

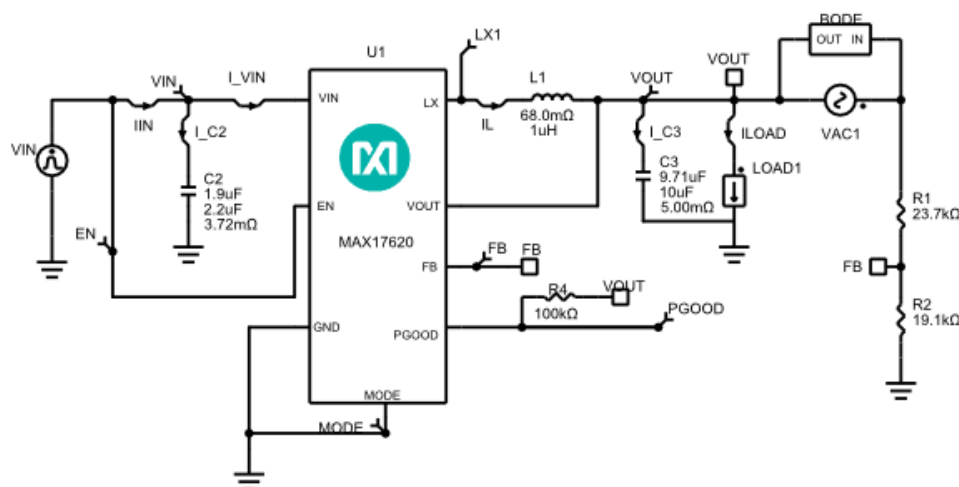
Initial Design

1.0

Design Requirements

Parameter	Value
Minimum Input Voltage	2.7V
Maximum Input Voltage	5.5V
Nominal Input Voltage	3.6V
Input Ripple Voltage	1V
Output Voltage	1.8V
Output Current	0.6A
Output Voltage Load Step Over/Undershoot	0.036V
Performance Tradeoff	Balance Efficiency and Size
BOM Priority	Cost
Mode of operation	PWM
Ambient Temperature	25C

Schematic



Notes

- Decreasing the output capacitance below recommended value might degrade the transient response or loop stability.
- If the current level (starting current for Load Steps) is too low, AC, Steady State and Load Step analyses may fail when PFM mode is selected.

BOM

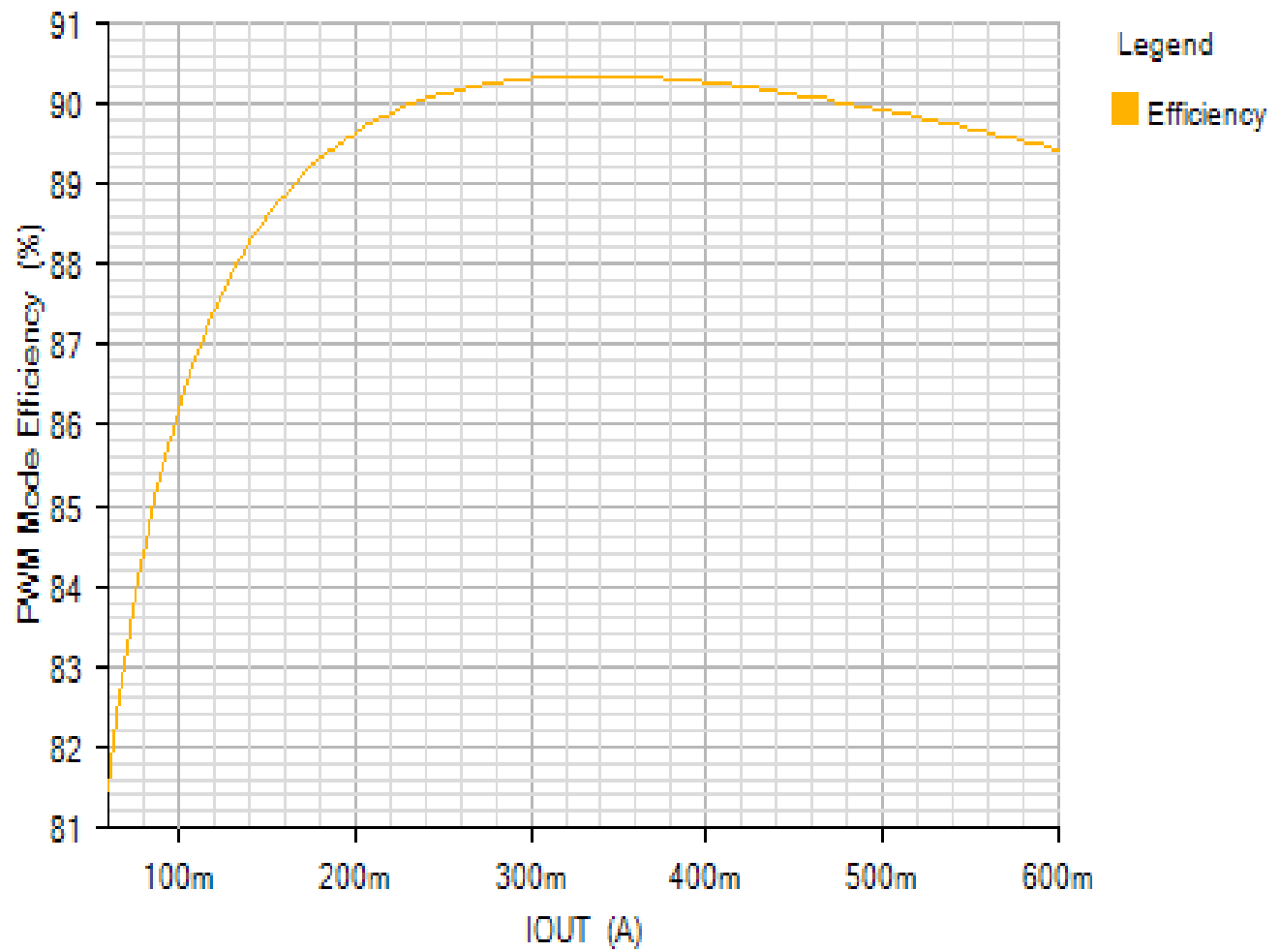
Ref	Qty	Part Number	Manufacturer	Description
U1	1	MAX17620	Maxim Integrated	4MHz, Miniature 600mA, Synchronous Step-Down DC-DC Converter with Integrated MOSFETs
C2	1	C1608X7R1A225K080AC	TDK	Cap Ceramic 2.2uF 10V X7R 10% SMD 0603 125C Paper T/R
C3	1	C2012X7R1A106K125AC	TDK	Cap Ceramic 10uF 10V X7R 10% SMD 0805 125C Plastic T/R
L1	1	VLS201612CX-1R0M	TDK	Inductor 1uH 20% 57mOhm 2.08A Isat 2.54A Irms
R1	1	ERJ2RKF2372X	Panasonic	Res Thick Film 0402 23.7K Ohm 1% 0.1W(1/10W) ±100ppm/°C Pad SMD Automotive T/R
R2	1	ERJ2RKF1912X	Panasonic	Res Thick Film 0402 19.1K Ohm 1% 0.1W(1/10W) ±100ppm/°C Pad SMD Automotive T/R
R4	1	ERJ2GEJ104X	Panasonic	Res Thick Film 0402 100K Ohm 5% 0.1W(1/10W) ±200ppm/°C Pad SMD Automotive T/R

