

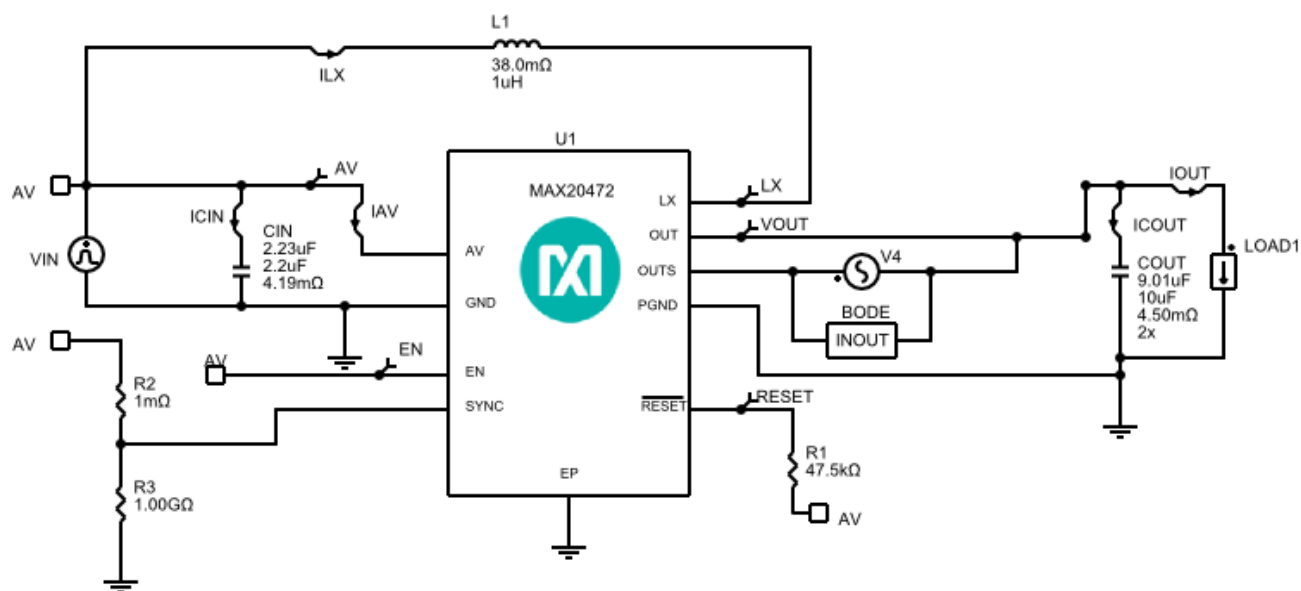
Initial Design

1.0

Design Requirements

Parameter	Value
Minimum Input Voltage	3V
Maximum Input Voltage	4V
Nominal Input Voltage	3.3V
Output Voltage	5V
Output Current	1A
Load Step Start Current	0.5A
Load Step Current	1A
Output Voltage Ripple	1%
Output Voltage Load Step Over/Undershoot	5%
Load Step Edge Rate	0.5A/us
Performance Priority	Balance
BOM Priority	Cost
External Synchronization Enable	PV
Switching Frequency	2200KHz
Inductor Current Ratio (LIR)	0.3
Ambient Temperature	25°C

Schematic



*****Notes*****

AC, Steady State, and Load Step may fail if SKIP mode is selected

PWM Mode: R2 = "Short", R3 = "Open"

Skip Mode: R2 = "Open", R3 = "Short"

External CLK (Model ONLY): R2 = "Open", R3 = "Open"

If an external clock is needed, connect SYNC to an external clock for the given application. For the model, SYNC will be floated.

BOM

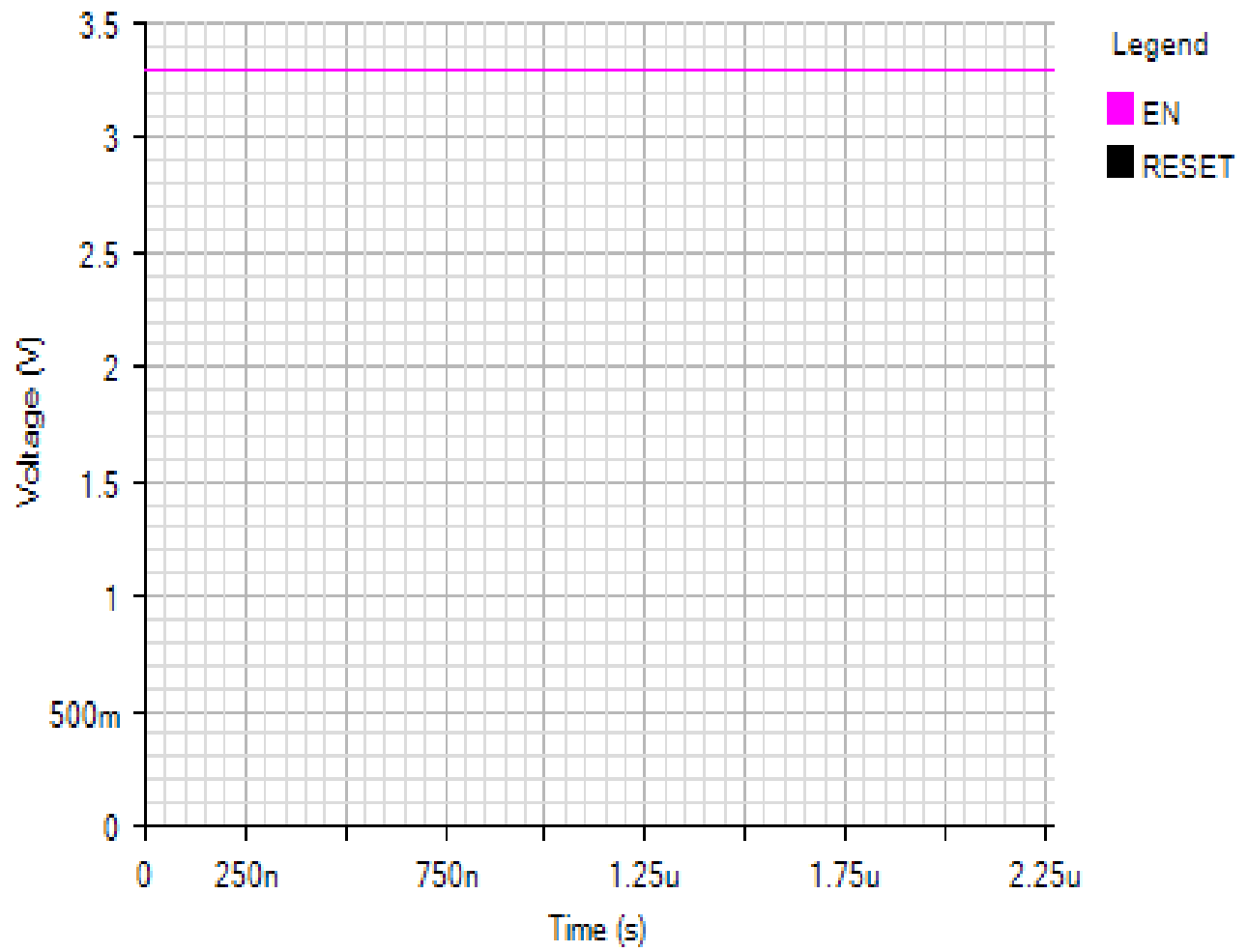
Ref	Qty	Part Number	Manufacturer	Description
U1	1	MAX20472	User-Defined	IC
CIN	1	GRM31MR71A225KA01	Murata	Multilayer Ceramic Capacitors (MLCC) - SMD/SMT 1206 2.2uF 10volts X7R 10%
COUT	2	C1210C106K4RAC	Kemet	Cap Ceramic 10uF 16V X7R 10% SMD 1210 125C Bulk
L1	1	7440680010	Würth Electronics	INDUCTOR POWER 1.0UH 2.8A SMD
R1	1	AR0402JR-0747K5	Yageo	Res Thick Film 0402 47.5K Ohm 5% 0.063W(1/16W) ±100ppm/°C Epoxy Pad SMD Automotive T/R

