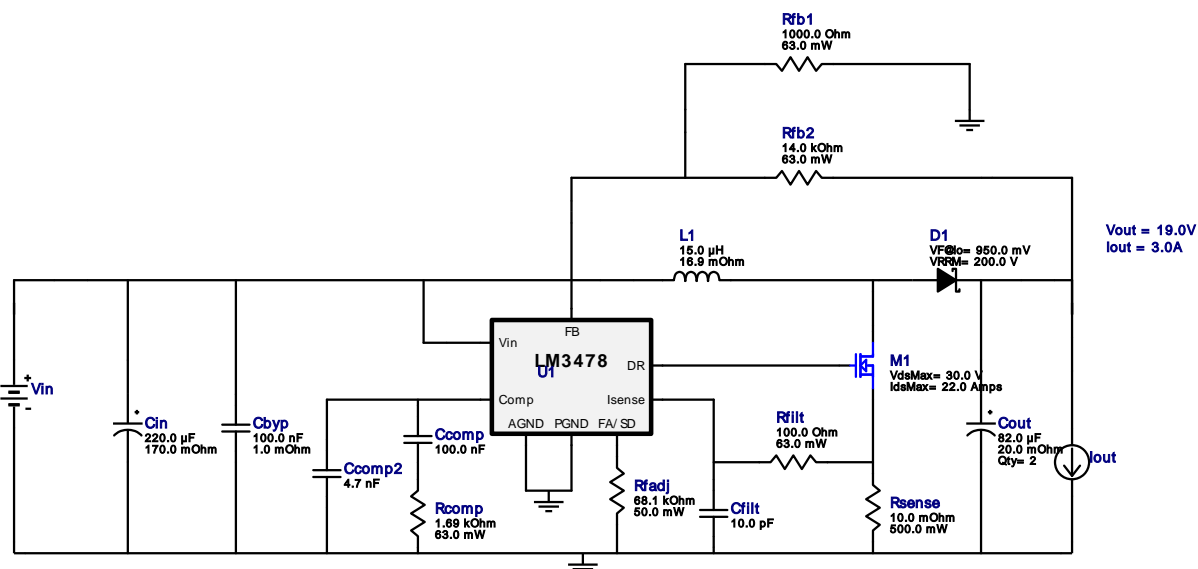


VinMin = 10.0V
VinMax = 17.0V
Vout = 19.0V
Iout = 3.0A

Device = LM3478MMX/NOPB
Topology = Boost
Created = 2020-09-29 07:11:49.027
BOM Cost = \$4.38
BOM Count = 17
Total Pd = 3.98W

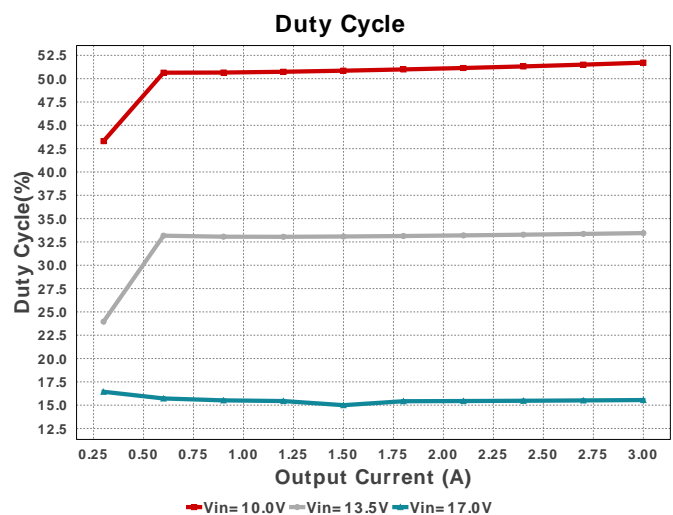
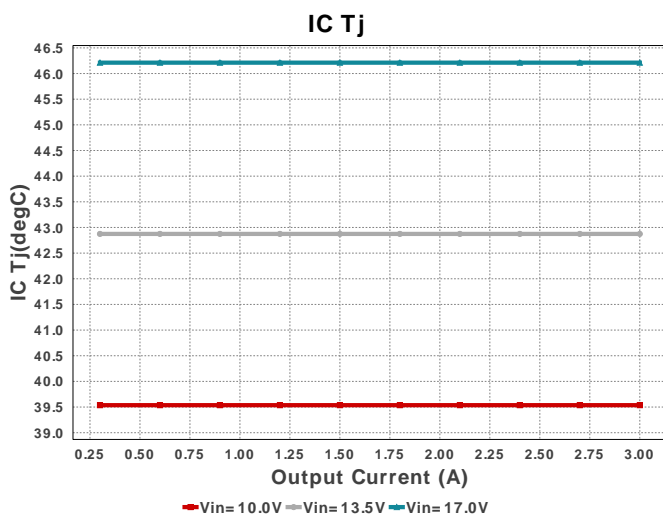


1. With the low turn of voltage of the LM34x8 your power supply may current limit before you reach your working input voltage. If this happens, or to preempt this from happening, you can include a low pass RC filter from input voltage to Vin on the IC. Make sure the rise time on the RC network is slower than your supply's rise time.

