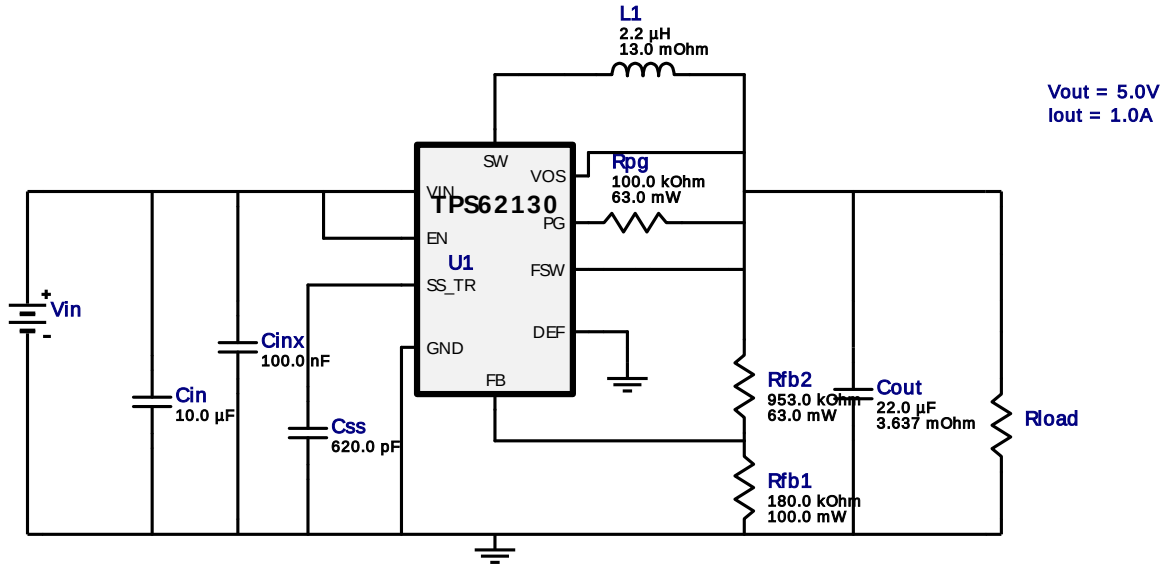
WEBENCH® Design Report

VinMin = 12.0V
VinMax = 13.0V
Vout = 5.0V
Iout = 1.0A

Device = TPS62130RGTR
Topology = Buck
Created = 7/15/16 9:06:20 PM
BOM Cost = $1.35
BOM Count = 9
Total Pd = 0.31W

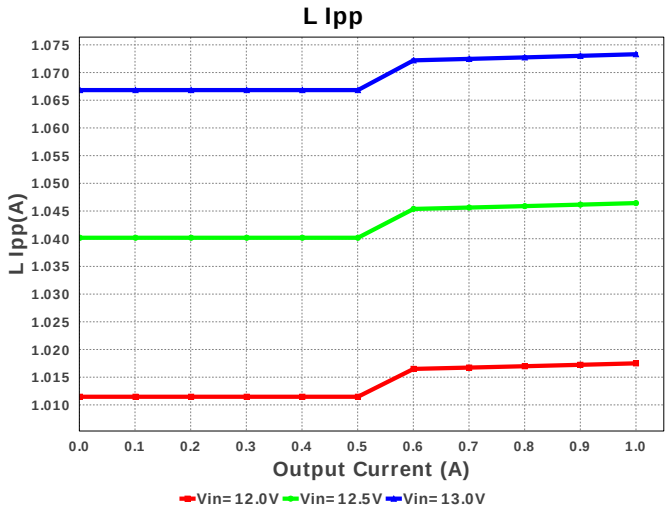
Design : 4742013/53 TPS62130RGTR
TPS62130RGTR 12.0V-13.0V to 5.00V @ 1.0A

