

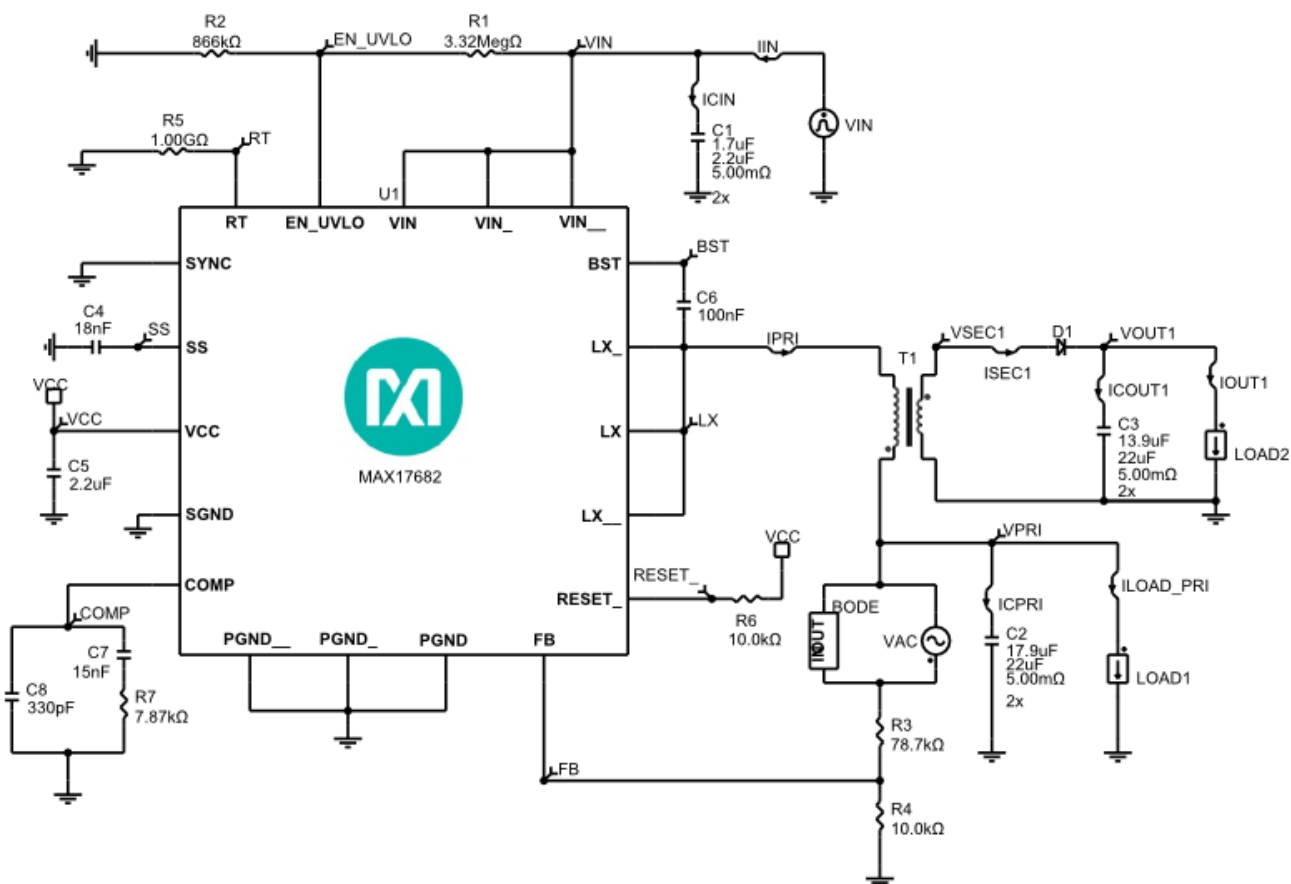
## Initial Design

1.0

**Design Requirements**

Parameter	Value
Output Configurations	Isolated and Non-Isolated
Minimum Input Voltage	16V
Maximum Input Voltage	40V
Nominal Input Voltage	24V
Input Steady-State Ripple	0.48V
Input Undervoltage Lockout Level	5.9V
Primary Output Voltage	8V
Primary Output Current	0.01A
Primary Output Steady State Ripple	0.08V
Output Voltage	12
Output Current	0.75
Output Steady State Ripple	0.12
Performance Priority	Balance Efficiency and Size
BOM Priority	Cost
Switching Frequency	250kHz
Ambient Temperature	25°C
Soft Start time	3ms

## Schematic



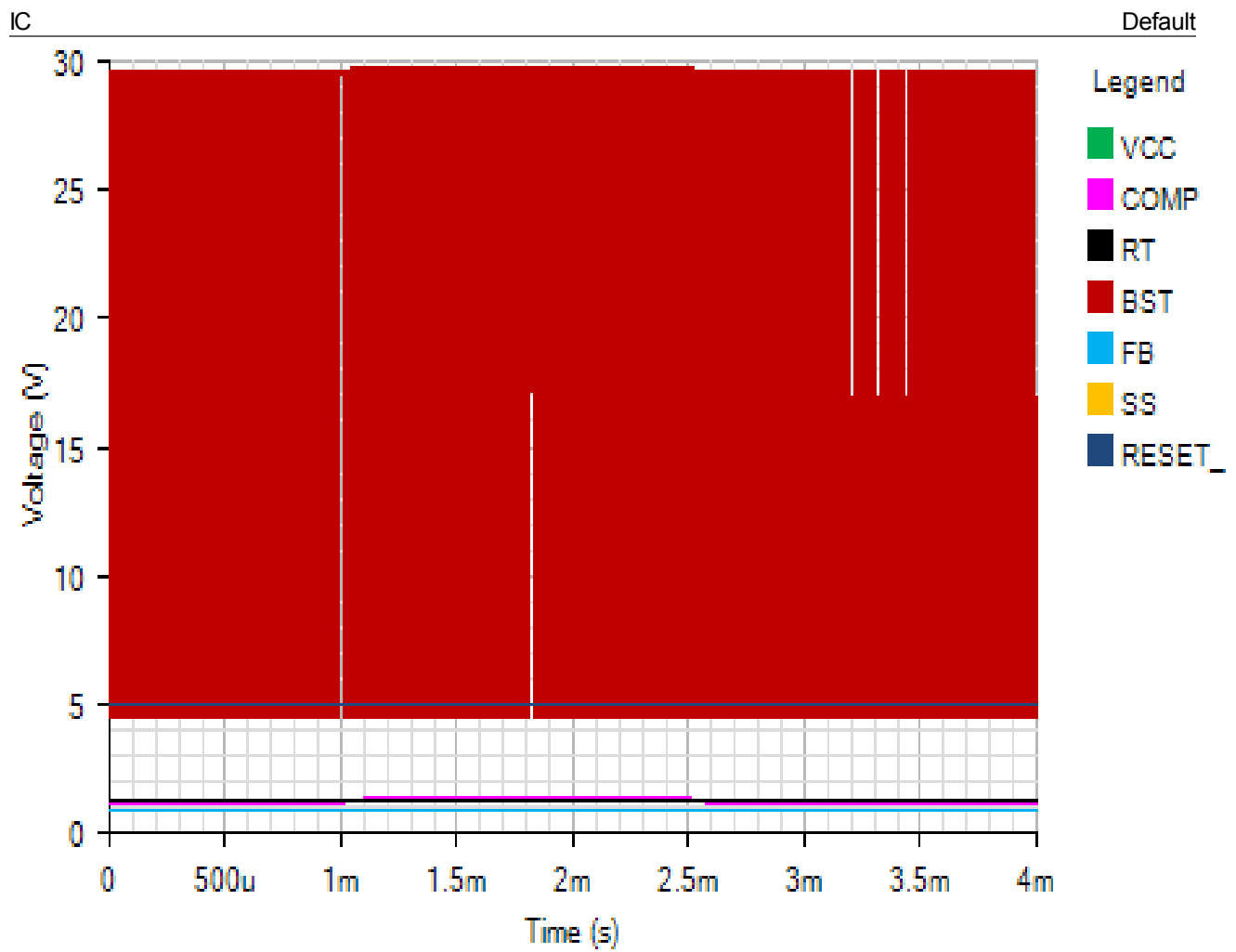
## BOM

Ref	Qty	Part Number	Manufacturer	Description
U1	1	<a href="#">MAX17682</a>	Maxim Integrated	4.5V to 42V Input, Ultra-Small, High-Efficiency, Iso-Buck DC-DC Converter
C1	2	<a href="#">C3225X7R2A225K230AB</a>	TDK	Cap Ceramic 2.2uF 100V X7R 10% SMD 1210 125C Plastic T/R
C2	2	<a href="#">C3225X7R1C226K250AC</a>	TDK	Cap Ceramic 22uF 16V X7R 10% SMD 1210 125C Plastic T/R
C3	2	<a href="#">C3225X7R1C226K250AC</a>	TDK	Cap Ceramic 22uF 16V X7R 10% SMD 1210 125C Plastic T/R
C4	1	<a href="#">GCM155R71E183KA55J</a>	Murata Manufacturing	Cap Ceramic 0.018uF 25V X7R 10% Pad SMD 0402 125°C Automotive T/R
C5	1	<a href="#">CGA4J3X7R1C225K125AB</a>	TDK	Cap Ceramic 2.2uF 16V X7R 10% Pad SMD 0805 125°C Automotive T/R
C6	1	<a href="#">GCM155R71C104KA55D</a>	Murata Manufacturing	Cap Ceramic 0.1uF 16V X7R 10% Pad SMD 0402 125°C Automotive T/R
C7	1	<a href="#">GCM155R71H153JA55D</a>	Murata Manufacturing	Cap Ceramic 0.015uF 50V X7R 5% Pad SMD 0402 125°C Automotive T/R
C8	1	<a href="#">CGA2B2C0G1H331J050BA</a>	TDK	Cap Ceramic 330pF 50V C0G 5% Pad SMD 0402 125°C Automotive T/R

