“Instrument Panel Module Interface Analysis”

Bill Burns

Senior Automotive Specialist

Troy, Michigan

Features:

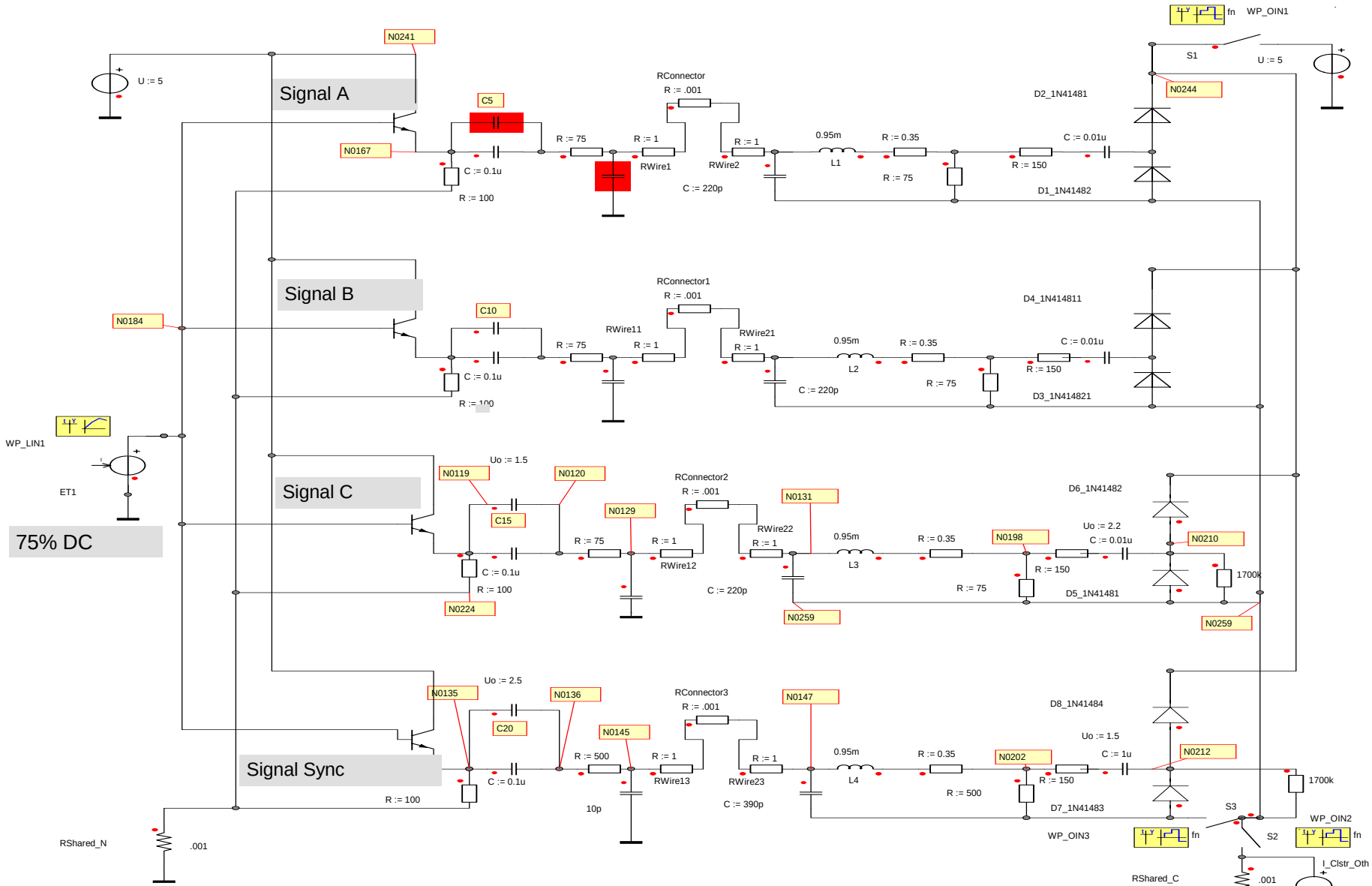
Applicability to automotive suppliers
Ease of use
Windows Compatibility
Spice semiconductor converter
Animated objects

Simplorer Analysis of Instrument Panel Module Interface Circuitry

Presentation Goal: Show applicability of Simplorer to automotive supplier environment

Analysis Goal: Put an accurate circuit model in place for the purpose of carrying out "ground lift" FMEAs.

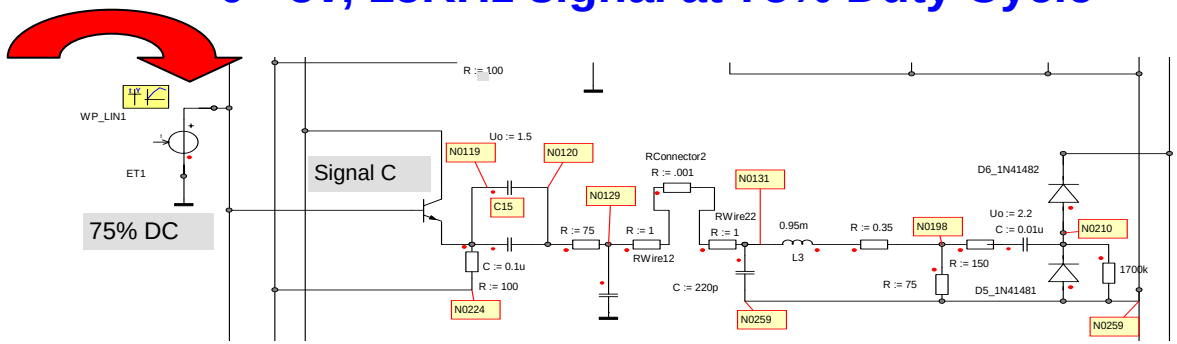
Strategic Goal: Engineers are not self promoters.Successes with electrical simulation may be going unnoticed due to that, and the difficulties in documenting results.Simplorer's Windows and MS/Office compatibility is a great tool for "advertising" our success stories.

