

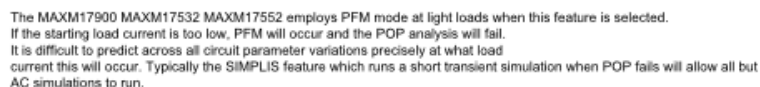
## Initial Design

1.0

**Design Requirements**

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Parameter	Value
Minimum Input Voltage	10V
Nominal Input Voltage	12V
Maximum Input Voltage	24V
Input Steady-State Ripple	0.48V
Input Undervoltage Lockout Level	3.6V
Output Voltage	5V
Output Current	0.1A
Output Voltage Load Step Over/Undershoot	0.15V
BOM Priority	Cost
Switching Frequency	600kHz
MODE of Operation	PWM
Soft Start Time	5.1ms
Ambient Temperature	25°C



Ref	Qty	Part Number	Manufacturer	Description
U1	1	MAXM17900	User-Defined	IC
C3	1	ECHU1H333GX5	Panasonic	Cap Film 0.033uF 50V PPS 2% (3.2 X 2.5 X 2.1mm) Stacked 125°C T/R
CIN	1	GRM31CR71H225KA88	Murata	Cap Ceramic 2.2uF 50V X7R 10% SMD 1206 125C
COUT	1	GRM21BR71A106KA73	Murata	Cap Ceramic 10uF 10V 0805 125C
R1	1	ERJ2RKF2613X	Panasonic	Res Thick Film 0402 261K Ohm 1% 0.1W(1/10W) ±100ppm/°C Pad SMD Automotive T/R
R2	1	ERJ3EKF4992V	Panasonic	Res Thick Film 0603 49.9K Ohm 1% 0.1W(1/10W) ±100ppm/°C Pad SMD Automotive T/R
				Res Thick Film 0603 69.8K Ohm 1%

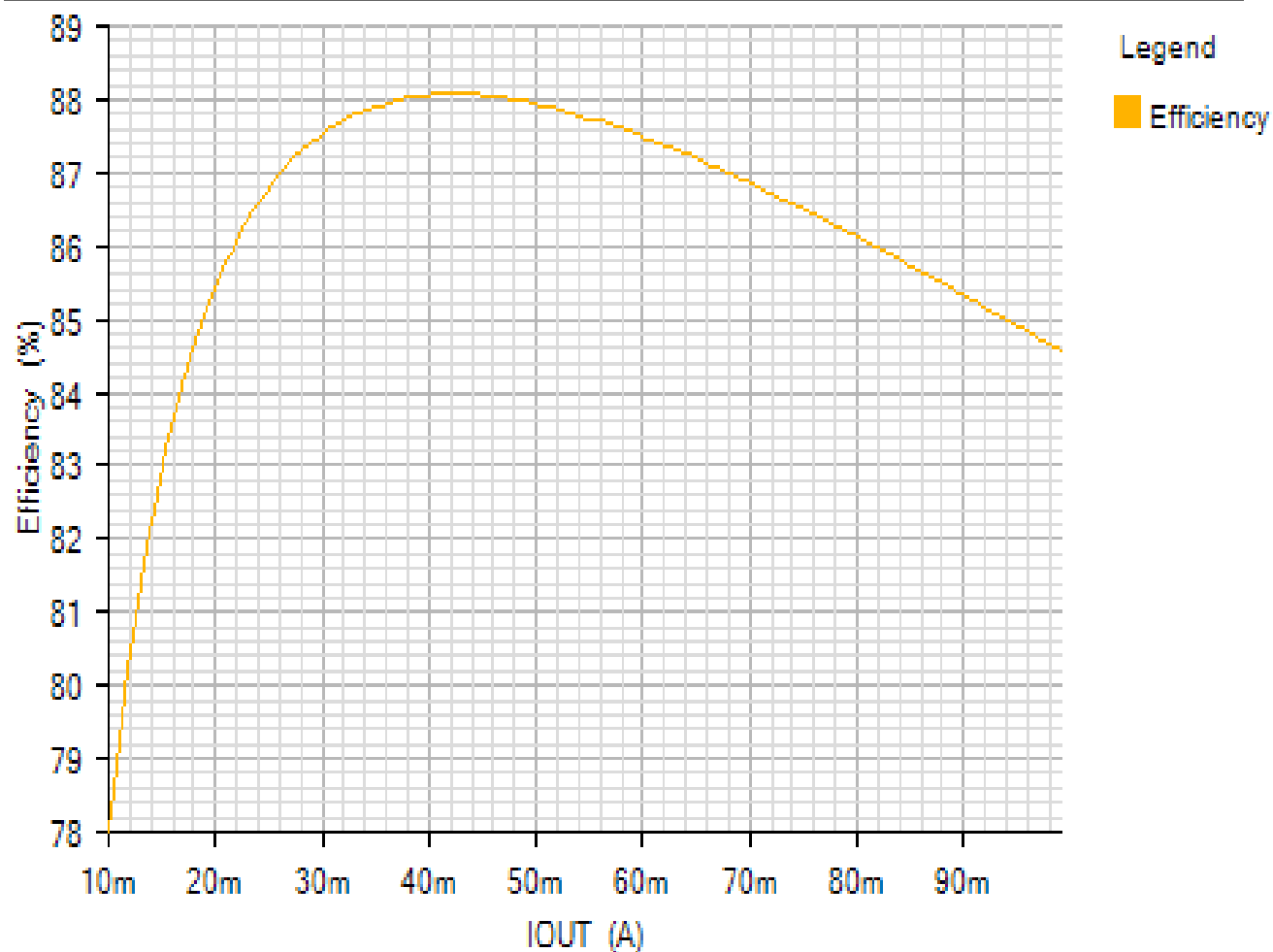
R3	1	ERJ3EKF6982V	Panasonic	0.1W(1/10W) $\pm 100\text{ppm}/^\circ\text{C}$ Pad SMD Automotive T/R
R4	1	ERJ3GEYJ103V	Panasonic	Res Thick Film 0603 10K Ohm 5% 0.1W(1/10W) $\pm 200\text{ppm}/^\circ\text{C}$ Pad SMD Automotive T/R

