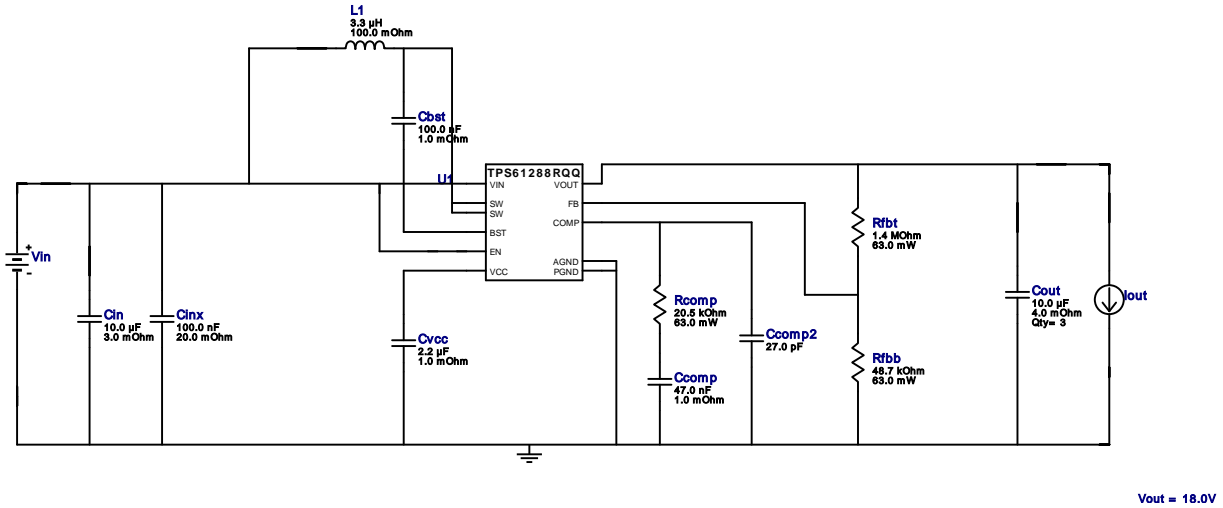


VinMin = 2.8V  
 VinMax = 4.6V  
 Vout = 18.0V  
 Iout = 0.0A

Device = TPS61288RQQR  
 Topology = Boost  
 Created = 2021-10-05 04:49:54.177  
 BOM Cost = NA  
 BOM Count = 14  
 Total Pd = 0.0W

