

MC1414L

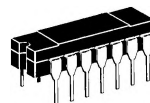
DUAL DIFFERENTIAL COMPARATOR

MONOLITHIC DUAL DIFFERENTIAL VOLTAGE COMPARATOR

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

Typical Amplifier Features:

- Two Separate Outputs
- Strobe Capability
- High Output Sink Current — 1.6 mA min Each Comparator
- Differential Input Characteristics:
Input Offset Voltage = 1.5 mV
Offset Voltage Drift = 5.0 $\mu\text{V}/^\circ\text{C}$
- Short Propagation Delay Time — 40 ns
- Output Compatible with All Saturating Logic Forms
 $V_{\text{out}} = +3.2 \text{ V to } -0.5 \text{ V typical}$

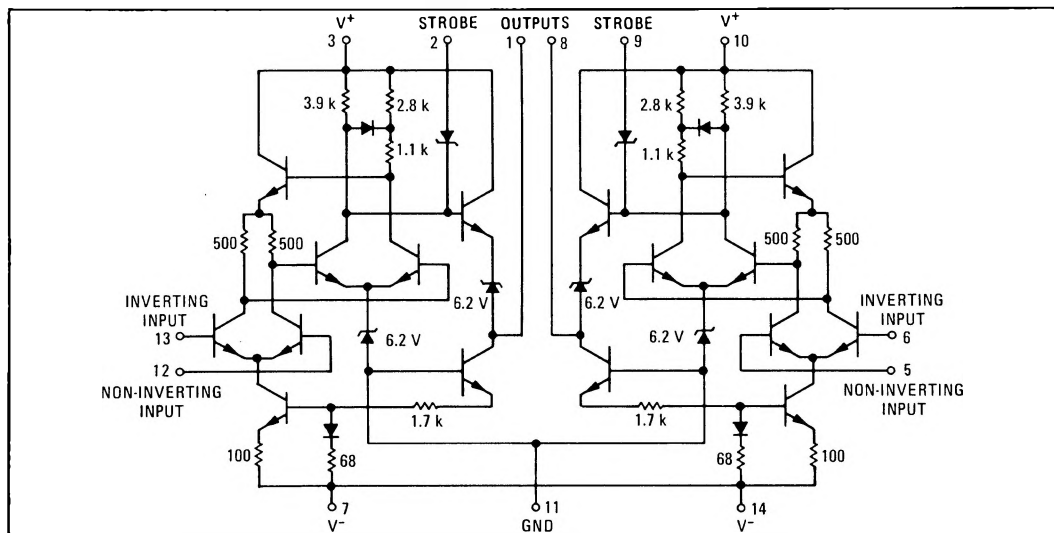


L SUFFIX
CERAMIC PACKAGE
CASE 632
TO-116

MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ 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) Ceramic Dual In-Line Package Derate above $T_A = 50^\circ\text{C}$	P_D	750 6.0	mW mW/ $^\circ\text{C}$
Operating Temperature Range	T_A	0 to +75	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-65 to +150	$^\circ\text{C}$

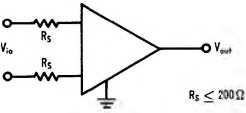
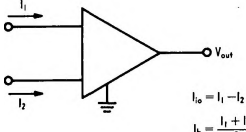
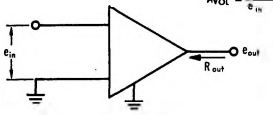
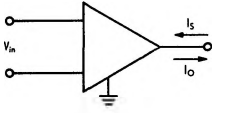
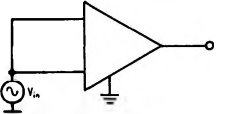
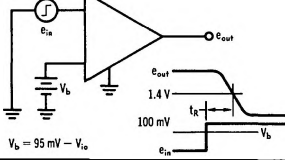
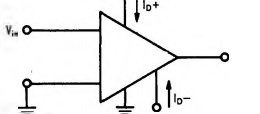
CIRCUIT SCHEMATIC



See Packaging Information Section for outline dimensions.

MC1414L (continued)

