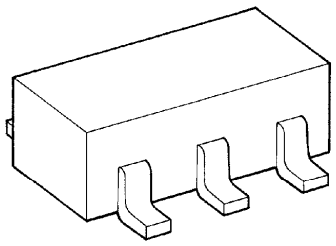
TOSHIBA CMOS LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

TC75S58F, TC75S58FU

SINGLE COMPARATOR

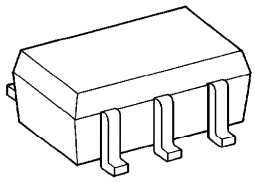
TC75S58F, TC75S58FU are CMOS type general-purpose single comparator capable of single power supply operation and using lower supply currents than the conventional bipolar comparators. Its open drain output forms wired OR with other open drain outputs.

TC75S58F



SSOP5-P-0.95

TC75S58FU



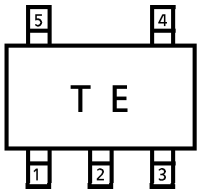
SSOP5-P-0.65A

Weight
SSOP5-P-0.95 : 0.014g (Typ.)
SSOP5-P-0.65A : 0.006g (Typ.)

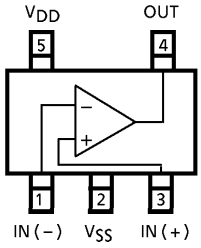
FEATURES

- Low supply current : $I_{DD} = 10\mu A$ (Typ.)
- Single power supply operation
- Wide common mode input voltage range : $V_{SS} \sim V_{DD} - 0.9V$
- Open drain output circuit
- Low input bias current
- Small package

MARKING (TOP VIEW)



PIN CONNECTION (TOP VIEW)



961001EBA1

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
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_O	±35	mA
Power Dissipation	P_D	200	mW
Operating Temperature	T_{opr}	−40~85	°C
Storage Temperature	T_{stg}	−55~125	°C

(Note) Since this product sometimes brings about latchup, 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.

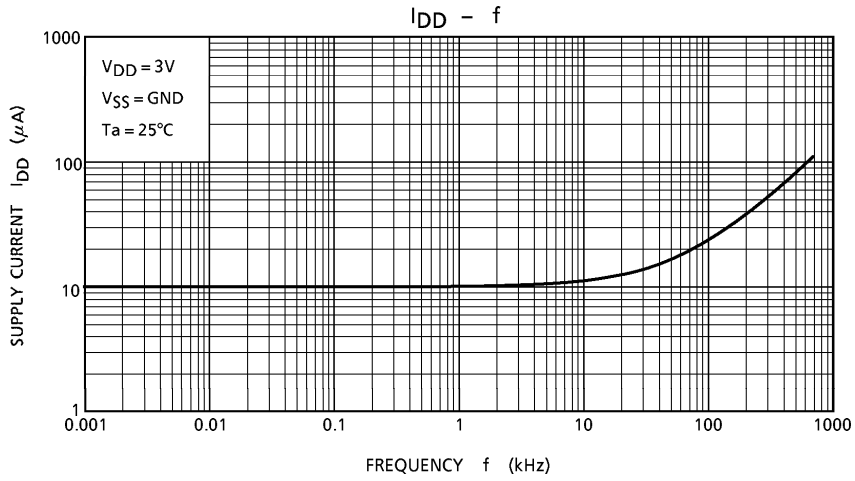
ELECTRICAL CHARACTERISTICS (V_{DD} = 5V, V_{SS} = GND, Ta = 25°C)

