Survival Kit



Sinusoidal signal:

$$s(t) = S.\sqrt{2}.\cos(\omega.t + \varphi) \text{ or } s(t) = S.\sqrt{2}.\sin(\omega.t + \varphi)$$

- $s(t)$: instantaneous value
- S: RMS value of $s(t)$
- ω: pulsation. T and f correspond respectively the period et the frequency de $s(t)$, on a ω=2π/T=2π/f
- φ: phase at the origin.

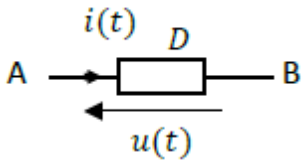
Complex Respresentation :

- Complex Amplitude :

  $|\underline{S}|=S$, RMS value of the signal $s(t)$
  $\arg(S)=\varphi$, phase at the origin de $s(t)$

- Complex impedance:

  A passive linear dipole D where current and voltage are deflected according to the receiver convention.



The complex impedance is the quantity $\underline{Z}$ verifying

$$\underline{Z} = \frac{\underline{U}}{\underline{I}}$$

Where $\underline{U}$ et $\underline{I}$ represents the complex amplitudes of $u(t)$ and $i(t)$.

Receiving Dipoles

- Resistor:
  - $u(t) = R.i(t)$
  - $\underline{Z}_R = R$
- Capacitor:
  - $i(t) = C.\frac{du(t)}{dt}$
  - $\underline{Z}_C = \frac{1}{jC\omega}$
- Inductor
  - $u(t) = L.\frac{di(t)}{dt}$
  - $\underline{Z}_L = jL\omega$

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