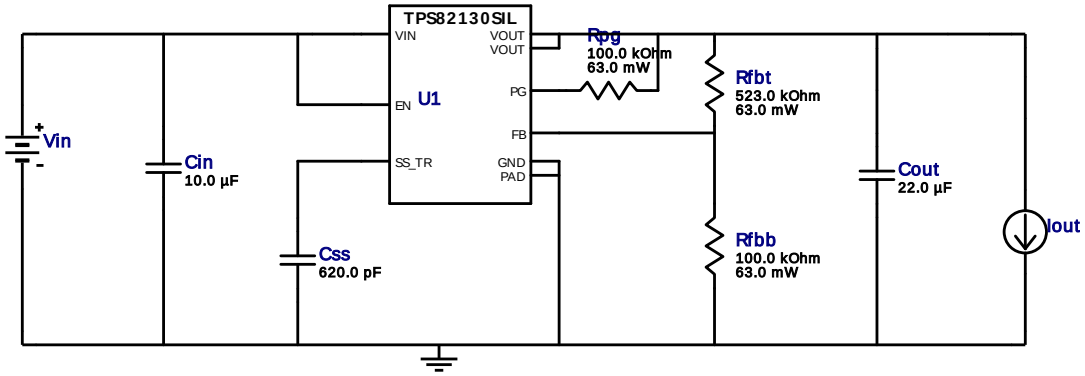
WEBENCH® Design Report

VinMin = 9.75V
VinMax = 10.25V
Vout = 5.0V
Iout = 1.5A

Device = TPS82130SILR
Topology = Buck
Created = 7/12/16 12:34:30 AM
BOM Cost = $2.56
BOM Count = 7
Total Pd = 0.63W

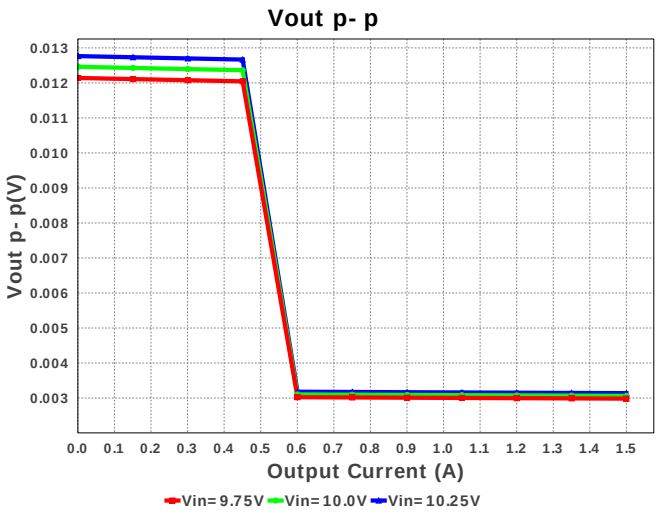
Design : 4737126/7 TPS82130SILR
TPS82130SILR 9.75V-10.25V to 5.00V @ 1.5A

