
2-Wire Serial EEPROM I²C Interface 2K

■ General Description

The FM24C02A is an industrial standard electrically erasable programmable read only memory (EEPROM) device that utilizes the industrial standard 2-wire interface for communications. The FM24C02A contains a memory array of 2K bits (256x8), which is organized in 16-byte per page.

The EEPROM operates in a wide voltage range from 1.7V to 5.5V, which fits most application. The product provides low-power operations and low standby current. The device is offered in Lead-free, RoHs, halogen free or Green package. The available package types are 8-pin SOIC, TSSOP, DFN, MSOP, and SOT-23-5L.

The FM24C02A is compatible to the standard 2-wire bus protocol. The simple bus consists of Serial Clock (SCL) and Serial Data (SDA) signals. Utilizing such bus protocol, a Master device, such as a microcontroller, can usually control one or more Slave devices, alike this FM24C02A. The bit stream over the SDA line includes a series of bytes, which identifies a particular Slave device, an instruction, an address within that Slave device, and a series of data, if appropriate. The FM24C02A also has a Write Protect function via WP pin to cease from overwriting the data stored inside the memory array.

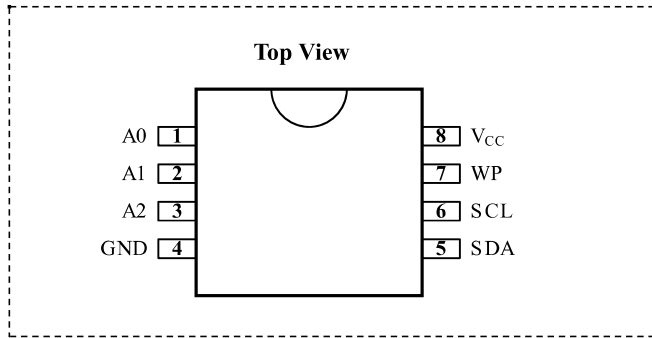
In order to refrain the state machine entering into a wrong state during power-up sequence or a power toggle off-on condition, a power on reset circuit is embedded. During power-up, the device does not respond to any instructions until the supply voltage (VCC) has reached an acceptable stable level above the reset threshold voltage. Once VCC passes the power on reset threshold, the device is reset and enters into the Standby mode. This would also avoid any inadvertent Write operations during power-up stage. During power-down process, the device will enter into standby mode, once VCC drops below the power on reset threshold voltage. In addition, the device will be in standby mode after receiving the Stop command, provided that no internal write operation is in progress. Nevertheless, it is not recommended to send a command until the VCC reaches its operating level.

■ Features

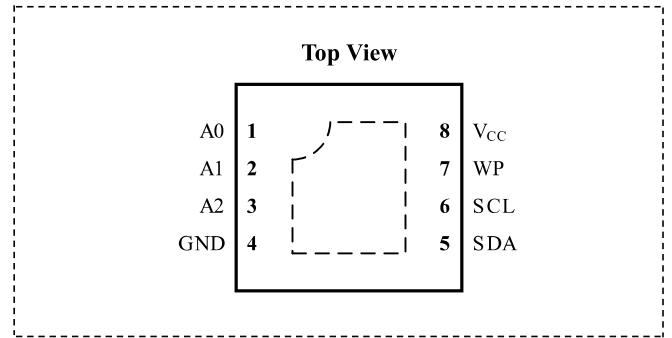
- Two-Wire Serial Interface, I²C Compatible
 - Bi-directional data transfer protocol
- Wide-voltage Operation: V_{CC} = 1.7V to 5.5V
- Speed: 400KHz (1.7V) and 1.0MHz (2.5V~5.5V)
- Standby current (max.): 1.0μA, 1.7V
- Read current (max.): 0.5mA, 5.5V
- Write current (max.): 0.5mA, 5.5V
- Hardware Data Protection
 - Write Protect Pin
- Sequential & Random Read Features
- Memory organization: 2Kb (256 x 8)
- Page Size: 16bytes
- Page write mode
 - Partial page writes allowed
- Self timed write cycle: 5.0ms (max.)
- Noise immunity on inputs, besides Schmitt trigger
- High-reliability
 - Endurance: 1 million cycles
 - Data retention: 100 years
- ESD Protection > 4000V
- Industrial grade
- Packages: SOP, TSSOP, DFN, MSOP, and SOT
- Lead-free, RoHs, Halogen free, Green

■ Pin Configuration

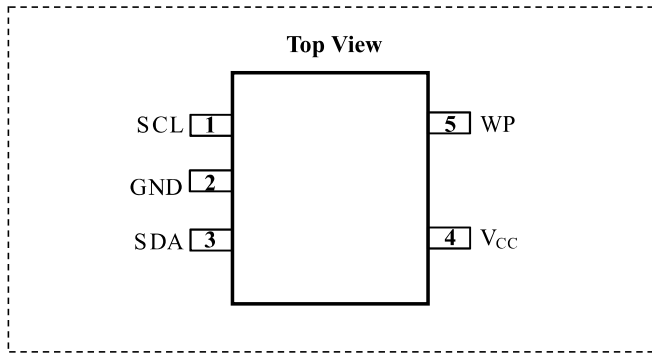
8-Pin SOP, TSSOP, MSOP



8-Lead DFN



5-Lead SOT23



■ Pin Definition

Pin Name	I/O	Definition
A0	I	Device Address Input
A1	I	Device Address Input
A2	I	Device Address Input
GND	-	Ground
SDA	I/O	Serial Address and Data input and Data out put
SCL	I	Serial Clock Input
WP	I	Write Protect Input
V _{CC}	-	Power Supply

■ Pin Descriptions

SCL

This input clock pin is used to synchronize the data transfer to and from the device.

SDA

The SDA is a bi-directional pin used to transfer addresses and data into and out of the device. The SDA pin is an open drain output and can be wired with other open drain or open collector outputs. However, the SDA pin requires a pull-up resistor connected to the power supply.

A0, A1, A2

The A0, A1 and A2 are the device address inputs.

Typically, the A0, A1, and A2 pins are for hardware addressing and a total of 8 devices can be connected on a single bus system. When A0, A1, and A2 are left floating, the inputs are defaulted to zero.

WP

WP is the Write Protect pin. While the WP pin is connected to the power supply of FM24C02A, the entire array becomes Write Protected (i.e. the device becomes Read only). When WP is tied to Ground or left floating, the normal write operations are allowed.

V_{CC}

Supply voltage

GND

Ground of supply voltage

■ Ordering Information

Part Number	Voltage Range	Industrial Grade	Package	Top Mark	SPQ
FM24C02AS08	1.7V to 5.5V	-40°C to +85°C	150-mil SOP-8L	24C02A YMW	3000PCS/Reel
FM24C02ATS08			3 x 4.4 mm TSSOP-8L		
FM24C02AN8			2 x 3 x 0.55 mm DFN-8L	xxx YMW	5000PCS/Reel
FM24C02AMS08			3 x 3 mm MSOP-8L	24C02A YMW	3000PCS/Reel
FM24C02AM5			2.9 x 1.6 mm SOT-23-5L	* * * *	3000PCS/Reel

Note:

- FM24C02A devices are Pb-free and RoHs compliant.
- The surface prints of our semiconductor devices are subject to change during the production process and do not involve changes in electrical parameters, and we will not separately state the notice.
- If you have any other custom purchase needs, please contact our sales department.



ESD SENSITIVITY CAUTION

ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications.



Note:

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