

TOSHIBA CMOS Linear Integrated Circuit Silicon Monolithic

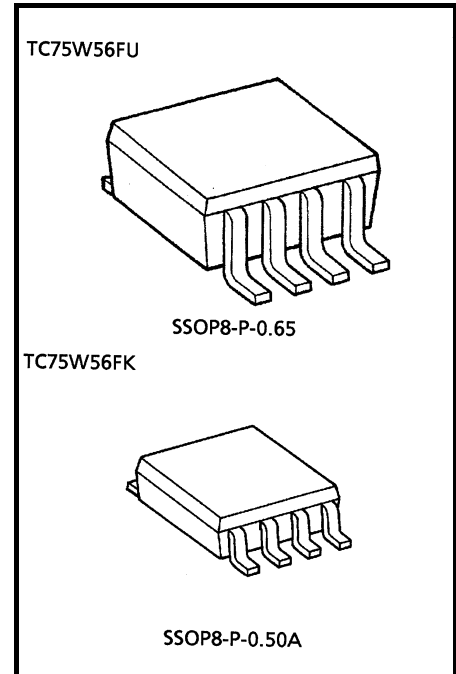
# TC75W56FU, TC75W56FK

## 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.

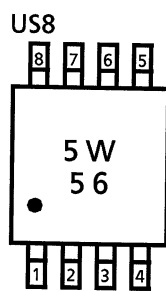
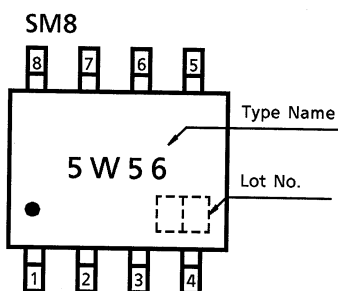
### Features

- 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

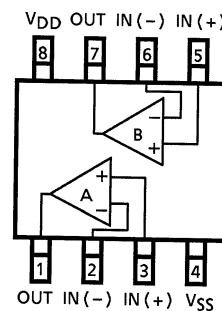


Weight  
 SSOP8-P-0.65 : 0.021g (typ.)  
 SSOP8-P-0.50A : 0.01g (typ.)

### 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	$V_{DD}, V_{SS}$	$\pm 3.5$ or 7	V
Differential input voltage	$DV_{IN}$	$\pm 7$	V
Input voltage	$V_{IN}$	$V_{SS}$ to $V_{DD}$	V
Output current	$I_{OUT}$	$\pm 3.5$	mA
Power dissipation	$P_D$	250 (TC75W56FU)	mW
		200 (TC75W56FK)	
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 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.

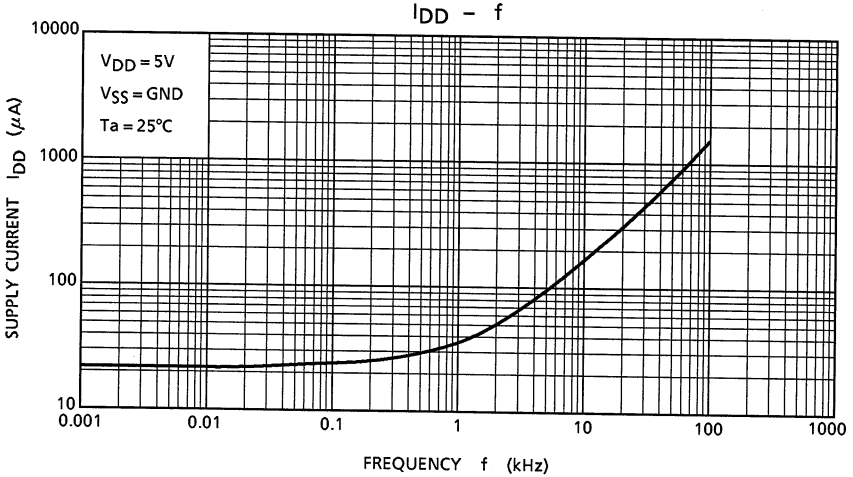
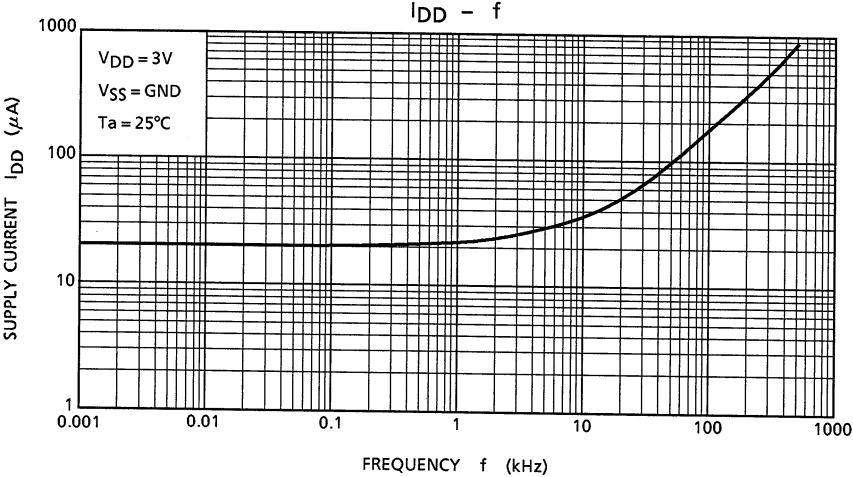
## Electrical Characteristics ( $V_{DD} = 5V$ , $V_{SS} = GND$ , $T_a = 25^\circ C$ )

