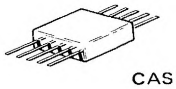
DIFFERENTIAL COMPARATOR

MC1710

. . . designed for use in level detection, low-level sensing, and memory applications.

Typical Amplifier Features:

- Differential Input Characteristics:
  Input Offset Voltage = 1.0 mV
  Offset Voltage Drift = 3.0 $\mu V/^{o}C$
- Fast Response Time — 40 ns
- Output Compatible with All Saturating Logic Forms
  V_{out} = +3.2 V to -0.5 V typical
- Low Output Impedance — 200 ohms



CASE 72
(TO-91)
"F" SUFFIX

CASE 96
(TO-99)
"G" SUFFIX

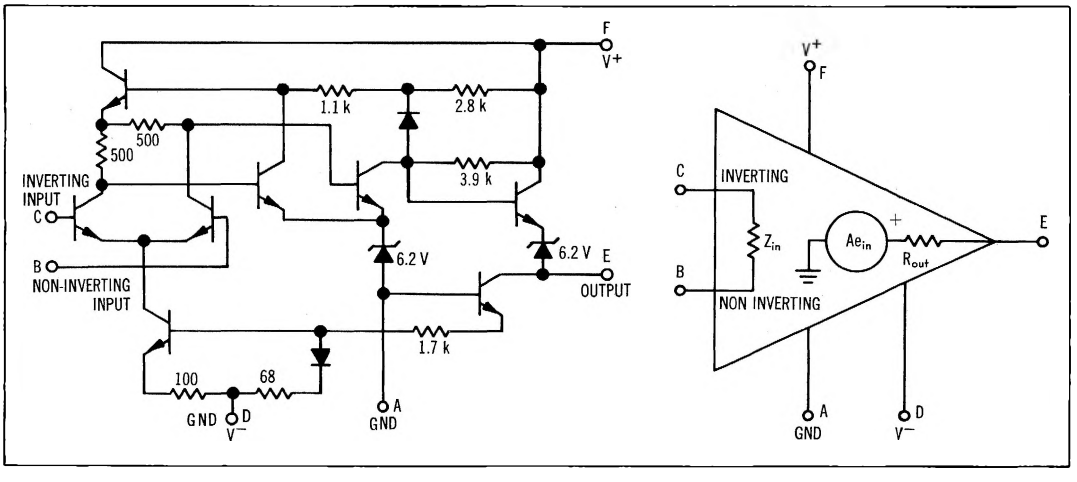
Lead 4 connected to case

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

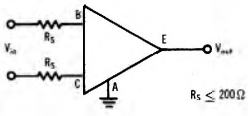
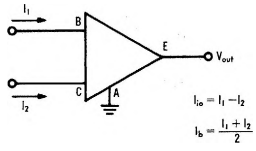
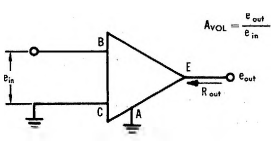
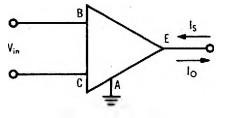
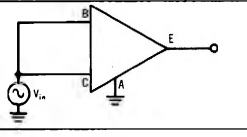
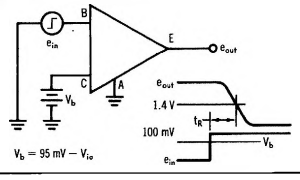
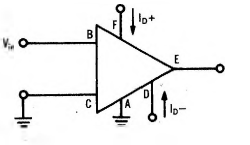
Rating	Symbol	Value	Unit
Power Supply Voltage	V^+ V^-	+ 14 - 7.0	Vdc Vdc
Differential Input Signal	V_{in}	± 5.0	Volts
Common Mode Input Swing	CMV_{in}	± 7.0	Volts
Peak Load Current	I_L	10	mA
Power Dissipation (package limitation) Metal Can Derate above T_A = 25°C Flat Package Derate above T_A = 25°C	P_D	 680 4.6 500 3.3	 mW mW/°C mW mW/°C
Operating Temperature Range	T_A	-55 to +125	°C
Storage Temperature Range	T_{stg}	-65 to +150	°C

PIN CONNECTIONS						
Schematic	A	B	C	D	E	F
"G" Package	1	2	3	4	7	8
"F" Package	1	2	3	5	6	8

CIRCUIT SCHEMATIC



ELECTRICAL CHARACTERISTICS (V^+ = +12 Vdc, V^- = −6 Vdc, T_A = 25°C unless otherwise noted)

