

# EBV Karl de Boois Short FPGA update



# EBV Core Franchises

Get Connected with the Best



*"I am your **gateway** to excellent technical support and an extensive technical community"*



Local System FAE

Market specialists

City & Infrastructure: Andrej Orel  
Industrial Scientific & Medical: Karl Lehnhoff  
Automotive & Aerospace: Frank-Steffen Russ  
Light Home & Building: Bernard Vicens

Technology specialists

Analog & Power: Milan Ivkovic  
High-End Processing: Ulrich Schmidt  
RF connectivity: Christian Krieger  
Sensing & Control: Uros Mali  
Software Solutions: David Negroni

EBV Technical support centre

Specialist FAE's

FPGA: Karl de Boois (NL)  
AI: Gianluca Filippini  
High power: Sergio Piovella  
Mid power Harald Reichert  
Motor control + functional safety: Canberk Sezer  
Image Sensing: Per Michael  
RF: Michael Goetz  
Security & RFID: Daniel Bartz  
Linux + Zephyr: Detlev Zundel  
Embedded SW: Thibault Richard  
IoT Cloud: Mike Powell  
Automotive Software + functional safety:  
• Maurizio Carella & Milan Milanovic  
Networking: Marco Accomazzo  
PCI: Alain Fournial

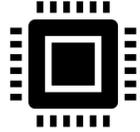
Supplier network (~50)

- Technical Marketing
- Technical specialists

- › Paul Zoetewij
- › System Field Application Engineer (FAE)
  1. Technical gateway to:
    - EBV specialists
    - Suppliers
    - Third parties
  2. Technical Assistance on:
    - System level design
    - Device selection
    - Benchmarks
    - Bom analysis
    - Cross referencing
  3. Technical support:
    - First line technical support
    - On-site support and training

# From Component To Complete System solutions

Technology. Passion. EBV.



## Core Franchises

<b>AMD</b>	AMLI   <b>OSRAM</b>	AVNET Embedded / <b>MSC</b>	<b>BROADCOM</b>	<b>EBV Chips</b>
<b>ESPRESSIF</b>	<b>Infineon</b>	<b>intel</b>	<b>ISSI</b>   LUMINUS	<b>MICROCHIP</b>
<b>Micron</b>	<b>nexperia</b>	<b>NISSHINO</b>	<b>NXP</b>	<b>onsemi</b>
<b>power integrations</b>	<b>RENESAS</b>	<b>SAMSUNG</b>	<b>SGMICRO</b>	<b>SIMCom</b>
<b>ST</b>	<b>TOSHIBA</b>	<b>VISHAY</b>		

Module AVNET EMBEDDED	SBC Mainboard	Embedded System	Panel PC	Rugged Tablet	ODM HMI custom
OSM: solderable	Pico-ITX, 3.5", EPIC, Mini-ITX ...	Rugged, Fanless, low power, wide temp	Industrial, Healthcare, Retail, Signage, HMI	8-12.1" Tablets	Full System, SBC, Carrier, PPC

## Accessories

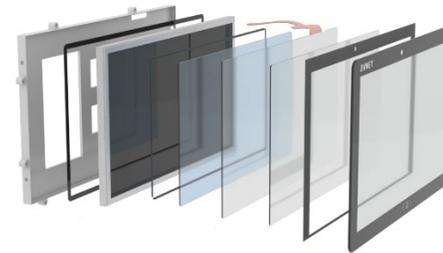


## Memory / Storage / Sensors

## Complementary

<b>ACEINNA</b>	<b>AMO</b> AMOTECH	<b>AzureWave</b>	<b>bridgelux</b>	<b>EVERLIGHT</b>
<b>EVERSPIN</b>	<b>HAILO</b>	<b>IESLab</b> 积成	<b>inventronics</b>	<b>IoTecha</b>
<b>KIOXIA</b>	<b>Laird</b> Smart Technology Division	<b>LEDIL</b>	<b>LUMINUS</b>	<b>muRata</b> MANUFACTURE BY ELECTRONICS
<b>NX</b> NanoXplore	<b>neoway</b>	<b>RFbeam</b> Microwave	<b>SciSense</b>	<b>semitech</b> SEMITECH
<b>SEQUANS</b>	<b>SEMICONDUCTOR</b>	<b>TAOGLAS</b>	<b>Telit</b> Cinterion	<b>WIT</b> WIT

