

TOSHIBA CMOS Linear Integrated Circuit Silicon Monolithic

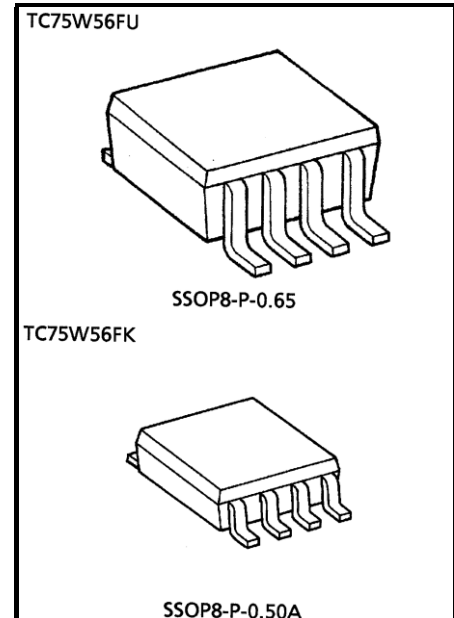
## TC75W56FU, TC75W56FK

### Dual Comparator

TC75W56 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.

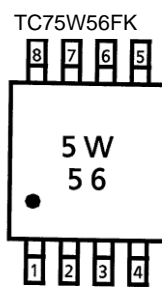
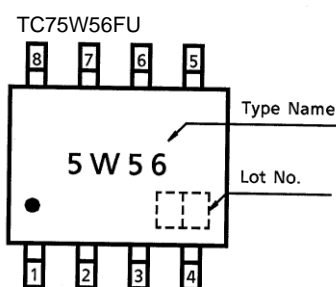
### Features

- Low supply current:  $I_{DD} = 20\mu A$  (typ.)
- Single power supply operation
- Wide common mode input voltage range:  $V_{SS}$  to  $V_{DD}-0.9V$
- Push-pull output circuit
- Low input bias current
- Small package

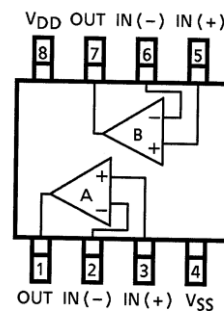


Weight  
 SSOP8-P-0.65 : 0.021g (typ.)  
 SSOP8-P-0.50A : 0.01g (typ.)

### Marking (Top View)



### Pin Connection (Top View)



Start of commercial production  
 1997-05

## Absolute Maximum Ratings (Ta = 25°C)

Characteristic	Symbol	Rating	N
Supply voltage	V <sub>DD</sub> , V <sub>SS</sub>	±3.5 or 7	V
Differential input voltage	DV <sub>IN</sub>	±7	V
Input voltage	V <sub>IN</sub>	V <sub>SS</sub> to V <sub>DD</sub>	V
Output current	I <sub>OUT</sub>	±35	mA
Power dissipation	P <sub>D</sub>	250 (TC75W56FU)	mW
		200 (TC75W56FK)	
Operating temperature	T <sub>opr</sub>	−40 to 85	°C
Storage temperature	T <sub>stg</sub>	−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 latchcap, which is peculiar to CMOS devices, note the following points:

