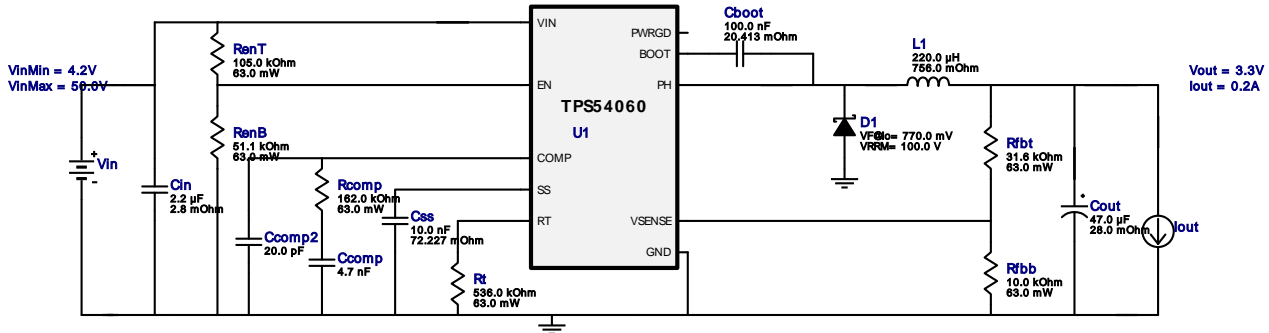

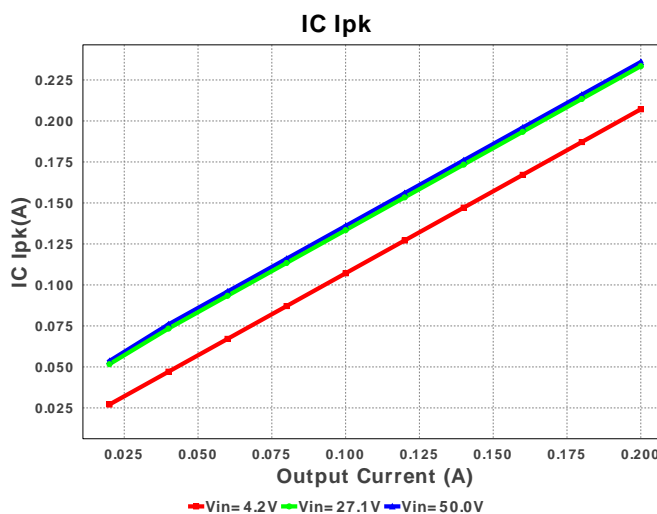
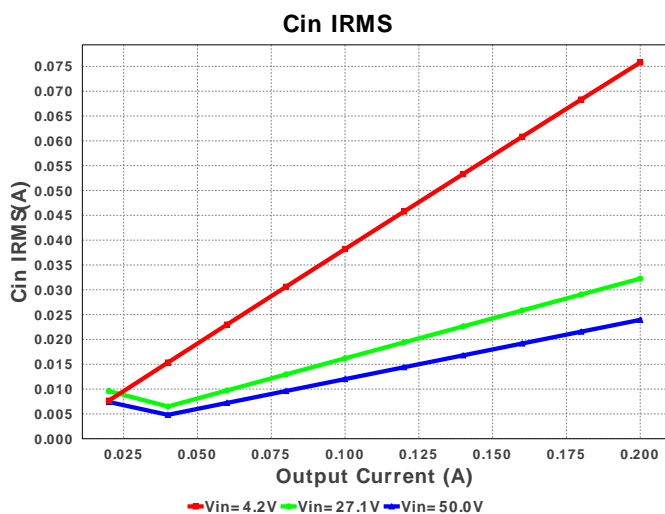
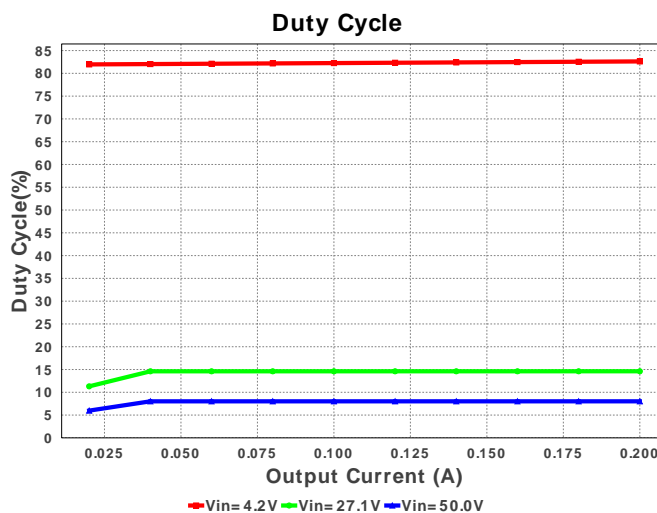
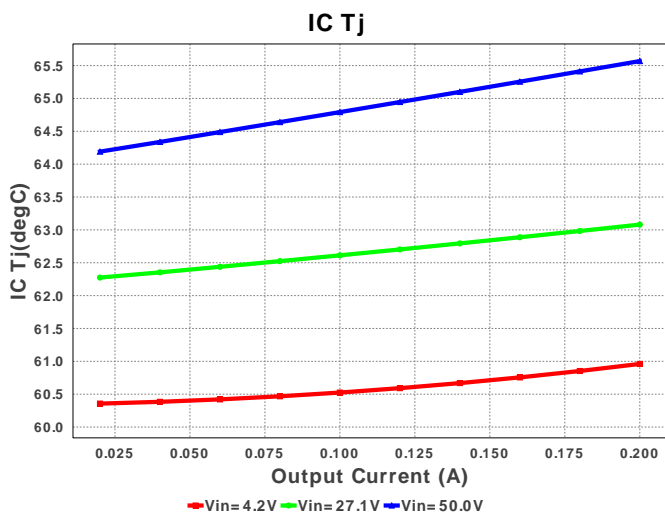


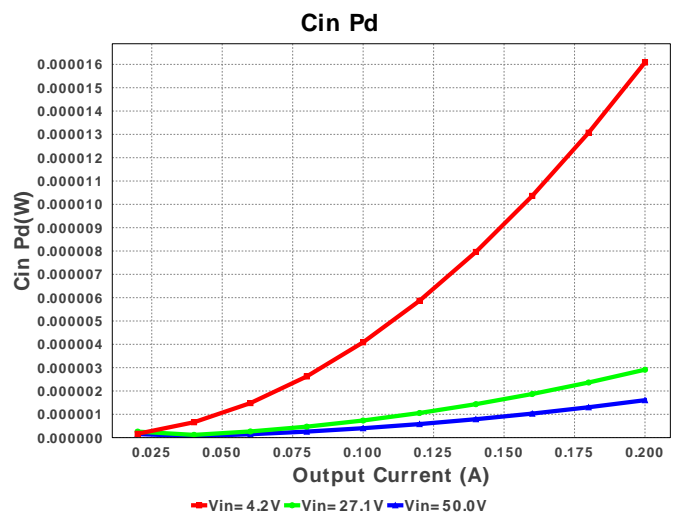
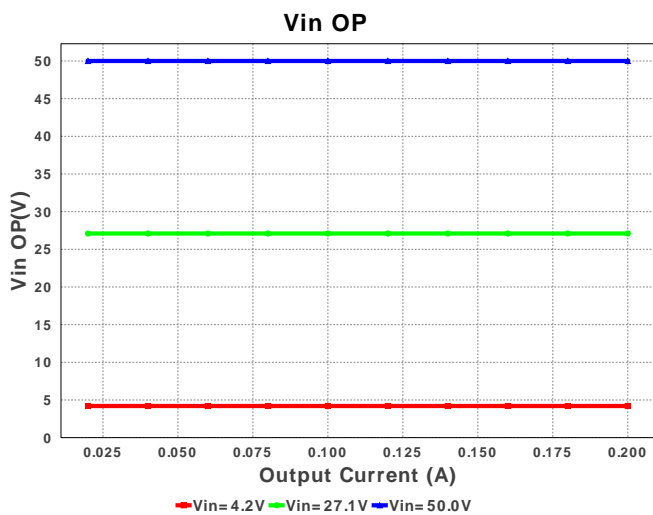
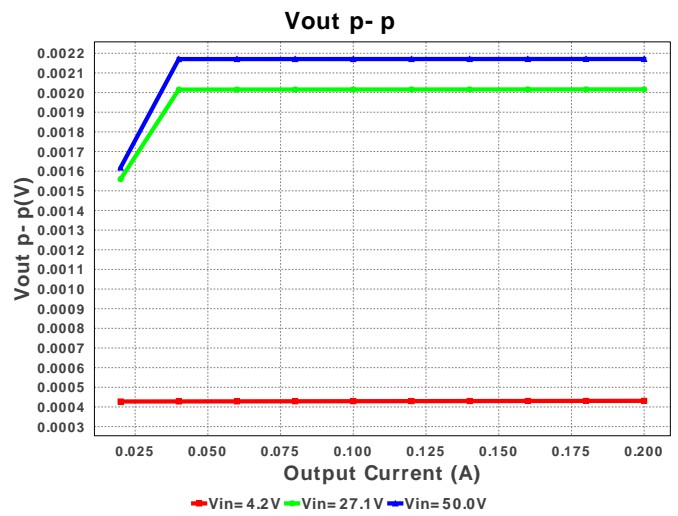
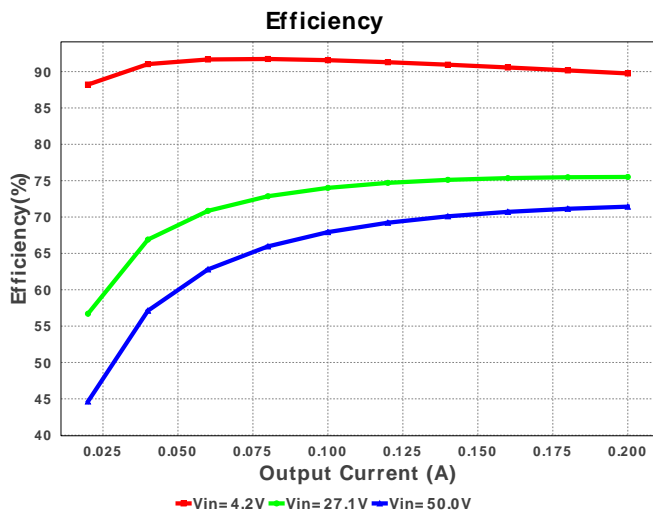
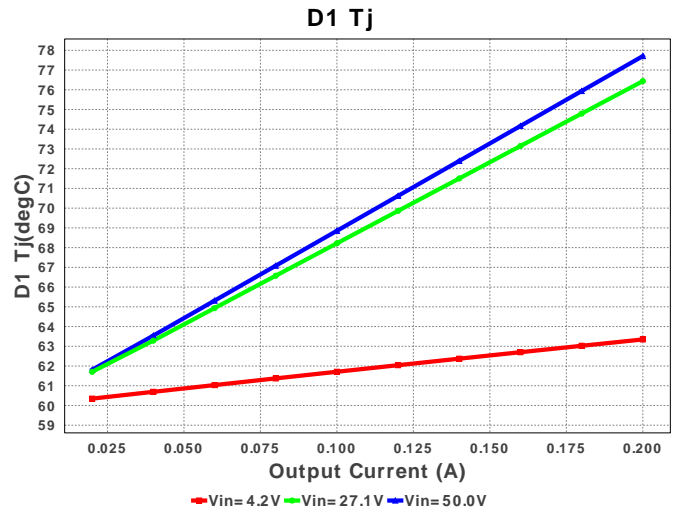
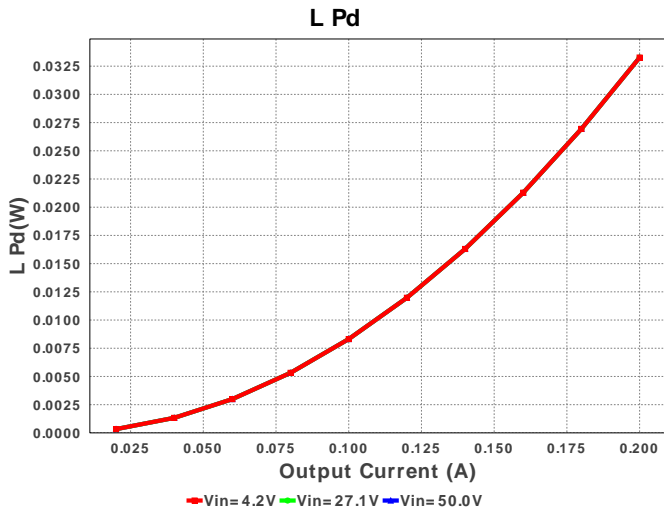
**WEBENCH® Design Report**

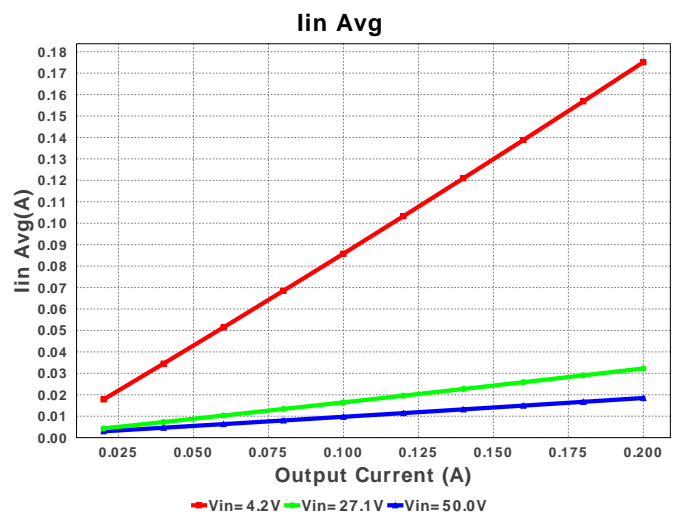
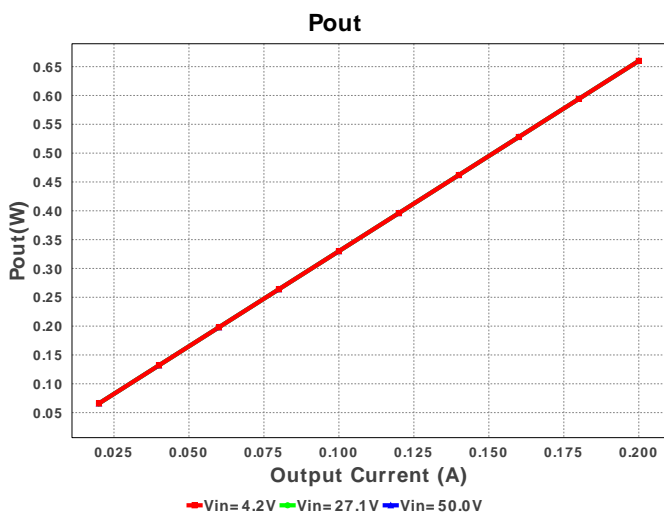
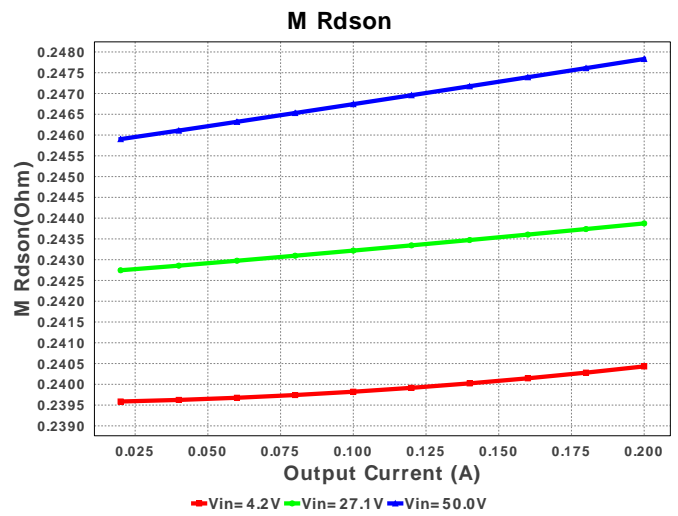
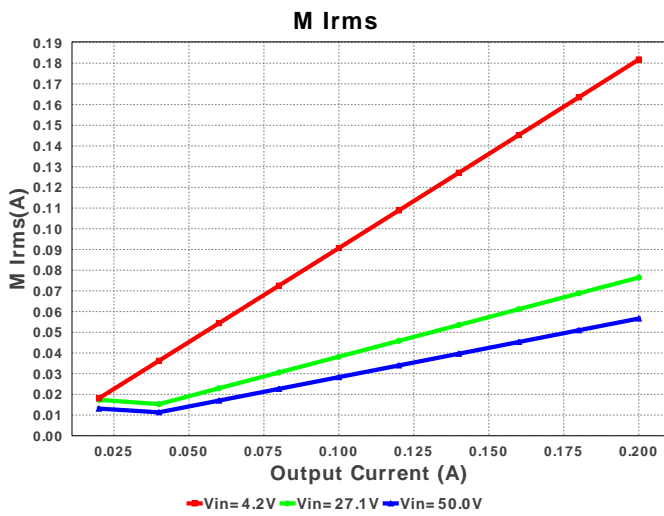
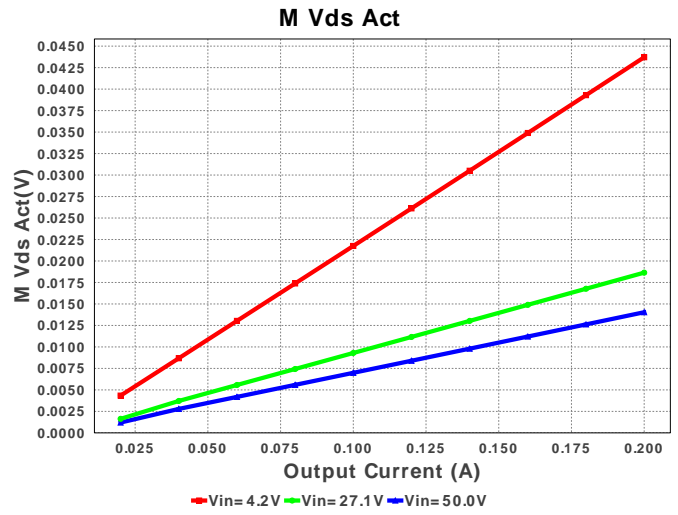
