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MIXED SIGNAL ASIC DESIGN METHODOLOGY FOR SPACE APPLICATIONS

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INTRODUCTION

↳ MINIATURISATION DEMANDS INCREASE IN “*ANALOGUE CONTENT*” OF ASICs

↳ ANALOGUE DESIGN REQUIRES :

- INVESTMENTS IN TOOLS
- INVESTMENTS IN MANPOWER

↳ NEEDS OF METHODOLOGIES TO MAINTAIN THE COMPETITIVE ADVANTAGE

OBJECTIVE

- ↪ EVALUATION OF TECHNOLOGIES
- ↪ EVALUATION OF DESIGN TOOLS
- ↪ IDENTIFICATION OF DESIGN ENVIRONMENT AND FLOW
- ↪ IDENTIFICATION OF A DEVELOPMENT FLOW
- ↪ APPLICATION OF THE METHODOLOGIES

TECHNOLOGY SURVEY

↪ IDENTIFICATION OF KEY FACTORS AND EVALUATION OF PARAMETERS

- ✧ GENERAL INFORMATION ON THE PROCESS
- ✧ PACKAGING AND TESTING FACILITIES
- ✧ QUALIFICATION AND RADIATION DATA
- ✧ MULTI-PROJECT-WAFER SERVICE
- ✧ FOUNDRY INTERFACE

MIXED SIGNAL ASIC DESIGN METHODOLOGY and FLOW

↪ DESIGN METHODOLOGY SHALL :

- ✧ FACILITATE DESIGN ALONG WITH CORRECT USE OF CAD
- ✧ PREDICT PERFORMANCES
- ✧ VERIFY COMPLIANCE WITH SPECIFICATIONS
- ✧ NOT BE BOUNDED TO DESIGN ENVIRONMENT or TECHNOLOGY
- ✧ ALLOW CELL LIBRARIES DEVELOPMENT FOR DESIGN REUSE
- ✧ REDUCE RISK and MAINTAIN SCHEDULE

MIXED SIGNAL ASIC DESIGN METHODOLOGY and FLOW

↪ DRIVING FORCES IN ENVIRONMENT and TOOLS SELECTION

- ✧ GOLDEN or REFERENCE SIMULATOR at SEVERAL VENDORS
- ✧ AVAILABILITY OF DESIGN KITS
- ✧ AVAILABILITY OF RELIABLE BACK-END TOOLS
- ✧ INTEGRATION WITH EXISTING DESIGN ENVIRONMENT

MIXED SIGNAL ASIC DEVELOPMENT FLOW

↪ DEVELOPMENT FLOW SHALL:

- ✧ GUIDE TRADE-OFFS ATE EARLY STAGE OF SYSTEM DEFINITION
- ✧ GUIDE ASIC PROJECT PLAN
- ✧ DEFINE CONTROL and VERIFICATION POINTS
- ✧ TRACE ASIC DESIGN and MANUFACTURING STEPS
- ✧ REDUCE RISKS

ON FIELD APPLICATION

↪ *ICARUS ASIC:*

✧ IMPLEMENTATION OF THE DEVELOPMENT FLOW

↪ *ABACUS ASIC:*

✧ IMPLEMENTATION OF THE DESIGN FLOW

CONCLUSIONS

- ↪ *IDENTIFICATION OF A DESIGN METHODOLOGY FOR MIXED SIGNALS ASICs*
- ↪ *IDENTIFICATION OF TECHNOLOGIES and DESIGN ENVIRONMENT*
- ↪ *IDENTIFICATION OF A DEVELOPMENT FLOW*
- ↪ *ON FIELD VERIFICATION OF THE METHODOLOGY*