

Initial Design

1.0

Design Requirements

Parameter	Value
Multi-function GPIO	MAX77816A (FPWM Mode Enable)
Minimum Input Voltage	2.5V
Maximum Input Voltage	5.5V
Nominal Input Voltage	5V
Input Voltage Ripple	1%
Output Voltage (Vout)	3.4V
Alternate Output Voltage (Vout_H)	5V
Output Current	3A
Output Voltage Ripple	1%
Performance Priority	Balance Efficiency and Size
BOM Priority	Cost
Mode of Operation	Skip
Inductor Peak Current Limit	5A
Inductor Peak Current Limit (GPIO)	5A
Output Voltage Ramp-up Slew Rate	20mV/us
Output Voltage Ramp-down Slew Rate	5mV/us
Over Voltage Protection Threshold	1.2
Active Output Discharge	(1==Enable)
Ambient Temperature	25°C

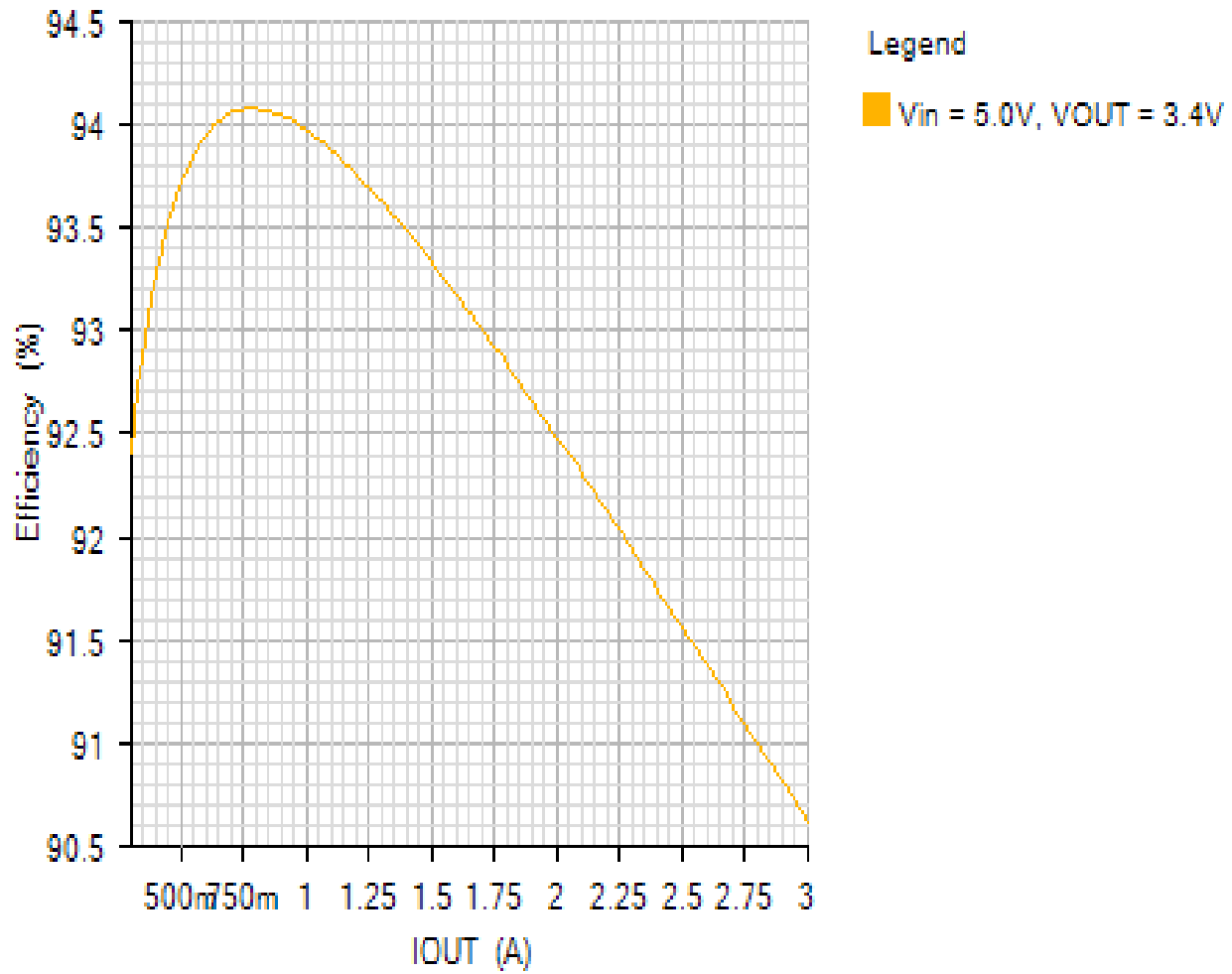
The online EE-Sim design tool does not support changing the GPIO function; only the default GPIO function for the selected version. Reverting to a previous version with EE-Sim 3.5 or earlier is required to support changing the GPIO function.

Ref	Qty	Part Number	Manufacturer	Description
U1	1	MAX77816A	User-Defined	IC
C1	1	CC0402KRX5R5BB105	Yageo	Cap Ceramic 1uF 6.3V X5R 10% Pad SMD 0402 85°C T/R
CIN	1	C1206C106K9PAC	Kemet	Cap Ceramic 10uF 6.3V X5R 10% SMD 1206 85C Bulk
COUT	1	GRM32ER60J476ME20L	Murata	Cap Ceramic 47uF 6.3V X5R 20% SMD 1210 85C Embossed T/R
L1	1	1277AS-H-1R0M=P2	Murata	1uH 20% 34mOhm 4.6Asat 3.7Arms

