

# DALLAS SEMICONDUCTOR

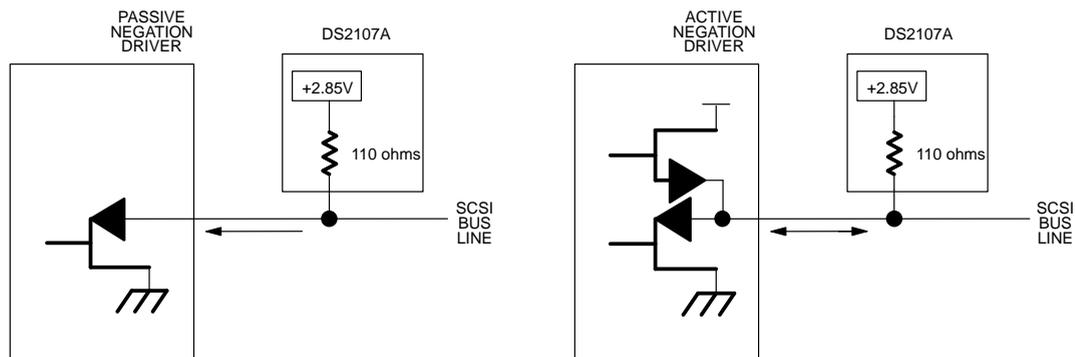
## Application Note 73 DS2107A Active Negation

The DS2107A is used in SCSI systems to provide active termination for 9 signal lines. In the typical 8 bit-wide data configuration (A cable), two DS2107A's are required to fully terminate the bus (9 control lines + 8 data lines + 1 parity line). In the 16-bit wide data configuration (P cable), three DS2107A's are required to fully terminate the bus (9 control lines + 16 data lines + 2 parity lines). The two packages available are DS2107AS, 16-pin SOIC, and DS2107AE, 20-pin TSSOP (Thin Shrink Small Outline Package).

### WHAT IS ACTIVE NEGATION?

Active negation is a technique used by the newer SCSI-2 and SCSI-3 bus drivers on single-ended SCSI

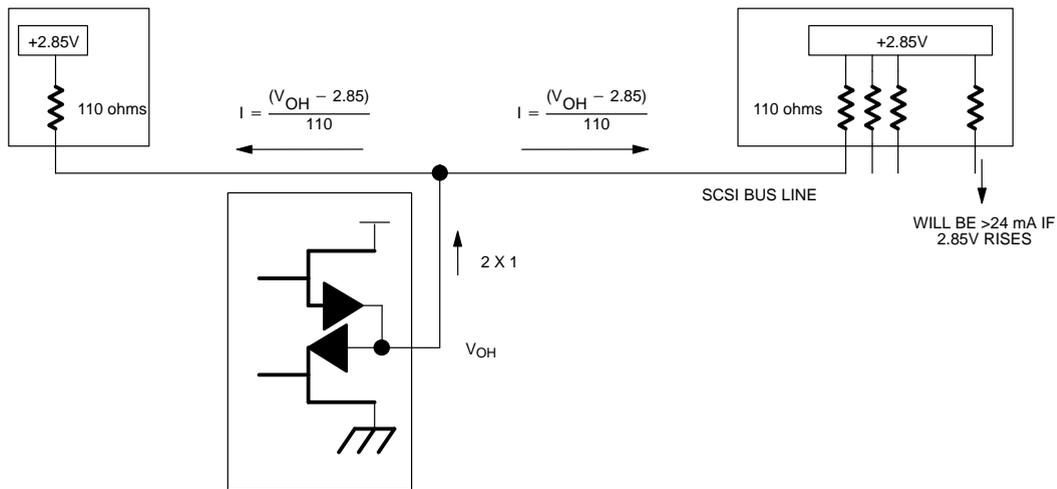
buses to insure clean monotonic transitions of the signal. Drivers employing active negation contain the ability to not only sink current but to source current as well. These drivers usually "yank" the SCSI signal to its negated state (i.e. high) by actively pulling the signal high with a driver capable of sourcing current. The SCSI-3 Parallel Interface specification states: "Additional benefit may be achieved by using active-negation drivers on the DATA BUS and parity signals when operating in fast synchronous data transfer mode by reducing the skews between the first group of signals (ACK, REQ, ACKQ, REQQ) and the DATA BUS and parity signals."



### WHY MUST TERMINATORS BE ABLE TO HANDLE ACTIVE NEGATION?

When a driver actively negates an SCSI signal, the bus may be pulled higher than the termination voltage present in the active terminators. If this occurs, current will begin flowing into the regulated 2.85V termination voltage. If the active terminator cannot sink all of the current that is being sourced by the driver, then it will begin to raise above its nominal 2.85V termination voltage which

will result in current greater than the 24 mA being sourced on the other SCSI bus signals being shared by the active terminator (which violates the SCSI specifications). Since drivers can be placed at any point along the SCSI bus and terminators only exist at the physical end of the bus, all active terminators must be able to fully sink all of the current generated by the active-negation drivers.



### HOW MUCH CURRENT MUST AN ACTIVE TERMINATOR SINK?

The SCSI-3 Parallel Interface specifications allows up to 20 mA sourced current per driver line. On "by nine" termination schemes like the DS2107A, this means the terminator must be able to sink 180 mA (9 lines x 20 mA/line). The DS2107A can sink at least 200 mA, which is within this limit.