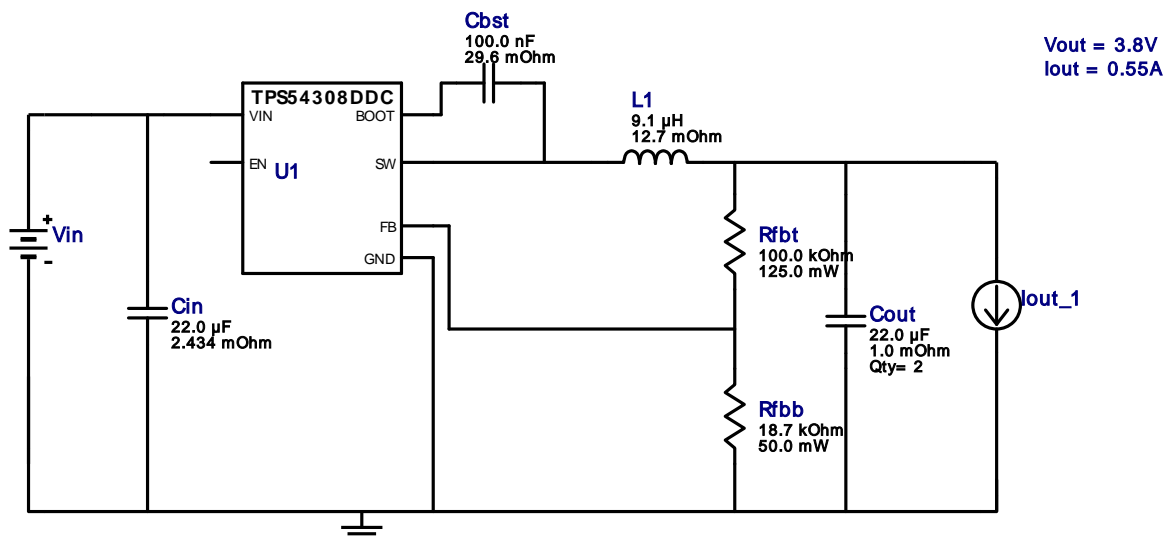


## WEBENCH® Design Report




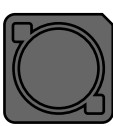


Design : TPS54308DDCR  
TPS54308DDCR 9.0V-12.6V to 3.80V @ 0.55A




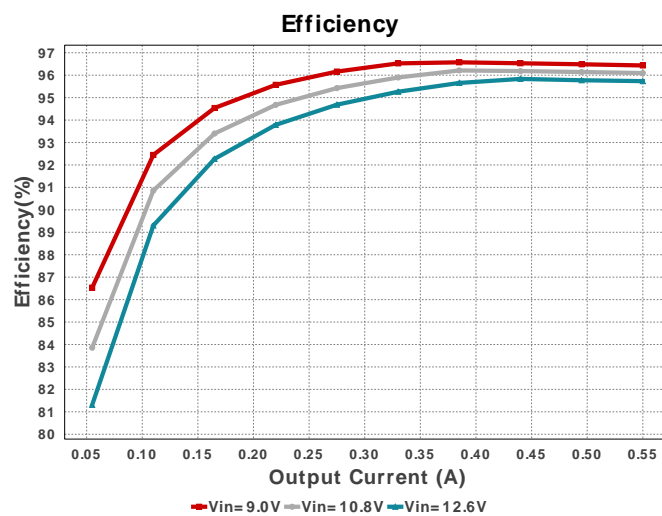
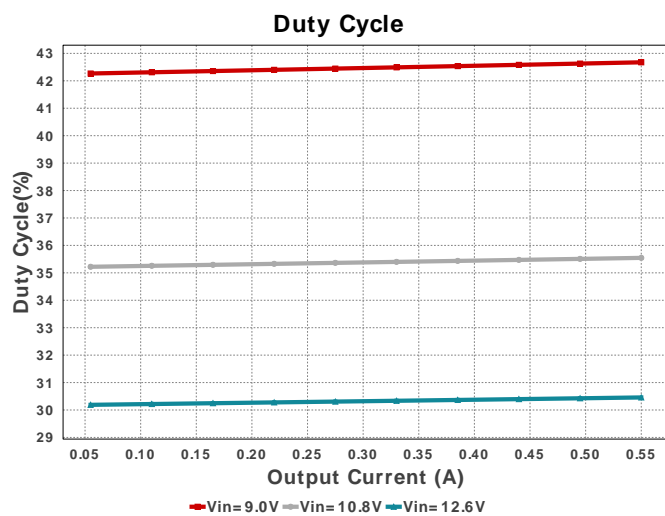
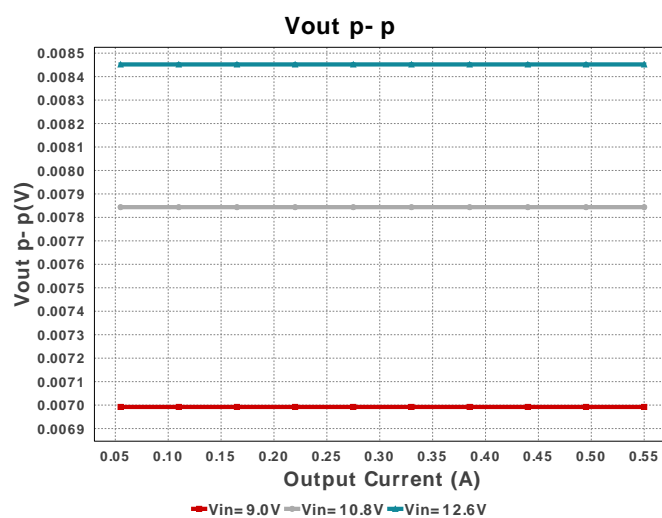
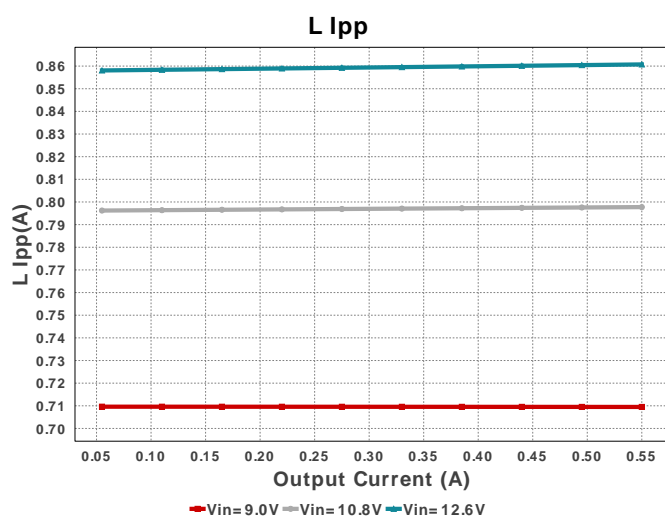
### My Comments

No comments

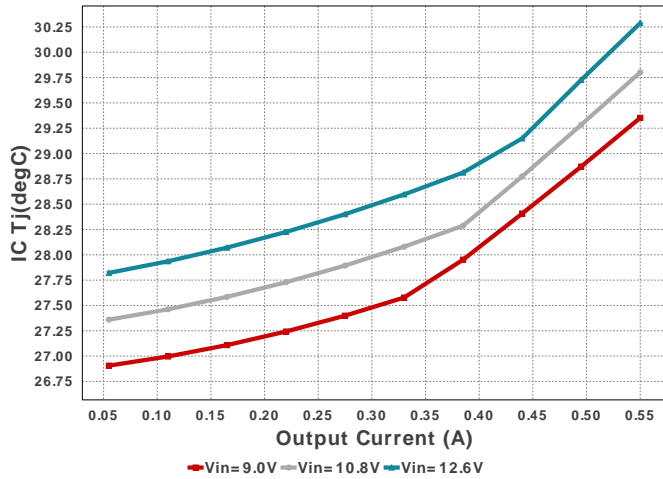
### Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cbst	TDK	CGA3E2X7R1H104K080AA Series= X7R	Cap= 100.0 nF ESR= 29.6 mOhm VDC= 50.0 V IRMS= 971.99 mA	1	\$0.02	 0603 5 mm <sup>2</sup>
2.	Cin	TDK	C4532X7R1E226M250KC Series= X7R	Cap= 22.0 uF ESR= 2.434 mOhm VDC= 25.0 V IRMS= 4.9165 A	1	\$0.47	 1812_280 23 mm <sup>2</sup>
3.	Cout	AVX	12103D226MAT2A Series= X5R	Cap= 22.0 uF ESR= 1.0 mOhm VDC= 25.0 V IRMS= 0.0 A	2	\$0.26	 1210 15 mm <sup>2</sup>
4.	L1	Würth Elektronik	7447798910	L= 9.1 µH DCR= 12.7 mOhm	1	\$2.23	 WE-PDF-1045 149 mm <sup>2</sup>
5.	Rfbb	Yageo	RC0201FR-0718K7L Series= ?	Res= 18.7 kOhm Power= 50.0 mW Tolerance= 1.0%	1	\$0.01	 0201 2 mm <sup>2</sup>
6.	Rfbs	Panasonic	ERJ-6ENF1003V Series= ERJ-6E	Res= 100.0 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7 mm <sup>2</sup>

