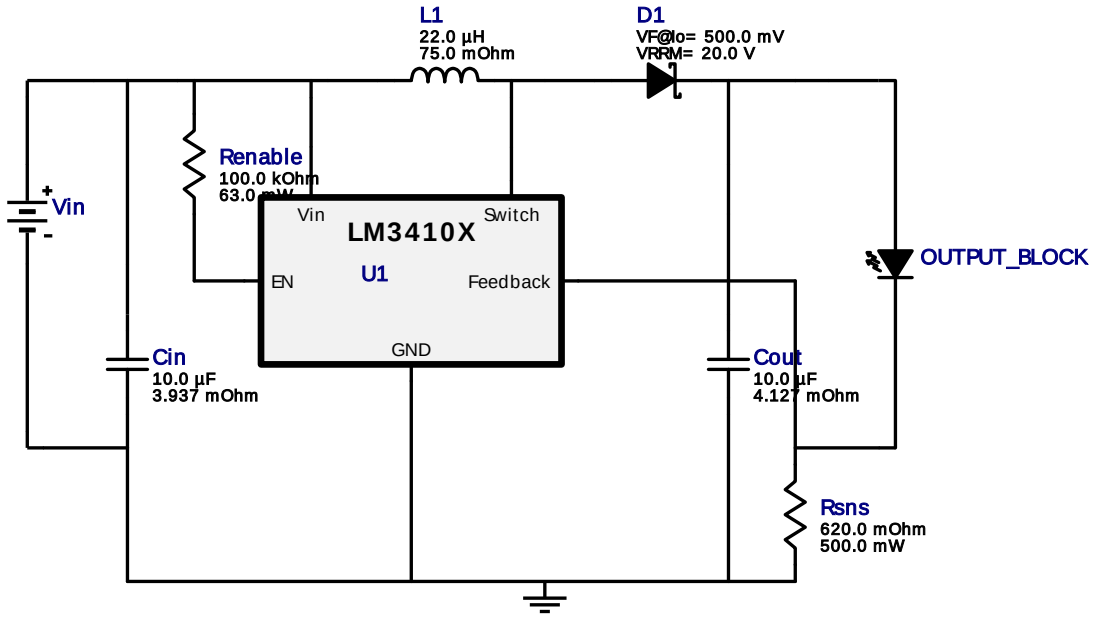
TEXAS INSTRUMENTS

WEBENCH® Design Report

VinMin = 3.0V
VinMax = 5.0V
Vout = 11.18V
Iout = 0.3A

Device = LM3410XMF/NOPB
Topology = Boost
Created = 8/4/16 12:39:29 AM
BOM Cost = $6.42
BOM Count = 8
Total Pd = 0.85W

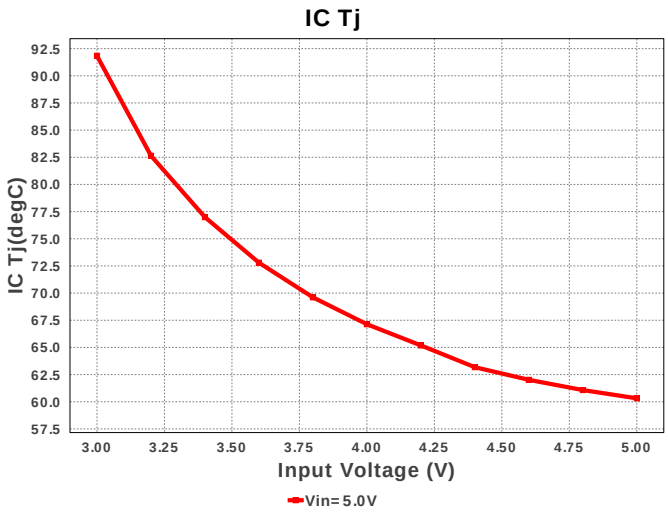
Design : 4738422/4 LM3410XMF/NOPB
LM3410XMF/NOPB 3.0V-5.0V to 11.37V @ 0.3A