## Simulation Results

Efficiency - Wed Dec 19 2018 16:45:18

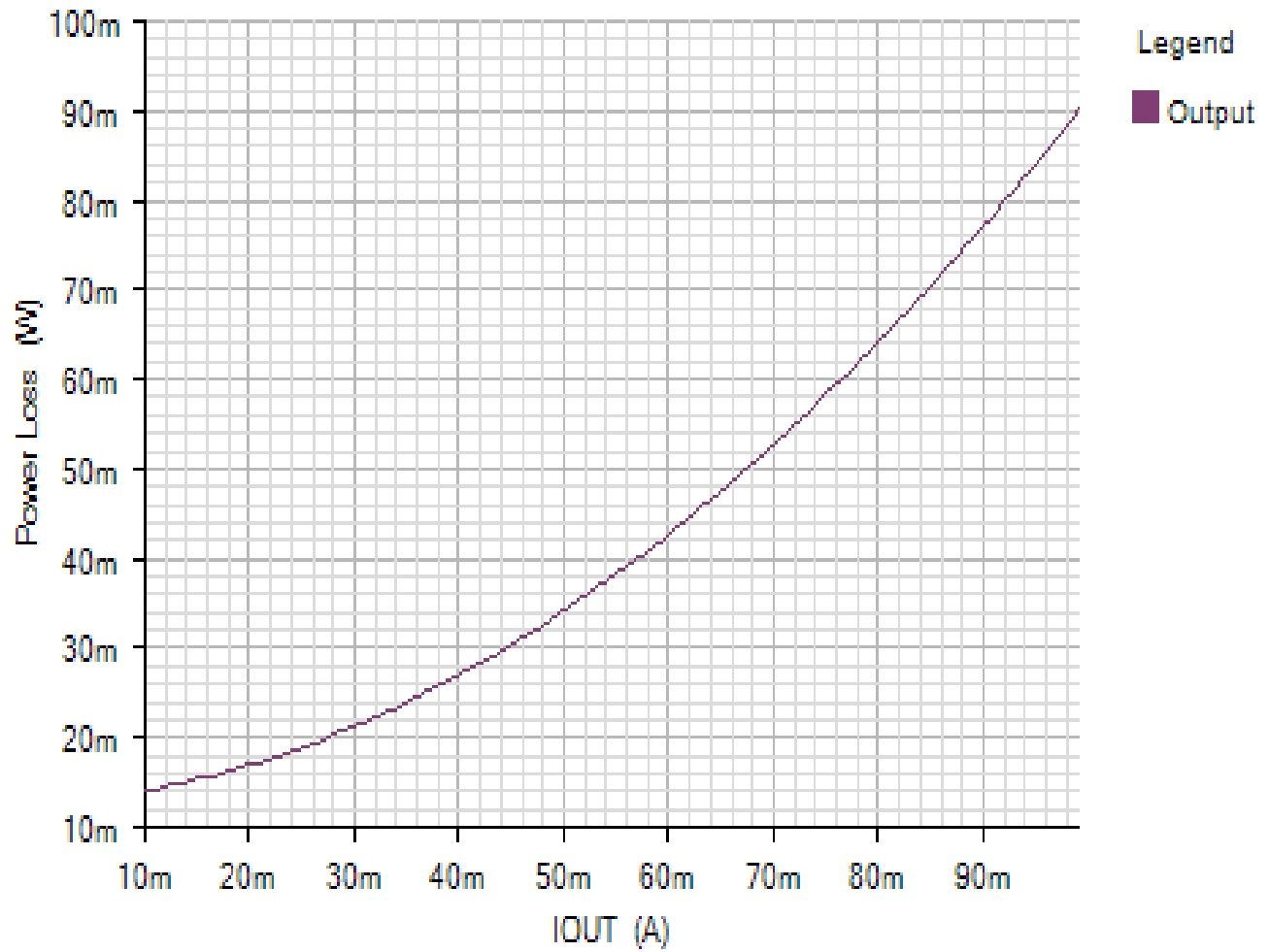
EFFICIENCY\_PLOT

Default



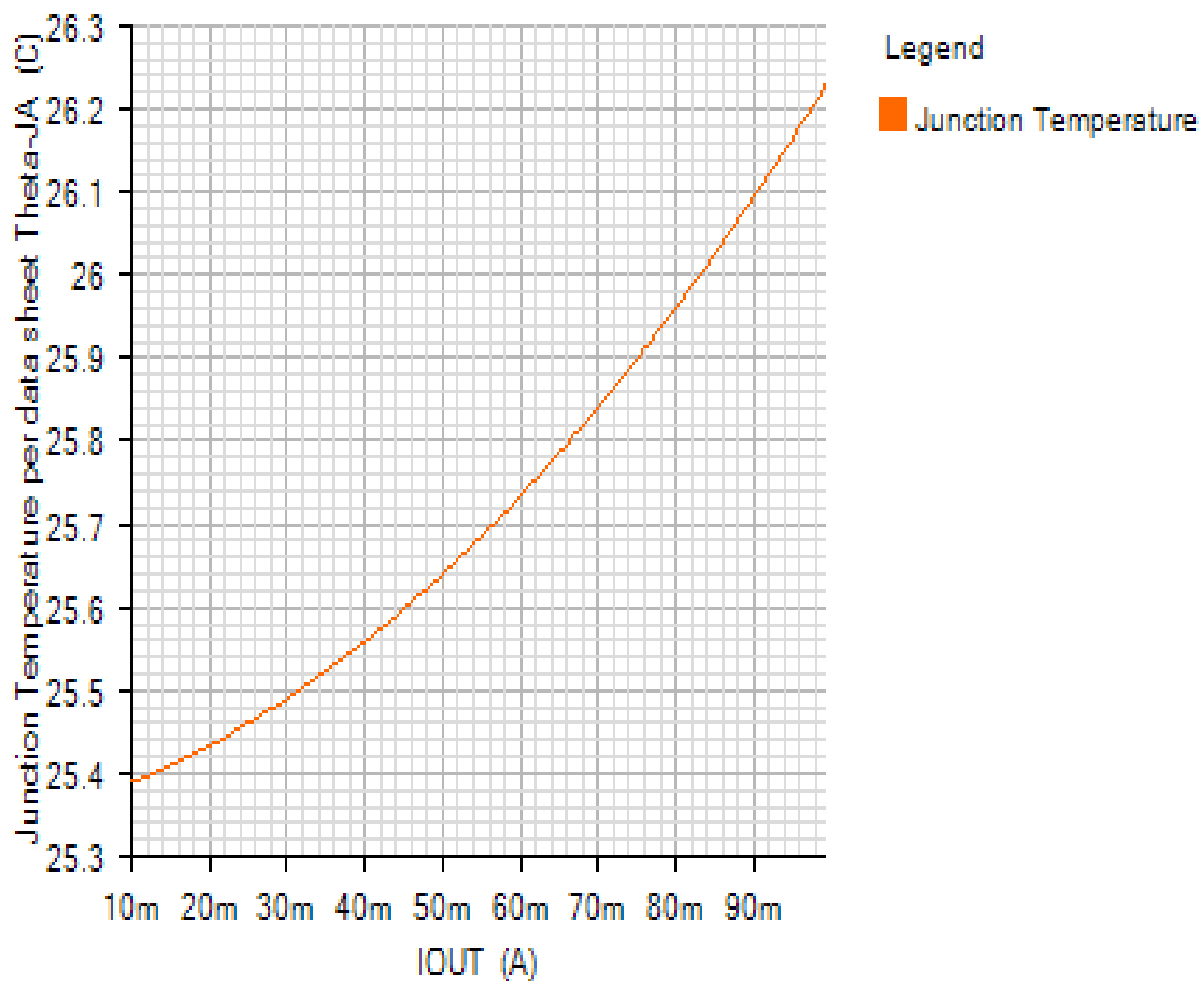
POWER\_LOSS\_PLOT

Default



JUNCTION\_TEMPERATURE\_PLOT

Default



Losses



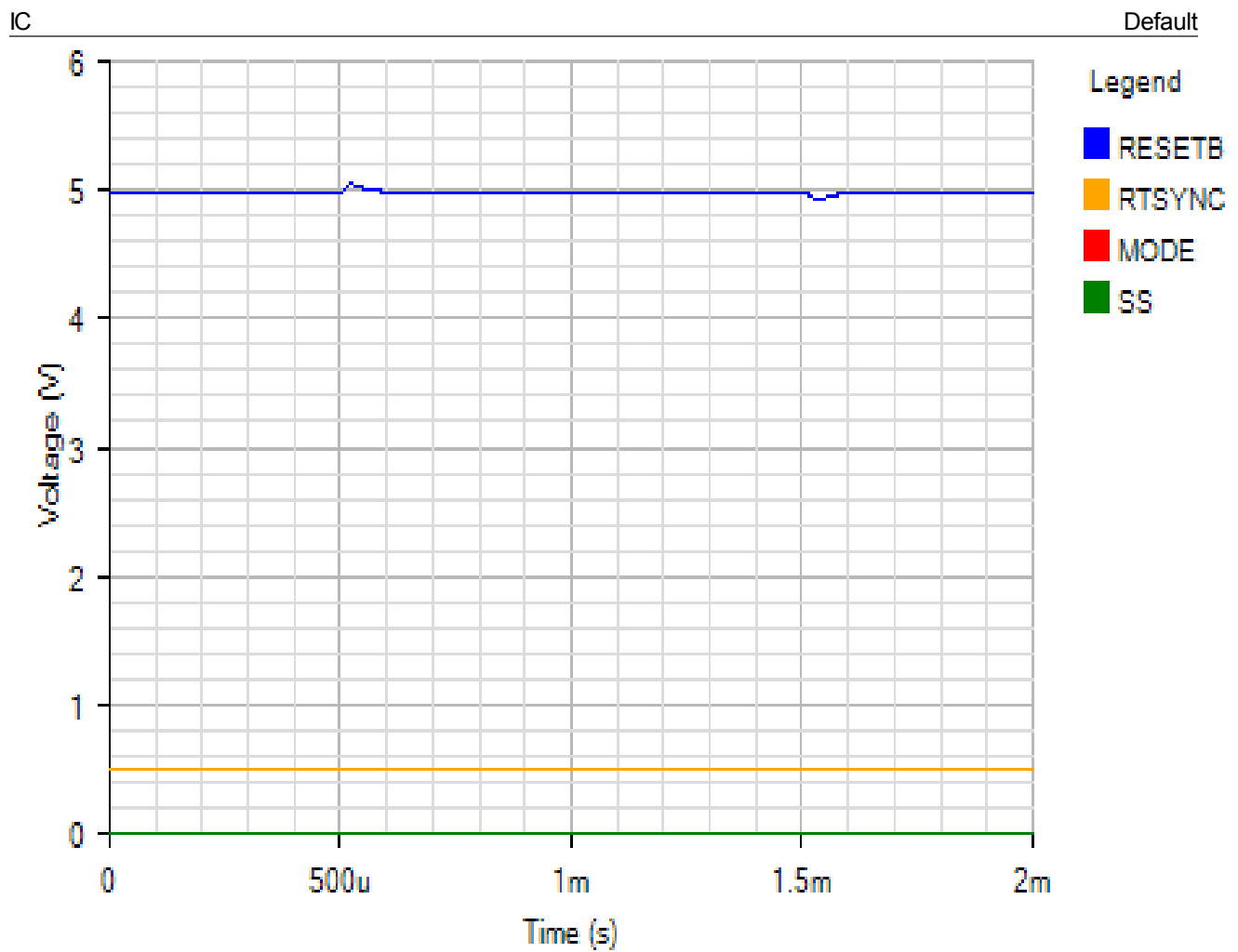
Component

Loss (W)

