



## Initial Design

1.0

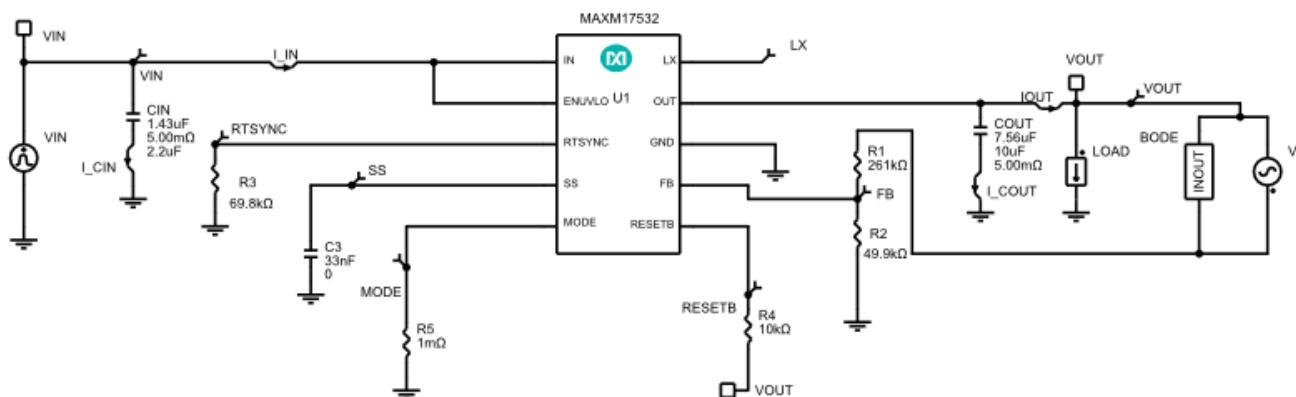
### Design Requirements

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Parameter	Value
Minimim Input Voltage	10V
Nominal Input Voltage	24V
Maximum Input Voltage	42V
Input Steady-State Ripple	0.48V
Input Undervoltage Lockout Level	4.2V
Output Voltage	5V
Output Current	0.1A
Output Voltage Load Step Overshoot/Undertshoot	0.15V
BOM Priority	Cost
Switching Frequency	600kHz
MODE of Operation	PWM
Soft Start Time	5.1ms
Ambient Temperature	25°C

## Schematic

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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

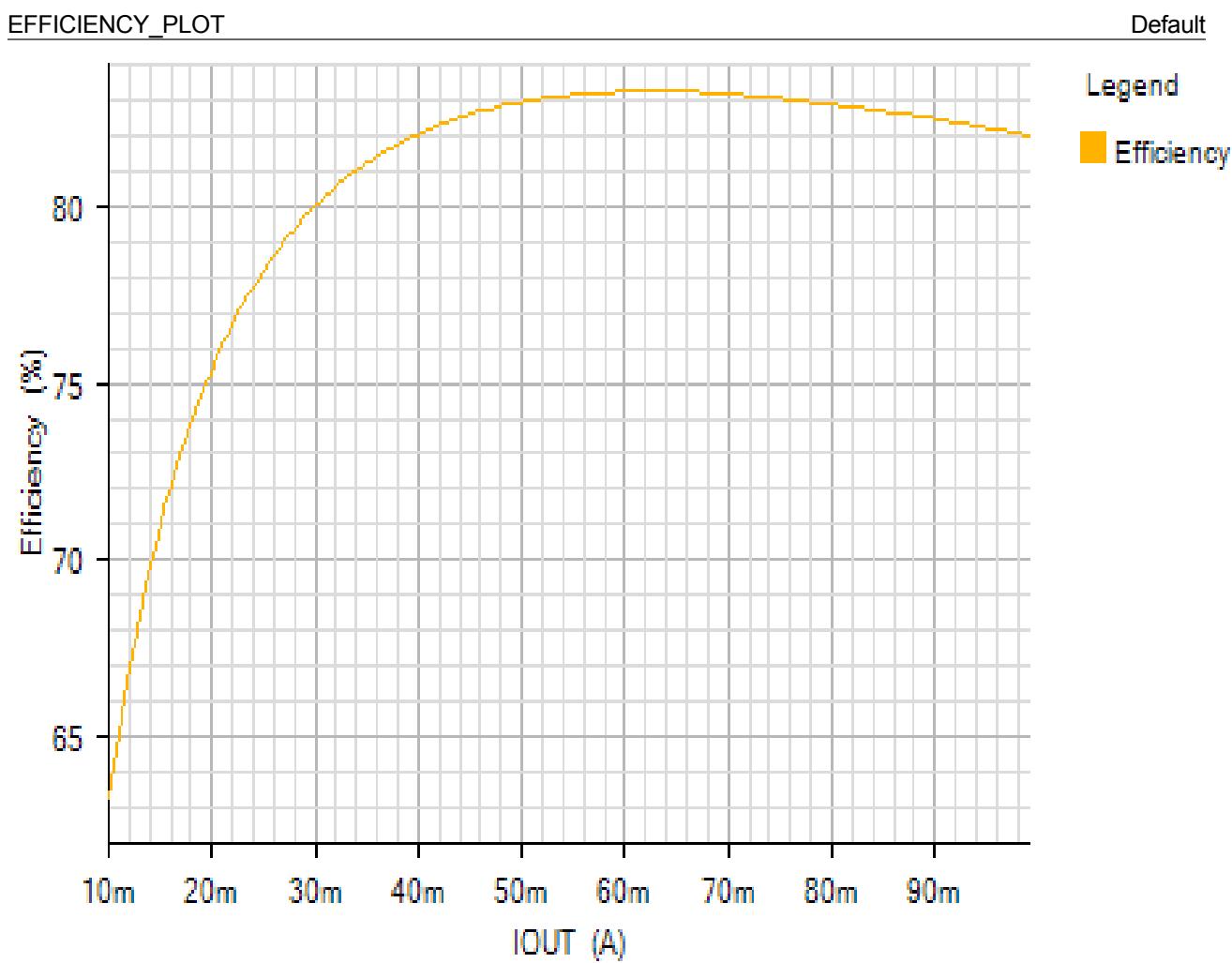
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Ref	Qty	Part Number	Manufacturer	Description
U1	1	MAXM17532	User-Defined	IC
C3	1	ECHU1H333GX5	Panasonic	Cap Film 0.033uF 50V PPS 2% (3.2 X 2.5 X 2.1mm) Stacked 125°C T/R
CIN	1	GRM31CR71H225KA88	Murata	Cap Ceramic 2.2uF 50V X7R 10% SMD 1206 125C
COUT	1	C2012X7R1A106K125AC	TDK	Cap Ceramic 10uF 10V X7R 10% SMD 0805 125C Plastic T/R
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%

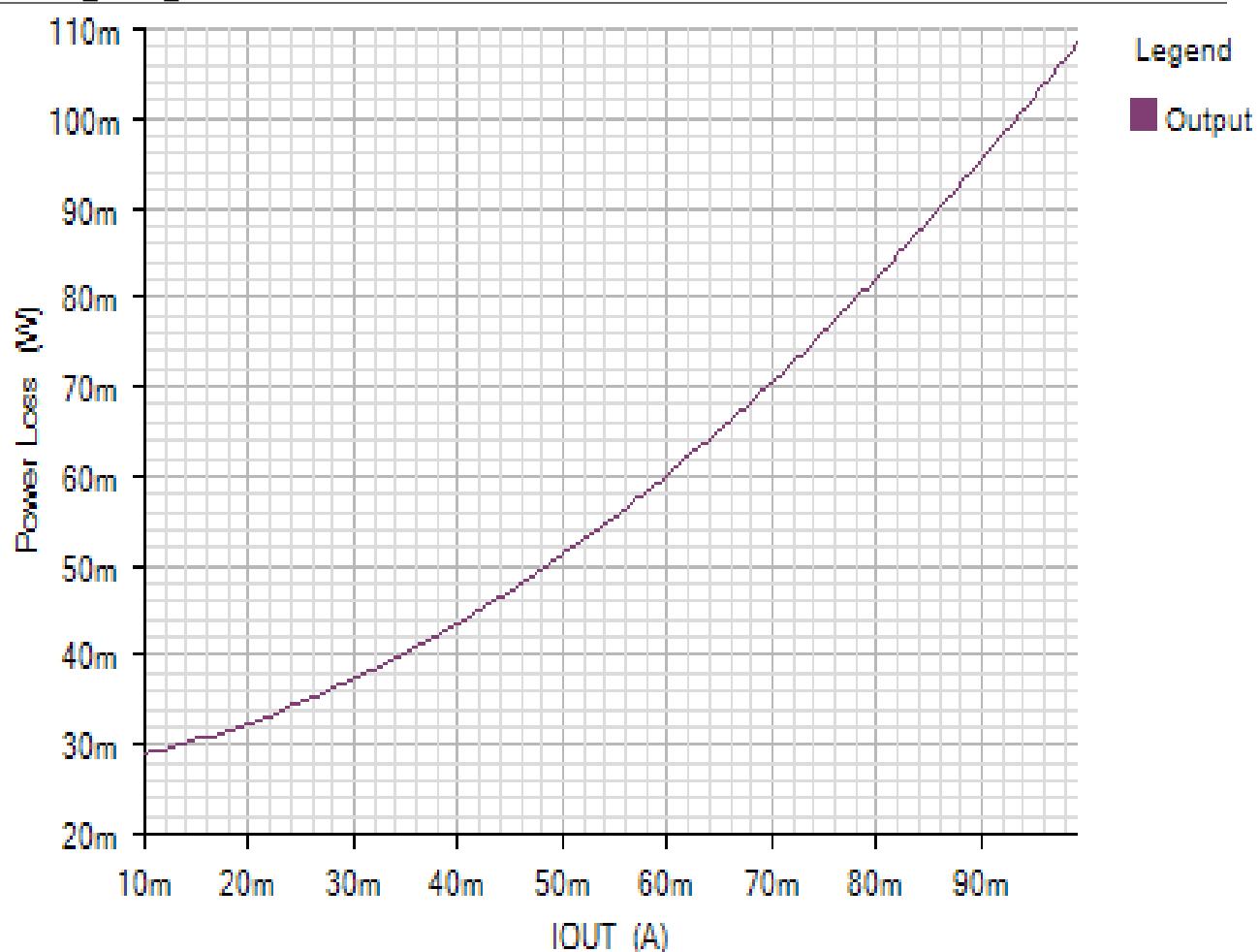
R3	1	ERJ3EKF6982V	Panasonic	0.1W(1/10W) ±100ppm/°C Pad SMD Automotive T/R
R4	1	ERJ2GEJ103X	Panasonic	Res Thick Film 0402 10K Ohm 5% 0.1W(1/10W) ±200ppm/°C Pad SMD Automotive T/R

