

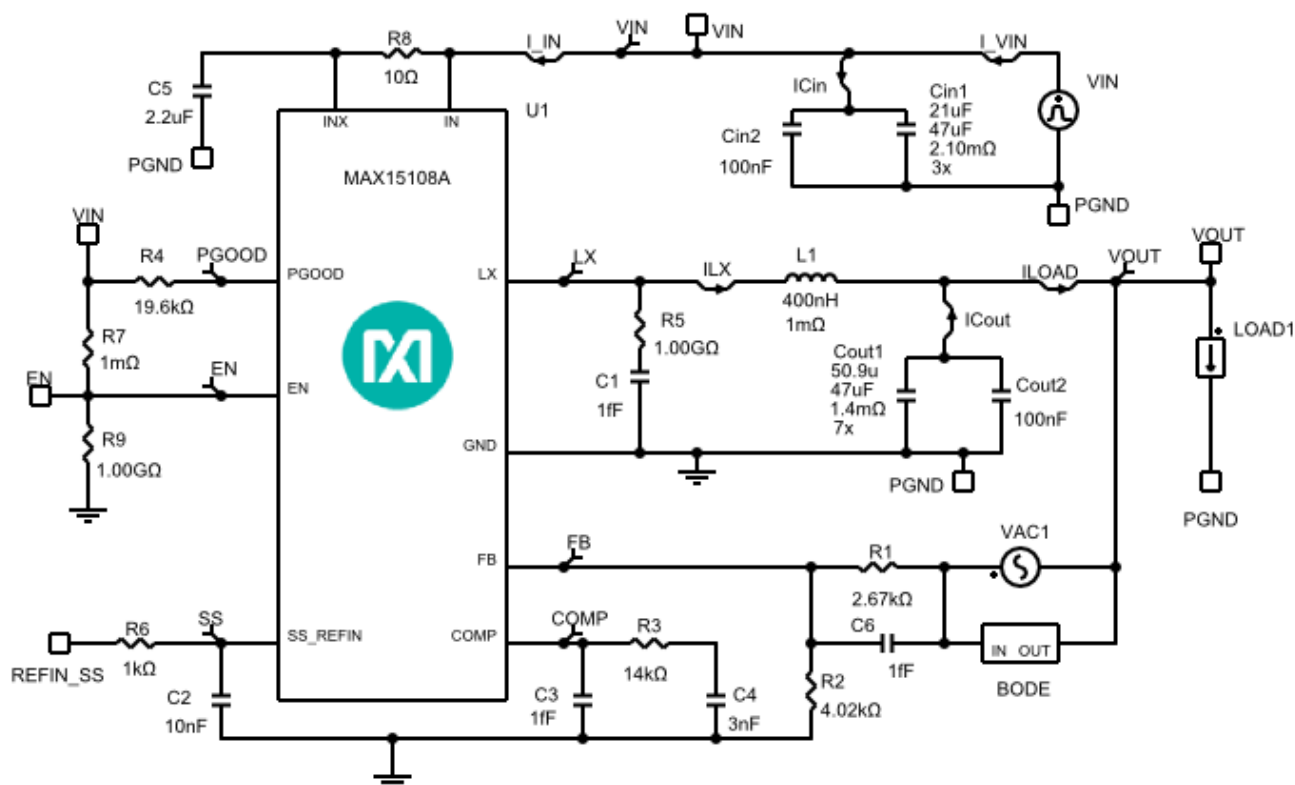
Initial Design

1.0

Design Requirements

Parameter	Value
Minimum Input Voltage	4.5V
Maximum Input Voltage	5.5V
Nominal Input Voltage	5V
Input Voltage Ripple	1%
Output Voltage	1V
Output Current	8A
Output Voltage Ripple	1%
Load Step Start Current	8A
Load Step Current	4A
Output Voltage Load Step Overshoot	5%
Performance Priority	Balance Efficiency and Size
BOM Priority	Cost
Inductor Current Ratio (LIR)	0.3

Schematic



BOM

Ref	Qty	Part Number	Manufacturer	Description
U1	1	MAX15108A	User-Defined	IC
C2	1	VJ0603Y103KXAAC	Vishay	Cap Ceramic 0.01uF 50V X7R 10% Pad SMD 0603 150°C T/R
C4	1	VJ0603Y302JXXAC	Vishay	Cap Ceramic 0.003uF 25V X7R 5% Pad SMD 0603 150°C T/R
C5	1	EMK107BB7225KA-T	Taiyo Yuden	Cap Ceramic 2.2uF 16V X7R 10% Pad SMD 0603 125°C T/R
Cin1	3	GRM31CR61A476KE15L	Murata	Cap Ceramic 47uF 10V X5R 10% SMD 1206 85C Embossed T/R
Cin2	1	CC0603JRX7R8BB104	Yageo	Cap Ceramic 0.1uF 25V X7R 5% Pad SMD 0603 125°C T/R
Cout1	7	GRM32ER60J476ME20L	Murata	Cap Ceramic 47uF 6.3V X5R 20% SMD 1210 85C Embossed T/R
Cout2	1	VJ0603Y104JXQPW1BC	Vishay	Cap Ceramic 0.1uF 10V X7R 5% Pad SMD 0603 125°C T/R
L1	1	SLC7530D-101MLB	Coilcraft	Inductor 100nH 20.5A Isat 38A Irms
R1	1	ERJ3EKF2671V	Panasonic	Res Thick Film 0603 2.67K Ohm 1% 0.1W(1/10W) ±100ppm/°C Pad SMD Automotive T/R

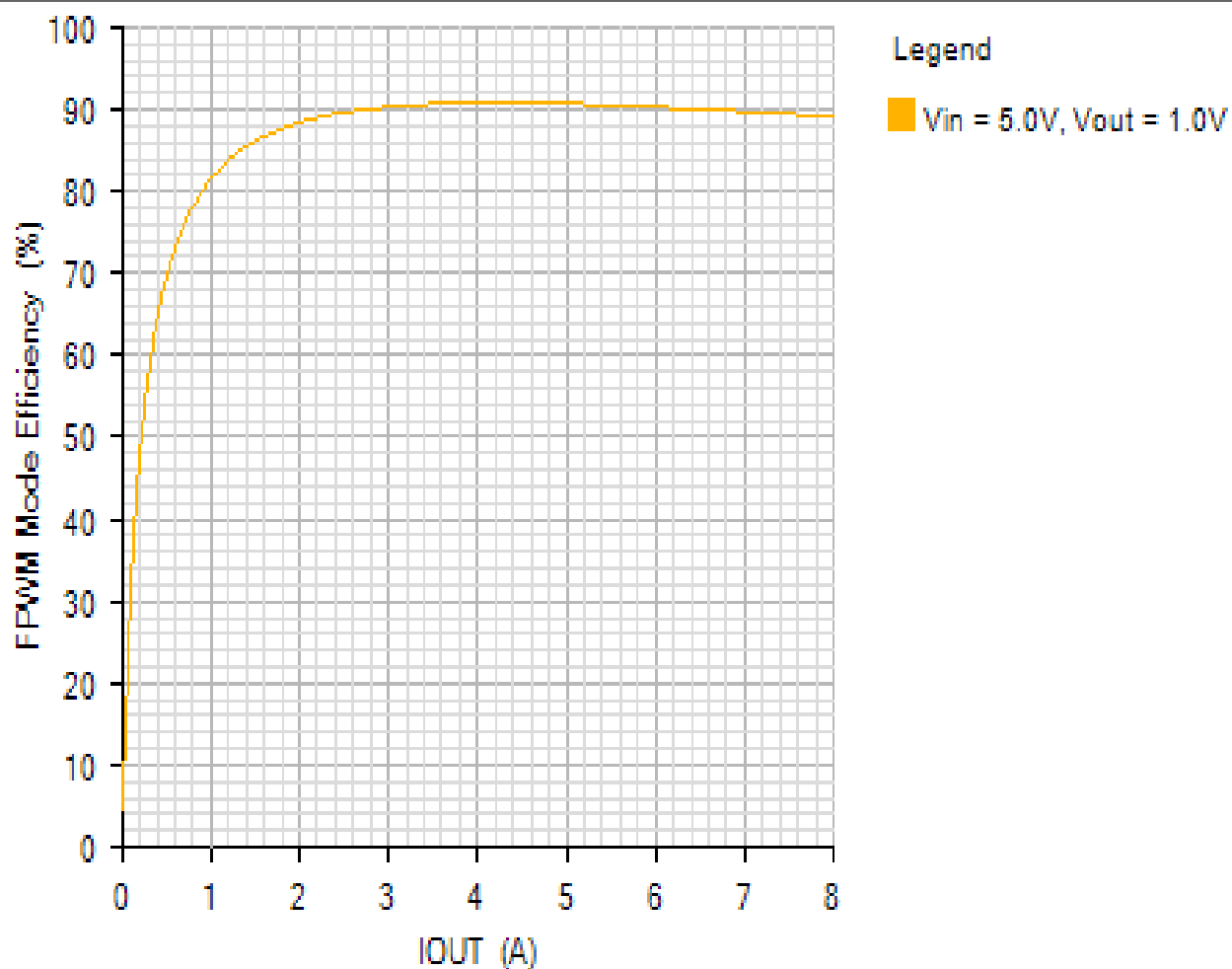
R2	1	ERJ3EKF4021V	Panasonic	Res Thick Film 0603 4.02K Ohm 1% 0.1W(1/10W) ±100ppm/°C Pad SMD Automotive T/R
R3	1	ERJ3EKF1402V	Panasonic	Res Thick Film 0603 14K Ohm 1% 0.1W(1/10W) ±100ppm/°C Pad SMD Automotive T/R
R4	1	ERJ3EKF1962V	Panasonic	Res Thick Film 0603 19.6K Ohm 1% 0.1W(1/10W) ±100ppm/°C Pad SMD Automotive T/R
R6	1	ERJ3EKF1001V	Panasonic	Res Thick Film 0603 1K Ohm 1% 0.1W(1/10W) ±100ppm/°C Pad SMD Automotive T/R
R8	1	ERJ3EKF10R0V	Panasonic	Res Thick Film 0603 10 Ohm 1% 0.1W(1/10W) ±100ppm/°C Pad SMD Automotive T/R

