

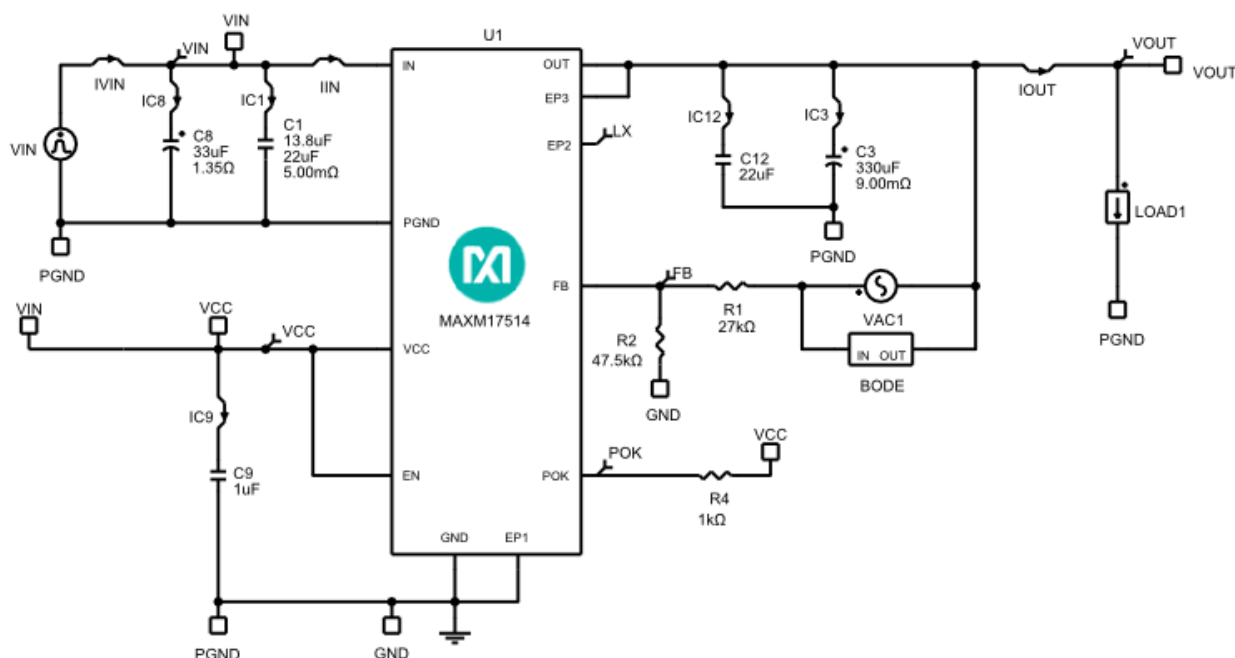
Initial Design

1.0

Design Requirements

Parameter	Value
Input Sources	Single Input
Minimum Input Voltage	4.5V
Maximum Input Voltage	5.5V
Nominal Input Voltage	5V
Input Steady-State Ripple	2%
VCC Input	5V
Output Voltage	1.2V
Output Voltage Over/Undershoot	6%
Output Current	4A
BOM Priority	Cost
Ambient Temperature	25°C

Schematic



***** Notes *****

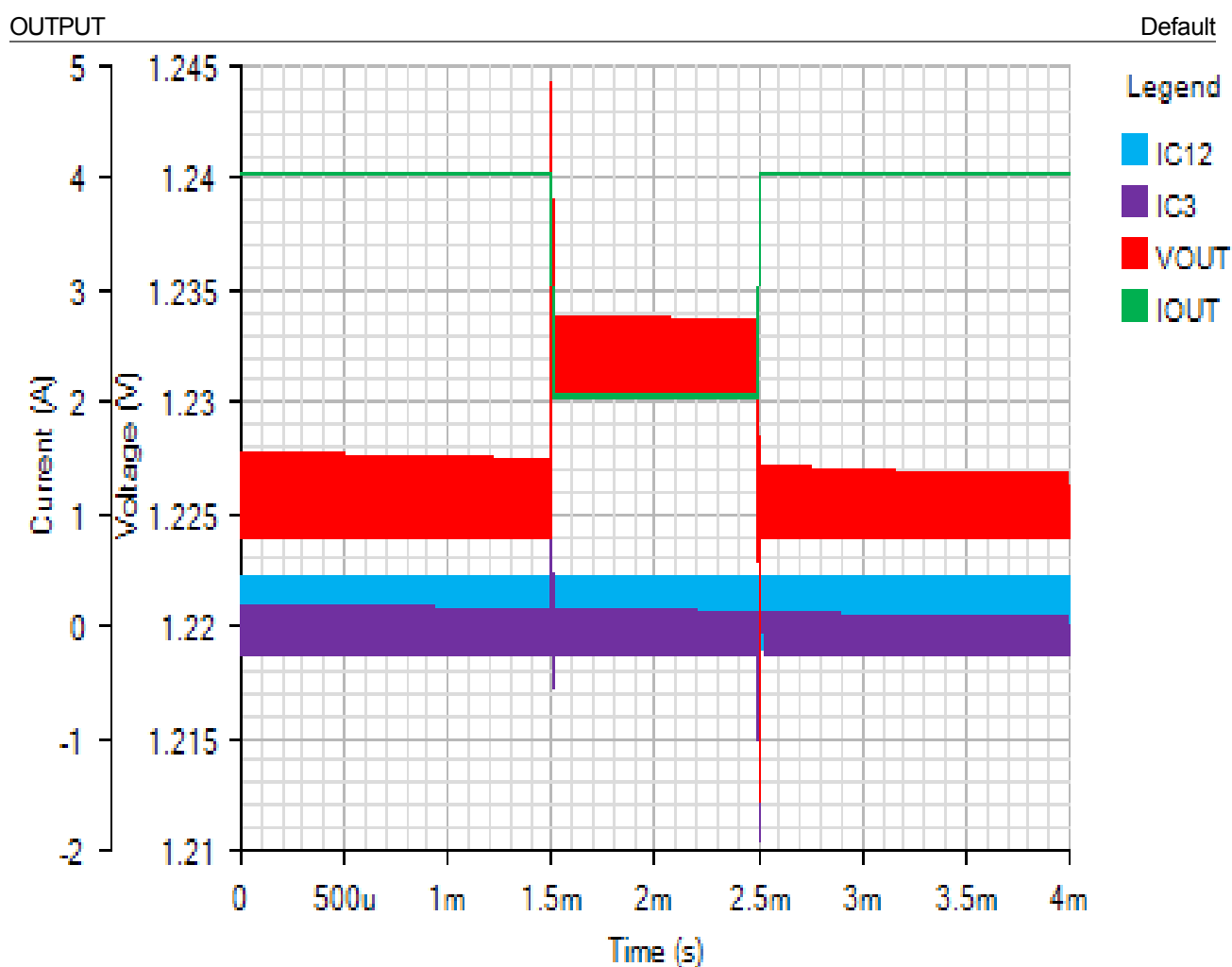
- Decreasing the output capacitance below recommended value might degrade the transient response or loop stability.
- If the current level (starting current for Load Steps) is below 1.5A, AC, Steady State and Load Step analyses may fail due to switch over in PFM mode.

BOM

Ref	Qty	Part Number	Manufacturer	Description
U1	1	MAXM17514	Maxim Integrated	2.4V-5.5V, 4A, High-Efficiency Power Module
C1	1	GRM31CR71A226ME15L	Murata	Cap Ceramic 22uF 10V X7R 20% SMD 1206 125C Embossed T/R
C3	1	2R5TPE330M9	Panasonic	Cap Tant Solid 330uF 2.5V D2E CASE 20% (7.3 X 4.3 X 1.8mm) SMD 7343 0.009 Ohm 105C Embossed T/R
C8	1	EEEEPA330UAR	Panasonic	Cap Aluminum 33uF 10V 20% (4 X 5.8mm) SMD 0.85 Ohm 160mA 2000h 105C Embossed T/R
C9	1	CC0603KRX7R6BB105	Yageo	Cap Ceramic 1uF 10V X7R 10% Pad SMD 0603 125°C T/R
C12	1	12066C226KAT2A	AVX	Cap Ceramic 22uF 6.3V X7R 10% Pad SMD 1206 125°C T/R
R1	1	ERJ3EKF2702V	Panasonic	Res Thick Film 0603 27K Ohm 1% 0.1W(1/10W) ±100ppm/°C Pad SMD Automotive T/R
R2	1	ERJ3EKF4752V	Panasonic	Res Thick Film 0603 47.5K Ohm 1% 0.1W(1/10W) ±100ppm/°C Pad SMD Automotive T/R
R4	1	ERJ3GEYJ102V	Panasonic	Res Thick Film 0603 1K Ohm 5% 0.1W(1/10W) ±200ppm/°C Pad SMD Automotive T/R

