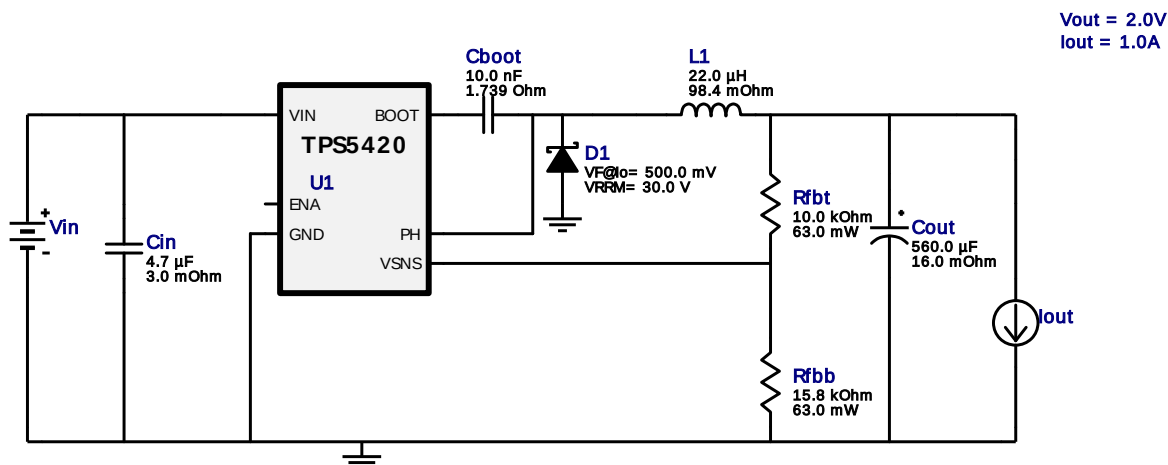


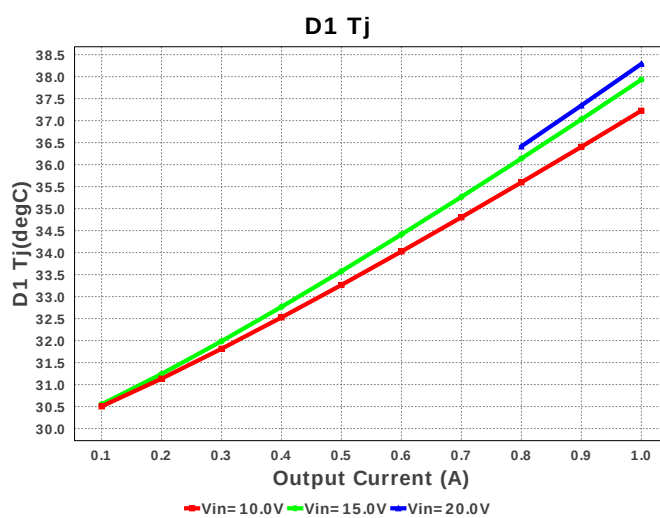
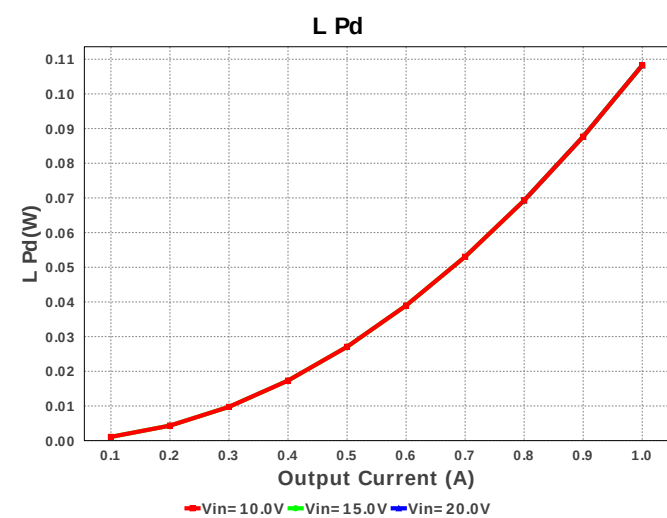
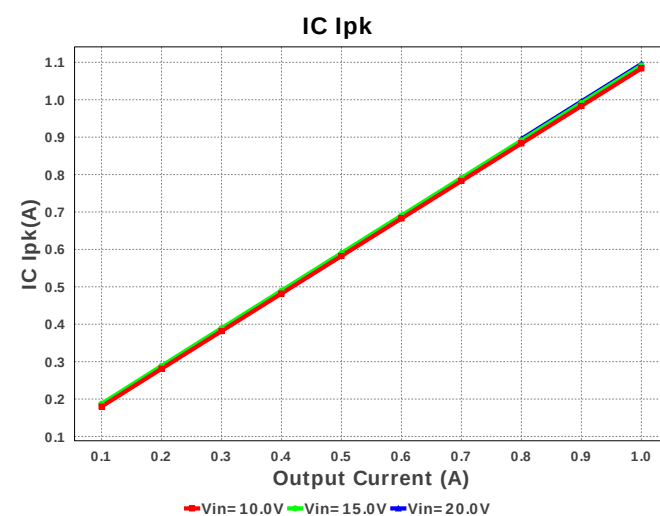
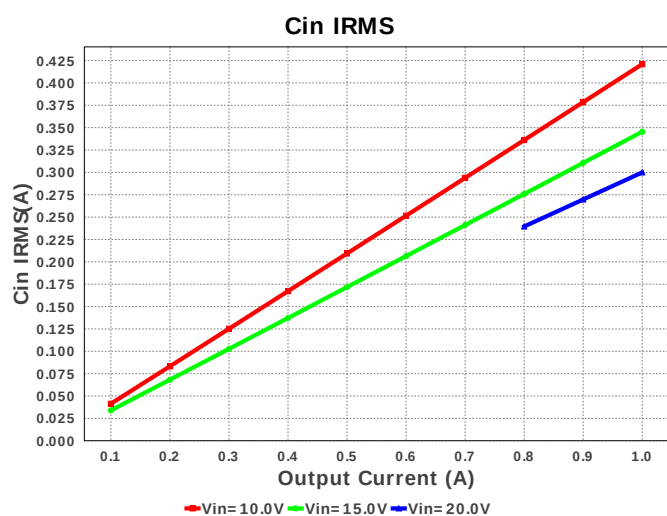
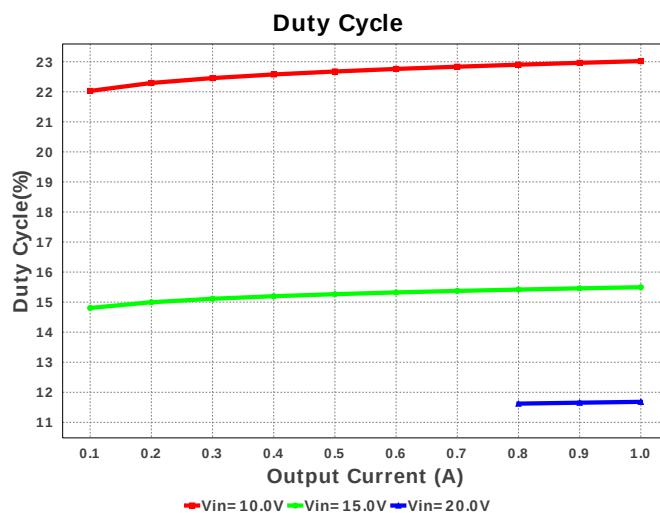
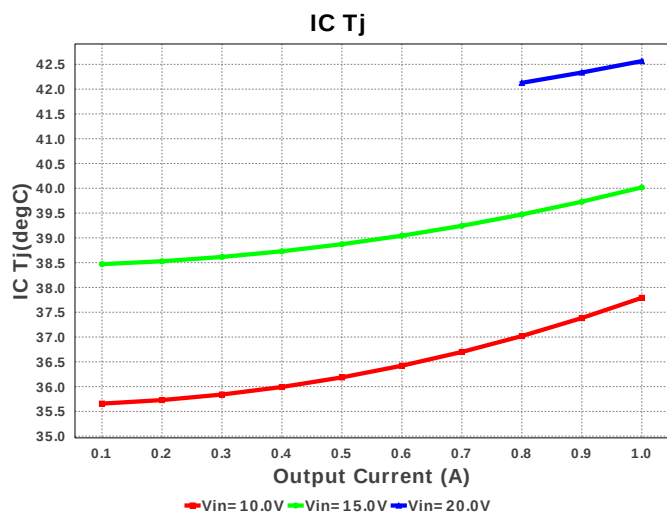
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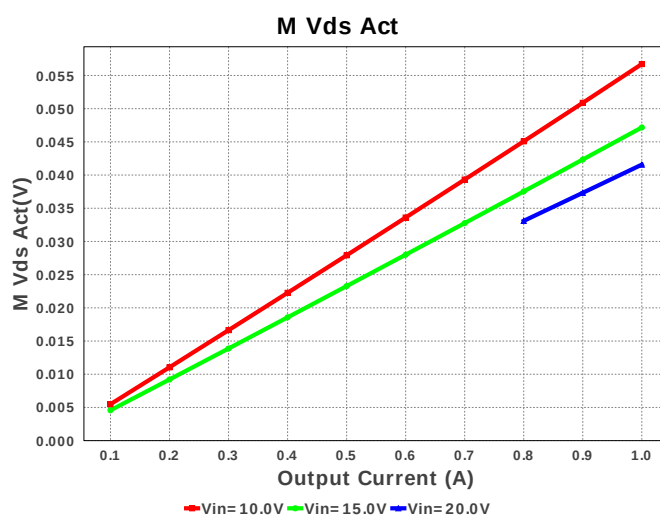
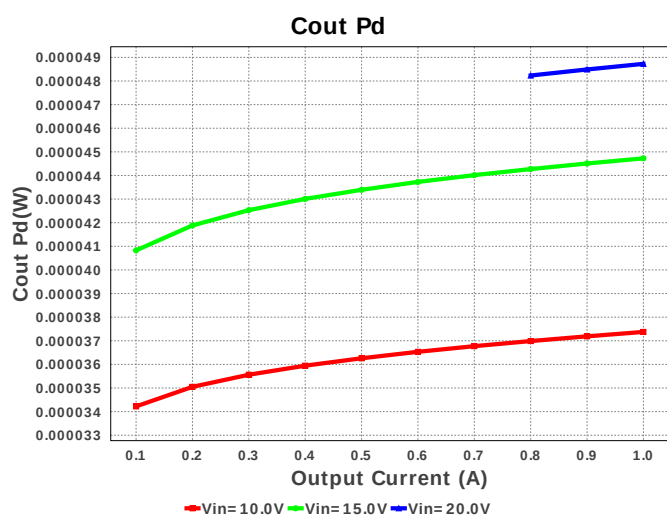
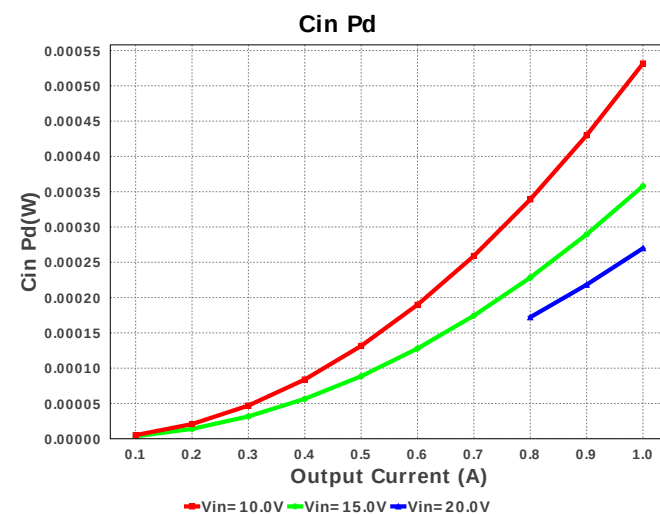
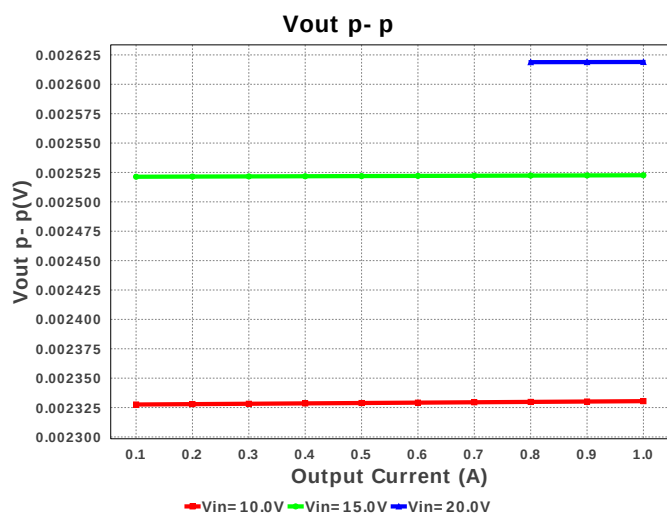
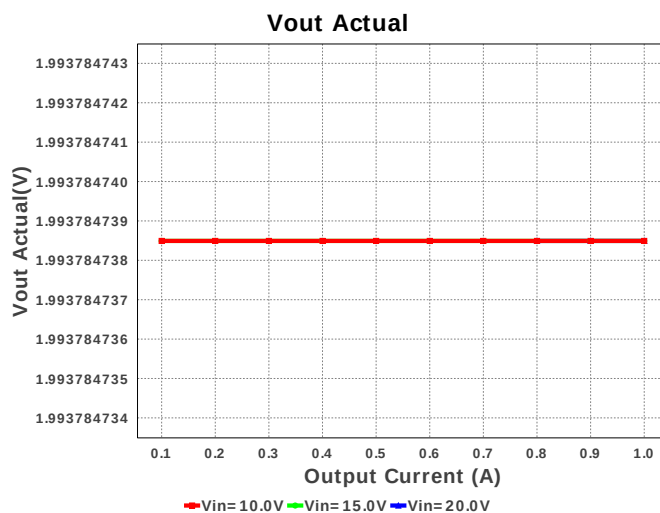
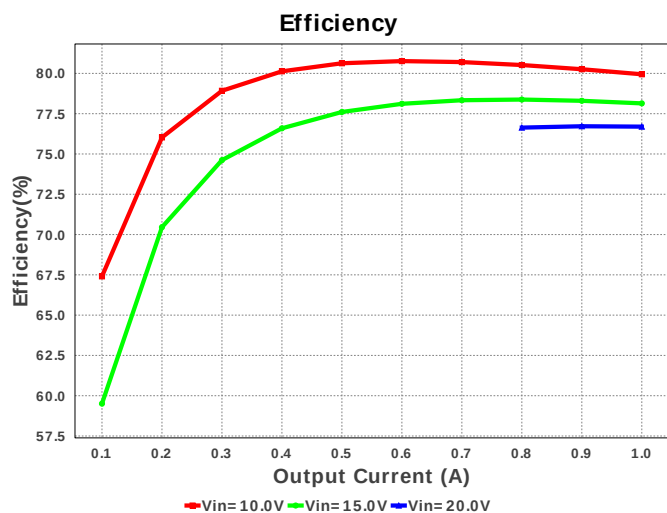