% of total

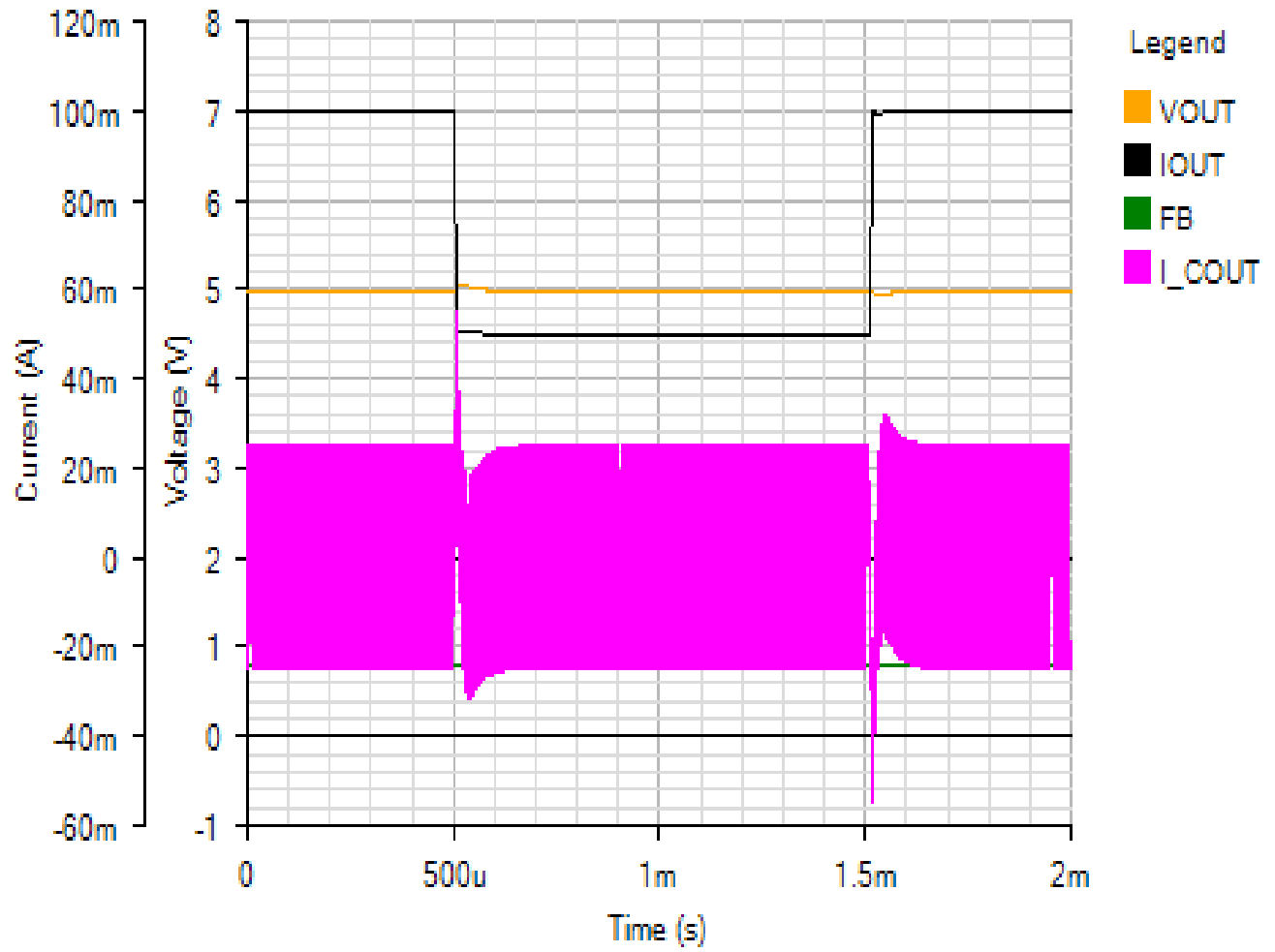
Component	Loss (W)	% of total
Inductor losses	0.05	55.6
Losses in IC	0.04	44.4
Total	0.09	100

