VinMin = 3.0V
VinMax = 5.0V
Vout = 1.0V
Iout = 3.5A

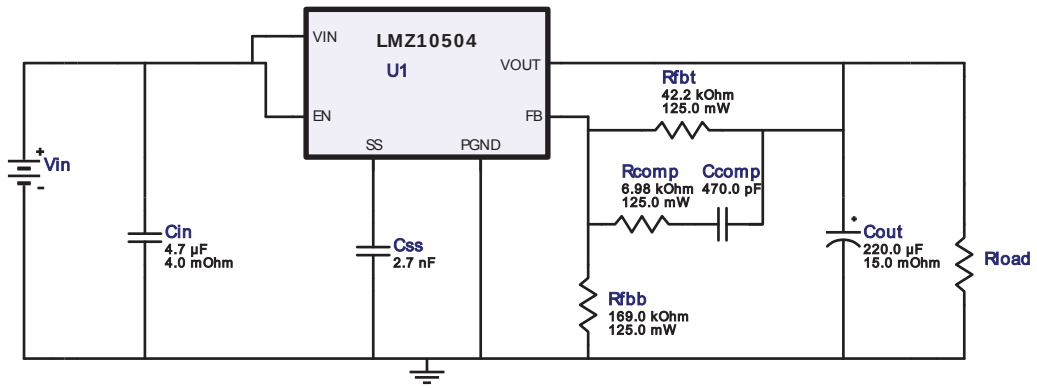
Device = LMZ10504TZX-ADJ/NOPB
Topology = Buck
Created = 6/24/14 10:44:29 AM
BOM Cost = $4.52
Footprint = 293.0mm2
BOM Count = 8
Total Pd = 0.68W

