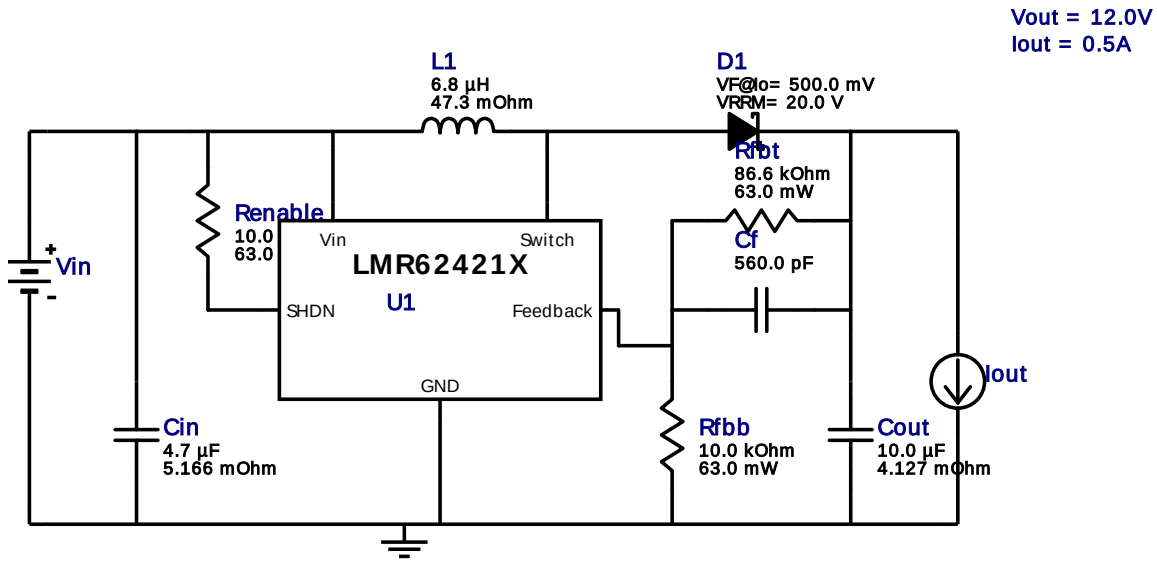
VinMin = 4.6V
VinMax = 5.4V
Vout = 12.0V
Iout = 0.5A

Device = LMR62421XSD/NOPB
Topology = Boost
Created = 7/18/16 7:09:16 PM
BOM Cost = $1.08
BOM Count = 9
Total Pd = 0.72W

WEBENCH® Design Report

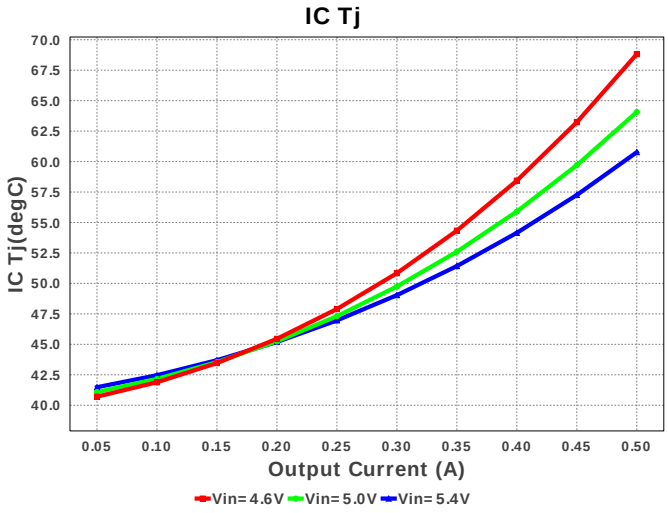
Design : 3496425/6 LMR62421XSD/NOPB
LMR62421XSD/NOPB 4.6V-5.4V to 12.00V @ 0.5A