# WEBENCH<sup>®</sup> Design Report

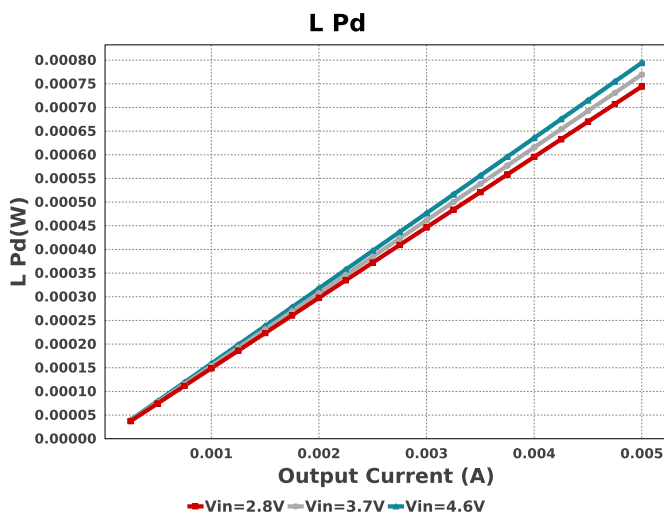
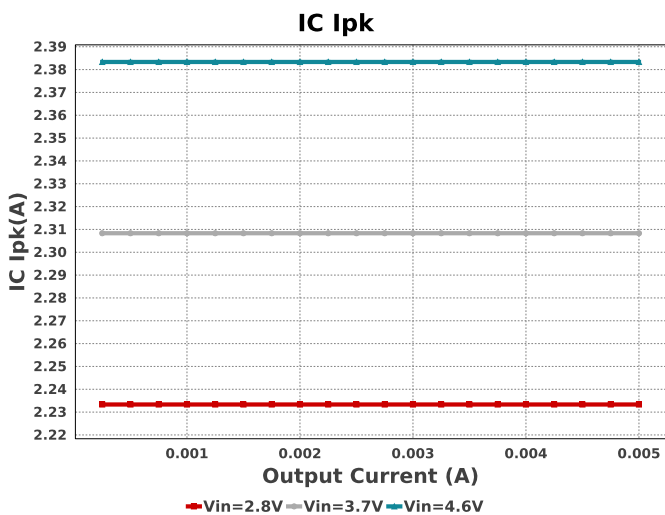
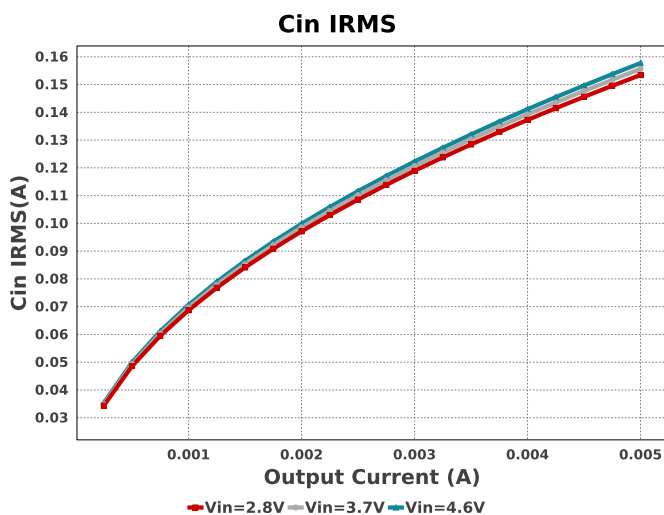
