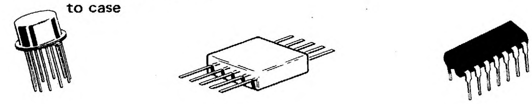
MC1712C

. . . designed for use as an operational amplifier utilizing operating characteristics as a function of the external feedback components.



CASE 96 (TO-99) "G" SUFFIX — CASE 72 (TO-91) "F" SUFFIX — CASE 93 (TO-116) "P" SUFFIX

Typical Amplifier Features:

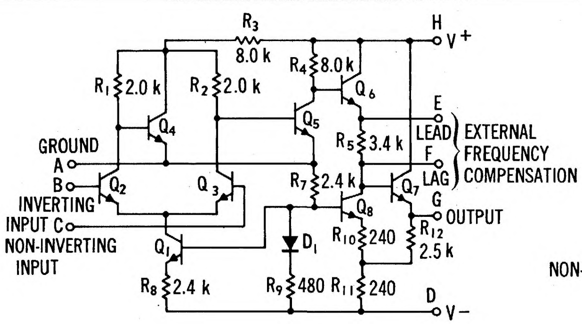
- Open Loop Gain A_{VOL} = 3400 typical
- Low Temperature Drift – ±5.0 μV/°C
- Output Voltage Swing – ±5.3 V typical @ +12 V and -6.0 V Supplies
- Low Output Impedance – Z_{out} = 200 ohms typical

MAXIMUM RATINGS (T_A = 25°C unless otherwise noted)

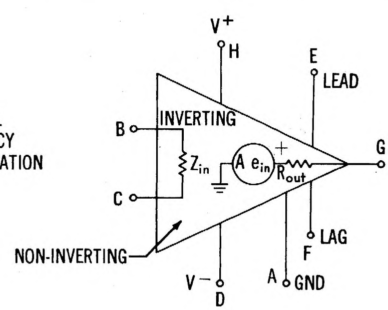
Rating	Symbol	Value	Unit
Power Supply Voltage (Total between V+ and V- terminals)	$\|V^+\|+\|V^-\|$	21	Vdc
Differential Input Signal	V_{in}	±5.0	Volts
Common Mode Input Swing	CMV_{in}	+1.5 -6.0	Volts
Peak Load Current	I_L	50	mA
Power Dissipation (Package Limitation) Metal Can Derate above 25°C Flat Package Derate above 25°C Plastic Package Derate above 25°C	P_D	 680 4.6 500 3.3 400 3.3	 mW mW/°C mW mW/°C mW mW/°C
Operating Temperature Range*	T_A	0 to +75	°C
Storage Temperature Range Metal Can and Flat Package Plastic Package	T_{stg}	 -65 to +150 -55 to +125	°C

* For full temperature range (-55°C to +125°C) and characteristic curves, see MC1712 data sheet.

CIRCUIT SCHEMATIC



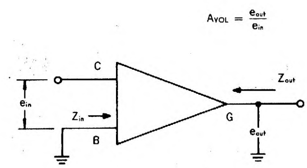
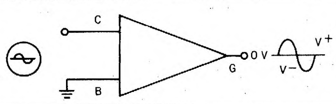
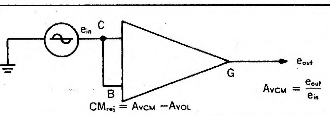
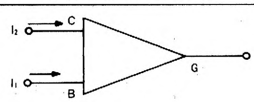
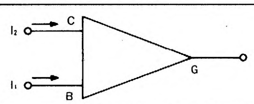
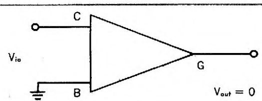
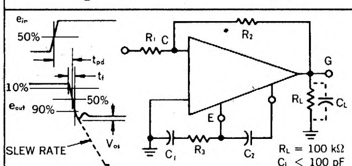
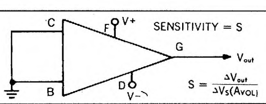
EQUIVALENT CIRCUIT



PIN CONNECTIONS								
Schematic	A	B	C	D	E	F	G	H
"G" Package	1	2	3	4	5	6	7	8
"F" Package	2	3	4	5	6	7	8	10
"P" Package	3	4	5	6*	9	10	12	13