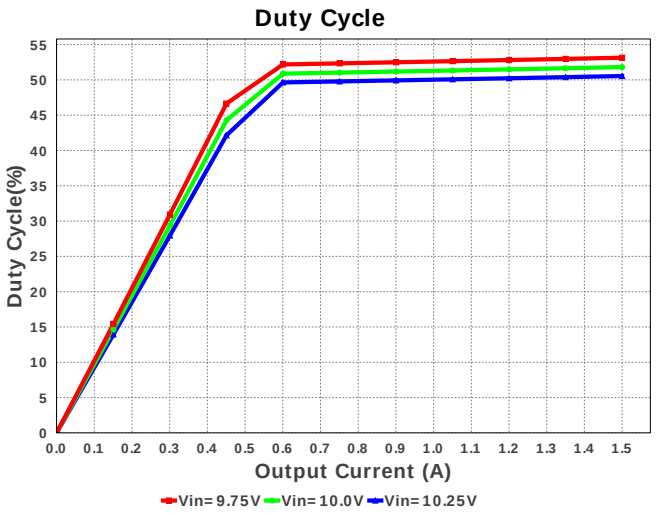
Vout = 5.0V
Iout = 1.5A

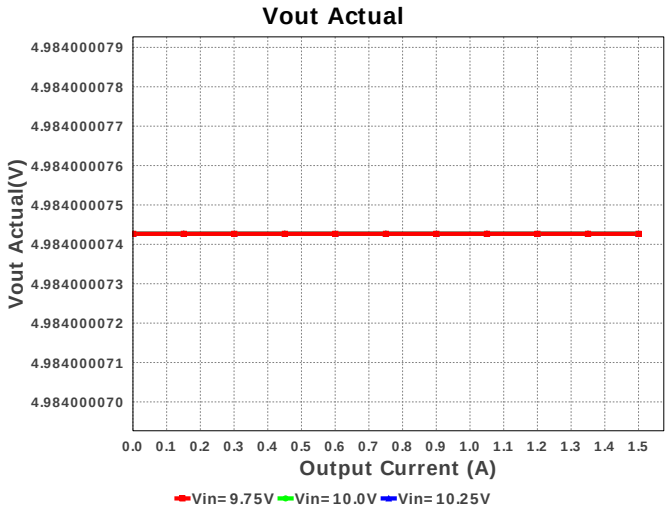


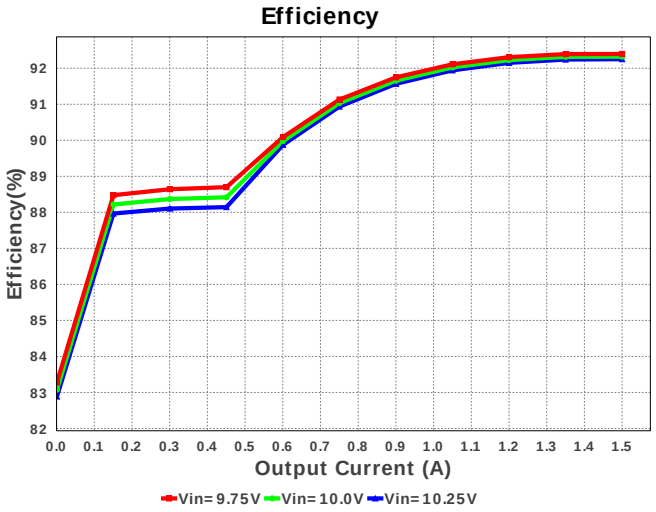
Electrical BOM

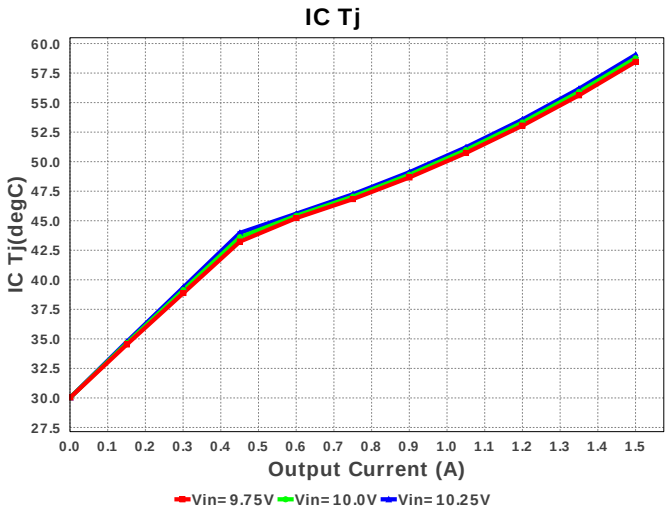
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cin	Taiyo Yuden	EMK212BJ106KG-T Series= X5R	Cap= 10.0 uF VDC= 16.0 V IRMS= 0.0 A	1	$0.05	0805 7 mm²
2.	Cout	Taiyo Yuden	LMK212BJ226MG-T Series= X5R	Cap= 22.0 uF VDC= 10.0 V IRMS= 0.0 A	1	$0.12	0805 7 mm²
3.	Css	Samsung Electro-Mechanics	CL21C621JBCNNNC Series= C0G/NP0	Cap= 620.0 pF VDC= 50.0 V IRMS= 0.0 A	1	$0.01	0805 7 mm²
4.	Rfbb	Vishay-Dale	CRCW0402100KFKED Series= CRCW..e3	Res= 100.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm²
5.	Rfbt	Vishay-Dale	CRCW0402523KFKED Series= CRCW..e3	Res= 523.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm²
6.	Rpg	Vishay-Dale	CRCW0402100KFKED Series= CRCW..e3	Res= 100.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm²
7.	U1	Texas Instruments	TPS82130SILR	Switcher	1	$2.35	SIL0008D_SMD 15 mm²

