



CONTACTLESS ISO 14443-B SAFEGUARDED Smartcard IC WITH 576 Bytes EEPROM

DATA BRIEF

- 8-BIT ARCHITECTURE CPU
- 8 KBytes of USER ROM, SECTOR COMBINATIVE
- SYSTEM ROM
- 192 Bytes of RAM
- 576 Bytes of EEPROM, SECTOR COMBINATIVE
 - Highly reliable CMOS EEPROM technology
 - 10 year data retention
 - 300,000 Erase/Write cycle endurance
 - Protected One Time Programmable block (32 or 64 bytes)
 - 1 to 16 bytes block Erase or Write in single cycle programming
- POWER SAVING STANDBY MODE
- VERY HIGH SECURITY FEATURES INCLUDING EEPROM FLASH ERASE
- ESD PROTECTION GREATER THAN 4000V
- 2 OPERATING CONFIGURATIONS
 - ISSUER
 - USER
- UNIQUE SERIAL NUMBER ON EACH DIE

CONTACTLESS SPECIFIC FEATURES

- ISO 14443 TYPE B COMPLIANT
- 13.56 MHZ OPERATION
- NOMINAL 106 KBIT/S DATA TRANSFER
- 10% AMPLITUDE MODULATION RECEPTION (READER TO CARD)
- BPSK-NRZ-L LOAD MODULATION CARD TO READER
- 3V OPERATION
- MORE THAN 1,000,000 RF CYCLES ENDURANCE

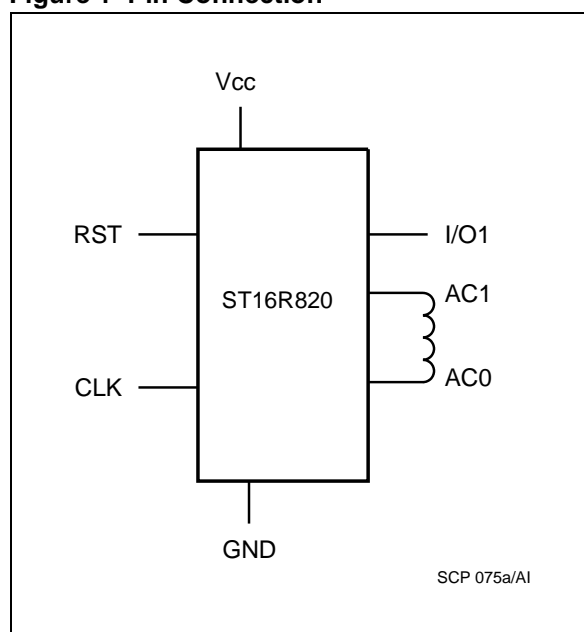
CONTACT SPECIFIC FEATURES

- EXTENDED VOLTAGE OPERATION, V_{cc} Range: 2.7V to 5.5V
- SERIAL ACCESS, ISO 7816-3 COMPATIBLE
- UP TO 5 MHz INTERNAL OPERATING FREQUENCY
- CONTACT ASSIGNMENT COMPATIBLE ISO 7816-2

Table 1 Contact mode

CLK	Clock
RST	Reset
I/O1	Data Input/Output
VCC	Supply Voltage
GND	Ground
AC1	Antenna coil
AC0	Antenna coil

Figure 1 Pin Connection



INTRODUCTION

The ST16R820, a member of the standard ST16 device family, is a serial access microcontroller specially designed for high volume contactless/contact Smartcard applications.

The ST16R820 is based on 8-bit CPU core and includes on chip memories: 192 Bytes of RAM, 8 KBytes of USER ROM, a SYSTEM ROM, and 576 Bytes of EEPROM.

