Winbond Electronics Corp.

SERIAL FLASH EEPROM SERIES

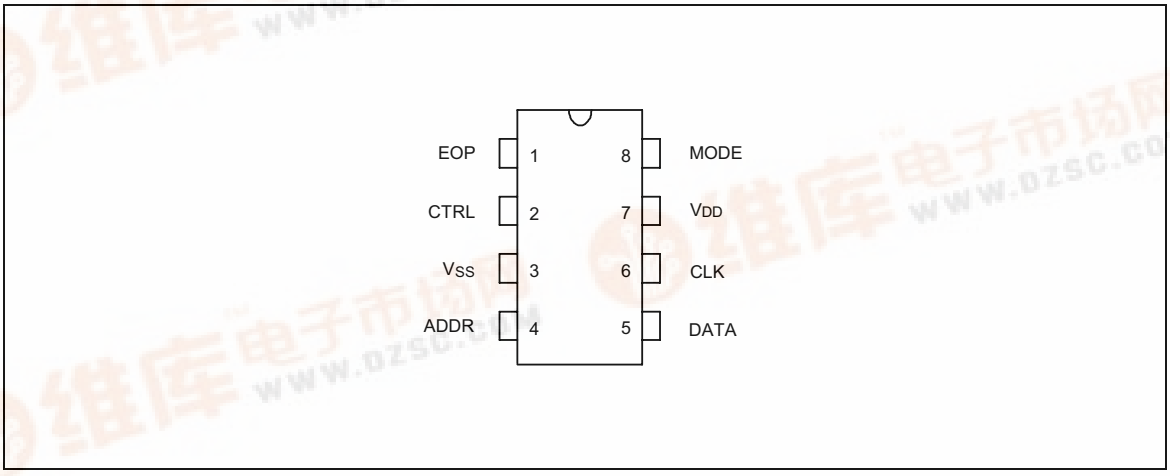
GENERAL DESCRIPTION

The W55FXX is a serial input/output flash EEPROM series that is typically used as the memory cell of a W51300 (voice recorder controller) or the ROM code emulator for the PowerSpeech™ series. The single voltage supply eliminates the need for an extra pump circuit during programming and erasing.

FEATURES

- Provides CLK, ADDR, and DATA pins to operate with Winbond PowerSpeech™ series
- 512K/1M/2M memory sizes available
- Directly cascadable for longer duration
- Fast frame-write operation
  - Frame (32 bits) program cycle time: 400 µS (typ.)
- Fast whole-chip-erase duration: 50 mS (max.)
- Read data access time: 500 nS (max.)
- Program/erase cycles: 10,000 (typ.)
- Data retention: 10 years (typ.)
- Low power consumption:
  - Operating: 5 mA (typ.)
  - Standby: 2 µA (typ.)

