RICOH

T-46-13-15 EK-073-9203

RP/RF534040E

CMOS 4Mbit MASK ROM

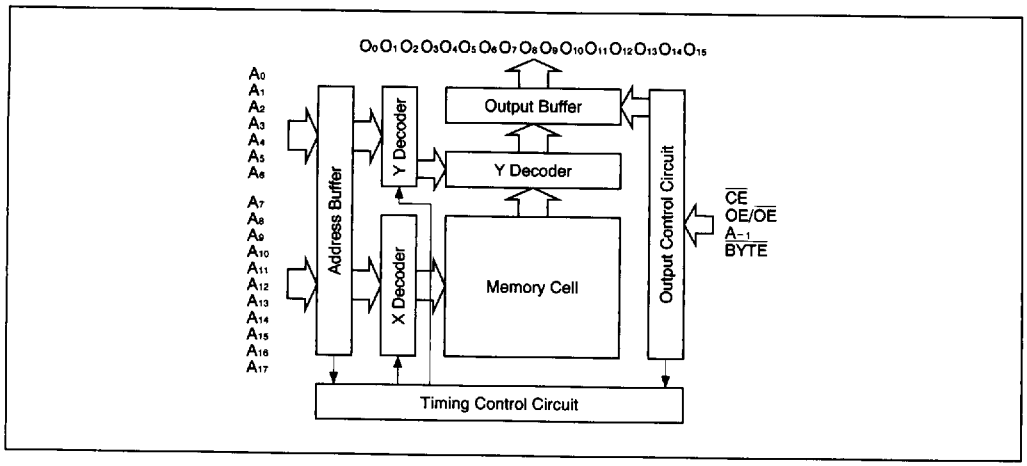
(524,288 word × 8 bit / 262,144 word × 16 bit)

RP/RF534040E is a 4 Mbit programmable mask ROM using CMOS process technology.
It has also been provided with a power down function which reduces supply current from 50mA (Max.) to 100μA (Max.) by setting the $\overline{CE}$ input to the " H " level.
In addition, the logic level of the output enable can be selected from among three types of logic levels, ACTIVE HIGH, ACTIVE LOW and ISOLATED.

■ FEATURES

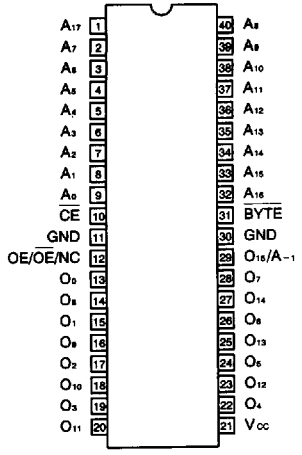
1. Organization : 524288 words x 8 bits
   262144 words x 16 bits
2. Access Time : 200 ns
3. TTL Compatible Input/Output
4. Single 5V Power Supply
5. Power Consumption : operation 275 mW (Max.)
   standby 0. 55 mW (Max.)
6. 3 - state Output
7. Package : RP534040E · · · 40 pin DIP
   RF534040E · · · 64 pin QFP

■ BLOCK DIAGRAM

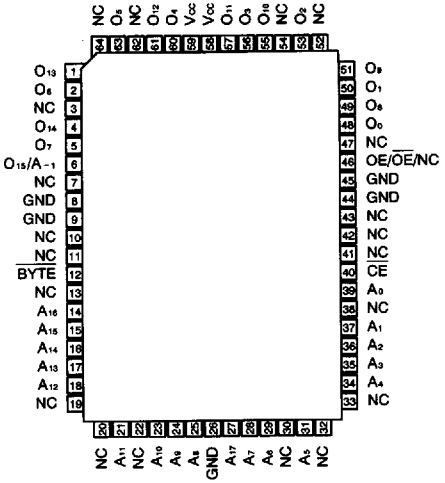


PIN DESCRIPTION

● RP534040E (40PIN DIP)



● RF534040E (64PIN QFP)



