



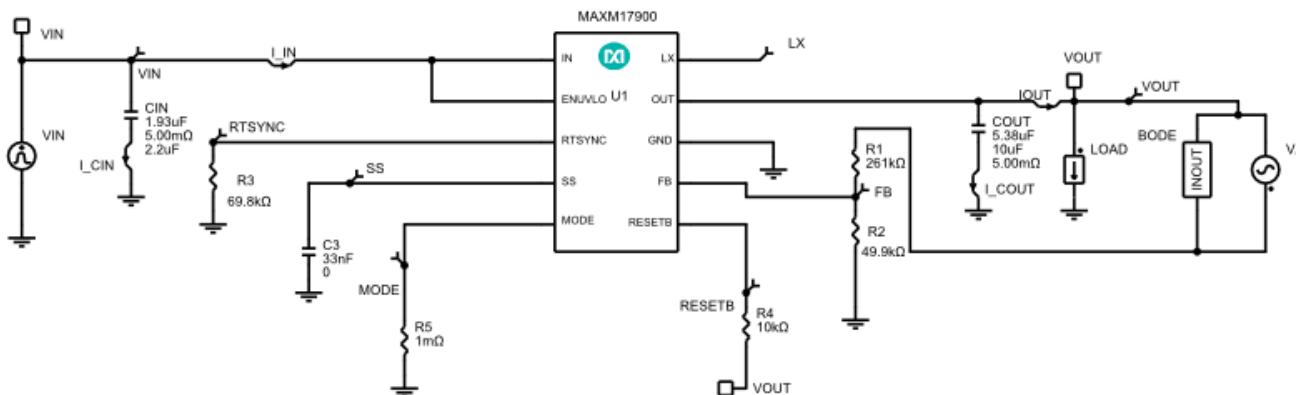
Initial Design

1.0

Design Requirements

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

Schematic



The MAXM17900 MAXM17532 MAXM17552 employs PFM mode at light loads when this feature is selected. If the starting load current is too low, PFM will occur and the POP analysis will fail. It is difficult to predict across all circuit parameter variations precisely at what load current this will occur. Typically the SIMPLIS feature which runs a short transient simulation when POP fails will allow all but AC simulations to run.

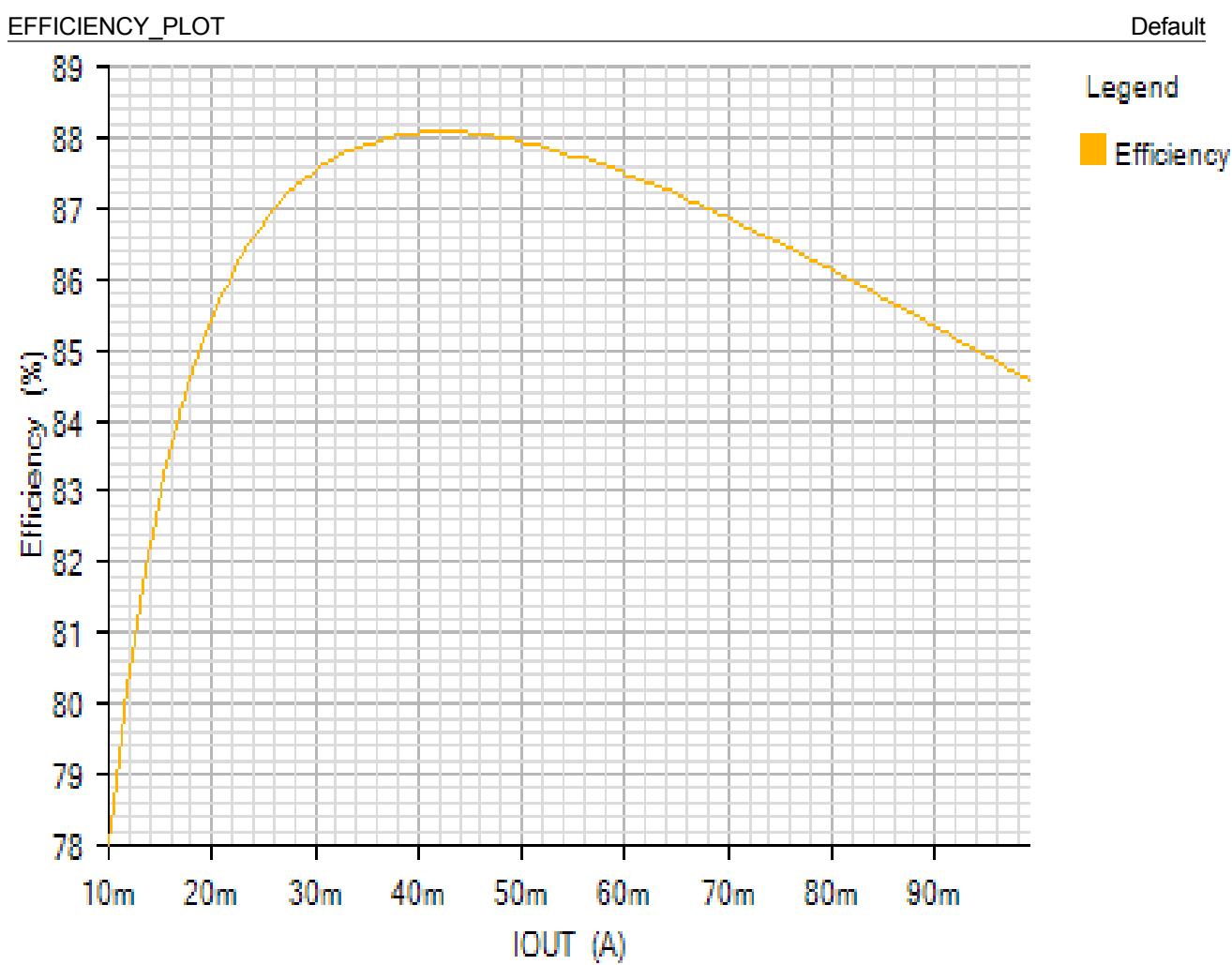
BOM

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 60.8K Ohm 1%

R3	1	ERJ3EKF6982V	Panasonic	0.1W(1/10W) ±100ppm/°C Pad SMD Automotive T/R
R4	1	ERJ3GEYJ103V	Panasonic	Res Thick Film 0603 10K Ohm 5% 0.1W(1/10W) ±200ppm/°C Pad SMD Automotive T/R

