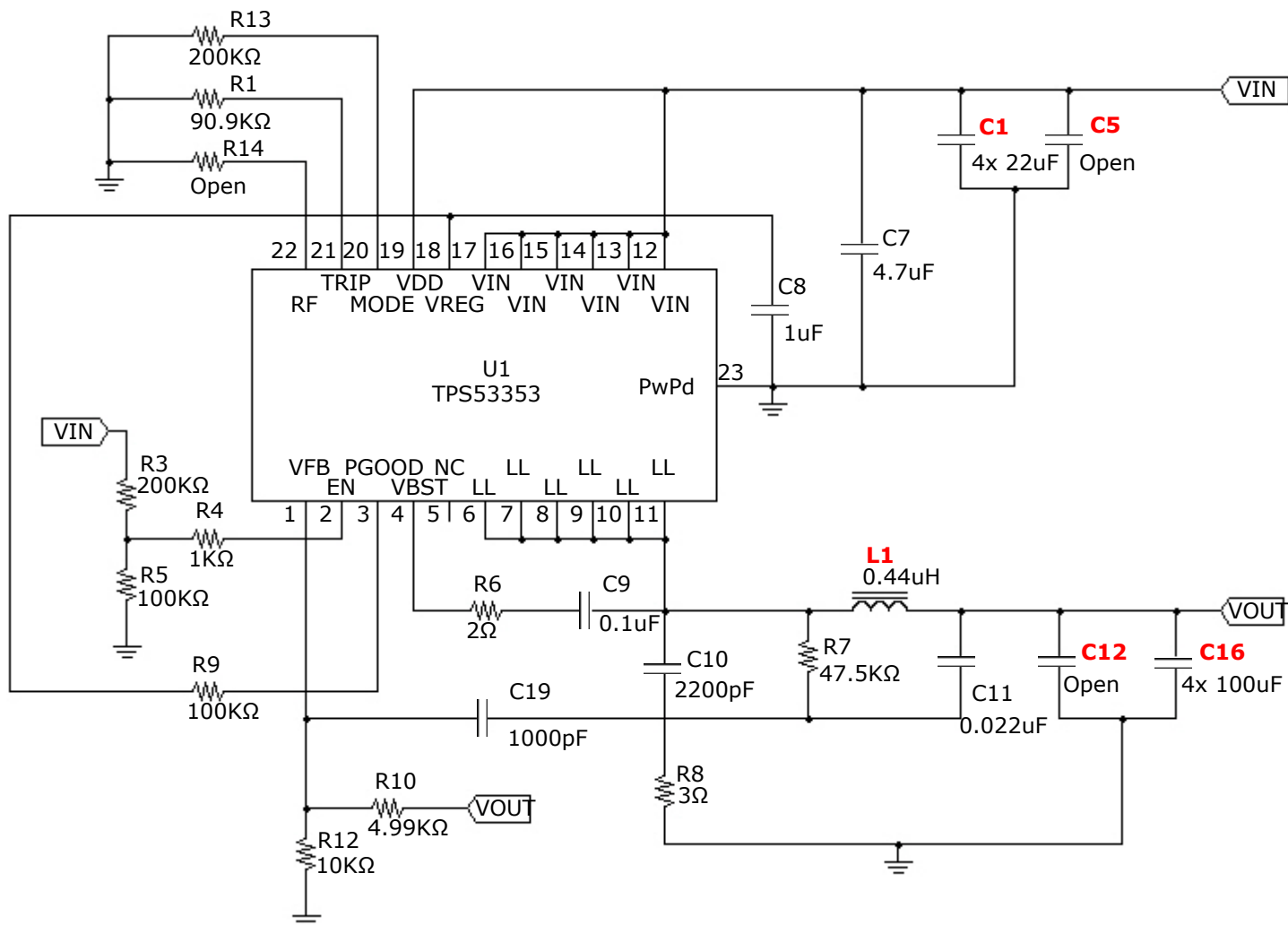


SwitcherPro Design Report Schematic

Design Name: 0.9V_Reg

Part: TPS53353

VinMin: 11V **VinMax:** 13V **Vout:** 900mV **Iout:** 16A



i This device uses Eco-mode™ to enhance efficiency at lower output currents. SwitcherPro does not currently model Eco-mode™ operation. Efficiency data is provided only for output currents above the Eco-mode™ operating threshold.

