

Features

- Wide single-supply range 2V~36V
- Split-supply range $\pm 1V$ to $\pm 18V$
- Low input bias current 25nA
- Open-Drain Output for Maximum Flexibility
- TTL, DTL, ECL, CMOS compatible outputs
- package: SOT23-5

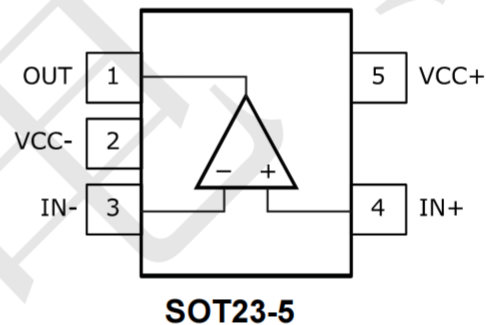
Applications

- Alarm and Monitoring Circuits
- Hysteresis Comparators
- Oscillators
- Window Comparators
- Industrial Equipment
- Test and Measurement

General Description

The is singleprecision voltage comparators capable of single-supplyor split-supply operation. The specific ations as low as 2.0 mV make this device an excellentground level with single-supply operation. Input offset-v oltag selection for many applications in consumer automotive, and It is designed to permit a common mode r ange-to-industrial electronics.

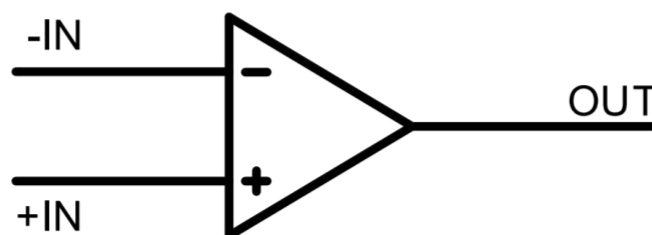
Pinout (top view)



Pin Configurations

Pin Number	Pin Name	Pin Function
1	OUT	Channel Output
2	VCC-	Chip Supply Voltage(Negative)/GND
3	IN-	Channel Inverting Input
4	IN+	Channel Non-inverting Input
5	VCC+	Chip Supply Voltage(Positive)

