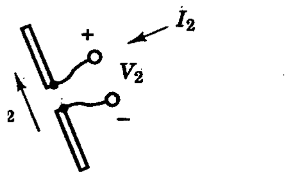
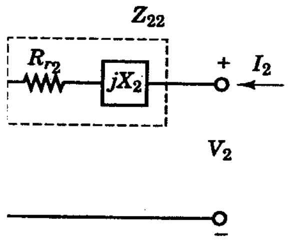
From: Staelin et. al. — Electromagnetic Waves (1994)






$I_1$

pled antennas.

the receiving antenna 2 is a
tenna is thus

2 (9.5.8)

ent A [depicted in Figure
na 2 is open-circuited; $d\overline{\ell}_2$

electric field that would be
e short dipole is electrically
field in the vicinity of the
near the dipole. Since the
its scattered nearfield $\overline{E}_{scatt}$
ect wave propagation in the
uation instead of the wave
9.25 that the voltage $V_{Th}^{(2)}$
nna 2 is just the difference
hrough the centers of each
**tours are not appreciably**
voltage measured is

$_1|d_2^{eff}\cos\psi$ (9.5.9)

hort dipole having physical



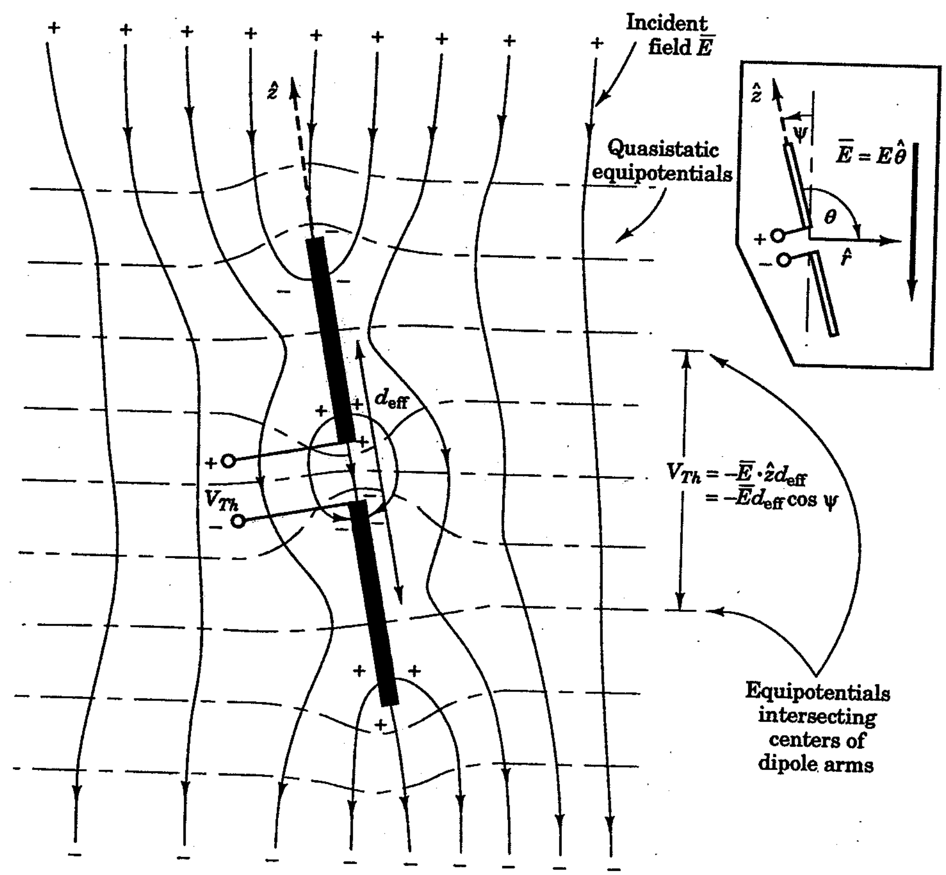



**Figure 9.25** Thevenin voltage $V_{Th}$ of a Hertzian dipole.

length $d_2$ and a triangular current distribution; $\psi$ is the angle between $\overline{E}_1$ and the dipole axis.[13]

It has already been shown in Section 6.3 [see (6.3.12)] that maximum power is received by antenna 2 when the impedance $Z_{L2}$ of transmission line 2 is matched to $Z_{22}$, or $Z_{L2} = Z_{22}^* = R_{22} - jX_{22}$. The maximum received power $P_2$ is thus

$$P_2 = \frac{|V_{Th}^{(2)}|^2}{8R_{22}} = \frac{|\overline{E}_1|^2(d_2^{eff})^2\cos^2\psi}{8\cdot 20k^2d_2^2} \tag{9.5.10}$$

13. Triangular current distributions are expected for thin short wires because of their *TEM*-like behavior, discussed further in Section 9.7.