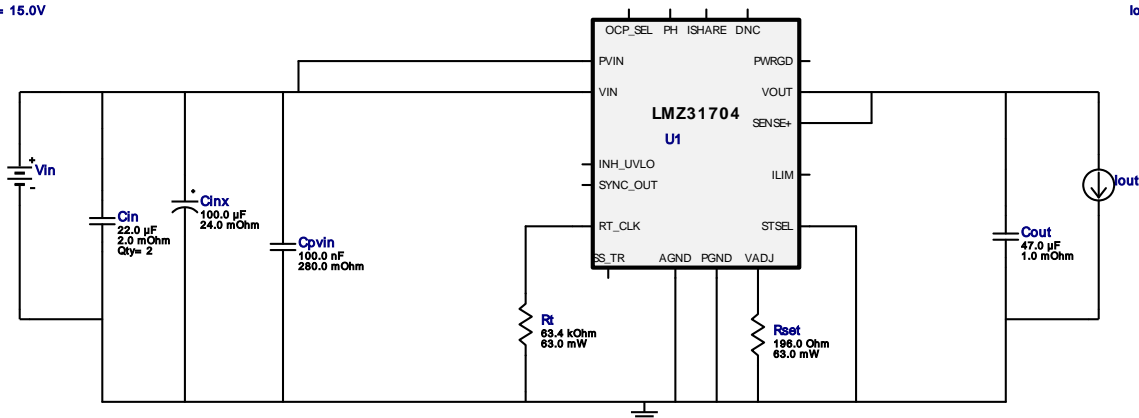


WEBENCH® Design Report

Design : 4211465/1 LMZ31704RVQR
LMZ31704RVQR 7.0V-15.0V to 5.00V @ 2.0A

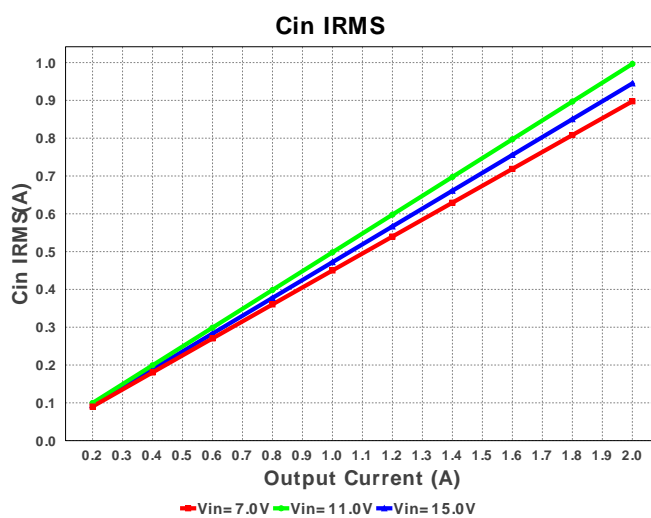
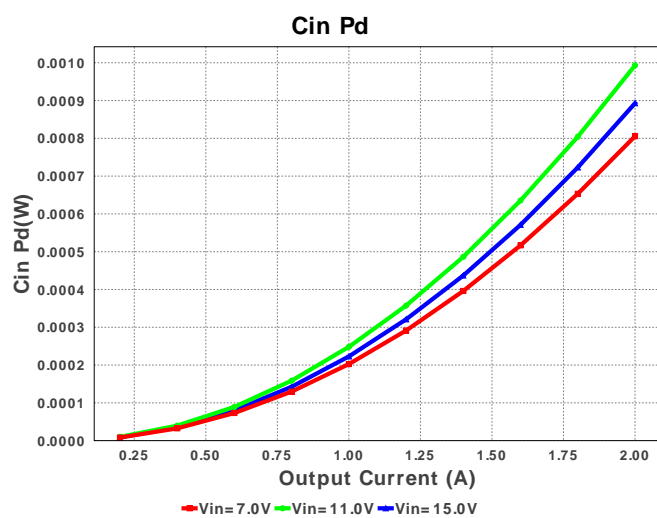