SIMPLIFIED SCHEMATIC



Simplified Schematic

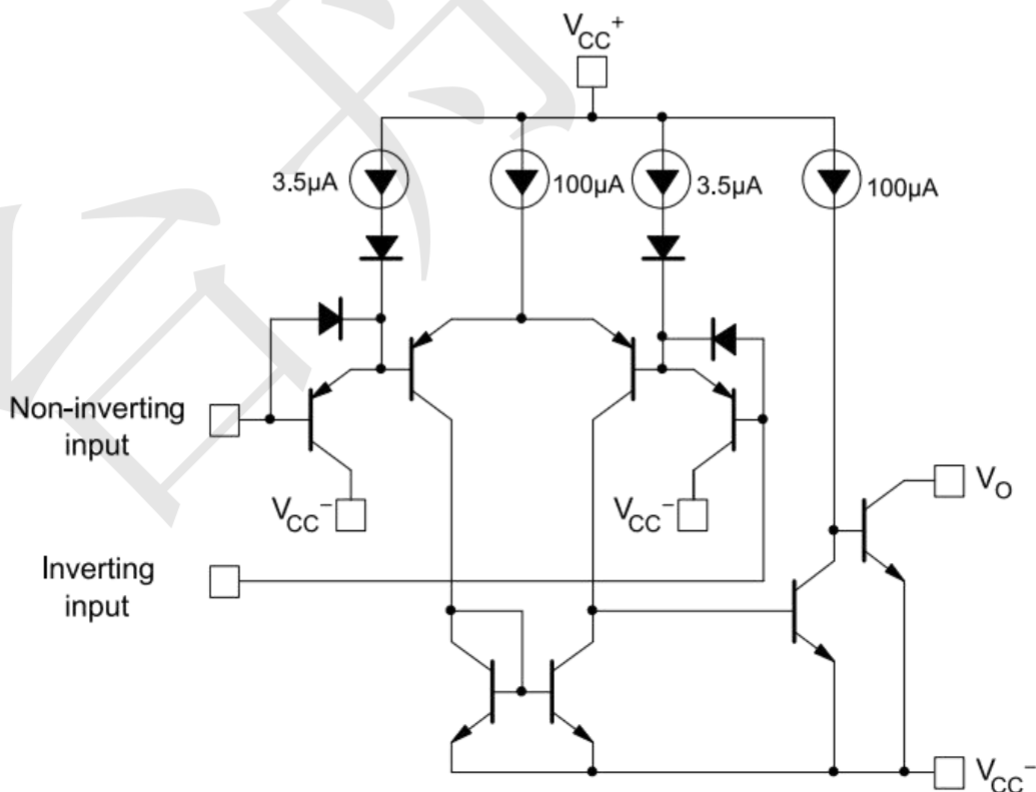
Absolute Maximum Ratings

		Value	UNIT
V _{CC}	Supply, V _s =(V ₊) - (V ₋)	±18 or 36	V
V _{IN}	Input pin (IN ₊ , IN ₋)	- 0.3 to V _{CC}	V
V _{OUT}	Signal output pin (2)	36	V
I _{IN}	Signal Input pin (IN ₊ , IN ₋)	10	mA
I _{OUT}	Signal output pin (2)	16	mA
T _{oper}	Operating Range	-40 to +125	°C
T _{stg}	Storage	-65 to +150	°C
T _J	Junction	+150	°C
HBM	ESD Susceptibility	±2000	V
MM		±1000	V

(1) Stresses above these ratings may cause permanent damage. Exposure to absolute maximum conditions for extended periods may degrade device reliability. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those specified is not implied.

(2) Short-circuit from output to V_{CC} can cause excessive heating and eventual destruction.

Schematic diagram



Electrical Characteristics (V_{CC} = 5.0V)

(At T_A = 25°C, unless otherwise noted.)

PARAMETER	SYMBOL	TEST Conditions	MIN	TYP	MAX	UNIT
POWER SUPPLY						
Operating Voltage Range	V _{CC}	Wide single-supply range	2.0	--	36	V
		Split-supply range	±1V	--	±18V	V
Supply Current	I _{CC}	R _L = ∞, V _{CC} = 5V	--	0.4	1.0	mA
		R _L = ∞, V _{CC} = 36V	--	1.0	2.5	mA
INPUT						
Input Offset Voltage	V _{OS}		--	2	5	mV
Input Offset Voltage Tempco	ΔV _{OS} /ΔT		--	1	--	μV/°C
Input Bias Current	I _B		--	--	50	nA
Input Offset Current	I _{OS}		--	--	250	nA
Common-Mode Voltage Range	V _{CM}	V _{CC} = 30V	0	--	V _{CC} -1.5	V
OUTPUT						
Output Saturation Voltage		V _{IN(-)} =1V, V _{IN(+)} =0V, I _{SINK} ≤4mA	--	250	--	mV
Output Current(sinking)		V _{IN(-)} =1V, V _{IN(+)} =0V, V _O ≤1.5V	6	16	--	mA
SWITCHING						
Small signal response time	t _{re}	V _{RL} =5V. R _L =5.1KΩ	--	1.3	--	us
Large signal response time	t _{rel}	V _{RL} =5V. R _L =5.1KΩ	--	300	--	ns

Notes:

1. Typical values represent the most likely parametric norm as determined at the time of characterization. Actual typical values may vary over time and will also depend on the application and configuration. The typical values are not tested and are not guaranteed on shipped production material.
2. All limits are guaranteed by testing or statistical analysis.

APPLICATION and IMPLEMENTATION

Application Information

will typically be used to compare a single signal to a reference or two signals against each other. Many users take advantage of the open drain output (logic high with pull-up) to drive the comparison logic output to a logic voltage level to an MCU or logic device.