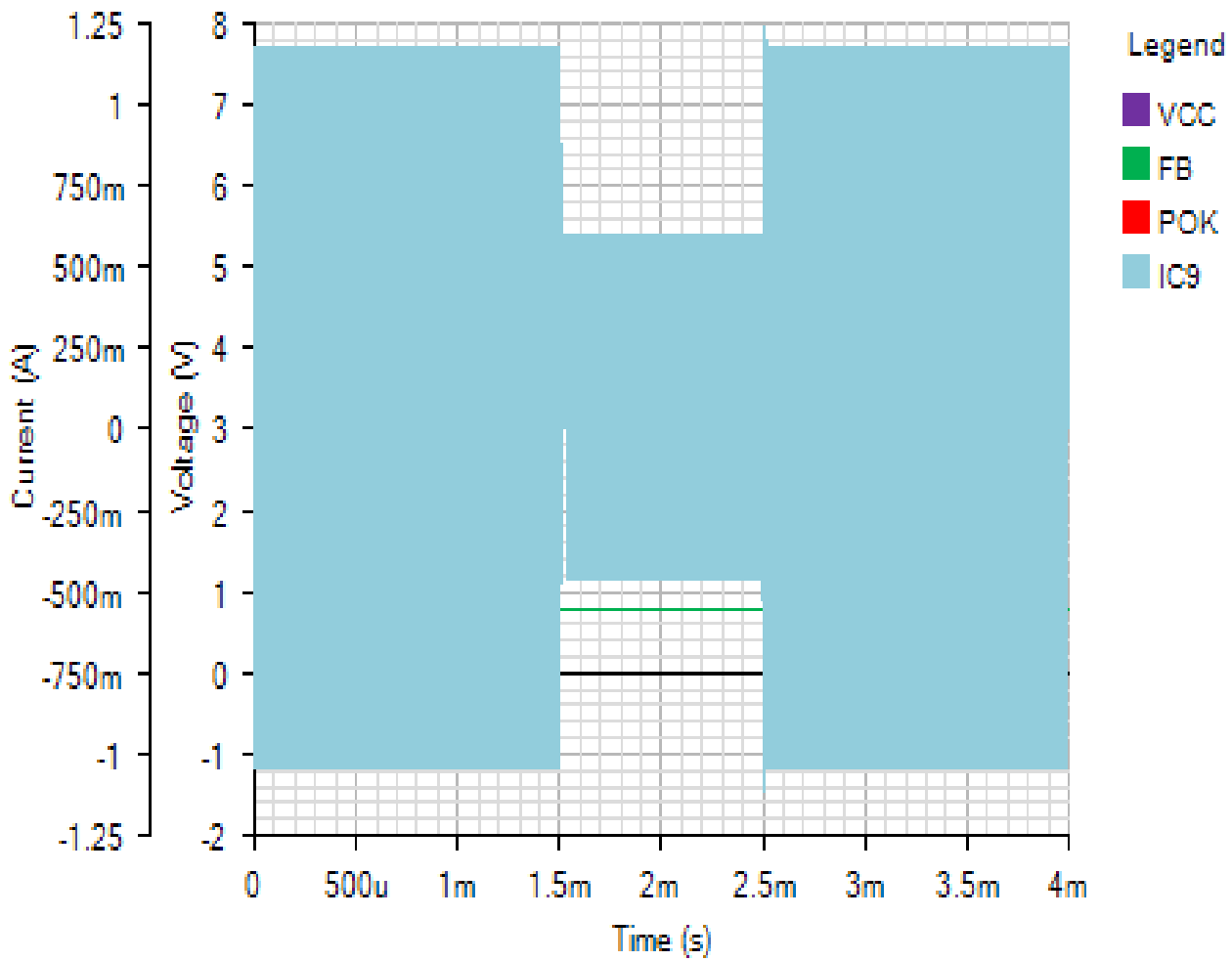
Simulation Results

Load Step - Mon Nov 26 2018 14:17:30



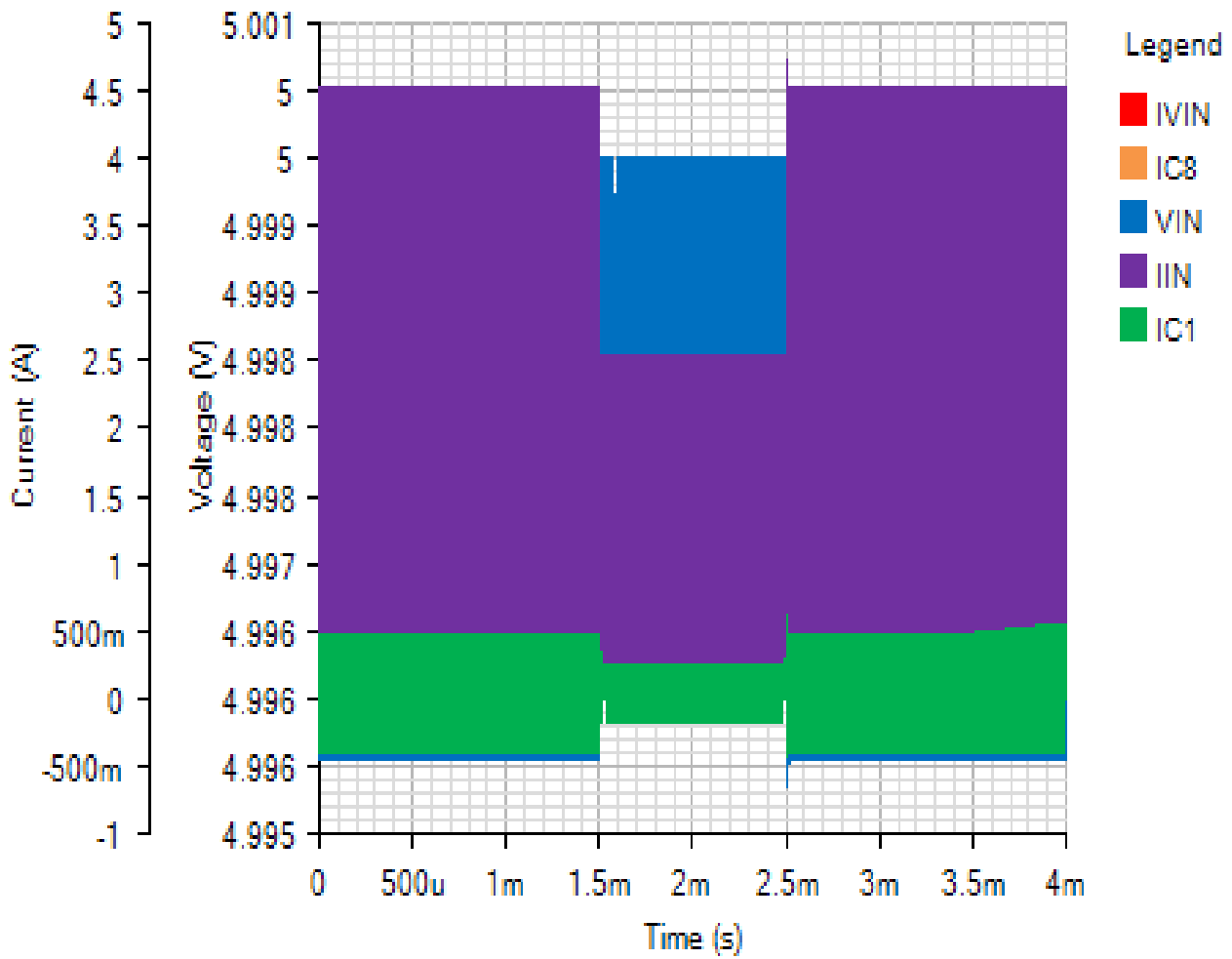
IC

Default



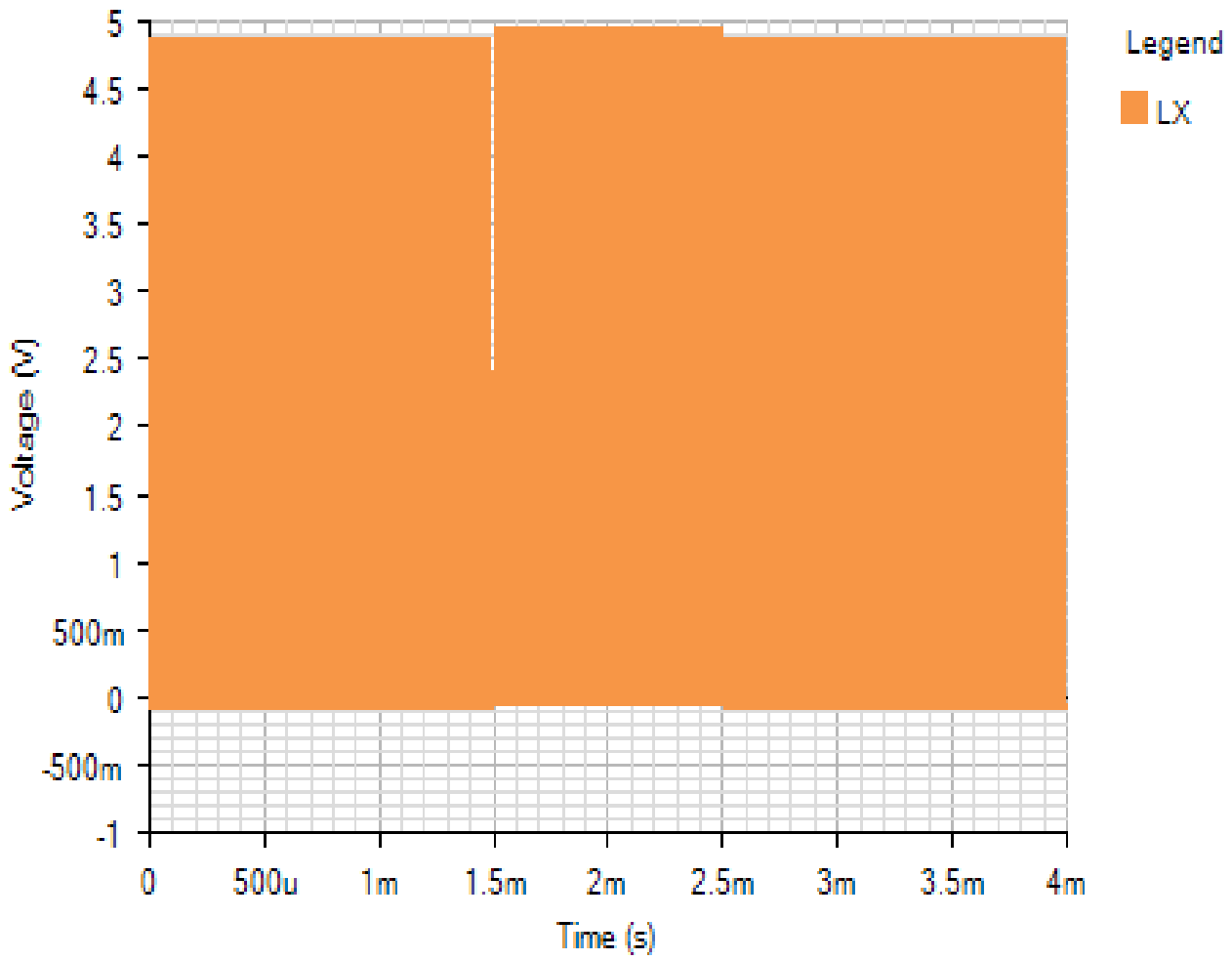
