Initial Design

1.0

Design Requirements

Parameter	Value
Minimum Input Voltage	7.5V
Maximum Input Voltage	60V
Nominal Input Voltage	24V
Input Steady-State Ripple	2%
Input Undervoltage Lockout Level	7.35V
Output Voltage	5V
Load Current	1.5A
Load Step Start Current	1.5A
Load Step Current	0.75A
Output Voltage Load Step Over/Undershoot	3%
Performance Priority	Balance Efficiency and Size
Cost Priority	Cost
Switching Frequency	900kHz
Ambient Temperature	25°C

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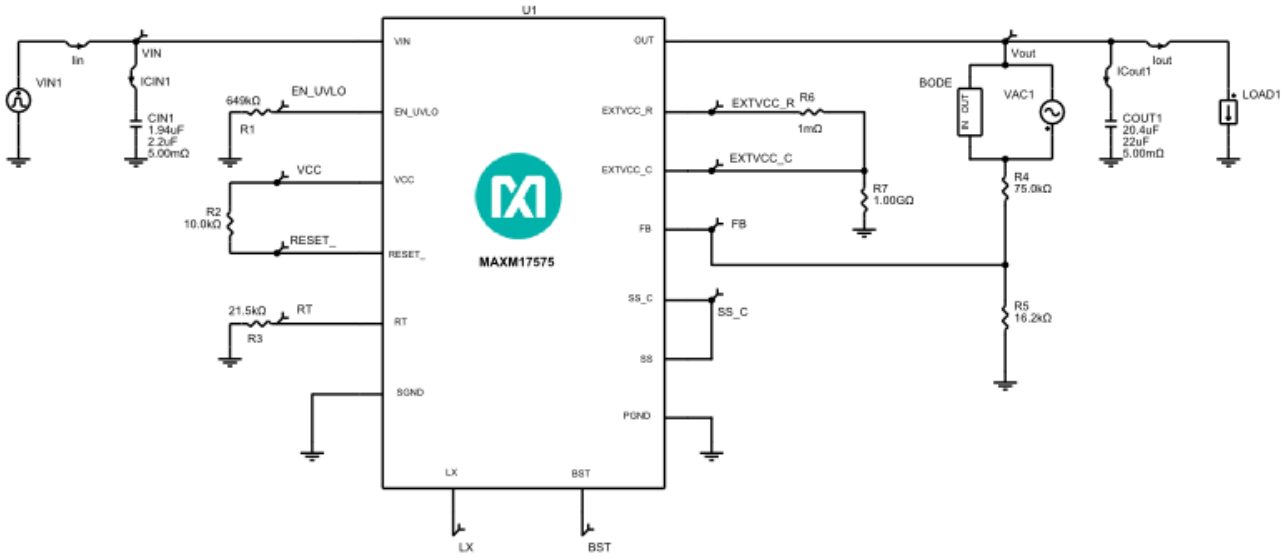
Schematic



BOM

Ref	Qty	Part Number	Manufacturer	Description
U1	1	MAXM17575ALI#	User-Defined	IC
CIN1	1	C1210C225K1R1C	Kemet	Cap Ceramic 2.2uF 100V 1210 125C
COUT1	1	GRM32ER71E226ME15	Murata	Cap Ceramic 22uF 25V 1210 125C
R1	1	ERJ2RKF6493X	Panasonic	Res Thick Film 0402 649K Ohm 1% 0.1W(1/10W) ±100ppm/°C Pad SMD Automotive T/R
R2	1	ERJ2RKF1002X	Panasonic	Res Thick Film 0402 10K Ohm 1% 0.1W(1/10W) ±100ppm/°C Pad SMD Automotive T/R
R3	1	ERJ2RKF2152X	Panasonic	Res Thick Film 0402 21.5K Ohm 1% 0.1W(1/10W) ±100ppm/°C Pad SMD Automotive T/R
R4	1	ERJ2RKF7502X	Panasonic	Res Thick Film 0402 75K Ohm 1% 0.1W(1/10W) ±100ppm/°C Pad SMD Automotive T/R
R5	1	ERJ2RKF1622X	Panasonic	Res Thick Film 0402 16.2K Ohm 1% 0.1W(1/10W) ±100ppm/°C Pad SMD Automotive T/R

Simulation Results

Efficiency - Sun Nov 25 2018 21:07:56

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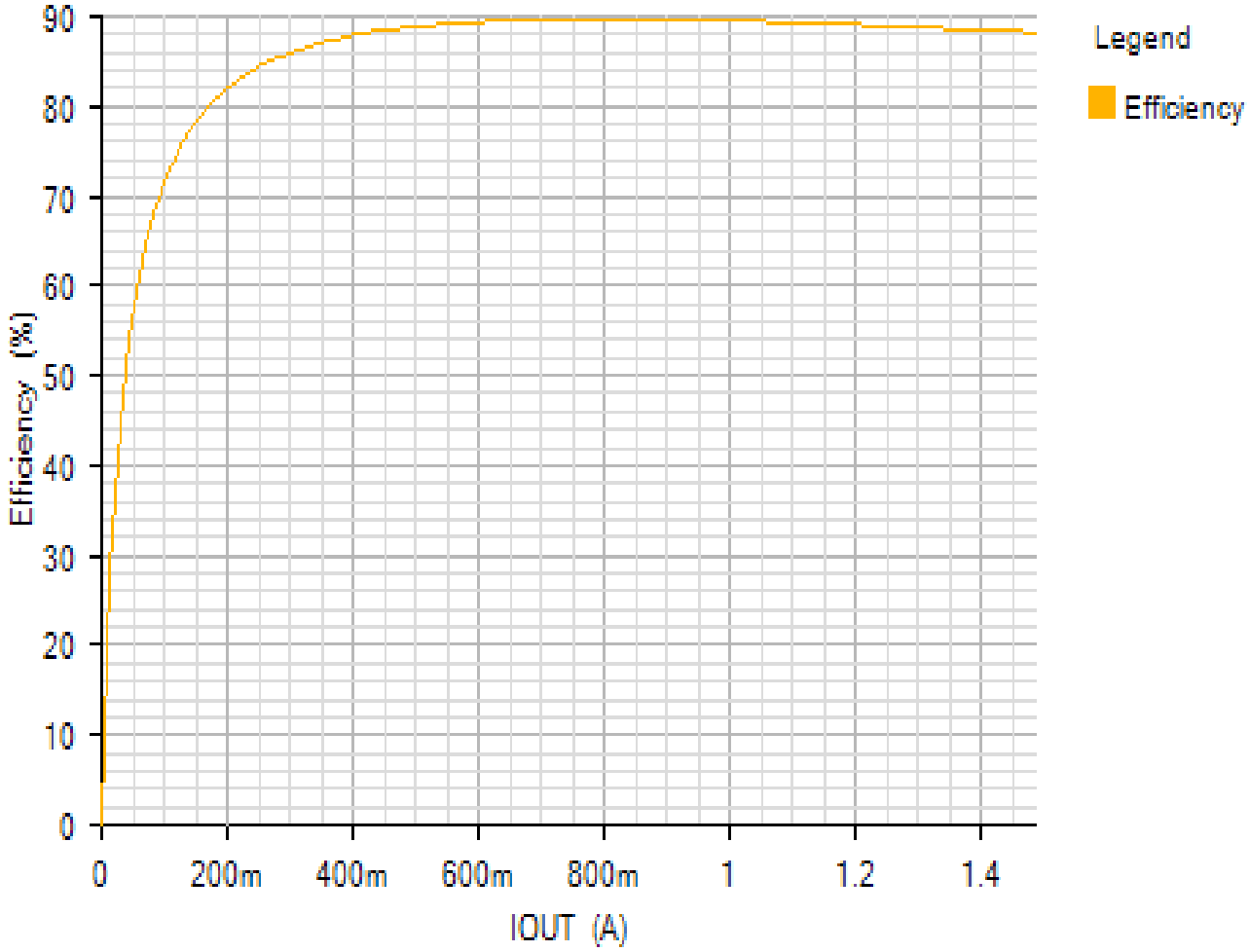
EFFICIENCY_PLOT Default



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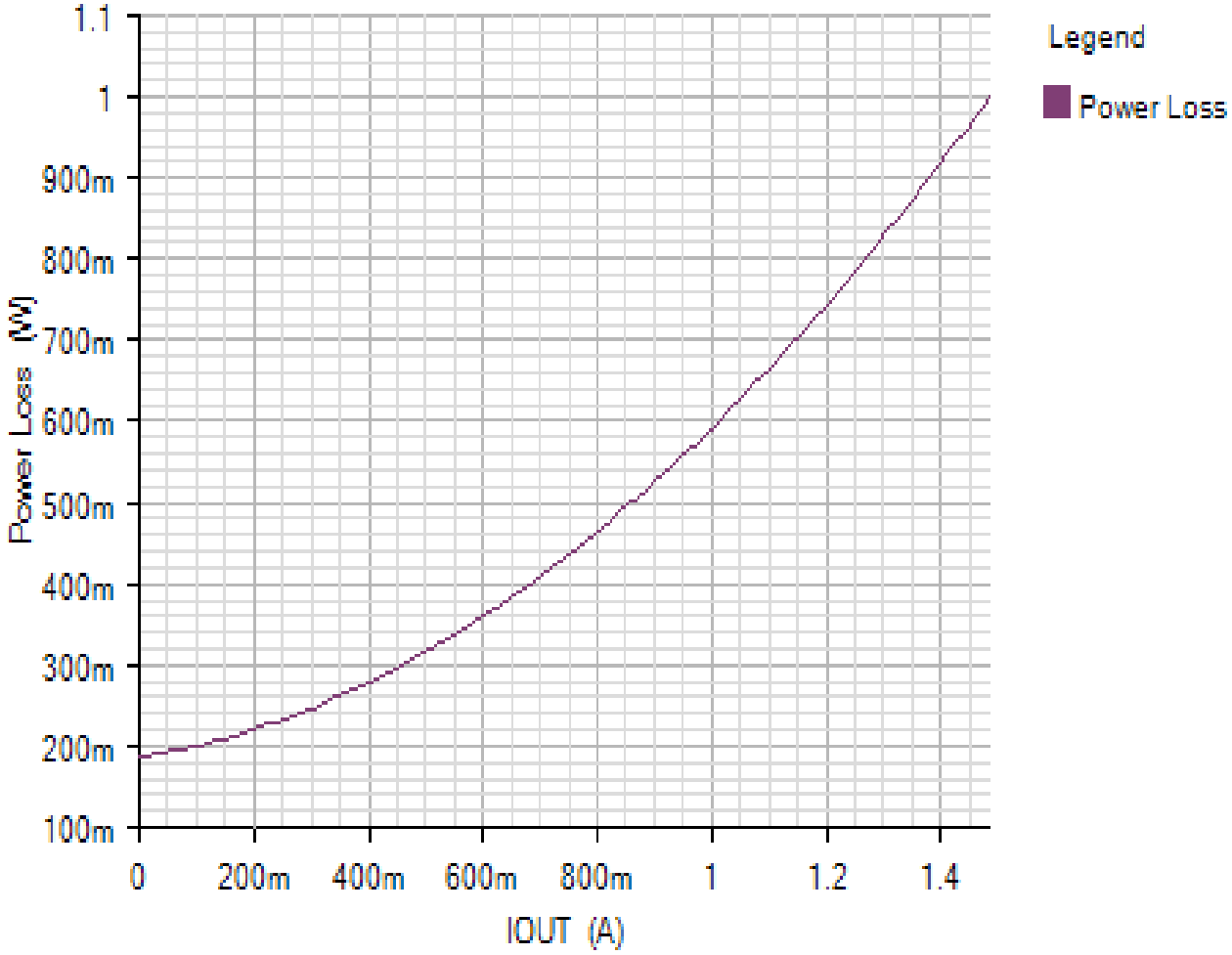
POWER_LOSS_PLOT Default



