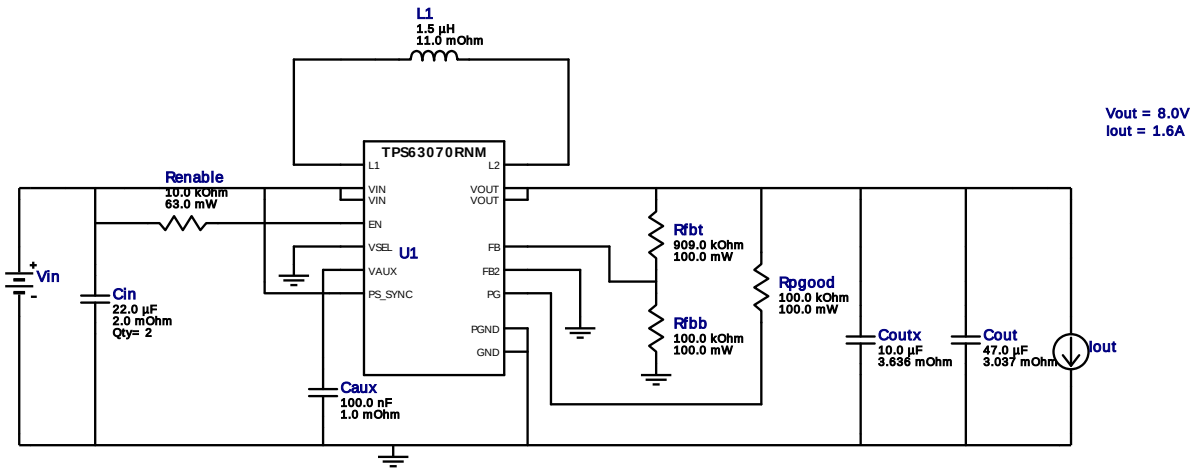
WEBENCH® Design Report

VinMin = 6.0V
VinMax = 8.4V
Vout = 8.0V
Iout = 1.6A

Device = TPS63070RNMR
Topology = Buck_Boost
Created = 2018-04-05 07:18:59.194
BOM Cost = $1.98
BOM Count = 11
Total Pd = 0.64W

