

OKI Semiconductor

1A

MR27V401D

524,288-Word x 8-Bit

Production Programmed Read Only Memory (P2ROM)

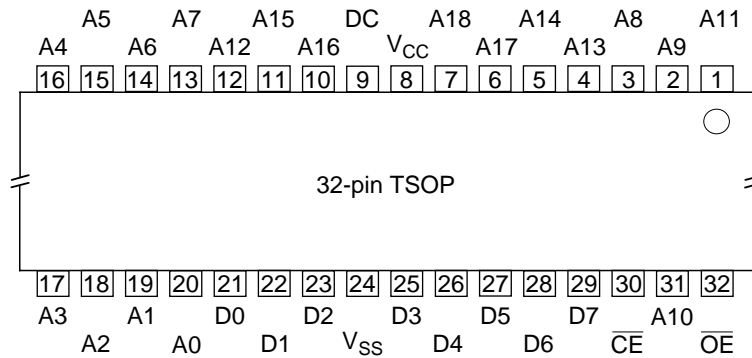
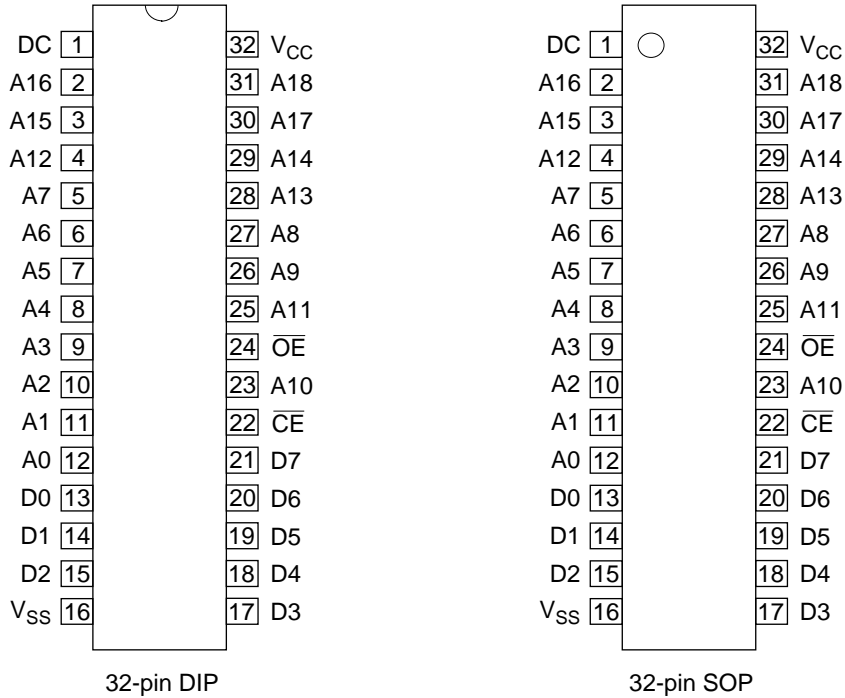
DESCRIPTION

The MR27V401D is a 4Mbit Production Programmed Read-Only Memory (P2ROM) organized as 524,288word x 8bit. The MR27V401D operates on a single +3V-3.3V power supply and is TTL compatible. Since the MR27V401D operates asynchronously, external clocks are not required, making this device easy-to-use. The MR27V401D 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

- 524,288 word x 8bit
- Single +3V-3.3V power supply
- Access time 80ns access time (Vcc=+3V)
 70ns access time (Vcc=+3.3V)
- Input / Output TTL compatible
- Three-state output
- Packages
 - 32-pin plastic DIP (DIP32-P-600-2.54) (Product name : MR27V401D-xxRA)
 - 32-pin plastic SOP (SOP32-P-525-1.27-K) (Product name : MR27V401D-xxMA)
 - 32-pin plastic TSOP (TSOP I 32-P-814-0.50-K) (Product name : MR27V401D-xxTA)

