FEDR27V1652E-02-02

OKI Semiconductor

This version : Oct. 2000
Previous version: Sep. 2000

MR27V1652E

1,048,576–Word × 16–Bit or 2,097,152–Word × 8–Bit
8–Word x 16-Bit or 16–Word x 8-Bit Page Mode Production Programmed Read Only Memory (P2ROM)

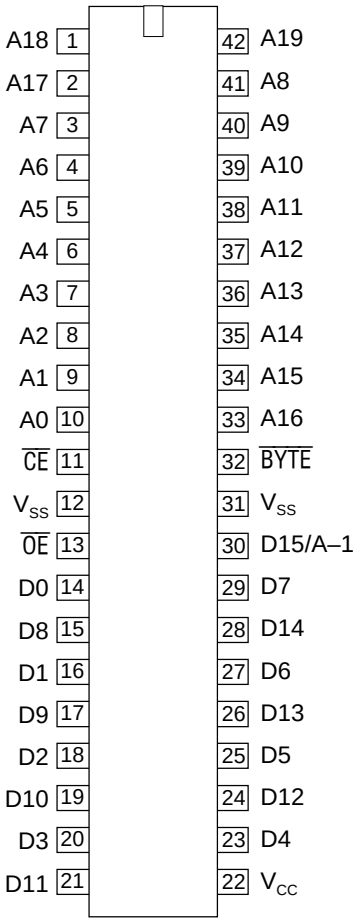
GENERAL DESCRIPTION

The MR27V1652E is a 16 Mbit Production Programmed Read Only Memory (P2ROM) with page mode. Its configuration can be electrically switched between 1,048,576-word × 16-bit and 2,097,152-word × 8-bit by the state of the $\overline{\text{BYTE}}$ pin. The MR27V1652E supports high speed asynchronous read operation using a single 3.3V power supply.

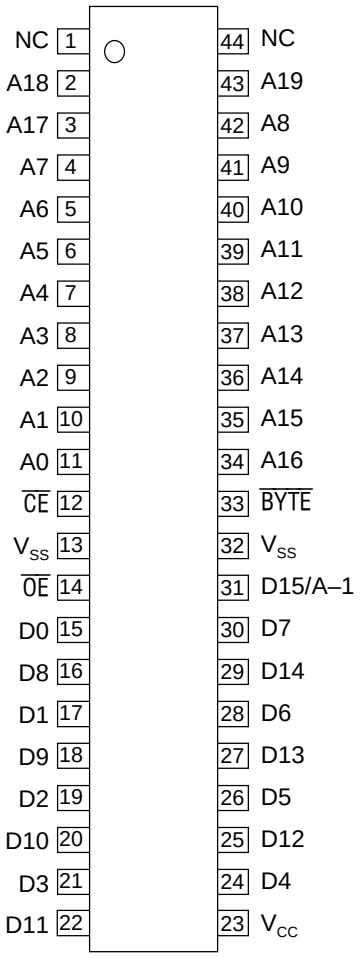
FEATURES

· 1,048,576-word × 16-bit/2,097,152-word × 8-bit electrically switchable configuration
· Page size of 8-word x 16-Bit or 16-word x 8-Bit
· +3.3 V power supply
· Access time
  Random access mode 100 ns MAX
  Page access mode 30 ns MAX
· Operating current 100 mA MAX
· Standby current 50 µA MAX
· Input/Output TTL compatible
· Tri-state output
· Packages:
  42-pin plastic DIP (DIP42-P-600-2.54) (Product Name : MR27V1652E-XXRA)
  44-pin plastic SOP (SOP44-P-600-1.27-K) (Product Name : MR27V1652E-XXMA)

PIN CONFIGURATION (TOP VIEW)