INPUT

Default



SWITCHING

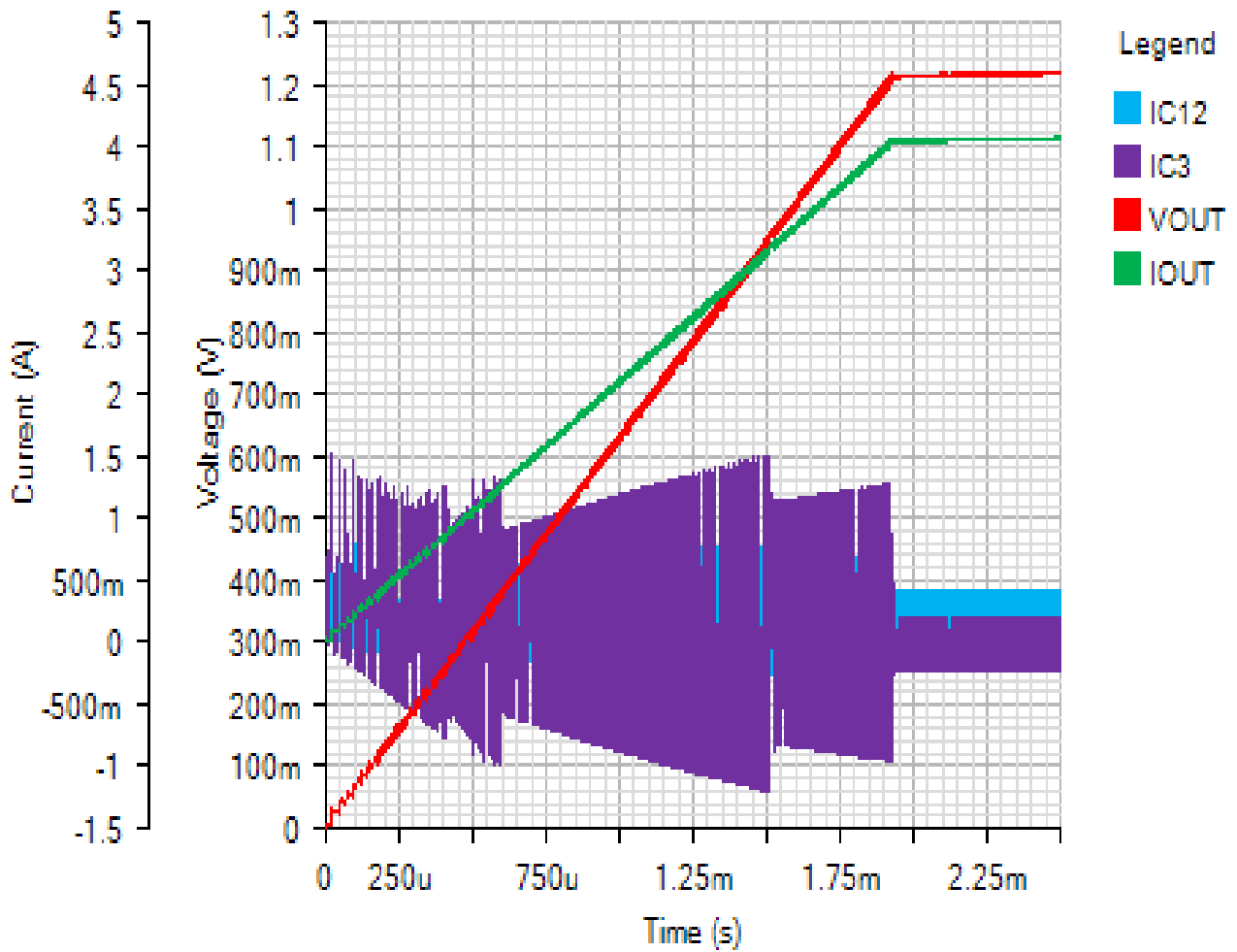
Default



Start Up - Mon Nov 26 2018 14:17:30

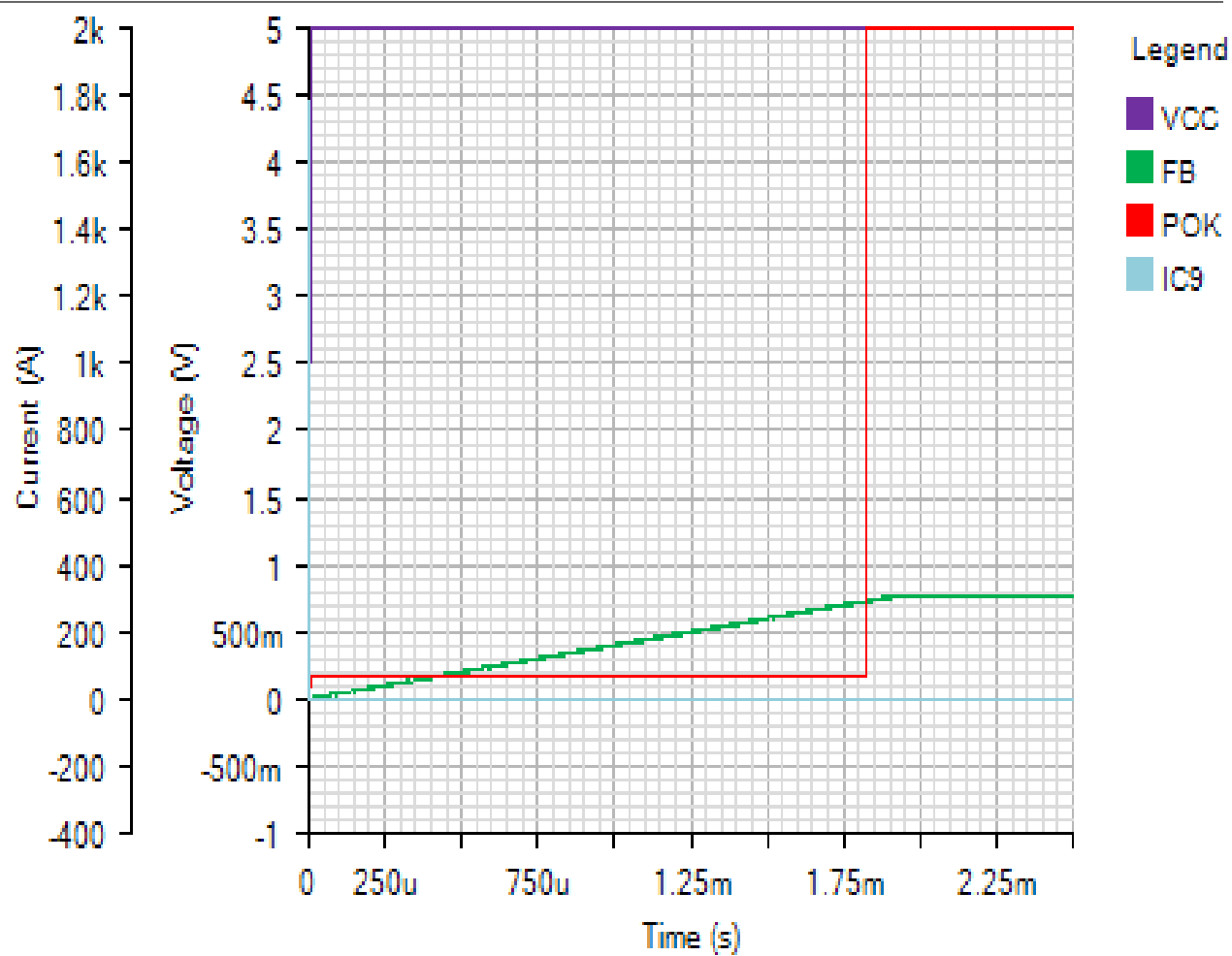
OUTPUT

Default



