

Investor Presentation
投资者报告



OTCQX: BRCHF | ASX: BRN

Global Chinese Financial Forum
Virtual Conference Main Event
国际金融投资博览会线上投资
会议年度重磅活动

November 2021 / 2021年11月

Forward Looking Statements / 前瞻性陈述

Certain views expressed here contain information derived from third parties or publicly available sources that have not been independently verified. This presentation includes certain statements, projections and estimates of the anticipated future financial performance of **BrainChip Holdings Ltd.** and the size, growth and nature of future markets for the company's products.

Such statements, projections and estimates reflect various assumptions made by the directors concerning anticipated results, which assumptions may or may not prove to be correct. **BrainChip Holdings Ltd.** and its subsidiaries have not sought independent verification of information in this presentation.

While the directors believe that they have reasonable grounds for each of the assumptions, statements, projections and estimates and all care has been taken in the preparation of this presentation, no warranty of representation, express or implied is given as to the accuracy, correctness, likelihood of achievement, or reasonableness of assumptions, estimates, statements and projections that are contained in this presentation. Such assumptions, estimates, statements and projections are intrinsically subject to significant uncertainties.

To the maximum extent allowed by law, none of **BrainChip Holdings Ltd.**, its directors, employees nor any other person accepts any liability arising out of any error, negligence or fault for any loss, without limitation, arising from the use of information contained in this presentation.



“Why BrainChip ?” / 为何选择BrainChip?

I believe technology exists to benefit humanity. / 我相信技术是为了造福人类。

Technology helps humans solve our problems, ease our suffering, and maximise our productivity and potential. / 技术帮助人类解决我们的问题，减轻我们的痛苦，以及最大限度地提高我们的生产力和潜力。

I believe BrainChip is trying to change the world for the better, and that's really cool. / 我相信BrainChip正试图改变世界，使之变得更好，这真的很酷。

I want to be part of that and help realise that ambition. / 我想成为其中的一部分，帮助实现这一雄心壮志。

It's what drives me, inspires me, and motivates me to succeed. / 这是驱动我、鼓舞我、激励我成功的原因。

It's why I came to work for BrainChip. / 这就是我来到BrainChip工作的原因。

It's why I invested my own money to become a shareholder in this company. / 这就是为何我投资自己的钱，成为这家公司的股东。

Tony Dawe

Introduction / 介绍

BrainChip is a global technology company revolutionizing the future of Artificial Intelligence (AI) . / BrainChip是一家全球技术公司，为人工智能（AI）的未来带来革命性的变化。



BrainChip is the world's first commercial producer of neuromorphic processor embedded in a System on Chip (SOC) for AI analysis on EDGE devices / BrainChip是世界上第一个将神经形态处理器嵌入片上系统（SOC）的商业生产商，用于EDGE设备的人工智能分析。

Our core product, the Akida™ chip, mimics the human brain's architecture resulting in a revolutionary neuromorphic hardware solution that enables a new generation of AI. /我们的核心产品Akida™芯片模仿人脑的架构，形成了一个革命性的神经形态硬件解决方案，实现了新一代的AI。

- * North America Headquarters Aliso Viejo, California (BrainChip Inc) / 北美总部位于加州Aliso Viejo（BrainChip Inc）。
- * Development teams located in Toulouse, France and Hyderabad, India / 开发团队位于法国图卢兹市和印度海得拉巴市
- * BrainChip Research Institute located in Perth, Western Australia / BrainChip研究所位于西澳大利亚州珀斯市
- * Founded in 2013 by Peter van der Made & Anil Mankar / Peter van der Made和Anil Mankar于2013年创建
- * Listed on the ASX September 2015, upgraded to OTCQX in June 2021 / 2015年9月在澳交所上市，2021年6月升级到OTCQX

Recent Activities / 最近活动

- * Chip design completed and delivered to Socionext in 2020 / 2020年完成芯片设计并交付给Socionext
- * Engineering samples delivered in late 2020 / 2020年底交付工程样品
- * Delivery of chips to EAP Customers in October 2021 / 2021年10月向EAP客户交付芯片
- * Commercial sales of Akida Development Systems commenced Oct 2021 / 2021年10月开始商业销售Akida开发系统
- * ADR program approved and trading expected to commence in November 2021 / ADR计划获得批准，预计将于2021年11月开始交易

