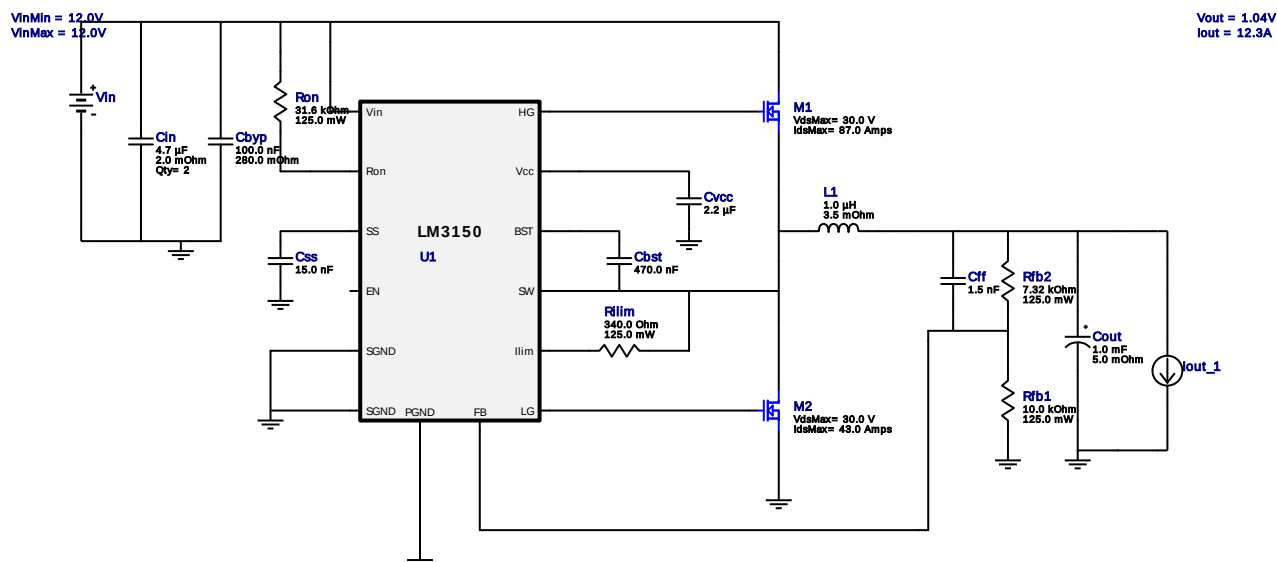


WEBENCH® Design Report

Design : 1949539/28 LM3150MH/NOPB
LM3150MH/NOPB 12.0V-12.0V to 1.04V @ 12.3A

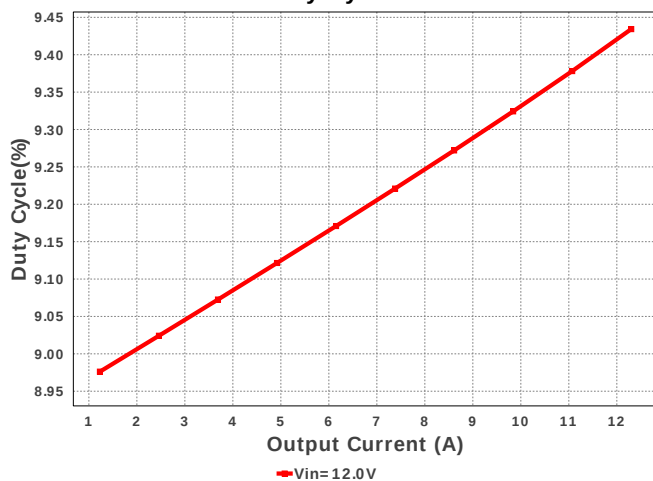


Electrical BOM

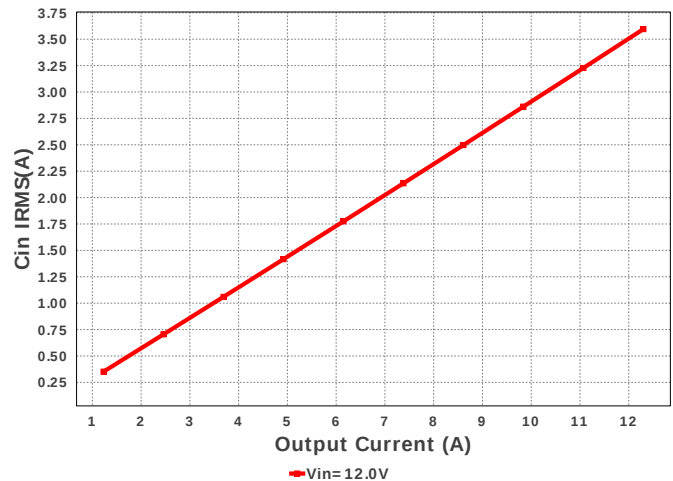
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cbst	Taiyo Yuden	EMK212B7474KD-T Series= X7R	Cap= 470.0 nF VDC= 16.0 V IRMS= 0.0 A	1	\$0.02	 0805 7 mm ²
2.	Cbyp	AVX	08053C104KAT2A Series= X7R	Cap= 100.0 nF ESR= 280.0 mOhm VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	 0805 7 mm ²
3.	Cff	Yageo America	CC0805KRX7R9BB152 Series= X7R	Cap= 1.5 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	 0805 7 mm ²
4.	Cin	MuRata	GRM21BR61E475MA12L Series= X5R	Cap= 4.7 uF ESR= 2.0 mOhm VDC= 25.0 V IRMS= 7.29 A	2	\$0.06	 0805 7 mm ²
5.	Cout	Panasonic	ETPF1000M5H Series= TPF	Cap= 1.0 mF ESR= 5.0 mOhm VDC= 2.5 V IRMS= 6.1 A	1	\$1.17	 CAPSMT_6_D4 59 mm ²
6.	Css	Yageo America	CC0805KRX7R9BB153 Series= X7R	Cap= 15.0 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	 0805 7 mm ²