WEBENCH® Design Report

Design : 823607/55 LMZ10504TZX-ADJ/NOPB
LMZ10504TZX-ADJ/NOPB 3.0V-5.0V to 1.0V @ 3.5A

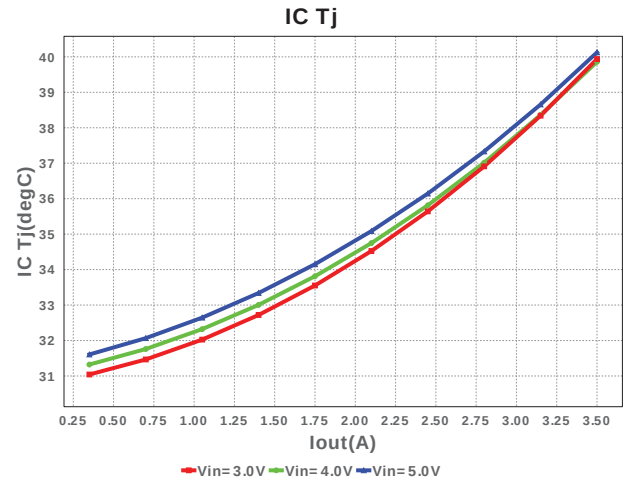
VinMin = 3.0V
VinMax = 5.0V

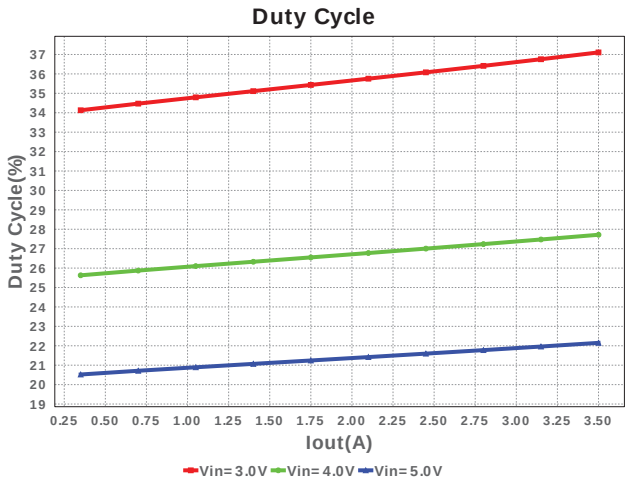
Vout = 1.0V
Iout = 3.5A

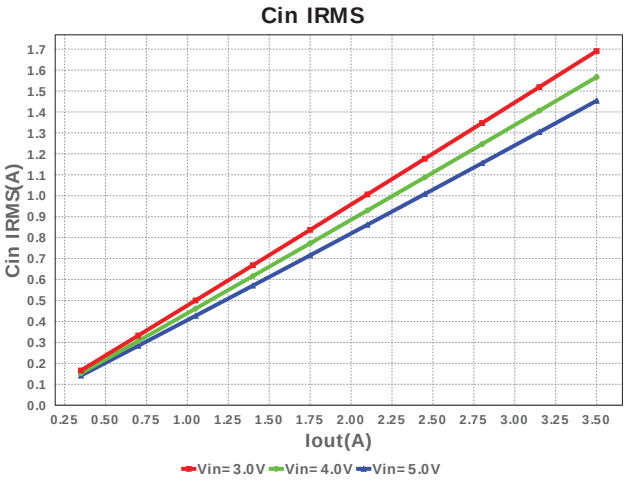


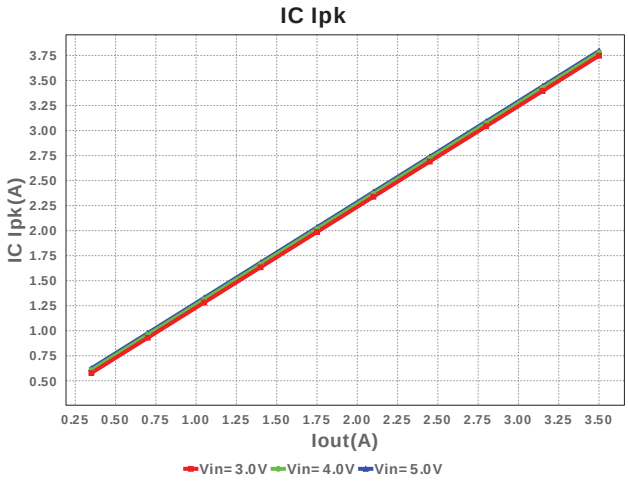
Electrical BOM

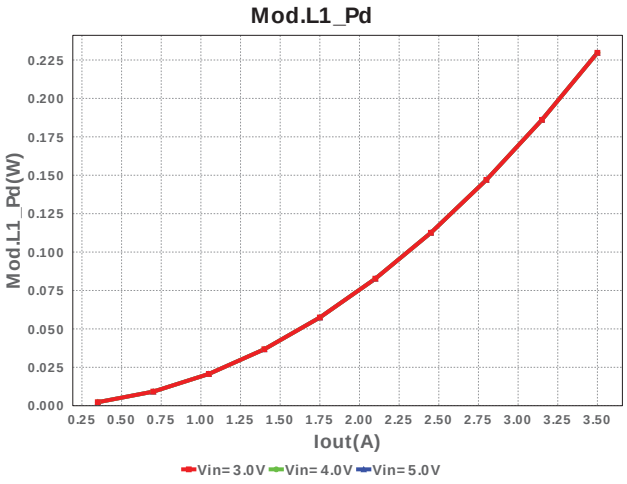
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Ccomp	Yageo America	CC0805KRX7R9BB471 Series= X7R	Cap= 470.0 pF VDC= 50.0 V IRMS= 0.0 A	1	$0.01	0805 7mm2
2.	Cin	Kemet	C0805C475K8PACTU Series= X5R	Cap= 4.7 µF ESR= 4.0 mOhm VDC= 10.0 V IRMS= 9.89 A	1	$0.03	0805 7mm2
3.	Cout	Panasonic	6SVPE220MW Series= 259	Cap= 220.0 µF ESR= 15.0 mOhm VDC= 6.3 V IRMS= 3.15 A	1	$0.14	CAPSMT_62_E61 53mm2
4.	Css	Yageo America	CC0805KRX7R9BB272 Series= X7R	Cap= 2.7 nF VDC= 50.0 V IRMS= 0.0 A	1	$0.01	0805 7mm2
5.	Rcomp	Panasonic	ERJ-6ENF6981V Series= 225	Res= 6.98 kOhm Power= 125.0 mW Tolerance= 1.0%	1	$0.01	0805 7mm2
6.	Rfbb	Panasonic	ERJ-6ENF1693V Series= 225	Res= 169.0 kOhm Power= 125.0 mW Tolerance= 1.0%	1	$0.01	0805 7mm2
7.	Rfbt	Panasonic	ERJ-6ENF4222V Series= 225	Res= 42.2 kOhm Power= 125.0 mW Tolerance= 1.0%	1	$0.01	0805 7mm2
8.	U1	Texas Instruments	LMZ10504TZX-ADJ/NOPB	Switcher	1	$4.30	TZA07A 199mm2