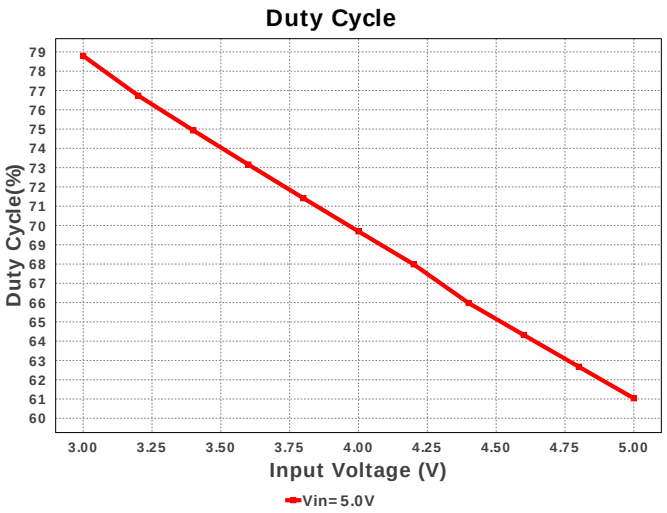


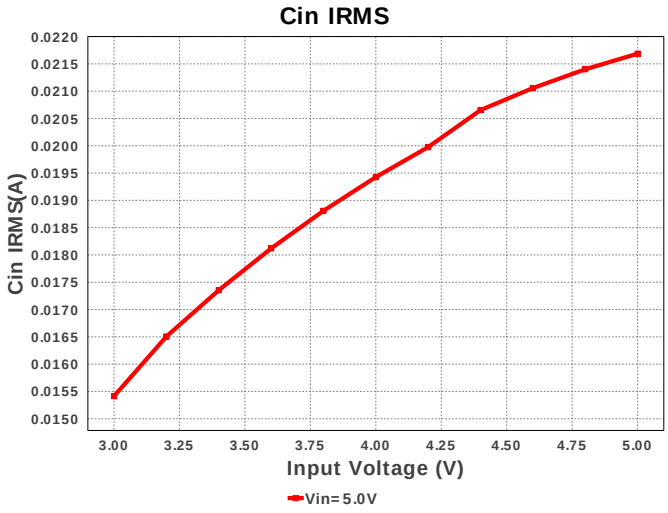
Electrical BOM

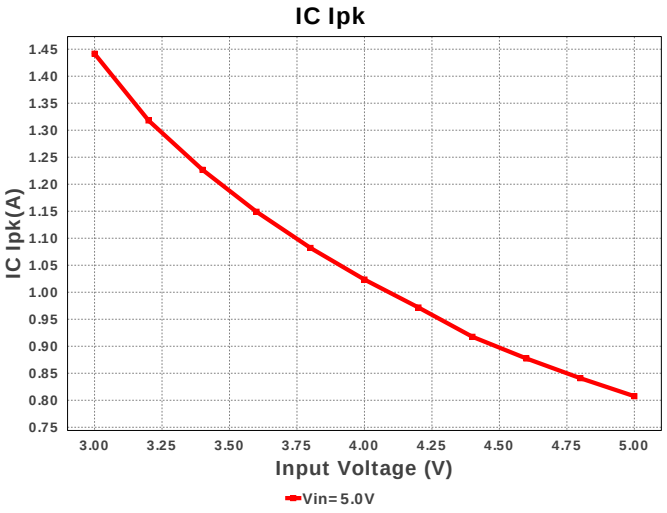
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cin	MuRata	GRM219R61A106KE44D Series= X5R	Cap= 10.0 uF ESR= 3.937 mOhm VDC= 10.0 V IRMS= 2.7713 A	1	$0.03	0805 7 mm²
2.	Cout	MuRata	GRM21BR61C106KE15L Series= X5R	Cap= 10.0 uF ESR= 4.127 mOhm VDC= 16.0 V IRMS= 2.46634 A	1	$0.03	0805 7 mm²
3.	D1	Diodes Inc.	B220-13-F	VF@Io= 500.0 mV VRRM= 20.0 V	1	$0.08	SMB 44 mm²
4.	D_LED	Cree	XHP50A-00-0000-0D00J40CB	LED	1	$5.02	xlampxhp 0 mm²
5.	L1	TDK	VLP8040T-220M	L= 22.0 µH DCR= 75.0 mOhm	1	$0.22	VLP8040 113 mm²
6.	Renable	Vishay-Dale	CRCW0402100KFKED Series= CRCW..e3	Res= 100.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm²
7.	Rsns	Rohm	MCR25JZHFLR620 Series= MCR25	Res= 620.0 mOhm Power= 500.0 mW Tolerance= 1.0%	1	$0.03	1210 15 mm²

