

TOSHIBA CMOS Linear Integrated Circuit Silicon Monolithic

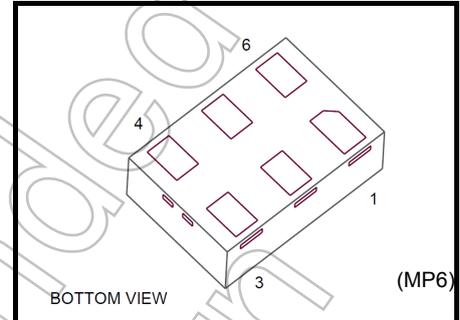
TC75S201L6X

Single Comparator

TC75S201L6X is a CMOS type general-purpose single comparator. The device can operate a single power supply and a lower supply current than a conventional bipolar general-purpose comparator. This device's push-pull output stage can be directly connected to CMOS logic ICs.

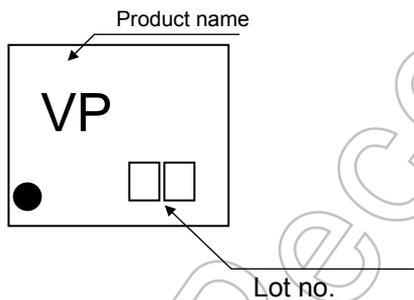
Features

- Full-Range Input/Output
- Small package
- Low input bias current
- Single power supply operation
- Low supply current: $I_{DD} = 20\mu A$ (typ.) @ $V_{DD} = 3.0 V$
- Push-pull output circuit

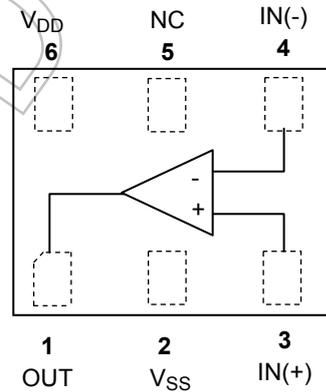


Weight: 2.0 mg (typ.)

Marking (Top View)



Pin Assignment (Top view)



Start of commercial production
2011-10

Absolute Maximum Ratings

| Characteristic | Symbol | Rating | Unit |
|---|-----------------|----------------------|------|
| Supply voltage | V_{DD} | ± 2.3 or 4.6 | V |
| Differential input voltage ⁽¹⁾ | ΔV_{IN} | ± 4.6 | V |
| Input voltage | V_{IN} | V_{SS} to V_{DD} | V |
| Output current | I_{OUT} | ± 35 | mA |
| Power dissipation | P_D | 250 (Note1) | mW |
| Operating temperature | T_{opr} | -40 to 85 | °C |
| Storage temperature | T_{stg} | -55 to 125 | °C |

Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings and the operating ranges.

Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

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

- Don't raise the voltage level of the output 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.

Note 1: Mounted on an FR4 board.

Operating Ranges ($T_a = 25^\circ\text{C}$)

| Characteristic | Symbol | Rating | Unit |
|----------------|------------------|-------------------------|------|
| Supply voltage | V_{DD} | 1.5 to 4.6 | V |
| | V_{DD}, V_{SS} | ± 0.75 to ± 2.3 | |

Electrical Characteristics ($V_{DD} = 3.0\text{ V}$, $V_{SS} = \text{GND}$, $T_a = 25^\circ\text{C}$)

| Characteristic | Symbol | Test Condition | Min | Typ. | Max | Unit |
|---------------------------------|-----------------|------------------------------|------|---------|---------|---------------|
| Input offset voltage | V_{IO} | — | — | ± 1 | ± 6 | mV |
| Input offset current | I_{IO} | — | — | 1 | — | μA |
| Input bias current | I_I | — | — | 1 | — | μA |
| Common-mode input voltage range | V_{ICM} | — | 0 | — | 3.0 | V |
| Supply current | I_{DD} (Note) | — | — | 20 | 44 | μA |
| Sink current | I_{SINK} | $V_{OL} = 0.5\text{ V}$ | 6 | 18 | — | mA |
| Source current | I_{SOURCE} | $V_{OH} = 2.5\text{ V}$ | 3 | 15 | — | mA |
| High-level Output voltage | V_{OL} | $I_{SINK} = 5.0\text{ mA}$ | — | 0.15 | 0.35 | V |
| Low-level Output voltage | V_{OH} | $I_{SOURCE} = 5.0\text{ mA}$ | 2.65 | 2.85 | — | |
| Propagation delay time (L/H) | t_{PLH} | Over drive = 100 mV | — | 600 | — | ns |
| Propagation delay time (H/L) | t_{PHL} | Over drive = 100 mV | — | 1000 | — | |
| Response time | t_{TLH} | Over drive = 100 mV | — | 30 | — | ns |
| | t_{THL} | Over drive = 100 mV | — | 24 | — | |

(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.

