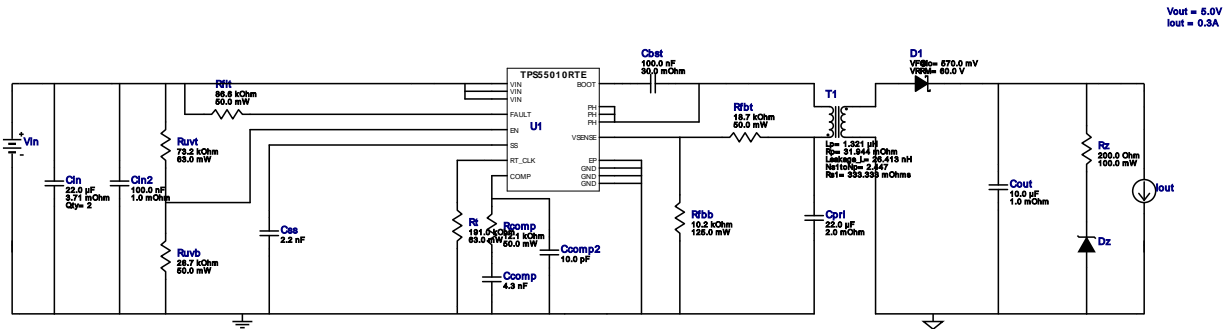


WEBENCH® Design Report

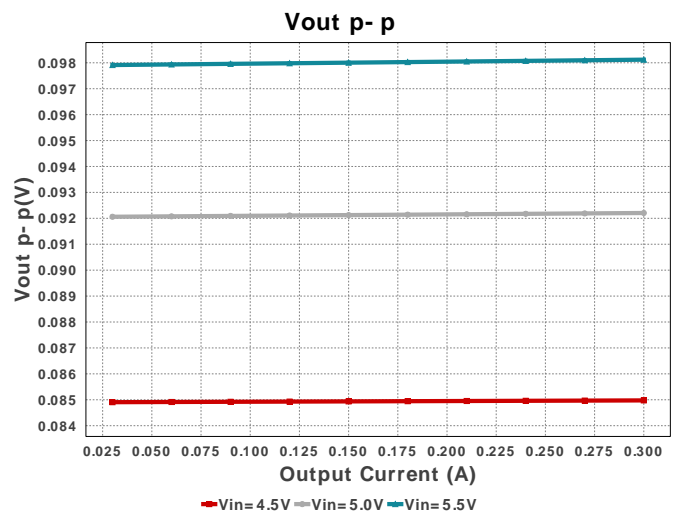
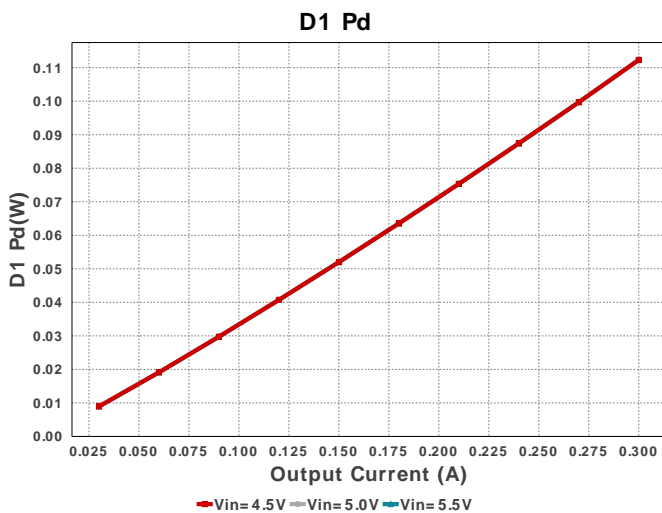
 Design : 1079026/1332 TPS55010RTER
 TPS55010RTER 4.5V-5.5V to 5.00V @ 0.3A

