

μ A730

DIFFERENTIAL AMPLIFIER

FAIRCHILD LINEAR INTEGRATED CIRCUITS

GENERAL DESCRIPTION — The μ A730 is a Differential Amplifier constructed on a single silicon chip using the Fairchild Planar* epitaxial process. This device has a wide range of applications since it has both a differential input and output; any combination of single-ended or differential configurations can be employed at its input and output. The emitter follower output stage gives this device a low output impedance making it useful as a preamplifier.

ABSOLUTE MAXIMUM RATINGS

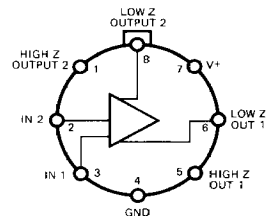
Supply Voltage	15 V
Differential Input Voltage	± 5 V
Common Mode Input Voltage	2.5 to 5.5 V
Internal Power Dissipation (Note 1)	500 mW
Operating Temperature Range	
Military (μ A730)	-55°C to $+125^{\circ}\text{C}$
Commercial (μ A730C)	0°C to $+70^{\circ}\text{C}$
Storage Temperature Range	-65°C to $+150^{\circ}\text{C}$
Lead Temperature (Soldering, 60 s)	300°C

NOTE:

1. Rating applies for ambient temperature to $+70^{\circ}\text{C}$; derate linearly at $6.3 \text{ mW}/^{\circ}\text{C}$ for ambient temperatures above $+70^{\circ}\text{C}$.

CONNECTION DIAGRAM 8-LEAD METAL CAN (TOP VIEW)

PACKAGE OUTLINE 5S
PACKAGE CODE H



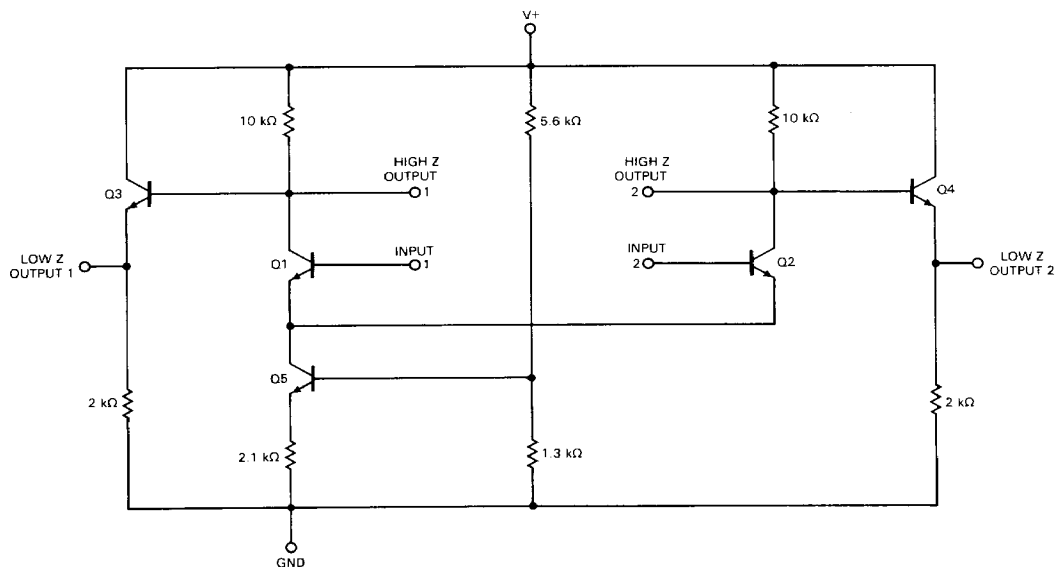
NOTE: Pin 4 connected to case.

ORDER INFORMATION

TYPE	PART NO.
μ A730	μ A730HM
μ A730C	μ A730HC

*Planar is a patented Fairchild process.

EQUIVALENT CIRCUIT

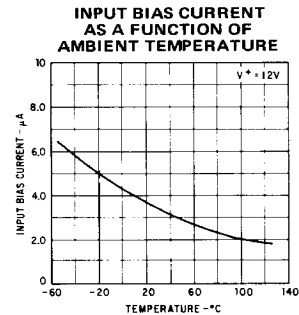
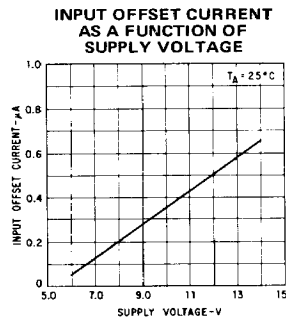
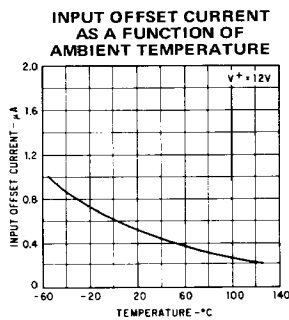


