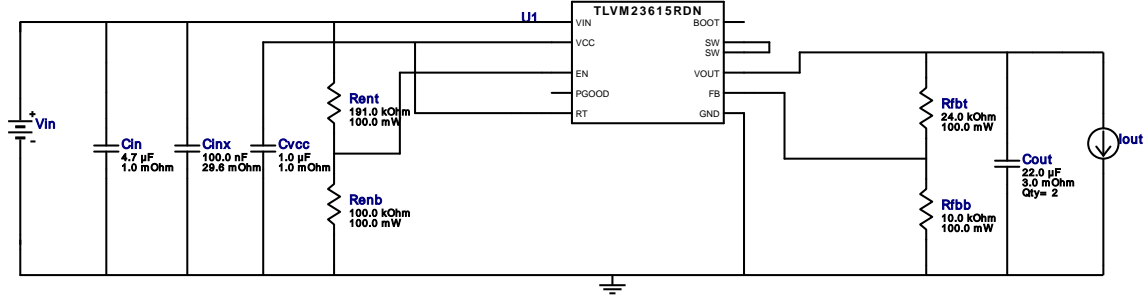


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 VinMax = 36.0V  
 Vout = 3.4V  
 Iout = 0.3A

Device = TLVM23615RDNR  
 Topology = Buck  
 Created = 2024-03-22 11:53:51.219  
 BOM Cost = \$1.25  
 BOM Count = 10  
 Total Pd = 0.32W

