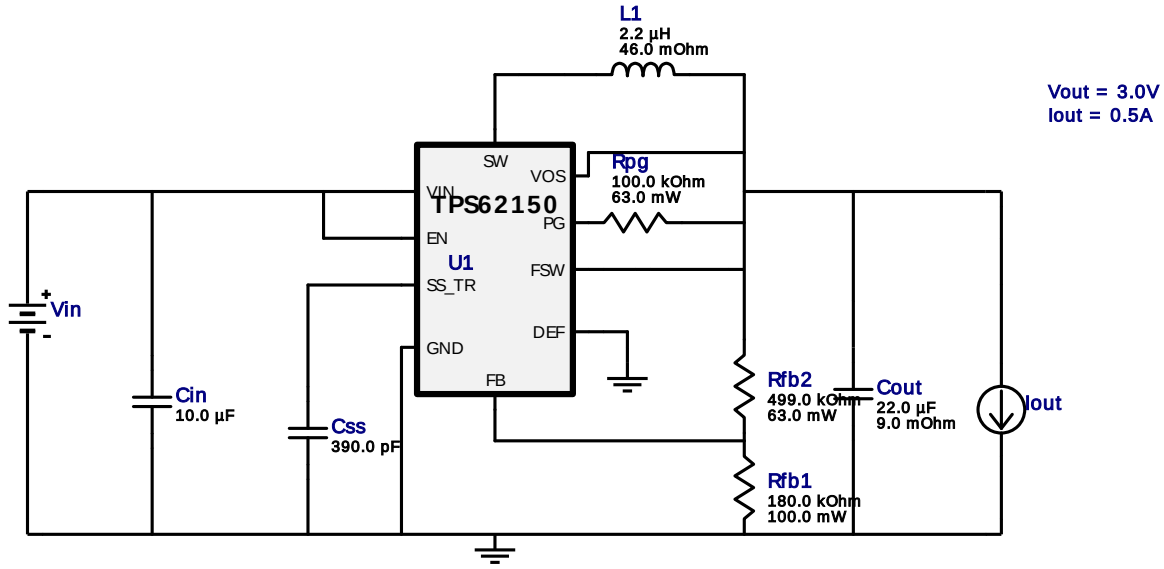
WEBENCH® Design Report

VinMin = 4.5V
VinMax = 5.5V
Vout = 3.0V
Iout = 0.5A

Device = TPS62150RGTR
Topology = Buck
Created = 7/19/16 5:40:13 AM
BOM Cost = $1.46
BOM Count = 8
Total Pd = 0.08W

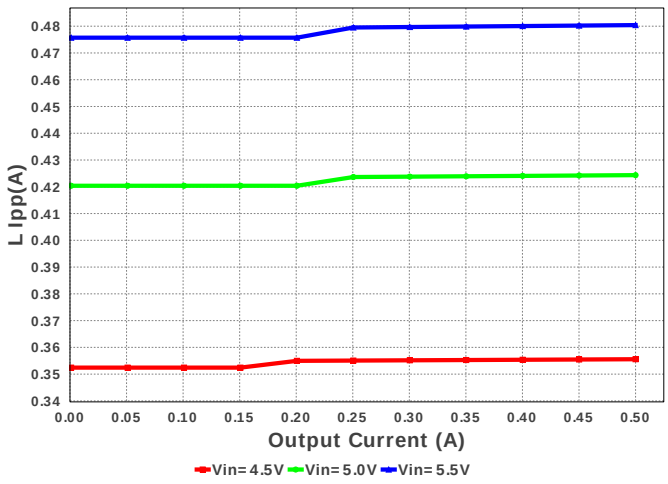
Design : 4742013/137 TPS62150RGTR
TPS62150RGTR 4.5V-5.5V to 3.00V @ 0.5A



