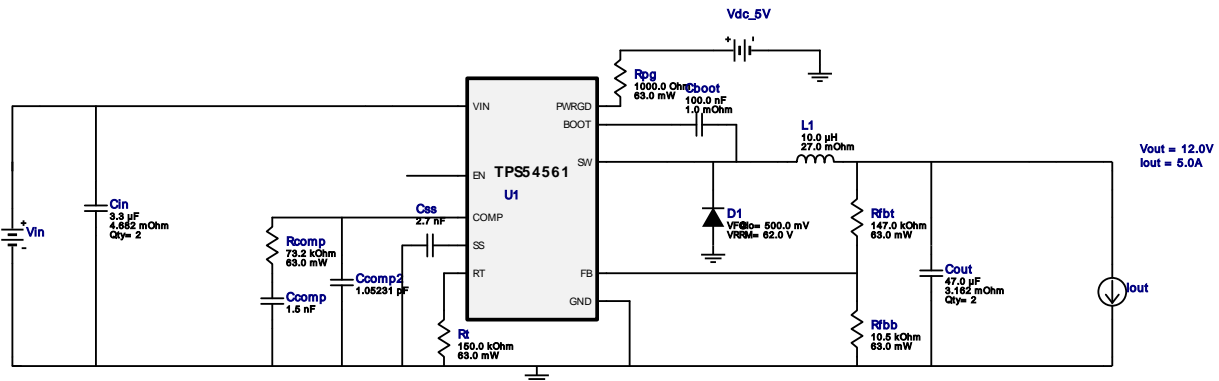


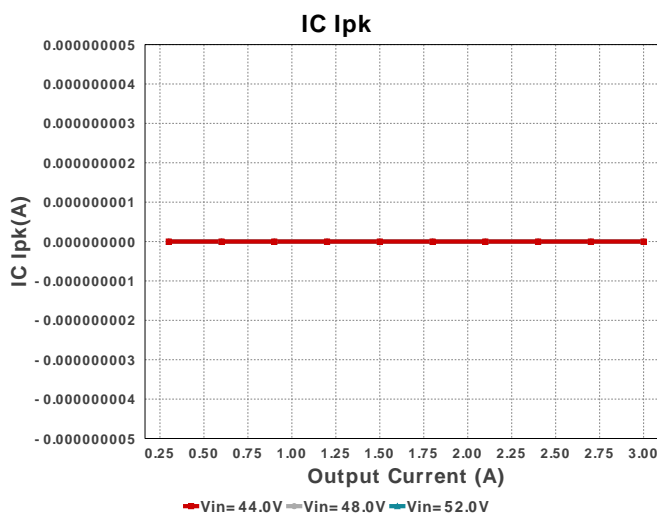
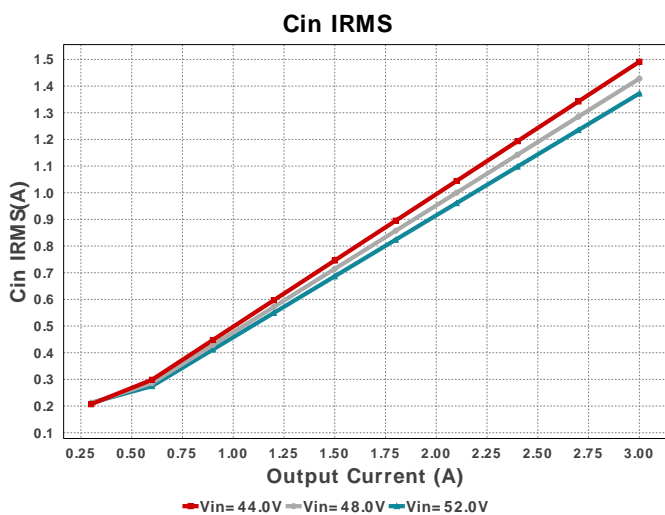
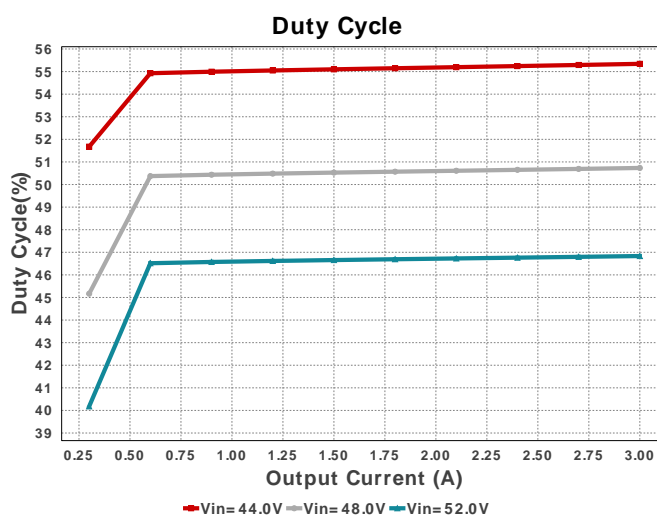
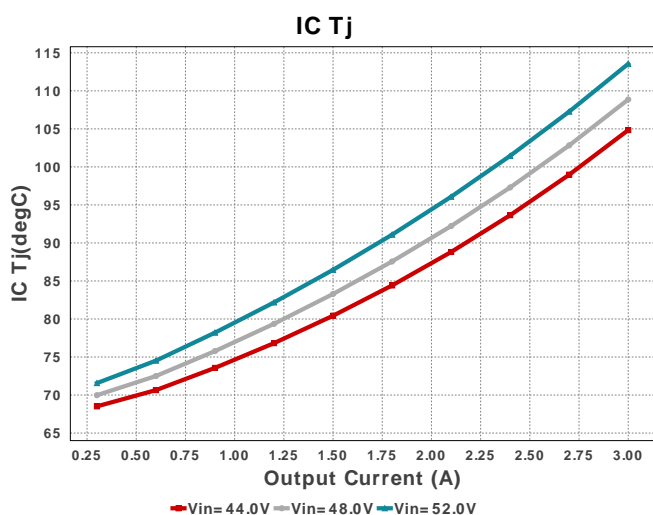
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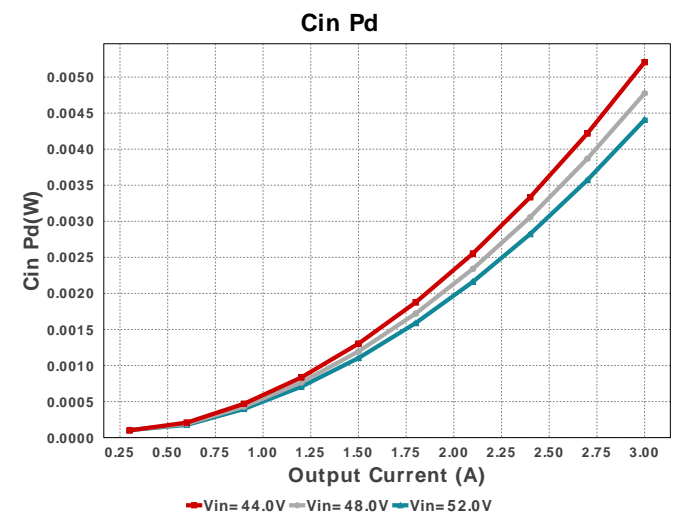
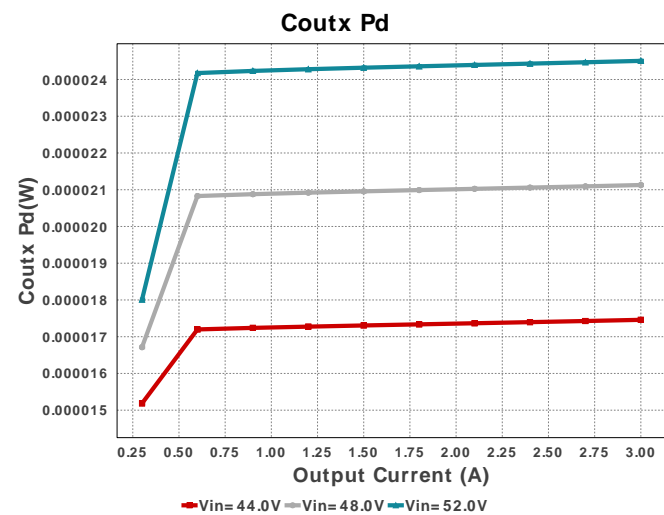
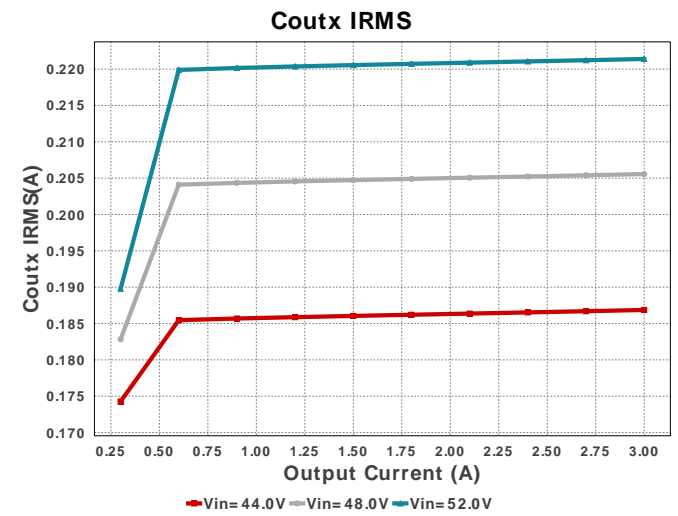
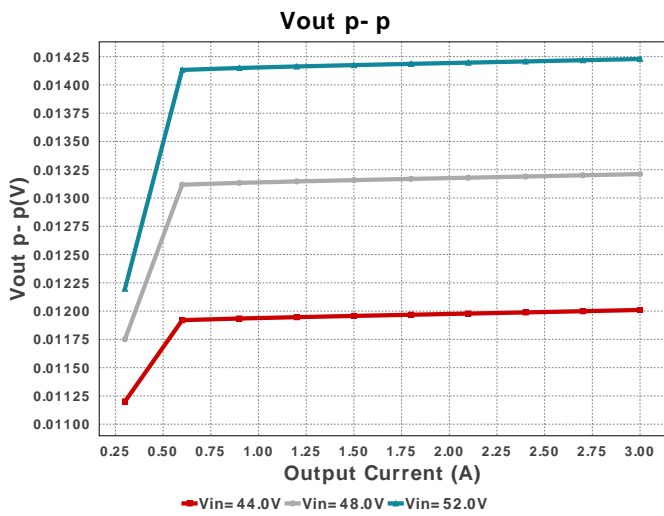
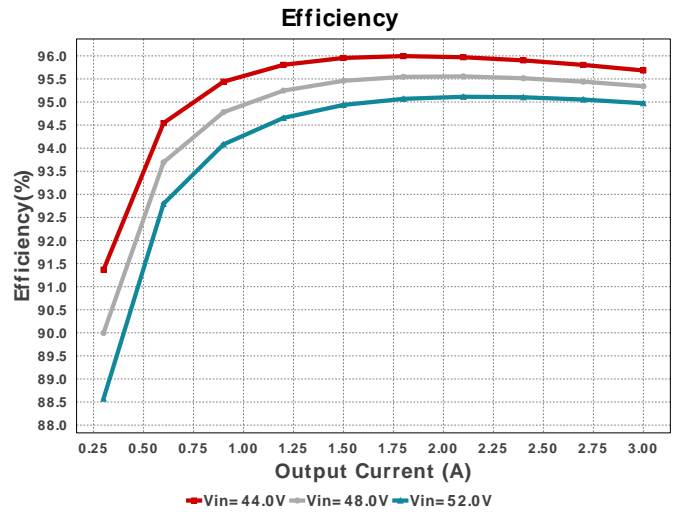
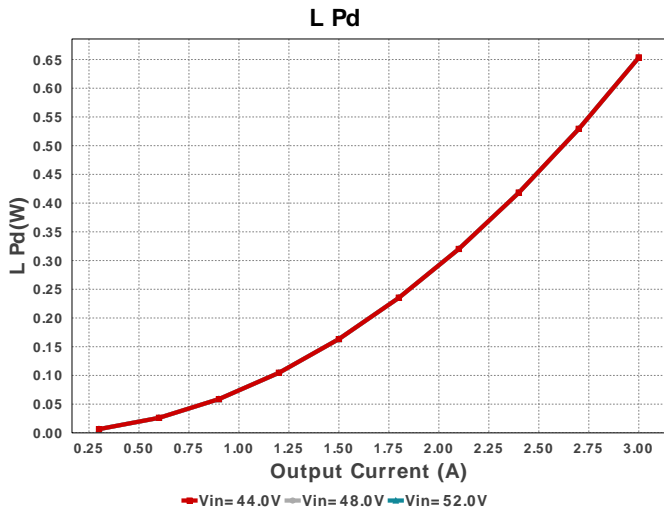
TPS54561DPRR 44V-52V to 12.00V @ 5A

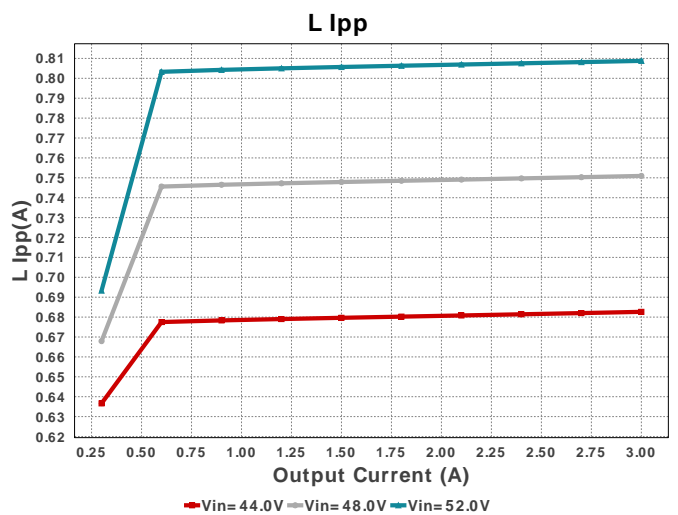
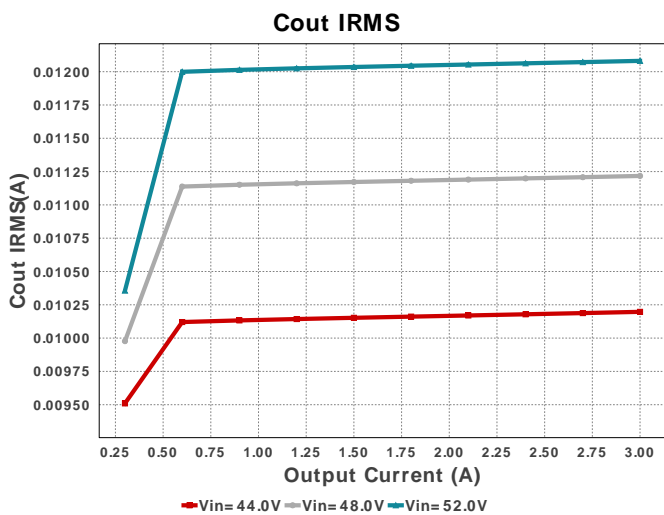
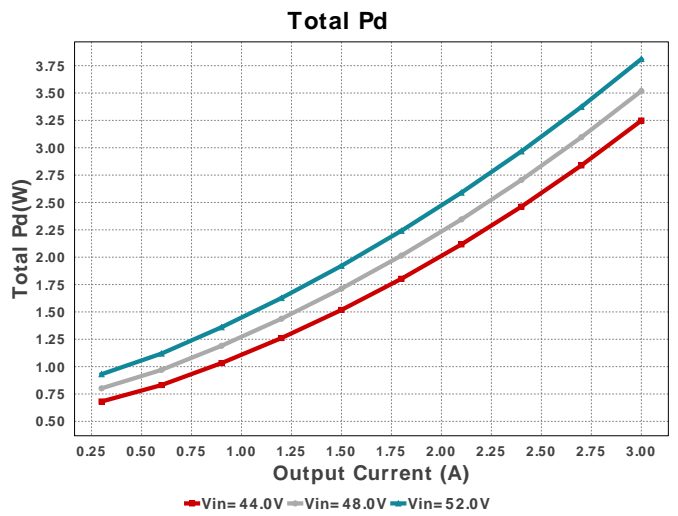
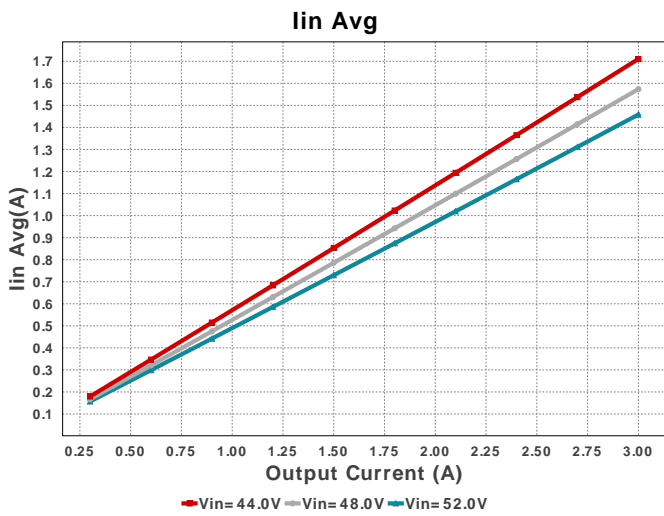
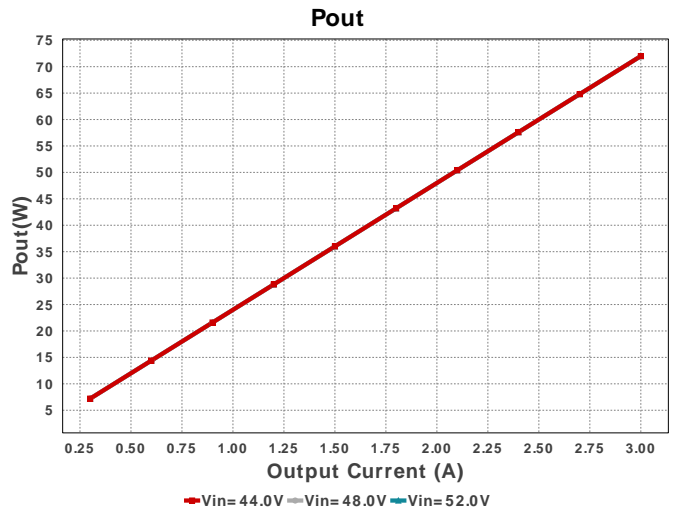
