

TC58257AP / AF 32,768 WORD X 8 BIT ELECTRICALLY CHIP ERASABLE AND PROGRAMMABLE READ ONLY MEMORY

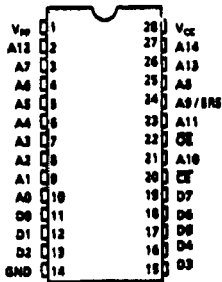
DESCRIPTION

TC58257AP/AF is a 32,768 word X 8 bit electrically chip erasable and programmable read only memory, and molded in a 28 pin plastic package. The TC58257AP / AF's access time is 200ns / 250ns, and has low power standby mode which reduces the power dissipation without increasing access time. The electrical characteristics are the same as U.V. EPROM TC57256AD's. For program operation, the programming is achieved by using the high speed programming mode. The TC58257AP / AF has an electrically chip erasing mode which can erase whole bits at the same time.

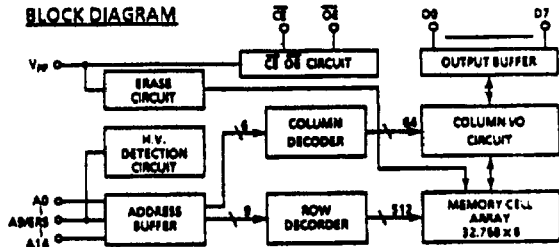
FEATURES

- Peripheral circuit : CMOS
- Memory cell : NMOS
- Fast access time : TC58257AP/AF-20 200ns
TC58257AP/AF-25 250ns
- Low power dissipation
Active : 30mA / 5MHz
Standby : 100µA
- Full static operation
- High speed programming mode
- Electrically chip erasing mode
- Inputs and outputs TTL compatibility
- Pin compatible with MASK ROM TC58257P, TMM23256P, EPROM TMM27256D/AD, and TC57256D/AD, one time PROM TMM24256P/AP/AF and TC54256P/AF/AF
- TC58257AP : DIP28 - P - 600
TC58257AF : SOP28 - P - 450

PIN CONNECTION (TOP VIEW)



BLOCK DIAGRAM



PIN NAMES

A0~A14	Address inputs
D0~D7	Output (input)
CE	Chip Enable Input
OE	Output Enable Input
A8/ERS	Address and Enable Control Input
Vpp	Program and Erase Power Supply Voltage
Vcc	VCC Power Supply Voltage
GND	Ground

MODE SELECTION

Mode	Pin	CE	OE	A8	Vpp	Vcc	A0~A8 (10~14)	D0~D7	Power
Read		L	L	•	3V	5V	•	Data Output	Active
Output Deselect		•	H	•			•	High Impedance	
Standby		H	•	•			•	High Impedance	
Program		L	H	•	12.75V or 12V	8.25V or 5V	•	Data Input	Active
Program Inhibit		H	•	•			•	High Impedance	
Program Verify		•	L	•			•	Data Out	
Chip Erase		L	H	•	12.75V or 12V	5V	•	Don't Care	Active
Chip Erase Inhibit		H	•	•			•	High Impedance	

• : VIH or VIL

MAXIMUM RATINGS

SYMBOL	ITEM	RATING	UNIT
V _{CC}	V _{CC} Power Supply Voltage	-0.6~7.0	V
V _{PP}	Program Supply Voltage	-0.6~14.0	V
V _{IN}	Input Voltage	-0.6~7.0	V
V _{IO}	Input/Output Voltage	-0.6~V _{CC} +0.5	V
P _D	Power Dissipation	1.0/0.6*	W
T _{SOLEDER}	Soldering Temperature · Time	260 · 10	°C · sec
T _{STG}	Storage Temperature	-65~125	°C
T _{OPR}	Operating Temperature	-10~70	°C
N _{FW}	Erase Write Endurance	100 ·	Cycles

* 80P

READ OPERATION

DC RECOMMENDED OPERATING CONDITIONS

SYMBOL	PARAMETER	MIN.	TYP.	MAX.	UNIT
V _{IH}	Input High Voltage	2.2	-	V _{CC} +0.3	V
V _{IL}	Input Low Voltage	-0.3	-	0.8	V
V _{CC}	V _{CC} Power Supply Voltage	4.50	5.00	5.50	V
V _{PP}	V _{PP} Power Supply Voltage	V _{CC} -0.6	V _{CC}	V _{CC} +0.6	V

DC AND OPERATING CHARACTERISTICS (T_a = -10~70°C, V_{CC} = 5V ± 10%)

SYMBOL	PARAMETER	CONDITION	MIN.	TYP.	MAX.	UNIT
I _I	Input Current	V _{IN} = 0~V _{CC}	-	-	±10	μA
I _{CC0}	Operating Current	CE = 0V, I _{OUT} = 0mA, f = 5MHz	-	-	30	mA
I _{CC1}	Standby Current	CE = V _{IH}	-	-	1	mA
I _{CC2}		CE = V _{CC} - 0.2V	-	-	100	μA
V _{OH}	Output High Voltage	I _{OH} = -400μA	2.4	-	-	V
V _{OL}	Output Low Voltage	I _{OL} = 2.1mA	-	-	0.4	V
I _{PP1}	V _{PP} Current	V _{PP} = V _{CC} - 0.6~V _{CC} + 0.6	-	-	±10	μA
I _{LO}	Output Leakage Current	V _{OUT} = 0.4~V _{CC}	-	-	±10	μA

