PCMCIA/JEIDA ONE TIME PROGRAMABLE ROM

1. VARIATION

Part Number	Memory Size	Description
EWB065SD**	64K BYTE	32K × 16 bit OTP ROM CARD
EWB129SD**	128K BYTE	64K × 16 bit OTP ROM CARD
EWB257SD**	256K BYTE	128K × 16 bit OTP ROM CARD
EWB513SD**	512K BYTE	256K × 16 bit OTP ROM CARD
EWB101SD**	1M BYTE	512K × 16 bit OTP ROM CARD
EWB201SD**	2M BYTE	1M × 16 bit OTP ROM CARD

2. OUTLINE OF FUNCTIONS AND FEATURES

(1) This memory card conforms to PCMCIA/JEIDA.
(2) Operating temperature range: TOPR = 0 ~ 60°C
Storage temperature range: TSTR = –20 ~ 60°C
(3) Size of the card: 85.6 × 54.0 × 3.3 mm
(4) Includes exclusive IC's for the control of I/O.
(5) Supports 2 types of exclusive attribute memory.
(5–1) EWB***SDY*: With 2K Bytes EEPROM which can read/written
(5–2) EWB***SDY*: Without exclusive attribute memory (output "FFh", read only)
(6) This memory card is programmed by manufacturer.

3. ELECTRICAL CHARACTERISTICS

3–1. Maximum Rating

Symbol	Description	Value	Unit
V_{CC}	SUPPLY VOLTAGE	–0.3 ~ 7.0	V
V_{IN}	INPUT SIGNAL VOLTAGE (*1)	–0.3 ~ V_{CC} +0.5	V
V_{OUT}	OUTPUT SIGNAL VOTLAGE	–0.3 ~ V_{CC}	V
T_{OPR}	OPERATING TEMPERATURE	0 ~ 60	°C
T_{STR}	STORAGE TEMPERATURE	–20 ~ 65	°C
HUM	HUMIDITY (*2)	10 ~ 95	%
PD	POWER DISSIPATION	1	W

*1: V_{IN}: Under 7.0 V

*2: No dew condition

3–2. Capacitance (Ta = 25°C, $V_{IN/OUT}$ = 0 V, f = 1 MHz)

Symbol	Description	Min	Typ	Max	Unit
C1	INPUT CAPACITANCE	—	14	20	pF
C2	I/O CAPACITANCE	—	14	20	pF

3–3. Recommended Operating Conditions (Ta = 0 ~ 60°C)

Symbol	Description	Min	Typ	Max	Unit
V_{CC}	V_{CC} SUPPLY VOLTAGE	4.50	5.0	5.5	V
V_{PP}	V_{PP} SUPPLY VOLTAGE AT READ	4.50	5.0	5.50	V
V_{IH}	HIGH LEVEL INPUT VOLTAGE	V_{CC}×0.8	—	V_{CC} +0.3	V
V_{IL}	LOW LEVEL INPUT VOLTAGE	–0.1	—	V_{CC}×0.1	V

3–4. I/C DC Electrical Characteristics (Ta = 0 ~ 60°C, Vcc = 5 V ±10%)

Symbol	Description	Object	Condition	Min	Typ	Max	Unit
ILI	LOW LEVEL INPUT CURRENT	1, 3	VIN=0V	–10	—	10	μA
		2		–65	—	–40	μA
IHI	HIGH LEVEL INPUT CURRENT	1, 2	VIN=Vcc	–10	—	10	μA
		3		10	—	65	μA
VOH	HIGH LEVEL OUTPUT VOLTAGE	3	IOH=-2.0 mA	Vcc–0.4	—	—	V
VOL	LOW LEVEL OUTPUT VOLTAGE	3	IOL=6.0 mA	—	—	Vss+0.4	V

1: A0 ~ A19

2: /CE1, /CE2, /OE, /WE, /REG

3: D0 ~ D15

/CE1, /CE2, /OE, /WE, /REG

: Pull-up to Vcc through 100 KΩ in the card

D0 ~ D15: Pull-down to GND through 100 KΩ in the card.