Simulation Results

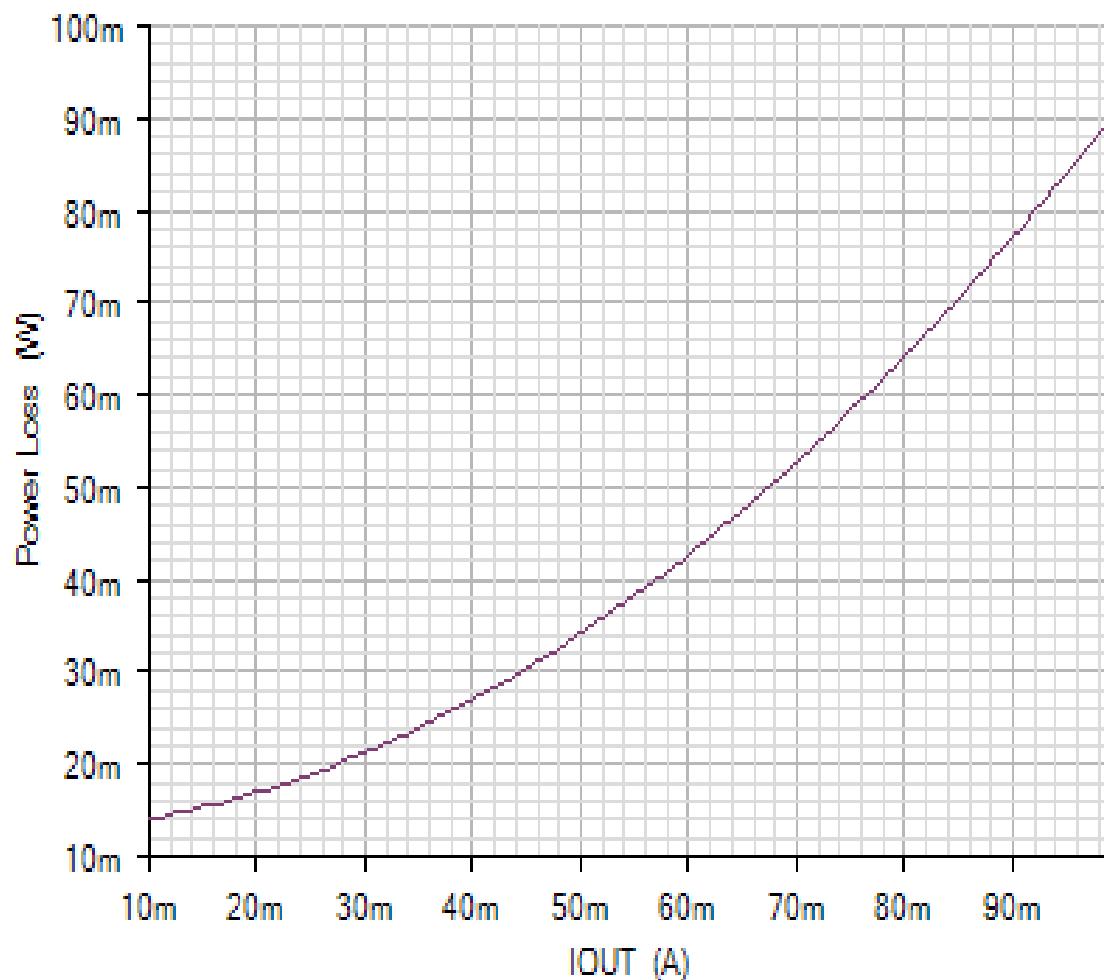
Efficiency - Wed Dec 19 2018 16:45:18



POWER LOSS PLOT

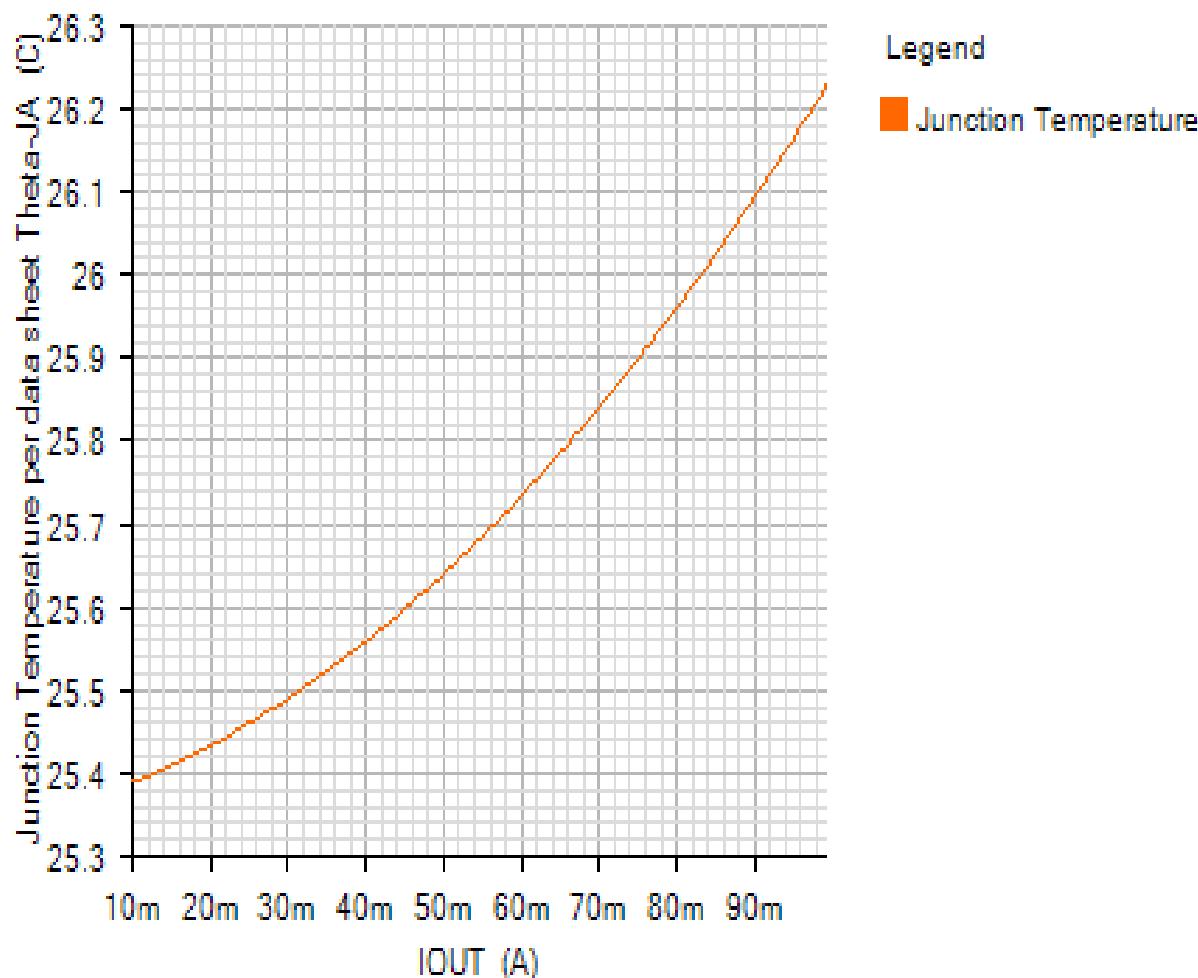
Default

Legend

█ Output

JUNCTION_TEMPERATURE_PLOT

Default

Losses

Component

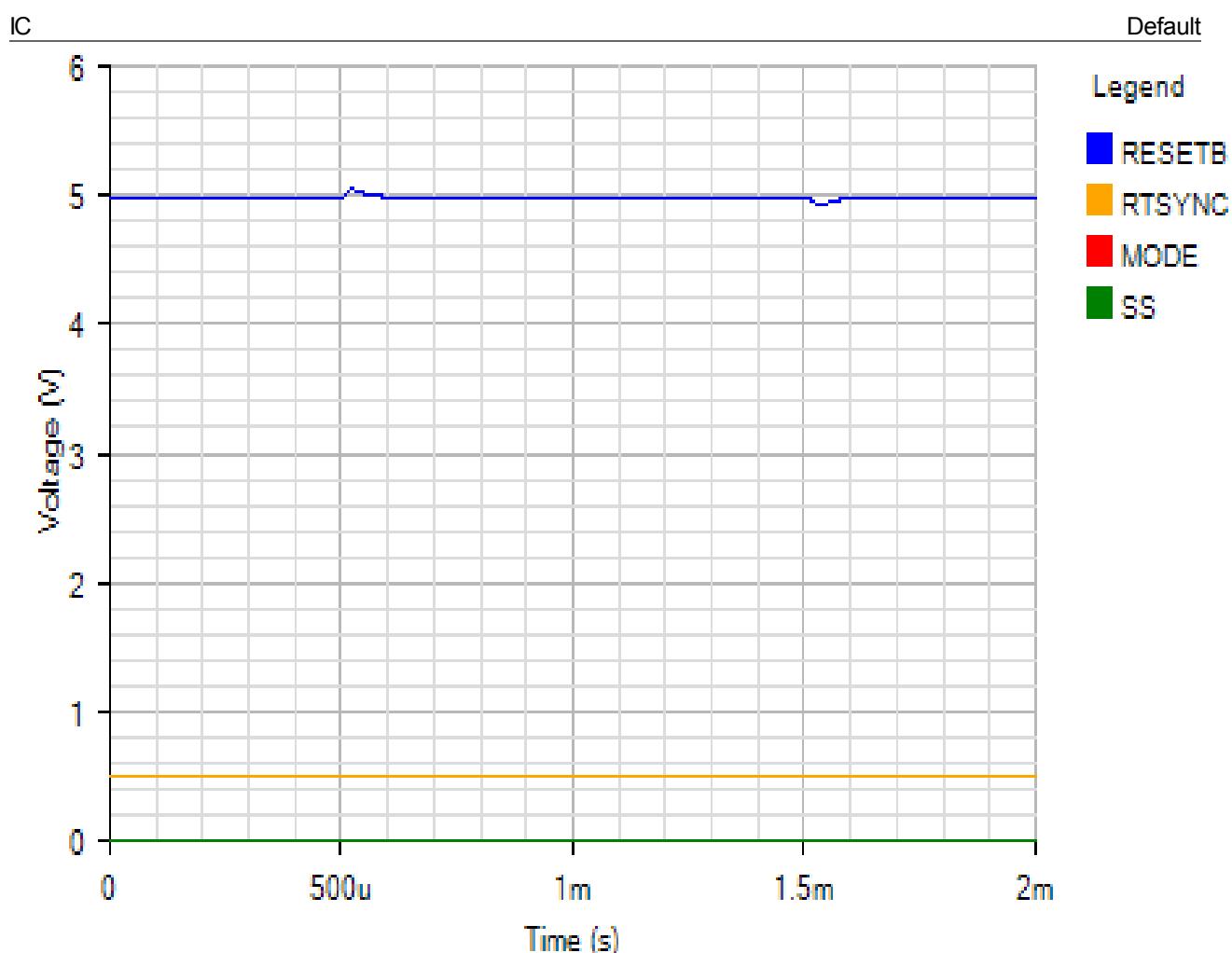
Loss (W)

