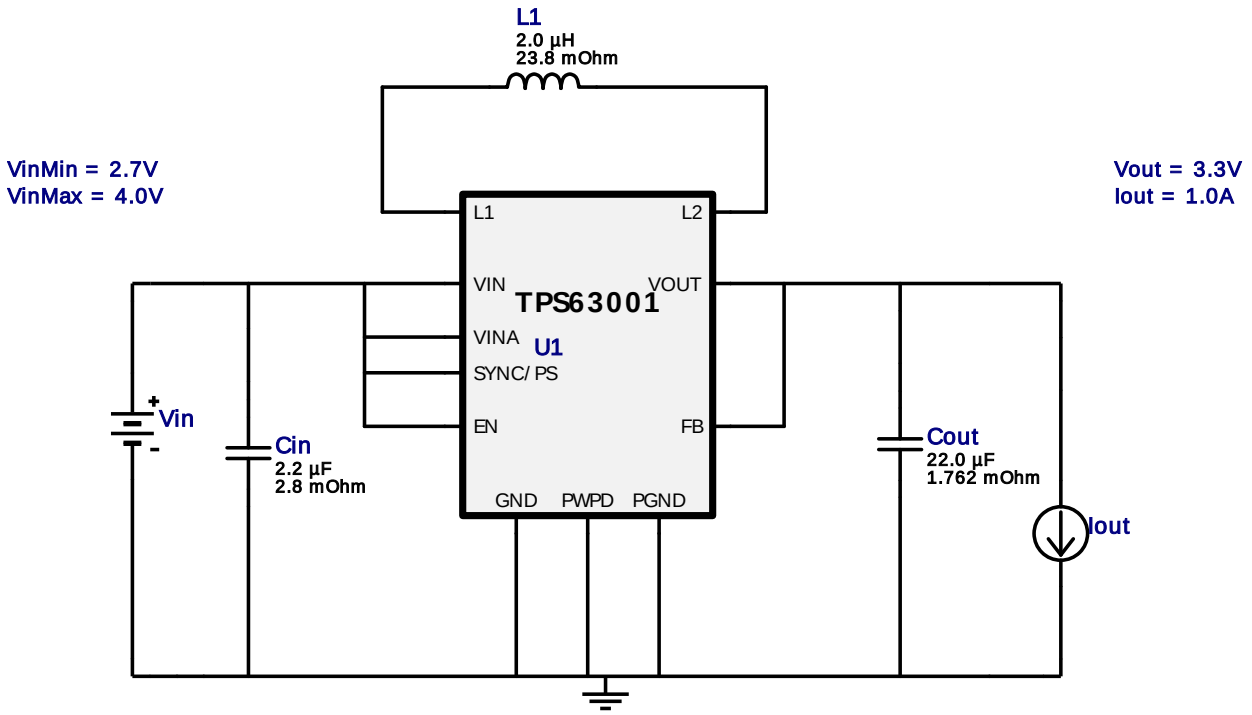
WEBENCH® Design Report

VinMin = 2.7V
VinMax = 4.0V
Vout = 3.3V
Iout = 1.0A

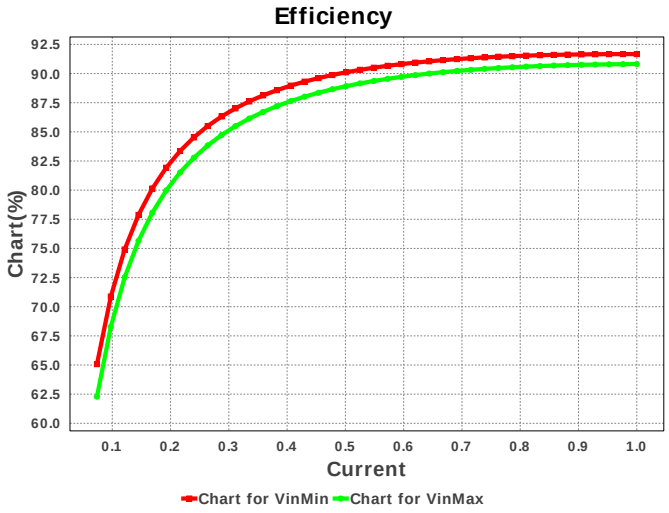
Device = TPS63001DRCR
Topology = Buck_Boost
Created = 8/11/15 6:44:21 AM
BOM Cost = $2.47
Footprint = 155.0 mm²
BOM Count = 4
Total Pd = 0.45W