Typical Application

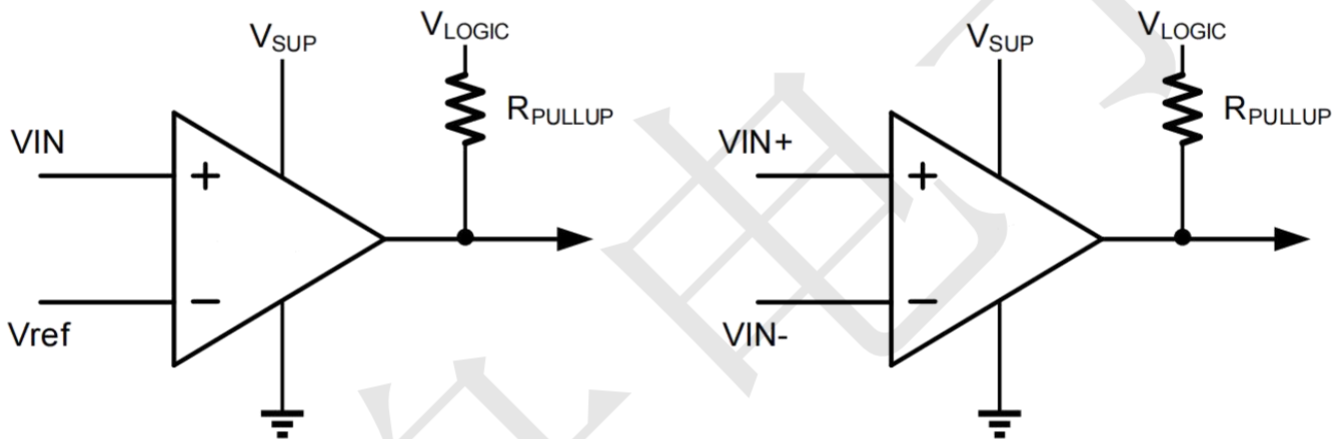


Figure 10. Typical Application Schematic

Power Supply Recommendations

For fast response and comparison applications with noisy or AC inputs, it is recommended to use a bypass capacitor on the supply pin to reject any variation on the supply voltage. This variation causes temporary fluctuations in the comparator's input common mode range and create an inaccurate comparison.

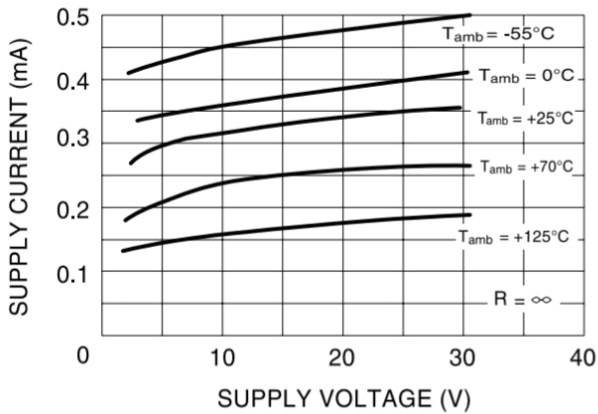
Layout

Layout Guidelines

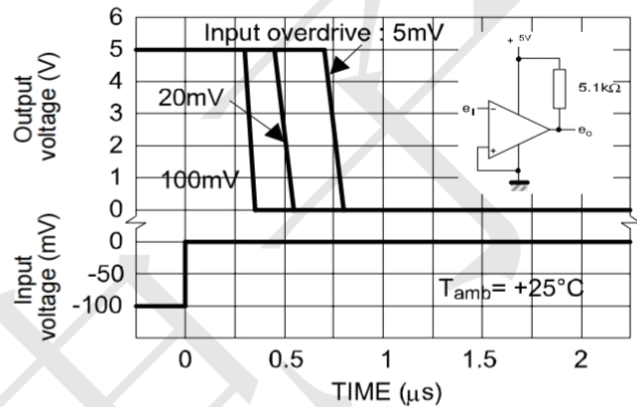
For accurate comparator applications without hysteresis it is important maintain a stable power supply with minimized noise and glitches, which can affect the high-level input common mode voltage range. In order to achieve this, it is best to add a bypass capacitor between the supply voltage and ground. This should be implemented on the positive power supply and negative supply (if available). If a negative supply is not being used, do not put a capacitor between the IC's GND pin and system ground.

Typical Performance Characteristics

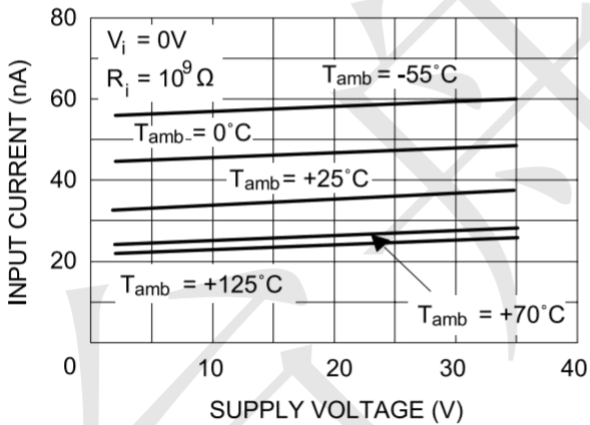
Supply current vs. supply voltage



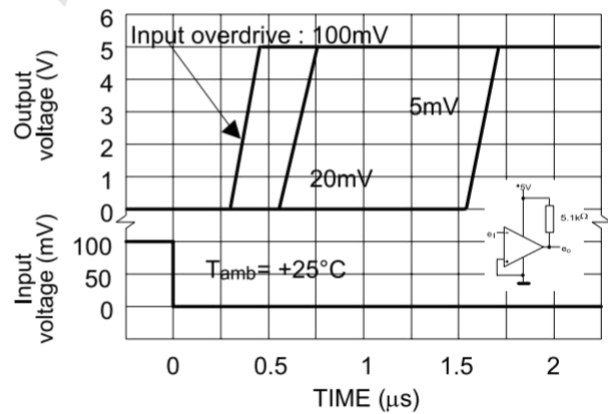
Response time for various input overdrives - negative transition