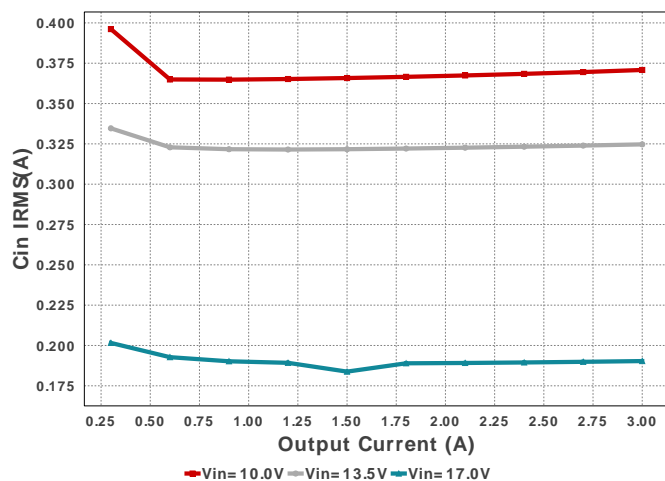
Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cbyp	Kemet	C0603C104Z3VACTU Series= Y5V	Cap= 100.0 nF ESR= 1.0 mOhm VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	0603 5 mm ²
2.	Ccomp	AVX	08053C104JAZ2A Series= X7R	Cap= 100.0 nF VDC= 25.0 V IRMS= 0.0 A	1	\$0.06	0805 7 mm ²
3.	Ccomp2	TDK	CGA4C2C0G1H472J060AA Series= C0G/NP0	Cap= 4.7 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.04	0805 7 mm ²
4.	Cfilt	Samsung Electro-Mechanics	CL21C100JBANNNC Series= C0G/NP0	Cap= 10.0 pF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	0805 7 mm ²
5.	Cin	Nichicon	UUD1E221MNL1GS Series= uD	Cap= 220.0 uF ESR= 170.0 mOhm VDC= 25.0 V IRMS= 450.0 mA	1	\$0.17	SM_RADIAL_8MM 113 mm ²
6.	Cout	Panasonic	35SVPF82M Series= SVPF	Cap= 82.0 uF ESR= 20.0 mOhm VDC= 35.0 V IRMS= 4.0 A	2	\$0.63	CAPSMT_62_E12 106 mm ²
7.	D1	SMC Diode Solutions	SBRD10200TR	Vf@Io= 950.0 mV VRRM= 200.0 V	1	\$0.12	DPAK 102 mm ²

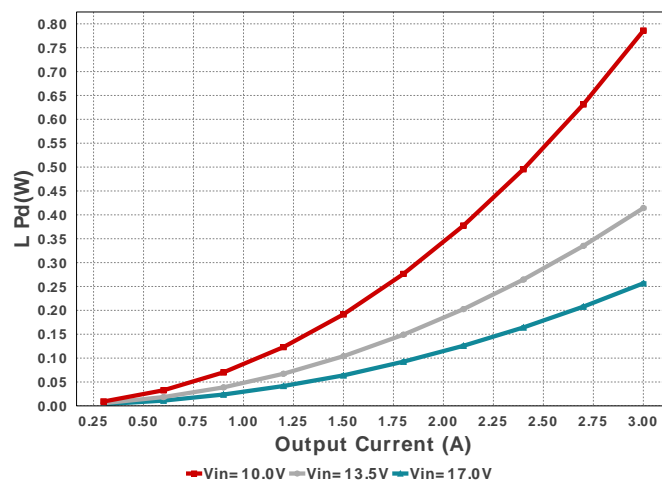
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
8.	L1	Coilcraft	XAL1010-153MEB	L= 15.0 μ H DCR= 16.9 mOhm	1	\$1.71	 XAL1010 160 mm ²
9.	M1	Texas Instruments	CSD17571Q2	VdsMax= 30.0 V IdsMax= 22.0 Amps	1	\$0.10	 DQK0006C 9 mm ²
10.	Rcomp	Vishay-Dale	CRCW04021K69FKED Series= CRCW..e3	Res= 1690.0Ohm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
11.	Rfadj	Yageo	RC0201FR-0768K1L Series= ?	Res= 68100.0Ohm Power= 50.0 mW Tolerance= 1.0%	1	\$0.01	 0201 2 mm ²
12.	Rfb1	Vishay-Dale	CRCW04021K00FKED Series= CRCW..e3	Res= 1000.0Ohm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
13.	Rfb2	Vishay-Dale	CRCW040214K0FKED Series= CRCW..e3	Res= 14000.0Ohm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
14.	Rfilt	Vishay-Dale	CRCW0402100RFKED Series= CRCW..e3	Res= 100.0Ohm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
15.	Rsense	Stackpole Electronics Inc	CSR1206FK10L0 Series= ?	Res= 0.01Ohm Power= 500.0 mW Tolerance= 1.0%	1	\$0.12	 1206 11 mm ²
16.	U1	Texas Instruments	LM3478MMX/NOPB	Switcher	1	\$0.73	 MUA08A 24 mm ²