Simulation Results

Efficiency - Tue Nov 20 2018 13:08:22

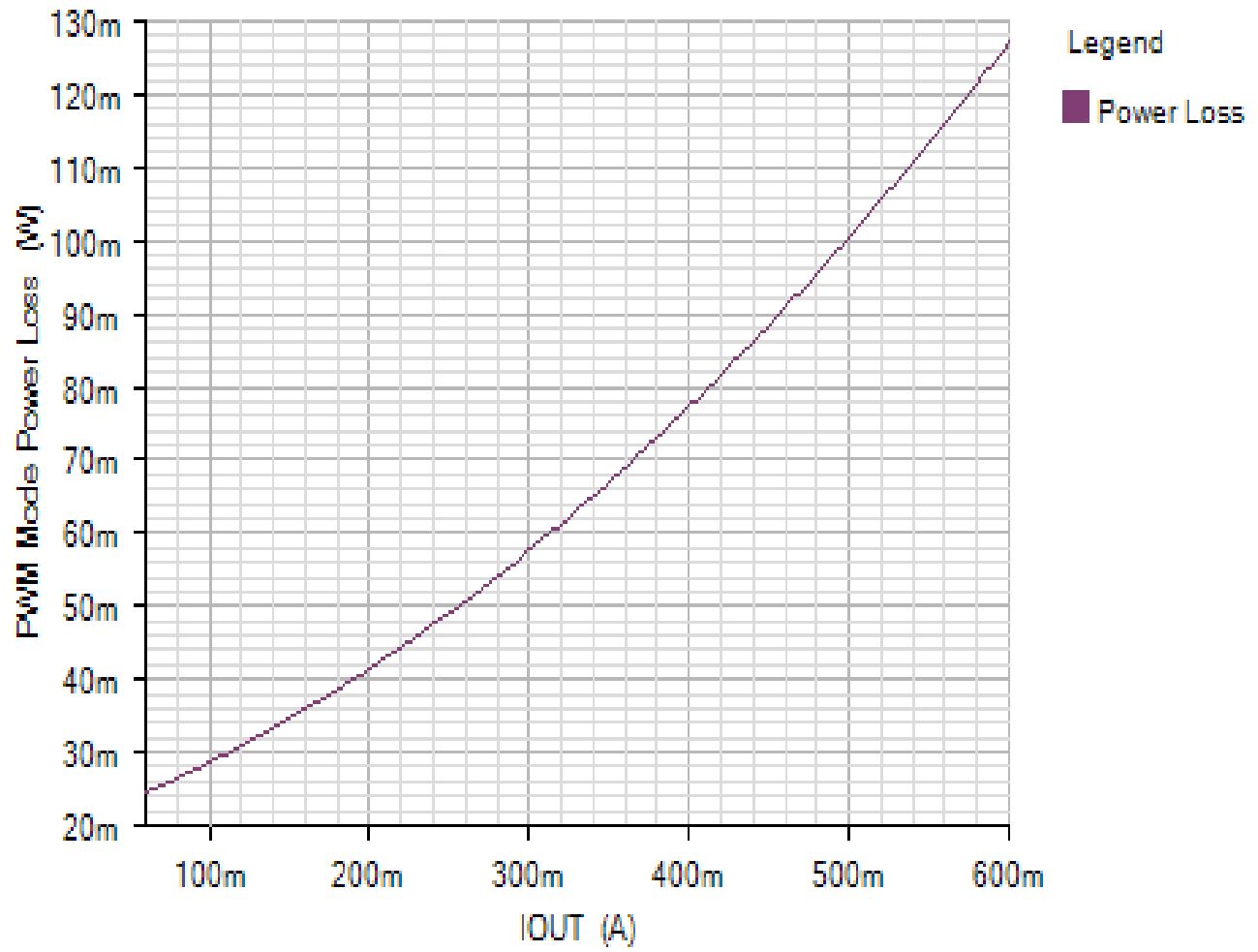
EFFICIENCY_PLOT

Default



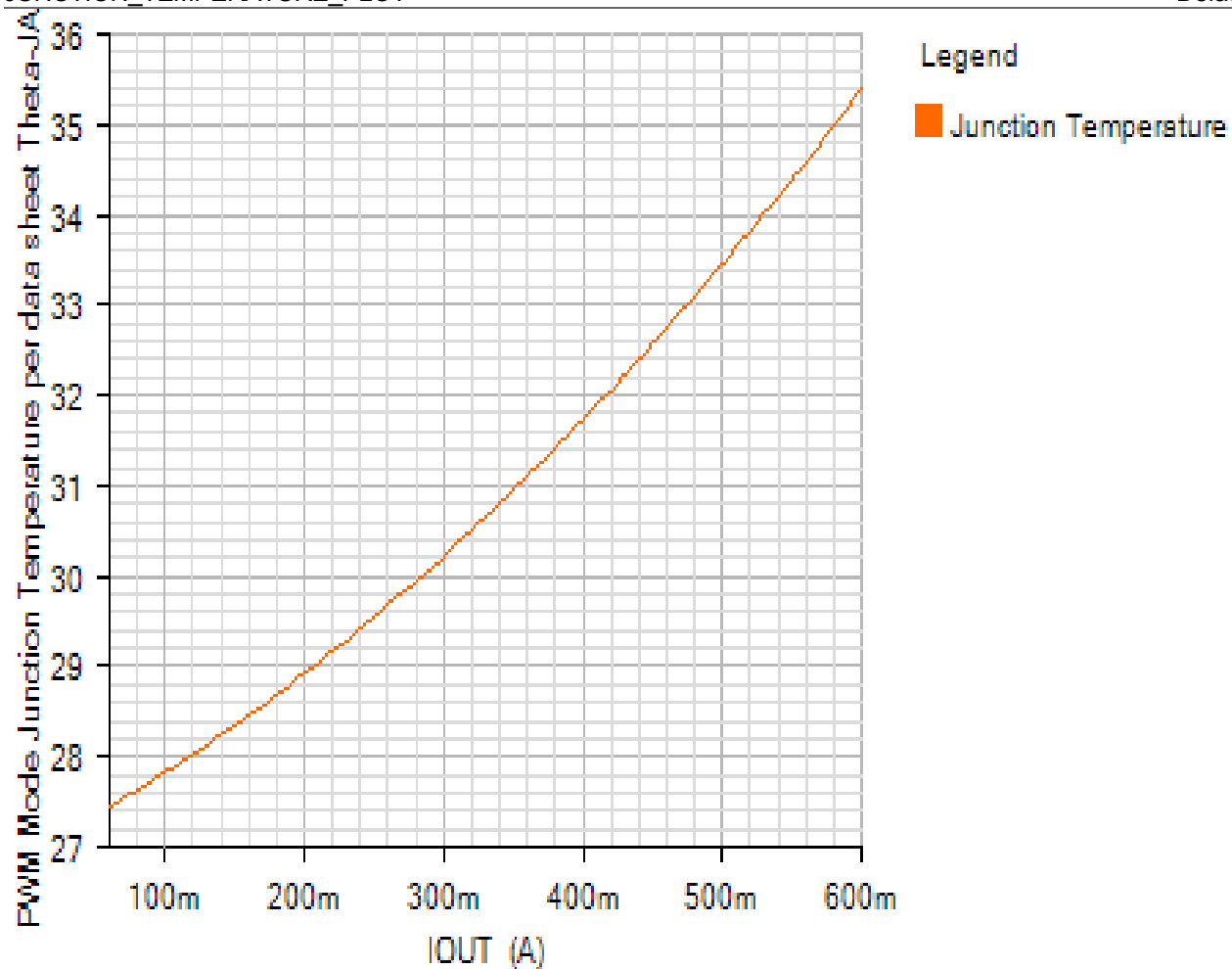
POWER_LOSS_PLOT

Default

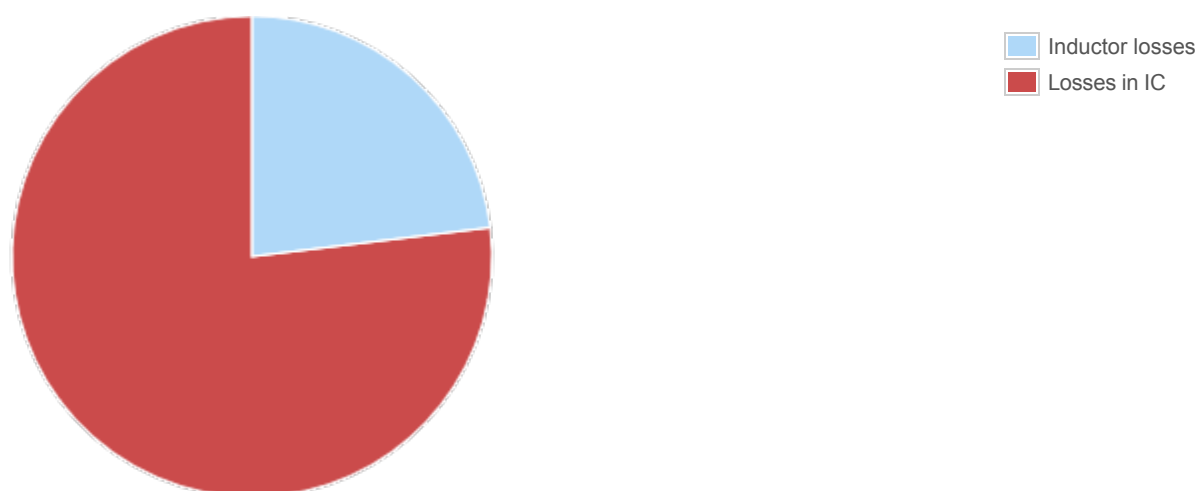


JUNCTION_TEMPERATURE_PLOT

Default



Losses



Component

Loss (W)

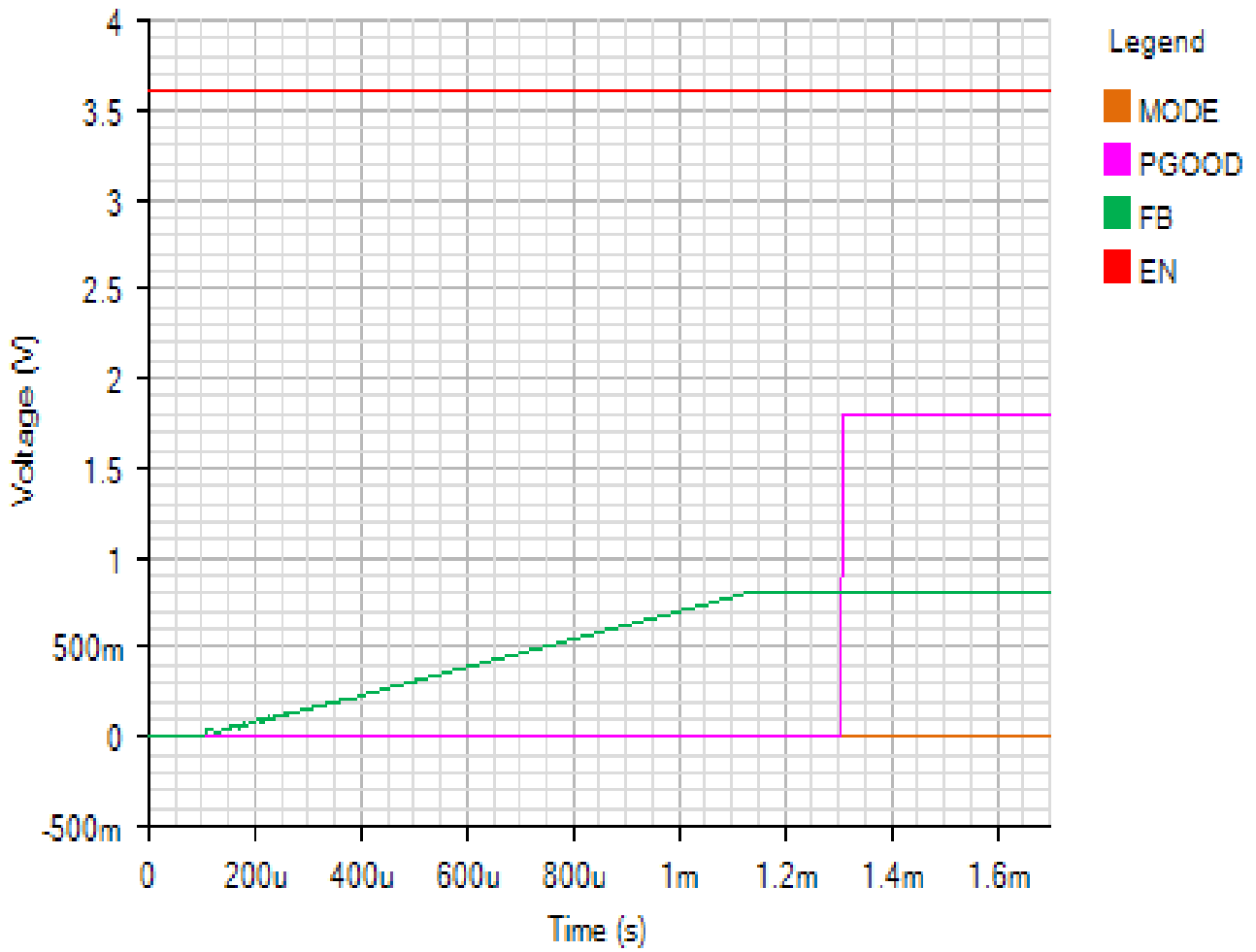
% of total

Component	Loss (W)	% of total
Inductor losses	0.03	23.1
Losses in IC	0.1	76.9
Total	0.13	100

