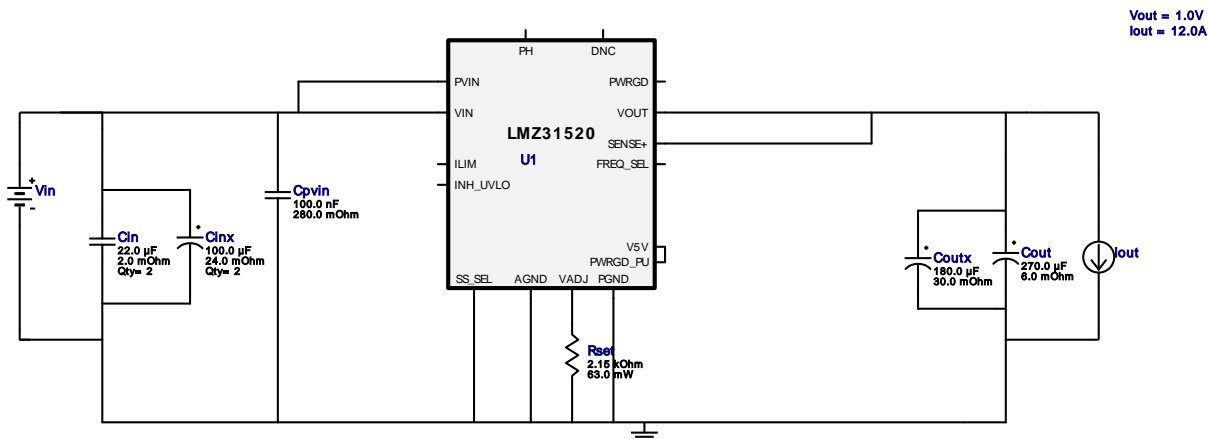


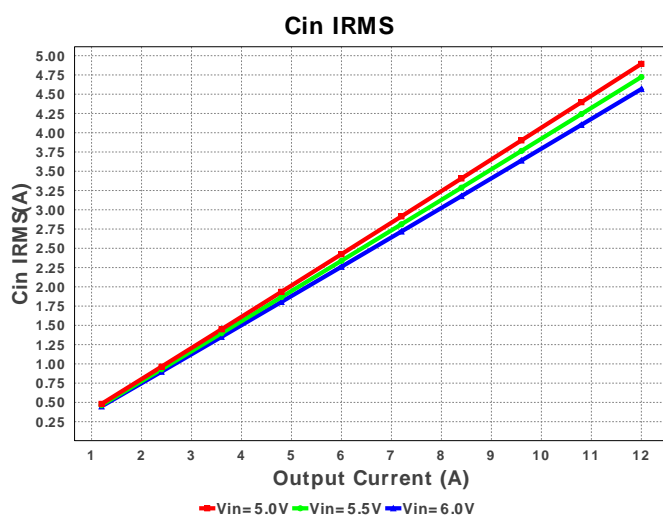
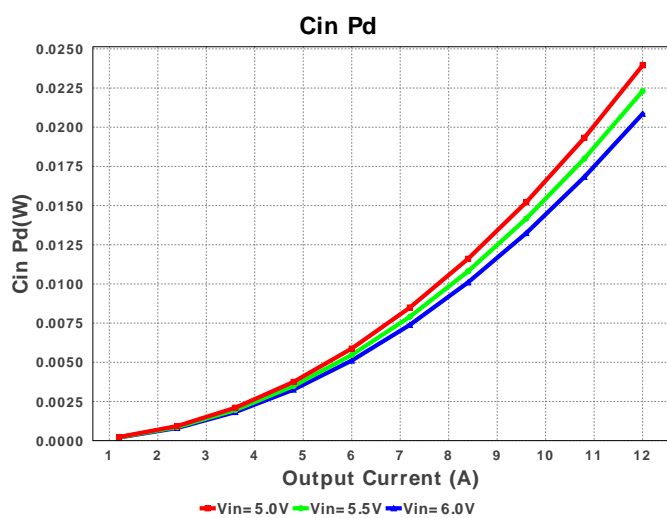
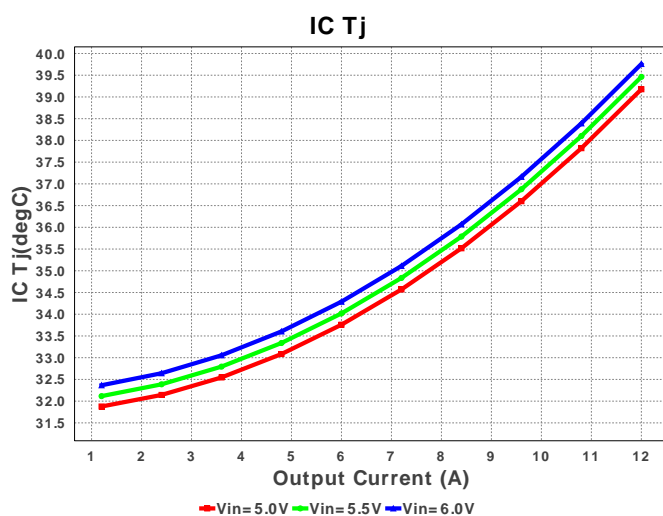
