

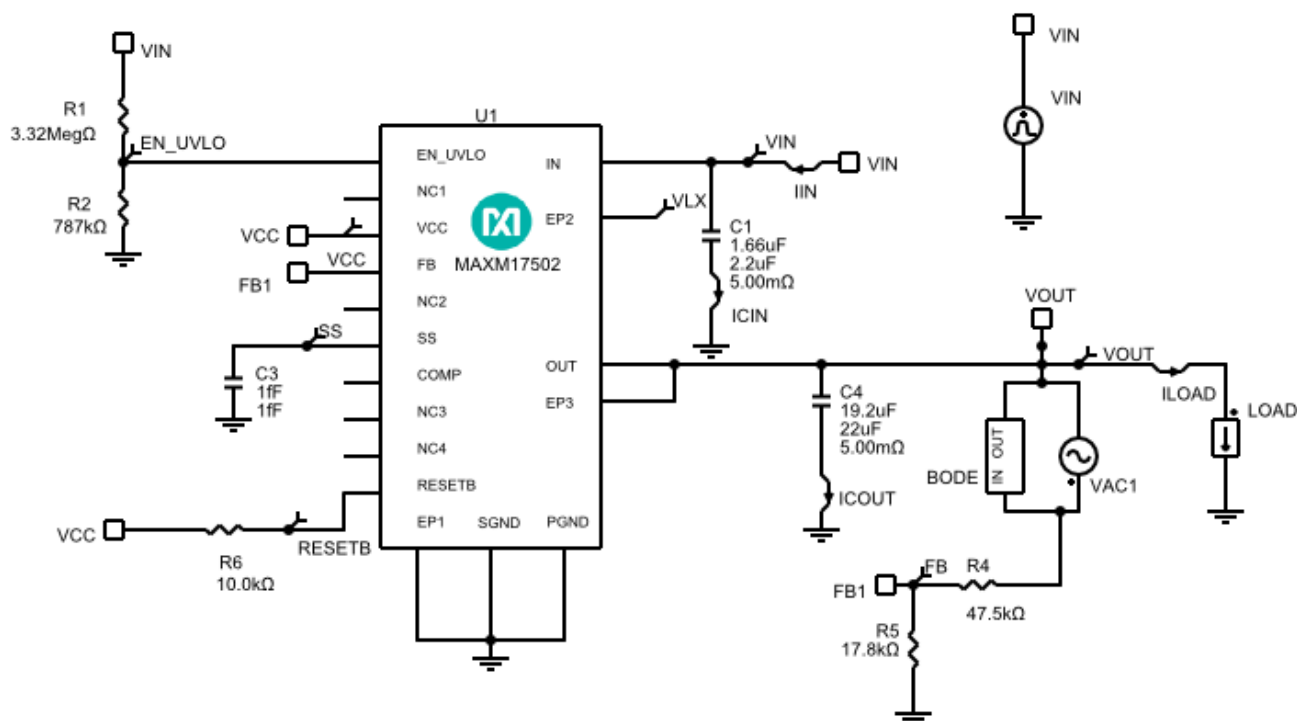
Initial Design

1.0

Design Requirements

Parameter	Value
Maximum Input Voltage	42V
Minimum Input Voltage	7V
Nominal Input Voltage	24V
Input Steady-State Ripple	0.48V
Input Undervoltage Lockout Level	6.3V
Output Voltage	3.3V
Output Current	1A
Output Voltage Load Step Over/Undershoot	0.15V
Performance Priority	Balance Efficiency and Size
BOM Priority	Cost
Ambient Temperature	25°C
Output Soft Start Time	0.0018s

Schematic



BOM

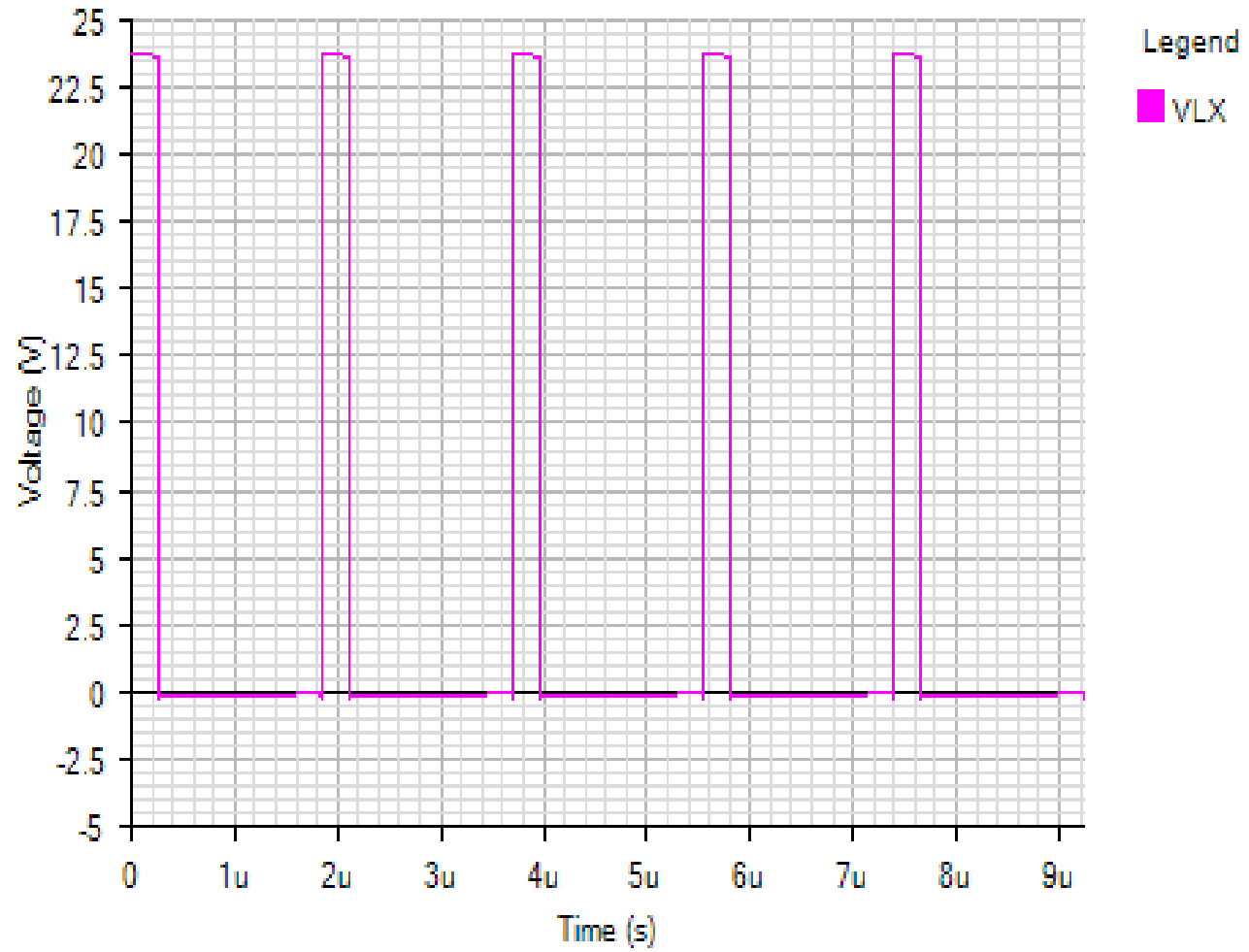
Ref	Qty	Part Number	Manufacturer	Description
U1	1	MAXM17502	Maxim Integrated	1A, 60V High-Efficiency, DC-DC Step-Down Power Module with Integrated Inductor
C1	1	GRM31CR72A225KA73	Murata	Cap Ceramic 2.2uF 100V 1206 125C
C4	1	GRM31CR70J226KE19L	Murata	Cap Ceramic 22uF 6.3V X7R 10% SMD 1206 125C Embossed T/R
R1	1	RC0603FR-073M32L	Yageo	Res Thick Film 0603 3.32M Ohm 1% 0.1W(1/10W) ±100ppm/°C Epoxy Pad SMD T/R
R2	1	ERJ2RKF7873X	Panasonic	Res Thick Film 0402 787K Ohm 1% 0.1W(1/10W) ±100ppm/°C Pad SMD Automotive T/R
R4	1	ERJ3EKF4752V	Panasonic	Res Thick Film 0603 47.5K Ohm 1% 0.1W(1/10W) ±100ppm/°C Pad SMD Automotive T/R
R5	1	ERJ3EKF1782V	Panasonic	Res Thick Film 0603 17.8K Ohm 1% 0.1W(1/10W) ±100ppm/°C Pad SMD Automotive T/R
R6	1	TRCR0603-103MT	Venkel	Res Thick Film 0603 10K Ohm 20% 0.063W(1/16W) ±200ppm/°C Pad SMD Reel

