# OKI semiconductor

# MSM6404VS

## MSM6404 PIGGY BACK

## GENERAL DESCRIPTION

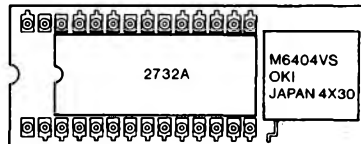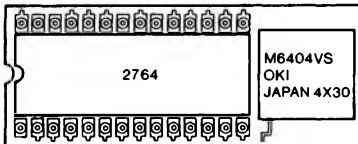The MSM6404VS is a device whose built-in ROM is replaced by external EPROM using the piggy-back method.

## FEATURES

- Supply Voltage: 5V ± 5%
- Frequency: DC ~ 4.2 MHz
- Operating Temperature: 0 ~ 70°C

Note: There are a few differences in the electrical characteristics of this chip and the evaluation chip. Please refer to next page for the detail.
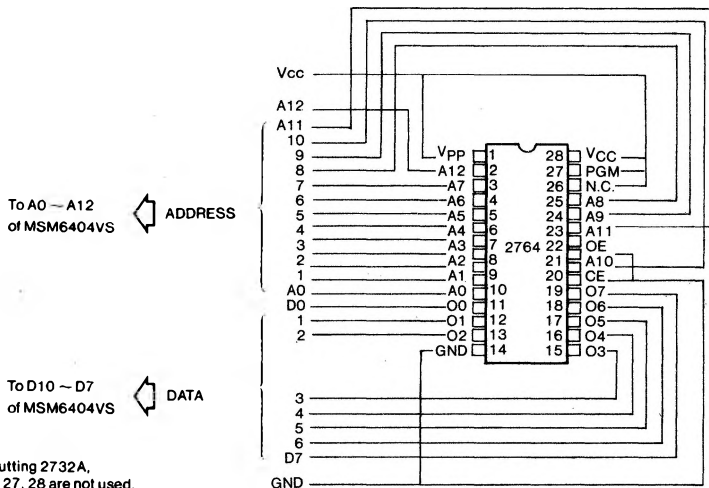
## PUTTING METHOD OF ROM
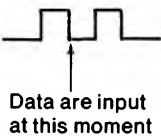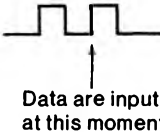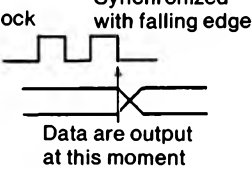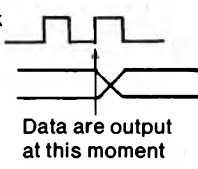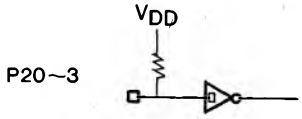
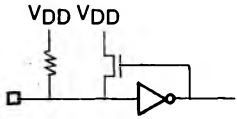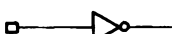**Please refer to drawing below.**



## PIN CONFIGURATION

**Pin Connection between MSM6404VS and EPROM**

## DIFFERENCES BETWEEN MSM6404 AND MSM6404VS (PIGGY-BACK)

| Item | 6404 | 6404VS (Piggy-Back) |
|---|---|---|
| 1. Port initialization during reset | Port P0, 1, 3 are set to "1" and port 2, 4, 5, 6, 7, 8 are reset to "0" directly by signal put into the RESET. | Port P0, 1, 3 are set to "1" and port 2, 4, 5, 6, 7, 8 are reset to "0" during reset cycle being executed. |
| 2. Timer Operation | After being reset, timer stops counting until data are set in it. | It is undecidable whether the timer starts counting or not after being reset. Therefore, the timer should be initialized by software. |
| 3. Shift registor | Serial Out F/F (SOF/F) is set to "0" after being reset. | It is undecidable whether Serial Out F/F (SOF/F) is set to "0" or "1" after being reset. Therefore Serial Out F/F should be initialized by software. |
| 4. Port input/output timing | Internal clock<br><br>Data are input at this moment<br><br>Internal clock — Synchronized with falling edge<br><br>Data are output at this moment | Internal clock<br><br>Data are input at this moment<br><br>Internal clock<br><br>Data are output at this moment |
| 5. Port input/output (maracteristics) | TTL F0=1<br>($I_{OL}$ = 1.6 mA 0.4V)<br><br>$V_{DD}$<br>P20~3<br><br>TTL compatible input<br>P00~P83<br>(Except P20~3) | LSTTL F0=1<br>($I_{OL}$ = 0.4 mA  0.4V)<br><br>$V_{DD}$ $V_{DD}$<br>P20~3<br><br>CMOS input<br>P00~83<br>(Except P20~3) |
| Available ROM capacity | 4K byte | Accessible up to 8K byte |
| IPL call instruction | Not available | Available |