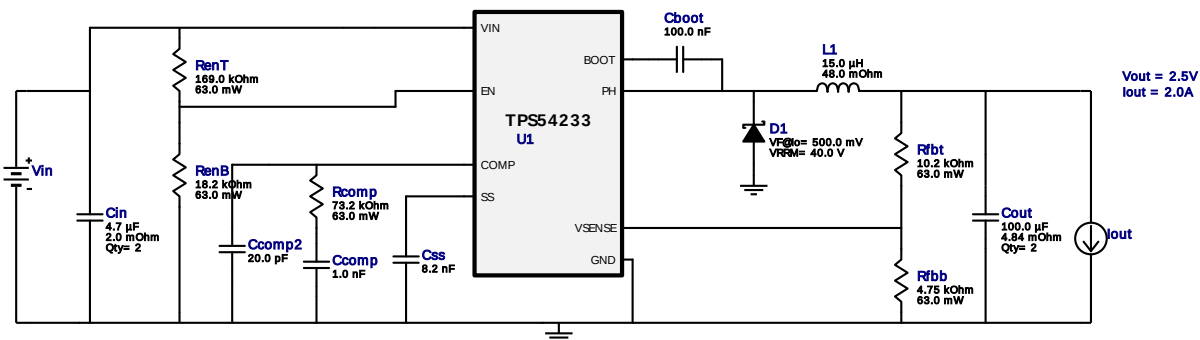
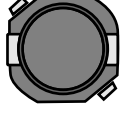


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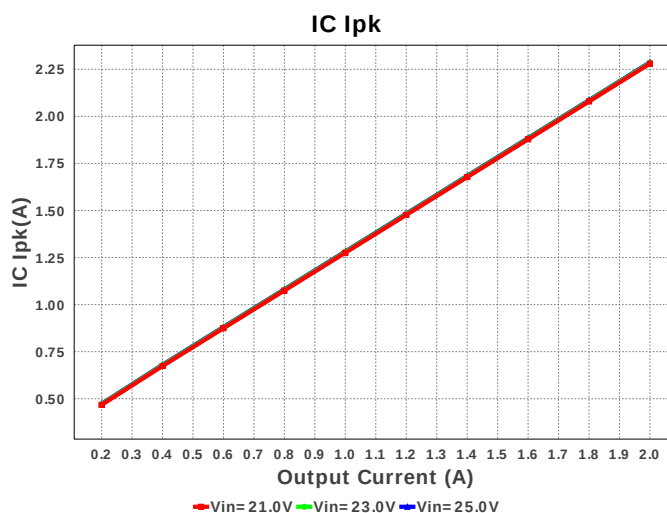
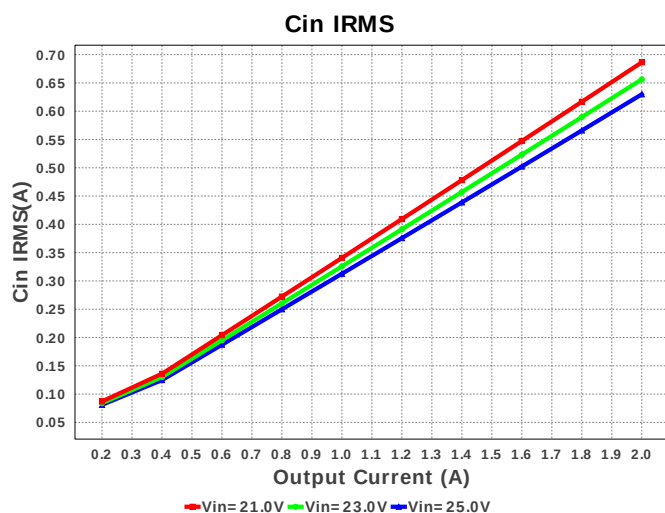
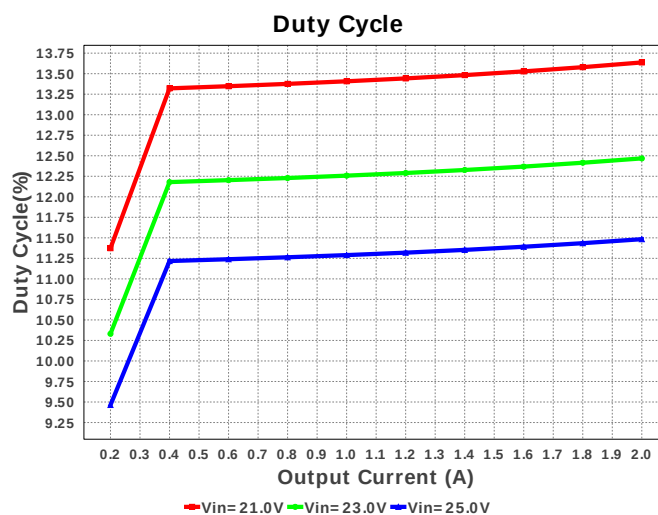
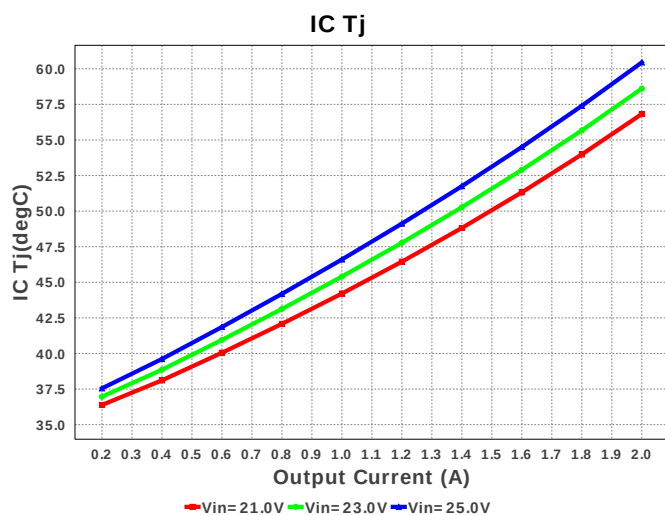
Design : 4742013/186 TPS54233DR
TPS54233DR 21.0V-25.0V to 2.50V @ 2.0A

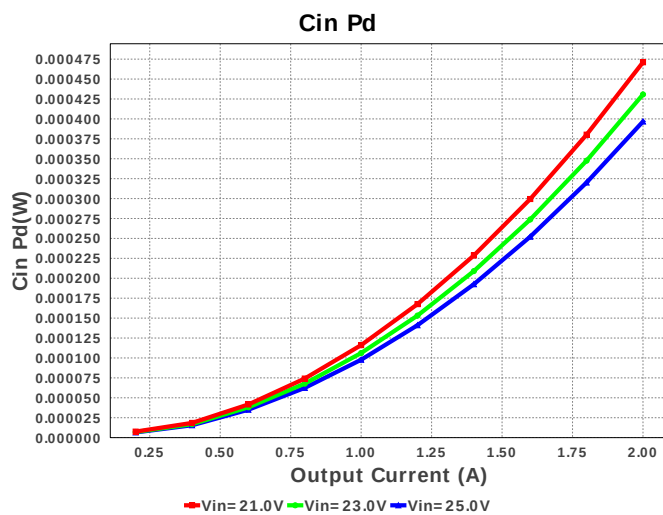
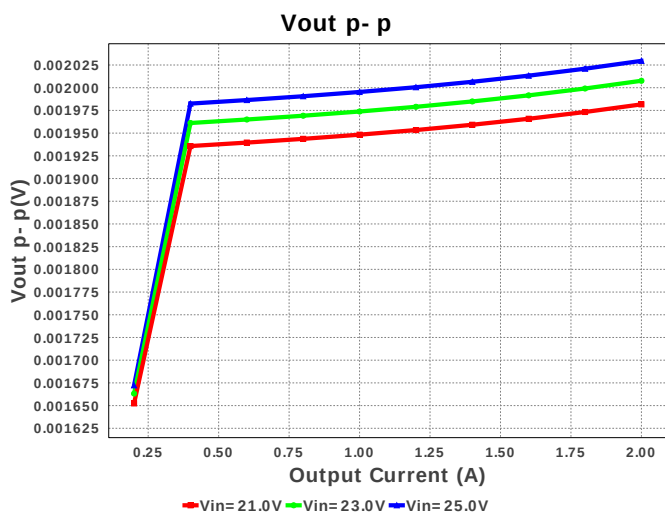
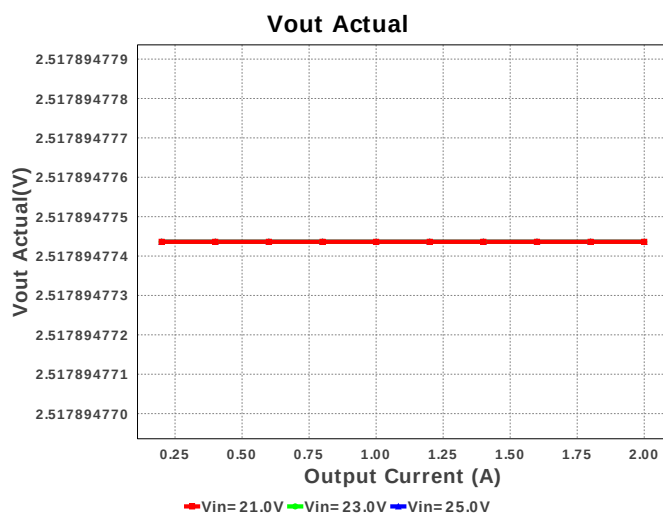
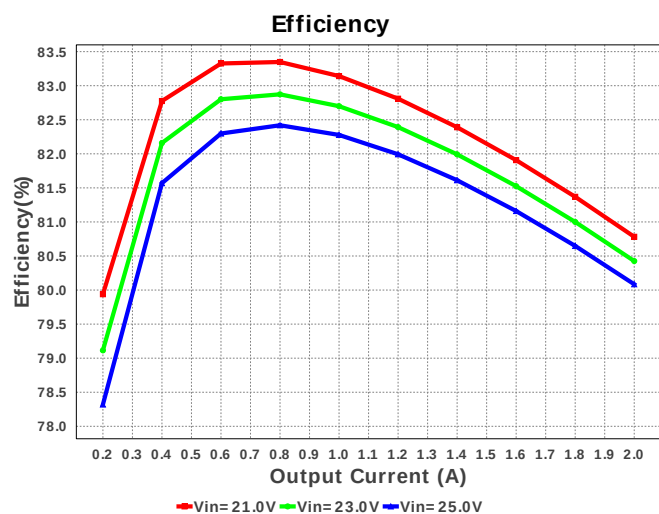
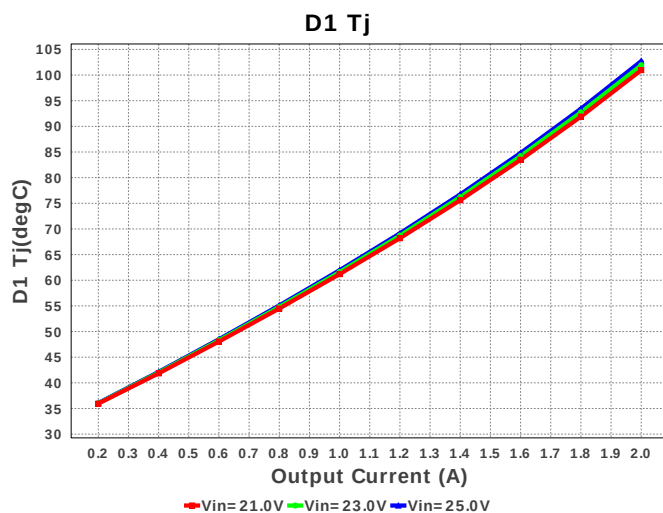
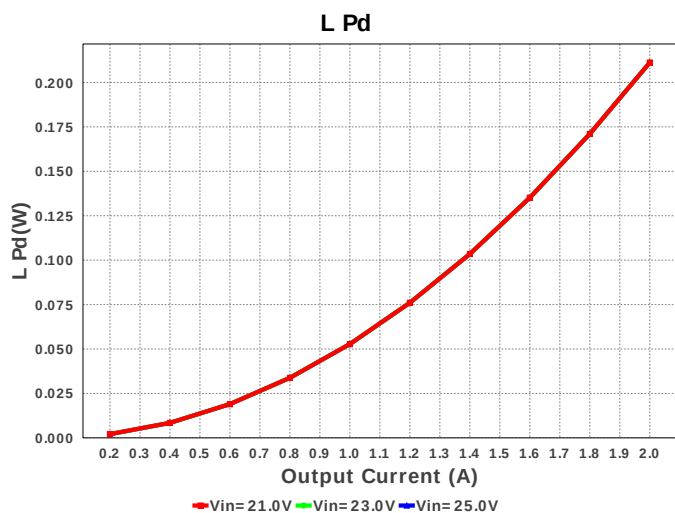


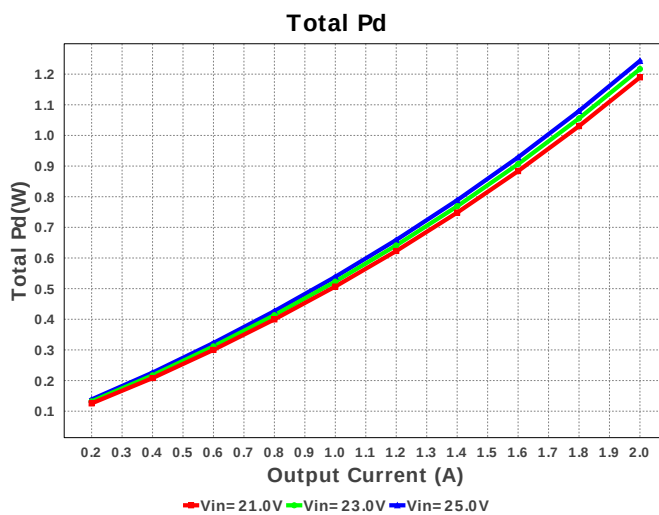
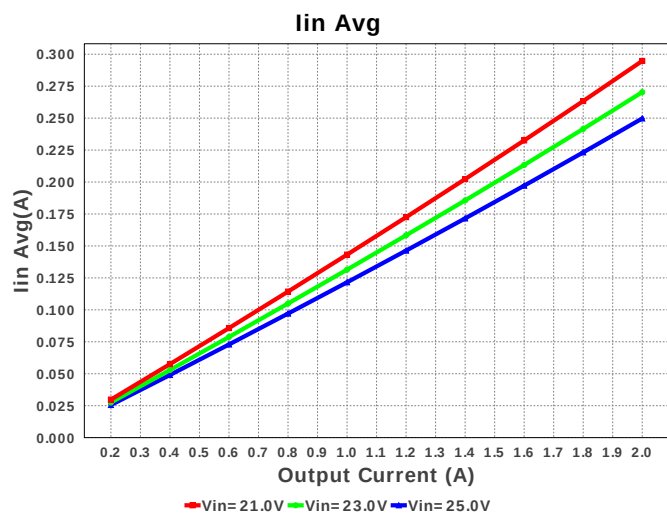
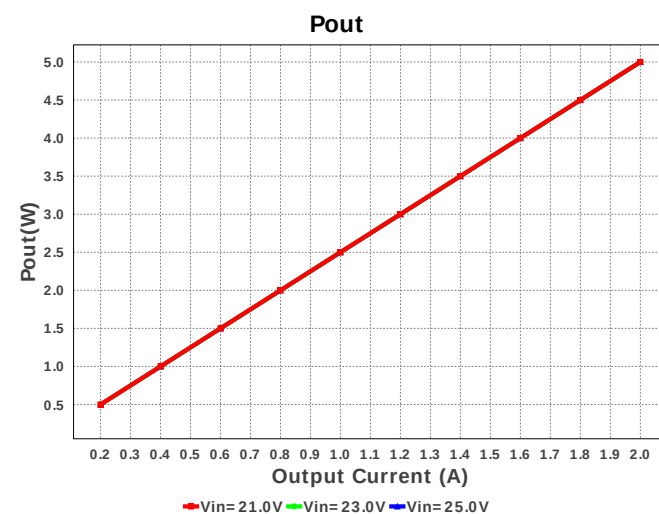
