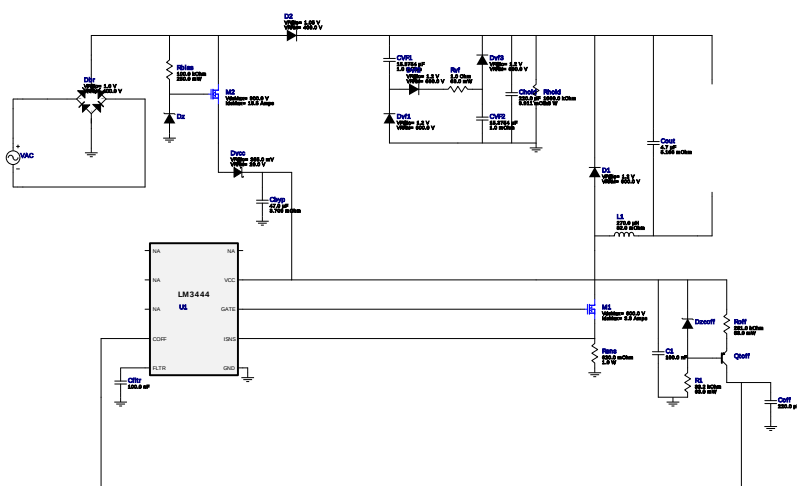
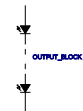


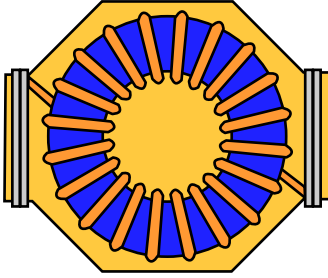
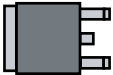
WEBENCH® Design Report

Design : 3496425/92 LM3444MM/NOPB
LM3444MM/NOPB 190.0V-250.0V to 15.54V @ 1.0A



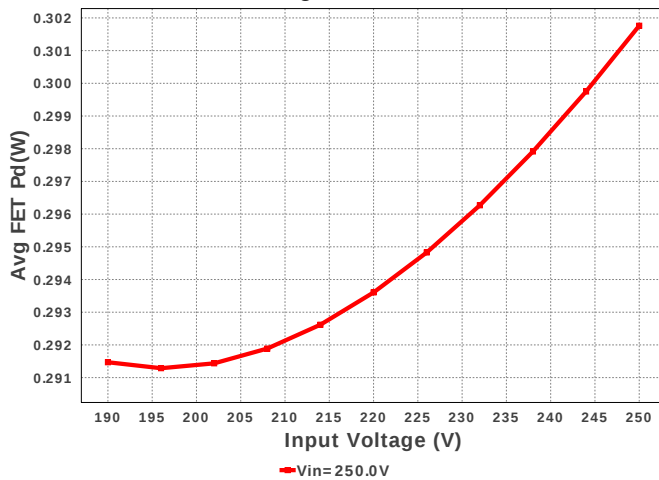
Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	C1	MuRata	GRM21BR71E104KA01L Series= X7R	Cap= 100.0 nF VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	0805 7 mm ²
2.	CVF1	CUSTOM	CUSTOM Series= ?	Cap= 15.3754 uF ESR= 1.0 mOhm VDC= 282.843 V IRMS= 1.42129 A	1	NA	CUSTOM 0 mm ²
3.	CVF2	CUSTOM	CUSTOM Series= ?	Cap= 15.3754 uF ESR= 1.0 mOhm VDC= 282.843 V IRMS= 1.42129 A	1	NA	CUSTOM 0 mm ²
4.	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
