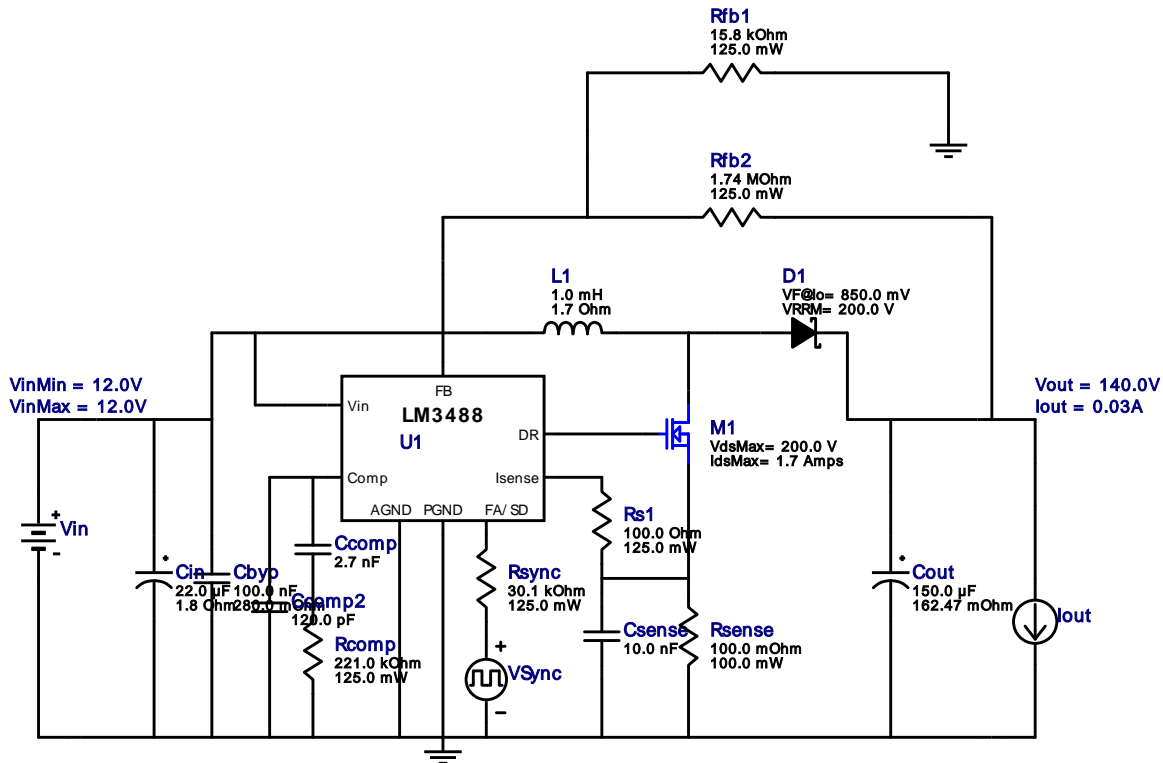




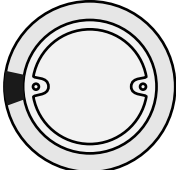


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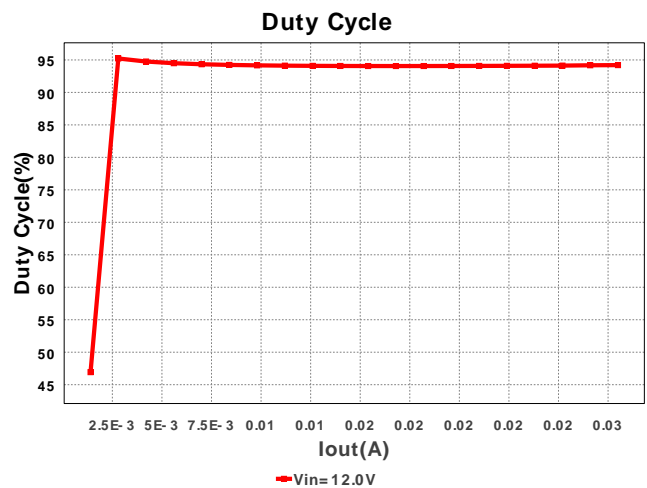
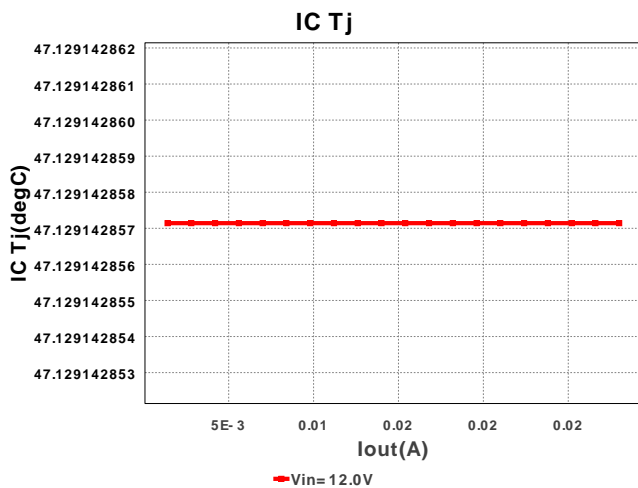
 Design : 3748998/32 LM3488MM/NOPB
 LM3488MM/NOPB 12.0V-12.0V to 140.0V @ 0.028A


