

OKI Semiconductor

MSM53V1655F

524,288-Double Words x 32-bit or 1,048,576-Words x 16-bit MaskROM
4Double Words x 32-Bit or 8Words x 16-Bit/Page Mode MASKROM

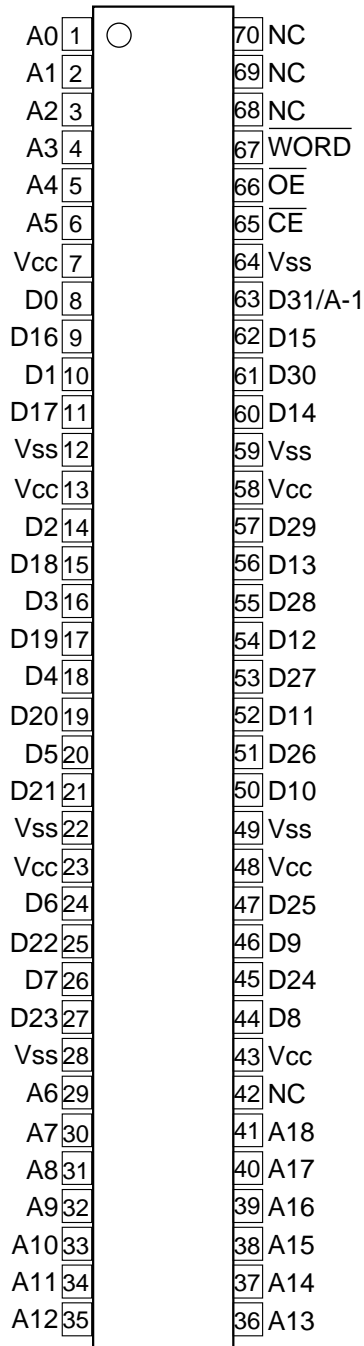
■ DESCRIPTION

The OKI MSM53V1655F is a 524,288-double words x 32-bit or 1,048,576-words x 16-bit CMOS Mask ROM with an asynchronous page read mode. Each page is organized 4double words x 32-bit or 8 words x 16-bit. It operates on a single 3.3V power supply and is TTL compatible. The chip's asynchronous I/O requires no external clock assuring easy operation. A power-down mode provides low power dissipation when the chip is not selected. The CE and OE pins are provided as control signals that permit three-stated output allowing easy memory expansion on a system bus. The MSM531655F is suited for use as large capacity fixed memory for microcomputers and data terminals.

