



Electronics for the Future

LogiCoA

# ROHM Offers LogiCoA™: Industry's First\* Analog-Digital Fusion Control Power Supply Solution

Provides functions equivalent to  
a fully digital control power supply  
with low power consumption

July 10, 2024

ROHM Co., Ltd.

Marketing Communications Dept.

\*ROHM July 10, 2024 study

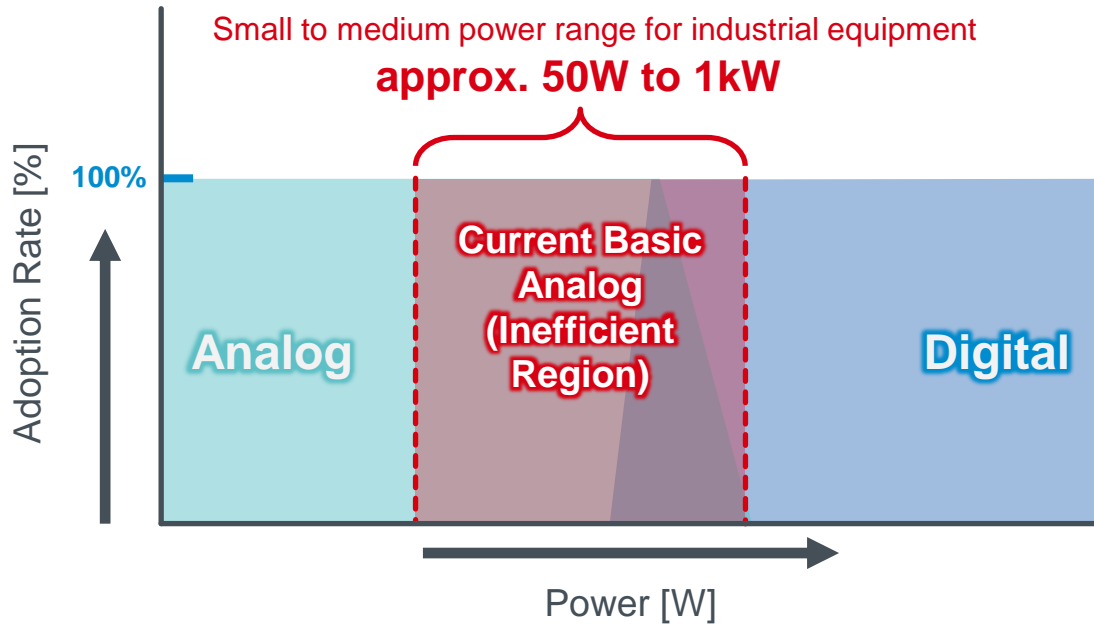
\* LogiCoA™ is a trademark or registered trademark of ROHM Co., Ltd.

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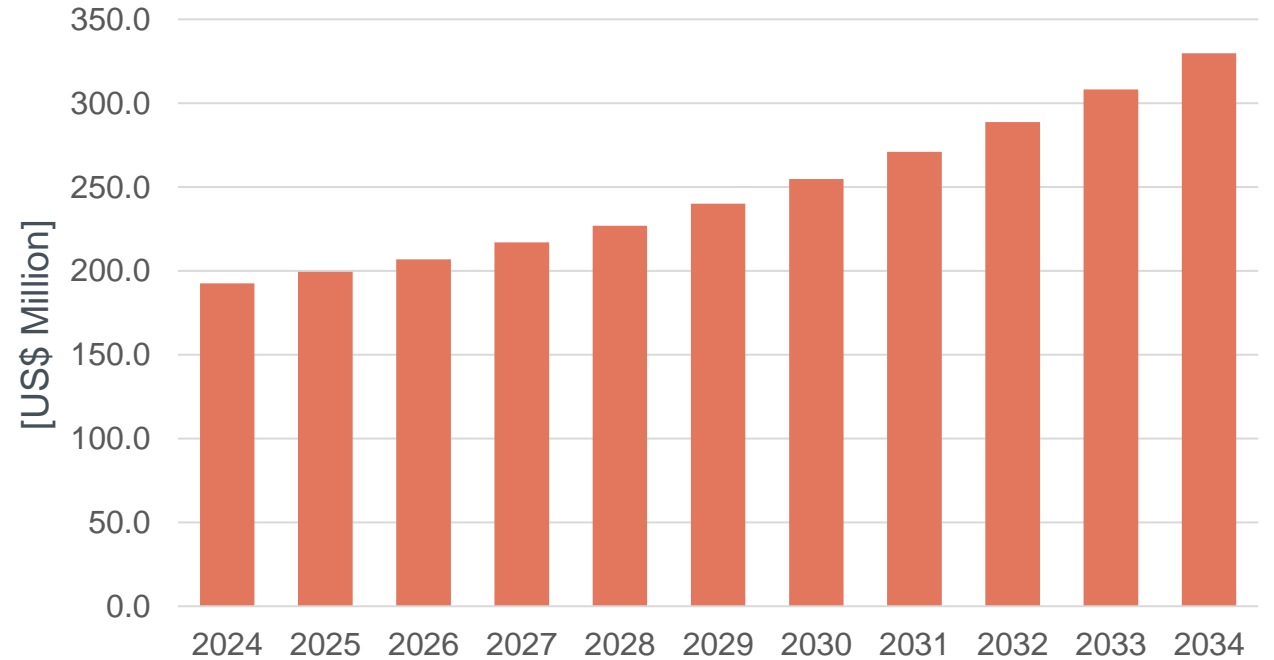