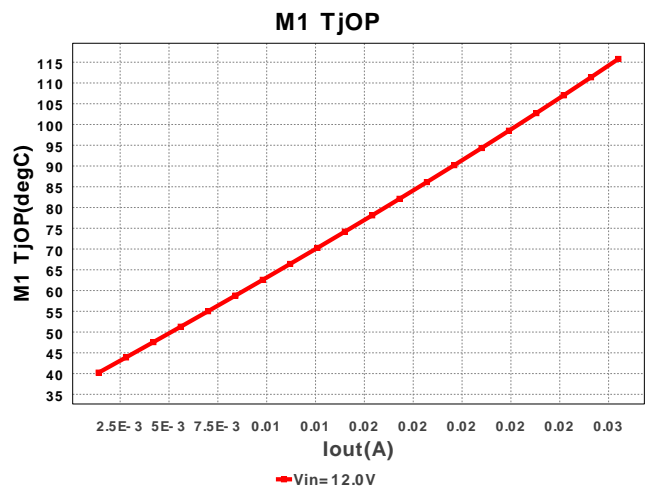
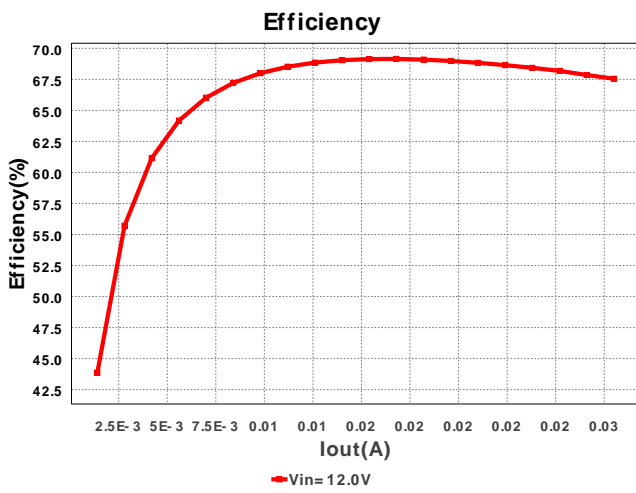
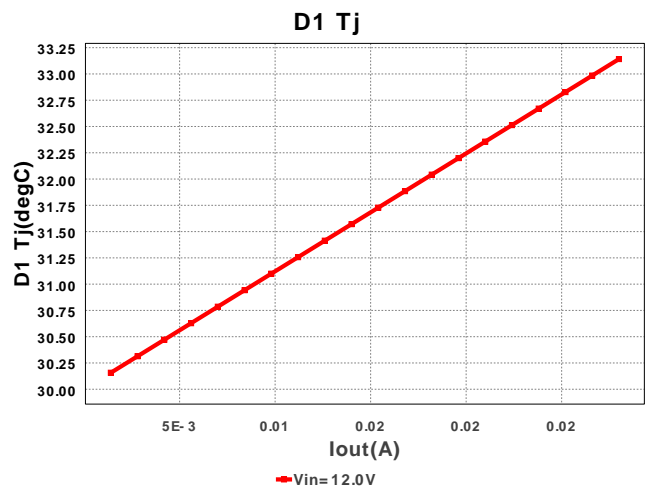
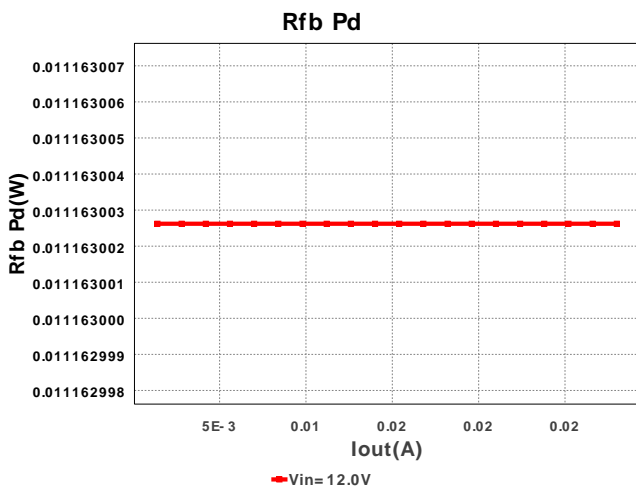
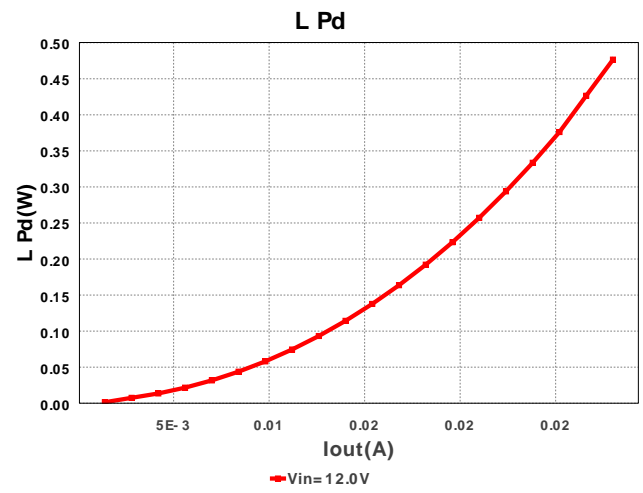
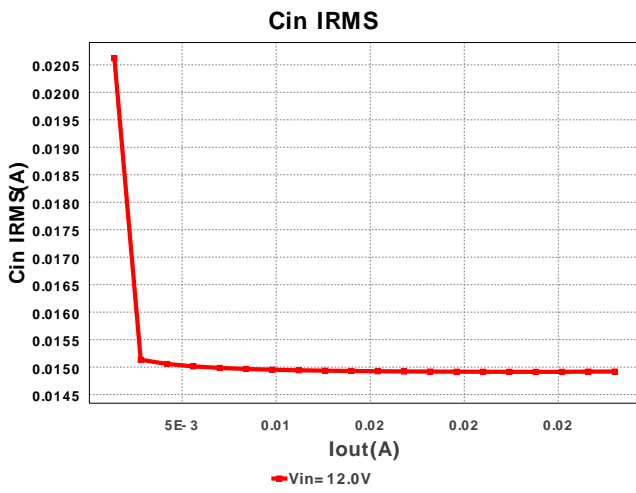
1. With the low turn of voltage of the LM3488 your power supply may current limit before you reach your working input voltage. If this happens, or to preempt this from happening, you can include a low pass RC filter from input voltage to Vin on the IC. Make sure the rise time on the RC network is slower than your supply's rise time. If you are not using the synchronization feature of the part use the LM3478.