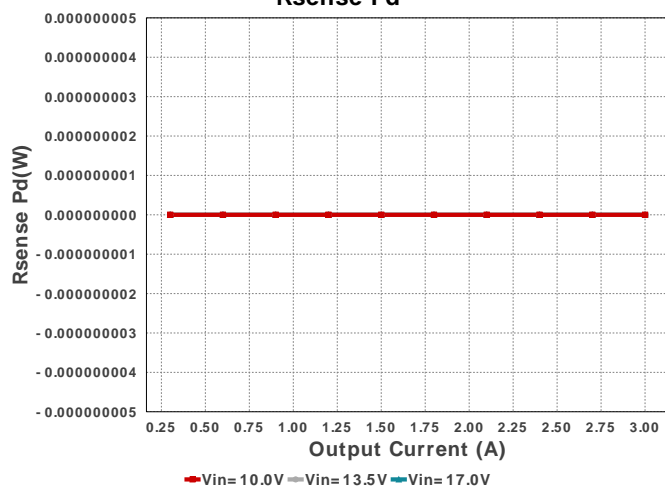
Cin IRMS



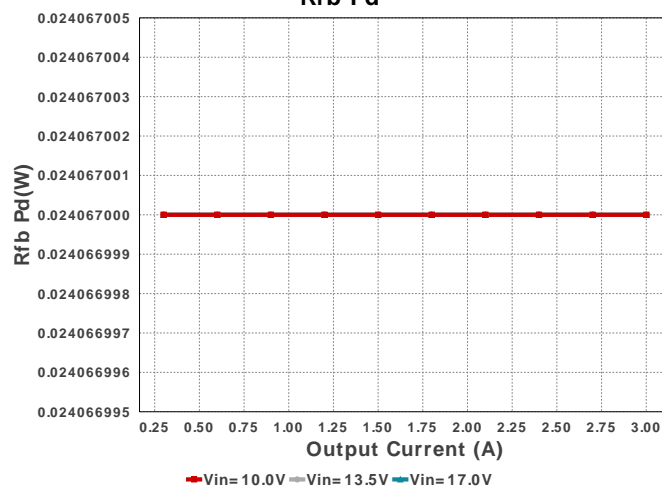
L Pd



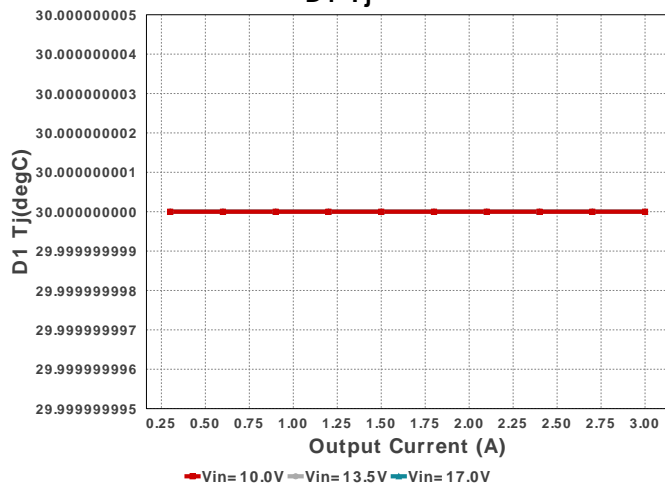
Rsense Pd



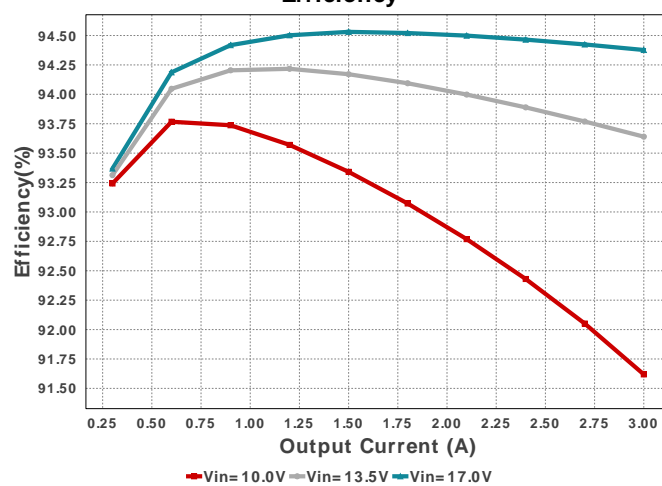
Rfb Pd

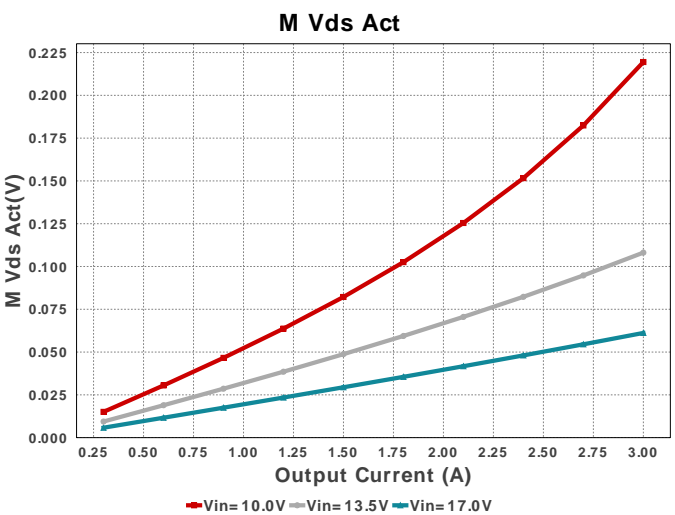
