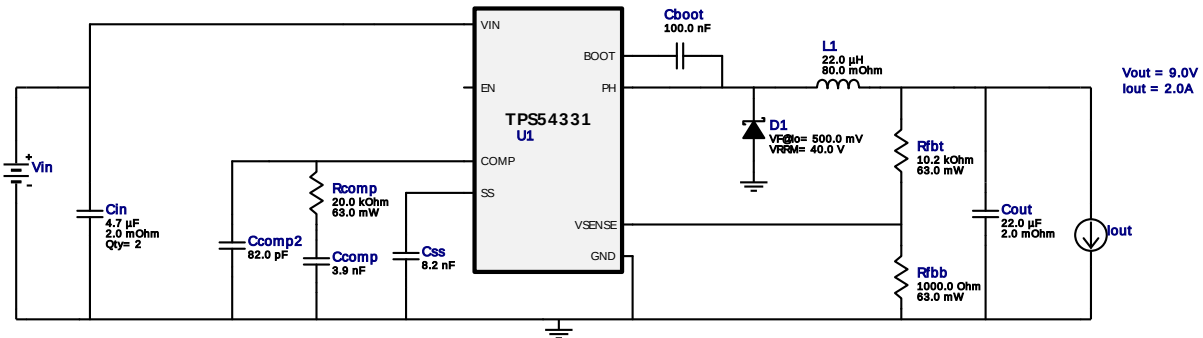


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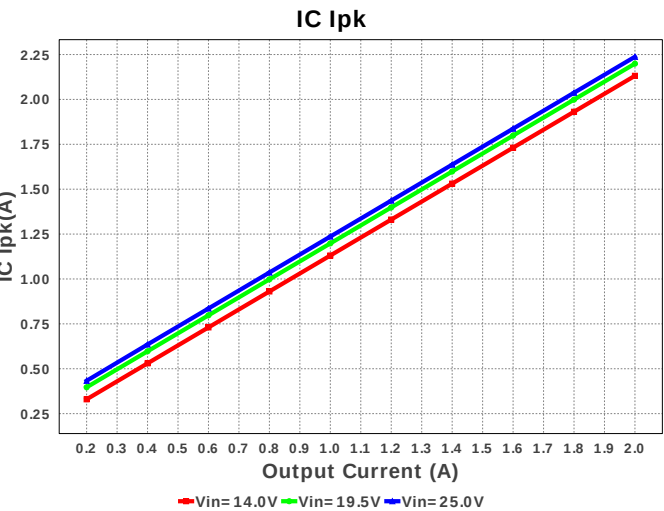
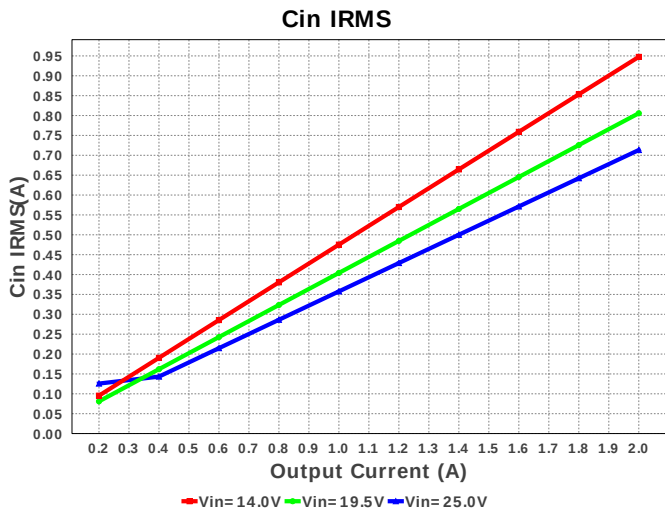
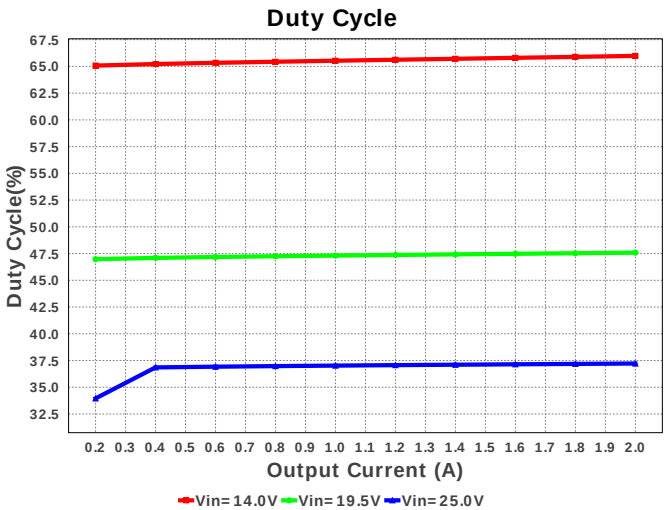
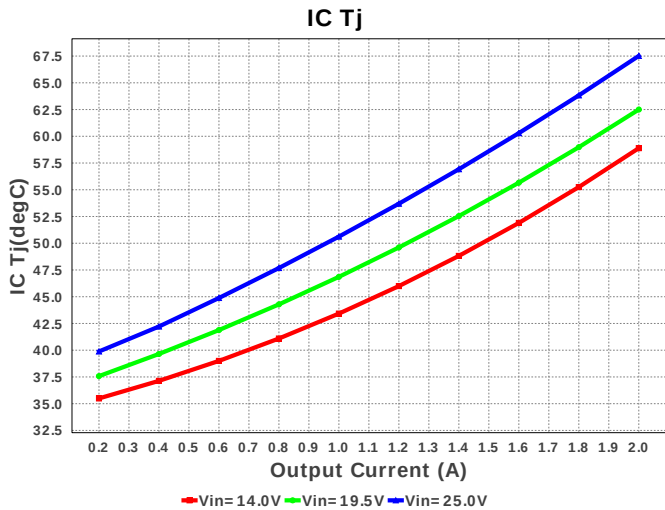
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TPS54331DDAR 14.0V-25.0V to 9.00V @ 2.0A

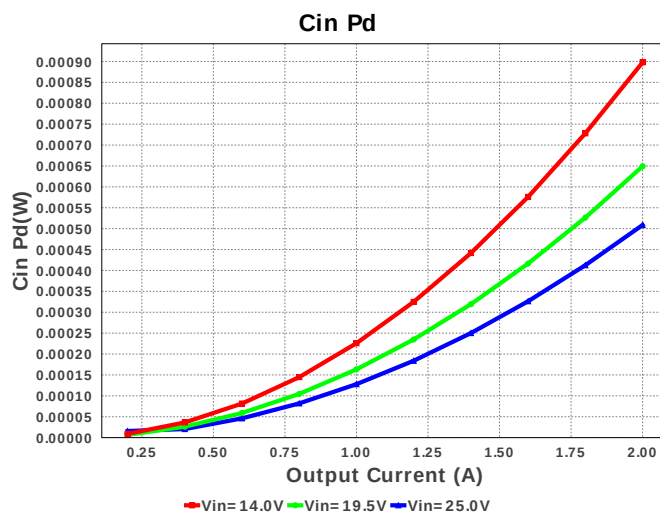
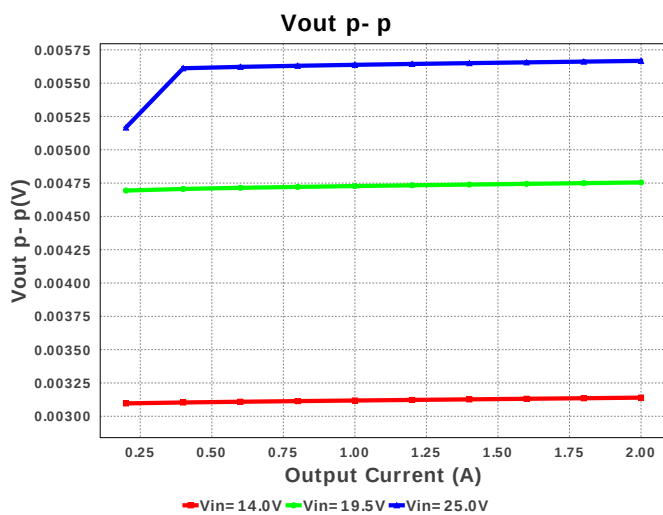
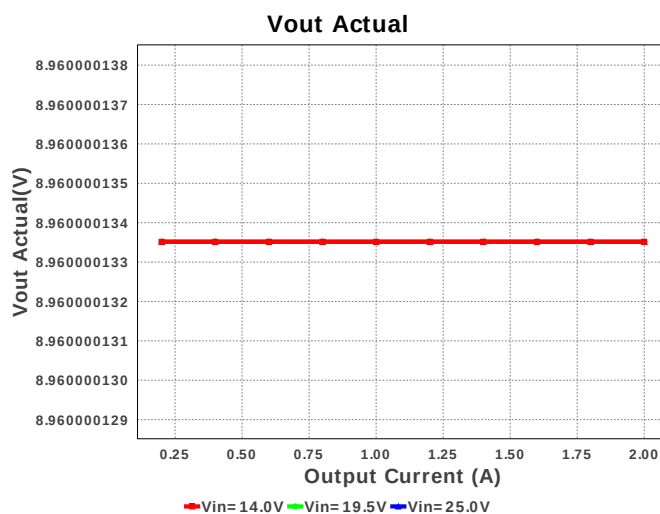
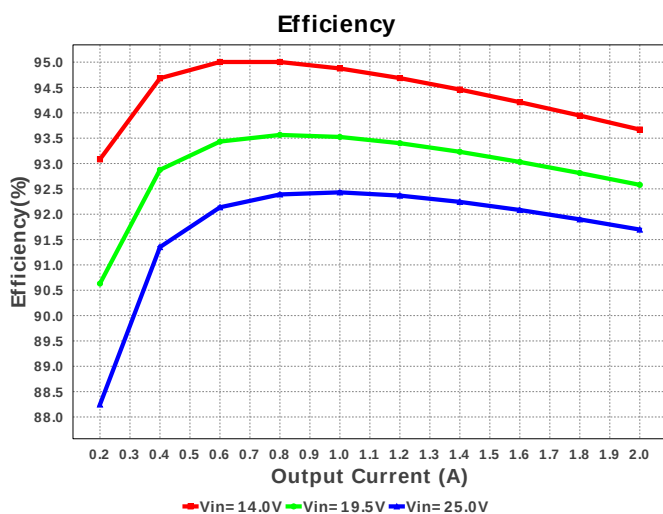
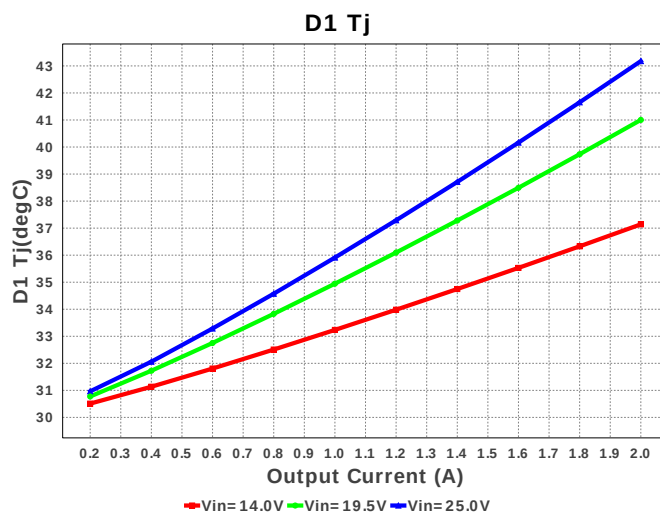
