

LM2900, LM3900 For Specifications, See MC3301 Data.

LM2901 For Specifications, See LM139 Data.

LM2902 For Specifications, See LM124 Data.

LM2903 For Specifications, See LM193

LM2904 For Specifications, See LM158

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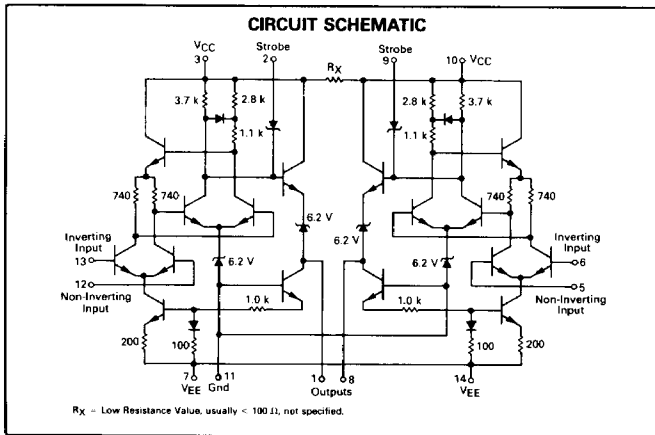
DUAL DIFFERENTIAL VOLTAGE COMPARATOR

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

- Two Separate Outputs
- Strobe Capability
- High Output Sink Current
2.8 mA Minimum (Each Comparator) for MC1514
1.6 mA Minimum (Each Comparator) for MC1414
- Differential Input Characteristics
Input Offset Voltage = 1.0 mV for MC1514
= 1.5 mV for MC1414
Offset Voltage Drift = 3.0 $\mu\text{V}/^\circ\text{C}$ for MC1514
= 5.0 $\mu\text{V}/^\circ\text{C}$ for MC1414
- Short Propagation Delay Time — 40 ns Typical
- Output Compatible with All Saturating Logic Forms
 $V_O = +3.2\text{ V to } -0.5\text{ V Typical}$

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

Rating	Symbol	Value	Unit
Power Supply Voltages	V_{CC} V_{EE}	+ 14 - 7.0	Vdc
Differential Mode Input Voltage Range	V_{IDR}	± 5.0	Vdc
Common Mode Input Voltage Range	V_{ICR}	± 7.0	Vdc
Peak Load Current	I_L	10	mA
Power Dissipation (Package Limitation)	P_D	1000 6.0 625 5.0	mW mW/ $^\circ\text{C}$ mW mW/ $^\circ\text{C}$
Operating Temperature	T_A	- 55 to + 125 0 to + 75	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	- 65 to + 150	$^\circ\text{C}$



**MC1414
MC1514**

**DUAL
DIFFERENTIAL
COMPARATOR**

(DUAL MC1710)

**SILICON MONOLITHIC
INTEGRATED CIRCUIT**



L SUFFIX
CERAMIC PACKAGE
CASE 632

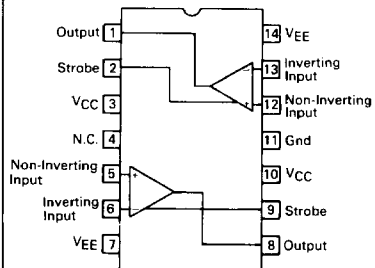


P SUFFIX
PLASTIC PACKAGE
CASE 646
(MC1414 Only)



D SUFFIX
PLASTIC PACKAGE
CASE 751A
(SO-14)
(MC1414 Only)

PIN CONNECTIONS



MC1414, MC1514

ELECTRICAL CHARACTERISTICS (V_{CC} = +12 Vdc, V_{EE} = -6.0 Vdc, T_A = 25°C unless otherwise noted.) (Each Comparator)

