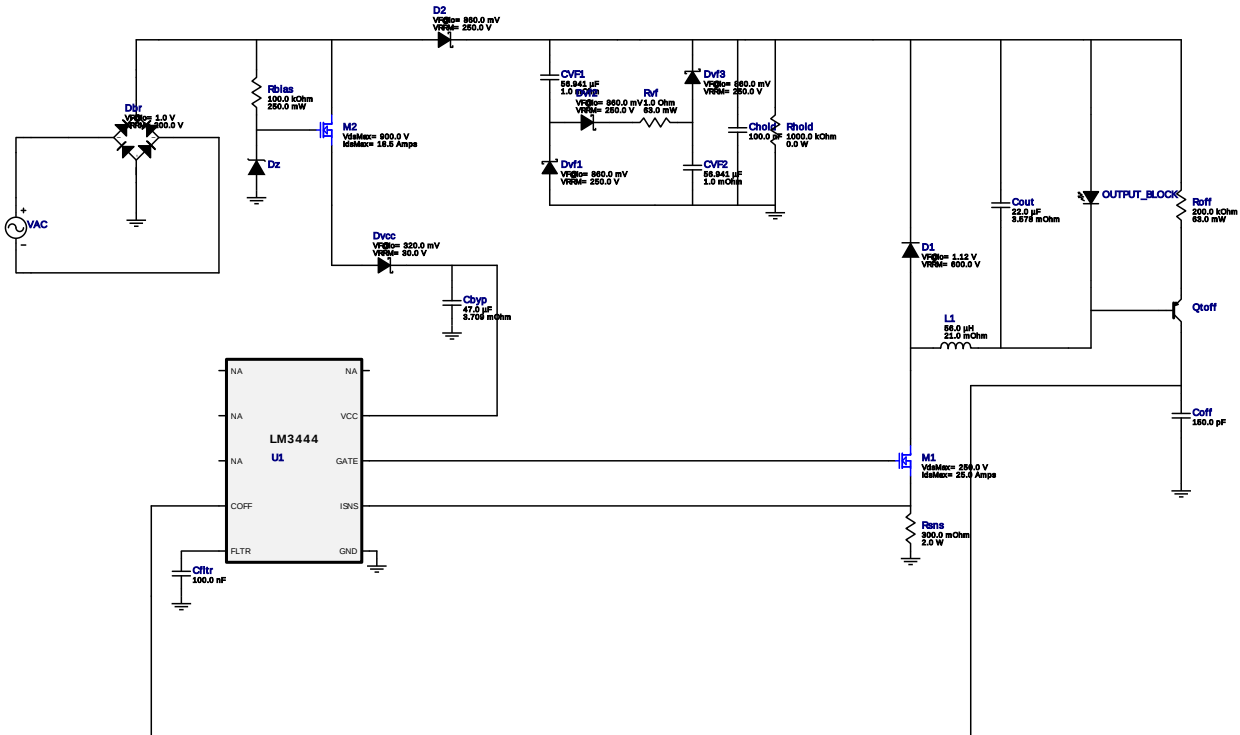


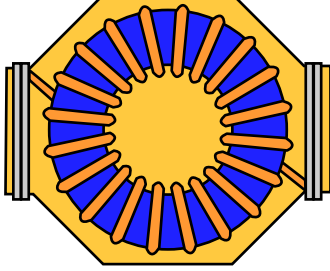
WEBENCH® Design Report

Design : 1754593/13 LM3444MM/NOPB
LM3444MM/NOPB 100.0V-110.0V to 3.30V @ 2.0A

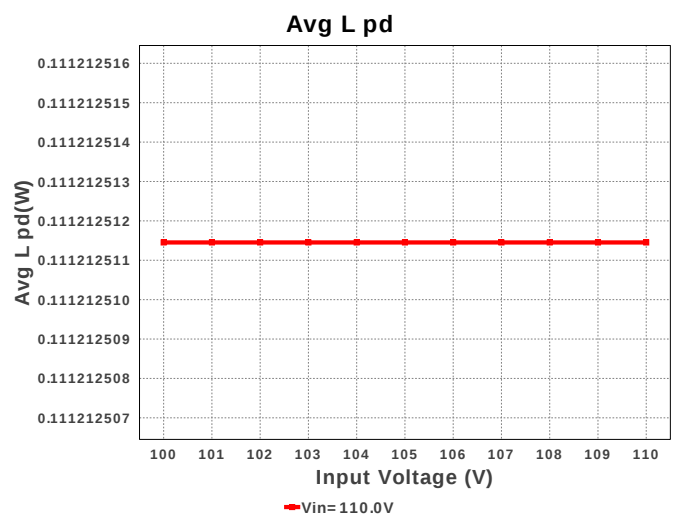
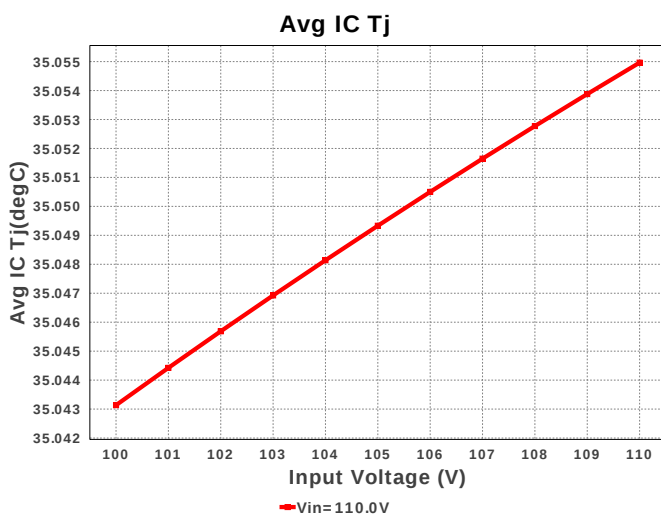
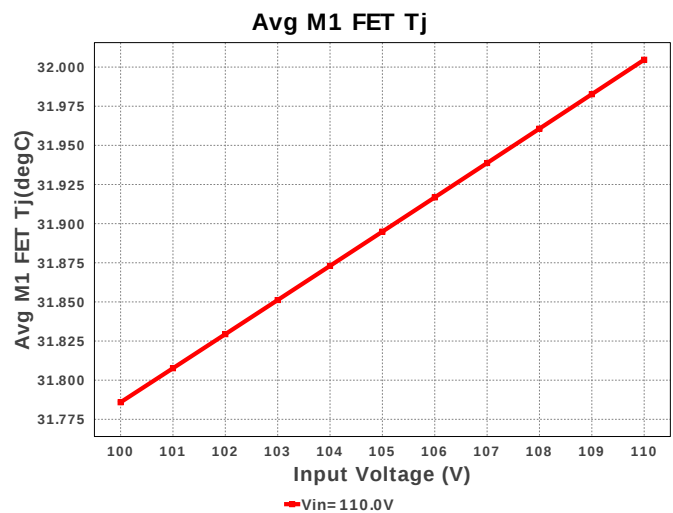
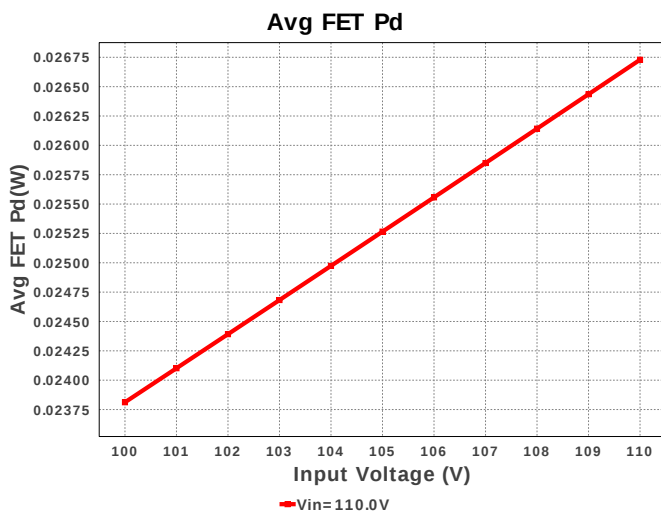


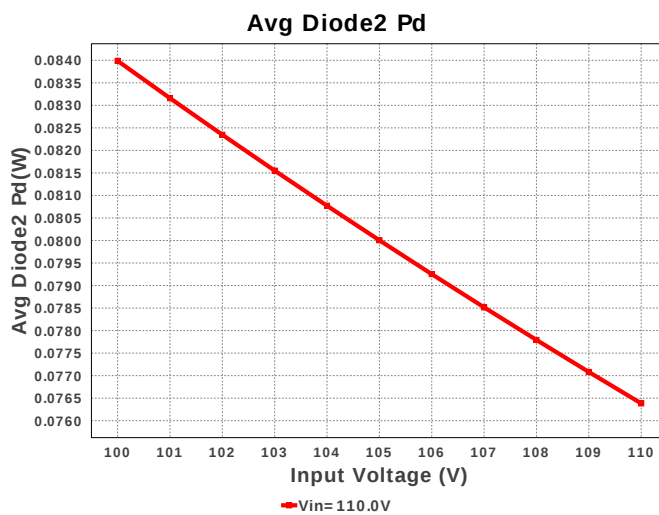
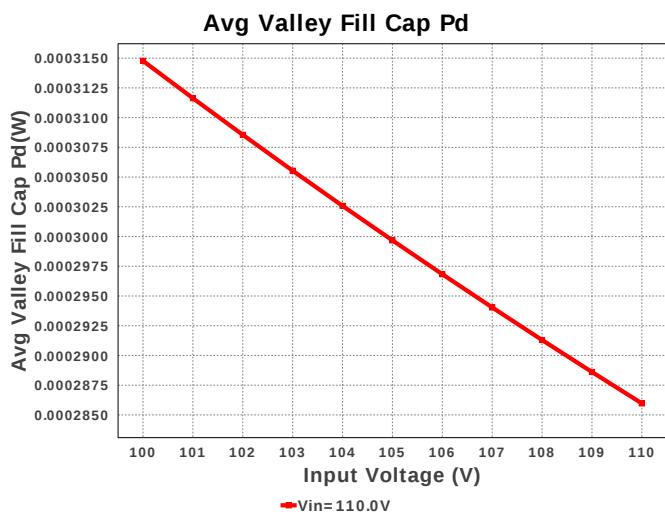
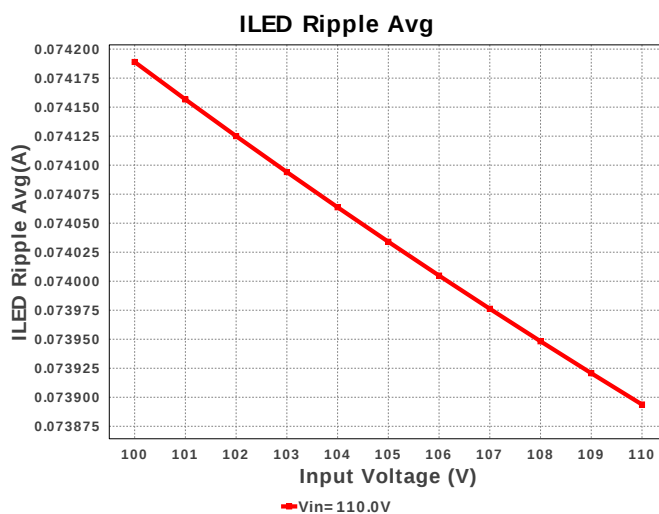
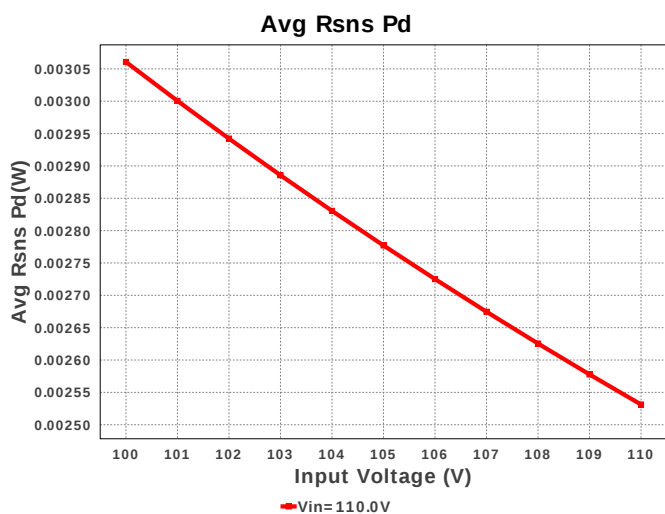
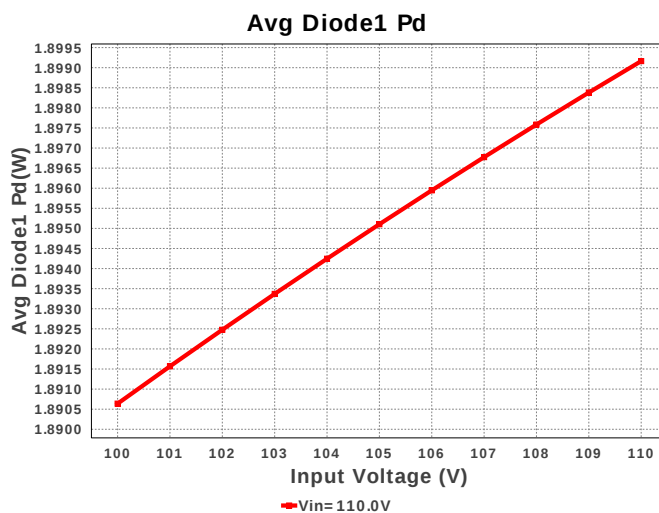
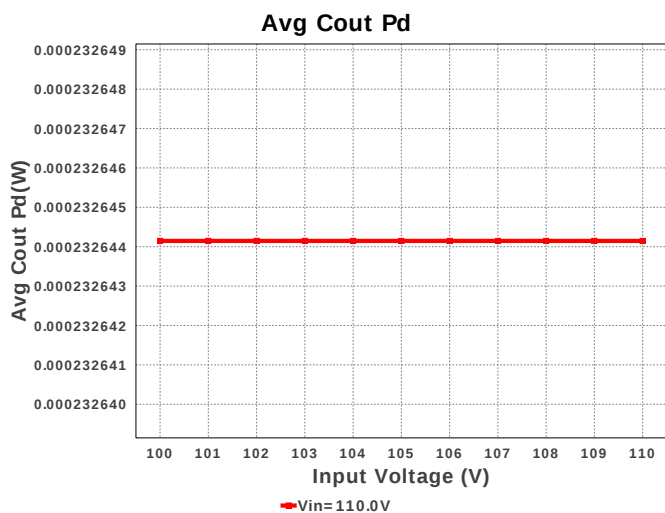
Electrical BOM

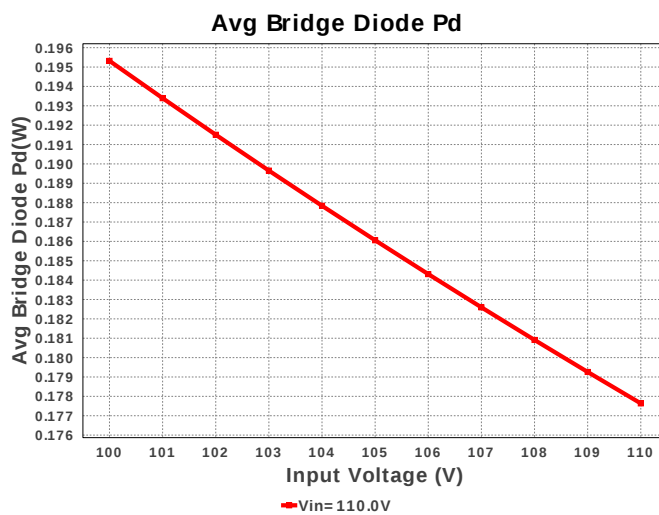
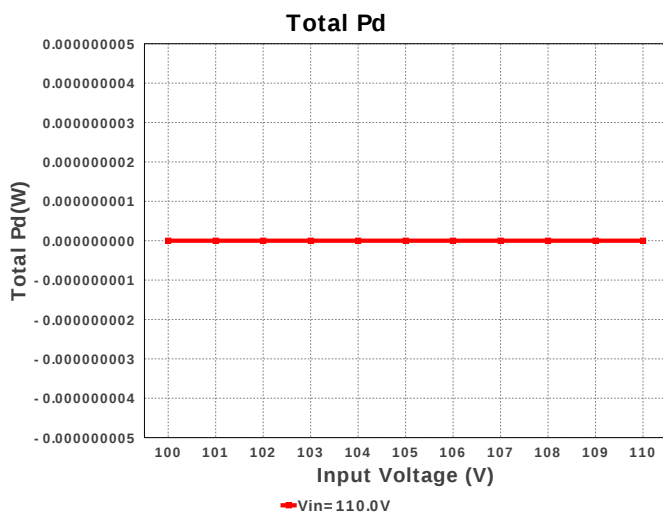
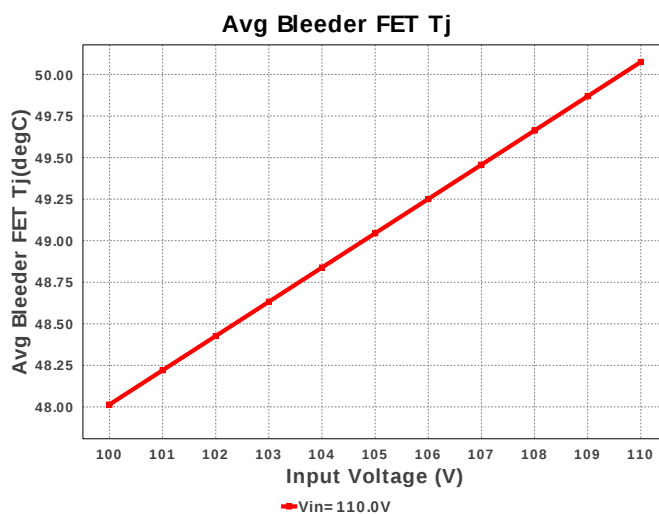
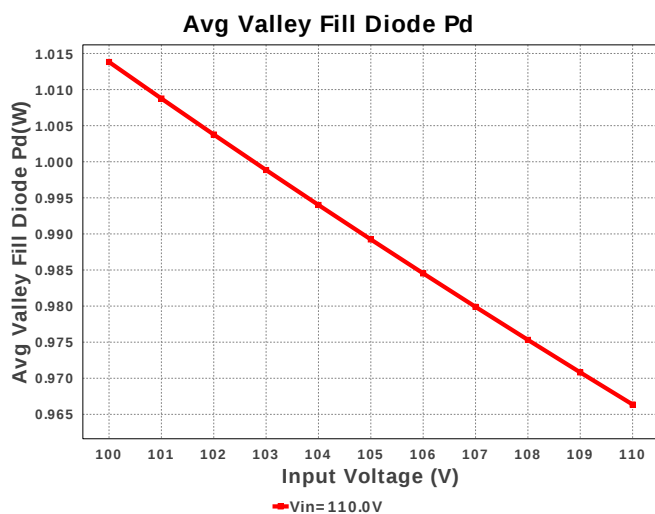
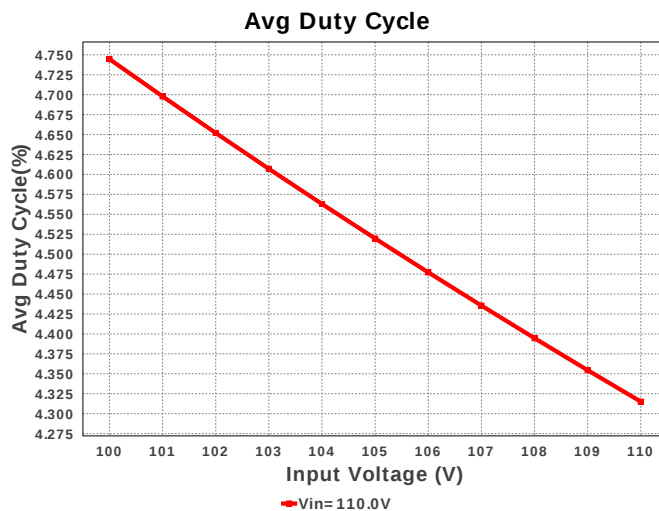
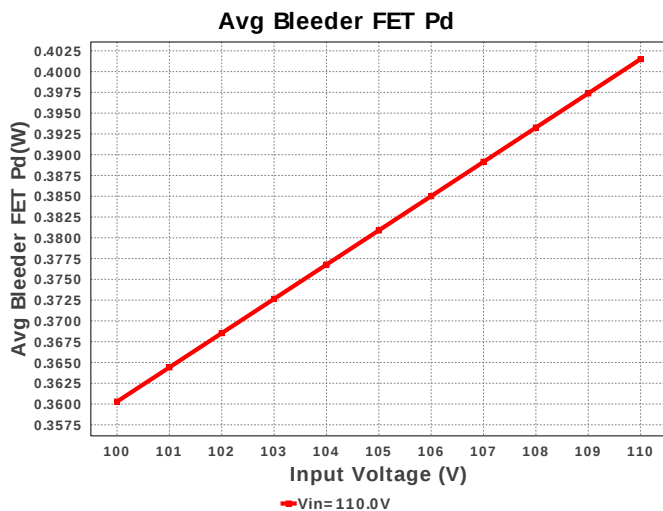
