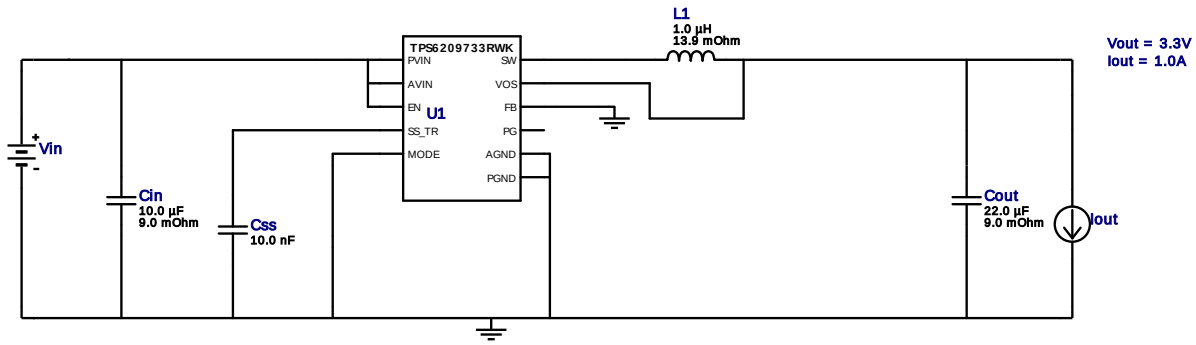
TEXAS INSTRUMENTS

WEBENCH® Design Report

VinMin = 3.6V
VinMax = 4.2V
Vout = 3.3V
Iout = 1.0A

Device = TPS6209733RWKR
Topology = Buck
Created = 7/12/16 11:28:23 PM
BOM Cost = $1.04
BOM Count = 5
Total Pd = 0.17W

