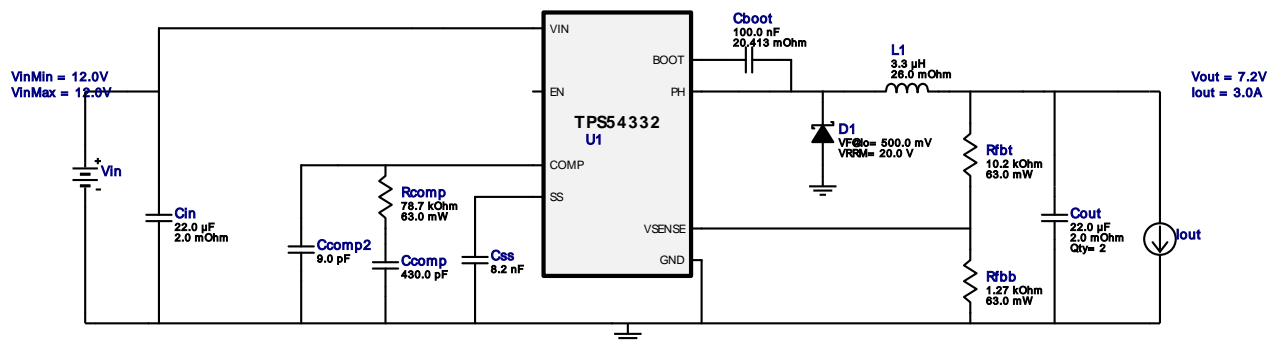


VinMin = 12.0V
VinMax = 12.0V
Vout = 7.2V
Iout = 3.0A

Device = TPS54332DDAR
Topology = Buck
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BOM Cost = \$2.08
Footprint = 198.0 mm²
BOM Count = 13
Total Pd = 1.49W


WEBENCH® Design Report

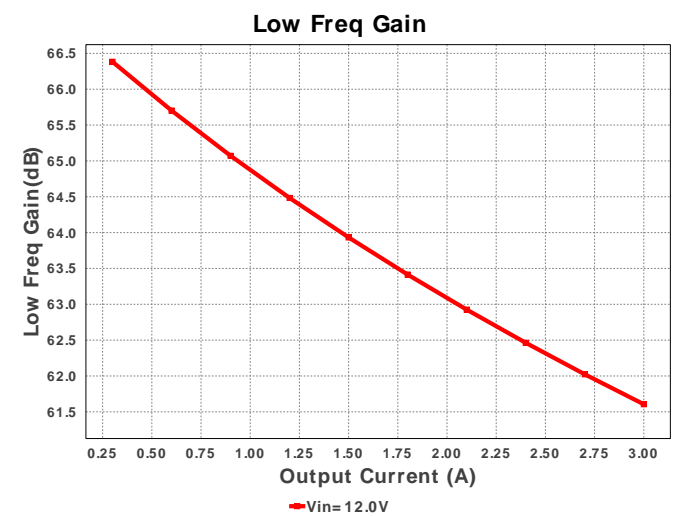
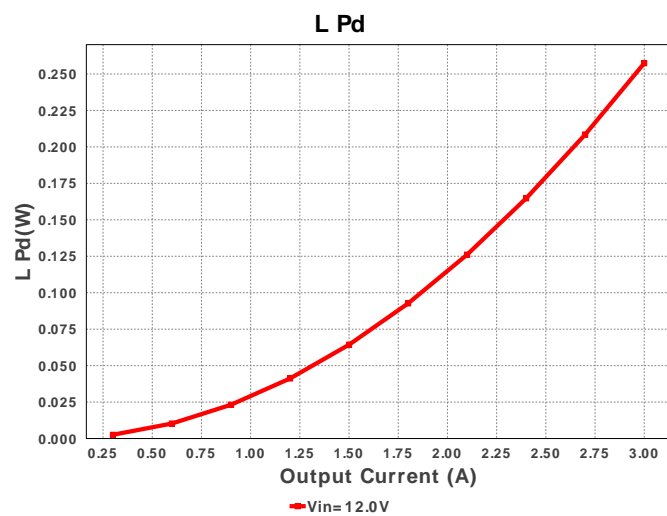
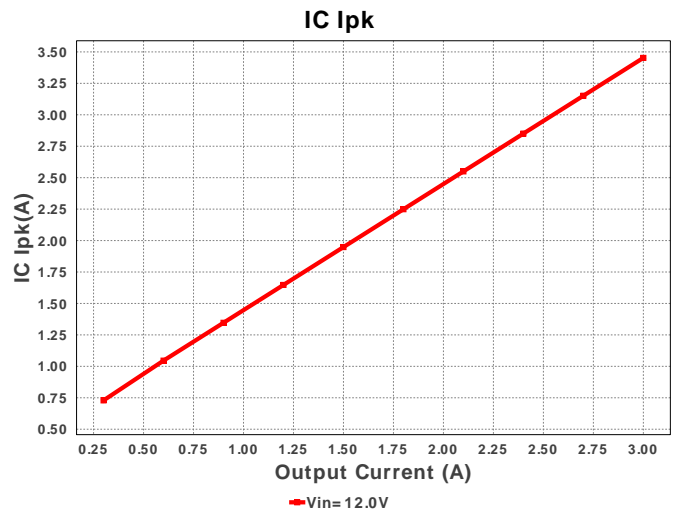
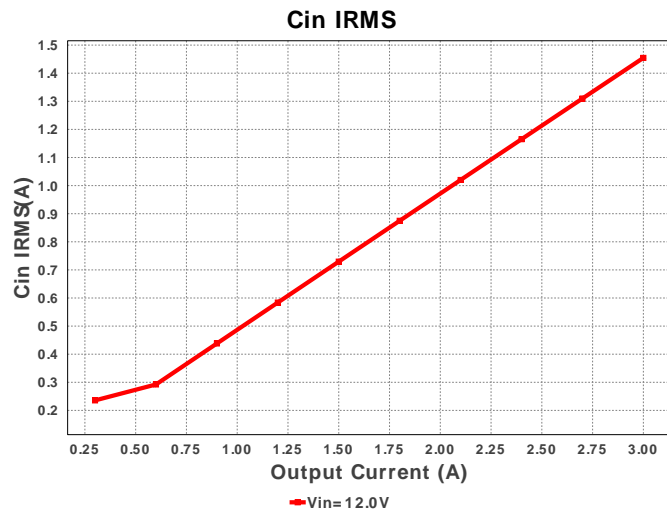
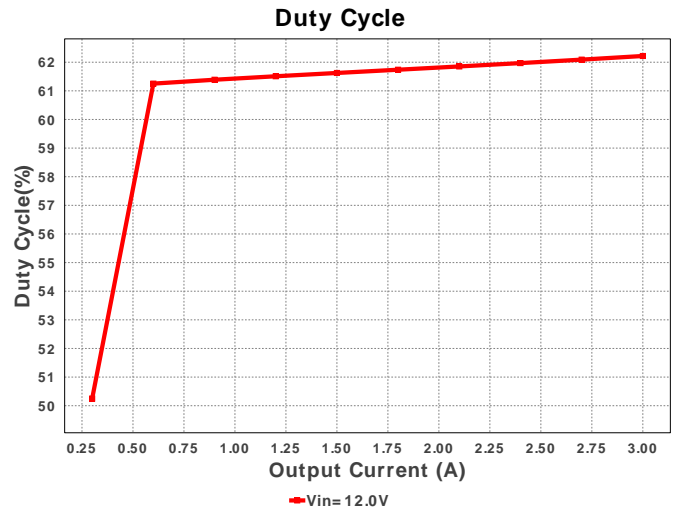
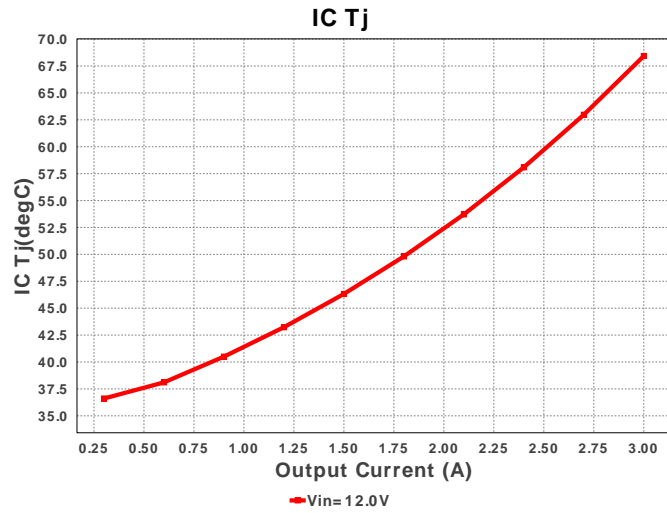
Design : 3514097/27 TPS54332DDAR
TPS54332DDAR 12.0V-12.0V to 7.20V @ 3.0A

