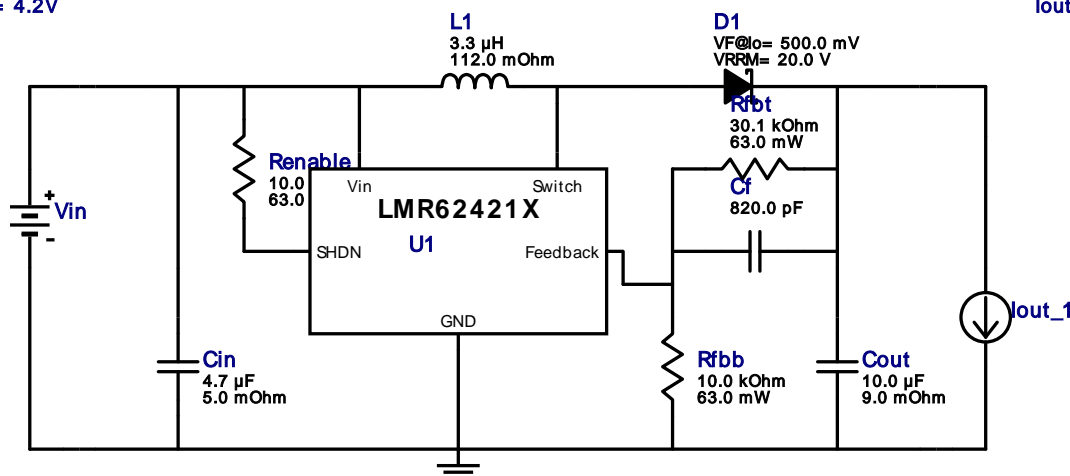


WEBENCH® Design Report










Design : 1382630/448 LMR62421XMF/NOPB
LMR62421XMF/NOPB 3.3V-4.2V to 5.0V @ 0.5A

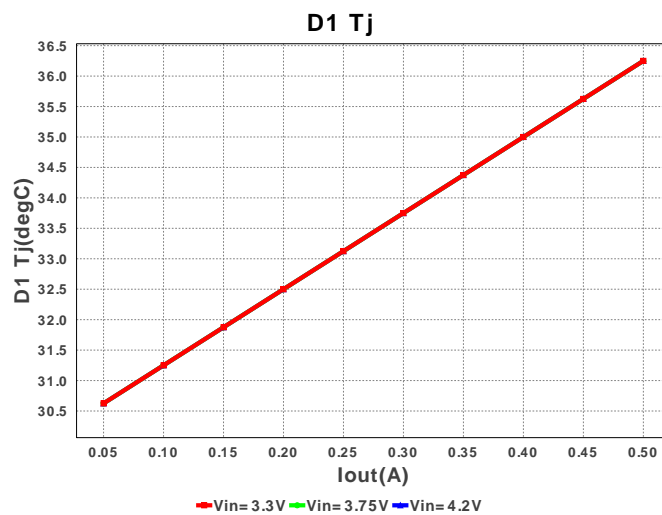
