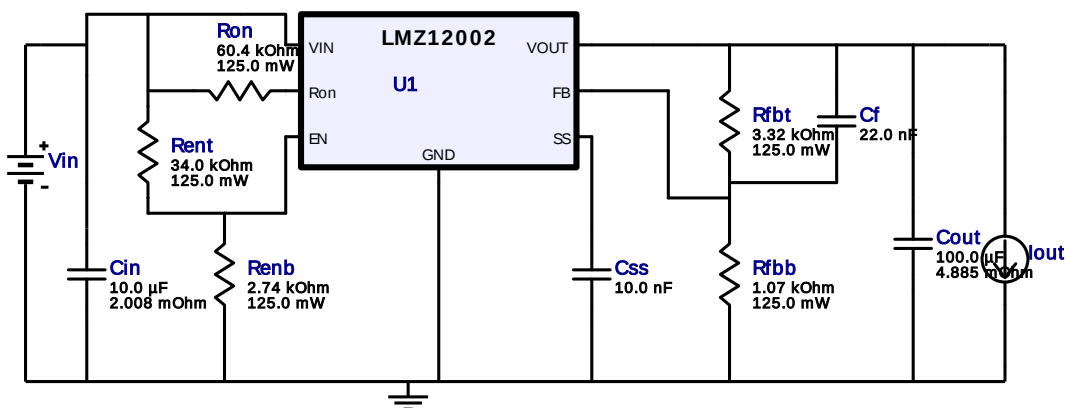


WEBENCH® Design Report

Design : 4755214/3 LMZ12002TZ-ADJ/NOPB
LMZ12002TZ-ADJ/NOPB 16.0V-19.0V to 3.30V @ 2.0A

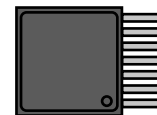
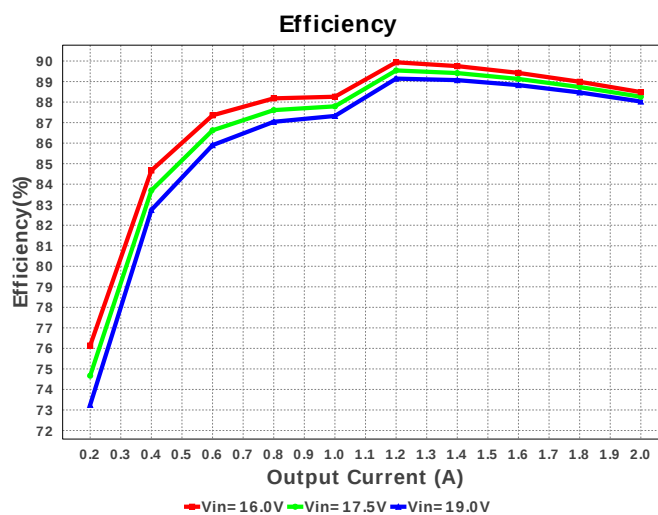
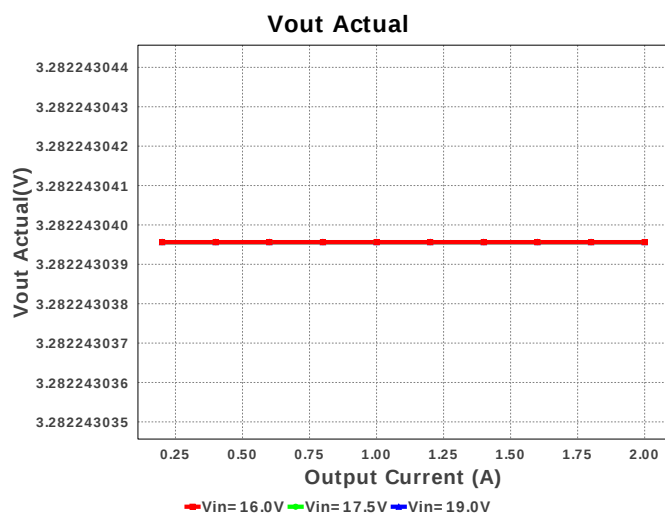
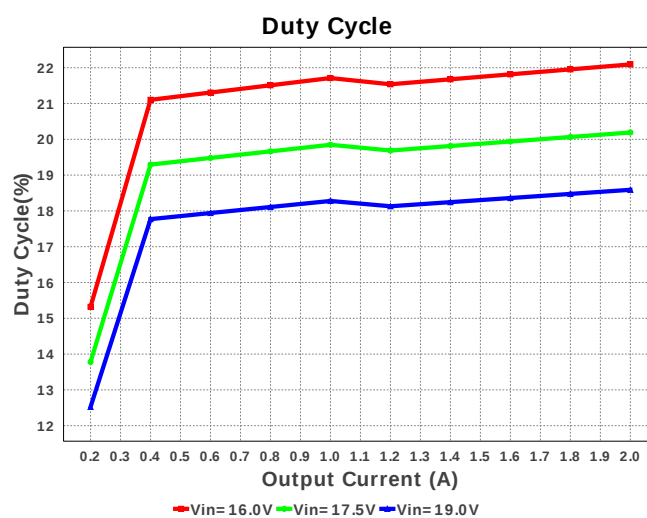
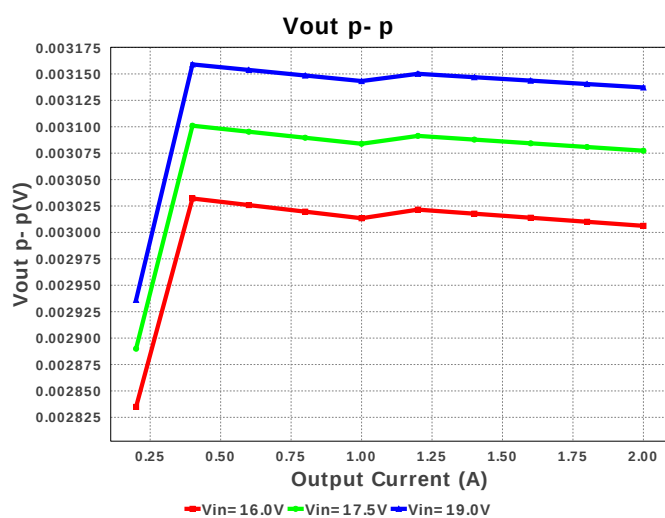
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Iout = 2.0A