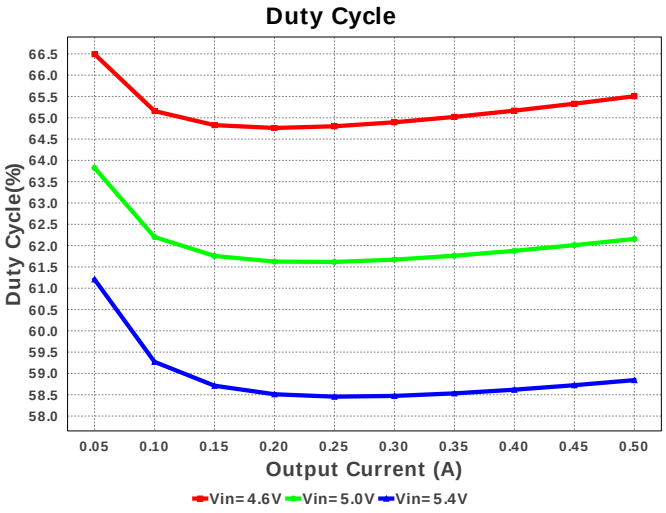


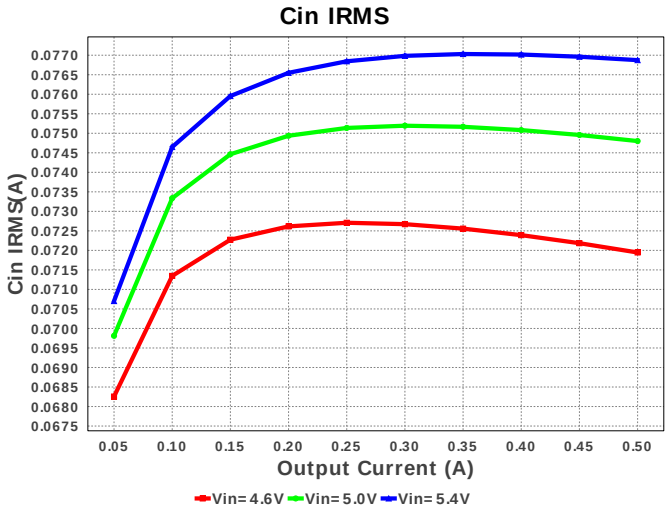
Electrical BOM

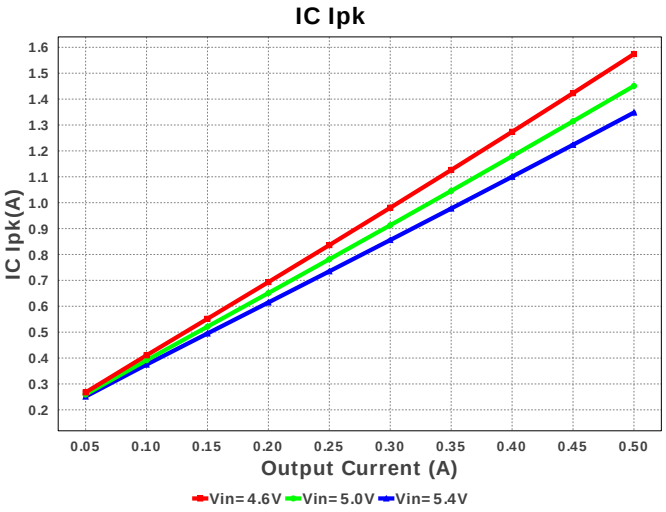
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cf	Yageo America	CC0805KRX7R9BB561 Series= X7R	Cap= 560.0 pF VDC= 50.0 V IRMS= 0.0 A	1	$0.01	0805 7 mm²
2.	Cin	MuRata	GRM21BC81E475KA12L Series= X6S	Cap= 4.7 uF ESR= 5.166 mOhm VDC= 25.0 V IRMS= 2.03531 A	1	$0.02	0805 7 mm²
3.	Cout	MuRata	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
4.	D1	Diodes Inc.	B220-13-F	VF@Io= 500.0 mV VRRM= 20.0 V	1	$0.08	SMB 44 mm²
5.	L1	Bourns	SRN6045-6R8Y	L= 6.8 µH DCR= 47.3 mOhm	1	$0.16	SRN6045 64 mm²
6.	Renable	Vishay-Dale	CRCW040210K0FKED Series= CRCW..e3	Res= 10.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm²
7.	Rfbb	Vishay-Dale	CRCW040210K0FKED Series= CRCW..e3	Res= 10.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm²
8.	Rfbt	Vishay-Dale	CRCW040286K6FKED Series= CRCW..e3	Res= 86.6 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm²