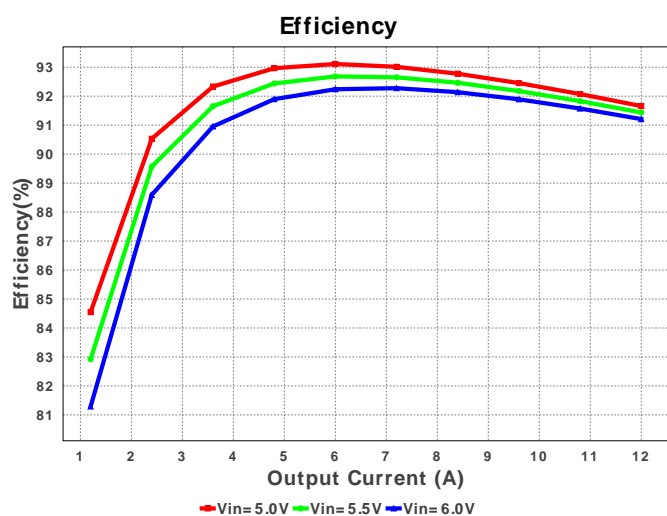
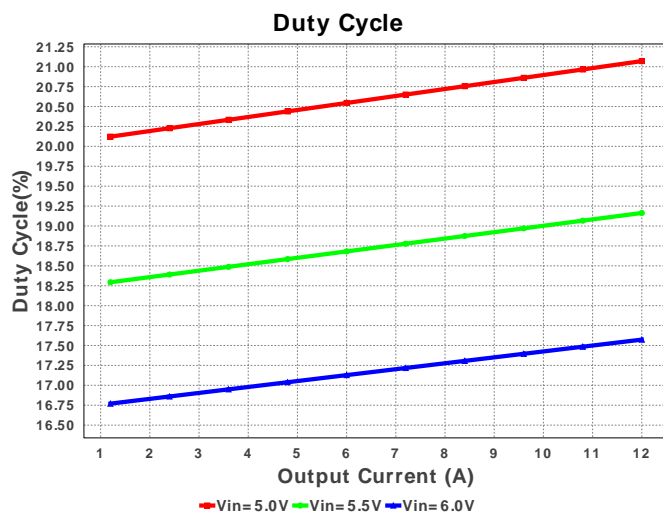
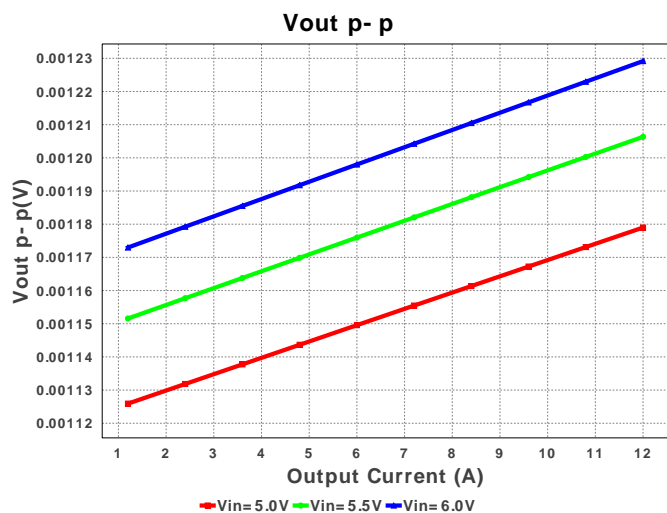
## WEBENCH® Design Report

