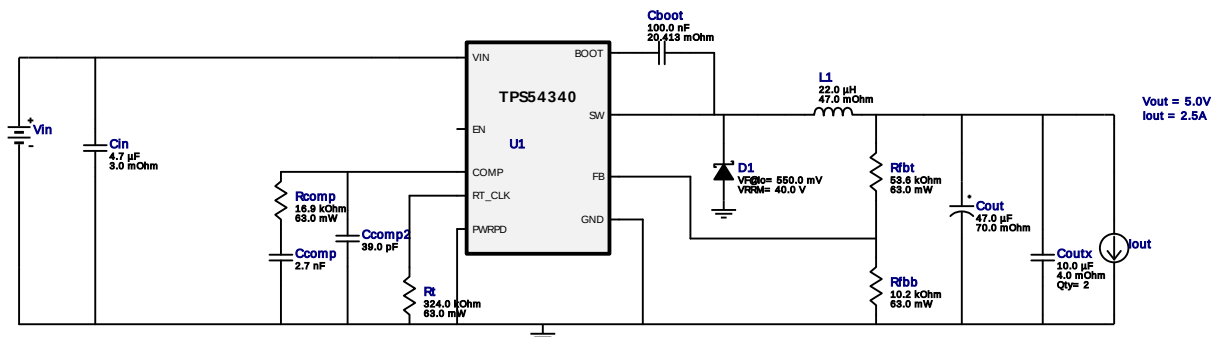


WEBENCH® Design Report

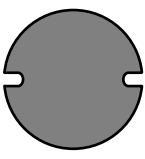
Design : 1177446/96 TPS54340DDAR
TPS54340DDAR 10.0V-24.0V to 5.00V @ 2.5A



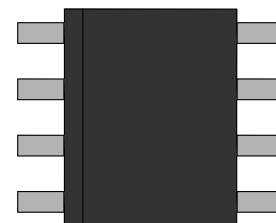
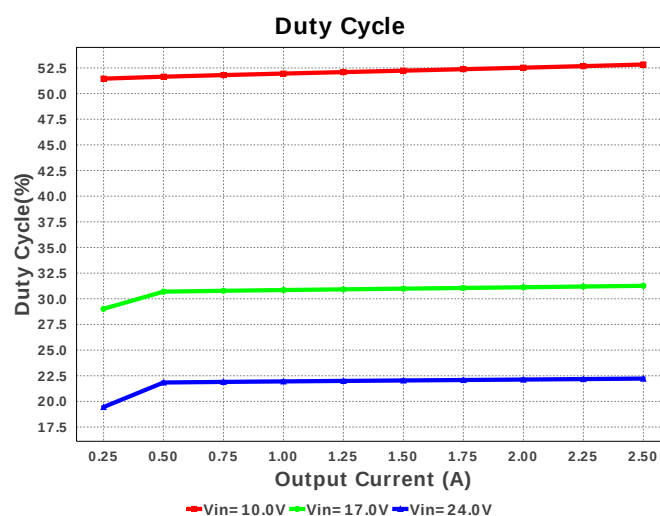
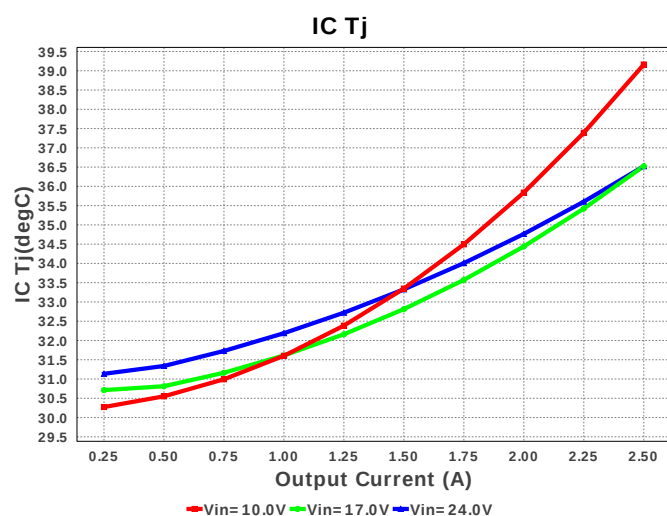
My Comments