BrainChip Holdings OTCQX: BRCHF | ASX: BRN

U.S. Share Price / 美国
股价¹ \$0.36

Market Cap / 市值² \$580.0M / \$5.8亿

FD Shares Outstanding /
完全摊薄后流通股 \$1.8B / \$18亿

Float / 公开流通股 \$1.3B / \$13亿

Insider Holdings / 内部
人士持股 19.9%

Employees / 员工 50+

Headquarters / 总部 Sydney, Australia /
澳大利亚悉尼

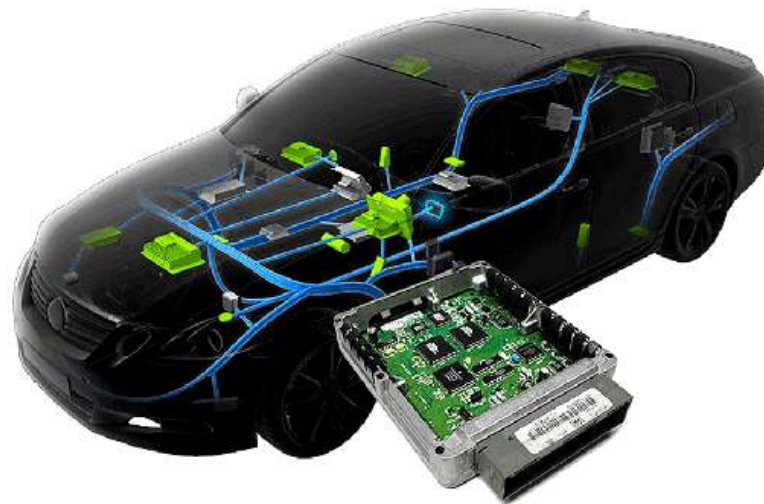
1) As of August 25, 2021 /
截止2021年8月25日

2) At June 30, 2020 /
2020年6月30日

brainchip What is "The Edge" and "IoT"? / 什么是“边缘”和“物联网”？

- Edge AI is a US\$40B global industry growing at 15-20% p.a. / 边缘智能是一个400亿美元规模的全球行业，每年增长15-20%。
- Any device that is connected to the Internet is an Internet of Things (IoT) device, e.g., Alexa, Mobile Phone, Ring camera. / 任何连接到互联网的设备都是物联网（IoT）设备，例如，Alexa、移动电话、Ring相机。
- These devices send data to a cloud for processing and results are returned to the device via the cloud e.g. SIRI, Alexa / 这些设备将数据发送到云端进行处理，结果通过云端返回给设备，例如SIRI、Alexa等。
- They are at the “edge” of the network and therefore are called Edge IoT devices / 它们处于网络的“边缘”，因此被称为边缘物联网设备。
- Examples of EDGE IoT devices that are in daily use: / 日常使用的EDGE物联网设备举例：
 - Autonomous Driving Systems / 自动驾驶系统
 - Drones/Satellites / 无人机/卫星
 - Industrial Sensors / 工业传感器
 - Mobile-Phones / 移动电话
 - TVs & Home Appliances / 电视和家用电器
 - Wearables (watches/glasses) / 可穿戴设备（手表/眼镜）
 - Medical Devices/Monitors / 医疗设备/监控器
 - Alexa or Google Home / Alexa或谷歌Home
 - Doorbell Cameras / 门铃摄像机
 - Security Cameras / 安保摄像机
 - Industrial Robots / 工业机器人

- Edge AI computing means that the information is processed on the device rather than sending it to the Cloud for processing. / 边缘人工智能计算意味着信息是在设备上处理的，而不是将其发送到云端进行处理。
- Edge AI devices can be used anywhere – don't require Cloud or Internet connectivity / 边缘人工智能设备可以在任何地方使用 - 不需要云或互联网连接
- A device that can do AI processing on the device without having to send data to a cloud server is called an "Edge AI Device" or "Edge AIoT". / 能够在设备上的人工智能处理而无需将数据发送到云服务器的设备被称为 "边缘人工智能设备" 或 "边缘AIoT"。
- This enables real-time responses and capable of operating within an extremely low power budget. / 这实现了实时响应，并能够在极低的功率预算下运行。
- Data stays on the chip; It can't be hacked which greatly enhances data privacy and security / 数据留在芯片上；它不能被黑客攻击，这大大增强了数据的隐私和安全。



What is Neuromorphic AI? / 什么是神经形态AI?

How is it different from traditional AI? / 它与传统的人工智能有什么不同?

Traditional AI / 传统的人工智能

- Processes data by executing massive amounts of math functions very quickly / 通过非常快速地执行大量的数学函数来处理数据
- Requires large computing capacity, consumes very high power which is impractical for many edge devices due to power, processor or heat constraints / 需要大的计算能力，消耗非常高的功率，由于功率、处理器或热量的限制，这对许多边缘设备来说是不现实的
- Data on most edge devices is pushed to another device or through the cloud to a data center where AI processing takes place. The results are then sent back to the edge device. / 大多数边缘设备上的数据被推送到另一个设备或通过云计算推送到一个数据中心，在那里进行人工智能处理，然后将结果发回给边缘设备
- “Training” a traditional AI system requires massive data sets, and the network must be taken down and retrained when new data needs to be added which can take hours, days, weeks or even months depending on the size of the network. / “训练”一个传统的人工智能系统需要大量的数据集，当需要添加新的数据时，网络必须被关闭并重新训练，这可能需要几个小时、几天、几周甚至几个月，这取决于网络的规模。

