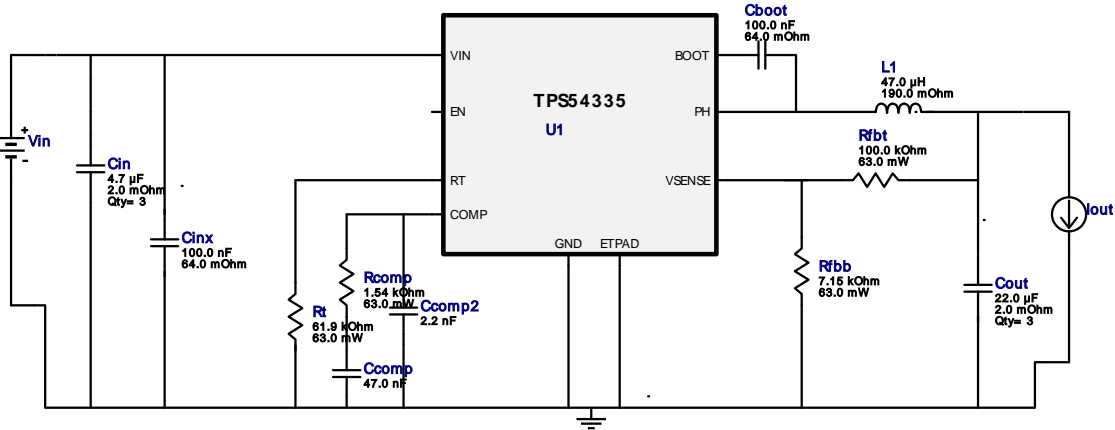


**WEBENCH® Design Report**

 Design : 1909153/74 TPS54335DDAR  
 TPS54335DDAR 14.0V-22.0V to 12.0V @ 0.7A

 VinMin = 14.0V  
 VinMax = 22.0V

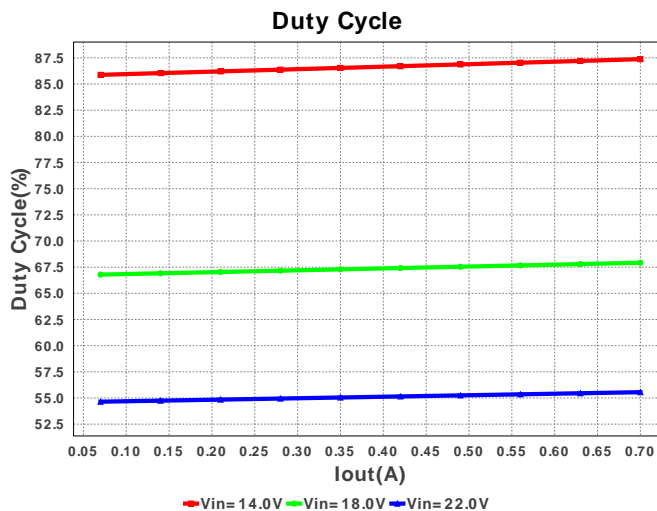
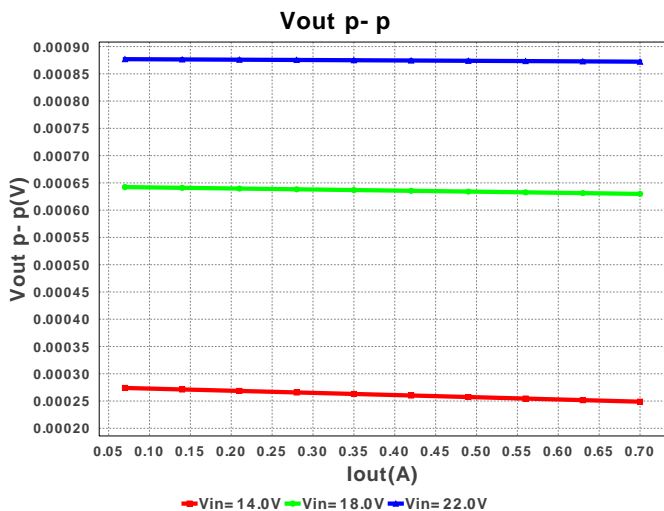
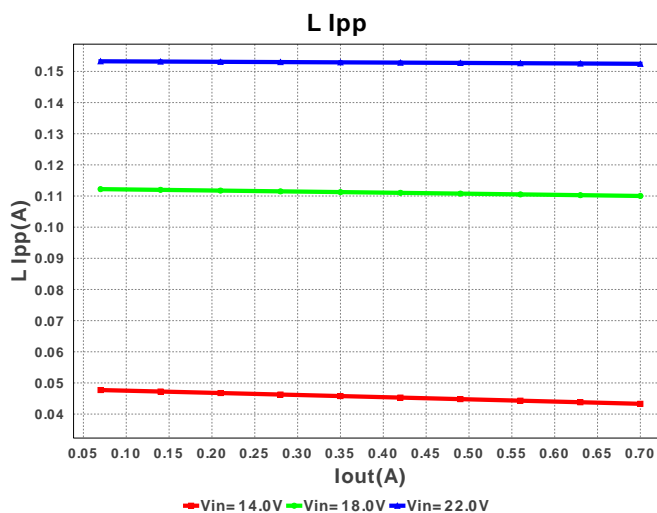
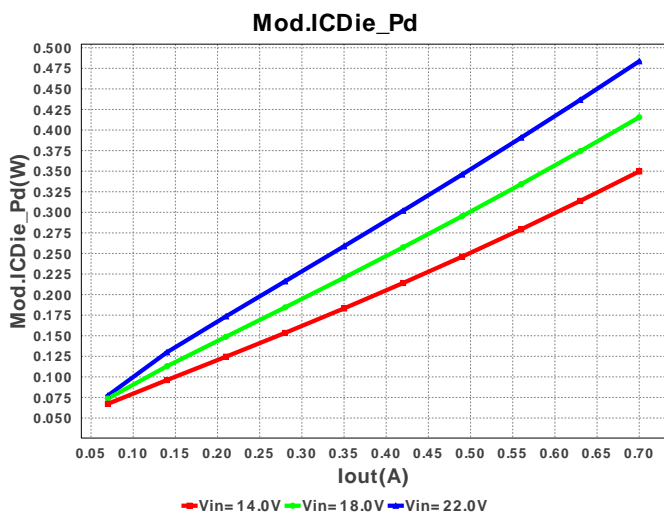
 Vout = 12.0V  
 Iout = 0.7A

