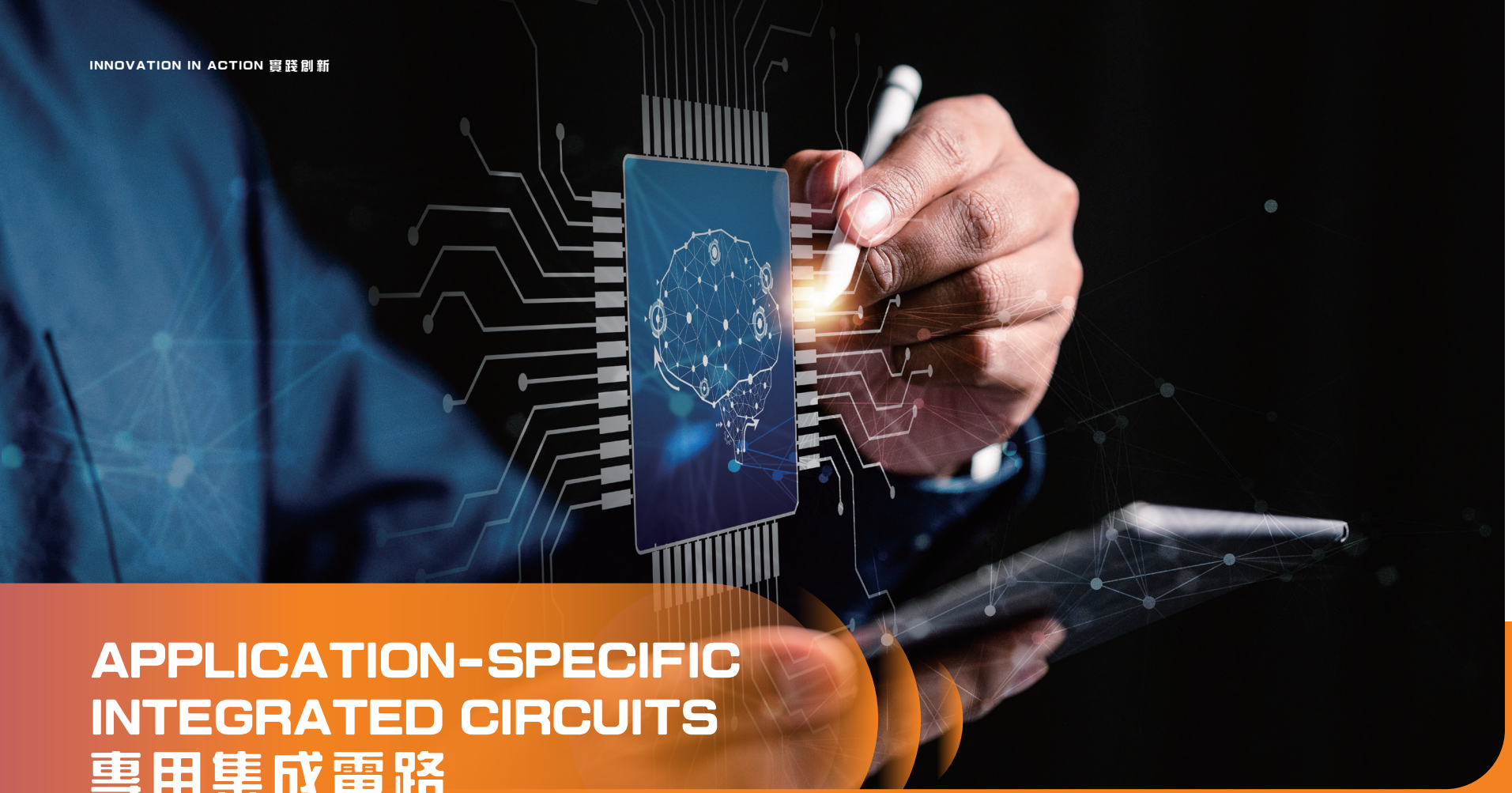


APPLICATION-SPECIFIC INTEGRATED CIRCUITS
專用集成電路

Integrated circuits are the backbone of advanced technologies, powering the development of electronics, telecommunications and smart city solutions. The Hong Kong Branch of National Engineering Research Centre for Application Specific Integrated Circuit System (CNERC) was set up in 2012 within the infrastructure of ASTRI, spearheading research and development in application-specific integrated circuits (ASICs) to support the national high-tech industrial growth.

集成電路是多種先進技術的骨幹，支援電子、電訊及智慧城市解決方案的發展。**2012**年，國家專用集成電路系統工程技術研究中心香港分中心依託應科院成立，帶領專用集成電路研發工作，助力推動國家高科技產業發展。

As the first CNERC branch in Hong Kong, the centre plays a pivotal role in ASTRI's technology strategy, complementing its six core priority areas. The branch focuses on microelectronics and integrated circuits, driving innovations that enable advancements in new industrialisation, intelligent manufacturing, smart city development, financial technologies, and next-generation network solutions.

