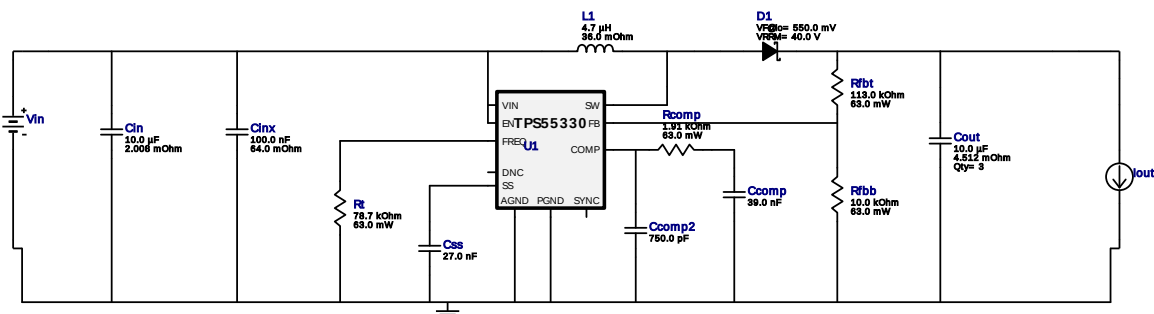


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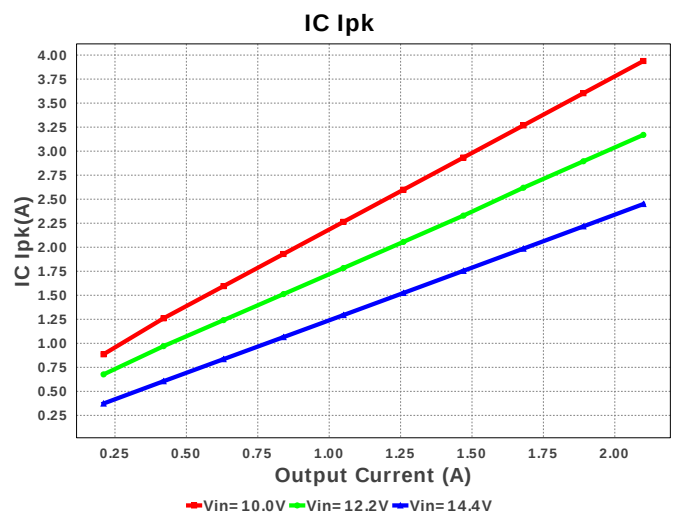
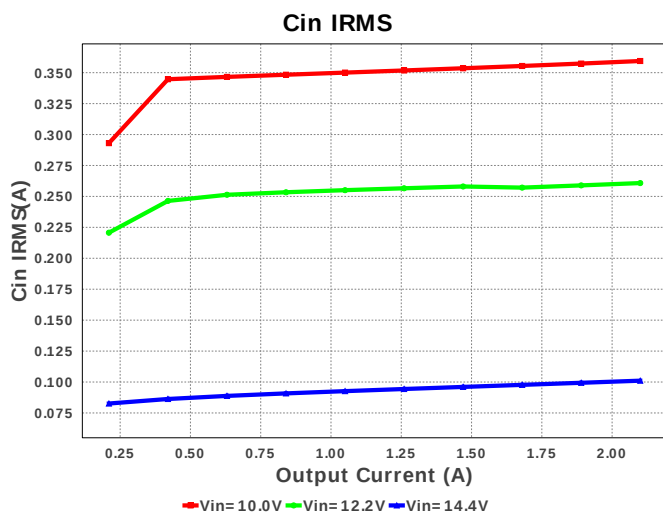
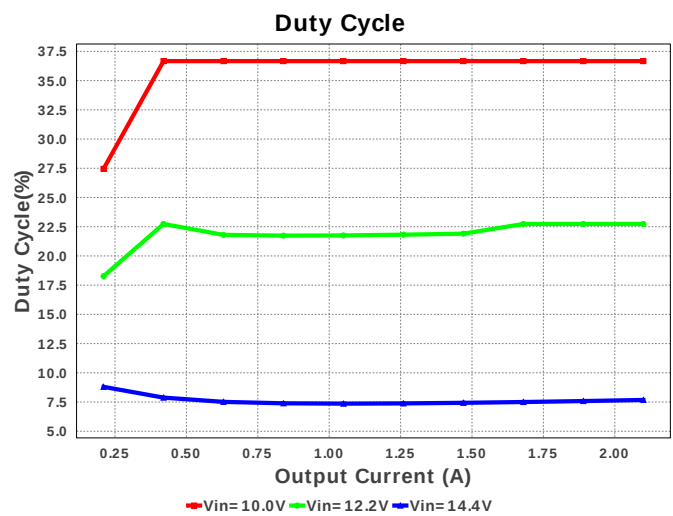
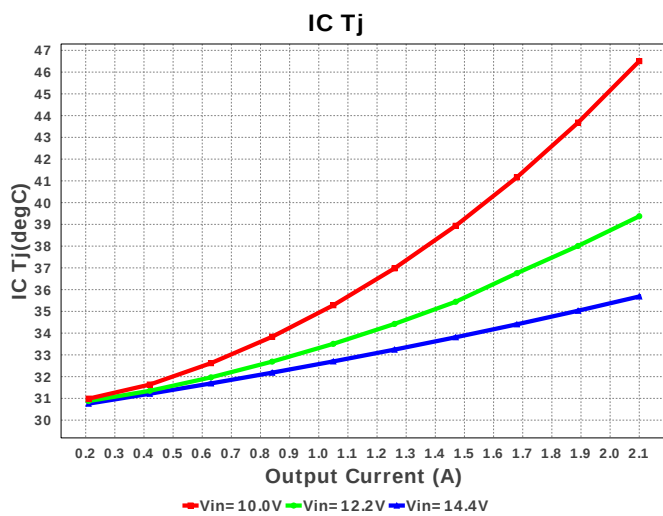
Design : 1641152/101 TPS55330RTER
TPS55330RTER 10.0V-14.4V to 15.00V @ 2.1A

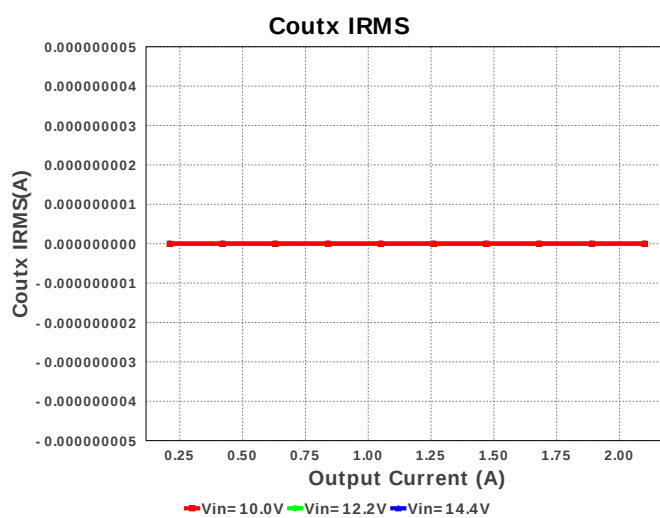
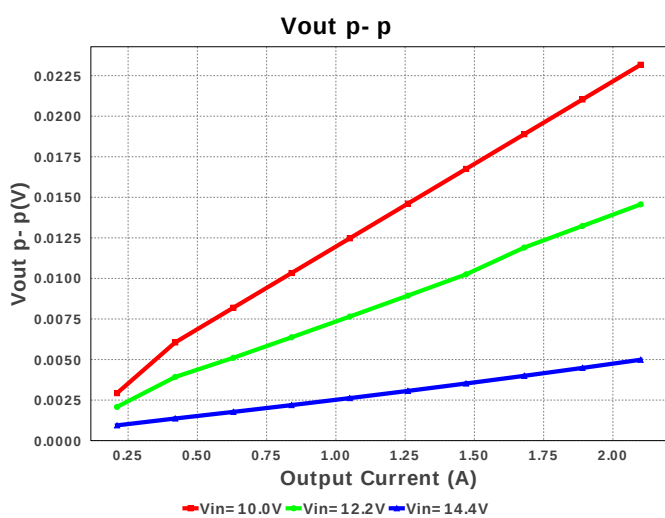
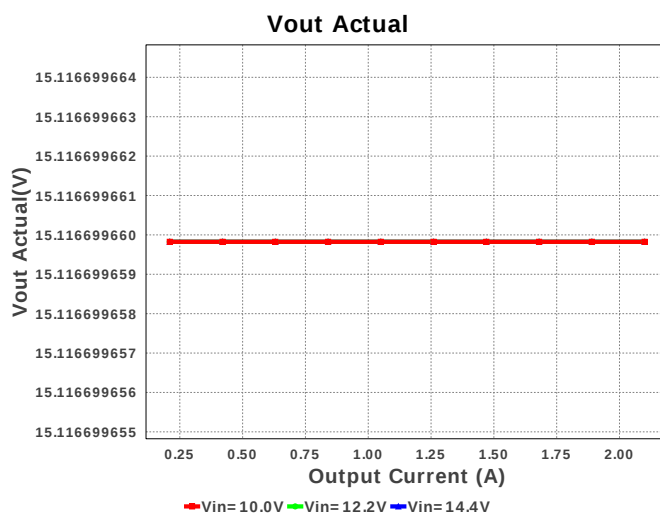
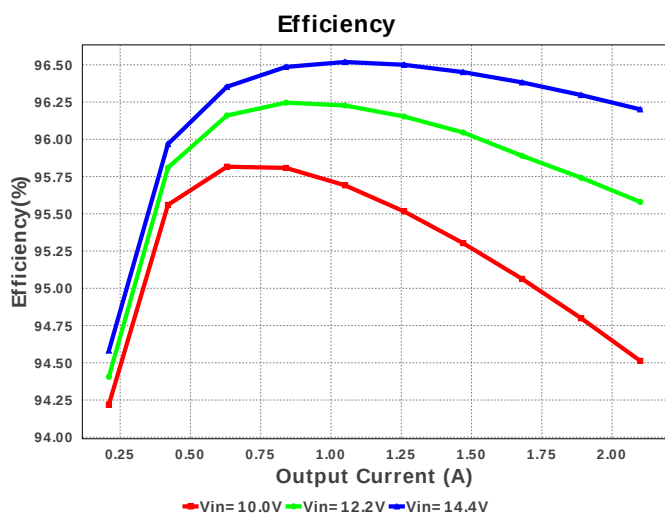
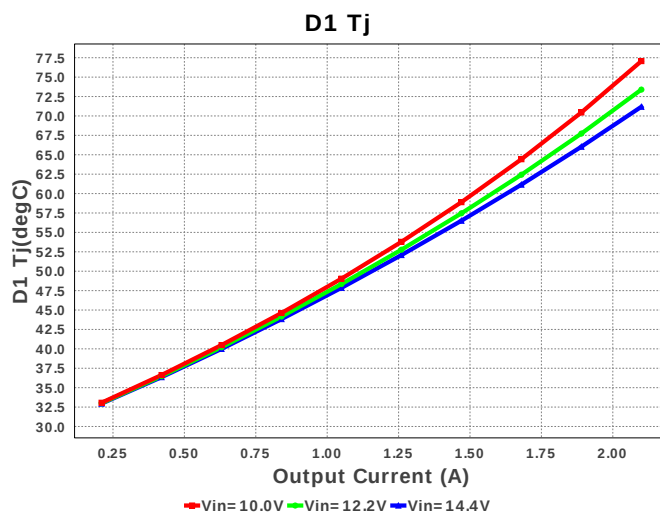
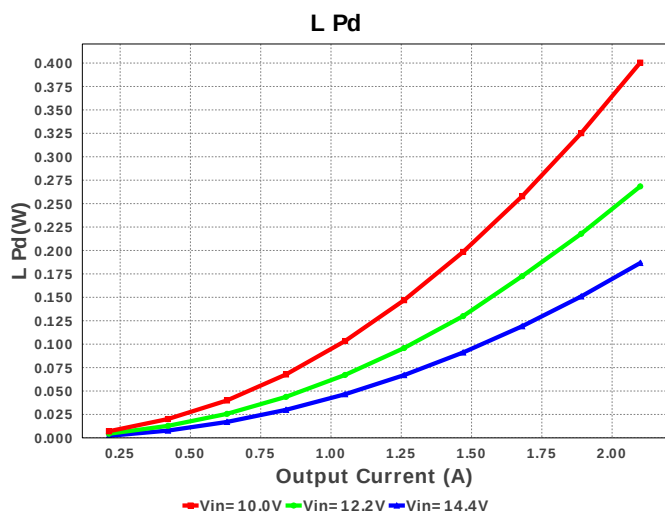


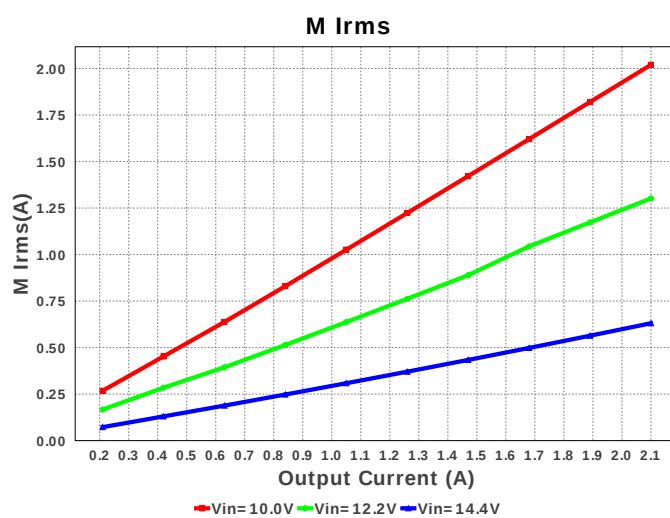