Simulation Results

Steady State - Mon Nov 26 2018 13:48:05

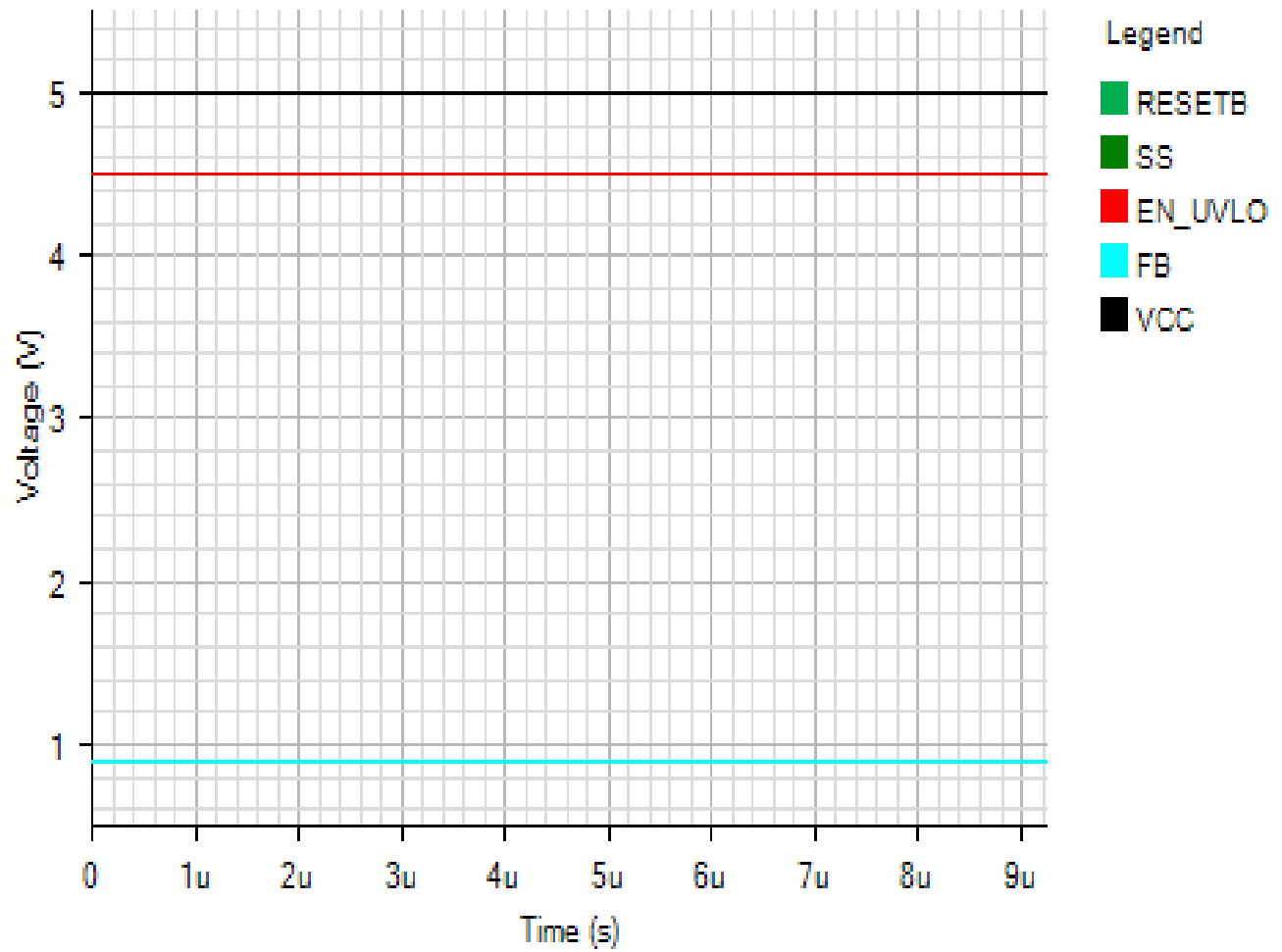
SWITCHING

Default



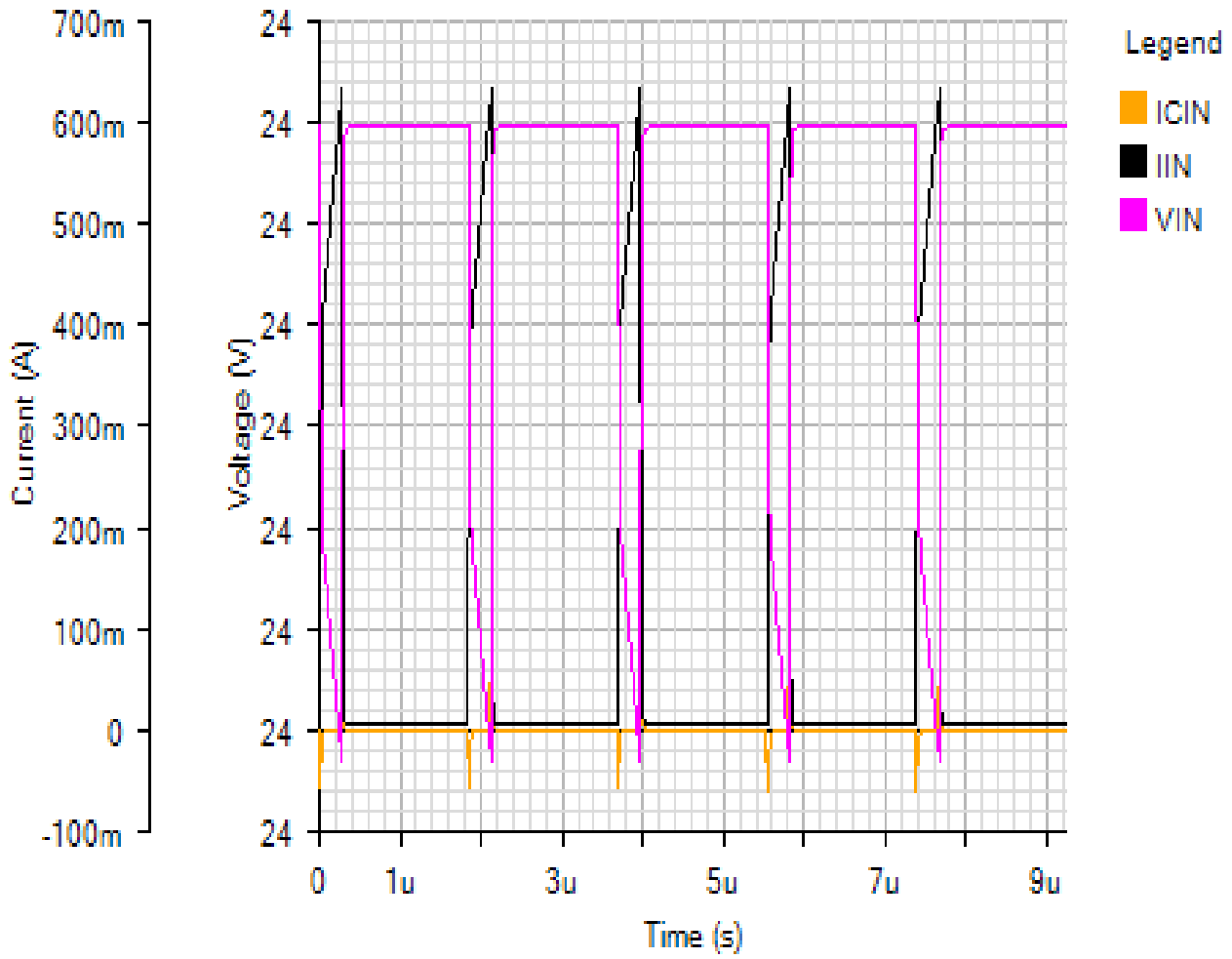
IC

Default



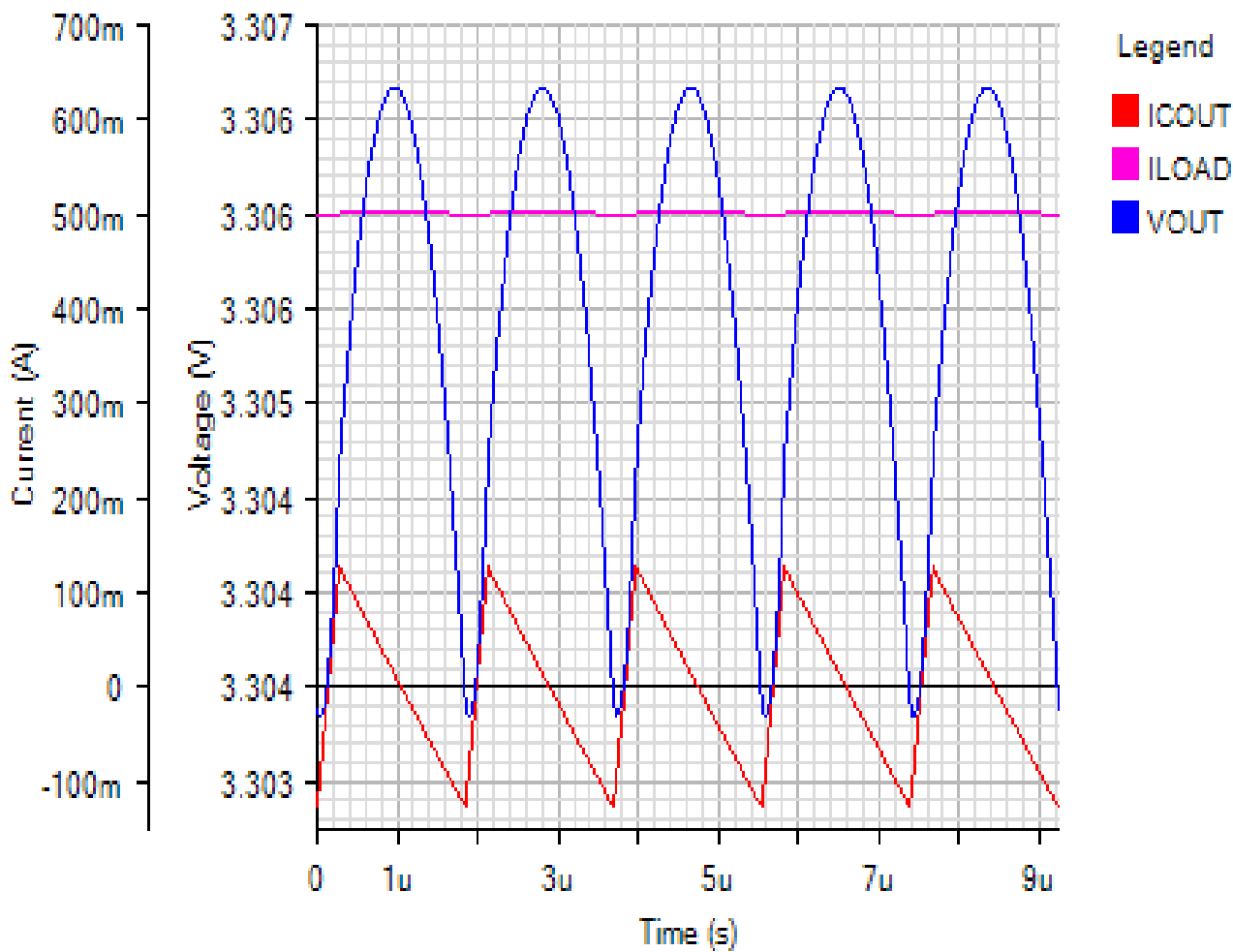
INPUT

Default