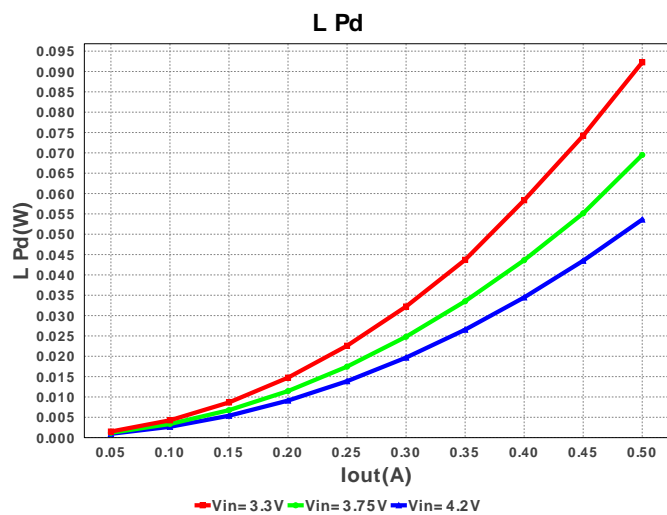
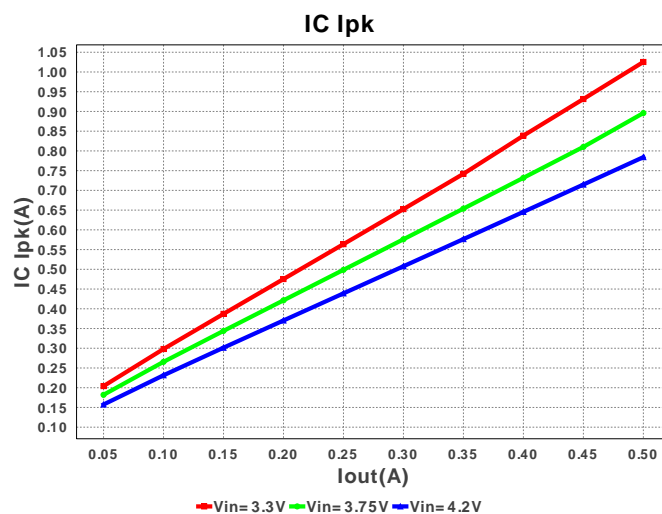
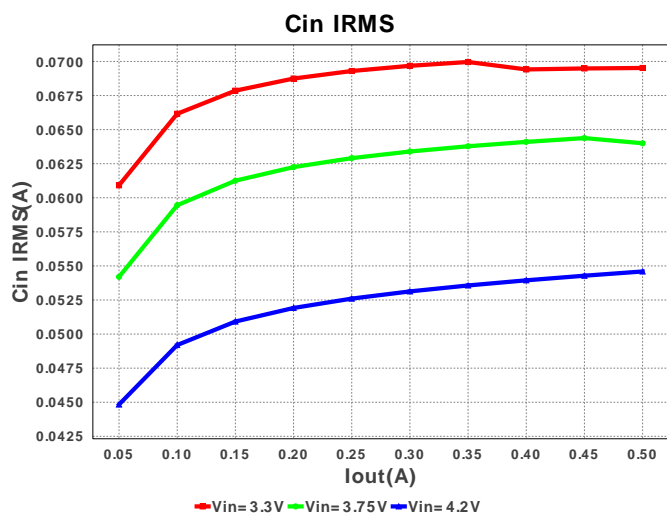
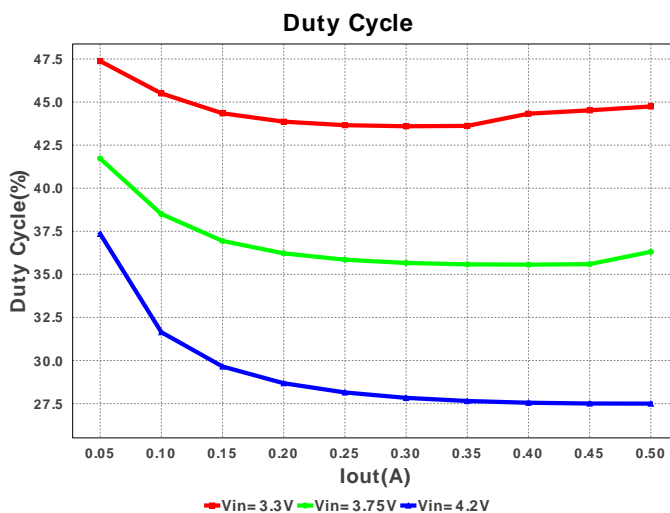
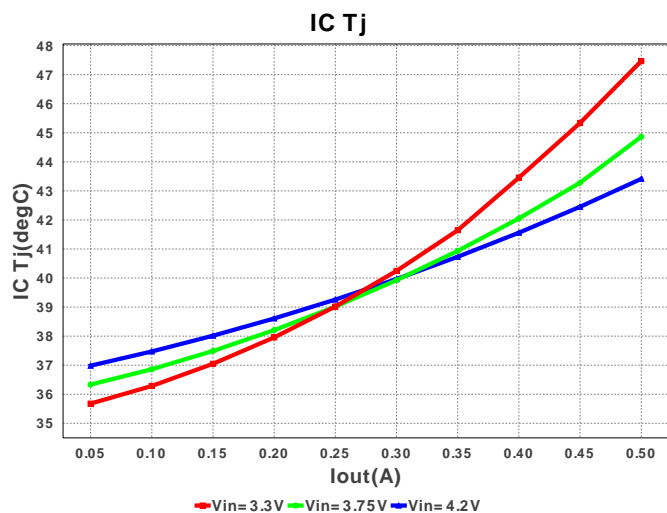
VinMax = 4.2V

