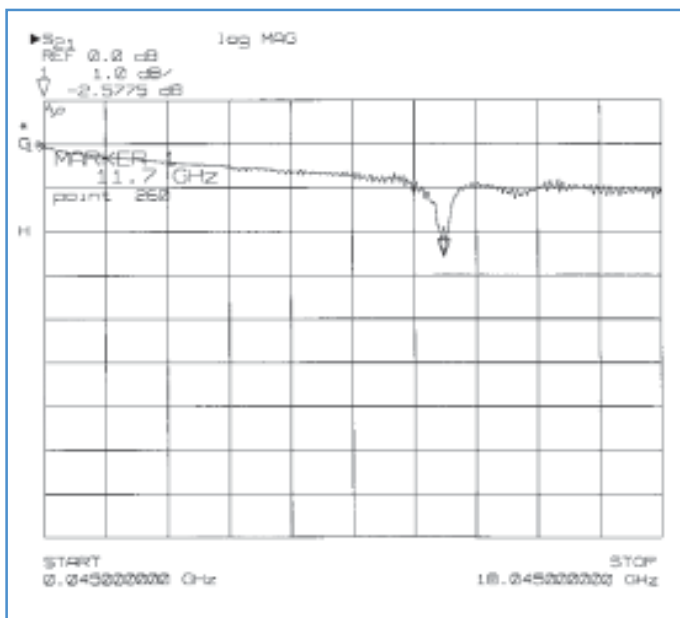


APPLICATION NOTES

A guide to the selection of RF coaxial cable *(continued)*

Fig. 3
Attenuation vs. Frequency



Attenuation Uniformity

The attenuation of any cable may not change uniformly as the frequency changes. Random and periodic impedance variations give rise to random and periodic attenuation responses. Narrow-band attenuation “spikes” such as that shown in Figure 3 can occur. If required, cables can be procured in various lengths where a maximum attenuation variation from nominal is specified over a customer defined frequency range.

Attenuation Stability

The attenuation of braided cables can increase with time and flexure. The change with time can be caused by corrosion of the braided shield, by contamination of the primary insulation due to jacket plasticizers, and by moisture penetration through the jacket. These effects can be essentially eliminated by encapsulating the braid with an appropriate flooding compound, as is done in the DB versions of the LMR cables. (Vapor penetration occurs at differing rates through all plastic and elastomeric materials.) Attenuation degradation is more pronounced at frequencies above 1 GHz. Cables having bare copper and tinned

copper braids exhibit far greater attenuation degradation than cables with silver plated braids. These effects are illustrated in Figure 5.

The following guidelines apply:

a. Tin plated braids: Below 1 GHz, cables manufactured with tin plated braids have 15-20% more attenuation than bare copper braids in the “as manufactured” condition, but are more stable than bare copper braided cables.

b. Foam polyethylene: Flexible braided cables with foam polyethylene dielectrics have approximately 15 to 40% lower attenuation than solid polyethylene cables of the same core size and impedance. However, some polyethylene foams can absorb moisture causing attenuation increases. LMR cables utilize a closed cell, non-hydroscopic foam composition and are not subject to this problem.

See LMR cables.

c. If PVC jackets are used, a Type IIA, non-contaminating PVC should be specified for applications where attenuation uniformity over time is

Fig. 4
Attenuation vs. Flexure