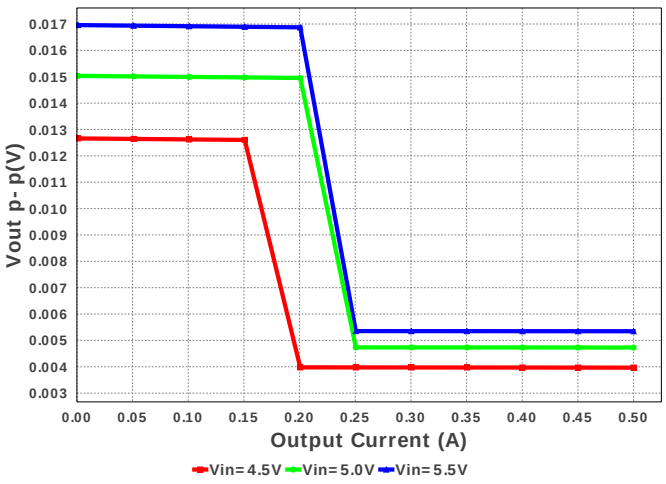
Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cin	Taiyo Yuden	LMK212BJ106KG-T Series= X5R	Cap= 10.0 uF VDC= 10.0 V IRMS= 0.0 A	1	$0.03	0805 7 mm²
2.	Cout	MuRata	GRM21BR60J226ME39L Series= X5R	Cap= 22.0 uF ESR= 9.0 mOhm VDC= 6.3 V IRMS= 3.5 A	1	$0.04	0805 7 mm²
3.	Css	MuRata	GRM033R71C391KA01D Series= X7R	Cap= 390.0 pF VDC= 16.0 V IRMS= 0.0 A	1	$0.01	0201 2 mm²
4.	L1	Vishay-Dale	IHLP1212BZER2R2M11	L= 2.2 µH DCR= 46.0 mOhm	1	$0.56	IHLP-1212BZ 19 mm²
5.	Rfb1	Yageo America	RC0603FR-07180KL Series= ?	Res= 180.0 kOhm Power= 100.0 mW Tolerance= 1.0%	1	$0.01	0603 5 mm²
6.	Rfb2	Vishay-Dale	CRCW0402499KFKED Series= CRCW..e3	Res= 499.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm²
7.	Rpg	Vishay-Dale	CRCW0402100KFKED Series= CRCW..e3	Res= 100.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm²
8.	U1	Texas Instruments	TPS62150RGTR	Switcher	1	$0.79	S-PVQFN-N16 17 mm²