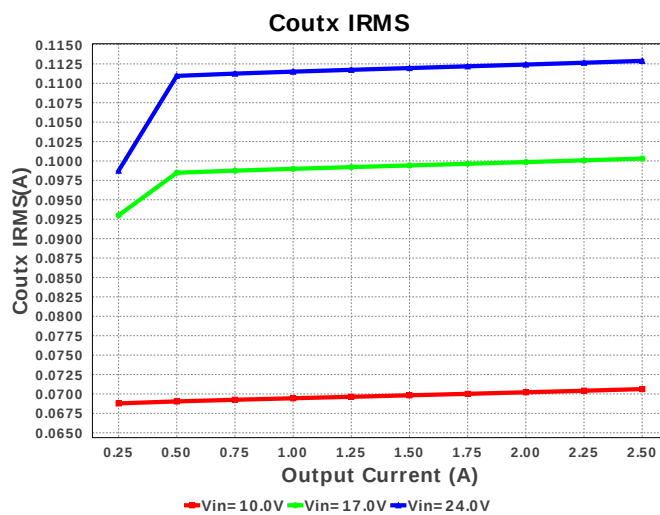
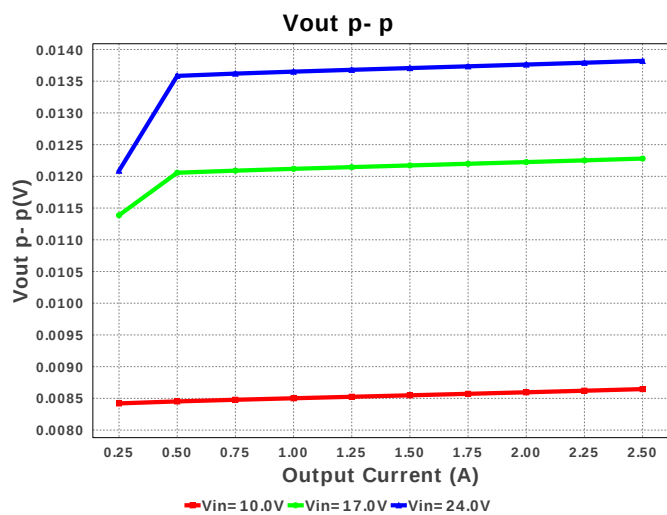
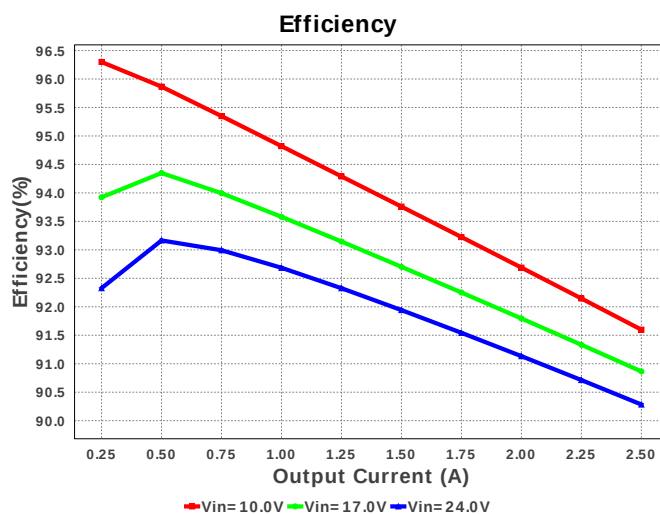
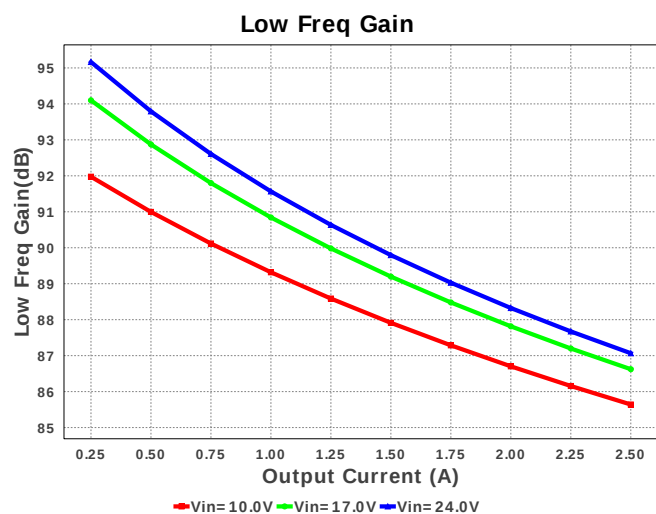
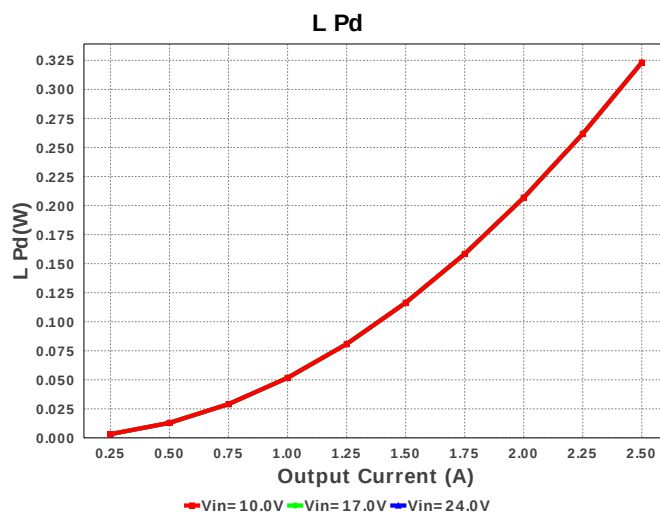
