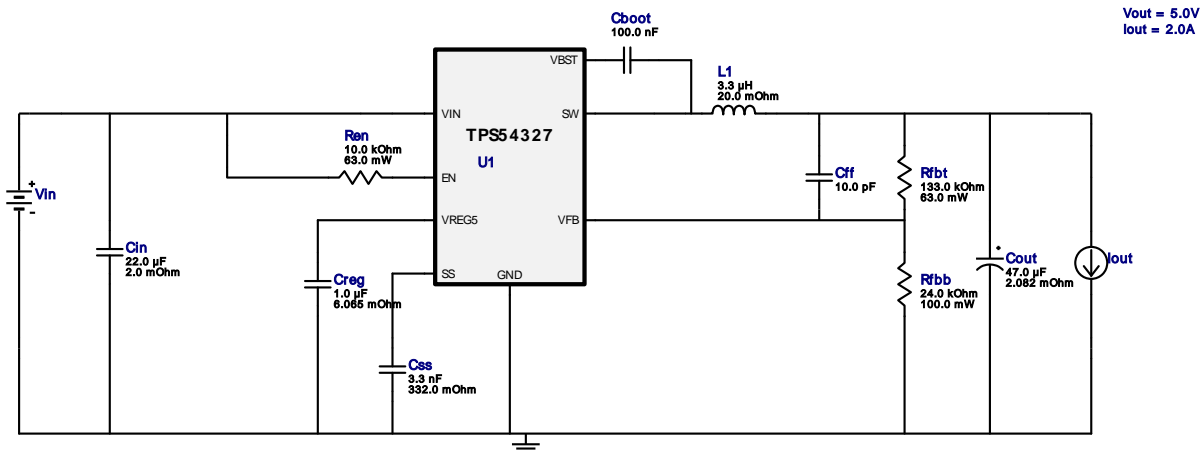


## WEBENCH® Design Report

Design : 1435520/8 TPS54327DDAR  
TPS54327DDAR 11.0V-15.0V to 5.00V @ 2.0A





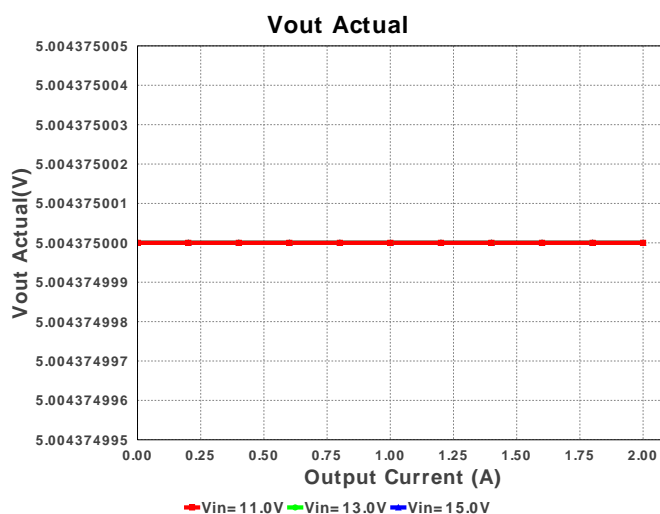
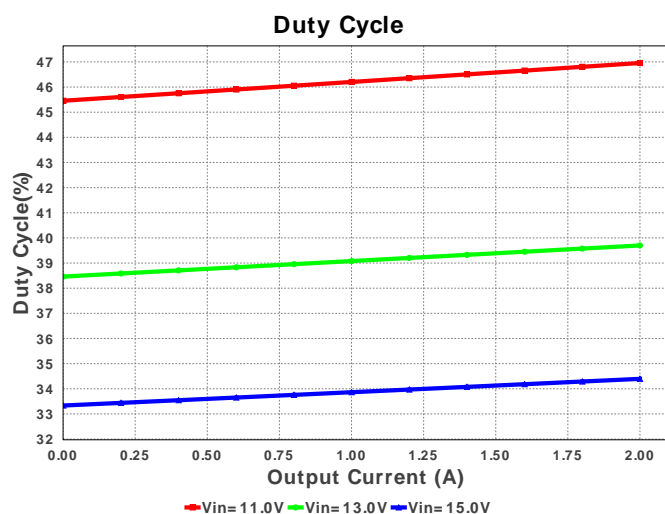
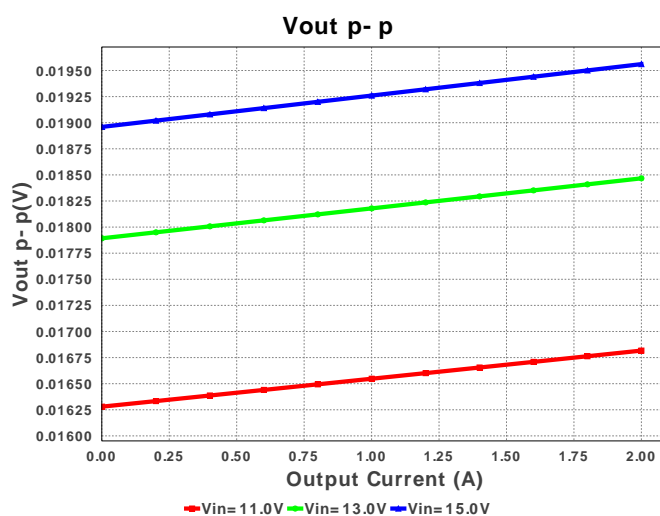
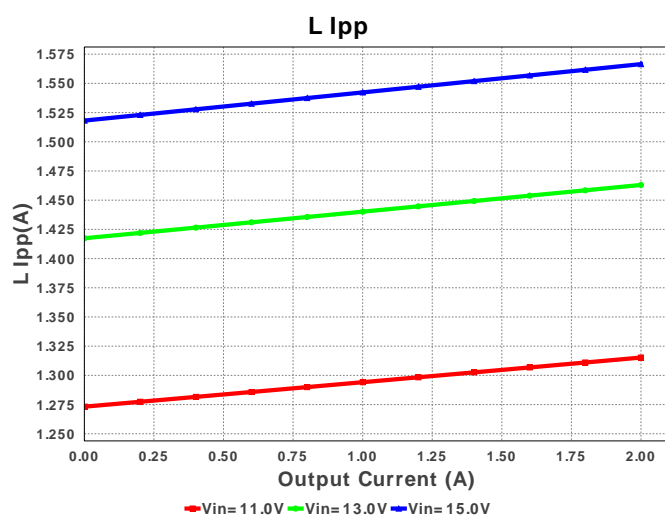
### My Comments