AC CHARACTERISTICS (Ta = -10~70°C, VCC = 5V ± 10%, VPP = VCC ± 0.6V)

SYMBOL	PARAMETER	TEST CONDITION	-20		-25		UNIT
			MIN.	MAX.	MIN.	MAX.	
t _{ACC}	Address Access Time	$\overline{CE} = \overline{OE} = V_{IL}$	-	200	-	250	ns
t _{CE}	\overline{CE} to Output Valid	$\overline{OE} = V_{IL}$	-	200	-	250	ns
t _{OE}	\overline{OE} to Output Valid	$\overline{CE} = V_{IL}$	-	70	-	100	ns
t _{OP1}	\overline{CE} to Output in High-Z	$\overline{OE} = V_{IL}$	0	60	0	90	ns
t _{OP2}	\overline{OE} to Output in High-Z	$\overline{CE} = V_{IL}$	0	60	0	90	ns
t _{OH}	Output Data Hold Time	$\overline{CE} = \overline{OE} = V_{IL}$	0	-	0	-	ns

AC TEST CONDITIONS

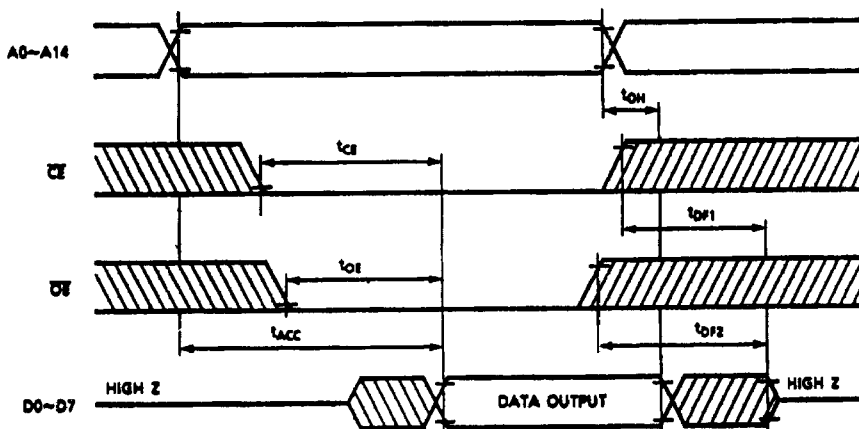
- Output Load : 1 TTL Gate and C_L = 100pF
- Input Pulse Rise and Fall Times : 10ns Max.
- Input Pulse Levels : 0.45V~2.4V
- Timing Measurement Reference Level : Inputs 0.8V and 2.2V, Outputs 0.8V and 2.0V

CAPACITANCE* (Ta = 25°C, f = 1MHz)

SYMBOL	PARAMETER	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
C _{IN}	Input Capacitance	V _{IN} = 0V	-	4	6	pF
C _{OUT}	Output Capacitance	V _{OUT} = 0V	-	8	12	pF

* This parameter is periodically sampled and is not 100% tested.

TIMING WAVEFORMS (READ)



PROGRAM OPERATION (MODE - I)

DC RECOMMENDED OPERATING CONDITIONS

SYMBOL	PARAMETER	MIN.	TYP.	MAX.	UNIT
V_{IH}	Input High Voltage	2.2	-	$V_{CC} + 1.0$	V
V_{IL}	Input Low Voltage	-0.3	-	0.8	V
V_{CC}	V_{CC} Power Supply Voltage	6.00	6.25	6.50	V
V_{PP}	V_{PP} Power Supply Voltage	12.50	12.75	13.00	V

DC AND OPERATING CHARACTERISTICS ($T_a = -10 \sim 70^\circ\text{C}$, $V_{CC} = 6.25\text{V} \pm 0.25\text{V}$, $V_{PP} = 12.75\text{V} \pm 0.25\text{V}$)

SYMBOL	PARAMETER	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
I_{LI}	Input Current	$V_{IN} = 0 \sim V_{CC}$	-	-	10	μA
V_{OH}	Output High Voltage	$I_{OH} = -400\mu\text{A}$	2.4	-	-	V
V_{OL}	Output Low Voltage	$I_{OL} = 2.1\text{mA}$	-	-	0.4	V
I_{CC}	V_{CC} Supply Current	-	-	-	40	mA
I_{PP}	V_{PP} Supply Current	$V_{PP} = 13.0\text{V}$	-	-	50	mA

AC PROGRAMMING CHARACTERISTICS ($T_a = -10 \sim 70^\circ\text{C}$, $V_{CC} = 6.25\text{V} \pm 0.25\text{V}$, $V_{PP} = 12.75\text{V} \pm 0.25\text{V}$)