Start Up - Tue Nov 20 2018 13:08:22

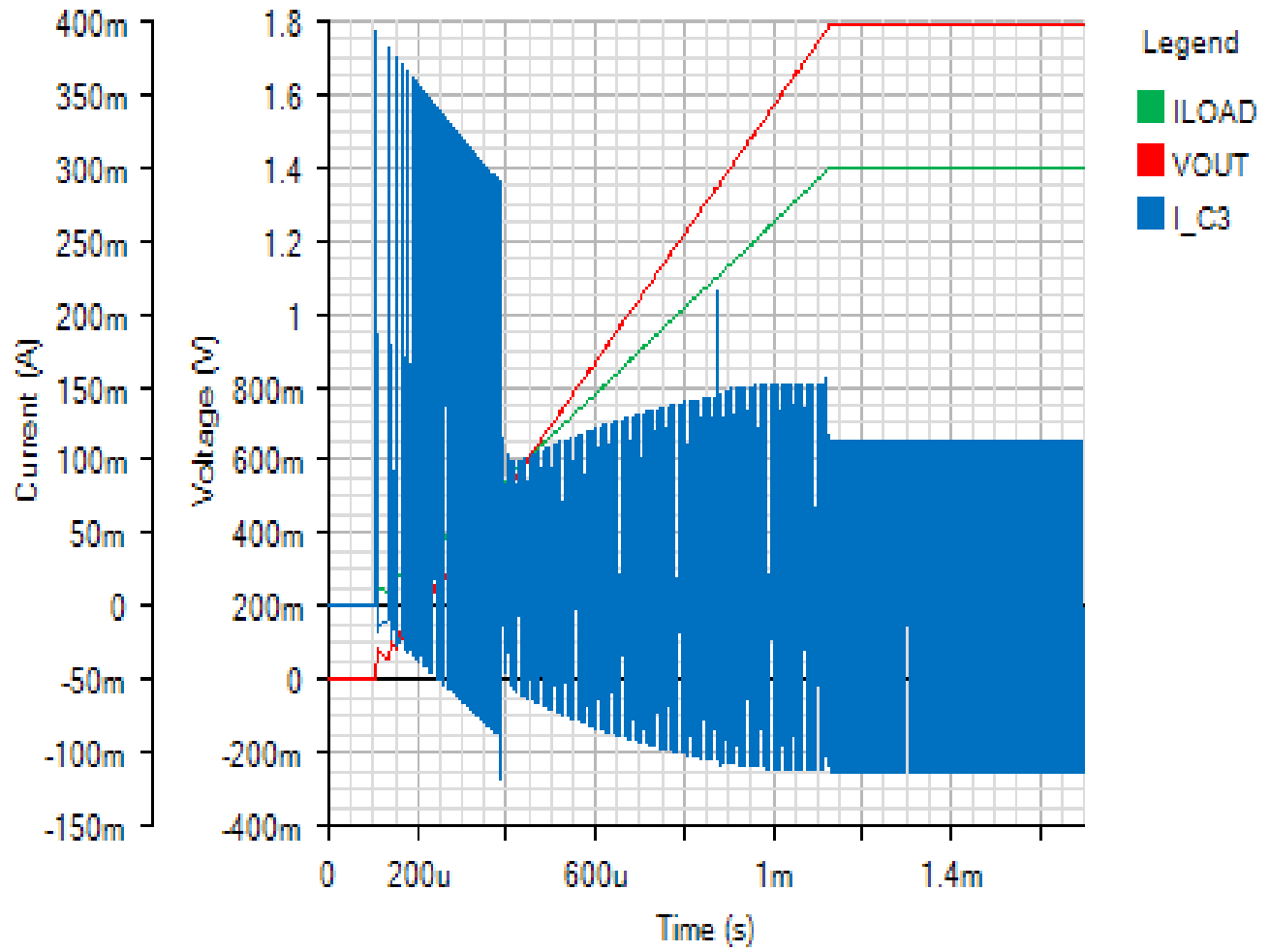
IC

Default



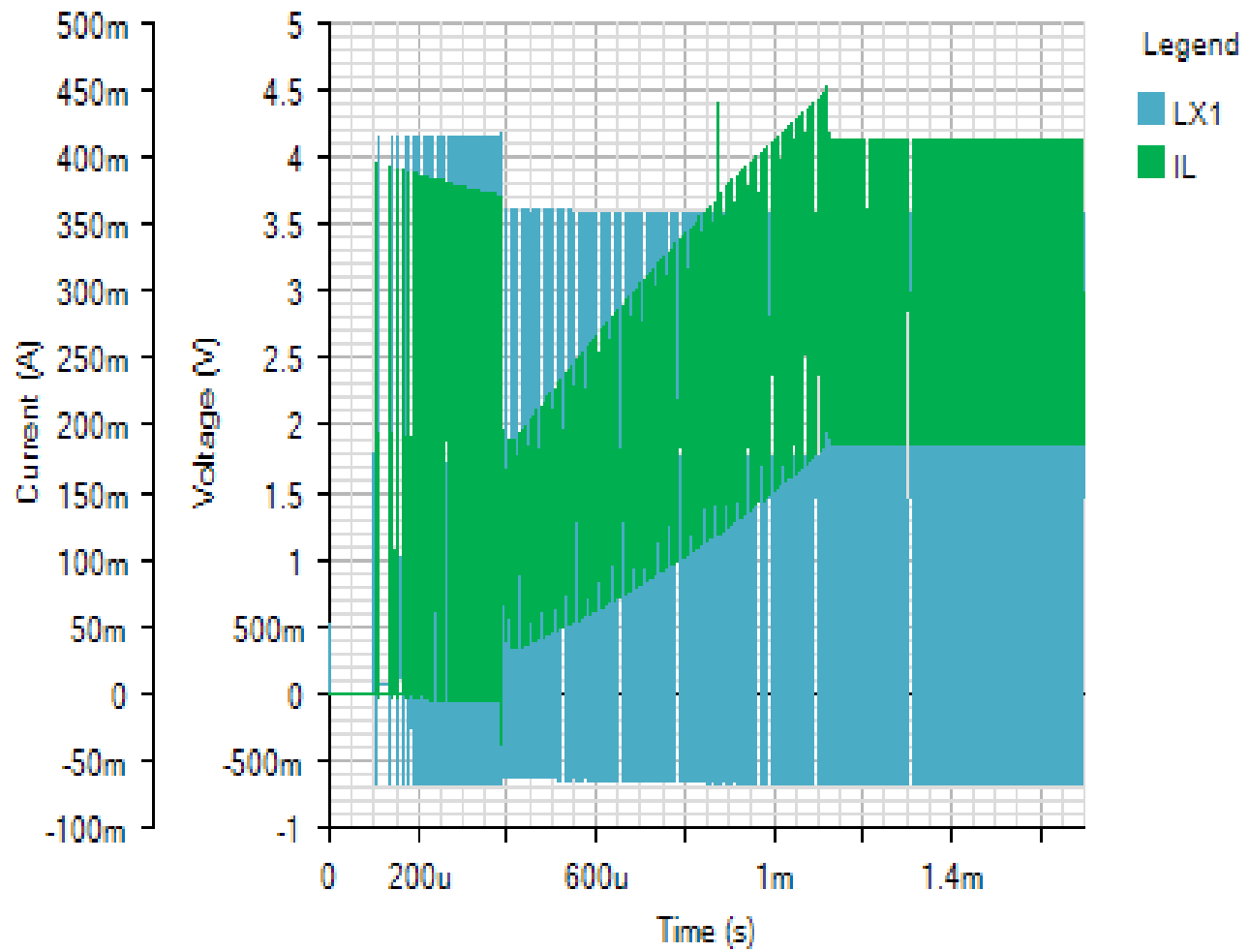
OUTPUT

Default



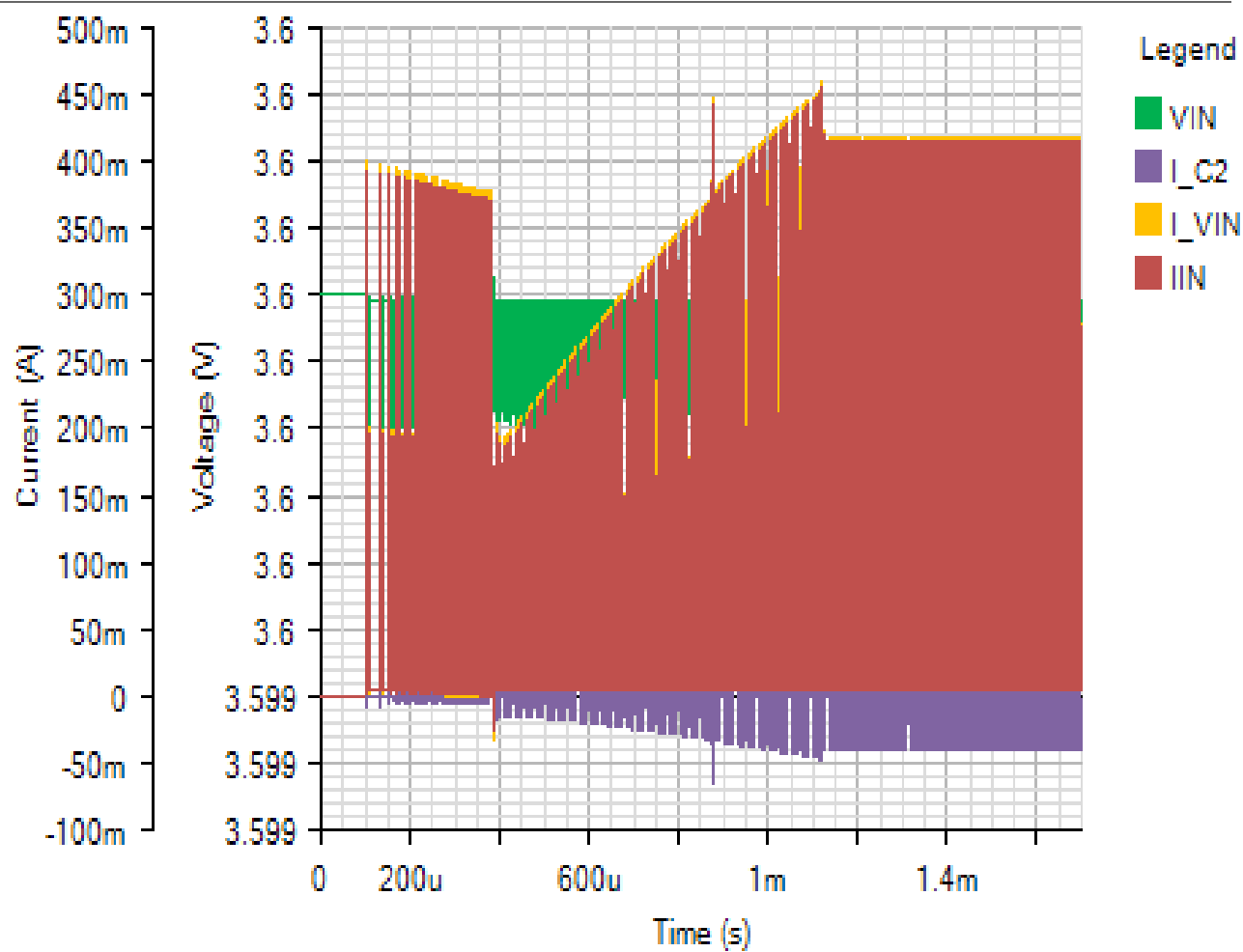
SWITCHING

