SPI-5 Cable/backplane Issues

Periodic structures

ACR

Distance versus specifications

Periodic Structure Issues

- Device spacing or connector spacing can not be quarter wavelength.
  - Common spacing for twist and flat cable is 160 MHz quarter wavelength spacing which creates a comb filter with the first notch at 160 MHz.
  - Spacing and modeling for cables and backplanes is critical.

Attenuation – Crosstalk Ratio ACR

- Some of the current cables have little or no margin at 160 and 320 MHz.
- Specifications need to be generated to insure adequate margin.
- Applies to both backplanes and cables.

Distance versus Electrical specification

- SPI-4 specifies distance without the detailed cable specification.
- If SPI-5 has distance specifications, it needs electrical specifications for the cables. It can not just be the wire gauge.
- Electrical specification is the cleanest engineering specification, but this does not meet some of the marketing requirements.

Distance versus Specifications

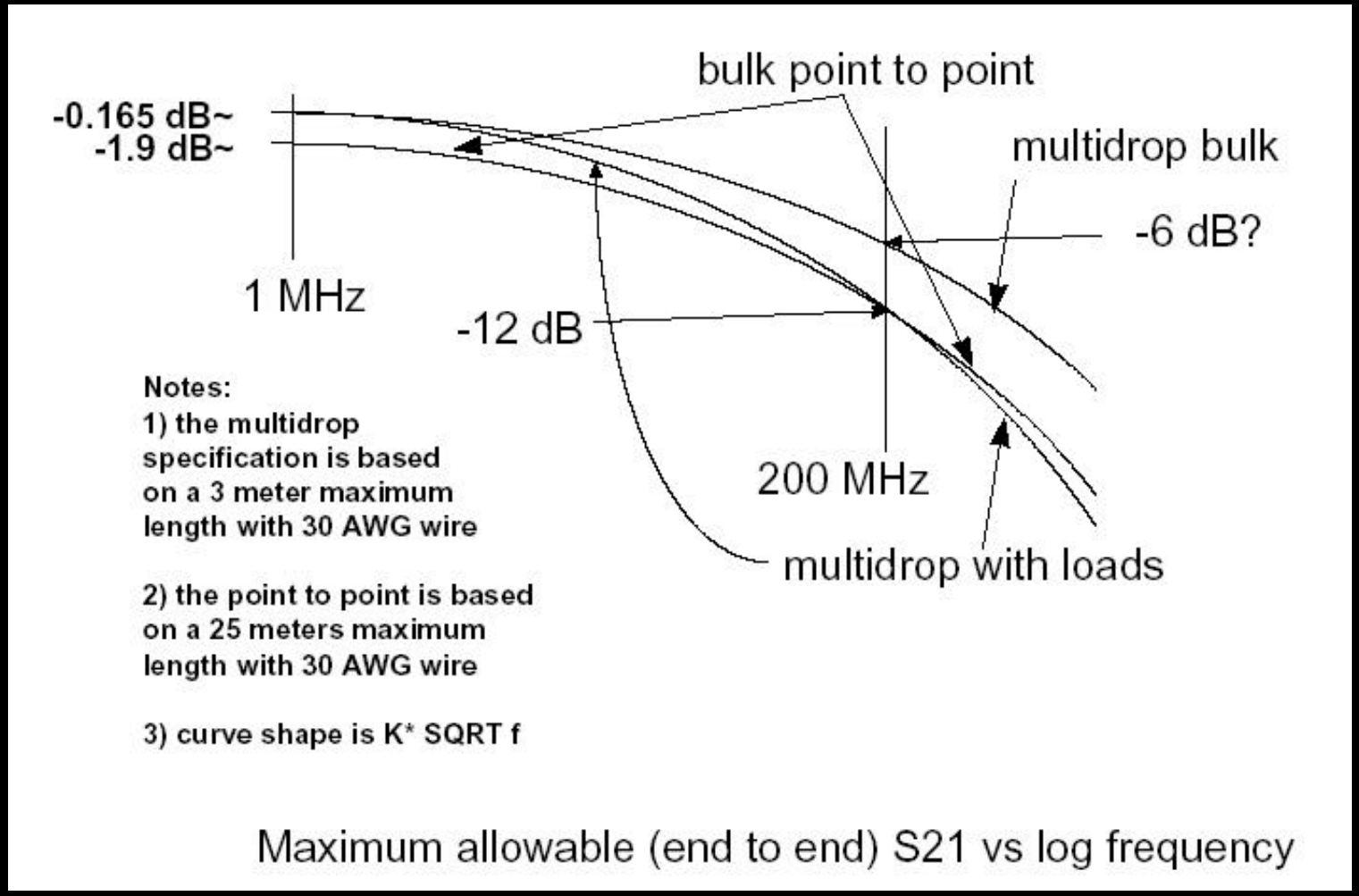
- PIP defines the testing of each of the parameters.
- Specifications for each test need to exist either in PIP or each generation of SPI.
- SPI-5 compliant cables should be for more than one generation.

