

# TC75S58AFE, TC75S58AFC

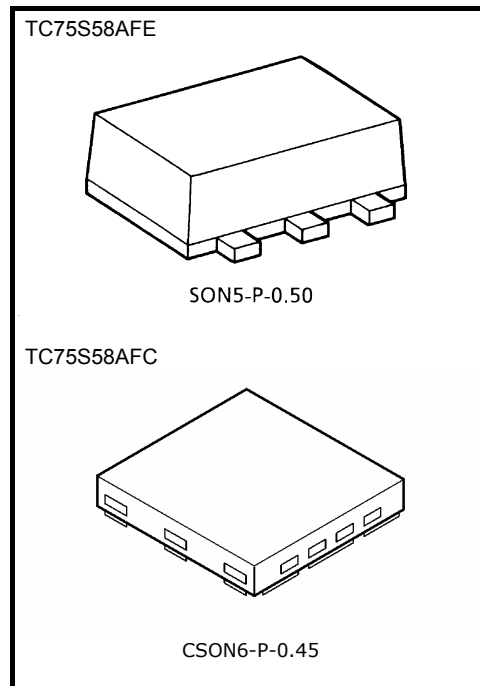
## Single Comparator (Open-Drain Output)

The TC75S58AFE and TC75S58AFC are CMOS general-purpose single comparators. The devices can operate from a single supply voltage and are designed for a lower supply-current than conventional general-purpose bipolar comparators. The output is designed for Open-Drain Output and can supply a higher voltage than the power supply. Therefore, it is possible to pull-up the voltage to a level higher than that of the power supply. The Open-Drain Output can be wired-OR with another Open-Drain Output circuit.

\* Output voltage should not exceed the maximum rating

### Feature

- Low Supply Current:  $I_{DD} = 10 \mu A$  (Typ.)
- Single Power Supply Operation
- Wide Common Mode Input:  $V_{SS} \sim V_{DD} - 0.9 V$
- Open-Drain Output Circuit
- Low Input Bias Current
- Small Package



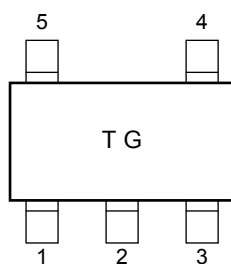
Weight

SON5-P-0.50 : 0.003 g (Typ.)

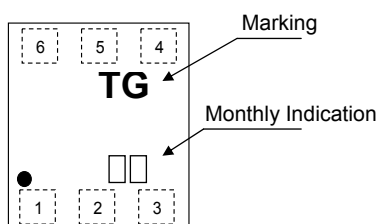
CSON6-P-0.45 : 0.002 g (Typ.)

### Marking (top view)

TC75S58AFE

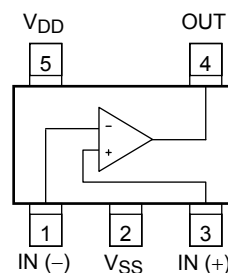


TC75S58AFC

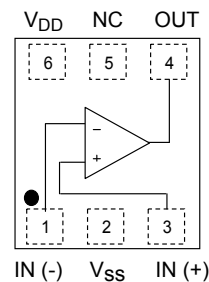


### Pin Assignment (top view)

TC75S58AFE



TC75S58AFC



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

Characteristics	Symbol	Rating		Unit
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> ~V <sub>DD</sub>		V
Output Current	I <sub>O</sub>	±35		mA
Output Voltage	V <sub>O</sub>	V <sub>SS</sub> ~ V <sub>SS</sub> + 7		V
Power Dissipation	P <sub>D</sub>	TC75S58AFE	100	mW
		TC75S58AFC	100 (Note1)	
Operating Temperature	T <sub>opr</sub>	-40~85		°C
Storage Temperature	T <sub>stg</sub>	-55~125		°C

Note: Due to the CMOS structure, this device may be susceptible to latch-up . To prevent latch-up, please take the following precautions;

- Ensure that no I/O pin's voltage level ever exceeds V<sub>dd</sub> or drops below V<sub>ss</sub>. In addition, check the power-on timing.
- Do not subject the device to excessive noise.