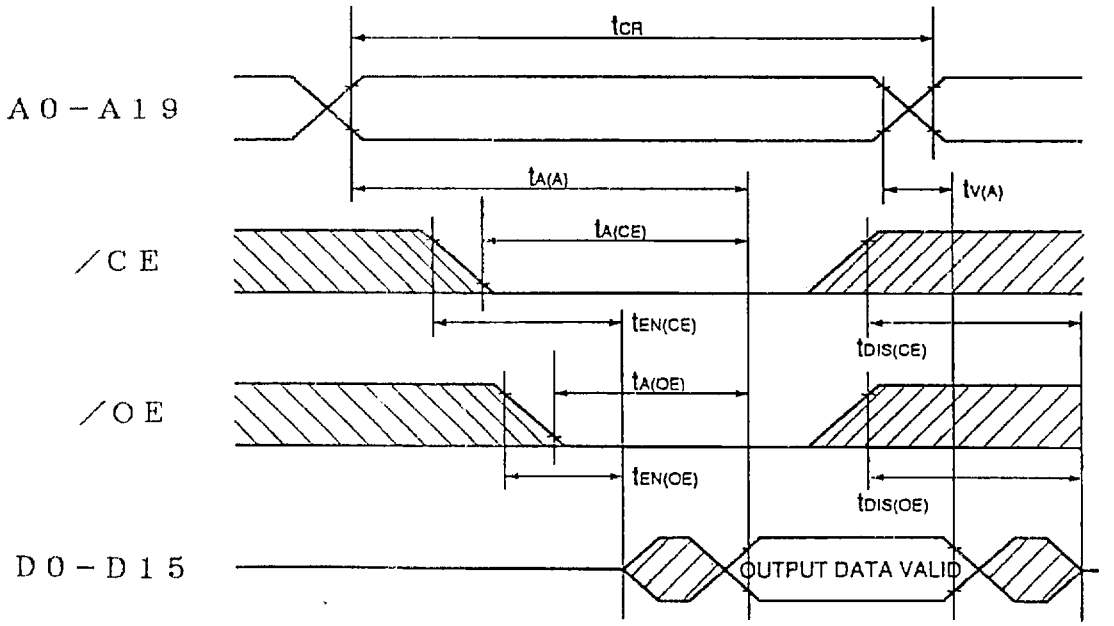
3–5. Current Consumption (Ta = 0 ~ 60%)

Symbol	Description	Condition		Min	Typ	Max	Unit
ISTBY1	Vcc STANDBY CURRENT 1	/CE1=/CE2=/WE=/OE=/REG= Vcc–0.4V OTHERS=0.4V/Vcc–0.4V Vcc=5V±0.5V, Vpp=Vcc		—	1.0	1.5	mA
IACT1	Vcc ACTIVE CURRENT (READ)	/CE1=/CE2=0.4V, IOUT=0 mA OTHERS=0.4V/Vcc–0.4V INPUT PALSE LEVEL (0.4V/Vcc–0.4V) Vcc=5V±0.5V, Vpp=Vcc	f=1uS	—	20	40	mA
			f=200nS	—	—	70	mA
IPP1	Vpp CURRENT (READ)	Vcc=5V±0.5V, Vpp=Vcc±0.25V		–20	—	20	μA

3–6. AC Electrical Characteristics at Read of Common Memory (Ta = 0 ~ 60°C, Vcc = 5 V ±10%)

Symbol	Description	Min	Max	Unit
TCR	READ CYCLE TIME	200	—	nS
TA (A)	ADDRESS ACCESS TIME	—	200	nS
TA (CE)	/CE ACCESS TIME	—	200	nS
TA (OE)	/OE ACCESS TIME	—	100	nS
TDIS (CE)	OUTPUT DISABLE TIME FROM /CE	—	90	nS
TDIS (OE)	OUTPUT DISABLE TIME FROM /OE	—	90	nS
TEN (CE)	OUTPUT ENABLE TIME FROM /CE	5	—	nS
TEN (OE)	OUTPUT ENABLE TIME FROM /OE	5	—	nS
TV (A)	VALID DATA HOLD TIME FROM ADDRESS INVALID	0	—	nS