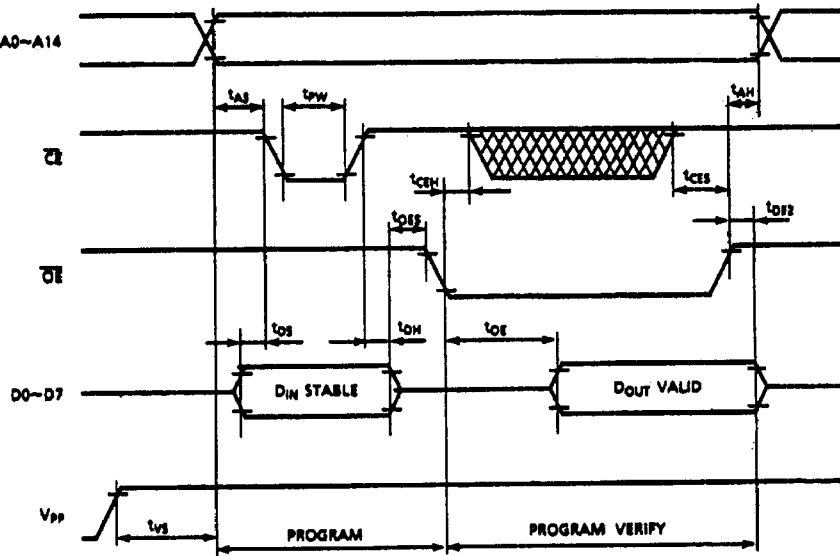
SYMBOL	PARAMETER	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
t_{AS}	Address Setup Time	-	2	-	-	μs
t_{AH}	Address Hold Time	-	2	-	-	μs
t_{CS}	\overline{CE} Setup Time	-	0	-	-	μs
t_{CH}	\overline{CE} Hold Time	-	0	-	-	μs
t_{OS}	\overline{OE} Setup Time	-	2	-	-	μs
t_{OH}	\overline{OE} Hold Time	-	2	-	-	μs
t_{DS}	Data Setup Time	-	2	-	-	μs
t_{DH}	Data Hold Time	-	2	-	-	μs
t_{VS}	V_{PP} Setup Time	-	2	-	-	μs
t_{PW}	Program Pulse Width	$\overline{CE} = V_{IL}$, $\overline{OE} = V_{IH}$	95	100	105	μs
t_{OE}	\overline{OE} to Output Valid	-	-	-	130	ns
t_{OP}	\overline{OE} to Output I_O High-Z	-	-	-	130	ns

AC TEST CONDITIONS

- Output Load : 1 TTL Gate and C_L (100pF)
- Input Pulse Rise and Fall Times : 10ns Max.
- Input Pulse Levels : 0.45V~2.4V
- Timing Measurement Reference Level : Input 0.8V and 2.2V, Output 0.8V and 2.0V.

TIMING WAVEFORMS (PROGRAM) (MODE - I)

($V_{CC} = 6.25V \pm 0.25V$, $V_{PP} = 12.75V \pm 0.25V$)



- Note**
1. V_{CC} must be applied simultaneously or before V_{PP} and cut off simultaneously or after V_{PP} .
 2. Removing the device from socket and setting the device in socket with $V_{PP} = 12.75V$ may cause permanent damage to the device.
 3. The V_{PP} supply voltage is permitted up to 14V for program operation.
So the voltage over 14V should not be applied to the V_{PP} terminal.
When the switching pulse voltage is applied to the V_{PP} terminal, the overshoot voltage of its pulse should not be exceeded 14V.

PROGRAM OPERATION (MODE - II)

DC RECOMMENDED OPERATING CONDITIONS

SYMBOL	PARAMETER	MIN.	TYP.	MAX.	UNIT
V _{IN}	Input High Voltage	2.2	-	V _{CC} + 1.0	V
V _{IL}	Input Low Voltage	-0.3	-	0.8	V
V _{CC}	V _{CC} Power Supply Voltage	4.5	5.0	5.5	V
V _{PP}	V _{PP} Power Supply Voltage	11.5	12.0	12.5	V

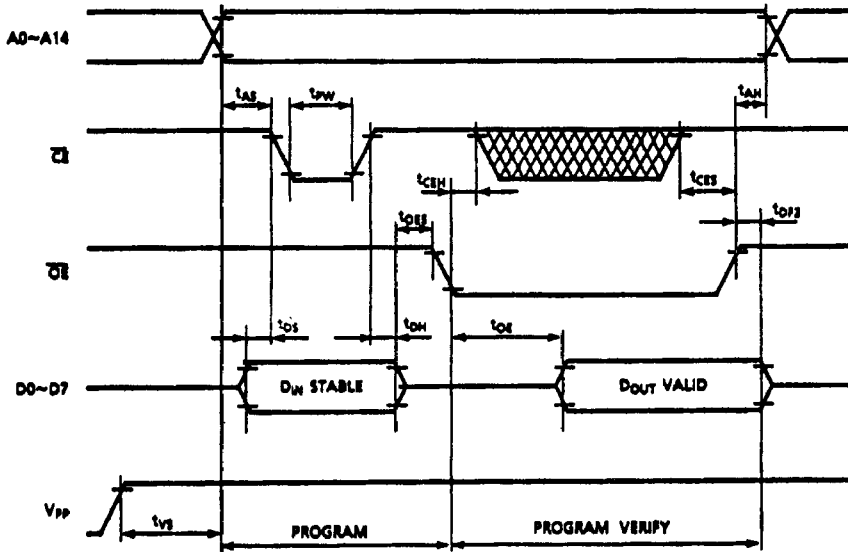
DC AND OPERATING CHARACTERISTICS (T_a = -10~70°C, V_{CC} = 5.0V ± 10%, V_{PP} = 12.0V ± 0.5V)