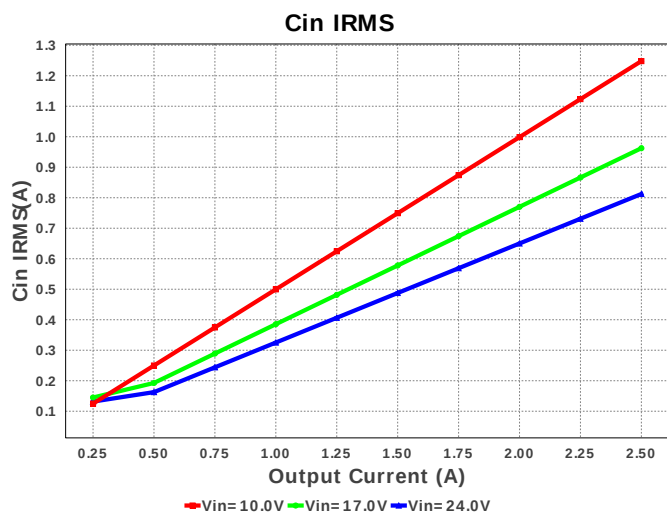
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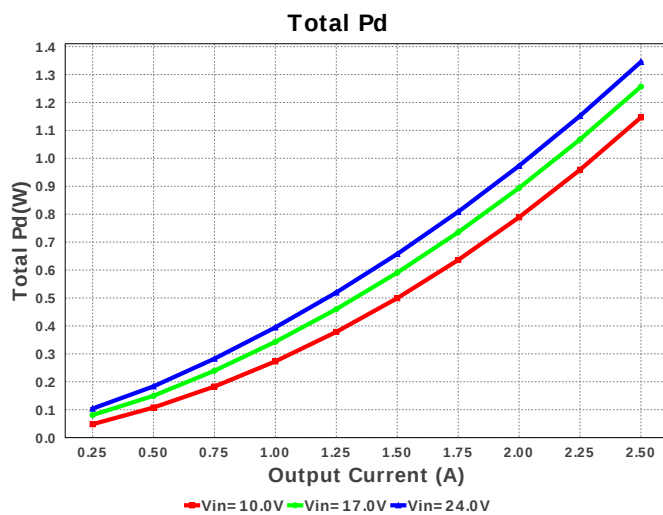
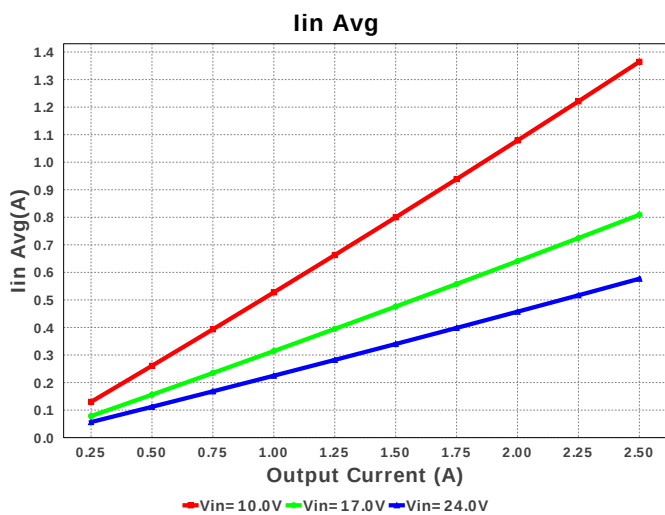