**Electrical BOM**

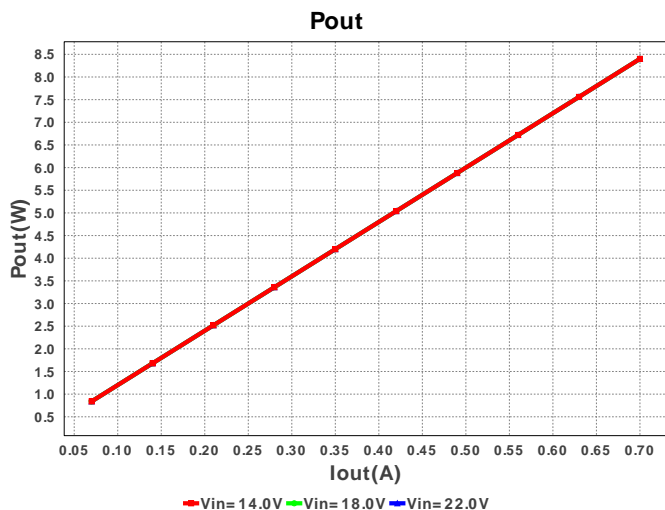
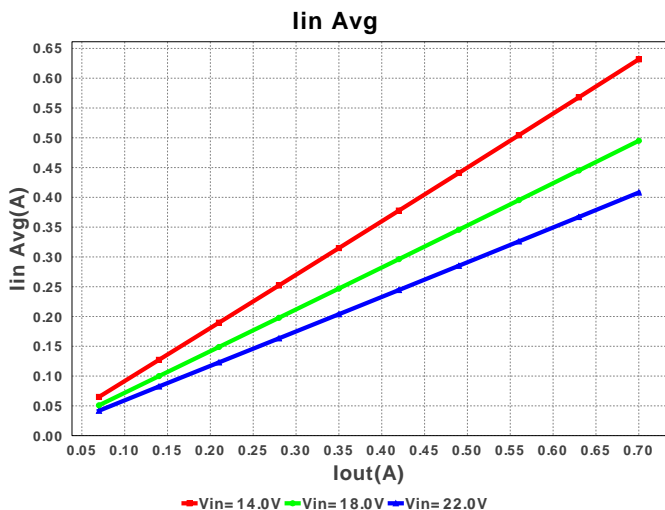
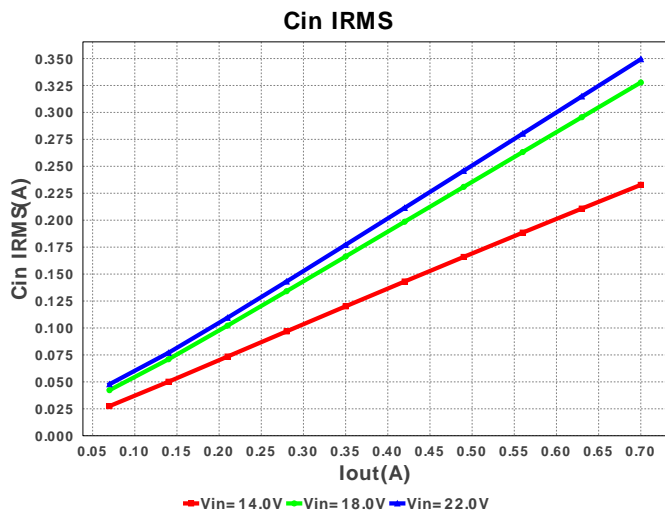
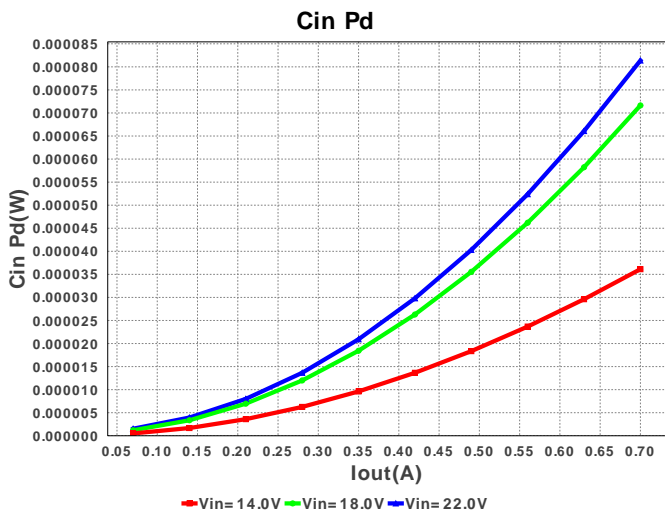
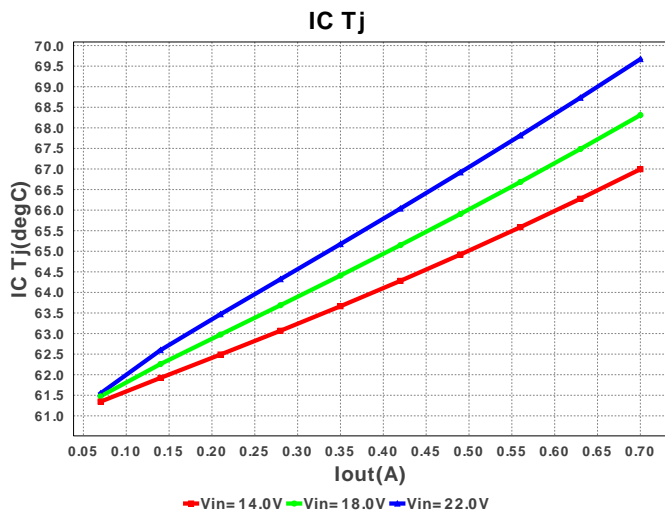
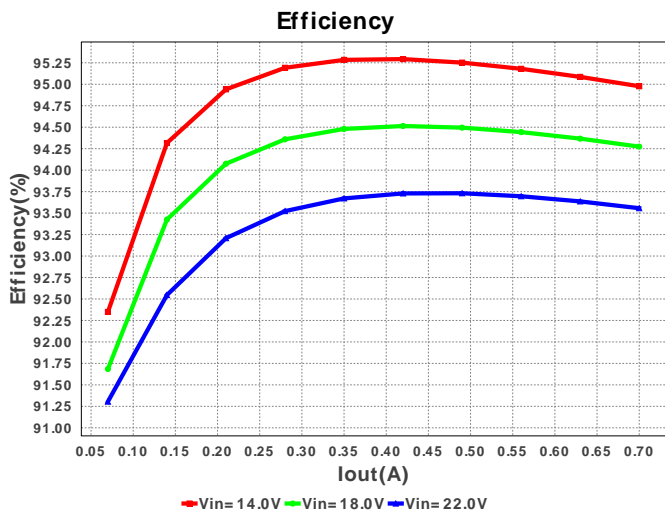
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cboot	Kemet	C0805C104K5RACTU Series= X7R	Cap= 100.0 nF ESR= 64.0 mOhm VDC= 50.0 V IRMS= 1.64 A	1	\$0.01	 0805 7mm2
2.	Ccomp	Taiyo Yuden	TMK212B7473KD-T Series= X7R	Cap= 47.0 nF VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	 0805 7mm2
3.	Ccomp2	Yageo America	CC0805KRX7R9BB222 Series= X7R	Cap= 2.2 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	 0805 7mm2
4.	Cin	MuRata	GRM21BR61E475MA12L Series= X5R	Cap= 4.7 µF ESR= 2.0 mOhm VDC= 25.0 V IRMS= 7.29 A	3	\$0.06	 0805 7mm2
5.	Cinx	Kemet	C0805C104K5RACTU Series= X7R	Cap= 100.0 nF ESR= 64.0 mOhm VDC= 50.0 V IRMS= 1.64 A	1	\$0.01	 0805 7mm2
6.	Cout	MuRata	GRM32ER61E226KE15L Series= X5R	Cap= 22.0 µF ESR= 2.0 mOhm VDC= 25.0 V IRMS= 3.67 A	3	\$0.28	 1210 15mm2
7.	L1	Bourns	SRN8040-470M	L= 47.0 µH DCR= 190.0 mOhm	1	\$0.21	 SRN8040 100mm2
8.	Rcomp	Vishay-Dale	CRCW04021K54FKED Series= CRCW..e3	Res= 1.54 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3mm2
9.	Rfbb	Vishay-Dale	CRCW04027K15FKED Series= CRCW..e3	Res= 7.15 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3mm2
10.	Rfbt	Vishay-Dale	CRCW0402100KFKED Series= CRCW..e3	Res= 100.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3mm2