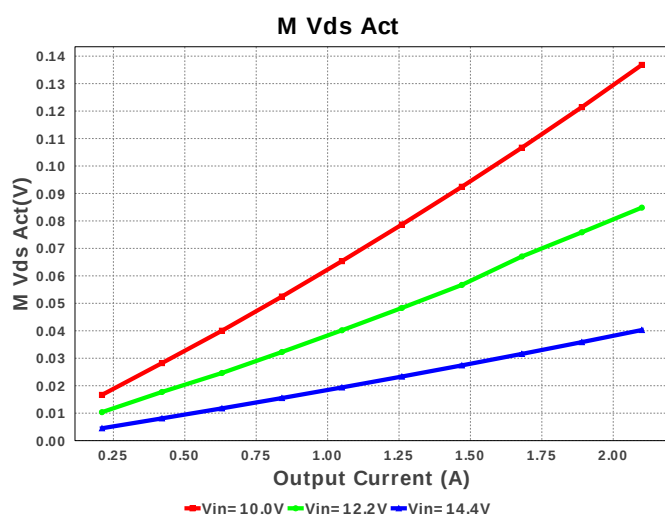
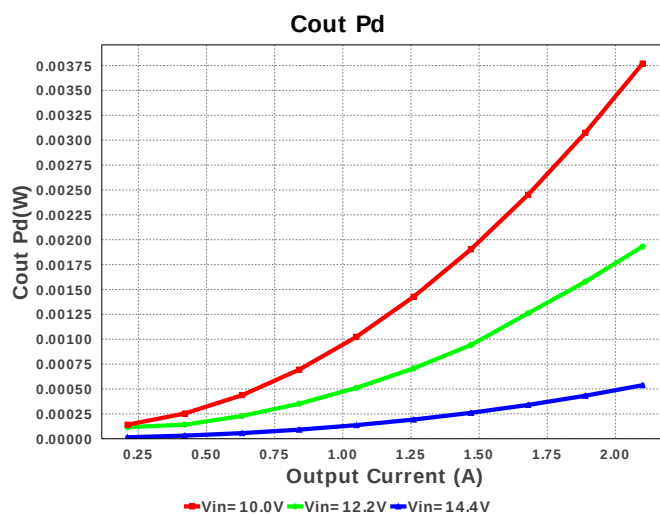
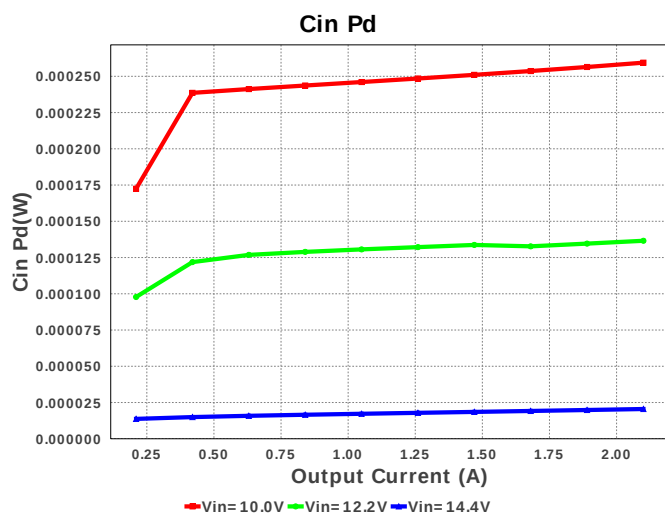
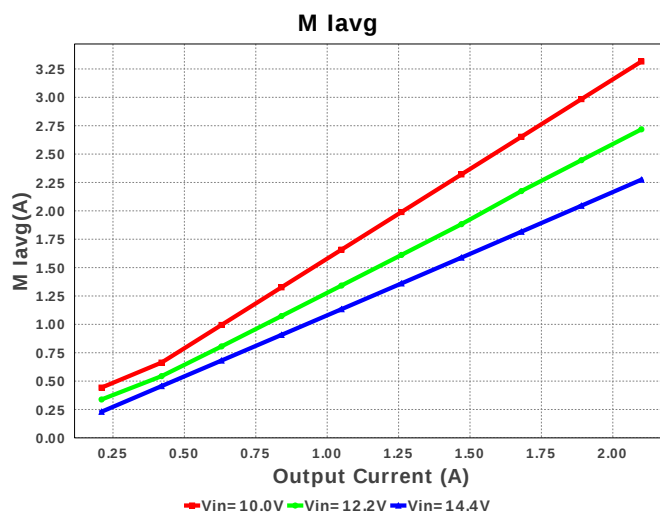
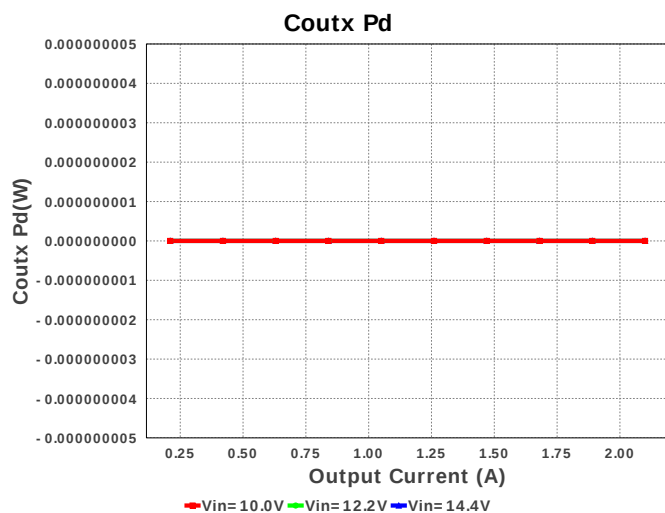
Electrical BOM

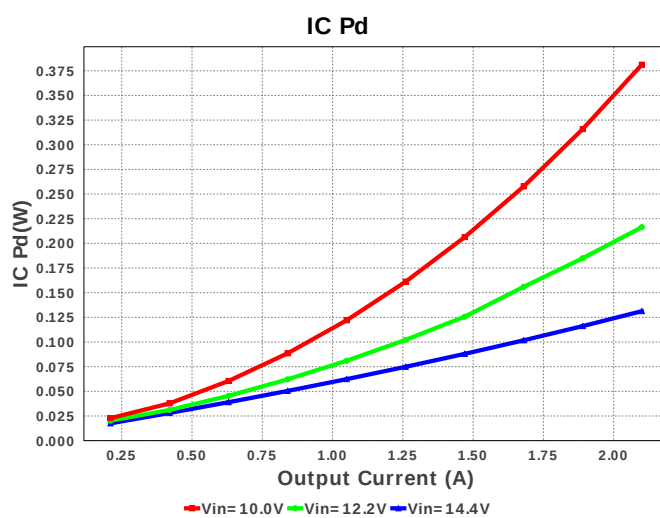
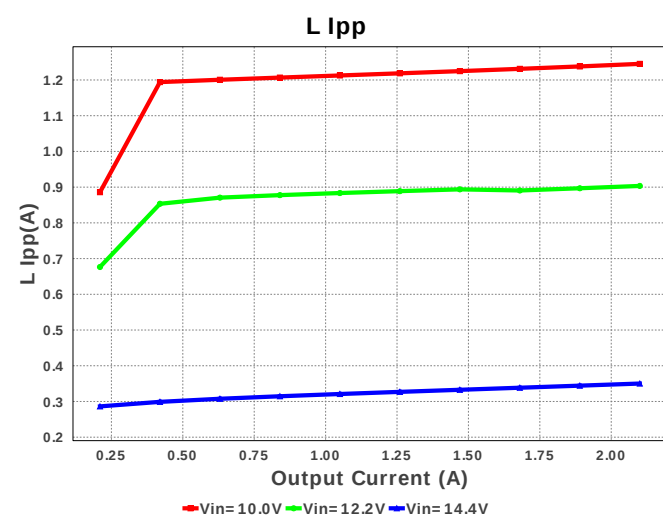
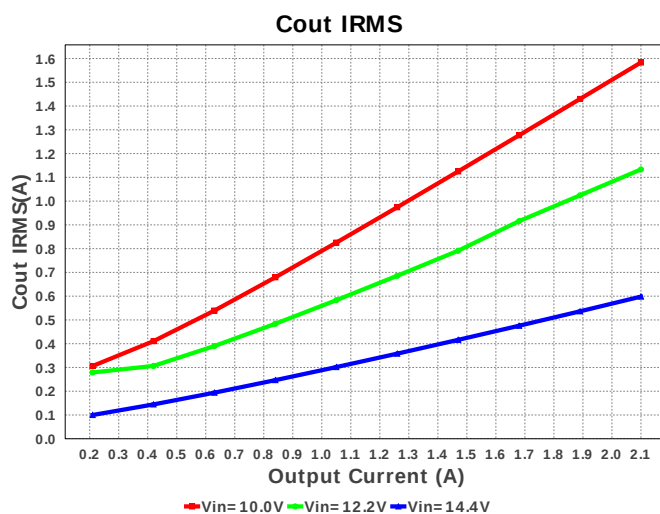
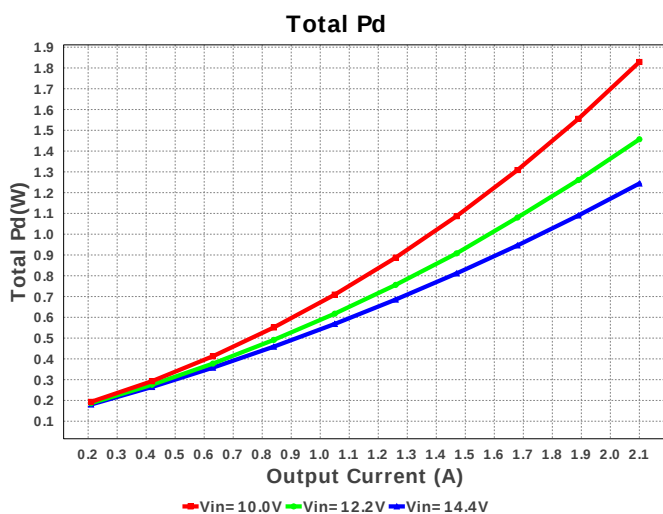
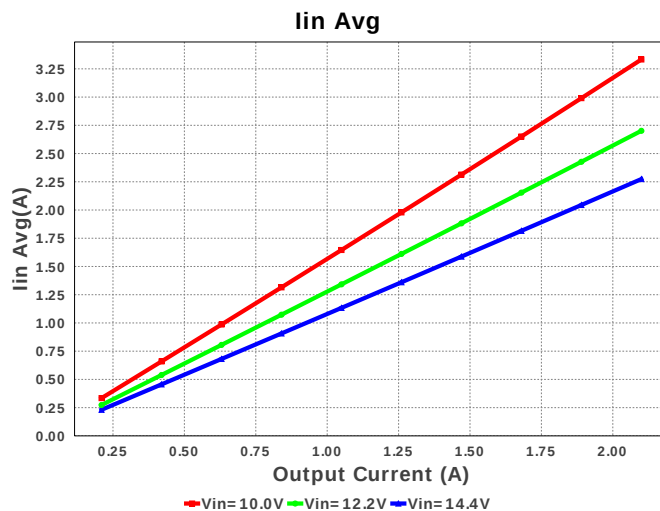
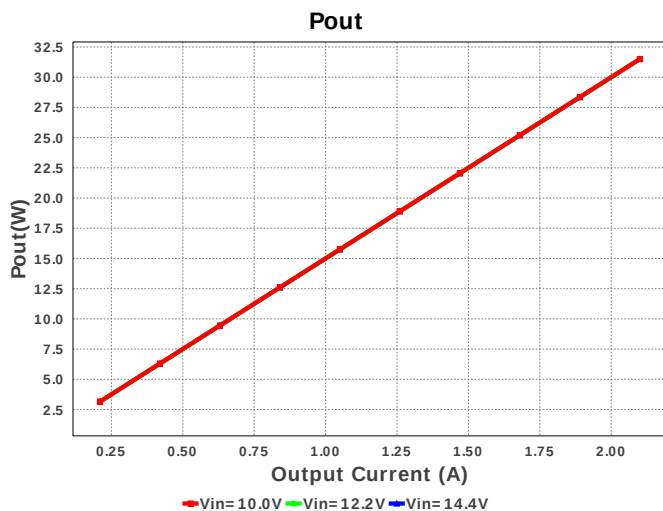
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Ccomp	MuRata	GRM155R61A393KA01D Series= X5R	Cap= 39.0 nF VDC= 10.0 V IRMS= 0.0 A	1	\$0.01	0402 3 mm ²