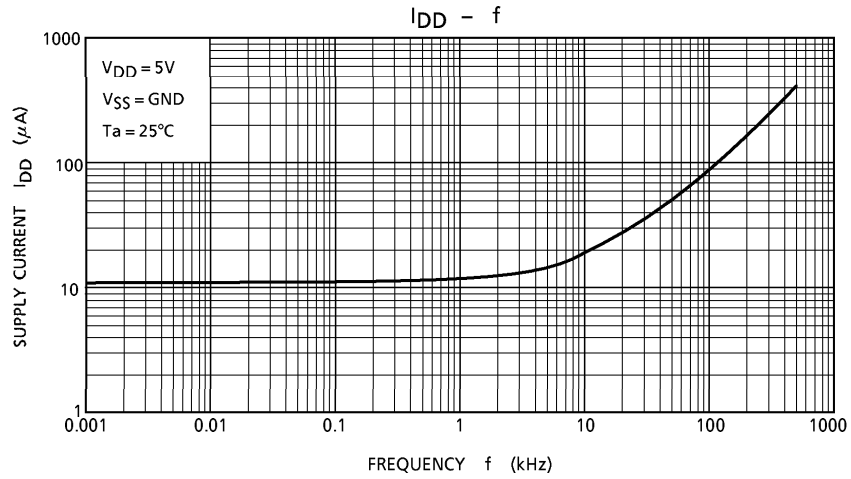
CHARACTERISTIC	SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Input Offset Voltage	V_{IO}	—	—	—	±1	±7	mV
Input Offset Current	I_{IO}	—	—	—	1	—	pA
Input Bias Current	I_I	—	—	—	1	—	pA
Common Mode Input Voltage	CMV_{IN}	—	—	0	—	4.1	V
Supply Current	I_{DD} (Note)	—	—	—	11	22	μA
Voltage Gain	G_V	—	—	—	94	—	dB
Sink Current	I_{sink}	—	V_{OL} = 0.5V	13	25	—	mA
Output Leak Current	I_{LEAK}	—	V_O = 5V	—	5	—	nA
Output Voltage	V_{OL}	—	I_{sink} = 5.0mA	—	0.1	0.3	V
Operating Supply Voltage	V_{DD}	—	—	1.8	—	7.0	V
Propagation Delay Time (Turn ON)	t_{PLH} (1)	—	Over drive = 100mV	—	800	—	ns
	t_{PLH} (2)	—	TTL step input	—	620	—	
Propagation Delay Time (Turn OFF)	t_{PHL} (1)	—	Over drive = 100mV	—	230	—	ns
	t_{PHL} (2)	—	TTL step input	—	350	—	
Response Time	t_{TLH}	—	Over drive = 100mV	—	190	—	ns
	t_{THL}	—	Over drive = 100mV	—	6	—	

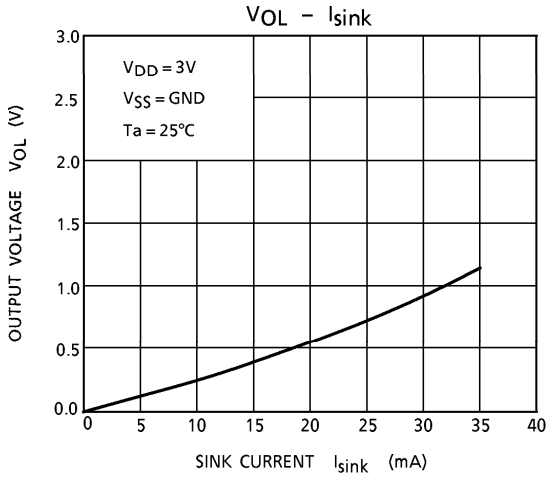
ELECTRICAL CHARACTERISTICS (V_{DD} = 3V, V_{SS} = GND, Ta = 25°C)