(Note 1) : FR4 in board implementation

(25.4mm × 25.4mm × 1.6t, Cu Pad: 0.4mm<sup>2</sup>)

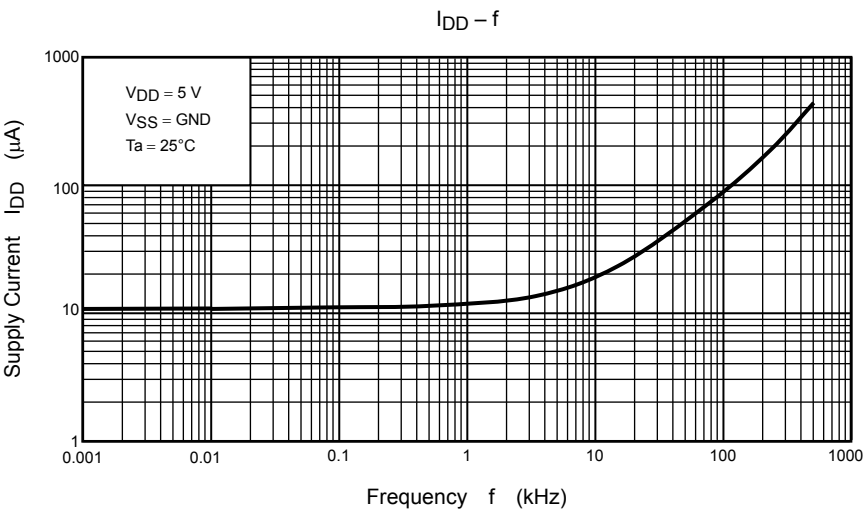
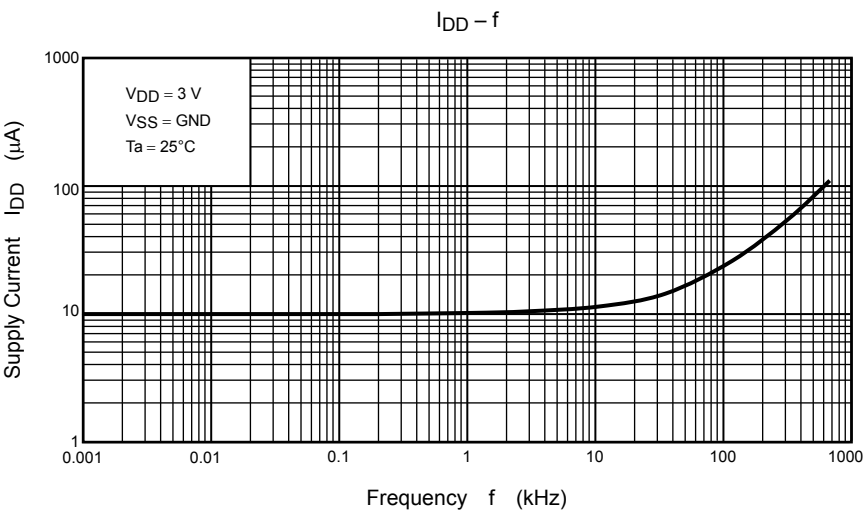
Electrical Characteristics ( $V_{DD} = 5\text{ V}$ ,  $V_{SS} = \text{GND}$ ,  $T_a = 25^\circ\text{C}$ )

