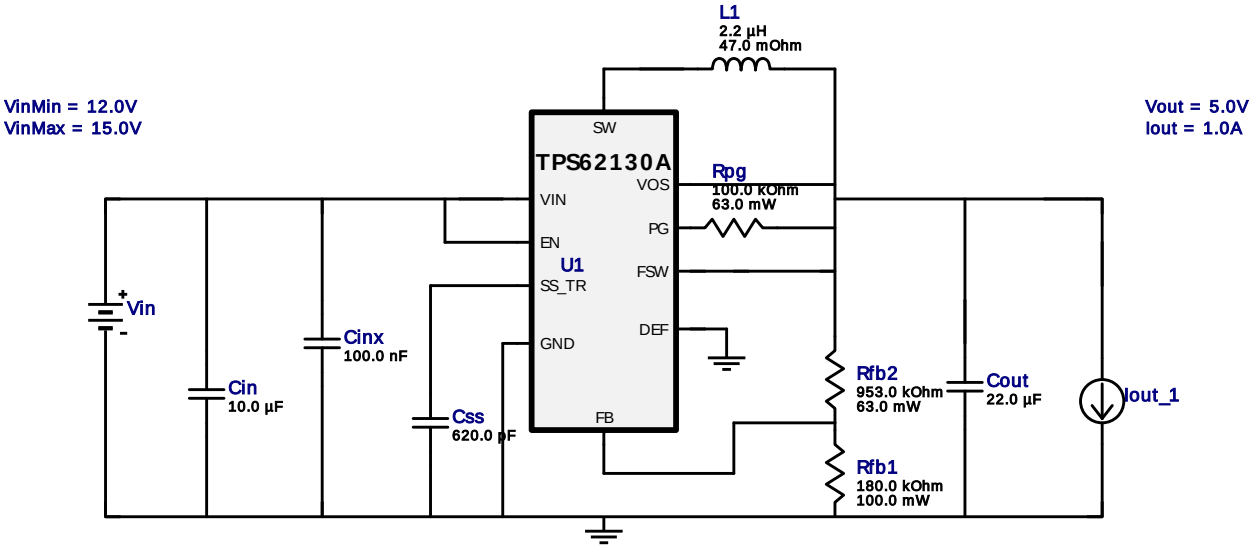
WEBENCH® Design Report

VinMin = 12.0V
VinMax = 15.0V
Vout = 5.0V
Iout = 1.0A

Device = TPS62130ARGTR
Topology = Buck
Created = 7/2/15 5:24:18 AM
BOM Cost = $1.41
Footprint = 94.0 mm²
BOM Count = 9
Total Pd = 0.4W

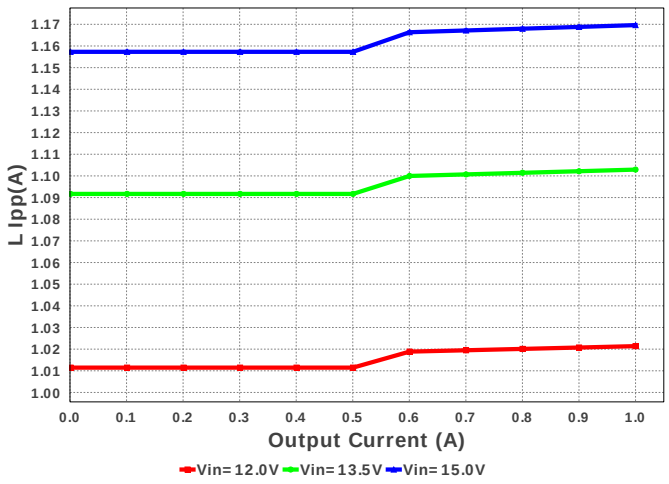
Design : 4213411/1 TPS62130ARGTR
TPS62130ARGTR 12.0V-15.0V to 5.00V @ 1.0A



