

MC1710 MC1710C



MOTOROLA

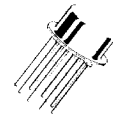
DIFFERENTIAL VOLTAGE COMPARATORS

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

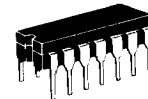
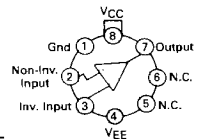
- Differential Input Characteristics –
Input Offset Voltage = 1.0 mV – MC1710
= 1.5 mV – MC1710C
Offset Voltage Drift = 3.0 $\mu\text{V}/^\circ\text{C}$ – MC1710
= 5.0 $\mu\text{V}/^\circ\text{C}$ – MC1710C
- Fast Response Time – 40 ns
- Output Compatible with all Saturating Logic Forms –
 $V_O = +3.2\text{ V}$ to -0.5 V (Typ)
- Low Output Impedance – 200 Ohms

DIFFERENTIAL COMPARATORS

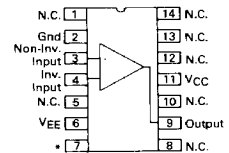
**SILICON MONOLITHIC
INTEGRATED CIRCUIT**



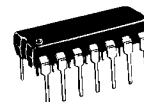
**G SUFFIX
METAL PACKAGE
CASE 601-04**



**L SUFFIX
CERAMIC PACKAGE
CASE 632-02
MO-001AA**



*Connected to pin 6 via the substrate on some plastic units.

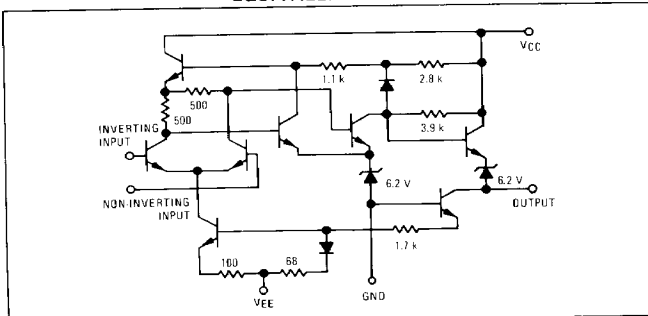


**P SUFFIX
PLASTIC PACKAGE
CASE 646-05
(MC1710C Only)**

MAXIMUM RATINGS ($T_A = +25^\circ\text{C}$ unless otherwise noted.)

Rating	Symbol	Value	Unit
Power Supply Voltage	$V_{CC}(\text{max})$ $V_{EE}(\text{max})$	+14 -7.0	Vdc Vdc
Differential Input Signal Voltage	V_{ID}	± 5.0	Volts
Common Mode Input Swing Voltage	V_{ICR}	± 7.0	Volts
Peak Load Current	I_L	10	mA
Power Dissipation (Package Limitations)	P_D		
Metal Package		680	mW
Derate above $T_A = +25^\circ\text{C}$		4.6	mW/ $^\circ\text{C}$
Ceramic Dual In-Line Package		625	mW
Derate above $T_A = +25^\circ\text{C}$		5.0	mW/ $^\circ\text{C}$
Operating Temperature Range	T_A	-55 to +125 0 to +75	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-65 to +150	$^\circ\text{C}$

EQUIVALENT CIRCUIT



MOTOROLA LINEAR/INTERFACE DEVICES

ELECTRICAL CHARACTERISTICS ($V_{CC} = +12$ Vdc, $V_{EE} = -6.0$ Vdc, $T_A = +25^{\circ}\text{C}$ unless otherwise noted.)

