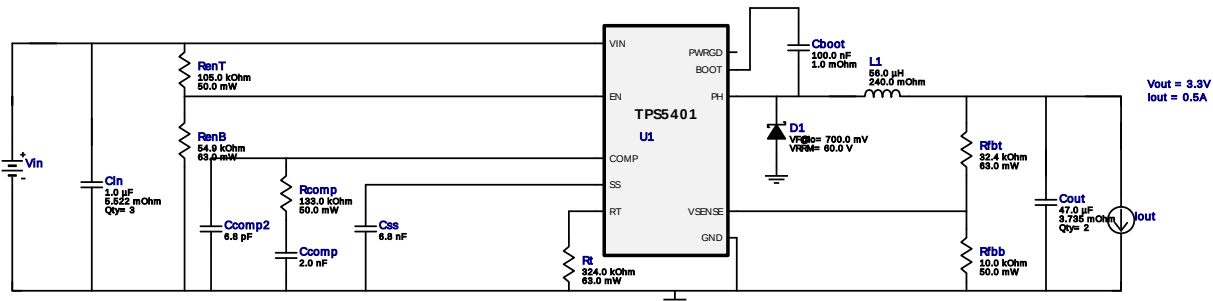


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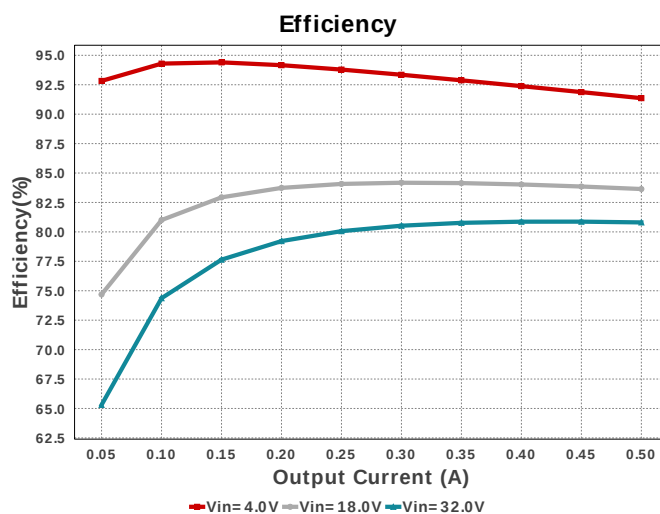
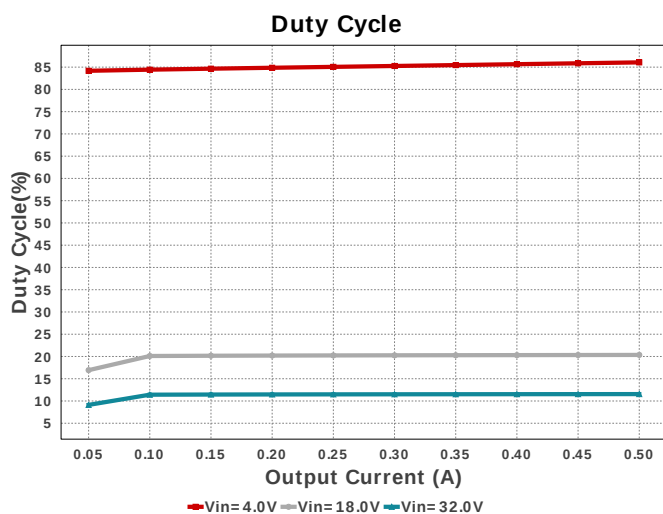
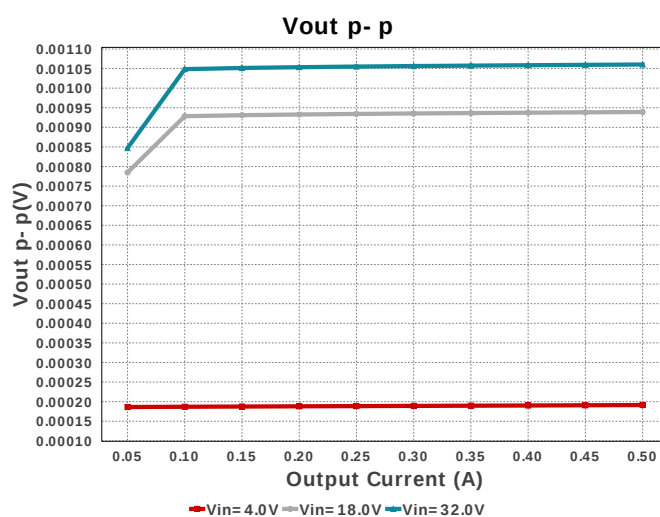
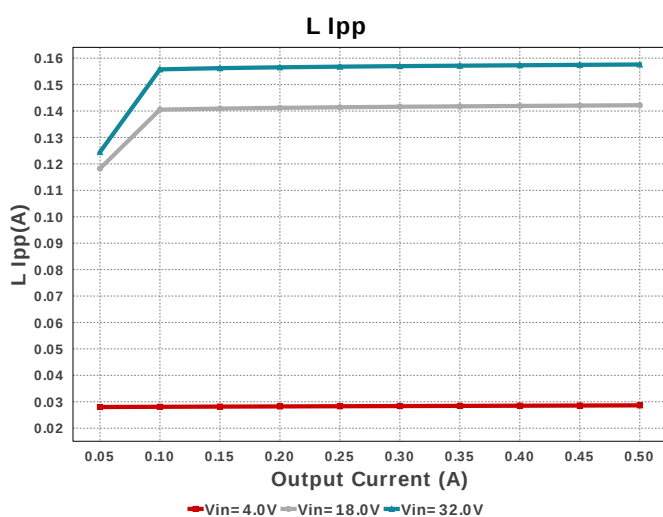
Design : 4730282/21 TPS5401DGQR
TPS5401DGQR 4.0V-32.0V to 3.30V @ 0.5A

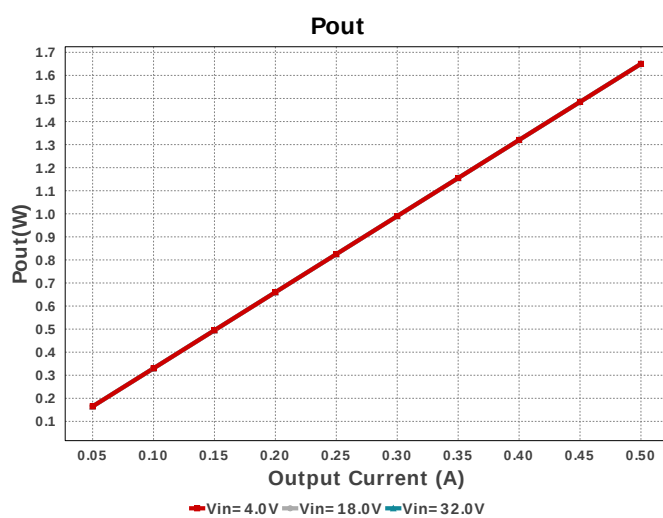
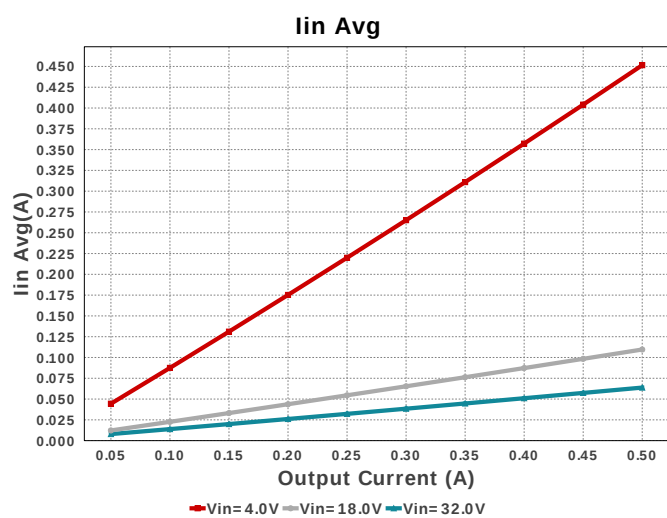
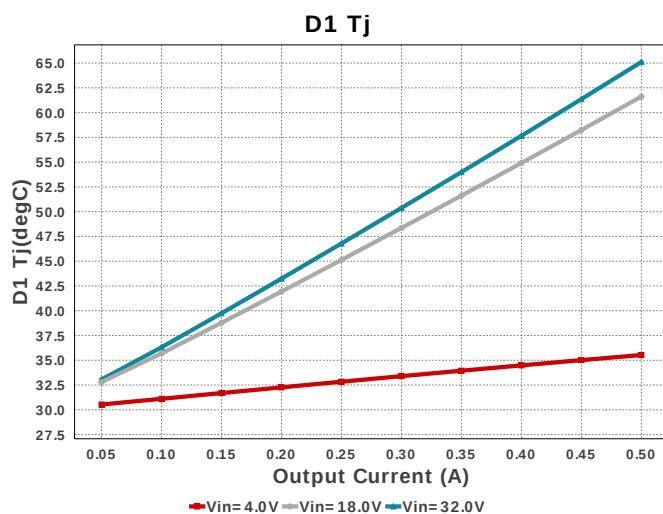
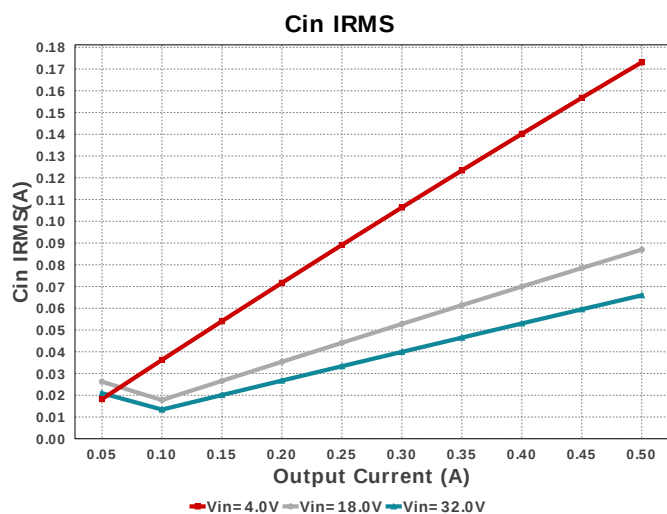
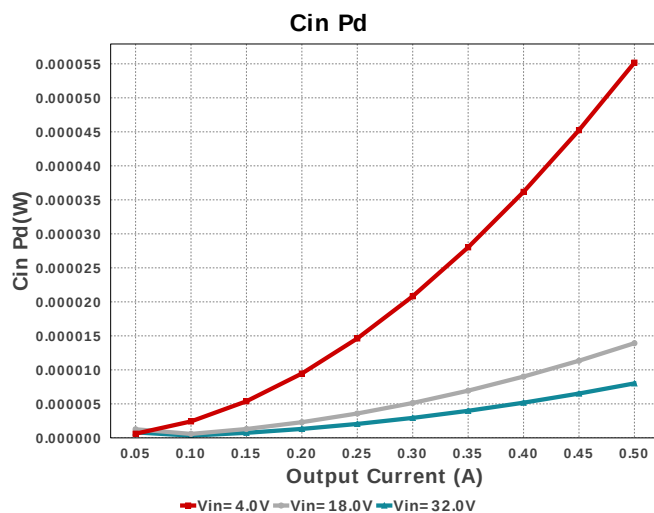
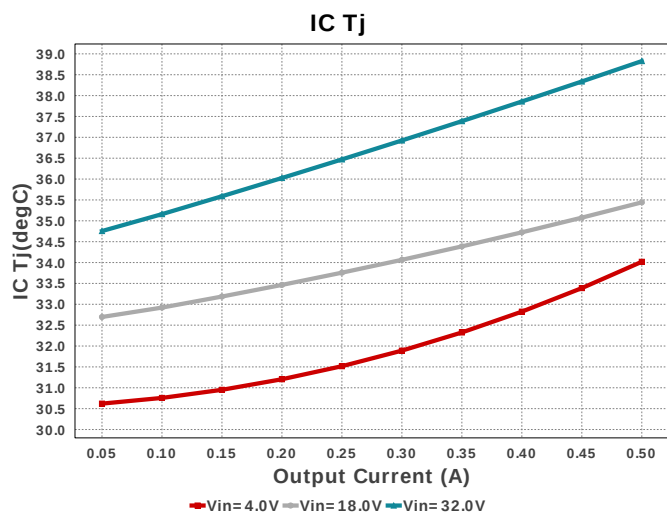


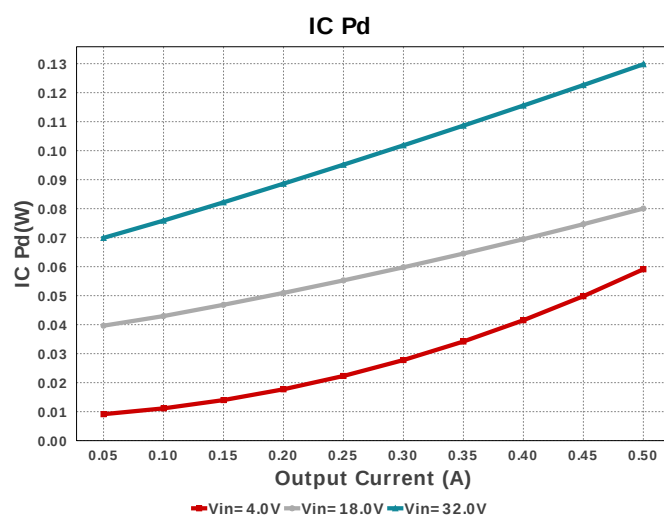
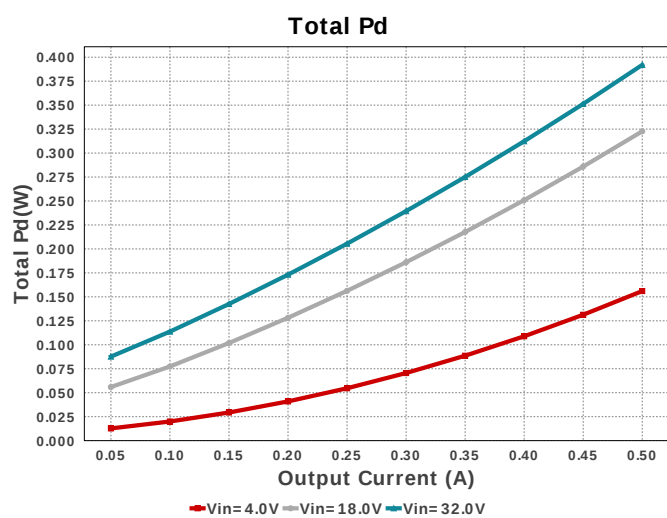
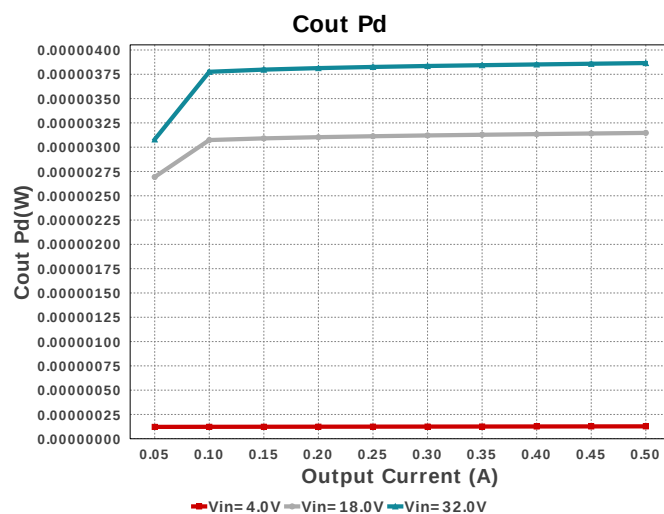
