HN62448 Series

524288-word × 16-bit/1048576-word × 8-bit CMOS
Mask Programmable ROM

HITACHI

ADE-203-397B (Z)
Rev. 2.0
Oct. 2, 1996

Description

The Hitachi HN62448 is a 8-Mbit CMOS mask-programmable ROM organized either as 524288-words by 16-bits or as 1048576-words by 8-bits. And a high speed access of 100/120 ns is the most suitable to the system using a high speed microcomputer by 16 bits.

Features

- Single 5 V power supply
- Access time:
  - Normal access time: 100/120 ns (max)
- Low power dissipation
  - Active: 300 mW (typ)
  - Standby: 5 μW (typ)
- Byte-wide or word-wide data organization with BHE
- Three-state data output for wired or-tying
- Directly TTL compatible (All input and output)

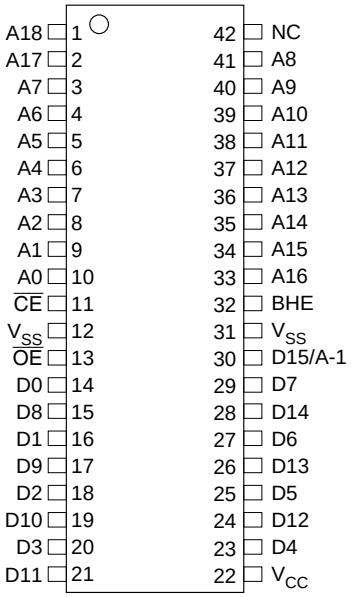
Ordering Information

Type No.	Access time	Package
HN62448P-10	100 ns	600mil 42-pin plastic DIP (DP-42)
HN62448P-12	120 ns	
HN62448FB-10	100 ns	44-pin plastic SOP (FP-44D)
HN62448FB-12	120 ns	
HN62448TT-10	100 ns	44-pin plastic TSOP II (TTP-44D)
HN62448TT-12	120 ns	

Hitachi semiconductor

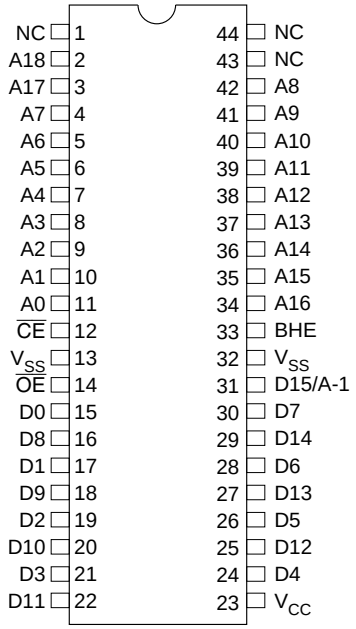
Pin Arrangement

HN62448P Series



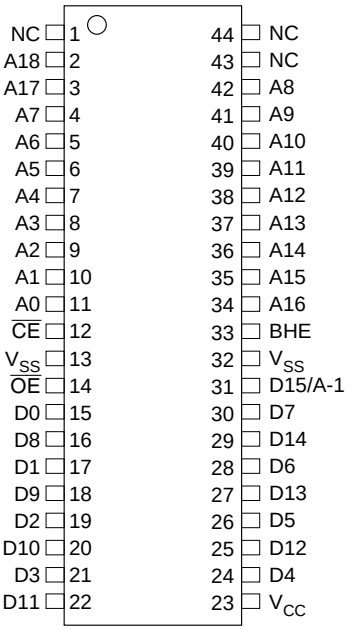
(Top View)

HN62448FB Series



(Top View)

