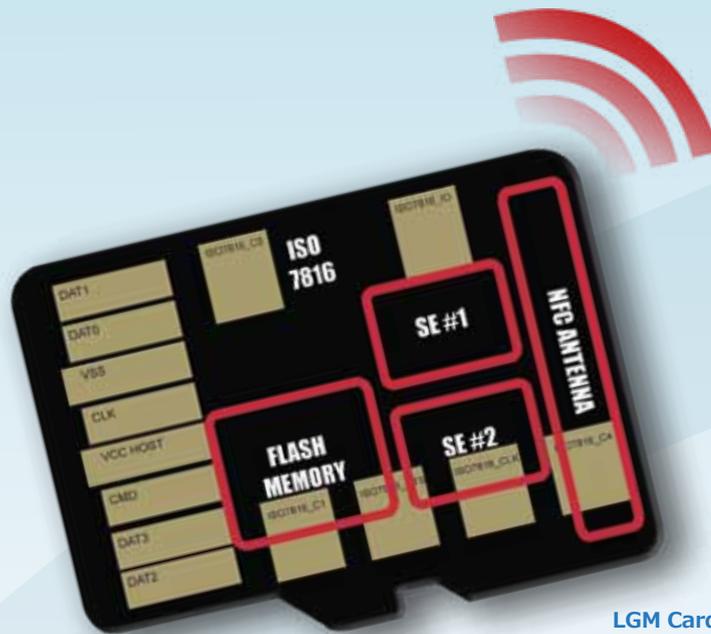# LGM Card

A standard size MicroSD memory card with built-in NFC antenna and two secure chips

LGM Card is a memory card with unique features: built-in high performance NFC antenna perfectly working under metal covers; two payment chips; and ISO 7816 contacts on its surface enabling to use existing personalization devices and processes during secure chips personalization.

LGM Card - Mobile payment product

Unique features

Miniature NFC antenna

Unique construction and electrical principle of the antenna generate strong enough radiation that overcomes limits of metal covers and have a great performance even in complicated electrical environments.

- *Convenient contactless services are independent of the phone model or phone orientation with respect to a contactless reader*
- *Huge immediately addressable base – globally over 4 billion users*

Two independent secure chips

LGM Card contains two secure chips (SE) with independent keys and independent control of these keys by issuer. Issuers can choose (after feasibility) type of SE used in LGM Card.

- *Tamper resistant secure solution fully under issuer control*
- *Co-operative models*
- *Proprietary micropayments*

ISO 7816 contacts

ISO 7816 contacts are placed on the surface of the LGM Card.

- *No investment into TSM*

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Applications

LGM Card offers **a variety of proximity and remote application solutions with tamper resistant security and SE under issuer's control:**

- Payments - EMV and close-loop

- Transit – Mifare DESFire

- Secure access

- Storing secure data, e.g. eID, medical records

- Loyalty cards

High performance embedded NFC antenna enables to **deliver all these applications immediately to billions of potential users** who will insert LGM Card into the MicroSD slot of their phones (not need to be smart phones). Two embedded secure chips open **variety of partnerships** while each partner might control his own business (secure chip).

We provide Mobile API and documentation for **fast market deployment**. LGM Card Mobile API supports main platforms, including Android, Symbian and Java and it is opened for any third party system solution, including HCE or TSM. Service providers can add their own secure services.

Mobile Payments

EMV contactless payments

Certification of LGM Card as MasterCard and Visa payment product is being prepared. Issuer can issue it as debit, credit or pre-paid card and offer contactless and Internet card-based payments using traditionally secure payments infrastructures; without investing into HCE or TSM.

EMV remote payments

Issuing bank can allow Internet payments using CVC/CVV code and/or the secure chip of LGM Card can store card ID for seamless authentication of users paying on the Internet.

LGM Card proprietary micropayments

In regions without payment and Internet infrastructures LGM Card is an ideal solution how to enable EMV based micropayments to in-store merchants.

Close-loop payments and loyalty programs

With its two embedded secure chips LGM Card can be used both for EMV and close-loop payments connected with merchant loyalty programs.

Transit

Secure chip of LGM Card can store transit application using close-loop wallet or EMV based payments. In this solution LGM Card is delivered also with secure chip supporting MIFARE DESFire. With LGM Card in their phones customers tap their phones to fare gates or speed-passes for highway tolls.

Secure Access and secure Applications

Physical secure chips of LGM Card can store mobile eID, tokens or generate One time password (OTP) for seamless access to Internet banking, clouds, to governmental servers; or to control access to buildings, cars, print devices etc. Customer taps his mobile phone with inserted LGM Card to any NFC enabled object while access is allowed only to authenticated persons.

Adding security to HCE

LGM Card can be used also in NFC-enabled phones with Android. Issuers and developers can add security while storing secure keys or tokens inside secure chip of LGM Card, thus eliminating unsafe cloud environment. HCE providers can add their own secure services to avoid malicious attacks.

Governmental projects

Personal sensitive data, e.g. eID, healthcare records, social card records, tax ID numbers etc. are stored on a physical secure chip and the whole solution is provided under specific certification. Application providers can move their existing certified solutions into mobile phones using LGM Card.

LGM Card Life cycle

Personalization of secure chip(s)

There are more ways of how secure chips of LGM Card can be personalized:

- **Contact personalization** needs MicroSD card embedded on a plastic carrier (see the picture). ISO 7816 contacts on the LGM Card's surface are exactly in the same position as they are on a common plastic chip payment card. EMV contact personalization of both two SEs is possible on common personalization devices. This can save costs for TSM personalization.

- **Contactless personalization** is done on a contactless reader connected to PC. MicroSD card has to be inserted in a mobile phone.

- **OTI personalization** uses TSM or Over the Internet (OTI).

LGM Card life cycle management (TwinStep)

Current contactless POS terminals and readers can be used to activate newly supported applications on LGM Cards that have already been issued and distributed to customers. Alternatively current contactless POS terminals and readers can be updated to support so called TwinStep. TwinStep can update card data or reset offline counters in a contactless way.

Using contact personalization and TwinStep for contactless life cycle management enables LGM Card issuers' to stay independent from expensive TSM services.

Summary

With LGM Card your secure mobile solutions immediately reach billions of customers, you can stay independent from mobile operators or phone vendors, you extend your revenue streams and eliminate costs for TSM services. You can choose partners or stay centric and provide your customers with easy, secure and convenient mobile payments, secure access, mobile eID, loyalty and various other solutions on just one MicroSD card.

Technical Characteristics

Form factor	- MicroSD card, Class 10, fully compliant with SD Card Association specifications
Flash controller	- 32-bit RICS microprocessor
Flash memory	- 19nm TSB NAND, 4 or 8 GB (samples for pilot projects) - 19nm TSB NAND, 16 GB
Secure chip#1	- NXP J5C145, JCOP 2.4.2 R1, 144KB EEPROM memory, MIFARE FleX (4K) - Security certification: Common Criteria CC EAL5+ - Applets: MasterCard (MMPP), VISA(VMPA), MIFARE4Mobile (M4M)
Secure chip#2 (alternatives)	- Alt.1: NXP J5C145, JCOP 2.4.2 R1, 144KB EEPROM memory, MIFARE FleX (4K) - Alt.2: NXP J5D081, JCOP 2.4.2 R2, 80KB EEPROM memory, MIFARE DESFire EV1 8K
NFC antenna	- Unique, patented design - ISO 14443A - Compliant with MIFARE™
Interfaces	- SD - ISO 14443A - ISO 7816