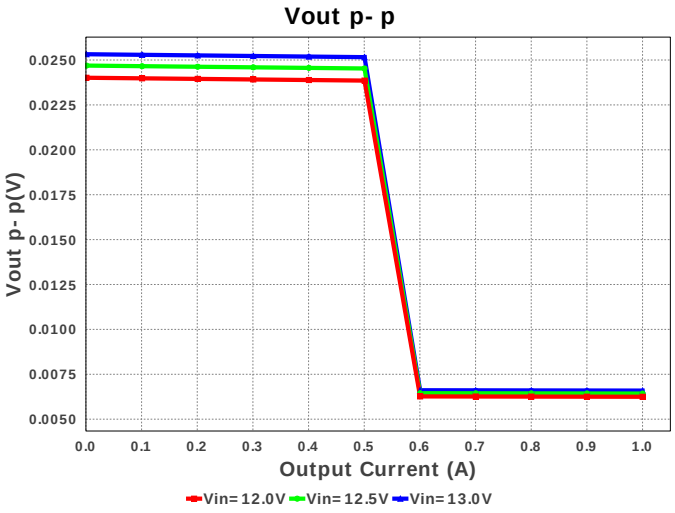


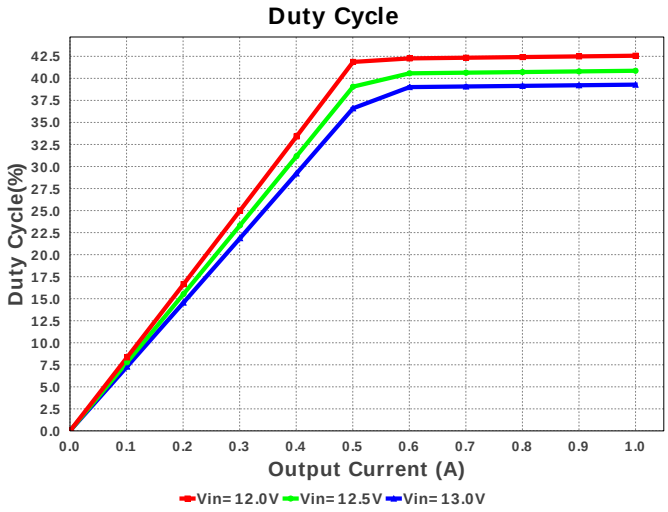
Electrical BOM

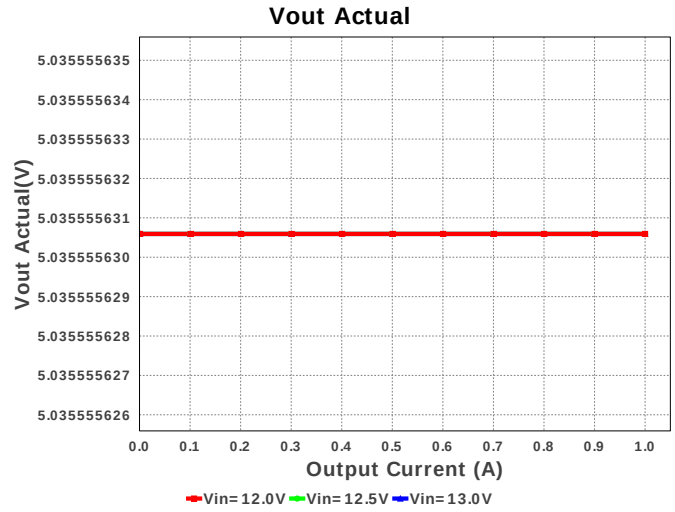
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cin	Taiyo Yuden	TMK316BJ106KL-T Series= X5R	Cap= 10.0 uF VDC= 25.0 V IRMS= 0.0 A	1	$0.05	1206 11 mm²
2.	Cinx	Kemet	C0603C104K3RACTU Series= X7R	Cap= 100.0 nF VDC= 25.0 V IRMS= 0.0 A	1	$0.01	0603 5 mm²
3.	Cout	MuRata	GRM31CR61A226KE19L Series= X5R	Cap= 22.0 uF ESR= 3.637 mOhm VDC= 10.0 V IRMS= 3.56456 A	1	$0.07	1206_190 11 mm²
4.	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
5.	L1	Bourns	SRN8040-2R2Y	L= 2.2 µH DCR= 13.0 mOhm	1	$0.22	SRN8040 100 mm²
6.	Rfb1	Yageo America	RC0603FR-07180KL Series= ?	Res= 180.0 kOhm Power= 100.0 mW Tolerance= 1.0%	1	$0.01	0603 5 mm²
7.	Rfb2	Vishay-Dale	CRCW0402953KFKED Series= CRCW..e3	Res= 953.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm²
8.	Rpg	Vishay-Dale	CRCW0402100KFKED Series= CRCW..e3	Res= 100.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm²