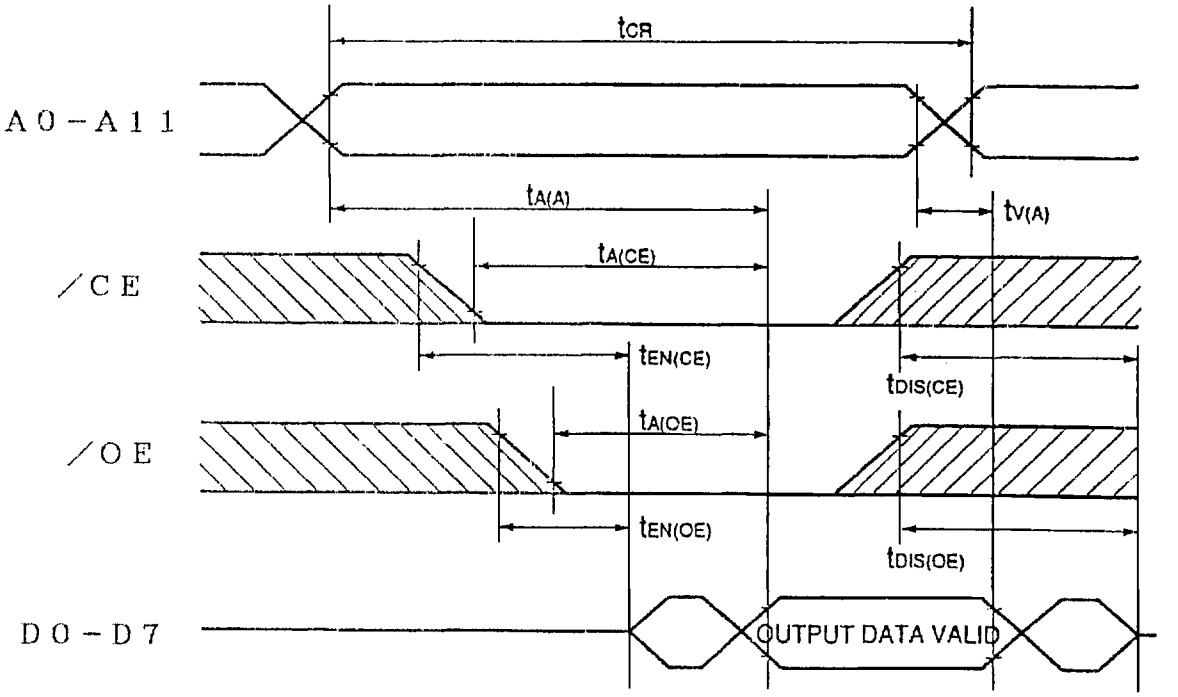
3–7. Read Timing of Common memory



3–8. AC Electrical Characteristics at Read of Attribute Memory (2 K Bytes EEPROM) (Ta = 0 ~ 60°C, V_{CC} = 5 V ±10%)

Symbol	Description	Min	Max	Unit
TCR	READ CYCLE TIME	300	—	nS
TA (A)	ADDRESS ACCESS TIME	—	300	nS
TA (CE)	/CE ACCESS TIME	—	300	nS
TA (OE)	/OE ACCESS TIME	—	150	nS
TDIS (CE)	OUTPUT DISABLE TIME FROM /CE	—	100	nS
TDIS (OE)	OUTPUT DISABLE TIME FROM /OE	—	100	nS
TEN (CE)	OUTPUT ENABLE TIME FROM /CE	5	—	nS
TEN (OE)	OUTPUT ENABLE TIME FROM /OE	5	—	nS
TV (A)	VALID DATA HOLD TIME FROM ADDRESS INVALID	0	—	nS