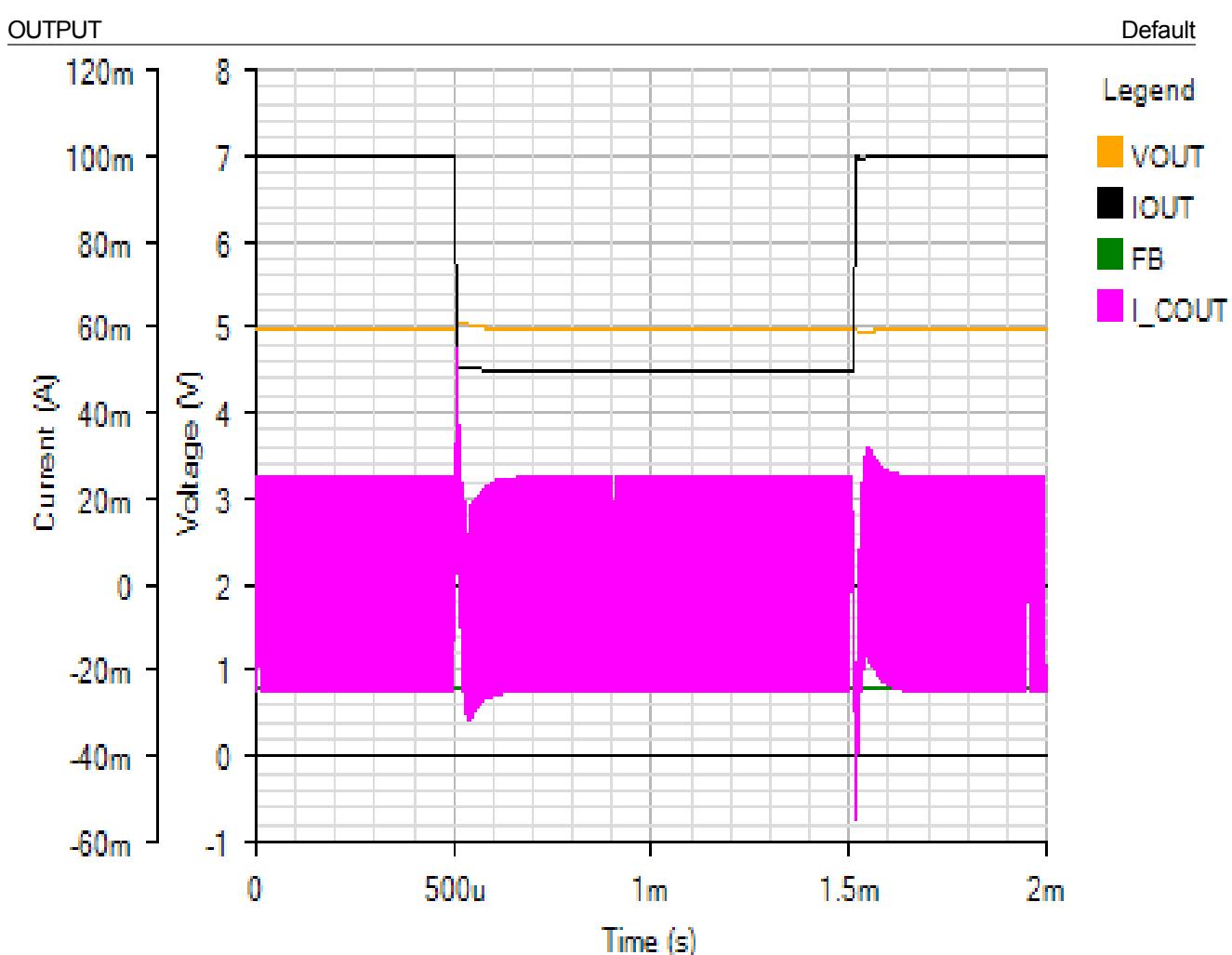
% of total

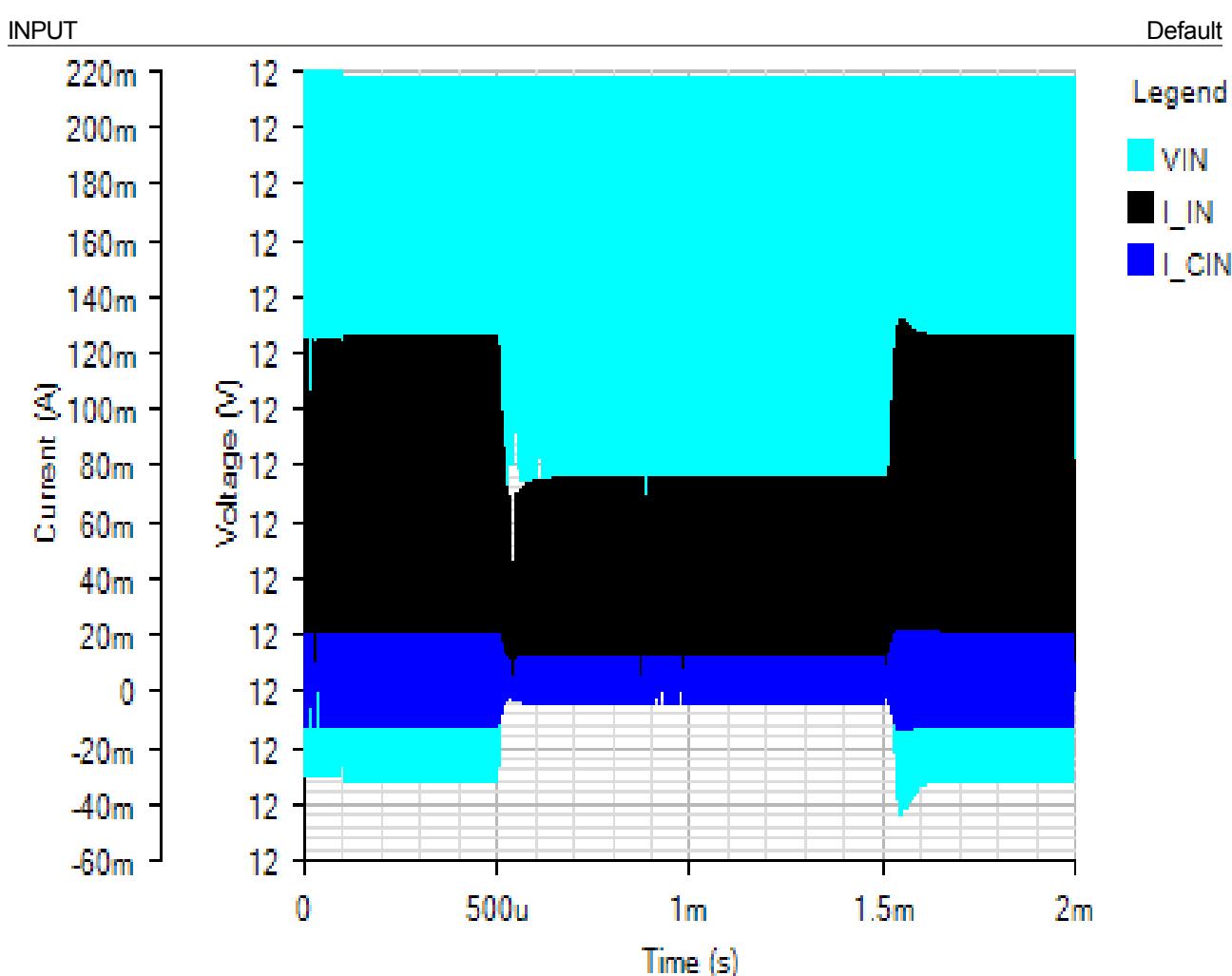


Component	Loss (W)	% of total
Inductor losses	0.05	55.6
Losses in IC	0.04	44.4
Total	0.09	100