## Display



## Solutions

## Software



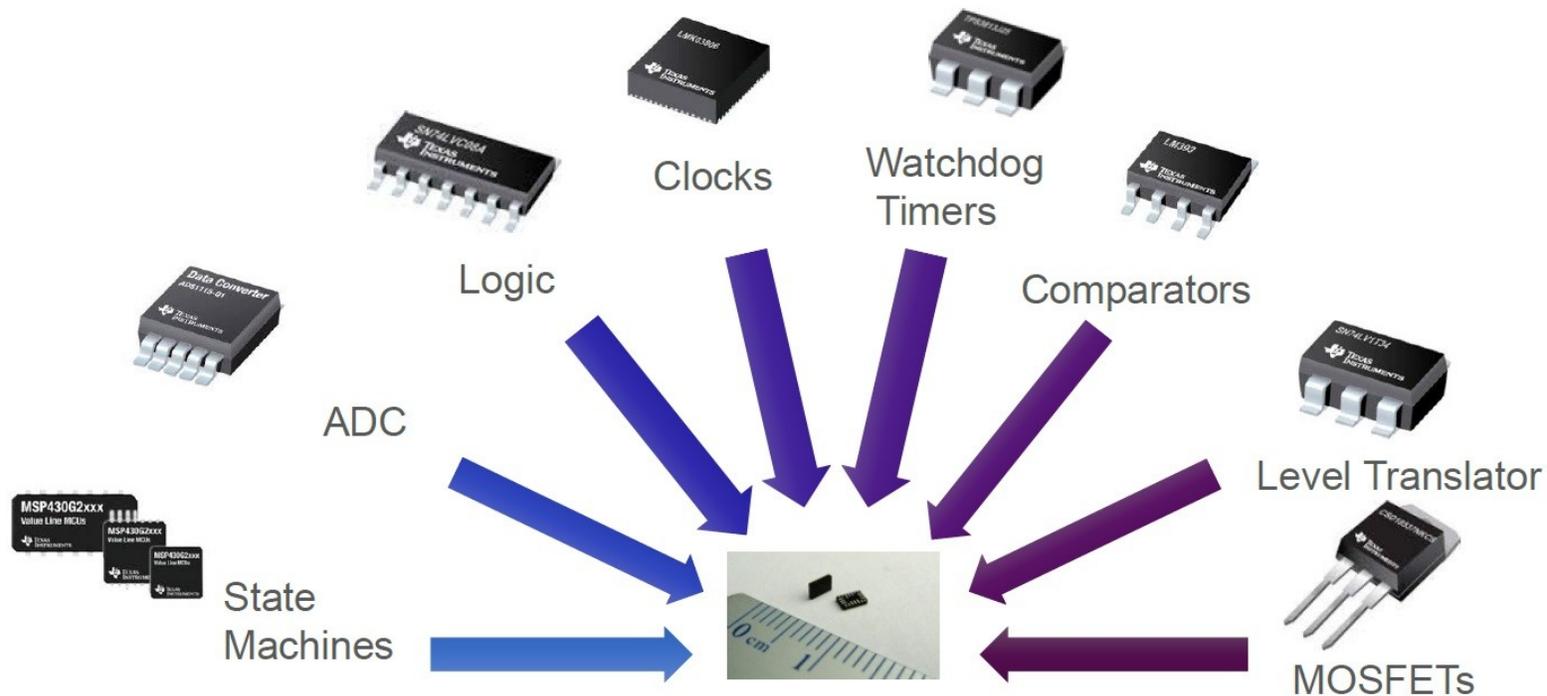
## From BSP, GUI, Apps to Cloud

# Renesas AnalogPAK, GreenPAK and ForgeFPGA

A futuristic digital cityscape with wireframe buildings and glowing lines, set against a dark blue background with a grid pattern. The scene is illuminated with bright blue light rays emanating from the bottom, creating a sense of depth and technology. In the background, there are several glowing spheres and a small satellite or probe orbiting.

