

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 μA 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 μA (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

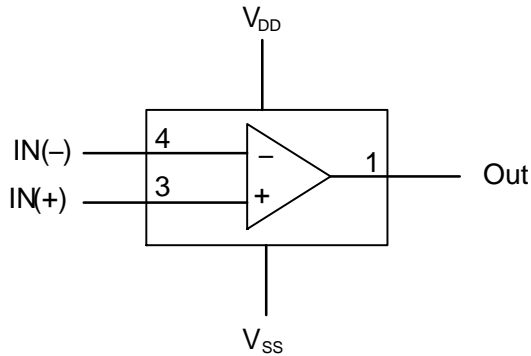
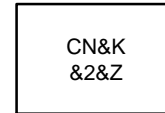


Figure 1. Functional Diagram

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.

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PIN CONFIGURATION

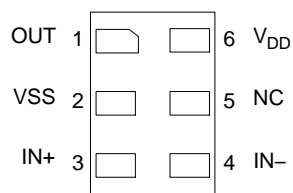


Figure 2. Pin Configuration (Top-Through View)

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 |

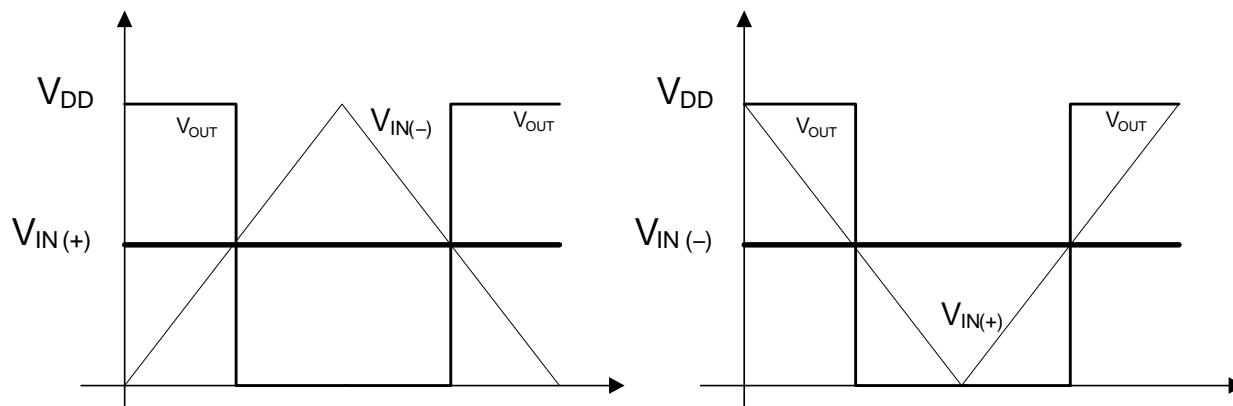


Figure 3. V_{IN} vs. V_{OUT}

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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 | μA |
| 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 | | μs |
| t_{PHL} | Propagation Delay (Turn-Off) | Overdrive = 20 mV, $C_L = 15\text{ pF}$ | | 0.54 | | μs |
| 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)

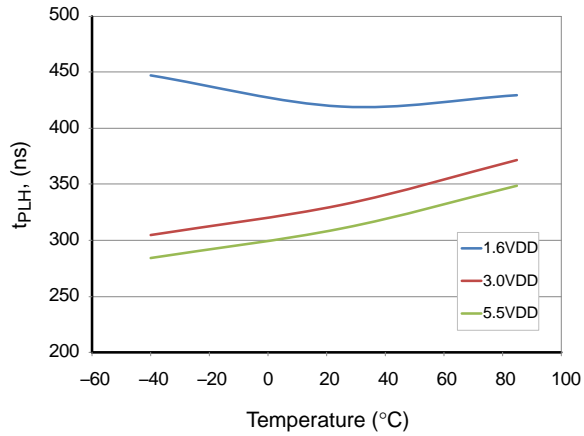


Figure 10. Propagation Delay $t_{(PLH)}$ vs. Temperature

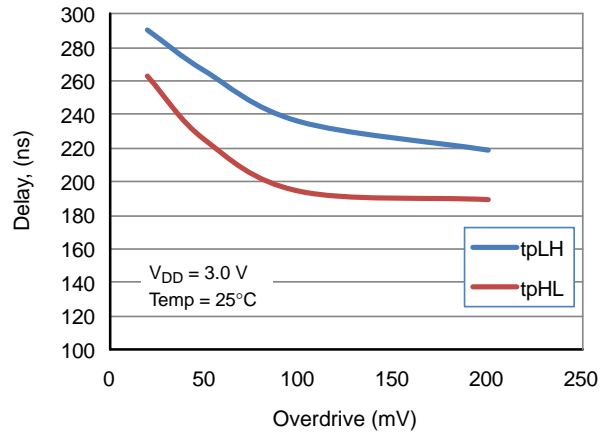


Figure 11. Propagation Delay vs. Input Overdrive

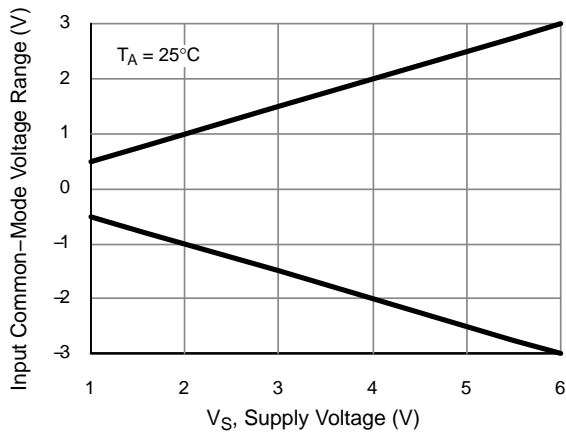


Figure 12. Input Common-Mode Voltage Range vs. Supply Voltage

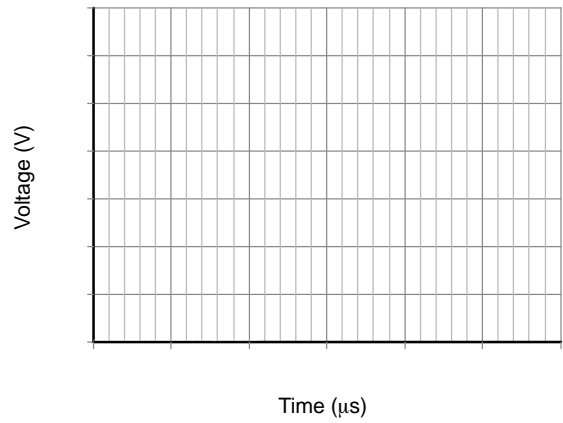


Figure 13. Power-Up Delay

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