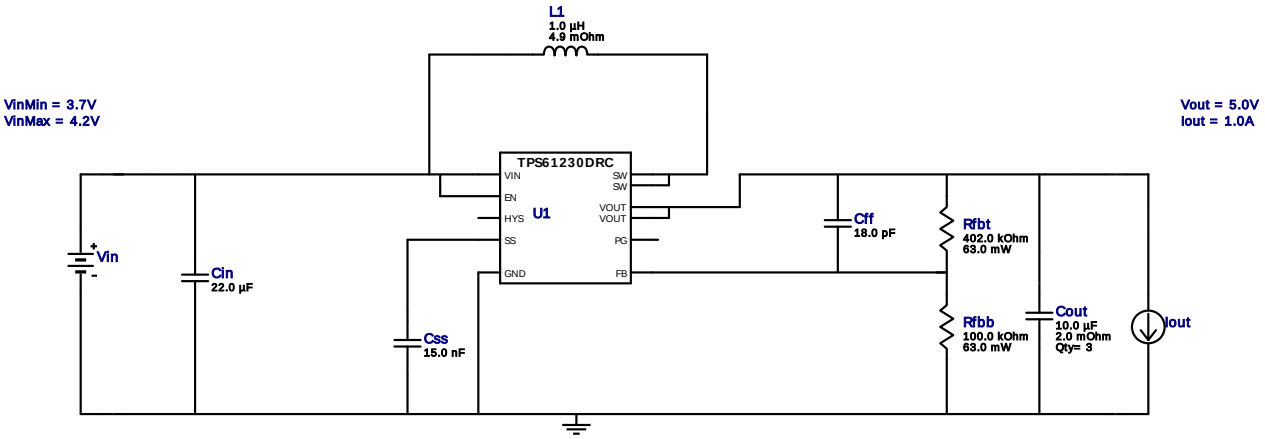
WEBENCH® Design Report

VinMin = 3.7V
VinMax = 4.2V
Vout = 5.0V
Iout = 1.0A

Device = TPS61230DRCR
Topology = Boost
Created = 9/2/14 5:44:06 AM
BOM Cost = $1.67
Footprint = 201.0mm2
BOM Count = 10
Total Pd = 0.3W

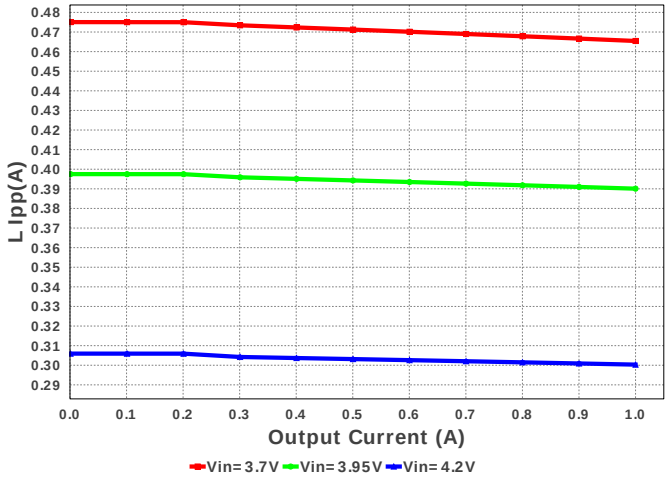
Design : 3822995/2 TPS61230DRCR
TPS61230DRCR 3.7V-4.2V to 5.0V @ 1.0A