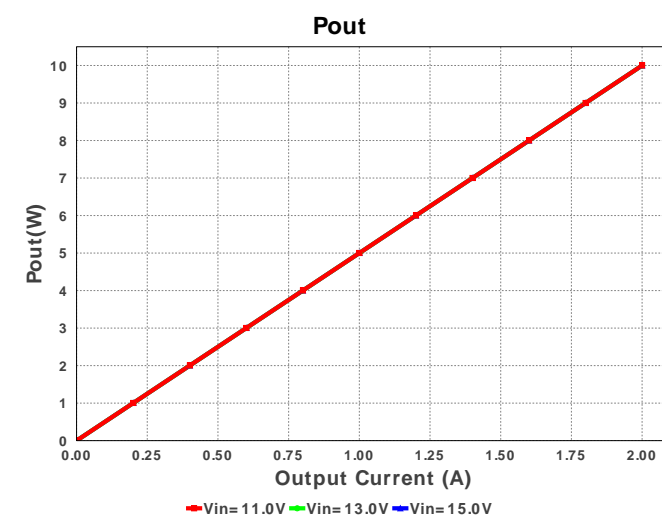
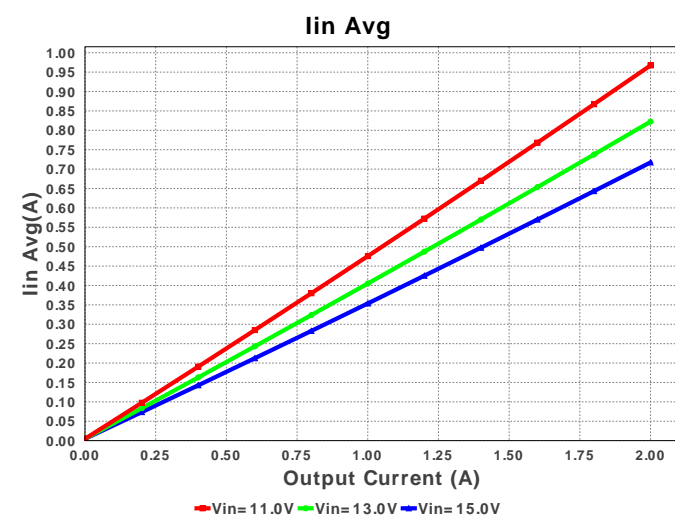
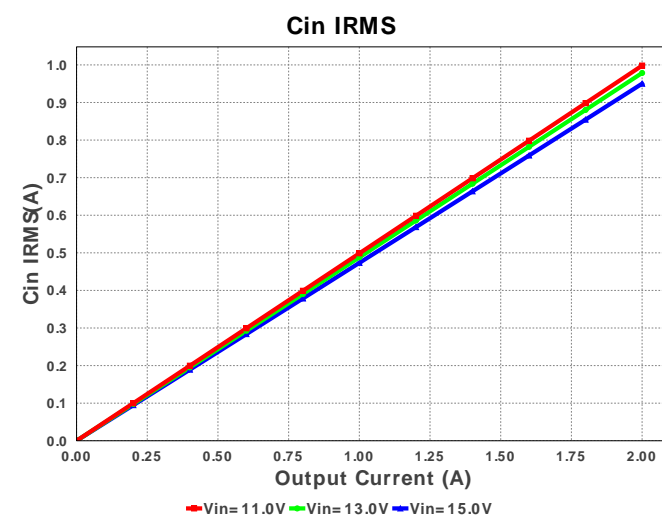
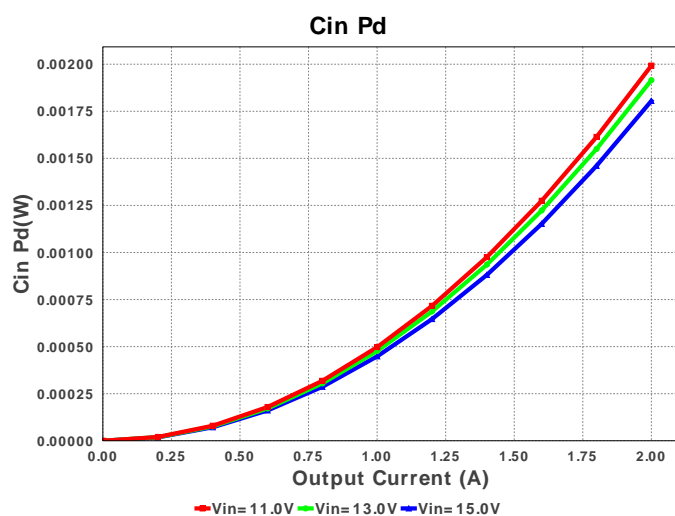
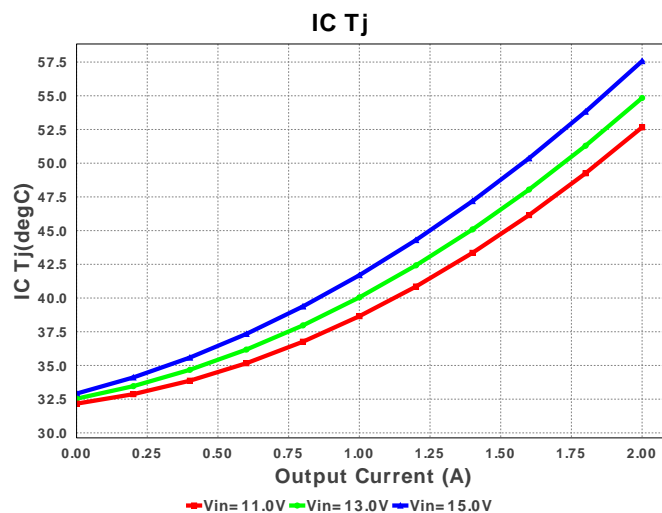
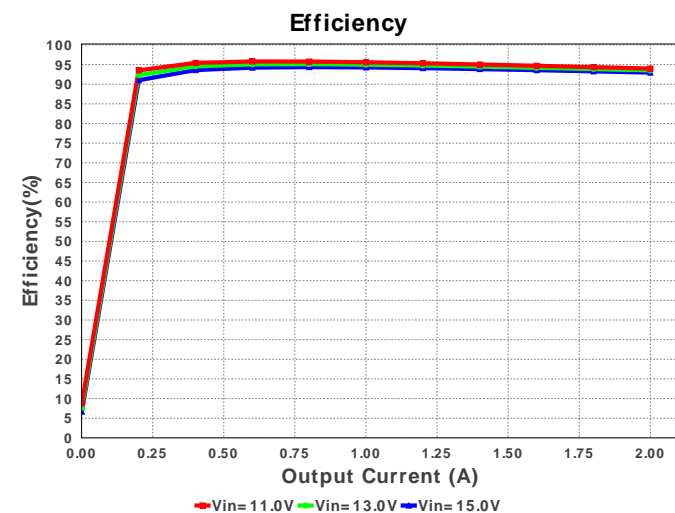
No comments

