## *32Kx8 bit Low Power full CMOS Static RAM*

### FEATURES

- Process Technology: Full CMOS
- Organization: 32K x 8
- Power Supply Voltage: 4.5~5.5V
- Low Data Retention Voltage: 2V(Min)
- Three state output and TTL Compatible
- Package Type: 28-DIP-600B, 28-SOP-450, 28-TSOP1-0813.4F/R

### GENERAL DESCRIPTION

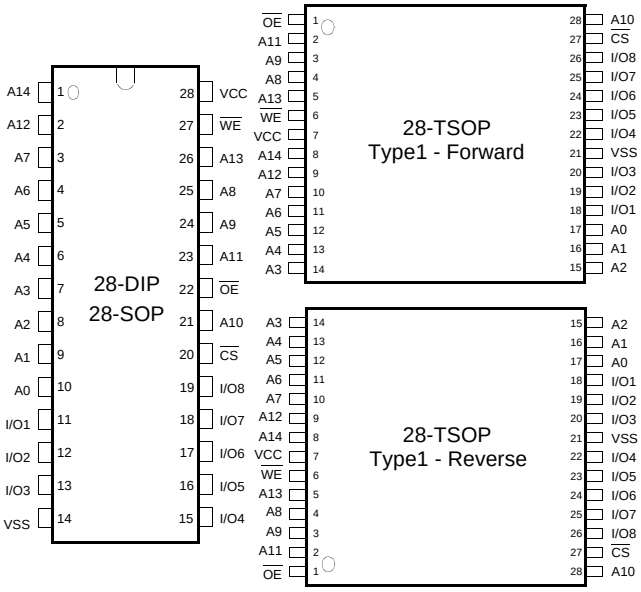
The K6X0808C1D families are fabricated by SAMSUNG′s advanced CMOS process technology. The families support verious operating temperature ranges and have various package types for user flexibility of system design. The families also support low data retention voltage for battery back-up operation with low data retention current.

### PRODUCT FAMILY

| Product Family | Operating Temperature | Vcc Range | Speed | Power Dissipation | | PKG Type |
|---|---|---|---|---|---|---|
| | | | | Standby ($I_{SB1}$, Max) | Operating ($I_{CC2}$, Max) | |
| K6X0808C1D-F | Industrial(-40~85°C) | 4.5~5.5V | 55[1]/70ns | 15µA | 25mA | 28-DIP-600B, 28-SOP-450, 28-TSOP1-0813.4F/R |
| K6X0808C1D-Q | Automotive(-40~125°C) | | | 25µA | | 28-SOP-450, 28-TSOP1-0813.4F |

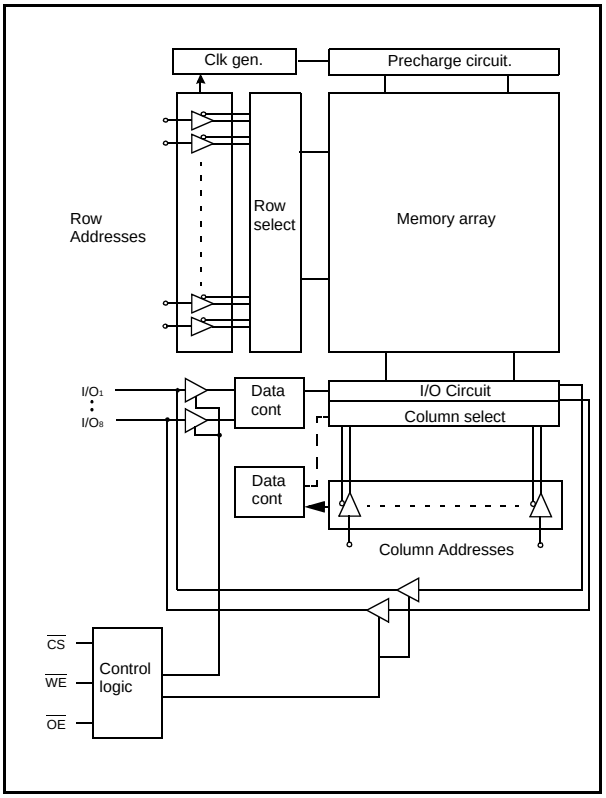
1. The parameters are tested with 50pF test load

### PIN DESCRIPTION




| Pin Name | Function | Pin Name | Function |
|---|---|---|---|
| $\overline{CS}$ | Chip Select Input | $I/O_1$~$I/O_8$ | Data Inputs/Outputs |
| $\overline{OE}$ | Output Enable Input | Vcc | Power |
| $\overline{WE}$ | Write Enable Input | Vss | Ground |
| $A_0$~$A_{14}$ | Address Inputs | NC | No connect |