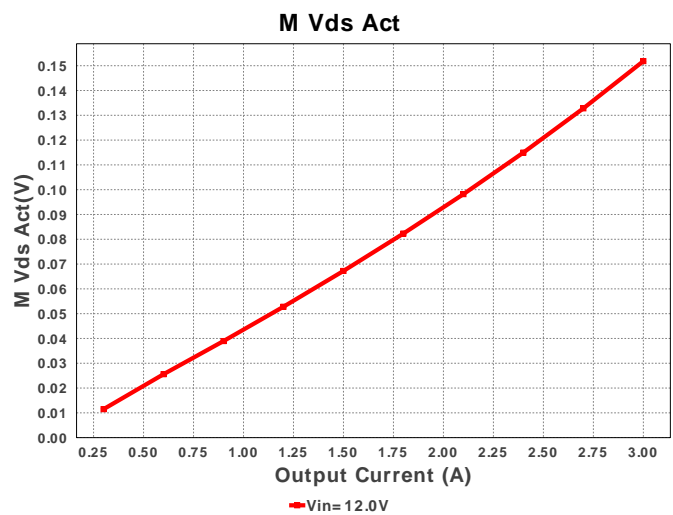
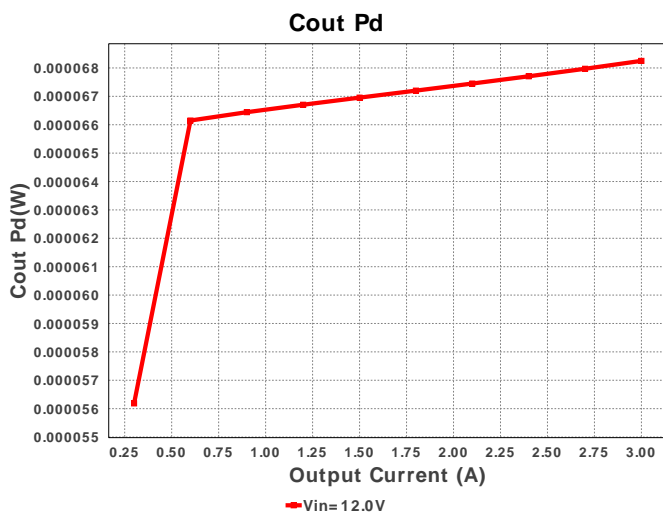
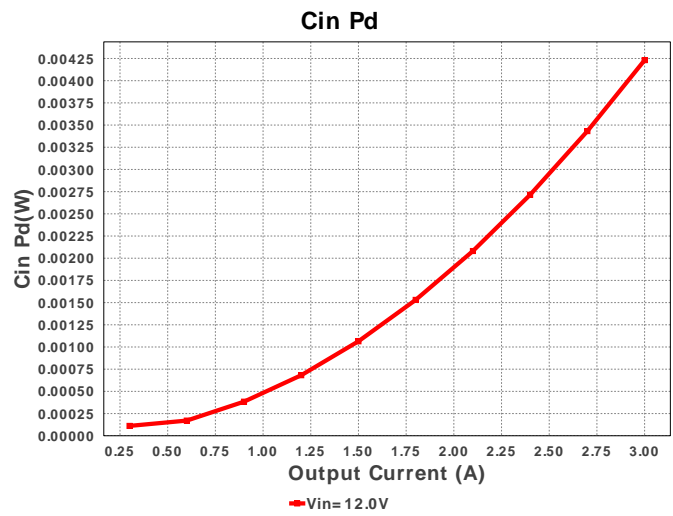
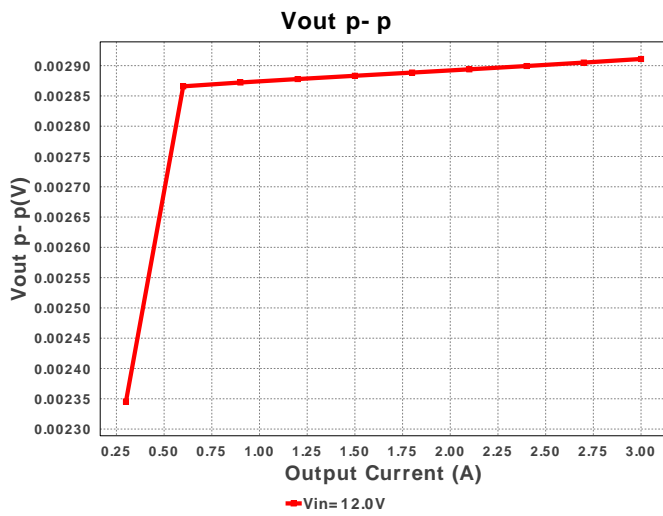
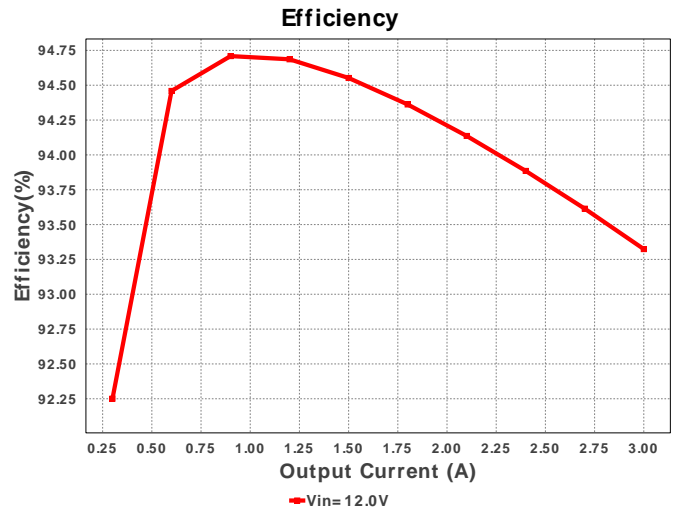
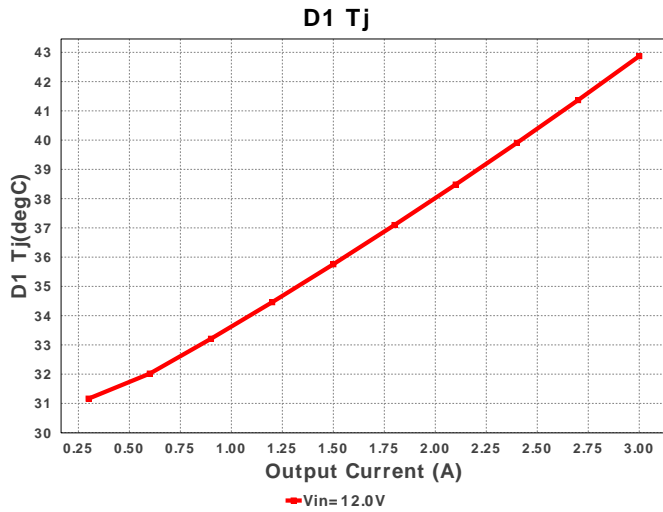


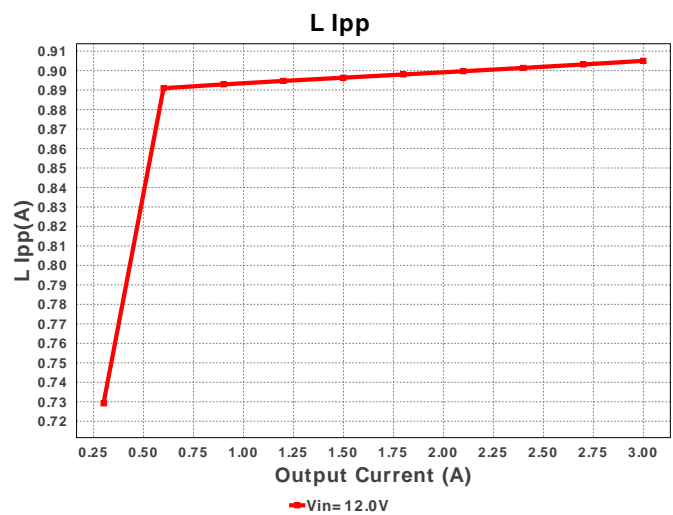
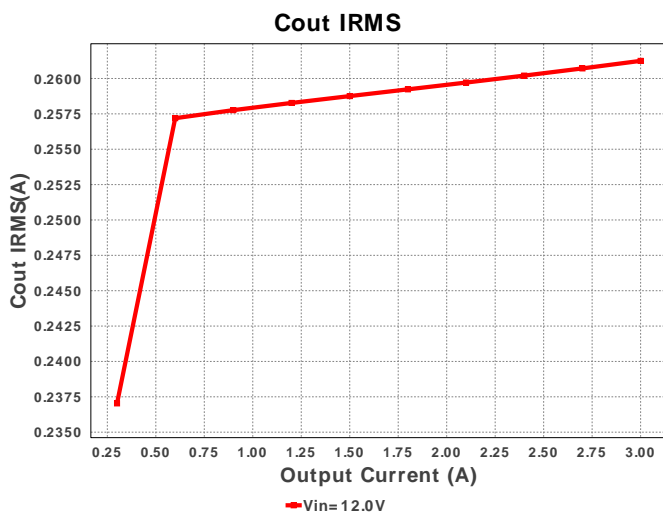
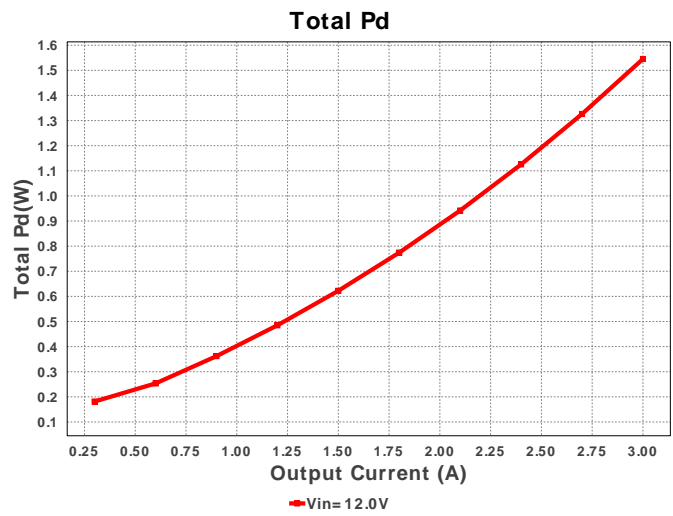
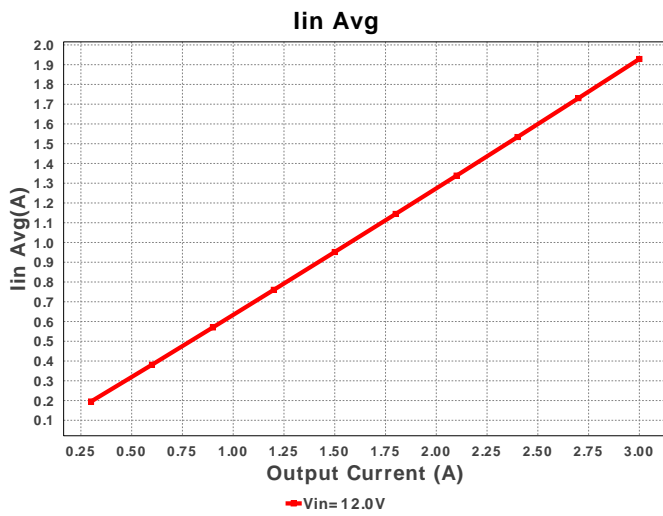
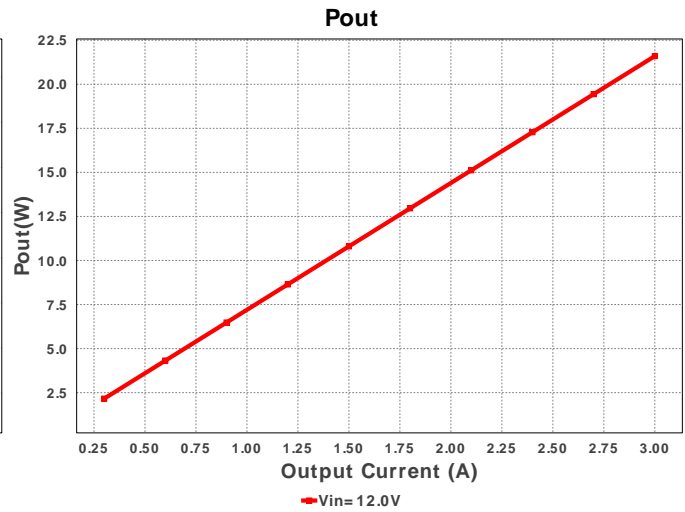
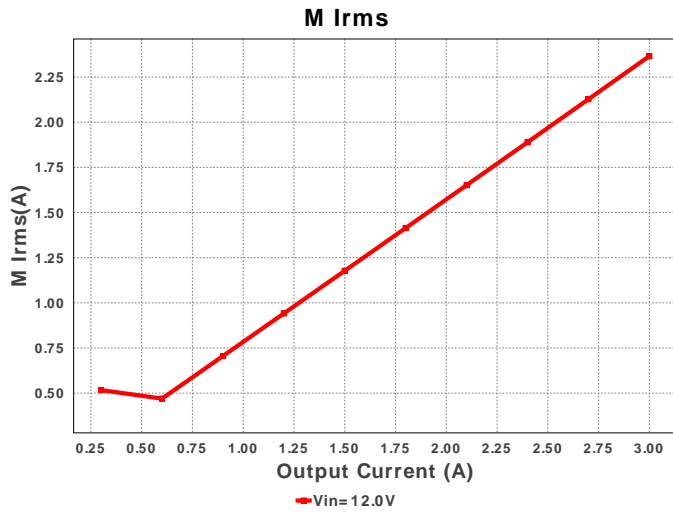
Electrical BOM

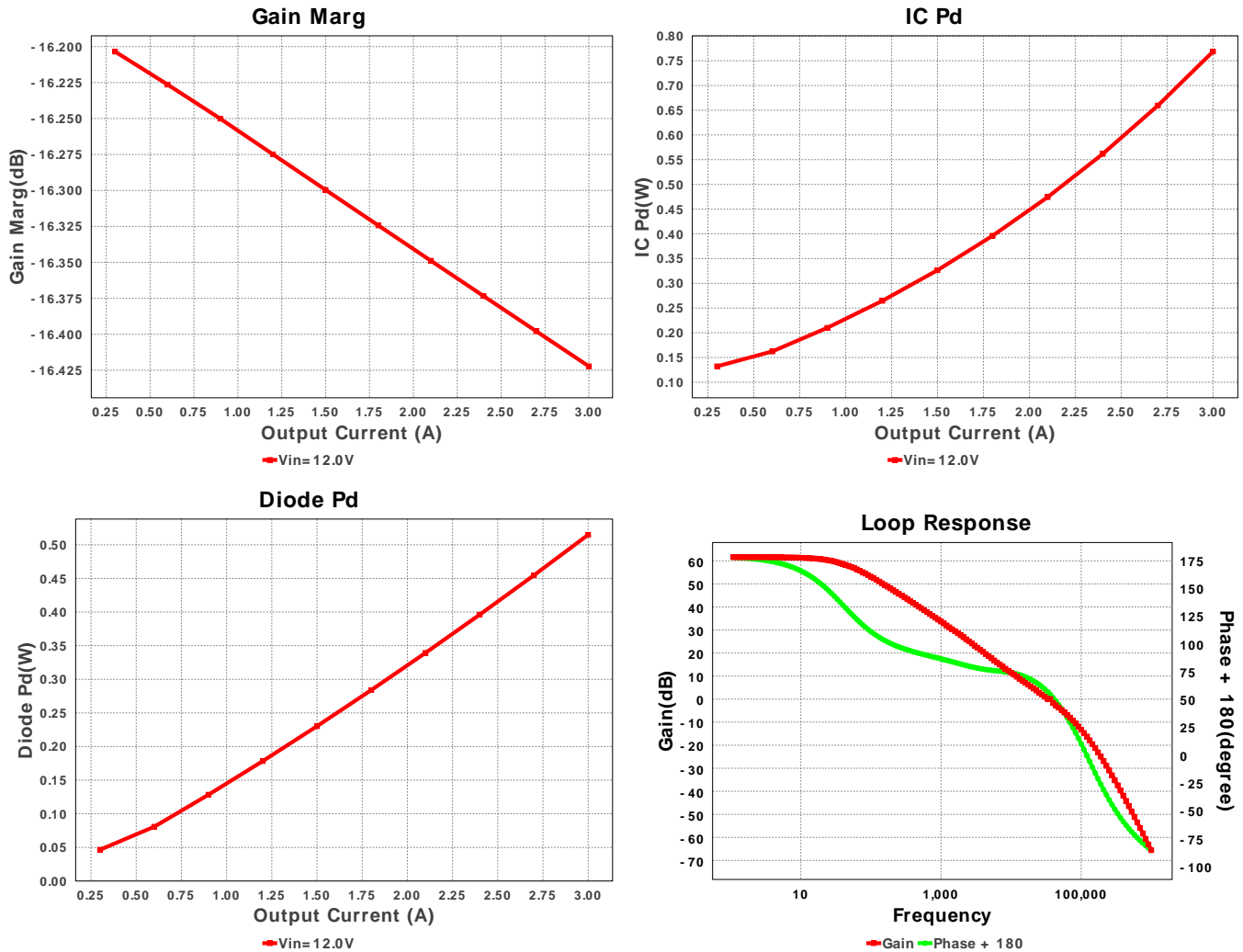