Characteristic	Symbol	MC1514			MC1414			Unit
		Min	Typ	Max	Min	Typ	Max	
Input Offset Voltage (V _O = 1.4 Vdc, T _A = 25°C) (V _O = 1.8 Vdc, T _A = T _{low} *) (V _O = 1.0 Vdc, T _A = T _{high} *)	V _{IO}	—	1.0	2.0	—	1.5	5.0	mVdc
Temperature Coefficient of Input Offset Voltage	ΔV _{IO} /ΔT	—	3.0	—	—	5.0	—	μV/°C
Input Offset Current (V _O = 1.4 Vdc, T _A = 25°C) (V _O = 1.8 Vdc, T _A = T _{low}) (V _O = 1.0 Vdc, T _A = T _{high})	I _{IO}	—	1.0	3.0	—	1.0	5.0	μAdc
Input Bias Current (V _O = 1.4 Vdc, T _A = 25°C) (V _O = 1.8 Vdc, T _A = T _{low}) (V _O = 1.0 Vdc, T _A = T _{high})	I _{IB}	—	12	20	—	15	25	μAdc
Open Loop Voltage Gain (T _A = 25°C) (T _A = T _{low} to T _{high})	A _{Vol}	1250 1000	1700 —	— —	1000 800	1500 —	— —	V/V
Output Resistance	R _O	—	200	—	—	200	—	Ohms
Differential Voltage Range	V _{IDR}	±5.0	—	—	±5.0	—	—	Vdc
High Level Output Voltage (V _{ID} ≥ 5.0 mV, 0 ≤ I _O ≤ 5.0 mA)	V _{OH}	2.5	3.2	4.0	2.5	3.2	4.0	Vdc
Low Level Output Voltage (V _{ID} ≥ -5.0 mV, I _{OS} = 2.8 mA) (V _{ID} ≥ -5.0 mV, I _{OS} = 1.6 mA)	V _{OL}	-1.0 —	-0.5 —	0 —	— -1.0	— -0.5	— 0	Vdc
Output Sink Current (V _{ID} ≥ -5.0 mV, V _{OL} ≤ 0.4 V, T _A = T _{low} to T _{high})	I _{OS}	2.8	3.4	—	1.6	2.5	—	mAdc
Input Common Mode Voltage Range (V _{EE} = -7.0 Vdc)	V _{ICR}	±5.0	—	—	±5.0	—	—	Vdc
Common-Mode Rejection Ratio (V _{EE} = -7.0 Vdc, R _S ≤ 200 Ω)	CMRR	80	100	—	70	100	—	dB
Strobe Low Level Current (V _{IL} = 0)	I _{IL}	—	—	2.5	—	—	2.5	mA
Strobe High Level Current (V _{IH} = 5.0 Vdc)	I _{IH}	—	—	1.0	—	—	1.0	μA
Strobe Disable Voltage (V _{OL} ≤ 0.4 Vdc)	V _{IL}	—	—	0.4	—	—	0.4	Vdc
Strobe Enable Voltage (V _{OH} ≥ 2.4 Vdc)	V _{IH}	3.5	—	6.0	3.5	—	6.0	Vdc
Propagation Delay Time (Figure 1)	t _{PLH} t _{PHL}	—	20 40	—	—	20 40	—	ns
Strobe Response Time (Figure 2)	t _{so} t _{sr}	—	15 6.0	—	—	15 6.0	—	ns
Total Power Supply Current, Both Comparators (V _O ≤ 0)	I _{CC} I _{EE}	—	12.8 11	18 14	—	12.8 11	18 14	mAdc
Total Power Consumption, Both Comparators	P _D	—	230	300	—	230	300	mW

*T_{low} = -55°C for MC1514, 0°C for MC1414
T_{high} = +125°C for MC1514, +75°C for MC1414

FIGURE 1 — PROPAGATION DELAY TIME

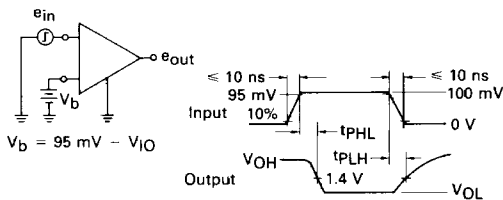
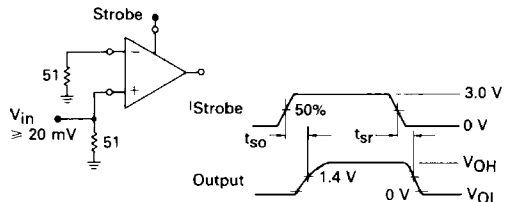


FIGURE 2 — STROBE RESPONSE TIME



MC1414, MC1514

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TYPICAL CHARACTERISTICS (Each Comparator)

