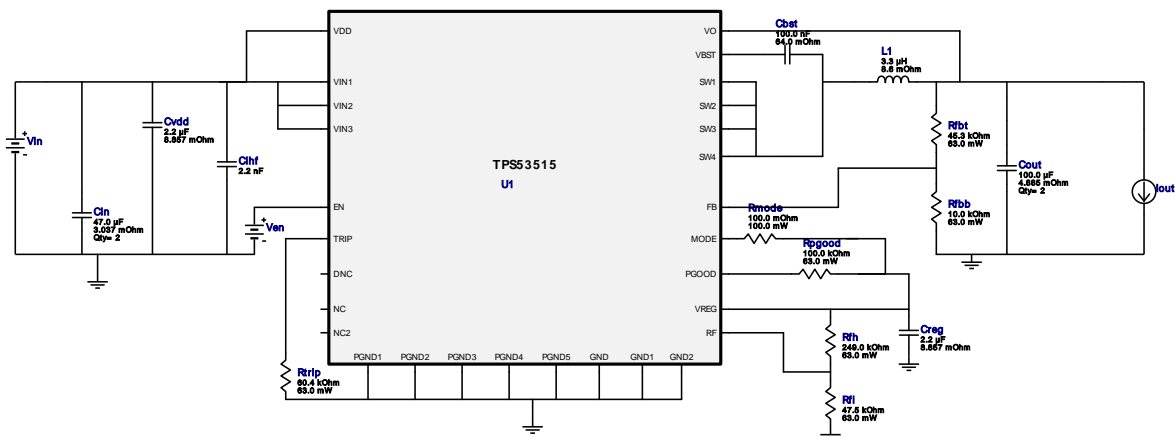

















WEBENCH® Design Report

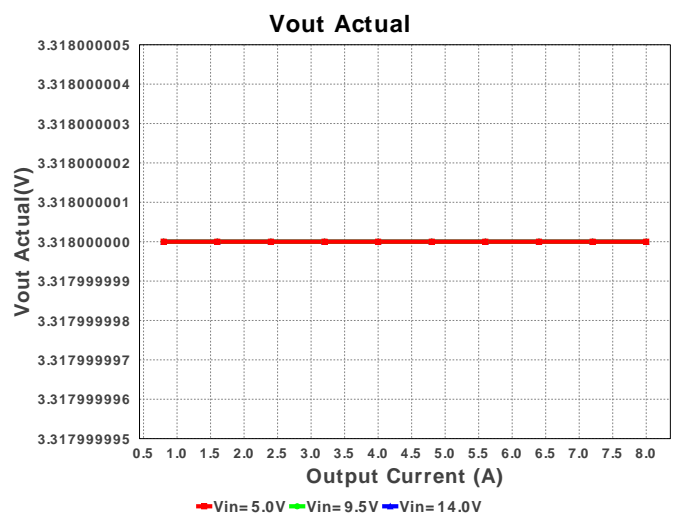
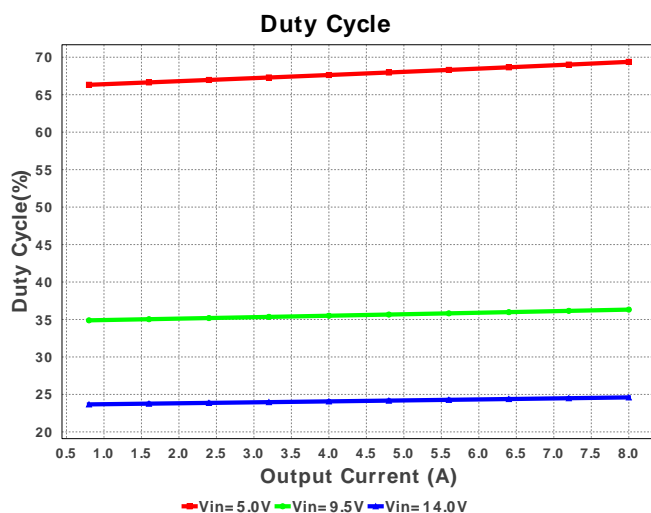
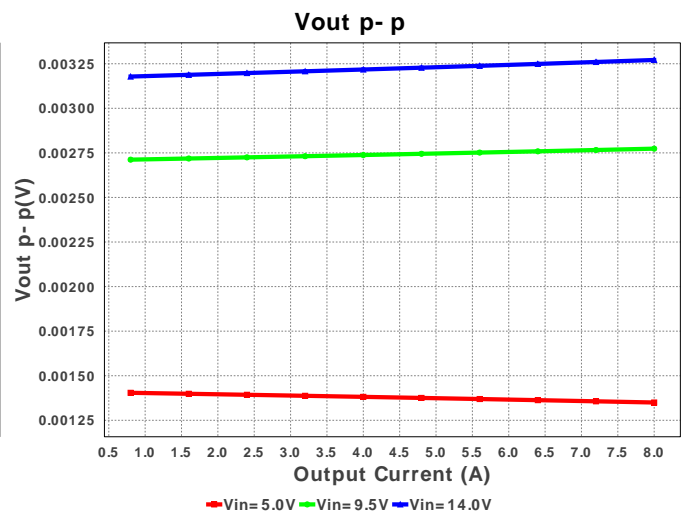
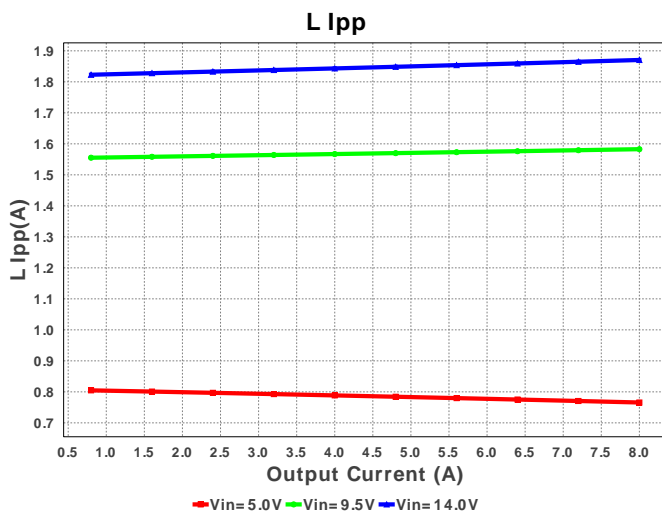
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TPS53515RVER 5.0V-14.0V to 3.30V @ 8.0A

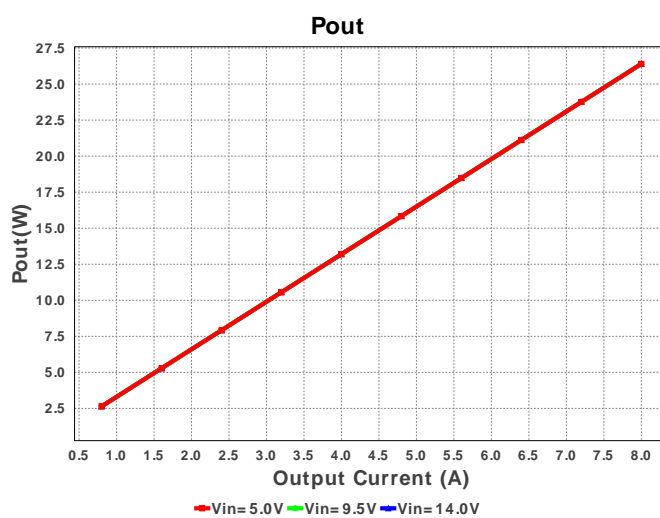
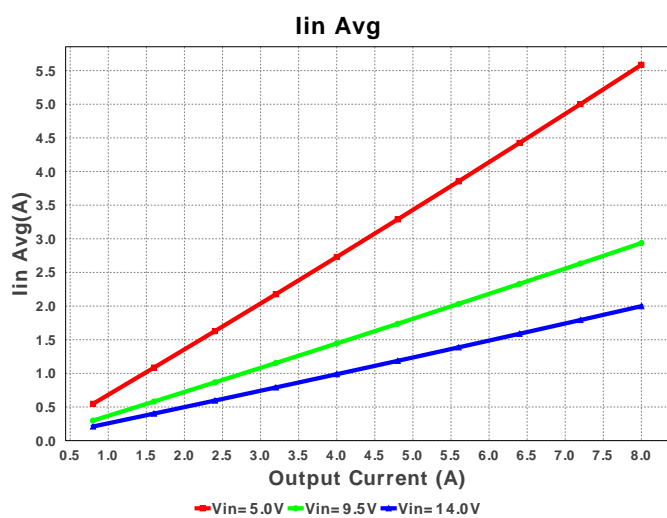
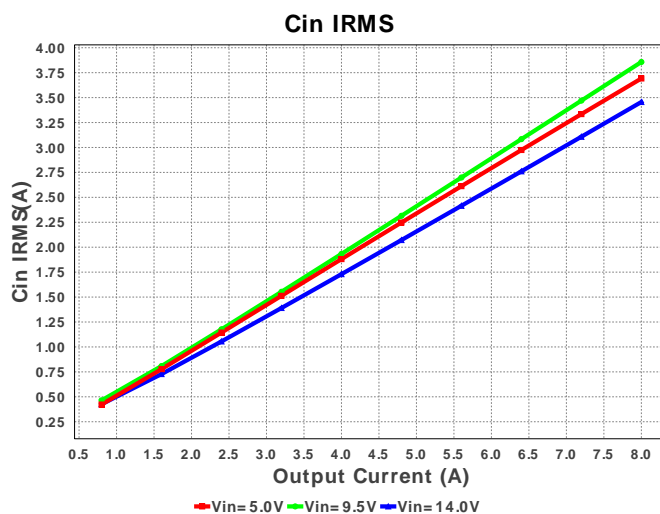
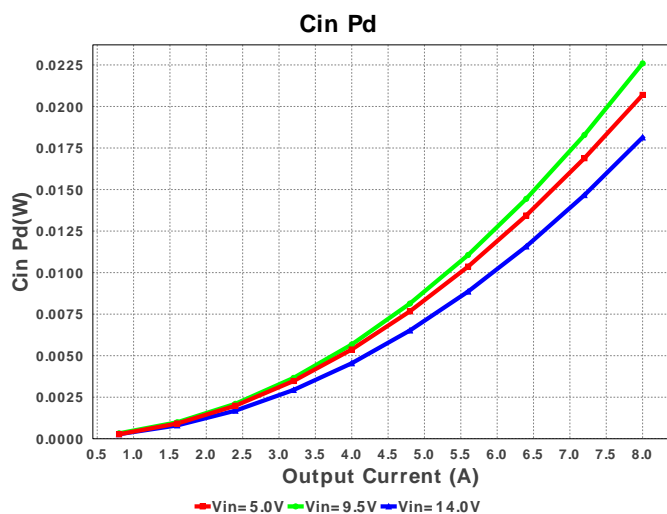
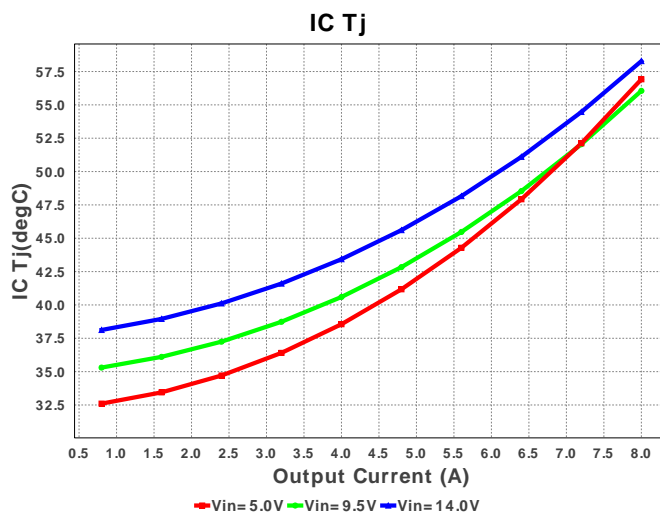
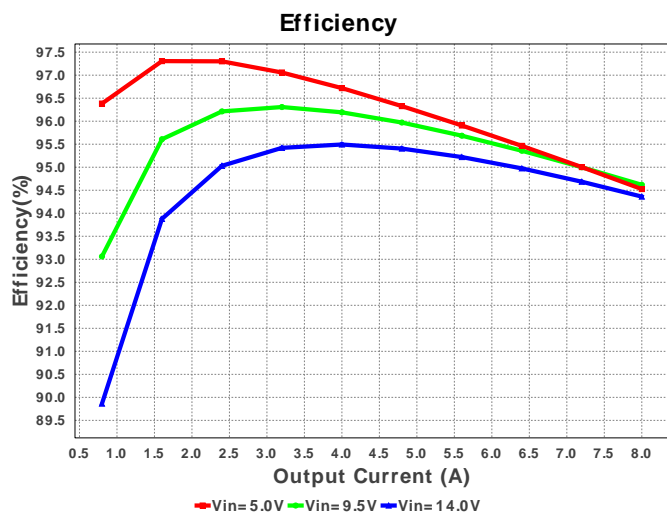


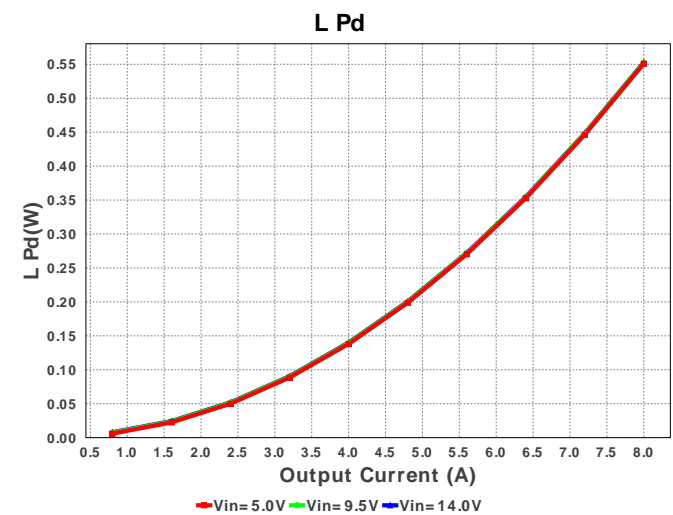
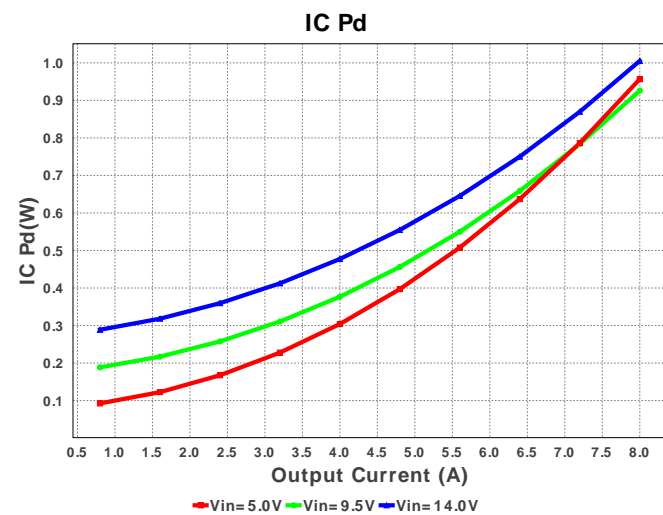
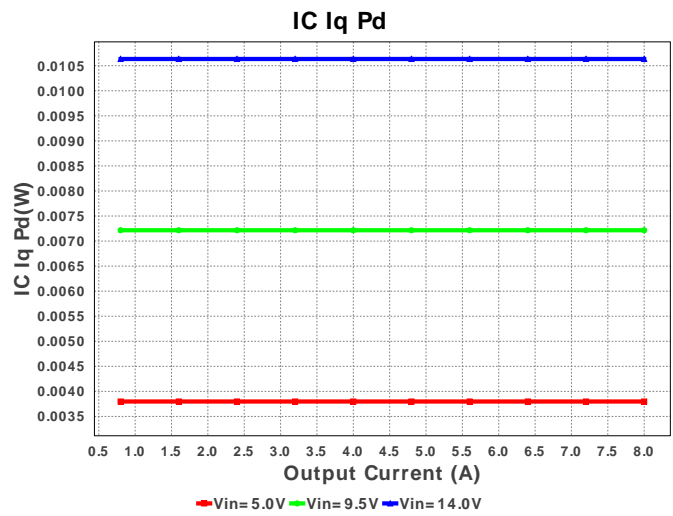
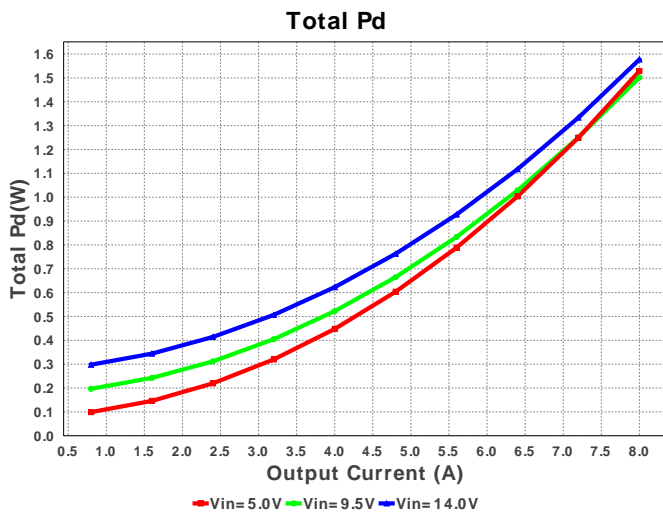