Simulation Results

Efficiency - Mon Nov 19 2018 11:42:21

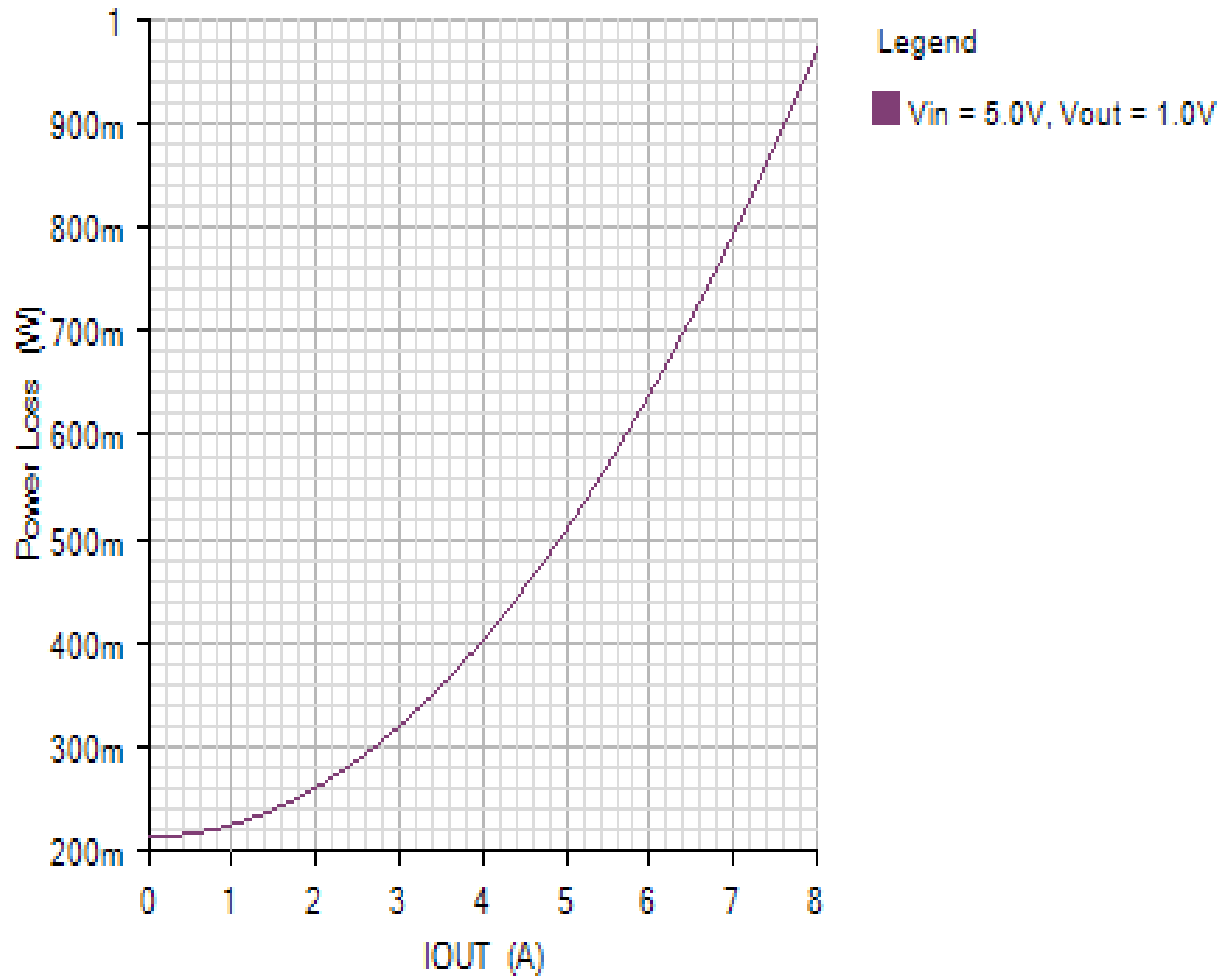
EFFICIENCY_PLOT

Default



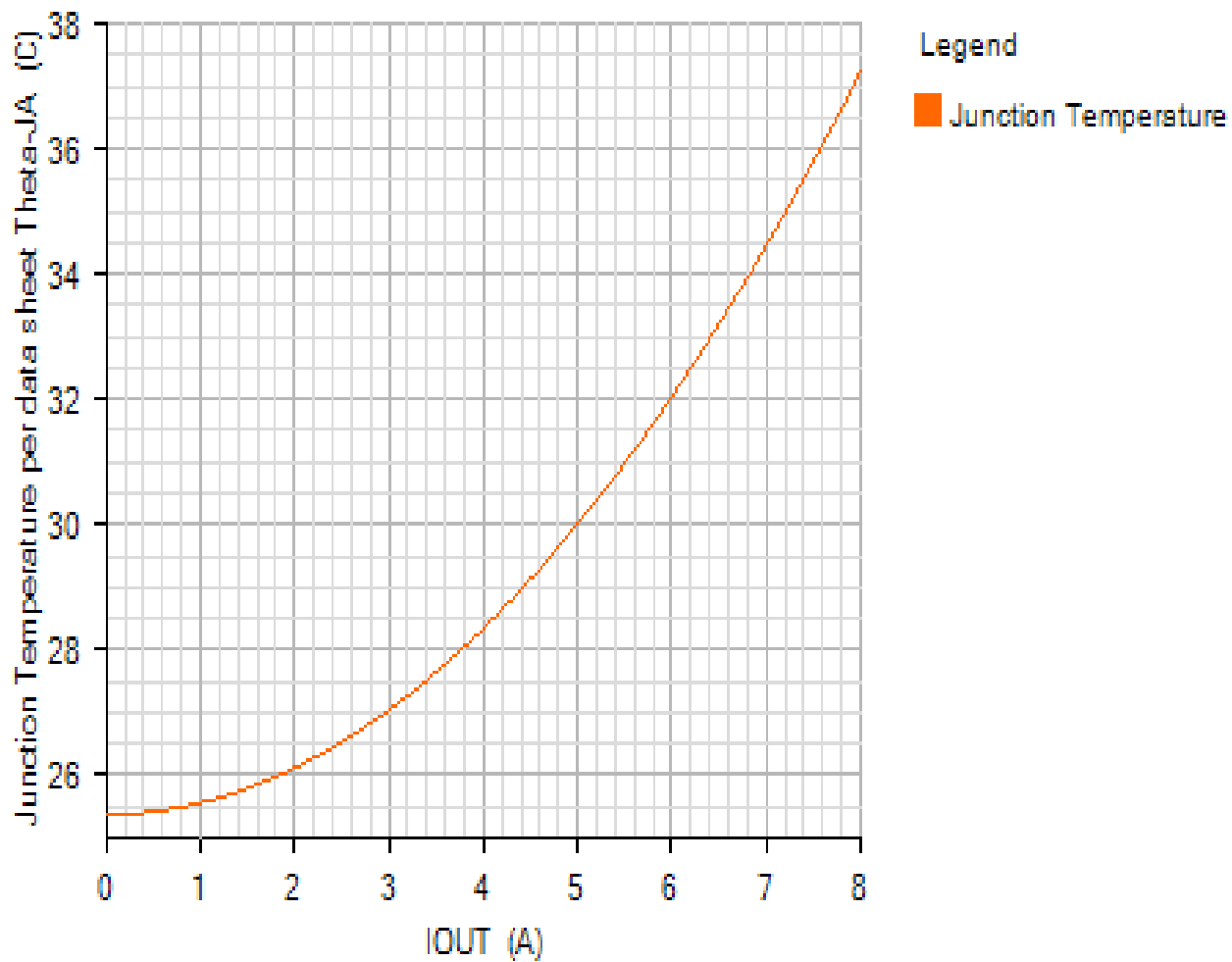
POWER_LOSS_PLOT

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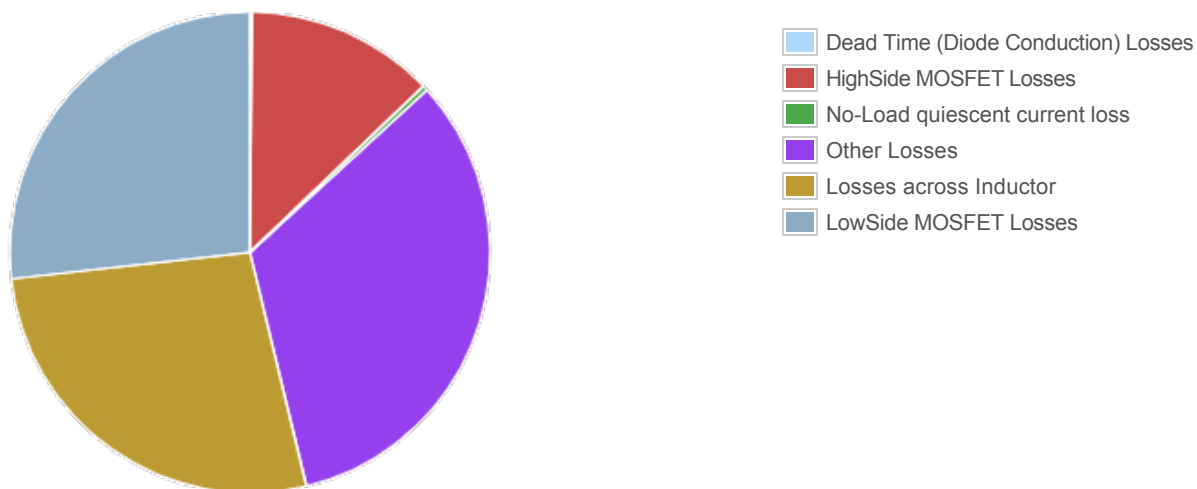