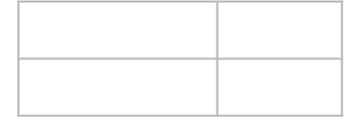
# INTRODUCTION

- GreenPAK is an IC that combines logic, timing and mixed signal functions together into a highly configurable and integrated solution. The majority of base die are OTP but a few MTP options exist. Small sizes and low cost create a compelling solution for customers. Rapid prototyping is common and the only cost is the final sales price to customers (there is no NRE for design creation by our team, there is no hidden programming fee, and custom programmed samples are free as well).



# SLG47001

## ANALOGPAK™ PROGRAMMABLE MIXED-SIGNAL MATRIX WITH ANALOG FEATURES



### Features

- Two ultra-low offset OpAmps
- Two 10-bit digital rheostats
- Multi-channel sampling analog comparator
- 59-byte Pattern generator
- GreenPAK™ configurable logic
- Reliable NVM CRC check

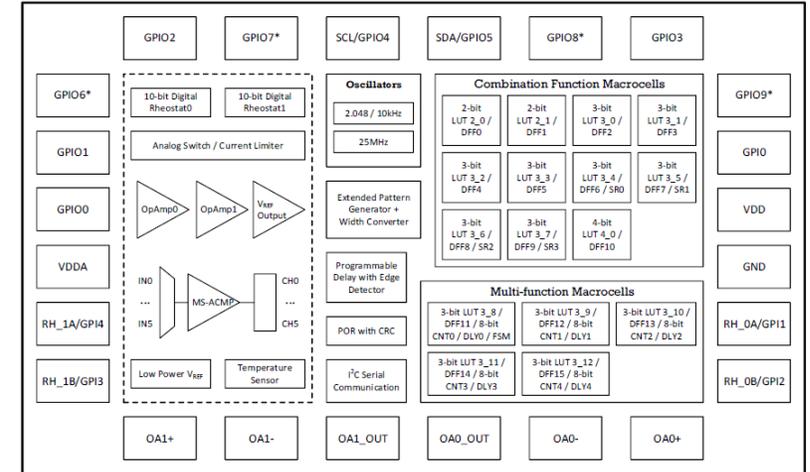
### Benefits

- High precision analog circuitry
- Customizable mixed-signal solution
- Configurable power-saving scenarios
- Compact size - 20-pin STQFN: 2.0 mm x 3.0 mm x 0.55 mm, 0.4 mm pitch

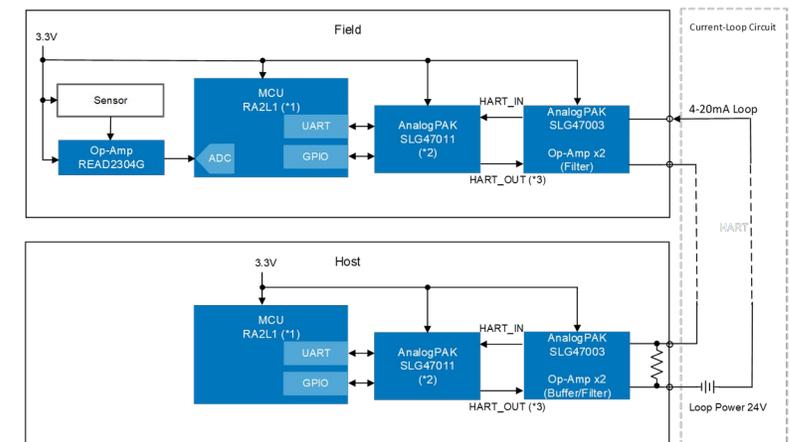
### Typical Applications

- Consumer Electronics
- Handheld and Portable Electronics
- Industrial Automation and Process Control
- Personal Computers and Servers
- Battery Voltage and Current Monitoring
- Adjustable Precision Threshold
- Sensor Offset Trimming/Calibration
- Tunable Analog Filters
- Operational Amplifier Adjustable Gain and Offset
- Adjustable Voltage-to-Current Conversions
- Smartphones and Fitness Bands
- Notebook and Tablet PC

