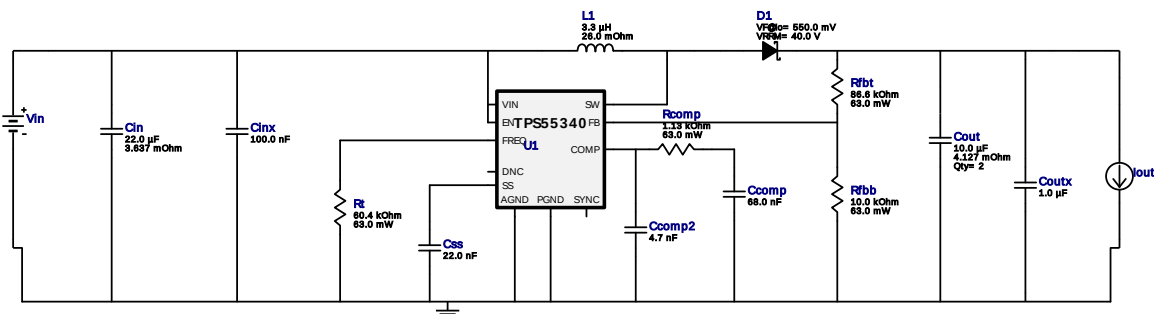


WEBENCH® Design Report

Design : 3893481/36 TPS55340RTER
TPS55340RTER 3.6V-4.2V to 12.00V @ 1.0A



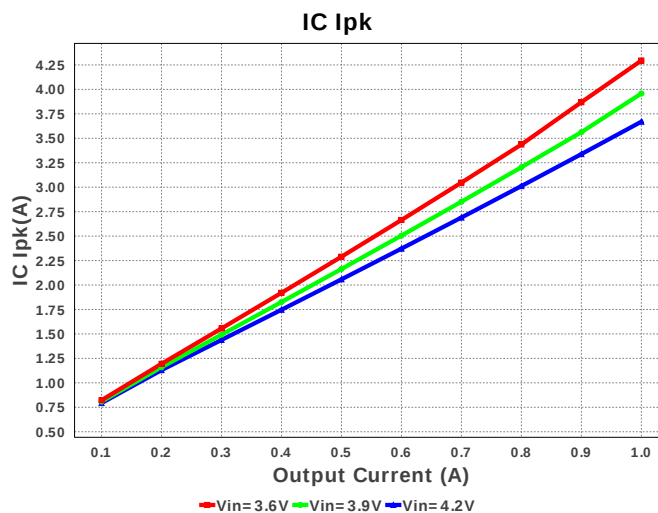
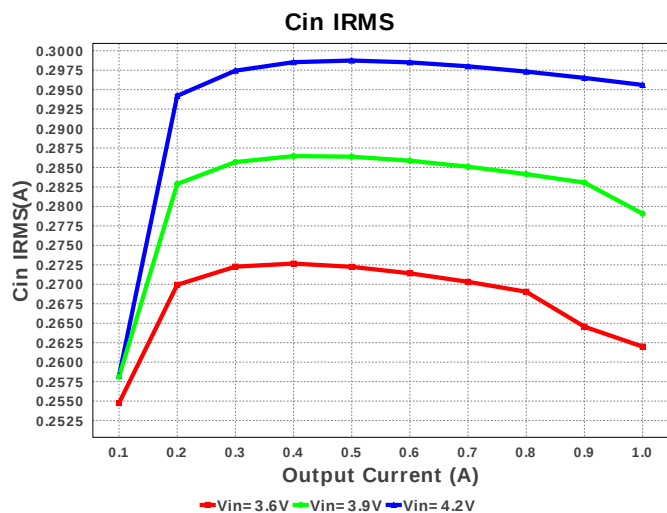
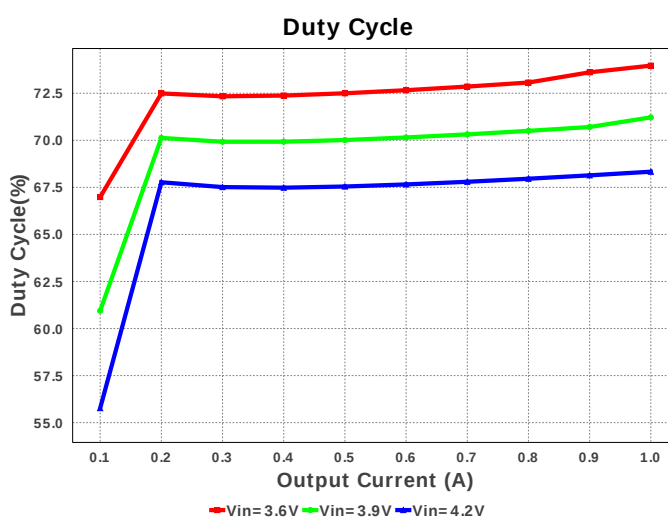
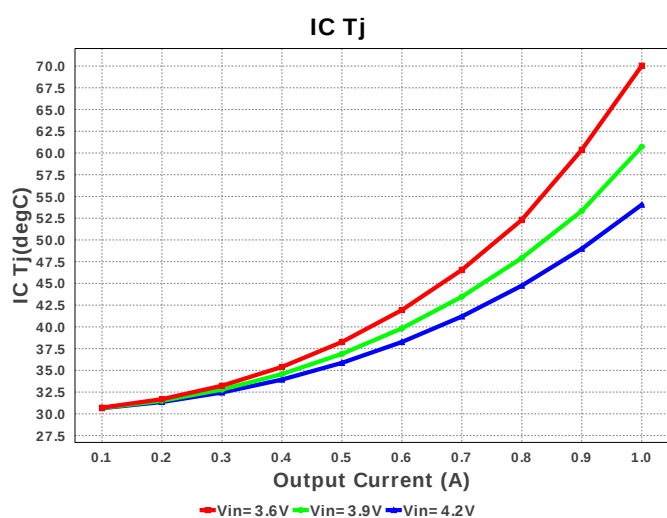
My Comments

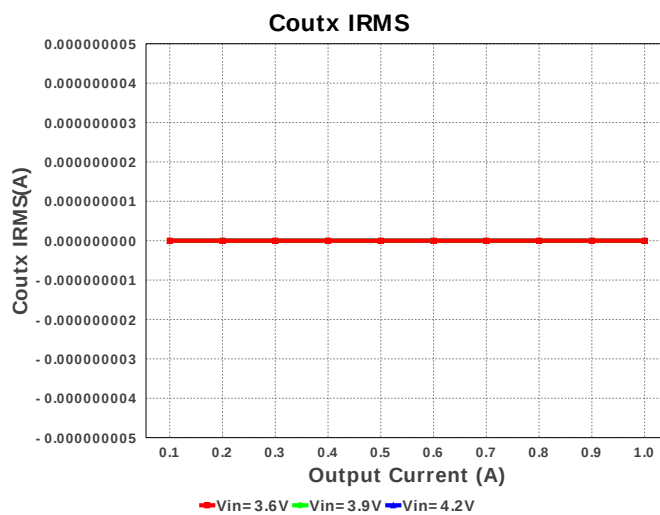
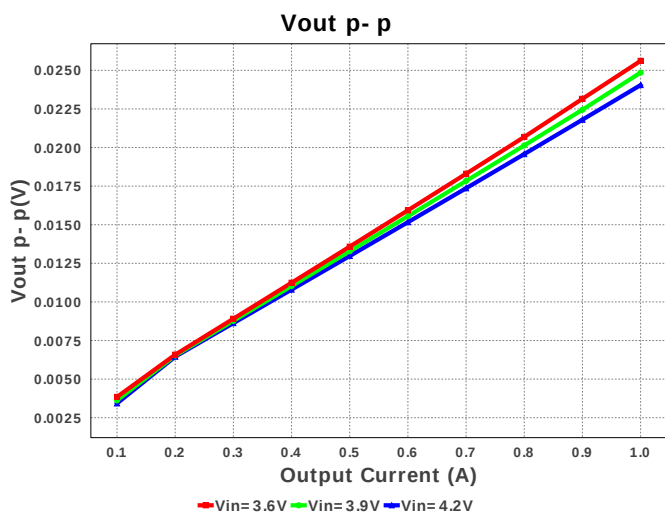
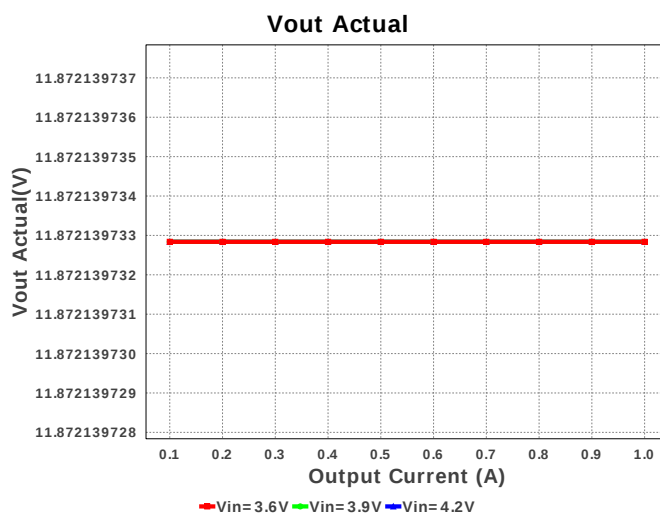
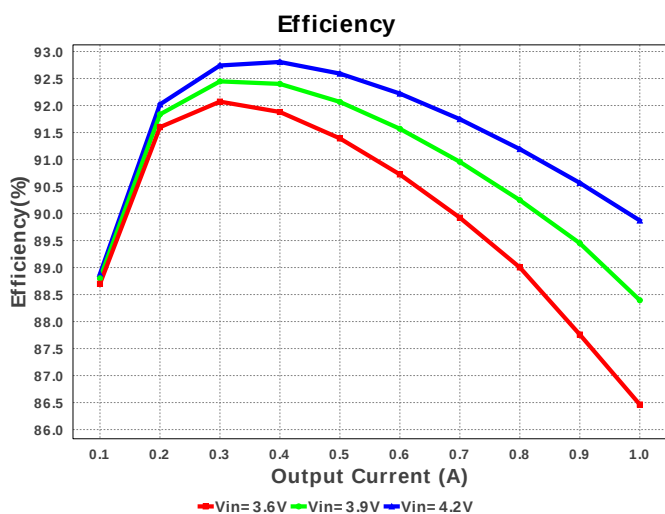
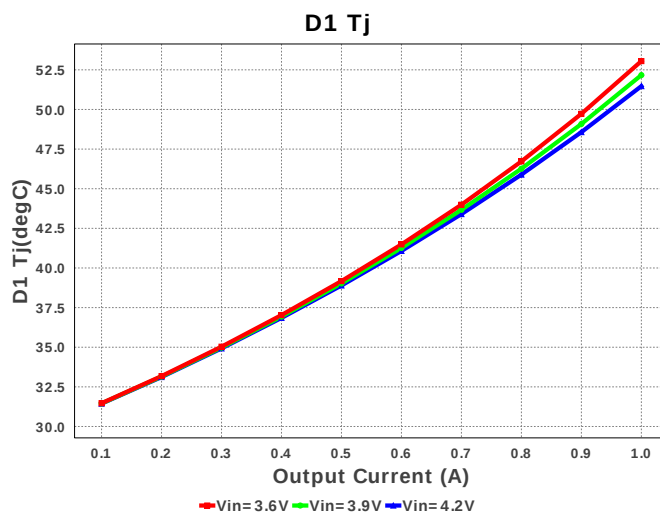
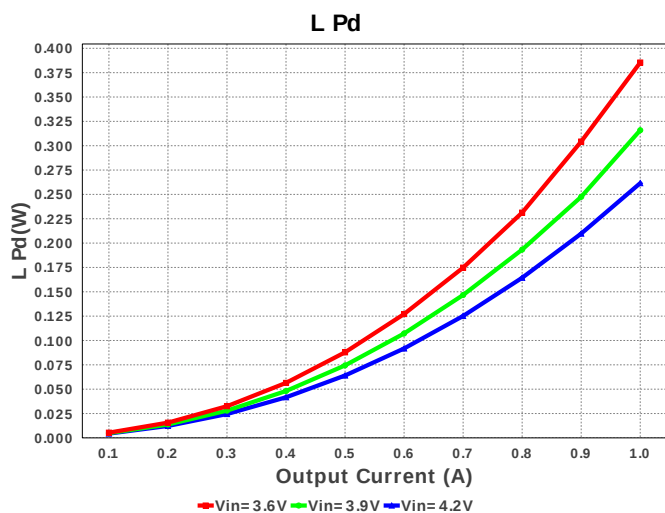
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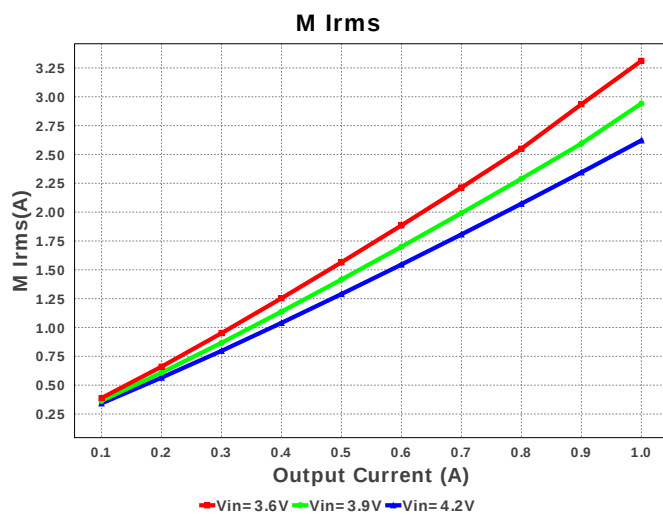