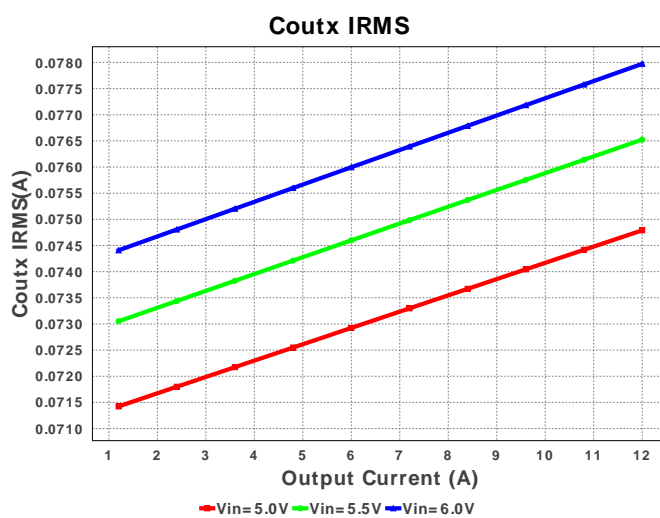
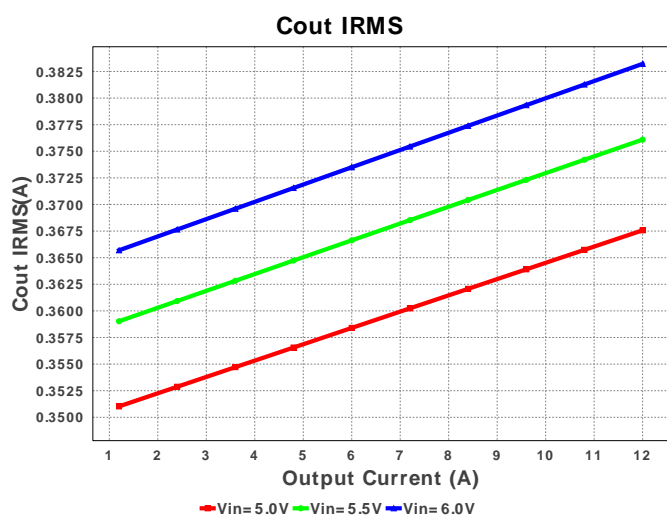
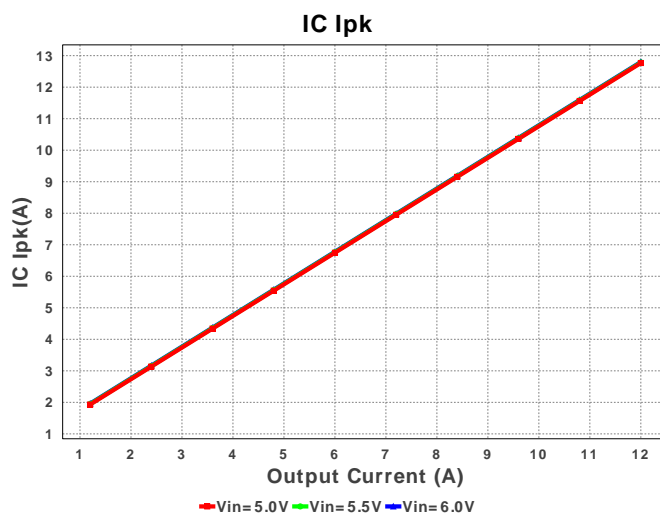
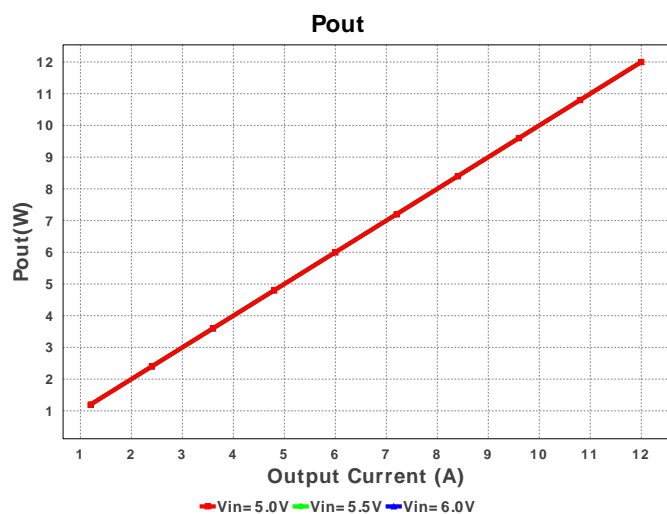