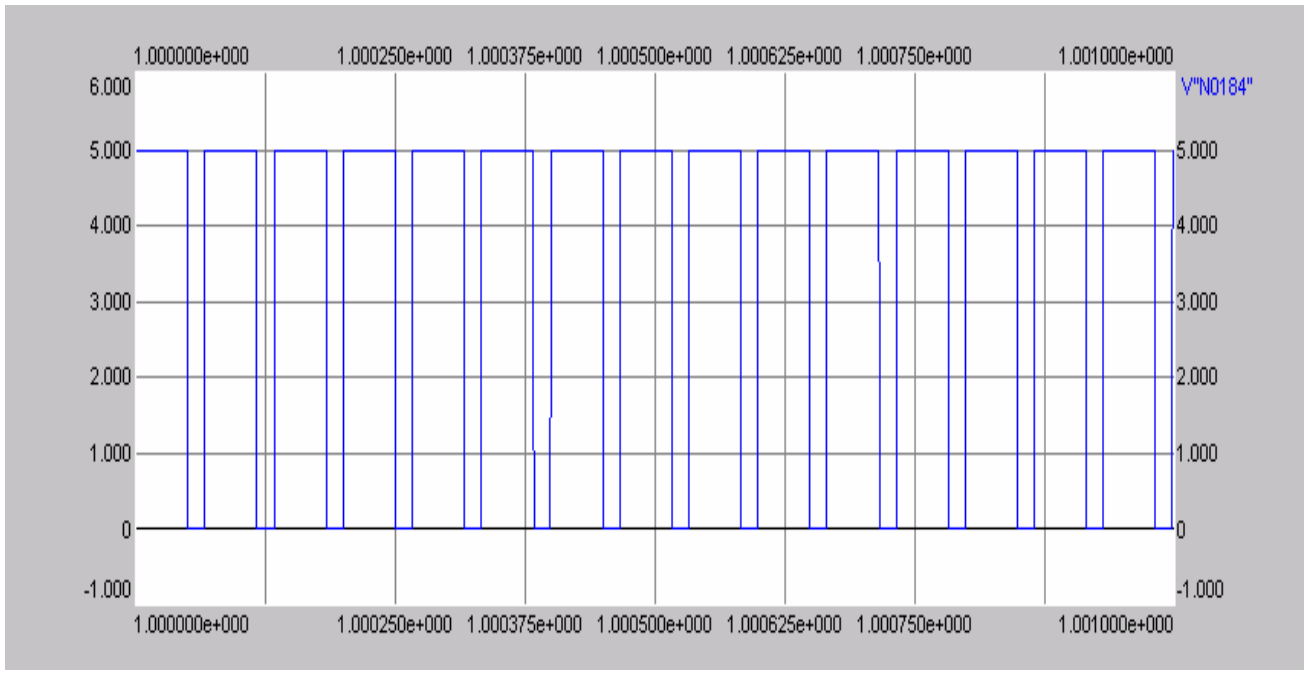


IP Module Interface

Input to Signal A/B/C/Sync Driver Q's

0 - 5v, 15KHz signal at 75% Duty Cycle





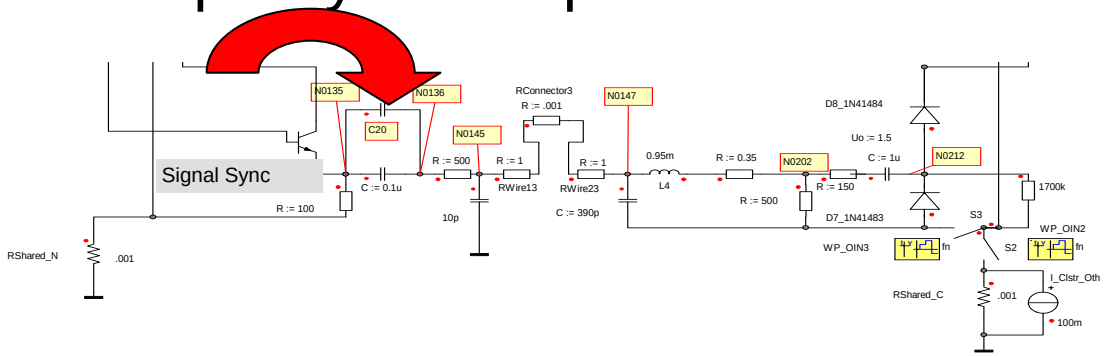
VOLTS

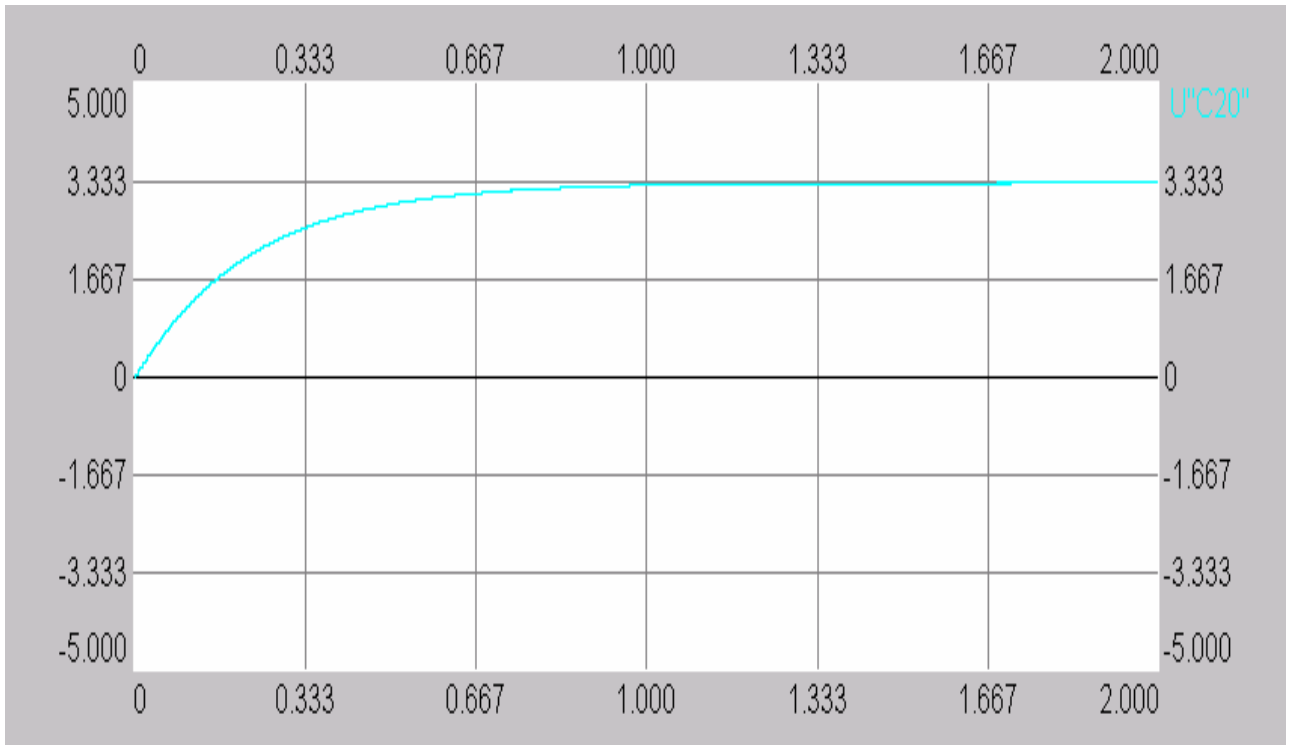
SECONDS

Start-Up Responses

- Charge-up of Sync capacitor
- Charge-up of A/B/C capacitors
- Sync Cluster Input Voltage
- Signal A/B/C Cluster Input Voltage
- Sync BA7603 Input Voltage
- Signal A/B/C IR3Y Input Voltage