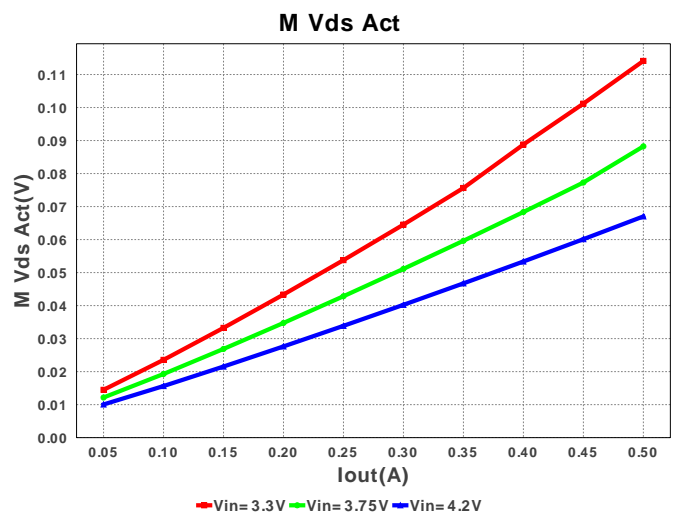
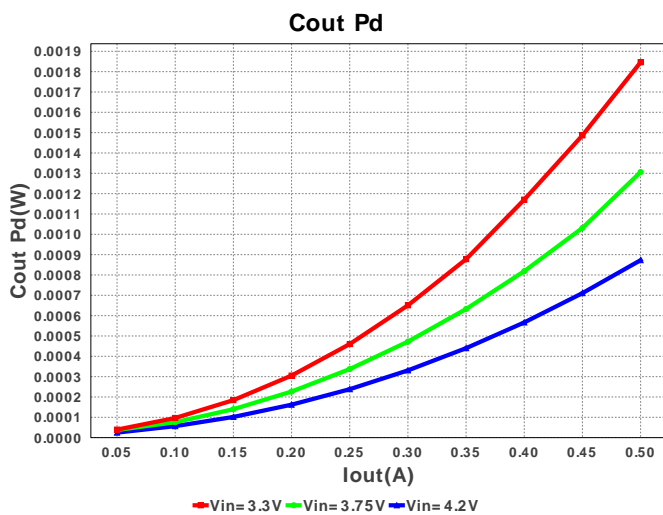
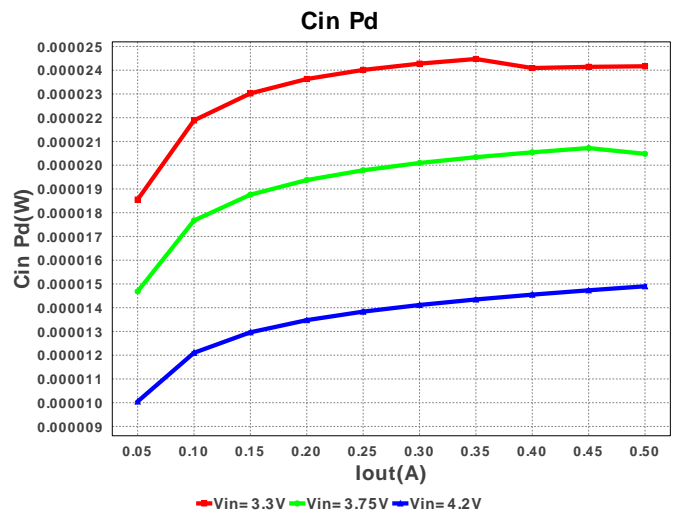
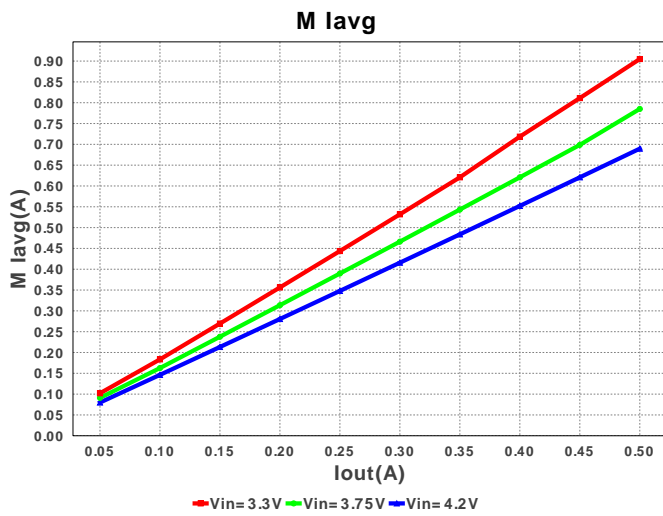
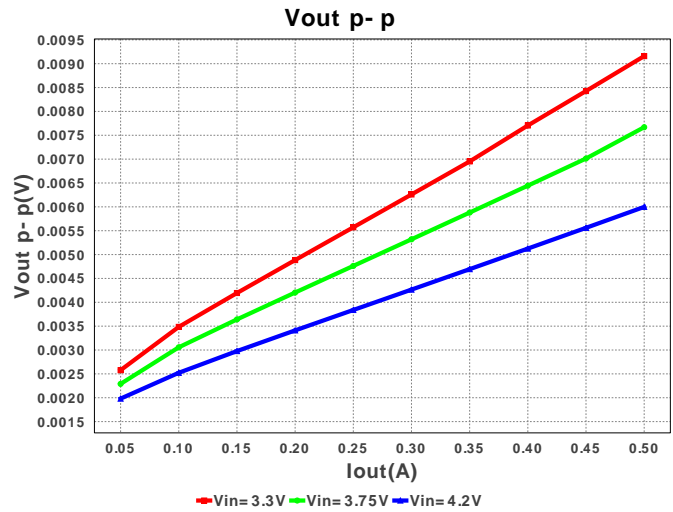
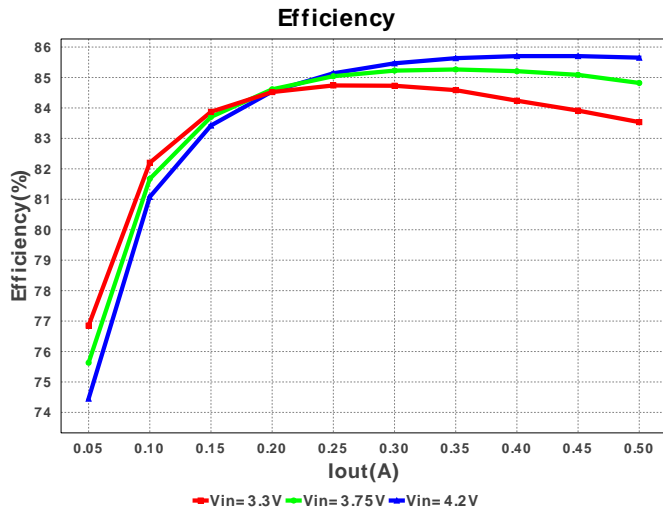
Iout = 0.5A