Akida Neuromorphic Processor block / Akida神经形态处理器模块

Data Processing / 数据处理

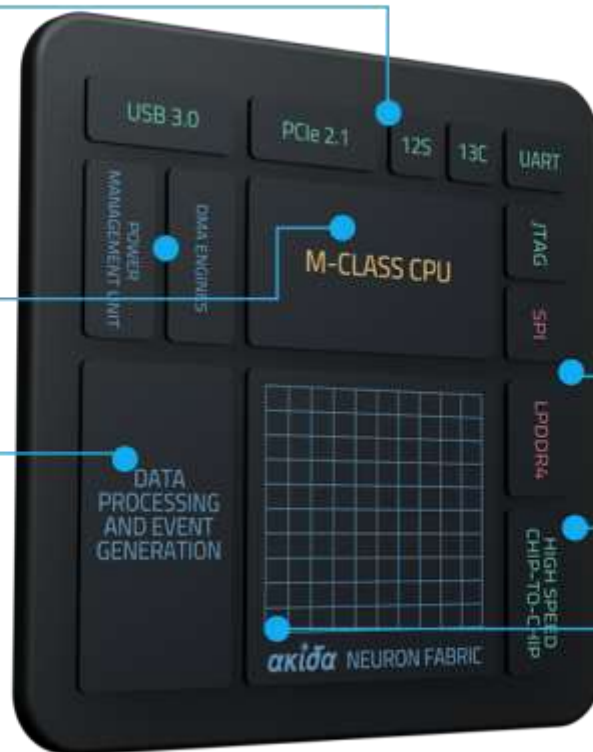
- Pixel-Event Converter / Pixel-Event转换器
- SW Data-Event Encoder / SW Data-Event编码器
- Any multivariable digital data / 任何多变量数字数据
- Sound, pressure, temp., others / 声音、压力、温度等

On-Chip Processor / 芯片上的处理器

- M-Class CPU with FPU & DSP / 带FPU和DSP的M系列CPU
- System Management / 系统管理
- Akida Configuration / Akida构造

Data Input Interfaces / 数据输入界面

- PCI Express 2.1 x2 Lane Endpoint / PCI Express 2.1 x2通道终端
- USB 3.0 Endpoint / USB 3.0终端
- I3S, I2C, UART, JTAG



External Memory Interfaces / 外部存储界面

- SPI FLASH for boot/storage / 用于启动/存储的SPI闪存
- LPDDR4 Program/Weights / LPDDR4程序/重量

Multi-Chip Expansion / 多芯片扩展

- PCIe 2.1 2 lane root complex / PCIe 2.1 2通道根复合体
- Connects up to 64 devices / 最多可以连接64个设备

Flexible Akida Neuron Fabric / 灵活的Akida神经元构造

- Implements 80 NPUs / 执行80个NPU
- All Digital logic with SRAM (8MB) / 带SRAM (8MB) 的全数字逻辑
- Also Available as Licensed IP Core / 也可作为授权的IP核心提供
- First Implementation: TSMC 28nm / 首次实施: 台积电28纳米

Akida Neuromorphic Processing / Akida神经形态处理

- Modeled after the way a human brain learns and processes sensory information / 以人脑学习和处理感官信息的方式为模型
- Only processes information when an event takes place – a “spike” / 只在事件发生时处理信息--“锋电位”。
- One-shot learning in real-time / 一次性的实时学习
- Ultra-low power consumption - low heat, doesn't require cooling fan / 超低功耗 - 低热量，不需要冷却风扇
- Does not require Internet or Cloud connectivity – it works everywhere, securely / 不需要互联网或云端连接--它在任何地方都能安全地工作。
- Small size suitable for wearable devices – watches, mobile phones, portable sensors / 小尺寸适用于可穿戴设备 - 手表、移动电话、便携式传感器等。
- Will help solve many of the big problems confronting humanity in coming decades / 将有助于解决未来几十年人类所面临的许多大问题。

The IoT Problem / 物联网问题

The explosion of IoT and AI (AIoT) is creating infrastructure and sustainability issues. / 物联网和人工智能（AIoT）的爆炸性增长正在产生基础设施和可持续性问题。



By 2025, over 41 billion IoT devices will be competing for internet bandwidth. / 到2025年，超过410亿台物联网设备将争夺互联网带宽。