Design : 4728750/14 TPS5420DR
TPS5420DR 10.0V-20.0V to 2.00V @ 1.0A

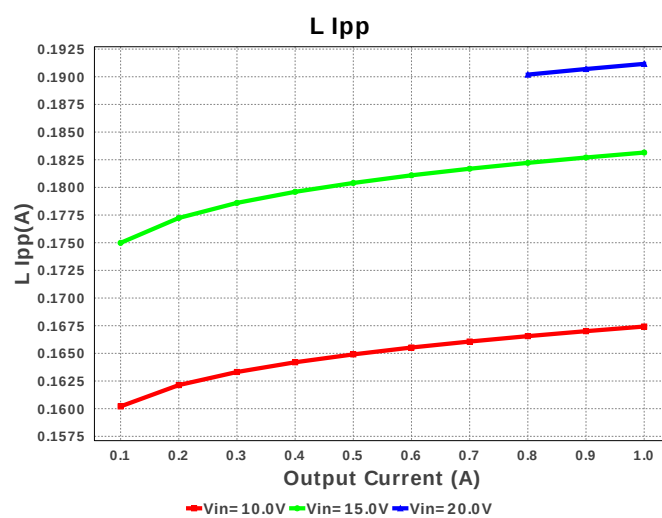
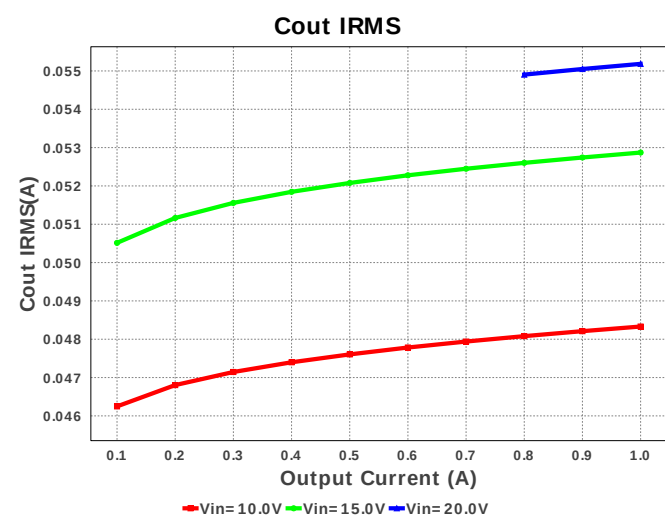
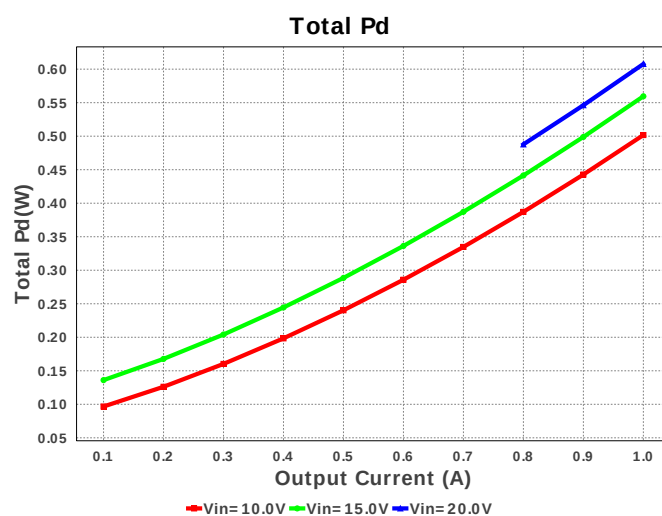
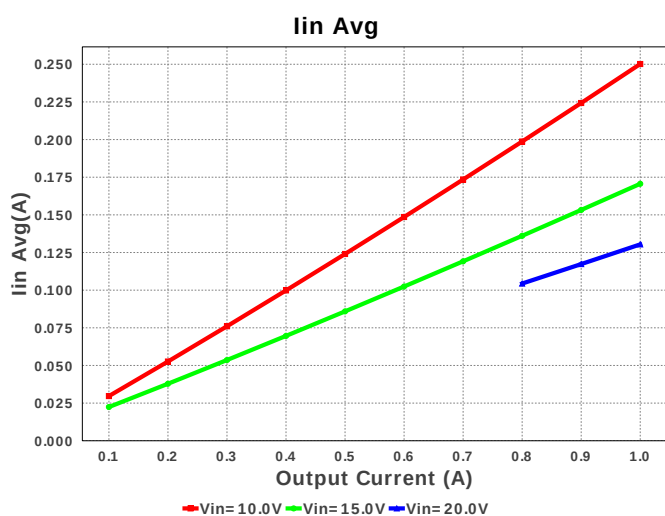
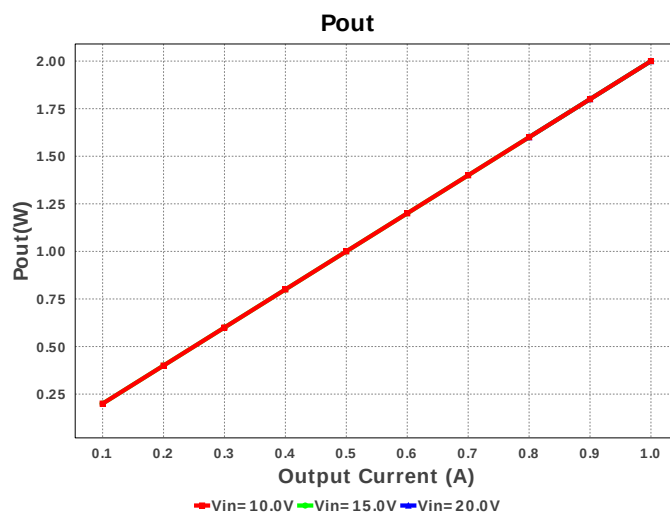
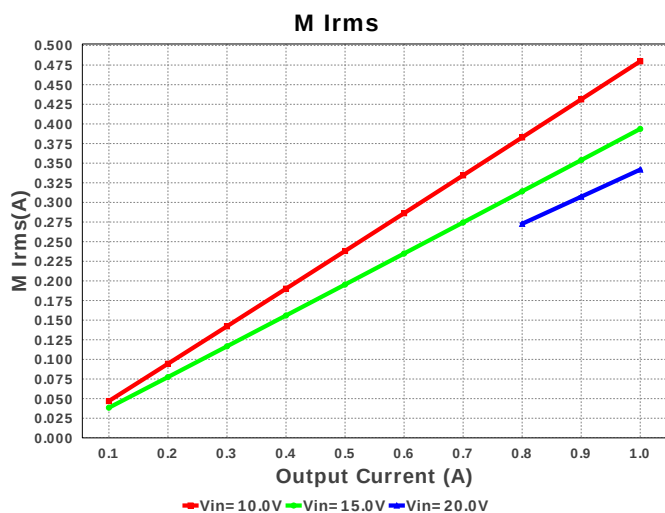


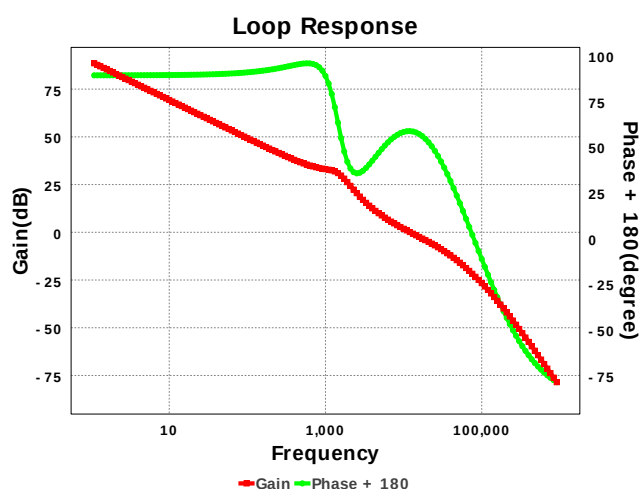
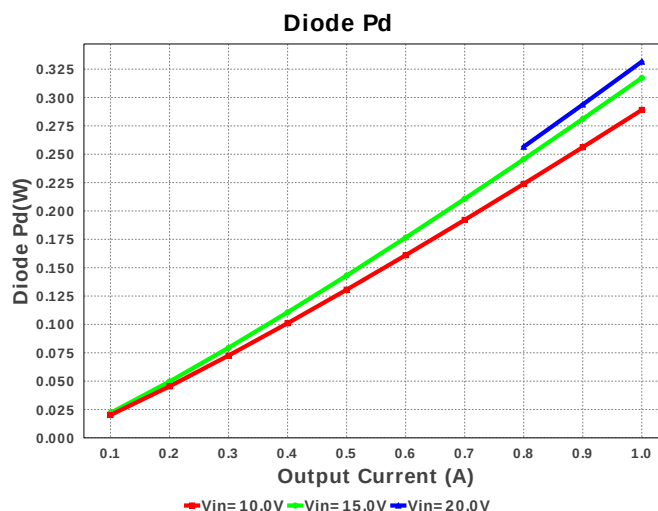
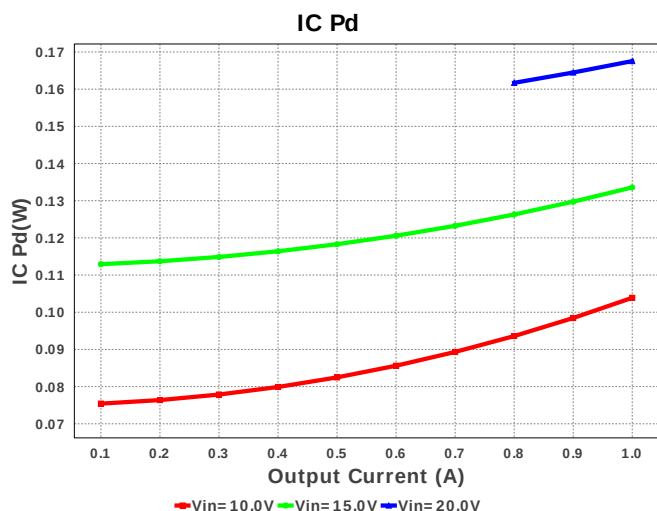
Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cboot	Kemet	C0805C103K5RACTU Series= X7R	Cap= 10.0 nF ESR= 1.739 Ohm VDC= 50.0 V IRMS= 411.0 mA	1	\$0.01	 0805 7 mm ²