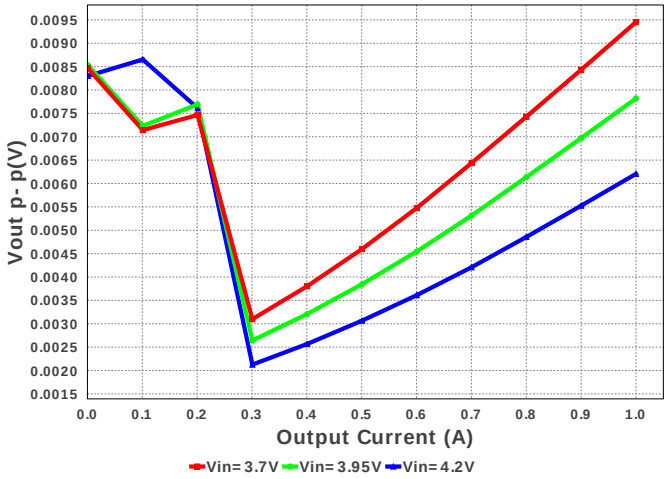
Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cff	Kemet	C0603C180J5GACTU Series= C0G/NP0	Cap= 18.0 pF VDC= 50.0 V IRMS= 0.0 A	1	$0.01	0603 5mm2
2.	Cin	TDK	C2012X5R0J226M Series= 285	Cap= 22.0 µF VDC= 6.3 V IRMS= 0.0 A	1	$0.06	0805 7mm2
3.	Cout	MuRata	GRM21BR61A106KE19L Series= X5R	Cap= 10.0 µF ESR= 2.0 mOhm VDC= 10.0 V IRMS= 0.0 A	3	$0.03	0805 7mm2
4.	Css	MuRata	GRM155R71C153KA01D Series= X7R	Cap= 15.0 nF VDC= 16.0 V IRMS= 0.0 A	1	$0.01	0402 3mm2
5.	L1	Bourns	SRU1028-1R0Y	L= 1.0 µH DCR= 4.9 mOhm	1	$0.33	SRU1028 144mm2
6.	Rfbb	Vishay-Dale	CRCW0402100KFKED Series= CRCW..e3	Res= 100.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3mm2
7.	Rfbt	Vishay-Dale	CRCW0402402KFKED Series= CRCW..e3	Res= 402.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3mm2
8.	U1	Texas Instruments	TPS61230DRCR	Switcher	1	$1.15	DRC0010G 16mm2

