μA711
DUAL COMPARATOR
FAIRCHILD LINEAR INTEGRATED CIRCUIT

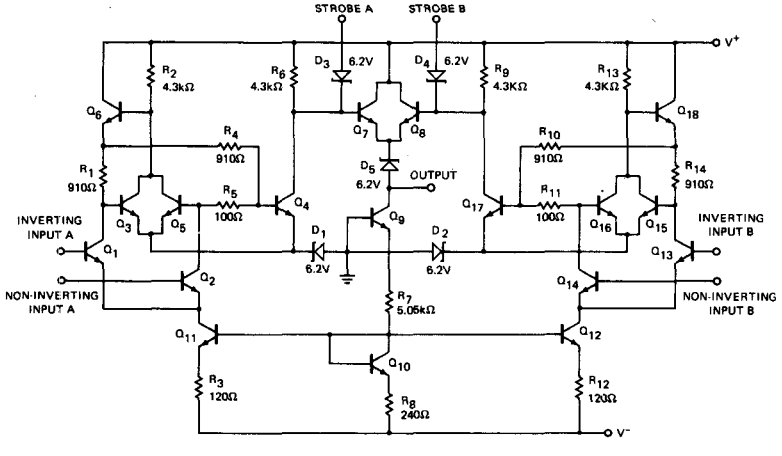
GENERAL DESCRIPTION – The μA711 is a Dual, Differential Voltage Comparator intended primarily for core-memory sense amplifier applications. The device features high accuracy, fast response times, large input voltage range, low power consumption and compatibility with practically all integrated logic 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 μA711, which is similar to the μA710 differential comparator, is constructed using the Fairchild Planar* epitaxial process.

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

ABSOLUTE MAXIMUM RATINGS

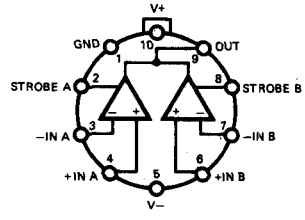
Positive Supply Voltage	+14 V
Negative Supply Voltage	−7.0 V
Peak Output Current	50 mA
Differential Input Voltage	±5.0 V
Input Voltage	±7.0 V
Strobe Voltage	0 to +6.0 V
Internal Power Dissipation (Note 1)	
Metal Can	500 mW
DIP	670 mW
Flatpak	570 mW
Operating Temperature Range	
Military (μA711)	−55°C to +125°C
Commercial (μA711C)	0°C to +70°C
Storage Temperature Range	−65°C to +150°C
Lead 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-LEAD METAL CAN
(TOP VIEWS)
PACKAGE OUTLINES 5F 5N
PACKAGE CODES H H

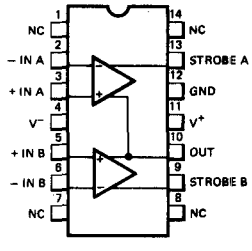


NOTE: Pin 5 connected to case.

ORDER INFORMATION

TYPE	PART NO.
μA711	μA711HM
μA711C	μA711HC

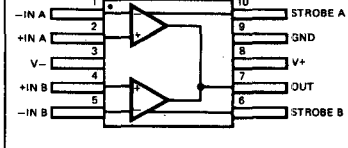
14-LEAD DIP
PACKAGE OUTLINES 6A 9A
PACKAGE CODES D P



ORDER INFORMATION

TYPE	PART NO.
μA711	μA711DM
μA711C	μA711DC
μA711C	μA711PC

10-LEAD FLATPAK
PACKAGE OUTLINE 3F
PACKAGE CODE F



ORDER INFORMATION

TYPE	PART NO.
μA711	μA711FM

*Planar is a patented Fairchild process.

μA711

ELECTRICAL CHARACTERISTICS (T_A = 25°C, V^+ = 12 V, V^- = −6.0 V unless otherwise specified)

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
Input Offset Voltage	V_{OUT} = +1.4 V, R_S ≤200 Ω, V_{CM} = 0		1.0	3.5	mV
	V_{OUT} = +1.4 V, R_S ≤200 Ω		1.0	5.0	mV
Input Offset Current	V_{OUT} = 1.4 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 V	±5.0			V
Differential Input Voltage Range		±5.0			V
Output Resistance			200		Ω
Output HIGH Voltage	V_{IN} ≥10 mV		4.5	5.0	V
Loaded Output HIGH Voltage	V_{IN} ≥10 mV, I_O = 5mA	2.5	3.5		V
Output LOW Voltage	V_{IN} ≥10 mV	−1.0	−0.5	0	V
Strobed Output Level	V_{STROBE} ≤0.3 V	−1.0		0	V
Output Sink Current	V_{IN} ≥10 mV, V_{out} ≥0	0.5	0.8		mA
Strobe Current	V_{STROBE} = 100 mV		1.2	2.5	mA
Positive Supply Current	V_{OUT} = Gnd, Inverting Input = +5mV		8.6		mA
Negative Supply Current	V_{OUT} = Gnd, Inverting Input = +5mV		3.9		mA
Power Consumption			130	200	mW

The following specifications apply for −55° C ≤ T_A ≤ +125°C:

Input Offset Voltage (Note 3)	R_S ≤200 Ω, V_{CM} = 0			4.5	mV
	R_S ≤200 Ω			6.0	mV
Input Offset Current (Note 3)				20	μA
Input Bias Current				150	μA
Temperature Coefficient of Input Offset Voltage			5.0		μV/°C
Voltage Gain		500			