### Block Diagram



### Example Application





# FORGEFPGA INTRODUCTION

## GOING BEYOND GREENPAK

Renesas has had **HUGE** success selling GreenPAK



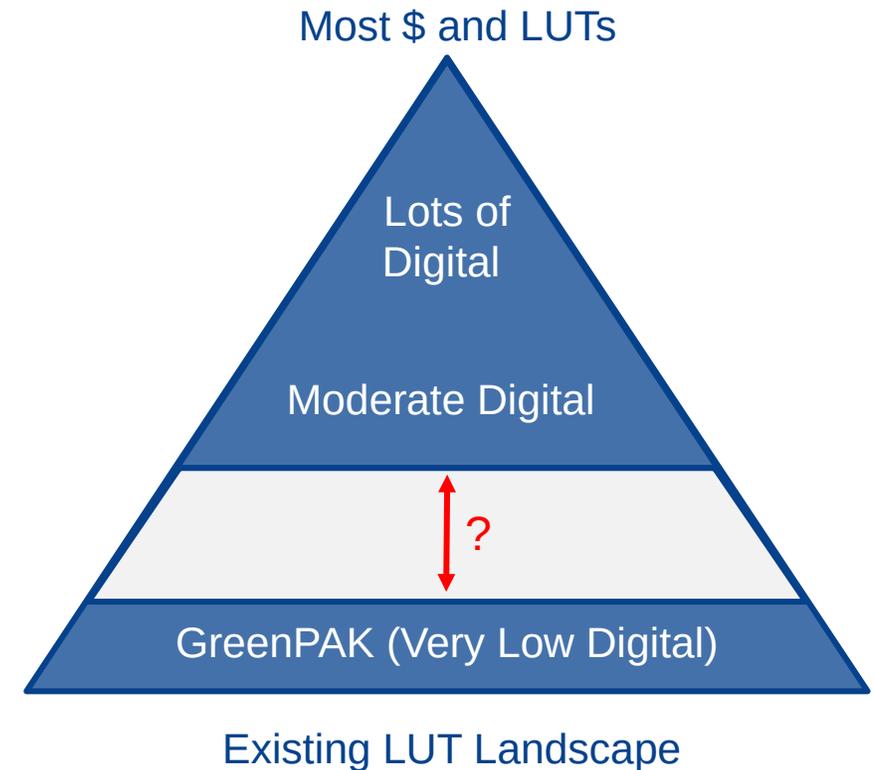
“This part is great, but I also want...”

...more low-power data buffering ...

... A different (or custom) interface...

... digital processing my sensors...

...and keep it cheap!”



- ✓ We will support customers with logic resources above existing GreenPAK.
- ✓ A small, cheap FPGA fills the digital resource gap between GreenPAK and larger, more expensive solutions.



# WHY IS SLG47910 REVOLUTIONARY

## 1k Digital Logic Core

- 1120 5-bit LUT equivalents
- 1120 DFFs
- 5kb distributed memory
- 32kb EBRAM
- OTP Non-Volatile Memory

Advanced 6-input,  
2 output LUTs

High Integration,  
Mem, OSC, PLL

## Power Supply

- VDDIO: 1.71V to 2.75V (Pending Increase)
- VDDCore: 1.1V (+-10%)
- Power Gating Structure & Data Retention

Lowest Standby  
Power

## High-Freq 50MHz Oscillator

## Phase-Locked Loop (PLL)

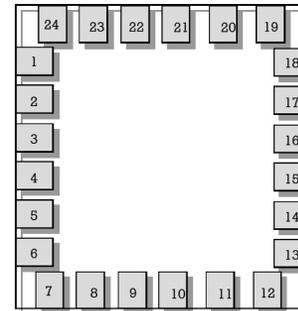
- Input from OSC or external source

Beats Competition

Less than \$0.50 in high volume

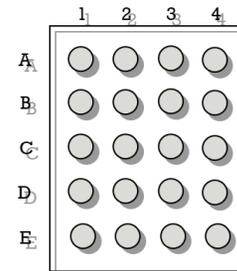
## Package Options

### SLG47910V



24-pin MSTQFN 0.4P  
3.0mm x 3.0mm

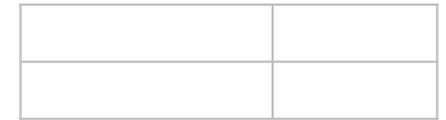
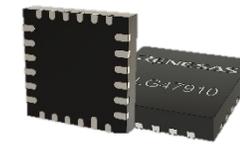
### SLG47910C