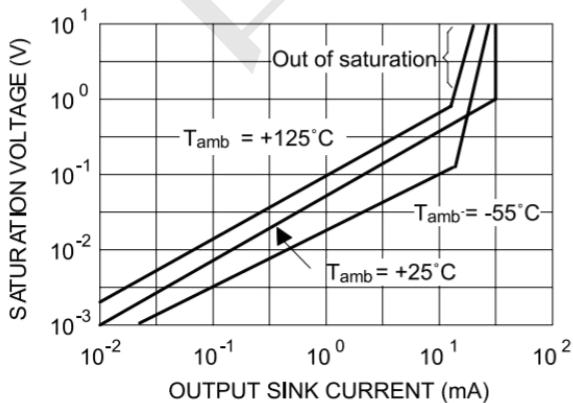
Input current vs. supply voltage



Response time for various input overdrives - positive transition

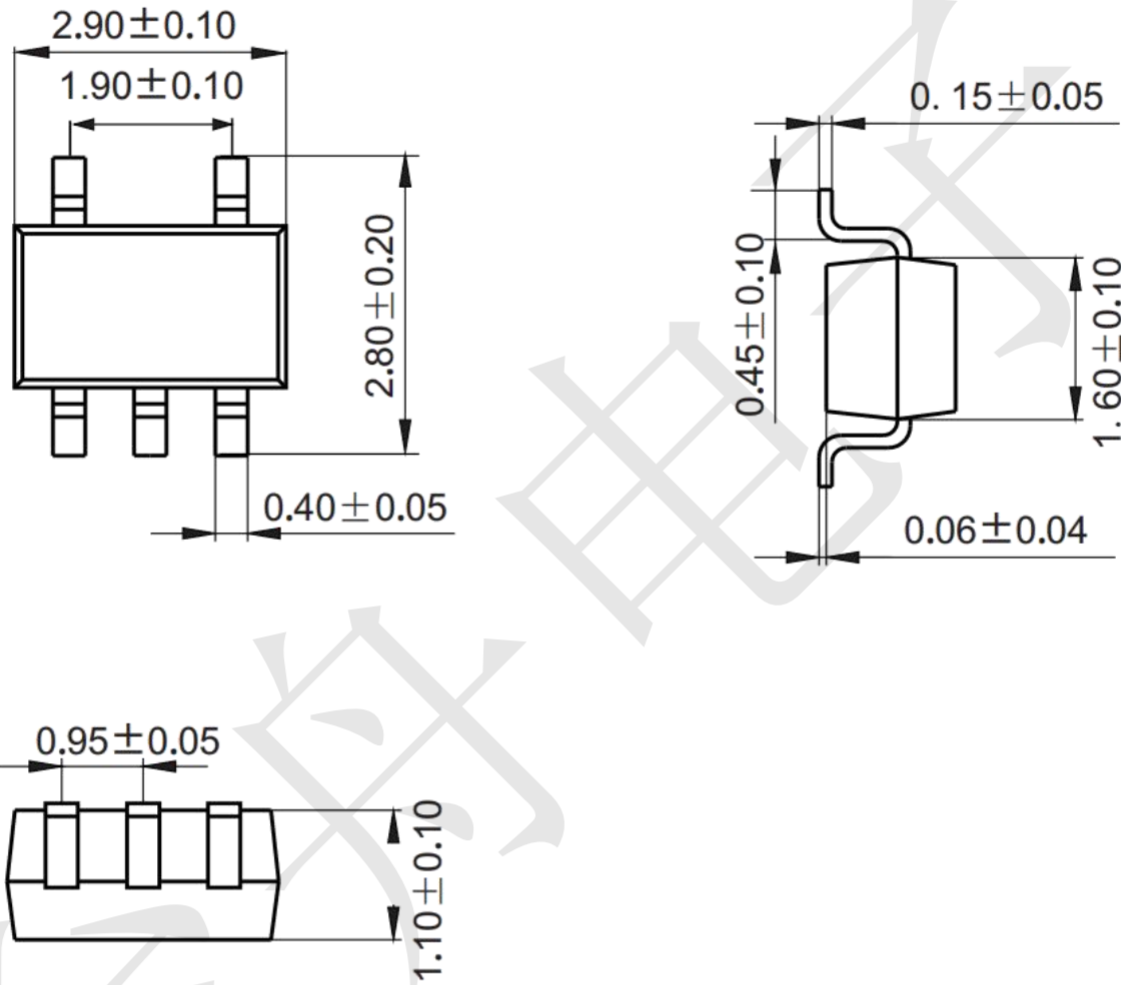


Output saturation voltage vs. output current



Package information (Unit: mm)

SOT23-5



Mounting Pad Layout (Unit: mm)