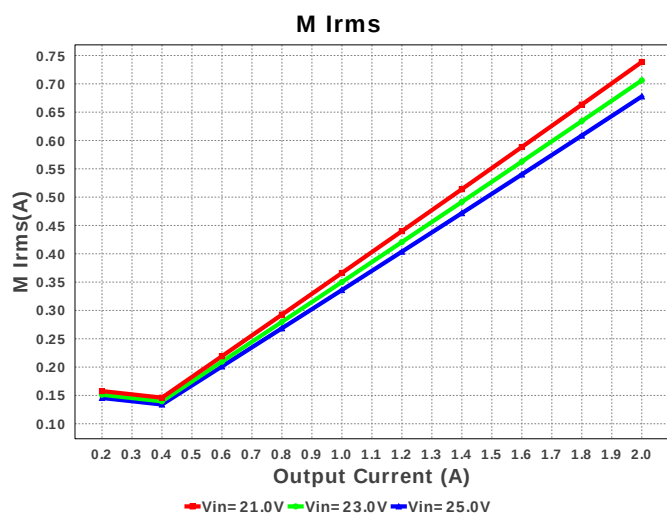
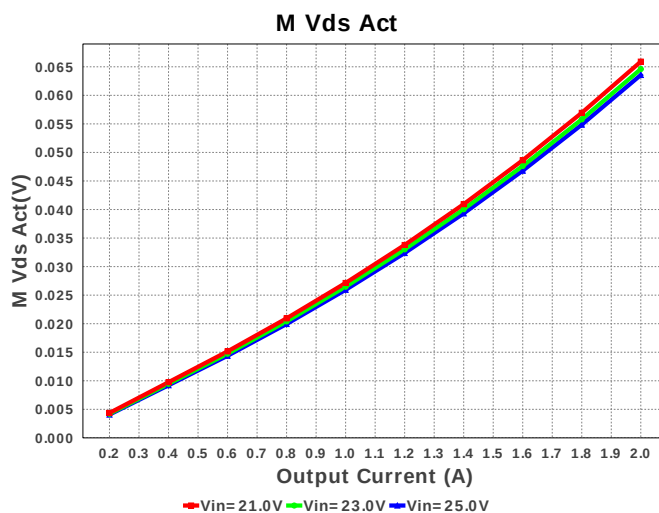
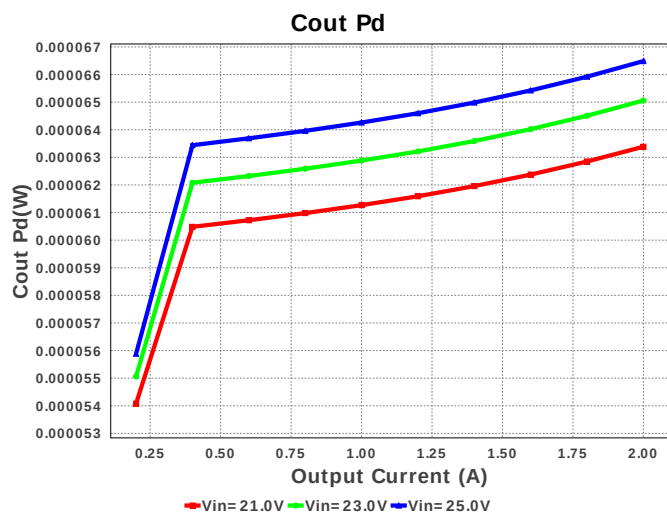
Electrical BOM

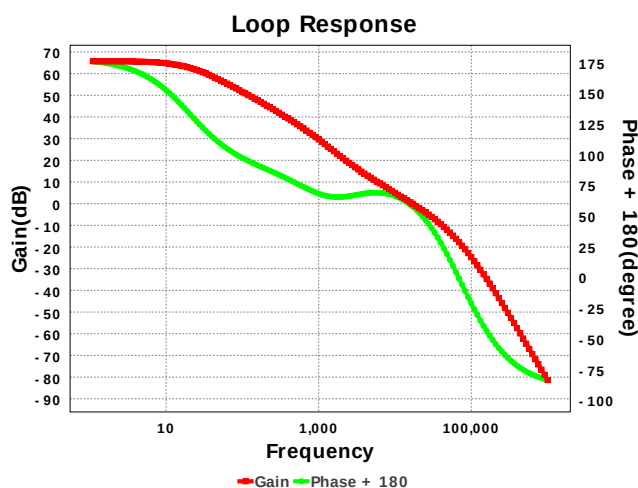
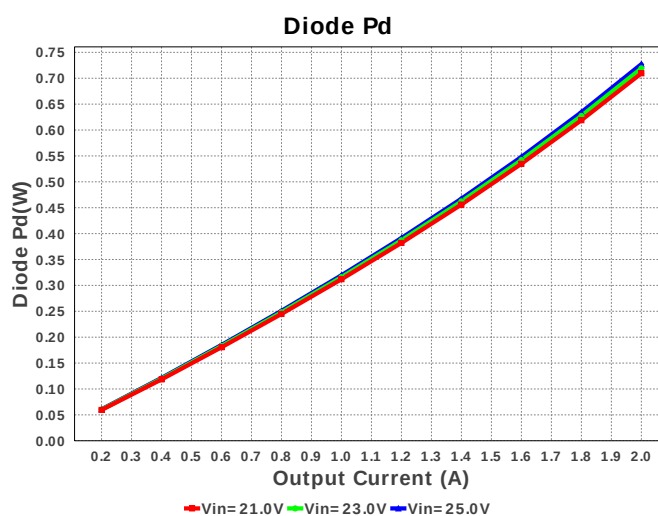
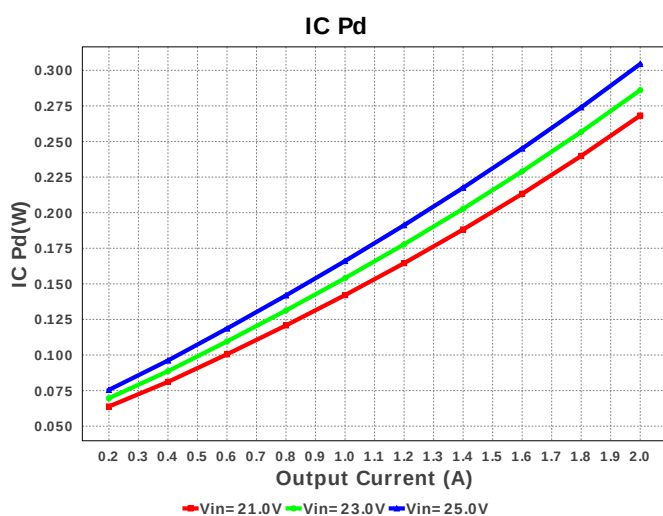
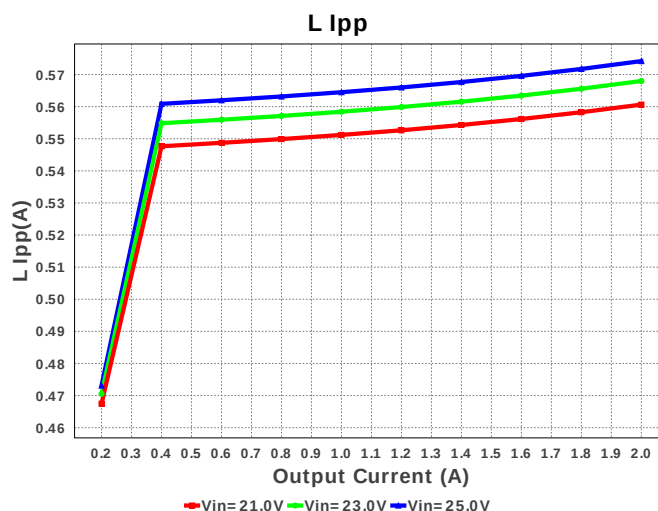
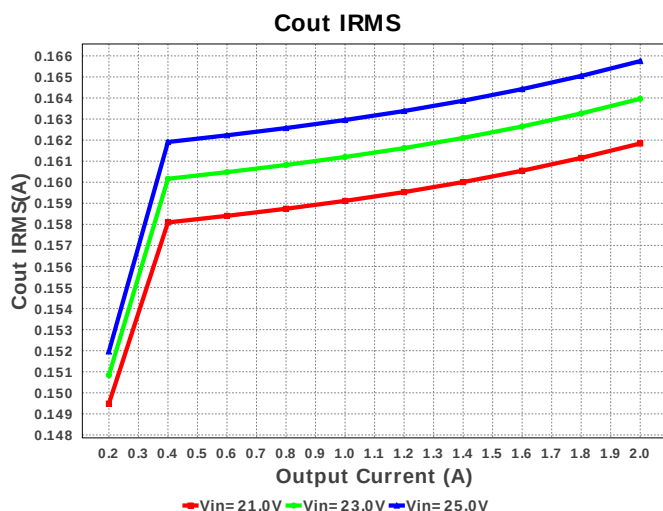
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cboot	MuRata	GRM155R61A104KA01D Series= X5R	Cap= 100.0 nF VDC= 10.0 V IRMS= 0.0 A	1	\$0.01	 0402 3 mm ²
2.	Ccomp	Samsung Electro-Mechanics	CL21C102JBCNFNC Series= C0G/NP0	Cap= 1.0 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	 0805 7 mm ²
