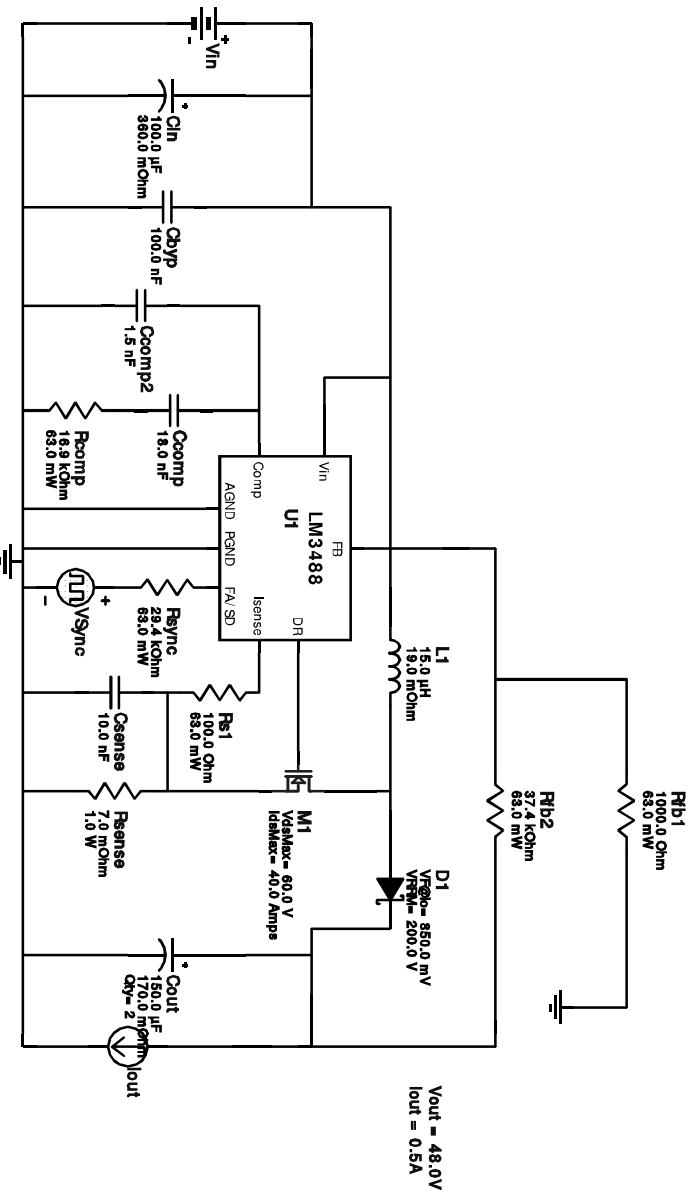


VinMin = 5.0V
VinMax = 5.0V
Vout = 48.0V
Iout = 0.5A

Device = LM3488MMX/NOPB
Topology = Boost
Created = 10/11/16 3:21:44 PM
BOM Cost = \$4.11
BOM Count = 17
Total Pd = 6.34W














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 C. Make sure the rise time on the RC network is slower than your supply's rise time. If you are not using the synchronization feature of the part use the LM3478.

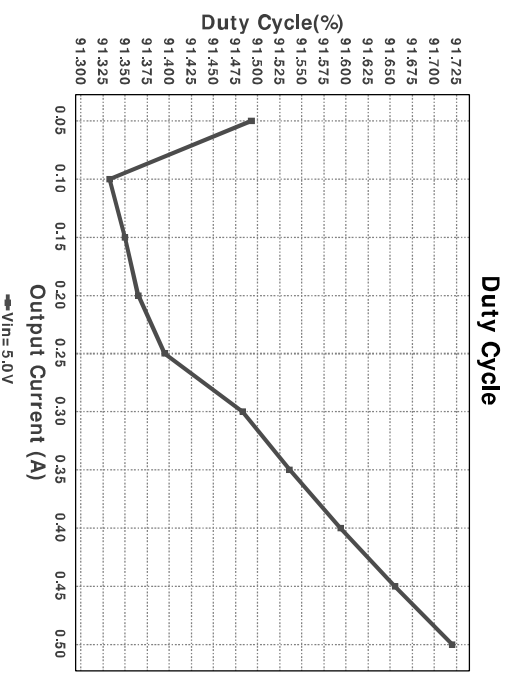
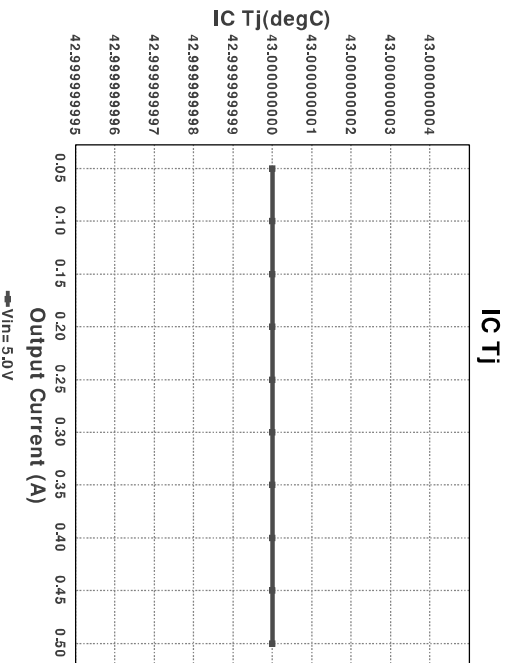
My Comments

