

μ A711

DUAL HIGH-SPEED DIFFERENTIAL COMPARATOR

FAIRCHILD LINEAR INTEGRATED CIRCUITS

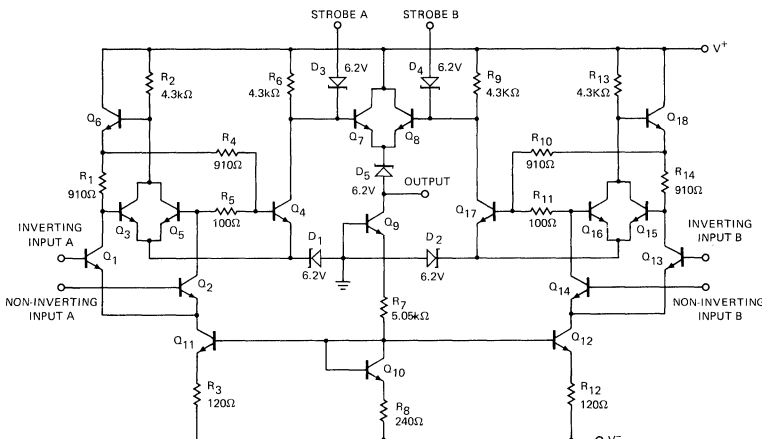
GENERAL DESCRIPTION — The μ A711 is a Dual, Differential Voltage Comparator intended primarily for core-memory sense amplifier applications. The device features high accuracy, fast response times, large input voltage range, low power consumption and compatibility with practically all integrated logic forms. When used as a sense amplifier, the threshold voltage can be adjusted over a wide range, almost independent of the integrated circuit characteristics. Independent strobing of each comparator channel is provided, and pulse stretching on the output is easily accomplished. Other applications of the dual comparator include a window discriminator in pulse height detectors and a double-ended limit detector for automatic Go/No-Go test equipment. The μ A711, which is similar to the μ A710 differential comparator, is constructed using the Fairchild Planar* epitaxial process.

- **FAST RESPONSE TIME . . . 40 ns TYPICAL**
- **5 mV MAXIMUM OFFSET VOLTAGE**
- **10 μ A MAXIMUM OFFSET CURRENT**
- **INDEPENDENT STROBING OF EACH COMPARATOR**

ABSOLUTE MAXIMUM RATINGS

Positive Supply Voltage	+14 V
Negative Supply Voltage	-7.0 V
Peak Output Current	50 mA
Differential Input Voltage	± 5.0 V
Input Voltage	± 7.0 V
Strobe Voltage	0 to +6.0 V
Internal Power Dissipation (Note 1)	
Metal Can	500 mW
DIP	670 mW
Flatpak	570 mW
Operating Temperature Range	
Military (μ A711)	-55°C to +125°C
Commercial (μ A711C)	0°C to +70°C
Storage Temperature Range	-65°C to +150°C
Pin Temperature	
Metal Can, Hermetic DIP and Flatpak (Soldering, 60 s)	300°C
Molded DIP (Soldering, 10 s)	260°C

EQUIVALENT CIRCUIT



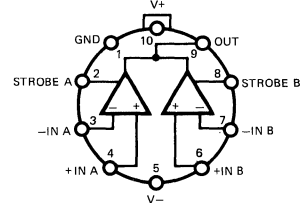
Notes on following page.

CONNECTION DIAGRAMS

10-PIN METAL CAN

(TOP VIEWS)

PACKAGE OUTLINES 5F 5N
PACKAGE CODES H H



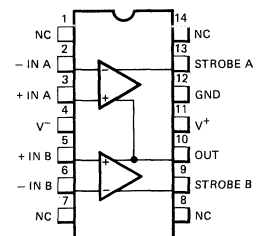
NOTE: Pin 5 connected to case.

ORDER INFORMATION

TYPE	PART NO.
μ A711	μ A711HM
μ A711C	μ A711HC

14-PIN DIP

PACKAGE OUTLINES 6A 9A
PACKAGE CODES D P

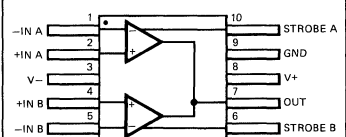


ORDER INFORMATION

TYPE	PART NO.
μ A711	μ A711DM
μ A711C	μ A711DC
μ A711C	μ A711PC

10-PIN FLATPAK

PACKAGE OUTLINE 3F
PACKAGE CODE F



ORDER INFORMATION

TYPE	PART NO.
μ A711	μ A711FM

*Planar is a patented Fairchild process.