PIN CONFIGURATION

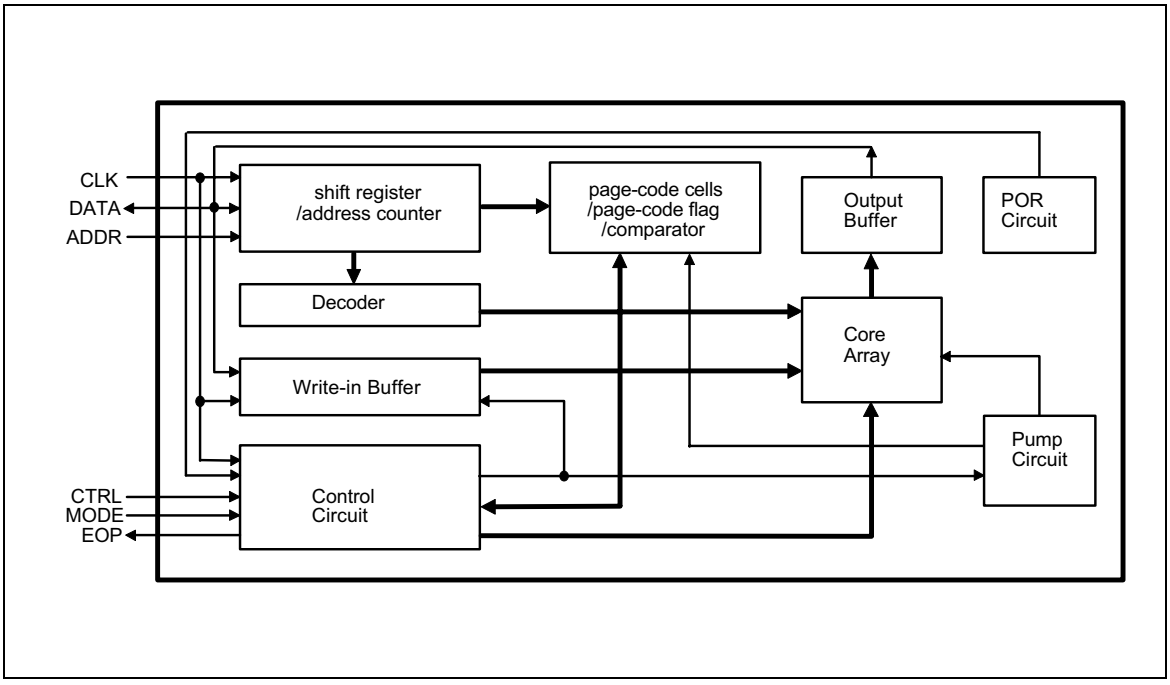


Publication Release Date: August 1996
Revision A2

PIN DESCRIPTION

NO.	PIN NAME	I/O	DESCRIPTION
1	EOP	O	End of process signal output
2	CTRL	I	Enable signal for program and erase operations when MODE = 0 Input clock for mode counter when MODE = 1
3	VSS	I	Ground
4	ADDR	I	Input clock for start adress shift-in
5	DATA	I/O	Bidirectional data line
6	CLK	I	Input clock for data write-in and read-out
7	VDD	I	Positive voltage supply
8	MODE	I	Mode select control pin

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	CONDITION	RATED VALUE	UNIT
Operating Temp.	T_{OPR}	-	0 to +70	°C
Storage Temp.	T_{STG}	-	-65 to +150	°C
Power Supply	V_{DD}–V_{SS}	-	-0.3 to +7.0	V
Input DC Voltage	V_{DC}	All pins	-0.5 to V_{DD} +1.0	V
Transient Voltage (< 20 nS)	V_{TRAN}	All pins	-1.0 to V_{DD} +1.0	V

Note: Exposure to conditions beyond those listed under Absolute Maximum Ratings may adversely affect the life and reliability of the device.

DC CHARACTERISTICS

(V_{DD} = 4.5V, V_{SS} = 0V, T_A = 25° C)

PARAMETER		SYMBOL	CONDITIONS	LIMITS			UNIT
				MIN.	TYP.	MAX.	
Operating voltage		V_{DD}	-	2.4 (Note)	4.5	5.5	V
Standby current		I_{SB}	All inputs = GND DATA & EOP open	-	2	4	μA
Operating current		I_{OP}	In read mode DATA & EOP open F_{OSC} = 1 MHz	-	5	10	mA
Input voltage	High	V_{IH}	All input pins	2.0		V_{DD}	V
	Low	V_{IL}		-0.3	-	0.8	V
Output current	Sink	I_{OL}	V_{OL} = 0.5V	2.5	5	-	mA
	Drive	I_{OH}	V_{OH} = 4.0V	-2.5	-5	-	mA
Input leakage current of CTRL, MODE		I_{LI1}	V_{IN} = 4.5V	-	-	4.5	μA
Input leakage current of DATA		I_{LI2}	V_{IN} = 0V	-	-	-4.5	μA

Note: For been working with W52900, the minimum operating voltage couldn't be less than 3.6 volt.

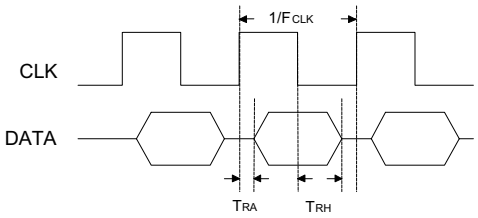
AC CHARACTERISTICS

(V_{DD} = 4.5V, V_{SS} = 0V, T_A = 25° C)

