WAFERSCALE INTEGRATION, INC.

**WS57C45**

**ADVANCE INFORMATION**

# HIGH-SPEED 2K × 8 REGISTERED CMOS PROM

## KEY FEATURES

- **Ultra-Fast Access Time**
  - — 20 ns Setup
  - — 10 ns Clock to Output
- **Low Power Consumption**
  - — 225 mW Active Power
- **Fast Programming**
- **Programmable Synchronous or Asynchronous Output Enable**
- **Pin Compatible with AM27S45 and CY7C245**
- **Immune to Latch-Up**
  - — Up to 200 mA
- **ESD Protection Exceeds 2000V**
- **Programmable Asynchronous Initialize Register**

2

## GENERAL DESCRIPTION

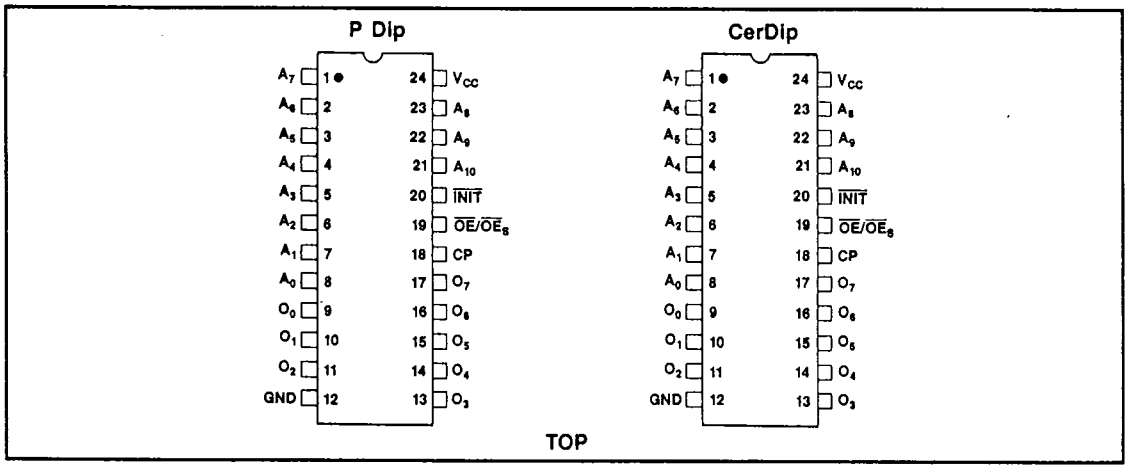
The WS57C45 is an extremely HIGH PERFORMANCE 16K Registered CMOS PROM. It is a direct drop-in replacement for such devices as the AM27S45 and CY7C245.

To meet the requirements of systems which execute and fetch instructions simultaneously, an 8-bit parallel data register has been provided at the output which allows PROM data to be stored while other data is being addressed.

An asynchronous initialization feature has been provided which allows a user programmable 2049th word to be placed on the outputs independent of the system clock. This feature can be used to force an initialize word or provide a preset or clear function.

A further advantage of the WS57C45 over Bipolar PROM devices is the fact that it utilizes a proven EPROM technology. Unlike devices which cannot be erased, every WS57C45 is 100% tested with worst case test patterns, switching characteristics, and functionality before assembly.

## PIN CONFIGURATION




## PRODUCT SELECTION GUIDE

| PARAMETER | WS57C45-20 | WS57C45-25 | WS57C45-35 |
|---|---|---|---|
| Address Access Time (Max) | 20 ns | 25 ns | 35 ns |
| Output Enable Time (Max) | 10 ns | 12 ns | 15 ns |

## ABSOLUTE MAXIMUM RATINGS*

Storage Temperature ..... -65°C to +150°C
Voltage on any pin with
respect to GND.....-0.6V to +7V
VPP with respect to GND .....-0.6V to +14.0V
ESD Protection .....>2000V

*Notice: Stresses above those listed here 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 of time may affect device reliability.

## OPERATING RANGE

| Range | Temperature | Vcc |
|---|---|---|
| Comm'l. | 0° to +70°C | +5V ± 5% |
| Military | −55° to +125°C | +5V ± 10% |

## DC READ CHARACTERISTICS Over Operating Range. (See above)

| SYMBOL | PARAMETER | TEST CONDITIONS | | MIN | MAX | UNITS |
|---|---|---|---|---|---|---|
| $V_{OL}$ | Output Low Voltage | $I_{OL}$= 16mA | | | 0.4 | V |
| $V_{OH}$ | Output High Voltage | $I_{OH}$= −4mA | | 2.4 | | |
| $I_{CC1}$ | Vcc Active Current (CMOS) | Notes 1 and 3 | Comm'l. | | 30 | mA |
| | | | Military | | 35 | |
| $I_{CC2}$ | Vcc Active Current (TTL) | Notes 2 and 3 | Comm'l. | | 40 | |
| | | | Military | | 40 | |
| $I_{LI}$ | Input Load Current | $V_{IN}$ = 5.5V or Gnd | | −10 | 10 | μA |
| $I_{LO}$ | Output Leakage Current | $V_{OUT}$ = 5.5V or Gnd | | −10 | 10 | |

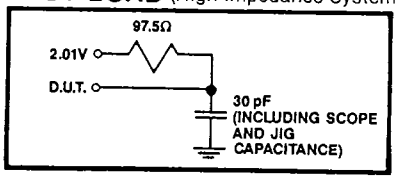
NOTES: 1) CMOS Inputs: GND ± 0.3V or $V_{CC}$ ± 0.3V. 3) A.C. Power component adds 3 mA/MHz.
2) TTL Inputs: $V_{IL} \leq 0.8V$, $V_{IH} \geq 2.0V$.