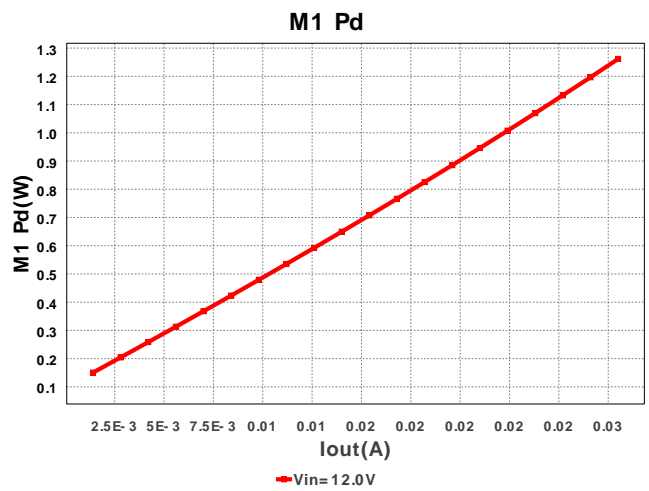
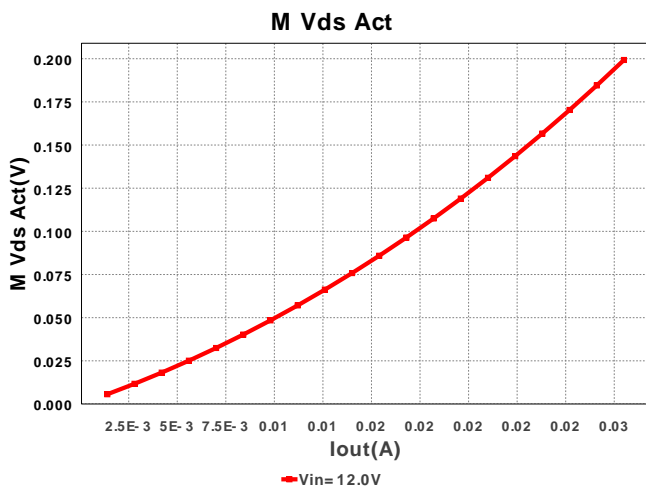
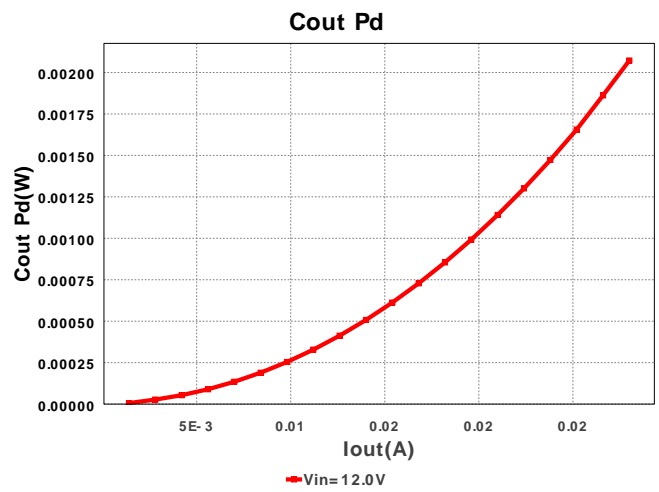
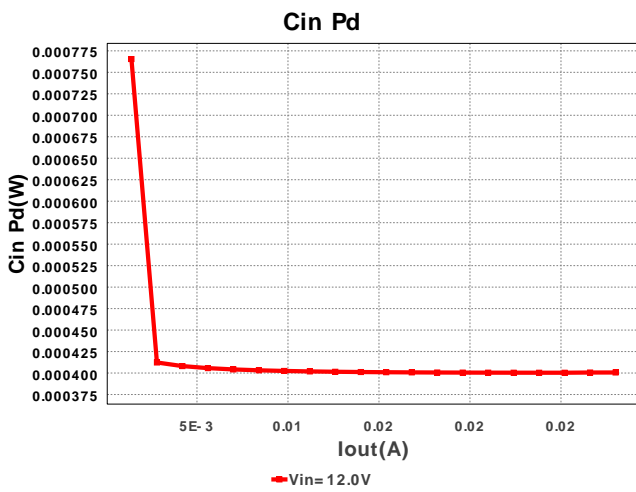
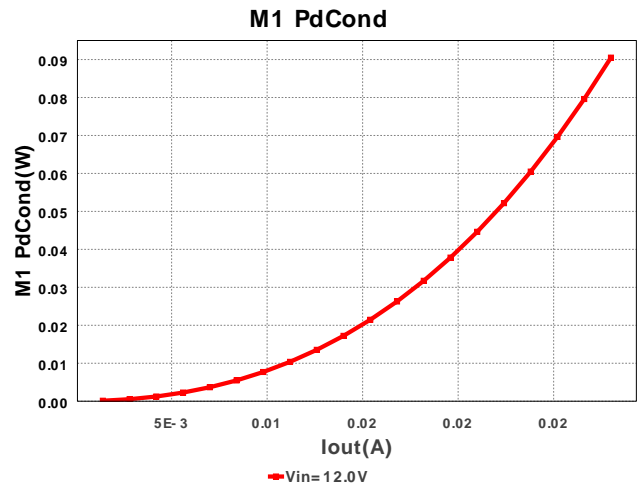
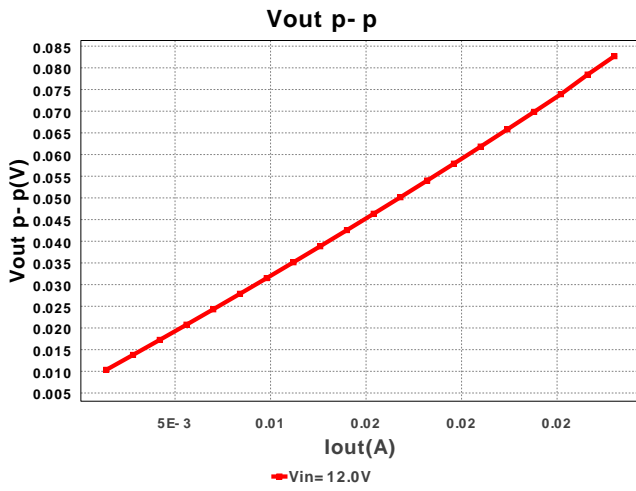
Electrical BOM

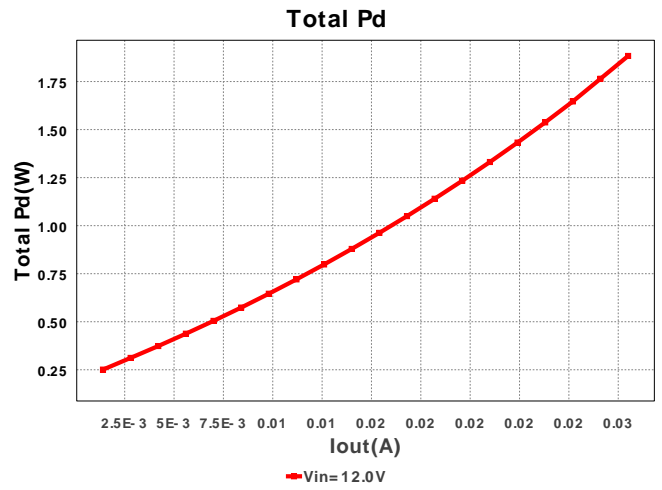
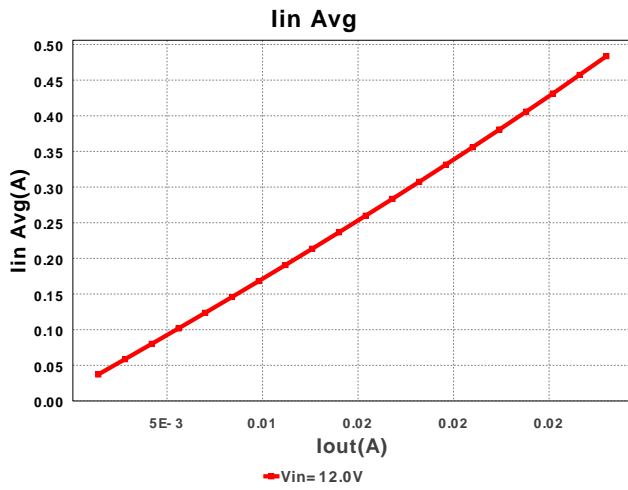
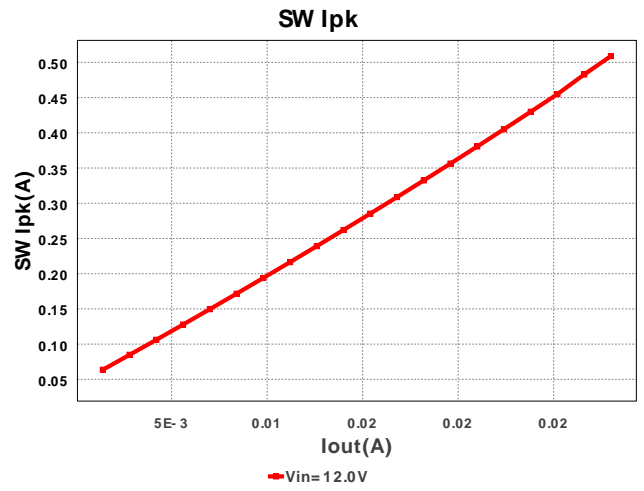
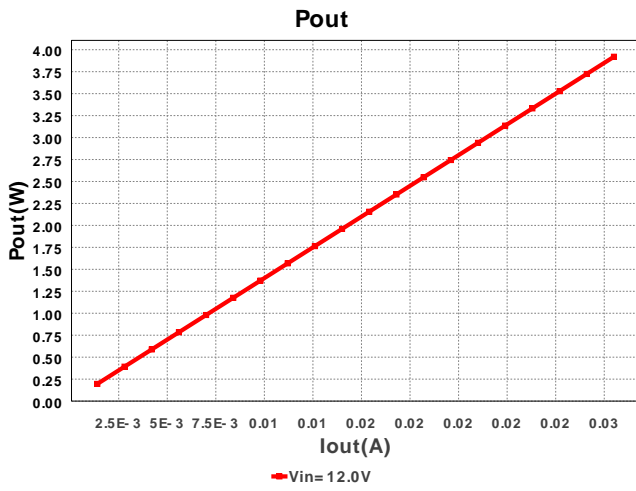
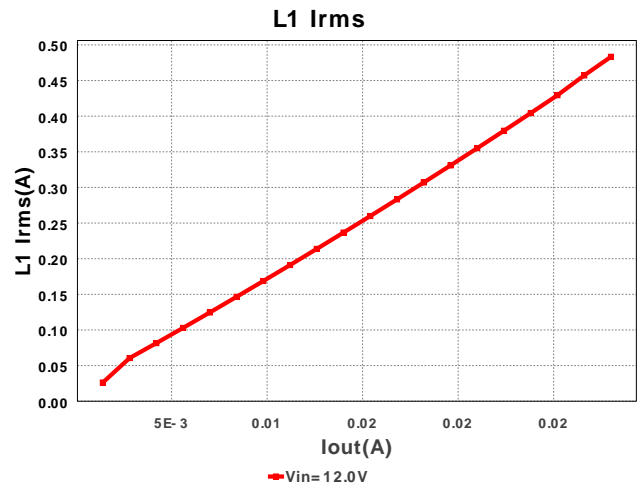
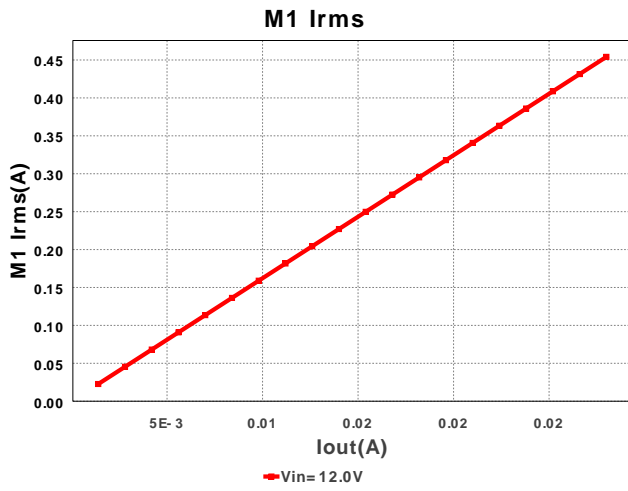
