

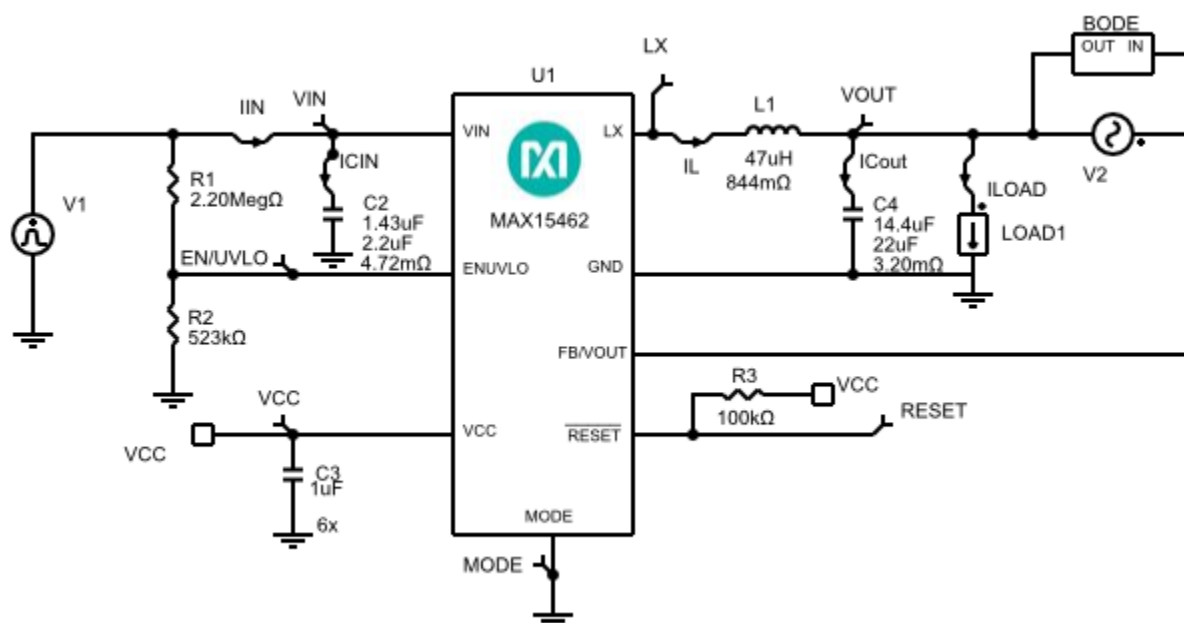
Initial Design

1.0

Design Requirements

Parameter	Value
Minimum Input Voltage	7V
Maximum Input Voltage	42V
Nominal Input Voltage	24V
Input Undervoltage Lockout Level	6.3V
Input Voltage Ripple	0.48V
Output Voltage	5V
Output Current	0.3A
Performance Priority	Balance Efficiency and Size
BOM Priority	Cost
Mode of operation	PWM
Ambient Temperature	25°C

Schematic



BOM

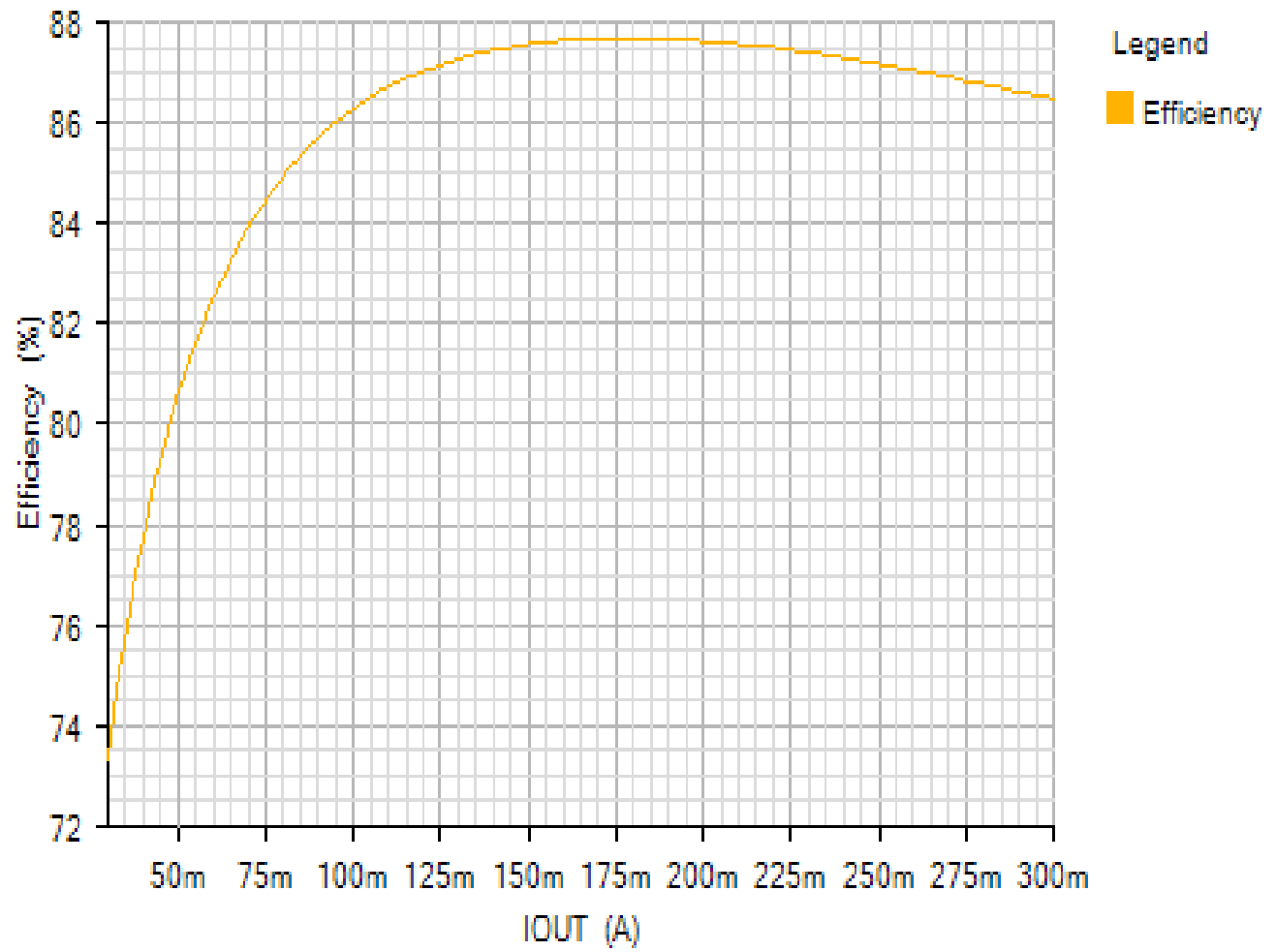
Ref	Qty	Part Number	Manufacturer	Description
U1	1	MAX15462BATA+	Maxim Integrated	42V, 300mA, Ultra-Small, High-Efficiency, Synchronous Step-Down DC-DC Converters
C2	1	GRM31CR71H225KA88	Murata	Cap Ceramic 2.2uF 50V X7R 10% SMD 1206 125C
C3	6	GRM155R70J105KA12J	Murata Manufacturing	Cap Ceramic 1uF 6.3V X7R 10% Pad SMD 0402 125°C T/R
C4	1	GRM31CR70J226KE19L	Murata	Cap Ceramic 22uF 6.3V X7R 10% SMD 1206 125C Embossed T/R
L1	1	SD43-473KLB	Coilcraft	Inductor 47uH 10% 759.6mOhm 0.87A Isat 0.86A Irms
R1	1	ERJ3EKF2204V	Panasonic	Res Thick Film 0603 2.2M Ohm 1% 0.1W(1/10W) ±100ppm/°C Pad SMD Automotive T/R
R2	1	ERJ2RKF5233X	Panasonic	Res Thick Film 0402 523K Ohm 1% 0.1W(1/10W) ±100ppm/°C Pad SMD Automotive T/R
R3	1	ERJ2GEJ104X	Panasonic	Res Thick Film 0402 100K Ohm 5% 0.1W(1/10W) ±200ppm/°C Pad SMD Automotive T/R

