

# High Performance Mixed-Signal Solutions

from Aeroflex

*We Connect the REAL World to the Digital World*

Solution-Minded



Performance-Driven



Customer-Focused



# Aeroflex (NASDAQ:ARXX) Corporate Overview



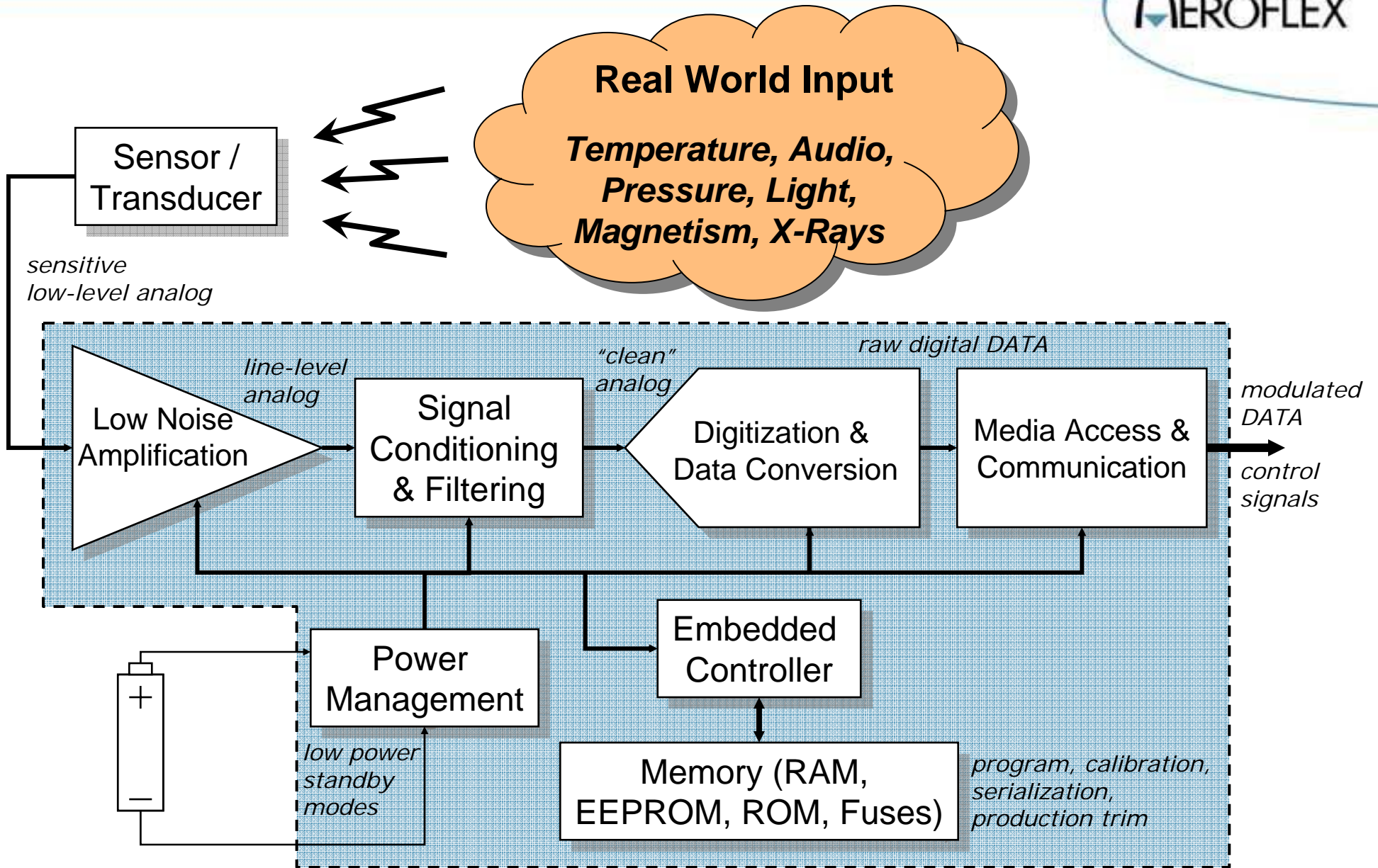
- ▼ **Diversified Microelectronics and Testing Manufacturer**
- ▼ **FY2006 Revenues of \$552M**
- ▼ **Business Segments:**
  - **AMS - Aeroflex Microelectronic Solutions**
    - ▼ **Aeroflex Colorado Springs**
      - **ASIC, Standard Products, CCA, Mixed-Signal**
  - **ATS - Aeroflex Test Solutions**
- ▼ **Approximately 2,600 employees worldwide**
- ▼ **Founded in 1937**
- ▼ **Headquarters in Plainview, NY**

# High Added Value



- ▼ Aeroflex Custom Mixed-Signal Products offer *high performance, high density, high reliability* solutions that:
  - improve **performance**
  - **differentiate** our customers' products
  - save **power, size** and **weight**
  - **work reliably**
  - improve **security**
  - **reduce overall system cost**