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	CVF1	CUSTOM	CUSTOM Series= ?	Cap= 56.941 uF ESR= 1.0 mOhm VDC= 124.451 V IRMS= 2.2872 A	1	NA	CUSTOM 0 mm ²
2.	CVF2	CUSTOM	CUSTOM Series= ?	Cap= 56.941 uF ESR= 1.0 mOhm VDC= 124.451 V IRMS= 2.2872 A	1	NA	CUSTOM 0 mm ²
3.	Cbyp	MuRata	GRM31CR61A476KE15L Series= X5R	Cap= 47.0 uF ESR= 3.709 mOhm VDC= 10.0 V IRMS= 4.2862 A	1	\$0.15	 1206_190 11 mm ²
4.	Cftr	MuRata	GRM21BR71E104KA01L Series= X7R	Cap= 100.0 nF VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	 0805 7 mm ²
5.	Chold	MuRata	GRM31CR72E104KW03L Series= X7R	Cap= 100.0 nF VDC= 250.0 V IRMS= 0.0 A	1	\$0.06	 1206 11 mm ²
6.	Coff	TDK	C2012C0G1H151J Series= C0G/NP0	Cap= 150.0 pF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	 0805 7 mm ²
7.	Cout	MuRata	GRM21BC80G226ME39L Series= X6S	Cap= 22.0 uF ESR= 3.578 mOhm VDC= 4.0 V IRMS= 3.29633 A	1	\$0.04	 0805 7 mm ²