SYMBOL	PARAMETER	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
I _I	Input Current	V _{IN} = 0~V _{CC}	-	-	10	μA
V _{OH}	Output High Voltage	I _{OH} = -400μA	2.4	-	-	V
V _{OL}	Output Low Voltage	I _{OL} = 2.1mA	-	-	0.4	V
I _{CC}	V _{CC} Supply Current	-	-	-	40	mA
I _{PP2}	V _{PP} Supply Current	V _{PP} = 12.5V	-	-	50	mA

AC PROGRAMMING CHARACTERISTICS (T_a = -10~70°C, V_{CC} = 5V ± 10%, V_{PP} = 12.0V ± 0.5V)

SYMBOL	PARAMETER	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
t _{AS}	Address Setup Time	-	2	-	-	μs
t _{AH}	Address Hold Time	-	2	-	-	μs
t _{CS}	CE Setup Time	-	0	-	-	μs
t _{CH}	CE Hold Time	-	0	-	-	μs
t _{OS}	OE Setup Time	-	2	-	-	μs
t _{OH}	OE Hold Time	-	2	-	-	μs
t _{DS}	Data Setup Time	-	2	-	-	μs
t _{DH}	Data Hold Time	-	2	-	-	μs
t _{VS}	V _{PP} Setup Time	-	2	-	-	μs
t _{pw}	Program Pulse Width	CE = V _{IO} OE = V _{IN}	0.95	1.0	1.05	μs
t _{opw}	Overprogram Pulse Width	Note 1	0.95	1.0	26.25	μs
t _{os}	OE to Output Valid	-	-	-	150	ns
t _{or2}	OE to Output in High-Z	-	-	-	130	ns

TIMING WAVEFORMS (PROGRAM MODE - II)
 ($V_{CC} = 5.0V \pm 10\%$, $V_{PP} = 12.0V \pm 0.5V$)



- Note**
1. V_{CC} must be applied simultaneously or before V_{PP} and cut off simultaneously or after V_{PP} .
 2. Removing the device from socket and setting the device in socket with $V_{PP} = 12.0V$ may cause permanent damage to the device.
 3. The V_{PP} supply voltage is permitted up to 14V for program operation.
 So the voltage over 14V should not be applied to the V_{PP} terminal.
 When the switching pulse voltage is applied to the V_{PP} terminal, the overshoot voltage of its pulse should not be exceeded 14V.

ERASE OPERATION (MODE - I)

DC RECOMMENDED OPERATING CONDITIONS

SYMBOL	PARAMETER	MIN.	TYP.	MAX.	UNIT
V_{IH}	Input High Voltage	2.2	-	$V_{CC} + 1.0$	V
V_{IL}	Input Low Voltage	-0.3	-	0.8	V
V_{CC}	V_{CC} Power Supply Voltage	4.5	5.0	5.5	V
V_{PP}	V_{PP} Power Supply Voltage	12.50	12.75	13.00	V
V_{IH1}	Input High Voltage H	11.5	12.0	12.5	V

DC AND OPERATING CHARACTERISTICS ($T_a = -10 \sim 70^\circ\text{C}$, $V_{CC} = 5V \pm 10\%$)

SYMBOL	PARAMETER	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
I_{LI}	Input Current	$V_{IH} = 0 \sim V_{CC}$	-	-	± 10	μA
I_{LH}	A9/ERS Input Current	$A9/ERS = 0 \sim V_{IH1}$	-	-	± 100	μA
I_{CC}	V_{CC} Supply Current	-	-	-	40	mA
I_{PP2}	V_{PP} Supply Current	$V_{PP} = 13.0V$	-	-	50	mA

AC ERASING CHARACTERISTICS ($T_a = -10 \sim 70^\circ\text{C}$, $V_{CC} = 5V \pm 10\%$, $V_{PP} = 12.75V \pm 0.25V$)