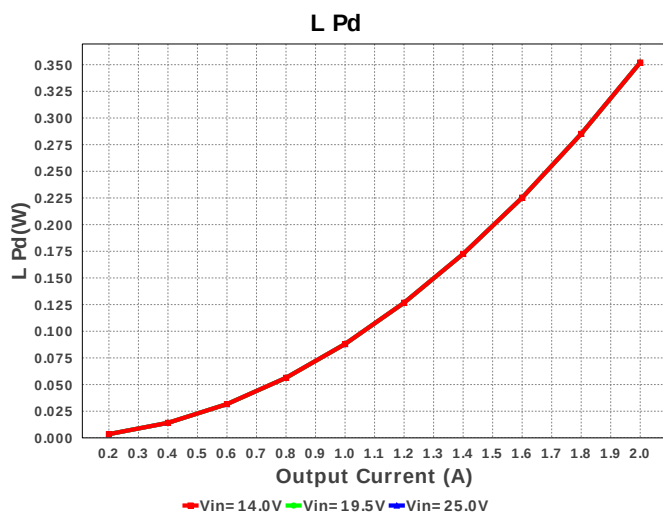


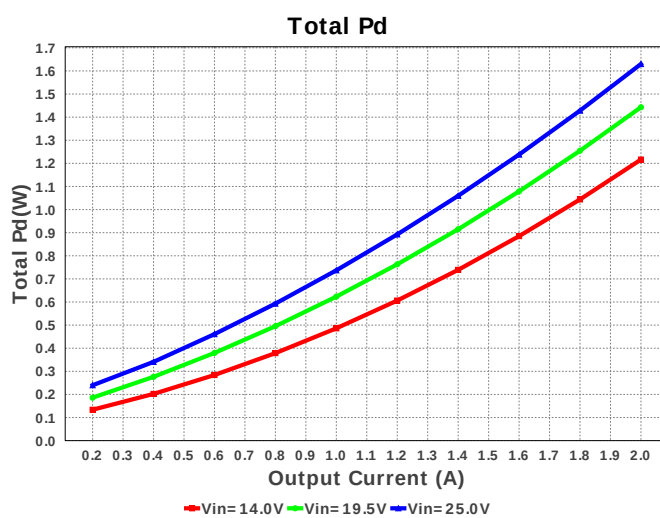
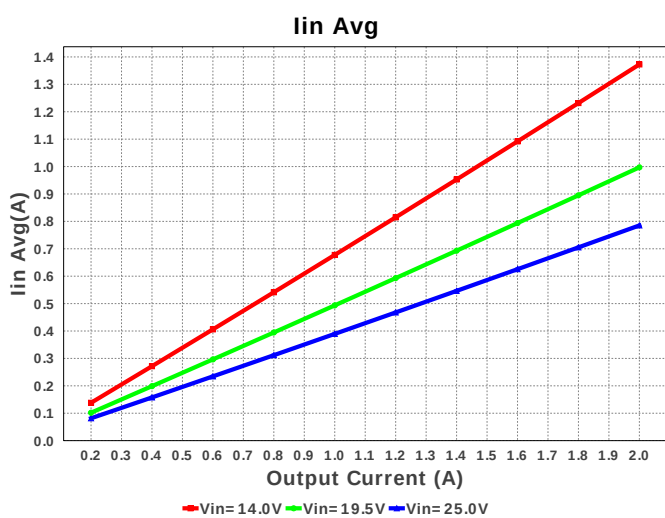
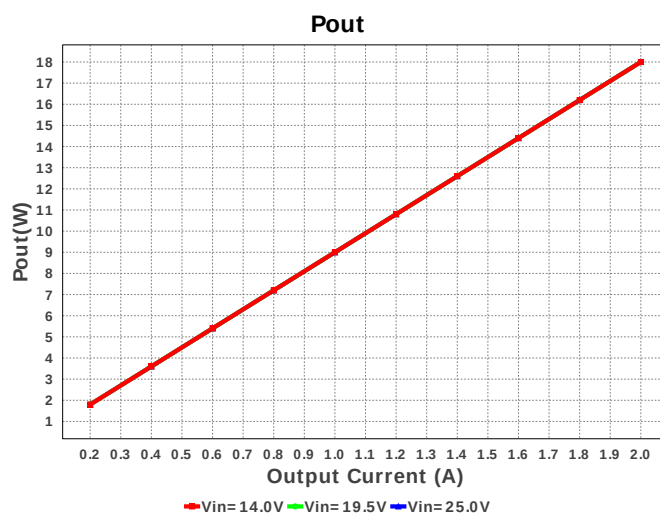
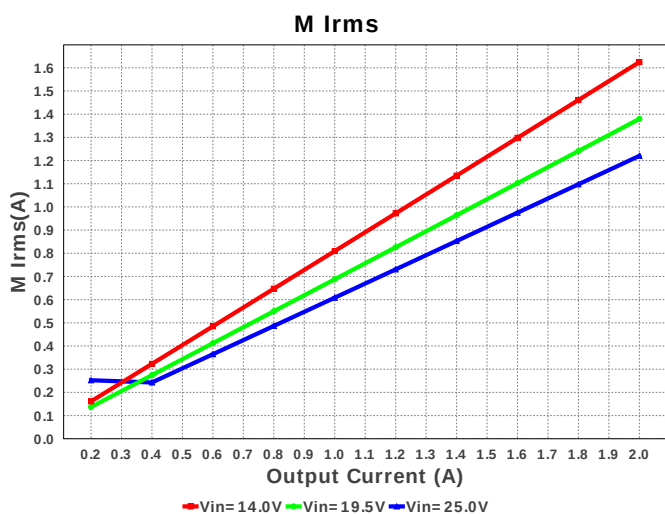
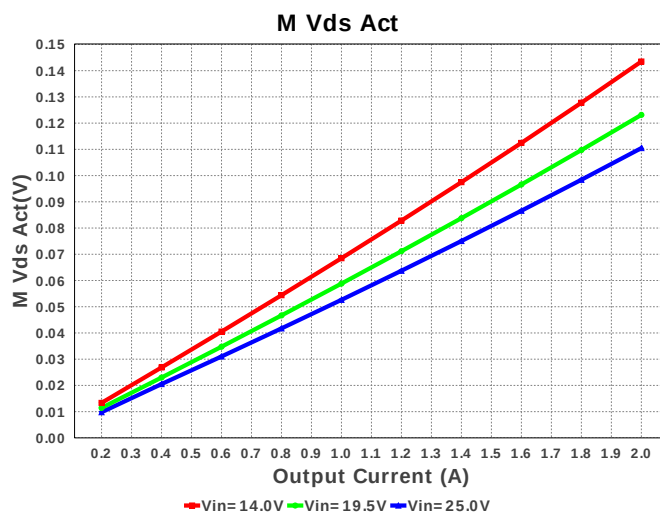
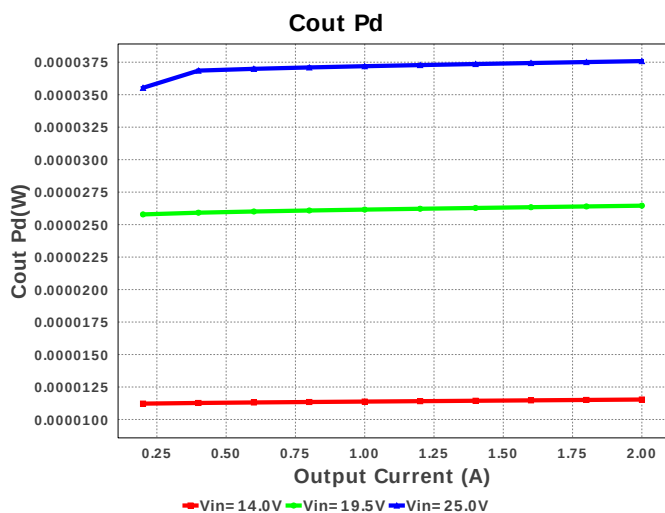
Electrical BOM

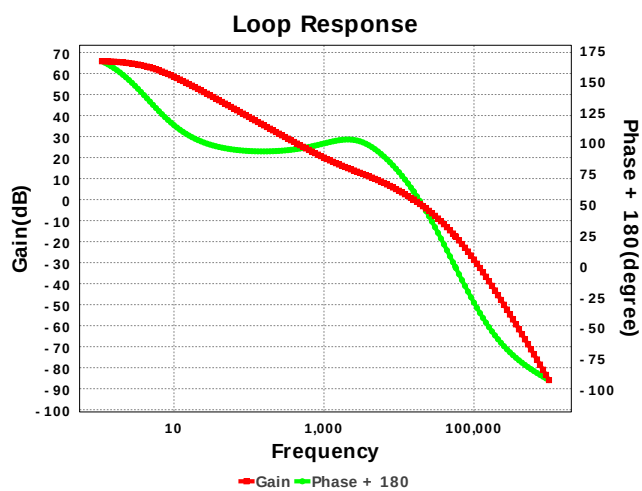
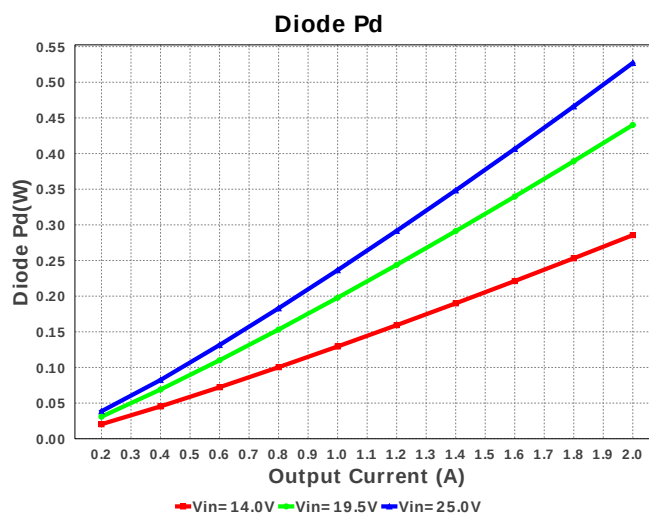
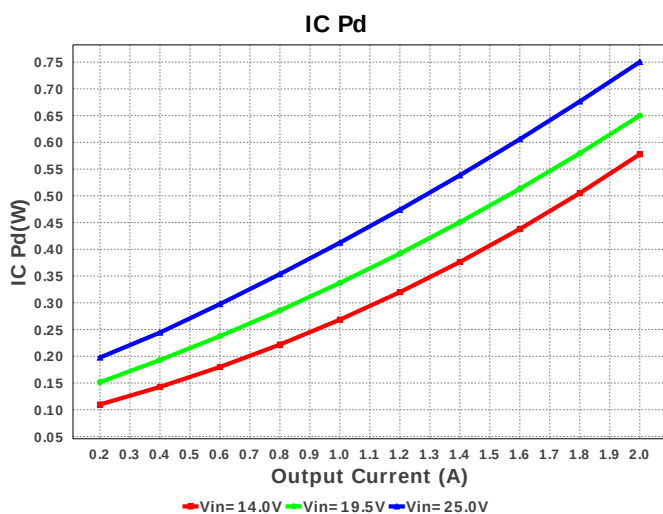
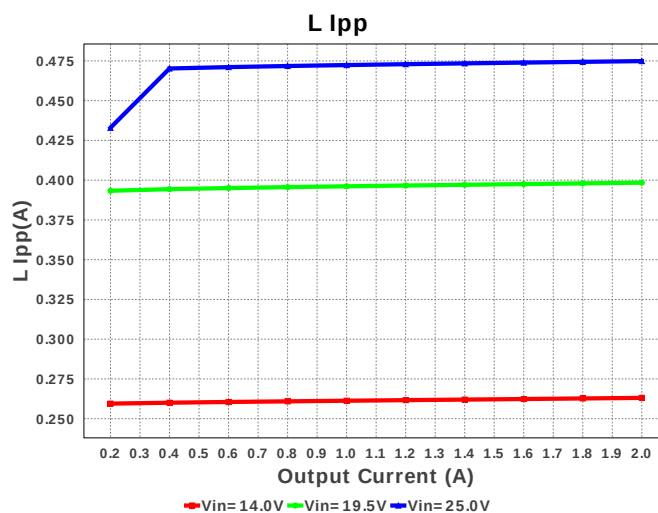
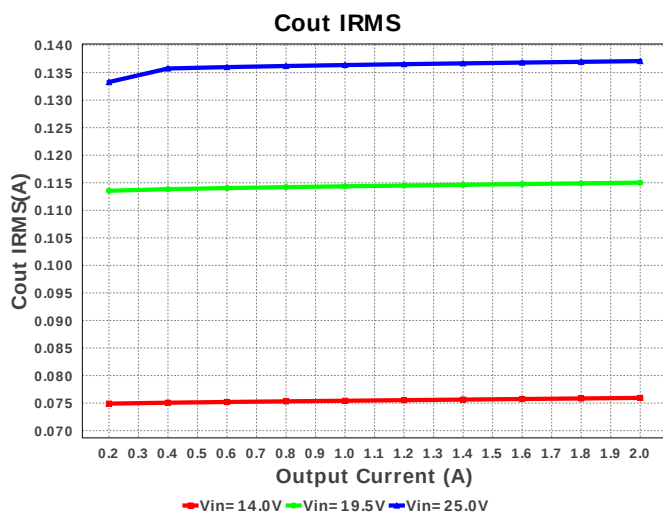
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cboot	MuRata	GRM155R61A104KA01D Series= X5R	Cap= 100.0 nF VDC= 10.0 V IRMS= 0.0 A	1	\$0.01	 0402 3 mm ²