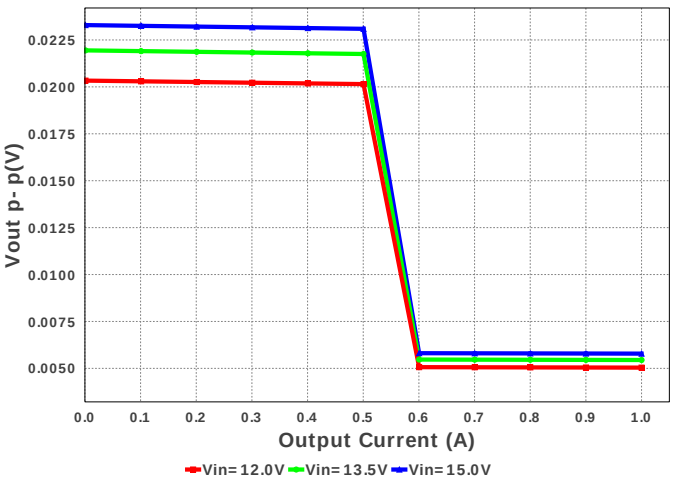
Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cin	MuRata	GRM219R61E106KA12 Series= X5R	Cap= 10.0 uF VDC= 25.0 V IRMS= 0.0 A	1	$0.05	0805 7 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 VDC= 10.0 V IRMS= 0.0 A	1	$0.08	1206 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	SDR0403-2R2ML	L= 2.2 µH DCR= 47.0 mOhm	1	$0.18	SDR0403 28 mm²
6.	Rfb1	Susumu Co Ltd	RR1220P-184-D Series= 264	Res= 180.0 kOhm Power= 100.0 mW Tolerance= 0.5%	1	$0.01	0805 7 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
9.	U1	Texas Instruments	TPS62130ARGTR	Switcher	1	$1.05	S-PVQFN-N16 25 mm²