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

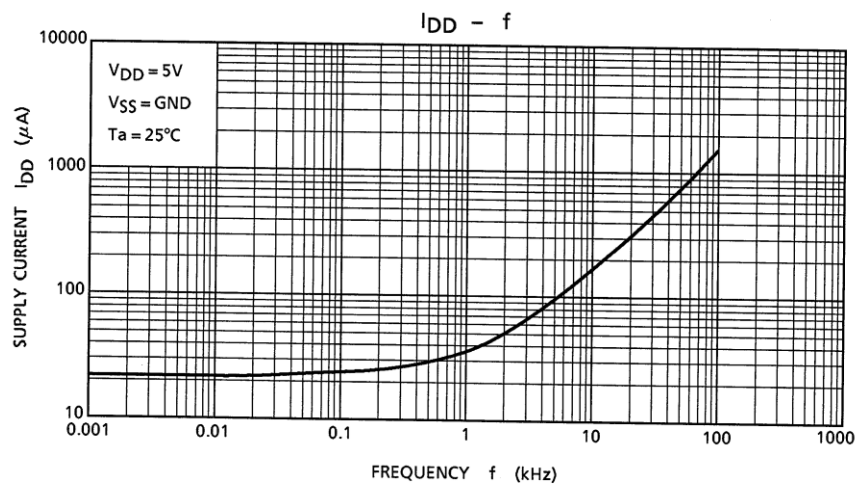
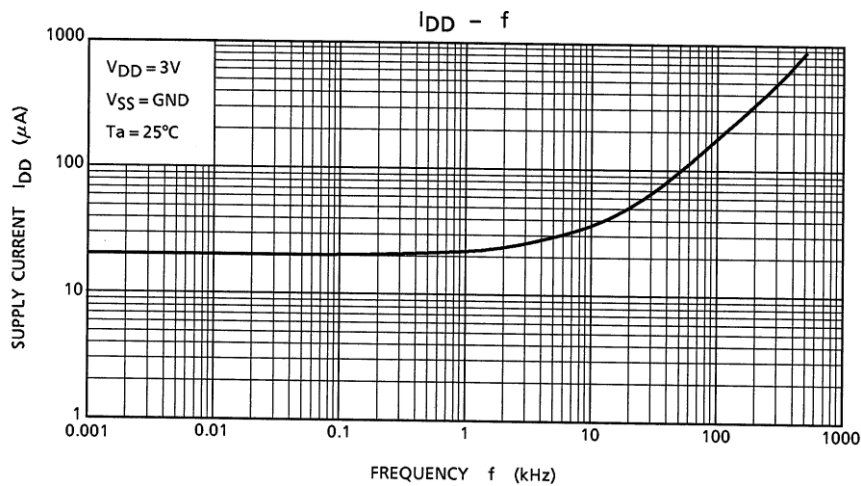
**Electrical Characteristics (V<sub>DD</sub> = 5V, V<sub>SS</sub> = GND, Ta = 25°C)**