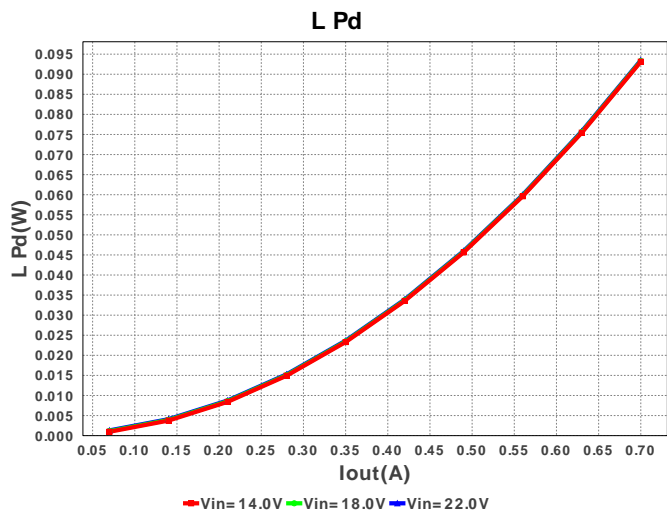
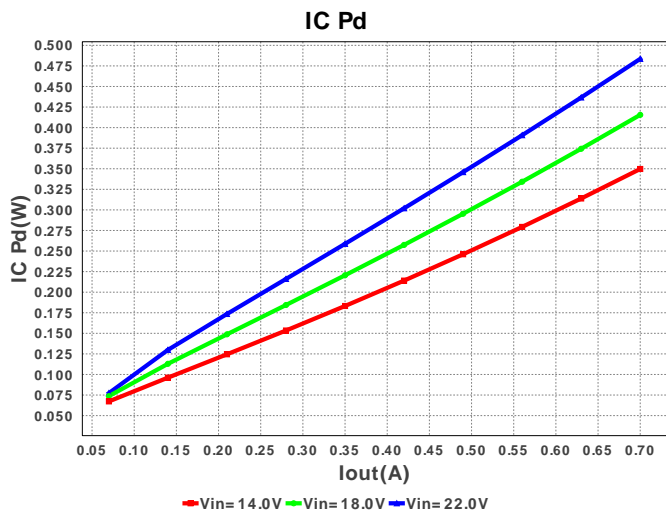
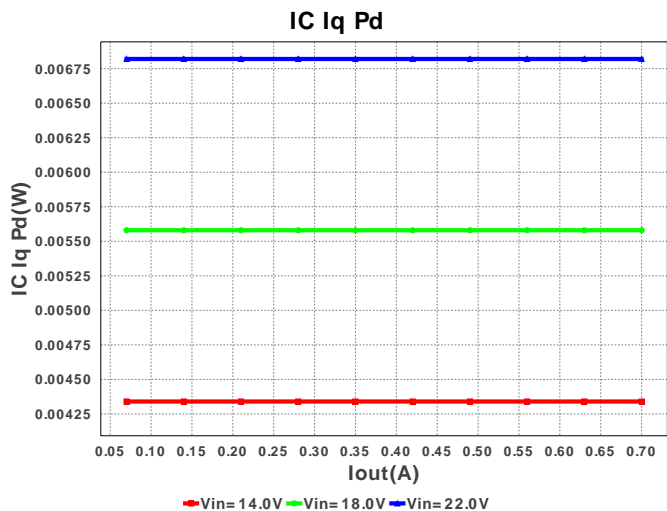
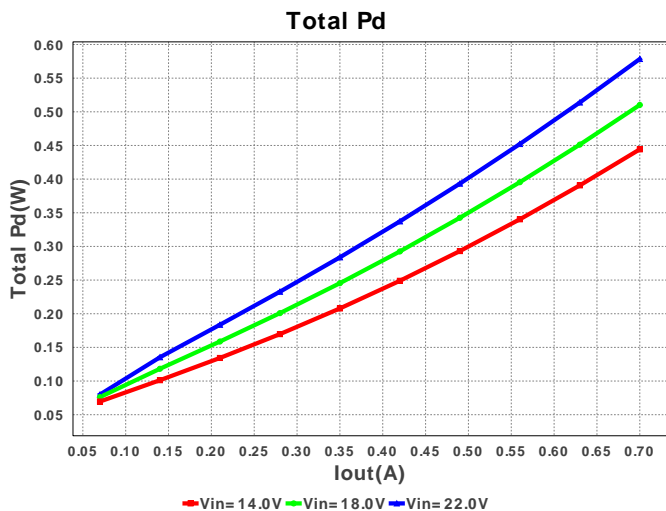
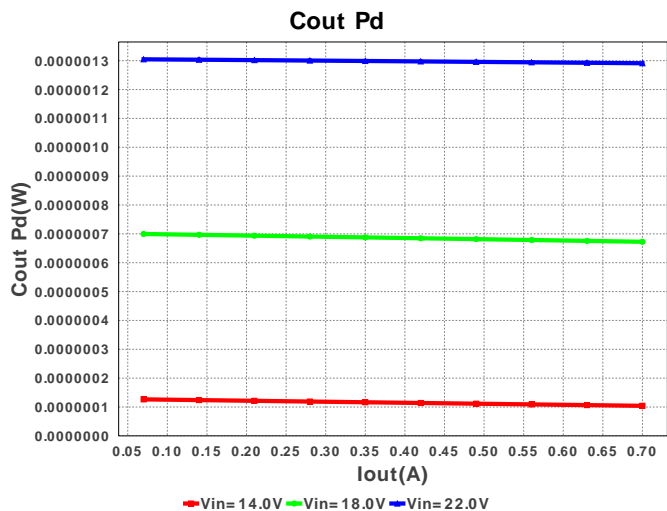
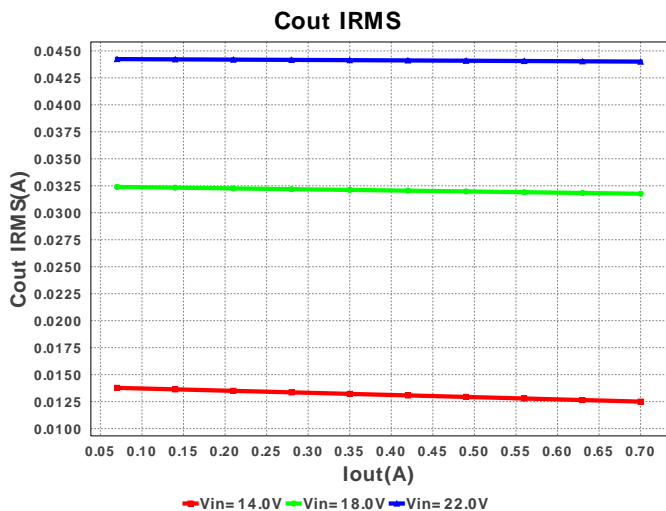
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
11.	Rt	Vishay-Dale	CRCW040261K9FKED Series= CRCW..e3	Res= 61.9 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3mm2
12.	U1	Texas Instruments	TPS54335DDAR	Switcher	1	\$0.90	

