

## Initial Design

1.0

**Design Requirements**

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Parameter	Value
Minimum Input Voltage	6.5V
Maximum Input Voltage	36V
Nominal Input Voltage	24V
Input Steady-State Ripple	3%
Input Undervoltage Lockout Level	6.4V
Output Voltage Programming	Internal Preset Voltages
Output Voltage	5V
Load Current	2A
Load Step Start Current	2A
Load Step Current	1A
Load Step Edge Rate	10A/us
Output Voltage Load Step Over/Undershoot	3%
Performance Priority	Design for High Efficiency
Cost Priority	Low Cost
Mode of Operation	PWM
Switching Frequency	400kHz
Ambient Temperature	25°C
Soft Start time	1ms

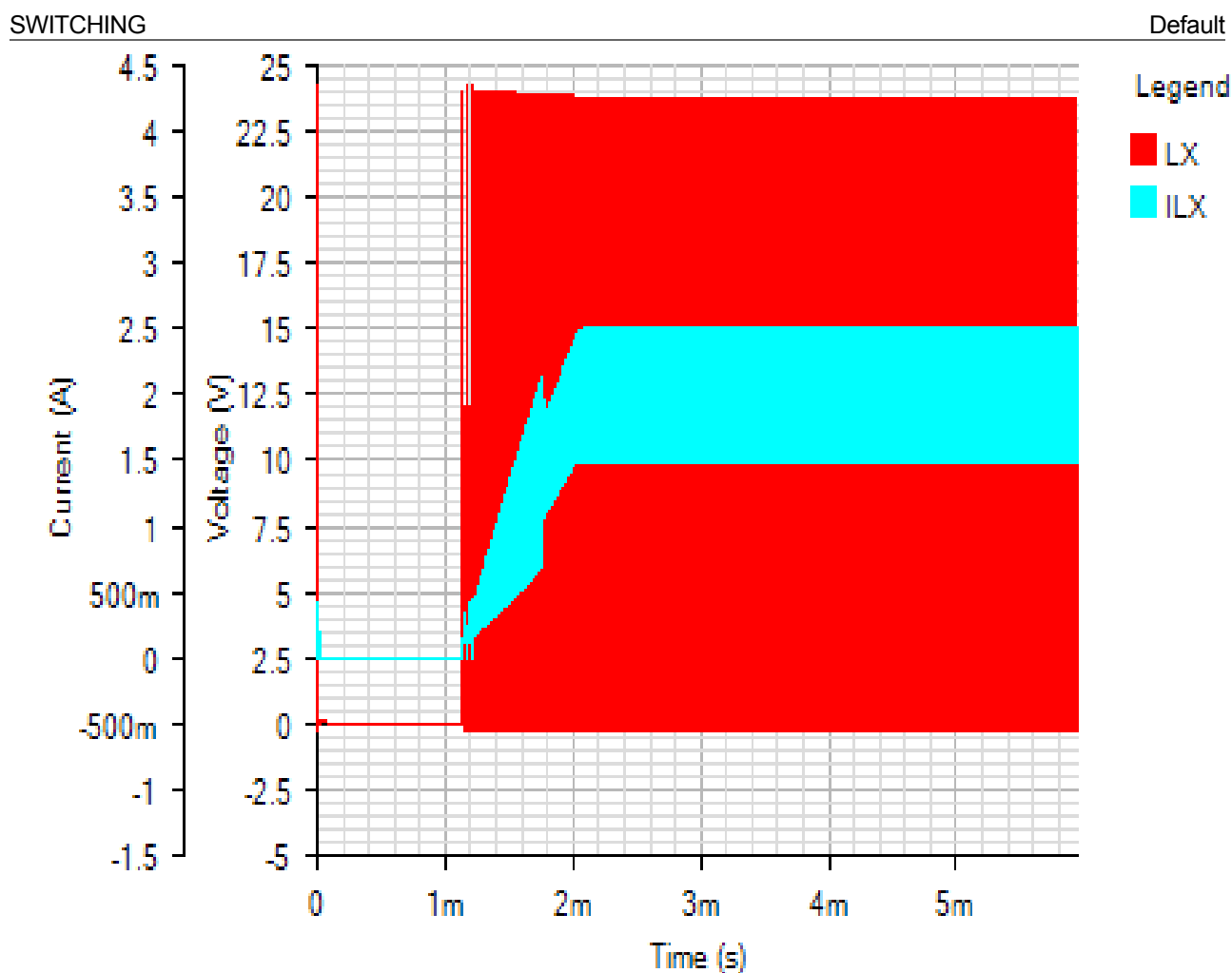
## BOM

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R2	1	ERJ2RKF7873X	Panasonic	0.1W(1/10W) $\pm 100\text{ppm}/^\circ\text{C}$ Pad SMD Automotive T/R
R6	1	ERJ2RKF1003X	Panasonic	Res Thick Film 0402 100K Ohm 1% 0.1W(1/10W) $\pm 100\text{ppm}/^\circ\text{C}$ Pad SMD Automotive T/R