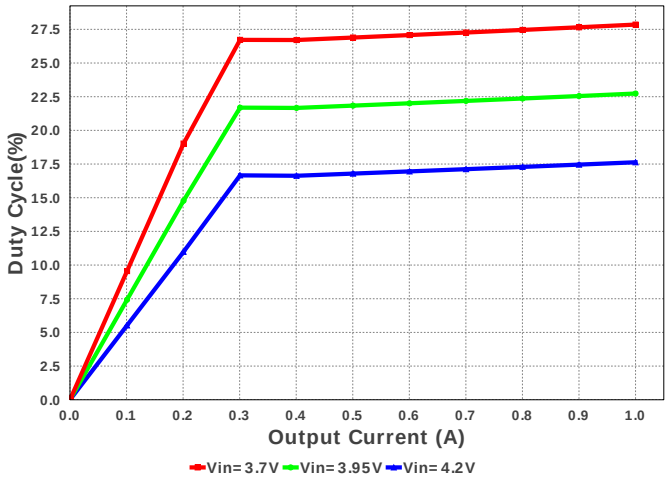
L Ipp



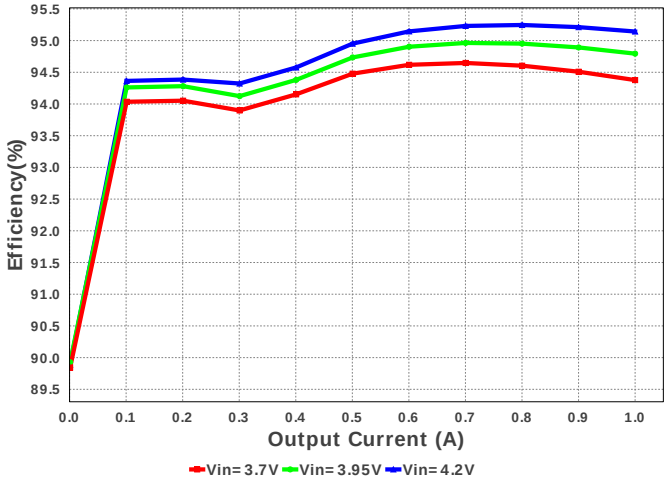
Vout p- p



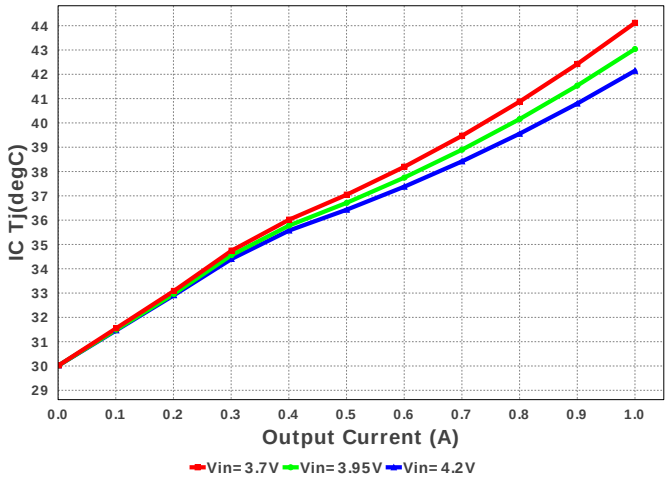
Duty Cycle



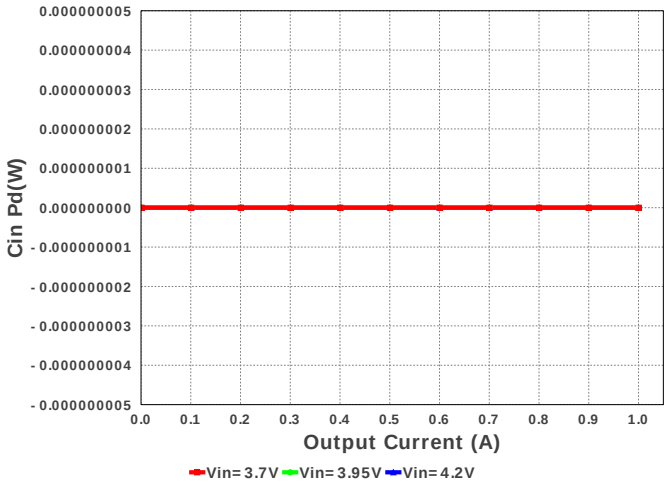
Efficiency

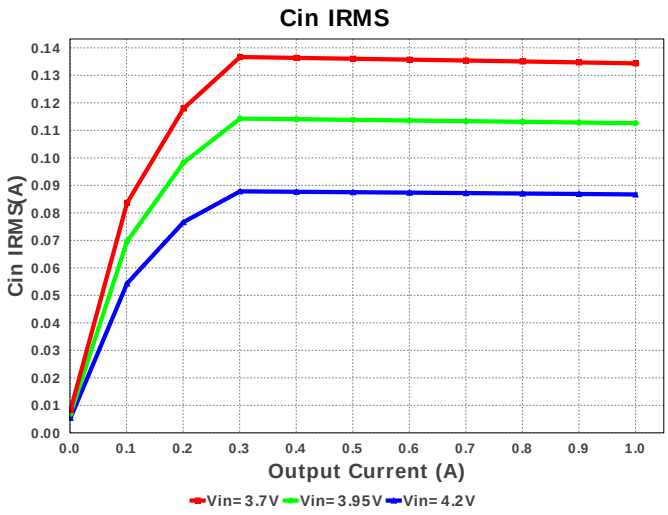


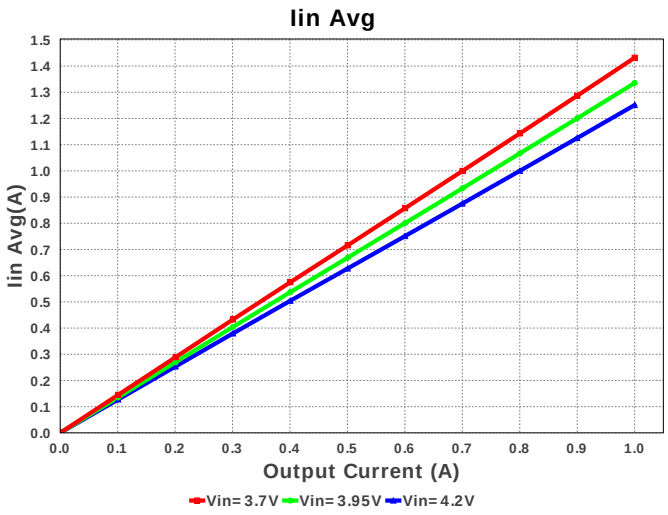
IC Tj

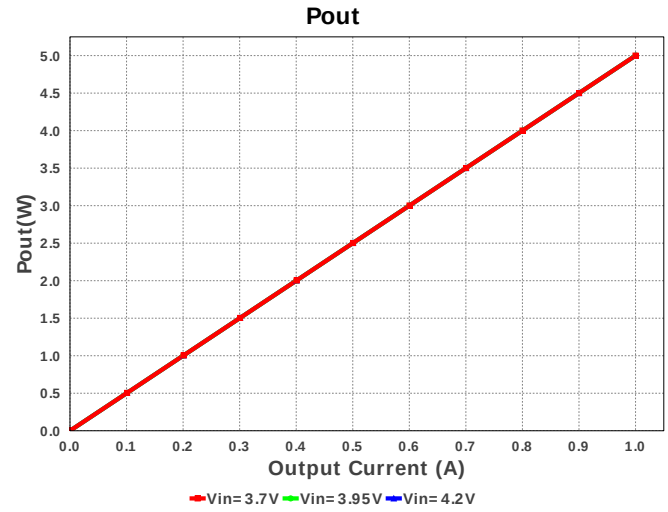


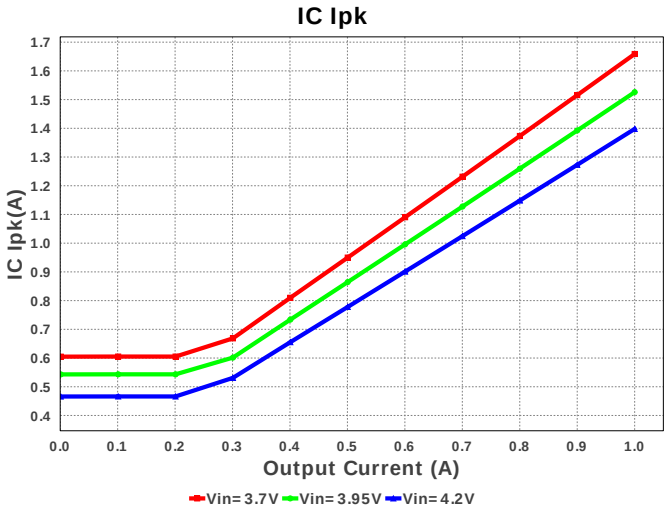
Cin Pd

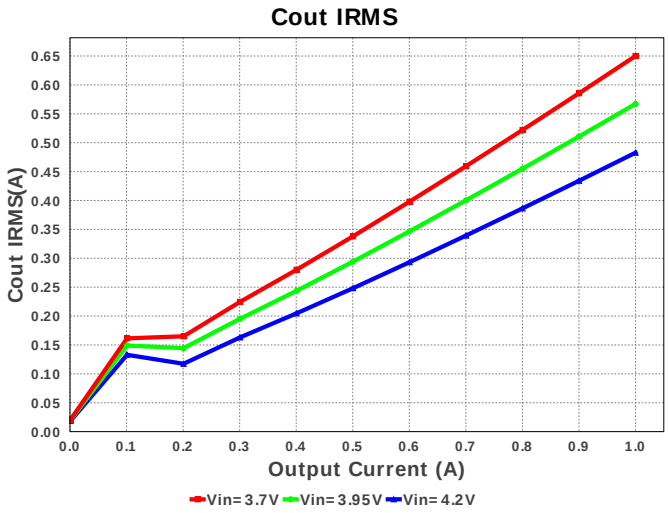


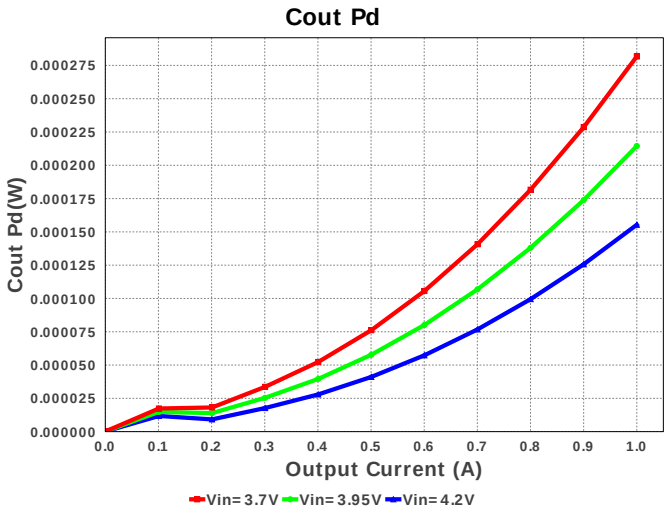


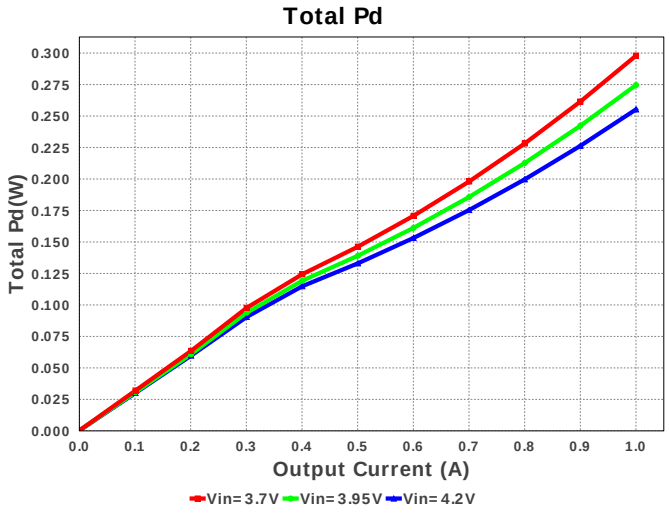


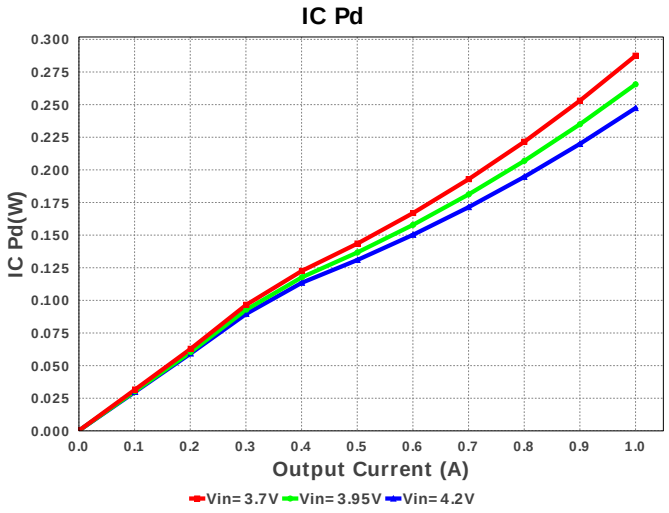


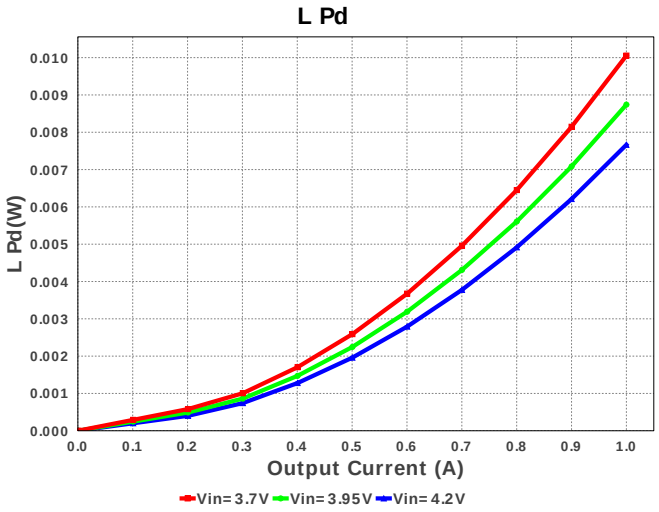