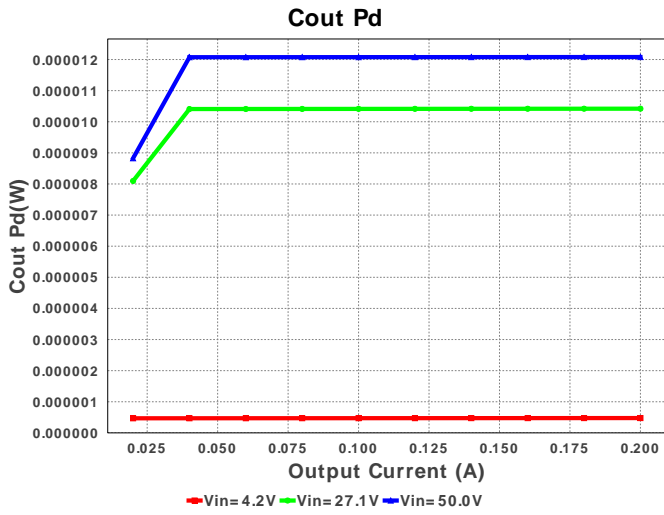
 Design : 670735/18 TPS54060DGQR  
 TPS54060DGQR 4.2V-50.0V to 3.3V @ 0.2A

**Electrical BOM**

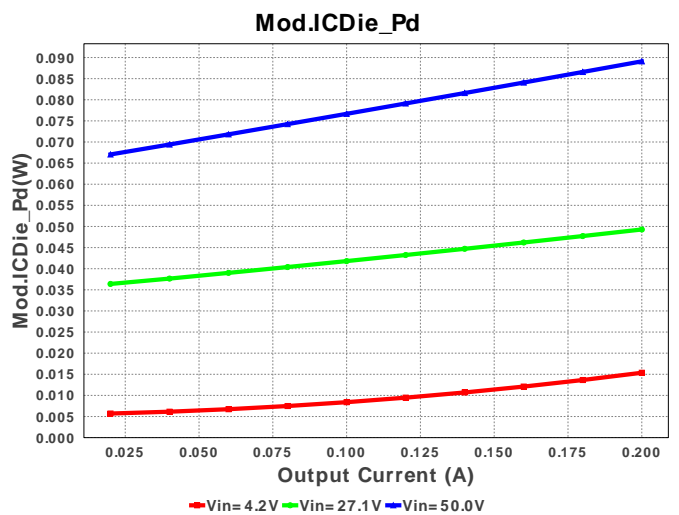
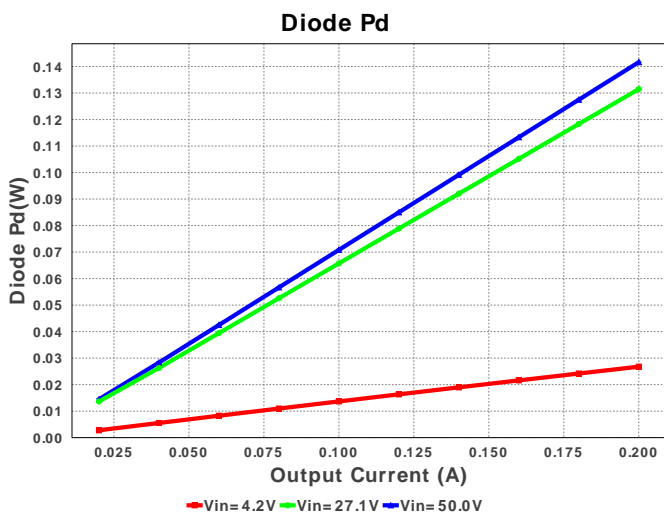
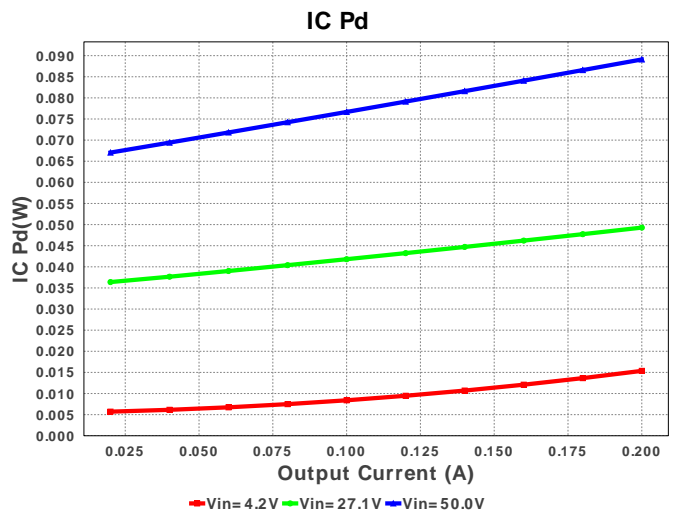
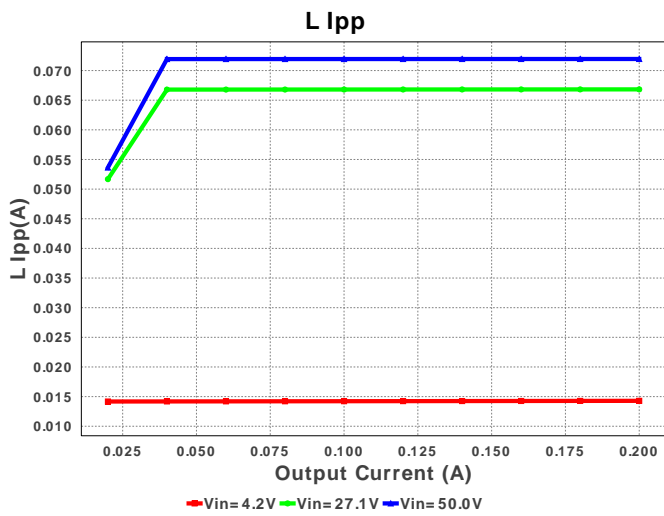
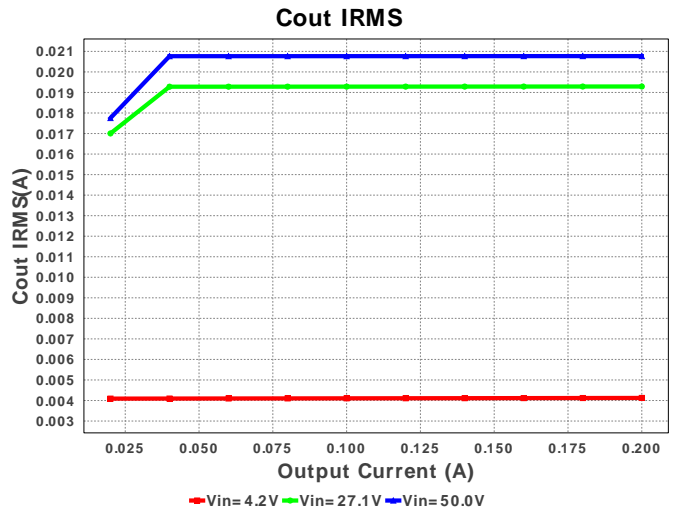
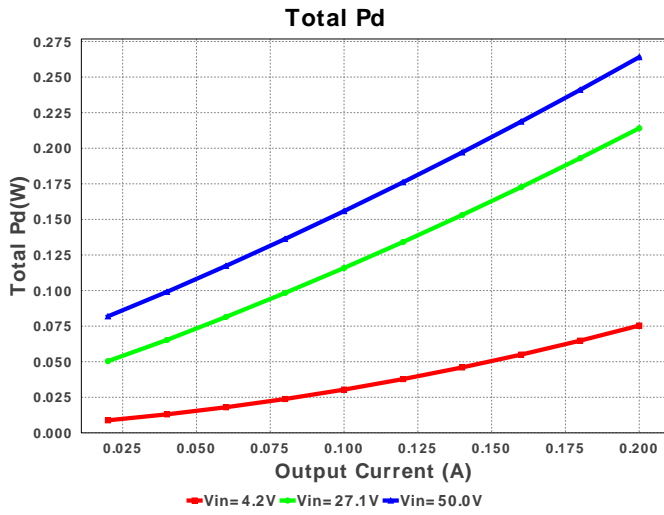
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cboot	TDK	C1005X5R1A104K Series= 285	Cap= 100.0 nF ESR= 20.413 mOhm VDC= 10.0 V IRMS= 0.0 A	1	\$0.01	 0402 3mm2
2.	Ccomp	Yageo America	CC0805KRX7R9BB472 Series= X7R	Cap= 4.7 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	 0805 7mm2