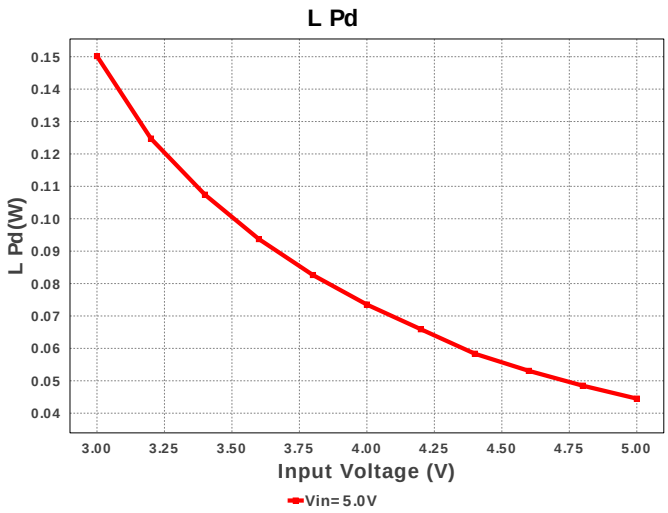
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
8.	U1	Texas Instruments	LM3410XMF/NOPB	Switcher	1	$1.00	MF05A 15 mm^2

