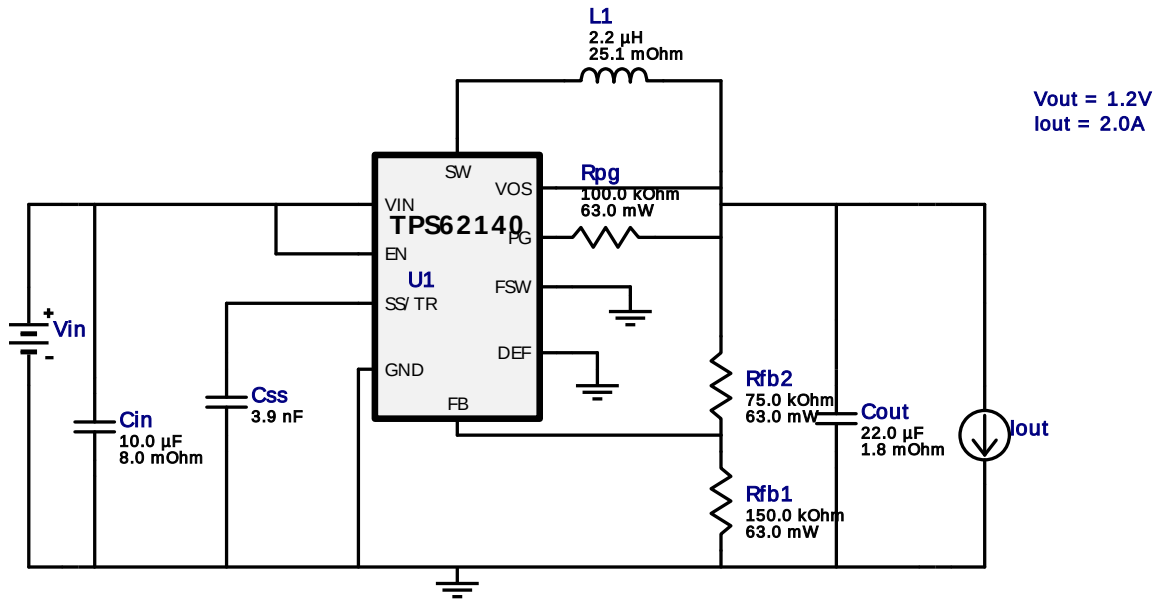
WEBENCH® Design Report

VinMin = 7.0V
VinMax = 9.0V
Vout = 1.2V
Iout = 2.0A

Device = TPS62140RGTR
Topology = Buck
Created = 6/12/13 6:23:45 PM
BOM Cost = $1.49
BOM Count = 8
Total Pd = 0.69W

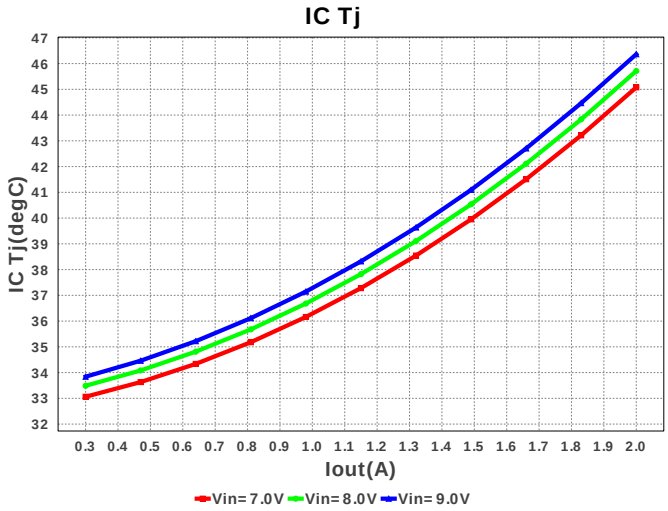
Design : 906020/14 TPS62140RGTR
TPS62140RGTR 7.0V-9.0V to 1.2V @ 2.0A