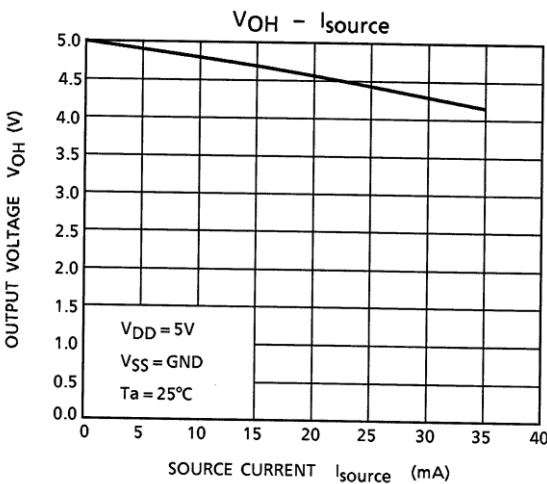
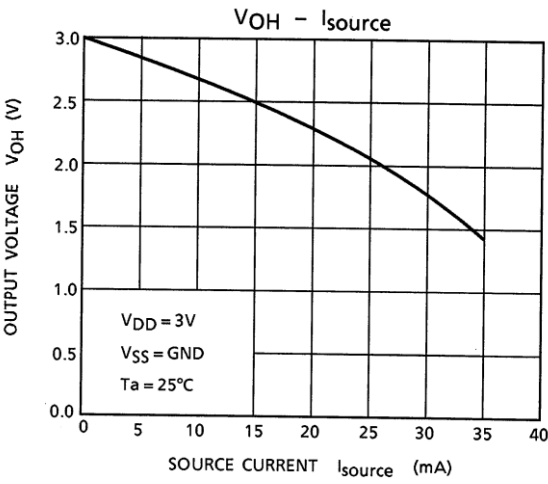
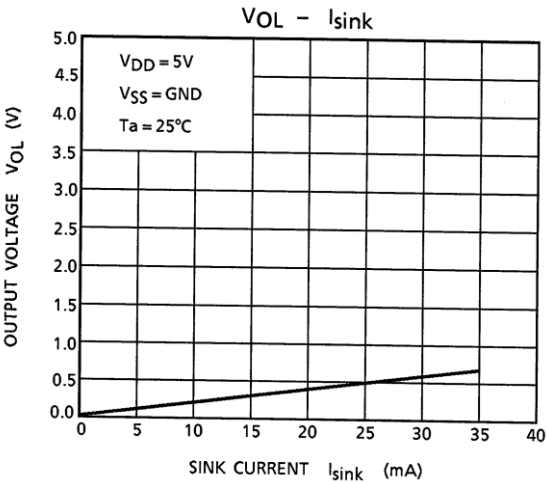
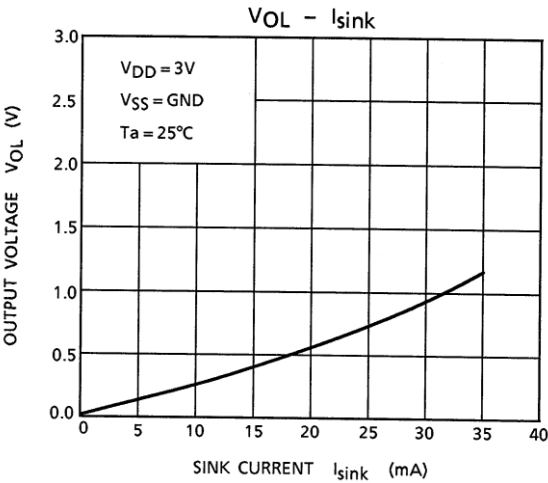
Characteristic	Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Input offset voltage	V <sub>IO</sub>	—	—	—	±1	±7	mV
Input offset current	I <sub>IO</sub>	—	—	—	1	—	pA
Input bias current	I <sub>I</sub>	—	—	—	1	—	pA
Common mode input voltage	CMV <sub>IN</sub>	—	—	0	—	4.1	V
Supply current	I <sub>DD</sub> (Note)	—	—	—	22	44	μA
Voltage gain	G <sub>V</sub>	—	—	—	94	—	dB
Sink current	I <sub>sink</sub>	—	V <sub>OL</sub> = 0.5V	13	25	—	mA
Source current	I <sub>source</sub>	—	V <sub>OH</sub> = 4.5V	9	21	—	mA
Output voltage	V <sub>OL</sub>	—	I <sub>sink</sub> = 5.0mA	—	0.1	0.3	V
	V <sub>OH</sub>	—	I <sub>source</sub> = 5.0mA	4.7	4.9	—	
Operating supply voltage	V <sub>DD</sub>	—	—	1.8	—	7.0	V
Propagation delay time (turn on)	t <sub>PLH</sub> (1)	—	Over drive = 100mV	—	680	—	ns
	t <sub>PLH</sub> (2)	—	TTL step input	—	500	—	
Propagation delay time (turn off)	t <sub>PHL</sub> (1)	—	Over drive = 100mV	—	250	—	ns
	t <sub>PHL</sub> (2)	—	TTL step input	—	380	—	
Response time	t <sub>TLH</sub>	—	Over drive = 100mV	—	60	—	ns
	t <sub>THL</sub>	—	Over drive = 100mV	—	8	—	

**Electrical Characteristics (V<sub>DD</sub> = 3V, V<sub>SS</sub> = GND, Ta = 25°C)**

Characteristic	Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Input offset voltage	V <sub>IO</sub>	—	—	—	±1	±7	mV
Input offset current	I <sub>IO</sub>	—	—	—	1	—	pA
Input bias current	I <sub>I</sub>	—	—	—	1	—	pA
Common mode input voltage	CMV <sub>IN</sub>	—	—	0	—	2.1	V
Supply current	I <sub>DD</sub> (Note)	—	—	—	20	40	μA
Sink current	I <sub>sink</sub>	—	V <sub>OL</sub> = 0.5V	6	18	—	mA
Source current	I <sub>source</sub>	—	V <sub>OH</sub> = 2.5V	3	15	—	mA
Output voltage	V <sub>OL</sub>	—	I <sub>sink</sub> = 5.0mA	—	0.15	0.35	V
	V <sub>OH</sub>	—	I <sub>source</sub> = 5.0mA	2.65	2.85	—	
Propagation delay time (turn on)	t <sub>PLH</sub>	—	Over drive = 100mV	—	550	—	ns
Propagation delay time (turn off)	t <sub>PHL</sub>	—	Over drive = 100mV	—	250	—	ns
Response time	t <sub>TLH</sub>	—	Over drive = 100mV	—	30	—	ns
	t <sub>THL</sub>	—	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.