HN62448TT Series

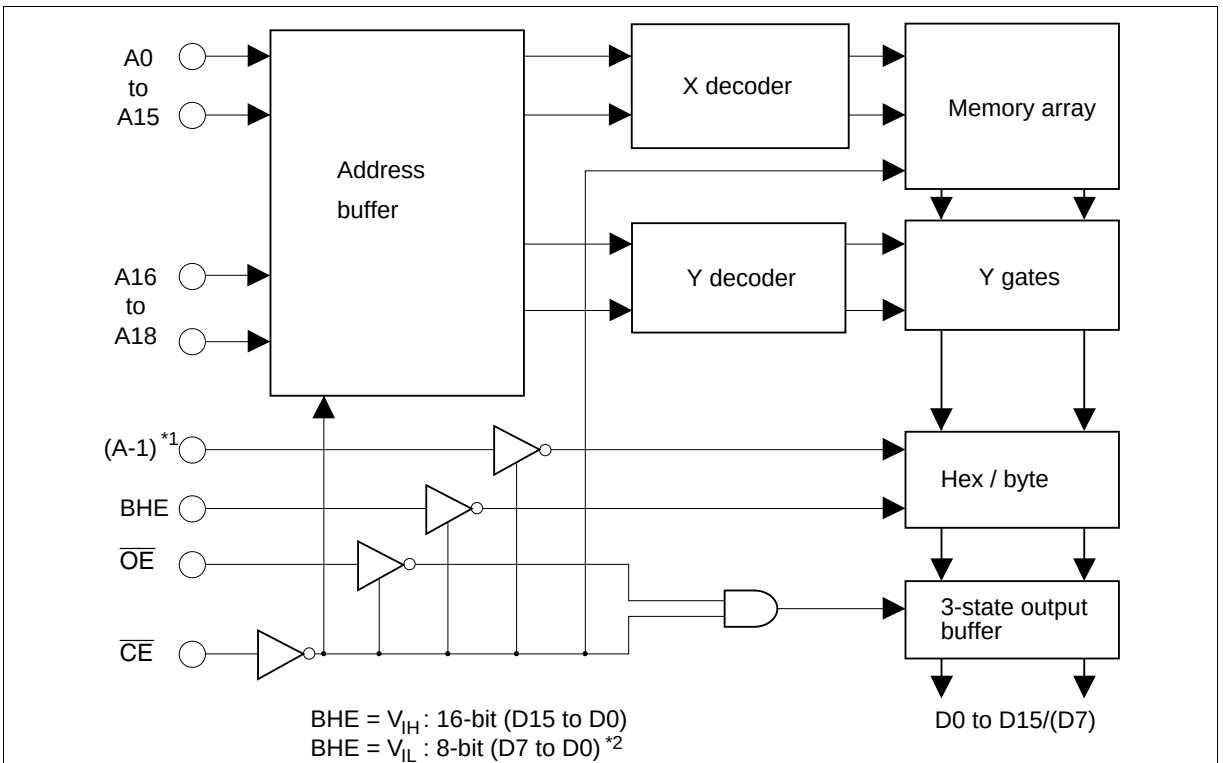


(Top View)

Pin Description

Pin name	Function
A0 to A18	Address input
D0 to D14	Data output
D15/A-1	Data output/address input
$\overline{OE}$	Output enable
$\overline{CE}$	Chip enable
BHE	Byte/word selection
V_{CC}	Power supply
V_{SS}	Ground
NC	No connection

Block Diagram



Note: 1. A-1 is least significant address.
2. When BHE is 'low', D14 to D8 gose the high impedance state.

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit	Note
Supply voltage	V_{CC}	–0.3 to +7.0	V	1
All input and output voltage	Vin, Vout	–0.3 to V_{CC} +0.3	V	1
Operating temperature range	Topr	0 to 70	°C	
Storage temperature range	Tstg	–55 to +125	°C	
Temperature under bias	Tbias	–20 to +85	°C	

Note: 1. With respect to V_{SS}.

Recommended DC Operating Conditions (Ta = 0 to +70°C)

Parameter	Symbol	Min	Typ	Max	Unit
Supply voltage	V_{CC}	4.5	5.0	5.5	V
	V_{SS}	0	0	0	V
Input voltage	V_{IH}	2.2	—	V_{CC} + 0.3	V
	V_{IL}	–0.3	—	0.8	V

DC Characteristics (V_{CC} = 5 V ± 10%, V_{SS} = 0 V, Ta = 0 to +70°C)

Parameter		Symbol	Min	Max	Unit	Test conditions
Supply current	Active	I_{CC}	—	100/80	mA	V_{CC} = 5.5 V, I_{DOUT} = 0 mA, t_{RC} = 100/120 ns
	Standby	I_{SB1}	—	30	µA	V_{CC} = 5.5 V, $\overline{CE} \geq V_{CC}$ –0.2 V
	Standby	I_{SB2}	—	3	mA	V_{CC} = 5.5 V, $\overline{CE} \geq$ 2.2 V
Input leakage current		$\|I_{IL}\|$	—	10	µA	Vin = 0 to V_{CC}
Output leakage current		$\|I_{OL}\|$	—	10	µA	$\overline{CE}$ = 2.2 V, V_{OUT} = 0 to V_{CC}
Output voltage		V_{OH}	2.4	—	V	I_{OH} = –205 µA
		V_{OL}	—	0.4	V	I_{OL} = 1.6 mA