## AC READ CHARACTERISTICS Over Operating Range. (See Above)

| PARAMETER | SYMBOL | WS57C45-20 | | WS57C45-25 | | WS57C45-35 | | UNITS |
|---|---|---|---|---|---|---|---|---|
| | | MIN | MAX | MIN | MAX | MIN | MAX | |
| Address Setup to Clock HIGH | $t_{SA}$ | 20 | | 25 | | 35 | | ns |
| Address Hold From Clock HIGH | $t_{HA}$ | 0 | | 0 | | 0 | | |
| Clock HIGH to Valid Output | $t_{CO}$ | | 10 | | 12 | | 15 | |
| Clock Pulse Width | $t_{PWC}$ | 12 | | 15 | | 20 | | |
| $\overline{OE}_S$ Setup to Clock HIGH | $t_{SOE_S}$ | 10 | | 12 | | 15 | | |
| $\overline{OE}_S$ Hold From Clock HIGH | $t_{HOE_S}$ | 5 | | 5 | | 5 | | |
| Delay From $\overline{INIT}$ to Valid Output | $t_{DI}$ | | 20 | | 20 | | 20 | |
| $\overline{INIT}$ Recovery to Clock HIGH | $t_{RI}$ | 15 | | 15 | | 20 | | |
| $\overline{INIT}$ Pulse Width | $t_{PWI}$ | 15 | | 15 | | 20 | | |
| Active Output From Clock HIGH | $t_{LZC}$ | | 15 | | 15 | | 20 | |
| Inactive Output From Clock HIGH | $t_{HZC}$ | | 15 | | 15 | | 20 | |
| Active Output From $\overline{OE}$ LOW | $t_{LZOE}$ | | 15 | | 15 | | 20 | |
| Inactive Output From $\overline{OE}$ HIGH | $t_{HZOE}$ | | 15 | | 15 | | 20 | |

T-46-13-25

### TEST LOAD (High Impedance Systems)

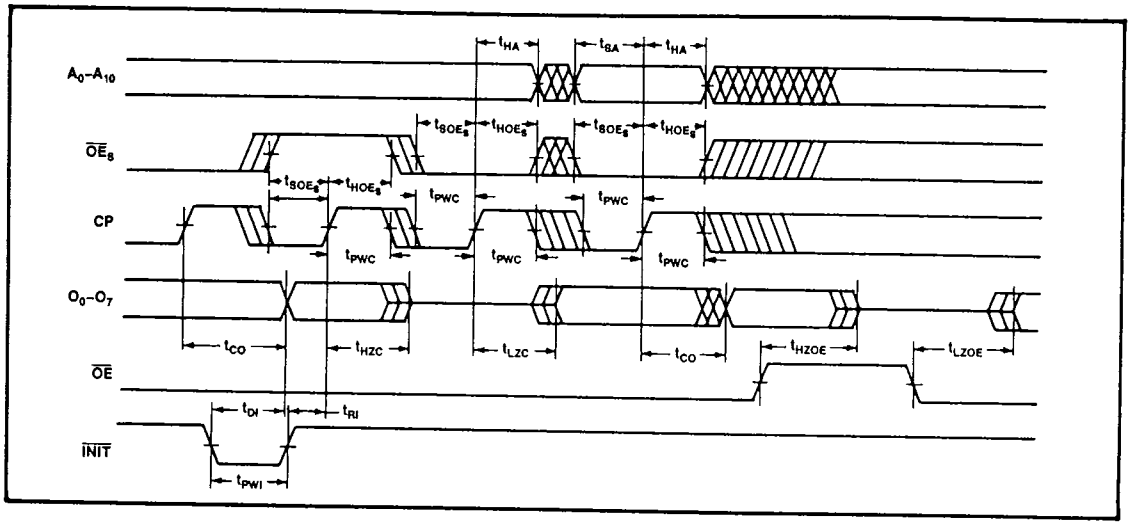



### TIMING LEVELS

Input Levels: 0 and 3V

Reference Levels: 0.8 and 2.0V

### AC READ TIMING DIAGRAM




2

### PROGRAMMERS

Data I/O Unipak 2 or 2B; WSI's MagicPro™ IBM PC Compatible Engineering Programmer.

### ORDERING INFORMATION

| PART NUMBER | SPEED (ns) | PACKAGE TYPE | PACKAGE DRAWING | OPERATING TEMPERATURE RANGE | WSI MANUFACTURING PROCEDURE |
|---|---|---|---|---|---|
| WS57C45-20S | 20 | 24 Pin Plastic DIP, 0.3″ | S1 | Comm'l | Standard |
| WS57C45-20K | 20 | 24 Pin CERDIP, 0.3″ | K1 | Comm'l | Standard |
| WS57C45-25S | 25 | 24 Pin Plastic DIP, 0.3″ | S1 | Comm'l | Standard |
| WS57C45-25K | 25 | 24 Pin CERDIP, 0.3″ | K1 | Comm'l | Standard |
| WS57C45-25KMB | 25 | 24 Pin CERDIP, 0.3″ | K1 | Military | MIL-STD-883C |
| WS57C45-35S | 35 | 24 Pin Plastic DIP, 0.3″ | S1 | Comm'l | Standard |
| WS57C45-35K | 35 | 24 Pin CERDIP, 0.3″ | K1 | Comm'l | Standard |
| WS57C45-35KMB | 35 | 24 Pin CERDIP, 0.3″ | K1 | Military | MIL-STD-883C |