

# 3 CHANNEL DIFFERENTIAL AMPLIFIER-COMPARATOR

Phototransistor input version of the standard ET9560

# ET9561

## FEATURES

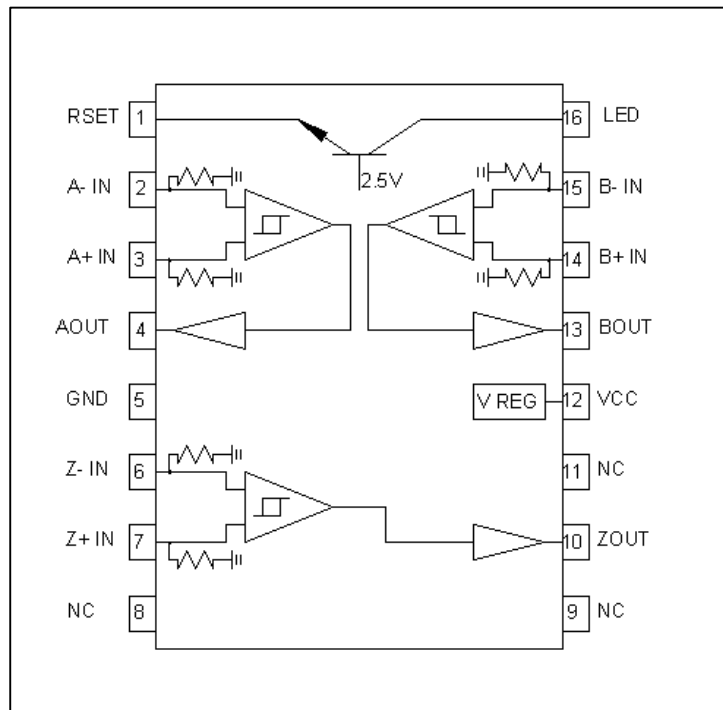
- Supply Voltage Range 4.5V to 30V
- Designed for phototransistor inputs
- Ungated index channel
- Current sink for LED drive (see application note

### APP-D2)

- Outputs short circuit protected
- 25mA peak drive current

## APPLICATIONS

- Optical Encoders
- Industrial Controls



## DESCRIPTION

These devices are specifically designed as receiver circuits for the phototransistor signals available in some optical encoders. Connect the emitters of the phototransistors to the input pins, with the collectors connected to Vcc. The inputs have 330 ohm resistors to terminate the phototransistors in an emitter follower mode. Differential inputs enhance noise rejection and performance over temperature. Care should be taken to use phototransistors on differential input pairs which have similar values of DC leakage current, as large differences in this characterstic will affect waveform symmetry.

## ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Min.	Max.	Units	Ref.
Operating Temperature Range	T <sub>A</sub>	-40	125	°C	Note 1
Supply Voltage Range	V <sub>CC</sub>	4.5	30	V	

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## ELECTRICAL CHARACTERISTICS

Unless otherwise specified, typical values given at  $V_{CC}=12V$ ,  $T_A = 25^{\circ}C$ , with LED and RSET open.

Parameters	Symbol	Min.	Typ.	Max.	Units	Test Conditions
High Level Supply Current	ICCH1	4.0	6.7	11.0	mA	$V_{CC} = 4.5 V$
	ICCH2	4.5	7.5	12.0		$V_{CC} = 30.0V$
Peak Photocurrent Input	IIP	0.3	0.5	15	mA	Note 2
Dark Cell Level	IID	0.0	0.05	7.5	mA	
Photocurrent Contrast Ratio	IR	2:1	-	-		Peak:Dark Cell
Hysteresis at Comparator Inputs	I <sub>H</sub>	6	11	20	mV	
Output High Level Voltage	V <sub>OH</sub>	2.5 28.0	3.0 28.5		V	$I_{OH} = -4mA, V_{CC} = 4.5V$ $I_{OH} = -4mA, V_{CC} = 30V$
Output Low Level Voltage	V <sub>OL</sub>		199	400	mV	$V_{CC} = 4.5V-30V$ $I_{OL} = 8mA$
Output Short-Circuit Current Driving High (All Outputs)	I <sub>OS</sub>	15	25	50	mA	$V_{CC} = 5V, V_{OUT} = 0V$
Output Short-Circuit Current Driving Low (All Outputs)	I <sub>OS</sub>	30	70	120	mA	$V_{CC} = 5V, V_{OUT} = 5V$
RSET Voltage	V <sub>RSET</sub>	1.3	1.7	2.1	V	R = 180 ohms

## AC SWITCHING CHARACTERISTICS

Values given at  $V_{CC} = 5V$ ,  $T_A = 25^{\circ}C$ ,  $C_L = 15pF$  on all outputs.

Parameters	Symbol	Min.	Typ.	Max	Units	Test Conditions
Propagation delay from Comparator Input to Output	T <sub>PD</sub>		850		ns	
Output Rise Time	T <sub>R</sub>		100		ns	
Output Fall Time	T <sub>F</sub>		20		ns	

## NOTES:

1. This is not a test parameter, but for information only.
2. Higher signal levels can be handled by adding resistors from the inputs to ground.

## PACKAGE

Chip Only  
16 Lead SOIC

## SUFFIX

-C  
-SOP

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