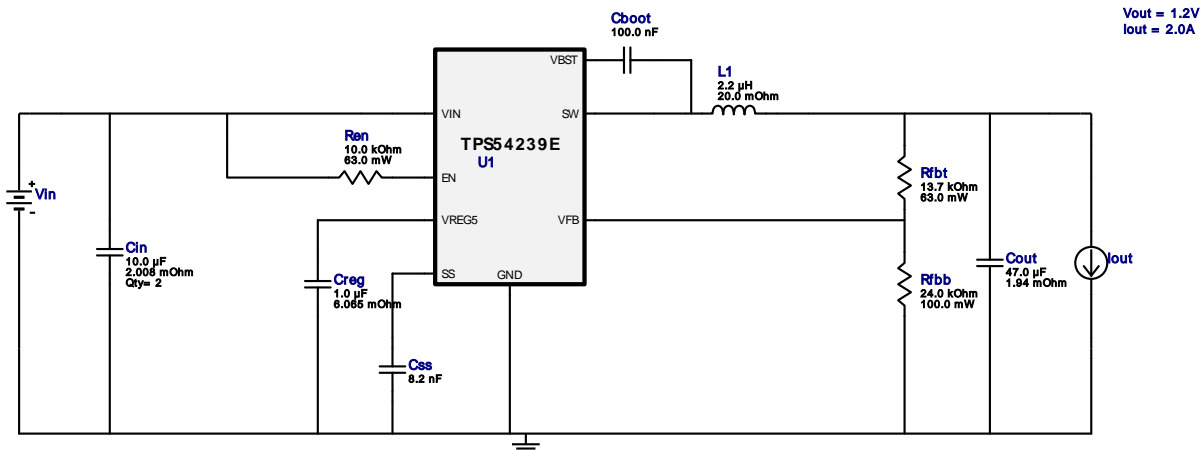



## WEBENCH® Design Report

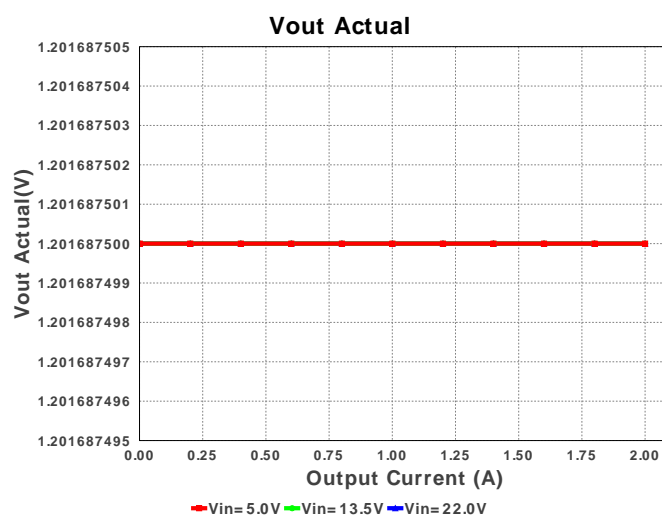
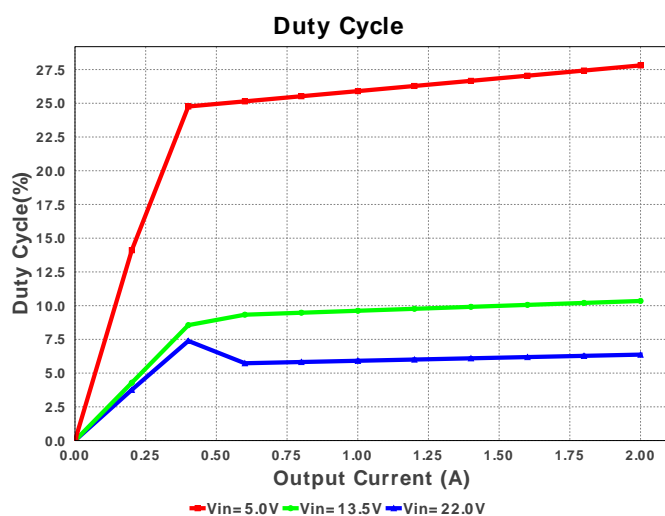
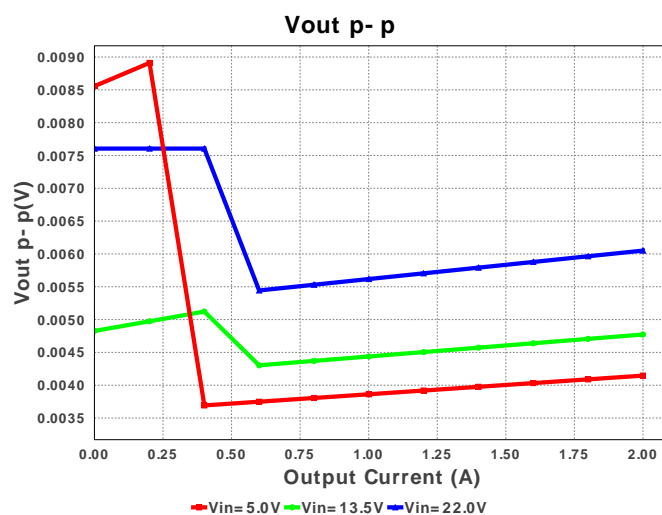
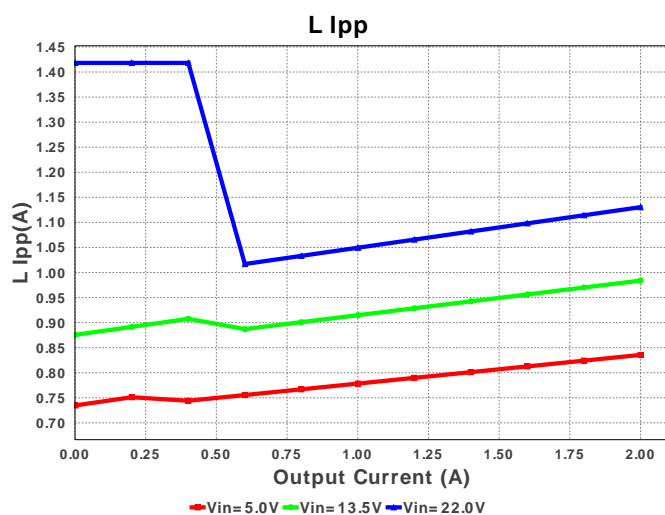
Design : 4466246/34 TPS54239EDDAR  
TPS54239EDDAR 5.0V-22.0V to 1.20V @ 2.0A

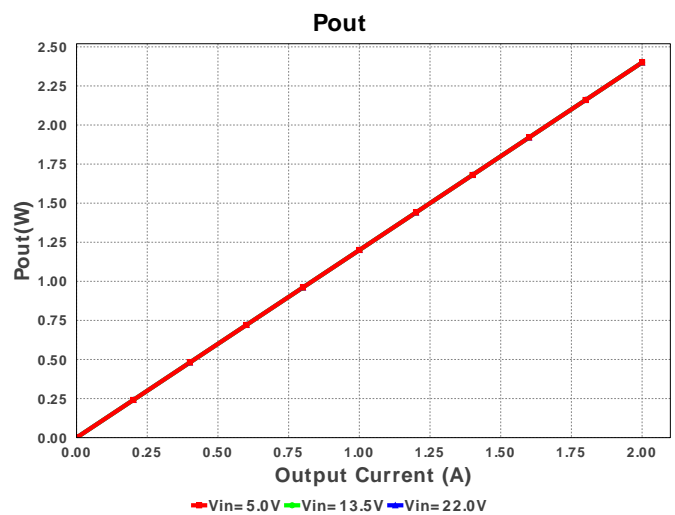
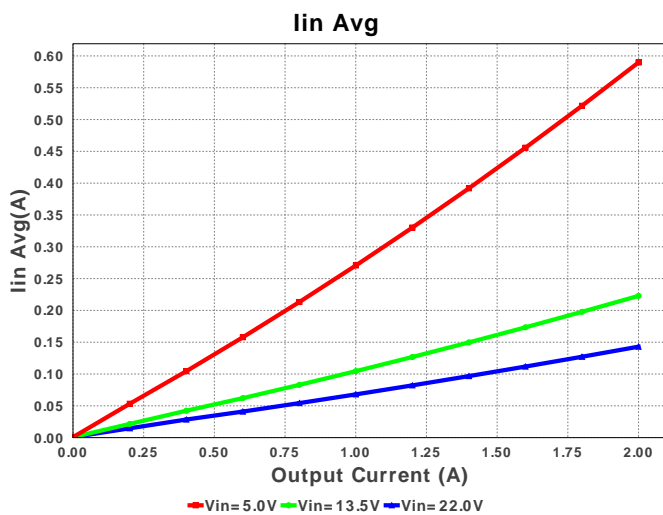
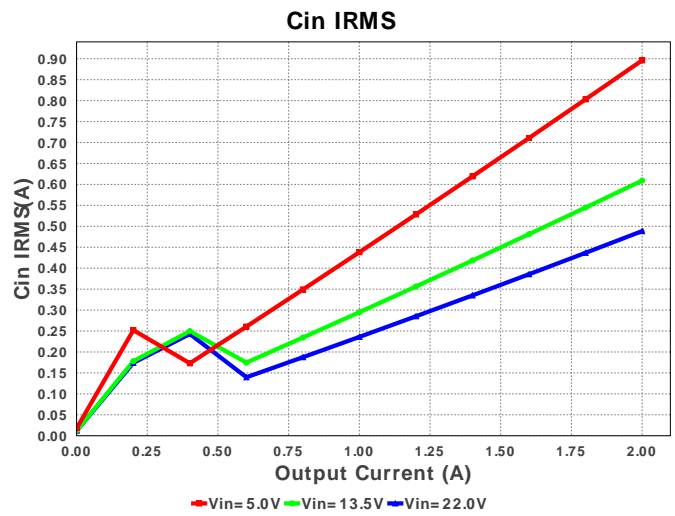
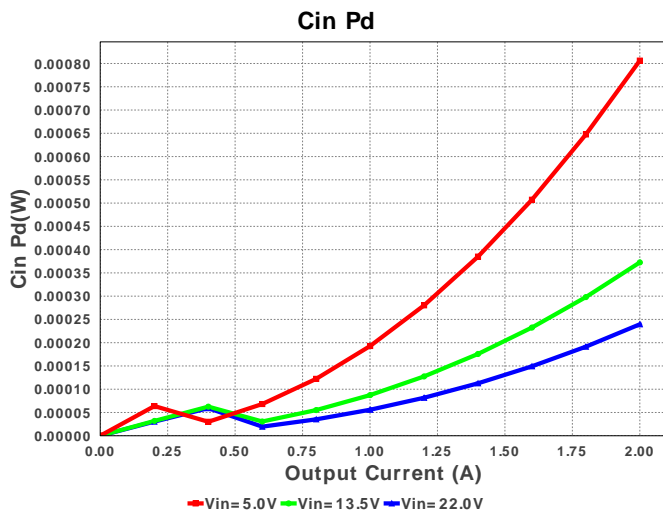
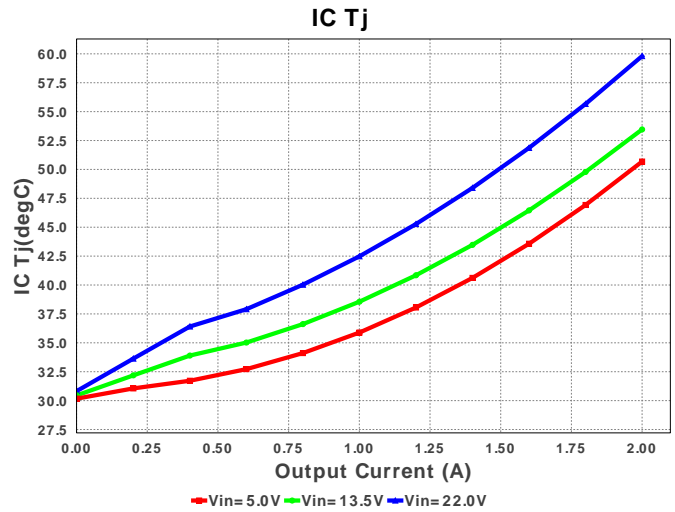
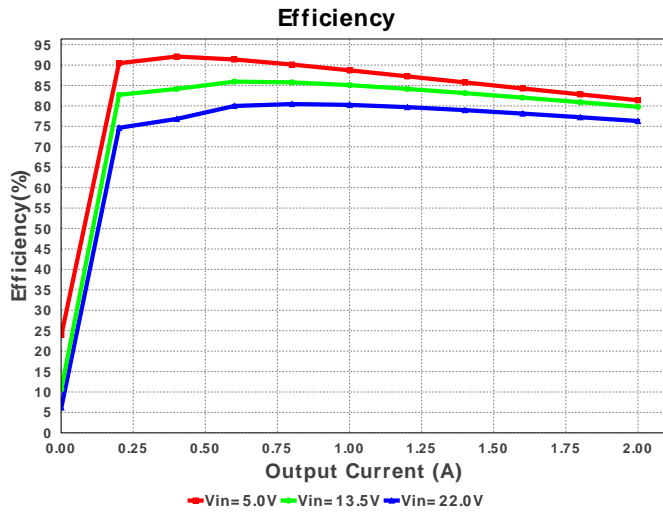