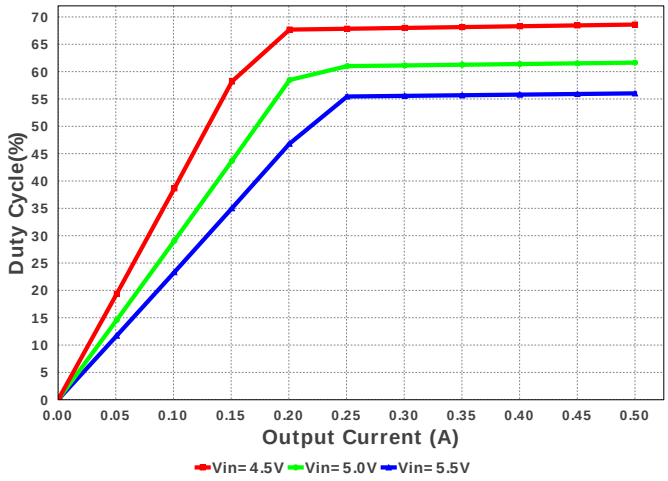
L Ipp



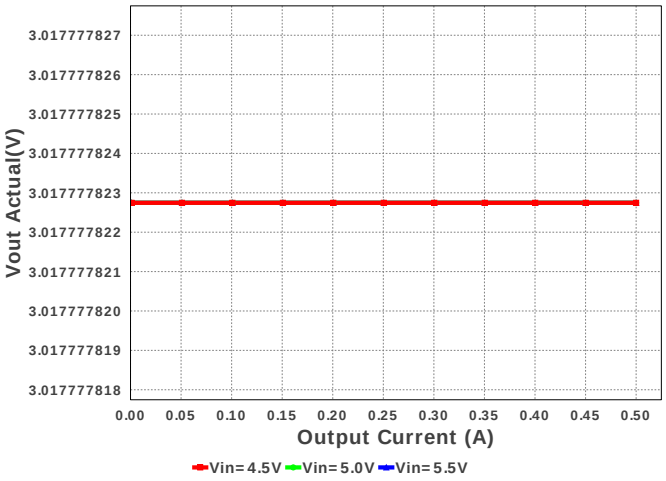
Vout p- p



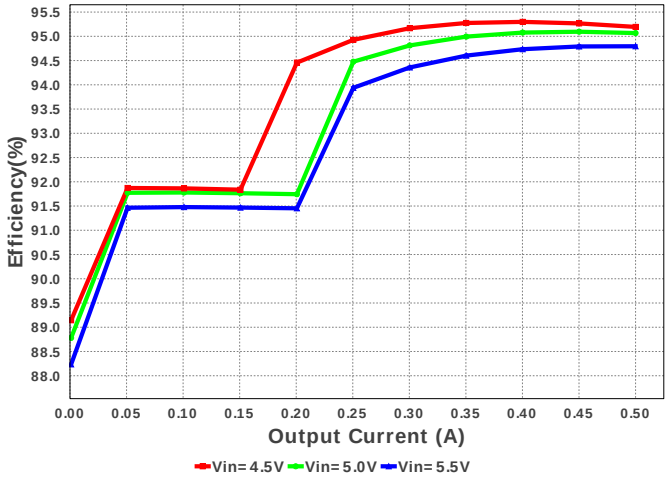
Duty Cycle



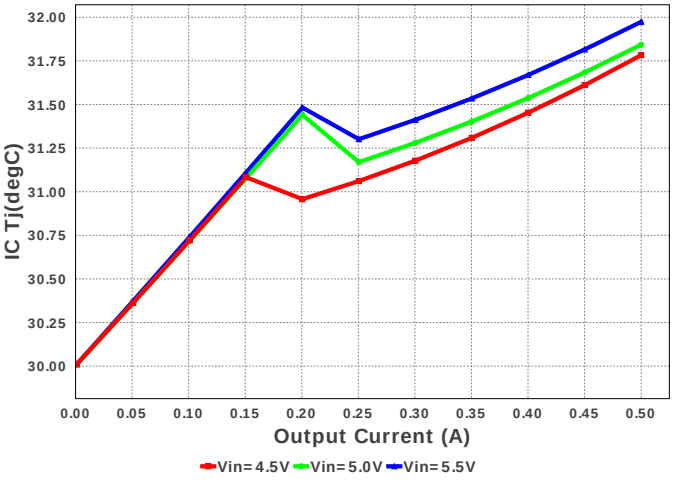
Vout Actual

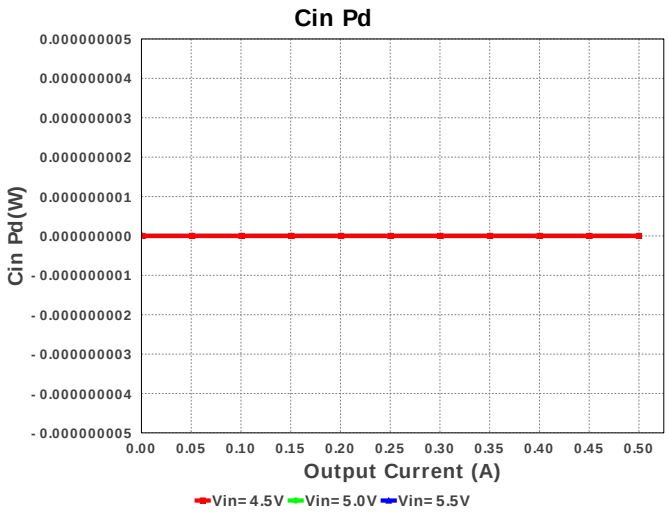


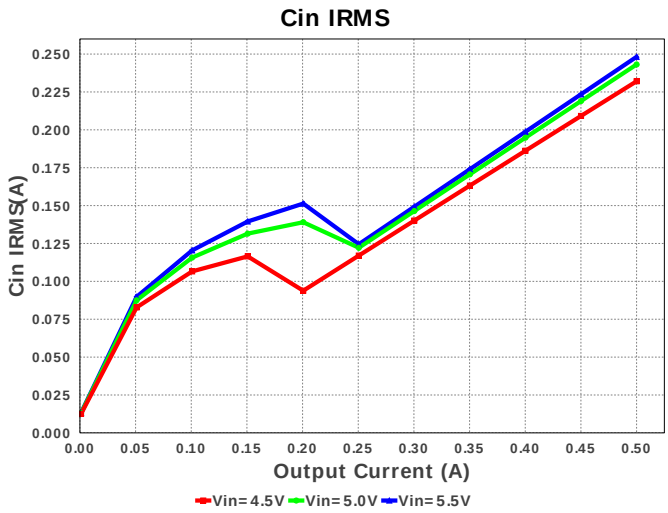
Efficiency

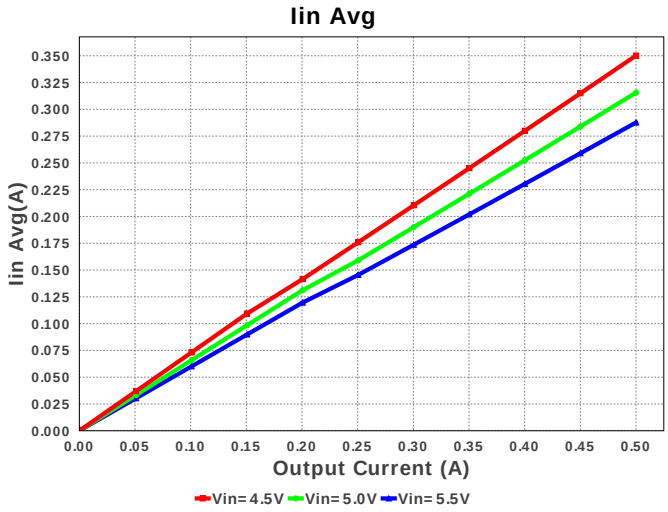


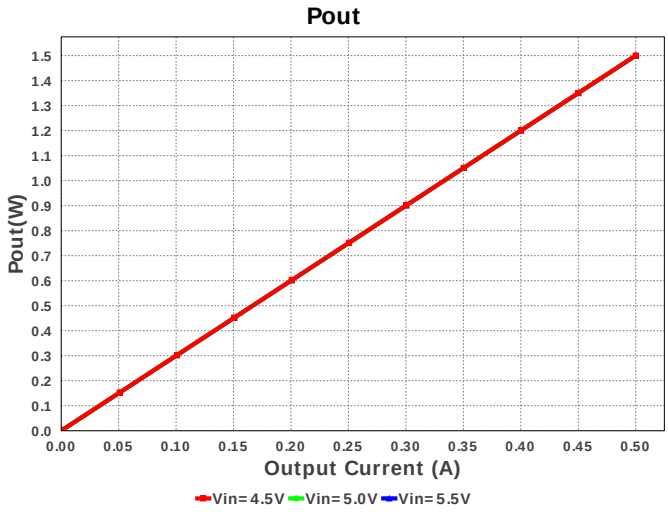
IC Tj

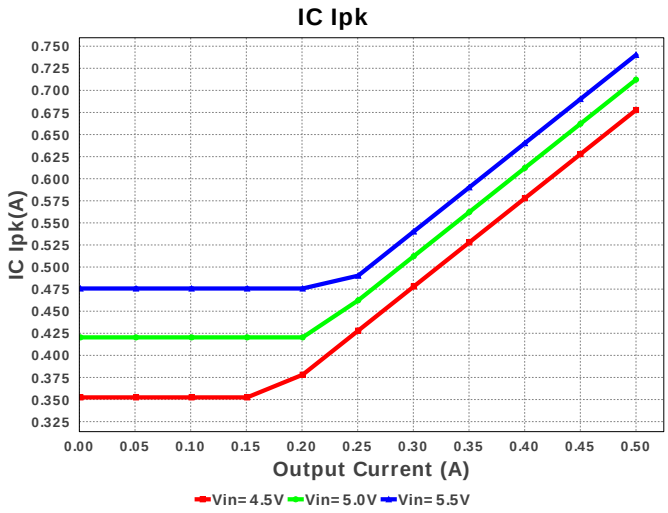


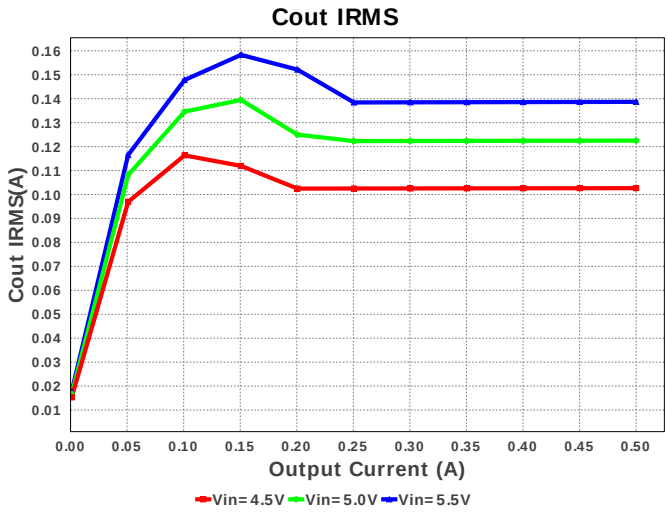


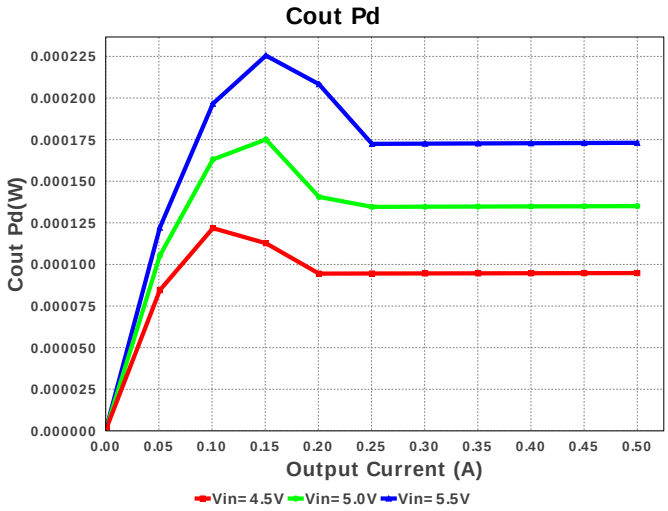


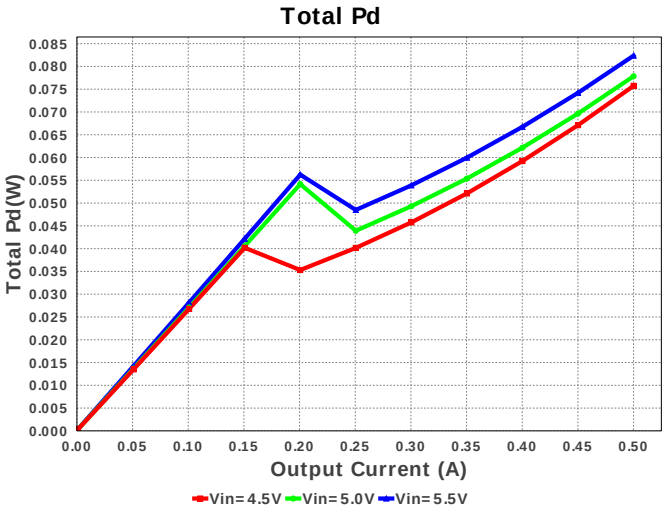


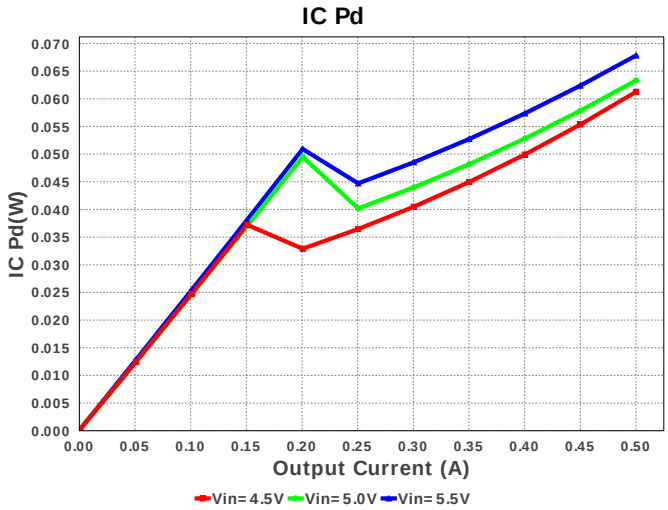


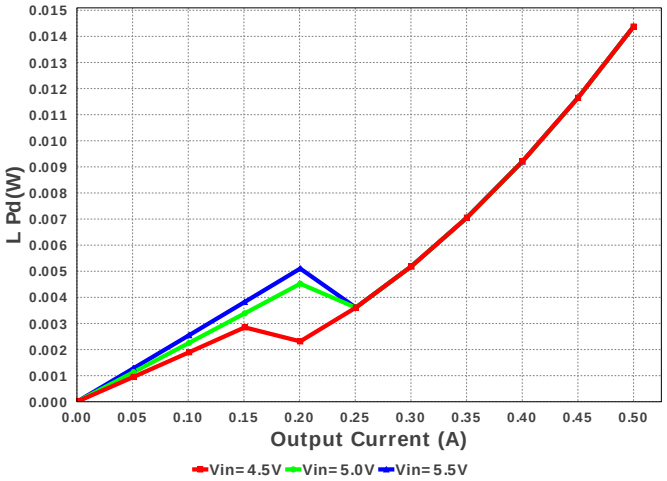