Efficiency - Fri Jan 04 2019 11:36:00

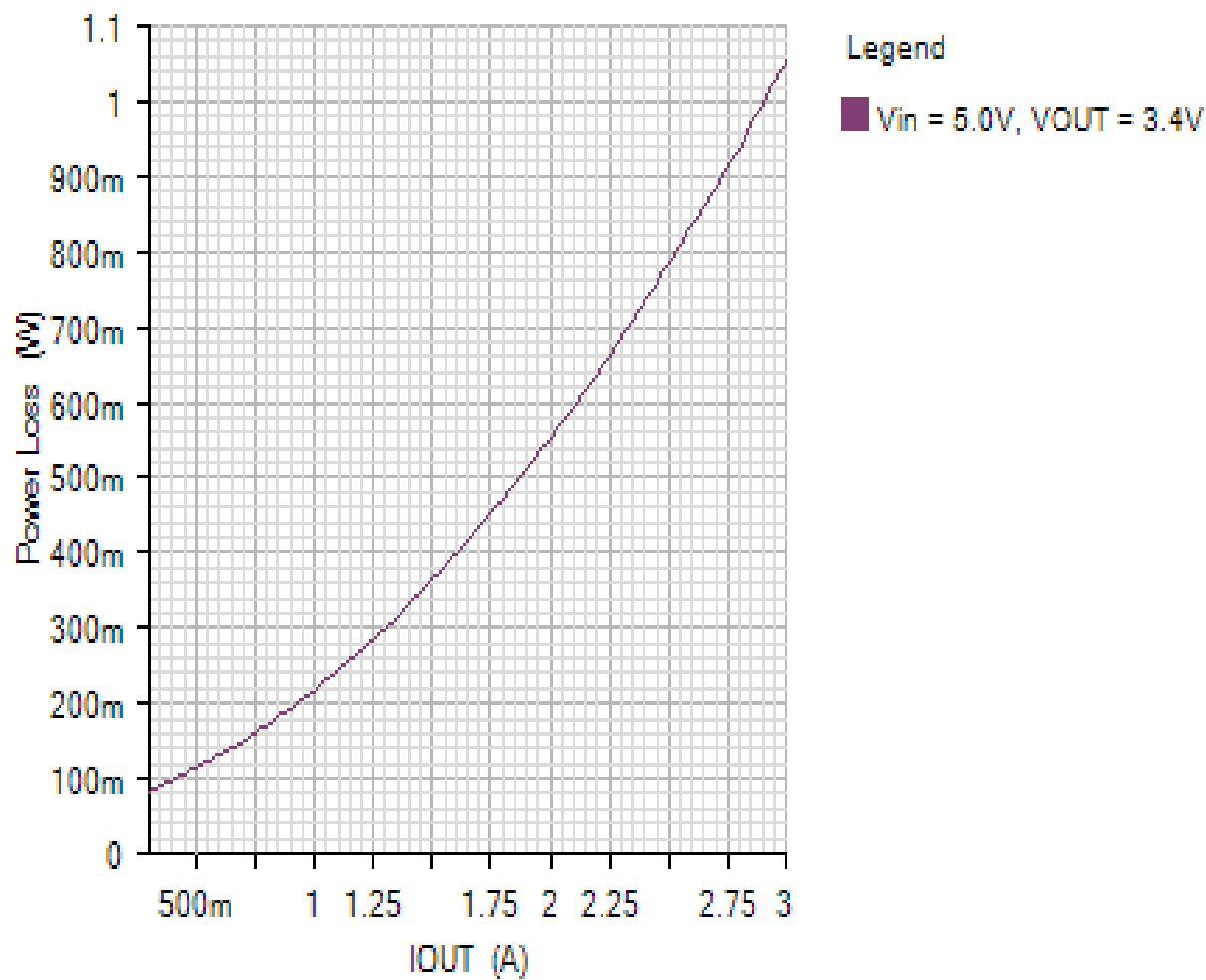
EFFICIENCY_PLOT

Default



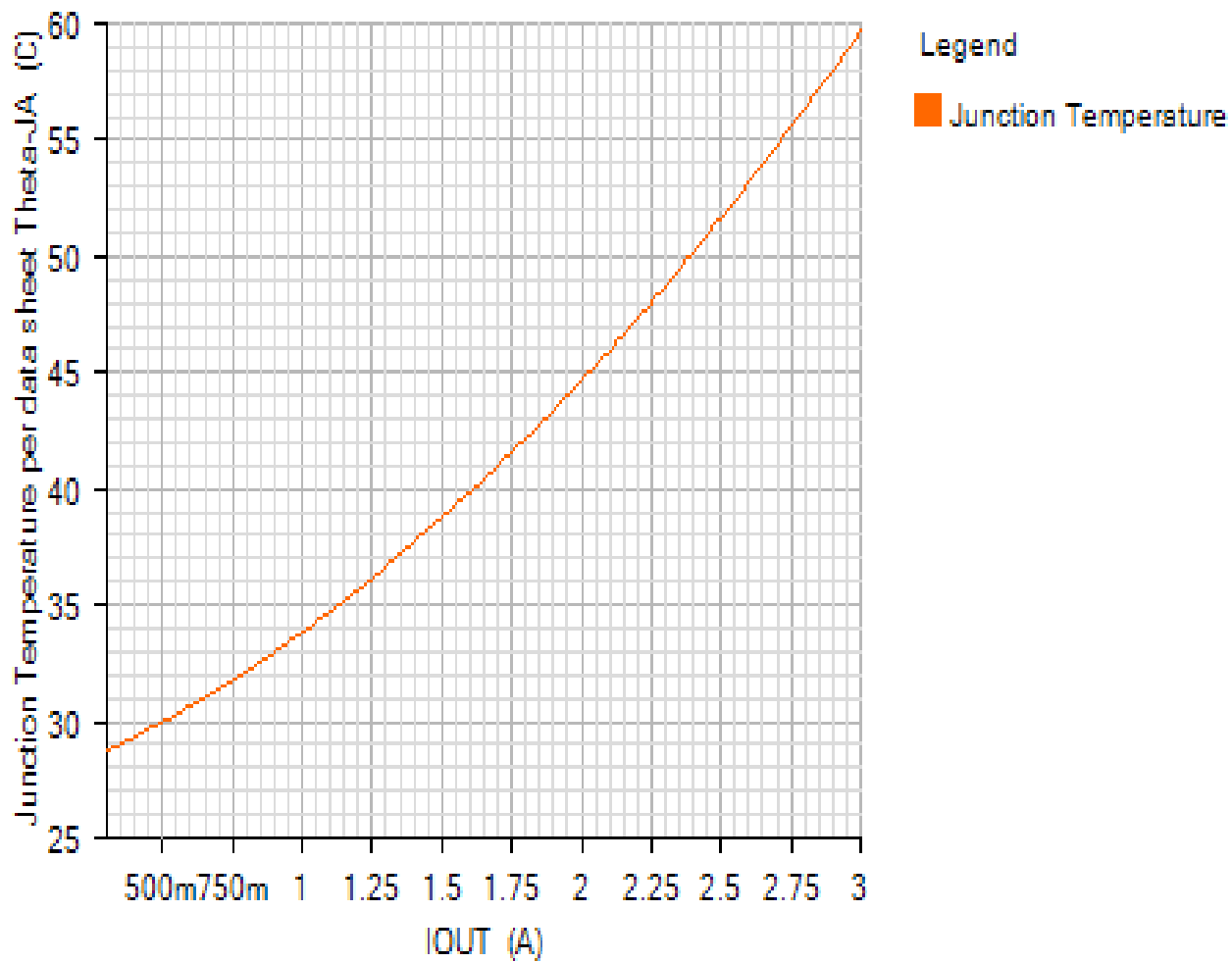
POWER_LOSS_PLOT

Default

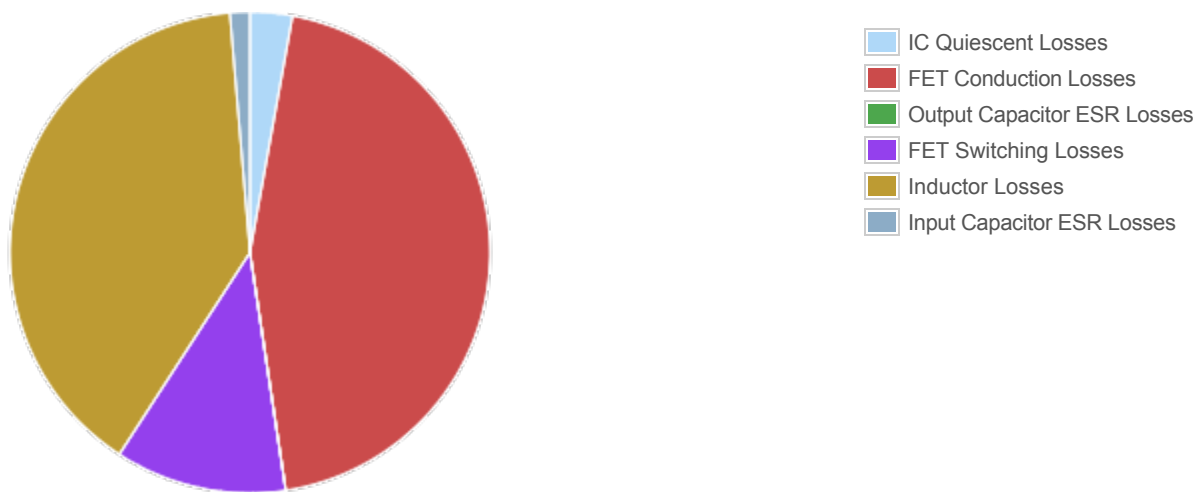


JUNCTION_TEMPERATURE_PLOT

Default



Losses



Component

Loss (W)

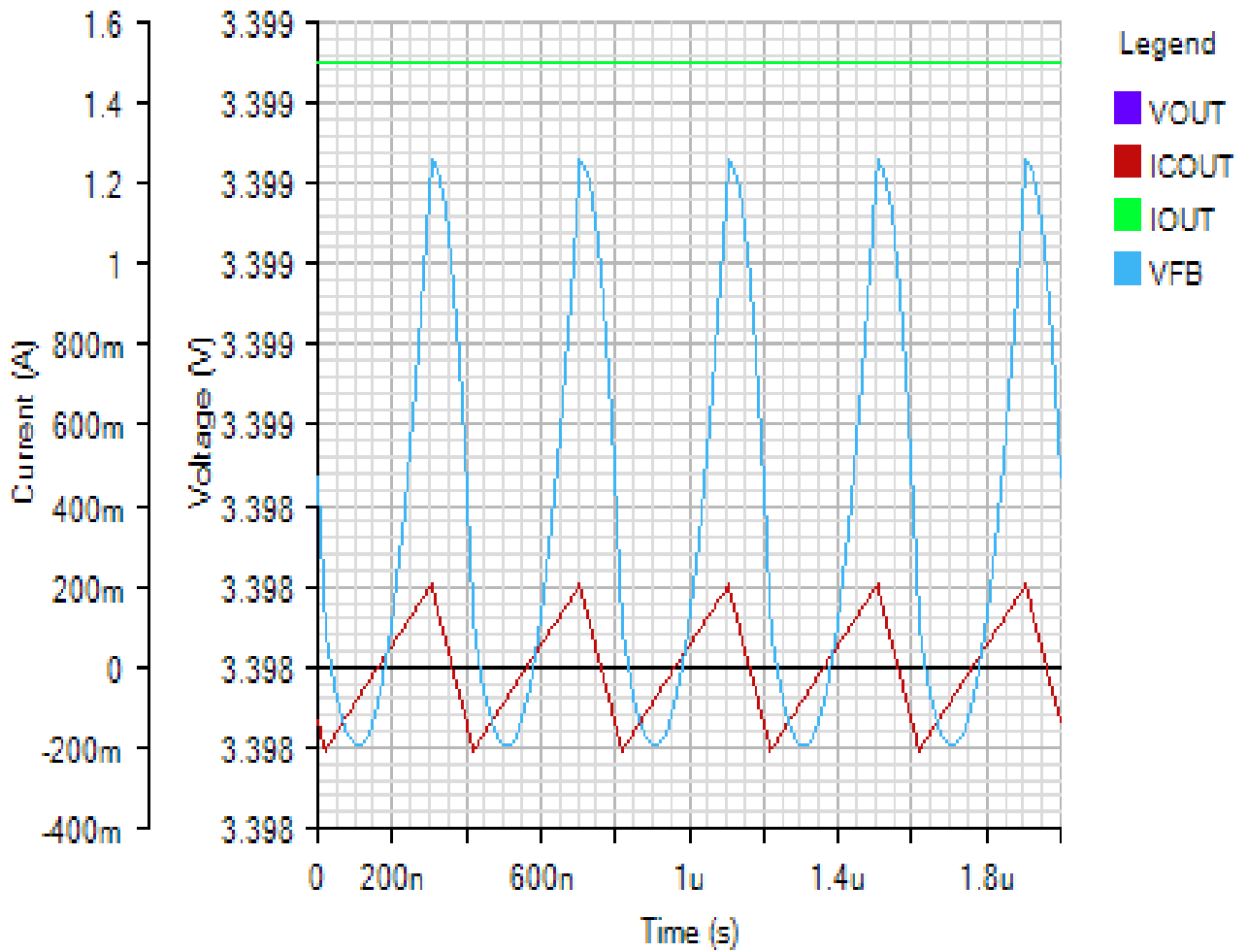
% of total

Component	Loss (W)	% of total
IC Quiescent Losses	0.028418	2.8
FET Conduction Losses	0.447759	44.8
Output Capacitor ESR Losses	0.000021	0
FET Switching Losses	0.11539	11.5
Inductor Losses	0.395014	39.5
Input Capacitor ESR Losses	0.013398	1.3
Total	1	100

