The problem?
Interconnecting filters and other high-dynamic range components to other modules or components. High dynamic range means that the response characteristics are important over ratios of minimum to maximum of greater than 40 dB.

Possible Solutions?
1) Hard connections, including coaxial connectors or waveguide flanges. In this case, the size of the connectors is such as to add additional length and insertion loss to the assembly, but isolation is greater than 80 or 90 dB, to at least 18 GHz.

2) Printed circuit interfaces between the interconnected components onto or into which the filters and other modules are soldered. In this case, the P.C. board is usually a short length of microstrip, stripline, CPW, CPS or similar. The filters and modules are provided with pins carrying the RF, pins for grounding to the transmission line and means for mounting to the board or its underlying substrate. In this case, length of the assembly is essentially determined by the walls carrying the pins and the length of the printed circuit interface board, which must be at least 0.100” long for mechanical integrity. Isolation is usually limited to about 40 dB at frequencies above 4 GHz, due to radiation from the pins, the board, and the difficulties associated with grounding the filters and modules sufficiently well so that energy does not leak past the input pin and go directly to the output pin.

3) Blind-Mate connectors. RS Microwave has developed blind-mate connections (P/N 24011-3-1) that enable “plugging-in” a filter into a module. These GPO-compatible connections result in assemblies with all the advantages of hard connections and printed circuit connections. Isolation is at least 85 dB to 18 GHz. Assembly length is the same or less than the printed circuit case. From the inside of one module to the inside of the filter is 0.260”. Mechanical integrity is excellent. Disassembly is “plug-n-play”. It is possible to build assemblies of filters and switches, with spacings determined by the filter size, isolation determined by the individual switch performance, filters fully replaceable by unplugging one and inserting another (no
soldering)....and virtually no cost impact. This approach should revolutionize interconnection philosophy for designers of high-dynamic range systems and subsystems.