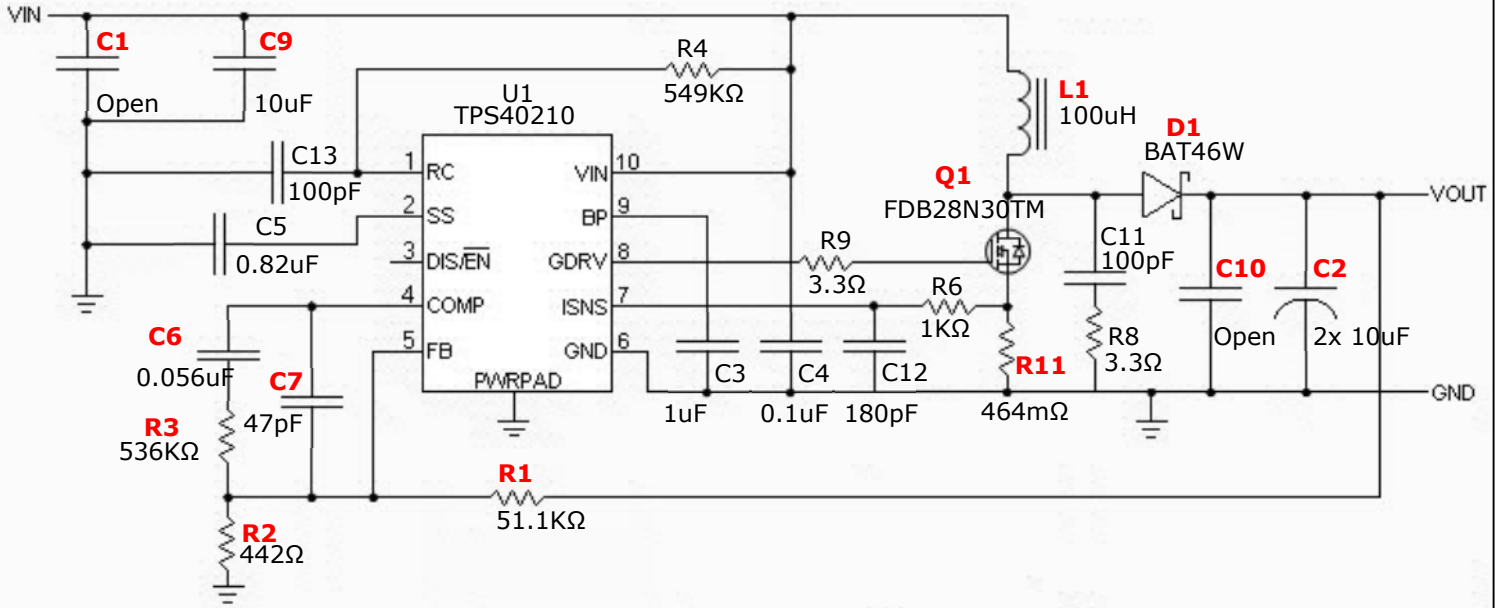


SwitcherPro Design Report Schematic

Design Name: tps40210

Part: TPS40210

VinMin: 12V VinMax: 12V Vout: 80V Iout: 10mA



SwitcherPro Design Report

Analysis - Main

Design Name: tps40210

Part: TPS40210

VinMin: 12V **VinMax:** 12V **Vout:** 80V **Iout:** 10mA

Parameter Units-Symbol	User Input Minimum	User Input Nominal	User Input Maximum	Default Input Minimum	Default Input Nominal	Default Input Maximum	Calculated Minimum	Calculated Nominal	Calculated Maximum
Input Voltage Volts - V	12.00	-	12.00	-	-	-	-	-	-
Input Ripple mVp-p - mVp-p	-	-	-	-	-	240	-	-	0.0
UVLO(Start) Volts - V	-	-	-	-	-	-	-	4.25	-
UVLO(Stop) Volts - V	-	-	-	-	-	-	-	-	-
Switching Frequency KHz - KHz	-	-	-	-	300	-	-	-	-
Slow Start ms - ms	-	-	-	-	40.00	-	-	-	-
Estimated PCB Area mm ² - mm ²	-	-	-	-	-	-	-	1267	-
Max Component Height mm - mm	-	-	-	-	-	30	-	-	25