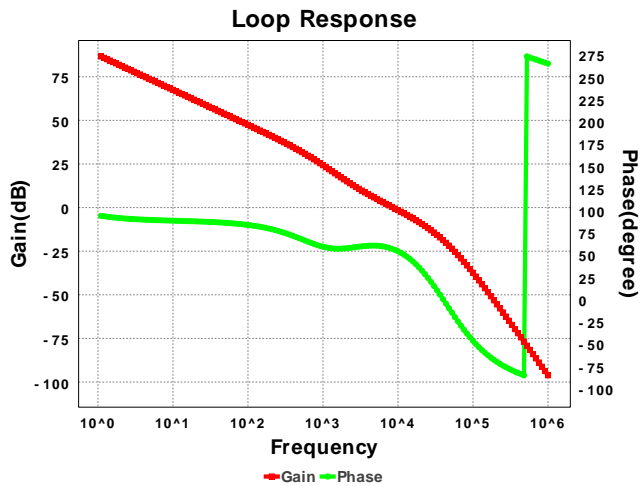


R-PDSO-G8 57mm2









## Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	349.306 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	42.978 mA	Current	Output capacitor RMS ripple current
3.	Iin Avg	408.56 mA	Current	Average input current
4.	L Ipp	148.881 mA	Current	Peak-to-peak inductor ripple current
5.	BOM Count	16	General	Total Design BOM count
6.	FootPrint	261.0 mm2	General	Total Foot Print Area of BOM components
7.	Frequency	775.0 kHz	General	Switching frequency
8.	IC Tolerance	10.0 mV	General	IC Feedback Tolerance
9.	Pout	8.4 W	General	Total output power
10.	Total BOM	\$2.21	General	Total BOM Cost
11.	Vout OP	12.0 V	Op_Point	Operational Output Voltage
12.	Cross Freq	8.636 kHz	Op_point	Bode plot crossover frequency
13.	Duty Cycle	55.553 %	Op_point	Duty cycle
14.	Efficiency	93.454 %	Op_point	Steady state efficiency
15.	IC Tj	69.871 degC	Op_point	IC junction temperature
16.	ICThetaJA	20.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
17.	IOUT_OP	700.0 mA	Op_point	Iout operating point
18.	Phase Marg	58.096 deg	Op_point	Bode Plot Phase Margin
19.	VIN_OP	22.0 V	Op_point	Vin operating point
20.	Vout p-p	832.08 $\mu$ V	Op_point	Peak-to-peak output ripple voltage
21.	Cin Pd	81.343 $\mu$ W	Power	Input capacitor power dissipation
22.	Cout Pd	1.231 $\mu$ W	Power	Output capacitor power dissipation
23.	IC Iq Pd	6.82 mW	Power	IC Iq Pd
24.	IC Pd	493.542 mW	Power	IC power dissipation
25.	L Pd	93.451 mW	Power	Inductor power dissipation
26.	Total Pd	588.375 mW	Power	Total Power Dissipation

## Design Inputs

#	Name	Value	Description
1.	Iout	700.0 mA	Maximum Output Current
2.	Iout1	700.0 mAmps	Output Current #1
3.	VinMax	22.0 V	Maximum input voltage
4.	VinMin	14.0 V	Minimum input voltage
5.	Vout	12.0 V	Output Voltage
6.	Vout1	12.0 Volt	Output Voltage #1
7.	base_pn	TPS54335	Texas Instruments Base Part Number
8.	source	DC	Input Source Type
9.	ta	60.0 degC	Ambient temperature

## Design Assistance

1. TPS54335 Product Folder : <http://www.ti.com/product/tps54335> : contains the data sheet and other resources.

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