## Simulation Results

Efficiency - Mon Nov 26 2018 15:28:33

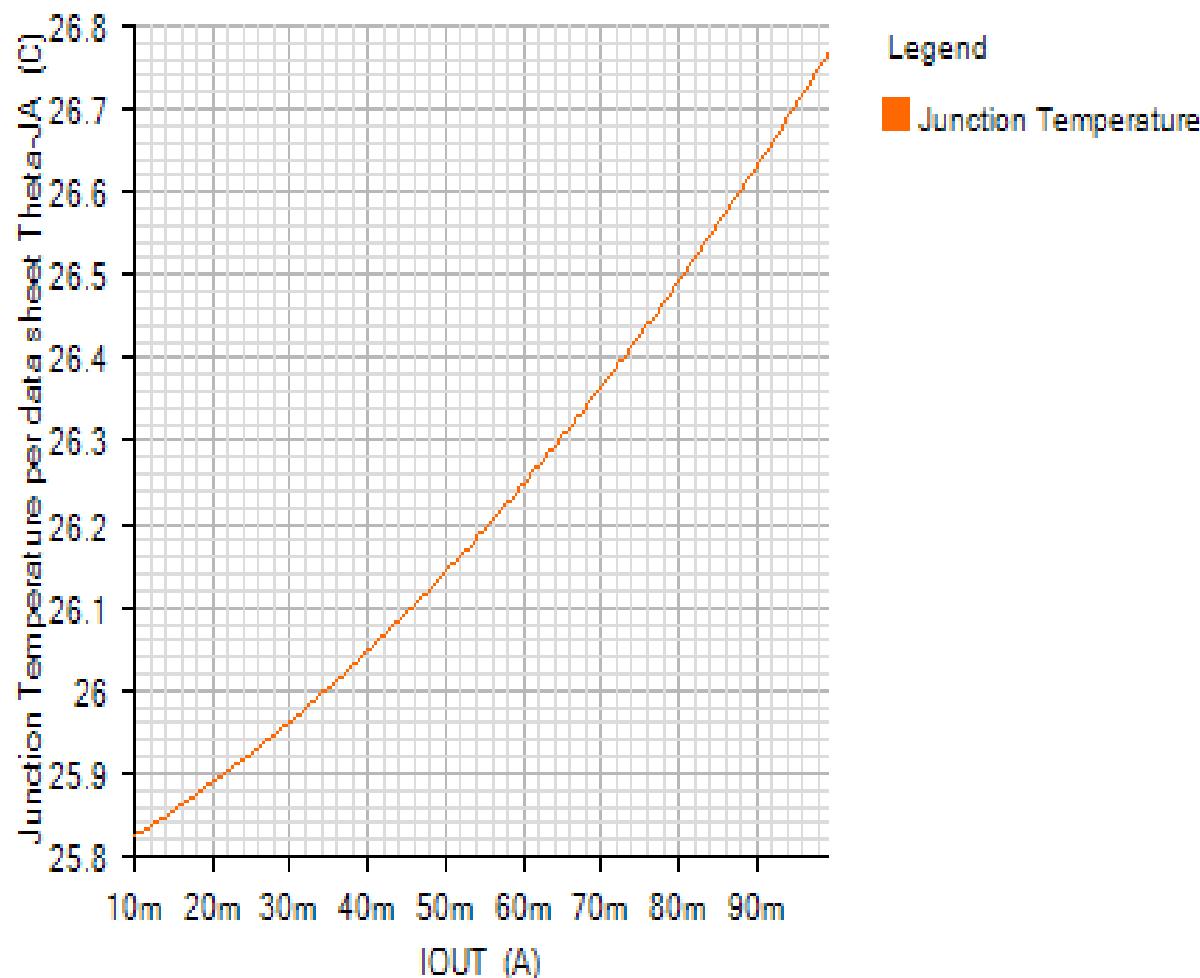


## POWER LOSS PLOT



JUNCTION\_TEMPERATURE\_PLOT

Default

Losses

Component

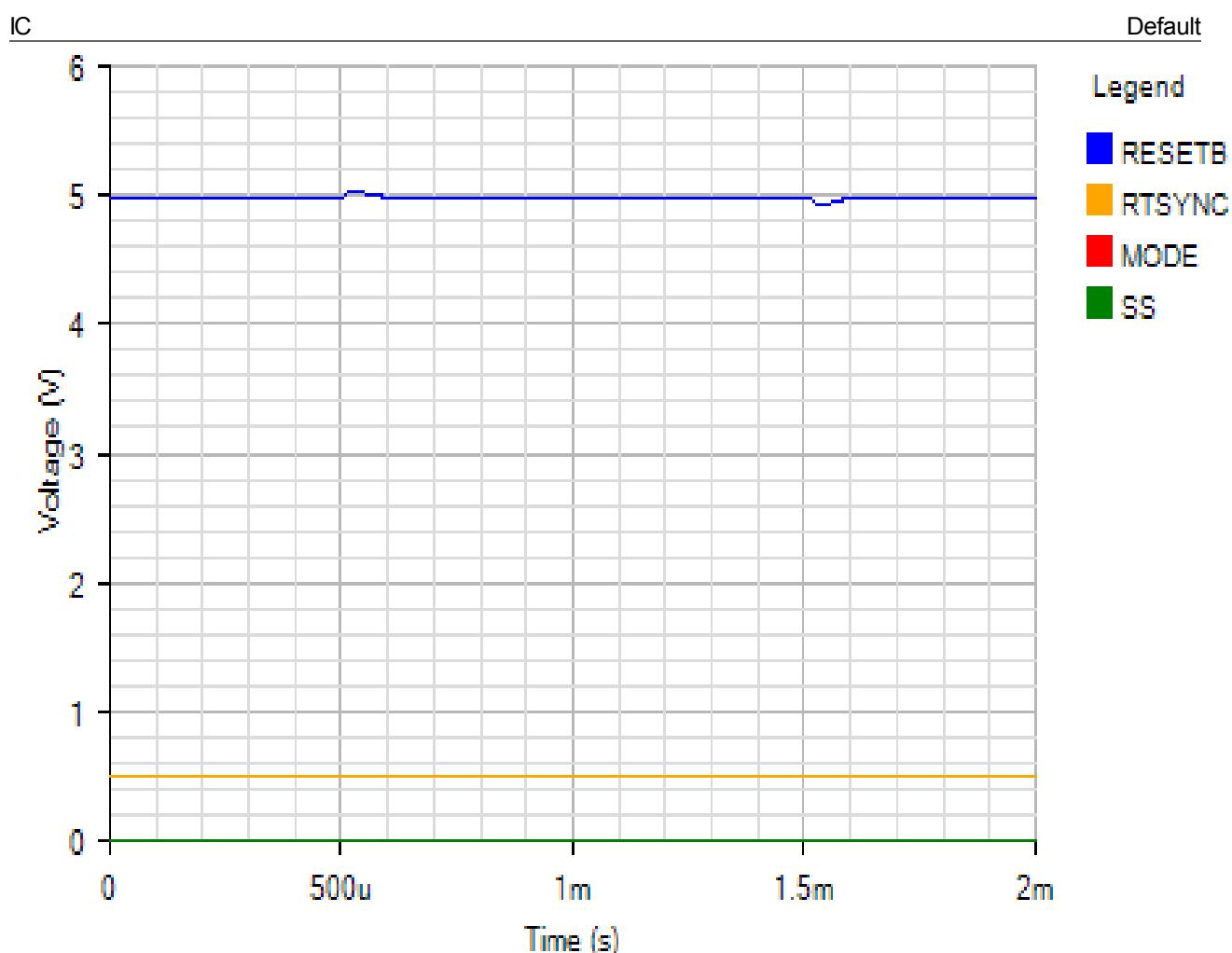
Loss (W)

