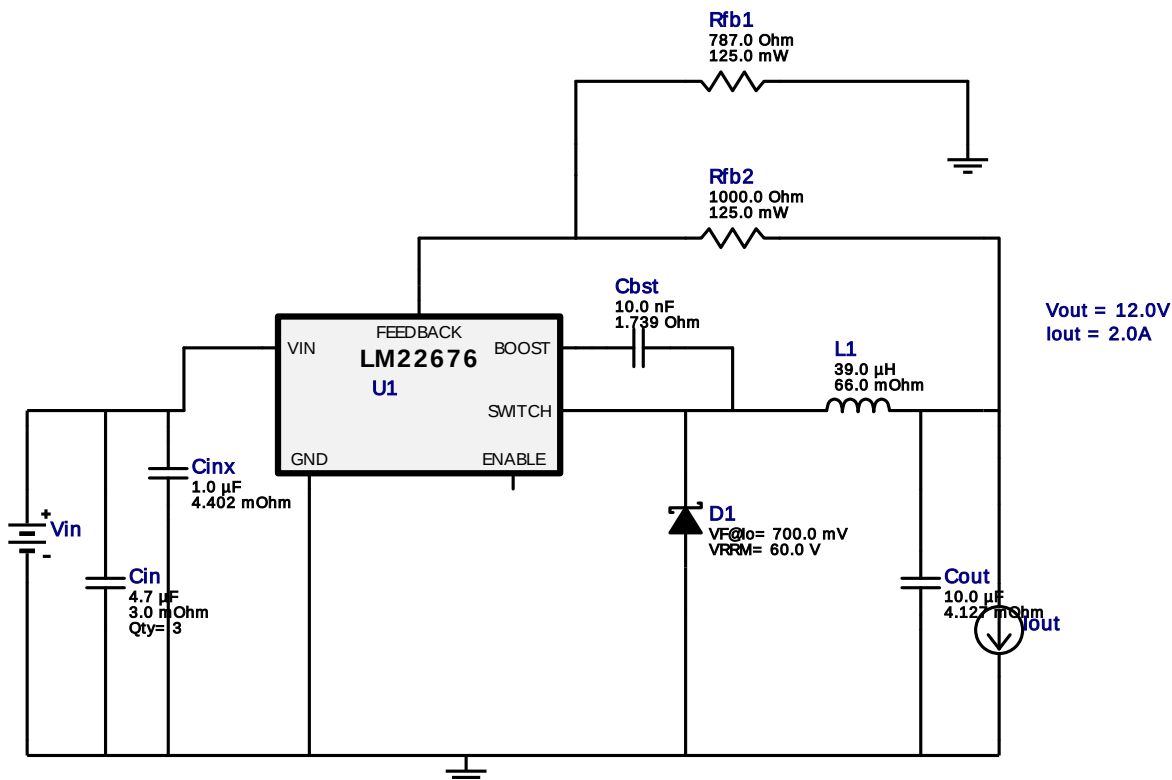


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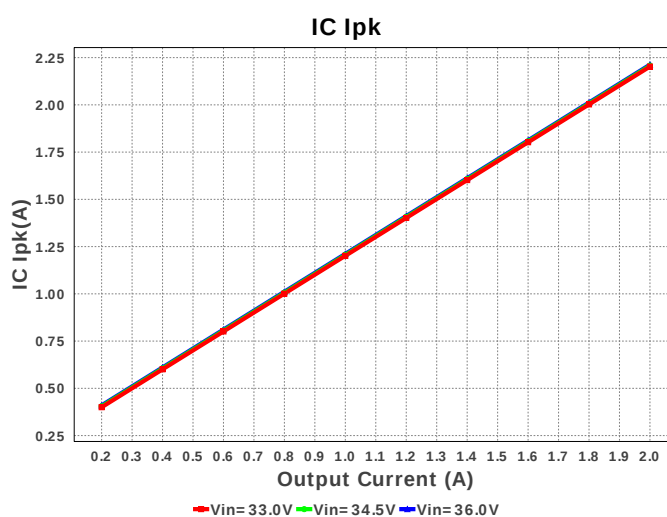
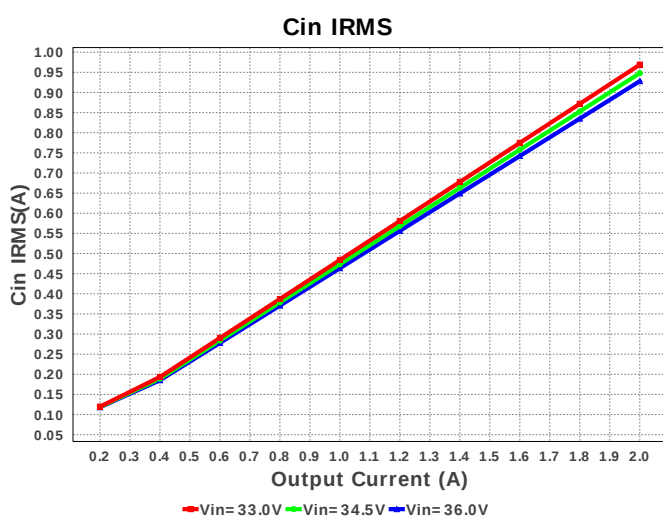
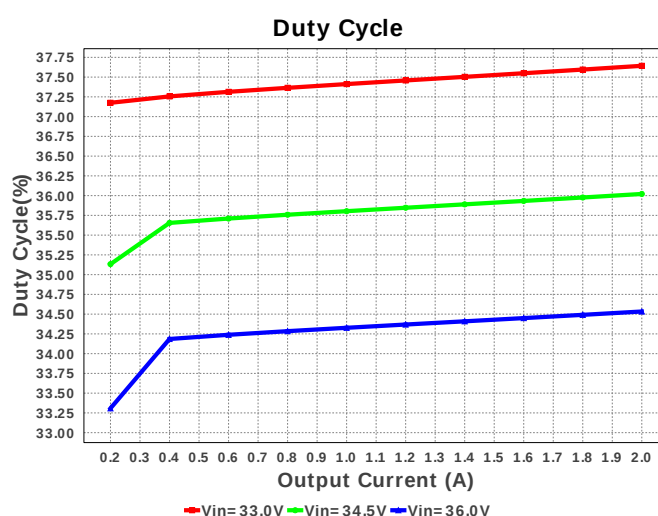
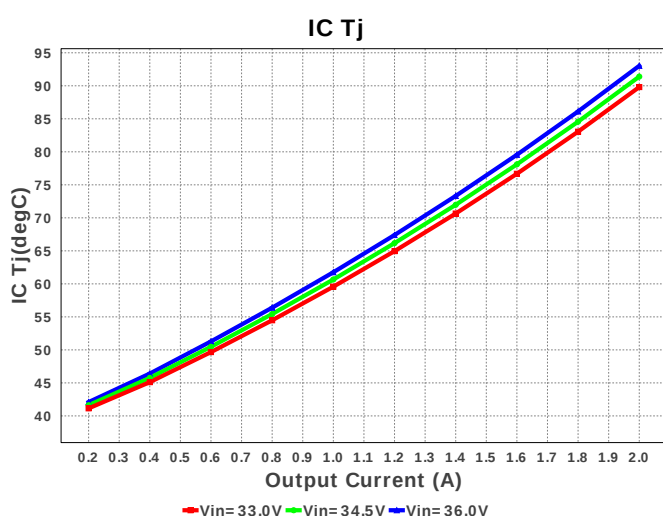
Design : 4742119/5 LM22676MRE-5.0/NOPB
LM22676MRE-5.0/NOPB 33.0V-36.0V to 12.00V @ 2.0A

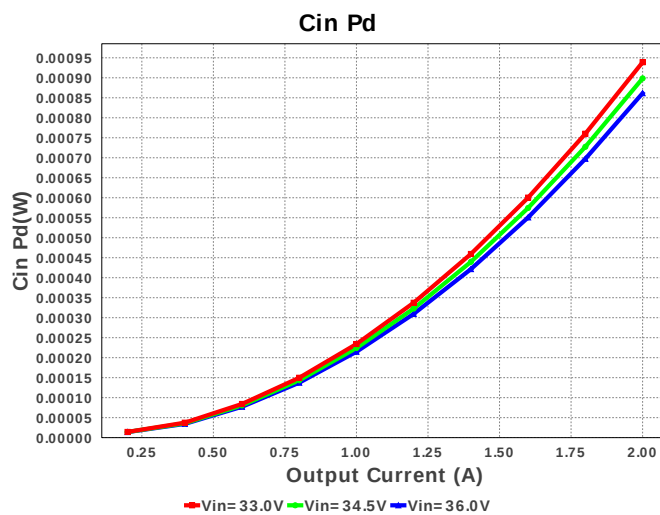
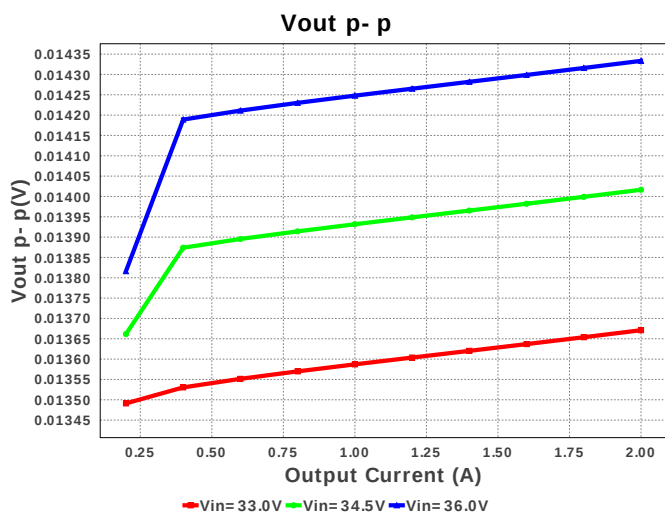
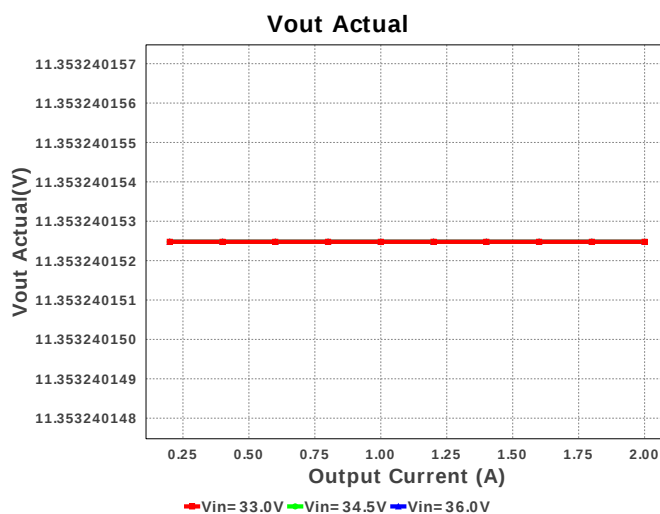
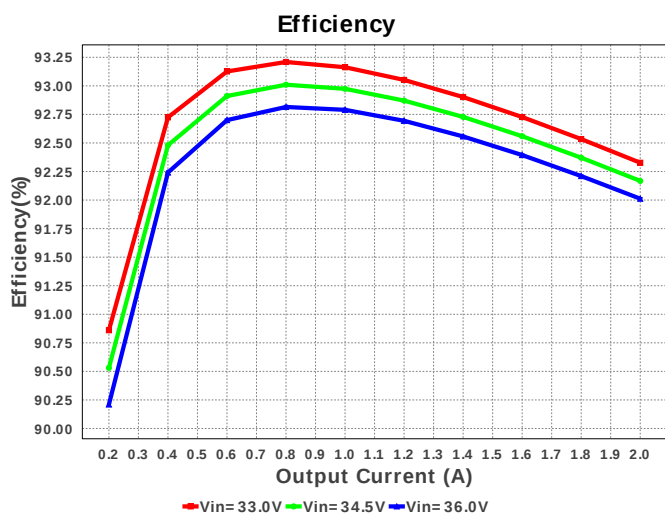
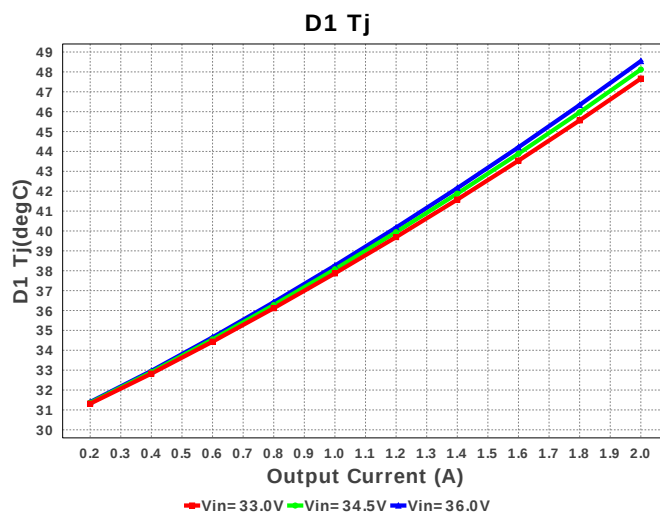
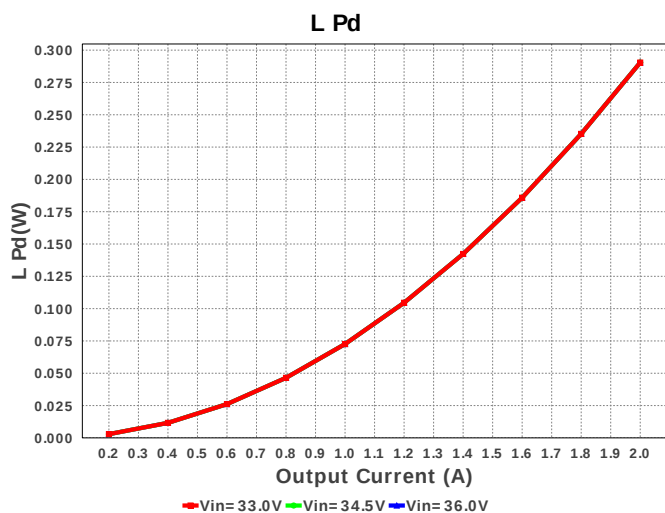


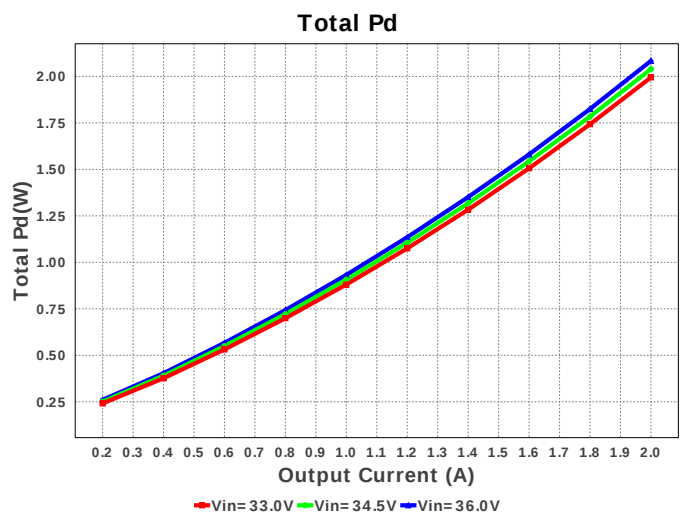
