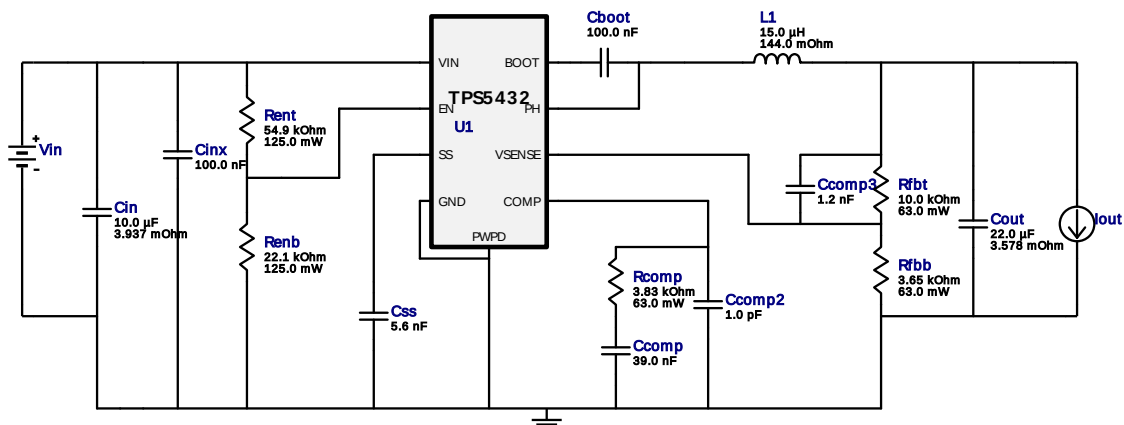


WEBENCH® Design Report

Design : 4742013/164 TPS5432DDAR
TPS5432DDAR 4.5V-5.5V to 3.00V @ 0.5A

Vout = 3.0V
Iout = 0.5A



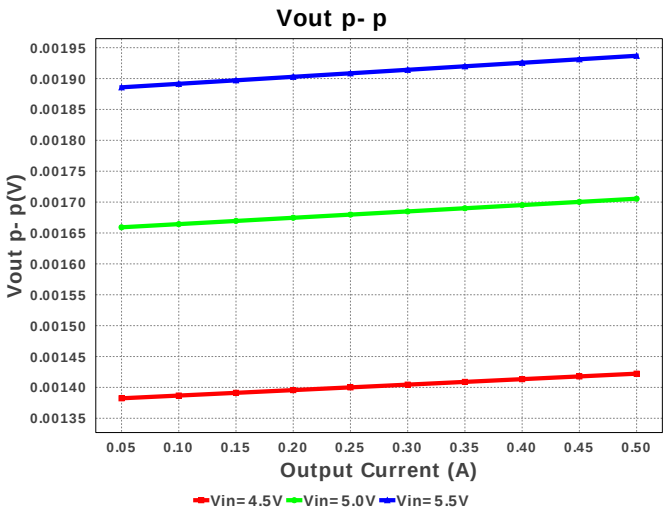
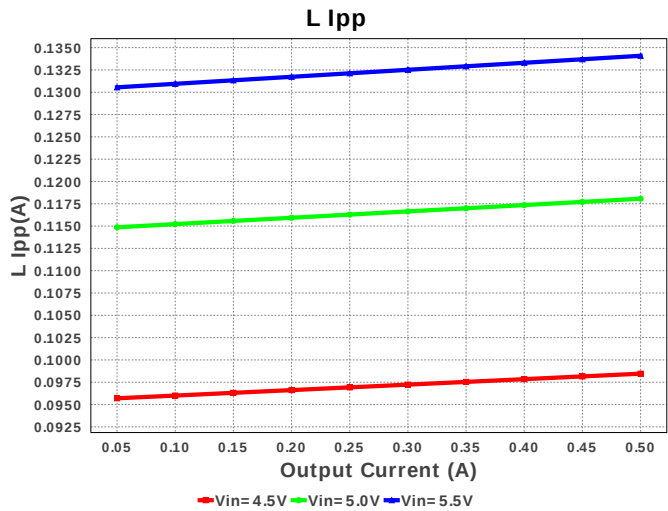
Electrical BOM

