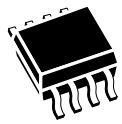
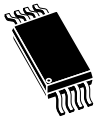
M24SR16-Y

Dynamic NFC/RFID tag IC with 16-Kbit EEPROM, NFC Forum Type 4 Tag and I²C interface

Data brief



SO8
(MN)



TSSOP8
(DW)

UFDFPN8
(MC)

Features

I²C interface

- Two-wire I²C serial interface supports 1 MHz protocol
- Single supply voltage: 2.7 V to 5.5 V

Contactless interface

- NFC Forum Type 4 Tag
- ISO/IEC 14443 Type A
- 106 Kbps data rate
- Internal tuning capacitance: 25 pF

Memory

- 2-Kbyte (16-kbit) EEPROM
- Support of NDEF data structure
- Data retention: 200 years
- Endurance: 1 million erase-write cycles
- Read up to 246 bytes in a single command
- Write up to 246 bytes in a single command
- 7 bytes unique identifier (UID)
- 128 bits passwords protection

Package

- 8-lead small-outline package (SO8) ECOPACK®2
- TSSOP8 ECOPACK®2
- UFDFPN8 ECOPACK®2

Digital pad

- GPO: configurable General Purpose Output
- RF disable: activation/deactivation of RF commands

Description

The M24SR16-Y device is a dynamic NFC/RFID tag IC with a dual interface. It embeds an EEPROM memory. It can be operated from an I²C interface or by a 13.56 MHz RFID reader or an NFC phone.

The I²C interface uses a two-wire serial interface, consisting of a bidirectional data line and a clock line. It behaves as a slave in the I²C protocol.

The RF protocol is compatible with ISO/IEC 14443 Type A and NFC Forum Type 4 Tag.

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1 Functional description

The M24SR16-Y device is a dynamic NFC/RFID tag that can be accessed either from the I^2C or the RF interface. The RF and I^2C host can read or write to the same memory, that is why only one host can communicate at a time with the M24SR16-Y. The management of the interface selection is controlled by the M24SR16-Y device itself.

The RF interface is based on the ISO/IEC 14443 Type A standard. The M24SR16-Y is compatible with the NFC Forum Type 4 Tag specifications and supports all corresponding commands.

The I^2C interface uses a two-wire serial interface consisting of a bidirectional data line and a clock line. The devices carry a built-in 4-bit device type identifier code in accordance with the I²C bus definition.

The device behaves as a slave in the I^2C protocol.

Figure 1 displays the block diagram of the M24SR16-Y device.