My Comments

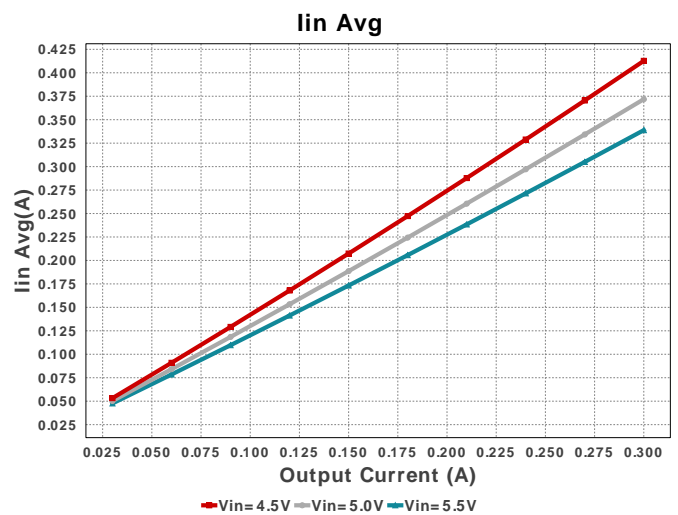
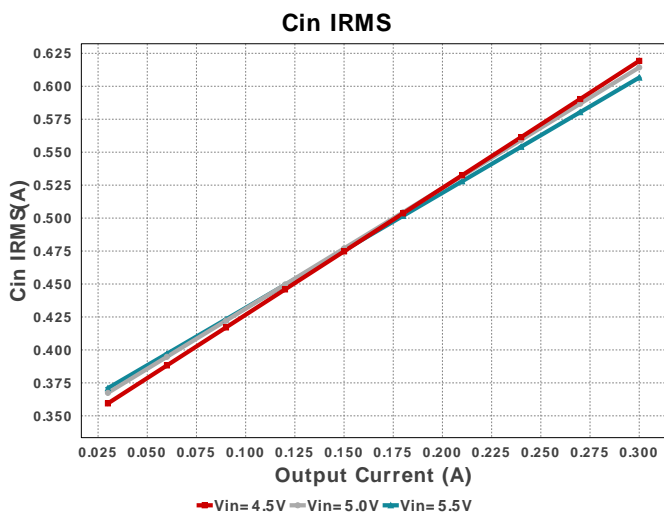
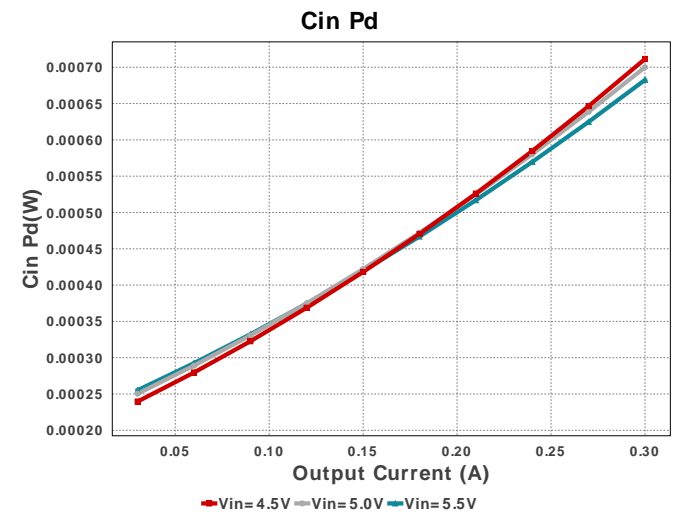
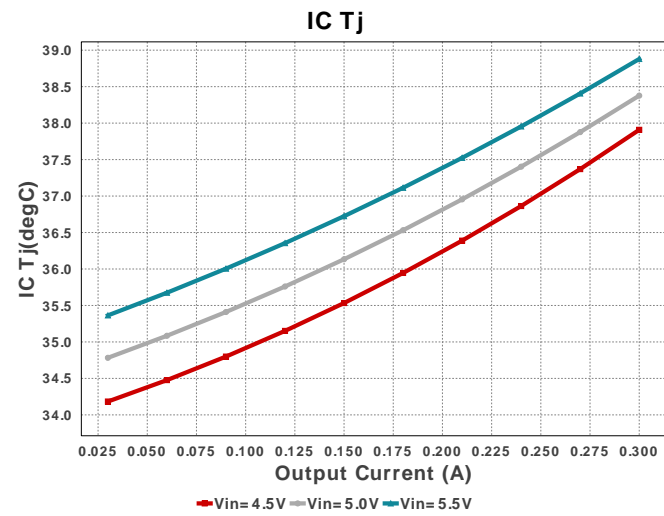