Simulation Results

Efficiency - Mon Nov 19 2018 13:06:24

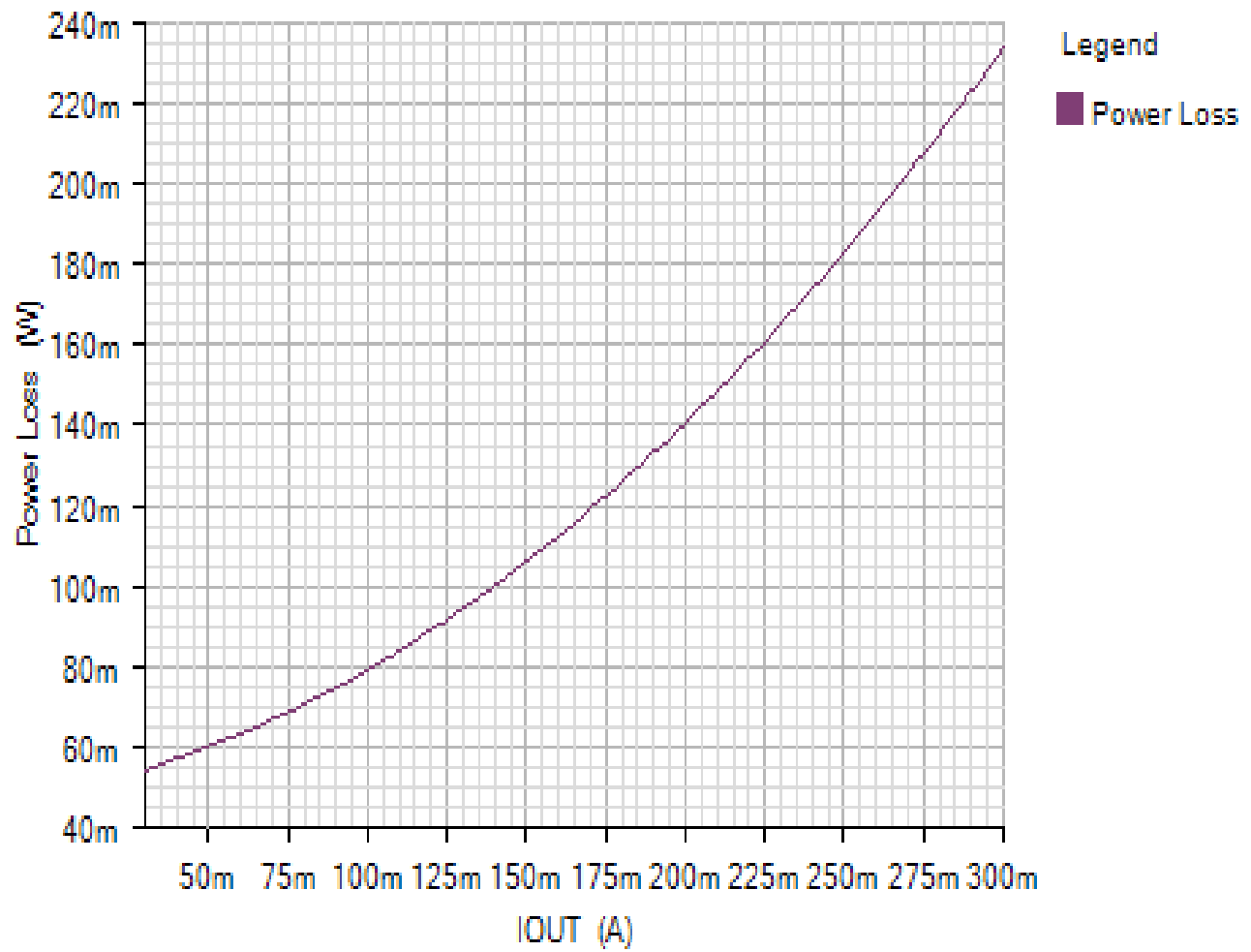
EFFICIENCY_PLOT

Default



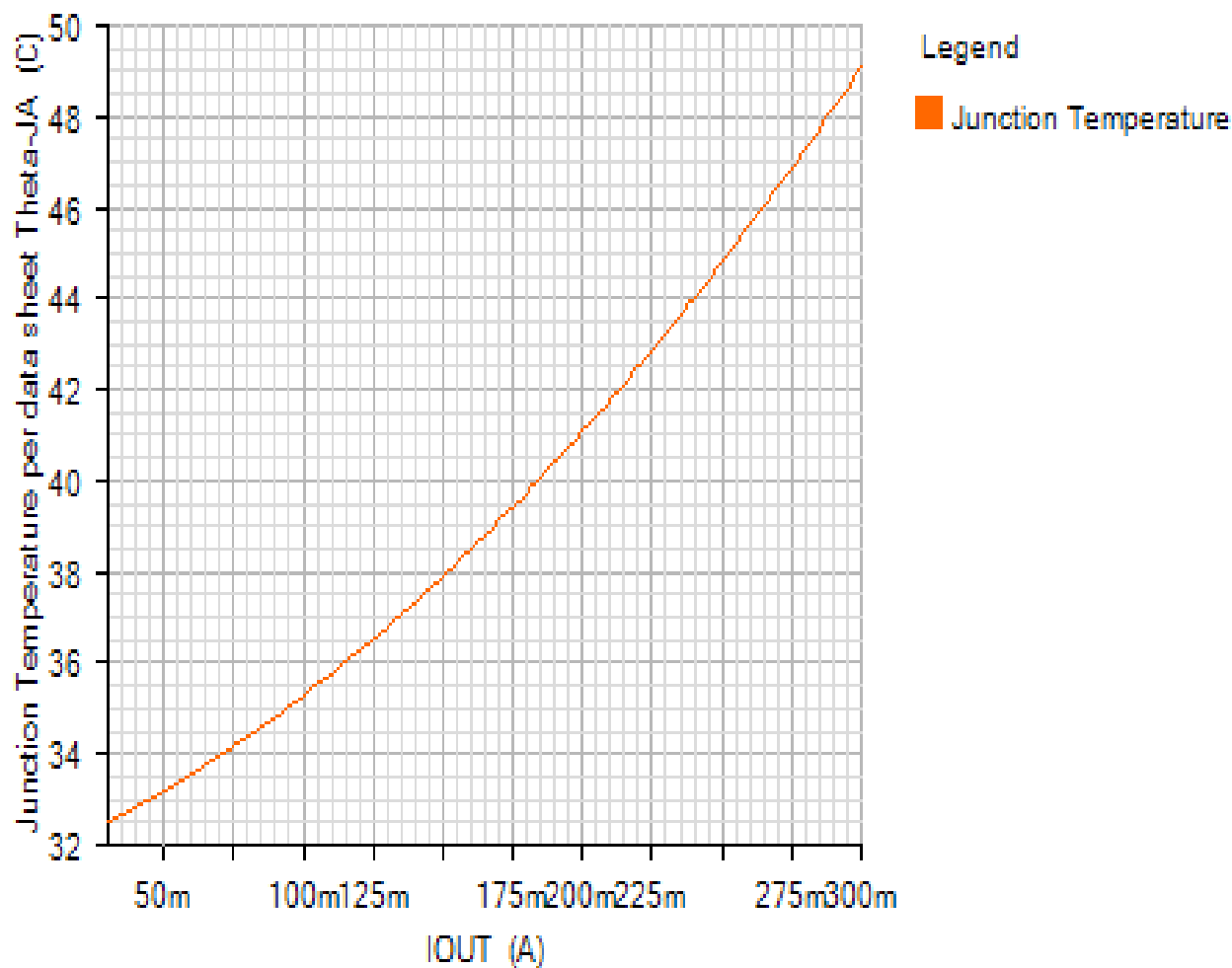
POWER_LOSS_PLOT

Default

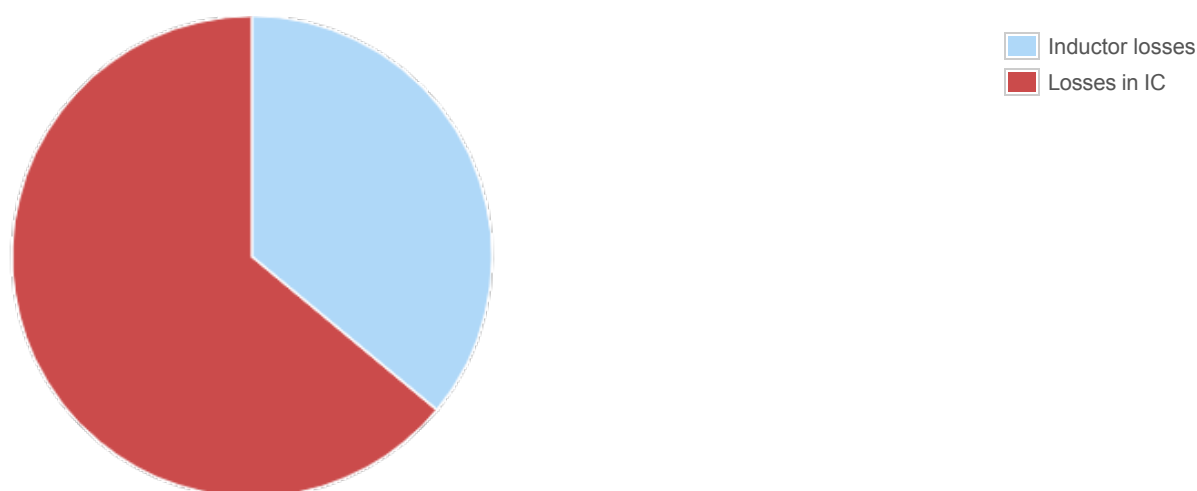


JUNCTION_TEMPERATURE_PLOT

Default



Losses



Component

Loss (W)

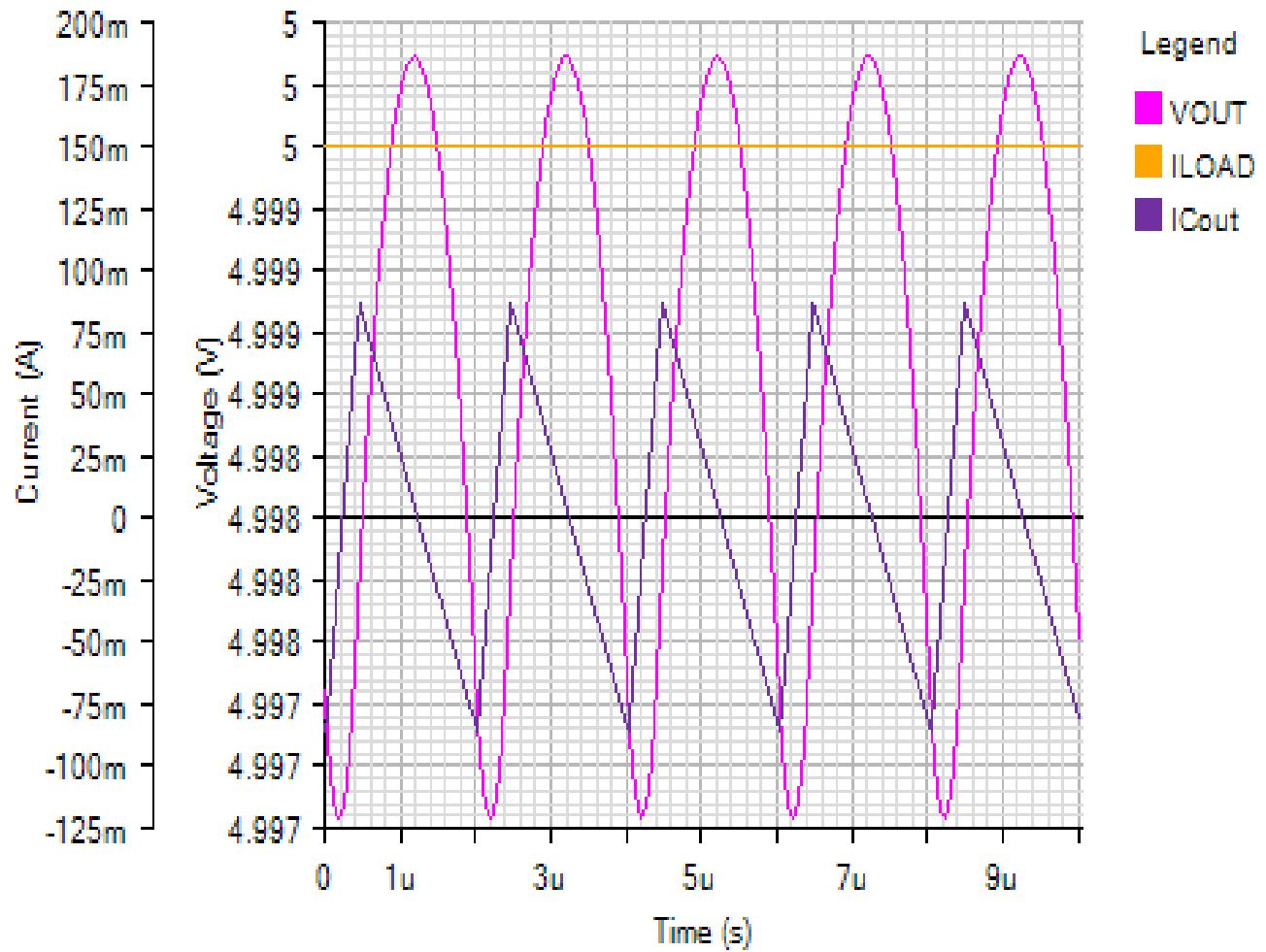
% of total

Component	Loss (W)	% of total
Inductor losses	0.09	36
Losses in IC	0.16	64
Total	0.25	100