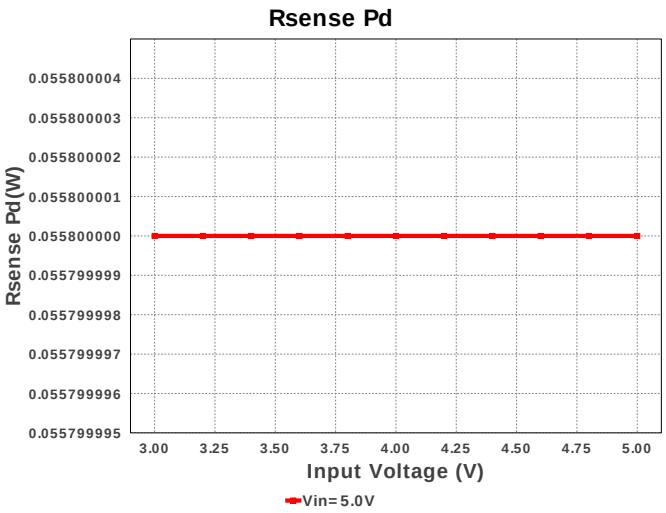


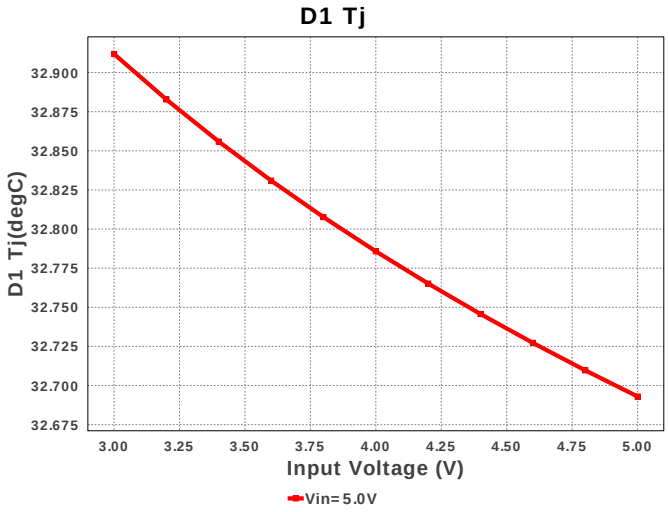


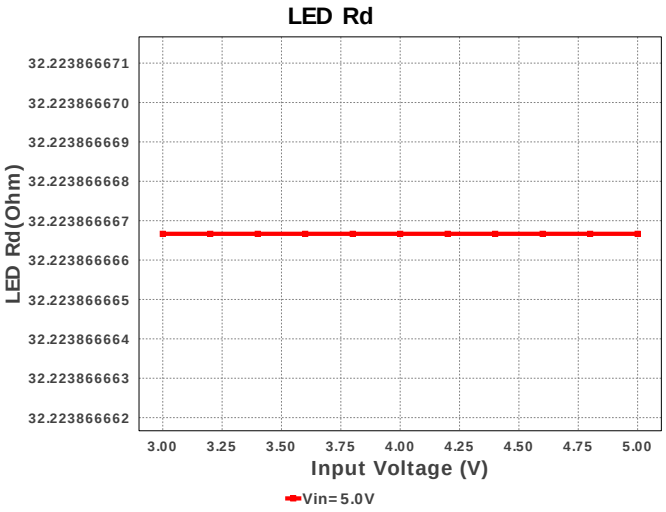


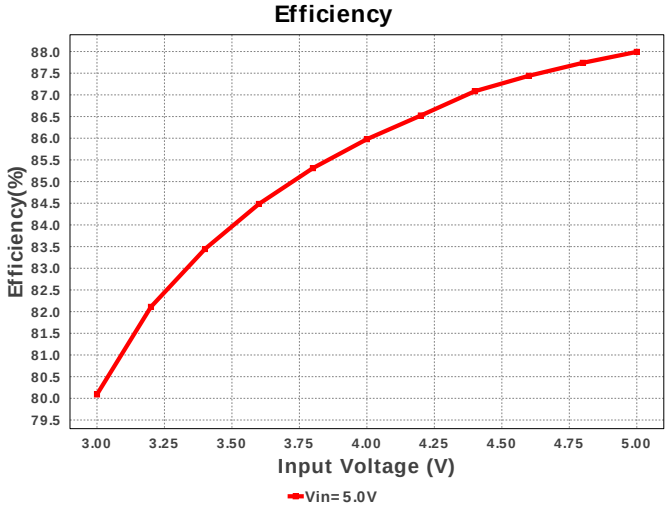


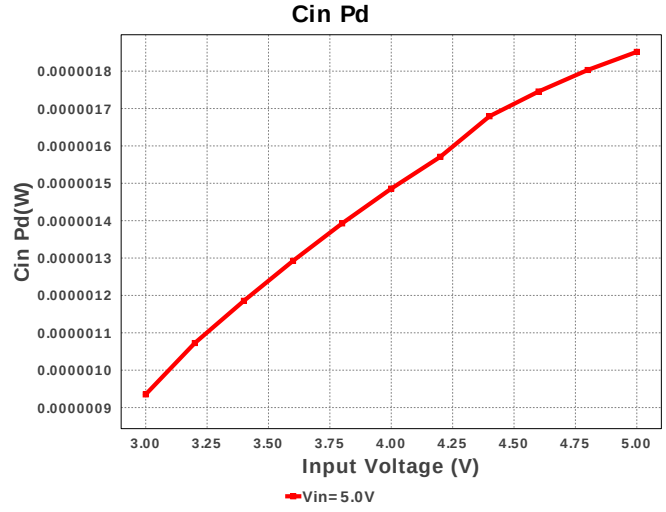


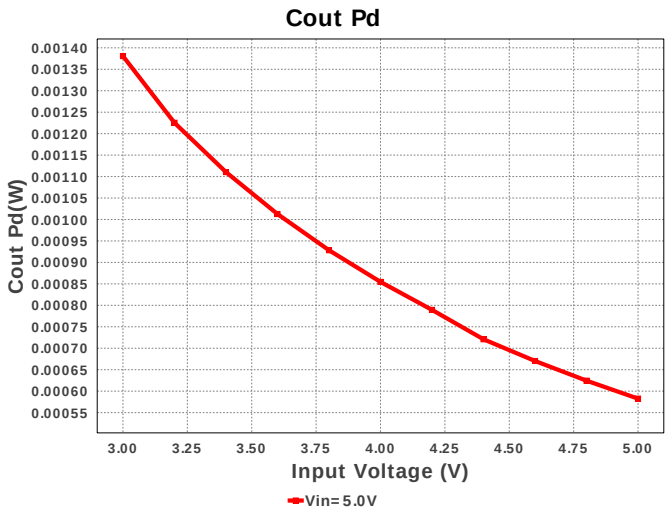


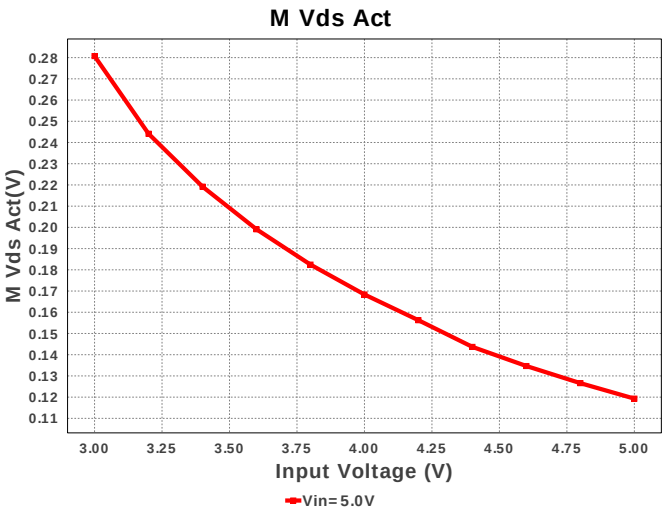


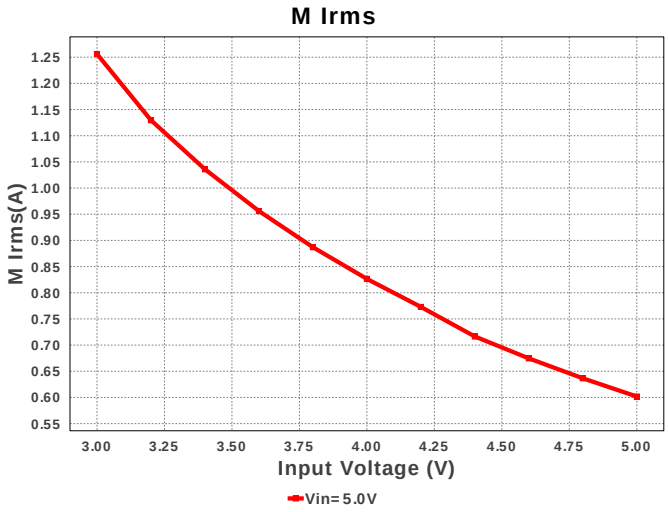


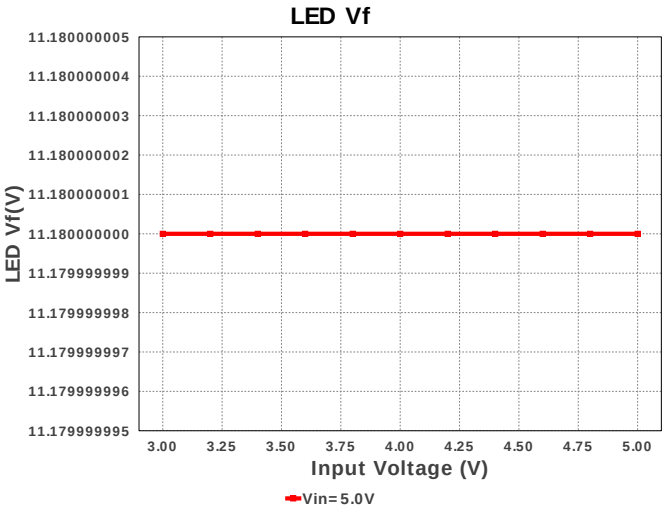


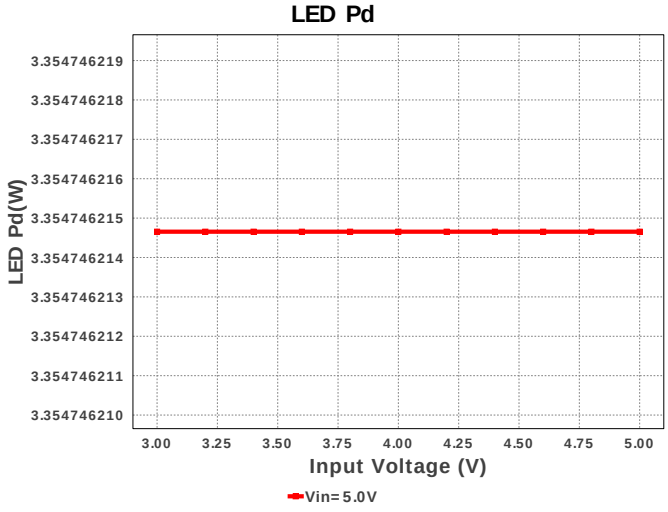


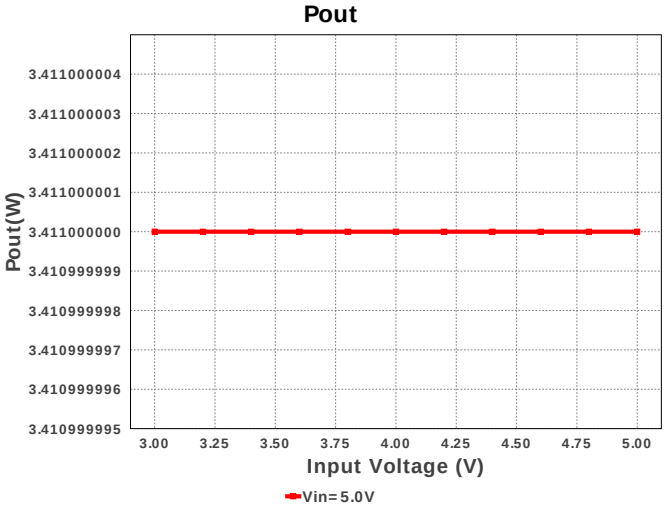


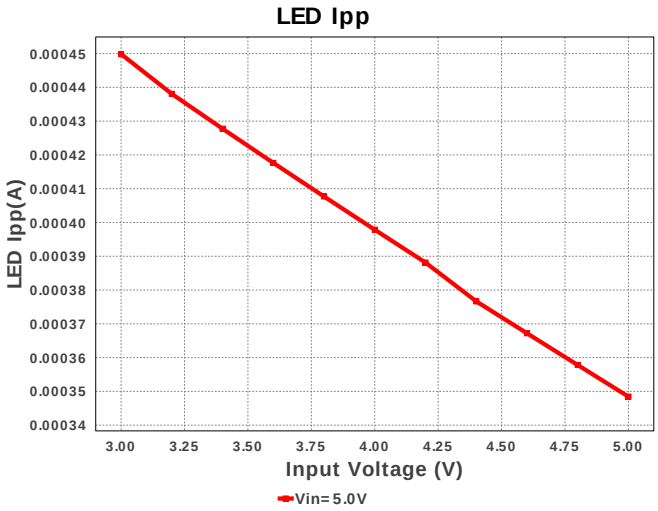


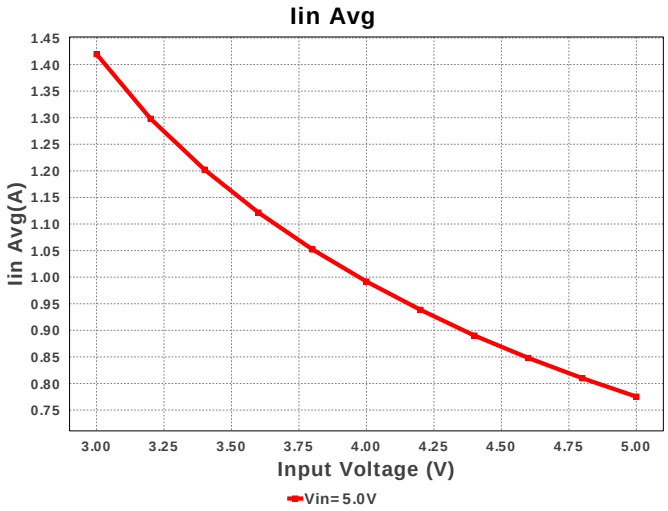


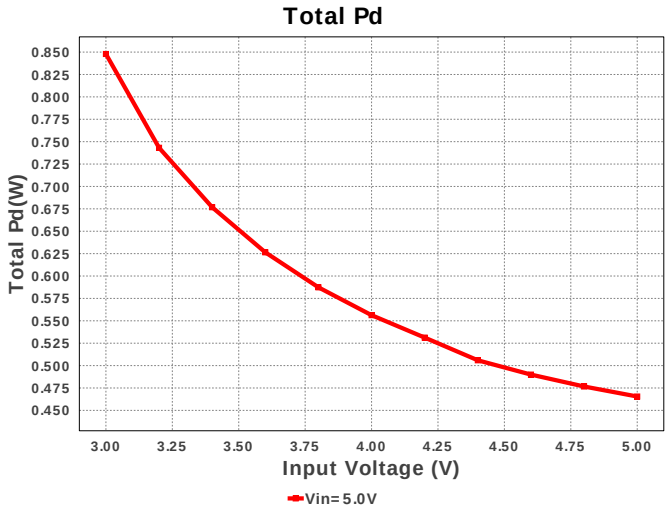


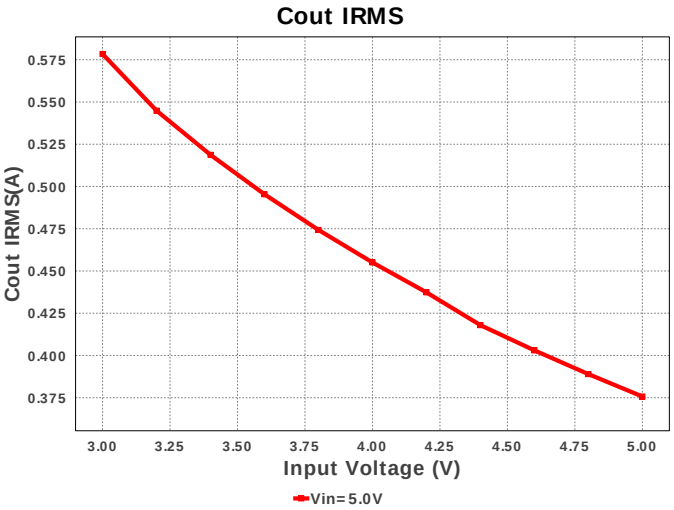


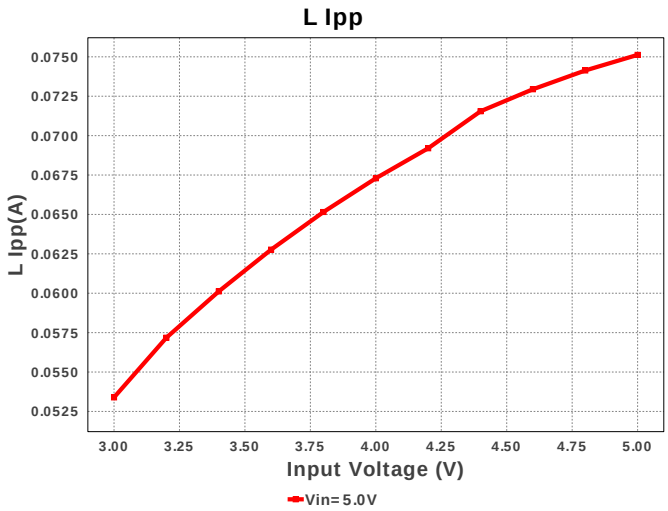