Simulation Results

Steady State - Wed Jan 02 2019 15:50:00

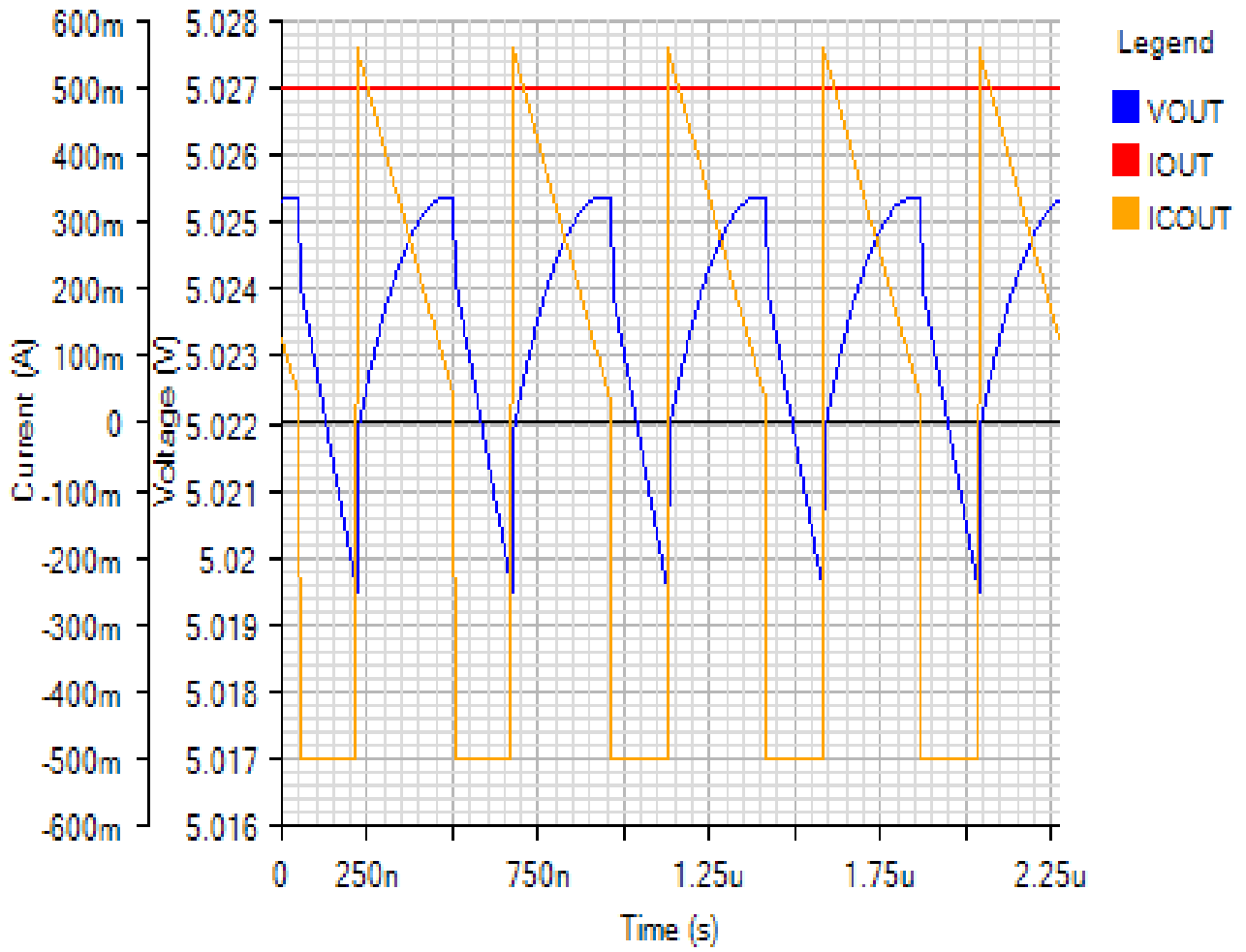
IC

Default



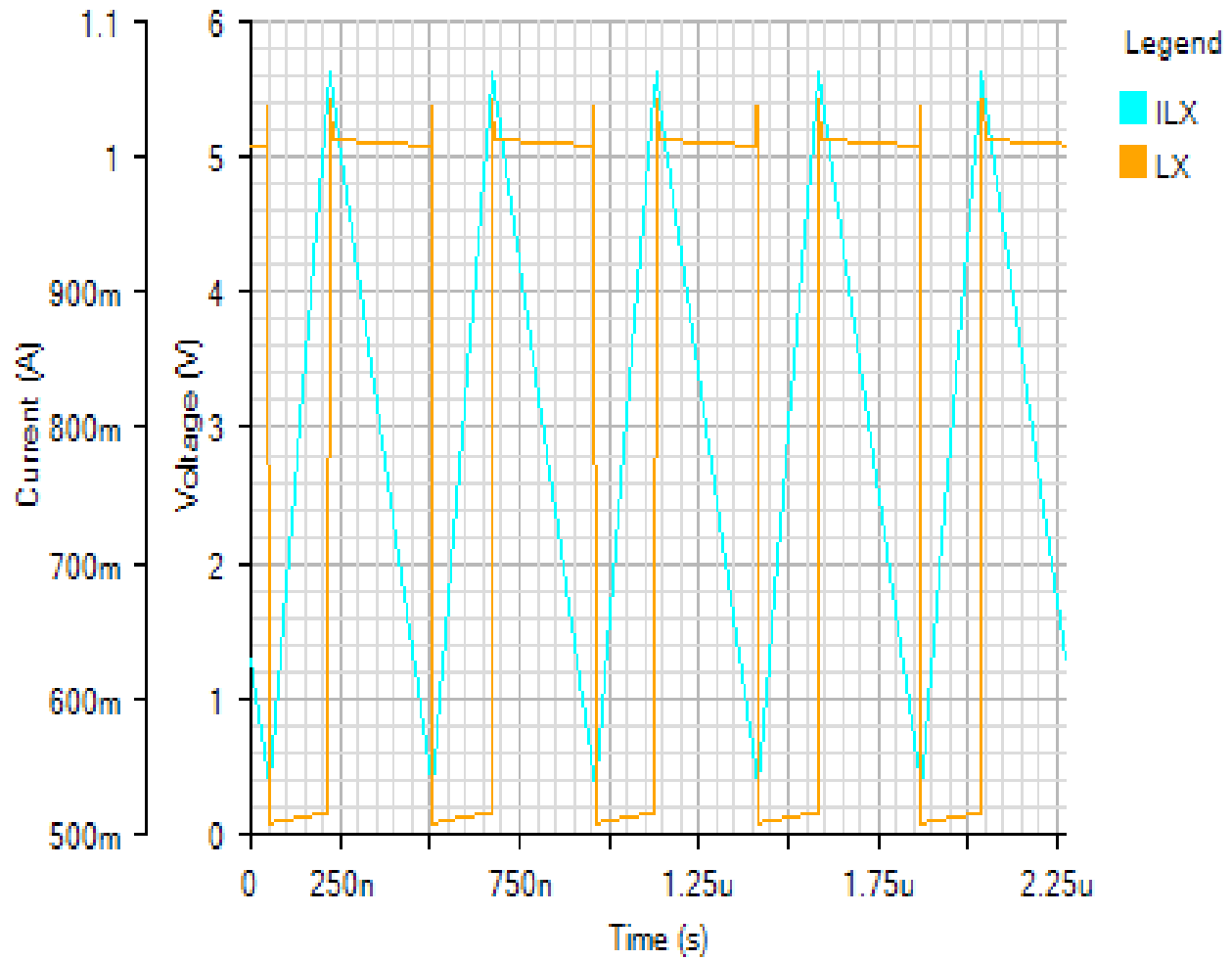
OUTPUT

Default



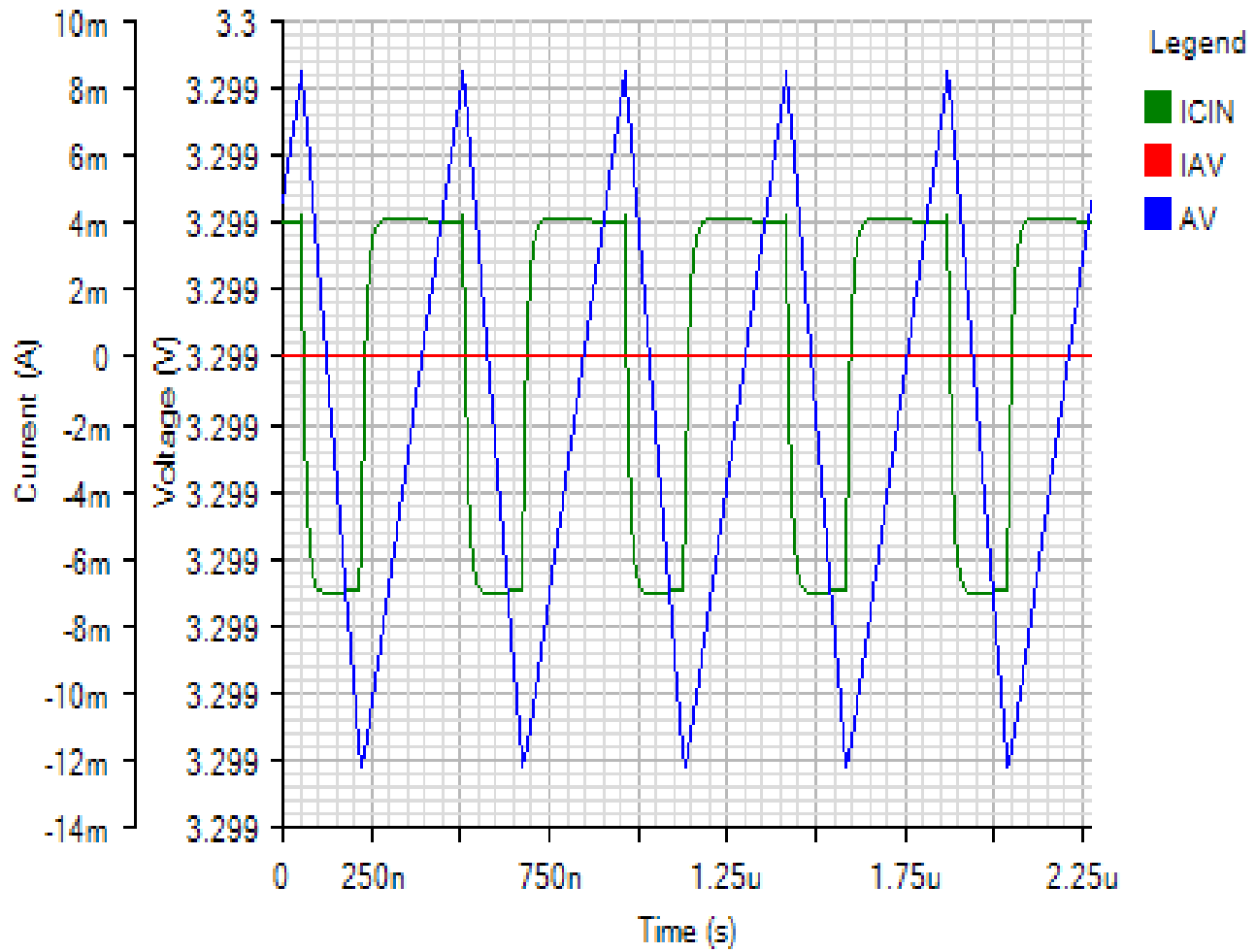
SWITCHING

Default



INPUT

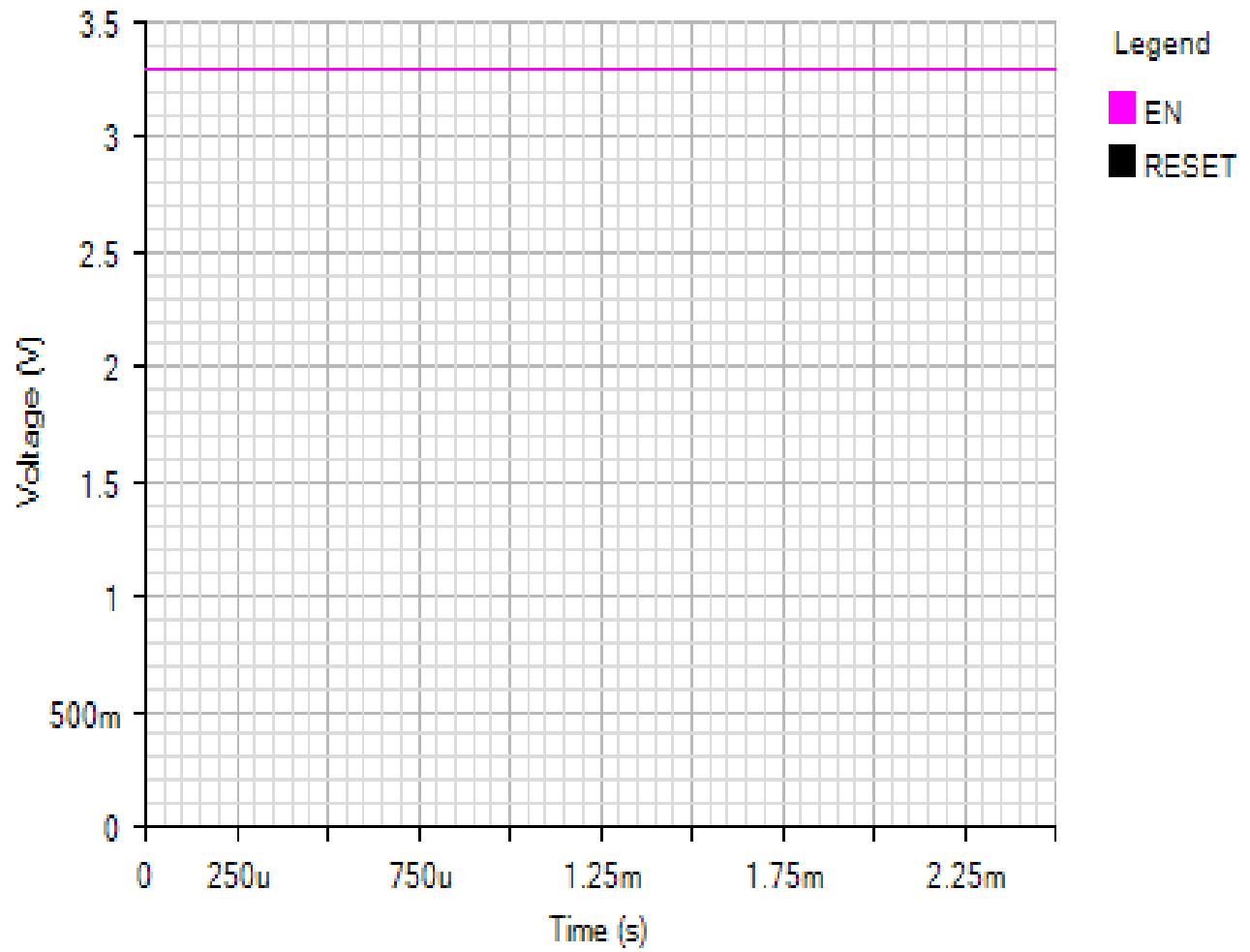
Default



