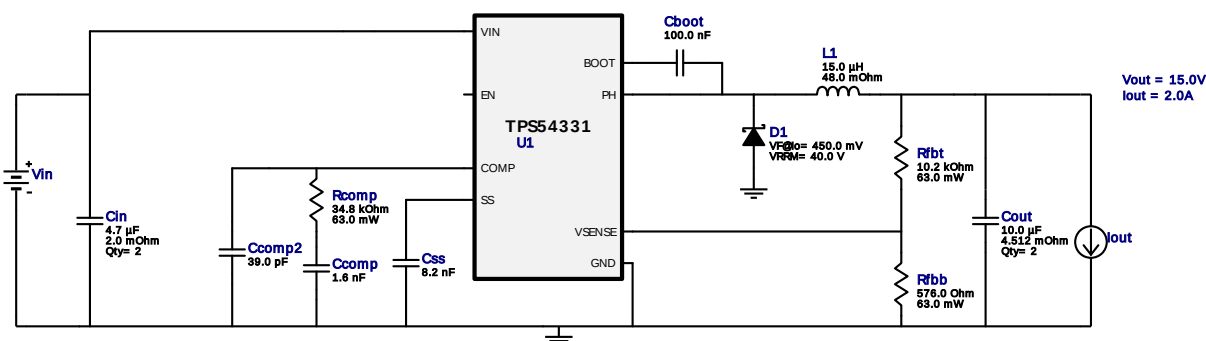


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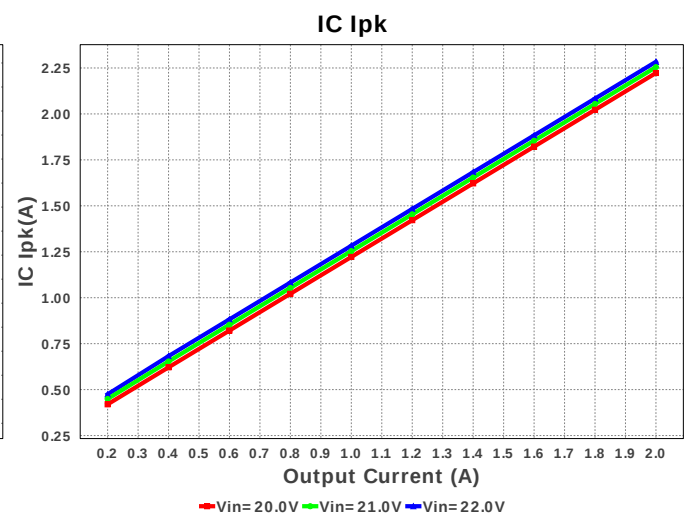
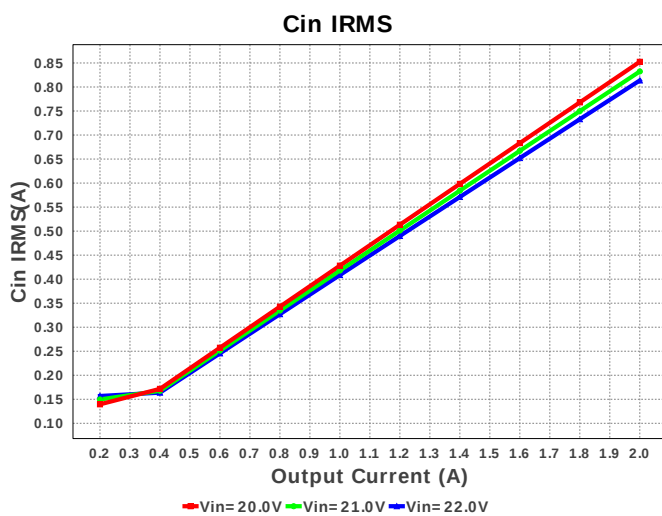
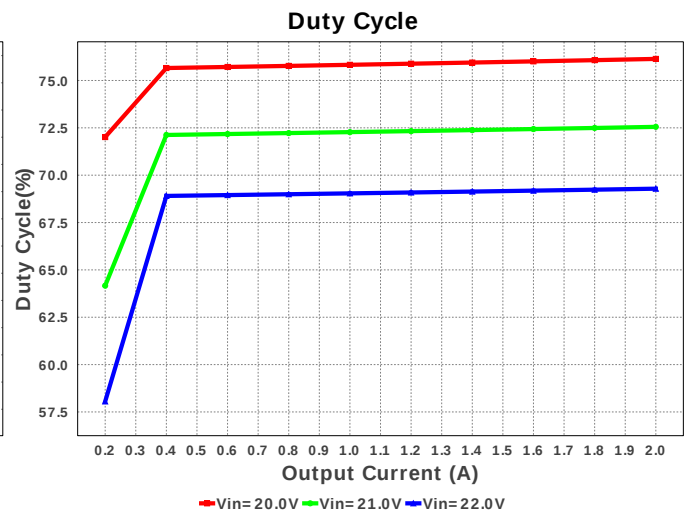
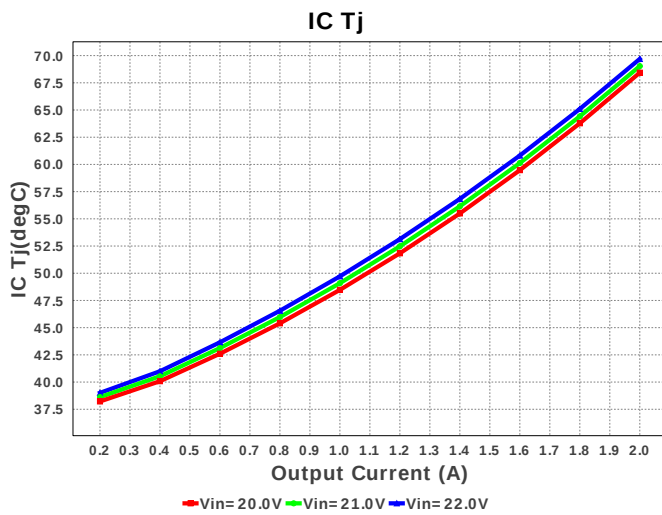
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TPS54331DDAR 20.0V-22.0V to 15.00V @ 2.0A

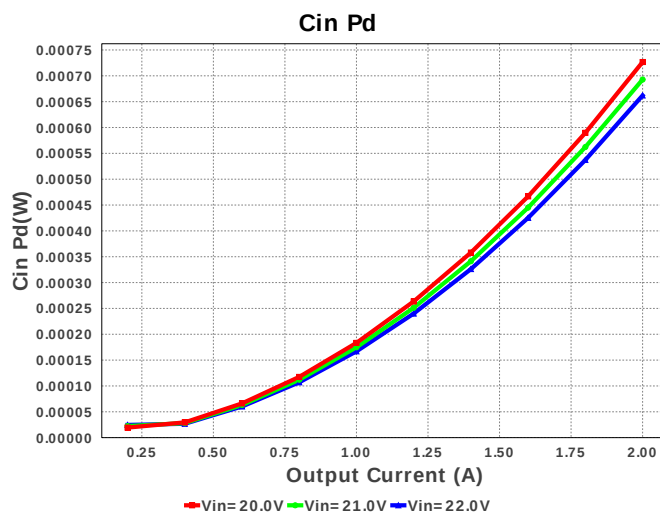
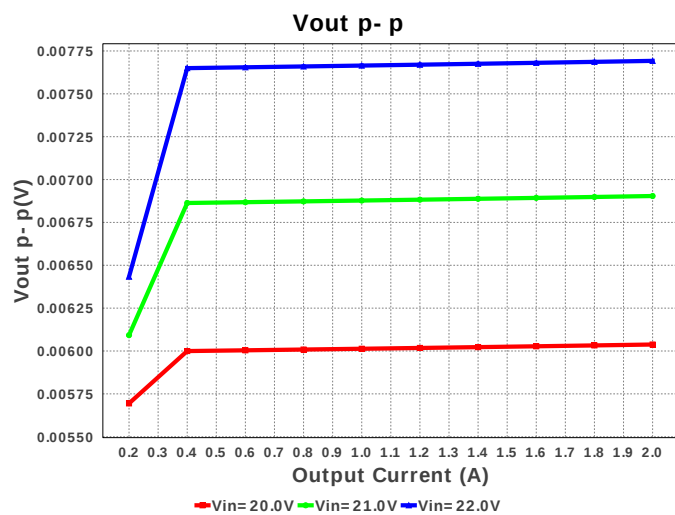
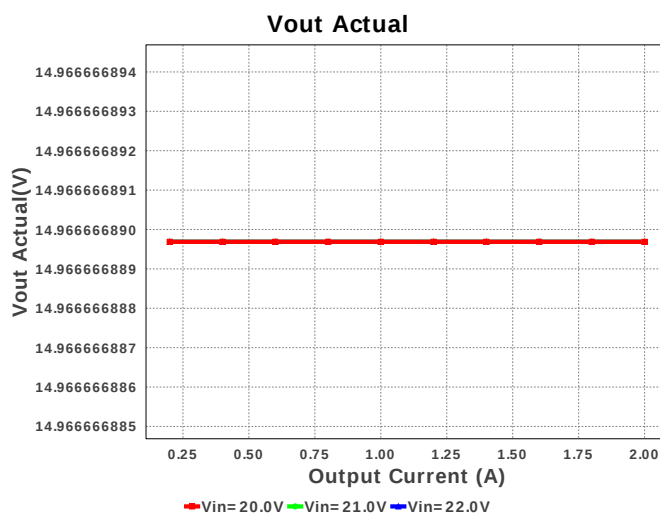
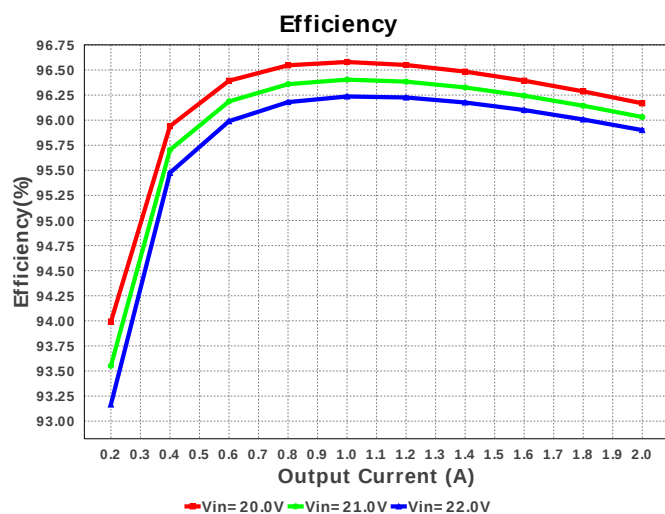
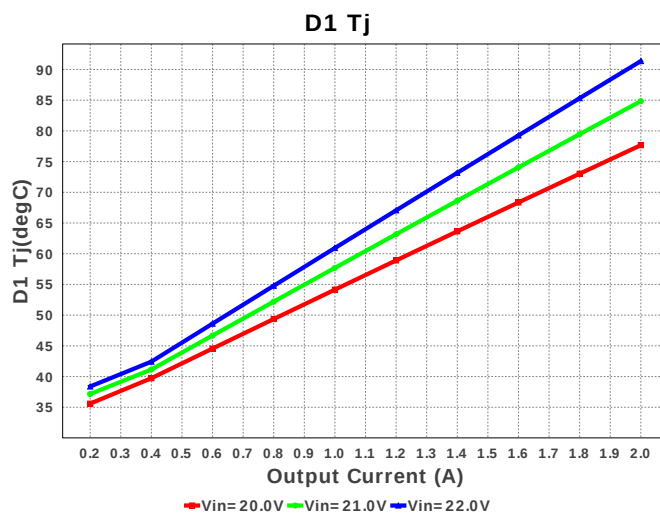
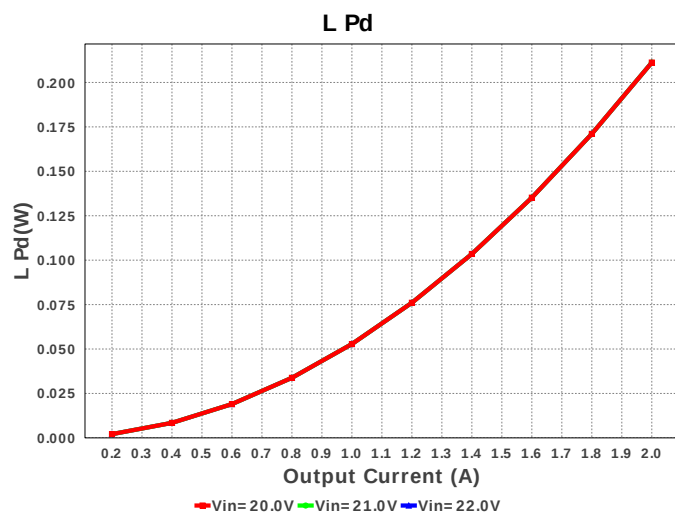


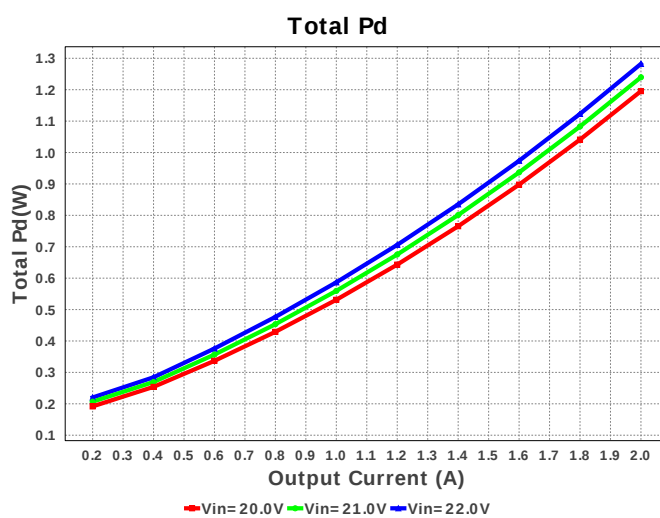