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

Characteristic Definitions (Linear operation)	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 = 0°C V _{out} = 1.0 Vdc, T _A = +75°C	V _{io}	-	1.5	5.0	mVdc
	Temperature Coefficient of Input Offset Voltage	TC _{Vio}	-	5.0	-	μV/°C
	Input Offset Current V _{out} = 1.4 Vdc, T _A = 25°C V _{out} = 1.8 Vdc, T _A = 0°C V _{out} = 1.0 Vdc, T _A = +75°C	I _{io}	-	1.0	5.0	μAdc
	Input Bias Current V _{out} = 1.4 Vdc, T _A = 25°C V _{out} = 1.8 Vdc, T _A = 0°C V _{out} = 1.0 Vdc, T _A = +75°C	I _b	-	15	25	μAdc
			-	18	40	
			-	-	40	
	Open Loop Voltage Gain T _A = 25°C T _A = 0 to +75°C	A _{VOL}	1000 800	1500	-	V/V
	Output Resistance	R _{out}	-	200	-	ohms
	Differential Voltage Range	V _{in}	±5.0	-	-	Vdc
	Positive Output Voltage V _{in} ≥ 5.0 mV, 0 ≤ I _O ≤ 5.0 mA	V _{OH}	2.5	3.2	4.0	Vdc
	Negative Output Voltage V _{in} ≥ -5.0 mV	V _{OL}	-1.0	-0.5	0	Vdc
	Output Sink Current V _{in} ≥ -5.0 mV, V _{out} ≥ 0, T _A = 0 to +75°C	I _s	1.6	2.5	-	mAdc
	Input Common Mode Range V ⁻ = -7.0 Vdc	CMV _{in}	±5.0	-	-	Volts
	Common Mode Rejection Ratio V ⁻ = -7.0 Vdc, R _S ≤ 200 Ω	CM _{rej}	70	100	-	dB
	Propagation Delay Time For Positive and Negative Going Input Pulse	t _{pd}	-	40	-	ns
	Total Power Supply Current V _{out} ≤ 0 Vdc	I _D ⁺ I _D ⁻	-	12.8 11	18 14	mAdc
	Total Power Consumption		-	230	300	mW

MC1414L (continued)

TYPICAL CHARACTERISTICS
(Each Comparator)

FIGURE 1 – VOLTAGE TRANSFER CHARACTERISTICS

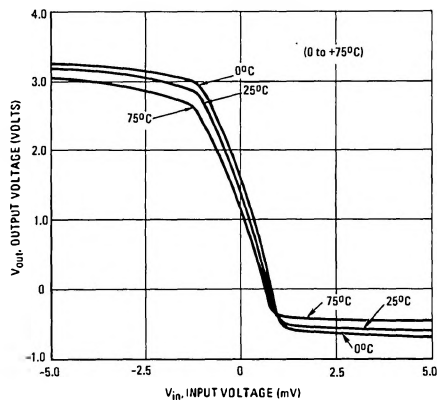


FIGURE 2 – INPUT OFFSET VOLTAGE versus TEMPERATURE

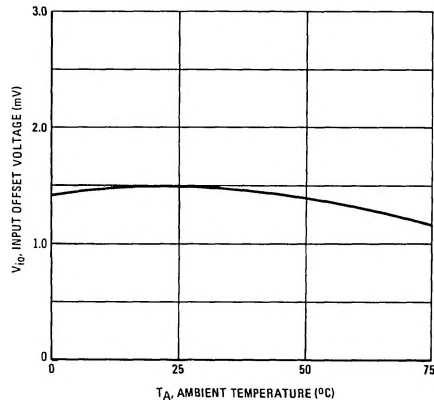


FIGURE 3 – INPUT OFFSET CURRENT versus TEMPERATURE

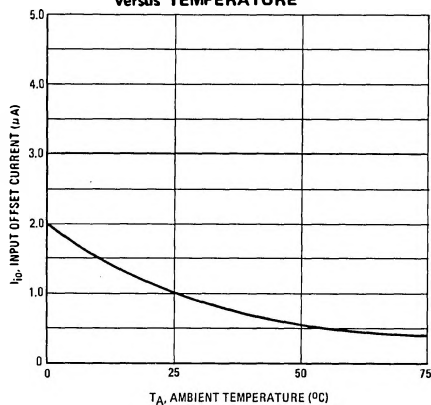


FIGURE 4 – INPUT BIAS CURRENT versus TEMPERATURE

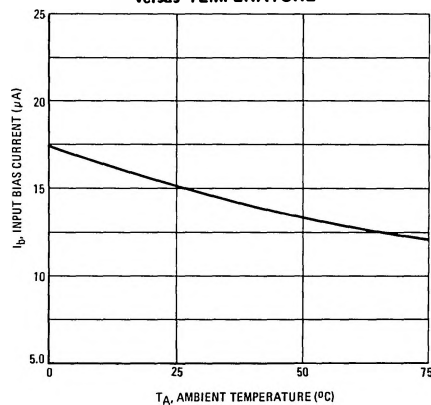


FIGURE 5 – GAIN VARIATION WITH POWER SUPPLY VOLTAGE

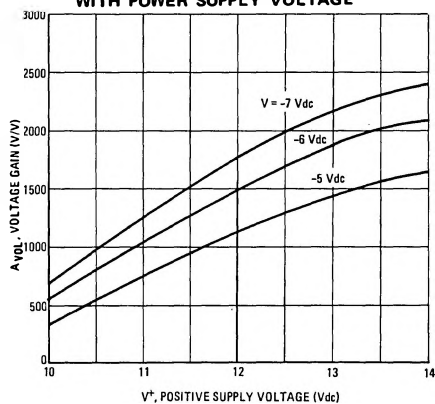
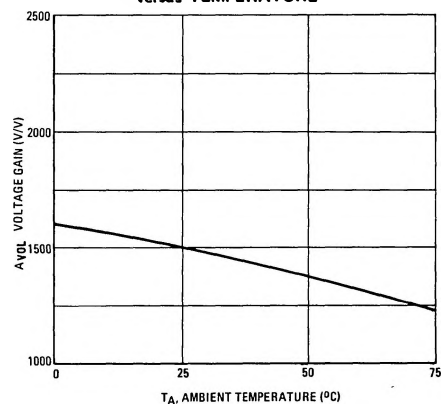


