

Features

- Smart Card Interface with Level Shifter
 - Standard Version
 - Perform ISO Output Signals from Data Input
 - Up to 8 Couplers Can Be Addressed (with Programmable Addresses)
 - Transparent Version
 - Use Directly ISO Input Signals for Easy Implementation
 - Up to 2 Couplers Can Be Addressed
- Power Management & Smart Card Interface
 - Compliant with ISO 7816, EMV2000, GIE-CB, GSM and WHQL Standards
 - Step-up/down Converter with Programmable Voltage Output:
 - 5V and 3V (60 mA), 1.8V (20 mA)
 - High Efficiency From 80% to 98%
 - 4 to 48 MHz Clock Input (7 MHz Min for Step-up Converter)
 - Card Detection and Automatic Deactivation Sequence
 - Programmable Activation Sequence
- Direct Connection to Smart Card
 - Short Circuit Current Limitation
 - 4 kV+ ESD Protection (MIL/STD 883 Class 3)
- Two-wire Host Serial Interface
- Power-on Reset (POR) and Power-fail Detector (PFD) with Reset Output
- Extended Voltage Range: 2.85 to 5.5V
- Low Power Consumption
 - 1 mA Maximum Operating Current
 - 25 μ A Typical Power-down Current (without Smart Card)
- Industrial Temperature Range: -40 to +85°C
- Package: TSSOP20

Description

AT83C24 is a smart card interface IC with integrated level shifter for smart card reader/writer applications such as EFT/POS terminals and set top boxes. It enables the management of any type of smart card from any kind of host.

Up to eight AT83C24 devices can be connected in parallel, thanks to the programmable TWI address. Its high efficiency DC/DC converter and its low power-down current make it particularly suited to low-power and portable applications. The reduce bill of material allow to significantly reduce the system cost. A sophisticated power management system guarantees the functionality of the device.



C51 Microcontroller with Smart Card Interface and Level Shifter

AT83C24

Advance Information

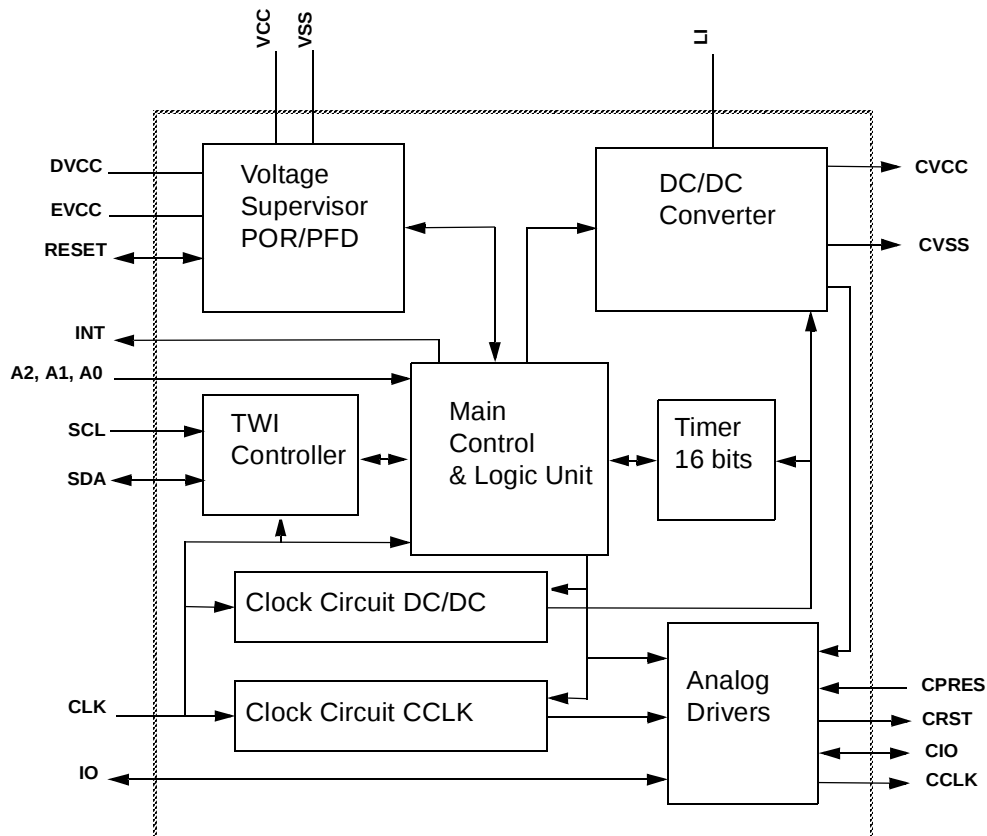
Summary

Rev. 4199AS–SCR–11/02



Note: This is a summary document. For more information, please contact cardreader@nto.atmel.com.