Default



INPUT

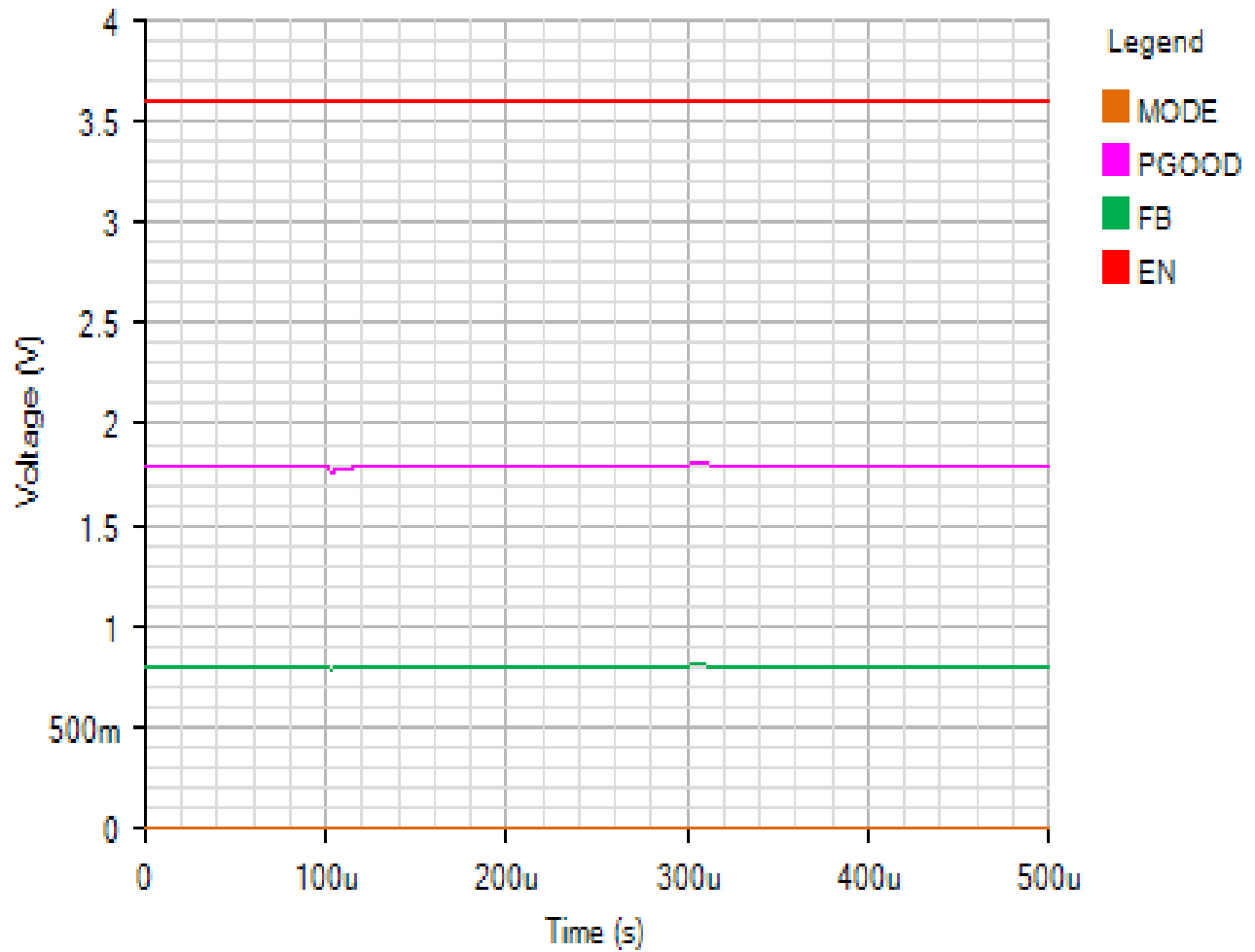
Default



Load Step - Tue Nov 20 2018 13:08:22

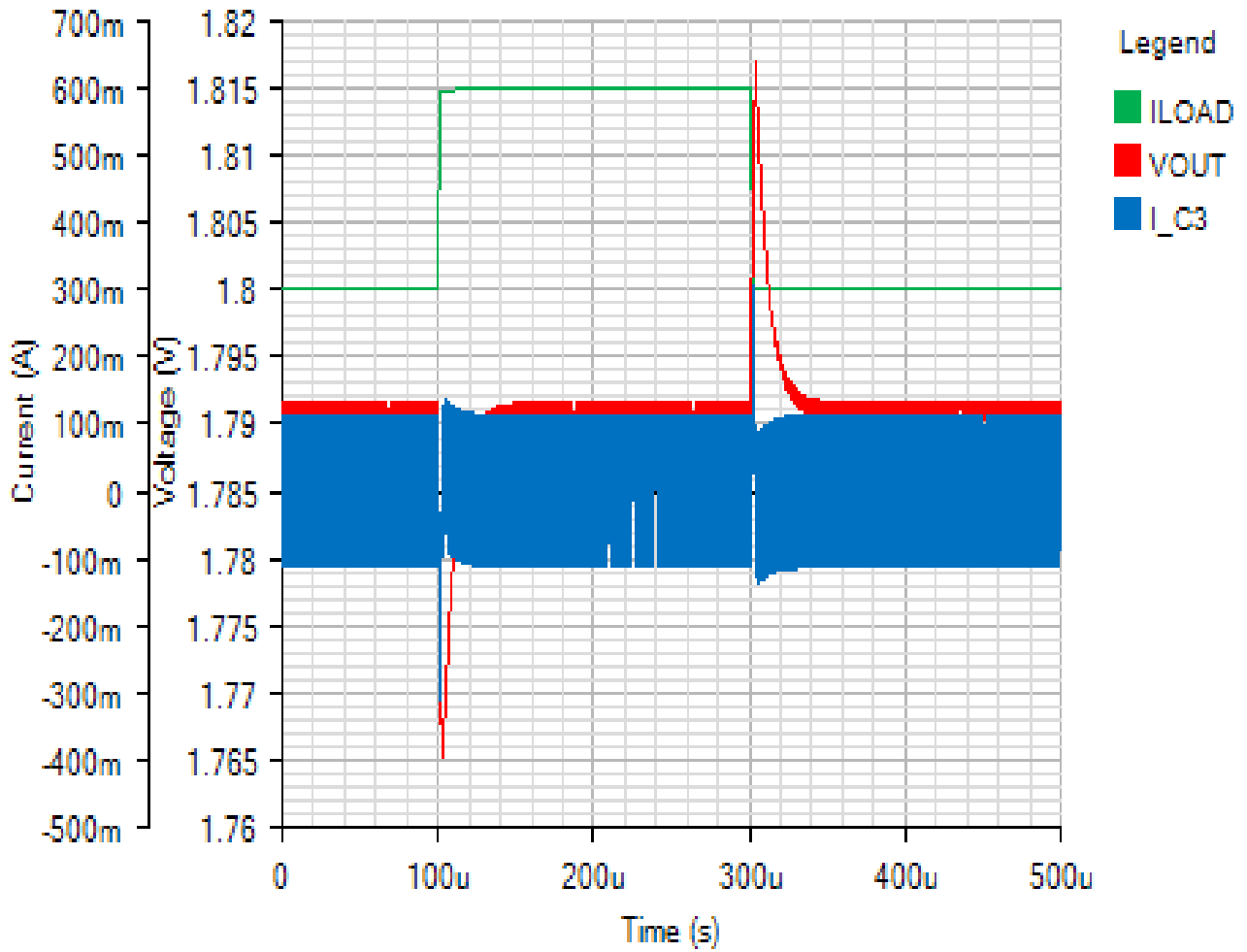
IC

Default



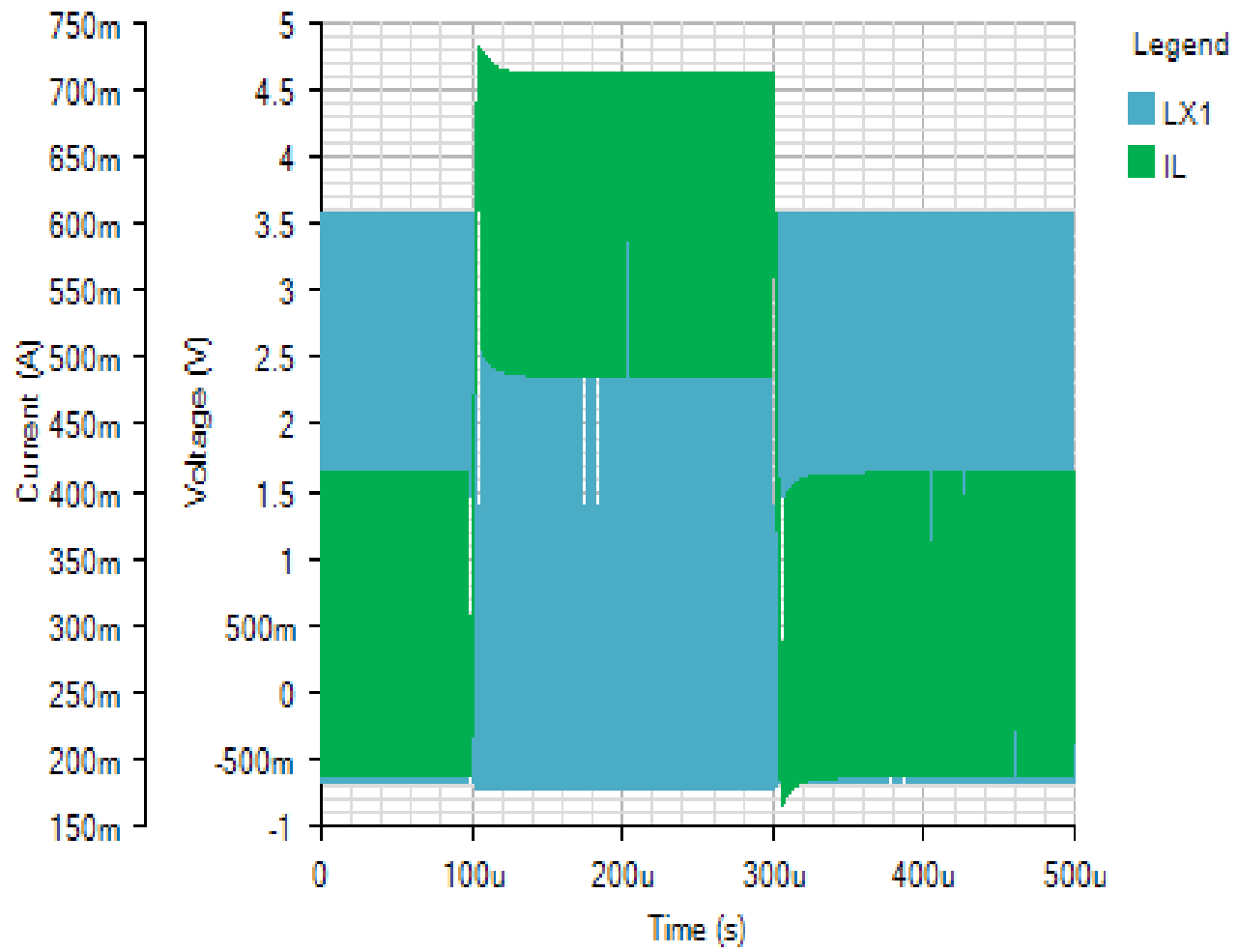
