

## RA Ecosystem Partner Solution Macronix ArmorFlash™ Memory



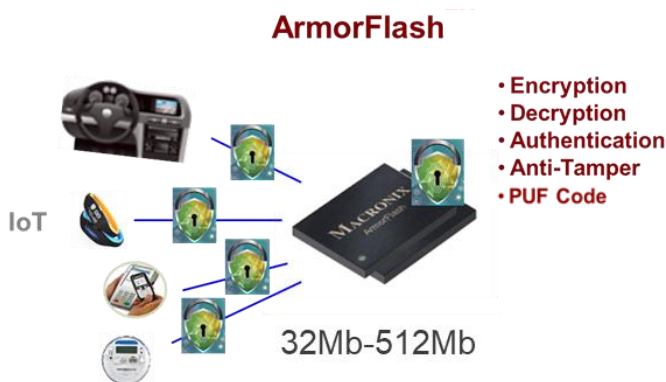
### Solution Summary

ArmorFlash is an ideal secure flash solution for embedded systems. It is built on top of Serial NOR flash by providing a secure ID, authentication, and an encrypted link to protect valuable data stored in it. ArmorFlash offers a physical unclonable function (PUF) that makes use of a semiconductor's biometrics, which are characteristics derived from fabrication that can be used for encoding or identification. These solutions are available for the Renesas [RA family of MCUs](#).

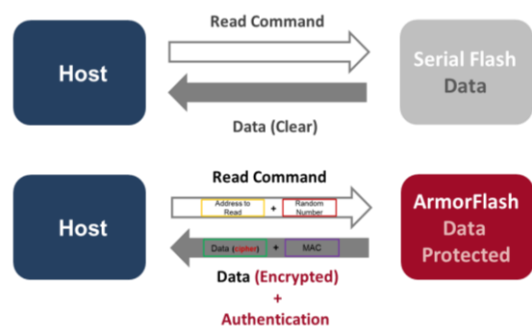
### Performance/Versatility

- Standard SPI/QSPI/OctaBus interface
- Non-volatile monotonic counters
- True random number generator (TRNG)
- PUF support
- Hardware crypto engines
- Symmetric and asymmetric key provision and management
- Secure areas for authentication/encryption/decryption
- Standard areas for authentication

### Diagrams/Graphics



### Serial Flash vs. ArmorFlash Data Flow



### Target Markets and Applications

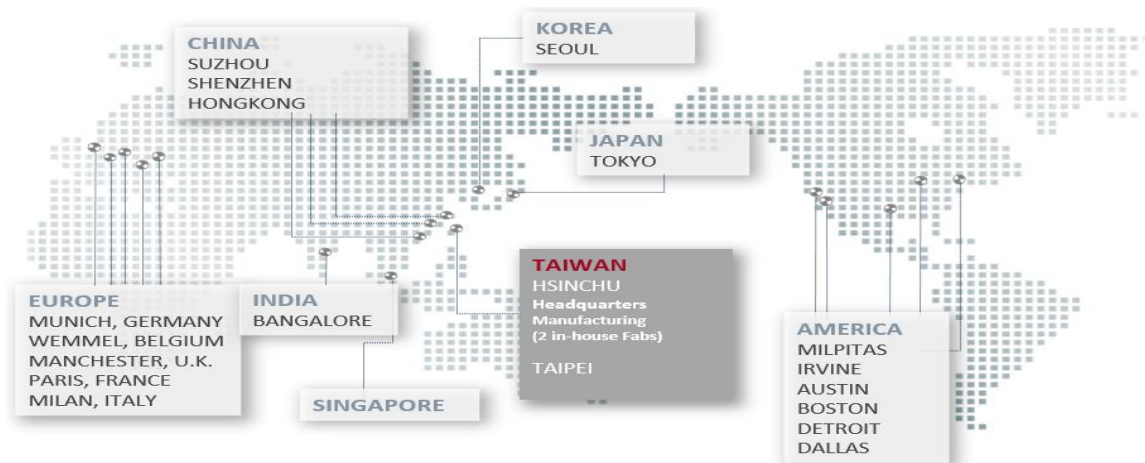
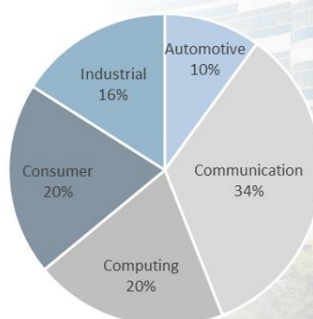
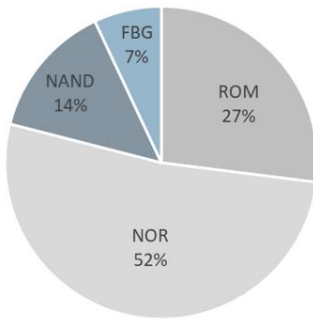
- Transportation
- Energy infrastructure
- Medical instruments and appliances
- Cellular network
- Enterprise and data centers
- Industrial 4.0
- Connected vehicles
- Secure data storage for embedded systems
- Secure flash for firmware storage and updates
- Root key storage on server platforms
- Trusted storage for automotive
- Unique identification for IoT, RoT



# Macronix at a Glance

- 1989**      Founded in Taiwan
- 8,800+**      Patents Granted ( ~Aug, 2022)
- US\$ 1,805Million**      2021 Revenue
- 4,000+ (22% in R&D)**      Employees Worldwide
- 2 in-house Fabs**      Complete In- house Wafer Manufacturing
  - 200mm Fab: NOR ~50K
  - 300mm Fab: NOR/NAND ~50K Design Capacity (wafer/month)

## 2021 Revenue by Products | 2021 Flash Revenue by Applications



<b>Security</b>	<b>LybraFlash</b>	<b>High Performance</b>	<b>Low Power</b>
<b>ArmorFlash</b>	<b>LybraFlash</b>	<b>OctaBus Memory</b>	<b>Ultra Low Power</b>
<ul style="list-style-type: none"> <li>AEC-Q100 Compliant</li> <li>NIST Cryptographic Algorithm Validation Program</li> </ul>	<ul style="list-style-type: none"> <li>High Reliability &amp; Longevity</li> <li>The Optimum Solution for Gigabit Flash Memory</li> </ul>	<ul style="list-style-type: none"> <li>Extreme Speed: 250 MHz with 500 MB/s</li> <li>Power "Instant-on" GUI Application</li> </ul>	<ul style="list-style-type: none"> <li>Wide Range Vcc 1.65 – 3.6V</li> <li>Ultra Low Vcc 1.2 V</li> <li>Power Saving &amp; Simple System Design</li> </ul>

Contact us : [Customer Feedback \(mxic.com.tw\)](mailto:Customer Feedback (mxic.com.tw))