OUTPUT

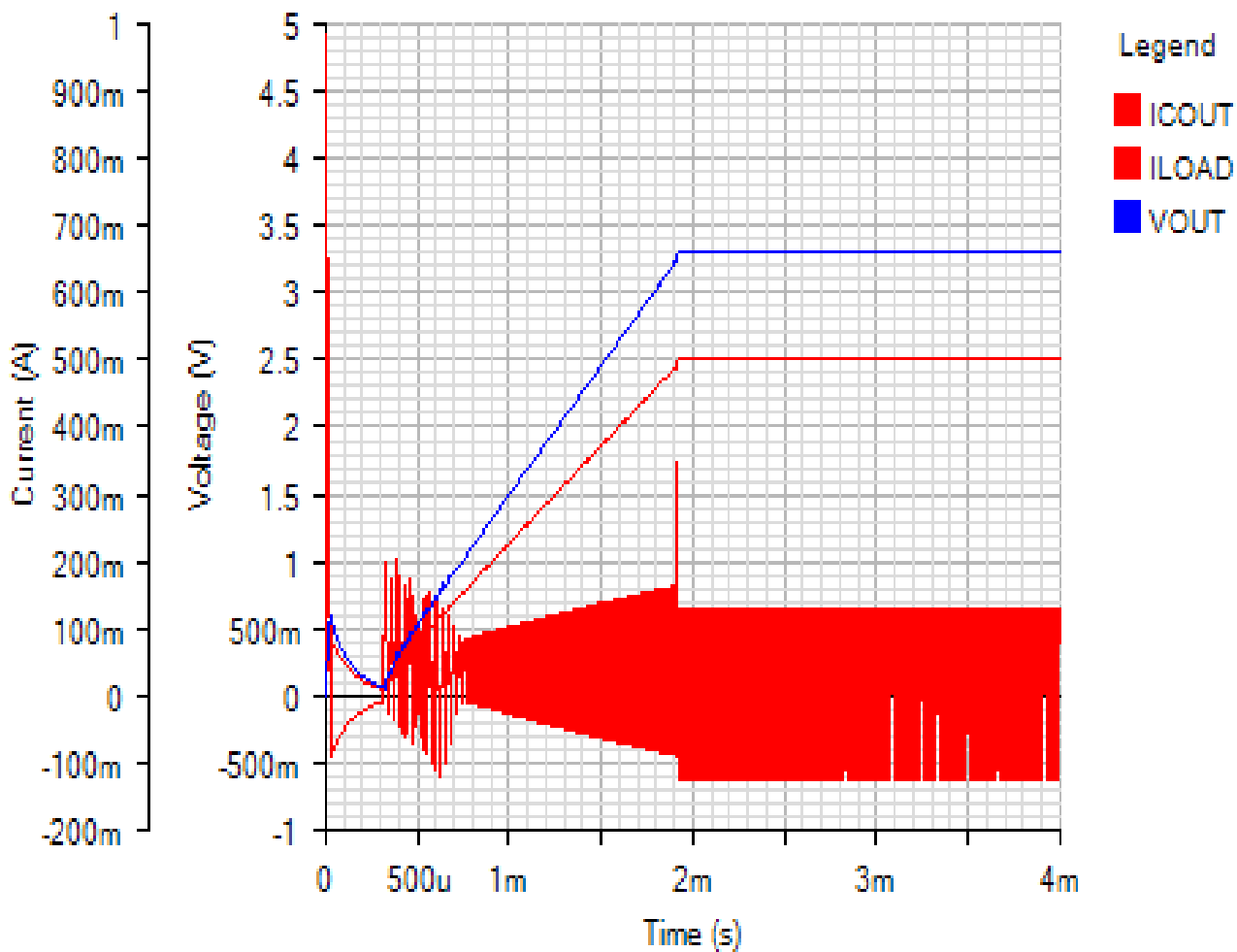
Default



Start Up - Mon Nov 26 2018 13:48:05

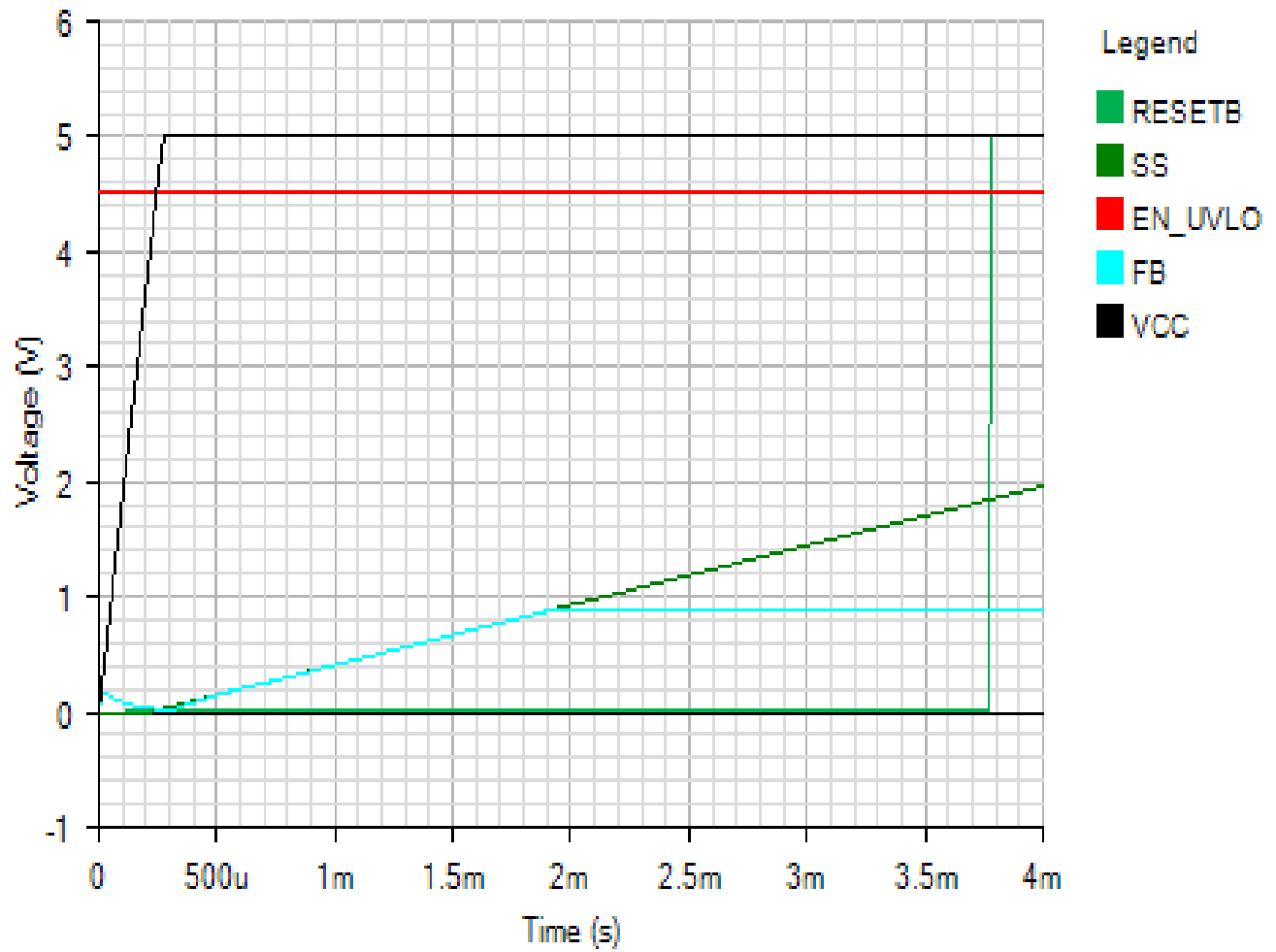
OUTPUT

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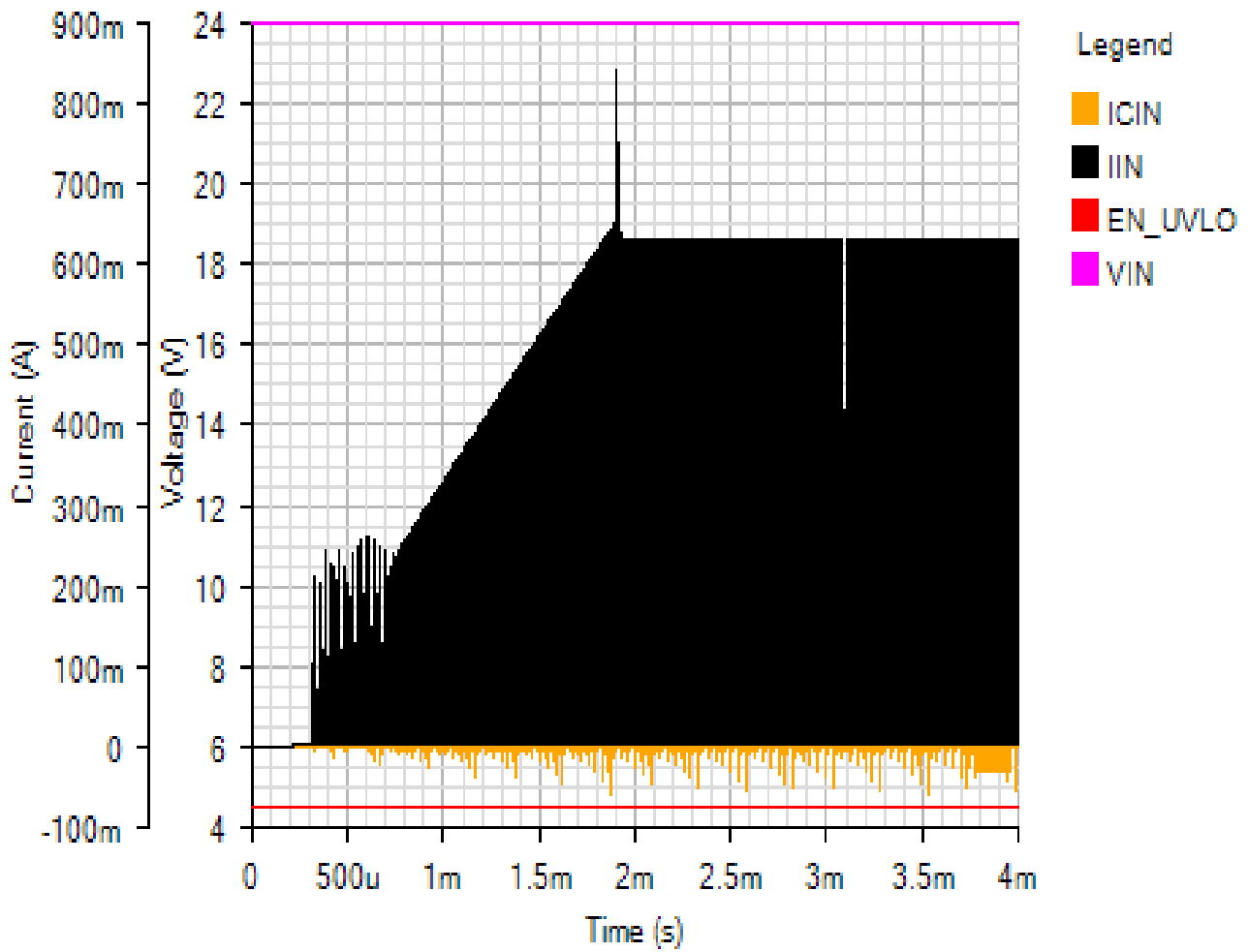
IC

