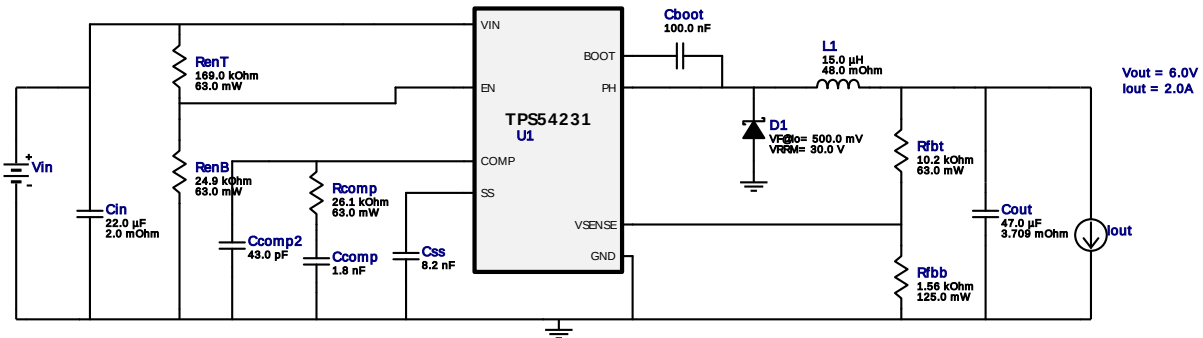


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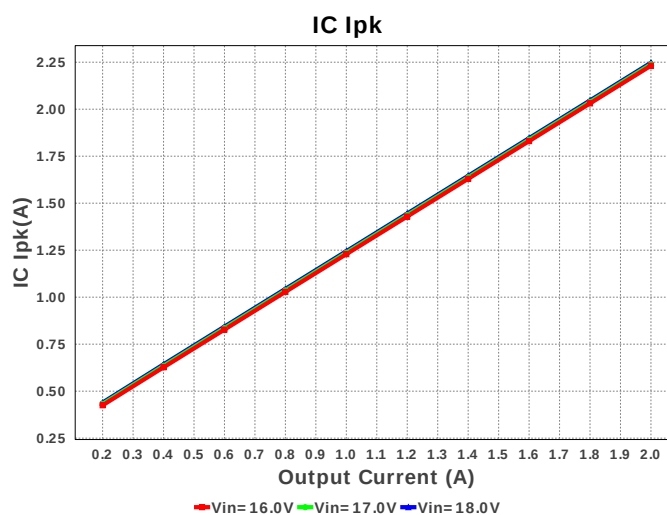
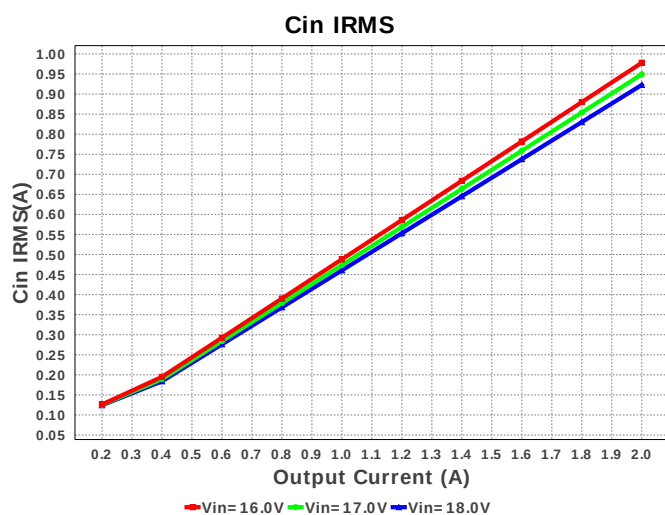
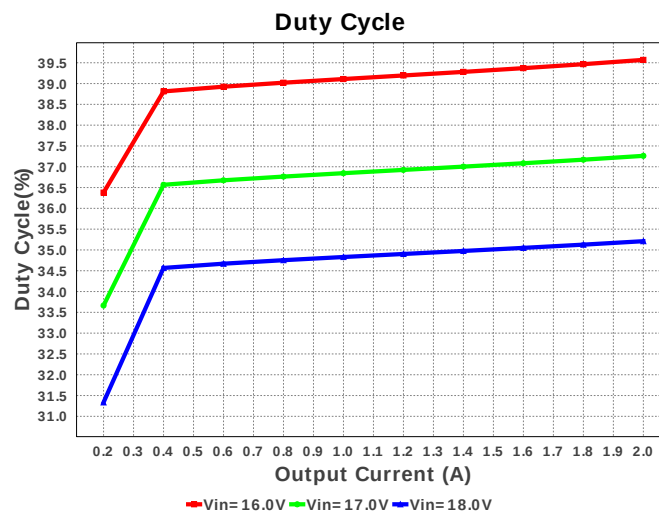
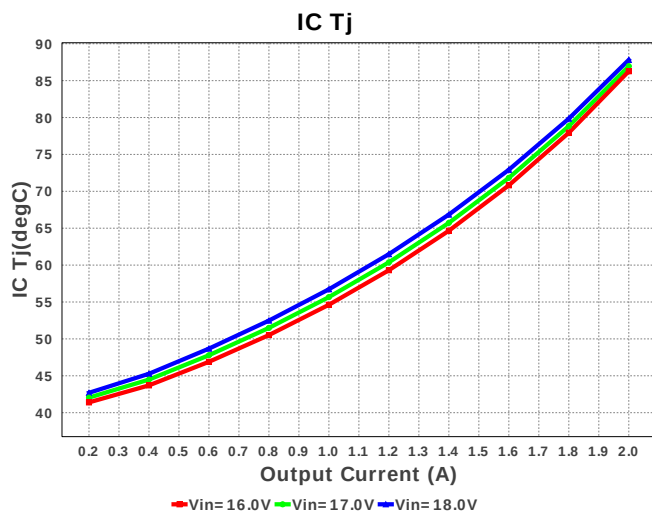
Design : 4800933/3 TPS54231DR
TPS54231DR 16.0V-18.0V to 6.00V @ 2.0A

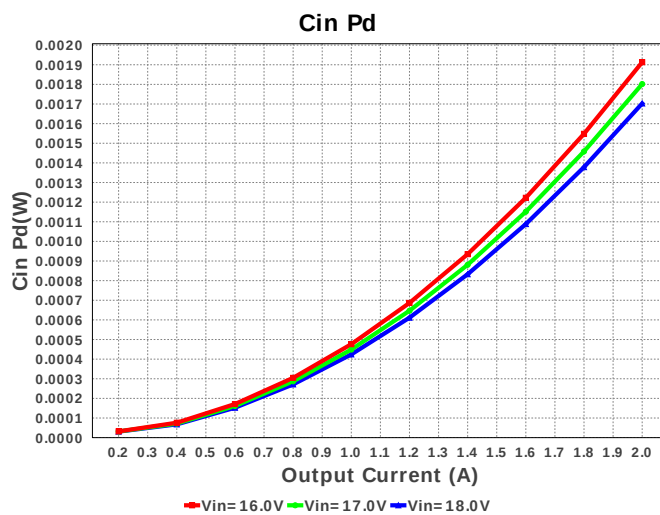
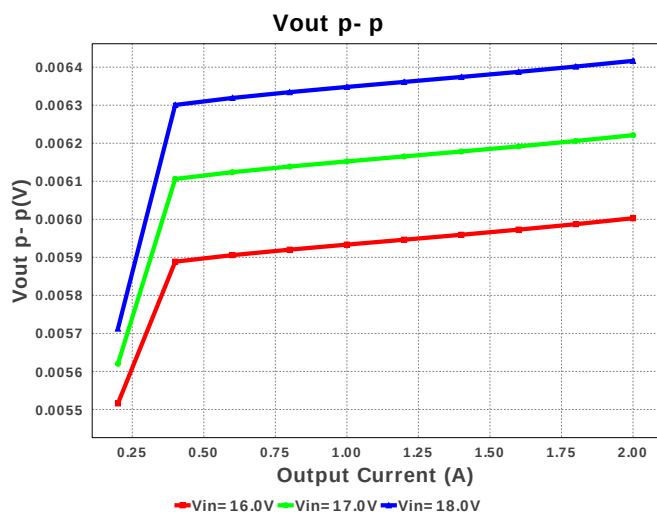
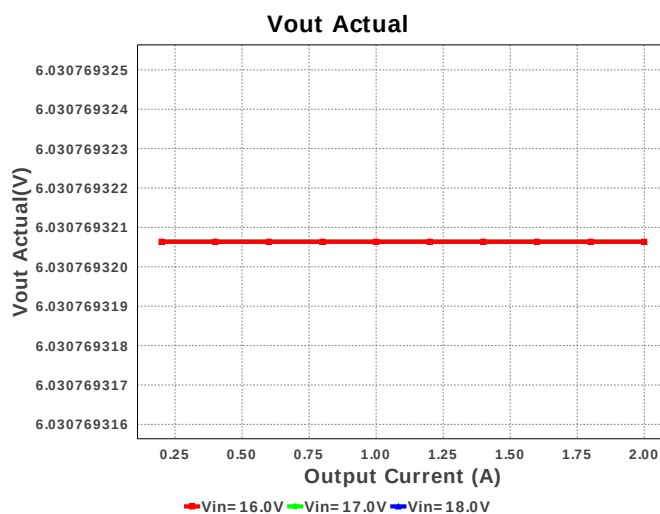
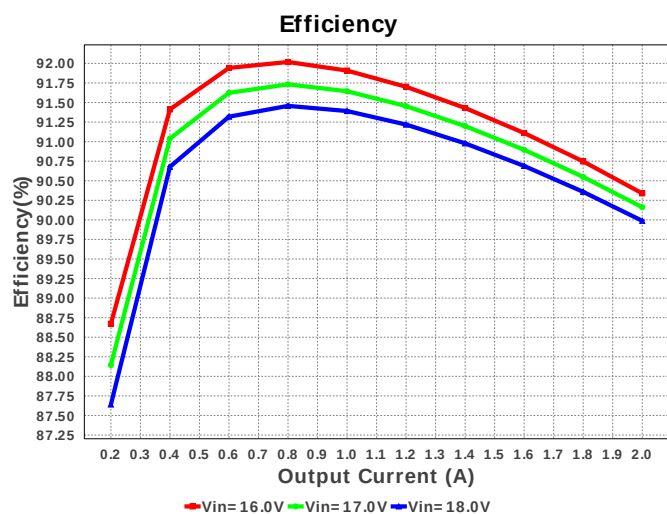
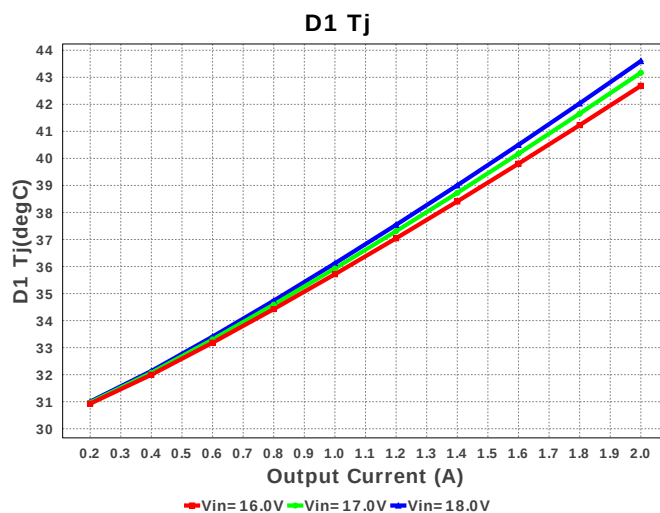
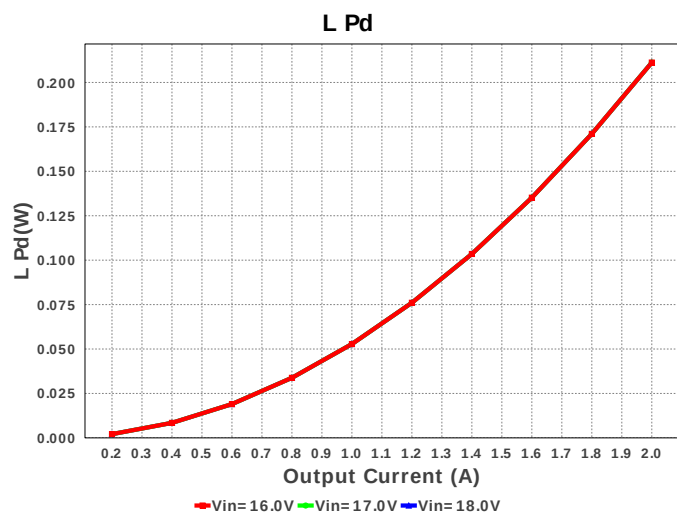


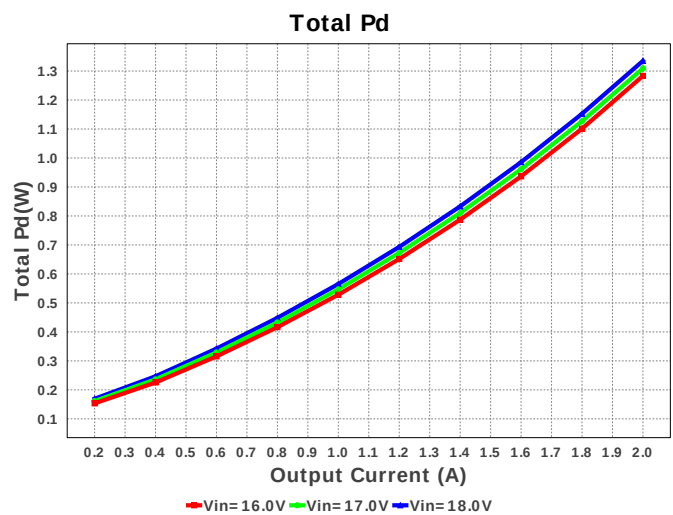
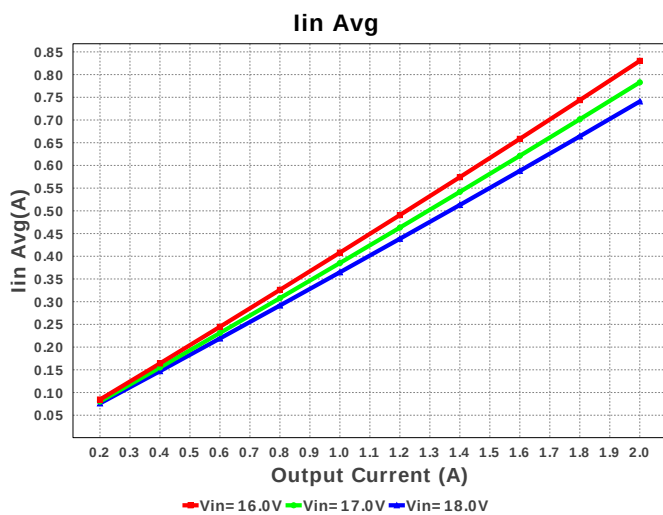