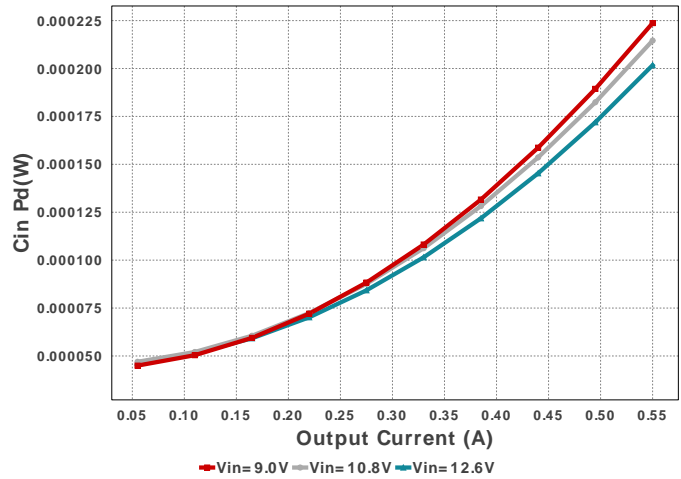
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
7.	U1	Texas Instruments	TPS54308DDCR	Switcher	1	\$0.60	 DDC0006A_N 10 mm <sup>2</sup>