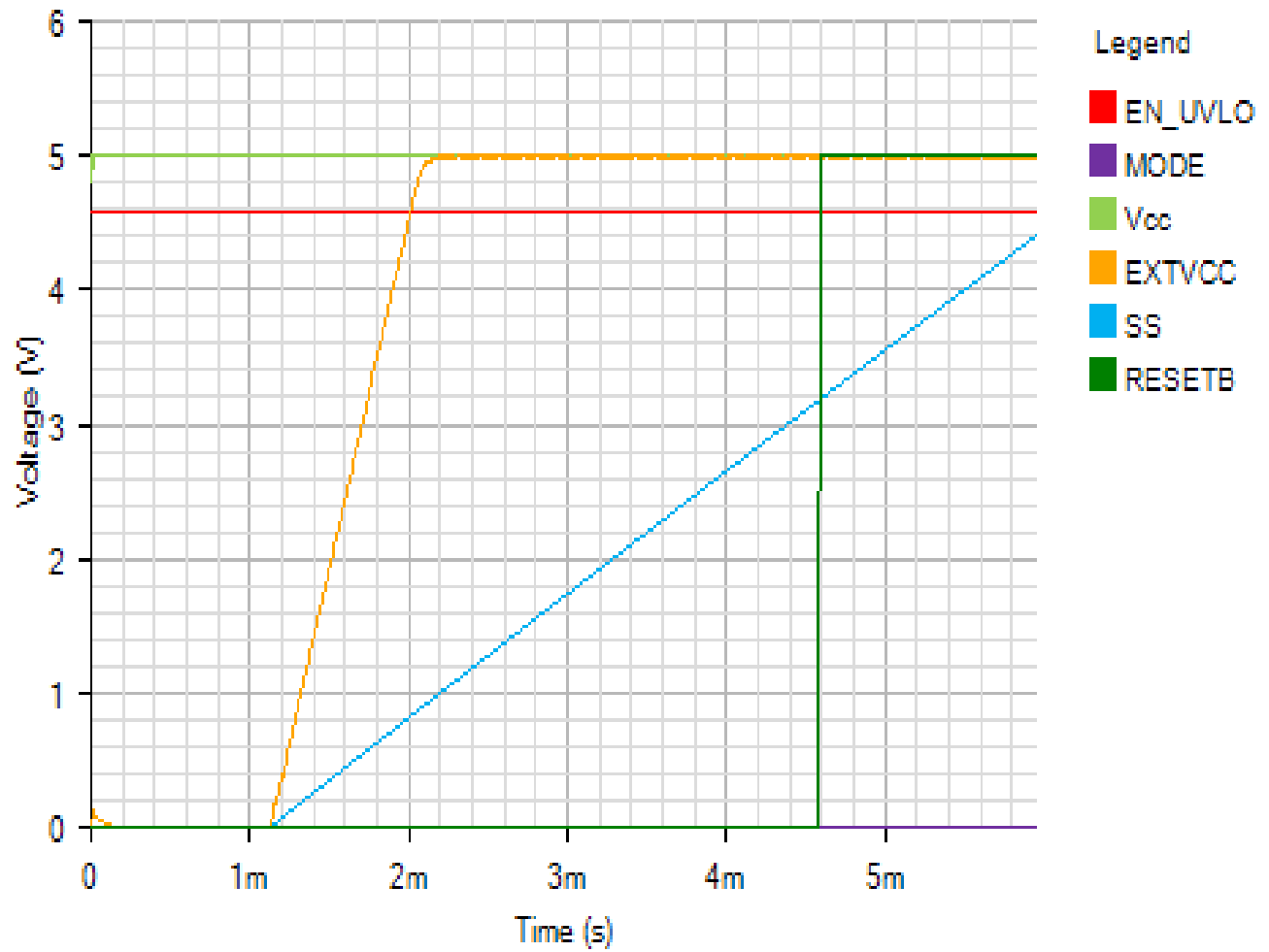
## Simulation Results

Start Up - Wed Dec 19 2018 17:10:52



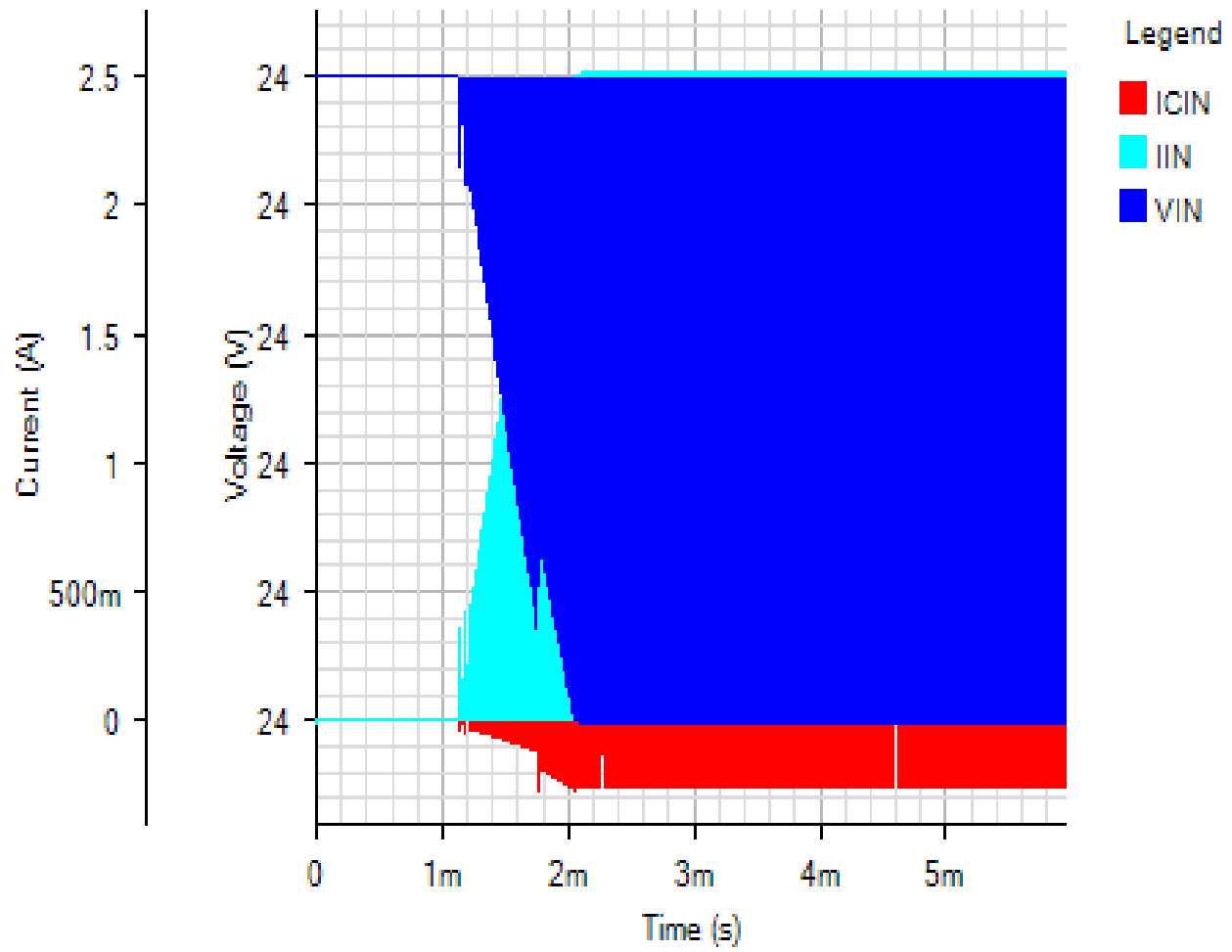
IC

Default



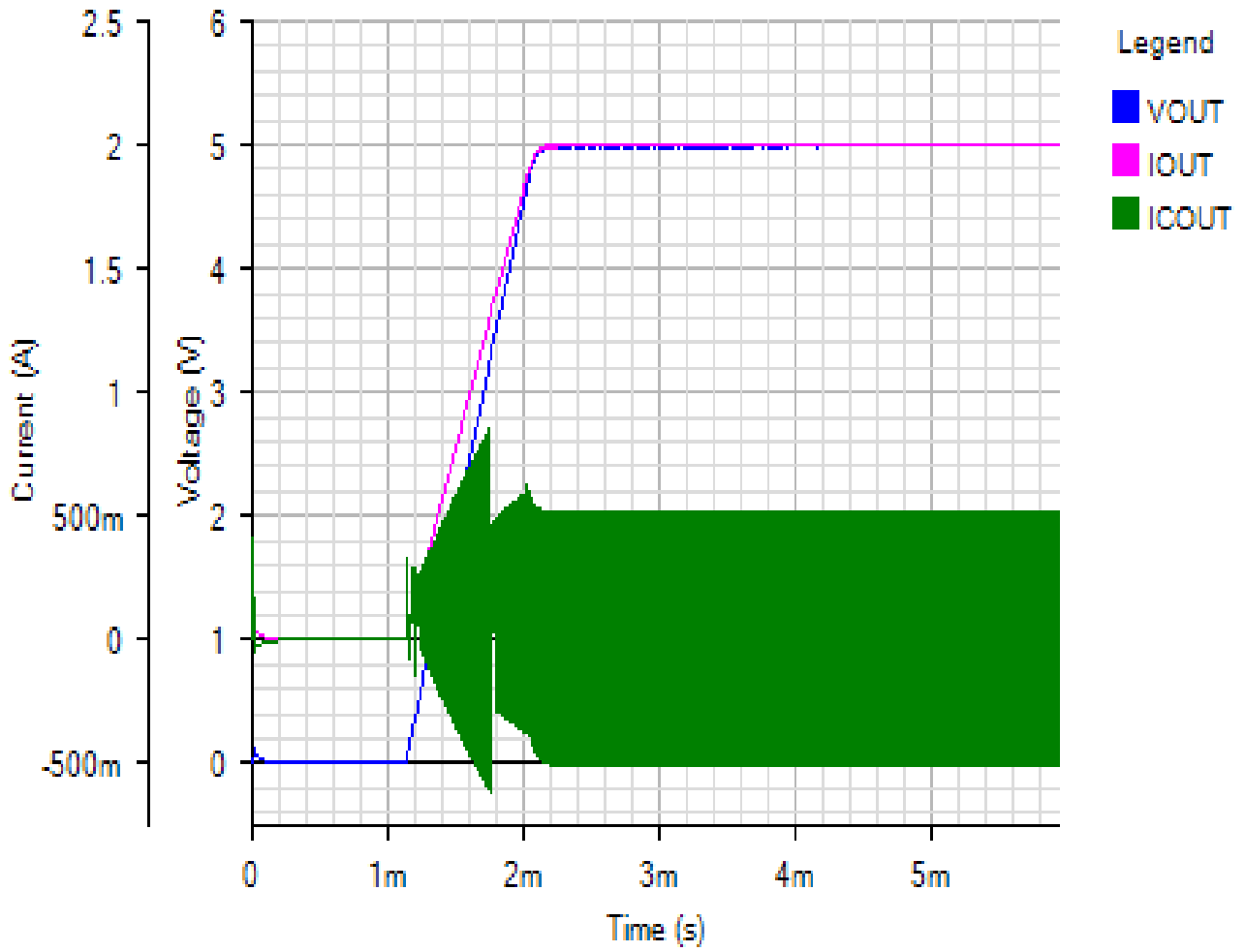
INPUT

Default



OUTPUT

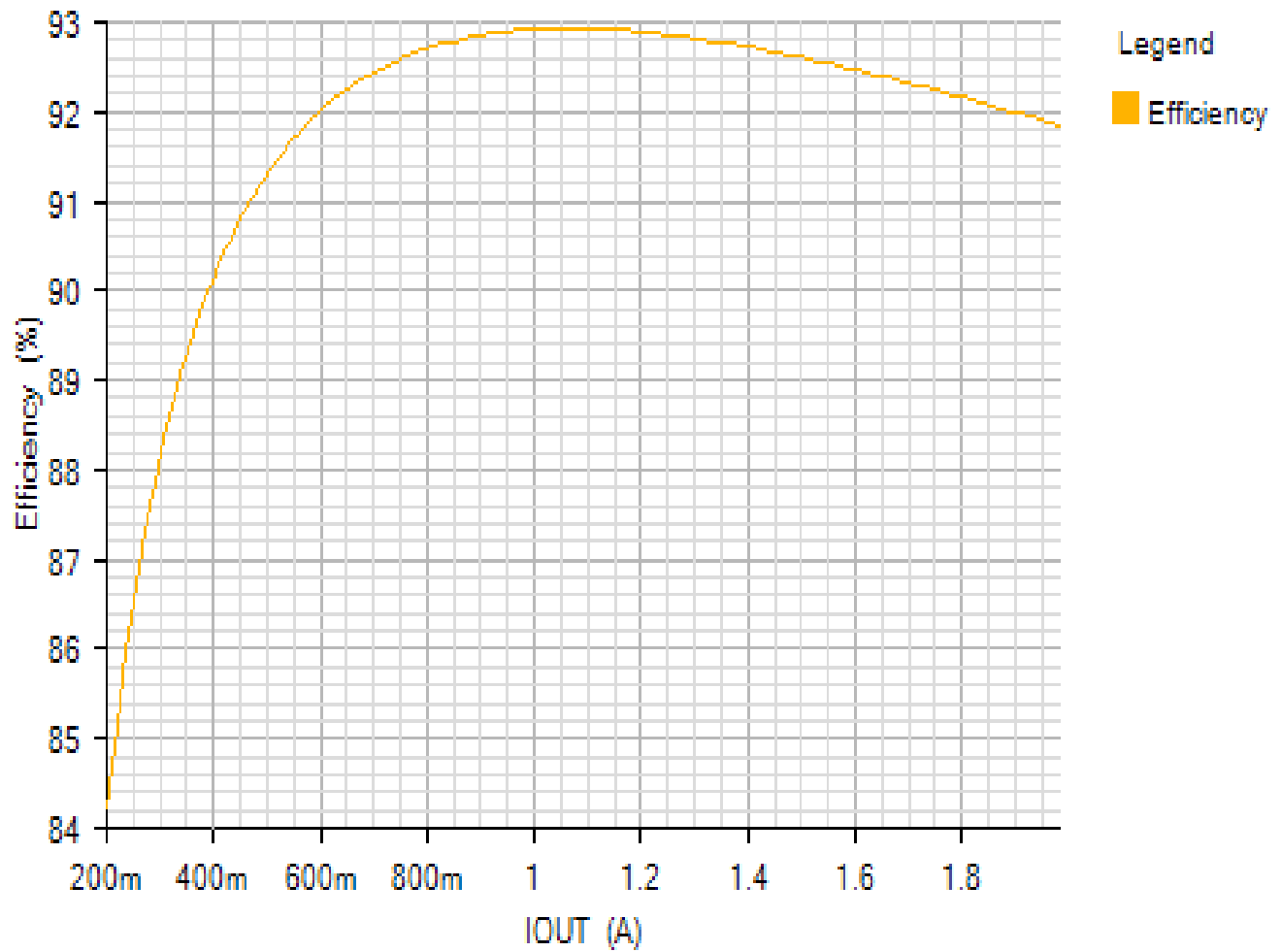
Default