FIGURE 6 – VOLTAGE GAIN versus TEMPERATURE



MC1414L (continued)

FIGURE 7 – RESPONSE TIME

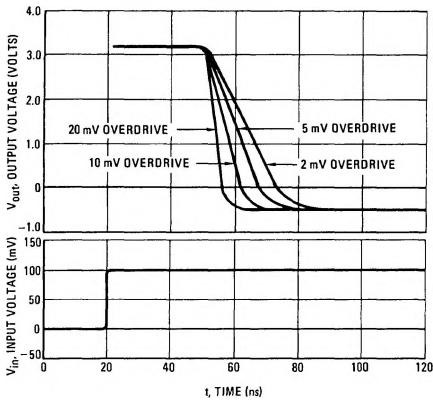


FIGURE 8 – POWER DISSIPATION
versus TEMPERATURE

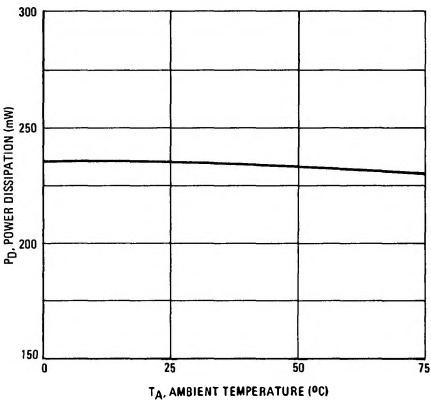


FIGURE 9 – RECOMMENDED SERIES RESISTANCE
versus MRTL LOADS

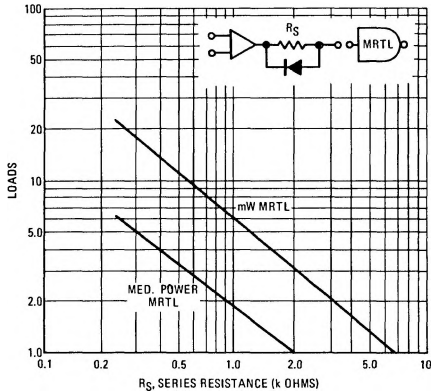


FIGURE 10 – SINK CURRENT versus TEMPERATURE

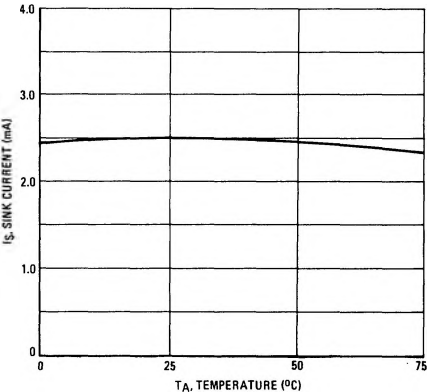
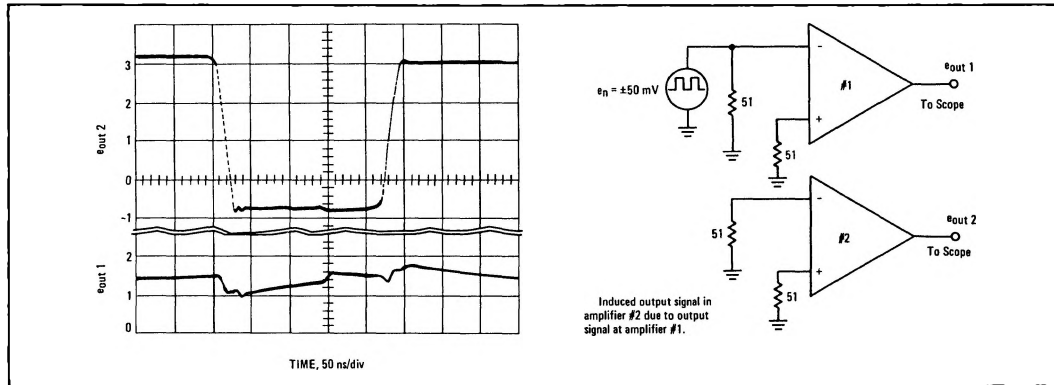


FIGURE 11 – CROSSTALK†



†Worst case condition shown – no load.