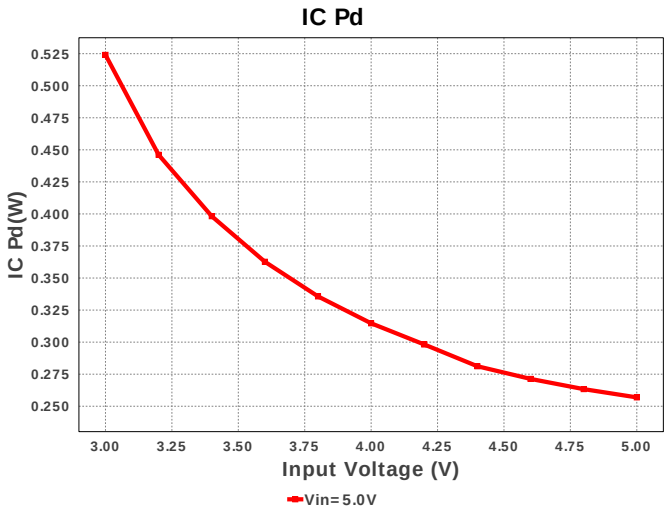


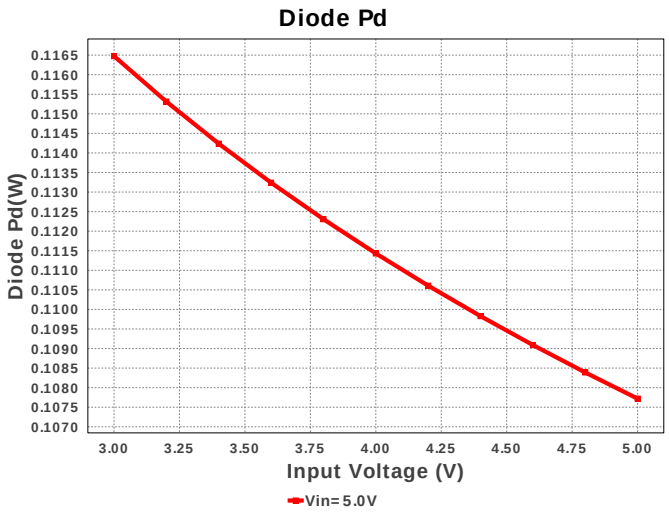


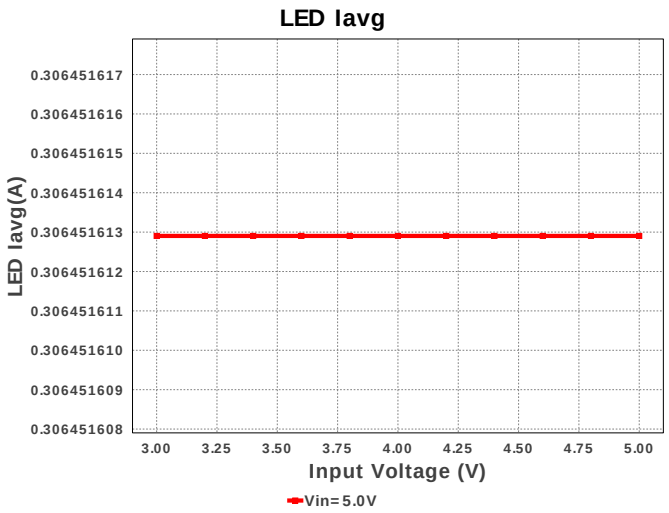












Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	15.413 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	578.442 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	1.442 A	Current	Peak switch current in IC
4.	Iin Avg	1.42 A	Current	Average input current
5.	L Ipp	53.392 mA	Current	Peak-to-peak inductor ripple current
6.	LED Iavg	306.452 mA	Current	LED Average Current
7.	LED Ipp	449.86 µA	Current	LED Ripple Current
8.	M Irms	1.256 A	Current	MOSFET RMS current
9.	BOM Count	8	General	Total Design BOM count