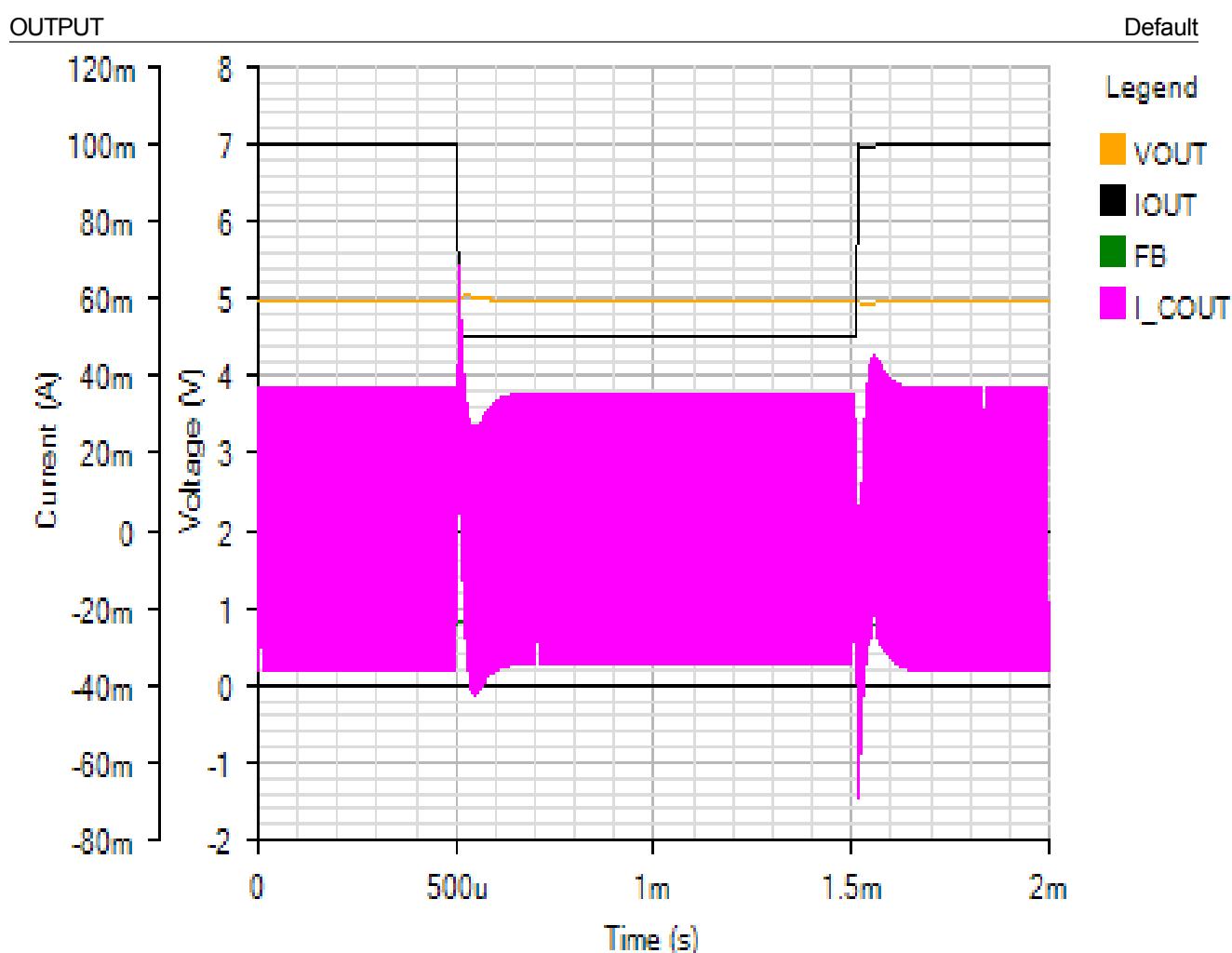
% of total

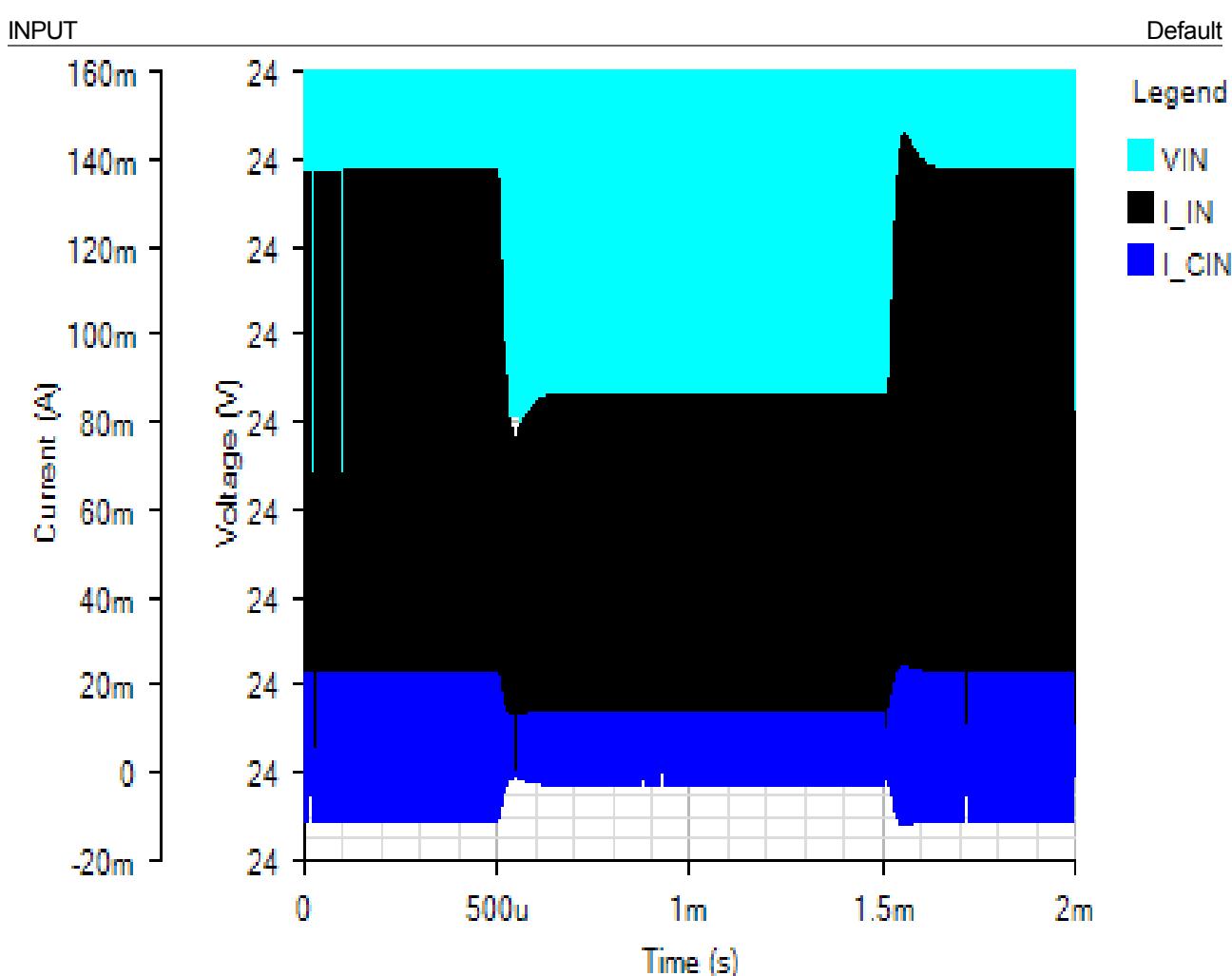


Component	Loss (W)	% of total
Inductor losses	0.05	45.5
Losses in IC	0.06	54.5
Total	0.11	100