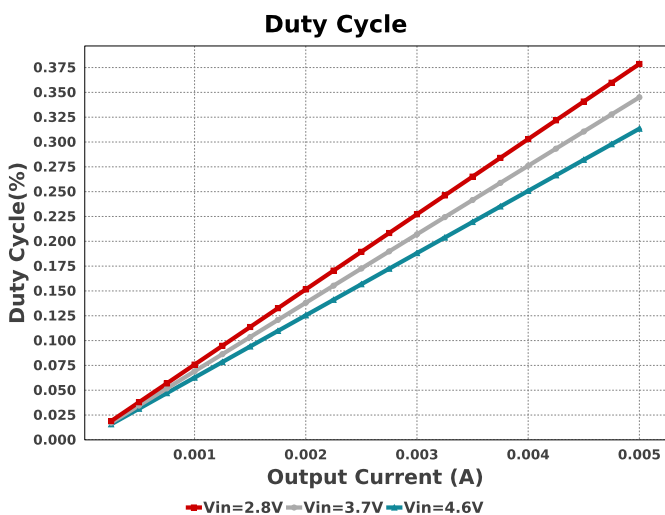
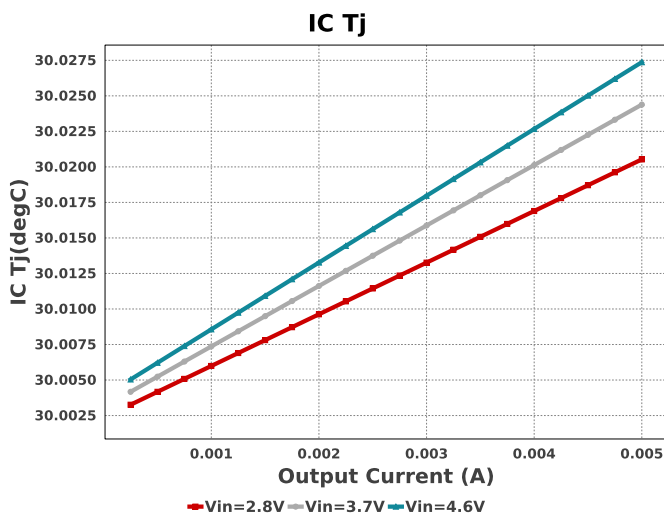
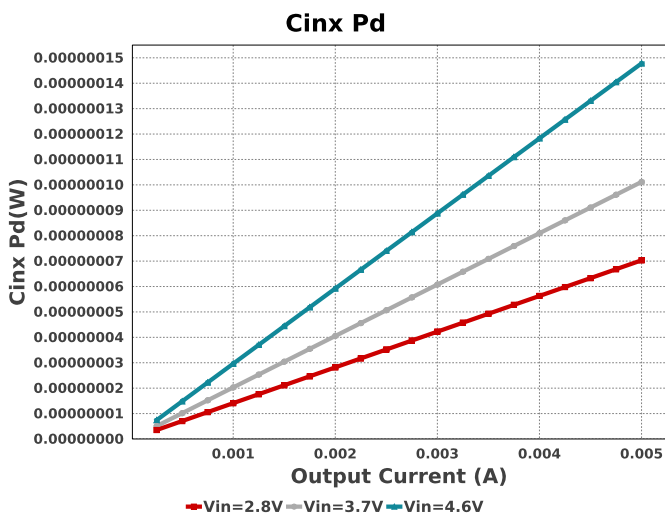
Design : 328 TPS61288RQQR  
 TPS61288RQQR 2.8V-4.6V to 18.00V @ 0.005A