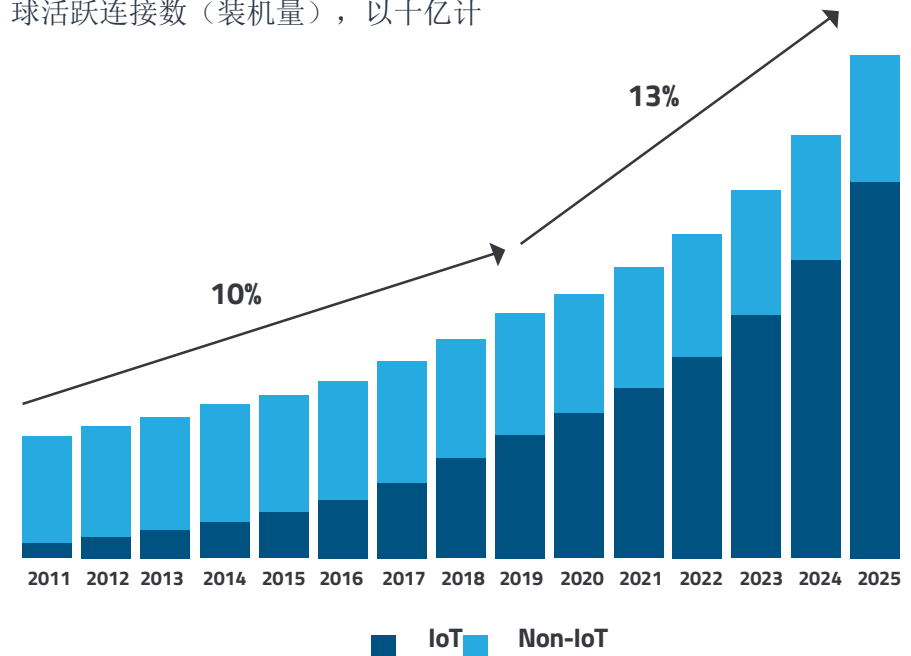
Typical IoT device data is pushed to the cloud for processing resulting in internet bandwidth constraints, higher latency, increased data security risks and device power issues. / 典型的物联网设备数据被推送到云端处理，导致互联网带宽的限制，更高的延迟，增加的数据安全风险和设备电源问题。



Data centers storing information from IoT devices and processing AI training and inference are forecast to consume 30% of global electricity by 2030. / 预计到2030年，存储物联网设备信息和处理人工智能训练和推理的数据中心将消耗全球30%的电力。

Total Number of Device Connections Including Non-IoT / 包括非物联网在内的设备连接总数¹

Number of Global Active Connections (installed base) in Billions / 全球活跃连接数（装机量），以十亿计

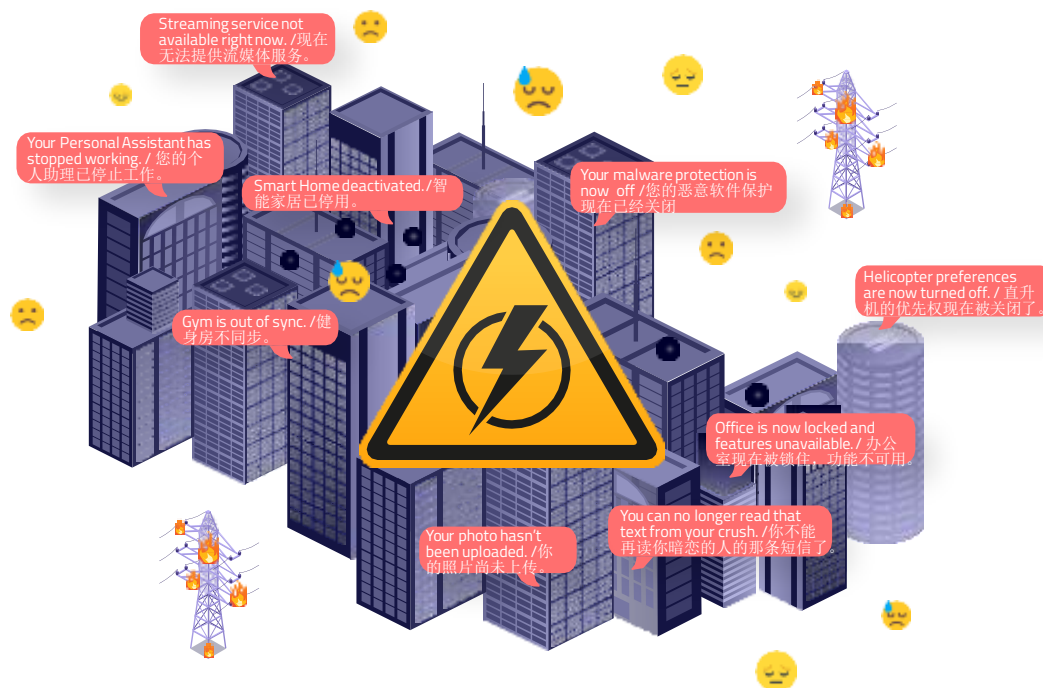
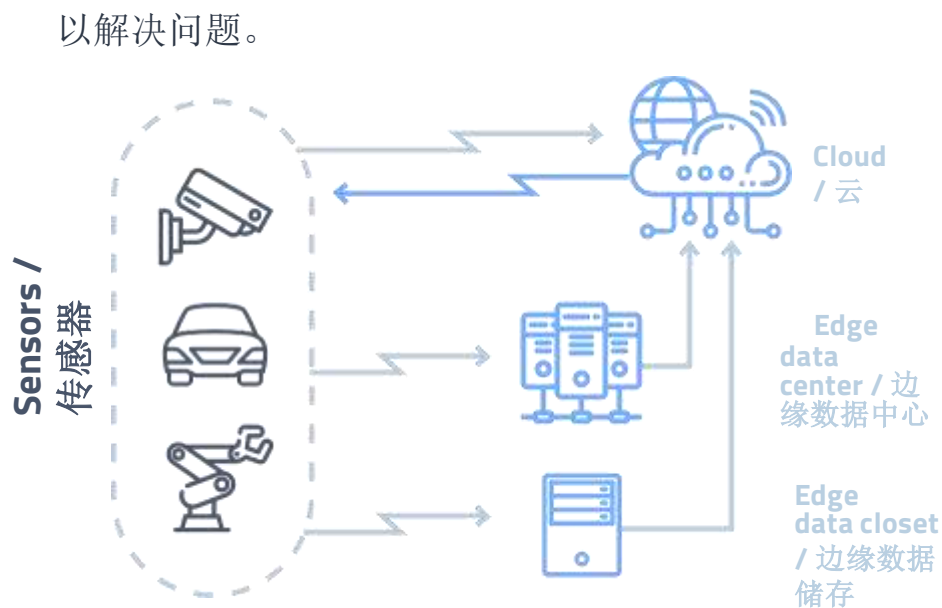