Efficiency - Wed Dec 19 2018 17:10:52

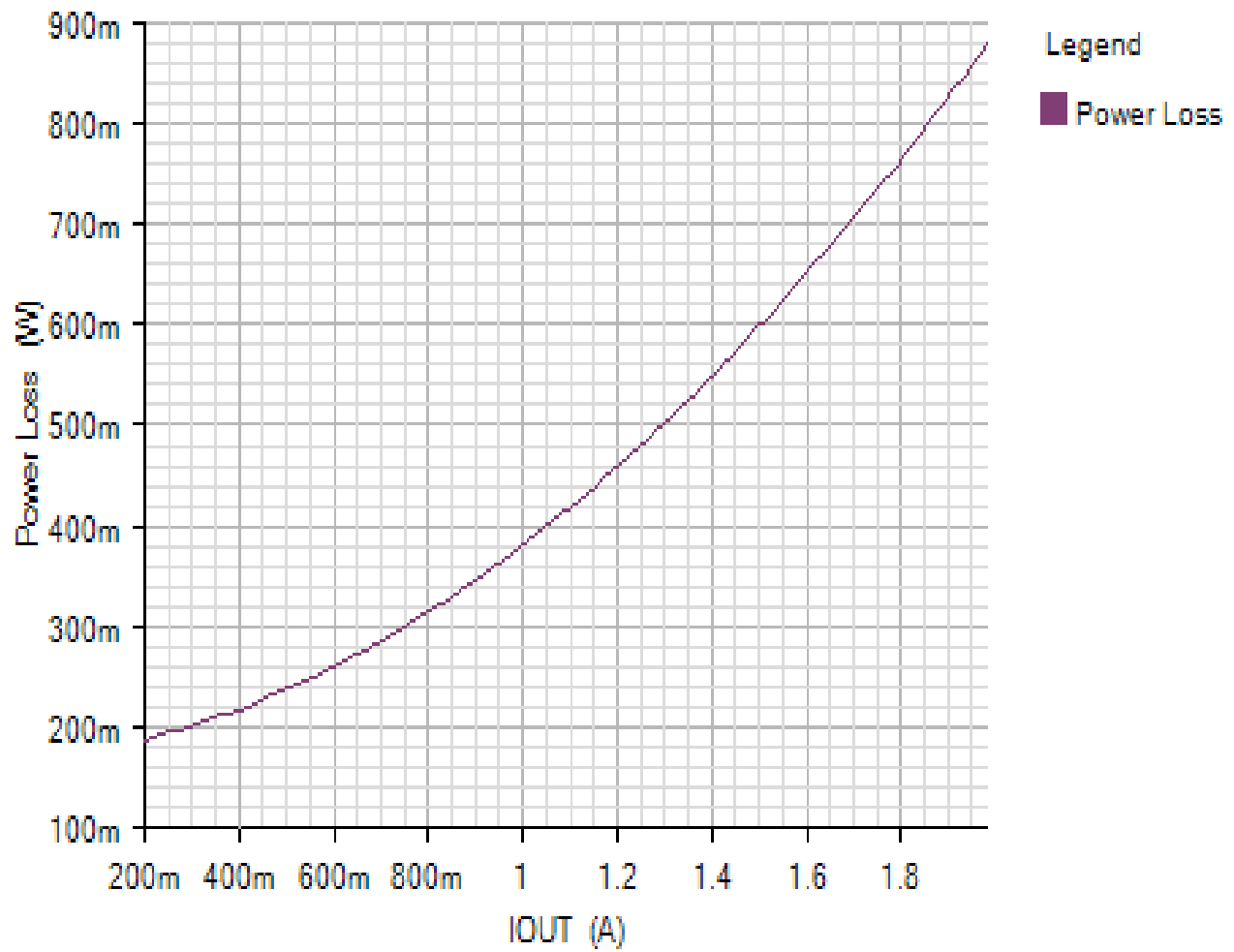
EFFICIENCY\_PLOT

Default



POWER\_LOSS\_PLOT

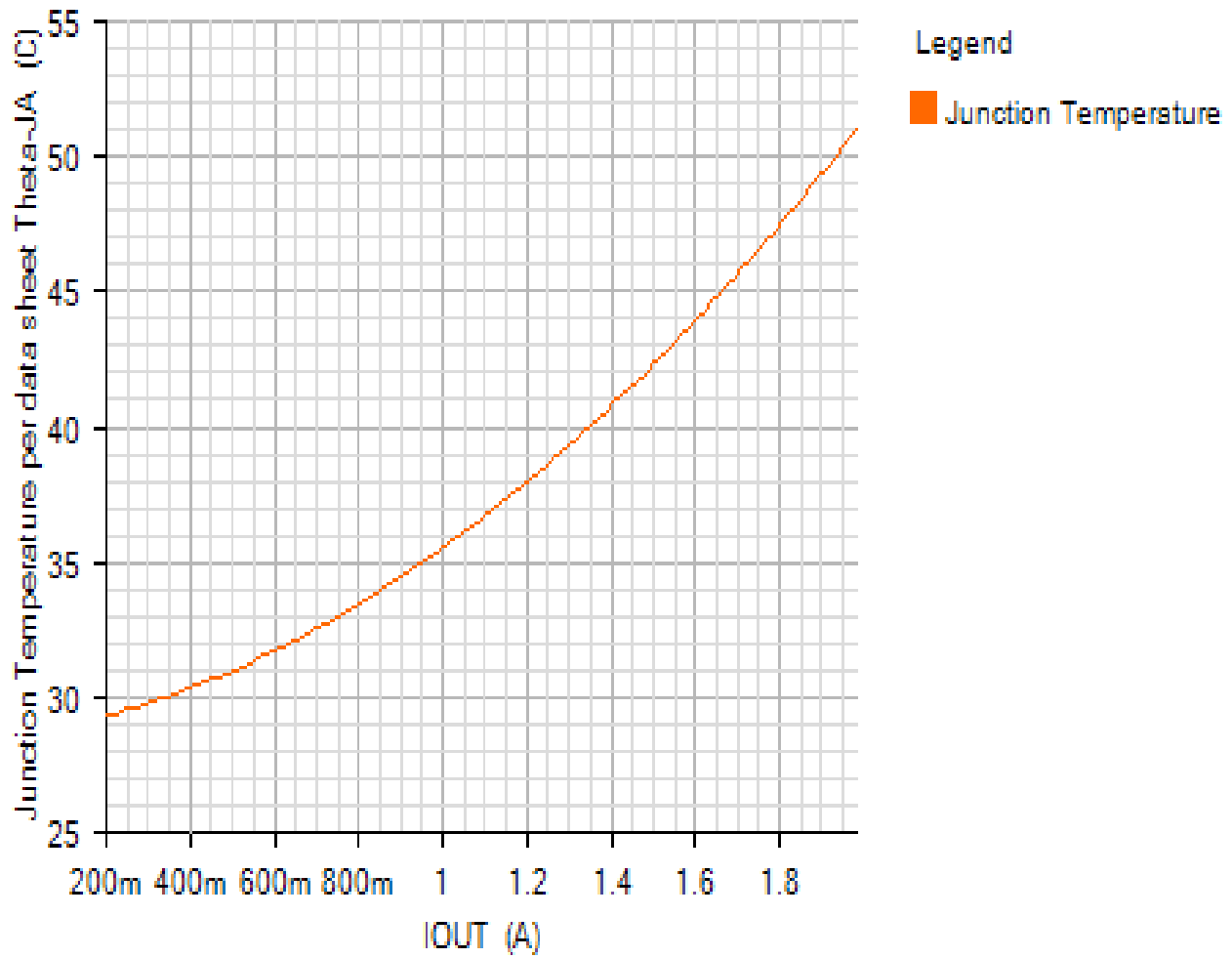
Default



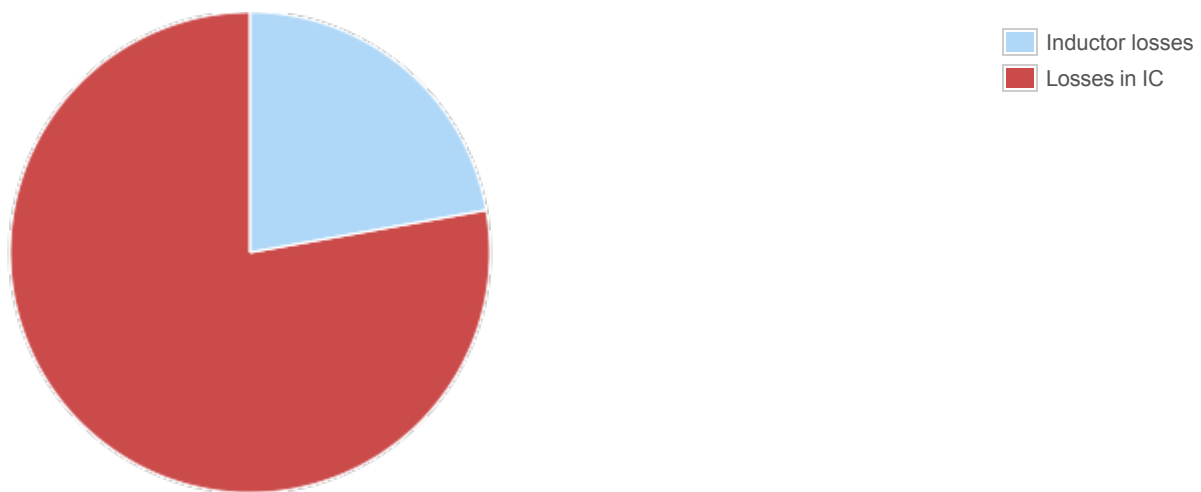


JUNCTION\_TEMPERATURE\_PLOT

Default



Losses



Component

Loss (W)