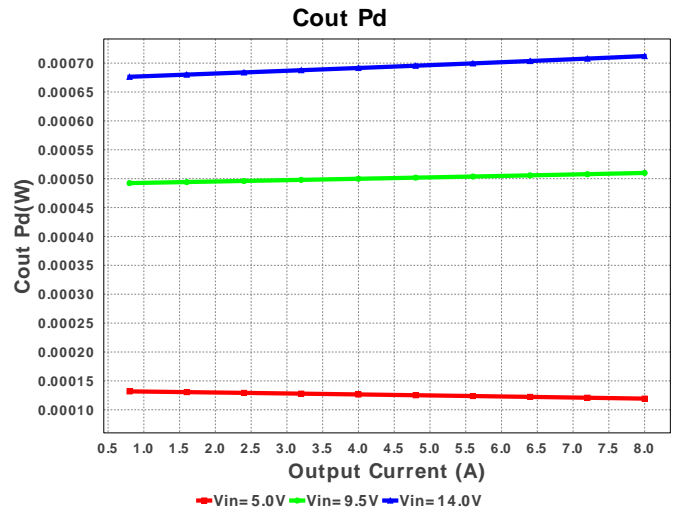
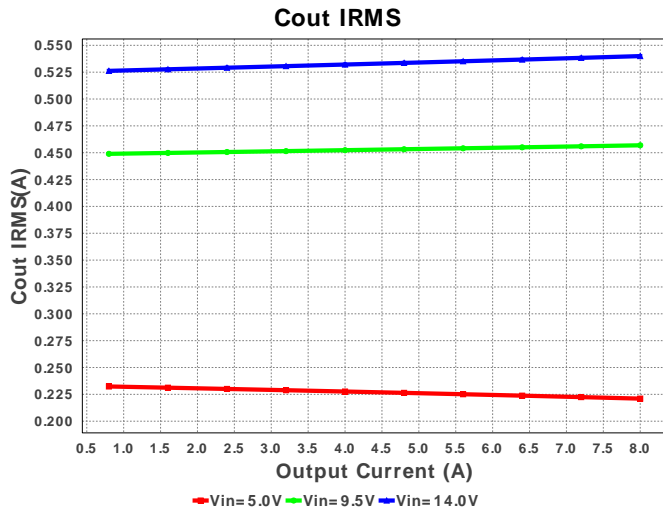
Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cbst	Kemet	C0805C104K5RACTU Series= X7R	Cap= 100.0 nF ESR= 64.0 mOhm VDC= 50.0 V IRMS= 1.64 A	1	\$0.01	 0805 7 mm²
2.	Cihf	MuRata	GRM155R61E222KA01D Series= X5R	Cap= 2.2 nF VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	 0402 3 mm²
3.	Cin	MuRata	GRM32ER61C476ME15L Series= X5R	Cap= 47.0 uF ESR= 3.037 mOhm VDC= 16.0 V IRMS= 4.59346 A	2	\$0.24	 1210_280 15 mm²
4.	Cout	MuRata	GRM31CR60J107ME39L Series= X5R	Cap= 100.0 uF ESR= 4.885 mOhm VDC= 6.3 V IRMS= 4.4118 A	2	\$0.14	 1206_190 11 mm²
5.	Creg	MuRata	GRM21BR61E225KA12L Series= X5R	Cap= 2.2 uF ESR= 8.857 mOhm VDC= 25.0 V IRMS= 1.3111 A	1	\$0.04	 0805 7 mm²