OUTPUT

Default



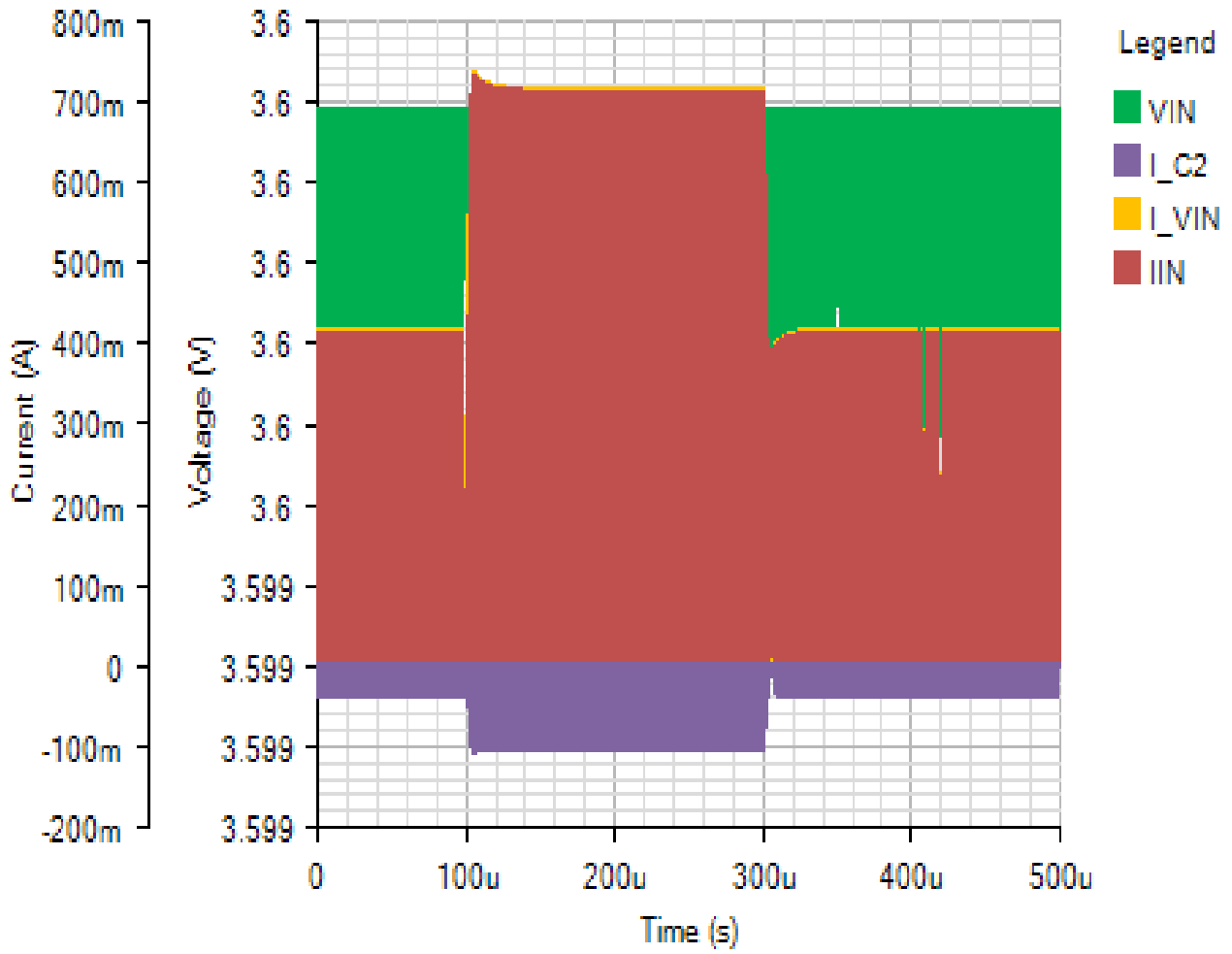
SWITCHING

Default

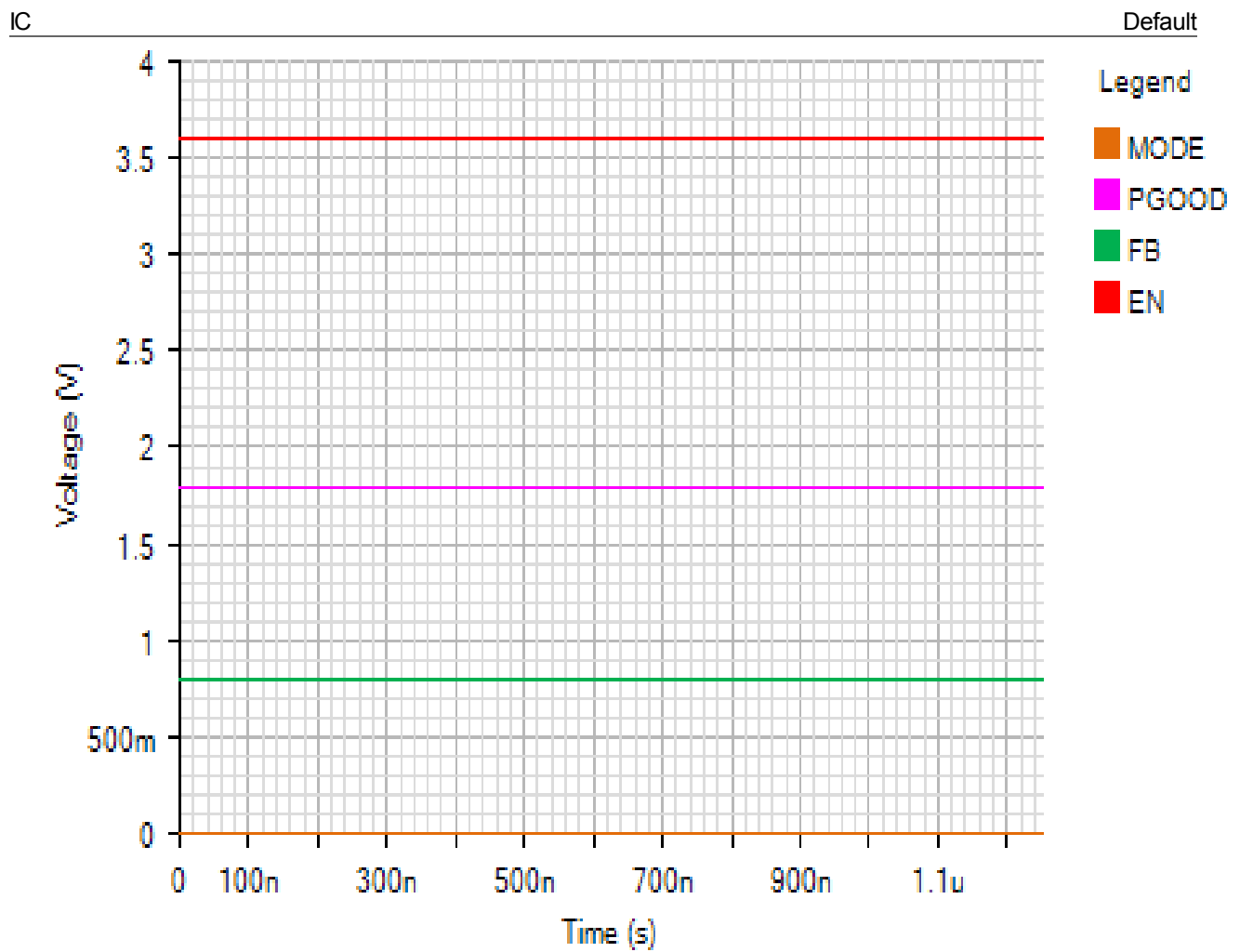


INPUT

Default

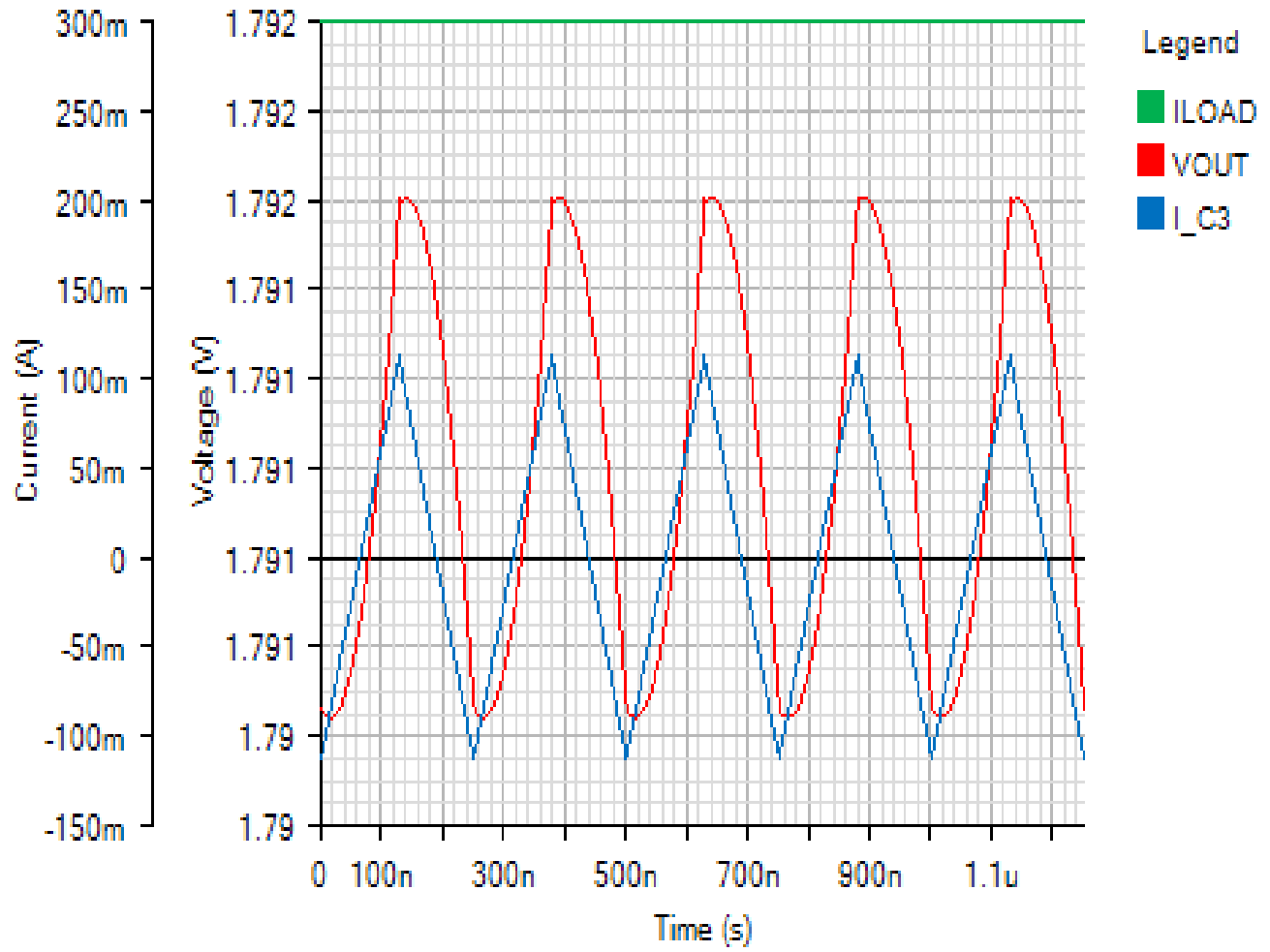