Load Step - Mon Nov 26 2018 15:28:33





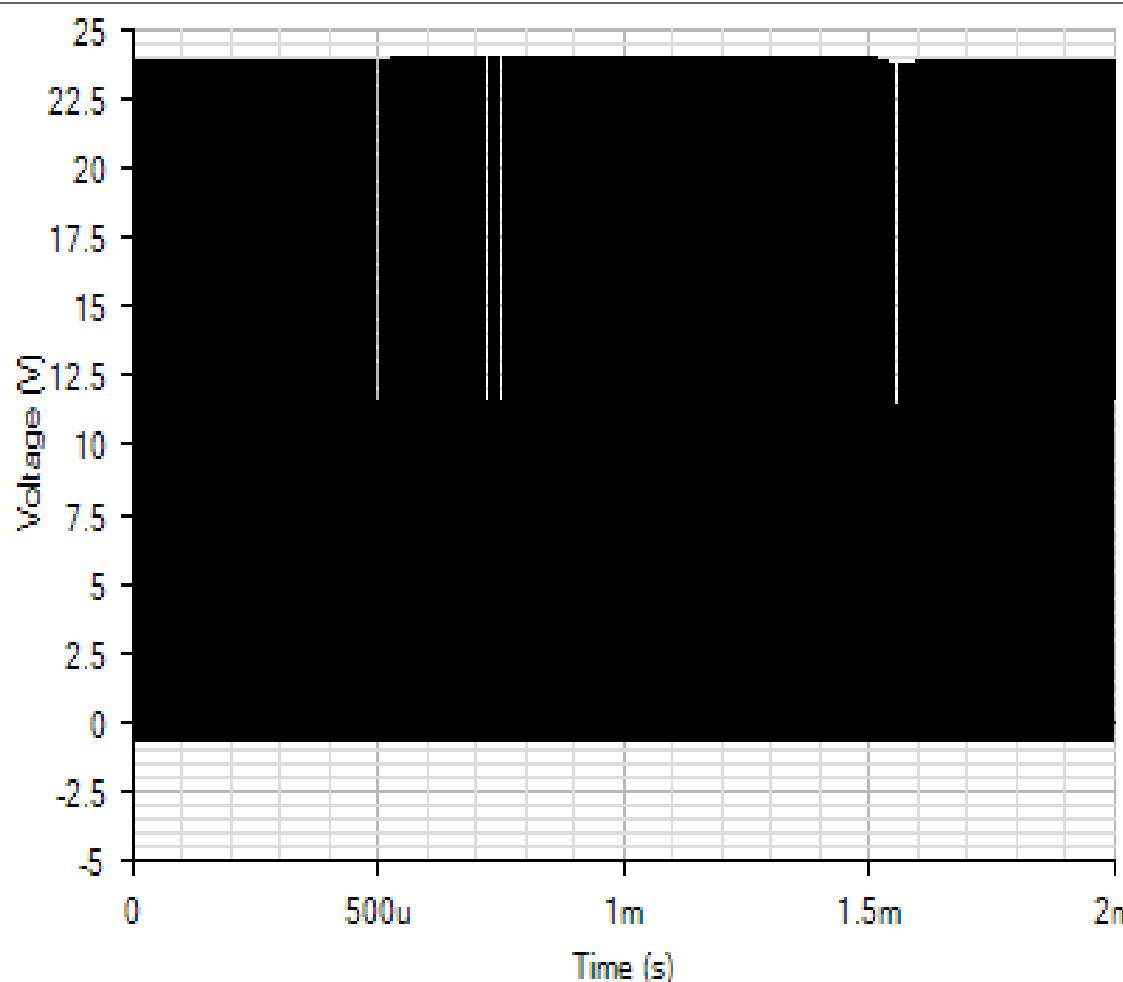


## SWITCHING

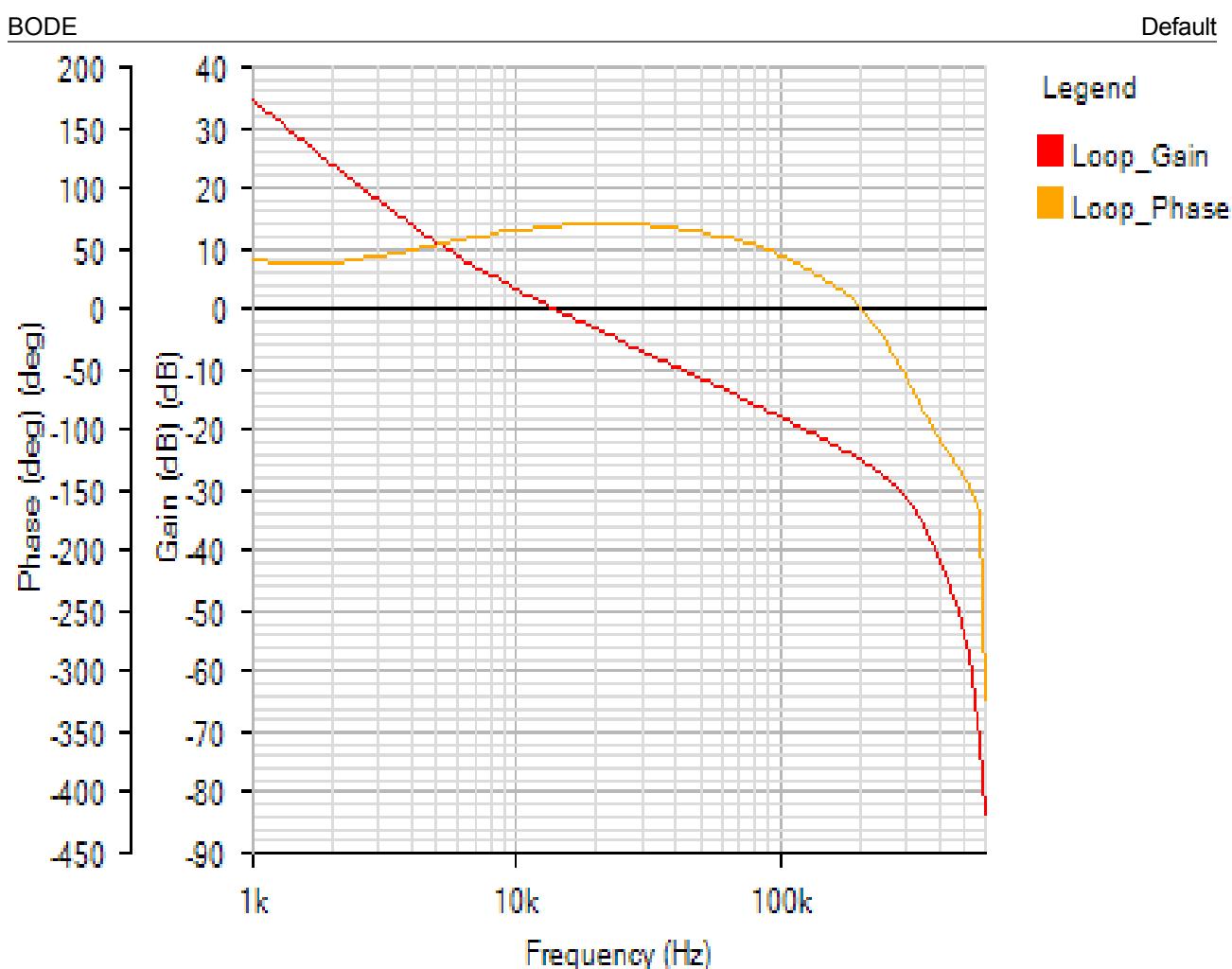
Default

Legend

LX



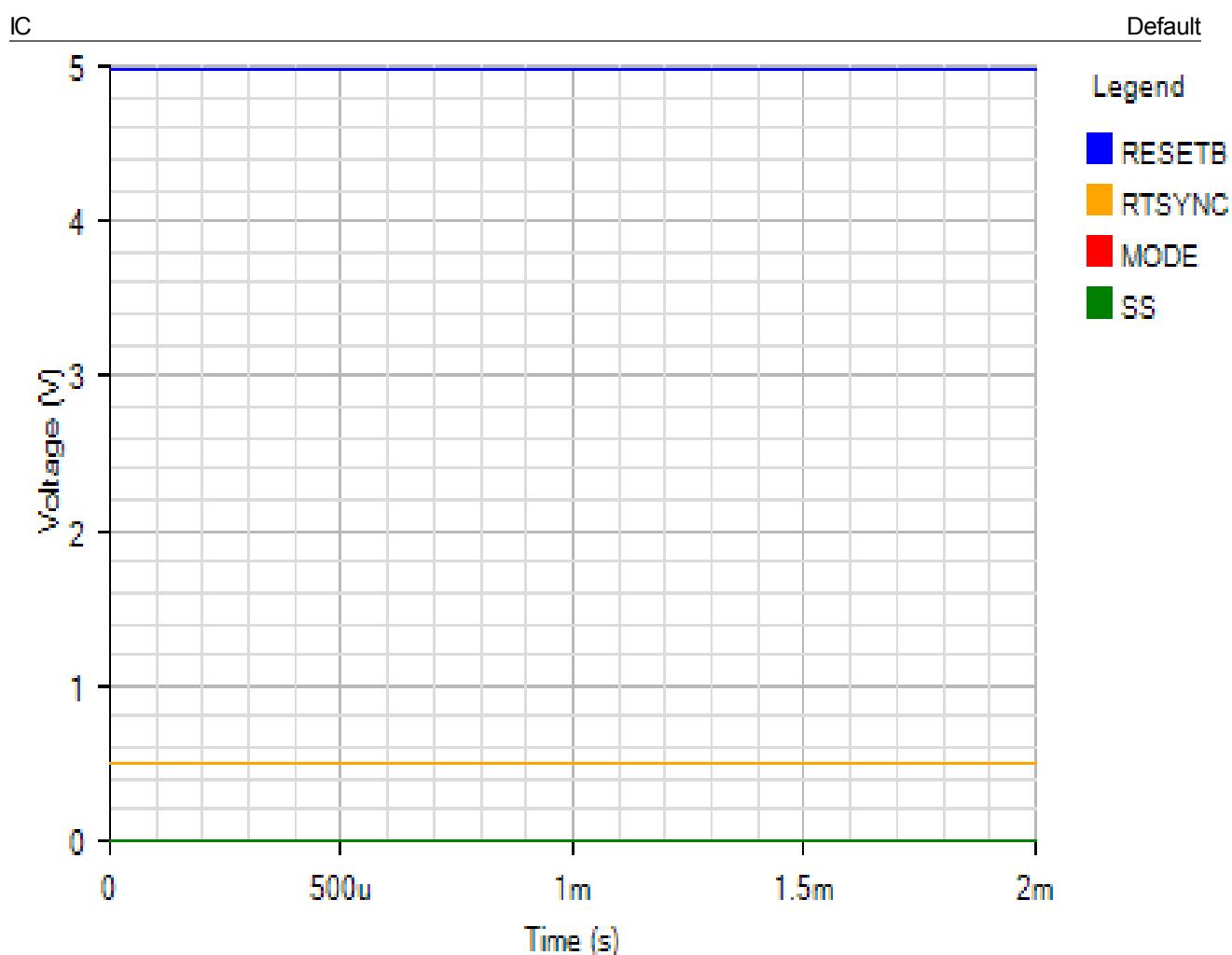