SwitcherPro Design Report

Analysis - Output1

Design Name: tps40210

Part: TPS40210

VinMin: 12V **VinMax:** 12V **Vout:** 80V **Iout:** 10mA

Parameter Units-Symbol	User Input Minimum	User Input Nominal	User Input Maximum	Default Input Minimum	Default Input Nominal	Default Input Maximum	Calculated Minimum	Calculated Nominal	Calculated Maximum
Output Voltage Volts - V	-	80.000	-	-	-	-	79.225	-	84.095
Output Ripple mVp-p - mVp-p	-	-	-	-	-	1600	-	-	0.8
Output Current Amps - A	-	-	0.010	0.100	-	-	-	-	-
Inductor Peak to Peak Current Amps - A	-	-	-	-	-	-	0.214	-	0.214
Current Limit Threshold Amps - A	-	-	-	-	0.015	-	-	-	-
Gain Margin dB - dB	-	-	-	-10	-	-	-	-63	-
Phase Margin Deg. - Deg.	-	-	-	45	-	-	-	59	-
Upper FET RDSon mOhms - mΩ	-	-	-	-	-	-	125	-	125
Duty Cycle % - %	-	-	-	-	-	-	53.6	-	53.6
On Time Min (switch) ns - ns	-	-	-	-	-	-	1622.8	-	1983.4
Cross Over Frequency KHz - KHz	-	-	-	-	-	-	-	3	-

SwitcherPro Design Report

Stress Results

Design Name: tps40210

Part: TPS40210

VinMin: 12V **VinMax:** 12V **Vout:** 80V **Iout:** 10mA

Device	Rated Voltage	Calculated Voltage	Rated Current (RMS)	Calculated Current (RMS)	Error Message	Power	Calculated Max Temp
C9 (High Freq. Input Cap)	16V	12.1V	3.5A	62mA	-	4uW	-
C2 (Bulk Output Cap)	450V	80.4V	0.25A	41mA	-	9mW	-
L1 (Output Inductor)	-	-	1.2A	65mA	-	600uW	-
Q1 (Power Switch)	300V	80.4V	28A	90mA	-	104mW	31°C
D1 (Catch Diode)	100V	80.4V	0.15A	10mA	-	18mW	32°C
R11 (Current Sense Resistor)	-	-	-	90mA	-	4mW	-