Characteristic		Symbol	Min	Typ	Max	Unit
Input Offset Voltage ($V_O = 1.4$ Vdc, $T_A = +25^{\circ}\text{C}$)	MC1710	V_{IO}	—	1.0	2.0	mVdc
	MC1710C		—	1.0	5.0	
($V_O = 1.8$ Vdc, $T_A = -55^{\circ}\text{C}$)	MC1710		—	—	3.0	
($V_O = 1.0$ Vdc, $T_A = +125^{\circ}\text{C}$)	MC1710		—	—	3.0	
($V_O = 1.5$ Vdc, $T_A = 0^{\circ}\text{C}$)	MC1710C		—	—	6.5	
($V_O = 1.2$ Vdc, $T_A = +75^{\circ}\text{C}$)	MC1710C		—	—	6.5	
Temperature Coefficient of Input Offset Voltage		$\Delta V_{IO}/\Delta T$	—	3.0	—	$\mu\text{V}/^{\circ}\text{C}$
Input Offset Current ($V_O = 1.4$ Vdc, $T_A = +25^{\circ}\text{C}$)	MC1710	I_{IO}	—	1.0	3.0	μAdc
	MC1710C		—	1.0	5.0	
($V_O = 1.8$ Vdc, $T_A = -55^{\circ}\text{C}$)	MC1710		—	—	7.0	
($V_O = 1.0$ Vdc, $T_A = +125^{\circ}\text{C}$)	MC1710		—	—	3.0	
($V_O = 1.5$ Vdc, $T_A = 0^{\circ}\text{C}$)	MC1710C		—	—	7.5	
($V_O = 1.2$ Vdc, $T_A = +75^{\circ}\text{C}$)	MC1710C		—	—	7.5	
Input Bias Current ($V_O = 1.4$ Vdc, $T_A = +25^{\circ}\text{C}$)	MC1710	I_{IB}	—	12	20	μAdc
	MC1710C		—	12	25	
($V_O = 1.8$ Vdc, $T_A = -55^{\circ}\text{C}$)	MC1710		—	—	45	
($V_O = 1.0$ Vdc, $T_A = +125^{\circ}\text{C}$)	MC1710		—	—	20	
($V_O = 1.5$ Vdc, $T_A = 0^{\circ}\text{C}$)	MC1710C		—	—	40	
($V_O = 1.2$ Vdc, $T_A = +75^{\circ}\text{C}$)	MC1710C		—	—	40	
Voltage Gain ($T_A = +25^{\circ}\text{C}$)	MC1710	A_{vol}	1250	1700	—	V/V
	MC1710C		1000	1700	—	
(T _A = T _{low} to T _{high}) (1)	MC1710		1000	—	—	
	MC1710C		800	—	—	
Output Resistance		r_o	—	200	—	Ohms
Differential Voltage Range		V_{ID}	± 5.0	—	—	Vdc
Positive Output Voltage ($V_{ID} \geq 5.0$ mV, $0 \leq I_O \leq 5.0$ mA)		V_{OH}	2.5	3.2	4.0	Vdc
Negative Output Voltage ($V_{ID} \geq -5.0$ mV)		V_{OL}	-1.0	-0.5	0	Vdc
Output Sink Current ($V_{ID} \geq -5.0$ mV, $V_O \leq 0$)	MC1710	I_{Os}	2.0	2.5	—	mAdc
	MC1710C		1.6	2.5	—	
(V _{ID} $\geq$ -5.0 mV, V _O $\geq$ 0, T _A = T _{low})	MC1710		1.0	2.0	—	
	MC1710C		0.5	—	—	
Input Common-Mode Voltage Range ($V_{EE} = -7.0$ Vdc)		V_{ICR}	± 5.0	—	—	Volts
Common-Mode Rejection Ratio ($V_{EE} = -7.0$ Vdc, $R_S \leq 200$ Ohms)	MC1710	CMRR	80	100	—	dB
	MC1710C		70	100	—	
Propagation Delay Time for Positive and Negative Going Input Pulse ($V_{ID} = 5.0$ mV + V_{IO})		t_{PLH} t_{PHL}	— —	40 35	— —	ns
Power Supply Current ($V_O \leq 0$)		I_{D+} I_{D-}	— —	6.4 5.5	9.0 7.0	mAdc
Power Consumption		P_D	—	115	150	mW

(1) T_{low} = -55°C for MC1710, 0°C for MC1710C
T_{high} = +125°C for MC1710, +75°C for MC1710C