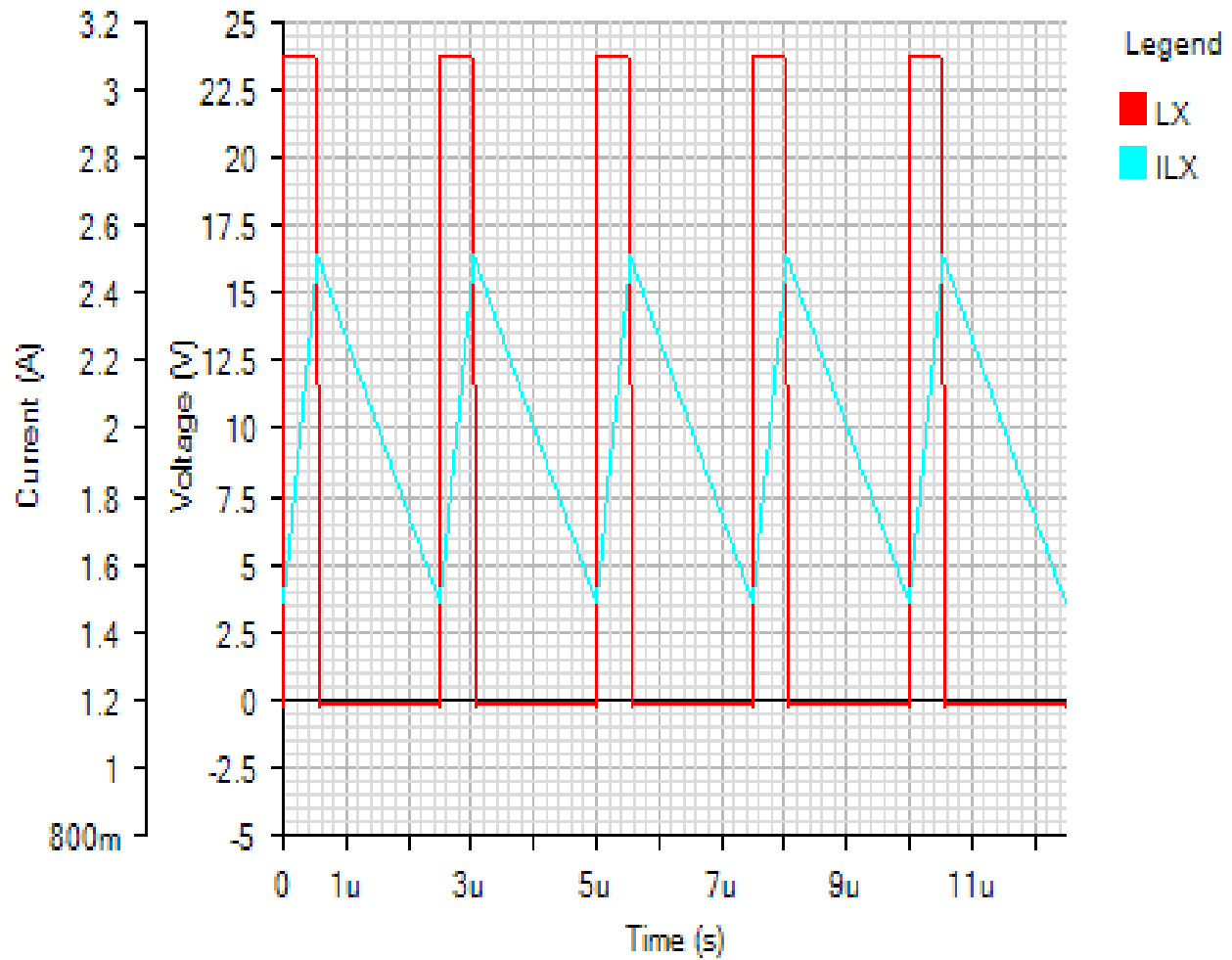
% of total

Component	Loss (W)	% of total
Inductor losses	0.195	22.2
Losses in IC	0.684	77.8
Total	0.879	100