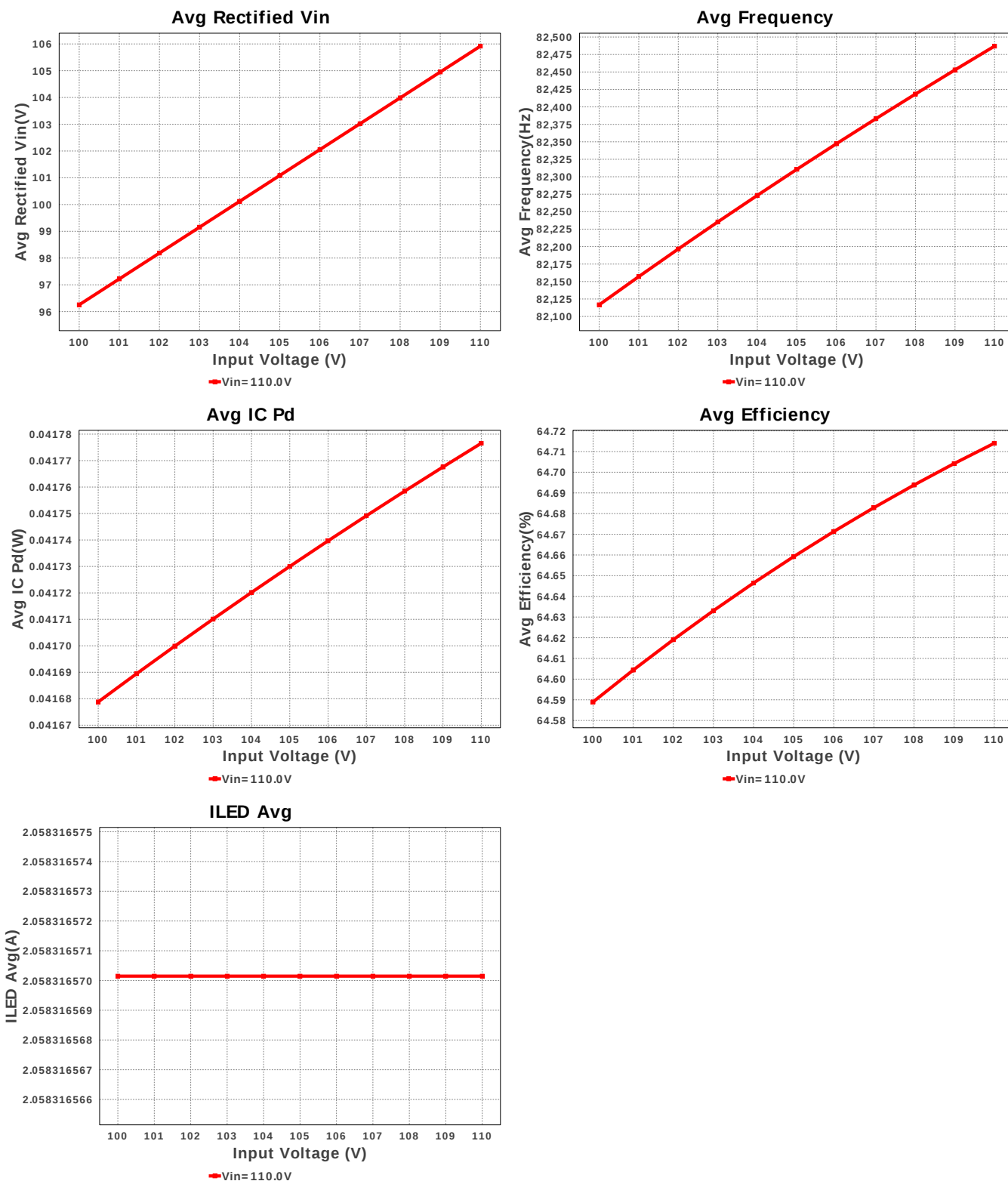
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
8.	D1	Bourns	CD214C-F3600	$V_F@I_o = 1.12\text{ V}$ $V_{RRM} = 600.0\text{ V}$	1	\$0.18	 SMC 83 mm ²
9.	D2	ON Semiconductor	MBRB40250TG	$V_F@I_o = 860.0\text{ mV}$ $V_{RRM} = 250.0\text{ V}$	1	\$0.94	 DDPAK 210 mm ²
10.	D_LED	CUSTOM	CUSTOM	LED	1	NA	CUSTOM 0 mm ²
11.	Dbr	Diodes Inc.	HD02-T	$V_F@I_o = 1.0\text{ V}$ $V_{RRM} = 200.0\text{ V}$	1	\$0.12	 MiniDIP 62 mm ²
12.	Dvcc	Toshiba	CMS06	$V_F@I_o = 320.0\text{ mV}$ $V_{RRM} = 30.0\text{ V}$	1	\$0.19	 M-FLAT 19 mm ²
13.	Dvf1	ON Semiconductor	MBRB40250TG	$V_F@I_o = 860.0\text{ mV}$ $V_{RRM} = 250.0\text{ V}$	1	\$0.94	 DDPAK 210 mm ²
14.	Dvf2	ON Semiconductor	MBRB40250TG	$V_F@I_o = 860.0\text{ mV}$ $V_{RRM} = 250.0\text{ V}$	1	\$0.94	 DDPAK 210 mm ²
15.	Dvf3	ON Semiconductor	MBRB40250TG	$V_F@I_o = 860.0\text{ mV}$ $V_{RRM} = 250.0\text{ V}$	1	\$0.94	 DDPAK 210 mm ²