Steady State - Fri Jan 04 2019 11:36:00

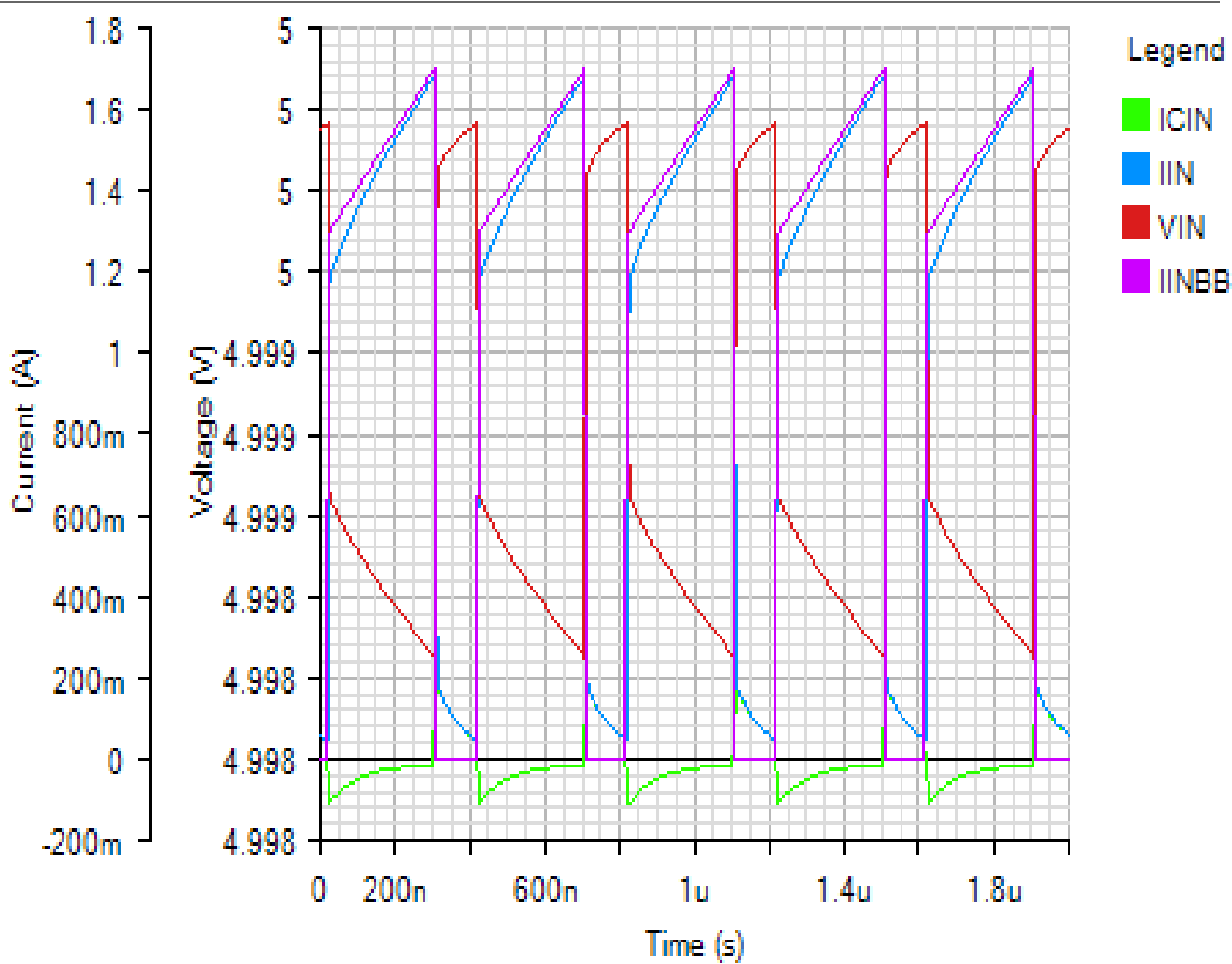
OUTPUT

Default



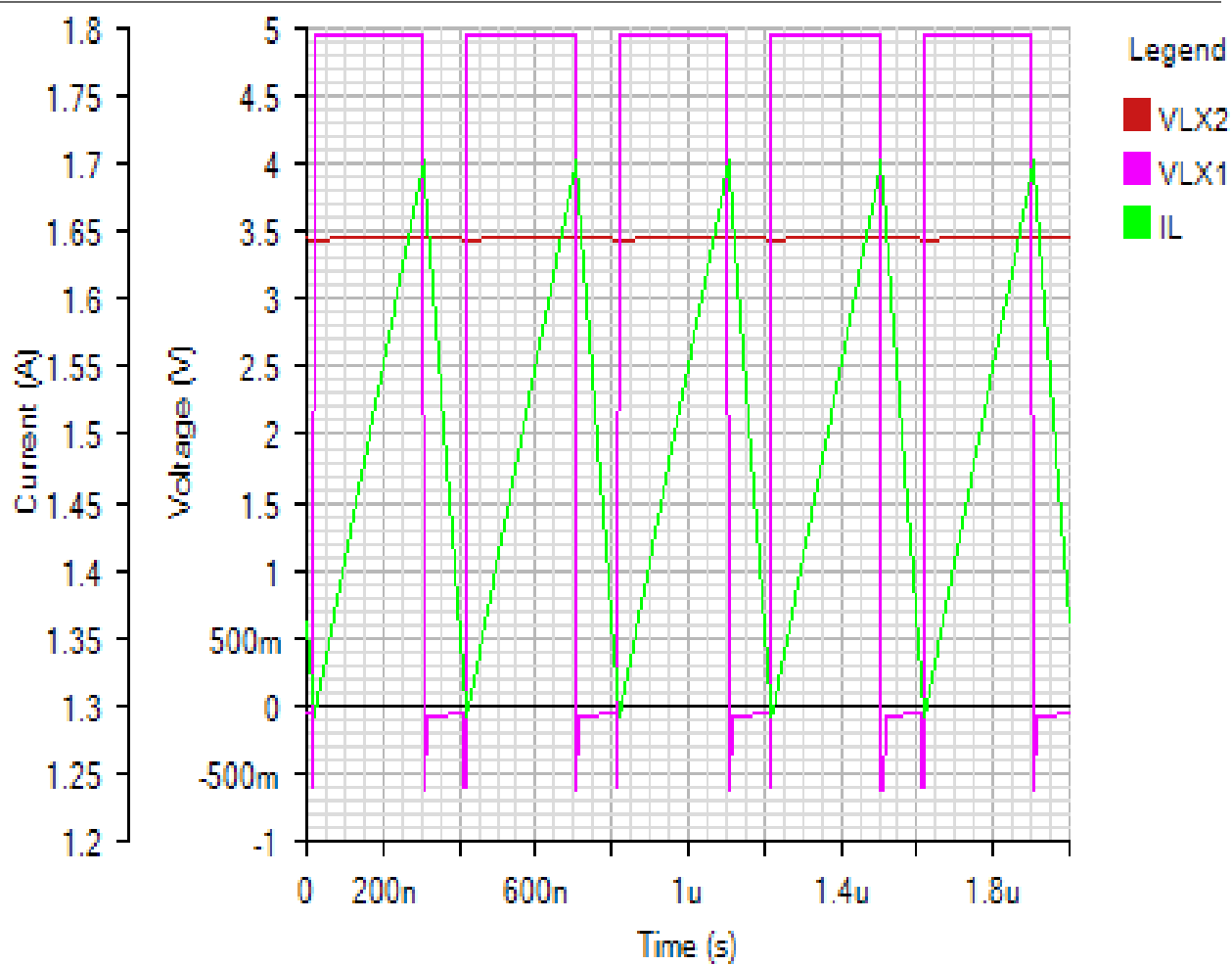
INPUT

Default



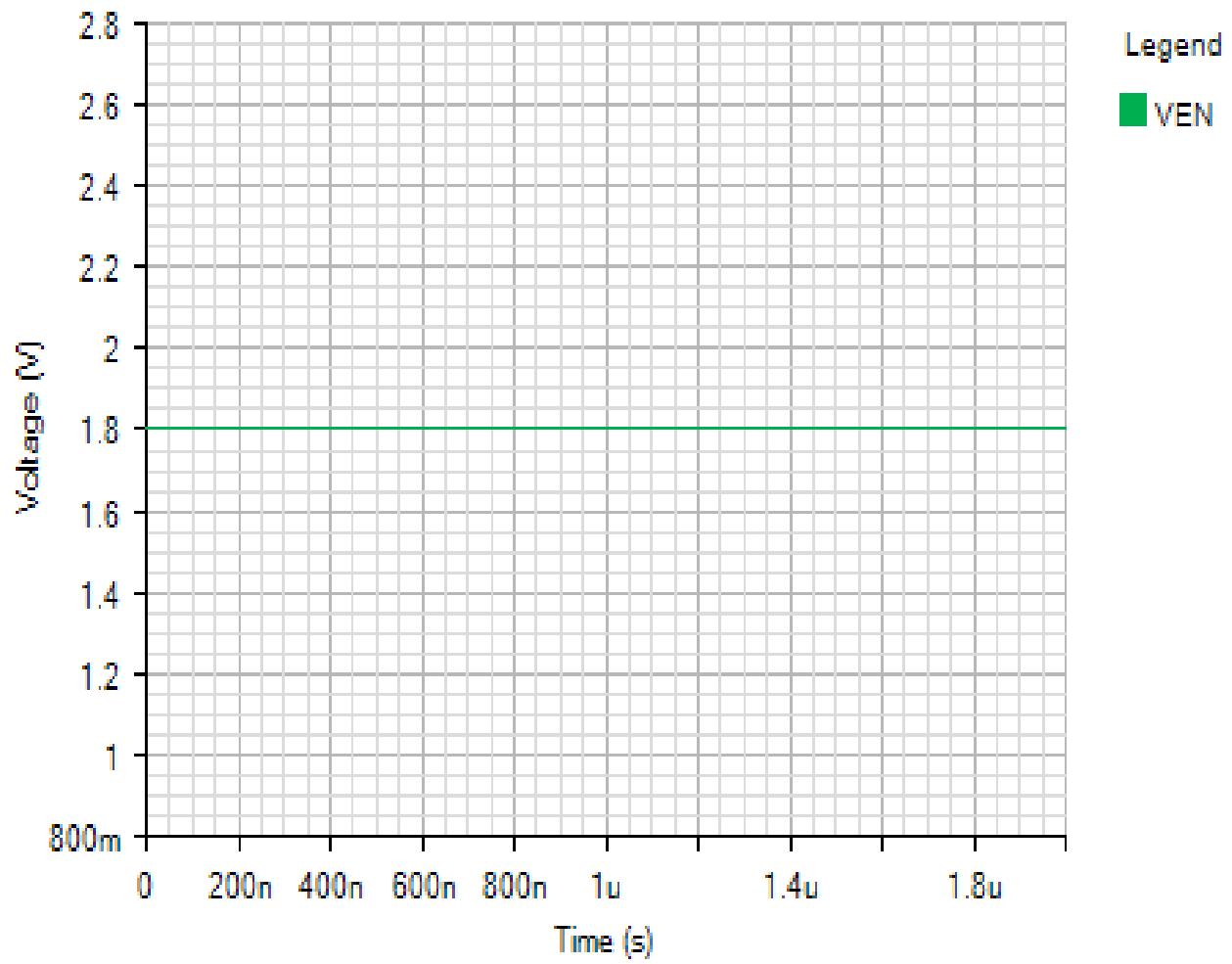
SWITCHING

Default



IC

