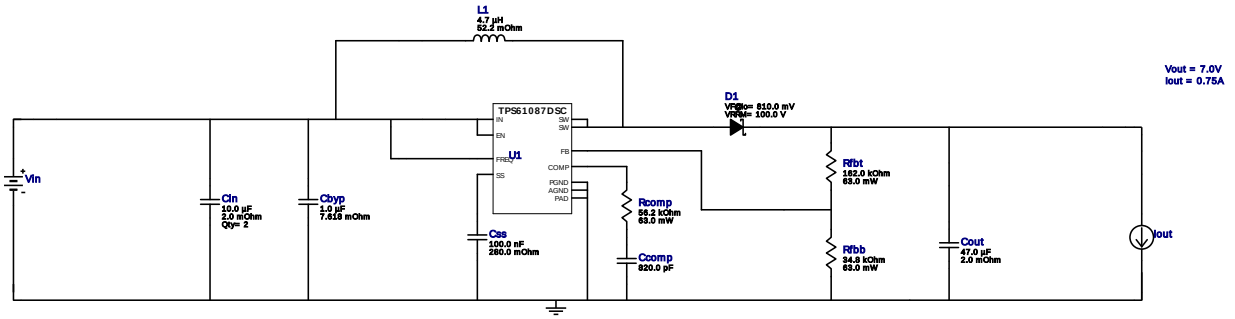
WEBENCH® Design Report

VinMin = 3.0V
VinMax = 4.2V
Vout = 7.0V
Iout = 0.75A

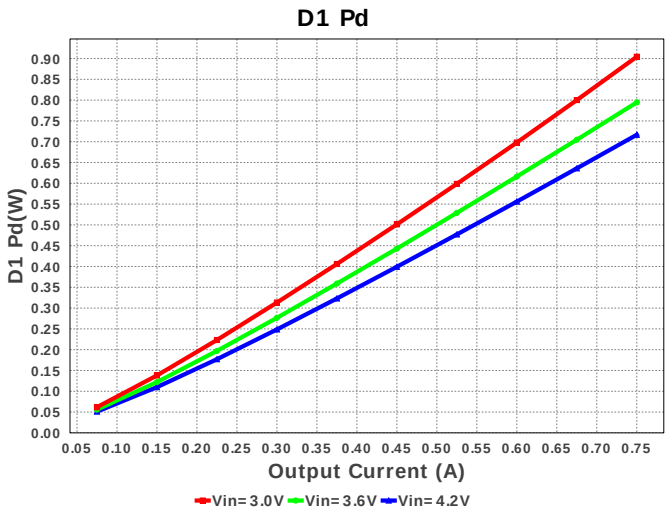
Device = TPS61087DSCR
Topology = Boost
Created = 10/29/15 2:45:08 PM
BOM Cost = $2.52
BOM Count = 12
Total Pd = 1.39W

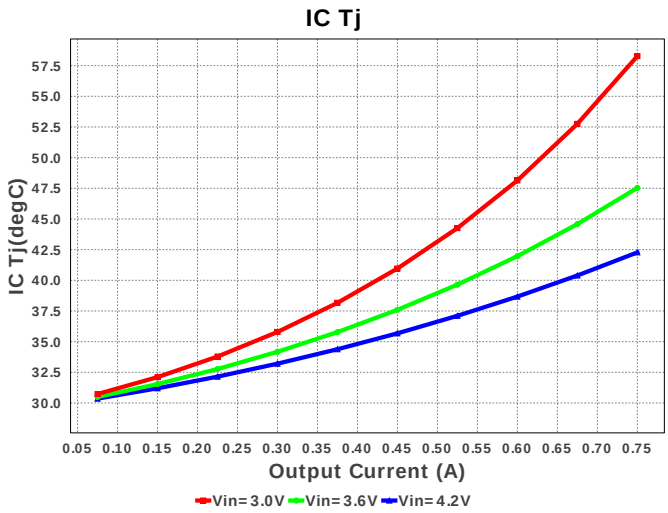
Design : 4530725/5 TPS61087DSCR
TPS61087DSCR 3.0V-4.2V to 7.00V @ 0.75A