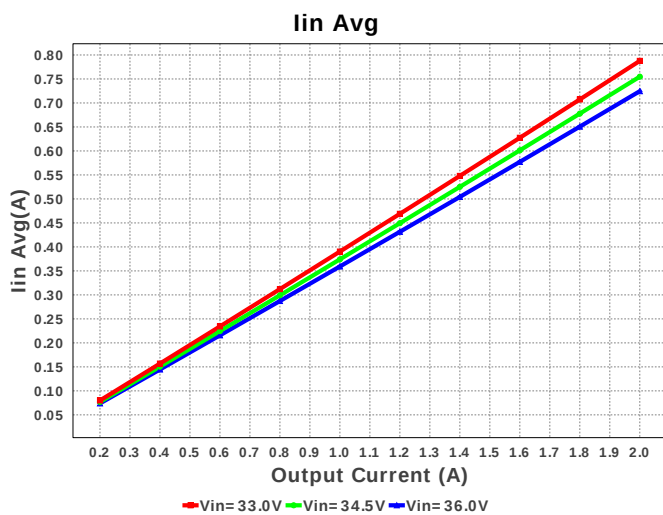
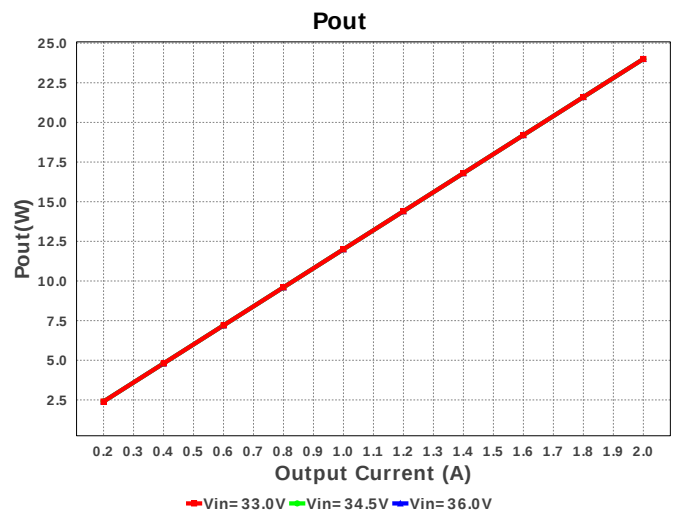
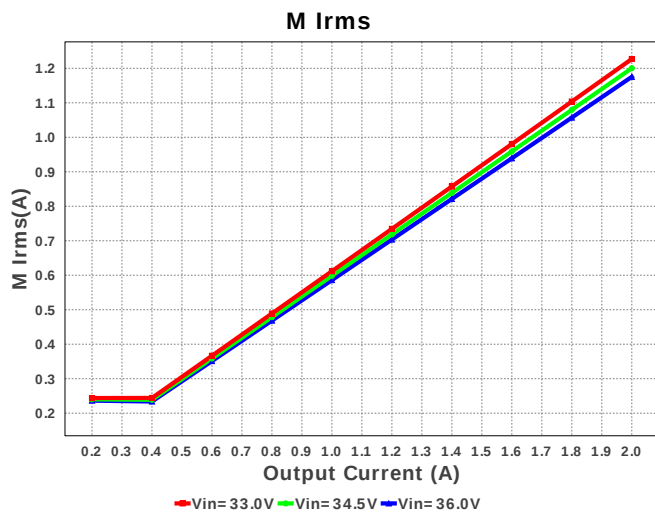
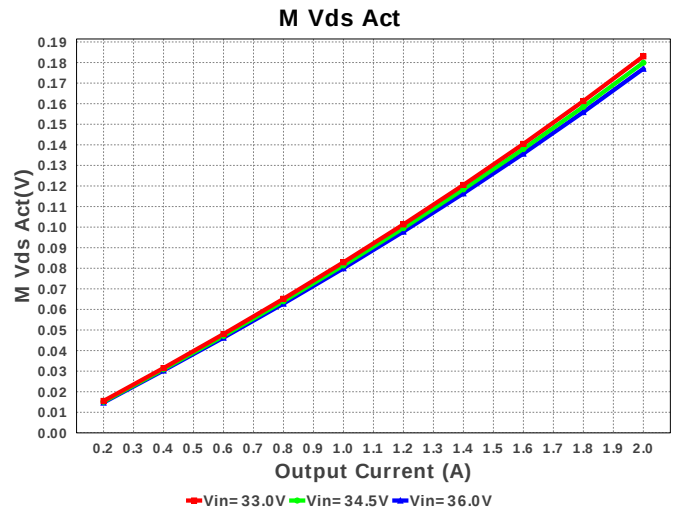
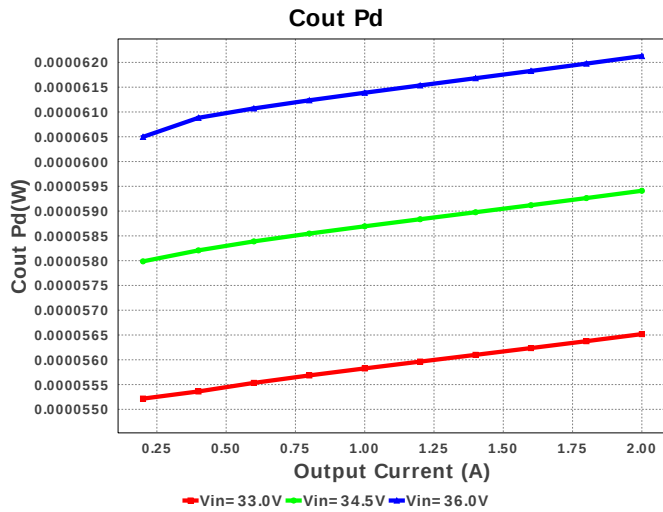
Electrical BOM

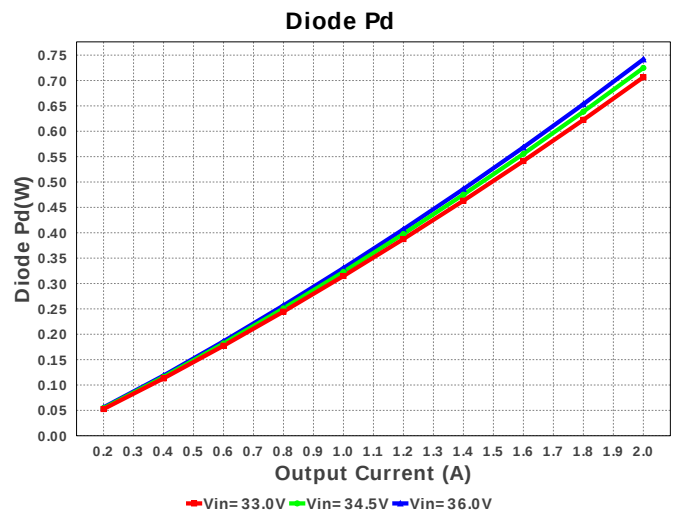
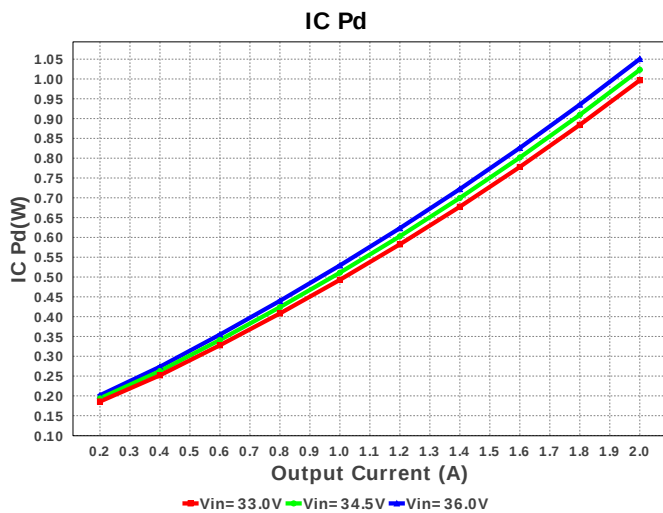
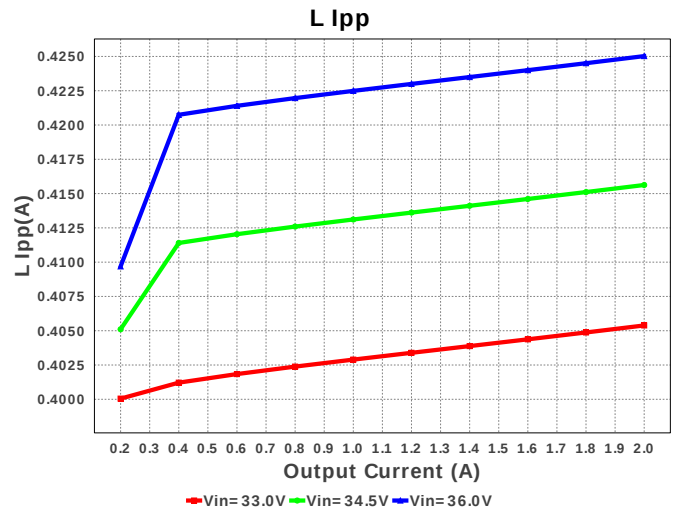
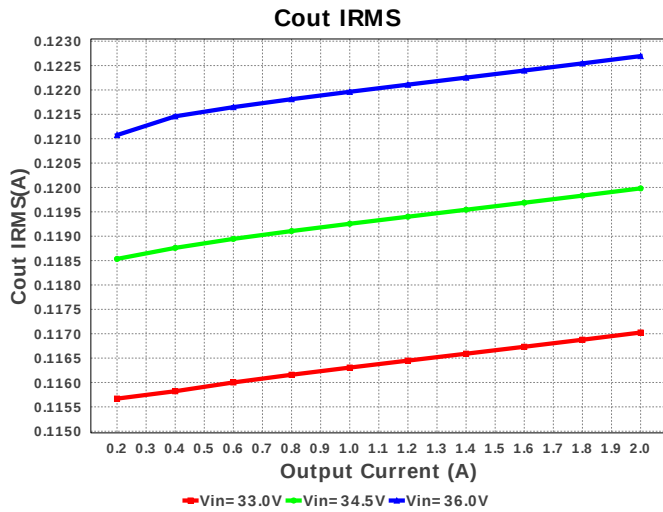
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cbst	Kemet	C0805C103K5RACTU Series= X7R	Cap= 10.0 nF ESR= 1.739 Ohm VDC= 50.0 V IRMS= 411.0 mA	1	\$0.01	 0805 7 mm²
2.	Cin	MuRata	GRM31CR71H475KA12L Series= X7R	Cap= 4.7 uF ESR= 3.0 mOhm VDC= 50.0 V IRMS= 4.98 A	3	\$0.07	 1206 11 mm²