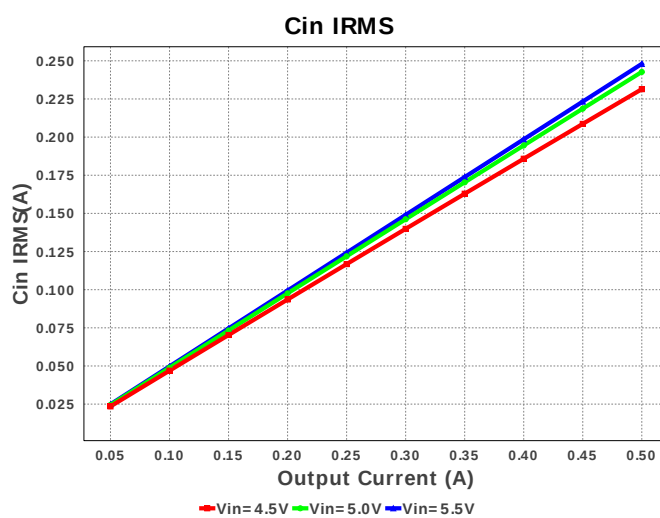
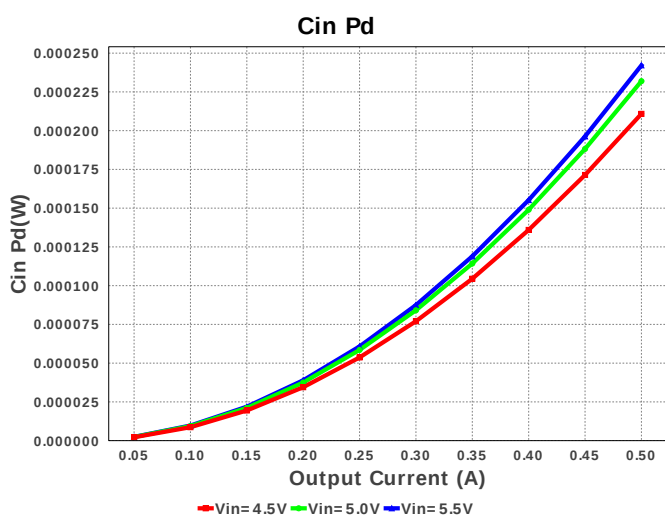
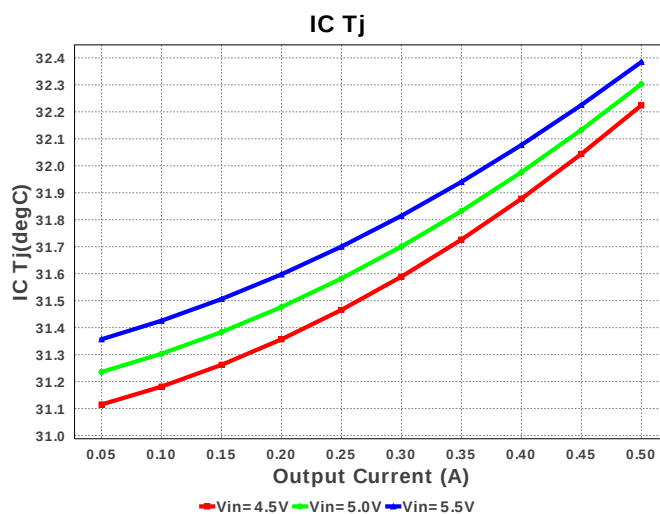
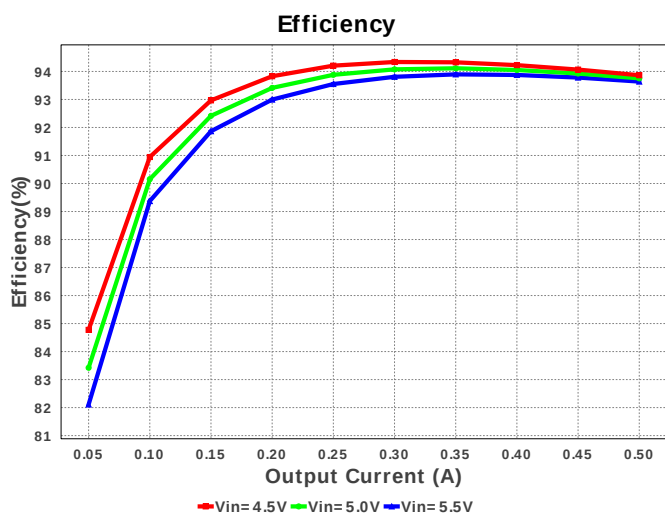
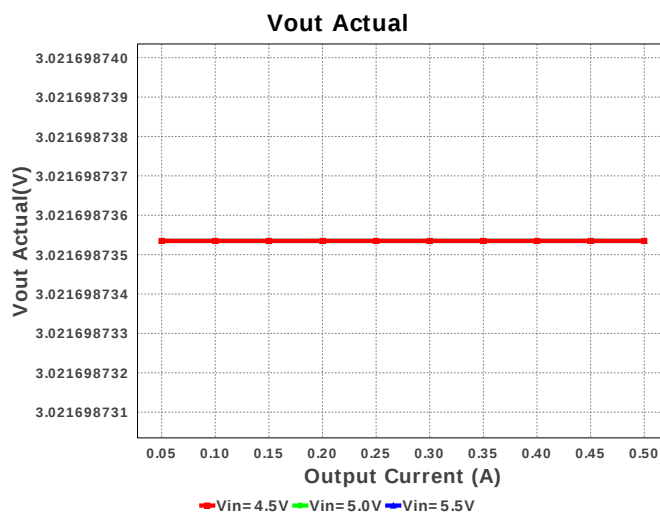
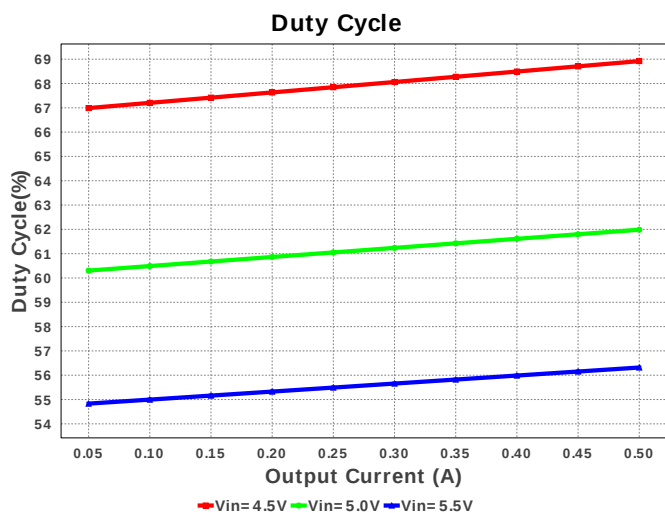
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cboot	MuRata	GRM21BR71E104KA01L Series= X7R	Cap= 100.0 nF VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	0805 7 mm ²
2.	Ccomp	MuRata	GRM155R61A393KA01D Series= X5R	Cap= 39.0 nF VDC= 10.0 V IRMS= 0.0 A	1	\$0.01	0402 3 mm ²
3.	Ccomp2	MuRata	GRM1555C1H1R0CA01D Series= C0G/NP0	Cap= 1.0 pF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	0402 3 mm ²
4.	Ccomp3	MuRata	GRM033R71C122KA01D Series= X7R	Cap= 1.2 nF VDC= 16.0 V IRMS= 0.0 A	1	\$0.01	0201 2 mm ²
5.	Cin	MuRata	GRM219R61A106KE44D Series= X5R	Cap= 10.0 uF ESR= 3.937 mOhm VDC= 10.0 V IRMS= 2.7713 A	1	\$0.03	0805 7 mm ²
6.	Cinx	MuRata	GRM155R60J104KA01D Series= X5R	Cap= 100.0 nF VDC= 6.3 V IRMS= 0.0 A	1	\$0.01	0402 3 mm ²
7.	Cout	MuRata	GRM21BC80G226ME39L Series= X6S	Cap= 22.0 uF ESR= 3.578 mOhm VDC= 4.0 V IRMS= 3.29633 A	1	\$0.04	0805 7 mm ²
8.	Css	Yageo America	CC0805KRX7R9BB562 Series= X7R	Cap= 5.6 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	0805 7 mm ²
9.	L1	Coilcraft	LPS5030-153MRB	L= 15.0 µH DCR= 144.0 mOhm	1	\$0.44	LPS5030 34 mm ²
10.	Rcomp	Vishay-Dale	CRCW04023K83FKED Series= CRCW..e3	Res= 3.83 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²