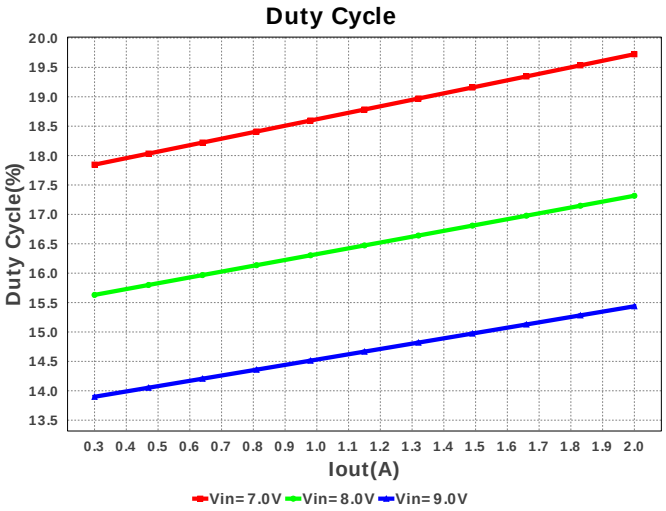


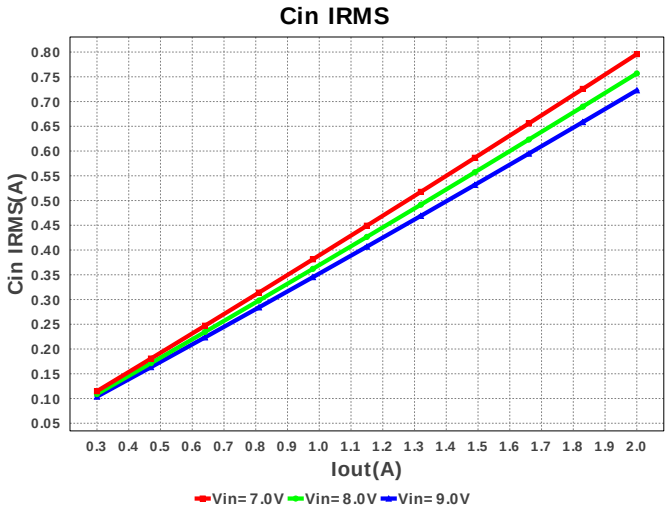
Electrical BOM

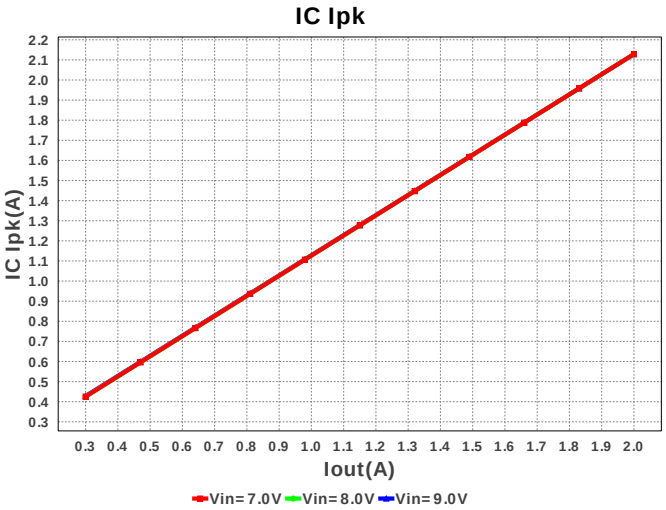
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cin	MuRata	GRM21BR61C106KE15L Series= X5R	Cap= 10.0 uF ESR= 8.0 mOhm VDC= 16.0 V IRMS= 0.0 A	1	$0.05	0805 13 mm²
2.	Cout	TDK	C2012X5R0J226M Series= X5R	Cap= 22.0 uF ESR= 1.8 mOhm VDC= 6.3 V IRMS= 0.0 A	1	$0.06	0805 13 mm²
3.	Css	TDK	C2012C0G1E392J Series= C0G/NP0	Cap= 3.9 nF VDC= 25.0 V IRMS= 0.0 A	1	$0.04	0805 13 mm²
4.	L1	Bourns	SRN6045-2R2Y	L= 2.2 µH DCR= 25.1 mOhm	1	$0.16	SRN6045 64 mm²
5.	Rfb1	Vishay-Dale	CRCW0402150KFKED Series= CRCW..e3	Res= 150.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 8 mm²
6.	Rfb2	Vishay-Dale	CRCW040275K0FKED Series= CRCW..e3	Res= 75.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 8 mm²
7.	Rpg	Vishay-Dale	CRCW0402100KFKED Series= CRCW..e3	Res= 100.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 8 mm²