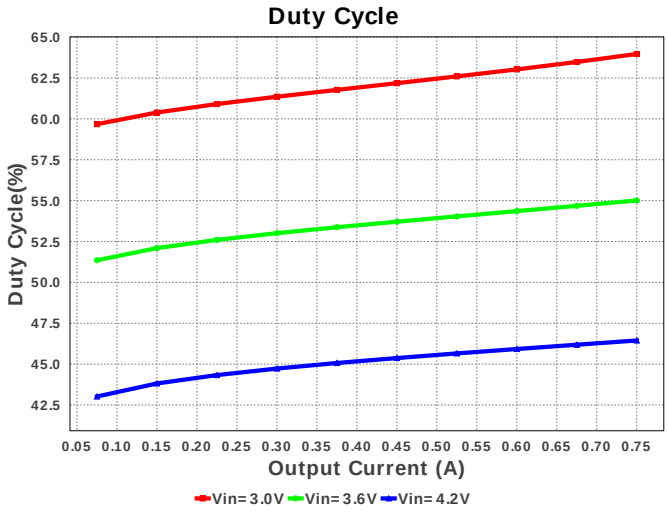


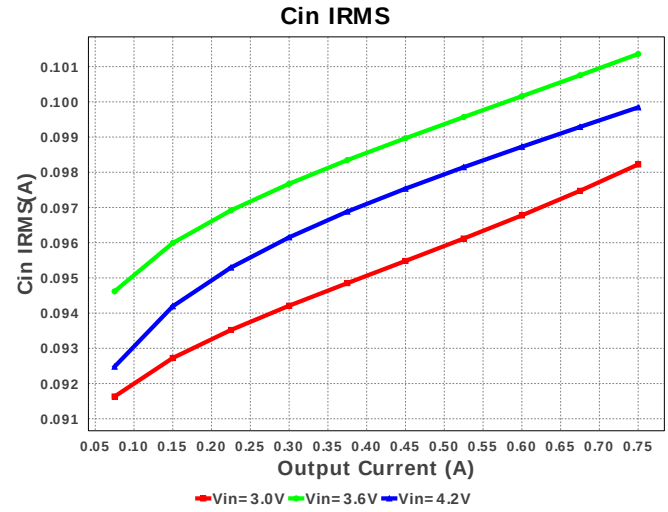
Electrical BOM

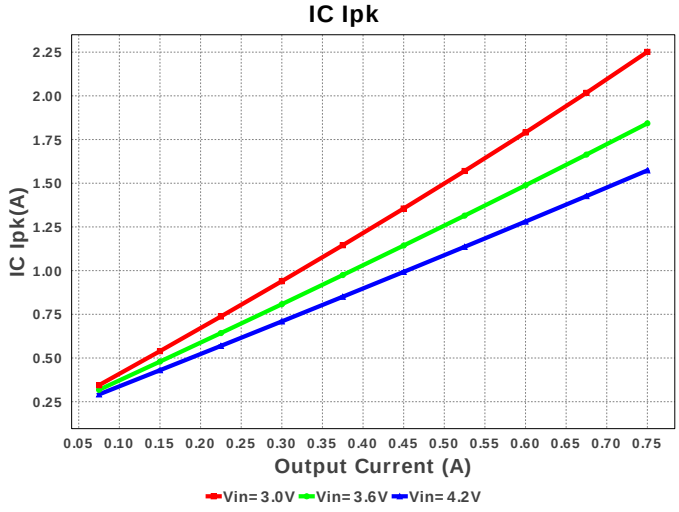
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cbyp	TDK	C1005X5R0J105M Series= X5R	Cap= 1.0 uF ESR= 7.618 mOhm VDC= 6.3 V IRMS= 0.0 A	1	$0.01	1005 3 mm²
2.	Ccomp	Yageo America	CC0805KRX7R9BB821 Series= X7R	Cap= 820.0 pF VDC= 50.0 V IRMS= 0.0 A	1	$0.01	0805 7 mm²
3.	Cin	MuRata	GRM21BR61A106KE19L Series= X5R	Cap= 10.0 uF ESR= 2.0 mOhm VDC= 10.0 V IRMS= 0.0 A	2	$0.03	0805 7 mm²
4.	Cout	MuRata	GRM32ER61C476ME15L Series= X5R	Cap= 47.0 uF ESR= 2.0 mOhm VDC= 16.0 V IRMS= 0.0 A	1	$0.24	1210 15 mm²
5.	Css	AVX	08053C104KAT2A Series= X7R	Cap= 100.0 nF ESR= 280.0 mOhm VDC= 25.0 V IRMS= 0.0 A	1	$0.01	0805 7 mm²
6.	D1	Vishay-Semiconductor	30WQ10FNPBF	VF@Io= 810.0 mV VRRM= 100.0 V	1	$0.01	DPAK 102 mm²
7.	L1	Coilcraft	XFL4020-472MEB	L= 4.7 µH DCR= 52.2 mOhm	1	$0.55	XFL4020 25 mm²
8.	Rcomp	Vishay-Dale	CRCW040256K2FKED Series= CRCW..e3	Res= 56.2 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm²
9.	Rfbb	Vishay-Dale	CRCW040234K8FKED Series= CRCW..e3	Res= 34.8 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm²
10.	Rfbt	Vishay-Dale	CRCW0402162KFKED Series= CRCW..e3	Res= 162.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm²
11.	U1	Texas Instruments	TPS61087DSCR	Switcher	1	$1.60	DSC0010A 0 mm²

