

TOSHIBA Cmos Linear Integrated Circuit Silicon Monolithic

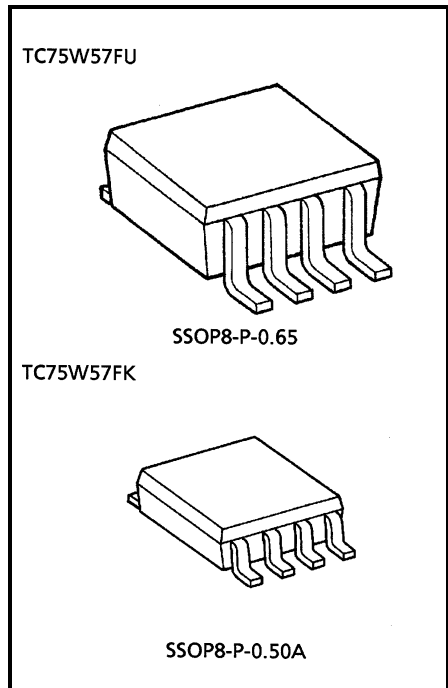
TC75W57FU, TC75W57FK

Dual Comparator

TC75W57 is a CMOS type general-purpose dual comparator capable of single power supply operation and using lower supply currents than the conventional bipolar comparators. Its push-pull output can connect directly to local IC's such as TTL and CMOS circuits.

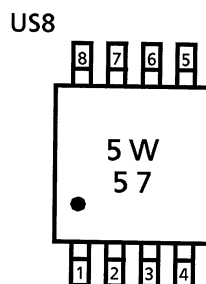
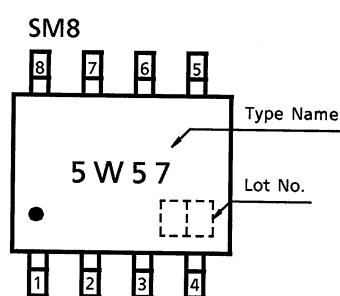
Features

- Low supply current: $I_{DD} = 200\mu A$ (typ.)
- Single power supply operation
- Wide common mode input voltage range: $V_{SS} \sim V_{DD} - 0.9V$
- Push-pull output circuit
- Low input bias current
- Small package

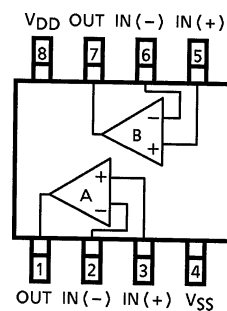


Weight
 SSOP8-P-0.65: 0.021g (typ.)
 SSOP8-P-0.50A: 0.01g (typ.)

Marking (Top View)



Pin Connection (Top View)



Maximum Ratings (Ta = 25°C)

| Characterisstic | Symbol | Rating | N |
|----------------------------|------------------|----------------------|----|
| Supply voltage | V_{DD}, V_{SS} | ± 3.5 or 7 | V |
| Differential input voltage | DV_{IN} | ± 7 | V |
| Input voltage | V_{IN} | $V_{SS} \sim V_{DD}$ | V |
| Output current | I_{OUT} | ± 35 | mA |
| Power dissipation | P_D | 250 (SM8) | mW |
| | | 200 (US8) | |
| Operating temperature | T_{opr} | -40~85 | °C |
| Storage temperature | T_{stg} | -55~125 | °C |

Note: Since this product sometimes brings about latchcap, which is peculiar to CMOS devices, note the following points:

- Don't raise the voltage level of I/O pins beyond V_{DD} , nor lower it below V_{SS} .
Consider the timing for power supply, too.
- Don't let any abnormal noise enter the device.

