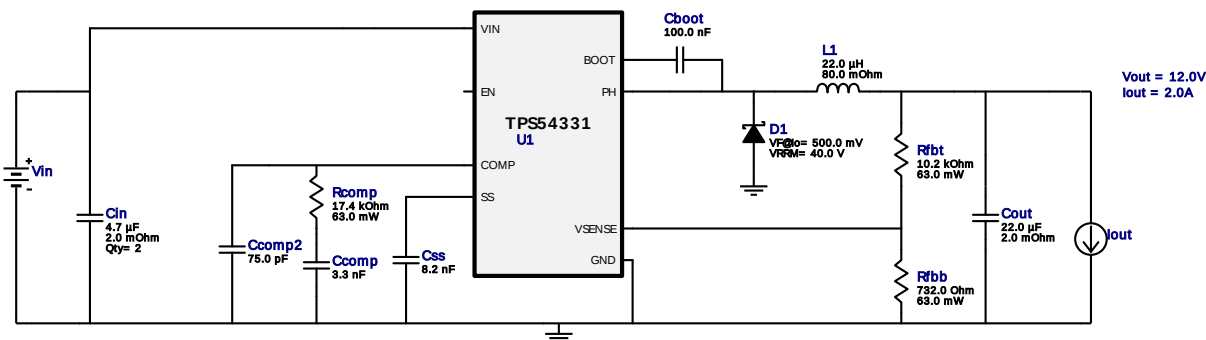


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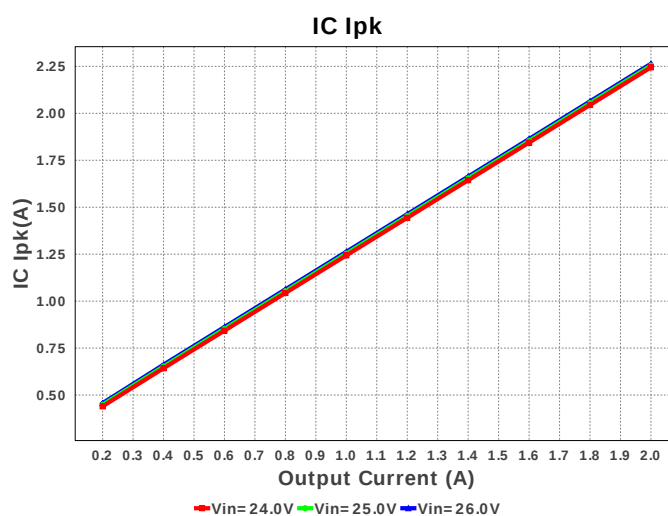
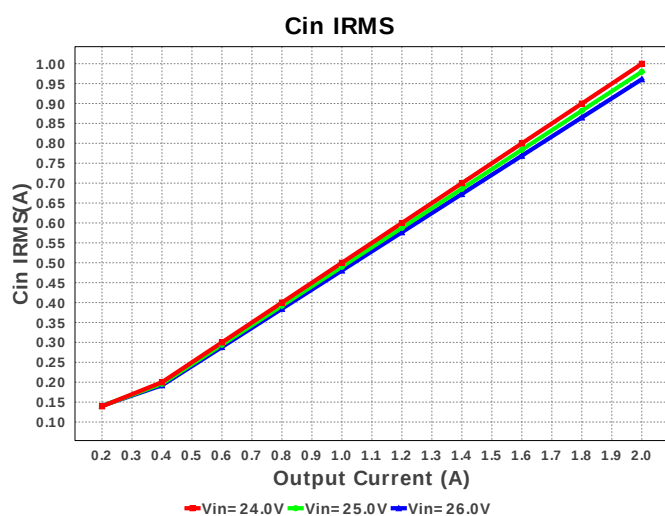
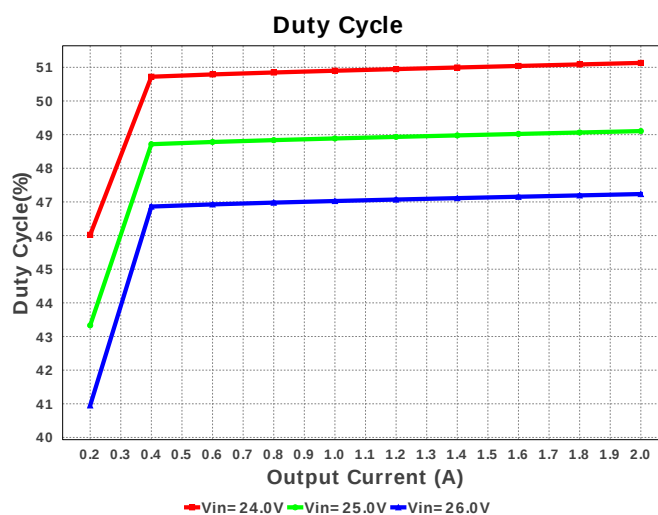
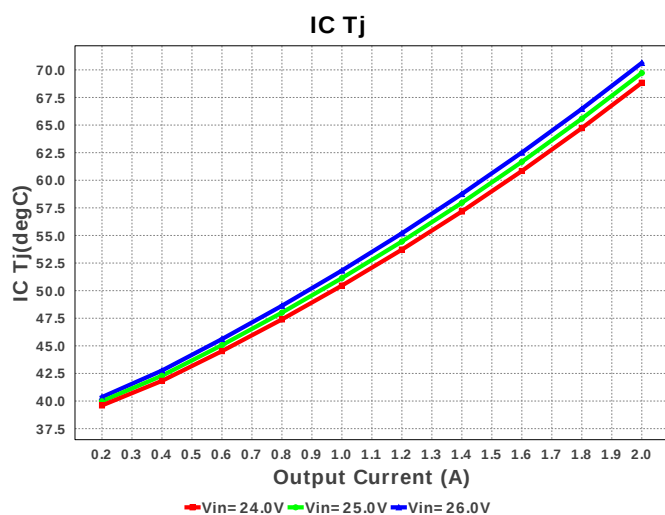
Design : 4769541/2 TPS54331DDAR
TPS54331DDAR 24.0V-26.0V to 12.00V @ 2.0A

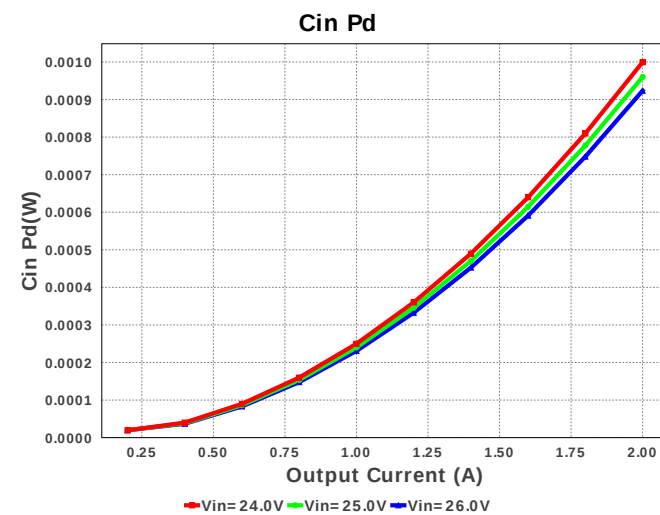
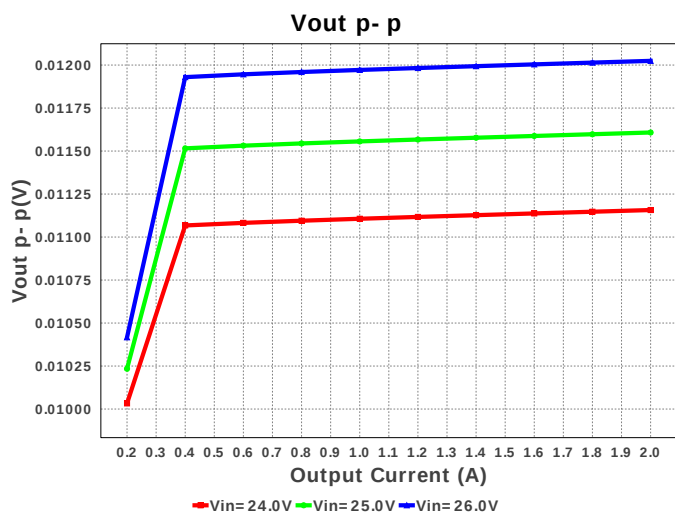
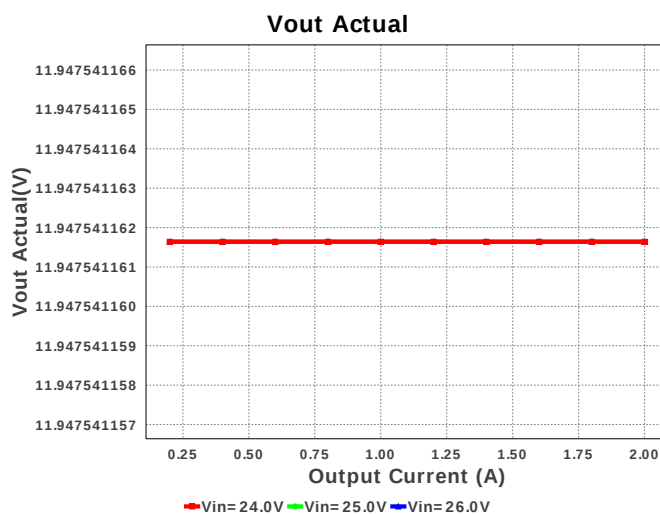
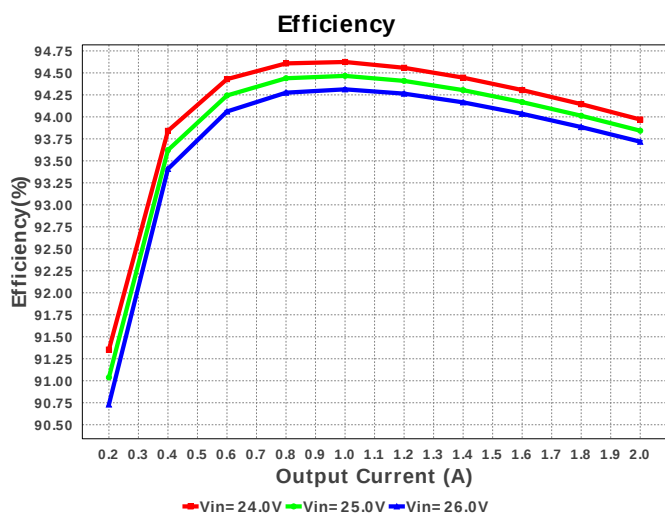
