DM7214/DM8214 tri-state dual 4:1 multiplexer

general description

The DM7214/DM8214 is pin-compatible with the DM54153/DM74153 dual 4:1 multiplexer, but has tri-state TTL outputs. These outputs can be bus-connected in large numbers, permitting expansion without pullup resistors or submultiplexers. Features include:

- Operates as dual 4:1 or single 8:1 multiplexer
- DM7214 may be connected 40-wide for expansion up to 160-line-to-1-line multiplexer
- DM8214 may be connected 128-wide for expansion up to 512-line-to-1-line multiplexer
- Output source current is −5.2 mA and sink current is 16 mA over the industrial temperature range, and −2 mA and 16 mA over the military temperature range
- Typical propagation delays of 20 ns
- High noise immunity and line-drive capability
- Complete compatibility with TTL devices in the 54/74 series and compatibility with DTL.

operation

For operation in the dual mode, four input data channels are connected to the A inputs and four channels to the B inputs. A common 2-bit address selects the A input switched to the A output and the B input switched to the B output. Either output is enabled with an "0" level strobe on that side or disabled by a "1" level strobe on that side. This permits 8-line-to-1-line operation if the two outputs are connected and alternately enabled while eight input data channels are applied to the A and B inputs.

The enabled states of the DM7214/DM8214 are the normal TTL "1" and "0" logic states. Outputs have active pullup when enabled, providing the low impedance, high fanout, speed and noise immunity of active-pullup TTL. However, when disabled, the outputs switch into a third, high-impedance state that permits only a maximum leakage current of 40 μA to flow regardless of the input data states. An enabled DM7214 output will supply leakage current to at least 39 outputs in the high-impedance state on the same output line and an enabled DM8214 output will supply leakage current into at least 127 high-impedance outputs, while driving at least three TTL loads.

Tri-state outputs therefore allow up to 40 DM7214 or 128 DM8214 outputs to be connected to one output data line without pullup resistors or significant degradation of data transfer rates. Fanout increases up to 10 if fewer outputs are connected. Noise immunity and length of lines that can be driven are generally much greater than provided by standard TTL outputs.

connection diagram