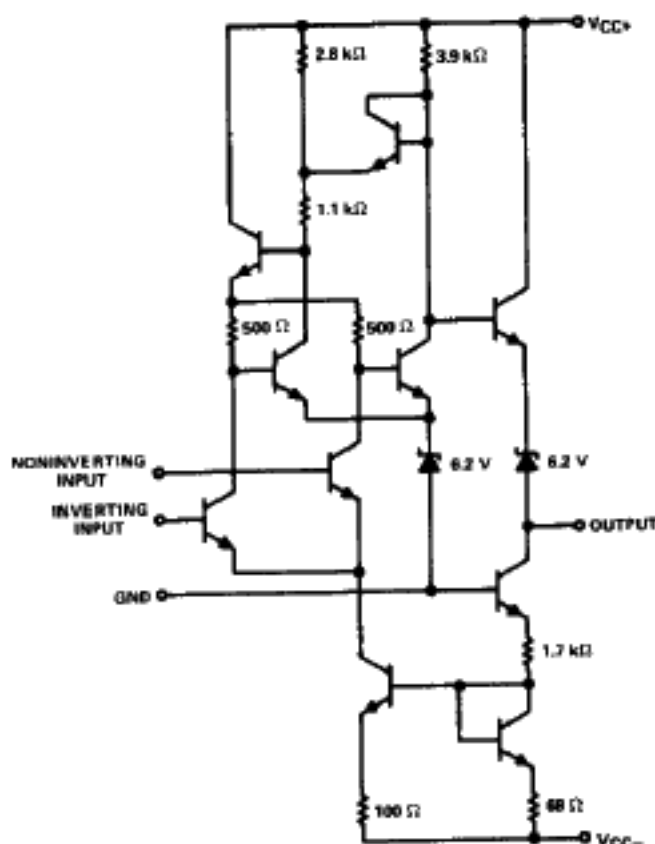


- Fast Response Times
- Low Offset Characteristics
- Output Compatible with Most TTL Circuits
- Designed to be Interchangeable with Fairchild μ A710

description

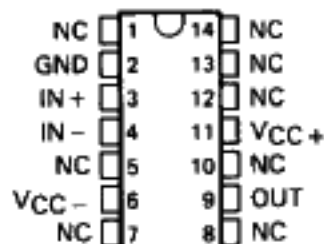
The μ A710 is a monolithic high-speed comparator having differential inputs and a low-impedance output. Component matching, inherent in silicon integrated circuit fabrication techniques, produces a comparator with low-drift and low-offset characteristics. This circuit is especially useful for applications requiring an amplitude discriminator, memory sense amplifier, or a high-speed voltage comparator. The μ A710M is characterized for operation over the full military temperature range of -55°C to 125°C .

schematic

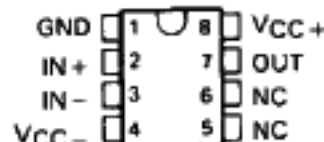


Component values shown are nominal.

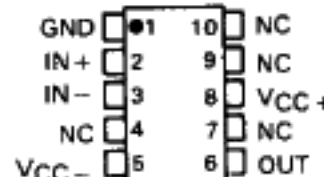
**J DUAL-IN-LINE PACKAGE
(TOP VIEW)**



**JG DUAL-IN-LINE PACKAGE
(TOP VIEW)**



**U FLAT PACKAGE
(TOP VIEW)**



NC—No internal connection

symbol



TYPE uA710M

DIFFERENTIAL COMPARATOR

absolute maximum ratings over operating free-air temperature range (unless otherwise noted)

Supply voltage V_{CC+} (see Note 1)	14 V
Supply voltage V_{CC-} (see Note 1)	-7 V
Differential input voltage (see Note 2)	± 5 V
Input voltage at either input (see Note 1)	± 7 V
Peak output current ($t_W \leq 1$ s)	10 mA
Continuous total power dissipation at (or below) 25°C free-air temperature (see Note 3)	300 mW
Operating free-air temperature range	-55°C to 125°C
Storage temperature range	-65°C to 150°C
Lead temperature 1,6 mm (1/16 inch) from case for 60 seconds	300°C