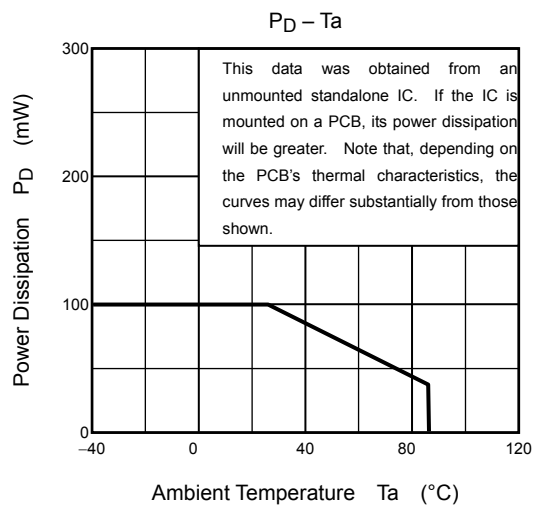
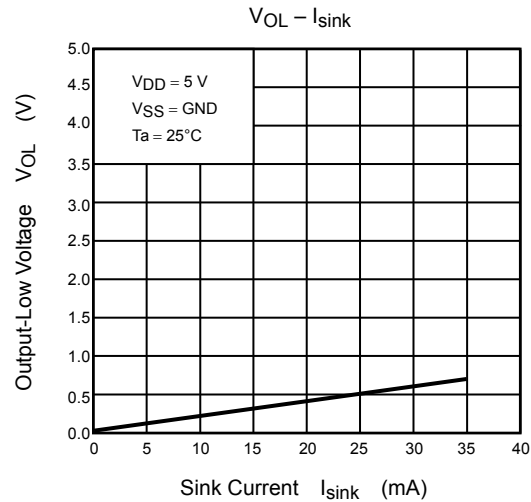
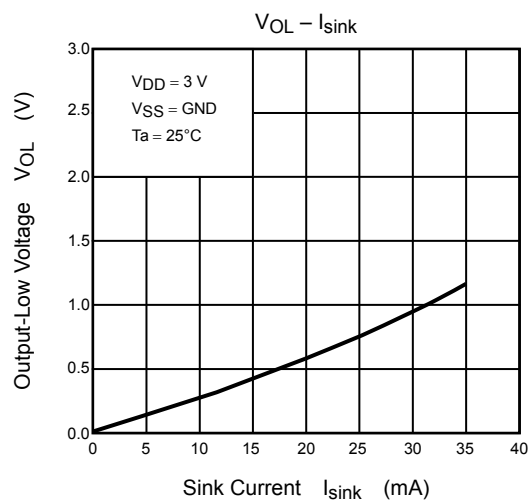
Characteristics	Symbol	Test Circuit	Test Condition	Min.	Typ.	Max.	Unit
Input Offset Voltage	$V_{IO}$	—	—	—	$\pm 1$	$\pm 7$	mV
Input Offset Current	$I_{IO}$	—	—	—	1	—	pA
Input Bias Current	$I_I$	—	—	—	1	—	pA
Common Mode Input Voltage	$CMV_{IN}$	—	—	0	—	4.1	V
Supply Current	$I_{DD}$ (注)	—	—	—	11	22	$\mu\text{A}$
Voltage Gain	$G_V$	—	—	—	94	—	dB
Sink Current	$I_{sink}$	—	$V_{OL} = 0.5\text{ V}$	13	25	—	mA
Output Leakage Current	$I_{LEAK}$	—	$V_{DD} = 5\text{ V}$ , $V_O = 5\text{ V}$	—	5	—	nA
Off-State Leakage Current	$I_{OFF}$	—	$V_{DD} = 0\text{ V}$ , $V_O = 5\text{ V}$	—	5	—	nA
Output-Low Voltage	$V_{OL}$	—	$I_{sink} = 5.0\text{ mA}$	—	0.1	0.3	V
Operating Supply Voltage Range	$V_{DD}$	—	—	1.8	—	7.0	V
Propagation Delay (Turn On)	$t_{PLH}$ (1)	—	Over Drive = 100 mV	—	800	—	ns
	$t_{PLH}$ (2)	—	TTL Step Input	—	620	—	
Propagation Delay (Turn Off)	$t_{PHL}$ (1)	—	Over Drive = 100 mV	—	230	—	ns
	$t_{PHL}$ (2)	—	TTL Step Input	—	350	—	
Response Time	$t_{TLH}$	—	Over Drive = 100 mV	—	190	—	ns
	$t_{THL}$	—	Over Drive = 100 mV	—	6	—	

Electrical Characteristics ( $V_{DD} = 3\text{ V}$ ,  $V_{SS} = \text{GND}$ ,  $T_a = 25^\circ\text{C}$ )

Characteristics	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)	—	—	—	10	20	$\mu\text{A}$
Sink Current	$I_{sink}$	—	$V_{OL} = 0.5\text{ V}$	6	18	—	mA
Output Leakage Current	$I_{LEAK}$	—	$V_{DD} = 3\text{ V}$ , $V_O = 3\text{ V}$	—	5	—	nA
Off-State Leakage Current	$I_{OFF}$	—	$V_{DD} = 0\text{ V}$ , $V_O = 3\text{ V}$	—	5	—	nA
Output-Low Voltage	$V_{OL}$	—	$I_{sink} = 5.0\text{ mA}$	—	0.15	0.35	V
Propagation Delay (Turn On)	$t_{PLH}$	—	Over Drive = 100 mV	—	590	—	ns
Propagation Delay (Turn Off)	$t_{PHL}$	—	Over Drive = 100 mV	—	230	—	ns
Response Time	$t_{TLH}$	—	Over Drive = 100 mV	—	170	—	ns
	$t_{THL}$	—	Over Drive = 100 mV	—	5	—	

Note: The current consumption of this device increases as its operating frequency increases. Note that the power dissipation should not exceed the allowable power.