Start Up - Wed Jan 02 2019 15:50:00

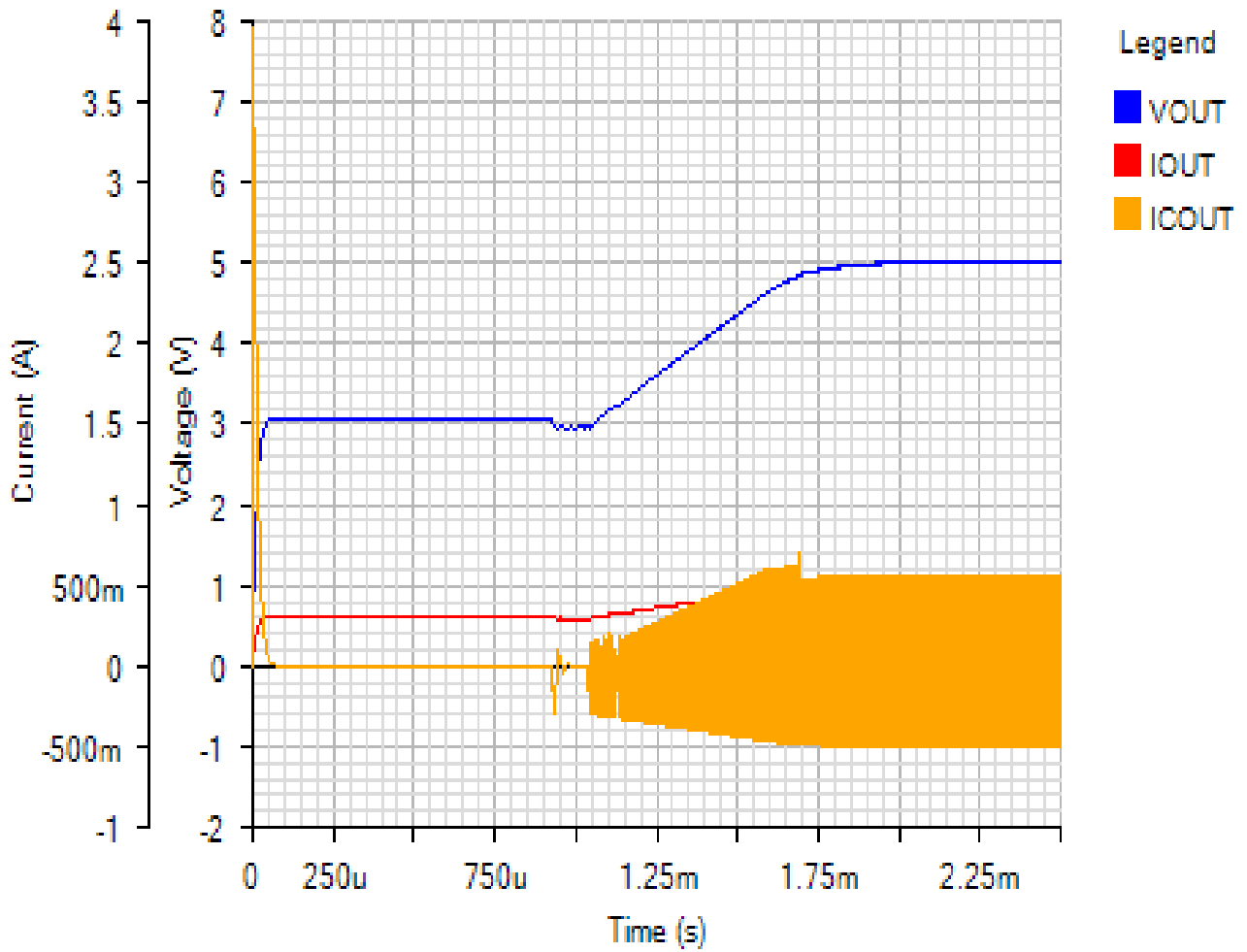
IC

Default



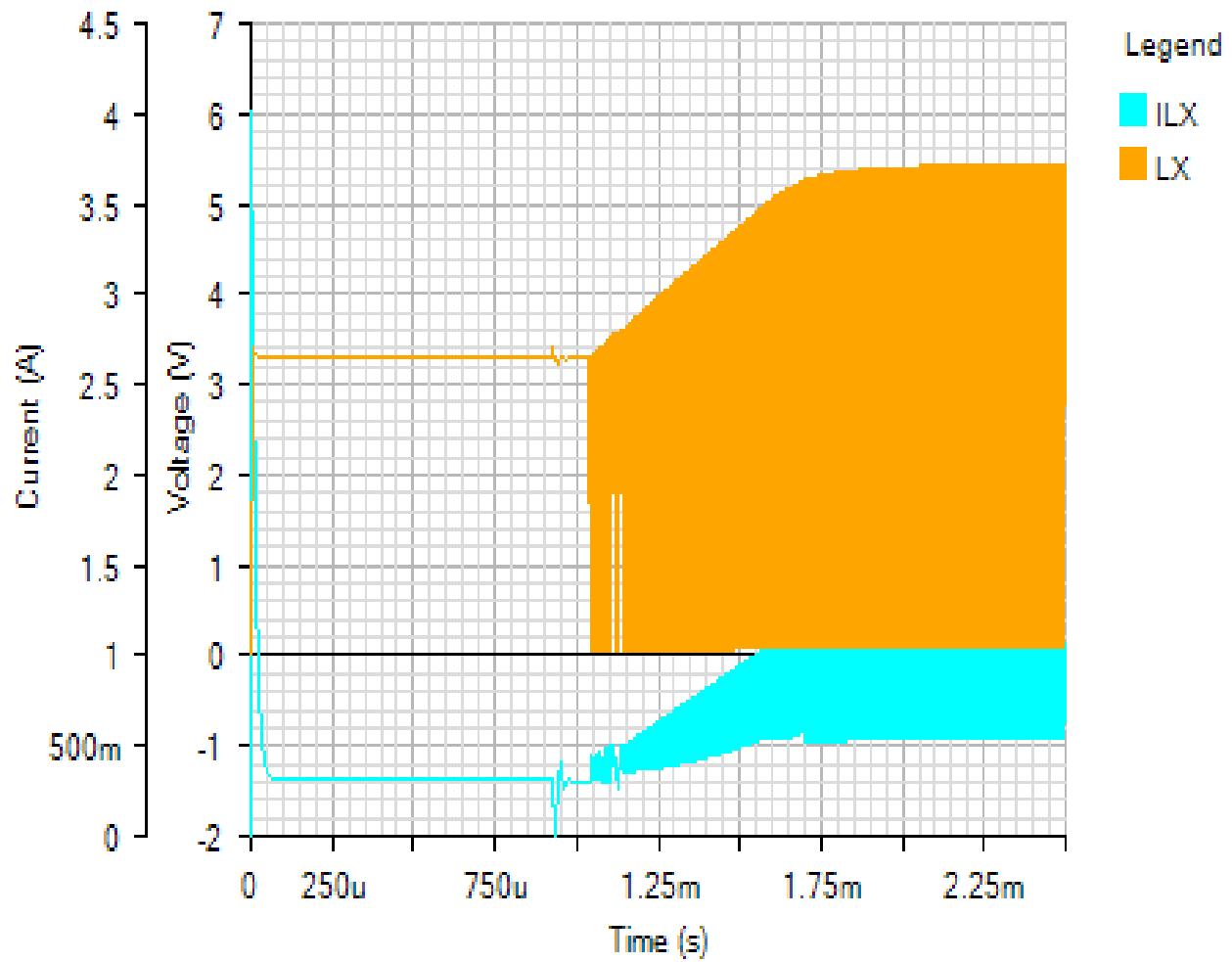
OUTPUT

Default



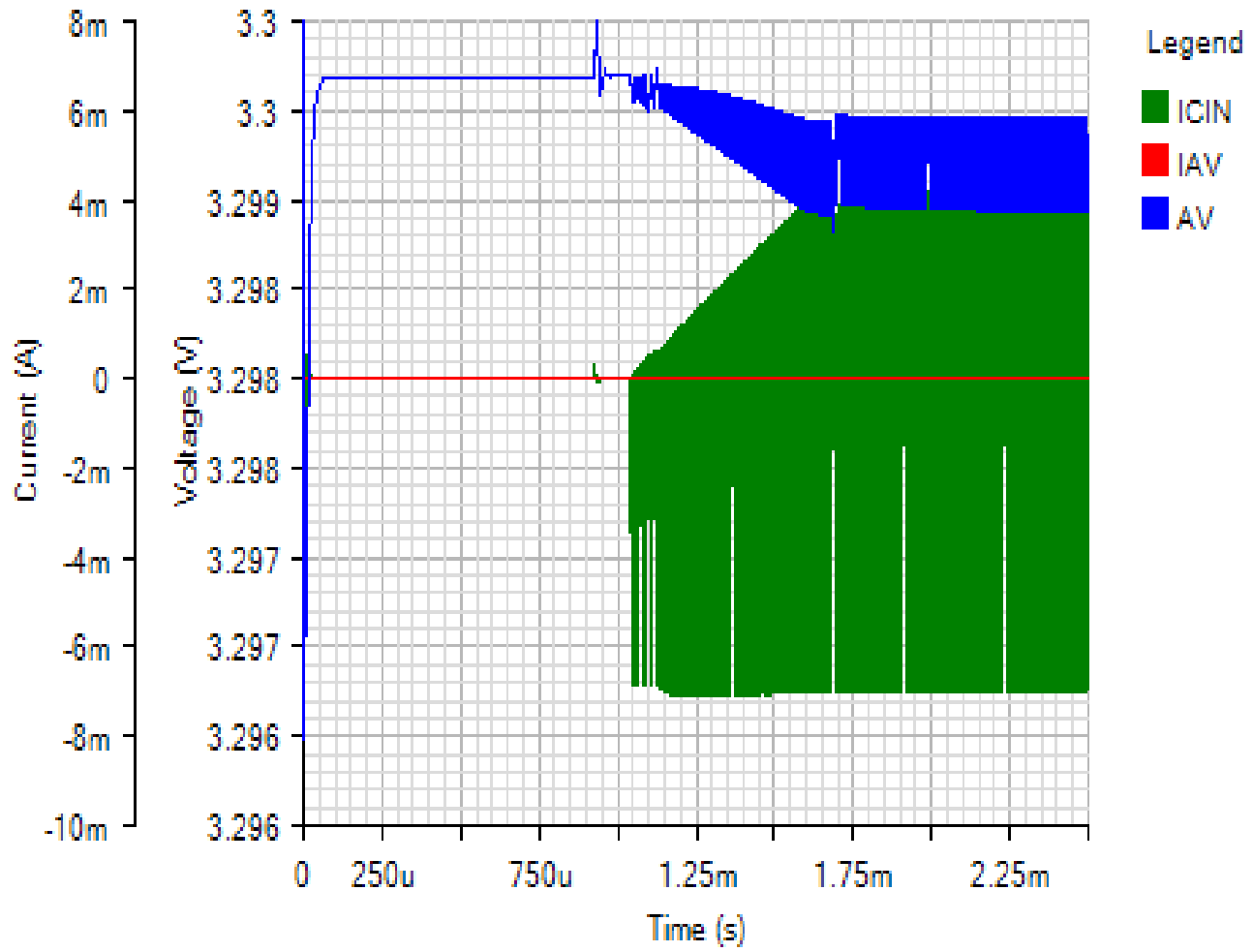
SWITCHING

Default



INPUT

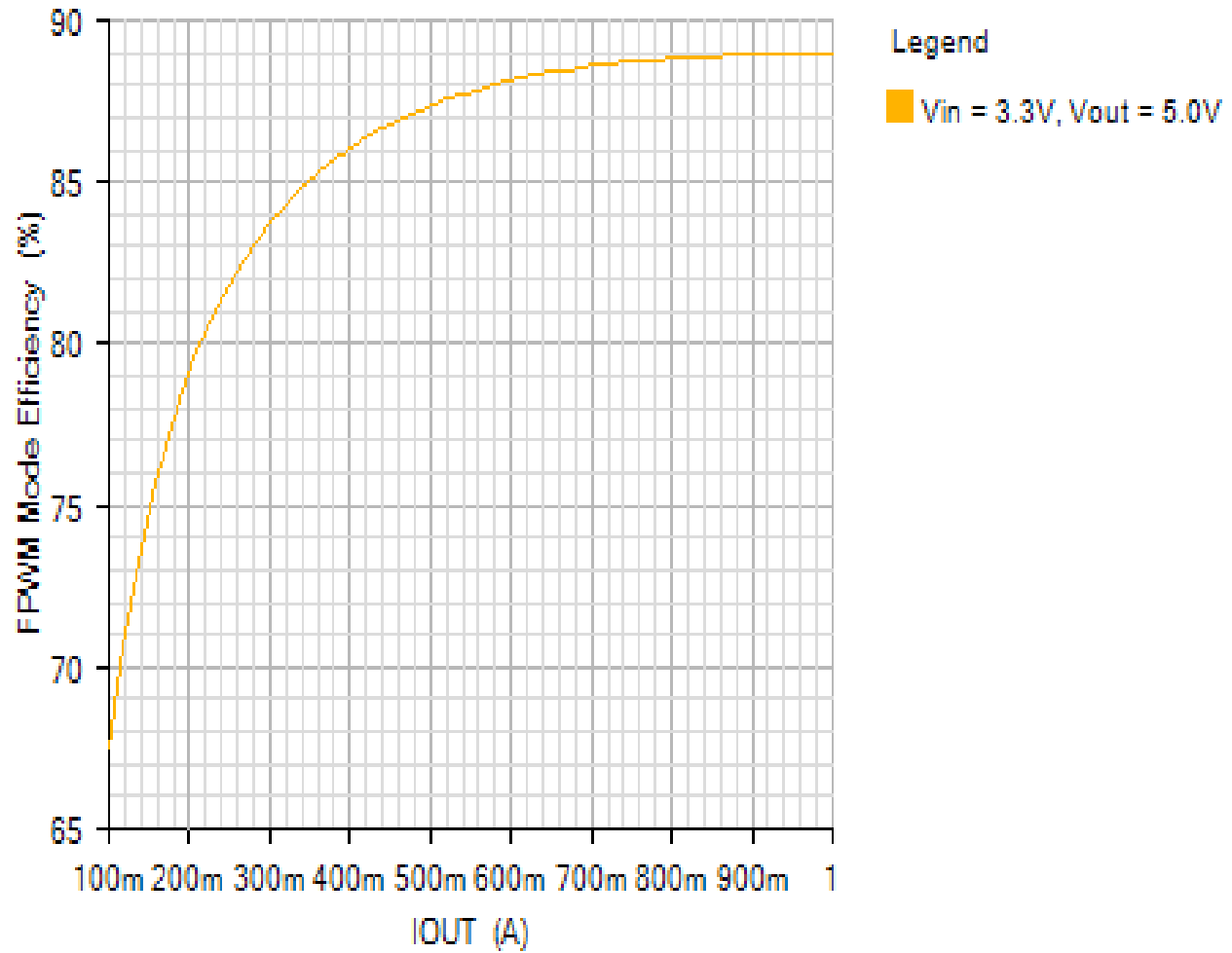
Default



Efficiency - Wed Jan 02 2019 15:50:00