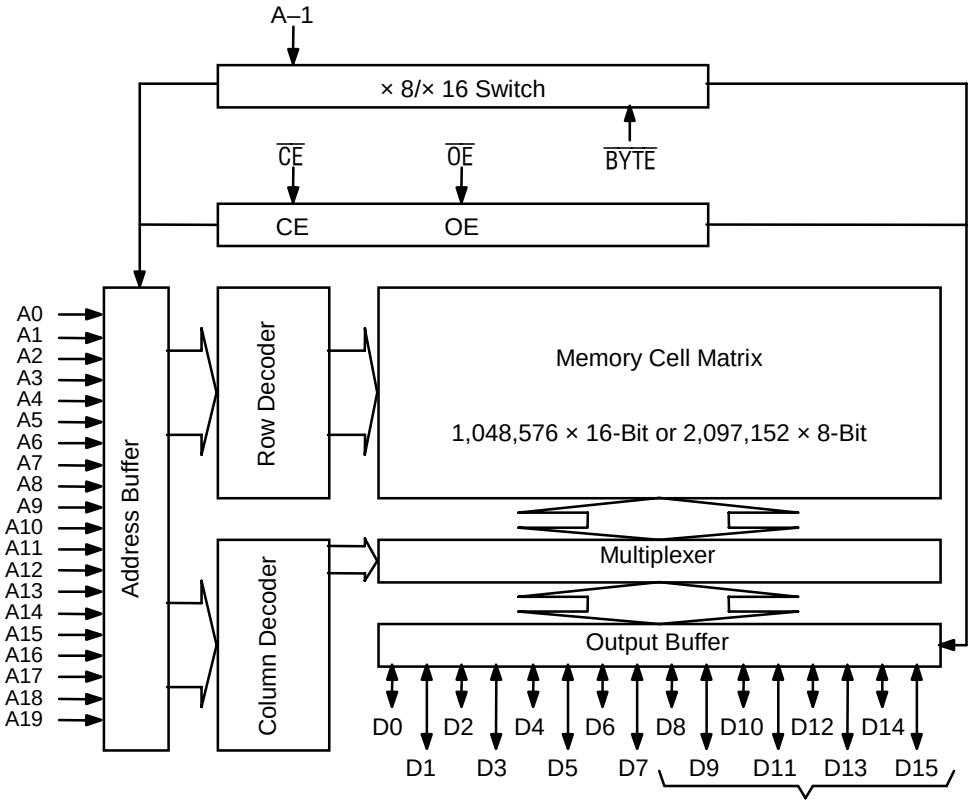
42-pin DIP



44-pin SOP

Pin name	Functions
D15/A–1	Data output/Address input
A0 to A19	Address input
D0 to D14	Data output
$\overline{CE}$	Chip enable
$\overline{OE}$	Output enable
$\overline{BYTE}$	Mode switch
V_{CC}	Power supply voltage
V_{SS}	GND
NC	Non connection

BLOCK DIAGRAM



In 8-bit output mode, these pins are placed in a high-Z state and pin D15 functions as the A-1 address pin.

FUNCTION TABLE

Mode	$\overline{CE}$	$\overline{OE}$	$\overline{BYTE}$	V_{CC}	D0 to D7	D8 to D14	D15/A–1
Read (16-Bit)	L	L	H	3.3 V	D_{OUT}		
Read (8-Bit)	L	L	L		D_{OUT}	Hi–Z	L/H
Output disable	L	H	H		Hi–Z		
			L				*
Standby	H	*	H		Hi–Z		
			L				*

*: Don't Care (H or L)

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Condition	Value	Unit
Operating temperature under bias	Ta	—	0 to 70	°C
Storage temperature	Tstg		–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} = 3.0 to 3.6 V	3.0	—	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}.

* : Vcc+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

DC Characteristics

(V_{CC} = 3.3 V ± 0.3 V, 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_{IH} tc =100 ns	—	—	100	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 µA	2.4	—	—	V
Output "L" level	V_{OL}	I_{OL} = 2.1 mA	—	—	0.4	V

Voltage is relative to V_{SS}.

* : Vcc+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

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

Parameter	Symbol	Condition	Min.	Max.	Unit
Address cycle time	t_C	—	100	—	ns
Address access time	t_{ACC}	$\overline{CE}$ = $\overline{OE}$ = V_{IL}	—	100	ns
Page cycle time	t_{PC}	—	30	—	ns
Page access time	t_{PAC}	—	—	30	ns
$\overline{CE}$ access time	t_{CE}	$\overline{OE}$ = V_{IL}	—	100	ns
$\overline{OE}$ access time	t_{OE}	$\overline{CE}$ = V_{IL}	—	30	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---------- 0 V/3 V

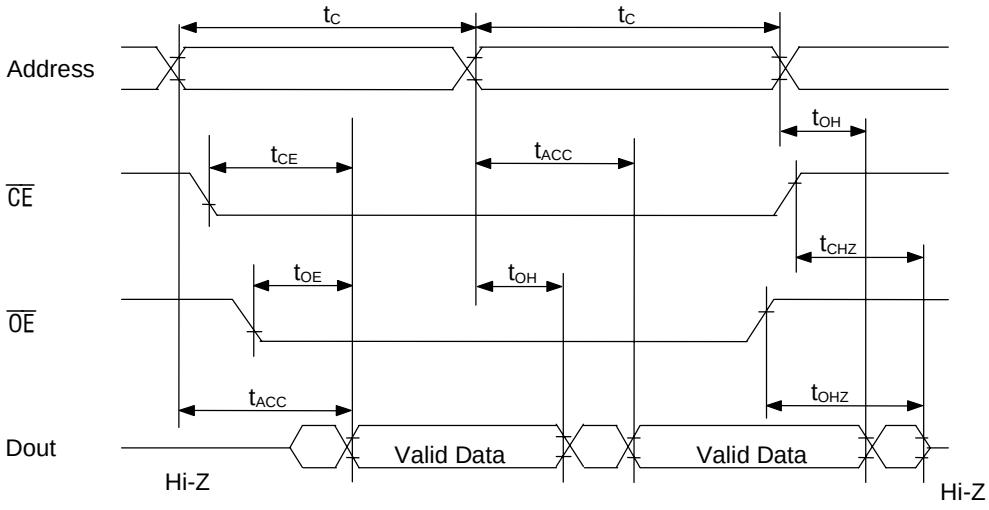
Input timing reference level ---------- 0.8 V/2.0 V