D1	1	<a href="#">SS3H10-E3/57T</a>	Vishay	Diode Schottky 100V 3A 2-Pin SMC T/R
R1	1	<a href="#">CRCW04023M32FKED</a>	Vishay	Res Thick Film 0402 3.32M Ohm 1% 0.063W(1/16W) ±100ppm/°C Pad SMD Automotive T/R
R2	1	<a href="#">ERJ2RKF8663X</a>	Panasonic	Res Thick Film 0402 866K Ohm 1% 0.1W(1/10W) ±100ppm/°C Pad SMD Automotive T/R
R3	1	<a href="#">ERJ2RKF7872X</a>	Panasonic	Res Thick Film 0402 78.7K Ohm 1% 0.1W(1/10W) ±100ppm/°C Pad SMD Automotive T/R
R4	1	<a href="#">ERJ2RKF1002X</a>	Panasonic	Res Thick Film 0402 10K Ohm 1% 0.1W(1/10W) ±100ppm/°C Pad SMD Automotive T/R
R6	1	<a href="#">ERJ2GEJ103X</a>	Panasonic	Res Thick Film 0402 10K Ohm 5% 0.1W(1/10W) ±200ppm/°C Pad SMD Automotive T/R
R7	1	<a href="#">ERJ2RKF7871X</a>	Panasonic	Res Thick Film 0402 7.87K Ohm 1% 0.1W(1/10W) ±100ppm/°C Pad SMD Automotive T/R
T1	1	Custom Transformer	User-Defined	IC