$\mu A730$ **ELECTRICAL CHARACTERISTICS** ($T_A = 25^\circ\text{C}$, $V^+ = 12.0\text{ V}$, and $V_{CM} = 3.5\text{ V}$ unless otherwise specified)

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
Input Offset Voltage	$R_S \leq 50\Omega$		1.0	2.5	mV
Input Offset Current			0.5	1.5	μA
Input Bias Current			3.5	7.5	μA
Input Resistance		5.0	20		$k\Omega$
Differential Voltage Gain	$R_L \geq 100\text{ k}\Omega$	100	145	160	
Differential Distortion	$R_L \geq 100\text{ k}\Omega$		80	300	mVpk-pk
Bandwidth		1.0	1.5		MHz
Single-Ended Output Resistance			70	500	Ω
Output Voltage Swing	$R_L \geq 100\text{ k}\Omega$	5.0	8.0		Vpk-pk
Supply Current	$R_L \geq 100\text{ k}\Omega$		9.5	13	mA
Power Consumption	$R_L \geq 100\text{ k}\Omega$		114	156	mW

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

Input Offset Voltage	$R_S \leq 50\Omega$			3.5	mV
Input Offset Current	$T_A = +125^\circ\text{C}$		0.2	1.5	μA
	$T_A = -55^\circ\text{C}$		1.0	3.0	μA
Input Bias Current	$T_A = -55^\circ\text{C}$		6.5	15	μA
Input Resistance		0.9			$k\Omega$
Input Voltage Range		3.5		5.2	V
Common Mode Rejection Ratio	$R_S \leq 50\Omega$ $f \leq 1.0\text{ kHz}$, $+3.5\text{ V} \leq V_{CM} \leq +5.2\text{ V}$	70	85		dB
Differential Voltage Gain	$R_L \geq 100\text{ k}\Omega$	90		175	
Common Mode Output Voltage		5.5	7.0	7.75	V
Output Resistance				600	Ω
Output Voltage Swing		4.5	6.8		Vpk-pk
Supply Current	$T_A = -55^\circ\text{C}$		10	15	mA
	$T_A = 125^\circ\text{C}$		8.0	11	mA
Power Consumption	$T_A = -55^\circ\text{C}$		120	180	mW
	$T_A = 125^\circ\text{C}$		96	121	mW

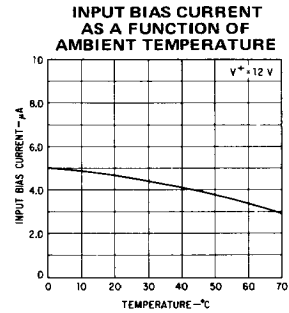
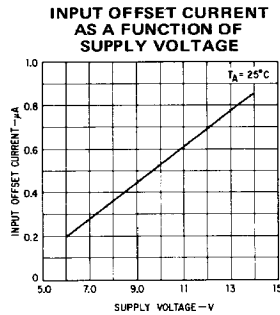
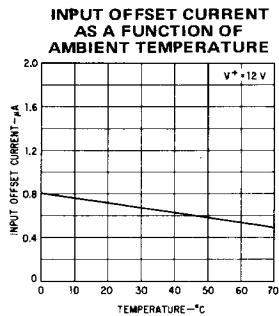
TYPICAL PERFORMANCE CURVES FOR $\mu A730$ 

$\mu A730C$ **ELECTRICAL CHARACTERISTICS** ($T_A = 25^\circ\text{C}$, $V^+ = 12.0\text{ V}$, and $V_{CM} = 3.5\text{ V}$ unless otherwise specified)