16.	Dz	Diodes Inc.	MMSZ5245BS-7-F	Zener	1	\$0.06	 SOD-323 9 mm ²
17.	L1	Bourns	PM2120-560K-RC	$L = 56.0\text{ }\mu\text{H}$ $\text{DCR} = 21.0\text{ m}\Omega$	1	\$1.33	 PM2120 890 mm ²
18.	M1	Infineon Technologies	BSC600N25NS3 G	$V_{dsMax} = 250.0\text{ V}$ $I_{dsMax} = 25.0\text{ Amps}$	1	\$1.41	 PG-TDSON-8 55 mm ²
19.	M2	STMicroelectronics	STW21N90K5	$V_{dsMax} = 900.0\text{ V}$ $I_{dsMax} = 18.5\text{ Amps}$	1	\$3.94	 TO-247 123 mm ²
20.	Qtoff	Fairchild Semiconductor	MMBTA92	Bipolar Transistor	1	\$0.05	 SOT-23 14 mm ²
21.	Rbias	Panasonic	ERJ-8ENF1003V Series= ERJ-8E	$\text{Res} = 100.0\text{ k}\Omega$ $\text{Power} = 250.0\text{ mW}$ $\text{Tolerance} = 1.0\%$	1	\$0.01	 1206 11 mm ²

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
22.	Rhold	CUSTOM	CUSTOM Series= ?	Res= 1000.0 kOhm Power= 0.0 W Tolerance= 0.0%	1	NA	CUSTOM 0 mm ²