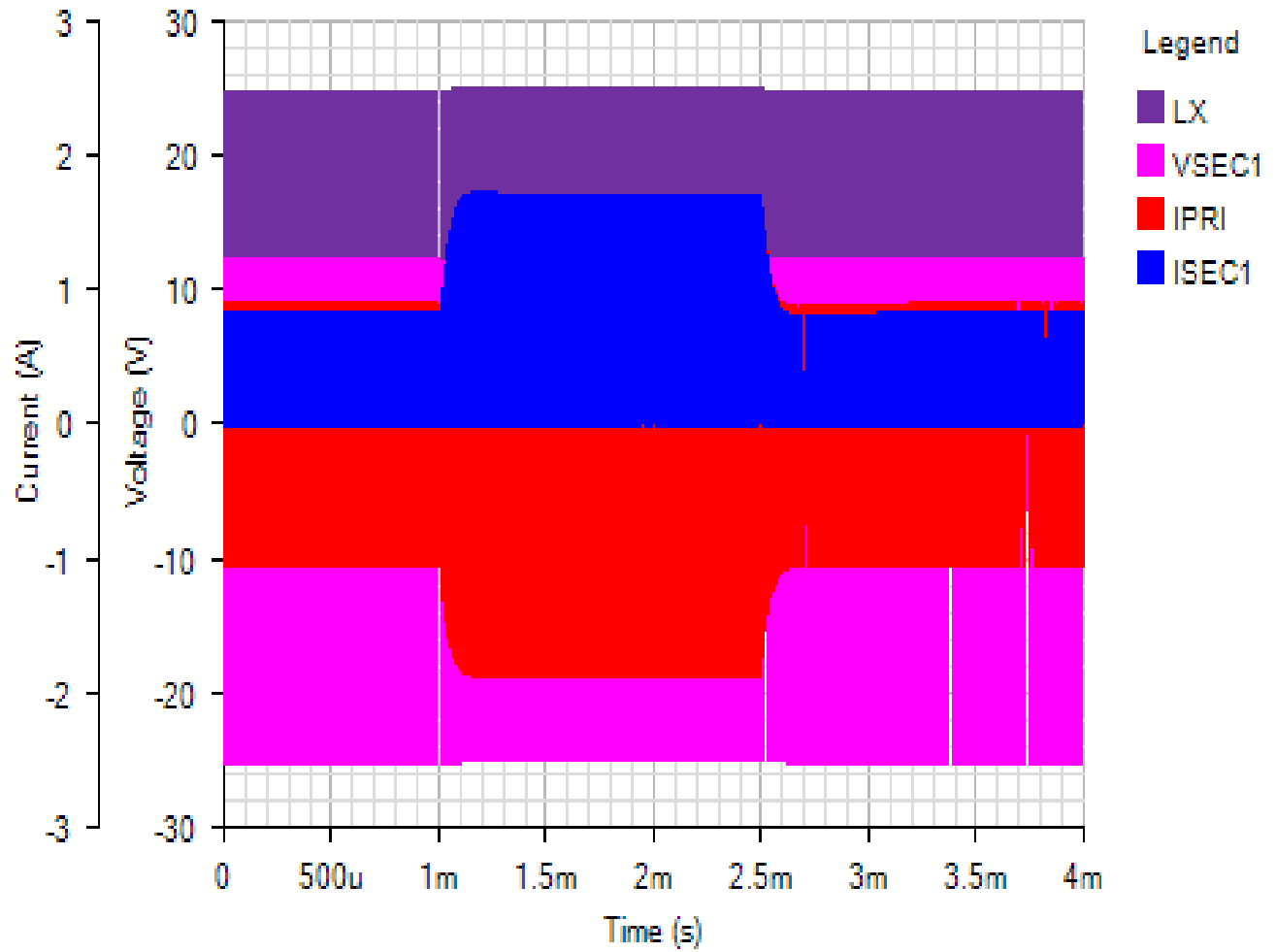
## Simulation Results

**Load Step - Mon Nov 19 2018 10:09:20**



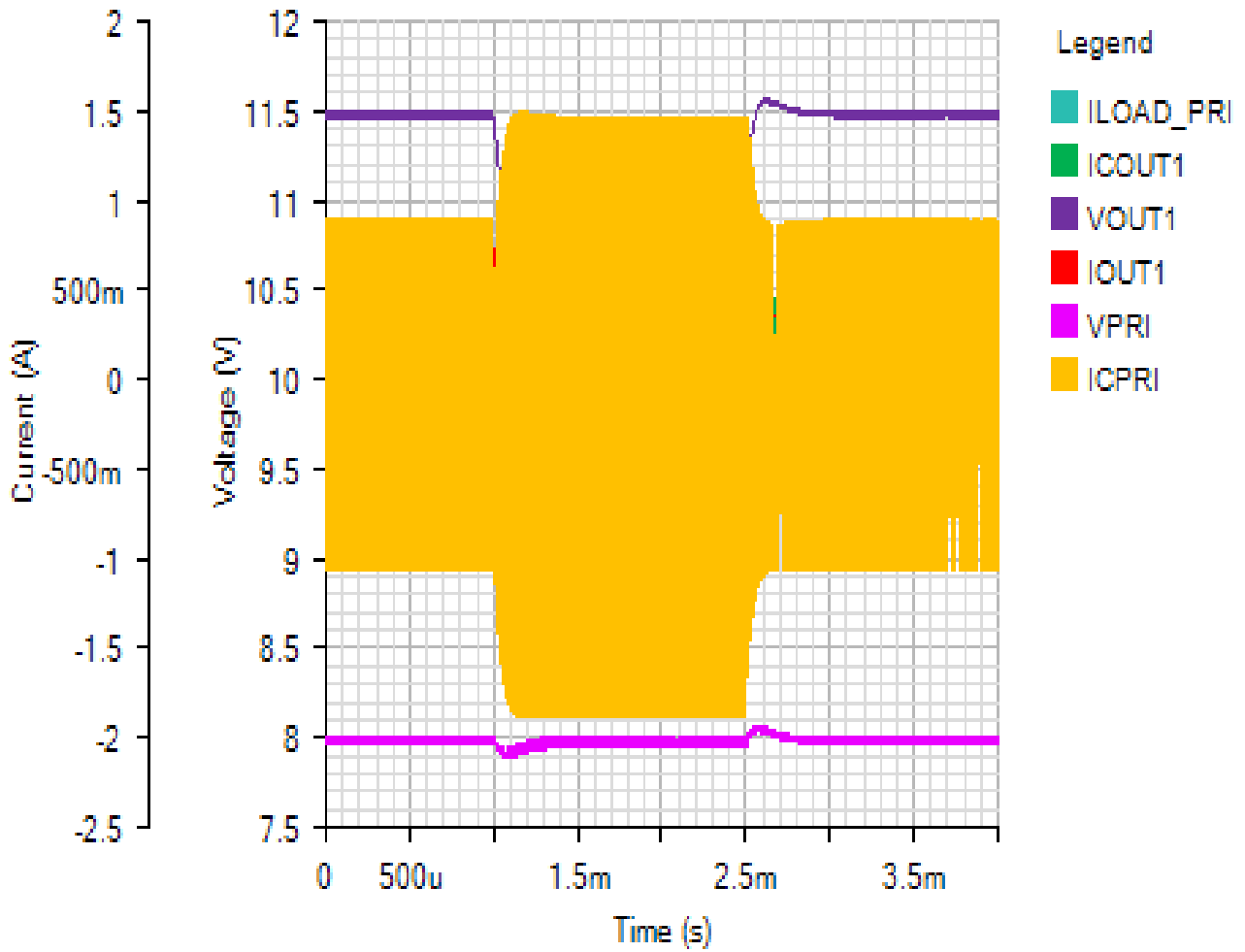
SWITCHING

Default



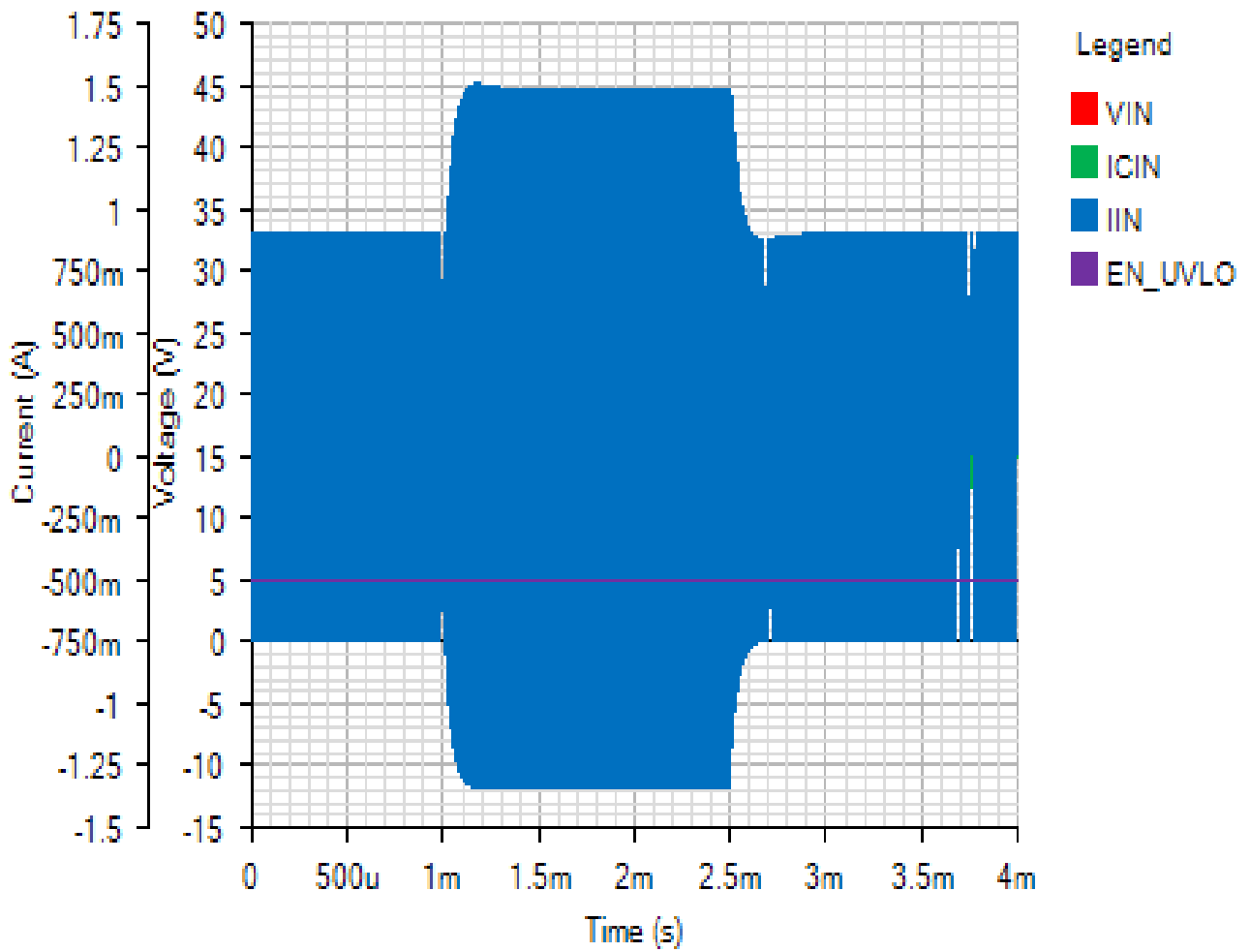
OUTPUT

Default



INPUT

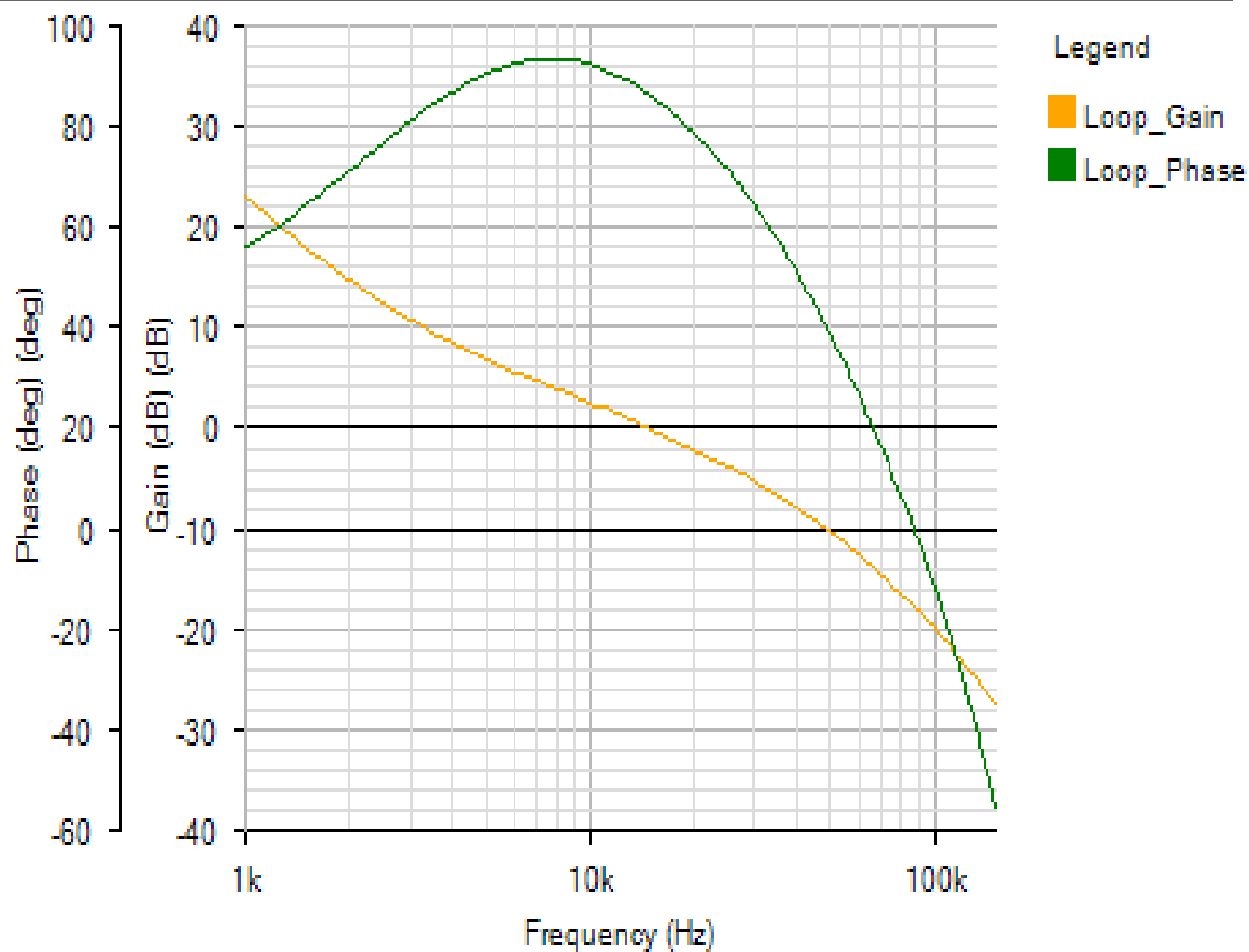
Default



