Envelope Generators Wildcat / 3500 series

kokoon
Joined: Jan 10, 2006
Posts: 138
Location: slovenia
Posted: Fri Mar 21, 2008 7:51 pm
Post subject: EFM envelope generators sustain "leak"
Subject description: 555-based ones

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that is, 3500 series module and wildcat EGs. i can proudly say that i understand the circuit, but i can't figure out why this occurs. the sustain doesn't really sustain, but is dropping in voltage constantly (towards ground, but i never waited that long). anyone else getting this?

here's the schemo (page 24 and 25):
http://ele4music.com/documents/efm-wildcat.pdf

after the decay phase is over (555 detects treshold reached), the only way for the C5 to discharge is through the R8 resistor... but even when pot P1 is set for a full sustain, C5 is still discharging towards zero. could anyone help me understand this?

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frijitz
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Audio files: 15
Posted: Fri Mar 21, 2008 8:43 pm

It's hard to understand how this design could work properly. The internal leakage of C5 will eventually cause D3 to be reverse biased, at which point the sustain-level control becomes isolated and has no effect. At least that's how it looks to me. But maybe there is some subtle feature I'm missing.

Ian

yusson
joined: Nov 24, 2005
Posts: 239
Location: France
Posted: Sat Mar 22, 2008 9:51 pm

What type of diode are you using ? I have had a really comparable problem when I was using schottky diodes, the problem was fixzd as soon as I used standard 1N4148 diodes. Also it's important that you use good quality capacitors for C5 (that is with low leakage).

I am using a very similar design in my yusynth modular and using good caps and avoiding schottky I have no problem at all.

Yves

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i'm using ordinary 1N4148 diodes. about the C5 capacitor - does higher voltage rating maybe mean better or worse leakage? i'm using a 63V aluminium electrolytic type capacitor - any other dielectric types possible here? tantalum?

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yusson

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63V is OK and I use tantalum.

Yves

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and you have a steady sustain phase? hmm i just did some reading, apparently tantalums generally have less leakage, i'll give it a try!

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i'm trying to move on with the wildcat, but i hit an obstacle. it's the EGs, but (probably) not the leaking - that sorta got solved with better caps.

so - what's happening:
after stuffing all 4 EGs, i started noticing weird phantom frequencies on the VCO. pretty low-freq, under 1kHz, judging by ear. probably even less.

when i connect the first two EGs to the power supply buss (they can only be connected in pairs), the effect kicks in. i haven't noticed it at first, but after connecting the second EG pair, it becomes really obvious.

i'm assuming the EGs make the power lines fluctuate (periodically?), so i tried disconnecting them. the VCO is clean again. then when i connect the +12V rail to the EGs, i'm in trouble again.

so what do i do next? i still don't have a scope, but i can try to isolate the phantom oscillations. what should i be looking for next?

the EGs work otherwise, they're quite useful actually, especially considering how simple design they are.

anyone?

yusson
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Posts: 239
Location: France

Questions : are you using NE555 chips (BJT version) or more modern CMOS version of the 555 ? If you are using the classic version, I strongly suggest that you replace them by modern CMOS substitutes. The current draw of the NE555 is known to be a problem. If this substitution does not solve your problem, try the following : instead of connecting the EG supplies directly to the power bus lines using the short straps as designed on the board, use long insulated wires and connect them to the power rails as close as possible to power supply output on the board (that is before the power supply straps of the first VCO).

Yves

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hmm.. connecting to power rails before VCO - i've already tried that, doesn't help.

how can i tell what version my NE555 chips are? they're STMicroelectronics, labeled like this:

ST CHN
NE555N
KPA625

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yusson
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Location: France

That the bi-junction classical chip, try to subtitue them with CMOS versions.

Yves

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ah, great! how do know which is which?

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By cheking the datasheets!

Here are some references for CMOS 555 timer : ICM7555, TLC555, LMC555

Yves

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great, i found NE555CN, this is supposed to be CMOS. will change them now! thank you very much!

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this fixed the problem indeed. the envelopes are no more polluting the rails!
big thanks, yusson!

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yusson
Joined: Nov 24, 2005
Posts: 239
Location: France

You're welcome pal !

Yves