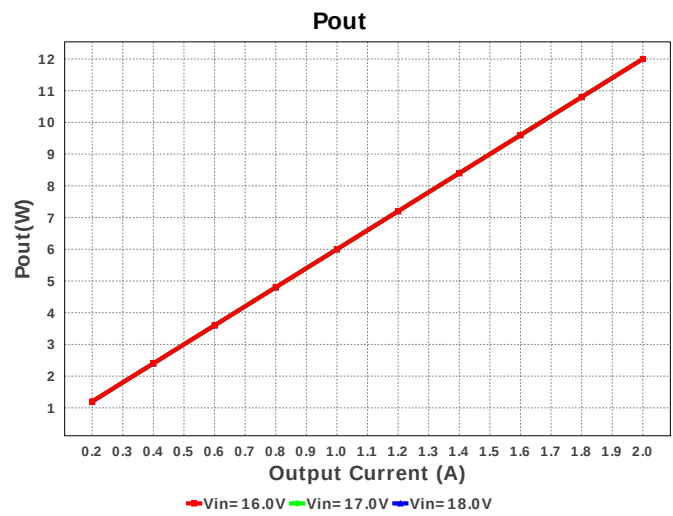
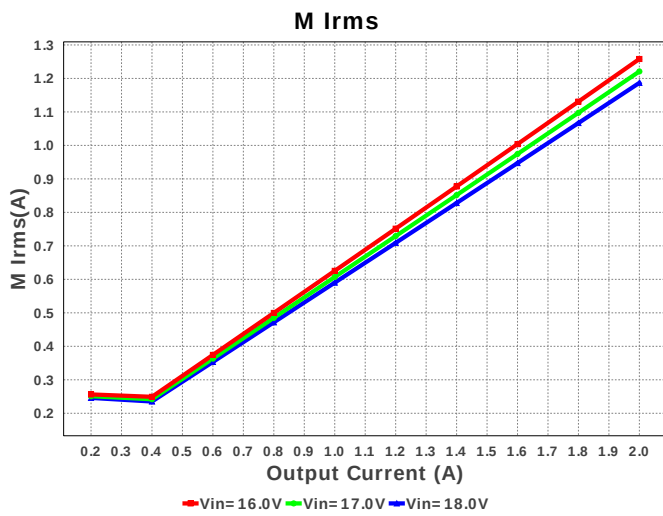
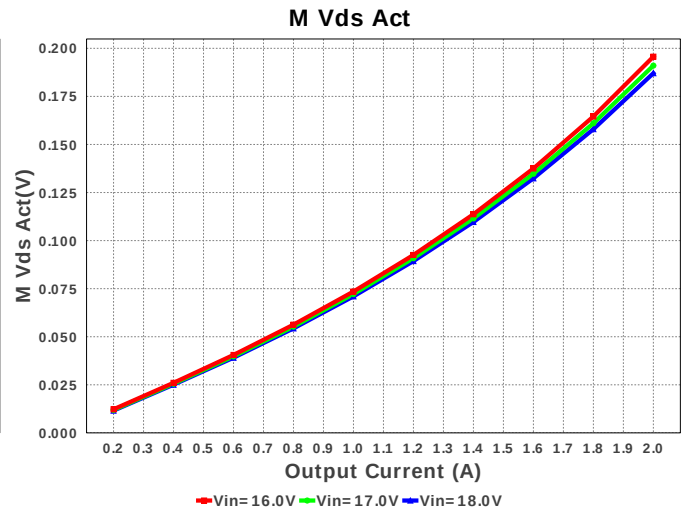
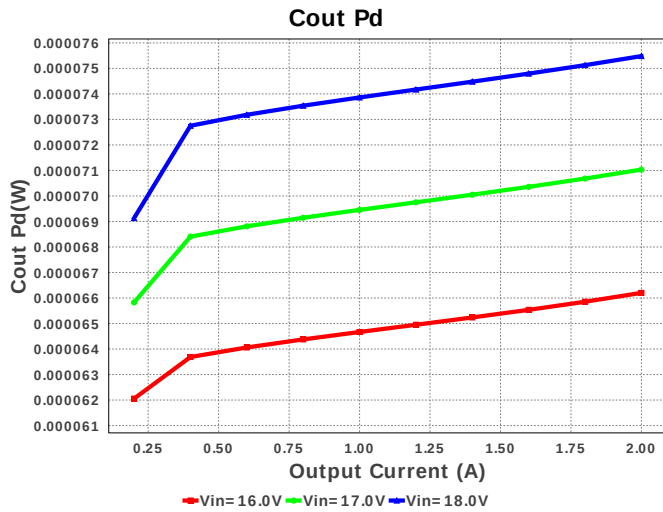
Electrical BOM

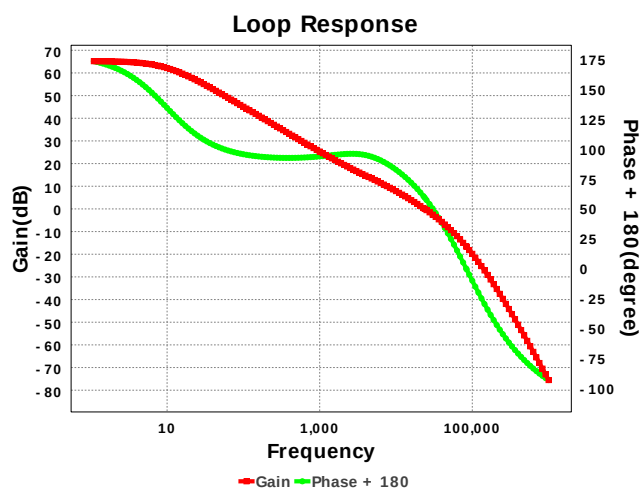
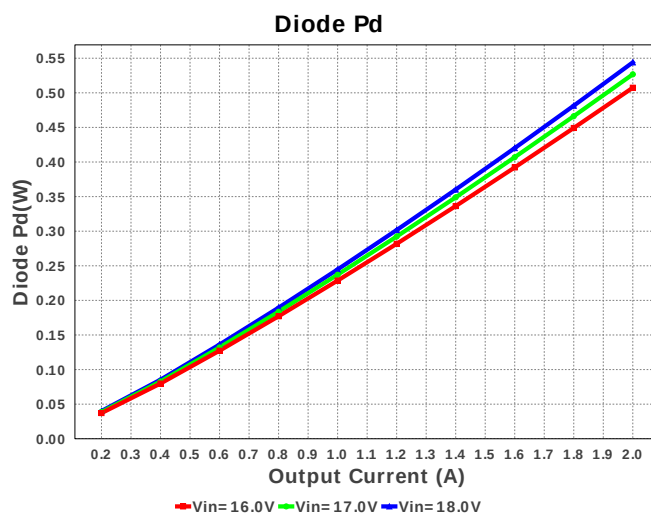
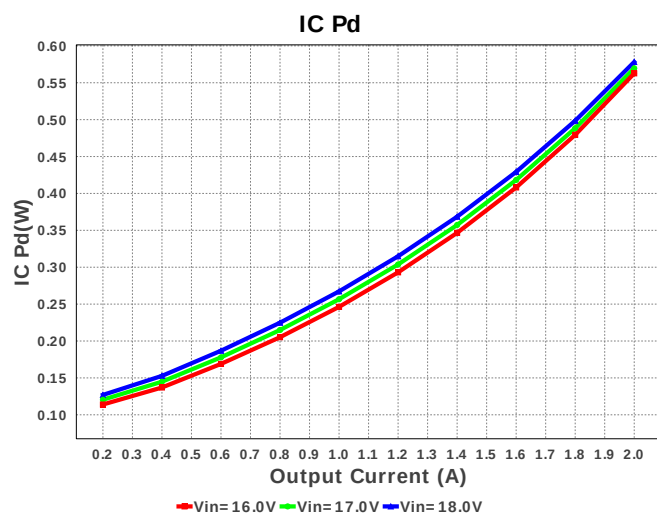
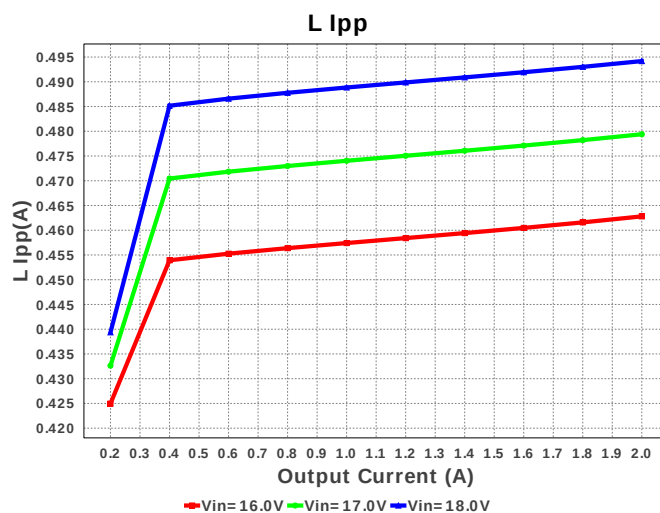
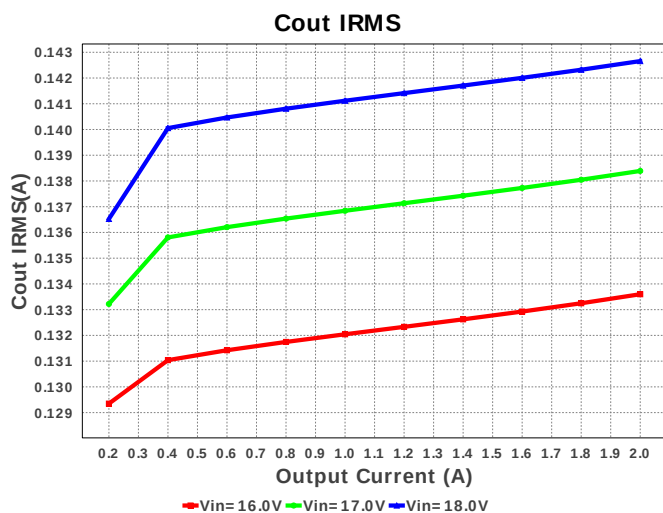
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cboot	MuRata	GRM155R61A104KA01D Series= X5R	Cap= 100.0 nF VDC= 10.0 V IRMS= 0.0 A	1	\$0.01	 0402 3 mm ²
2.	Ccomp	MuRata	GRM033R71A182KA01D Series= X7R	Cap= 1.8 nF VDC= 10.0 V IRMS= 0.0 A	1	\$0.01	 0201 2 mm ²