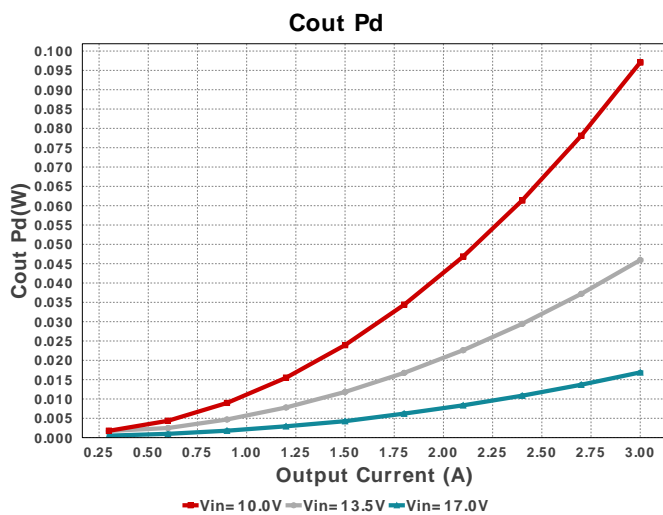
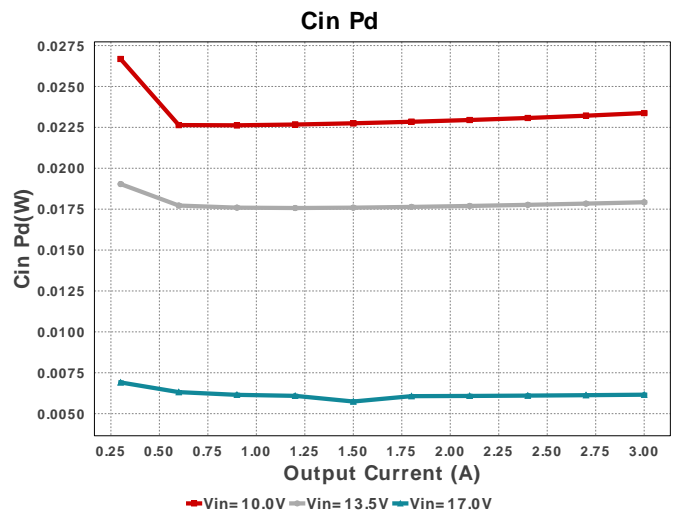
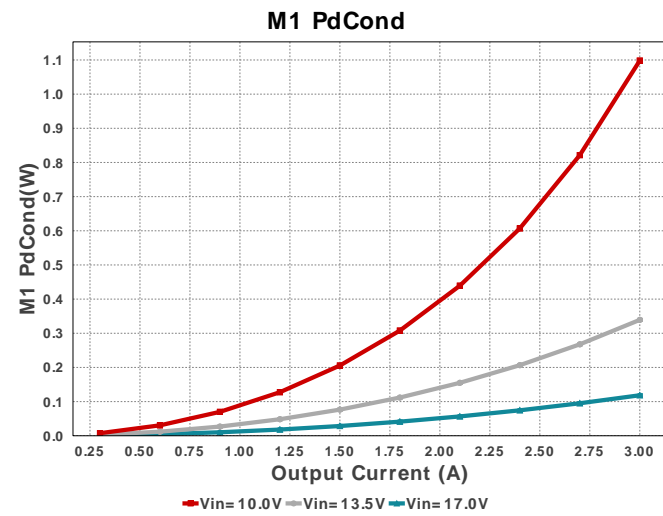
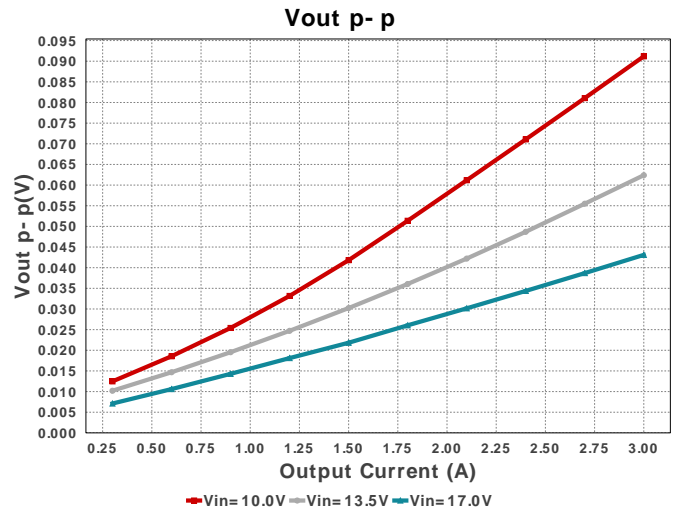
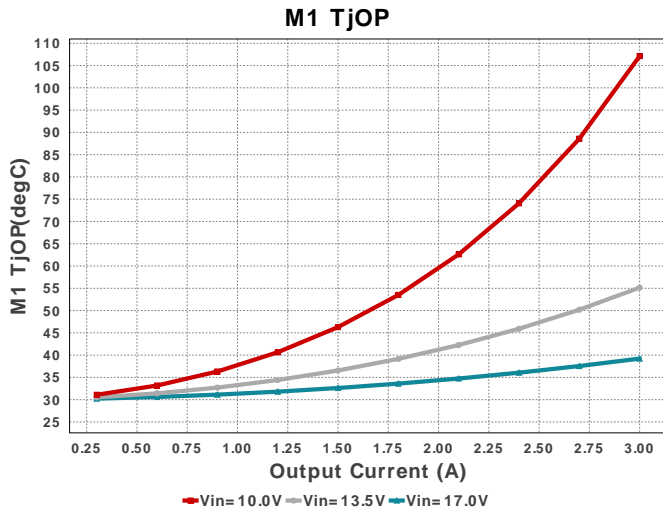