Power systems used in industrial equipment are primarily analog-controlled in the small to medium power range of approx. 50W to 1kW, while digital control is mainstream in the high power region

Differentiation of Power Supply Control Methods Based on Power Range



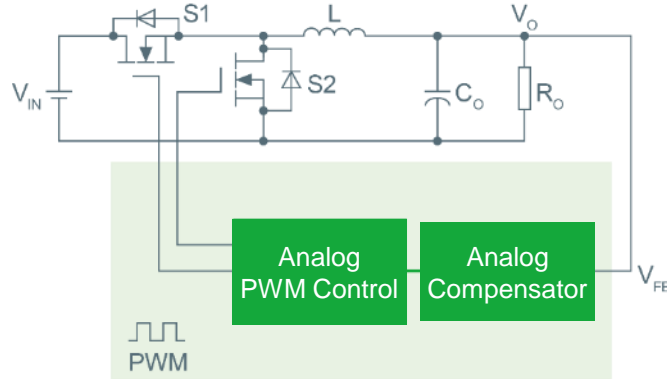
Market Size for Small to Medium Power Industrial Equipment (approx. 50W to 1kW)



Introducing new power supply solutions in the small to medium power range is expected to see significant demand in the future by bringing great benefits to users

## Analog Control

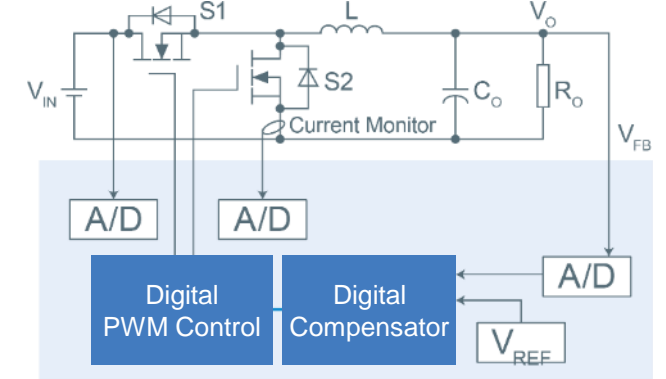
### Analog Controller



Parameter	Analog Control	
Cost	Excellent	No need for CPU, need design margins
Power Consumption	Excellent	Low ( $I_{cc}=3\text{mA}$ to $5\text{mA}$ )
Functions	Negative	Low functionality (no complex functions)

## Fully Digital Control

### High-Speed High-Power High-Cost CPU



Parameter	Digital Control	
Cost	Neutral	High-speed CPU/DSP (high cost), no need for design margins
Power Consumption	Negative	High ( $I_{cc}=100\text{mA}$ to $150\text{mA}$ )
Functions	Excellent	Calibration, logging, etc.