Capacitance (V_{CC} = 5 V ± 10%, V_{SS} = 0 V, Ta = 25°C, Vin = 0 V, f = 1 MHz)

Parameter	Symbol	Min	Max	Unit
Input capacitance*[1]	Cin	—	15	pF
Output capacitance*[1]	Cout	—	15	pF

Note: 1. This parameter is periodically sampled and not 100% tested.

AC Characteristics (V_{CC} = 5 V ± 10%, V_{SS} = 0 V, Ta = 0 to + 70°C)

Test Condition

- Output load: 1TTL gate + C_L = 100 pF (including scope & jig)
- Input pulse levels: 0.45 to 2.8 V
- Input and output timing reference levels: 1.5V
- Input rise and fall time: 5 ns

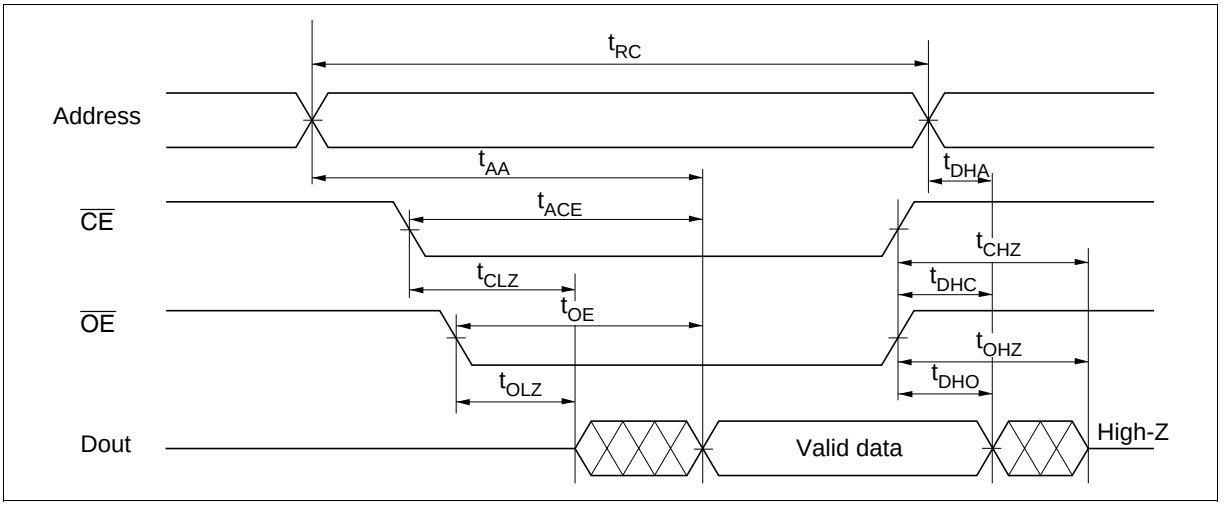
Read Cycle

		HN62448-10		HN62448-12			
Parameter	**Symbol**	**Min**	**Max**	**Min**	**Max**	**Unit**	**Note**
Read cycle time	t_{RC}	100	—	120	—	ns	
Address access time	t_{AA}	—	100	—	120	ns	3
$\overline{CE}$ access time	t_{ACE}	—	100	—	120	ns	3
$\overline{OE}$ access time	t_{OE}	—	40	—	50	ns	3
BHE access time	t_{BHE}	—	100	—	120	ns	
Output hold time from address change	t_{DHA}	0	—	0	—	ns	2
Output hold time from $\overline{CE}$	t_{DHC}	0	—	0	—	ns	2
Output hold time from $\overline{OE}$	t_{DHO}	0	—	0	—	ns	2
Output hold time from BHE	t_{DHB}	0	—	0	—	ns	
$\overline{CE}$ to output in high-Z	t_{CHZ}	—	40	—	40	ns	1
$\overline{OE}$ to output in high-Z	t_{OHZ}	—	40	—	40	ns	1
BHE to output in high-Z	t_{BHZ}	—	40	—	40	ns	1
$\overline{CE}$ to output in low-Z	t_{CLZ}	5	—	5	—	ns	4
$\overline{OE}$ to output in low-Z	t_{OLZ}	5	—	5	—	ns	4
BHE to output in low-Z	t_{BLZ}	5	—	5	—	ns	