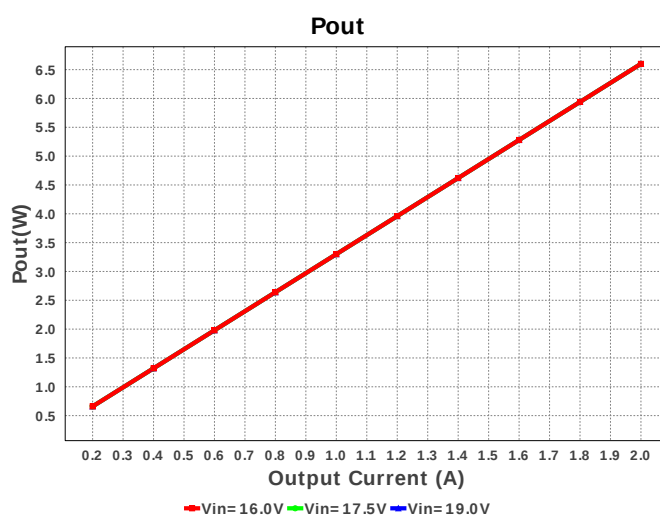
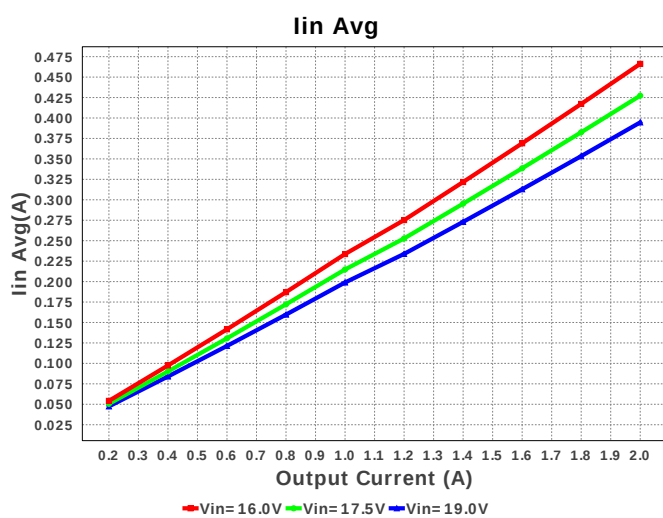
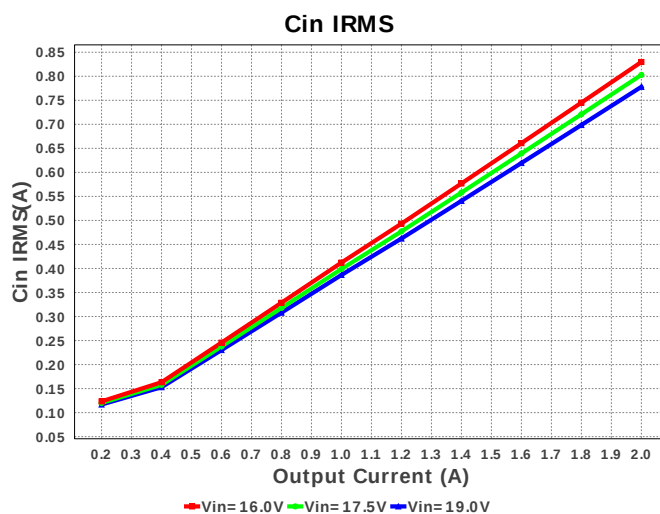
