$$\mathcal{D}^{a}(\omega)=\frac{2\zeta^{\mathrm{abc}}}{\hbar\left(\xi^{\mathrm{bb}}\xi^{\mathrm{cc}}\right)/2}$$

$$\zeta^{\mathrm{abc}}(\omega)=\frac{i\pi e^{2}}{\hbar^{2}}\int\frac{d^{3}k}{8\pi^{3}}\sum_{vcc'}{}'\mathrm{Im}\left[S^{\mathrm{a}}_{c'c}(\mathbf{k})r^{\mathrm{b}}_{vc'}(\mathbf{k})r^{\mathrm{c}}_{cv}(\mathbf{k})+\right.$$
$$\left.S^{\mathrm{a}}_{cc'}(\mathbf{k})r^{\mathrm{b}}_{vc}(\mathbf{k})r^{\mathrm{c}}_{c'v}(\mathbf{k})\right]\delta(\omega_{cv}\left(\mathbf{k}\right)-\omega)$$

$$\xi^{\mathrm{ab}}(\omega)=\frac{2\pi e^{2}}{\hbar^{2}}\int\frac{d^{3}k}{8\pi^{3}}\sum_{vc}r^{\mathrm{a}}_{vc}(\mathbf{k})r^{\mathrm{b}}_{cv}(\mathbf{k})\delta(\omega_{cv}\left(\mathbf{k}\right)-\omega)$$