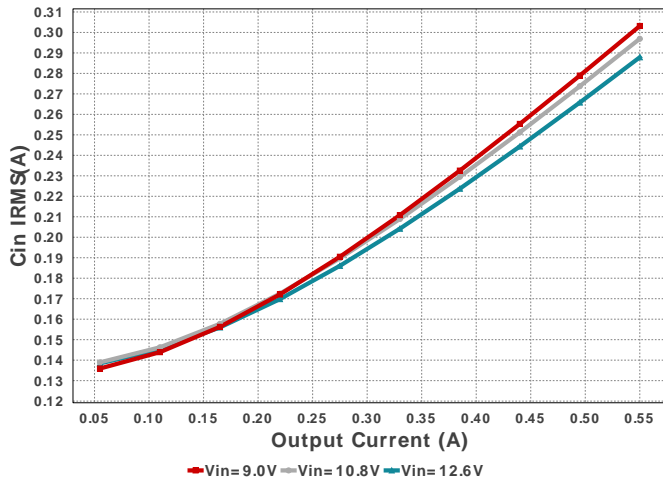
IC Tj



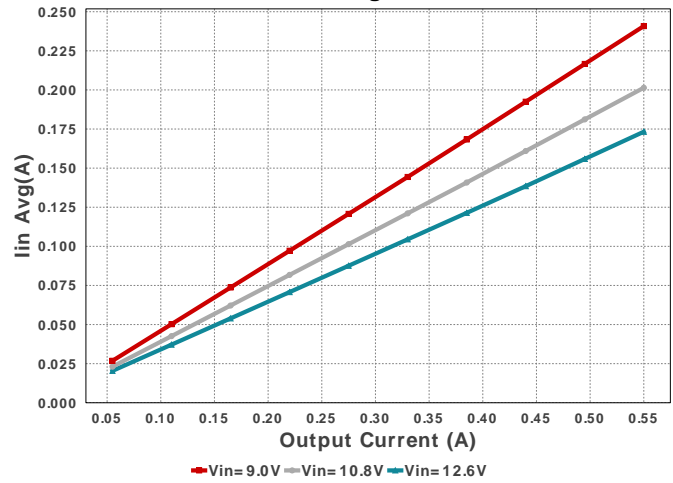
Cin Pd



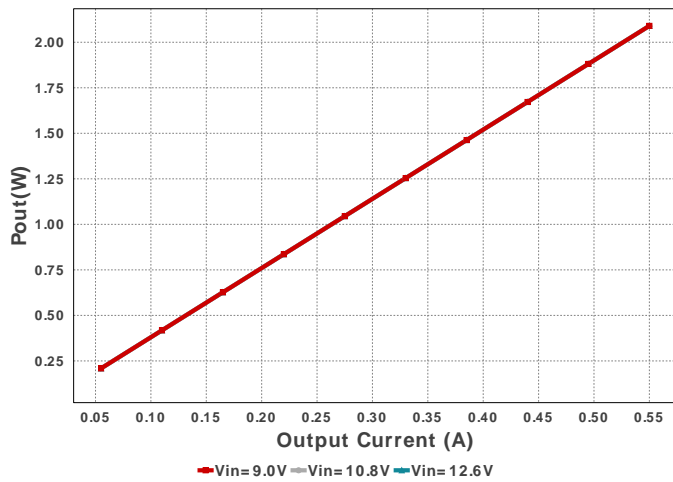
Cin IRMS



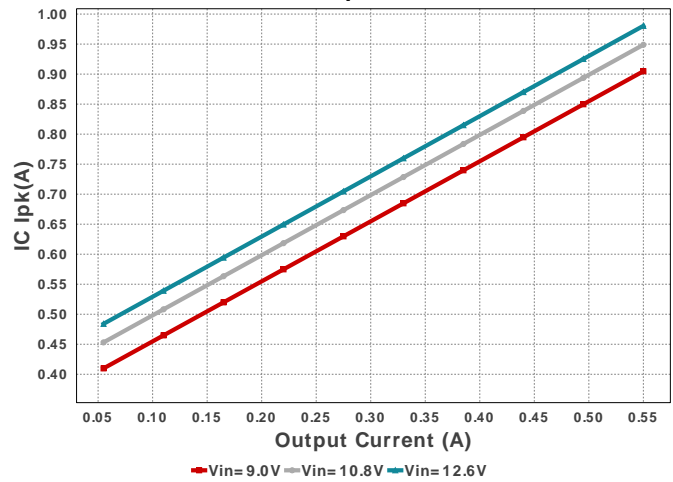
Iin Avg

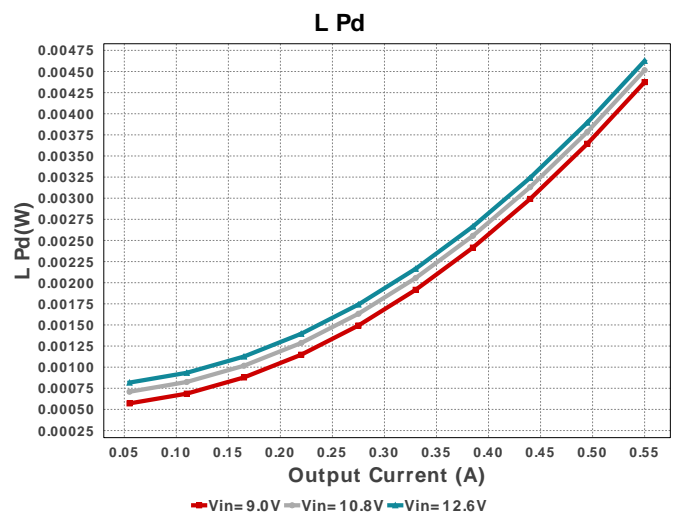