Above Issues

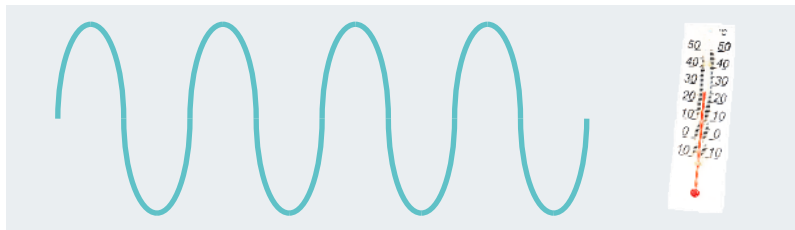
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**Low cost + Low power + High functionality**

Achieved with **LogiCoA**

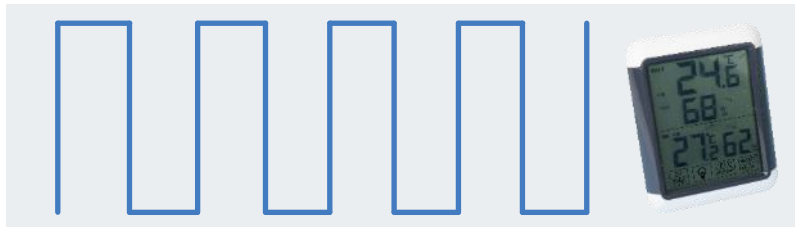
## Analog

Analog refers to **data represented as a continuously varying quantity**. Basically, anything that changes smoothly and continuously without being divided into distinct parts can be considered analog.

