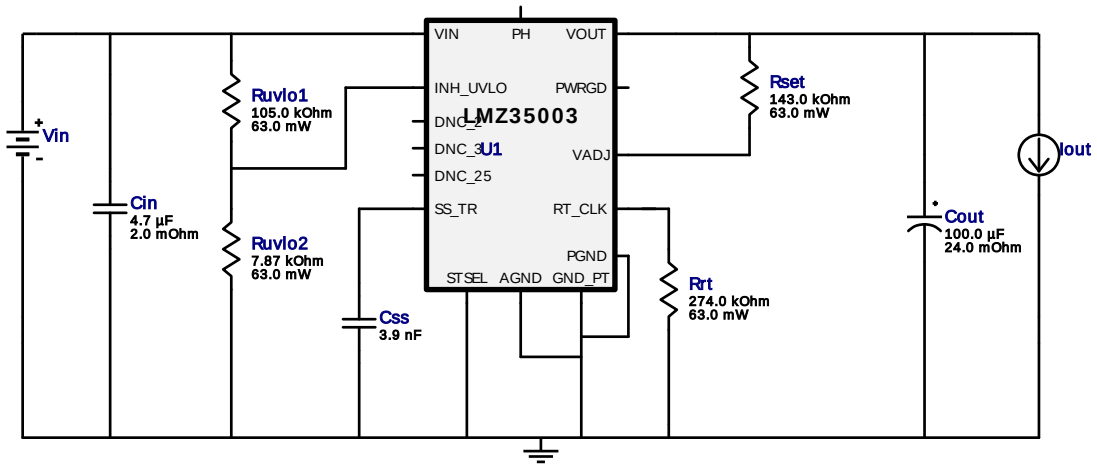
WEBENCH® Design Report

VinMin = 20.0V
VinMax = 24.0V
Vout = 12.0V
Iout = 2.0A

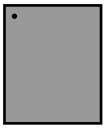
Device = LMZ35003RKGR
Topology = Buck
Created = 8/22/16 4:27:45 AM
BOM Cost = $8.48
BOM Count = 8
Total Pd = 2.33W

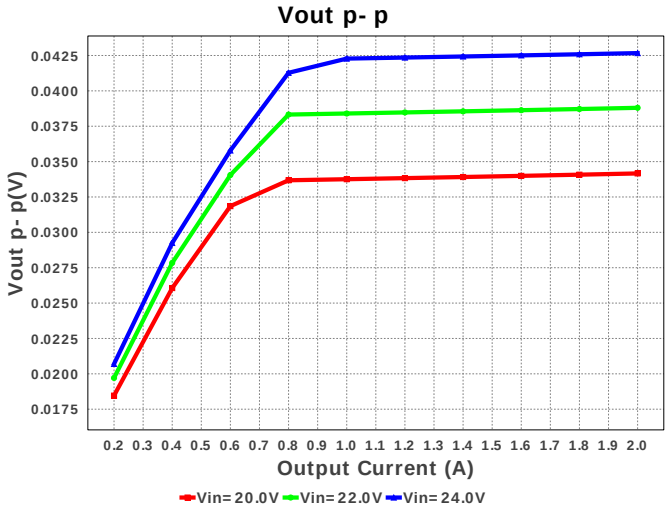
Design : 4108001/11 LMZ35003RKGR
LMZ35003RKGR 20.0V-24.0V to 12.00V @ 2.0A