Load Step - Wed Dec 19 2018 16:45:18

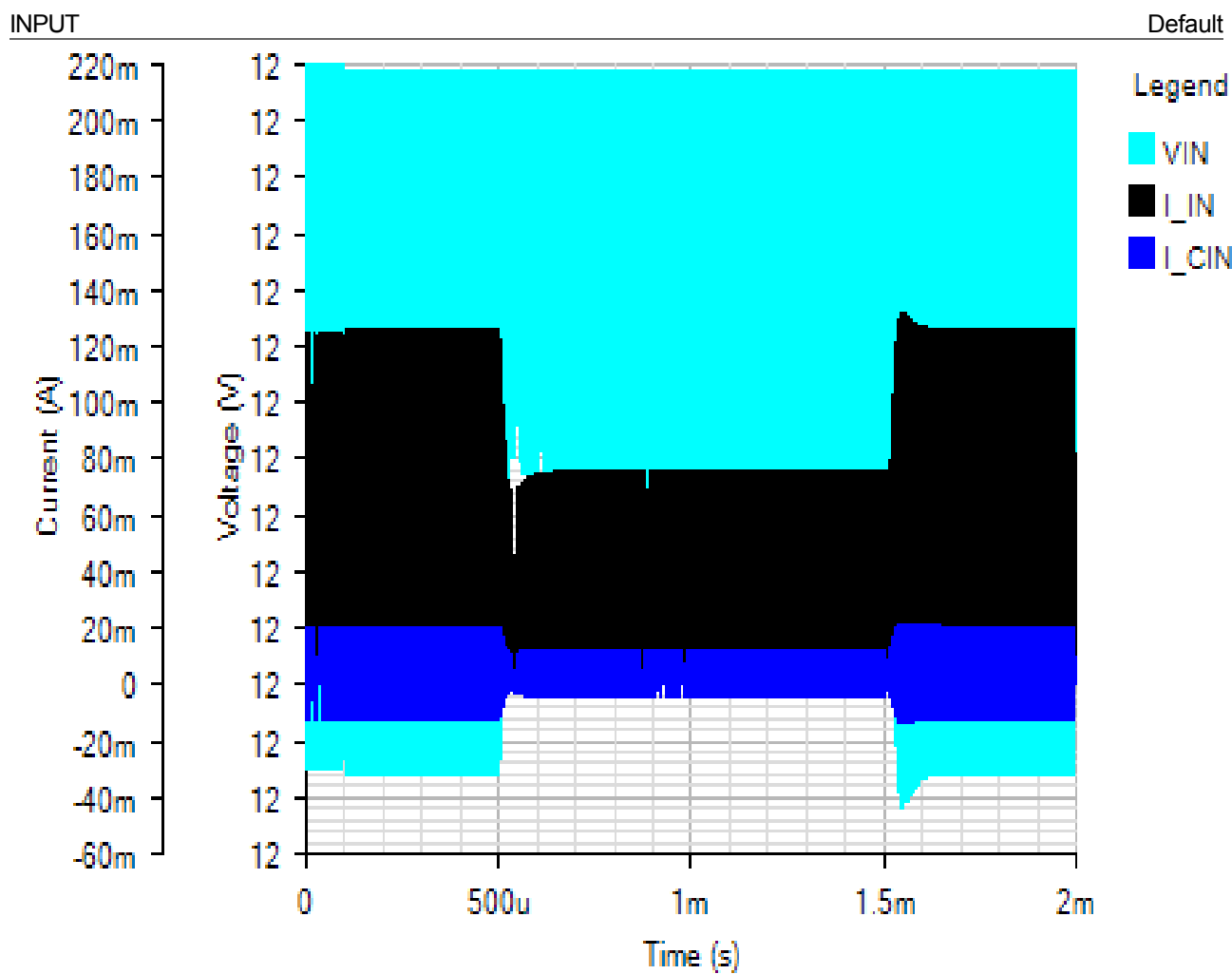


OUTPUT

Default

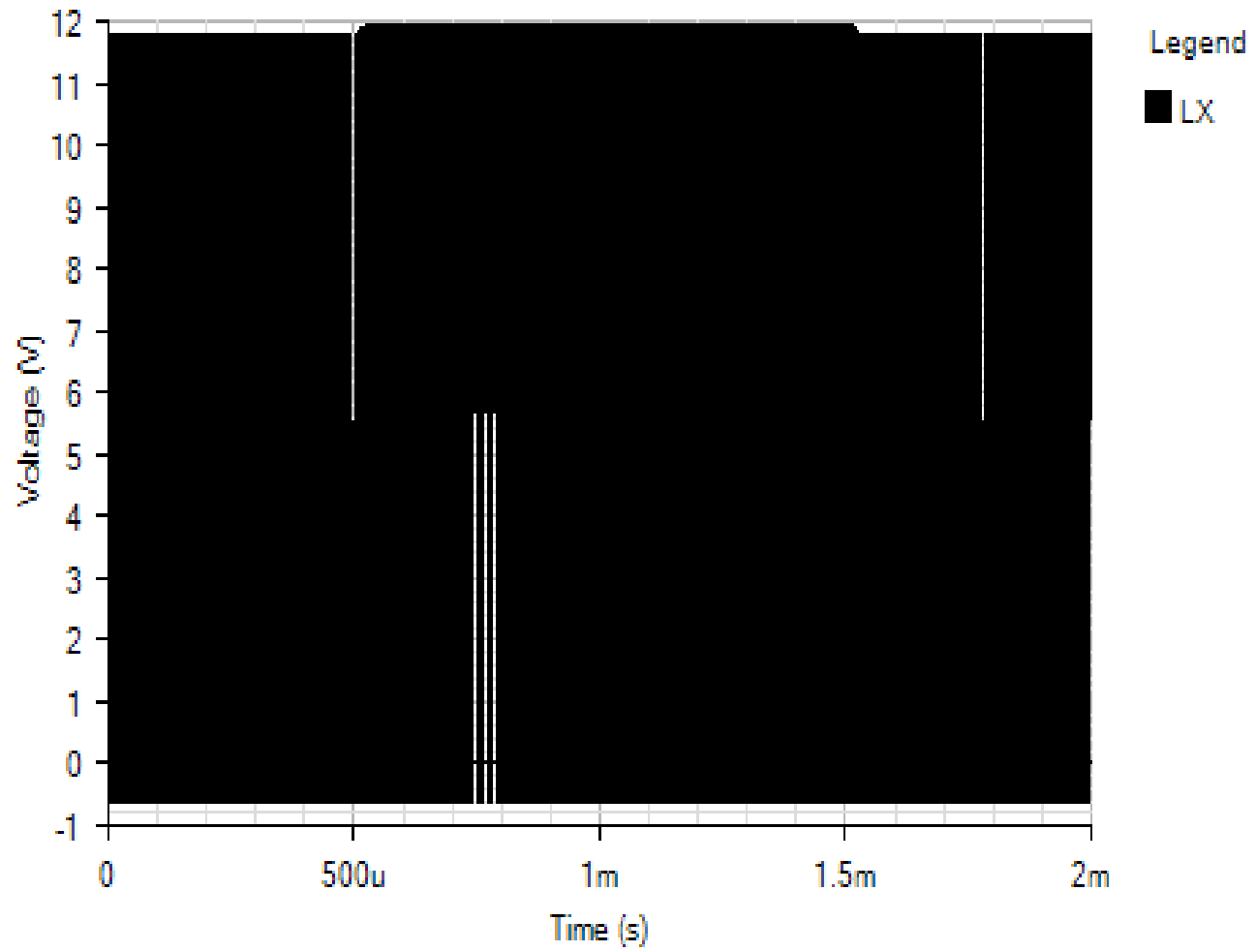




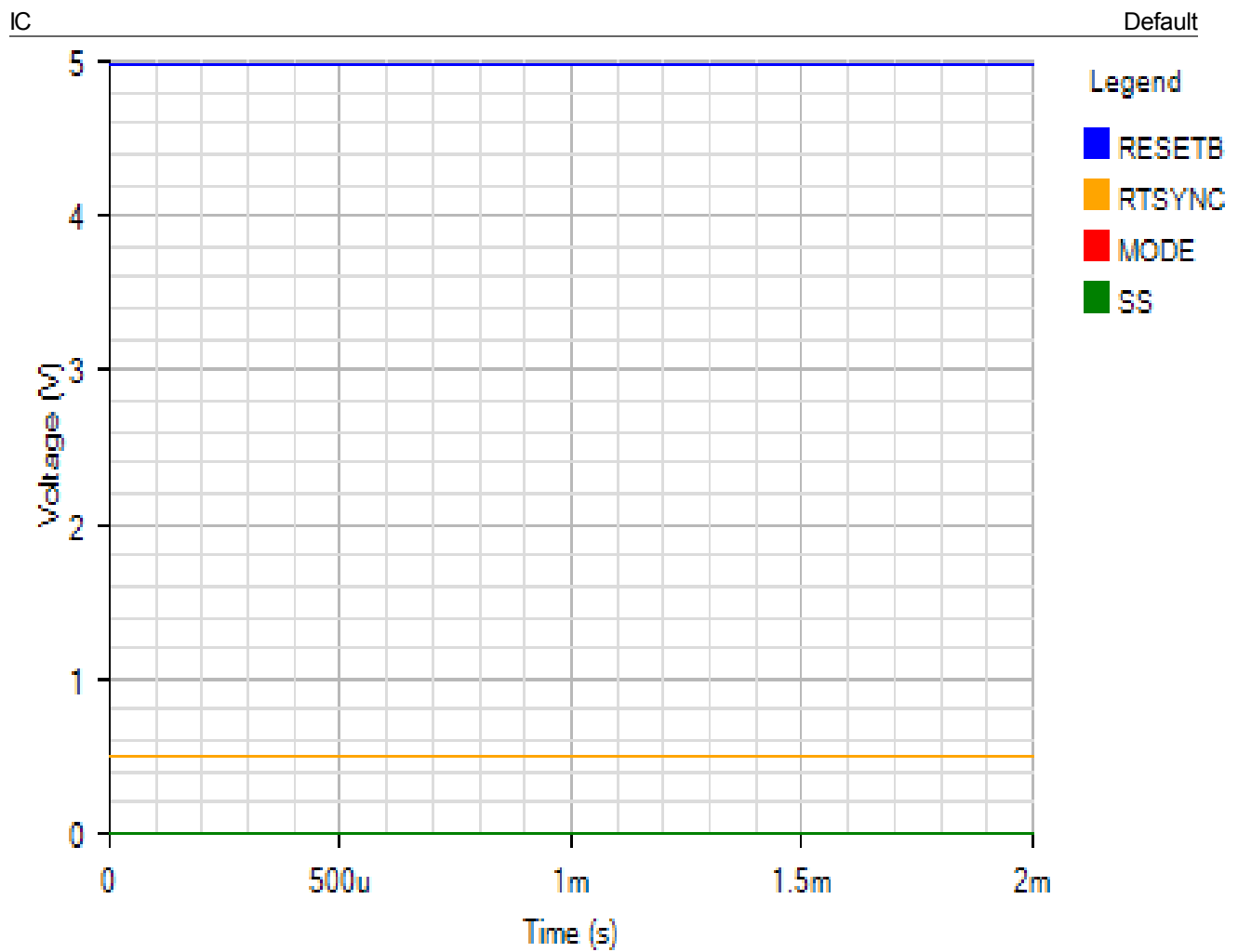


SWITCHING

Default

