



8708

8192 BIT ERASABLE AND ELECTRICALLY REPROGRAMMABLE READ ONLY MEMORY

1024x8 Organization

- **Fast Programming** —
Typ. 100 sec. For All 8K Bits
- **Low Power During Programming**
- **Access Time**—450 ns
- **Standard Power Supplies**—
+12V, ±5V
- **Static**—No Clocks Required
- **Inputs and Outputs TTL**
Compatible During Both Read
and Program Modes
- **Three-State Output**—OR-Tie
Capability

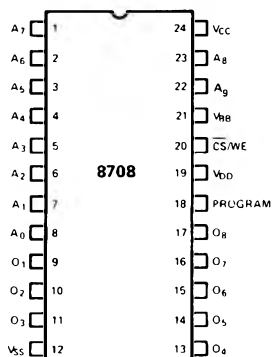
The Intel® 8708 is a high speed 8192 bit erasable and electrically reprogrammable ROM (EPROM) ideally suited where fast turn around and pattern experimentation are important requirements.

The 8708 is packaged in a 24 pin dual-in-line package with transparent lid. The transparent lid allows the user to expose the chip to ultraviolet light to erase the bit pattern. A new pattern can then be written into the device.

A pin for pin mask programmed ROM, the Intel® 8308, is available for large volume production runs of systems initially using the 8708.

The 8708 is fabricated with the time proven N-channel silicon gate technology.

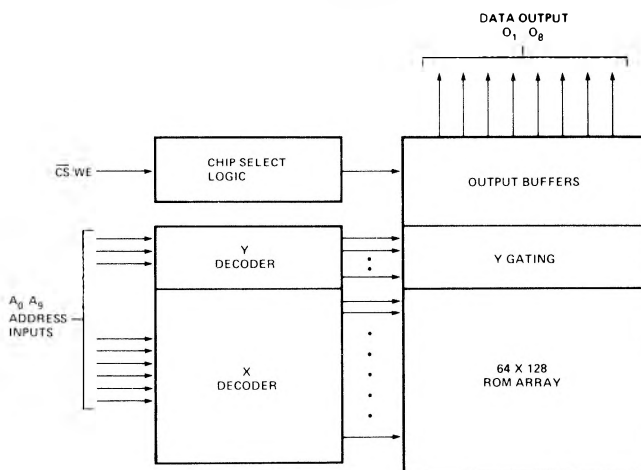
PIN CONFIGURATION



PIN NAMES

A ₀ -A ₉	ADDRESS INPUTS
O ₁ -O ₈	DATA OUTPUTS
CS/WE	CHIP SELECT/WRITE ENABLE INPUT

BLOCK DIAGRAM



PIN CONFIGURATION DURING READ OR PROGRAM

MODE	PIN NUMBER						
	9-11, 13-17	12	18	19	20	21	24
READ	D _{OUT}	V _{SS}	V _{SS}	V _{DD}	V _{IL}	V _{BB}	V _{CC}
PROGRAM	D _{IN}	V _{SS}	Pulsed V _{IHP}	V _{DD}	V _{IHW}	V _{BB}	V _{CC}

PROGRAMMING

The programming specifications are identical to those of the 2708. (See ROM and PROM Programming Instructions, page 6-74).

ABSOLUTE MAXIMUM RATINGS*

Temperature Under Bias	-25°C to +85°C
Storage Temperature	-65°C to +125°C
V _{DD} With Respect to V _{BB}	+20V to -0.3V
V _{CC} and V _{SS} With Respect to V _{BB}	+15V to -0.3V
All Input or Output Voltages With Respect to V _{BB} During Read	+15V to -0.3V
$\overline{\text{CS}}/\text{WE}$ Input With Respect to V _{BB} During Programming	+20V to -0.3V
Program Input With Respect to V _{BB}	+35V to -0.3V
Power Dissipation	1.5W

*COMMENT: Stresses above those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

READ OPERATION

D.C. AND OPERATING CHARACTERISTICS

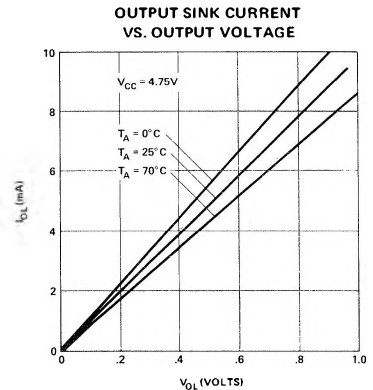
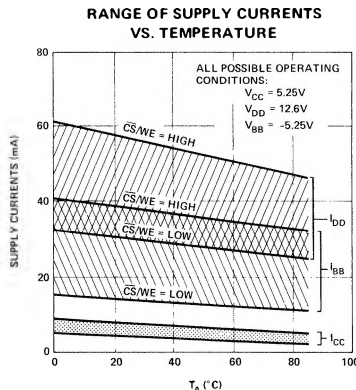
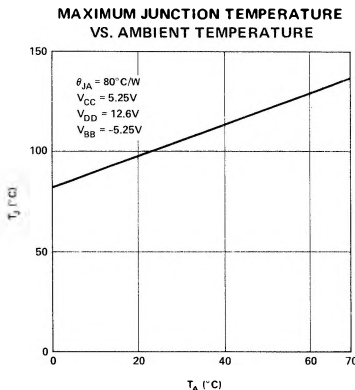
T_A = 0°C to 70°C, V_{CC} = +5V ±5%, V_{DD} = +12V ±5%, V_{BB} = -5V ±5%, V_{SS} = 0V, Unless Otherwise Noted.

