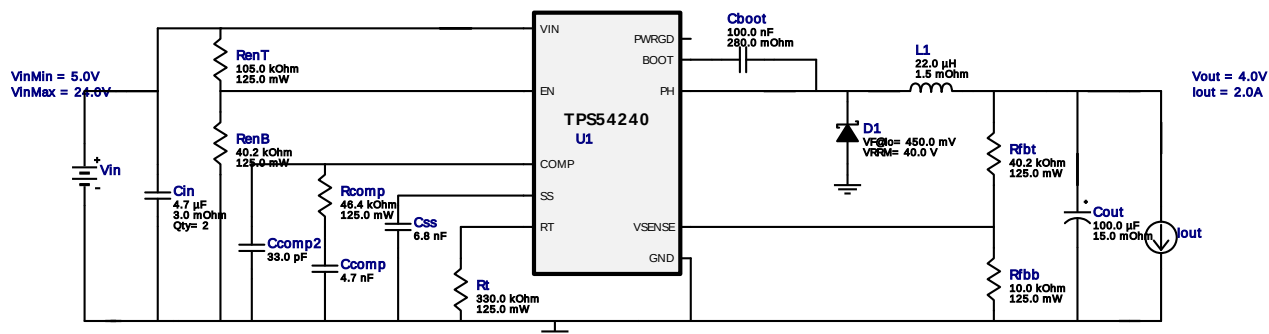


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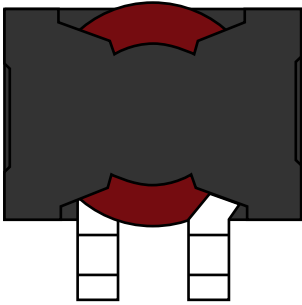
Design : 255474/33 TPS54240DGQR
TPS54240DGQR 5.0V-24.0V to 4.0V @ 2.0A

