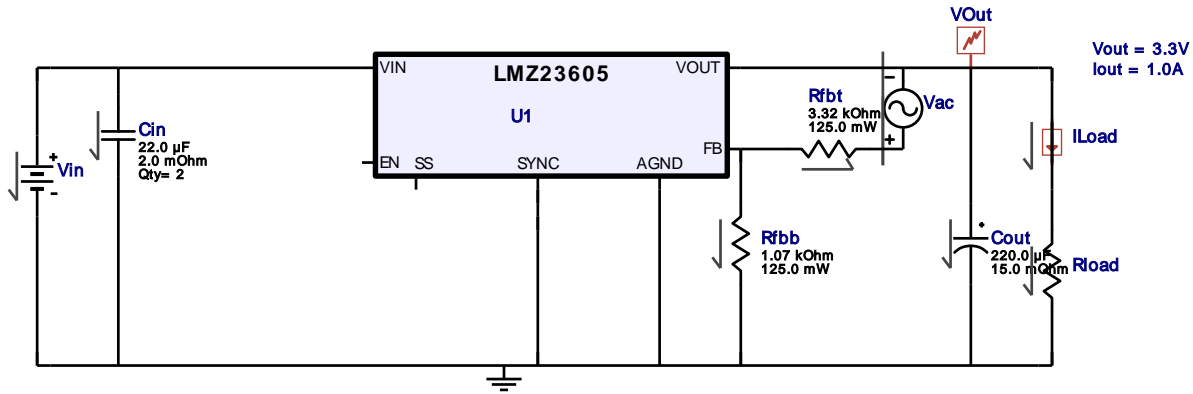
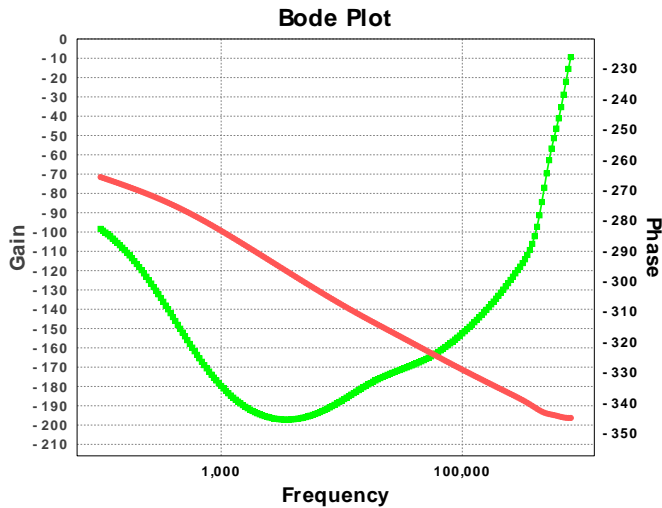


**WEBENCH® Electrical Simulation Report**

**Electrical BOM**

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cin	MuRata	GRM32ER61E226KE15L Series= X5R	Cap= 22.0 µF ESR= 2.0 mOhm VDC= 25.0 V IRMS= 3.67 A	2	\$0.16	 1210 15 mm <sup>2</sup>
2.	Cout	Panasonic	6SVPE220MW Series= 259	Cap= 220.0 µF ESR= 15.0 mOhm VDC= 6.3 V IRMS= 3.15 A	1	\$0.14	 CAPSMT_62_E61 53 mm <sup>2</sup>
3.	Rfbb	Panasonic	ERJ-6ENF1071V Series= 225	Res= 1.07 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7 mm <sup>2</sup>
4.	Rfbt	Panasonic	ERJ-6ENF3321V Series= 225	Res= 3.32 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7 mm <sup>2</sup>
5.	U1	Texas Instruments	LMZ23605TZ/NOPB	Switcher	1	\$9.25	 TZA07A 199 mm <sup>2</sup>

**Simulation Parameters**

#	Name	Parameter Name	Description	Values
1.	Cinj	C	Injection Isolation Capacitance	10 F
2.	Linj	L	Injection Isolation Inductance	10 H
3.	Vinj	AC	AC Voltage Source Amplitude	1 V
4.	Rload	R	Load Resistance	3.3 Ohm



## Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	417.627 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	431.912 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	1.748 A	Current	Peak switch current in IC
4.	Iin Avg	264.33 mA	Current	Average input current
5.	M Irms	474.413 mA	Current	MOSFET RMS current
6.	BOM Count	6	General	Total Design BOM count
7.	FootPrint	295.0 mm <sup>2</sup>	General	Total Foot Print Area of BOM components
8.	Frequency	800.0 kHz	General	Switching frequency
9.	IC Tolerance	20.0 mV	General	IC Feedback Tolerance
10.	M Vds Act	26.624 mV	General	Voltage drop across the MosFET
11.	Mode	CCM	General	Conduction Mode
12.	Pout	3.3 W	General	Total output power
13.	Total BOM	\$9.73	General	Total BOM Cost
14.	Vout OP	3.3 V	Op_Point	Operational Output Voltage
15.	Cross Freq	53.103 kHz	Op_point	Bode plot crossover frequency
16.	Duty Cycle	22.507 %	Op_point	Duty cycle
17.	Efficiency	83.23 %	Op_point	Steady state efficiency
18.	IC Tj	37.943 degC	Op_point	IC junction temperature
19.	ICThetaJA	12.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
20.	IOUT_OP	1.0 A	Op_point	Iout operating point
21.	Phase Marg	49.355 deg	Op_point	Bode Plot Phase Margin
22.	VIN_OP	15.0 V	Op_point	Vin operating point
23.	Vout p-p	1.063 mV	Op_point	Peak-to-peak output ripple voltage
24.	Cin Pd	174.412 μW	Power	Input capacitor power dissipation
25.	Cout Pd	2.798 mW	Power	Output capacitor power dissipation
26.	IC Drive Pd	0.0 W	Power	Driver power dissipation
27.	IC Iq Pd	15.0 mW	Power	IC Iq Pd
28.	IC Pd	661.952 mW	Power	IC power dissipation
29.	Total Pd	664.922 mW	Power	Total Power Dissipation

## Design Inputs

#	Name	Value	Description
1.	Iout	1.0 A	Maximum Output Current
2.	Iout1	1.0 Amps	Output Current #1
3.	VinMax	15.0 V	Maximum input voltage
4.	VinMin	10.0 V	Minimum input voltage
5.	Vout	3.3 V	Output Voltage
6.	Vout1	3.3 Volt	Output Voltage #1
7.	base_pn	LMZ23605	Texas Instruments Base Part Number
8.	source	DC	Input Source Type
9.	ta	30.0 degC	Ambient temperature

## Design Assistance

1. The 2nd Gen Modules are very easy to use and just need a basic design using a resistor divider at the feedback and input and output caps to work. To design for UVLO you could click on the drop down menu in the 'Change Inputs' menu and select the 'UVLO Enabled Design'. The internal softstart time is set at 1.6mSec. If a longer softstart time is desired, you could change the preset to the desired amount and click on 'Submit'. Webench will then add an external softstart cap to the schematic.

2. LMZ23605 Product Folder : <http://www.ti.com/product/LMZ23605> : contains the data sheet and other resources.

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

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