OKI

Oki, Network Solutions for a Global Society

FEDR27T401E-02-01
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OKI Semiconductor

MR27T401E

512K–Word × 8–Bit P2ROM

FEATURES

·524,288-word × 8-bit
· 2.7 V to 3.6 V power supply
· Access time 100 ns MAX
· Operating current 25 mA MAX
· Standby current 10 µA MAX
· Input/Output TTL compatible
· Three-state output

PACKAGES

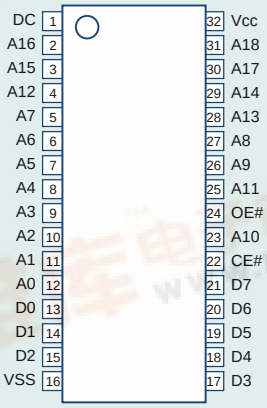
· MR27T401E-xxxMA
32-pin plastic SOP (SOP32-P-525-1.27-K)
· MR27T401E-xxxTA
32-pin plastic TSOP (TSOP I 32-P-814-0.50-1K)

P2ROM ADVANCED TECHNOLOGY

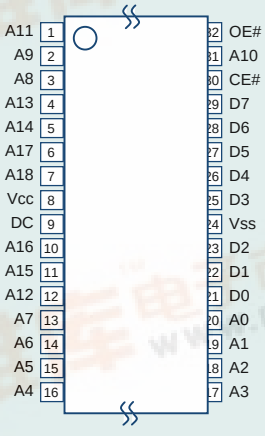
P2ROM stands for Production Programmed ROM. This exclusive Oki technology utilizes factory test equipment for programming the customers code into the P2ROM prior to final production testing. Advancements in this technology allows production costs to be equivalent to MASKROM and has many advantages and added benefits over the other non-volatile technologies, which include the following;

- **Short lead time**, since the P2ROM is programmed at the final stage of the production process, a large P2ROM inventory "bank system" of un-programmed packaged products are maintained to provide an aggressive lead-time and minimize liability as a custom product.
- **No mask charge**, since P2ROMs do not utilize a custom mask for storing customer code, no mask charges apply.
- **No additional programming charge,** unlike Flash and OTP that require additional programming and handling costs, the P2ROM already has the code loaded at the factory with minimal effect on the production throughput. The cost is included in the unit price.
- **Custom Marking is** available at no additional charge.

PIN CONFIGURATION (TOP VIEW)

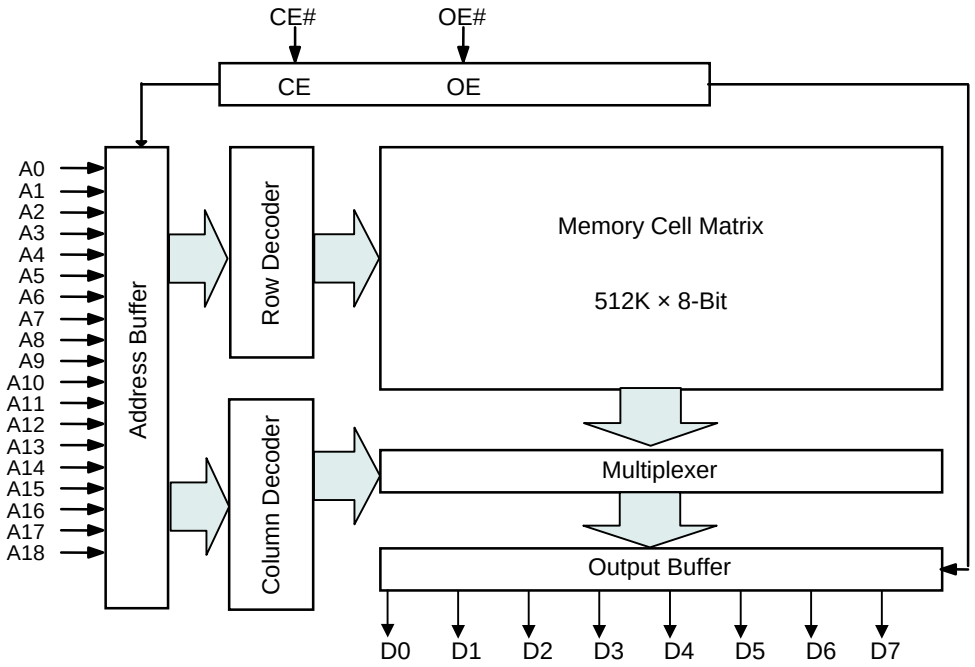


32SOP,



32TSOP(Type-I)

