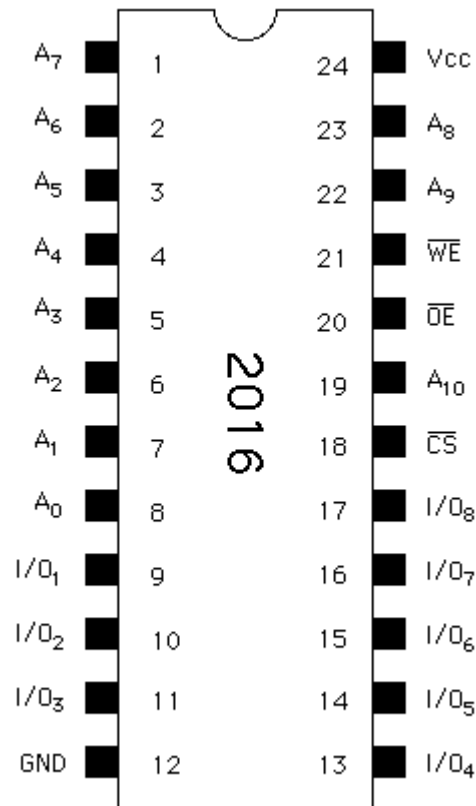


## 2016/6116/9128 - 2048x8 bit Static RAM



### Description

The 2016/6116 series of Static RAMs are 16,384 bit memories organized as 2,048 words by 8 bits and operates on a single +5V supply. 2016's and equivalents are generally NMOS or MOS process parts, where the 6116 and compatibles are built from CMOS technology. All provide three state outputs, are TTL compatible, and allow for direct interfacing with common system bus structures.

#### ⌞ Access Time

⌞ 25 to 450ns depending on part speed grade

#### ⌞ Fully TTL compatible

#### ⌞ Three-State Outputs

#### ⌞ Single Supply ( $V_{cc} = +5V \pm 10\%$ )

#### ⌞ Fully Static Operation, no clock or refreshing required

#### ⌞ Current varies from 10-100mA, CMOS versions are generally lower power

#### ⌞ Standby power (deselected chip) varies from 1-100uA

### Pin Names

A0 - A10 Address Inputs

I/O1 - I/O8 Data Input/Outputs

CS\* Chip Select Input (Active LOW)

WE\* Write Enable Input (Active LOW)

OE\* Output Enable Input (Active LOW)

Vcc Power (+5Vdc)

GND Ground (0Vdc)

---

### **Operating Characteristics**

Vcc = 5V +- 5%

GND = 0V

Supply Current = 10 to 100mA depending on manufacturer and fabrication process

---

### **Read Timing (Standard 6116-90)**

Chip Select Access Time = 90ns min

Chip Deselect Access Time = 40ns max

### **Write Timing (Standard Grade)**

Write Cycle Time = 90ns min

Write Pulse Width = 55ns min

Address Setup Prior to Write = 0ns

Chip Select to End of Write = 55ns min

Write Recovery Time = 0ns

---

**Used In**

Bally/Midway - TRON, Two Tigers, Kickman, Satan's Hollow, Timber, Wacko, etc.

Sega - Championship Baseball, etc.

Capcom - Ghosts and Goblins, etc.

Atari - Dig Dug, Xevious, etc.

---

**Cross-references to**

2016/6116:

- ✎ Hitachi **HM6116**, **HM6116L**
- ✎ Fujitsu **MB8416A**
- ✎ NEC **uPD446**
- ✎ Mitsubishi **5M5517**, **M58725**
- ✎ Mostek **MK4802**
- ✎ Motorola **MCM4016**, **MCM65116**
- ✎ Texas Instruments **TMS4016**
- ✎ Toshiba **TC5517**, **TMM2016**
- ✎ OKI **MSM5128**, **MSM2128**
- ✎ Sony **CXK5816**
- ✎ Sieko/Epson **SRM2016**

- ✍ Sharp **LH5116**
  - ✍ Synertek **SY2128**
- 

**Can substitute:**

2016 and 6116 parts can generally be substituted for each other. Be careful to note if the device will serve as battery-backed memory for parameters, high scores, etc. If so, use a CMOS (6116) series part for longer battery life.

In a pinch, Cache RAM can be substituted (the extra speed Cache RAM provides will not be utilized, but if you have some in your parts-box...) although it's usually in a "skinny dip" type package (0.3" wide).

6116 compatible Cache RAM:

- ✍ Cypress **CY7C128**
  - ✍ IDT **IDT6116A**
  - ✍ Vitelic **V61C16**
  - ✍ Micron **VT20C19**
  - ✍ Sony **CXK5814P**
  - ✍ Toshiba **TC2018**
  - ✍ Motorola **MCM2018A**
  - ✍ Hitachi **HM6716**
- 

**Source of information**

Fairchild Bipolar Memory Data Book, 1983

Fujitsu Microelectronics Memory Data Book, 1982

United Microelectronics Corporation Memory IC's Data Book, 1990-1991

NEW Electronics Inc. Memory Products Data Book, 1985

---