Steady State - Mon Nov 19 2018 13:06:24

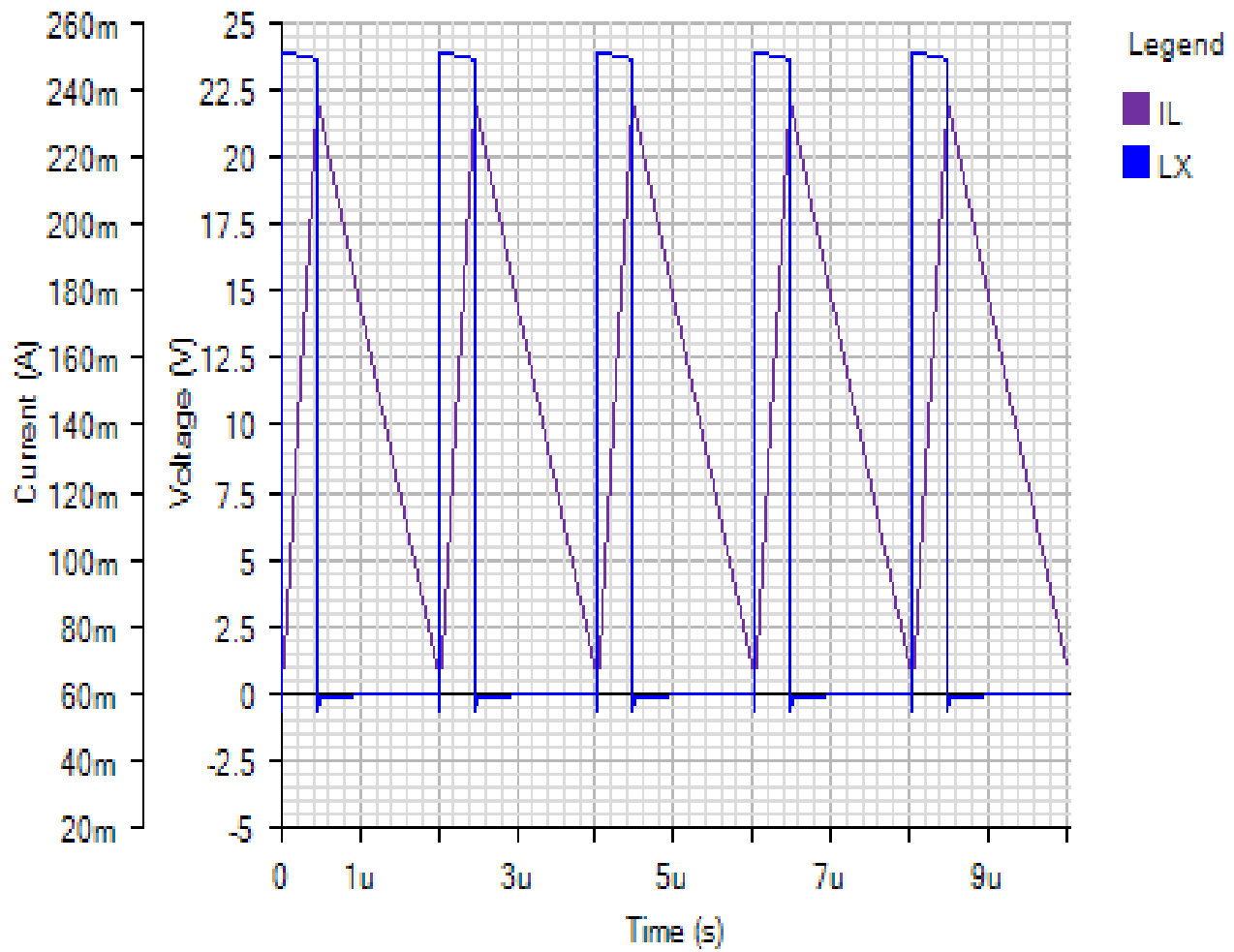
OUTPUT

Default



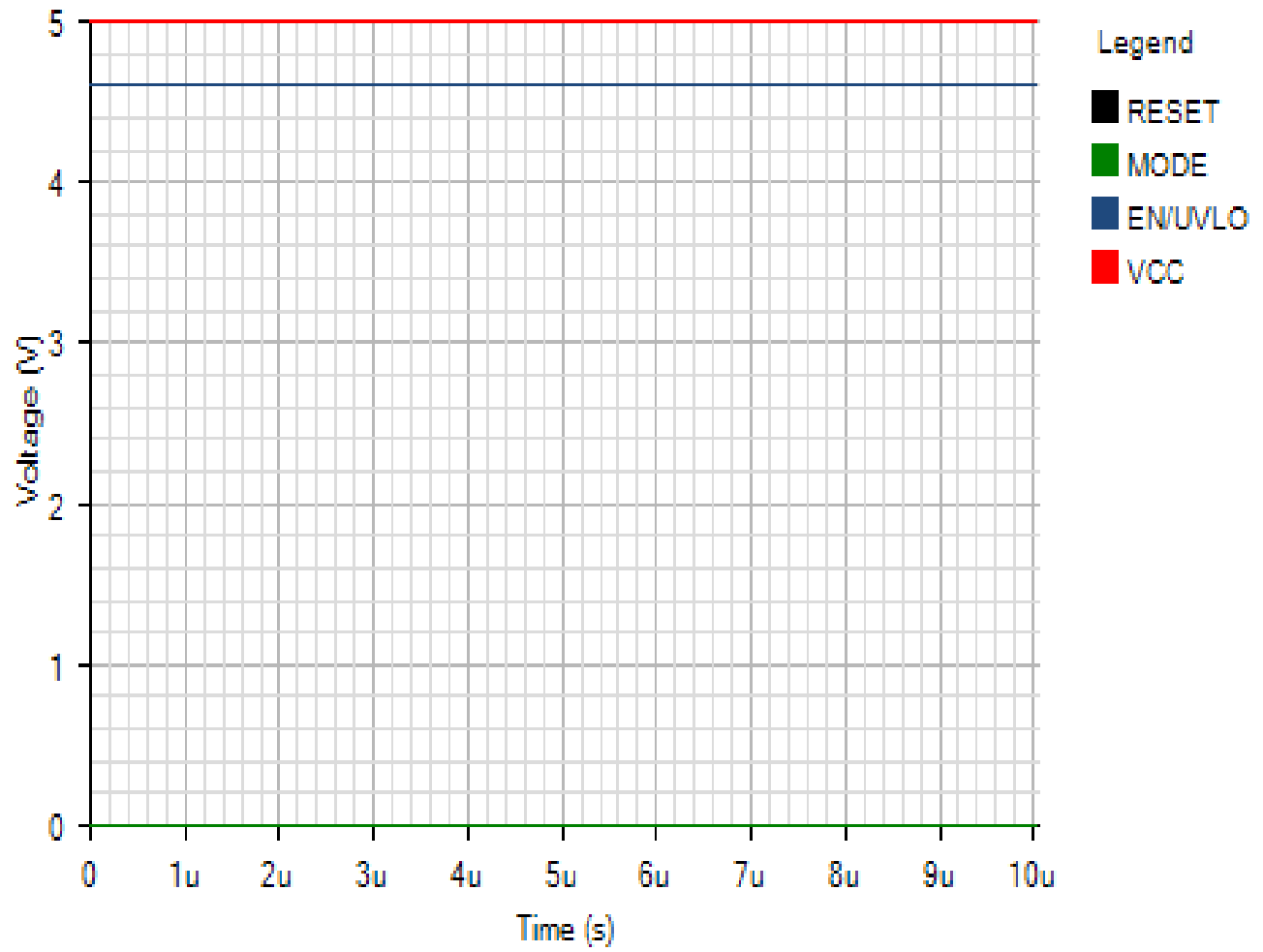
SWITCHING

Default



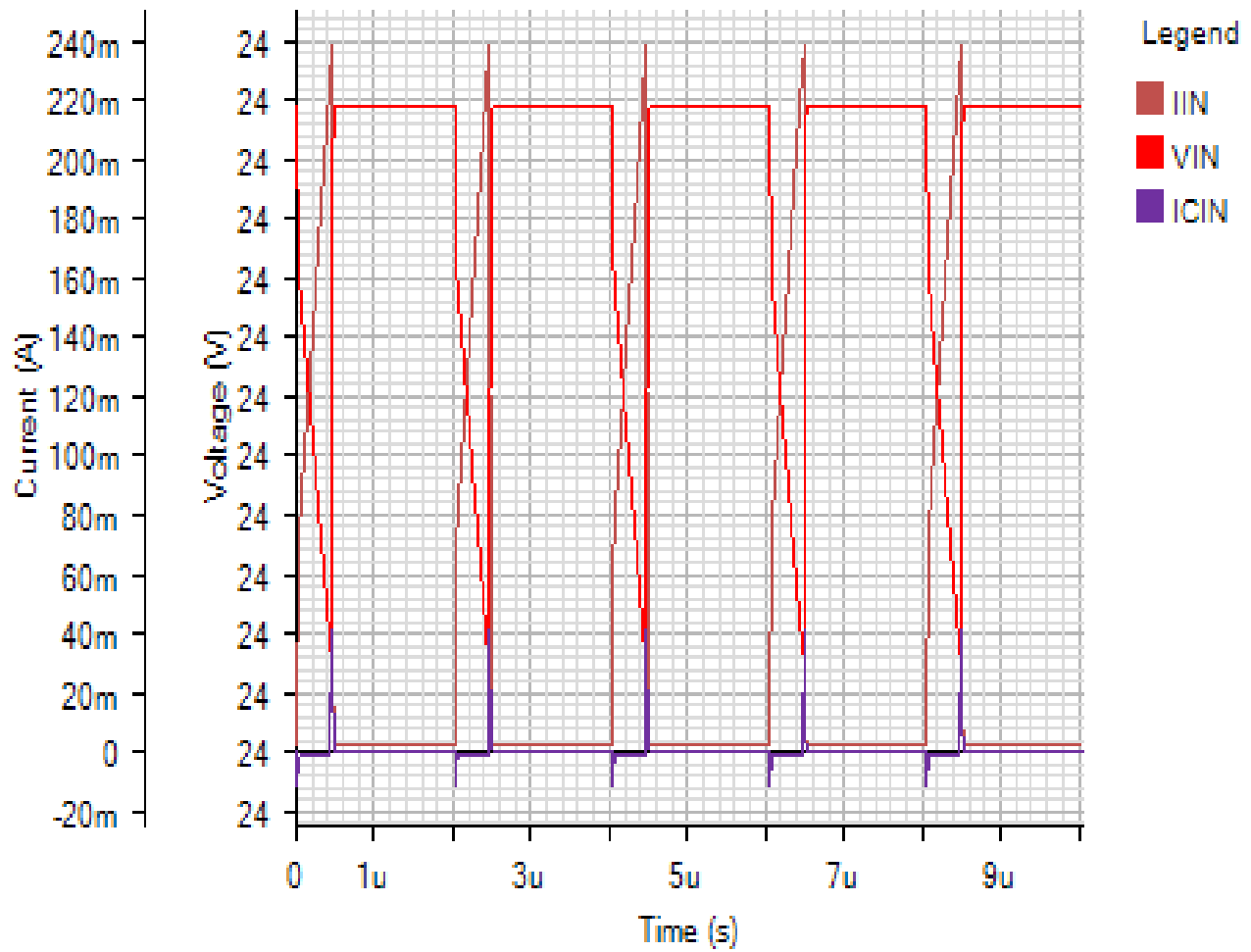