7.	Cvcc	Taiyo Yuden	EMK212B7225KG-T Series= X7R	Cap= 2.2 uF VDC= 16.0 V IRMS= 0.0 A	1	\$0.03	 0805 7 mm ²
8.	L1	Bourns	SRP1235-1R0M	L= 1.0 µH DCR= 3.5 mOhm	1	\$0.53	 SRP1235 253 mm ²

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
9.	M1	Texas Instruments	CSD17302Q5A	VdsMax= 30.0 V IdsMax= 87.0 Amps	1	\$0.36	 TRANS_NexFET_Q5A 55 mm²
10.	M2	Texas Instruments	CSD17573Q5B	VdsMax= 30.0 V IdsMax= 43.0 Amps	1	\$0.75	 TRANS_NexFET_Q5B 58 mm²
11.	Rfb1	Panasonic	ERJ-6ENF1002V Series= ERJ-6E	Res= 10.0 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7 mm²
12.	Rfb2	Panasonic	ERJ-6ENF7321V Series= ERJ-6E	Res= 7.32 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7 mm²
13.	Rilim	Vishay-Dale	CRCW0805340RFKEA Series= CRCW..e3	Res= 340.0 Ohm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7 mm²
14.	Ron	Panasonic	ERJ-6ENF3162V Series= ERJ-6E	Res= 31.6 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7 mm²
15.	U1	Texas Instruments	LM3150MH/NOPB	Switcher	1	\$1.62	 MXA14A 59 mm²