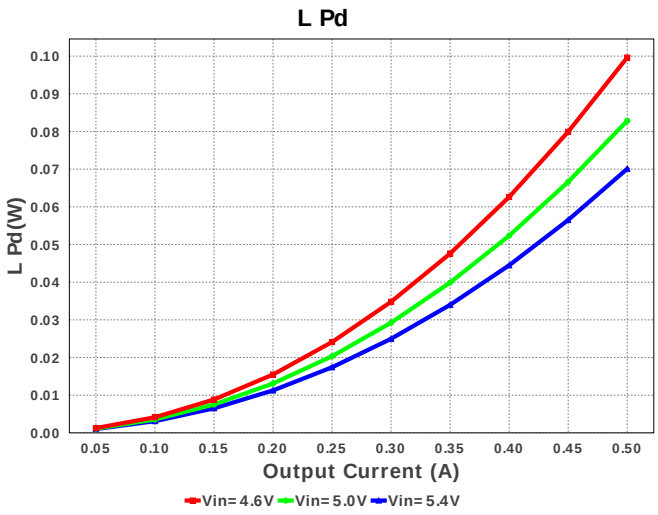
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
9.	U1	Texas Instruments	LMR62421XSD/NOPB	Switcher	1	$0.75	SDE06A 16 mm^2