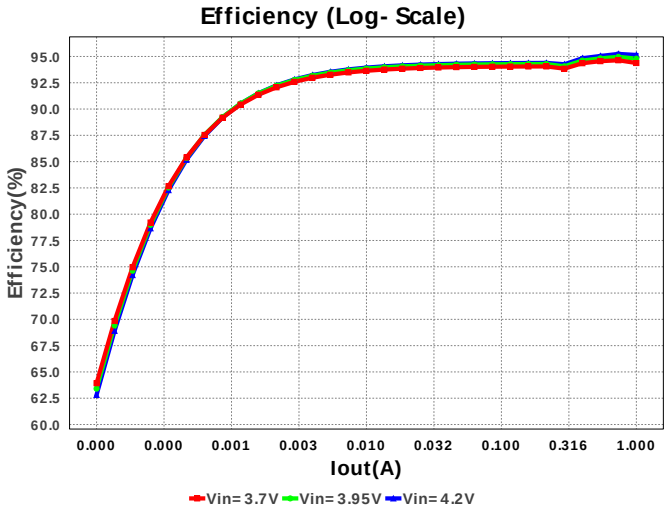












Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	134.357 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	650.036 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	1.659 A	Current	Peak switch current in IC
4.	Iin Avg	1.432 A	Current	Average input current
5.	L Ipp	465.425 mA	Current	Peak-to-peak inductor ripple current
6.	BOM Count	10	General	Total Design BOM count
7.	FootPrint	201.0 mm2	General	Total Foot Print Area of BOM components
8.	Frequency	2.0 MHz	General	Switching frequency
9.	Pout	5.0 W	General	Total output power
10.	Total BOM	$1.67	General	Total BOM Cost