VinMin = 5.0V
VinMax = 24.0V
Vout = 4.0V
Iout = 2.0A

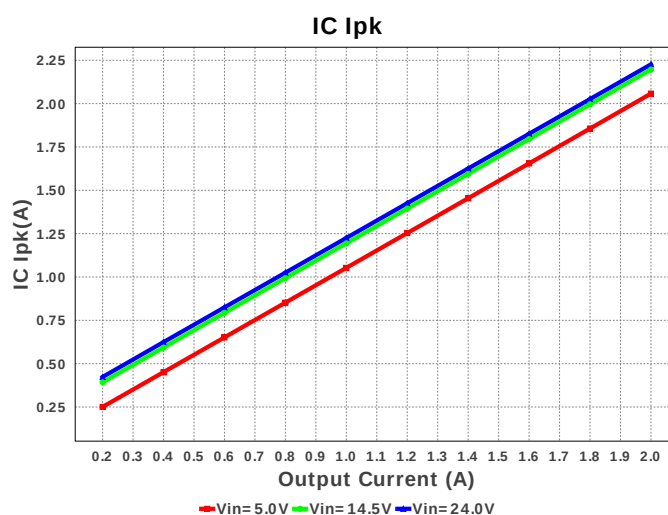
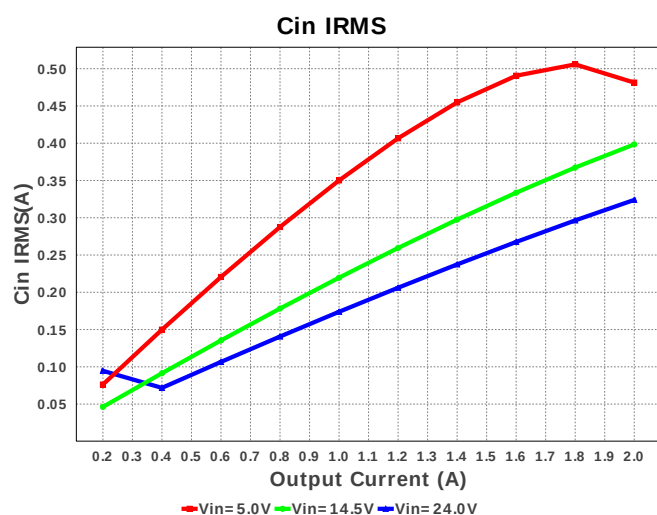
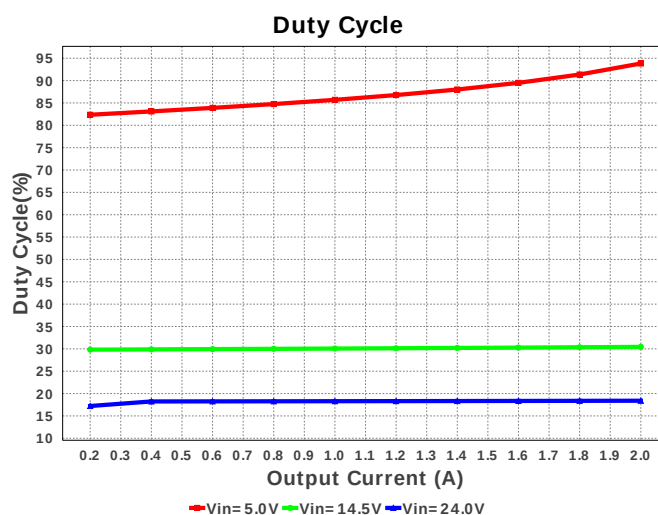
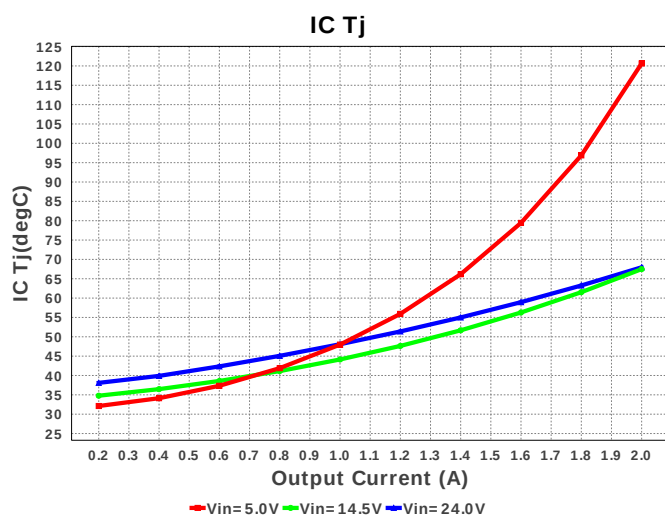
Device = TPS54240DGQR
Topology = Buck
Created = 10/7/14 7:13:20 AM
BOM Cost = \$4.83
Footprint = 1,128.0 mm²
BOM Count = 16
Total Pd = 0.02W