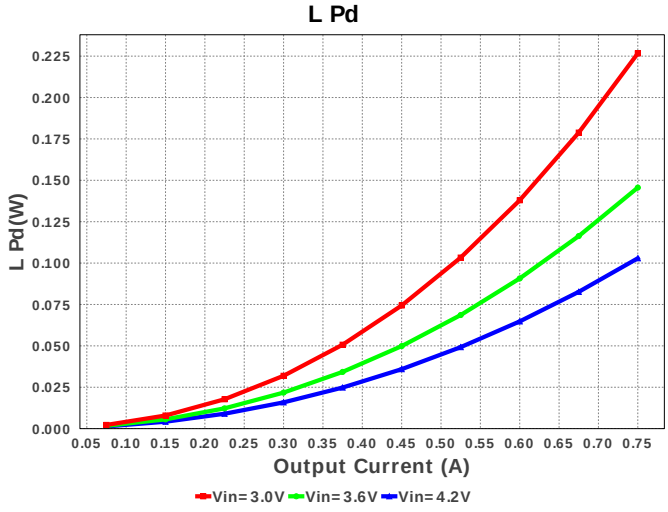


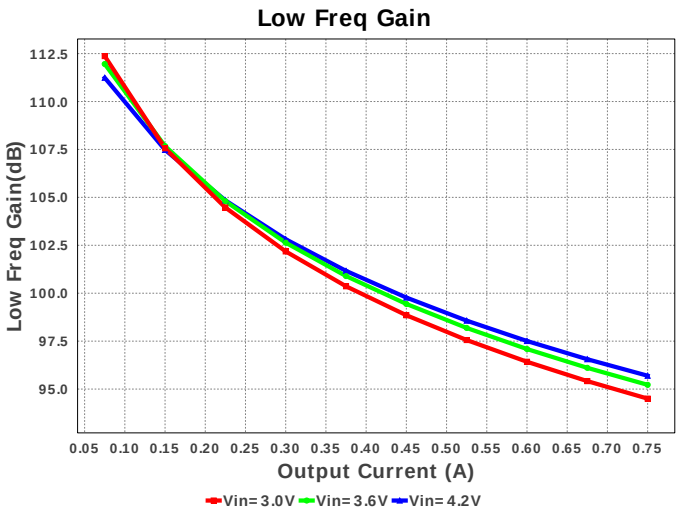


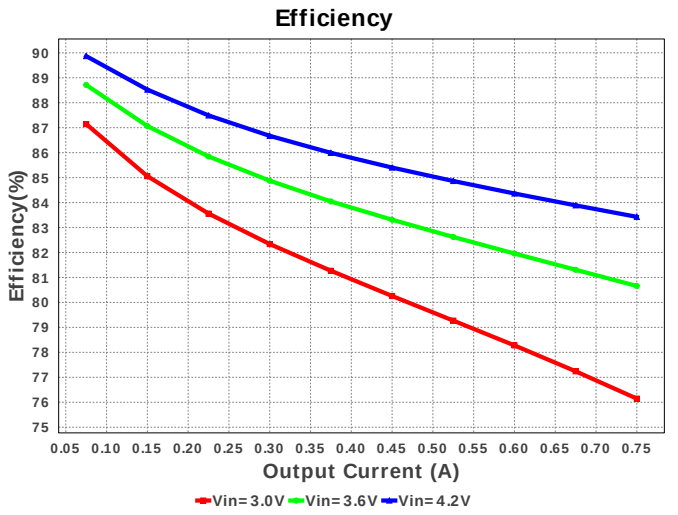


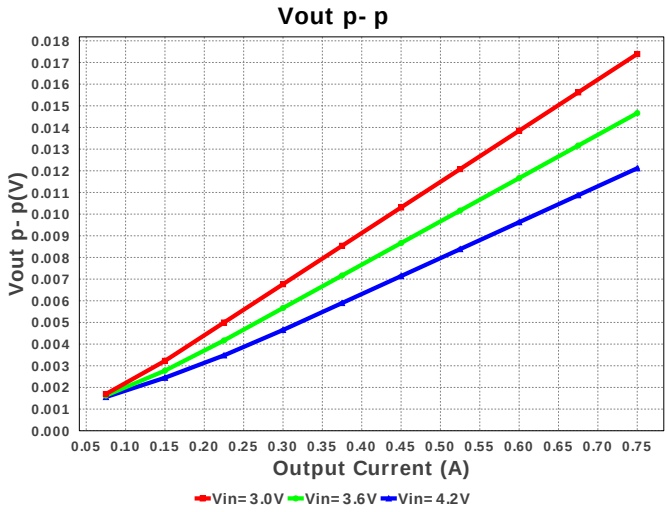


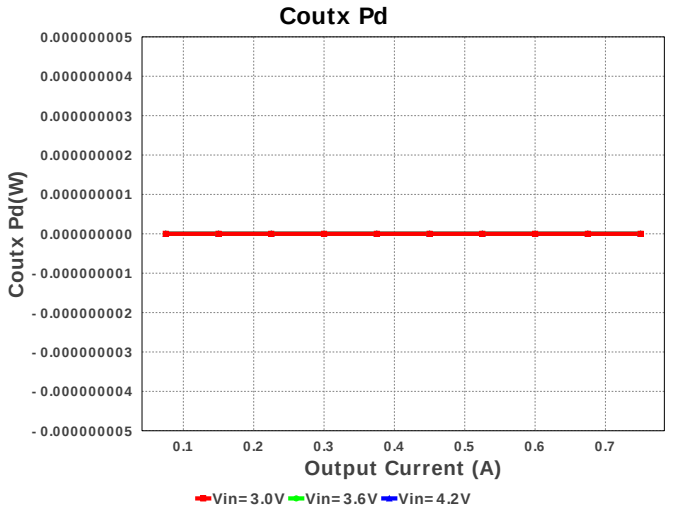


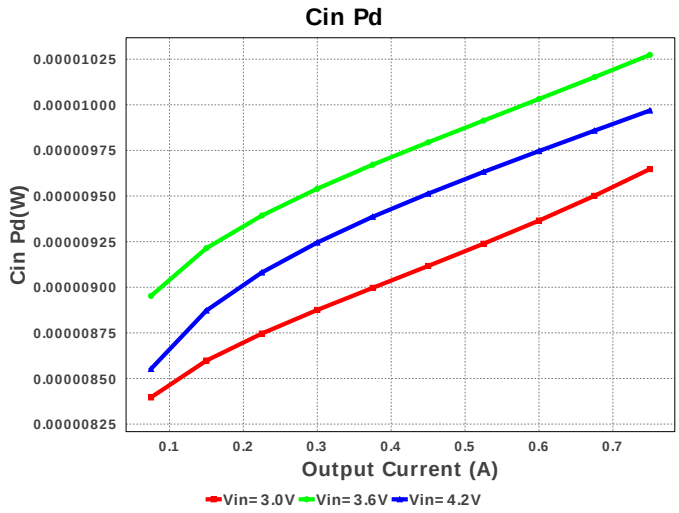


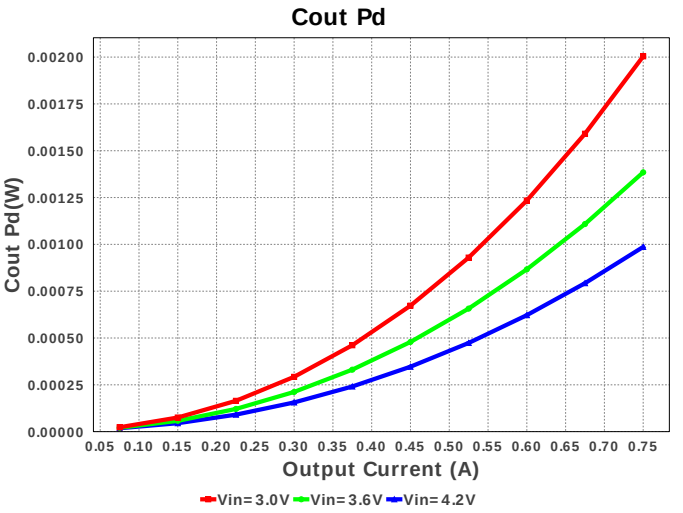


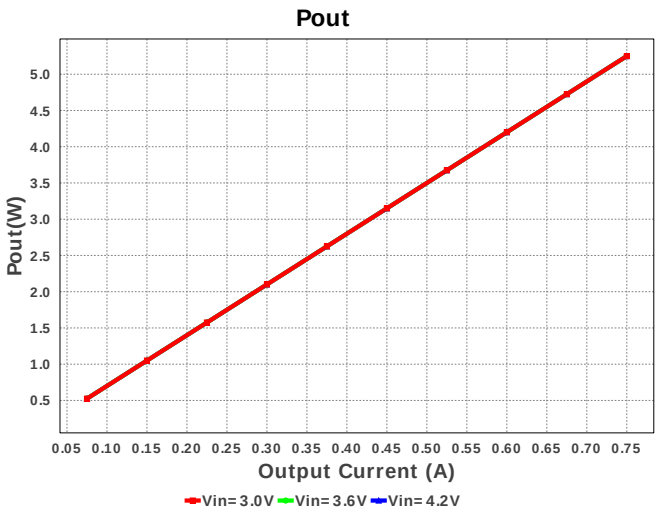


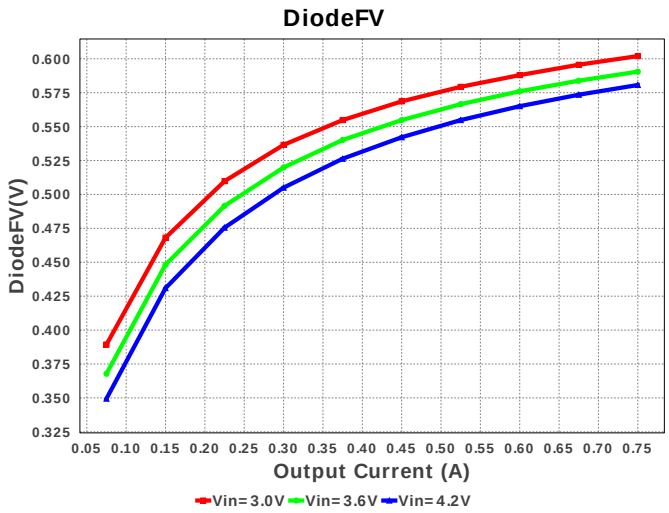


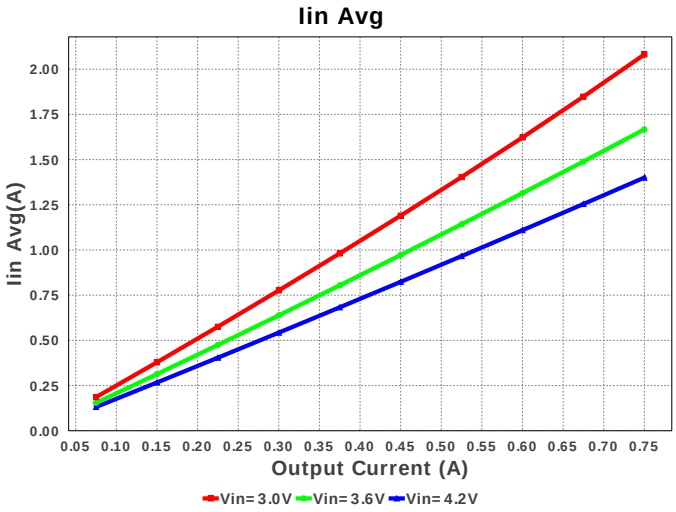


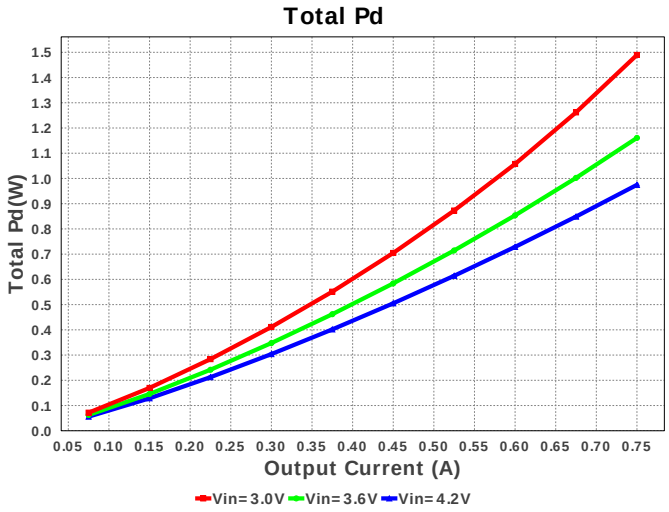