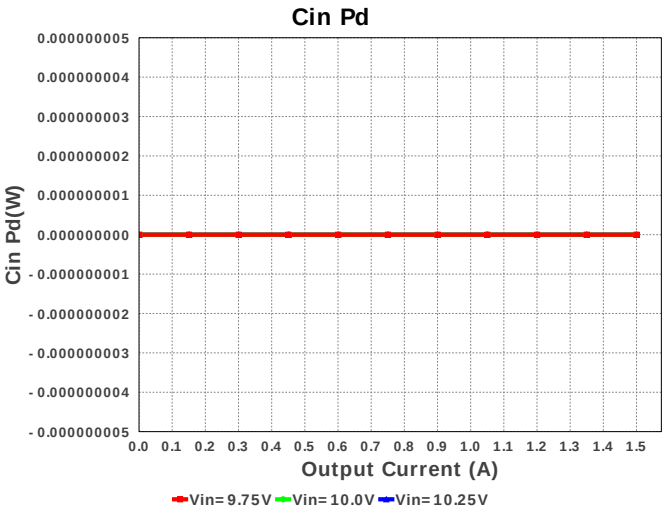


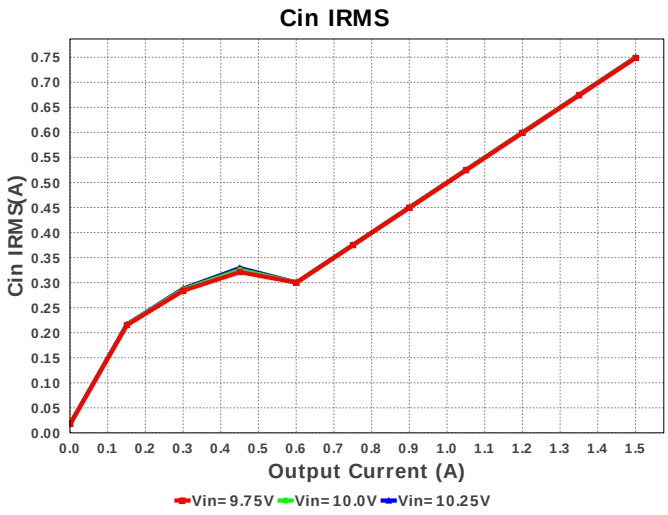


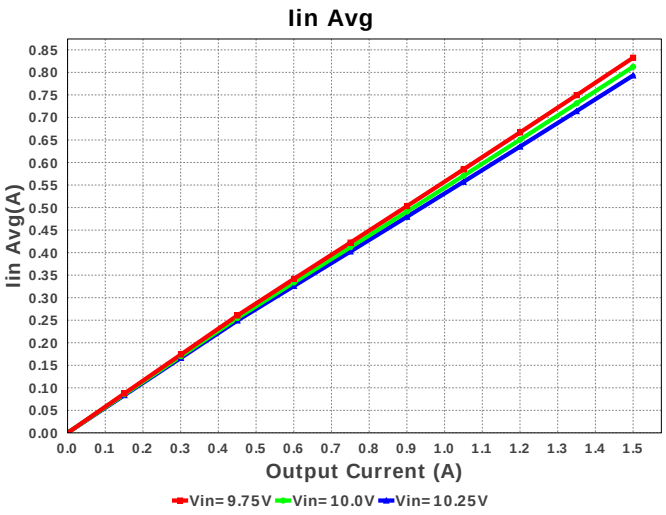


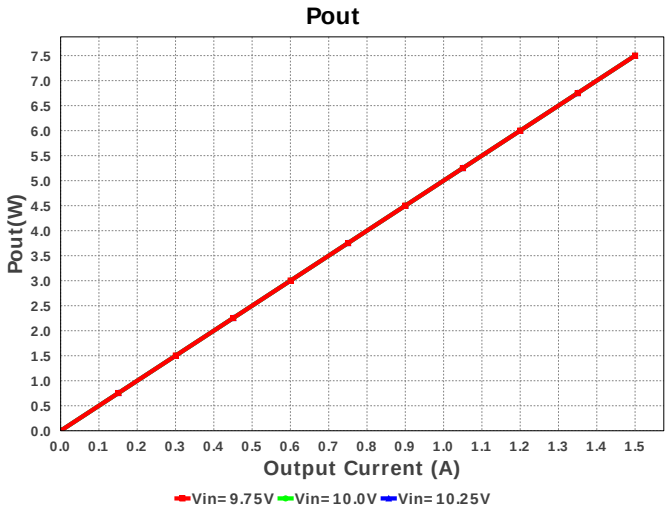


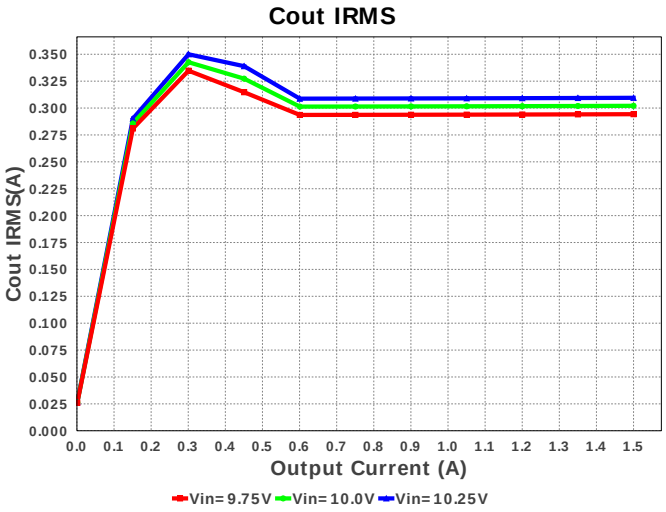


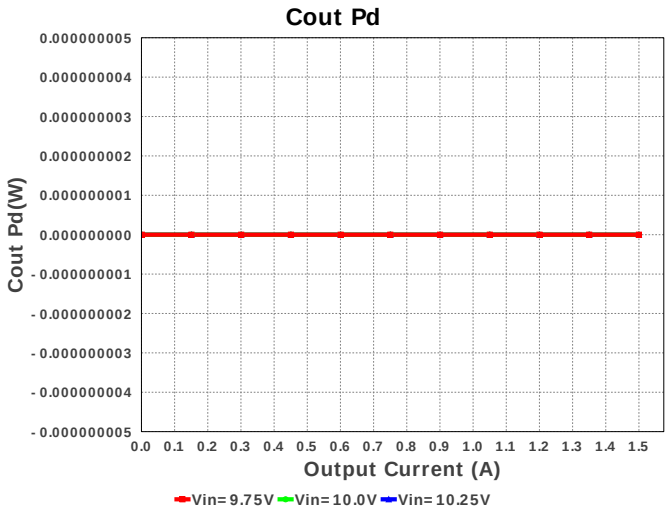


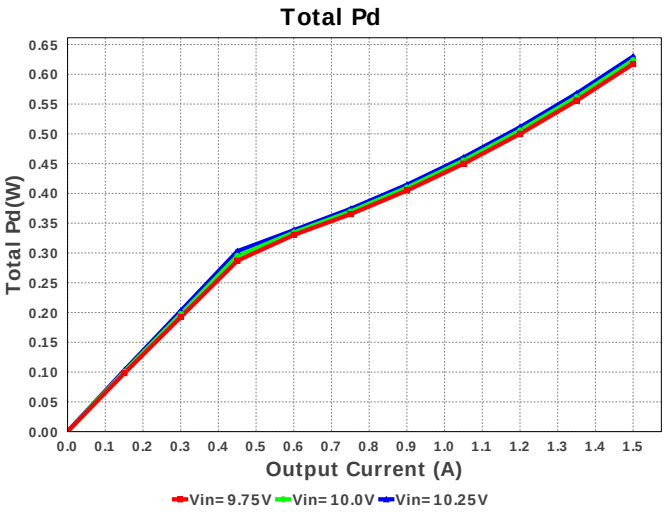


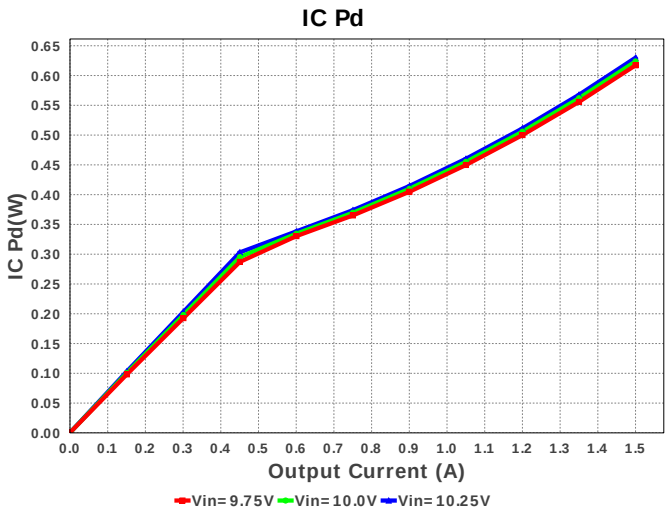


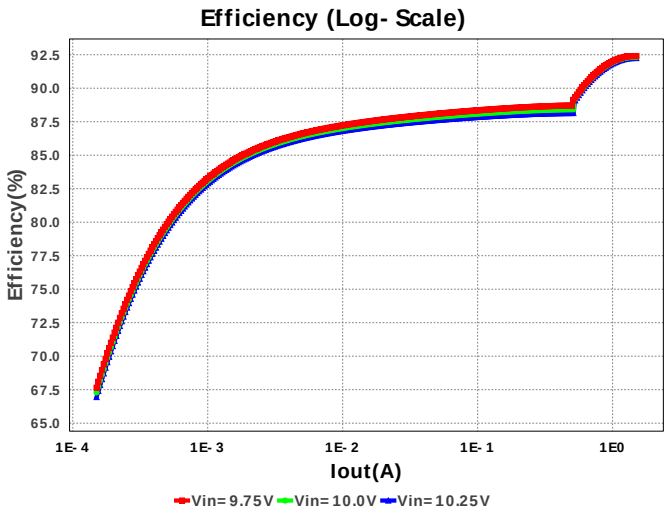












Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	749.956 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	309.516 mA	Current	Output capacitor RMS ripple current
3.	Iin Avg	793.16 mA	Current	Average input current
4.	BOM Count	7	General	Total Design BOM count
5.	FootPrint	44.0 mm^2	General	Total Foot Print Area of BOM components
6.	Frequency	2.25 MHz	General	Switching frequency
7.	Pout	7.5 W	General	Total output power