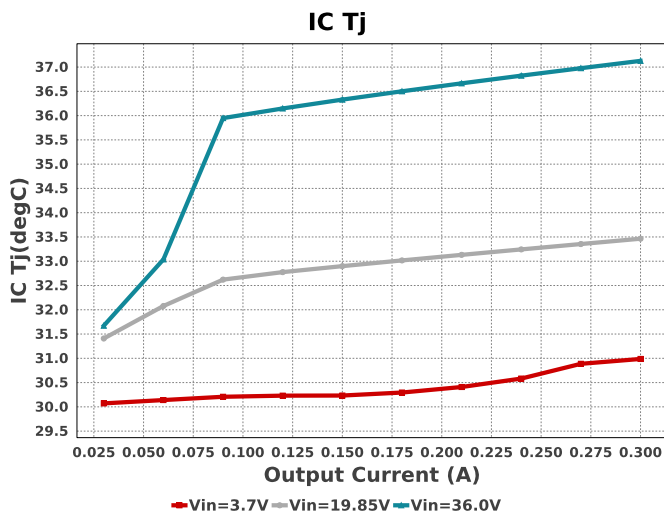
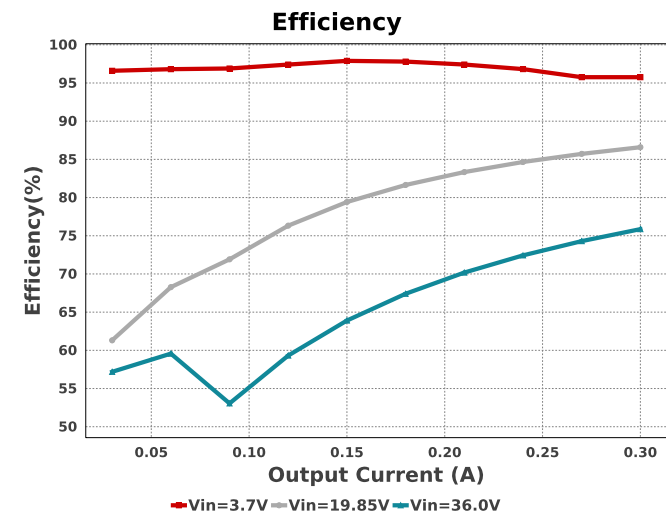
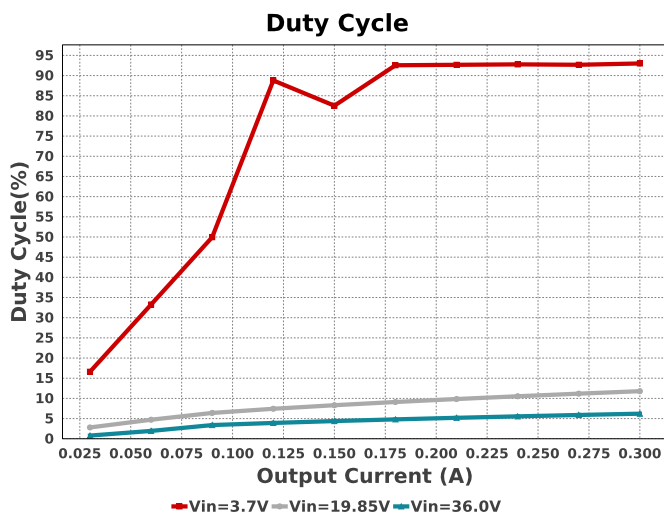
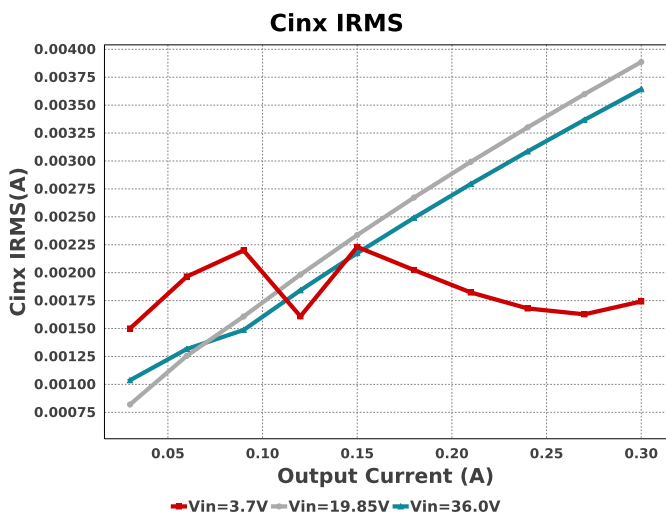
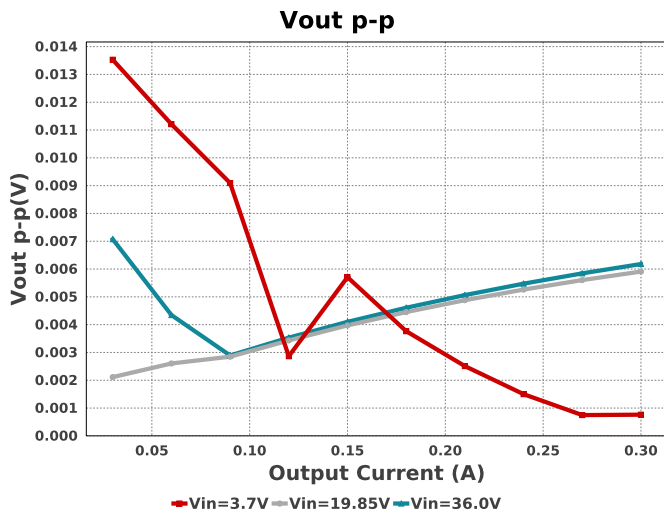
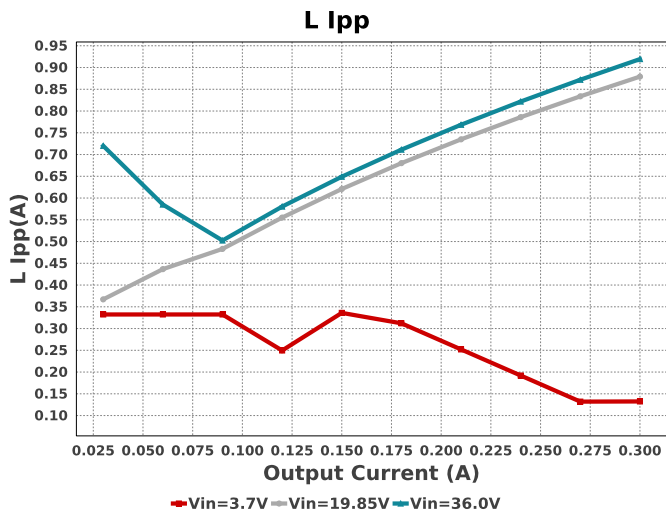
# WEBENCH® Design Report