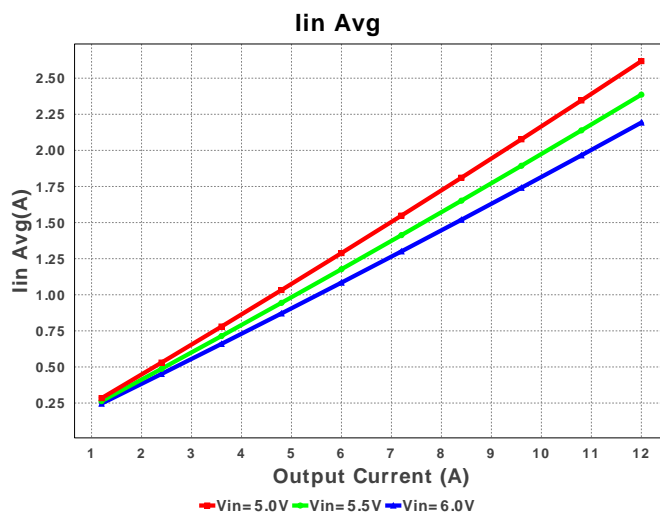
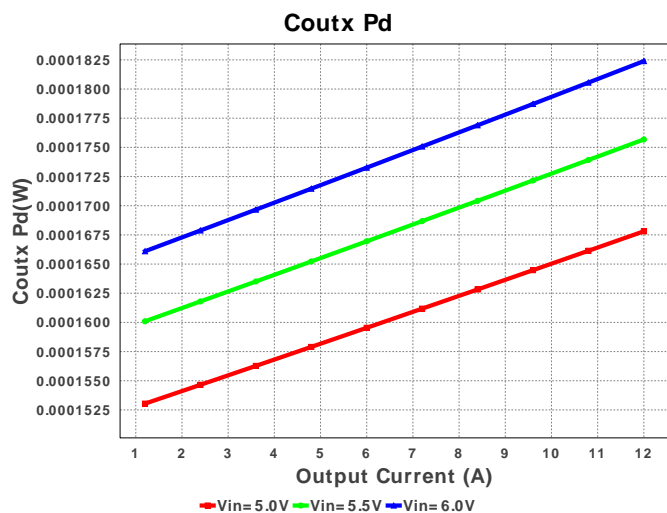
Design : 4058737/185 LMZ31520RLGR  
LMZ31520RLGR 5.0V-6.0V to 1.00V @ 12.0A