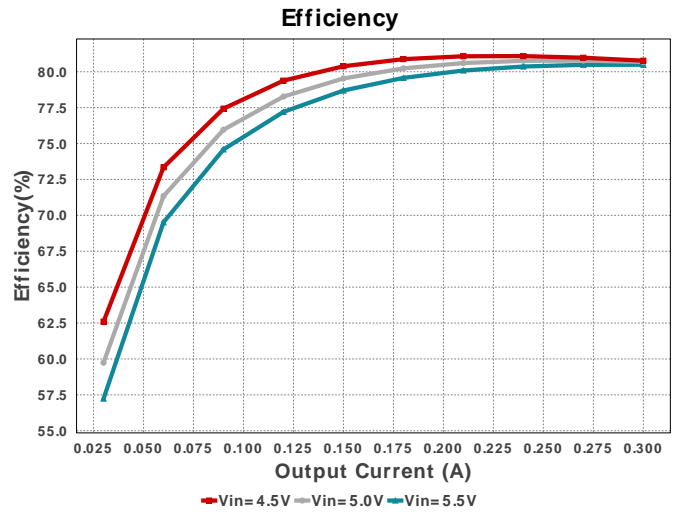
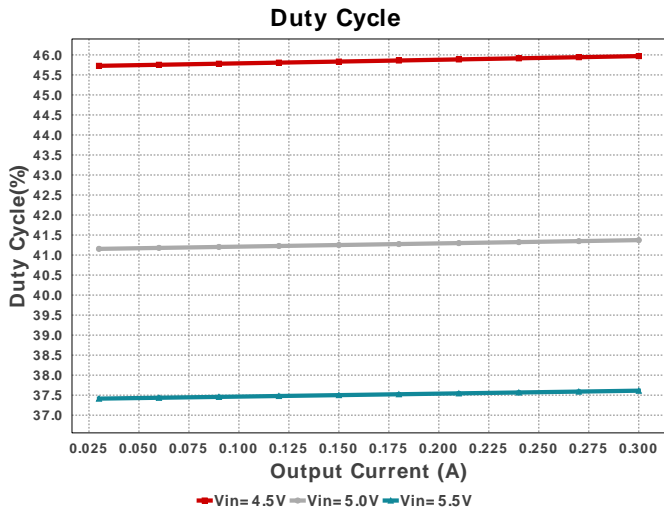
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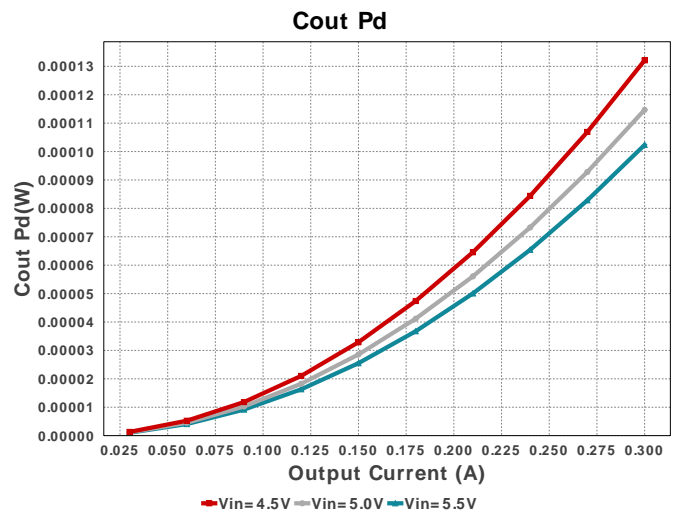
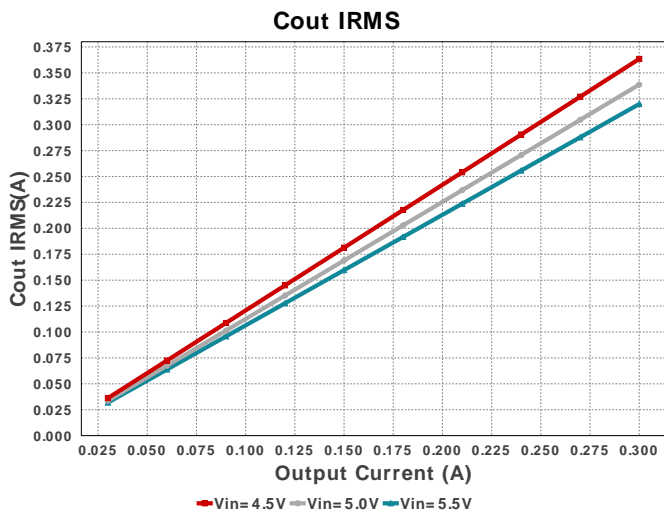