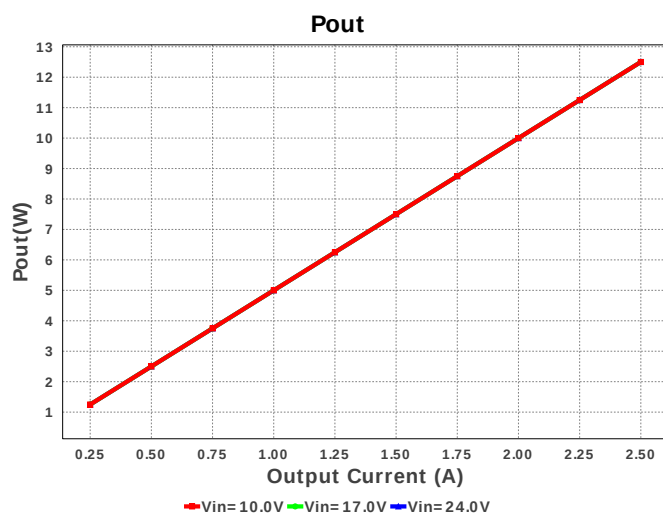
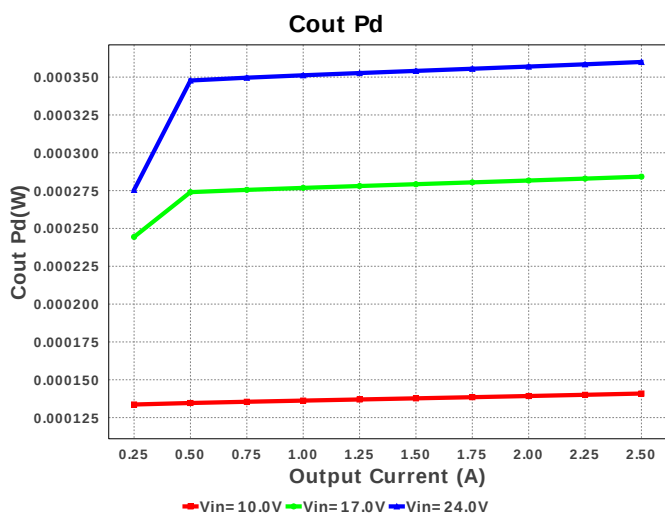
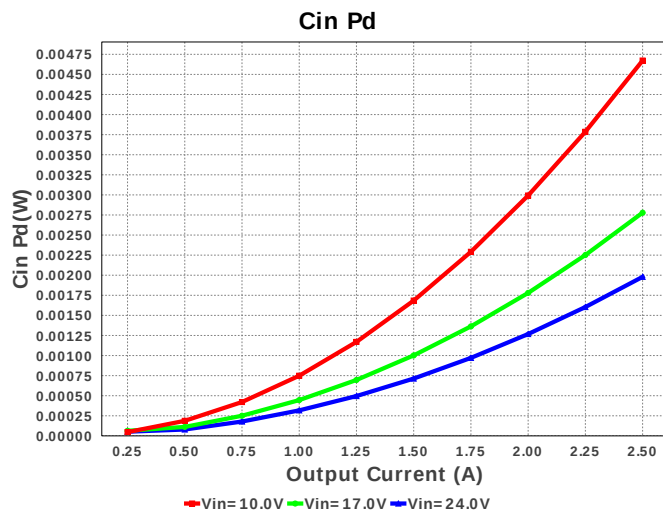
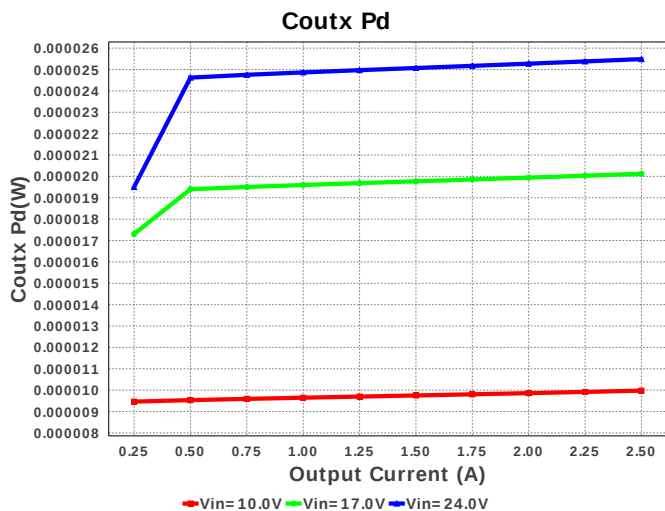
Electrical BOM