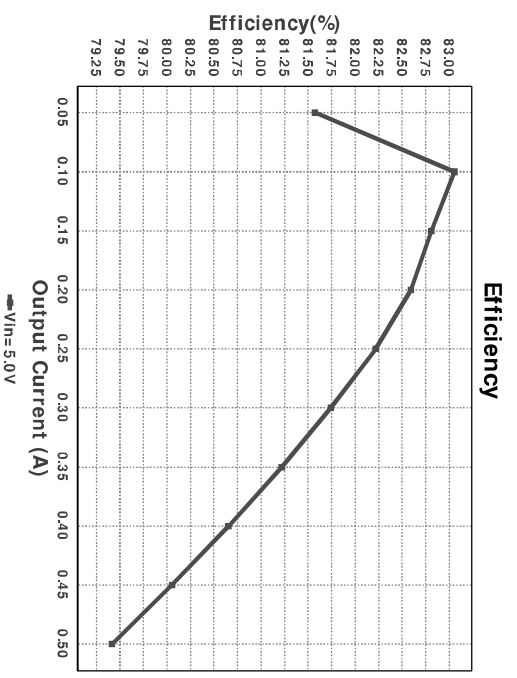
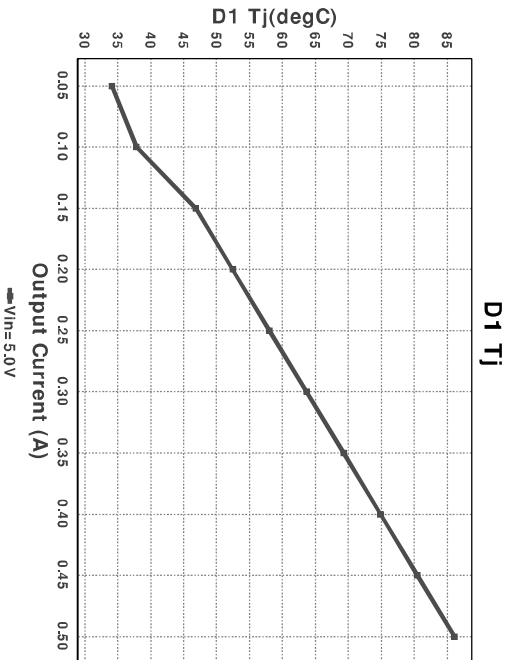
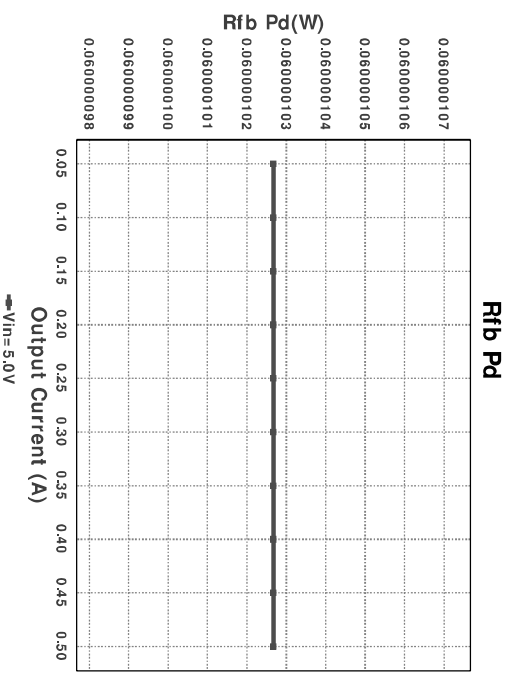
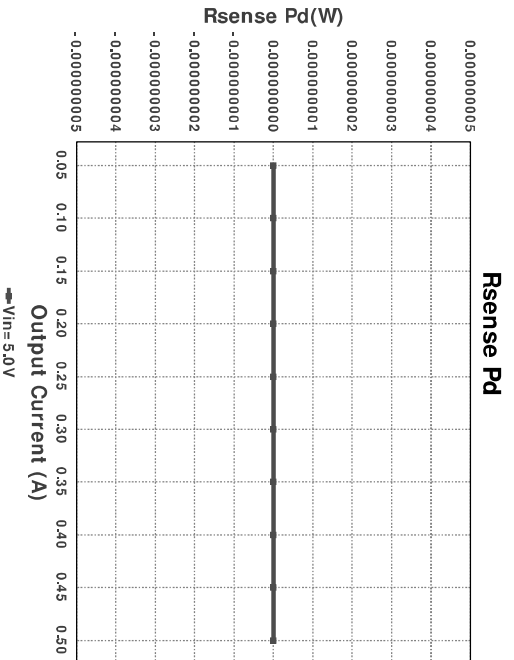
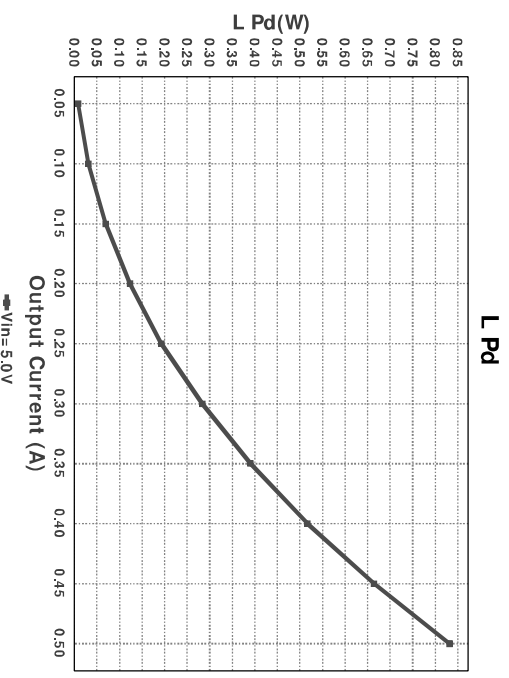
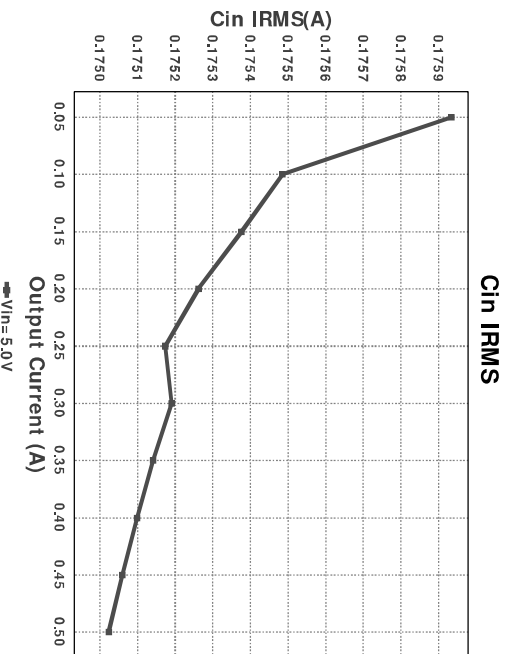