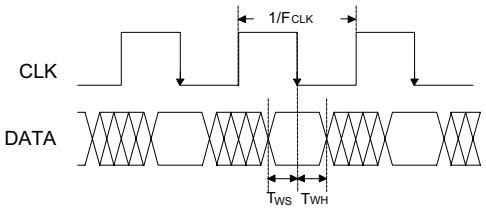
PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT
MODE pulse width	T_{MP}	-	1	-	-	µS
CTRL pulse width	T_{WP}	Page coding mode	400	-	700	µS
Clock frequency of ADDR	F_{ADDR}	-	-	-	1	MHz
Clock frequency of CLK	F_{CLK}	-	-	-	1	MHz
Clock frequency of CTRL	F_{CTRL}	-	-	-	1	MHz
Interval between ADDR end & CLK begin	T_I	Read/Write mode	1	-	-	µS
Interval between CLK & CTRL	T_{GCC}	Write mode	1	-	-	µS
Interval between ADDR & CTRL	T_{GCA}	Page coding mode	1	-	-	µS
Interval between addressing end & block-erase begin	T_{AE}	Block erase mode	1	-	-	µS
Interval between MODE rising edge & CTRL clock begin	T_{MB}	Mode selection	500	-	-	nS
Interval between CTRL clock end & MODE falling edge	T_{ME}	Mode selection	500	-	-	nS
Interval between MODE falling edge & another pin active	T_{GM}	-	1	-	-	µS
Data access time	T_{RA}	Read mode	-	-	500	nS
Data set up time	T_{WS}	Write mode	250	-	-	nS
	T_{AS}	-	250	-	-	nS
Data hold time	T_{RH}	Read mode	0	-	-	nS
	T_{WH}	Write mode	10	-	-	nS
	T_{AH}	-	10	-	-	nS
Programming duration	T_{PR}	Write mode	400	-	-	µS
Whole-chip-erase time	T_{WE}	Whole-chip-erase mode	45	-	50	mS
Block-erase time	T_{BE}	Block-erase mode	40	-	45	mS

TIMING WAVEFORM

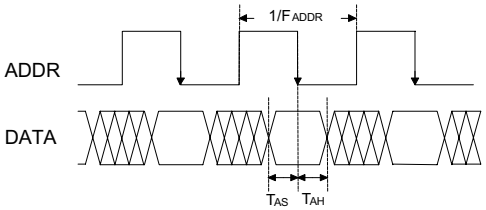
Read Cycle



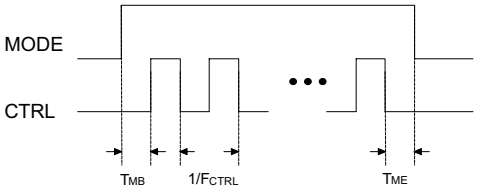
Write Cycle



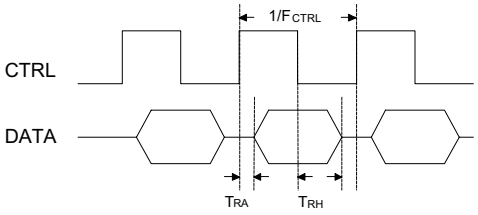
Address Shift-in Cycle



Mode Select Duration



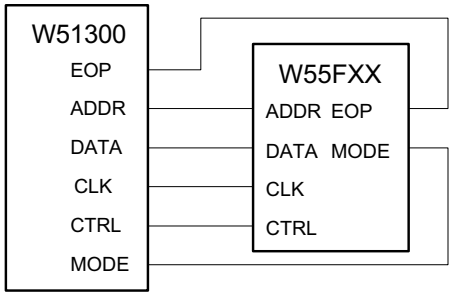
Page-code Cell Read Out Cycle

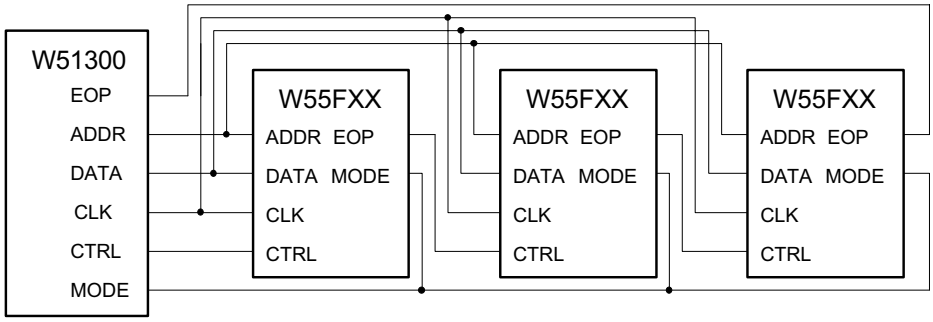


Note: The duty cycle of any clock is 50%.

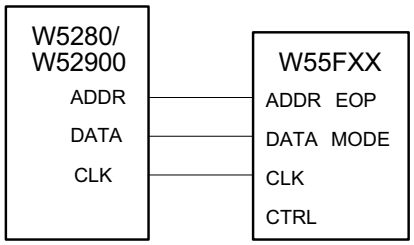
APPLICATION CIRCUITS (for reference only)

- For Voice Recorder Applications





- For PowerSpeech Applications



ORDERING INFORMATION

PART NO.	MEMORY SIZE
W55F05	512K BITS
W55F10	1M BITS
W55F20	2M BITS

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