From measured signals to $\tau_{E,e}$ @tG

Vacuum discharge
$I_{\mathrm{ch}}^{\mathrm{vac}}(t),\ V_{\mathrm{loop}}^{\mathrm{vac}}(t)$

Plasma discharge
$I_{\mathrm{ch+p}}(t),$
$V_{\mathrm{loop}}(t),\ n_e(t)$

Chamber resistance
$$R_{\mathrm{ch}} \approx \frac{V_{\mathrm{loop}}^{\mathrm{vac}}}{I_{\mathrm{ch}}^{\mathrm{vac}}}$$

Plasma current
$$I_p = I_{\mathrm{ch+p}} - \frac{V_{\mathrm{loop}}}{R_{\mathrm{ch}}}$$

Quasi–stationary interval $[t_1, t_2]$:
$$\bar{I}_p = \langle I_p \rangle, \quad \bar{V}_{\mathrm{loop}} = \langle V_{\mathrm{loop}} \rangle, \quad \bar{n}_e = \langle n_e \rangle$$

Plasma resistivity
$$R_p = \frac{\bar{V}_{\mathrm{loop}}}{\bar{I}_p}$$

Central T_e (Spitzer)
$$T_e(0) \approx 0.9\, R_p^{-2/3}$$

Ohmic heating
$$\bar{P}_{\mathrm{OH}} = \bar{V}_{\mathrm{loop}}\, \bar{I}_p$$

Electron energy
$$\bar{W}_e = \tfrac{3}{2}\, \bar{n}_e k_{\mathrm{B}}\, T_e V_p$$

Electron energy confinement time
$$\tau_{E,e} = \frac{\bar{W}_e}{\bar{P}_{\mathrm{OH}}}$$