3.	Ccomp2	Samsung Electro-Mechanics	CL21C200JBANNNC Series= C0G/NP0	Cap= 20.0 pF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	 0805 7 mm ²
4.	Cin	MuRata	GRM32ER71H475KA88L Series= X7R	Cap= 4.7 uF ESR= 2.0 mOhm VDC= 50.0 V IRMS= 5.35 A	2	\$0.19	 1210 15 mm ²
5.	Cout	MuRata	GRM31CD80G107ME39L Series= X6T	Cap= 100.0 uF ESR= 4.84 mOhm VDC= 4.0 V IRMS= 4.3381 A	2	\$0.14	 1206_190 11 mm ²
6.	Css	MuRata	GRM033R61A822KA01D Series= X5R	Cap= 8.2 nF VDC= 10.0 V IRMS= 0.0 A	1	\$0.01	 0201 2 mm ²
7.	D1	Diodes Inc.	B340A-13-F	VF@Io= 500.0 mV VRRM= 40.0 V	1	\$0.11	 SMA 37 mm ²
8.	L1	TDK	CLF10040T-150M	L= 15.0 uH DCR= 48.0 mOhm	1	\$0.46	 CLF10040 148 mm ²
9.	Rcomp	Vishay-Dale	CRCW040273K2FKED Series= CRCW...e3	Res= 73.2 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