Twist and flat cable 200MHz / 160MHz

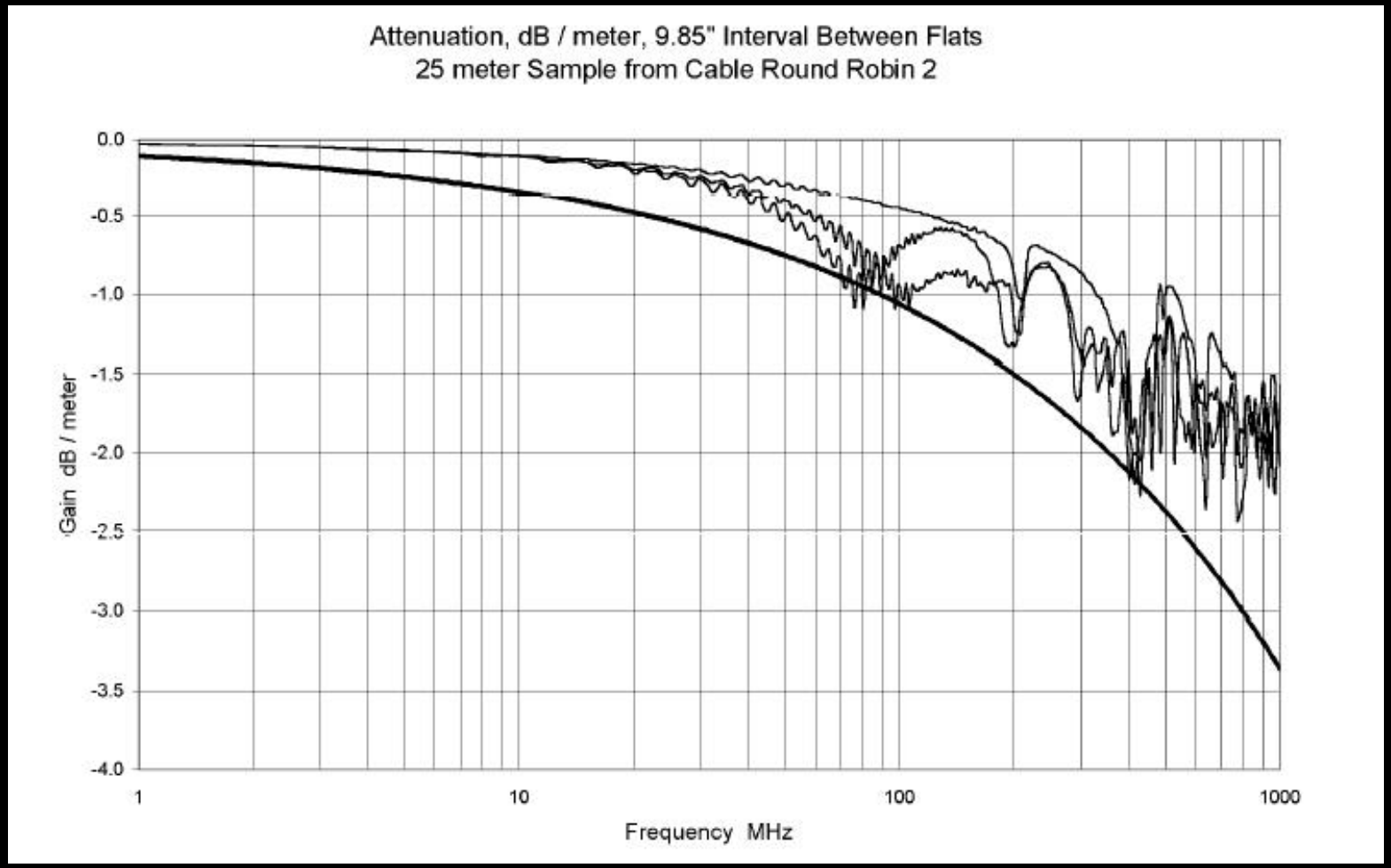
Table 21 - Attenuation requirements for SCSI bulk cable

Distance between SCSI bus segment terminators (m)	Attenuation per m 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^2 (32 AWG) solid/ 0,050 92 mm^2 (30 AWG) stranded	multiple loads allowed
0 to 12	0,48	6	0,050 92 mm^2 (30 AWG) solid/ 0,080 42 mm^2 (28 AWG) stranded	multiple loads allowed
>12 to 25	0,48	12	0,050 92 mm^2 (30 AWG) solid/ 0,080 42 mm^2 (28 AWG) stranded	point to point only
Both the per meter and the length equivalent to the terminator to terminator spacing requirements shall be simultaneously met				

Cables must match K*SQRT f for table



Twist and flat attenuation



Twist and Flat Crosstalk