IC

Default



INPUT

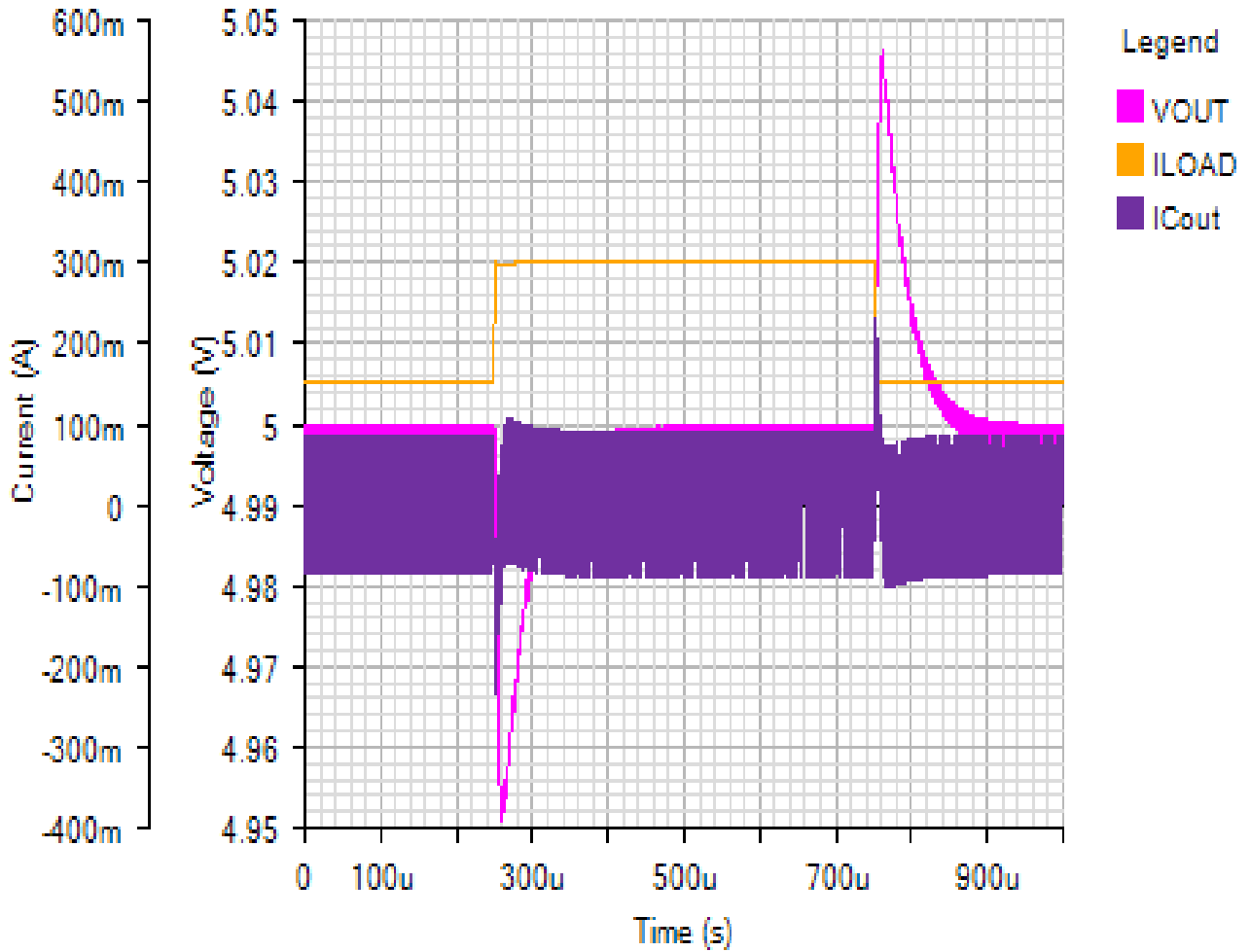
Default



Load Step - Mon Nov 19 2018 13:06:24

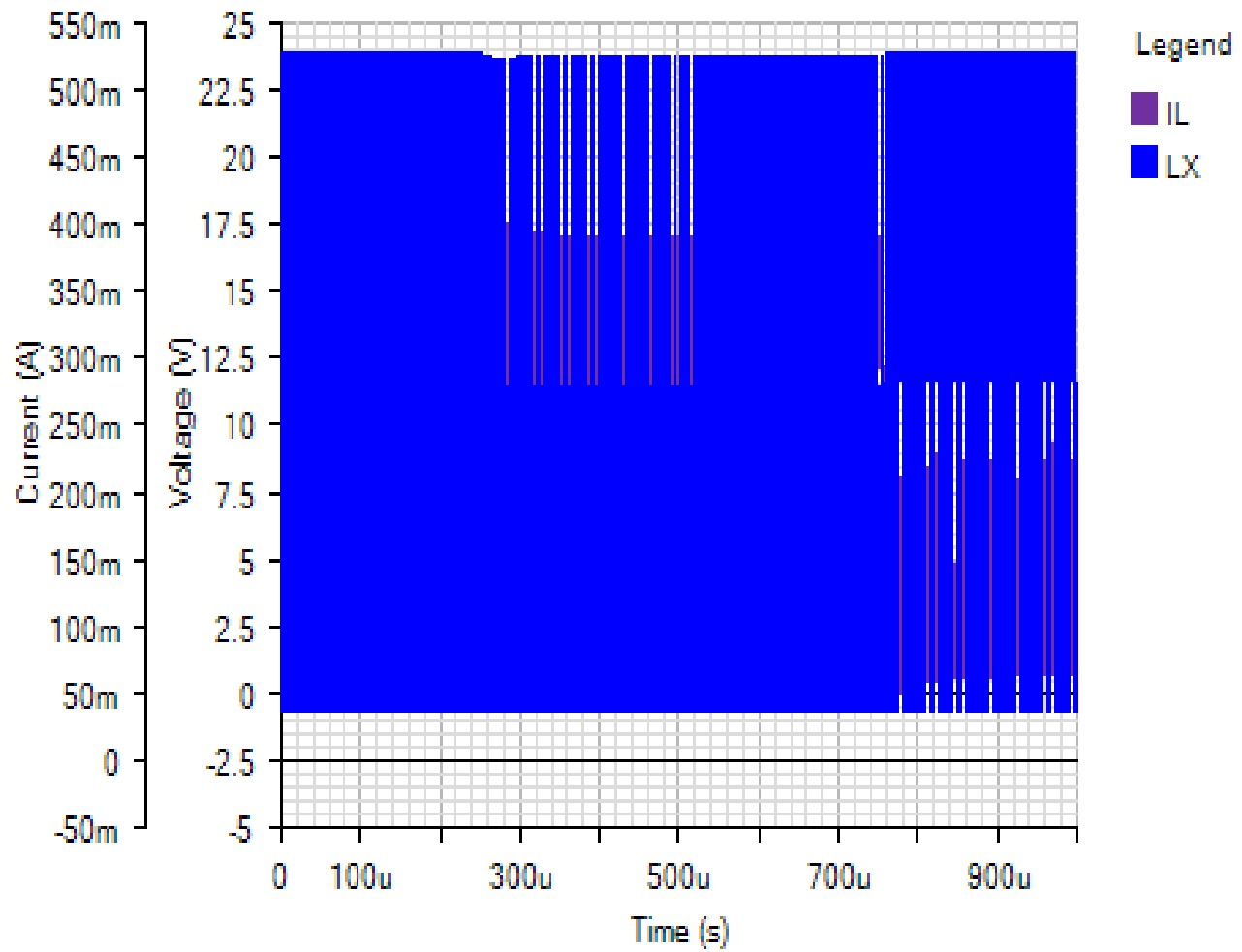
OUTPUT

Default