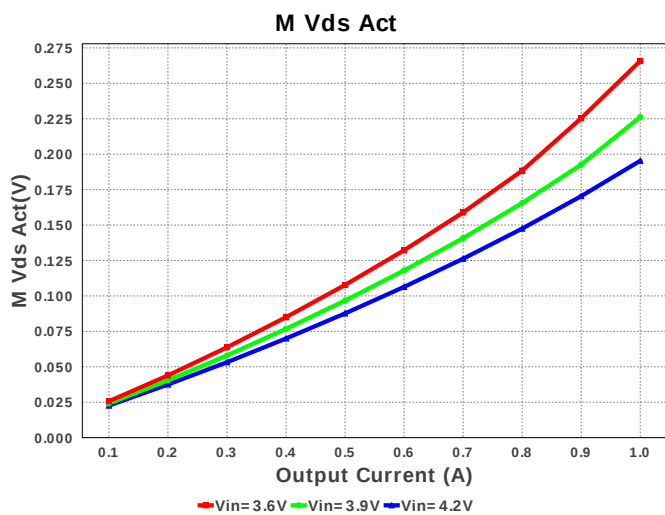
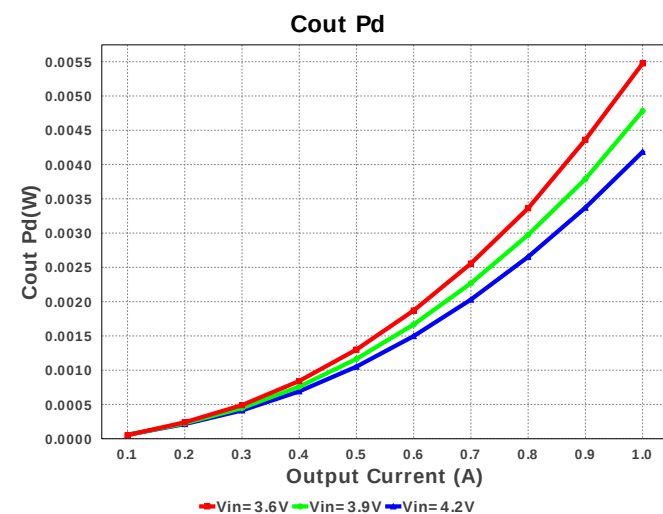
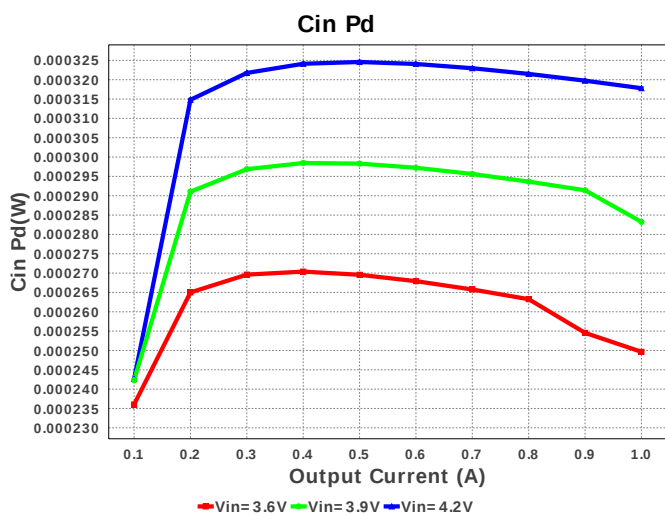
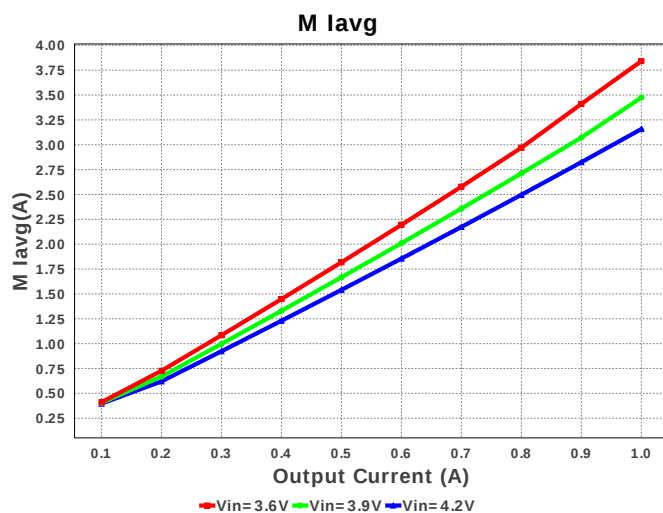
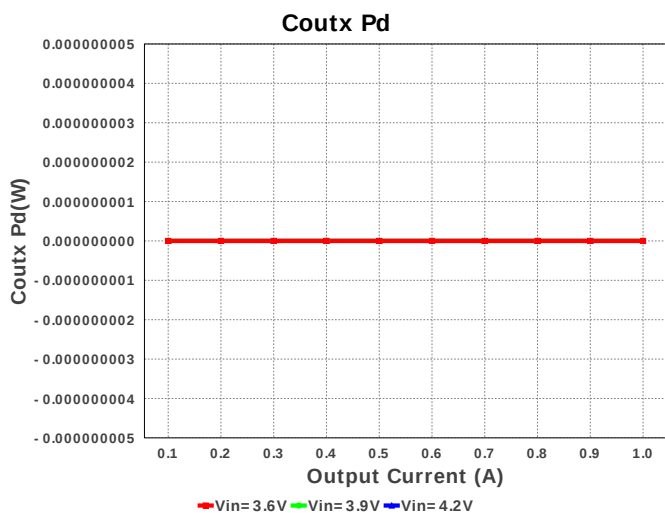
Electrical BOM

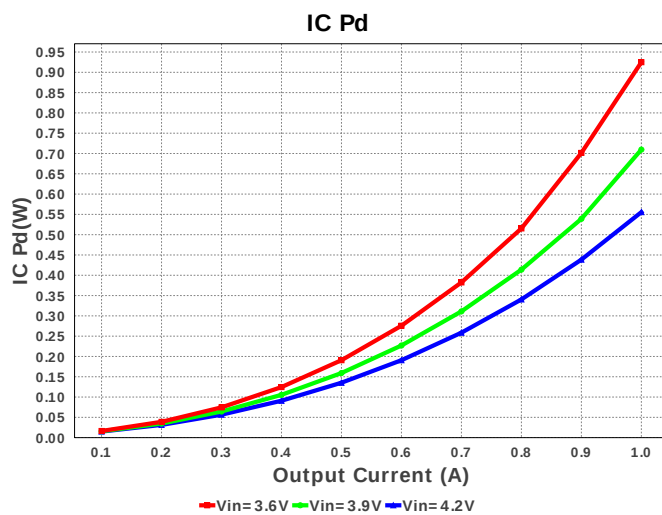
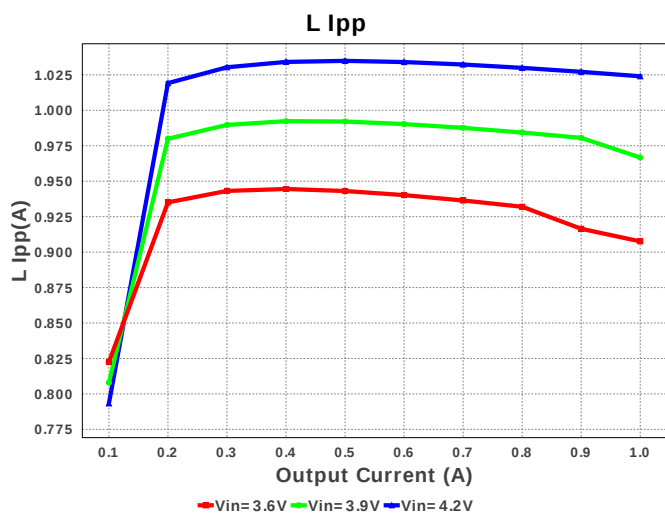
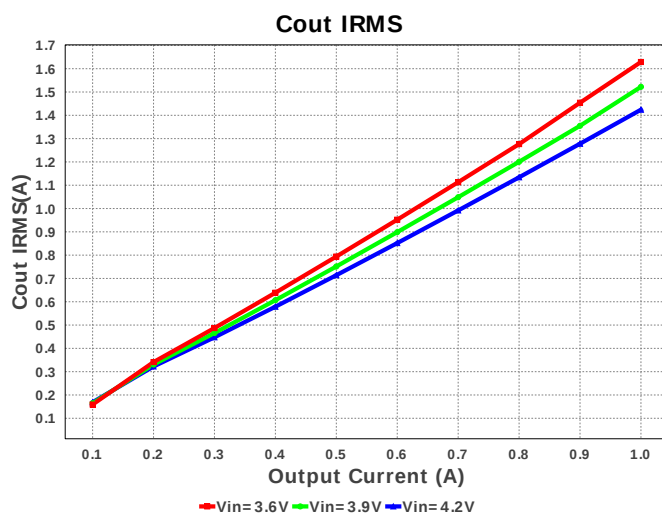
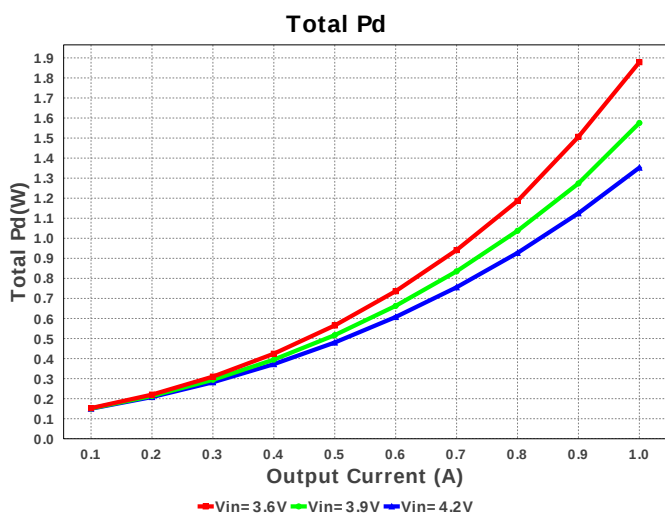
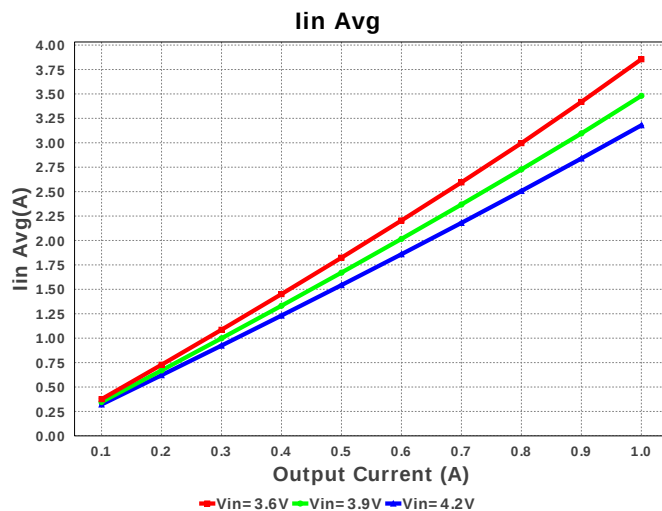
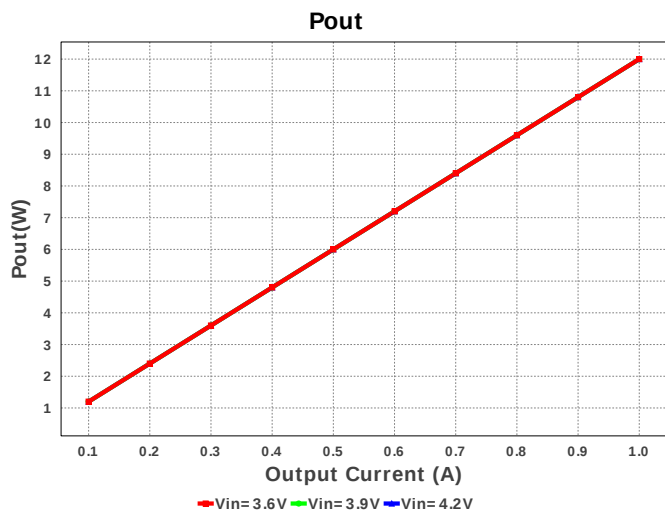
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Ccomp	MuRata	GRM155R61A683KA01D Series= X5R	Cap= 68.0 nF VDC= 10.0 V IRMS= 0.0 A	1	\$0.01	0402 3 mm ²