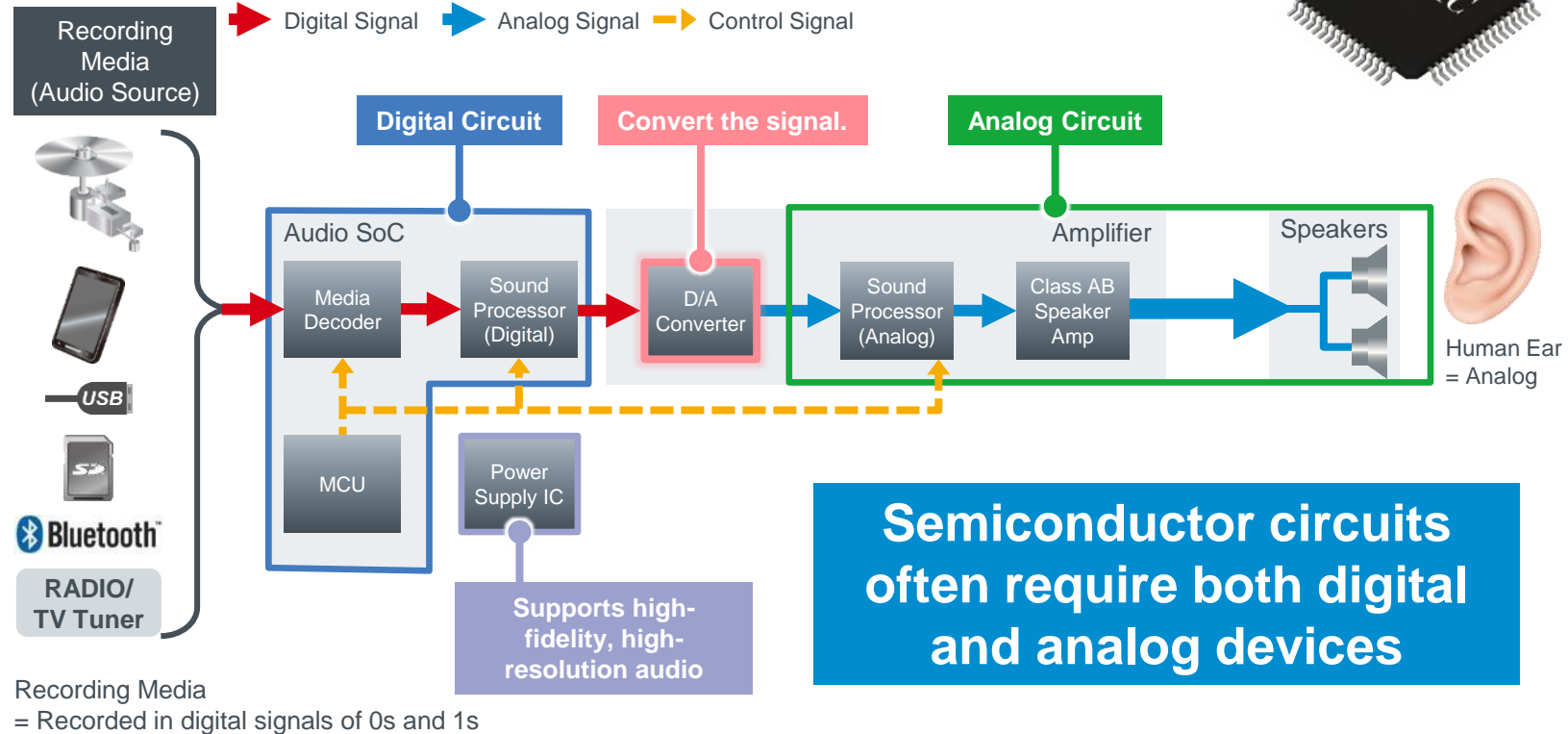


## Digital

Digital refers to **representing continuous quantities by breaking them into discrete steps and expressing them as numbers**. Anything that uses scales or indicators to represent numerical values can be called digital. (Using combinations of 0s and 1s)



## Audio Application Example



**Semiconductor circuits often require both digital and analog devices**

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# ROHM LogiCoA™ Power Supply Solution Overview



LogiCoA™ is a trademark or registered trademark of ROHM Co., Ltd.

A new power solution that achieves exceptional functionality with low cost and low power consumption, LogiCoA™ power supply combines 3 elements: power supply topology, power control OS, and LogiCoA™ MCU

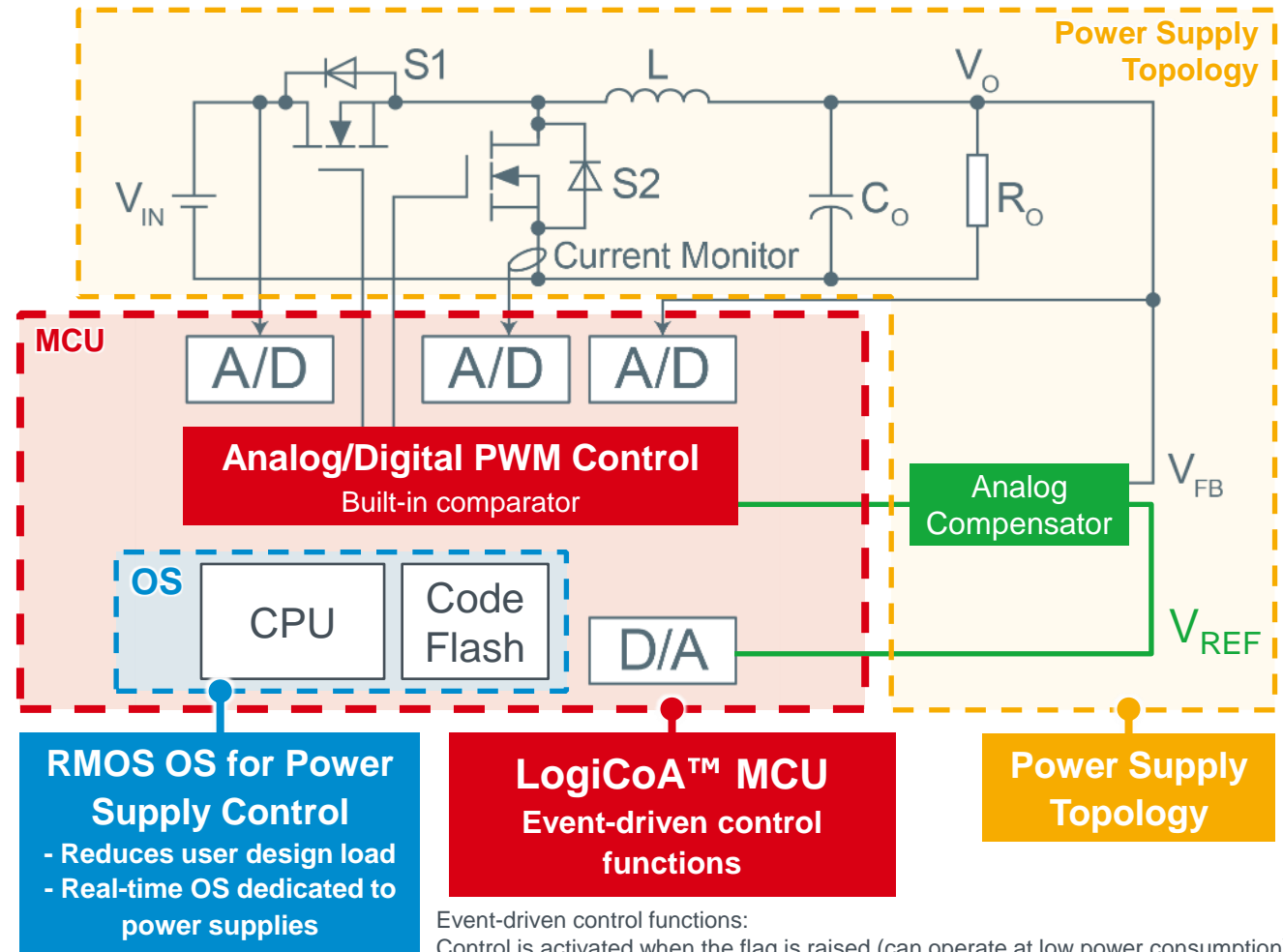
The brand that forms the basis of this solution