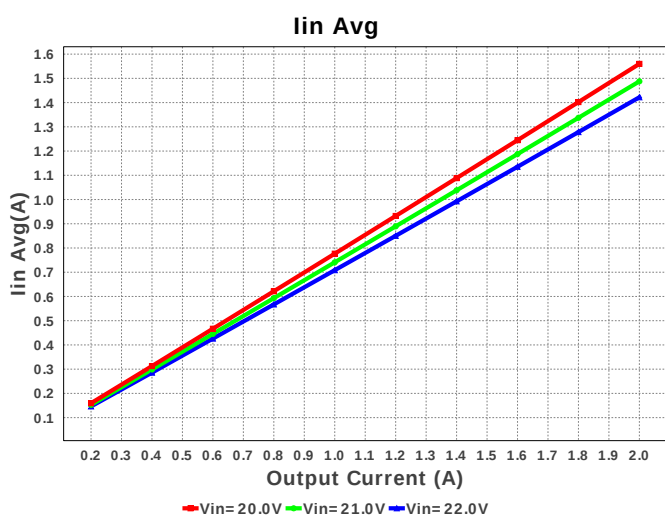
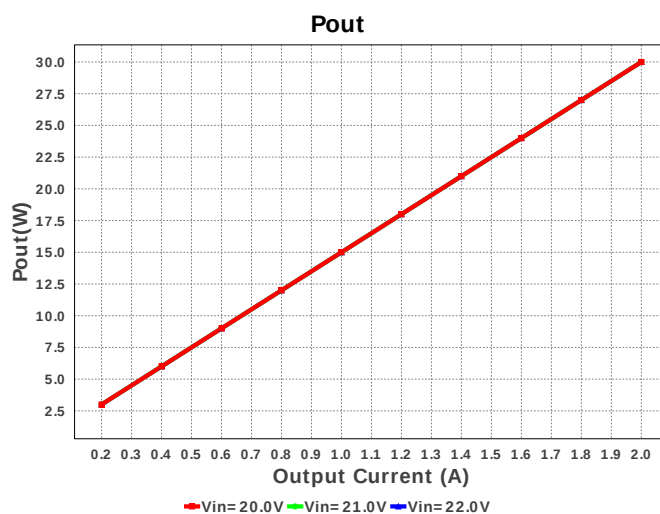
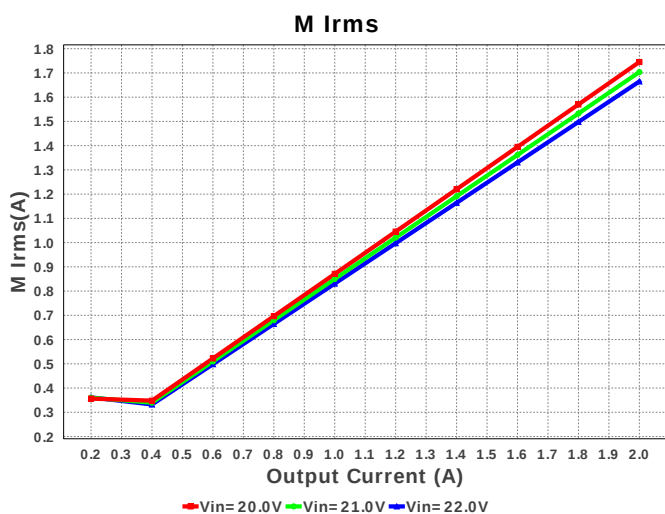
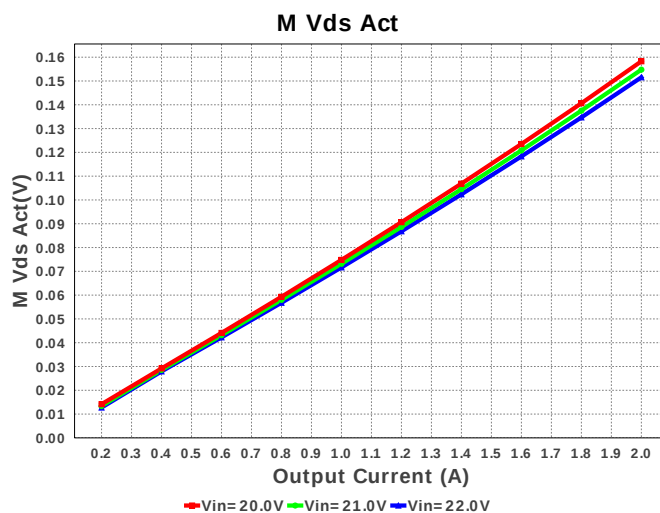
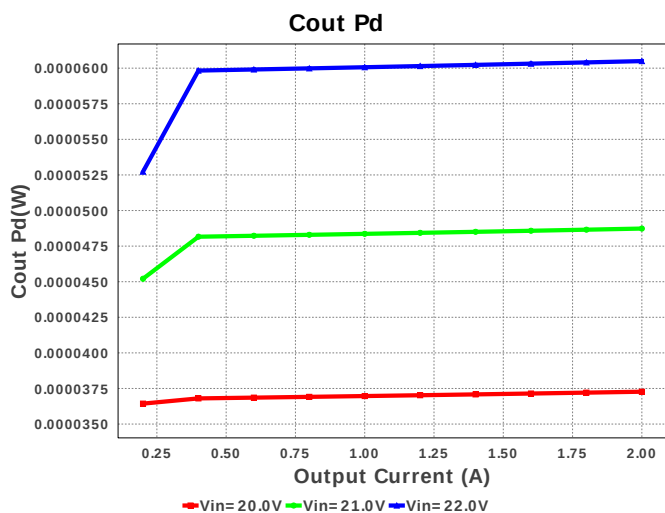
Electrical BOM

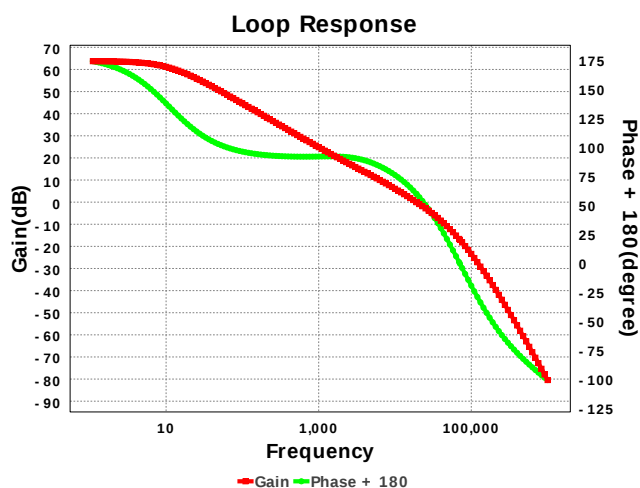
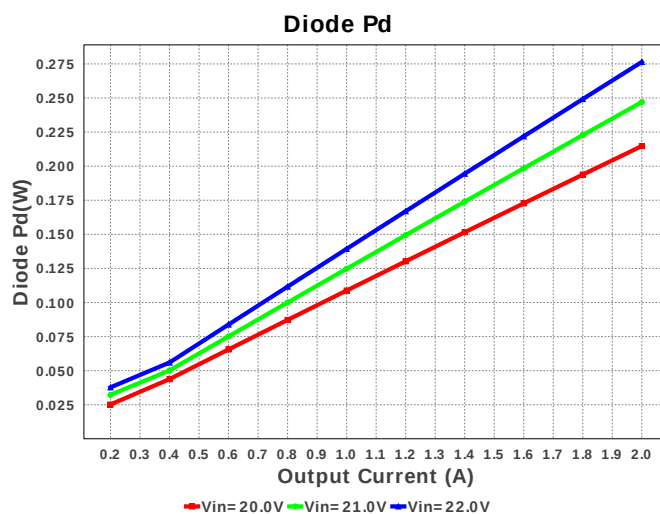
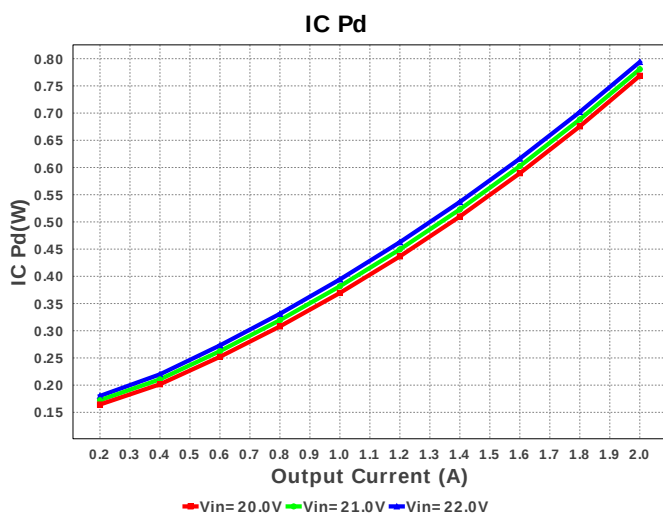
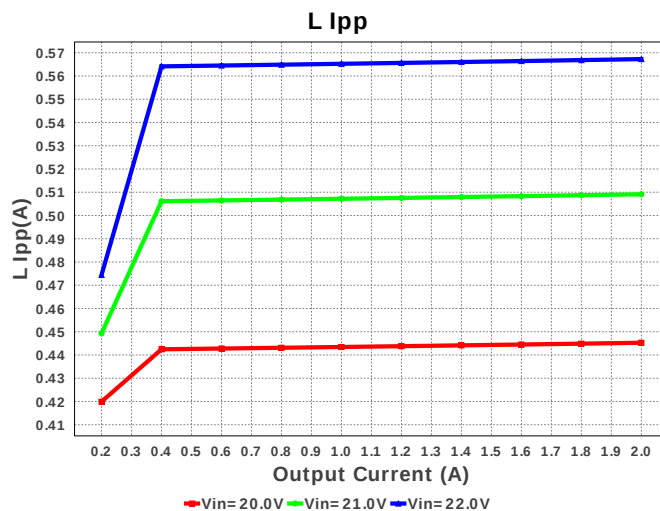
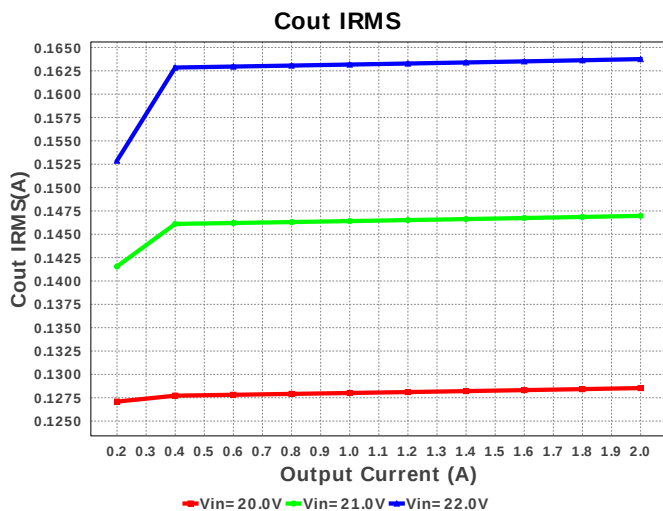
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cboot	MuRata	GRM155R61A104KA01D Series= X5R	Cap= 100.0 nF VDC= 10.0 V IRMS= 0.0 A	1	\$0.01	0402 3 mm ²
2.	Ccomp	MuRata	GRM1885C1H162JA01D Series= C0G/NP0	Cap= 1.6 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	0603 5 mm ²