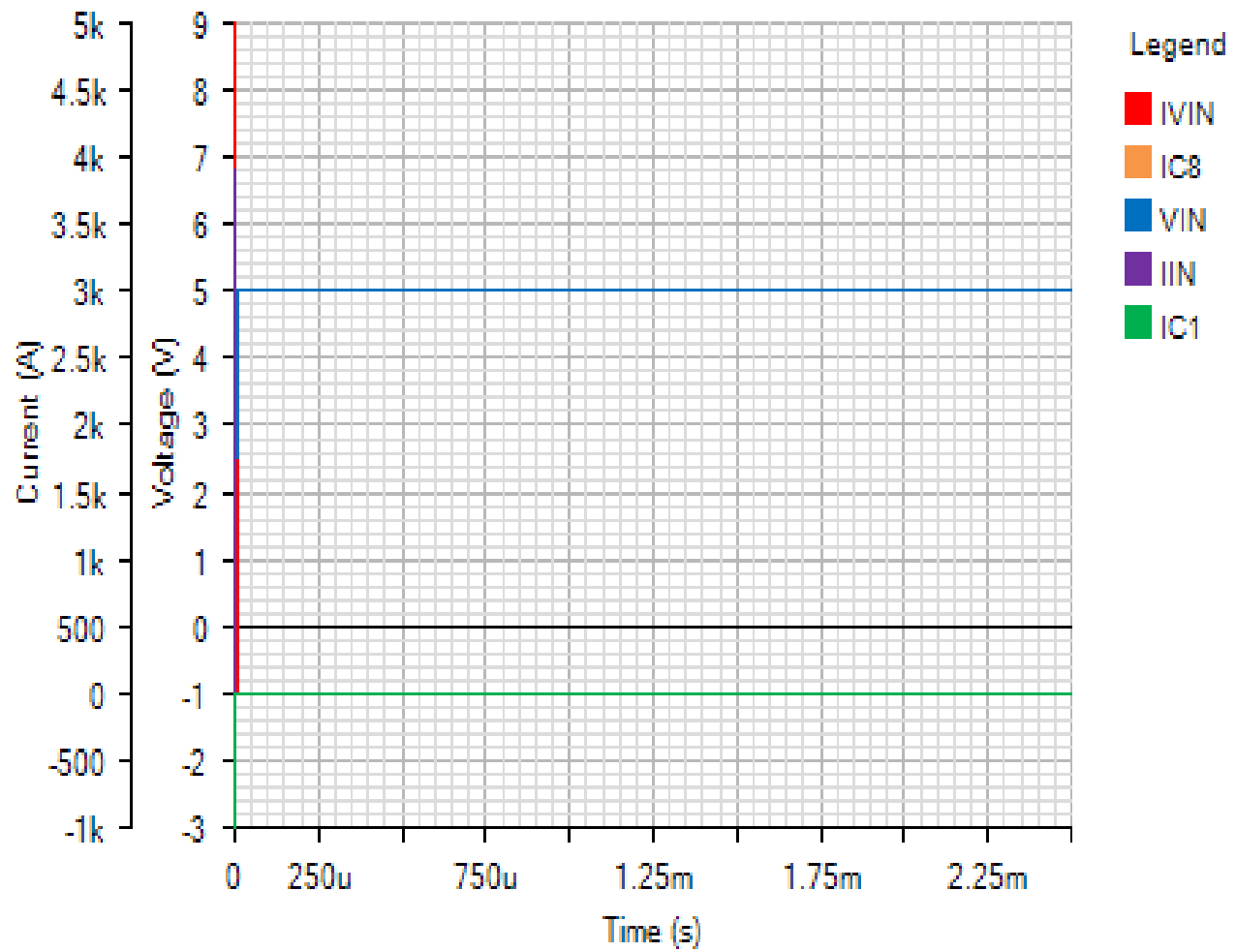
IC

Default



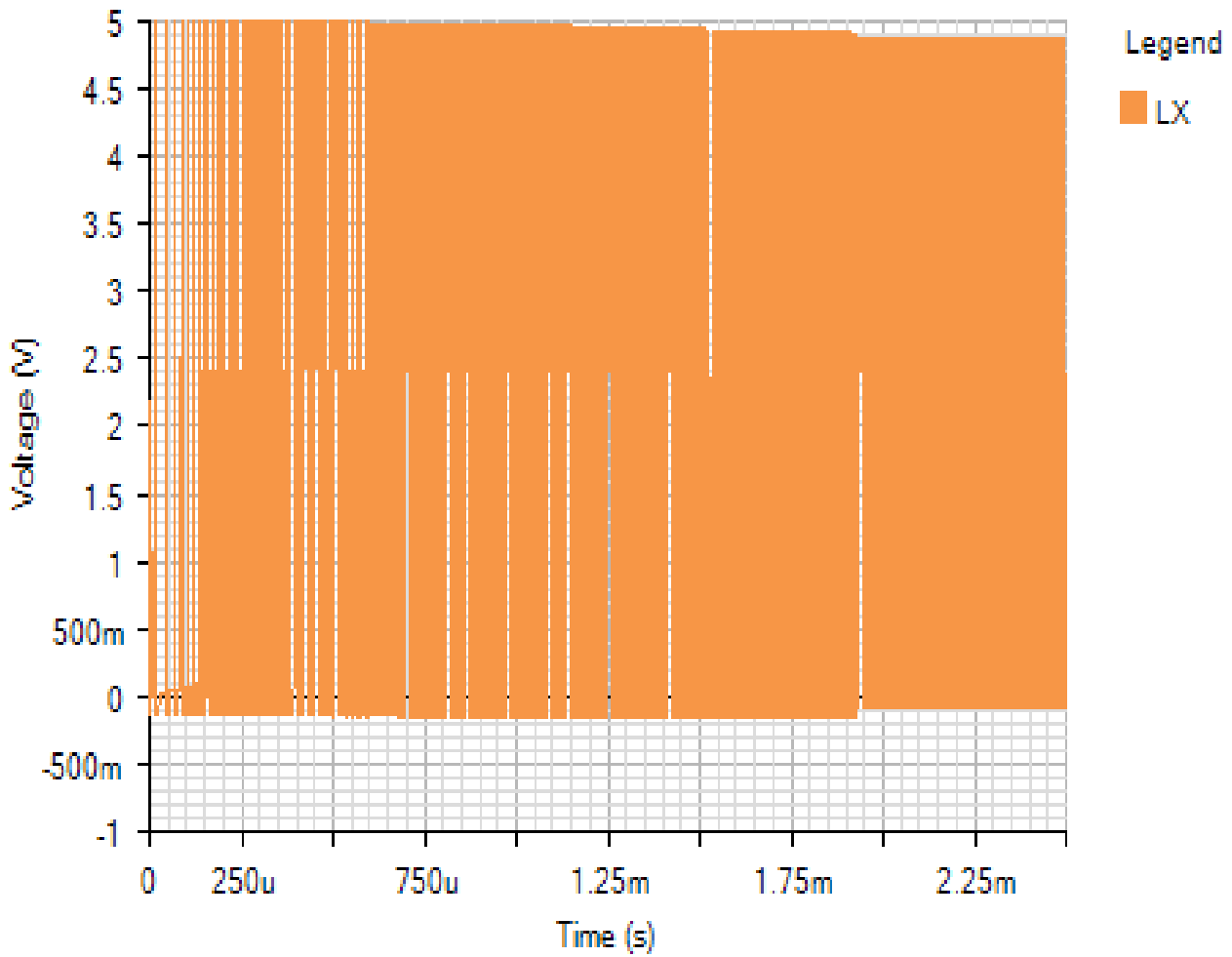
INPUT

Default



SWITCHING

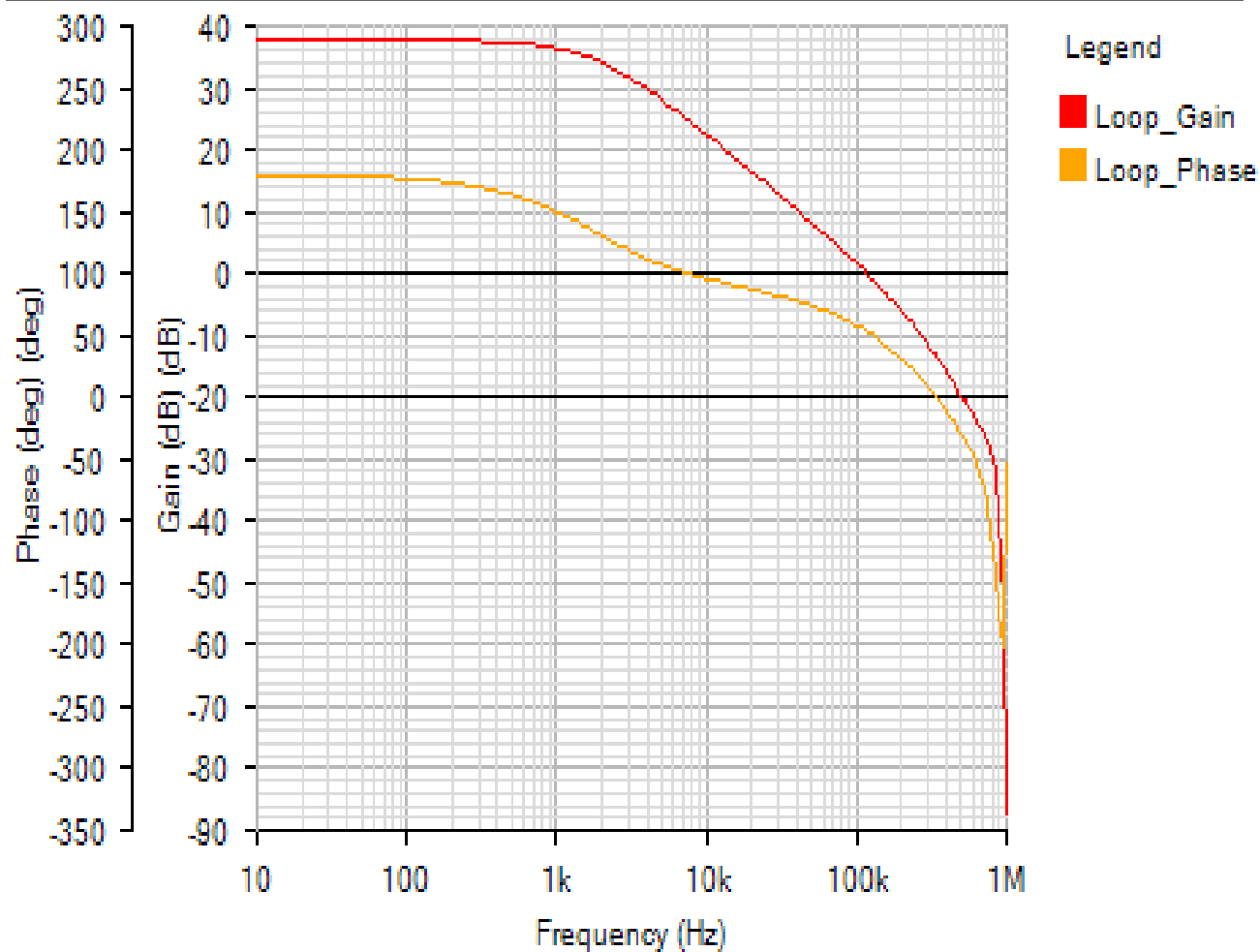
Default