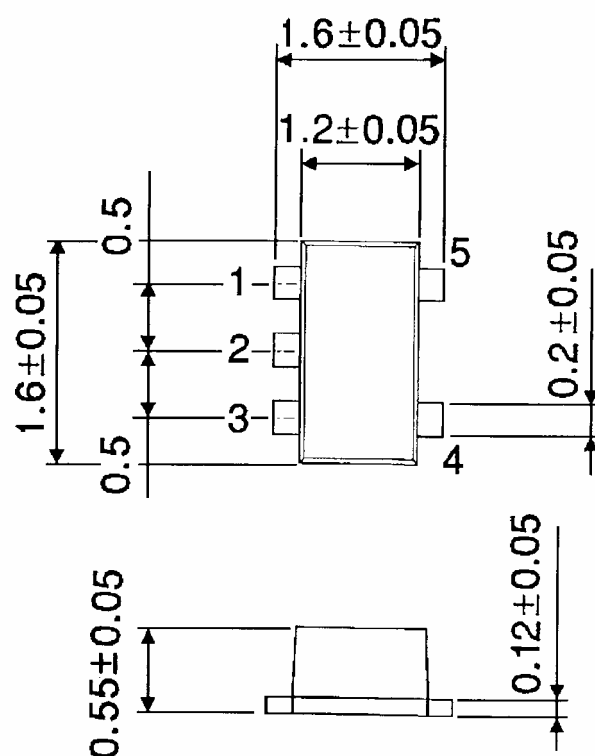




## Package Dimension

SON5-P-0.50

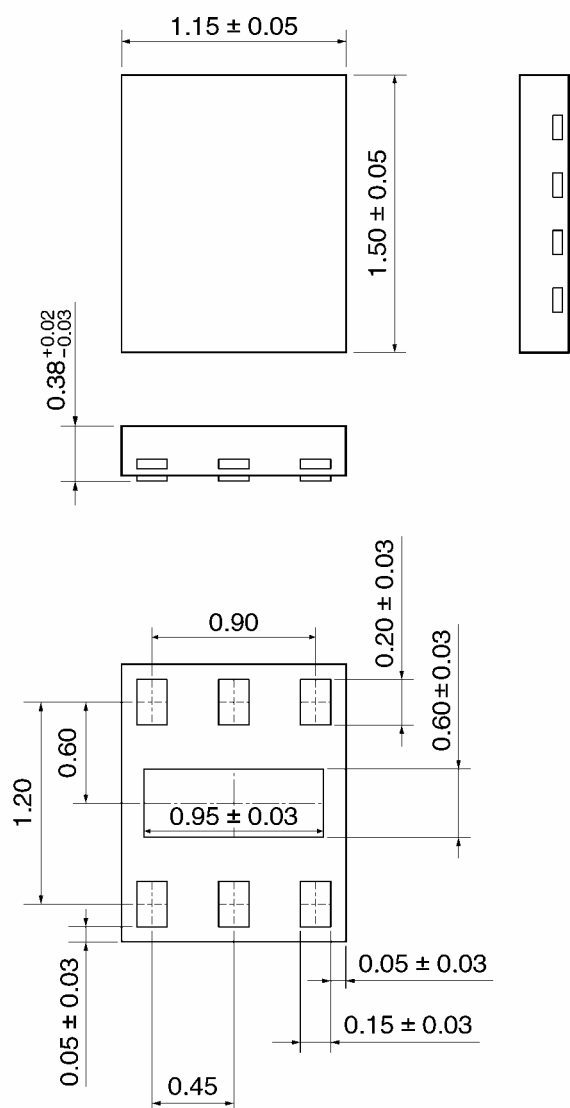
Unit : mm



Weight: 0.003 g (Typ.)

## CSON6-P-0.45

Unit: mm



Weight: 0.002 g (Typ.)

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