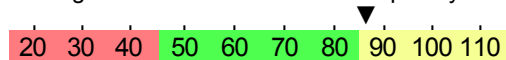
AC Loop - Mon Nov 19 2018 10:09:20

BODE

Default

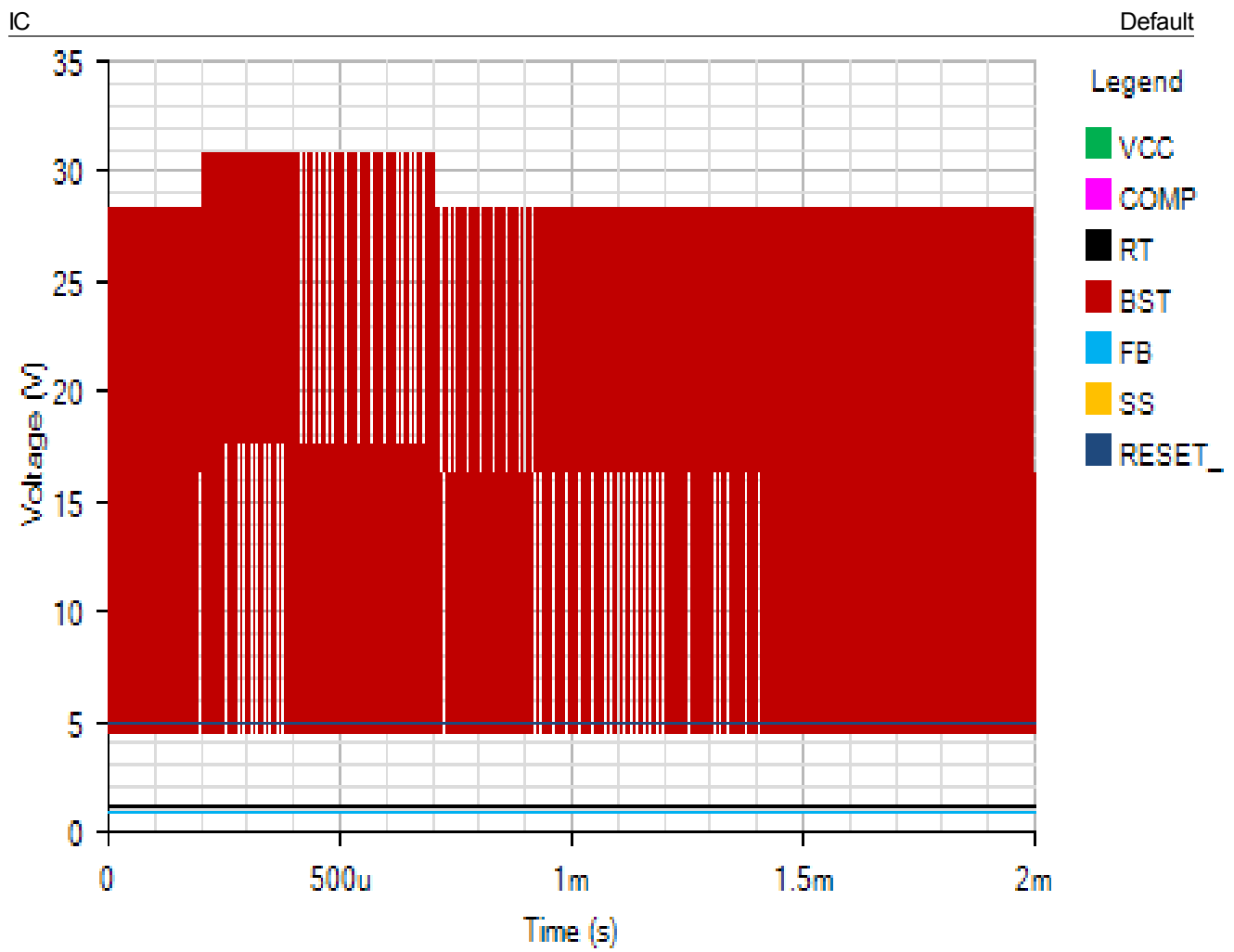


Phase Margin: 86.27° at a crossover frequency of 15kHz



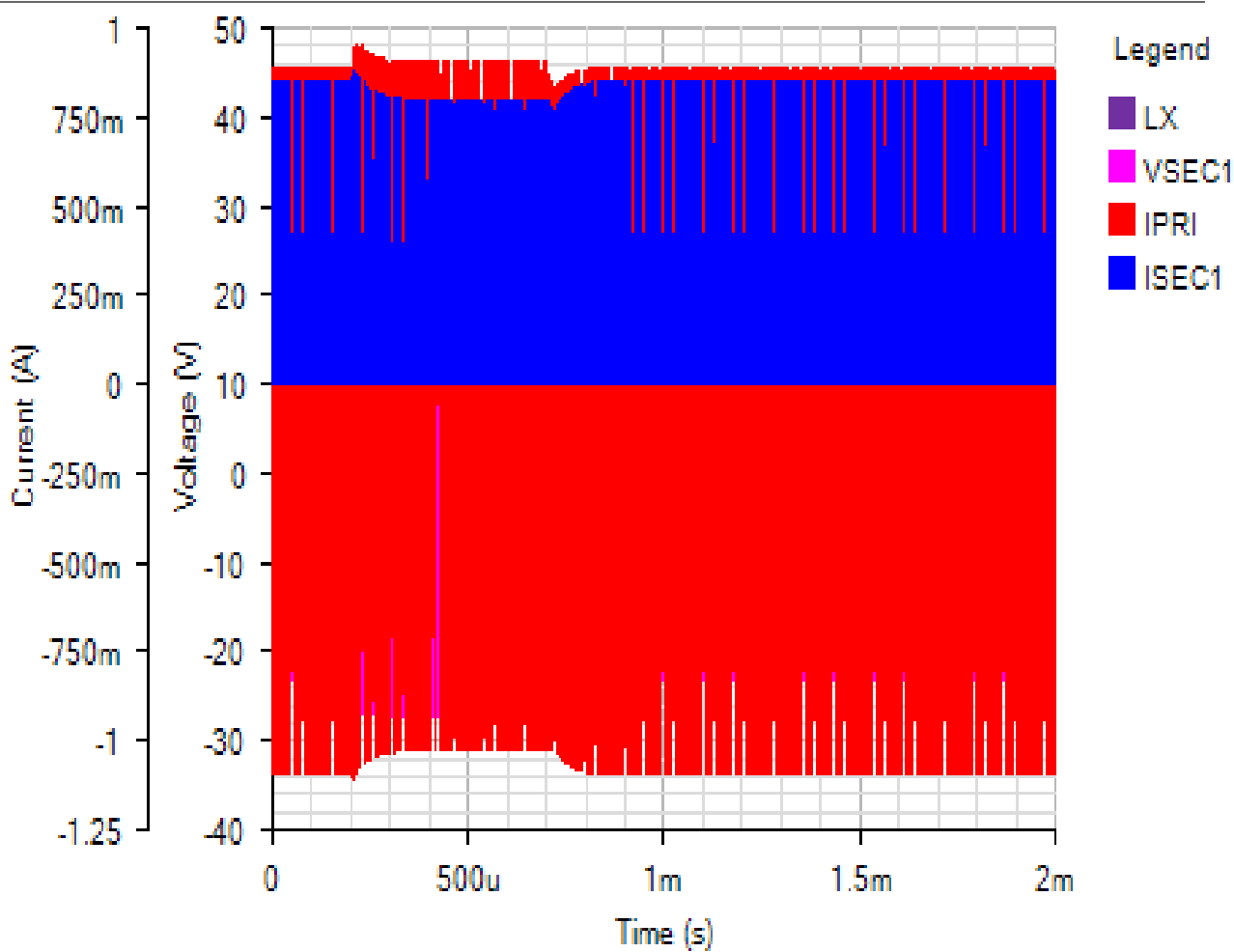


Line Transient - Mon Nov 19 2018 10:09:20



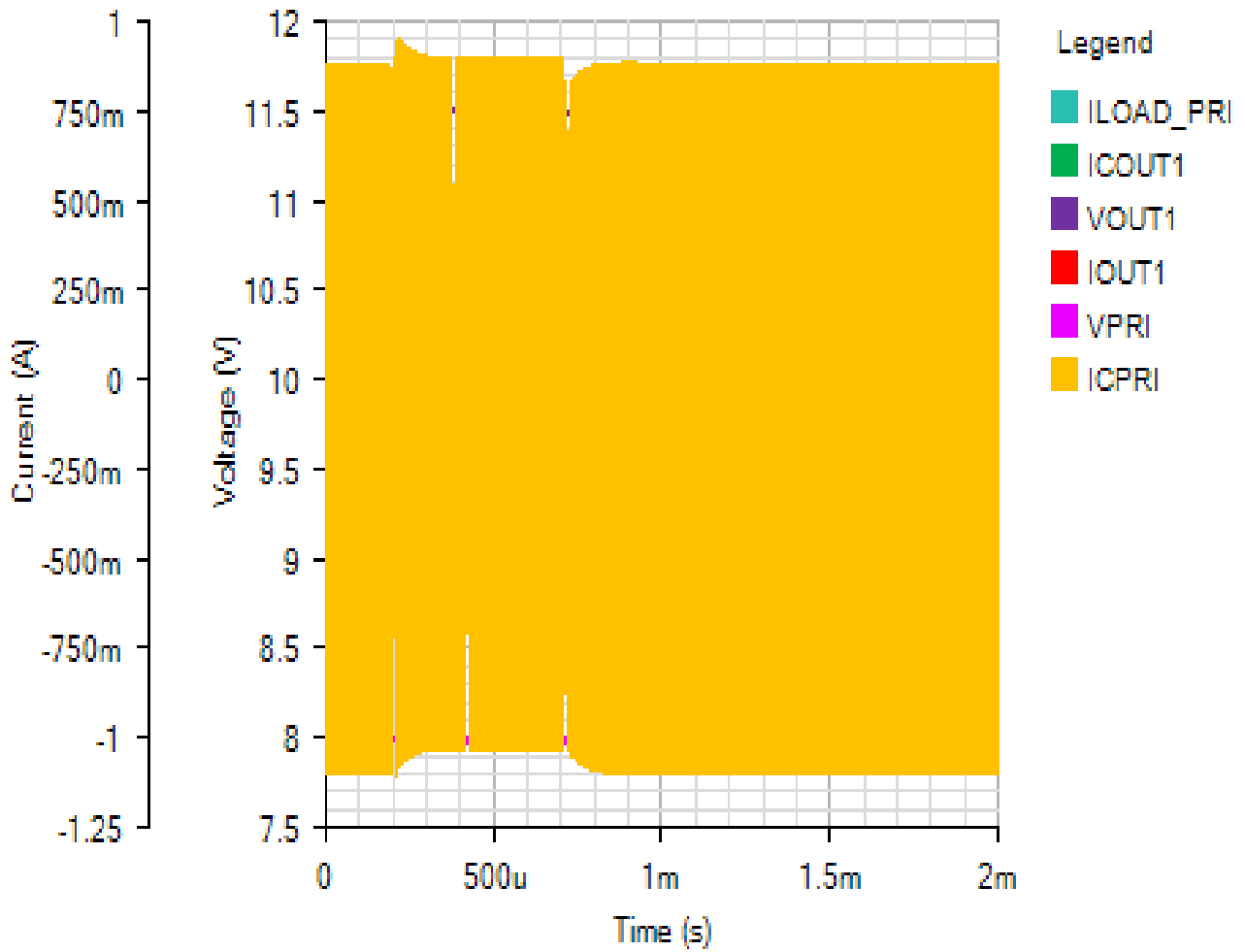