JUNCTION_TEMPERATURE_PLOT

Default



Losses



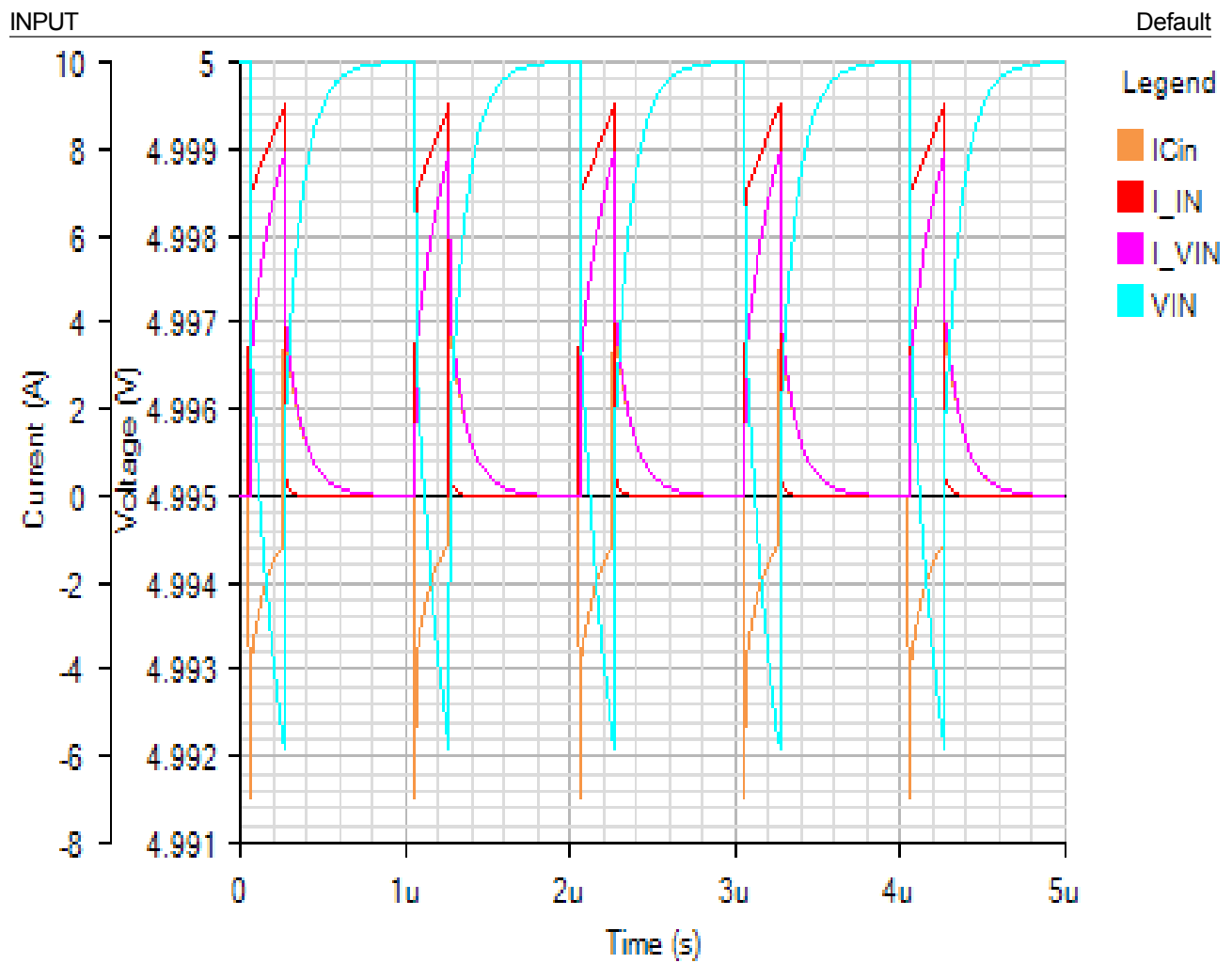
Component

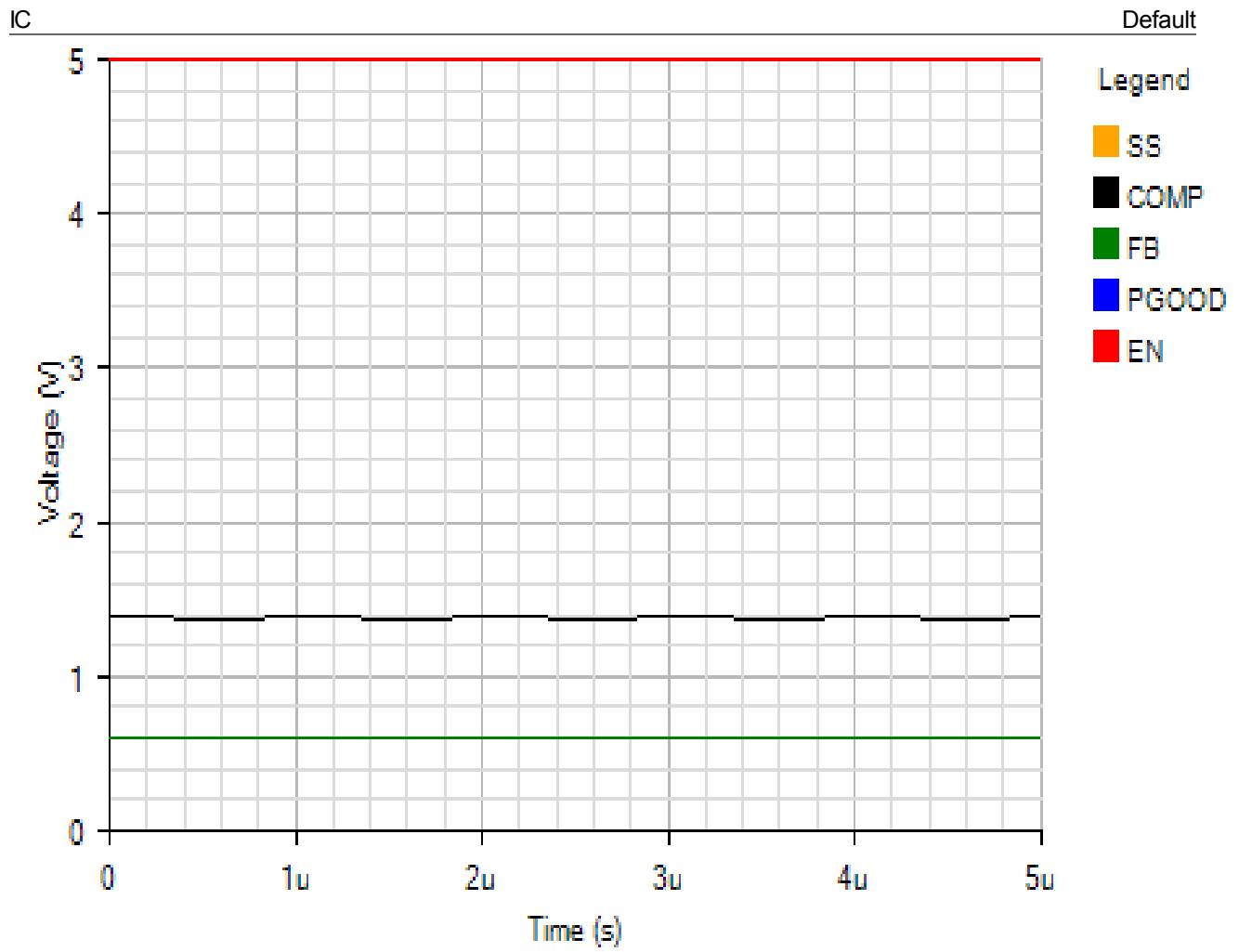
Loss (W)

% of total

Component	Loss (W)	% of total
Dead Time (Diode Conduction) Losses	0.001398	0.1
HighSide MOSFET Losses	0.123869	12.7
No-Load quiescent current loss	0.0035	0.4
Other Losses	0.321663	33
Losses across Inductor	0.263552	27
LowSide MOSFET Losses	0.260651	26.7
Total	0.974634	100