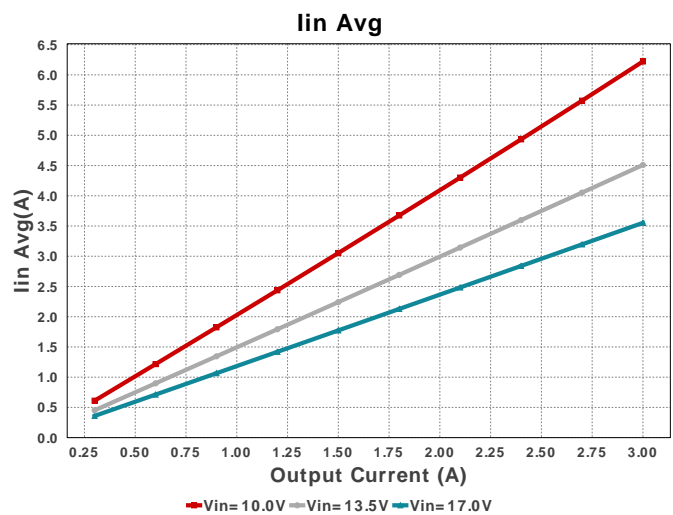
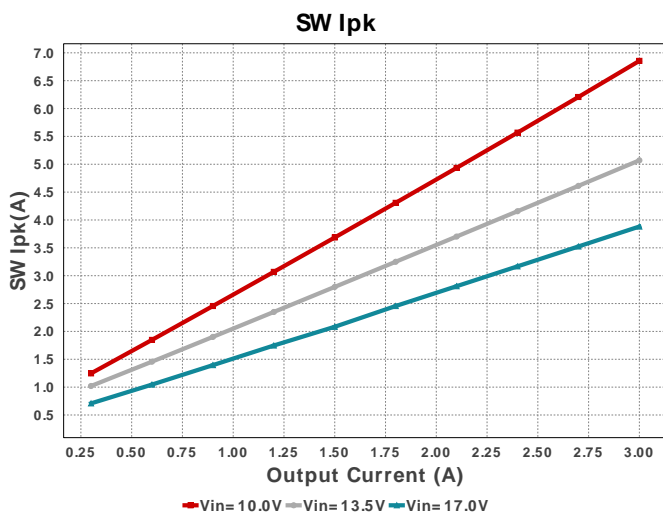
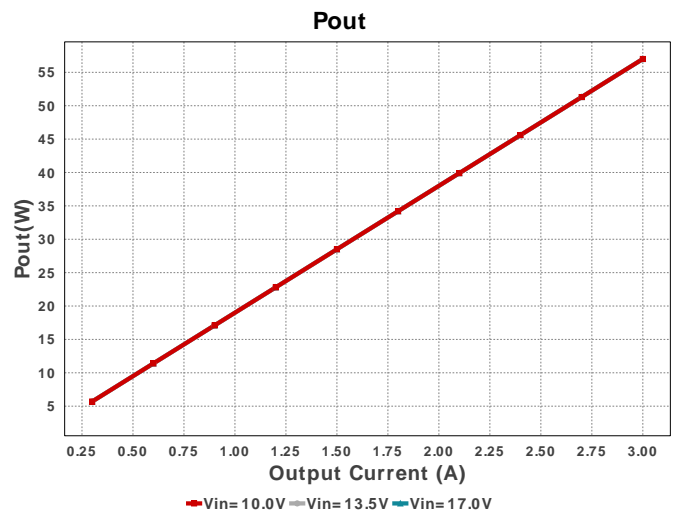
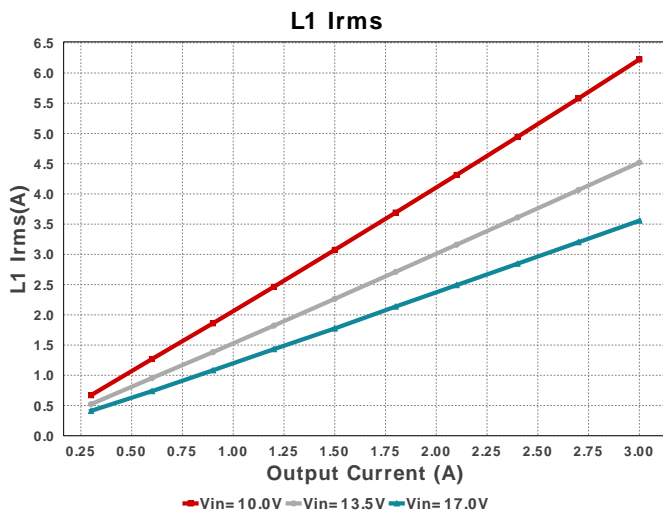
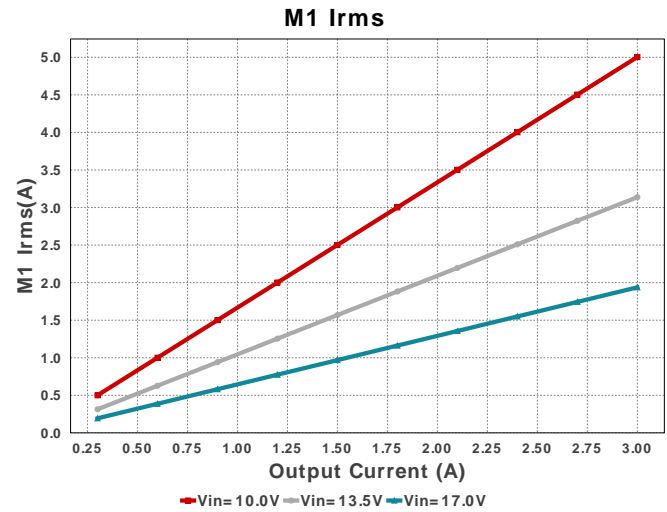
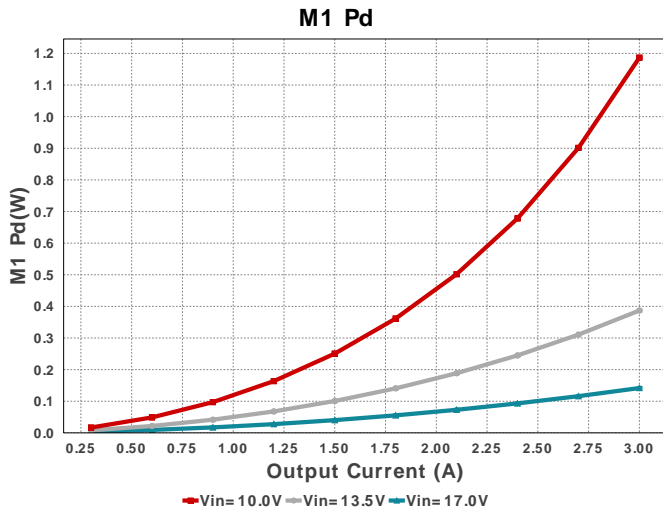
D1 Tj