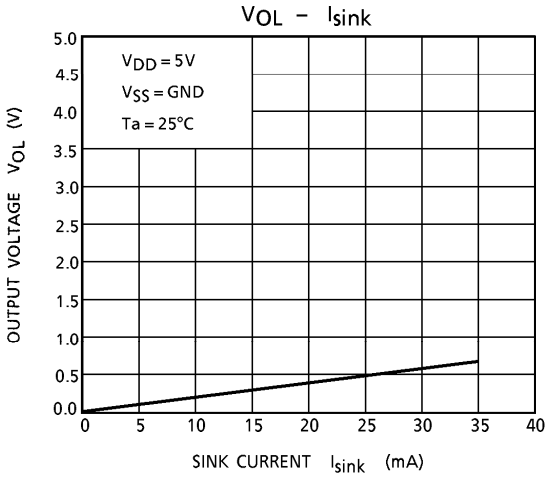
CHARACTERISTIC	SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Input Offset Voltage	V_{IO}	—	—	—	±1	±7	mV
Input Offset Current	I_{IO}	—	—	—	1	—	pA
Input Bias Current	I_I	—	—	—	1	—	pA
Common Mode Input Voltage	CMV_{IN}	—	—	0	—	2.1	V
Supply Current	I_{DD} (Note)	—	—	—	10	20	μA
Sink Current	I_{sink}	—	V_{OL} = 0.5V	6	18	—	mA
Output Leak Current	I_{LEAK}	—	V_O = 3V	—	5	—	nA
Output Voltage	V_{OL}	—	I_{sink} = 5.0mA	—	0.15	0.35	V
Propagation Delay Time (Turn ON)	t_{PLH}	—	Over drive = 100mV	—	590	—	ns
Propagation Delay Time (Turn OFF)	t_{PHL}	—	Over drive = 100mV	—	230	—	ns
Response Time	t_{TLH}	—	Over drive = 100mV	—	170	—	ns
	t_{THL}	—	Over drive = 100mV	—	5	—	

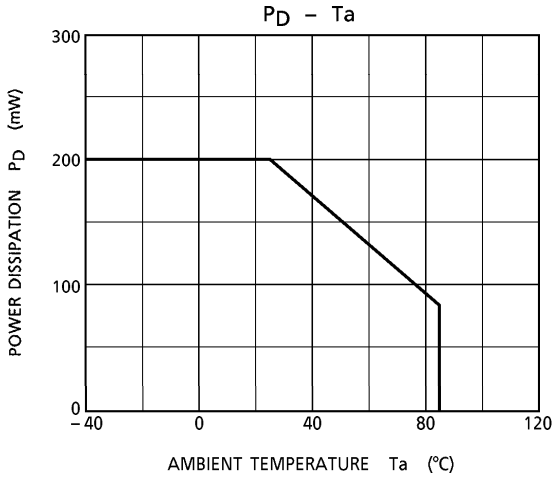
(Note) Since this product causes an increase in current consumption with a rise in operational frequency, make sure that power consumption does not exceed the allowable dissipation.


I_{DD} – f
V_{DD} = 3V
V_{SS} = GND
Ta = 25°C
SUPPLY CURRENT I_{DD} (μA)
1000
100
10
1
0.001
0.01
0.1
1
10
100
1000
FREQUENCY f (kHz)


I_{DD} – f
V_{DD} = 5V
V_{SS} = GND
Ta = 25°C
SUPPLY CURRENT I_{DD} (μA)
1000
100
10
1
0.001
0.01
0.1
1
10
100
1000
FREQUENCY f (kHz)


V_{OL} – I_{sink}
V_{DD} = 3V
V_{SS} = GND
Ta = 25°C
OUTPUT VOLTAGE V_{OL} (V)
SINK CURRENT I_{sink} (mA)
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0
5
10
15
20
25
30
35
40

