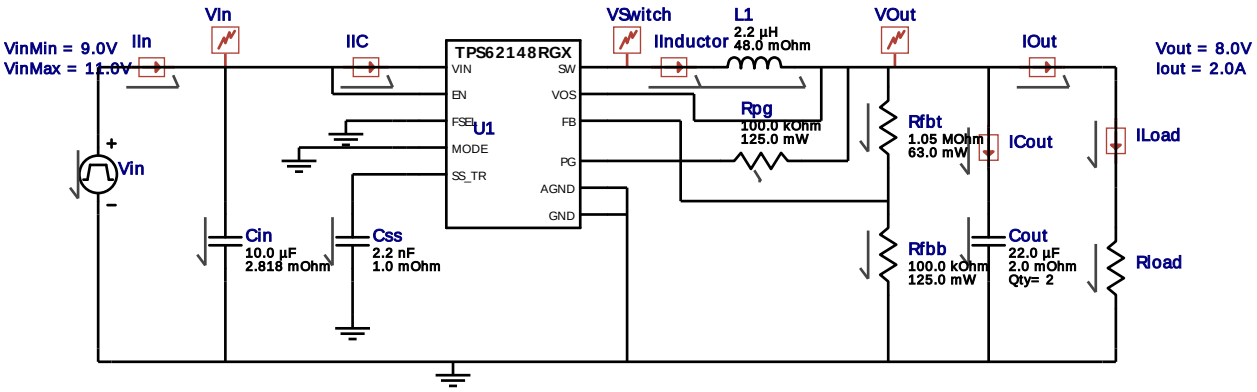
WEBENCH® Electrical Simulation Report

VinMin = 9.0V
VinMax = 11.0V
Vout = 8.0V
Iout = 2.0A

Device = TPS62148RGXR
Topology = Buck
Created = 2018-05-03 03:21:24.767
User ID = 5316501
Design Id = 15
eSim Id = 3
Simulation Type = Input Transient