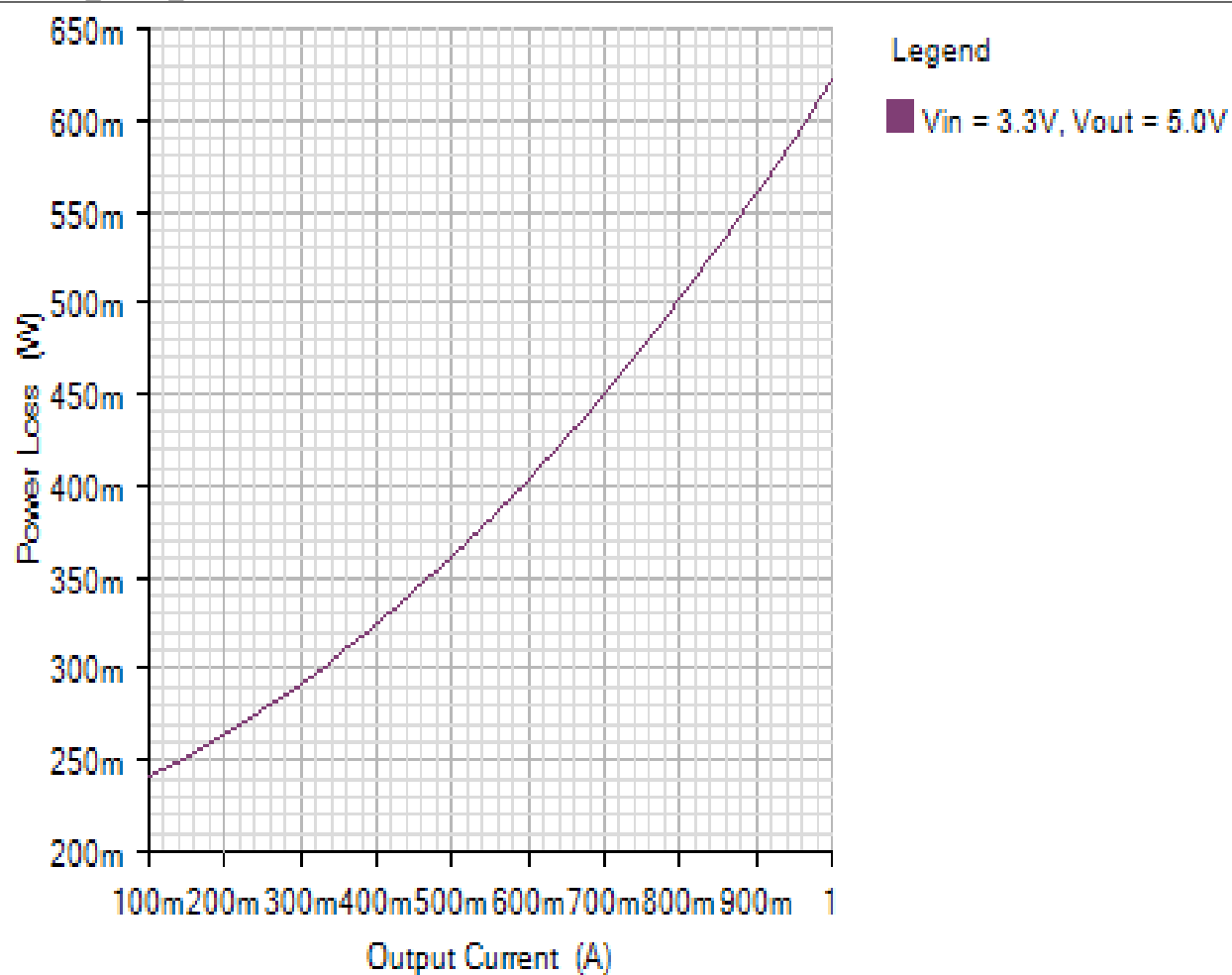
EFFICIENCY_PLOT

Default



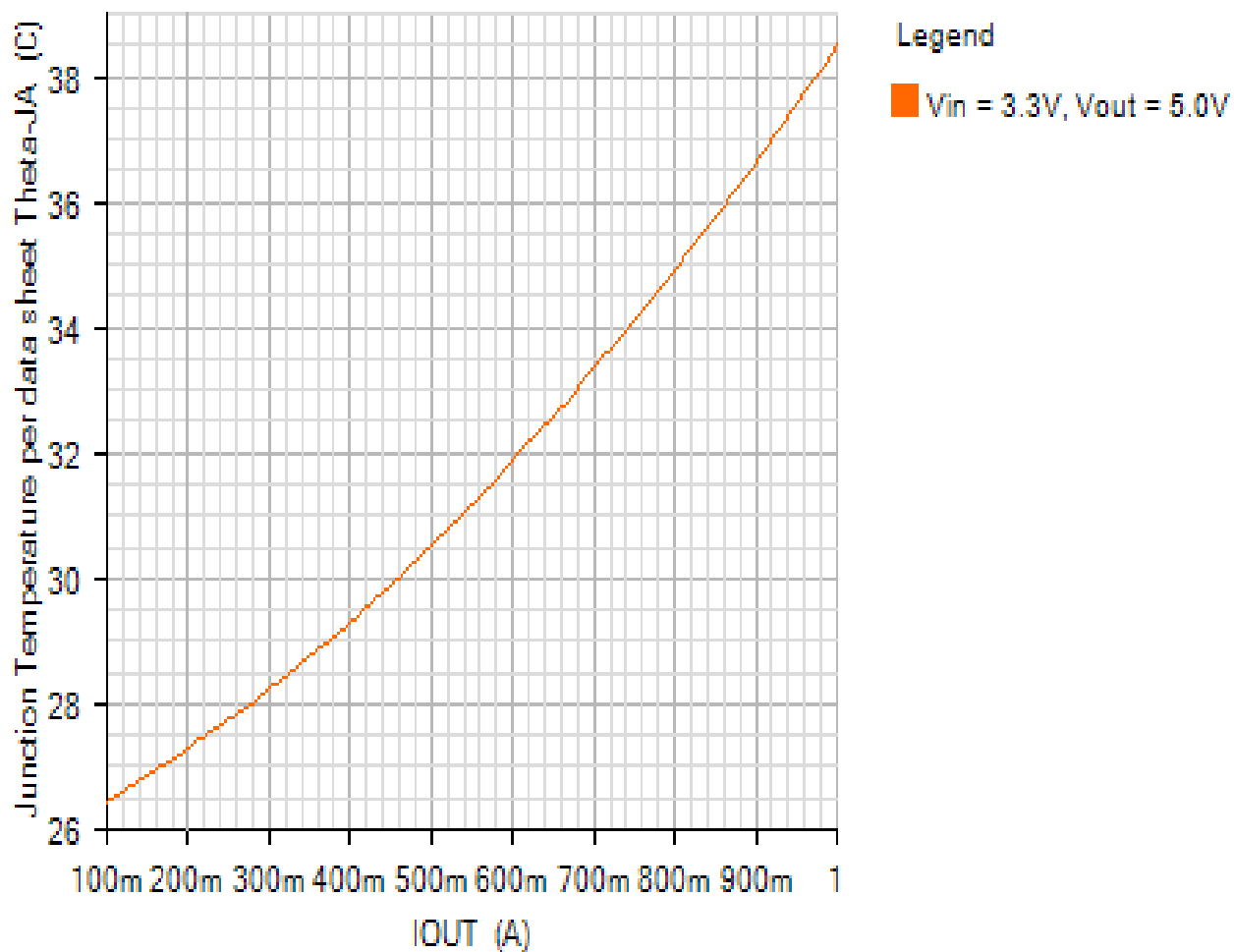
POWER_LOSS_PLOT

Default

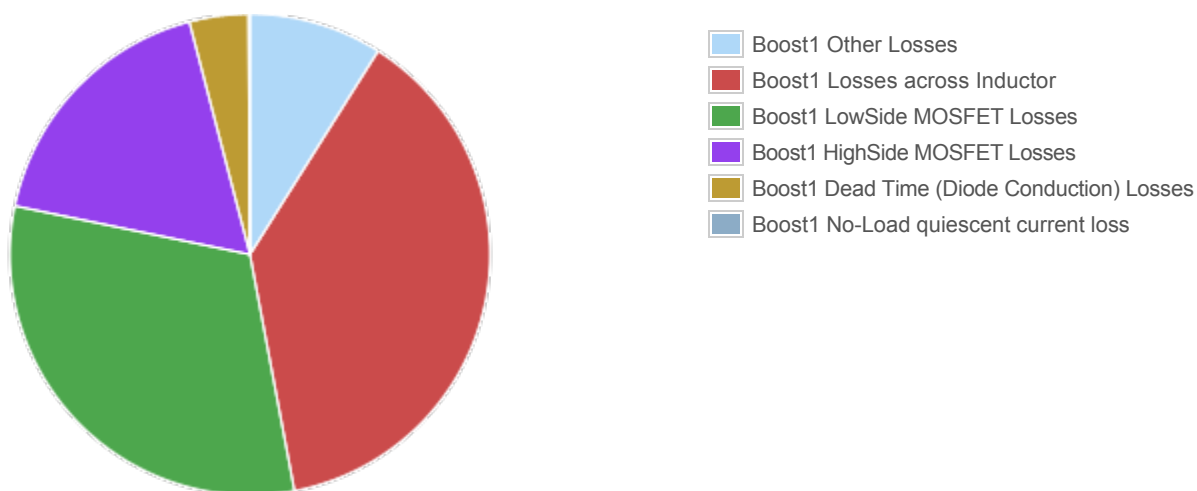


JUNCTION_TEMPERATURE_PLOT

Default



Losses



Component

Loss (W)

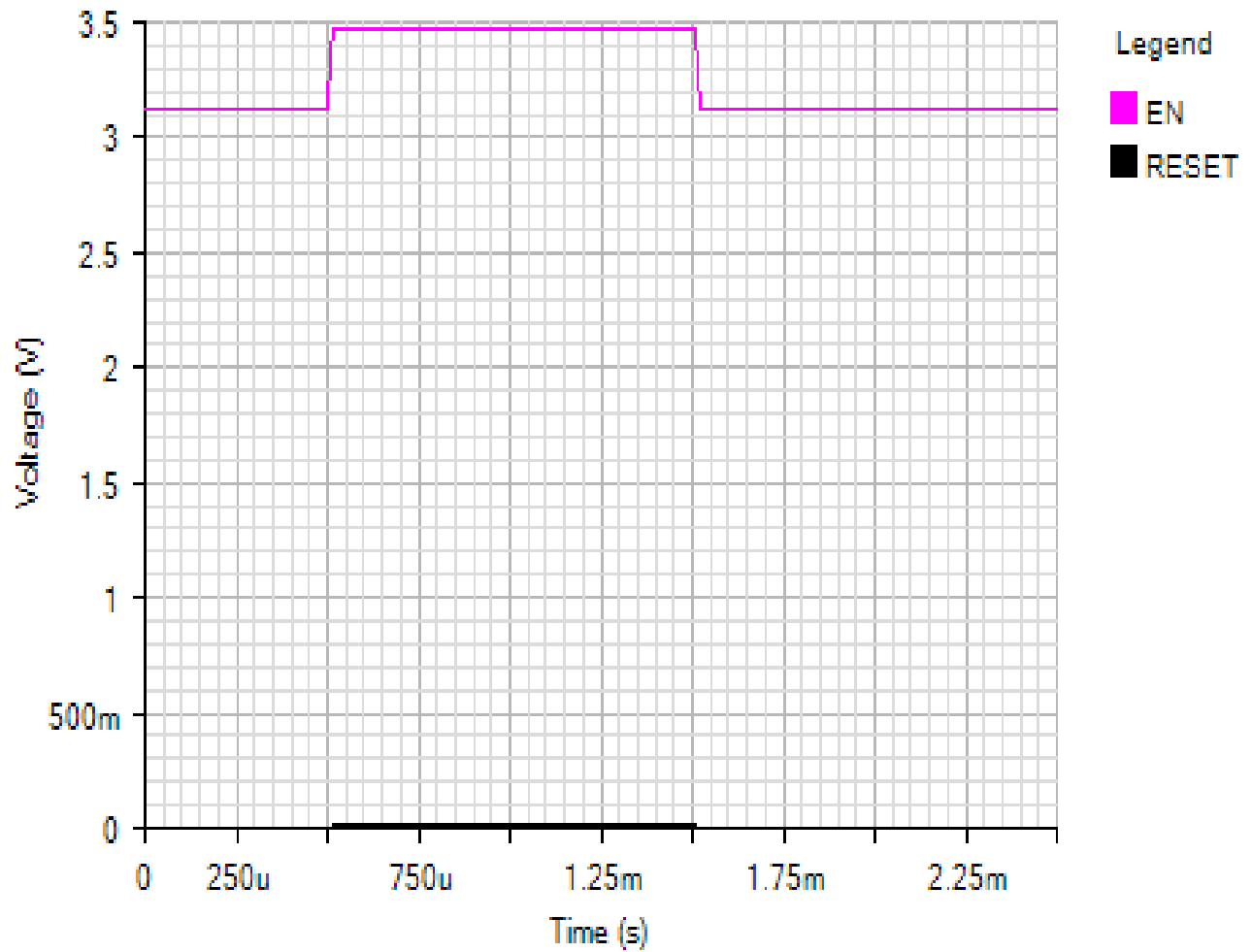
% of total

Component	Loss (W)	% of total
Boost1 Other Losses	0.055712	9
Boost1 Losses across Inductor	0.236762	38.1
Boost1 LowSide MOSFET Losses	0.194034	31.2
Boost1 HighSide MOSFET Losses	0.110043	17.7
Boost1 Dead Time (Diode Conduction) Losses	0.02464	4
Boost1 No-Load quiescent current loss	0.00066	0.1
Total	0.62185	100

