

# Low Voltage Comparator

## FAN156



SIP6 1.45x1.0  
 CASE 127EB

### Description

The FAN156 is a low-power single comparator that typically consumes less than 10  $\mu\text{A}$  of supply current. It is guaranteed to operate at a low voltage of 1.6 V and is fully operational up to 5.5 V, making it convenient for use in 1.8, 3.0 V, and 5.0 V systems.

The FAN156 has a complementary push-pull P- and N-channel output stage capable of driving a rail-to-rail output swing with a load ranging up to 5.0 mA.

### Features

- Low Supply Current:  $I_{DD}$  6  $\mu\text{A}$  (Typical)
- Single Power Supply Operation
- Wide Common-Mode Input Voltage Range
- Push-Pull Output Circuit
- Low Input Bias Current
- Internal Hysteresis
- Packaged in MicroPak™ 6
- This is a Pb-Free Device

### Applications

- Mobile Phones
- Alarm and Security Systems
- Personal Digital Assistants

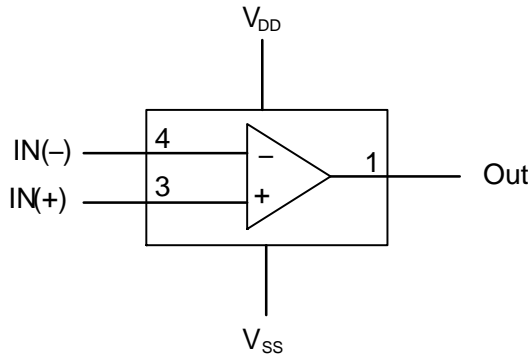
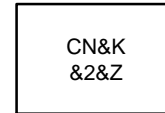


Figure 1. Functional Diagram

### MARKING DIAGRAM



CN = Specific Device Code  
 &K = 2-Digits Lot Run Traceability Code  
 &2 = 2-Digit Date Code  
 &Z = Assembly Plant Code

### ORDERING INFORMATION

See detailed ordering and shipping information on page 7 of this data sheet.

# FAN156

## PIN CONFIGURATION

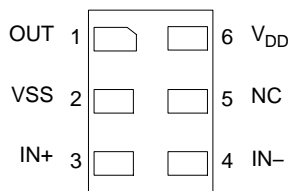


Figure 2. Pin Configuration (Top-Through View)

### PIN DEFINITIONS

Pin #	Name	Description
1	OUT	Comparator Output
2	$V_{SS}$	Negative Supply Voltage
3	IN+	Non-Inverting Input
4	IN-	Inverting Input
5	NC	No Connect
6	$V_{DD}$	Positive Supply Voltage

### FUNCTION TABLE

Inputs	Outputs
$IN(-) > IN(+)$	Output LOW
$IN(+ > IN(-)$	Output HIGH

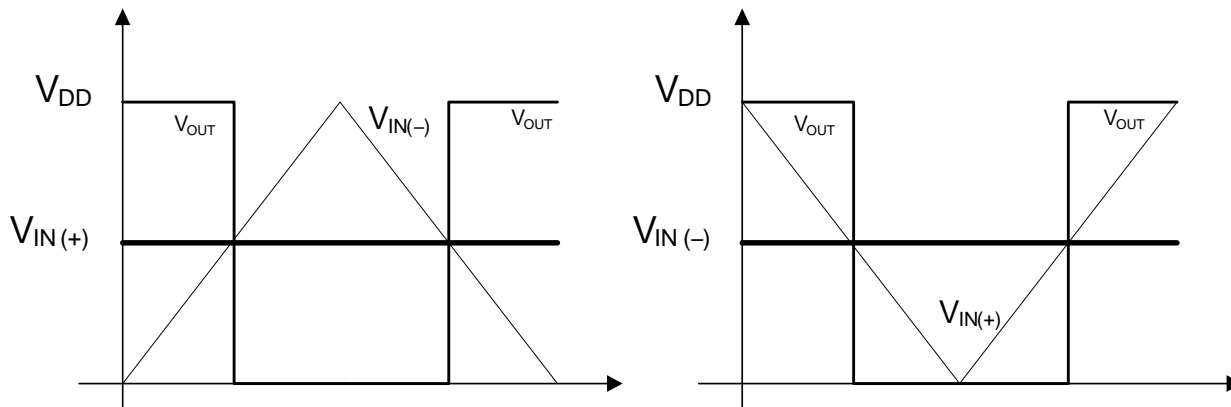


Figure 3.  $V_{IN}$  vs.  $V_{OUT}$

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## ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Condition	Min.	Max.	Unit
$V_{DD}$ to $V_{SS}$	Supply Voltage		-3.0		

ELECTRICAL CHARACTERISTICS

Symbol
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## ELECTRICAL CHARACTERISTICS (continued)