My Comments

Input Transient Simulation

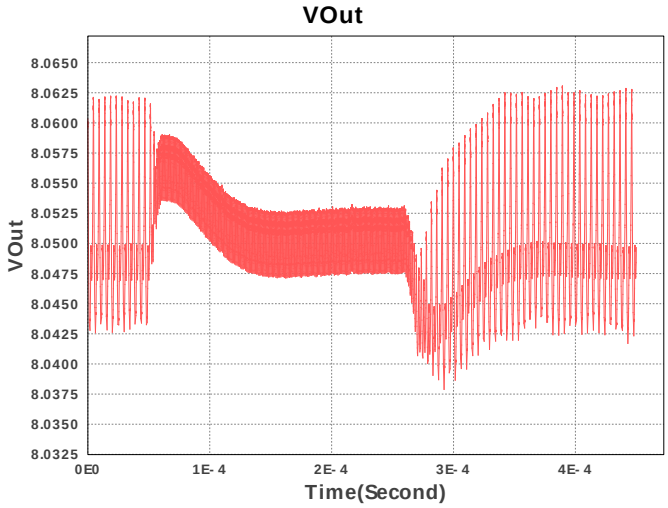
Electrical BOM

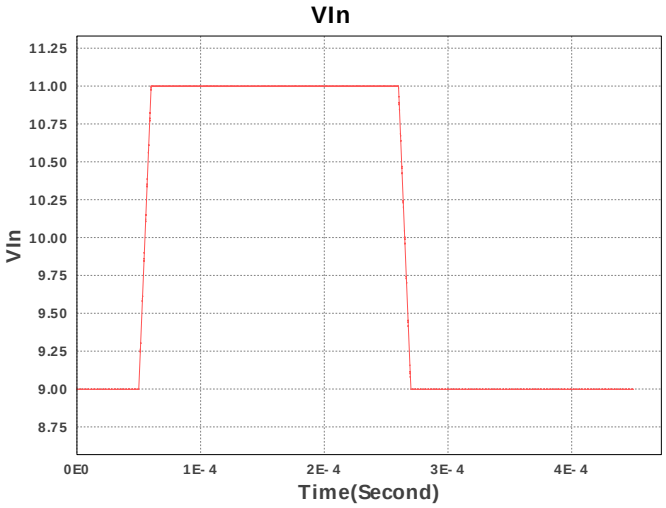
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cin	TDK	C2012X6S1C106K085AC Series= X6S	Cap= 10.0 µF ESR= 2.818 mOhm VDC= 16.0 V IRMS= 3.887 A	1	$0.07	0805 7 mm²
2.	Cout	MuRata	GRM32ER61C226KE20L Series= X5R	Cap= 22.0 µF ESR= 2.0 mOhm VDC= 16.0 V IRMS= 3.68 A	2	$0.15	1210 15 mm²
3.	Css	MuRata	GRM033R61A222KA01D Series= X5R	Cap= 2.2 nF ESR= 1.0 mOhm VDC= 10.0 V IRMS= 0.0 A	1	$0.01	0201 2 mm²
4.	L1	Pulse Engineering	PA4332.222NLT	L= 2.2 µH DCR= 48.0 mOhm	1	$0.21	PA4332 27 mm²
5.	Rfbb	Panasonic	ERJ-6ENF1003V Series= ERJ-6E	Res= 100.0 kOhm Power= 125.0 mW Tolerance= 1.0%	1	$0.01	0805 7 mm²
6.	Rfbt	Vishay-Dale	CRCW04021M05FKED Series= CRCW..e3	Res= 1.05 MOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm²
7.	Rpg	Panasonic	ERJ-6ENF1003V Series= ERJ-6E	Res= 100.0 kOhm Power= 125.0 mW Tolerance= 1.0%	1	$0.01	0805 7 mm²
8.	U1	Texas Instruments	TPS62148RGXR	Switcher	1	$0.81	RGX0011A 12 mm²

Simulation Parameters

#	Name	Parameter Name	Description	Values
1.	Cout	IC	Initial Voltage	8.0 V
2.	Css	IC	Initial Voltage	0.7 V

#	Name	Parameter Name	Description	Values
3.	Rload	R	Load Resistance	4.0 Ohm





Design Inputs

#	Name	Value	Description
1.	Iout	2.0 A	Maximum Output Current
2.	VinMax	11.0 V	Maximum input voltage
3.	VinMin	9.0 V	Minimum input voltage
4.	Vout	8.0 V	Output Voltage
5.	base_pn	TPS62148	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	30.0 degC	Ambient temperature

Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	900.404 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	266.778 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	2.462 A	Current	Peak switch current in IC
4.	Iin Avg	1.539 A	Current	Average input current
5.	L Ipp	924.14 mA	Current	Peak-to-peak inductor ripple current
6.	BOM Count	9	General	Total Design BOM count
7.	FootPrint	94.0 mm^2	General	Total Foot Print Area of BOM components
8.	Frequency	1.005 MHz	General	Switching frequency
9.	Mode	CCM	General	Conduction Mode
10.	Pout	16.0 W	General	Total output power
11.	Total BOM	$1.43	General	Total BOM Cost
12.	Duty Cycle	74.616 %	Op Point	Duty cycle
13.	Efficiency	94.486 %	Op Point	Steady state efficiency
14.	IC Tj	58.259 degC	Op Point	IC junction temperature
15.	ICThetaJA	38.4 degC/W	Op Point	IC junction-to-ambient thermal resistance
16.	IOUT_OP	2.0 A	Op Point	Iout operating point
17.	VIN_OP	11.0 V	Op Point	Vin operating point
18.	Vout Actual	8.05 V	Op Point	Vout Actual calculated based on selected voltage divider resistors
19.	Vout OP	8.0 V	Op Point	Operational Output Voltage
20.	Vout Sch	8.0 V	Op Point	Output voltage selected
21.	Vout Tolerance	5.482 %	Op Point	Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable
22.	Vout p-p	5.278 mV	Op Point	Peak-to-peak output ripple voltage
23.	Cin Pd	2.285 mW	Power	Input capacitor power dissipation
24.	Cout Pd	71.17 µW	Power	Output capacitor power dissipation
25.	IC Iq Pd	253.0 µW	Power	IC Iq Pd
26.	IC Pd	735.915 mW	Power	IC power dissipation
27.	L Pd	195.416 mW	Power	Inductor power dissipation
28.	Total Pd	933.708 mW	Power	Total Power Dissipation

Design Assistance

1. **TPS62148** Product Folder : http://www.ti.com/product/tps62148 : contains the data sheet and other resources.