2.	Cin	MuRata	GRM31CR71H475KA12L Series= X7R	Cap= 4.7 uF ESR= 3.0 mOhm VDC= 50.0 V IRMS= 4.98 A	1	\$0.07	 1206 11 mm ²
3.	Cout	Panasonic	2R5SVPC560M Series= SVPC	Cap= 560.0 uF ESR= 16.0 mOhm VDC= 2.5 V IRMS= 3.5 A	1	\$0.32	 SM_RADIAL_6.3AMM 80 mm ²
4.	D1	Diodes Inc.	B230A-13-F	VF@Io= 500.0 mV VRRM= 30.0 V	1	\$0.09	 SMA 37 mm ²
5.	L1	TDK	SLF6045T-220M1R1-3PF	L= 22.0 µH DCR= 98.4 mOhm	1	\$0.43	 SLF6045 64 mm ²
6.	Rfbb	Vishay-Dale	CRCW040215K8FKED Series= CRCW..e3	Res= 15.8 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
7.	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
8.	U1	Texas Instruments	TPS5420DR	Switcher	1	\$1.70	 M08A 55 mm ²









Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	299.948 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	55.185 mA	Current	Output capacitor RMS ripple current
3.	IC IpK	1.096 A	Current	Peak switch current in IC
4.	Iin Avg	130.39 mA	Current	Average input current
5.	L Ipp	191.17 mA	Current	Peak-to-peak inductor ripple current
6.	M1 Irms	341.794 mA	Current	Q lavg
7.	BOM Count	8	General	Total Design BOM count
8.	FootPrint	260.0 mm ²	General	Total Foot Print Area of BOM components
9.	Frequency	500.0 kHz	General	Switching frequency