$\mu A711$ **ELECTRICAL CHARACTERISTICS:** $T_A = 25^\circ\text{C}$, $V^+ = 12\text{ V}$, $V^- = -6.0\text{ V}$ unless otherwise specified

CHARACTERISTICS	CONDITIONS	MIN	TYP	MAX	UNITS
Input Offset Voltage	$V_{OUT} = +1.4\text{ V}$, $R_S \leq 200\ \Omega$, $V_{CM} = 0$		1.0	3.5	mV
	$V_{OUT} = +1.4\text{ V}$, $R_S \leq 200\ \Omega$		1.0	5.0	mV
Input Offset Current	$V_{OUT} = 1.4\text{ V}$		0.5	10.0	μA
Input Bias Current			25	75	μA
Voltage Gain		750	1500		
Response Time (Note 2)			40		ns
Strobe Release Time			12		ns
Input Voltage Range	$V^- = -7.0\text{ V}$	± 5.0			V
Differential Input Voltage Range		± 5.0			V
Output Resistance			200		Ω
Output HIGH Voltage	$V_{IN} \geq 10\text{ mV}$		4.5	5.0	V
Loaded Output HIGH Voltage	$V_{IN} \geq 10\text{ mV}$, $I_O = 5\text{ mA}$	2.5	3.5		V
Output LOW Voltage	$V_{IN} \geq 10\text{ mV}$	-1.0	-0.5	0	V
Strobed Output Level	$V_{STROBE} \leq 0.3\text{ V}$	-1.0		0	V
Output Sink Current	$V_{IN} \geq 10\text{ mV}$, $V_{out} \geq 0$	0.5	0.8		mA
Strobe Current	$V_{STROBE} = 100\text{ mV}$		1.2	2.5	mA
Positive Supply Current	$V_{OUT} = \text{Gnd}$, Inverting Input = +5mV		8.6		mA
Negative Supply Current	$V_{OUT} = \text{Gnd}$, Inverting Input = +5mV		3.9		mA
Power Consumption			130	200	mW

The following specifications apply for $-55^\circ\text{C} \leq T_A \leq +125^\circ\text{C}$:

Input Offset Voltage (Note 3)	$R_S \leq 200\ \Omega$, $V_{CM} = 0$			4.5	mV
	$R_S \leq 200\ \Omega$			6.0	mV
Input Offset Current (Note 3)				20	μA
Input Bias Current				150	μA
Temperature Coefficient of Input Offset Voltage			5.0		$\mu\text{V}/^\circ\text{C}$
Voltage Gain		500			

NOTES:

- Rating applies to ambient temperatures up to 70°C . Above 70°C ambient derate linearly at $6.3\text{ mW}/^\circ\text{C}$ for the Metal Can, $8.3\text{ mW}/^\circ\text{C}$ for the DIP, and $7.1\text{ mW}/^\circ\text{C}$ for the Flatpak.
- The response time specified (see definitions) is for a 100 mV step input with 5 mV overdrive.
- The input offset voltage is specified for a logic threshold as follows:
711: 1.8 V at -55°C , 1.4 V at $+25^\circ\text{C}$, 1.0 V at $+125^\circ\text{C}$
711C: 1.5 V at 0°C , 1.4 V at $+25^\circ\text{C}$, 1.2 V at $+70^\circ\text{C}$

FAIRCHILD • μ A711

μ A711C

ELECTRICAL CHARACTERISTICS: $T_A = 25^\circ\text{C}$, $V^+ = 12\text{ V}$, $V^- = -6.0\text{ V}$ unless otherwise specified

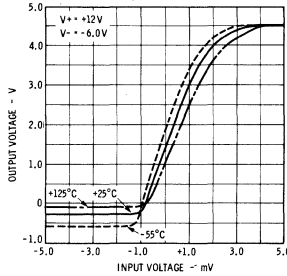
CHARACTERISTICS	CONDITIONS	MIN	TYP	MAX	UNITS
Input Offset Voltage	$V_{OUT} = +1.4\text{ V}$, $R_S \leq 200\ \Omega$, $V_{CM} = 0$		1.0	5.0	mV
	$V_{OUT} = +1.4\text{ V}$, $R_S \leq 200\ \Omega$		1.0	7.5	mV
Input Offset Current	$V_{OUT} = +1.4\text{ V}$		0.5	15	μA
Input Bias Current			25	100	μA
Voltage Gain		700	1500		
Response Time (Note 2)			40		ns
Strobe Release Time			12		ns
Input Voltage Range	$V^- = -7.0\text{ V}$	± 5.0			V
Differential Input Voltage Range		± 5.0			V
Output Resistance			200		Ω
Output HIGH Voltage	$V_{IN} \geq 10\text{ mV}$		4.5	5.0	V
Loaded Output HIGH Voltage	$V_{IN} \geq 10\text{ mV}$, $I_O = 5\text{ mA}$	2.5	3.5		V
Output LOW Voltage	$V_{IN} \geq 10\text{ mV}$	-1.0	-0.5	0	V
Strobed Output Level	$V_{STROBE} \leq 0.3\text{ V}$	-1.0		0	V
Output Sink Current	$V_{IN} \geq 10\text{ mV}$, $V_{OUT} \geq 0$	0.5	0.8		mA
Strobe Current	$V_{STROBE} = 100\text{ mV}$		1.2	2.5	mA
Positive Supply Current	$V_{OUT}\text{ Gnd}$, Inverting Input = +10mV		8.6		mA
Negative Supply Current	$V_{OUT}\text{ Gnd}$, Inverting Input = +10mV		3.9		mA
Power Consumption			130	230	mW