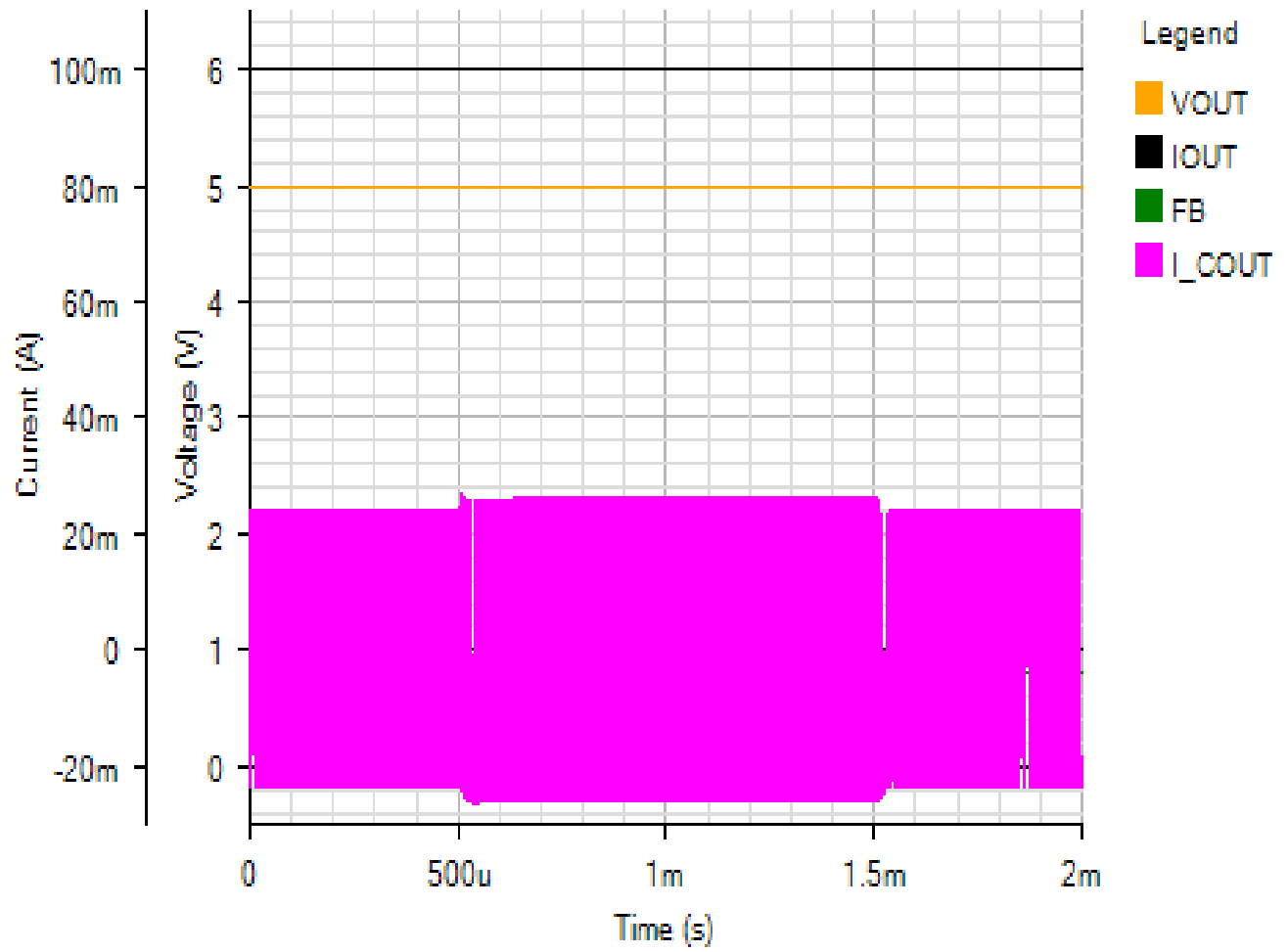


Line Transient - Wed Dec 19 2018 16:45:18



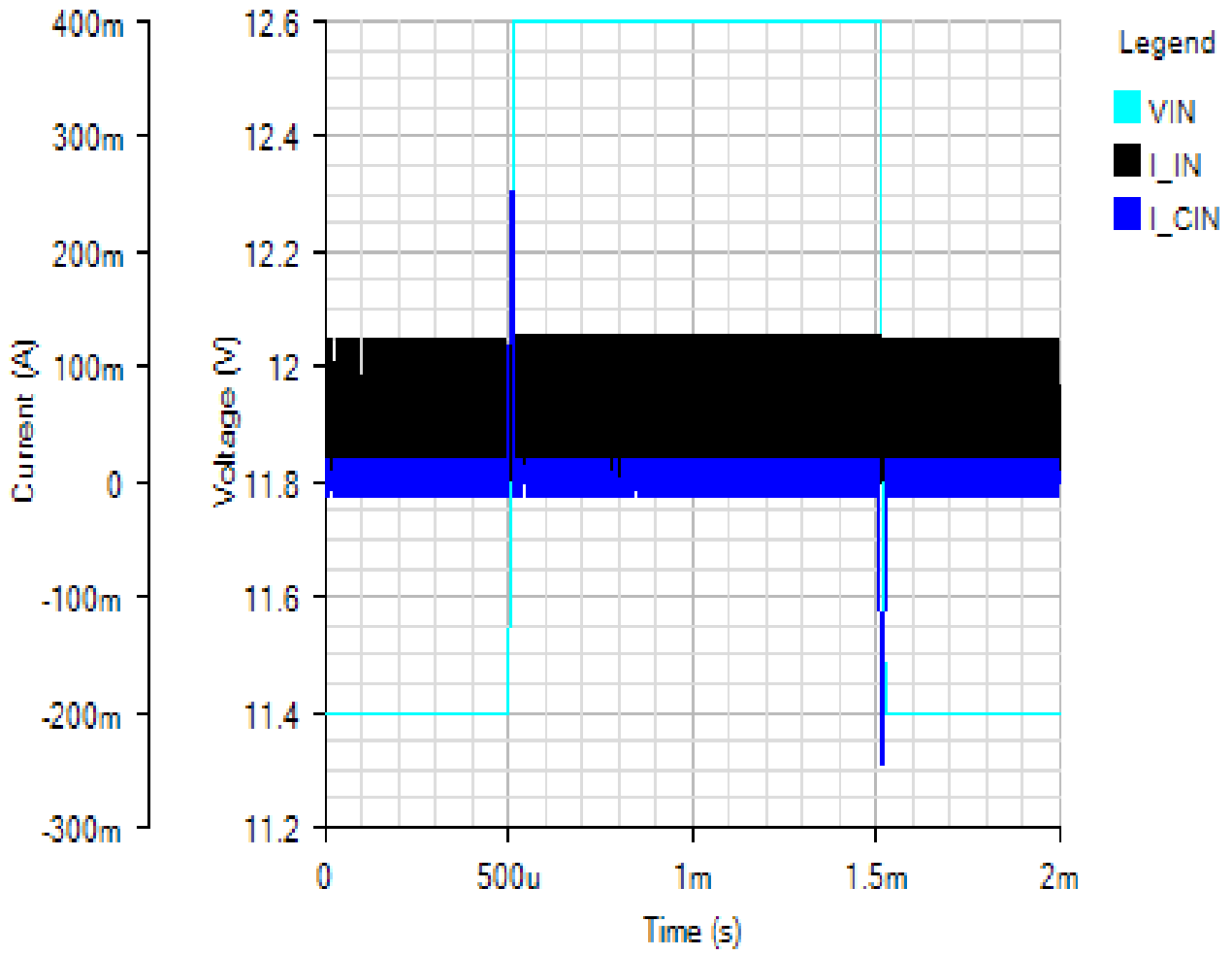
OUTPUT

Default



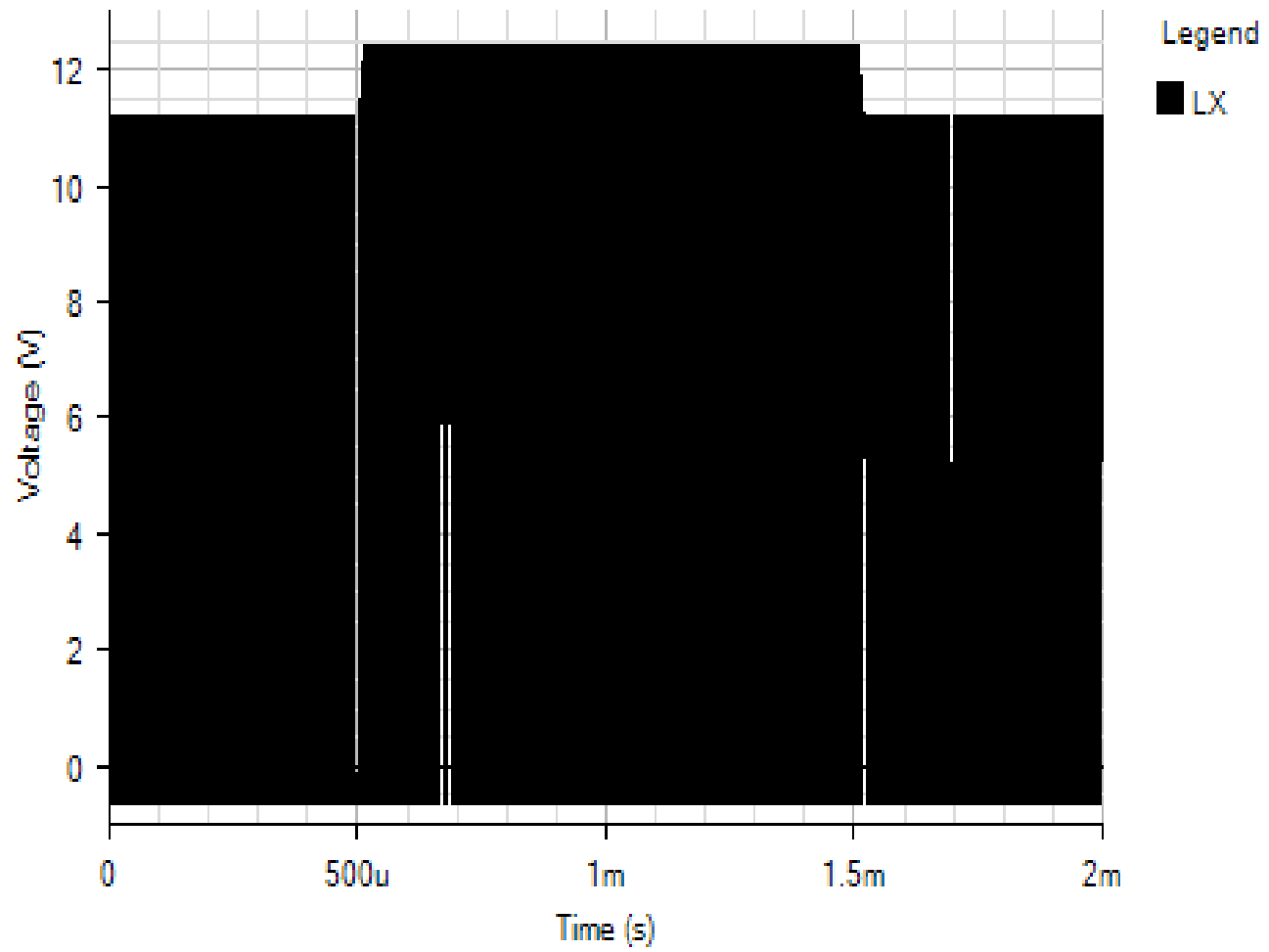
INPUT

Default



SWITCHING

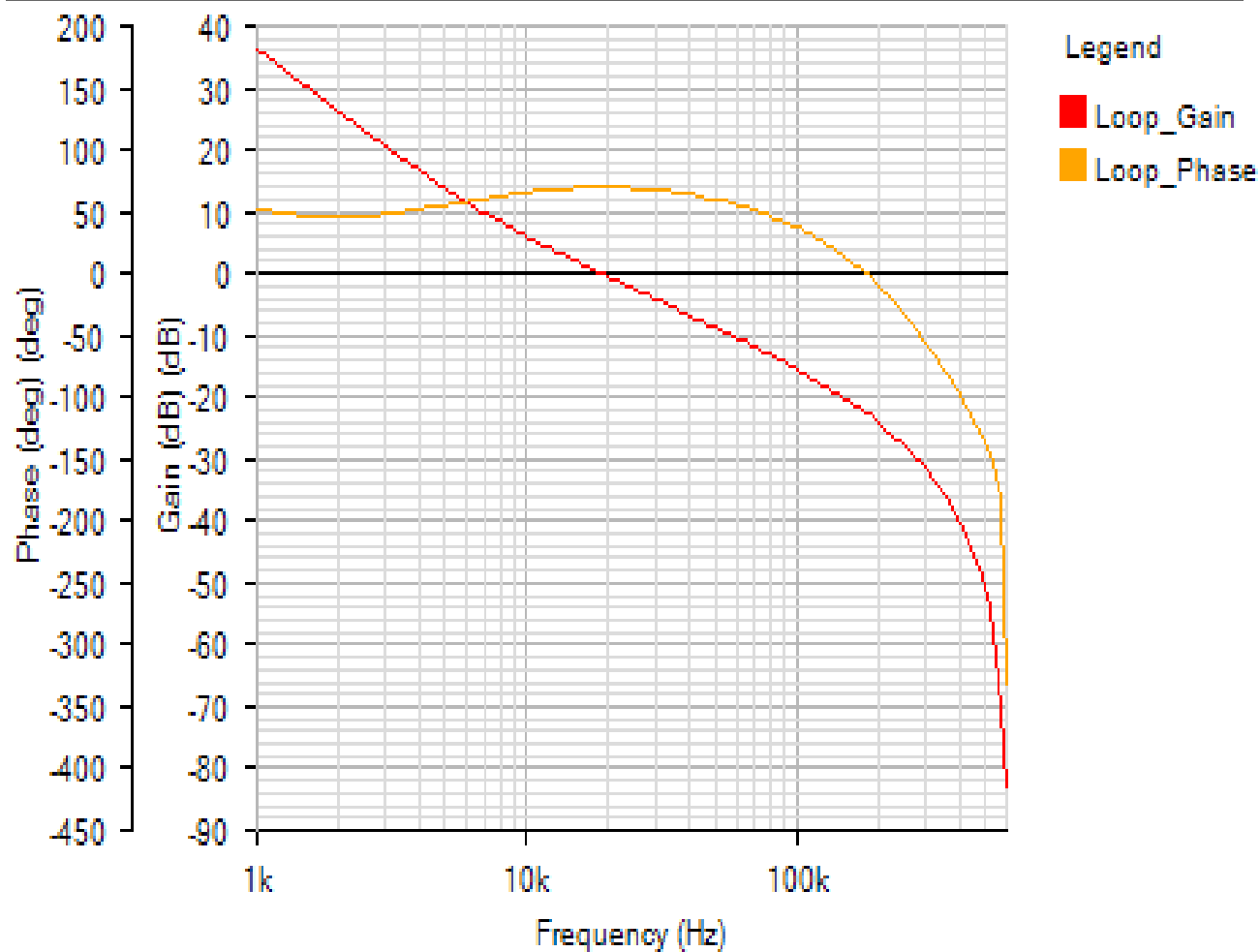