- NOTES: 1. All voltage values, except differential voltages, are with respect to the network ground terminal.
 2. Differential voltages are at the noninverting input terminal with respect to the inverting input terminal.
 3. For operation above 25°C free-air temperature, refer to the Dissipation Derating Curves in Section 2. In the J and JG packages, uA710M chips are alloy mounted.

electrical characteristics at specified free-air temperature, $V_{CC+} = 12$ V, $V_{CC-} = -6$ V (unless otherwise noted)

PARAMETER	TEST CONDITIONS†	MIN	TYP	MAX	UNIT
V_{IO} Input offset voltage	$R_S \leq 200 \Omega$, See Note 4	25°C	0.6	2	mV
		Full range		3	
αV_{IO} Average temperature coefficient of input offset voltage	$R_S \leq 50 \Omega$, See Note 4	Full range	3	10	$\mu V/^\circ C$
I_{IO} Input offset current	See Note 4	25°C	0.75	3	μA
		Full range		7	
αI_{IO} Average temperature coefficient of input offset current	See Note 4	-55°C to 25°C	5	25	$nA/^\circ C$
		25°C to 125°C	15	75	
I_{IB} Input bias current	See Note 4	25°C	13	20	μA
		Full range		45	
V_{ICR} Common-mode input voltage range	$V_{CC-} = -7$ V	25°C	± 5		V
V_{ID} Differential input voltage range		25°C	± 5		V
A_{VD} Large-signal differential voltage amplification	No load, See Note 4	25°C	1250	1700	
		Full range	1000		
V_{OH} High-level output voltage	$V_{ID} = 5$ mV, $I_{OH} = -5$ mA	25°C	2.5	3.2	4 V
V_{OL} Low-level output voltage	$V_{ID} = -5$ mV, $I_{OL} = 0$	25°C	-1	-0.5	6‡ V
I_{OL} Low-level output current	$V_{ID} = -5$ mV, $V_O = 0$	25°C	2	2.5	mA
		-55°C	1	2.3	
		125°C	0.5	1.7	
r_o Output resistance	$V_O = 1.4$ V	25°C	200		Ω
CMRR Common-mode rejection ratio	$R_S \leq 200 \Omega$	25°C	80	100	dB
I_{CC+} Supply current from V_{CC+}	$V_{ID} = -5$ V to 5 V	25°C	5.2	9	mA
I_{CC-} Supply current from V_{CC-}	(-10 mV for typ),	25°C	-4.6	-7	mA
P_D Total power dissipation	No load	25°C	90	150	mW

NOTE 4: These characteristics are verified by measurements at the following temperatures and output voltage levels: $V_O = 1.8$ V at $T_A = -55^\circ C$, $V_O = 1.4$ V at $T_A = 25^\circ C$, and $V_O = 1$ V at $T_A = 125^\circ C$. These output voltage levels were selected to approximate the logic threshold voltages of the types of digital logic circuits these comparators are intended to drive.

† Full range for uA710M is -55°C to 125°C.

‡ The algebraic convention where the more-positive (less-negative) limit is designated as maximum is used in this data sheet for logic levels only, e.g., when 0 V is the maximum, the minimum limit is a more-negative voltage.

4

Voltage Comparators

switching characteristics, $V_{CC+} = 12\text{ V}$, $V_{CC-} = -6\text{ V}$, $T_A = 25^\circ\text{C}$

PARAMETER	TEST CONDITIONS	TYP	UNIT
Response time	No load, See Note 5	40	ns

NOTE 5: The response time specified is for a 100-mV input step with 5-mV overdrive and is the interval between the input step function and the instant when the output crosses 1.4 V.