# Mixed-Signal Block Diagram



# Product Example: Imaging Read-Out IC (ROIC)



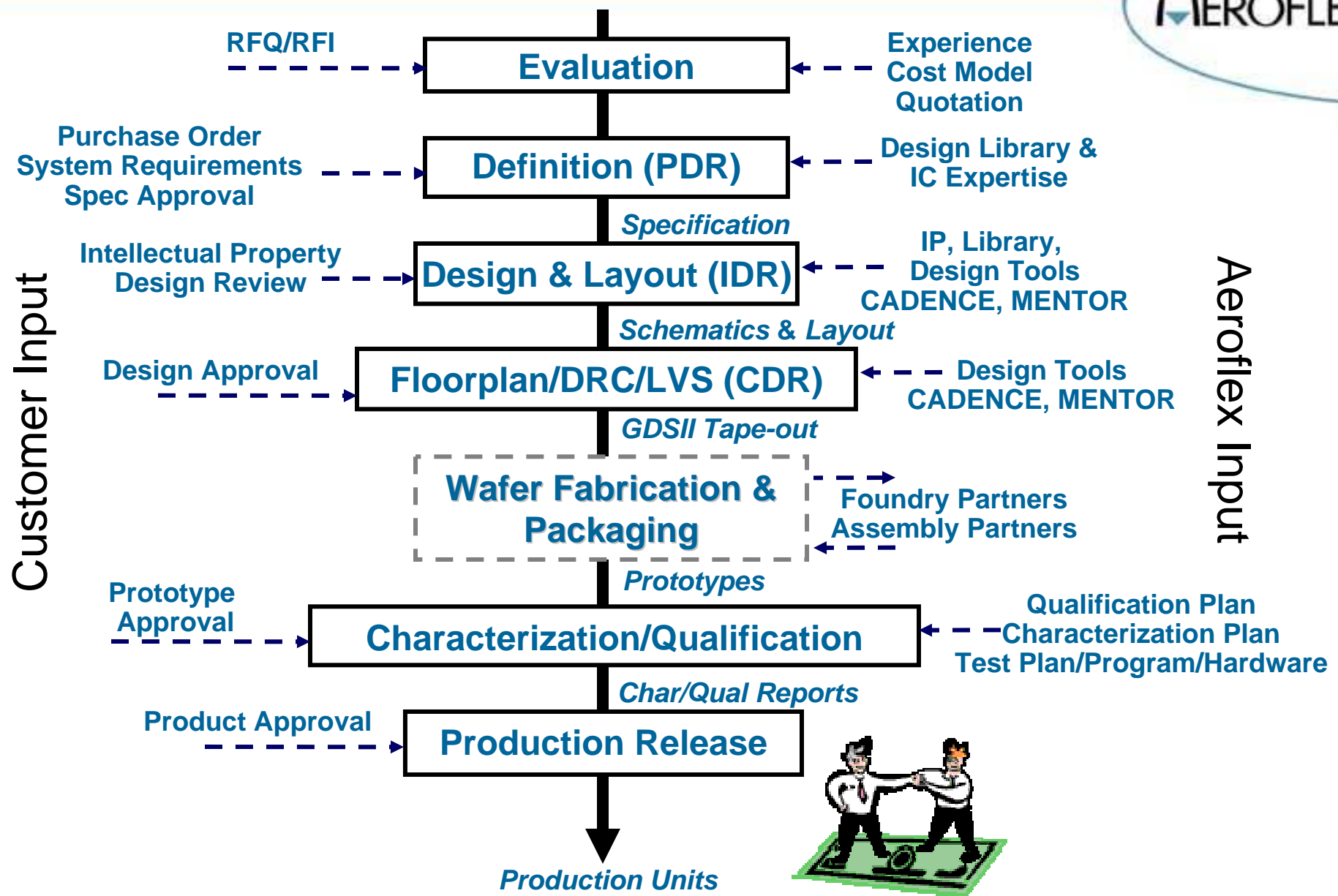
- ▼ **Massively Parallel ADC Channels**
  - **>128 ADC Channels Run Concurrently**
  - **19 bit resolution (18 ENOB)**
  - **Input Offset Current Cancellation**
  - **$< 2\text{pA}_{\text{rms}}$  input-referred noise**
  - **$< 4.5\text{mW/channel}$**
  - **$> -110\text{dB}$  Channel Isolation at 1kHz**
  - **Low-Cost, Standard CMOS Technology**
- ▼ **2.5V +/-0.1% Reference**
  - **$< 10\text{ppm}/^\circ\text{C}$  (20°C-40°C)**

# Target Markets & Applications

- ▼ Medical Telemetry
- ▼ Industrial “Smart” Sensors
- ▼ Automotive Sensors
- ▼ Smart Wireless Sensor Networks
- ▼ Automatic Test Equipment
- ▼ High End Audio
- ▼ Hearing Aids
- ▼ Specialized Imaging
  - Infrared, Machine Vision
- ▼ Rotational/Positional Encoding
- ▼ POS, Magnetic Stripe, RFID
- ▼ Industrial Communication Networks