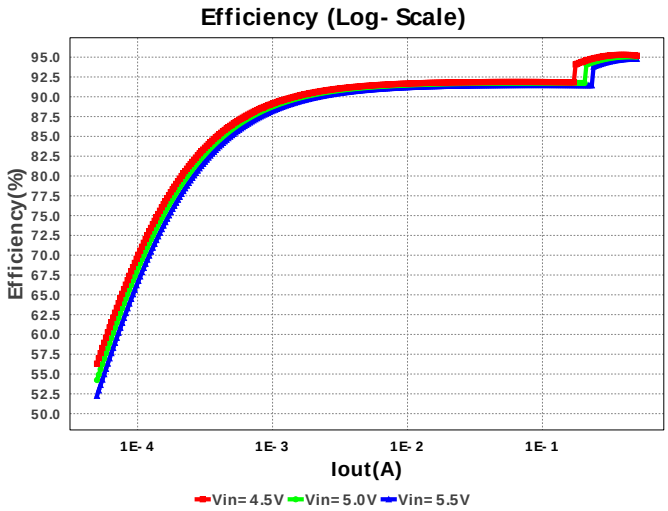












Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	248.18 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	138.682 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	740.205 mA	Current	Peak switch current in IC
4.	Iin Avg	287.7 mA	Current	Average input current
5.	L Ipp	480.41 mA	Current	Peak-to-peak inductor ripple current
6.	BOM Count	8	General	Total Design BOM count
7.	FootPrint	62.0 mm^2	General	Total Foot Print Area of BOM components
8.	Frequency	1.325 MHz	General	Switching frequency
9.	Pout	1.5 W	General	Total output power
10.	Total BOM	$1.46	General	Total BOM Cost