5.	Cftr	MuRata	GRM21BR71E104KA01L Series= X7R	Cap= 100.0 nF VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	0805 7 mm ²
6.	Chold	TDK	C3225X7T2W224K Series= X7T	Cap= 220.0 nF ESR= 9.911 mOhm VDC= 400.0 V IRMS= 0.0 A	1	\$0.14	1210 15 mm ²

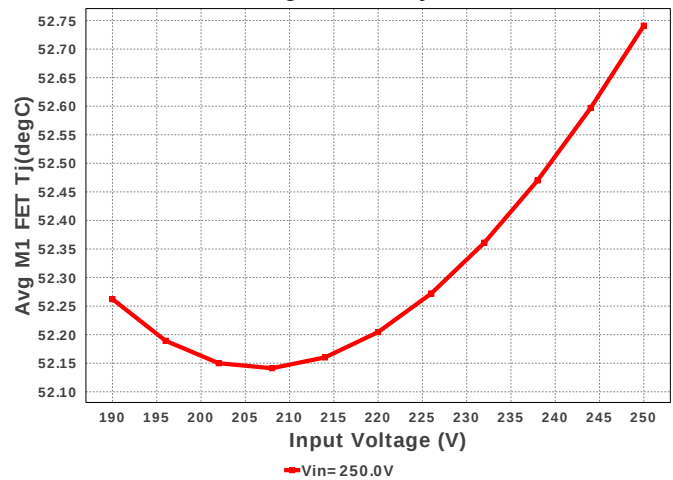
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
7.	Coff	Yageo America	CC0805JRNPO9BN221 Series= C0G/NP0	Cap= 220.0 pF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	 0805 7 mm ²
8.	Cout	MuRata	GRM21BC81E475KA12L Series= X6S	Cap= 4.7 uF ESR= 5.166 mOhm VDC= 25.0 V IRMS= 2.03531 A	1	\$0.02	 0805 7 mm ²
9.	D1	Bourns	CD214B-F3600	VF@Io= 1.2 V VRRM= 600.0 V	1	\$0.14	 SMB 44 mm ²
10.	D2	Bourns	CD1408-FU1400	VF@Io= 1.05 V VRRM= 400.0 V	1	\$0.13	 Diode_1408 13 mm ²
11.	D_LED	Philips Lumileds	LXML-PWC2	LED	5	\$1.26	 luxeon_rebel 23 mm ²