Note: Non-IoT includes all mobile phones, tablets, PCs, laptops and fixed phone lines. IoT includes all consumer and B2B devices connected. / 注：非物联网包括所有移动电话、平板电脑、个人电脑、笔记本电脑和固定电话线。物联网包括所有连接的消费者和B2B设备。

1) IoT Analytics – Cellular IoT & LPWA Connectivity Market Tracker 2010-25 / 物联网分析 - 蜂窝式物联网和LPWA连接市场追踪2010-25

The IoT Problem / 物联网问题

With a rising number of AI in IoT (AIoT) devices and additional sensing technologies, AI training and inference is being pushed to the Edge or geographically closer to device itself, to solve the problem. / 随着物联网（AIoT）设备和额外传感技术数量的增加，人工智能的训练和推理正在被推到边缘设备或地理上更接近设备本身的地方，以解决问题。



Bandwidth competing for the same resources / 争夺相同资源的带宽



Privacy and security threats / 隐私和安全威胁



Demand for autonomous learning / 对自主学习的需求



Latency / 延迟

Power Consumption and Emissions / 电力消耗和排放

A study last year found that training an off-the-shelf AI language-processing system produced / 去年的一项研究发现，训练一个现成的人工智能语言处理系统产生

1,400 pounds of emissions / 1400磅排放



The full suite of experiments needed to build and train that AI language system from scratch can generate / 从头开始建立和训练该人工智能语言系统所需的全套实验产生