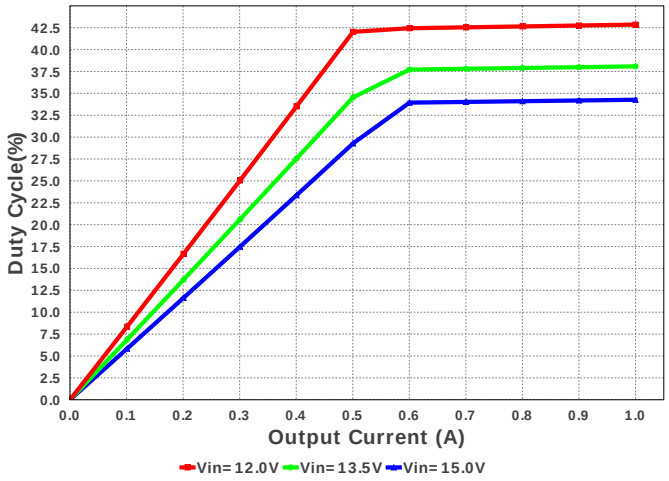
L Ipp



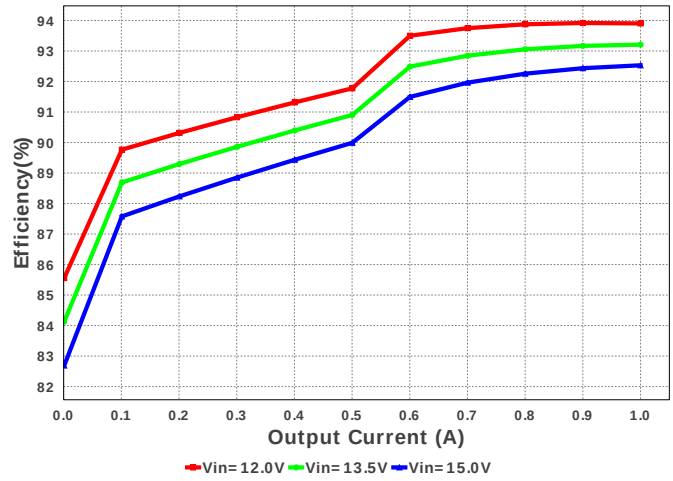
Vout p- p



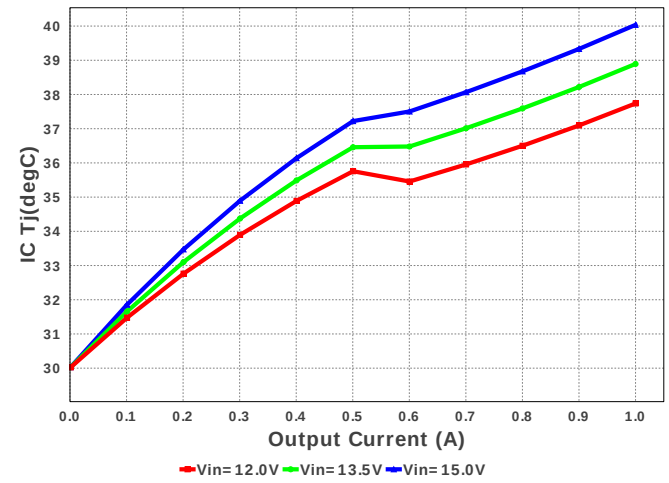
Duty Cycle



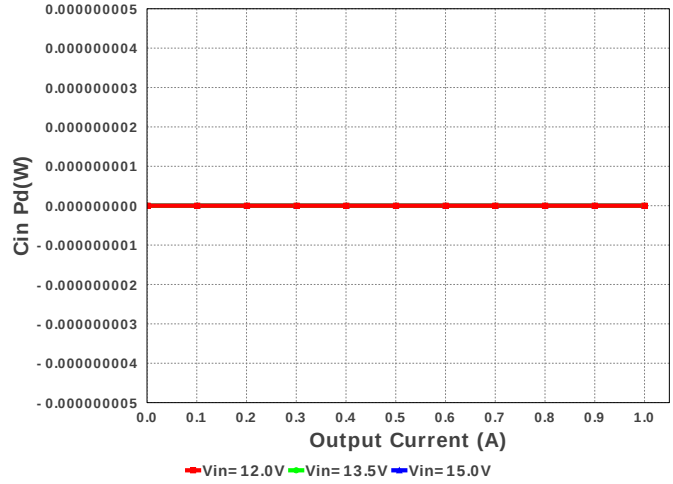
Efficiency

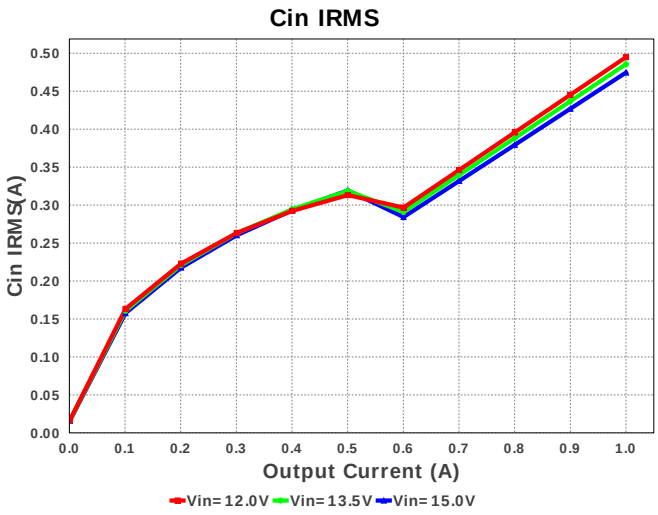


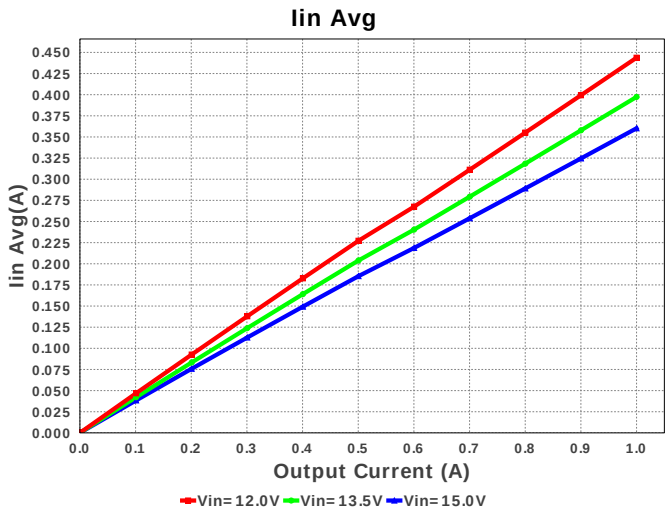
IC Tj

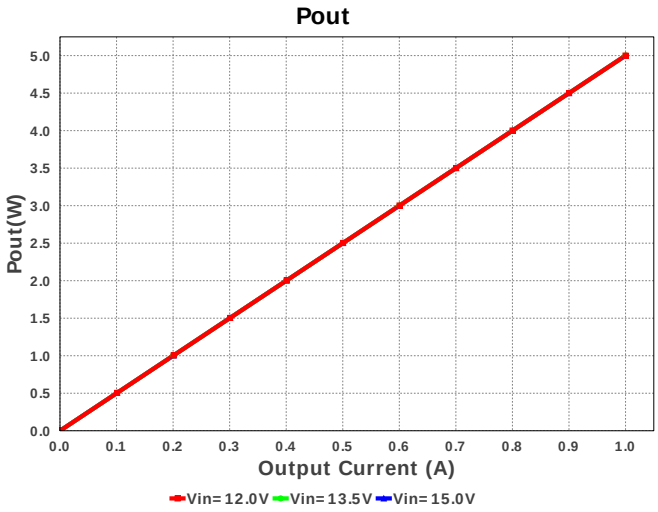


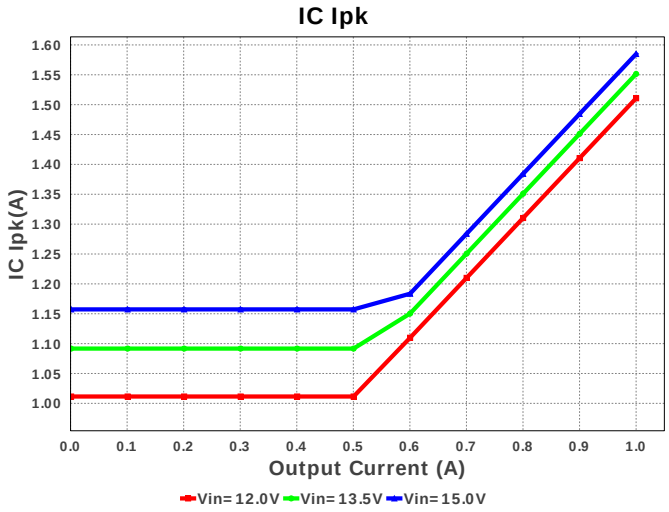
Cin Pd

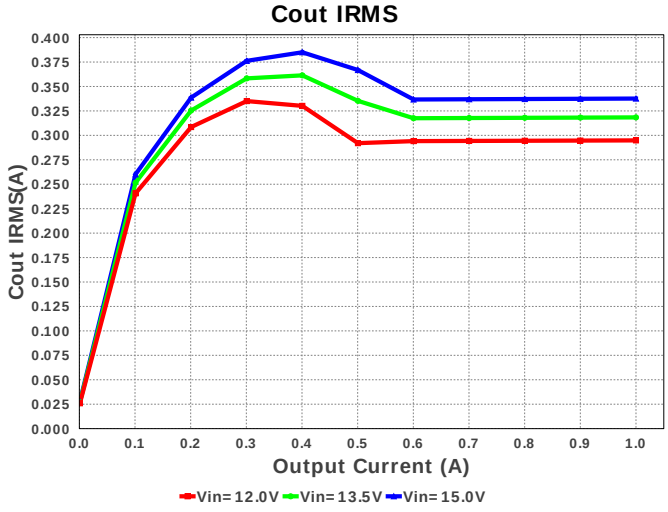


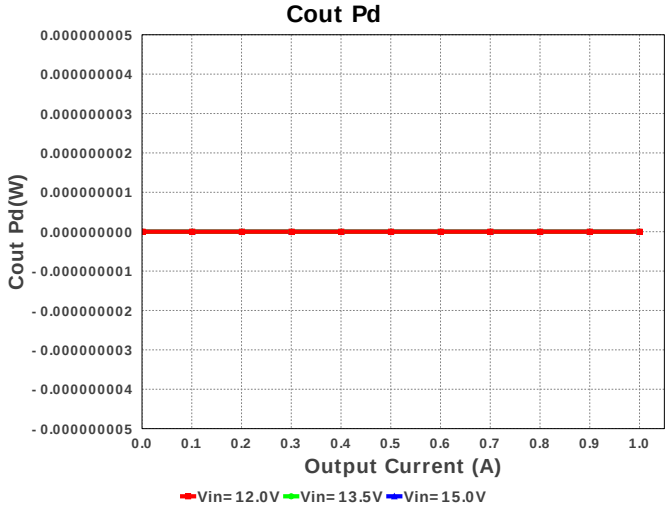


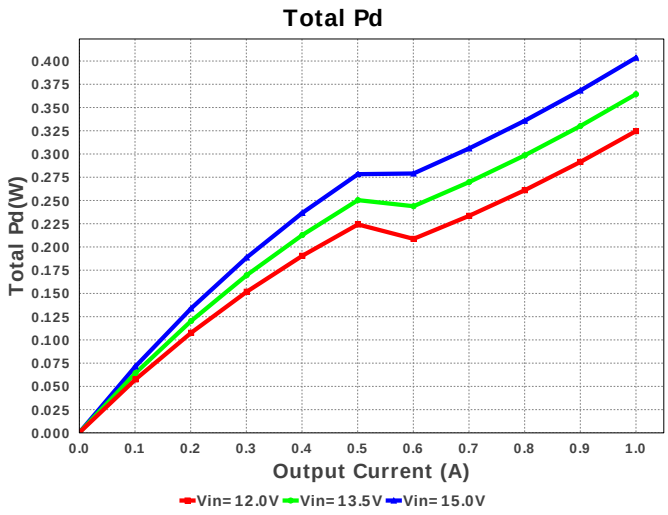


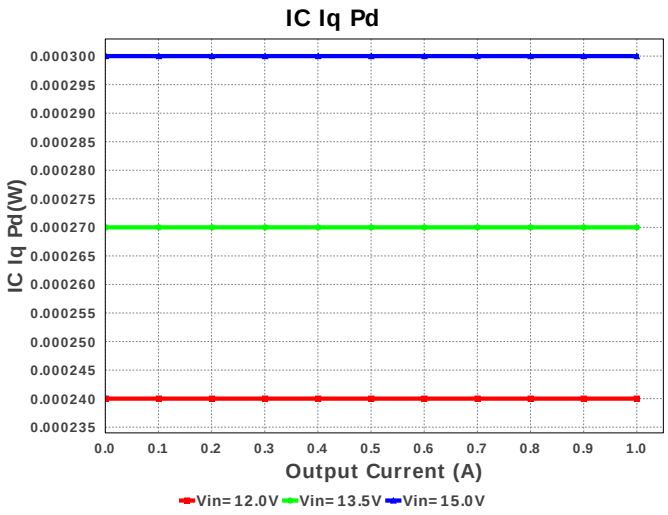


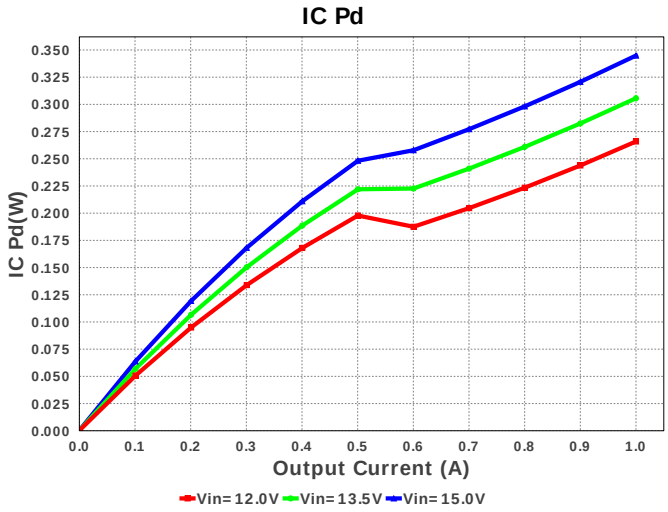


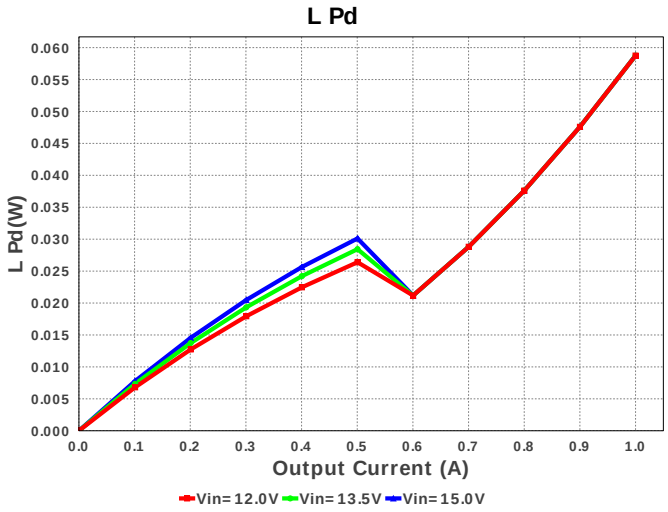


