SP504 & SP505: FAQ

Part Number: SP504 and SP505

Date: May 31, 2006

Question:
What are the differences between the SP504 and SP505?

Answer:
There are a number of feature and functional differences between SP504 and SP505. The SP505 is a more enhanced and more advanced device. See below for a detailed treatment of differences.

Speed

- The SP504 max data rate is 10Mbps, SP505A is also 10Mbps but SP505B is 16Mbps.

Internal Termination Networks

- SP504 requires an external 150Ω resistor on three pins {SD(b), ST(b) and TT(b)} for full compliance in V.35 mode. The SP505 has all those terminations internal. So this saves component count and space. Those resistors are not needed in other modes and must be removed for any of the V.11 modes. So more importantly, it simplifies the design of a flexible serial port because with the SP504 you would need a way to jumper in or switch in or out those resistors on the board. That may require manual jumpers, toggle switches or FET switches. The SP505 takes care of all that internally.
- SP505 has a built in 120Ω termination resistor on three receivers. The SP504 does not; users would need to add their own external termination resistor.

Latched Control Inputs

- SP505 can latch the control/configuration inputs. SP504 does not; its control inputs must either be continuously driven or latched externally

Individual Driver Enable pins

- SP505 has individual driver enable inputs on all seven drivers. These make it easier to build a flexible port that can be configured as either a DCE or DTE and for implementing many vendor-specific types of serial ports.
- SP504 has individual driver enable pins for two of its seven drivers.

Internal Loopback

- SP505 has an internal loopback feature. This can be used to help diagnose connection problems.

Advanced Failsafe

- All receivers on both devices have a basic failsafe protection that forces the receiver output to “1” if the inputs are open. SP505 has an advanced failsafe protection on its three high-speed differential drivers that put the driver output into a known state if the differential bus is open, shorted or terminated. This is a useful feature to prevent the receiver outputs from toggling if there is an unconnected or faulty cable.

Pinout and Configuration Differences

- They both go into an 80 pin QFP. Most of their pinout is the same but because of the slightly different features there are several pins different.
- Configuration inputs are different. The SP504 uses 8 pins for configuration, 4 for drivers and 4 for receivers. The SP505 uses four pins and a latch pin.
- SP505 has 8 defined operating modes matching the most popular communications protocols, plus tri-state and two loopback modes. SP504 configures the drivers and receivers using separate sets of control pins so you could potentially enter non-standard or undefined modes either intentionally or accidentally.