LogiCoA™ is a brand that embodies a design philosophy of fusing digital elements to maximize the performance of analog circuits. Combining the advantages of analog and digital contributes to more efficient power utilization.

\*LogiCoA™ (logo created and trademark registered)  
Proposed by ROHM (RMOS: Real-time Micro Operating System)

Click here for more information  
<https://www.rohm.com/reference-designs/ref66009>



Provides new value for small to medium power supply systems that could not be achieved with conventional analog or digital control

## High Efficiency

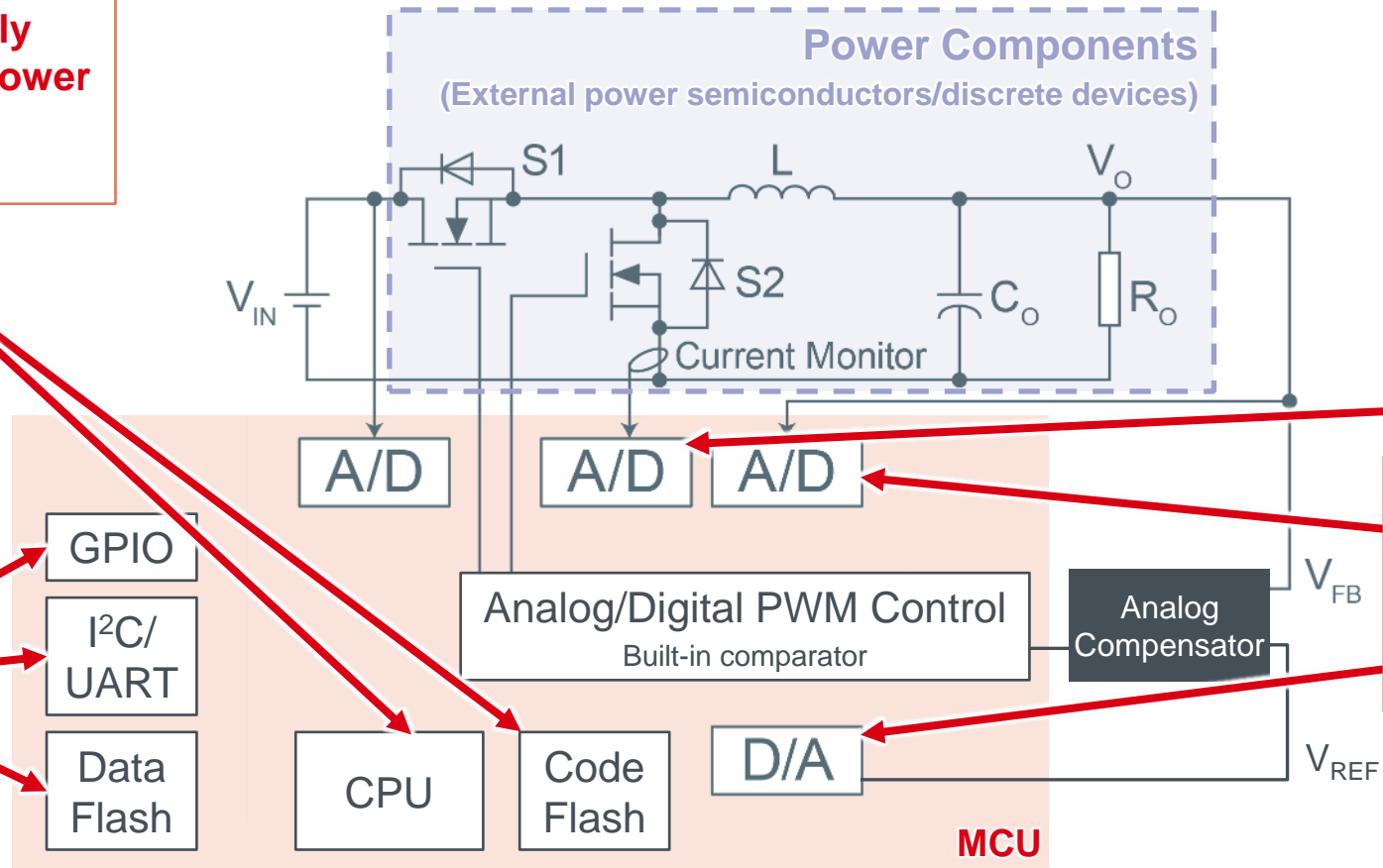
The LogiCoA™ MCU monitors operating conditions, **constantly optimizing the operation of power semiconductors to improve efficiency**