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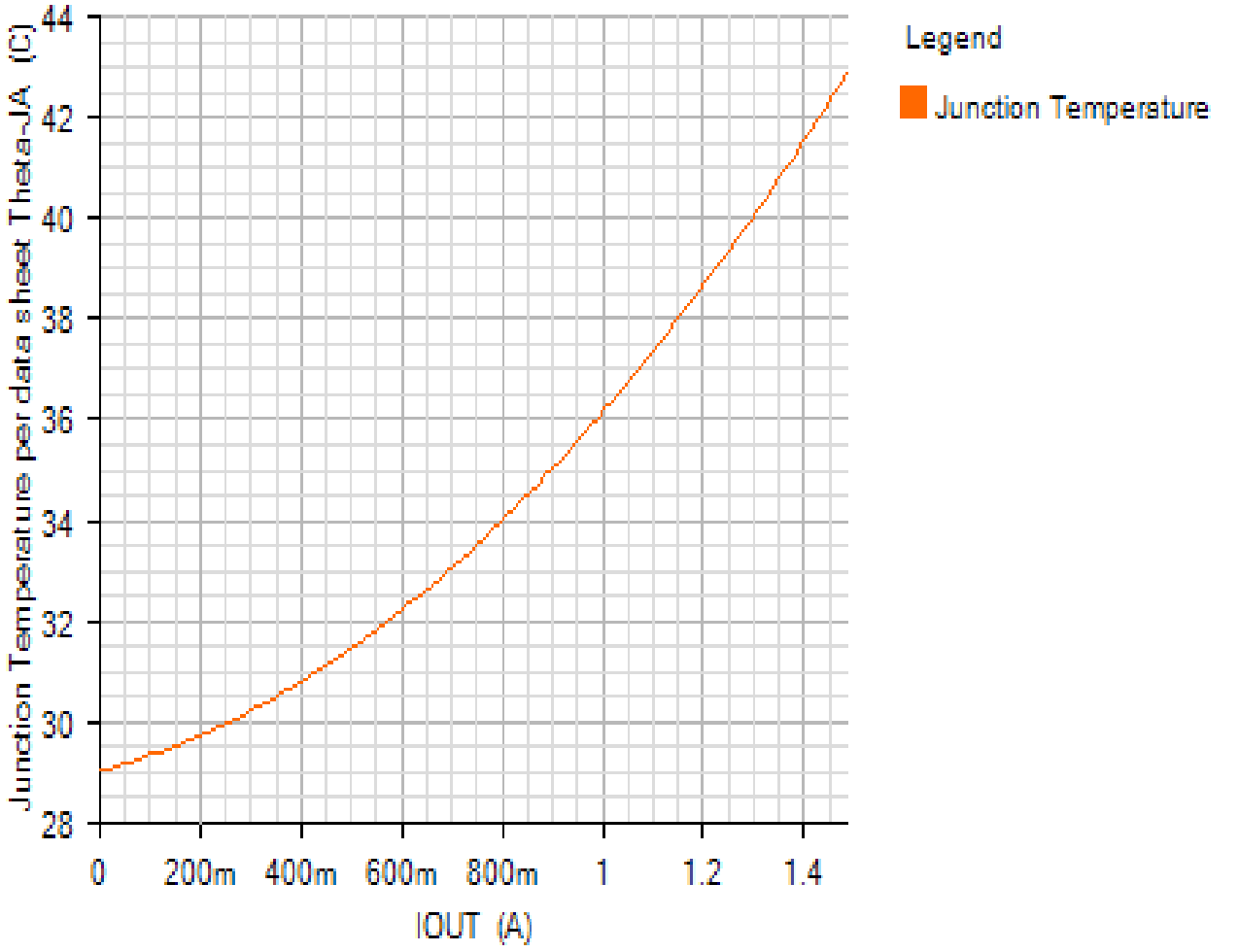
JUNCTION_TEMPERATURE_PLOT Default



Losses

Component	Loss (W)	% of total

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Component	Loss (W)	% of total
Total	0	100

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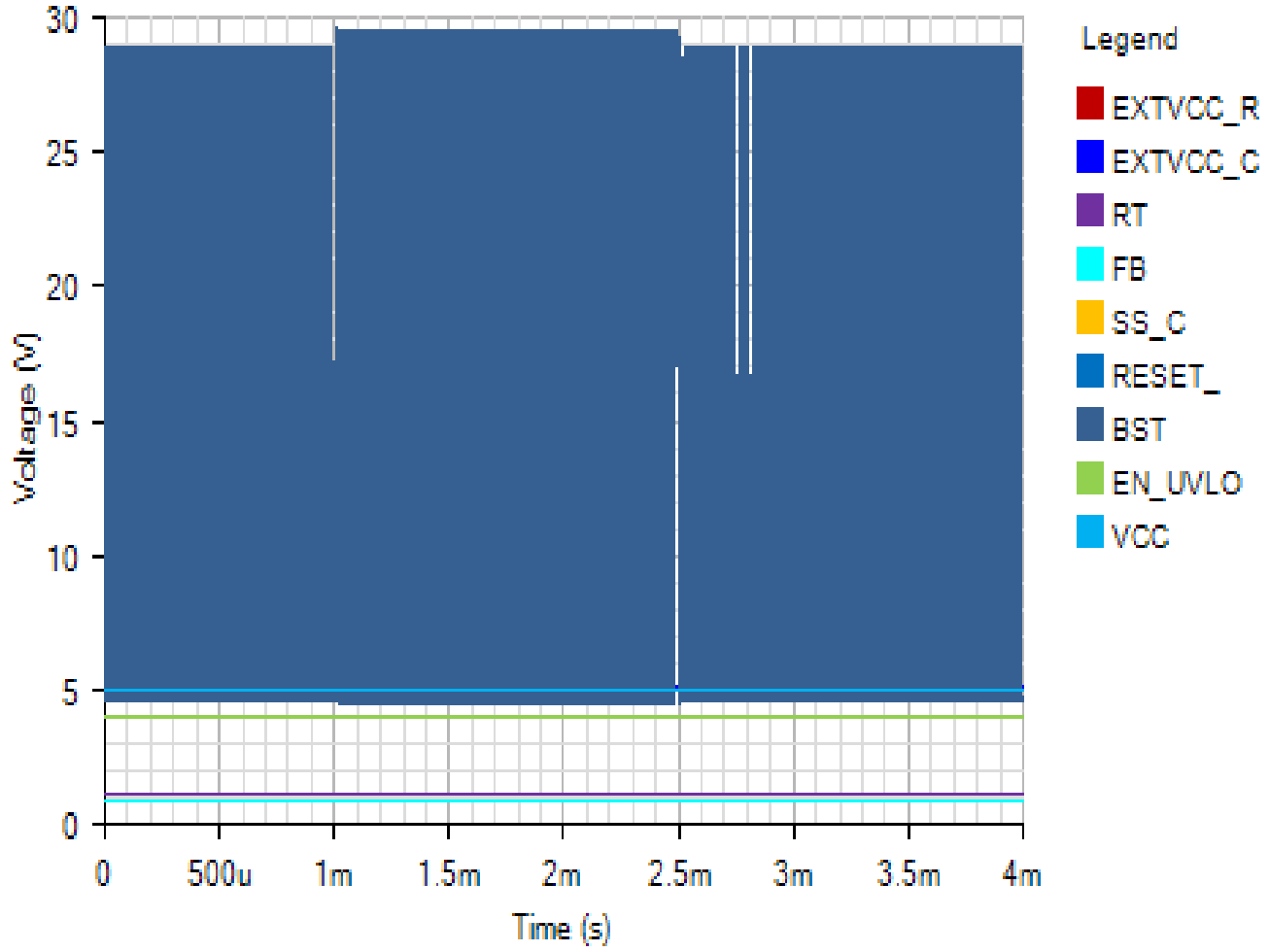
Load Step - Sun Nov 25 2018 21:07:56

