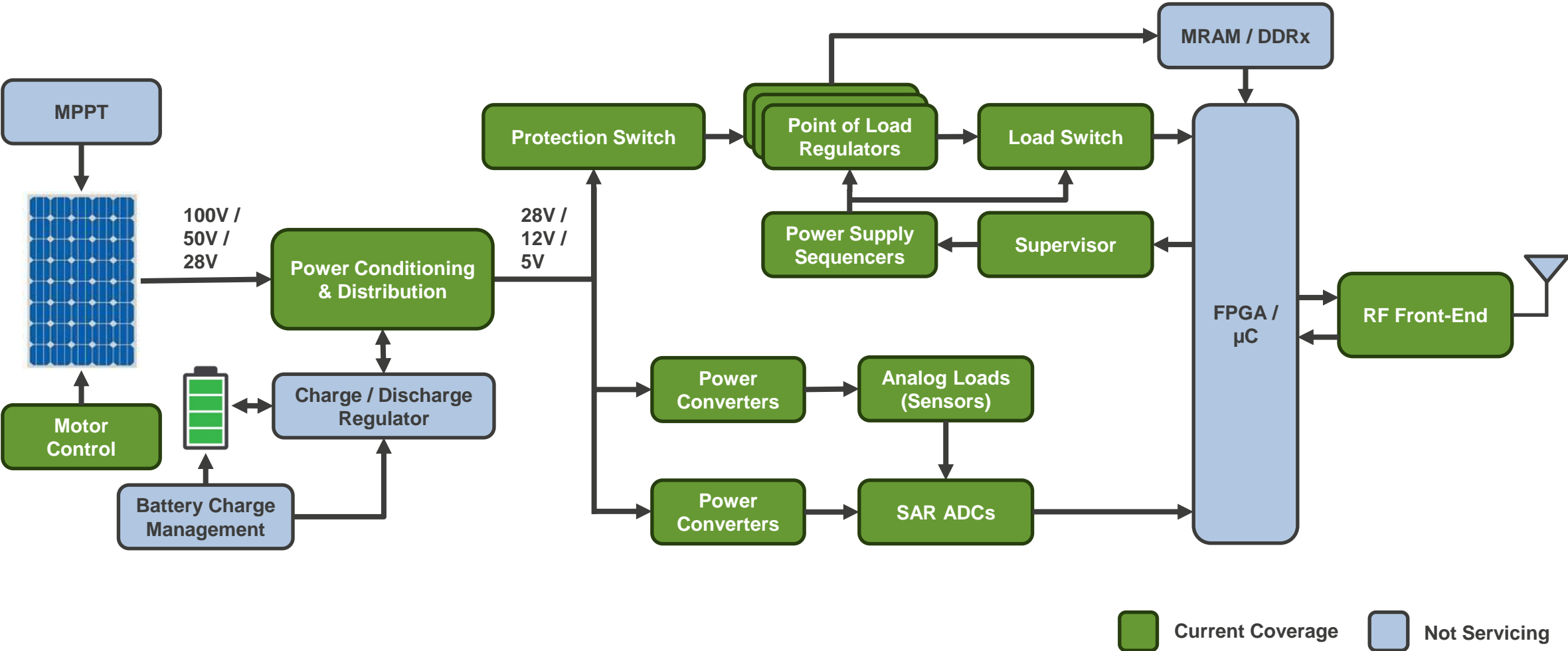
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**Each flow has designated wafers
without crossover between flows.**

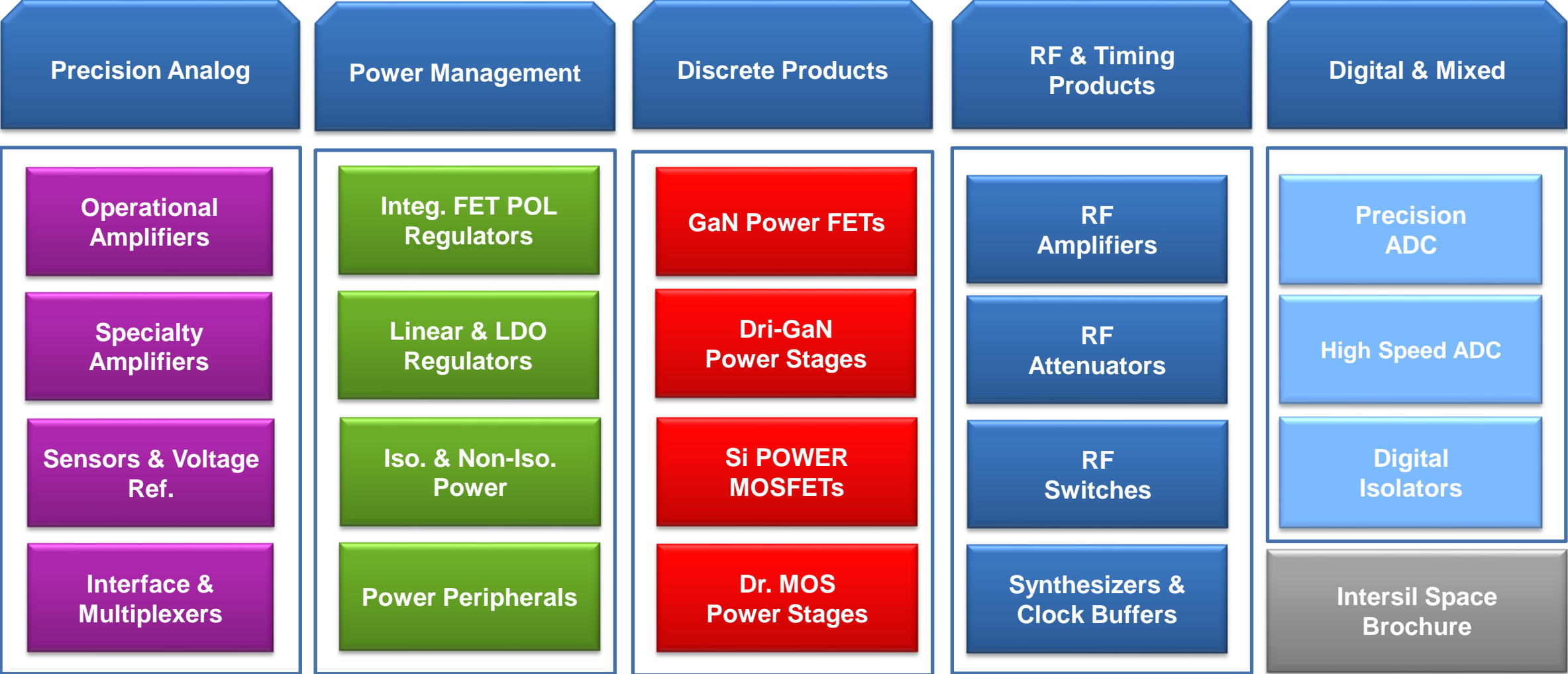
SUPPORTING THE BROAD SPECTRUM OF SPACE



SATELLITE BLOCK DIAGRAM



PRODUCT PORTFOLIO FOR SPACE APPLICATIONS



ACCEDE I ESCCON

2025

Seville – Spain
25 to 27th March

MICHELE.PERGOLA.YN@RENESAS.COM

THANK YOU!