Voltage Comparators

LM160/LM260/LM360 high speed differential comparator

general description

The LM160/LM260/LM360 is a very high speed differential input, complementary TTL output voltage comparator with improved characteristics over the μA760/μA760C, for which it is a pin-for-pin replacement. The device has been optimized for greater speed, input impedance and fan-out, and lower input offset voltage. Typically delay varies only 3 ns for overdrive variations of 5 mV to 500 mV.

Complementary outputs having minimum skew are provided. Applications involve high speed analog to digital convertors and zero-crossing detectors in disc file systems.

features

- Guaranteed high speed 20 ns max
- Tight delay matching on both outputs
- Complementary TTL outputs
- High input impedance
- Low speed variation with overdrive variation
- Fan-out of 4
- Low input offset voltage
- Series 74 TTL compatible

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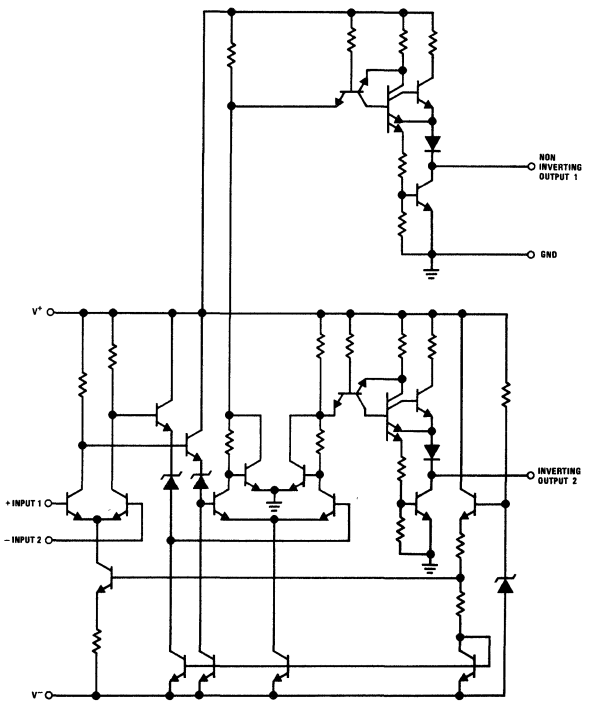
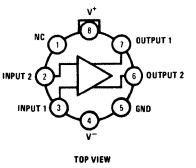
schematic and connection diagrams

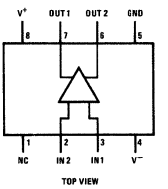


Metal Can Package



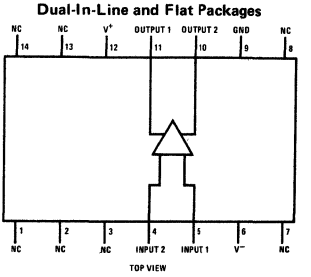
Order Number LM160H, LM260H, or LM360H
See Package 11

Dual-In-Line Package



Order Number LM360N
See Package 20

Dual-In-Line and Flat Packages



Order Number LM160D, LM260D or LM360D
See Package 1

Order Number LM160F
See Package 4

absolute maximum ratings

Positive Supply Voltage	+8V	Operating Temperature Range	
Negative Supply Voltage	−8V	LM160	−55°C to +125°C
Peak Output Current	20 mA	LM260	−25°C to +85°C
Differential Input Voltage	±5V	LM360	0°C to +70°C
Input Voltage	$V^+ \geq V_{IN} \geq V^-$	Storage Temperature Range	−65°C to +150°C
		Lead Temperature (Soldering, 10 sec)	300°C

electrical characteristics ($T_{MIN} \leq T_A \leq T_{MAX}$)

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
Operating Conditions					
Supply Voltage V_{CC}^+		4.5	5	6.5	V
Supply Voltage V_{CC}^-		−4.5	−5	−6.5	V
Input Offset Voltage	$R_S \leq 200\Omega$		2	5	mV
Input Offset Current			.5	3	μA
Input Bias Current			5	20	μA
Output Resistance (Either Output)	$V_{OUT} = V_{OH}$		100		Ω
Response Time	$T_A = 25°C$, $V_S = \pm5V$ (Note 1)		13	25	ns
	$T_A = 25°C$, $V_S = \pm5V$ (Note 2)		12	20	ns
	$T_A = 25°C$, $V_S = \pm5V$ (Note 3)		14		ns
Response Time Difference Between Outputs					
(t_{pd} of $+V_{IN1}$) − (t_{pd} of $-V_{IN2}$)	$T_A = 25°C$, (Note 1)		2		ns
(t_{pd} of $+V_{IN2}$) − (t_{pd} of $-V_{IN1}$)	$T_A = 25°C$, (Note 1)		2		ns
(t_{pd} of $+V_{IN1}$) − (t_{pd} of $+V_{IN2}$)	$T_A = 25°C$, (Note 1)		2		ns
(t_{pd} of $-V_{IN1}$) − (t_{pd} of $-V_{IN2}$)	$T_A = 25°C$, (Note 1)		2		ns
Input Resistance	f = 1 MHz		17		kΩ
Input Capacitance	f = 1 MHz		3		pF
Average Temperature Coefficient of Input Offset Voltage	$R_S = 50\Omega$		8		μV/°C
Average Temperature Coefficient of Input Offset Current			7		nA/°C
Common Mode Input Voltage Range	$V_S = \pm6.5V$	±4	±4.5		V
Differential Input Voltage Range		±5			V
Output High Voltage (Either Output)	$I_{OUT} = -320\mu A$, $V_S = \pm4.5V$	2.4	3		V
Output Low Voltage (Either Output)	$I_{SINK} = 6.4$ mA		.25	.4	V
Positive Supply Current	$V_S = \pm6.5V$		18	32	mA
Negative Supply Current	$V_S = \pm6.5V$		−9	−16	mA

Note 1: Response time measured from the 50% point of a 30 mVp-p 10 MHz sinusoidal input to the 50% point of the output.
Note 2: Response time measured from the 50% point of a 2 Vp-p 10 MHz sinusoidal input to the 50% point of the output.
Note 3: Response time measured from the start of a 100 mV input step with 5 mV overdrive to the time when the output crosses the logic threshold.