

OKI Semiconductor

1A

MR27V801D

1,048,576-Word x 8-Bit One Time PROM

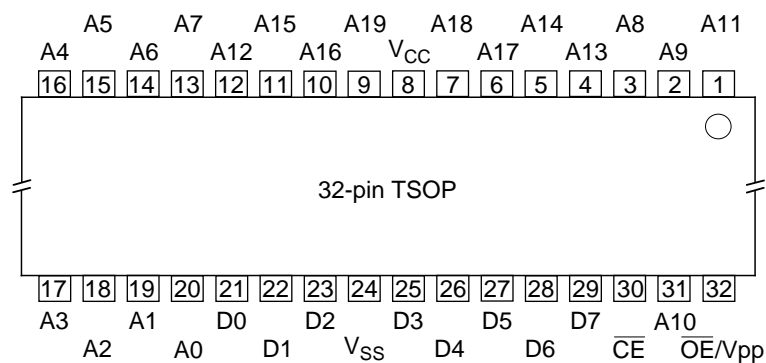
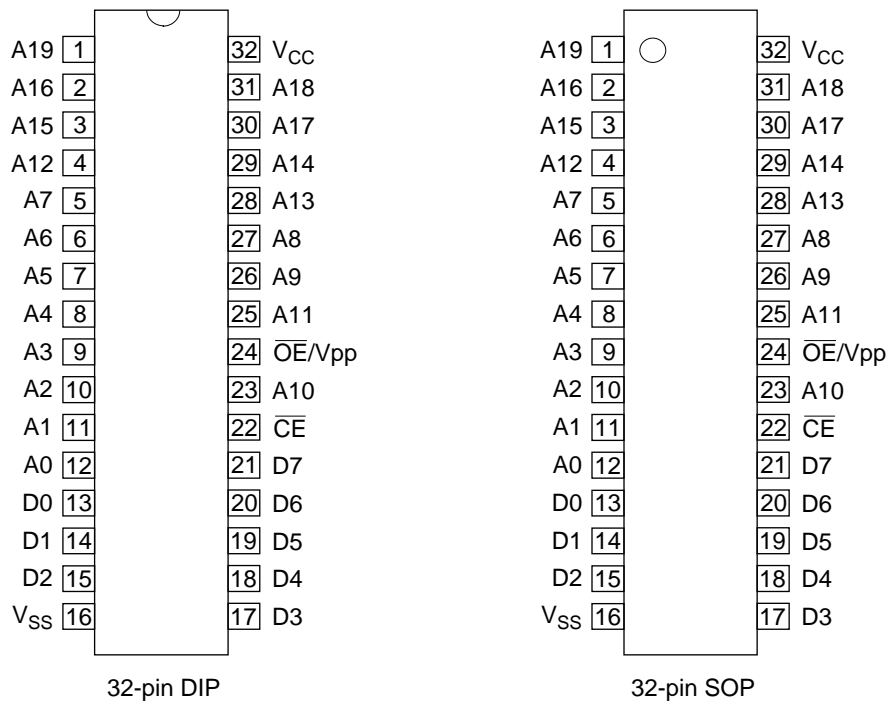
DESCRIPTION

The MR27V801D is a 8Mbit electrically Programmable Read-Only Memory organized as 1,048,576 word x 8bit. The MR27V801D operates on a single +3V-3.3V power supply and is TTL compatible. Since the MR27V801D operates asynchronously, external clocks are not required, making this device easy-to-use. The MR27V801D is suitable as large-capacity fixed memory for microcomputers and data terminals. It is manufactured using a CMOS double silicon gate technology and is offered in 32-pin DIP, 32-pin SOP or 32-pin TSOP packages.