IC Default



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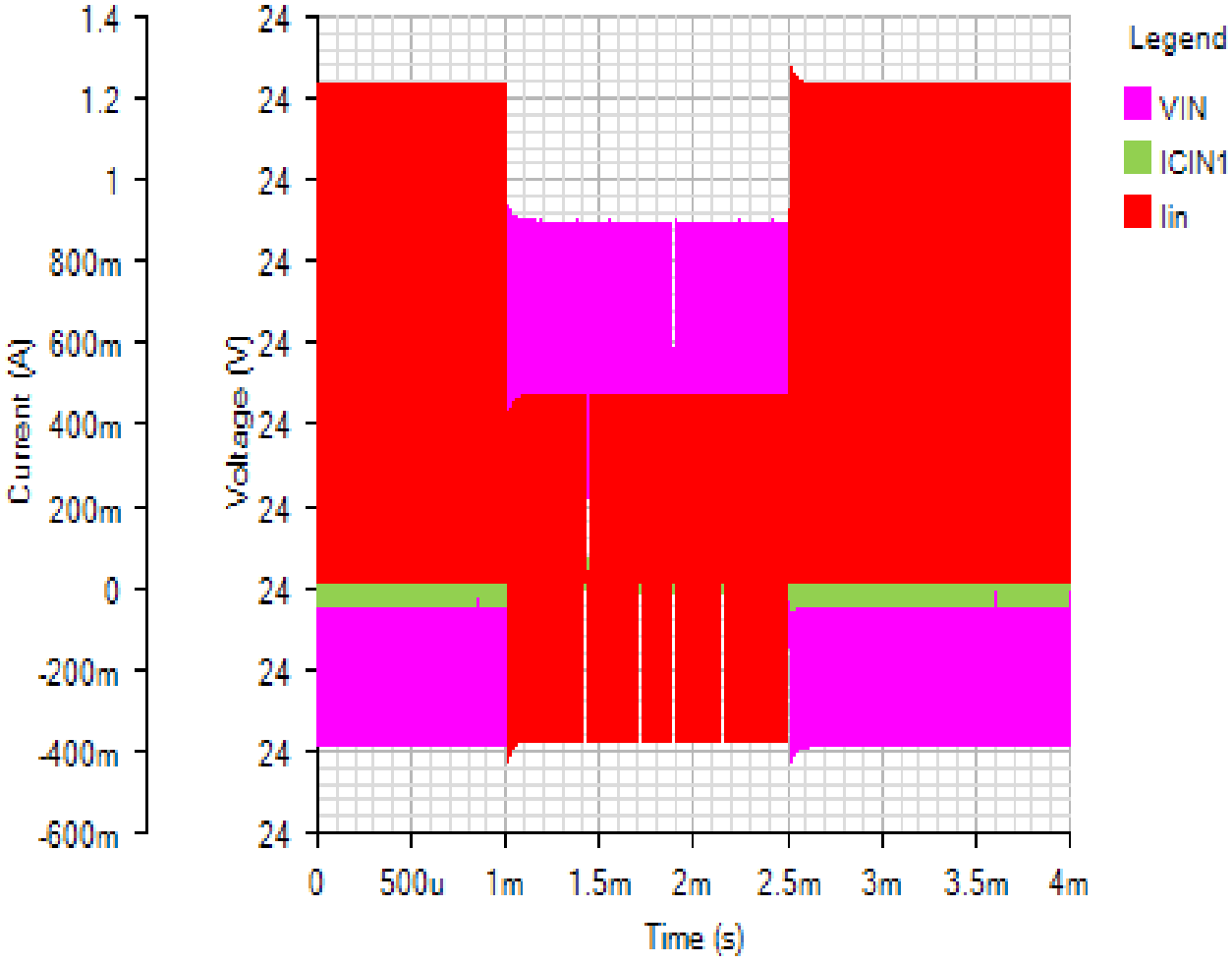

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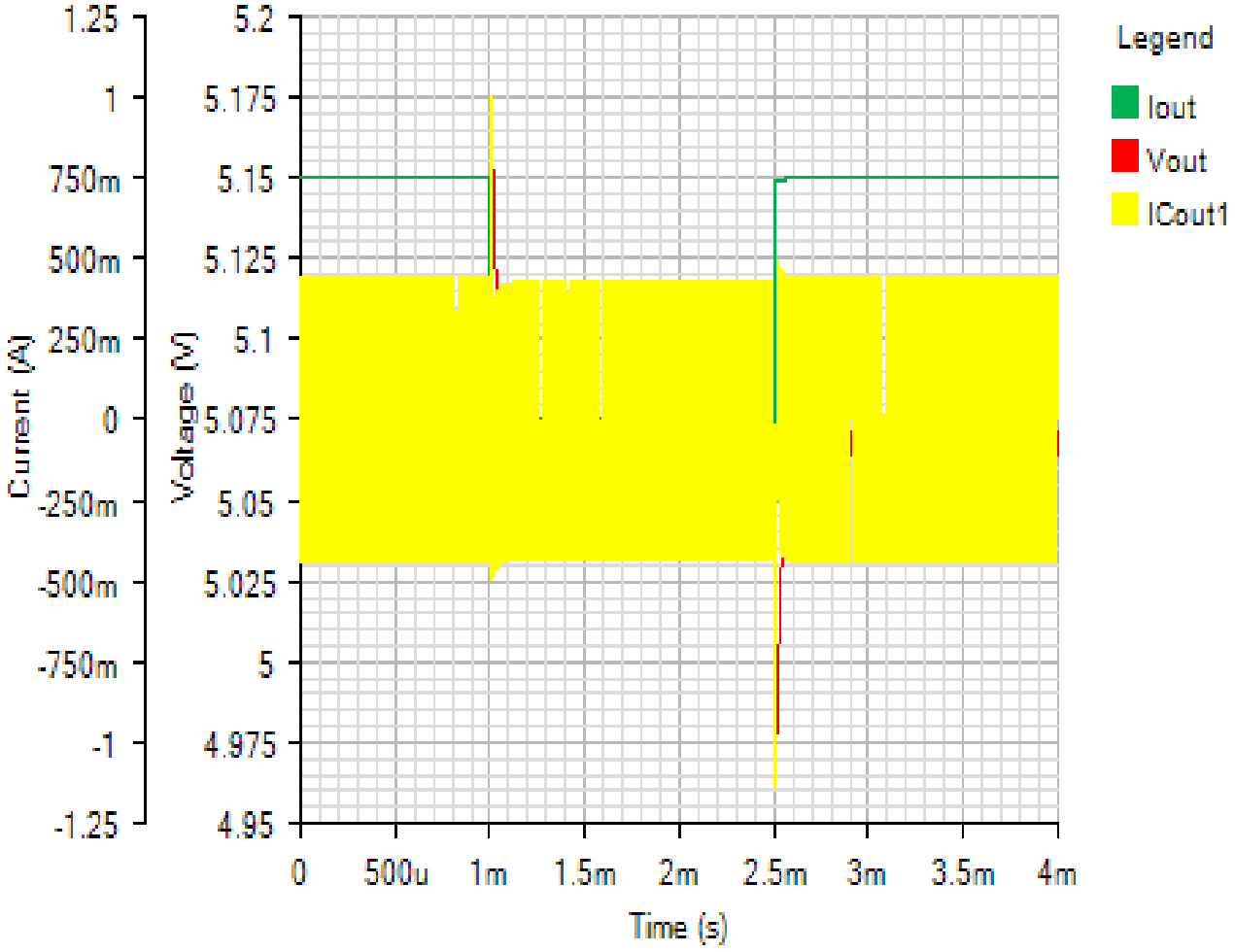

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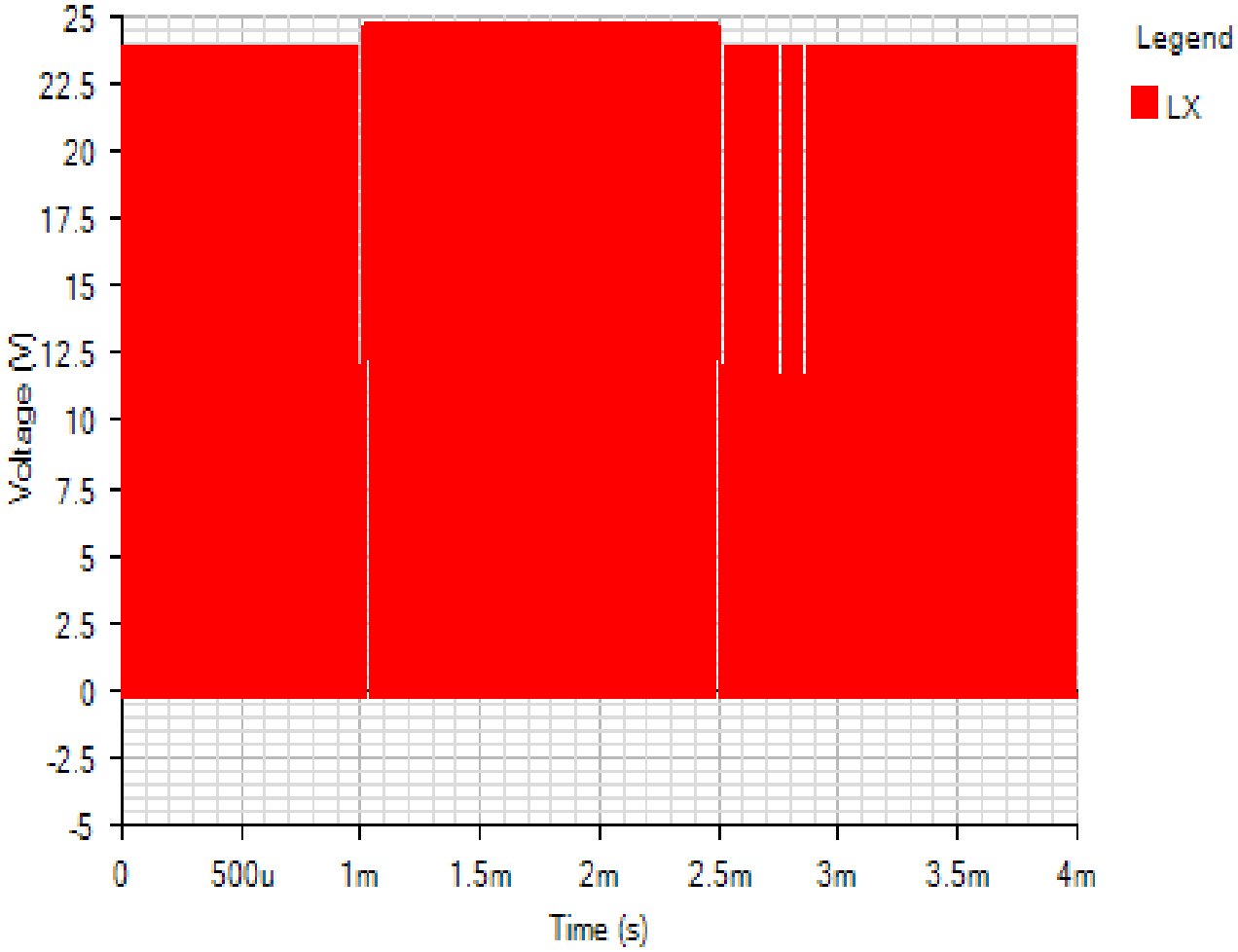
SWITCHING Default