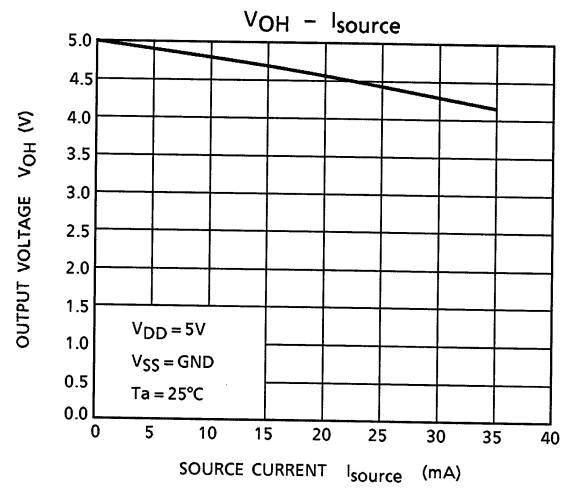
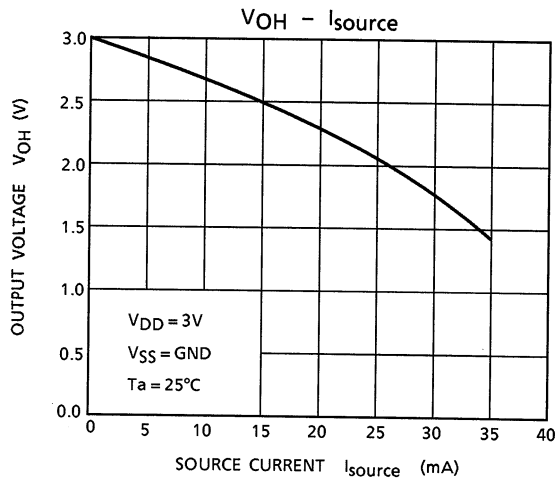
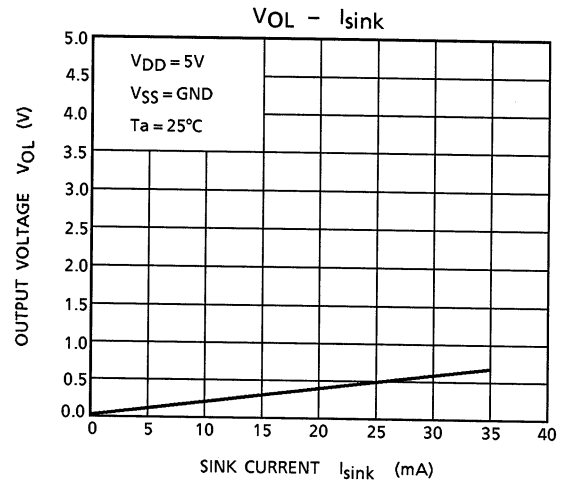
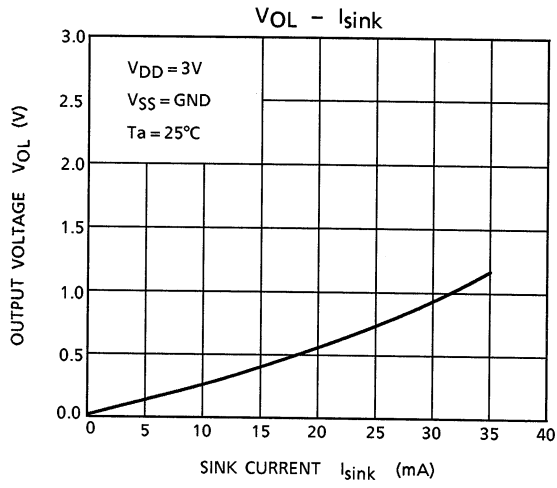
Characteristic	Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Input offset voltage	$V_{IO}$	—	—	—	$\pm 1$	$\pm 7$	mV
Input offset current	$I_{IO}$	—	—	—	1	—	pA
Input bias current	$I_I$	—	—	—	1	—	pA
Common mode input voltage	$CMV_{IN}$	—	—	0	—	4.1	V
Supply current	$I_{DD}$ (Note)	—	—	—	22	44	$\mu A$
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	—	680	—	ns
	$t_{PLH}$ (2)	—	TTL step input	—	500	—	
Propagation delay time (turn off)	$t_{PHL}$ (1)	—	Over drive = 100mV	—	250	—	ns
	$t_{PHL}$ (2)	—	TTL step input	—	380	—	
Response time	$t_{TLH}$	—	Over drive = 100mV	—	60	—	ns
	$t_{THL}$	—	Over drive = 100mV	—	8	—	

