



## NXP 1024 x 8-bit CMOS EEPROM PCA24S08 with access protection

# Pin-for-pin replacement for 24C08 serial EEPROM with access protection

Programmable access protection limits reads or writes for each block, for higher reliability and greater data security.

### Key features

- ▶ Non-volatile storage of 8 kbits organized as 8 blocks of 128 bytes each
- ▶ Programmable access protection to limit reads or writes for each block
- ▶ Write operation: byte and 16-byte page write mode
- ▶ Read operation: sequential and random read
- ▶ Self-timed write cycle (5 ms max)
- ▶ I<sup>2</sup>C-bus interface up to 400-kHz clock frequency
- ▶ Operating power supply voltage range of 2.5 to 3.6 V
- ▶ Compatible with existing industry-standard 24C08 serial EEPROM
- ▶ Non-RF replacement of the AT24RF08C asset identification EEPROM
- ▶ High reliability:
  - Ten years non-volatile data-retention time
  - 100,000 write-cycle endurance

### Applications

- ▶ Prevent accidental erasure of specific EEPROM data blocks
- ▶ Prevent read or write access to sensitive information
- ▶ Provide storage of data with a higher level of security

The NXP PCA24S08 is an 8-kbit EEPROM with access permissions, set via the I<sup>2</sup>C-bus, that isolate memory blocks from unauthorized or inadvertent reads or writes. The user sets protection bits that control access to the individual memory blocks and also sets optional sticky bits that prevent the protection bits from changing. The PCA24S08 is pin-compatible with industry-standard 24C08 serial EEPROMs, allowing users to replace existing devices and incorporate this access protection feature during redesign or board respin.

Two hardware pins provide additional control of the EEPROM. When held high, the write protect pin (WP) provides write protection for all standard and access-protection memory. When held low, the  $\overline{\text{PROT}}$  pin disables the device from all operations and resets the sticky bits to permissive, to support changing of the protection bits. The sticky bits are also reset to permissive during the power-on reset cycle.

The PCA24S08 uses five specific I<sup>2</sup>C-bus addresses, four to access the data in the standard memory and one to access the protection and sticky bits in the access-protection memory. All data bytes are received and transmitted via the serial I<sup>2</sup>C-bus and only one PCA24S08 is allowed on the bus.

There are four possible standard-memory addresses and Bits B2 and B1 represent the two most significant bits of the word to be addressed within the standard memory. The address bit that is matched to pin 3 (A2) on a standard 24C08 serial EEPROM is internally connected HIGH so addresses A8h through AFh (hex) are used.

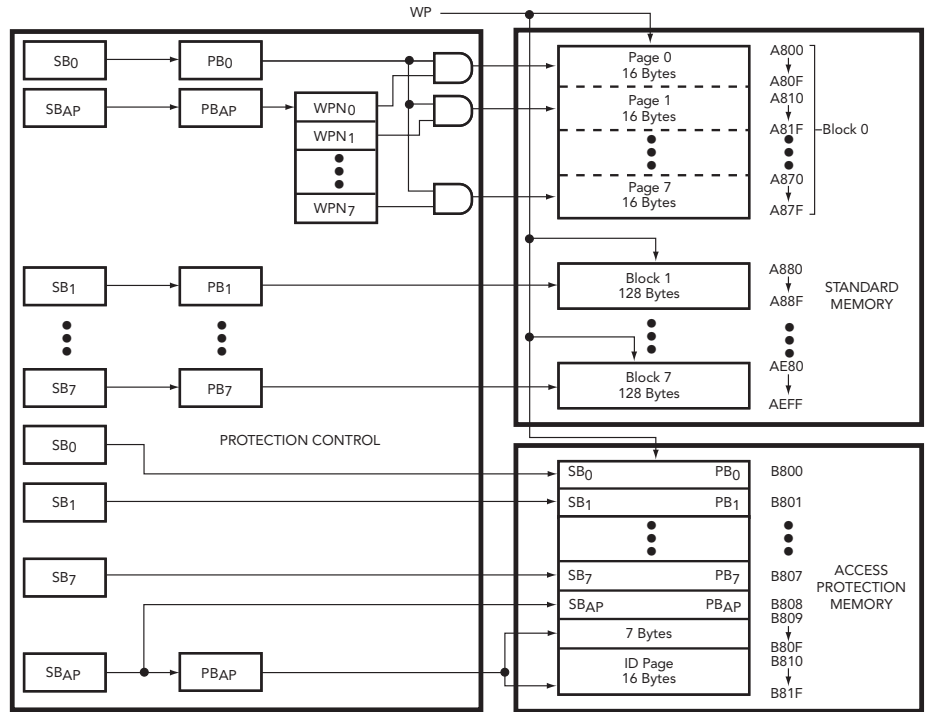
The protection address is set to B8h and used exclusively to communicate with the access-protection memory.

### Access protection

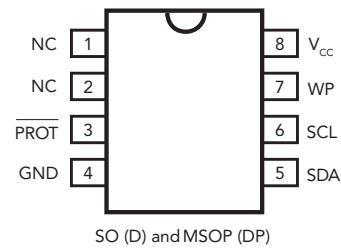
The PCA24S08's standard memory is divided into eight blocks of 1 kbits (128 bytes) and each block is physically organized into eight pages of 128 bits (16 bytes) for a total capacity of 1024 words of eight bits each. In addition to this standard memory, there are two pages of access-protection memory that store the block access protection bits and the device revision ID information. The access protection bit (PB) registers located in the access-protection memory determine what type of accesses will be permitted via the serial port (read/write, read only, or none). Read and write access protection is organized on a page and block basis for block 0, and only on a block basis for blocks 1 through 7. The sticky bit (SB) prevents the protection bits from being changed. The ID value is located on the ID page of the access-protection memory.

Writes to the I<sup>2</sup>C-bus serial interface may include from one to 16 bytes at a time, depending on the protocol followed by the bus master. All page accesses must be properly aligned to the internal EEPROM page.

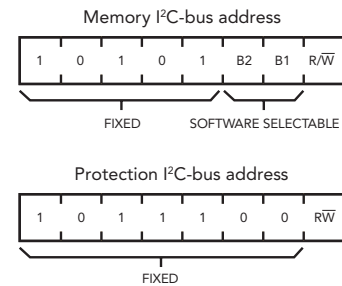
For more information visit [www.nxp.com/i2c](http://www.nxp.com/i2c).



Block diagram of access protection



Pin configuration



### Ordering information

Part number	Container	PCA24S08
SO	Tube Tape and reel	PCA24S08D PCA24S08D-T
MSOP	Tape and reel	PCA24S08DP-T

Note: in Europe/Asia use ,118 instead of -T for tape and reel