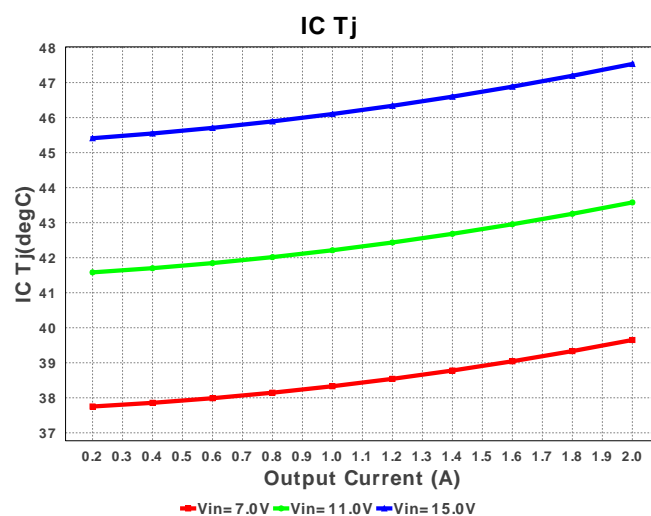
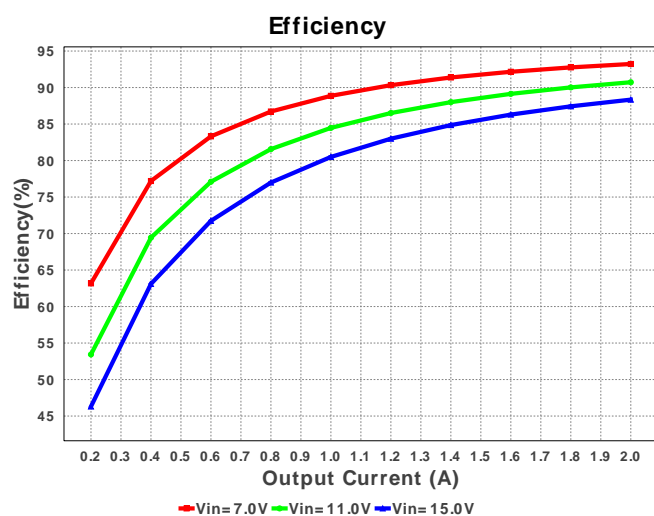
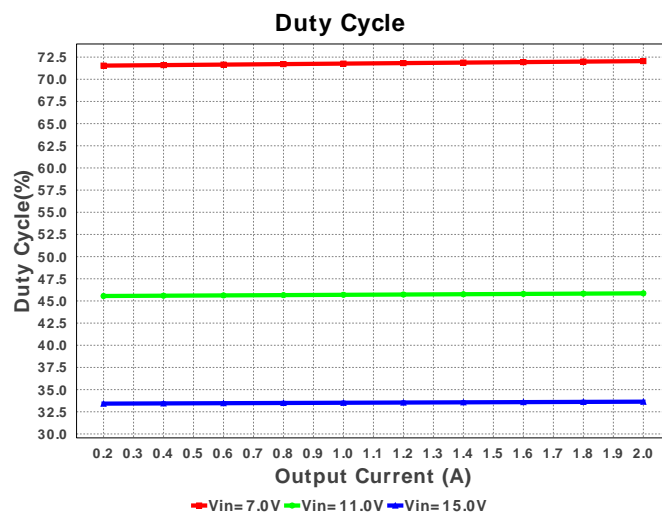
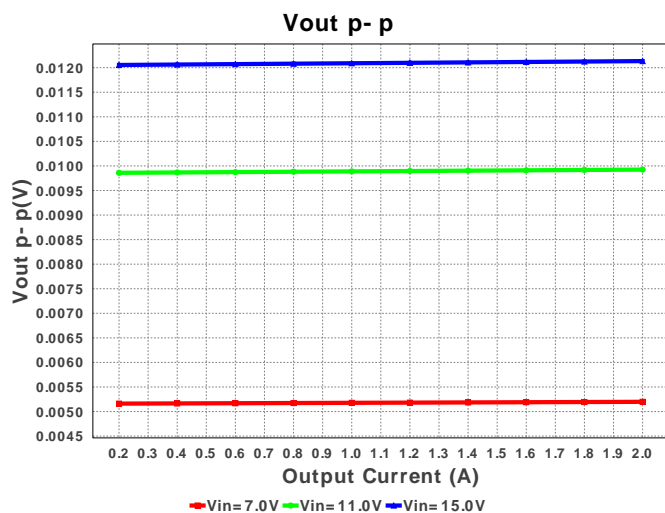
VinMin = 7.0V
VinMax = 15.0V