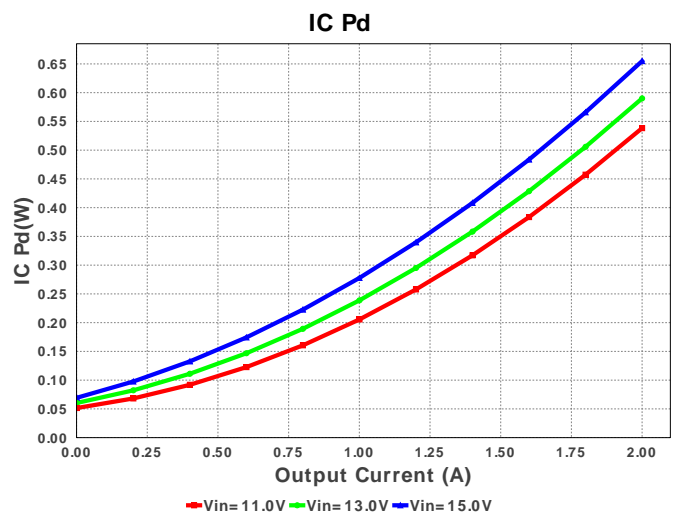
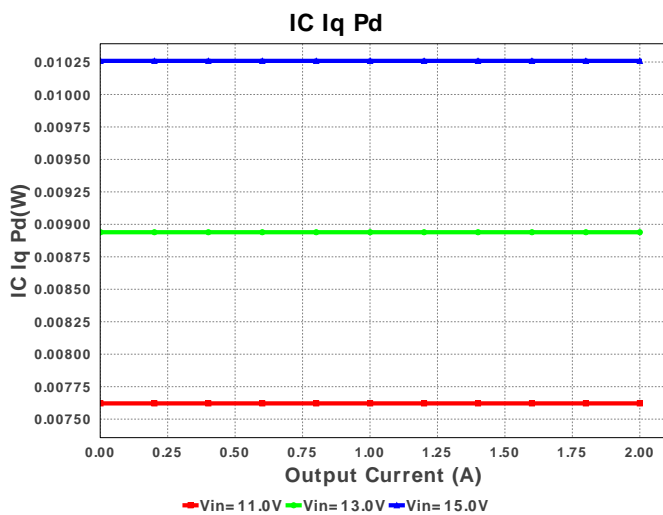
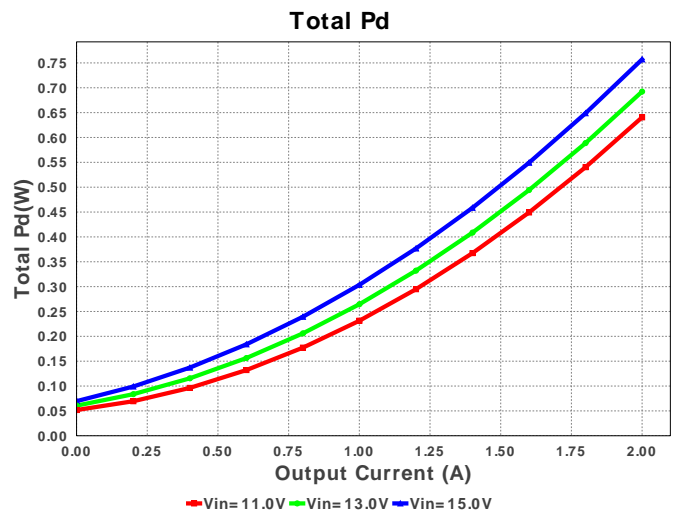