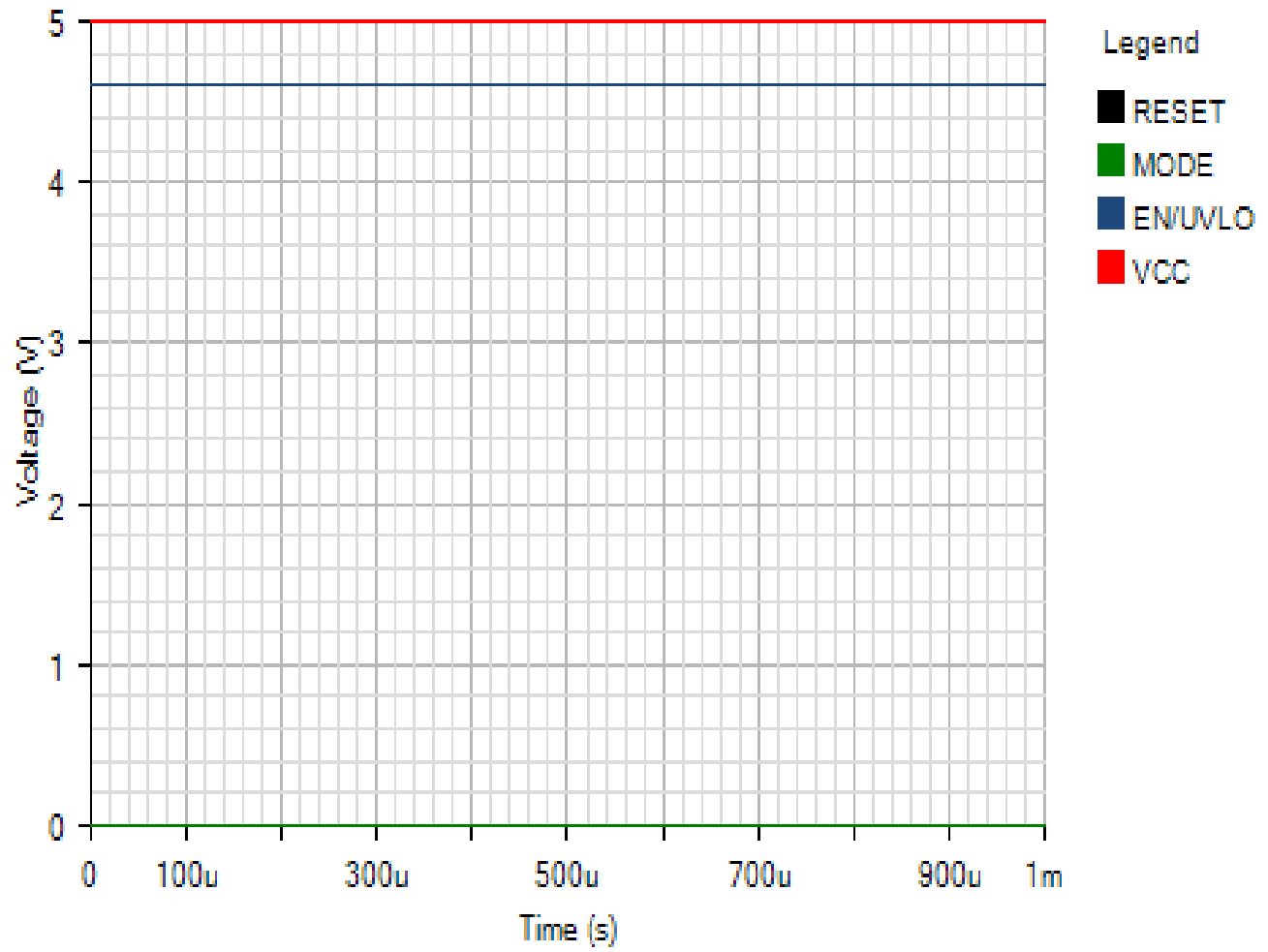
SWITCHING

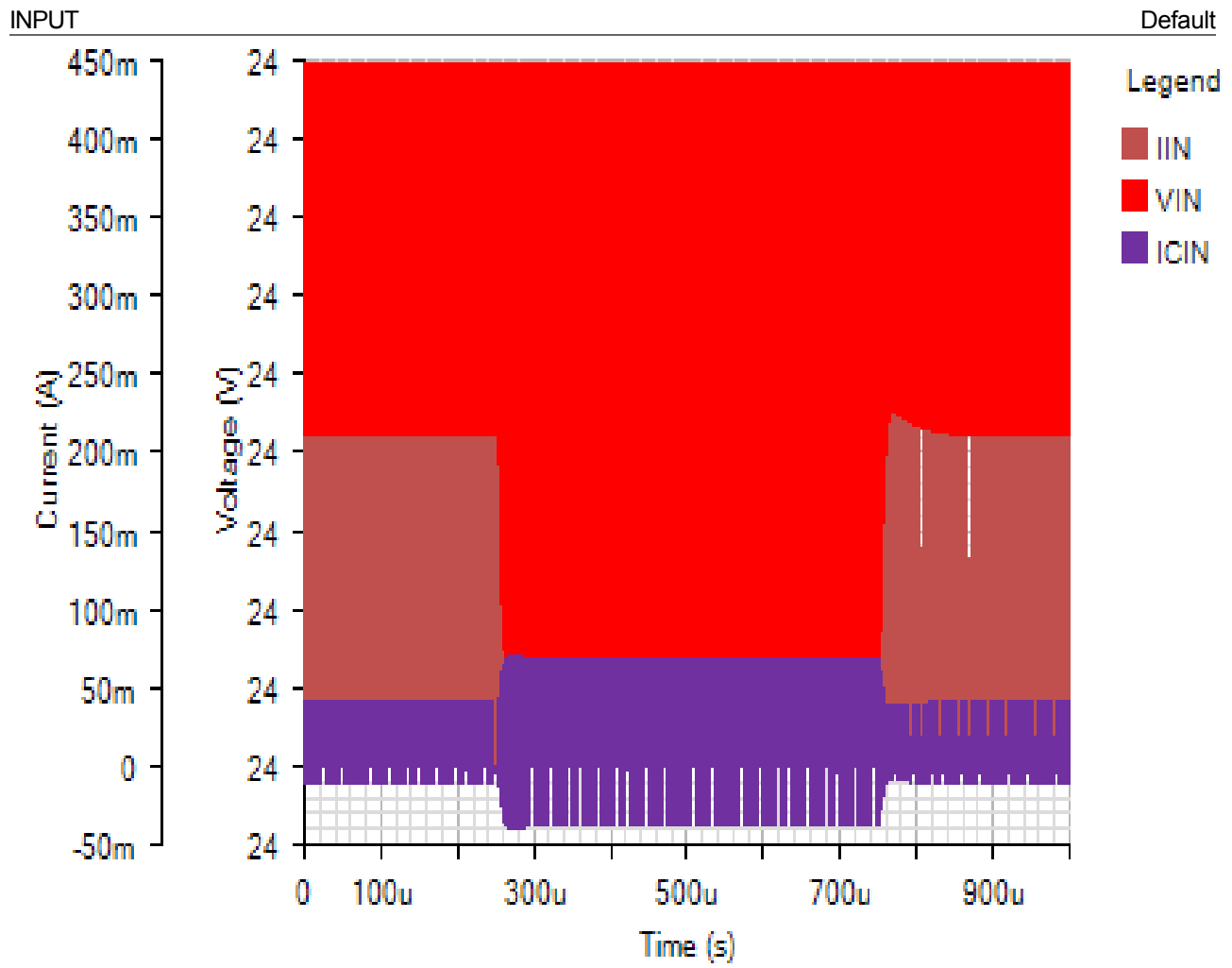
Default



IC

Default

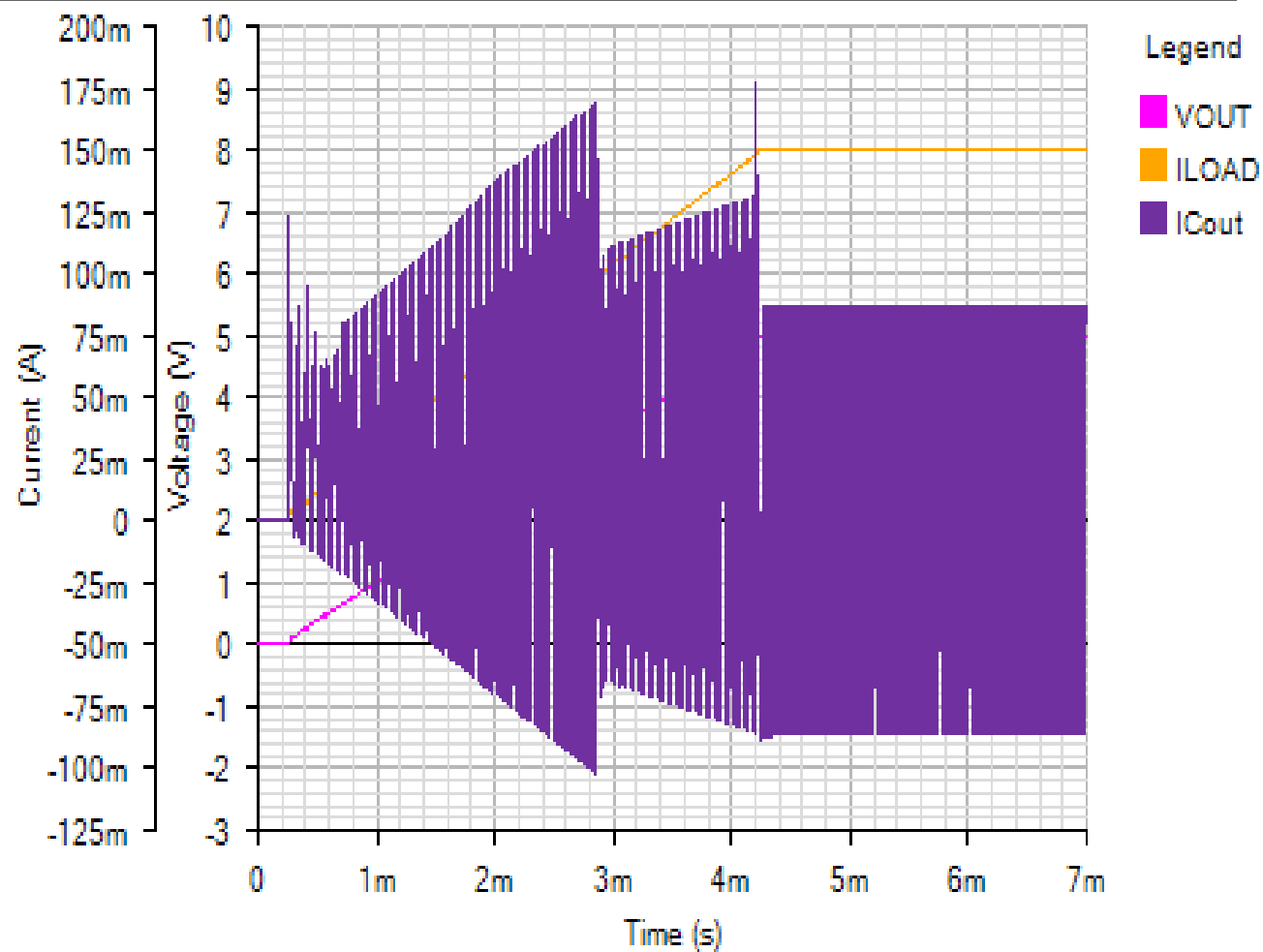




Start Up - Mon Nov 19 2018 13:06:24