Default



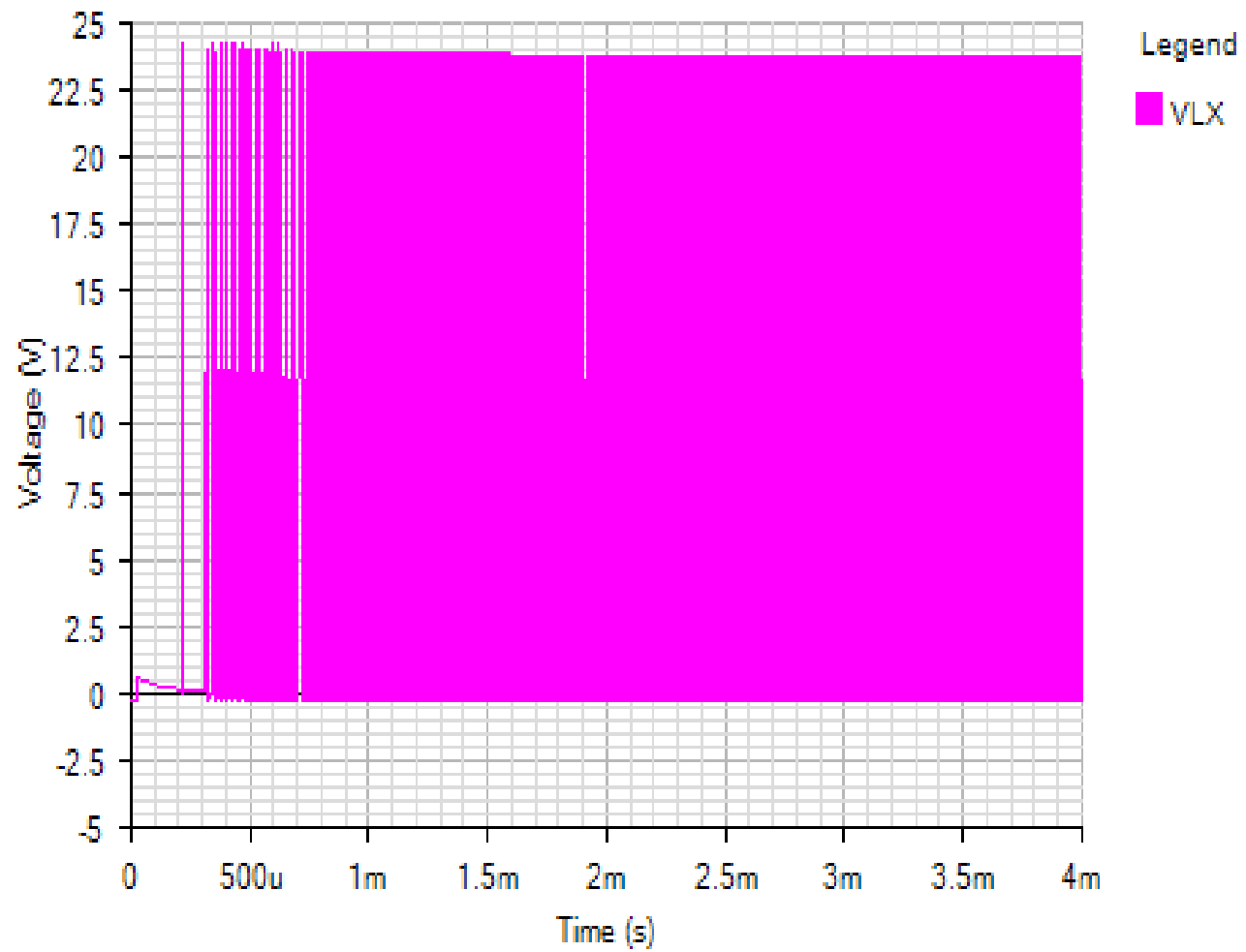
INPUT

Default



SWITCHING

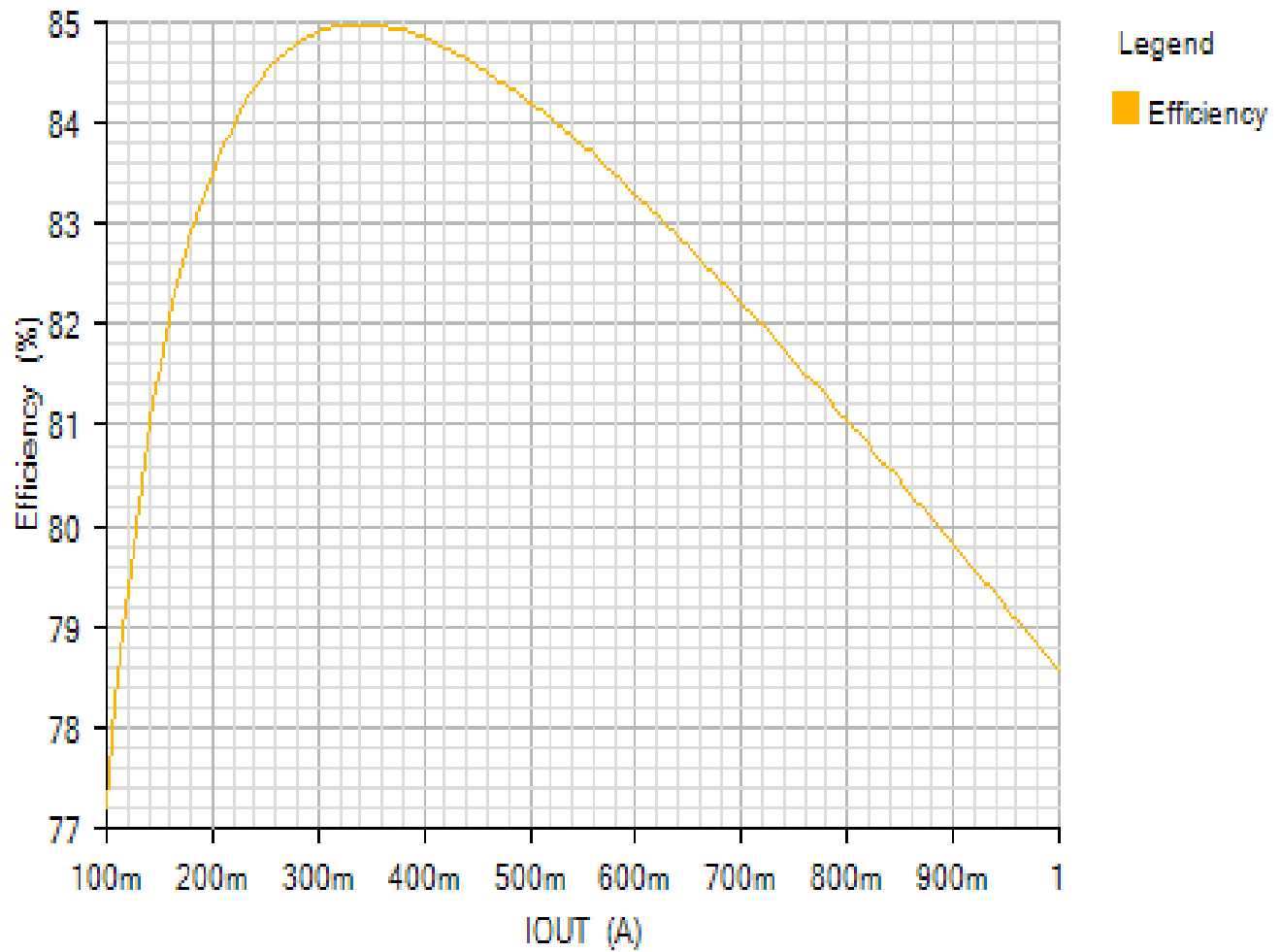
Default



Efficiency - Mon Nov 26 2018 13:48:05