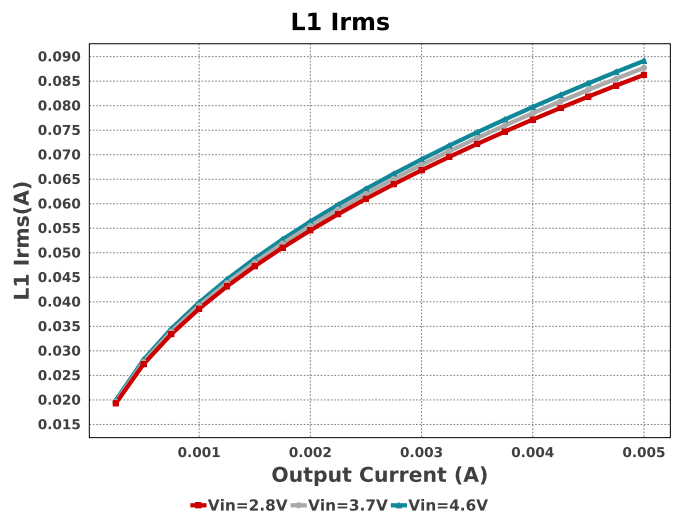
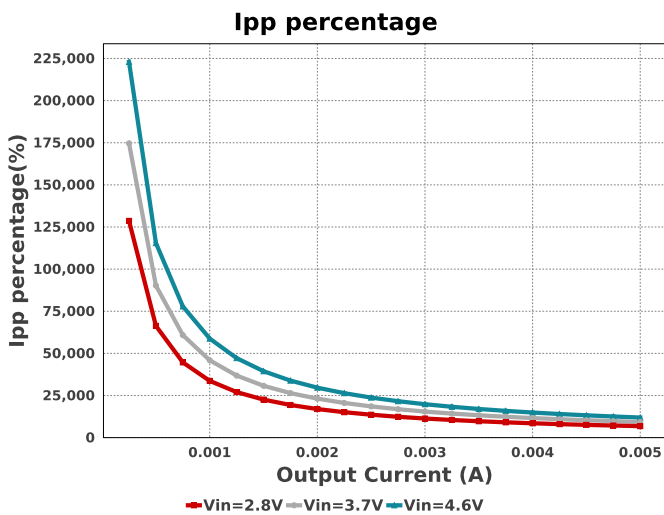
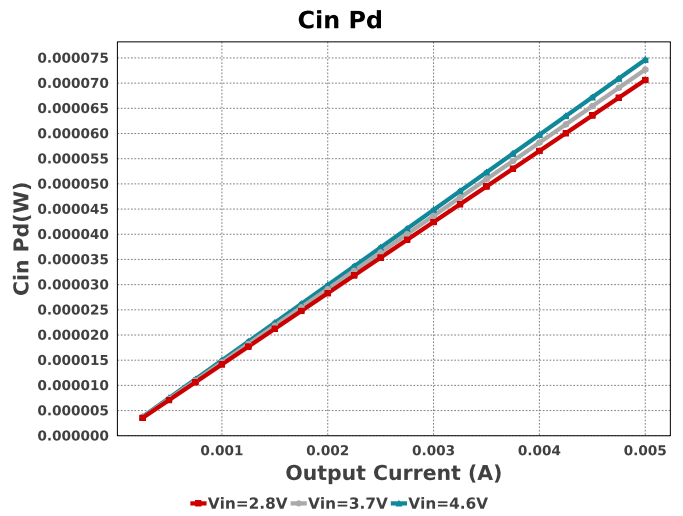
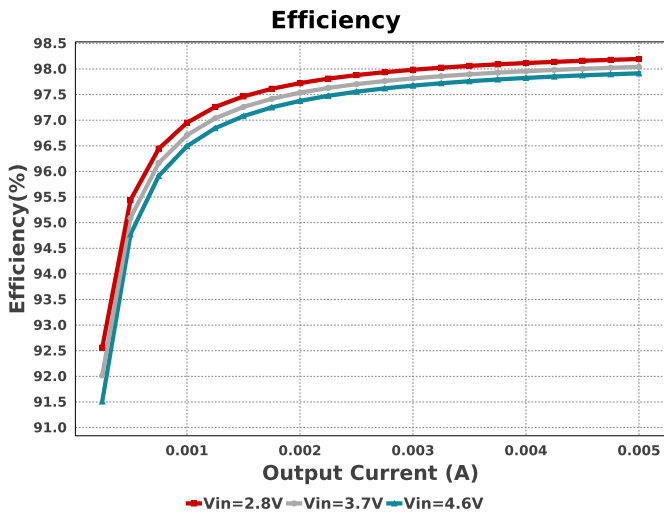
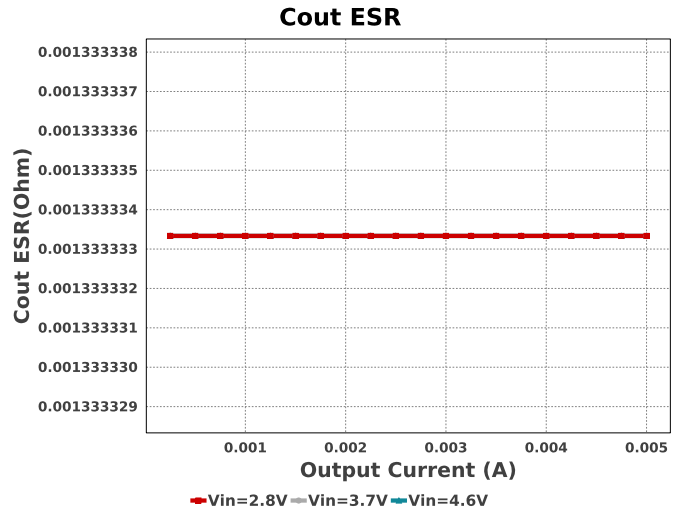
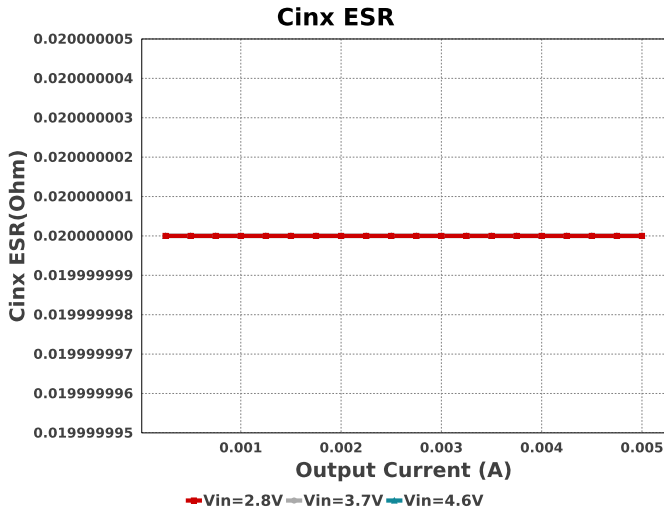