■ FEATURES

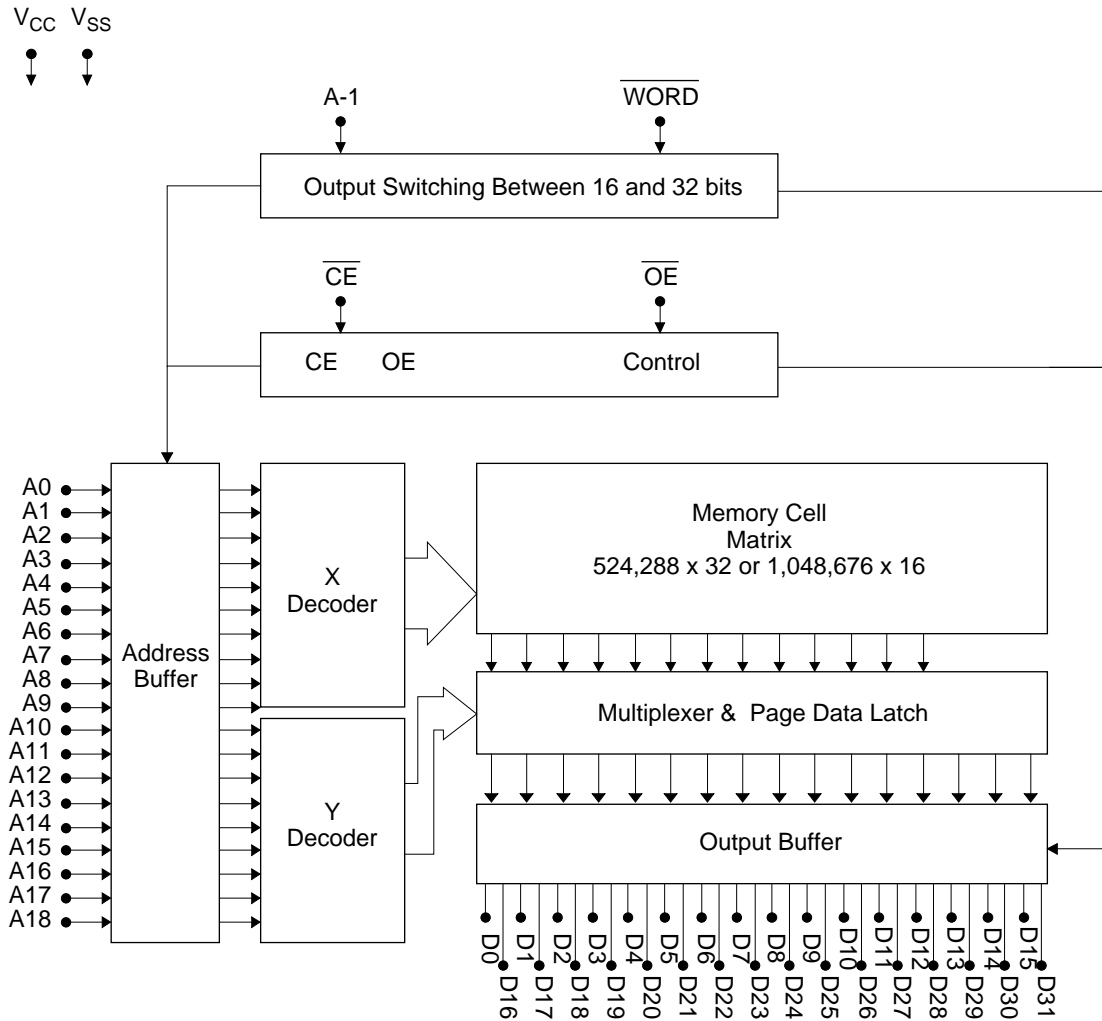
- Single 3.3V power supply
- 524,288-double words x 32-bit / 1,048,576-words x 16-bit
- 4-double words(A1,A0) or 8-words(A1,A0,A-1) / Page
- Access time
 - 100ns Max (Normal access)
 - 30ns Max (Page access)
- Input/Output TTL compatible
- Tri-State output configurations
- Internal powerdown function
- Packages:
 - 70-PIN PLASTIC SSOP (SSOP70-P-500-K)
 - 70-PIN PLASTIC TSOP (TSOP70-P-400/0.65)
- Pin compatible OTP available

PIN CONFIGURATION



Pin Name	Function
D31/A-1	Data output / address input
A0 to A18	Address input
D0 to D30	Data output
CE	Chip enable
OE	Output enable
WORD	Mode switch (H:DW/L:W)
V _{CC} , V _{SS}	Power supply

BLOCK DIAGRAM



FUNCTION TABLE

$\overline{\text{CE}}$	$\overline{\text{OE}}$	BYTE	A-1/D31	D0—D15	D16—D31	D _{OUT} Mode	LSB	MSB
H	X	X	X	Hi-Z	Hi-Z	Hi-Z	—	—
L	H	X	X	Hi-Z	Hi-Z		—	—
L	L	H	Input Inhibited (D31)	D0 to D15	D16 to D31	32 bit	A0	A18
L	L	H	Input Inhibited (D31)	D0 to D15	D16 to D31	32 bit(Page Mode)	A0	A1
L	L	L	L	D0 to D15	Hi-Z	16 bit	A-1	A18
L	L	L	H	D16 to D31	Hi-Z		A-1	A18
L	L	L	L	D0 to D15	Hi-Z	16 bit(Page Mode)	A-1	A1
L	L	L	H	D16 to D31	Hi-Z		A-1	A1

ABSOLUTE MAXIMUM LIMITS

Parameter	Symbol	Conditions	Limits	Unit
Power Supply Voltage	V_{CC}	to V_{SS}	-0.3 to 7	V
Input Voltage	V_I		-0.3 to $V_{CC} + 0.5$	V
Output Voltage	V_O		-0.3 to $V_{CC} + 0.5$	V
Power Dissipation	P_D	Per Package $T_{opr} = 25^\circ\text{C}$	1.0	W
Operating Temperature	T_{opr}	—	0 to 70	$^\circ\text{C}$
Storage Temperature	T_{stg}	—	-55 to 150	$^\circ\text{C}$

RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Conditions	Limits			Unit
			Min.	Typ.	Max.	
Power Supply Voltage	V_{CC}	—	3.0	3.3	3.6	V
	V_{SS}	—	0.0	0.0	0.0	V
"H" Input Voltage	V_{IH}	—	2.2	3.3	$V_{CC} + 0.5$	V
"L" Input Voltage	V_{IL}	—	-0.3	0.0	0.8	V
Operating Temperature	T_{opr}	—	0	—	70	$^\circ\text{C}$

