

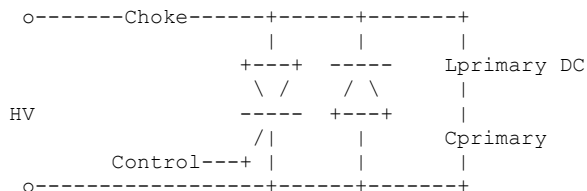
Delivered-To: terrellfmail-dnvr.uswest.net  
 Resent-Date: Fri, 2 Mar 2001 18:11:27 -0700  
 Resent-From: teslapupman.com  
 Resent-Sender: tesla-requestpupman.com  
 Date: Fri, 02 Mar 2001 16:13:06 -0700  
 From: "Tesla list" <teslapupman.com>  
 To: teslapupman.com  
 X-Sender: twfteslapop.dnvr.uswest.net  
 X-Mailer: QUALCOMM Windows Eudora Pro Version 4.1  
 Subject: Re: Fast (nanosecond) SCR  
 X-Mailing-List: <teslapupman.com> archive/latest/2981  
 X-Loop: teslapupman.com

Original poster: "Antonio Carlos M. de Queiroz by way of Terry Fritz <twfteslauswest.net>" <acmqcompuland.com.br>

Tesla list wrote:

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> Original poster: "Eddie Burwell by way of Terry Fritz <twfteslauswest.net>" <eburwellHIWAAAY.net>
>
> The GA301 has been around since '89 or maybe earlier. The data sheet I have
> does not specify I^2T but the peak current vs. pulse with graph would put it
> down to 50A for a single half wave cycle for a 100KHz coil. If you wanted
> more than one cycle it would have to be de-rated still further. Then there
> is the issue of stringing enough of them together to get to the 10KV+
> range... I tried using some more garden variety power SCRs to approach the
> problem by running peak currents of 1KA at 1KV. The main problem of a usual
> "phase control" SCR is the turn off time. It really would be nice to be able
> to turn off at the first notch. "Inverter grade" SCRs are much better in
> this respect but there seems to be a trade off between turn off time and
> hold off voltage. Now if only the GA301 had a cheap 1KV 1KA brother...
>
> IGBTs look quite promising. They are similar to SCRs in that they are four
> layer devices and handle peak currents quite well. In addition they can be
> operated in parallel without too much trouble. And perhaps one of their best
> attributes: they can be turned off quickly (by SCR standards) and on command.
>...
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(I have not paid much attention to previous posts about solid-state drives, so I may be overlooking something of reinventing the wheel.) A capacitor-discharge Tesla coil with an SCR or an IGBT in place of the gap would require bidirectional switching at high voltage, what is not so simple with active devices in both directions. But how about a system made of a DC high-voltage supply, a fast high-current and high-voltage SCR (or several in series), and a similar diode, inverted, in parallel? The assembly could have one terminal grounded for convenience. Something as (use a fixed width font to see):



The SCR would be hold the primary voltage for some time, and when triggered would be automatically turned off after each half cycle, while the diode conducts. By varying the duration of the current in the control line, the oscillations could be cleanly stopped at any zero crossing of the primary current (while the amplitude of the oscillations is larger than the DC current through the charging choke. Add something as a relay to interrupt the charging current if it becomes greater than the oscillation current and the SCR doesn't turn off). An IGBT or power MOSFET of suitable ratings can be used in the same way.

Antonio Carlos M. de Queiroz

The OLTC, DRSSSTC, SISG... All started here with this concept...