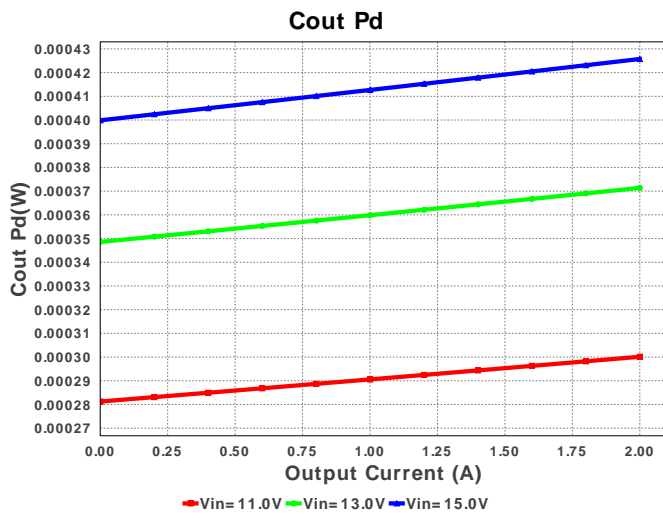
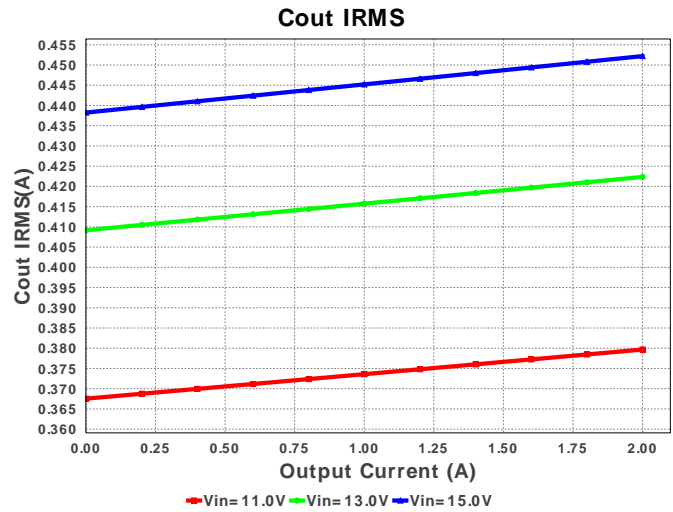
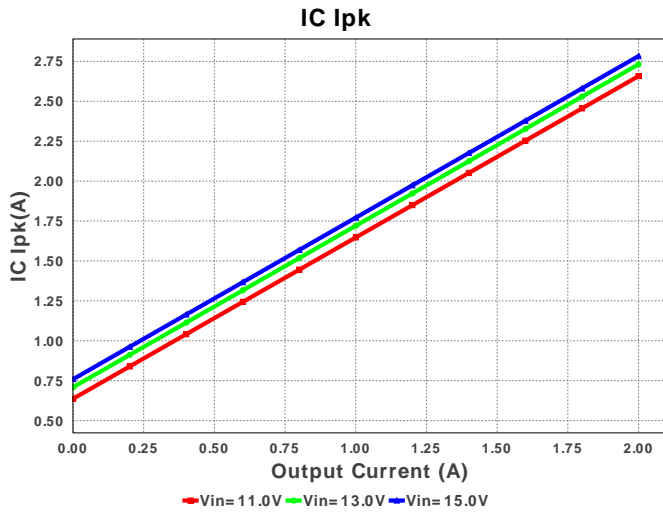
### Electrical BOM