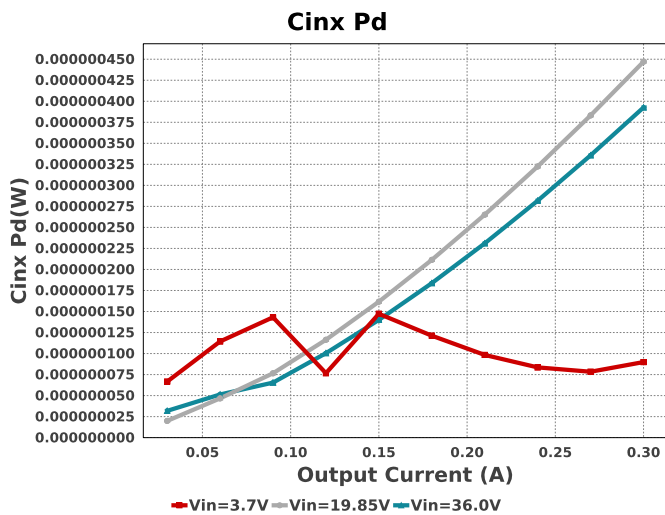
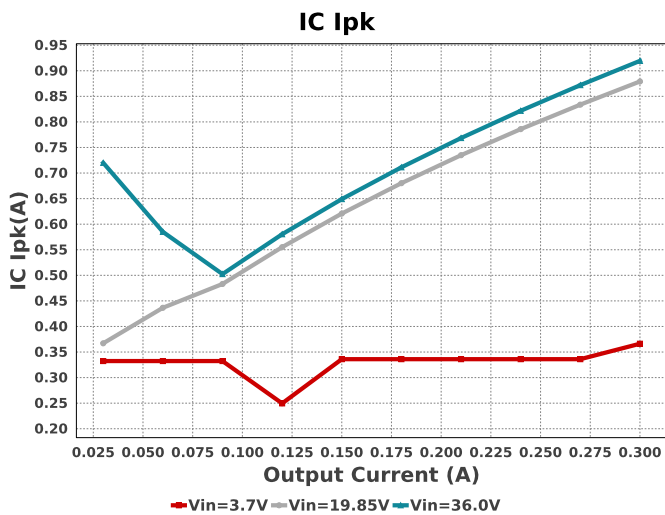
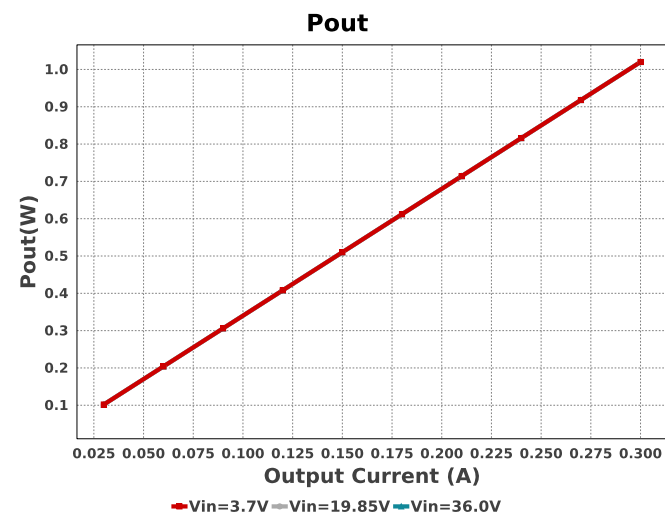
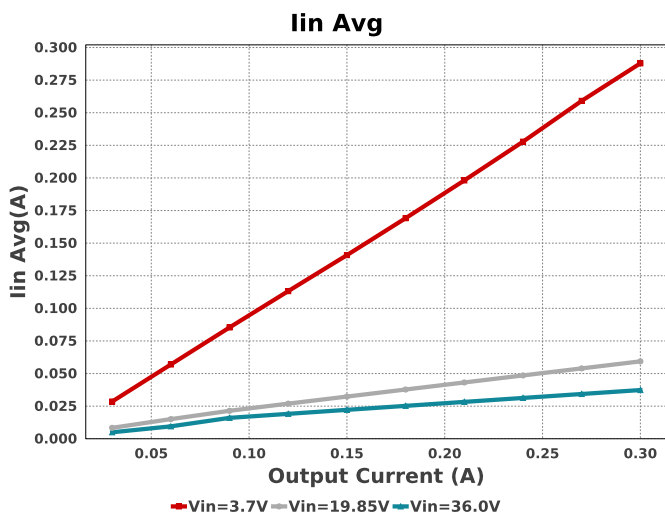
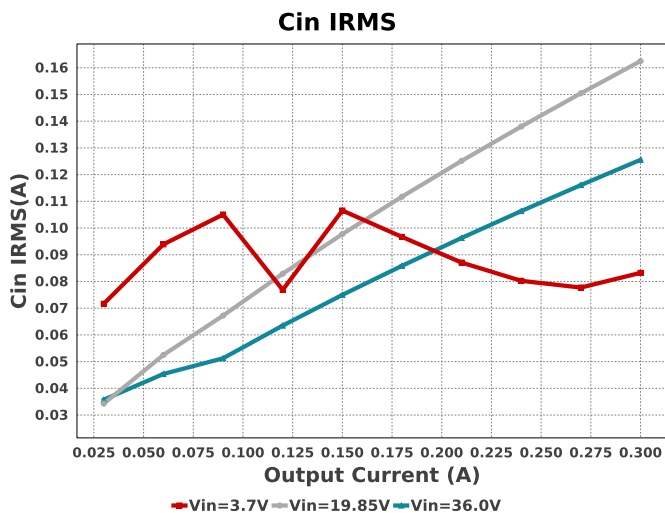
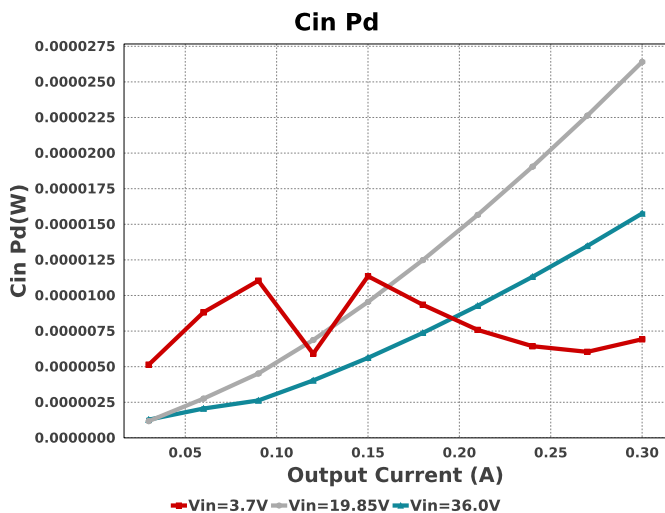
Design : 14877 TLVM23615RDNR  
 TLVM23615RDNR 3.7V-36V to 3.40V @ 0.3A