Default



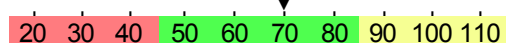
AC Loop - Wed Dec 19 2018 16:45:18

BODE

Default



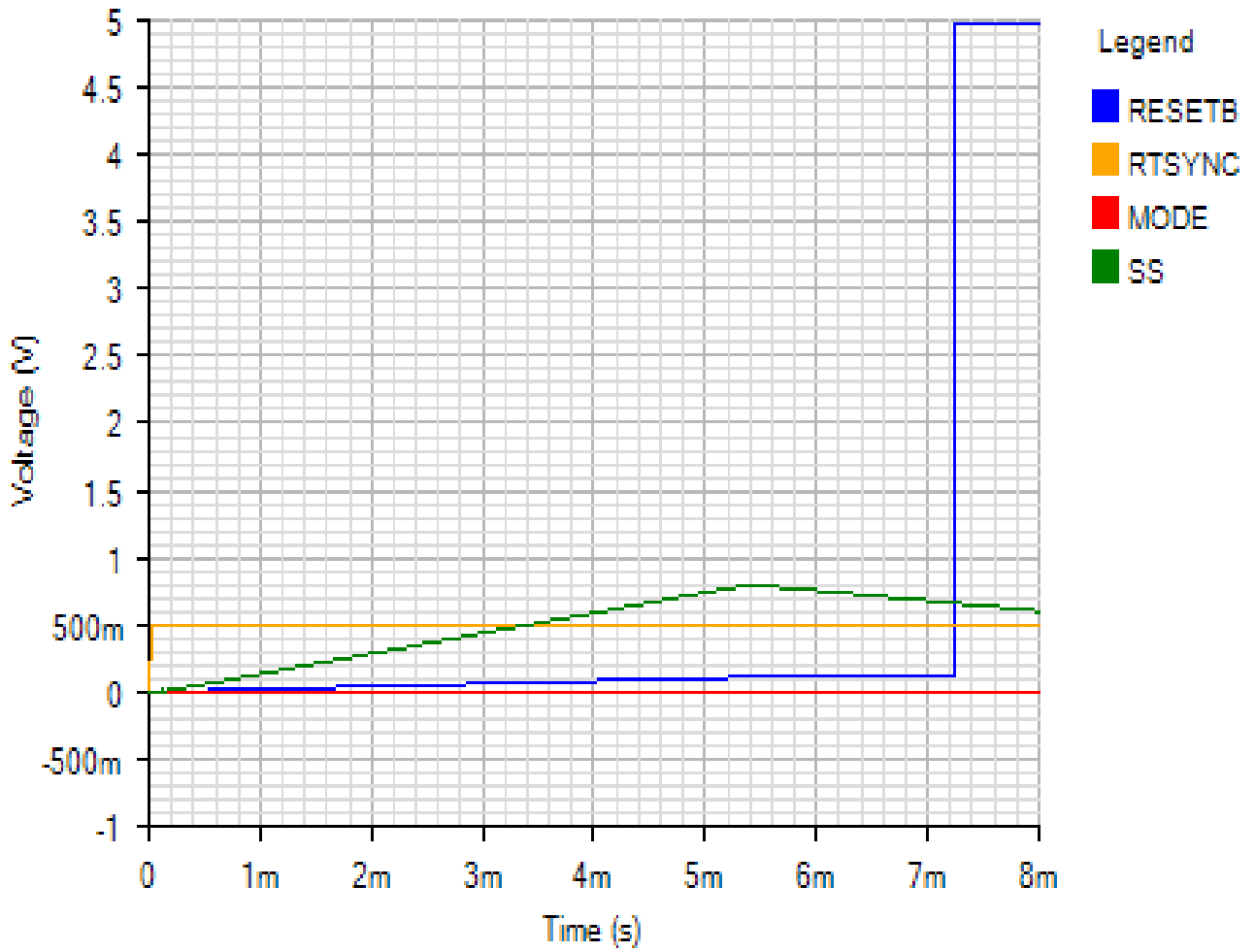
Phase Margin: 69.7° at a crossover frequency of 19kHz