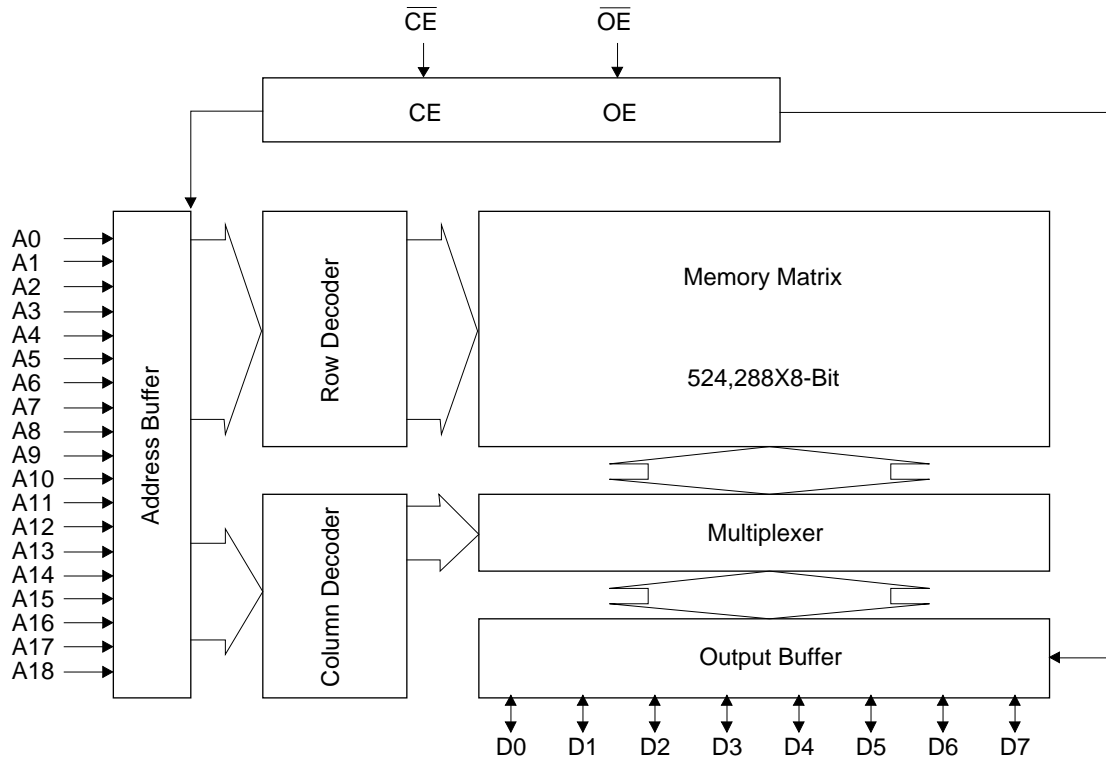
PIN CONFIGURATION (TOP VIEW)



PIN NAMES	FUNCTIONS
A0 - A18	Address input
D0 - D7	Data output
CE	Chip enable
OE	Output enable
V _{CC}	Power supply voltage
V _{SS}	GND
DC	Don't care *

* : Logical input level is ignored , however the pin is connected to internal circuit.

BLOCK DIAGRAM



FUNCTION TABLE

MODE	\overline{CE}	\overline{OE}	DC	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

* : Don't Care (H or L)

** : Don't Care (H or L or Open)

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
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
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

($V_{CC}=3V\pm 0.3V$, $T_a=0$ 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}	$\overline{CE}=V_{IL}$, $\overline{OE}=V_{IH}$ $t_c=80\text{ns}$	-	-	20	mA
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}	$I_{OH}=-400\mu\text{A}$	2.4	-	-	V
Output "L" level	V_{OL}	$I_{OL}=2.1\text{mA}$	-	-	0.4	V

Voltage is relative to V_{SS}

* : $V_{CC}+1.5\text{V}$ (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

($V_{CC}=3.3V\pm 0.3V$, $T_a=0$ 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}	$\overline{CE}=V_{IL}$, $\overline{OE}=V_{IH}$ $t_c=70\text{ns}$	-	-	25	mA
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}	$I_{OH}=-400\mu\text{A}$	2.4	-	-	V
Output "L" level	V_{OL}	$I_{OL}=2.1\text{mA}$	-	-	0.4	V