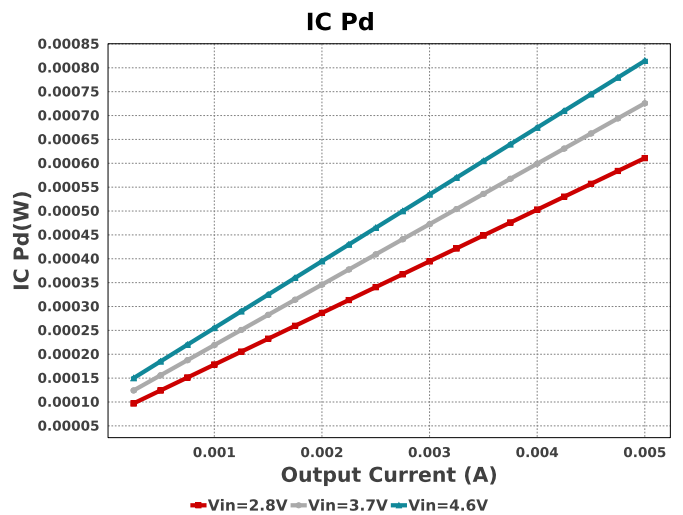
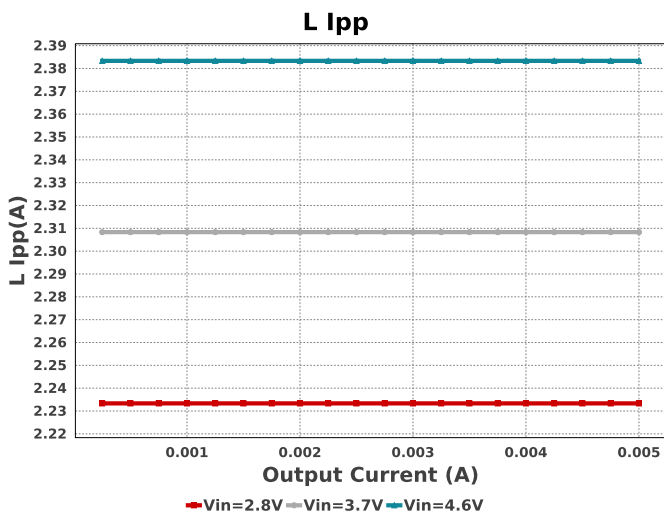
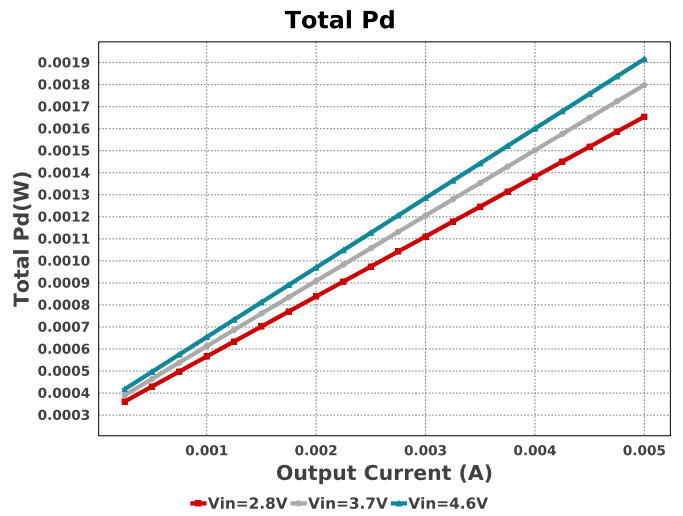
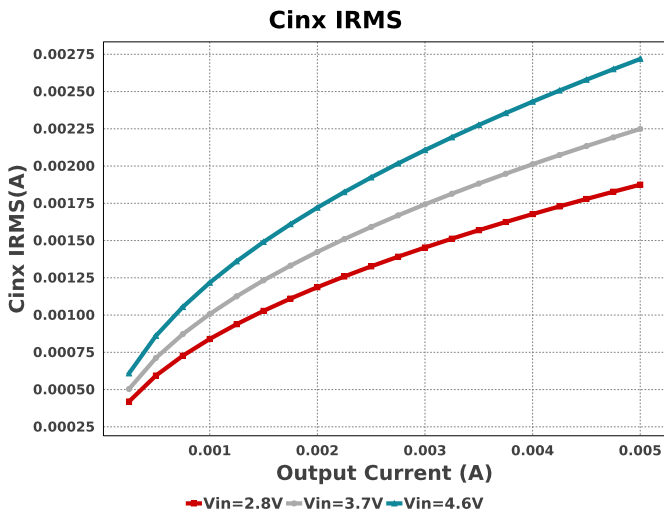
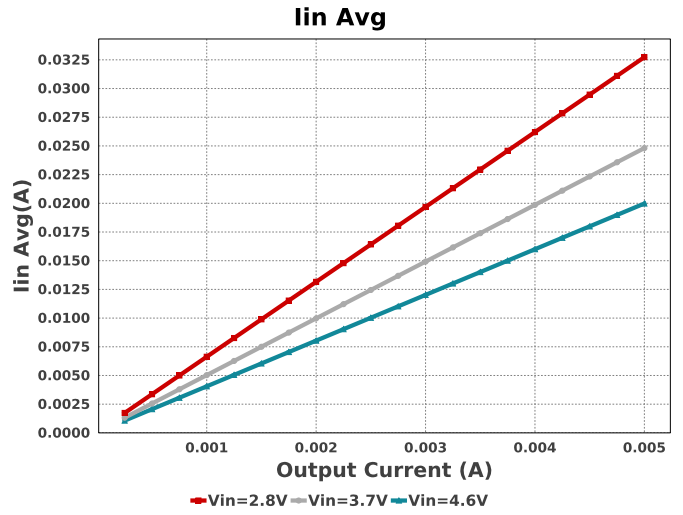
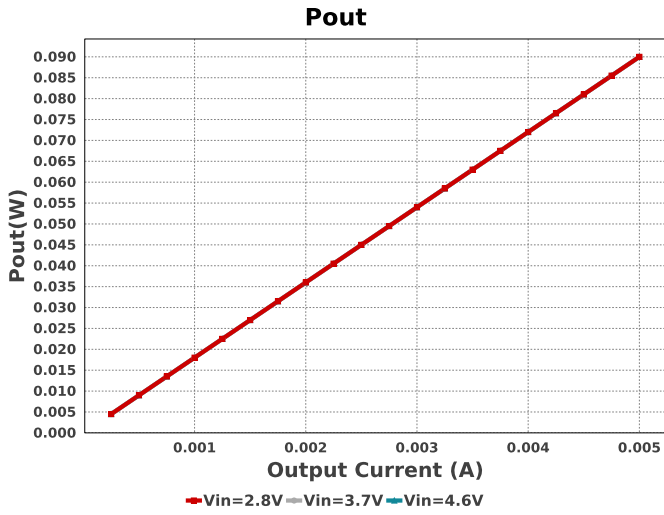
## Electrical BOM