Characteristic Definitions	Characteristic	Symbol	Min	Typ	Max	Unit
	Input Offset Voltage V_{out} = 1.4 Vdc, T_A = 25°C V_{out} = 1.8 Vdc, T_A = -55°C V_{out} = 1.0 Vdc, T_A = +125°C	V_{io}	- - -	1.0 - -	2.0 3.0 3.0	mVdc
	Temperature Coefficient of Input Offset Voltage	TC_{Vio}	-	3.0	-	μV/°C
	Input Offset Current V_{out} = 1.4 Vdc, T_A = 25°C V_{out} = 1.8 Vdc, T_A = -55°C V_{out} = 1.0 Vdc, T_A = +125°C	I_{io}	- - -	1.0 - -	3.0 7.0 3.0	μAdc
	Input Bias Current V_{out} = 1.4 Vdc, T_A = 25°C V_{out} = 1.8 Vdc, T_A = -55°C V_{out} = 1.0 Vdc, T_A = +125°C	I_b	- - -	12 - -	20 45 20	μAdc
	Open Loop Voltage Gain T_A = 25°C T_A = -55 to +125°C	A_{VOL}	1250 1000	1700 -	- -	V/V
	Output Resistance	R_{out}	-	200	-	ohms
	Differential Voltage Range	V_{in}	±5.0	-	-	Vdc
	Positive Output Voltage $V_{in} \geq$ 5.0 mV, 0 ≤ I_o ≤ 0.5 mA	V_{OH}	2.5	3.2	4.0	Vdc
	Negative Output Voltage $V_{in} \geq$ -5.0 mV	V_{OL}	-1.0	-0.5	0	Vdc
	Output Sink Current $V_{in} \geq$ -5.0 mV, $V_{out} \geq$ 0, T_A = 25°C $V_{in} \geq$ -5.0 mV, $V_{out} \geq$ 0, T_A = -55°C	I_s	 2.0 1.0	 2.5 2.0	 - -	mAdc
	Input Common Mode Range	CMV_{in}	±5.0	-	-	Volts
	Common Mode Rejection Ratio V^- = -7.0 Vdc, $R_S \leq 200\Omega$	CM_{rej}	80	100	-	dB
	Response Time For Positive and Negative Going Input Pulse	t_R	-	40	-	ns
	Power Supply Current $V_{out} \leq$ 0 Vdc	I_{D^+} I_{D^-}	- -	6.4 5.5	9.0 7.0	mAdc
	Power Consumption TO-99 Metal Can TO-91 Flat Package		- -	115 115	150 150	mW

