

## AFCI Solution

# Smart Edge AI Sensing for Arc Fault Detection (AFCI)



### Solution Summary

Future Electronics introduces an Edge AI Arc Fault Detection system using **Renesas RA6M4** MCU, for fast, efficient detection. Ideal for solar, smart energy, and DC systems, it delivers real-time safety monitoring with minimal resources.

AFCI solution is using FDC AI Plus solution a combination of FDC AI and Reality-AI solution.

### Features/Benefits

- **AI-Based Time Series Recognition powered by Renesas Reality-AI**

Detects:

- Arc faults (small & large arc)
- Open & closed circuits
- Tampering & abnormal current profiles

- **Ultra Fast Detection**

Inference time as low as 10–250ms, including pre-processing and multi-window verification.

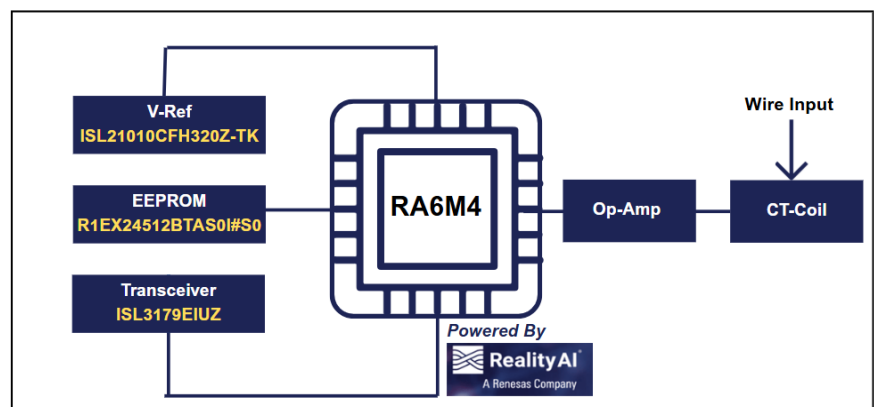
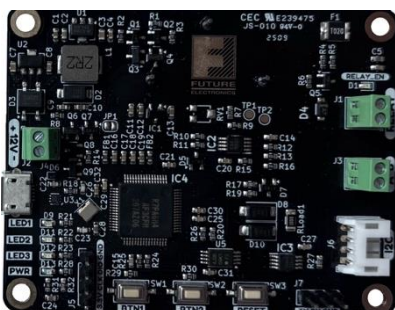
- **One Button Learn**

On board button helps auto-calibrate board to customer's design environment.

Able to use calibrated data to replicate to other boards.

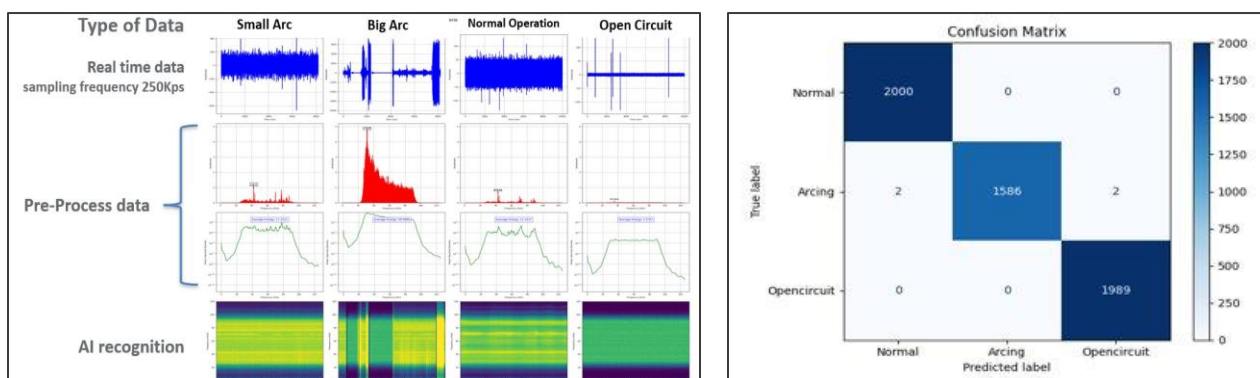
Remove needs for On-Cloud AI/ML training

### Diagrams/Graphics



### Target Markets and Applications

- Solar Inverters
- Circuit Breaker
- DC Charging



**Arcing Detection Accuracy: 99.74%**

Characteristics	AI Sensing	Traditional Method
Arc Detection Accuracy	>90%	80%-90%
Small Arc Detection	Yes	No
Customizable*	Yes	No

*\*Solution is a prototype, customizable to customer's use case*

## About Future

Founded in 1968, Future Electronics is powered by a comprehensive global network of engineers, technical specialists, and Future Design Centers (FDCs), delivering design and technical support to customers worldwide.

Our FDCs are strategically located across the Americas and the Asia-Pacific region—including three major hubs in APAC—and are staffed by over 340 Field Application Engineers (FAEs) and more than 80 technology and product specialists.

FDC is dedicated to accelerating innovation, enabling new product introductions (NPIs), and supporting advanced application development in emerging and high-growth market segments.

As part of our customer-centric support model, Future Design Centers provide centralized technical assistance and turnkey design services. FDCs also design and promote innovative reference platforms based on the latest supplier technologies—tailored to real-world market demands. Acting as trusted third-party design partners, our FDCs offer comprehensive hardware and software engineering services, serving as an extension of our customers' engineering teams to help streamline development processes and shorten time-to-market.