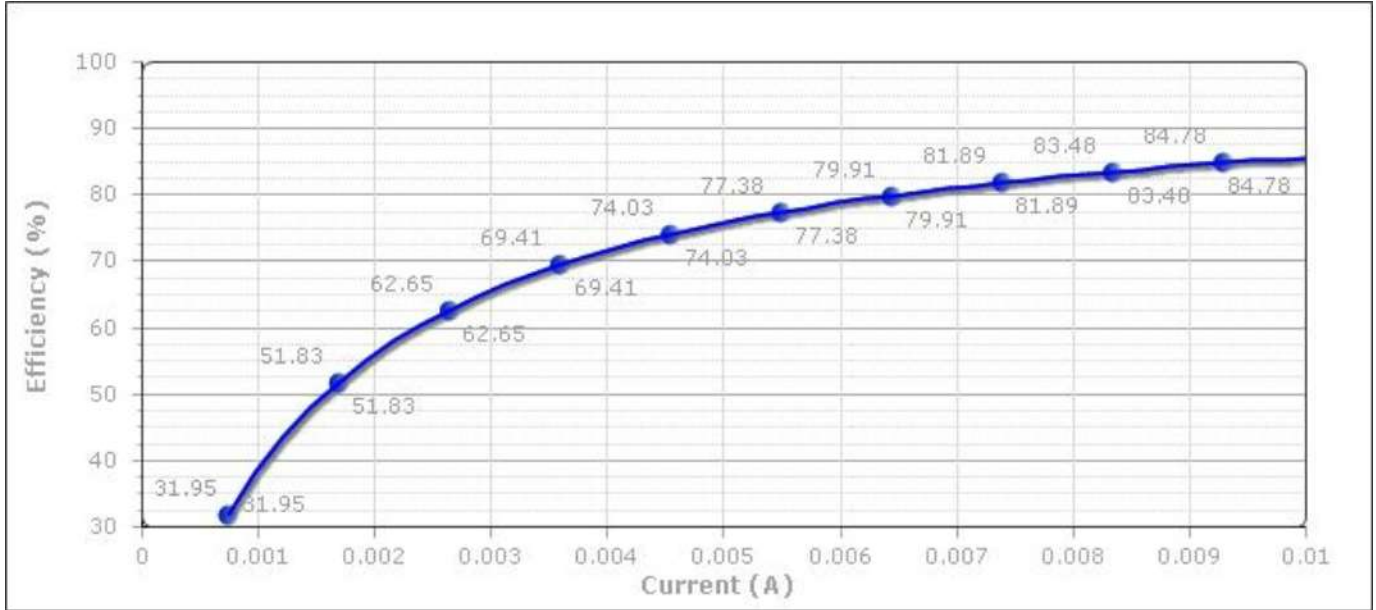
SwitcherPro Design Report

Efficiency

Design Name: tps40210

Part: TPS40210

VinMin: 12V **VinMax:** 12V **Vout:** 80V **Iout:** 10mA



— Efficiency For Vin Max
— Efficiency For Vin Min

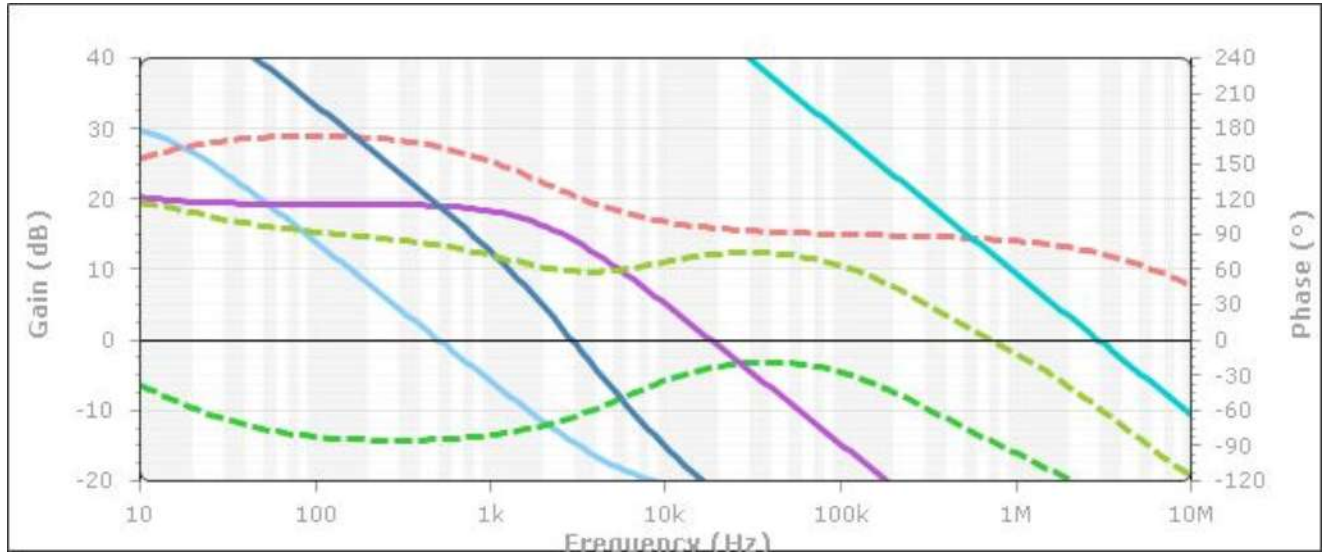
SwitcherPro Design Report

Loop Response

Design Name: tps40210

Part: TPS40210

VinMin: 12V **VinMax:** 12V **Vout:** 80V **Iout:** 10mA



- Power Stage Gain
- Power Stage Phase
- Compensation Gain
- Compensation Phase
- Error Amp Gain
- Total Gain
- Total Phase