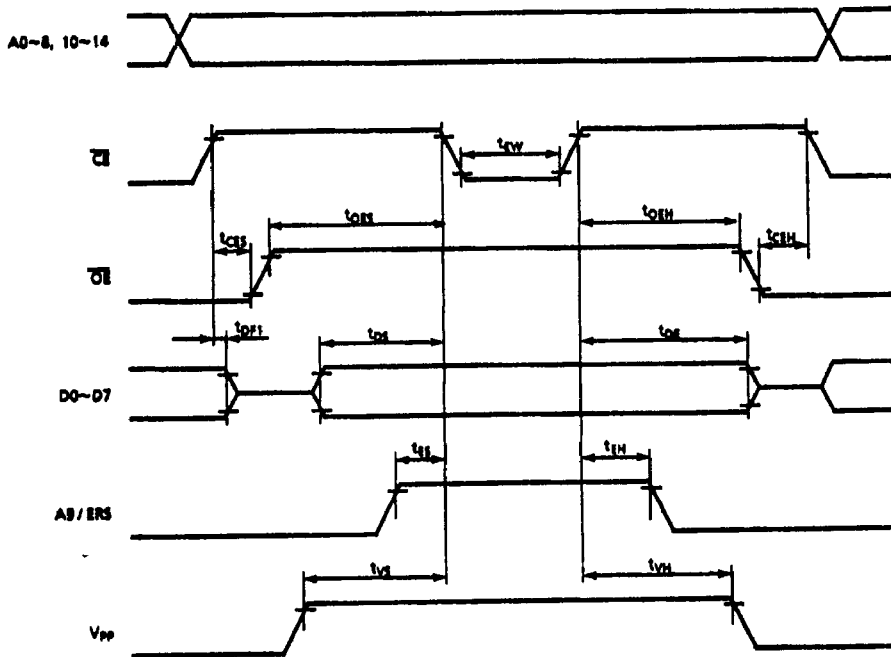
SYMBOL	PARAMETER	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
t_{CS}	\overline{CE} Setup Time	-	2	-	-	μs
t_{CH}	\overline{CE} Hold Time	-	2	-	-	μs
t_{OS}	\overline{OE} Setup Time	-	2	-	-	μs
t_{OH}	\overline{OE} Hold Time	-	500	-	-	μs
t_{DS}	Data Setup Time	-	2	-	-	μs
t_{DH}	Data Hold Time	-	500	-	-	μs
t_{VS}	V_{PP} Setup Time	-	2	-	-	μs
t_{VH}	V_{PP} Hold Time	-	500	-	-	μs
t_{AS}	A9/ERS Setup Time	-	2	-	-	μs
t_{AH}	A9/ERS Hold Time	-	2	-	-	μs
t_{EW}	Erase Pulse Width	$\overline{CE} = V_{IL}$, $\overline{OE} = V_{OH}$, $A9 = V_{IH1}$	950	1000	1050	ms
t_{OH1}	\overline{CE} to Output in High-Z	$\overline{OE} = V_{IL}$	-	-	150	ns

Input Pulse Rise and Fall Time: 10ns Max.
 Input Pulse Levels : 0.45V-2.4V

PROGRAM VERIFY MODE

TIMING WAVEFORMS (ERASE MODE - I)

($V_{CC} = 5V \pm 10\%$, $V_{PP} = 12.75V \pm 0.25V$)



Note 1. V_{CC} must be applied simultaneously or before V_{PP} and cut off simultaneously or after V_{PP} .

1. Removing the device from socket and setting the device in socket with $V_{PP}=12.75V$ may cause permanent damage to the device.
2. The V_{PP} supply voltage is permitted up to 14V for erase operation. So the voltage over 14V should not be applied to the V_{PP} terminal. When the switching pulse voltage is applied to the V_{PP} terminal, the overshoot voltage of its pulse should not be exceeded 14V.

ERASE OPERATION (MODE - II)

DC RECOMMENDED OPERATING CONDITIONS

SYMBOL	PARAMETER	MIN.	TYP.	MAX.	UNIT
V_{IH}	Input High Voltage	2.2	-	$V_{CC} + 1.0$	V
V_{IL}	Input Low Voltage	-0.3	-	0.8	V
V_{CC}	V_{CC} Power Supply Voltage	4.5	5.0	5.5	V
V_{PP}	V_{PP} Power Supply Voltage	11.5	12.0	12.5	V
V_{IH1}	Input High Voltage H	11.5	12.0	12.5	V

DC AND OPERATING CHARACTERISTICS ($T_a = -10 \sim 70^\circ\text{C}$, $V_{CC} = 5V \pm 10\%$)

SYMBOL	PARAMETER	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
I_{LI}	Input Current	$V_{IH} = 0 \sim V_{CC}$	-	-	± 10	μA
I_{LE}	AS/ERS Input Current	$AS/ERS = 0 \sim V_{IH1}$	-	-	± 100	μA
I_{CC}	V_{CC} Supply Current	-	-	-	40	mA
I_{PP}	V_{PP} Supply Current	$V_{PP} = 12.5V$	-	-	50	mA

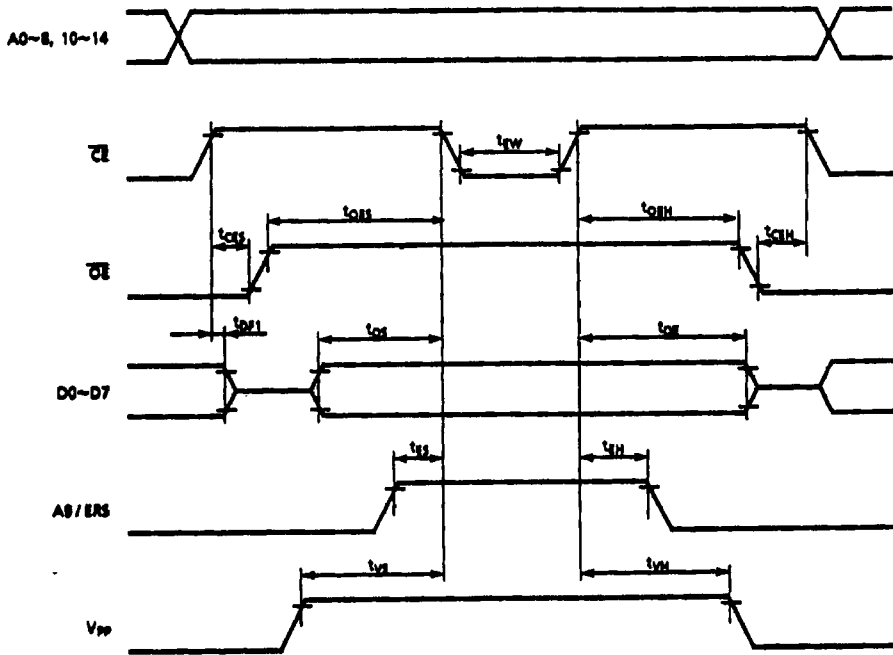
AC ERASING CHARACTERISTICS ($T_a = -10 \sim 70^\circ\text{C}$, $V_{CC} = 5V \pm 10\%$, $V_{PP} = 12.0V \pm 0.5V$)