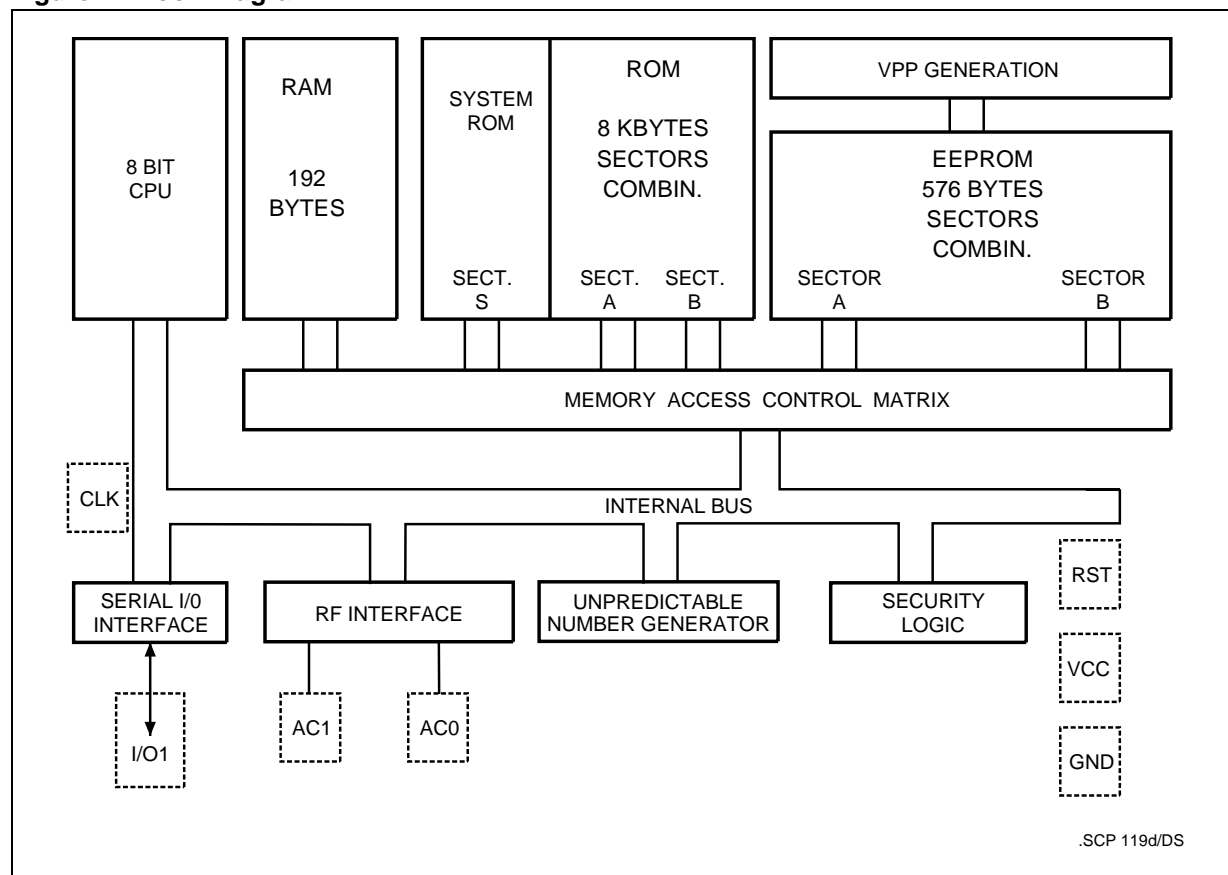
Both ROM and EEPROM memories can be configured into two sectors. Access rules from any memory section or sector to any other are set-up

by the User's defined Memory Access Control Matrix (MACM).

Reliability data related to the ST16R820 product, manufactured using STMicroelectronics' advanced CMOS EEPROM technology, confirm data retention of up to 10 years and endurance up to 300,000 Erase/Write cycles.

Contact / contactless operations are fully compatible with the ISO standards for Smartcard applications.

Figure 2 Block Diagram



Information furnished is believed to be accurate and reliable. However, STMicroelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of STMicroelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. STMicroelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of STMicroelectronics.

The ST logo is a registered trademark of STMicroelectronics.
All other names are the property of their respective owners.

© 2000 STMicroelectronics - All rights reserved
BULL CP8 Patents

STMicroelectronics GROUP OF COMPANIES
Australia - Belgium - Brazil - Canada - China - Czech Republic - Finland - France - Germany -
Hong Kong - India - Israel - Italy - Japan - Malaysia - Malta - Morocco - Singapore -
Spain - Sweden - Switzerland - United Kingdom - United States
www.st.com