3.	Cinx	MuRata	GRM21BR71H105KA12L Series= X7R	Cap= 1.0 uF ESR= 4.402 mOhm VDC= 50.0 V IRMS= 1.677 A	1	\$0.05	 0805 7 mm²
4.	Cout	MuRata	GRM21BR61C106KE15L Series= X5R	Cap= 10.0 uF ESR= 4.127 mOhm VDC= 16.0 V IRMS= 2.46634 A	1	\$0.03	 0805 7 mm²
5.	D1	Diodes Inc.	B260A-13-F	VF@Io= 700.0 mV VRRM= 60.0 V	1	\$0.09	 SMA 37 mm²
6.	L1	Bourns	SRR1210-390M	L= 39.0 uH DCR= 66.0 mOhm	1	\$0.44	 SRR1210 196 mm²

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
7.	Rfb1	Vishay-Dale	CRCW0805787RFKEA Series= CRCW..e3	Res= 787.0 Ohm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7 mm ²
8.	Rfb2	Panasonic	ERJ-6ENF1001V Series= ERJ-6E	Res= 1000.0 Ohm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7 mm ²
9.	U1	Texas Instruments	LM22676MRE-5.0/NOPB	Switcher	1	\$2.07	 MRA08B 56 mm ²









Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	928.145 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	122.694 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	2.213 A	Current	Peak switch current in IC
4.	Iin Avg	724.54 mA	Current	Average input current
5.	L Ipp	425.03 mA	Current	Peak-to-peak inductor ripple current
6.	M1 Irms	1.175 A	Current	Q lavg
7.	BOM Count	11	General	Total Design BOM count
8.	FootPrint	355.0 mm ²	General	Total Foot Print Area of BOM components