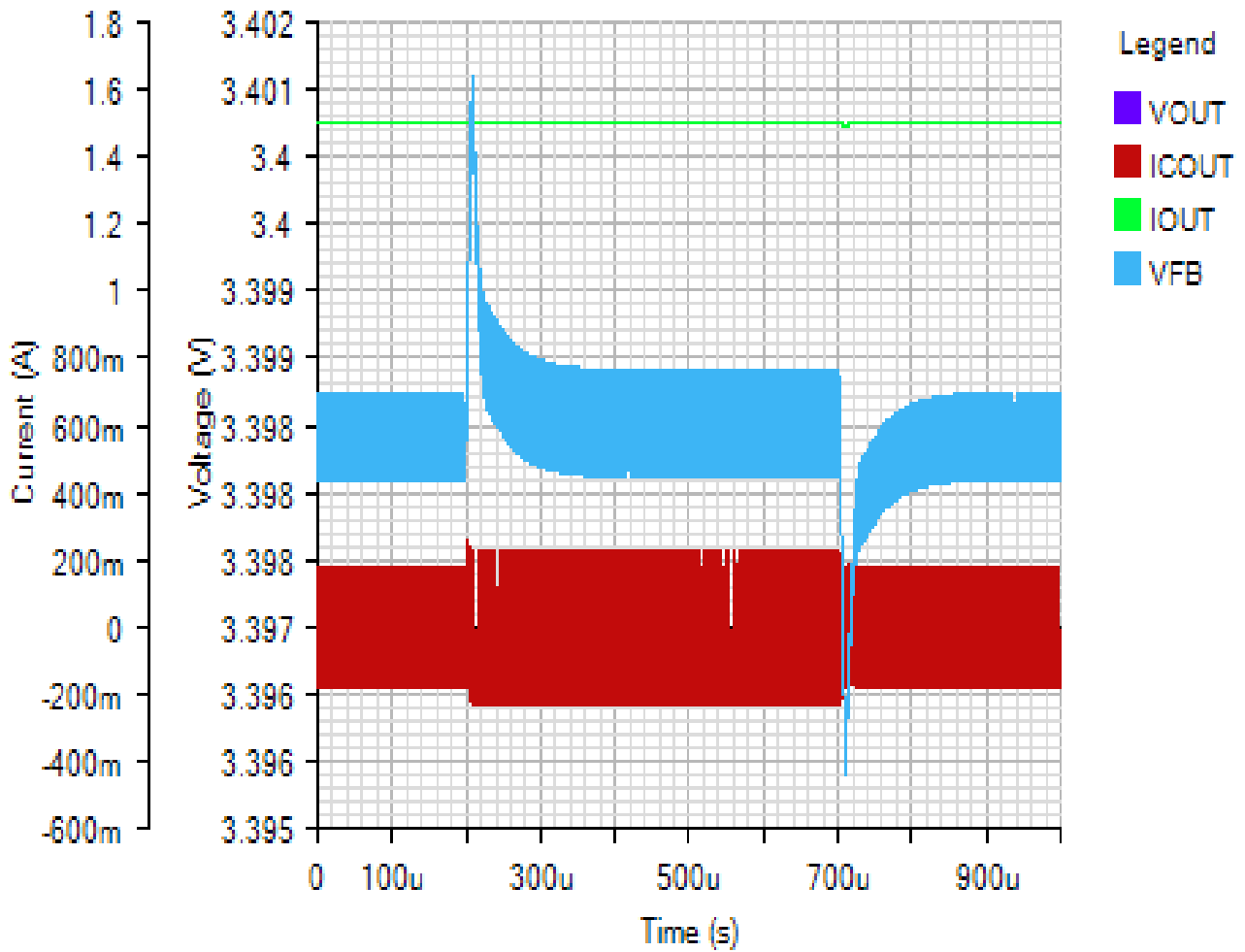
Default



Line Transient - Fri Jan 04 2019 11:36:00

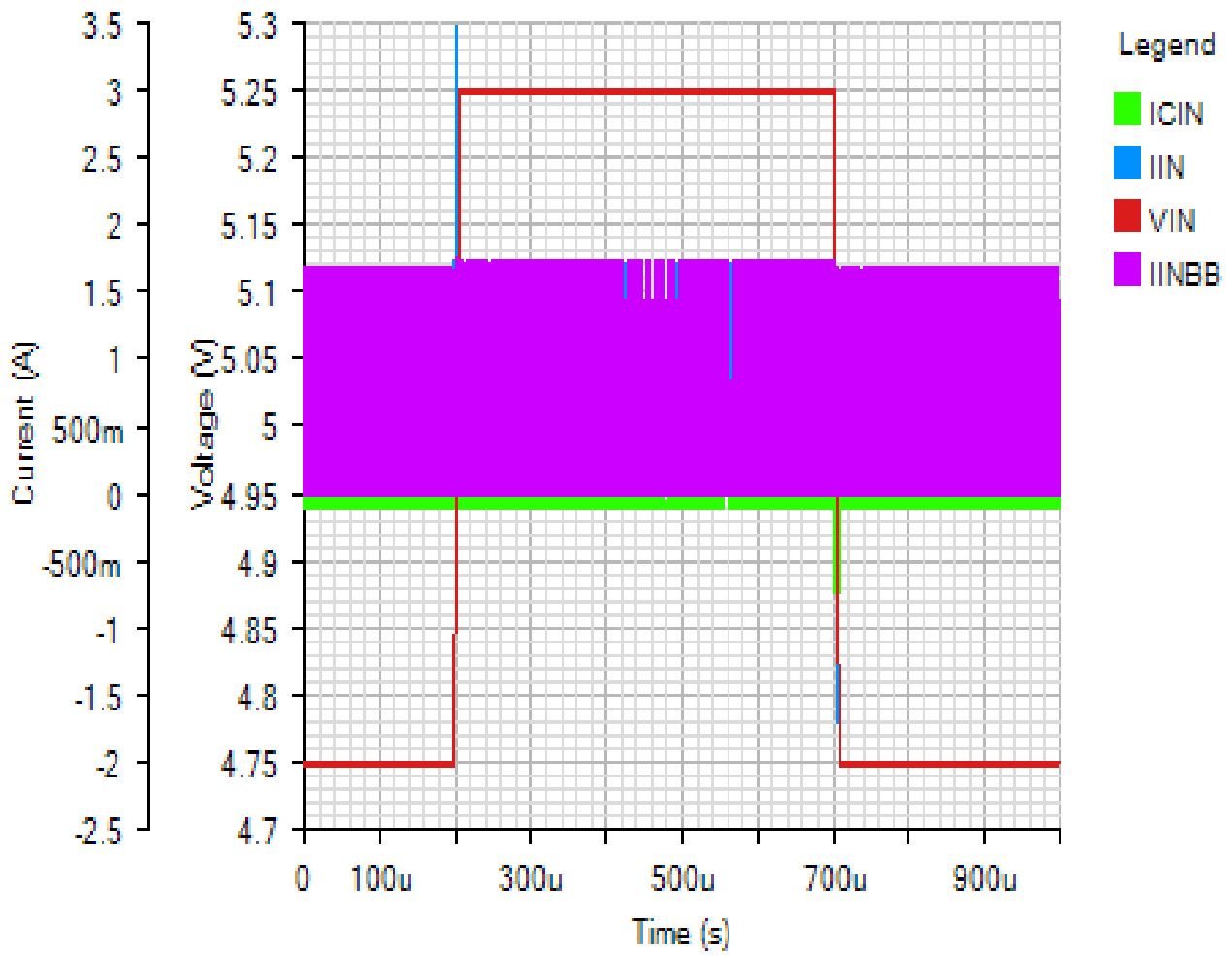
OUTPUT

Default



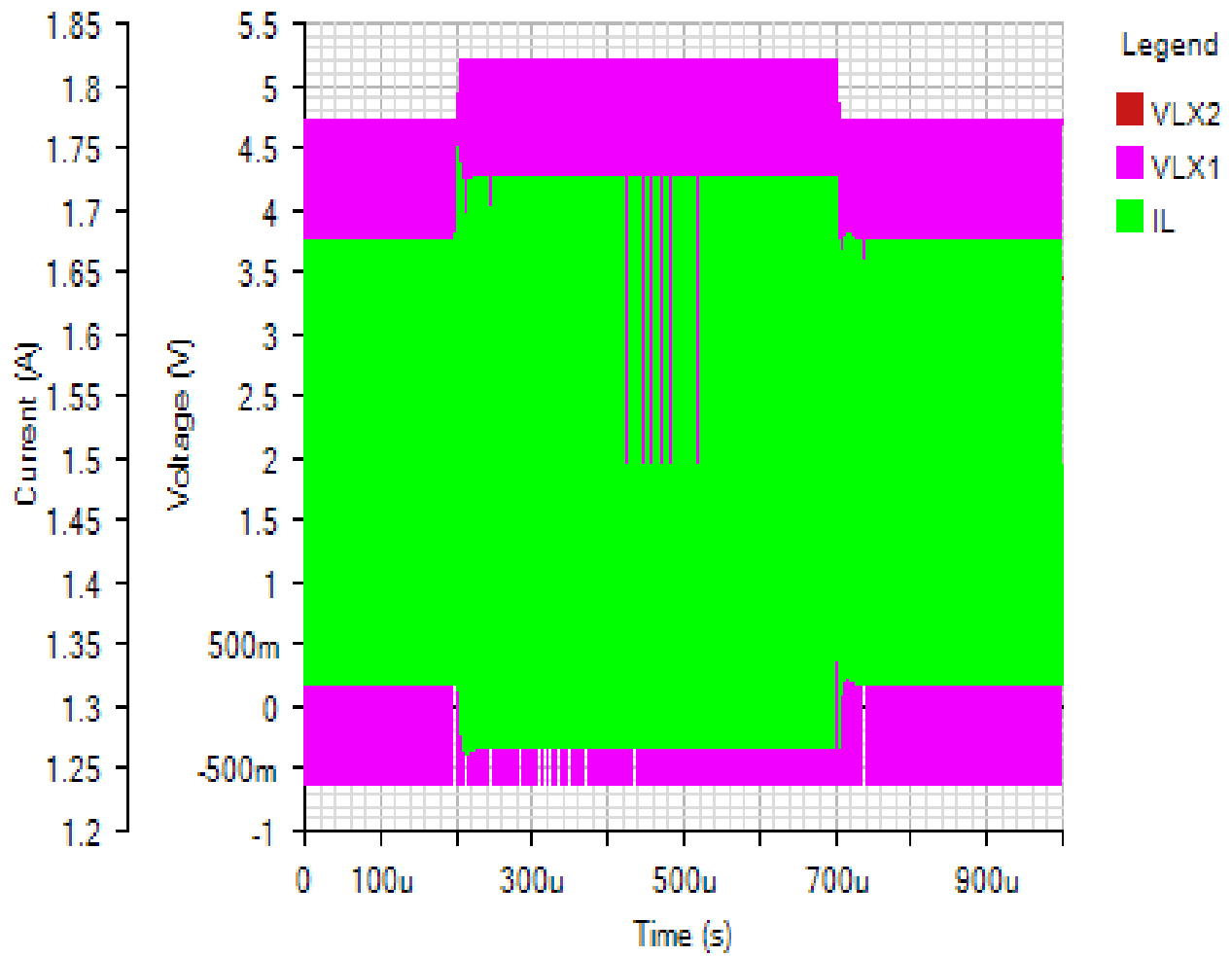
INPUT

Default



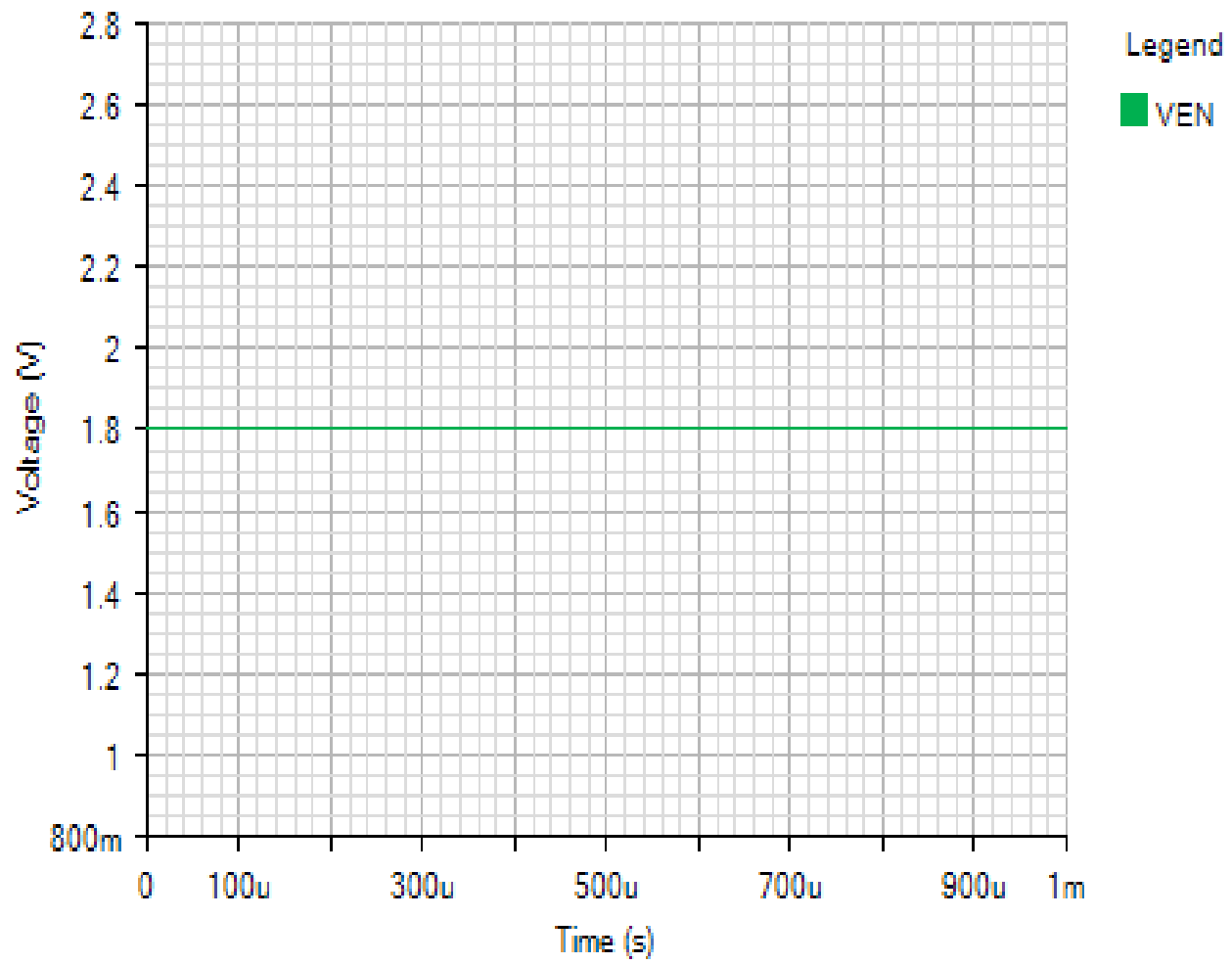