AC Loop - Mon Nov 26 2018 15:28:33

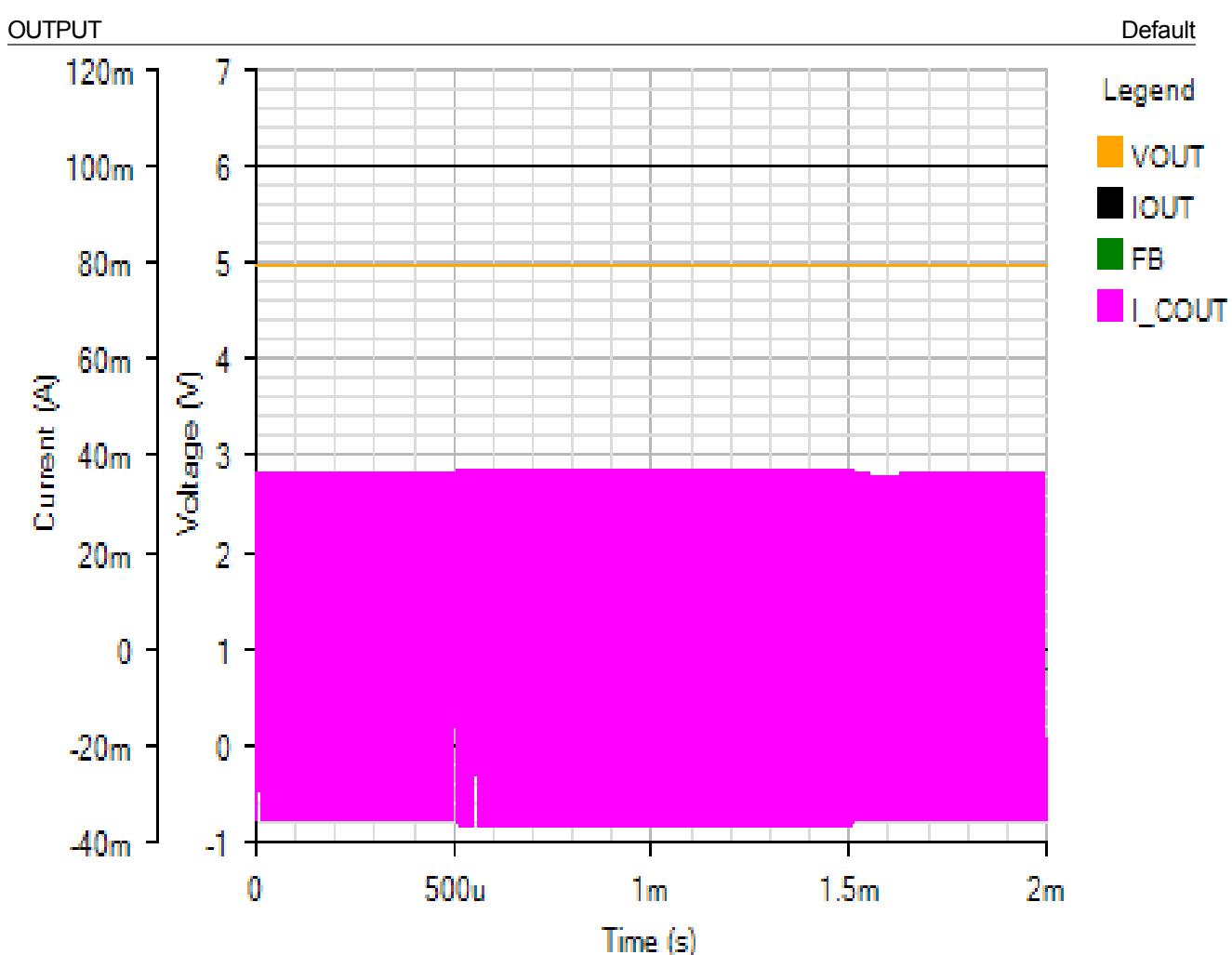


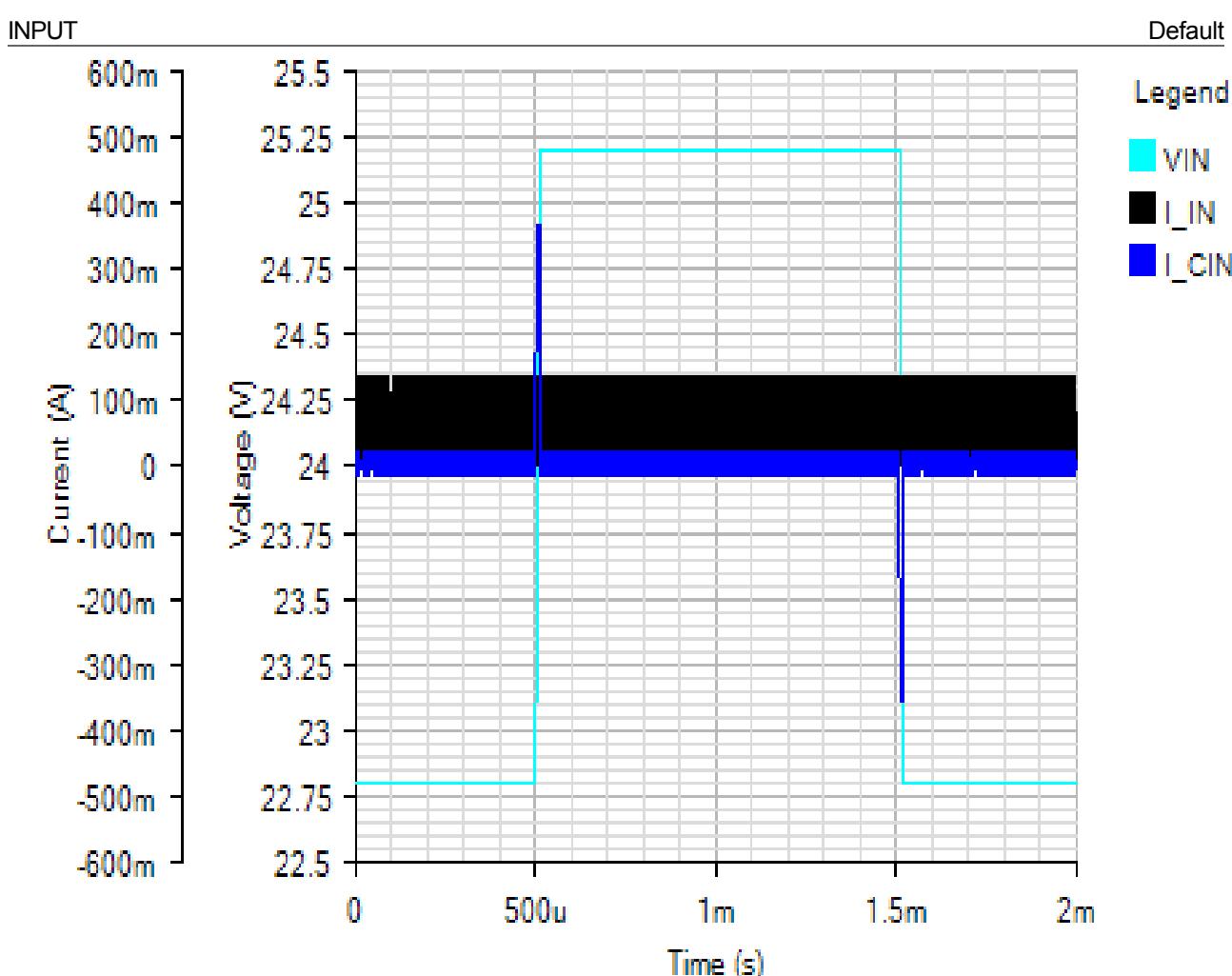
Phase Margin: 68.85° at a crossover frequency of 14.1kHz

