

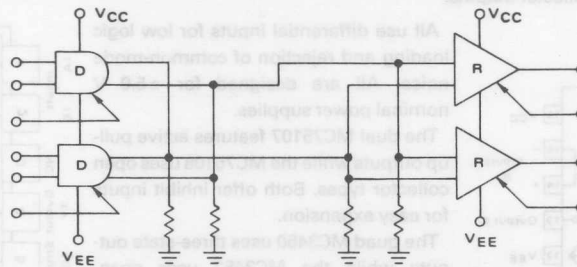
DIFFERENTIAL CURRENT-MODE SYSTEM

An unofficial standard for data transmission over generous lengths of either twisted-pair or coaxial cable. Lengths up to a mile are practical.

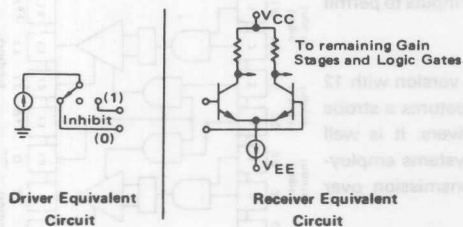
A current source (or sink) is switched between the pair of lines in response to the applied input logic condition. The current sources are designed to operate over a wide range of voltage compliance. Party line systems employing several drivers are configured by shutting off all but one of the current sources with appropriate Enable inputs.

Differential receivers are employed to detect the voltage generated by the driver current flowing through the required termination resistors. Differential receivers can sense correctly a few millivolts even when superimposed on up to ± 3.5 V of common mode noise.

A unidirectional, current-mode system generally employing split power supplies for both driver and receiver. Party-lines systems may be configured easily.



CURRENT MODE	
DRIVERS	
Configuration	Switched Current Source, Differential Lines
Output Current	6 or 12 mA nominal
Output Compliance Range	-3.0 V to +10 V
Output Leakage Current	100 μ A max
RECEIVERS	
Configuration	Differential Amplifier Input; Open Collector or Active Pull-up Outputs
Input Thresholds	± 25 mV max
Common Mode Range	± 3.0 V max
Differential Voltage Range	± 5.0 V max
Input Current ($V_{ID} = 0.5$ V, $V_{IC} = \pm 3.0$ V) ($V_{ID} = -2.0$ V, $V_{IC} = \pm 3.0$ V)	75 μ A max -10 μ A



For longer cable lengths or noisier environments, the added noise immunity available with differential mode systems is highly desirable. This system is satisfactory for line lengths beyond a mile. In a current-mode system, an active current source is switched between one or the other of two lines. A differential input receiver that rejects noise appearing common mode to both inputs is often used. Thus, the receiver can guarantee a given logic output with only ± 20 mV of differential signal despite up to ± 3.5 V of common mode noise. By inhibiting the current source on unused drivers, party line systems with multiple drivers and receivers can be constructed sharing a single pair of lines, thus saving considerable hardware in many systems.

SUGGESTED ICs FOR IMPLEMENTATION

Quad Devices:

$T_A = 0$ to 70°C

Package: P Suffix - Case 648

Dual Devices:

$T_A = 0$ to 70°C

Package: P Suffix - Case 646

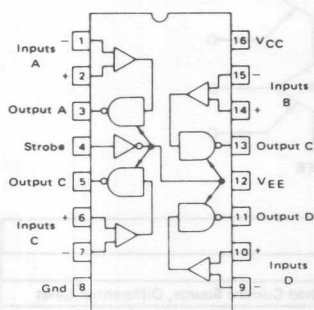
RECEIVERS

MC3450 - Quad; active pull-up outputs; common three-state enable.

MC3452 - Quad; open collector outputs.

MC75107 - Dual; active pull-up output.

MC75108 - Dual; open collector output.

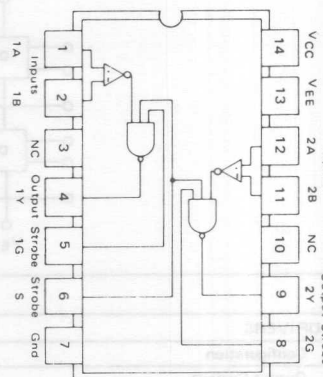


All use differential inputs for low logic loading and rejection of common-mode noise. All are designed for ± 5.0 V nominal power supplies.

The dual MC75107 features active pull-up outputs while the MC75108 uses open collector types. Both offer inhibit inputs for easy expansion.

The quad MC3450 uses three-state outputs while the MC3452 uses open-collector outputs. Both have a single enable input for expansion/three-state bus capability.

Second source available for 75107-108. Second source for MC3450-52 is DS3650-52.

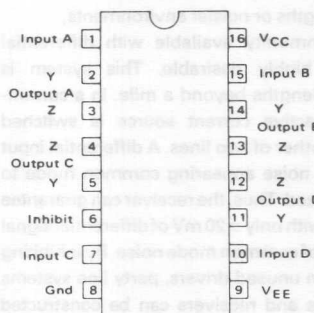


ALL RECEIVERS

Input V_{TH} mV Max	I_{IH} @ $V_{ID} = 0.5$ V μA Max	I_{IL} @ $V_{ID} = -2.0$ V μA Max	t_{PLH} ns Max
± 25	75	-10	25

DRIVERS

MC3453 - Quad; common inhibit input; current sink approximately 12 mA.

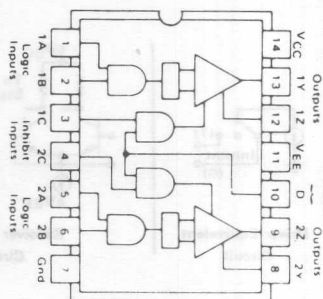


The MC75S110 is a 12 mA dual current mode driver, with strobe inputs to permit party-line systems.

The MC3453 is a quad version with 12 mA current sources. It features a strobe common to all four drivers. It is well suited to high-density systems employing bit-parallel data transmission over long line lengths.

Second sources available for MC75S110 type.

MC75S110 - Dual; industry standard.



BOTH DRIVERS

I_O (on) mA Min	I_O (off) μA Max	t_{PHL} ns Max
6.5	100	15