2.	Ccomp2	Samsung Electro-Mechanics	CL21C751JBCNNNC Series= C0G/NP0	Cap= 750.0 pF VDC= 50.0 V IRMS= 0.0 A	1	\$0.03	0805 7 mm ²
3.	Cin	MuRata	GRM32ER7YA106KA12L Series= X7R	Cap= 10.0 uF ESR= 2.008 mOhm VDC= 35.0 V IRMS= 4.6772 A	1	\$0.22	1210_280 15 mm ²
4.	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 7 mm ²
5.	Cout	MuRata	GRM31CR61E106KA12L Series= X5R	Cap= 10.0 uF ESR= 4.512 mOhm VDC= 25.0 V IRMS= 2.447 A	3	\$0.05	1206_190 11 mm ²
6.	Css	MuRata	GRM155R61A273KA01D Series= X5R	Cap= 27.0 nF VDC= 10.0 V IRMS= 0.0 A	1	\$0.01	0402 3 mm ²
7.	D1	Diodes Inc.	B540C-13-F	VF@Io= 550.0 mV VRRM= 40.0 V	1	\$0.17	SMC 83 mm ²
8.	L1	Coilcraft	XAL5030-472MEB	L= 4.7 uH DCR= 36.0 mOhm	1	\$0.63	XAL5030 54 mm ²
9.	Rcomp	Vishay-Dale	CRCW04021K91FKED Series= CRCW..e3	Res= 1.91 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
10.	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
11.	Rfbt	Vishay-Dale	CRCW0402113KFKED Series= CRCW..e3	Res= 113.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²

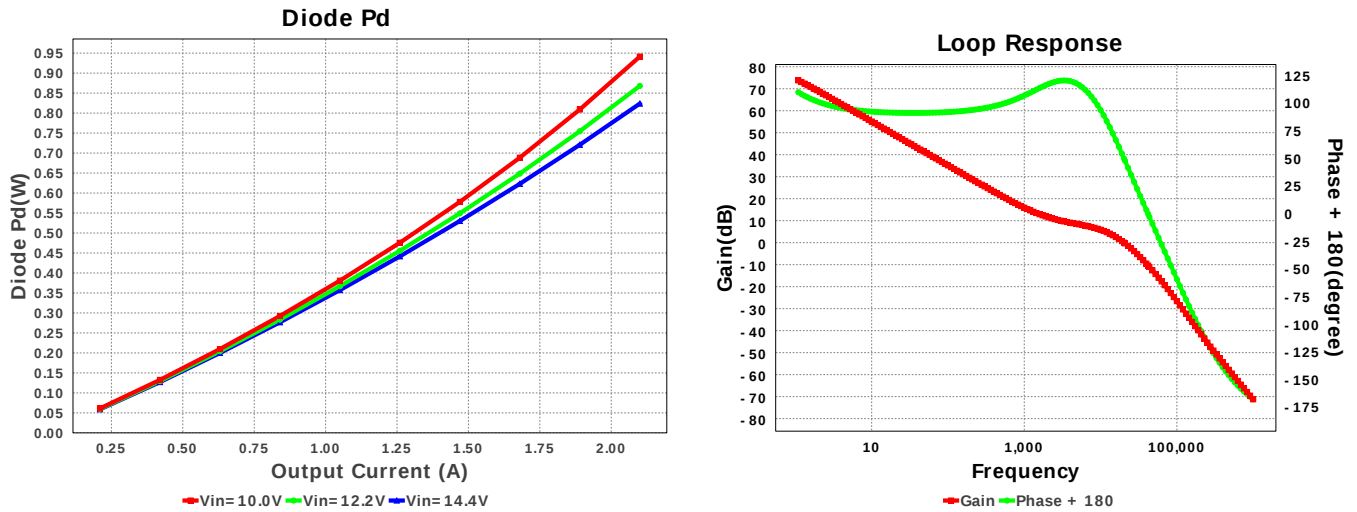
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
12.	Rt	Vishay-Dale	CRCW040278K7FKED Series= CRCW..e3	Res= 78.7 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm²
13.	U1	Texas Instruments	TPS55330RTER	Switcher	1	\$1.75	 S-PWQFN-N16 17 mm²











Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	359.43 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	1.575 A	Current	Output capacitor RMS ripple current
3.	Coutx IRMS	0.0 A	Current	Output capacitor_x RMS ripple current
4.	IC Ipk	3.938 A	Current	Peak switch current in IC
5.	Iin Avg	3.333 A	Current	Average input current
6.	L Ipp	1.245 A	Current	Peak-to-peak inductor ripple current
7.	M Iavg	3.316 A	Current	MOSFET Average current
8.	M1 Irms	2.02 A	Current	Q Iavg
9.	BOM Count	16	General	Total Design BOM count
10.	FootPrint	241.0 mm ²	General	Total Foot Print Area of BOM components
11.	Frequency	602.557 kHz	General	Switching frequency
12.	IC Tolerance	9.0 mV	General	IC Feedback Tolerance
13.	M Vds Act	136.81 mV	General	Voltage drop across the MosFET
14.	Pout	31.5 W	General	Total output power
15.	Total BOM	\$3.05	General	Total BOM Cost
16.	D1 Tj	77.064 degC	Op_Point	D1 junction temperature
17.	Low Freq Gain	74.61 dB	Op_Point	Gain at 10Hz
18.	Vout Actual	15.117 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
19.	Vout OP	15.0 V	Op_Point	Operational Output Voltage
20.	Cross Freq	14.677 kHz	Op_point	Bode plot crossover frequency
21.	Duty Cycle	36.667 %	Op_point	Duty cycle
22.	Efficiency	94.513 %	Op_point	Steady state efficiency
