

ABSTRACT

Electromagnetic wave absorber box of 36.5 cm x 36.5 cm x 40.75 cm and the thickness is 13.5 cm. It is designed and constructed from ferromagnetic sand, styrofoam, and gasoline in order to get a new material that never exists (pure ITTelkom invention). This electromagnetic wave absorber box is purposed to test several specifications of AUT (impedance, VSWR, bandwidth).

The specifications of electromagnetic wave box absorber that must be fulfilled are $\epsilon_r = 2-j1$, $\mu_r = 1$ dan $\sigma = 0.111 \frac{mho}{m}$, able to work on frequency 2000 MHz \pm 500 MHz and afford attenuation 30 dB or 25.571 Np/m in one direction (position) on material. The absorber material itself must be solid through shaping a box as designed.

By mixing the three of materials above with volume comparison of ferromagnetic sand, styrofoam, and gasoline respectively 1:150:7.5 it will afford a material with characteristic $\epsilon_r = 1.9538 - j0.9$, $\mu_r = 1.024535$ dan $\sigma = 0.1004$ mho/m on frequency 2000 MHz \pm 500 MHz by using Network Analyzer. By placing sample of absorber material on receive antenna (dipole sleeve), it is found that the attenuation is 25.903 Np/m for high bandwidth antenna horn as transmitter.

By doing measurement at IT Telkom microwave laboratory using Network Analyzer to several specification of dipole sleeve antenna obtained different result when using electromagnetic wave absorber box. The obtained VSWR is better when using this box, it is 1.073 on frequency 1740.12 MHz with impedance 51.852 Ω . Operational frequency obtained narrower, it is from 1719.12 MHz to 1807.11 MHz.

Key word: absorber material, attenuation, dipole sleeve, 2000 MHz \pm 500 MHz