

LT8648S Supply Design Summary Report

Vin : 9V (min.), 12V (nom.), 15V (max.)

Output Rails : Vout1 = 4.98V / 6A (max.)

Project Name : SURFv6

Project Date : 1/31/22

Designer : PSA



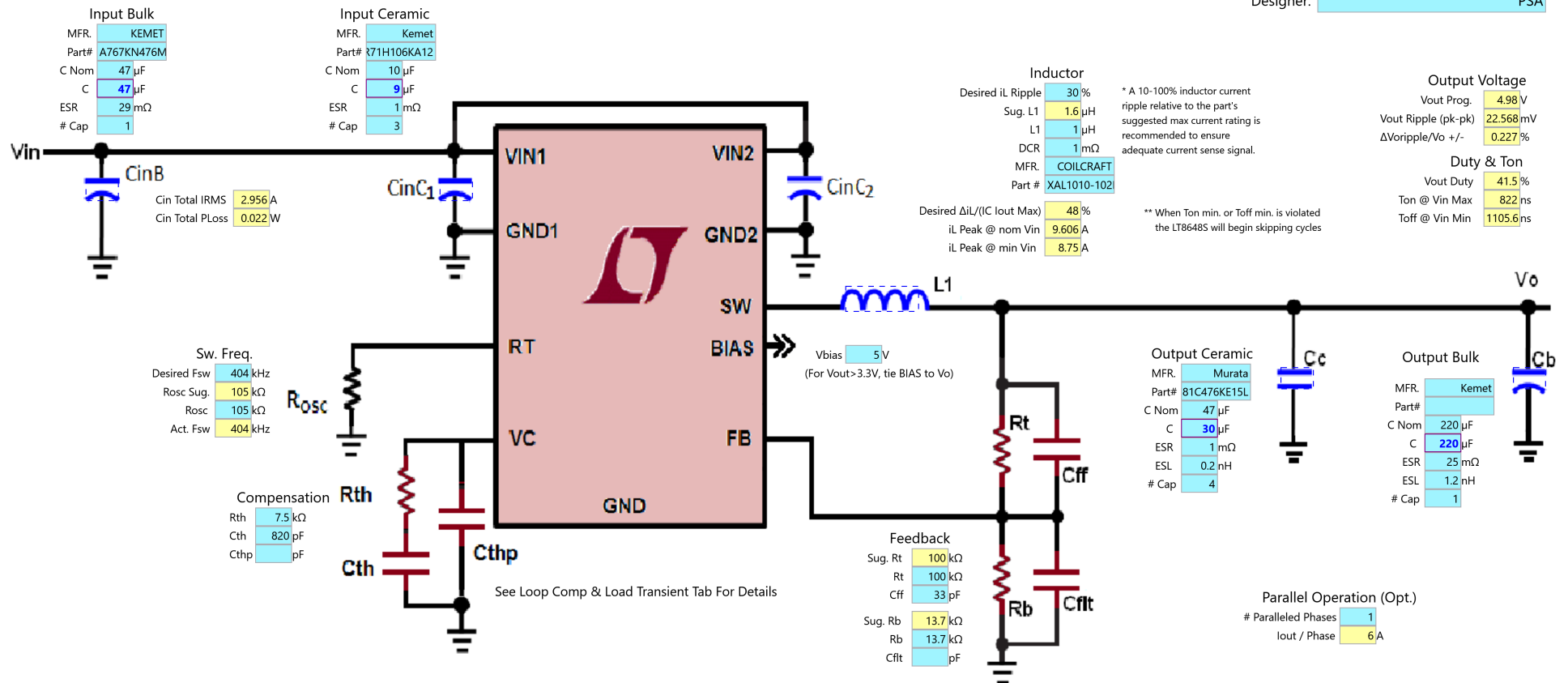
LT8648S Solution - Simplified Schematic

V_{in} : 9V (min.), 12V (nom.), 15V (max.)

Output Rails : V_{out1} = 4.98V / 6A (max.)