up to 78,000 pounds of emissions / 高达78,000磅的排放量

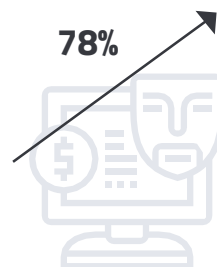


Data security and privacy / 数据安全和隐私

Data security threats are increasing. / 数据安全的威胁正在增加

4 years / 四年

78%

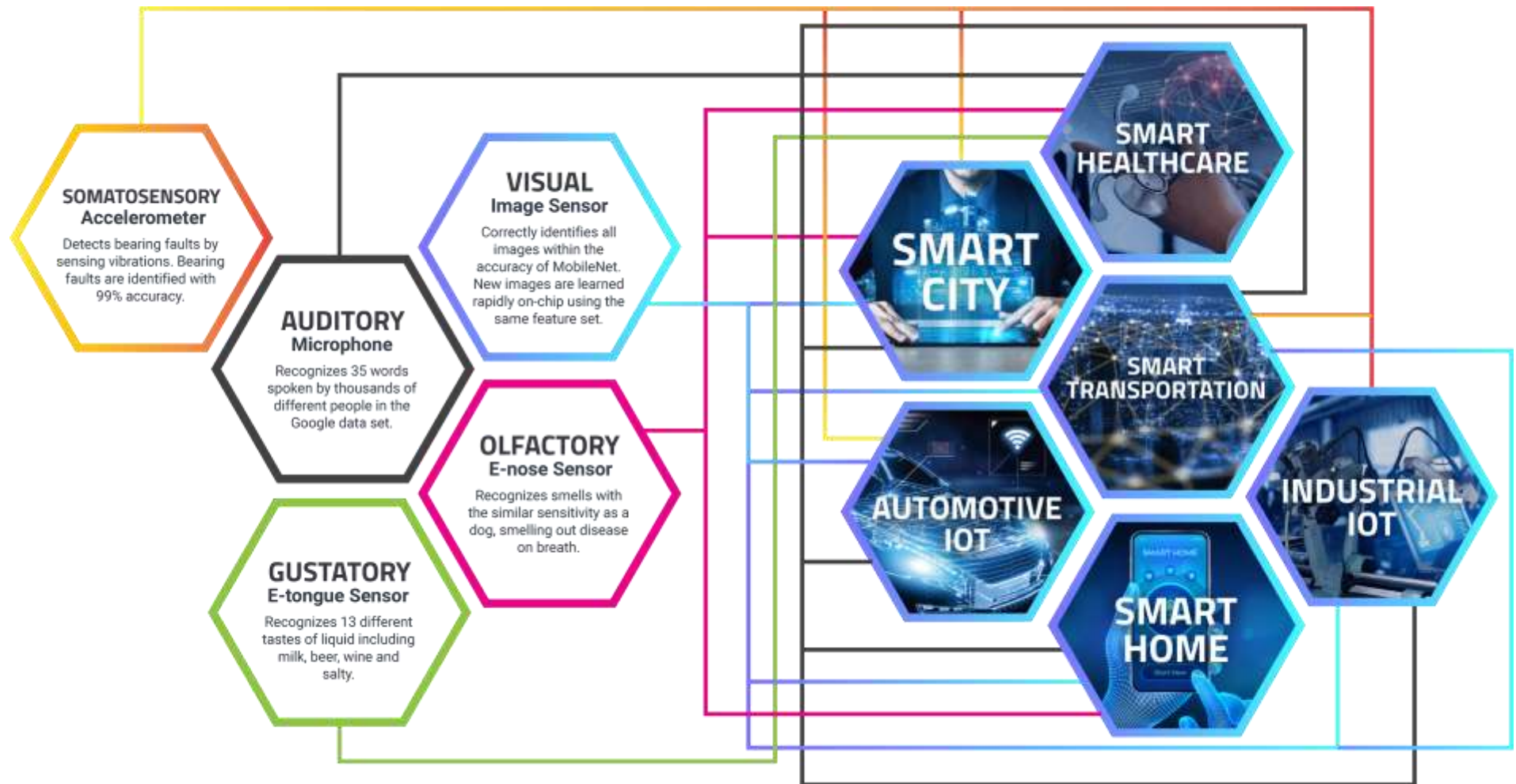


The inefficiency of managing exabytes and petabytes of data has increased chances of security breaches and data losses. / 管理艾字节和拍字节数据的效率低下，增加了安全漏洞和数据损失的几率。

- ✓ Organizations are heavily dependent on gathering data through multiple touch points / 组织在很大程度上依赖于通过多个触点收集数据
- ✓ Critical data can be exposed to cyberattacks / 关键数据可能暴露在网络攻击之下
- ✓ As technology advances, companies will need to always consider the implications of keeping personal and company data secure. / 随着技术的发展，公司将需要始终考虑保持个人和公司数据安全的影响。



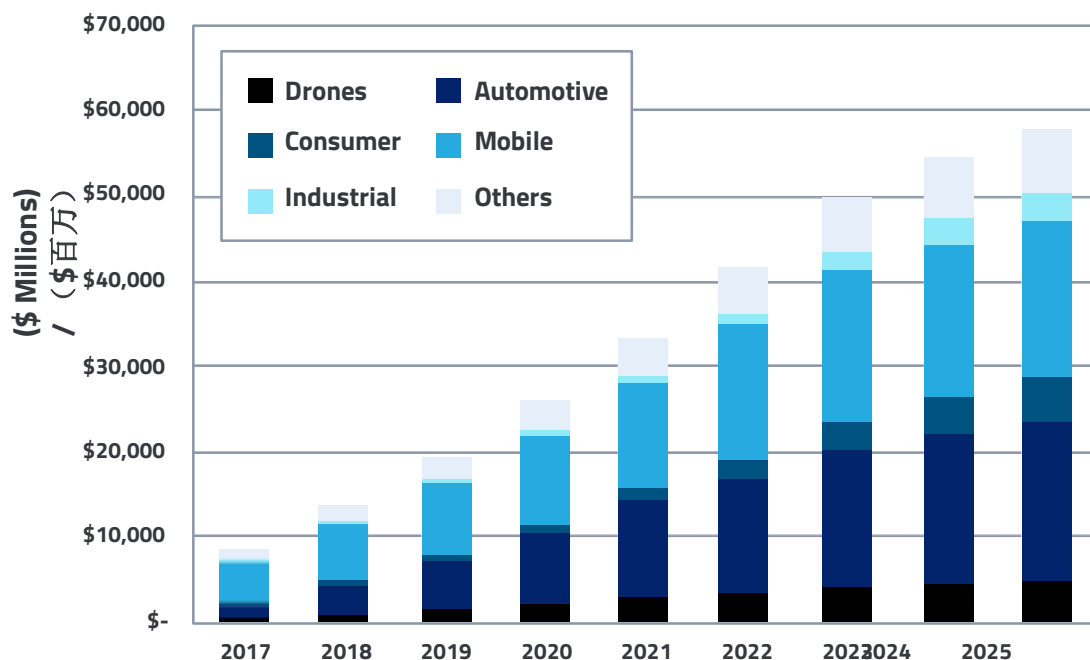
Akida enables efficient processing for all Sensor Modalities / Akida实现了对所有传感器模式的有效处理