FEATURES

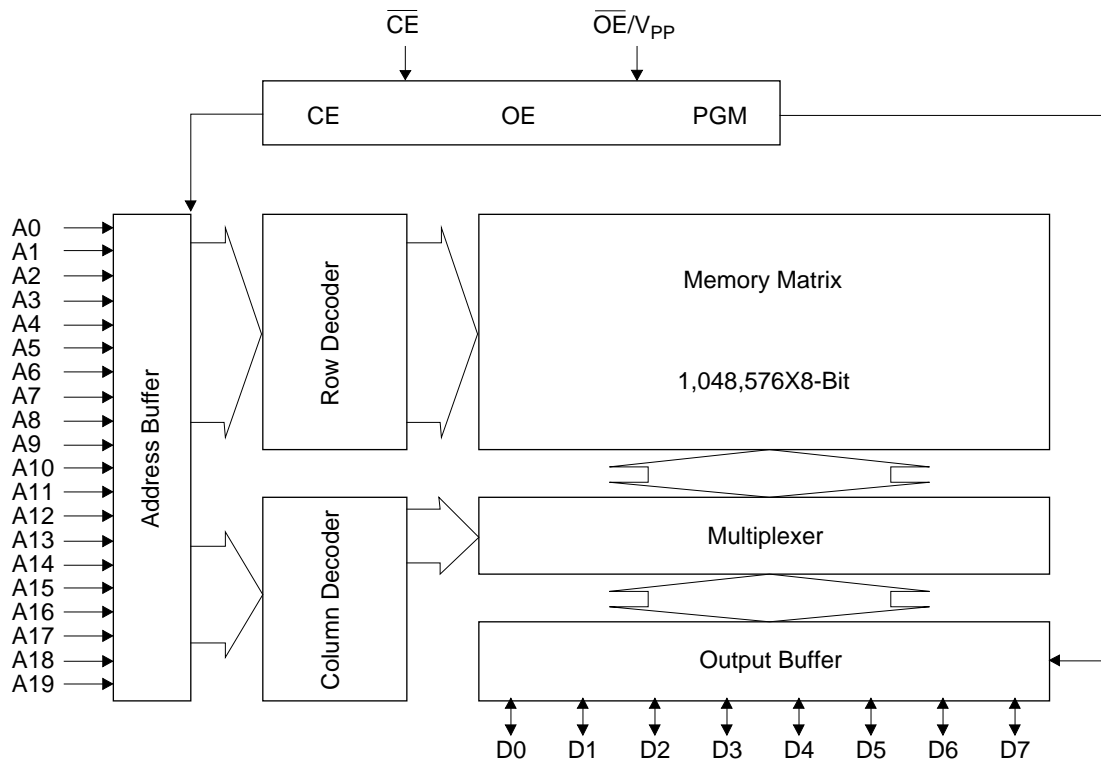
- 1,048,576 word x 8bit
- Single +3V-3.3V power supply
- Access time 100ns access time (Vcc=+3V)
 80ns access time (Vcc=+3.3V)
- Input / Output TTL compatible
- Three-state output
- Packages 32-pin plastic DIP (DIP32-P-600-2.54) (Product name : MR27V801DRA)
 32-pin plastic SOP (SOP32-P-525-1.27-K) (Product name : MR27V801DMA)
 32-pin plastic TSOP (TSOP I 32-P-814-0.50-K) (Product name : MR27V801DTA)

PIN CONFIGURATION (TOP VIEW)



PIN NAMES	FUNCTIONS
A0 - A19	Address input
D0 - D7	Data output
\overline{CE}	Chip enable
\overline{OE}/V_{PP}	Output enable / Program power supply voltage
V_{CC}	Power supply voltage
V_{SS}	GND

BLOCK DIAGRAM



FUNCTION TABLE

MODE	\overline{CE}	\overline{OE}/V_{PP}	V_{CC}	D0 - D7
READ	L	L	3.0V to 3.3V	D _{OUT}
OUTPUT DISABLE	L	H		Hi-Z
STAND-BY	H	*		Hi-Z
PROGRAM	L	9.75V	4.0V	D _{IN}
PROGRAM INHIBIT	H			Hi-Z
PROGRAM VERIFY	L	L		D _{OUT}

*: Don't Care

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Condition	Value	Unit
Operating temperature under bias	T_{opr}	-	0 to 70	°C
Storage temperature	T_{stg}		-55 to 125	°C
Input voltage	V_I	relative to V_{SS}	-0.5 to $V_{CC} + 0.5$	V
Output voltage	V_O		-0.5 to $V_{CC} + 0.5$	V
Power supply voltage	V_{CC}		-0.5 to 5	V
Program power supply voltage	V_{PP}		-0.5 to 11.5	V
Power dissipation per package	P_D	-	1.0	W