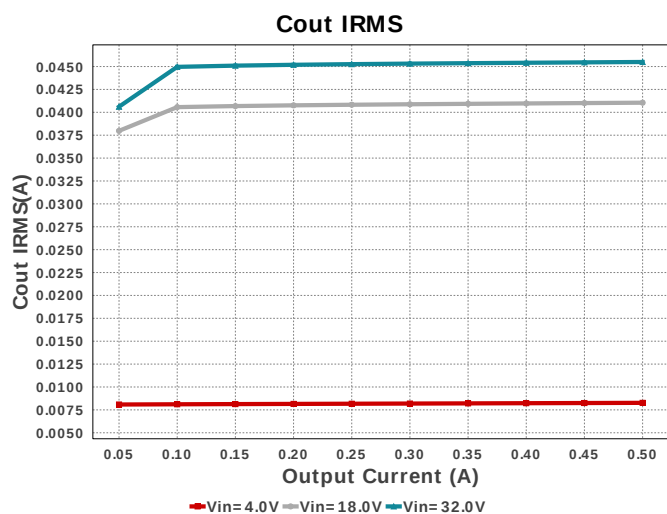
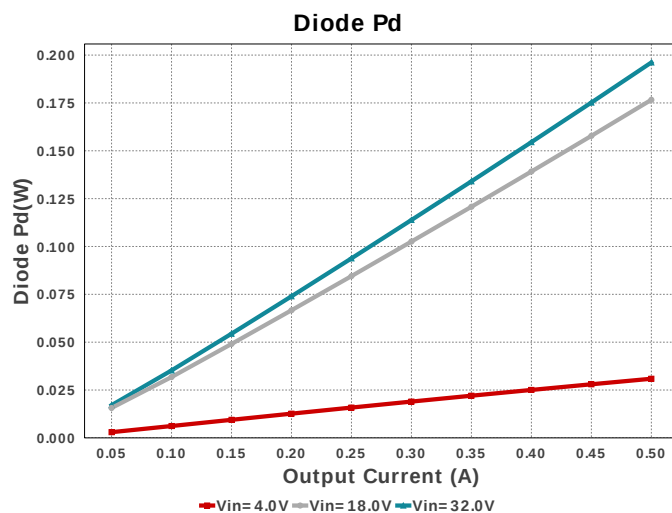
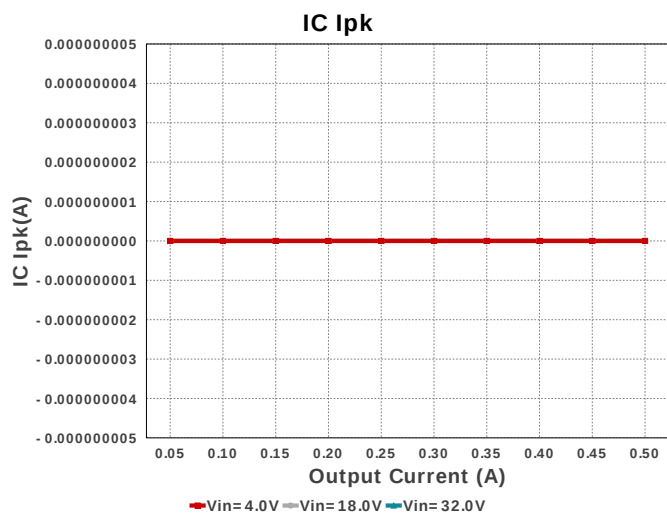
Electrical BOM

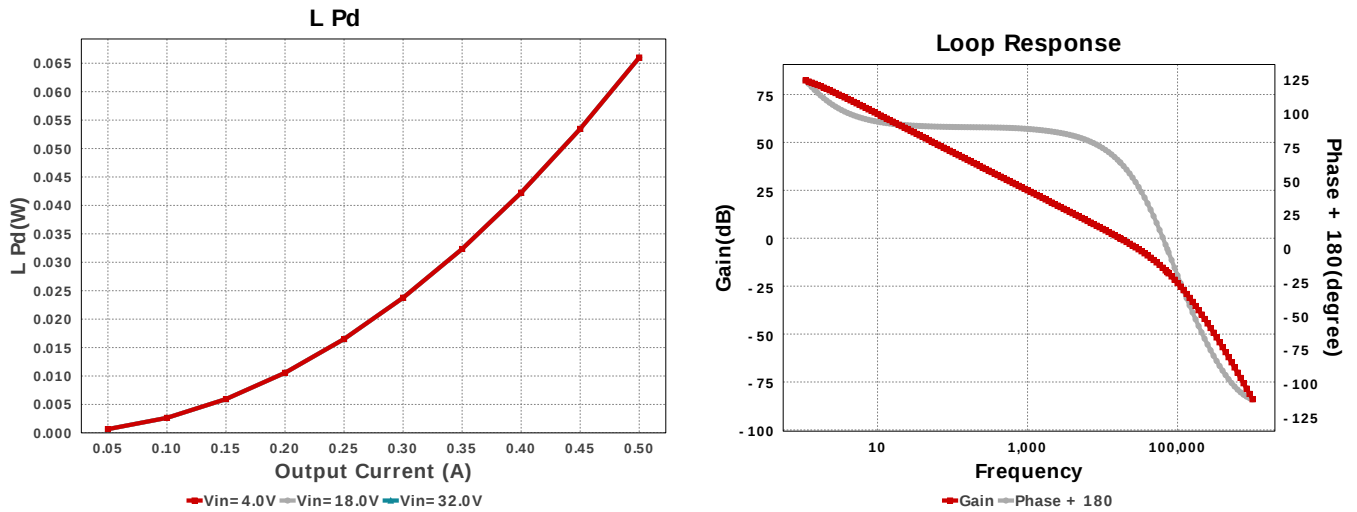
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cboot	MuRata	GRM155R61A104KA01D Series= X5R	Cap= 100.0 nF ESR= 1.0 mOhm VDC= 10.0 V IRMS= 0.0 A	1	\$0.01	 0402 3 mm ²
2.	Ccomp	Kemet	C0805C202J3GACTU Series= C0G/NP0	Cap= 2.0 nF VDC= 5.0 V IRMS= 0.0 A	1	\$0.13	 0805 7 mm ²
3.	Ccomp2	AVX	06031U6R8BAT2A Series= C0G/NP0	Cap= 6.8 pF VDC= 100.0 V IRMS= 0.0 A	1	\$0.07	 0603 5 mm ²
4.	Cin	TDK	C1608X5R1H105K080AB Series= X5R	Cap= 1.0 uF ESR= 5.522 mOhm VDC= 50.0 V IRMS= 2.2162 A	3	\$0.03	 0603 5 mm ²
