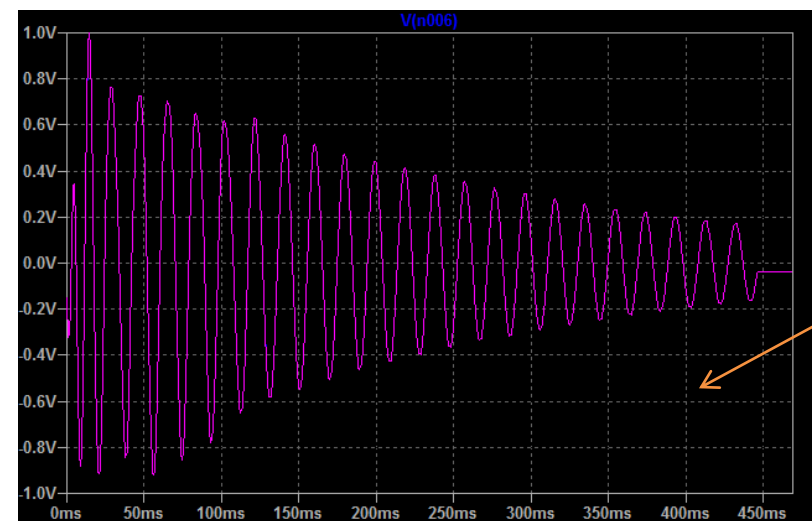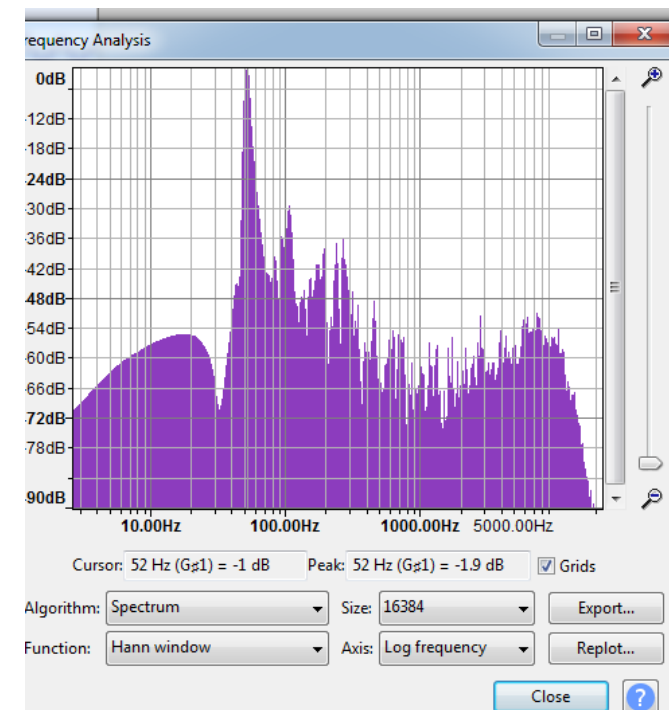Bass drum hit in Bicep - Glue