20 30 40 50 60 70 80 90 100 110

## Line Transient - Mon Nov 26 2018 15:28:33





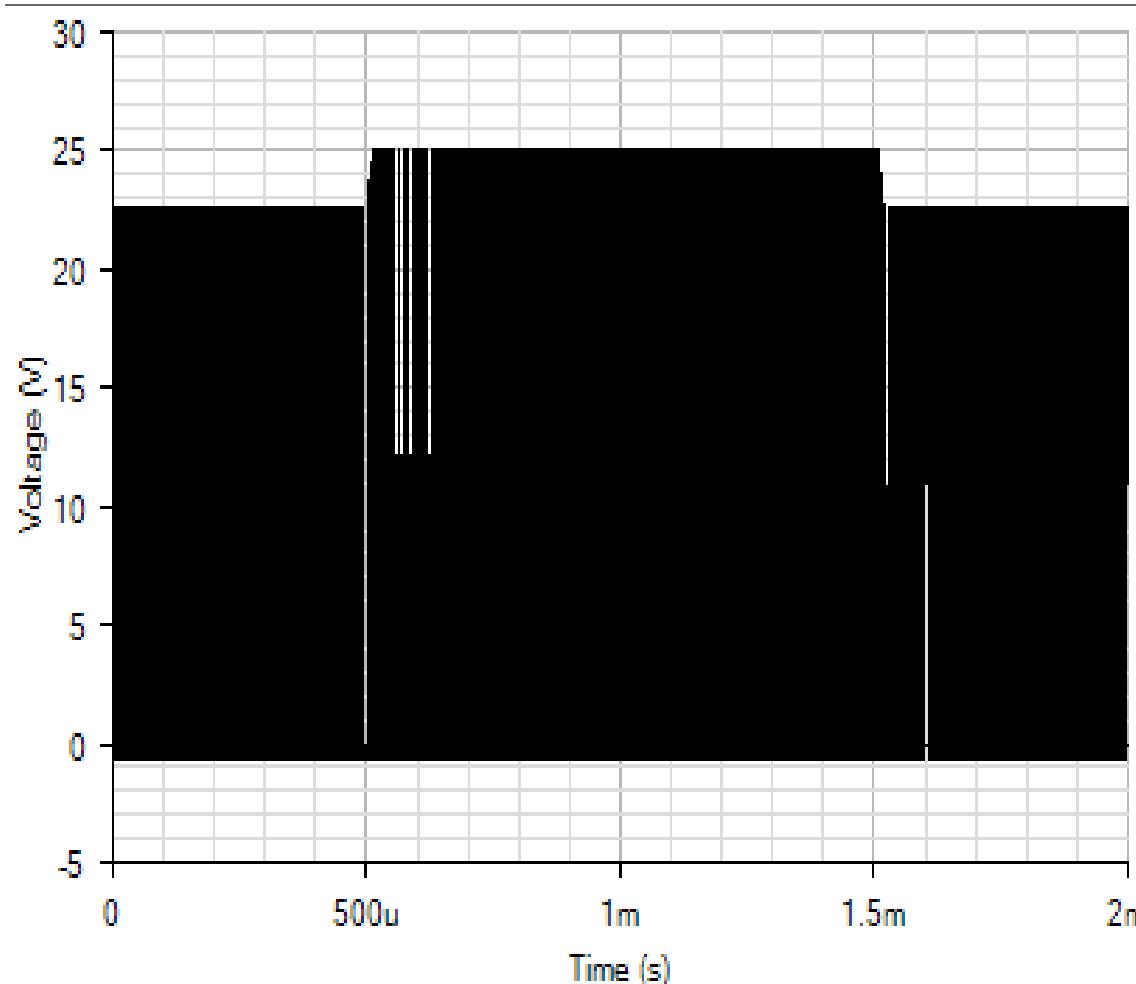


## SWITCHING

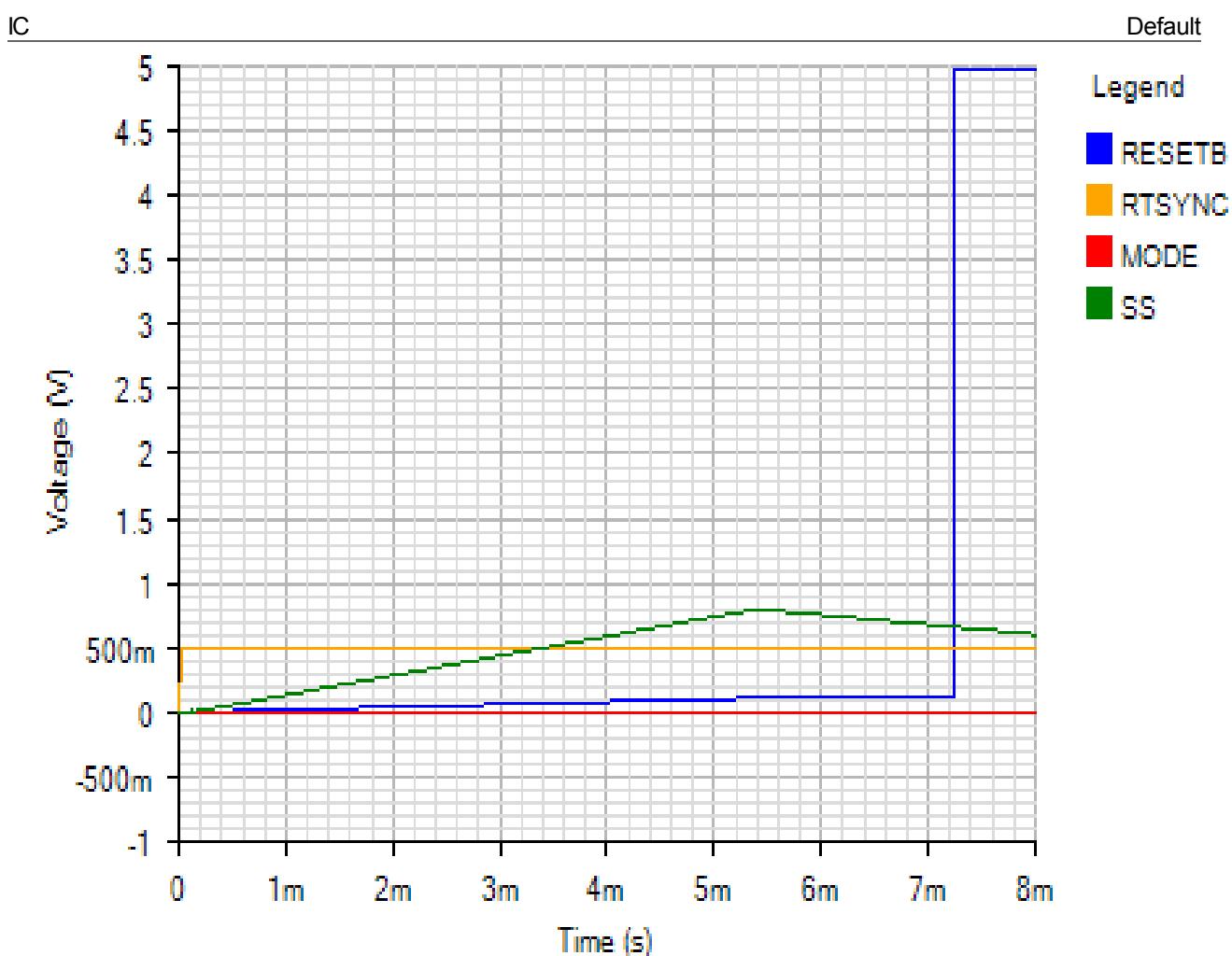
Default

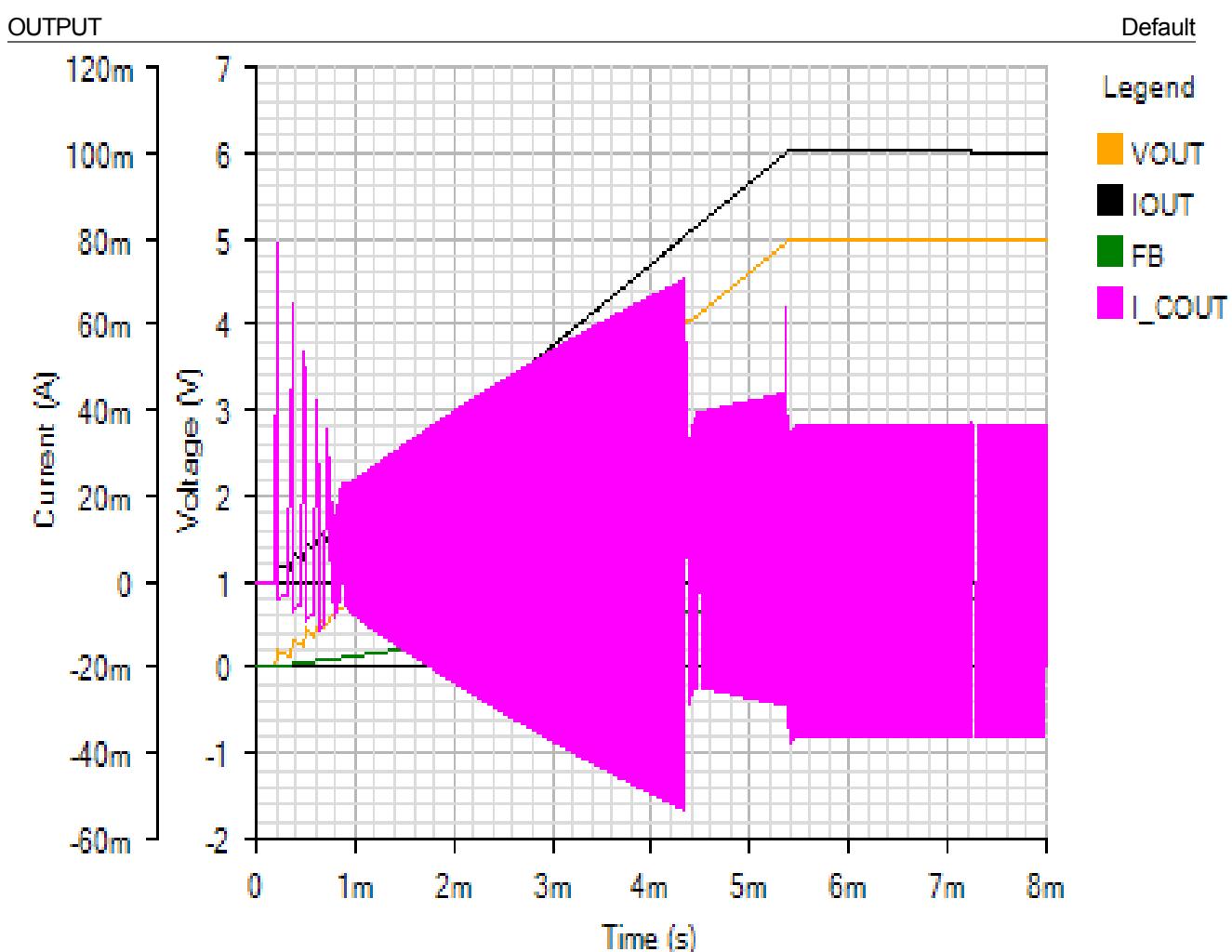
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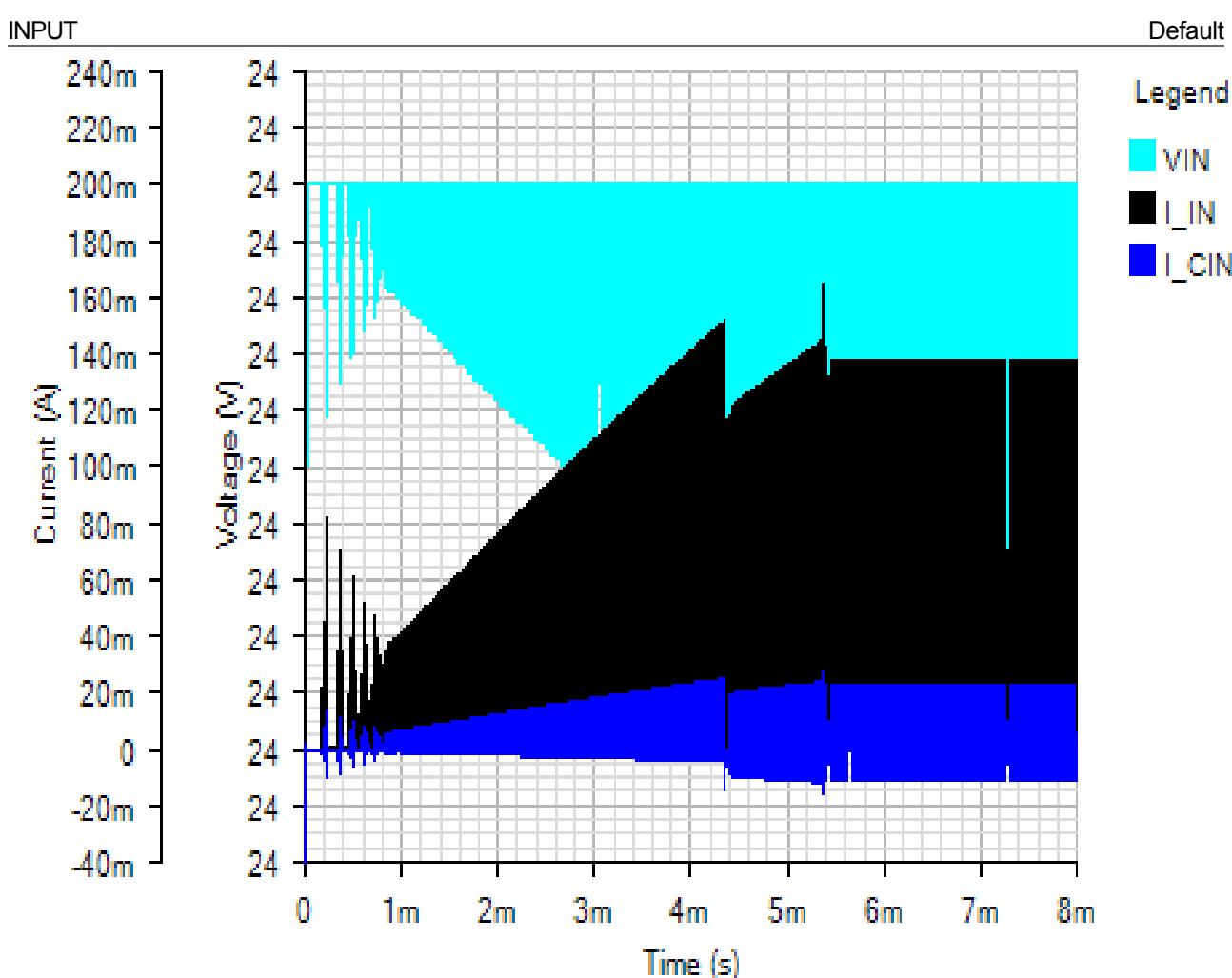
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Start Up - Mon Nov 26 2018 15:28:33