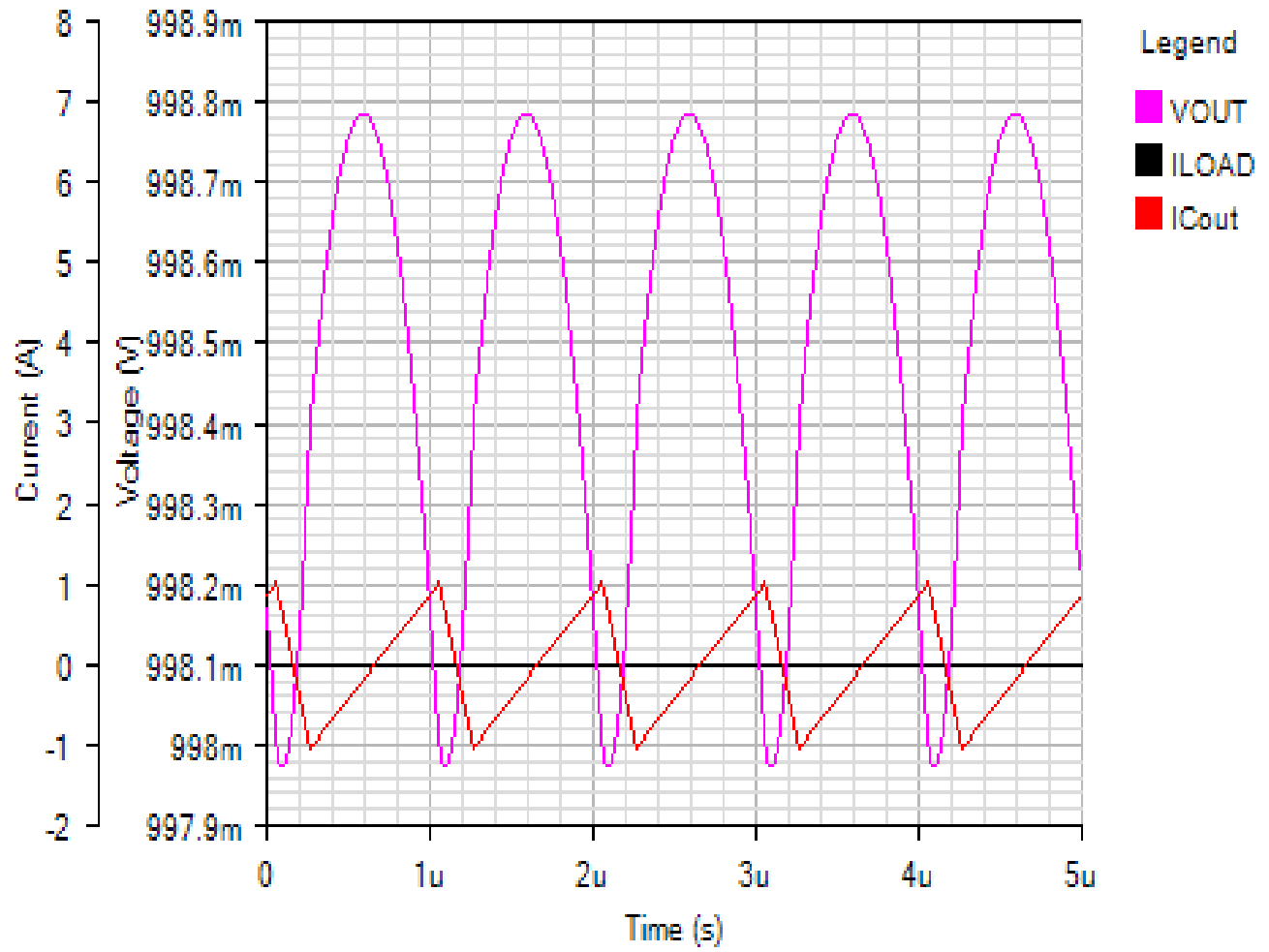
Steady State - Mon Nov 19 2018 11:42:21





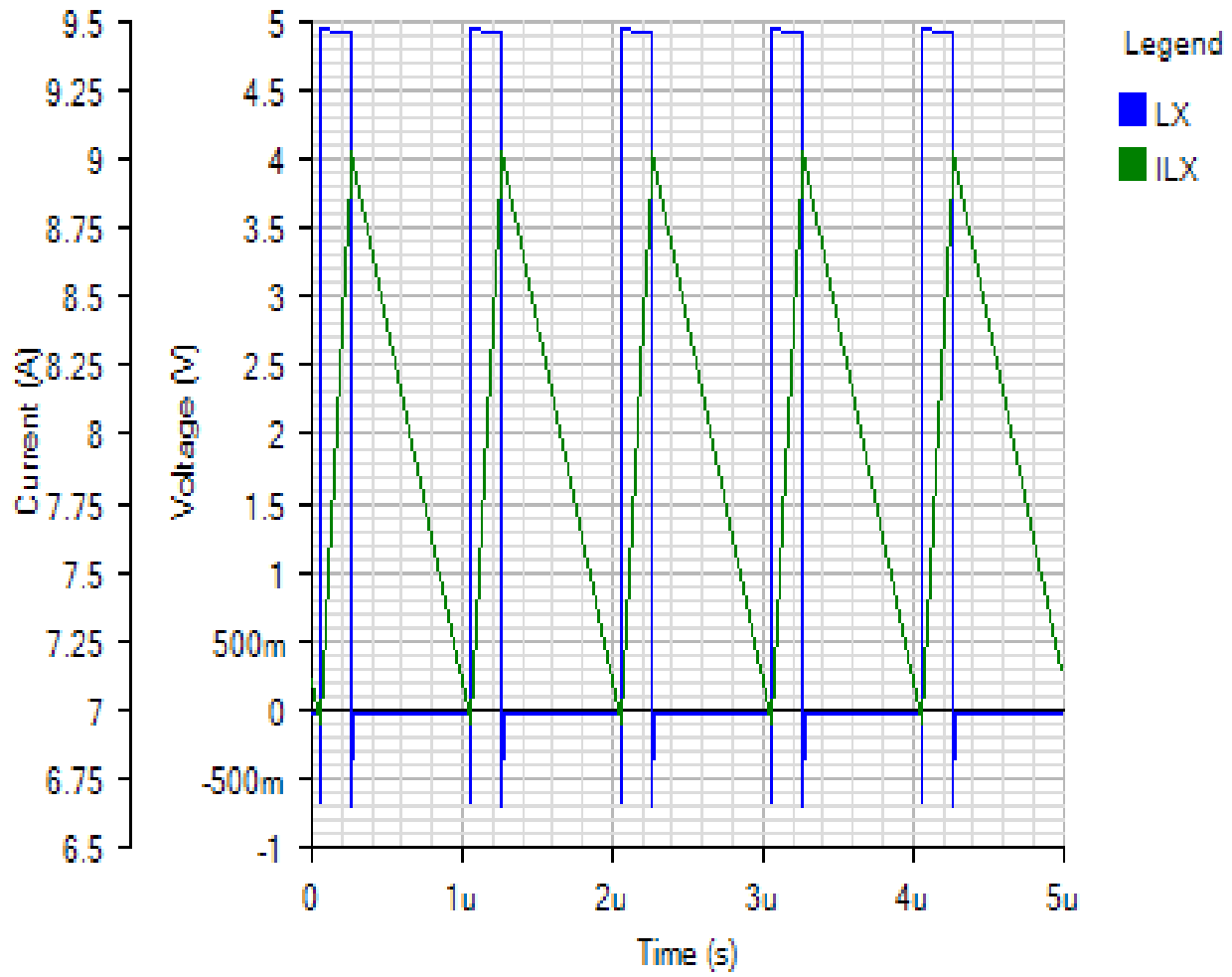
OUTPUT

Default



SWITCHING

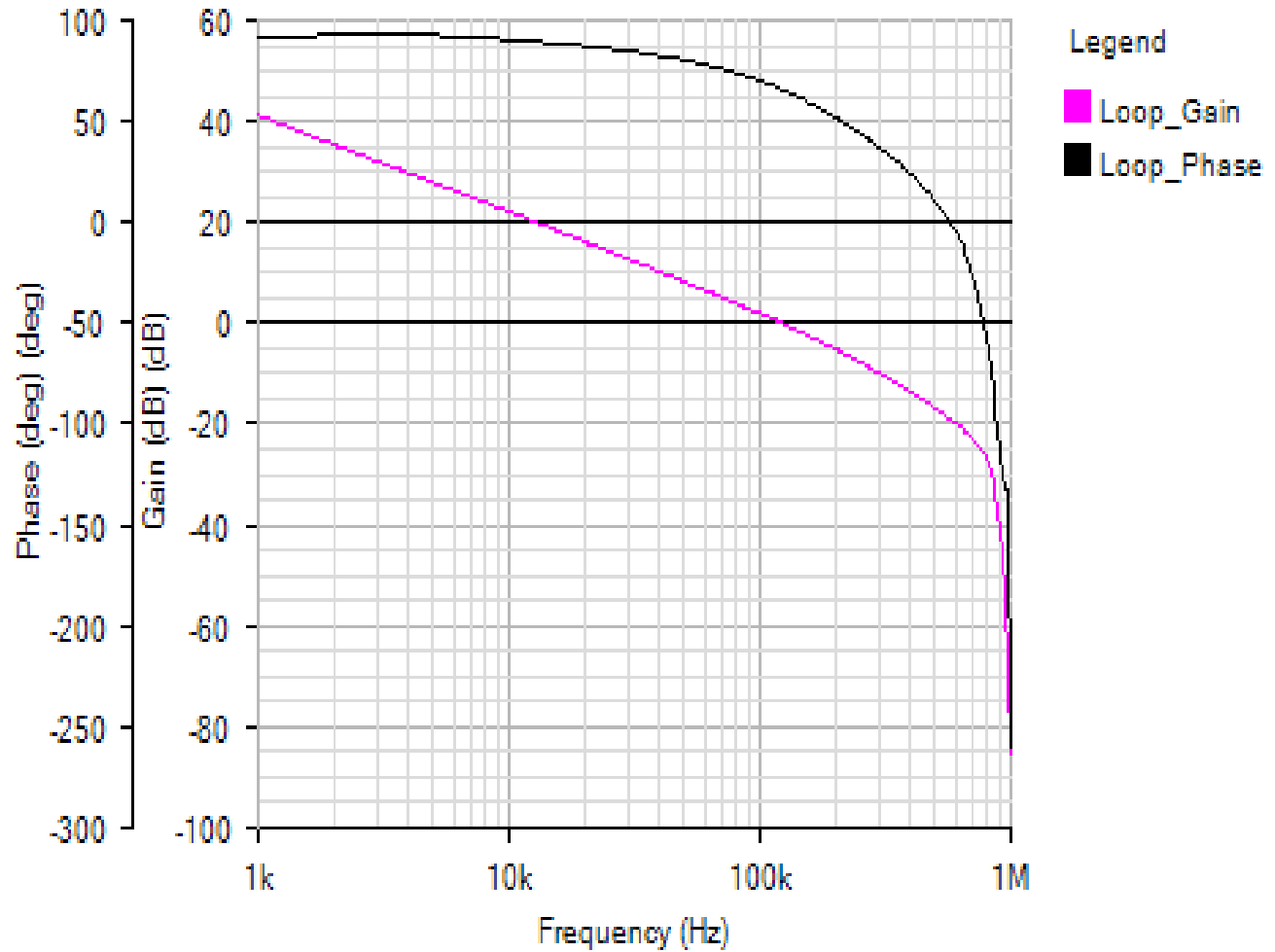
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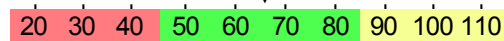
AC Analysis - Mon Nov 19 2018 11:42:21

