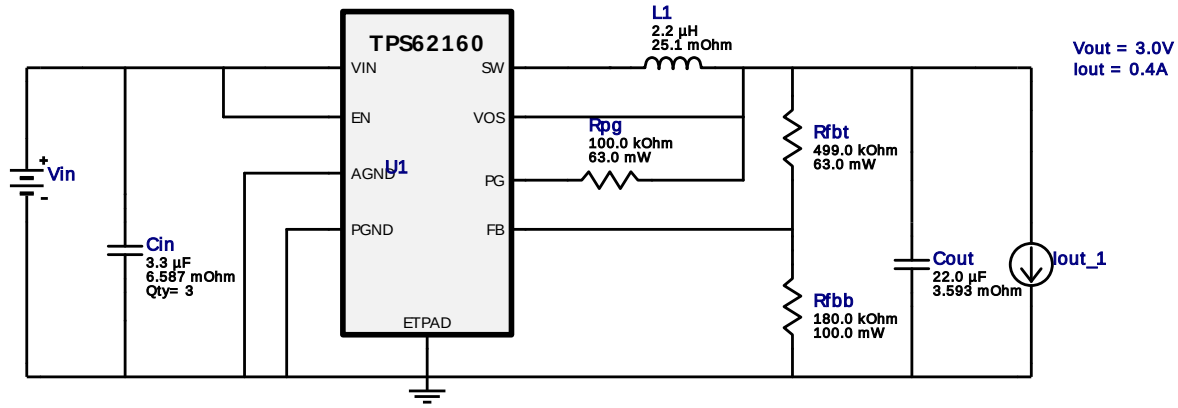
WEBENCH® Design Report

VinMin = 5.0V
VinMax = 15.0V
Vout = 3.0V
Iout = 0.4A

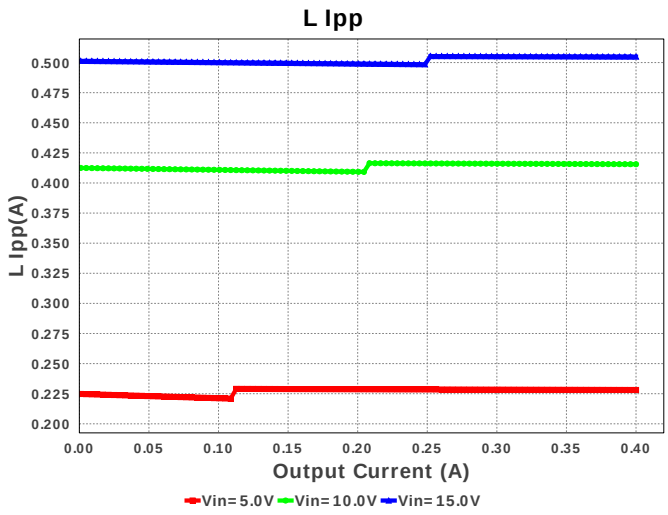
Device = TPS62160DSGR
Topology = Buck
Created = 9/14/16 6:29:38 AM
BOM Cost = $1.31
BOM Count = 9
Total Pd = 0.23W

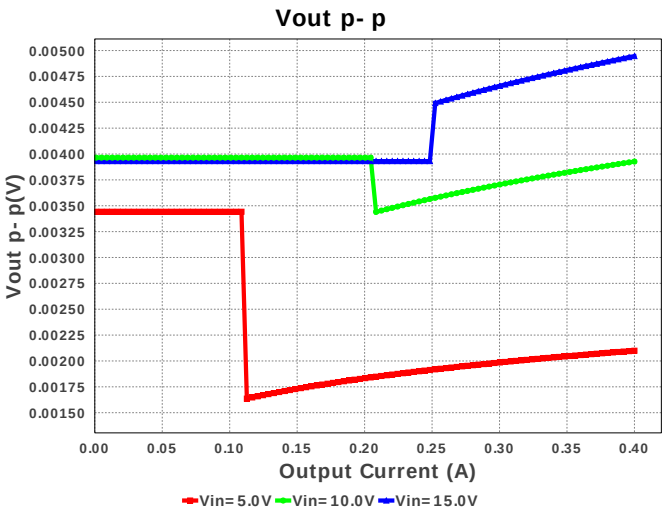
Design : 2425056/64 TPS62160DSGR
TPS62160DSGR 5.0V-15.0V to 3.00V @ 0.4A