Steady State - Tue Nov 20 2018 13:08:22



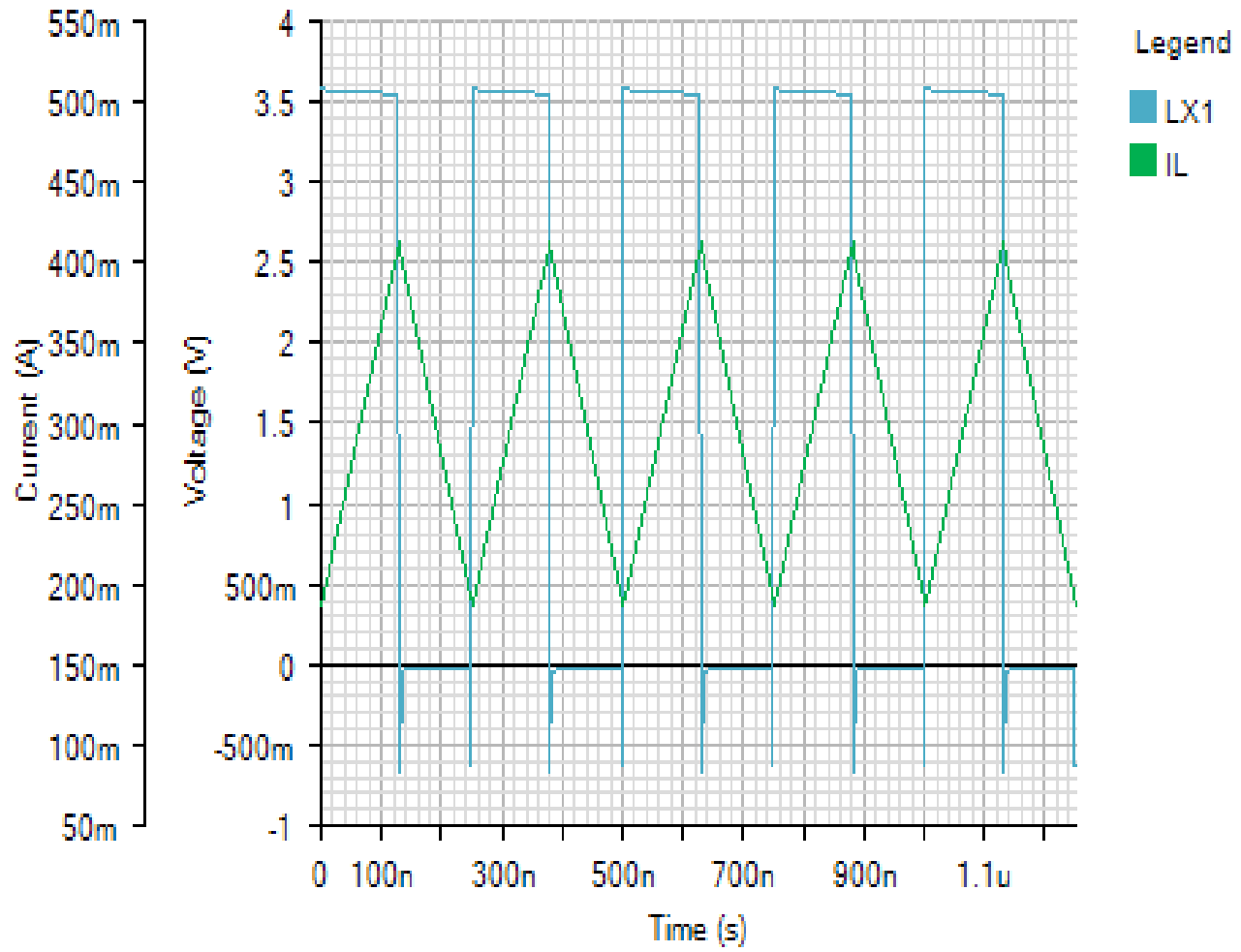
OUTPUT

Default



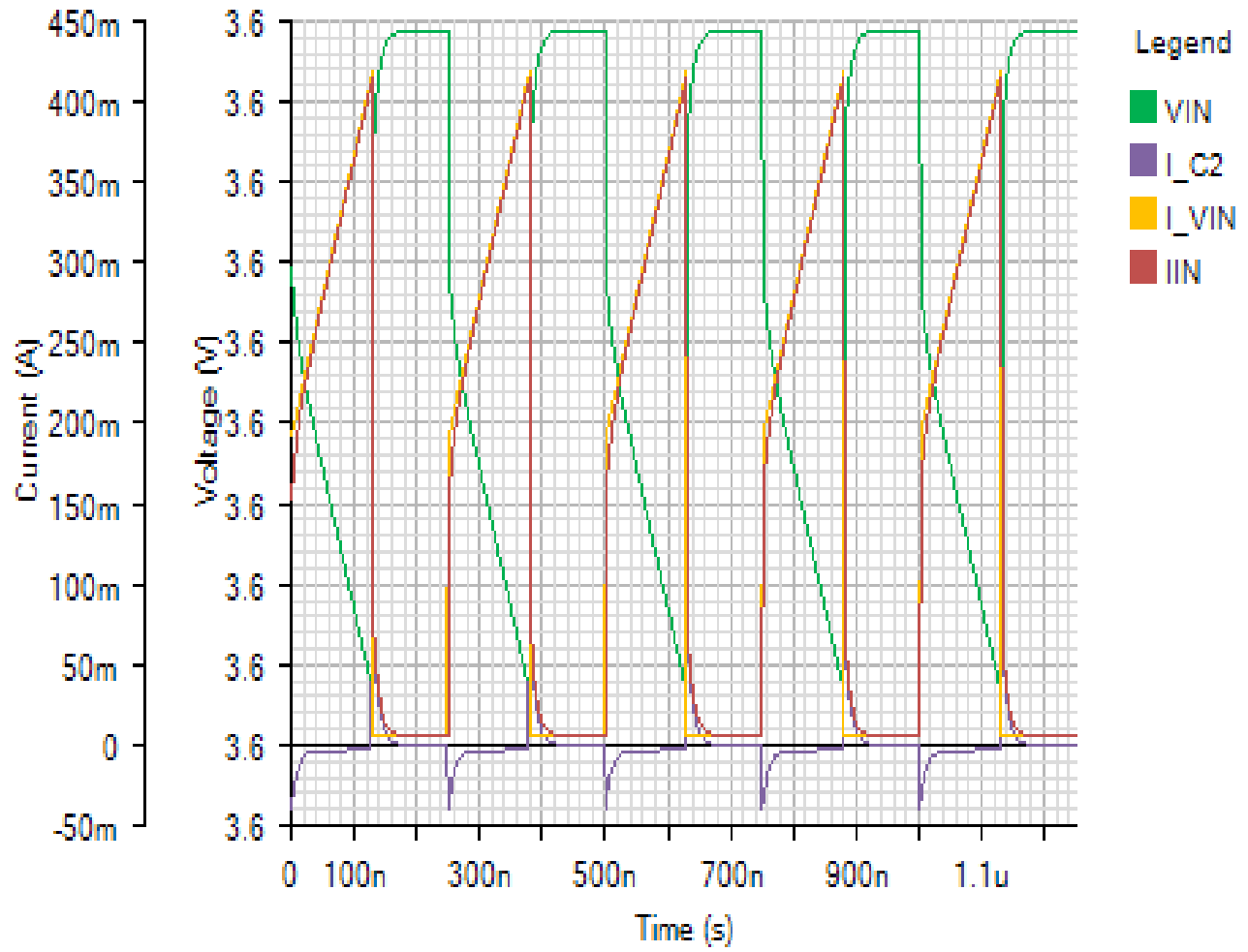
SWITCHING

Default



INPUT

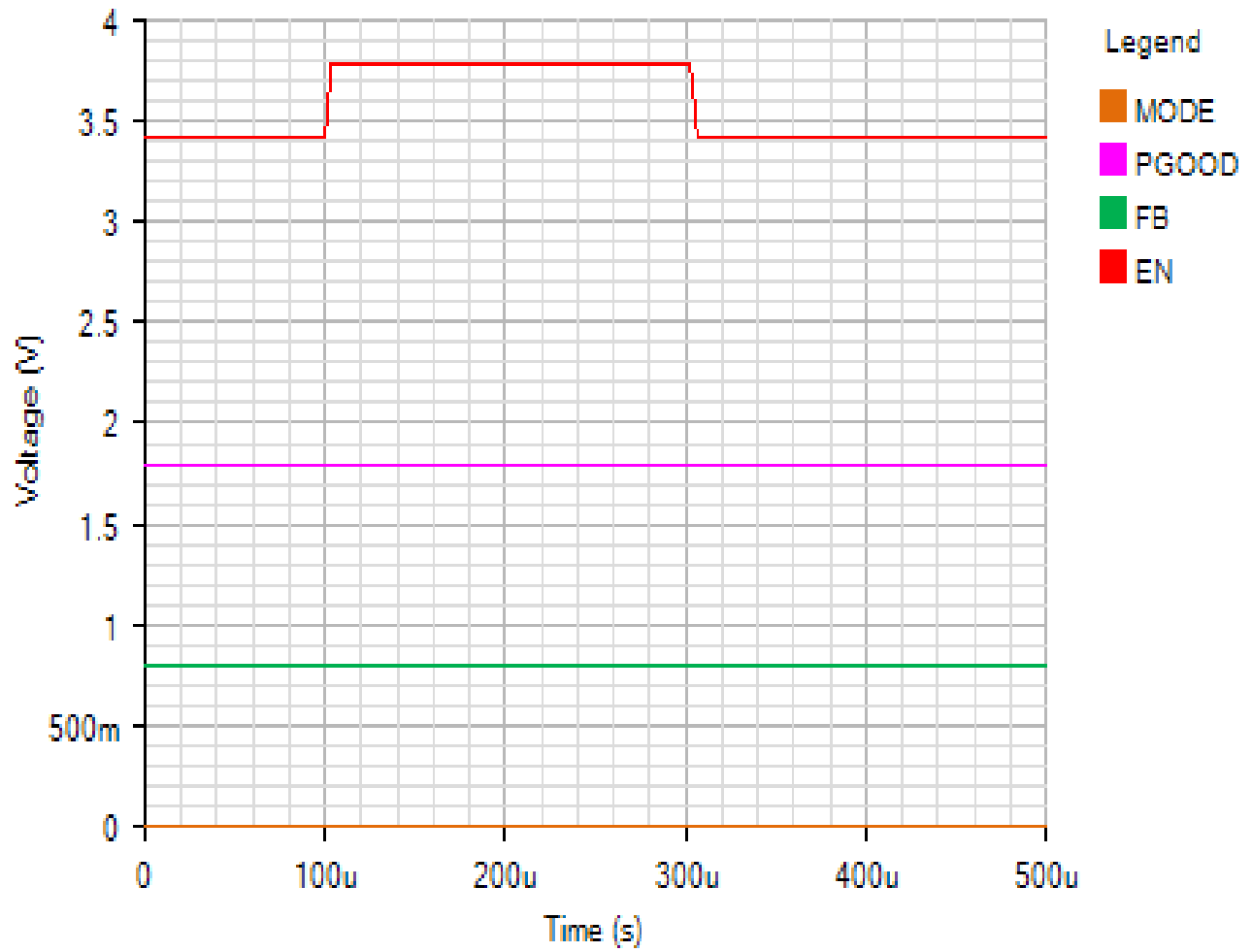