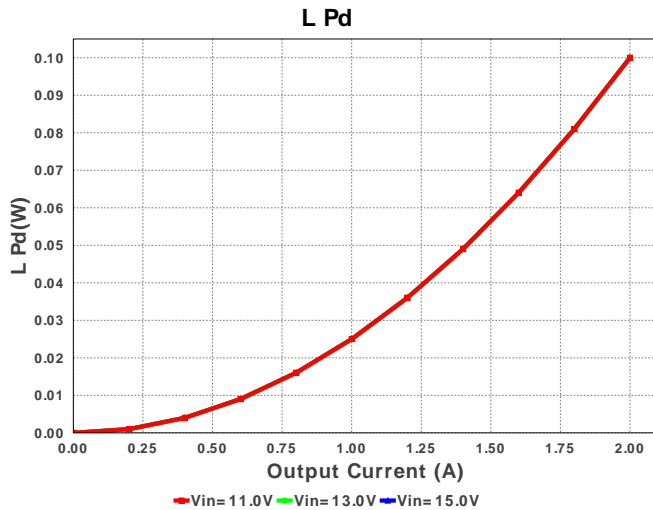
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cboot	MuRata	GRM155R61A104KA01D Series= X5R	Cap= 100.0 nF VDC= 10.0 V IRMS= 0.0 A	1	\$0.01	 0402 3 mm <sup>2</sup>
2.	Cff	Kemet	C0805C100M4GACTU Series= C0G/NP0	Cap= 10.0 pF VDC= 16.0 V IRMS= 0.0 A	1	\$0.01	 0805 7 mm <sup>2</sup>
3.	Cin	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 <sup>2</sup>
4.	Cout	TDK	C3216X5R1E476M160AC Series= X5R	Cap= 47.0 uF ESR= 2.082 mOhm VDC= 25.0 V IRMS= 5.0279 A	1	\$0.35	 1206 11 mm <sup>2</sup>
5.	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>
6.	Css	Kemet	C0805C332K5RACTU Series= X7R	Cap= 3.3 nF ESR= 332.0 mOhm VDC= 50.0 V IRMS= 319.0 mA	1	\$0.01	 0805 7 mm <sup>2</sup>
7.	L1	Bourns	SDR0805-3R3ML	L= 3.3 uH DCR= 20.0 mOhm	1	\$0.22	 SDR0805 96 mm <sup>2</sup>
8.	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>
9.	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>