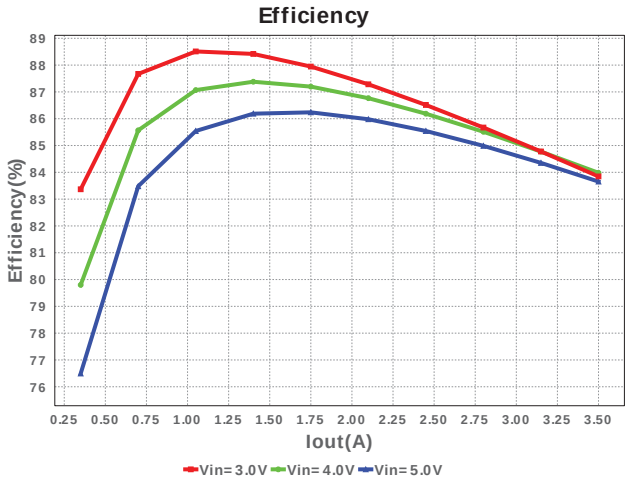


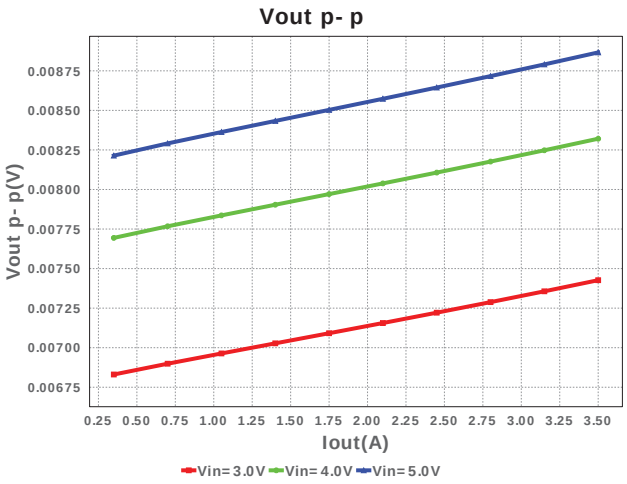


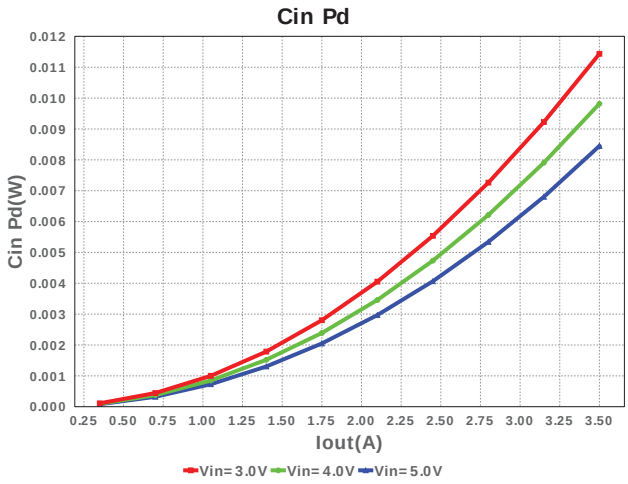


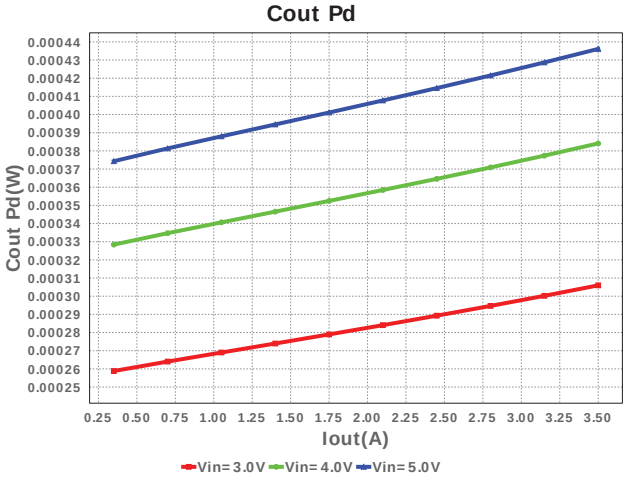


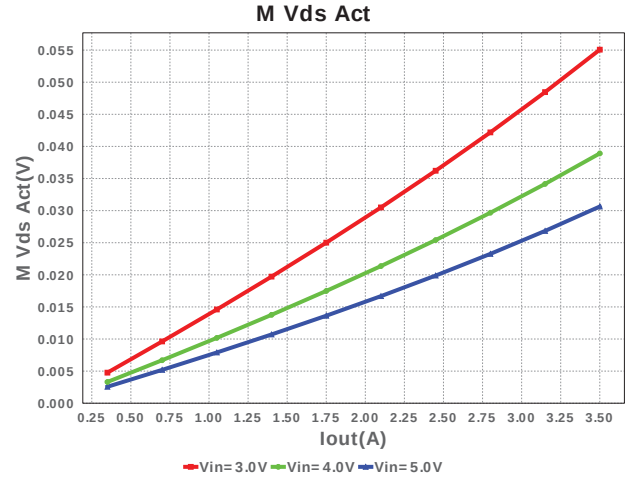


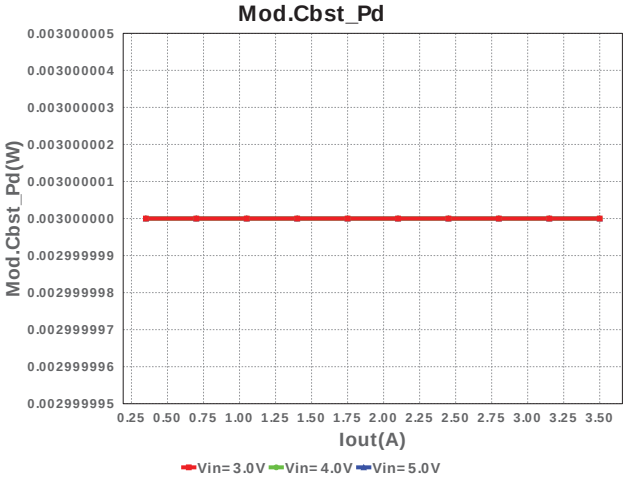


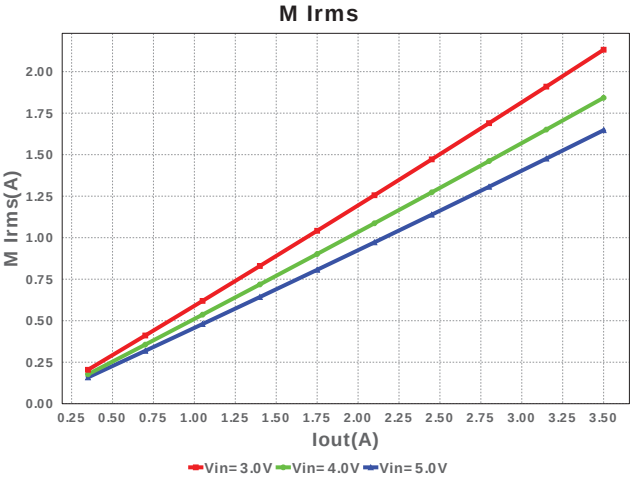


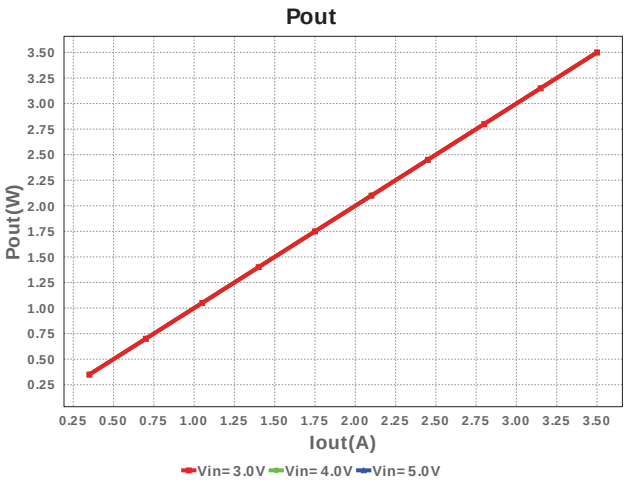


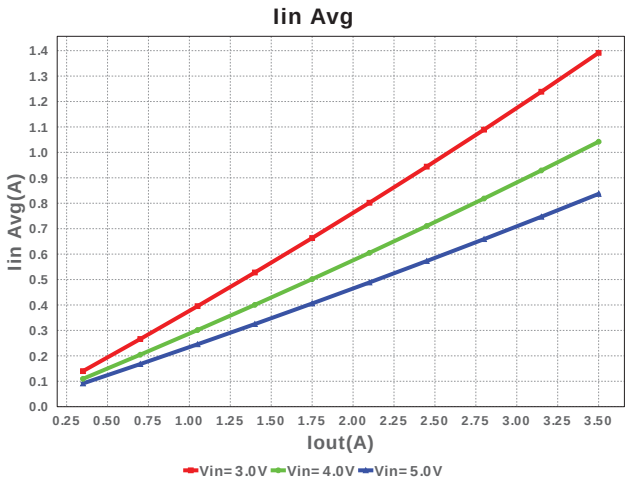


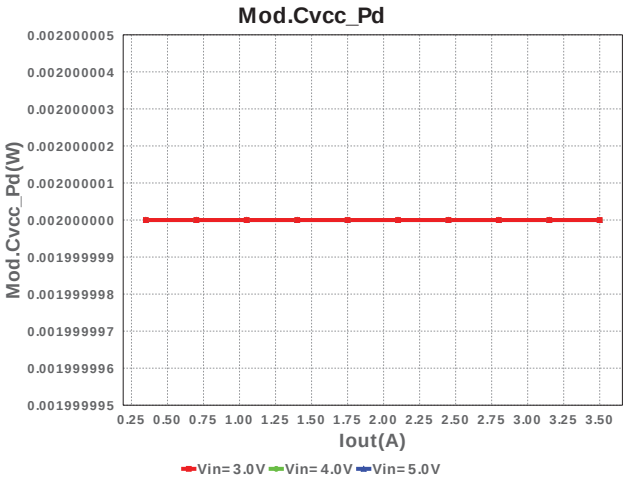


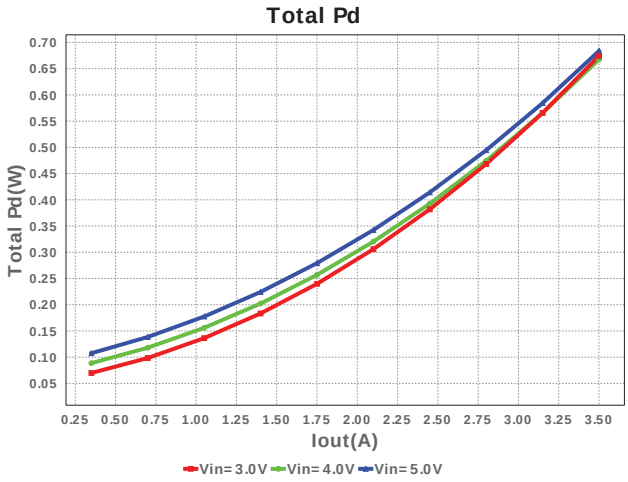


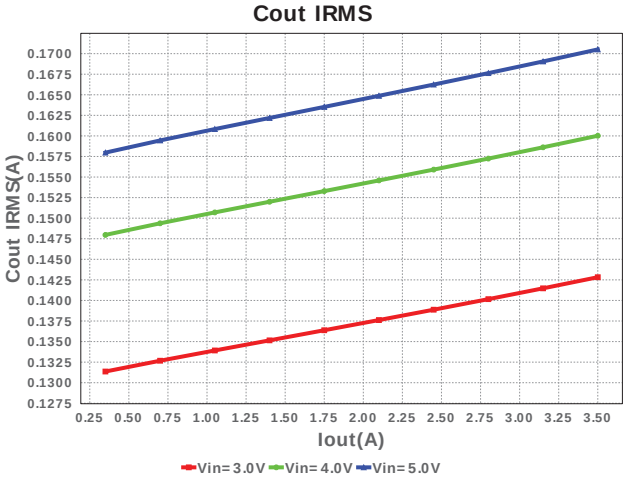


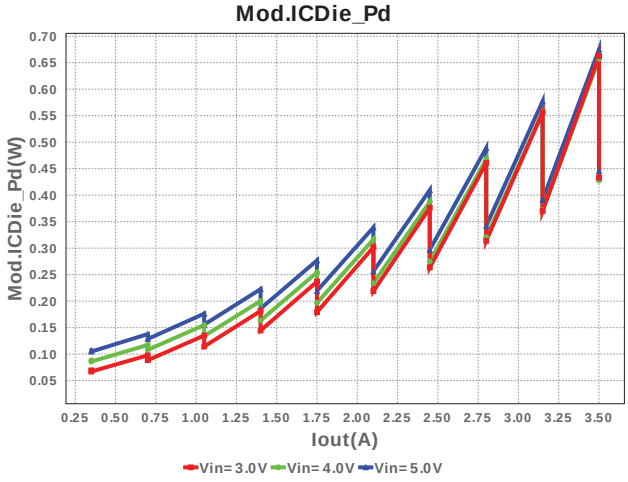












Operating Values

#	Name	Value	Category	Description
1.	BOM Count	8		Total Design BOM count
2.	Total BOM	$4.52		Total BOM Cost