3.	Ccomp2	MuRata	GRM1885C1H200JA01D Series= C0G/NP0	Cap= 20.0 pF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	 0603 5mm2
4.	Cin	TDK	C3225X7R2A225K230AB Series= X7R	Cap= 2.2 uF ESR= 2.8 mOhm VDC= 100.0 V IRMS= 9.825 A	1	\$0.19	 1210 15mm2
5.	Cout	United Chemi-Con	APXE100ARA470ME61G Series= PXE	Cap= 47.0 uF ESR= 28.0 mOhm VDC= 10.0 V IRMS= 2.31 A	1	\$0.39	 CAPSMT_62_E61 53mm2
6.	Css	TDK	C1005X7R1C103K Series= 285	Cap= 10.0 nF ESR= 72.227 mOhm VDC= 16.0 V IRMS= 0.0 A	1	\$0.01	 1005 3mm2
7.	D1	Diodes Inc.	DFLS1100-7	VF@Io= 770.0 mV VRRM= 100.0 V	1	\$0.19	 PowerDI123 13mm2
8.	L1	Coilcraft	MSS1038-224KLB	L= 220.0 uH DCR= 756.0 mOhm	1	\$0.49	 MSS1038 151mm2
9.	Rcomp	Vishay-Dale	CRCW0402162KFKED Series= CRCW..e3	Res= 162.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3mm2
10.	RenB	Vishay-Dale	CRCW040251K1FKED Series= CRCW..e3	Res= 51.1 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3mm2
11.	RenT	Vishay-Dale	CRCW0402105KFKED Series= CRCW..e3	Res= 105.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3mm2

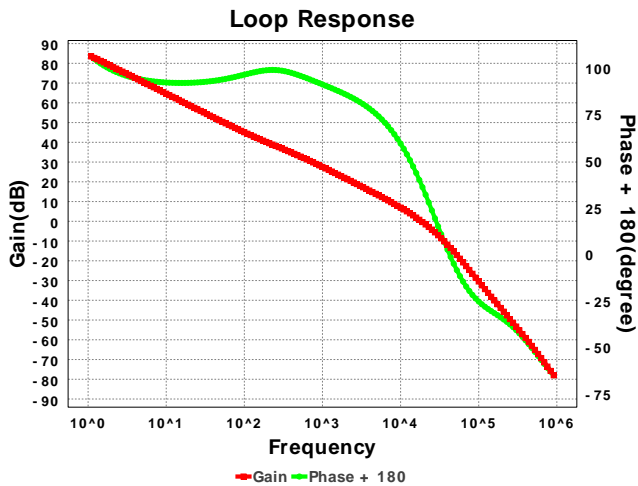
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
12.	Rfbb	Vishay-Dale	CRCW040210K0FKED Series= CRCW..e3	Res= 10.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3mm2
13.	Rfbt	Vishay-Dale	CRCW040231K6FKED Series= CRCW..e3	Res= 31.6 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3mm2