10.	RenB	Vishay-Dale	CRCW040218K2FKED Series= CRCW...e3	Res= 18.2 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
11.	RenT	Vishay-Dale	CRCW0402169KFKED Series= CRCW...e3	Res= 169.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
12.	Rfbb	Vishay-Dale	CRCW04024K75FKED Series= CRCW..e3	Res= 4.75 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
13.	Rfbt	Vishay-Dale	CRCW040210K2FKED Series= CRCW..e3	Res= 10.2 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
14.	U1	Texas Instruments	TPS54233DR	Switcher	1	\$0.55	

D0008A 57 mm²







Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	629.85 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	165.752 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	2.287 A	Current	Peak switch current in IC
4.	Iin Avg	249.73 mA	Current	Average input current
5.	L Ipp	574.18 mA	Current	Peak-to-peak inductor ripple current
6.	M Irms	677.75 mA	Current	MOSFET RMS current
7.	BOM Count	16	General	Total Design BOM count
8.	FootPrint	326.0 mm ²	General	Total Foot Print Area of BOM components
9.	Frequency	300.0 kHz	General	Switching frequency
10.	M Vds Act	63.565 mV	General	Voltage drop across the MosFET
11.	Pout	5.0 W	General	Total output power

#	Name	Value	Category	Description
12.	Total BOM	\$1.87	General	Total BOM Cost
13.	D1 Tj	102.721 degC	Op_Point	D1 junction temperature
14.	Low Freq Gain	65.712 dB	Op_Point	Gain at 10Hz
15.	Vout Actual	2.518 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