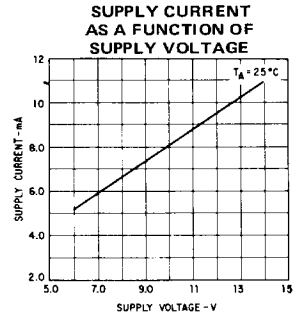
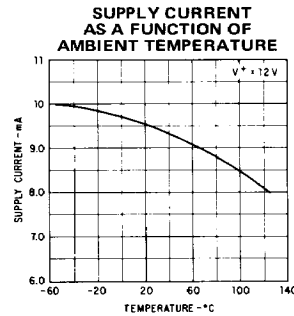
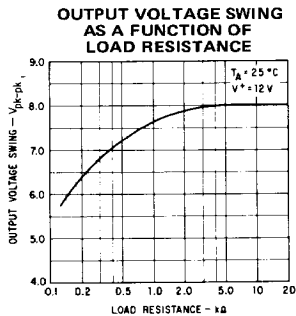
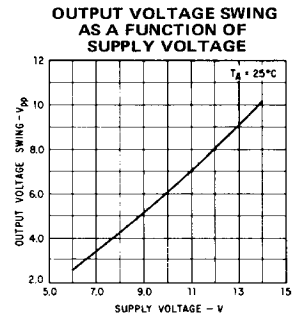
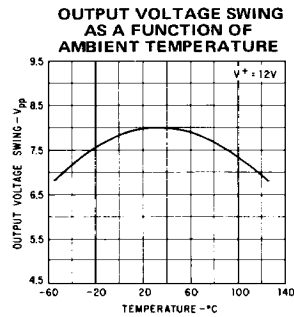
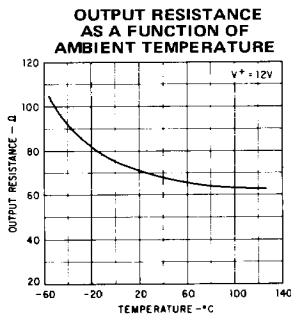
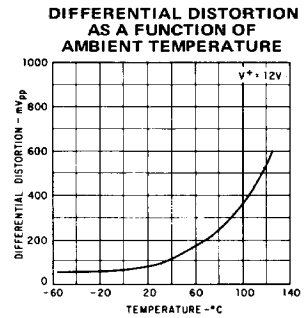
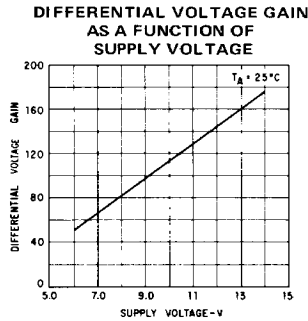
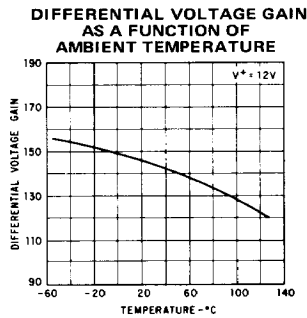
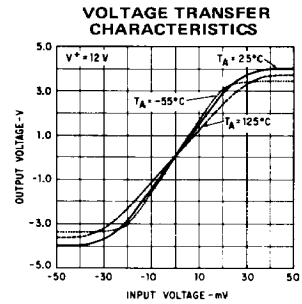
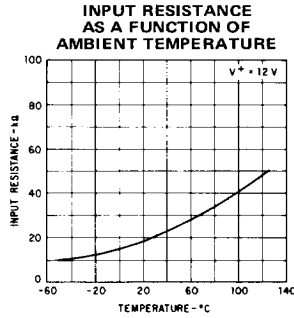
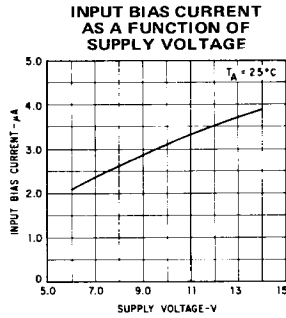
PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
Input Offset Voltage	$R_S \leq 50\Omega$		2.0	5.0	mV
Input Offset Current			0.7	3.0	μA
Input Bias Current			4.5	16.0	μA
Input Resistance		2.5	15		$k\Omega$
Differential Voltage Gain	$R_L \geq 100\text{ k}\Omega$	100	135	160	
Differential Distortion	$R_L \geq 100\text{ k}\Omega$		85	300	mVp-p
Bandwidth		1.0	1.5		MHz
Single-Ended Output Resistance			70	500	Ω
Output Voltage Swing	$R_L \geq 100\text{ k}\Omega$	5.0	8.0		V _{pk-pk}
Supply Current	$R_L \geq 100\text{ k}\Omega$		9.5	13	mA
Power Consumption	$R_L \geq 100\text{ k}\Omega$		114	156	mW