SwitcherPro Design Report

Analysis - Main

Design Name: 0.9V_Reg **Part:** TPS53353

VinMin: 11V **VinMax:** 13V **Vout:** 900mV **Iout:** 16A

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	11.00	-	13.00	-	-	-	-	-	-
Input Ripple mVp-p - mVp-p	-	-	-	-	-	260	-	-	64.7
UVLO(Start) Volts - V	-	-	-	-	-	-	-	4.20	-
UVLO(Stop) Volts - V	-	-	-	-	-	-	-	3.95	-
Switching Frequency KHz - KHz	-	-	-	-	500	-	-	-	-
Slow Start ms - ms	-	-	-	-	2.80	-	-	-	-
Estimated PCB Area mm ² - mm ²	-	-	-	-	-	-	-	272	-
Max Component Height mm - mm	-	-	-	-	-	25	-	-	2

SwitcherPro Design Report

Analysis - Output1

Design Name: 0.9V_Reg

Part: TPS53353

VinMin: 11V **VinMax:** 13V **Vout:** 900mV **Iout:** 16A

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	-	0.900	-	-	-	-	0.000	-	1.811
Output Ripple mVp-p - mVp-p	-	-	-	-	-	18	-	-	4.5
Output Current Amps - A	-	-	16.000	0.001	-	-	-	-	-
Inductor Peak to Peak Current Amps - A	-	-	-	-	-	-	4.894	-	4.961
Current Limit Threshold Amps - A	-	-	-	-	3.000	-	-	-	-
Gain Margin dB - dB	--	-	-	--	-	-	-	-	-
Phase Margin Deg. - Deg.	--	-	-	--	-	-	-	-	-
Upper FET RDSon mOhms - mΩ	-	-	-	-	-	-	5	-	5
Lower FET RDSon mOhms - mΩ	-	-	-	-	-	-	2	-	2
Duty Cycle % - %	-	-	-	-	-	-	7.2	-	8.6
On Time Min (switch) ns - ns	-	-	-	-	-	-	120.6	-	214.0
Cross Over Frequency KHz - KHz	-	-	-	-	-	-	-	-	-

SwitcherPro Design Report

Stress Results

Design Name: 0.9V_Reg

Part: TPS53353

VinMin: 11V **VinMax:** 13V **Vout:** 900mV **Iout:** 16A

Device	Rated Voltage	Calculated Voltage	Rated Current (RMS)	Calculated Current (RMS)	Error Message	Power	Calculated Max Temp
C1 (High Freq. Input Cap)	16V	13.1V	4.5A	1.12A	-	5mW	-
C16 (Bulk Output Cap)	6.3V	904.5mV	3A	0.36A	-	513uW	-
L1 (Output Inductor)	-	-	31A	16.1A	-	77mW	-
U1 (Converter)	25V	13.1V	40A	16.1A	-	2.2W	58°C

