



## Himax Launches WiseEye WE-I Plus HX6537-A to Support AI Deep Learning with Google's TensorFlow Lite for Microcontrollers

**TAINAN, Taiwan – June 30, 2020** – Himax Technologies, Inc. (Nasdaq: HIMX) (“Himax” or “Company”), a leading supplier and fabless manufacturer of display drivers and other semiconductor products, today announced the launch of WiseEye WE-I Plus HX6537-A solution that supports Google’s TensorFlow Lite for Microcontrollers. In this collaboration, Himax is providing the HX6537-A processor with NN (neural network) based SDK (Software Development Kit) for developers to generate deep learning inferences running on TensorFlow Lite for Microcontrollers kernel to boost overall system AI performance.

The Himax WiseEye solution is composed of the Himax HX6537-A processor and Himax AoS sensor. With support to TensorFlow Lite for Microcontrollers, developers are able to take advantage of the WE-I Plus platform as well as the integrated ecosystem from TensorFlow Lite for Microcontrollers to develop their NN based edge AI applications targeted for Notebook, TV, Home Appliance, Battery Camera and IP Surveillance edge computing markets. The benefits of the Himax HX6537-A processor are driven by three unique features.

### **Ultra low power and high-performance AI processor**

The HX6537-A processor adopts a programmable DSP that runs at 400MHz with power-efficient and multi-level power schemes that incorporate CDM, HOG and JPEG hardware accelerators for real-time motion detection, object detection and image processing. The processor remains in low power mode until a movement/object is identified by accelerators. Afterwards, DSP coped with the running NN inference on TensorFlow Lite for Microcontrollers kernel will be able to perform the needed CV operation to send out the metadata results over TLS (Transport Level Security) protocol to main SOC and/or cloud service for application level operation. The average power consumption for Google Person Detection example inference could be under 5mW.

### **Support Google TensorFlow Lite for Microcontrollers**

As a result of Himax support to TensorFlow Lite for Microcontrollers, it is now possible to leverage the TensorFlow ecosystem to train and deploy TensorFlow models onto Himax's ultra low power hardware. For software development, Himax has ported WE-I Plus SDK.AI with optimized Machine Learning Inference (MLI) library dedicated to TensorFlow Lite for Microcontrollers. The MLI software library could bolster inference running on TensorFlow Lite for Microcontrollers MLI kernel 5 times faster than the reference kernel. This will enable developers to get the benefit of performance and comprehensive NN based machine learning models and kernel of TensorFlow Lite for Microcontrollers to easily deploy their video and voice-oriented AI applications.

### **Comprehensive WiseEye Computer Vision solution with Himax AoS Sensor**

To address overall system low power needs, HX6537-A provides a proprietary sensor interface that works with Himax’s ultra low power AoS (Always On Sensor) sensor solutions to support up to VGA@60fps image input and fast wake-up for speedy sensor image capture. Additionally, average Himax AoS sensor power consumption can be less than 1mW.

“Himax WE-I Plus, coupled with Himax AoS image sensors, broadens TensorFlow Lite ecosystem offering and provides developers with possibilities of high performance and ultra low power,” said Pete Warden, Technical Lead of TensorFlow Lite for Microcontrollers at Google.

“Himax continues to demonstrate its expertise in developing innovative technologies that enable the company to partner with leaders such as Google in the AIoT industry. The unique design of HX6537-A by Himax provides a state-of-the-art CNN based deep learning SDK.AI with TensorFlow Lite for Microcontrollers which will enable developers and customers

to accelerate the development of CV applications to drive ultra low power system goals for edge AI applications,” said Jordan Wu, President and Chief Executive Officer of Himax Technologies.

Himax showcase the WiseEye WE-I Plus empower AI deep learning example on TensorFlow Lite for Microcontrollers GitHub on June 17, 2020. Reference Link of TensorFlow Lite for Microcontrollers GitHub:

[https://github.com/tensorflow/tensorflow/blob/master/tensorflow/lite/micro/examples/person\\_detection\\_experimental/README.md](https://github.com/tensorflow/tensorflow/blob/master/tensorflow/lite/micro/examples/person_detection_experimental/README.md)

### **About Himax Technologies, Inc.**

Himax Technologies, Inc. (NASDAQ: HIMX) is a fabless semiconductor solution provider dedicated to display imaging processing technologies. Himax is a worldwide market leader in display driver ICs and timing controllers used in TVs, laptops, monitors, mobile phones, tablets, digital cameras, car navigation, virtual reality (VR) devices and many other consumer electronics devices. Additionally, Himax designs and provides controllers for touch sensor displays, in-cell Touch and Display Driver Integration (TDDI) single-chip solutions, LED driver ICs, power management ICs, scaler products for monitors and projectors, tailor-made video processing IC solutions, silicon IPs and LCOS micro-displays for augmented reality (AR) devices and heads-up displays (HUD) for automotive. The Company also offers digital camera solutions, including CMOS image sensors and wafer level optics for AR devices, 3D sensing and machine vision, which are used in a wide variety of applications such as mobile phone, tablet, laptop, TV, PC camera, automobile, security, medical devices, home appliance and Internet of Things. Founded in 2001 and headquartered in Tainan, Taiwan, Himax currently employs around 2,000 people from three Taiwan-based offices in Tainan, Hsinchu and Taipei and country offices in China, Korea, Japan, Israel, and the US. Himax has 2,919 patents granted and 581 patents pending approval worldwide as of March 31<sup>st</sup>, 2020. Himax has retained its position as the leading display imaging processing semiconductor solution provider to consumer electronics brands worldwide.

<http://www.himax.com.tw>

### **Forward Looking Statements**

Factors that could cause actual events or results to differ materially include, but not limited to, general business and economic conditions and the state of the semiconductor industry; market acceptance and competitiveness of the driver and non-driver products developed by the Company; demand for end-use applications products; reliance on a small group of principal customers; the uncertainty of continued success in technological innovations; our ability to develop and protect our intellectual property; pricing pressures including declines in average selling prices; changes in customer order patterns; changes in estimated full-year effective tax rate; shortages in supply of key components; changes in environmental laws and regulations; exchange rate fluctuations; regulatory approvals for further investments in our subsidiaries; our ability to collect accounts receivable and manage inventory and other risks described from time to time in the Company's SEC filings, including those risks identified in the section entitled "Risk Factors" in its Form 20-F for the year ended December 31, 2019 filed with the SEC, as may be amended.

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