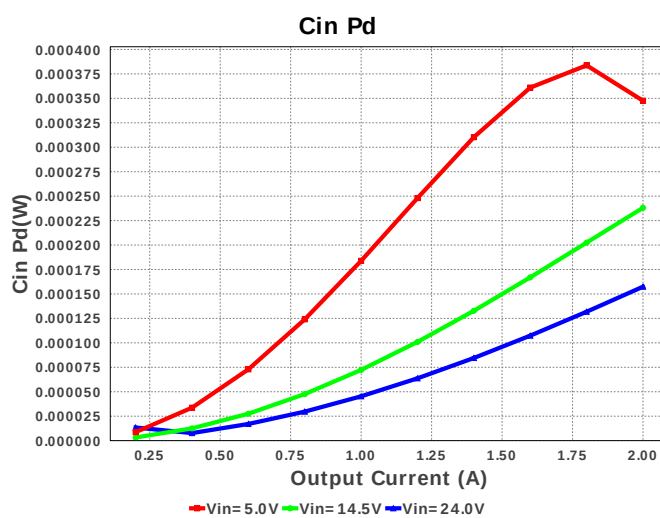
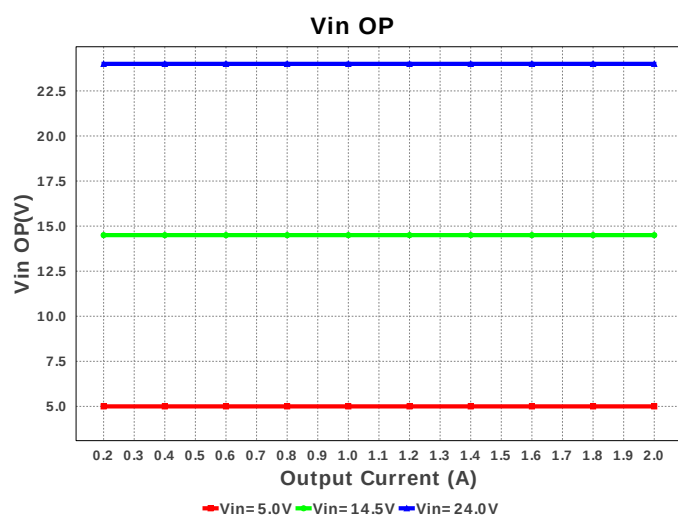
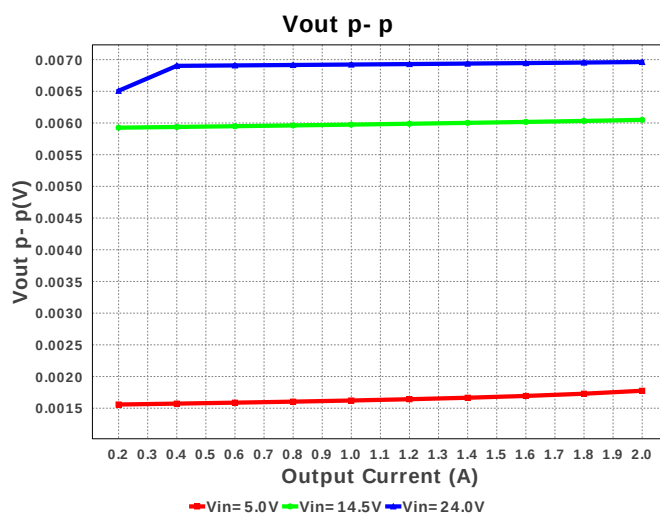