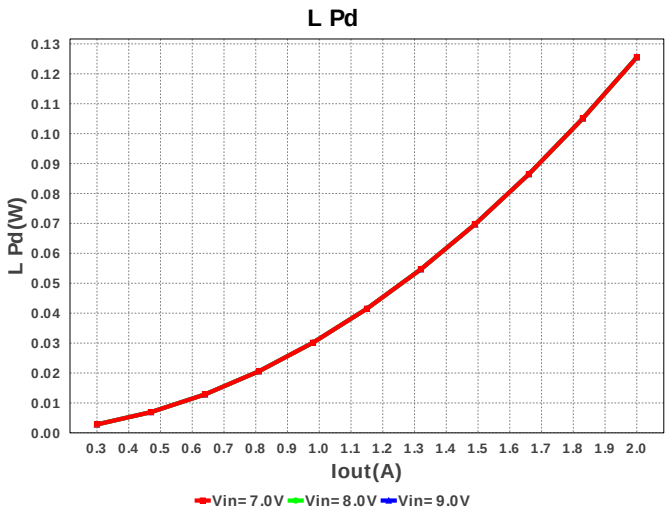
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
8.	U1	Texas Instruments	TPS62140RGTR	Switcher	1	$1.15	 S-PVQFN-N16 36 mm^2