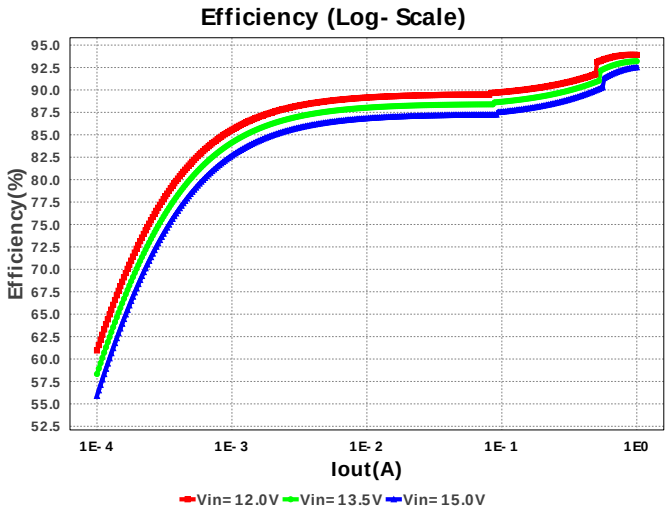












Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	474.609 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	337.646 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	1.585 A	Current	Peak switch current in IC
4.	Iin Avg	360.24 mA	Current	Average input current
5.	L Ipp	1.17 A	Current	Peak-to-peak inductor ripple current
6.	BOM Count	9	General	Total Design BOM count
7.	FootPrint	94.0 mm^2	General	Total Foot Print Area of BOM components
8.	Frequency	1.332 MHz	General	Switching frequency
9.	Pout	5.0 W	General	Total output power
10.	Total BOM	$1.41	General	Total BOM Cost