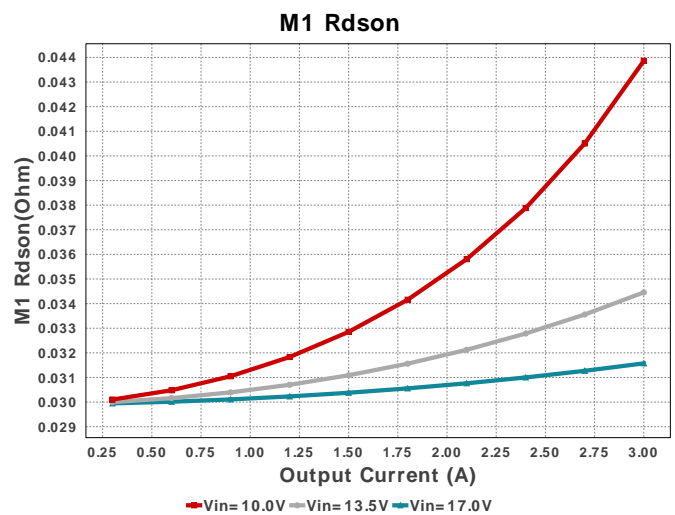
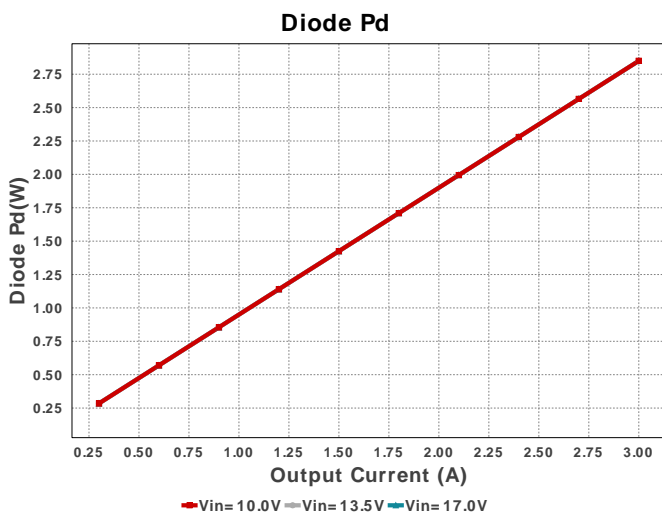
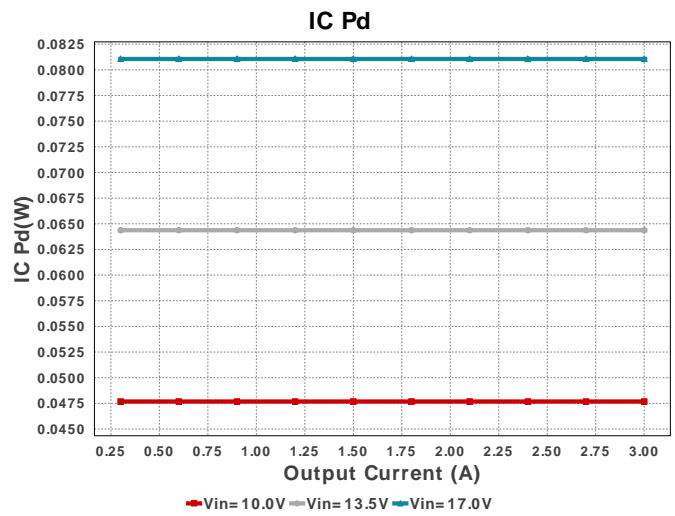
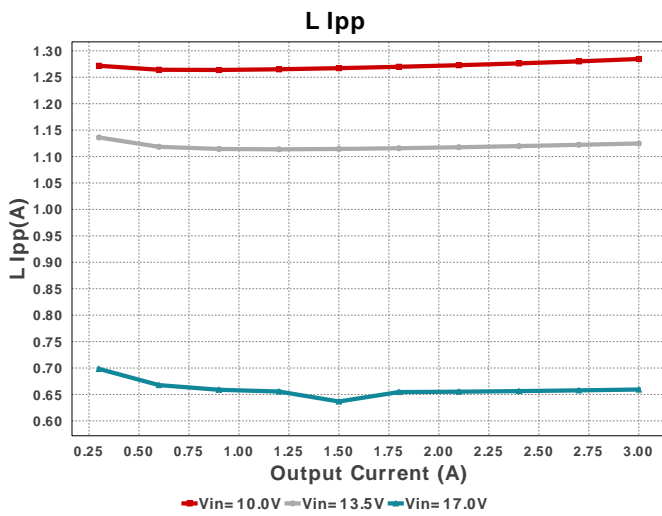
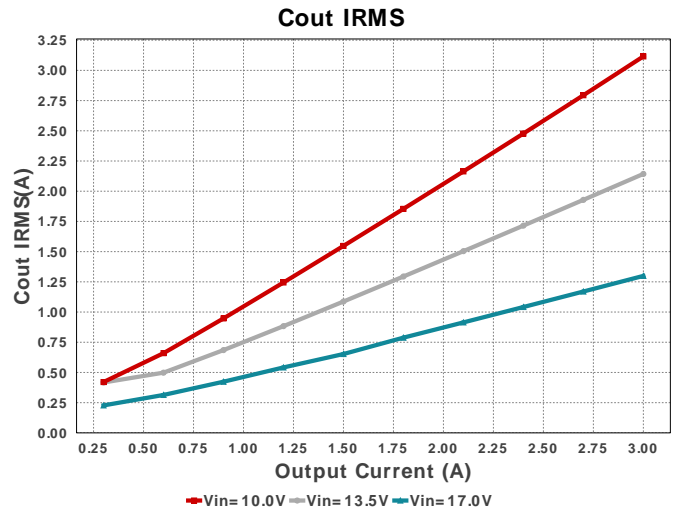
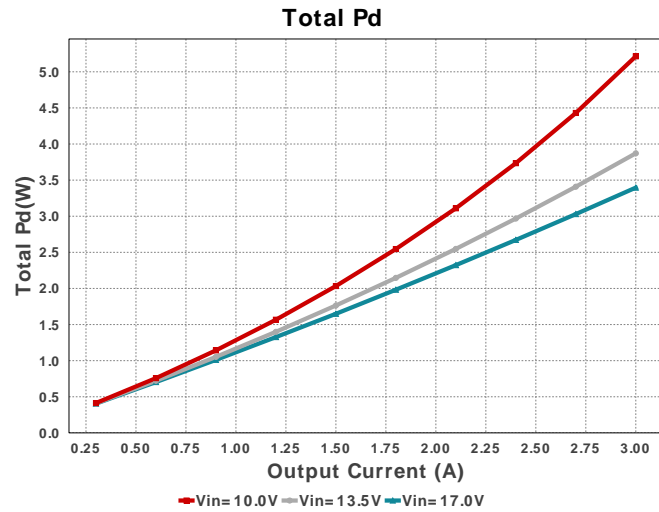