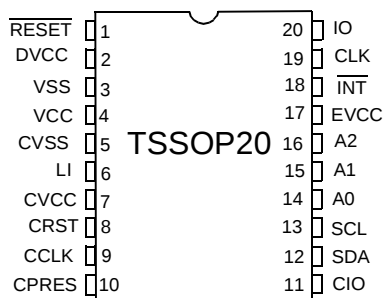
Block Diagram



Pin Description

Pinout

Figure 1. AT83C24 20-pin TSSOP



All the AT83C24 signals are detailed in Table 1.

Table 1. Pin Description

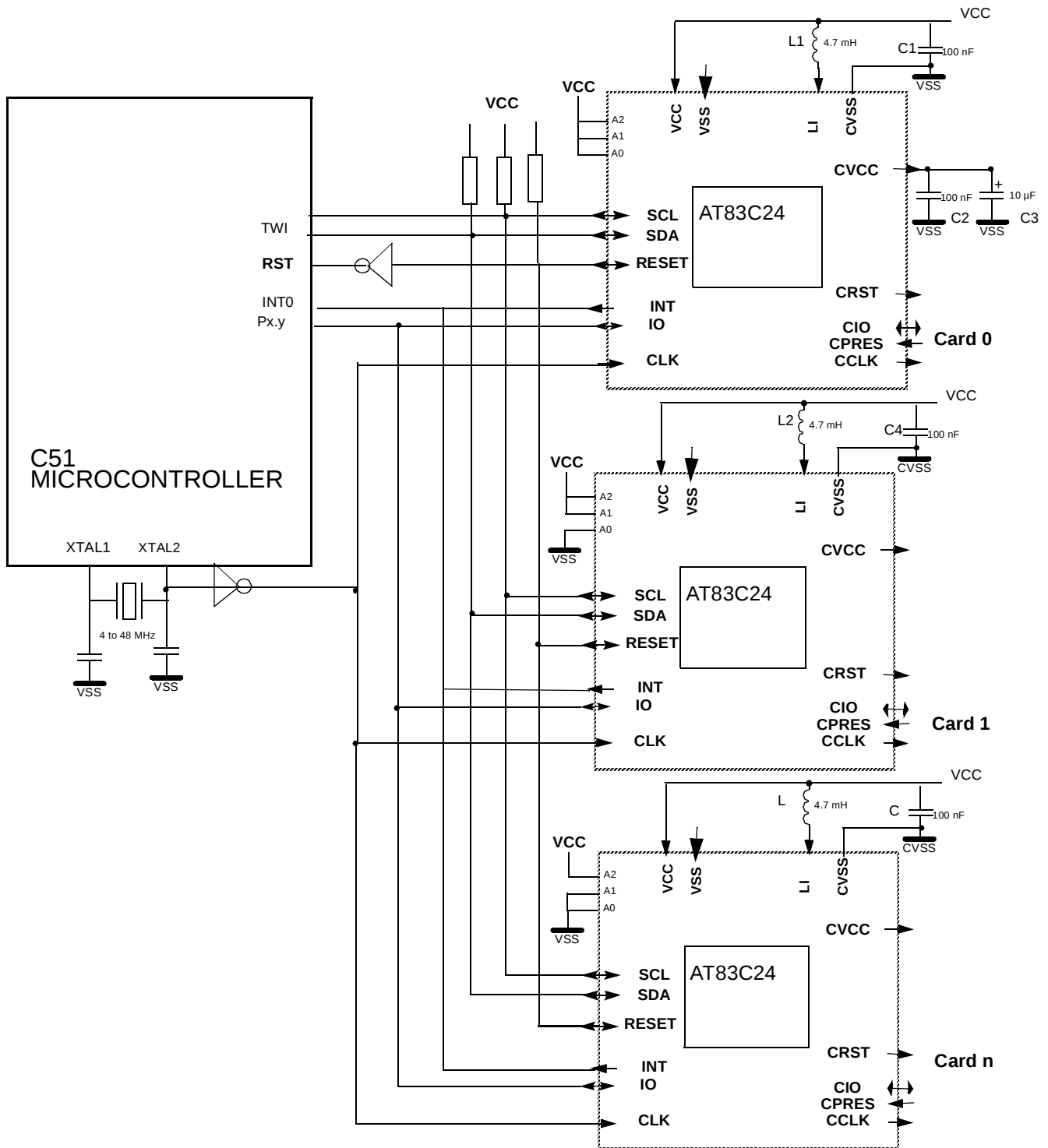
Signal Name	Internal Power Supply	ESD	Type	Description
A2-A1-A0	EVCC	2 kV	I	TWI bus slave address selection input A2 and A1 pins are connected to RST and CLK signals in "transparent mode".
$\overline{\text{INT}}$	EVCC	2 kV	O open-drain	$\overline{\text{INT}}$ interrupts the microcontroller. An internal Pull-up to EVCC can be activated in the pad if necessary using INT_PULLUP bit (CONFIG4 register).
$\overline{\text{RESET}}$	VCC	2 kV	I/O open-drain	MCU Interface Function Power-on reset and Power-fail detection output (active low). A low level on this pin keeps the device under reset when applied on power-on or generates a power-fail reset if applied when the device is running. Asserting $\overline{\text{RESET}}$ when the chip is in Shut-Down mode returns the chip to normal operation.
SDA	VCC	2 kV	I/O open-drain	MCU Interface Function TWI serial data
SCL	VCC	2 kV	I/O open-drain	MCU Interface Function TWI serial clock
IO	EVCC	2 kV	I/O	MCU Interface Function Copy of Card I/O
CLK	EVCC	2 kV	I	MCU Interface Function Master Clock and high level reference for the I/O pin
CIO	CVCC	4 kV+	I/O	Smart card interface function Card I/O
CPRES	VCC	4 kV+	I (pull-up)	Smart card interface function Internal/external Pull-up (see Pull-up bit) Card presence
CCLK	CVCC	4 kV+	O	Smart card interface function Card clock
CRST	CVCC	4 kV+	O	Smart card interface function Card reset
VCC		2 kV+	PWR	Supply Voltage VCC is used to power the internal voltage regulators and I/O buffers.
LI		2 kV+	PWR	DC/DC Input LI must be tied to VCC through an external coil (typically 4.7 μH) and provide the current for the charge pump of the DC/DC converter. It may be directly connected to VCC if the step-up converter is not used.
CVCC		4 kV+	PWR	Card Supply Voltage CVCC is the programmable voltage output for the card interface. It must be connected to an external decoupling capacitor (4.7 to 10 μF)