SwitcherPro Design Report

Bill of Materials

Design Name: tps40210

Part: TPS40210

VinMin: 12V **VinMax:** 12V **Vout:** 80V **Iout:** 10mA

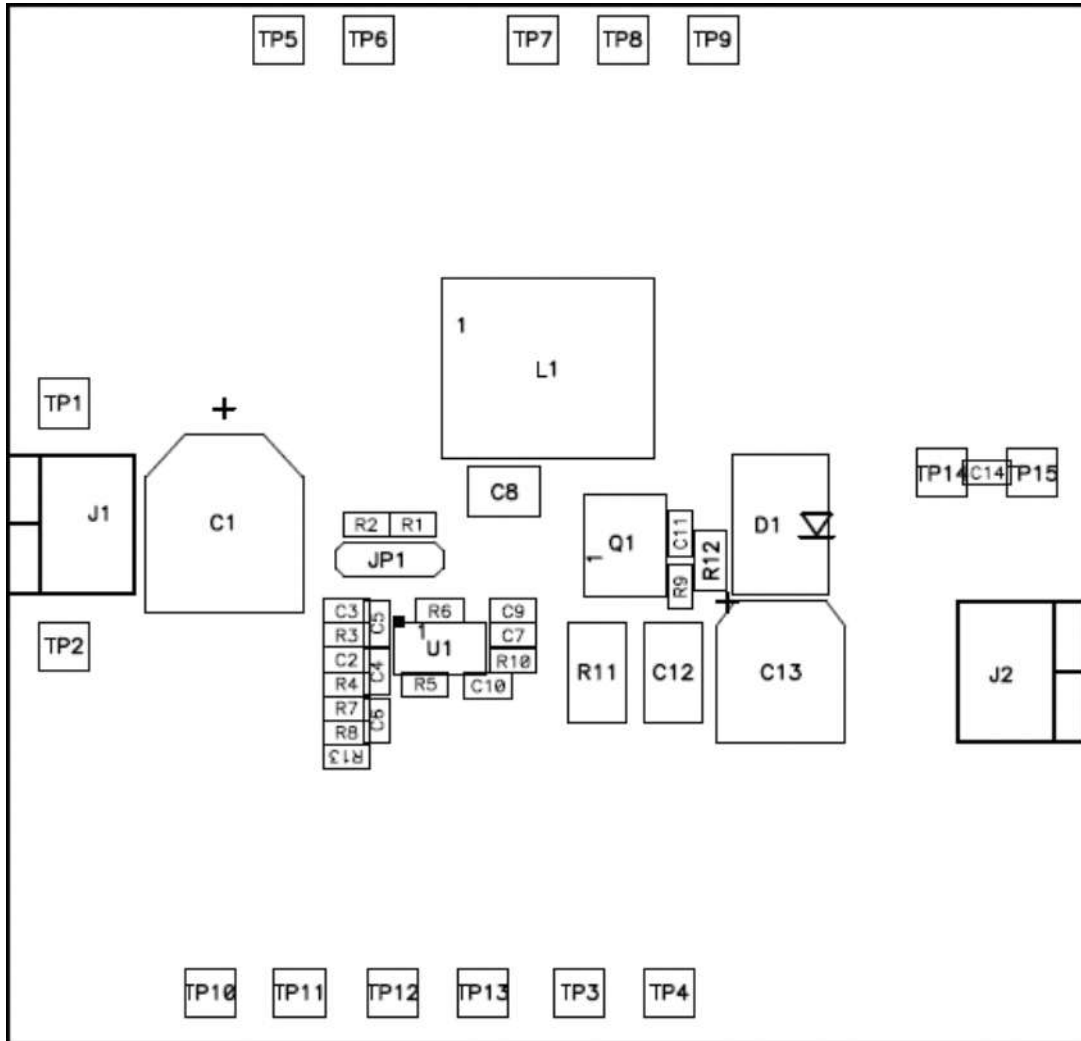
Name	Quantity	Part Number	Description	Manufacturer	Package	Area(mm ²)	Height(mm)
C11	1	Standard	Capacitor, Ceramic, 100pF, 100V, 10%	Standard	2820	36	3
C12	1	Standard	Capacitor, Ceramic, 180pF, 20V, 1%	Standard	0603	2	1
C13	1	Standard	Capacitor, Ceramic, 100pF, 20V, 10%	Standard	0603	2	1
C2	2	EKE00FG210P00	Capacitor, Electrolytic, 10uF, 450V, 20%	Vishay	EKE00 12.5 x 25 x 25	156	25
C3	1	Standard	Capacitor, Ceramic, 1uF, 6.3V, 1%	Standard	0603	2	1
C4	1	Standard	Capacitor, Ceramic, 0.1uF, 20V, 10%	Standard	0603	2	1
C5	1	Standard	Capacitor, Ceramic, 0.82uF, 16V, 20%	Standard	0603	2	1
C6	1	Standard	Capacitor, Ceramic, 0.056uF, 20V, 20%	Standard	0603	2	1
C7	1	Standard	Capacitor, Ceramic, 47pF, 20V, 20%	Standard	0603	2	1
C9	1	C3216X5R1C106KT	Capacitor, Ceramic, 10uF, 16V, 10%	TDK	X5R	6	2
D1	1	BAT46W	Diode, Schottky, 100V, 0.15A	Diodes Inc	SOD-123	7	2
L1	1	ELLCTV101M	Inductor, 100uH, 1.2A, 140mΩ	Panasonic	ELLATV	111	4
Q1	1	FDB28N30TM	Transistor, NFET, 300V, 28A, 150mΩ	Fairchild Semiconductor	TO-263(D2PAK)	157	4
R1	1	Standard	Resistor, SurfaceMount, 51.1KΩ, 100mW, 1%	Standard	0603	2	1