Design : 3888243/70 TPS63070RNMR
TPS63070RNMR 6.0V-8.4V to 8.00V @ 1.6A



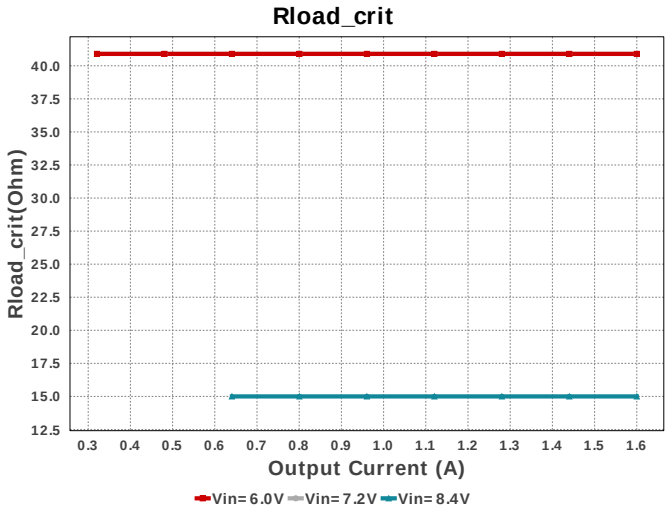
My Comments

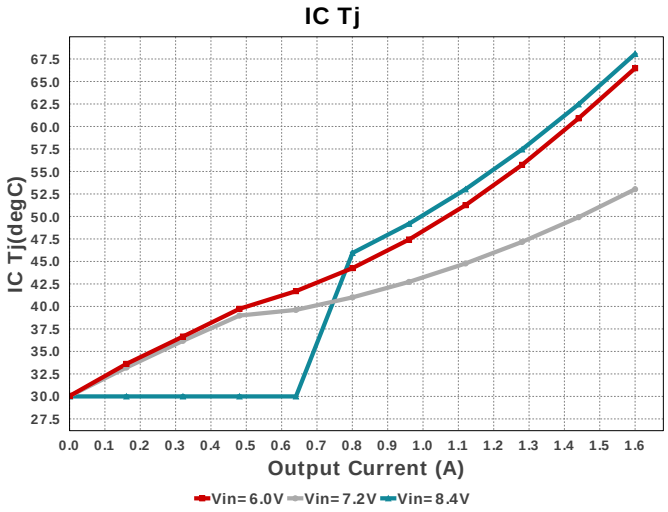
No comments

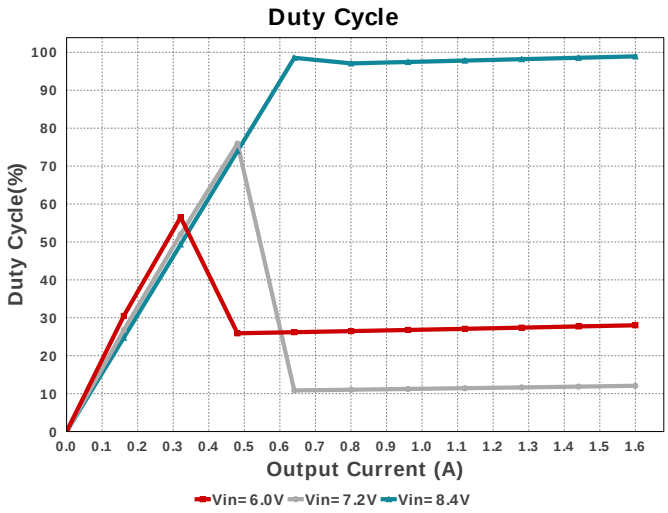
Electrical BOM

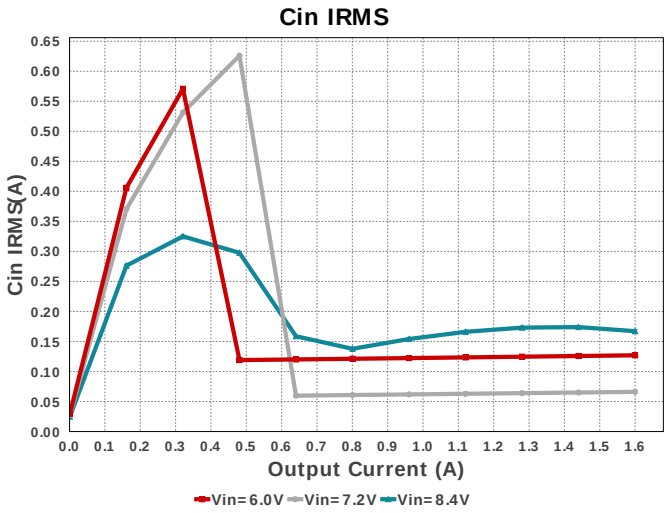
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Caux	MuRata	GRM155R60J104KA01D Series= X5R	Cap= 100.0 nF ESR= 1.0 mOhm VDC= 6.3 V IRMS= 0.0 A	1	$0.01	0402 3 mm²
2.	Cin	MuRata	GRM32ER61C226KE20L Series= X5R	Cap= 22.0 uF ESR= 2.0 mOhm VDC= 16.0 V IRMS= 3.68 A	2	$0.15	1210 15 mm²
3.	Cout	MuRata	GRM32ER61C476ME15L Series= X5R	Cap= 47.0 uF ESR= 3.037 mOhm VDC= 16.0 V IRMS= 4.59346 A	1	$0.30	1210_280 15 mm²
4.	Coutx	MuRata	GRM188R61C106MA73D Series= X5R	Cap= 10.0 uF ESR= 3.636 mOhm VDC= 16.0 V IRMS= 2.8889 A	1	$0.09	0603 5 mm²
5.	L1	Bourns	SRN8040-1R5Y	L= 1.5 µH DCR= 11.0 mOhm	1	$0.24	SRN8040 100 mm²
6.	Renable	Stackpole Electronics Inc	RMCF0402FT10K0 Series= ?	Res= 10.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm²
7.	Rfbb	Yageo America	RC0603FR-07100KL Series= ?	Res= 100.0 kOhm Power= 100.0 mW Tolerance= 1.0%	1	$0.01	0603 5 mm²
8.	Rfbt	Vishay-Dale	CRCW0603909KFKEA Series= CRCW..e3	Res= 909.0 kOhm Power= 100.0 mW Tolerance= 1.0%	1	$0.01	0603 5 mm²
9.	Rpgood	Yageo America	RC0603FR-07100KL Series= ?	Res= 100.0 kOhm Power= 100.0 mW Tolerance= 1.0%	1	$0.01	0603 5 mm²