SYMBOL	PARAMETER	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
t_{CS}	\overline{CE} Setup Time	-	2	-	-	μs
t_{CH}	\overline{CE} Hold Time	-	2	-	-	μs
t_{OS}	\overline{OE} Setup Time	-	2	-	-	μs
t_{OH}	\overline{OE} Hold Time	-	500	-	-	μs
t_{DS}	Data Setup Time	-	2	-	-	μs
t_{DH}	Data Hold Time	-	500	-	-	μs
t_{VS}	V_{PP} Setup Time	-	2	-	-	μs
t_{VH}	V_{PP} Hold Time	-	500	-	-	μs
t_{ES}	AS/ERS Setup Time	-	2	-	-	μs
t_{EH}	AS/ERS Hold Time	-	2	-	-	μs
t_{EW}	Erase Pulse Width	$\overline{CE} = V_{IL}$, $\overline{OE} = V_{OH}$, $AS = V_{IH1}$	1950	2000	2050	ms
t_{OPI}	\overline{CE} to Output in High-Z	$\overline{OE} = V_{L}$	-	-	150	ns

Input Pulse Rise and Fall Time: 10ns Max.
 Input Pulse Levels : 0.45V-3.4V

TIMING WAVEFORMS (ERASE MODE - II)

(VCC = 5V ± 10%, VPP = 12.0V ± 0.5V)



Note 1. VCC must be applied simultaneously or before Vpp and cut off simultaneously or after Vpp.

2. Removing the device from socket and setting the device in socket with Vpp=12.0V may cause permanent damage to the device.
3. The Vpp supply voltage is permitted up to 14V for erase operation.
 E: the voltage over 14V should not be applied to the Vpp terminal.
 When the switching pulse voltage is applied to the Vpp terminal, the overshoot voltage of its pulse should not be exceeded 14V.

(MODE - I)

Mode		pin	\overline{CE}	\overline{OE}	AS	V_{pp}	V_{CC}	D0~D7	Power
Read Operation	Read		L	L	*	5V	5V	Data Out	Active
	Output Deselect	*	H	*	High Impedance				
	Standby	H	*	*	High Impedance			Standby	
Program Operation	Program		L	H	*	12.75V	6.25V	Data In	Active
	Program Inhibit	H	*	*	High Impedance				
	Program Verify	*	L	*	Data Out				
Erase Operation	Erase		L	H	*	12V	12.75V	5V	Don't Care
	Erase Inhibit	H	*	*	High Impedance				Active

Note : H : V_{IH} , L : V_{IL} , * : V_{IH} or V_{IL}

(MODE - II)

Mode		pin	\overline{CE}	\overline{OE}	AS	V_{pp}	V_{CC}	D0~D7	Power
Read Operation	Read		L	L	*	5V	5V	Data Out	Active
	Output Deselect	*	H	*	High Impedance				
	Standby	H	*	*	High Impedance			Standby	
Program Operation	Program		L	H	*	12V	5V	Data In	Active
	Program Inhibit	H	*	*	High Impedance				
	Program Verify	*	L	*	Data Out				
Erase Operation	Erase		L	H	*	12V	12V	5V	Don't Care
	Erase Inhibit	H	*	*	High Impedance				Active

Note : H : V_{IH} , L : V_{IL} , * : V_{IH} or V_{IL}

STANDBY MODE

The TC58257AP/AF has a low power standby mode controlled by the \overline{CE} signal. By applying a high level to the \overline{CE} input, the TC58257AP/AF is placed in the standby mode which reduce the operating current to 100 μ A by applying MOS-high level (V_{CC}) and then the outputs are in a high impedance state, independent of the \overline{OE} inputs.

PROGRAM MODE

Initially, when received by customers, all bits of the TC58257AP/AF are in the "1" state which is erased state. Therefore the program operation is to introduce "0" data into the desired bit locations by electrically programming. The TC58257AP/AF is in the programming mode when the V_{pp} input is at 12.75V or 12.0V and \overline{CE} is at TTL-Low under $\overline{OE}=V_{IH}$. The TC58257AP/AF can be programmed any location at anytime either individually, sequentially, or at random.

PROGRAM VERIFY MODE

The verify mode is to check if desired data is correctly programmed on the programmed bits. The verify is accomplished with \overline{CE} at V_{IL} .

PROGRAM INHIBIT MODE

Under the condition that the program voltage (12.75V or 12.0V) is applied to V_{pp} terminal, a high level \overline{CE} input inhibits the TC58257AP/AF from being programmed. Programming of two or more TC58257AP/AF's in parallel with different data is easily accomplished. That is, all inputs except for \overline{CE} may be commonly connected, and a TTL low level program pulse is applied to the \overline{CE} of the desired device only and TTL high level signal is applied to the other devices.