Market Outlook / 市场前景

- Since 2015, the data centre industry has experienced a 300,000X growth in compute requirements, with graphics processing units (GPUs) providing most of that horsepower. (Business Wire) / 自2015年以来，数据中心行业的计算需求增长了30万倍，其中图形处理单元（GPU）提供了大部分的马力。(Business Wire)
- Tractica forecasts that AI edge device shipments will increase from 161 million units in 2018 to 2.6 billion units worldwide by 2025. / Tractica预测，人工智能边缘设备的全球出货量将从2018年的1.61亿台增加到2025年的26亿台。
- The AI edge device market is forecast to be worth US\$60 billion in the next 4 years / 预计未来4年，人工智能边缘设备市场价值600亿美元
- BrainChip has a 2-3 year lead over its nearest competitor / BrainChip比其最近的竞争对手有2-3年的领先优势

Edge Based Devices requiring AI - \$60B by 2025 / 需要人工智能的边缘设备 - 2025年达到600亿美元



Source / 来源: Tractica

BrainChip estimates it has a 2-3 year lead over its competitors / BrainChip估计它比其竞争对手有2-3年的领先优势

BrainChip is currently developing the next generation of Akida products / 目前，BrainChip正在开发下一代Akida产品

	Micro to MW Power Use / 微型到兆瓦 级的电力使用	Real-Time On-Chip Learning & Training / 实时芯片上学习和培 训	TensorFlow Compatible / 与 TensorFlow 兼容	Stand-Alone Possible (No CPU Required) / 可独立运行（无需 CPU）	On-Chip Convolution / 芯片上卷积
BrainChip Akida™ AKD1000	✓	✓	✓	✓	✓
IBM TrueNorth	✓	None / 无	Learn Corel	✗	✗
Intel Loihi	✓	Programmable / 可编程	Learn NEF	✗	✗
Google Coral TPU	2-5W	Math Chip / 数学芯片	✓	✗	✗
DLAs (Nvidia, Others)	✗	Math Chip / 数学芯片	✓	✗	✗

Early Access Program (EAP) / 早期使用计划

Program provides customers with engineering samples and development systems boards for early evaluation. / 该计划为客户提供工程样品和开发系统板，用于早期评估。

Most EAP customers cannot be identified due to Non-Disclosure Agreements. / 由于有保密协议，大多数EAP客户的身份不能说明。

15 EAP customers including: / 15个EAP客户包括:

- * Ford Motor Company is evaluating Akida for Advanced Driver Assistance Systems (ADAS) and Autonomous Vehicle (AV) applications / 福特汽车公司正在评估Akida在高级驾驶辅助系统（ADAS）和自动驾驶汽车（AV）方面的应用。
- * Joint development agreement with Valeo Corporation, a Tier-1 European automotive supplier of sensors and systems, for ADAS and AV applications / 与欧洲一级汽车传感器和系统供应商法雷奥公司就ADAS和AV应用达成联合开发协议
- * Collaboration with a VORAGO Technologies to support a Phase I of a NASA program for a neuromorphic processor that meets spaceflight requirements / 与VORAGO Technologies合作，支持美国国家航空航天局（NASA）关于满足太空飞行要求的神经形态处理器的第一阶段项目。



IP Licensing & Research Partners / 知识产权许可和研究合作伙伴



First IP Licensing agreement with Renesas, a tier-one semiconductor manufacturer specializing in microcontroller for consumer electronics and automotive products, for a single-use, royalty-bearing, worldwide IP design license, allowing Renesas to use Akida in its system-on-chip products. / 与专门从事消费电子和汽车产品的微控制器的一级半导体制造商瑞萨公司签订了第一份知识产权许可协议，该协议为一次性使用、收取权利金的全球知识产权设计许可，允许瑞萨公司在其系统芯片产品中使用Akida。



Research project with Biotome for the identification of COVID-19 antibodies in blood samples using a sensor and Akida. Biotome has paid for this research project. The aim is to develop a commercial medical device for antibody classification for a range of diseases. / 与Biotome合作的研究项目，使用传感器和Akida识别血液样本中的新冠病毒抗体。Biotome已经为这个研究项目支付了费用。其目的是开发一种商业医疗设备，用于对一系列疾病进行抗体分类。

Pathway to Profit / 盈利之路

Revenue streams / 营收流



IP licensing
/ 知识产权
许可



Royalties
/ 权利金



**Engineering
Support / 工
程支持**



**Chip and board
commercial
Sales / 芯片和
电路板商业销
售**



**NRE Fees /
NRE费用**



Peter AJ van der Made
Founder & CEO / 创始人兼首席执行官

- * Over 40 years of experience in computer innovation / 在计算机创新方面有超过40年的经验
- * Founded vCIS Technology and served as CTO and Chief Scientist. vCIS Technology was acquired by Internet Security systems and subsequently IBM / 创立了vCIS Technology，并担任CTO和首席科学家。vCIS Technology被Internet Security systems收购，随后被IBM收购。
- * Founded PolyGraphic Systems and designed Graphics Accelerator boards and subsequent chip for IBM PC graphics / 创立PolyGraphic Systems，设计图形加速器线路板和随后的IBM PC图形芯片
- * Author of Higher Intelligence / Higher Intelligence作者
- * Designed and patented the first generations of digital neuromorphic devices on which Akida is based between 2004 and 2008 / 在2004年至2008年期间，设计了Akida所基于的第一代数字神经形态设备，并获得专利。