Electrical Characteristics ($V_{DD} = 1.8\text{ V}$, $V_{SS} = \text{GND}$, $T_a = 25^\circ\text{C}$)

| Characteristic | Symbol | Test Condition | Min | Typ. | Max | Unit |
|---------------------------------|-----------------|------------------------------|------|---------|---------|---------------|
| Input offset voltage | V_{IO} | — | — | ± 1 | ± 6 | mV |
| Input offset current | I_{IO} | — | — | 1 | — | μA |
| Input bias current | I_I | — | — | 1 | — | μA |
| Common-mode input voltage range | V_{ICM} | — | 0 | — | 1.8 | V |
| Supply current | I_{DD} (Note) | — | — | 17 | 40 | μA |
| Sink current | I_{SINK} | $V_{OL} = 0.5\text{ V}$ | 3.0 | 8.0 | — | mA |
| Source current | I_{SOURCE} | $V_{OH} = 1.3\text{ V}$ | 1.0 | 6.4 | — | mA |
| High-level Output voltage | V_{OL} | $I_{SINK} = 3.0\text{ mA}$ | — | 0.15 | 0.35 | V |
| Low-level Output voltage | V_{OH} | $I_{SOURCE} = 3.0\text{ mA}$ | 1.45 | 1.65 | — | |
| Propagation delay time (L/H) | t_{PLH} | Over drive = 100 mV | — | 590 | — | ns |
| Propagation delay time (H/L) | t_{PHL} | Over drive = 100 mV | — | 1000 | — | |
| Response time | t_{TLH} | Over drive = 100 mV | — | 26 | — | ns |
| | t_{THL} | Over drive = 100 mV | — | 33 | — | |