Start-Up: Sync Capacitor C20 Voltage

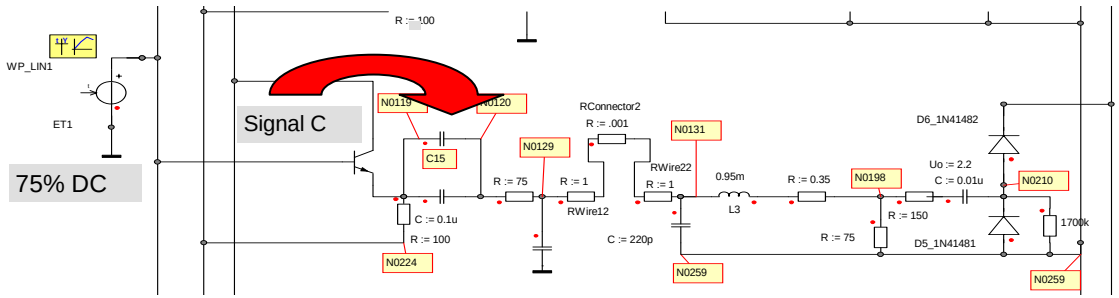


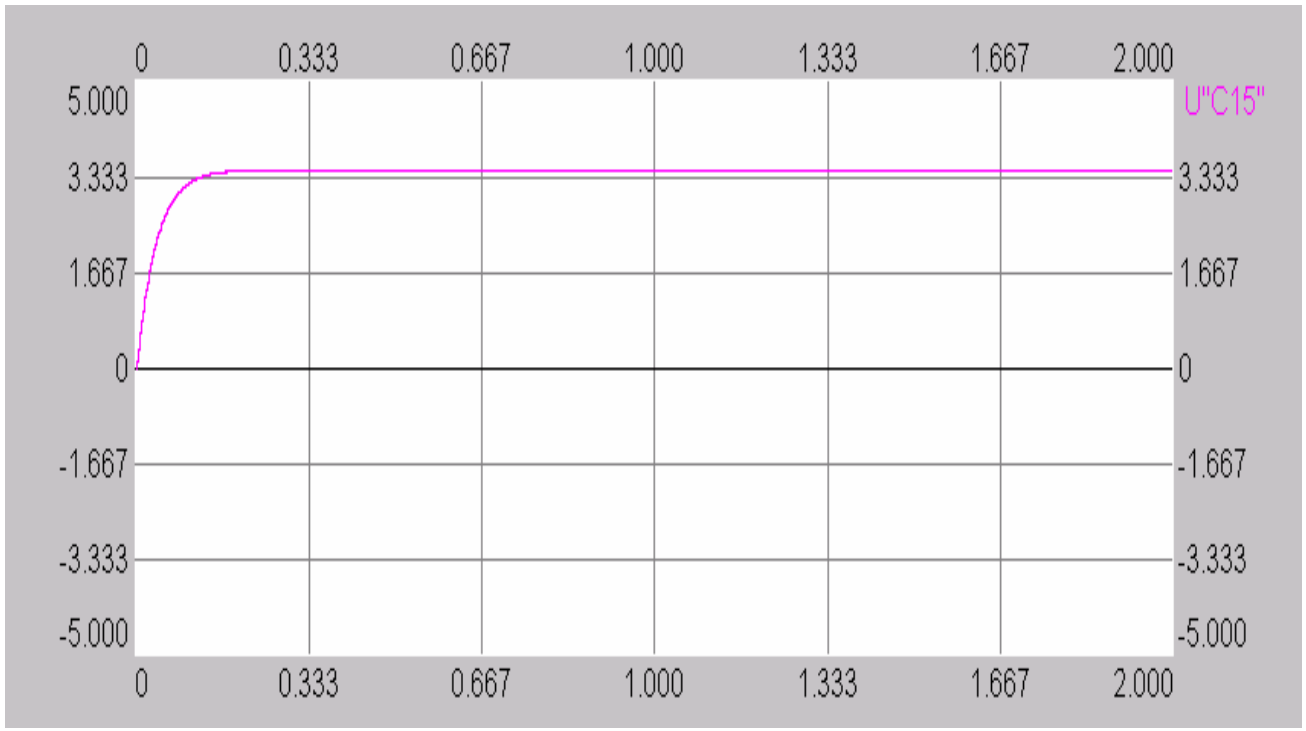


VOLTS

SECONDS

Start-Up: Signals A/B/C Capacitor C15 Voltage

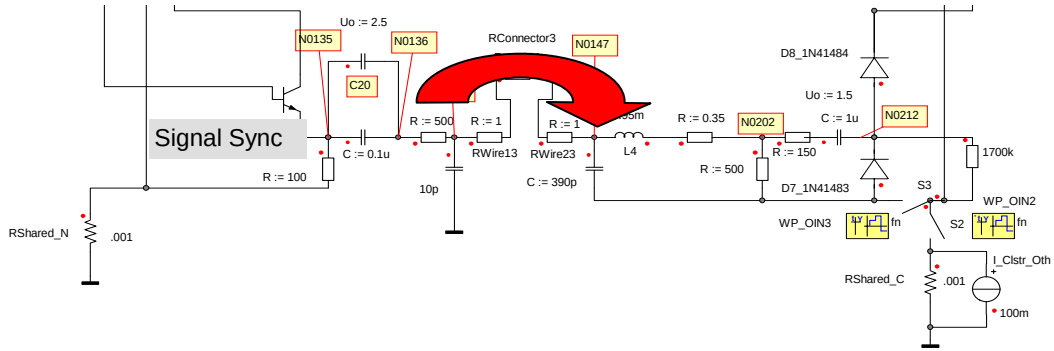


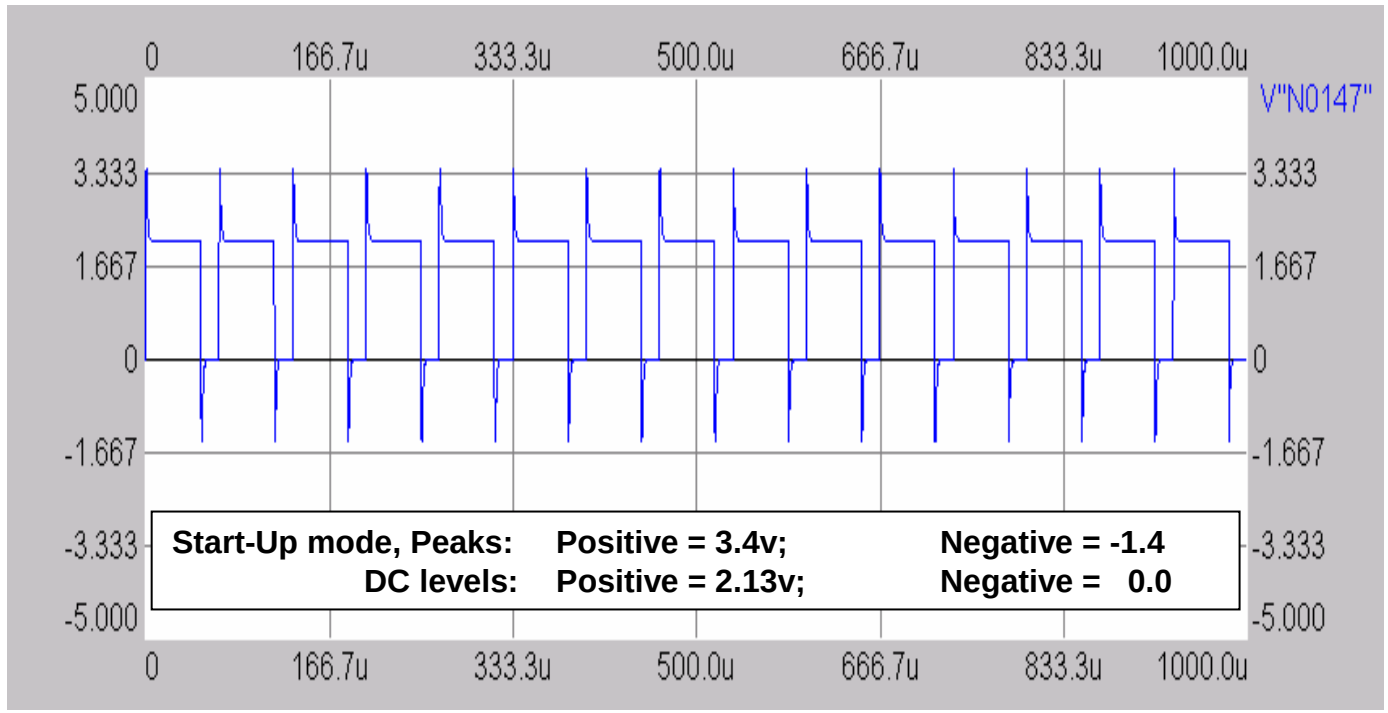


VOLTS

SECONDS

Start-Up: Sync Cluster Input Voltage

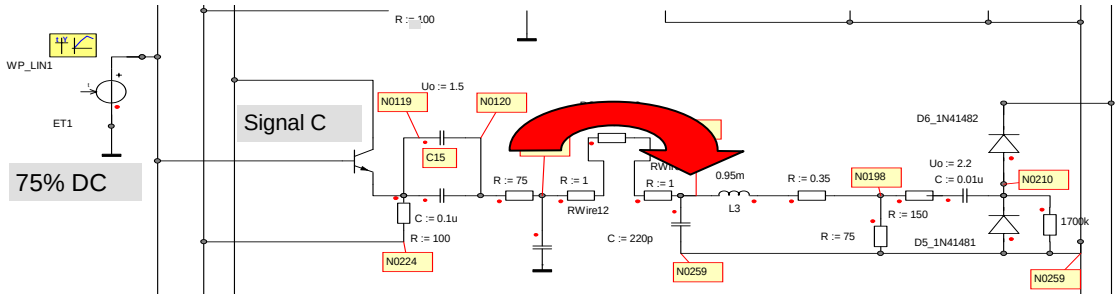


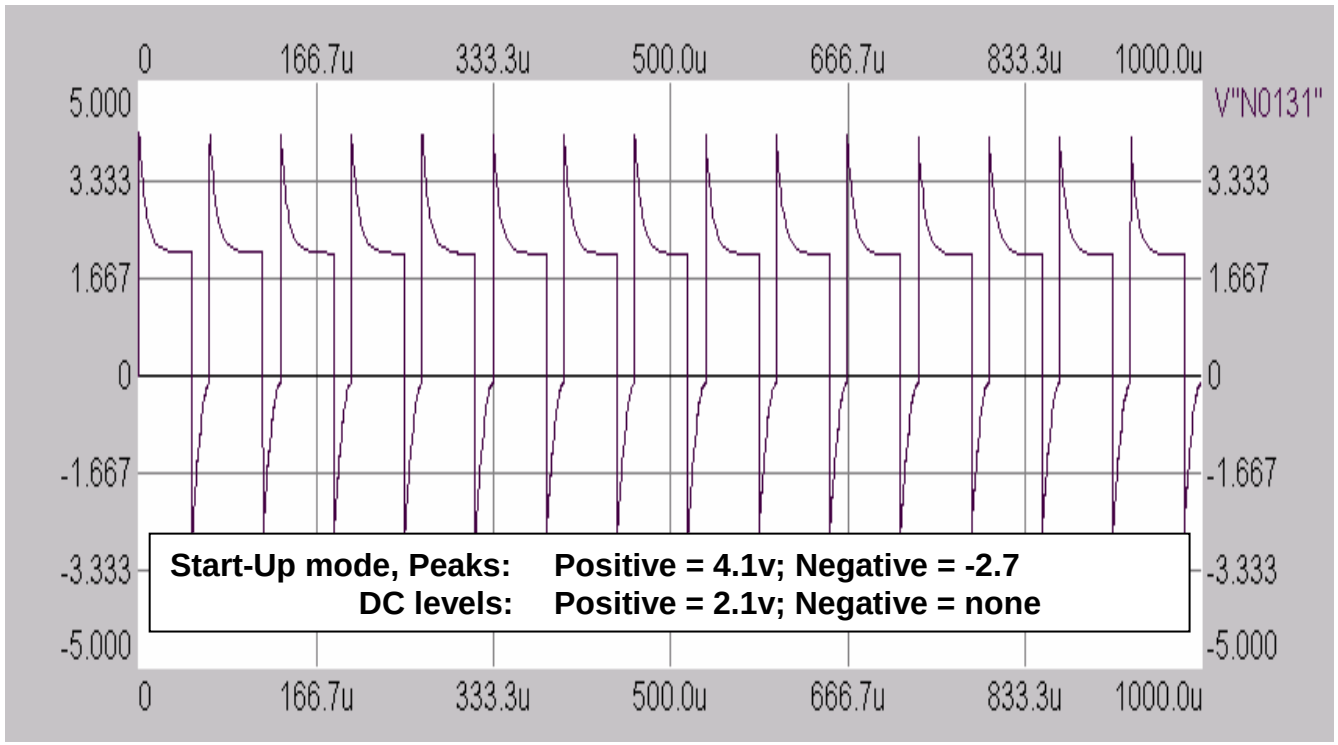


VOLTS

SECONDS

Signal A/B/C Cluster Input Voltage