20-pin WLCSP 0.35P  
1.85mm x 1.6mm

# SLG47910V

## FORGEFPGA\_LOW DENSITY FPGA SOLUTIONS FROM RENESAS



### Features

- Dense Array of Configurable Logic
  - 1120 5-bit LUT equivalents
  - 1120 DFFs
  - 5 kb distributed memory
  - 32 kb BRAM
  - Configurable through NVM and/or SPI interface
- 50 MHz On-chip Oscillator
- Phase-Locked Loop (PLL)
  - Input from external source or internal
- Power Supply: VDDIO (1.71V to 2.75V pending increase) and VDDC (1.1V ±5%)
- Power-On-Reset (POR)
- GPIO Count: 19 GPIOs in the QFN Packaging
- Operating Temperature Range: -40 °C to 85 °C
- RoHS Compliant/Halogen-Free
- Package: 24-pin QFN: 3.0 mm x 3.0 mm, 0.4 mm pitch

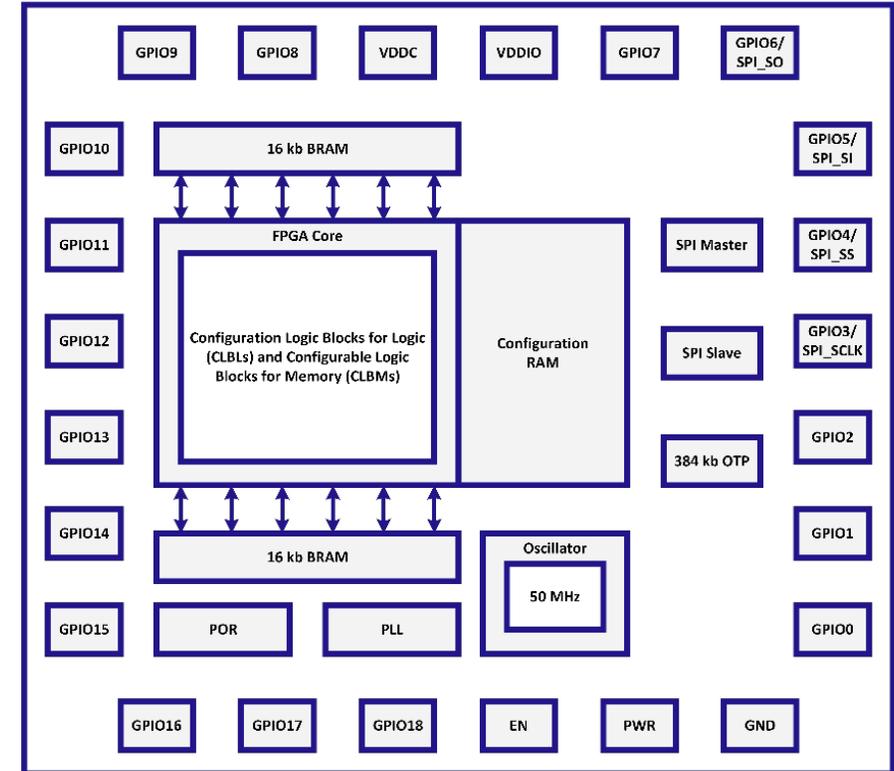
### Benefits

- BRAM Retention: store data during PWR reset function
- Lowest Standby Power
- Full-featured FPGA at an extremely competitive price point
- Device can be programmed through easy-to-use free [Go Configure Software Hub](#)

### Typical Applications

- Low power and low cost allow for use in a wide range of applications previously closed to FPGAs
- [UART to 7-Segment Display](#)
- [Four-Channel Breathing Example](#)
- [Frequency Meter](#)
- [7-Segment Display using PmodSSD](#)

### Block Diagram





# FORGEFPGA SOLVES TYPICAL LOW-DENSITY FPGA BARRIERS

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## Why Renesas ForgeFPGA?