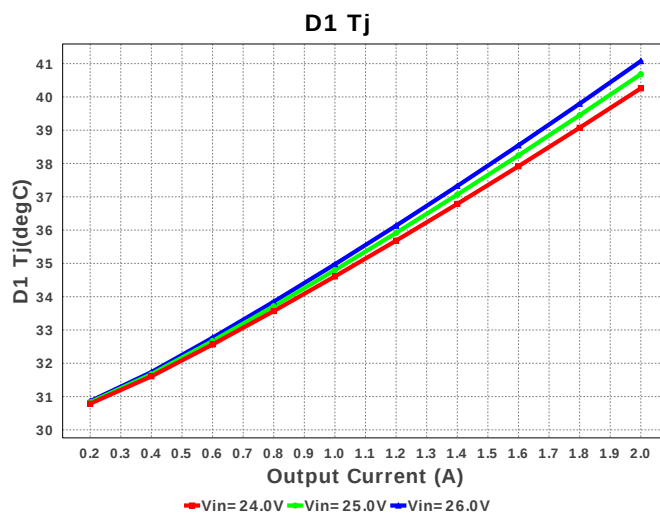
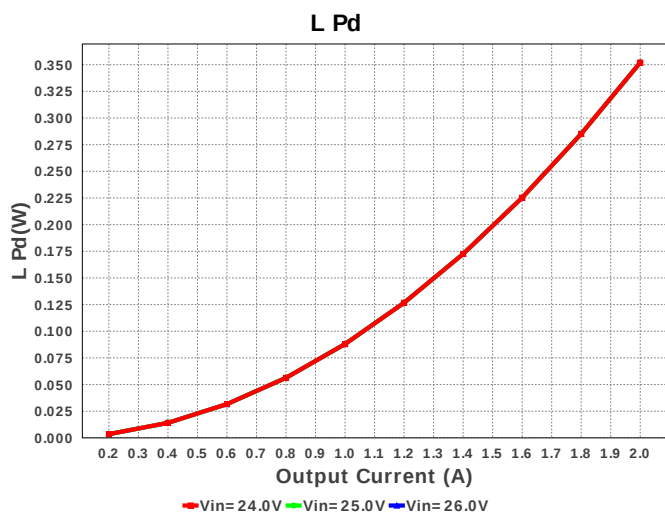


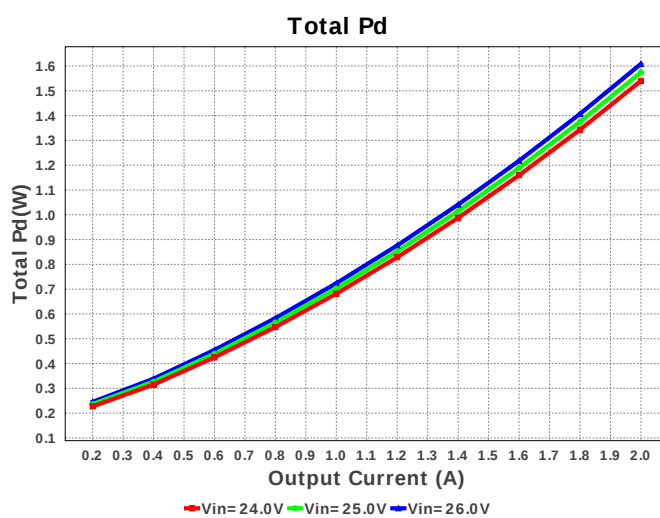
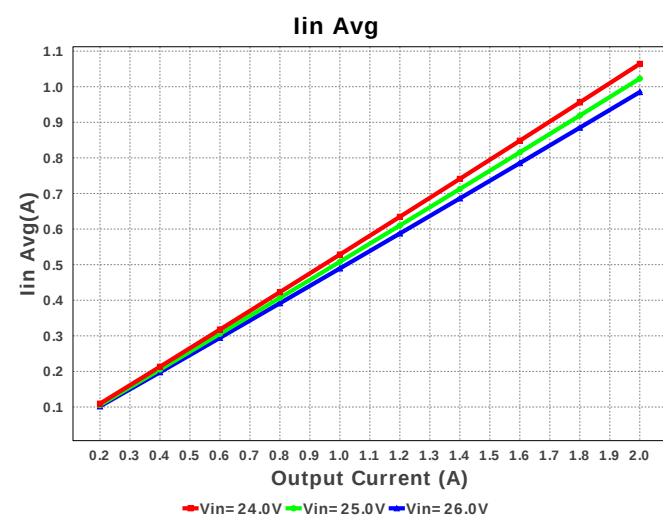
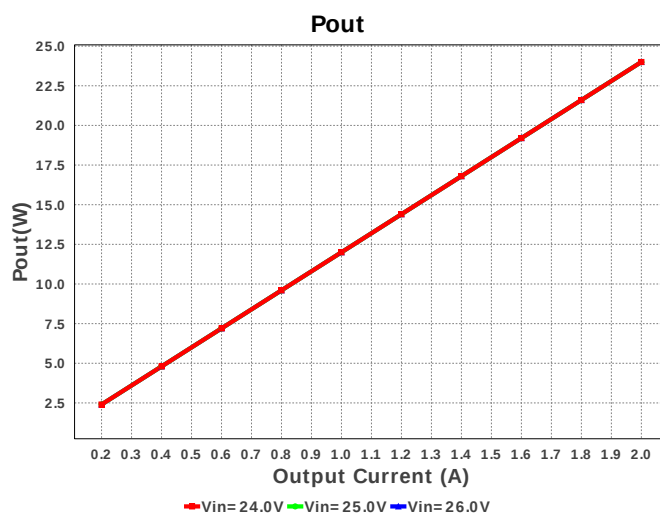
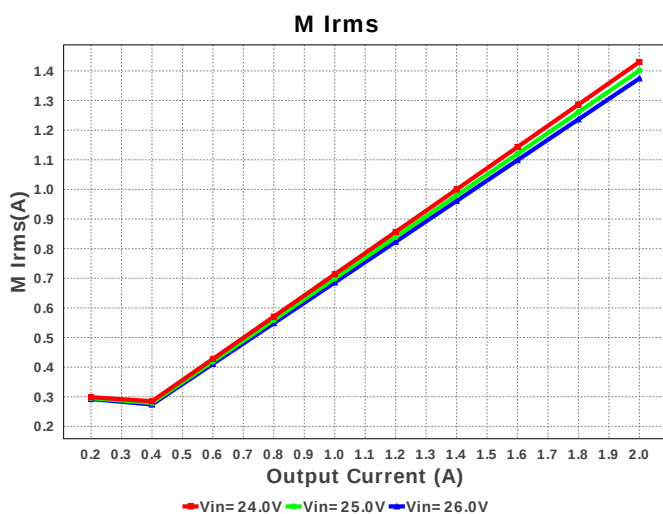
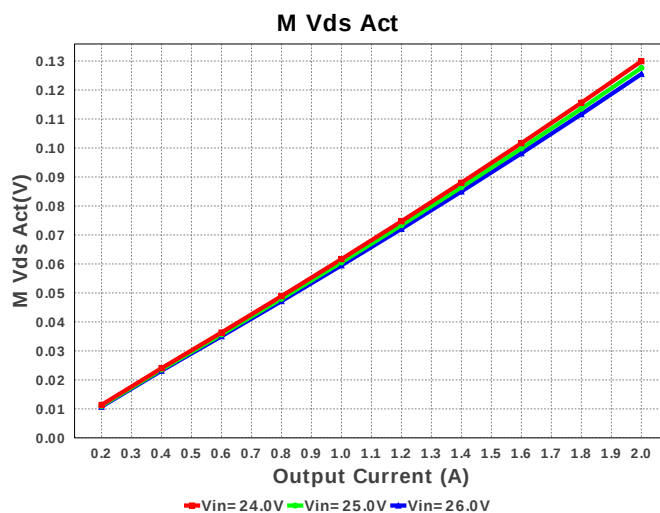
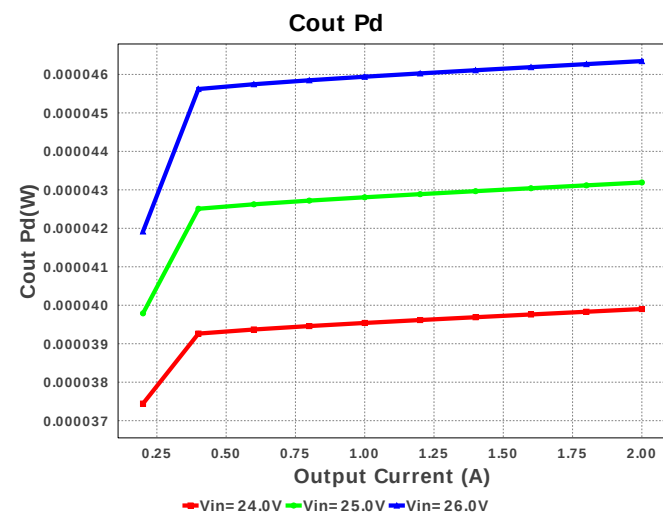
Electrical BOM

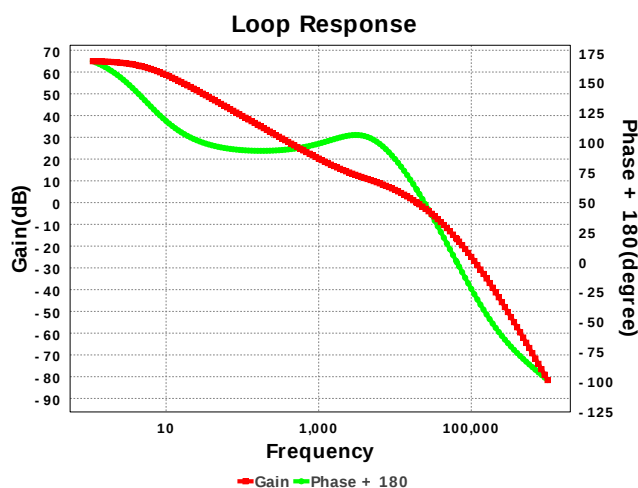
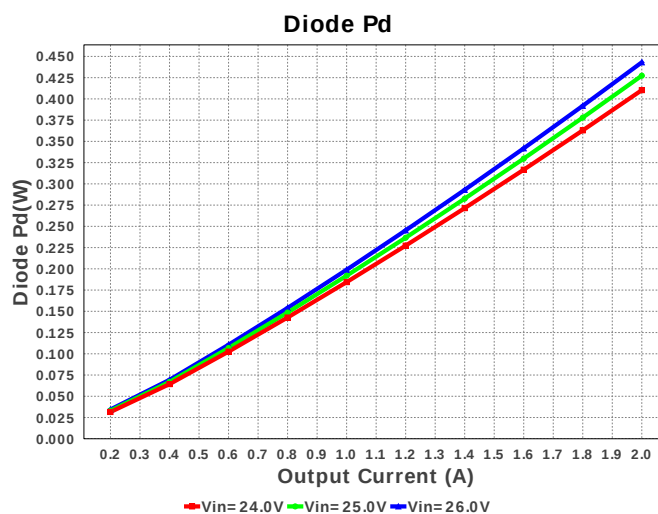
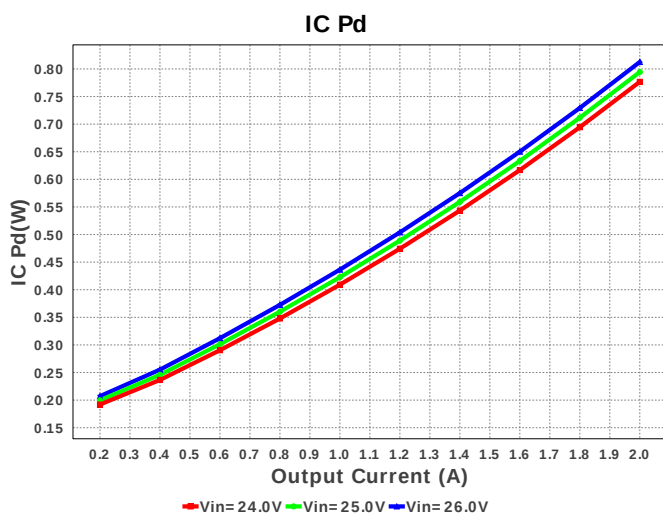
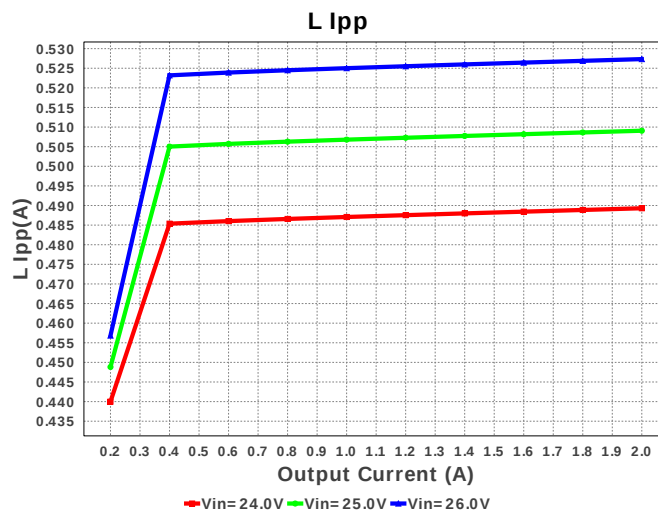
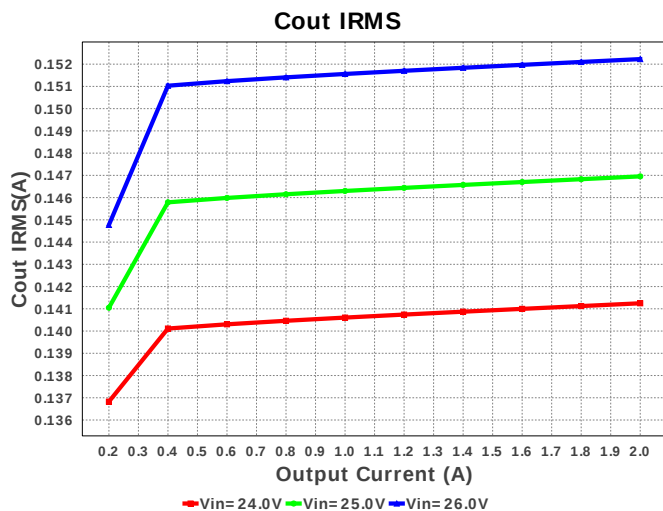