R11	1	Standard	Resistor, SurfaceMount, 464mΩ, 100mW, 1%	Standard	0603	2	1
R2	1	Standard	Resistor, SurfaceMount, 442Ω, 100mW, 1%	Standard	0603	2	1
R3	1	Standard	Resistor, SurfaceMount, 536KΩ, 100mW, 1%	Standard	0603	2	1
R4	1	Standard	Resistor, SurfaceMount, 549KΩ, 100mW, 1%	Standard	0603	2	1
R6	1	Standard	Resistor, SurfaceMount, 1KΩ, 100mW, 1%	Standard	0603	2	1
R8	1	Standard	Resistor, SurfaceMount, 3.3Ω, 100mW, 1%	Standard	0603	2	1
R9	1	Standard	Resistor, SurfaceMount, 3.3Ω, 100mW, 1%	Standard	0603	2	1
U1	1	TPS40210	IC, Controller, 10 pins	Texas Instruments, Inc.	DCQ	16	2

SwitcherPro Design Report Layout

Design Name: tps40210

Part: TPS40210

VinMin: 12V **VinMax:** 12V **Vout:** 80V **Iout:** 10mA



SwitcherPro Design Report Layout Notes

Design Name: tps40210

Part: TPS40210

VinMin: 12V **VinMax:** 12V **Vout:** 80V **Iout:** 10mA

TPS40210

The EVM has been designed using a 4-Layer, 2-oz copper-clad circuit board 3.0" x 3.0" with all components in a 1.15" x 2.15" active area on the top side and all active traces to the top and bottom layers to allow the user to easily view, probe and evaluate the TPS40210 control device in a practical double-sided application. Moving components to both sides of the PCB or using additional internal layers can offer additional size reduction for space constrained systems.