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

μA711C

ELECTRICAL CHARACTERISTICS (T_A = 25°C, V^+ = 12 V, V^- = −6.0 V unless otherwise specified)

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
Input Offset Voltage	V_{OUT} = +1.4 V, R_S ≤200 Ω, V_{CM} = 0		1.0	5.0	mV
	V_{OUT} = +1.4 V, R_S ≤200 Ω		1.0	7.5	mV
Input Offset Current	V_{OUT} = +1.4 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 V	±5.0			V
Differential Input Voltage Range		±5.0			V
Output Resistance			200		Ω
Output HIGH Voltage	V_{IN} ≥10 mV		4.5	5.0	V
Loaded Output HIGH Voltage	V_{IN} ≥10 mV, I_O = 5 mA	2.5	3.5		V
Output LOW Voltage	V_{IN} ≥10 mV	−1.0	−0.5	0	V
Strobed Output Level	V_{STROBE} ≤0.3 V	−1.0		0	V
Output Sink Current	V_{IN} ≥10 mV, V_{OUT} ≥0	0.5	0.8		mA
Strobe Current	V_{STROBE} = 100 mV		1.2	2.5	mA
Positive Supply Current	V_{OUT} Gnd, Inverting Input = +10mV		8.6		mA
Negative Supply Current	V_{OUT}Gnd, Inverting Input = +10mV		3.9		mA
Power Consumption			130	230	mW

The following specifications apply for 0° C ≤ T_A ≤ +70° C:

Input Offset Voltage (Note 3)	R_S ≤ 200 Ω; V_{CM} = 0			6.0	mV
	R_S ≤ 200 Ω			10	mV
Input Offset Current (Note 3)				25	μA
Input Bias Current				150	μA
Temperature Coefficient of Input Offset Voltage			5.0		μV/°C
Voltage Gain		500			

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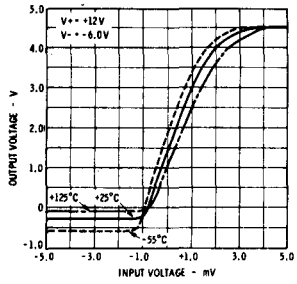
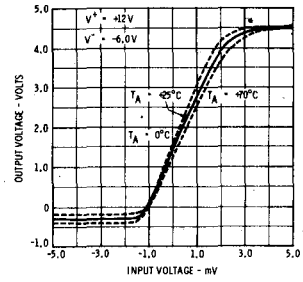
TYPICAL PERFORMANCE CURVES FOR μA711 AND μA711C

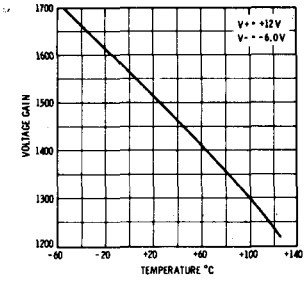
VOLTAGE TRANSFER CHARACTERISTIC μA711



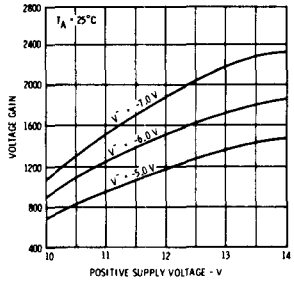
VOLTAGE TRANSFER CHARACTERISTIC μA711C



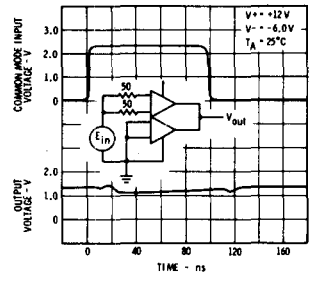
VOLTAGE GAIN AS A FUNCTION OF AMBIENT TEMPERATURE



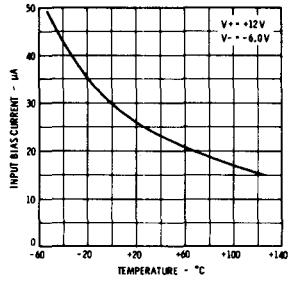
VOLTAGE GAIN AS A FUNCTION OF SUPPLY VOLTAGES



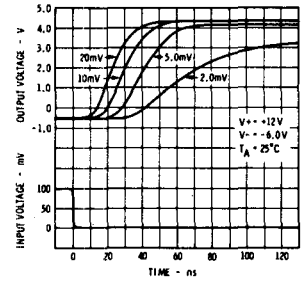
COMMON MODE PULSE RESPONSE



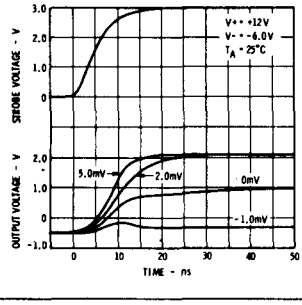
INPUT BIAS CURRENT AS A FUNCTION OF AMBIENT TEMPERATURE



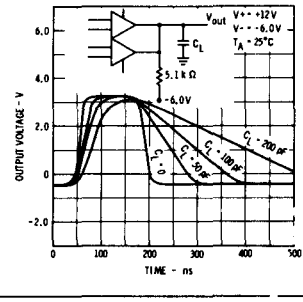
RESPONSE TIME FOR VARIOUS INPUT OVERDRIVES



STROBE RELEASE TIME FOR VARIOUS INPUT OVERDRIVES



OUTPUT PULSE STRETCHING WITH CAPACITIVE LOADING



POWER CONSUMPTION AS A FUNCTION OF AMBIENT TEMPERATURE