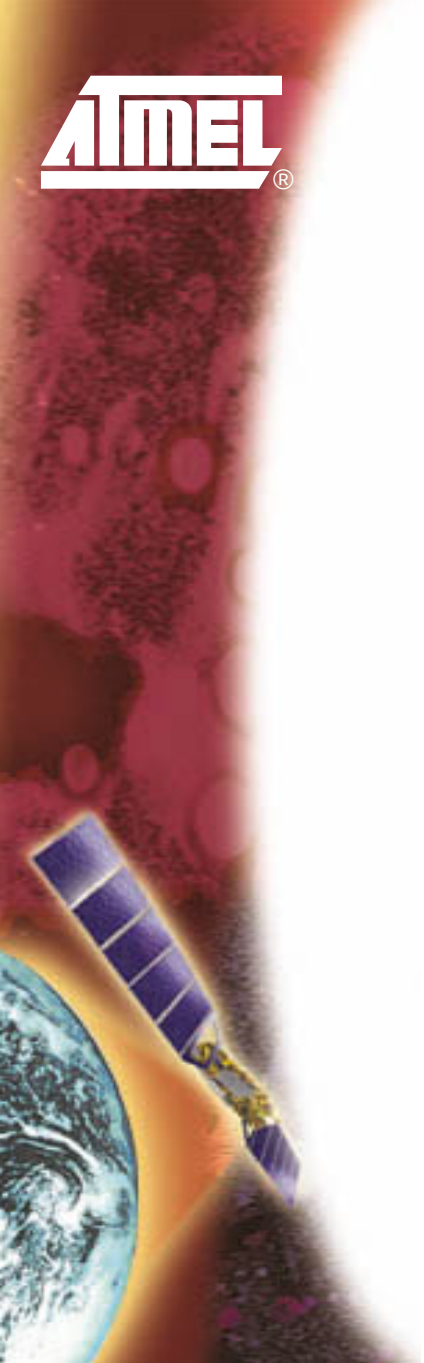


SMPW Service General Description

MPW Workshop - ESTEC

June 17th, 2004

Space Multi Project Wafer

In our 20 years continuing commitment to give customers access to advanced technologies for Space Applications,

Atmel is offering a new Space foundry service:

SMPW

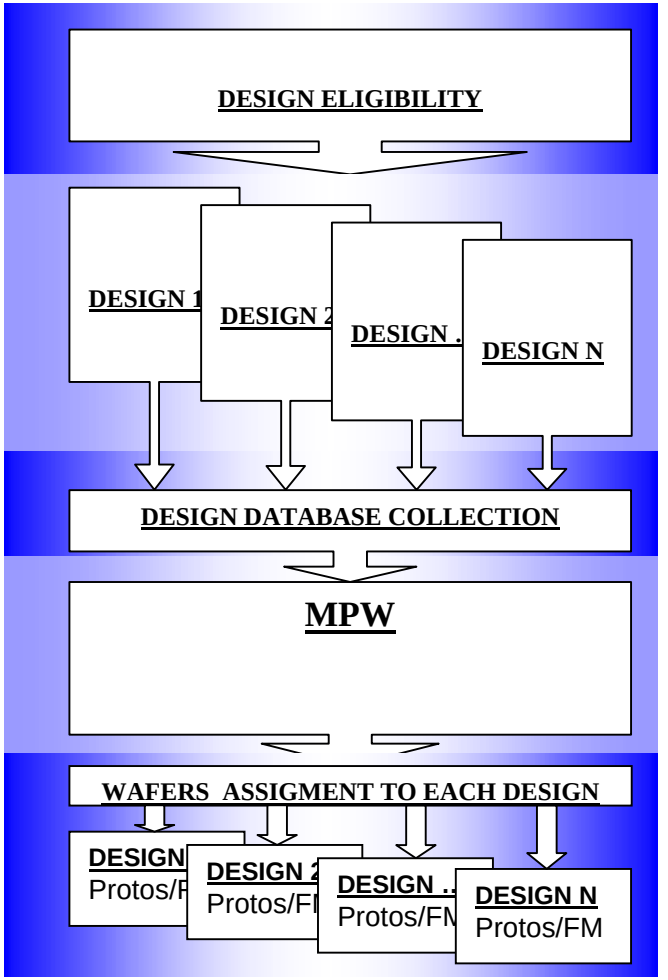
(Space Multi Project Wafer)