10.	IC Tolerance	18.315 mV	General	IC Feedback Tolerance
11.	M Vds Act	41.569 mV	General	Voltage drop across the MosFET
12.	Pout	2.0 W	General	Total output power
13.	Total BOM	\$2.64	General	Total BOM Cost
14.	D1 Tj	38.29 degC	Op_Point	D1 junction temperature
15.	Vout Actual	1.994 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
16.	Vout OP	2.0 V	Op_Point	Operational Output Voltage
17.	Cross Freq	12.197 kHz	Op_point	Bode plot crossover frequency
18.	Duty Cycle	11.682 %	Op_point	Duty cycle
19.	Efficiency	76.696 %	Op_point	Steady state efficiency
20.	IC Tj	42.566 degC	Op_point	IC junction temperature
21.	ICThetaJA	75.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
22.	IOUT_OP	1.0 A	Op_point	Iout operating point
23.	Phase Marg	59.448 deg	Op_point	Bode Plot Phase Margin
24.	VIN_OP	20.0 V	Op_point	Vin operating point
25.	Vout p-p	3.06 mV	Op_point	Peak-to-peak output ripple voltage
26.	Cin Pd	269.906 μ W	Power	Input capacitor power dissipation
27.	Cout Pd	48.725 μ W	Power	Output capacitor power dissipation
28.	Diode Pd	331.606 mW	Power	Diode power dissipation
29.	IC Pd	167.541 mW	Power	IC power dissipation
30.	L Pd	108.24 mW	Power	Inductor power dissipation
31.	Total Pd	607.722 mW	Power	Total Power Dissipation

#	Name	Value	Category	Description
32.	Vout Tolerance	2.295 %		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	20.0	Maximum input voltage
3.	VinMin	10.0	Minimum input voltage
4.	Vout	2.0	Output Voltage
5.	base_pn	TPS5420	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	30.0	Ambient temperature

Design Assistance

1. Feature Highlights: 2A, 500kHz Fixed Switching Frequency, Internal Compensation
2. **TPS5420** Product Folder : <http://www.ti.com/product/TPS5420> : contains the data sheet and other resources.

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