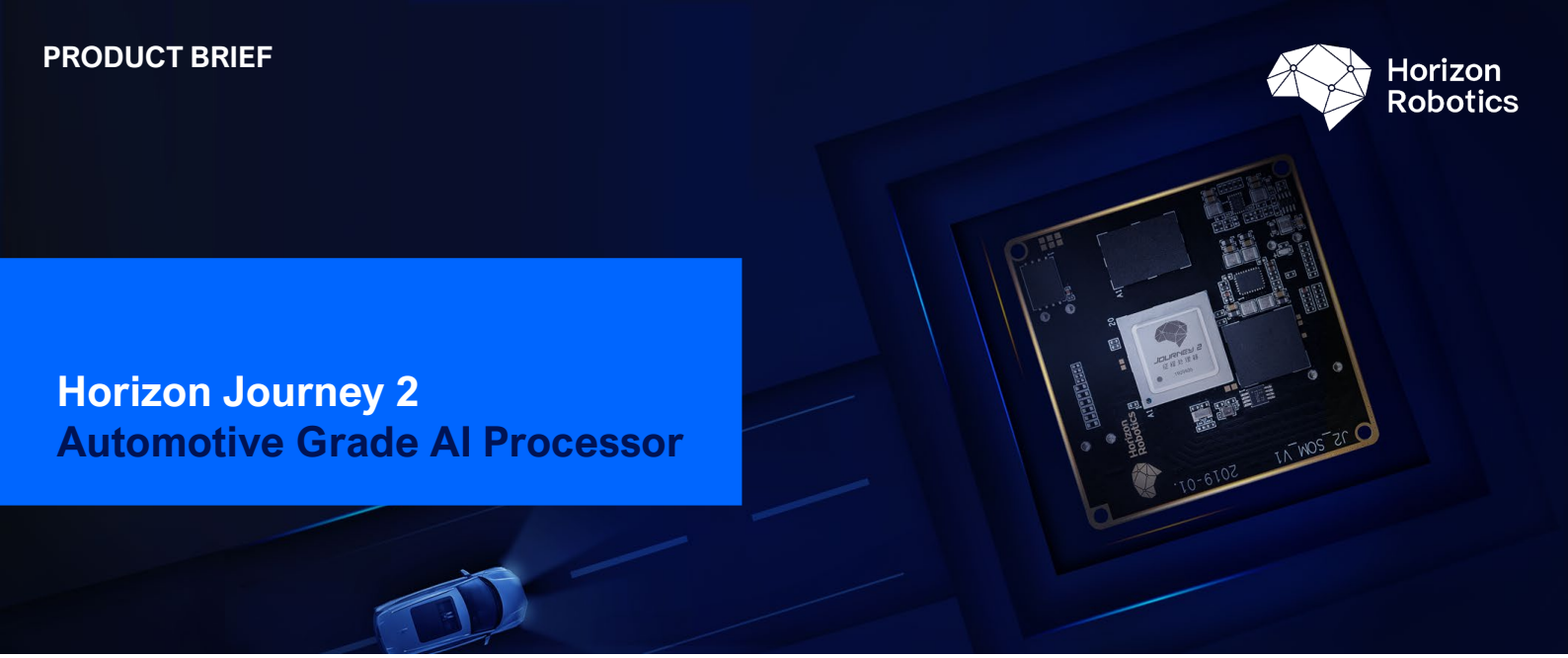
PRODUCT BRIEF

Horizon Robotics

Horizon Journey 2
Automotive Grade AI Processor



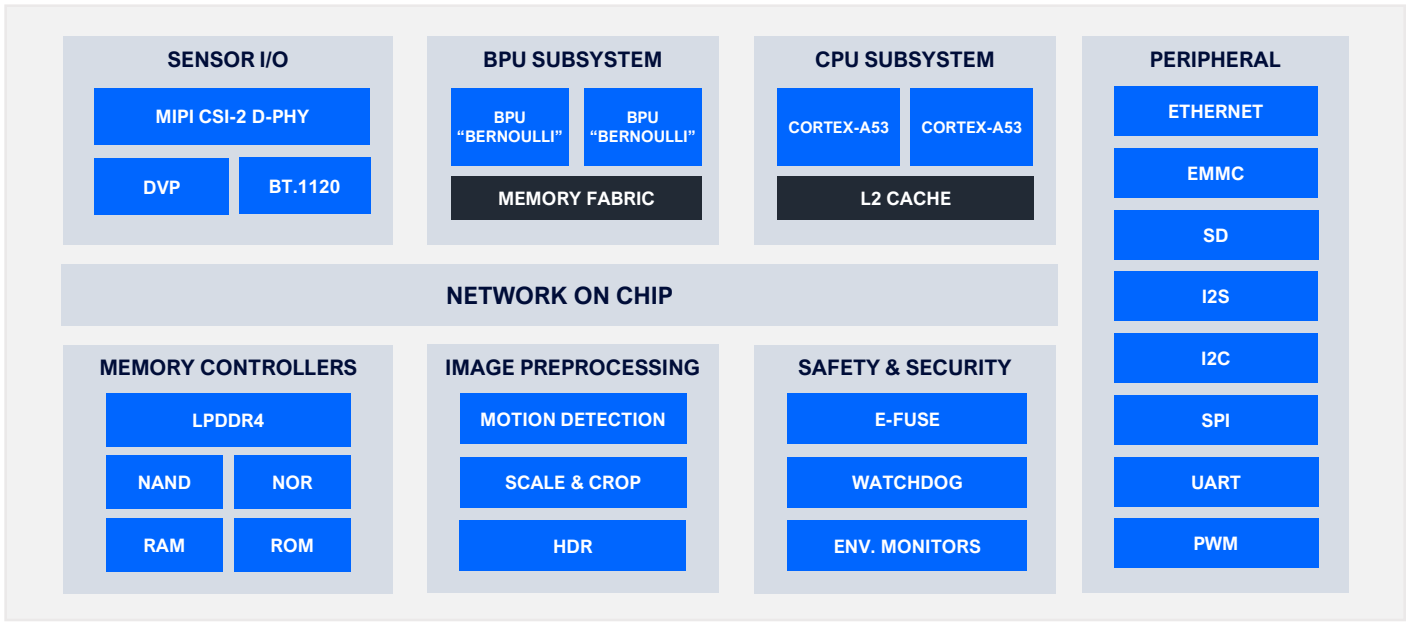
Industry's First Automotive Grade SoC Dedicated to AI Perception

Journey 2 is a high-performance and power efficient AI processor specifically designed for automotive and edge perception use cases. Designed with Horizon Robotics' proprietary deep learning compute "BPU" cores, Journey 2 enables customers with 4 TOPs of dedicated deep learning performance at a low power consumption of 2 Watts while meeting automotive grade operating conditions.

Development on Journey 2 is supported by Horizon Robotics OpenExplorer AI toolkit, which provides a Linux-based training framework and development environment for customers to customize the product as per their demands. Automated tools are also included to help customers maximize utilization rate on the Dual BPU cores.

When paired with Horizon Robotics' pre-optimized perception algorithms, Journey 2 can achieve over 90% BPU utilization rate. The combined solution supports advanced perception capabilities and features that enable ADAS and high-level autonomous driving functions. 2D & 3D object detection can run simultaneously with parsing workloads of up to 24 key categories.

4+ Deep Learning TOPS	**2W** Under typical workloads
4K30 Real-Time Processing	**ISP** Built-In Image Processor
BPU Dual Bernoulli 28nm HPC+	**Grade 2** AEC-Q100 Qualified



GENERAL SPECIFICATIONS	