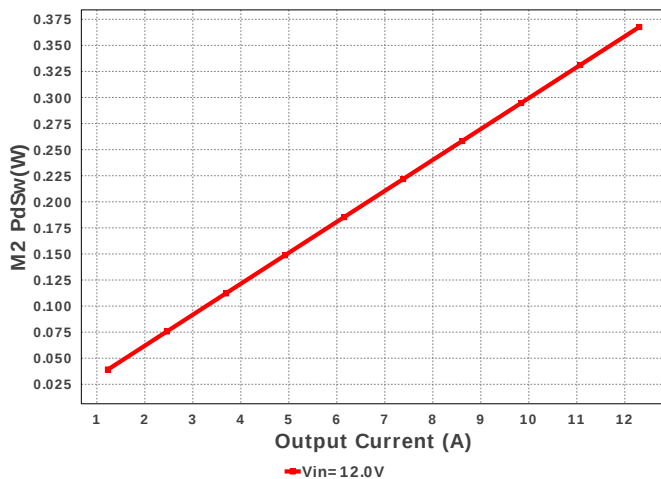
Duty Cycle



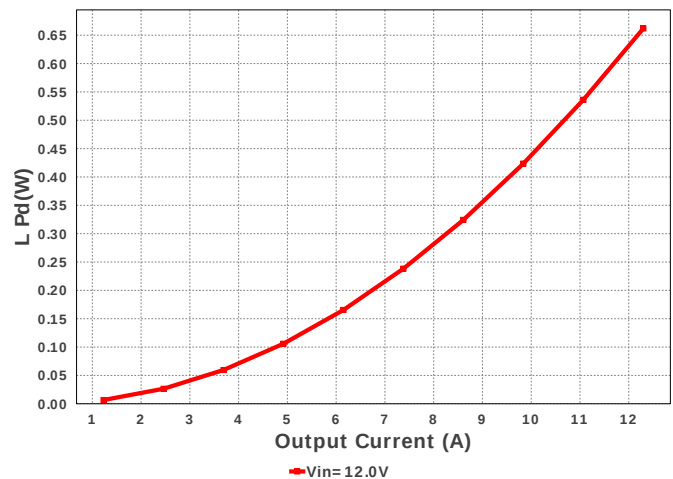
Cin IRMS



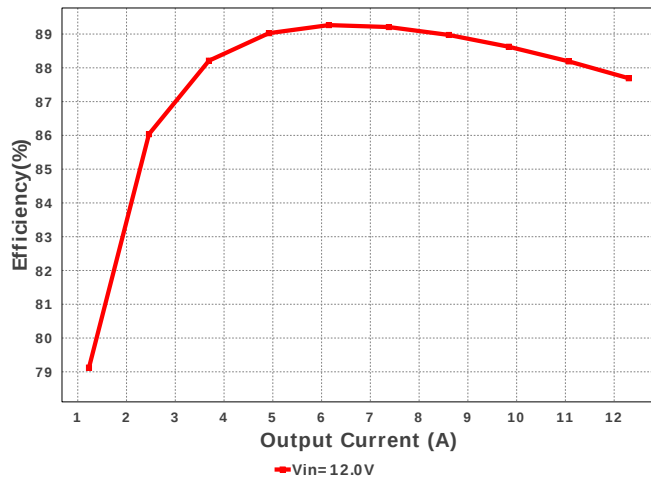
M2 PdSw