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cboot	TDK	C1005X5R1A104K Series= X5R	Cap= 100.0 nF ESR= 20.413 mOhm VDC= 10.0 V IRMS= 0.0 A	1	\$0.01	 0402 3 mm ²
2.	Ccomp	Samsung Electro-Mechanics	CL21C431JBANNNC Series= C0G/NP0	Cap= 430.0 pF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	 0805 7 mm ²
3.	Ccomp2	Yageo America	CC0805DRNP09BN9R0 Series= C0G/NP0	Cap= 9.0 pF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	 0805 7 mm ²
4.	Cin	MuRata	GRM32ER61E226KE15L Series= X5R	Cap= 22.0 uF ESR= 2.0 mOhm VDC= 25.0 V IRMS= 3.67 A	1	\$0.16	 1210 15 mm ²
5.	Cout	MuRata	GRM32ER61C226KE20L Series= X5R	Cap= 22.0 uF ESR= 2.0 mOhm VDC= 16.0 V IRMS= 3.68 A	2	\$0.16	 1210 15 mm ²
6.	Css	MuRata	GRM033R61A822KA01D Series= X5R	Cap= 8.2 nF VDC= 10.0 V IRMS= 0.0 A	1	\$0.01	 0201 2 mm ²
7.	D1	Diodes Inc.	B220-13-F	VF@Io= 500.0 mV VRRM= 20.0 V	1	\$0.08	 SMB 44 mm ²
8.	L1	Coilcraft	XAL4030-332MEB	L= 3.3 uH DCR= 26.0 mOhm	1	\$0.72	 XAL4030 25 mm ²
9.	Rcomp	Vishay-Dale	CRCW040278K7FKED Series= CRCW..e3	Res= 78.7 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
10.	Rfbb	Vishay-Dale	CRCW04021K27FKED Series= CRCW..e3	Res= 1.27 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
11.	Rfbt	Vishay-Dale	CRCW040210K2FKED Series= CRCW..e3	Res= 10.2 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