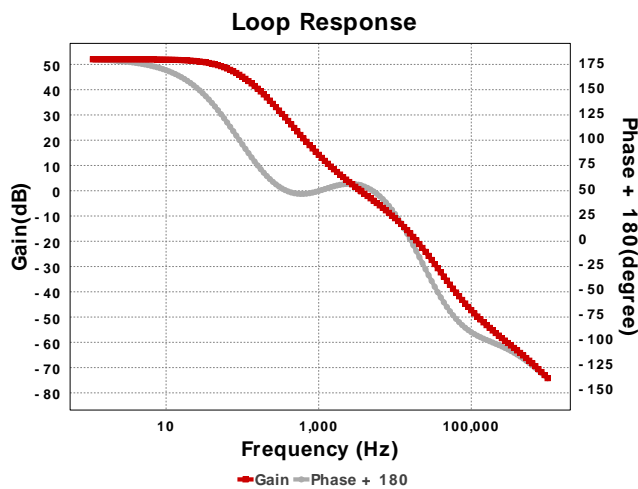
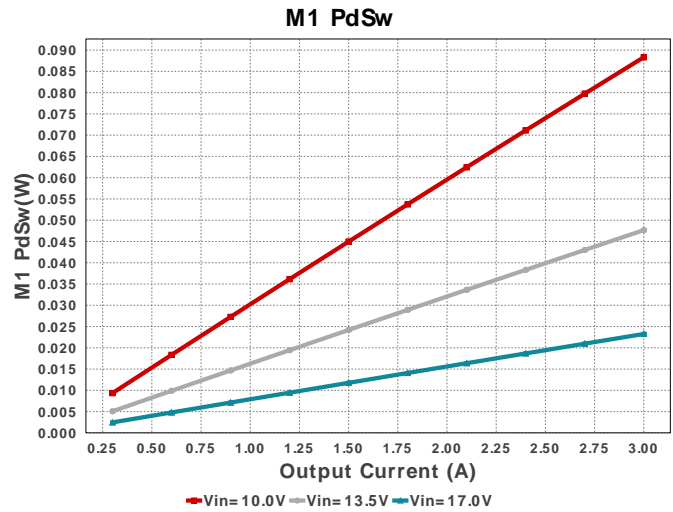
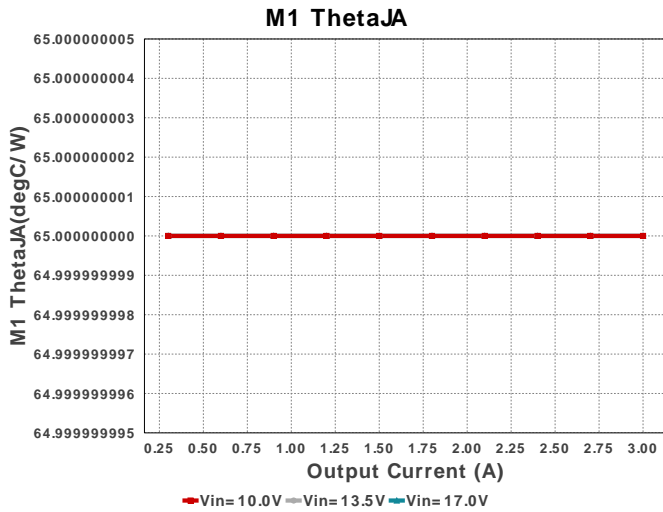
Efficiency











Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	375.662 mA	Capacitor	Input capacitor RMS ripple current
2.	Cin Pd	23.991 mW	Capacitor	Input capacitor power dissipation
3.	Cout IRMS	3.058 A	Capacitor	Output capacitor RMS ripple current
4.	Cout Pd	93.54 mW	Capacitor	Output capacitor power dissipation
5.	D1 Tj	30.0 degC	Diode	D1 junction temperature
6.	Diode Pd	2.85 W	Diode	Diode power dissipation
7.	IC Pd	47.736 mW	IC	IC power dissipation
8.	IC Tj	39.547 degC	IC	IC junction temperature
9.	IC Tolerance	24.3 mV	IC	IC Feedback Tolerance
10.	ICThetaJA	200.0 degC/W	IC	IC junction-to-ambient thermal resistance
11.	Iin Avg	6.098 A	IC	Average input current
12.	L Ipp	1.301 A	Inductor	Peak-to-peak inductor ripple current
13.	L Pd	756.21 mW	Inductor	Inductor power dissipation
14.	L1 Irms	6.106 A	Inductor	Inductor ripple current
15.	M Vds Act	219.521 mV	Mosfet	M Vds
16.	M1 Irms	5.004 A	Mosfet	M1 MOSFET Irms
17.	M1 Pd	1.187 W	Mosfet	M1 MOSFET total power dissipation
18.	M1 PdCond	1.098 W	Mosfet	M1 MOSFET conduction losses
19.	M1 PdSw	88.945 mW	Mosfet	M1 MOSFET switching losses
20.	M1 Rdson	43.871 mOhm	Mosfet	Drain-Source On-resistance
21.	M1 ThetaJA	65.0 degC/W	Mosfet	MOSFET junction-to-ambient thermal resistance
22.	M1 TjOP	107.18 degC	Mosfet	M1 MOSFET junction temperature
23.	Cin Pd	23.991 mW	Power	Input capacitor power dissipation
24.	Cout Pd	93.54 mW	Power	Output capacitor power dissipation
25.	Diode Pd	2.85 W	Power	Diode power dissipation
26.	IC Pd	47.736 mW	Power	IC power dissipation
27.	L Pd	756.21 mW	Power	Inductor power dissipation
28.	M1 Pd	1.187 W	Power	M1 MOSFET total power dissipation
29.	M1 PdCond	1.098 W	Power	M1 MOSFET conduction losses
30.	M1 PdSw	88.945 mW	Power	M1 MOSFET switching losses
31.	Rfb Pd	24.067 mW	Power	Rfb Power Dissipation
32.	Rsense Pd	358.2 mW	Power	LED Current Rsns Power Dissipation

#	Name	Value	Category	Description
33.	Total Pd	3.984 W	Power	Total Power Dissipation
34.	Rfb Pd	24.067 mW	Resistor	Rfb Power Dissipation
35.	Rsense Pd	358.2 mW	Resistor	LED Current Rsns Power Dissipation
36.	BOM Count	17	System Information	Total Design BOM count
37.	Cross Freq	2.242 kHz	System Information	Bode plot crossover frequency
38.	Duty Cycle	50.778 %	System Information	Duty cycle
39.	Efficiency	93.467 %	System Information	Steady state efficiency
40.	FootPrint	669.0 mm ²	System Information	Total Foot Print Area of BOM components
41.	Frequency	258.549 kHz	System Information	Switching frequency
42.	Gain Marg	-15.402 dB	System Information	Bode Plot Gain Margin
43.	Iout	3.0 A	System Information	Iout operating point
44.	Low Freq Gain	52.323 dB	System Information	Gain at 1Hz
45.	Mode	CCM	System Information	Conduction Mode
46.	Phase Marg	53.567 deg	System Information	Bode Plot Phase Margin
47.	Pout	57.0 W	System Information	Total output power
48.	SW Ipk	6.746 A	System Information	Peak switch current
49.	Total BOM	\$4.38	System Information	Total BOM Cost
50.	Vin	10.0 V	System Information	Vin operating point
51.	Vout	19.0 V	System Information	Operational Output Voltage
52.	Vout Actual	18.9 V	System Information	Vout Actual calculated based on selected voltage divider resistors
53.	Vout Tolerance	3.85 %	System Information	Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable
54.	Vout p-p	90.368 mV	System Information	Peak-to-peak output ripple voltage

Design Inputs

#	Name	Value	Description
1.	Iout	3.0	Maximum Output Current
2.	VinMax	17.0	Maximum input voltage
3.	VinMin	10.0	Minimum input voltage
4.	Vout	19.0	Output Voltage
5.	acFrequency	60.0	AC Frequency
6.	base_pn	LM3478	Base Product Number
7.	source	DC	Input Source Type
8.	Ta	30.0	Ambient temperature

Design Assistance

1. **LM3478** Product Folder : <http://www.ti.com/product/LM3478> : contains the data sheet and other resources.

Important Notice and Disclaimer

TI provides technical and reliability data (including datasheets), design resources (including reference designs), application or other design advice, web tools, safety information, and other resources AS IS and with all faults, and disclaims all warranties. These resources are intended for skilled developers designing with TI products. You are solely responsible for (1) selecting the appropriate TI products for your application, (2) designing, validating and testing your application, and (3) ensuring your application meets applicable standards, and any other safety, security, or other requirements.

These resources are subject to change without notice. TI grants you permission to use these resources only for development of an application that uses the TI products described in the resource. Other reproduction and display of these resources is prohibited. No license is granted to any other TI intellectual property right or to any third party intellectual property right. TI disclaims responsibility for, and you will fully indemnify TI and its representatives against, any claims, damages, costs, losses, and liabilities arising out of your use of these resources.

Providing these resources does not expand or otherwise alter TI's applicable Terms of Sale or other applicable terms available either on ti.com or provided in conjunction with TI products.