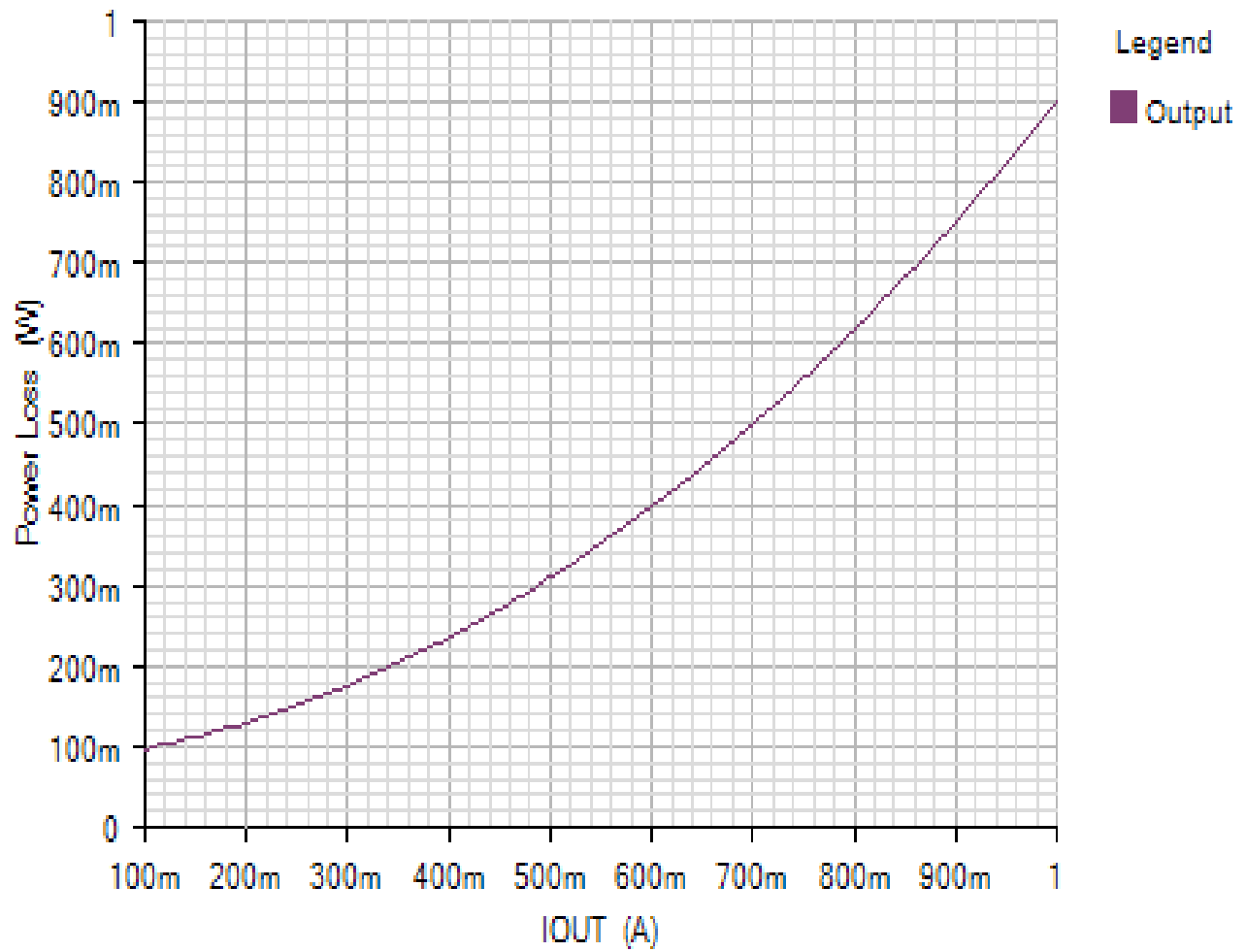
EFFICIENCY_PLOT

Default



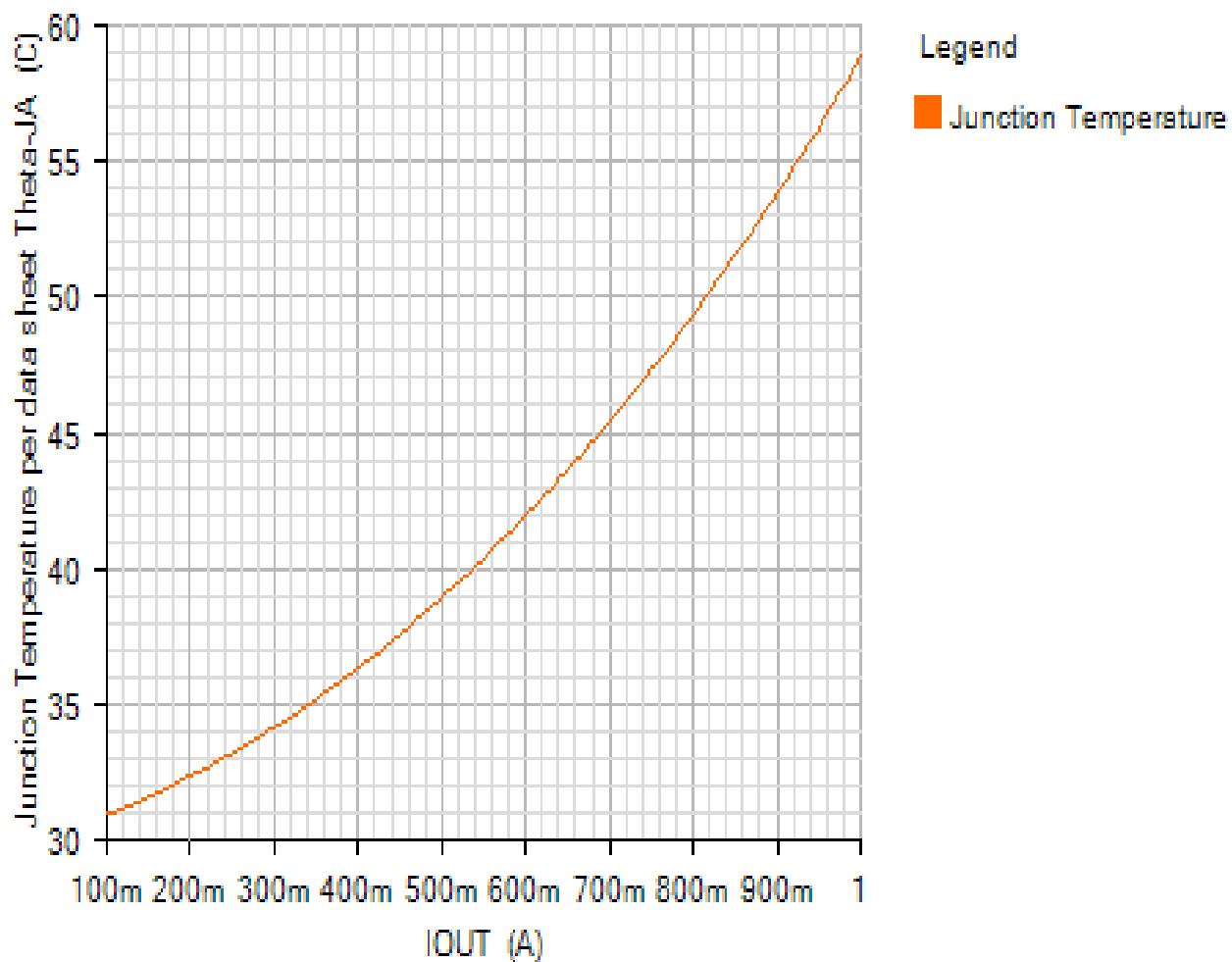
POWER_LOSS_PLOT

Default



JUNCTION_TEMPERATURE_PLOT

Default



Losses



Component

Loss (W)