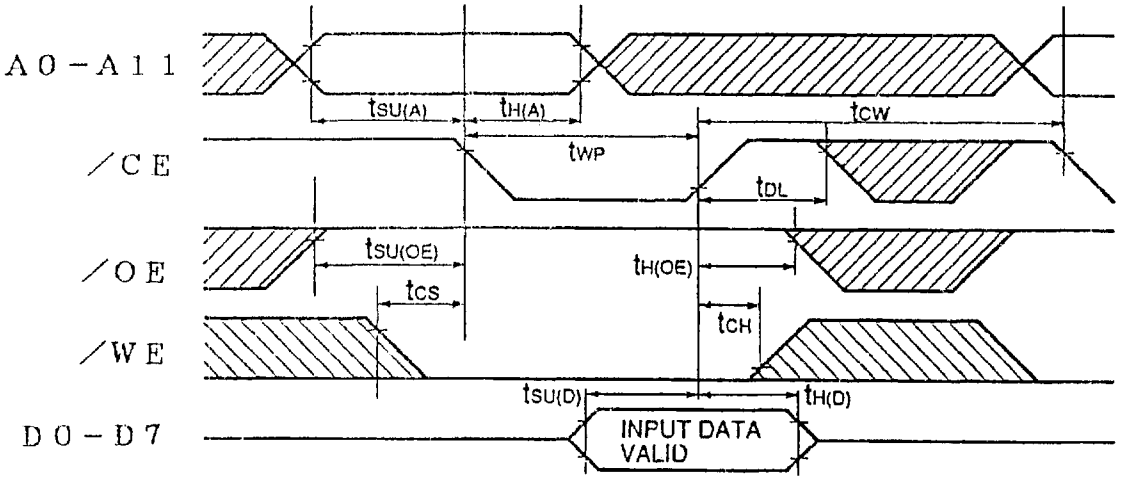
3–9. Read Timing of Attribute Memory (2K Bytes EEPROM)



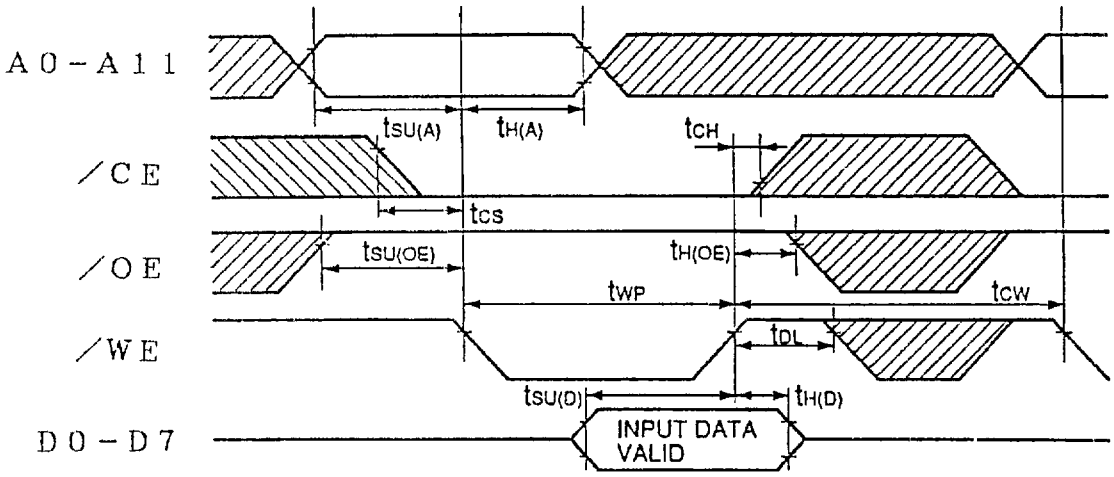
3–10. AC Electrical Characteristics at Write of Attribute Memory (2K Bytes EEPROM) (Ta = 0 ~ 60°C, Vcc = 5 V ±10%)

Symbol	Description	Min	Max	Unit
TCW	WRITE CYCLE TIME	15	—	mS
TWP	WRITE PULSE WIDTH	150	—	nS
TSU (A)	ADDRESS SETUP TIME	30	—	nS
TSU (D)	DATA SETUP TIME	80	—	nS
TH (D)	DATA HOLD TIME	30	—	nS
TSU (OE)	/OE SETUP TIME	15	—	nS
TH (OE)	/OE HOLD TIME	15	—	nS
TH (A)	ADDRESS HOLD TIME	100	—	nS
TCS	WRITE HOLD TIME	30	—	nS
TCH	WRITE HOLD TIME	0	—	nS
TDL	DATA LATCH TIME	50	—	nS