23.	Roff	Vishay-Dale	CRCW0402200KFKED Series= CRCW..e3	Res= 200.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
24.	Rsns	Stackpole Electronics Inc	CSRN2512FKR300 Series= ?	Res= 300.0 mOhm Power= 2.0 W Tolerance= 1.0%	1	\$0.13	2512 43 mm ²
25.	Rvf	Vishay-Dale	CRCW04021R00FKED Series= CRCW..e3	Res= 1.0 Ohm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
26.	U1	Texas Instruments	LM3444MM/NOPB	Switcher	1	\$0.35	0 mm ²









Operating Values

#	Name	Value	Category	Description
1.	ILED Avg	2.058 A	Current	Average Current per LED for the AC line period
2.	ILED Ripple Avg	74.029 mA	Current	Average LED Ripple Current for the AC line period
3.	Avg Rectified Vin	105.917 V	General	Average Rectified Voltage for the AC Line Period
4.	BOM Count	26	General	Total Design BOM count
5.	FootPrint	2.237 k mm ²	General	Total Foot Print Area of BOM components
6.	Total BOM	\$0.0	General	Total BOM Cost
7.	Avg Bleeder FET Tj	50.074 degC	Op_Point	Bleeder MOSFET average junction temperature over the AC Line Period
8.	Avg M1 FET Tj	32.005 degC	Op_Point	M1 MOSFET average junction temperature over the AC Line Period
9.	Avg Duty Cycle	4.322 %	Op_point	Average Duty Cycle over the AC Line Period
10.	Avg Efficiency	67.59 %	Op_point	Average Efficiency over the AC Line Period

#	Name	Value	Category	Description
11.	Avg Frequency	82.481 kHz	Op_point	Average Switching Frequency over the AC Line Period
12.	Avg IC Tj	35.055 degC	Op_point	Average IC junction temperature for the AC line period
13.	VIN_OP	110.0 V	Op_point	AC Input RMS Voltage
14.	Avg Bleeder FET Pd	401.487 mW	Power	Average power dissipation in the bleeder FET over the AC line period
15.	Avg Bridge Diode Pd	126.888 mW	Power	Average Power Dissipation in the Bridge Diode over the AC Line Period