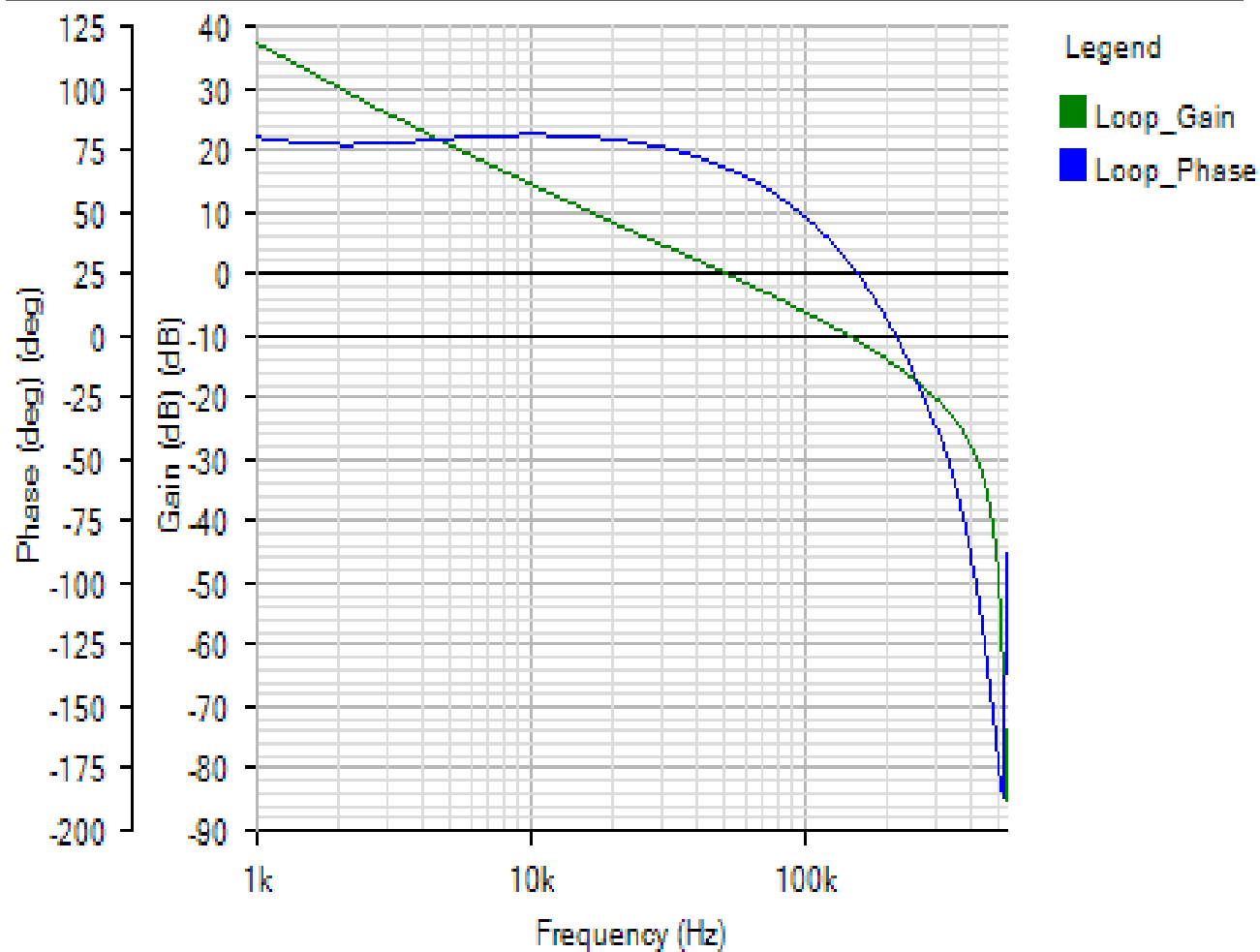
% of total

Component	Loss (W)	% of total
Inductor losses	0.4	44.4
Losses in IC	0.5	55.6
Total	0.9	100

AC Loop - Mon Nov 26 2018 13:48:05

BODE

Default



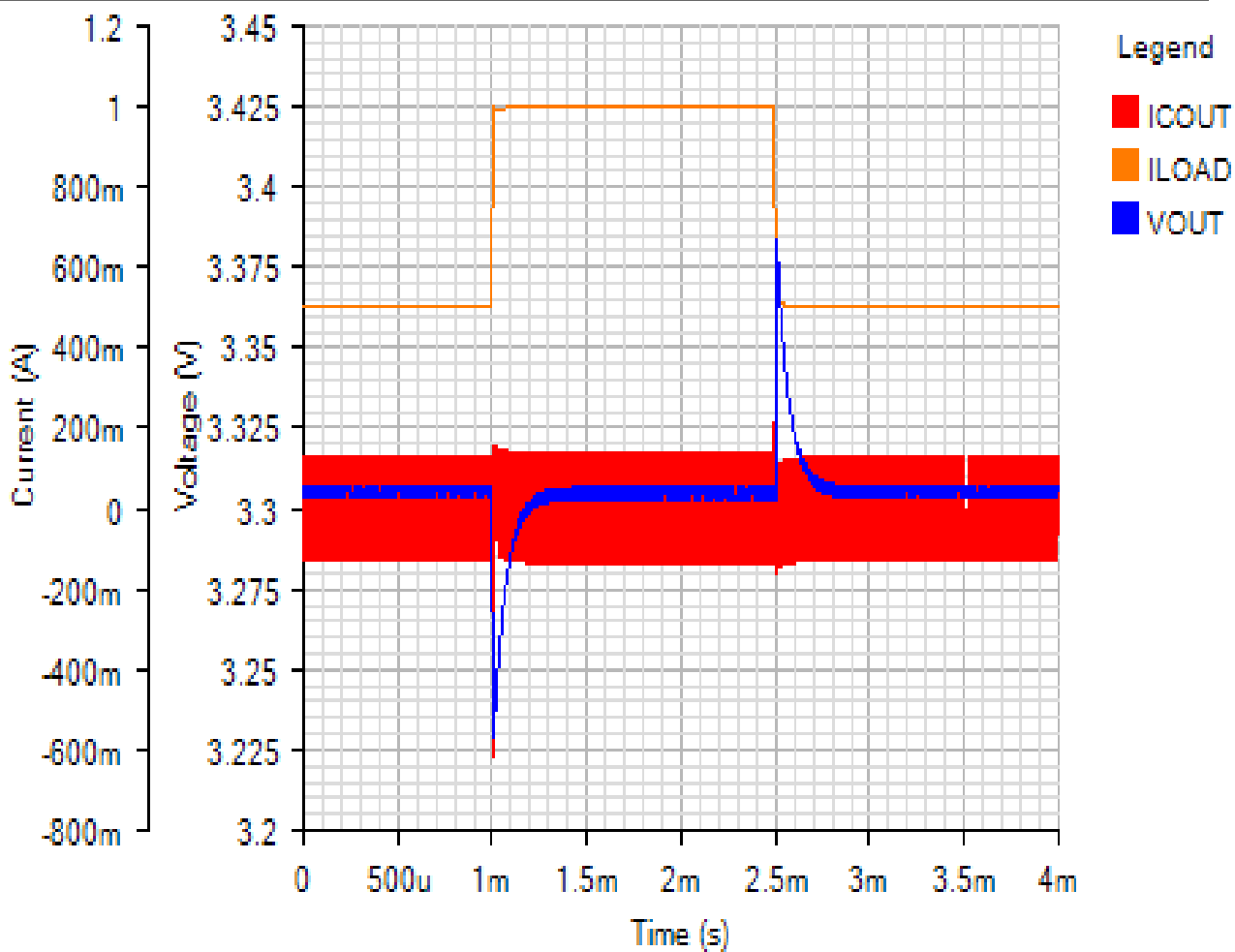
Phase Margin: 67.79° at a crossover frequency of 51kHz



