Knowing $\frac{\epsilon-1}{\epsilon+2} = \frac{4\pi\alpha}{3d^3}$,

Let $\alpha' = \frac{4\pi\alpha}{3d^3}$ where α is the polarizability and d is the dipole distance in micrometers in DDSCAT.

$\implies \frac{\epsilon-1}{\epsilon+2} = \alpha' \implies \epsilon - 1 = \alpha'(\epsilon+2) \implies \epsilon - 1 = \alpha'\epsilon + 2\alpha'$
$\implies \epsilon = \alpha'\epsilon + 2\alpha' + 1 \implies \epsilon - \alpha'\epsilon = 2\alpha' + 1$
$\implies \epsilon(1-\alpha') = 2\alpha' + 1 \implies \epsilon = \frac{2\alpha'+1}{1-\alpha'}$

Knowing that α' is complex, let $\alpha' = \mathrm{a} + i\mathrm{b}$
$\implies \epsilon = \frac{2(\mathrm{a}+i\mathrm{b})+1}{1-(\mathrm{a}+i\mathrm{b})} \implies \epsilon = \frac{2(\mathrm{a}+i\mathrm{b})+1}{1-(\mathrm{a}+i\mathrm{b})}\frac{1-\mathrm{a}+i\mathrm{b}}{1-\mathrm{a}+i\mathrm{b}}$
$\implies \epsilon = \frac{(2(\mathrm{a}+i\mathrm{b})+1)(1-\mathrm{a}+i\mathrm{b})}{(1-\mathrm{a}+i\mathrm{b})(1-\mathrm{a}+i\mathrm{b})} \implies \epsilon = \frac{(2(\mathrm{a}+i\mathrm{b})+1)(1-\mathrm{a}+i\mathrm{b})}{(1-\mathrm{a})^2+\mathrm{b}^2}$
$\implies \epsilon = \frac{2(\mathrm{a}+i\mathrm{b})-2\mathrm{a}(\mathrm{a}+i\mathrm{b})+2i\mathrm{b}(\mathrm{a}+i\mathrm{b})+1-\mathrm{a}+i\mathrm{b}}{(1-\mathrm{a})^2+\mathrm{b}^2}$
$\implies \epsilon = \frac{2\mathrm{a}+2i\mathrm{b}-2\mathrm{a}^2-2i\mathrm{ab}+2i\mathrm{ab}-2\mathrm{b}^2+1-\mathrm{a}+i\mathrm{b}}{(1-\mathrm{a})^2+\mathrm{b}^2}$
$\implies \epsilon = \frac{\mathrm{a}-2\mathrm{a}^2-2\mathrm{b}^2+1+3i\mathrm{b}}{(1-\mathrm{a})^2+\mathrm{b}^2}$

Knowing that ϵ is complex, let $\epsilon = \mathrm{c} + i\mathrm{d}$
$\implies \mathrm{c} + i\mathrm{d} = \frac{\mathrm{a}-2\mathrm{a}^2-2\mathrm{b}^2+1+3i\mathrm{b}}{(1-\mathrm{a})^2+\mathrm{b}^2}$
$\implies \mathrm{c} = \frac{\mathrm{a}-2\mathrm{a}^2-2\mathrm{b}^2+1}{(1-\mathrm{a})^2+\mathrm{b}^2}$ and $\mathrm{d} = \frac{3\mathrm{b}}{(1-\mathrm{a})^2+\mathrm{b}^2}$
$\implies \mathrm{c} = \frac{(2\mathrm{a}+1)(1-\mathrm{a})-2\mathrm{b}^2}{(1-\mathrm{a})^2+\mathrm{b}^2}$ and $\mathrm{d} = \frac{3\mathrm{b}}{(1-\mathrm{a})^2+\mathrm{b}^2}$