2.	Ccomp2	Yageo America	CC0805KRX7R9BB472 Series= X7R	Cap= 4.7 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	0805 7 mm ²
3.	Cin	MuRata	GRM31CR61A226KE19L Series= X5R	Cap= 22.0 µF ESR= 3.637 mOhm VDC= 10.0 V IRMS= 3.56456 A	1	\$0.07	1206_190 11 mm ²
4.	Cinx	MuRata	GRM155R61A104KA01D Series= X5R	Cap= 100.0 nF VDC= 10.0 V IRMS= 0.0 A	1	\$0.01	0402 3 mm ²
5.	Cout	MuRata	GRM21BR61C106KE15L Series= X5R	Cap= 10.0 µF ESR= 4.127 mOhm VDC= 16.0 V IRMS= 2.46634 A	2	\$0.03	0805 7 mm ²
6.	Coutx	Taiyo Yuden	EMK107B7105KA-T Series= X7R	Cap= 1.0 µF VDC= 16.0 V IRMS= 0.0 A	1	\$0.01	0603 5 mm ²
7.	Css	MuRata	GRM033C80J223KE01D Series= X6S	Cap= 22.0 nF VDC= 6.3 V IRMS= 0.0 A	1	\$0.01	0201 2 mm ²
8.	D1	Diodes Inc.	B540C-13-F	VF@Io= 550.0 mV VRRM= 40.0 V	1	\$0.17	SMC 83 mm ²
9.	L1	Coilcraft	XAL4030-332MEB	L= 3.3 µH DCR= 26.0 mOhm	1	\$0.72	XAL4030 25 mm ²
10.	Rcomp	Vishay-Dale	CRCW04021K13FKED Series= CRCW..e3	Res= 1.13 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
11.	Rfbb	Vishay-Dale	CRCW040210K0FKED Series= CRCW..e3	Res= 10.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²

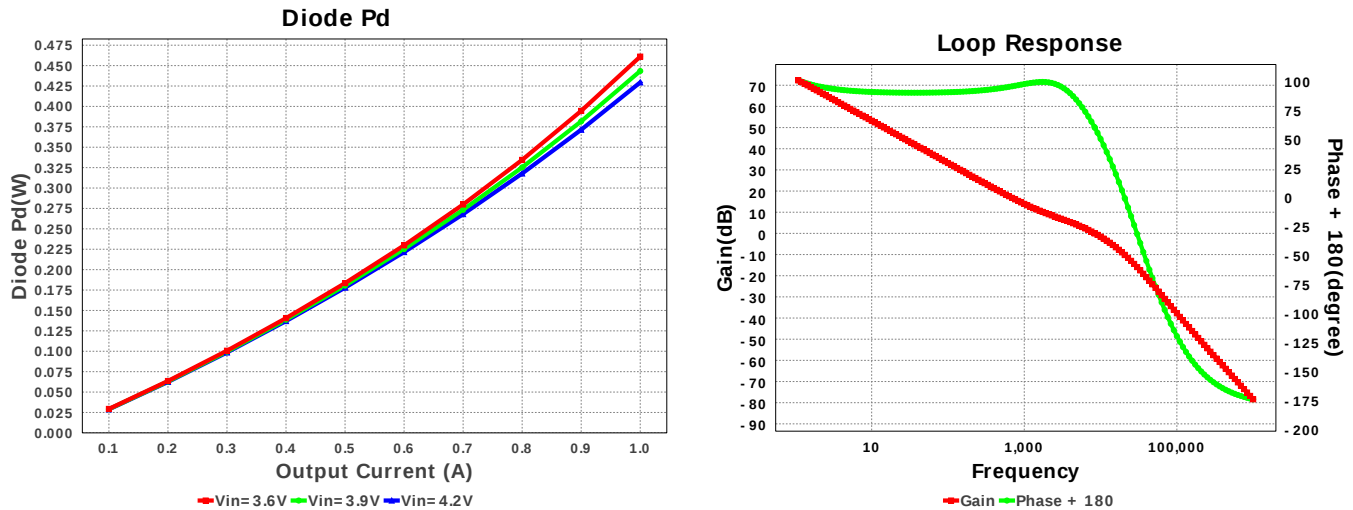
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
12.	Rfbt	Vishay-Dale	CRCW040286K6FKED Series= CRCW..e3	Res= 86.6 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
13.	Rt	Vishay-Dale	CRCW040260K4FKED Series= CRCW..e3	Res= 60.4 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