Steady State - Wed Dec 19 2018 17:10:52

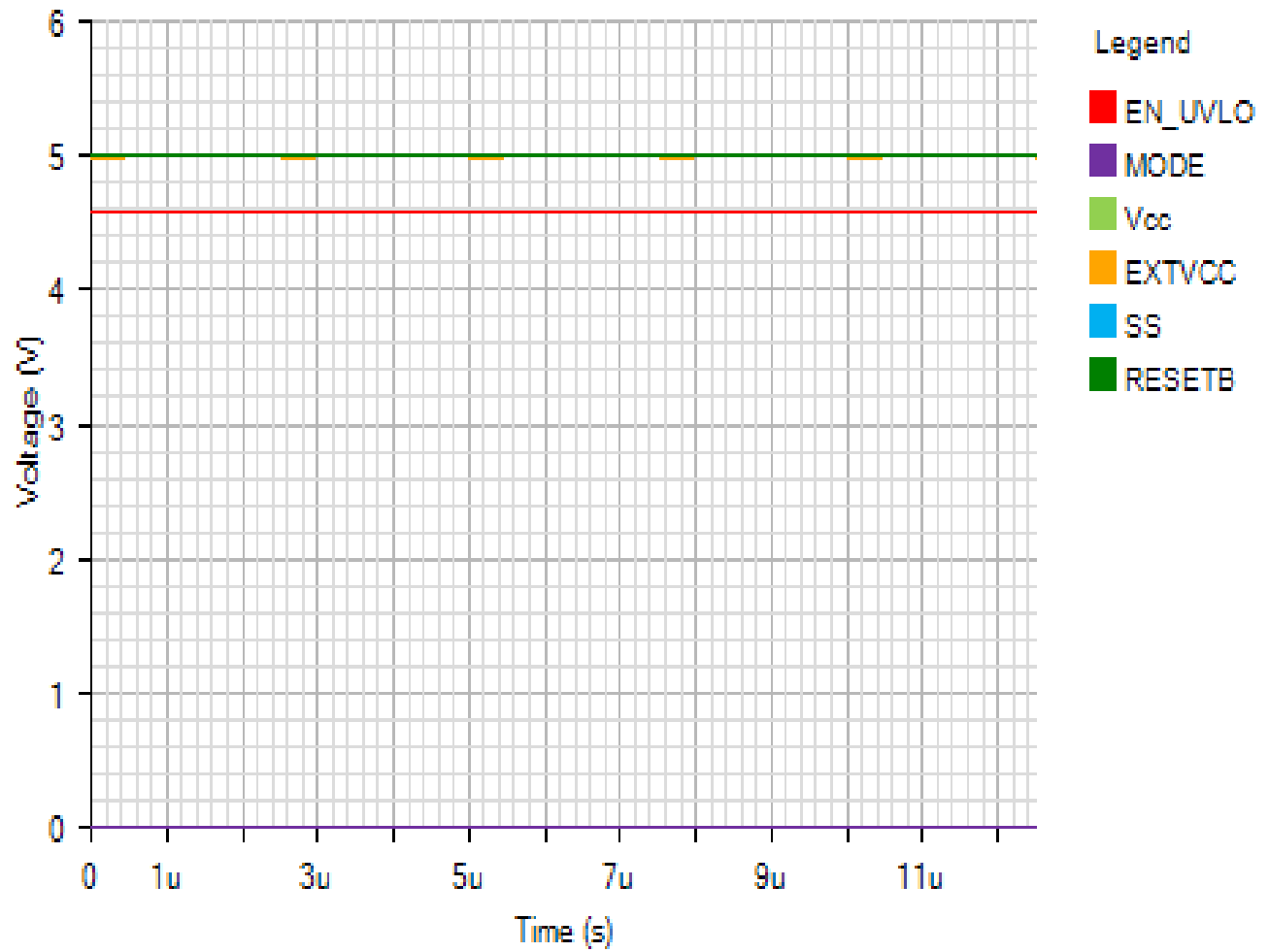
SWITCHING

Default



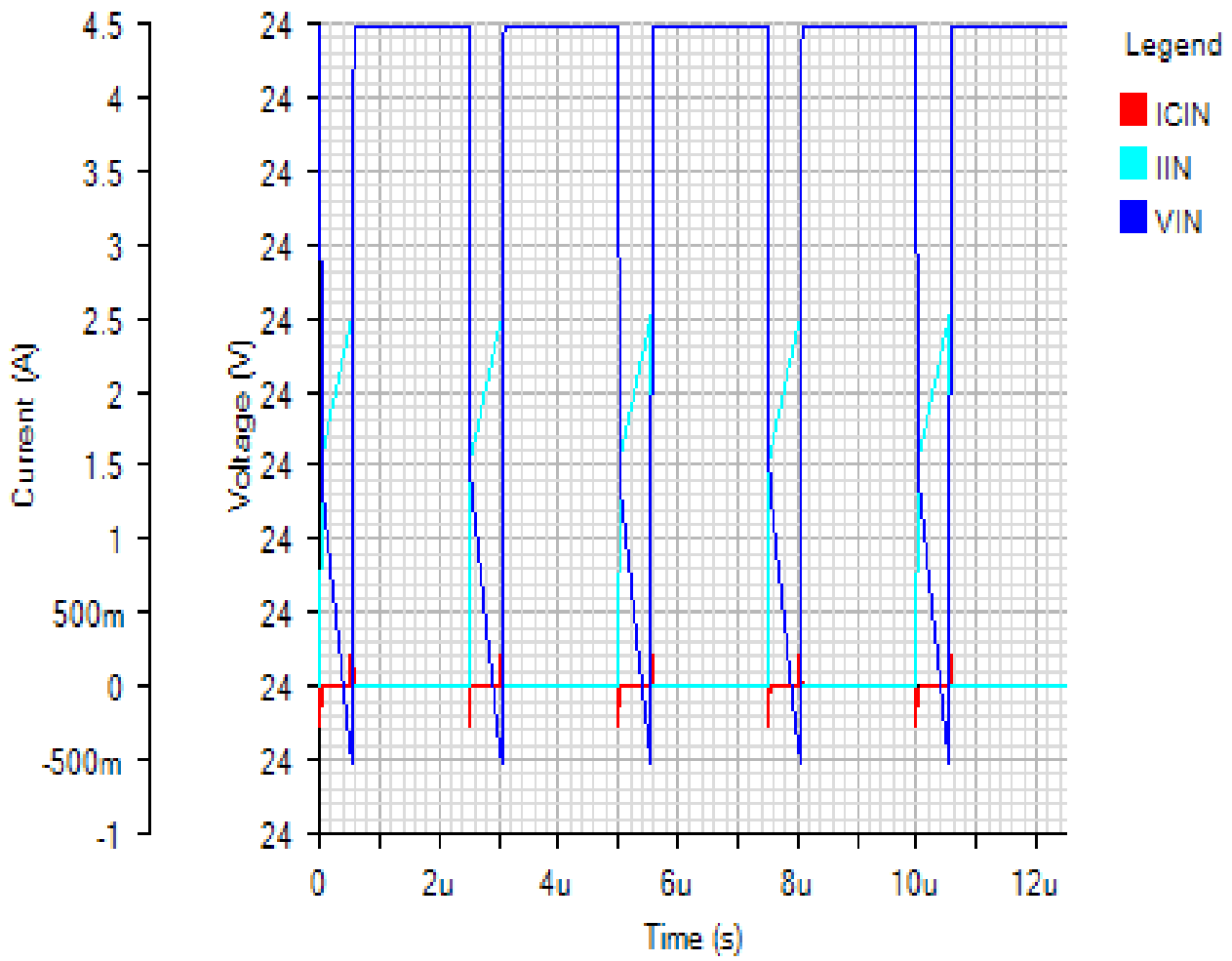
IC

Default



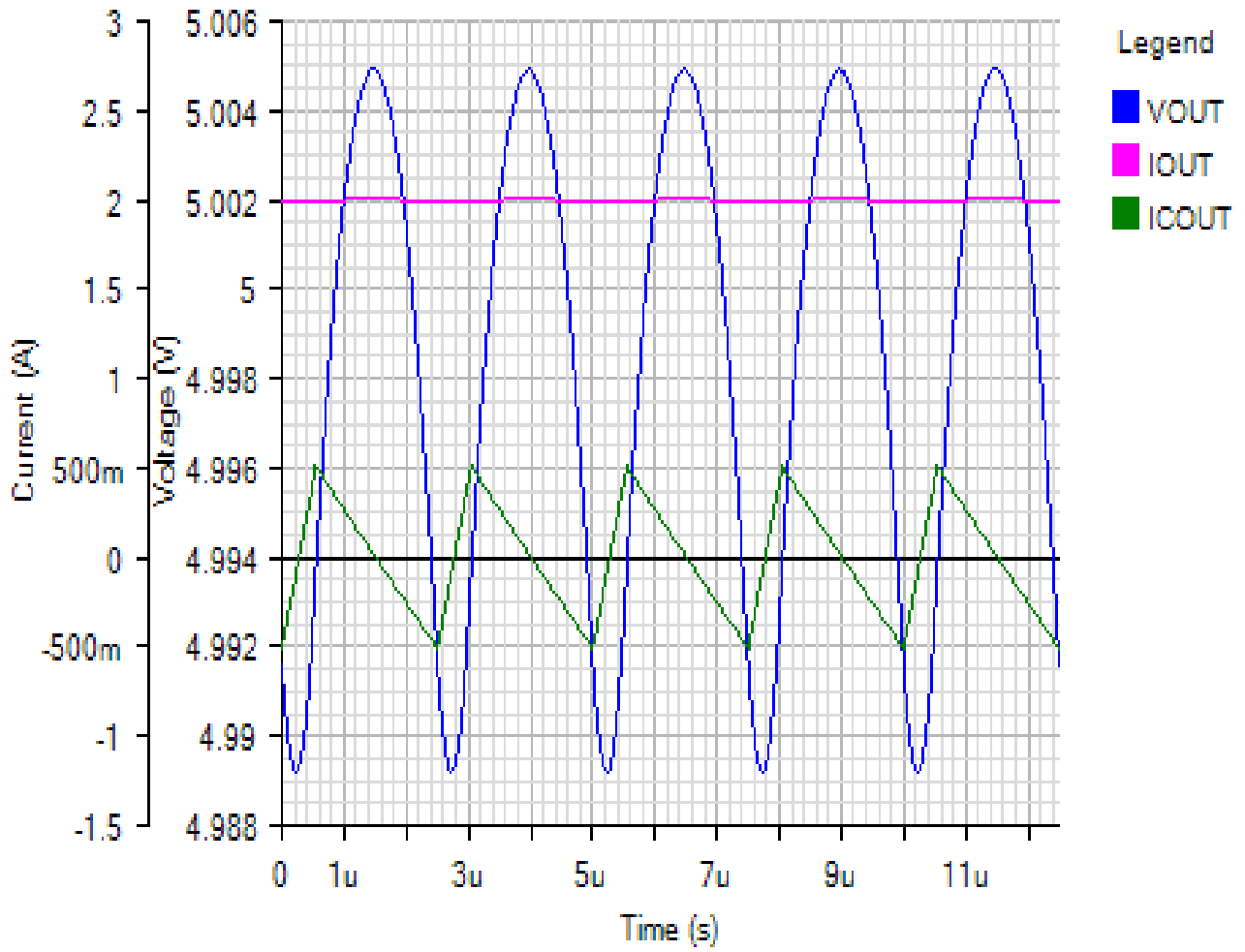
INPUT

Default