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Start Up - Sun Nov 25 2018 21:07:56

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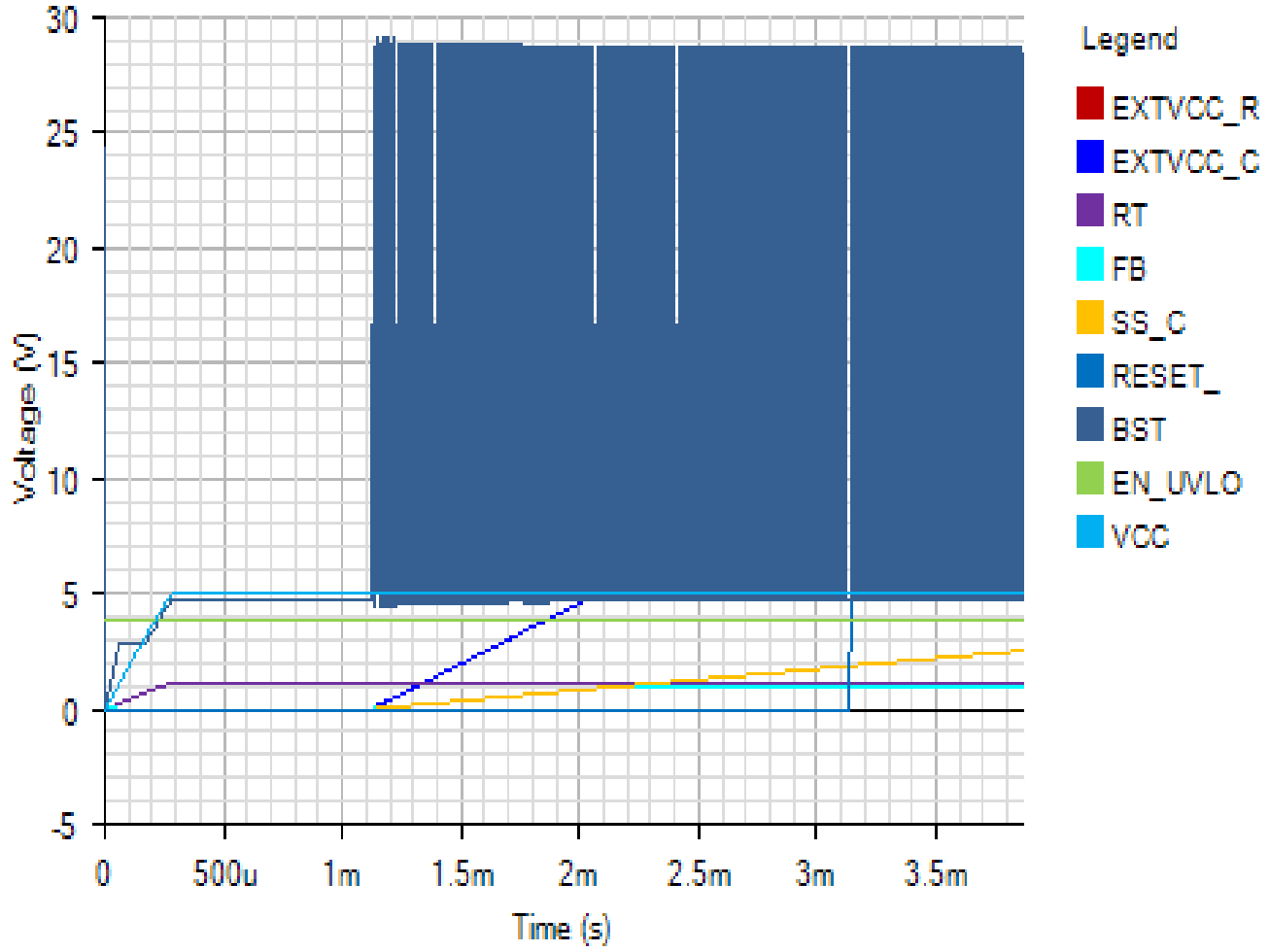

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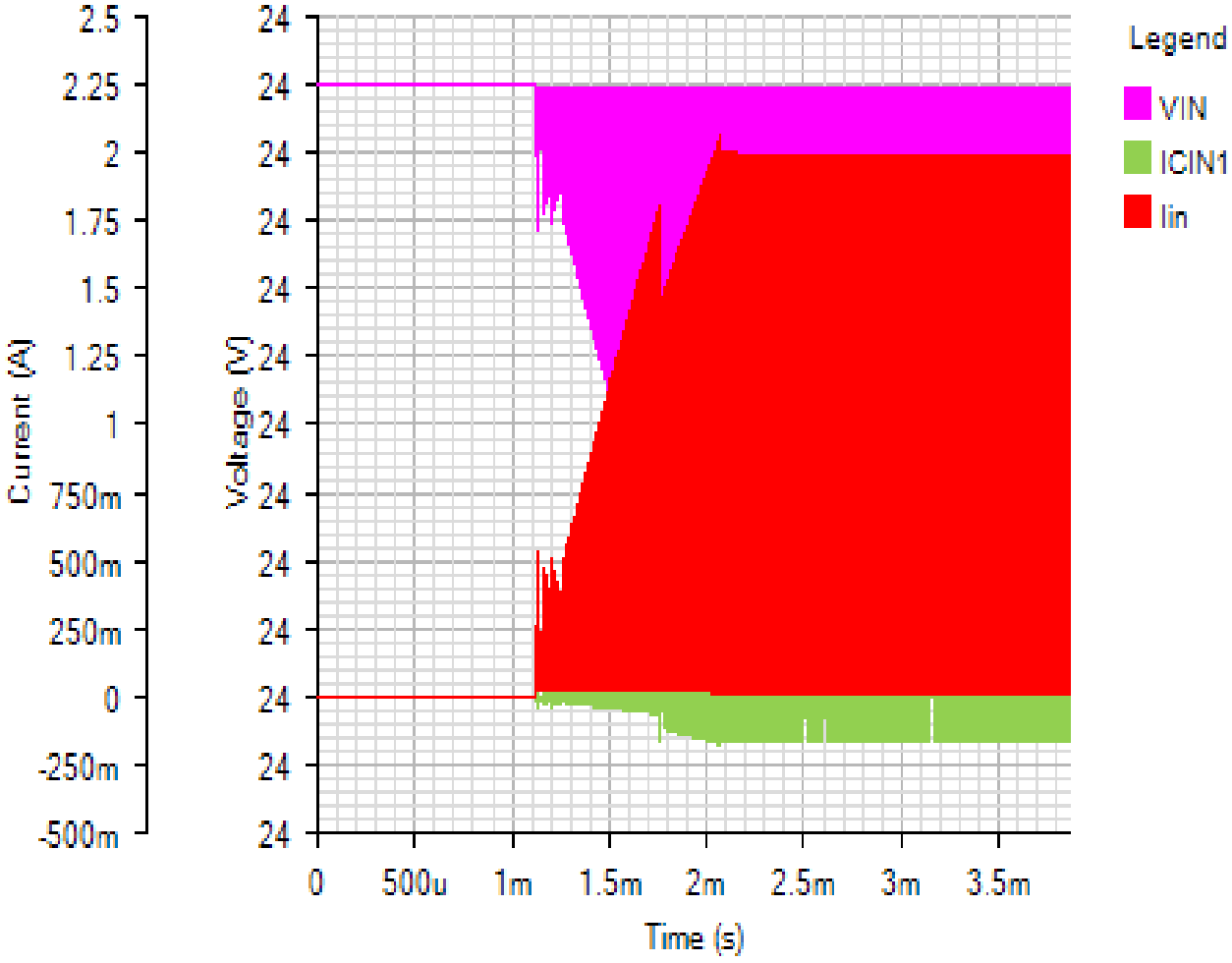