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
$V_{DD} = 1.6\text{ V}$ , $V_{SS} = \text{GND}$ , and $T_A = +25^\circ\text{C}$						
$I_{DD}$	Supply Current			5	15	$\mu\text{A}$
PSRR	Power Supply Rejection Ratio (Note 3)	$\Delta V_{DD} = 0.5\text{ V}$	45	80		dB
$I_{OS}$	Output Short Circuit Current	$V_O = V_{DD}$		5.5		mA
		$V_O = V_{SS}$		7.5		
$V_{OL}$	Low-Level Output Voltage	$I_{SINK} = 5.0\text{ mA}$		0.10	0.25	V
$V_{OH}$	High-Level Output Voltage	$I_{SOURCE} = 5.0\text{ mA}$	1.35	1.50		V
$t_{PLH}$	Propagation Delay (Turn-On)	Overdrive 20 mV, $C_L = 15\text{ pF}$		0.52		$\mu\text{s}$
$t_{PHL}$	Propagation Delay (Turn-Off)	Overdrive = 20 mV, $C_L = 15\text{ pF}$		0.54		$\mu\text{s}$
$t_{TLH}$	Response Time, Output Rise/Fall (Note 4)	$C_L = 50\text{ pF}$		16.5		ns
$t_{THL}$				13.0		

2. Differential input switching level is guaranteed at the minimum or maximum offset voltage, minus or plus half the maximum hysteresis voltage.

3. Guaranteed by design and characterization data.

4. Input signal: 1 kHz, square-wave signal with 10 ns edge rate.

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## TYPICAL PERFORMANCE CHARACTERISTICS

$T_A$

Figure 4. Supply Current vs. Temperature

Figure 5. Supply Current vs. Output Transition Frequency

Figure 6. Supply Current vs. Supply Voltage

Figure 7. Output HIGH vs. Output Drive Current

Figure 8. Output LOW vs. Output Drive Current

Figure 9. Propagation Delay  $t_{(PHL)}$  vs. Temperature

TYPICAL PERFORMANCE CHARACTERISTICS (continued)

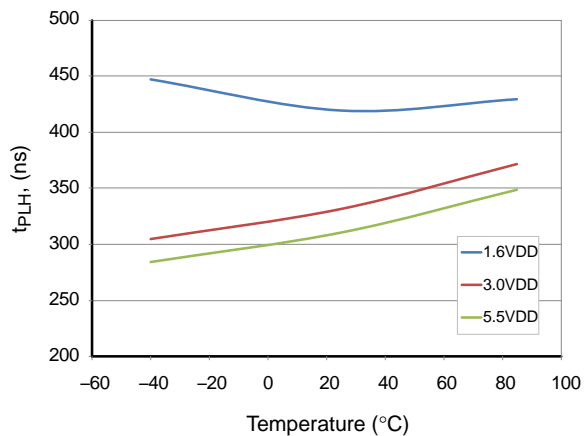


Figure 10. Propagation Delay  $t_{(PLH)}$  vs. Temperature

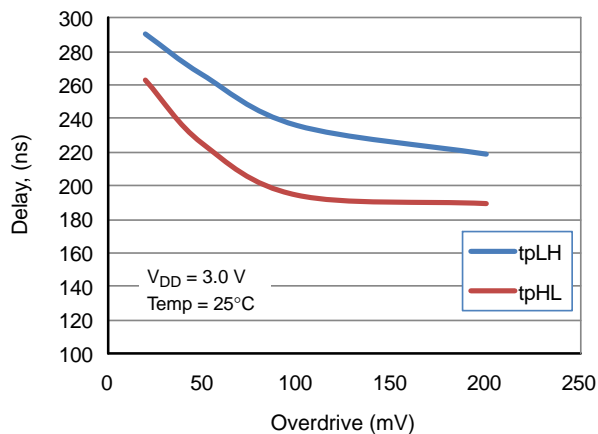


Figure 11. Propagation Delay vs. Input Overdrive

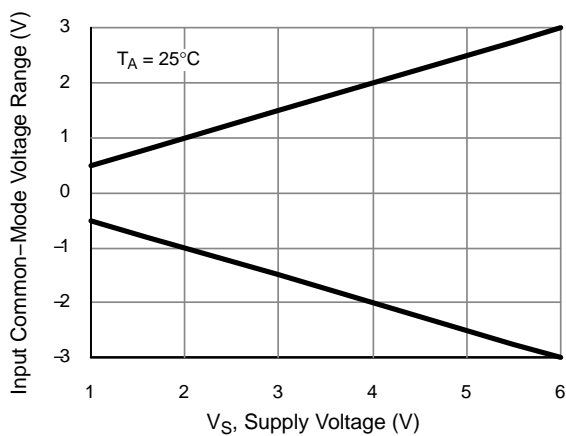


Figure 12. Input Common-Mode Voltage Range vs. Supply Voltage

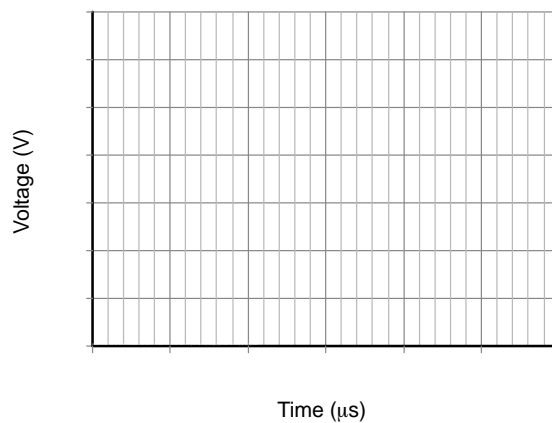


Figure 13. Power-Up Delay

SIP6 1.45X1.0

2. DIM



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