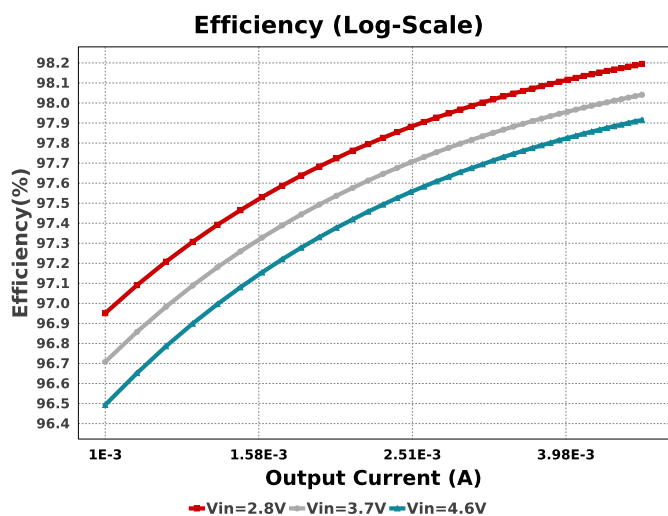
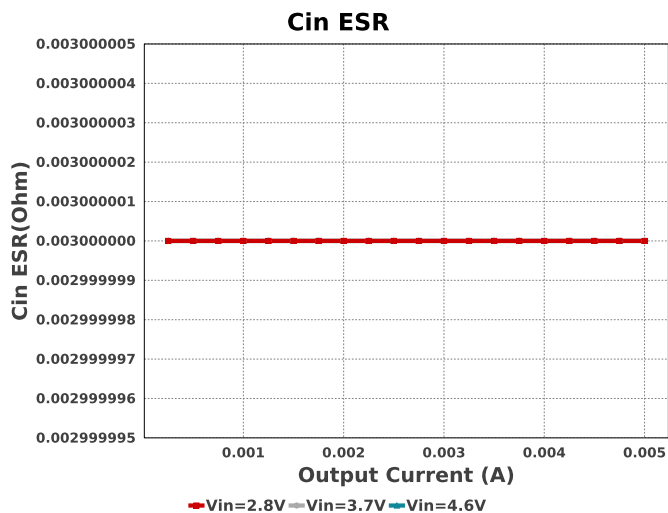
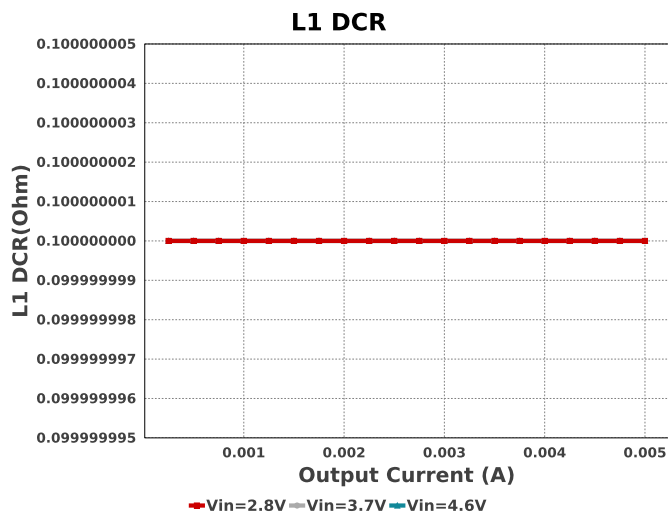
Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
Cbst	MuRata	GRM155R71A104KA01D Series= X7R	Cap= 100.0 nF ESR= 1.0 mOhm VDC= 10.0 V IRMS= 0.0 A	1	\$0.01	0402 3 mm <sup>2</sup>
Ccomp	MuRata	GRM033R60J473KE19D Series= X5R	Cap= 47.0 nF ESR= 1.0 mOhm VDC= 6.3 V IRMS= 0.0 A	1	\$0.01	0201 2 mm <sup>2</sup>
Ccomp2	Samsung Electro-Mechanics	CL21C270JBANNNC Series= C0G/NP0	Cap= 27.0 pF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	0805 7 mm <sup>2</sup>
Cin	Kemet	C0805C106K8PACTU Series= X5R	Cap= 10.0 uF ESR= 3.0 mOhm VDC= 10.0 V IRMS= 11.43 A	1	\$0.03	0805 7 mm <sup>2</sup>
Cinx	MuRata	GRM188R71H104KA93D Series= X7R	Cap= 100.0 nF ESR= 20.0 mOhm VDC= 50.0 V IRMS= 3.8 A	1	\$0.02	0603 5 mm <sup>2</sup>
Cout	MuRata	GRM21BR61E106MA73L Series= X5R	Cap= 10.0 uF ESR= 4.0 mOhm VDC= 25.0 V IRMS= 2.8 A	3	\$0.05	0805 7 mm <sup>2</sup>
Cvcc	Kemet	C0603C225K8PACTU Series= X5R	Cap= 2.2 uF ESR= 1.0 mOhm VDC= 10.0 V IRMS= 0.0 A	1	\$0.04	0603 5 mm <sup>2</sup>
L1	CUSTOM	CUSTOM	L= 3.3 uH 100.0 mOhm	1	NA	 IHLP-3232DZ 0 mm <sup>2</sup>
Rcomp	Vishay-Dale	CRCW040220K5FKED Series= CRCW..e3	Res= 20.5 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
Rfbb	Vishay-Dale	CRCW040248K7FKED Series= CRCW..e3	Res= 48.7 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm <sup>2</sup>
Rfbt	Vishay-Dale	CRCW04021M40FKED Series= CRCW..e3	Res= 1.4 MOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm <sup>2</sup>
U1	Texas Instruments	TPS61288RQQR	Switcher	1	\$1.48	RQQ0011A-MFG 9 mm <sup>2</sup>