Output load ---------- 100 pF

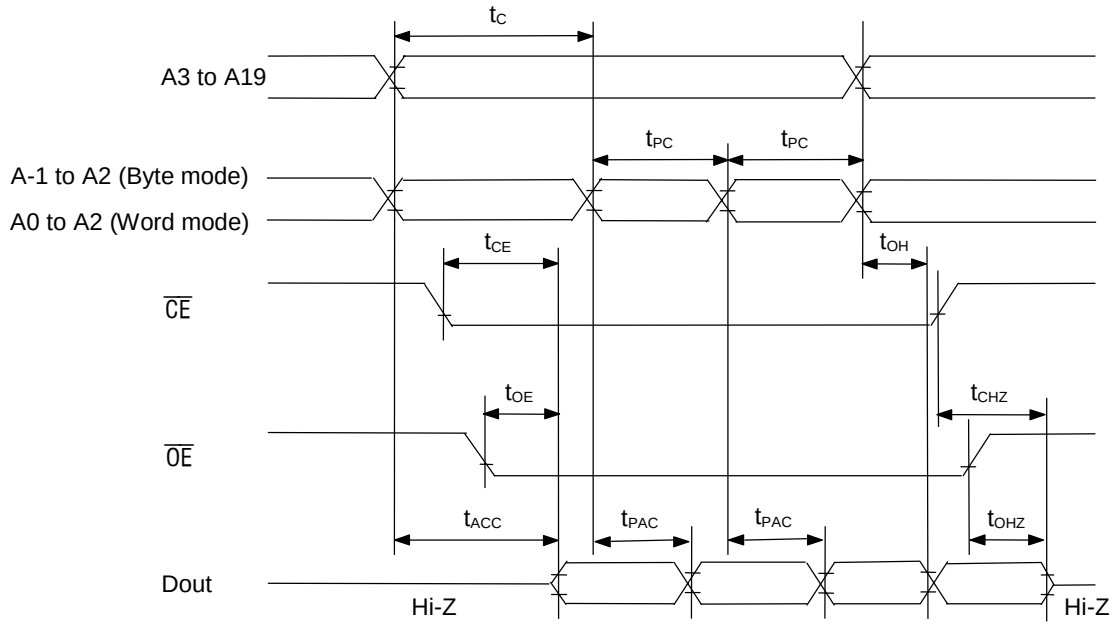
Output timing reference level---------- 0.8 V/2.0 V

Timing Chart (Read Cycle)

Random Access Mode Read Cycle



Page Access Mode Read Cycle



Pin Capacitance

(V_{CC} = 3.3 V, Ta = 25°C, f = 1 MHz)

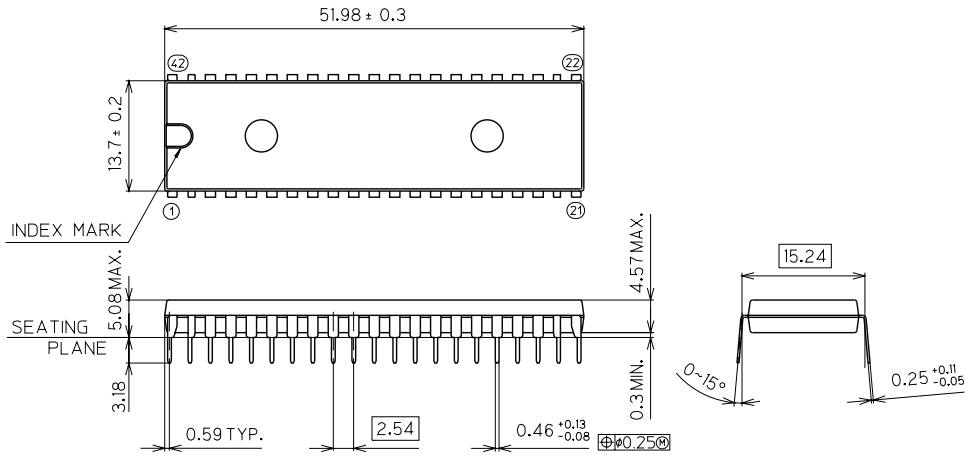
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Input	C_{IN1}	V_I = 0 V	—	—	10	pF
$\overline{BYTE}$	C_{IN2}		—	—	120	
Output	C_{OUT}	V_O = 0 V	—	—	10(12)	

