

Re: AC sine wave: What does increasing the frequency do?

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"John Larkin" <jjlarkin@highlandSNIPtechTHISnologyPLEASE.com> wrote in message >

.....

> a. For a sinusoidal source, a time-varying resistive load can have a
> load current with a non-zero fundamental phase shift, hence a reactive
> load component. This load component can be expressed as an equivalent
> inductance or capacitance.

>

> b. For a sinusoidal source, a time-varying reactive load can have a
> load current with a non-quadrature phase shift, hence a real load
> component. This real component can be expressed as a positive or
> negative equivalent resistance. This is why a varicap can be used as a
> parametric amplifier.

>

>

> In case a, it takes no power to vary the resistance (as say moving a
> pot wiper or switching resistors in or out) because the synthesized
> reactance doesn't dissipate power. In case b, power must be involved
> in varying the reactance (spinning the shaft of a variable cap, or
> pumping a varactor) because we're synthesizing a real resistance.

>

> Also interesting is that, in case a, since we can shift the
> fundamental but can't shift the zero crossings, we must also generate
> harmonics. There's probably something similar in case b.

>

> I'm not trying so much to win an argument as I am marvelling over a
> few things I hadn't given a lot of thought to before. There's some
> sort of neat duality going on here. I'm especially impressed by the
> requirement to generate harmonics to reconcile the fundamental phase
> shift with the zero crossings.

>

The classes of gyrators here, has made for an interesting and
understandable thread.

Sometime this kind of stuff will be written up in depth, (maybe already

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has!). I'll bet that during the process 'understanding' will be #1 item to fall by the wayside :-)
regards
john