TYPICAL CHARACTERISTICS

OUTPUT RESPONSE FOR VARIOUS
INPUT OVERDRIVES

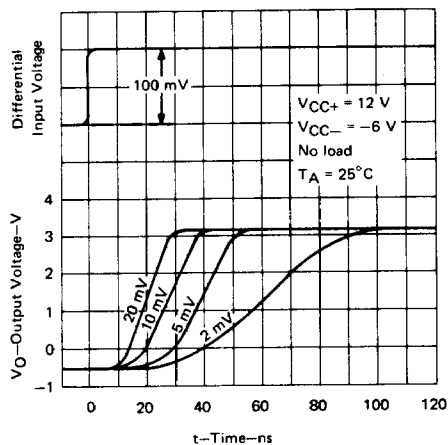


FIGURE 1

OUTPUT RESPONSE FOR VARIOUS
INPUT OVERDRIVES

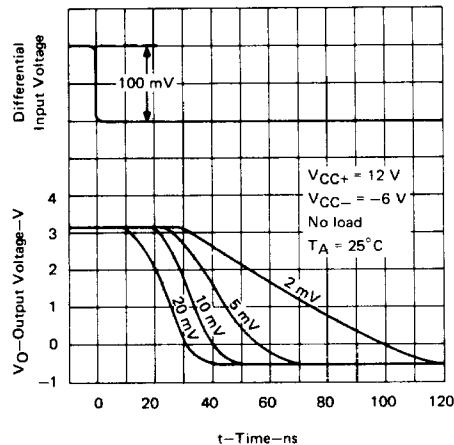


FIGURE 2

4

Voltage Comparators

TYPE μ A710M DIFFERENTIAL COMPARATOR

TYPICAL CHARACTERISTICS

COMMON-MODE PULSE RESPONSE
vs
ELAPSED TIME

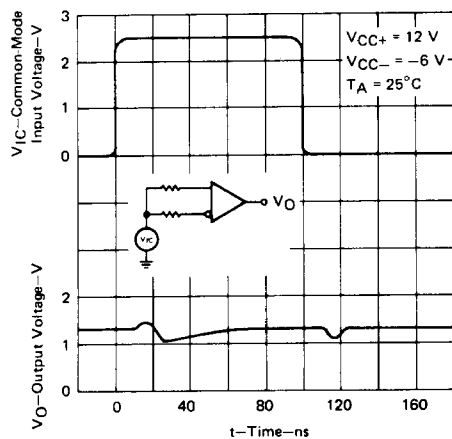


FIGURE 3

OUTPUT VOLTAGE
vs
FREE-AIR TEMPERATURE

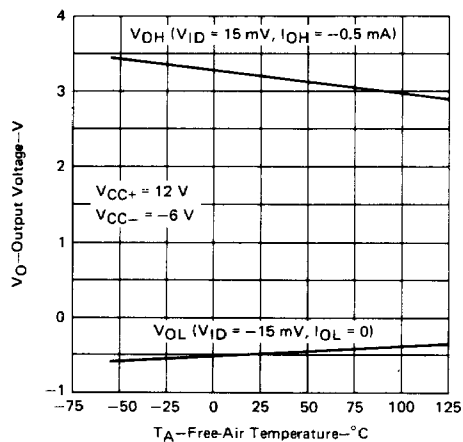


FIGURE 4

VOLTAGE TRANSFER CHARACTERISTICS

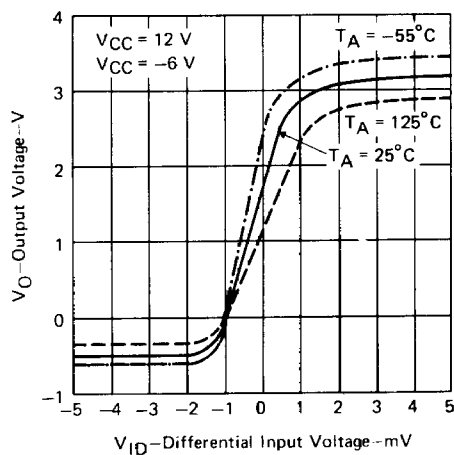


FIGURE 5

TOTAL POWER DISSIPATION
vs
FREE-AIR TEMPERATURE

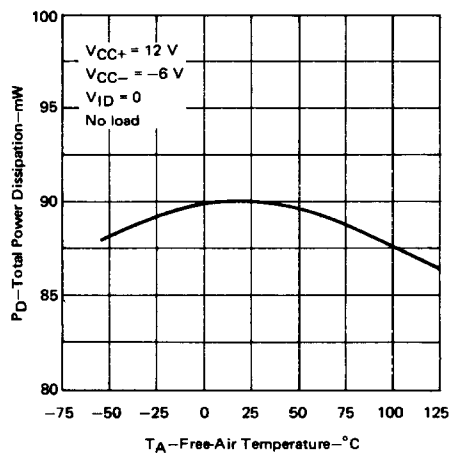


FIGURE 6

4

Voltage Comparators