BODE

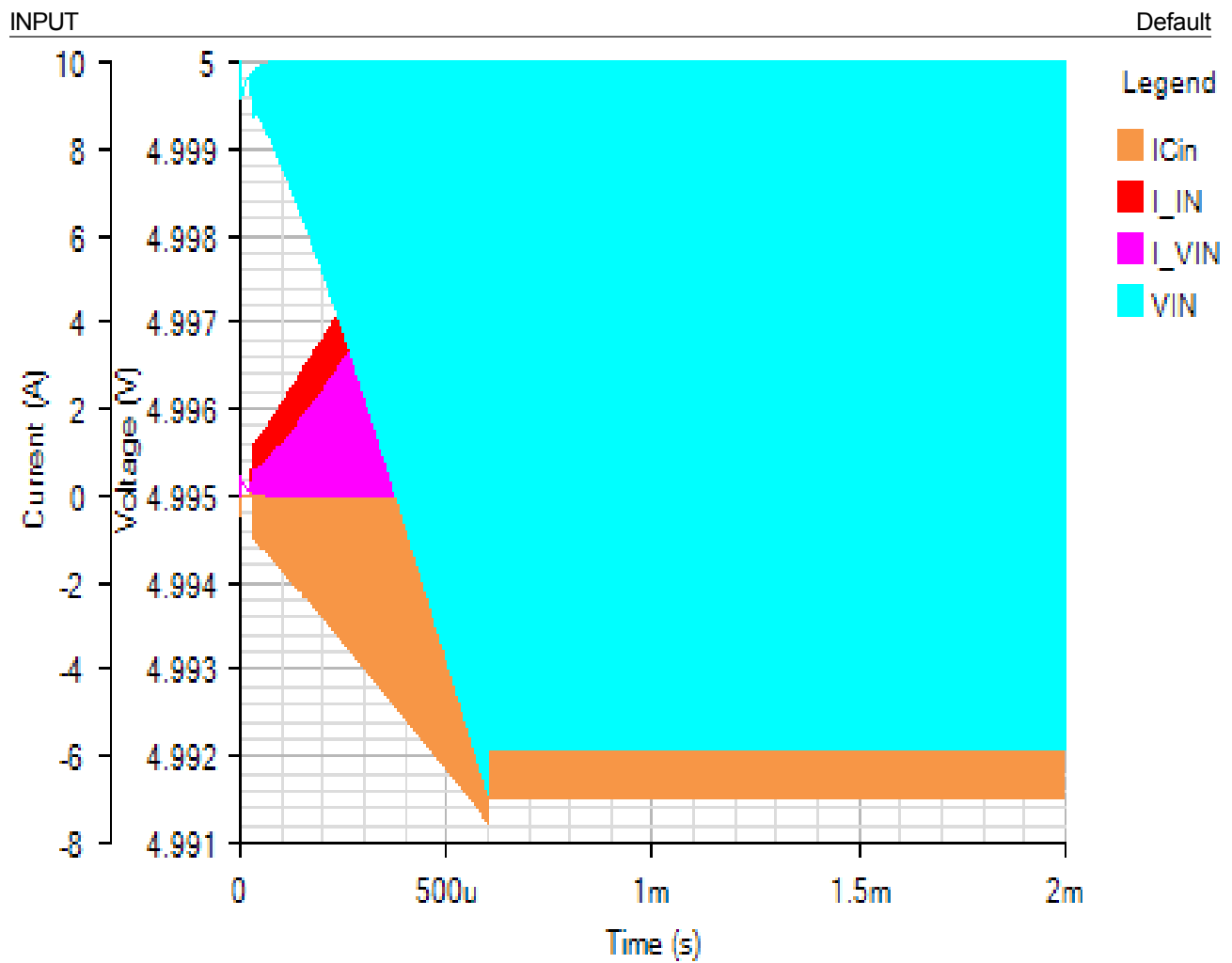
Default



Phase Margin: 65.9° at a crossover frequency of 122.1kHz

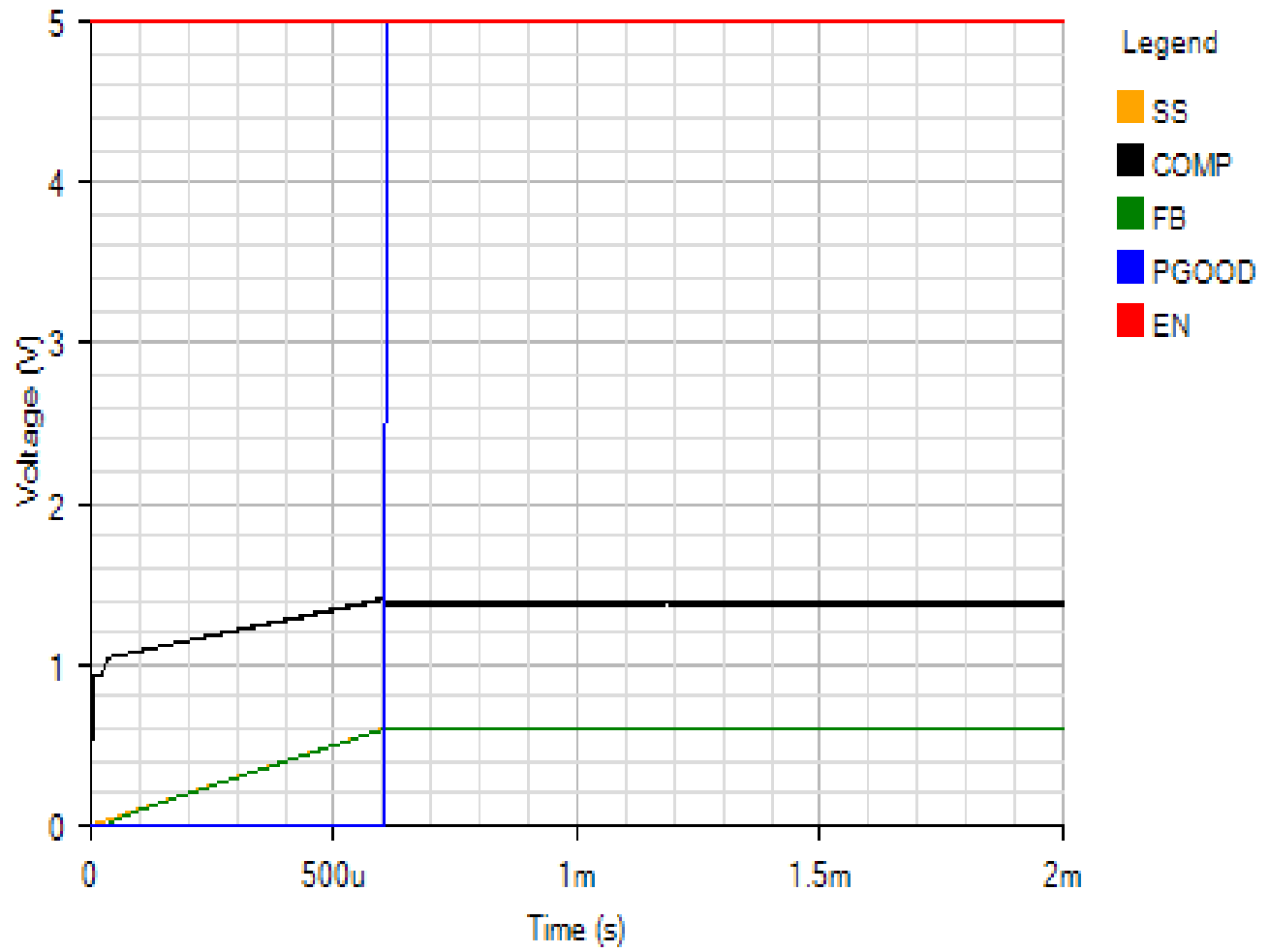


Start Up - Mon Nov 19 2018 11:42:21



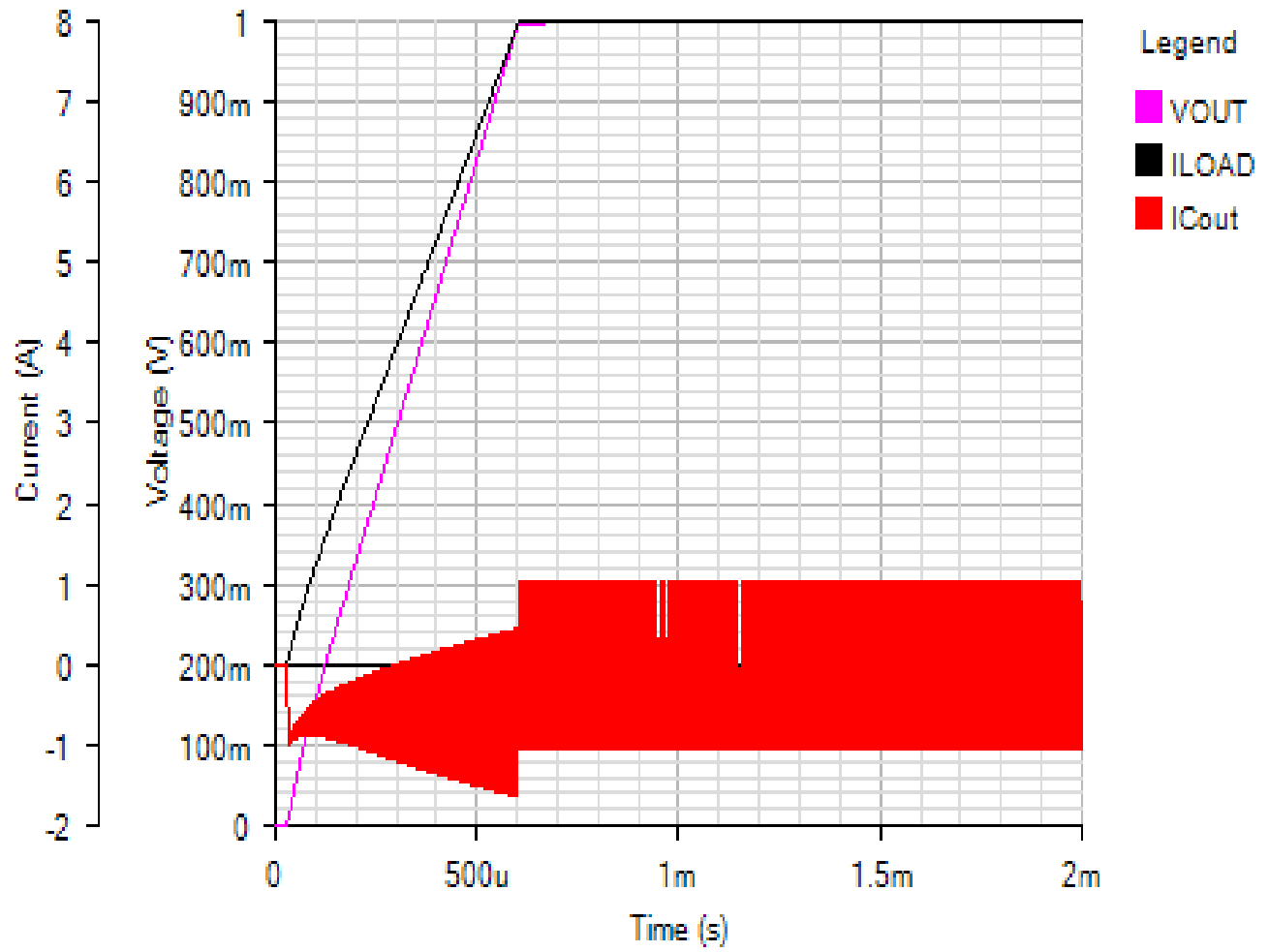