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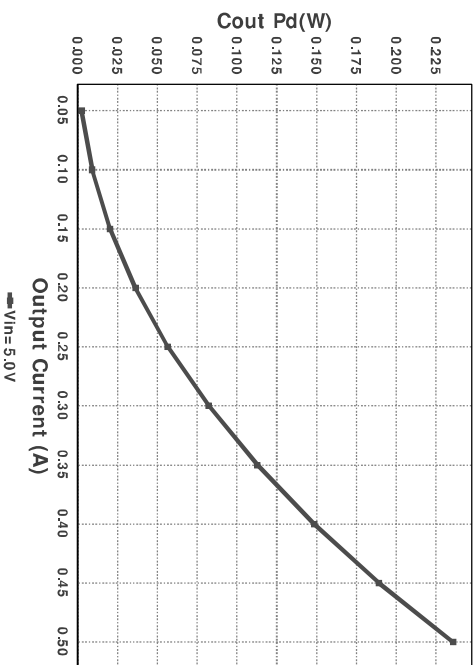
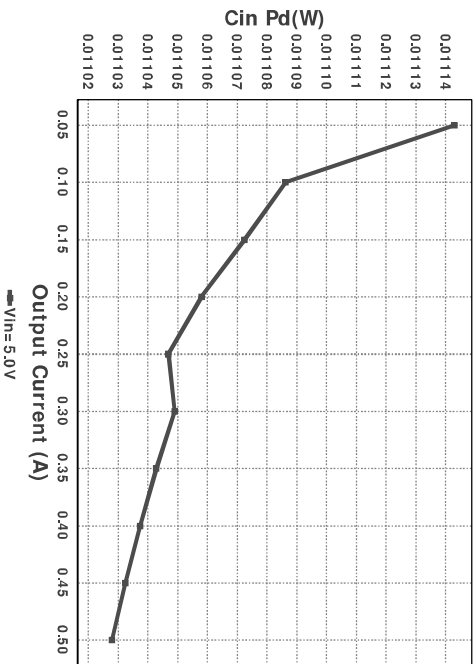
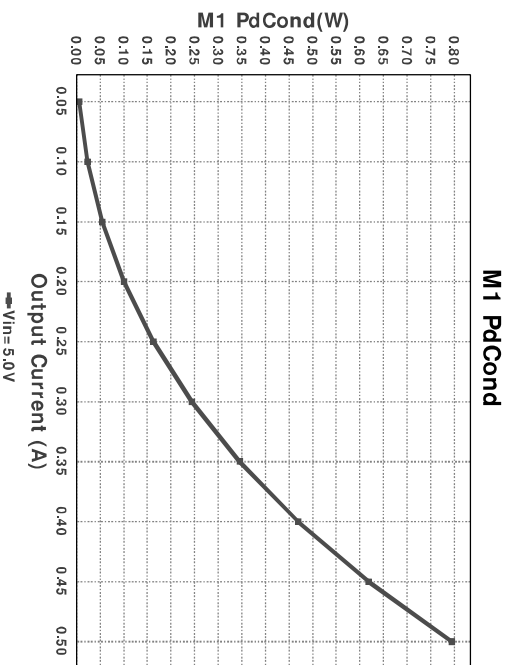
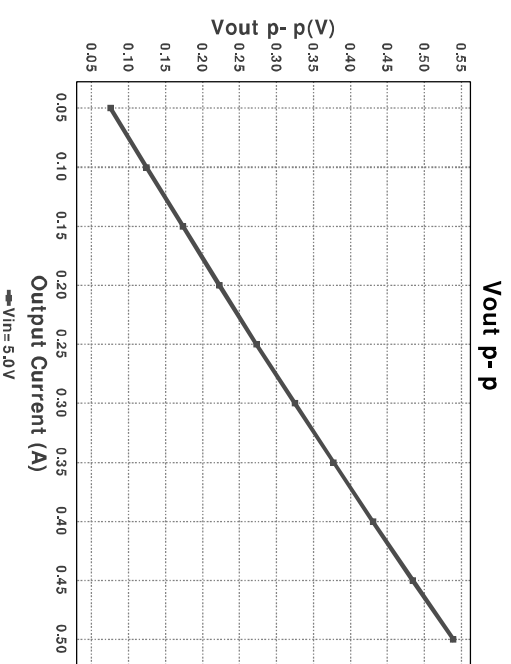
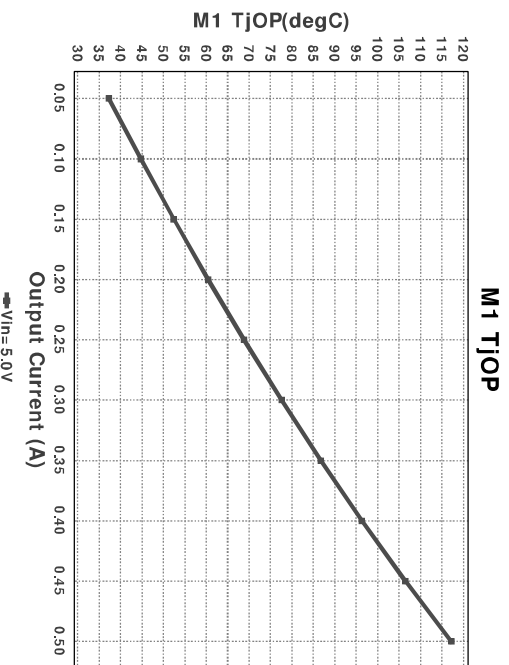
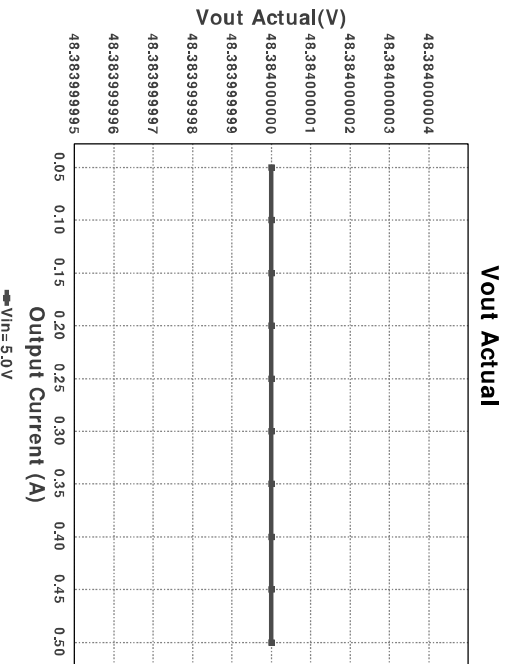
Electrical BOM