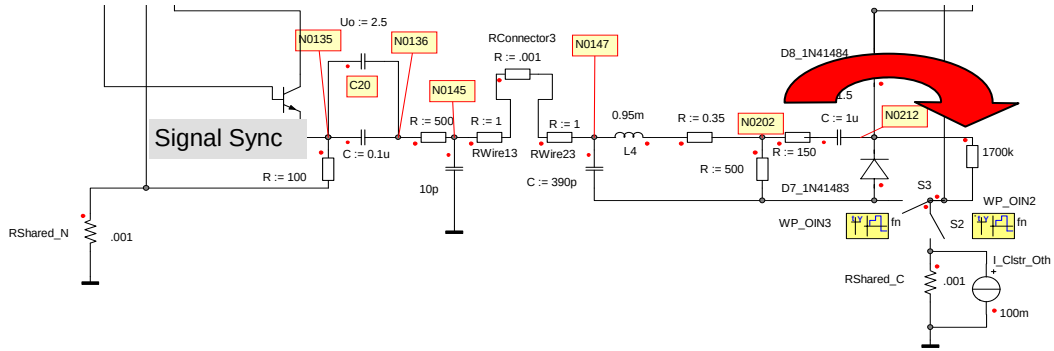


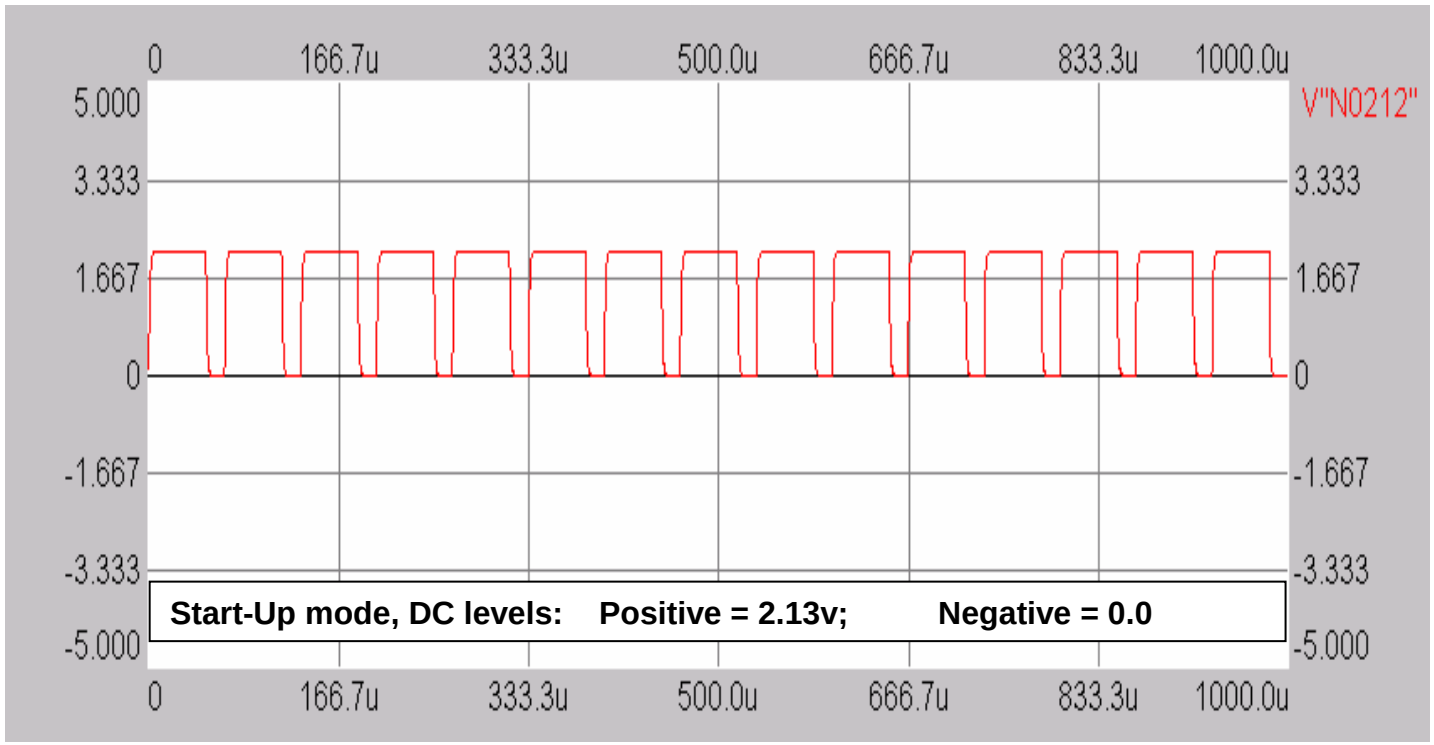


VOLTS

SECONDS

Start-Up: Sync BA7603 Input Voltage

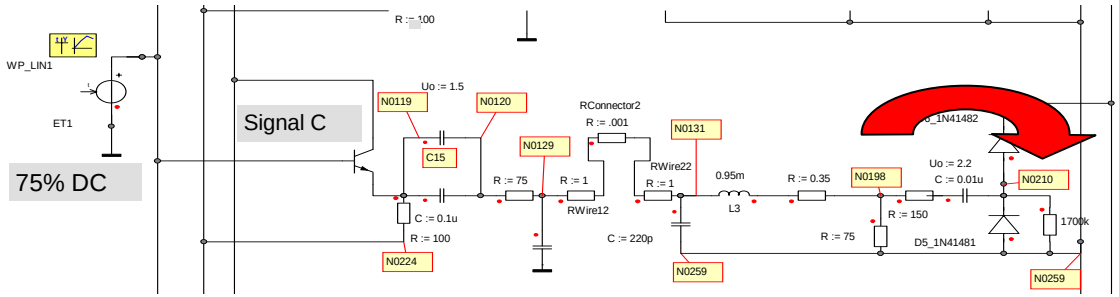


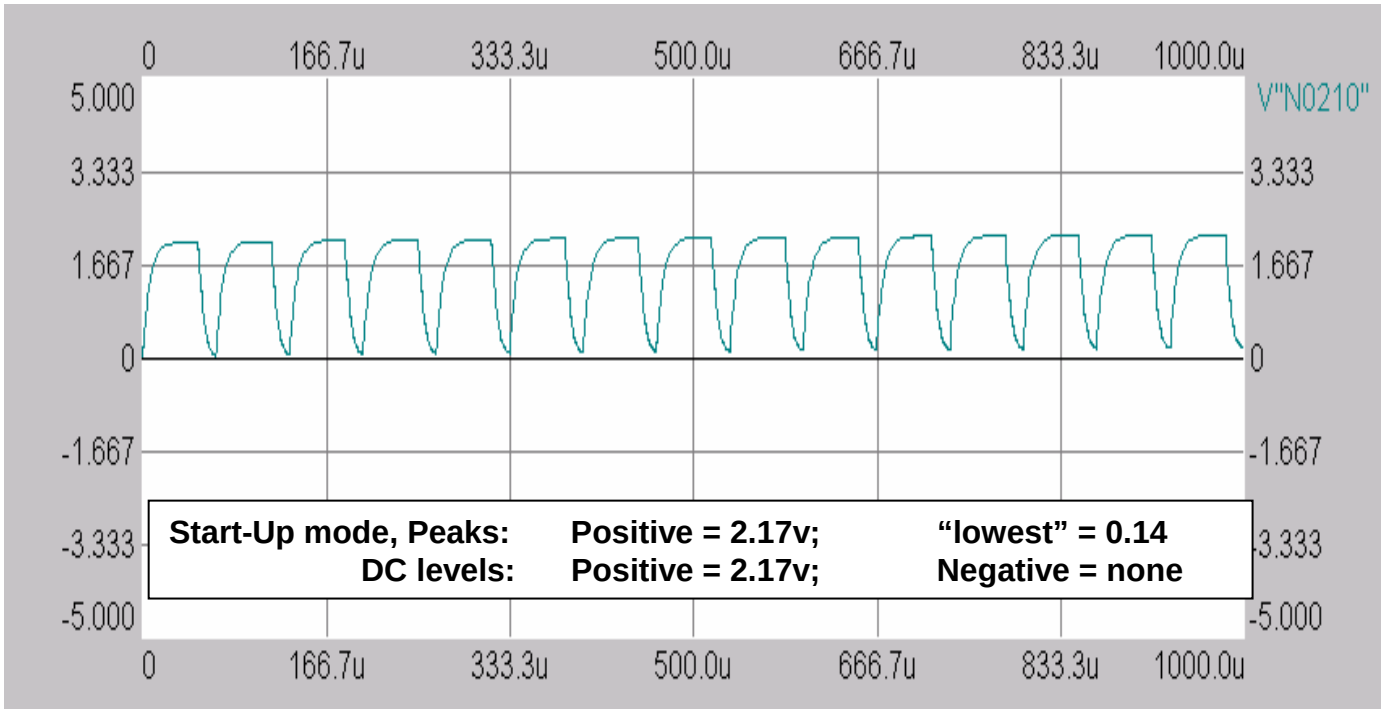


VOLTS

SECONDS

Start-Up: Signal A/B/C IR3Y Input Voltage





VOLTS

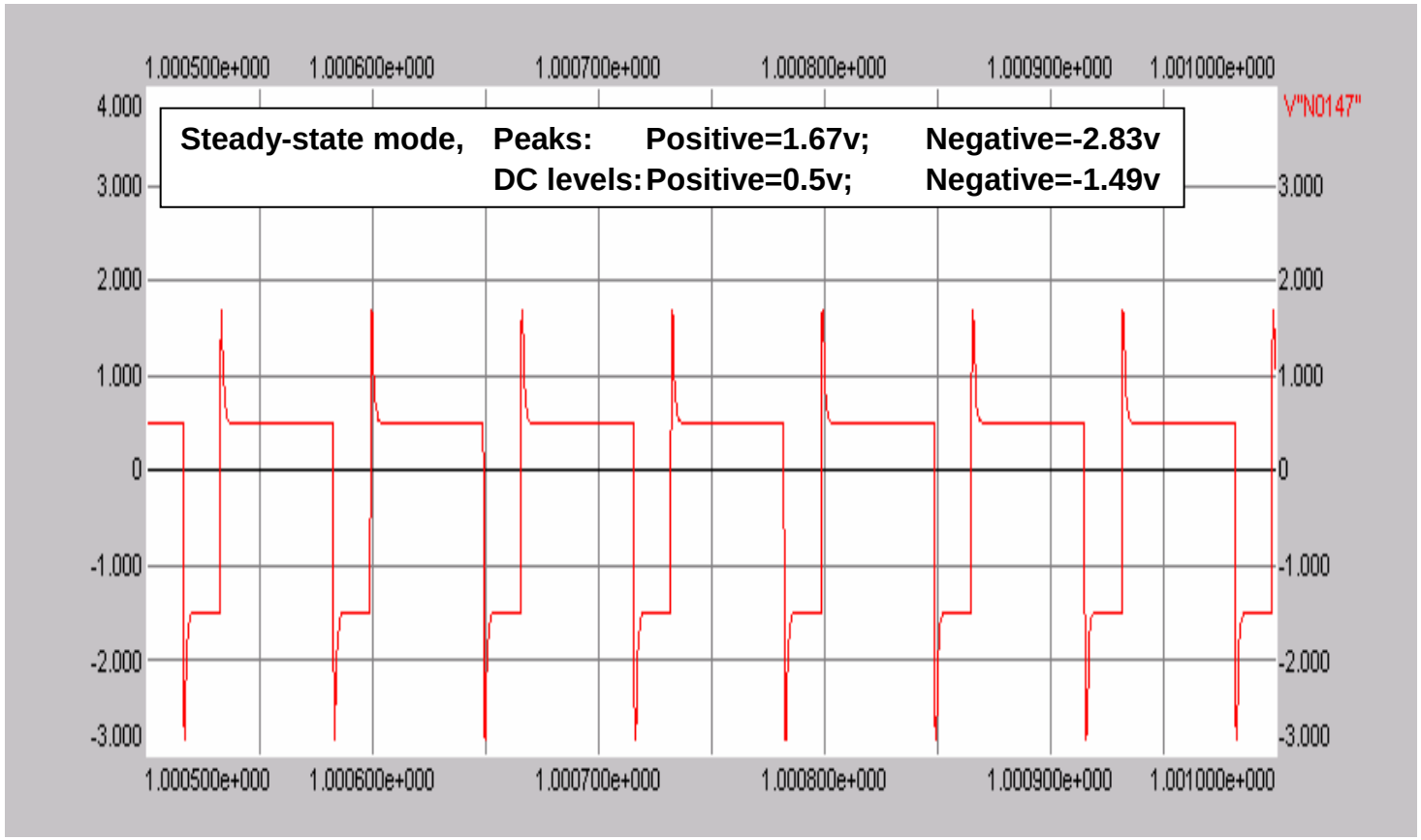
SECONDS

Steady-State Responses

- Sync Cluster Input Voltage
- Signal A/B/C Cluster Input Voltage
- Sync BA7603 Input Voltage
- Signal A/B/C IR3Y Input Voltage