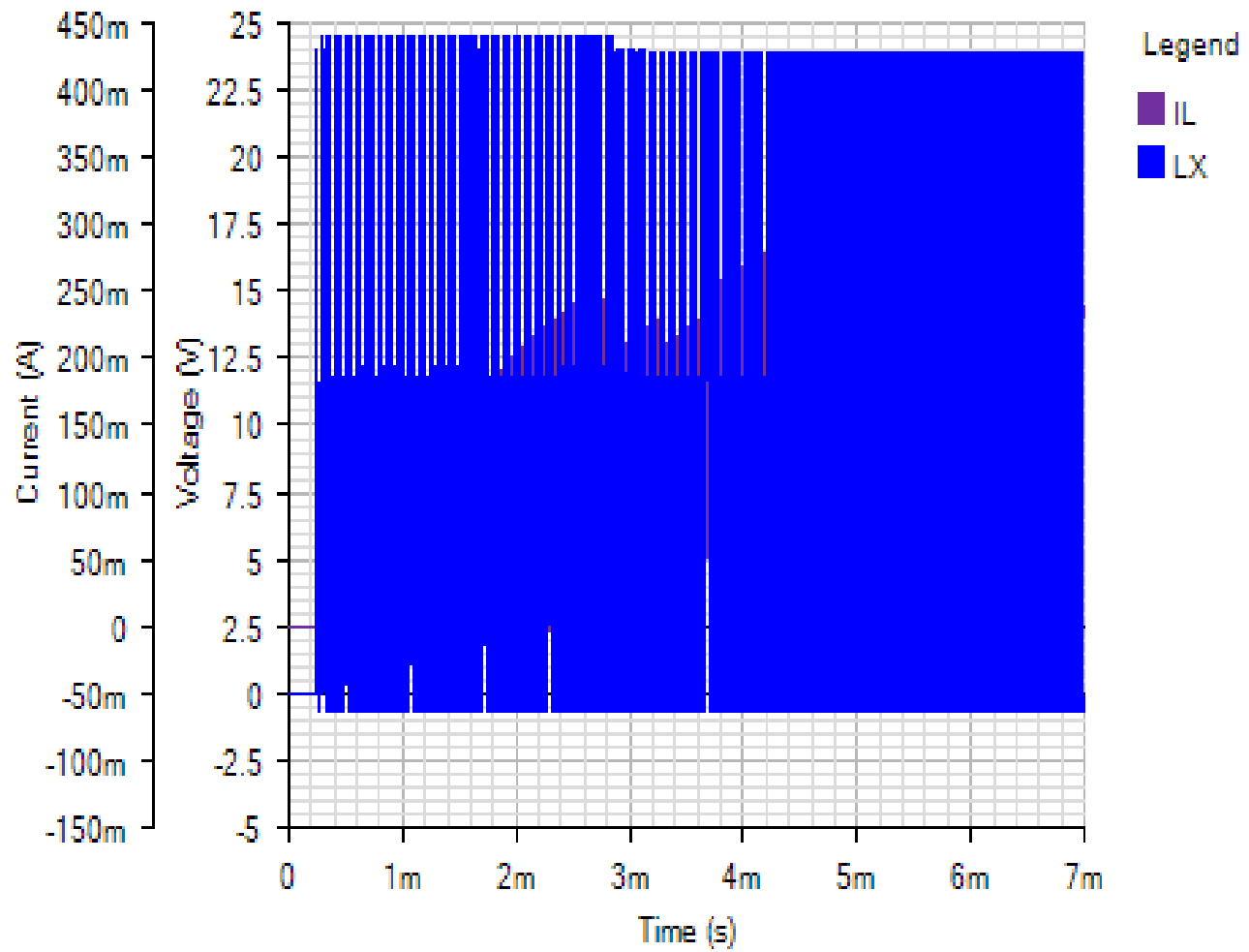
OUTPUT

Default



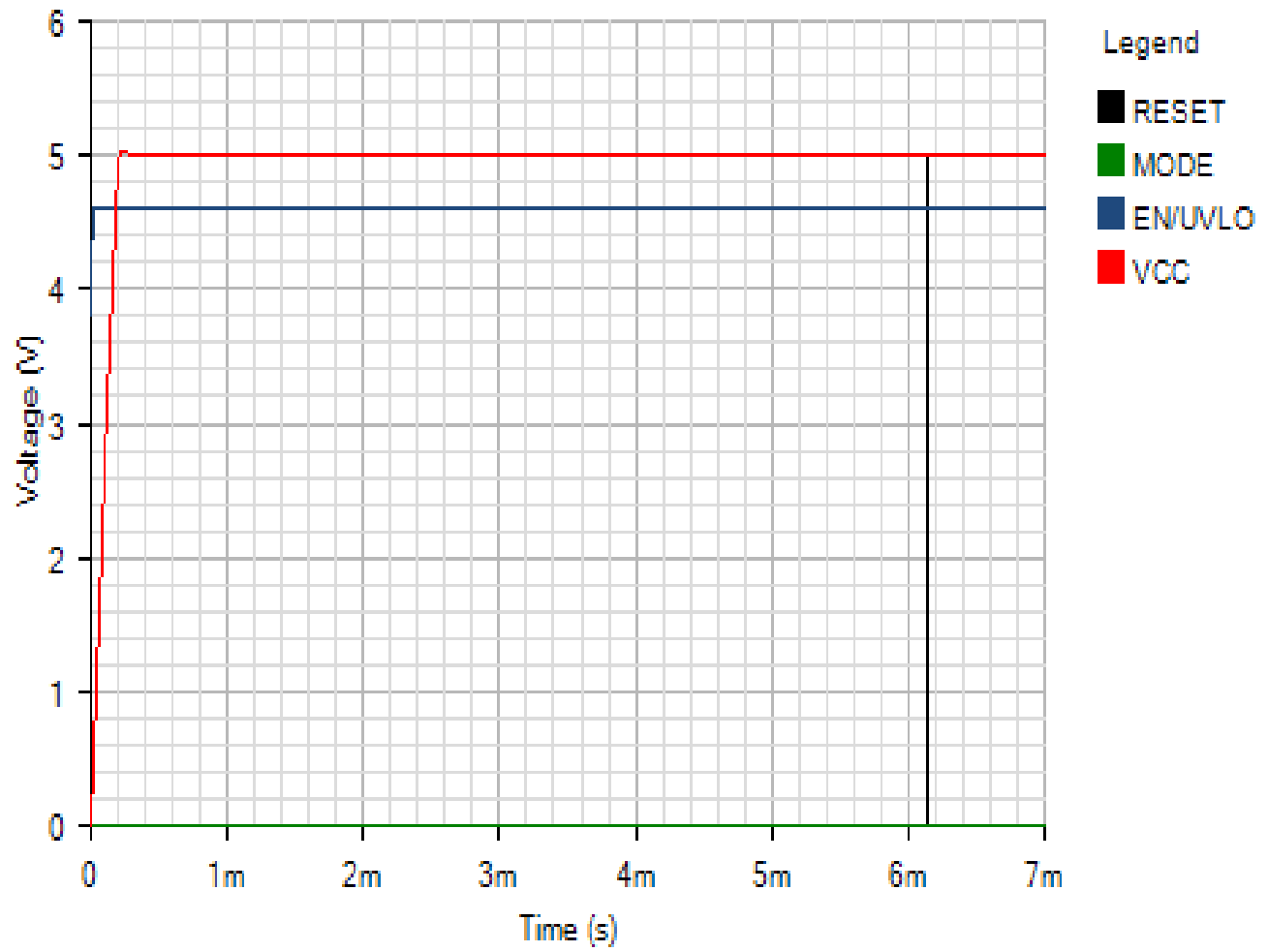
SWITCHING

Default



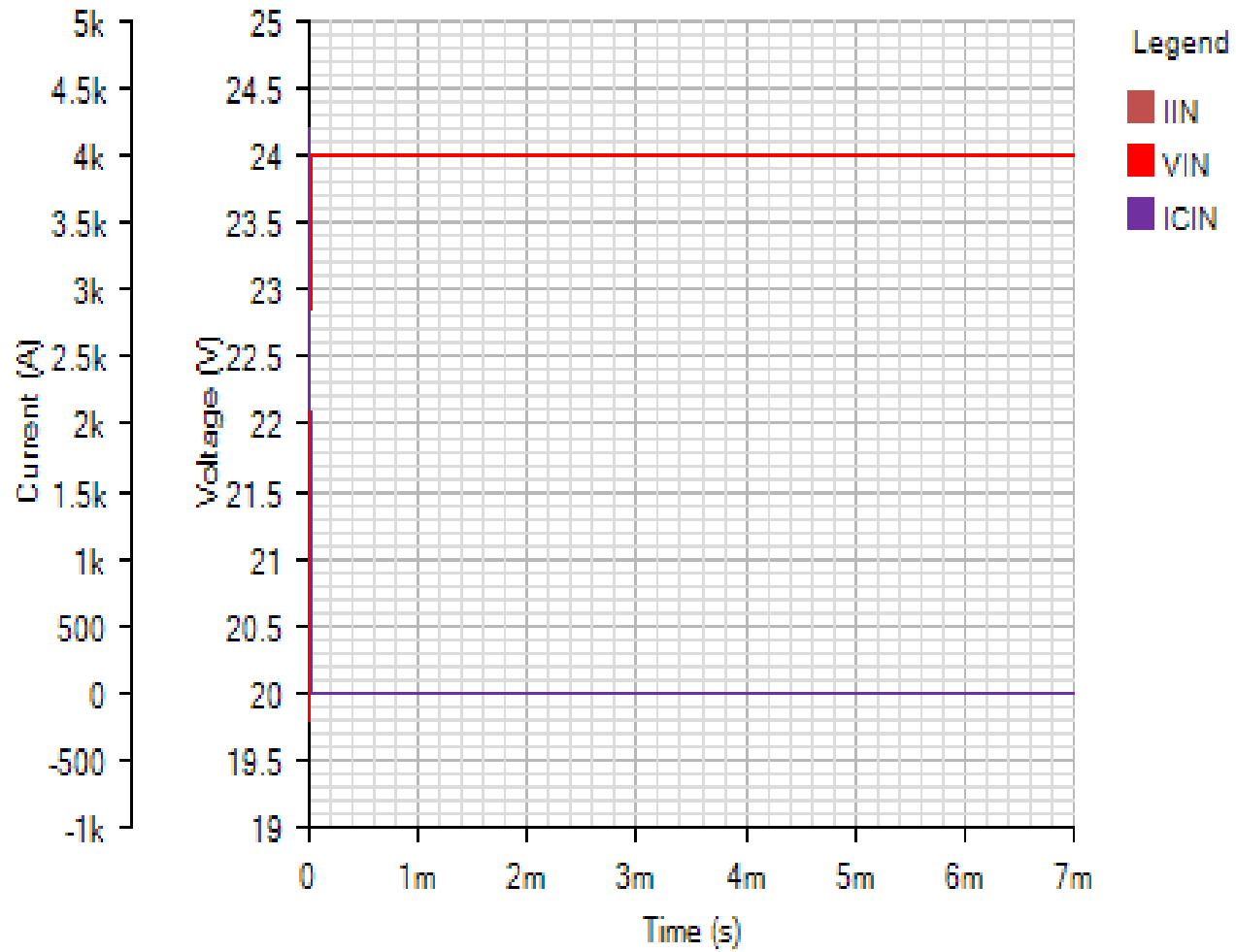
IC

Default

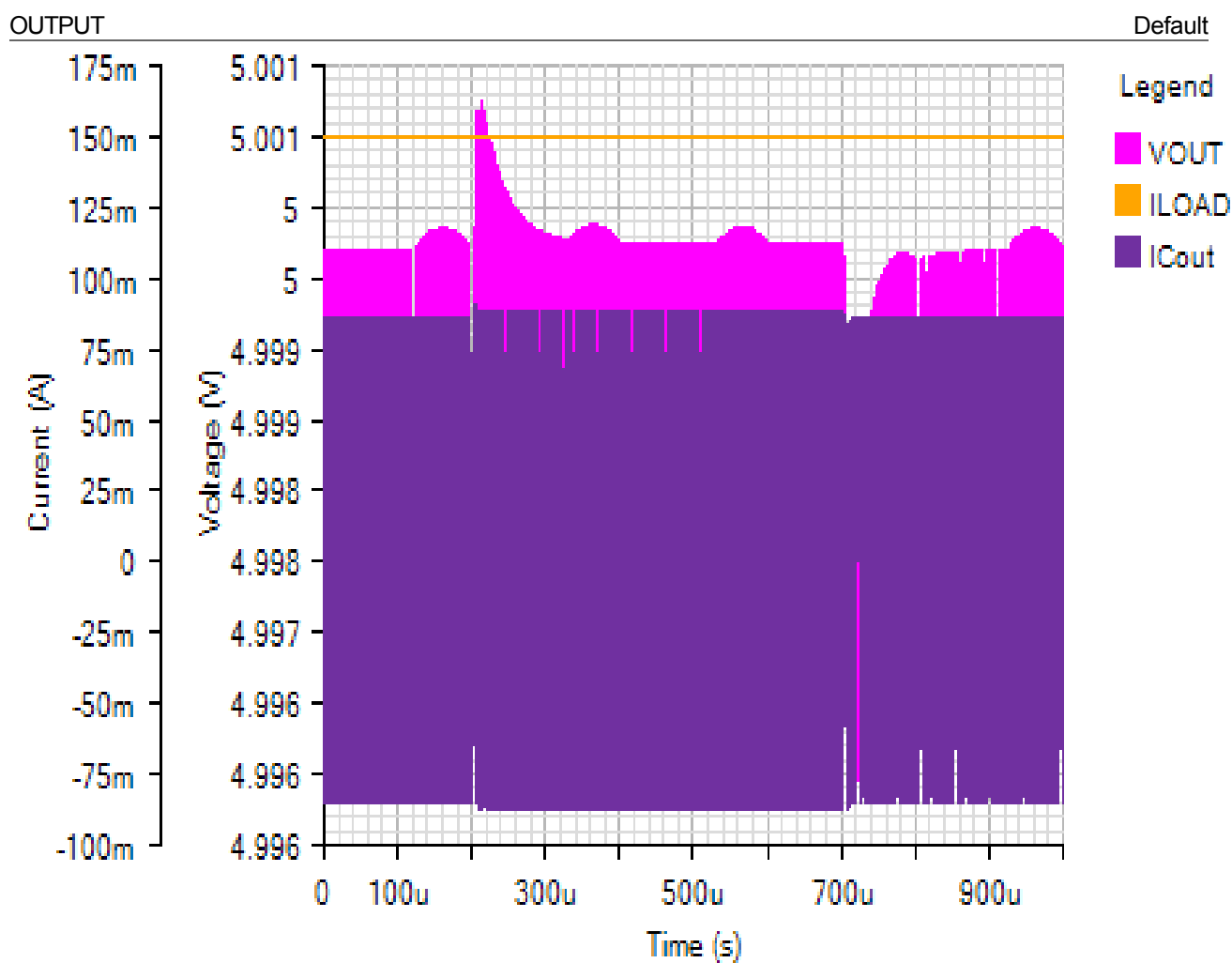