3–11. Write Timing of Attribute Memory (2K Bytes EEPROM) (/CE Controll)



3–12. Write Timing of Attribute Memory (2K Bytes EEPROM) (/WE Controll)



3–13. AC Test Conditions

VCC	: 5 V ± 10%
Ta	: 0 ~ 60°C
Input pulse level	: VIH=VCC × 0.8 V VIL=VCC × 0.1 V
I/O timing reference level	: 1.5 V
Output load	: 100 pF + 1 TTL gate (including oscilloscope and jig)

3–14. Operating Modes of Common Memory

Operating Mode	/REG	A0	/CE1	/CE2	/OE	/WE	D0 ~ D7	D8 ~ D15
STANDBY	*	*	VIH	VIH	*	*	Hi-Z	Hi-Z
EVEN DATA READ	VIH	VIL	VIL	VIH	VIL	VIH	OUTPUT	Hi-Z
ODD DATA READ 1	VIH	VIH	VIL	VIH	VIL	VIH	OUTPUT	Hi-Z
ODD DATA READ 2	VIH	*	VIH	VIL	VIL	VIH	Hi-Z	OUTPUT
WORD READ	VIH	*	VIL	VIL	VIL	VIH	OUTPUT	OUTPUT

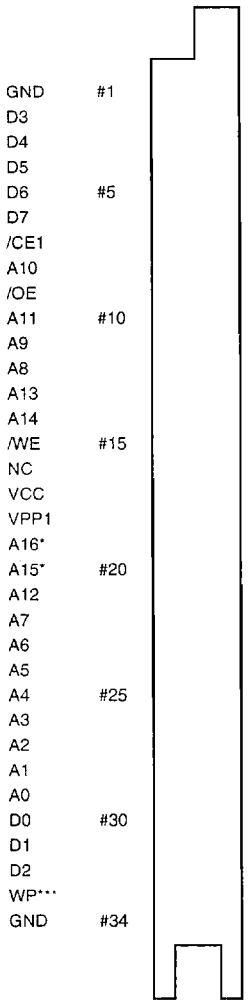
Hi-Z : High impeda
* : VIH or VIL

3–15. Operating Modes of Attribute memory (2K Bytes EEPROM)

Operating Mode	/REG	A0	/CE1	/CE2	/OE	/WE	D0 ~ D7	D8 ~ D15
BYTE DATA READ	VIL	VIL	VIL	VIH	VIL	VIH	OUTPUT	Hi-Z
	VIL	VIH	VIL	VIH	VIL	VIH	Hi-Z	Hi-Z
WORD DATA READ	VIL	*	VIL	VIL	VIL	VIH	OUTPUT	Hi-Z
BYTE DATA WRITE	VIL	VIL	VIL	VIH	VIH	VIL	INPUT	Hi-Z
	VIL	VIH	VIL	VIH	VIH	VIL	INVALID	Hi-Z
WORD DATA WRITE	VIL	*	VIL	VIL	VIH	VIL	INPUT	INVALID

Hi-Z : High impeda
* : VIH or VIL

4. PIN ASSIGNMENT



GND	#1		#35	GND
D3				/CD1**
D4				D11
D5				D12
D6	#5			D13
D7			#40	D14
/CE1				D15
A10				/CE2
/OE				NC
A11	#10			NC
A9			#45	NC
A8				A17*
A13				A18*
A14				A19*
/WE	#15			NC
NC			#50	NC
VCC				VCC
VPP1				VPP2
A16*				NC
A15*	#20			NC
A12			#55	NC
A7				NC
A6				NC
A5				NC
A4	#25			NC
A3			#60	NC
A2				/REG
A1				BVD2***
A0				BVD1***
D0	#30			D8
D1			#65	D9
D2				D10
WP***				/CD2**
GND	#34		#68	GND

A15* : EWB065, EWB129, EWB257, EWB513, EWB101

A16* : EWB129, EWB257, EWB513, EWB101

A17* : EWB257, EWB513, EWB101

A18* : EWB513, EWB101

A19* : EWB101

/CD1**, /CD2**

: Connect to GND in the card.

WP***, BVD1***, BVD2***

: Connect to Vcc in the card.

NC : No connect