3.	Ccomp2	Samsung Electro-Mechanics	CL21C430JBANNNC Series= C0G/NP0	Cap= 43.0 pF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	 0805 7 mm ²
4.	Cin	MuRata	GRM32ER61E226KE15L Series= X5R	Cap= 22.0 uF ESR= 2.0 mOhm VDC= 25.0 V IRMS= 3.67 A	1	\$0.16	 1210 15 mm ²
5.	Cout	MuRata	GRM31CR61A476KE15L Series= X5R	Cap= 47.0 uF ESR= 3.709 mOhm VDC= 10.0 V IRMS= 4.2862 A	1	\$0.15	 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.	B230A-13-F	VF@Io= 500.0 mV VRRM= 30.0 V	1	\$0.09	 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	CRCW040226K1FKED Series= CRCW..e3	Res= 26.1 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
10.	RenB	Vishay-Dale	CRCW040224K9FKED Series= CRCW..e3	Res= 24.9 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	Yageo America	RT0805BRD071K56L Series= RT0805	Res= 1.56 kOhm Power= 125.0 mW Tolerance= 0.1%	1	\$0.05	0805 7 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	TPS54231DR	Switcher	1	\$0.55	

D0008A 57 mm²







Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	922.717 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	142.657 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	2.247 A	Current	Peak switch current in IC
4.	Iin Avg	740.84 mA	Current	Average input current
5.	L Ipp	494.18 mA	Current	Peak-to-peak inductor ripple current
6.	M1 Irms	1.187 A	Current	Q lavg