INPUT

Default

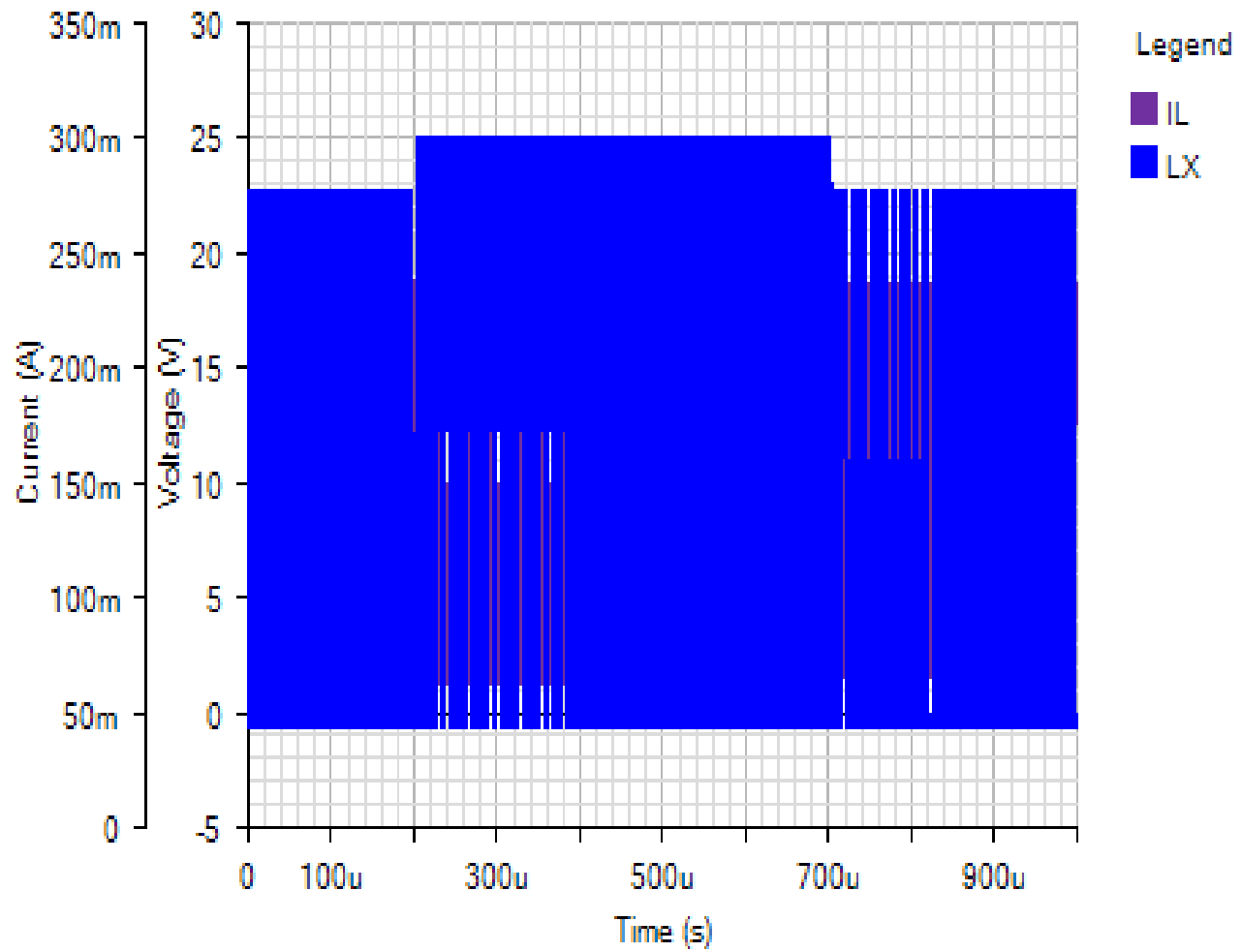


Line Transient - Mon Nov 19 2018 13:06:24



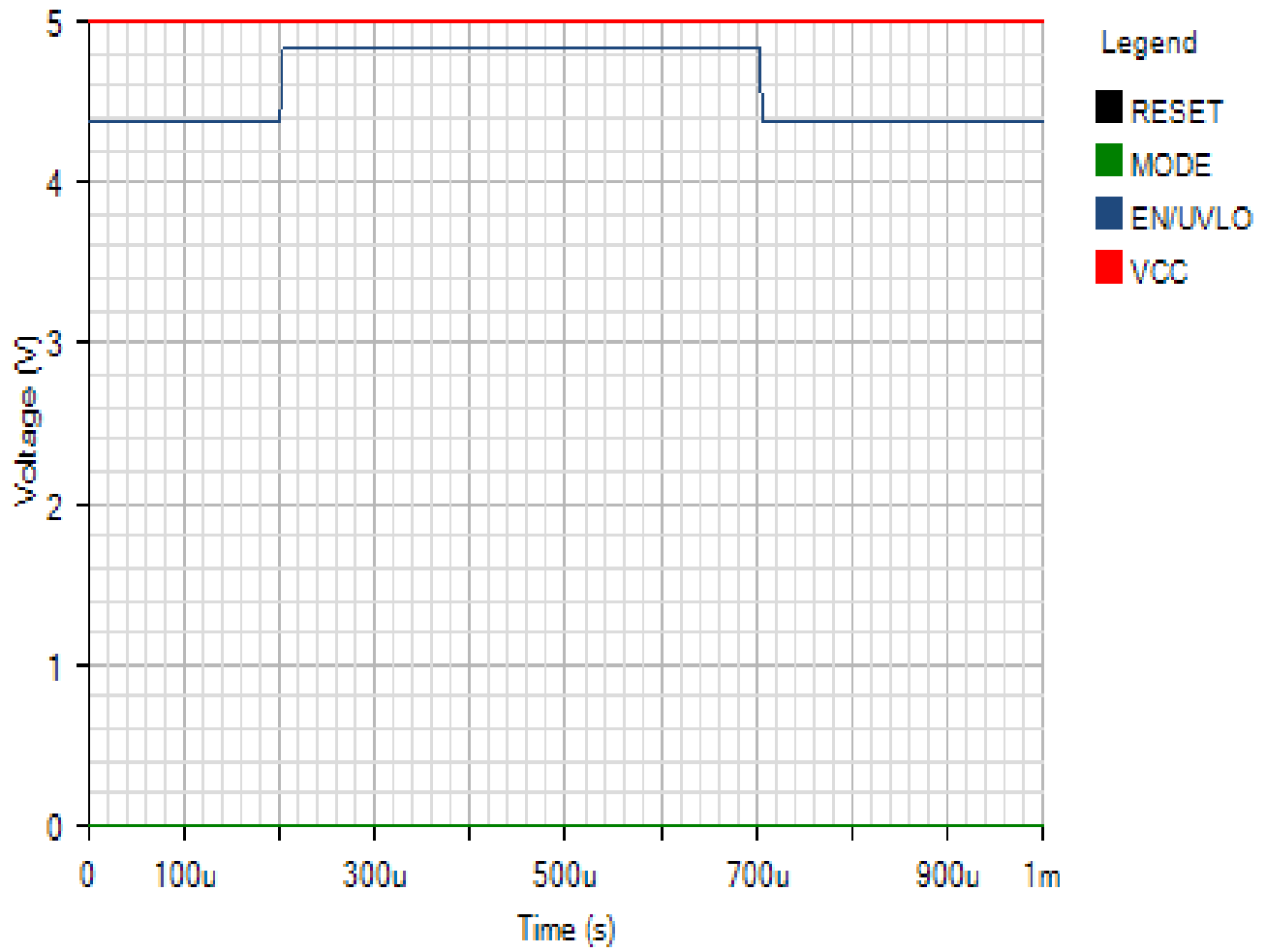
SWITCHING

Default



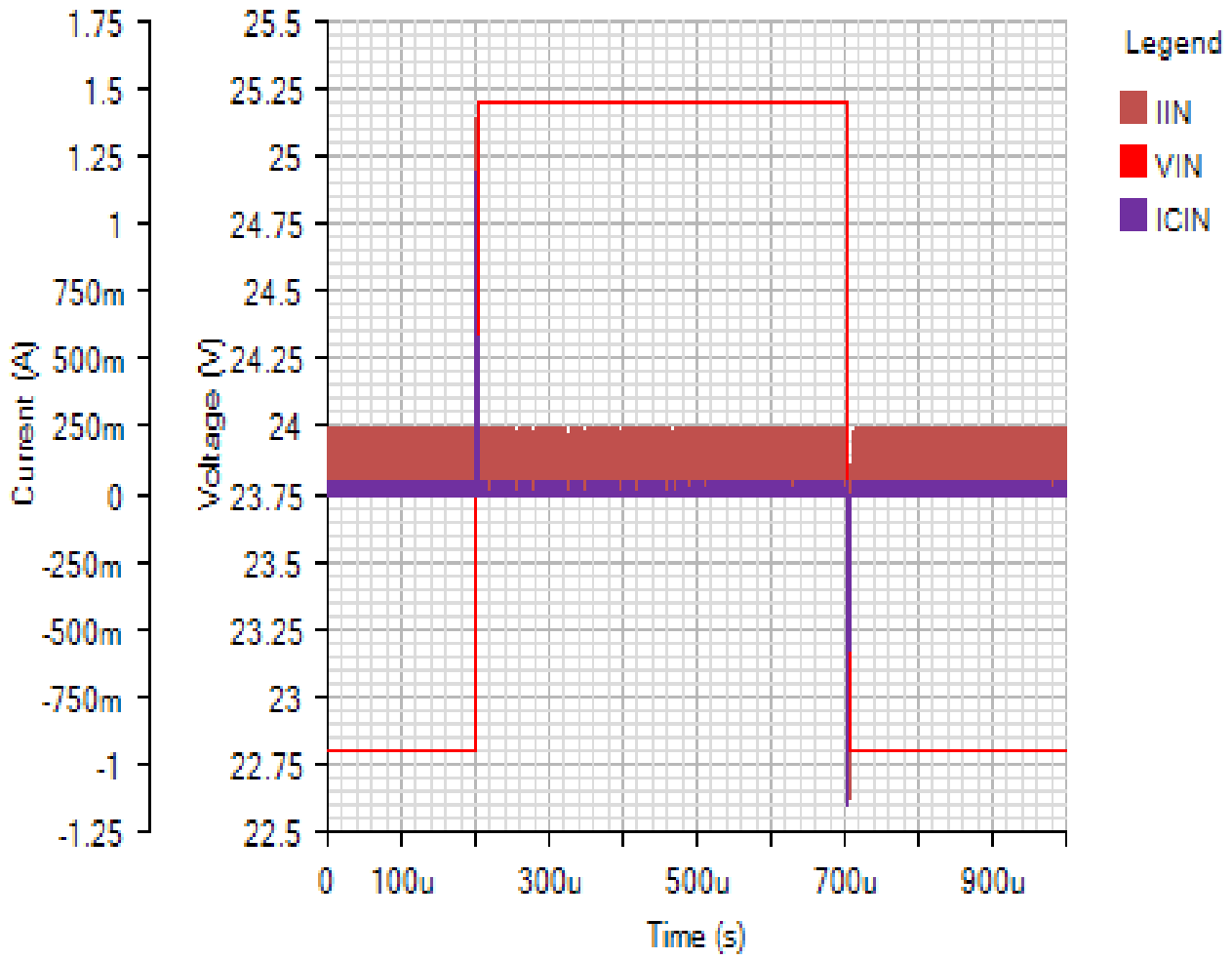
