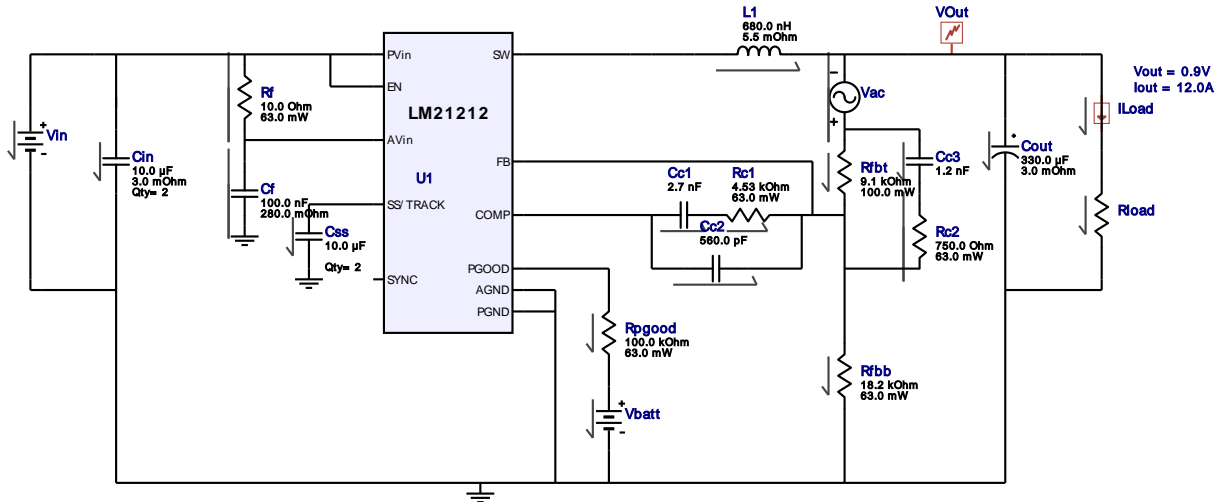



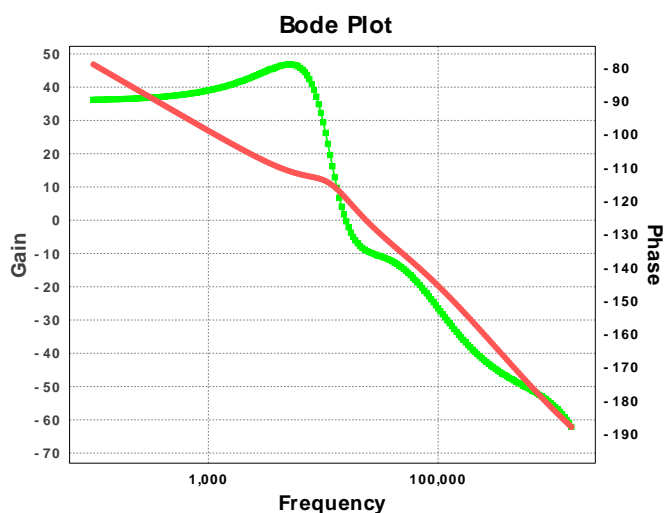
WEBENCH® Electrical Simulation Report

Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cc1	Yageo America	CC0805KRX7R9BB272 Series= X7R	Cap= 2.7 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	 0805 7 mm ²
2.	Cc2	Yageo America	CC0805KRX7R9BB561 Series= X7R	Cap= 560.0 pF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	 0805 7 mm ²
3.	Cc3	MuRata	GRM216R71E122KA01D Series= X7R	Cap= 1.2 nF VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	 0805 7 mm ²
4.	Cf	AVX	08053C104KAT2A Series= X7R	Cap= 100.0 nF ESR= 280.0 mOhm VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	 0805 7 mm ²
5.	Cin	Kemet	C0805C106K8PACTU Series= X5R	Cap= 10.0 µF ESR= 3.0 mOhm VDC= 10.0 V IRMS= 11.43 A	2	\$0.04	 0805 7 mm ²
6.	Cout	Panasonic	EEFGX0D331R Series= 1266	Cap= 330.0 µF ESR= 3.0 mOhm VDC= 2.0 V IRMS= 4.0 A	1	\$0.58	 7343-20 59 mm ²
7.	Css	Samsung Electro-Mechanics	CL10A106MQ8NNNC Series= X5R	Cap= 10.0 µF VDC= 6.3 V IRMS= 0.0 A	2	\$0.02	 0603 5 mm ²
8.	L1	CUSTOM(USERCUSTOMIZED)	CUSTOM_INDUCTOR_MD	L= 680.0 nH DCR= 5.5 mOhm	1	\$0.10	 DR127 42 mm ²
9.	Rc1	Vishay-Dale	CRCW04024K53FKED Series= CRCW...e3	Res= 4.53 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
10.	Rc2	Vishay-Dale	CRCW0402750RFKED Series= CRCW..e3	Res= 750.0 Ohm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
11.	Rf	Vishay-Dale	CRCW040210R0FKED Series= CRCW..e3	Res= 10.0 Ohm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
12.	Rfbb	Vishay-Dale	CRCW040218K2FKED Series= CRCW..e3	Res= 18.2 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
13.	Rfbt	Susumu Co Ltd	RR1220P-912-D Series= 264	Res= 9.1 kOhm Power= 100.0 mW Tolerance= 0.5%	1	\$0.01	0805 7 mm ²
14.	Rpgood	Vishay-Dale	CRCW0402100KFKED Series= CRCW..e3	Res= 100.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
15.	U1	Texas Instruments	LM21212MHX-1/NOPB	Switcher	1	\$3.30	 MYB20AA 678 mm ²