Voltage is relative to V_{SS}

* : $V_{CC}+1.5\text{V}$ (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±0.3V, Ta=0 to 70°C)

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

Measurement conditions

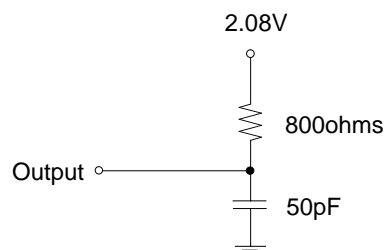
Input signal level	-----	0V/3V
Input timing reference level	-----	0.8V/2.0V
Output load	-----	50pF
Output timing reference level	-----	0.8V/2.0V

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

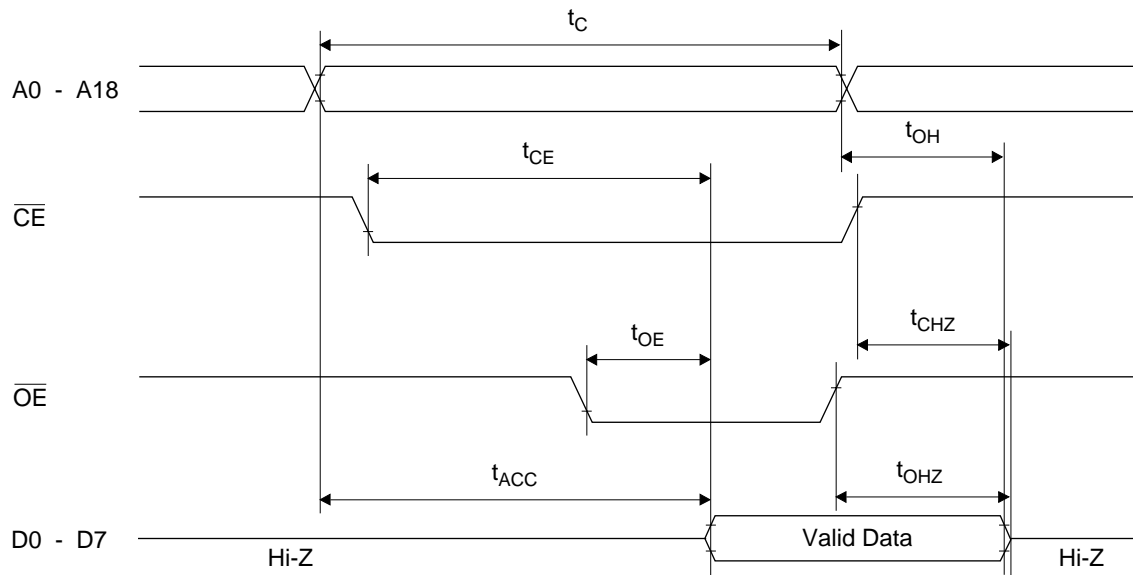
Parameter	Symbol	Condition	Min.	Max.	Unit
Address cycle time	T _C	-	70	-	ns
Address access time	T _{ACC}	$\overline{CE}=\overline{OE}=V_{IL}$	-	70	ns
\overline{CE} access time	T _{CE}	$\overline{OE}=V_{IL}$	-	70	ns
\overline{OE} access time	T _{OE}	$\overline{CE}=V_{IL}$	-	35	ns
Output disable time	T _{CHZ}	$\overline{OE}=V_{IL}$	0	30	ns
	T _{OHZ}	$\overline{CE}=V_{IL}$	0	25	ns
Output hold time	T _{OH}	$\overline{CE}=\overline{OE}=V_{IL}$	0	-	ns

Measurement conditions

Input signal level	-----	0V/3V
Input timing reference level	-----	0.8V/2.0V
Output load	-----	50pF
Output timing reference level	-----	0.8V/2.0V



TIMING CHART (READ CYCLE)



PIN Capacitance

(V_{CC}=3.3V, T_a=25°C, f=1MHz)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Input	C _{IN}	V _I =0V	-	-	8 (10)	pF
Output	C _{OUT}	V _O =0V	-	-	10 (12)	

() : DIP only