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FIGURE 3 — VOLTAGE TRANSFER CHARACTERISTICS

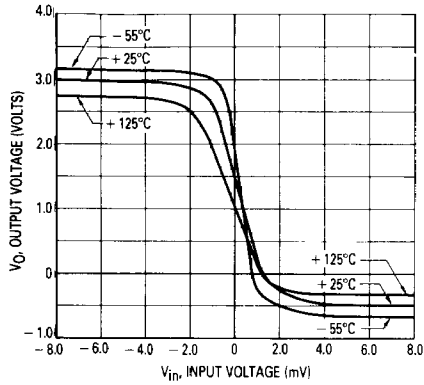


FIGURE 4 — INPUT OFFSET VOLTAGE versus TEMPERATURE

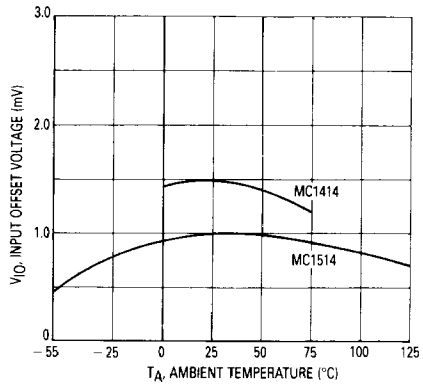


FIGURE 5 — INPUT OFFSET CURRENT versus TEMPERATURE

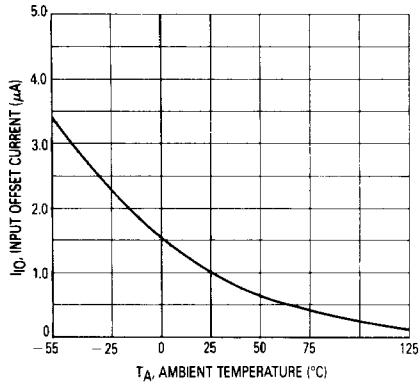


FIGURE 6 — INPUT BIAS CURRENT versus TEMPERATURE

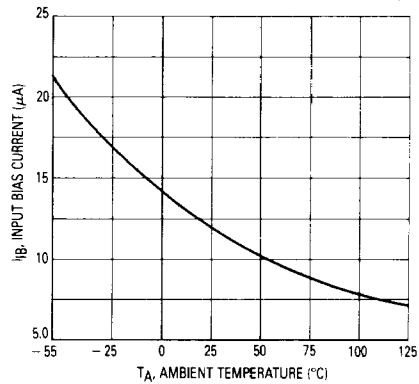


FIGURE 7 — GAIN VARIATION WITH POWER SUPPLY VOLTAGE

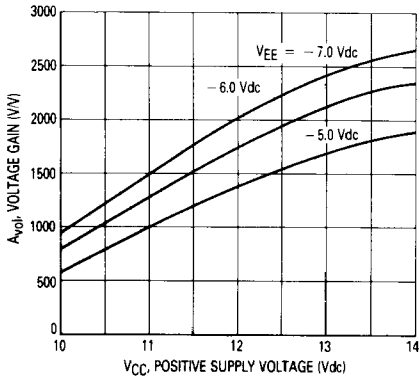
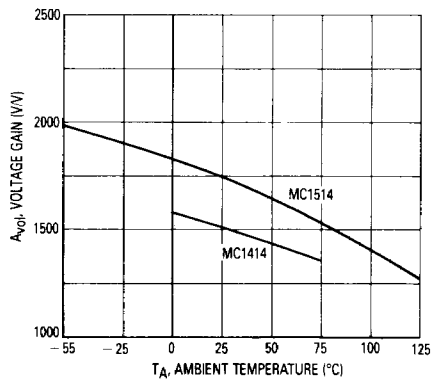


FIGURE 8 — VOLTAGE GAIN versus TEMPERATURE



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FIGURE 9 — RESPONSE TIME

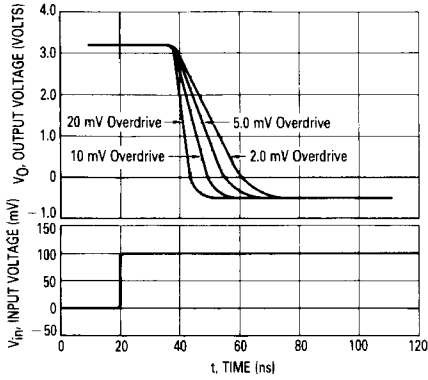


FIGURE 10 — POWER DISSIPATION versus TEMPERATURE

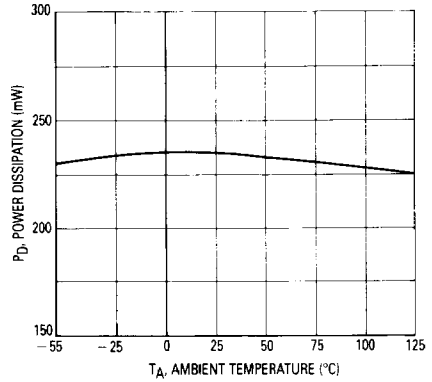


FIGURE 11 — RECOMMENDED SERIES RESISTANCE versus MRTL LOADS

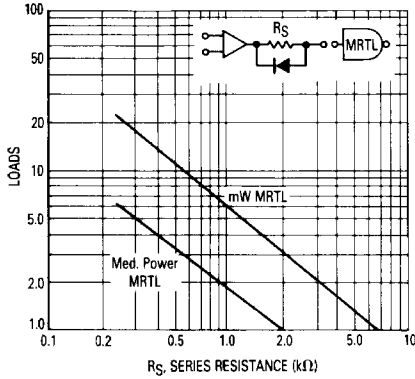


FIGURE 12 — SINK CURRENT versus TEMPERATURE

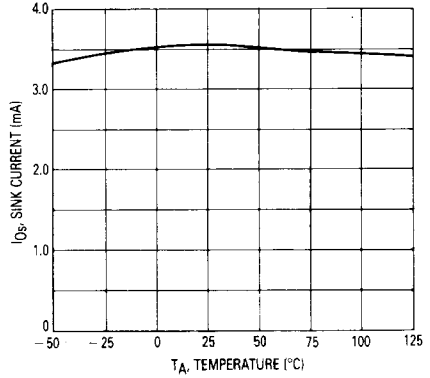


FIGURE 13 — CROSSTALK†