The following specifications apply for $0^\circ\text{C} \leq T_A \leq +70^\circ\text{C}$:

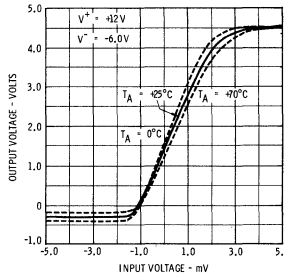
Input Offset Voltage (Note 3)	$R_S \leq 200\ \Omega$, $V_{CM} = 0$			6.0	mV
	$R_S \leq 200\ \Omega$			10	mV
Input Offset Current (Note 3)				25	μA
Input Bias Current				150	μA
Temperature Coefficient of Input Offset Voltage			5.0		$\mu\text{V}/^\circ\text{C}$
Voltage Gain		500			

TYPICAL PERFORMANCE CURVES FOR $\mu A711$ AND $\mu A711C$

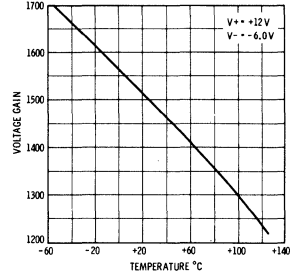
VOLTAGE TRANSFER CHARACTERISTIC
 $\mu A711$



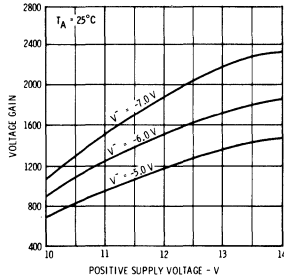
VOLTAGE TRANSFER CHARACTERISTIC
 $\mu A711C$



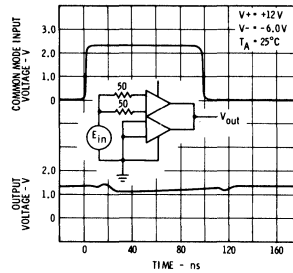
VOLTAGE GAIN AS A FUNCTION OF AMBIENT TEMPERATURE



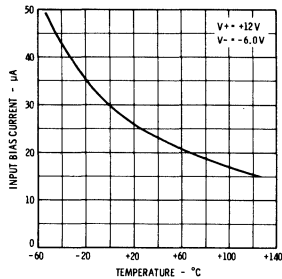
VOLTAGE GAIN AS A FUNCTION OF SUPPLY VOLTAGES



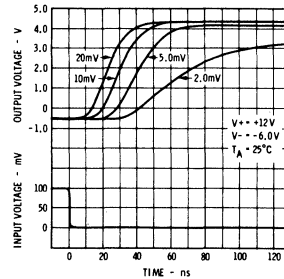
COMMON MODE PULSE RESPONSE



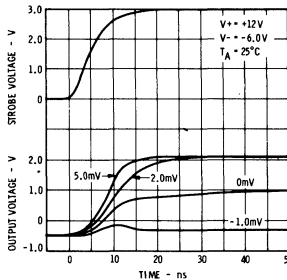
INPUT BIAS CURRENT AS A FUNCTION OF AMBIENT TEMPERATURE



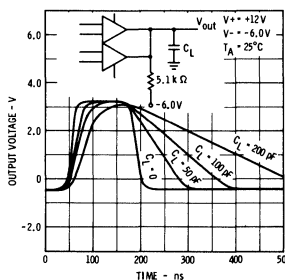
RESPONSE TIME FOR VARIOUS INPUT OVERDRIVES



STROBE RELEASE TIME FOR VARIOUS INPUT OVERDRIVES



OUTPUT PULSE STRETCHING WITH CAPACITIVE LOADING



POWER CONSUMPTION AS A FUNCTION OF AMBIENT TEMPERATURE