### Operating Values

#	Name	Value	Category	Description
1.	BOM Count	14		Total Design BOM count
2.	Total BOM	NA		Total BOM Cost
3.	Cin ESR	3.0 mOhm	Capacitor	Cin Capacitor ESR
4.	Cin IRMS	153.429 mA	Capacitor	Input capacitor RMS ripple current
5.	Cin Pd	70.621 μW	Capacitor	Input capacitor power dissipation
6.	Cinx ESR	20.0 mOhm	Capacitor	Cin Capacitor ESR
7.	Cinx IRMS	1.875 mA	Capacitor	Bulk capacitor RMS ripple current
8.	Cinx Pd	70.312 nW	Capacitor	Bulk capacitor power dissipation
9.	Cout ESR	1.333 mOhm	Capacitor	Cout Capacitor ESR
10.	IC Ipk	2.233 A	IC	Peak switch current in IC
11.	IC Pd	610.92 μW	IC	IC power dissipation
12.	IC Tj	30.021 degC	IC	IC junction temperature
13.	IC Tolerance	12.0 mV	IC	IC Feedback Tolerance
14.	ICThetaJA Effective	33.6 degC/W	IC	Effective IC Junction-to-Ambient Thermal Resistance
15.	Iin Avg	32.734 mA	IC	Average input current
16.	Ipp percentage	6.823 k%	Inductor	Inductor ripple current percentage (with respect to average inductor current)
17.	L Ipp	2.233 A	Inductor	Peak-to-peak inductor ripple current
18.	L Pd	744.44 μW	Inductor	Inductor power dissipation
19.	L1 DCR	100.0 mOhm	Inductor	L1 DCR
20.	L1 Irms	86.281 mA	Inductor	Inductor ripple current
21.	Cin Pd	70.621 μW	Power	Input capacitor power dissipation
22.	Cinx Pd	70.312 nW	Power	Bulk capacitor power dissipation
23.	IC Pd	610.92 μW	Power	IC power dissipation
24.	L Pd	744.44 μW	Power	Inductor power dissipation
25.	Total Pd	1.654 mW	Power	Total Power Dissipation
26.	Duty Cycle	378.6 m%	System	Duty cycle
27.	Efficiency	98.195 %	System	Steady state efficiency
28.	FootPrint	178.0 mm <sup>2</sup>	System	Total Foot Print Area of BOM components

#	Name	Value	Category	Description
29.	Iout	5.0 mA	System Information	Iout operating point
30.	Iout transient step used for Cout calculations	2.5 mA	System Information	Custom Transient current step requirement that was used for Cout selection (A).
31.	Mode	PFM	System Information	Conduction Mode
32.	Overshoot Value	28.195 nV	System Information	Theoretical Vout Overshoot Value
33.	Pout	90.0 mW	System Information	Total output power
34.	Undershoot Value	56.732 mV	System Information	Theoretical Vout Undershoot Value
35.	Vin	2.8 V	System Information	Vin operating point
36.	Vout	17.848 V	System Information	Operational Output Voltage
37.	Vout Actual	17.848 V	System Information	Vout Actual calculated based on selected voltage divider resistors
38.	Vout Ripple requirement used for Cout calculations	1.0 %	System Information	Custom maximum output ripple requirement that was used for Cout selection(% of Vout).
39.	Vout Tolerance	3.991 %	System Information	Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable
40.	Vout transient requirement used for Cout calculations	3.0 %	System Information	Custom Transient voltage change requirement that was used for Cout selection (% of Vout).

## Design Inputs

Name	Value	Description
Iout	5.0 m	Maximum Output Current
VinMax	4.6	Maximum input voltage
VinMin	2.8	Minimum input voltage
Vout	18.0	Output Voltage
base_pn	TPS61288	Base Product Number
source	DC	Input Source Type
Ta	30.0	Ambient temperature

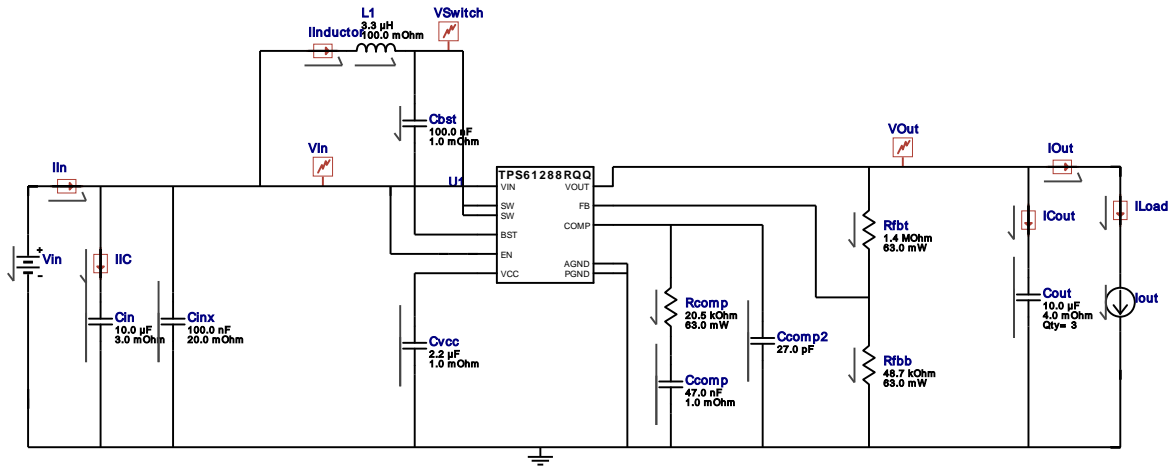
## WEBENCH® Assembly

# WEBENCH® Electrical Simulation Report

Design Id = 328

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Simulation Type = Steady State