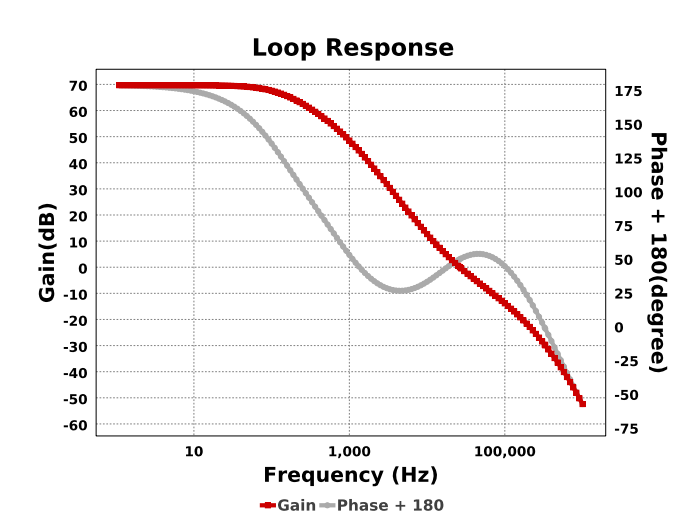
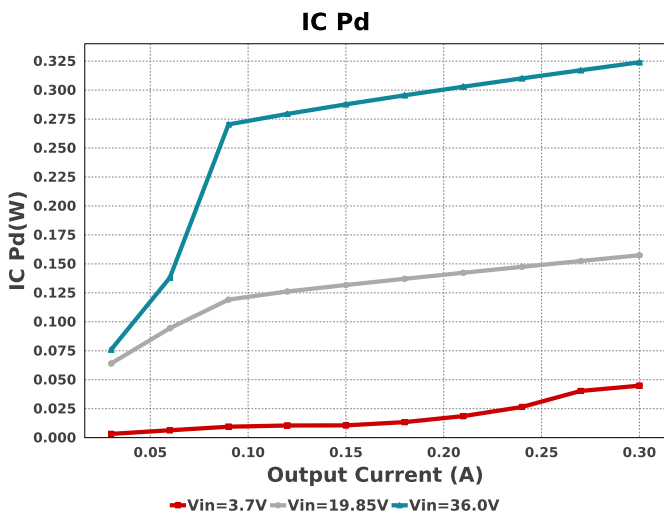
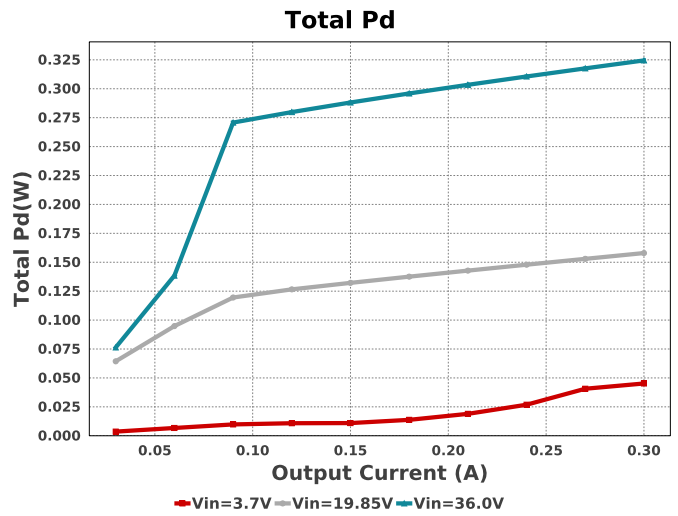