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
10.	Rfbt	Vishay-Dale	CRCW0402133KFKED Series= CRCW..e3	Res= 133.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm <sup>2</sup>
11.	U1	Texas Instruments	TPS54327DDAR	Switcher	1	\$0.65	 R-PDSO-G8 55 mm <sup>2</sup>









## Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	950.049 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	452.204 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	2.783 A	Current	Peak switch current in IC
4.	Iin Avg	717.14 mA	Current	Average input current
5.	L Ipp	1.566 A	Current	Peak-to-peak inductor ripple current
6.	BOM Count	11	General	Total Design BOM count
7.	FootPrint	209.0 mm <sup>2</sup>	General	Total Foot Print Area of BOM components
8.	Frequency	665.357 kHz	General	Switching frequency
9.	Mode	CCM	General	Conduction Mode
10.	Pout	10.0 W	General	Total output power
11.	Total BOM	\$1.45	General	Total BOM Cost
12.	Vout Actual	5.004 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
13.	Vout OP	5.0 V	Op_Point	Operational Output Voltage
14.	Duty Cycle	34.395 %	Op_point	Duty cycle
15.	Efficiency	92.962 %	Op_point	Steady state efficiency
16.	IC Tj	57.572 degC	Op_point	IC junction temperature
17.	ICThetaJA	42.1 degC/W	Op_point	IC junction-to-ambient thermal resistance
18.	IOUT_OP	2.0 A	Op_point	Iout operating point
19.	VIN_OP	15.0 V	Op_point	Vin operating point
20.	Vout p-p	19.561 mV	Op_point	Peak-to-peak output ripple voltage
21.	Cin Pd	1.805 mW	Power	Input capacitor power dissipation
22.	Cout Pd	425.746 μW	Power	Output capacitor power dissipation
23.	IC Iq Pd	10.259 mW	Power	IC Iq Pd
24.	IC Pd	654.908 mW	Power	IC power dissipation
25.	L Pd	100.0 mW	Power	Inductor power dissipation
26.	Total Pd	757.085 mW	Power	Total Power Dissipation
27.	Vout Tolerance	3.573 %		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	15.0	Maximum input voltage
3.	VinMin	11.0	Minimum input voltage
4.	Vout	5.0	Output Voltage
5.	base_pn	TPS54327	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	30.0	Ambient temperature

## Design Assistance

1. **TPS54327** Product Folder : <http://www.ti.com/product/TPS54327> : contains the data sheet and other resources.

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