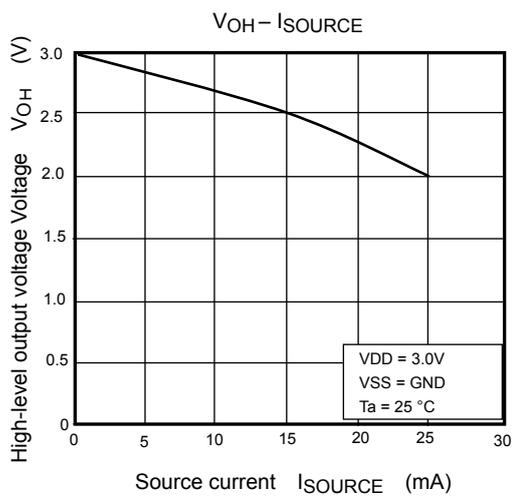
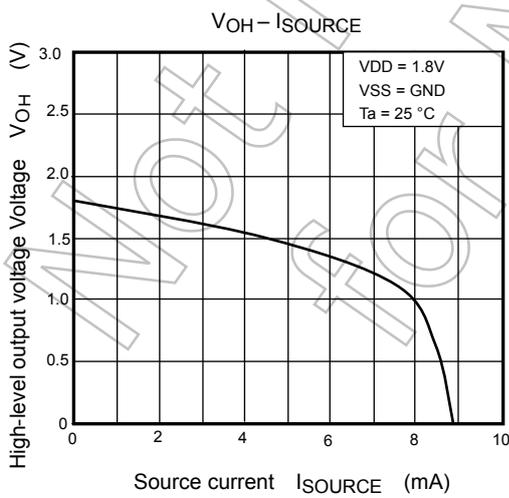
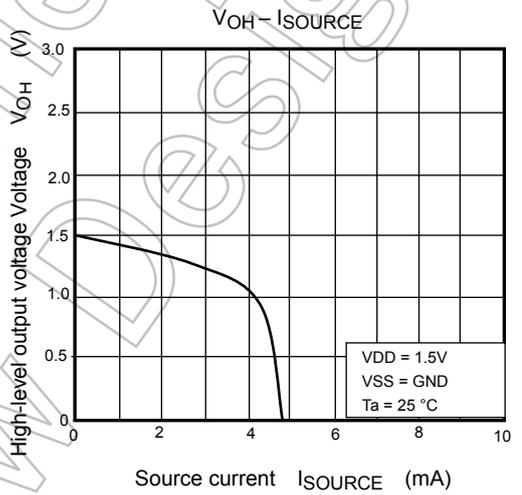
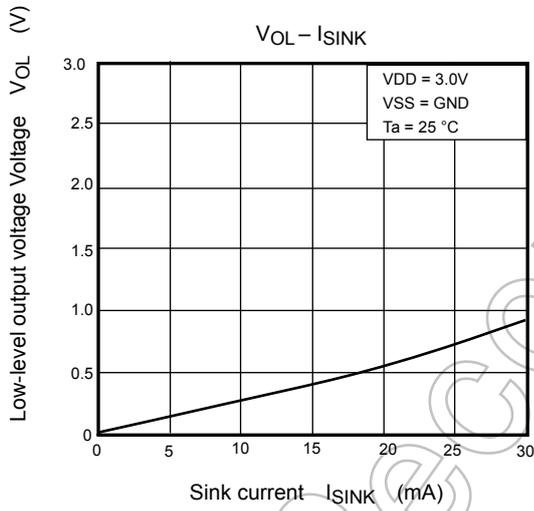
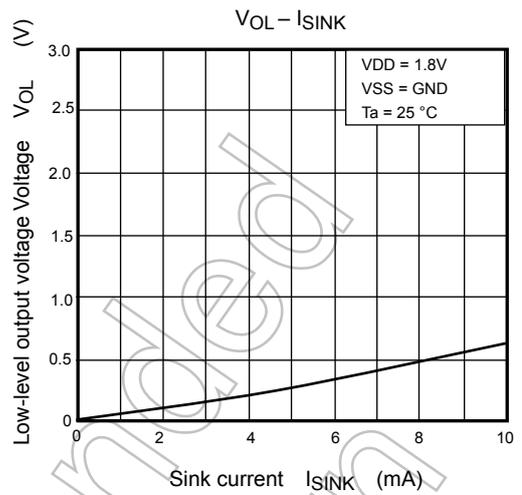
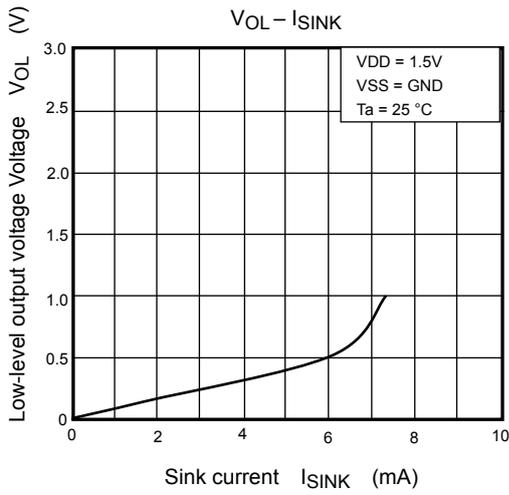
(Note): Since this product causes an increase in current consumption with a rise in operational frequency, make sure that power consumption does not exceed the allowable dissipation.

Electrical Characteristics ($V_{DD} = 1.5\text{ V}$, $V_{SS} = \text{GND}$, $T_a = 25^\circ\text{C}$)