### FUNCTIONAL BLOCK DIAGRAM

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## PRODUCT LIST

| Industrial Temp. Products(-40~85°C) | | Automotive Temp. Products(-40~125°C) | |
|---|---|---|---|
| **Part Name** | **Function** | **Part Name** | **Function** |
| K6X0808C1D-DF55<br>K6X0808C1D-DF70<br>K6X0808C1D-GF55<br>K6X0808C1D-GF70<br>K6X0808C1D-TF55<br>K6X0808C1D-TF70<br>K6X0808C1D-RF55<br>K6X0808C1D-RF70 | 28-DIP, 55ns, LL Pwr<br>28-DIP, 70ns, LL Pwr<br>28-SOP, 55ns, LL Pwr<br>28-SOP, 70ns, LL Pwr<br>28-TSOP-F, 55ns, LL Pwr<br>28-TSOP-F, 70ns, LL Pwr<br>28-TSOP-R, 55ns, LL Pwr<br>28-TSOP-R, 70ns, LL Pwr | K6X0808C1D-GQ55<br>K6X0808C1D-GQ70<br>K6X0808C1D-TQ55<br>K6X0808C1D-TQ70 | 28-SOP, 55ns, L Pwr<br>28-SOP, 70ns, L Pwr<br>28-TSOP-F, 55ns, L Pwr<br>28-TSOP-F, 70ns, L Pwr |

## FUNCTIONAL DESCRIPTION

| $\overline{CS}$ | $\overline{OE}$ | $\overline{WE}$ | I/O | Mode | Power |
|---|---|---|---|---|---|
| H | X[1)] | X[1)] | High-Z | Deselected | Standby |
| L | H | H | High-Z | Output Disabled | Active |
| L | L | H | Dout | Read | Active |
| L | X[1)] | L | Din | Write | Active |

1. X means don't care (Must be in high or low states)

## ABSOLUTE MAXIMUM RATINGS[1)]

| Item | Symbol | Ratings | Unit | Remark |
|---|---|---|---|---|
| Voltage on any pin relative to Vss | $V_{IN}$,$V_{OUT}$ | -0.5 to $V_{CC}$+0.5V(Max. 7.0V) | V | - |
| Voltage on Vcc supply relative to Vss | $V_{CC}$ | -0.3 to 7.0 | V | - |
| Power Dissipation | $P_D$ | 1.0 | W | - |
| Storage temperature | $T_{STG}$ | -65 to 150 | °C | - |
| Operating Temperature | $T_A$ | -40 to 85 | °C | K6X0808C1D-F |
| | | -40 to 125 | °C | K6X0808C1D-Q |

1. Stresses greater than those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. Functional operation should be restricted to recommended operating condition. Exposure to absolute maximum rating conditions for extended periods may affect reliability.

## RECOMMENDED DC OPERATING CONDITIONS[1)]

| Item | Symbol | Min | Typ | Max | Unit |
|---|---|---|---|---|---|
| Supply voltage | Vcc | 4.5 | 5.0 | 5.5 | V |
| Ground | Vss | 0 | 0 | 0 | V |
| Input high voltage | $V_{IH}$ | 2.2 | - | Vcc+0.5[2)] | V |
| Input low voltage | $V_{IL}$ | -0.5[3)] | - | 0.8 | V |

Note:
1. Industrial Product: $T_A$=-40 to 85°C, Otherwise specified
   Automotive Product: $T_A$=-40 to 125°C, Otherwise specified
2. Overshoot: Vcc+3.0V in case of pulse width≤30ns.
3. Undershoot: -3.0V in case of pulse width≤30ns.
4. Overshoot and undershoot are sampled, not 100% tested.

## CAPACITANCE[1)] (f=1MHz, TA=25°C)

| Item | Symbol | Test Condition | Min | Max | Unit |
|---|---|---|---|---|---|
| Input capacitance | $C_{IN}$ | $V_{IN}$=0V | - | 8 | pF |
| Input/Output capacitance | $C_{IO}$ | $V_{IO}$=0V | - | 10 | pF |

1. Capacitance is sampled, not 100% tested

## DC AND OPERATING CHARACTERISTICS

| Item | Symbol | Test Conditions | | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| Input leakage current | $I_{LI}$ | $V_{IN}$=Vss to Vcc | | -1 | - | 1 | µA |
| Output leakage current | $I_{LO}$ | $\overline{CS}$=$V_{IH}$ or $\overline{OE}$=$V_{IH}$ or $\overline{WE}$=$V_{IL}$, $V_{IO}$=Vss to Vcc | | -1 | - | 1 | µA |
| Operating power supply current | $I_{CC}$ | $I_{IO}$=0mA, $\overline{CS}$=$V_{IL}$, $V_{IN}$=$V_{IH}$ or $V_{IL}$, Read | | - | - | 5 | mA |
| Average operating current | $I_{CC1}$ | Cycle time=1µs, 100% duty, $I_{IO}$=0mA, $\overline{CS}$≤0.2V, $V_{IN}$≤0.2V$_{IN}$≥Vcc -0.2V | | - | - | 7 | mA |
| | $I_{CC2}$ | Cycle time=Min,100% duty, $I_{IO}$=0mA, $\overline{CS}$=$V_{IL}$, $V_{IN}$=$V_{IH}$ or $V_{IL}$ | | - | - | 25 | mA |
| Output low voltage | $V_{OL}$ | $I_{OL}$=2.1mA | | - | - | 0.4 | V |
| Output high voltage | $V_{OH}$ | $I_{OH}$=-1.0mA | | 2.4 | - | - | V |
| Standby Current(TTL) | $I_{SB}$ | $\overline{CS}$=$V_{IH}$, Other inputs=$V_{IH}$ or $V_{IL}$ | | - | - | 0.4 | mA |
| Standby Current (CMOS) | $I_{SB1}$ | $\overline{CS}$≥Vcc-0.2V, Other inputs=0~Vcc | K6X0808C1D-F | - | - | 15 | µA |
| | | | K6X0808C1D-Q | - | - | 25 | µA |