IC

Default



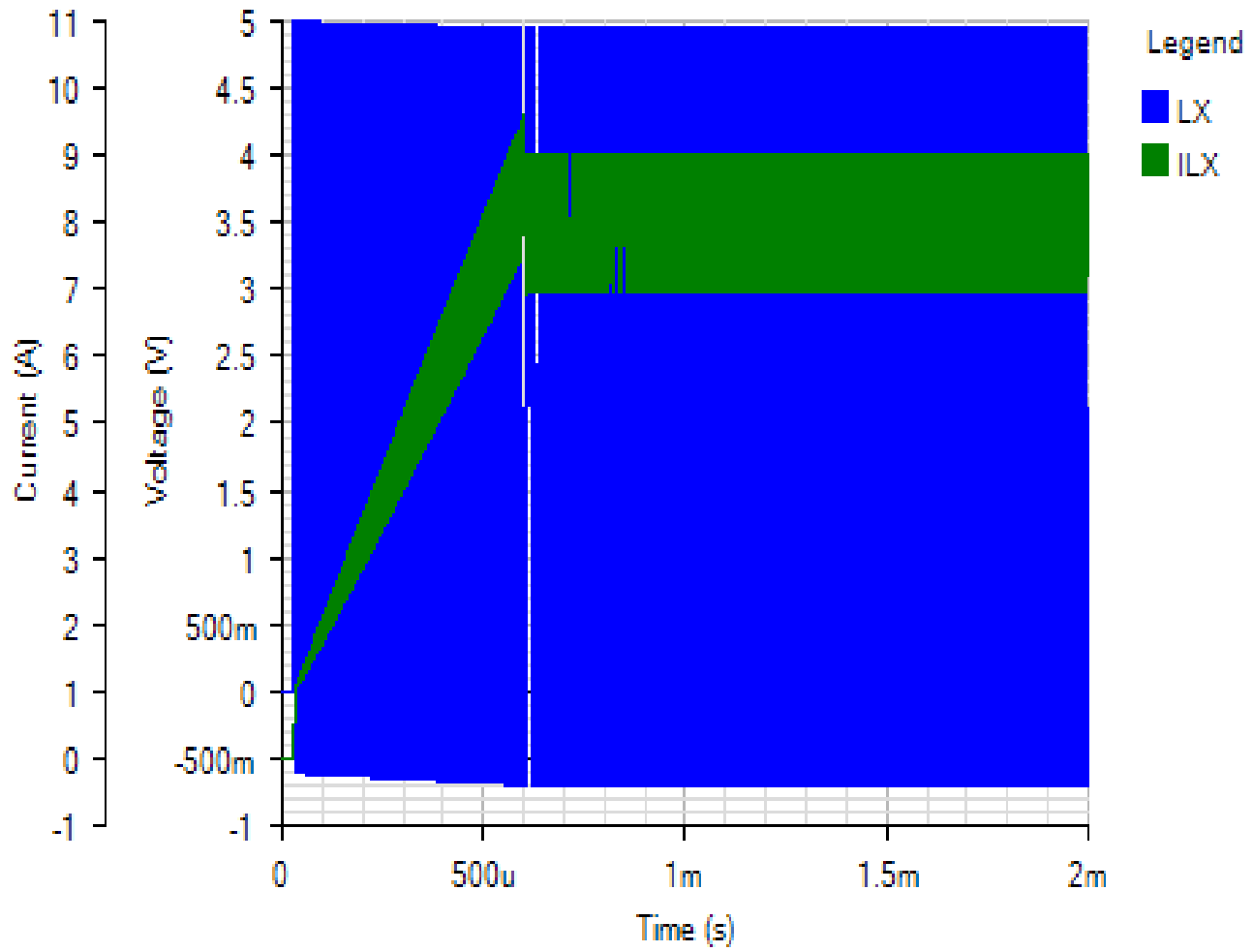
OUTPUT

Default

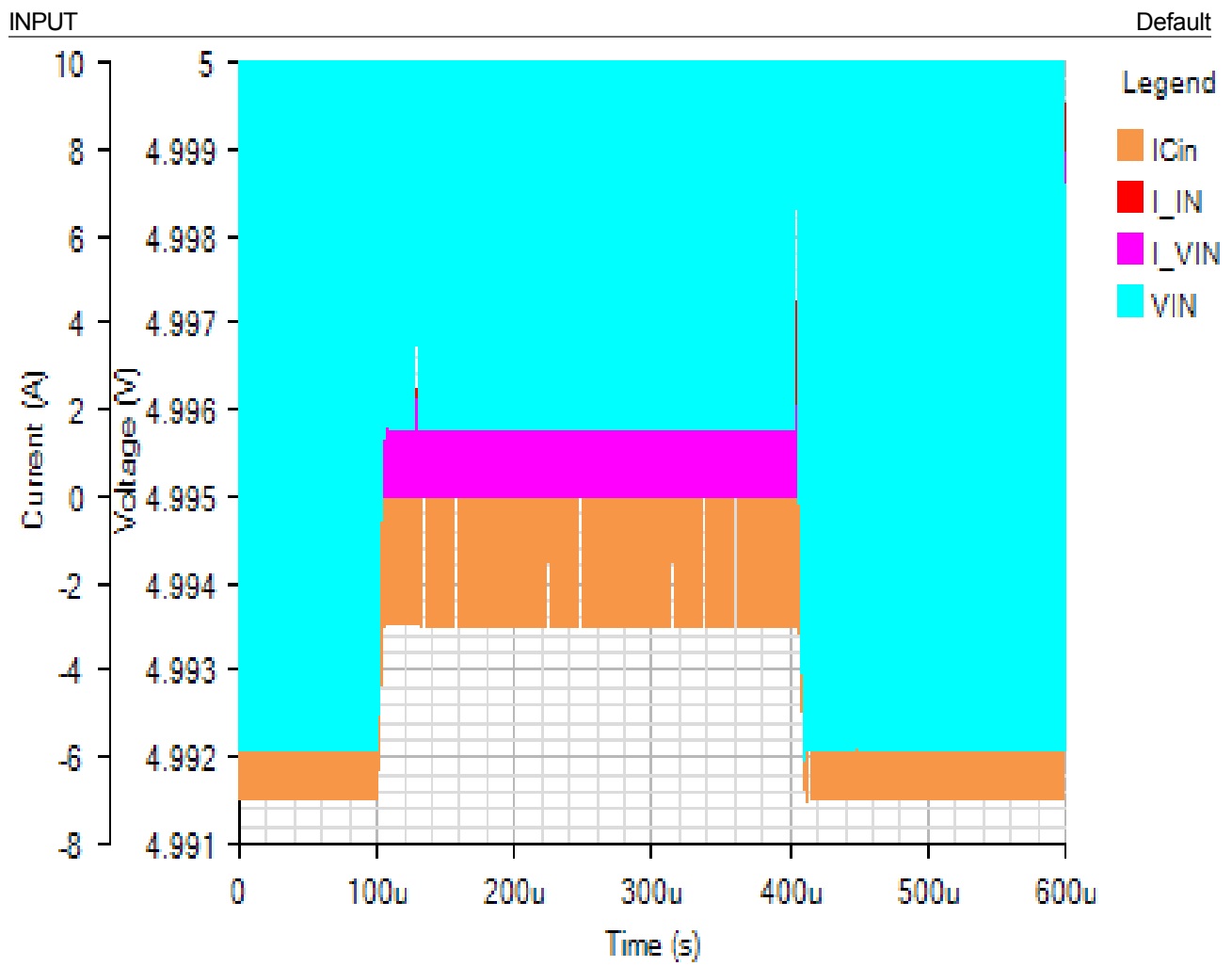


SWITCHING

Default

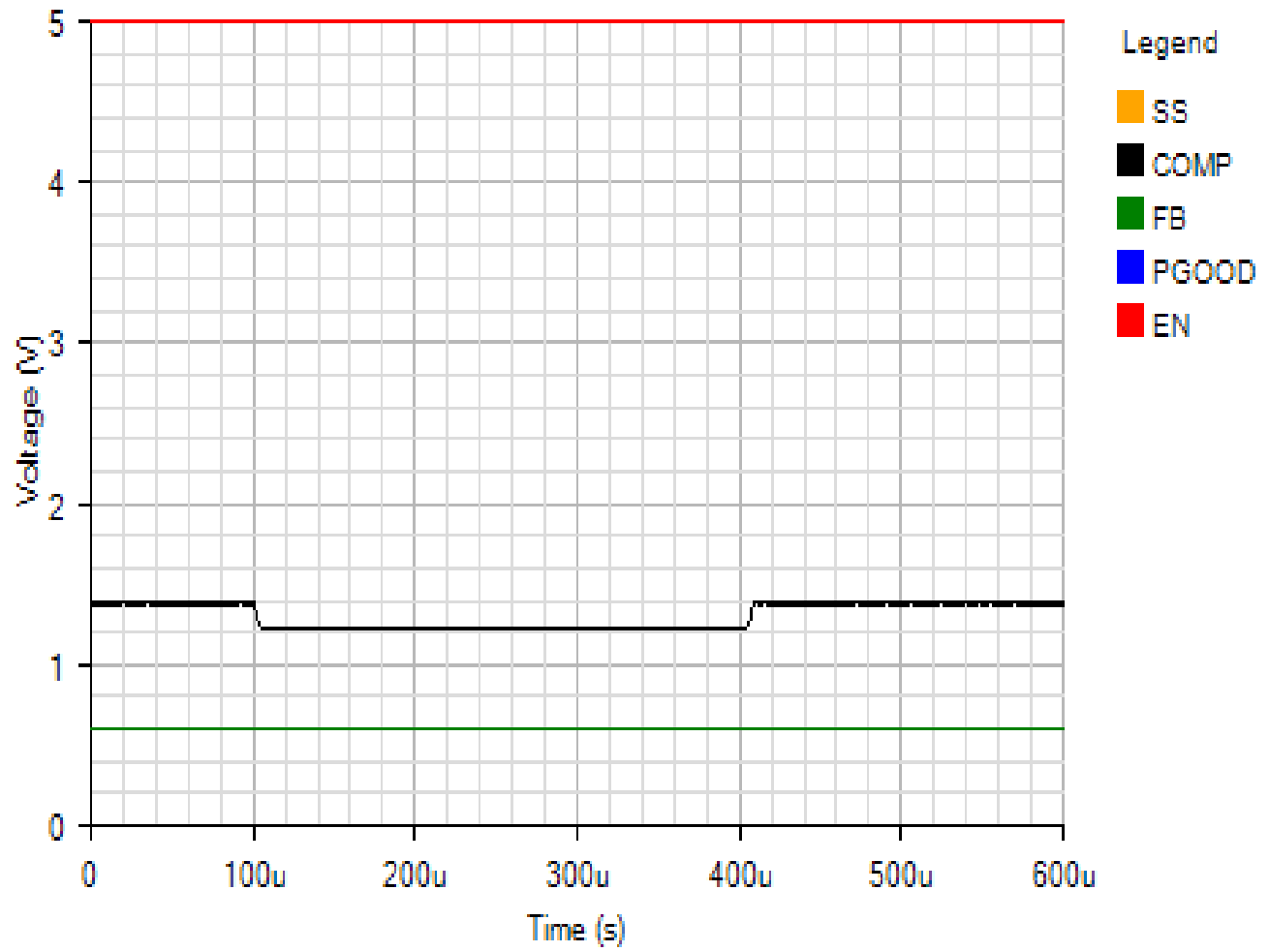


Load Step - Mon Nov 19 2018 11:42:21