8.	Total BOM	$2.56	General	Total BOM Cost
9.	ICThetaJA Effective	46.1 degC/W	Op_Point	Effective IC Junction-to-Ambient Thermal Resistance
10.	Vout Actual	4.984 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
11.	Vout OP	5.0 V	Op_Point	Operational Output Voltage
12.	Duty Cycle	50.544 %	Op_point	Duty cycle
13.	Efficiency	92.252 %	Op_point	Steady state efficiency
14.	IC Tj	59.04 degC	Op_point	IC junction temperature
15.	IOUT_OP	1.5 A	Op_point	Iout operating point
16.	VIN_OP	10.25 V	Op_point	Vin operating point
17.	Vout p-p	3.139 mV	Op_point	Peak-to-peak output ripple voltage
18.	Cin Pd	0.0 W	Power	Input capacitor power dissipation
19.	Cout Pd	0.0 W	Power	Output capacitor power dissipation
20.	IC Pd	629.941 mW	Power	IC power dissipation
21.	Total Pd	629.904 mW	Power	Total Power Dissipation
22.	Vout Tolerance	4.62 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	1.5	Maximum Output Current
2.	SoftStart	0.293 ms	Soft Start Time (ms)
3.	VinMax	10.25	Maximum input voltage
4.	VinMin	9.75	Minimum input voltage
5.	Vout	5.0	Output Voltage
6.	base_pn	TPS82130	Texas Instruments Base Part Number
7.	source	DC	Input Source Type
8.	ta	30.0	Ambient temperature

Design Assistance

1. Feature Highlights: DCS-Control(TM) Architecture with up to 3A output current, Power module with integrated inductor, 3V to 17V Input Voltage Range, Adjustable output voltage from 0.9V to 5V, Optional softstart capacitor for slow startup, Power Save Mode for light load efficiency, 100% duty cycle for lowest dropout, PG=Low when device is in shutdown through EN or Thermal Shutdown

2. TPS82130 Product Folder : http://www.ti.com/product/TPS82130 : contains the data sheet and other resources.