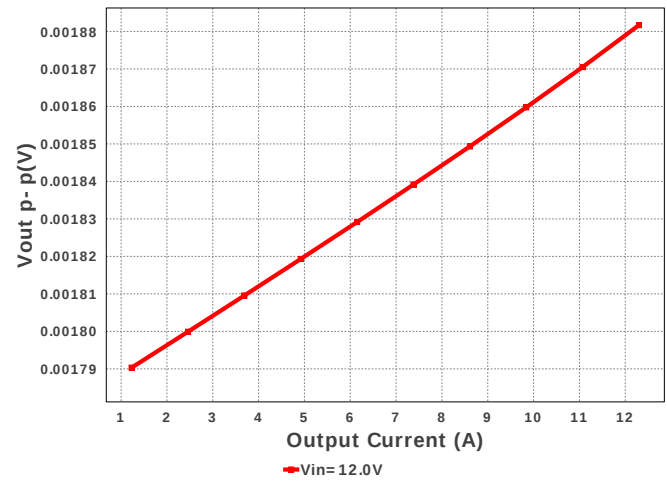
L Pd



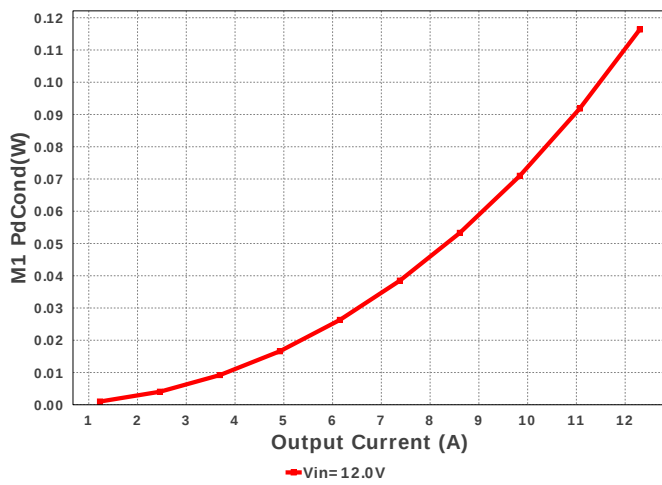
Efficiency



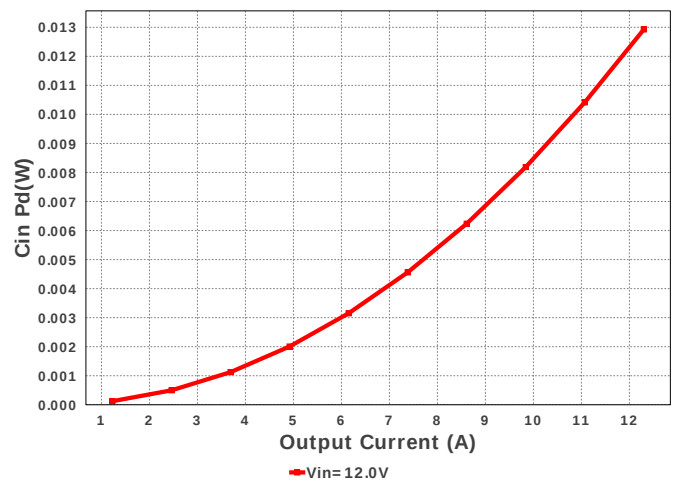
Vout p- p