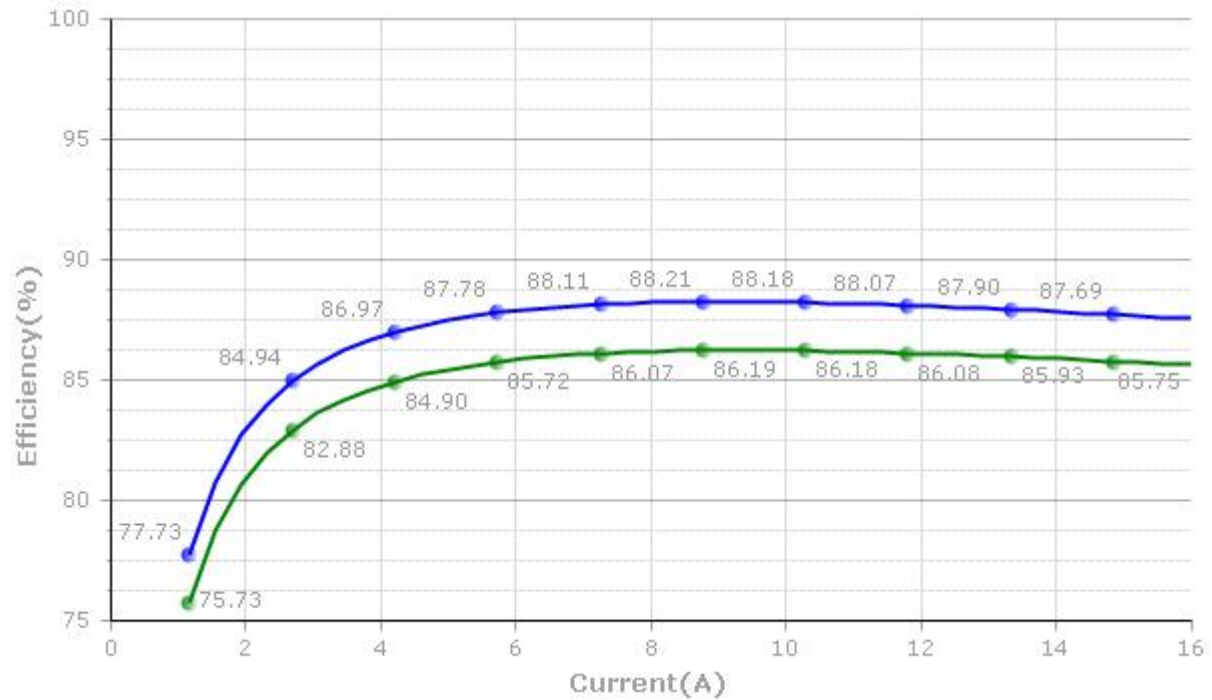
SwitcherPro Design Report

Efficiency

Design Name: 0.9V_Reg

Part: TPS53353

VinMin: 11V **VinMax:** 13V **Vout:** 900mV **Iout:** 16A



— Efficiency For Vin Max
— Efficiency For Vin Min

SwitcherPro Design Report

Bill of Materials

Design Name: 0.9V_Reg **Part:** TPS53353

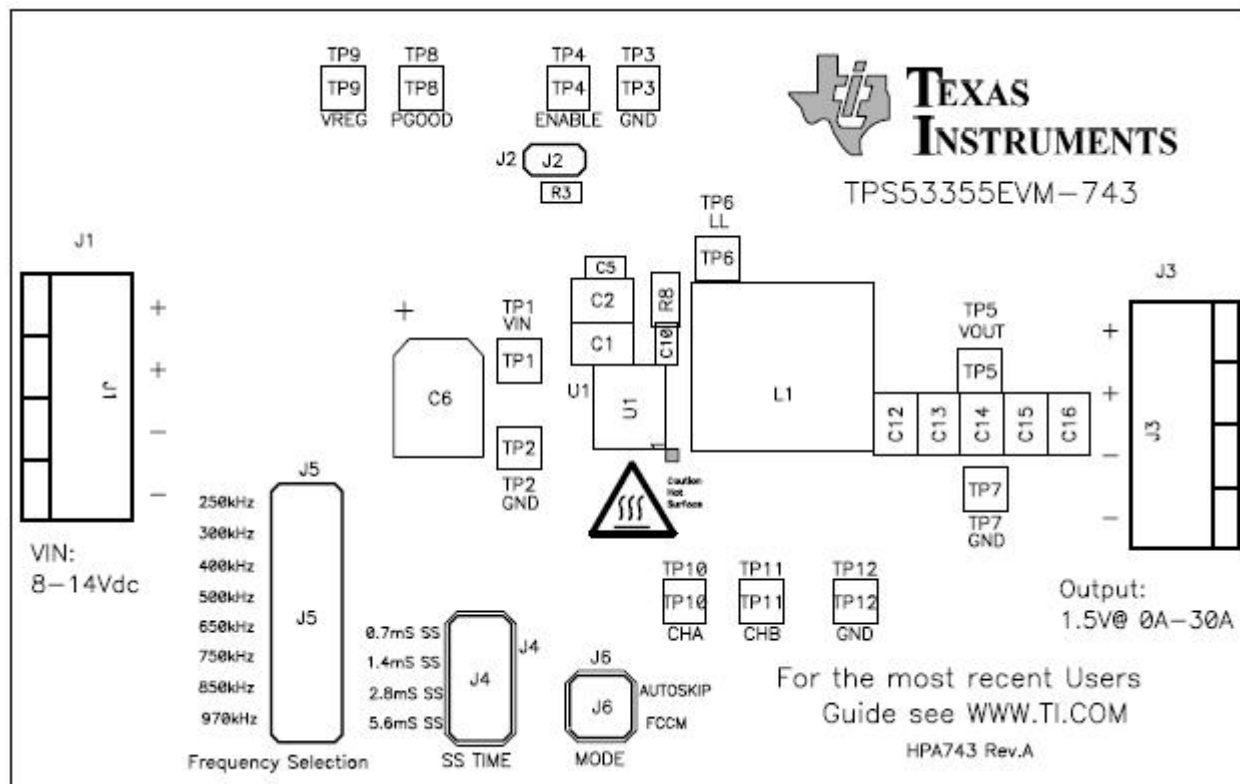
VinMin: 11V **VinMax:** 13V **Vout:** 900mV **Iout:** 16A