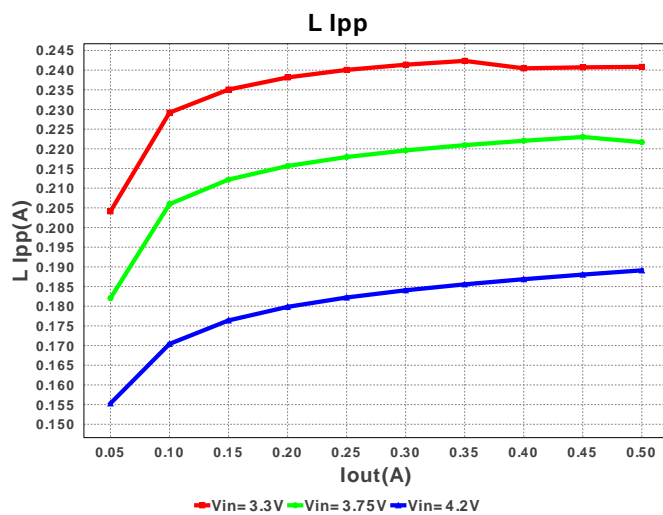
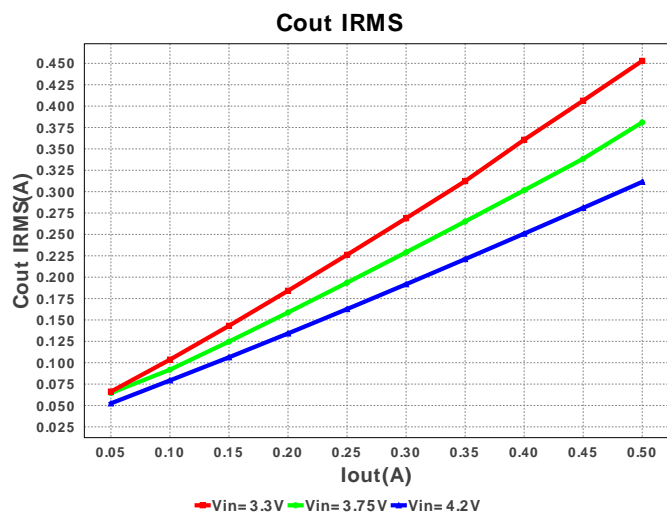
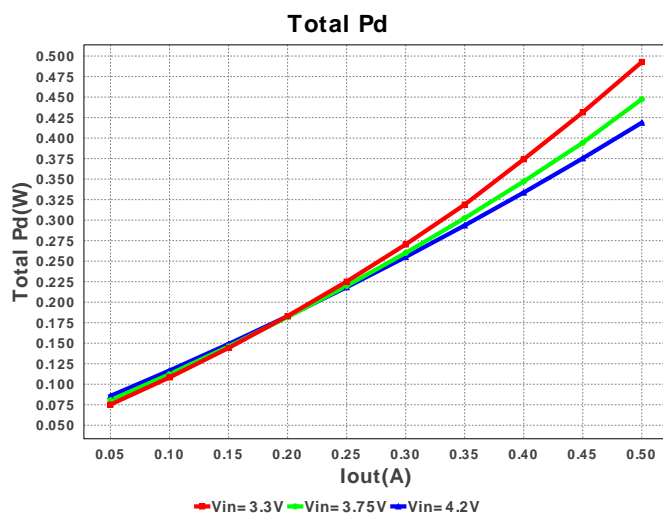
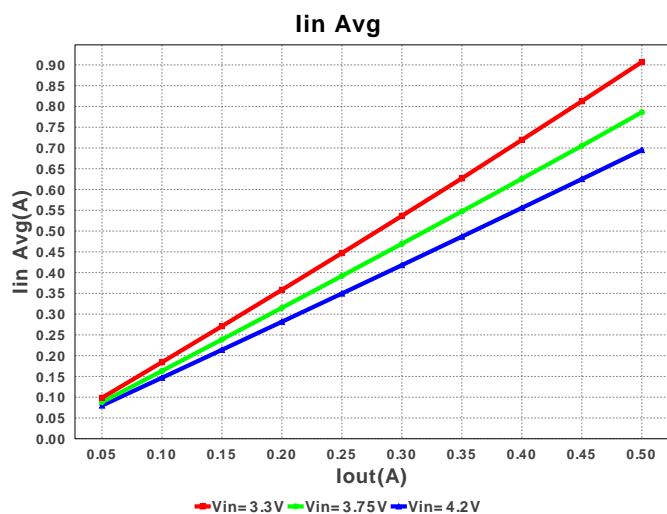
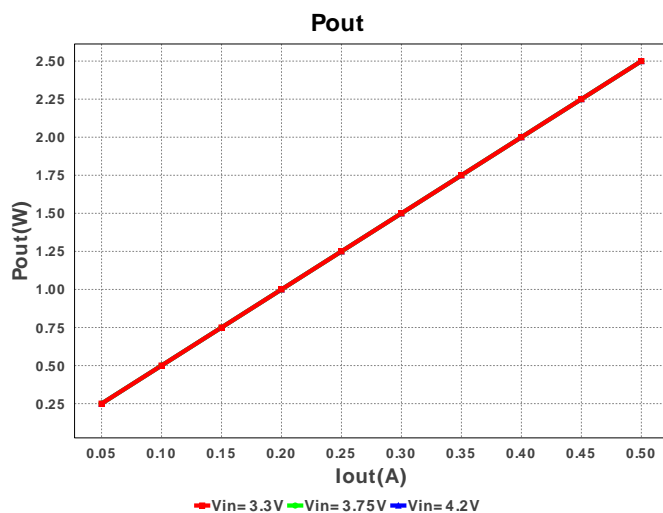
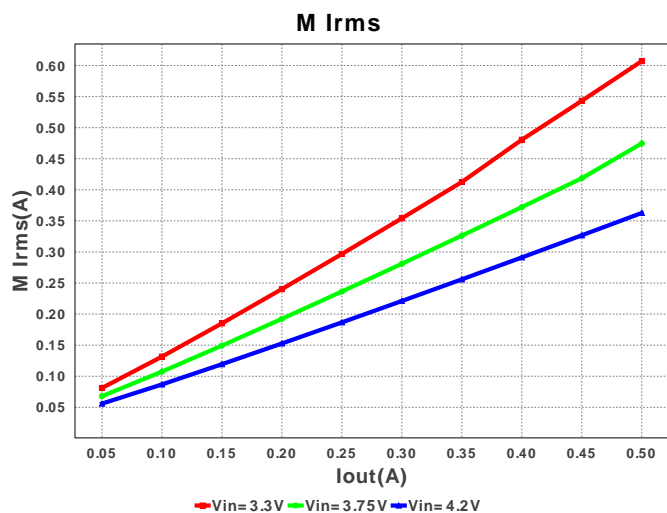