HIGH SPEED PROGRAMMING MODE - I

The program time can be greatly decreased by using this high speed programming mode. The device is set up in the high speed programming mode when the programming voltage (+12.75V) is applied to the V_{pp} terminal with $V_{CC}=6.25V$. The programming is achieved by applying a single TTL low level 100 μ s pulse to the \overline{CE} input after addresses and data are stable. Then the programmed data is verified by using Program Verify Mode. If the programmed data is not correct, another program pulse of 100 μ s is applied and then the programmed data is verified. This should be repeated until the program operates correctly (max. 25 times).

When programming has been completed, the data in all addresses should be verified with $V_{CC}=V_{pp}=5V$.

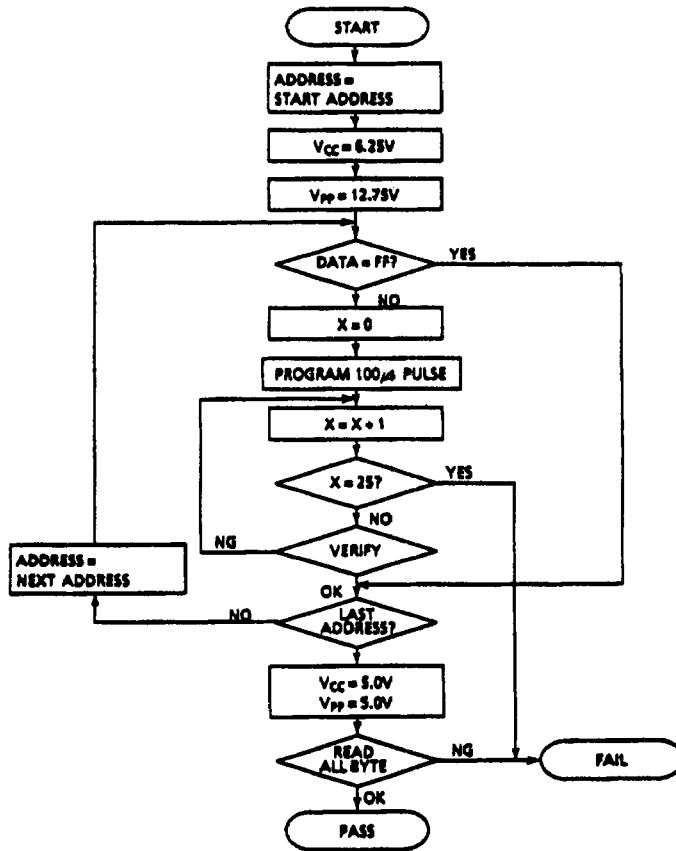
HIGH SPEED PROGRAMMING MODE - II

The program time can be greatly decreased by using this high speed programming mode. The device is set up in the high speed programming mode when the programming voltage (+12.0V) is applied to the V_{pp} terminal with $V_{CC}=5.0V$. The programming is achieved by applying a single TTL low level 1ms pulse to the \overline{CE} input after addresses and data are stable. Then the programmed data is verified by using Program Verify Mode. If the programmed data is not correct, another program pulse of 1ms is applied and then the programmed data is verified. This should be repeated until the program operates correctly (max. 25 times).

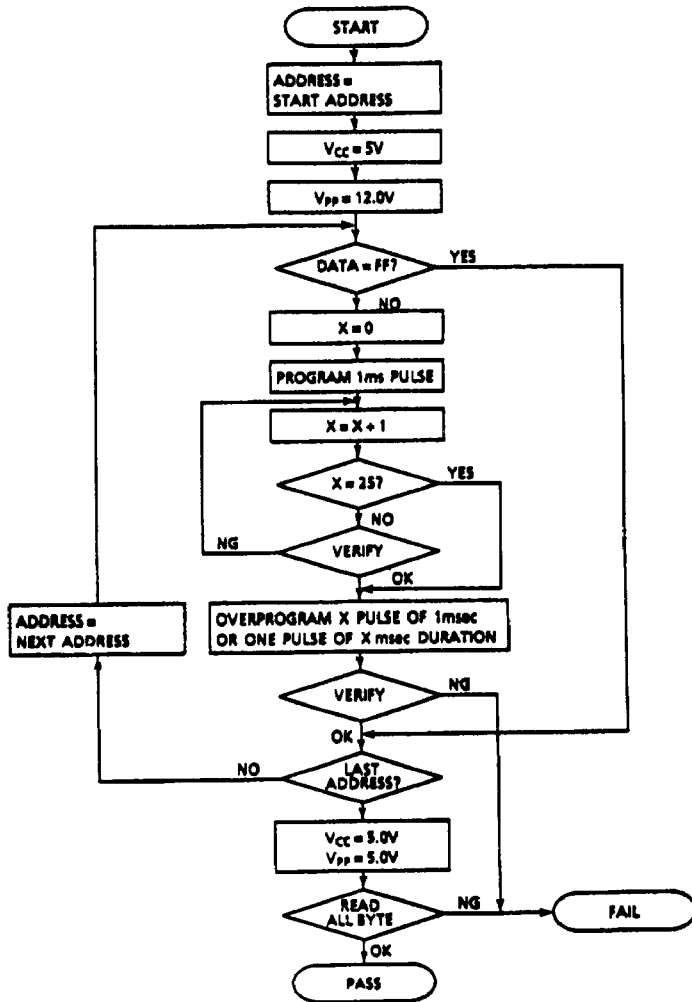
After correctly programming the selected address, one additional program pulse with pulse width 1 time that needed for programming is applied.