Line Transient - Wed Jan 02 2019 15:50:00

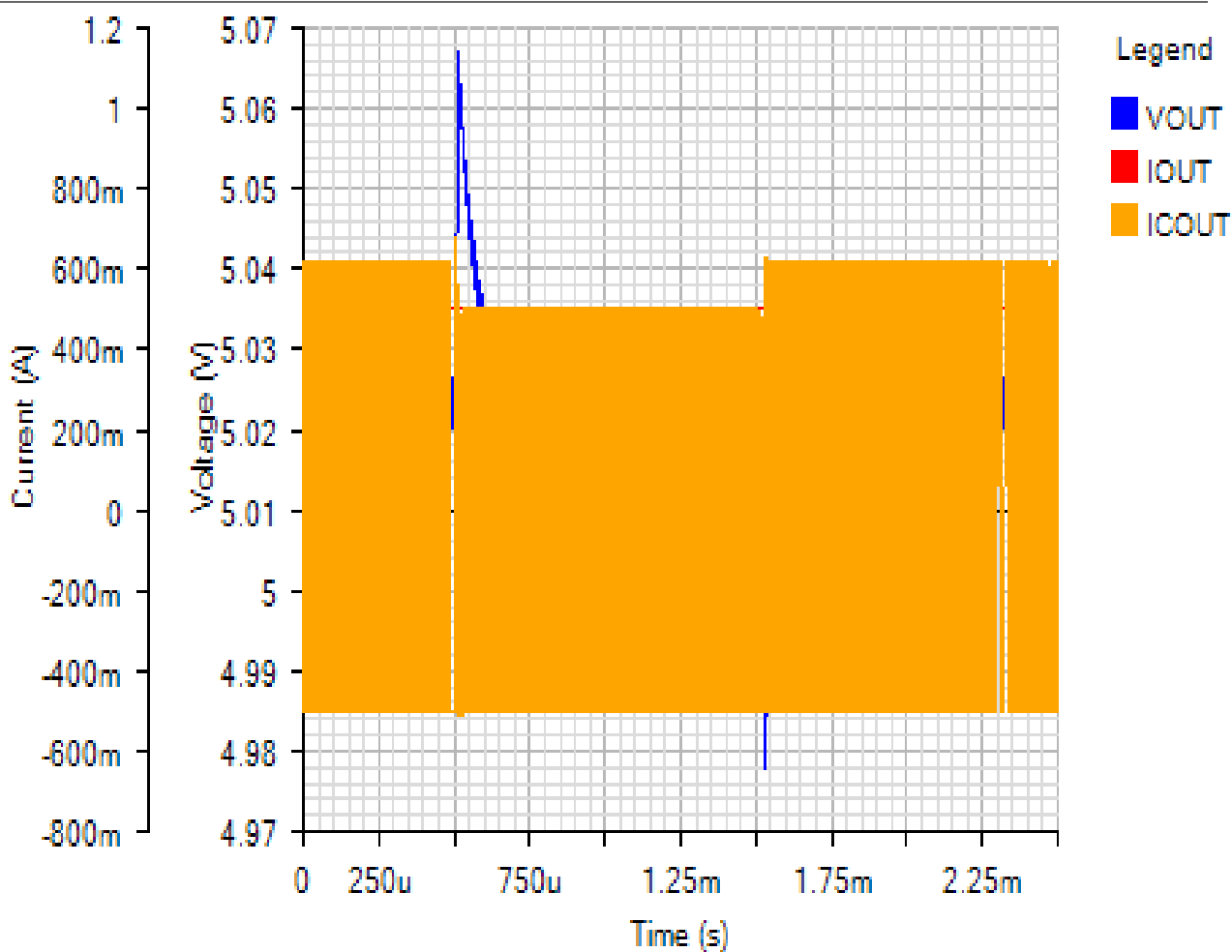
IC

Default



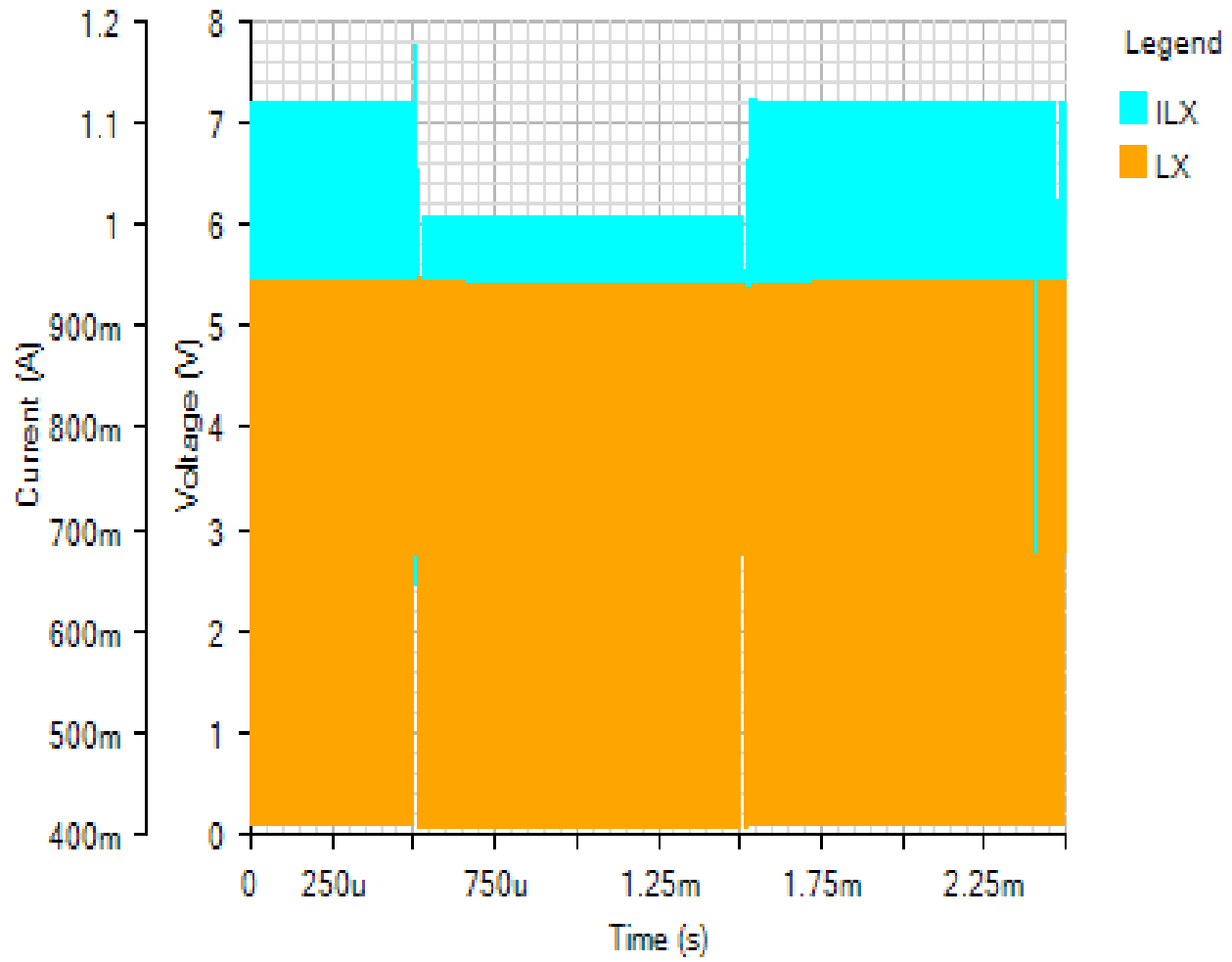
OUTPUT

Default



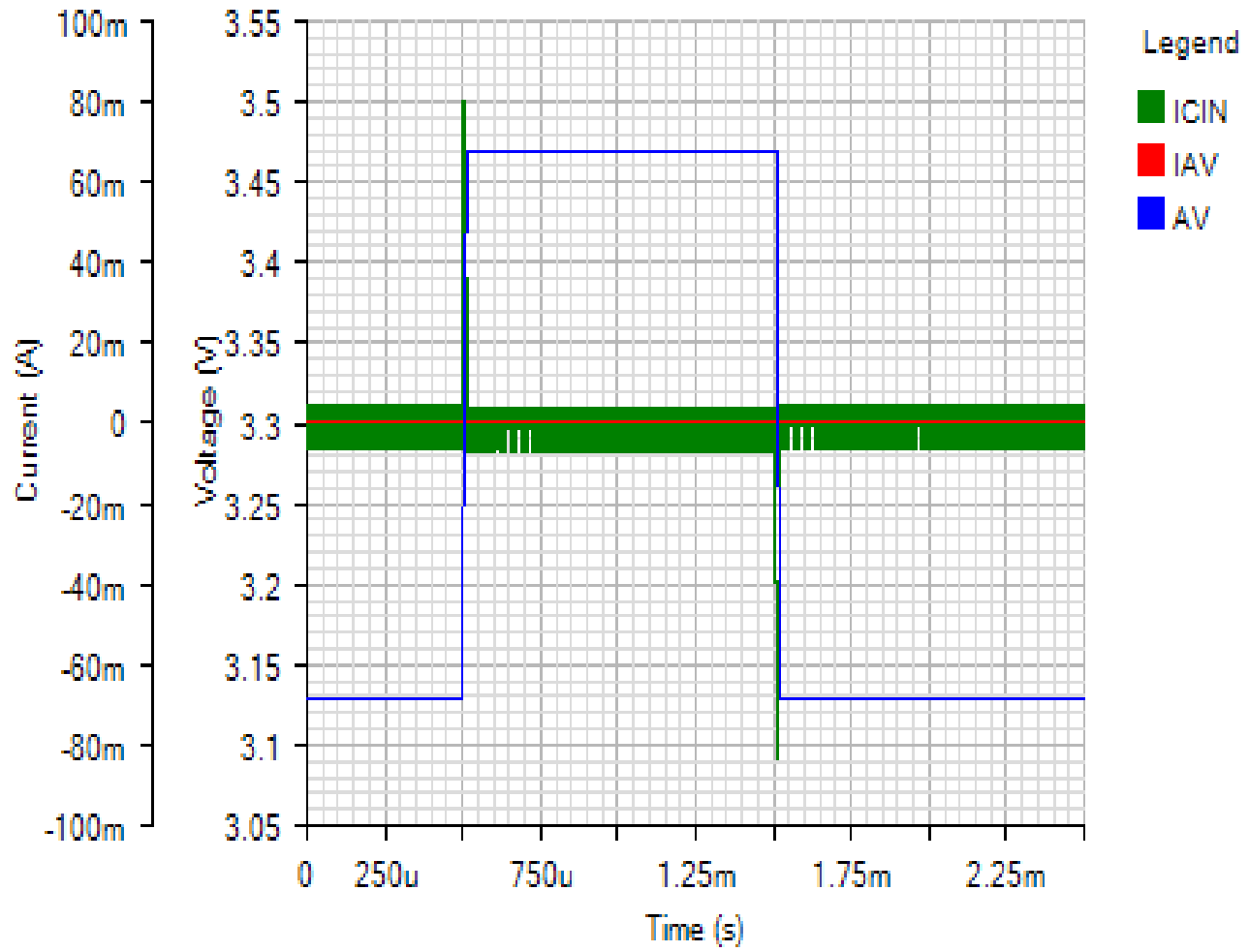
SWITCHING

Default