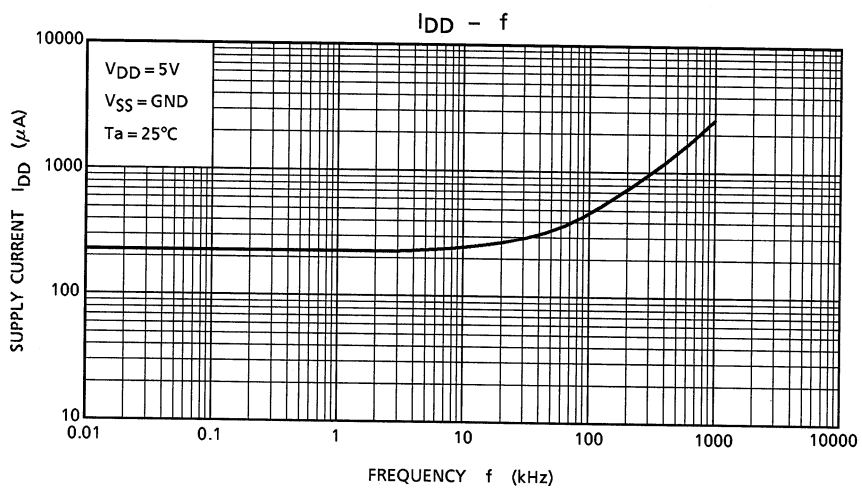
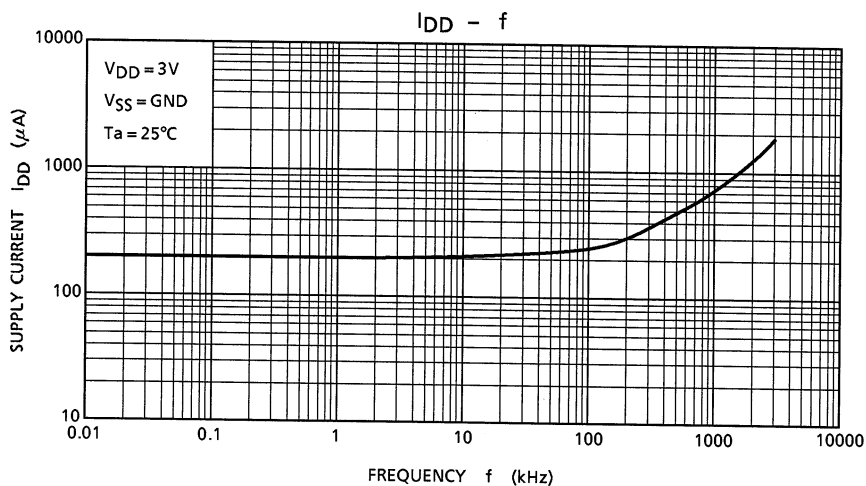
Electrical Characteristics ($V_{DD} = 5V$, $V_{SS} = GND$, $T_a = 25^\circ C$)

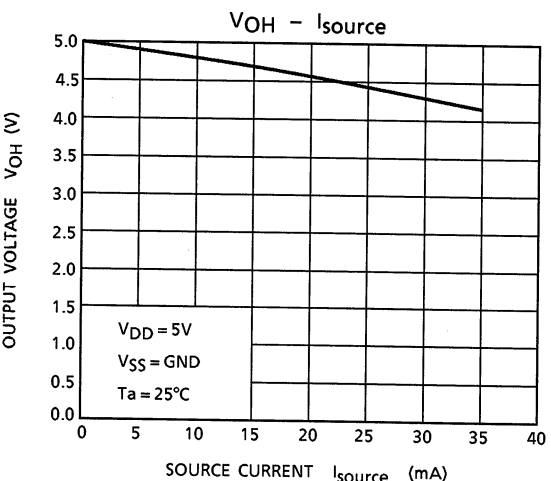
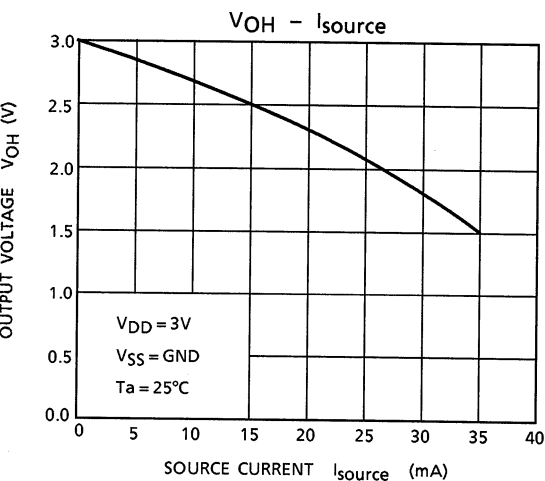
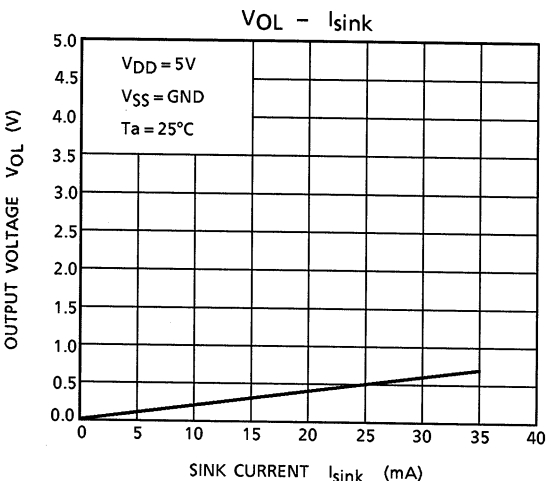
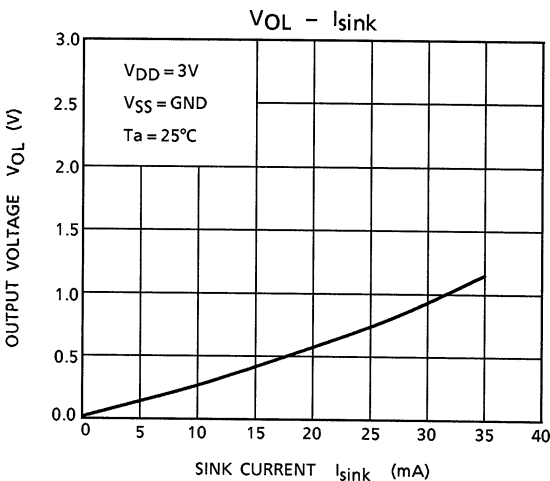
| Characteristic | Symbol | Test Circuit | Test Condition | Min | Typ. | Max | Unit |
|-----------------------------------|-----------------|--------------|----------------------|-----|---------|---------|---------|
| Input offset voltage | V_{IO} | — | — | — | ± 1 | ± 7 | mV |
| Input offset current | I_{IO} | — | — | — | 1 | — | pA |
| Input bias current | I_I | — | — | — | 1 | — | pA |
| Common mode input voltage | CMV_{IN} | — | — | 0 | — | 4.1 | V |
| Supply current | I_{DD} (Note) | — | — | — | 220 | 440 | μA |
| Voltage gain | G_V | — | — | — | 94 | — | dB |
| Sink current | I_{sink} | — | $V_{OL} = 0.5V$ | 13 | 25 | — | mA |
| Source current | I_{source} | — | $V_{OH} = 4.5V$ | 9 | 21 | — | mA |
| Output voltage | V_{OL} | — | $I_{sink} = 5.0mA$ | — | 0.1 | 0.3 | V |
| | V_{OH} | — | $I_{source} = 5.0mA$ | 4.7 | 4.9 | — | |
| Operating supply voltage | V_{DD} | — | — | 1.8 | — | 7.0 | V |
| Propagation delay time (turn on) | t_{PLH} (1) | — | Over drive = 100mV | — | 140 | — | ns |
| | t_{PLH} (2) | — | TTL step input | — | 90 | — | |
| Propagation delay time (turn off) | t_{PHL} (1) | — | Over drive = 100mV | — | 90 | — | ns |
| | t_{PHL} (2) | — | TTL step input | — | 70 | — | |
| Response time | t_{TLH} | — | Over drive = 100mV | — | 11 | — | ns |
| | t_{THL} | — | Over drive = 100mV | — | 7 | — | |