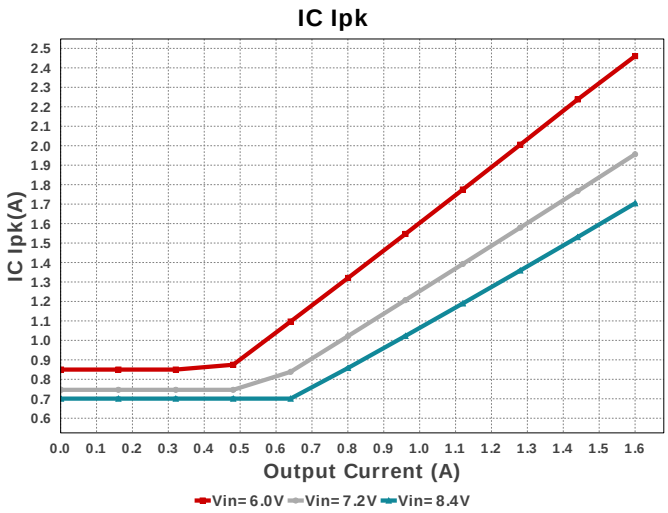
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
10.	U1	Texas Instruments	TPS63070RNMR	Switcher	1	$1.00	RNM0015A 14 mm²

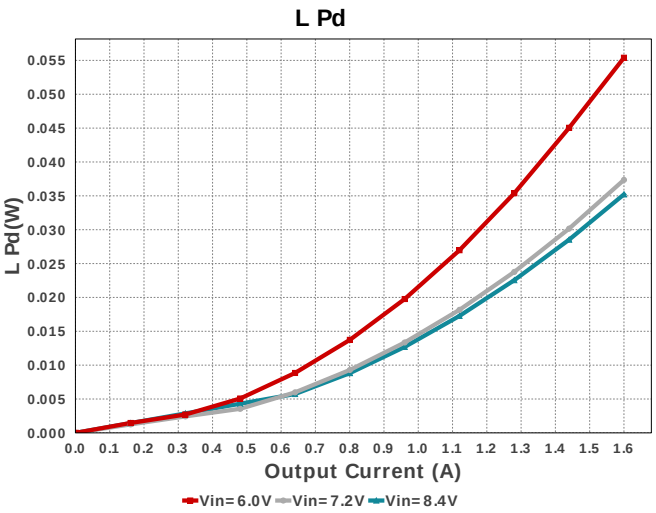


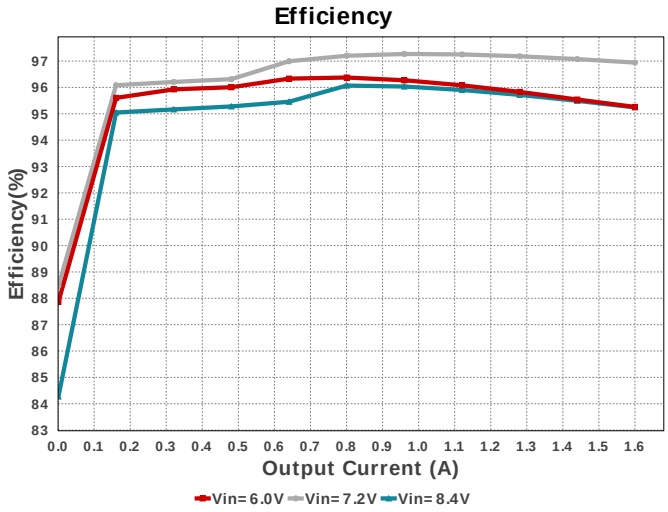


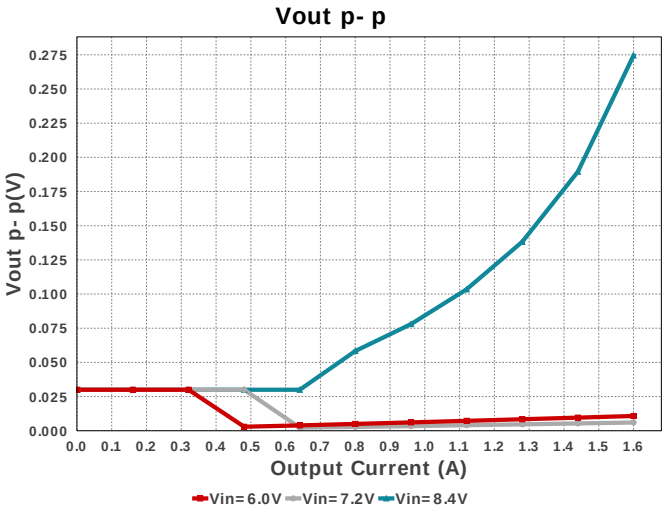


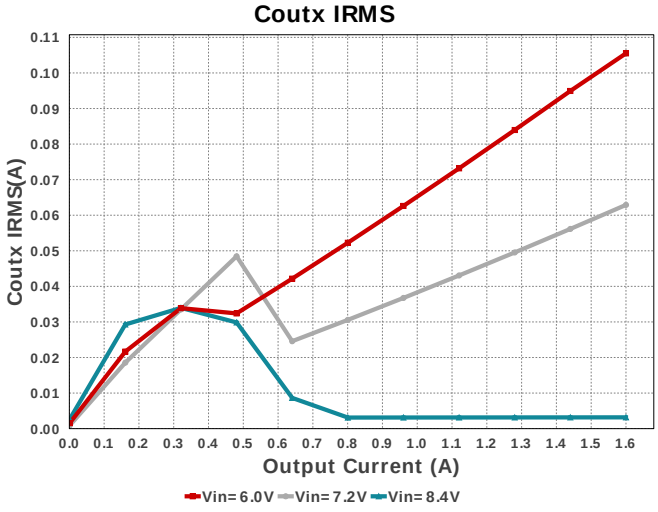


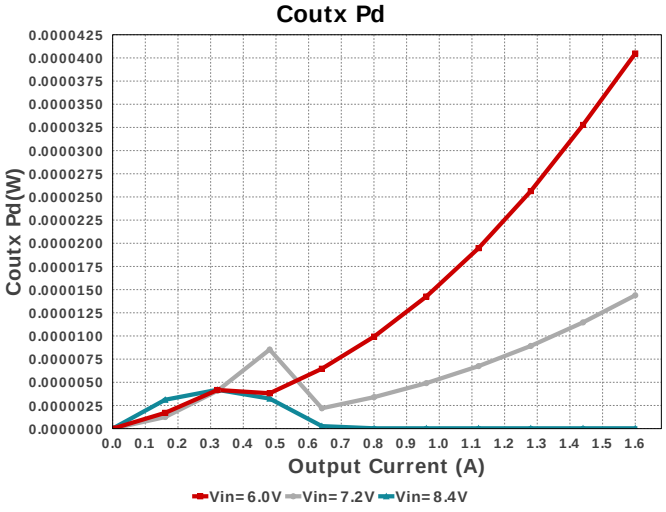


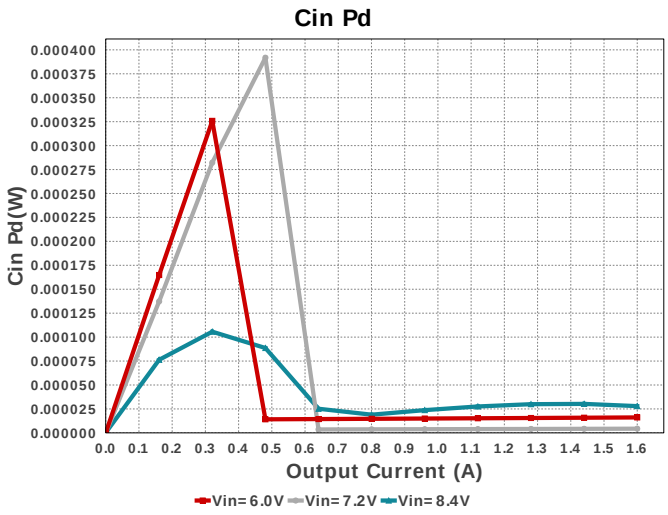


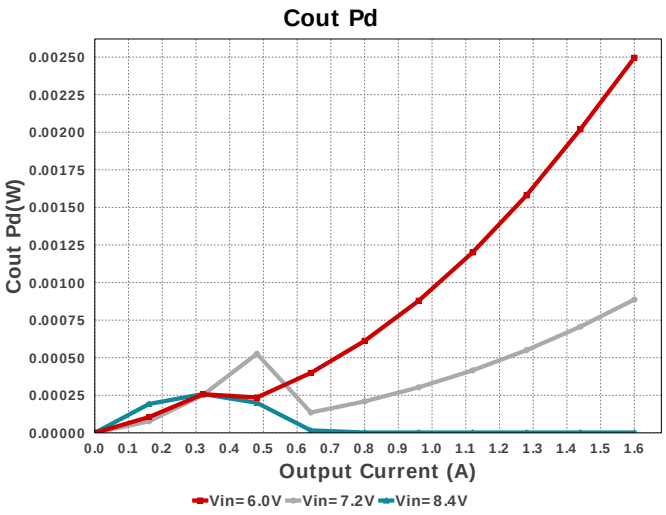


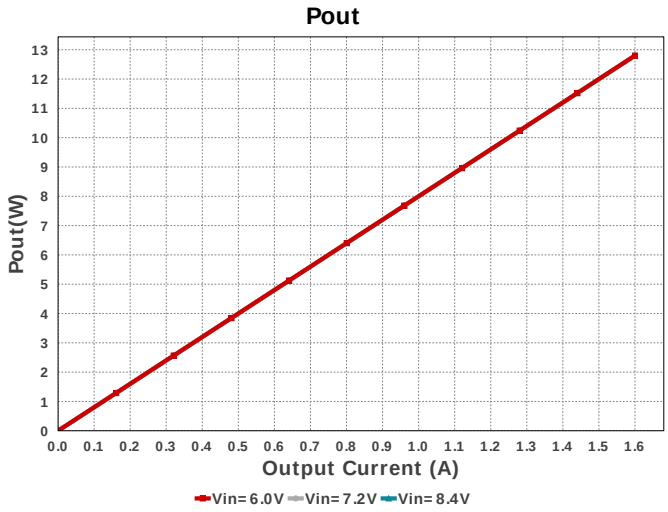


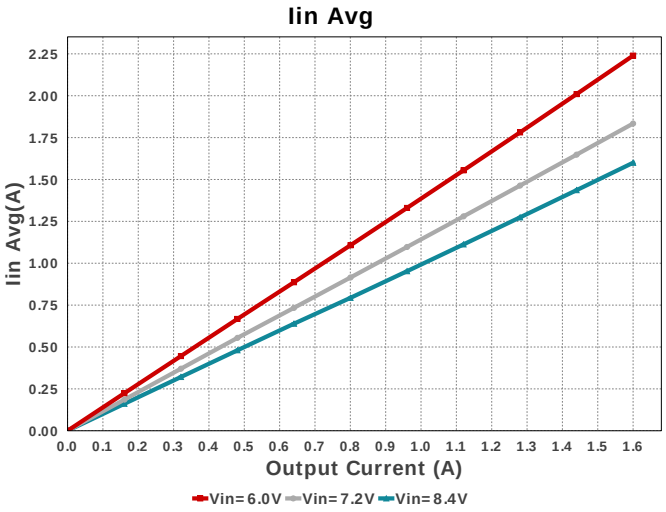


