LOW POWER SINGLE VOLTAGE COMPARATOR

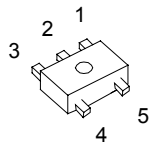
DESCRIPTION

The UTC TS391/A consist of a low power voltage comparator designed specifically to operate from a single supply over a wide range of voltages. Operation from split power supplies is also possible.

This comparator also a unique characteristic in that the input common-mode voltage range includes ground even though operated from a single power supply voltage.

FEATURES

*Wide single supply voltage range or dual supplies +2V to +34V or ±1V to ±18V
*Very low supply current (0.2mA) independent of supply voltage (1 mW /comparator at +5V)
*Low input bias current: 25nA typ.
*Low input offset current: ±5nA typ.
*Low input offset voltage: ±1mV typ
*Input common-mode voltage range includes ground.
*Low output saturation voltage: 250mV typ.(Io=4mA).
*Differential input voltage range equal to the supply voltage.



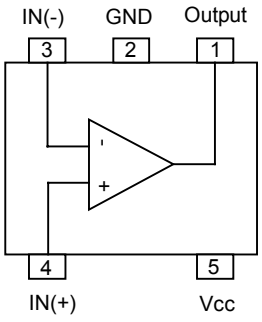
SOT-25

MARKING

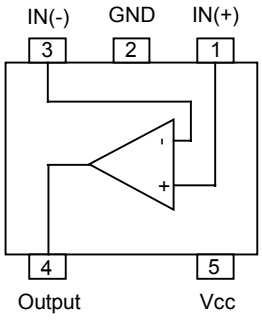
Part Number	Marking
TS391	S1
TS391A	SA

PIN CONNECTIONS (top view)

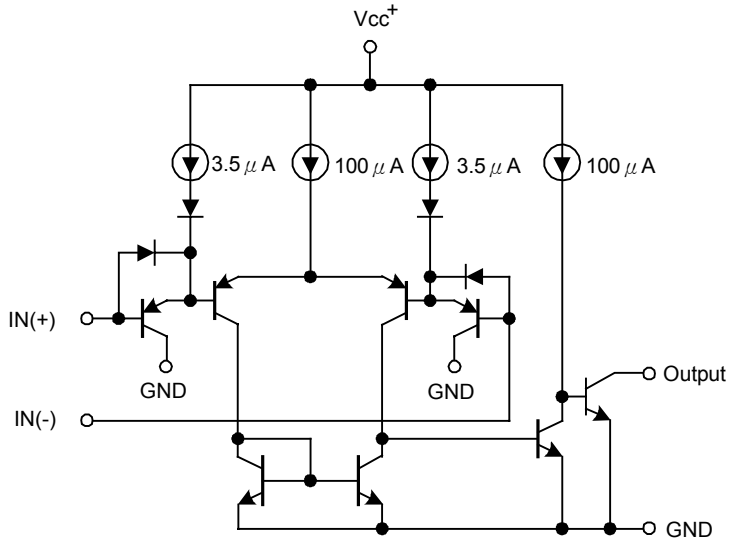
TS391



TS391A



BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	RATING	UNIT
Supply Voltage	Vcc	±18 or 36	V
Differential Input Voltage	Vid	±36	V
Input Voltage	Vi	-0.3 ~ +36	V
Output Short-circuit to Ground [1]		Infinite	
Power Dissipation [2]	Pd	500	mW
Operating Free Air Temperature Range	Topr	-40 ~ +125	℃
Storage Temperature Range	Tstg	-65 ~ +150	℃

1. Short-circuit from the output to Vcc can cause excessive heating and eventual destruction.The maximum output current is approwimately 20mA,independent of the magnitude of Vcc.
2. Tj=150℃, Tamb=25℃ with Rthja=250℃/W for SOT25 Package.

ELECTRICAL CHARACTERISTICS

Vcc=5.0V, All voltage referenced to GND ,Tamb=25°C(unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNITS
Input Offset Voltage [1]	Vio	Tamb=+25℃ Tmin.≤Tamb≤Tmax.		1	5 9	mV
Input Bias Current [2]	Iib	Tamb=+25℃ Tmin.≤Tamb≤Tmax.		25	250 400	nA
Input Offset Current	Iio	Tamb=+25℃ Tmin.≤Tamb≤Tmax.		5	50 150	nA
Large Signal Voltage Gain	Gv	Vcc=15V,R_L=15k,Vo=1 to 11V	50	200		V/mV
Supply Current	Icc	Vcc=5V,no load Vcc=30V,no load		0.2 0.5	0.5 1.25	mA
Input Common Mode Voltage Range [3]	Vicm	Tamb=+25℃ Tmin.≤Tamb≤Tmax.	0 0		Vcc -1.5 Vcc -2	mV
Differential Input Voltage [4]	Vid				Vcc	mV
Output sink current	Isink	Vid=-1V,Vo=1.5V	6	16		mA
Low Level Output Voltage	V_{OL}	Vid=1V,Vcc=Vo=30V Tamb=+25℃ Tmin.≤Tamb≤Tmax.		250	400 700	mV
High Level Output Current	I_{OH}	Vid=1V,Vcc=Vo=30V Tamb=+25℃ Tmin.≤Tamb≤Tmax.		0.1	 1	nA μA
Response Time	tre	R_L=5.1kΩ to Vcc [5]		1.3		μs
Large Signal Response Time	t_{rel}	Vi=TTL,Vref=+1.4V,R_L=5.1kΩ to Vcc		300		ns

1.At output switch point, Vo=1.4V,Rs=0Ω with Vcc from 5V to 30V and over the full input common-mode range(0V to Vcc 1.5V).

2.The direction of the input current is out of the IC due to the PN P input stage. This current is essentially constant, independent of the state of the output, so no loading charge exists on the reference or input lines.

3.The input common-mode voltage of either input signal voltage should not be allowed to go negative by more than 0.3V.The upper end of the common-mode voltage range is Vcc+ -1.5V,but either or both inputs can go to +30V without damage.

4.Positive excursions of input voltage may exceed the power supply level. As long as the other voltage remains within the common-mode range the comparator will provide a proper output state.
The low input voltage state must not be less than –0.3V(or 0.3V below the negative power supply, if used).

5.The response time specified is for a 100mV input step with 5mV overdrive. For larger overdrive signals 300ns can be obtained.

TYPICAL PERFORMANCE CHARACTERISTICS