2.	Ccomp	Yageo America	CC0805KRX7R9BB392 Series= X7R	Cap= 3.9 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	 0805 7 mm ²
3.	Ccomp2	Yageo America	CC0805JRNPO9BN820 Series= C0G/NP0	Cap= 82.0 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	GRM32ER61C226ME20L Series= X5R	Cap= 22.0 uF ESR= 2.0 mOhm VDC= 16.0 V IRMS= 3.68 A	1	\$0.12	 1210 15 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.	B240A-13-F	VF@Io= 500.0 mV VRRM= 40.0 V	1	\$0.09	 SMA 37 mm ²
8.	L1	Bourns	SDR1105-220ML	L= 22.0 uH DCR= 80.0 mOhm	1	\$0.29	 SDR1105 157 mm ²
9.	Rcomp	Vishay-Dale	CRCW040220K0FKED Series= CRCW..e3	Res= 20.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
10.	Rfbb	Vishay-Dale	CRCW04021K00FKED Series= CRCW..e3	Res= 1000.0 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	713.238 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	137.086 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	2.237 A	Current	Peak switch current in IC
4.	Iin Avg	785.2 mA	Current	Average input current
5.	L Ipp	474.88 mA	Current	Peak-to-peak inductor ripple current
6.	M1 Irms	1.22 A	Current	Q lavg
7.	BOM Count	13	General	Total Design BOM count
8.	FootPrint	324.0 mm ²	General	Total Foot Print Area of BOM components
9.	Frequency	570.0 kHz	General	Switching frequency
10.	M Vds Act	110.479 mV	General	Voltage drop across the MosFET
11.	Pout	18.0 W	General	Total output power

#	Name	Value	Category	Description
12.	Total BOM	\$1.6	General	Total BOM Cost
13.	D1 Tj	43.178 degC	Op_Point	D1 junction temperature
14.	Low Freq Gain	65.85 dB	Op_Point	Gain at 10Hz
15.	Vout Actual	8.96 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