Symbol	Parameter	Min.	Typ. ^[1]	Max.	Unit	Conditions
I _{LI}	Address and Chip Select Input Sink Current		1	10	μA	V _{IN} = 5.25 V or V _{IN} = V _{IL}
I _{LO}	Output Leakage Current		1	10	μA	V _{OUT} = 5.25V, $\overline{\text{CS}}/\text{WE}$ = 5V
I _{DD} ^[2]	V _{DD} Supply Current		50	65	mA	Worst Case Supply Currents:
I _{CC} ^[2]	V _{CC} Supply Current		6	10	mA	All Inputs High
I _{BB} ^[2]	V _{BB} Supply Current		30	45	mA	$\overline{\text{CS}}/\text{WE}$ = 5V; T _A = 0°C
V _{IL}	Input Low Voltage	V _{SS}		0.65	V	
V _{IH}	Input High Voltage	3.0		V _{CC} +1	V	
V _{OL}	Output Low Voltage			0.45	V	I _{OL} = 1.6mA
V _{OH1}	Output High Voltage	3.7			V	I _{OH} = -100μA
V _{OH2}	Output High Voltage	2.4			V	I _{OH} = -1mA
P _D	Power Dissipation			800	mW	T _A = 70°C

NOTES: 1. Typical values are for T_A = 25°C and nominal supply voltages.

2. The total power dissipation of the 8708 is specified at 800 mW. It is not calculable by summing the various currents (I_{DD}, I_{CC}, and I_{BB}) multiplied by their respective voltages since current paths exist between the various power supplies and V_{SS}. The I_{DD}, I_{CC}, and I_{BB} currents should be used to determine power supply capacity only.

TYPICAL D.C. CHARACTERISTICS



A.C. CHARACTERISTICS

$T_A = 0^\circ\text{C}$ to 70°C , $V_{CC} = +5\text{V} \pm 5\%$, $V_{DD} = +12\text{V} \pm 5\%$, $V_{BB} = -5\text{V} \pm 5\%$, $V_{SS} = 0\text{V}$, Unless Otherwise Noted.

Symbol	Parameter	Min.	Typ.	Max.	Unit
t_{ACC}	Address to Output Delay		280	450	ns
t_{CO}	Chip Select to Output Delay		60	120	ns
t_{DF}	Chip De-Select to Output Float	0		120	ns
t_{OH}	Address to Output Hold	0			ns

CAPACITANCE $T_A = 25^\circ\text{C}$, $f = 1\text{MHz}$

Symbol	Parameter	Typ.	Max.	Unit	Conditions
C_{IN}	Input Capacitance	4	6	pF	$V_{IN} = 0\text{V}$
C_{OUT}	Output Capacitance	8	12	pF	$V_{OUT} = 0\text{V}$

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

A.C. TEST CONDITIONS

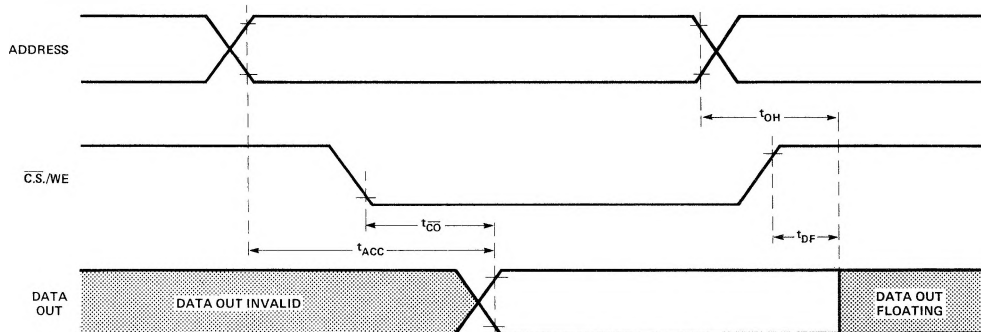
Output Load: 1 TTL gate and $C_L = 100\text{pF}$

Input Rise and Fall Times: $\leq 20\text{ns}$

Timing Measurement Reference Levels: 0.8V and 2.8V for inputs; 0.8V and 2.4V for outputs

Input Pulse Levels: 0.65V to 3.0V

WAVEFORMS



ERASURE CHARACTERISTICS

The erasure characteristics of the 8708 are such that erasure begins to occur when exposed to light with wavelengths shorter than approximately 4000 Angstroms (\AA). It should be noted that sunlight and certain types of fluorescent lamps have wavelengths in the 3000-4000 \AA range. Data show that constant exposure to room level fluorescent lighting could erase the typical 8708 in approximately 3 years while it would take approximately 1 week to cause erasure when exposed to direct sunlight. If the 8708 is to be exposed to these types of lighting conditions for extended periods of time, opaque labels are available from Intel which should be placed over the 8708 window to prevent unintentional erasure.

The recommended erasure procedure (see page 3-55) for the 8708 is exposure to shortwave ultraviolet light which has a wavelength of 2537 Angstroms (\AA). The integrated dose (i.e., UV intensity \times exposure time) for erasure should be a minimum of 15W-sec/cm^2 . The erasure time with this dosage is approximately 15 to 20 minutes using an ultraviolet lamp with a $12000\mu\text{W/cm}^2$ power rating. The 8708 should be placed within one inch from the lamp tubes during erasure. Some lamps have a filter on their tubes and this filter should be removed before erasure.