RECOMMENDED OPERATING CONDITIONS

(Ta=0 to 70°C)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
V_{CC} power supply voltage	V_{CC}	$V_{CC}=2.7V - 3.6V$	2.7	-	3.6	V
V_{PP} power supply voltage	\overline{OE}/V_{PP}		-0.5	-	$V_{CC}+0.5$	V
Input "H" level	V_{IH}		2.2	-	$V_{CC}+0.5^*$	V
Input "L" level	V_{IL}		-0.5**	-	0.6	V

Voltage is relative to V_{SS} * : $V_{CC}+1.5V$ (Max.) when pulse width of overshoot is less than 10nS.

** : -1.5V (Min.) when pulse width of undershoot is less than 10nS.

ELECTRICAL CHARACTERISTICS (Read operation)**DC Characteristics 1**(V_{CC}=3V±0.3V, Ta=0 to 70°C)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Input leakage current	I _{LI}	V _I =0 to V _{CC}	-	-	10	μA
Output leakage current	I _{LO}	V _O =0 to V _{CC}	-	-	10	μA
V _{CC} power supply current (Standby)	I _{CCSC}	$\overline{CE}=V_{CC}$	-	-	50	μA
	I _{CCST}	$\overline{CE}=V_{IH}$	-	-	1	mA
V _{CC} power supply current (Read)	I _{CCA}	$\overline{CE}=V_{IL}, \overline{OE}/V_{PP}=V_{IH}$ tc=100ns	-	-	25	mA
V _{PP} power supply current	I _{PP}	$\overline{OE}/V_{PP}=V_{CC}$	-	-	10	μA
Input "H" level	V _{IH}	-	2.2	-	V _{CC} +0.5*	V
Input "L" level	V _{IL}	-	-0.5**	-	0.6	V
Output "H" level	V _{OH}	I _{OH} =-400μA	2.4	-	-	V
Output "L" level	V _{OL}	I _{OL} =2.1mA	-	-	0.4	V

Voltage is relative to V_{SS}* : V_{CC}+1.5V (Max.) when pulse width of overshoot is less than 10nS.

** : -1.5V (Min.) when pulse width of undershoot is less than 10nS.

DC Characteristics 2(V_{CC}=3.3V±0.3V, Ta=0 to 70°C)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Input leakage current	I _{LI}	V _I =0 to V _{CC}	-	-	10	μA
Output leakage current	I _{LO}	V _O =0 to V _{CC}	-	-	10	μA
V _{CC} power supply current (Standby)	I _{CCSC}	$\overline{CE}=V_{CC}$	-	-	50	μA
	I _{CCST}	$\overline{CE}=V_{IH}$	-	-	1	mA
V _{CC} power supply current (Read)	I _{CCA}	$\overline{CE}=V_{IL}, \overline{OE}/V_{PP}=V_{IH}$ tc=80ns	-	-	30	mA
V _{PP} power supply current	I _{PP}	$\overline{OE}/V_{PP}=V_{CC}$	-	-	10	μA
Input "H" level	V _{IH}	-	2.2	-	V _{CC} +0.5*	V
Input "L" level	V _{IL}	-	-0.5**	-	0.6	V
Output "H" level	V _{OH}	I _{OH} =-400μA	2.4	-	-	V
Output "L" level	V _{OL}	I _{OL} =2.1mA	-	-	0.4	V

Voltage is relative to V_{SS}* : V_{CC}+1.5V (Max.) when pulse width of overshoot is less than 10nS.