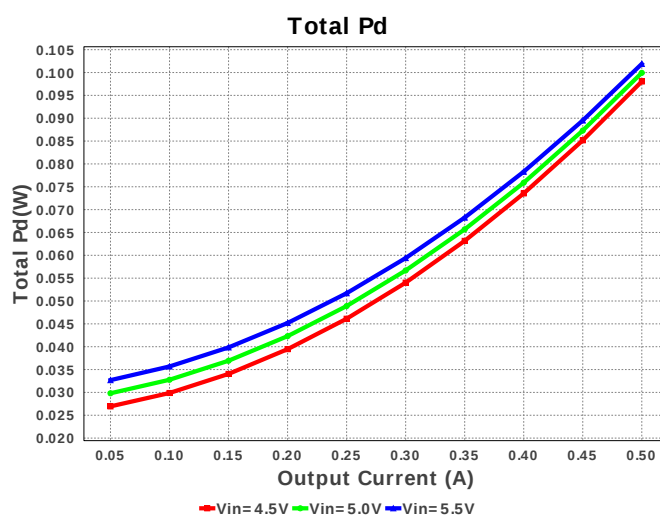
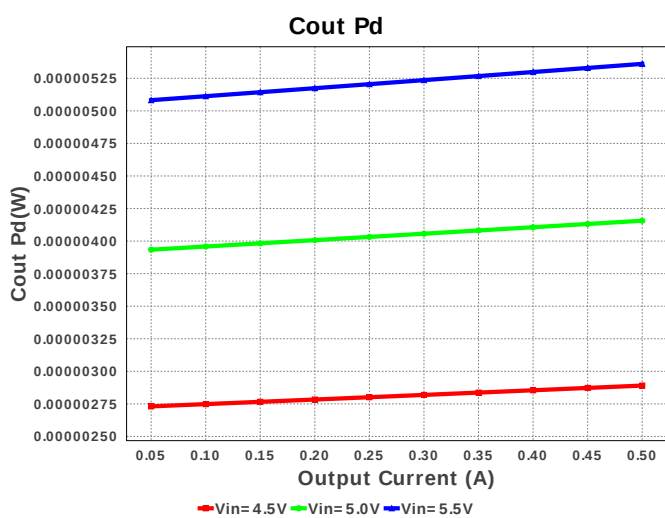
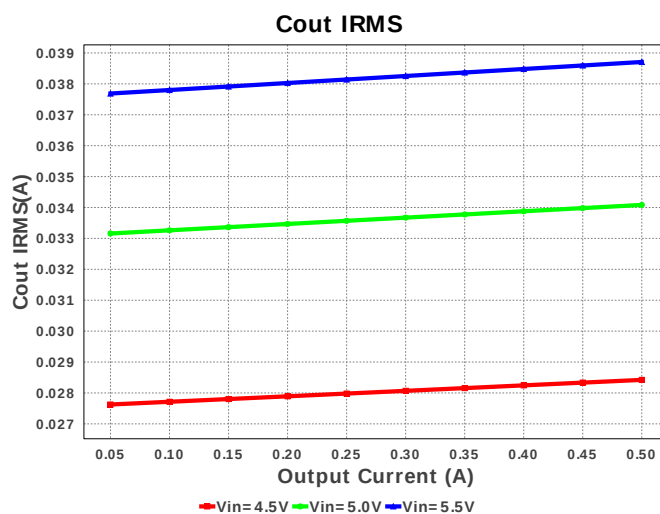
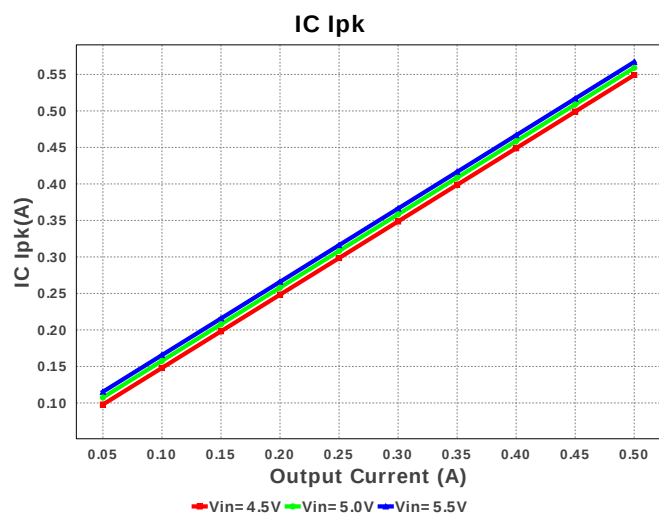
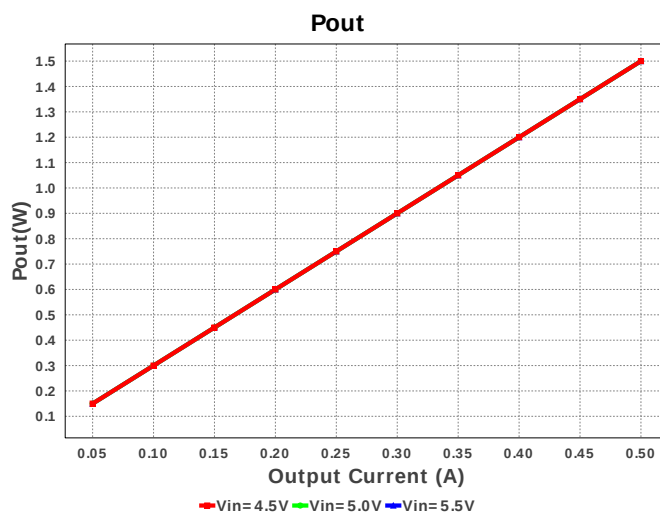
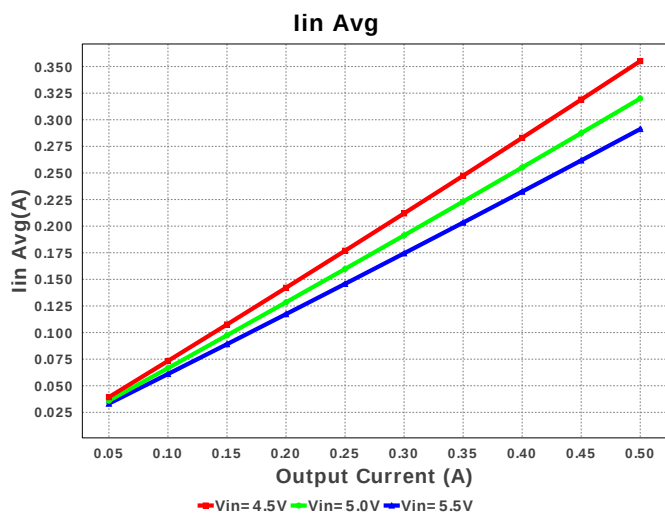
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
11.	Renb	Panasonic	ERJ-6ENF2212V Series= ERJ-6E	Res= 22.1 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7 mm²
12.	Rent	Panasonic	ERJ-6ENF5492V Series= ERJ-6E	Res= 54.9 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7 mm²
13.	Rfbb	Vishay-Dale	CRCW04023K65FKED Series= CRCW..e3	Res= 3.65 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm²
14.	Rfbt	Vishay-Dale	CRCW040210K0FKED Series= CRCW..e3	Res= 10.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm²
15.	U1	Texas Instruments	TPS5432DDAR	Switcher	1	\$1.00	