Fundamental = 52 Hz
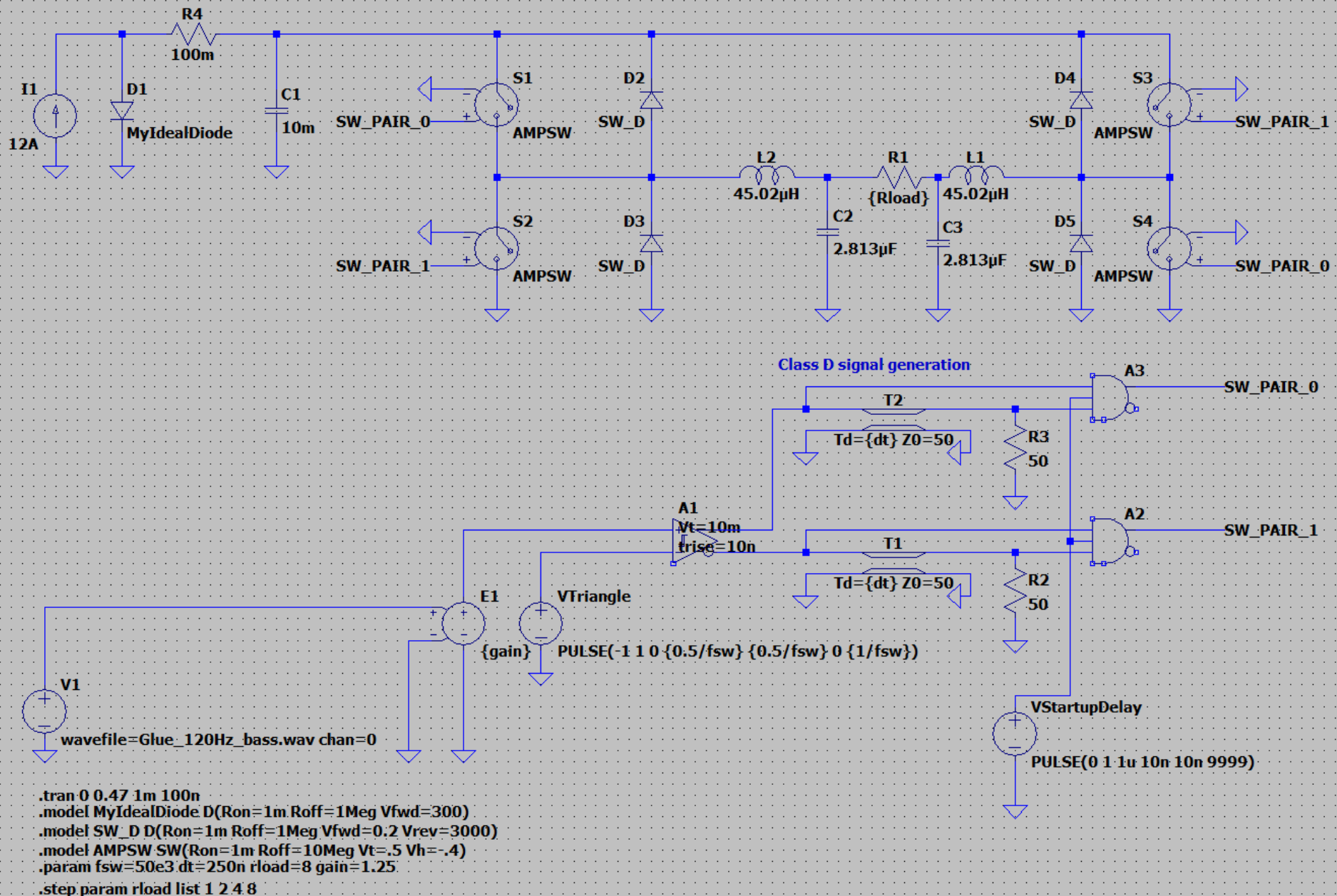
Minimum time between hits = 0.7s