14.	U1	Texas Instruments	TPS55340RTER	Switcher	1	\$1.85	S-PWQFN-N16 17 mm ²











Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	261.998 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	1.609 A	Current	Output capacitor RMS ripple current
3.	Coutx IRMS	0.0 A	Current	Output capacitor_x RMS ripple current
4.	IC IpK	4.295 A	Current	Peak switch current in IC
5.	Iin Avg	3.855 A	Current	Average input current
6.	L Ipp	907.59 mA	Current	Peak-to-peak inductor ripple current
7.	M Iavg	3.841 A	Current	MOSFET Average current
8.	M Irms	3.311 A	Current	MOSFET RMS current
9.	BOM Count	15	General	Total Design BOM count
10.	FootPrint	181.0 mm ²	General	Total Foot Print Area of BOM components
11.	Frequency	778.91 kHz	General	Switching frequency
12.	IC Tolerance	9.0 mV	General	IC Feedback Tolerance
13.	M Vds Act	265.759 mV	General	Voltage drop across the MosFET
14.	Pout	12.0 W	General	Total output power
15.	Total BOM	\$2.96	General	Total BOM Cost
16.	D1 Tj	53.051 degC	Op_Point	D1 junction temperature
17.	Low Freq Gain	71.702 dB	Op_Point	Gain at 10Hz
18.	Vout Actual	11.872 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
19.	Vout OP	12.0 V	Op_Point	Operational Output Voltage
20.	Cross Freq	7.151 kHz	Op_point	Bode plot crossover frequency
21.	Duty Cycle	73.966 %	Op_point	Duty cycle