PIN DESCRIPTION

Pin Name	Function
A_{-1}～A_{17}	Address Input
O_0～O_{15}	Data Output
OE/$\overline{OE}$	Output Enable Input
$\overline{CE}$	Chip Enable Input
$\overline{BYTE}$	BYTE output/WORD MODE swiching
V_{CC}	Power Supply (+5V)
GND	Ground
NC	No connection

OUTPUT MODE SWITCHING

Output mode switching is done by $\overline{BYTE}$ input. $\overline{BYTE}$ input at high level sets to WORD MODE (16 bit output). $\overline{BYTE}$ input at low level sets to BYTE MODE (8 bit output). During BYTE MODE the O_{15} output pin switches to A_{-1} input pin.

$\overline{CE}$	$\overline{OE}$ (OE)	$\overline{BYTE}$	A_{-1} (O_{15})	$O_{0\sim7}$	$O_{8\sim15}$	MODE	LSB	MSB
H	X	X	X	Hi−Z	Hi−Z	Standby	−	−
L	H (L)	X	X	Hi−Z	Hi−Z	Output Hi−Z	−	−
L	L (H)	H	Inhibit	$O_{0\sim7}$	$O_{8\sim15}$	WORD	A_0	A_{17}
L	L (H)	L	L	$O_{0\sim7}$	Hi−Z	BYTE	A_{-1}	A_{17}
L	L (H)	L	H	$O_{8\sim15}$	Hi−Z			

(Note) X : Don't Care
Hi −Z : High Impedance

■ ABSOLUTE MAXIMUM RATING

Symbol	Parameter	Condition	Limit	Unit
V_{CC}	Supply Voltage	With respect to GND	− 0.3 ~ 7	V
V_I	Input Voltage		− 0.3 ~ V_{CC} + 0.5	V
V_O	Output Voltage		− 0.3 ~ V_{CC} + 0.3	V
Pd	Power Consumption	Ta = 25 ℃	350	mW
Topr	Operating Temperature		0 ~ 70	℃
Tstg	Storage Temperature		− 40 ~ 125	℃

■ RECOMMENDED OPERATING CONDITION (Ta=0~70℃)

Symbol	Parameter	Min.	Typ.	Max.	Unit
V_{CC}	Supply Voltage	4.5	5.0	5.5	V
V_{IH}	" H " Input Voltage	2.2		V_{CC}	V
V_{IL}	" L " Input Voltage	0		0.8	V

■ ELECTRICAL CHARACTERISTICS

● DC ELECTRICAL CHARACTERISTICS (Ta=0~70℃, Vcc=5V±10%)

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
I_{SB1}	Supply Current (Standby)	*1			0.1	mA
I_{SB2}	Supply Current (Standby)	*2			2	mA
I_{CC}	Supply Current (Operation)	I_O = 0 mA, t_{RC} = 200 ns			50	mA
V_{OH}	" H " Output Voltage	I_{OH} = − 0.4 mA	2.4			V
V_{OL}	" L " Output Voltage	I_{OL} = 2.5 mA			0.4	V
V_{IH}	" H " Input Voltage		2.2		V_{CC}+0.3	V
V_{IL}	" L " Input Voltage		−0.3		0.8	V
I_{LI}	Input Leakage Current	V_I = 0V ~ V_{CC}	− 10		10	μA
I_{LO}	Output Leakage Current	V_O = 0V ~ V_{CC} Chip Deselected	− 10		10	μA