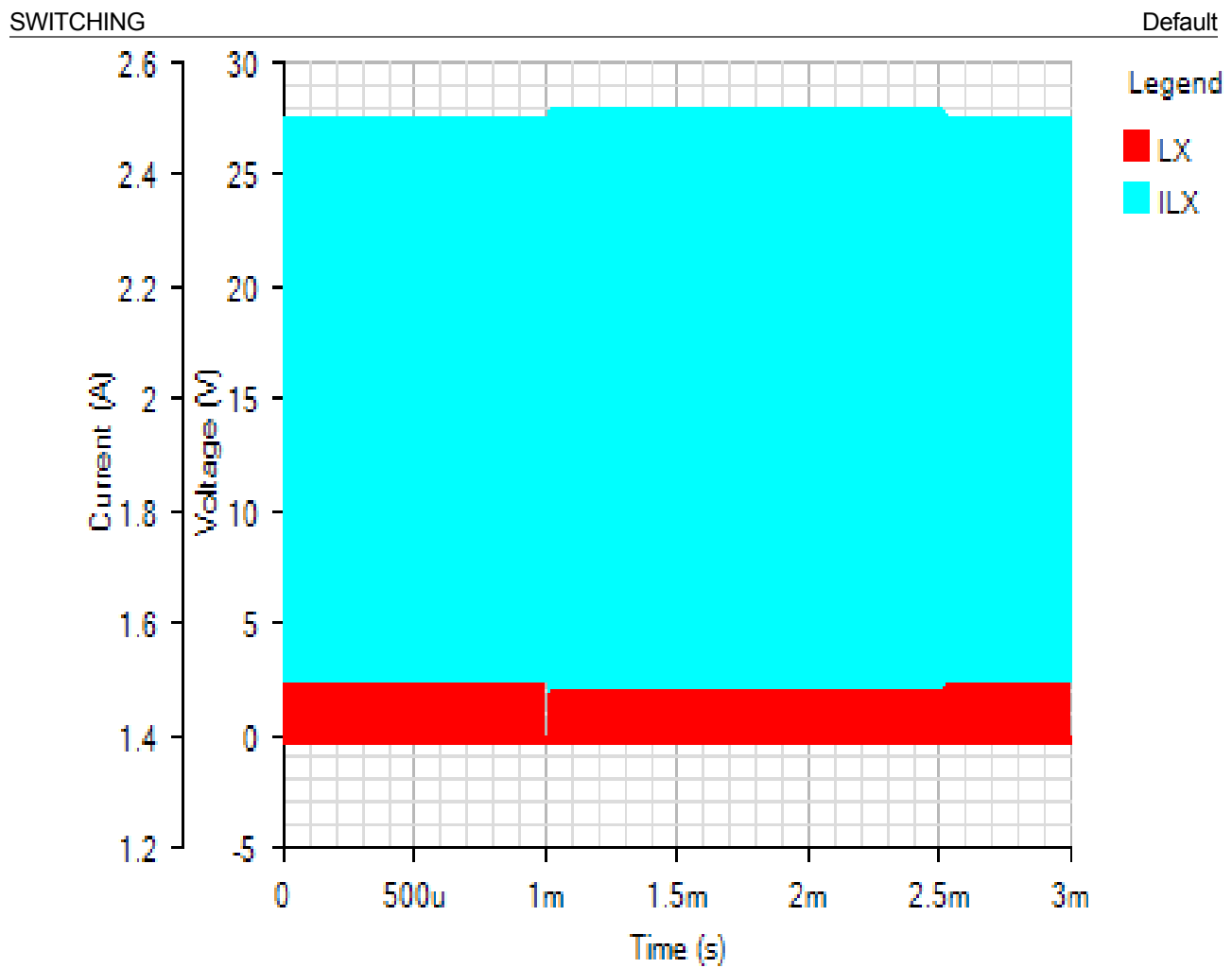


OUTPUT

Default

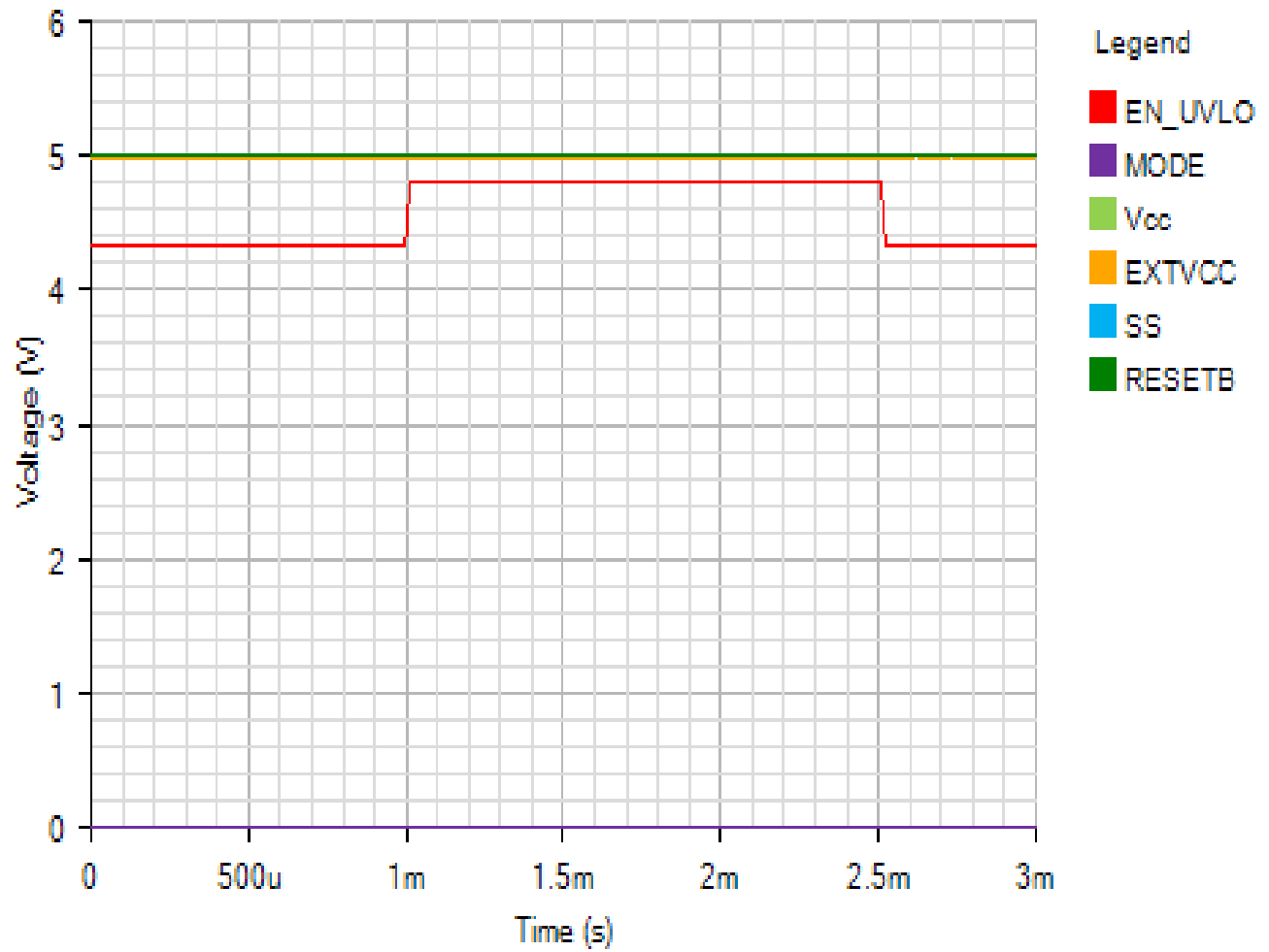


Line Transient - Wed Dec 19 2018 17:10:52



IC

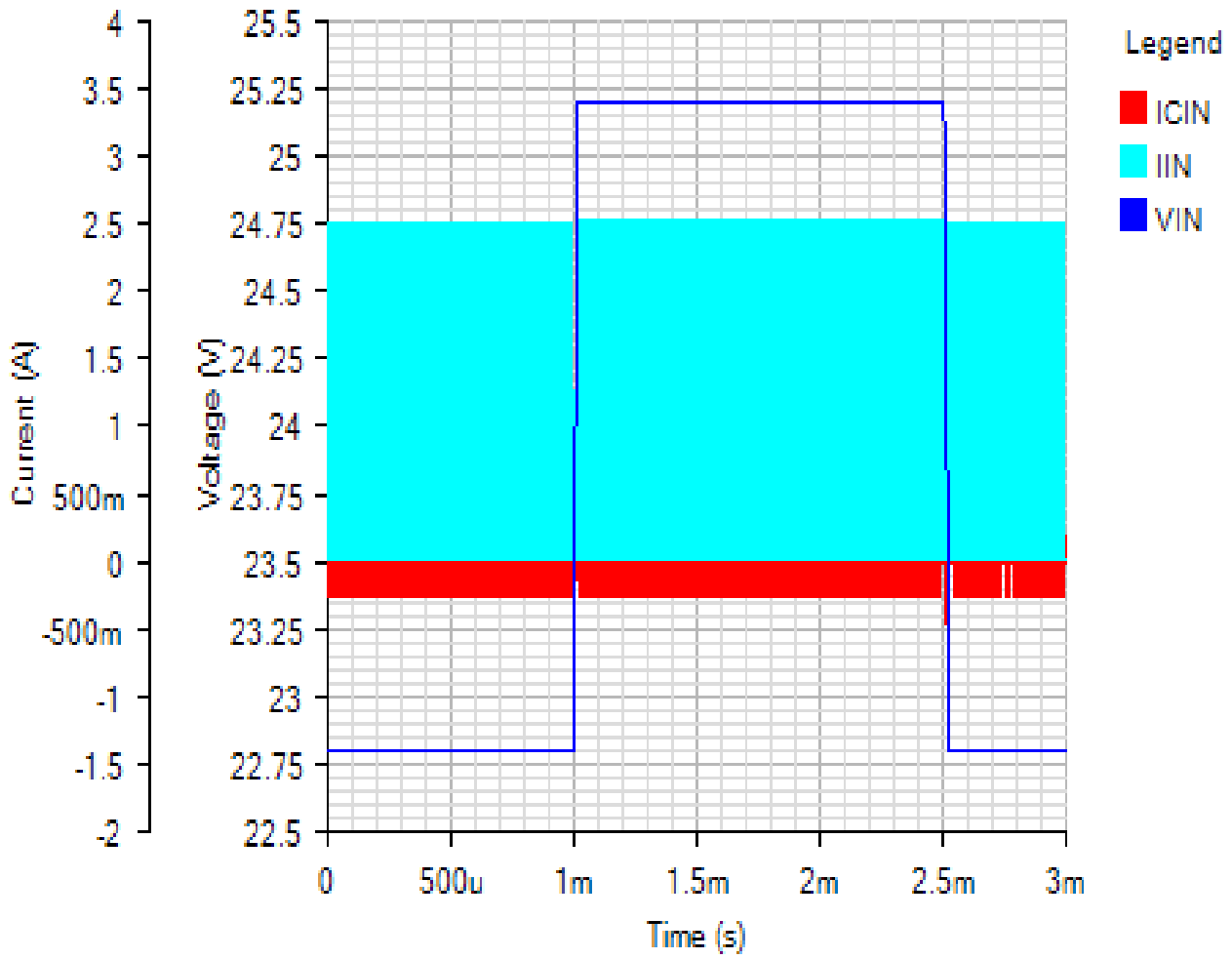
Default





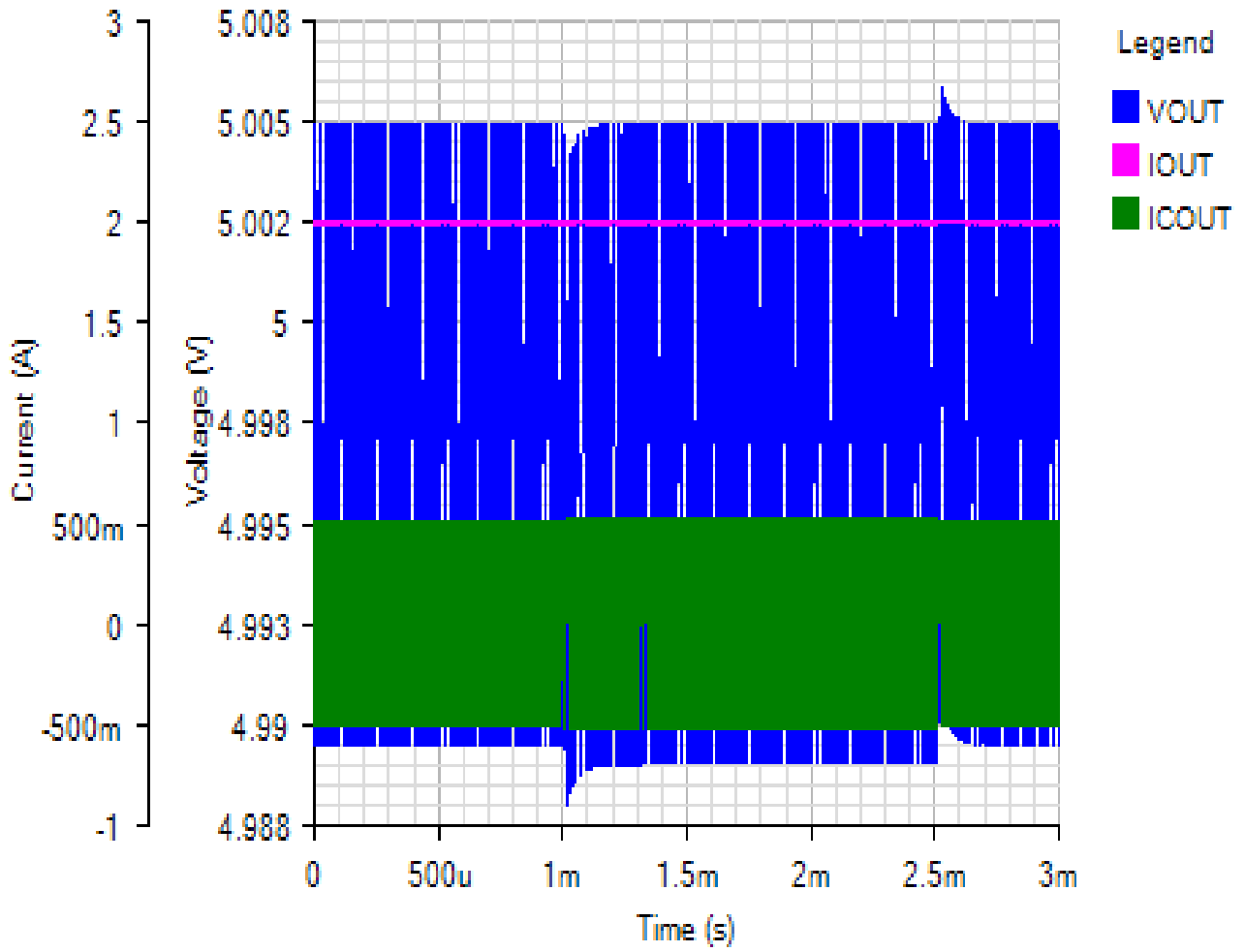