TYPICAL CHARACTERISTICS

FIGURE 1 – VOLTAGE TRANSFER CHARACTERISTICS

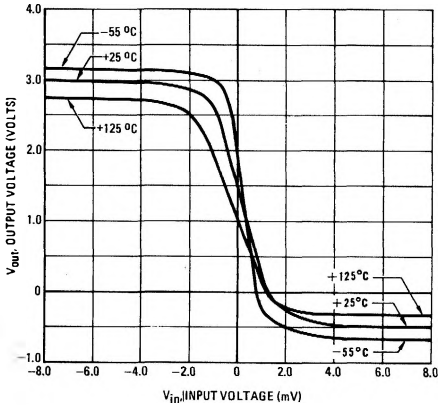


FIGURE 2 – INPUT OFFSET VOLTAGE versus TEMPERATURE

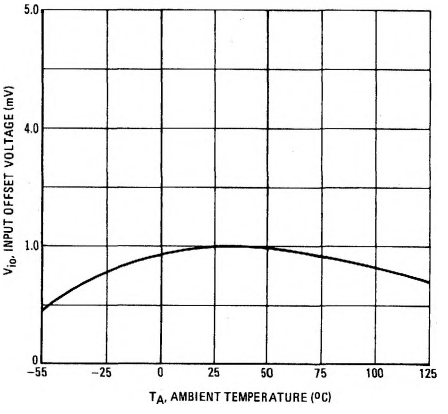


FIGURE 3 – INPUT OFFSET CURRENT versus TEMPERATURE

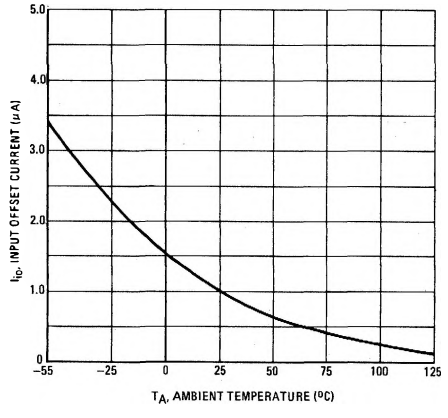


FIGURE 4 – INPUT BIAS CURRENT versus TEMPERATURE

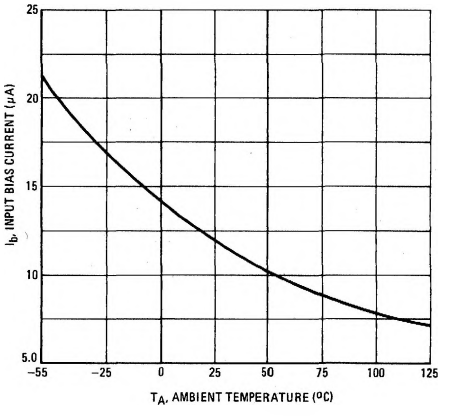


FIGURE 5 – GAIN VARIATION WITH POWER SUPPLY VOLTAGE

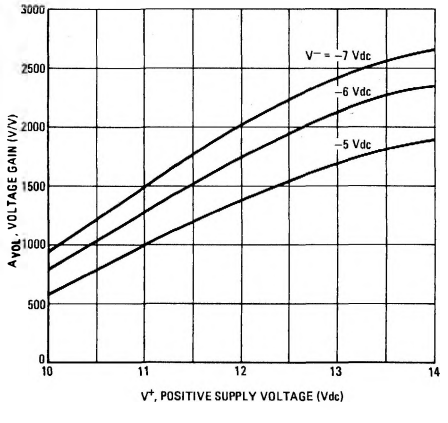


FIGURE 6 – VOLTAGE GAIN versus TEMPERATURE

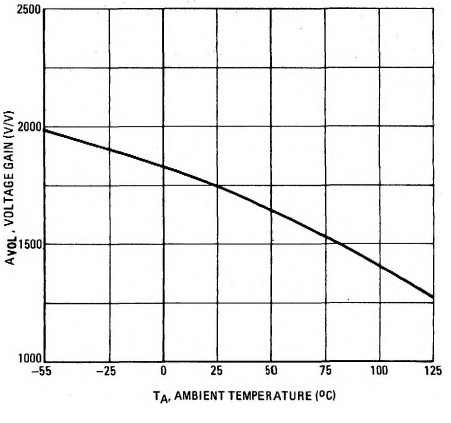


FIGURE 7 – RESPONSE TIME

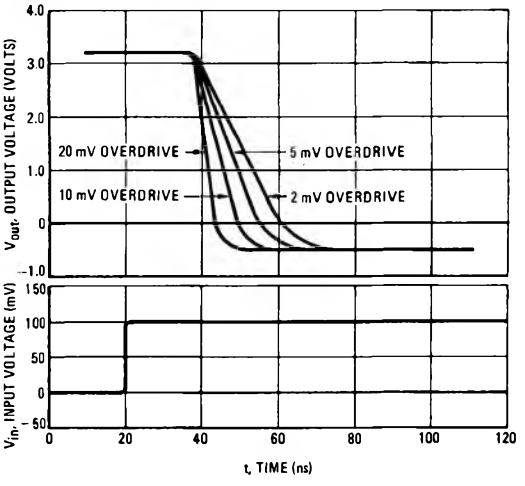


FIGURE 8 – POWER DISSIPATION versus TEMPERATURE

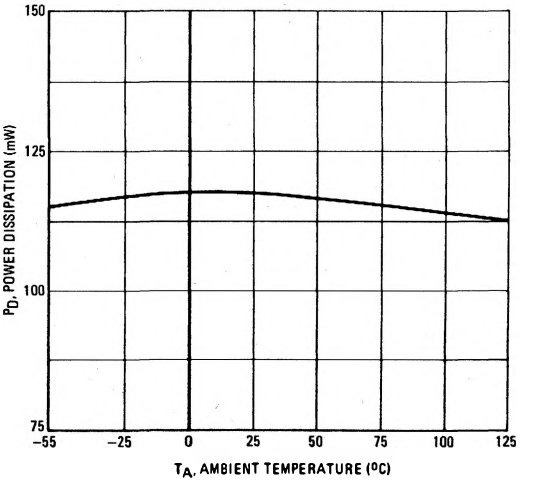


FIGURE 9 – SERIES RESISTANCE versus MRTL FAN-OUTS

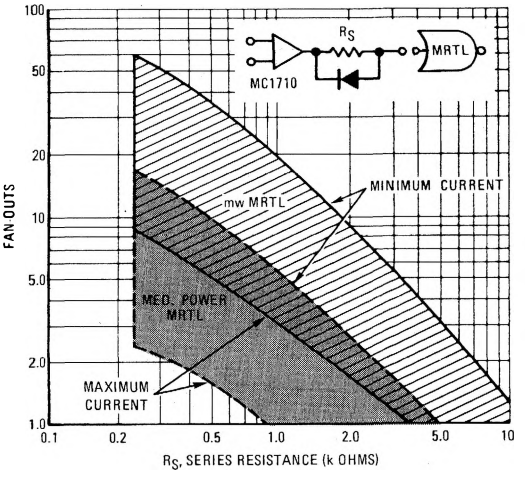


FIGURE 10 – FAN-OUT CAPABILITY WITH MDTL OR MTTL OUTPUT SWING