12.	Dbr	Diodes Inc.	HD04-T	VF@Io= 1.0 V VRRM= 400.0 V	1	\$0.12	 MiniDIP 62 mm ²
13.	Dvcc	ON Semiconductor	MBR0520LT1G	VF@Io= 385.0 mV VRRM= 20.0 V	1	\$0.06	 SOD-123 13 mm ²
14.	Dvf1	Bourns	CD214B-F3600	VF@Io= 1.2 V VRRM= 600.0 V	1	\$0.14	 SMB 44 mm ²
15.	Dvf2	Bourns	CD214B-F3600	VF@Io= 1.2 V VRRM= 600.0 V	1	\$0.14	 SMB 44 mm ²
16.	Dvf3	Bourns	CD214B-F3600	VF@Io= 1.2 V VRRM= 600.0 V	1	\$0.14	 SMB 44 mm ²
17.	Dz	ON Semiconductor	BZX84C15LT1G	Zener	1	\$0.02	 SOT-23 14 mm ²
18.	Dzcoff	ON Semiconductor	BZX84C5V1LT1G	Zener	1	\$0.02	 SOT-23 14 mm ²
19.	L1	Bourns	PM2110-271K-RC	L= 270.0 uH DCR= 82.0 mOhm	1	\$1.21	 PM2110 890 mm ²
20.	M1	Fairchild Semiconductor	FCD4N60TM	VdsMax= 600.0 V IdsMax= 3.9 Amps	1	\$0.49	 DPAK 102 mm ²
21.	M2	STMicroelectronics	STW21N90K5	VdsMax= 900.0 V IdsMax= 18.5 Amps	1	\$3.94	 TO-247 123 mm ²