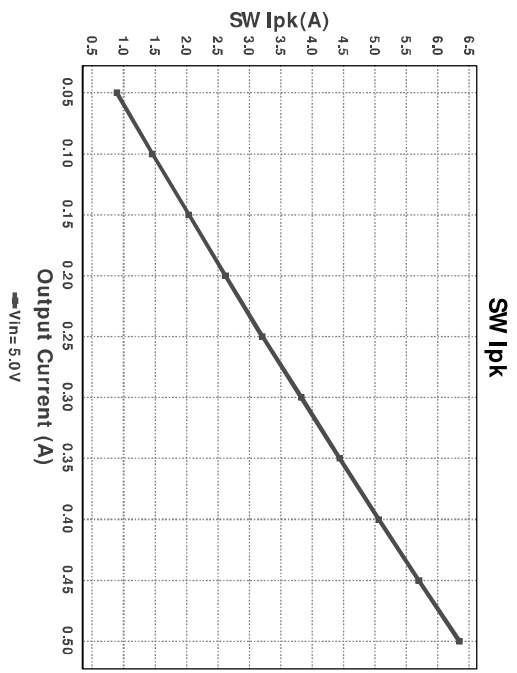
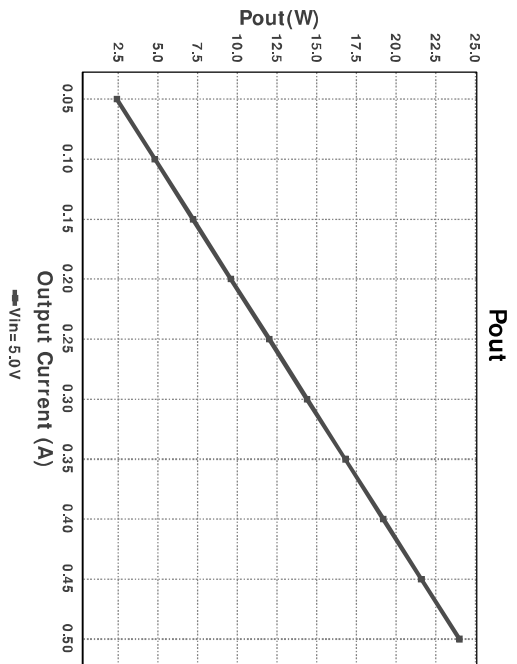
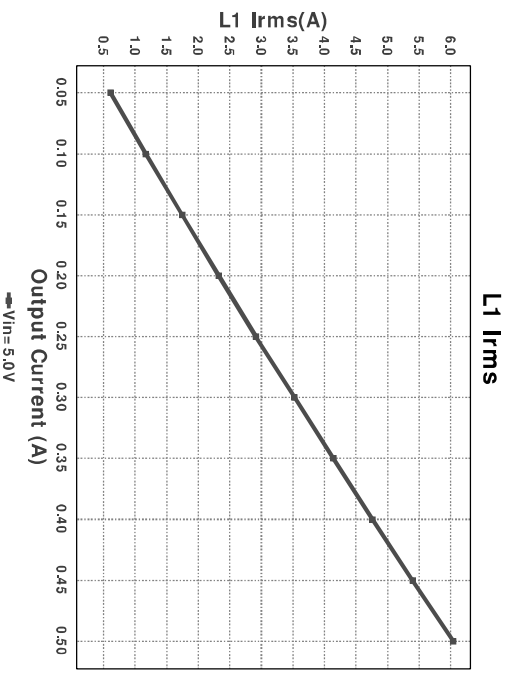
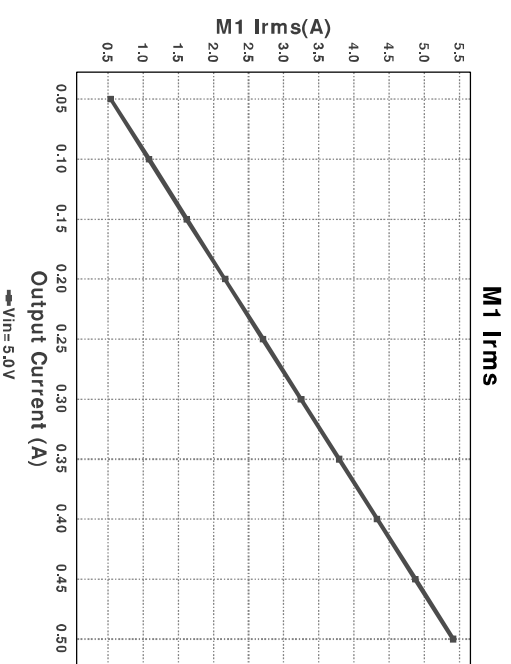
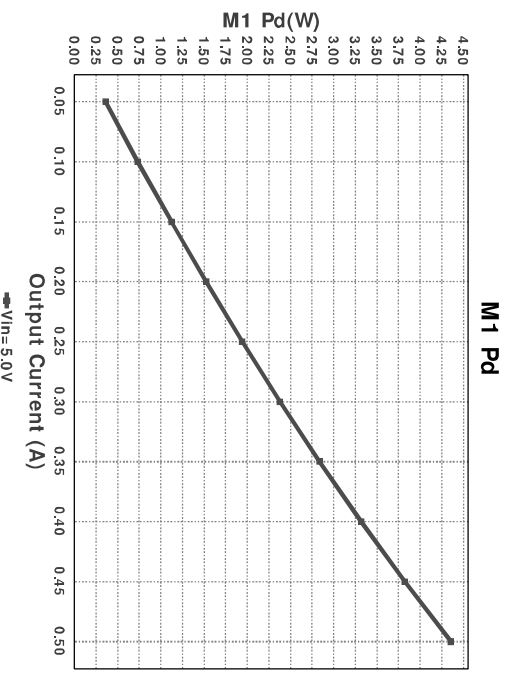
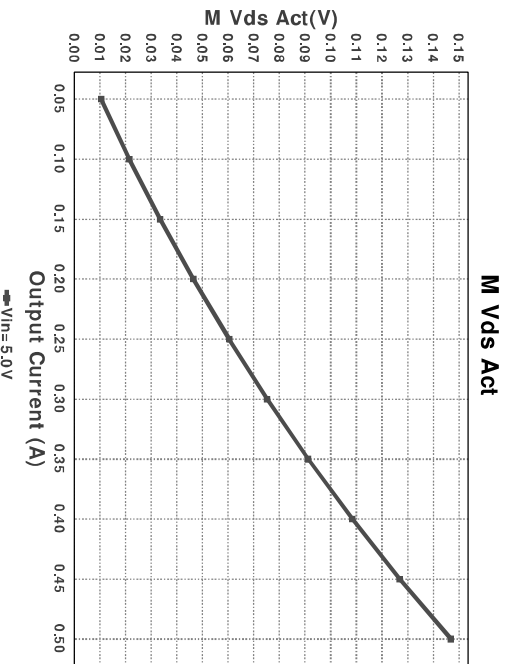
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cbyp	MuRata	GRM155R60J104KA01D Series= X5R	Cap= 100.0 nF VDC= 6.3 V IRMS= 0.0 A	1	\$0.01	0402 3 mm²
2.	Ccomp	Yageo America	CC0805KRX7R9BB183 Series= X7R	Cap= 18.0 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	0805 7 mm²
3.	Ccomp2	Yageo America	CC0805KRX7R9BB152 Series= X7R	Cap= 1.5 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	0805 7 mm²
4.	Cin	Panasonic	EEE-FK1C101P Series= FK	Cap= 100.0 uF ESR= 360.0 mOhm VDC= 16.0 V IRMS= 240.0 mA	1	\$0.12	SM_RADIAL_D 84 mm²
5.	Cout	Panasonic	EEV-FK2A151M Series= FK	Cap= 150.0 uF ESR= 170.0 mOhm VDC= 100.0 V IRMS= 793.0 mA	2	\$0.78	SM_RADIAL_J16 399 mm²