Electrical Characteristics ($V_{DD} = 3V$, $V_{SS} = GND$, $T_a = 25^\circ C$)

| Characteristic | Symbol | Test Circuit | Test Condition | Min | Typ. | Max | Unit |
|-----------------------------------|-----------------|--------------|----------------------|------|---------|---------|---------|
| Input offset voltage | V_{IO} | — | — | — | ± 1 | ± 7 | mV |
| Input offset current | I_{IO} | — | — | — | 1 | — | pA |
| Input bias current | I_I | — | — | — | 1 | — | pA |
| Common mode input voltage | CMV_{IN} | — | — | 0 | — | 2.1 | V |
| Supply current | I_{DD} (Note) | — | — | — | 200 | 400 | μA |
| Sink current | I_{sink} | — | $V_{OL} = 0.5V$ | 6 | 18 | — | mA |
| Source current | I_{source} | — | $V_{OH} = 2.5V$ | 3 | 15 | — | mA |
| Output voltage | V_{OL} | — | $I_{sink} = 5.0mA$ | — | 0.15 | 0.35 | V |
| | V_{OH} | — | $I_{source} = 5.0mA$ | 2.65 | 2.85 | — | |
| Propagation delay time (turn on) | t_{PLH} | — | Over drive = 100mV | — | 110 | — | ns |
| Propagation delay time (turn off) | t_{PHL} | — | Over drive = 100mV | — | 90 | — | ns |
| Response time | t_{TLH} | — | Over drive = 100mV | — | 7 | — | ns |
| | t_{THL} | — | Over drive = 100mV | — | 8 | — | |

Note: Since this product causes an increase in current consumption with a rise in operational frequency, make sure that power consumption does not exceed the allowable dissipation.