Load Step - Mon Nov 26 2018 13:48:05

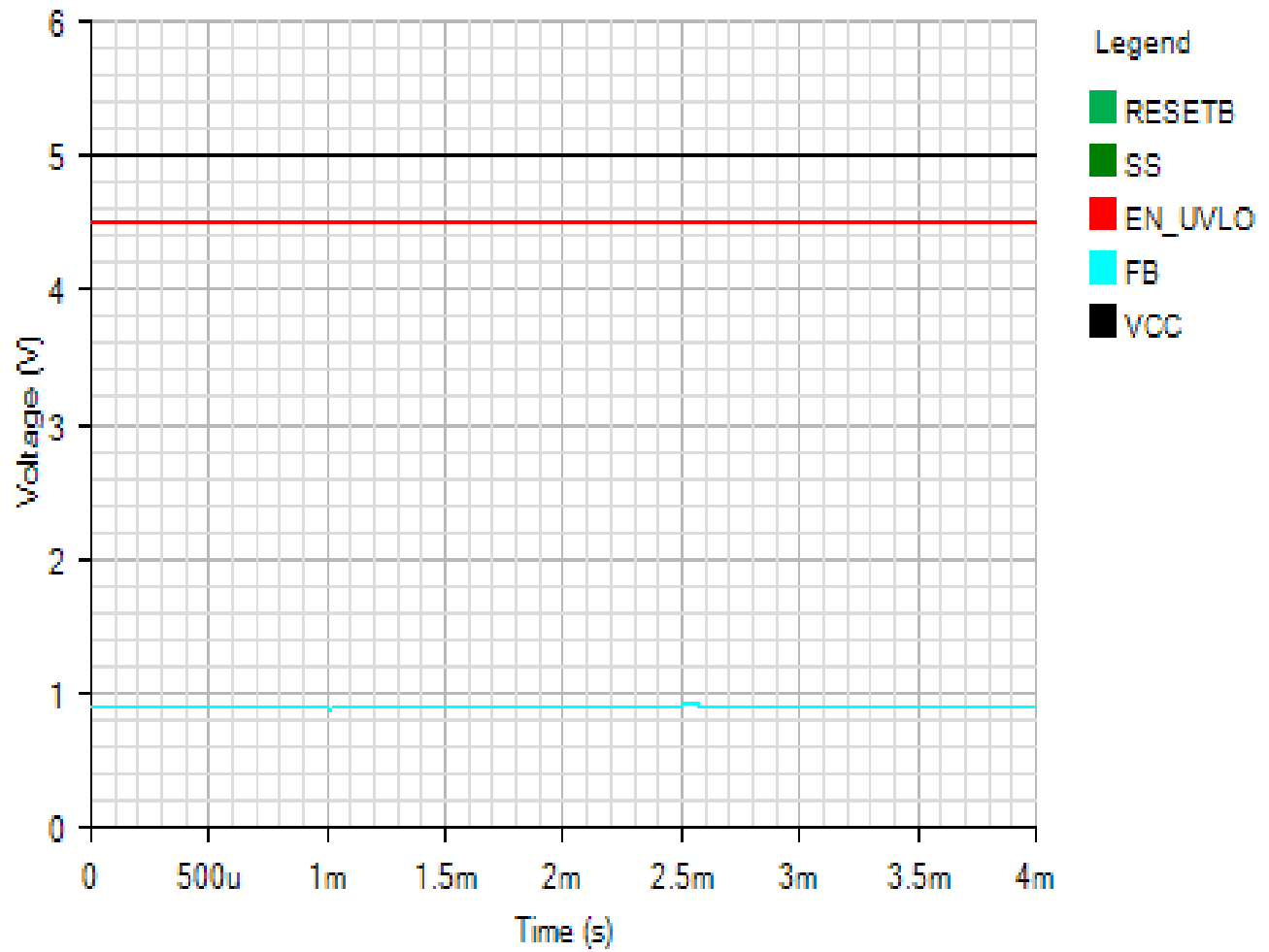
OUTPUT

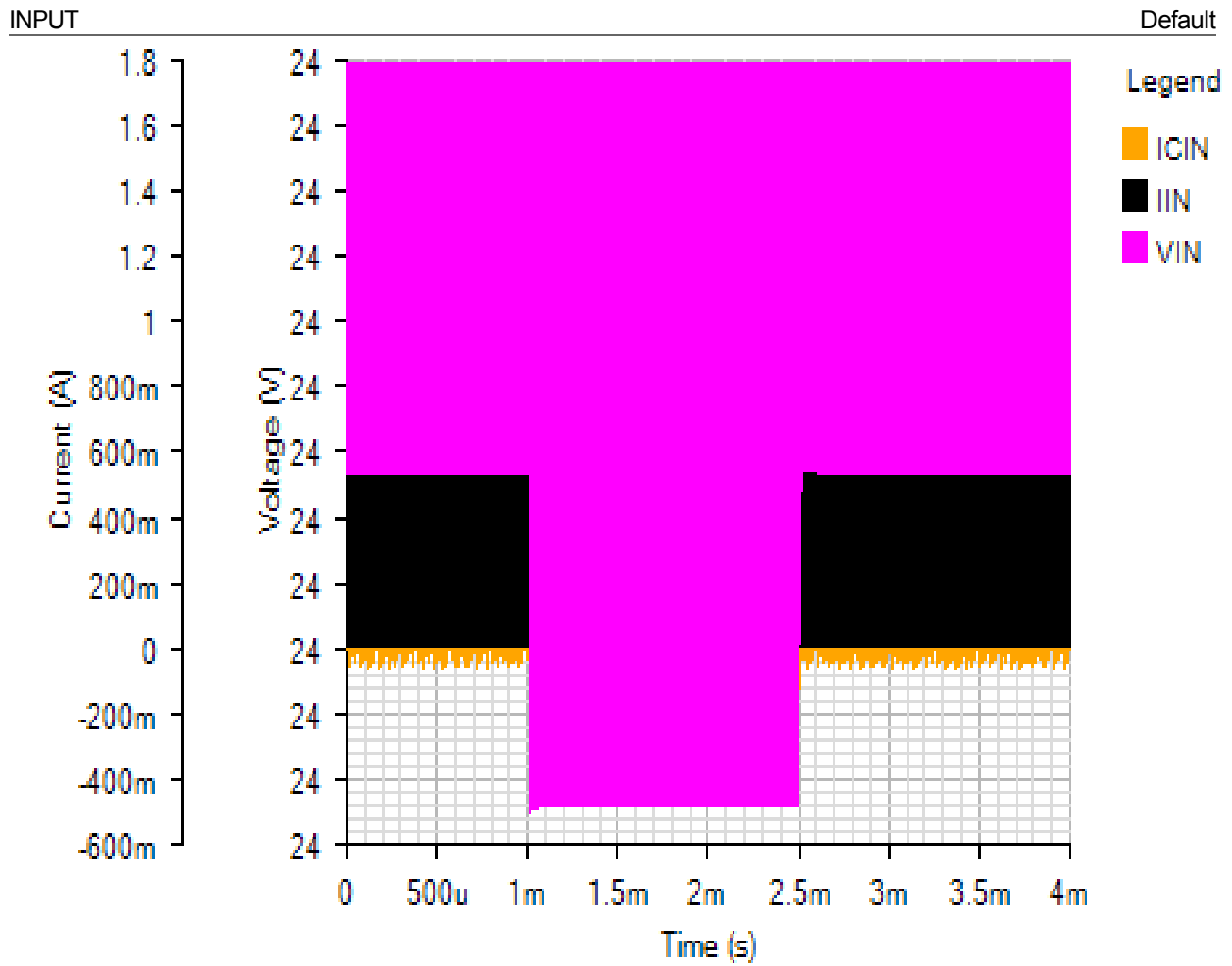
Default



IC

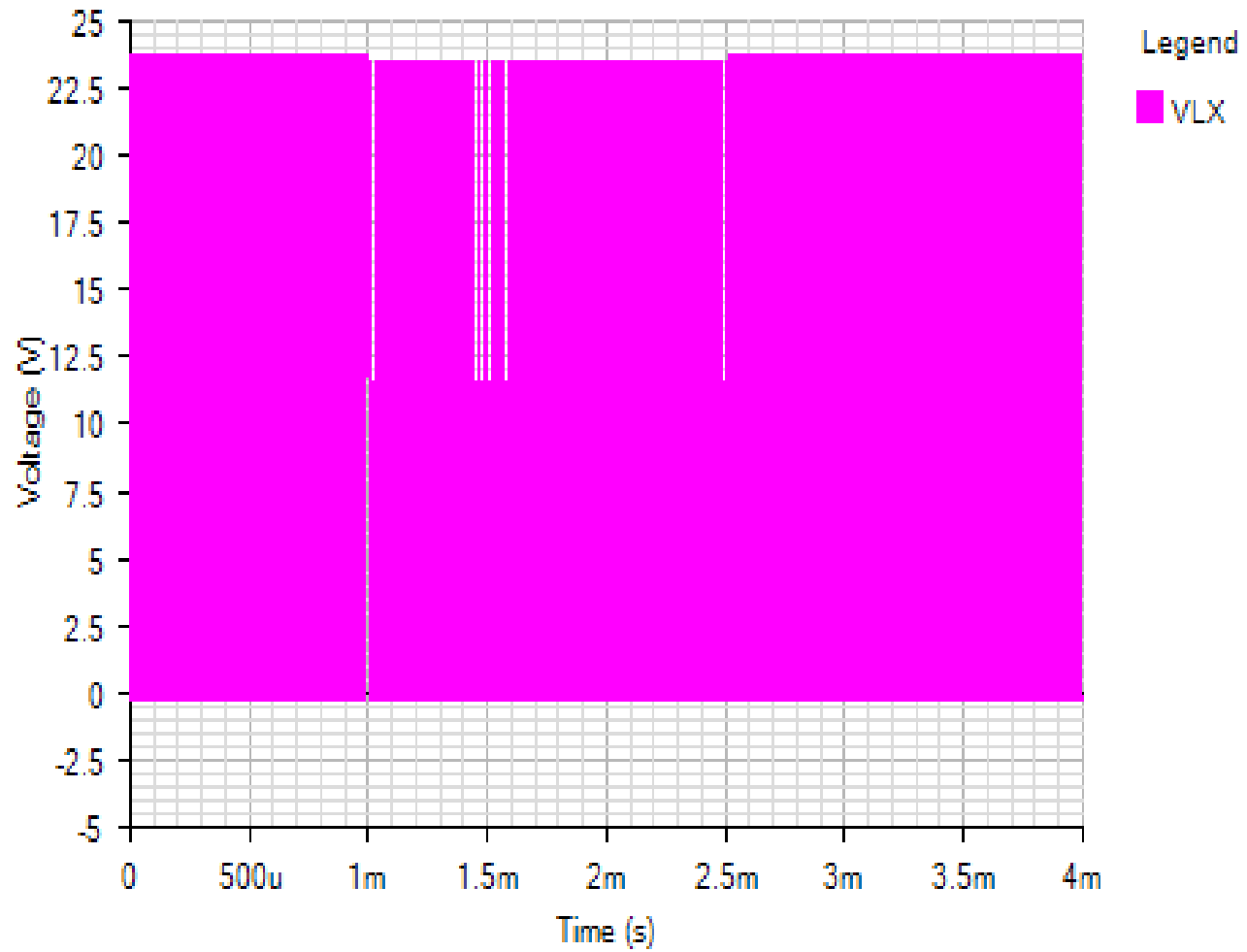
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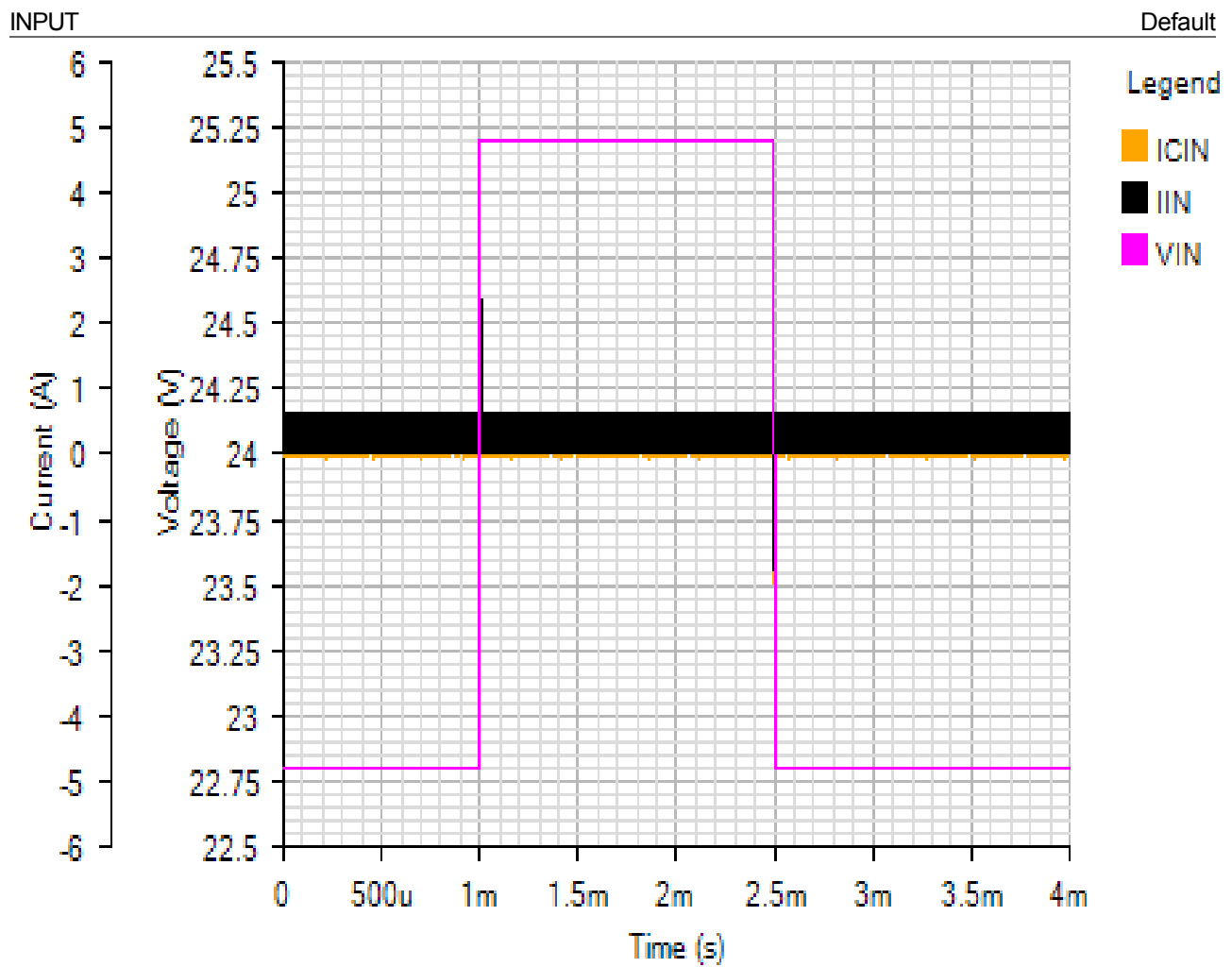