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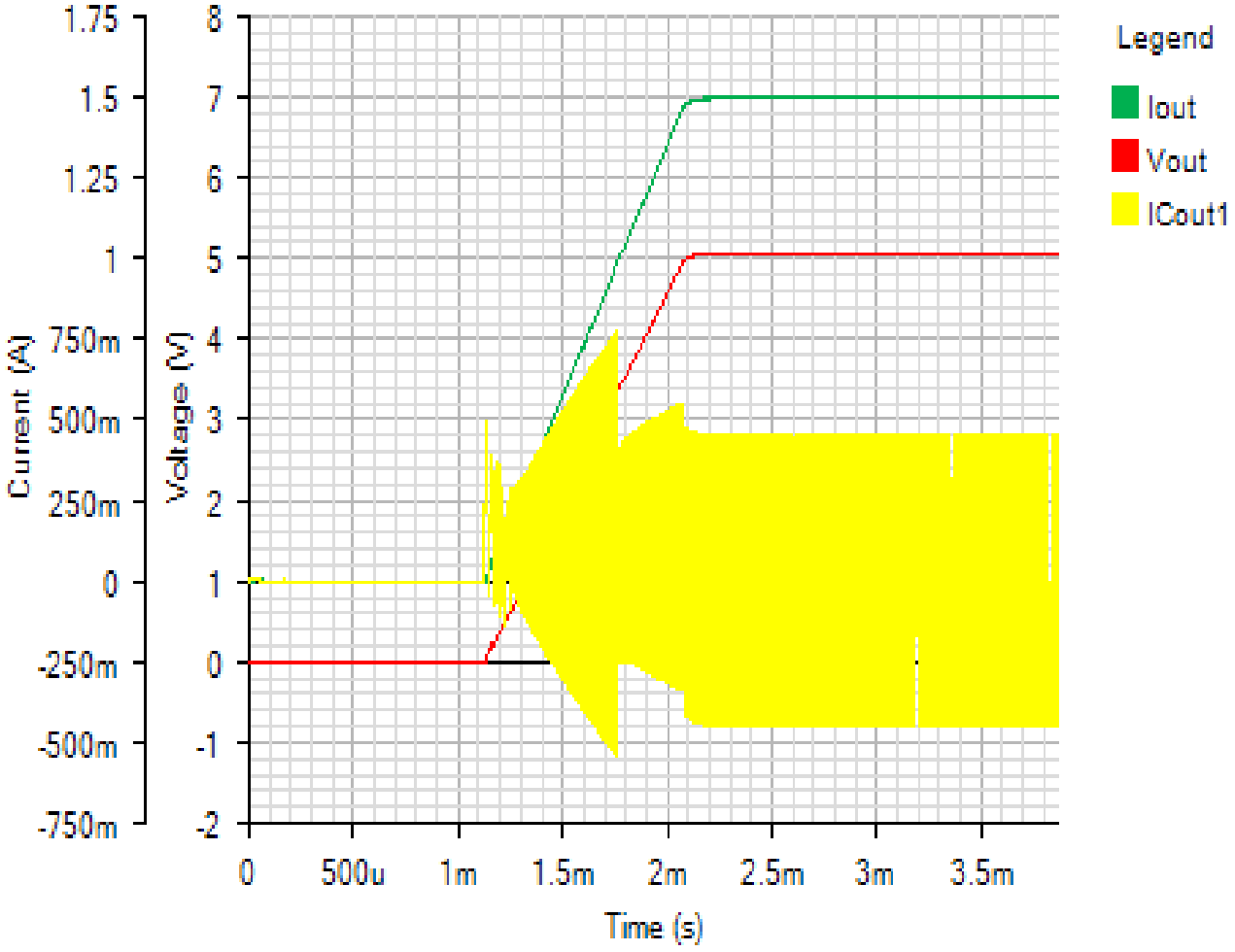

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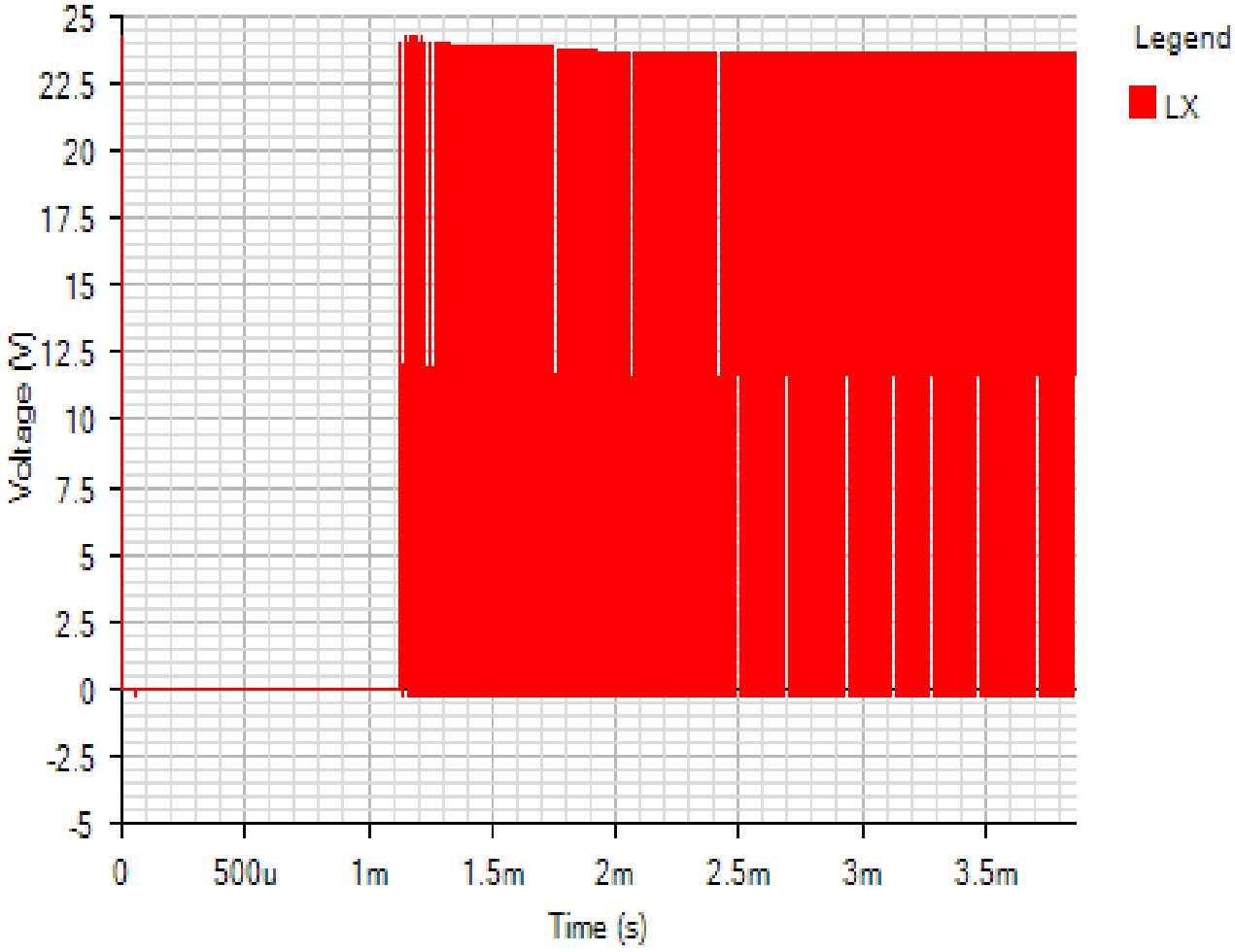

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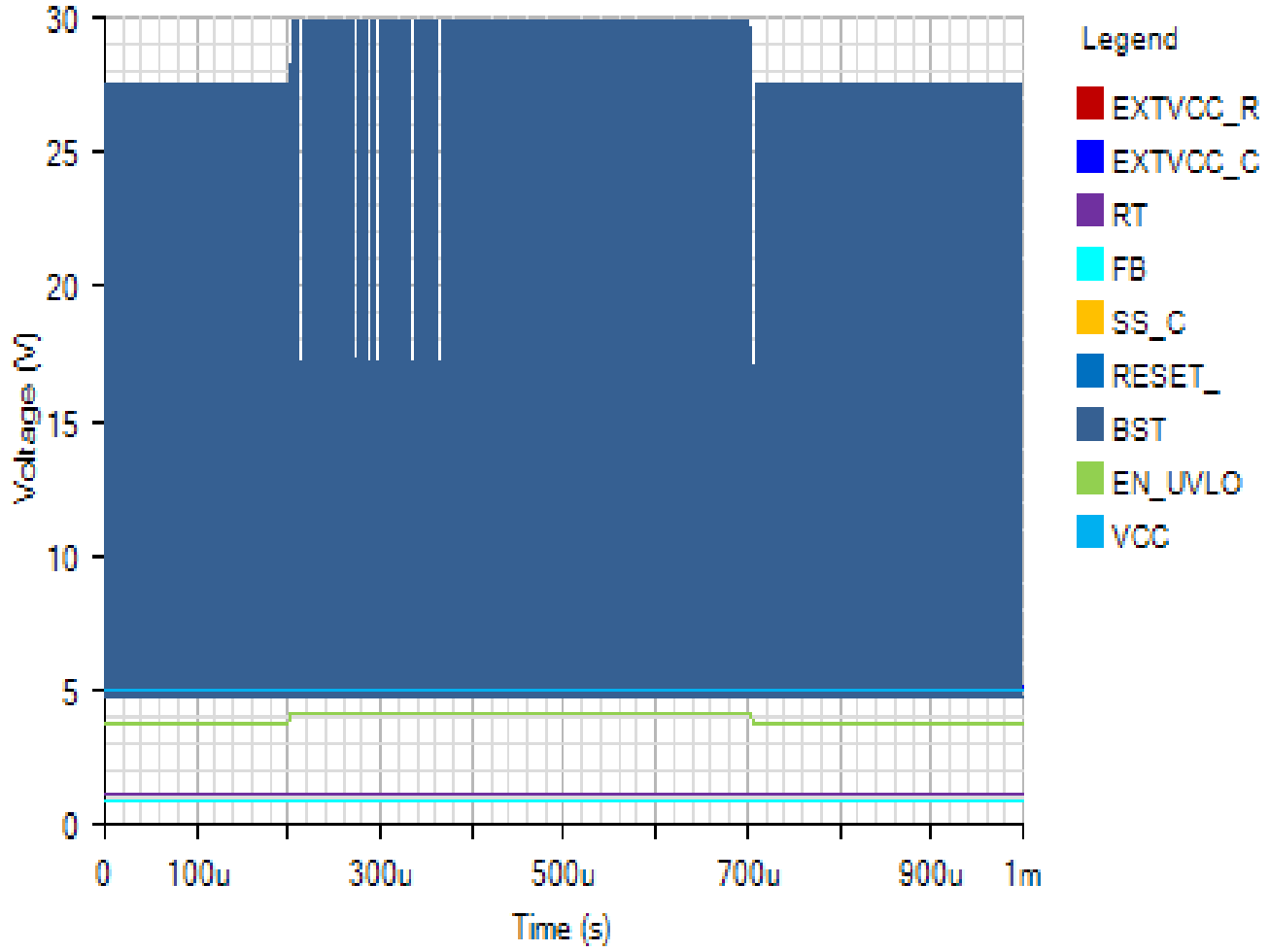
Line Transient - Sun Nov 25 2018 21:07:56

