Re: absorbing reactance into series LC

Source: http://sci.tech−archive.net/Archive/sci.electronics.design/2007−02/msg04051.html

- *From*: "Phil Newman" <phillenium2002@xxxxxxxxxxx>
- *Date*: 21 Feb 2007 02:04:01 −0800

On 21 Feb, 00:11, max...@xxxxxxxxxxx wrote:

> On Feb 19, 9:37 pm, "john jardine" <j...@xxxxxxxxxxxxxxxxxxxxx> wrote:
>
> <max...@xxxxxxxxxxx> wrote in message
>
> news:1171928681.715064.75550@xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
>
> > On Feb 19, 6:14 pm, "john jardine"
> > <j...@xxxxxxxxxxxxxxxxxxxx> wrote:
> >
> > "Phil Newman"
> > <phillenium2...@xxxxxxxxxxx> wrote in
> > message
> >
> > news:1171898397.535879.120540@xxxxxxxxxxxxxxxxxxxxxxxxxxxxx
> >
> > > If your X is
> > > frequency
> > > invariant
> > > then it is a
> > > resistor.
> > > If you have
> > > L C R in
> > > series
> > > (where R

can be the
resistance
of the

L),

then in
resonance
you will see
R (real).
R also sets
the Q factor
of your
series
circuit, so
its
bandwidth.
http://en.wikipedia.org/wiki/RLC_circuit

thanks for your answer.

However, I beleive the job
of the susceptance/reactance
is to shift
the resonant frequency of
the LC series from w = 1 to
another
frequency, which denotes
the transmission zero of the
filter.

Phil

It's very difficult to understand the wording.
It is possible to drop the resonant frequency
to say 0.5 Rads, using

just a

resistance. Maybe that's what's wanted in
this case.
john

To drop the res freq you increase the inductance and/or capacitance.
Increasing resistance increases the bandwidth not the resonant
(center) frequency. Reactance is XL=2*pi*F*L, XC=1/(2*pi*F*C), so
changing the reactance requires change L, C, or F.

Yes. But ... It's not the size of that resistor that's the problem, it's knowing where to put it!.

As example, for a parallel tuned circuit we always go ...
Fres=1/2*pi*root (L/C). Fine, no problem!.

It's not correct. The true formula is ...
Fres=1/2*pi* root(1/L*C−R^2/L^2). [a ballache to use so we don't]

But ... look how that coil resistance "R" has slimed itself in and ingratiated itself with the resonant frequency. (only rears it's head at very very low Q values). That "R" can become big enough to noticeably poison the reactive effect of the inductor and drop the Fres.

Idle thought could suggest maybe it's not unreasonable that a series tuned circuit, which is a kind of inversion of a parallel one, might for a similar reason also suffer an "R" caused resonant frequency shift. I.e same lousy Q and lower Fres.
In this case (as you note), the "R" can have no Fres effect if in series with the inductor, so maybe it needs to go in ... with the ... :)

(Dragged out I know but I'm constantly surprised at the number of ways a few
RCL components can be put together yet offer distinct features)
john

Don't think so..., resistor placement is for microwave this is subsonic (0.160Hz),It's an impedance mismatch problem between stages,

> just do a simple norton transform to match 'em up.− Hide quoted text −
>
> − Show quoted text −

Thanks, how can I do this? my network theory isn't great.

basically, I've been using the equation Lw^2 + Xw + 1/C to find the resonant frequency, and then using w^2 = 1/LC to calculate the new values of L or C.

This works in terms of shifting the resonant frequency, but in terms of the whole circuit really doesn't work very well.

How can I do these norton transforms?

Phil

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