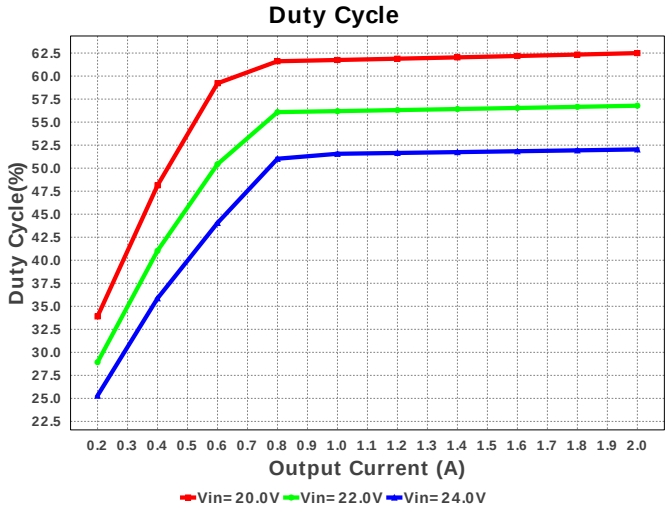


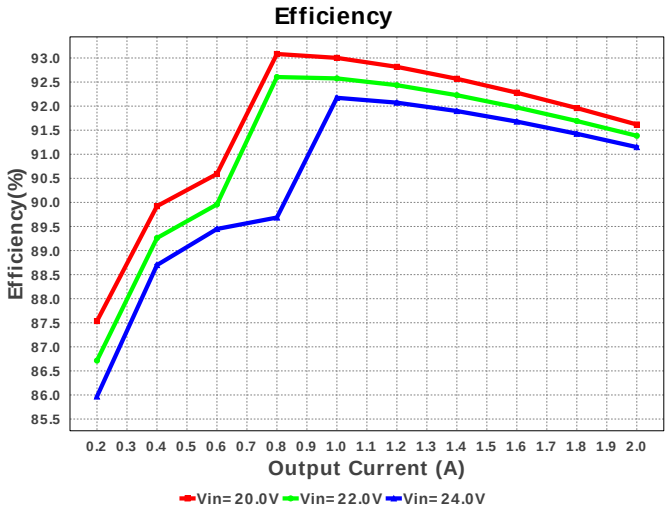
Electrical BOM

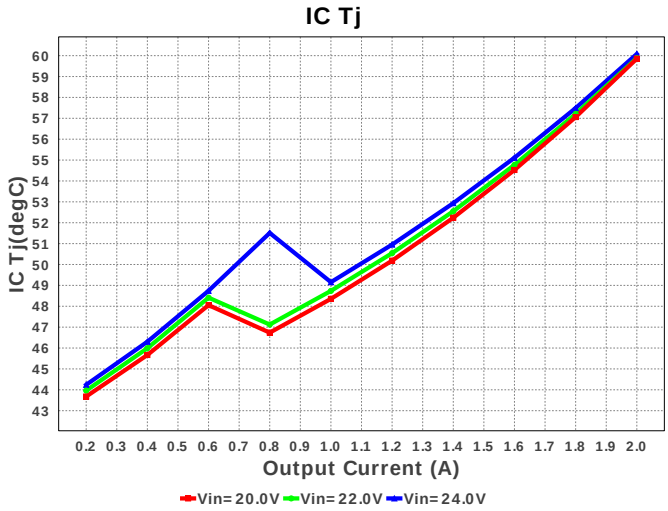
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cin	MuRata	GRM32ER71H475KA88L Series= X7R	Cap= 4.7 uF ESR= 2.0 mOhm VDC= 50.0 V IRMS= 5.35 A	1	$0.19	1210 15 mm^2
2.	Cout	Panasonic	16SVPC100M Series= SVPC	Cap= 100.0 uF ESR= 24.0 mOhm VDC= 16.0 V IRMS= 2.49 A	1	$0.29	SM_RADIAL_6.3AMM 80 mm^2
3.	Css	MuRata	GRM033R71A392KA01D Series= X7R	Cap= 3.9 nF VDC= 10.0 V IRMS= 0.0 A	1	$0.01	0201 2 mm^2
4.	Rrt	Vishay-Dale	CRCW0402274KFKED Series= CRCW..e3	Res= 274.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm^2
5.	Rset	Vishay-Dale	CRCW0402143KFKED Series= CRCW..e3	Res= 143.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm^2
6.	Ruvlo1	Vishay-Dale	CRCW0402105KFKED Series= CRCW..e3	Res= 105.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm^2
7.	Ruvlo2	Vishay-Dale	CRCW04027K87FKED Series= CRCW..e3	Res= 7.87 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm^2

