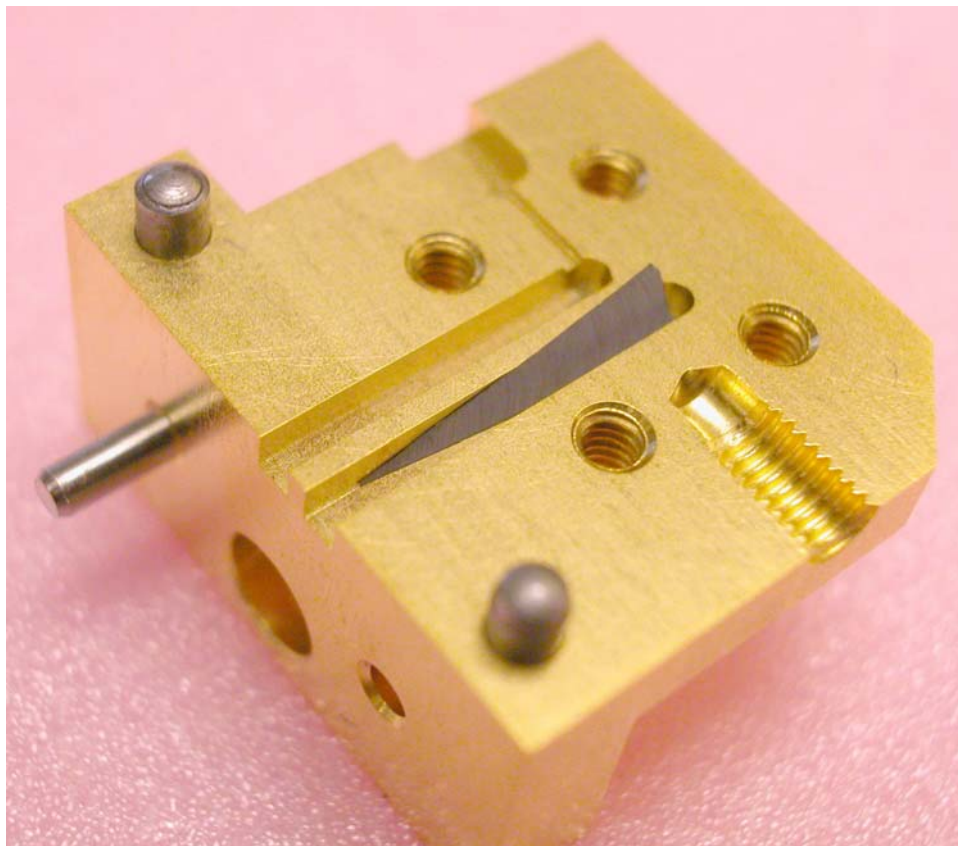


ECCOSORB[®] MF-117 used in Waveguide Termination for 84-116 GHz Receiver Development Program