SWITCHING

Default



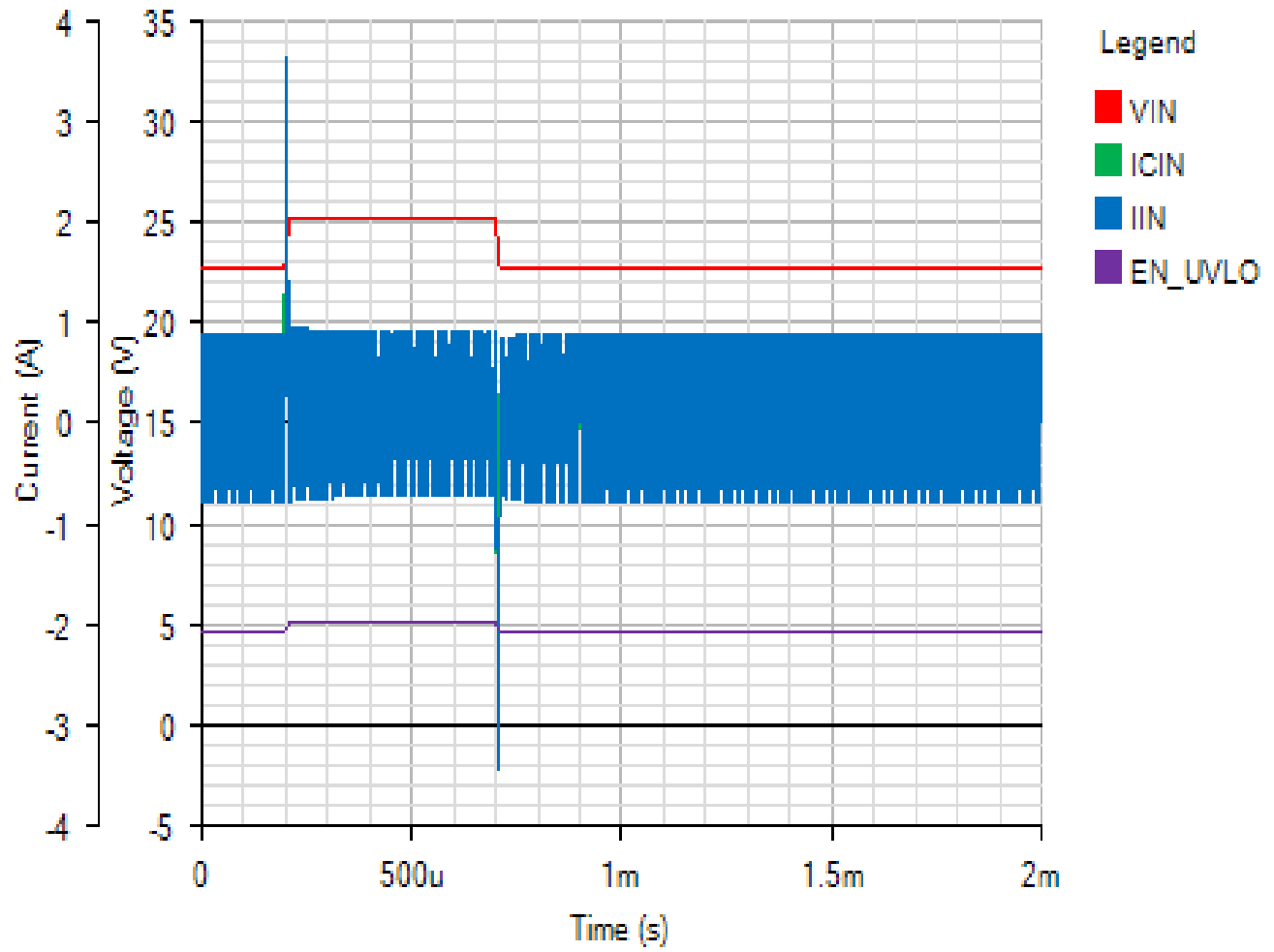
OUTPUT

Default



INPUT

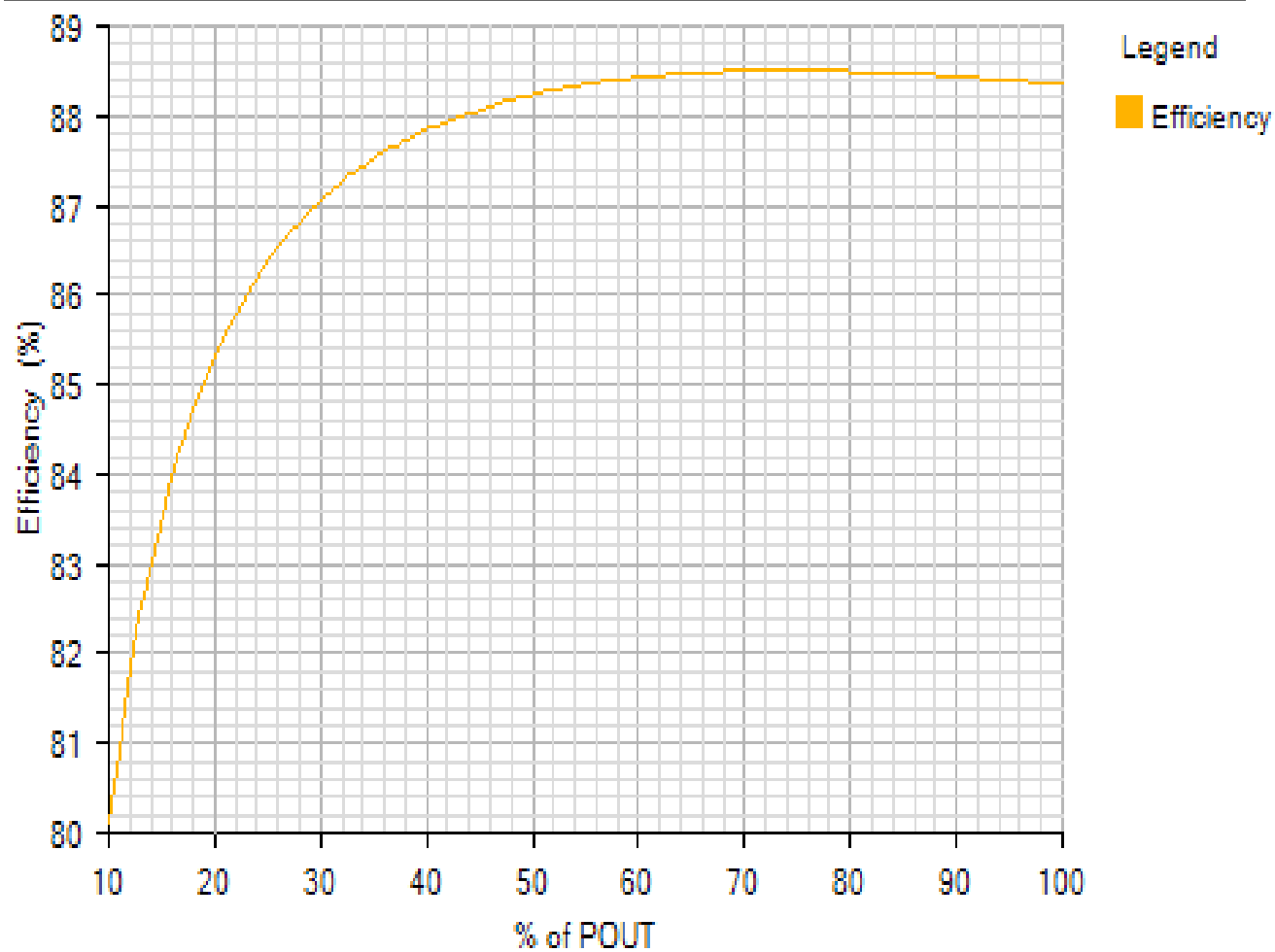
Default



Efficiency - Mon Nov 19 2018 10:09:20

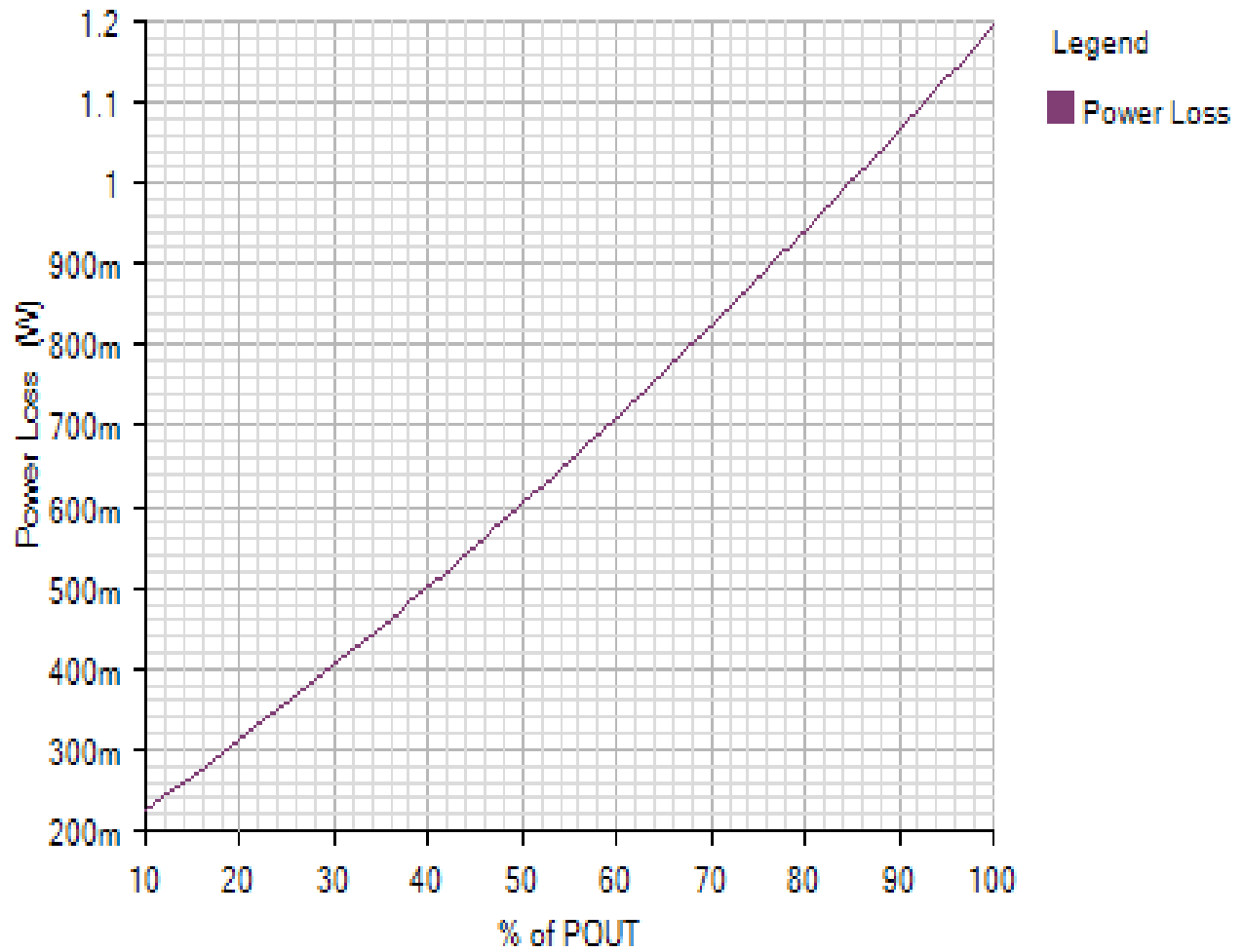
EFFICIENCY\_PLOT

Default



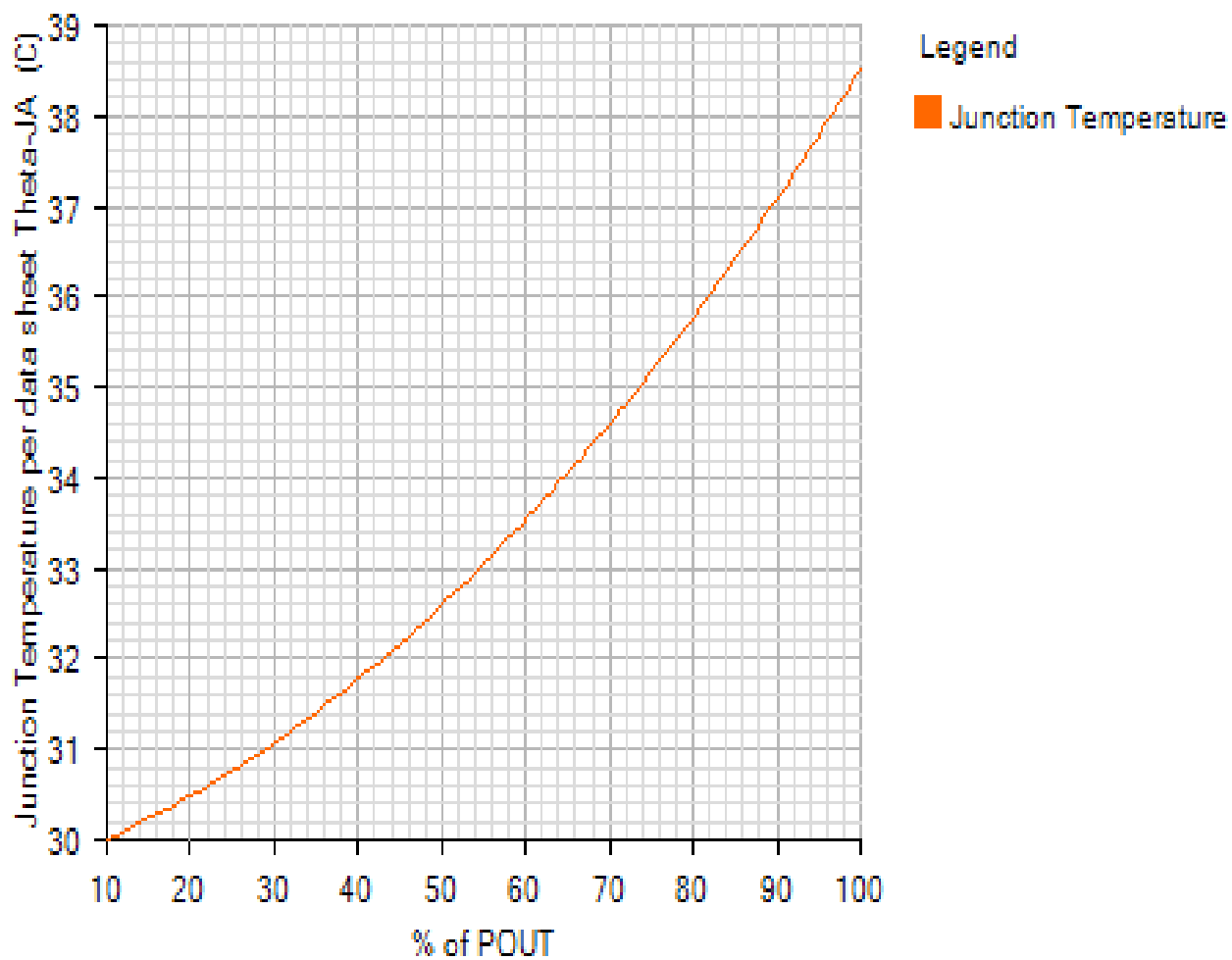
POWER\_LOSS\_PLOT