Start Up - Wed Dec 19 2018 16:45:18

IC

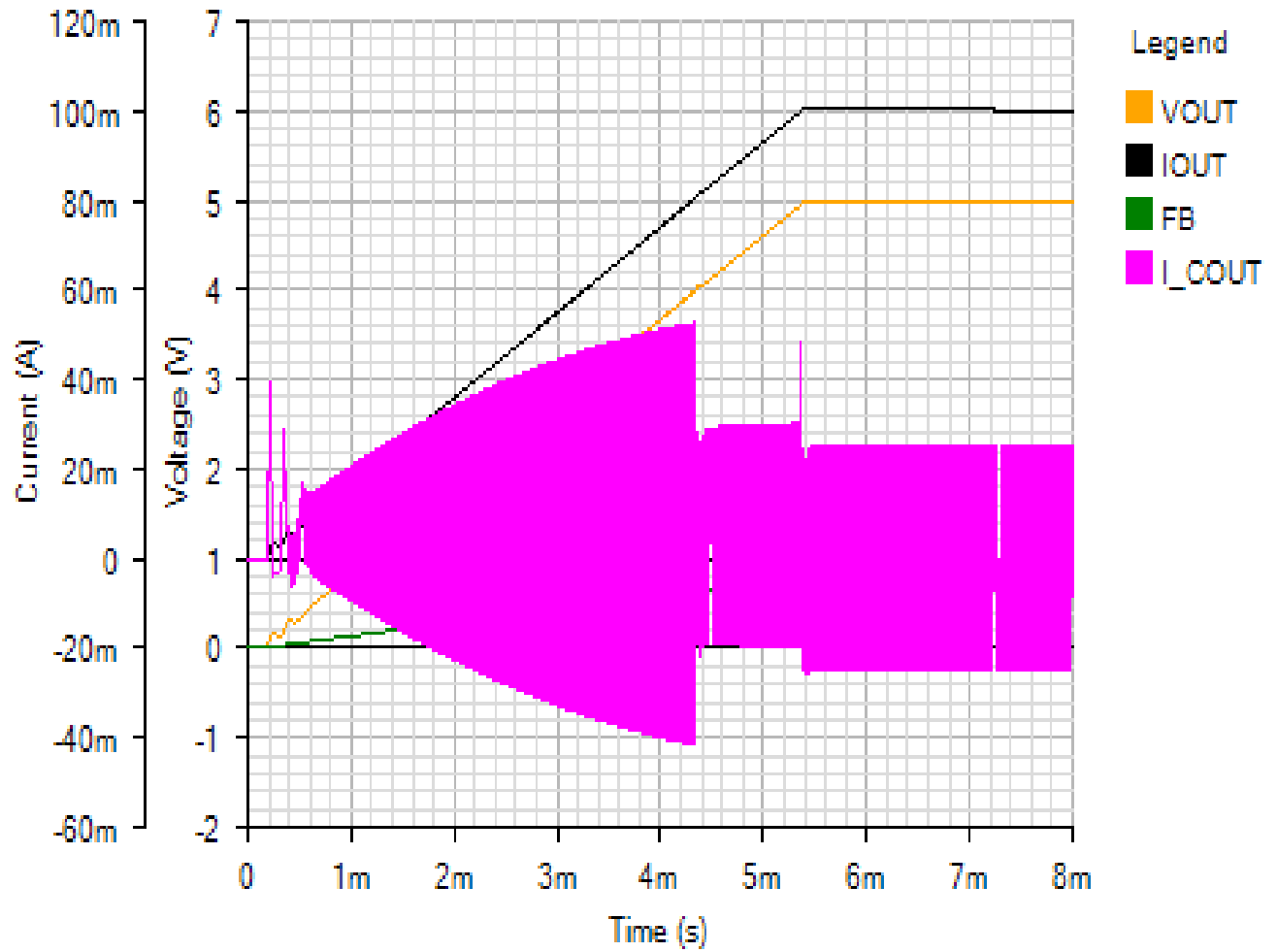
Default





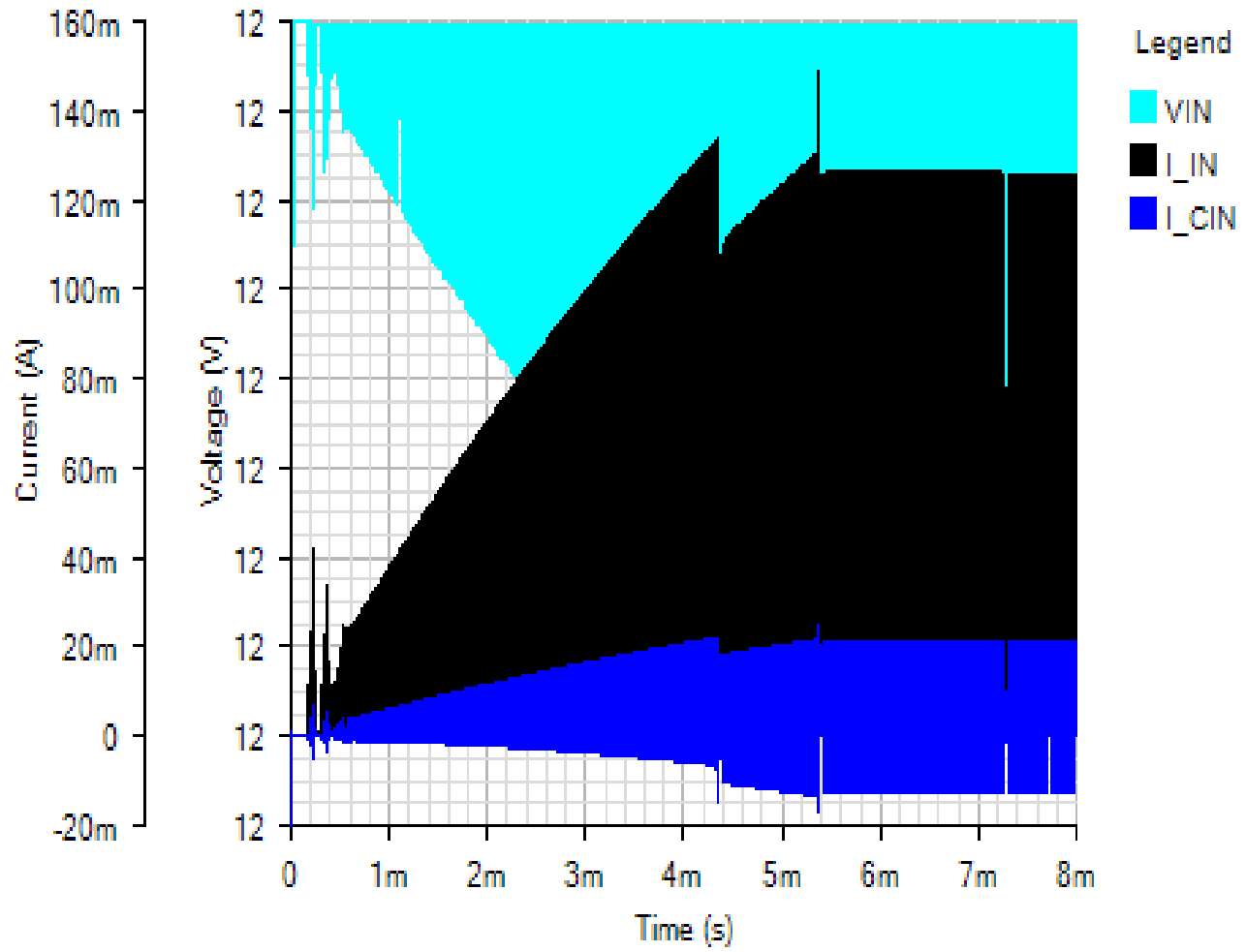
OUTPUT

Default



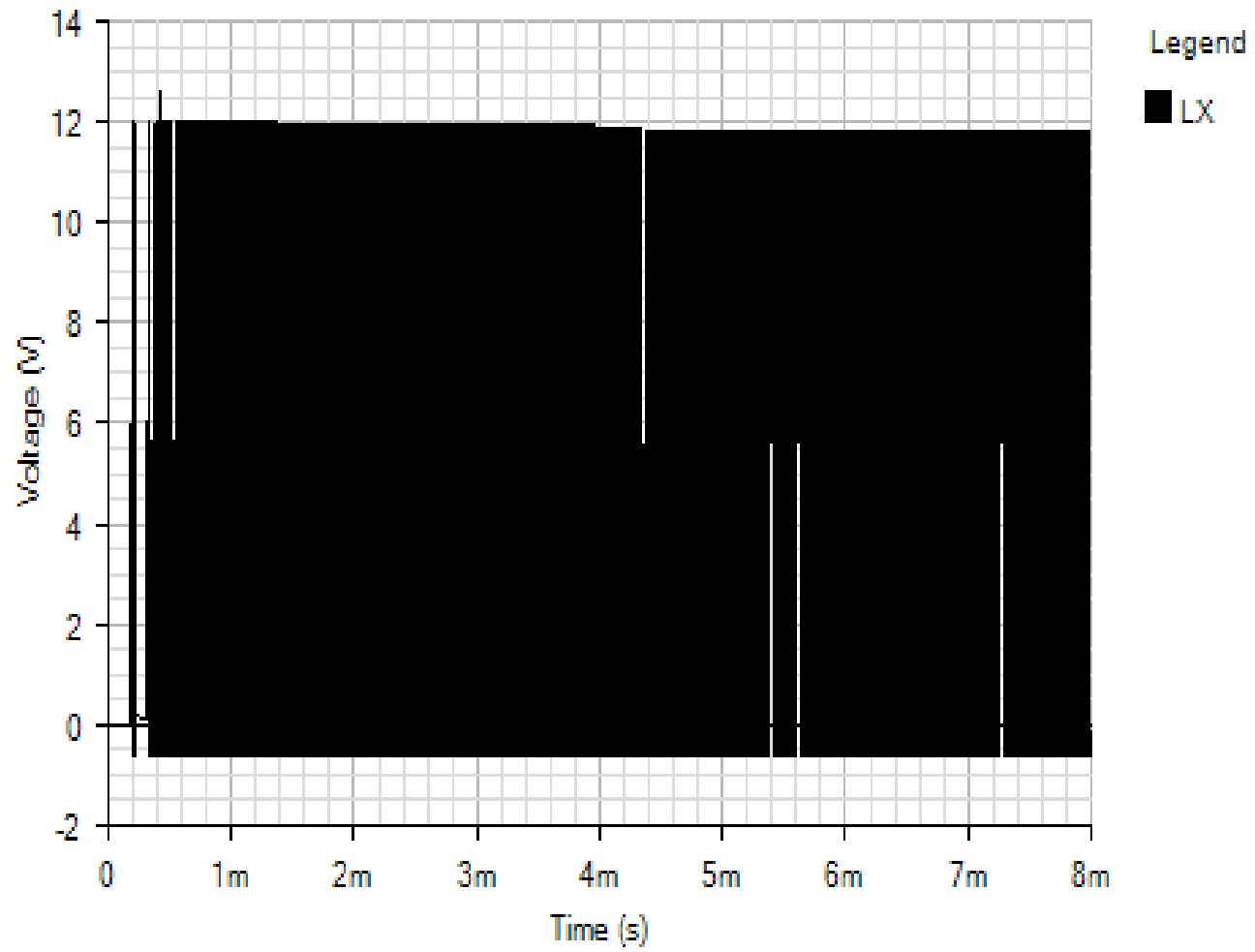
INPUT

Default