SWITCHING

Default



IC

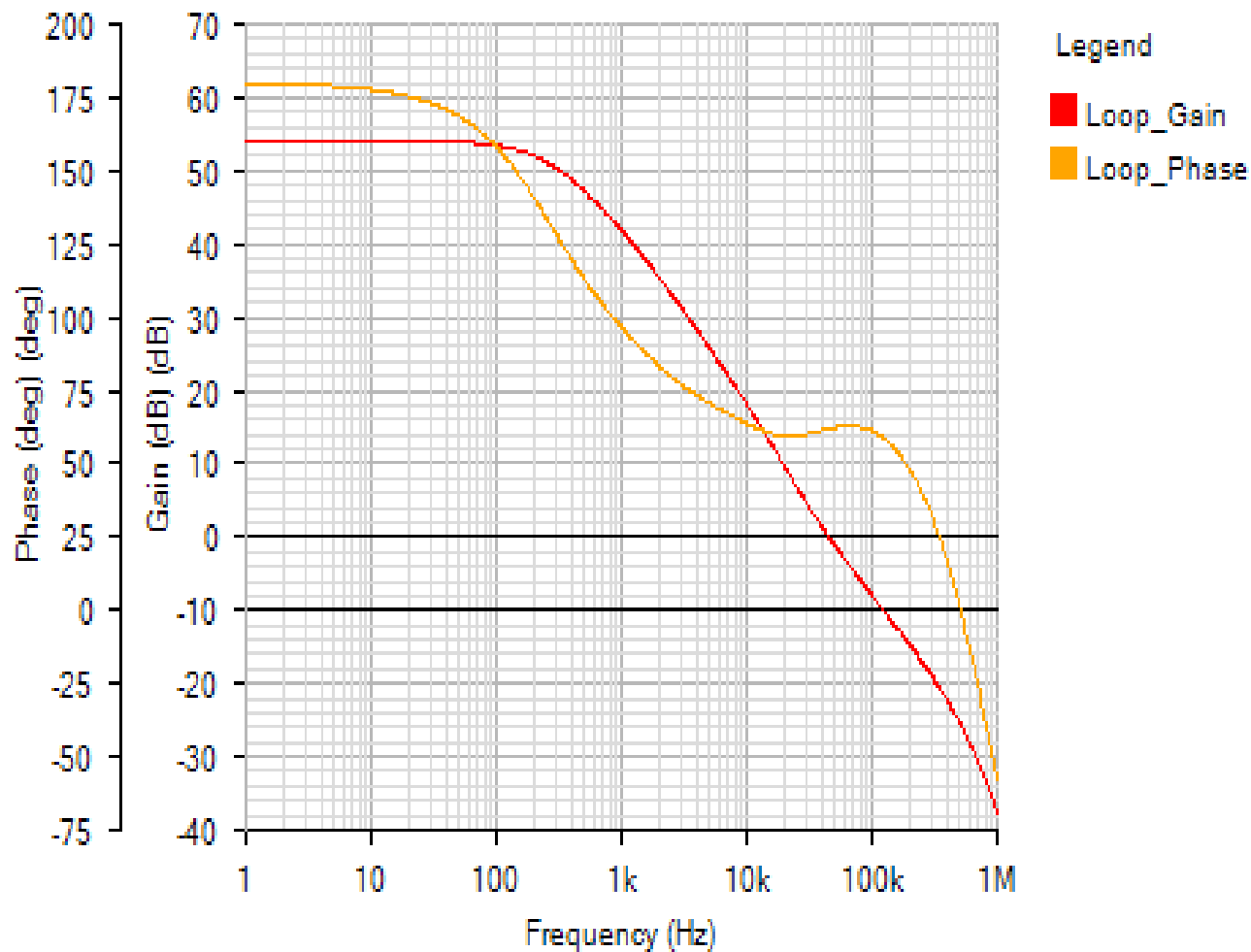
Default



AC Loop - Fri Jan 04 2019 11:36:00

BODE

Default



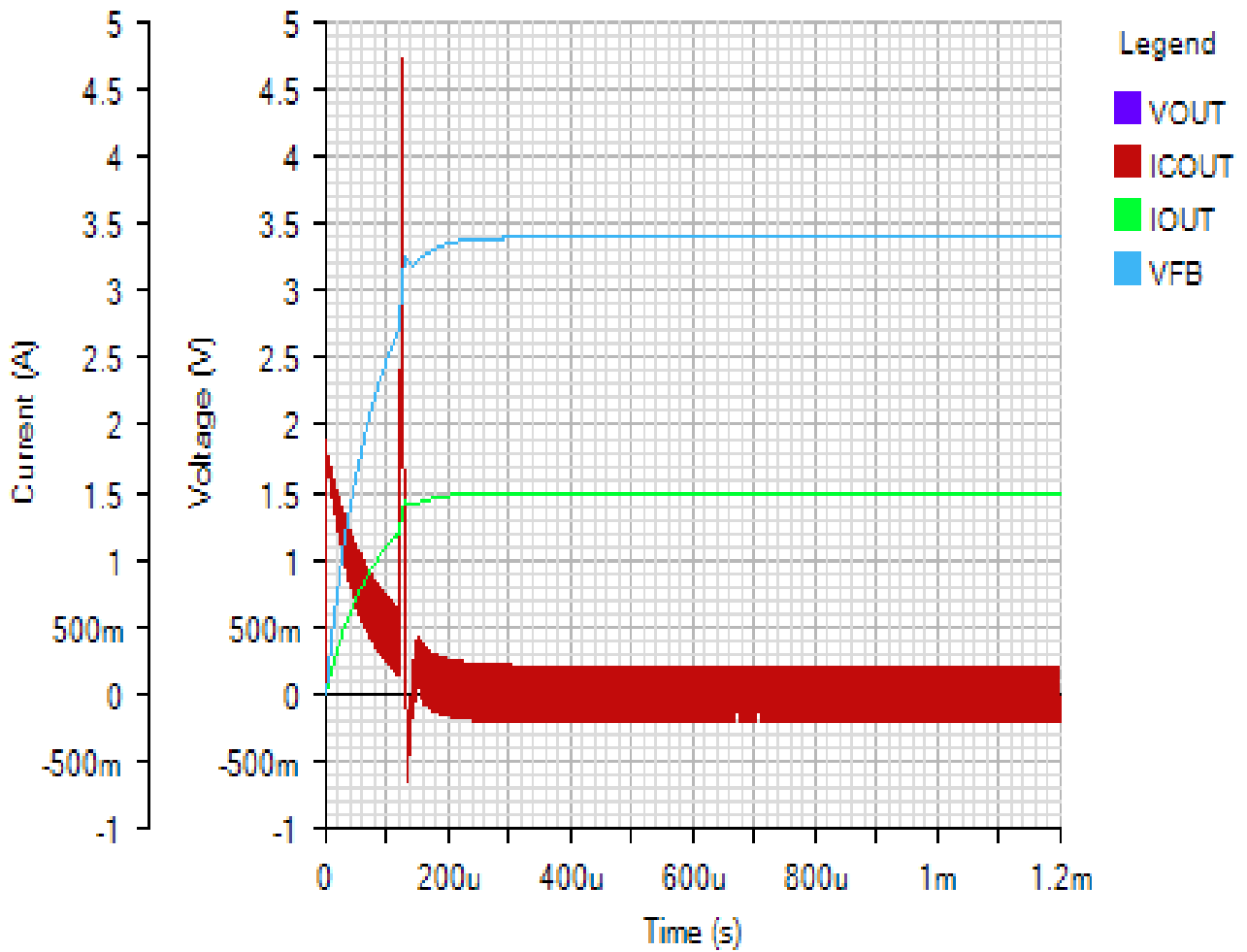
Phase Margin: 62.01° at a crossover frequency of 45.4kHz