* Pin 7 is electrically connected to substrate and to V−

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Characteristic Definitions (1)	Characteristic	Symbol	Min	Typ	Max	Unit
	Open Loop Voltage Gain R_L = 100 kΩ	A_{VOL}				V/V
	(V^+ = 6.0 Vdc, V^- = -3.0 Vdc, V_{out} = ± 2.5 V)		500	800	1500	
	(V^+ = 12 Vdc, V^- = -6.0 Vdc, V_{out} = ± 5.0 V)		2000	3400	6000	
	(V^+ = 12 Vdc, V^- = -6.0 Vdc, V_{out} = ± 5.0 Vdc, T_A = 0, +75°C)		1500	-	7000	
	(V^+ = 6.0 Vdc, V^- = -3.0 Vdc, V_{out} = ± 2.5 V, T_A = 0, +75°C)		400	-	1750	
	Output Impedance	Z_{out}				ohms
	(V^+ = 6.0 Vdc, V^- = -3.0 Vdc, f = 20 Hz)		-	300	800	
	(V^+ = 12 Vdc, V^- = -6.0 Vdc, f = 20 Hz)		-	200	600	
	Input Impedance	Z_{in}				k ohms
	(V^+ = 6.0 Vdc, V^- = -3.0 Vdc, f = 20 Hz)		16	55	-	
	(V^+ = 12 Vdc, V^- = -6.0 Vdc, f = 20 Hz)		10	32	-	
	Output Voltage Swing	V_{out}				V_{peak}
	(V^+ = 6.0 Vdc, V^- = -3.0 Vdc, R_L = 100 kΩ)		±2.5	±2.7	-	
	(V^+ = 12 Vdc, V^- = -6.0 Vdc, R_L = 100 kΩ)		±5.0	±5.3	-	
	(V^+ = +6.0 Vdc, V^- = -3.0 Vdc, R_L = 10 kΩ)		± 1.5	± 2.0	-	
	(V^+ = +12 Vdc, V^- = -6.0 Vdc, R_L = 10 kΩ)		± 3.5	± 4.0	-	
	Input Common Mode Voltage Swing	CMV_{in}				V_{peak}
	(V^+ = 6.0 Vdc, V^- = -3.0 Vdc)		+0.5	-	-	
			-1.5	-	-	
	(V^+ = 12 Vdc, V^- = -6.0 Vdc)		+0.5	-	-	
			-4.0	-	-	
	Common Mode Rejection Ratio	CM_{rej}				dB
	(V^+ = 6.0 Vdc, V^- = -3.0 Vdc, f ≤ 1.0 kHz)		70	95	-	
	(V^+ = 12 Vdc, V^- = -6.0 Vdc, f ≤ 1.0 kHz)		70	95	-	
	Input Bias Current $I_b = \frac{I_1 + I_2}{2}$, T_A = 25°C	I_b				µA
	(V^+ = 6.0 Vdc, V^- = -3.0 Vdc)		-	1.5	5.0	
	(V^+ = 12 Vdc, V^- = -6.0 Vdc)		-	2.5	7.5	
	T_A = 0°C to +75°C: (V^+ = 6.0 Vdc, V^- = -3.0 Vdc)		-	2.5	8.0	
	(V^+ = 12 Vdc, V^- = -6.0 Vdc) T_A = 0°C to +75°C		-	4.0	12	
	Input Offset Current ($I_{io} = I_1 - I_2$)	I_{io}				µA
	(V^+ = 6.0 Vdc, V^- = -3.0 Vdc)		-	0.3	2.0	
	(V^+ = 6.0 Vdc, V^- = -3.0 Vdc, T_A = 0°C to +75°C)		-	-	2.5	
	(V^+ = 12 Vdc, V^- = -6.0 Vdc)		-	0.5	2.0	
	(V^+ = 12 Vdc, V^- = -6.0 Vdc, T_A = 0°C to +75°C)		-	-	2.5	
	Input Offset Voltage R_S = 2.0 kΩ	V_{io}				mV
	(V^+ = 6.0 Vdc, V^- = -3.0 Vdc)		-	1.7	6.0	
	(V^+ = 6.0 Vdc, V^- = -3.0 Vdc, T_A = 0°C to +75°C)		-	-	7.5	
	(V^+ = 12 Vdc, V^- = -6.0 Vdc)		-	1.5	5.0	
	(V^+ = 12 Vdc, V^- = -6.0 Vdc, T_A = 0°C to +75°C)		-	-	6.5	
	Step Response					
	V^+ = 12 Vdc, V^- = -6.0 Vdc, Gain = 100, V_{in} = 1.0 mV, R_1 = 1.0 kΩ, R_2 = 100 kΩ, C_2 = 50 pF, R_3 = ∞, C_1 = open	V_{os}	-	20	40	%
		t_f	-	10	30	ns
		t_{pd}	-	10	-	ns
		dV_{out}/dt (2)	-	12	-	V/µs
	V^+ = 12 Vdc, V^- = -6.0 Vdc, Gain = 1.0, V_{in} = 10 mV, R_1 = 10 kΩ, R_2 = 10 kΩ, C_1 = 0.01 µF, R_3 = 20Ω, C_2 = open	V_{os}	-	10	50	%
		t_f	-	25	120	ns
		t_{pd}	-	16	-	ns
		dV_{out}/dt (2)	-	1.5	-	V/µs
	Average Temperature Coefficient of Input Offset Voltage R_S = 50 Ω (T_A = 0, +75°C)	TC_{Vio}	-	5.0	-	µV/°C
	Average Temperature Coefficient Input Offset Current	TC_{Iio}				nA/°C
	(T_A = +25°C to +75°C)		-	4.0	-	
	(T_A = 0 to +25°C)		-	6.0	-	
	DC Power Dissipation	P_D				mW
	(V_{out} = 0, V^+ = 6.0 Vdc, V^- = -3.0 Vdc)		-	17	30	
	(V_{out} = 0, V^+ = 12 Vdc, V^- = -6.0 Vdc)		-	70	120	
	Positive Supply Sensitivity (V^- constant = -6.0 Vdc, V^+ = 12 Vdc to 6.0 Vdc)	S^+	-	60	300	µV/V
	Negative Supply Sensitivity (V^+ constant = 12 Vdc, V^- = -6.0 Vdc to -3.0 Vdc)	S^-	-	60	300	µV/V

(1) All definitions imply linear operation. (2) dV_{out}/dt = Slew Rate