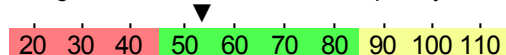
AC Loop - Mon Nov 26 2018 14:17:30

BODE

Default



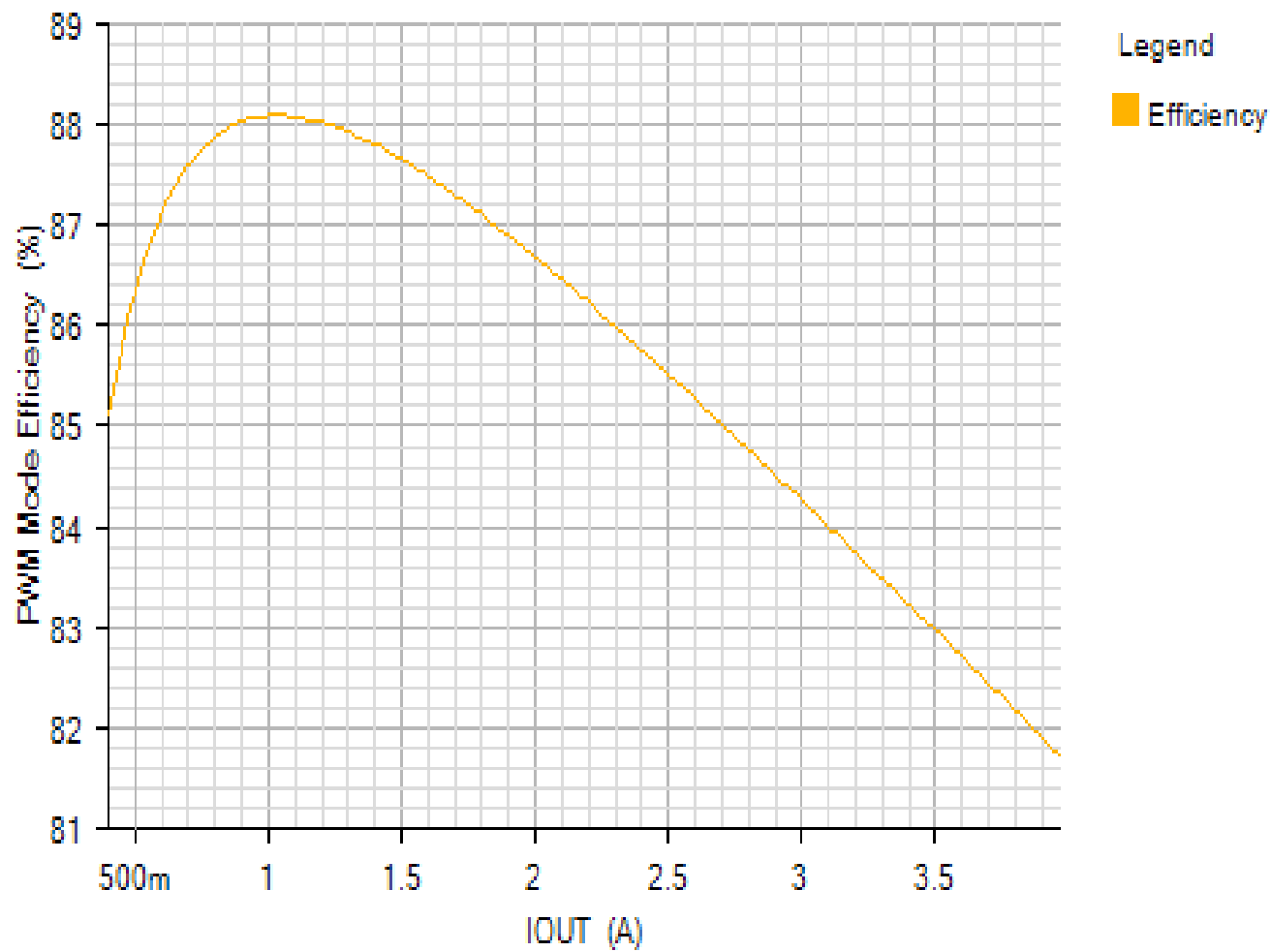
Phase Margin: 53.44° at a crossover frequency of 116.2kHz