IC

Default



INPUT

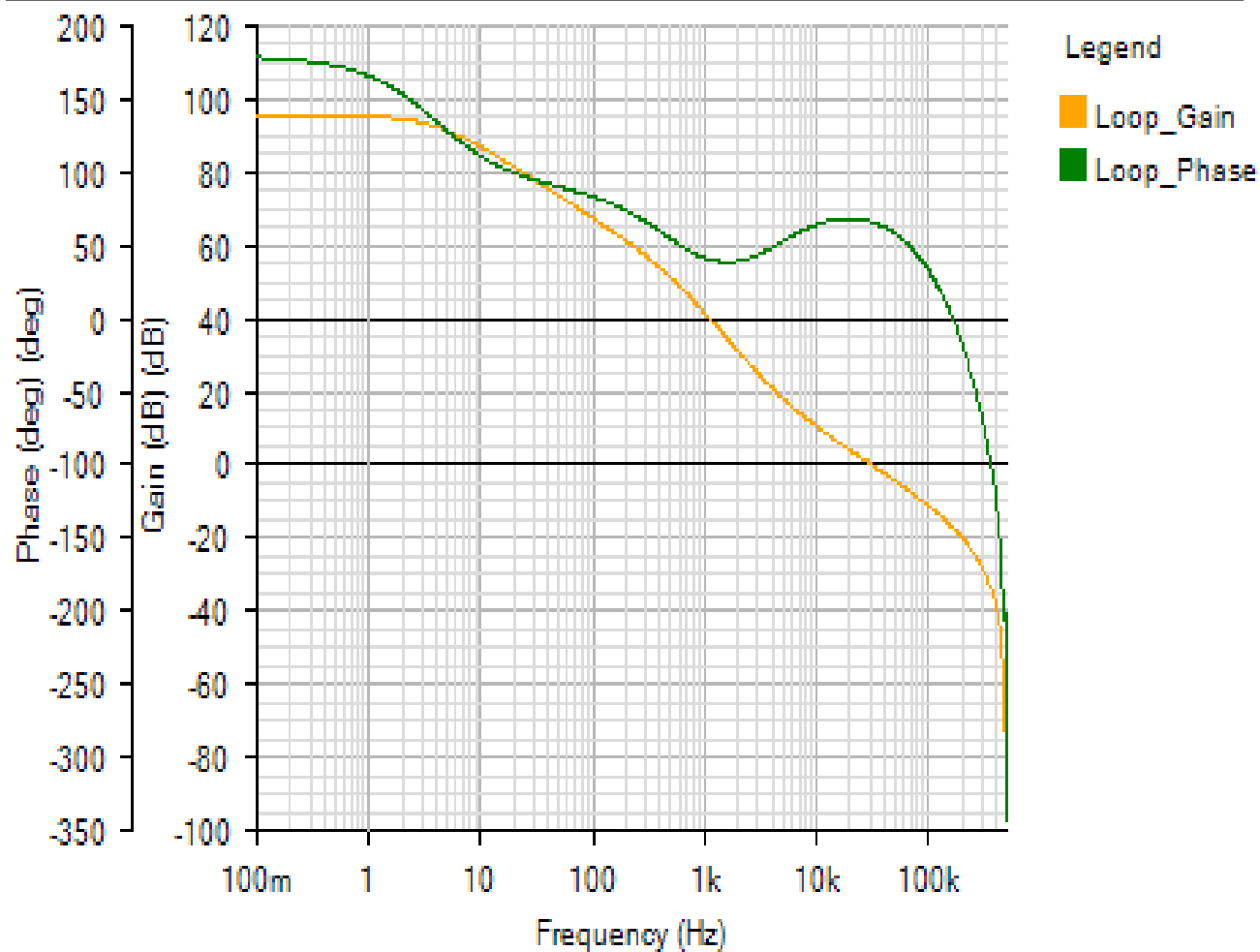
Default



AC Loop - Mon Nov 19 2018 13:06:24

BODE

Default



Phase Margin: 66.08° at a crossover frequency of 31kHz