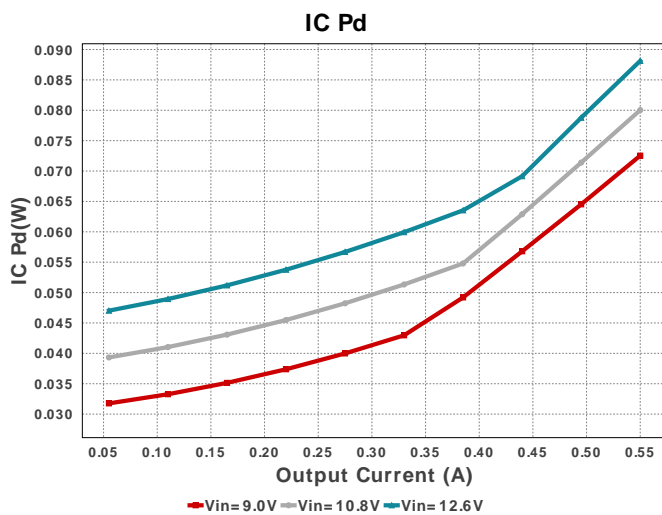
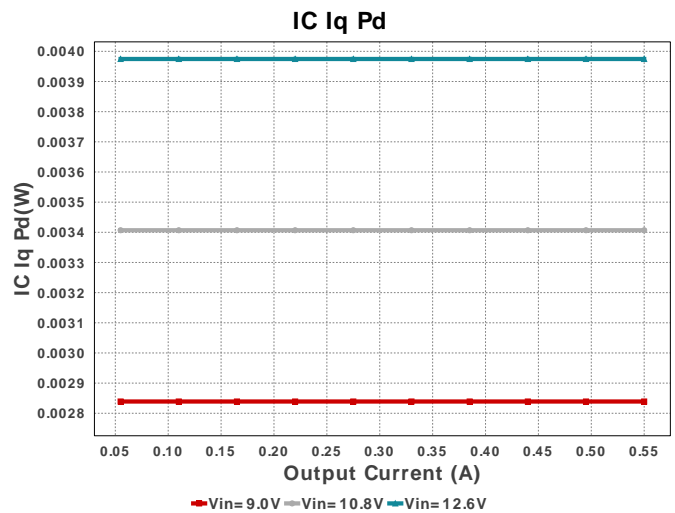
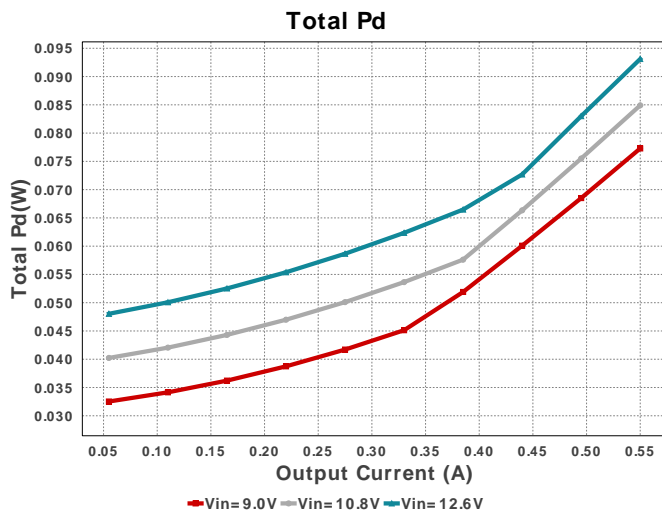
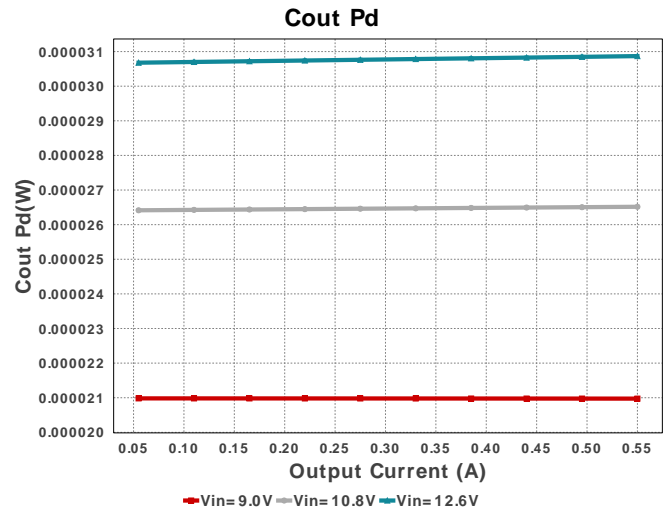
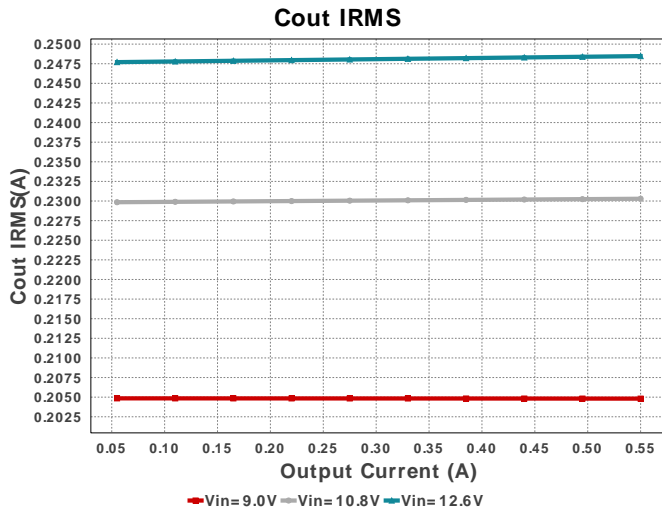