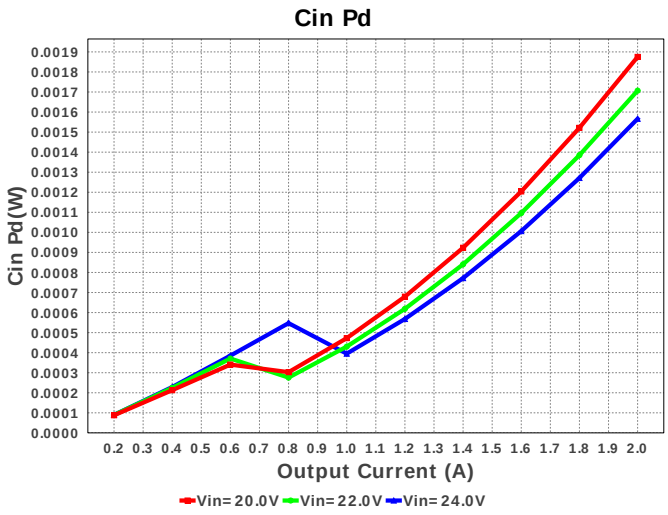
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
8.	U1	Texas Instruments	LMZ35003RKGR	Switcher	1	$7.95	 RKG0041A 143 mm^2