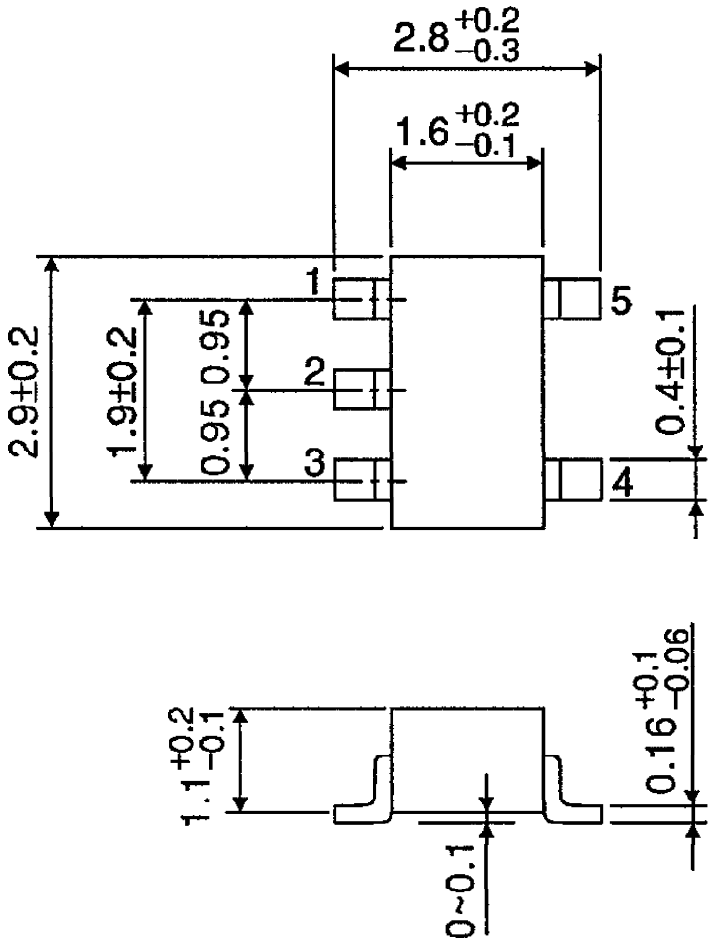

V_{OL} – I_{sink}
V_{DD} = 5V
V_{SS} = GND
Ta = 25°C
OUTPUT VOLTAGE V_{OL} (V)
SINK CURRENT I_{sink} (mA)
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0
5
10
15
20
25
30
35
40


P_D – Ta
POWER DISSIPATION P_D (mW)
AMBIENT TEMPERATURE Ta (°C)
300
200
100
0
– 40
0
40
80
120

OUTLINE DRAWING

SSOP5-P-0.95

Unit : mm

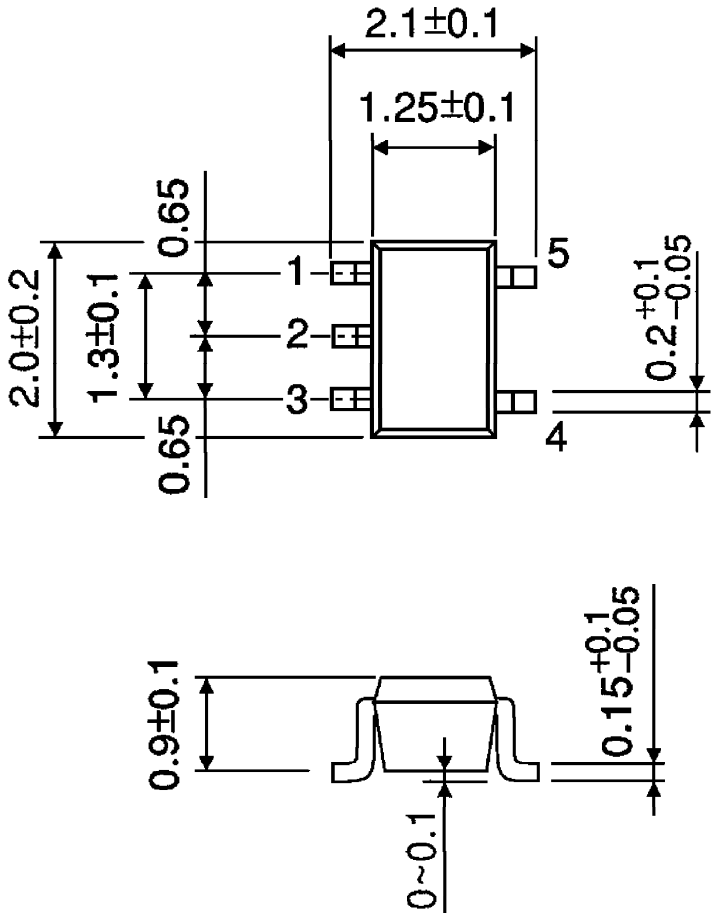


Weight : 0.014g (Typ.)

OUTLINE DRAWING

SSOP5-P-0.65A

Unit : mm



Weight : 0.006g (Typ.)