SWITCHING

Default

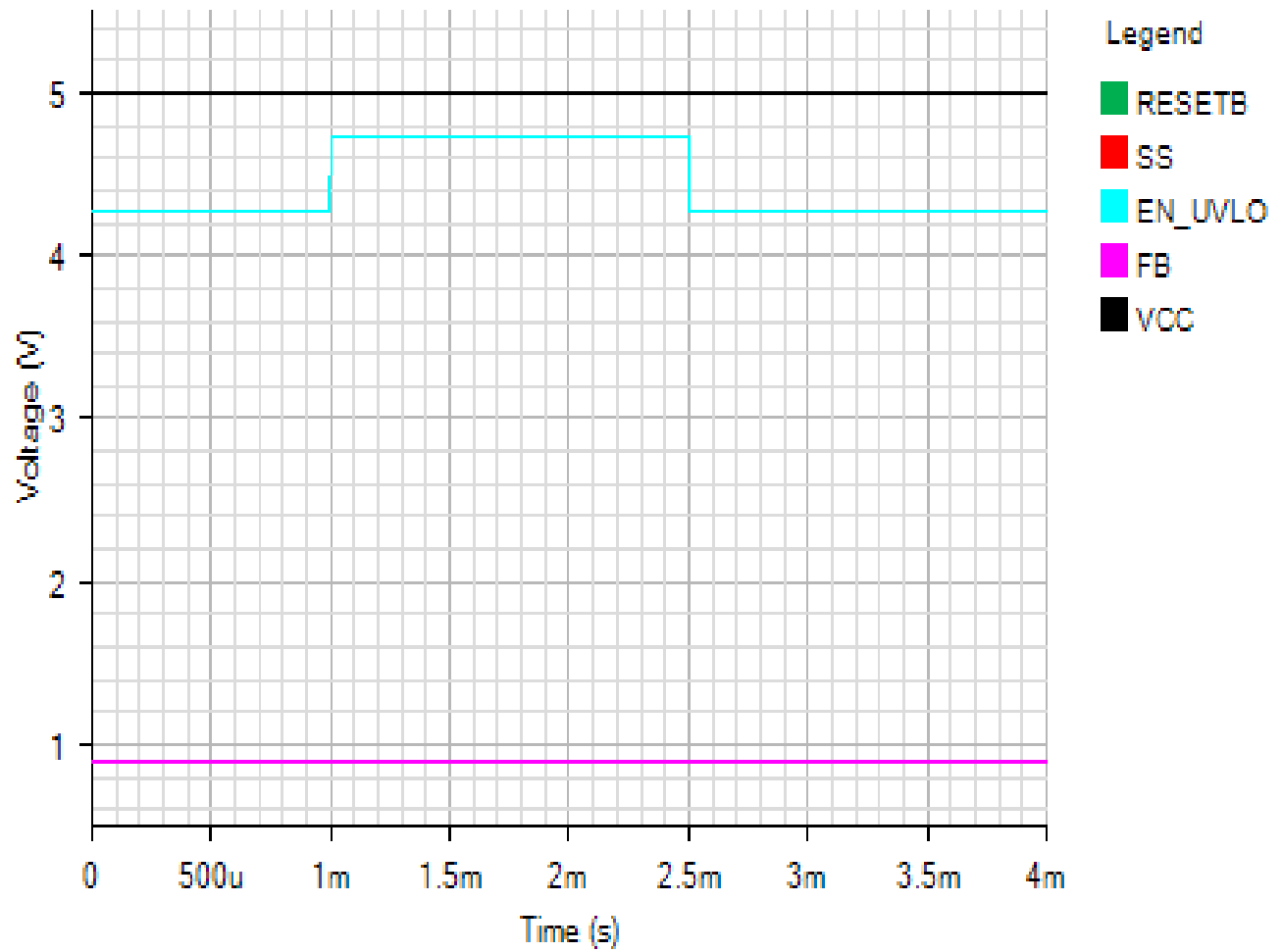


Line Transient - Mon Nov 26 2018 13:48:05



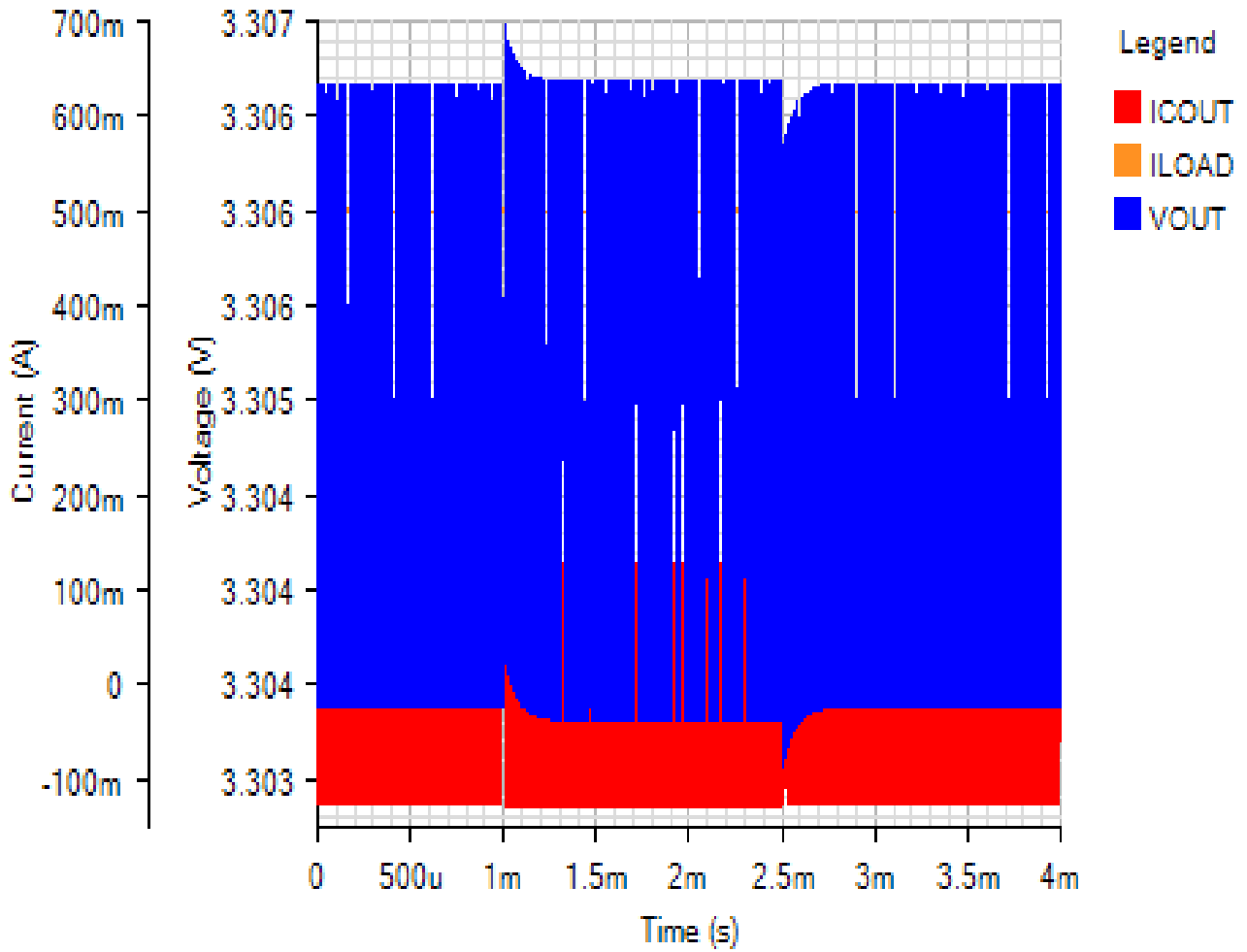
IC

Default



OUTPUT

Default



SWITCHING

Default