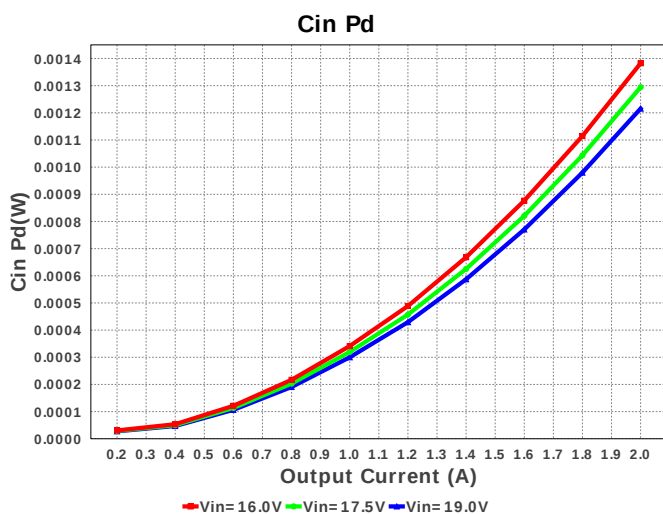
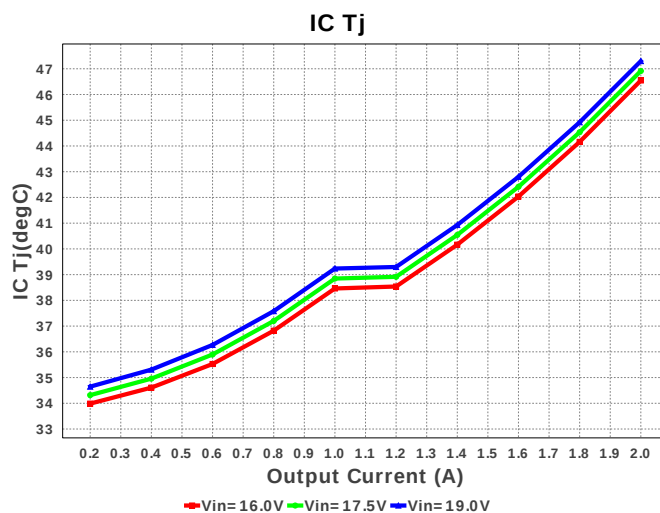
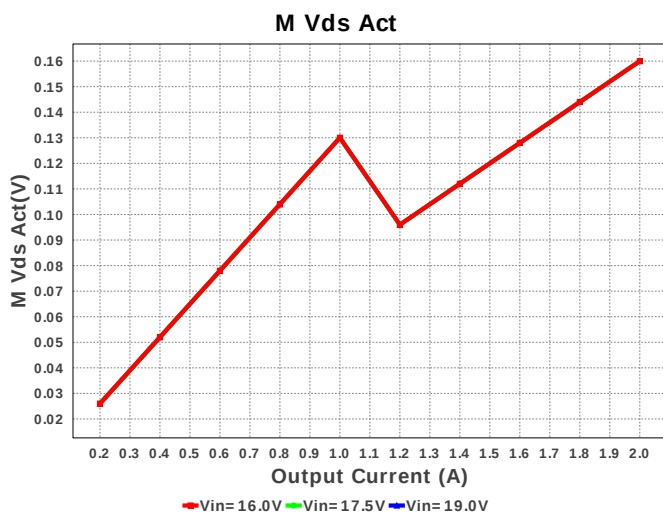