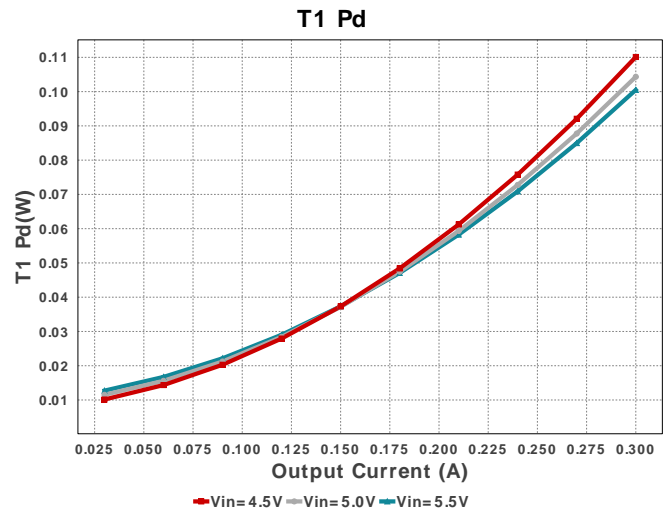
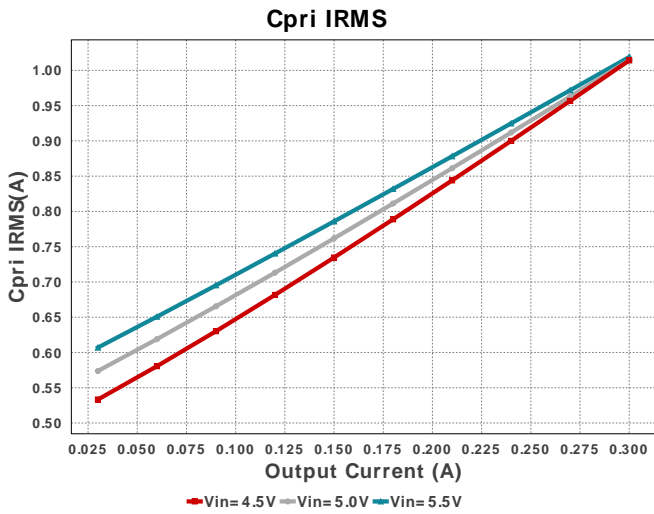
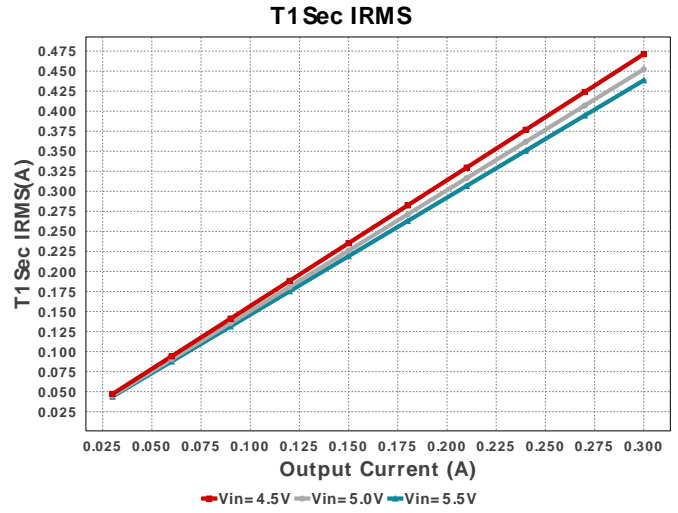
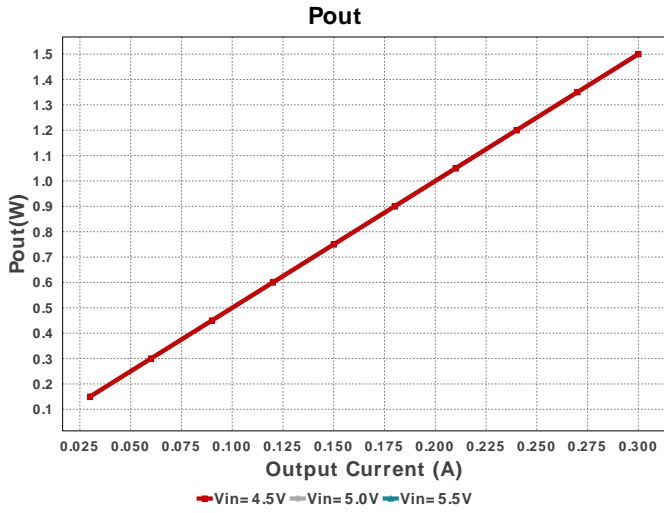
Electrical BOM