23.	Gain Marg	-10.48 dB	Op_point	Bode Plot Gain Margin
24.	IC Tj	46.505 degC	Op_point	IC junction temperature
25.	ICThetaJA	43.3 degC/W	Op_point	IC junction-to-ambient thermal resistance
26.	IOUT_OP	2.1 A	Op_point	Iout operating point
27.	Phase Marg	54.202 deg	Op_point	Bode Plot Phase Margin
28.	VIN_OP	10.0 V	Op_point	Vin operating point
29.	Vout p-p	27.845 mV	Op_point	Peak-to-peak output ripple voltage
30.	Cin Pd	259.413 μW	Power	Input capacitor power dissipation
31.	Cout Pd	3.731 mW	Power	Output capacitor power dissipation
32.	Coutx Pd	0.0 W	Power	Output capacitor_x power loss
33.	Diode Pd	941.28 mW	Power	Diode power dissipation
34.	IC Pd	381.195 mW	Power	IC power dissipation
35.	L Pd	400.451 mW	Power	Inductor power dissipation
36.	Total Pd	1.829 W	Power	Total Power Dissipation
37.	Vout Tolerance	2.602 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	2.1	Maximum Output Current
2.	VinMax	14.4	Maximum input voltage
3.	VinMin	10.0	Minimum input voltage
4.	Vout	15.0	Output Voltage
5.	base_pn	TPS55330	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	30.0	Ambient temperature

Design Assistance

1. **TPS55330** Product Folder : <http://www.ti.com/product/TPS55330> : contains the data sheet and other resources.

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