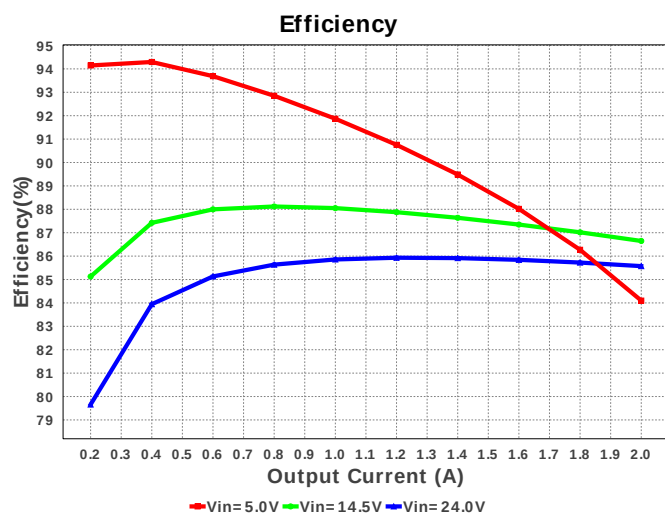
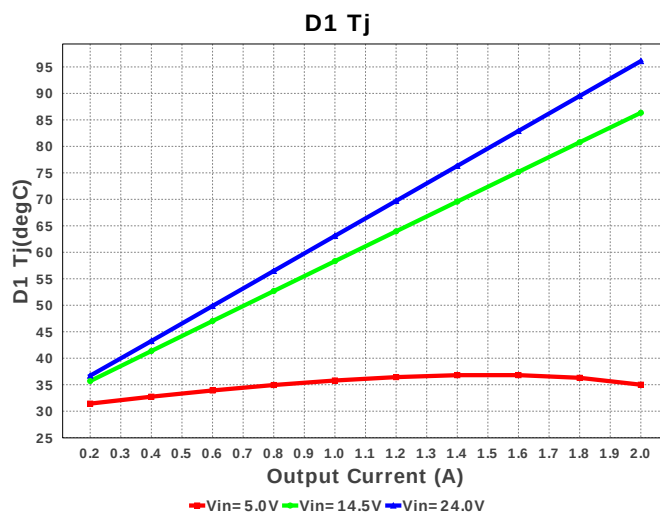
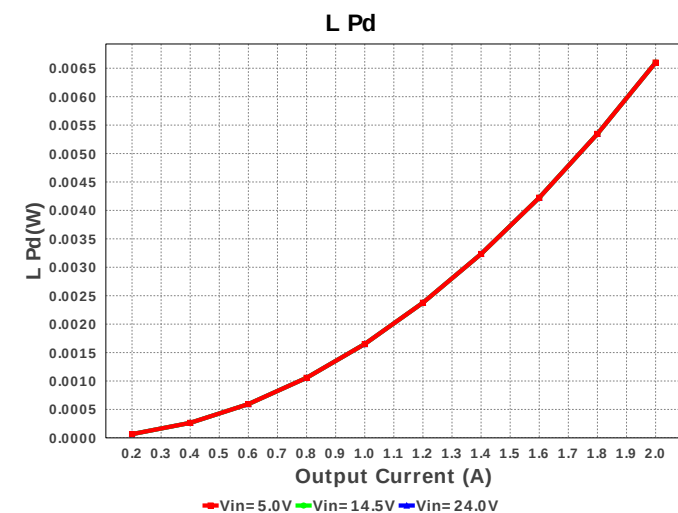