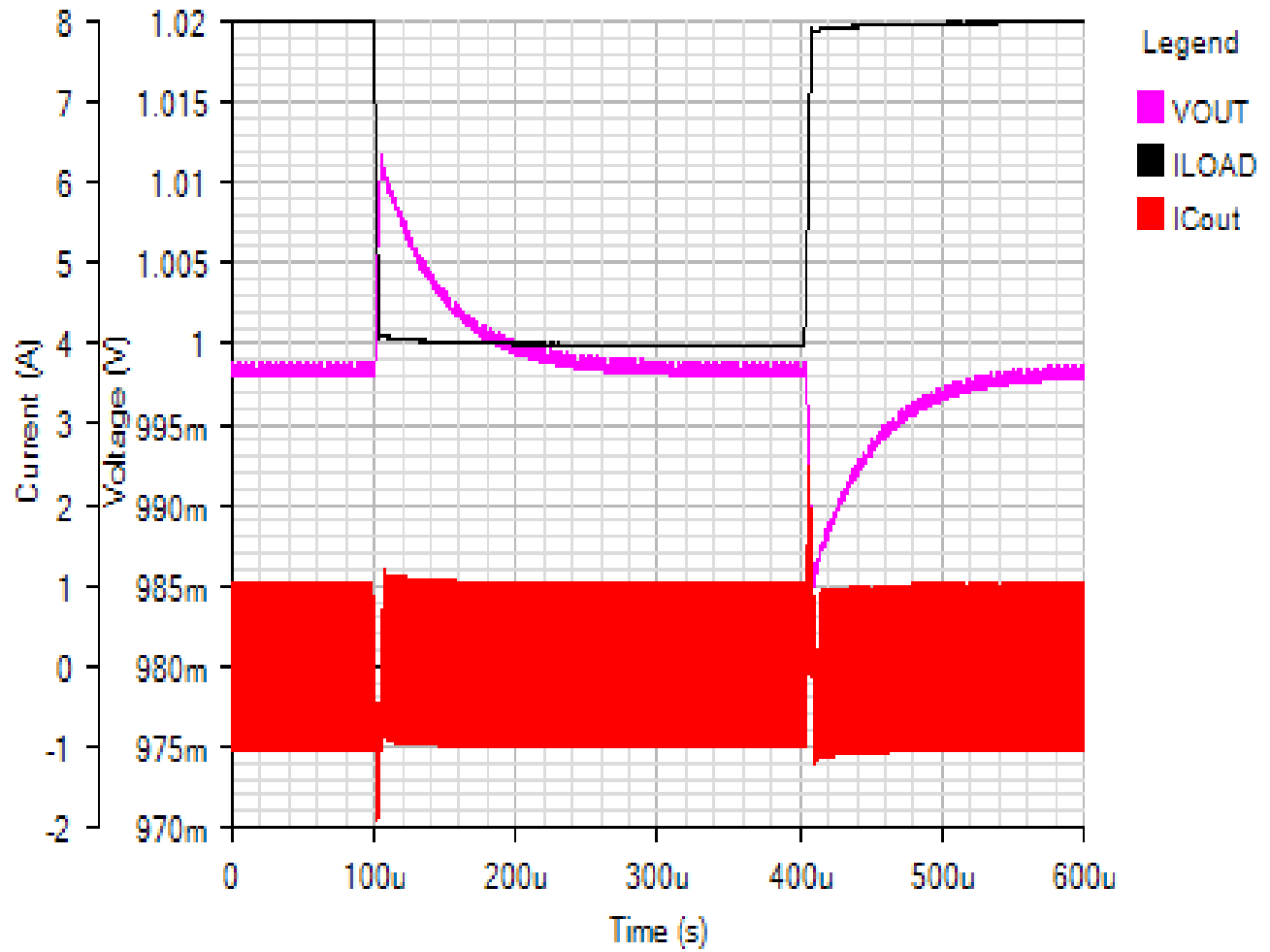
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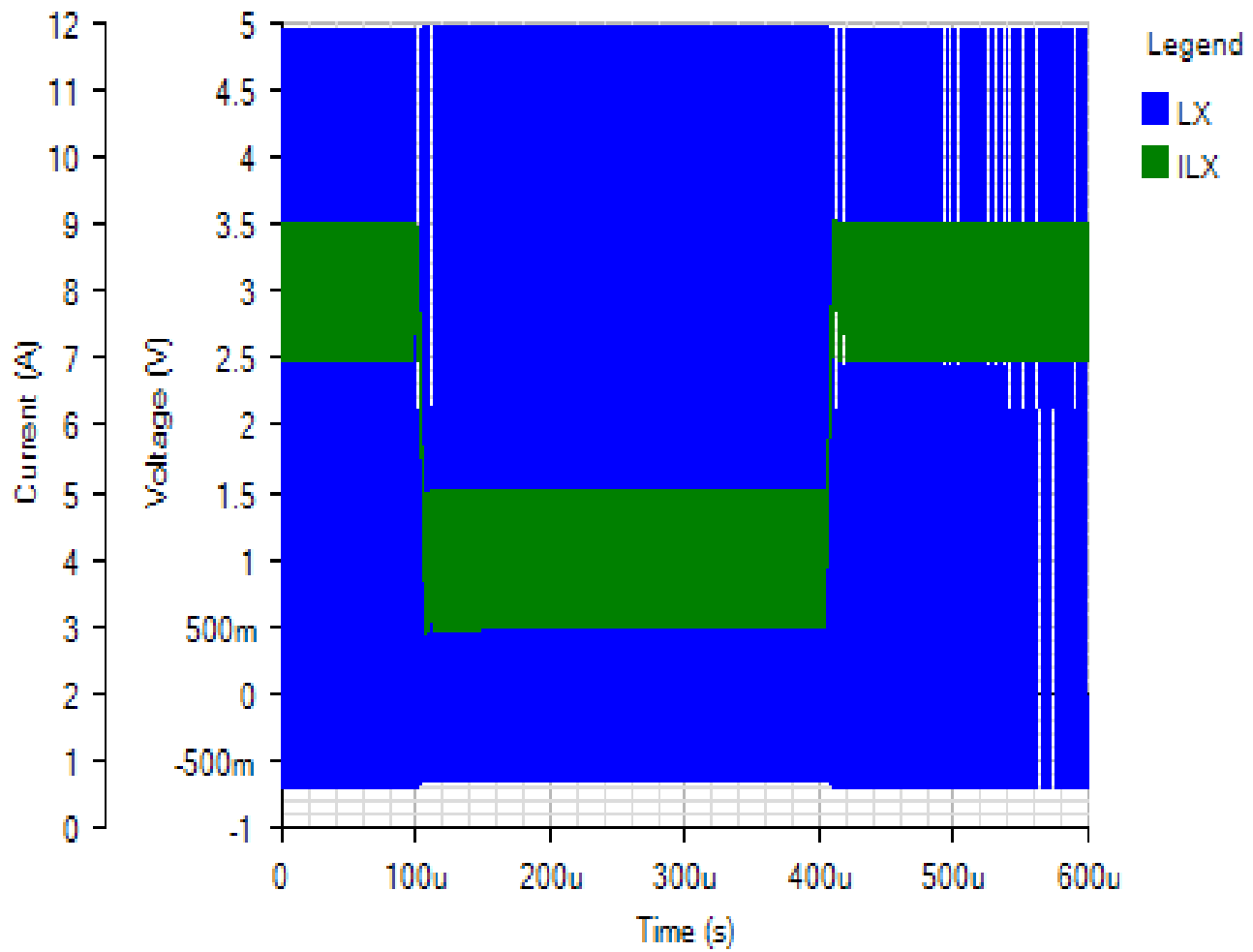
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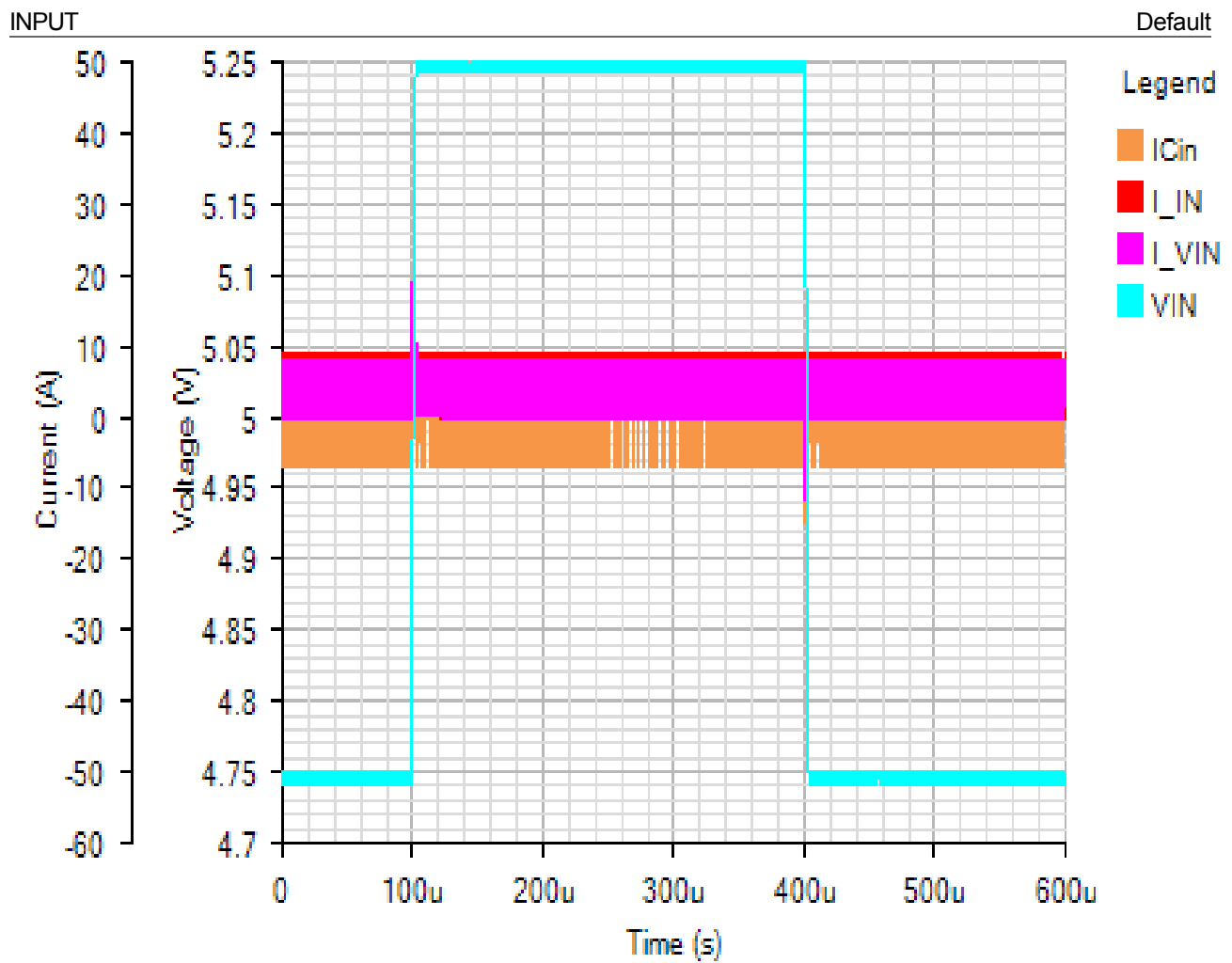


