

# SPI-4 Length and Signal Specification

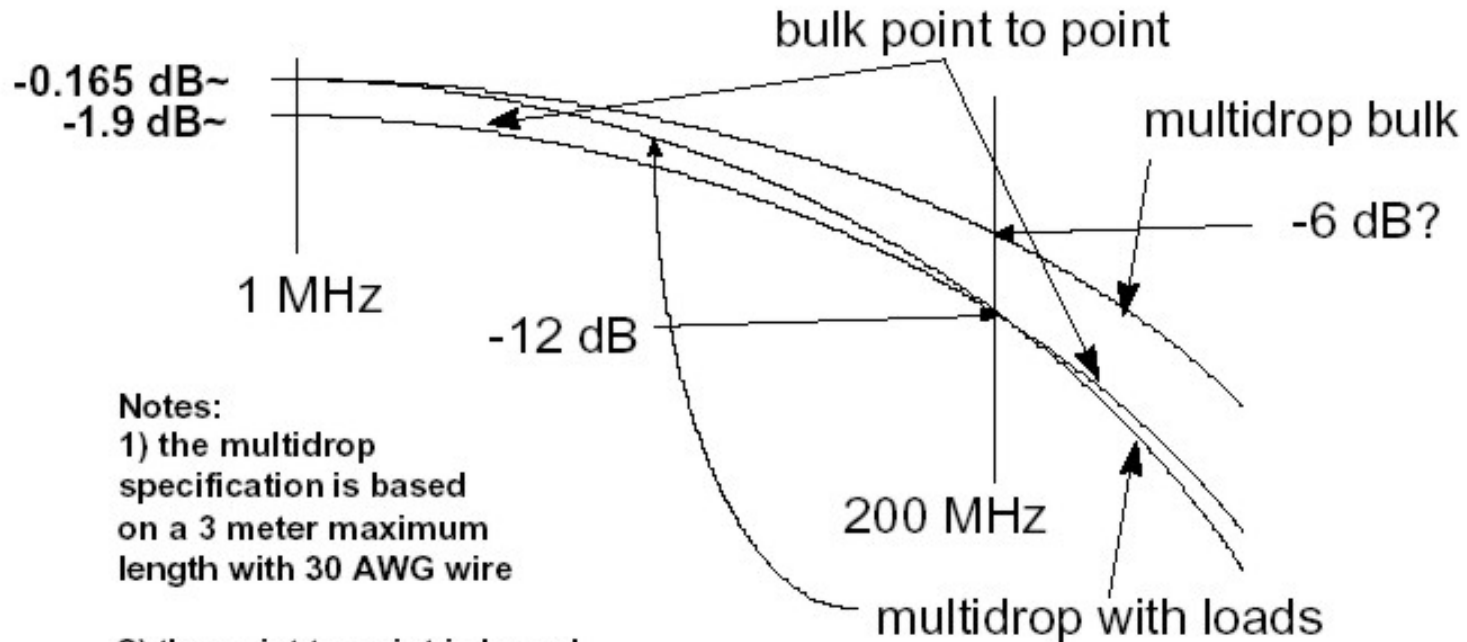
Interconnect requirements

Budget – engineering – PIP/SSM

# Interconnect Requirements

- SPI-4 specifies the Driver/Receiver Specifications
  - Interconnect must deliver to the receiver a signal level at the receiver mask.
  - Specifying loss is not the full answer for the bulk media.
    - 6 db for a loaded cable – 6 db for connectors and loads.
    - 12 db for point to point

# SPI-4 requirements



**Notes:**

1) the multidrop specification is based on a 3 meter maximum length with 30 AWG wire

2) the point to point is based on a 25 meters maximum length with 30 AWG wire

3) curve shape is  $K \cdot \text{SQRT } f$

Maximum allowable (end to end) S21 vs log frequency

# SPI-4 Table 11

Table 11 - Attenuation requirements for SCSI cable media

Distance between SCSI bus terminators (meters)	Attenuation per meter maximum (dB) at 200 MHz	Attenuation of length equivalent to terminator to terminator distance maximum (dB) at 200 MHz	Distances are consistent with these minimum size conductors when used with high quality dielectrics	Notes
0 to 9	0,63	6	0,032 4 mm <sup>2</sup> (32 AWG) solid/ 0,050 92 mm <sup>2</sup> (30 AWG) stranded	multiple loads allowed
0 to 12	0,48	6	0,050 92 mm <sup>2</sup> (30 AWG) solid/ 0,080 42 mm <sup>2</sup> (28 AWG) stranded	multiple loads allowed
>12 to 25	0,48	12	0,050 92 mm <sup>2</sup> (30 AWG) solid/ 0,080 42 mm <sup>2</sup> (28 AWG) stranded	point to point only
<p><b>Note:</b> Both the per meter and the length equivalent to the terminator to terminator spacing requirements shall be simultaneously met</p>				

# Budget for interconnect

- The frequency specified in SPI-4 may not be accurate for the signals.
  - 200 MHz points depends a lot on the dielectric characteristics
  - Length specifications without fully specifying the media limits the design engineers.
  - Leaving the requirements to PIP and SSM to model the full characteristics of the interface is a better solution.

# SPI-5 issues

- Cables may have periodic structures that will have high losses at 160 MHz, but not at 200 MHz.
  - A cable that passes the 200 MHz test may not work for Fast-320, with 160 MHz signals.
  - Swept frequency or driver to Receiver mask is better, leaving the details to PIP and SSM.