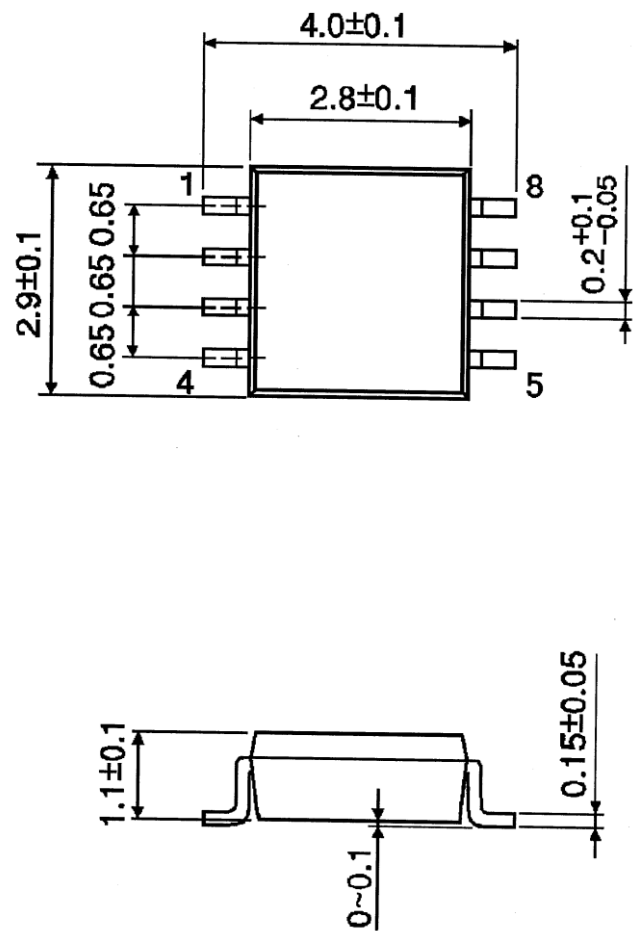




Package Dimensions

SSOP8-P-0.65

Unit: mm

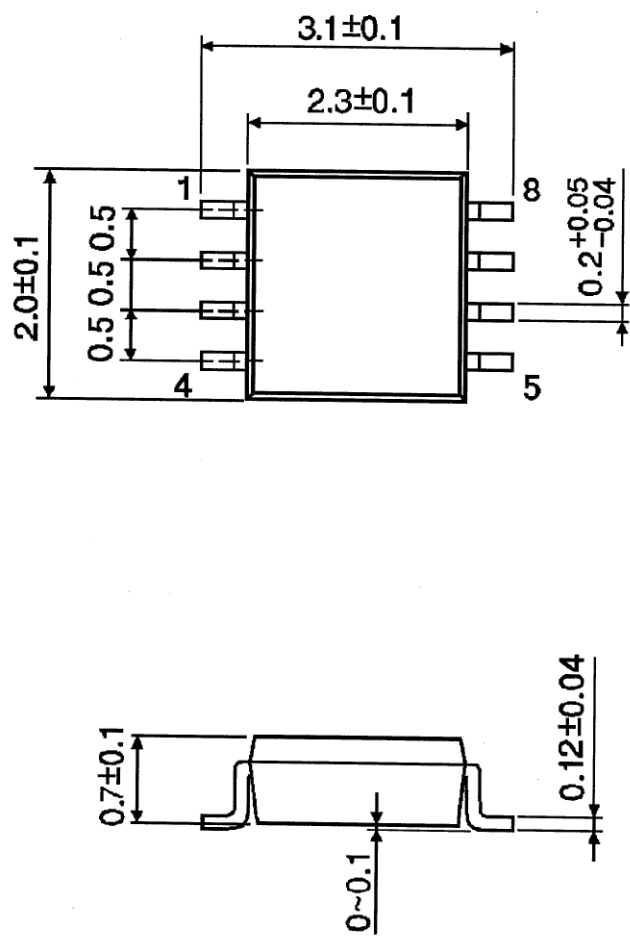


Weight: 0.021g(typ.)

Package Dimensions

SSOP8-P-0.50A

Unit: mm



Weight: 0.01g(typ.)

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