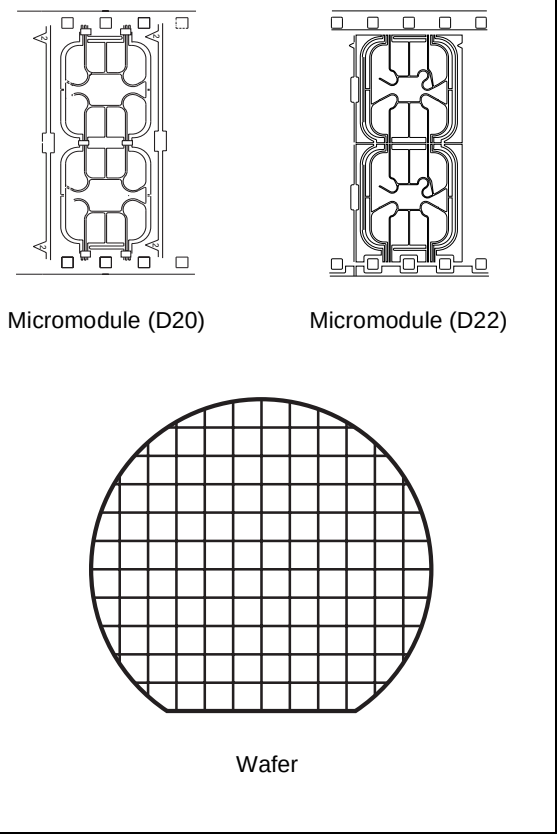
M14C64
M14C32

Memory Card IC
64/32 Kbit Serial I^2C Bus EEPROM

DATA BRIEFING

- Compatible with I^2C Extended Addressing
- Two Wire I^2C Serial Interface
  Supports 400 kHz Protocol
- Single Supply Voltage (2.5 V to 5.5 V)
- Hardware Write Control
- BYTE and PAGE WRITE (up to 32 Bytes)
- BYTE, RANDOM and SEQUENTIAL READ Modes
- Self-Timed Programming Cycle
- Automatic Address Incrementing
- Enhanced ESD/Latch-Up Behaviour
- 1 Million Erase/Write Cycles (minimum)
- 40 Year Data Retention (minimum)
- 5 ms Programming Time (typical)



DESCRIPTION

Each device is an electrically erasable programmable memory (EEPROM) fabricated with STMicroelectronics's High Endurance, Single Polysilicon, CMOS technology. This guarantees an endurance typically well above one million Erase/Write cycles, with a data retention of 40 years. The memory operates with a power supply as low as 2.5 V for the M14Cxx-W version.

The M14C32 is available in wafer form (either sawn or unsawn) and in micromodule form (on film). The M14C64 is available in micro-module

Table 1. Signal Names

SDA	Serial Data/Address Input/ Output
SCL	Serial Clock
$\overline{WC}$	Write Control
V_{CC}	Supply Voltage
GND	Ground

Figure 1. Logic Diagram

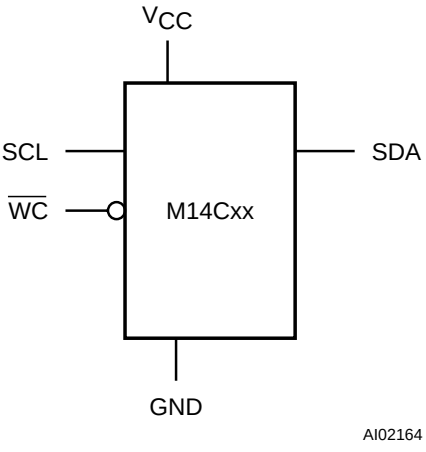


Figure 2. D20 Contact Connections

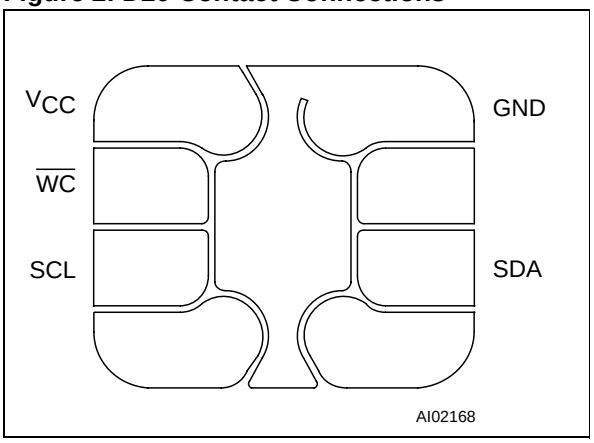
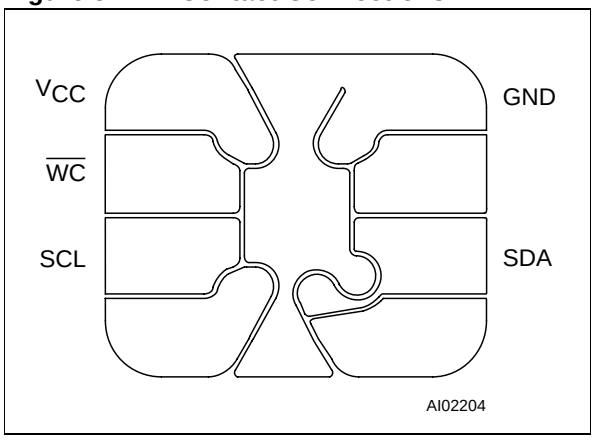


Figure 3. D22 Contact Connections



form only. For availability of the M14C64 in wafer form, please contact your ST sales office.