INPUT

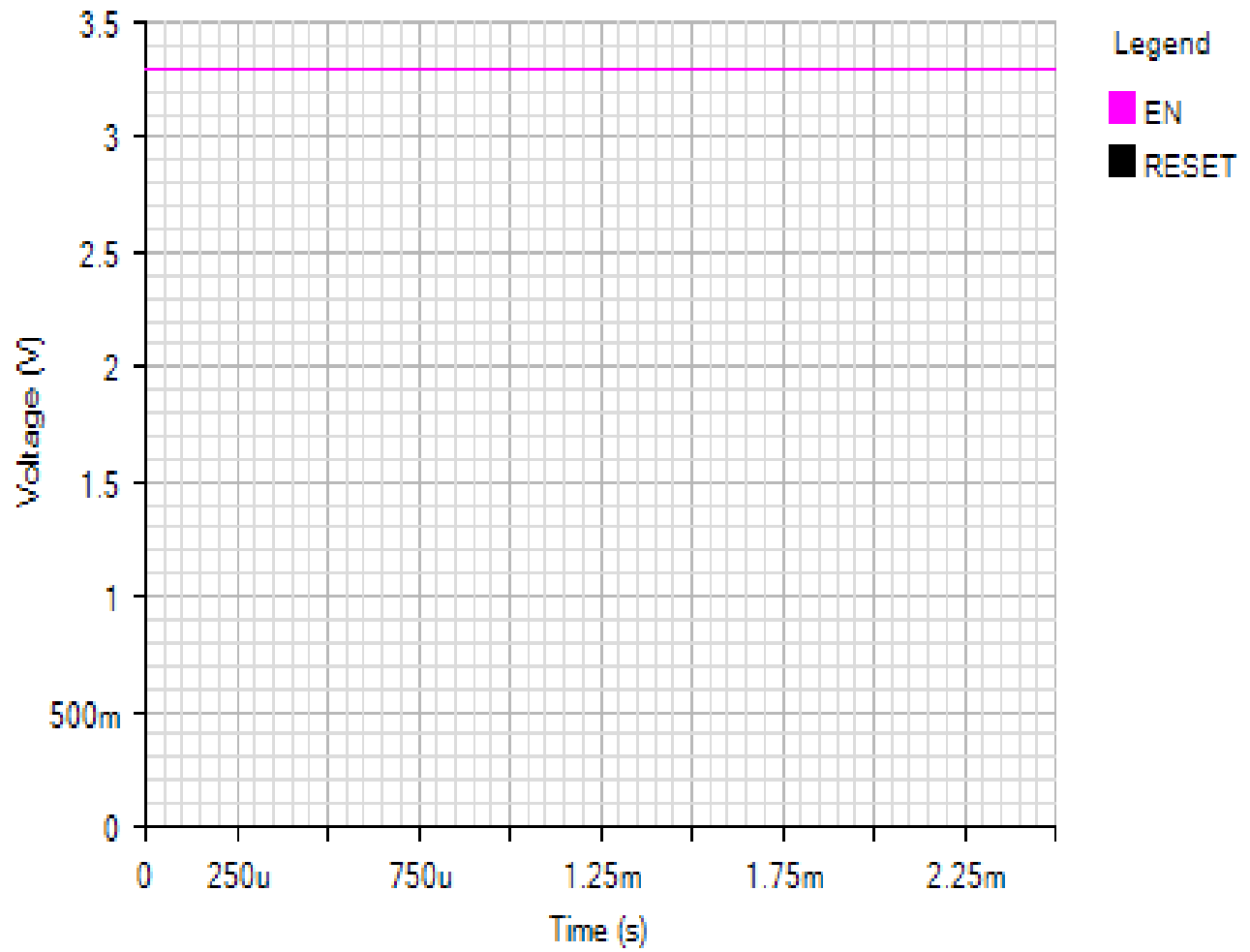
Default



Load Step - Wed Jan 02 2019 15:50:00

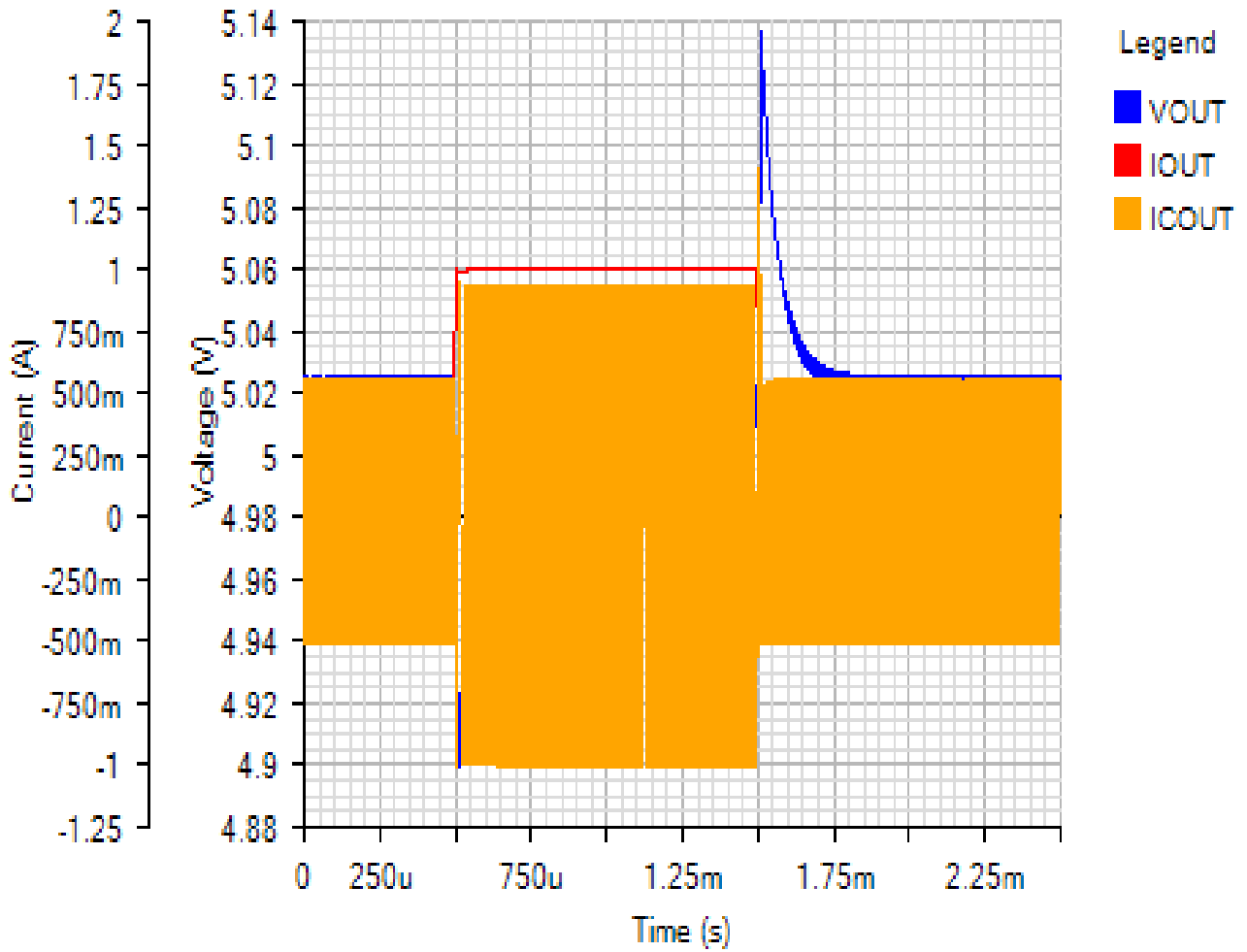
IC

Default



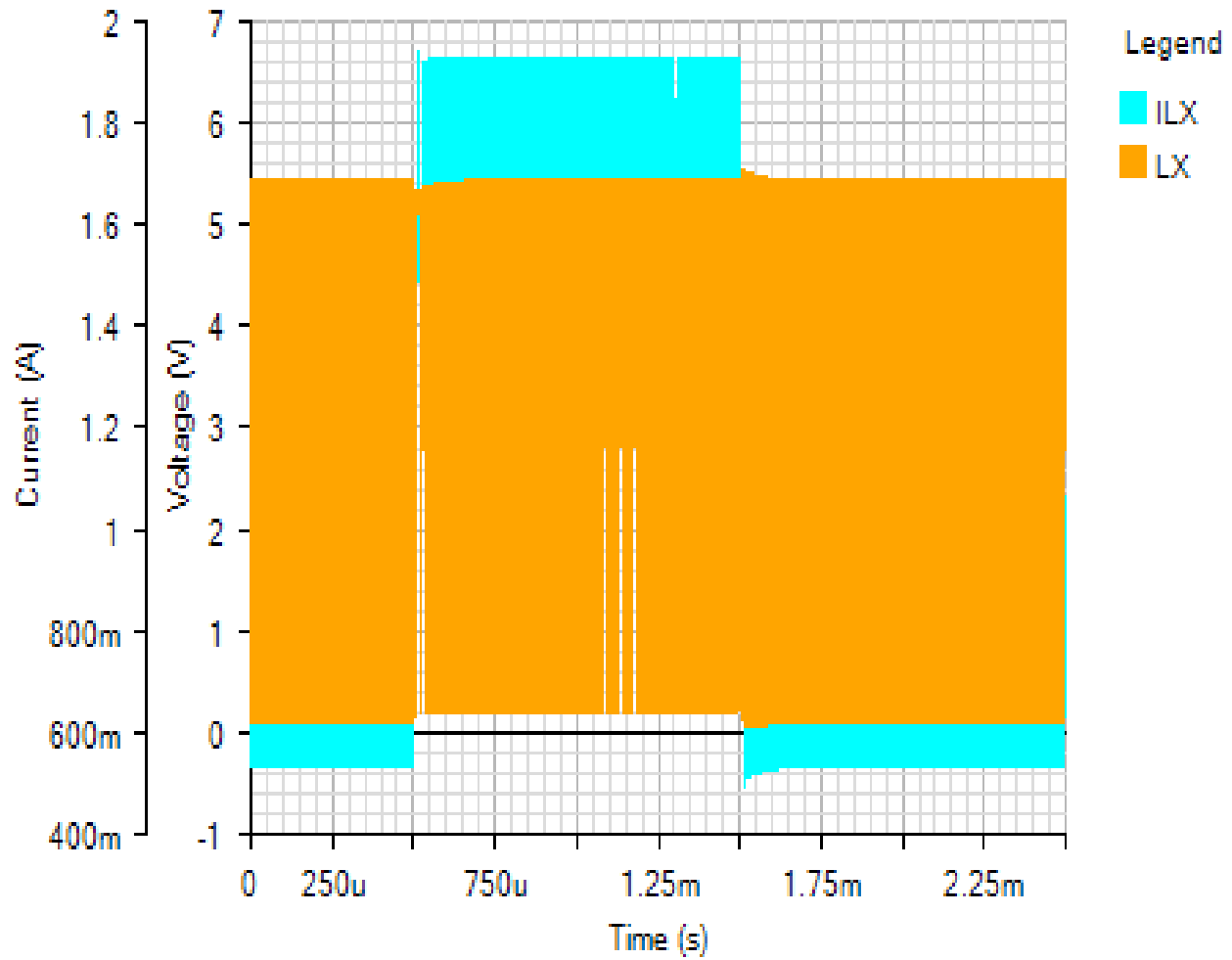
OUTPUT

Default



