# ST32H480

Data brief



# Smartcard microcontroller with a 32-bit ARM<sup>®</sup> SC000<sup>™</sup> CPU and 480 Kbytes of high-density Flash memory

# Wafer D18 micromodule

## **Features**

#### Hardware features

- ARM<sup>®</sup> SecurCore<sup>®</sup> SC000<sup>™</sup> 32-bit RISC core
- 13 Kbytes of user RAM
- 480 Kbytes of user Flash memory:
  - 10-year data retention
  - 100 000 Erase/Write cycles per page
  - Page erase granularity: 512 bytes
  - Block erase granularity: 2 Kbytes
- Asynchronous Receiver Transmitter supporting the ISO/IEC 7816-3 T=0 and T=1 protocols
- Two 16-bit timers with interrupt capability
- Watchdog timer
- 1.8 V and 3 V supply voltage ranges
- External clock frequency from 1 up to 5 MHz •
- High performance provided by the 30 MHz CPU clock frequency
- Current consumption compatible with GSM and ETSI specifications
- Power-saving Standby and Hibernate states
- Contact assignment compatible with ISO 7816-2
- ESD protection:
  - 4 kV (HBM)
  - 1 kV (CDM)

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### Delivery forms:

- D18 micromodules
- Wafers

#### Security features

- Monitoring of environmental parameters
- Protection against faults
- ISO 3309 CRC calculation block .
- True random number generator
- Unique serial number on each die
- Hardware data encryption standard (DES) accelerator

#### Software features

- Flash memory loader •
- Flash memory drivers

#### **Development environment**

- Software development and firmware generation are supported by a comprehensive set of development tools dedicated to software design and validation:
  - C compiler, simulator and emulator

## Applications

Major applications include:

- Mobile communications (GSM, 3G, LTE and CDMA)
- Java Card<sup>™</sup> applications
- Internet of things (IoT)

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For further information contact your local STMicroelectronics sales office.

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## 1 Description

The device is a serial access microcontroller designed for secure mobile applications. It incorporates the most recent generation of ARM processors for embedded systems. Its SecurCore<sup>®</sup> SC000<sup>™</sup> 32-bit RISC core is built on the Cortex<sup>®</sup> M0 core with additional security features to help to protect against advanced forms of attacks. The SC000<sup>™</sup> core brings great performance and excellent code density thanks to the Thumb<sup>®</sup>-2 instruction set. The CPU interfaces with the on-chip RAM, ROM and NVM via a 32-bit internal bus.

The high-speed, 480-Kbyte, embedded Flash memory introduces more flexibility to the system.

The device also offers a serial communication interface fully compatible with the ISO 7816-3 standard (T=0, T=1) for smartcard applications. In addition, it includes two general-purpose 16-bit timers, an ISO 3309 CRC calculation block and a watchdog timer. Finally, it has a hardware Data Encryption Standard (DES) accelerator that the user can use to optimize the application performance.

The device operates in the -25 to +85 °C temperature range, and the 1.8 V and 3 V supply voltage ranges. A comprehensive range of power-saving modes enables the design of efficient low-power applications.

The device is delivered in D18 micromodules. It is also available in wafers.









Figure 1. Device block diagram

## 1.1 Software development tool description

Dedicated ARM<sup>®</sup> SecurCore<sup>®</sup> SC000<sup>™</sup> software development tools are provided by ARM and Keil<sup>®</sup>. This includes the Instruction Set Simulator (ISS) and C compiler. The documentation is available on the ARM and Keil websites.

Moreover, STMicroelectronics provide:

- A time-accurate hardware emulator controlled by the Keil debugger and the ST development environment.
- A complete product simulator based on Keil's ISS simulator for the ARM SecurCore SC000 CPU.
- A ROMed Flash memory loader with very high-speed software downloading capabilities.



# 2 Ordering information

Example:	ST32	Н	480	T	18	А	XXX
Device type ST32 = ARM <sup>®</sup> SecurCore <sup>®</sup> SC000™ CF	PU platform						
Technology							
H = 40-nm Flash memory		]					
Memory size (NVM)							
480 = 480 Kbytes							
Device option							
Reserved							
Delivery form							
18 = D18 micromodule							
W6 = Wafer							
External hardware revision							
A							
Chameleon code							
XXX							

Note: Not all combinations are necessarily available. For a list of available options (speed, package, etc.) or for further information on any aspect of this device, please contact your nearest STMicroelectronics sales office.



# 3 Revision history

Date	Revision	Changes
07-Feb-2017	1	Initial release.



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