BLOCK DIAGRAM



PIN DESCRIPTIONS

Pin name	Functions
A0 to A18	Address inputs
D0 to D7	Data outputs
CE#	Chip enable input
OE#	Output enable input
V_{CC}	Power supply voltage
V_{SS}	Ground
DC	Don't Care *,

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

FUNCTION TABLE

Mode	CE#	OE#	V_{CC}	D0 to D7
Read	L	L	3.0 V	Dout
Output disable	L	H		Hi-Z
Standby	H	*		Hi-Z

*: 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} = 2.7 to 3.6 V	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}.

* : 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.

PIN CAPACITANCE

(V_{CC} = 3.0 V, Ta = 25°C, f = 1 MHz)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Input	C_{IN1}	V_I = 0 V	—	—	8	pF
DC	C_{IN2}		—	—	200	
Output	C_{OUT}	V_O = 0 V	—	—	10	

ELECTRICAL CHARACTERISTICS

DC Characteristics

(V_{CC} = 2.7 V to 3.6 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}	CE# = V_{CC}		—	—	10	µA
	I_{CCST}	CE# = V_{IH}		—	—	1	mA
V_{CC} power supply current (Read)	I_{CCA1}	CE# = V_{IL}	tc = 100 ns	—	—	25	mA
	I_{CCA2}	OE# = V_{IH}	tc = 200 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} = –1 mA		2.4	—	—	V
Output "L" level	V_{OL}	I_{OL} = 2 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

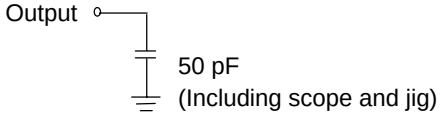
(V_{CC} = 2.7 V to 3.6 V, Ta = 0 to 70°C)

Parameter	Symbol	Condition	Min.	Max.	Unit
Address cycle time	t_C	—	100	—	ns
Address access time	t_{ACC}	CE# = OE# = V_{IL}	—	100	ns
CE# access time	t_{CE}	OE# = V_{IL}	—	100	ns
OE# access time	t_{OE}	CE #= V_{IL}	—	40	ns
Output disable time	t_{CHZ}	OE# = V_{IL}	0	35	ns
	t_{OHZ}	CE# = V_{IL}	0	30	ns
Output hold time	t_{OH}	CE #= OE# = V_{IL}	0	—	ns

Measurement conditions

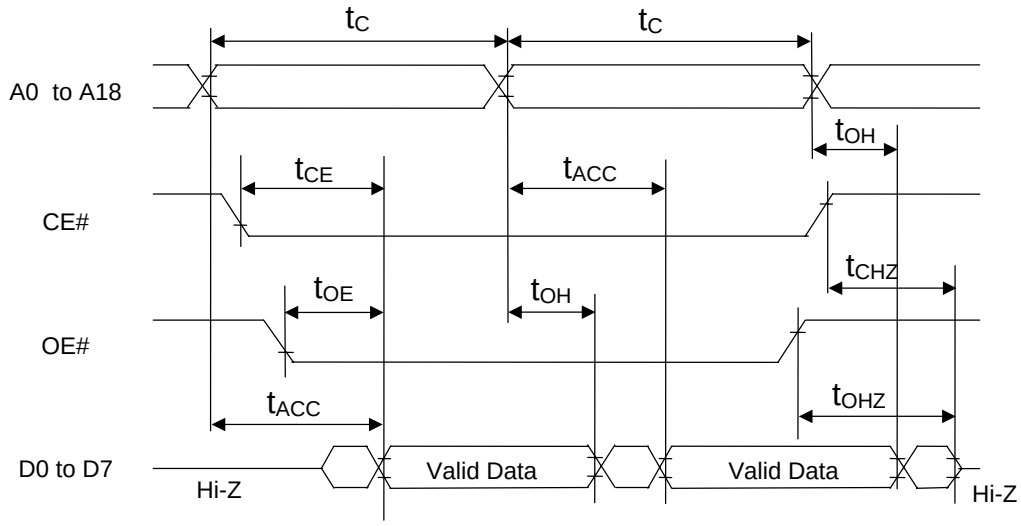
Input signal level ---------- 0 V/Vcc V
Input timing reference level ---------- 1/2Vcc
Output load ---------- 50 pF
Output timing reference level ---------- 1/2Vcc