Steady State

Sync Cluster Input Voltage



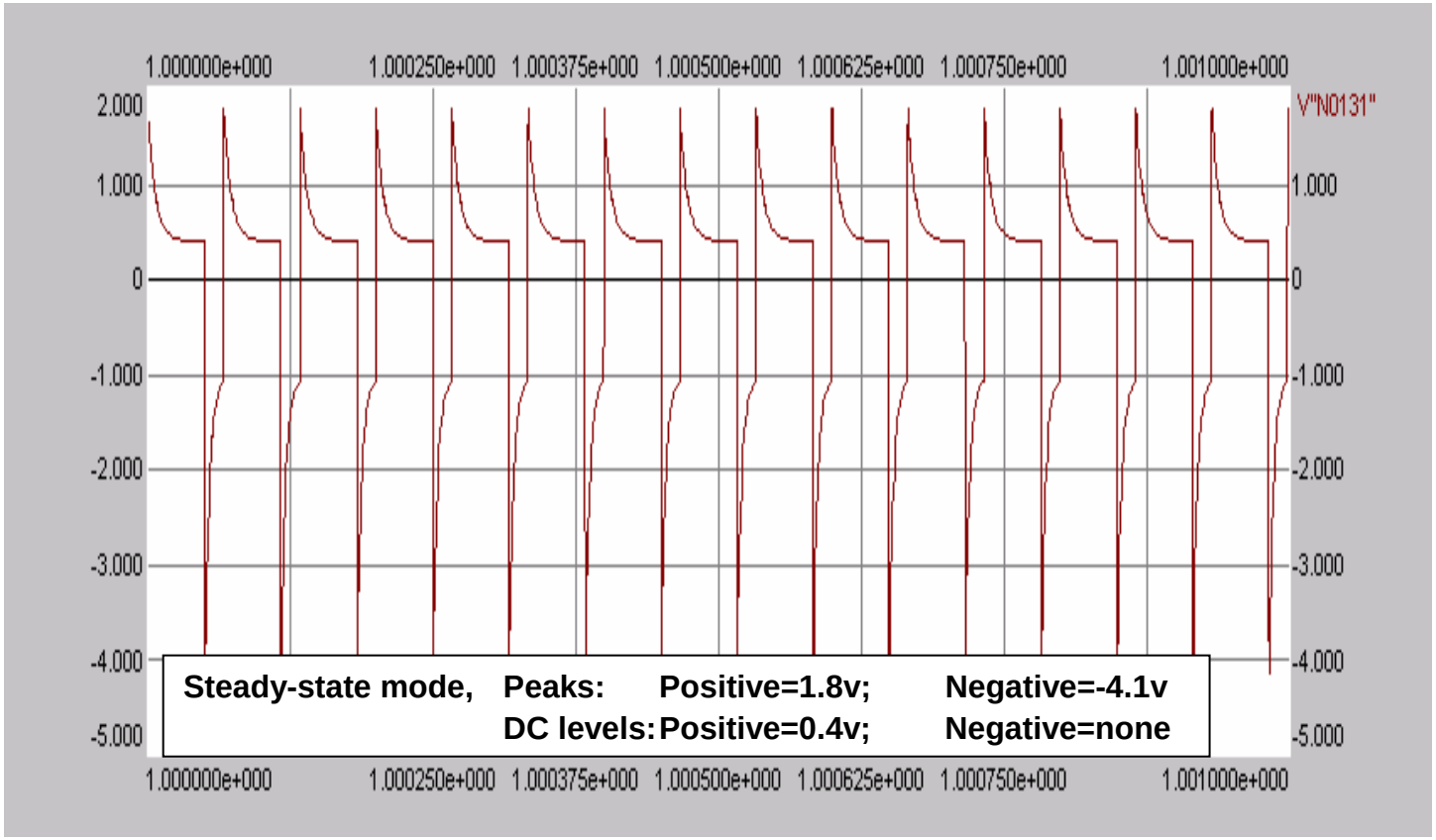
VOLTS

SECONDS

Steady State

Signal A/B/C Cluster Input Voltage

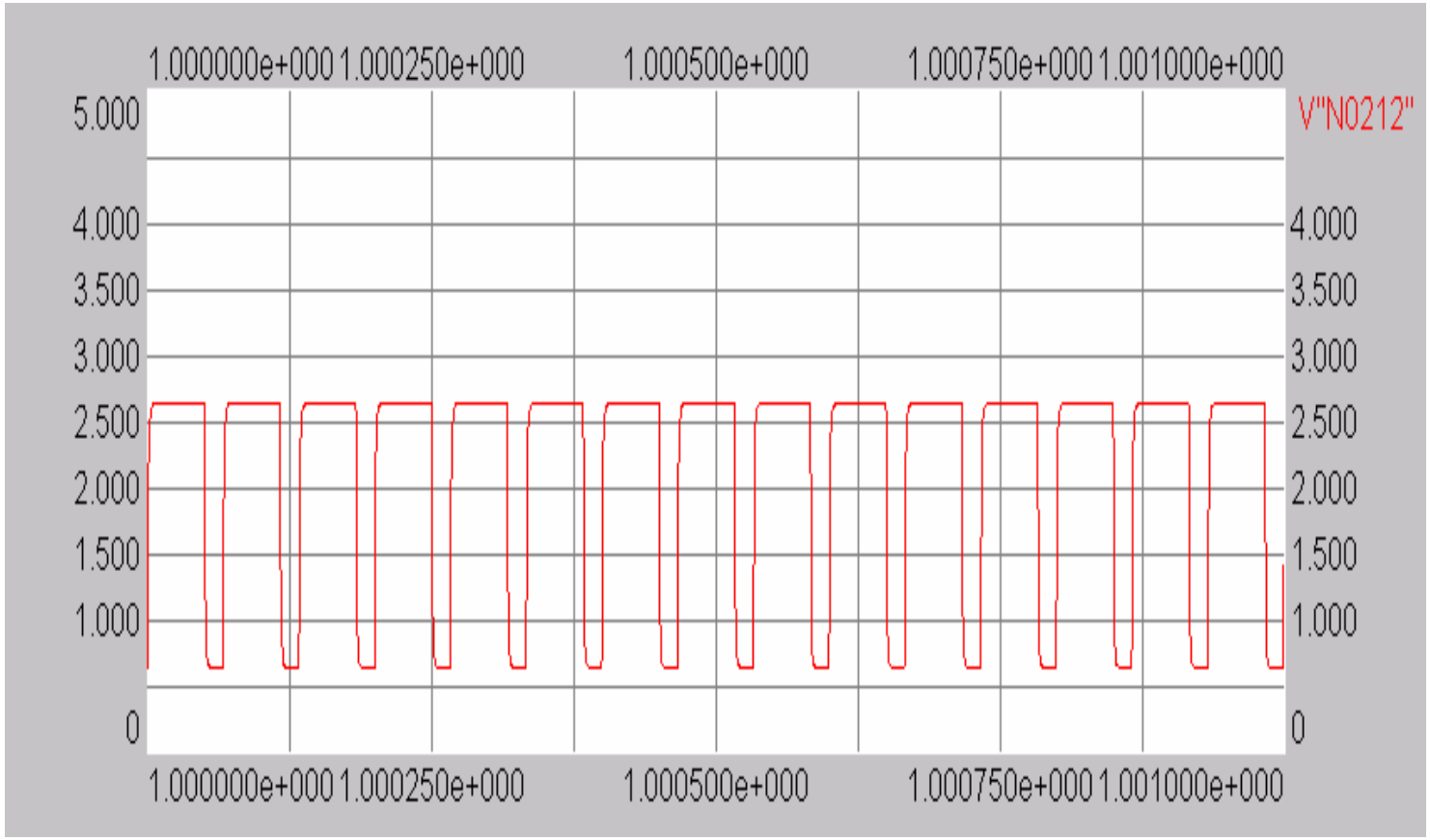
VOLTS



SECONDS

Steady State

Sync BA7603 Input Voltage

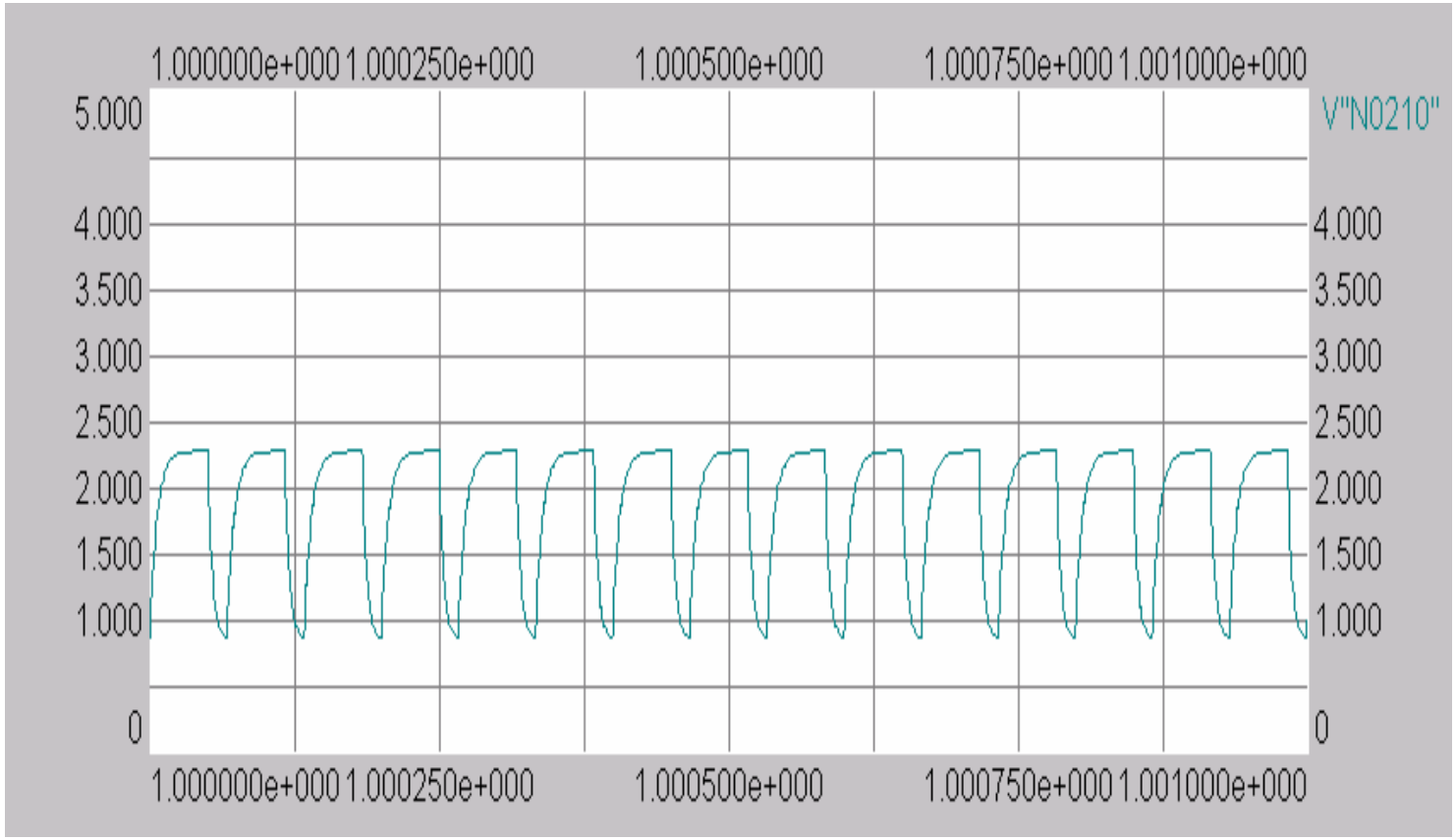


VOLTS

SECONDS

Steady State

Signal A/B/C IR3Y Input Voltage



VOLTS

SECONDS

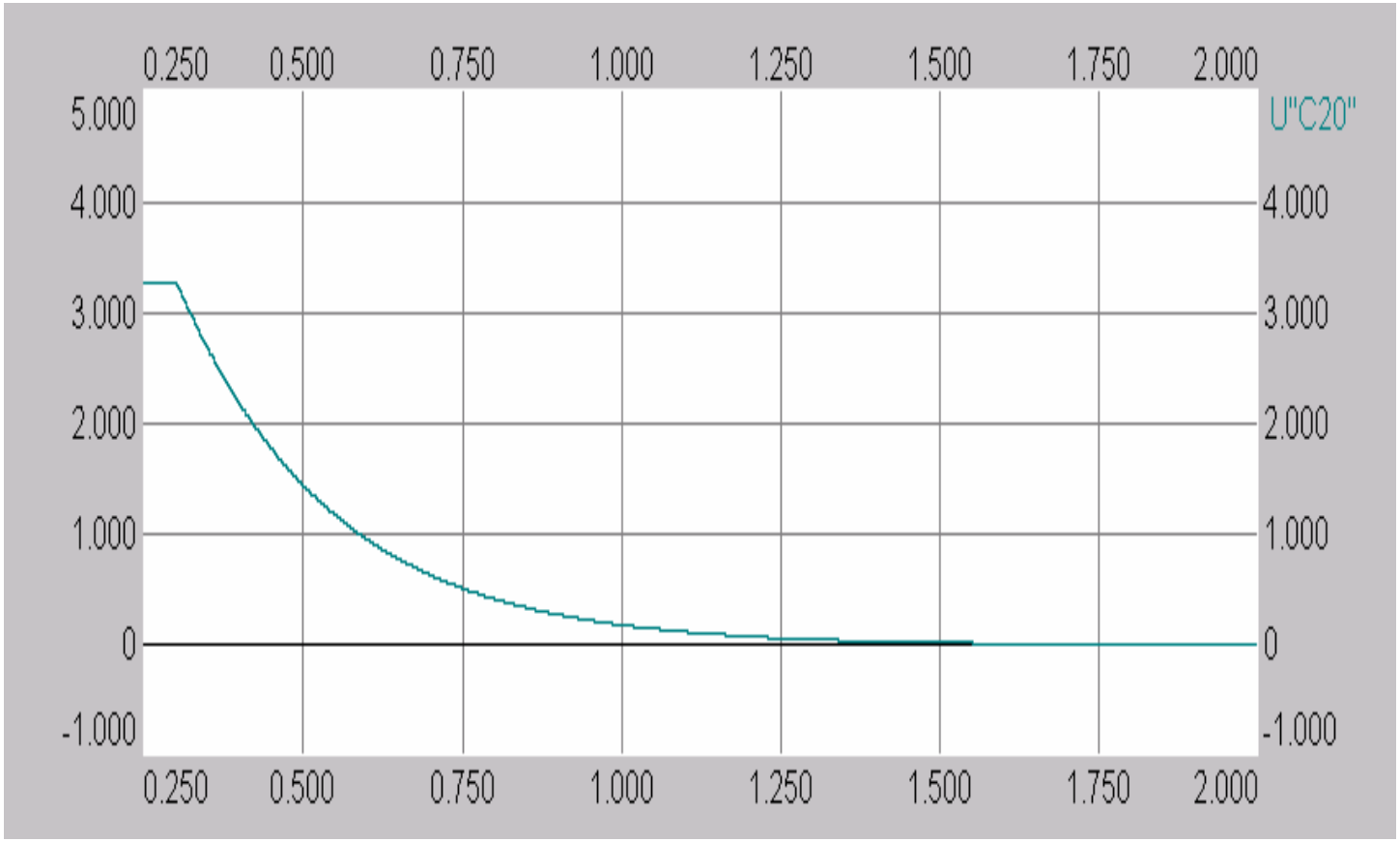
Shut-Down Responses

(input signal and power to low impedances at 301 msec)