3.	Cin IRMS	1.453 A	Current	Input capacitor RMS ripple current
4.	Cout IRMS	170.512 mA	Current	Output capacitor RMS ripple current
5.	IC Ipk	3.795 A	Current	Peak switch current in IC
6.	Iin Avg	836.77 mA	Current	Average input current
7.	M1 Irms	1.647 A	Current	Q Iavg
8.	FootPrint	293.0 mm2	General	Total Foot Print Area of BOM components
9.	Frequency	1000.0 kHz	General	Switching frequency
10.	IC Tolerance	20.0 mV	General	IC Feedback Tolerance
11.	M Vds Act	30.636 mV	General	Voltage drop across the MosFET

#	Name	Value	Category	Description
12.	Pout	3.5 W	General	Total output power
13.	Vout OP	1.0 V	Op_Point	Operational Output Voltage
14.	Cross Freq	91.201 kHz	Op_point	Bode plot crossover frequency
15.	Duty Cycle	22.15 %	Op_point	Duty cycle
16.	Efficiency	83.655 %	Op_point	Steady state efficiency
17.	IC Tj	40.125 degC	Op_point	IC junction temperature
18.	ICThetaJA	15.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
19.	IOUT_OP	3.5 A	Op_point	Iout operating point
20.	Phase Marg	71.478 deg	Op_point	Bode Plot Phase Margin
21.	VIN_OP	5.0 V	Op_point	Vin operating point
22.	Vout p-p	8.866 mV	Op_point	Peak-to-peak output ripple voltage
23.	Cin Pd	8.45 mW	Power	Input capacitor power dissipation
24.	Cout Pd	436.116 µW	Power	Output capacitor power dissipation
25.	Module CbstPd	3.0 mW	Power	Internal Module Cbst Power Dissipation
26.	Module CvccPd	2.0 mW	Power	Internal Module Cvcc Power Dissipation
27.	Module ICPd	445.292 mW	Power	Internal Module IC Power Dissipation
28.	Module L1Pd	229.688 mW	Power	Internal Module Inductor Power Dissipation
29.	Total Pd	683.85 mW	Power	Total Power Dissipation

Design Inputs

#	Name	Value	Description
1.	Iout	3.5 A	Maximum Output Current
2.	Iout1	3.5 Amps	Output Current #1
3.	VinMax	5.0 V	Maximum input voltage
4.	VinMin	3.0 V	Minimum input voltage
5.	Vout	1.0 V	Output Voltage
6.	Vout1	1.0 Volt	Output Voltage #1
7.	base_pn	LMZ10504	Base Product Number
8.	source	DC	Input Source Type
9.	Ta	30.0 degC	Ambient temperature

Design Assistance

1. **LMZ10504** Product Folder : http://www.ti.com/product/lmz10504 : contains the data sheet and other resources.