

$$Z_H = -\eta_0 * \frac{\frac{j}{\beta^* r} + \frac{1}{(\beta^* r)^2}}{\frac{j}{\beta^* r} + \frac{1}{(\beta^* r)^2} - \frac{j}{(\beta^* r)^3}} =$$
$$\frac{1 + \frac{1}{(\beta^* r)}}{1 + \frac{1}{(\beta^* r)} - \frac{j}{(\beta^* r)^2}} .$$