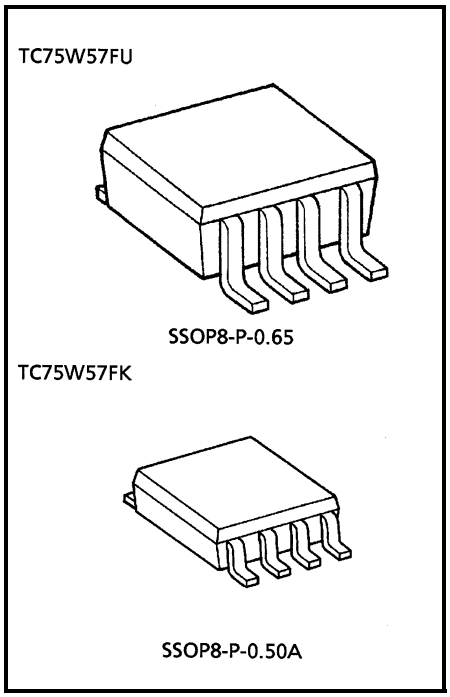
TOSHIBA Cmos Linear Integrated Circuit Silicon Monolithic

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.

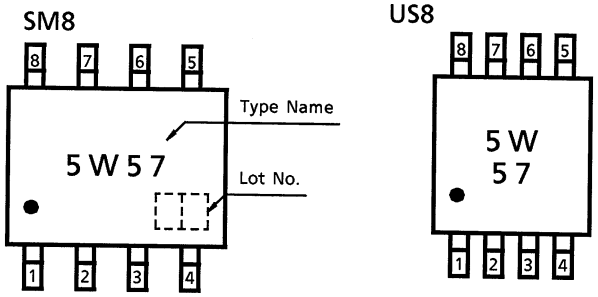


Weight
SSOP8-P-0.65: 0.021g (typ.)
SSOP8-P-0.50A: 0.01g (typ.)

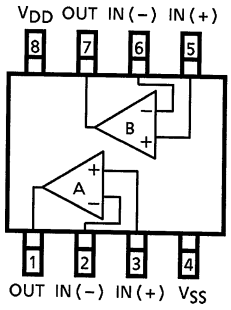
Features

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

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}~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.

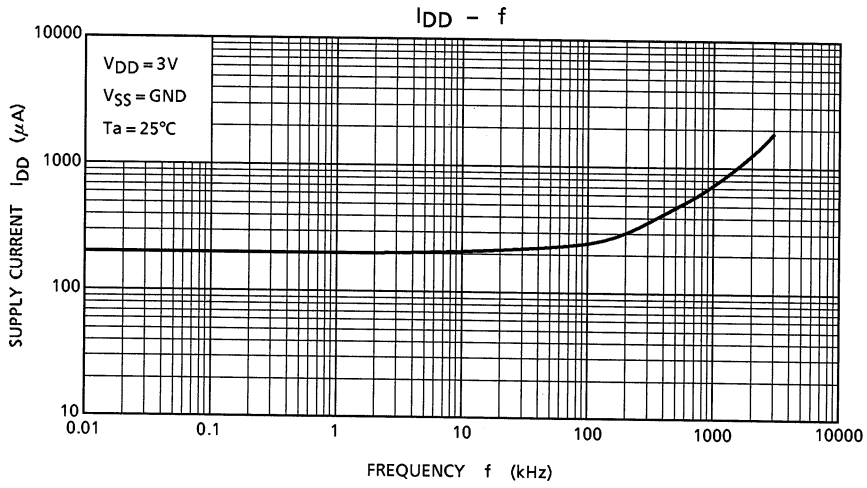
Electrical Characteristics (V_{DD} = 5V, V_{SS} = GND, Ta = 25°C)

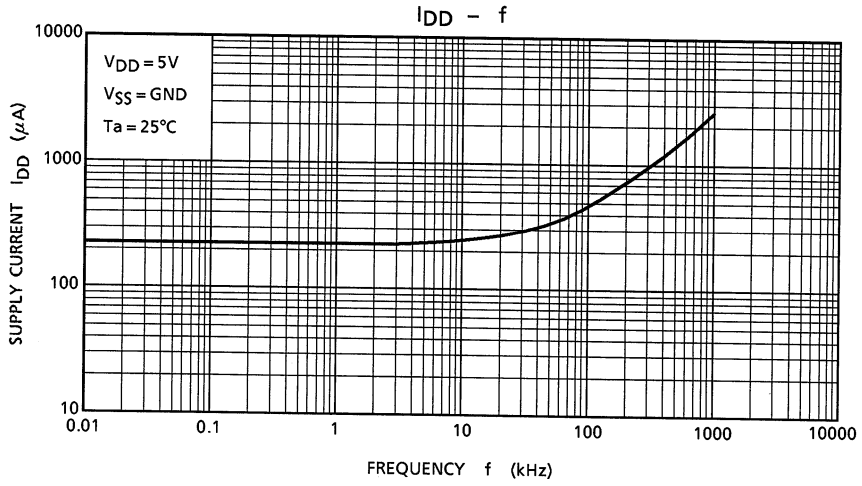
Characteristic	Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Input offset voltage	V_{IO}	—	—	—	±1	±7	mV
Input offset current	I_{IO}	—	—	—	1	—	pA
Input bias current	I_I	—	—	—	1	—	pA
Common mode input voltage	CMV_{IN}	—	—	0	—	4.1	V
Supply current	I_{DD} (Note)	—	—	—	220	440	μA
Voltage gain	G_V	—	—	—	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	—	