Through its leadership in research and development in ASIC, ASTRI continues to deliver cutting-edge solutions that empower industries and foster technological growth, reinforcing Hong Kong's position as a hub for innovation and technology.

國家專用集成電路系統工程技術研究中心在香港設立的首家分中心，在應科院的技術策略中扮演關鍵角色，並與其六大優先發展領域互補優勢，聚焦微電子及集成電路研發，藉此帶動新型工業化與智能製造、智慧城市、金融科技及新一代網絡解決方案等技術創新。

憑藉在專用集成電路研發上的領導角色，應科院不斷為業界提供尖端解決方案，驅動行業發展及技術進步，進一步強化香港作為創新科技中心的地位。

Research Areas & Focus
研究領域與重點

AI and IoT Chips
人工智能及物聯網芯片

The Third Generation Semiconductors 第三代半導體

3D Integrated Chip
三維集成芯片

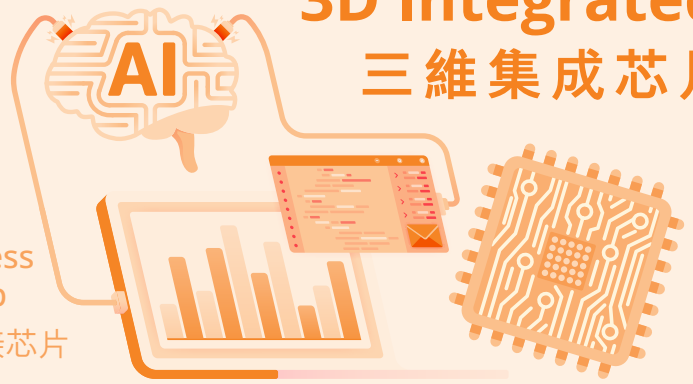
SiC/GaN-based Power Modules
基於碳化矽/氮化鎵的電力模塊

Power Control and Driver Chip
功率控制及驅動芯片

Vision System AI Algorithms and Chips
視覺系統人工智能算法與芯片

Low-power Wireless Connection Chip
低功耗無線連接芯片

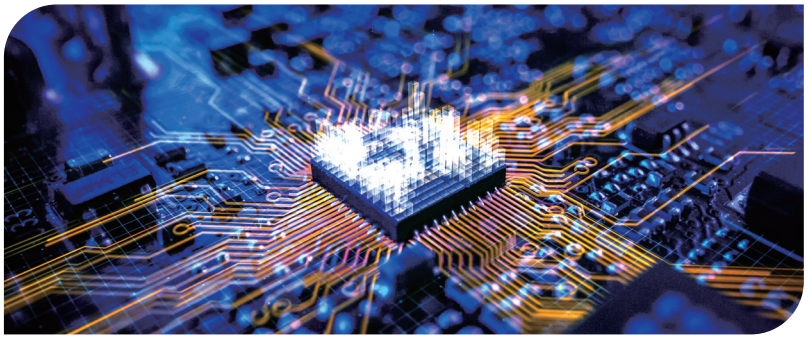
Energy Storage Technology
電力與儲能技術



Technologies Breakthrough
技術突破

ASTRI continues to lead innovation in application-specific integrated circuits, developing advanced solutions that enhance performance, optimise efficiency, and address critical industry needs. These technologies are driving progress across sectors including artificial intelligence, automotive safety, sustainable energy, and semiconductor packaging, solidifying Hong Kong's role as a hub for cutting-edge R&D.

應科院持續引領專用數碼電路創新，開發先進集成電路方案，提升性能、優化效率並滿足行業關鍵需求。這些技術推動人工智能、汽車安全、可持續能源及半導體封裝等多元領域發展，鞏固香港作為領先創科中心的地位。

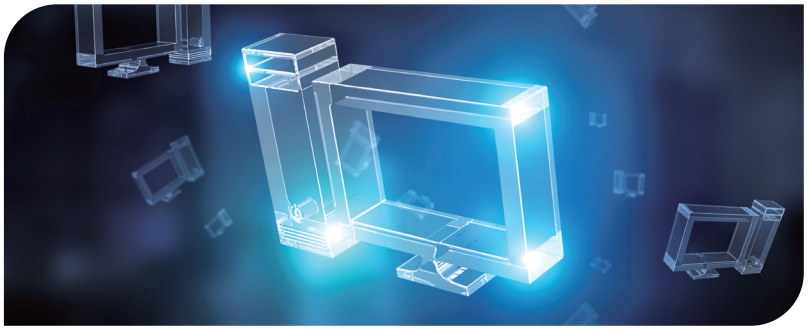


Ultrasonic Sensor System-on-Chip (SoC)

Aligned with the national semiconductor strategy, ASTRI developed an Ultrasonic Sensor SoC integrating a low-noise amplifier and high-precision processors. This technology improves road safety by enabling safer automotive systems, reducing accidents, and enhancing vehicle performance. The SoC represents a significant step in domestic substitution of ultrasonic radar chips, supporting the localisation of advanced semiconductor technologies.

