

DESCRIPTION

The $\mu A710$ is a High Speed Differential Voltage Comparator featuring low offset voltage, high sensitivity and a wide input voltage range. It is ideally suited for use as a pulse height discriminator, an analog comparator or a digital line receiver. The output structure of the $\mu A710$ is compatible with DTL, TTL and Utilogic integrated circuits.

The $\mu A710$ is specified for operation over the MIL temperature range of -55°C to $+125^{\circ}\text{C}$. The $\mu A710\text{C}$ is specified for operation over the commercial/industrial temperature range of 0°C to $+75^{\circ}\text{C}$.

FEATURES

- FAST RESPONSE – 40ns
- HIGH SENSITIVITY – 1.7V/mv
- LOW OFFSET VOLTAGE TEMPERATURE COEFFICIENT – $3.5\mu\text{V}/^{\circ}\text{C}$
- HIGH INPUT VOLTAGE RANGE – $\pm 5.0\text{V}$

ABSOLUTE MAXIMUM RATINGS

Positive Supply Voltage	+14.0V
Negative Supply Voltage	-7.0V
Peak Output Current	10mA
Differential Input Voltage	$\pm 5.0\text{V}$
Input Voltage	$\pm 7.0\text{V}$
Internal Power Dissipation (Note 4)	
TO-99	300mW
TO-91	200mW

Operating Temperature Range

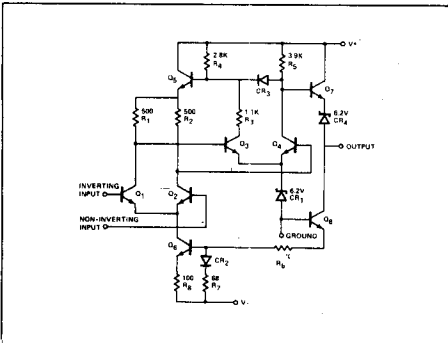
$\mu A710$	-55°C to $+125^{\circ}\text{C}$
$\mu A710\text{C}$	0°C to $+75^{\circ}\text{C}$

Storage Temperature Range

	-65°C to $+150^{\circ}\text{C}$
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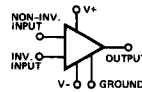
Lead Temperature (Soldering, 60 sec) 300°C
 Maximum Ratings are limiting values above which serviceability may be impaired.

BASIC CIRCUIT SCHEMATIC

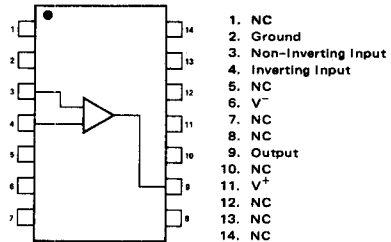


LINEAR INTEGRATED CIRCUITS

PIN CONFIGURATION

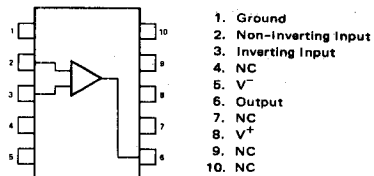


A PACKAGE (Top View)



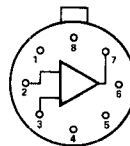
ORDER PART NOS. $\mu A710A/\mu A710CA$

G PACKAGE



ORDER PART NOS. $\mu A710G/\mu A710GC$

T PACKAGE



ORDER PART NOS. $\mu A710T/\mu A710TC$

SIGNETICS ■ μ A710 – DIFFERENTIAL VOLTAGE COMPARATOR

ELECTRICAL CHARACTERISTICS (Note 1)

(Standard Conditions: $T_A = +25^\circ\text{C}$, $V^+ = 12\text{V}$, $V^- = -6.0\text{V}$ unless otherwise specified)