11.	Vout Actual	3.018 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors

#	Name	Value	Category	Description
12.	Vout OP	3.0 V	Op_Point	Operational Output Voltage
13.	Duty Cycle	56.022 %	Op_point	Duty cycle
14.	Efficiency	94.795 %	Op_point	Steady state efficiency
15.	IC Tj	31.974 degC	Op_point	IC junction temperature
16.	ICThetaJA	29.1 degC/W	Op_point	IC junction-to-ambient thermal resistance
17.	IOUT_OP	500.0 mA	Op_point	Iout operating point
18.	VIN_OP	5.5 V	Op_point	Vin operating point
19.	Vout p-p	5.348 mV	Op_point	Peak-to-peak output ripple voltage
20.	Cin Pd	0.0 W	Power	Input capacitor power dissipation
21.	Cout Pd	173.095 µW	Power	Output capacitor power dissipation
22.	IC Pd	67.821 mW	Power	IC power dissipation
23.	L Pd	14.375 mW	Power	Inductor power dissipation
24.	Total Pd	82.361 mW	Power	Total Power Dissipation
25.	Vout Tolerance	3.311 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	500.0 m	Maximum Output Current
2.	VinMax	5.5	Maximum input voltage
3.	VinMin	4.5	Minimum input voltage
4.	Vout	3.0	Output Voltage
5.	base_pn	TPS62150	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 1A 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. **TPS62150** Product Folder : http://www.ti.com/product/TPS62150 : contains the data sheet and other resources.