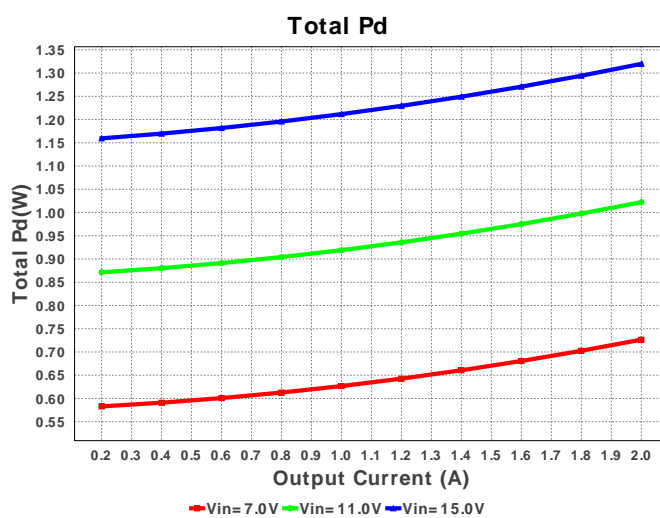
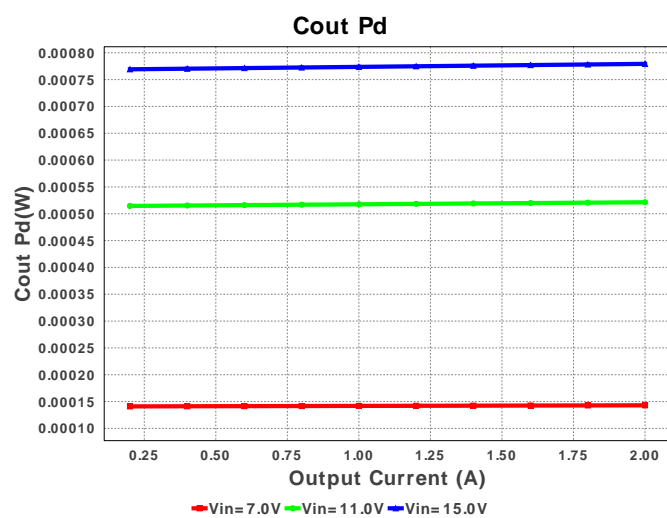
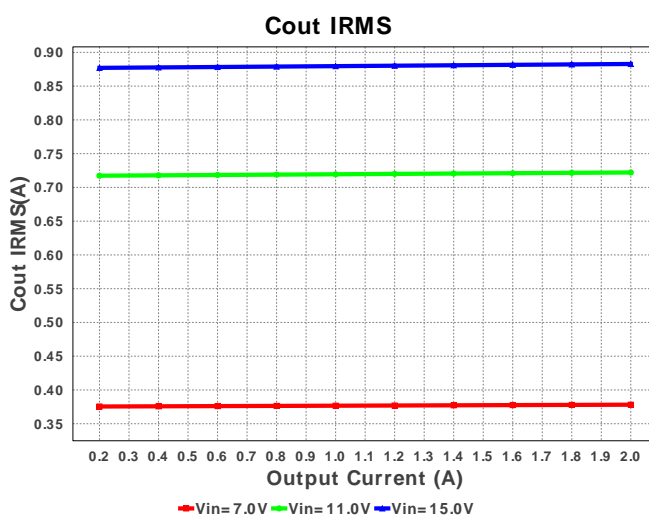
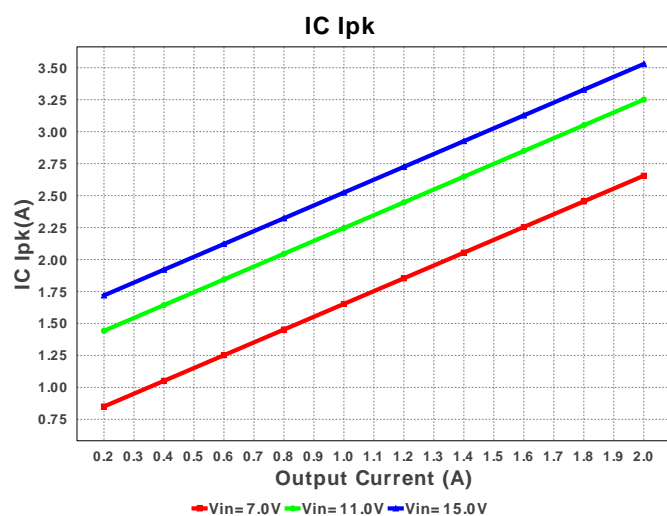
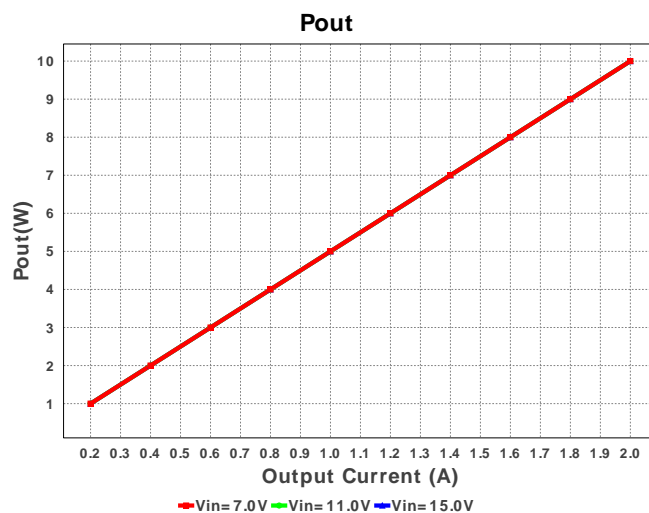
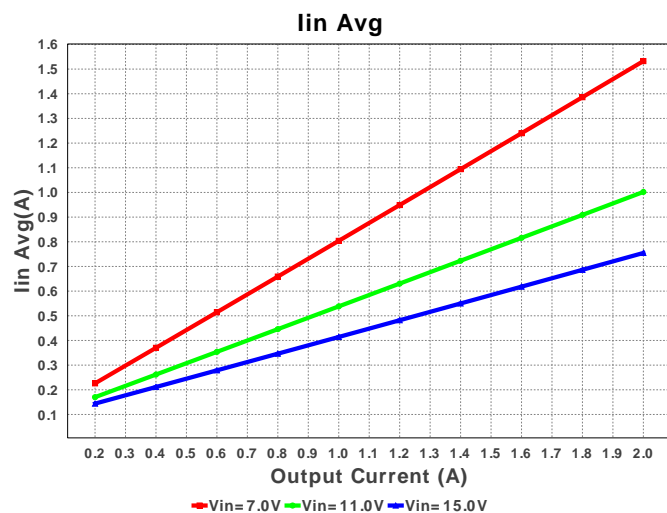
Vout = 5.0V
Iout = 2.0A