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





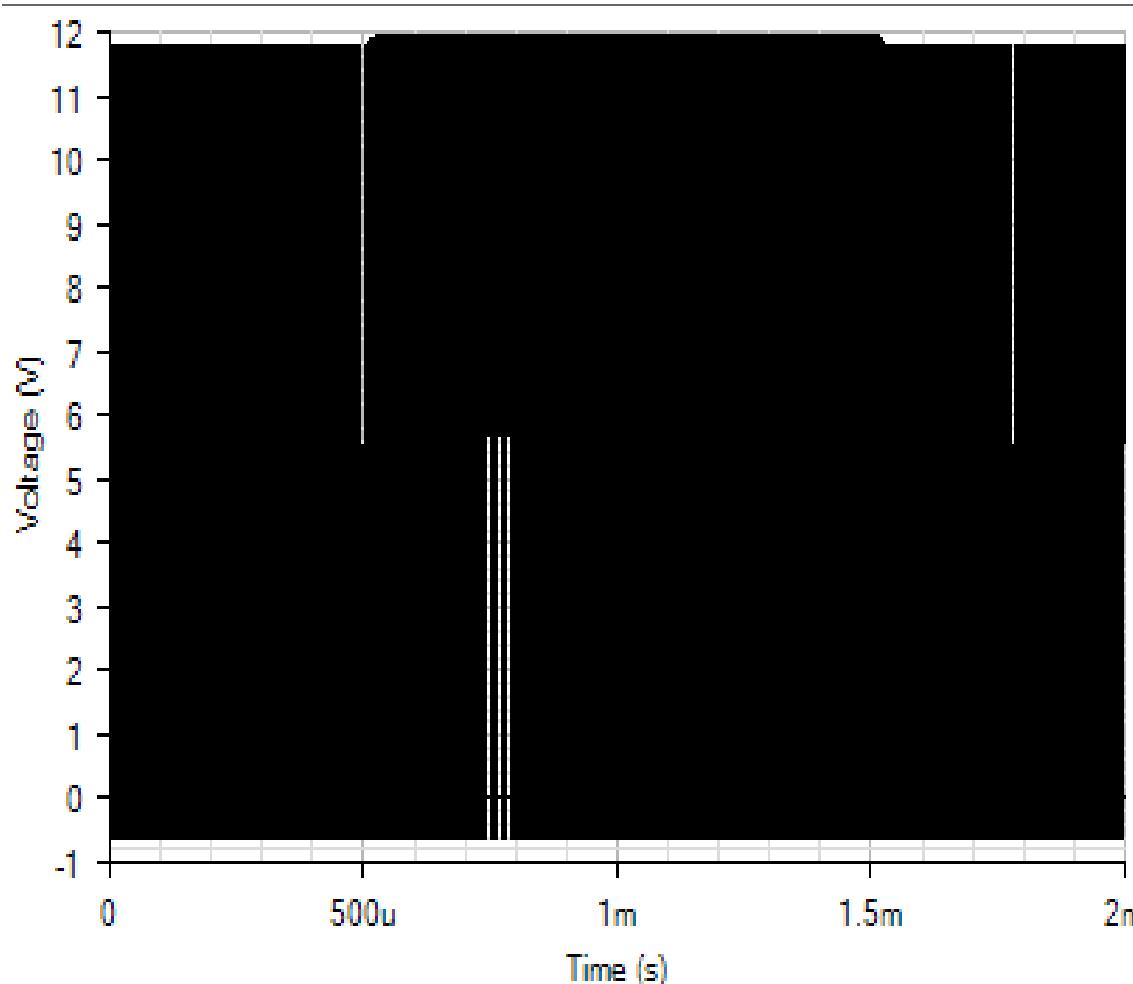


SWITCHING

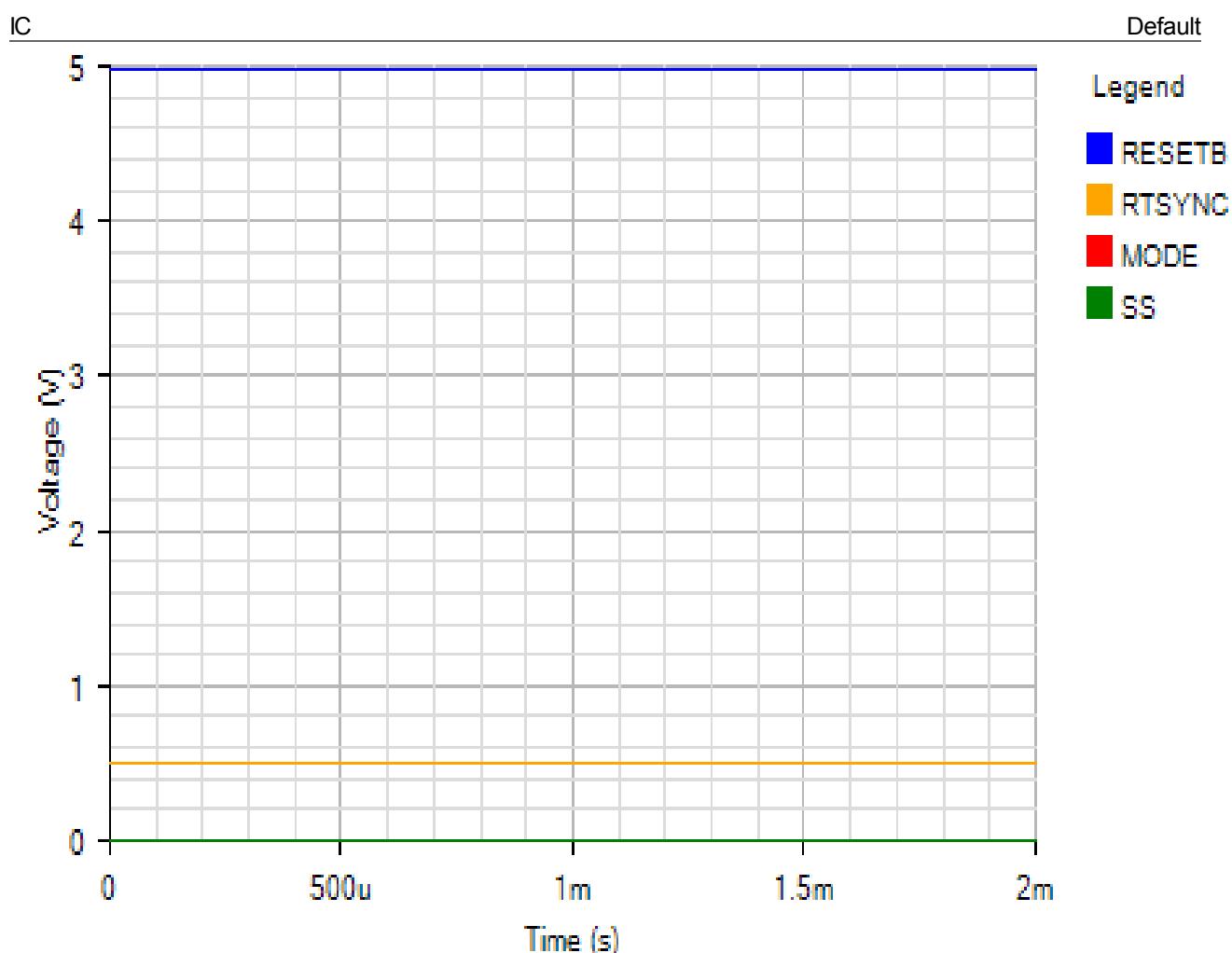
Default

Legend

■ LX

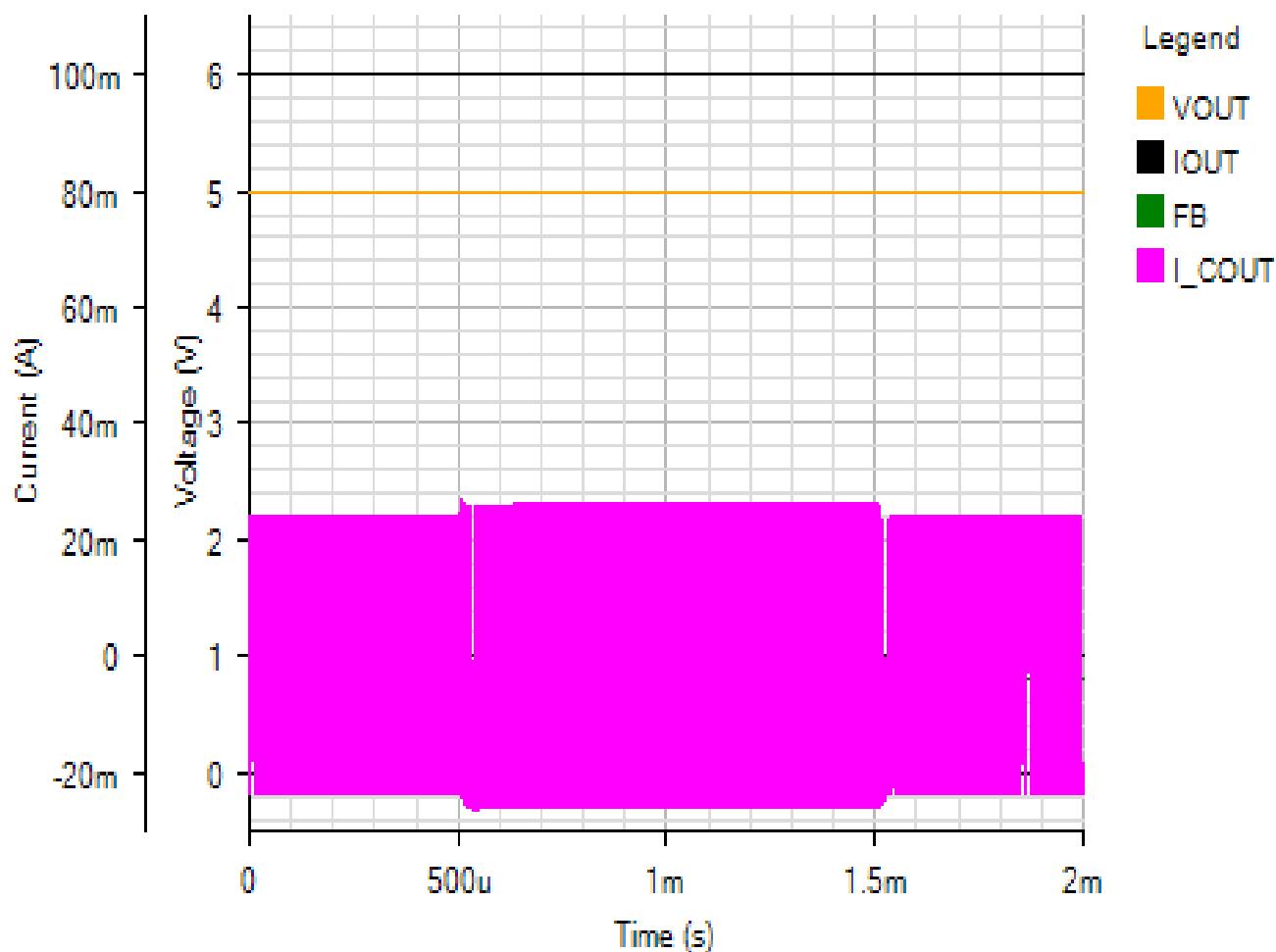


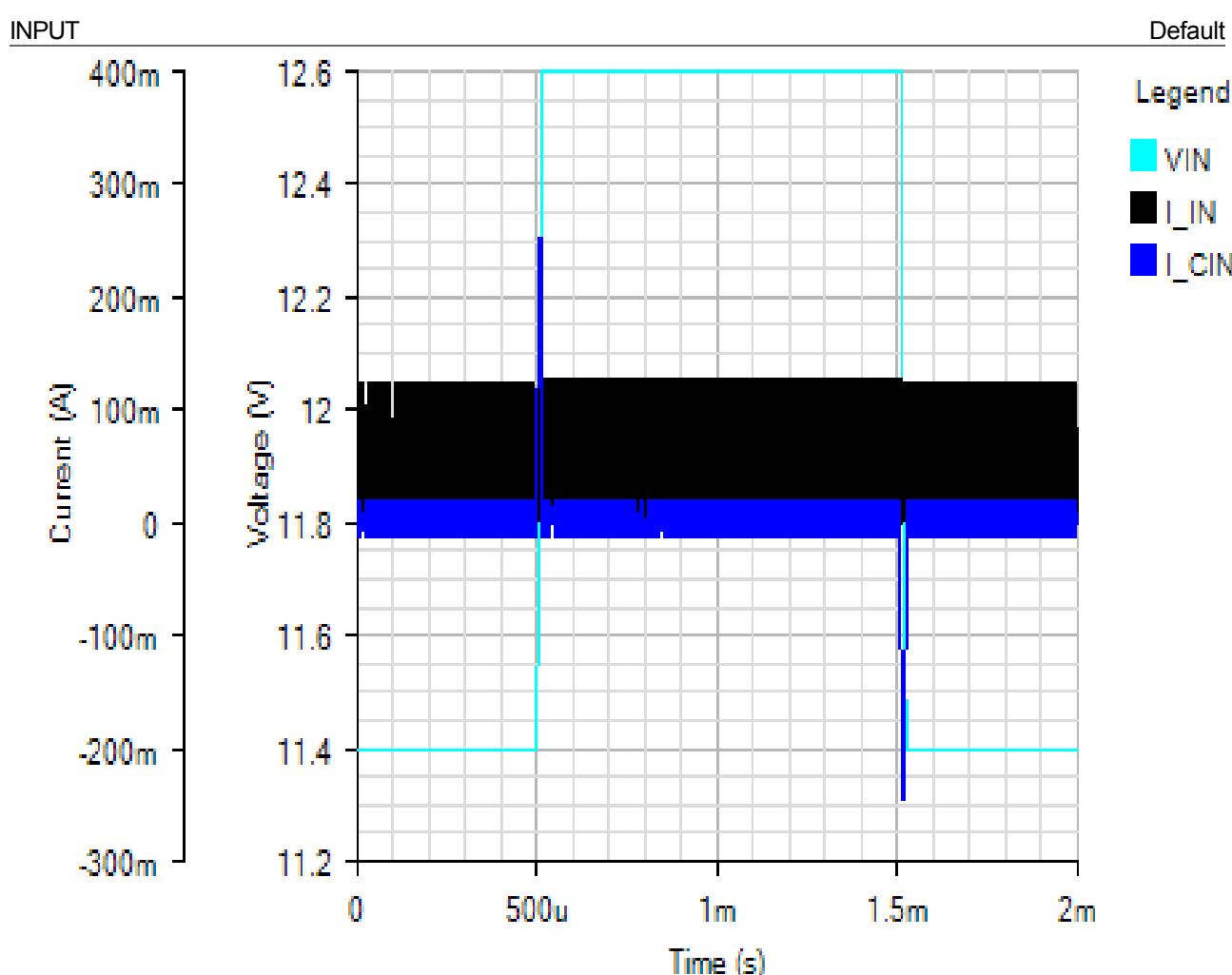
Line Transient - Wed Dec 19 2018 16:45:18