CPU Processor Cores	▪ Dual-Core ARM Cortex® A53 up to 1 GHz ▪ 32 KB/32 KB I/D L1 cache ▪ 512 KB L2 cache ▪ Supports DVFS
BPU Cores	▪ Dual-Core Bernoulli architecture BPU ▪ Independent clock and power between cores ▪ Parallel and fast filtering of task-irrelevant information ▪ Supports temperature & performance monitoring
External Memory Interface	▪ LPDDR4 interface ▪ 32-bit LPDDR4 @ 3200 MHz (max 2GB) ▪ SPI NorFlash interface (1/2/4 bit) ▪ NorFlash boot mode
Sensor Interface	▪ 4K@30FPS, 1080p@60FPS, 720p@120FPS ▪ MIPI interface: CSI-2 RX and TX, 4 lanes each ▪ Embedded synchronous time stamp ▪ Input image formats: 8/10/12/14/16 bit RAW, YUV422 8/10 bit ▪ BT.1120 & DVP interface input and output
Host Interface	▪ Built-in SPI slave as a control bridge to host ▪ Built-in SDIO slave as a data bridge to host ▪ Host can access all the registers and DDR address ▪ Secured addressing map ▪ Maximum SPI clock of 50 MHz
Peripheral Interface	▪ 2 × I2S, 3 × SPI, 4 × I2C, and 2 × UART ▪ 1 × Gigabit Ethernet ▪ 2 × SDIO ▪ Multiple GPIO and PWM
OpenExplorer AI Training Toolkit	▪ Supports mainstream neural networks ▪ Model compiler and optimizer ▪ Binary-compatible simulator ▪ Real-scenario driven SDK & easy-to-use APIs
Physical & Electrical	▪ Design and Qualified for AEC-Q100 Grade 2 ▪ Support operating temperature -40°C ~ 105°C ▪ Power Consumption: Typically 2W (Sleep mode supported) ▪ Standard package: FCBGA400, 17 × 17 mm, 0.8 mm pitch

To learn more about Journey 2 visit **www.horizon.ai/product/journey**

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