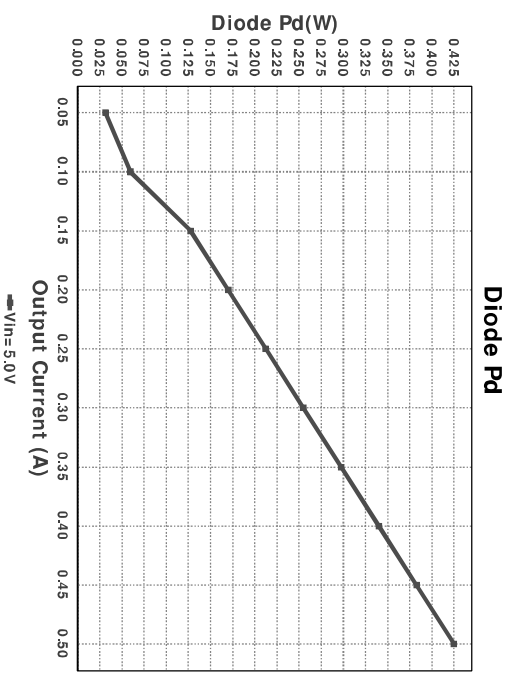
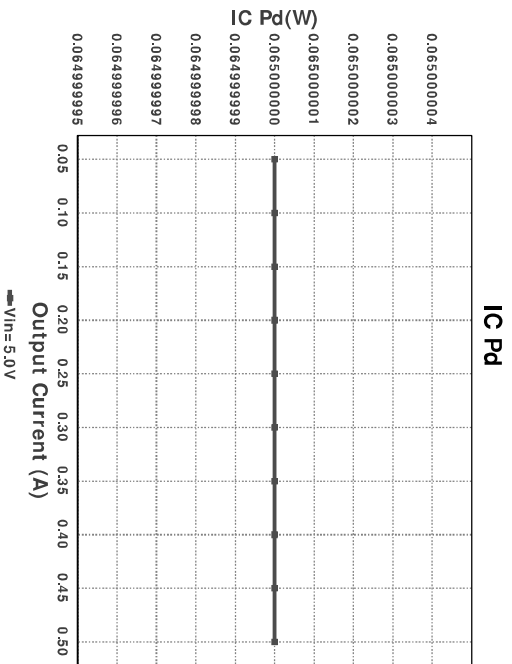
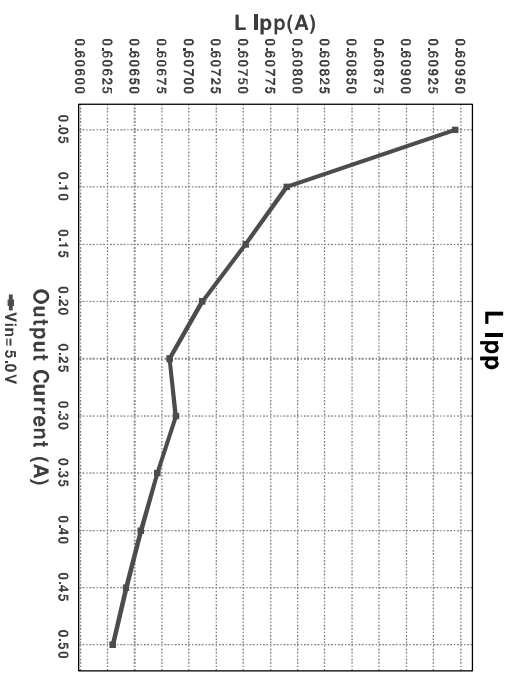
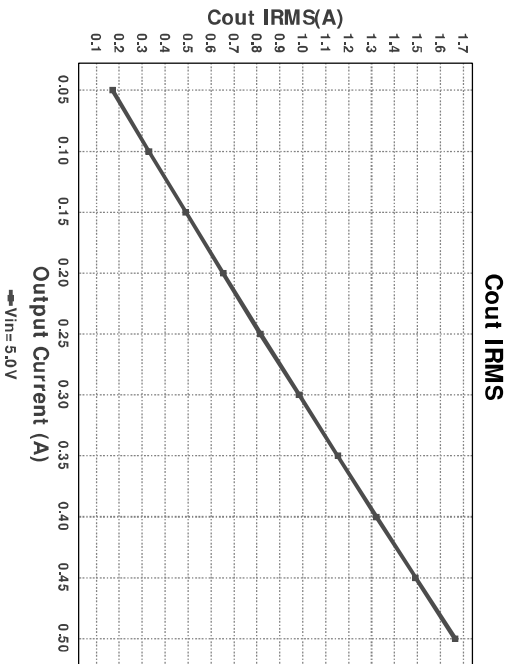
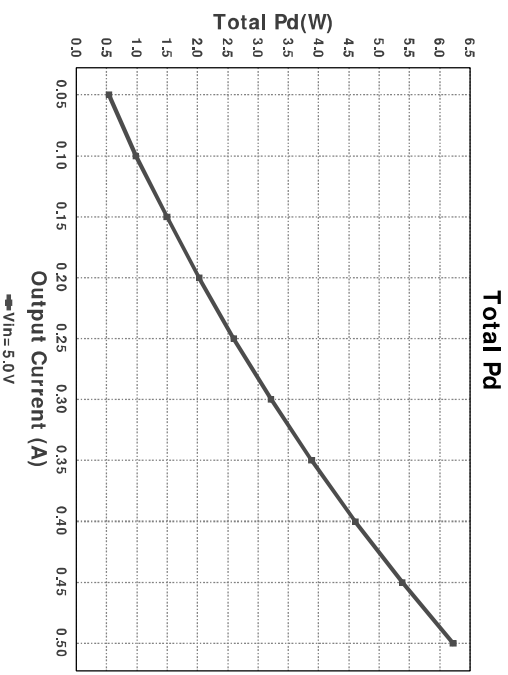
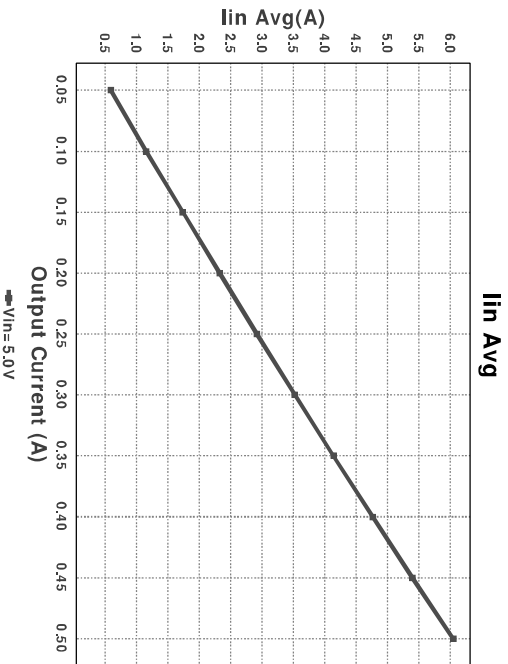
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
6.	Csense	MuRata	GRM216R71H103KA01D Series= X7R	Cap= 10.0 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	 0805 7 mm ²
7.	D1	Diodes Inc.	DFLS1200-7	VF@Io= 850.0 mV VRRM= 200.0 V	1	\$0.21	 PowerDI123 13 mm ²
8.	L1	Coilcraft	MSS1210-153MEB	L= 15.0 µH DCR= 19.0 mOhm	1	\$0.81	 MSS1210 204 mm ²
9.	M1	Infineon Technologies	BSZ100N06LS3 G	VdsMax= 60.0 V IdsMax= 40.0 Amps	1	\$0.33	 PG-TSDSON-8 19 mm ²
10.	Rcomp	Vishay-Dale	CRCW040216K9FKED Series= CRCW.e3	Res= 16.9 KOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
11.	Rfp1	Vishay-Dale	CRCW04021K00FKED Series= CRCW.e3	Res= 1000.0 Ohm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
12.	Rfp2	Vishay-Dale	CRCW040237K4FKED Series= CRCW.e3	Res= 37.4 KOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
13.	Rs1	Vishay-Dale	CRCW0402100RFKED Series= CRCW.e3	Res= 100.0 Ohm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
14.	Rsense	Susumu Co Ltd	PRL1632-R007-F-T1 Series= PRL1632	Res= 7.0 mOhm Power= 1.0 W Tolerance= 1.0%	1	\$0.19	 0612 11 mm ²
15.	Rsynr	Vishay-Dale	CRCW040229K4FKED Series= CRCW.e3	Res= 29.4 KOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
16.	U1	Texas Instruments	LM3488MMX/NOPB	Switcher	1	\$0.80	 MUA08A 24 mm ²