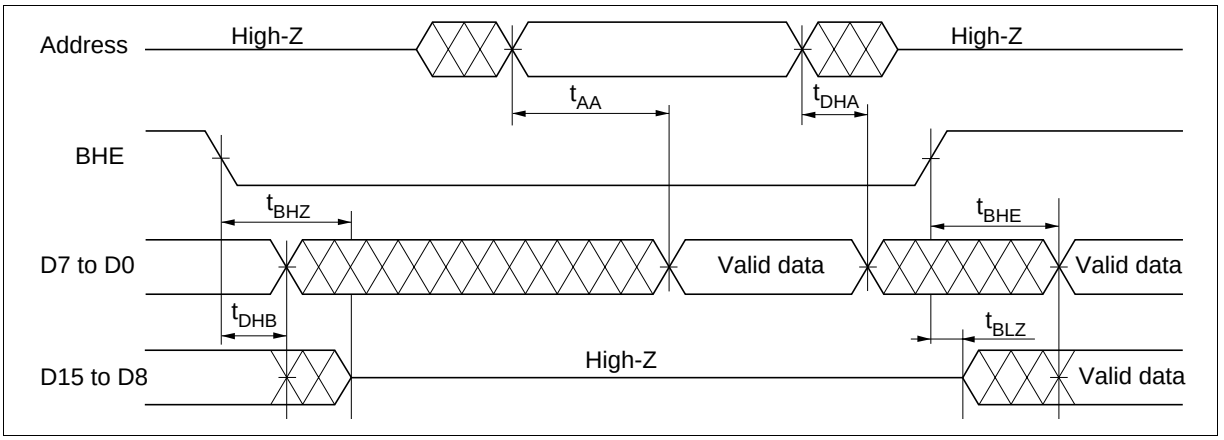
Note:
1. t_{CHZ}, t_{OHZ} and t_{BHZ} are defined as the time at which the output achieves the open circuit conditions and are not referred to output voltage levels.
2. t_{DHA}, t_{DHC}, t_{DHO}: Determined by faster.
3. t_{AA}, t_{ACE}, t_{OE}: Determined by slower.
4. t_{CLZ}, t_{OLZ}: Determined by slower.
5. $\overline{CE}$ and $\overline{OE}$ are enable A18 to A0 are valid.
6. D15/A-1 pin is in the output state when BHE is high, $\overline{CE}$ and $\overline{OE}$ are enable. Therefore, the input signals of opposite phase to the output must not be applied to them.
7. This device is used ATD (Address Transient Detector). Therefore, transfer either $\overline{CE}$ or address (A2 to A18) after power up to 4.5 V.

Timing Waveforms

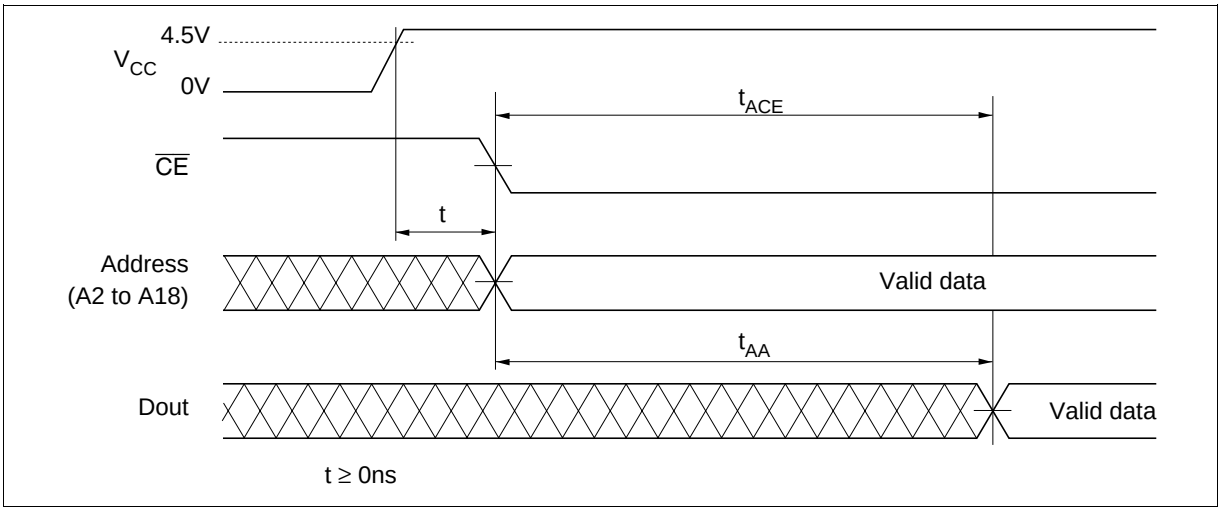
Word Mode (BHE = 'V_{IH}') **or Byte Mode** (BHE = 'V_{IL}')*[2,3,4]