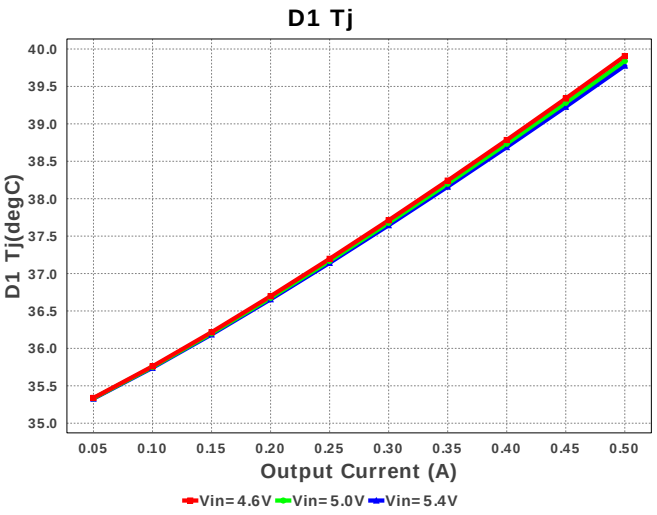


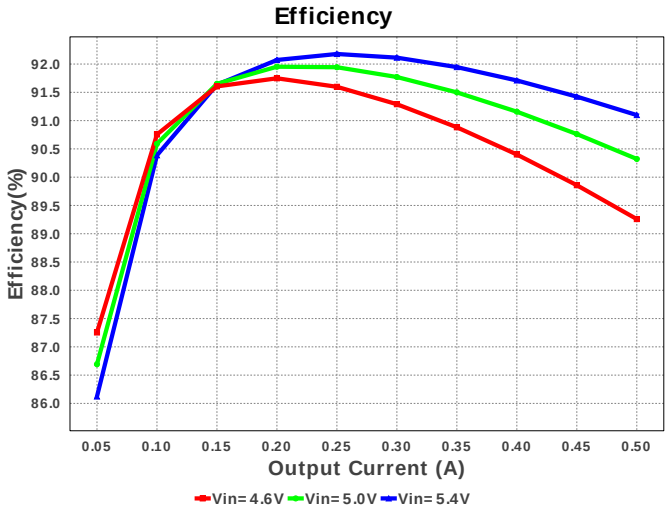


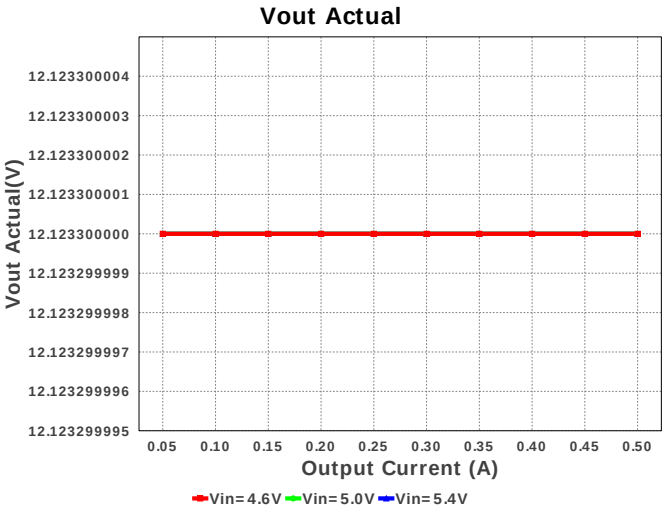


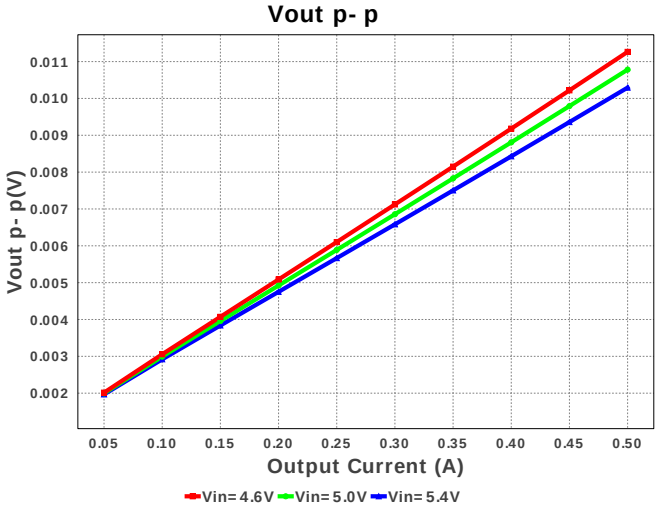


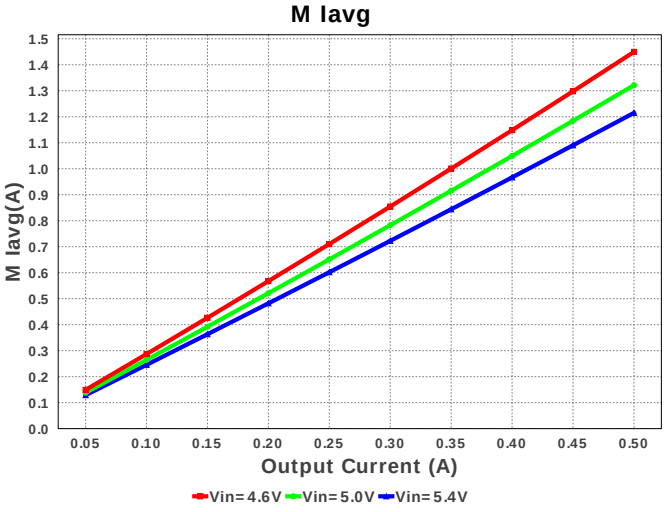


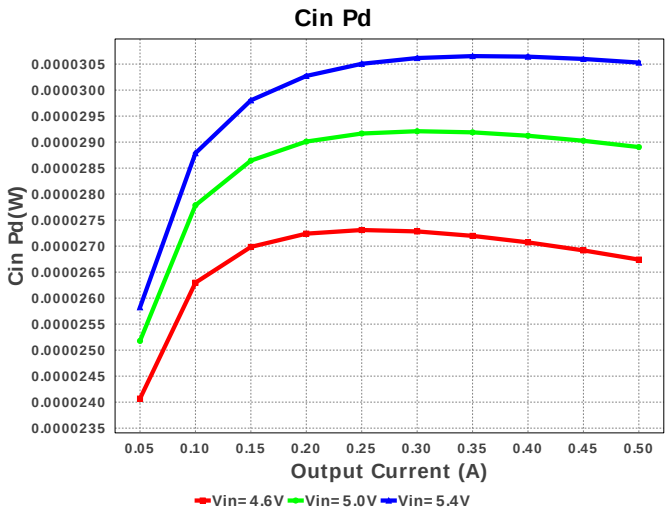


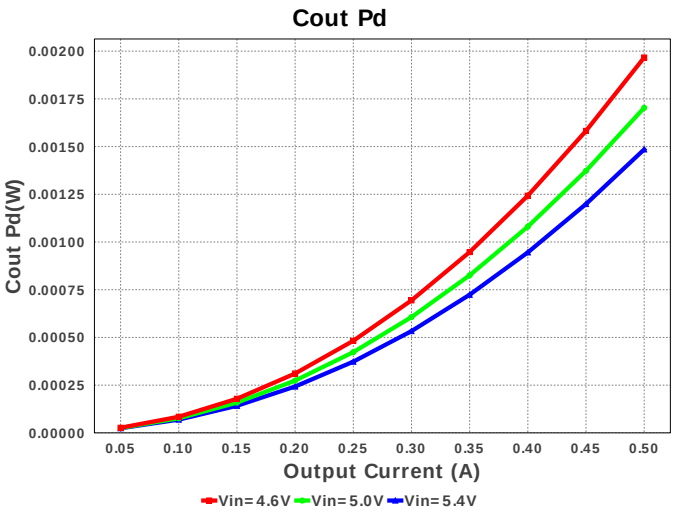


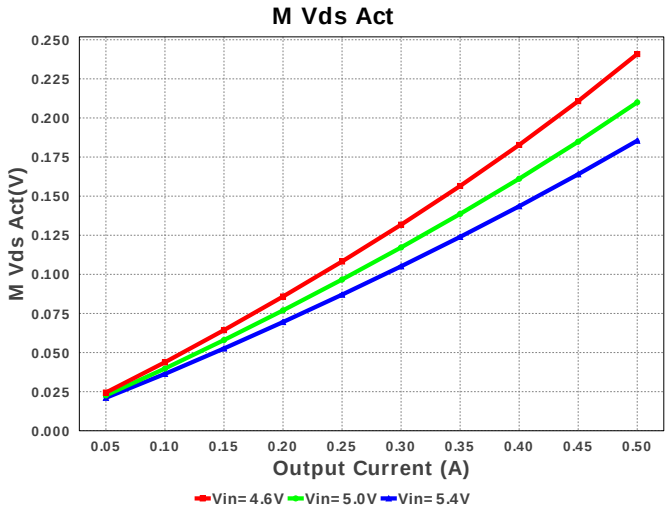


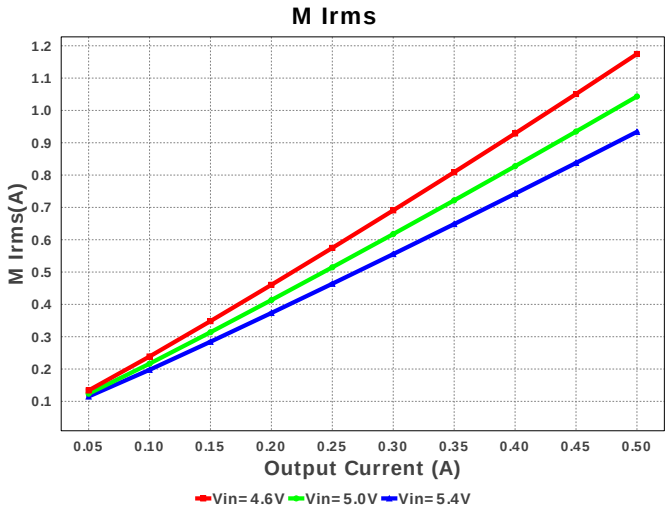


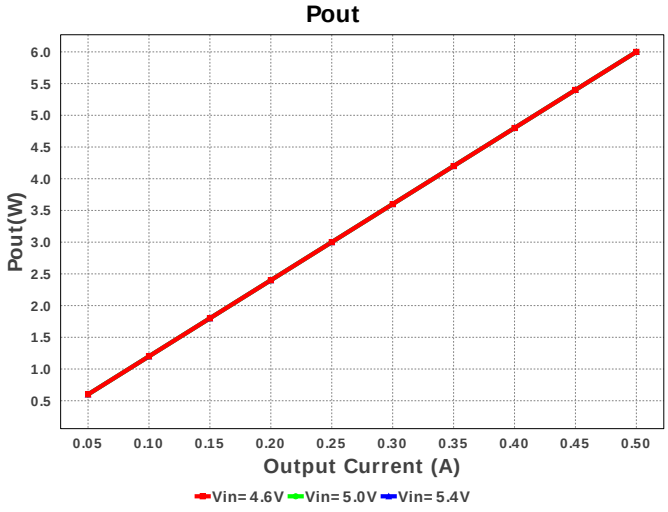


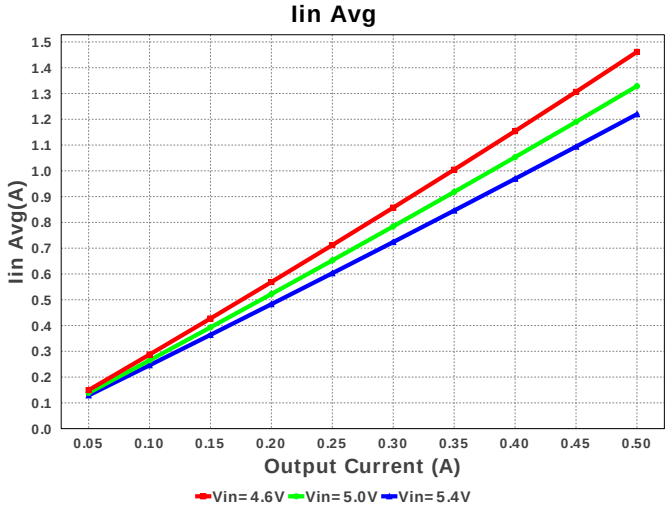


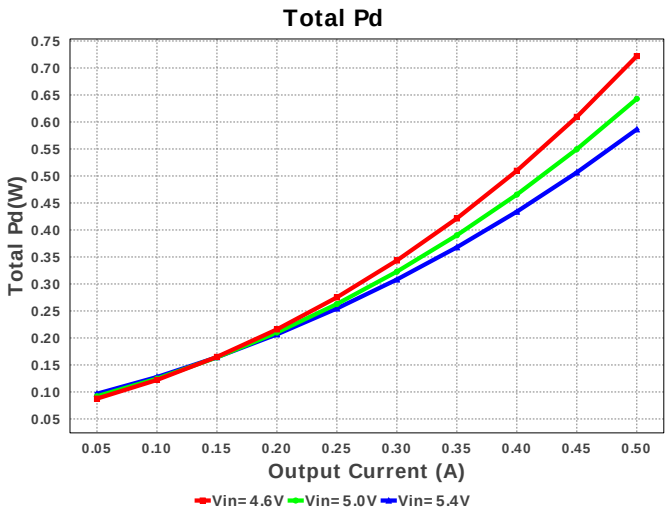


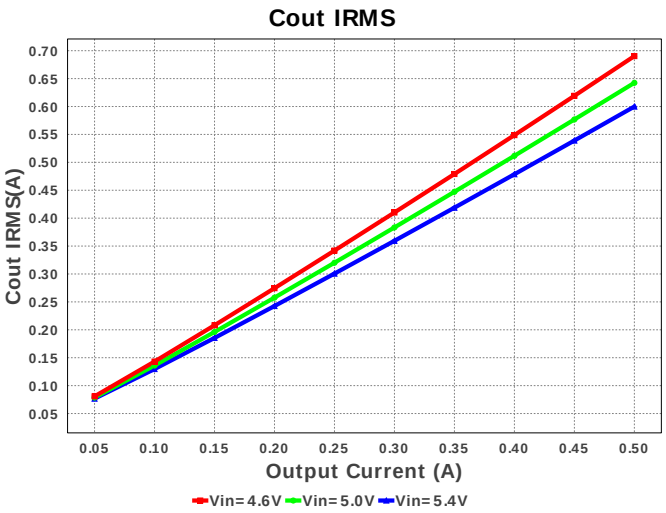


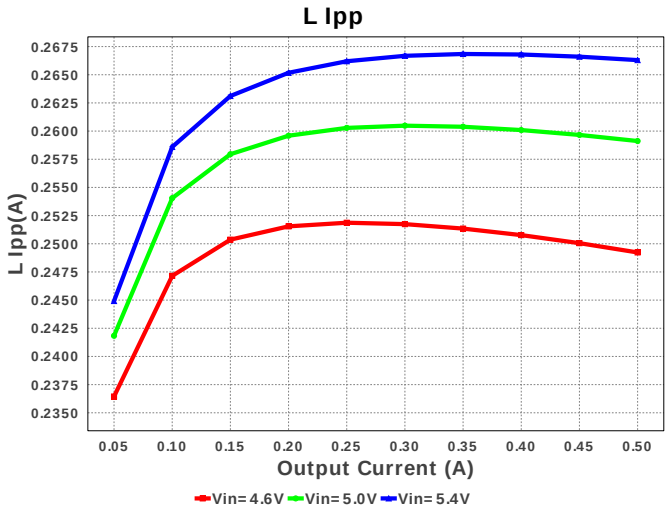