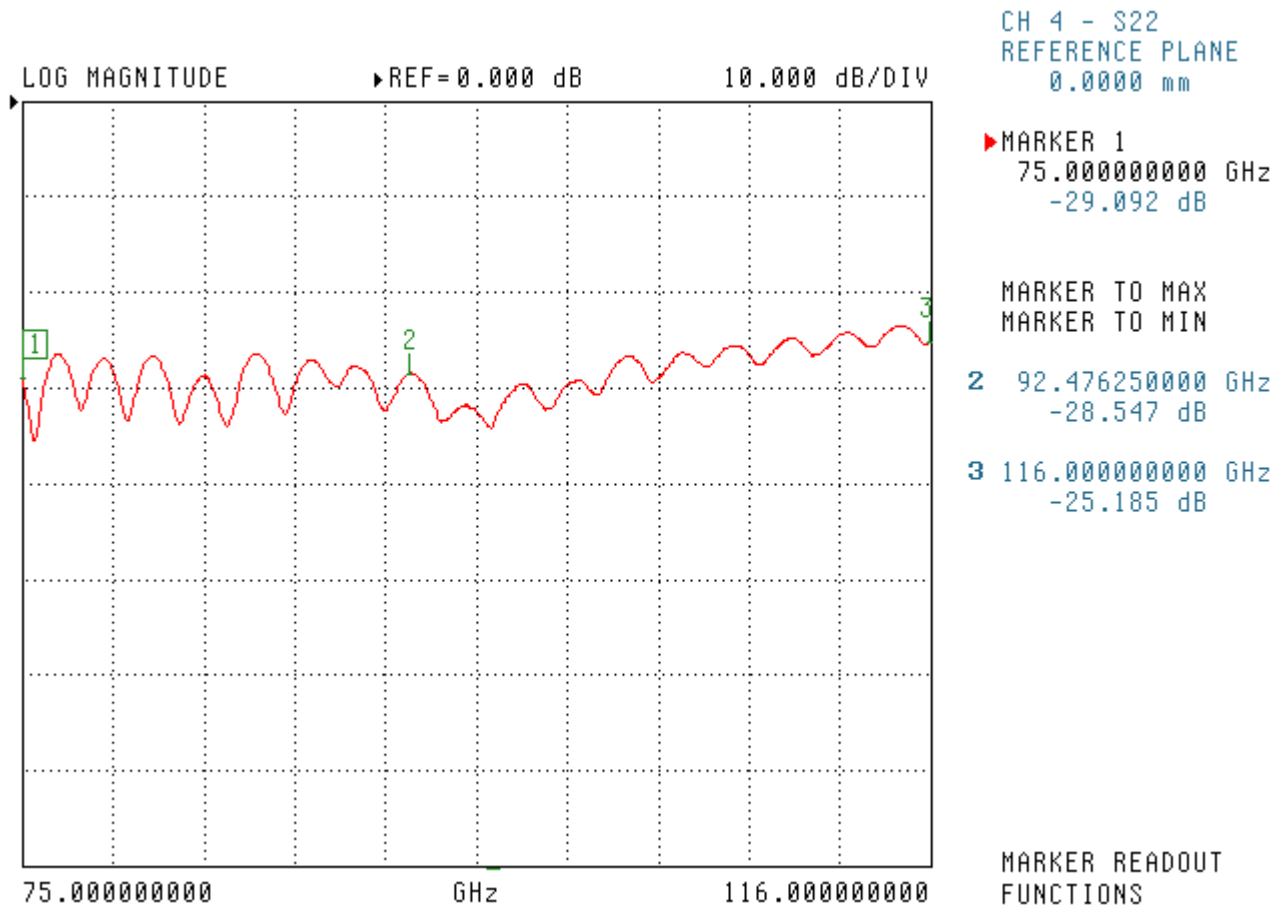
ECCOSORB[®] MF-117, a magnetically loaded epoxy, was selected for a high frequency (84-116 GHz) waveguide termination used in the international Atacama Large Millimeter Array (ALMA).

This specific microwave absorber was chosen for several reasons, specifically bandwidth, and attenuation. However these RF requirements pale in nature to the operational requirements, which required low out-gassing and a service temperature of a cryogenic 4 Kelvin.

Once machined from a solid bar of ECCOSORB[®] MF-117 each wedge design, tapered in two directions (see figure below) is inserted into one half of a rectangular waveguide, which measures 2.44 x 1.22 mm. The load is then bonded in place using an RTV silicone adhesive and the upper half of the waveguide split-block is assembled.



Once assembled, the RF performance of these loads was measured using a 75-116 GHz Vector Network Analyzer. A plot of the reflected signal is shown below. It is evident that the reflected signal from the load is attenuated by more than 20 dB across the entire RF bandwidth.



ALMA Band 3 Receiver: (http://www.hia-ihc.nrc-cnrc.gc.ca/atrgv/alma_e.html)

S. Claude et al “Performance of the Band 3 (84-116 GHz) Receiver for ALMA”, Presented at the 17th International Symposium on Space Terahertz Technology, Paris, May 10–12, 2006.

The ALMA Telescope Facility: (www.alma.nrao.edu/)

ALMA will be located at an elevation of 5000 m in the Chajnantor Plain of northern Chile – the best accessible millimeter wavelength astronomy site in the world. The resolution and sensitivity of the array will constitute a great leap forward compared to existing facilities; and it will become the world’s preeminent radio astronomy facility.