IC Default



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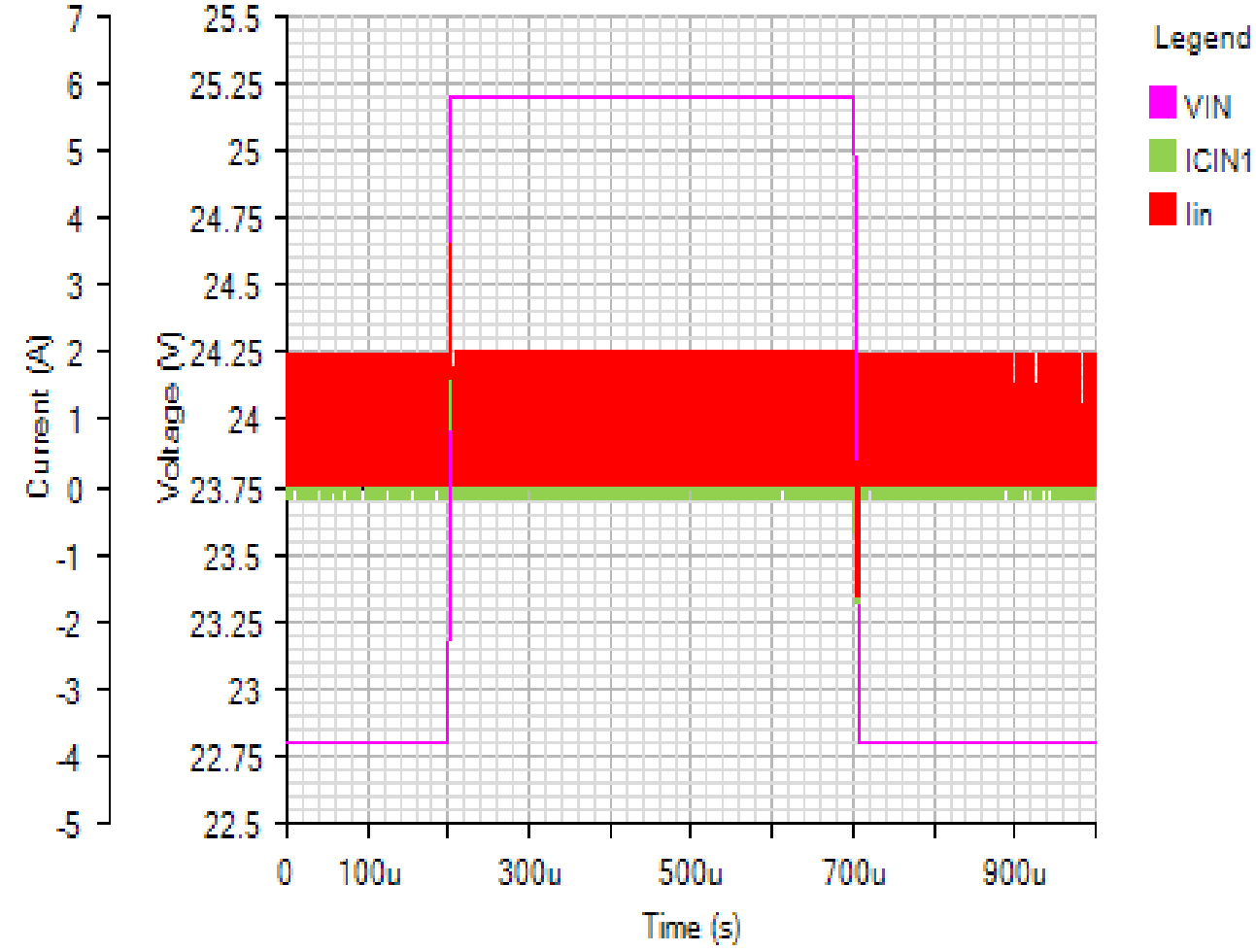

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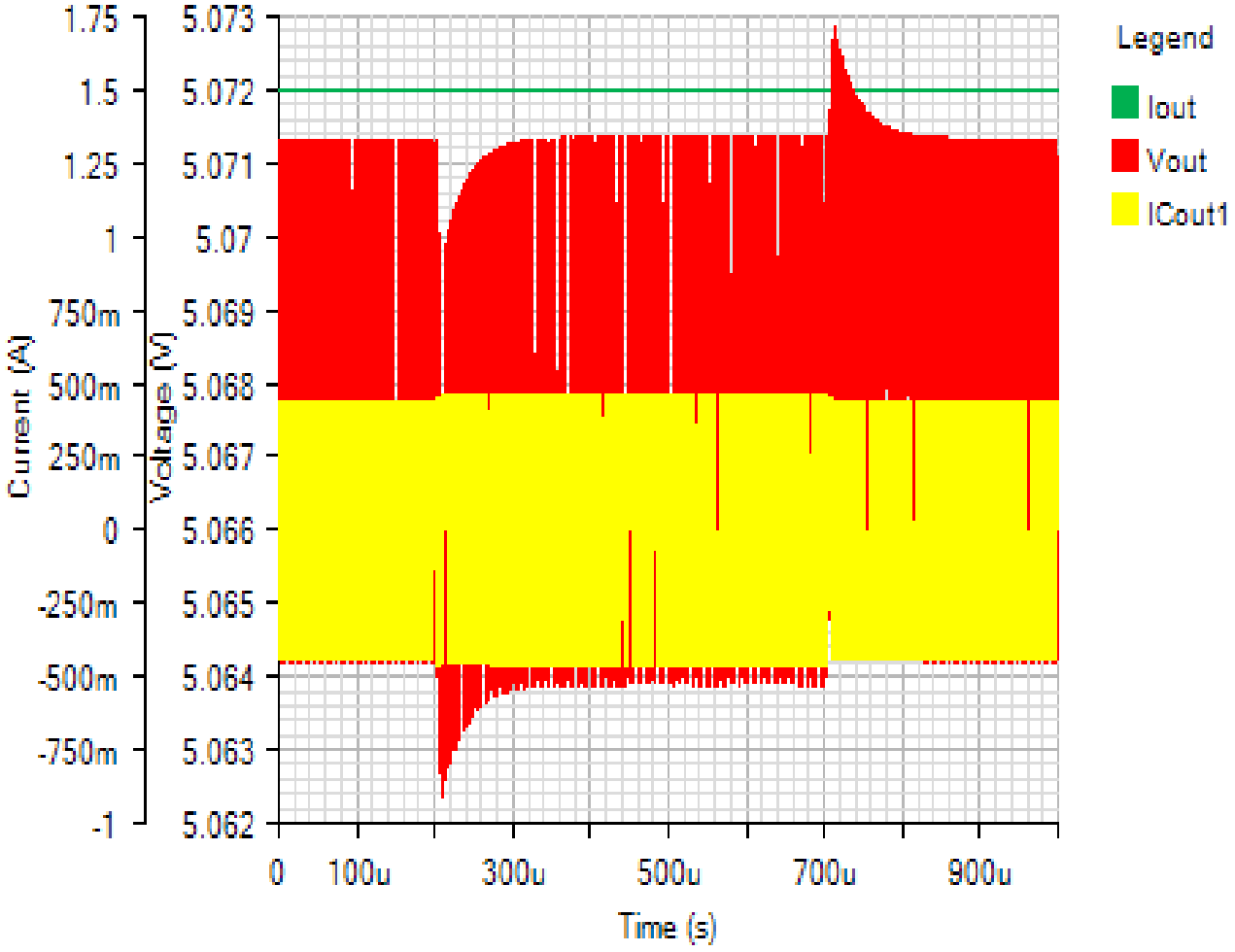

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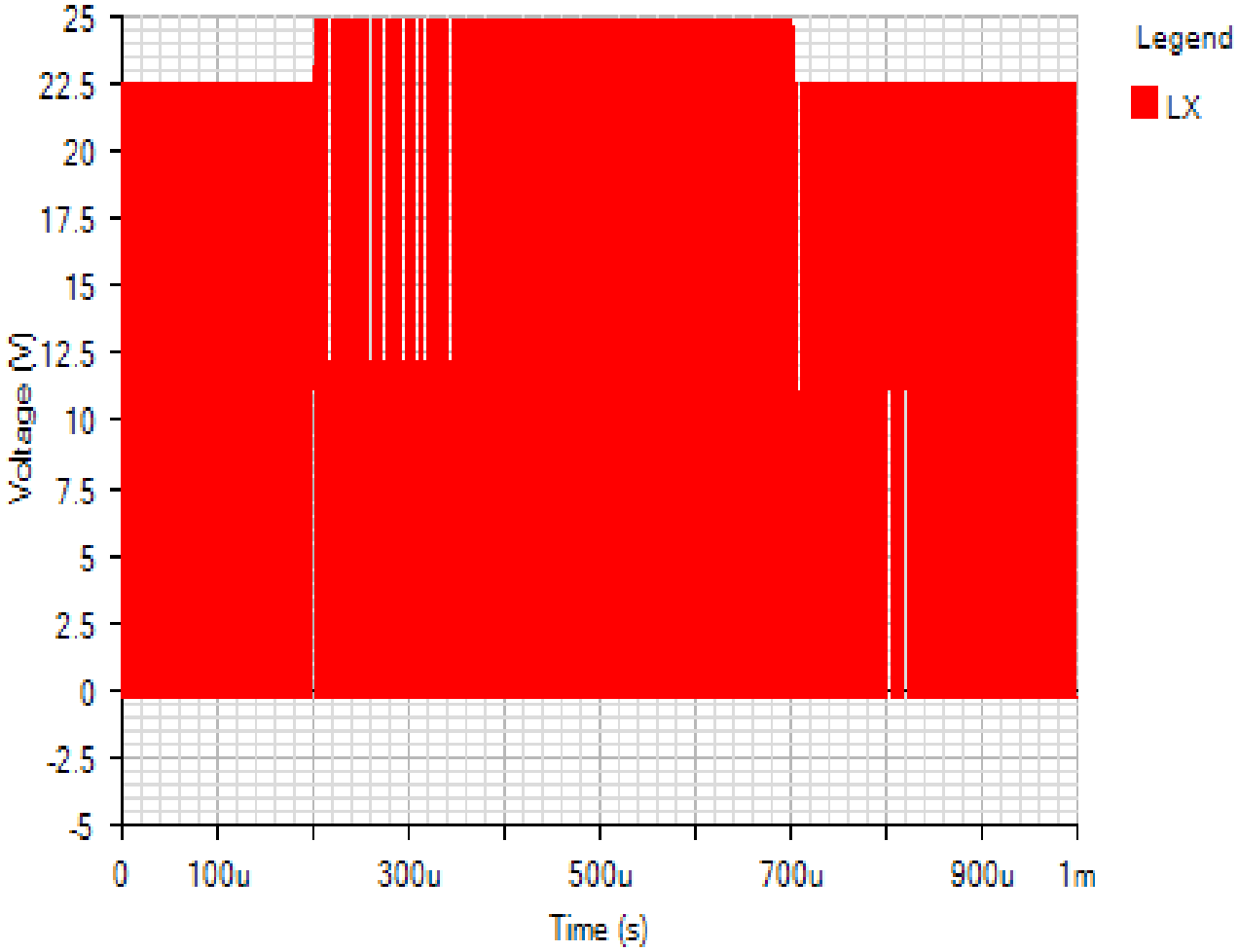