22.	Qtoff	Fairchild Semiconductor	MMBT4403	Bipolar Transistor	1	\$0.03	 SOT-23 14 mm ²
23.	R1	Vishay-Dale	CRCW040233K2FKED Series= CRCW..e3	Res= 33.2 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
24.	Rbias	Panasonic	ERJ-8ENF1003V Series= ERJ-8E	Res= 100.0 kOhm Power= 250.0 mW Tolerance= 1.0%	1	\$0.01	 1206 11 mm ²
25.	Rhold	CUSTOM	CUSTOM Series= ?	Res= 1000.0 kOhm Power= 0.0 W Tolerance= 0.0%	1	NA	CUSTOM 0 mm ²
26.	Roff	Vishay-Dale	CRCW0402261KFKED Series= CRCW..e3	Res= 261.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
27.	Rsns	Rohm	MCR100JZHFLR620 Series= ?	Res= 620.0 mOhm Power= 1.0 W Tolerance= 1.0%	1	\$0.14	 2512 43 mm ²
28.	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
29.	U1	Texas Instruments	LM3444MM/NOPB	Switcher	1	\$0.35	0 mm ²

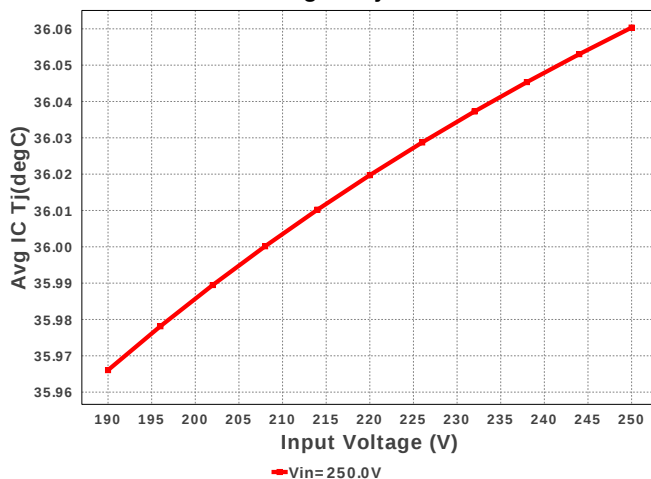
Avg FET Pd



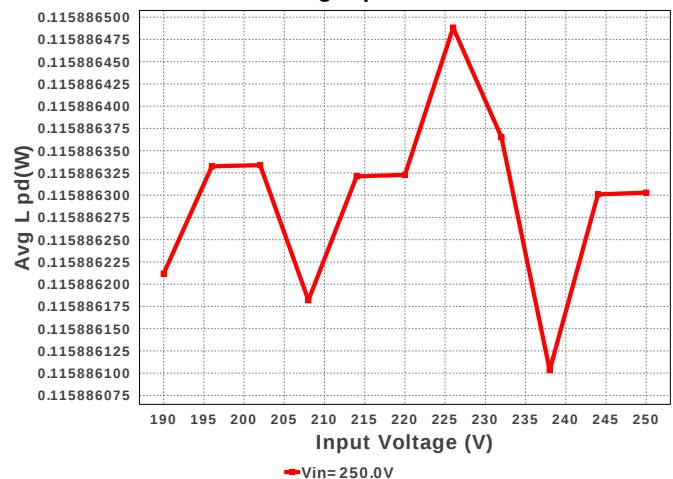
Avg M1 FET Tj

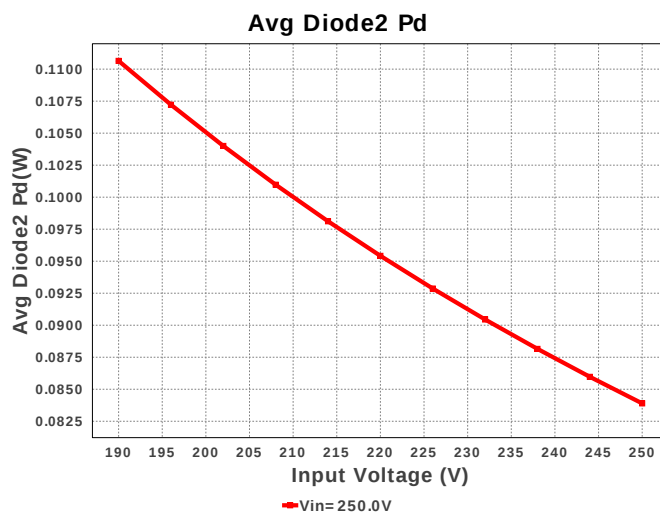
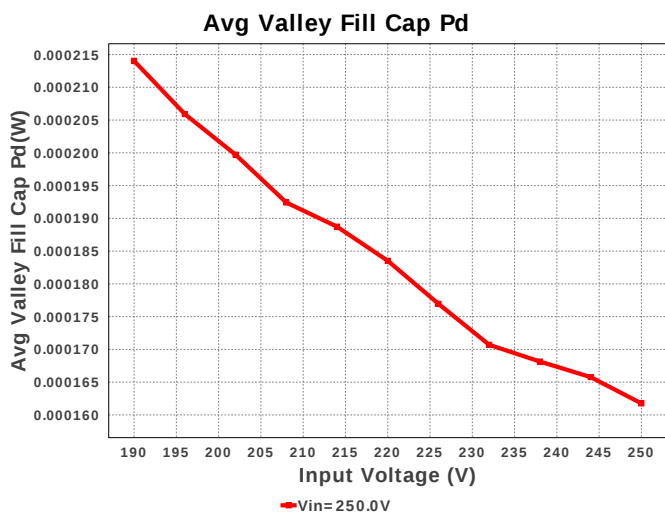
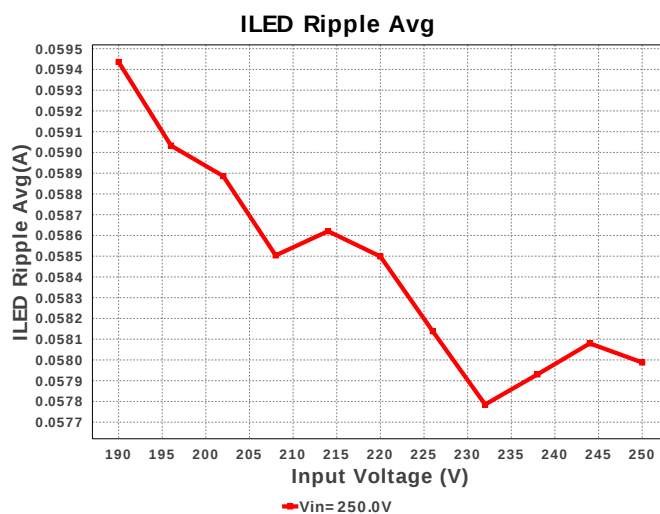
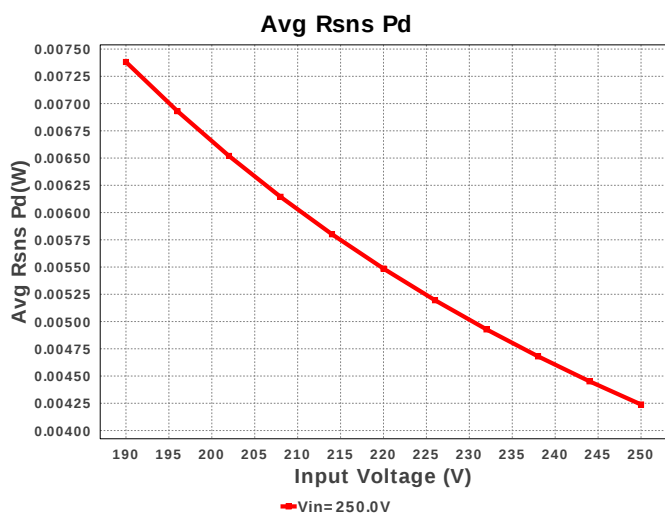
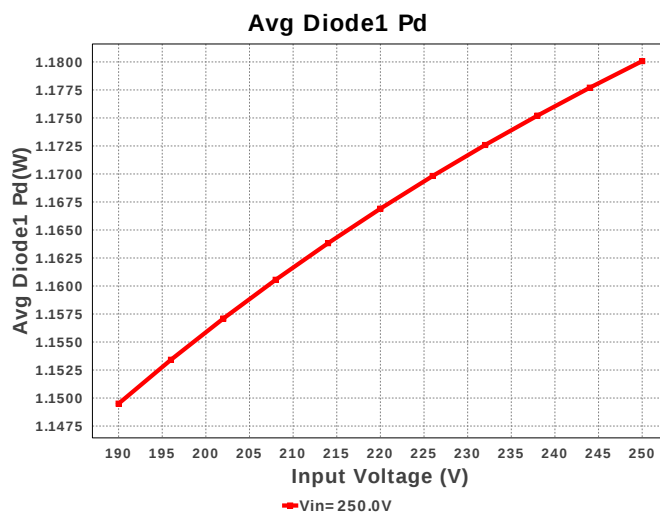
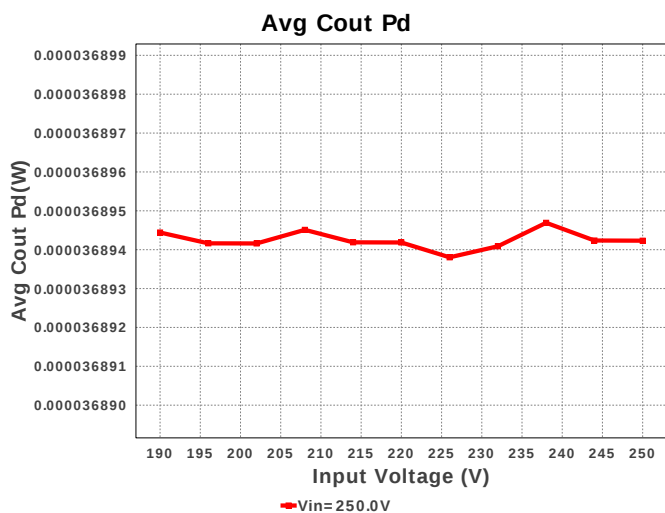


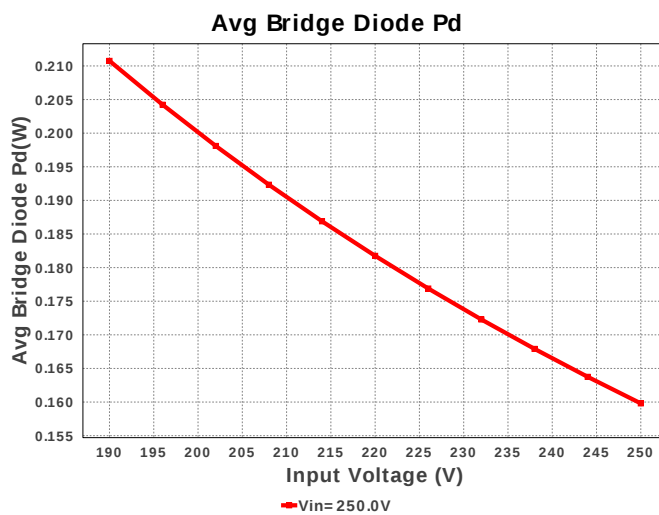
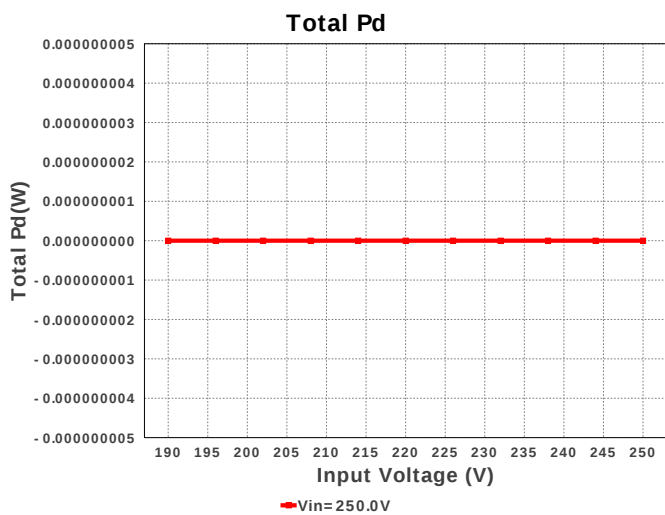
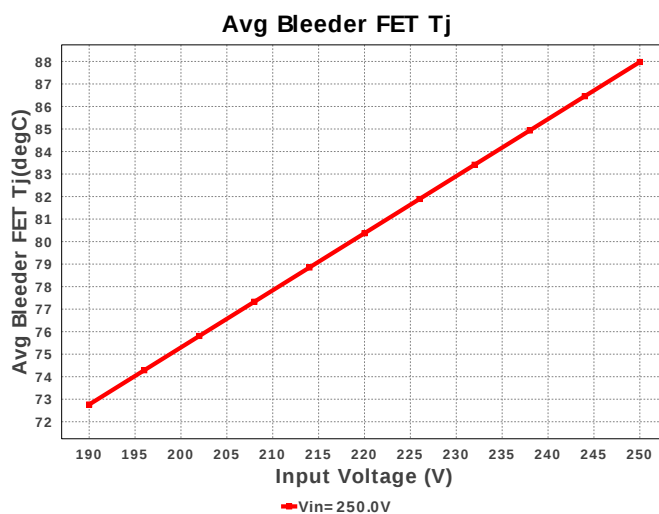
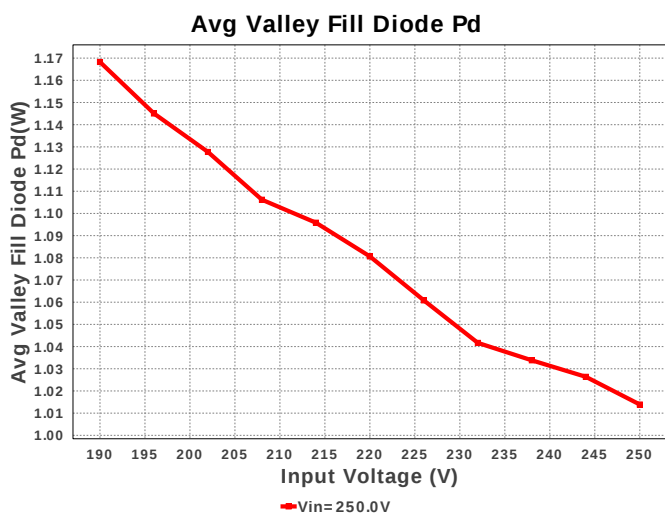
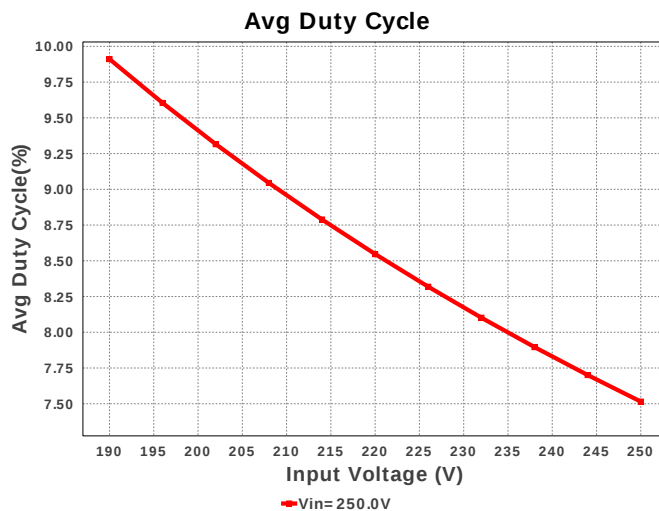
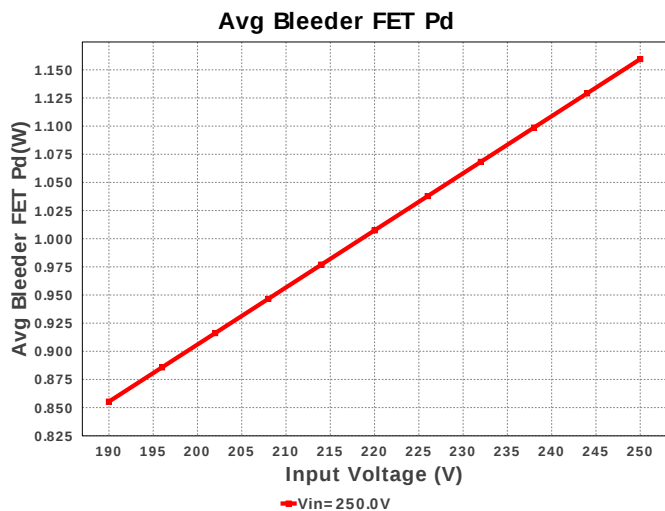
Avg IC Tj

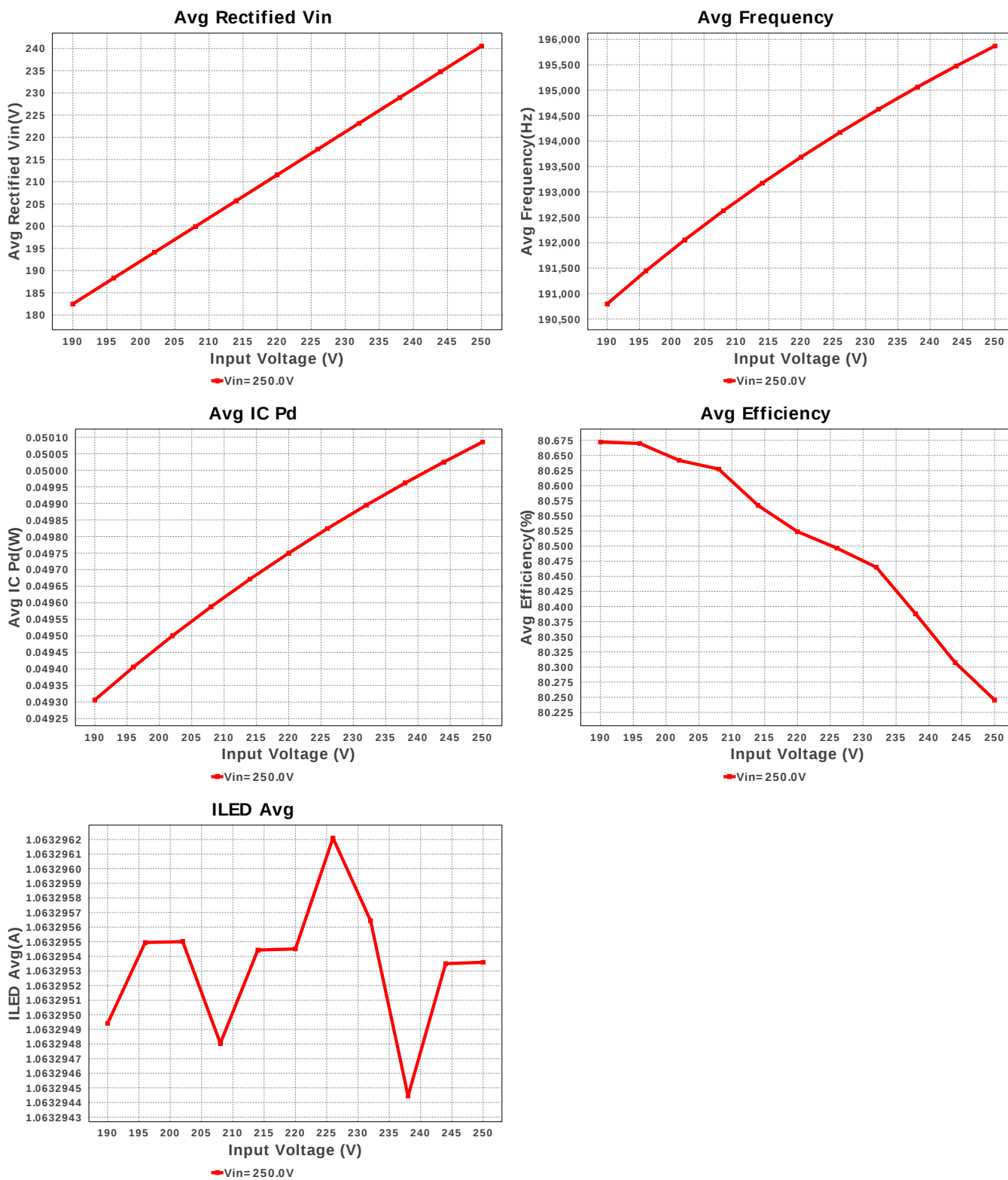


Avg L pd









Operating Values

#	Name	Value	Category	Description
1.	ILED Avg	1.063 A	Current	Average Current per LED for the AC line period