OUTPUT

Default



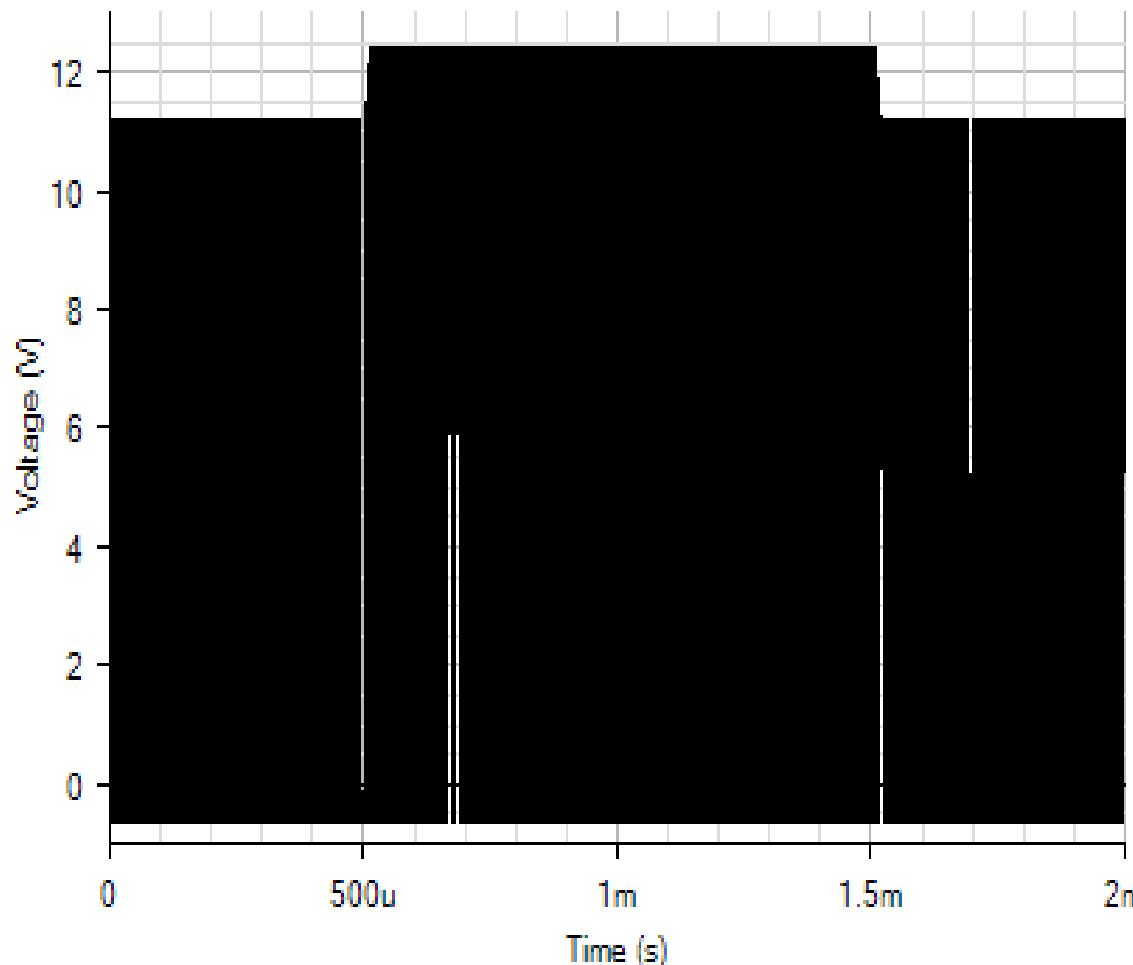


SWITCHING

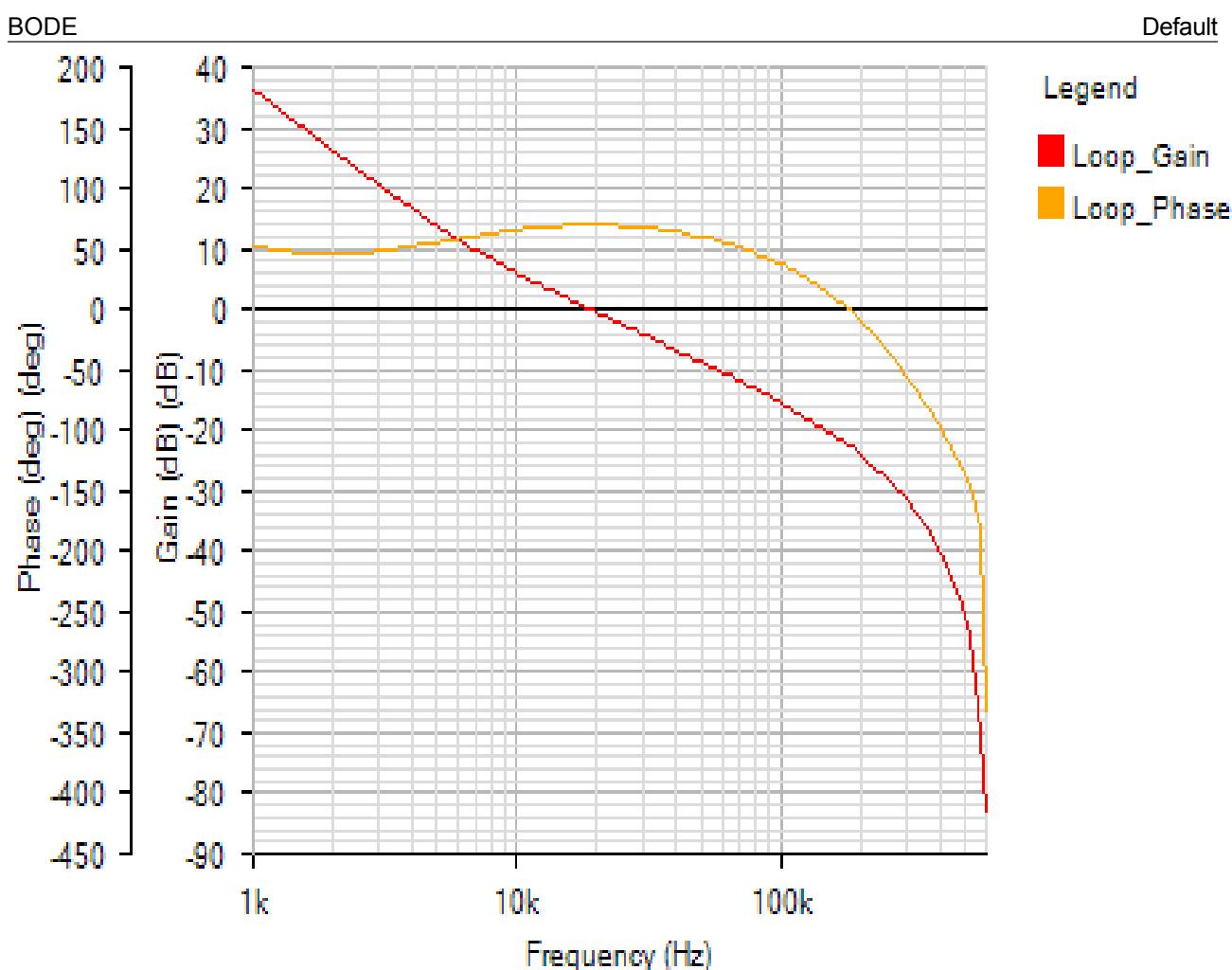
Default

Legend

LX



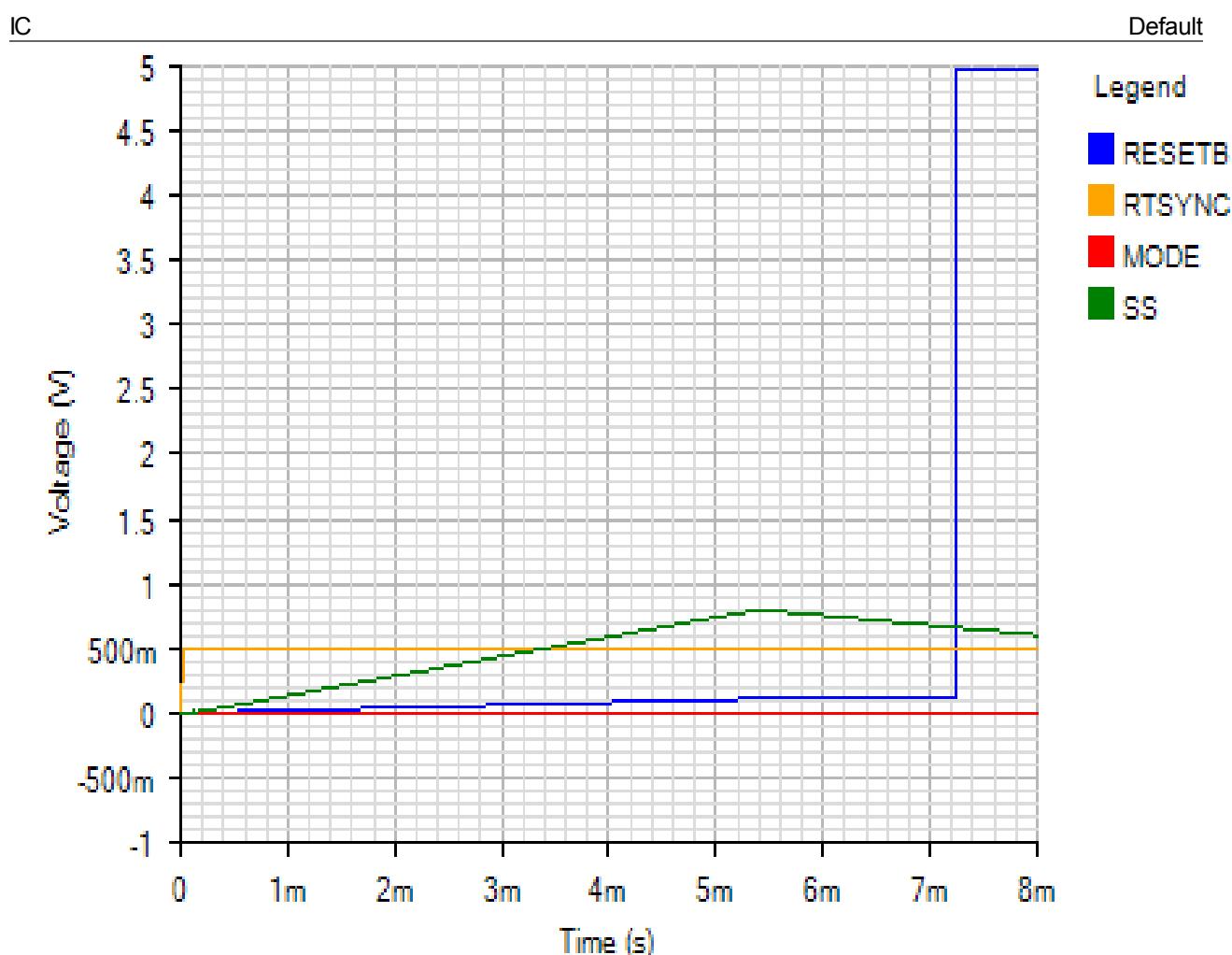