- Discharge of Sync capacitor
- Discharge of A/B/C capacitors
- Sync Cluster Input Voltage
- Signal A/B/C Cluster Input Voltage
- Sync BA7603 Input Voltage
- Signal A/B/C IR3Y Input Voltage

Shut-Down Responses

Sync Capacitor C20 Voltage

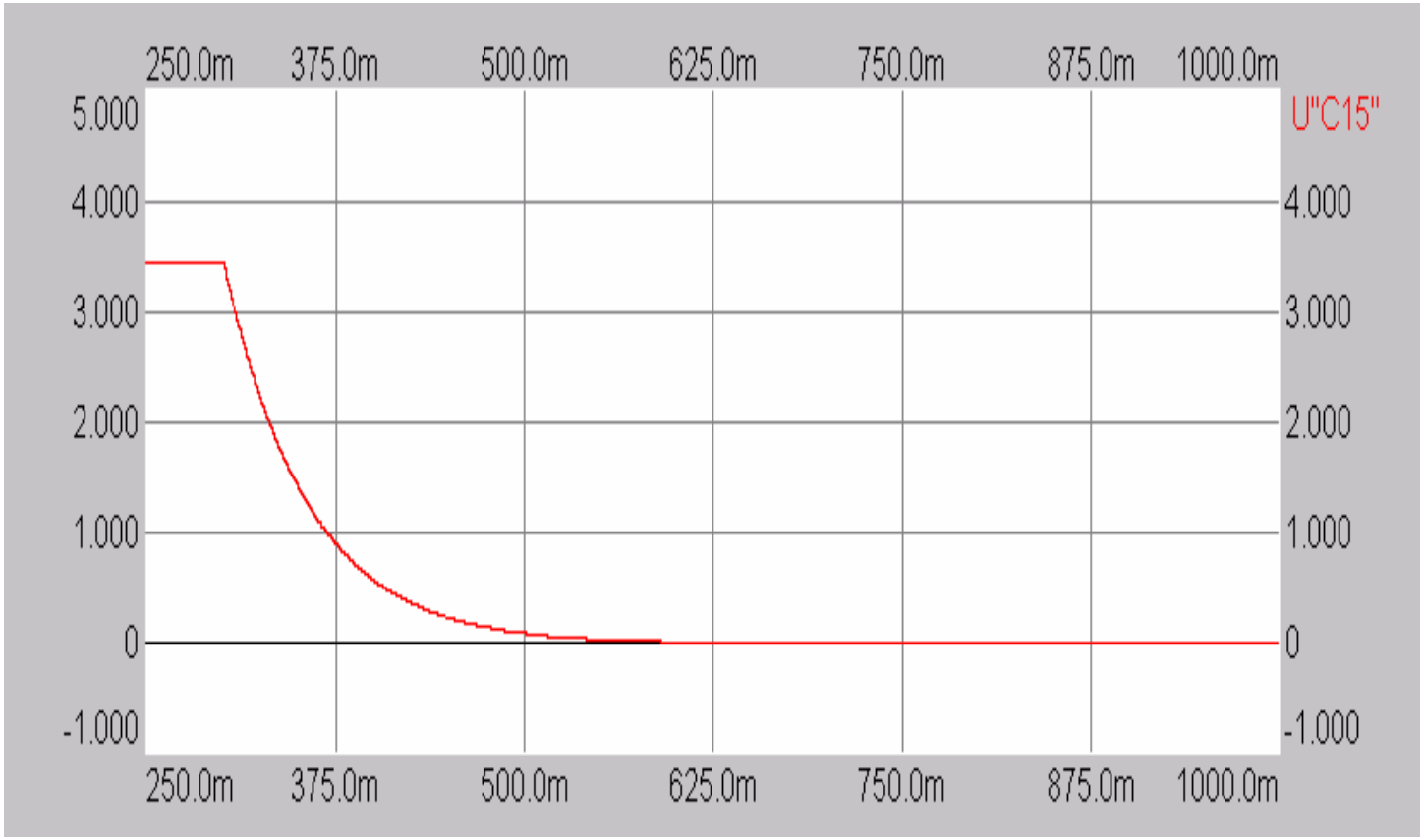


VOLTS

SECONDS

Shut-Down Responses

A/B/C Capacitor C15 Voltage

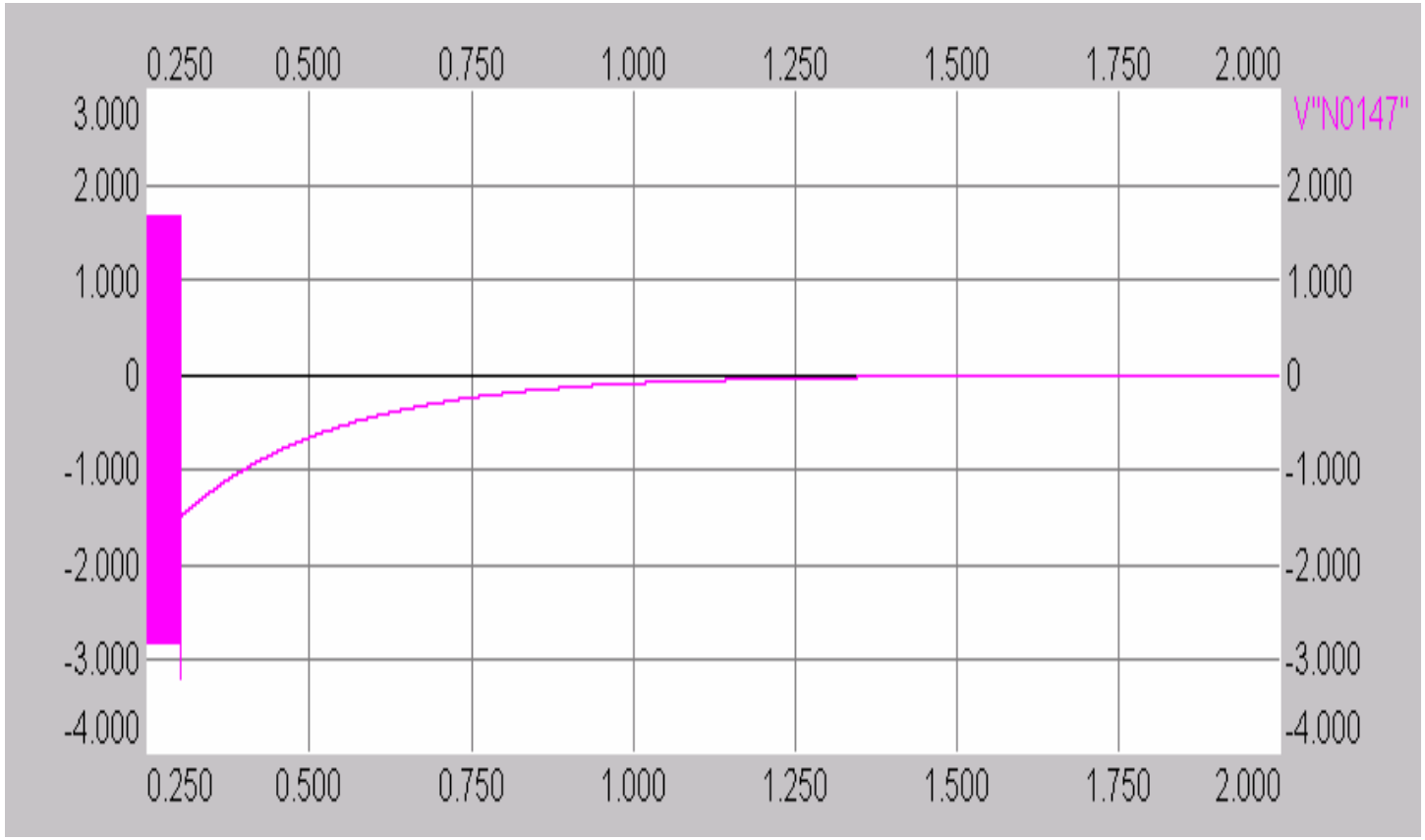


VOLTS

SECONDS

Shut-Down Responses

Sync Cluster Input Voltage