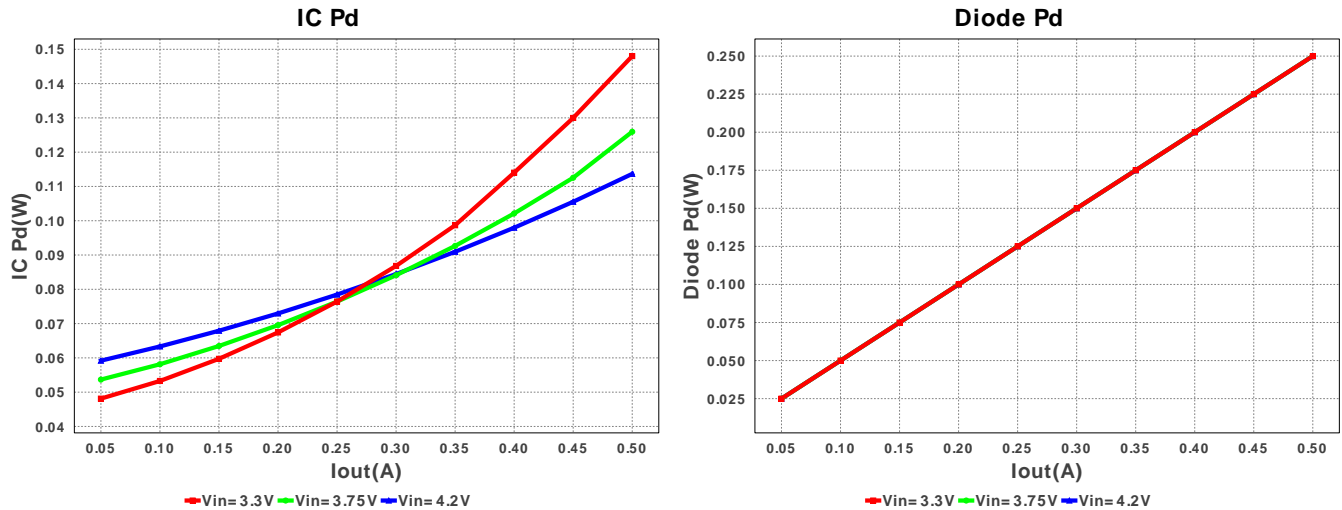
Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cf	Yageo America	CC0805KRX7R9BB821 Series= X7R	Cap= 820.0 pF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	 0805 7mm2
2.	Cin	MuRata	GRM188R60J475KE19D Series= X5R	Cap= 4.7 uF ESR= 5.0 mOhm VDC= 6.3 V IRMS= 2.0 A	1	\$0.02	 0603 5mm2
3.	Cout	MuRata	GRM188R60J106ME47D Series= X5R	Cap= 10.0 uF ESR= 9.0 mOhm VDC= 6.3 V IRMS= 2.74 A	1	\$0.03	 0603 5mm2
4.	D1	Diodes Inc.	B220A-13-F	VF@Io= 500.0 mV VRRM= 20.0 V	1	\$0.09	 SMA 37mm2
5.	L1	Bourns	SRN3015-3R3M	L= 3.3 uH DCR= 112.0 mOhm	1	\$0.13	 SRN3015 16mm2
6.	Renable	Vishay-Dale	CRCW040210K0FKED Series= CRCW..e3	Res= 10.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3mm2
7.	Rfbb	Vishay-Dale	CRCW040210K0FKED Series= CRCW..e3	Res= 10.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3mm2
8.	Rfbt	Vishay-Dale	CRCW040230K1FKED Series= CRCW..e3	Res= 30.1 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3mm2
9.	U1	Texas Instruments	LMR62421XMF/NOPB	Switcher	1	\$0.75	 MF05A 15mm2









Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	69.522 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	452.911 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	1.025 A	Current	Peak switch current in IC
4.	Iin Avg	906.9 mA	Current	Average input current
5.	L Ipp	240.83 mA	Current	Peak-to-peak inductor ripple current
6.	M Iavg	904.915 mA	Current	MOSFET Average current
7.	M Irms	607.105 mA	Current	MOSFET RMS current
8.	BOM Count	9	General	Total Design BOM count
9.	FootPrint	94.0 mm2	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
12.	M Vds Act	114.119 mV	General	Voltage drop across the MosFET
13.	Pout	2.5 W	General	Total output power
14.	Total BOM	\$1.06	General	Total BOM Cost
15.	D1 Tj	36.25 degC	Op_Point	D1 junction temperature
16.	Vout OP	5.0 V	Op_Point	Operational Output Voltage
17.	Cross Freq	17.342 kHz	Op_point	Bode plot crossover frequency
18.	Duty Cycle	44.746 %	Op_point	Duty cycle
19.	Efficiency	83.535 %	Op_point	Steady state efficiency
20.	IC Tj	47.466 degC	Op_point	IC junction temperature
21.	ICThetaJA	118.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
22.	IOUT_OP	500.0 mA	Op_point	Iout operating point
23.	Phase Marg	90.988 deg	Op_point	Bode Plot Phase Margin
24.	VIN_OP	3.3 V	Op_point	Vin operating point
25.	Vout p-p	9.159 mV	Op_point	Peak-to-peak output ripple voltage
26.	Cin Pd	24.166 μ W	Power	Input capacitor power dissipation
27.	Cout Pd	1.846 mW	Power	Output capacitor power dissipation
28.	Diode Pd	250.0 mW	Power	Diode power dissipation
29.	IC Pd	148.017 mW	Power	IC power dissipation
30.	L Pd	92.255 mW	Power	Inductor power dissipation
31.	Total Pd	492.76 mW	Power	Total Power Dissipation