6.	Cvdd	MuRata	GRM21BR61E225KA12L Series= X5R	Cap= 2.2 uF ESR= 8.857 mOhm VDC= 25.0 V IRMS= 1.3111 A	1	\$0.04	 0805 7 mm²
7.	L1	Coilcraft	XAL7070-332MEB	L= 3.3 uH DCR= 8.6 mOhm	1	\$1.19	 XAL7070 87 mm²
8.	Rfbb	Vishay-Dale	CRCW040210K0FKED Series= CRCW..e3	Res= 10.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm²
9.	Rfbt	Vishay-Dale	CRCW040245K3FKED Series= CRCW..e3	Res= 45.3 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm²

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
10.	Rfh	Vishay-Dale	CRCW0402249KFKED Series= CRCW..e3	Res= 249.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
11.	Rfl	Vishay-Dale	CRCW040247K5FKED Series= CRCW..e3	Res= 47.5 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
12.	Rmode	Panasonic	ERJ-3RSFR10V Series= ERJ-3R	Res= 100.0 mOhm Power= 100.0 mW Tolerance= 1.0%	1	\$0.03	 0603 5 mm ²
13.	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
14.	Rtrip	Vishay-Dale	CRCW040260K4FKED Series= CRCW..e3	Res= 60.4 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
15.	U1	Texas Instruments	TPS53515RVER	Switcher	1	\$2.70	 R-PVQFN-N28 26 mm ²







Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	3.456 A	Current	Input capacitor RMS ripple current
2.	Cout IRMS	539.963 mA	Current	Output capacitor RMS ripple current
3.	Iin Avg	1.998 A	Current	Average input current
4.	L Ipp	1.87 A	Current	Peak-to-peak inductor ripple current
5.	BOM Count	17	General	Total Design BOM count
6.	FootPrint	210.0 mm ²	General	Total Foot Print Area of BOM components