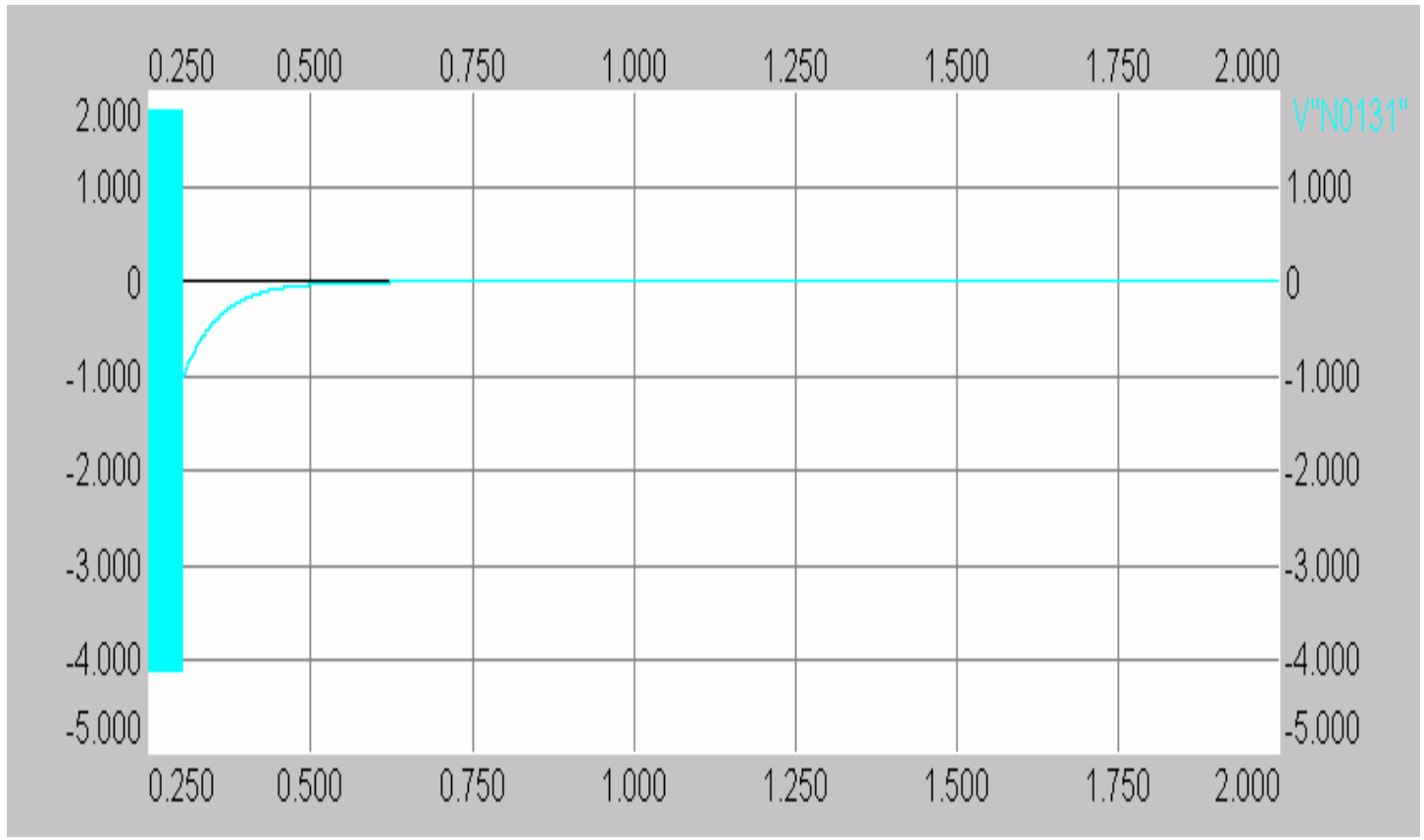


VOLTS

SECONDS

Shut-Down Responses

A/B/C Cluster Input Voltage

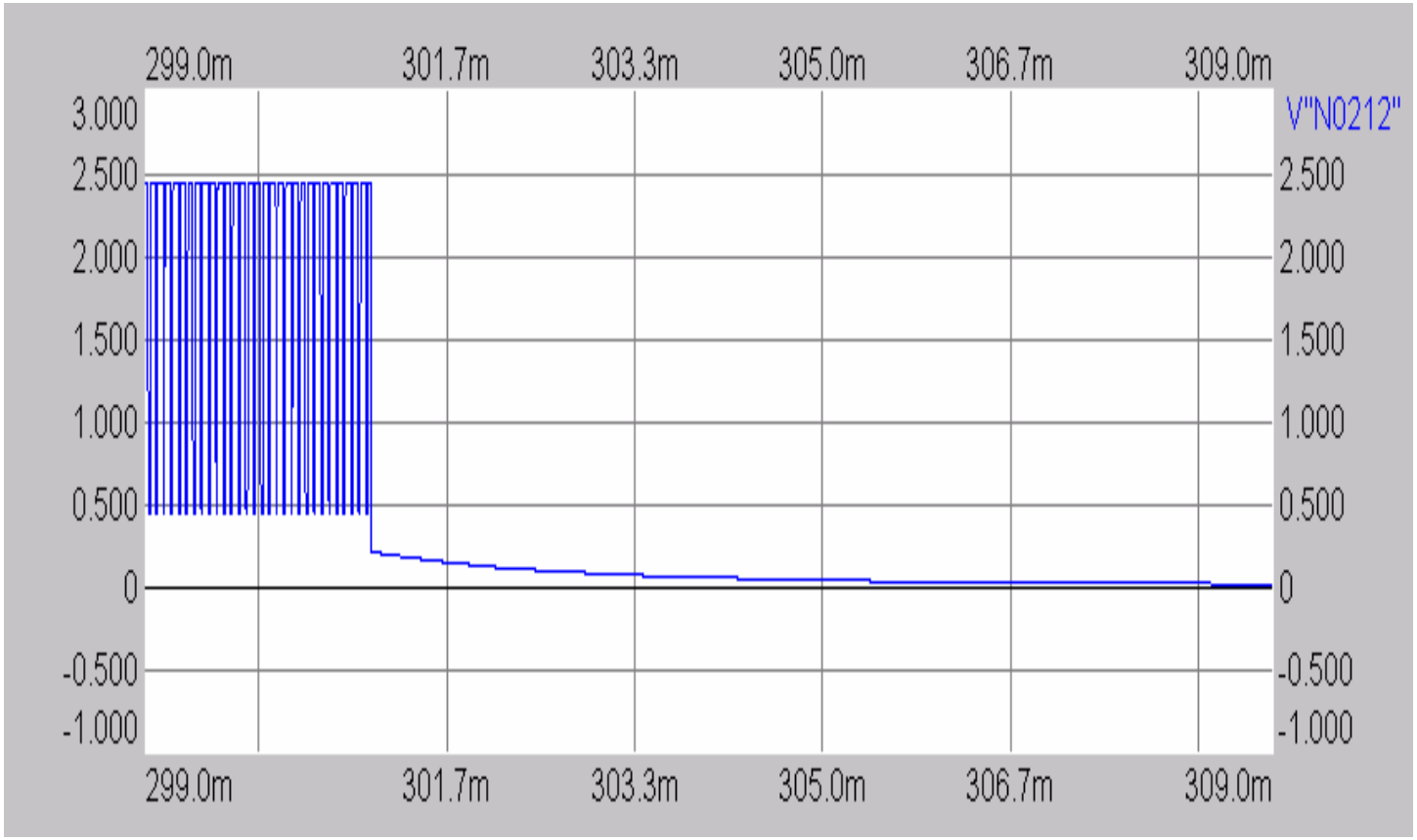


VOLTS

SECONDS

Shut-Down Responses

BA7603 Input Voltage

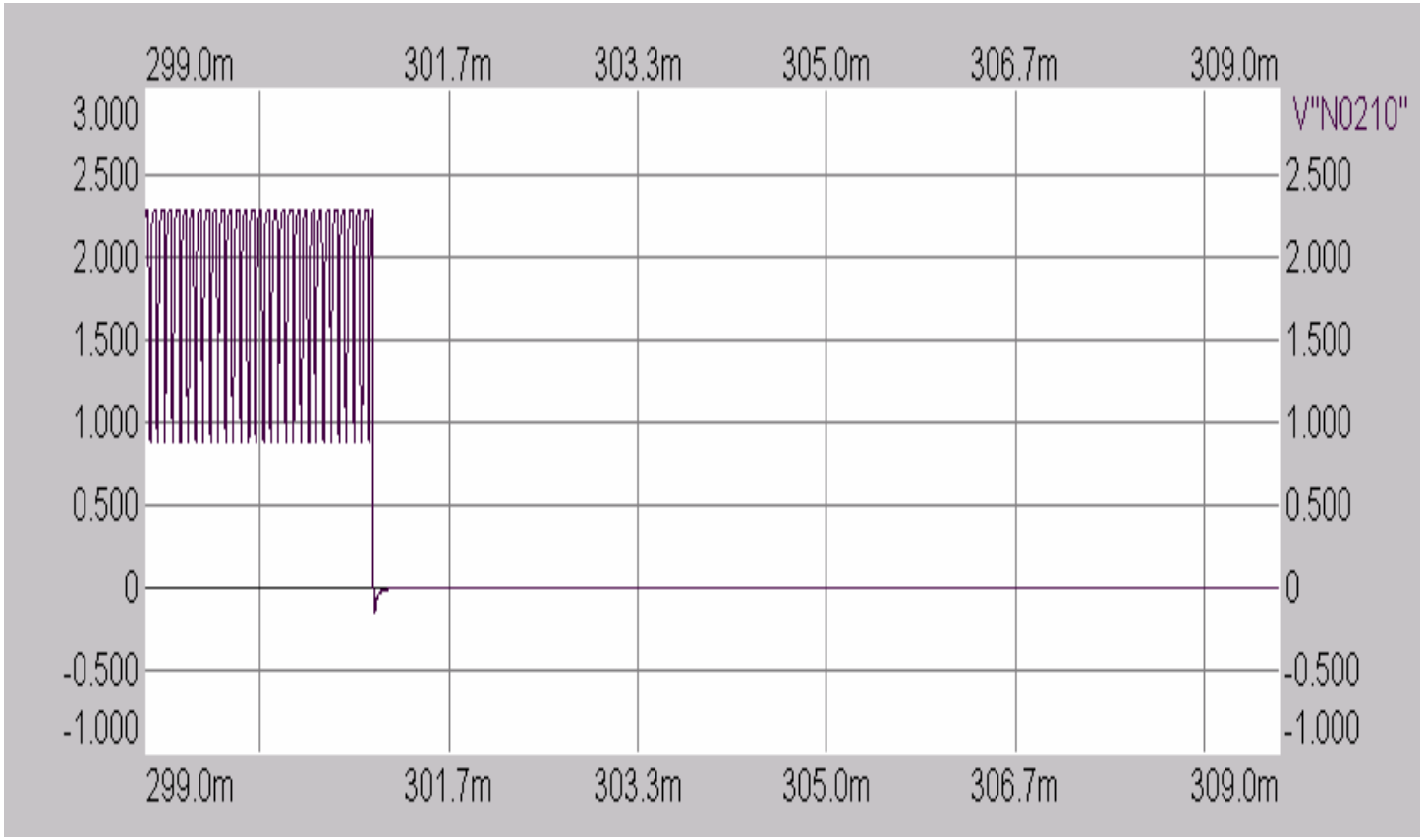


VOLTS

SECONDS

Shut-Down Responses

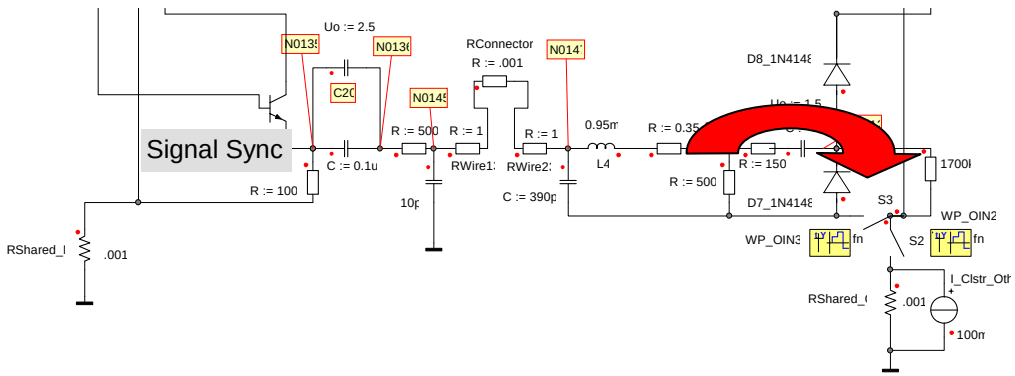
A/B/C IR3Y Input Voltage



Ground Lift Responses

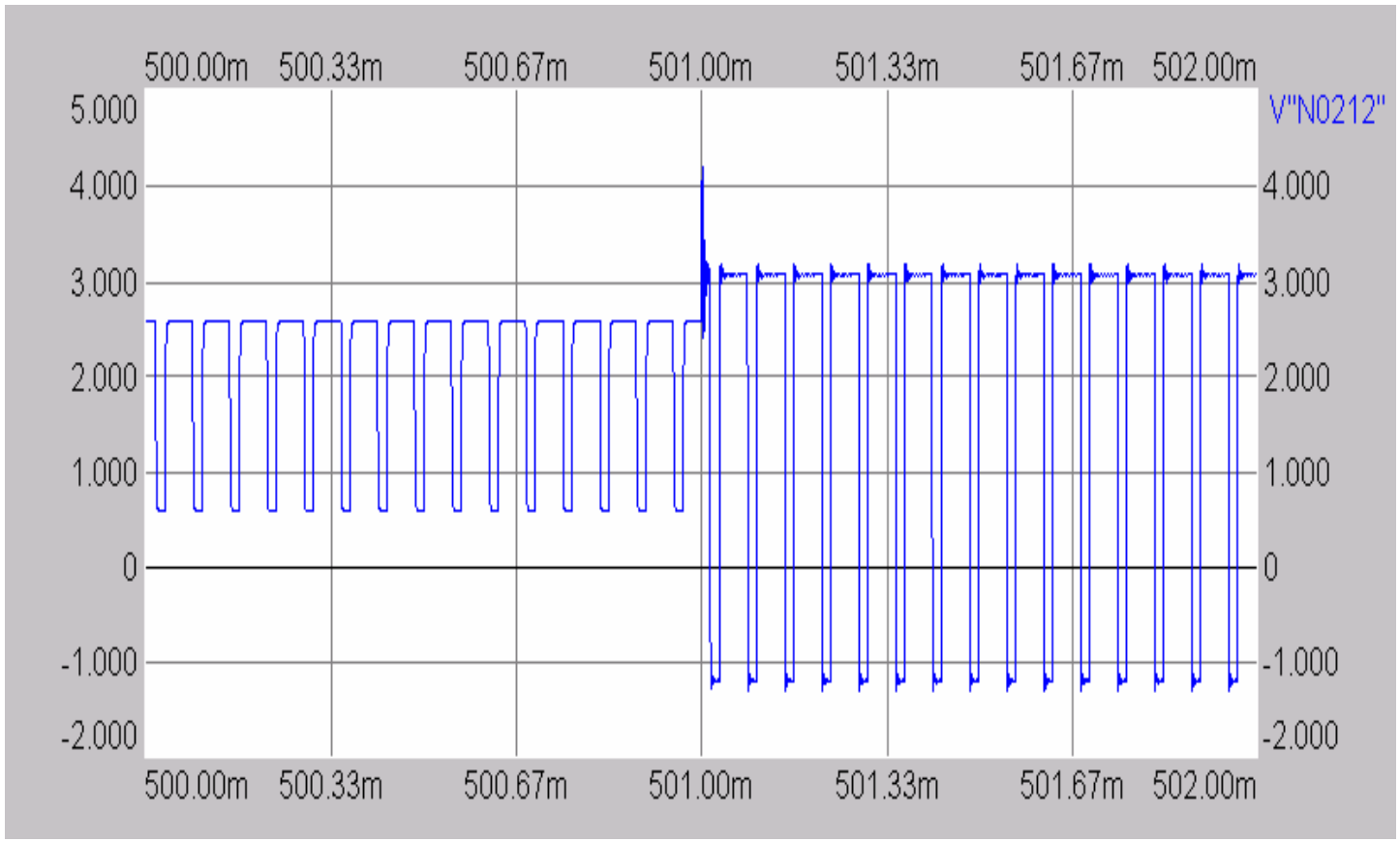