Design Inputs

#	Name	Value	Description
1.	Iout	500.0 mA	Maximum Output Current
2.	Iout1	500.0 mAmps	Output Current #1
3.	VinMax	4.2 V	Maximum input voltage
4.	VinMin	3.3 V	Minimum input voltage
5.	Vout	5.0 V	Output Voltage
6.	Vout1	5.0 Volt	Output Voltage #1
7.	base_pn	LMR62421X	Texas Instruments Base Part Number
8.	source	DC	Input Source Type
9.	ta	30.0 degC	Ambient temperature

Design Assistance

1. LMR62421X Product Folder : <http://www.ti.com/product/lmr62421> : contains the data sheet and other resources.

Texas Instruments' WEBENCH simulation tools attempt to recreate the performance of a substantially equivalent physical implementation of the design. Simulations are created using Texas Instruments' published specifications as well as the published specifications of other device manufacturers. While Texas Instruments does update this information periodically, this information may not be current at the time the simulation is built. Texas Instruments does not warrant the accuracy or completeness of the specifications or any information contained therein. Texas Instruments does not warrant that any designs or recommended parts will meet the specifications you entered, will be suitable for your application or fit for any particular purpose, or will operate as shown in the simulation in a physical implementation. Texas Instruments does not warrant that the designs are production worthy.

You should completely validate and test your design implementation to confirm the system functionality for your application prior to production.

Use of Texas Instruments' WEBENCH simulation tools is subject to [Texas Instruments' Site Terms and Conditions of Use](#). Prototype boards based on WEBENCH created designs are provided AS IS without warranty of any kind for evaluation and testing purposes and are subject to the terms of the [Evaluation License Agreement](#).