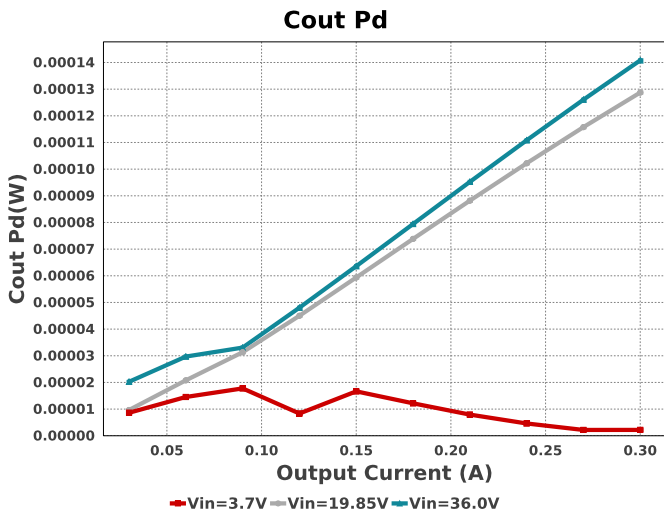
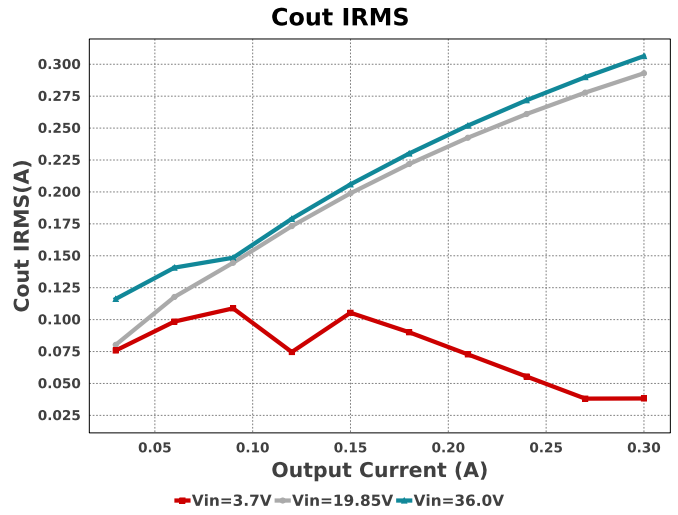
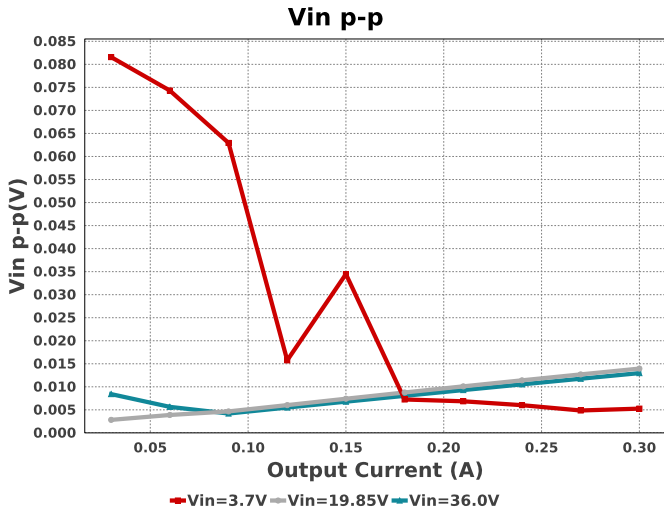