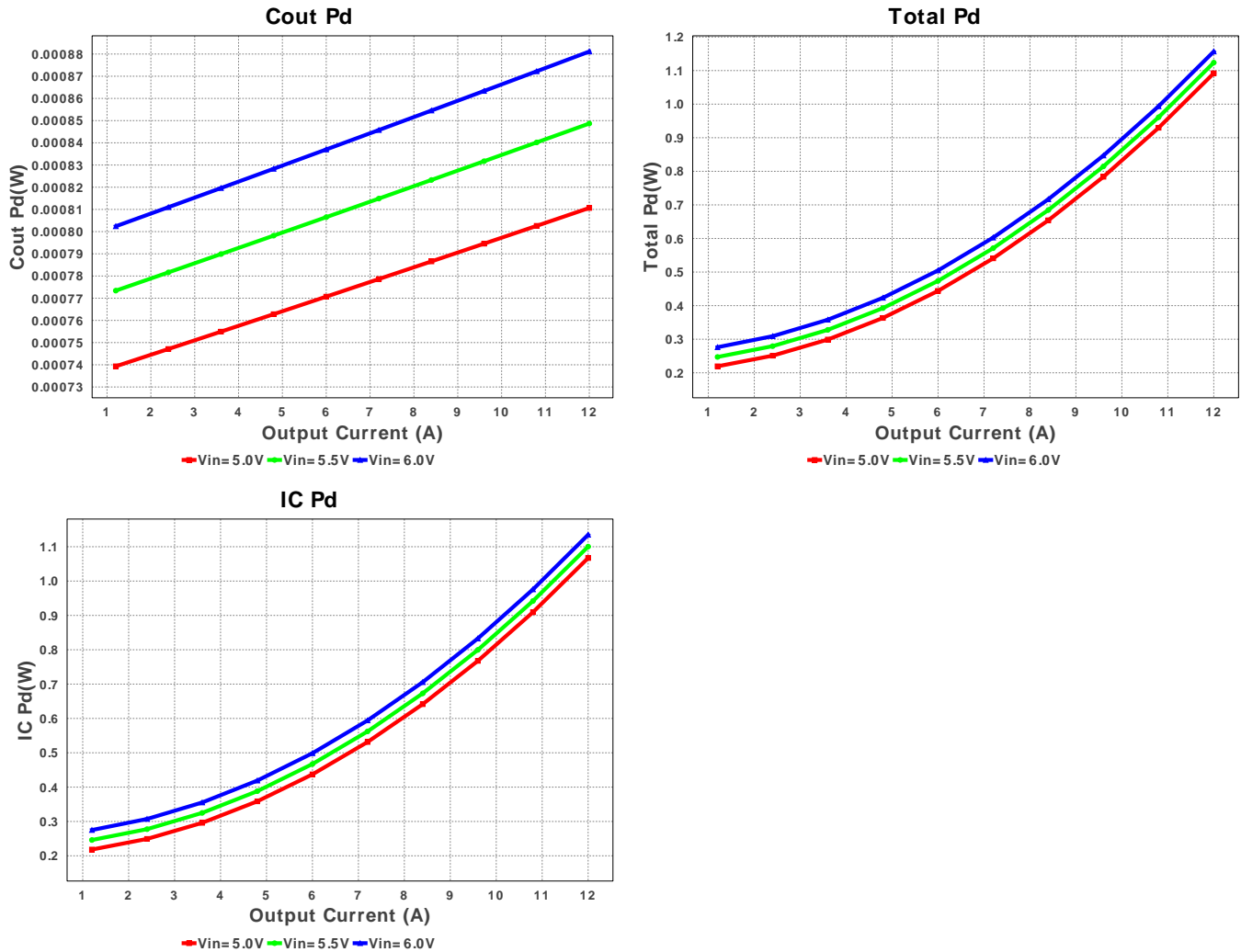


## Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cin	MuRata	GRM32ER61C226ME20L Series= X5R	Cap= 22.0 uF ESR= 2.0 mOhm VDC= 16.0 V IRMS= 3.68 A	2	\$0.12	 1210 15 mm <sup>2</sup>
2.	Cinx	Chemi-Con	APXE160ARA101MF80G Series= PXE	Cap= 100.0 uF ESR= 24.0 mOhm VDC= 16.0 V IRMS= 2.7 A	2	\$0.52	 CAPSMT_62_F80 74 mm <sup>2</sup>
3.	Cout	Panasonic	2TPSF270M6E Series= ?	Cap= 270.0 uF ESR= 6.0 mOhm VDC= 2.0 V IRMS= 3.2 A	1	\$0.88	 CAPSMT_6_B2S 17 mm <sup>2</sup>
4.	Coutx	Chemi-Con	APXC2R5ARA181ME60G Series= PXC	Cap= 180.0 uF ESR= 30.0 mOhm VDC= 2.5 V IRMS= 2.0 A	1	\$0.40	 CAPSMT_62_E60 53 mm <sup>2</sup>
5.	Cpvin	AVX	08053C104KAT2A Series= X7R	Cap= 100.0 nF ESR= 280.0 mOhm VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	 0805 7 mm <sup>2</sup>
6.	Rset	Vishay-Dale	CRCW04022K15FKED Series= CRCW..e3	Res= 2.15 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm <sup>2</sup>
7.	U1	Texas Instruments	LMZ31520RLGR	Switcher	1	\$14.00	 R-PB4QFN-N72 306 mm <sup>2</sup>







## Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	4.567 A	Current	Input capacitor RMS ripple current
2.	Cout IRMS	383.215 mA	Current	Output capacitor RMS ripple current
3.	Coutx IRMS	77.973 mA	Current	Output capacitor_x RMS ripple current
4.	IC IpK	12.799 A	Current	Peak switch current in IC
5.	Iin Avg	2.193 A	Current	Average input current
6.	BOM Count	9	General	Total Design BOM count
7.	FootPrint	563.0 mm <sup>2</sup>	General	Total Foot Print Area of BOM components