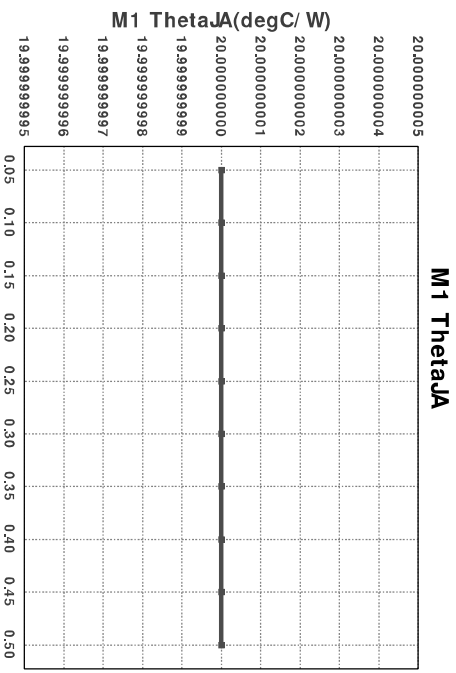
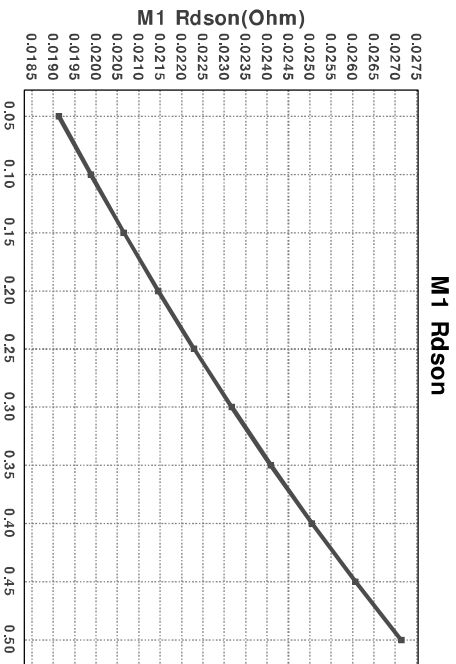