Efficiency - Mon Nov 26 2018 14:17:30

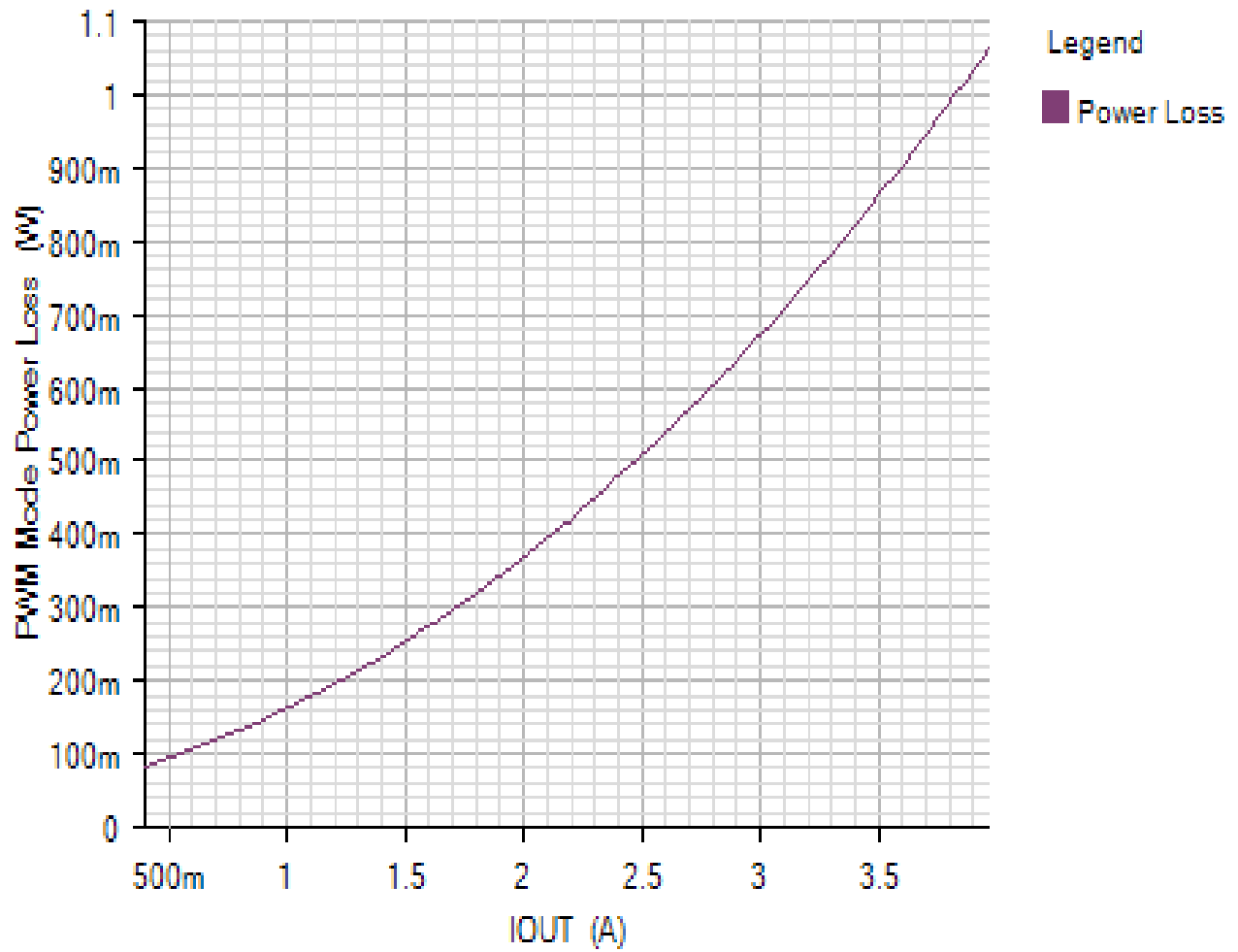
EFFICIENCY_PLOT

Default



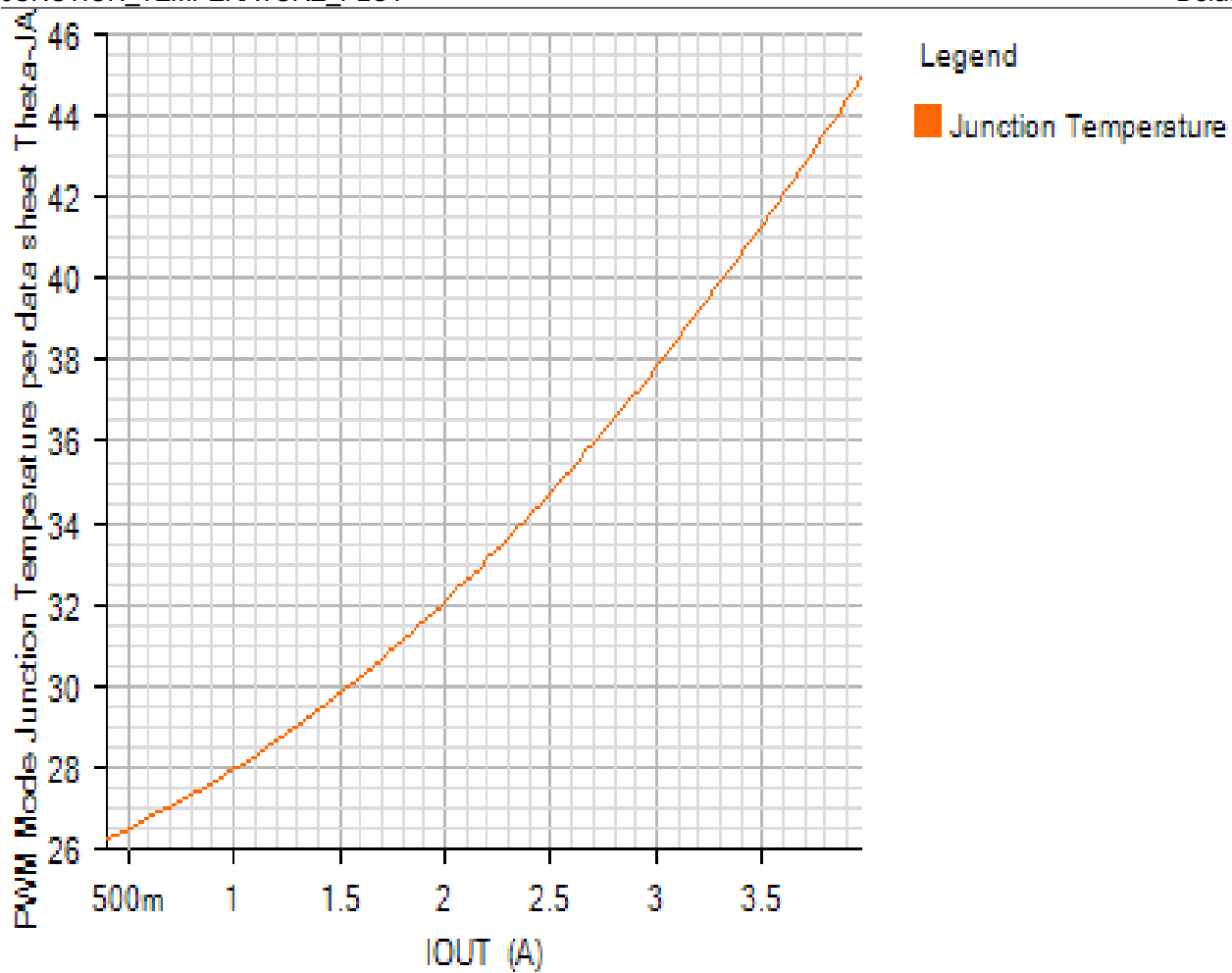
POWER_LOSS_PLOT

Default

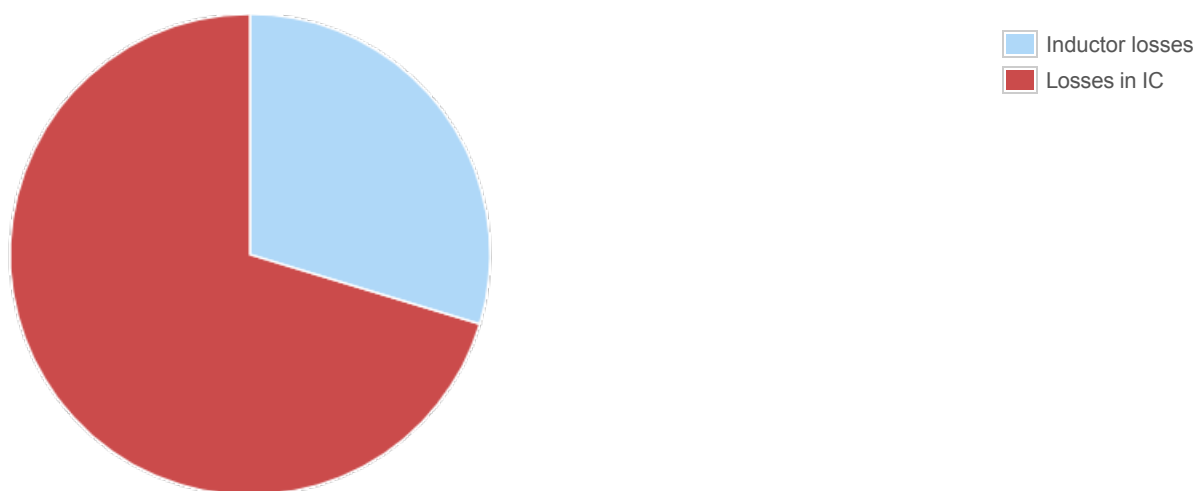


JUNCTION_TEMPERATURE_PLOT

Default



Losses



Component

Loss (W)

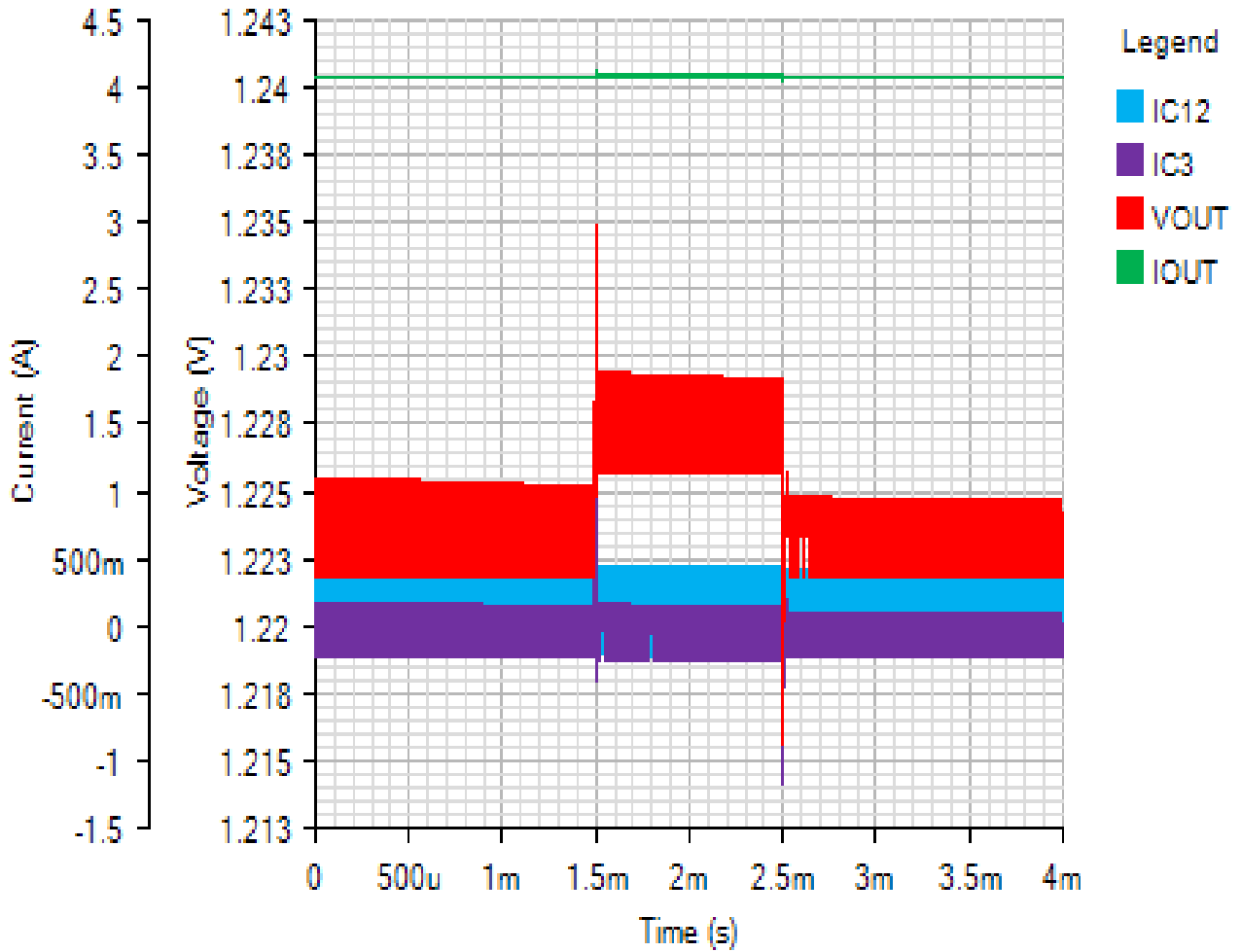
% of total

Component	Loss (W)	% of total
Inductor losses	0.27	29.7
Losses in IC	0.64	70.3
Total	0.91	100