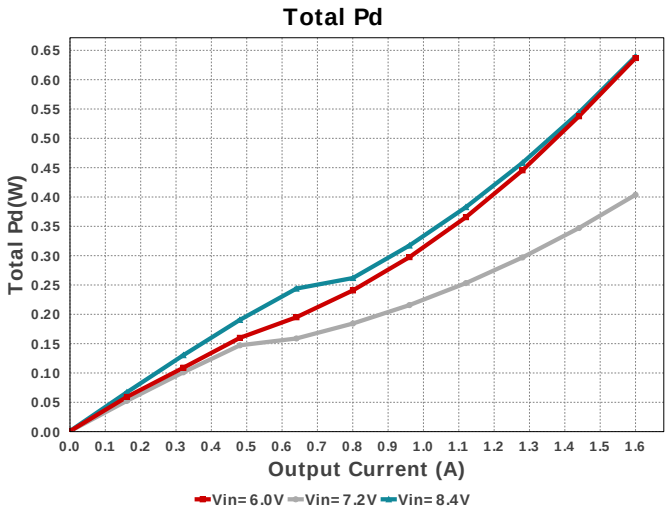


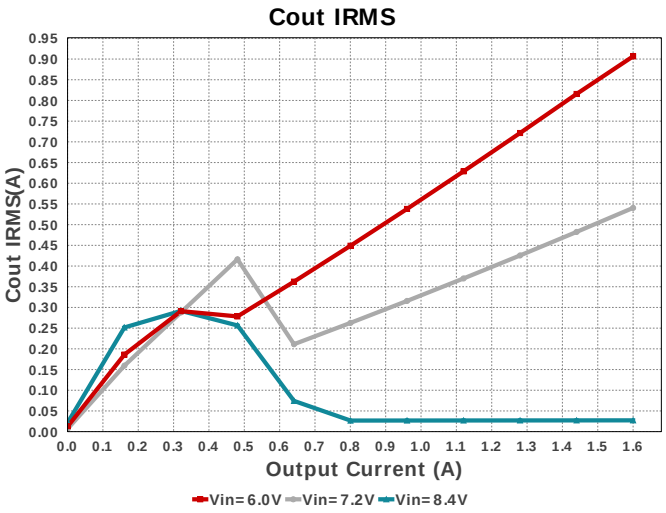


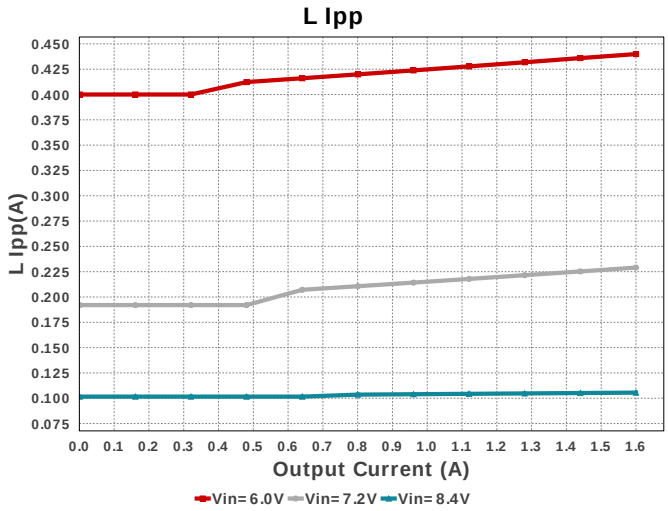


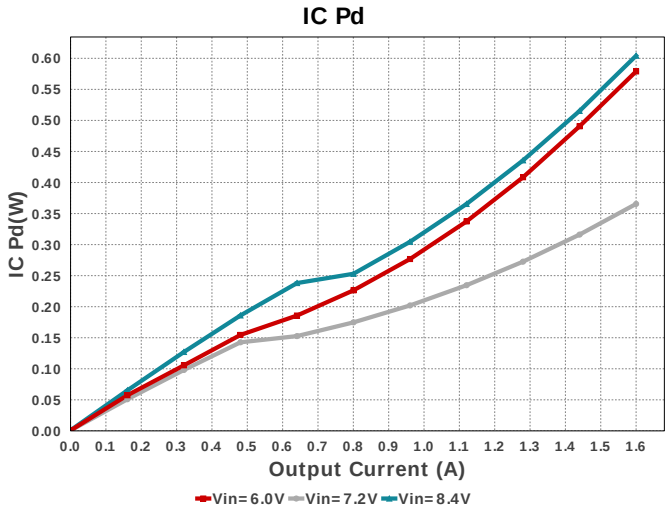


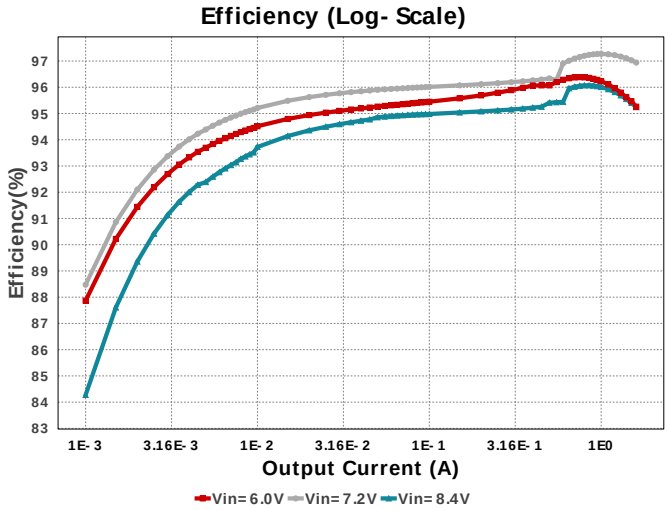












Operating Values

#	Name	Value	Category	Description
1.	BOM Count	11		Total Design BOM count
2.	Total BOM	$1.98		Total BOM Cost
3.	Cin IRMS	126.99 mA	Current	Input capacitor RMS ripple current
4.	Cout IRMS	906.53 mA	Current	Output capacitor RMS ripple current
5.	Coutx IRMS	105.51 mA	Current	Output capacitor_x RMS ripple current
6.	IC Ipk	2.46 A	Current	Peak switch current in IC