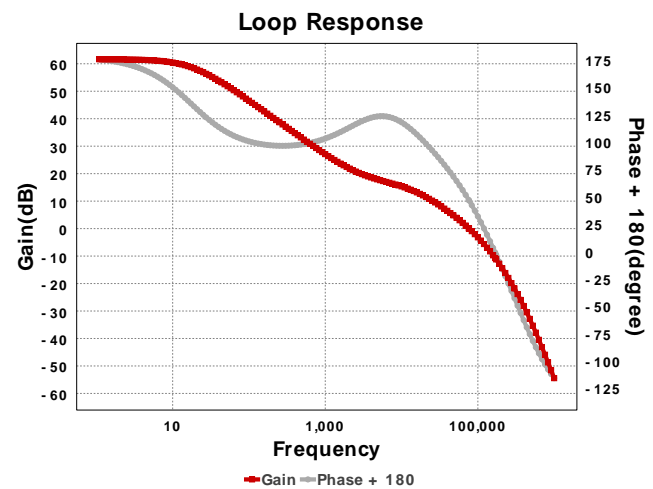
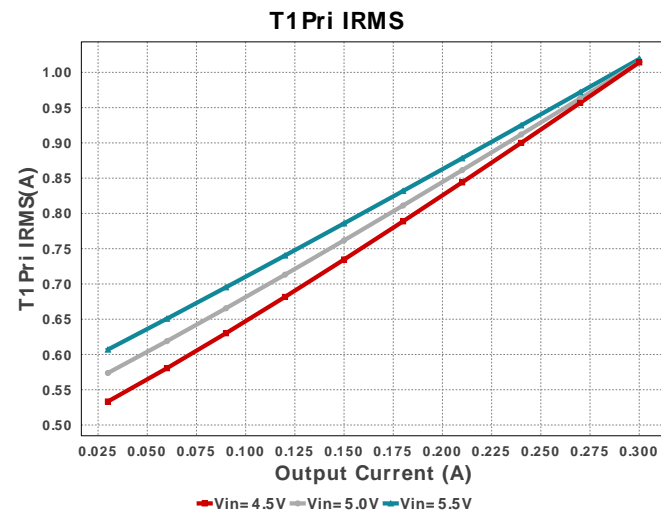
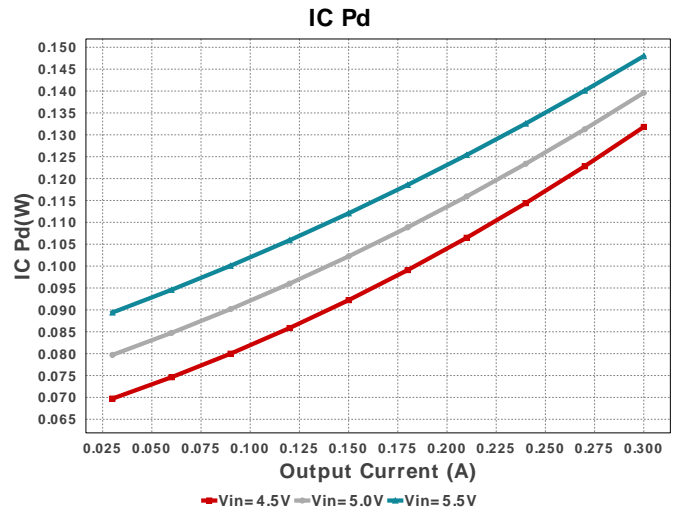
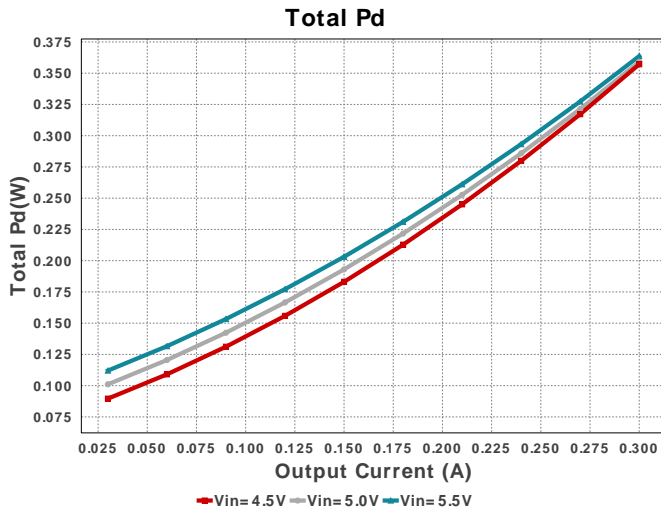
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cbst	MuRata	GRM188R71C104KA01D Series= X7R	Cap= 100.0 nF ESR= 30.0 mOhm VDC= 16.0 V IRMS= 1.7 A	1	\$0.01	0603 5 mm ²
2.	Ccomp	Kemet	C0603C432J5GAC7867 Series= C0G/NP0	Cap= 4.3 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.09	0603 5 mm ²
3.	Ccomp2	Samsung Electro-Mechanics	CL21C100JBANFNC Series= C0G/NP0	Cap= 10.0 pF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	0805 7 mm ²
4.	Cin	TDK	C1608X5R1A226M080AC Series= X5R	Cap= 22.0 uF ESR= 3.71 mOhm VDC= 10.0 V IRMS= 2.69936 A	2	\$0.13	0603 5 mm ²
5.	Cin2	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 ²
6.	Cout	Taiyo Yuden	LMK212BJ106KG-T Series= X5R	Cap= 10.0 uF ESR= 1.0 mOhm VDC= 10.0 V IRMS= 0.0 A	1	\$0.03	0805 7 mm ²
7.	Cpri	MuRata	GRM32ER61C226KE20L Series= X5R	Cap= 22.0 uF ESR= 2.0 mOhm VDC= 16.0 V IRMS= 3.68 A	1	\$0.15	1210 15 mm ²
8.	Css	TDK	C2012C0G1H222K060AA Series= C0G/NP0	Cap= 2.2 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.03	0805 7 mm ²
9.	D1	Nexperia	PMEG6010CEH,115	VF@Io= 570.0 mV VRRM= 60.0 V	1	\$0.04	SOD-123F 12 mm ²
10.	Dz	Diodes Inc.	DFLZ6V2-7	Zener	1	\$0.15	PowerDI123 13 mm ²
11.	Rcomp	Yageo America	RC0201FR-0712K1L Series= ?	Res= 12.1 kOhm Power= 50.0 mW Tolerance= 1.0%	1	\$0.01	0201 2 mm ²