3.	Ccomp2	Yageo America	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	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	GRM31CR61E106KA12L Series= X5R	Cap= 10.0 uF ESR= 4.512 mOhm VDC= 25.0 V IRMS= 2.447 A	2	\$0.05	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.	1N5819HW-7-F	VF@Io= 450.0 mV VRRM= 40.0 V	1	\$0.08	SOD-123 13 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	CRCW040234K8FKED Series= CRCW..e3	Res= 34.8 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
10.	Rfbb	Vishay-Dale	CRCW0402576RFKED Series= CRCW..e3	Res= 576.0 Ohm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
11.	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

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
12.	U1	Texas Instruments	TPS54331DDAR	Switcher	1	\$0.65	 DDA0008H 57 mm ²









Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	813.63 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	163.755 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	2.284 A	Current	Peak switch current in IC
4.	Iin Avg	1.422 A	Current	Average input current
5.	L Ipp	567.26 mA	Current	Peak-to-peak inductor ripple current
6.	M1 Irms	1.665 A	Current	Q lavg
7.	BOM Count	14	General	Total Design BOM count
8.	FootPrint	295.0 mm ²	General	Total Foot Print Area of BOM components
9.	Frequency	570.0 kHz	General	Switching frequency
10.	M Vds Act	151.542 mV	General	Voltage drop across the MosFET
11.	Mode	CCM	General	Conduction Mode

#	Name	Value	Category	Description
12.	Pout	30.0 W	General	Total output power
13.	Total BOM	\$1.74	General	Total BOM Cost
14.	D1 Tj	91.364 degC	Op_Point	D1 junction temperature
15.	Low Freq Gain	63.727 dB	Op_Point	Gain at 10Hz
16.	Vout Actual	14.967 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
17.	Vout OP	15.0 V	Op_Point	Operational Output Voltage
18.	Cross Freq	19.161 kHz	Op_point	Bode plot crossover frequency