AC Loop - Wed Dec 19 2018 16:45:18

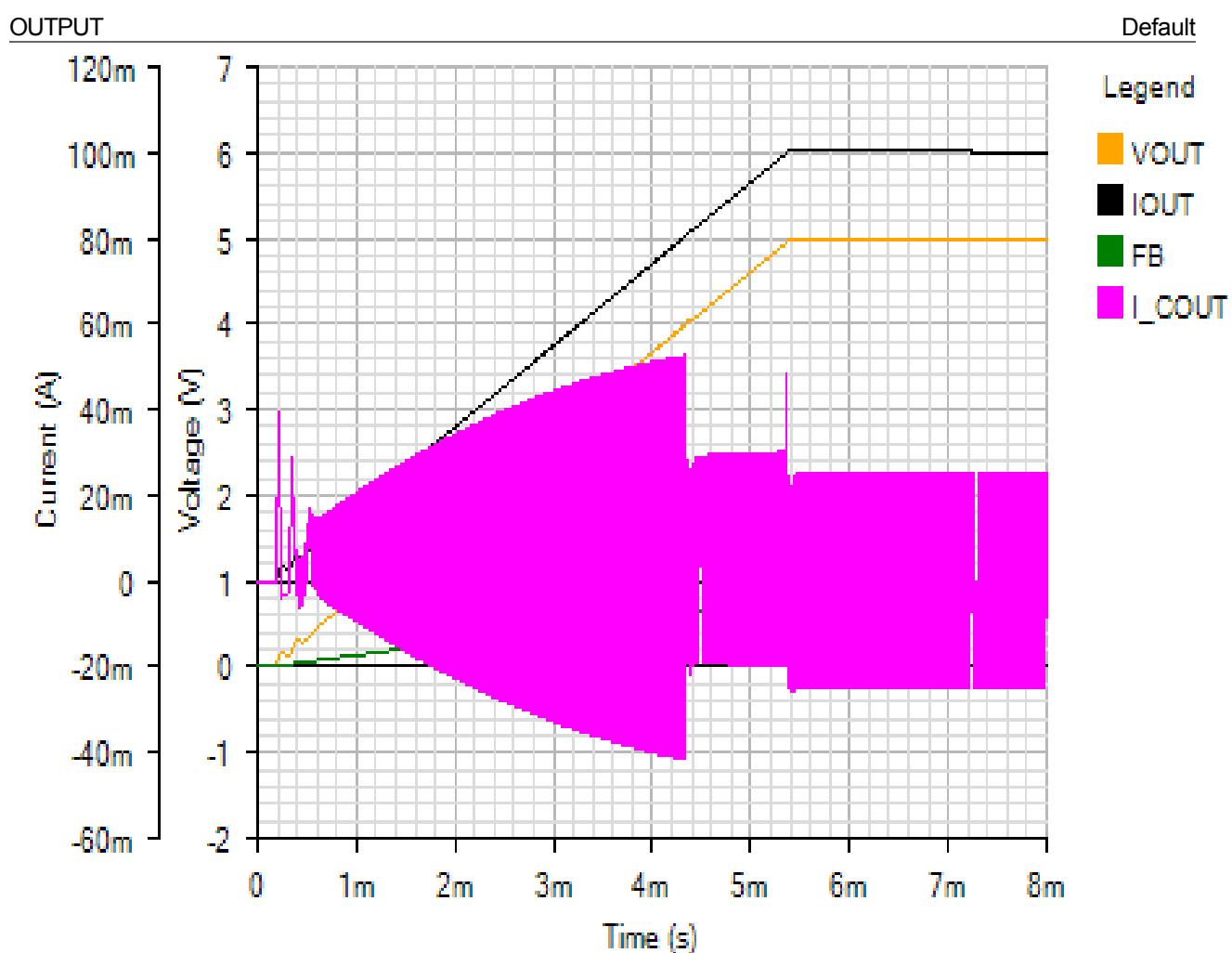


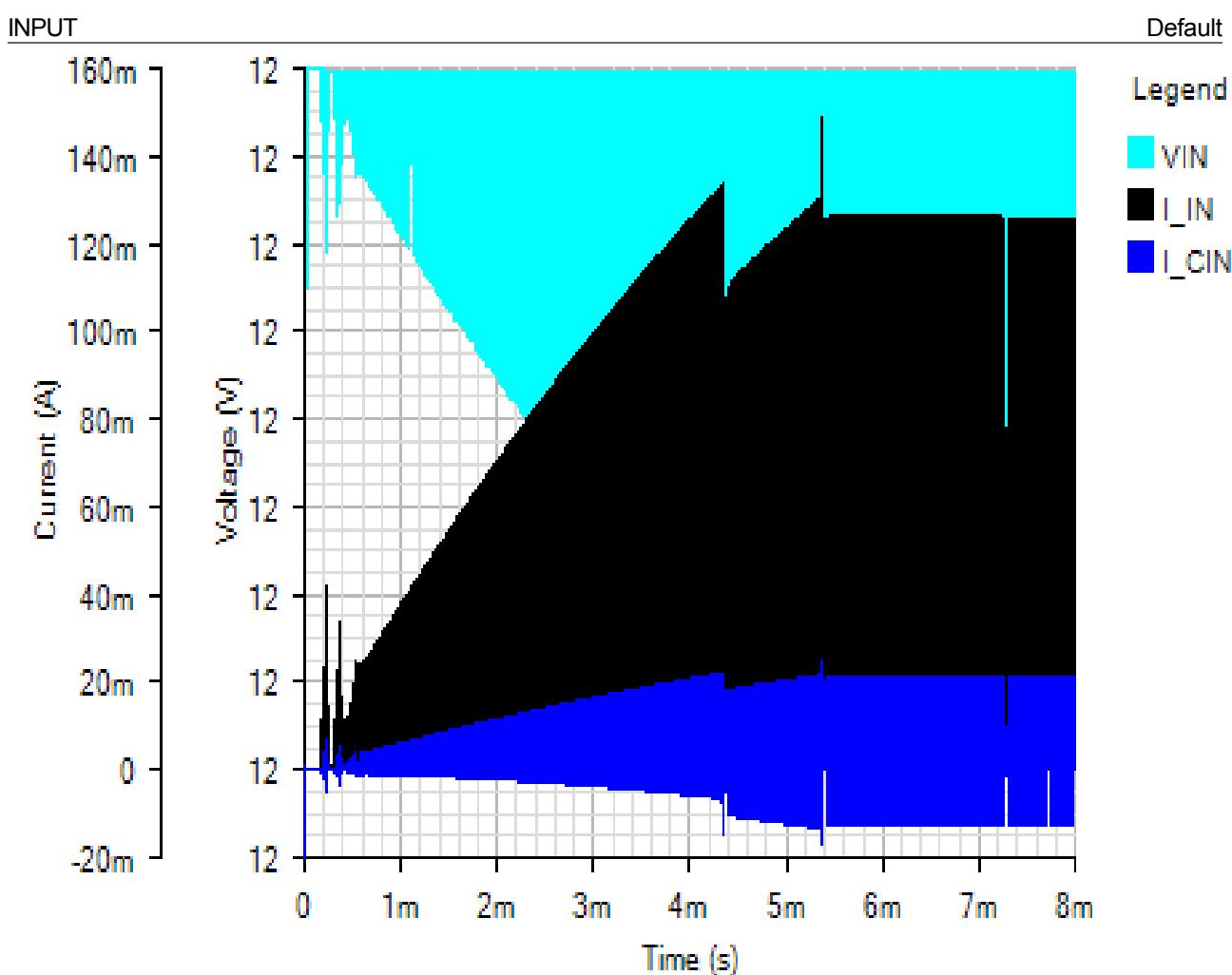
Phase Margin: 69.7° at a crossover frequency of 19kHz