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
12.	Rfbb	Vishay-Dale	CRCW080510K2FKEA Series= CRCW..e3	Res= 10.2 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	0805 7 mm ²
13.	Rfbt	Yageo America	RC0201FR-0718K7L Series= ?	Res= 18.7 kOhm Power= 50.0 mW Tolerance= 1.0%	1	\$0.01	0201 2 mm ²
14.	Rflt	Yageo America	RC0201FR-0786K6L Series= ?	Res= 86.6 kOhm Power= 50.0 mW Tolerance= 1.0%	1	\$0.01	0201 2 mm ²
15.	Rt	Vishay-Dale	CRCW0402191KFKED Series= CRCW..e3	Res= 191.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
16.	Ruvb	Yageo America	RC0201FR-0728K7L Series= ?	Res= 28.7 kOhm Power= 50.0 mW Tolerance= 1.0%	1	\$0.01	0201 2 mm ²
17.	Ruvt	Vishay-Dale	CRCW040273K2FKED Series= CRCW..e3	Res= 73.2 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
18.	Rz	Susumu Co Ltd	RR1220P-201-D Series= RR12	Res= 200.0 Ohm Power= 100.0 mW Tolerance= 0.5%	1	\$0.01	0805 7 mm ²
19.	T1	CUSTOM	CUSTOM	Lp= 1.321 µH Rp= 31.944 mOhm Leakage_L= 26.413 nH Ns1toNp= 2.447 Rs1= 333.333 mOhms	1	NA	CUSTOM 0 mm ²
20.	U1	Texas Instruments	TPS55010RTER	Switcher	1	\$0.90	RTE0016C 16 mm ²









Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	606.589 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	319.91 mA	Current	Output capacitor RMS ripple current
3.	Cpri IRMS	1.019 A	Current	Primary Capacitor RMS Current
4.	Iin Avg	338.85 mA	Current	Average input current
5.	T1Pri IRMS	1.019 A	Current	Transformer Primary RMS Current
6.	T1Sec IRMS	438.569 mA	Current	Transformer Secondary RMS Current
7.	BOM Count	21	General	Total Design BOM count
8.	FootPrint	130.0 mm ²	General	Total Foot Print Area of BOM components
9.	Frequency	499.033 kHz	General	Switching frequency
10.	Mode	DCM	General	Conduction Mode
11.	Pout	1.5 W	General	Total output power
12.	Total BOM	\$0.0	General	Total BOM Cost
13.	Cross Freq	76.083 kHz	Op Point	Bode plot crossover frequency
14.	Duty Cycle	37.611 %	Op Point	Duty cycle
15.	Efficiency	80.486 %	Op Point	Steady state efficiency
16.	IC Tj	38.879 degC	Op Point	IC junction temperature
17.	ICThetaJA	60.0 degC/W	Op Point	IC junction-to-ambient thermal resistance
18.	IOUT_OP	300.0 mA	Op Point	Iout operating point
19.	Low Freq Gain	61.615 dB	Op Point	Gain at 1Hz
20.	Phase Marg	47.804 deg	Op Point	Bode Plot Phase Margin
21.	VIN_OP	5.5 V	Op Point	Vin operating point
22.	Vout Actual	2.349 V	Op Point	Vout Actual calculated based on selected voltage divider resistors
23.	Vout OP	5.0 V	Op Point	Operational Output Voltage
24.	Vout Tolerance	2.774 %	Op Point	Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable
25.	Vout p-p	98.12 mV	Op Point	Peak-to-peak output ripple voltage
26.	Cin Pd	682.548 μW	Power	Input capacitor power dissipation
27.	Cout Pd	102.343 μW	Power	Output capacitor power dissipation
28.	D1 Pd	112.321 mW	Power	Output Diode Power Dissipation
29.	IC Pd	147.987 mW	Power	IC power dissipation
30.	T1 Pd	100.506 mW	Power	Transformer Power Dissipation

#	Name	Value	Category	Description
31.	Total Pd	363.676 mW	Power	Total Power Dissipation

Design Inputs

#	Name	Value	Description
1.	Iout	300.0 m	Maximum Output Current
2.	VinMax	5.5	Maximum input voltage
3.	VinMin	4.5	Minimum input voltage
4.	Vout	5.0	Output Voltage
5.	base_pn	TPS55010	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	30.0	Ambient temperature

Design Assistance

1. **TPS55010** Product Folder : <http://www.ti.com/product/TPS55010> : contains the data sheet and other resources.

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