Pout



IC Ipk





## Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	287.882 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	248.472 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	980.367 mA	Current	Peak switch current in IC
4.	Iin Avg	173.26 mA	Current	Average input current
5.	L Ipp	860.73 mA	Current	Peak-to-peak inductor ripple current
6.	BOM Count	8	General	Total Design BOM count
7.	FootPrint	225.0 mm <sup>2</sup>	General	Total Foot Print Area of BOM components
8.	Frequency	340.0 kHz	General	Switching frequency
9.	Mode	CCM	General	PWM/PFM Mode
10.	Pout	2.09 W	General	Total output power
11.	Total BOM	\$3.86	General	Total BOM Cost

#	Name	Value	Category	Description
12.	Duty Cycle	30.458 %	Op Point	Duty cycle
13.	Efficiency	95.735 %	Op Point	Steady state efficiency
14.	IC Tj	30.288 degC	Op Point	IC junction temperature
15.	ICThetaJA Effective	60.0 degC/W	Op Point	Effective IC Junction-to-Ambient Thermal Resistance
16.	IOUT_OP	550.0 mA	Op Point	Iout operating point
17.	VIN_OP	12.6 V	Op Point	Vin operating point
18.	Vout Actual	3.783 V	Op Point	Vout Actual calculated based on selected voltage divider resistors
19.	Vout Tolerance	1.702 %	Op Point	Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable
20.	Vout p-p	8.452 mV	Op Point	Peak-to-peak output ripple voltage
21.	Cin Pd	201.721 $\mu$ W	Power	Input capacitor power dissipation
22.	Cout Pd	30.869 $\mu$ W	Power	Output capacitor power dissipation
23.	IC Iq Pd	3.975 mW	Power	IC Iq Pd
24.	IC Pd	88.131 mW	Power	IC power dissipation
25.	L Pd	4.626 mW	Power	Inductor power dissipation
26.	Total Pd	93.108 mW	Power	Total Power Dissipation

## Design Inputs

#	Name	Value	Description
1.	Iout	550.0 m	Maximum Output Current
2.	VinMax	12.6	Maximum input voltage
3.	VinMin	9.0	Minimum input voltage
4.	Vout	3.8	Output Voltage
5.	base_pn	TPS54308	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	25.0	Ambient temperature

## Design Assistance

1. **TPS54308** Product Folder : <http://www.ti.com/product/TPS54308> : contains the data sheet and other resources.

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