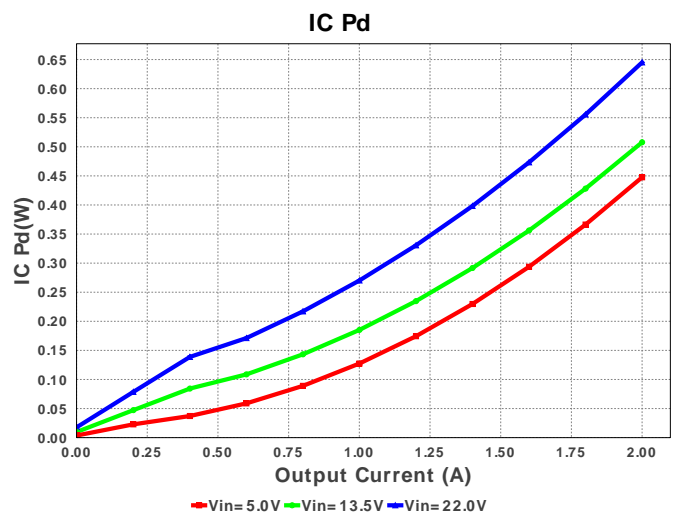
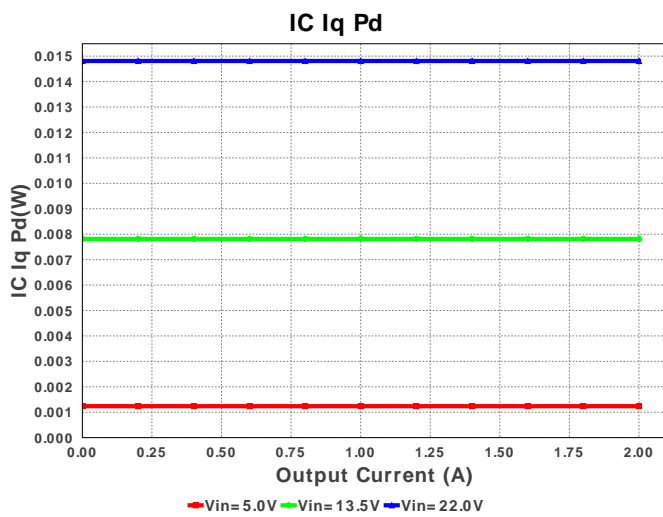
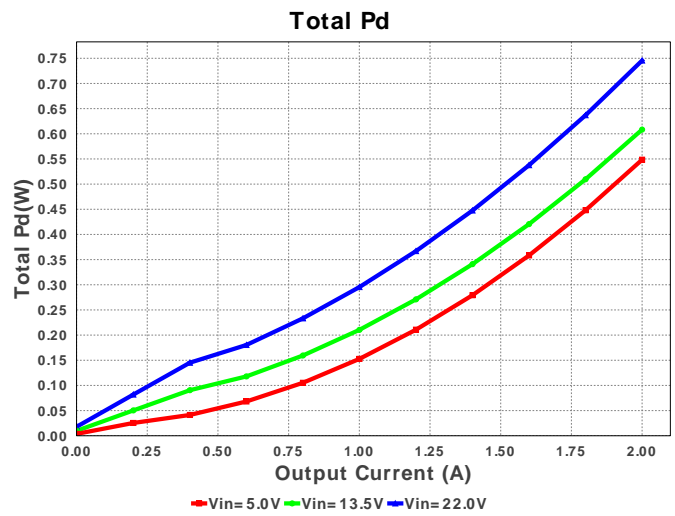
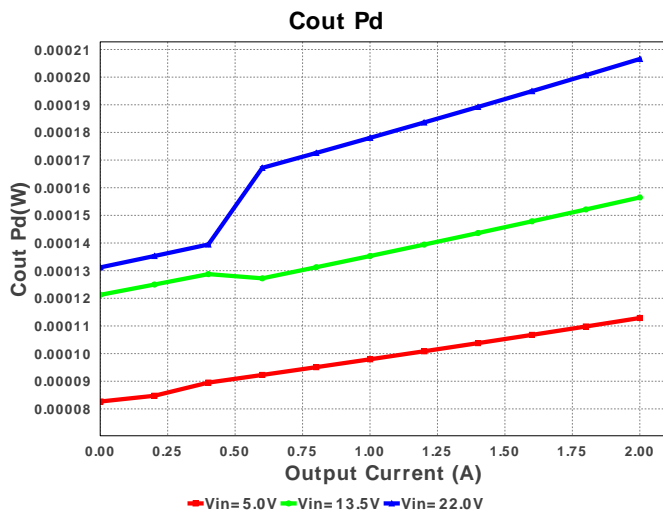
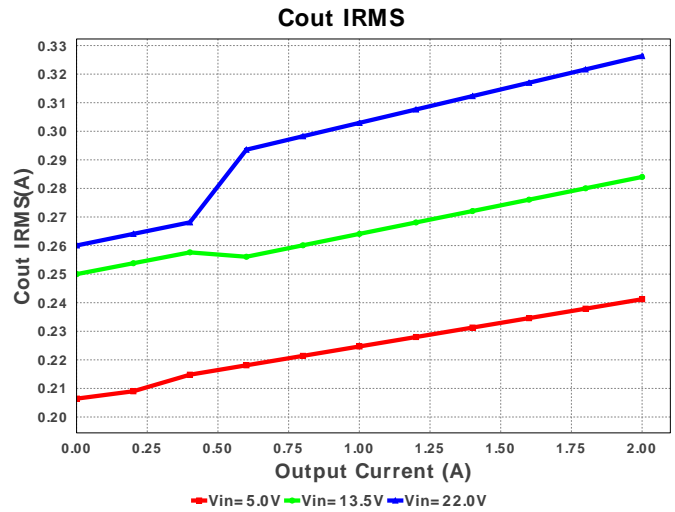
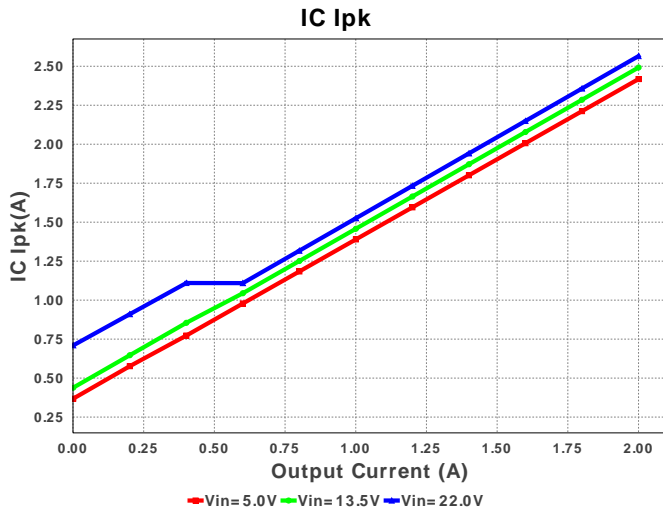
## Electrical BOM

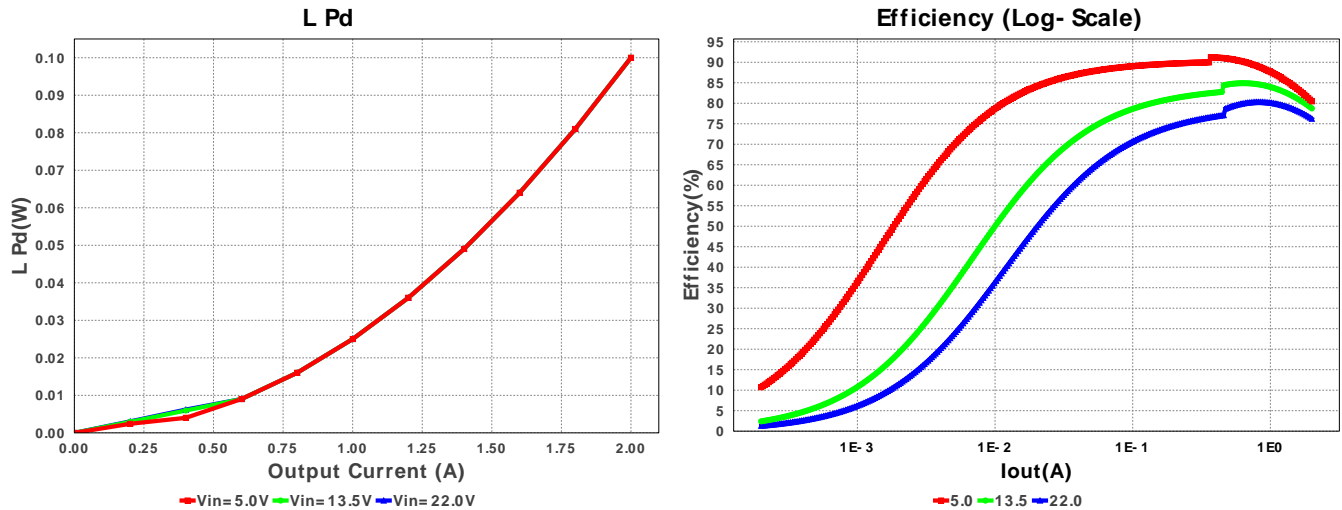
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cboot	MuRata	GRM155R61A104KA01D Series= X5R	Cap= 100.0 nF VDC= 10.0 V IRMS= 0.0 A	1	\$0.01	 0402 3 mm <sup>2</sup>
2.	Cin	MuRata	GRM32ER7YA106KA12L Series= X7R	Cap= 10.0 uF ESR= 2.008 mOhm VDC= 35.0 V IRMS= 4.6772 A	2	\$0.22	 1210_280 15 mm <sup>2</sup>