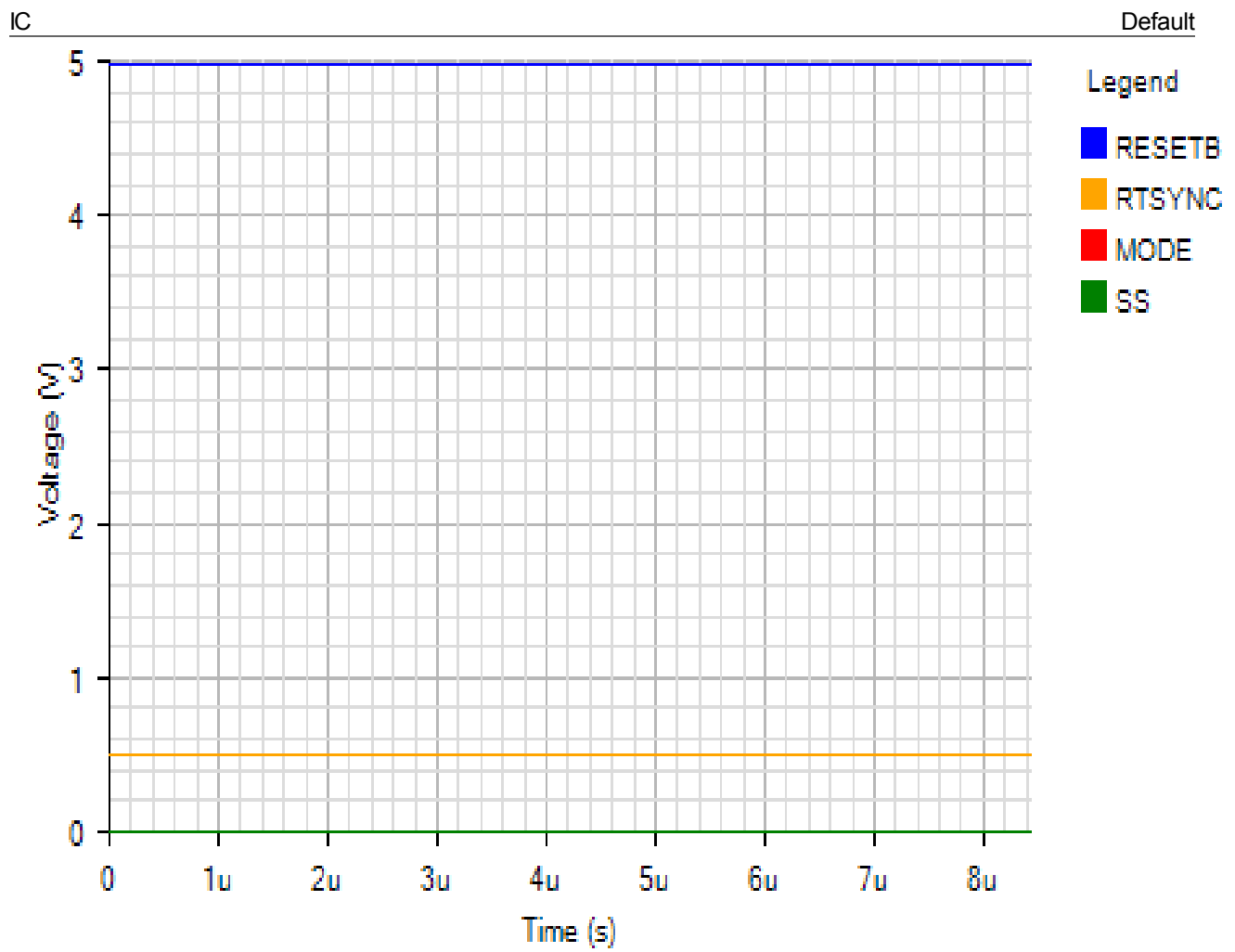


SWITCHING

Default

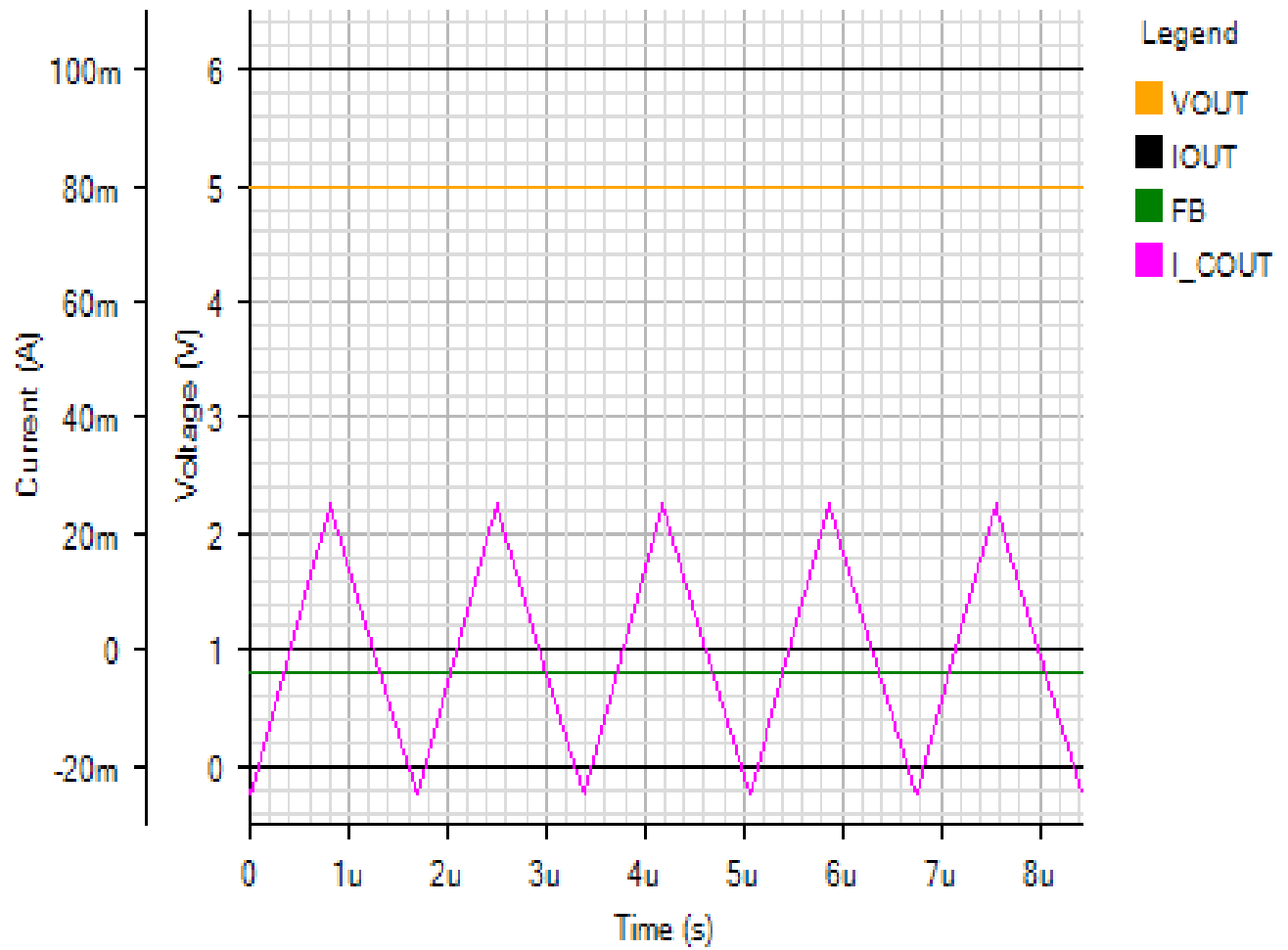


Steady State - Wed Dec 19 2018 16:45:18



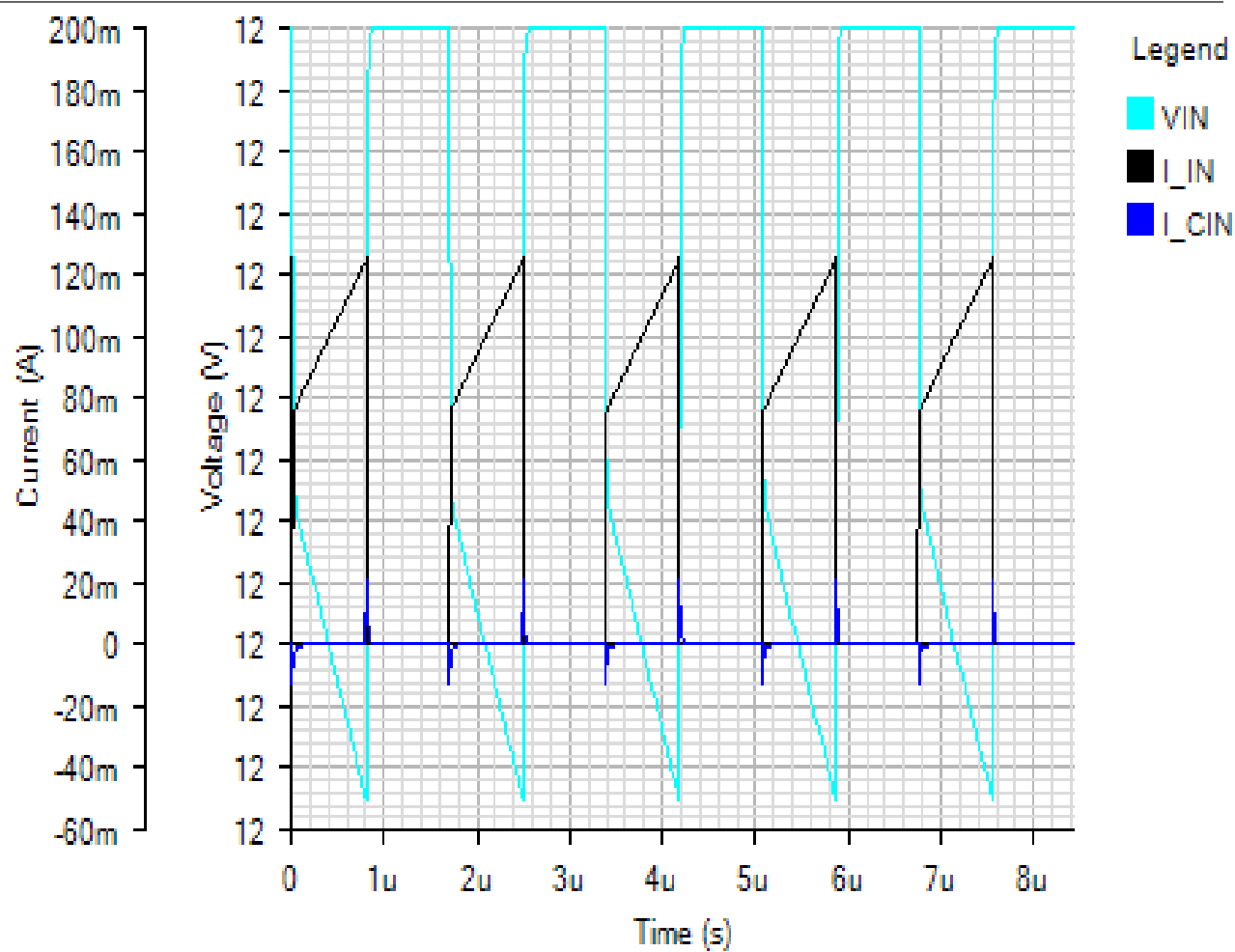
OUTPUT

Default



INPUT

Default



SWITCHING

Default