11.	Vout OP	5.0 V	Op_Point	Operational Output Voltage

#	Name	Value	Category	Description
12.	Duty Cycle	34.269 %	Op_point	Duty cycle
13.	Efficiency	92.531 %	Op_point	Steady state efficiency
14.	IC Tj	40.035 degC	Op_point	IC junction temperature
15.	ICThetaJA	29.1 degC/W	Op_point	IC junction-to-ambient thermal resistance
16.	IOUT_OP	1.0 A	Op_point	Iout operating point
17.	VIN_OP	15.0 V	Op_point	Vin operating point
18.	Vout p-p	5.786 mV	Op_point	Peak-to-peak output ripple voltage
19.	Cin Pd	0.0 W	Power	Input capacitor power dissipation
20.	Cout Pd	0.0 W	Power	Output capacitor power dissipation
21.	IC Iq Pd	300.0 µW	Power	IC Iq Pd
22.	IC Pd	344.852 mW	Power	IC power dissipation
23.	L Pd	58.75 mW	Power	Inductor power dissipation
24.	Total Pd	403.595 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	15.0	Maximum input voltage
4.	VinMin	12.0	Minimum input voltage
5.	Vout	5.0	Output Voltage
6.	Vout1	5.0	Output Voltage #1
7.	base_pn	TPS62130A	Base Product Number
8.	source	DC	Input Source Type
9.	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, PG=Low when device is in shutdown through EN, UVLO or Thermal Shutdown

2. **TPS62130A** Product Folder : http://www.ti.com/product/TPS62130A : contains the data sheet and other resources.