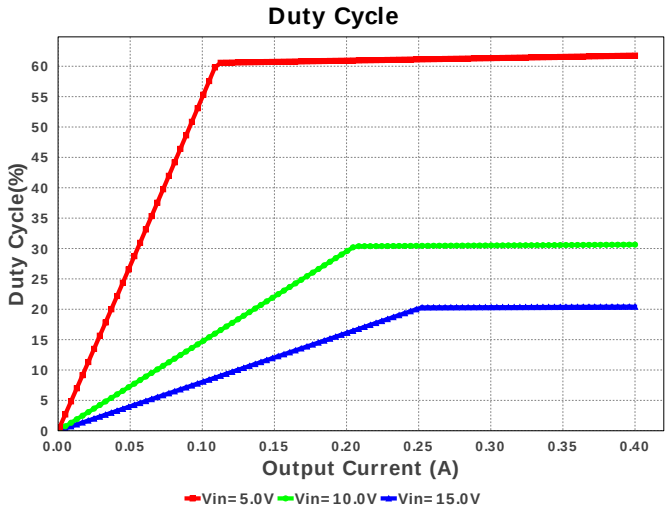


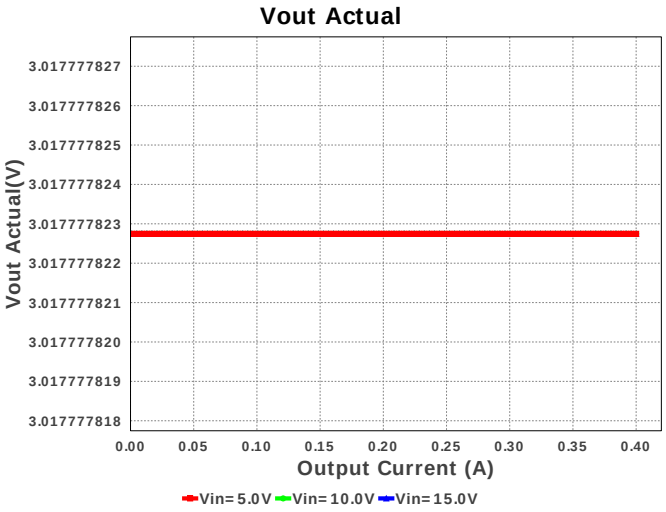
Electrical BOM

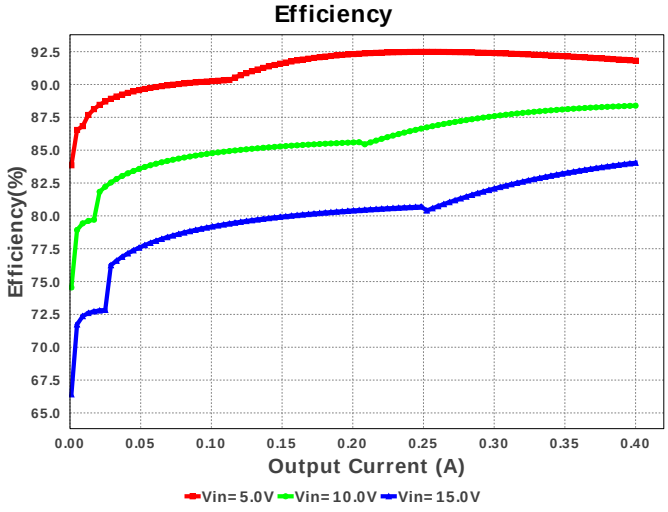
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cin	MuRata	GRM21BR61E335KA12L Series= X5R	Cap= 3.3 uF ESR= 6.587 mOhm VDC= 25.0 V IRMS= 0.0 A	3	$0.09	0805 7 mm²
2.	Cout	MuRata	GRM31CR70J226KE19L Series= X7R	Cap= 22.0 uF ESR= 3.593 mOhm VDC= 6.3 V IRMS= 3.44359 A	1	$0.12	1206_190 11 mm²
3.	L1	Bourns	SRN6045-2R2Y	L= 2.2 µH DCR= 25.1 mOhm	1	$0.16	SRN6045 64 mm²
4.	Rfbb	Yageo America	RC0603FR-07180KL Series= ?	Res= 180.0 kOhm Power= 100.0 mW Tolerance= 1.0%	1	$0.01	0603 5 mm²
5.	Rfbt	Vishay-Dale	CRCW0402499KFKED Series= CRCW..e3	Res= 499.0 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	TPS62160DSGR	Switcher	1	$0.73	S-PWSON-N8 10 mm²

