Near Field Communication (NFC)

Nearly a decade since it was first introduced, Near Field Communication (NFC) is entering the consumer technology mass market. It will soon be available on hundreds of millions of smart phones and personal mobile devices. NFC is about to revolutionize everyday activities bringing a new era of connectivity into our daily life.

Based on Radio Frequency (RF) technology at 13.56MHz, NFC provides a short-range up to 10cm wireless data connection to mobile devices. By using this new capability on existing infrastructures, the NFC enabled device is then able to support services designed for contactless cards: ticketing, payment, loyalty programs. In addition, NFC offers new functions such as the reading of NFC tags, validation of transactions and Peer-to-Peer communication.

NFC raises the bar for security, performance and convenience for the smart card industry.

Information exchange applications, such as “smart” posters, operate in a relatively open manner. Many other applications, in particular those described as electronic wallet functions, utilize information that users want to keep private. In fact, the trust of the consumer that their personal data and financial transactions are protected will be critical to wide market success for NFC.

Infineon, Your partner of choice for your NFC solution

As member of the NFC Forum and other NFC-relevant standardization bodies, we drive actively the NFC market development. Thanks to our Security Leadership and Contactless Excellence, we contribute today to the emerging NFC market with an exceptionally broad and innovative portfolio supporting all NFC applications and business models.

Since the NFC RF communication functionality is to be integrated by the wireless chipset industry in their combo-devices (Bluetooth, IR, ...), we focus on security chips used to protect sensitive information from exposure, as well as RFID chips used in NFC Tags, important in the roll out of the NFC technology. We designed products to meet the security and the performance required by the challenging requirements of NFC.

We achieve the required security level to support efficiently the different solutions from the NFC SIM to the embedded Secure Elements which requires long term security. Our secure microcontrollers are certified according to the Common Criteria and EMVCo international standards. Dedicated ones feature the award-winning security technology Integrity Guard, ensuring robust protection of sensitive payment and authentication data. The security technology Integrity Guard bundles several highly sophisticated digital security mechanisms to cover a vast range of potential attacks.

Our entire portfolio is designed to deliver the highest performance of the chosen solution (SIM, microSD, Dual Interface, ...) crucial to the success of NFC applications. Widespread market penetration of NFC relies on customer experience. And the consumer expects that communications and transactions will be processed quickly, reliably and intuitively.

We support NFC Systems based on open standards such as CIPURSE™ from the OSPT Alliance. The CIPURSE™ system will ease the deployment of NFC solutions to be used in ticketing and transport applications. It operates on standard infrastructures and does not require specific terminal and specific TSM management. CIPURSE™ offers a clear and transparent licensing scheme for the NFC Stakeholders and users.

www.infineon.com/nfc
A Unique and Complete NFC Product Portfolio

<table>
<thead>
<tr>
<th>Secure Elements</th>
<th>NFC SIM</th>
<th>Embedded SE</th>
<th>Solutions with Flexible Antenna</th>
<th>NFC MicroSD™</th>
</tr>
</thead>
<tbody>
<tr>
<td>SWP Product</td>
<td>✔</td>
<td>✔</td>
<td>Possibility to package together a NFC Modem and a SWP/DCLB chip into a MicroSD</td>
<td></td>
</tr>
<tr>
<td>DCLB Product</td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dual Interface Product</td>
<td>Boosted NFC SIM Card</td>
<td>✔</td>
<td>✔</td>
<td>Boosted NFC MicroSD™ Card</td>
</tr>
</tbody>
</table>

**SWP Secure Elements**
Since 2007, the Single Wire Protocol (SWP) interface is the standard interface connection between the UICC/SIM and the CLF (ContactLess Frontend) modem within NFC-enabled mobile devices. Infineon’s SLE 97 SOLID FLASH™ Family is the state-of-the-art product generation, for high performance security chip cards supporting the SWP interface. The SLE 97 family is provided in various form factors, addressing besides SIM/UICC Secure Elements also embedded a swall as MicroSD Secure Elements. The SLE 97 products implement a 32-bit CPU based on the SecurCore® SC300™ from ARM, enhanced by Infineon’s Cache and Security Technology. They offer a wide range of peripherals, including powerful processors for the cryptographic algorithms RSA and 3DES used in payment transactions. Furthermore they offer AES cryptography, which is used for instance in CIPURSE™, the open standard for public transport. In addition to ISO/IEC 7816 and SWP, the following communication interfaces are also available to support all implementations of NFC Secure Elements: SPI, I²C and GPIOs.

**DCLB Secure Elements**
The Digital ContactLess Bridge (DCLB) is an open connectivity interface optimized for embedded Secure Element implementations, available on products of the SLE 78 family. Incorporating Infineon’s award digital security technology “Integrity Guard” with fully encrypted data path, the SLE 78 with DCLB Interface are the ideal solution for a standalone Secure Element for embedded solutions. Products using the DCLB interface can be combined with NFC modems from various suppliers.

**Dual Interface Secure Elements**
The Infineon SOLID FLASH™ Dual Interface (DI) Security Controllers, such as the SLE 78 Family, are highly secure controllers supporting the simultaneous communication of both contact based and contact-less interfaces; compared to typical controllers that actually support only one interface at a time (e.g., contact-less only for paying, contact-based only for usage at a bank terminal). Combined with an integrated antenna and booster chip (e.g. MicroSD) or with a flexible antenna (e.g. SIMpass™), the Infineon SOLID FLASH™ DI Controllers support secure NFC applications. These controllers also incorporate Integrity Guard. With the DI SIM solution, secure NFC payment can be immediately enabled on any handset. Furthermore, the Boosted NFC Secure Element, a derivative of the Dual Interface Secure Controller family, can be used on small form factor devices to overcome the limitations of integrated micro-antennas. This solution can significantly increase contactless communication capability.

**RFID Chips for NFC Tags**
With my-d™ move NFC and my-d™ NFC, we provide a broad range of NFC Forum™ Type 2 Tag Operation ICs ideally suited for open NFC applications like device pairing, information sharing, sticker and smart poster reading.

---

**Published by**
Infineon Technologies AG
85579 Neubiberg, Germany
© 2013 Infineon Technologies AG.
All Rights Reserved.
Visit us: www.infineon.com

**Order Number:** B189-H9665-G4-X-7600
**Date:** 09 / 2013

**Attention please!**
The information given in this document shall in no event be regarded as a guarantee of conditions or characteristics (“Beschaffenheitsgarantie”). With respect to any examples or hints given herein, any typical values stated herein and/or any information regarding the application of the device, Infineon Technologies hereby disclaims any and all warranties and liabilities of any kind, including without limitation warranties of non-infringement of intellectual property rights of any third party.

**Information**
For further information on technology, delivery terms and conditions and prices please contact your nearest Infineon Technologies Office (www.infineon.com).

**Warnings**
Due to technical requirements components may contain dangerous substances. For information on the types in question please contact your nearest Infineon Technologies Office. Infineon Technologies Components may only be used in life-support devices or systems with the express written approval of Infineon Technologies, if a failure of such components can reasonably be expected to cause the failure of that life-support device or system, or to affect the safety or effectiveness of that device or system. Life support devices or systems are intended to be implanted in the human body, or to support and/or maintain and sustain and/or protect human life. If they fail, it is reasonable to assume that the health of the user or other persons may be endangered.