Word Mode, Byte Mode Switch*[5, 6]

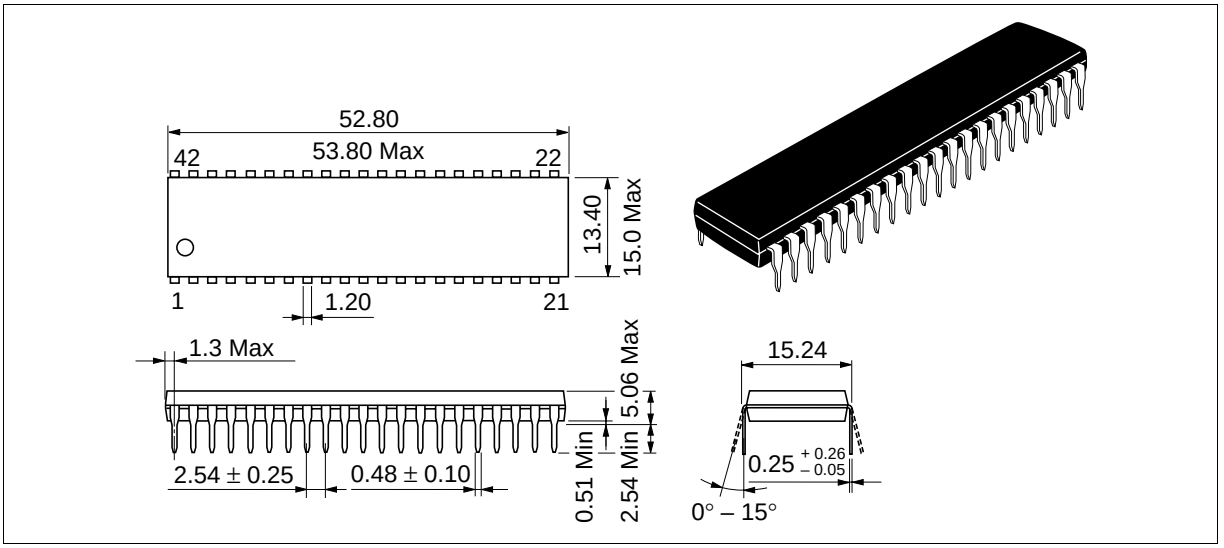


Power Up Sequence[*7]

