



Quantum Leap Solutions Partner Portfolio

Our Story

Quantum Leap Solutions is a technical sales and advisory firm with established offices in San Jose, Los Angeles, and Austin. Our expertise lies in assisting companies in the completion of their custom silicon designs through a comprehensive suite of IP, EDA, and Services offerings. Our portfolio includes highly reliable and silicon-proven IP offerings available for licensing. Whether you are working on an SOC, ASIC, RFIC, or mixed signal design, we provide compelling solutions tailored to your needs.

Since our inception in 2011, Quantum Leap Solutions has been a trusted provider of IP, design, and manufacturing services for custom IC designs throughout North America. We specialize in delivering semiconductor intellectual property (IP) and design services, offering companies silicon-proven, and low-risk solutions in targeted markets.

Our Partners

ACL Digital

ACL Digital is a global semiconductor services and solutions provider and helps its clients meet market-driven challenges. ACL Digital works closely with several integrated device manufacturers (IDMs), fabless Semiconductor Companies, Original Equipment Manufacturers, Pure Play Foundries, Engineering Design Automation (EDA) and IP vendors to accelerate their products to the market. With more than 1200 engineers and services from RTL to GDSII, ACL Digital is also a TSMC Design Center Alliance Partner, a RISC-V Center of Excellence, and an ARM Approved Design Partner.

Alphacore

The Alphacore design team has extensive experience in RF or mixed signal intellectual property (IP), including high performance ADC and DACs, specialized imaging systems, hardware-based cybersecurity solutions as well as custom design services.

EnSilica

EnSilica, a UK company founded in 2001, is a fabless ASIC supplier that designs and supplies digital & mixed signal ASICs for automotive/industrial, healthcare and communications markets. EnSilica have ASIC and design expertise in the following application areas: RF & LIDAR/Automotive, Sensing & Control, Communications & Radar, Healthcare & Medical, Satellite RFICs, Digital and DSP, ARM, RISC-V and FuSa applications.

ACL Digital has design expertise in the following application areas:

RTL Design & Architecture

Architects – Micro Architects
 RTL Front-End Design & Integration
 Linting, CDC, Logical Equivalence
 RTP Design, IP Design, SoC Integration
 UPF Based Low Power Expertise

SoC & IP Verification

IP/SoC Verification
 UNM, OVM, VMM, eRM, RVM
 Assertion Based Verification
 Constraint Random Verification
 Power Aware Verification
 Formal Verification
 AMS Verification

Physical Design

Physical Design (HM, Block, SoC Level)
 Scan Insertion, Synthesis and STA
 Physical Verification
 PPA (Power, Performance, Area Optimization))
 Tools and Flow Development
 Synthesis and STA
 PD Implementation
 Low Power Expertise

Design For Test

DFT Design – Hierarchical, Full Flat, Mixed Signal
 DFT Implementation – Logic, Memory, IO
 DFT Verification – ATPG, MBIST/LBIST BSCAN
 Experience in Industry Standard Protocols

FPGA / Prototyping / Hardware

FPGA Based Design and V&V
 Experienced Team in Safety Critical Design
 Experienced Team in V&V as per DO245 DALs
 Emulation – All Major Emulators
 ASIC Prototyping
 Board Design & Post Silicon

Memory & Analog

Circuit Design & Characterization, Tools & Foundries
 Layout Design
 View Verification, AMS Modeling & Verification
 Memory Compiler Development
 Test Chip Development

ALPHACORE Data Converters

Data Converters				Process Technologies				
MSPS	Bits	Type	Architecture	GF55nm	TSMC 28HPC+	GF 22FDx	TSMC 16FFC	TSMC 12FFC
5,000	6	DAC	Current Steering			✓		
10,000	6	ADC	Flash			✓		
20,000	6	ADC	Flash			✓		
40,000	8	ADC	Flash			✓		
160	16	ADC	Pipeline			✓		
500	12	DAC	Current Steering	✓				
6,000	12	DAC	Current Steering			✓		
12,500	6	ADC	Time-Domain Hybrid ADC			✓		
5,000	11	ADC	Hybrid SAR			✓		
400	14	ADC	Hybrid SAR		✓			
200	14	ADC	Hybrid SAR		✓			
400	12	DAC	Current Steering		✓			
200	14	DAC	Current Steering		✓			
4,000	11	ADC	Hybrid SAR		✓			
8,000	11	ADC	Hybrid SAR		✓	✓		
6,000	11	ADC	Hybrid SAR				✓	✓
6,000	14	DAC	Current Steering				✓	✓

ALPHACORE Analog IP

Analog IP		Process Technologies						
Type	Specs	GF55nm	TSMC 28HPC+	GF 22FDx	TSMC 16FFC	TSMC 12FFC	GF130	TSMC 40 ULPe
PLL: PLL13G	Input Frequency: 40 MHz; Output Frequency: 5.5-13.5 GHz, RMS Jitter: 350fs						✓	
PLL: PLL5G150F	Input Frequency: 100 MHz, 200 MHz; Output Frequency: 5 GHz, RMS Jitter < 150fs			✓				✓
BGR								✓
200 mA Low Dropout Regulator								✓
500 mA Low Dropout Regulator								✓
High-Speed Comparator								✓
Other analog blocks available on request:								
PLLs - please contact QLS for more information								
Temperature Sensor								
Precision Band Gap Reference								
Precision Sample and Hold Amplifier								
Low noise input MUX								
Low-noise Amplifier								
Programmable Gain Amplifier								
Delay Locked Loops								
Pulse Width Modulator								
Samples								
Switches								
Readout Buffer								
Serial Peripheral Interface								

Other capabilities:

- CMOS Image Sensors, Readout ICs, Focal Plane Arrays, Camera Systems, Neuromorphic Imagers
- Power Management ICs for Harsh Environments, DC-DC Converters, Solar Array Interface, LDOs
- Radiation hardened solutions.