Design : 3893481/26 TPS6209733RWKR
TPS6209733RWKR 3.6V-4.2V to 3.30V @ 1.0A



My Comments

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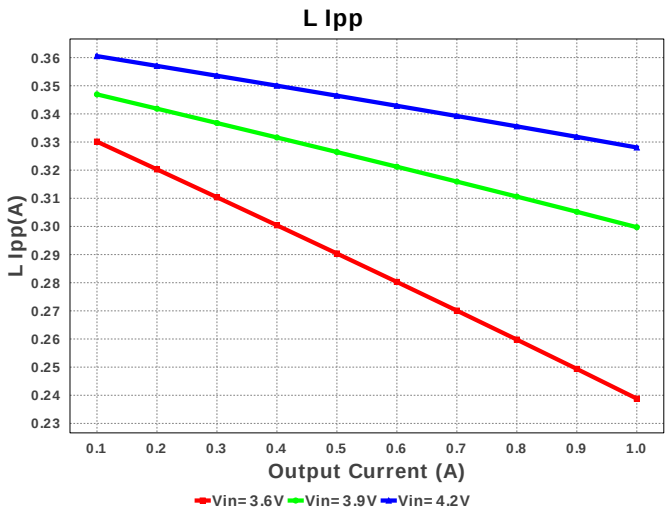
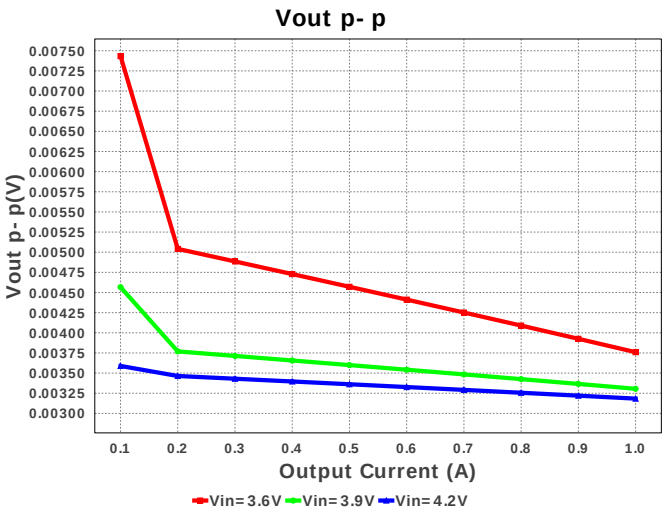
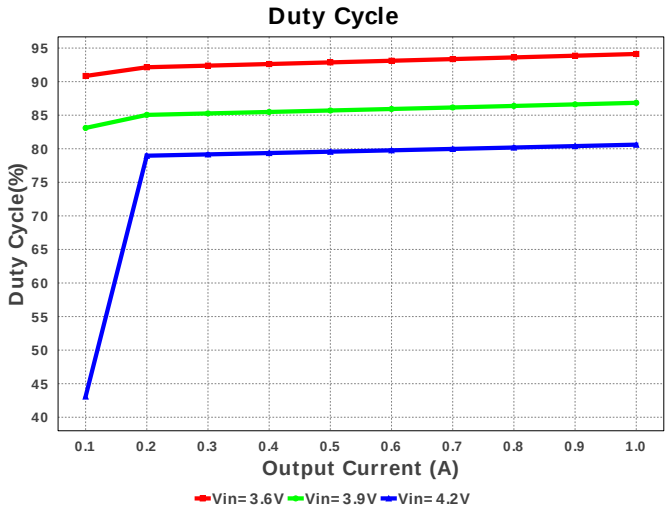
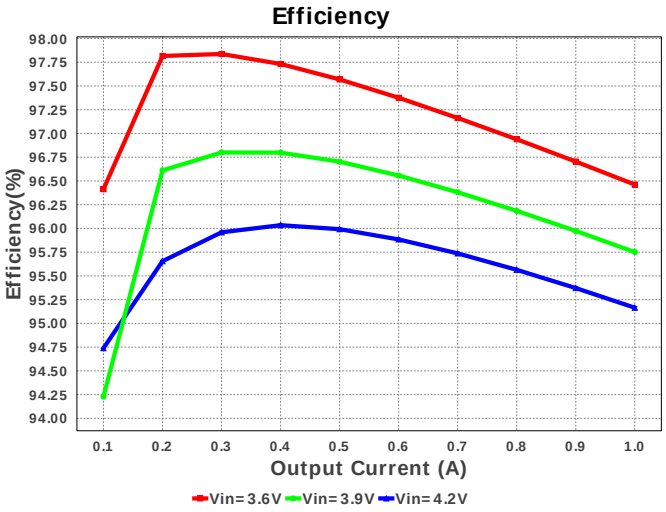
Electrical BOM

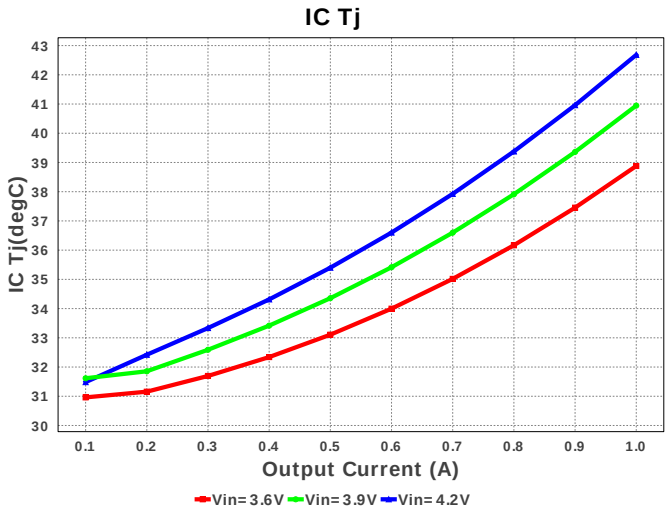
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cin	MuRata	GRM188R60J106ME47D Series= X5R	Cap= 10.0 uF ESR= 9.0 mOhm VDC= 6.3 V IRMS= 2.74 A	1	$0.02	0603 5 mm²
2.	Cout	MuRata	GRM21BR60J226ME39L Series= X5R	Cap= 22.0 uF ESR= 9.0 mOhm VDC= 6.3 V IRMS= 3.5 A	1	$0.04	0805 7 mm²
3.	Css	MuRata	GRM033R61A103KA01D Series= X5R	Cap= 10.0 nF VDC= 10.0 V IRMS= 0.0 A	1	$0.01	0201 2 mm²
4.	L1	Bourns	SRN6045-1R0Y	L= 1.0 µH DCR= 13.9 mOhm	1	$0.16	SRN6045 64 mm²
5.	U1	Texas Instruments	TPS6209733RWKR	Switcher	1	$0.81	RWK0011B 9 mm²