SMPW Foundry Service Objectives

- A service for ANY European Space Customer
  - On the advanced 0.18µm RHA technology
  - With the ATC18RHA ASIC standard cell libraries
- Reduced manufacturing non recurring costs of ASIC development
  - By sharing reticules and silicon costs between several designs
- Same set of reticules for Prototyping and Flight Models
- In case of run overbooking, ESA will apply following priority criteria
    - 1 ESA mission ASICs
    - 2 ESA R&D ASICs
    - 3 non ESA commercial ASICs
    - 4 non ESA R&D ASICs

Generalities (1)

- **No design constraints specific to SMPW**
  - **ATC18RHA design kit applies without restrictions**
  - **Each design is developed independently of the others**
  - **But new synchronization milestones are created**
- **SMPW is a Space foundry service**
  - **The SMPW is limited to reticules and wafers manufacturing**
  - **1 sole reticules set for all the designs embarked**
  - **Several designs manufactured on the same wafer**
  - **Wafers split in sub-lots assigned to 1 design**



Generalities (2)

- SMPW runs will be launched at fix dates made public in advance to the space community
- Each run includes
  - Reticules manufacturing
  - 1 lot with priority for prototyping
- Complementary lots for Flight Models can be launched
  - With the same reticules
  - Without date restriction
  - When needs appear
- ESA reserved and funded 4 runs dedicated to ESA projects
  - Nevertheless, if surface available on the reticule, non ESA projects could embark on an ESA dedicated run,
    - after ESA approval

Generalities (3)

- **2 majors milestones dedicated to SMPW management are created**
  - **Logic Review Closing Date (LRCD)**
    - **Fix date**
    - **Firm approval from ESA to what designs are on the run**
    - **Firm confirmation from Atmel to embark the design**
    - **Firm confirmation from customer to embark and meet the schedule of the SMPW**
    - **From this date, cancellation charges apply**
  - **Design Review Closing Date (DRCD)**
    - **Fix date**
    - **Start of the foundry manufacturing**

Wafers assignment

- **Prototyping**
  - **The first lot of 25 wafers will produce in priority prototypes**
- **Flight Models**
  - **Can be manufactured with the remaining wafers of the first lot (if any)**
  - **If not, launch of a new lot with the same reticule**

SMPW Definition and Validation

- **Definition and Validation of the SMPW in the frame of an ESA contract**

  - **Atmel led an engineering activity to adapt the existing mono project procedures to the SMPW**

  - **Objectives and constraints**
    - **Reduce customers' foundry costs**
    - **No negative impact from one customer design on the others**
    - **Secure the space quality**
    - **Processes have to be as close as possible of the current space manufacturing flow**
    - **Produce the maximum quantity of parts despite the limitations of equipments**

SMPW Definition and Validation

- Technical constraints are impacting mostly the organization of the designs on the reticule
- No technical modifications in the process of the wafer
- But, the spare areas between the designs will be filled with “dummy structures”
- No technical modifications in the probe and assembly processes
- But, management rules have been added allowing to treat each wafer sub lot as a mono-project wafer

SMPW Definition and Validation

- **Verification with a so-called “Validation Run”**
  - **Reticule using SMPW organization rules**
  - **Production of an engineering wafers lot (prototypes)**
  - **Verification of the complementary management rules introduced in probe and assembly areas**

SMPW Definition and Validation

- **Designs embarked on the "Validation Run"**
  - **4 designs on 3 different matrix sizes**
    - **1 design on the largest matrix (170 mm2)**
    - **1 design on the second largest matrix (114 mm2)**
    - **2 designs on the intermediate matrix (74mm2)**

- **"Validation Run" schedule**
  - **Design Review Closing Date (DRCD) Mid July 2004**
  - **Prototype assy and test November 2004**
  - **Final Validation Run conclusions December 2004**

SMPW more information

- Atmel website (www.atmel.com) will indicate
  - The MPW runs dates
  - The free remaining area on the reticule per run
- Direct link
  http://www.atmel.com/product/product_card.asp?part_id=2318
- Contact point
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