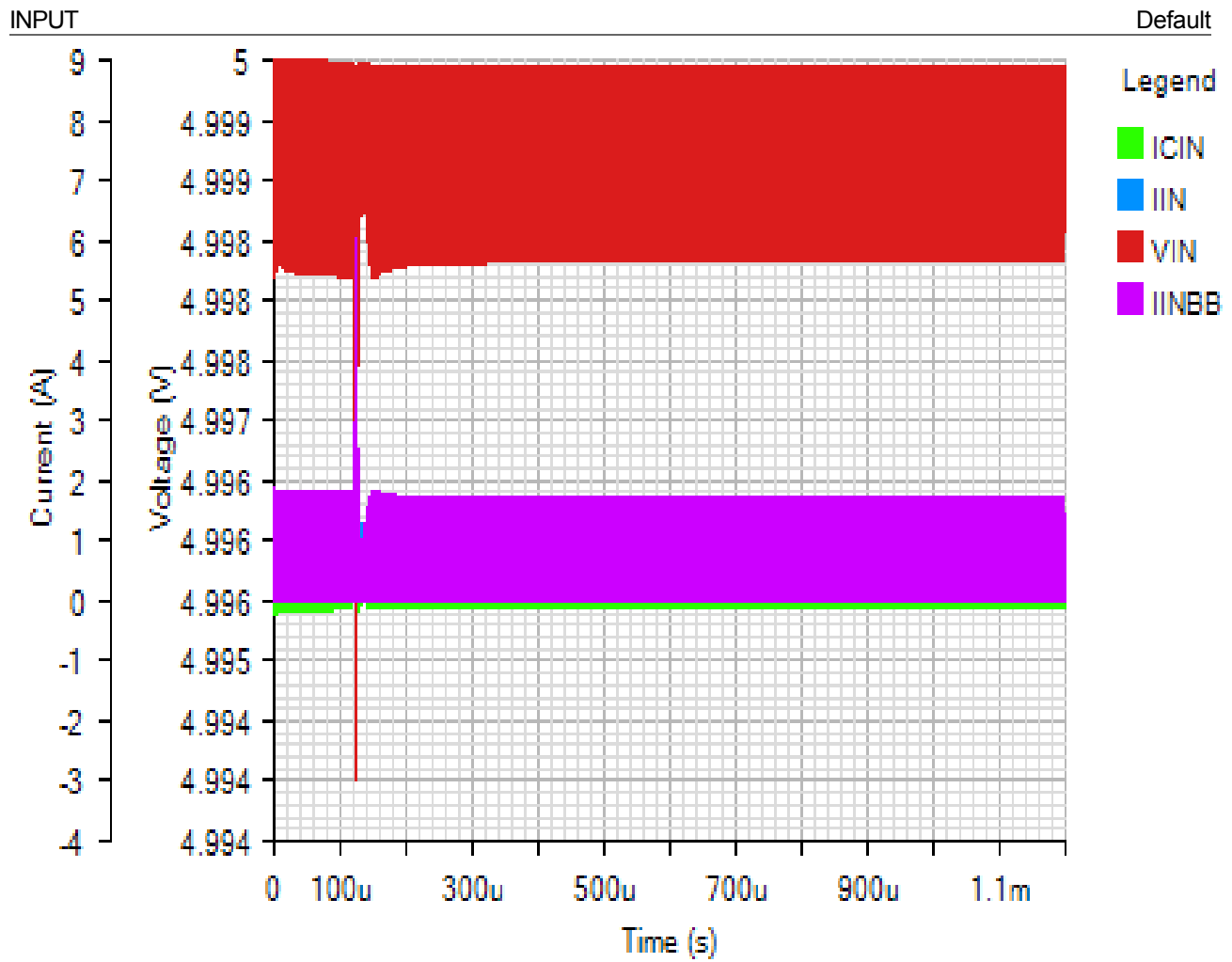


Start Up - Fri Jan 04 2019 11:36:00

OUTPUT

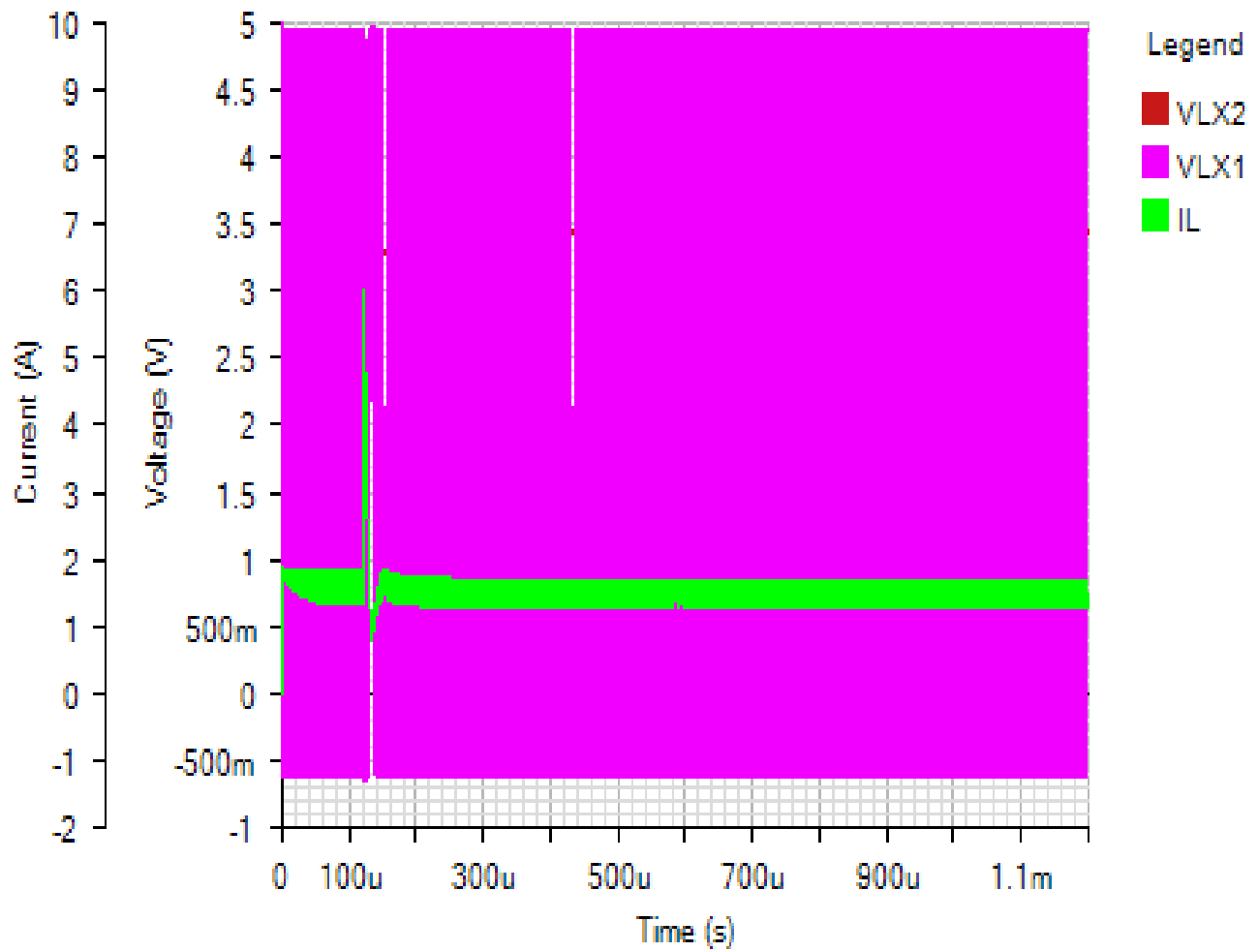
Default





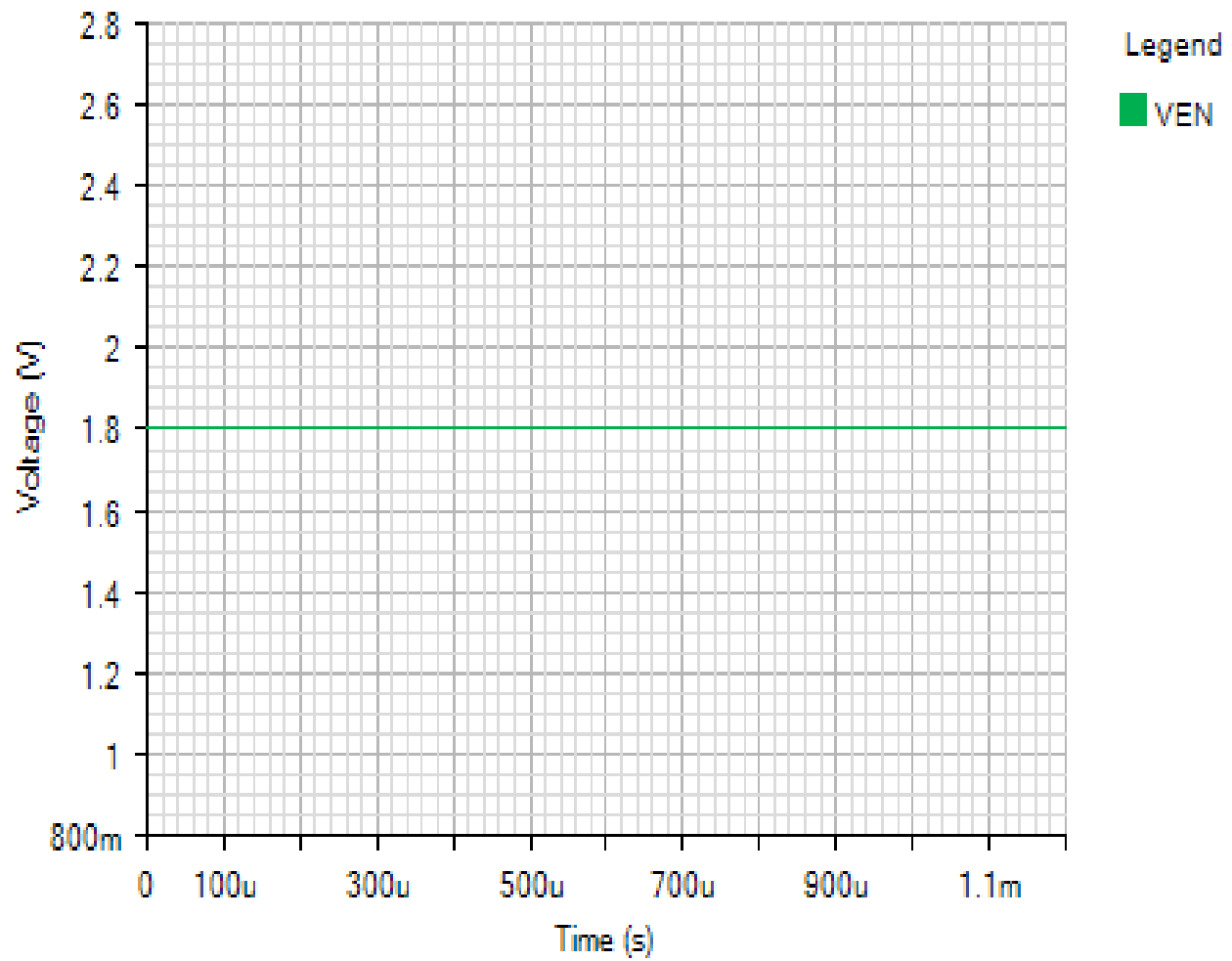
SWITCHING

Default



IC

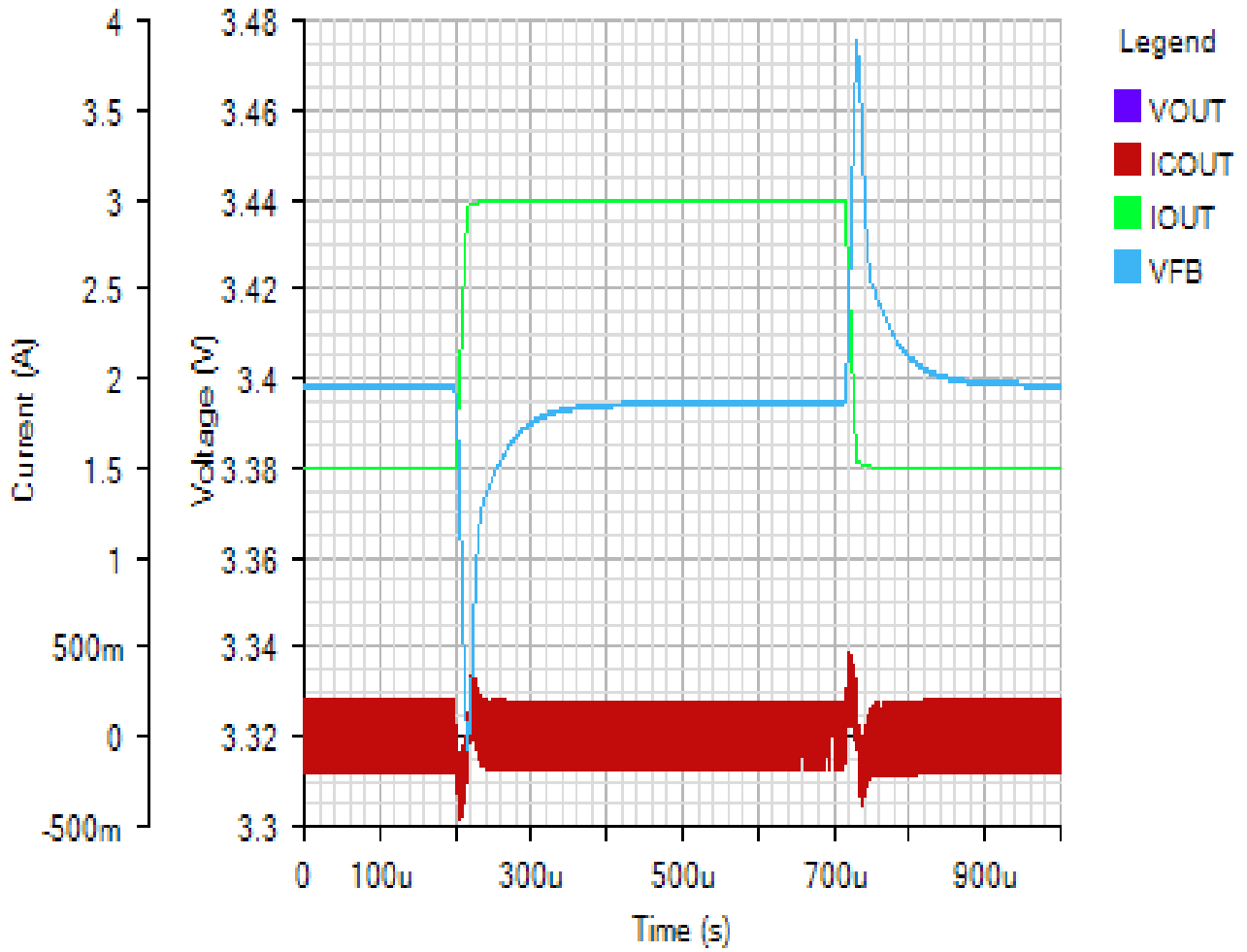
