

The timing diagram illustrates the propagation of a carry signal through a 4-bit ripple-carry adder. The horizontal axis represents time in units of 2.5 ns, ranging from 0.0 to 20.0. The vertical axis represents the signal level, with a dashed line indicating the initial state (low).

- Carry-in (Blue):** A constant high signal starting at 0.0 ns, labeled with a '0' at the input.
- Sum (Orange):** The sum output for each bit. It starts at 0.0 ns, rises to a high level at 5.0 ns (labeled '5'), and rises again at 10.0 ns (labeled '8').
- Carry-out (Green):** The carry signal for each bit. It starts at 0.0 ns, rises to a high level at 5.0 ns, and falls back to low at 15.0 ns.
- Sum (Red):** The sum output for each bit. It starts at 0.0 ns, rises to a high level at 10.0 ns, and falls back to low at 12.5 ns.
- Carry-out (Purple):** The carry signal for each bit. It starts at 0.0 ns, rises to a high level at 12.5 ns, and falls back to low at 15.0 ns.
- Carry-in (Brown):** A constant low signal starting at 0.0 ns, labeled with a '3' at the input.

The diagram shows the ripple of the carry signal from the least significant bit (bit 0) to the most significant bit (bit 3). The carry signal for bit 0 is high, and the carry signal for bit 3 is low, indicating a carry-out of 0.

0.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20