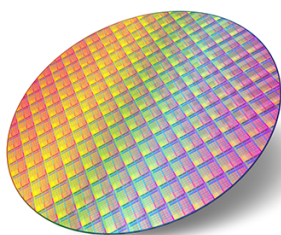
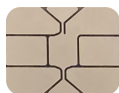


## Smartcard microcontroller with 32-bit SecurCore®SC000™ CPU and 480 Kbytes of high-density flash memory



Sawn/unsawn wafers



D19 micromodule



8-pin UFDFPN  
(2 × 3 mm)

### Product status link

[ST32H480S0](#)

## Features

### Hardware features

- Arm® SecurCore® SC000™ 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 of 1 up to 5 MHz
- High performance provided by the 32 MHz CPU clock frequency
- Current consumption compatible with GSM and ETSI specifications
- Power-saving Standby and Hibernate states
- Contact assignment compatible ISO 7816-2
- ESD protection:
  - 4 kV (HBM)
  - 1 kV (CDM)
- Delivery forms:
  - ECOPACK-compliant sawn/unsawn wafers
  - ECOPACK-compliant 8-pin UFDFPN (2 × 3 mm) packages
  - D19 micromodules

### 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<sup>®</sup> Card applications
- IoT

## 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® SC000™ 32-bit RISC core is built on the Cortex® M0 core with additional security features to help to protect against advanced forms of attacks. The SC000™ core brings great performance and excellent code density thanks to the Thumb®-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 gives 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.

Two general-purpose 16-bit timers, an ISO 3309 CRC calculation block and a watchdog timer are available.

A hardware Data Encryption Standard (DES) accelerator can be used by the user to optimize the application performance.

The device operates in the –25 to +85 °C temperature range and 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 sawn or unsawn wafers, 8-pin UDFPN (2 × 3 mm) packages and D19 micromodules.

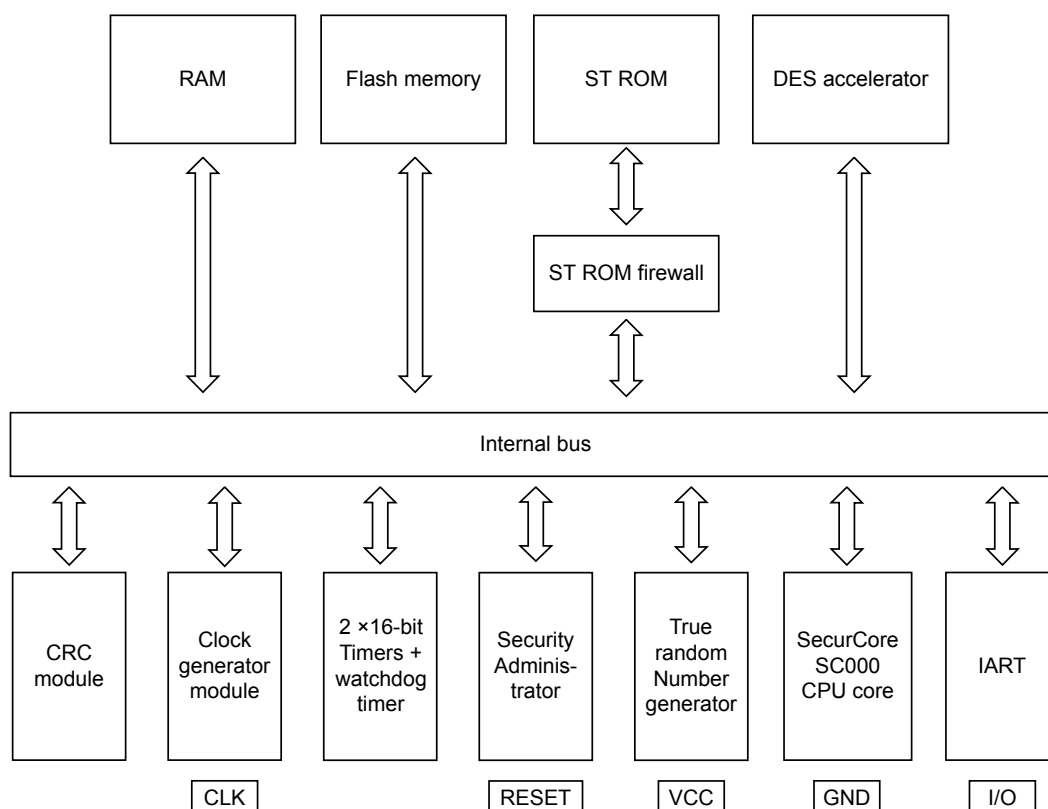
In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK packages, depending on their level of environmental compliance. ECOPACK specifications, grade definitions and product status are available at: [www.st.com](http://www.st.com). ECOPACK is an ST trademark.

**Note:** Arm is a registered trademark of Arm Limited (or its subsidiaries) in the US and/or elsewhere.

arm



**Figure 1. ST32H480S0 device block diagram**



## 1.1 Software development tool description

Dedicated SecurCore® SC000™ software development tools are provided by Arm® and Keil®. This includes the instruction set simulator (ISS) and C compiler. The documentation is available from the Arm and Keil websites.

Moreover, STMicroelectronics provides:

- 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 capability.

## 2 Ordering information

Example:	ST32	H	480	S0	0N	B	ABC						
<b>Device type</b>	ST32 = Arm® SecurCore® SC000™ CPU platform												
<b>Product family</b>													
H = 40-nm Flash memory													
<b>Memory size (NVM)</b>	480 = 480 Kbytes												
<b>Device option</b>													
S0													
<b>Delivery form</b>	0N = Unsawn wafer 54 = Sawn wafer 19 = D19 micromodule F2 = 8-pin (2 × 3 mm)												
<b>Product external revision</b>	A = Revision 1 B = Revision 2												
<b>Customer authentication</b>	ABC = External firmware revision and customer identification												

**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.

## Revision history

**Table 1. Document revision history**

Date	Revision	Changes
01-Aug-2023	1	Initial release.
15-Jul-2024	2	Change in publication scope.

## Contents

<b>1</b>	<b>Description</b>	<b>3</b>
1.1	Software development tool description	4
<b>2</b>	<b>Ordering information</b>	<b>5</b>
	<b>Revision history</b>	<b>6</b>
	<b>List of figures</b>	<b>8</b>
	<b>List of tables</b>	<b>9</b>

## List of figures

<b>Figure 1.</b>	ST32H480S0 device block diagram . . . . .	3
------------------	---	---





## List of tables

Table 1.	Document revision history . . . . .	6
----------	-------------------------------------	---

**IMPORTANT NOTICE – READ CAREFULLY**

STMicroelectronics NV and its subsidiaries ("ST") reserve the right to make changes, corrections, enhancements, modifications, and improvements to ST products and/or to this document at any time without notice. Purchasers should obtain the latest relevant information on ST products before placing orders. ST products are sold pursuant to ST's terms and conditions of sale in place at the time of order acknowledgment.

Purchasers are solely responsible for the choice, selection, and use of ST products and ST assumes no liability for application assistance or the design of purchasers' products.

No license, express or implied, to any intellectual property right is granted by ST herein.

Resale of ST products with provisions different from the information set forth herein shall void any warranty granted by ST for such product.

ST and the ST logo are trademarks of ST. For additional information about ST trademarks, refer to [www.st.com/trademarks](http://www.st.com/trademarks). All other product or service names are the property of their respective owners.

Information in this document supersedes and replaces information previously supplied in any prior versions of this document.

© 2024 STMicroelectronics – All rights reserved