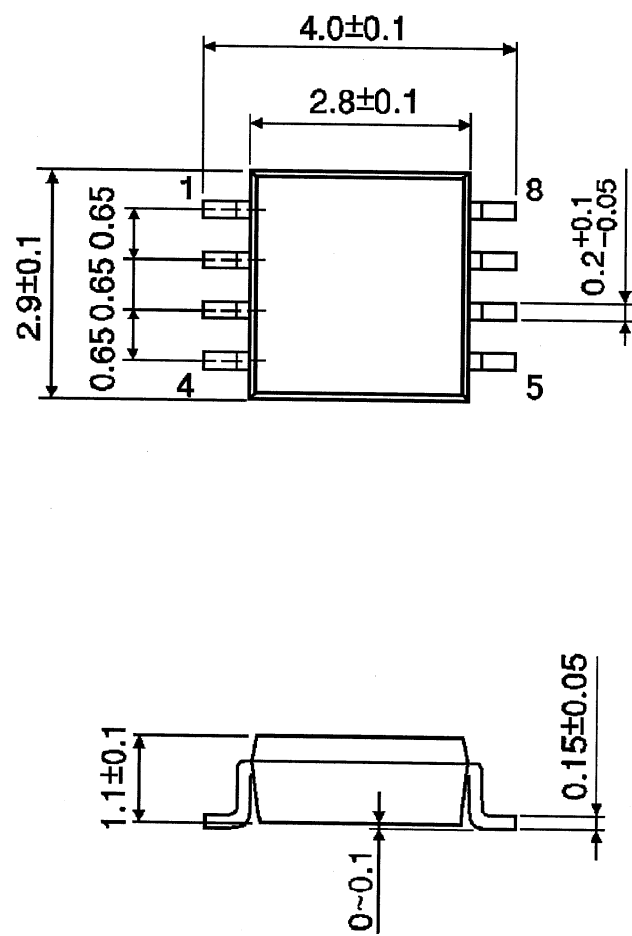




Package Dimensions

SSOP8-P-0.65

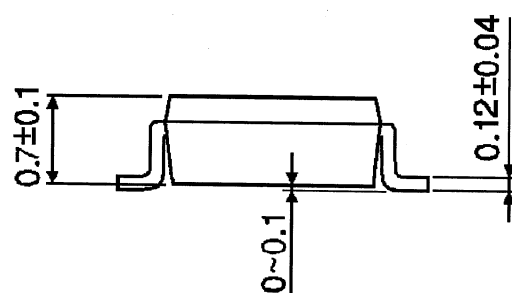
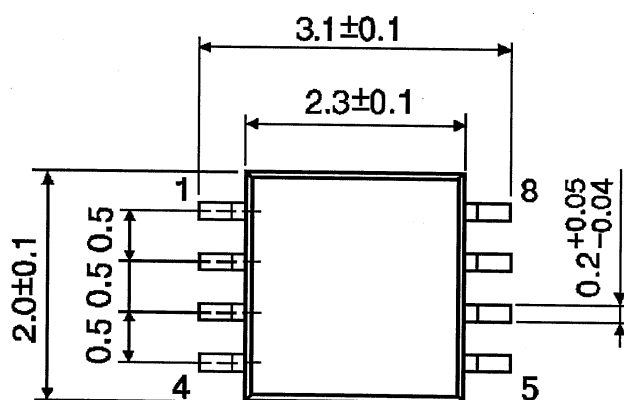
Unit: mm



Weight: 0.021g(typ.)

SSOP8-P-0.50A

Unit: mm



Weight: 0.01g(typ.)

RESTRICTIONS ON PRODUCT USE

000707EBA

- TOSHIBA is continually working to improve the quality and reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to comply with the standards of safety in making a safe design for the entire system, and to avoid situations in which a malfunction or failure of such TOSHIBA products could cause loss of human life, bodily injury or damage to property.
In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent TOSHIBA products specifications. Also, please keep in mind the precautions and conditions set forth in the "Handling Guide for Semiconductor Devices," or "TOSHIBA Semiconductor Reliability Handbook" etc..
- The TOSHIBA products listed in this document are intended for usage in general electronics applications (computer, personal equipment, office equipment, measuring equipment, industrial robotics, domestic appliances, etc.). These TOSHIBA products are neither intended nor warranted for usage in equipment that requires extraordinarily high quality and/or reliability or a malfunction or failure of which may cause loss of human life or bodily injury ("Unintended Usage"). Unintended Usage include atomic energy control instruments, airplane or spaceship instruments, transportation instruments, traffic signal instruments, combustion control instruments, medical instruments, all types of safety devices, etc.. Unintended Usage of TOSHIBA products listed in this document shall be made at the customer's own risk.
- The products described in this document are subject to the foreign exchange and foreign trade laws.
- The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by TOSHIBA CORPORATION for any infringements of intellectual property or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any intellectual property or other rights of TOSHIBA CORPORATION or others.
- The information contained herein is subject to change without notice.