Default

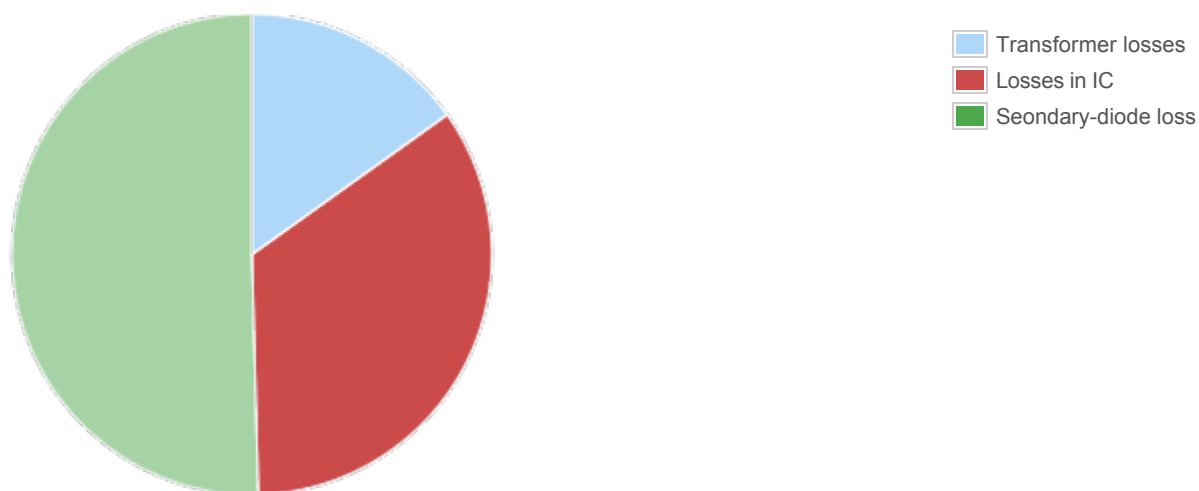


JUNCTION\_TEMPERATURE\_PLOT

Default



Losses



Component

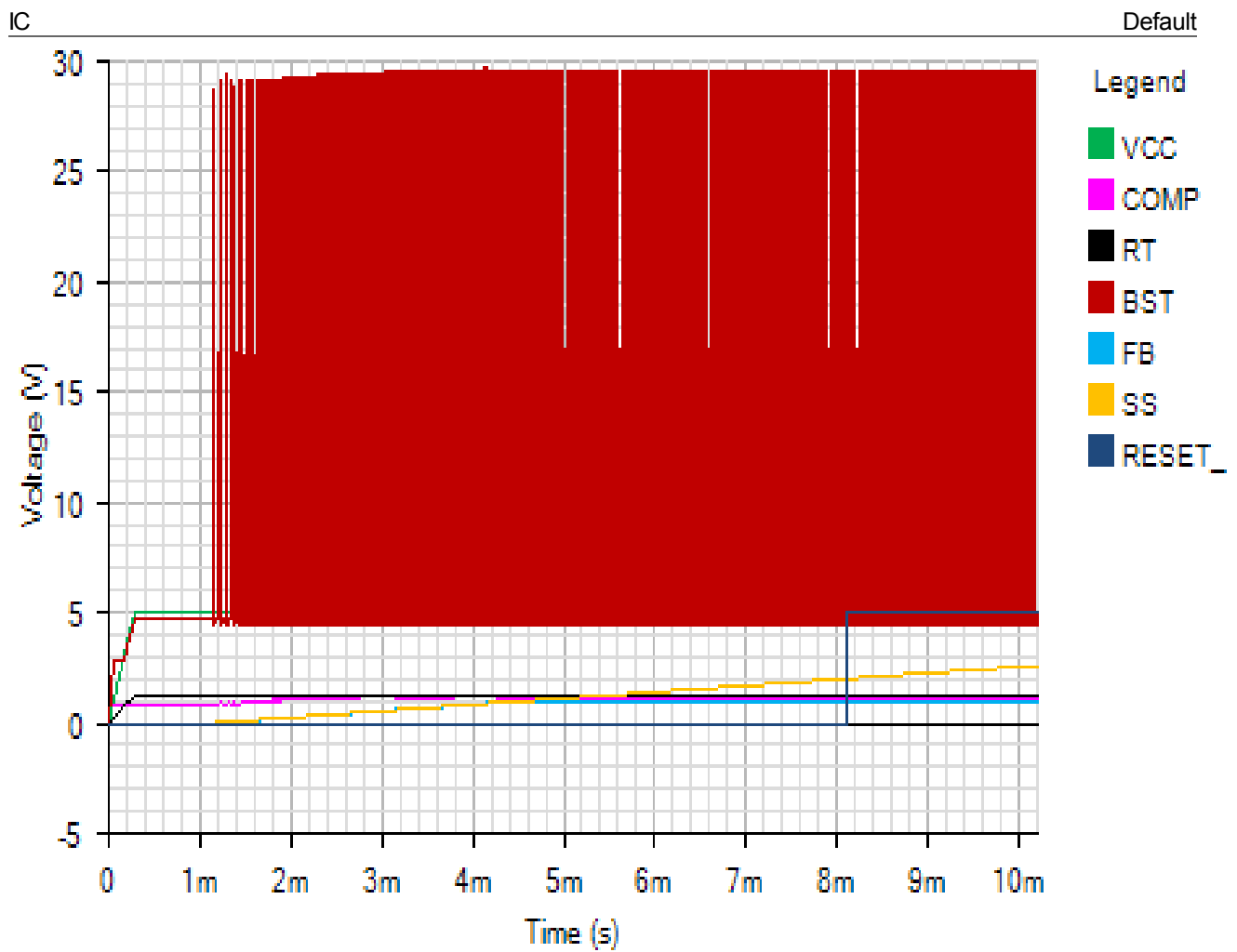
Loss (W)

% of total

Component	Loss (W)	% of total
Transformer losses	0.18	15.1
Losses in IC	0.41	34.5
Secondary-diode loss	0.6	50.4
Total	1.19	100