11.	Duty Cycle	27.854 %	Op_point	Duty cycle
12.	Efficiency	94.377 %	Op_point	Steady state efficiency
13.	IC Tj	44.116 degC	Op_point	IC junction temperature
14.	ICThetaJA	49.1 degC/W	Op_point	IC junction-to-ambient thermal resistance
15.	IOUT_OP	1.0 A	Op_point	Iout operating point
16.	VIN_OP	3.7 V	Op_point	Vin operating point
17.	Vout p-p	9.452 mV	Op_point	Peak-to-peak output ripple voltage
18.	Cin Pd	0.0 W	Power	Input capacitor power dissipation
19.	Cout Pd	281.698 µW	Power	Output capacitor power dissipation
20.	IC Pd	287.489 mW	Power	IC power dissipation
21.	L Pd	10.054 mW	Power	Inductor power dissipation
22.	Total Pd	297.908 mW	Power	Total Power Dissipation

Design Inputs

#	Name	Value	Description
1.	Iout	1.0 A	Maximum Output Current
2.	Iout1	1.0 Amps	Output Current #1
3.	SoftStart	0.5 ms	Soft Start Time (ms)
4.	VinMax	4.2 V	Maximum input voltage
5.	VinMin	3.7 V	Minimum input voltage

#	Name	Value	Description
6.	Vout	5.0 V	Output Voltage
7.	Vout1	5.0 Volt	Output Voltage #1
8.	base_pn	TPS61230	Base Product Number
9.	source	DC	Input Source Type
10.	Ta	30.0 degC	Ambient temperature

Design Assistance

1. **TPS61230** Product Folder : http://www.ti.com/product/tps61230 : contains the data sheet and other resources.