7.	Frequency	419.046 kHz	General	Switching frequency
8.	Pout	26.4 W	General	Total output power
9.	Total BOM	\$4.84	General	Total BOM Cost
10.	ICThetaJA Effective	28.13 degC/W	Op_Point	Effective IC Junction-to-Ambient Thermal Resistance
11.	Vout Actual	3.318 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors

#	Name	Value	Category	Description
12.	Vout OP	3.3 V	Op_Point	Operational Output Voltage
13.	Duty Cycle	24.603 %	Op_point	Duty cycle
14.	Efficiency	94.362 %	Op_point	Steady state efficiency
15.	IC Tj	58.281 degC	Op_point	IC junction temperature
16.	IOUT_OP	8.0 A	Op_point	Iout operating point
17.	VIN_OP	14.0 V	Op_point	Vin operating point
18.	Vout p-p	3.271 mV	Op_point	Peak-to-peak output ripple voltage
19.	Cin Pd	18.137 mW	Power	Input capacitor power dissipation
20.	Cout Pd	712.136 μ W	Power	Output capacitor power dissipation
21.	IC Iq Pd	10.634 mW	Power	IC Iq Pd
22.	IC Pd	1.005 W	Power	IC power dissipation
23.	L Pd	552.907 mW	Power	Inductor power dissipation
24.	Total Pd	1.577 W	Power	Total Power Dissipation
25.	Vout Tolerance	2.366 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	8.0	Maximum Output Current
2.	VinMax	14.0	Maximum input voltage
3.	VinMin	5.0	Minimum input voltage
4.	Vout	3.3	Output Voltage
5.	base_pn	TPS53515	Texas Instruments Base Part Number
6.	source	DC	Input Source Type
7.	ta	30.0	Ambient temperature

Design Assistance

1. TPS53515 Product Folder : <http://www.ti.com/product/TPS53515> : contains the data sheet and other resources.

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