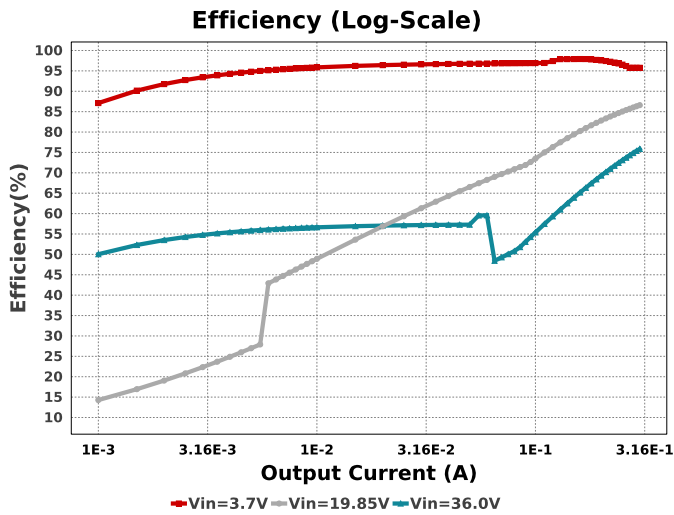
## Electrical BOM

Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
Cin	MuRata	GRM32ER71H475KA88L Series= X7R	Cap= 4.7 uF ESR= 1.0 mOhm VDC= 50.0 V IRMS= 6.0 A	1	\$0.16	1210 15 mm <sup>2</sup>
Cinx	TDK	CGA3E2X7R1H104K080AA Series= X7R	Cap= 100.0 nF ESR= 29.6 mOhm VDC= 50.0 V IRMS= 971.99 mA	1	\$0.01	0603 5 mm <sup>2</sup>
Cout	MuRata	GRM21BR61A226ME44L Series= X5R	Cap= 22.0 uF ESR= 3.0 mOhm VDC= 10.0 V IRMS= 3.84 A	2	\$0.09	0805 7 mm <sup>2</sup>
Cvcc	Taiyo Yuden	EMK107B7105KA-T Series= X7R	Cap= 1.0 uF ESR= 1.0 mOhm VDC= 16.0 V IRMS= 0.0 A	1	\$0.01	0603 5 mm <sup>2</sup>
Renb	Vishay-Dale	CRCW0603100KFKEA Series= CRCW..e3	Res= 100.0 kOhm Power= 100.0 mW Tolerance= 1.0%	1	\$0.01	0603 5 mm <sup>2</sup>
Rent	Yageo	RC0603FR-07191KL Series= ?	Res= 191.0 kOhm Power= 100.0 mW Tolerance= 1.0%	1	\$0.01	0603 5 mm <sup>2</sup>
Rfbb	Yageo	RC0603FR-0710KL Series= ?	Res= 10.0 kOhm Power= 100.0 mW Tolerance= 1.0%	1	\$0.01	0603 5 mm <sup>2</sup>
Rfbt	Yageo	RC0603FR-0724KL Series= ?	Res= 24.0 kOhm Power= 100.0 mW Tolerance= 1.0%	1	\$0.01	0603 5 mm <sup>2</sup>
U1	Texas Instruments	TLVM23615RDNR	Switcher	1	\$0.85	RPE0009A 9 mm <sup>2</sup>









## Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	125.536 mA	Capacitor	Input capacitor RMS ripple current
2.	Cin Pd	15.759 $\mu$ W	Capacitor	Input capacitor power dissipation
3.	Cinx IRMS	3.642 mA	Capacitor	Bulk capacitor RMS ripple current
4.	Cinx Pd	392.63 nW	Capacitor	Bulk capacitor power dissipation
5.	Cout IRMS	306.385 mA	Capacitor	Output capacitor RMS ripple current
6.	Cout Pd	140.81 $\mu$ W	Capacitor	Output capacitor power dissipation
7.	IC Ipk	919.358 mA	IC	Peak switch current in IC
8.	IC Pd	323.99 mW	IC	IC power dissipation
9.	IC Tj	37.128 degC	IC	IC junction temperature
10.	IC Tolerance	12.5 mV	IC	IC Feedback Tolerance
11.	ICThetaJA Effective	22.0 degC/W	IC	Effective IC Junction-to-Ambient Thermal Resistance
12.	Iin Avg	37.347 mA	IC	Average input current
13.	Cin Pd	15.759 $\mu$ W	Power	Input capacitor power dissipation
14.	Cinx Pd	392.63 nW	Power	Bulk capacitor power dissipation
15.	Cout Pd	140.81 $\mu$ W	Power	Output capacitor power dissipation
16.	IC Pd	323.99 mW	Power	IC power dissipation
17.	Total Pd	324.493 mW	Power	Total Power Dissipation
18.	BOM Count	10	System	Total Design BOM count
19.	Cross Freq	26.425 kHz	System	Bode plot crossover frequency
20.	Duty Cycle	6.212 %	System	Duty cycle
21.	Efficiency	75.865 %	System	Steady state efficiency
22.	FootPrint	65.0 mm <sup>2</sup>	System	Total Foot Print Area of BOM components
23.	Frequency	1000.0 kHz	System	Switching frequency
24.	Gain Marg	-29.654 dB	System	Bode Plot Gain Margin
25.	Iout	300.0 mA	System	Iout operating point
26.	L Ipp	919.36 mA	System	Peak-to-peak inductor ripple current
27.	Low Freq Gain	69.692 dB	System	Gain at 1Hz
28.	Mode	DCM	System	Conduction Mode
29.	Phase Marg	50.728 deg	System	Bode Plot Phase Margin
30.	Pout	1.02 W	System	Total output power
31.	Total BOM	\$1.25	System	Total BOM Cost
32.	Vin	36.0 V	System	Vin operating point
33.	Vin p-p	12.974 mV	System	Peak-to-peak input voltage
34.	Vout	3.4 V	System	Operational Output Voltage

#	Name	Value	Category	Description
35.	Vout Actual	3.4 V	System Information	Vout Actual calculated based on selected voltage divider resistors
36.	Vout Tolerance	2.694 %	System Information	Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable
37.	Vout p-p	6.18 mV	System Information	Peak-to-peak output ripple voltage

## Design Inputs

Name	Value	Description
Iout	300.0 m	Maximum Output Current
VinMax	36.0	Maximum input voltage
VinMin	3.7	Minimum input voltage
Vout	3.4	Output Voltage
base_pn	TLVM23615	Base Product Number
source	DC	Input Source Type
Ta	30.0	Ambient temperature
UserFsw	1000.0 k	Customer Selected Frequency

# WEBENCH® Assembly

## Design Assistance

1. Master key : 9323268074580801[v1]
2. **TLVM23615** Product Folder : <https://www.ti.com/product/TLVM23615> : contains the data sheet and other resources.

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