12.	U1	Texas Instruments	TPS54332DDAR	Switcher	1	\$0.73	 DDA0008H 57 mm ²









Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	1.456 A	Current	Input capacitor RMS ripple current
2.	Cout IRMS	260.593 mA	Current	Output capacitor RMS ripple current
3.	IC IpK	3.451 A	Current	Peak switch current in IC
4.	Iin Avg	1.924 A	Current	Average input current
5.	L Ipp	902.72 mA	Current	Peak-to-peak inductor ripple current
6.	M1 Irms	2.363 A	Current	Q lavg
7.	BOM Count	13	General	Total Design BOM count
8.	FootPrint	198.0 mm ²	General	Total Foot Print Area of BOM components
9.	Frequency	1000.0 kHz	General	Switching frequency
10.	M Vds Act	151.614 mV	General	Voltage drop across the MosFET
11.	Pout	21.6 W	General	Total output power
12.	Total BOM	\$2.08	General	Total BOM Cost
13.	D1 Tj	41.502 degC	Op_Point	D1 junction temperature
14.	Vout OP	7.2 V	Op_Point	Operational Output Voltage
15.	Cross Freq	33.662 kHz	Op_point	Bode plot crossover frequency
16.	Duty Cycle	62.062 %	Op_point	Duty cycle
17.	Efficiency	93.549 %	Op_point	Steady state efficiency
18.	Gain Marg	-16.422 dB	Op_point	Bode Plot Gain Margin
19.	IC Tj	68.382 degC	Op_point	IC junction temperature