Output load



TIMING CHART (READ CYCLE)

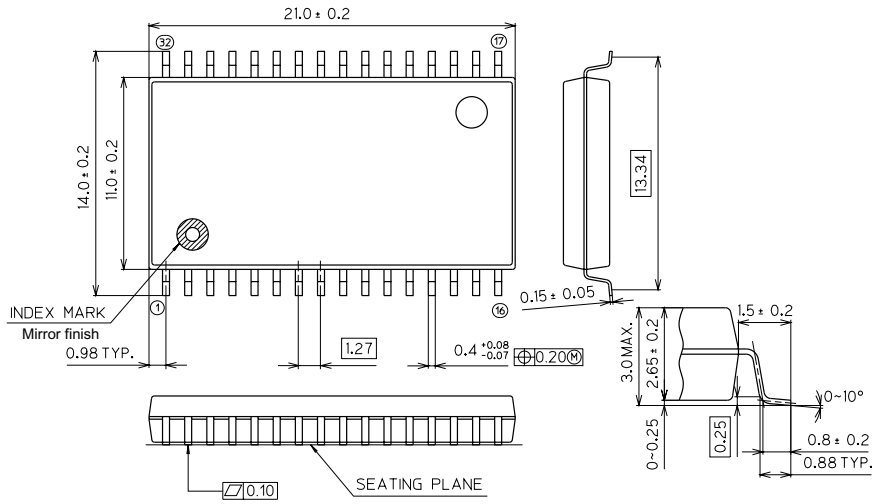
Read



PACKAGE DIMENSIONS

(Unit: mm)

SOP32-P-525-1.27-K



Package material	Epoxy resin
Lead frame material	42 alloy
Pin treatment	Solder plating (≥5µm)
Package weight (g)	1.32 TYP.
Rev. No./Last Revised	5/Fev. 10, 1997

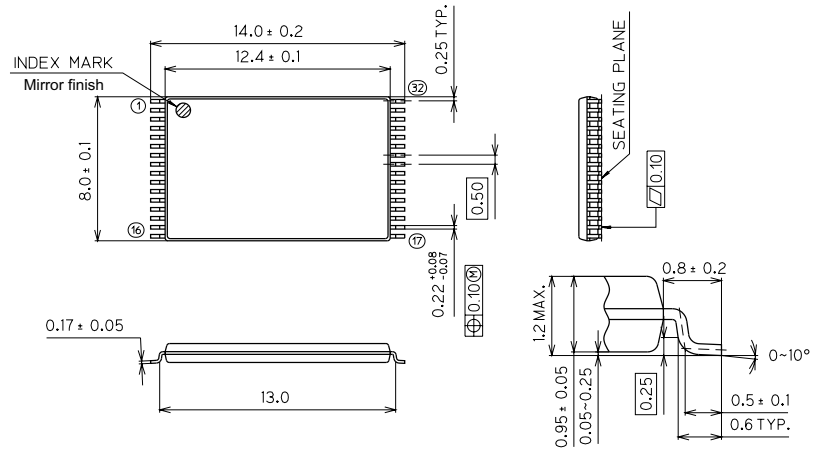
Oki Electric Industry Co., Ltd.

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).

(Unit: mm)

TSOP(1)32-P-0814-0.50-1K



Package material	Epoxy resin
Lead frame material	42 alloy
Pin treatment	Solder plating (≥5µm)
Package weight (g)	0.27 TYP.
Rev. No./Last Revised	3/Dec. 10, 1996

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REVISION HISTORY

Document No.	Date	Page		Description
		Previous Edition	Current Edition	
FEDR27T401E-02-01	Apr. 17, 2002	–	–	Final edition 1

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