# Mixed-Signal Program Flow & Tools



# Extensive Mixed-Signal Development Expertise



- ▼ **3 Aeroflex Design Centers:**
  - Aliso Viejo, CA, Colorado Springs, CO, Grass Valley, CA
  
- ▼ **Strong and Growing Development Team**
  - 25 Experienced Development Engineers
  - Test & Characterization Experts
  
- ▼ **More Than 225 Man-Years' Design Experience in**
  - Flash/Pipelined Converters to 250MSPS
  - $\Sigma$ - $\Delta$  Converters to 22 Bits
  - High Frequency/Low Noise Design
  - Mixed-Signal Design
  - Embedded Processors/System on Chip
  - Embedded Memories – RAM & NV
  - Complex Digital Systems Design
  - Analog Layout
  - Floorplanning, Routing & Finishing
  - Prototype Bench Evaluation & Debug
  - Product Characterization

# System-on-Chip Design Library Examples



- ▼ **Signal Processing**
  - Switched Capacitor Filters
  - Custom DSP
  - Instrumentation Amplifiers
- ▼ **Data Conversion**
  - Speeds to 100MHz
  - Resolutions To 20bits
  - Sigma Delta ADC
  - Flash ADC
  - Successive Approximation
- ▼ **Power Management**
  - Voltage Regulators
  - Band-gap Reference
- ▼ **Clock Generation**
  - RC and Crystal Oscillators
  - Phase-Locked Loop (PLL)
  - Frequency Generator
  - Delay-Locked Loop (DLL)
- ▼ **Self-powered Circuits**
  - RFID
- ▼ **Embedded Control**
  - ARM9 & ARM7
  - 8051
  - 68HC11
- ▼ **Watchdog Circuit**
- ▼ **UART**
- ▼ **Memories**
  - Flash (To >40MHz)
  - EEPROM
  - SRAM
  - Multi-port RAM
  - FIFO
  - ROM
- ▼ **Interface**
  - USB2.0, USB1.1
  - IEEE 1394
  - PCI
  - LVDS
  - Serial Bus (I<sup>2</sup>S, I<sup>2</sup>C, SPI)
  - RS-232 (+/-5V And +/-10V)
  - RS-485

# Full Service IC Development



- ▼ **One-Stop Shopping:**
  - All design & layout performed in-house
  - Flexible Design Interface
- ▼ **World Class Foundry Partners**
  - Mixed-Signal, High Voltage & RF CMOS to 0.18 $\mu$ m
  - BiCMOS to 0.18 $\mu$ m
  - Digital CMOS to 0.18 $\mu$ m
  - QML-V/QML-Q/AS9000/ISO-9001 Certified
- ▼ **In-House Test and Assembly for Fast Prototyping**
  - Custom Packaging Experts
    - ▼ Passive Attach, MCP, Stacked Die, Custom Substrate Design
  - Class 100 Assembly Clean Room for Hermetic Packages
  - Test Floor with Digital, Memory & Mixed-Signal ATE
  - Fully Equipped On-Site FA Lab
- ▼ **World Class Production Test/Assembly Partners**
  - Leading Edge Package Technology
  - High Volume Pricing

# Customer-Focused Program Management



- ▼ **Dedicated Program Managers Assigned**
  - **“Cradle to Grave” Responsibility**
- ▼ **Military/Aerospace Program Experience**
  - **Exacting Customer Requirements & Timetables**
- ▼ **Real-Time, Password Protected Customer Web Access**
  - **Specifications**
  - **Simulation Data**
  - **Weekly Action Item Logs**
  - **Real Time Schedule Report**
  - **Wafer Lot Status**

# Ensuring First-Pass Success



- ▼ **Experience**
  - Our Mixed-Signal Team has Centuries of Experience
  - We SPECIALIZE in High Performance Signal Processing
- ▼ **Libraries & IP**
  - Maximize Cell Reuse
  - Concentrate on Existing Fabrication Processes
- ▼ **Test Chips**
  - When Possible, Prove Complicated Circuits in Silicon Prior to Chip Tapeout
- ▼ **Programmability**
  - Anticipate Problem Areas
  - Provide Metal-Only Circuit Adjustments
  - Implement Fuses and/or EEPROM where possible

# Aeroflex Mixed-Signal Summary



- ▼ **We Connect the REAL World to the Digital World**
  - Low-noise Analog Signal Processing
  - High Dynamic Range Converters
  - Precision References
  - EXTREME System Integration
- ▼ **Low Power...**
  - As low as 2mW/channel
- ▼ **Cost Effective...**
  - Significant reduction over standard product solutions
- ▼ **Embedded, Smart *Plug & Sense* Solutions...**
  - Standard digital interfaces
  - Analog signals do not leave integrated sensor product