** : -1.5V (Min.) when pulse width of undershoot is less than 10nS.

AC Characteristics 1

($V_{CC}=3V\pm 0.3V$, $T_a=0$ to $70^\circ C$)

Parameter	Symbol	Condition	Min.	Max.	Unit
Address cycle time	T_C	-	100	-	ns
Address access time	T_{ACC}	$\overline{CE}=\overline{OE}/V_{PP}=V_{IL}$	-	100	ns
\overline{CE} access time	T_{CE}	$\overline{OE}/V_{PP}=V_{IL}$	-	100	ns
\overline{OE} access time	T_{OE}	$\overline{CE}=V_{IL}$	-	50	ns
Output disable time	T_{CHZ}	$\overline{OE}/V_{PP}=V_{IL}$	0	30	ns
	T_{OHZ}	$\overline{CE}=V_{IL}$	0	25	ns
Output hold time	T_{OH}	$\overline{CE}=\overline{OE}/V_{PP}=V_{IL}$	0	-	ns

Measurement conditions

Input signal level	-----	0V/3V
Input timing reference level	-----	0.8V/2.0V
Output load	-----	100pF
Output timing reference level	-----	0.8V/2.0V

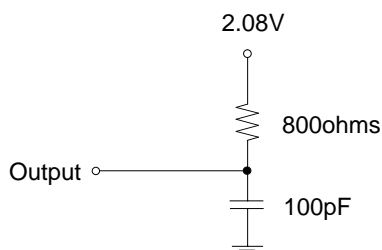
AC Characteristics 2

($V_{CC}=3.3V\pm 0.3V$, $T_a=0$ to $70^\circ C$)

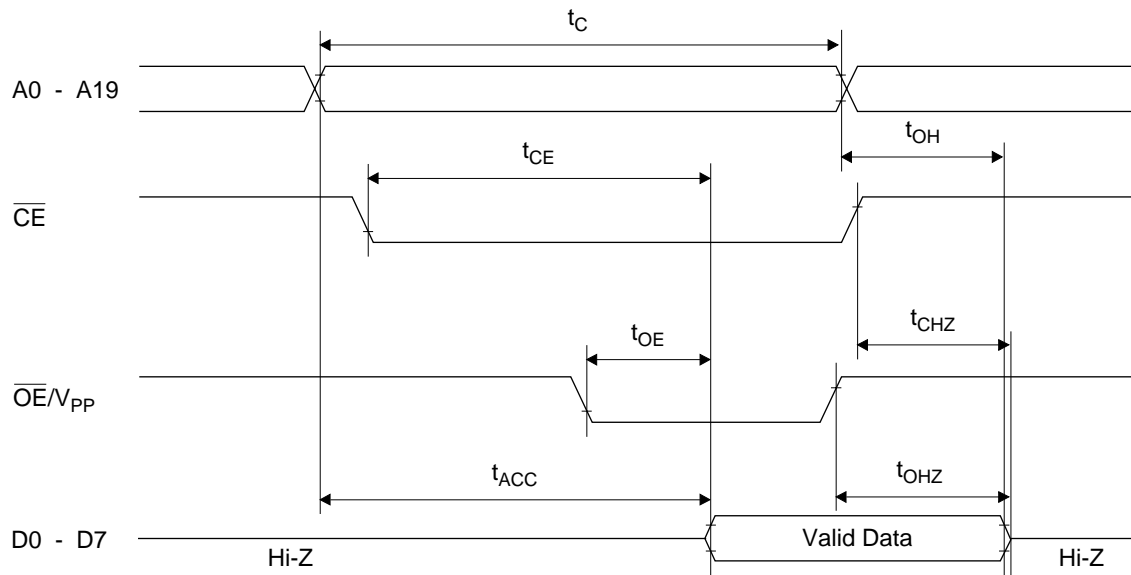
Parameter	Symbol	Condition	Min.	Max.	Unit
Address cycle time	T_C	-	80	-	ns
Address access time	T_{ACC}	$\overline{CE}=\overline{OE}/V_{PP}=V_{IL}$	-	80	ns
\overline{CE} access time	T_{CE}	$\overline{OE}/V_{PP}=V_{IL}$	-	80	ns
\overline{OE} access time	T_{OE}	$\overline{CE}=V_{IL}$	-	40	ns
Output disable time	T_{CHZ}	$\overline{OE}/V_{PP}=V_{IL}$	0	30	ns
	T_{OHZ}	$\overline{CE}=V_{IL}$	0	25	ns
Output hold time	T_{OH}	$\overline{CE}=\overline{OE}/V_{PP}=V_{IL}$	0	-	ns

Measurement conditions

Input signal level	-----	0V/3V
Input timing reference level	-----	0.8V/2.0V
Output load	-----	100pF
Output timing reference level	-----	0.8V/2.0V