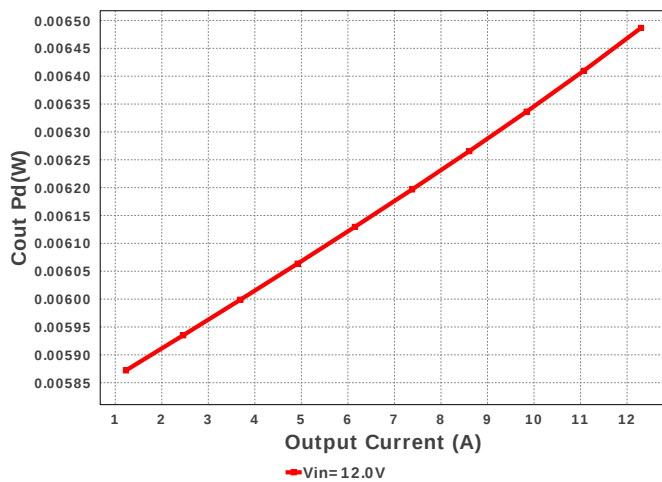
M1 PdCond



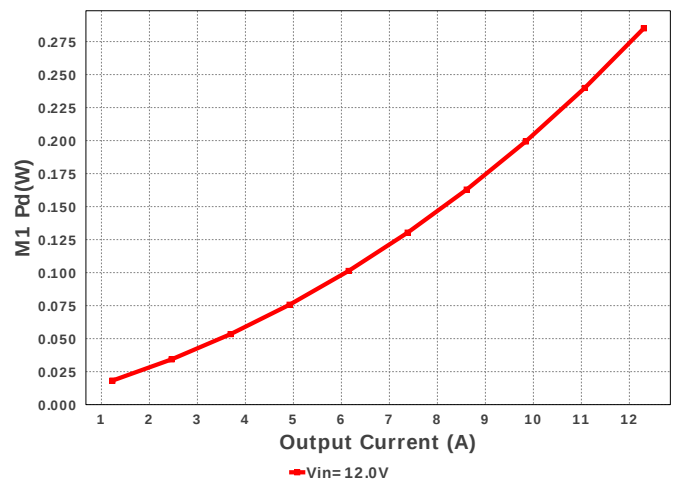
Cin Pd

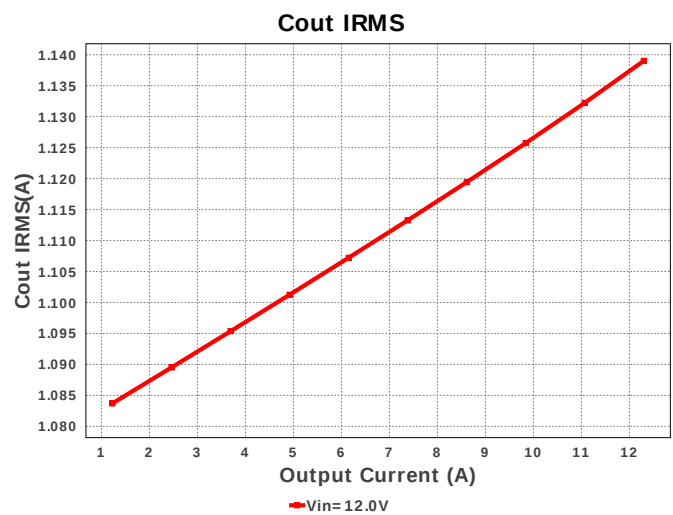
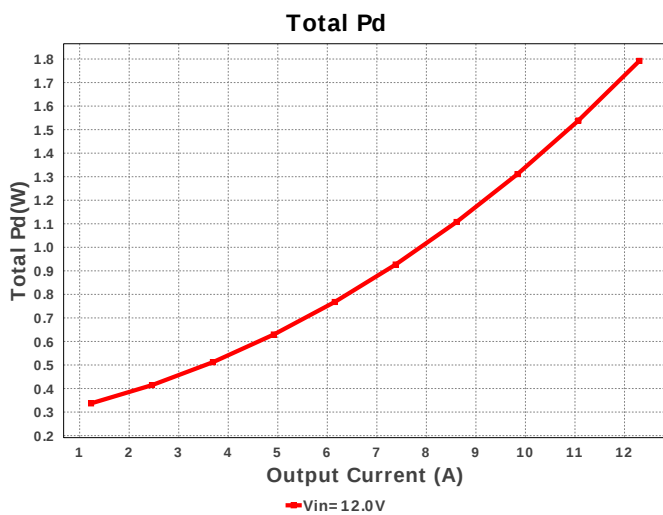