7.	Iin Avg	2.24 A	Current	Average input current
8.	L Ipp	439.905 mA	Current	Peak-to-peak inductor ripple current
9.	FootPrint	183.0 mm^2	General	Total Foot Print Area of BOM components
10.	Frequency	2.5 MHz	General	Switching frequency
11.	Mode	BOOST PWM CCM	General	PWM/PFM Mode
12.	Pout	12.8 W	General	Total output power
13.	Duty Cycle	28.024 %	Op Point	Duty cycle
14.	Efficiency	95.26 %	Op Point	Steady state efficiency
15.	IC Tj	66.473 degC	Op Point	IC junction temperature
16.	ICThetaJA	63.0 degC/W	Op Point	IC junction-to-ambient thermal resistance
17.	IOUT_OP	1.6 A	Op Point	Iout operating point
18.	VIN_OP	6.0 V	Op Point	Vin operating point
19.	Vout Actual	8.072 V	Op Point	Vout Actual calculated based on selected voltage divider resistors
20.	Vout Tolerance	1.82 %	Op Point	Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable
21.	Vout p-p	10.802 mV	Op Point	Peak-to-peak output ripple voltage
22.	Cin Pd	16.126 µW	Power	Input capacitor power dissipation
23.	Cout Pd	2.496 mW	Power	Output capacitor power dissipation
24.	Coutx Pd	40.477 µW	Power	Output capacitor_x power loss
25.	IC Pd	578.944 mW	Power	IC power dissipation
26.	L Pd	55.393 mW	Power	Inductor power dissipation
27.	Total Pd	636.914 mW	Power	Total Power Dissipation
28.	Rload_crit	40.9 Ohm		Minimum Rload required during Start up

Design Inputs

#	Name	Value	Description
1.	Iout	1.6	Maximum Output Current
2.	VinMax	8.4	Maximum input voltage
3.	VinMin	6.0	Minimum input voltage
4.	Vout	8.0	Output Voltage
5.	base_pn	TPS63070	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	30.0	Ambient temperature

Design Assistance

1. **TPS63070** Product Folder : http://www.ti.com/product/TPS63070 : contains the data sheet and other resources.