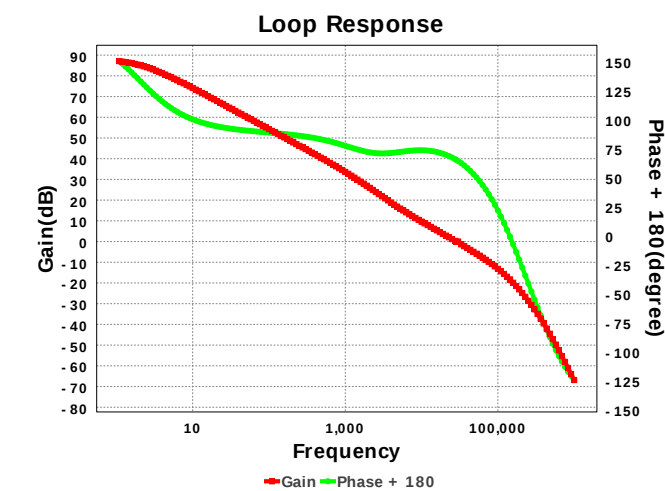
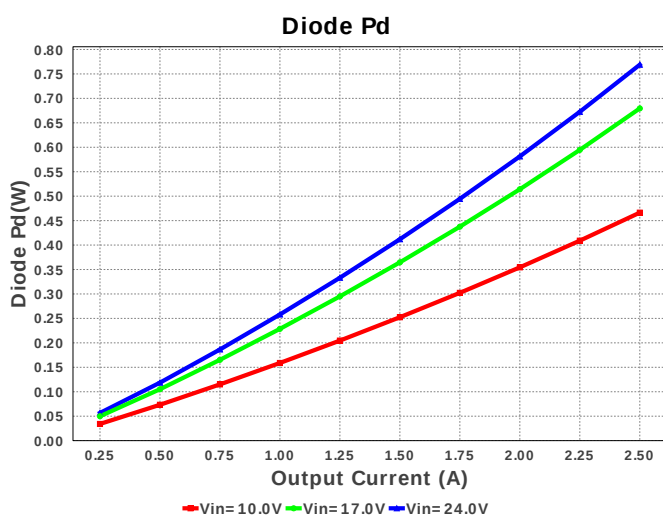
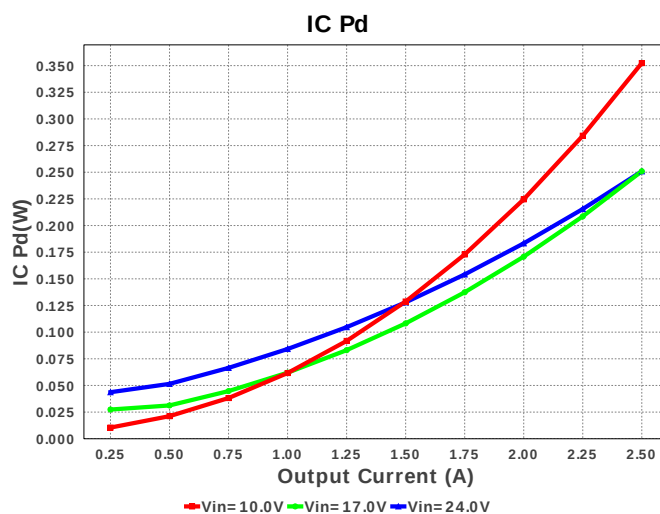
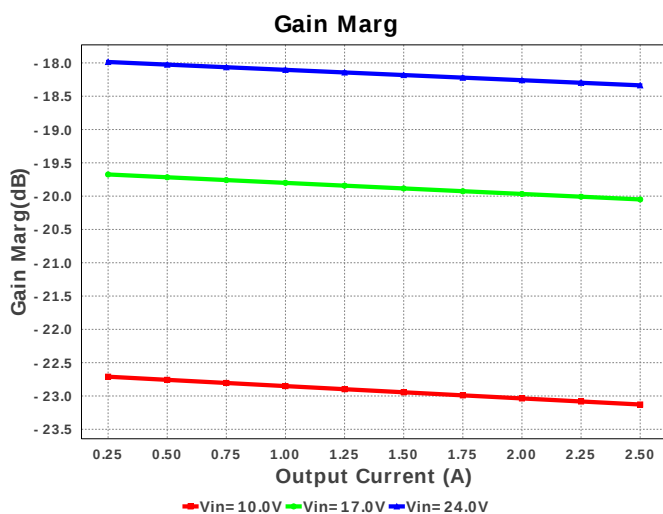
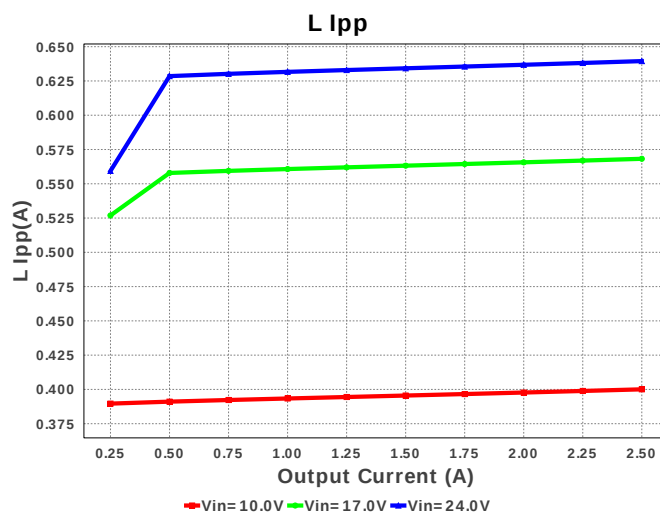
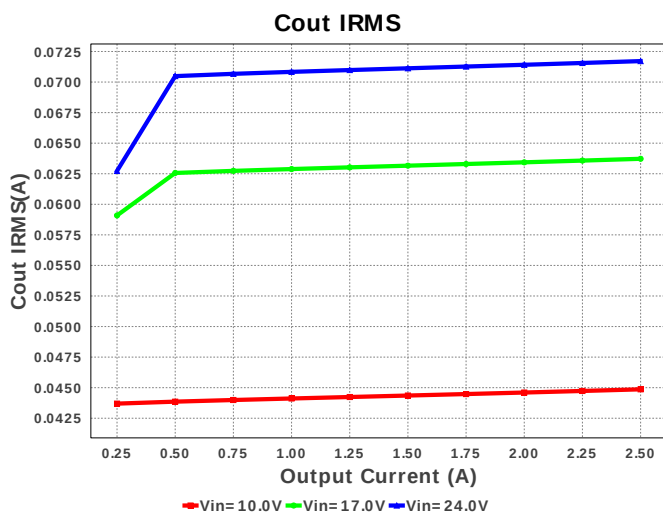
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cboot	TDK	C1005X5R1A104K Series= X5R	Cap= 100.0 nF ESR= 20.413 mOhm VDC= 10.0 V IRMS= 0.0 A	1	\$0.01	 1005 3 mm ²
2.	Ccomp	Yageo America	CC0805KRX7R9BB272 Series= X7R	Cap= 2.7 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	 0805 7 mm ²
3.	Ccomp2	Yageo America	CC0805JRNPO9BN390 Series= C0G/NP0	Cap= 39.0 pF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	 0805 7 mm ²
4.	Cin	MuRata	GRM31CR71H475KA12L Series= X7R	Cap= 4.7 uF ESR= 3.0 mOhm VDC= 50.0 V IRMS= 4.98 A	1	\$0.07	 1206 11 mm ²
5.	Cout	Panasonic	10TPB47M Series= TPB	Cap= 47.0 uF ESR= 70.0 mOhm VDC= 10.0 V IRMS= 1.1 A	1	\$0.36	 3528-21 17 mm ²
6.	Coutx	MuRata	GRM21BR71A106KE51L Series= X7R	Cap= 10.0 uF ESR= 4.0 mOhm VDC= 10.0 V IRMS= 4.35 A	2	\$0.06	 0805 7 mm ²
7.	D1	Diodes Inc.	B540C-13-F	VF@Io= 550.0 mV VRRM= 40.0 V	1	\$0.17	 SMC 83 mm ²
8.	L1	Bourns	SDR1307-220ML	L= 22.0 µH DCR= 47.0 mOhm	1	\$0.35	 SDR1307 227 mm ²
9.	Rcomp	Vishay-Dale	CRCW040216K9FKED Series= CRCW..e3	Res= 16.9 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
10.	Rfbb	Vishay-Dale	CRCW040210K2FKED Series= CRCW..e3	Res= 10.2 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
11.	Rfbt	Vishay-Dale	CRCW040253K6FKED Series= CRCW..e3	Res= 53.6 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
12.	Rt	Vishay-Dale	CRCW0402324KFKED Series= CRCW..e3	Res= 324.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
13.	U1	Texas Instruments	TPS54340DDAR	Switcher	1	\$1.68	

