TENTATIVE TOSHIBA MOS DIGITAL INTEGRATED CIRCUIT SILICON GATE CMOS

SmartMedia™ with ID

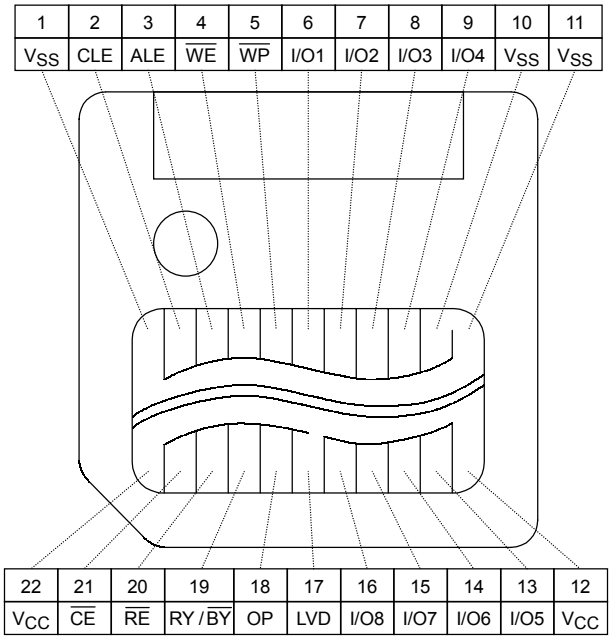
DESCRIPTION

The SmartMedia™ with ID is a single 3.3-volt flash memory card that has a unique 128 bit code stored in each card. The 128 bit code (serial number) is embedded in an unerasable OTP (One Time Programming) extended block area of the device. The procedures to access this block are available using commands supplied under a non-disclosure agreement. This architecture is applicable to image files, music files or electronic book contents which require copyright protection.

FEATURES

- Modes
  Read, Reset, Auto Page Program
  Auto Block Erase, Status Read
  ID number read
- Mode control
  Serial input/output
  Command control
- Power supply
  Vcc=3.3V±0.3V
- Package
  FDC-22A (weight:1.8g avg.)
- Complies with the SmartMedia™v Electrical Specification and Data Format Specification issued by the SSFDC Forum.
- SmartMedia™ with ID Line up
  16Mbytes : TH58NS128DC / TC58NS128DC
  32Mbytes : TC58NS256DC
  64Mbytes : TH58NS512DC

PIN ASSIGNMENT (TOP VIEW)



PIN NAME

I/O1~I/O8	I/O port
$\overline{CE}$	Chip enable
$\overline{WE}$	Write enable
$\overline{RE}$	Read enable
CLE	Command latch enable
ALE	Address latch enable
$\overline{WP}$	Write protect
RY / $\overline{BY}$	Ready / busy
GND	Ground
LVD	Low Voltage Detect
V_{CC}	Power supply
V_{SS}	Ground

SmartMedia™ is a trademark of Toshiba Corporation

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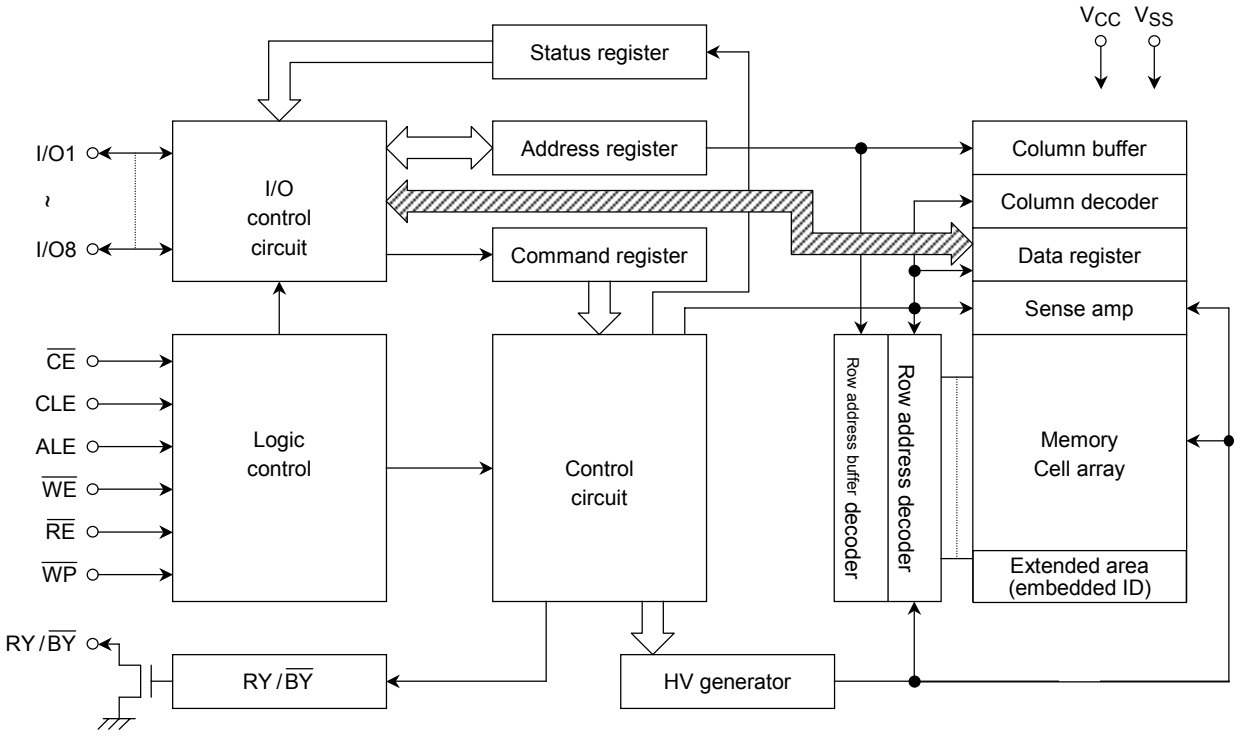
Introduction

