

# Telenor Connexion eSIM

## – for integrated industrial M2M and telematics communication

**Telenor Connexion eSIM is a patented SIM-solution tailored for integrated communications in industrialised environments such as vehicles and machines.**

By using the eSIM you will benefit from three main important aspects when moving into large-scale M2M/telematics solutions:

- Improved SIM reliability in harsh environments
- Improved assembly efficiency for industrial large-scale production
- Smaller footprint – design efficiency

### **Efficient assembly**

*As M2M communications are becoming more and more standardised, efficient production and assembly becomes critical.*

The eSIM can be used in standard pick & place machines, thereby eliminating the manual assembly processes common when handling ordinary SIM-cards.

### **Industrial reliability**

*Business critical applications integrated in vehicles and machines must work at all times. M2M/telematics applications in remote and harsh environments place new and higher demands on SIM reliability over many years.*



The eSIM is a surface mounted SIM, directly soldered to the circuit board and thereby eliminating the mechanical interface connector of an ordinary SIM.

The SMD chip packaging is designed to withstand environmental factors such as high temperatures, vibration, shock, humidity and corrosion.

### **Design efficiency**

*Everything is getting smaller and the design of traditional SIM-cards is simply not fit for the future integrated industrial communication solutions.*

The eSIM reduces the space needed by up to 90%, compared with the traditional SIM + holder.

All together, Telenor Connexion eSIM will help your business improve your product quality, reliability and cut costs – all necessities for a successful M2M/telematics deployment.

### **For more information**

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# Technical information

## General Features – Infineon VQFN8 chip card

- 16-bit microcomputer in 0.13  $\mu\text{m}$  CMOS technology with 24-bit linear addressing
- Highly efficient instruction set based on an 80251 type architecture
- Up to 16 Mbytes linear address space (each level)
- 68 bytes register file with 11 double word, 16 word and 16 byte registers
- Defined migration path from SLE50PE products with minimized customer effort based on an adapted tool set
- SW compatible with SLE76P
- Dedicated, 80251-based architecture implementation with an execution time faster than a standard 80251
- 360 kBytes E<sup>2</sup>PROM with full E<sup>2</sup>PROM functionality and free partitioning between code and data
- 8 kBytes RAM
- 1 kByte unified cache for code and data
- Symmetric Crypto Processor (SCP) for triple-key, triple-DES and AES acceleration (128, 192 and 256-bit)
- External Clock frequency 1 up to 10 MHz
- Internal Clock with up to 33 MHz: Programmable internal frequency (PLL x1...x8 and free running mode).
- Adjustable internal frequency according to available power or required performance

- Two 16-bit Autoreload Timers and Watch Dog Timer
- Power-saving sleep mode
- Enhanced UART for handling serial interface in accordance with ISO/IEC 7816 part 3 supporting transmission protocols T=1 and T=0 (support of clock division factor of 8)
- Improved CRC module with loadable initialization vector (developed according to ISO/IEC 3309 supporting CCIT v.41 & HDLC X25)
- Supply voltage range: 1.62 V to 5.5 V

## Supported standards

- ISO/IEC 7816
- GSM 11.11, 11.12, 11.18
- ETSI TS 102 221
- ETSI TS16949 Automotive standard
- JESD22-A101
- JESD22-B103
- Support of current consumption limits:
  - < 10 mA @ 5.5 V
  - < 6 mA @ 3.3 V
  - < 4 mA @ 1.98 V
- Operating temperature range: -40 to +105°C
- Storing temperature range: - 40° to +125°C
- ESD protection larger than 4 kV (HBM)

## E<sup>2</sup>PROM technology

- Typical programming time (erase & write) = 2.3 ms without firmware
- Fast personalization mode = 1 ms per page without firmware
- Flexible page mode for 1 to 128 bytes write/erase operation for the whole NVM size
- 32 bits security area (PROM)
- Minimum of 500.000 write/erase cycles @ 25°C per page
- E<sup>2</sup>PROM programming voltage generated on chip
- Flash Loader concept
- High speed flash download for fast personalization (10s / 512k)
- Flash upload service by Infineon (optional)

## Additional features tailored for machine-to-machine (M2M) applications

- Extended temperature range -40 to +105°C
- Vibration Variable Frequency (VVF) according to JESD22-B103
- Temperature Humidity Bias (THB) according to JESD22-A101 Humidity
- Advanced E<sup>2</sup>PROM technology
  - Typical 500.000 write/erase cycles @ 105°C per page
  - Typical data retention of 10 years @ 105°C