TIMING CHART (READ CYCLE)



PIN Capacitance

($V_{CC}=3.3V, T_a=25^\circ C, f=1MHz$)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Input	C_{IN1}	$V_I=0V$	-	-	8 (10)	pF
\overline{OE}/V_{PP}	C_{IN2}		-	-	60	
Output	C_{OUT}	$V_O=0V$	-	-	10 (12)	

() : DIP only

ELECTRICAL CHARACTERISTICS (Programming operation)**DC Characteristics**

(Ta=25°C±5°C)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Input leakage current	I _{LI}	V _I =V _{CC} +0.5V	-	-	10	μA
V _{PP} power supply current (Program)	I _{PP2}	$\overline{CE}=V_{IL}$	-	-	50	mA
V _{CC} power supply current	I _{CC}	-	-	-	50	mA
Input "H" level	V _{IH}	-	3.0	-	V _{CC} +0.5	V
Input "L" level	V _{IL}	-	-0.5	-	0.8	V
Output "H" level	V _{OH}	I _{OH} =-400μA	2.4	-	-	V
Output "L" level	V _{OL}	I _{OL} =2.1mA	-	-	0.45	V
Program voltage	V _{PP}	-	9.5	9.75	10.0	V
V _{CC} power supply voltage	V _{CC}	-	3.9	4.0	4.1	V

Voltage is relative to V_{SS}**AC Characteristics**(V_{CC}=4.0V±0.1V, V_{pp}=9.75V±0.25V, Ta=25°C±5°C)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Address set-up time	T _{AS}	-	100	-	-	ns
Data set-up time	T _{DS}	-	100	-	-	ns
Address hold time	T _{AH}	-	2	-	-	μs
Data hold time	T _{DH}	-	100	-	-	ns
Output float delay from \overline{CE}	T _{CHZ}	-	0	-	100	ns
V _{PP} voltage set-up time	T _{VS}	-	2	-	-	μs
Program pulse width	T _{PW}	-	9	10	11	μs
Data valid from \overline{CE}	T _{CE}	-	-	-	100	ns
Address hold from \overline{CE} high	T _{AHC}	-	0	-	-	ns
V _{PP} voltage recovery time	T _{VR}	-	2	-	-	μs

Pin Check Function

Pin Check Function is to check contact between each device-pin and each socket-lead with EPROM programmer.

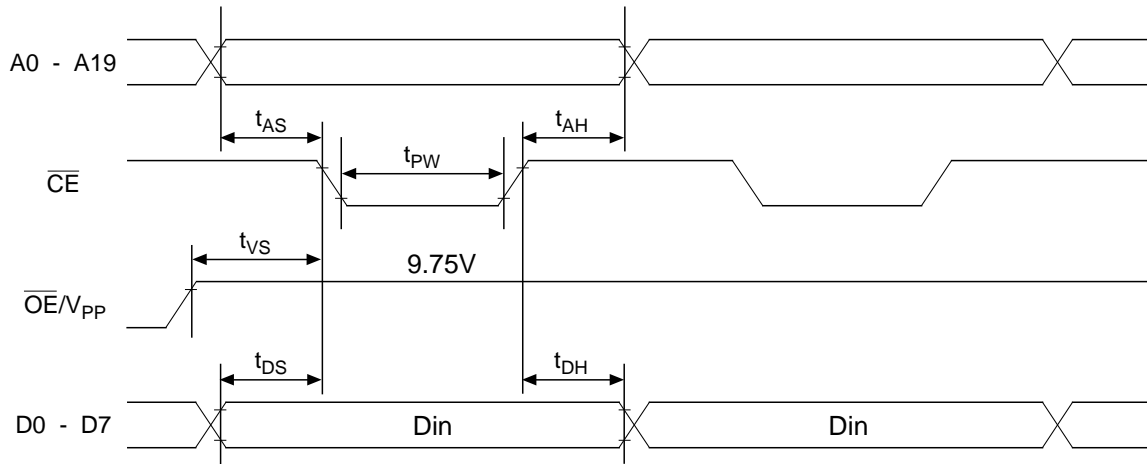
Setting up address as the following condition call the preprogrammed codes on device outputs.