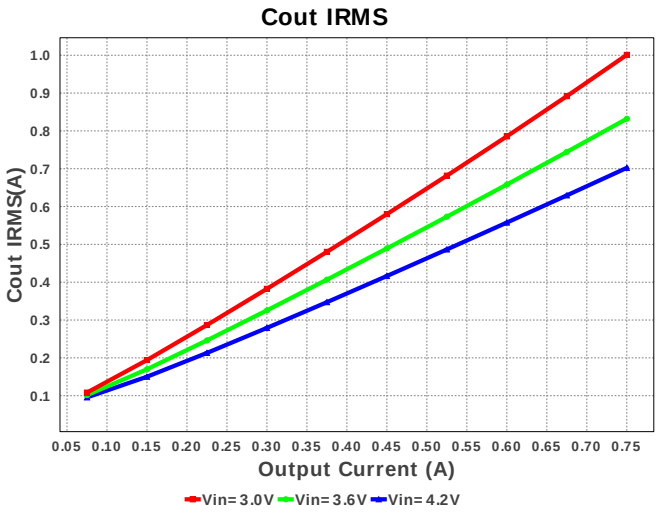


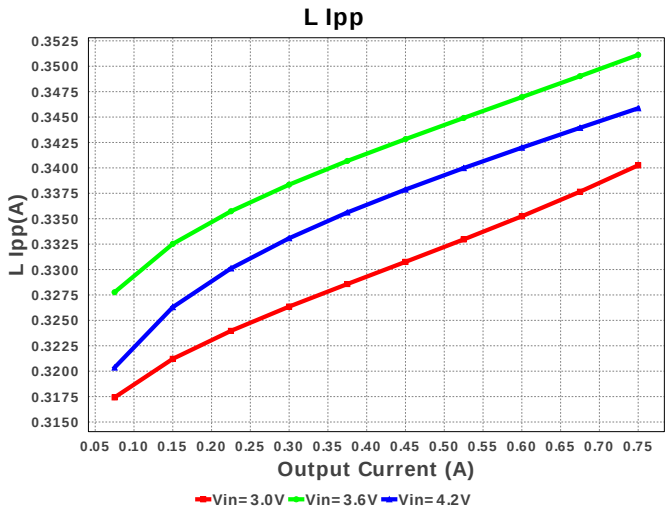


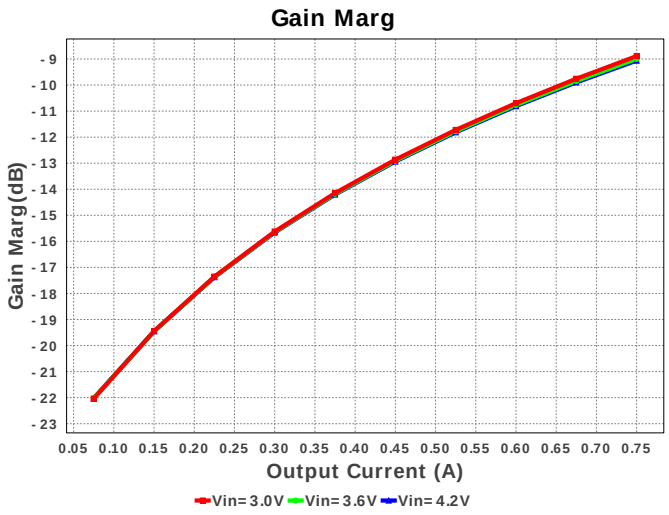


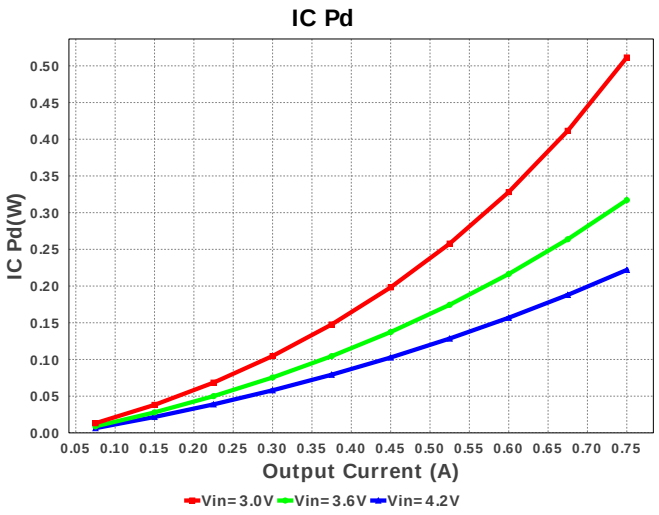


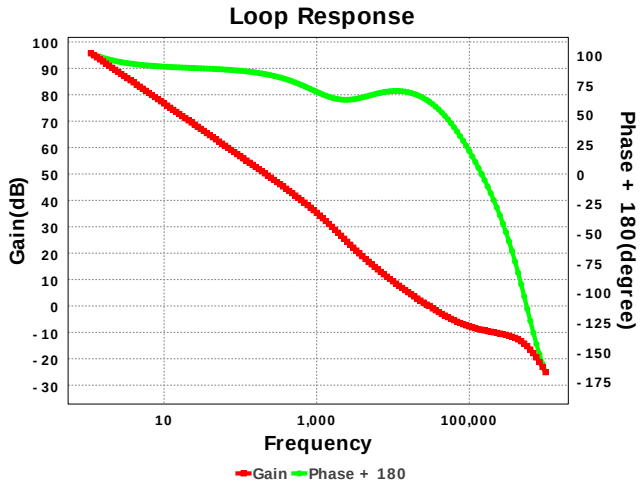


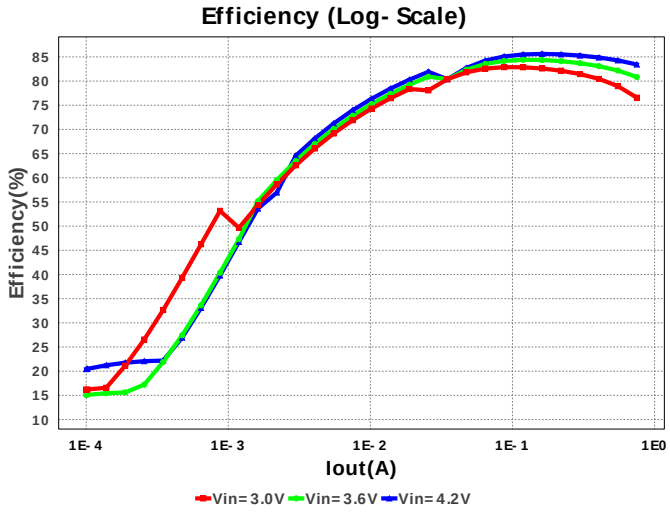












Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	97.632 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	992.725 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	2.229 A	Current	Peak switch current in IC