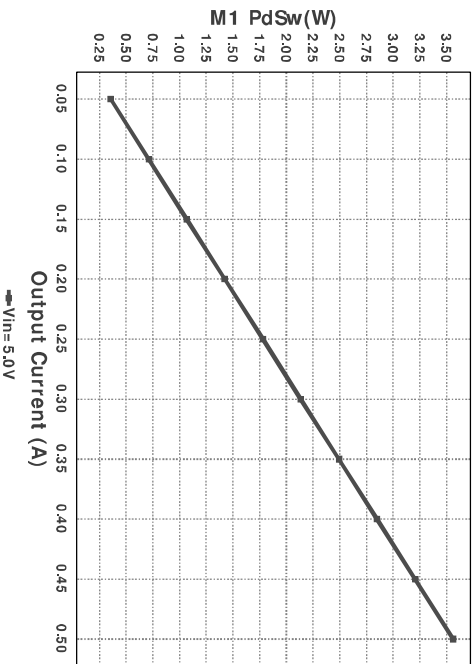




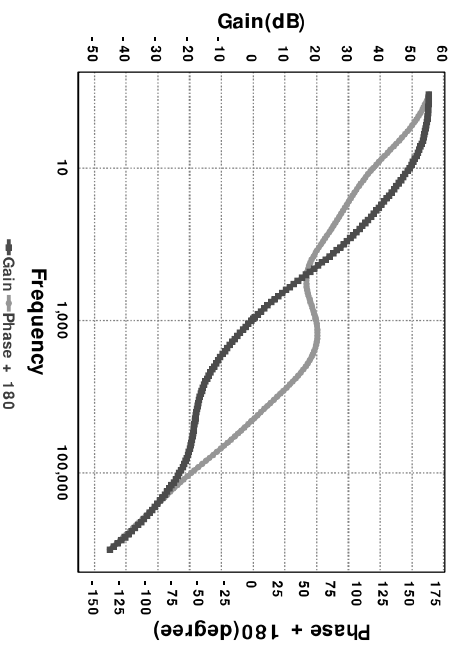




M1 PdSw



Loop Response



Operating Values

#	Name	Value	Category	Description
1.	Ein IRMS	175.077 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	1.668 A	Current	Output capacitor RMS ripple current
3.	IIn Avg	6.067 A	Current	Average input current
4.	L Ipp	606.49 mA	Current	Peak-to-peak inductor ripple current
5.	L1 Irms	6.064 A	Current	Inductor ripple current
6.	M1 Irms	5.4 A	Current	M1 MOSFET Irms
7.	SW Ipk	6.365 A	Current	Peak switch current
8.	BOM Count	17	General	Total Design BOM count
9.	FootPrint	1.192 k mm ²	General	Total Foot Print Area of BOM components
10.	Frequency	500.0 kHz	General	Switching frequency
11.	IC Tolerance	15.3 mV	General	IC Feedback Tolerance
12.	M Vds Act	147.704 mV	General	M Vds
13.	M1 Rdson	27.351 mOhm	General	MOSFET junction-to-ambient thermal resistance
14.	M1 ThetaJA	20.0 degC/W	General	Conduction Mode
15.	Mode	CCM	General	Total output power
16.	Pout	24.0 W	General	Total BOM Cost
17.	Total BOM	\$4.11	General	D1 junction temperature
18.	D1 Tj	86.1 degC	Op Point	Gain at 10Hz
19.	Low Freq Gain	55.306 dB	Op Point	Vout Actual calculated based on selected voltage divider resistors
20.	Vout Actual	48.384 V	Op Point	Operational Output Voltage
21.	Vout OP	48.0 V	Op Point	Bode plot crossover frequency
22.	Cross Freq	948.129 Hz	Op Point	Duty cycle
23.	Duty Cycle	91.752 %	Op Point	Steady state efficiency
24.	Efficiency	79.113 %	Op Point	Bode Plot Gain Margin
25.	Gain Marg	-18.286 dB	Op Point	IC junction temperature
26.	IC Tj	43.0 degC	Op Point	IC junction-to-ambient thermal resistance
27.	ICThetaJA	200.0 degC/W	Op Point	IC operating point
28.	IOUT_OP	500.0 mA	Op Point	M1 MOSFET junction temperature
29.	M1 TOP	119.286 degC	Op Point	Bode Plot Phase Margin
30.	Phase Marg	60.814 deg	Op Point	Vin operating point
31.	VIN_OP	5.0 V	Op Point	

#	Name	Value	Category	Description
32.	Vout-p-p	541.026 mV	Op_point	Peak-to-peak output ripple voltage
33.	Cin Pd	11.035 mW	Power	Input capacitor power dissipation
34.	Cout Pd	236.59 mW	Power	Output capacitor power dissipation
35.	Diode Pd	425.0 mW	Power	Diode power dissipation
36.	IC Pd	65.0 mW	Power	IC power dissipation
37.	L Pd	838.485 mW	Power	Inductor power dissipation
38.	M1 Pd	4.464 W	Power	M1 MOSFET total power dissipation
39.	M1 PdCond	797.635 mW	Power	M1 MOSFET conduction losses
40.	M1 PdSw	3.667 W	Power	M1 MOSFET switching losses
41.	Rfb Pd	60.0 mW	Power	Rfb Power Dissipation
42.	Resense Pd	173.007 mW	Power	LED Current Rens Power Dissipation
43.	Total Pd	6.336 W	Power	Total Power Dissipation
44.	Vout Tolerance	3.206 %	Power	Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	500.0 m	Maximum Output Current
2.	VinMax	5.0	Maximum input voltage
3.	VinMin	5.0	Minimum input voltage
4.	Vout	48.0	Output Voltage
5.	base_pn	LM3488	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	30.0	Ambient temperature
8.	UserFsw	500.0 k	Customer Selected Frequency

Design Assistance

1. **LM3488** Product Folder : <http://www.ti.com/product/LM3488> : contains the data sheet and other resources.

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