16.	Avg Cout Pd	233.466 µW	Power	Average Power Dissipation in the Output Capacitor over the AC Line Period
17.	Avg Diode1 Pd	1.913 W	Power	Average Power Dissipation in D1 over the AC Line Period
18.	Avg Diode2 Pd	46.255 mW	Power	Average Power Dissipation in D1 over the AC Line Period
19.	Avg FET Pd	26.73 mW	Power	Average power dissipation in the switching FET over the AC line period
20.	Avg IC Pd	41.775 mW	Power	Average Power Dissipation in the IC over the AC line period
21.	Avg L pd	111.128 mW	Power	Average Inductor power dissipation over the AC line period
22.	Avg Rsns Pd	2.538 mW	Power	Average power dissipation in the Current limit resistor over the AC line period
23.	Avg Valley Fill Cap Pd	285.757 µW	Power	Average Power Dissipation in the Valley Fill Capacitors over the AC Line Period
24.	Avg Valley Fill Diode Pd	585.593 mW	Power	Average Power Dissipation in the Valley Fill Diodes over the AC Line Period
25.	Total Pd	0.0 W	Power	Total Power Dissipation
26.	Vout Tolerance	909.09 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
2.	VinMax	110.0	Maximum input voltage
3.	VinMin	100.0	Minimum input voltage
4.	Vout	3.3	Output Voltage
5.	acFrequency	50.0	Light Output in Lumen
6.	application	LED_DRIVER	LED Application
7.	base_pn	LM3444	Texas Instruments Base Part Number
8.	isLEDArchitect	N	LED Architect Project
9.	ledparallel	1.0	Number of LED in parallel
10.	ledpartnumber		LED Part number
11.	ledseries	1.0	Number of LED in series
12.	line_fsw	50.0	AC Line Frequency
13.	source	AC	Input Source Type
14.	ta	30.0	Ambient temperature

Design Assistance

1. LM3444 Product Folder : <http://www.ti.com/product/LM3444> : 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](#).