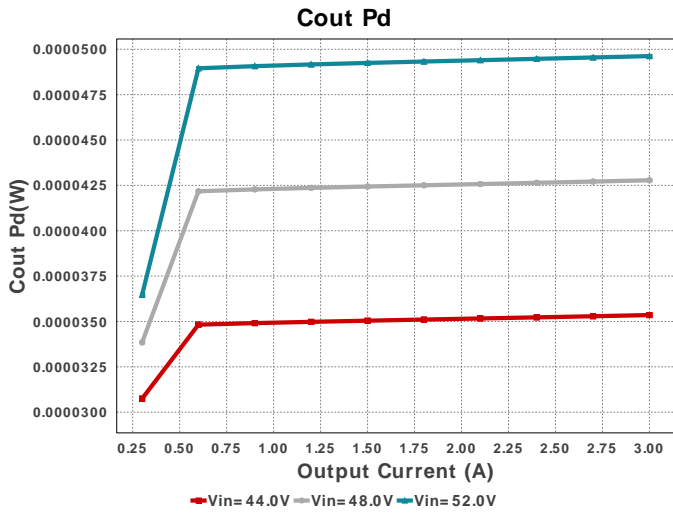

Electrical BOM

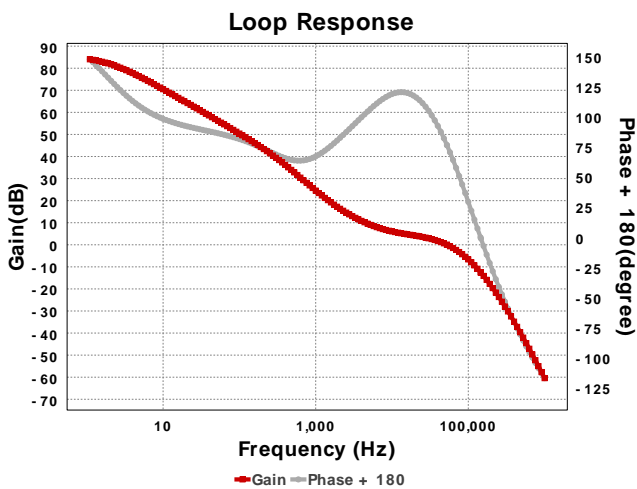
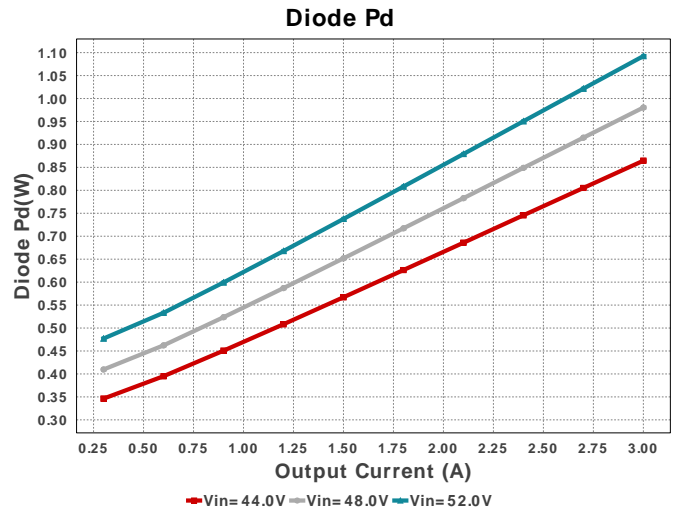
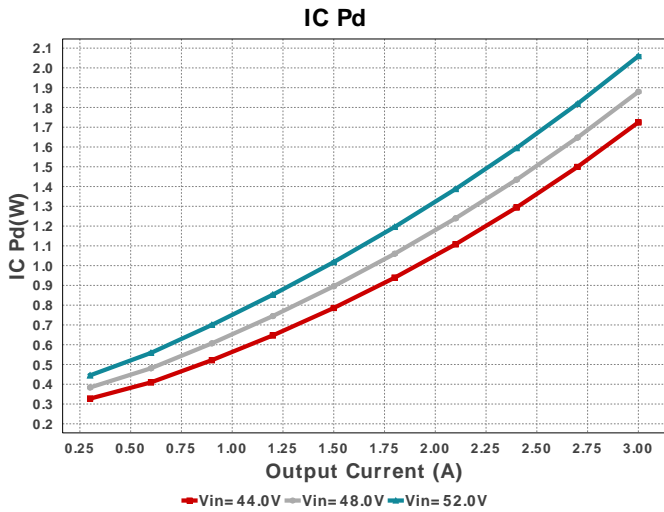
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cboot	MuRata	GRM155R71A104KA01D Series= X7R	Cap= 100.0 nF ESR= 1.0 mOhm VDC= 10.0 V IRMS= 0.0 A	1	\$0.01	0402 3 mm ²
2.	Ccomp	Samsung Electro-Mechanics	CL10C152JB8NNNC Series= C0G/NP0	Cap= 1.5 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.02	0603 5 mm ²
3.	Ccomp2	CUSTOM	CUSTOM Series= ?	Cap= 1.05231 pF VDC= 0.0 V IRMS= 0.0 A	1	NA	CUSTOM 0 mm ²
4.	Cin	TDK	C3225X7S2A335K200AB Series= X7S	Cap= 3.3 uF ESR= 4.682 mOhm VDC= 100.0 V IRMS= 3.39944 A	2	\$0.29	1210 15 mm ²