Imported into LTSPICE after 120Hz 4th order LP filter

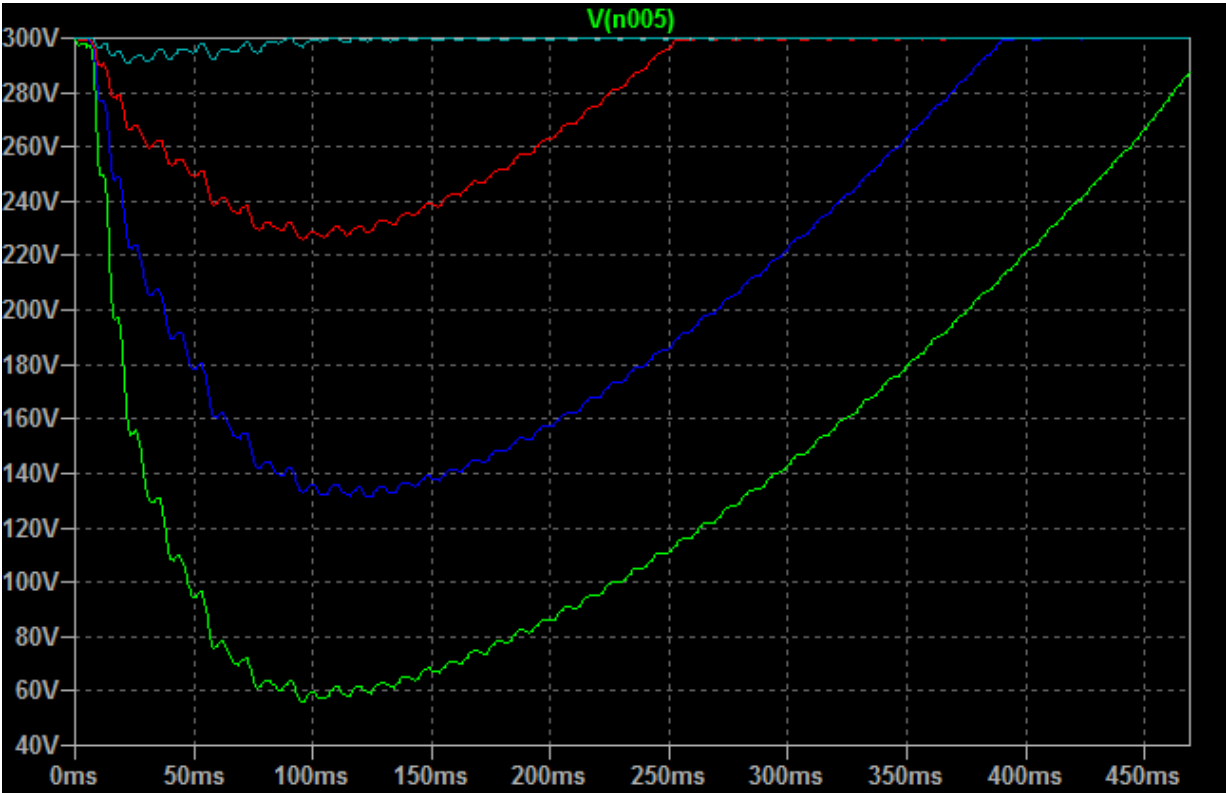LT spice simulation of current limited supply with large capacitive storage

Supply voltage sag with different resistive loads (8/4/2/1Ω) @ 300V nominal bus.
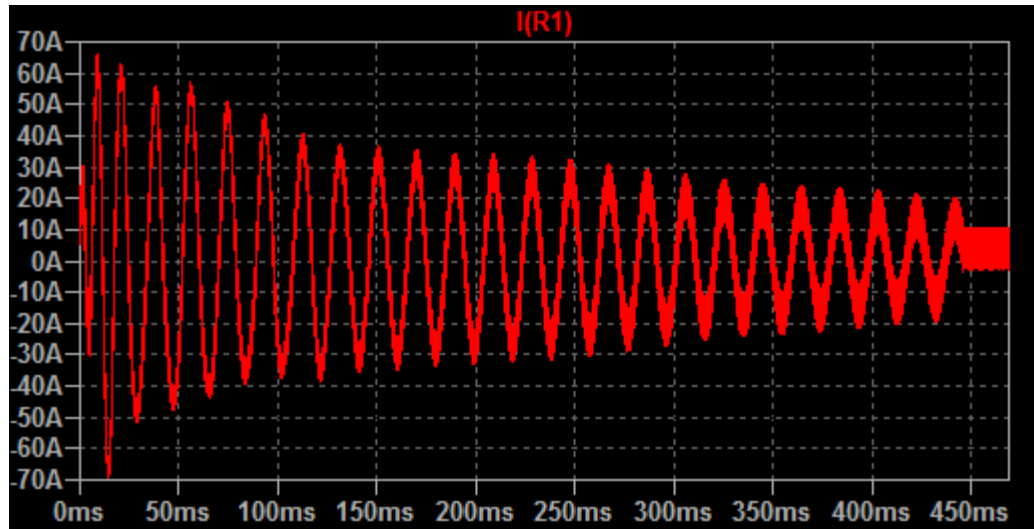Peak level set to 100% modulation (clipping point).

Results indicate running with 300V bus is sane for 8/4ohm and amplifier will be essentially distortion free for 8ohm at peak output.