3.	Cout	TDK	C3216X6S0G476M Series= X6S	Cap= 47.0 uF ESR= 1.94 mOhm VDC= 4.0 V IRMS= 0.0 A	1	\$0.13	 1206 11 mm <sup>2</sup>
4.	Creg	MuRata	GRM188R61A105KA61D Series= X5R	Cap= 1.0 uF ESR= 6.065 mOhm VDC= 10.0 V IRMS= 1.30675 A	1	\$0.01	 0603 5 mm <sup>2</sup>
5.	Css	MuRata	GRM033R61A822KA01D Series= X5R	Cap= 8.2 nF VDC= 10.0 V IRMS= 0.0 A	1	\$0.01	 0201 2 mm <sup>2</sup>
6.	L1	TDK	CLF7045T-2R2N	L= 2.2 uH DCR= 20.0 mOhm	1	\$0.42	 CLF7045 86 mm <sup>2</sup>
7.	Ren	Vishay-Dale	CRCW040210K0FKED Series= CRCW..e3	Res= 10.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm <sup>2</sup>
8.	Rfbb	Yageo America	RC0603FR-0724KL Series= ?	Res= 24.0 kOhm Power= 100.0 mW Tolerance= 1.0%	1	\$0.01	 0603 5 mm <sup>2</sup>
9.	Rfbt	Vishay-Dale	CRCW040213K7FKED Series= CRCW..e3	Res= 13.7 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm <sup>2</sup>

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
10.	U1	Texas Instruments	TPS54239EDDAR	Switcher	1	\$0.75	 DDA0008E 57 mm <sup>2</sup>









## Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	488.438 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	326.309 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	2.565 A	Current	Peak switch current in IC