Line Transient - Mon Nov 26 2018 14:17:30

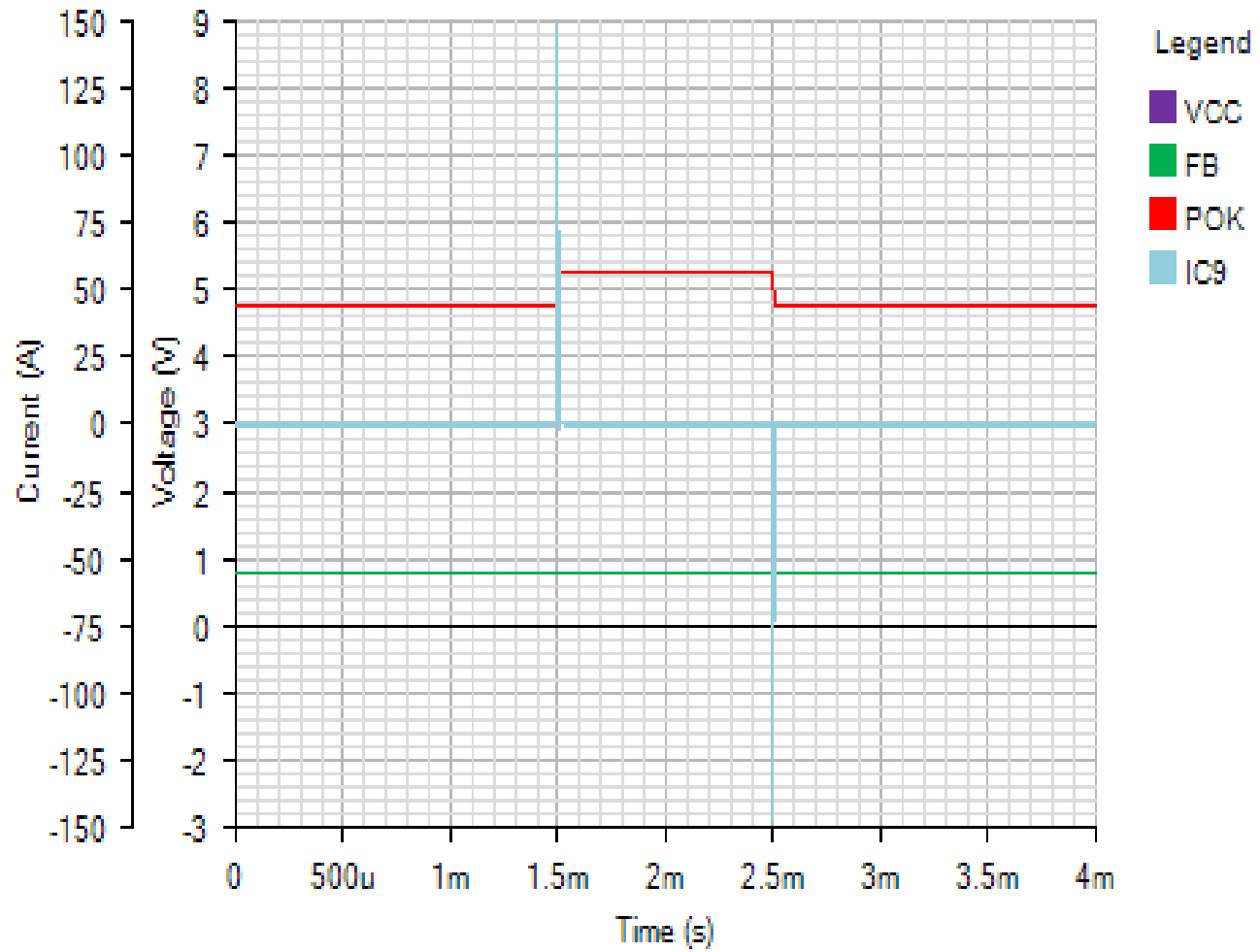
OUTPUT

Default



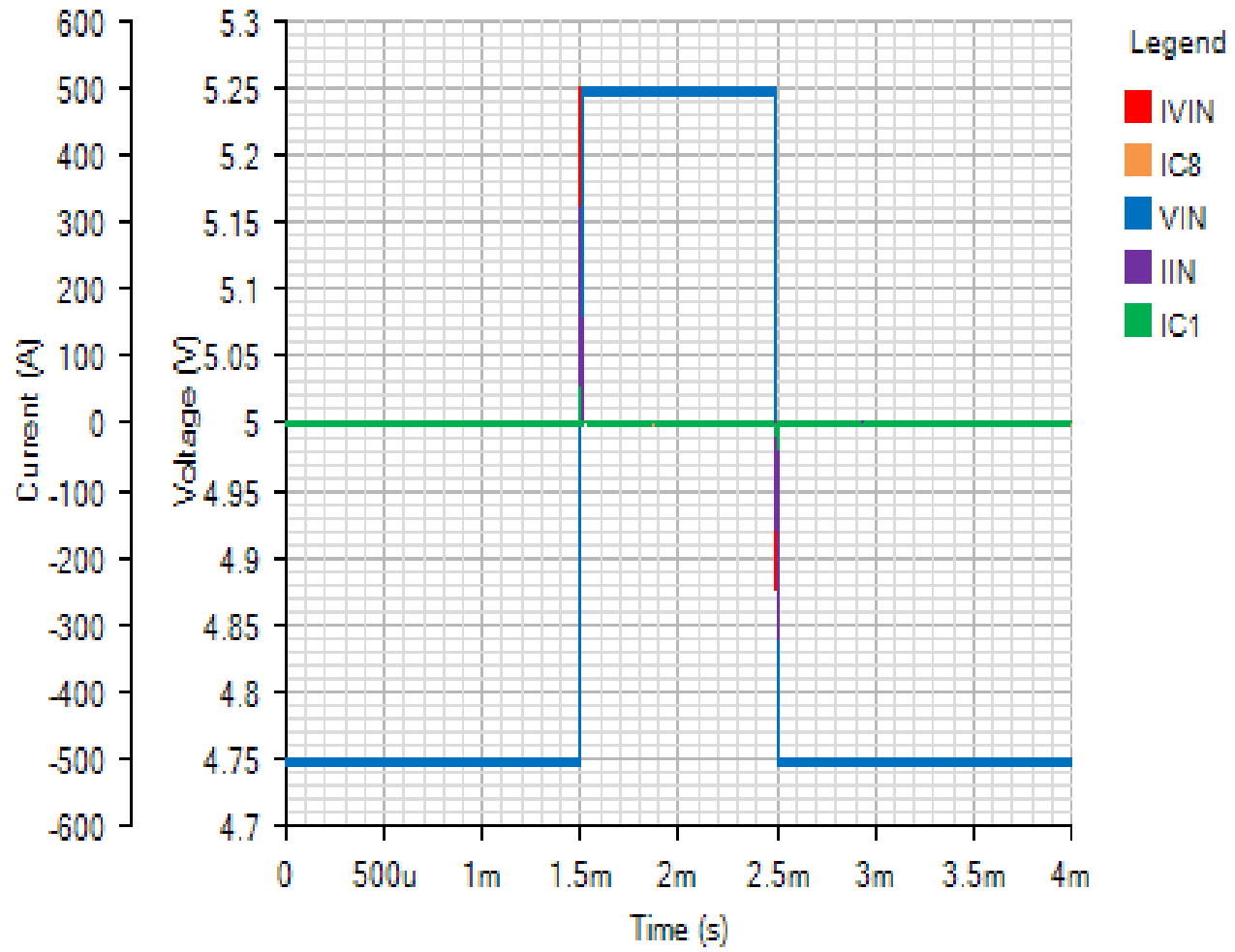
IC

Default



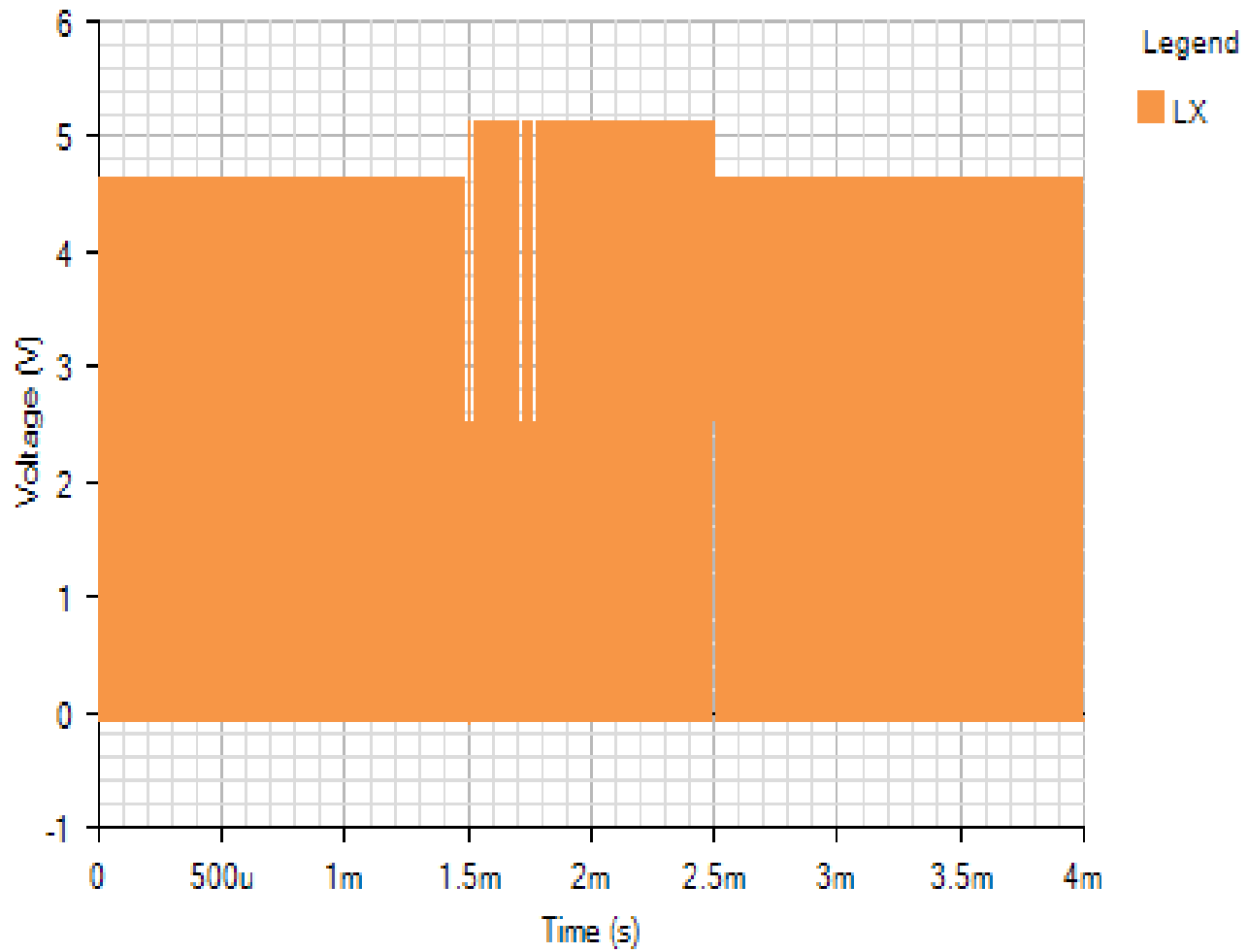
INPUT

Default



SWITCHING