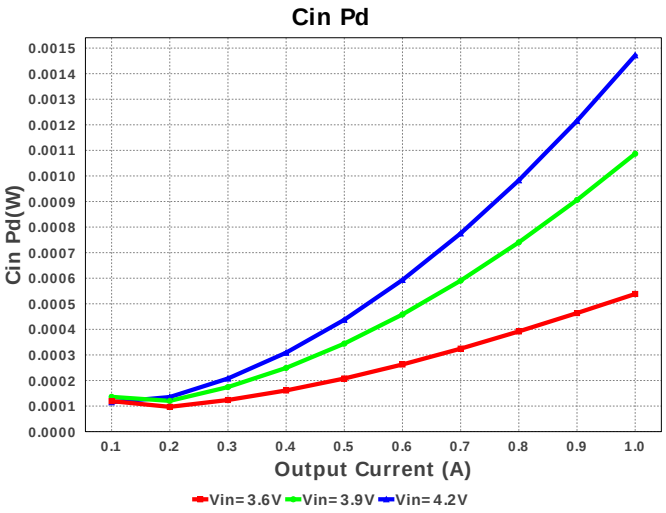




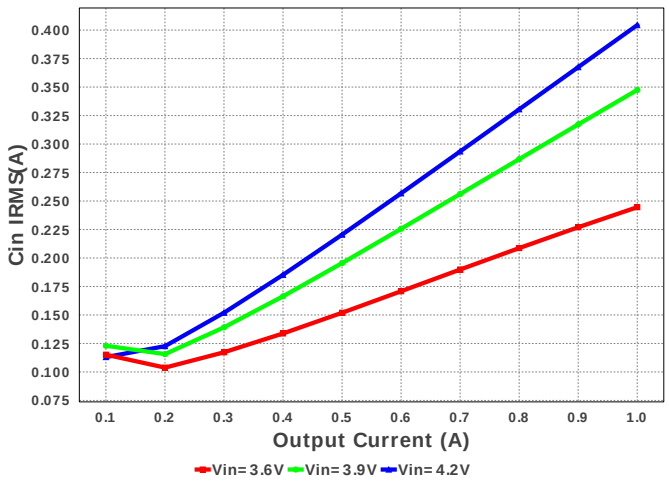




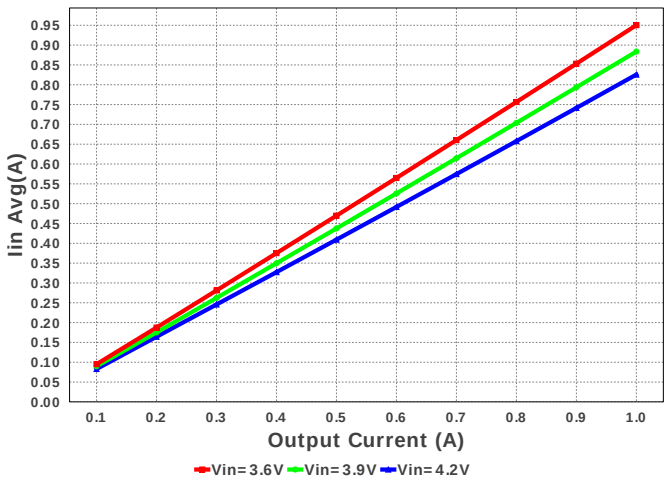




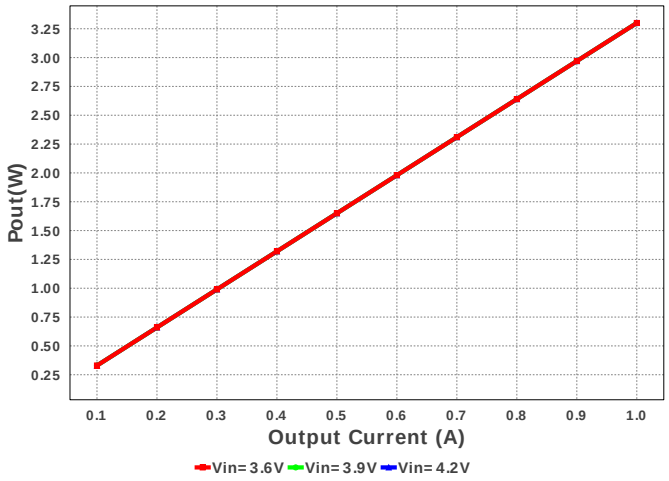
Cin IRMS



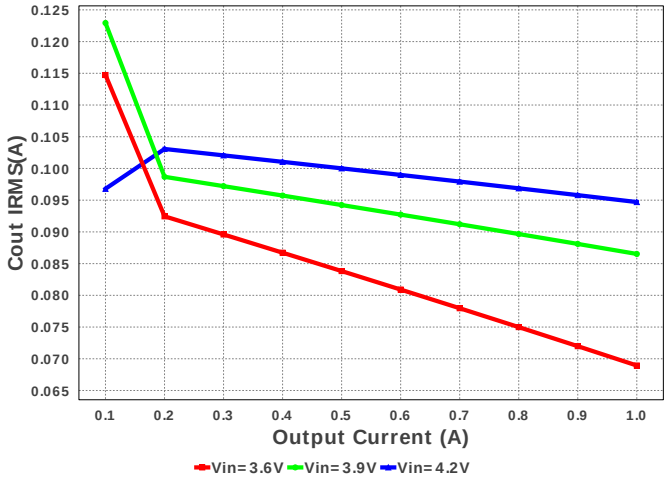
Iin Avg



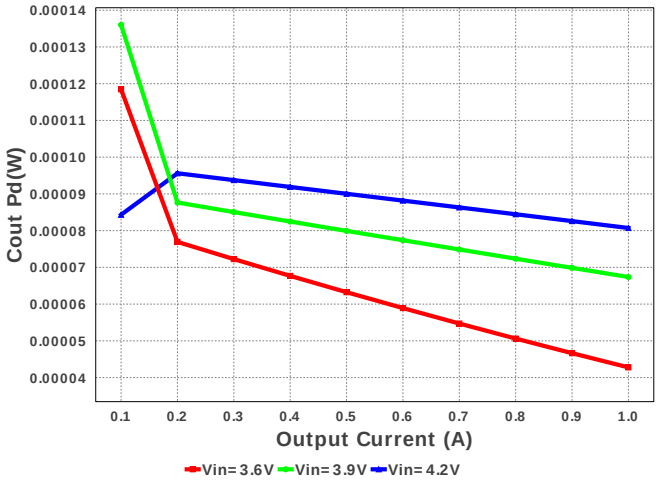
Pout



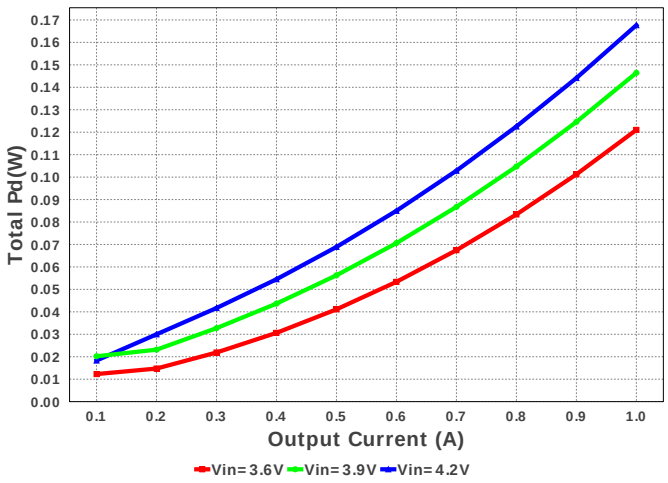
Cout IRMS

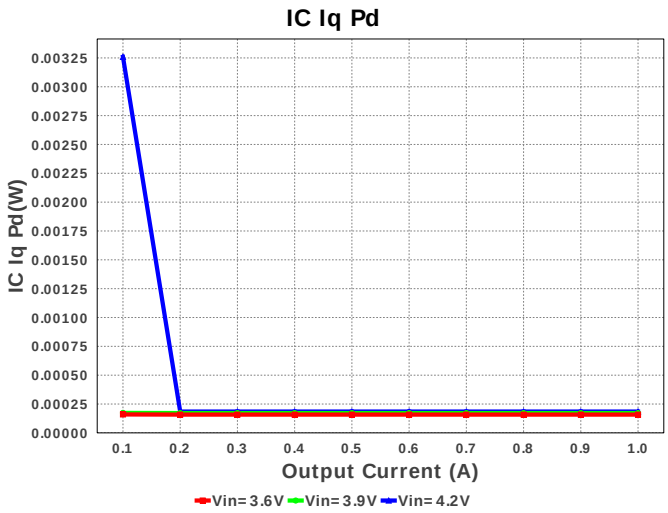


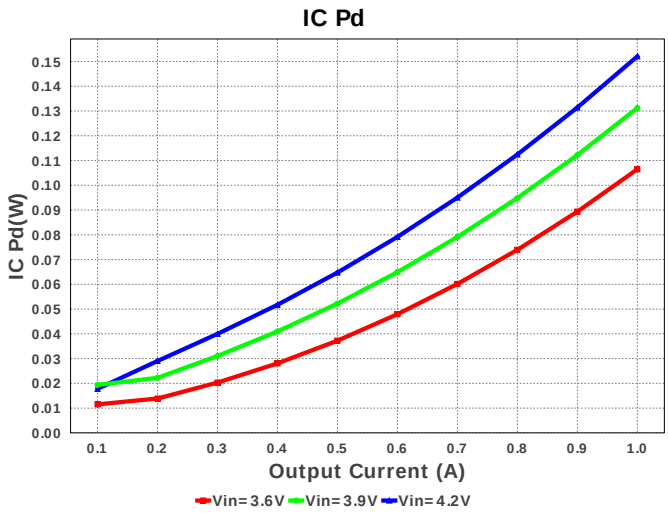
Cout Pd

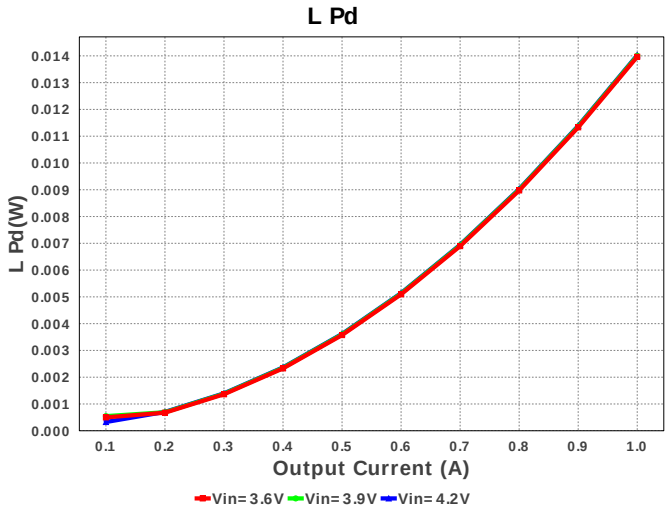


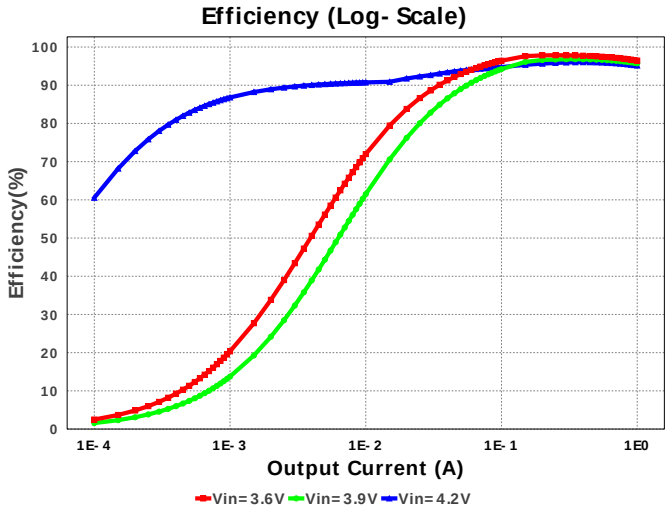
Total Pd











Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	404.384 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	94.703 mA	Current	Output capacitor RMS ripple current
3.	Iin Avg	825.63 mA	Current	Average input current
4.	L Ipp	328.06 mA	Current	Peak-to-peak inductor ripple current
5.	BOM Count	5	General	Total Design BOM count
6.	FootPrint	87.0 mm^2	General	Total Foot Print Area of BOM components
7.	Frequency	1.938 MHz	General	Switching frequency
8.	IC Tolerance	69.3 mV	General	IC Feedback Tolerance
9.	Pout	3.3 W	General	Total output power
10.	Total BOM	$1.04	General	Total BOM Cost
11.	Vout OP	3.3 V	Op_Point	Operational Output Voltage
12.	Duty Cycle	80.611 %	Op_point	Duty cycle
13.	Efficiency	95.165 %	Op_point	Steady state efficiency
14.	IC Tj	42.682 degC	Op_point	IC junction temperature
15.	ICThetaJA	83.4 degC/W	Op_point	IC junction-to-ambient thermal resistance
16.	IOUT_OP	1.0 A	Op_point	Iout operating point
17.	VIN_OP	4.2 V	Op_point	Vin operating point
18.	Vout p-p	3.183 mV	Op_point	Peak-to-peak output ripple voltage
19.	Cin Pd	1.472 mW	Power	Input capacitor power dissipation
20.	Cout Pd	80.718 µW	Power	Output capacitor power dissipation
21.	IC Iq Pd	184.8 µW	Power	IC Iq Pd
22.	IC Pd	152.066 mW	Power	IC power dissipation
23.	L Pd	14.025 mW	Power	Inductor power dissipation
24.	Total Pd	167.661 mW	Power	Total Power Dissipation
25.	Vout Tolerance	2.1 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	1.0	Maximum Output Current

#	Name	Value	Description
2.	VinMax	4.2	Maximum input voltage
3.	VinMin	3.6	Minimum input voltage
4.	Vout	3.3	Output Voltage
5.	base_pn	TPS6209733	Texas Instruments Base Part Number
6.	source	DC	Input Source Type
7.	ta	30.0	Ambient temperature

Design Assistance

1. TPS6209733 Product Folder : http://www.ti.com/product/TPS62097 : contains the data sheet and other resources.