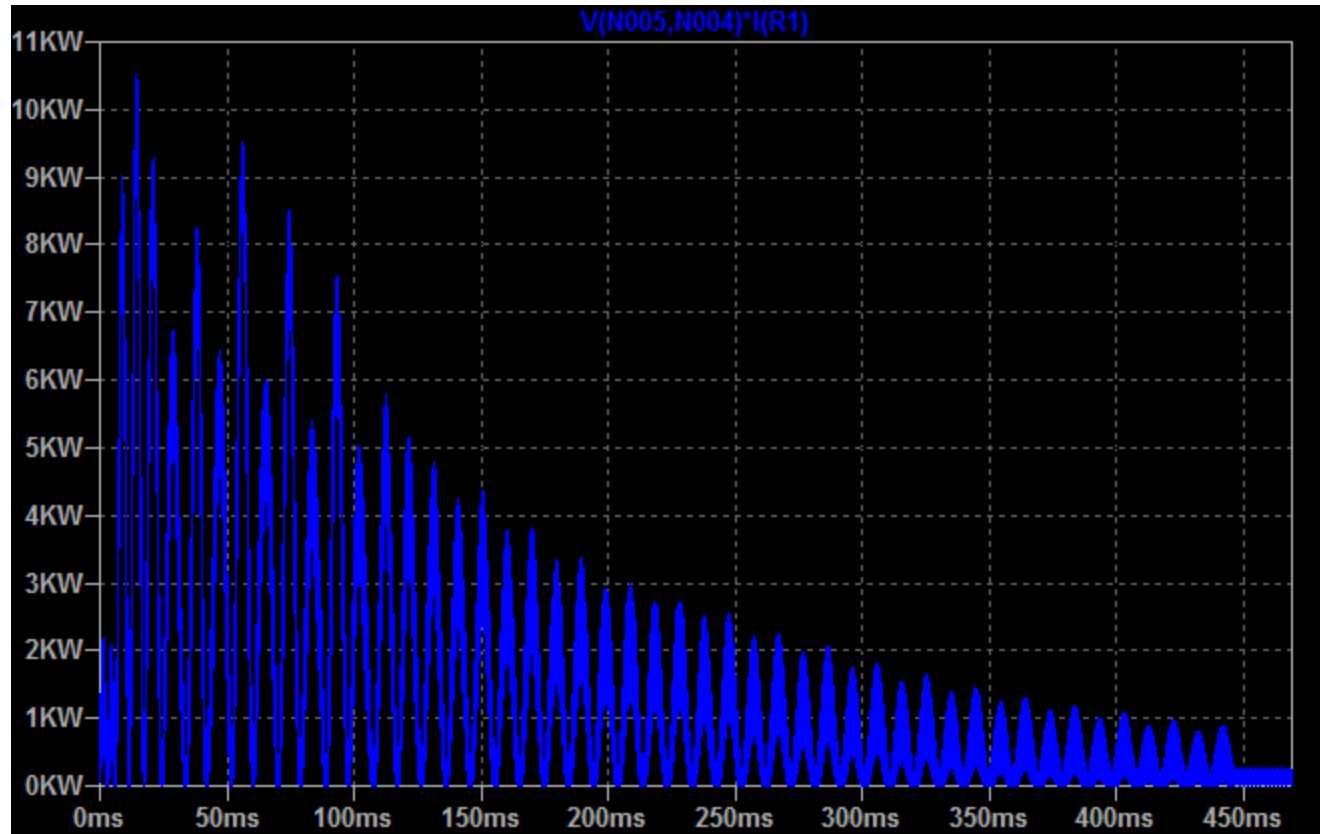| Load	Minimum bus voltage	Compression	Recovery time
8	290.8V	-0.27dB	108mS
4	225V	-2.50dB	255mS
2	131V	-7.20dB	NA
1	56V	-14.60dB	NA

Look ahead limiter will compress input signal to avoid class-D amplifier reaching 100% modulation, the minimum required compression is recorded

Output current into 4Ω (also approximate capacitor ripple)

RMS capacitor: 8ohms 14.365A, 4ohms 21.428A

Power output into 8ohms

1.3235kW average

Strategies for dealing with low ohm load (IPAL etc.)

- Reduced dc bus – Lowers switching loss if problematic
- Restrict maximum duty cycle – lowers effective maximum output amplitude

Limiter

- DAC drives amplifier (modulator), by monitoring rail voltage we can estimate duty cycle

- Rail voltage changes slowly, LP filter rail voltage and use to estimate duty cycle and use zero attack limiter on duty cycle estimate.

- Maximum duty cycle should be restricted to <0.5 for low ohm loads, depending on output device stress it may also be required to lower bus voltage.

- Hold/release adjustable.

- Additional user peak and long term average limiting