TYPICAL CHARACTERISTICS

FIGURE 1 – VOLTAGE TRANSFER CHARACTERISTICS

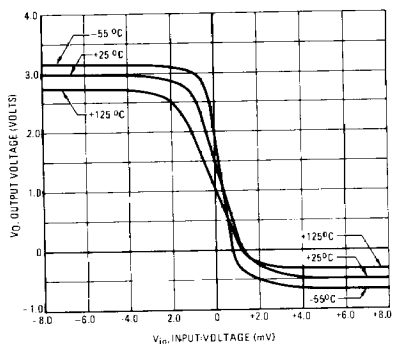


FIGURE 3 – INPUT OFFSET CURRENT versus TEMPERATURE

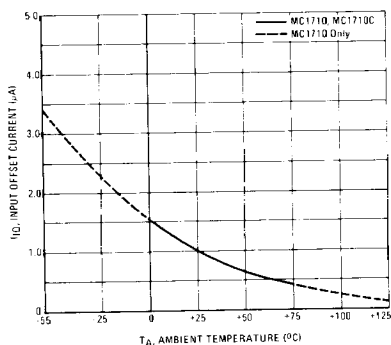


FIGURE 5 – GAIN VARIATION WITH POWER SUPPLY VOLTAGE

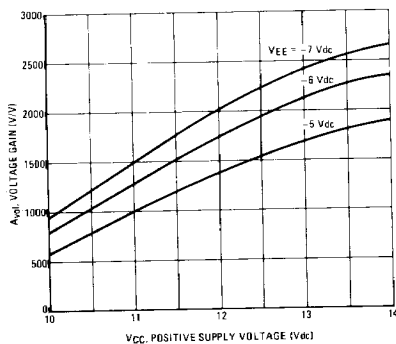


FIGURE 2 – INPUT OFFSET VOLTAGE versus TEMPERATURE

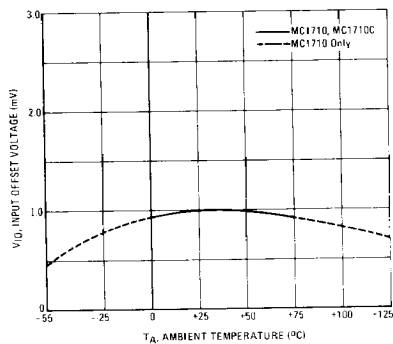


FIGURE 4 – INPUT BIAS CURRENT versus TEMPERATURE

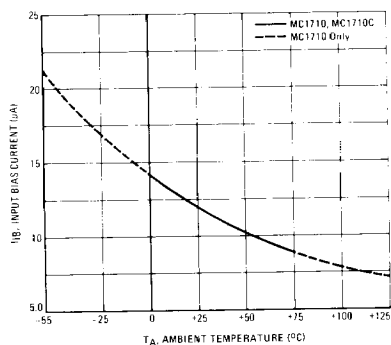
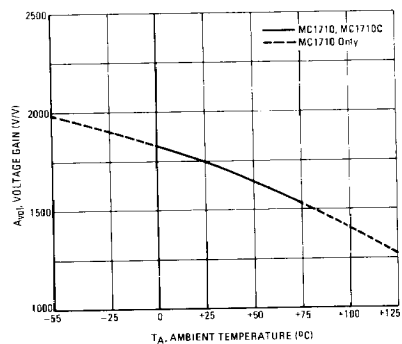


FIGURE 6 – VOLTAGE GAIN versus TEMPERATURE



TYPICAL CHARACTERISTICS (Continued)

FIGURE 7 – RESPONSE TIME

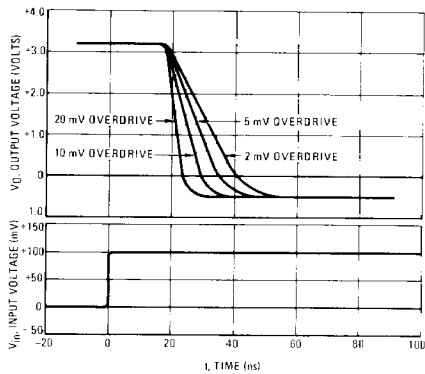


FIGURE 8 – POWER DISSIPATION versus TEMPERATURE

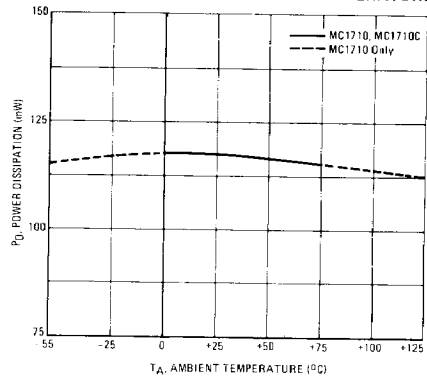


FIGURE 9 – RECOMMENDED SERIES RESISTANCE versus MRTL LOADS

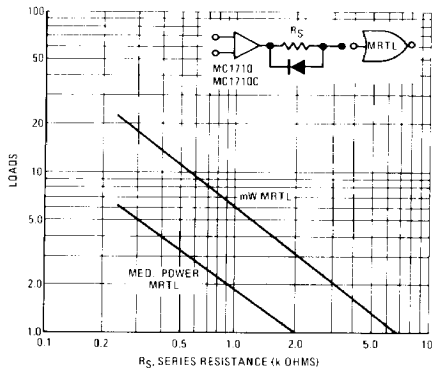


FIGURE 10 – FAN-OUT CAPABILITY WITH MDTL OR MTTL OUTPUT SWING