INPUT

Default



OUTPUT

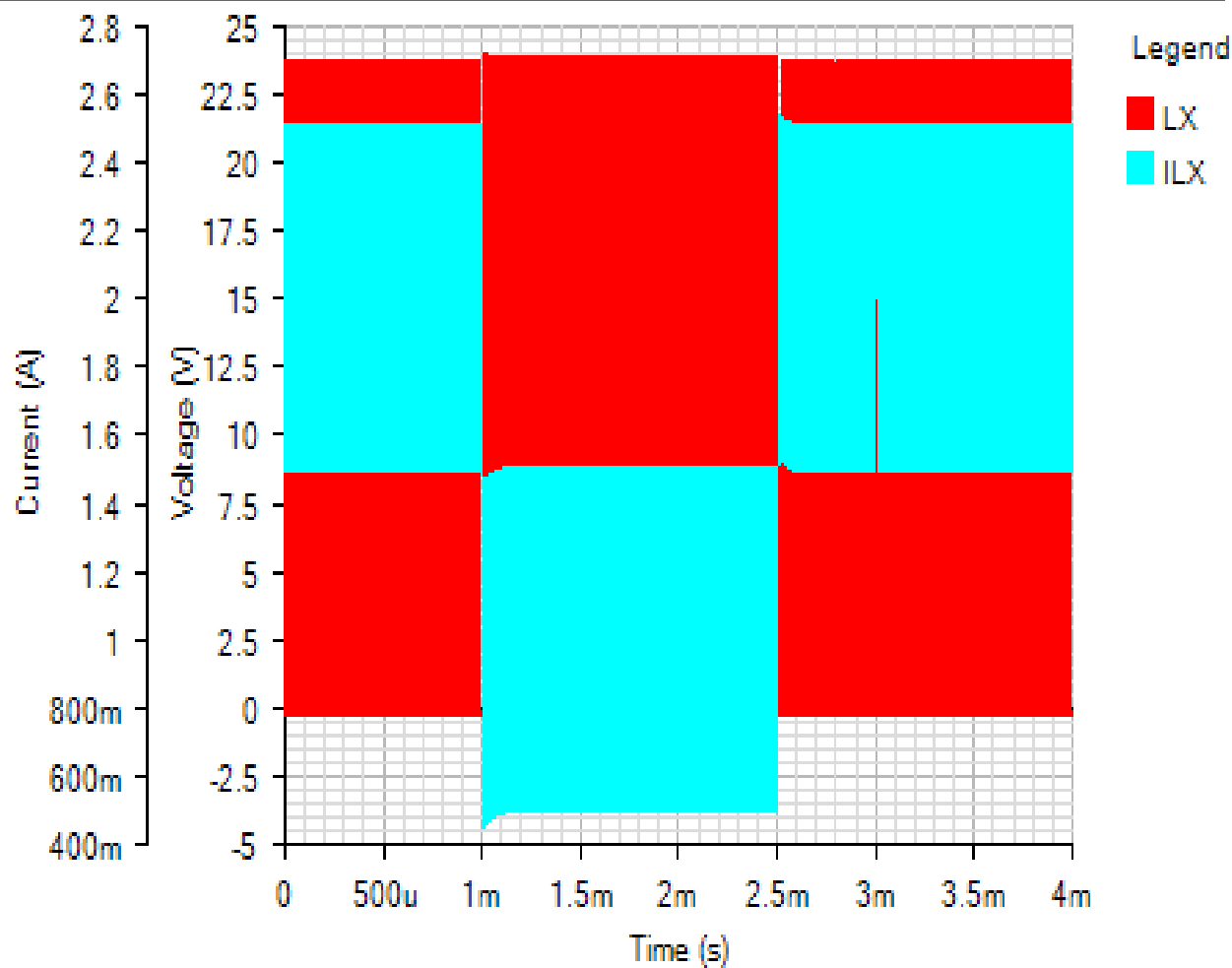
Default



Load Step - Wed Dec 19 2018 17:10:52

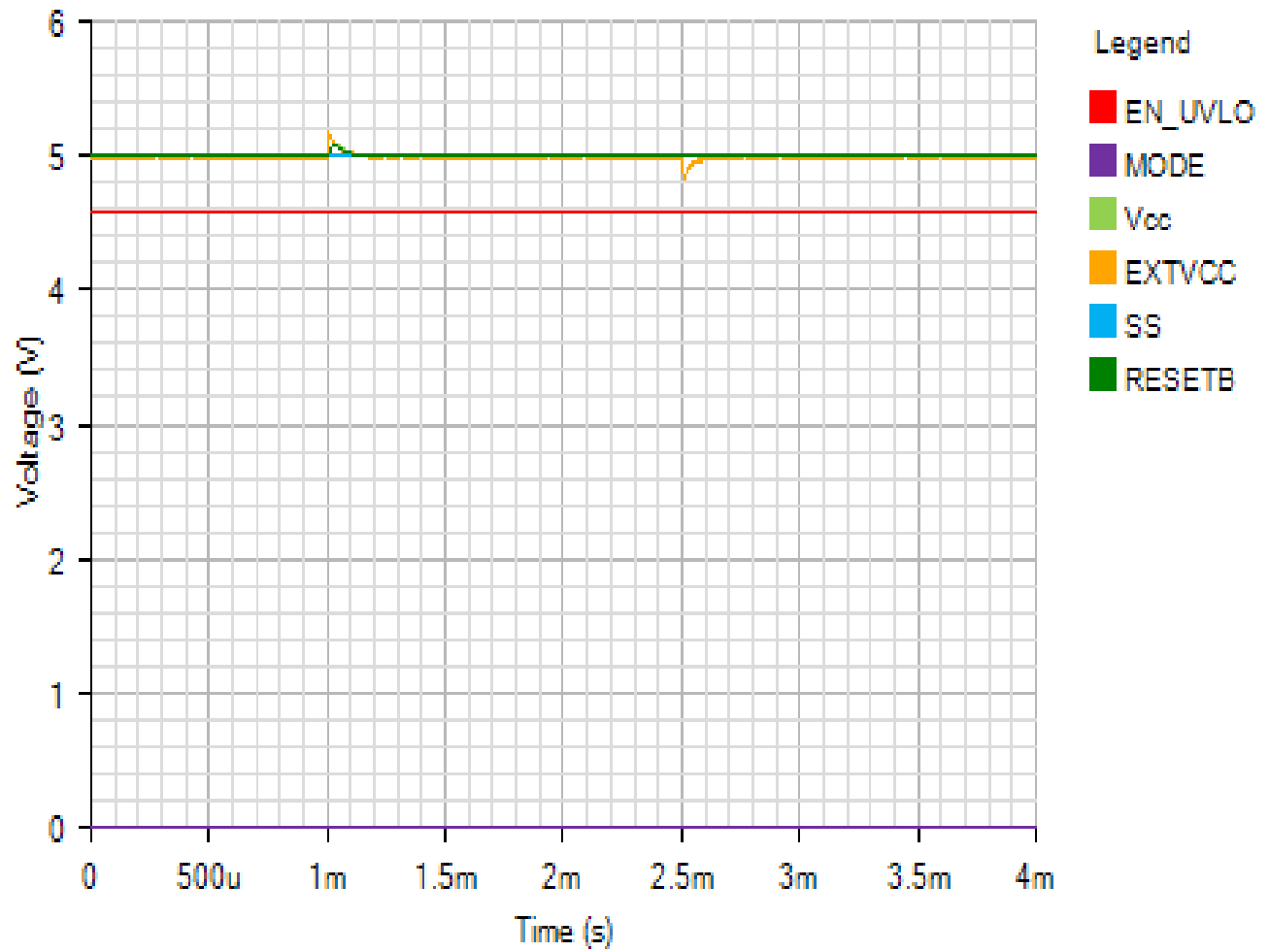
SWITCHING

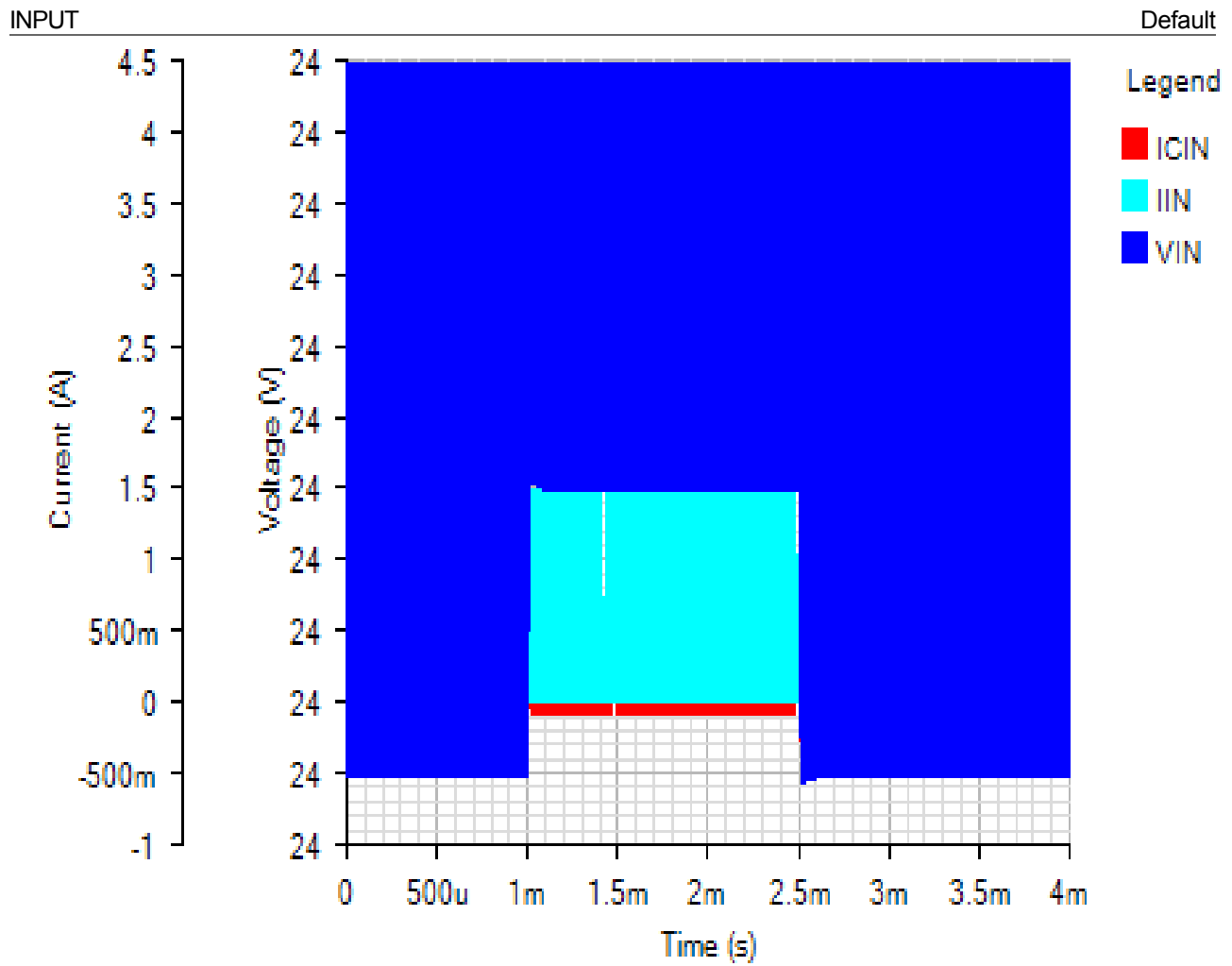
Default