When programming has been completed, the data in all addresses should be verified with $V_{CC}=V_{pp}=5V$.

HIGH SPEED PROGRAM MODE-I FLOW CHART



HIGH SPEED PROGRAM MODE - II FLOW CHART



ELECTRIC SIGNATURE MODE

Electric signature mode allows to read out a code from TC58257AP/AF which identifies its manufacture and device type.

The programming equipment may read out manufacture code and device code from TC58257AP/AF by using this mode before program operation and automatically set program voltage (V_{pp}) and algorithm.

Electric Signature mode is set up when 12V is applied to address line A9 and the rest of address lines is set to V_{IL} in read operation. Data output in this conditions is manufacturer code. Device code is identified when address A0 is set to V_{IH} . These two codes possess an odd parity with the parity bit of MSB (D7).

The following table shows electric signature of TC58257AP/AF.

SIGNATURE \ PINS	A0 (10)	D7 (19)	D6 (18)	D5 (17)	D4 (16)	D3 (15)	D2 (13)	D1 (12)	D0 (11)	HEX. DATA
Manufacture Code	V_{IL}	1	0	0	1	1	0	0	0	98
Device Code	V_{IH}	1	0	1	0	0	1	0	0	A4

Notes: A9=12V±0.5V

A1-A8, A10-A14, CE, OE = V_{IL}

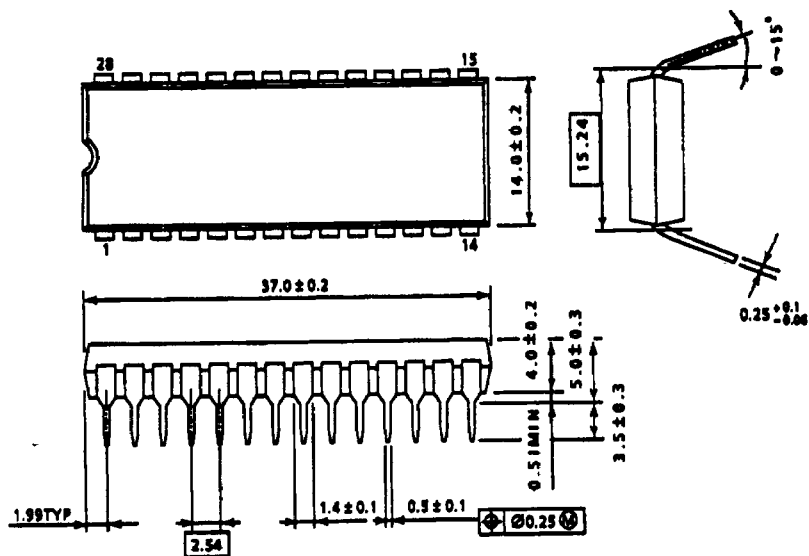
TC58257AP/AF-20, TC58257AP/AF-25

OUTLINE DRAWINGS (TC58257AP)

- Plastic DIP

DIP28-P-600

Unit: mm



Note: Package width and length do not include mold protrusion, allowable mold protrusion is 0.15mm.

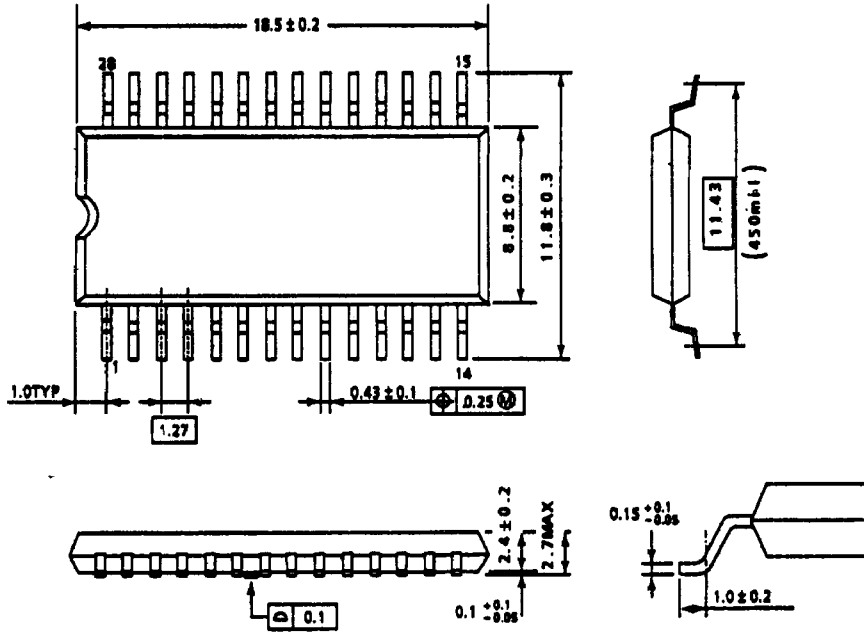
TC58257AP/AF-20, TC58257AP/AF-25

OUTLINE DRAWINGS (TC58257AF)

- Plastic SOP

SOP28-P-450

Unit: mm



Note: Package width and length do not include mold protrusion, allowable mold protrusion is 0.15mm.