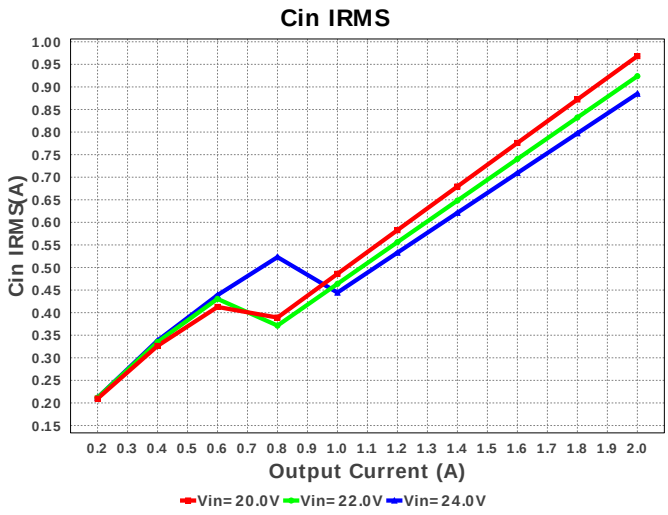


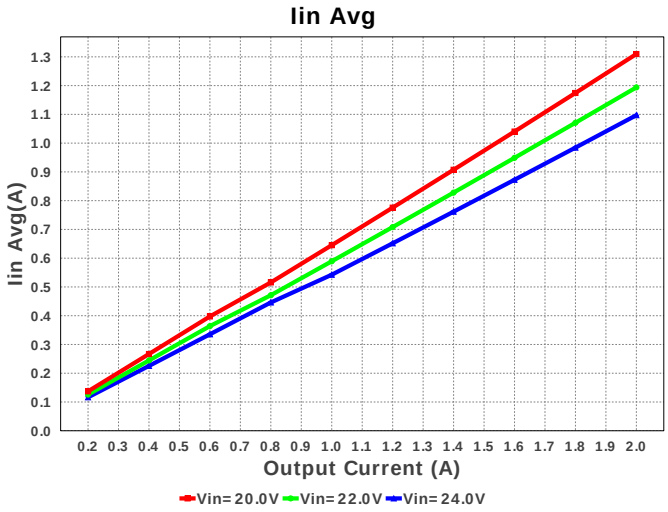


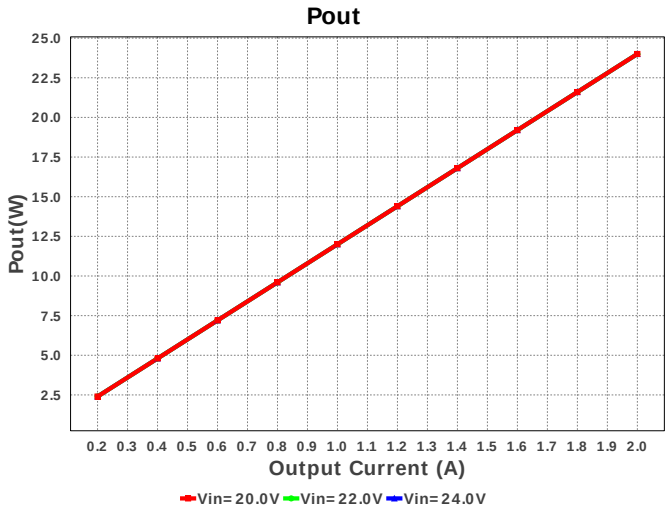


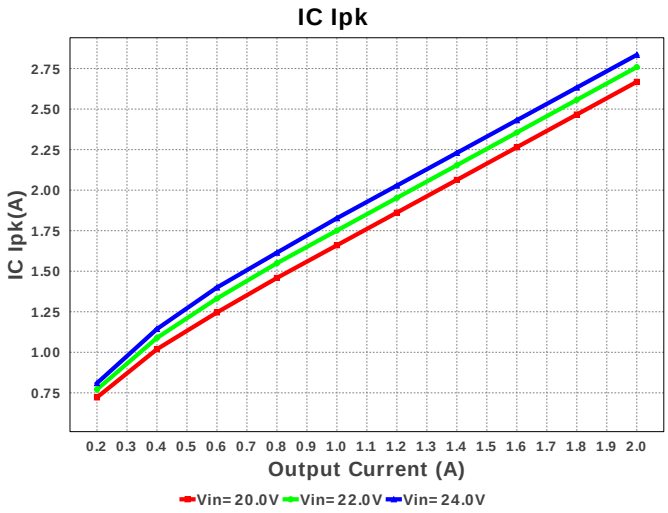


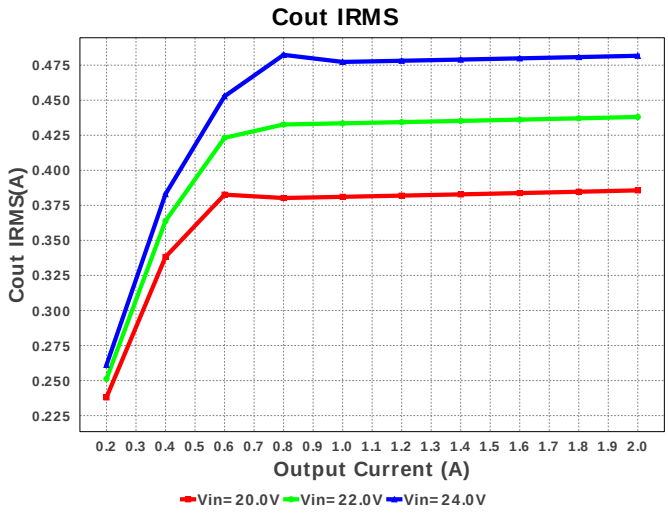


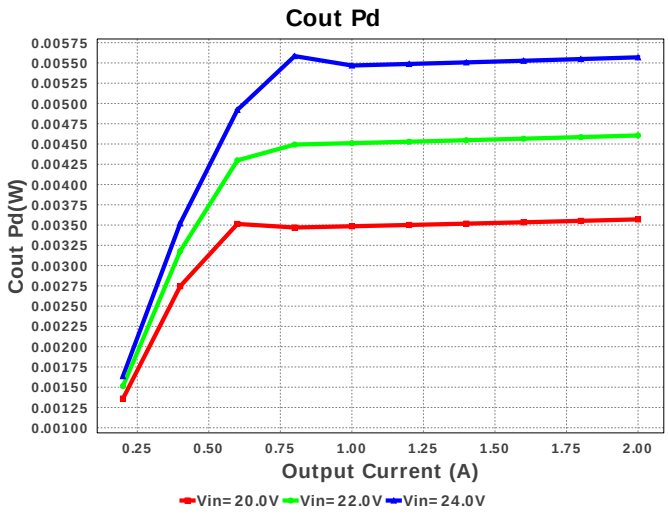


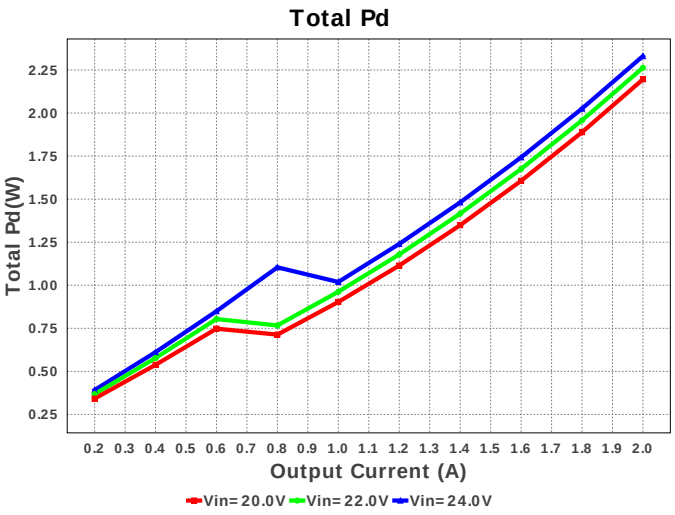


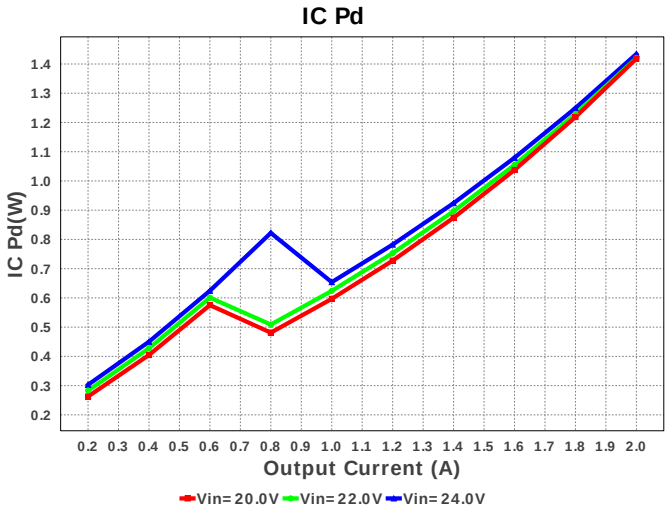












Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	884.992 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	479.401 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	2.0 A	Current	Peak switch current in IC
4.	Iin Avg	1.097 A	Current	Average input current
5.	BOM Count	8	General	Total Design BOM count
6.	FootPrint	252.0 mm^2	General	Total Foot Print Area of BOM components
7.	Frequency	800.0 kHz	General	Switching frequency
8.	Mode	CCM	General	Conduction Mode
9.	Pout	24.0 W	General	Total output power
10.	Total BOM	$8.48	General	Total BOM Cost
11.	Vout OP	12.0 V	Op_Point	Operational Output Voltage
12.	Cross Freq	10.153 kHz	Op_point	Bode plot crossover frequency
13.	Duty Cycle	52.035 %	Op_point	Duty cycle