LT8648S - 42V, 15A Synchronous Step-down Silent Switcher 2

Project Name: SURFv6
Date: 1/31/22
Designer: PSA

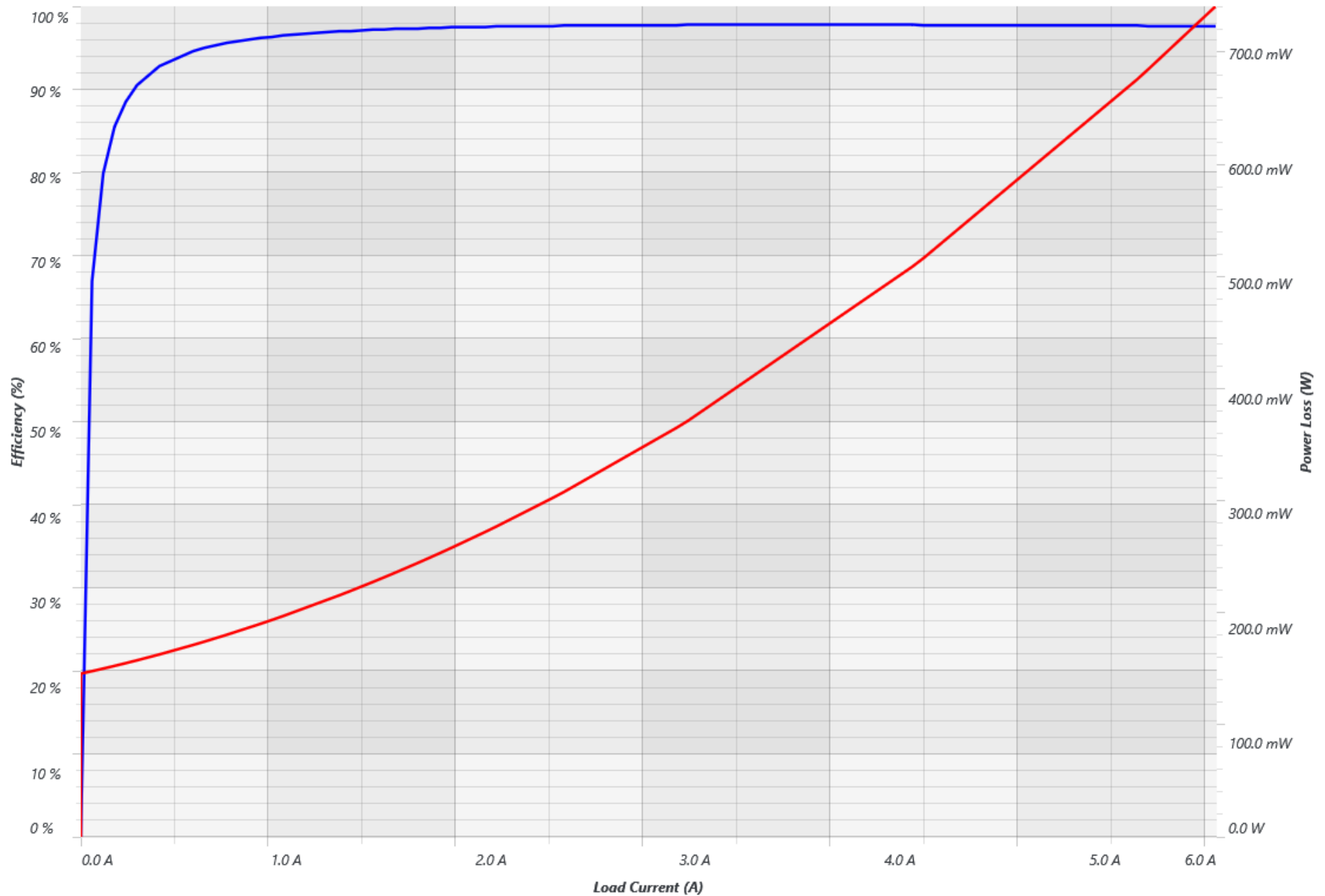


LT8648S Solution - Efficiency & Loss Estimations

Rail # 1 : $V_{in} = 12V$, $V_{out1} = 4.98V$

* Estimations For CCM Mode Only. Inductor AC Losses Entered by User