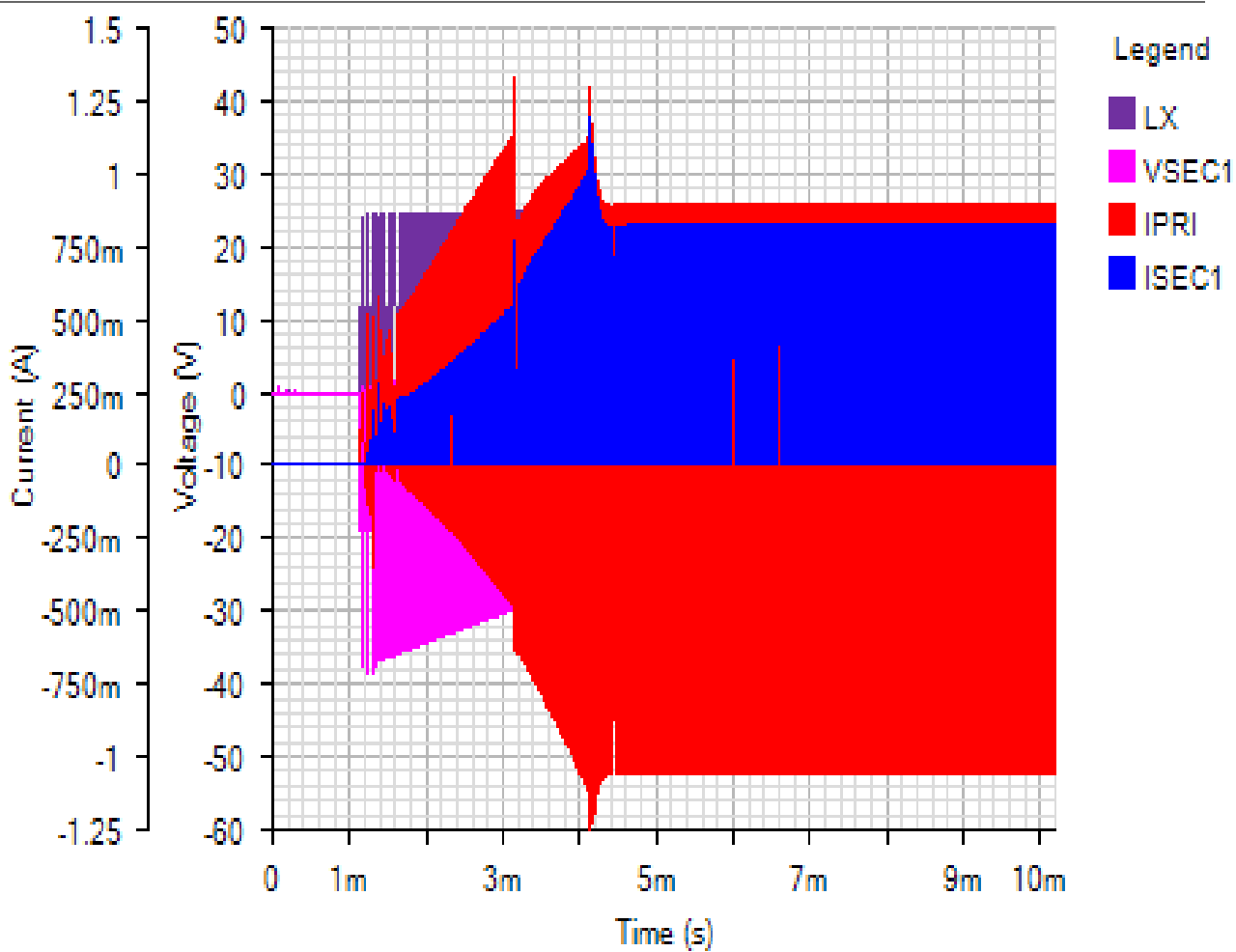


Start Up - Mon Nov 19 2018 10:09:20



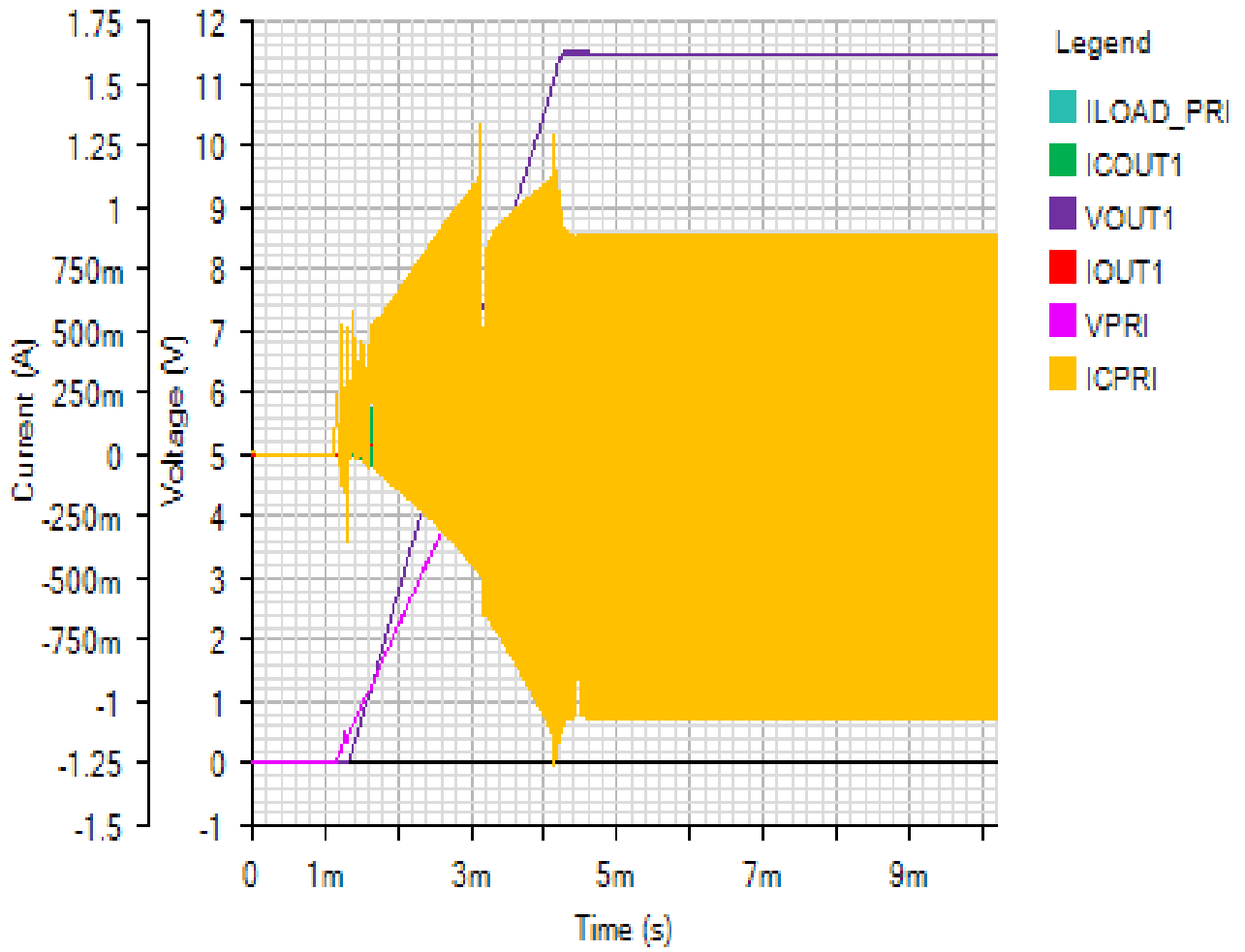
SWITCHING

Default



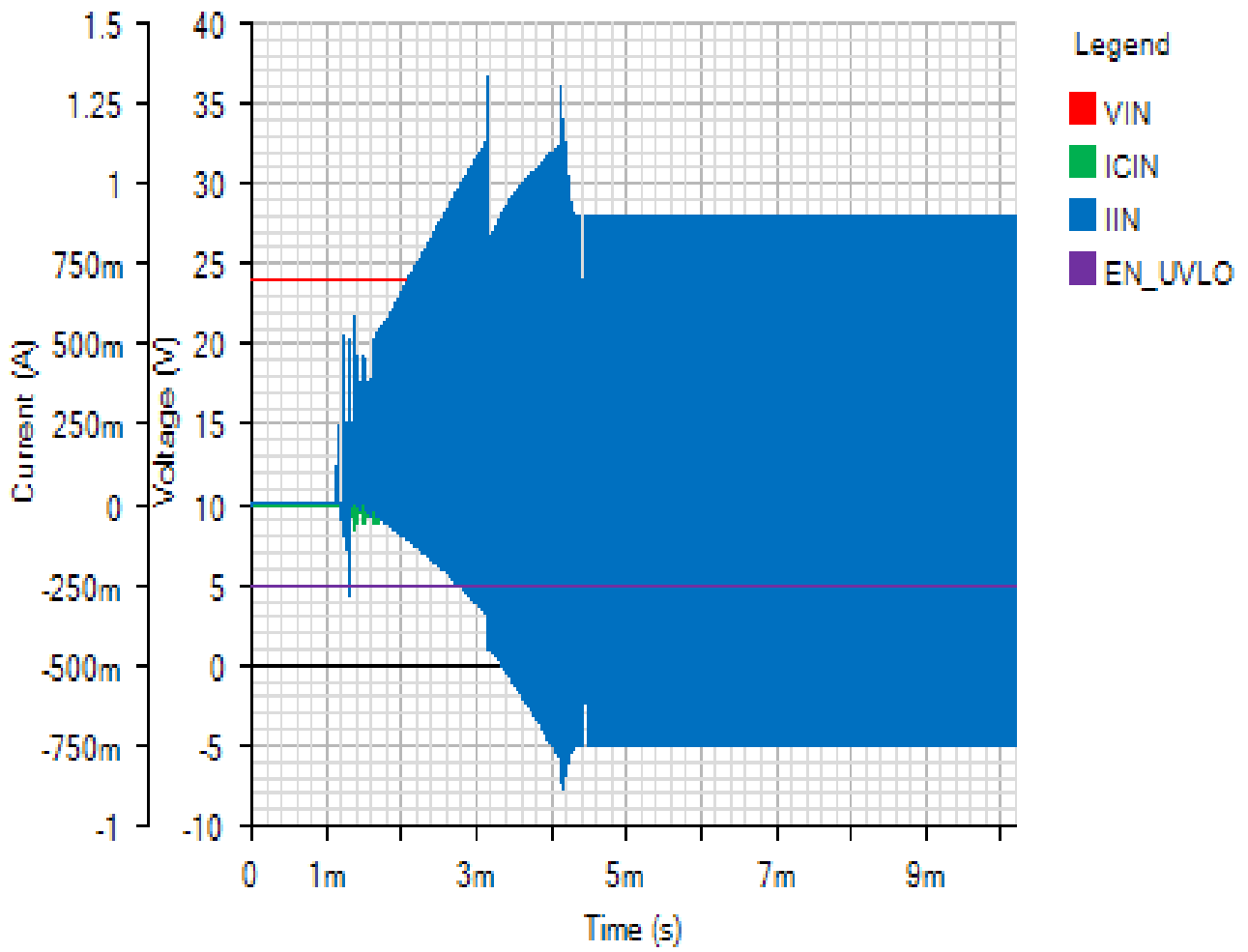
OUTPUT

Default