4.	Iin Avg	2.06 A	Current	Average input current
5.	L Ipp	338.21 mA	Current	Peak-to-peak inductor ripple current
6.	BOM Count	12	General	Total Design BOM count
7.	FootPrint	205.0 mm^2	General	Total Foot Print Area of BOM components
8.	Frequency	1.2 MHz	General	Switching frequency
9.	Pout	5.25 W	General	Total output power
10.	Total BOM	$2.52	General	Total BOM Cost
11.	Low Freq Gain	94.54 dB	Op_Point	Gain at 10Hz
12.	Cross Freq	29.207 kHz	Op_point	Bode plot crossover frequency
13.	Duty Cycle	63.583 %	Op_point	Duty cycle
14.	Efficiency	77.54 %	Op_point	Steady state efficiency
15.	Gain Marg	-8.955 dB	Op_point	Bode Plot Gain Margin
16.	IC Tj	57.622 degC	Op_point	IC junction temperature
17.	ICThetaJA	55.3 degC/W	Op_point	IC junction-to-ambient thermal resistance
18.	IOUT_OP	750.0 mA	Op_point	Iout operating point
19.	Phase Marg	61.909 deg	Op_point	Bode Plot Phase Margin
20.	VIN_OP	3.0 V	Op_point	Vin operating point
21.	Vout p-p	17.393 mV	Op_point	Peak-to-peak output ripple voltage
22.	Cin Pd	9.532 µW	Power	Input capacitor power dissipation
23.	Cout Pd	1.971 mW	Power	Output capacitor power dissipation
24.	Coutx Pd	0.0 W	Power	Output capacitor_x power loss
25.	D1 Pd	797.045 mW	Power	Output Diode Power Dissipation
26.	IC Pd	499.502 mW	Power	IC power dissipation
27.	L Pd	221.897 mW	Power	Inductor power dissipation
28.	Total Pd	1.388 W	Power	Total Power Dissipation
29.	DiodeFV	533.318 mV	Unknown	Peak-to-peak output ripple voltage

Design Inputs

#	Name	Value	Description
1.	Iout	750.0 m	Maximum Output Current
2.	Iout1	750.0 m	Output Current #1
3.	VinMax	4.2	Maximum input voltage
4.	VinMin	3.0	Minimum input voltage
5.	Vout	7.0	Output Voltage
6.	Vout1	7.0	Output Voltage #1
7.	base_pn	TPS61087	Base Product Number
8.	source	DC	Input Source Type
9.	Ta	30.0	Ambient temperature

Design Assistance

1. **TPS61087** Product Folder : http://www.ti.com/product/TPS61087 : contains the data sheet and other resources.