Default



Line Transient - Tue Nov 20 2018 13:08:22

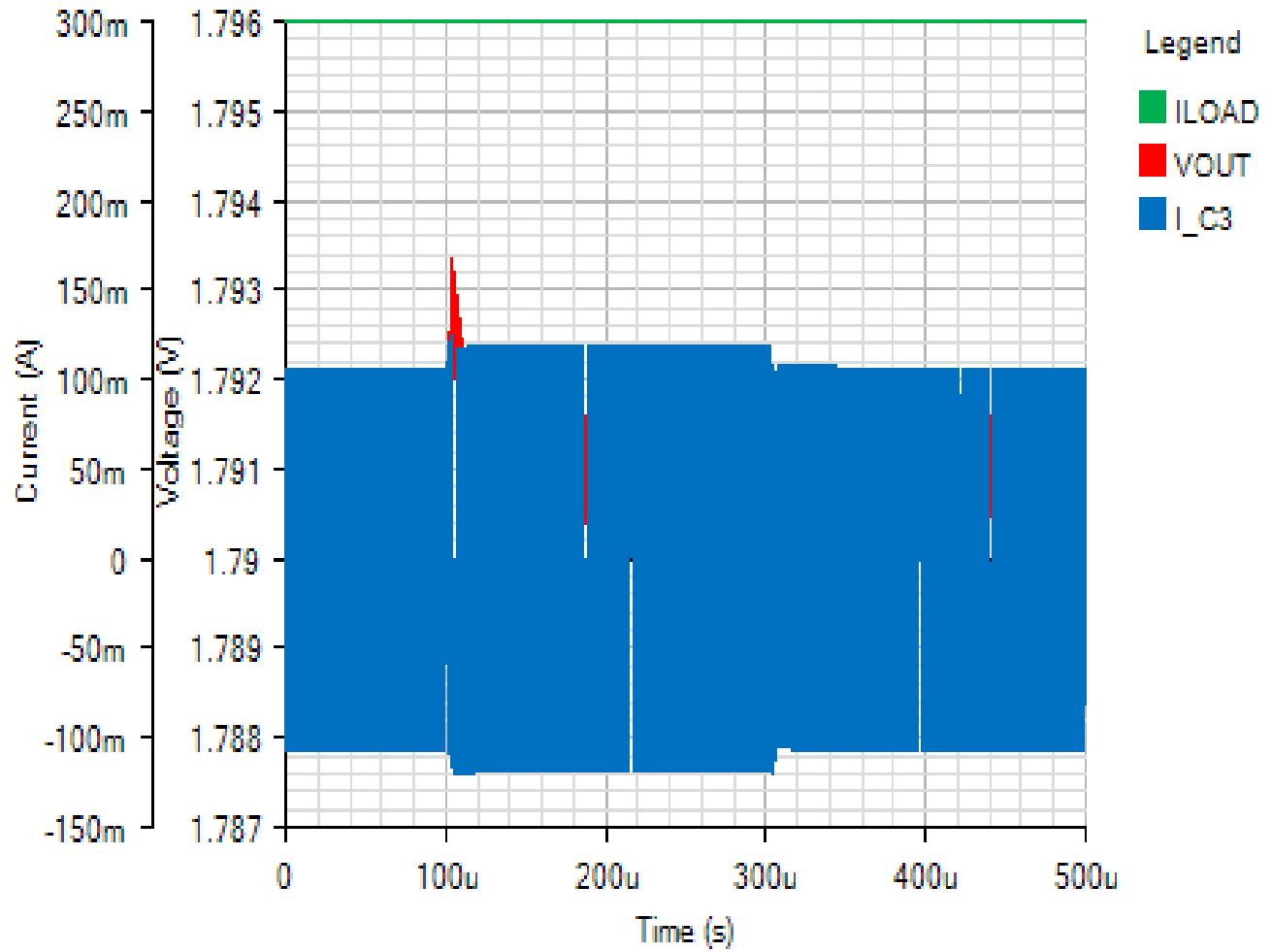
IC

Default



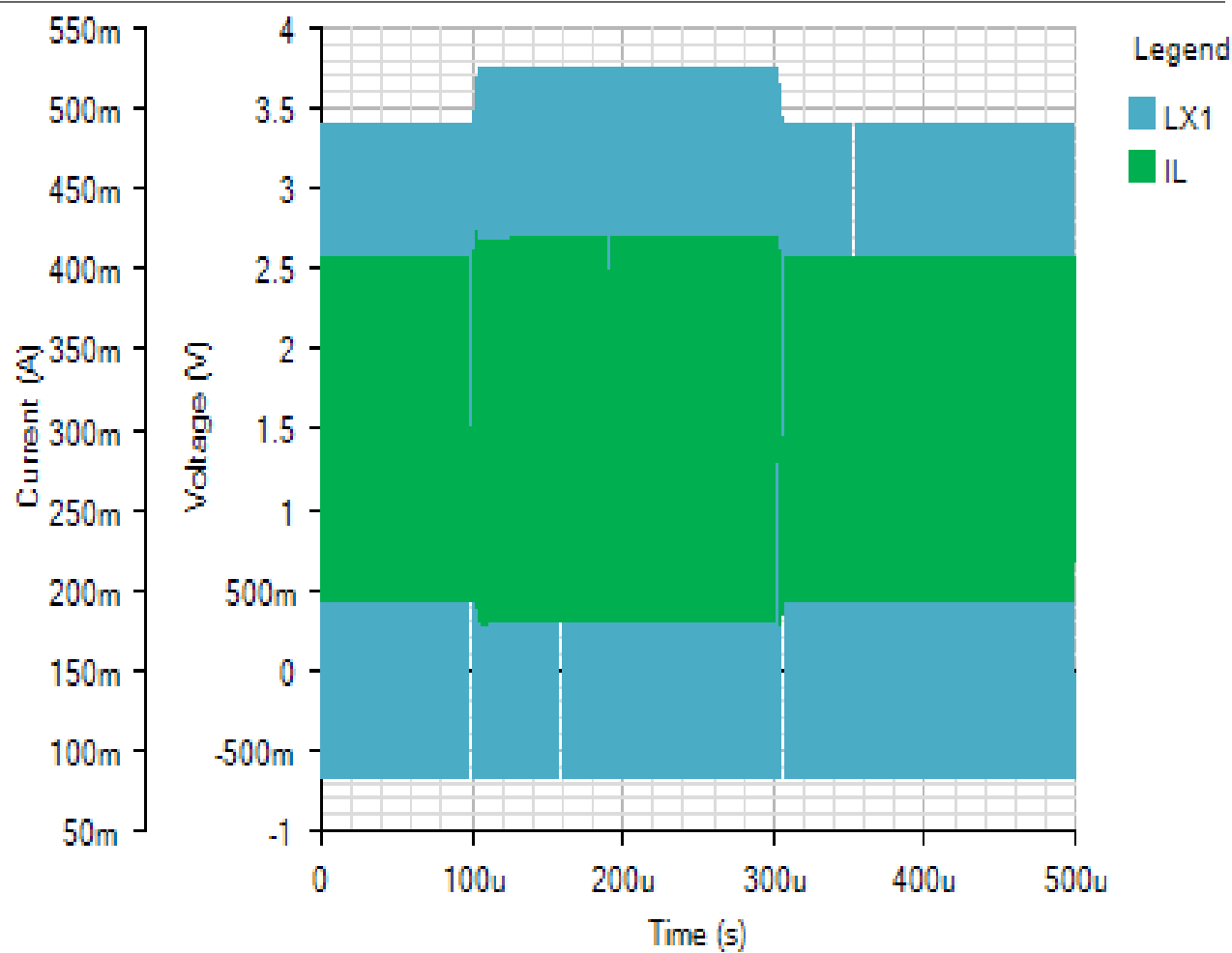
OUTPUT

Default



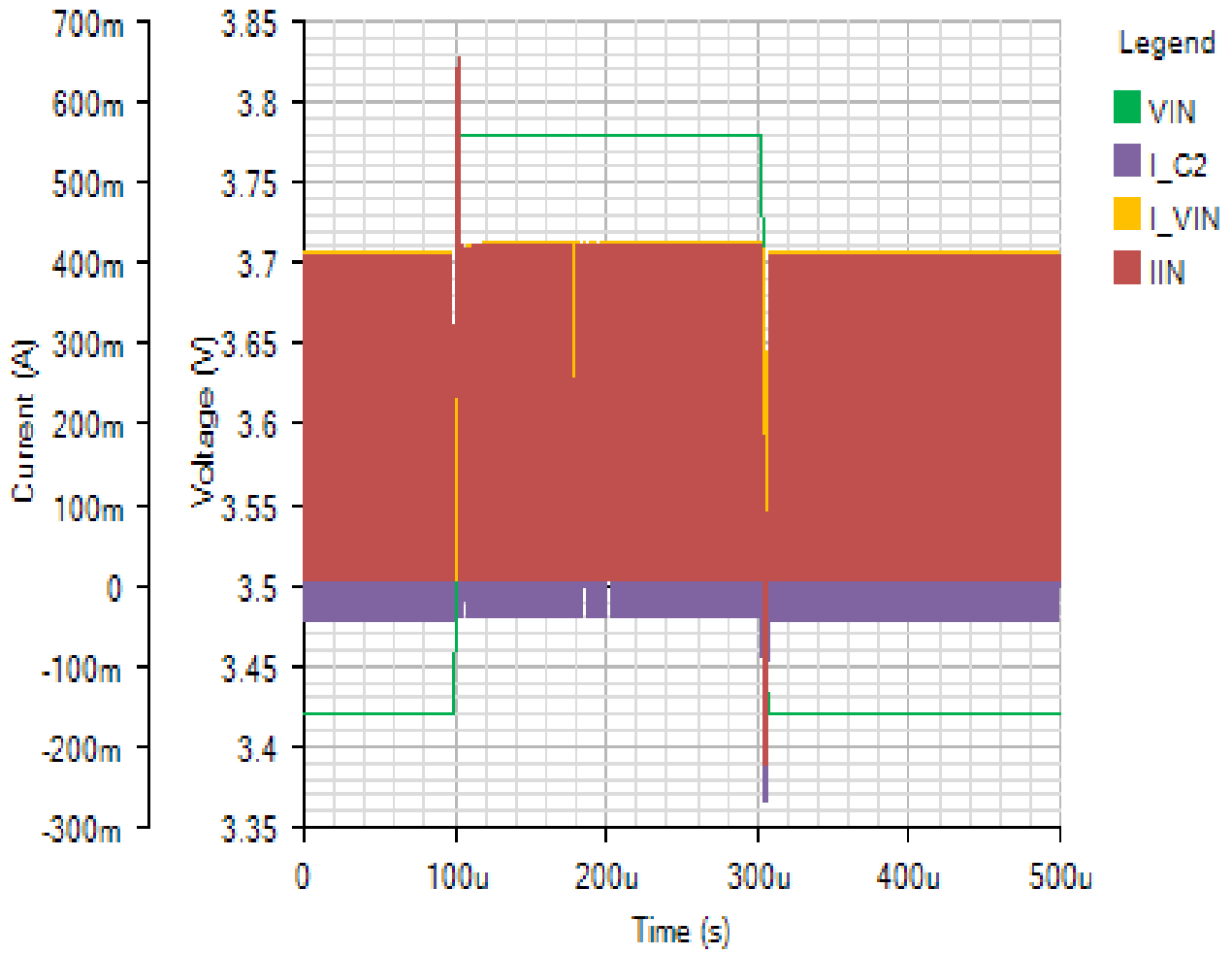