5.	Cout	TDK	C5750X5R1C476M230KA Series= X5R	Cap= 47.0 uF ESR= 3.162 mOhm VDC= 16.0 V IRMS= 5.1344 A	2	\$0.72	2220_250 54 mm ²
6.	Css	MuRata	GRM1885C1H272JA01J Series= C0G/NP0	Cap= 2.7 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.02	0603 5 mm ²
7.	D1	CUSTOM	CUSTOM	VF@Io= 500.0 mV VRRM= 62.0 V	1	NA	CUSTOM 0 mm ²
8.	L1	Coilcraft	XAL6060-103MEB	L= 10.0 uH DCR= 27.0 mOhm	1	\$0.82	XAL6060 72 mm ²
9.	Rcomp	Vishay-Dale	CRCW040273K2FKED Series= CRCW..e3	Res= 73200.0Ohm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
10.	Rfbb	Vishay-Dale	CRCW040210K5FKED Series= CRCW..e3	Res= 10500.0Ohm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
11.	Rfbt	Vishay-Dale	CRCW0402147KFKED Series= CRCW..e3	Res= 147000.0Ohm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
12.	Rpg	Vishay-Dale	CRCW04021K00FKED Series= CRCW..e3	Res= 1000.0Ohm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
13.	Rt	Vishay-Dale	CRCW0402150KFKED Series= CRCW..e3	Res= 150000.0Ohm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
14.	U1	Texas Instruments	TPS54561DPRR	Switcher	1	\$2.02	S-PWSON-N10 26 mm ²









Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	2.073 A	Capacitor	Input capacitor RMS ripple current
2.	Cin Pd	10.059 mW	Capacitor	Input capacitor power dissipation
3.	Cout IRMS	424.203 mA	Capacitor	Output capacitor RMS ripple current
4.	Cout Pd	284.5 μW	Capacitor	Output capacitor power dissipation
5.	Diode Pd	1.9 W	Diode	Diode power dissipation
6.	IC Ipk	0.0 A	IC	Peak switch current in IC
7.	IC Pd	2.908 W	IC	IC power dissipation