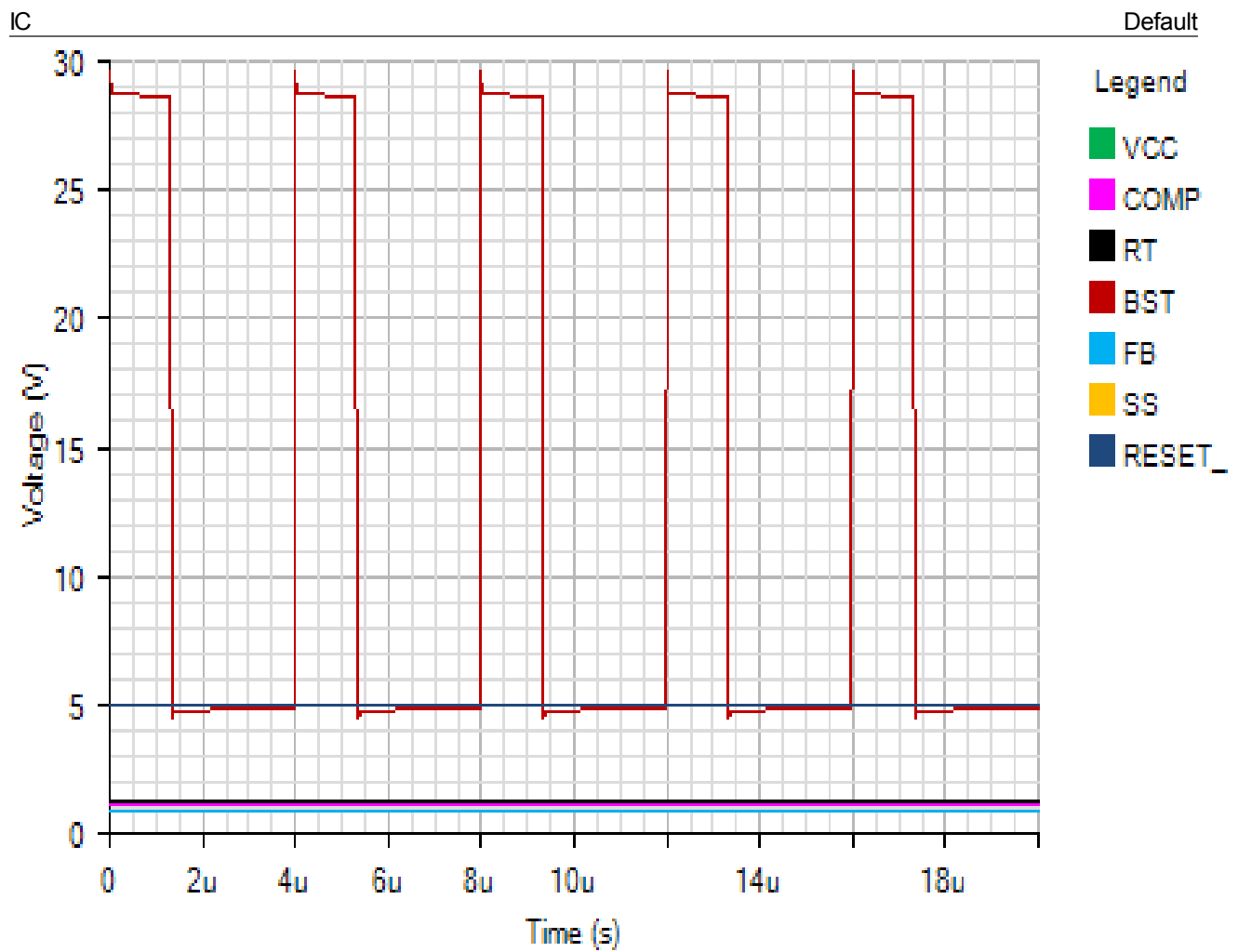


INPUT

Default

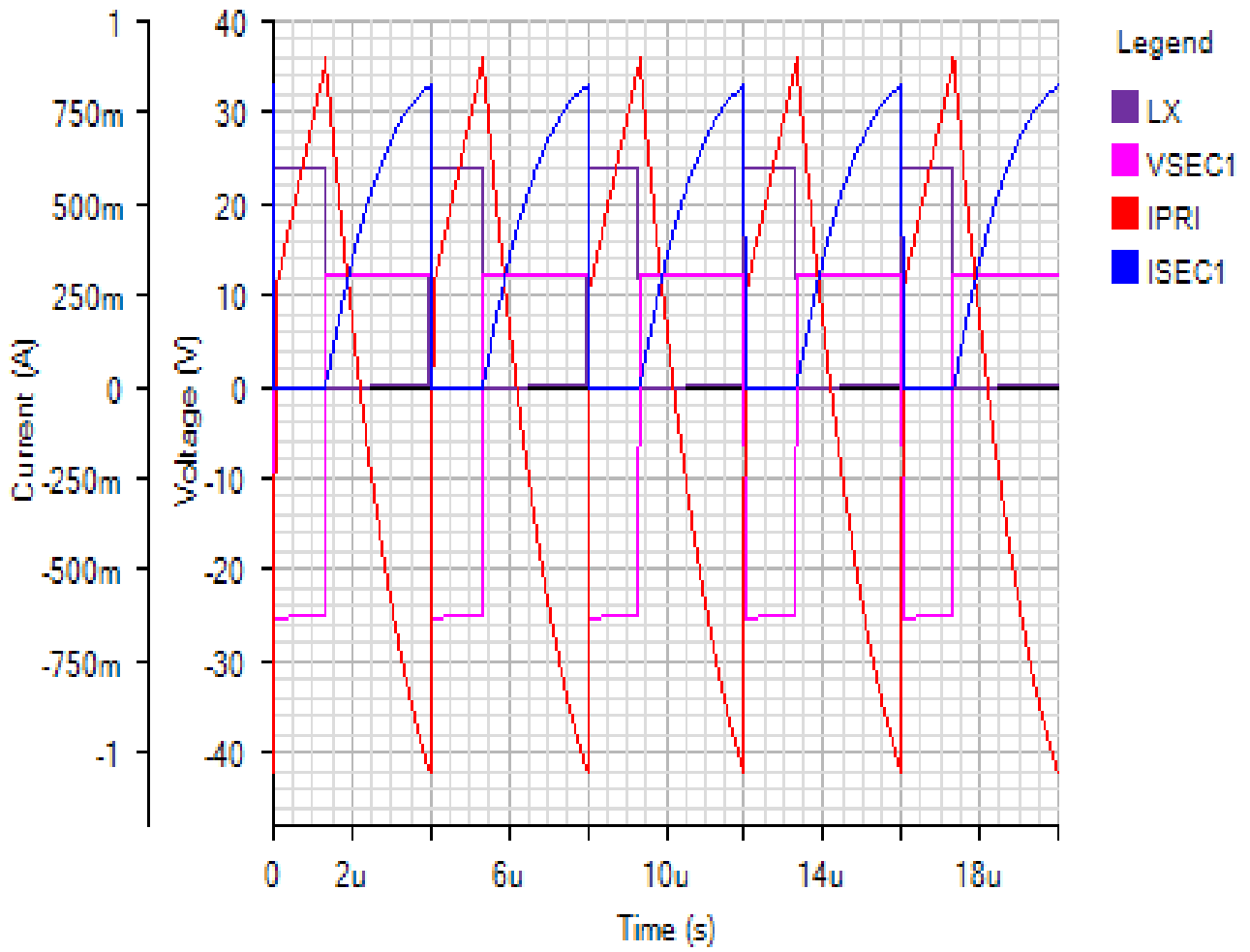


Steady State - Mon Nov 19 2018 10:09:20



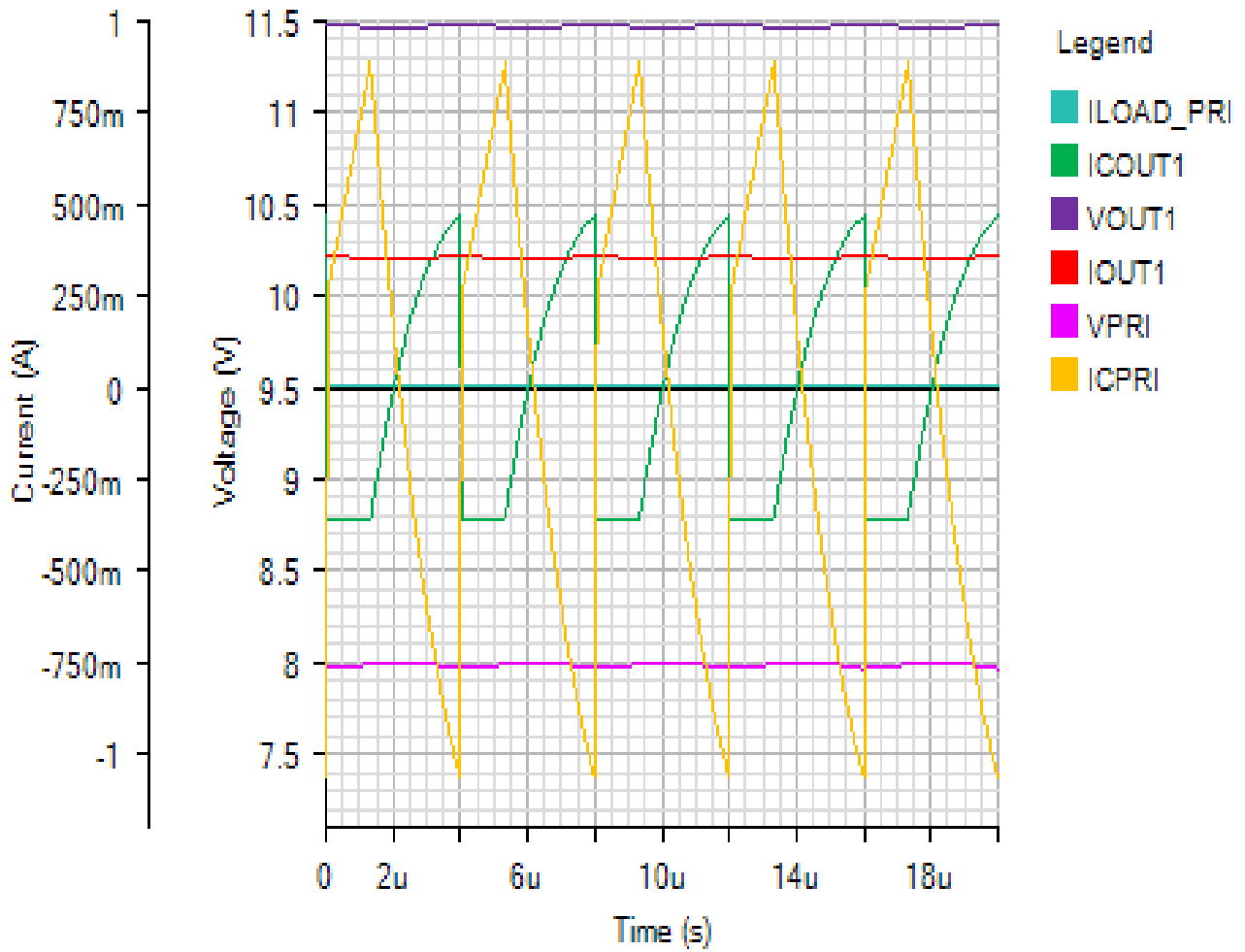
SWITCHING

Default



OUTPUT

Default



INPUT

Default