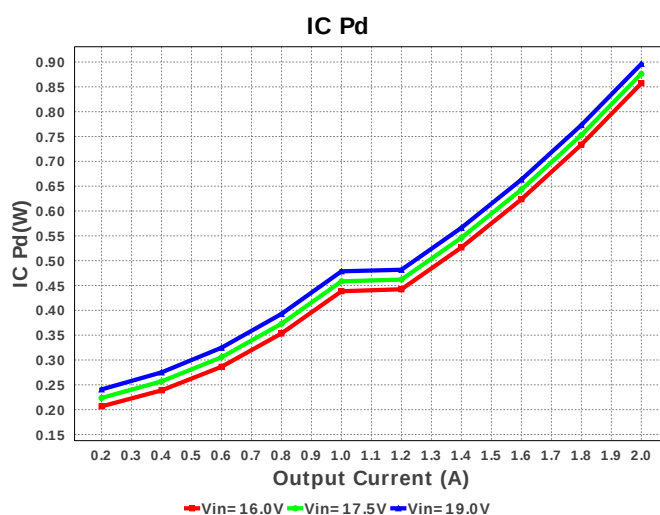
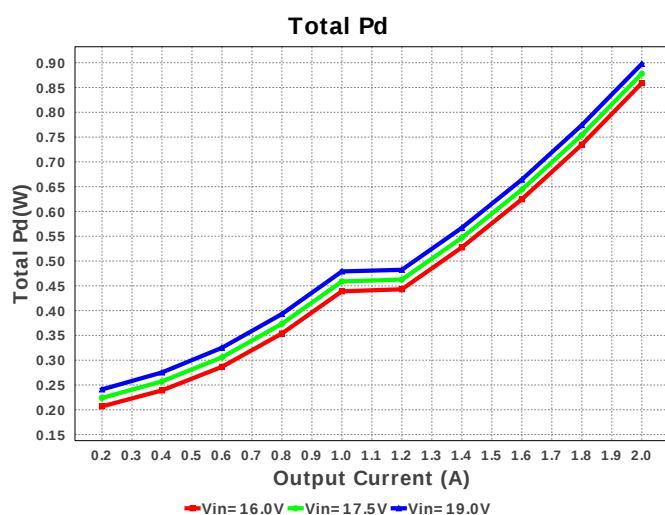
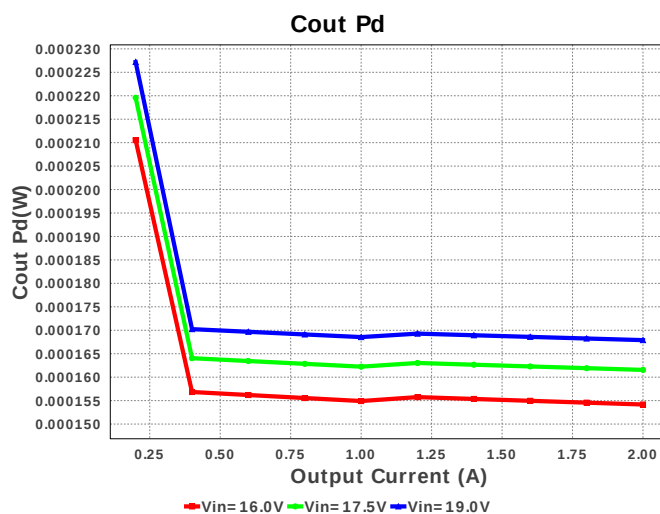
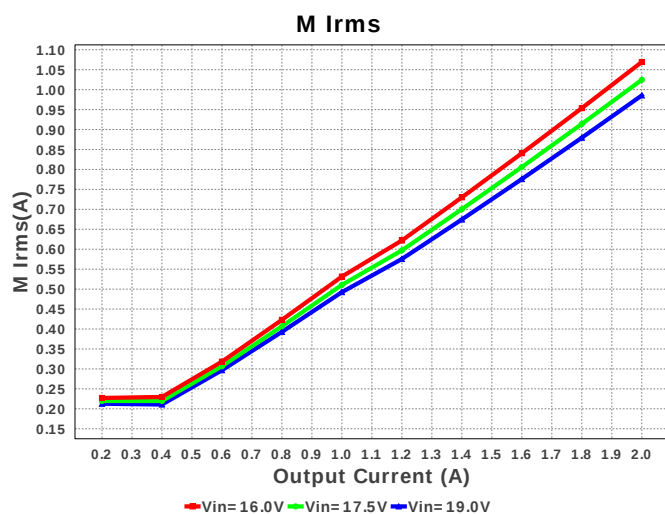
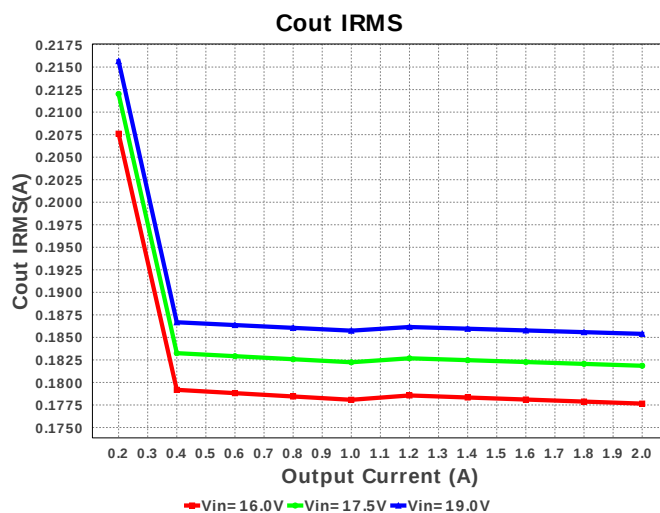
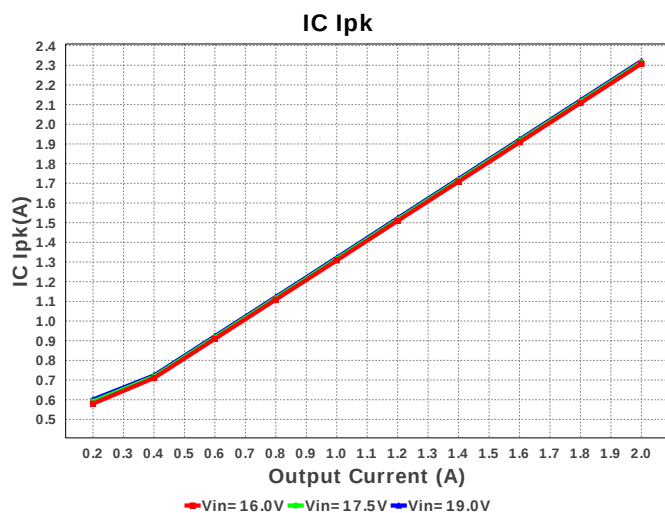
Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cf	Yageo America	CC0805KRX7R9BB223 Series= X7R	Cap= 22.0 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	0805 7 mm ²
2.	Cin	MuRata	GRM32ER7YA106KA12L Series= X7R	Cap= 10.0 uF ESR= 2.008 mOhm VDC= 35.0 V IRMS= 4.6772 A	1	\$0.22	1210_280 15 mm ²
3.	Cout	MuRata	GRM31CR60J107ME39L Series= X5R	Cap= 100.0 uF ESR= 4.885 mOhm VDC= 6.3 V IRMS= 4.4118 A	1	\$0.14	1206_190 11 mm ²
4.	Css	MuRata	GRM216R71H103KA01D Series= X7R	Cap= 10.0 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	0805 7 mm ²
5.	Renb	Panasonic	ERJ-6ENF2741V Series= ERJ-6E	Res= 2.74 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	0805 7 mm ²
6.	Rent	Panasonic	ERJ-6ENF3402V Series= ERJ-6E	Res= 34.0 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	0805 7 mm ²
7.	Rfbb	Panasonic	ERJ-6ENF1071V Series= ERJ-6E	Res= 1.07 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	0805 7 mm ²
8.	Rfbs	Panasonic	ERJ-6ENF3321V Series= ERJ-6E	Res= 3.32 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	0805 7 mm ²
9.	Ron	Panasonic	ERJ-6ENF6042V Series= ERJ-6E	Res= 60.4 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	0805 7 mm ²