Rail #1 (4.98V) Efficiency & Power Loss

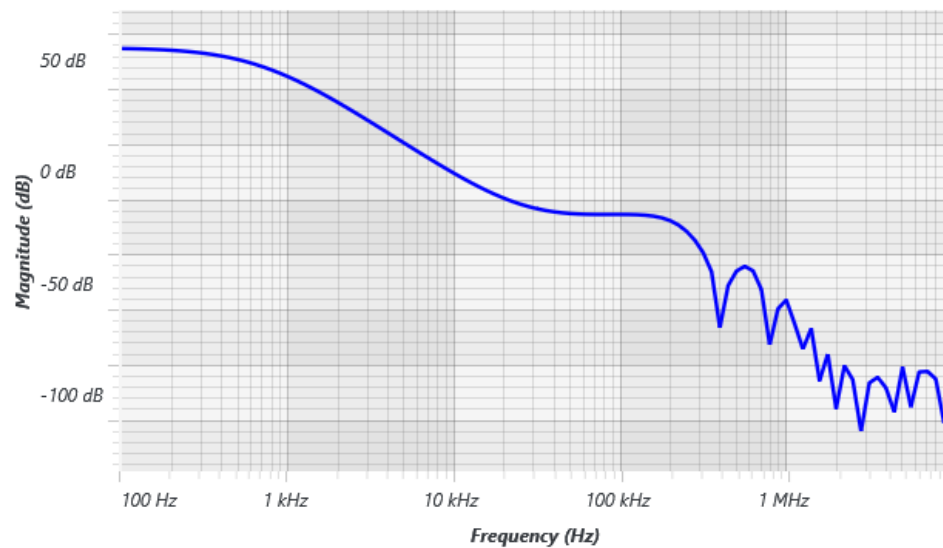


LT8648S Solution - Loop Gain & Load Transient Estimations

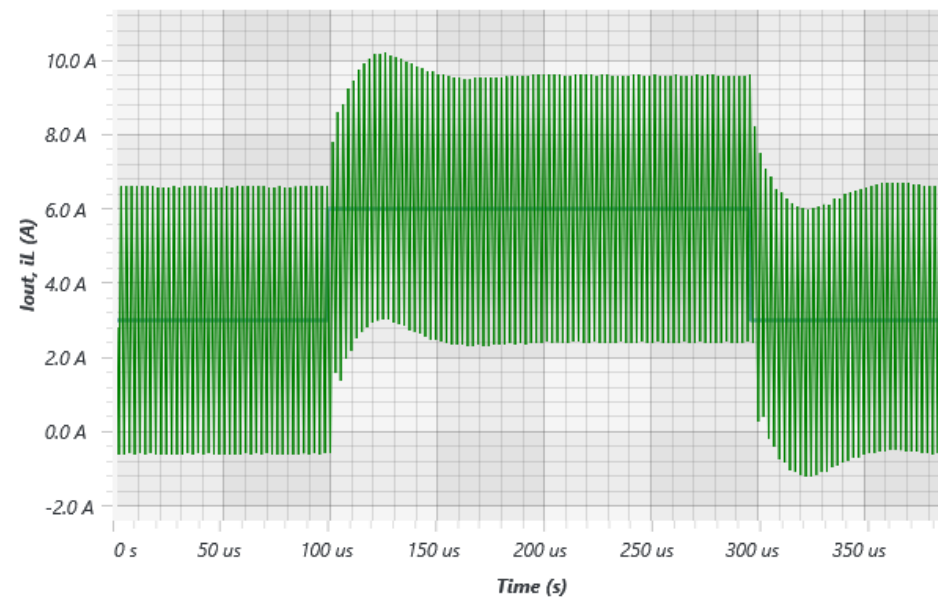
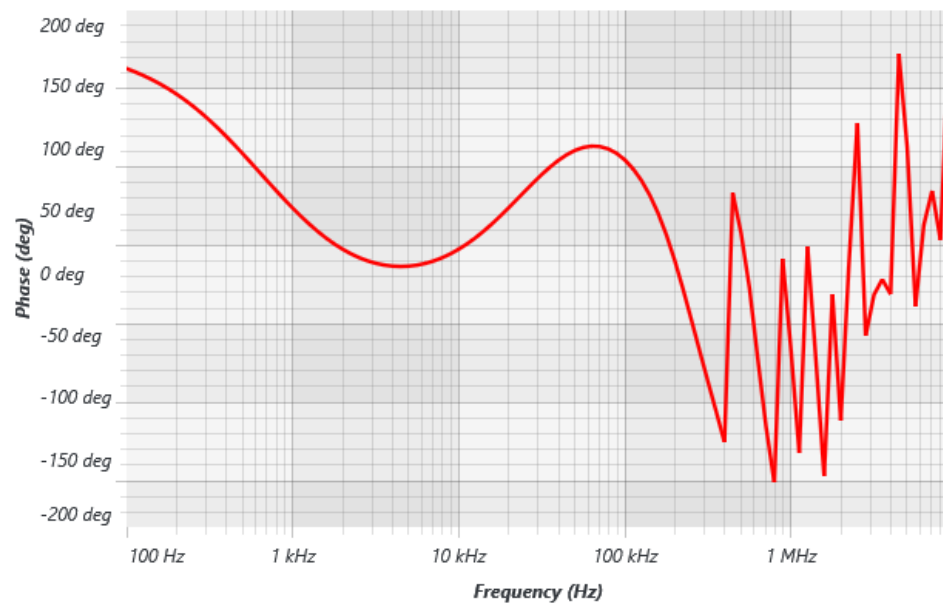
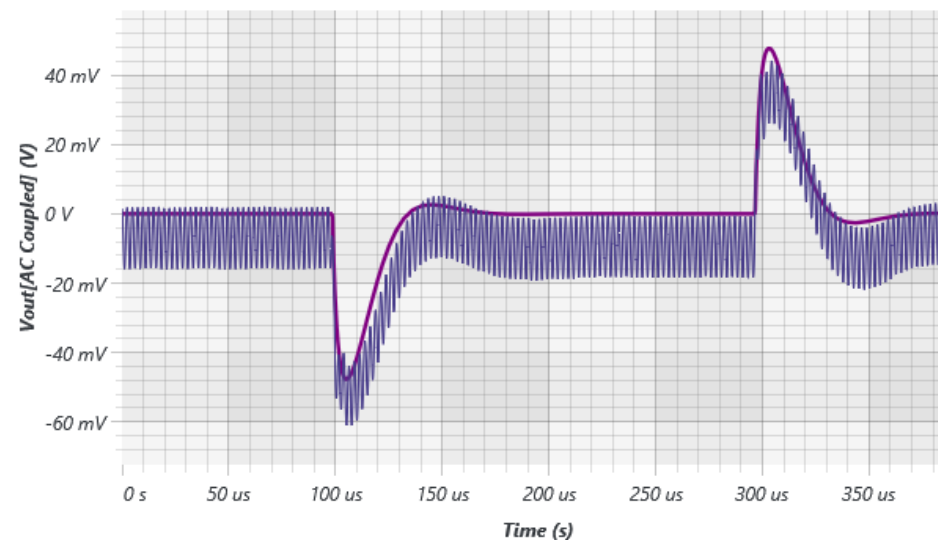
Rail # 1 : $V_{in} = 12V$, $V_{out1} = 4.98V$, $I_{out1} = 6A$