SWITCHING

Default



INPUT

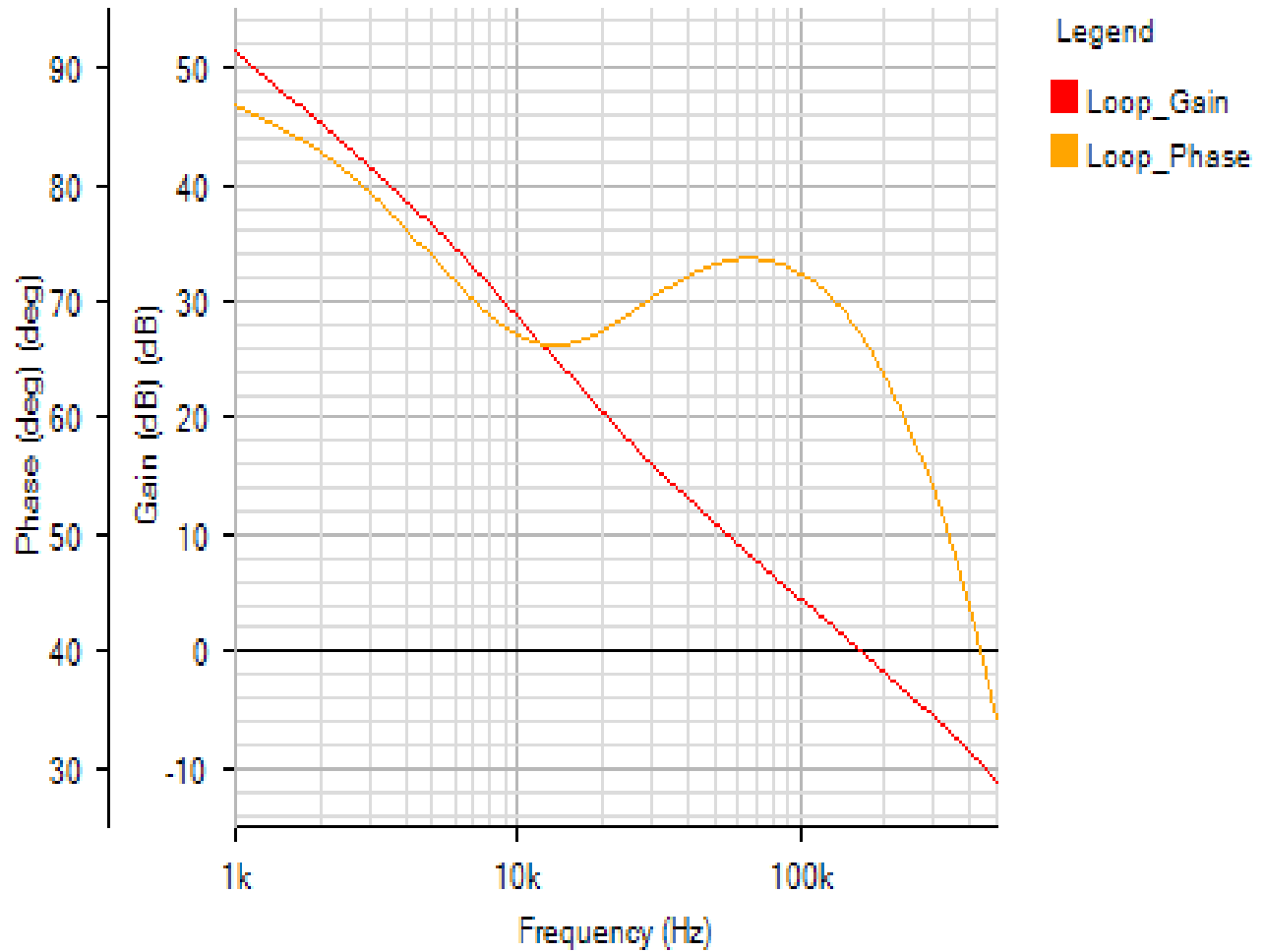
Default



AC Loop - Tue Nov 20 2018 13:08:22

BODE

Default



Phase Margin: 67.12° at a crossover frequency of 165.5kHz