## Low Consumption

**Low power consumption** is achieved by coordinating operation between the LogiCoA™ MCU and power control OS

## High Functionality

Controlling the additional functions and interfaces with the MCU adds new value not possible with analog control



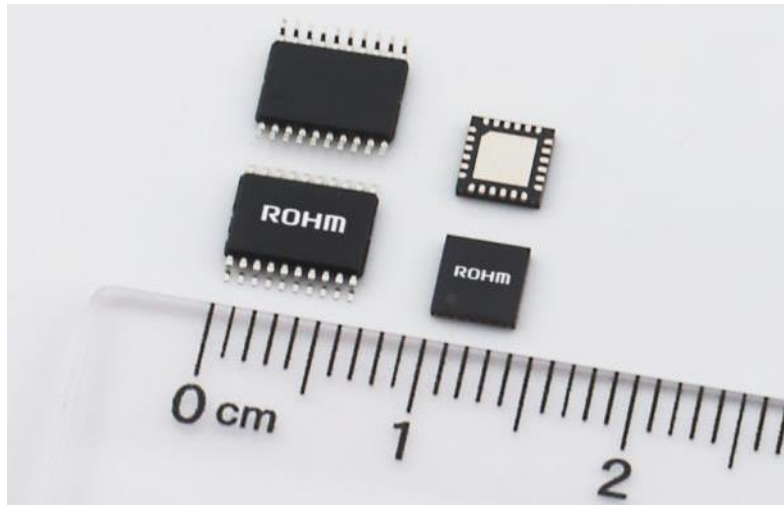
## Low Cost

A calibration function corrects for variations, **reducing the size and cost of external power components**

## LogiCoA™ MCU Specifications (Tentative)

Part No.]	Operating Voltage	Temperature	Timers	Comparators	A/D Converter	D/A Converter	Programmable Gain Amplifier	CPU	Memory			Package
									Code Flash	Data Flash	RAM	
☆ ML62Q2033	4.5V to 5.5V	Ta = -40°C to +105°C (Tj=+115°C) (Absolute Max. Rating: Tj Max.= +125°C)	16bit timer with PWM/Capture × 6 channels, 10 outputs Max. 64MHz operation (Resolution: 15.625ns)	3ch (Asynchronous clock operation) Response time: Typ. 100ns	12bit SA-ADC: 5ch	8bit, 2ch	1ch, Gain setting: 4 Levels (×4/×8/×16/×32)	16bit RISC CPU Core (U16), Max. 16MHz operation	16KB	4KB (Erasable unit: 128B)	2KB	TSSOP20
☆ ML62Q2035									32KB			
☆ ML62Q2043			16KB						WQFN24			
☆ ML62Q2045			32KB									