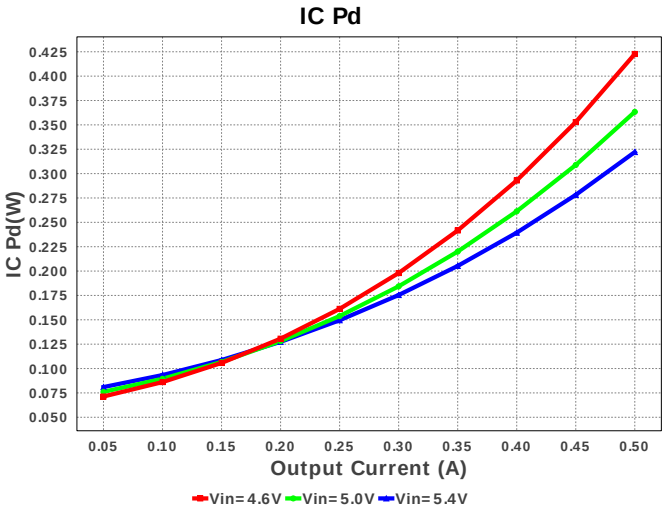


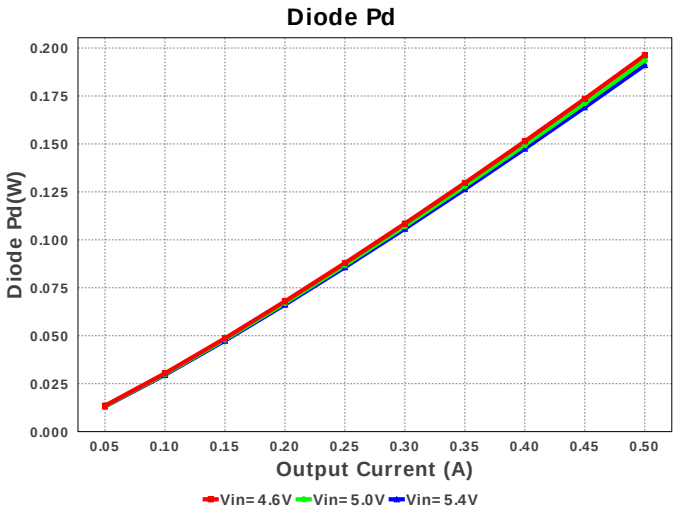












Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	71.946 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	690.317 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	1.574 A	Current	Peak switch current in IC
4.	Iin Avg	1.461 A	Current	Average input current
5.	L Ipp	249.23 mA	Current	Peak-to-peak inductor ripple current
6.	M Iavg	1.45 A	Current	MOSFET Average current
7.	M Irms	1.175 A	Current	MOSFET RMS current
8.	BOM Count	9	General	Total Design BOM count
9.	FootPrint	153.0 mm^2	General	Total Foot Print Area of BOM components