19.	Duty Cycle	69.287 %	Op_point	Duty cycle
20.	Efficiency	95.901 %	Op_point	Steady state efficiency
21.	Gain Marg	-17.071 dB	Op_point	Bode Plot Gain Margin
22.	IC Tj	69.696 degC	Op_point	IC junction temperature
23.	ICThetaJA	50.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
24.	IOUT_OP	2.0 A	Op_point	Iout operating point
25.	Phase Marg	60.044 deg	Op_point	Bode Plot Phase Margin
26.	VIN_OP	22.0 V	Op_point	Vin operating point
27.	Vout p-p	7.692 mV	Op_point	Peak-to-peak output ripple voltage
28.	Cin Pd	661.994 μ W	Power	Input capacitor power dissipation
29.	Cout Pd	60.496 μ W	Power	Output capacitor power dissipation
30.	Diode Pd	276.414 mW	Power	Diode power dissipation
31.	IC Pd	793.923 mW	Power	IC power dissipation
32.	L Pd	211.2 mW	Power	Inductor power dissipation
33.	Total Pd	1.282 W	Power	Total Power Dissipation
34.	Vout Tolerance	5.479 %		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	22.0	Maximum input voltage
3.	VinMin	20.0	Minimum input voltage
4.	Vout	15.0	Output Voltage
5.	base_pn	TPS54331	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	30.0	Ambient temperature

Design Assistance

1. **TPS54331** Product Folder : <http://www.ti.com/product/TPS54331> : contains the data sheet and other resources.

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