22.	Efficiency	86.465 %	Op_point	Steady state efficiency
23.	Gain Marg	-9.532 dB	Op_point	Bode Plot Gain Margin
24.	IC Tj	70.046 degC	Op_point	IC junction temperature
25.	ICThetaJA	43.3 degC/W	Op_point	IC junction-to-ambient thermal resistance
26.	IOUT_OP	1.0 A	Op_point	Iout operating point
27.	Phase Marg	59.81 deg	Op_point	Bode Plot Phase Margin
28.	VIN_OP	3.6 V	Op_point	Vin operating point
29.	Vout p-p	33.656 mV	Op_point	Peak-to-peak output ripple voltage
30.	Cin Pd	249.655 μW	Power	Input capacitor power dissipation
31.	Cout Pd	5.345 mW	Power	Output capacitor power dissipation
32.	Coutx Pd	0.0 W	Power	Output capacitor_x power loss
33.	Diode Pd	461.022 mW	Power	Diode power dissipation
34.	IC Pd	924.866 mW	Power	IC power dissipation
35.	L Pd	385.4 mW	Power	Inductor power dissipation
36.	Total Pd	1.878 W	Power	Total Power Dissipation
37.	Vout Tolerance	2.557 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	1.0	Maximum Output Current
2.	VinMax	4.2	Maximum input voltage
3.	VinMin	3.6	Minimum input voltage
4.	Vout	12.0	Output Voltage
5.	base_pn	TPS55340	Texas Instruments Base Part Number
6.	source	DC	Input Source Type
7.	ta	30.0	Ambient temperature

Design Assistance

1. TPS55340 Product Folder : <http://www.ti.com/product/TPS55340> : contains the data sheet and other resources.

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