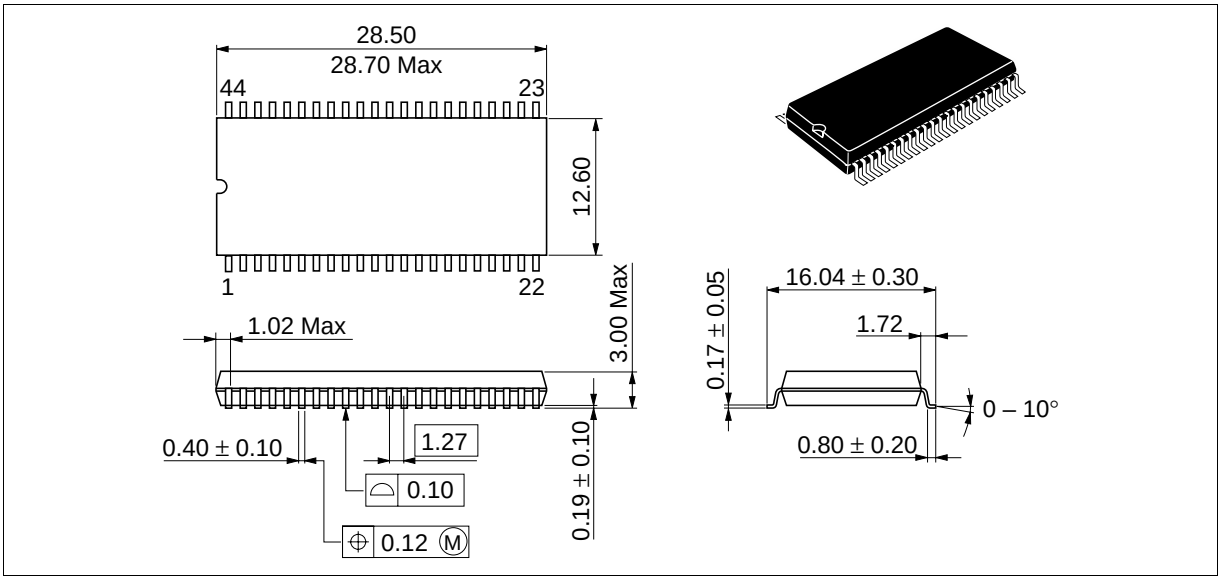


Package Dimensions

HN62448P Series (DP-42) Unit: mm

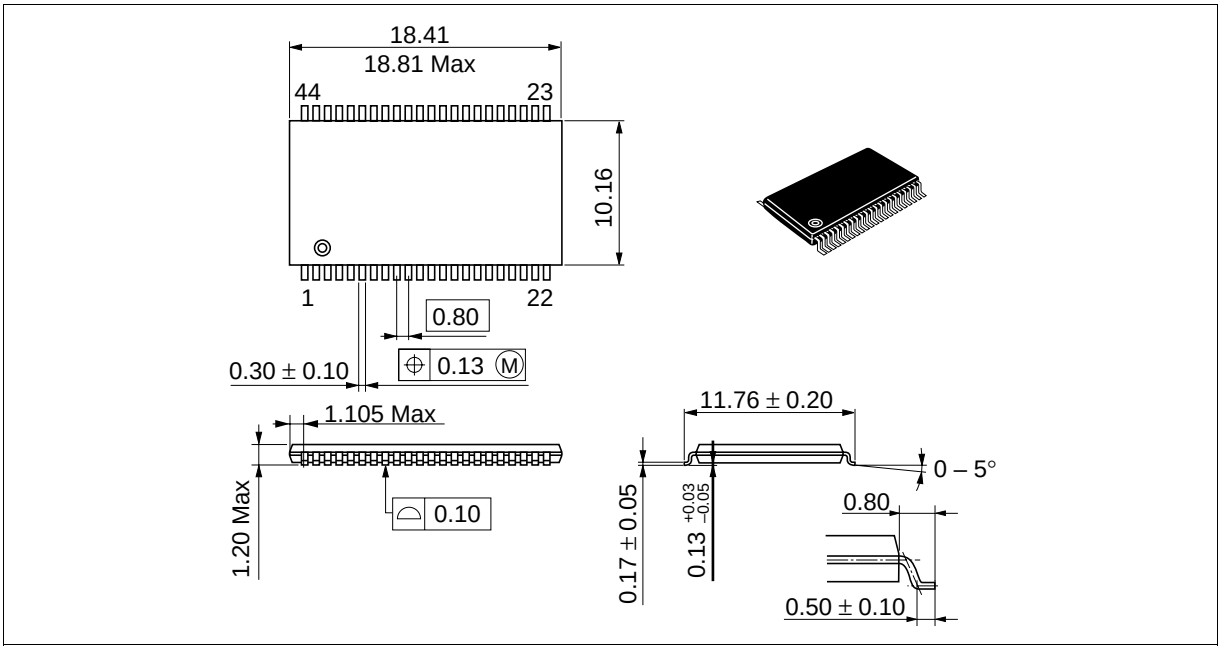


HN62448FB Series (FP-44D) Unit: mm



Package Dimensions (cont.)

HN62448TT Series (TTP-44D) Unit: mm



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Revision Record

Rev.	Date	Contents of Modification	Drawn by	Approved by
1.0	Jun. 13, 1995	Initial issue	T. Kawajiri	H. Moriuchi
2.0	Oct. 2, 1996	Change of format AC Characteristics Input pulse levels: 0.45 to 2.4 V to 0.45 to 2.8 V		