5.	Cout	MuRata	GRM31CC80J476KE18L Series= X6S	Cap= 47.0 uF ESR= 3.735 mOhm VDC= 6.3 V IRMS= 4.0522 A	2	\$0.12	 1206_190 11 mm ²
6.	Css	TDK	C2012C0G1H682J060AA Series= C0G/NP0	Cap= 6.8 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.05	 0805 7 mm ²
7.	D1	Diodes Inc.	B160-13-F	VF@Io= 700.0 mV VRRM= 60.0 V	1	\$0.06	 SMA 37 mm ²
8.	L1	Bourns	SDR0805-560KL	L= 56.0 uH DCR= 240.0 mOhm	1	\$0.24	 SDR0805 96 mm ²
9.	Rcomp	Yageo America	RC0201FR-07133KL Series= ?	Res= 133.0 kOhm Power= 50.0 mW Tolerance= 1.0%	1	\$0.01	 0201 2 mm ²
10.	RenB	Vishay-Dale	CRCW040254K9FKED Series= CRCW..e3	Res= 54.9 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
11.	RenT	Yageo America	RC0201FR-07105KL Series= ?	Res= 105.0 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	Yageo America	RC0201FR-0710KL Series= ?	Res= 10.0 kOhm Power= 50.0 mW Tolerance= 1.0%	1	\$0.01	0201 2 mm ²
13.	Rfbt	Vishay-Dale	CRCW040232K4FKED Series= CRCW..e3	Res= 32.4 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
14.	Rt	Vishay-Dale	CRCW0402324KFKED Series= CRCW..e3	Res= 324.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
15.	U1	Texas Instruments	TPS5401DGQR	Switcher	1	\$0.70	S-PDSO-G10 24 mm ²









Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	65.968 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	45.497 mA	Current	Output capacitor RMS ripple current
3.	IC IpK	0.0 A	Current	Peak switch current in IC