Table 1. Pin Description (Continued)

Signal Name	Internal Power Supply	ESD	Type	Description
DVCC		2 kV+	PWR	Digital Supply Voltage Is internally generated and used to supply the digital core. This pin has to be connected to an external capacitor of 100 nF and should not be connected to other devices.
EVCC		2 kV+	PWR	Extra Supply Voltage EVCC is used to supply the level shifters of host interface I/O pin and CLK pin. EVCC voltage can be supplied from the external EVCC pin or generated internally by an automatic follow up of the logic high level on the I/O pin (connect a 100nF to ground in this configuration).
CVSS		2 kV+	GND	DC/DC Ground CVSS is used to sink high shunt currents from the external coil.
VSS			GND	Ground

Typical Application

Figure 2. Typical Application Diagram





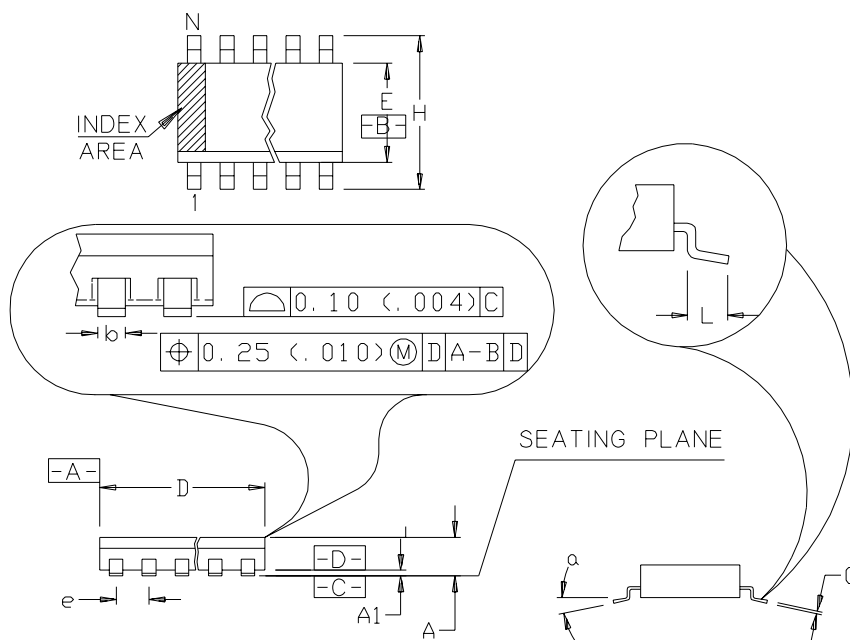
Ordering Information

Table 2. Possible Order Entries

Part Number	Supply Voltage	Temperature Range	Package	Packing
AT83C24-6GSIL	2.85 - 5.4V	Industrial	TSSOP20	Stick
AT83C24-6GRIL	2.85 - 5.4V	Industrial	TSSOP20	Reel

Package Drawing

TSSOP20



	MM		INCH	
A	----	1.10	----	.043
A1	0.05	0.15	.002	.006
b	0.19	0.30	.007	.012
C	0.09	0.20	.003	.008
D	6.40	6.60	.252	.260
E	4.30	4.50	.169	.177
e	0.65	BSC	.026	BSC
H	6.40	BSC	.252	BSC
L	0.50	0.70	.020	.028
N	20		20	
α	0°~8°		0°~8°	



Atmel Headquarters

Corporate Headquarters

2325 Orchard Parkway
San Jose, CA 95131
TEL 1(408) 441-0311
FAX 1(408) 487-2600

Europe

Atmel Sarl
Route des Arsenaux 41
Case Postale 80
CH-1705 Fribourg
Switzerland
TEL (41) 26-426-5555
FAX (41) 26-426-5500

Asia

Room 1219
Chinachem Golden Plaza
77 Mody Road Tsimhatsui
East Kowloon
Hong Kong
TEL (852) 2721-9778
FAX (852) 2722-1369

Japan

9F, Tonetsu Shinkawa Bldg.
1-24-8 Shinkawa
Chuo-ku, Tokyo 104-0033
Japan
TEL (81) 3-3523-3551
FAX (81) 3-3523-7581

Atmel Operations

Memory

2325 Orchard Parkway
San Jose, CA 95131
TEL 1(408) 441-0311
FAX 1(408) 436-4314

Microcontrollers

2325 Orchard Parkway
San Jose, CA 95131
TEL 1(408) 441-0311
FAX 1(408) 436-4314

La Chantreterie
BP 70602
44306 Nantes Cedex 3, France
TEL (33) 2-40-18-18-18
FAX (33) 2-40-18-19-60

ASIC/ASSP/Smart Cards

Zone Industrielle
13106 Rousset Cedex, France
TEL (33) 4-42-53-60-00
FAX (33) 4-42-53-60-01

1150 East Cheyenne Mtn. Blvd.
Colorado Springs, CO 80906
TEL 1(719) 576-3300
FAX 1(719) 540-1759

Scottish Enterprise Technology Park
Maxwell Building
East Kilbride G75 0QR, Scotland
TEL (44) 1355-803-000
FAX (44) 1355-242-743

RF/Automotive

Theresienstrasse 2
Postfach 3535
74025 Heilbronn, Germany
TEL (49) 71-31-67-0
FAX (49) 71-31-67-2340

1150 East Cheyenne Mtn. Blvd.
Colorado Springs, CO 80906
TEL 1(719) 576-3300
FAX 1(719) 540-1759

Biometrics/Imaging/Hi-Rel MPU/ High Speed Converters/RF Data- com

Avenue de Rochepleine
BP 123
38521 Saint-Egreve Cedex, France
TEL (33) 4-76-58-30-00
FAX (33) 4-76-58-34-80

e-mail

literature@atmel.com

Web Site

<http://www.atmel.com>

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