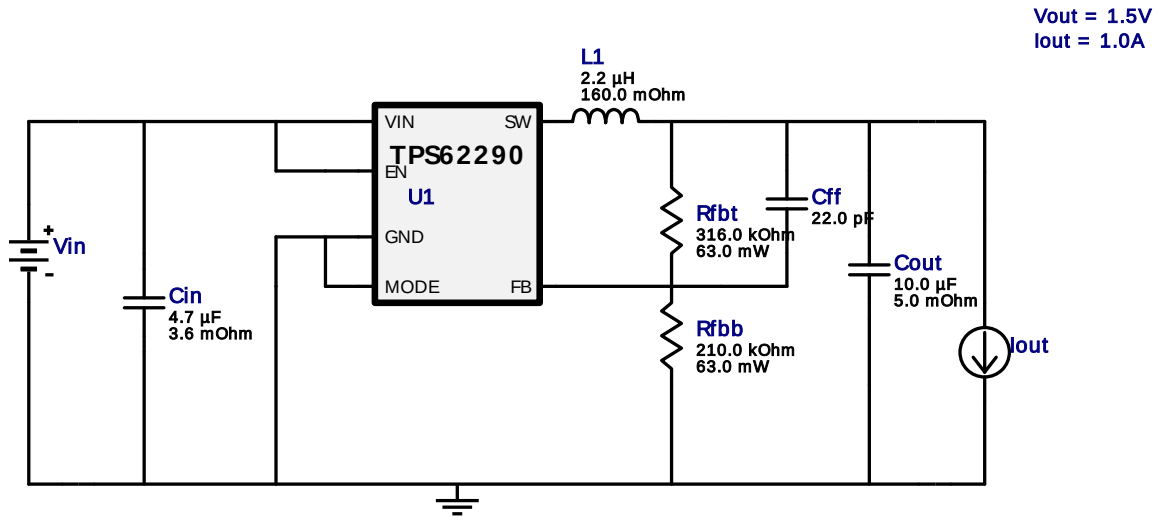
WEBENCH® Design Report

VinMin = 4.0V
VinMax = 6.0V
Vout = 1.5V
Iout = 1.0A

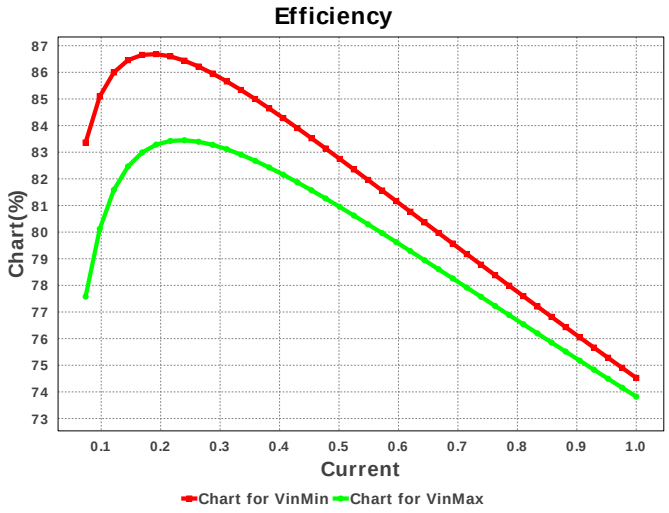
Device = TPS62290DRVR
Topology = Buck
Created = 7/9/13 1:39:35 AM
BOM Cost = $1.32
BOM Count = 7
Total Pd = 0.41W

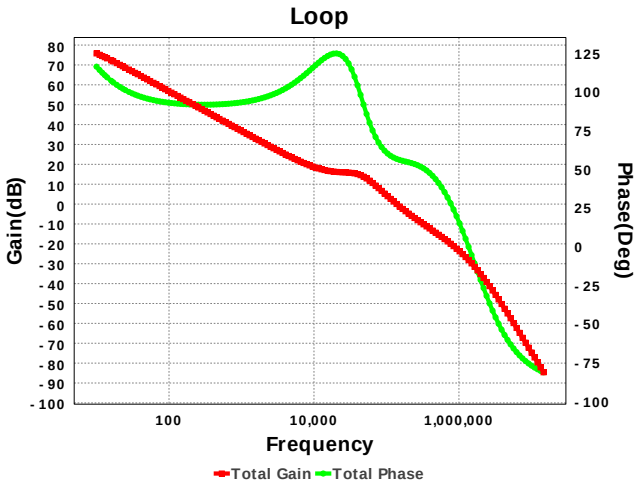
Design : 906020/22 TPS62290DRVR
TPS62290DRVR 4.0V-6.0V to 1.5V @ 1.0A



Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cff	Kemet	C0603C220J5GACTU Series= C0G/NP0	Cap= 22.0 pF VDC= 50.0 V IRMS= 0.0 A	1	$0.01	0603 10 mm²
2.	Cin	TDK	C1608X5R0J475M Series= X5R	Cap= 4.7 uF ESR= 3.6 mOhm VDC= 6.3 V IRMS= 1.6 A	1	$0.03	0603 10 mm²
3.	Cout	TDK	C1608X5R0J106M Series= X5R	Cap= 10.0 uF ESR= 5.0 mOhm VDC= 6.3 V IRMS= 1.9 A	1	$0.06	0603 10 mm²
4.	L1	Coilcraft	XPL2010-222MLB	L= 2.2 µH DCR= 160.0 mOhm	1	$0.35	XPL2010 16 mm²
5.	Rfbb	Vishay-Dale	CRCW0402210KFKED Series= CRCW..e3	Res= 210.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 8 mm²
6.	Rfbt	Vishay-Dale	CRCW0402316KFKED Series= CRCW..e3	Res= 316.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 8 mm²
7.	U1	Texas Instruments	TPS62290DRVR	Switcher	1	$0.85	S-PWSON-N6 17 mm²





Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	500.0 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	85.0 mA	Current	Output capacitor RMS ripple current
3.	IC Irms	1.0 A	Current	Calculated current across IC
4.	L Ipp Max	294.0 mA	Current	Inductor Peak to Peak Current calculated Max
5.	L Ipp Min	233.0 mA	Current	Inductor Peak to Peak Current calculated Min
6.	L1 Irms	1.0 A	Current	Inductor ripple current
7.	BOM Count	7	General	Total Design BOM count
8.	FootPrint	78.0 mm^2	General	Total Foot Print Area of BOM components
9.	Frequency	2.25 MHz	General	Switching frequency
10.	IC Tolerance	6.0 mV	General	IC Feedback Tolerance
11.	Pout	1.5 W	General	Total output power
12.	Total BOM	$1.32	General	Total BOM Cost
13.	Cin Vdrop	6.03 V	Op_Point	Calculated voltage across input cap
14.	Cout Vdrop	1.51 V	Op_Point	Calculated voltage across output capacitor
15.	ESR Zero Freq	3.94 MHz	Op_Point	ESR Zero Frequency
16.	IC Vdrop	6.03 V	Op_Point	Calculated voltage across IC
17.	LC Conner Freq	37.751 kHz	Op_Point	LC conner frequency
18.	Vout OP	1.5 V	Op_Point	Operational Output Voltage
19.	Cross Freq	138.225 kHz	Op_point	Bode plot crossover frequency
20.	Duty Cycle	31.6 %	Op_point	Duty cycle
21.	Efficiency	73.822 %	Op_point	Steady state efficiency
22.	IC Tj	50.0 degC	Op_point	IC junction temperature
23.	IOUT_OP	1.0 A	Op_point	Iout operating point
24.	Gain Marg	-28.217 deg	Op_point	Bode Plot Gain Margin
25.	Phase Marg	56.87 deg	Op_point	Bode Plot Phase Margin
26.	VIN_OP	6.0 V	Op_point	Vin operating point
27.	Vout p-p	2.5 mV	Op_point	Peak-to-peak output ripple voltage
28.	Cin Pd	908.0 µW	Power	Input capacitor power dissipation
29.	Cout Pd	36.0 µW	Power	Output capacitor power dissipation
30.	IC Pd	409.0 mW	Power	IC power dissipation
31.	M1 Rdson Max	383.0 mOhm	Power	High side FET Rdson max
32.	M1 Rdson Min	337.0 mOhm	Power	High side FET Rdson min
33.	M2 Rdson Max	232.0 mOhm	Power	Low side FET Rdson Max
34.	M2 Rdson Min	187.0 mOhm	Power	Low side FET Rdson Min
35.	Total Pd	409.0 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	6.0	Maximum input voltage
4.	VinMin	4.0	Minimum input voltage
5.	Vout	1.5	Output Voltage
6.	Vout1	1.5	Output Voltage #1
7.	base_pn	TPS62290	Base Product Number
8.	source	DC	Input Source Type
9.	Ta	30.0	Ambient temperature

Design Assistance

1. **TPS62290** Product Folder : http://www.ti.com/product/tps62290 : contains the data sheet and other resources.