## 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	$V_{IO}$	—	—	—	$\pm 1$	$\pm 7$	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)	—	—	—	20	40	$\mu A$
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	—	550	—	ns
Propagation delay time (turn off)	$t_{PHL}$	—	Over drive = 100mV	—	250	—	ns
Response time	$t_{TLH}$	—	Over drive = 100mV	—	30	—	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.

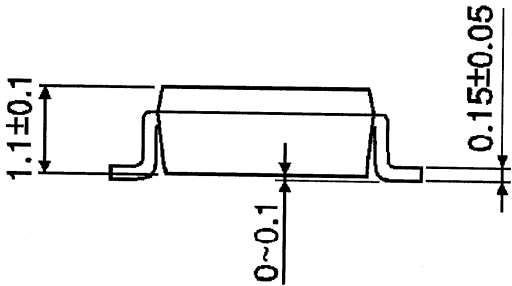
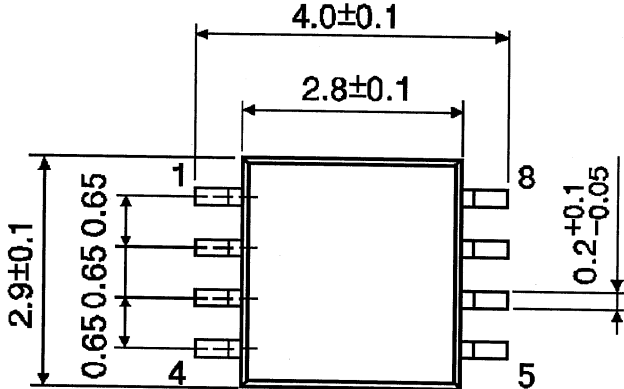




**Package Dimensions**

SSOP8-P-0.65

Unit: mm

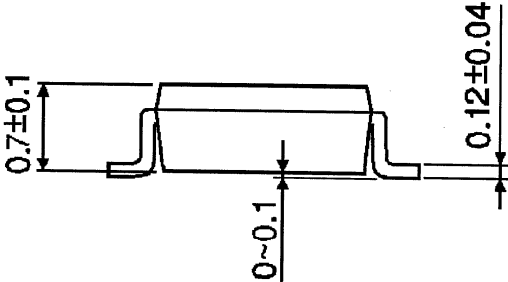
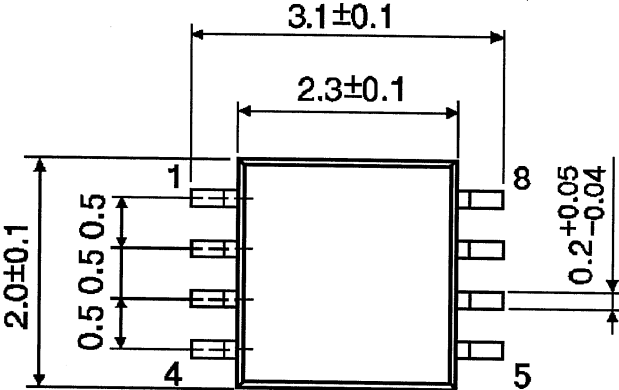


Weight: 0.021g(typ.)

**Package Dimensions**

SSOP8-P-0.50A

Unit: mm



Weight: 0.01g(typ.)

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