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
9.	U1	Texas Instruments	TPS62130RGTR	Switcher	1	$0.96	 S-PVQFN-N16 17 mm^2

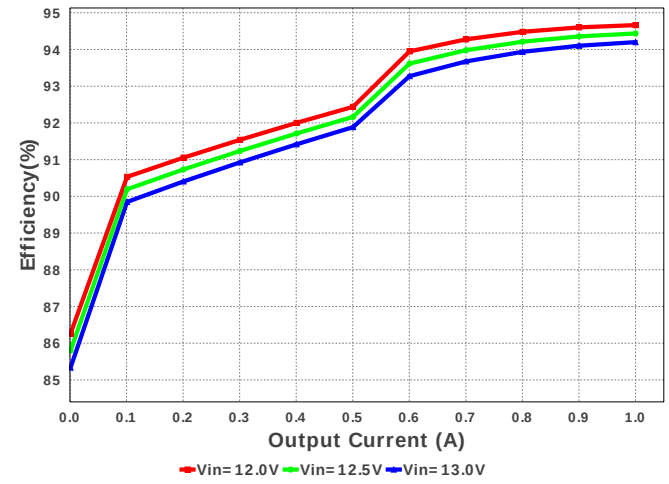




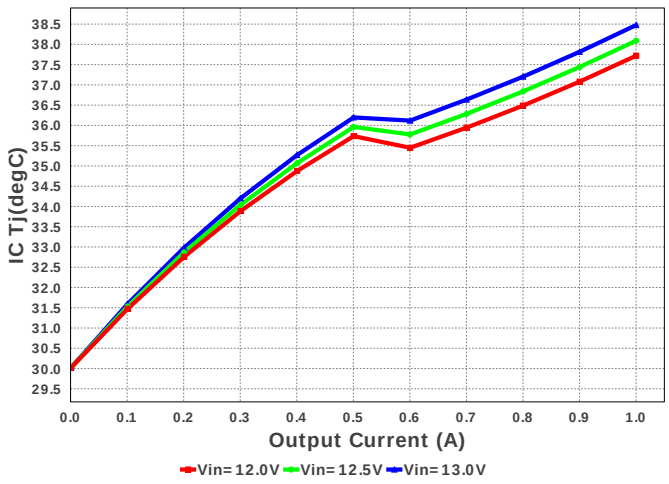




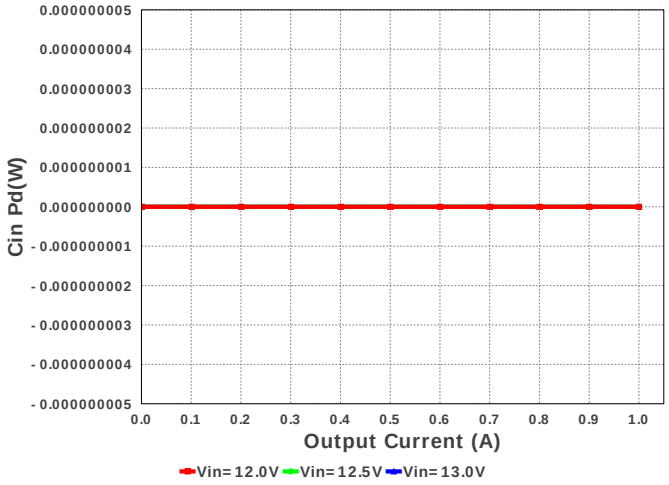
Efficiency



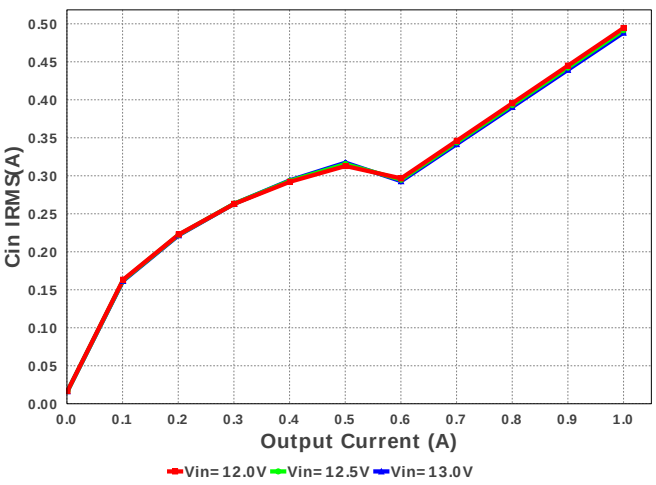
IC Tj



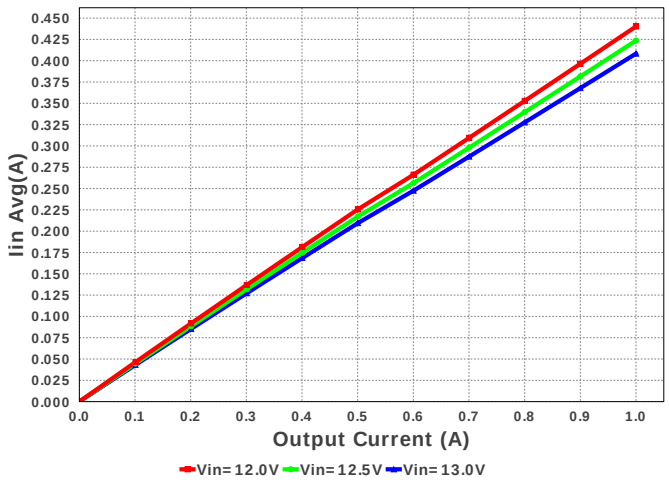
Cin Pd



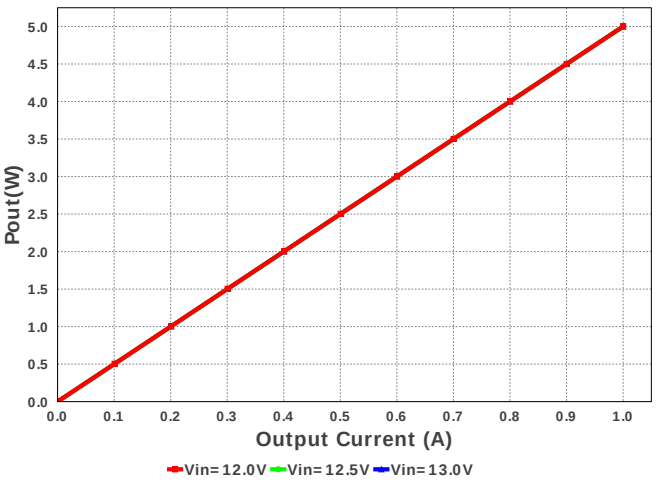
Cin IRMS

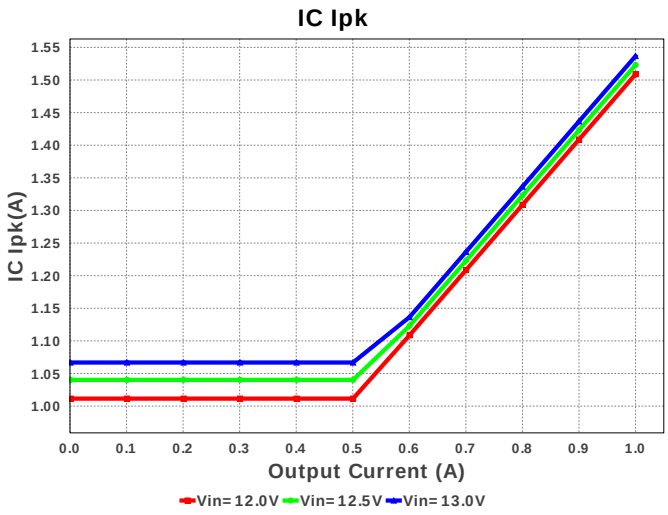


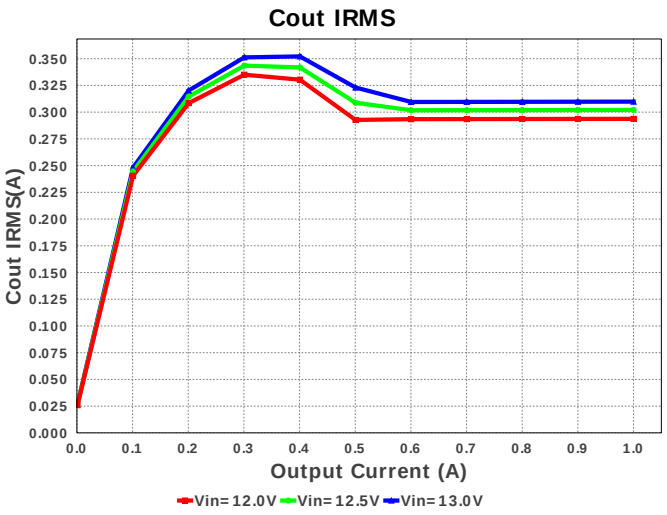
Iin Avg

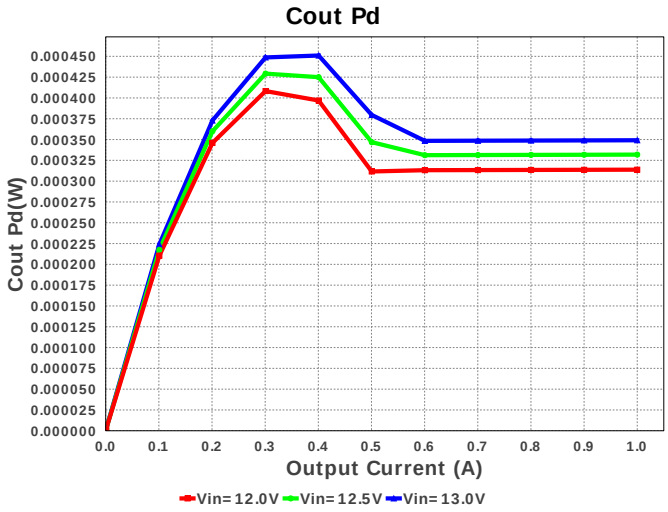


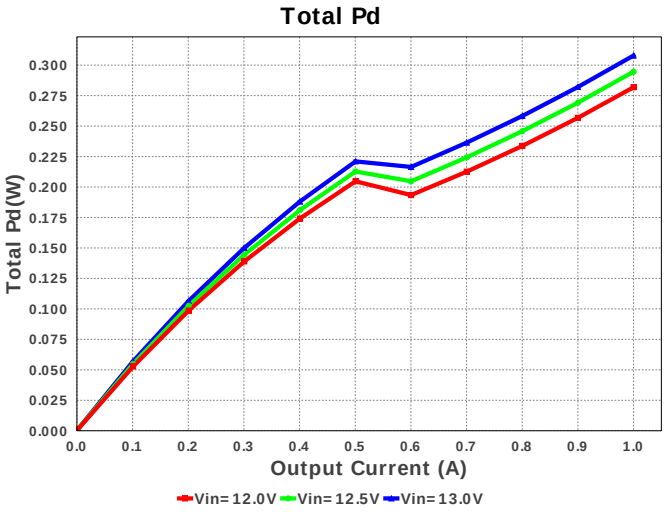
Pout

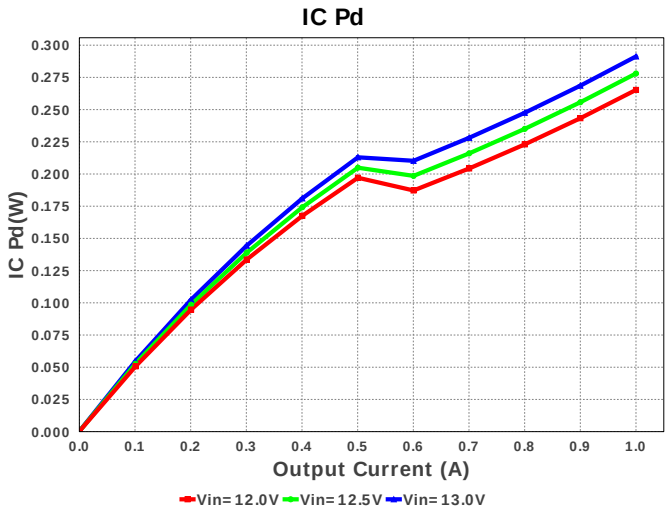


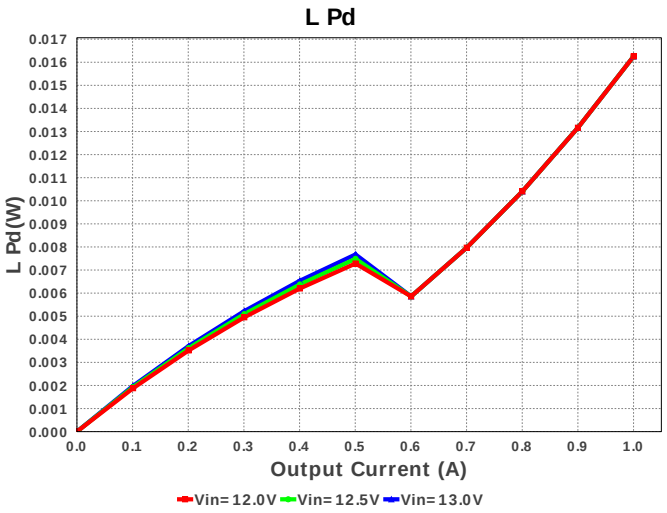


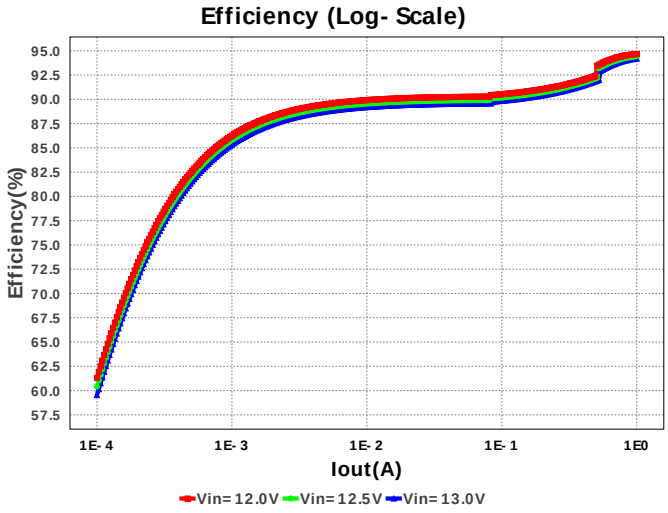












Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	488.393 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	309.836 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	1.537 A	Current	Peak switch current in IC
4.	Iin Avg	408.3 mA	Current	Average input current
5.	L Ipp	1.073 A	Current	Peak-to-peak inductor ripple current
6.	BOM Count	9	General	Total Design BOM count
7.	FootPrint	161.0 mm^2	General	Total Foot Print Area of BOM components
8.	Frequency	1.331 MHz	General	Switching frequency
9.	Pout	5.0 W	General	Total output power
10.	Total BOM	$1.35	General	Total BOM Cost
11.	Vout Actual	5.036 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
12.	Vout OP	5.0 V	Op_Point	Operational Output Voltage
13.	Duty Cycle	39.289 %	Op_point	Duty cycle
14.	Efficiency	94.2 %	Op_point	Steady state efficiency
15.	IC Tj	38.476 degC	Op_point	IC junction temperature
16.	ICThetaJA	29.1 degC/W	Op_point	IC junction-to-ambient thermal resistance
17.	IOUT_OP	1.0 A	Op_point	Iout operating point
18.	VIN_OP	13.0 V	Op_point	Vin operating point
19.	Vout p-p	6.592 mV	Op_point	Peak-to-peak output ripple voltage
20.	Cin Pd	0.0 W	Power	Input capacitor power dissipation
21.	Cout Pd	349.147 µW	Power	Output capacitor power dissipation
22.	IC Pd	291.257 mW	Power	IC power dissipation
23.	L Pd	16.25 mW	Power	Inductor power dissipation
24.	Total Pd	307.858 mW	Power	Total Power Dissipation
25.	Vout Tolerance	3.53 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	1.0	Maximum Output Current
2.	VinMax	13.0	Maximum input voltage
3.	VinMin	12.0	Minimum input voltage
4.	Vout	5.0	Output Voltage
5.	base_pn	TPS62130	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	30.0	Ambient temperature

Design Assistance

1. Feature Highlights: DCS-Control(TM) Architecture with upto 3A output current, 3V to 17V Input Voltage Range, Adjustable output voltage from 0.9V to 6VSelectable operating frequency, Optional Softstart Capacitor for slow startup, Tracking,Pin selectable output voltage (nominal, +5%) Seamless Power Save Mode for Light Load Efficiency, Power Good Output, 100% Duty Cycle mode, Short Circuit Protection, Thermal Shutdown

2. **TPS62130** Product Folder : http://www.ti.com/product/TPS62130 : contains the data sheet and other resources.