Default



Load Step - Fri Jan 04 2019 11:36:00

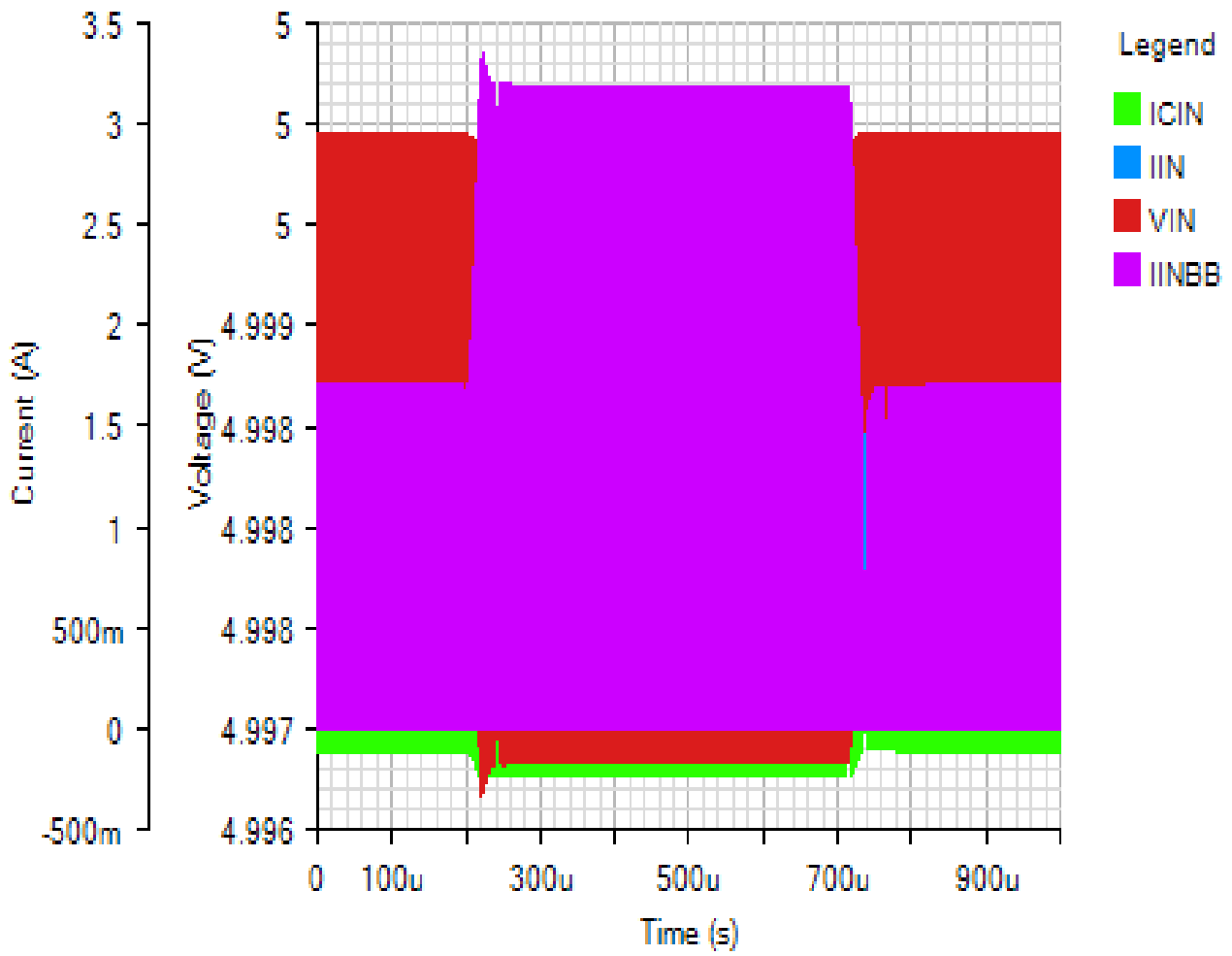
OUTPUT

Default



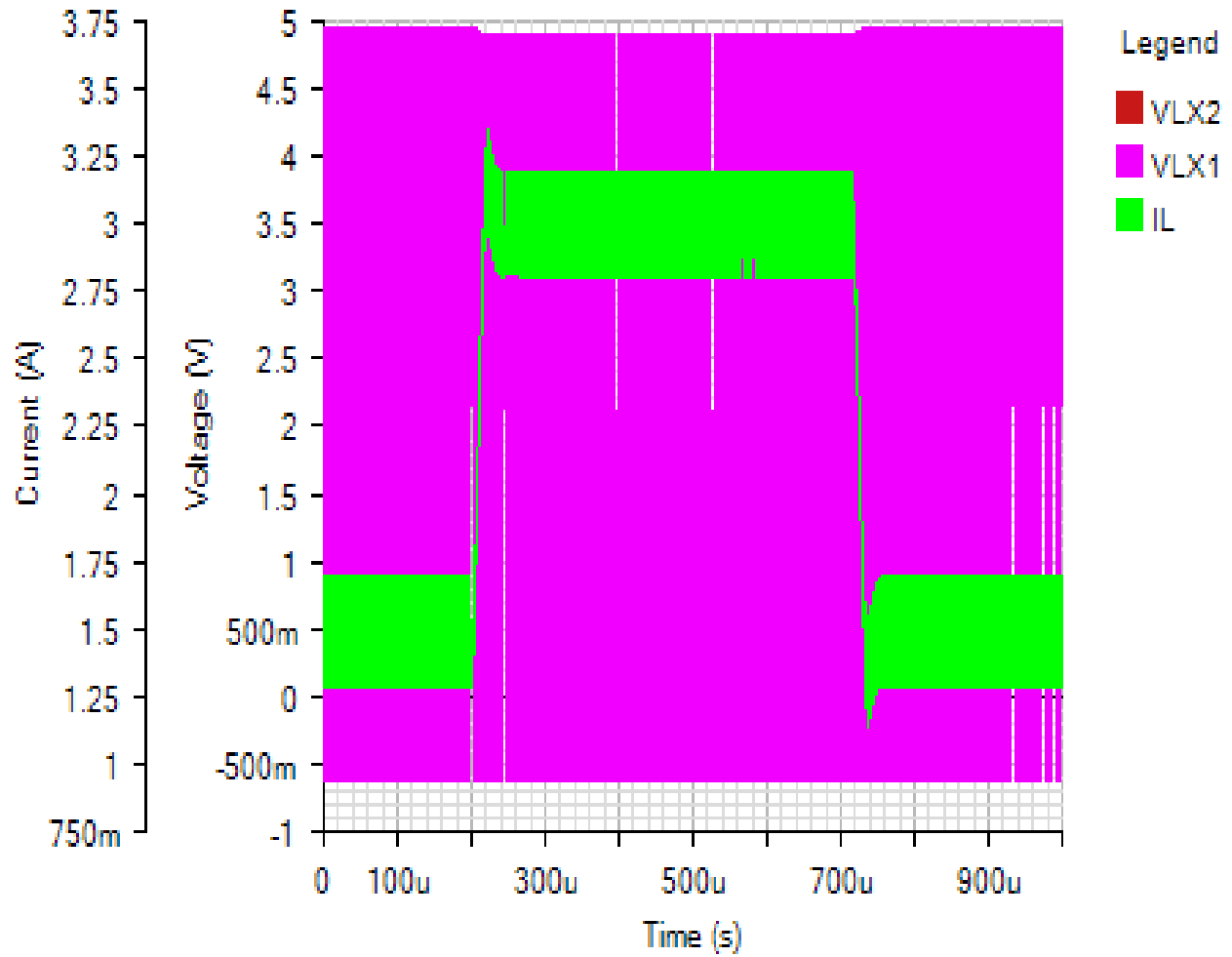
INPUT

Default



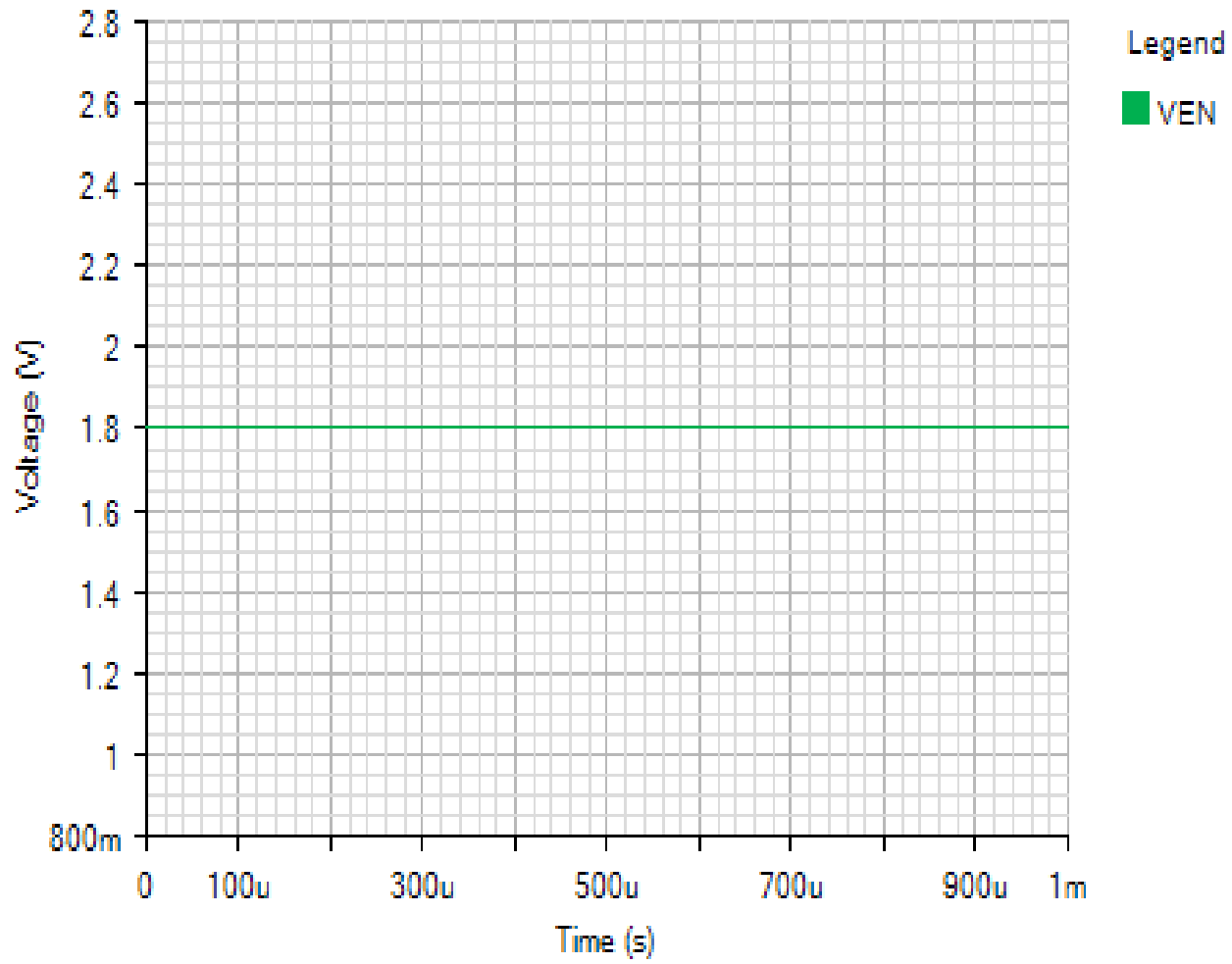
SWITCHING