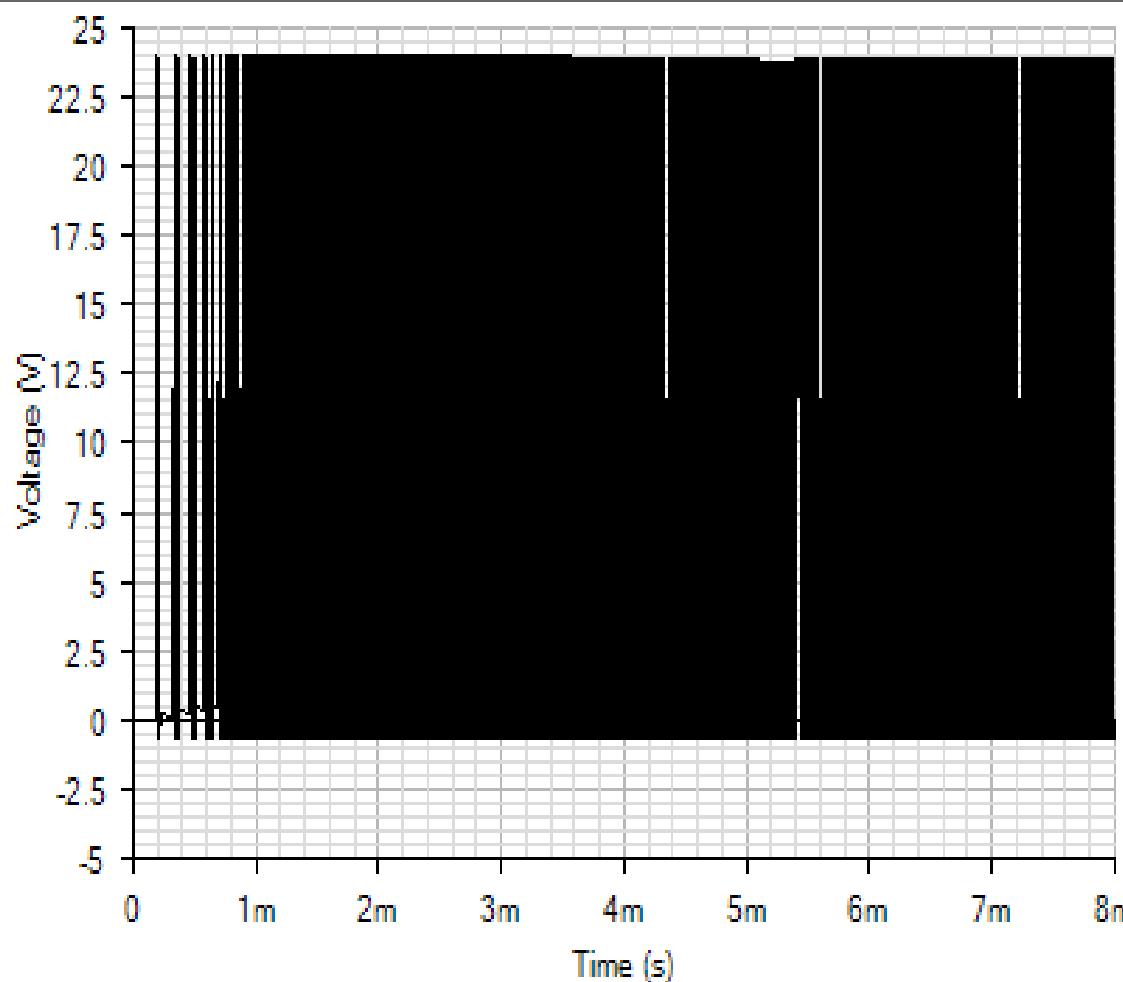


SWITCHING

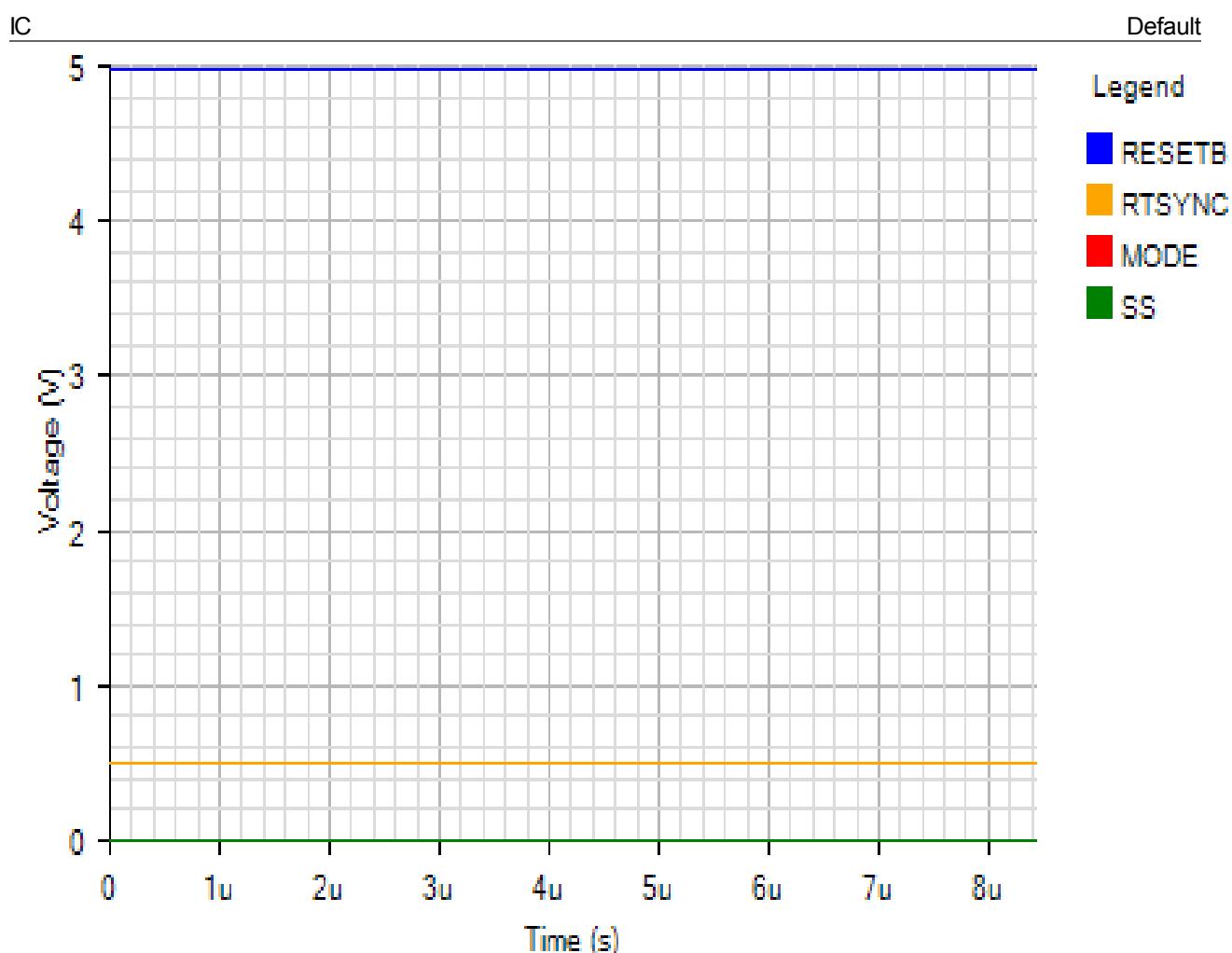
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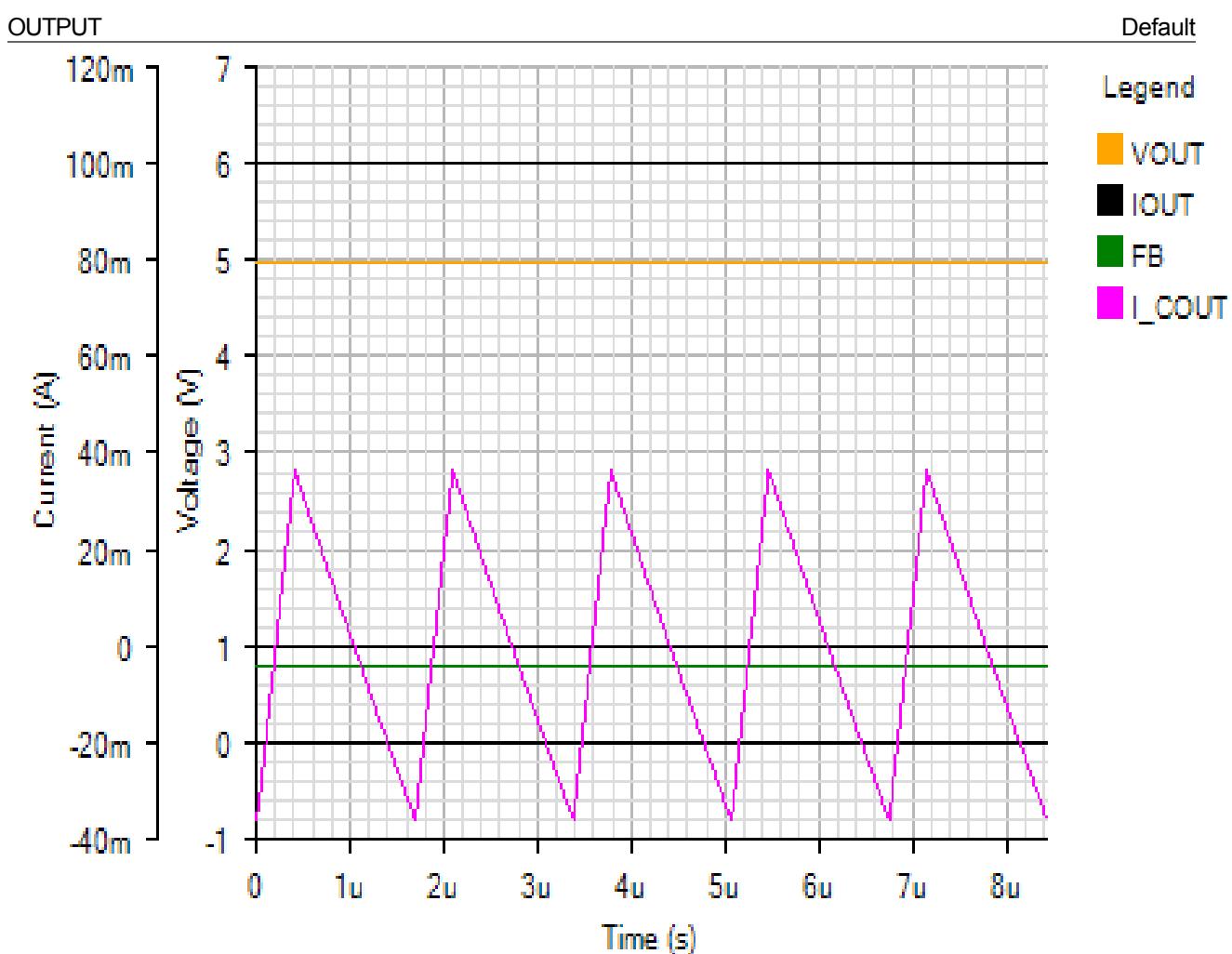