This document describes the specifications specific to SmartMedia with ID, especially related to the reading of the ID. Please refer to the data sheet for Standard SmartMedia for details about the electrical characteristics and timing, etc.

	SmartMedia™ -ID	Standard SmartMedia™
16 Mbytes	TH58NS128DC/TC58NS128DC	TH58V128DC/TC58128DC
32 Mbytes	TC58NS256DC	TC58256DC
64 Mbytes	TH58NS512DC	TH58512DC

BLOCK DIAGRAM



Device operation

ID read mode

The 3rd byte of the ID read mode is used to recognize electrically whether or not the device has an ID number in the extended area. ID read sequence is shown below. Regarding the detailed timing, please refer to the data sheet for Standard SmartMedia.

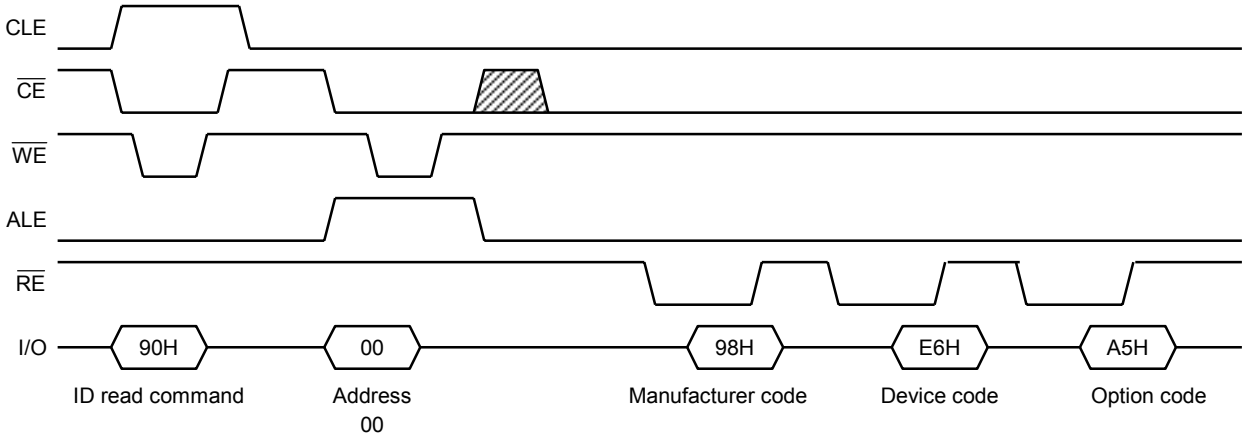


Fig.1 ID read timing

Table 1. Code table 1

	I/O8	I/O7	I/O6	I/O5	I/O4	I/O3	I/O2	I/O1	Hex
Manufacturer code	1	0	0	1	1	0	0	0	98H
Device code[1]	*	*	*	*	*	*	*	*	XxH
Option code	1	0	1	0	0	1	0	1	A5H

Notes:

* The 2nd byte from the ID read mode is different for each device. Refer to Table 2.

Devices that do not output A5h for the 3rd byte do not have an embedded ID in the extended area.

Table 2. Code table 2

Capacity	The 2nd byte from ID read mode (Hex)
16 Mbytes	73H
32 Mbytes	75H
64 Mbytes	76H

Package outline (the reference model)

- Package : FDC-22A