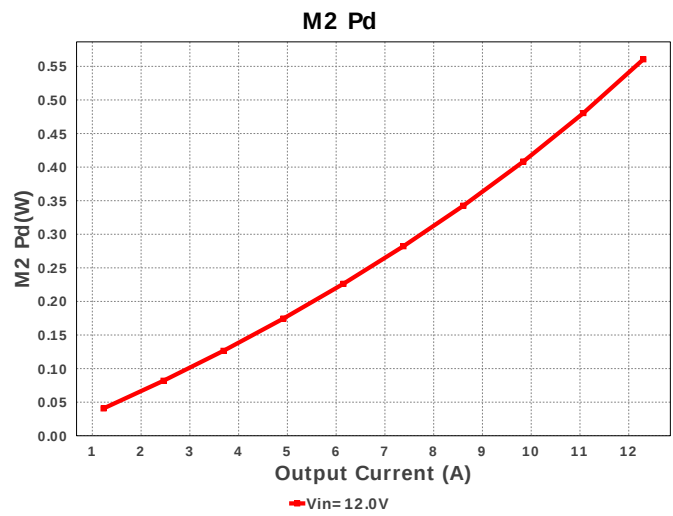
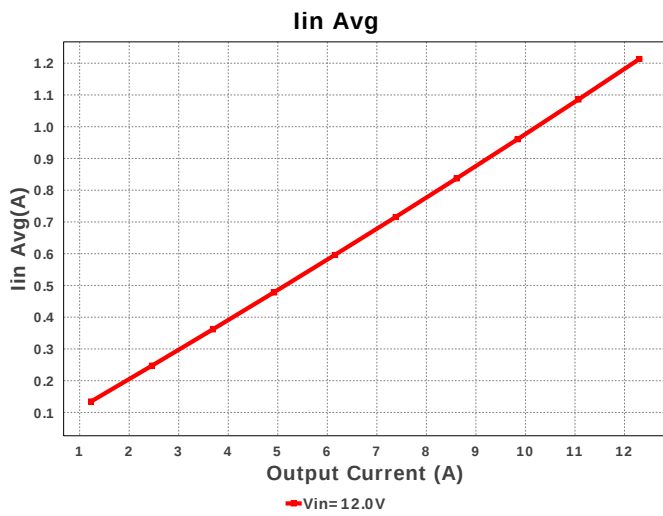
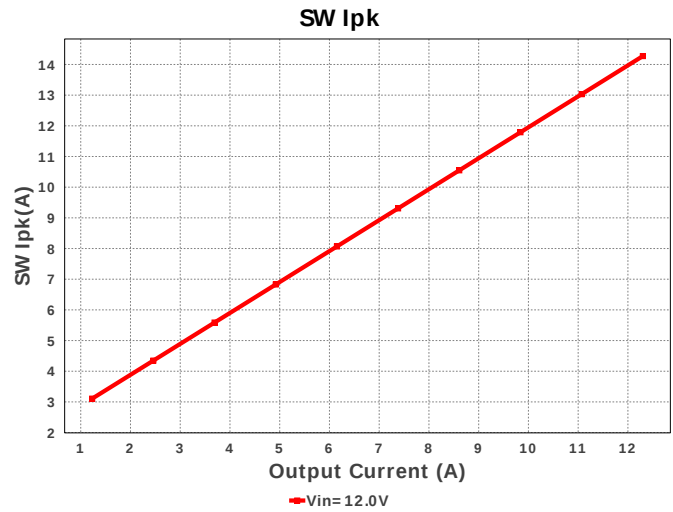
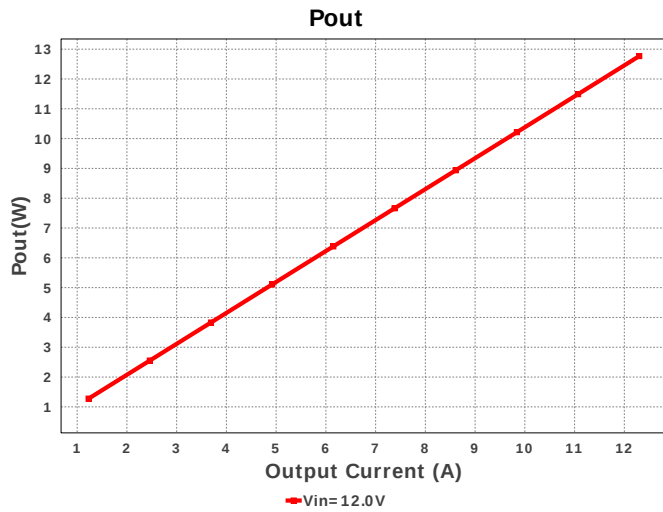