2.	ILED Ripple Avg	57.495 mA	Current	Average LED Ripple Current for the AC line period
3.	Avg Rectified Vin	240.551 V	General	Average Rectified Voltage for the AC Line Period
4.	BOM Count	33	General	Total Design BOM count
5.	FootPrint	1.695 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	87.977 degC	Op_Point	Bleeder MOSFET average junction temperature over the AC Line Period
8.	Avg M1 FET Tj	52.737 degC	Op_Point	M1 MOSFET average junction temperature over the AC Line Period
9.	Avg Duty Cycle	7.512 %	Op_point	Average Duty Cycle over the AC Line Period
10.	Avg Efficiency	80.561 %	Op_point	Average Efficiency over the AC Line Period

#	Name	Value	Category	Description
11.	Avg Frequency	195.875 kHz	Op_point	Average Switching Frequency over the AC Line Period
12.	Avg IC Tj	36.06 degC	Op_point	Average IC junction temperature for the AC line period
13.	VIN_OP	250.0 V	Op_point	AC Input RMS Voltage
14.	Avg Bleeder FET Pd	1.16 W	Power	Average power dissipation in the bleeder FET over the AC line period
15.	Avg Bridge Diode Pd	113.957 mW	Power	Average Power Dissipation in the Bridge Diode over the AC Line Period
16.	Avg Cout Pd	36.894 μ W	Power	Average Power Dissipation in the Output Capacitor over the AC Line Period
17.	Avg Diode1 Pd	1.18 W	Power	Average Power Dissipation in D1 over the AC Line Period
18.	Avg Diode2 Pd	83.865 mW	Power	Average Power Dissipation in D1 over the AC Line Period
19.	Avg FET Pd	278.216 mW	Power	Average power dissipation in the switching FET over the AC line period
20.	Avg IC Pd	50.086 mW	Power	Average Power Dissipation in the IC over the AC line period
21.	Avg L pd	115.886 mW	Power	Average Inductor power dissipation over the AC line period
22.	Avg Rsns Pd	4.235 mW	Power	Average power dissipation in the Current limit resistor over the AC line period
23.	Avg Valley Fill Cap Pd	158.302 μ W	Power	Average Power Dissipation in the Valley Fill Capacitors over the AC Line Period
24.	Avg Valley Fill Diode Pd	1.003 W	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	193.074 m%		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	1.0	Maximum Output Current
2.	VinMax	250.0	Maximum input voltage
3.	VinMin	190.0	Minimum input voltage
4.	Vout	15.0	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	LXML-PWC2	LED Part number
11.	ledseries	5.0	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.

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