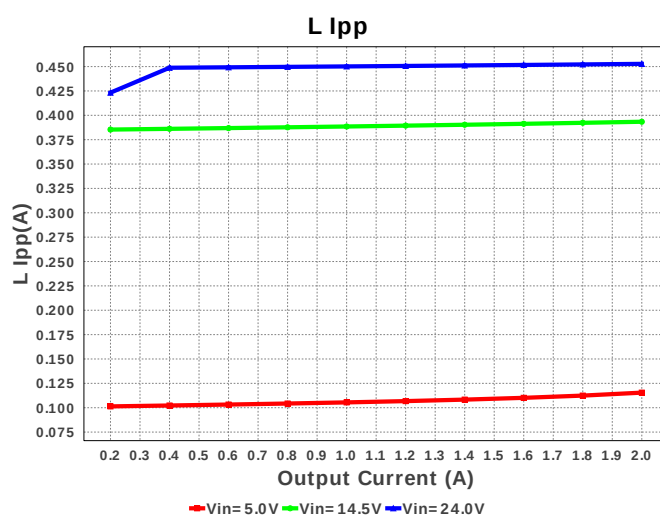
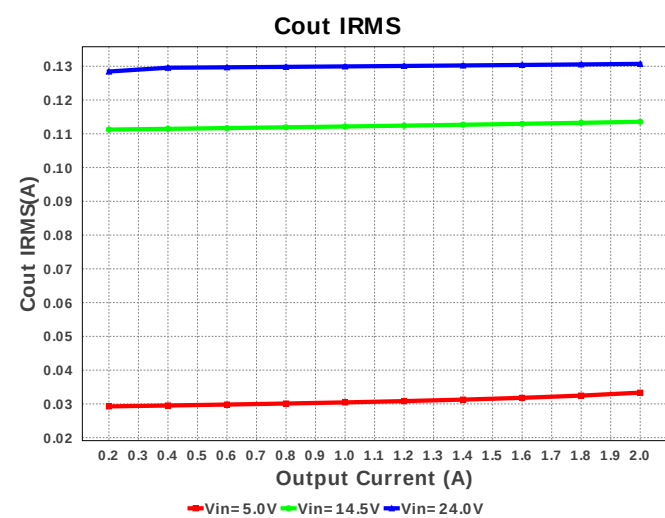
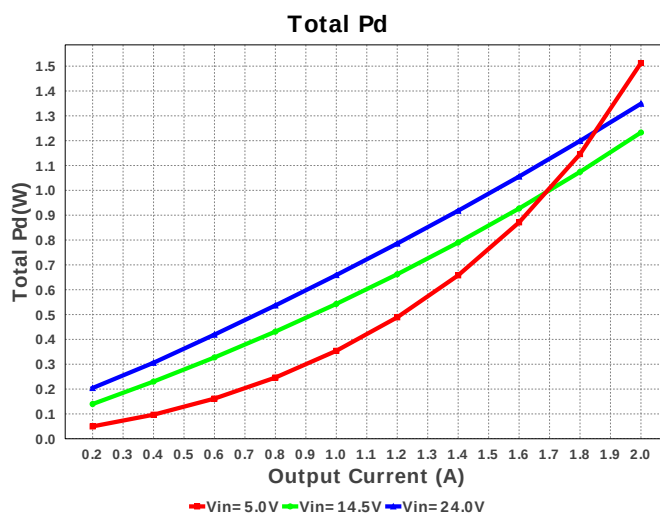
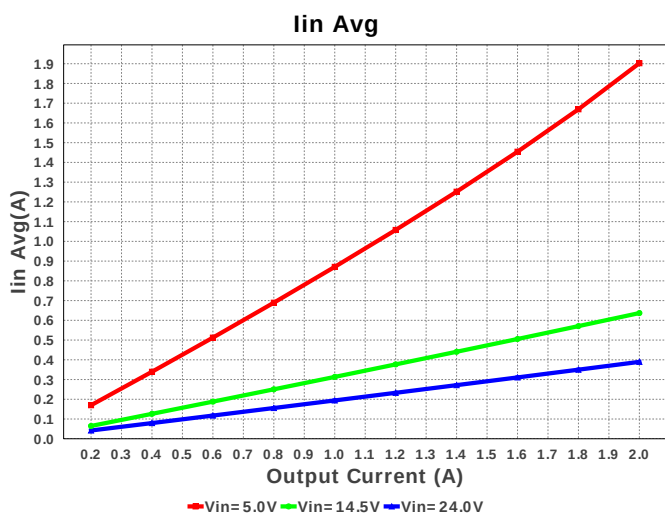
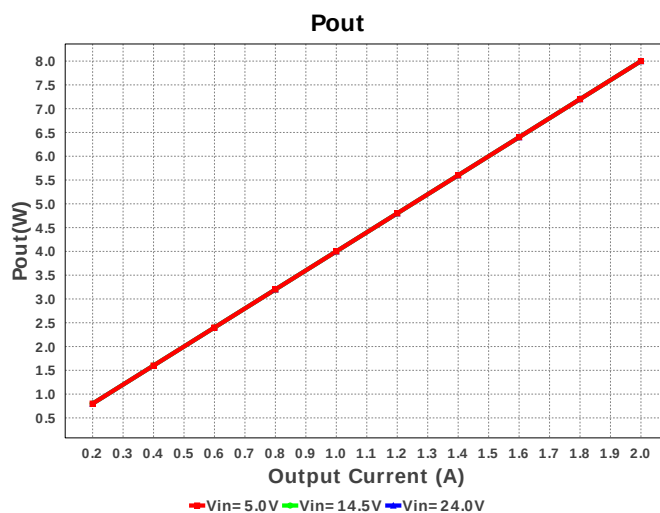
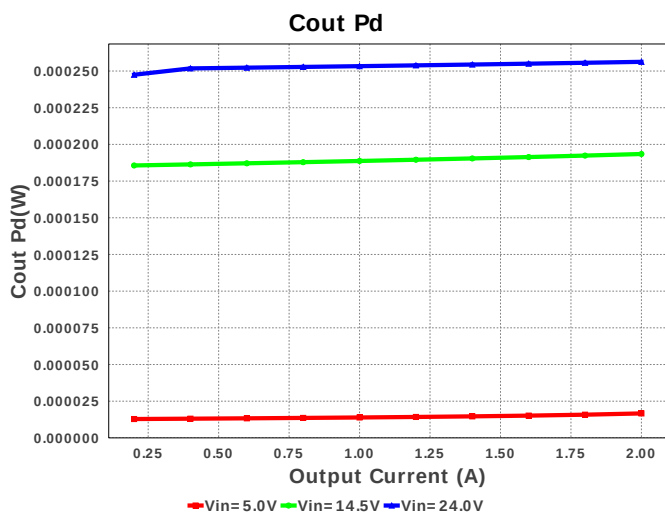
Electrical BOM