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

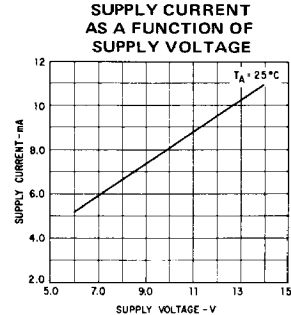
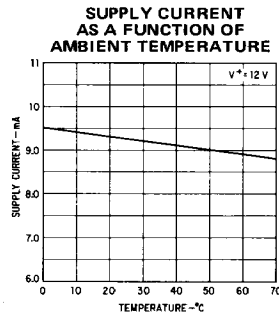
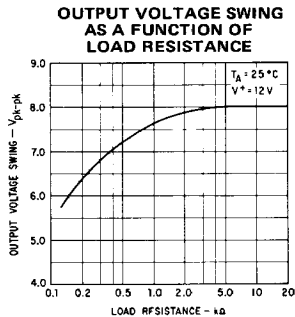
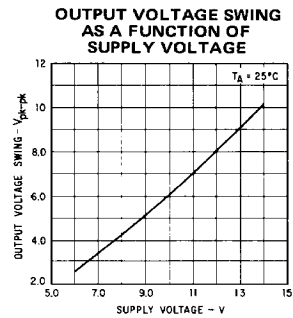
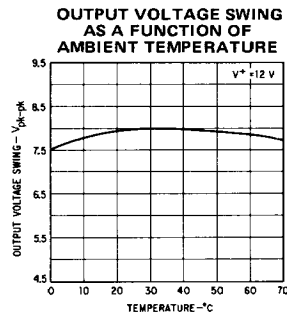
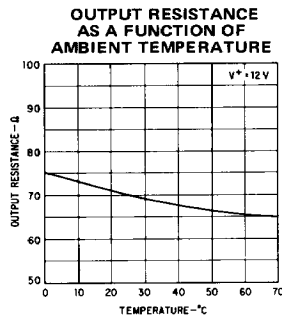
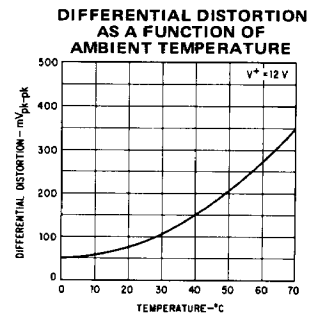
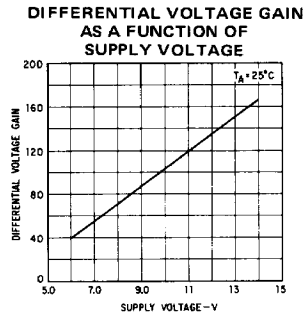
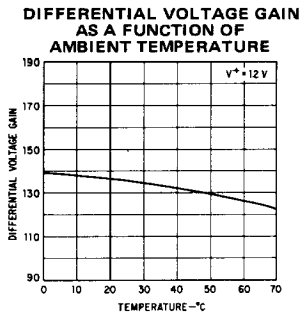
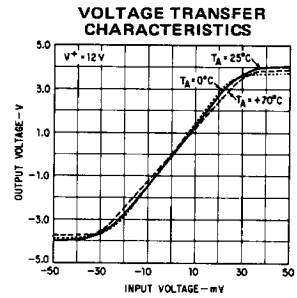
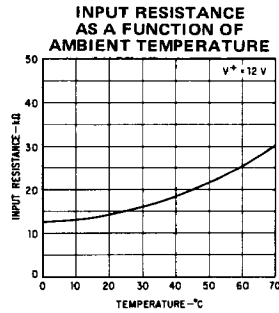
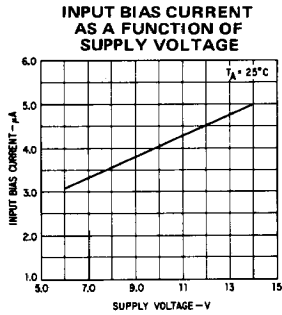
Input Offset Voltage	$R_S \leq 50\Omega$			7.5	mV
Input Offset Current	$T_A = +70^\circ\text{C}$		0.5	3.0	μA
	$T_A = 0^\circ\text{C}$		0.8	5.0	μA
Input Bias Current	$T_A = 0^\circ\text{C}$		5.0	20	μA
Input Resistance		1.8			$k\Omega$
Input Voltage Range		+3.5		+5.2	
Common Mode Rejection Ratio	$R_S \leq 50\Omega$ $f \leq 1.0\text{ kHz}$, $+3.5\text{ V} \leq V_{CM} \leq +5.2\text{ V}$	60	80		dB
Differential Voltage Gain	$R_L \geq 100\text{ k}\Omega$	80		190	
Common Mode Output Voltage		5.0	7.0	8.0	V
Output Resistance				600	Ω
Output Voltage Swing		4.5	7.5		V _{pk-pk}
Supply Current	$T_A = 0^\circ\text{C}$		10	15	mA
	$T_A = +70^\circ\text{C}$		8.8	13	mA
Power Consumption	$T_A = 0^\circ\text{C}$		120	180	mW
	$T_A = +70^\circ\text{C}$		106	156	mW

TYPICAL PERFORMANCE CURVES FOR $\mu A730C$ 

TYPICAL PERFORMANCE CURVES FOR $\mu A730$



TYPICAL PERFORMANCE CURVES FOR $\mu A730C$



TYPICAL PERFORMANCE CURVES FOR $\mu A730$ AND $\mu A730C$