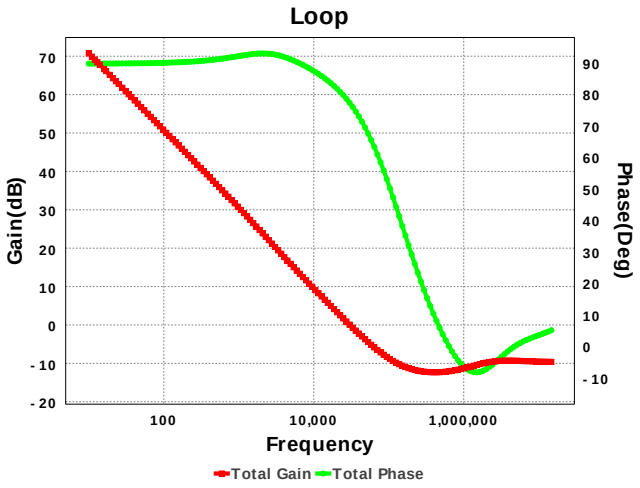
Design : 4320088/16 TPS63001DRCR
TPS63001DRCR 2.7V-4.0V to 3.30V @ 1.0A



Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cin	TDK	C3225X7R2A225K230AB Series= X7R	Cap= 2.2 uF ESR= 2.8 mOhm VDC= 100.0 V IRMS= 9.8247 A	1	$0.19	1210 15 mm²
2.	Cout	TDK	C4532X7R1C226M Series= X7R	Cap= 22.0 uF ESR= 1.762 mOhm VDC= 16.0 V IRMS= 0.0 A	1	$0.41	1812 23 mm²
3.	L1	Sumida	CDR7D28MNNP-2R0NC	L= 2.0 µH DCR= 23.8 mOhm	1	$0.62	CDR7D28MN 92 mm²
4.	U1	Texas Instruments	TPS63001DRCR	Switcher	1	$1.25	MPDS117K 0 mm²





Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	380.0 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	580.0 mA	Current	Output capacitor RMS ripple current
3.	IC Irms	1.23 A	Current	Calculated current across IC
4.	L Ipp Max	203.0 mA	Current	Inductor Peak to Peak Current calculated Max
5.	L Ipp Min	195.0 mA	Current	Inductor Peak to Peak Current calculated Min
6.	L1 Irms	1.23 A	Current	Inductor ripple current
7.	BOM Count	4	General	Total Design BOM count
8.	FootPrint	155.0 mm^2	General	Total Foot Print Area of BOM components
9.	Frequency	1.4 MHz	General	Switching frequency
10.	IC Tolerance	5.0 mV	General	IC Feedback Tolerance
11.	Pout	3.3 W	General	Total output power
12.	Total BOM	$2.47	General	Total BOM Cost
13.	Cin Vdrop	4.02 V	Op_Point	Calculated voltage across input cap
14.	Cout Vdrop	3.32 V	Op_Point	Calculated voltage across output capacitor
15.	ESR Zero Freq	4.248 MHz	Op_Point	ESR Zero Frequency
16.	IC Vdrop	4.02 V	Op_Point	Calculated voltage across IC
17.	LC Conner Freq	25.343 kHz	Op_Point	LC conner frequency
18.	Vout OP	3.3 V	Op_Point	Operational Output Voltage
19.	Cross Freq	30.355 kHz	Op_point	Bode plot crossover frequency
20.	Duty Cycle	82.5 %	Op_point	Duty cycle
21.	Efficiency	91.669 %	Op_point	Steady state efficiency
22.	Gain Marg	-1.0 dB	Op_point	Bode Plot Gain Margin
23.	IC Tj	43.0 degC	Op_point	IC junction temperature
24.	IOUT_OP	1.0 A	Op_point	Iout operating point
25.	Phase Marg	77.441 deg	Op_point	Bode Plot Phase Margin
26.	VIN_OP	4.0 V	Op_point	Vin operating point
27.	Vout p-p	1.1 mV	Op_point	Peak-to-peak output ripple voltage
28.	Cin Pd	412.0 µW	Power	Input capacitor power dissipation
29.	Cout Pd	638.0 µW	Power	Output capacitor power dissipation
30.	IC Pd	448.0 mW	Power	IC power dissipation
31.	M1 Rdson Max	102.0 mOhm	Power	High side FET Rdson max
32.	M1 Rdson Min	101.0 mOhm	Power	High side FET Rdson min
33.	M2 Rdson Max	104.0 mOhm	Power	Low side FET Rdson Max
34.	M2 Rdson Min	102.0 mOhm	Power	Low side FET Rdson Min
35.	Total Pd	448.0 mW	Power	Total Power Dissipation

Design Inputs

#	Name	Value	Description
1.	Iout	1.0	Maximum Output Current
2.	Iout1	1.0	Output Current #1
3.	VinMax	4.0	Maximum input voltage
4.	VinMin	2.7	Minimum input voltage
5.	Vout	3.3	Output Voltage
6.	Vout1	3.3	Output Voltage #1
7.	base_pn	TPS63001	Base Product Number
8.	source	DC	Input Source Type
9.	Ta	30.0	Ambient temperature

Design Assistance

1. **TPS63001** Product Folder : http://www.ti.com/product/TPS63001 : contains the data sheet and other resources.