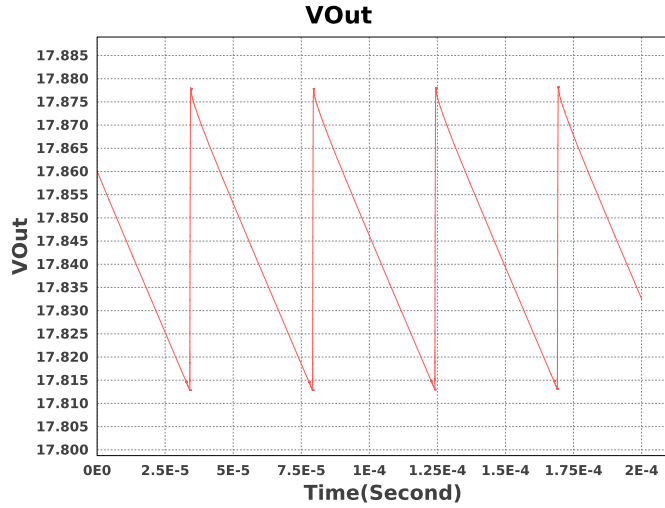


VinMin = 2.8V  
VinMax = 4.6V

Vout = 18.0V  
Iout = 0.0A

## Simulation Parameters

#	Name	Parameter Name	Description	Values
1.	Iout	I	Load Current	0.005 A

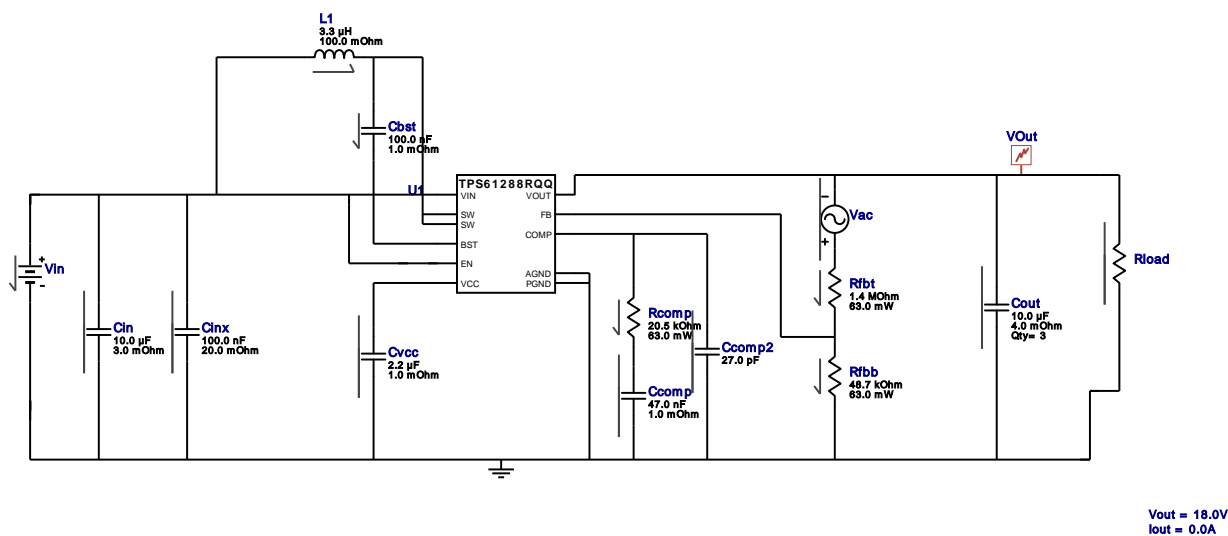




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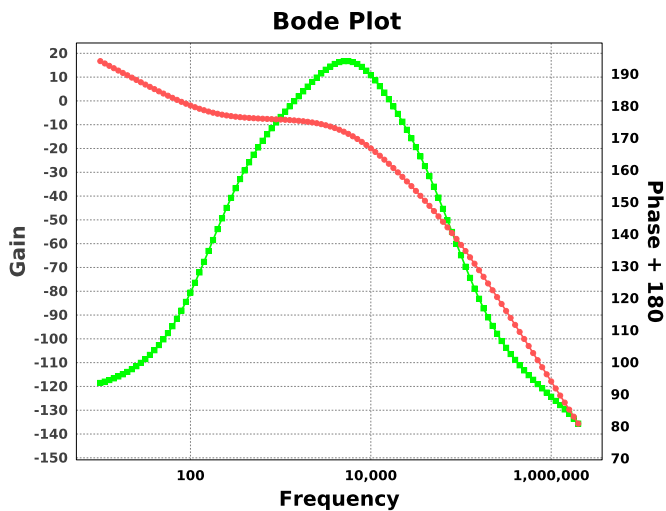
sim\_id = 2

Simulation Type = Bode Plot



### Simulation Parameters

#	Name	Parameter Name	Description	Values
1.	Cinj	C	Ac Injection Source	10000000 F
2.	Linj	L	AC Injection inductance	10000000 H
3.	Vinj	V	Ac Injection Source	AC=1 V
4.	Cout	IC	no description	no values
5.	Rload	R	Load resistance	3600.0 Ohm



### Design Assistance

1. Master key : D9CED8BEE5623EB1[v1]
2. **TPS61288** Product Folder : <https://www.ti.com/product/TPS61288> : contains the data sheet and other resources.

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