*1 : CE = Vcc − 0.2V, Total input = 0.2V or Vcc − 0.2V, Io = 0 mA

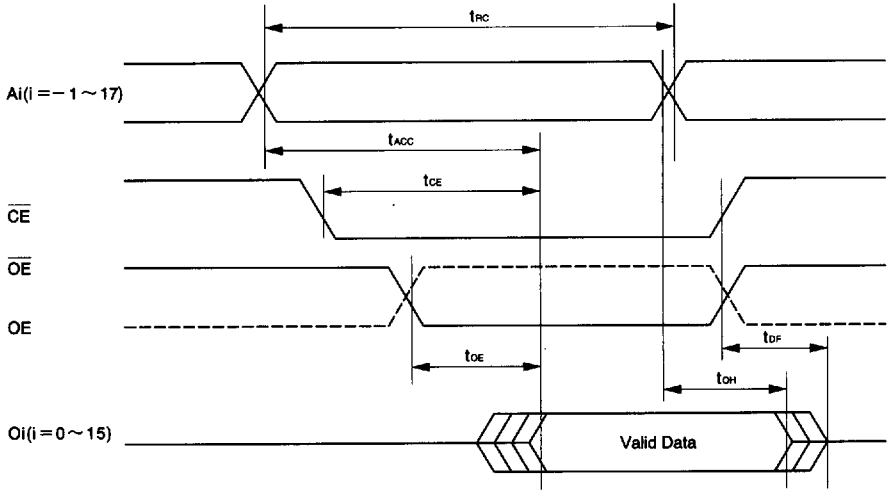
*2 : $\overline{CE}$ = 2.2V, Total input = 0.8V or 2.2V, Io = 0 mA

● AC ELECTRICAL CHARACTERISTICS (Ta=0~70℃, Vcc=5V±10%)

Symbol	Parameter	Min.	Typ.	Max.	Unit
t_{RC}	Read Cycle Time	200			ns
t_{ACC}	Address Access Time			200	ns
t_{CE}	Chip Enable Access Time			200	ns
t_{OE}	Output Enable Access Time			80	ns
t_{DF}	Output Floating Delay Time	0		80	ns
t_{OH}	Output Hold Time	0			ns

Input Voltage : V_{IL} = 0.6V, V_{IH} = 2.4V, tr, tf = 10 ns
Output Load : 1 TTL + 100 pF
Measuring Voltage : V_{IL} = 0.8V, V_{IH} = 2.2V, V_{OL} = 0.8V, V_{OH} = 2.2V

● TIMING CHART



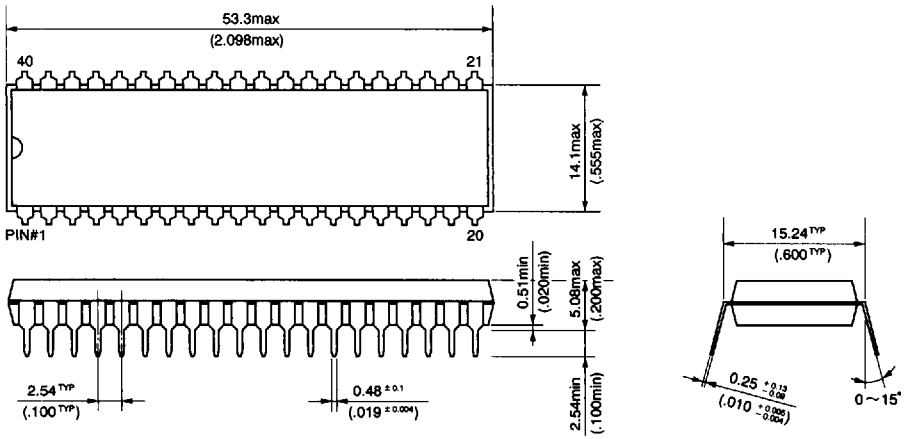
NOTE
(Valid data after power on)
After power on, with $\overline{CE}$ set to GND level, valid data output will be sent after t_{ACC}, from a change in at least one address input.
If other than the above parameters, the valid data output will be sent after t_{CE} due to the $\overline{CE}$ rise pulse.

● CAPACITANCE

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
Ci	Input Capacitance	f = 1MHz			10	pF
Co	Output Capacitance				15	pF

PACKAGE DIMENSION (Unit : mm/inch)

● 40PIN DIP (RP534040E)



● 64PIN QFP (RF534040E)