16.	Vout OP	2.5 V	Op_Point	Operational Output Voltage
17.	Cross Freq	16.925 kHz	Op_point	Bode plot crossover frequency
18.	Duty Cycle	11.484 %	Op_point	Duty cycle
19.	Efficiency	80.085 %	Op_point	Steady state efficiency
20.	Gain Marg	-17.742 dB	Op_point	Bode Plot Gain Margin
21.	IC Tj	60.446 degC	Op_point	IC junction temperature
22.	ICThetaJA	100.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
23.	IOUT_OP	2.0 A	Op_point	Iout operating point
24.	Phase Marg	58.717 deg	Op_point	Bode Plot Phase Margin
25.	VIN_OP	25.0 V	Op_point	Vin operating point
26.	Vout p-p	2.03 mV	Op_point	Peak-to-peak output ripple voltage
27.	Cin Pd	396.711 µW	Power	Input capacitor power dissipation
28.	Cout Pd	66.486 µW	Power	Output capacitor power dissipation
29.	Diode Pd	727.208 mW	Power	Diode power dissipation
30.	IC Pd	304.459 mW	Power	IC power dissipation
31.	L Pd	211.2 mW	Power	Inductor power dissipation
32.	Total Pd	1.243 W	Power	Total Power Dissipation
33.	Vout Tolerance	4.927 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	2.0	Maximum Output Current
2.	VinMax	25.0	Maximum input voltage
3.	VinMin	21.0	Minimum input voltage
4.	Vout	2.5	Output Voltage
5.	base_pn	TPS54233	Texas Instruments Base Part Number
6.	source	DC	Input Source Type
7.	ta	30.0	Ambient temperature

Design Assistance

1. TPS54233 Product Folder : <http://www.ti.com/product/TPS54233> : contains the data sheet and other resources.

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