Each memory is compatible with the I^2C extended memory standard. This is a two wire serial interface that uses a bi-directional data bus and serial clock. The memory carries a built-in 7-bit unique Device Type Identifier code (1010000) in accordance with the I^2C bus definition. Only one memory can be attached to each I^2C bus.

The memory behaves as a slave device in the I^2C protocol, with all memory operations synchronized by the serial clock. Read and write operations are initiated by a START condition, generated by the bus master. The START condition is followed by the Device Select Code which is composed of a stream of 7 bits (1010000), plus one read/write bit (R/$\overline{W}$) and is terminated by an acknowledge bit.

When writing data to the memory, the memory inserts an acknowledge bit during the 9th bit time, following the bus master's 8-bit transmission. When data is read by the bus master, the bus master acknowledges the receipt of the data byte in the same way. Data transfers are terminated by a STOP condition after an Ack for WRITE, and after a NoAck for READ.

Table 2. Ordering Information Scheme

Example 1: M14C64 - W D22

Memory Capacity

64 64 Kbit

32 32 Kbit

Operating Voltage

W 2.5 V to 5.5 V

Delivery Form

D22 Module on Super 35 mm film (M14C64 only)

D20 Module on Super 35 mm film (M14C32 only)

Example 2: M14C32 - W W2

Memory Capacity

32 32 Kbit

Operating Voltage

W 2.5 V to 5.5 V

Delivery Form

W2 Unsawn wafer (275 µm ± 25 µm thickness)

W4 Unsawn wafer (180 µm ± 15 µm thickness)

S2x Sawn wafer (275 µm ± 25 µm thickness)

S4x Sawn wafer (180 µm ± 15 µm thickness)

where “x” indicates the sawing orientation, as follows (and as shown in Figure 4)

1 GND at top right

2 GND at bottom right

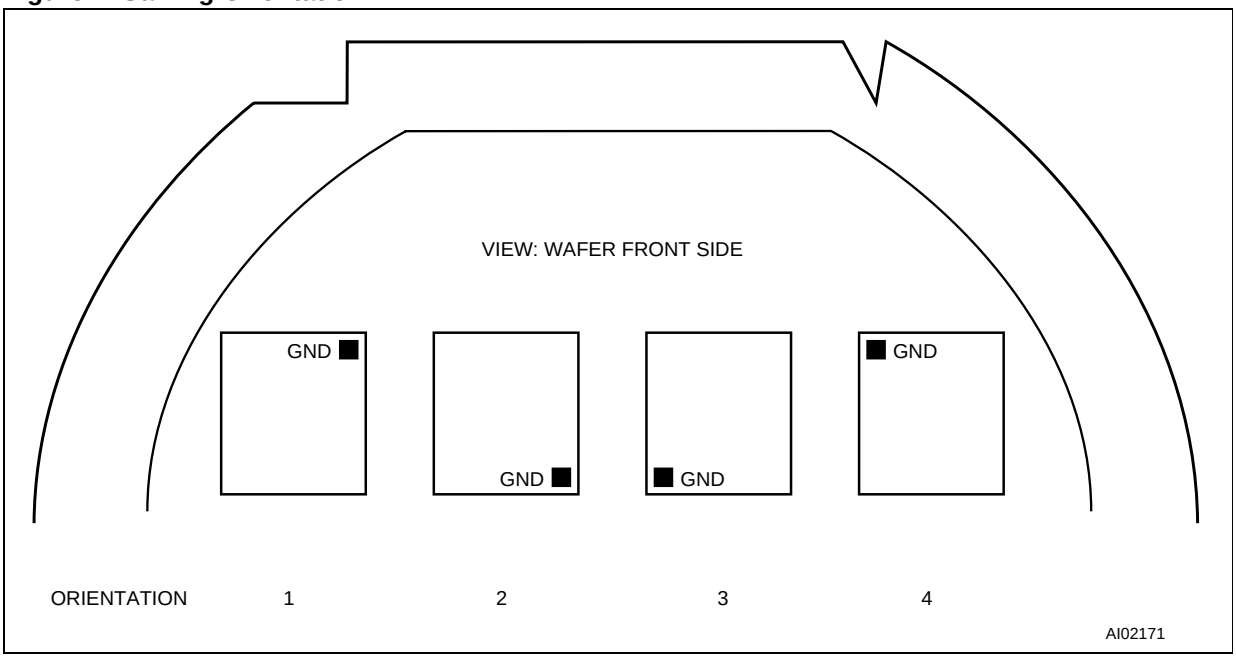
3 GND at bottom left

4 GND at top left

Devices are shipped from the factory with the memory content set at all ‘1’s (FFh).

For a list of available options (speed, package, etc...) or for further information on any aspect of this device, please contact the ST Sales Office nearest to you.

Figure 4. Sawing Orientation



Sawn wafers are scribed and mounted in a frame on adhesive tape. The orientation is defined by the position of the GND pad on the die, viewed with active area of product visible, relative to the notches of the frame (as shown in Figure 4). The orientation of the die with respect to the plastic frame notches is specified by the Customer.

One further concern, when specifying devices to be delivered in this form, is that wafers mounted on adhesive tape must be used within a limited period from the mounting date:

– two months, if wafers are stored at 25°C, 55% relative humidity
– six months, if wafers are stored at 4°C, 55% relative humidity