COMPANY OVERVIEW

Design House specialized in parts and systems for space and hi-rel applications

Sister companies in Madrid (ES) and Frankfurt Oder (DE)

Suppliers of electronics, microelectronics and mechanisms

Strong R&D activity and product-oriented strategy

EUR 10.5M revenues in FY19

42 employees
RAD-HARD ASICs/FPGAs

WE ARE FABLESS

Experts in analog, digital and mixed signal

Own proprietary rad-hard IPs in several technologies. Unrestricted access to rad-hard standard libraries

Flexible supply chain. Packaging and quality flows adapted to customer needs

One-stop shop. Turnkey solutions

Cost reduction and better performance in your equipment by:

Replacing costly flight FPGAs by digital ASICs in high-volume applications \( \rightarrow \) FPGA to ASIC conversion

Integrating many functionalities into a single chip

Reducing the amount of EEE parts in electronic equipment
## RAD-HARD ASICs/FPGAs

### Main projects

<table>
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<tr>
<th>Project</th>
<th>Description</th>
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<tbody>
<tr>
<td><strong>REDSAT ASIC chipset ELSA</strong></td>
<td>Management of the Multichip Control Module (MCCM) of a reconfigurable active array antenna (Ku Band). 600+ chips in a single mission (Hispasat 36W-1 GEO comsat)</td>
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<tr>
<td><strong>COSMIC VISION</strong></td>
<td>Front End Readout ASIC for Cosmic Vision Instrumentation Payload</td>
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<tr>
<td><strong>RTU ASIC</strong></td>
<td>Control and management of Data I/O Interface, Battery Charge Control and Power Distribution in satellite constellations.</td>
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<tr>
<td><strong>QUANTUM Beam Hopping Enabled Digital ASIC</strong></td>
<td>Control and management of RF subassemblies while enabling fast beam hopping in active array antenna</td>
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<tr>
<td><strong>QUANTUM FPGAs</strong></td>
<td>Design, programming and verification of two space FPGAs according to ECSS-Q-60B standard</td>
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<tr>
<td><strong>TMTC ASIC</strong></td>
<td>Mixed-signal ASIC for telemetry and telecommand handling for general purpose in satellites</td>
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<tr>
<td><strong>RTG4 FPGAs</strong></td>
<td>Verification tools to corroborate good implementation of SEU/SET-Mitigation Techniques in 3rd/4th Generation Flash FPGAs. Validation of the effectiveness of these tools through Heavy Ion and proton radiation.</td>
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RAD-HARD IC PRODUCTS
LVDS for SpaceWire networks

Data transmission along twisted pair cables at very high data-rates and excellent EMI performance

- ARQUIMEA LVDS family of ICs: Driver, Receiver, Transceiver, Repeater
- 0.25-um BiCMOS technology process. Fully European supply chain
- Full compliance with the ANSI_EIA/TIA644A standard
- Over 500Mbps data transfer rate per channel
- 3.3V single power supply
- Small propagation delay, low channel-to-channel skew and low jitter
- Extended input common mode range from -4V to +5V
- Cold-spare in all pins
- Fail Safe protection
- Input hysteresis implemented at the receiver side
- TID: 300 kRad(Si)
- SEL immune up to LET of 60 MeV*cm²/mg
- BER down to 1E-13 err/bit in GEO orbit
- ESD protection above 8kV HBM

ECSS Qualification ongoing. FMs available in Q3-19
RAD-HARD IC PRODUCTS
10/100 Mbps Ethernet PHY Transceiver

First rad-hard Ethernet PHY in the market

Standard solution for launchers, satellites and spacecraft

Compatible with Time Sensitive Networks (TSN) and Time-Triggered Ethernet for deterministic real-time communications

- Compatible with IEEE 802.3 10BASE-T, IEEE 802.3 100BASE-TX and ANSI X3.263-1995
- Integrated high performance 100 Mb/s clock recovery circuitry requiring no external filters
- Programmable loopback modes for easy system diagnostics
- 3.3V/1.8V power supply
- Cold spare
- MII/RMII MAC communication interface
- MI interface for MAC management and diagnostics
- TID > 100 kRad
- SEU threshold LET > 30MeV/mg/cm²
- SEU Error Rate < 10⁻¹² errors/bit-day (at < 70 MeV/mg/cm²)
- SEL immune up to LET of 60MeV/mg/cm²
- QFP64 package

Prototypes available. Seeking funding for ESCC qualification
RAD-HARD IC PRODUCTS

2.5 Gbps SERDES Transceiver

Used in high-speed communications to compensate for limited input/output.

Data transmission over a single line or a differential pair to minimize the number of I/O pins and interconnects.

- 1.6 to 2.5-Gbps transmission/reception speed
- Interfaces to backplane, copper cables or optical converters
- On-Chip 8-Bit/10-Bit Encoding/Decoding, Comma Detect
- Low Power: < 500mW (Power consumption < 5mW if the device is disabled)
- TID > 100 kRad
- SEU threshold LET > 30MeV/mg/cm²
- SEU Error Rate < 10⁻¹⁰ errors/bit-day (at <70 MeV/mg/cm²)
- SEL immune up to LET of 70MeV/mg/cm²
- BER < 10⁻¹² for GEO orbit
- Available in space-grade ceramic (CQFP68) and plastic packages

(*) Parameters to be confirmed

Under development. EMs available in Q3-19
RAD-HARD MICROELECTRONICS AND NEW SPACE

There are many alternatives open for EEE Parts in New Space:

- Radiation hardening → Up-screened COTS vs Rad Tolerant vs Rad Hard
- Packaging → Ceramic vs hi-rel plastic
- Qualification levels → ESCC vs reduced evaluation

We propose Chinese flight-proven parts with independent reduced ESCC evaluation at very competitive prices:

**First use case → Rad-hard 40Mb CMOS SRAM**
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