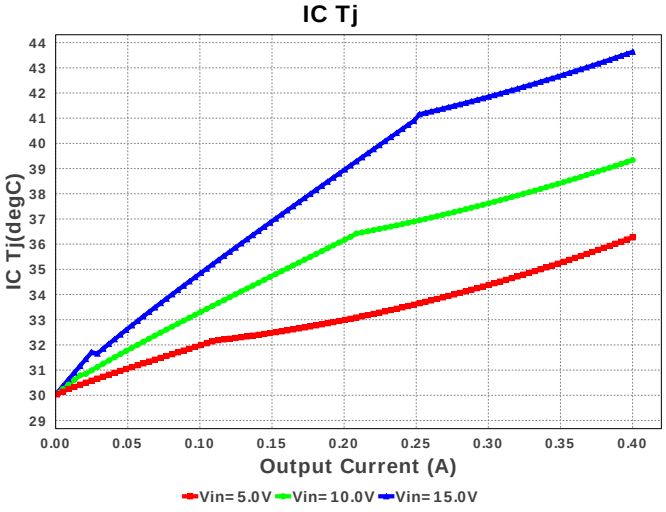


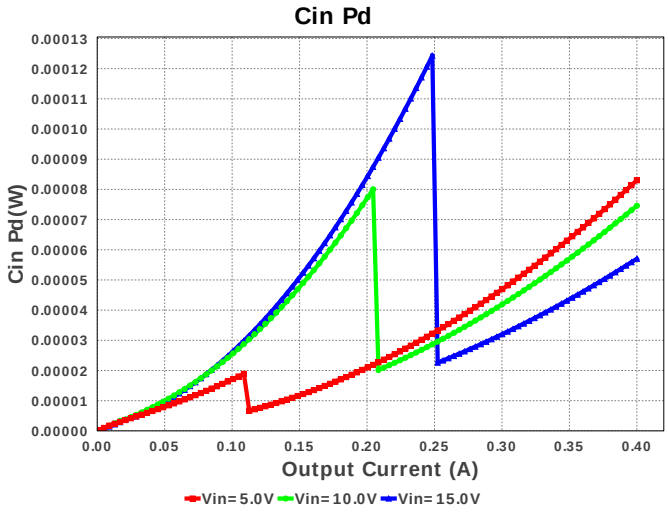


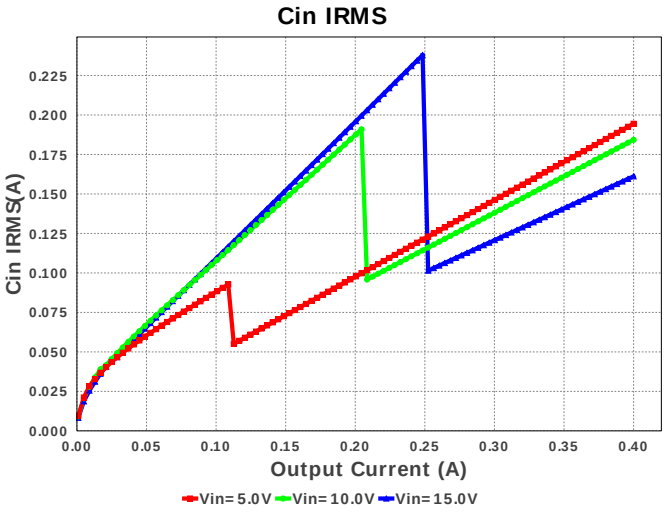


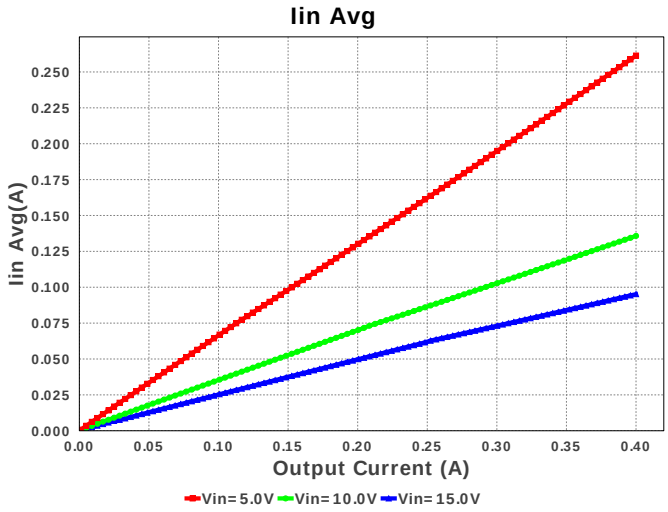


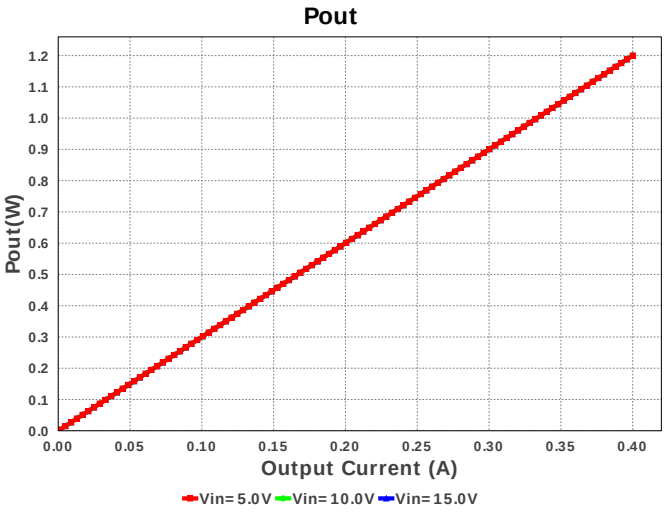


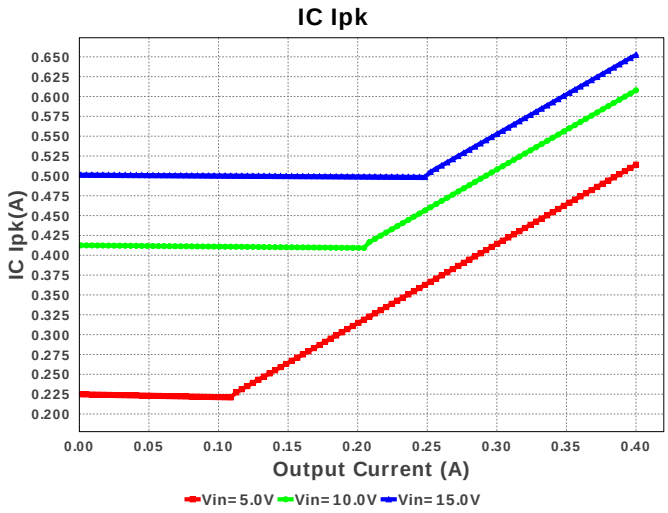


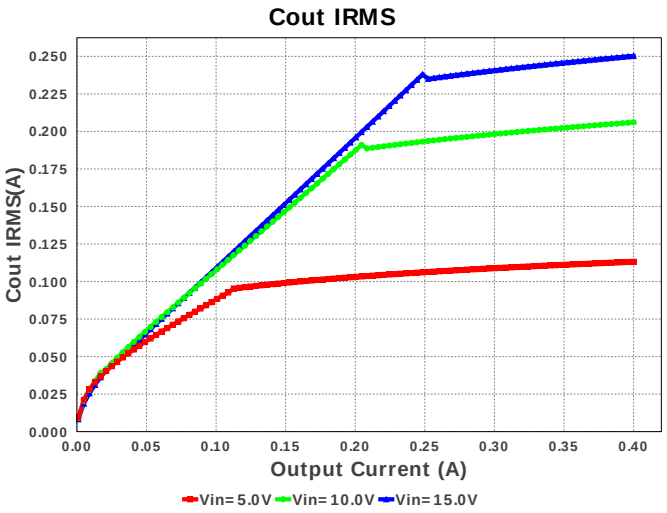


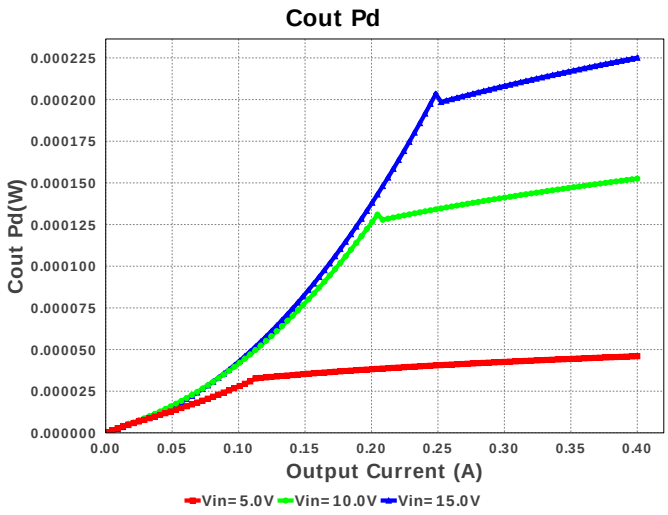


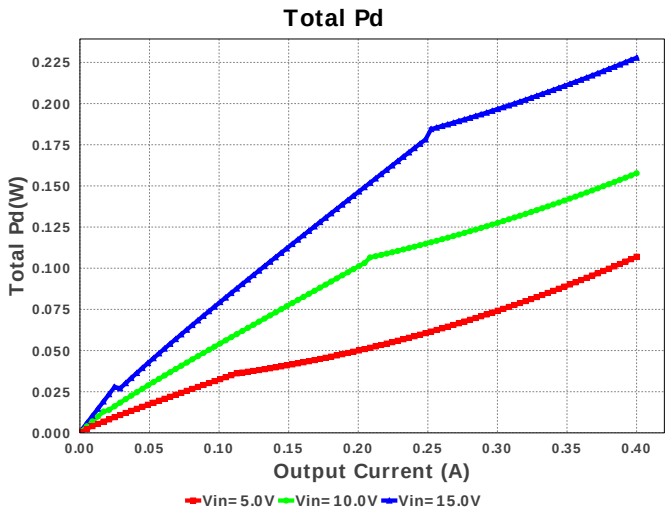


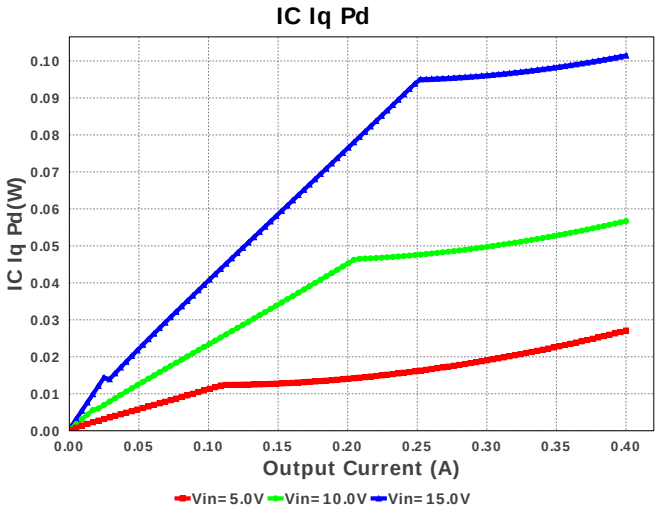


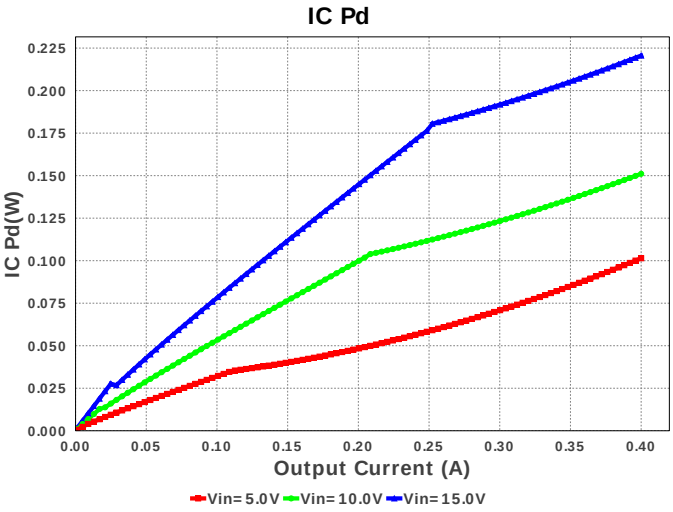


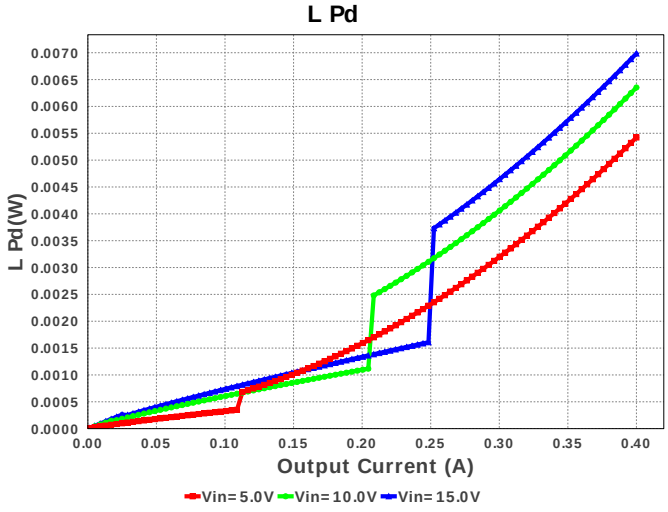


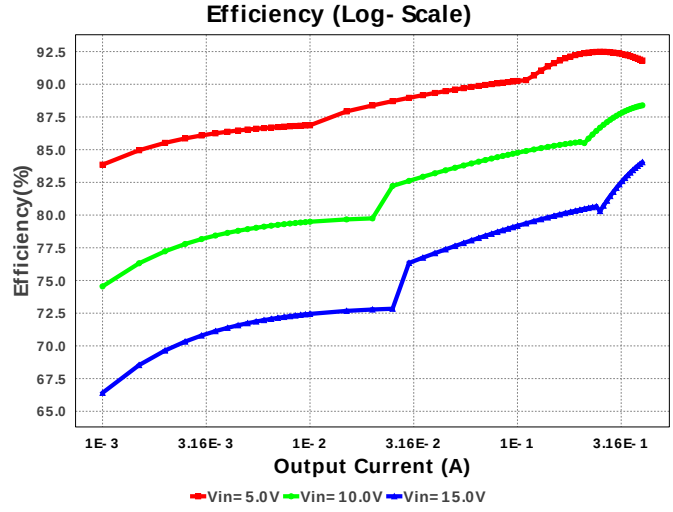












Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	161.144 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	250.305 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	652.464 mA	Current	Peak switch current in IC
4.	Iin Avg	95.191 mA	Current	Average input current
5.	L Ipp	504.93 mA	Current	Peak-to-peak inductor ripple current
6.	BOM Count	9	General	Total Design BOM count
7.	FootPrint	115.0 mm^2	General	Total Foot Print Area of BOM components
8.	Frequency	2.206 MHz	General	Switching frequency
9.	Mode	CCM	General	Conduction Mode
10.	Pout	1.2 W	General	Total output power
11.	Total BOM	$1.31	General	Total BOM Cost

#	Name	Value	Category	Description
12.	Vout Actual	3.018 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
13.	Vout OP	3.0 V	Op_Point	Operational Output Voltage
14.	Duty Cycle	20.419 %	Op_point	Duty cycle
15.	Efficiency	84.041 %	Op_point	Steady state efficiency
16.	IC Tj	43.633 degC	Op_point	IC junction temperature
17.	ICThetaJA	61.8 degC/W	Op_point	IC junction-to-ambient thermal resistance
18.	IOUT_OP	400.0 mA	Op_point	Iout operating point
19.	VIN_OP	15.0 V	Op_point	Vin operating point
20.	Vout p-p	4.946 mV	Op_point	Peak-to-peak output ripple voltage
21.	Cin Pd	57.015 µW	Power	Input capacitor power dissipation
22.	Cout Pd	225.111 µW	Power	Output capacitor power dissipation
23.	IC Iq Pd	101.462 mW	Power	IC Iq Pd
24.	IC Pd	220.599 mW	Power	IC power dissipation
25.	L Pd	6.986 mW	Power	Inductor power dissipation
26.	Total Pd	227.873 mW	Power	Total Power Dissipation
27.	Vout Tolerance	1.485 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	400.0 m	Maximum Output Current
2.	VinMax	15.0	Maximum input voltage
3.	VinMin	5.0	Minimum input voltage
4.	Vout	3.0	Output Voltage
5.	base_pn	TPS62160	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 6V, Seamless Power Save Mode for Light Load Efficiency, Power Good Output, 100% Duty Cycle mode, Short Circuit Protection, Thermal Shutdown

2. **TPS62160** Product Folder : http://www.ti.com/product/TPS62160 : contains the data sheet and other resources.