10.	Frequency	1.6 MHz	General	Switching frequency
11.	IC Tolerance	25.0 mV	General	IC Feedback Tolerance

#	Name	Value	Category	Description
12.	M Vds Act	240.858 mV	General	Voltage drop across the MosFET
13.	Pout	6.0 W	General	Total output power
14.	Total BOM	$1.08	General	Total BOM Cost
15.	D1 Tj	39.905 degC	Op_Point	D1 junction temperature
16.	Vout Actual	12.123 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
17.	Vout OP	12.0 V	Op_Point	Operational Output Voltage
18.	Cross Freq	8.502 kHz	Op_point	Bode plot crossover frequency
19.	Duty Cycle	65.505 %	Op_point	Duty cycle
20.	Efficiency	89.259 %	Op_point	Steady state efficiency
21.	IC Tj	68.818 degC	Op_point	IC junction temperature
22.	ICThetaJA	80.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
23.	IOUT_OP	500.0 mA	Op_point	Iout operating point
24.	Phase Marg	86.336 deg	Op_point	Bode Plot Phase Margin
25.	VIN_OP	4.6 V	Op_point	Vin operating point
26.	Vout p-p	11.264 mV	Op_point	Peak-to-peak output ripple voltage
27.	Cin Pd	26.741 µW	Power	Input capacitor power dissipation
28.	Cout Pd	1.967 mW	Power	Output capacitor power dissipation
29.	Diode Pd	196.211 mW	Power	Diode power dissipation
30.	IC Pd	422.726 mW	Power	IC power dissipation
31.	L Pd	99.625 mW	Power	Inductor power dissipation
32.	Total Pd	722.008 mW	Power	Total Power Dissipation
33.	Vout Tolerance	3.839 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	500.0 m	Maximum Output Current
2.	VinMax	5.4	Maximum input voltage
3.	VinMin	4.6	Minimum input voltage
4.	Vout	12.0	Output Voltage
5.	base_pn	LMR62421X	Texas Instruments Base Part Number
6.	source	DC	Input Source Type
7.	ta	35.0	Ambient temperature

Design Assistance

1. LMR62421X Product Folder : http://www.ti.com/product/LMR62421 : contains the data sheet and other resources.