9.	Frequency	500.0 kHz	General	Switching frequency
10.	IC Tolerance	75.0 mV	General	IC Feedback Tolerance
11.	M Vds Act	177.014 mV	General	Voltage drop across the MosFET
12.	Pout	24.0 W	General	Total output power
13.	Total BOM	\$2.92	General	Total BOM Cost
14.	D1 Tj	48.543 degC	Op_Point	D1 junction temperature
15.	Vout Actual	11.353 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
16.	Vout OP	12.0 V	Op_Point	Operational Output Voltage
17.	Cross Freq	58.415 kHz	Op_point	Bode plot crossover frequency
18.	Duty Cycle	34.533 %	Op_point	Duty cycle
19.	Efficiency	92.012 %	Op_point	Steady state efficiency
20.	IC Tj	93.027 degC	Op_point	IC junction temperature
21.	ICThetaJA	60.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
22.	IOUT_OP	2.0 A	Op_point	Iout operating point
23.	Phase Marg	44.519 deg	Op_point	Bode Plot Phase Margin
24.	VIN_OP	36.0 V	Op_point	Vin operating point
25.	Vout p-p	14.333 mV	Op_point	Peak-to-peak output ripple voltage
26.	Cin Pd	861.453 μ W	Power	Input capacitor power dissipation
27.	Cout Pd	62.127 μ W	Power	Output capacitor power dissipation
28.	Diode Pd	741.715 mW	Power	Diode power dissipation
29.	IC Pd	1.05 W	Power	IC power dissipation
30.	L Pd	290.4 mW	Power	Inductor power dissipation
31.	Total Pd	2.084 W	Power	Total Power Dissipation

#	Name	Value	Category	Description
32.	Vout Tolerance	2.648 %		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	36.0	Maximum input voltage
3.	VinMin	33.0	Minimum input voltage
4.	Vout	12.0	Output Voltage
5.	base_pn	LM22676	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	30.0	Ambient temperature

Design Assistance

1. Why WEBENCH recommends the 5.0 option for your 12.0V output: The internal compensation for the ADJ version of the LM22676 is optimized for output voltages below 5V. Therefore it is recommended that for outputs greater than 5V, the 5.0 option be used with an additional external resistive feedback divider. Part Description The LM22676 is a monolithic integrated circuit that provides all of the active functions for a step-down (buck) switching regulator capable of driving up to 3.0A loads with excellent line and load regulation characteristics. High efficiency (>90%) is obtained through the use of a low ON-resistance N-channel MOSFET.

2. **LM22676** Product Folder : <http://www.ti.com/product/LM22676> : contains the data sheet and other resources.

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You should completely validate and test your design implementation to confirm the system functionality for your application prior to production.

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