16.	Vout OP	9.0 V	Op_Point	Operational Output Voltage
17.	Cross Freq	15.615 kHz	Op_point	Bode plot crossover frequency
18.	Duty Cycle	37.219 %	Op_point	Duty cycle
19.	Efficiency	91.697 %	Op_point	Steady state efficiency
20.	Gain Marg	-17.361 dB	Op_point	Bode Plot Gain Margin
21.	IC Tj	67.515 degC	Op_point	IC junction temperature
22.	ICThetaJA	50.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
23.	IOUT_OP	2.0 A	Op_point	Iout operating point
24.	Phase Marg	61.168 deg	Op_point	Bode Plot Phase Margin
25.	VIN_OP	25.0 V	Op_point	Vin operating point
26.	Vout p-p	5.667 mV	Op_point	Peak-to-peak output ripple voltage
27.	Cin Pd	508.708 μW	Power	Input capacitor power dissipation
28.	Cout Pd	37.585 μW	Power	Output capacitor power dissipation
29.	Diode Pd	527.121 mW	Power	Diode power dissipation
30.	IC Pd	750.3 mW	Power	IC power dissipation
31.	L Pd	352.0 mW	Power	Inductor power dissipation
32.	Total Pd	1.63 W	Power	Total Power Dissipation
33.	Vout Tolerance	5.404 %		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	14.0	Minimum input voltage
4.	Vout	9.0	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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