Ken Scarince
Chief Financial Officer / 首席财务官

- * Former finance consultant at 8020 Consulting / 曾任8020 Consulting的财务顾问
- * Former Controller at Virgin Galactic / 曾任Virgin Galactic的财务总监
- * Former Vice President, Finance & Chief Accounting Officer at Virgin America / 曾任Virgin America财务副总裁兼首席会计官



Rob Telson
VP of Worldwide Sales / 全球销售副总裁

- * Over 20 years of experience in sales with expertise in licensing intellectual property / 超过20年的销售经验，擅长知识产权许可方面
- * Former Vice President of Foundry Sales worldwide and Vice President of Sales of the Americas at ARM / 曾任ARM全球代工销售副总裁和美洲销售副总裁
- * Developed a cohesive worldwide sales strategy on disruptive technologies within the semiconductor space at Synopsys / 在Synopsys的半导体领域内制定了一个颠覆性技术的有凝聚力的全球销售战略。
- * BS in Political Science at University of Arizona and Program for Leadership Development Certificate from Harvard Business School / 亚利桑那大学政治学学士和哈佛大学商学院领导力发展项目证书



Anil Mankar
Chief Development Officer / 首席开发官

- * Over 30 years of experience in developing products in the semiconductor industry / 在半导体行业有超过30年的产品开发经验
- * Developed PC core Logic chipsets at Western Digital / 在西部数据公司开发个人电脑核心逻辑芯片组
- * Former VP of Engineering and Chief Development Officer at Conexant Systems Inc. / 曾任Conexant Systems Inc.的工程副总裁和首席开发官。
- * SVP of VLSI Engineering at Mindspeed Technologies / Mindspeed Technologies的VLSI工程高级副总裁

- * Demand for AI enabled Edge and Internet of things (IOT) devices forecasted to grow at double-digit annual growth rates for the foreseeable future. / 预计在可预见的未来，对支持人工智能的边缘设备和物联网（IOT）设备的需求将以两位数的年增长率增长。
- * Due to bandwidth, data security, latency and power constraints on edge devices, product demand will shift from cloud-dependent AI devices to solutions where data is captured on the device. / 由于边缘设备的带宽、数据安全、延迟和功率限制，产品需求将从依赖云的人工智能设备转向在设备上采集数据的解决方案。
- * Massive power consumption and emissions resulting from AI data centers will force a shift in AI processing from traditional cloud data centers to processing on the device. Akida's cloud independence capabilities are uniquely suited to address these AI related infrastructure and sustainability issues. / 人工智能数据中心产生的大量电力消耗和排放将迫使人工智能处理从传统的云数据中心转移到设备上处理。Akida的云独立能力独特地适合解决这些与人工智能有关的基础设施和可持续发展问题。

- * The Akida chip is high performance, small, ultra-low power and enables a wide array of edge capabilities beyond competing products, including training, learning, and inference all on the chip. No other edge AI device on the market today enables these features and capabilities. / Akida芯片性能高、体积小、功耗超低，能够实现超越竞争产品的各种边缘功能，包括训练、学习和推理都在芯片上进行。目前市场上没有其他边缘人工智能设备能够实现这些特性和能力。
- * The Akida architecture is both scalable and flexible to and addresses the requirements for the vast and growing number of IoT and edge devices in consumer and industrial applications, including automotive, healthcare, smart home, security among many others. / Akida架构具有可扩展性和灵活性，能够满足消费者和工业应用中大量且不断增长的物联网和边缘设备的要求，包括汽车、医疗保健、智能家居、安全等。
- * 15 Early Access Partners (EAP) include Ford, Valeo, Vorago and NASA, as well as a commercial IP license with Renesas, a tier-one, Japanese, consumer electronics and automotive semiconductor supplier. / 15个早期使用计划的合作伙伴（EAP）包括福特、法雷奥、Vorago和美国国家航空航天局，以及与日本一级消费电子和汽车半导体供应商瑞萨公司的商业知识产权许可。
- * Commercial production shipments commenced in Q4 2021. / 2021年第四季度开始商业生产出货。
- * Revenue model includes IP licensing, product sales & support, royalty streams / 收入模式包括知识产权许可、产品销售和支持、权利金流。

Company Contacts / 联系方式

North & South America / 北美洲和南美洲

Ken Scarince, Chief Financial Officer / 首席财务官

kscarince@brainchip.com

Europe, Asia & Australia / 亚洲和澳大利亚

Tony Dawe, Investor Relations Manager /

投资者关系经理

tdawe@brainchip.com

External Communications / 外部沟通

Mark Komonoski

Integrus Communications

mkomonoski@integcom.us

BrainChip Holdings Ltd

Australia / 澳大利亚

225 George Street, Level 12

Sydney, NSW 2000

U.S. / 美国

65 Enterprise

Aliso Viejo, CA 92656

Questions?
问题？