DC CHARACTERISTICS

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

Parameter	Symbol	Conditions	Limits			Unit
			Min.	Typ.	Max.	
"H" Output Voltage	V_{OH}	$I_{OH} = -400\mu\text{A}$	2.4	—	—	V
"L" Output Voltage	V_{OL}	$I_{OH} = 1.0\text{mA}$	—	—	0.4	V
Input Leakage Current	I_{LI}	$V_I = 0 \text{ to } V_{CC}$	-10	—	10	μA
Output Leakage Current	I_{LO}	$V_O = 0 \text{ to } V_{CC}$ $CE = V_{IH\text{ MIN}}$	-10	—	10	μA
Power Supply Current (Operating)	I_{CC}	$CE = V_{IL}, OE = V_{IH}, t_C = 100\text{ns}$	—	—	100	mA
Power Supply Current (Standby)	I_{CCS1}	$CE = V_{CC} - 0.2V$	—	—	50	μA
	I_{CCS}	$CE = V_{IH\text{ MIN}}$	—	—	500	μA

AC CHARACTERISTICS

Test conditions

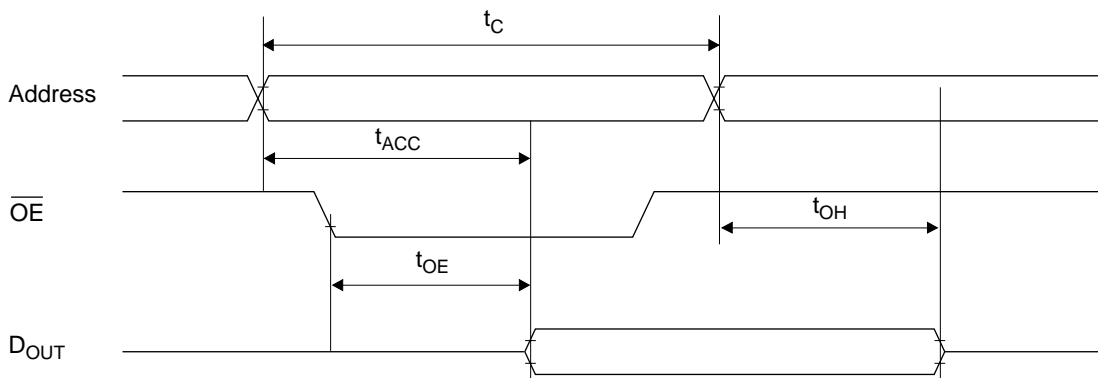
Parameter	Conditions
Input Signal Level	$V_{IH}=3.0V, V_{IL}=0.0V$
Transtion Time	$t_r=t_f=5ns$
Timing Reference Level	Input Voltage=1.5V Output Voltage=0.8V&2.0V
Load Condition	$CL=100pF+1TTL$

Read Cycle

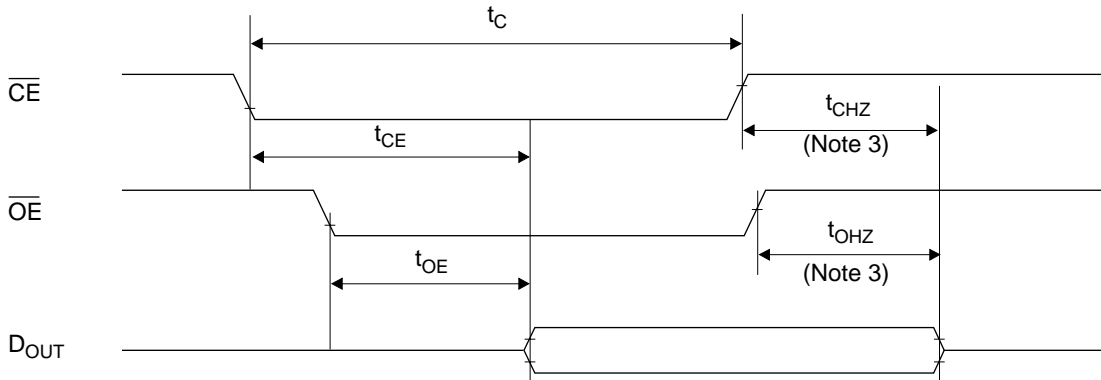
(Ta = 0 to 70°C)