超聲波感測器晶片系統

為配合國家半導體發展策略，應科院研發集成低噪聲放大器及高精度處理器的超聲波感測器晶片系統。此技術不僅可令汽車系統安全升級，提高道路安全，減少意外發生，更有助增強車輛整體性能。超聲波晶片系統標誌着以中國內地技術取代超聲波雷達晶片的重要突破，進一步促進先進半導體技術的本地化發展。



3D-IC Technology with Through-Glass Via (TGV)

ASTRI partnered with leading laser solution providers to advance Through-Glass Via (TGV) technology, a critical component in 3D-IC packaging. By incorporating Laser Induced Deep Etching (LIDE) techniques, ASTRI is addressing the demand for miniaturised, high-performance electronic devices. TGV technology enables vertical electrical connections through glass substrates, supporting the next generation of compact and efficient semiconductor components.

玻璃通孔三維集成電路封裝技術

應科院與頂尖鐳射解決方案供應商合作，推進玻璃通孔技術的發展，亦即三維集成電路封裝的關鍵組件。應科院為此引進鐳射誘發深蝕刻技術積極解決市場對微型化及高性能電子裝置的需求。玻璃通孔技術能夠實現在玻璃基板上的垂直電連接，支援新一代小型及高效能半導體元件的技術。

Through these advancements, ASTRI is driving innovation in application-specific integrated circuits, enhancing technologies that power intelligent systems, sustainable energy solutions, and semiconductor manufacturing, while reinforcing Hong Kong's position as a leader in high-tech development.

憑藉這些技術突破，應科院不斷推動專用集成電路的創新技術，提升智能系統、可持續能源方案及半導體製造的相關技術，鞏固香港於高科技發展領域的領導地位。

Partnership and Commercialisation
合作夥伴及市場化項目

Display Bridge Chip for Automotive Applications 車用顯示橋接晶片技術	We established a collaboration with a Hong Kong-listed enterprise specialising in IC products and display solutions to develop a Display Bridge Chip, a System-on-Chip (SoC) designed for automotive applications. This advanced SoC integrates an Microcontroller Unit Core, Local Dimming Core, and Memory with high-speed Mobile Industry Processor Interface, enabling high-rate display data input and output.	我們與一家專門從事集成電路產品及顯示解決方案的香港上市企業合作，共同開發專為車載應用設計的橋接晶片。這款先進的晶片系統整合了微控制器單元、局部調光核心和記憶體，並配備高速移動產業處理器介面接口，可實現高速顯示訊息輸入和輸出。
Advanced Energy Storage Systems (ESS) 先進儲能系統**(ESS)**	ASTRI is collaborating with a Hong Kong-based sustainable energy company to develop intelligent charging station solutions featuring advanced Energy Storage Systems. We are also exploring an extension into the emerging Low-Altitude Economy sector, focusing on future eVTOL (electric Vertical Take-Off and Landing) charging infrastructure, while contributing to the sustainable urban mobility and decarbonisation.	應科院正與一家香港可持續能源公司合作，開發採用先進儲能系統的智能充電站解決方案。我們亦正探討將合作擴展至新興的低空經濟領域，聚焦未來電動垂直起降飛行器(eVTOL)充電基礎設施，為可持續城市交通的發展和減碳進程作出貢獻。

Project commenced in 2024/25*
2024/25年度開展的研發項目*

Advanced Energy Storage Module for Storage Station Application	用於儲能電站的先進儲能模組
Mixed Signal IP Platform for Automotive Ultrasonic Sensors	適用於汽車超聲波傳感器的混合信號IP平台
NTN RF Transceiver Chip Towards 5G-A/6G Applications	面向5G-A/6G的NTN射頻收發機芯片
High-Speed and High-Resolution Hybrid Analog-to-Digital Converter for 5G-A/6G Terminals	用於5G-A/6G終端的高速高分辨率混合式模數轉換器
Micron-Diameter High-Aspect-Ratio Through-Silicon Via (MH-TSV) Filling for 3D-Interconnect	應用於三維互連的微米直徑高深寬比的矽通孔填充
Ultra Low-cost SiC Substrate (ULSiC)	低成本碳化矽襯底
AI-Assisted Generation System for Digital Logic Design	用於數碼邏輯設計的人工智能輔助生成系統
Tiny Machine Learning Hardware Platform Computation Optimisation	微型機器學習硬件平台計算優化

* Funded by the Innovation and Technology Fund
* 創新及科技基金資助