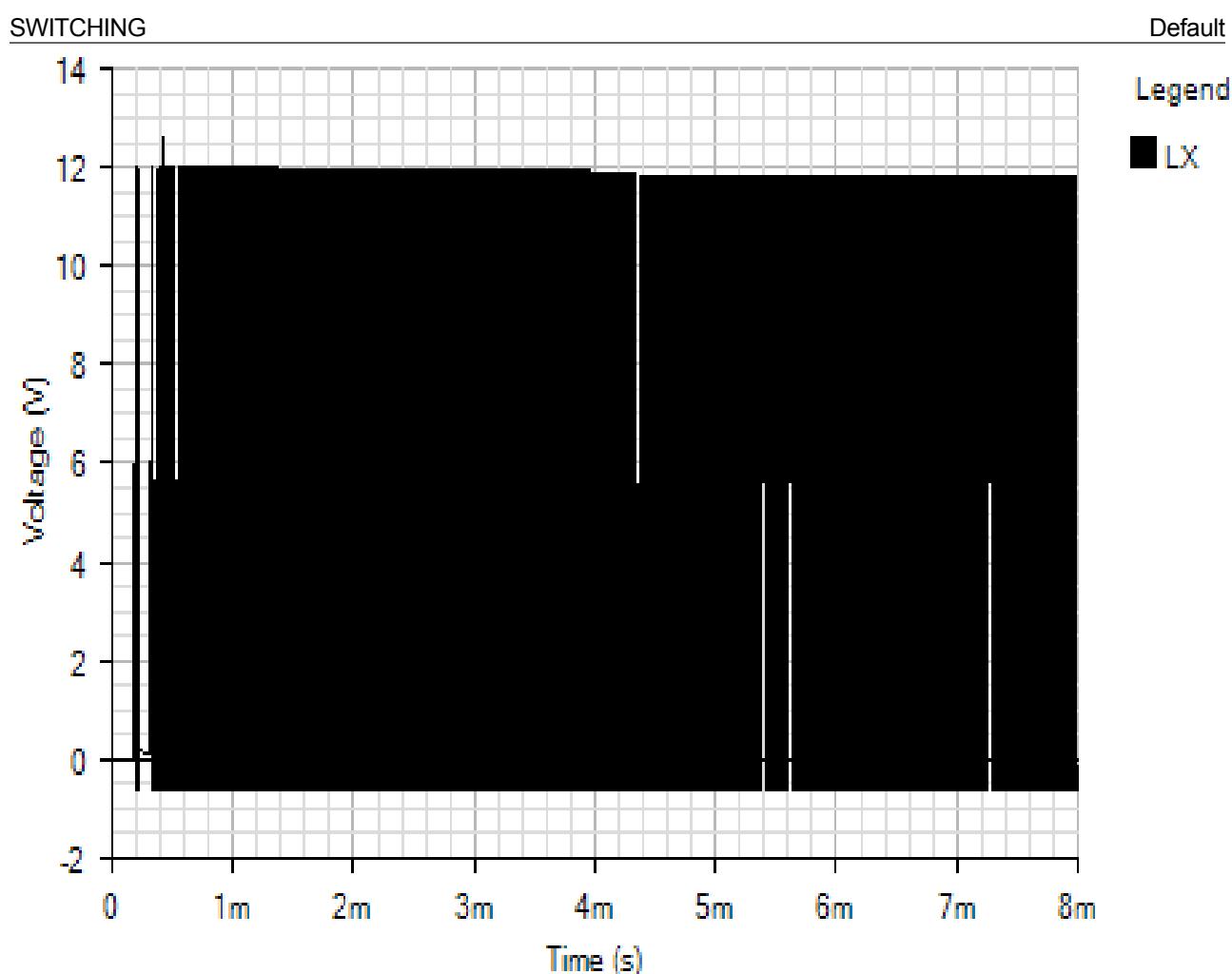
20 30 40 50 60 70 80 90 100 110

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

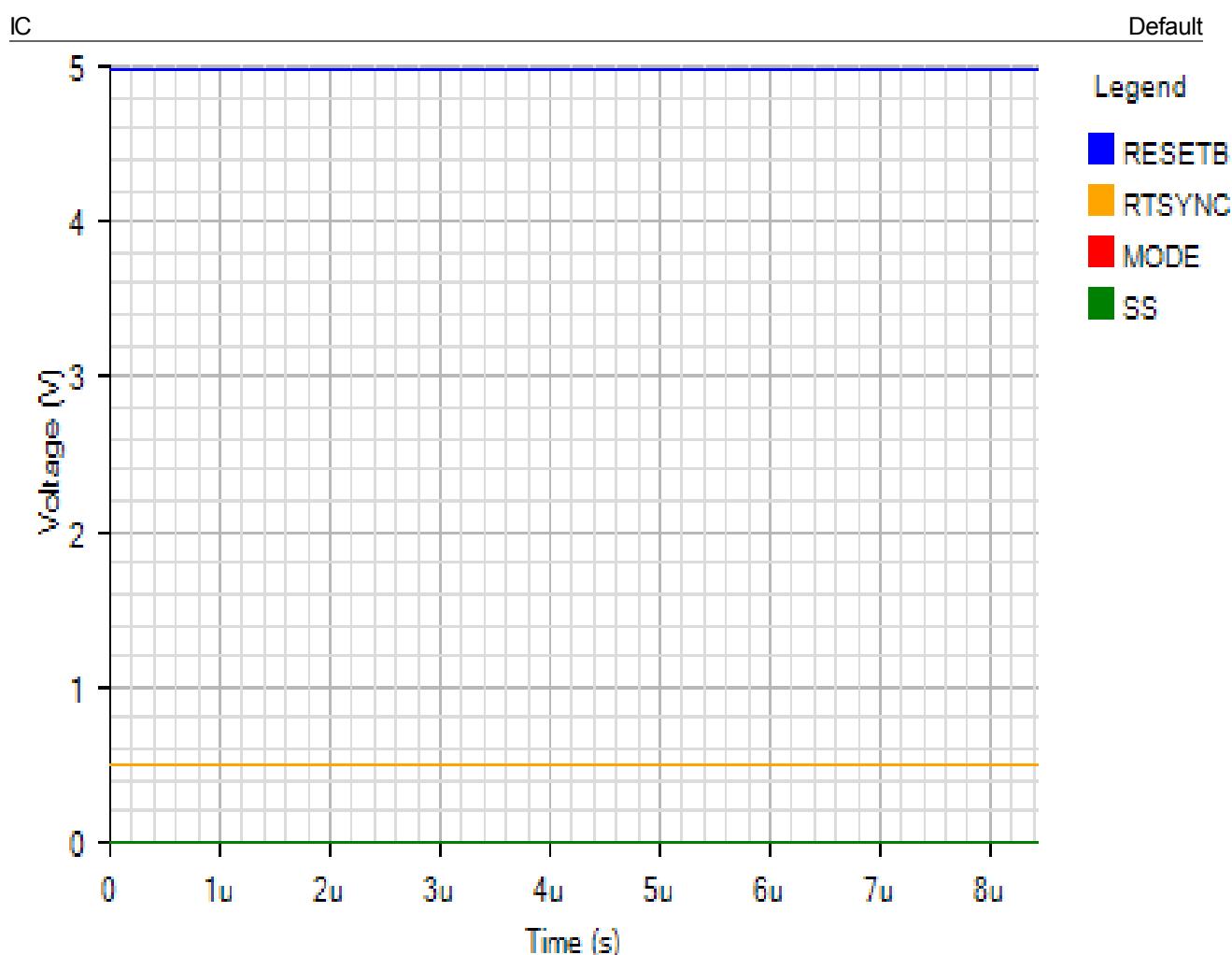