7.	BOM Count	14	General	Total Design BOM count
8.	FootPrint	300.0 mm ²	General	Total Foot Print Area of BOM components
9.	Frequency	570.0 kHz	General	Switching frequency
10.	M Vds Act	187.056 mV	General	Voltage drop across the MosFET
11.	Mode	CCM	General	Conduction Mode

#	Name	Value	Category	Description
12.	Pout	12.0 W	General	Total output power
13.	Total BOM	\$1.54	General	Total BOM Cost
14.	D1 Tj	43.6 degC	Op_Point	D1 junction temperature
15.	Low Freq Gain	65.175 dB	Op_Point	Gain at 10Hz
16.	Vout Actual	6.031 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
17.	Vout OP	6.0 V	Op_Point	Operational Output Voltage
18.	Cross Freq	23.829 kHz	Op_point	Bode plot crossover frequency
19.	Duty Cycle	35.21 %	Op_point	Duty cycle
20.	Efficiency	89.988 %	Op_point	Steady state efficiency
21.	Gain Marg	-16.747 dB	Op_point	Bode Plot Gain Margin
22.	IC Tj	87.814 degC	Op_point	IC junction temperature
23.	ICThetaJA	100.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
24.	IOUT_OP	2.0 A	Op_point	Iout operating point
25.	Phase Marg	59.699 deg	Op_point	Bode Plot Phase Margin
26.	VIN_OP	18.0 V	Op_point	Vin operating point
27.	Vout p-p	6.417 mV	Op_point	Peak-to-peak output ripple voltage
28.	Cin Pd	1.703 mW	Power	Input capacitor power dissipation
29.	Cout Pd	75.482 μ W	Power	Output capacitor power dissipation
30.	Diode Pd	543.983 mW	Power	Diode power dissipation
31.	IC Pd	578.138 mW	Power	IC power dissipation
32.	L Pd	211.2 mW	Power	Inductor power dissipation
33.	Total Pd	1.335 W	Power	Total Power Dissipation
34.	Vout Tolerance	4.488 %		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	18.0	Maximum input voltage
3.	VinMin	16.0	Minimum input voltage
4.	Vout	6.0	Output Voltage
5.	base_pn	TPS54231	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	30.0	Ambient temperature

Design Assistance

1. **TPS54231** Product Folder : <http://www.ti.com/product/TPS54231> : contains the data sheet and other resources.

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