14.	Efficiency	91.135 %	Op_point	Steady state efficiency
15.	IC Tj	60.137 degC	Op_point	IC junction temperature
16.	ICThetaJA	14.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
17.	IOUT_OP	2.0 A	Op_point	Iout operating point
18.	Phase Marg	89.001 deg	Op_point	Bode Plot Phase Margin
19.	VIN_OP	24.0 V	Op_point	Vin operating point
20.	Vout p-p	39.941 mV	Op_point	Peak-to-peak output ripple voltage
21.	Cin Pd	1.566 mW	Power	Input capacitor power dissipation
22.	Cout Pd	5.516 mW	Power	Output capacitor power dissipation
23.	IC Pd	3.047 W	Power	IC power dissipation
24.	Total Pd	2.335 W	Power	Total Power Dissipation
25.	Vout Tolerance	625.0 m%		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	2.0	Maximum Output Current

#	Name	Value	Description
2.	VinMax	24.0	Maximum input voltage
3.	VinMin	20.0	Minimum input voltage
4.	Vout	12.0	Output Voltage
5.	base_pn	LMZ35003	Texas Instruments Base Part Number
6.	source	DC	Input Source Type
7.	ta	40.0	Ambient temperature

Design Assistance

1. LMZ35003 Product Folder : http://www.ti.com/product/LMZ35003 : contains the data sheet and other resources.