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cboot	MuRata	GRM155R61A104KA01D Series= X5R	Cap= 100.0 nF VDC= 10.0 V IRMS= 0.0 A	1	\$0.01	 0402 3 mm ²
2.	Ccomp	MuRata	GRM216R71E332KA01D Series= X7R	Cap= 3.3 nF VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	 0805 7 mm ²
3.	Ccomp2	Samsung Electro-Mechanics	CL21C750JBANNNC Series= C0G/NP0	Cap= 75.0 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	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
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	CRCW040217K4FKED Series= CRCW..e3	Res= 17.4 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
10.	Rfbb	Vishay-Dale	CRCW0402732RFBED Series= CRCW..e3	Res= 732.0 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	960.975 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	152.227 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	2.264 A	Current	Peak switch current in IC
4.	Iin Avg	984.95 mA	Current	Average input current
5.	L Ipp	527.33 mA	Current	Peak-to-peak inductor ripple current
6.	M1 Irms	1.375 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	125.505 mV	General	Voltage drop across the MosFET
11.	Mode	CCM	General	Conduction Mode

#	Name	Value	Category	Description
12.	Pout	24.0 W	General	Total output power
13.	Total BOM	\$1.64	General	Total BOM Cost
14.	D1 Tj	41.076 degC	Op_Point	D1 junction temperature
15.	Low Freq Gain	64.976 dB	Op_Point	Gain at 10Hz
16.	Vout Actual	11.948 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
17.	Vout OP	12.0 V	Op_Point	Operational Output Voltage
18.	Cross Freq	19.397 kHz	Op_point	Bode plot crossover frequency
19.	Duty Cycle	47.234 %	Op_point	Duty cycle
20.	Efficiency	93.718 %	Op_point	Steady state efficiency
21.	Gain Marg	-16.821 dB	Op_point	Bode Plot Gain Margin
22.	IC Tj	70.632 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	60.758 deg	Op_point	Bode Plot Phase Margin
26.	VIN_OP	26.0 V	Op_point	Vin operating point
27.	Vout p-p	12.024 mV	Op_point	Peak-to-peak output ripple voltage
28.	Cin Pd	923.472 μW	Power	Input capacitor power dissipation
29.	Cout Pd	46.346 μW	Power	Output capacitor power dissipation
30.	Diode Pd	443.032 mW	Power	Diode power dissipation
31.	IC Pd	812.632 mW	Power	IC power dissipation
32.	L Pd	352.0 mW	Power	Inductor power dissipation
33.	Total Pd	1.609 W	Power	Total Power Dissipation
34.	Vout Tolerance	5.451 %		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	26.0	Maximum input voltage
3.	VinMin	24.0	Minimum input voltage
4.	Vout	12.0	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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