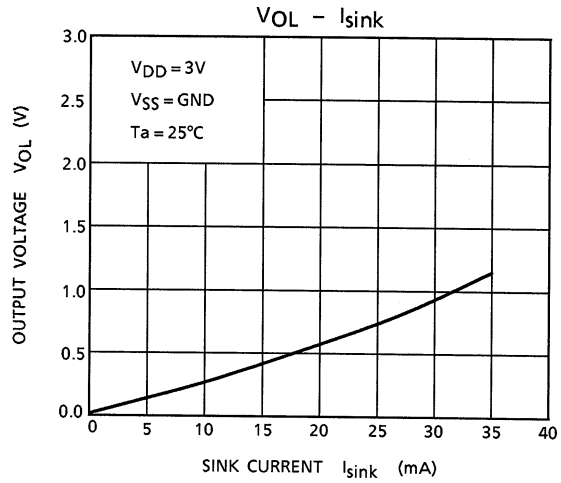
Electrical Characteristics (V_{DD} = 3V, V_{SS} = GND, Ta = 25°C)

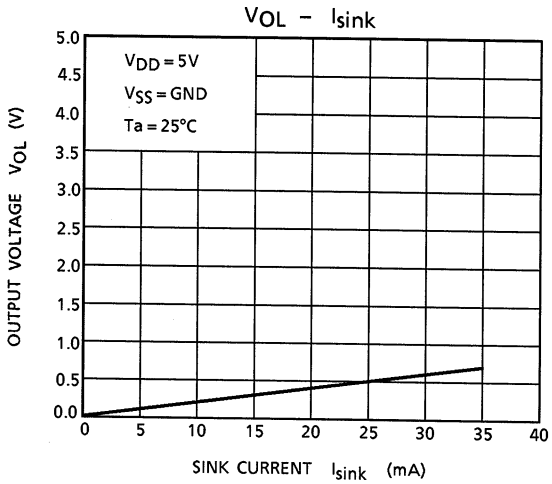
Characteristic	Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Input offset voltage	V_{IO}	—	—	—	±1	±7	mV
Input offset current	I_{IO}	—	—	—	1	—	pA
Input bias current	I_I	—	—	—	1	—	pA
Common mode input voltage	CMV_{IN}	—	—	0	—	2.1	V
Supply current	I_{DD} (Note)	—	—	—	200	400	μA
Sink current	I_{sink}	—	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	—	

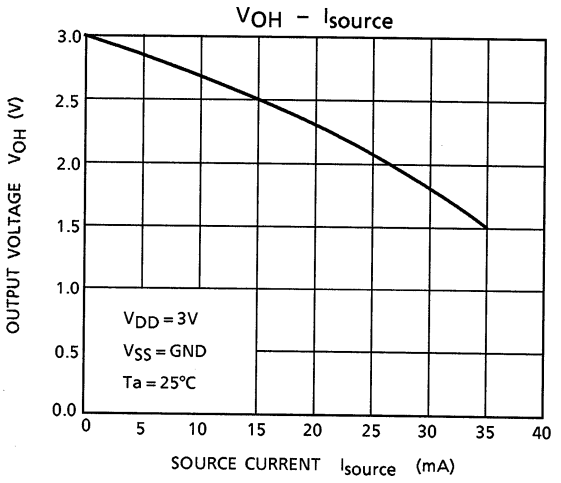
Note: Since this product causes an increase in current consumption with a rise in operational frequency, make sure that power consumption does not exceed the allowable dissipation.