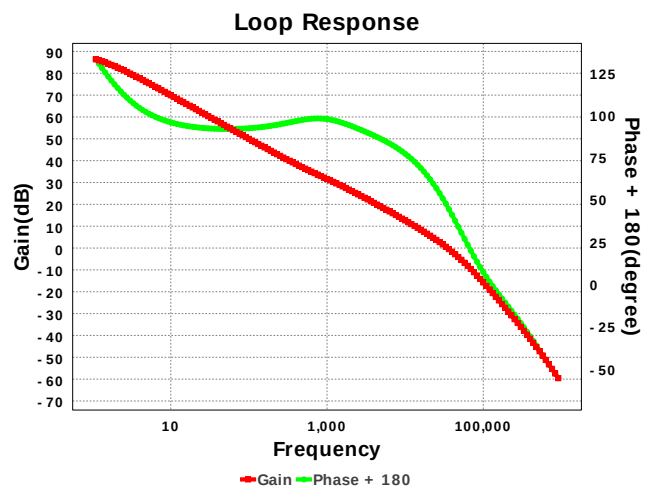
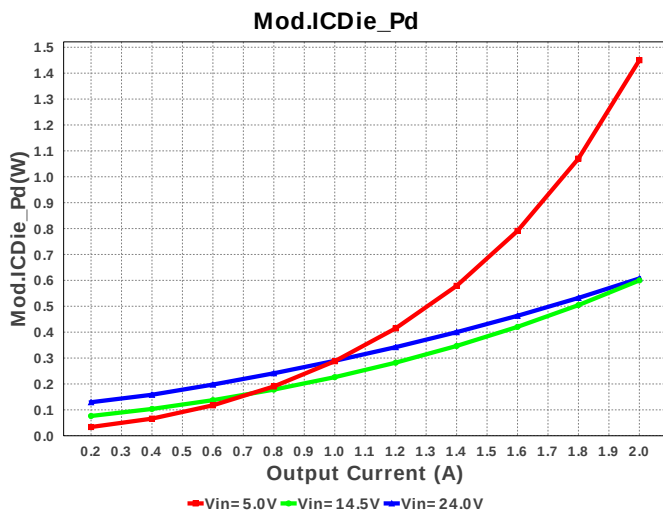
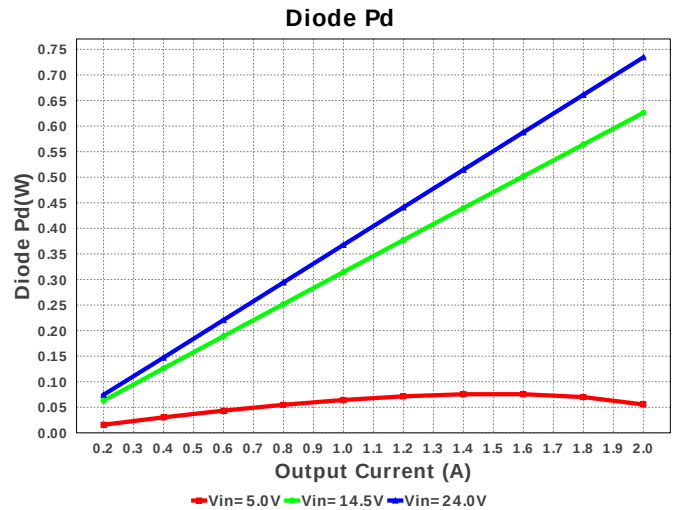
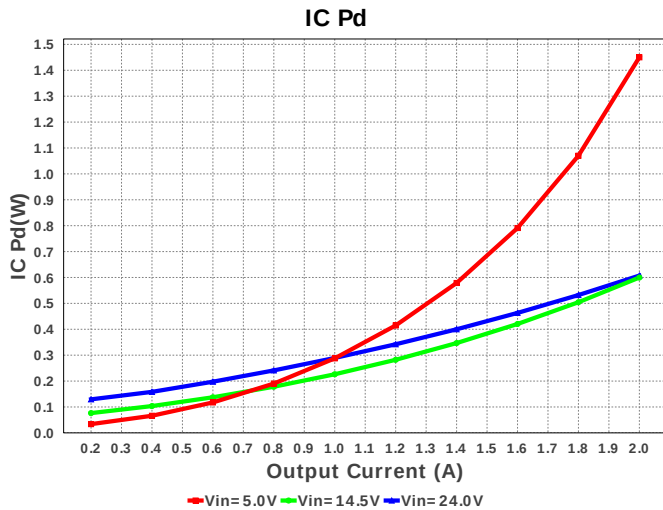
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cboot	AVX	08053C104KAT2A Series= X7R	Cap= 100.0 nF ESR= 280.0 mOhm VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	 0805 7 mm ²
2.	Ccomp	Vishay-Bccomponents	VJ0805Y472KXACW1BC Series= X7R	Cap= 4.7 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	 0805 7 mm ²
3.	Ccomp2	Yageo America	CC0805JRNP09BN330 Series= C0G/NP0	Cap= 33.0 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	2	\$0.10	 1206 11 mm ²
5.	Cout	Panasonic	EEF-UD0J101R Series= UD	Cap= 100.0 uF ESR= 15.0 mOhm VDC= 6.3 V IRMS= 3.0 A	1	\$0.76	 CAPSMT_6_UD 59 mm ²
6.	Css	Yageo America	CC0805KRX7R9BB682 Series= X7R	Cap= 6.8 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	 0805 7 mm ²
7.	D1	Diodes Inc.	B340LB-13-F	VF@Io= 450.0 mV VRRM= 40.0 V	1	\$0.14	 SMB 44 mm ²
8.	L1	Coilcraft	SER2915L-223KL	L= 22.0 uH DCR= 1.5 mOhm	1	\$2.05	 SER2915 895 mm ²
9.	Rcomp	Vishay-Dale	CRCW080546K4FKEA Series= CRCW..e3	Res= 46.4 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7 mm ²