EnSilica Mixed Signal ASICS

EnSilica have ASIC and design expertise in the following application areas:

Automotive

H Bridge Solenoid and Motor Controllers
 Advanced Radar processing
 Video & image processing
 V2X security and communication
 Gas, gyro, position, pressure, force sensor interfacing
 Driver monitoring / wellbeing
 Battery cell monitoring
 Driver monitoring systems (DMS)
 ISO 26262

Communications and Radar

Signal processing for satellite and cellular communications systems
 High speed interfaces CSI-2, Ethernet, CPRI, PCIe and JESD204B
 RF & mmWave RF FE development
 Digital beamforming and phases arrays
 Base stations and Remote Radio Heads
 MIMO systems
 Satellite and cellular systems

Industrial

Pressure and flow sensors
 Gas sensors
 Chemical sensors
 Movement and occupancy sensors
 Motor and Solenoid controllers
 Tags and RFIDs
 Inductive speed and position sensors
 Precision timers
 GaN, Laser and LED drivers
 Ultrasonic sensor drivers
 Arm safety architectures
 ISO 13849-1:2015 & IEC 61508-2:2010

Wearables and Healthcare

Vital signs sensor interfacing monitoring:

- Electrocardiography (ECG)
- Photoplethysmography (PPG)
- Impedance pneumography
- SpO2 measurement
- Near infra-red spectroscopy (NIRS)

<ul style="list-style-type: none"> Fluorescent glucose sensing (non-invasive to body tissue) Body temperature sensors
Electrochemical sensor interfacing
Differential capacitive sensors
Hearing aids
Lab-on chip interfaces
Designing and integrating wireless interfaces including NFC/RFID and BLE
Satellite RFICs
Ka band suitable for GEO, LEO
17.2 to 21.2 GHz Rx
27.5 to 30.0 GHz Tx
4 Rx element paths
4 Tx element paths
Ka-band fine gain and phase control
Integrated IQ frequency conversion
Comprehensive and flexible IQ IF/BB path to data converters
Low power operation VDDRF=1.1V
Logic at 1.8V
Support for large arrays
Analog, hybrid & digital beamforming
Small size WLCSP
Digital and DSP
Systems/DSP expertise include
Modem design – BLE/DVB/DAB/WiFi
Remote Radio Heads - DDC/DUC
Advanced MIMO processing and beamforming
Advanced Radar signal processing
Cryptography
Development of efficient data-path designs
Integration of high-speed interfaces
PCIe, USB, MIPI, CSI-2, CPRI, 1/25/10Gb Ethernet, LPDDR/DDR
Processor integration
Cores - Arm, Cadence Tensilica, MIPS
AMBA - AHB/AXI/APB
Advanced Verification
Constrained random SV based verification using UVM and VIPs
Embedding system models in environment using MATLAB/SystemC
FPGA based prototyping / emulation
Post silicon validation
Bit accurate models and GPU acceleration in CUDA
Embedded software
DSP and embedded software development for Arm, TenSilica, GPUs
Linux drivers and BSP
Physical design

FlexLogix eFPGAs

FlexLogix EFLX Provides Fast Flexible Computing

- Mature Solutions
 - Flexible Architecture and Sizing
 - Dynamically Reconfigurable eFPGA in useconds
 - RAD Hardened Capable
- High Density, High Performance and Low Power
 - Area and Utilization Leading Technology
 - Supported on Multiple Popular Processes
 - Optimized Functionality for Low Power
- Software Tool Chain
 - Power Estimator
 - On Chip Debug

EFLX eFPGA Availability			
TSMC	Product	Logic	DSP
40 ULP/EF*/LP*	EFLX 1K w/Power Gating	Silicon Proven	On Demand
28 HPC/HPC+	EFLX 4K	Silicon Proven	Silicon Proven
16 FFC/FFC+	EFLX 4K	Silicon Proven	Silicon Proven
12 FFC/FFC+	EFLX 4K	Silicon Proven	Silicon Proven
N7/N6	EFLX 4K	Available	Available
NS	EFLX 4K	In Planning	In Planning
Global Foundries			
22 FDX	EFLX 4K	In Design**	In Design**
12 LP/LP+	EFLX 4K	Silicon Proven	Silicon Proven
12LP LP	EFLX 4K w/Power Gating	Silicon Proven	Silicon Proven
12LP RHBD	EFLX 4K	Silicon Proven	Silicon Proven
Other			
Sandia 180 RHBD	EFLX 4K	Silicon Proven	
Samsung 14LPP*	EFLX 4K	Available	Available
* Available. Re-timing Required ** Early IP drops available for concurrent design			