(cluster side Sync ground opened at 501 msec)

- BA7603 input voltage at Lift
- BA7603 input voltage 1.5 sec. after Lift
- Lifted “ground” lead voltage



Ground Lift Responses

BA7603 input voltage at Lift

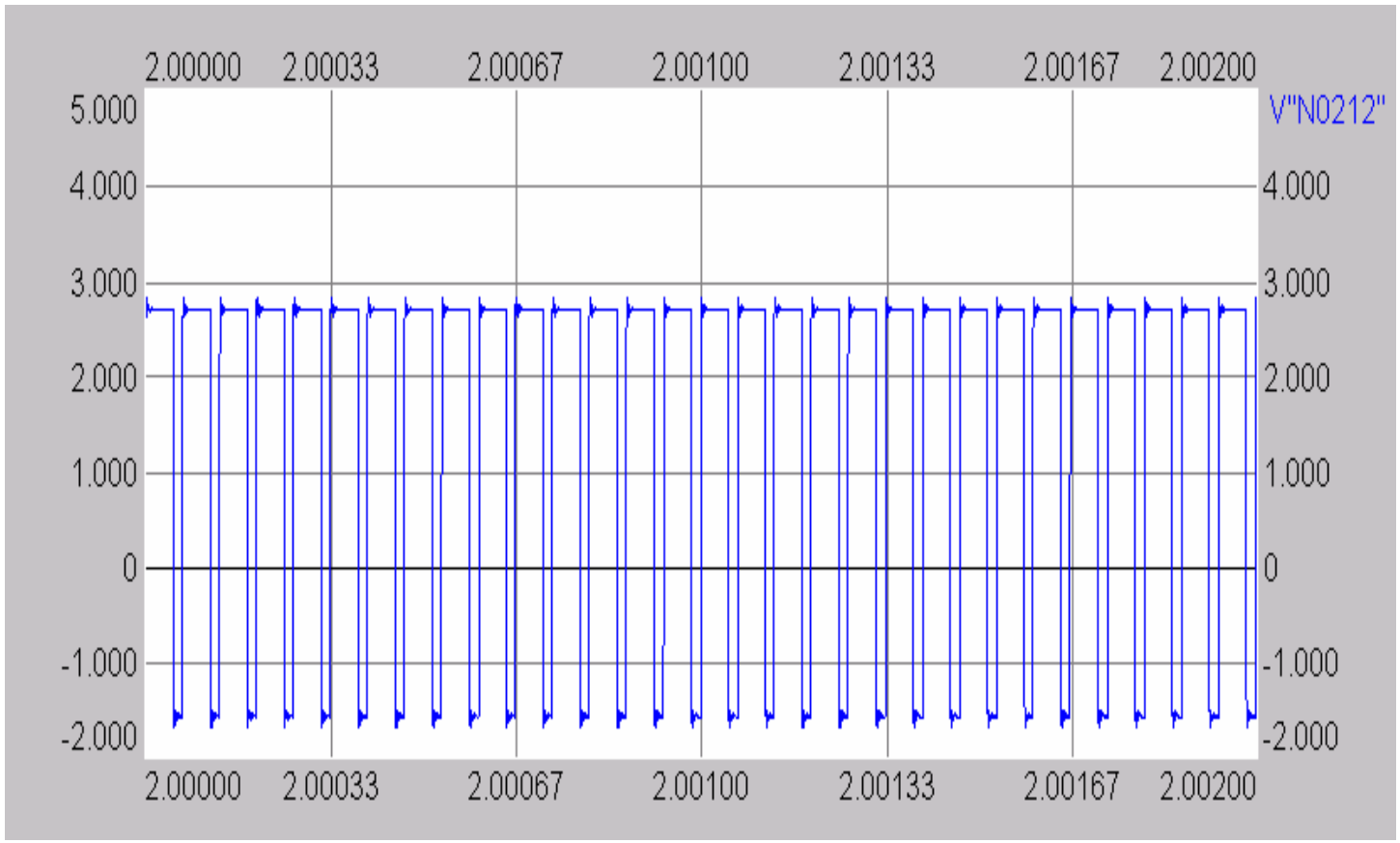


VOLTS

SECONDS

Ground Lift Responses

BA7603 input voltage 1.5 sec. after Lift

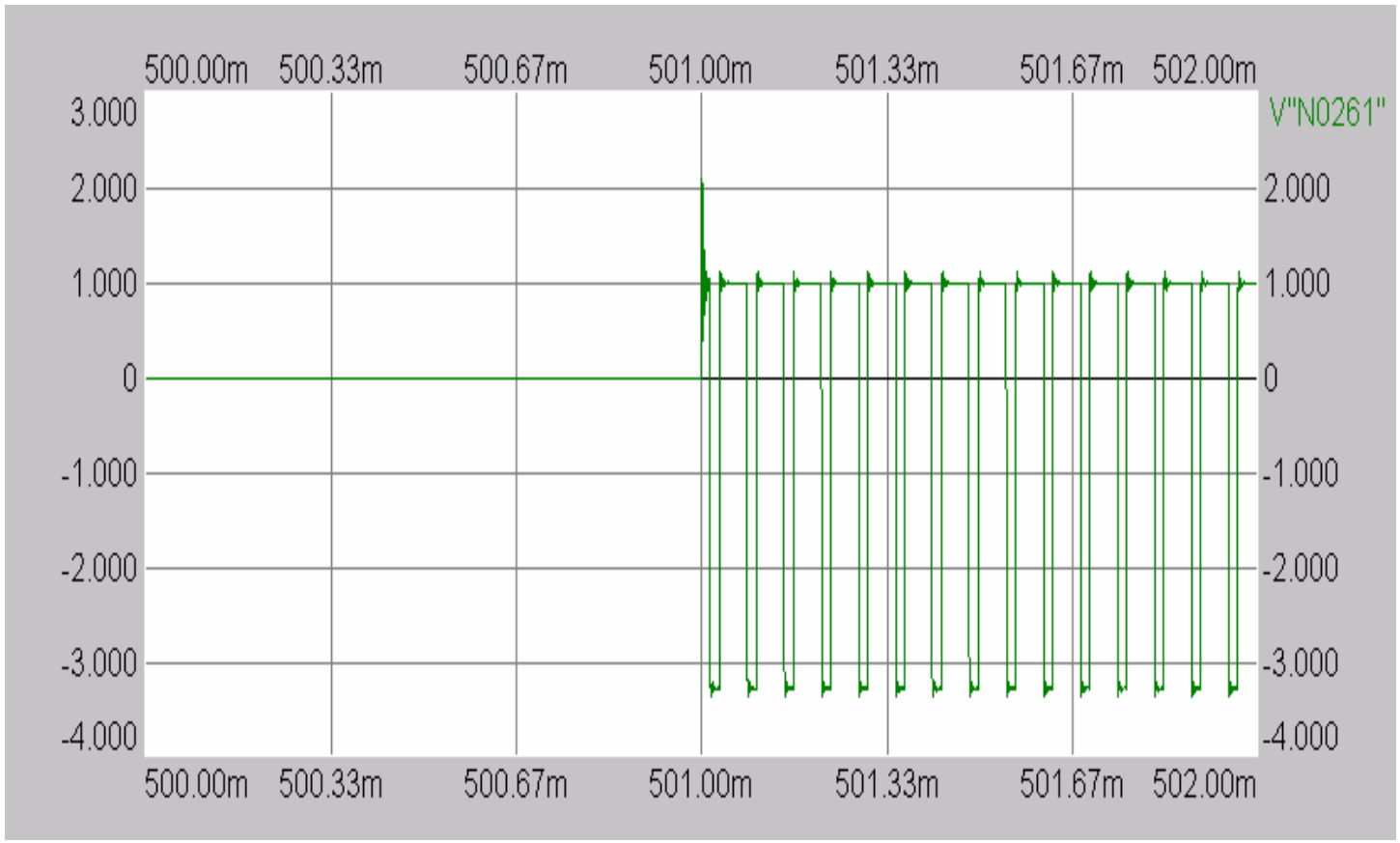


VOLTS

SECONDS

Ground Lift Responses

Lifted “ground” lead voltage



VOLTS

SECONDS