| Characteristic | Symbol | Test Condition | Min | Typ. | Max | Unit |
|---------------------------------|-----------------|------------------------------|------|---------|---------|---------------|
| Input offset voltage | V_{IO} | — | — | ± 1 | ± 6 | mV |
| Input offset current | I_{IO} | — | — | 1 | — | μA |
| Input bias current | I_I | — | — | 1 | — | μA |
| Common-mode input voltage range | V_{ICM} | — | 0 | — | 1.5 | V |
| Supply current | I_{DD} (Note) | — | — | 18 | 36 | μA |
| Sink current | I_{SINK} | $V_{OL} = 0.5\text{ V}$ | 1.0 | 5.9 | — | mA |
| Source current | I_{SOURCE} | $V_{OH} = 1.0\text{ V}$ | 0.5 | 4.3 | — | mA |
| High-level Output voltage | V_{OL} | $I_{SINK} = 1.5\text{ mA}$ | — | 0.15 | 0.35 | V |
| Low-level Output voltage | V_{OH} | $I_{SOURCE} = 1.5\text{ mA}$ | 1.15 | 1.35 | — | |
| Propagation delay time (L/H) | t_{PLH} | Over drive = 100 mV | — | 600 | — | ns |
| Propagation delay time (H/L) | t_{PHL} | Over drive = 100 mV | — | 1000 | — | |
| Response time | t_{TLH} | Over drive = 100 mV | — | 30 | — | ns |
| | t_{THL} | Over drive = 100 mV | — | 42 | — | |

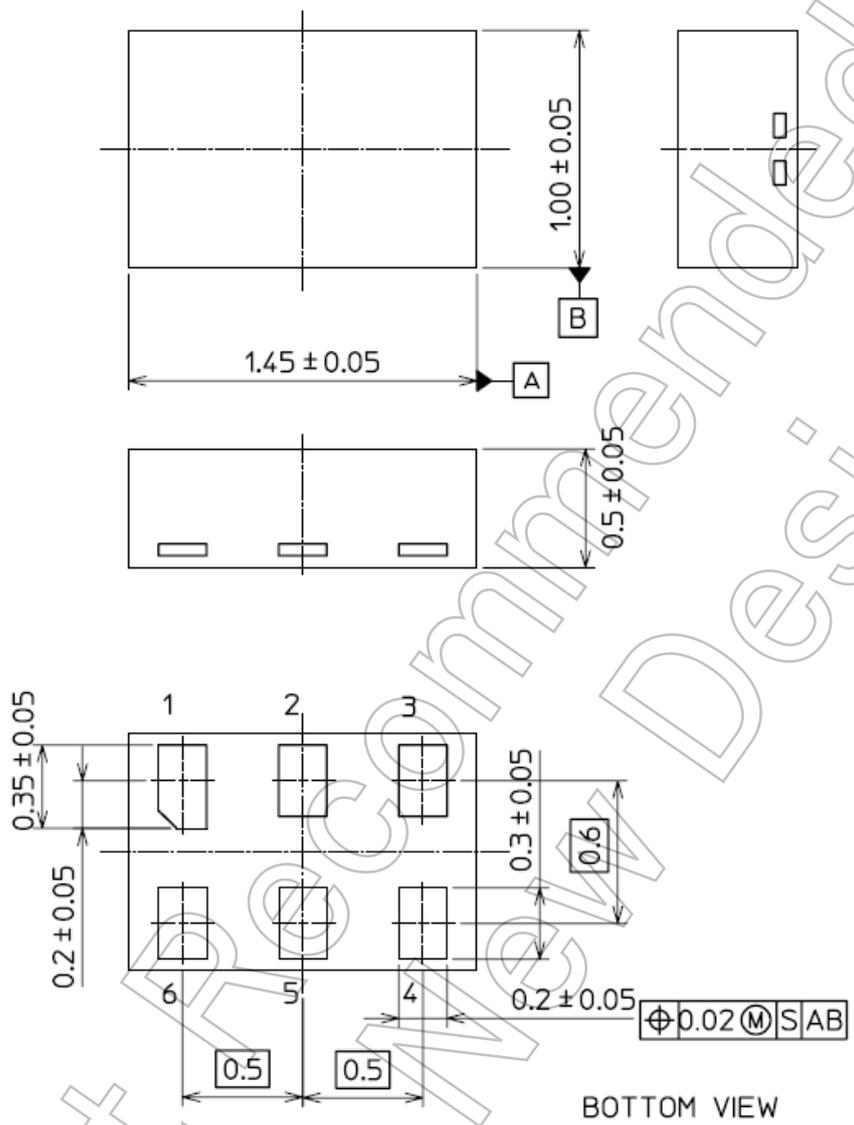
(Note): Since this product causes an increase in current consumption with a rise in operational frequency, make sure that power consumption does not exceed the allowable dissipation.

Not Recommended for New Design



Package Dimensions

Unit: mm



Weight : 2.0 mg (typ.)

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