☆ Under Development



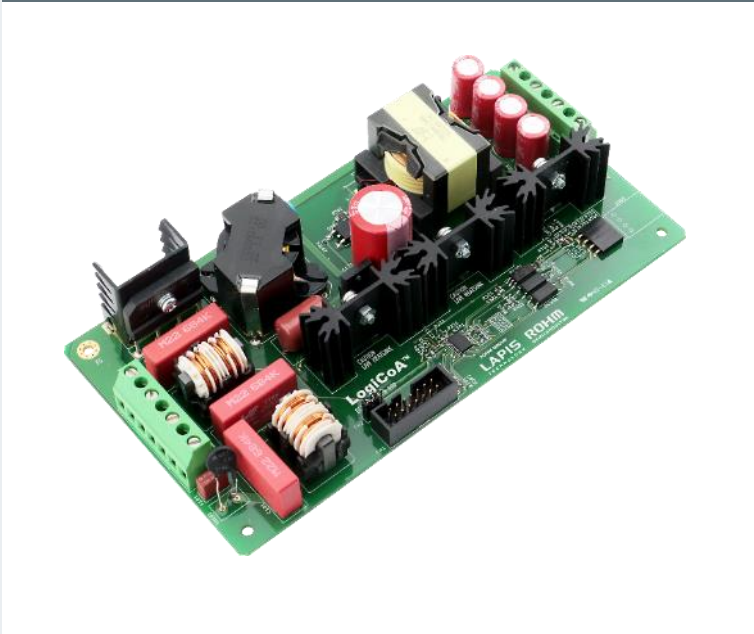
**LogiCoA™ MCU samples optimized for LogiCoA™ power solutions are available now**

## Reference design boards will be offered for a variety of power supply topologies

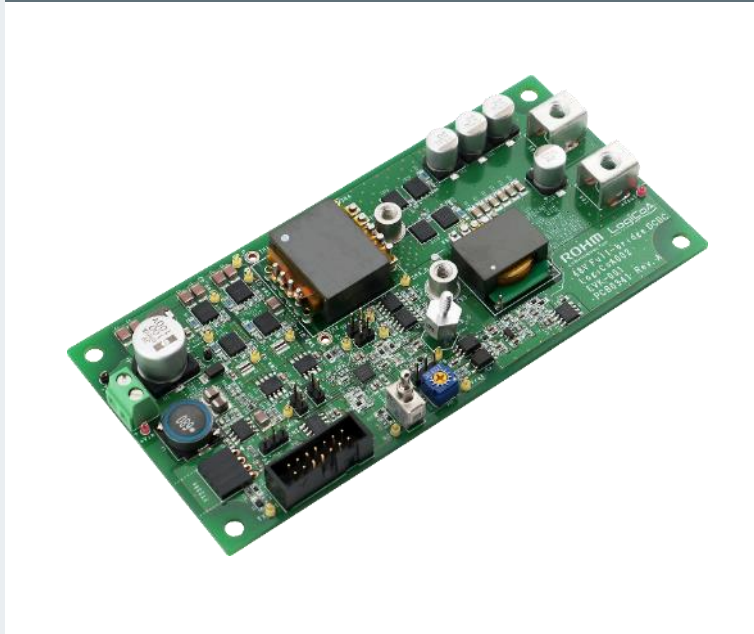
**Buck Converter**  
April 2024 (Announced here)



**PFC + Flyback**  
(Preparation scheduled for the 2nd quarter of FY2024)



**Full-Bridge**  
(Preparation scheduled for the 3rd quarter of FY2024)



**“Analog-digital fusion control” can be achieved for different power supply topologies**





Electronics for the Future

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