R-PDSO-G8 57 mm²







Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	813.034 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	72.109 mA	Current	Output capacitor RMS ripple current
3.	Coutx IRMS	113.511 mA	Current	Output capacitor _x RMS ripple current
4.	Iin Avg	580.04 mA	Current	Average input current
5.	L Ipp	643.01 mA	Current	Peak-to-peak inductor ripple current
6.	BOM Count	14	General	Total Design BOM count
7.	FootPrint	437.0 mm ²	General	Total Foot Print Area of BOM components
8.	Frequency	300.123 kHz	General	Switching frequency
9.	Mode	CCM	General	Conduction Mode
10.	Pout	12.5 W	General	Total output power
11.	Total BOM	\$2.82	General	Total BOM Cost

#	Name	Value	Category	Description
12.	ICThetaJA Effective	26.0 degC/W	Op_Point	Effective IC Junction-to-Ambient Thermal Resistance
13.	Low Freq Gain	87.067 dB	Op_Point	Gain at 10Hz
14.	Vout OP	5.0 V	Op_Point	Operational Output Voltage
15.	Cross Freq	28.603 kHz	Op_point	Bode plot crossover frequency
16.	Duty Cycle	22.345 %	Op_point	Duty cycle
17.	Efficiency	89.806 %	Op_point	Steady state efficiency
18.	Gain Marg	-18.337 dB	Op_point	Bode Plot Gain Margin
19.	IC Tj	36.542 degC	Op_point	IC junction temperature
20.	IOUT_OP	2.5 A	Op_point	Iout operating point
21.	Phase Marg	66.235 deg	Op_point	Bode Plot Phase Margin
22.	VIN_OP	24.0 V	Op_point	Vin operating point
23.	Vout p-p	13.897 mV	Op_point	Peak-to-peak output ripple voltage
24.	Cin Pd	1.983 mW	Power	Input capacitor power dissipation
25.	Cout Pd	363.979 µW	Power	Output capacitor power dissipation
26.	Coutx Pd	25.769 µW	Power	Output capacitor_x power loss
27.	Diode Pd	841.801 mW	Power	Diode power dissipation
28.	IC Pd	251.626 mW	Power	IC power dissipation
29.	L Pd	323.125 mW	Power	Inductor power dissipation
30.	Total Pd	1.419 W	Power	Total Power Dissipation

Design Inputs

#	Name	Value	Description
1.	Iout	2.5	Maximum Output Current
2.	Iout1	2.5	Output Current #1
3.	VinMax	24.0	Maximum input voltage
4.	VinMin	10.0	Minimum input voltage
5.	Vout	5.0	Output Voltage
6.	Vout1	5.0	Output Voltage #1
7.	base_pn	TPS54340	Base Product Number
8.	source	DC	Input Source Type
9.	Ta	30.0	Ambient temperature
10.	UserFsw	300.0 k	Customer Selected Frequency

Design Assistance

1. **TPS54340** Product Folder : <http://www.ti.com/product/TPS54340> : contains the data sheet and other resources.

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