Parameter	Symbol	Conditions	Limits			Unit
			Min.	Typ.	Max.	
Random Access Cycle time	t_C	—	100	—	—	ns
Random Address Access time	t_{ACC}	—	—	—	100	ns
Page Set up time	t_{PSET}	—	100	—	—	ns
Page Access Cycle time	t_{PC}	—	30	—	—	ns
Page Access time	t_{PAC}	—	—	—	30	ns
\overline{CE} Access time	t_{CE}	—	—	—	100	ns
\overline{OE} Access time	t_{OE}	—	—	—	30	ns
\overline{CE} Output Disable time	t_{CHZ}	—	0	—	30	ns
\overline{OE} Output Disable time	t_{OHZ}	—	0	—	25	ns
Output Hold time	t_{OH}	—	0	—	—	ns

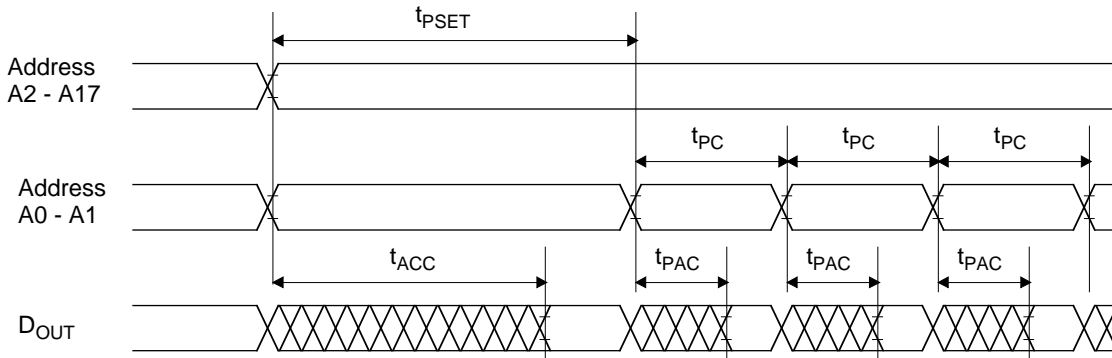
Read Cycle (Note1)



Read Cycle (Note2)



Page Mode Read Cycle (Note4)



- Note)
1. CE is low level.
 2. Address is fixed before or at the same time when CE level falls.
 3. t_{CHZ} & t_{OHZ} indicate the time until floating. They are not determined by the output level.
 4. CE is low level and OE is low level.

I/O CAPACITANCE

Parameter	Symbol	Conditions	Rated Value			Unit
			Min.	Typ.	Max.	
Input Capacitance	C_I	$V_I=0V$	—	—	8	pF
Output Capacitance	C_O	$V_O=0V$	—	—	10	pF

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ADDRESSES & SEMICONDUCTOR WEB SITES

OKI Electric Industry Co., Ltd.,

Device Business Group,
10-3, Shibaura, 4-chome,
Minato-ku, Tokyo 108, Japan,
Tel.: +81-(0)3-5445-6327,
Fax.: +81-(0)3-5445-6328,
<http://www.oki.co.jp/OKI/DBG/english/index.htm>
(NOTE: URL is case sensitive)

OKI Semiconductor Group,

785 North Mary Avenue,
Sunnyvale, CA 94086, U.S.A.,
Tel.: +1-408-720-1900,
Fax.: +1-408-720-1918,
<http://www.okisemi.com/>

OKI Electric Europe GmbH,

Head Office Europe,
Hellersbergstrasse 2,
D-41460 Neuss, Germany,
Tel: +49-2131-15960,
Fax: +49-2131-103539,
<http://www.oki-europe.de/>

OKI Electronics (Hong Kong) Ltd.,

Suite 1901-1&19, Tower 3,
China Hong Kong City,
33 Canton Road, Tsimshatsui,
Kowloon, Hong Kong,
Tel.: +852-2-736-2336,
Fax.: +852-2-736-2395

OKI Semiconductor (Asia) Pte. Ltd.,

78 Shenton Way 09-01,
Singapore 0207,
Tel.: +65-221-3722,
Fax.: +65-323-5376

OKI Semiconductor (Asia) Pte. Ltd.,

Taipei Branch,
7th Fl. No.260, Tun Hwa North Road,
Taipei, Taiwan, R.O.C.,
Sumitomo-Flysun Building,
Tel.: +886-2-2719-2561,
Fax.: +886-2-2715-2892
<http://www.oki.net.tw/>

For further information, please contact:

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