Default

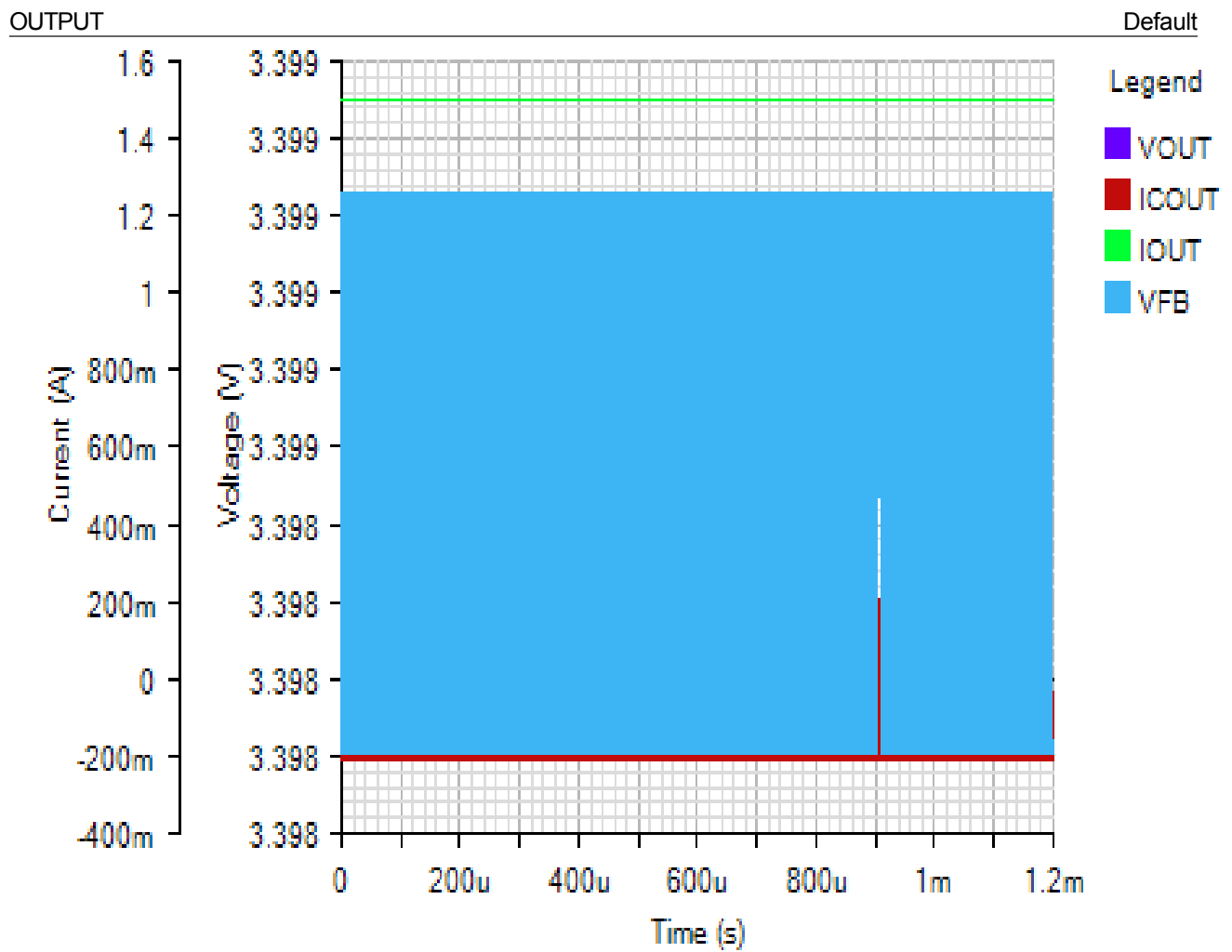


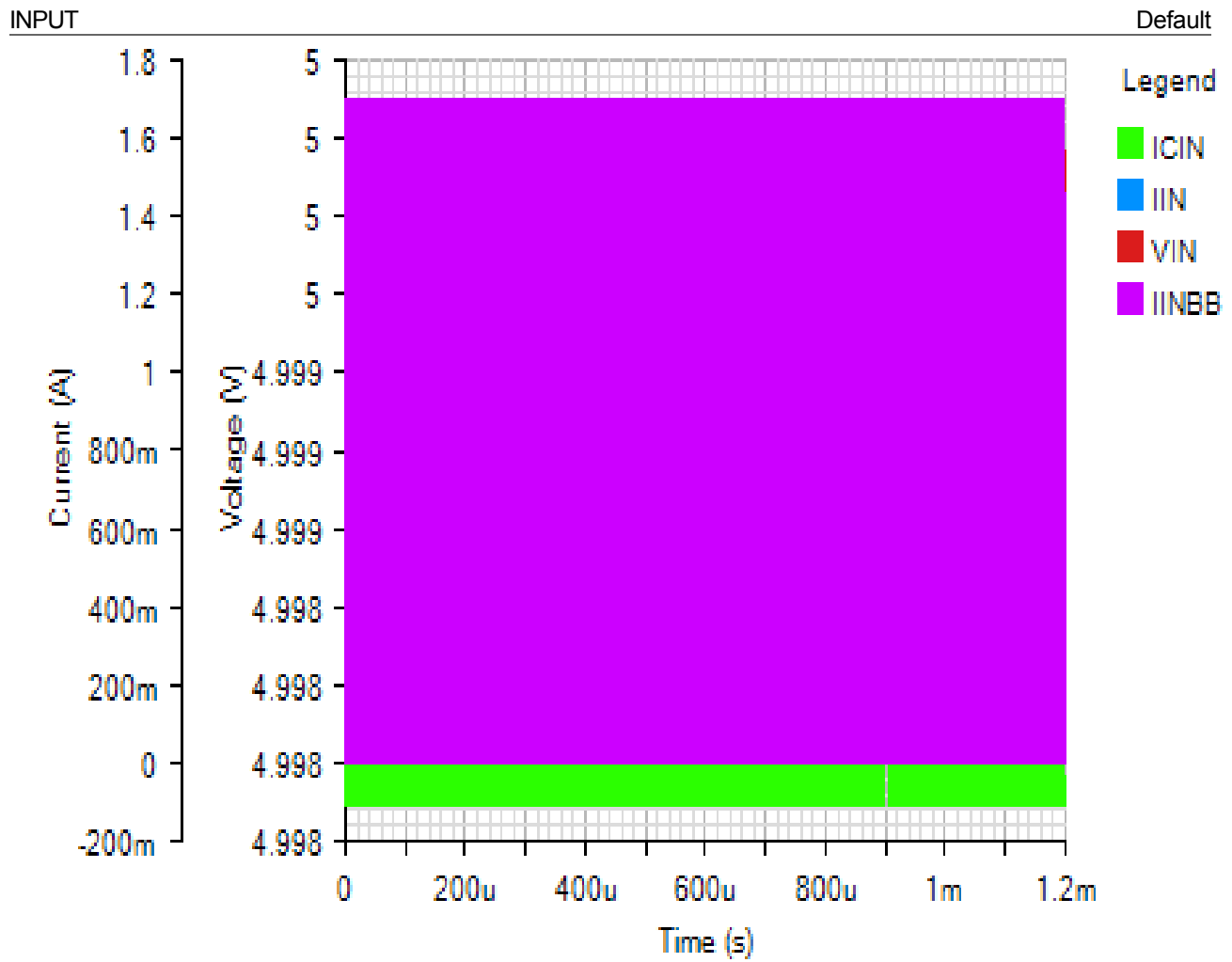
IC

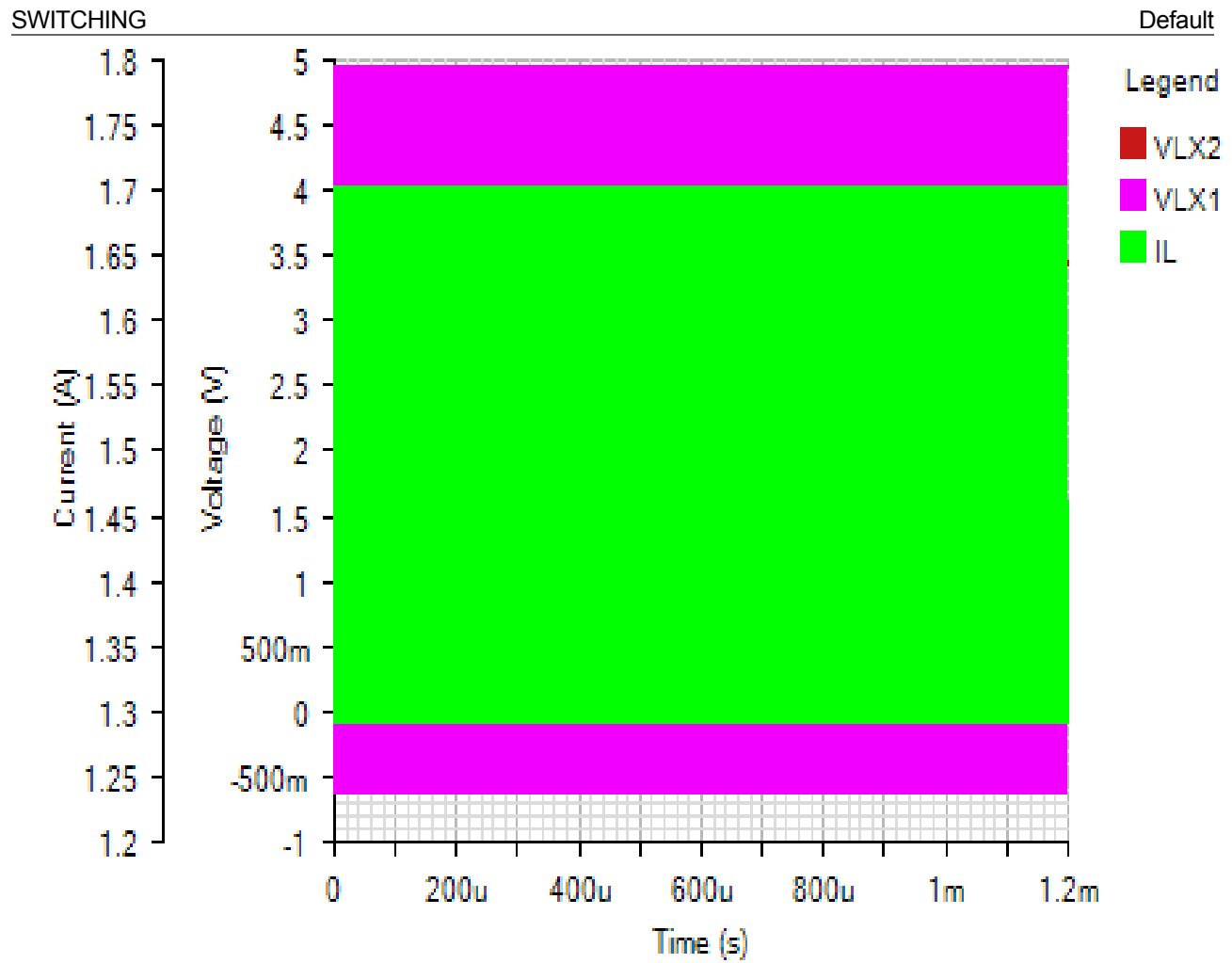
Default



Dynamic Voltage Change (MAX77816C Only) - Fri Jan 04 2019 11:36:00







IC

Default