Figure 1. M24SR16-Y block diagram

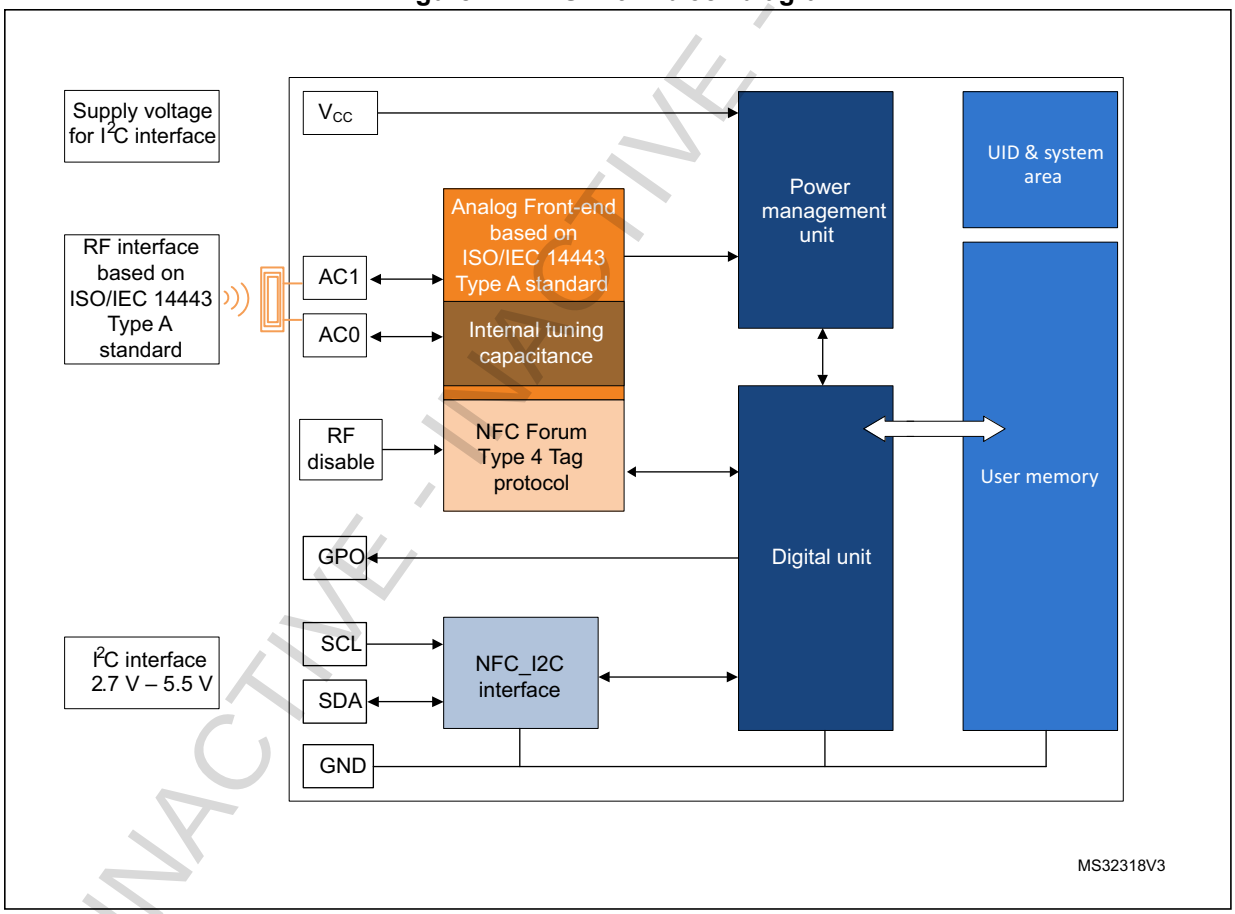

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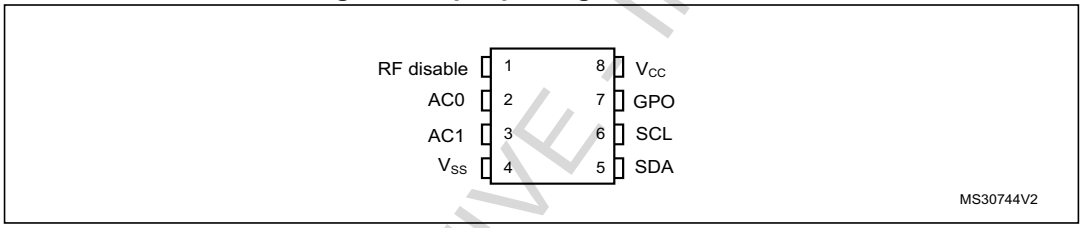
Table 1. Signal names

Signal name	Function	Direction
SDA	Serial data	I/O
SCL	Serial clock	Input
AC0, AC1	Antenna coils	-
V_{CC}	Supply voltage	-
VSS	Ground	-
GPO	Interrupt output (1)	Open drain output
RF disable	Disable the RF communication (2)	Input

1. An external pull-up > 4.7 kΩ is required.
2. An external pull-down is required when the voltage on V_{cc} is above its POR level.

Figure 2. 8-pin package connections



1. See Package mechanical data section for package dimensions, and how to identify pin 1.

1.1 Functional modes

The M24SR16-Y has two functional modes available. The difference between the modes lies in the power supply source (see *Table 2*).

Table 2. Functional modes

Modes	Supply source	Comments
I^2C mode	V_{cc}	The I^2C interface is available
Tag mode	RF field only	The I^2C interface is disconnected
Dual interface mode	RF field or V_{cc}	Both I^2C and RF interfaces are available

1.1.1 I^2C mode

M24SR16-Y is powered by V_{CC}. The I^2C interface is connected to the M24SR16-Y. The I^2C host can communicate with the M24SR16-Y device.

1.1.2 Tag mode

The M24SR16-Y is supplied by the RF field and can communicate with an RF host (RFID reader or an NFC phone). The User memory can only be accessed by the RF commands.

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1.1.3 Dual interface mode

Both interfaces, RF and I^2C, are connected to the M24SR16-Y and both RF or I^2C host can communicate with the M24SR16-Y device. The power supply and the access management are carried out by the M24SR16-Y itself. For further details, please refer to the token mechanism chapter.

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2 Part numbering

Table 3. Ordering information scheme for packaged devices

Example: M24 SR 16- Y MN 6 T /2

Device type

M24 = I^2C interface device

Device feature

SR = Short range

Memory size

16 = memory size in Kbits

Voltage range

Y = 2.7 to 5.5 V

Package

MN = SO8N
DW = TSSOP8
MC = UFDFPN8

Device grade

6 = industrial: device tested with standard test flow over –40 to 85 °C

Option

T = Tape and reel packing

Capacitance

/2 = 25 pF

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3 Revision history

Table 4. Document revision history

Date	Revision	Changes
24-Jan-2014	1	Initial release.

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