20.	ICThetaJA	50.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
21.	IOUT_OP	3.0 A	Op_point	Iout operating point
22.	Phase Marg	57.26 deg	Op_point	Bode Plot Phase Margin
23.	VIN_OP	12.0 V	Op_point	Vin operating point
24.	Vout p-p	2.904 mV	Op_point	Peak-to-peak output ripple voltage
25.	Cin Pd	4.238 mW	Power	Input capacitor power dissipation
26.	Cout Pd	67.909 μW	Power	Output capacitor power dissipation
27.	Diode Pd	460.092 mW	Power	Diode power dissipation
28.	IC Pd	767.642 mW	Power	IC power dissipation
29.	L Pd	257.4 mW	Power	Inductor power dissipation
30.	Total Pd	1.489 W	Power	Total Power Dissipation
31.	Low Freq Gain	61.605 dB	Unknown	Gain at 10Hz

Design Inputs

#	Name	Value	Description
1.	Iout	3.0	Maximum Output Current
2.	Iout1	3.0	Output Current #1
3.	VinMax	12.0	Maximum input voltage
4.	VinMin	12.0	Minimum input voltage
5.	Vout	7.2	Output Voltage
6.	Vout1	7.2	Output Voltage #1
7.	base_pn	TPS54332	Base Product Number
8.	source	DC	Input Source Type
9.	Ta	30.0	Ambient temperature

Design Assistance

1. **TPS54332** Product Folder : <http://www.ti.com/product/tps54332> : contains the data sheet and other resources.

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