### Competitive Pricing

- **The best value low-density FPGA:** Perfect for high-volume, cost-conscious developers to engage with the low-density FPGA space.



### Low Power Consumption:

- **Exceptional efficiency:** With a sleep current of just 14uA, significantly lower than competitors makes it ideal for wearable and battery-operated electronics.

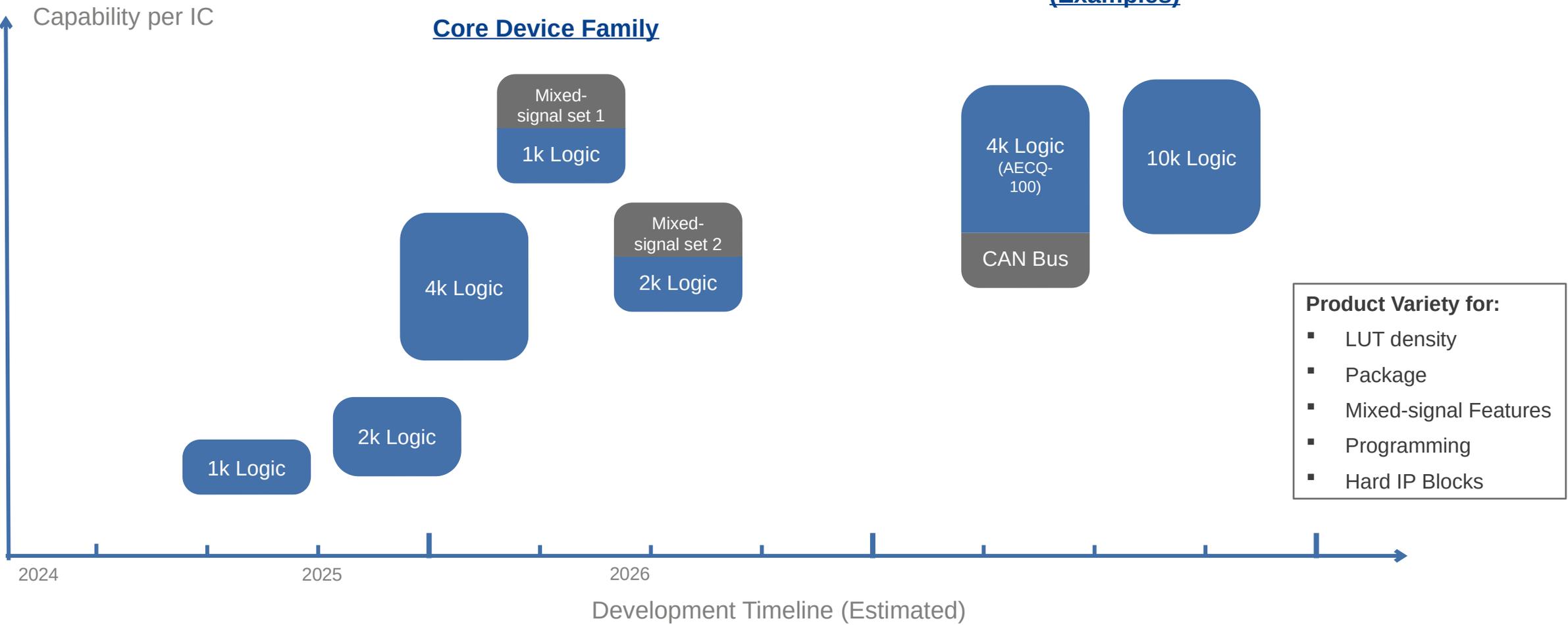


### Customer-Centric Design:

- ForgeFPGA address key customer requirements, enhancing its appeal in the low-density FPGA market.
- **Free design software:** Completely free to download and completely free of any licensing restrictions.

# DEVELOPMENT ROADMAP

Projected Customer Sampling Release Schedule



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**TECHNOLOGY.**

**PASSION.**

**EBV.**