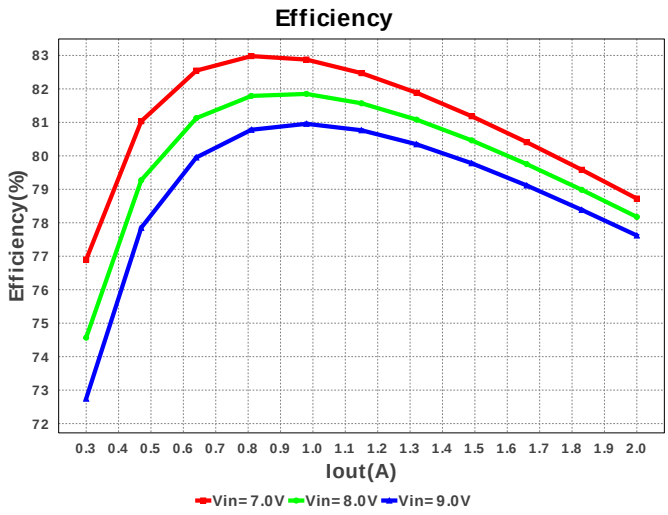


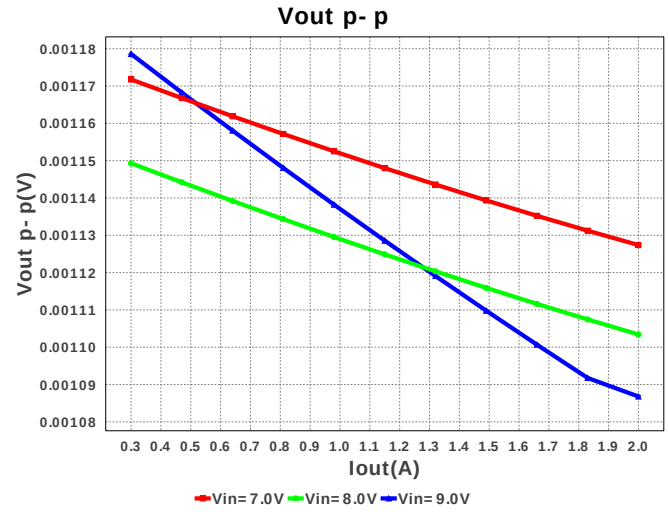


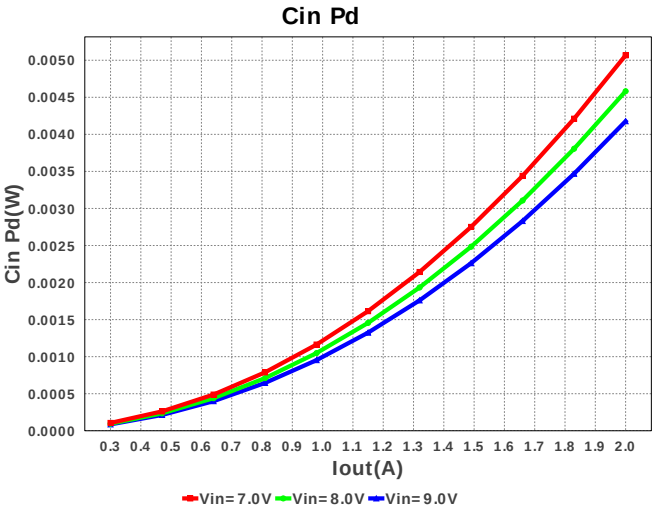


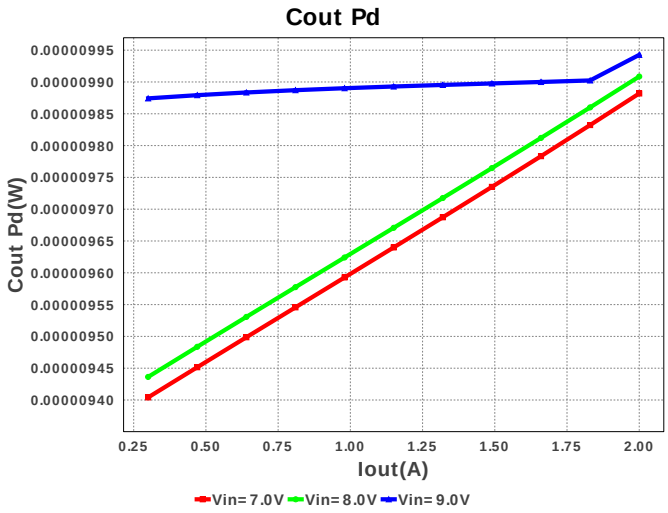


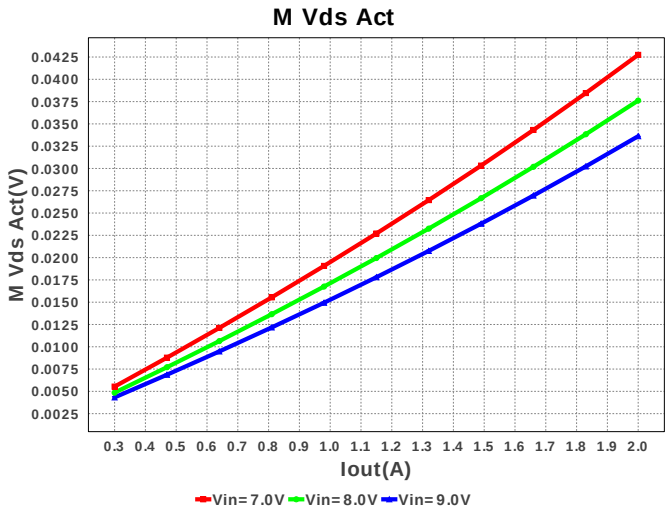


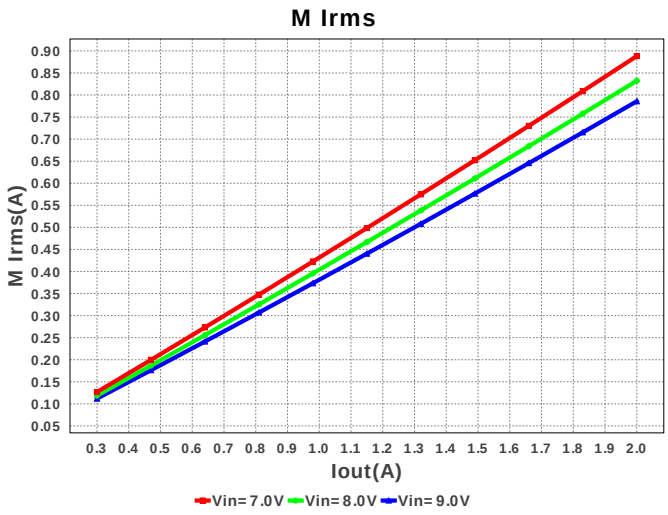


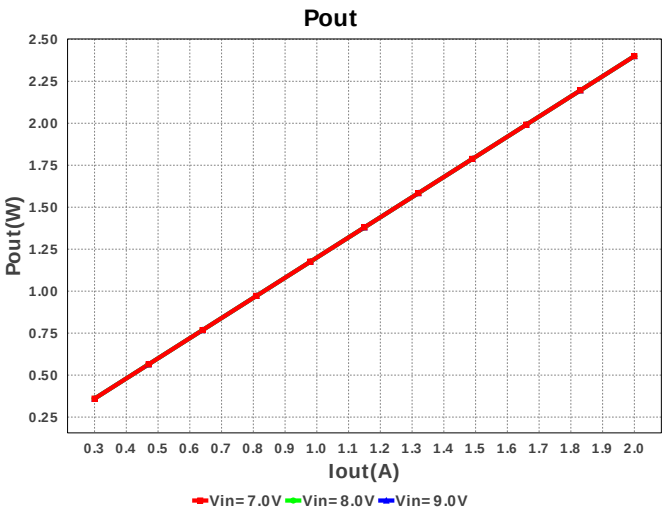


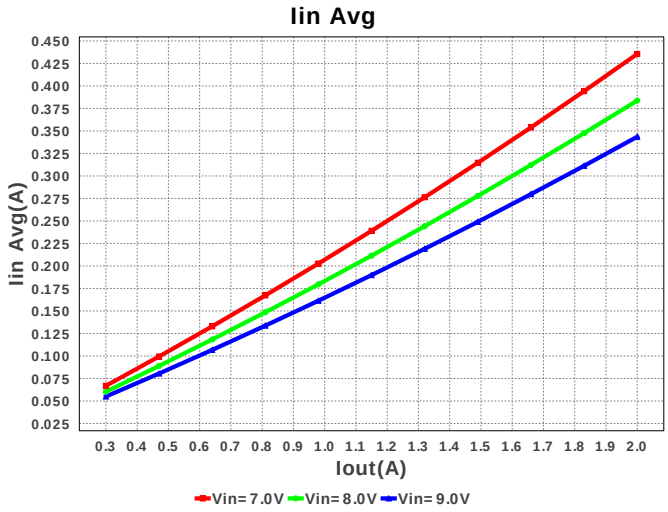


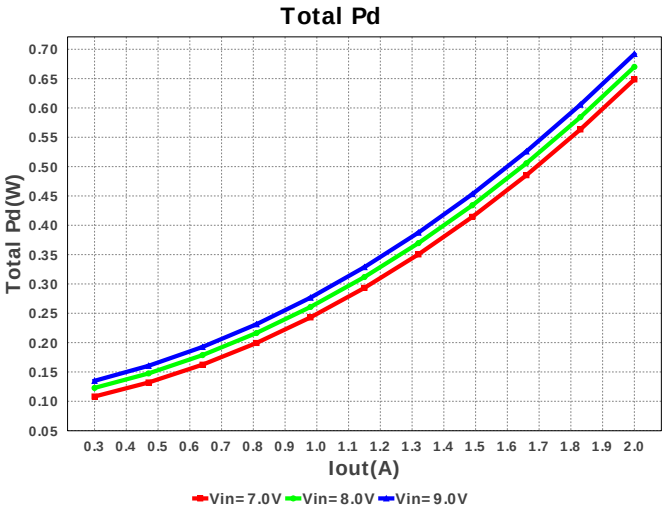


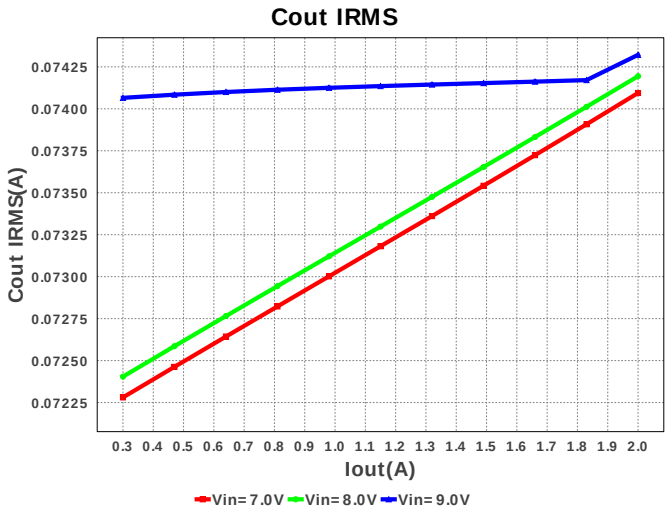


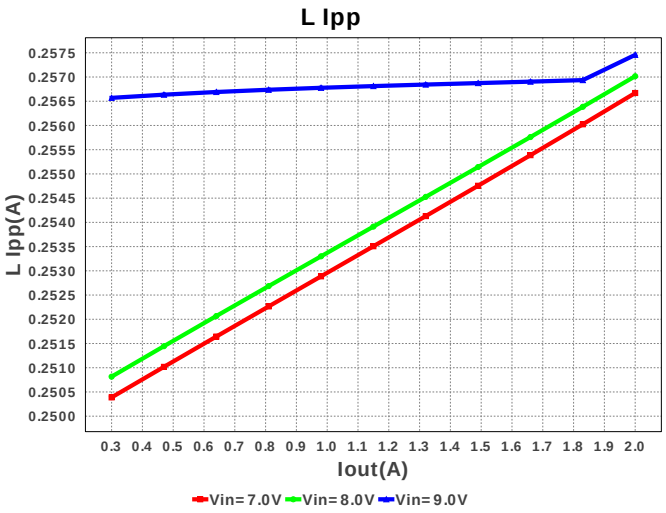


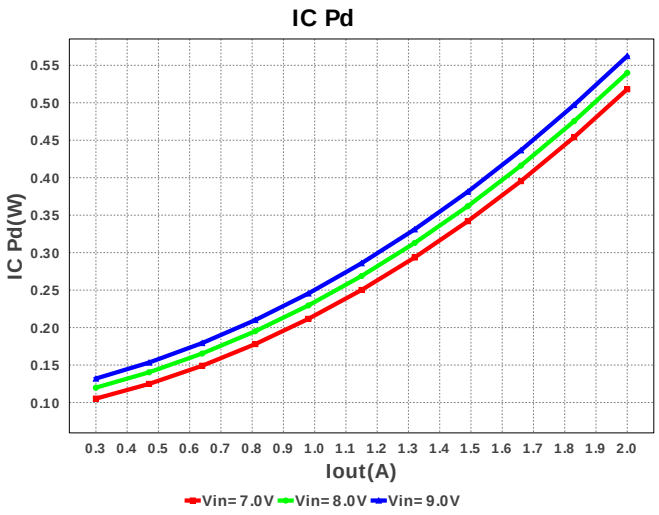


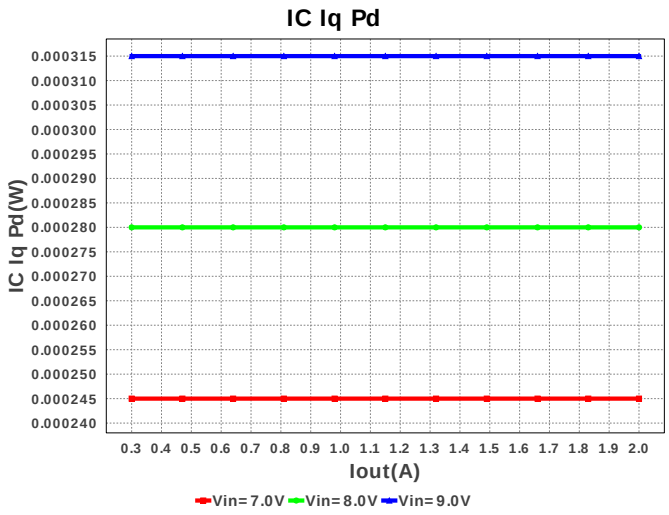












Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	722.606 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	74.321 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	2.129 A	Current	Peak switch current in IC
4.	Iin Avg	343.55 mA	Current	Average input current
5.	L Ipp	257.457 mA	Current	Peak-to-peak inductor ripple current
6.	M1 Irms	785.798 mA	Current	Q Iavg
7.	BOM Count	8	General	Total Design BOM count
8.	FootPrint	162.0 mm^2	General	Total Foot Print Area of BOM components
9.	Frequency	2.126 MHz	General	Switching frequency
10.	IC Tolerance	21.6 mV	General	IC Feedback Tolerance
11.	M Vds Act	33.618 mV	General	Voltage drop across the MosFET
12.	Pout	2.4 W	General	Total output power
13.	Total BOM	$1.49	General	Total BOM Cost
14.	Vout OP	1.2 V	Op_Point	Operational Output Voltage
15.	Duty Cycle	15.437 %	Op_point	Duty cycle
16.	Efficiency	77.62 %	Op_point	Steady state efficiency
17.	IC Tj	46.363 degC	Op_point	IC junction temperature
18.	ICThetaJA	29.1 degC/W	Op_point	IC junction-to-ambient thermal resistance
19.	IOUT_OP	2.0 A	Op_point	Iout operating point
20.	VIN_OP	9.0 V	Op_point	Vin operating point
21.	Vout p-p	1.087 mV	Op_point	Peak-to-peak output ripple voltage
22.	Cin Pd	4.177 mW	Power	Input capacitor power dissipation
23.	Cout Pd	9.943 µW	Power	Output capacitor power dissipation
24.	IC Pd	562.294 mW	Power	IC power dissipation
25.	L Pd	125.5 mW	Power	Inductor power dissipation
26.	Total Pd	691.978 mW	Power	Total Power Dissipation

Design Inputs

#	Name	Value	Description
1.	Iout	2.0	Maximum Output Current
2.	Iout1	2.0	Output Current #1
3.	VinMax	9.0	Maximum input voltage
4.	VinMin	7.0	Minimum input voltage
5.	Vout	1.2	Output Voltage
6.	Vout1	1.2	Output Voltage #1
7.	base_pn	TPS62140	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 2A 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. **TPS62140** Product Folder : http://www.ti.com/product/tps62140 : contains the data sheet and other resources.