10.	FootPrint	204.0 mm^2	General	Total Foot Print Area of BOM components
11.	Frequency	1.6 MHz	General	Switching frequency
12.	IC Tolerance	12.0 mV	General	IC Feedback Tolerance
13.	M Vds Act	280.76 mV	General	Voltage drop across the MosFET
14.	Pout	3.411 W	General	Total output power
15.	Total BOM	$6.42	General	Total BOM Cost
16.	D1 Tj	32.92 degC	Op_Point	D1 junction temperature
17.	Vout OP	11.37 V	Op_Point	Operational Output Voltage
18.	Duty Cycle	78.801 %	Op_point	Duty cycle
19.	Efficiency	80.083 %	Op_point	Steady state efficiency
20.	IC Tj	91.852 degC	Op_point	IC junction temperature
21.	ICThetaJA	118.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
22.	IOUT_OP	300.0 mA	Op_point	Iout operating point
23.	LED Rd	32.224 Ohm	Op_point	LED DynamicResistance
24.	LED Vf	11.18 V	Op_point	Total LED Forward Calculated Voltage
25.	VIN_OP	3.0 V	Op_point	Vin operating point
26.	Cin Pd	935.267 nW	Power	Input capacitor power dissipation
27.	Cout Pd	1.381 mW	Power	Output capacitor power dissipation
28.	Diode Pd	116.783 mW	Power	Diode power dissipation
29.	IC Pd	524.176 mW	Power	IC power dissipation
30.	L Pd	150.216 mW	Power	Inductor power dissipation
31.	LED Pd	3.355 W	Power	LED Power Dissipation
32.	Rsense Pd	55.8 mW	Power	Rsense Power Dissipation
33.	Total Pd	848.345 mW	Power	Total Power Dissipation
34.	Vout Tolerance	105.54 m%		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	300.0 m	Maximum Output Current
2.	VinMax	5.0	Maximum input voltage
3.	VinMin	3.0	Minimum input voltage
4.	Vout	11.18	Output Voltage
5.	application	LED_DRIVER	LED Application
6.	base_pn	LM3410X	Texas Instruments Base Part Number
7.	isLEDArchitect	N	LED Architect Project
8.	ledparallel	1.0	Number of LED in parallel
9.	ledpartnumber	XHP50A-00-0000-0D00L40CB	LED Part number
10.	ledseries	1.0	Number of LED in series
11.	line_fsw	60.0	AC Line Frequency
12.	source	DC	Input Source Type
13.	ta	30.0	Ambient temperature

Design Assistance

1. LM3410X Product Folder : http://www.ti.com/product/LM3410 : contains the data sheet and other resources.