8.	Frequency	500.0 kHz	General	Switching frequency
9.	Pout	12.0 W	General	Total output power
10.	Total BOM	\$16.58	General	Total BOM Cost
11.	Vout OP	1.0 V	Op_Point	Operational Output Voltage
12.	Duty Cycle	17.574 %	Op_point	Duty cycle
13.	Efficiency	91.209 %	Op_point	Steady state efficiency
14.	IC Tj	39.759 degC	Op_point	IC junction temperature
15.	ICThetaJA	8.6 degC/W	Op_point	IC junction-to-ambient thermal resistance
16.	IOUT_OP	12.0 A	Op_point	Iout operating point
17.	VIN_OP	6.0 V	Op_point	Vin operating point
18.	Vout p-p	1.229 mV	Op_point	Peak-to-peak output ripple voltage
19.	Cin Pd	20.859 mW	Power	Input capacitor power dissipation
20.	Cout Pd	881.121 $\mu$ W	Power	Output capacitor power dissipation
21.	Coutx Pd	182.394 $\mu$ W	Power	Output capacitor_x power loss
22.	IC Pd	1.135 W	Power	IC power dissipation
23.	Total Pd	1.157 W	Power	Total Power Dissipation
24.	Vout Tolerance	1.0 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

## Design Inputs

#	Name	Value	Description
1.	Iout	12.0	Maximum Output Current
2.	VinMax	6.0	Maximum input voltage

#	Name	Value	Description
3.	VinMin	5.0	Minimum input voltage
4.	Vout	1.0	Output Voltage
5.	base_pn	LMZ31520	Texas Instruments Base Part Number
6.	source	DC	Input Source Type
7.	ta	30.0	Ambient temperature

## Design Assistance

1. LMZ31520 Product Folder : <http://www.ti.com/product/LMZ31520> : contains the data sheet and other resources.

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