WHAT ARE PROCESSORS?

Processors are the brains of any computing device, from laptops and smartphones to smartwatches and smart speakers. They perform calculations, execute instructions, and manage data.

But how do they enable and integrate with other emerging technologies such as the Internet of Things (IoT), virtual reality (VR), and augmented reality (AR).

1 IoT and processors

IoT refers to the network of physical objects embedded with sensors, software, and connectivity that can communicate and exchange data with each other and the cloud. IoT devices can range from smart home appliances and wearables to industrial machines and vehicles. Processors play a key role in enabling IoT by providing computing power, memory, and security for the devices. Depending on the application, IoT processors can vary in size, speed, and energy efficiency. For example, a processor for a smart thermostat may be smaller, slower, and more power-efficient than a processor for a smart car.

2 VR and processors

VR refers to the technology that creates immersive and interactive simulations of real or imagined environments using headsets, controllers, and sensors. VR can be used for entertainment, education, training, and therapy. Processors play a key role in enabling VR by rendering high-quality graphics, audio, and physics for the simulations. Depending on the complexity and realism of the simulation, VR processors can require high performance, low latency, and thermal management. For example, a processor for a VR game may need to deliver fast frame rates, smooth motion, and realistic effects.

3 AR and processors

AR refers to the technology that overlays digital information and objects onto the real world using cameras, screens, and glasses. AR can be used for navigation, gaming, shopping, and work. Processors play a key role in enabling AR by processing visual, audio, and spatial data for the overlays. Depending on the

functionality and accuracy of the overlay, AR processors can require high resolution, low power consumption, and artificial intelligence. For example, a processor for an AR app may need to recognize objects, track movements, and generate content.

4 Processor challenges

As emerging technologies such as IoT, VR, and AR become more widespread and sophisticated, processors are facing several challenges. These include scaling up performance and functionality without sacrificing energy efficiency or cost, balancing computing power between edge devices and the cloud, enhancing security and privacy of data and devices, supporting interoperability and compatibility of different platforms and standards, as well as innovating new architectures and designs to overcome physical and technical limitations.

5 Processor opportunities

Processors have numerous opportunities to advance and improve emerging technologies such as IoT, VR, and AR. For example, they can leverage new materials and technologies like nanotechnology, quantum computing, and neuromorphic computing to increase speed, capacity, and functionality. Additionally, artificial intelligence and machine learning can be integrated to create smarter and more adaptive devices and applications. Moreover, specialized processors can be developed for domains like health, education, and entertainment. Furthermore, collaboration between stakeholders like developers, manufacturers, and users can lead to the creation of standards and best practices. Finally, exploring new possibilities of emerging technologies can help enhance human experiences and capabilities.