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
10.	RenB	Panasonic	ERJ-6ENF4022V Series= 225	Res= 40.2 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7 mm ²
11.	RenT	Panasonic	ERJ-6ENF1053V Series= 225	Res= 105.0 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7 mm ²
12.	Rfbb	Panasonic	ERJ-6ENF1002V Series= 225	Res= 10.0 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7 mm ²
13.	Rfbt	Panasonic	ERJ-6ENF4022V Series= 225	Res= 40.2 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7 mm ²
14.	Rt	CUSTOM	CUSTOM Series= CUSTOM	Res= 330.0 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.10	CUSTOM 3 mm ²
15.	U1	Texas Instruments	TPS54240DGQR	Switcher	1	\$1.49	 S-PDSO-G10 24 mm ²









Operating Values

#	Name	Value	Category	Description
1.	BOM Count	16		Total Design BOM count
2.	Total BOM	\$4.826		Total BOM Cost
3.	Cin IRMS	2.655 mA	Current	Input capacitor RMS ripple current
4.	Cout IRMS	2.907 mA	Current	Output capacitor RMS ripple current
5.	IC Ipk	14.176 mA	Current	Peak switch current in IC
6.	Iin Avg	4.718 mA	Current	Average input current
7.	L Ipp	14.176 mA	Current	Peak-to-peak inductor ripple current
8.	FootPrint	1.128 k mm ²	General	Total Foot Print Area of BOM components
9.	Frequency	369.347 kHz	General	Switching frequency
10.	Pout	4.0 mW	General	Total output power
11.	D1 Tj	30.036 degC	Op_Point	D1 junction temperature
12.	Vout OP	4.0 V	Op_Point	Operational Output Voltage
13.	Cross Freq	11.341 kHz	Op_point	Bode plot crossover frequency
14.	Duty Cycle	11.52 %	Op_point	Duty cycle
15.	Efficiency	16.955 %	Op_point	Steady state efficiency
16.	IC Tj	31.2 degC	Op_point	IC junction temperature
17.	ICThetaJA	62.5 degC/W	Op_point	IC junction-to-ambient thermal resistance
18.	IOUT_OP	1.0 mA	Op_point	Iout operating point
19.	Phase Marg	26.216 deg	Op_point	Bode Plot Phase Margin
20.	VIN_OP	5.0 V	Op_point	Vin operating point
21.	Vout p-p	217.985 μ V	Op_point	Peak-to-peak output ripple voltage
22.	Cin Pd	10.575 nW	Power	Input capacitor power dissipation
23.	Cout Pd	126.772 nW	Power	Output capacitor power dissipation
24.	Diode Pd	398.161 μ W	Power	Diode power dissipation
25.	IC Pd	19.194 mW	Power	IC power dissipation
26.	L Pd	1.65 nW	Power	Inductor power dissipation
27.	Total Pd	19.592 mW	Power	Total Power Dissipation

Design Inputs

#	Name	Value	Description
1.	Iout	2.0 A	Maximum Output Current
2.	Iout1	2.0 Amps	Output Current #1
3.	SoftStart	2.176 ms	Soft Start Time (ms)
4.	VinMax	24.0 V	Maximum input voltage
5.	VinMin	5.0 V	Minimum input voltage
6.	Vout	4.0 V	Output Voltage
7.	Vout1	4.0 Volt	Output Voltage #1
8.	base_pn	TPS54240	Base Product Number
9.	source	DC	Input Source Type
10.	Ta	30.0 degC	Ambient temperature
11.	UserFsw	569.812 kHz	Customer Selected Frequency

Design Assistance

1. **TPS54240** Product Folder : <http://www.ti.com/product/tps54240> : contains the data sheet and other resources.

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