14.	Rt	Vishay-Dale	CRCW0402536KFKED Series= CRCW..e3	Res= 536.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3mm2
15.	U1	Texas Instruments	TPS54060DGQR	Switcher	1	\$1.45	 S-PDSO-G10 24mm2











## Operating Values

#	Name	Value	Category	Description
1.	BOM Count	15		Total Design BOM count
2.	Total BOM	\$2.81		Total BOM Cost
3.	Cin IRMS	23.946 mA	Current	Input capacitor RMS ripple current
4.	Cout IRMS	20.77 mA	Current	Output capacitor RMS ripple current
5.	IC Ipk	235.976 mA	Current	Peak switch current in IC
6.	Iin Avg	18.48 mA	Current	Average input current
7.	L Ipp	71.951 mA	Current	Peak-to-peak inductor ripple current
8.	M1 Irms	56.635 mA	Current	Q lavg
9.	FootPrint	302.0 mm <sup>2</sup>	General	Total Foot Print Area of BOM components
10.	Frequency	236.572 kHz	General	Switching frequency
11.	IC Tolerance	8.0 mV	General	IC Feedback Tolerance
12.	M Vds Act	14.036 mV	General	Voltage drop across the MosFET
13.	Pout	660.0 mW	General	Total output power
14.	D1 Tj	77.706 degC	Op_Point	D1 junction temperature
15.	Vout OP	3.3 V	Op_Point	Operational Output Voltage
16.	Cross Freq	18.507 kHz	Op_point	Bode plot crossover frequency
17.	Duty Cycle	8.019 %	Op_point	Duty cycle
18.	Efficiency	71.427 %	Op_point	Steady state efficiency
19.	IC Tj	65.568 degC	Op_point	IC junction temperature
20.	ICThetaJA	62.5 degC/W	Op_point	IC junction-to-ambient thermal resistance