4.	Iin Avg	142.98 mA	Current	Average input current
5.	L Ipp	1.13 A	Current	Peak-to-peak inductor ripple current
6.	BOM Count	11	General	Total Design BOM count
7.	FootPrint	204.0 mm <sup>2</sup>	General	Total Foot Print Area of BOM components
8.	Frequency	532.802 kHz	General	Switching frequency
9.	Pout	2.4 W	General	Total output power
10.	Total BOM	\$1.8	General	Total BOM Cost
11.	Vout Actual	1.202 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
12.	Vout OP	1.2 V	Op_Point	Operational Output Voltage
13.	Duty Cycle	6.37 %	Op_point	Duty cycle
14.	Efficiency	76.298 %	Op_point	Steady state efficiency
15.	IC Tj	59.804 degC	Op_point	IC junction temperature
16.	ICThetaJA	46.2 degC/W	Op_point	IC junction-to-ambient thermal resistance
17.	IOUT_OP	2.0 A	Op_point	Iout operating point
18.	VIN_OP	22.0 V	Op_point	Vin operating point
19.	Vout p-p	6.051 mV	Op_point	Peak-to-peak output ripple voltage
20.	Cin Pd	239.526 μW	Power	Input capacitor power dissipation
21.	Cout Pd	206.566 μW	Power	Output capacitor power dissipation
22.	IC Iq Pd	14.809 mW	Power	IC Iq Pd
23.	IC Pd	645.106 mW	Power	IC power dissipation
24.	L Pd	100.0 mW	Power	Inductor power dissipation
25.	Total Pd	745.561 mW	Power	Total Power Dissipation
26.	Vout Tolerance	2.578 %		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	5.0	Minimum input voltage
4.	Vout	1.2	Output Voltage
5.	base_pn	TPS54239E	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	30.0	Ambient temperature

## Design Assistance

1. **TPS54239E** Product Folder : <http://www.ti.com/product/TPS54239E> : contains the data sheet and other resources.

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