PARAMETERS	TEST CONDITIONS	MIN		TYP		MAX		UNITS
		μA710	μA710C	μA710	μA710C	μA710	μA710C	
Input Offset Voltage	$R_S \leq 200\Omega$ Note 3			0.6	1.6	2.0	5.0	mV
Input Offset Current	Note 3			0.75	1.8	3.0	5.0	μA
Input Bias Current				13	16	20	25	μA
Voltage Gain		1250	1000	1700	1500			
Output Resistance				200	200			Ω
Output Sink Current	$\Delta V_{in} \geq 5\text{mV}$, $V_{out} = 0$	2.0	1.6	2.5				mA
Response Time	Note 2			40	40			ns
Except as noted, the following specifications apply over the temperature ranges of: $-55^\circ\text{C} \leq T_A \leq +125^\circ\text{C}$ for the S5710 $0^\circ\text{C} \leq T_A \leq +75^\circ\text{C}$ for the N5710								
Input Offset Voltage	$R_S \leq 200\Omega$ Note 3					3.0	6.5	
Average Temperature Coefficient of Input Offset Voltage	$R_S = 50\Omega$, $T_A = +25^\circ\text{C}$ to $+125^\circ\text{C}$			3.5		10		$\mu\text{V}/^\circ\text{C}$
	$R_S = 50\Omega$, $T_A = +25^\circ\text{C}$ to -55°C			2.7		10		
	$R_S = 50\Omega$, $T_A = 0^\circ\text{C}$ to $+75^\circ\text{C}$				5		20	
Input Offset Current	$T_A = +125^\circ\text{C}$ Note 3			0.25		3.0		μA
	$T_A = -55^\circ\text{C}$			1.8		7.0		μA
	$T_A = 0^\circ\text{C}$ to $+75^\circ\text{C}$						7.5	μA
Average Temperature Coefficient of Input Offset Current	$T_A = +25^\circ\text{C}$ to $+125^\circ\text{C}$			5.0		25		$\text{nA}/^\circ\text{C}$
	$T_A = +25^\circ\text{C}$ to -55°C			15		75		$\text{nA}/^\circ\text{C}$
	$T_A = +25^\circ\text{C}$ to $+75^\circ\text{C}$				15		50	$\mu\text{A}/^\circ\text{C}$
	$T_A = +25^\circ\text{C}$ to 0°C				24		100	$\mu\text{A}/^\circ\text{C}$
Input Bias Current	$T_A = -55^\circ\text{C}$			27		45		μA
	$T_A = 0^\circ\text{C}$				25		40	μA
Input Common Mode Voltage Range	$V^- = -7.0\text{V}$	± 5.0	± 5.0					V
Common Mode Rejection Ratio	$R_S \leq 200\Omega$	80	70	100	98			dB
Differential Input Voltage Range		± 5.0	± 5.0					
Voltage Gain		1000	800					
Positive Output Level	$\Delta V_{in} \geq 5\text{mV}$, $0 \leq I_{out} \leq 5.0\text{mA}$	2.5	2.5	3.2	3.2	4.0	4.0	V
Negative Output Level	$\Delta V_{in} \geq 5\text{mV}$	-1.0	-1.0	-0.5	-0.5	0	0	V
Output Sink Current	$T_A = +125^\circ\text{C}$, $\Delta V_{in} \geq 5\text{mV}$, $V_{out} = 0$	0.5		1.7				mA
	$T_A = -55^\circ\text{C}$, $\Delta V_{in} \geq 5\text{mV}$, $V_{out} = 0$	1.0		2.3				mA
	$T_A = 0^\circ\text{C}$ to $+75^\circ\text{C}$, $\Delta V_{in} \geq 5\text{mV}$, $V_{out} = 0$		0.5					mA
Positive Supply Current	$V_{out} \leq 0$			5.2	5.2	9.0	9.0	mA
Negative Supply Current				4.6	4.6	7.0	7.0	mA
Power Consumption				90	90	150	150	mW

(Recommended Operating Supply Voltages: $V^+ = 12\text{V}$, $V^- = -6\text{V}$)

NOTES:

- All voltages are referenced to pin F.
- The response time specified is measured with a 100mV input step, and a 5mV overdrive.
- Input Offset Voltage and Input Offset Current are specified for output voltage levels of:

μA710	μA710C
1.8V at -55°C	1.5V at 0°C
1.4V at $+25^\circ\text{C}$	1.4V at $+25^\circ\text{C}$
1.0V at $+125^\circ\text{C}$	1.2V at $+75^\circ\text{C}$
- Rating applies for temperatures up to: $\mu\text{A710} - +125^\circ\text{C}$
 $\mu\text{A710C} - +75^\circ\text{C}$