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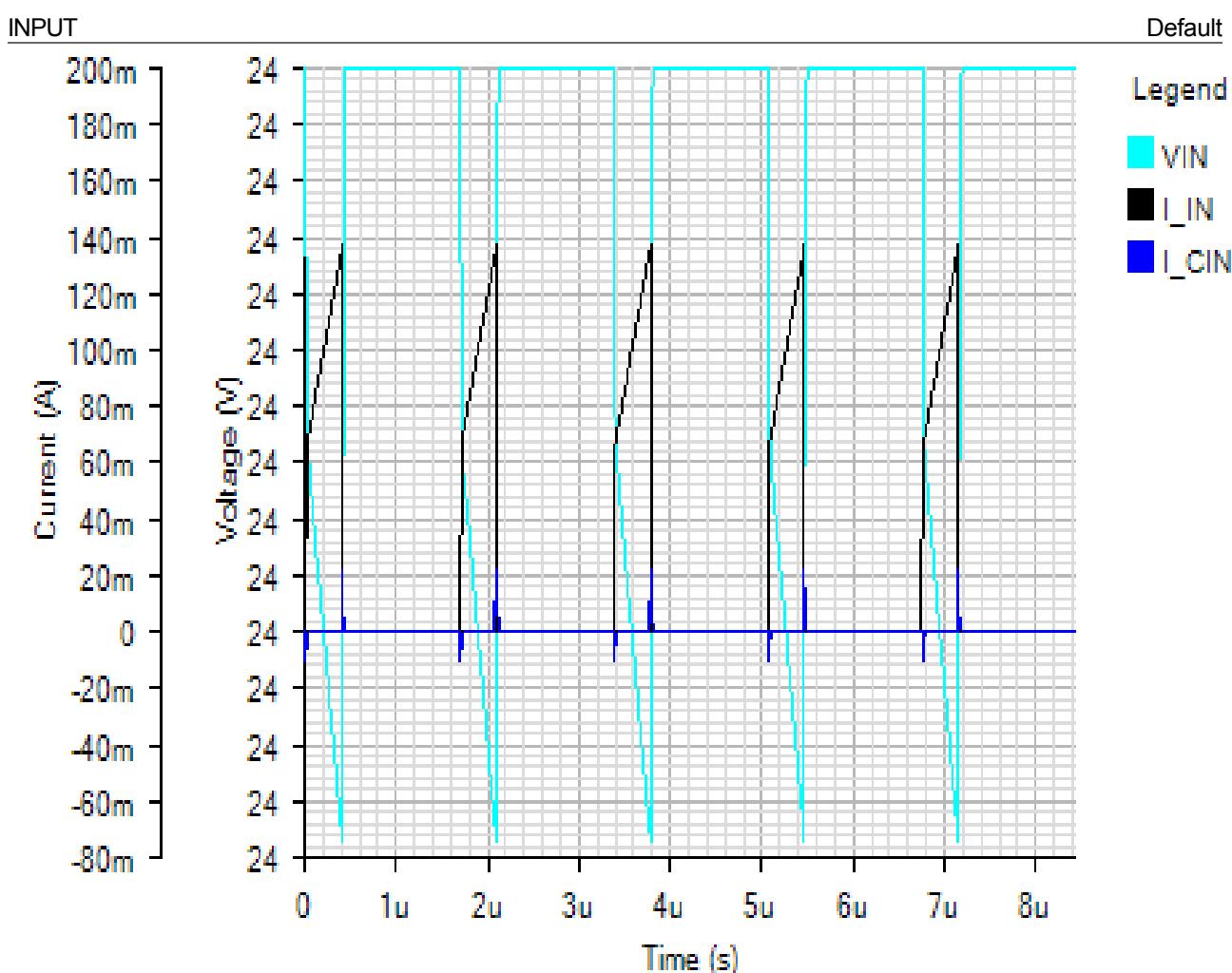
■ LX



Steady State - Mon Nov 26 2018 15:28:33







SWITCHING

Default

Legend

■ LX