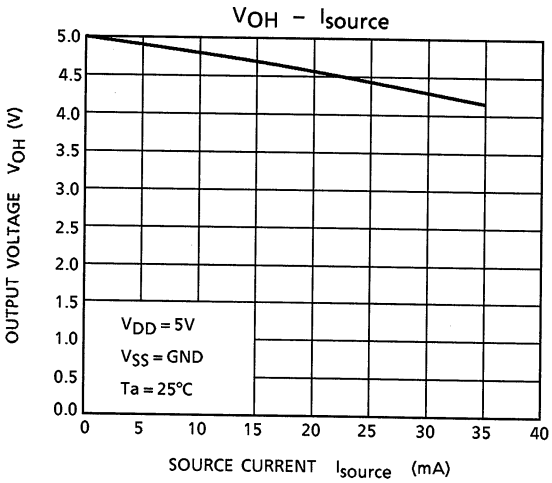

I_{DD} – f
V_{DD} = 3V
V_{SS} = GND
Ta = 25°C
SUPPLY CURRENT I_{DD} (μA)
10000
1000
100
10
0.01
0.1
1
10
100
1000
10000
FREQUENCY f (kHz)


I_{DD} – f
V_{DD} = 5V
V_{SS} = GND
Ta = 25°C
SUPPLY CURRENT I_{DD} (μA)
10000
1000
100
10
0.01
0.1
1
10
100
1000
10000
FREQUENCY f (kHz)


VOL – Isink
VDD = 3V
VSS = GND
Ta = 25°C
OUTPUT VOLTAGE VOL (V)
SINK CURRENT Isink (mA)
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0 5 10 15 20 25 30 35 40

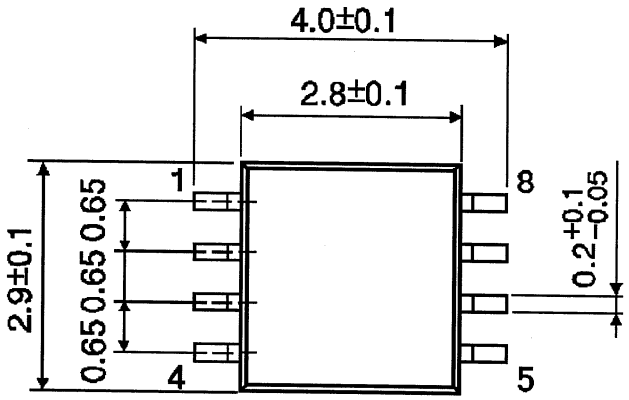

VOL – Isink
VDD = 5V
VSS = GND
Ta = 25°C
OUTPUT VOLTAGE VOL (V)
SINK CURRENT Isink (mA)
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0 5 10 15 20 25 30 35 40

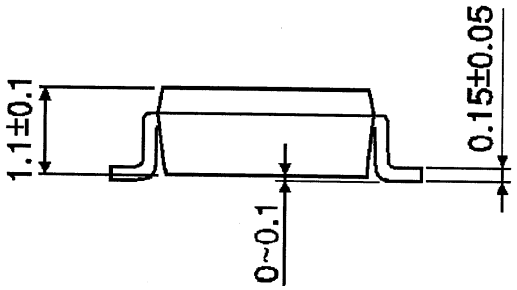

VOH – Isource
VDD = 3V
VSS = GND
Ta = 25°C
OUTPUT VOLTAGE VOH (V)
SOURCE CURRENT Isource (mA)
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0 5 10 15 20 25 30 35 40


VOH – Isource
VDD = 5V
VSS = GND
Ta = 25°C
OUTPUT VOLTAGE VOH (V)
SOURCE CURRENT Isource (mA)
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0 5 10 15 20 25 30 35 40

Package Dimensions

SSOP8-P-0.65 Unit: mm

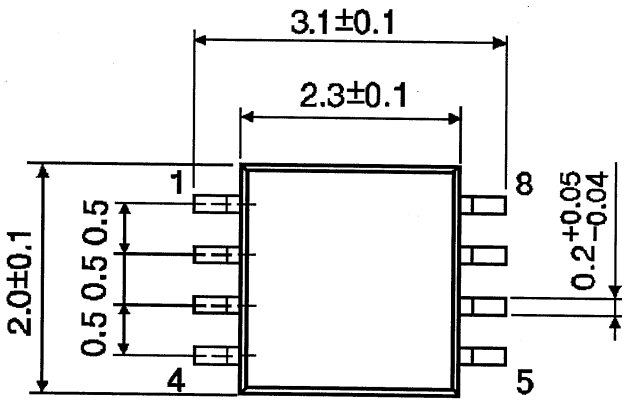


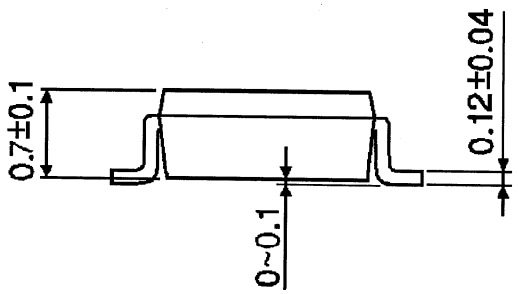


Weight: 0.021g(typ.)

Package Dimensions

SSOP8-P-0.50A Unit: mm





Weight: 0.01g(typ.)

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