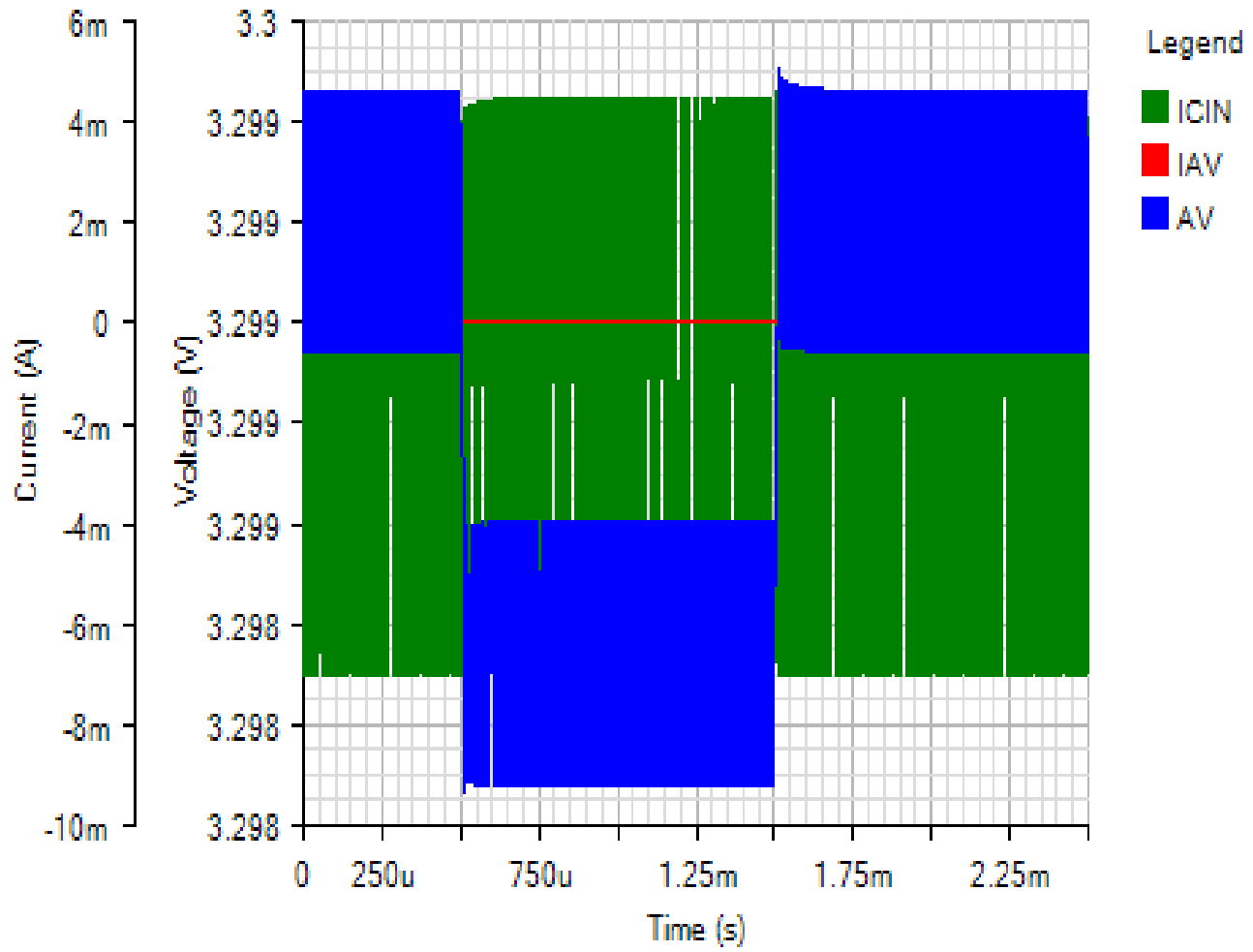
SWITCHING

Default



INPUT

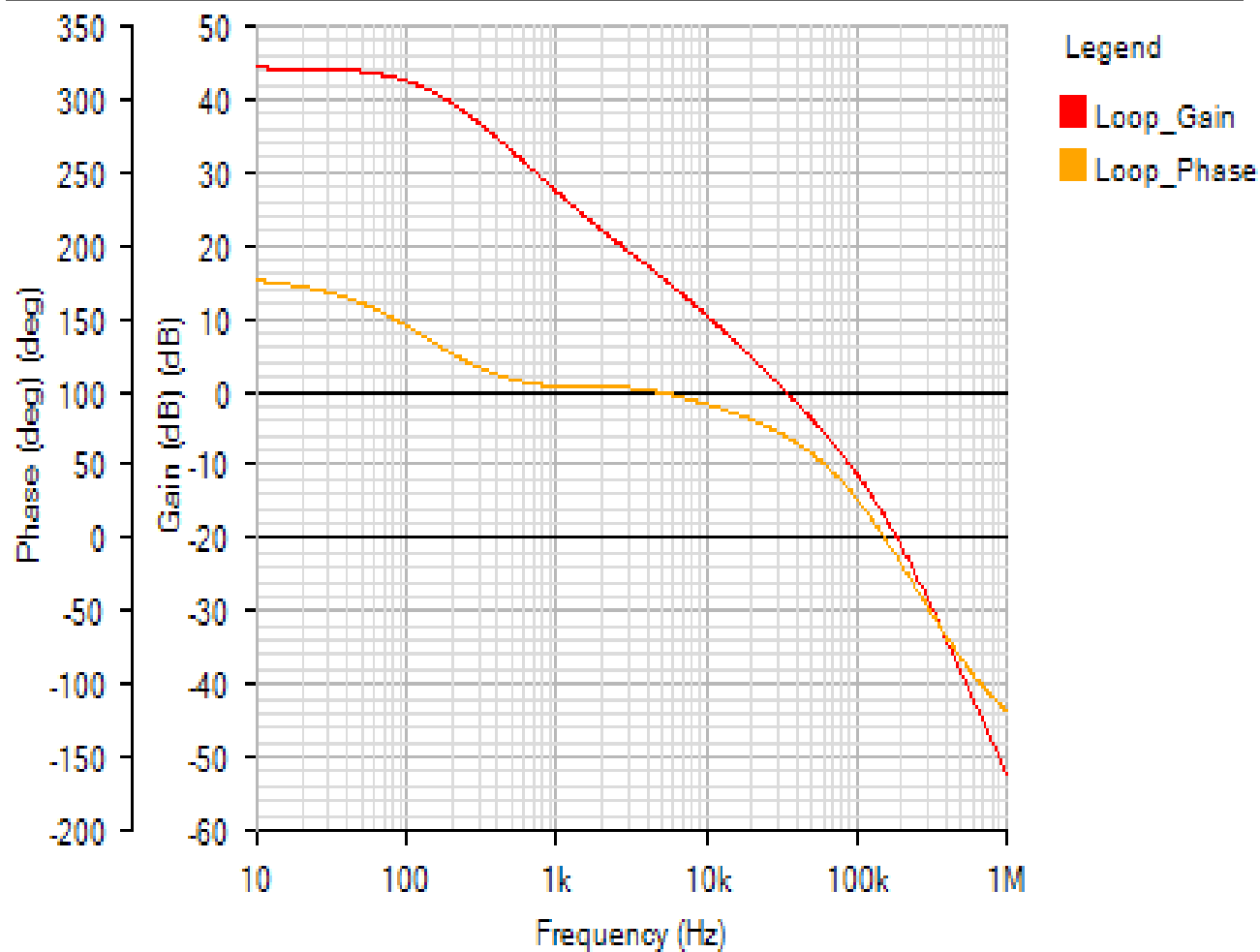
Default



AC Loop - Wed Jan 02 2019 15:50:00

BODE

Default



Phase Margin: 69.47° at a crossover frequency of 33.7kHz