Name	Quantity	Part Number	Description	Manufacturer	Package	Area(mm ²)	Height(mm)
C1	4	GRM32ER61C226KE20L	Capacitor, Ceramic, 22uF, 16V, 10%	Murata Manufacturing	1210	10	2
C10	1	Standard	Capacitor, Ceramic, 2200pF, 50V, 20%	Standard	0603	2	1
C11	1	Standard	Capacitor, Ceramic, 0.022uF, 50V, 20%	Standard	0603	2	1
C16	4	GRM32ER60J107ME20L	Capacitor, Ceramic, 100uF, 6.3V, 20%	Murata Manufacturing	1210	10	2
C19	1	Standard	Capacitor, Ceramic, 1000pF, 50V, 20%	Standard	0603	2	1
C7	1	Standard	Capacitor, Ceramic, 4.7uF, 25V, 20%	Standard	0805	3	1
C8	1	Standard	Capacitor, Ceramic, 1uF, 50V, 20%	Standard	0603	2	1
C9	1	Standard	Capacitor, Ceramic, 0.1uF, 50V, 20%	Standard	0603	2	1
L1	1	PA0513.441NLT	Inductor, 0.44uH, 31A, 300uΩ	Pulse Engineering	SRU5018	0.271	0.314
R1	1	Standard	Resistor, SurfaceMount, 90.9KΩ, 100mW, 1%	Standard	0603	2	1
R10	1	Standard	Resistor, SurfaceMount, 4.99KΩ, 100mW, 1%	Standard	0603	2	1
R12	1	Standard	Resistor, SurfaceMount, 10KΩ, 100mW, 1%	Standard	0603	2	1
R13	1	Standard	Resistor, SurfaceMount, 200KΩ, 100mW, 1%	Standard	0603	2	1
R3	1	Standard	Resistor, SurfaceMount, 200KΩ, 100mW, 1%	Standard	0603	2	1
R4	1	Standard	Resistor, SurfaceMount, 1KΩ, 100mW, 1%	Standard	0603	2	1
R5	1	Standard	Resistor, SurfaceMount, 100KΩ, 100mW, 5%	Standard	0603	2	1
R6	1	Standard	Resistor, SurfaceMount, 2Ω, 100mW, 1%	Standard	0603	2	1
R7	1	Standard	Resistor, SurfaceMount, 47.5KΩ, 100mW, 1%	Standard	0603	2	1
R8	1	Standard	Resistor, SurfaceMount, 3Ω, 100mW, 1%	Standard	0603	2	1
R9	1	Standard	Resistor, SurfaceMount, 100KΩ, 100mW, 5%	Standard	0603	2	1
U1	1	TPS53353	IC, Converter, 22 pins	Texas Instruments, Inc.	DQP	30	1.5

SwitcherPro Design Report Layout

Design Name: 0.9V_Reg **Part:** TPS53353

VinMin: 11V **VinMax:** 13V **Vout:** 900mV **Iout:** 16A



SwitcherPro Design Report

Layout Notes

Design Name: 0.9V_Reg

Part: TPS53353

VinMin: 11V **VinMax:** 13V **Vout:** 900mV **Iout:** 16A

TPS53355

LayoutThe figures (Figure 17 through Figure 24) in users guide show the design of the TPS53355EVM-743 printed circuit board. The EVM has been designed using 6 Layers, 2oz copper circuit board.