(V_{CC}=3.3V±0.3V, $\overline{CE}=V_{IL}$, $\overline{OE}/V_{pp}=V_{IL}$, Ta=25°C±5°C)

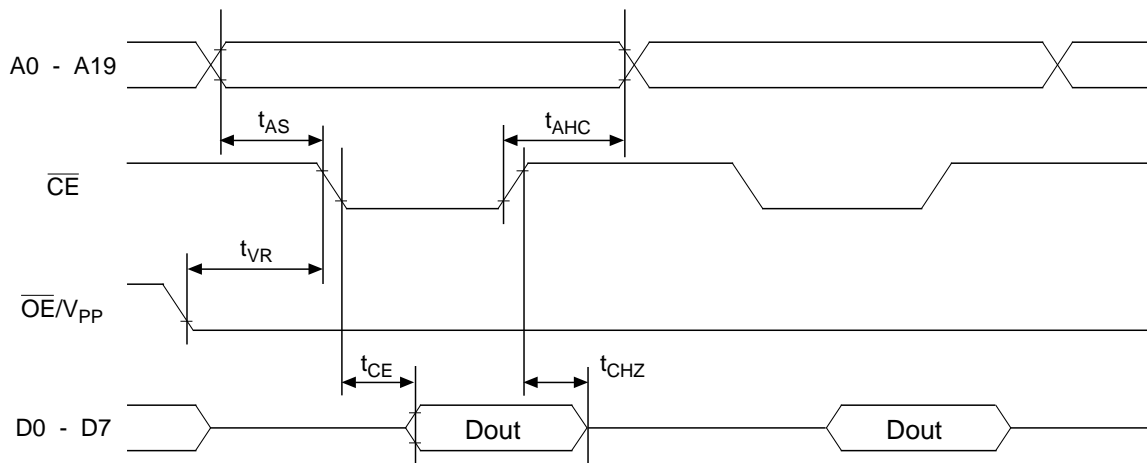
A0	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12	A13	A14	A15	A16	A17	A18	A19	DATA
0	1	0	1	0	1	0	1	0	VH*	1	1	0	1	0	1	0	1	0	1	AA
1	0	1	0	1	0	1	0	1	VH*	0	0	1	0	1	0	1	0	1	0	55
Other conditions																				FF

*: VH=8V±0.25V

Consecutive Programming Waveforms

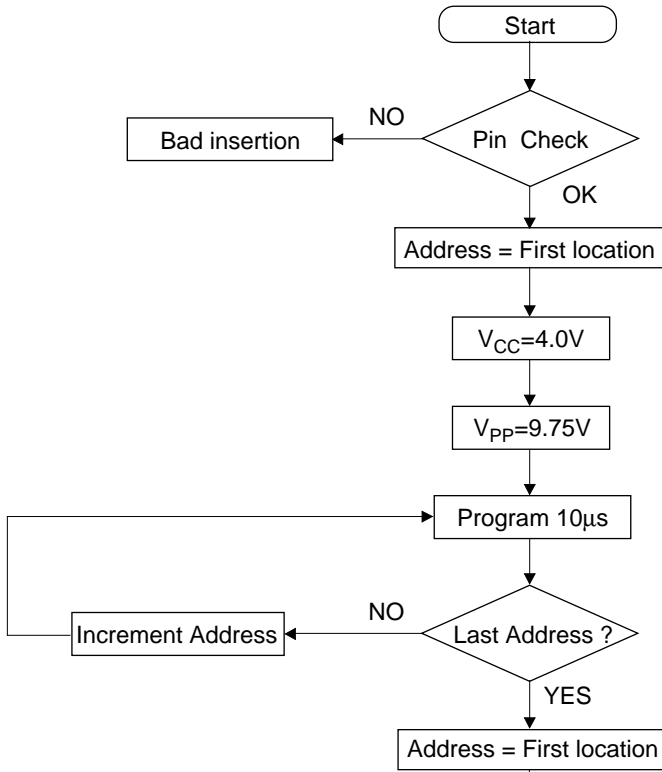


Consecutive Program Verify Waveforms



Programming / Verify Flow Chart

Programming



Verify