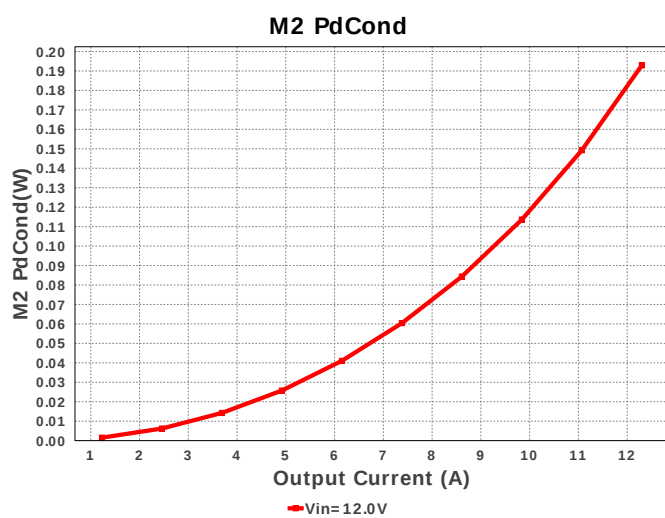
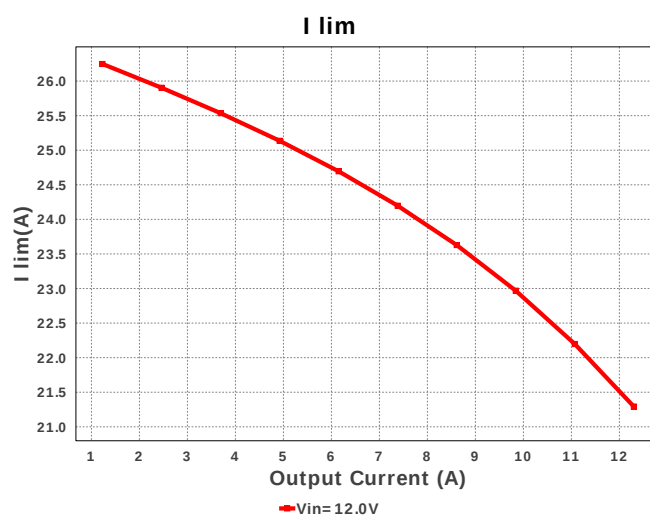
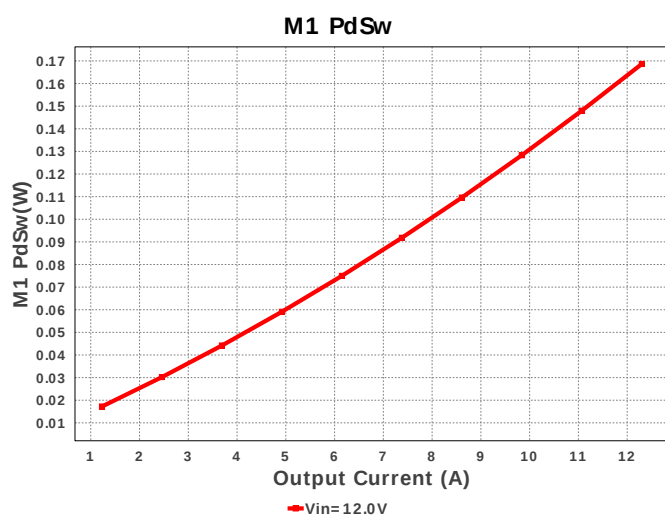
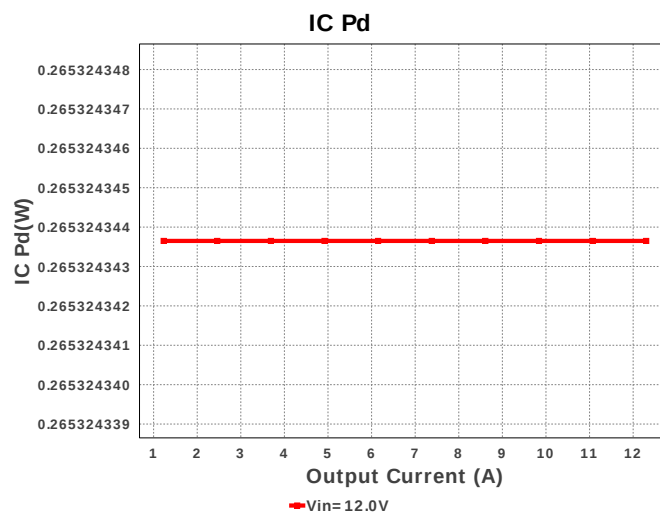
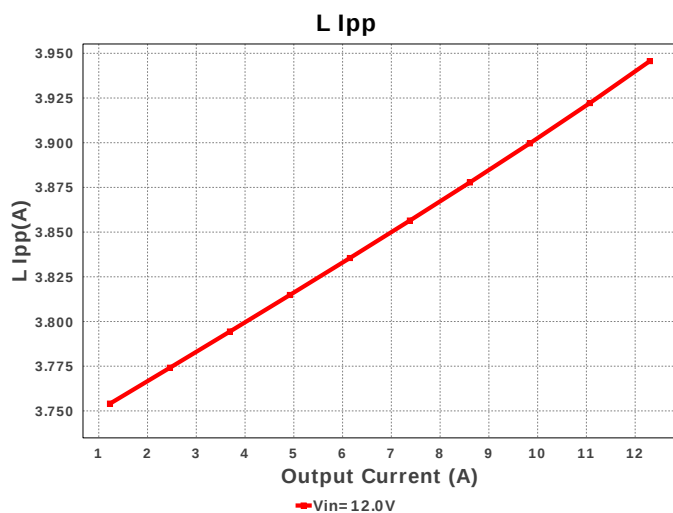
Cout Pd