IC

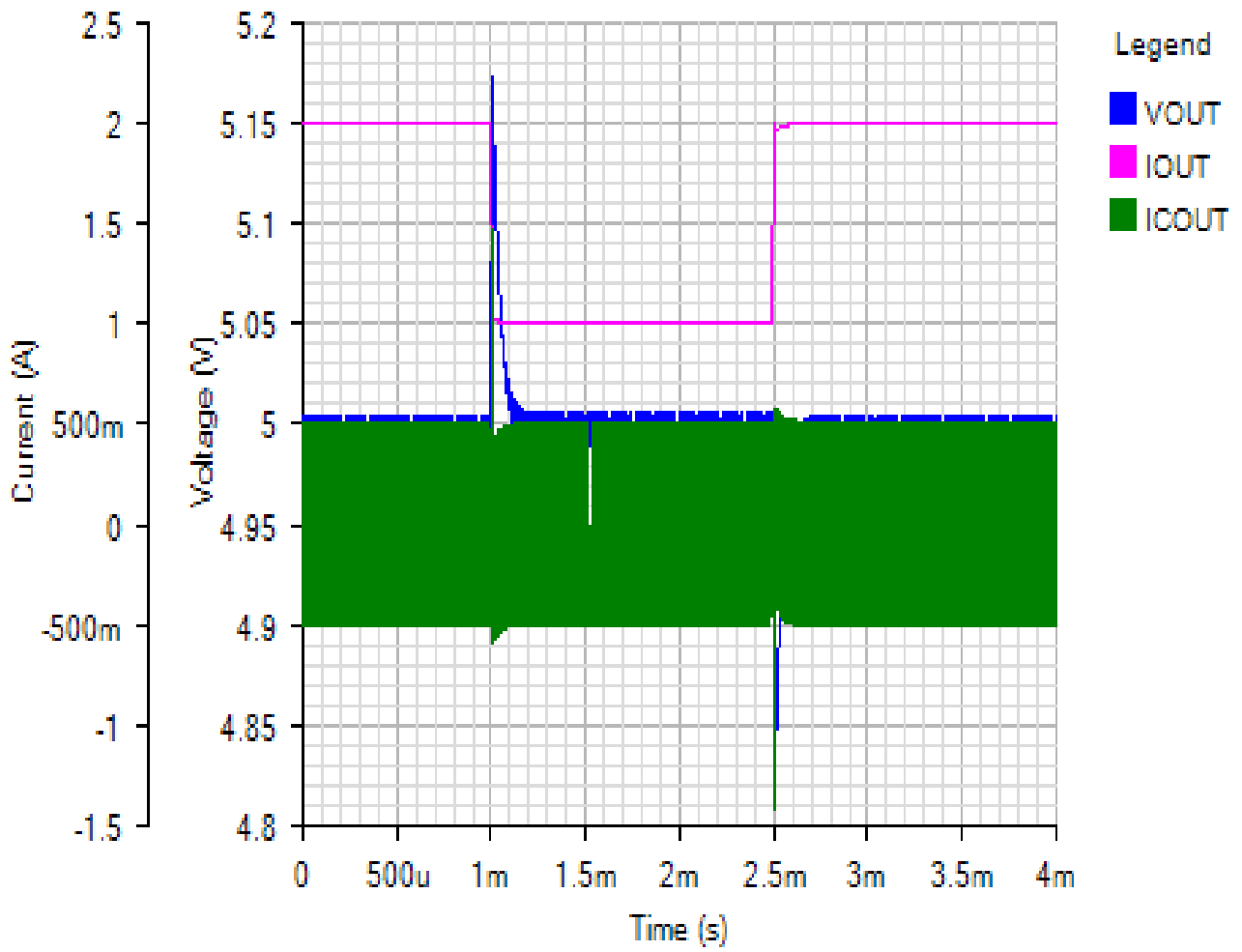
Default





OUTPUT

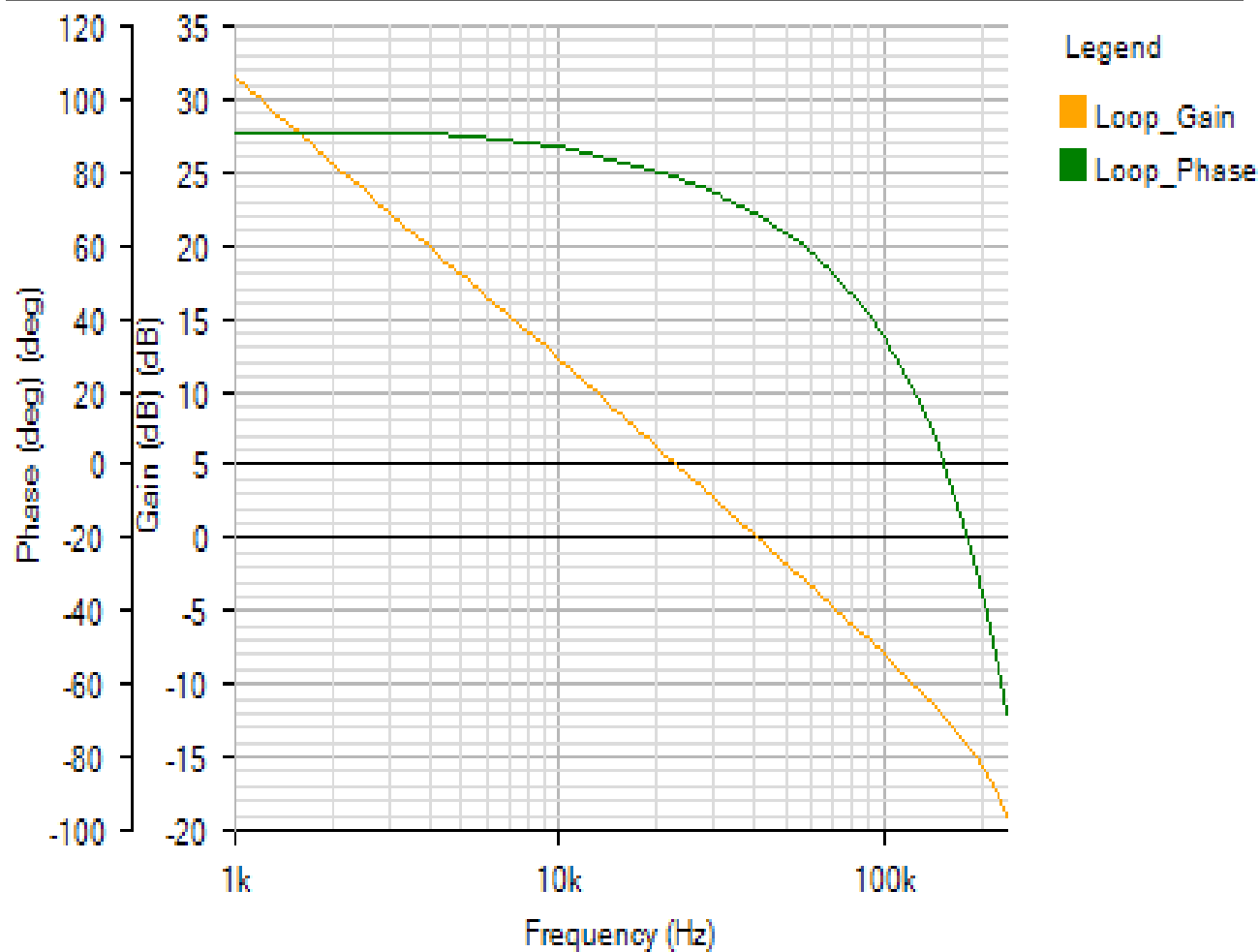
Default



AC Loop - Wed Dec 19 2018 17:10:52

BODE

Default



Phase Margin: 68.45° at a crossover frequency of 41.1kHz