SWITCHING

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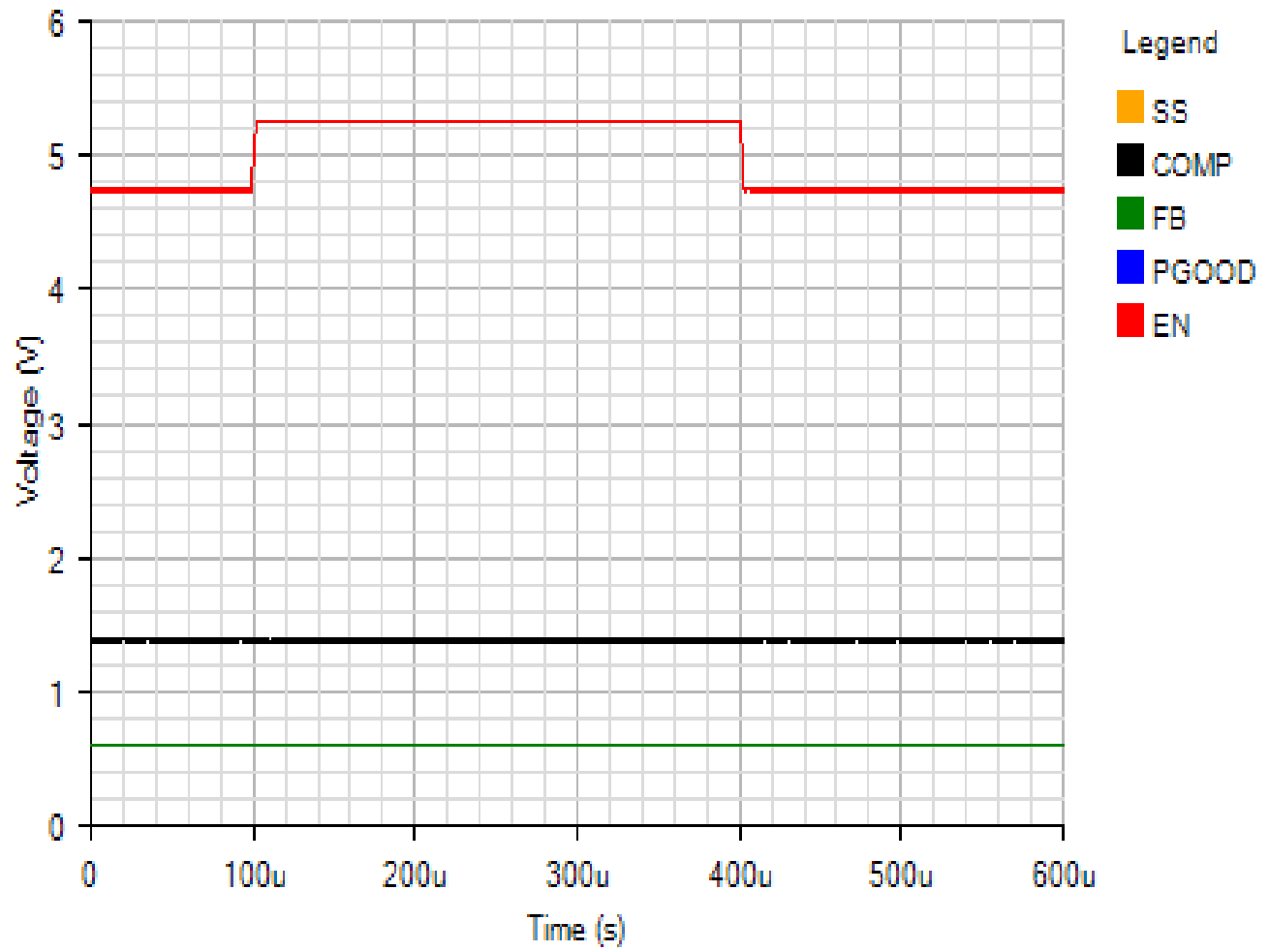


Line Transient - Mon Nov 19 2018 11:42:21



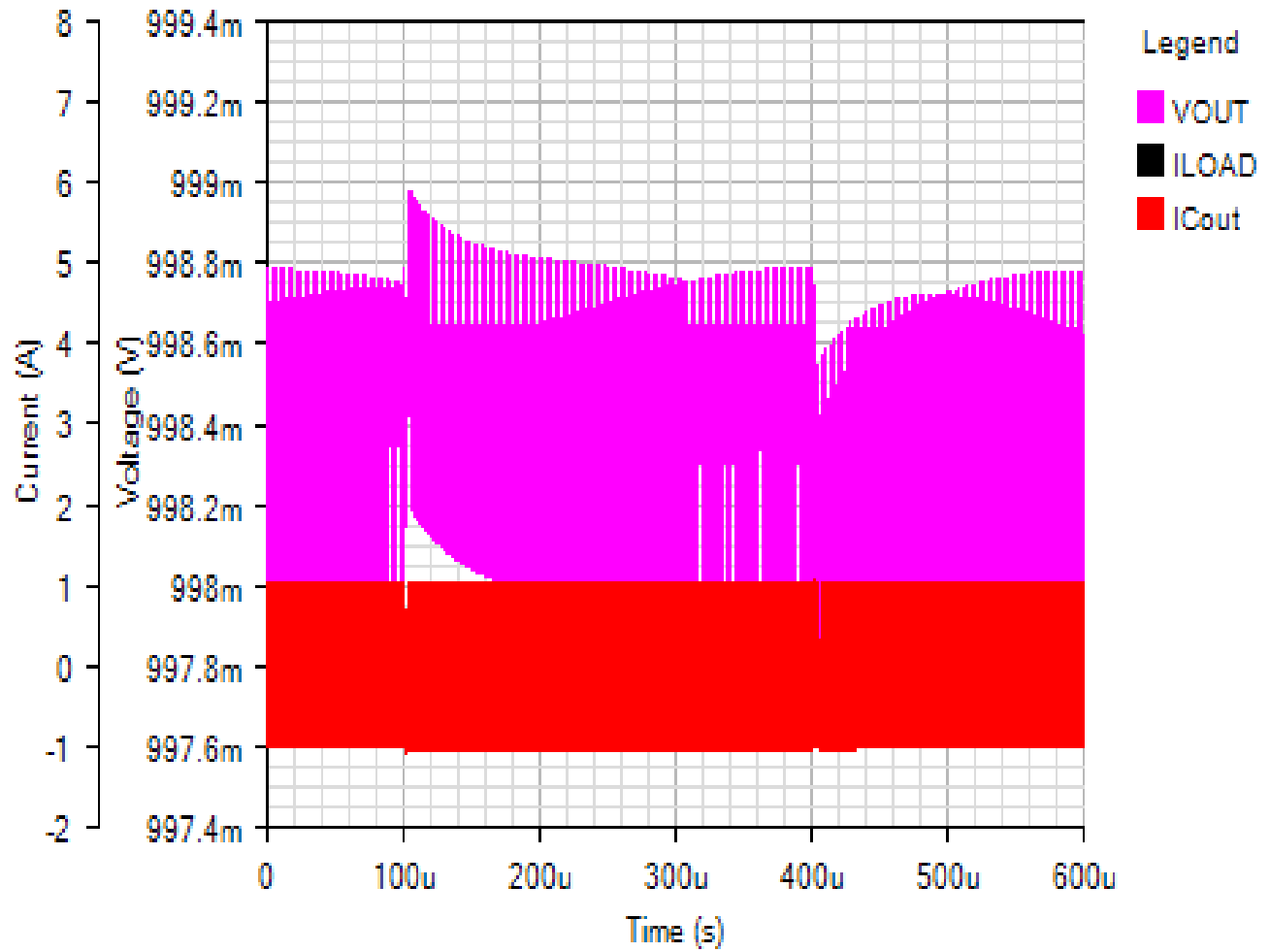
IC

Default



OUTPUT

Default



SWITCHING

Default