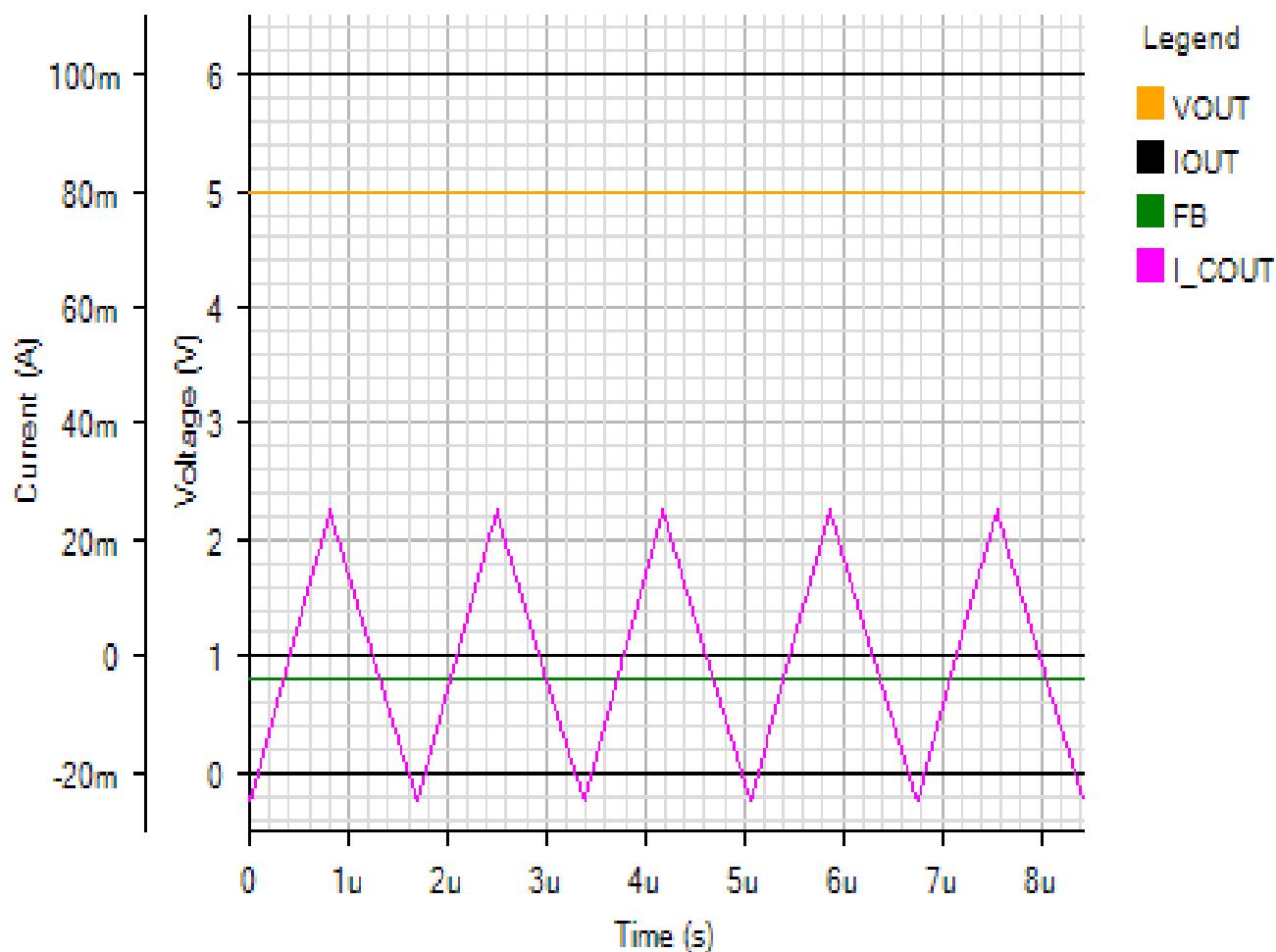


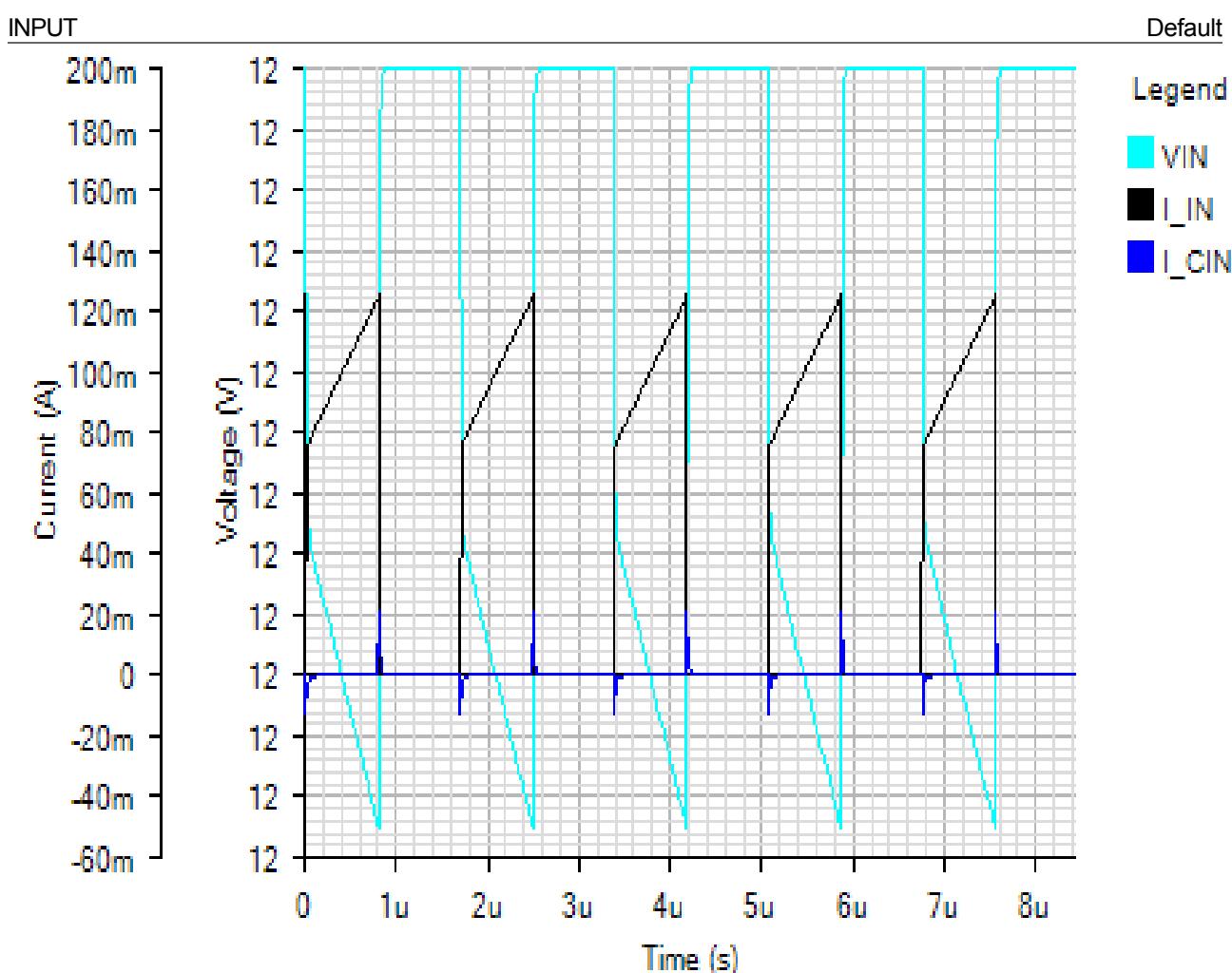
Steady State - Wed Dec 19 2018 16:45:18



OUTPUT

Default





SWITCHING

Default

Legend

■ LX