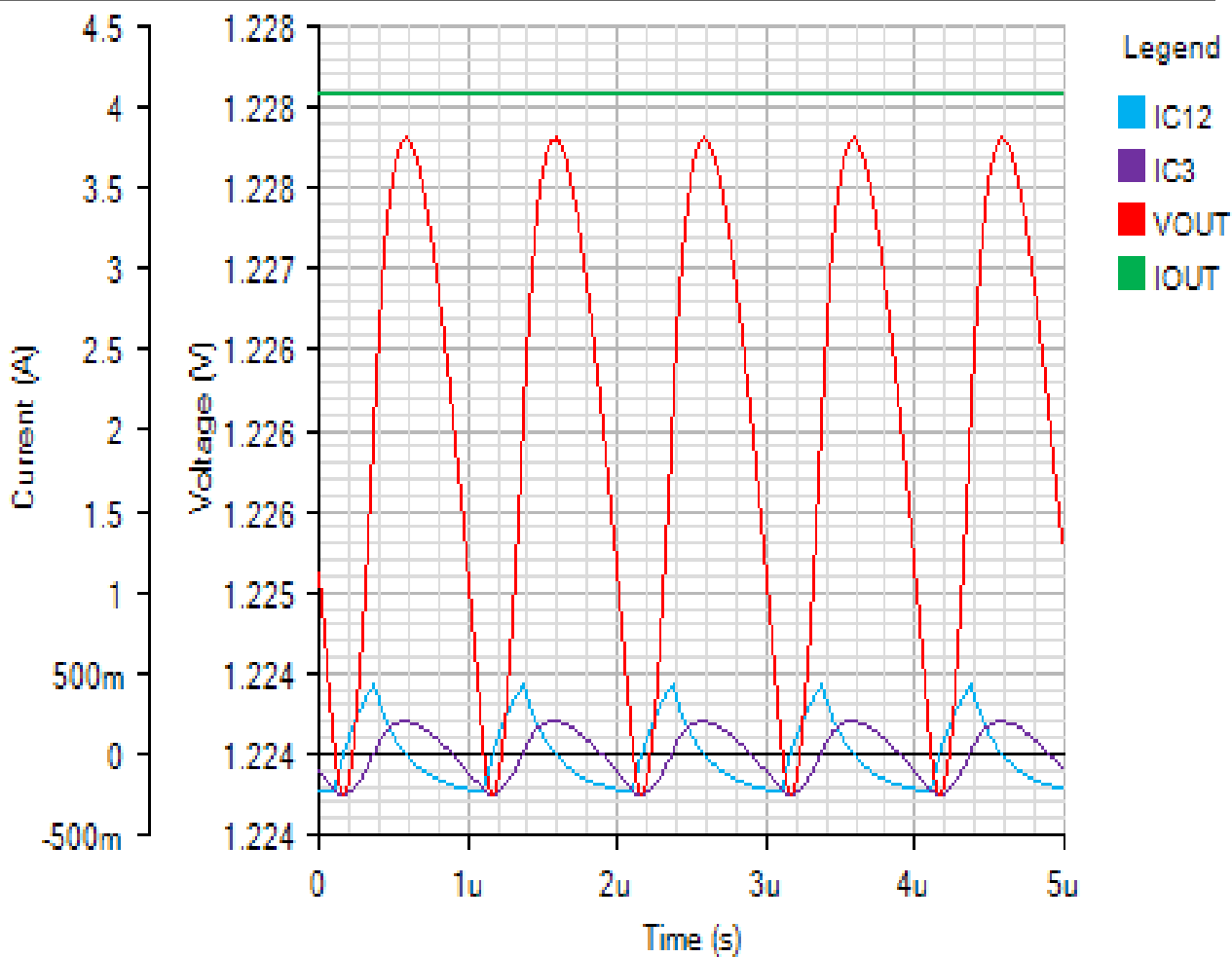
Default



Steady State - Mon Nov 26 2018 14:17:30

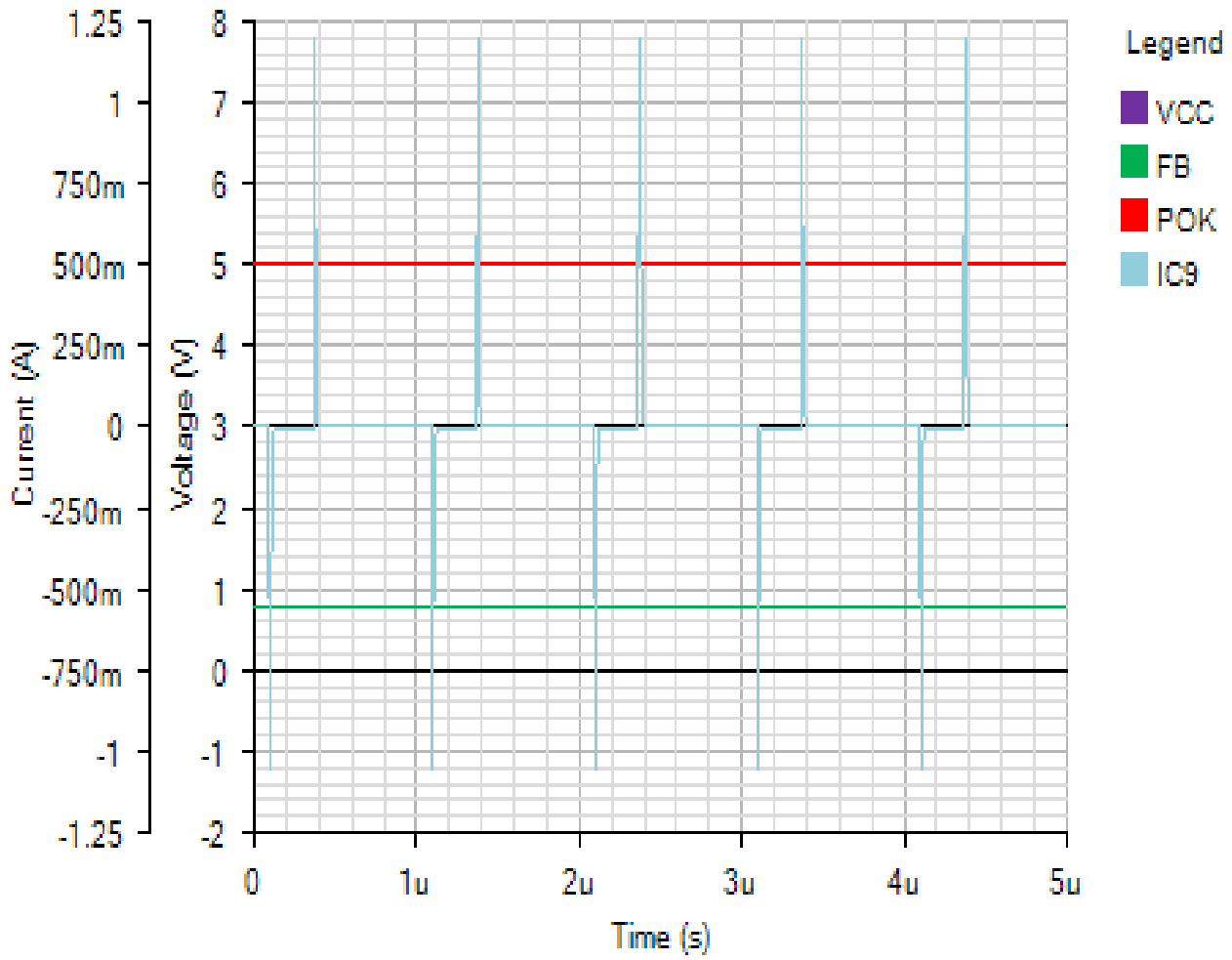
OUTPUT

Default



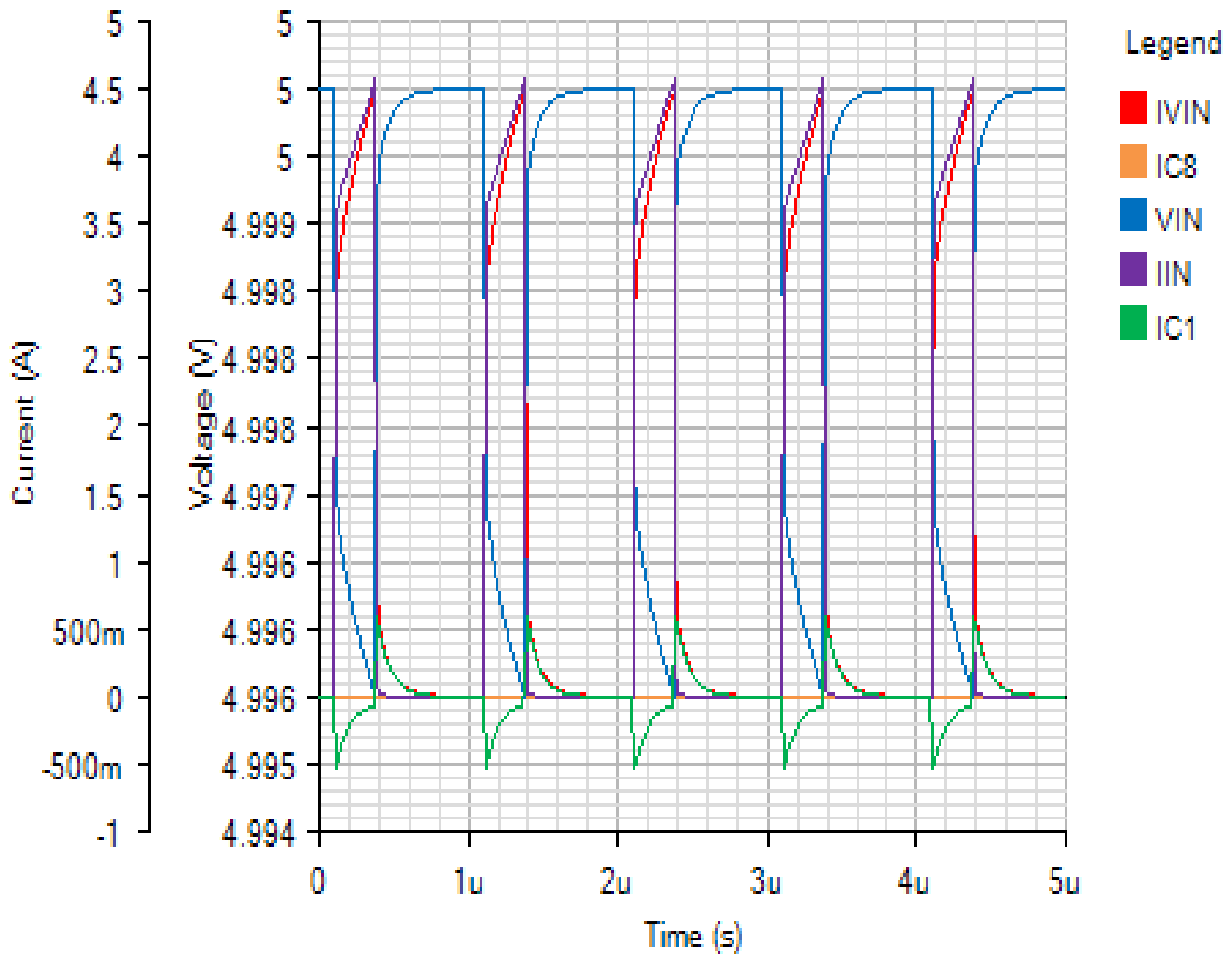
IC

Default



INPUT

Default



SWITCHING

Default