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
10. U1		Texas Instruments	LMZ12002TZ-ADJ/NOPB	Switcher	1	\$5.58	

TZA07A 199 mm²





Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	778.042 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	185.39 mA	Current	Output capacitor RMS ripple current
3.	IC Ip _k	2.321 A	Current	Peak switch current in IC
4.	Iin Avg	391.02 mA	Current	Average input current
5.	M1 Irms	977.035 mA	Current	Q ₁ I _{avg}
6.	BOM Count	10	General	Total Design BOM count
7.	FootPrint	272.0 mm ²	General	Total Foot Print Area of BOM components
8.	Frequency	420.275 kHz	General	Switching frequency
9.	IC Tolerance	20.0 mV	General	IC Feedback Tolerance
10.	M V _{ds} Act	160.0 mV	General	Voltage drop across the MosFET
11.	Pout	6.6 W	General	Total output power

#	Name	Value	Category	Description
12.	Total BOM	\$6.01	General	Total BOM Cost
13.	Vout Actual	3.282 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
14.	Vout OP	3.3 V	Op_Point	Operational Output Voltage
15.	Duty Cycle	18.589 %	Op_point	Duty cycle
16.	Efficiency	88.837 %	Op_point	Steady state efficiency
17.	IC Tj	45.98 degC	Op_point	IC junction temperature
18.	ICThetaJA	19.3 degC/W	Op_point	IC junction-to-ambient thermal resistance
19.	IOUT_OP	2.0 A	Op_point	Iout operating point
20.	VIN_OP	19.0 V	Op_point	Vin operating point
21.	Vout p-p	3.137 mV	Op_point	Peak-to-peak output ripple voltage
22.	Cin Pd	1.216 mW	Power	Input capacitor power dissipation
23.	Cout Pd	167.895 μ W	Power	Output capacitor power dissipation
24.	IC Pd	827.963 mW	Power	IC power dissipation
25.	Total Pd	829.342 mW	Power	Total Power Dissipation
26.	Vout Tolerance	4.066 %		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
2.	VinMax	19.0	Maximum input voltage
3.	VinMin	16.0	Minimum input voltage
4.	Vout	3.3	Output Voltage
5.	base_pn	LMZ12002	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	30.0	Ambient temperature

Design Assistance

1. **LMZ12002** Product Folder : <http://www.ti.com/product/LMZ12002> : contains the data sheet and other resources.

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