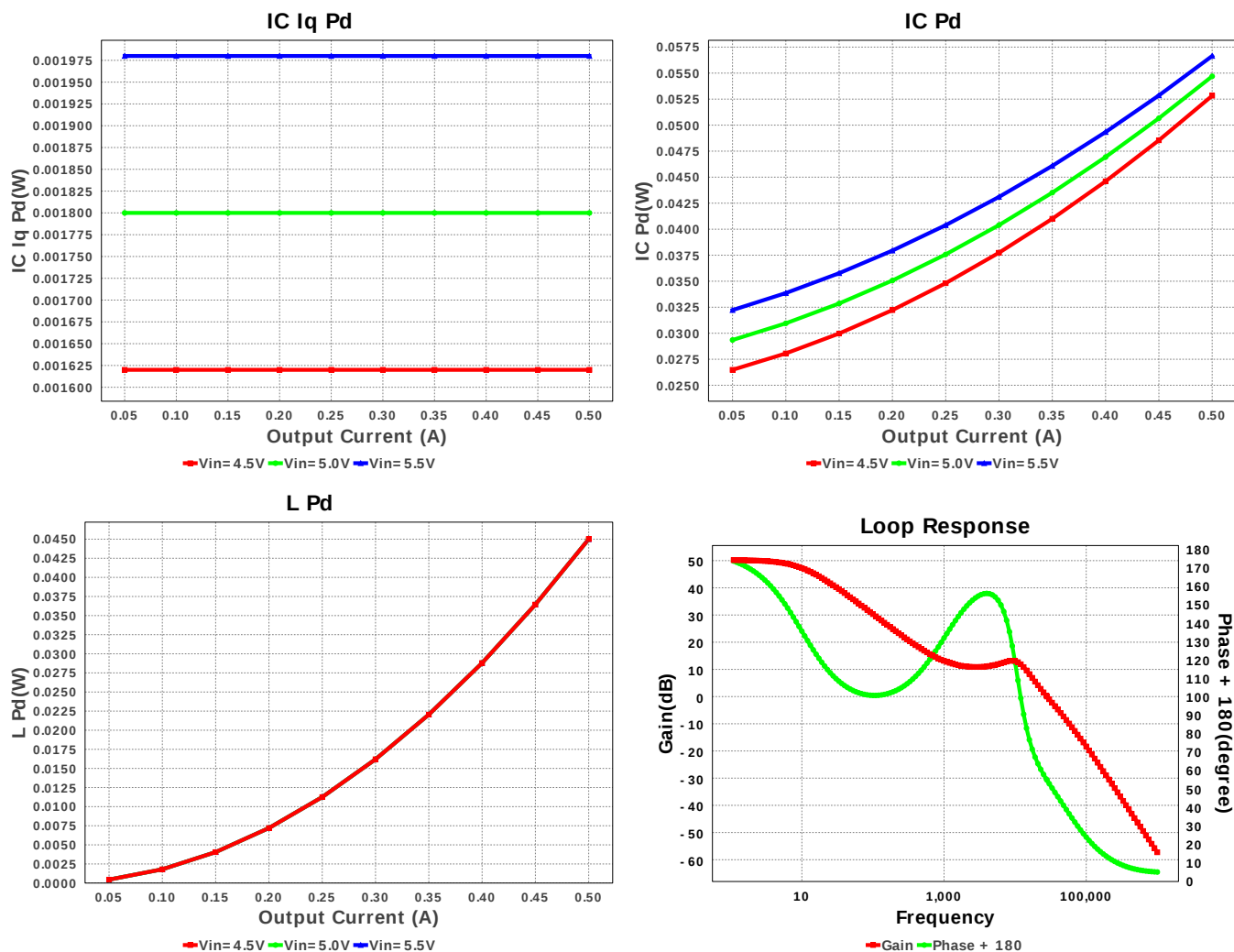


R-PDSO-G8 57 mm²









Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	247.997 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	38.708 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	567.043 mA	Current	Peak switch current in IC
4.	Iin Avg	291.25 mA	Current	Average input current
5.	L Ipp	134.09 mA	Current	Peak-to-peak inductor ripple current
6.	BOM Count	15	General	Total Design BOM count
7.	FootPrint	152.0 mm ²	General	Total Foot Print Area of BOM components
8.	Frequency	700.0 kHz	General	Switching frequency
9.	IC Tolerance	20.0 mV	General	IC Feedback Tolerance
10.	Pout	1.5 W	General	Total output power
11.	Total BOM	\$1.62	General	Total BOM Cost
12.	Low Freq Gain	49.859 dB	Op_Point	Gain at 10Hz
13.	Vout Actual	3.022 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
14.	Vout OP	3.0 V	Op_Point	Operational Output Voltage
15.	Cross Freq	26.9 kHz	Op_point	Bode plot crossover frequency
16.	Duty Cycle	56.317 %	Op_point	Duty cycle
17.	Efficiency	93.639 %	Op_point	Steady state efficiency
18.	Gain Marg	-86.858 dB	Op_point	Bode Plot Gain Margin
19.	IC Tj	32.385 degC	Op_point	IC junction temperature
20.	ICThetaJA	42.1 degC/W	Op_point	IC junction-to-ambient thermal resistance
21.	IOUT_OP	500.0 mA	Op_point	Iout operating point
22.	Phase Marg	55.629 deg	Op_point	Bode Plot Phase Margin
23.	VIN_OP	5.5 V	Op_point	Vin operating point
24.	Vout p-p	1.457 mV	Op_point	Peak-to-peak output ripple voltage
25.	Cin Pd	242.135 μW	Power	Input capacitor power dissipation
26.	Cout Pd	5.361 μW	Power	Output capacitor power dissipation
27.	IC Iq Pd	1.98 mW	Power	IC Iq Pd
28.	IC Pd	56.646 mW	Power	IC power dissipation
29.	L Pd	45.0 mW	Power	Inductor power dissipation
30.	Total Pd	101.895 mW	Power	Total Power Dissipation

#	Name	Value	Category	Description
31.	Vout Tolerance	3.992 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	500.0 m	Maximum Output Current
2.	VinMax	5.5	Maximum input voltage
3.	VinMin	4.5	Minimum input voltage
4.	Vout	3.0	Output Voltage
5.	base_pn	TPS5432	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	30.0	Ambient temperature

Design Assistance

1. **TPS5432** Product Folder : <http://www.ti.com/product/TPS5432> : contains the data sheet and other resources.

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