Simulation Parameters

#	Name	Parameter Name	Description	Values
1.	Cinj	C	Injection Isolation Capacitance	10 F
2.	Linj	L	Injection Isolation Inductance	10 H
3.	Vinj	AC	AC Voltage Source Amplitude	1 V
4.	Rload	R	Load Resistance	0.075 Ohm



Operating Values

#	Name	Value	Category	Description
1.	BOM Count	17		Total Design BOM count
2.	Total BOM	\$4.2		Total BOM Cost
3.	Cin IRMS	4.65 A	Current	Input capacitor RMS ripple current
4.	Cout IRMS	718.791 mA	Current	Output capacitor RMS ripple current
5.	IC Ipk	13.245 A	Current	Peak switch current in IC
6.	Iin Avg	2.436 A	Current	Average input current
7.	L Ipp	2.49 A	Current	Peak-to-peak inductor ripple current
8.	M1 Irms	5.148 A	Current	Q lavg
9.	FootPrint	880.0 mm ²	General	Total Foot Print Area of BOM components
10.	Frequency	500.0 kHz	General	Switching frequency
11.	IC Tolerance	6.0 mV	General	IC Feedback Tolerance
12.	M Vds Act	34.714 mV	General	Voltage drop across the MosFET
13.	Mode	CCM	General	Conduction Mode
14.	Pout	10.8 W	General	Total output power

#	Name	Value	Category	Description
15.	Vout OP	900.0 mV	Op_Point	Operational Output Voltage
16.	Cross Freq	28.634 kHz	Op_point	Bode plot crossover frequency
17.	Duty Cycle	18.404 %	Op_point	Duty cycle
18.	Efficiency	80.625 %	Op_point	Steady state efficiency
19.	IC Tj	67.714 degC	Op_point	IC junction temperature
20.	ICThetaJA	24.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
21.	IOUT_OP	12.0 A	Op_point	Iout operating point
22.	Phase Marg	42.056 deg	Op_point	Bode Plot Phase Margin
23.	VIN_OP	5.5 V	Op_point	Vin operating point
24.	Vout p-p	1.886 mV	Op_point	Peak-to-peak output ripple voltage
25.	Cin Pd	32.437 mW	Power	Input capacitor power dissipation
26.	Cout Pd	1.55 mW	Power	Output capacitor power dissipation
27.	IC Iq Pd	27.5 mW	Power	IC Iq Pd
28.	IC Pd	1.571 W	Power	IC power dissipation
29.	L Pd	990.0 mW	Power	Inductor power dissipation
30.	M1 PdCond	178.708 mW	Power	M1 MOSFET switching losses
31.	M1 PdSw	825.0 mW	Power	M1 MOSFET switching losses
32.	M1 PdCond	529.214 mW	Power	M2 MOSFET switching losses
33.	M2 Pdbody	0.0 W	Power	Power dissipation through lower FET
34.	Total Pd	2.595 W	Power	Total Power Dissipation
35.	Low Freq Gain	89.298 dB	Unknown	Gain at 10Hz

Design Inputs

#	Name	Value	Description
1.	Iout	12.0 A	Maximum Output Current
2.	Iout1	12.0 Amps	Output Current #1
3.	SoftStart	5.0 ms	Soft Start Time (ms)
4.	VinMax	5.5 V	Maximum input voltage
5.	VinMin	4.75 V	Minimum input voltage
6.	Vout	900.0 mV	Output Voltage
7.	Vout1	900.0 mVolt	Output Voltage #1
8.	base_pn	LM21212	Base Product Number
9.	source	DC	Input Source Type
10.	Ta	30.0 degC	Ambient temperature
11.	UserFsw	500.0 kHz	Customer Selected Frequency

Design Assistance

1. **LM21212** Product Folder : <http://www.ti.com/product/lm21212%2D1> : contains the data sheet and other resources.

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