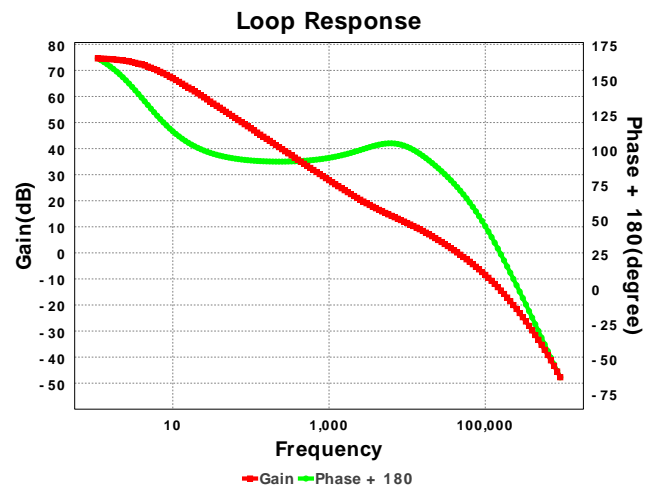
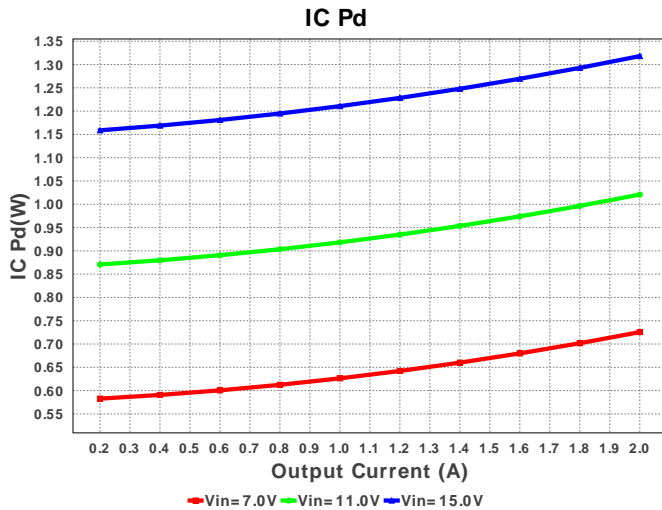


Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cin	MuRata	GRM32ER61C226KE20L Series= X5R	Cap= 22.0 uF ESR= 2.0 mOhm VDC= 16.0 V IRMS= 3.68 A	2	\$0.16	 1210 15 mm ²
2.	Cinx	Chemi-Con	APXE160ARA101MF80G Series= PXE	Cap= 100.0 uF ESR= 24.0 mOhm VDC= 16.0 V IRMS= 2.7 A	1	\$0.52	 CAPSMT_62_F80 74 mm ²
3.	Cout	MuRata	GRM32ER61A476KE20L Series= X5R	Cap= 47.0 uF ESR= 1.0 mOhm VDC= 10.0 V IRMS= 0.0 A	1	\$0.24	 1210 15 mm ²
4.	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 ²
5.	Rset	Vishay-Dale	CRCW0402196RFKED Series= CRCW...e3	Res= 196.0 Ohm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
6.	Rt	Vishay-Dale	CRCW040263K4FKED Series= CRCW...e3	Res= 63.4 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
7.	U1	Texas Instruments	LMZ31704RVQR	Switcher	1	\$5.25	 S-PB3QFN-N42 144 mm ²







Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	944.947 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	882.789 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	3.529 A	Current	Peak switch current in IC
4.	Iin Avg	754.65 mA	Current	Average input current
5.	BOM Count	8	General	Total Design BOM count
6.	FootPrint	275.0 mm ²	General	Total Foot Print Area of BOM components
7.	Frequency	1000.0 kHz	General	Switching frequency
8.	Pout	10.0 W	General	Total output power
9.	Total BOM	\$6.36	General	Total BOM Cost
10.	Vout OP	5.0 V	Op_Point	Operational Output Voltage
11.	Cross Freq	44.365 kHz	Op_point	Bode plot crossover frequency
12.	Duty Cycle	33.639 %	Op_point	Duty cycle
13.	Efficiency	88.341 %	Op_point	Steady state efficiency
14.	IC Tj	47.531 degC	Op_point	IC junction temperature
15.	ICThetaJA	13.3 degC/W	Op_point	IC junction-to-ambient thermal resistance
16.	IOUT_OP	2.0 A	Op_point	Iout operating point
17.	Phase Marg	73.517 deg	Op_point	Bode Plot Phase Margin
18.	VIN_OP	15.0 V	Op_point	Vin operating point
19.	Vout p-p	12.134 mV	Op_point	Peak-to-peak output ripple voltage
20.	Cin Pd	892.924 μW	Power	Input capacitor power dissipation
21.	Cout Pd	779.316 μW	Power	Output capacitor power dissipation
22.	IC Pd	1.318 W	Power	IC power dissipation
23.	Total Pd	1.32 W	Power	Total Power Dissipation

Design Inputs

#	Name	Value	Description
1.	Iout	2.0	Maximum Output Current
2.	Iout1	2.0	Output Current #1
3.	VinMax	15.0	Maximum input voltage
4.	VinMin	7.0	Minimum input voltage
5.	Vout	5.0	Output Voltage
6.	Vout1	5.0	Output Voltage #1
7.	base_pn	LMZ31704	Base Product Number
8.	source	DC	Input Source Type
9.	Ta	30.0	Ambient temperature

Design Assistance

1. **LMZ31704** Product Folder : <http://www.ti.com/product/LMZ31704> : contains the data sheet and other resources.

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