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Steady State - Sun Nov 25 2018 21:07:56

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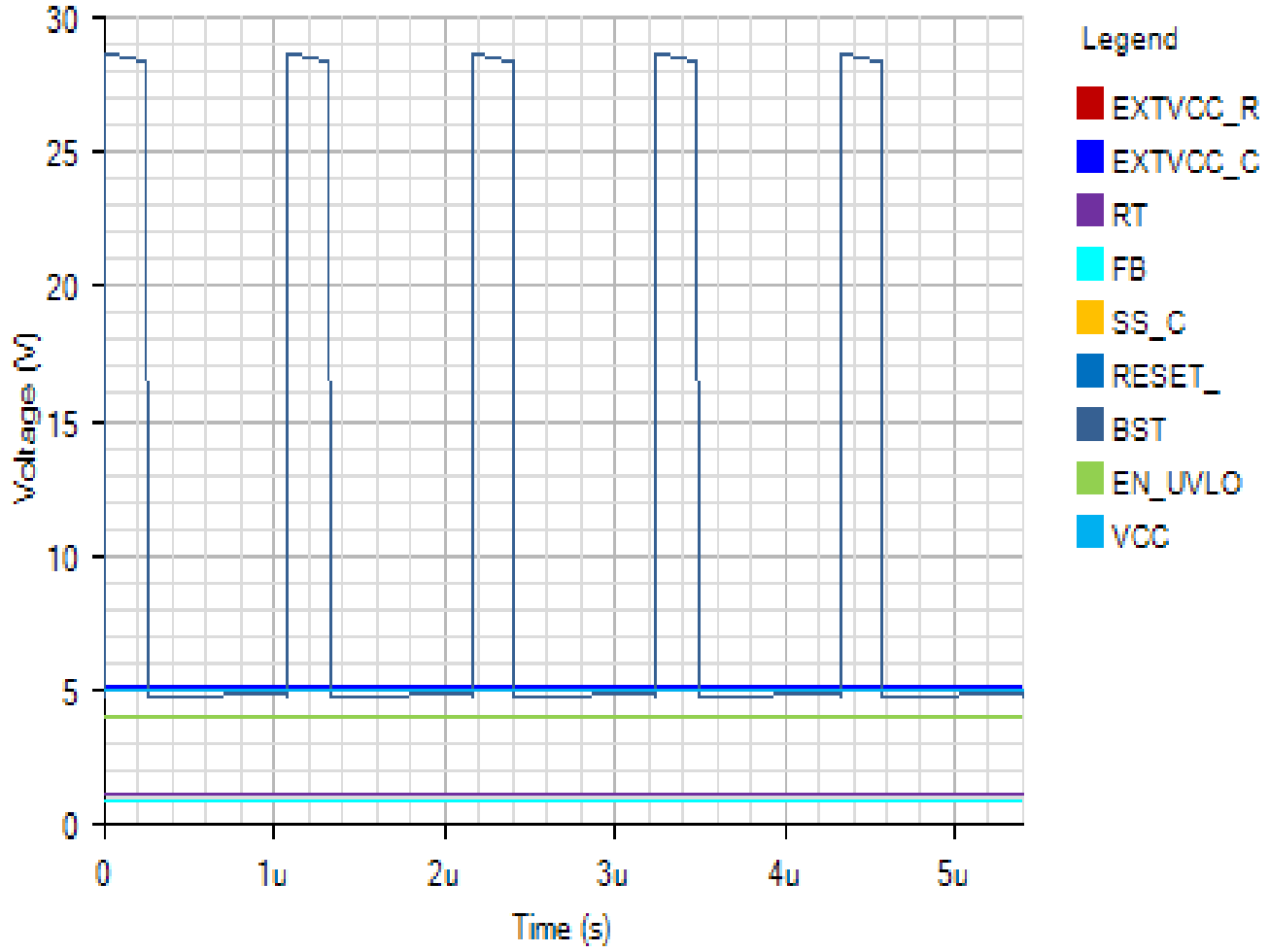

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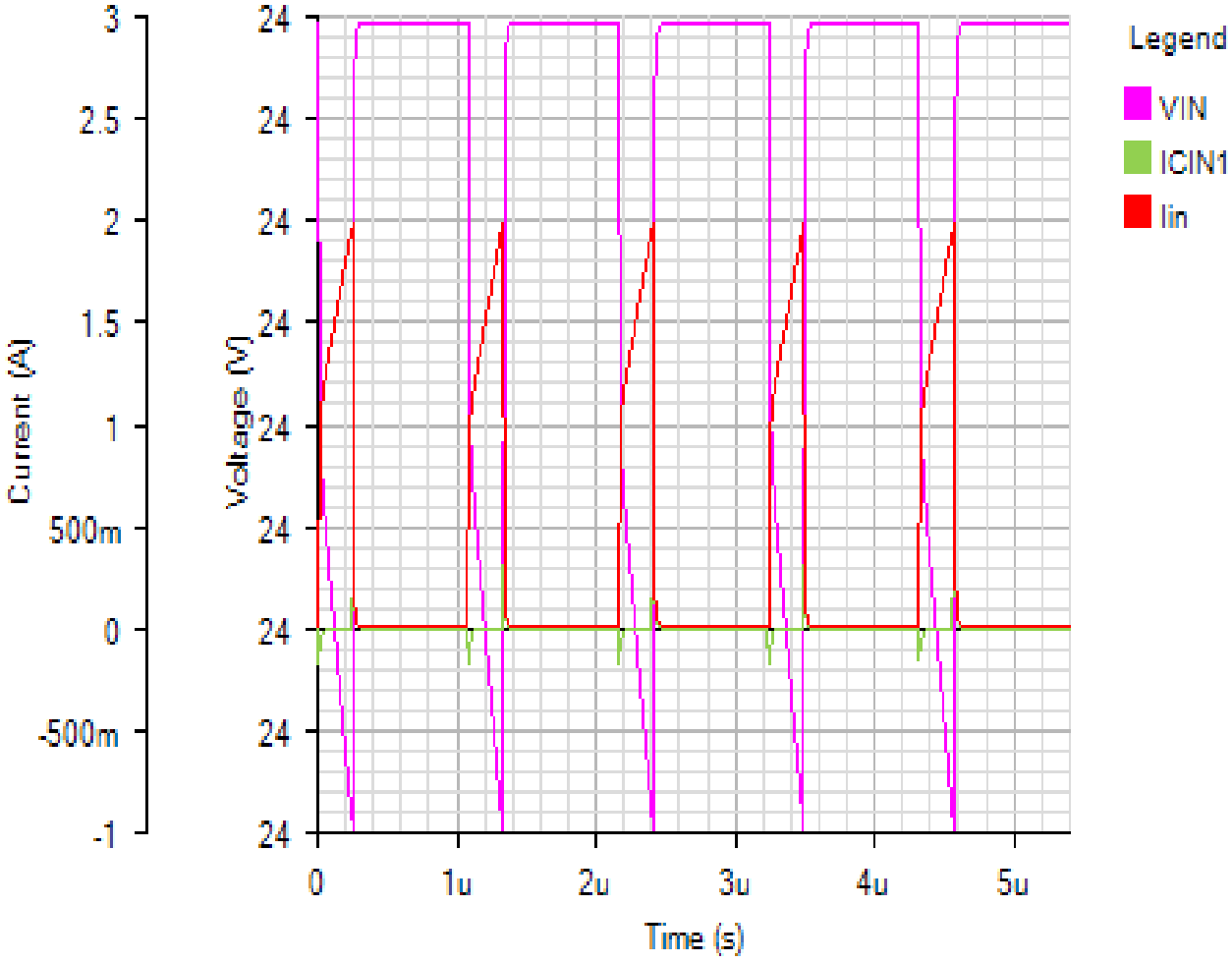