4.	Iin Avg	63.811 mA	Current	Average input current
5.	L Ipp	157.61 mA	Current	Peak-to-peak inductor ripple current
6.	BOM Count	18	General	Total Design BOM count
7.	FootPrint	229.0 mm ²	General	Total Foot Print Area of BOM components
8.	Frequency	375.624 kHz	General	Switching frequency
9.	Mode	CCM	General	Conduction Mode
10.	Pout	1.65 W	General	Total output power
11.	Total BOM	\$1.65	General	Total BOM Cost
12.	Cross Freq	17.058 kHz	Op Point	Bode plot crossover frequency
13.	D1 Tj	65.11 degC	Op Point	D1 junction temperature
14.	Duty Cycle	11.551 %	Op Point	Duty cycle
15.	Efficiency	80.805 %	Op Point	Steady state efficiency
16.	Gain Marg	-17.707 dB	Op Point	Bode Plot Gain Margin
17.	IC Tj	38.826 degC	Op Point	IC junction temperature
18.	ICThetaJA	68.0 degC/W	Op Point	IC junction-to-ambient thermal resistance
19.	IOUT_OP	500.0 mA	Op Point	Iout operating point
20.	Low Freq Gain	82.337 dB	Op Point	Gain at 1Hz
21.	Phase Marg	64.425 deg	Op Point	Bode Plot Phase Margin
22.	VIN_OP	32.0 V	Op Point	Vin operating point
23.	Vout Actual	3.392 V	Op Point	Vout Actual calculated based on selected voltage divider resistors
24.	Vout OP	3.3 V	Op Point	Operational Output Voltage
25.	Vout Tolerance	1.544 %	Op Point	Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable
26.	Vout p-p	1.06 mV	Op Point	Peak-to-peak output ripple voltage
27.	Cin Pd	8.01 μW	Power	Input capacitor power dissipation
28.	Cout Pd	3.866 μW	Power	Output capacitor power dissipation
29.	Diode Pd	196.148 mW	Power	Diode power dissipation
30.	IC Pd	129.799 mW	Power	IC power dissipation
31.	L Pd	66.0 mW	Power	Inductor power dissipation
32.	Total Pd	391.953 mW	Power	Total Power Dissipation

Design Inputs

#	Name	Value	Description
1.	Iout	500.0 m	Maximum Output Current
2.	VinMax	32.0	Maximum input voltage
3.	VinMin	4.0	Minimum input voltage
4.	Vout	3.3	Output Voltage
5.	base_pn	TPS5401	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	30.0	Ambient temperature

Design Assistance

1. **TPS5401** Product Folder : <http://www.ti.com/product/TPS5401> : contains the data sheet and other resources.

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