

# WG Tech Solutions

## IMAGE CLASSIFICATION APPLICATION

### Overview

The Image Classification Model is a commercial-ready Edge AI solution designed for real-time image recognition on the PSoC™ Edge E84 Evaluation Kit. Leveraging the kit's integrated Neural Processing Unit (NPU) and advanced security features, this model delivers high-performance, low-power, and secure image classification directly on embedded devices. It empowers consumer electronics manufacturers to integrate intelligent and secure image recognition capabilities, enhancing product functionality and trustworthiness in a competitive market. This solution is ideal for applications requiring on-device processing of visual data, ensuring privacy, efficiency, and responsiveness.

### Key Features

- **Unified Inference Engine:** Optimized for low-power operation on the PSoC™ Edge E84, enabling efficient processing of image classification tasks.
- **NPU Integration:** Utilizes the integrated Neural Processing Unit for accelerated image classification, supporting real-time performance.
- **Real-Time Processing:** Enables rapid image recognition for dynamic, edge-based applications, ensuring quick decision-making.
- **Low-Power Design:** Tailored for energy-efficient performance, making it ideal for battery-powered devices and extended operational lifetimes.
- **Pre-trained Model:** Ready-to-use, reducing development time and effort for integrating advanced AI capabilities.
- **Security-Enhanced:** Leverages the PSoC™ Edge E84's advanced security features, including PSA Level 4 certification, to ensure secure operation in sensitive environments.
- **Advanced Graphics Support:** Benefits from the PSoC™ Edge E84's low-power 2.5D GPU and MIPI DSI/DBI display controllers for enhanced visual processing and output.

### Benefits

- **Simplified Development:** Pre-trained and fully tested, reducing time-to-market for integrating advanced AI capabilities into products.
- **Enhanced User Experience:** Delivers seamless and responsive image recognition for a wide range of consumer and industrial applications.

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- **Future-Proof Solution:** Machine learning-based model ensures adaptability to evolving market demands and new use cases.
- **Cost Efficiency:** Provides a ready-to-deploy solution for edge AI tasks, minimizing development costs and resource requirements.
- **Reduced Latency:** Real-time processing on the edge eliminates delays associated with cloud-based solutions, enabling faster responses.
- **Enhanced Privacy:** Local data processing ensures that sensitive visual data remains on the device, protecting user privacy.
- **Secure Operation:** Leverages the PSoC™ Edge E84's robust security features, including hardware-based encryption and PSA Level 4 certification, for trusted deployment.

## Use Cases

- **Smart Home Devices:** Enables facial recognition for secure access control and object recognition for automated home automation systems.
- **Wearable Technology:** Supports gesture recognition for hands-free operation and environmental object detection for context-aware features.
- **Consumer Electronics:** Facilitates scene detection in cameras, content recommendation in smart TVs based on viewer presence, and intelligent visual processing in drones and robotic devices.
- **Industrial IoT:** Supports defect detection in manufacturing, equipment condition monitoring, and visual quality control in low-power, edge-based applications.
- **Security Systems:** Enables real-time object and face recognition for surveillance cameras and access control systems.
- **Retail Applications:** Enhances shelf monitoring and inventory management through real-time image classification of products.

## Specification and Compatibility

### Supported Devices

- Infineon PSoC™ Edge E84

### Model Size

- 1MB – (may vary if additional face / object detection features are implemented)

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