21.	IOUT_OP	200.0 mA	Op_point	Iout operating point
22.	Phase Marg	37.656 deg	Op_point	Bode Plot Phase Margin
23.	VIN_OP	50.0 V	Op_point	Vin operating point
24.	Vout p-p	2.171 mV	Op_point	Peak-to-peak output ripple voltage
25.	Cin Pd	1.606 μW	Power	Input capacitor power dissipation
26.	Cout Pd	12.08 μW	Power	Output capacitor power dissipation
27.	Diode Pd	141.651 mW	Power	Diode power dissipation
28.	IC Pd	89.095 mW	Power	IC power dissipation
29.	L Pd	33.264 mW	Power	Inductor power dissipation
30.	Total Pd	264.015 mW	Power	Total Power Dissipation

## Design Inputs

#	Name	Value	Description
1.	Iout	200.0 mA	Maximum Output Current
2.	Iout1	200.0 mAmps	Output Current #1
3.	VinMax	50.0 V	Maximum input voltage
4.	VinMin	4.2 V	Minimum input voltage
5.	Vout	3.3 V	Output Voltage
6.	Vout1	3.3 Volt	Output Voltage #1
7.	base_pn	TPS54060	Base Product Number
8.	source	DC	Input Source Type
9.	Ta	60.0 degC	Ambient temperature

## Design Assistance

1. **TPS54060** Product Folder : <http://www.ti.com/product/tps54060> : contains the data sheet and other resources.

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**You should completely validate and test your design implementation to confirm the system functionality for your application prior to production.**

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