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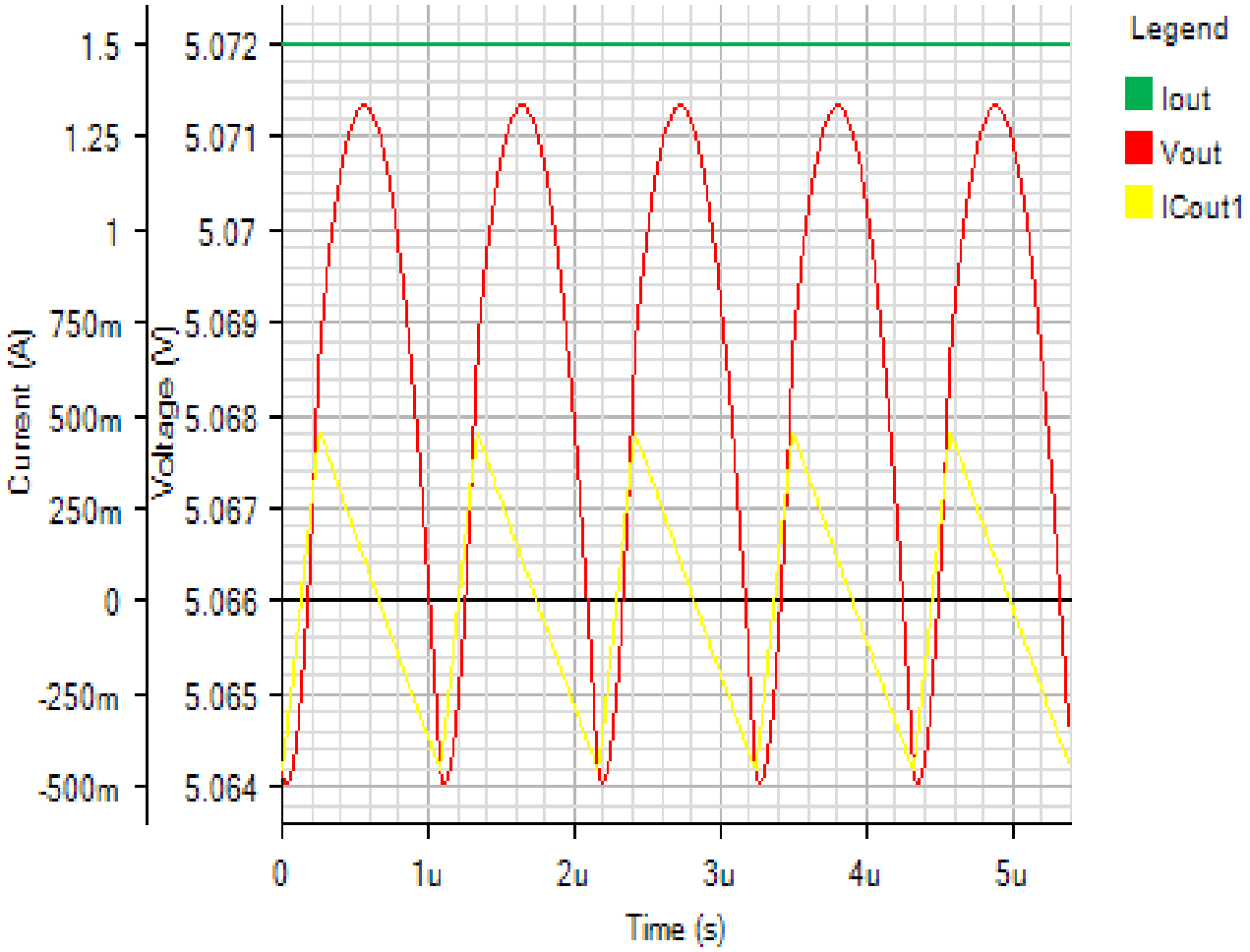

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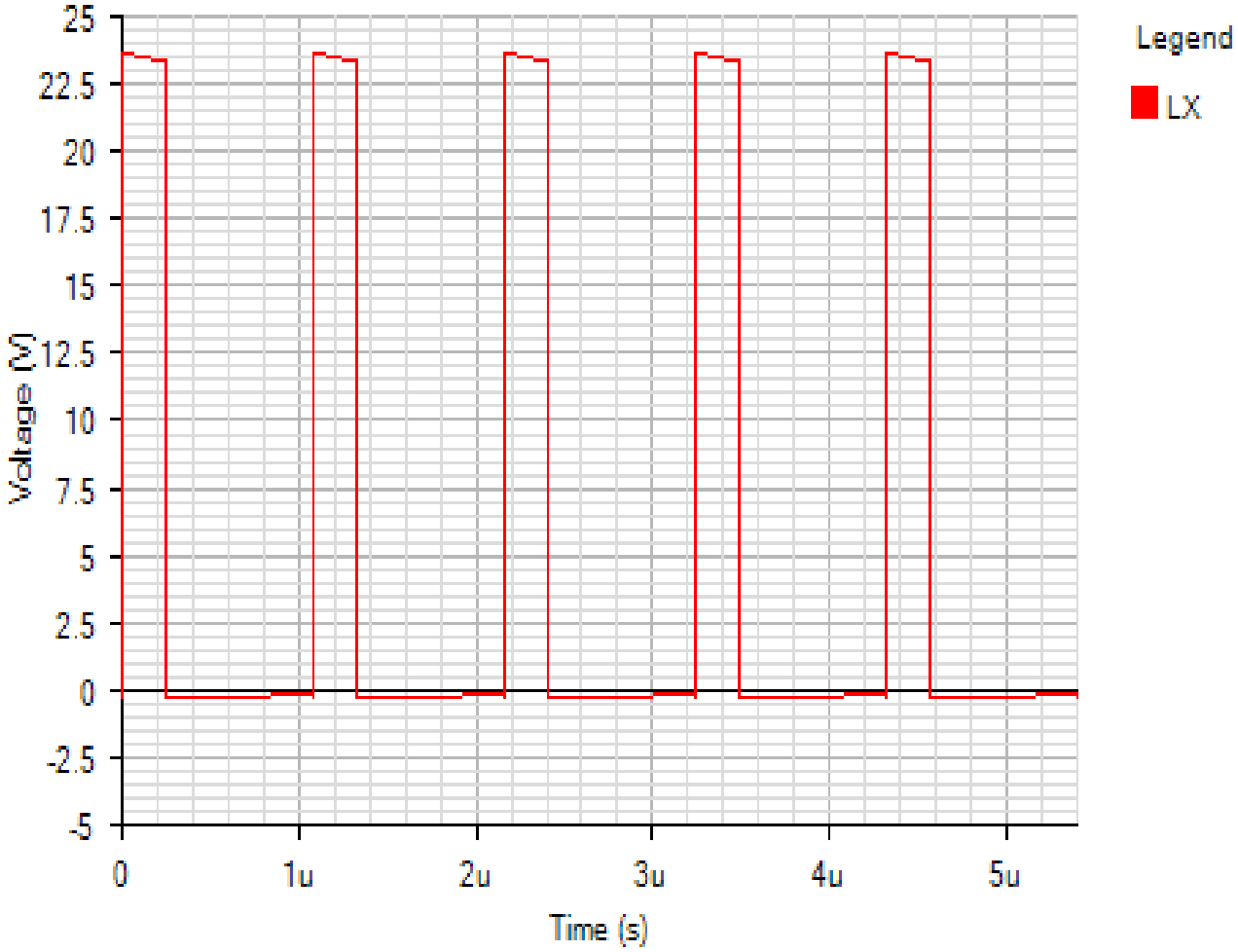

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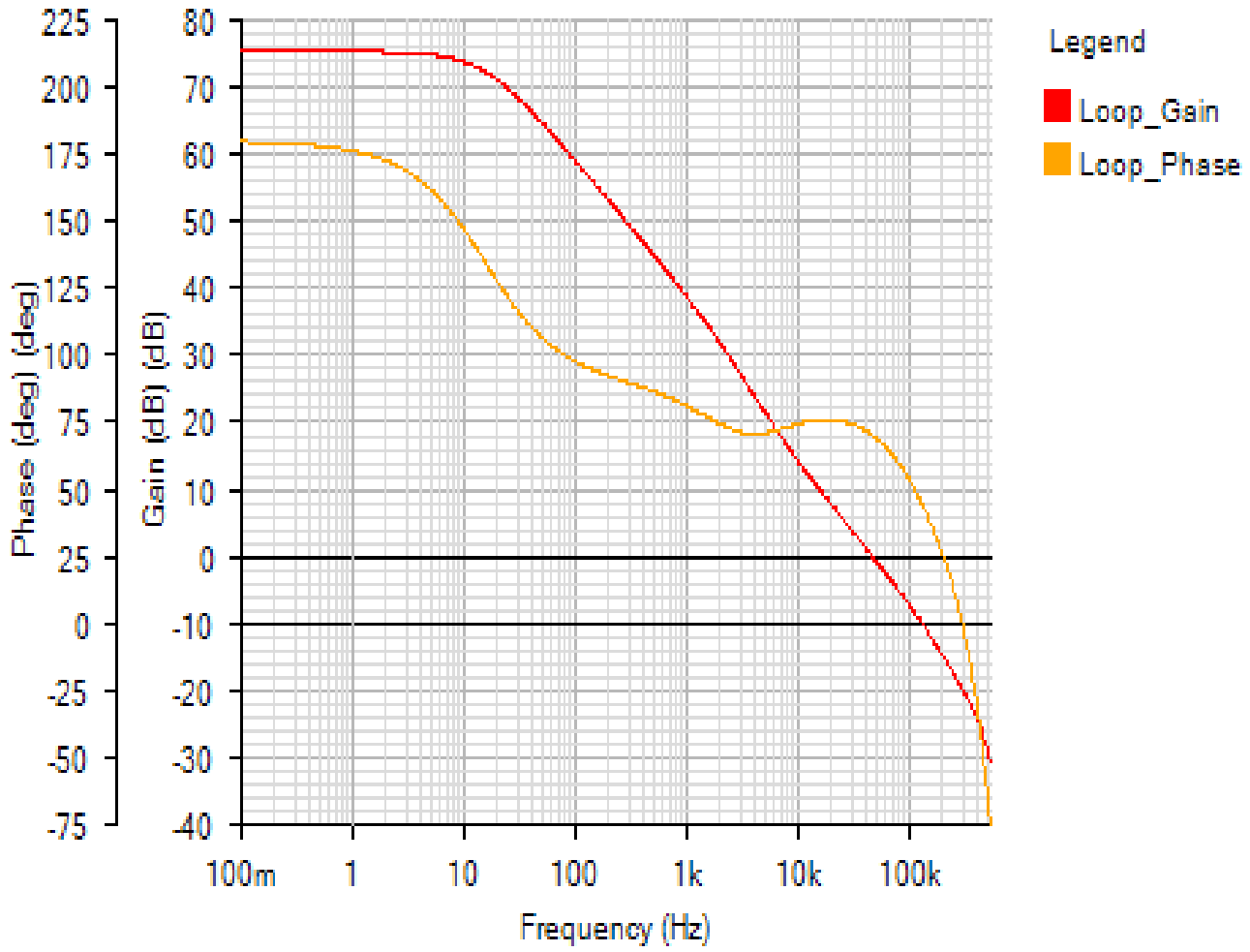
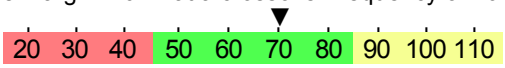
AC Loop - Sun Nov 25 2018 21:07:56

BODE Default



Phase Margin: 70.1° at a crossover frequency of 46.8kHz



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