M1 Pd







Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	3.595 A	Current	Input capacitor RMS ripple current
2.	Cout IRMS	1.139 A	Current	Output capacitor RMS ripple current
3.	I lim	21.28 A	Current	Current limit threshold
4.	Iin Avg	1.214 A	Current	Average input current
5.	L Ipp	3.946 A	Current	Peak-to-peak inductor ripple current
6.	SW Ipk	14.273 A	Current	Peak switch current
7.	BOM Count	16	General	Total Design BOM count
8.	FootPrint	557.0 mm ²	General	Total Foot Print Area of BOM components
9.	Frequency	262.107 kHz	General	Switching frequency
10.	IC Tolerance	12.0 mV	General	IC Feedback Tolerance
11.	Pout	12.767 W	General	Total output power

#	Name	Value	Category	Description
12.	Total BOM	\$4.67	General	Total BOM Cost
13.	Duty Cycle	9.434 %	Op_point	Duty cycle
14.	Efficiency	87.676 %	Op_point	Steady state efficiency
15.	IOUT_OP	12.3 A	Op_point	Iout operating point
16.	VIN_OP	12.0 V	Op_point	Vin operating point
17.	Vout p-p	1.882 mV	Op_point	Peak-to-peak output ripple voltage
18.	Cin Pd	12.927 mW	Power	Input capacitor power dissipation
19.	Cout Pd	6.487 mW	Power	Output capacitor power dissipation
20.	IC Pd	265.324 mW	Power	IC power dissipation
21.	L Pd	661.894 mW	Power	Inductor power dissipation
22.	M1 Pd	285.053 mW	Power	M1 MOSFET total power dissipation
23.	M1 PdCond	116.409 mW	Power	M1 MOSFET conduction losses
24.	M1 PdSw	168.644 mW	Power	M1 MOSFET switching losses
25.	M2 Pd	562.949 mW	Power	M2 MOSFET total power dissipation
26.	M2 PdCond	193.034 mW	Power	M2 MOSFET conduction losses
27.	M2 PdSw	369.915 mW	Power	M2 MOSFET switching losses
28.	Total Pd	1.795 W	Power	Total Power Dissipation

Design Inputs

#	Name	Value	Description
1.	Iout	12.3	Maximum Output Current
2.	Iout1	12.3	Output Current #1
3.	VinMax	12.0	Maximum input voltage
4.	VinMin	12.0	Minimum input voltage
5.	Vout	1.038	Output Voltage
6.	Vout1	1.038	Output Voltage #1
7.	base_pn	LM3150	Base Product Number
8.	source	DC	Input Source Type
9.	Ta	30.0	Ambient temperature

Design Assistance

1. **LM3150** Product Folder : <http://www.ti.com/product/LM3150> : contains the data sheet and other resources.

Texas Instruments' WEBENCH simulation tools attempt to recreate the performance of a substantially equivalent physical implementation of the design. Simulations are created using Texas Instruments' published specifications as well as the published specifications of other device manufacturers. While Texas Instruments does update this information periodically, this information may not be current at the time the simulation is built. Texas Instruments does not warrant the accuracy or completeness of the specifications or any information contained therein. Texas Instruments does not warrant that any designs or recommended parts will meet the specifications you entered, will be suitable for your application or fit for any particular purpose, or will operate as shown in the simulation in a physical implementation. Texas Instruments does not warrant that the designs are production worthy.

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

Use of Texas Instruments' WEBENCH simulation tools is subject to [Texas Instruments' Site Terms and Conditions of Use](#). Prototype boards based on WEBENCH created designs are provided AS IS without warranty of any kind for evaluation and testing purposes and are subject to the terms of the [Evaluation License Agreement](#).