Function generator

Occiliscope

Resonant circuit

Zc

resistor

Zr

V1

V2

# $Z'_c + iZ_C"$ calculation

Measured phase=$\theta_m$

$$|Z_t| = \frac{V1_{rms}}{I_{rms}} = \frac{V1_{rms}}{V2_{rms}/Z_r}$$

$$Z_c" = |Z_t| \sin(\theta\_m)$$

$$Z'_r + Z'_c = |Z_t| \cos(\theta_m), \text{ then}$$

$$Z'_c = |Z_t| \cos(\theta_m) - Z'_r$$

Therefore

$$|Z_c| = (Z'^2_c + Z"^2_c)\wedge 0.5$$

$$\theta_c = \tan^{-1} Z_c" /Z_c'$$