** Estimations For CCM Mode Only. Estimations Based On Small Signal Avg. Model*

Rail #1 (4.98V) Loop Gain



Rail #1 (4.98V) Load Transient



LT8648S Solution - Summary

LT8648S Supply Design Summary

Project Info: SURFv6, 1/31/22, PSA



Design Specifications

Steady State :

Rail #	Vin Min.	Vin Nom.	Vin Max.	Fsw	Vo	ΔVo	ΔVo%	Io Max	ΔILp-p	ΔIL%	iLpk	Duty	Ton min.	Toff min.
1	9 V	12 V	15 V	404 kHz	4.98 V	22.57 mV	0.2 %	6 A	7.21 A	48 %	9.61 A	41.5 %	822 ns	1106 ns

Efficiency and Loop :

Rail #	Vo	Iomax	Eff.@Iomax	PLoss@Iomax	Loop BW	Loop PM	Step Low	Step High	Step Slew	ΔVo@Step	ΔVo@Step %
1	4.98 V	6 A	97.61 %	0.731 W	22.39 kHz	79.31 deg	3 A	6 A	100 A/μs	60.990848521	+/-1.2 %

Recommendations and Warnings :

Message	
Rail #1 Capacitance value is not de-rated. Inadequate information provided to estimate de-rated value. Please check the capacitor's entries in library.	
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Power Components

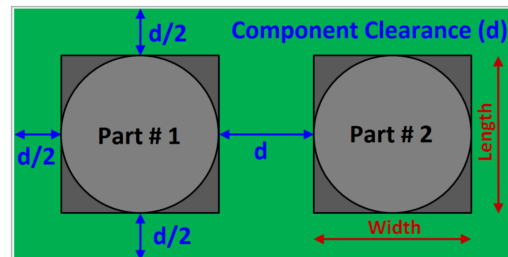
Power Components Bill Of Materials :

Export BOM

Ref. Des.	Value	Quantity	Description	Mfr. Name	Mfr. Part #	Pkg. (Imperial)	L(mm)	W(mm)	H(mm)	User Note
U1		1	IC	LINEAR TECH	LT8648S		7	4	0.94	
Lo1	1μH	1	IND	COILCRAFT	XAL1010-102MEB		11.3	10	10	
Cinb1	47μF	1	CAP	KEMET	A767KN476M1HLAE029	▼	0	0	0	
Cinc1 Cinc2 Cinc3	10μF	3	CAP	Kemet	GRM32ER71H106KA12	▼	0	0	0	
Cob1	220μF	1	CAP	Kemet		▼	0	0	0	
Coc1 Coc2 Coc3 Coc4	47μF	4	CAP	Murata	GRM32EC81C476KE15L	▼	0	0	0	

Power Components Footprint :

# Components	11	
Max. Height	10	mm
Component Clearance (d)	1.5	mm
* Power Components Area (Excludes ICs)	147.2	mm ²
	0.228	in ²
* Power Components Area (Includes ICs)	194	mm ²
	0.301	in ²



* Notes :

1. The calculated power component area is only the simple sum of component footprint areas with given clearance, assuming all power components are on the same side of PCB. It is NOT the final PCB size with layout design.
2. Component count should change with the number of paralleled phases.