( ):DIP only

PACKAGE DIMENSIONS

(Unit: mm)

DIP42-P-600-2.54

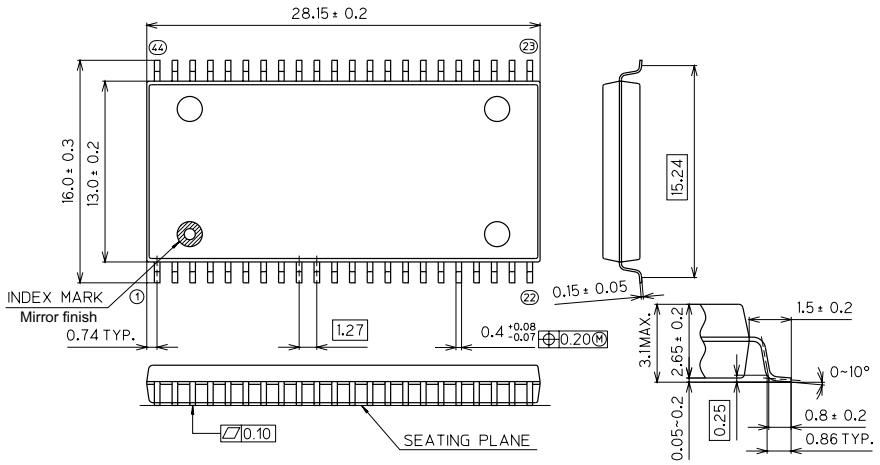


Package material	Epoxy resin
Lead frame material	42 alloy
Pin treatment	Solder plating (≥5µm)
Package weight (g)	6.20 TYP.
Rev. No./Last Revised	2/Dec. 11, 1996

Oki Electric Industry Co., Ltd.

(Unit: mm)

SOP44-P-600-1.27-K



Package material	Epoxy resin
Lead frame material	42 alloy
Pin treatment	Solder plating (≥5µm)
Package weight (g)	2.10 TYP.
Rev. No./Last Revised	4/Dec. 5, 1996

Oki Electric Industry Co., Ltd.

Notes for Mounting the Surface Mount Type Package

The surface mount type packages are very susceptible to heat in reflow mounting and humidity absorbed in storage.
Therefore, before you perform reflow mounting, contact Oki's responsible sales person for the product name, package name, pin number, package code and desired mounting conditions (reflow method, temperature and times).

NOTICE

1. The information contained herein can change without notice owing to product and/or technical improvements. Before using the product, please make sure that the information being referred to is up-to-date.

2. The outline of action and examples for application circuits described herein have been chosen as an explanation for the standard action and performance of the product. When planning to use the product, please ensure that the external conditions are reflected in the actual circuit, assembly, and program designs.

3. When designing your product, please use our product below the specified maximum ratings and within the specified operating ranges including, but not limited to, operating voltage, power dissipation, and operating temperature.

4. Oki assumes no responsibility or liability whatsoever for any failure or unusual or unexpected operation resulting from misuse, neglect, improper installation, repair, alteration or accident, improper handling, or unusual physical or electrical stress including, but not limited to, exposure to parameters beyond the specified maximum ratings or operation outside the specified operating range.

5. Neither indemnity against nor license of a third party's industrial and intellectual property right, etc. is granted by us in connection with the use of the product and/or the information and drawings contained herein. No responsibility is assumed by us for any infringement of a third party's right which may result from the use thereof.

6. The products listed in this document are intended for use in general electronics equipment for commercial applications (e.g., office automation, communication equipment, measurement equipment, consumer electronics, etc.). These products are not authorized for use in any system or application that requires special or enhanced quality and reliability characteristics nor in any system or application where the failure of such system or application may result in the loss or damage of property, or death or injury to humans.
   Such applications include, but are not limited to, traffic and automotive equipment, safety devices, aerospace equipment, nuclear power control, medical equipment, and life-support systems.

7. Certain products in this document may need government approval before they can be exported to particular countries. The purchaser assumes the responsibility of determining the legality of export of these products and will take appropriate and necessary steps at their own expense for these.

8. No part of the contents contained herein may be reprinted or reproduced without our prior permission.

Copyright 2000 Oki Electric Industry Co., Ltd.