8.	IC Tj	135.605 degC	IC	IC junction temperature
9.	ICThetaJA Effective	26.0 degC/W	IC	Effective IC Junction-to-Ambient Thermal Resistance
10.	Iin Avg	1.261 A	IC	Average input current
11.	L Ipp	1.47 A	Inductor	Peak-to-peak inductor ripple current
12.	L Pd	742.5 mW	Inductor	Inductor power dissipation
13.	Cin Pd	10.059 mW	Power	Input capacitor power dissipation
14.	Cout Pd	284.5 μW	Power	Output capacitor power dissipation
15.	Diode Pd	1.9 W	Power	Diode power dissipation
16.	IC Pd	2.908 W	Power	IC power dissipation
17.	L Pd	742.5 mW	Power	Inductor power dissipation
18.	Total Pd	5.561 W	Power	Total Power Dissipation
19.	BOM Count	16	System	Total Design BOM count
20.	Cross Freq	51.685 kHz	System	Bode plot crossover frequency
21.	Duty Cycle	23.981 %	System	Duty cycle
22.	Efficiency	91.518 %	System	Steady state efficiency
23.	FootPrint	367.0 mm ²	System	Total Foot Print Area of BOM components
24.	Frequency	652.775 kHz	System	Switching frequency
25.	Gain Marg	-11.626 dB	System	Bode Plot Gain Margin

#	Name	Value	Category	Description
26.	Iout	5.0 A	System Information	Iout operating point
27.	Low Freq Gain	82.243 dB	System Information	Gain at 1Hz
28.	Mode	CCM	System Information	Conduction Mode
29.	Phase Marg	45.148 deg	System Information	Bode Plot Phase Margin
30.	Pout	60.0 W	System Information	Total output power
31.	Total BOM	NA	System Information	Total BOM Cost
32.	Vin	52.0 V	System Information	Vin operating point
33.	Vout	12.0 V	System Information	Operational Output Voltage
34.	Vout Actual	12.0 V	System Information	Vout Actual calculated based on selected voltage divider resistors
35.	Vout Tolerance	2.904 %	System Information	Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable
36.	Vout p-p	5.643 mV	System Information	Peak-to-peak output ripple voltage

Design Inputs

#	Name	Value	Description
1.	Iout	5.0	Maximum Output Current
2.	VinMax	52.0	Maximum input voltage
3.	VinMin	44.0	Minimum input voltage
4.	Vout	12.0	Output Voltage
5.	acFrequency	60.0	AC Frequency
6.	base_pn	TPS54561	Base Product Number
7.	source	DC	Input Source Type
8.	Ta	60.0	Ambient temperature

Design Assistance

1. **TPS54561** Product Folder : <http://www.ti.com/product/TPS54561> : contains the data sheet and other resources.

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