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cby	AVX	08053C104KAT2A Series= X7R	Cap= 100.0 nF ESR= 280.0 mOhm VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	 0805 7mm2
2.	Ccomp	Yageo America	CC0805KRX7R9BB272 Series= X7R	Cap= 2.7 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	 0805 7mm2
3.	Ccomp2	Yageo America	CC0805JRNP09BN121 Series= C0G/NP0	Cap= 120.0 pF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	 0805 7mm2
4.	Cin	Nippon Chemi-Con	EMVY160ADA220ME55G Series= MVY	Cap= 22.0 μF ESR= 1.8 Ohm VDC= 16.0 V IRMS= 95.0 mA	1	\$0.10	 CAPSMT_62_E55 53mm2
5.	Cout	Panasonic	EEUED2D151 Series= 286	Cap= 150.0 μF ESR= 162.47 mOhm VDC= 200.0 V IRMS= 1.4 A	1	\$0.51	 CAPPR7.5-16X25 324mm2

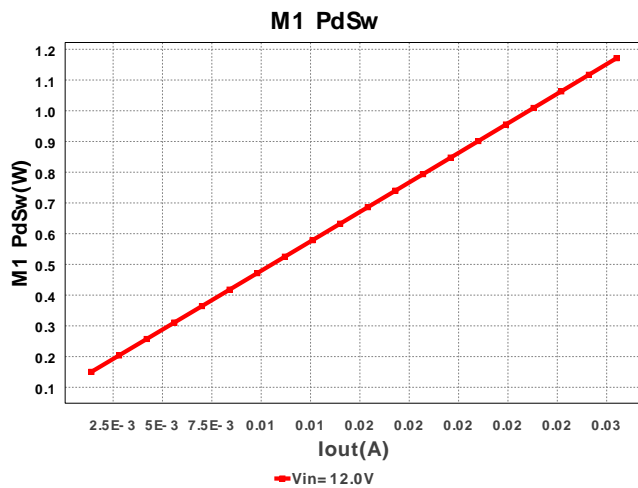
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
6.	Csense	MuRata	GRM216R71H103KA01D Series= X7R	Cap= 10.0 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	 0805 7mm2
7.	D1	Diodes Inc.	DFLS1200-7	VF@Io= 850.0 mV VRRM= 200.0 V	1	\$0.21	 PowerDI123 13mm2
8.	L1	Bourns	SRR1260-102K	L= 1.0 mH DCR= 1.7 Ohm	1	\$0.45	 SRR1260 210mm2
9.	M1	Vishay-Siliconix	SI4464DY-E3	VdsMax= 200.0 V IdsMax= 1.7 Amps	1	\$0.48	 SOIC-8 55mm2
10.	Rcomp	Vishay-Dale	CRCW0805221KFKEA Series= CRCW..e3	Res= 221.0 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7mm2
11.	Rfb1	Vishay-Dale	CRCW080515K8FKEA Series= CRCW..e3	Res= 15.8 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7mm2
12.	Rfb2	Vishay-Dale	CRCW08051M74FKEA Series= CRCW..e3	Res= 1.74 MOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7mm2
13.	Rs1	Vishay-Dale	CRCW0805100RFKEA Series= CRCW..e3	Res= 100.0 Ohm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7mm2
14.	Rsense	Panasonic	ERJ-3RSFR10V Series= 227	Res= 100.0 mOhm Power= 100.0 mW Tolerance= 1.0%	1	\$0.03	 0603 5mm2
15.	Rsync	Vishay-Dale	CRCW080530K1FKEA Series= CRCW..e3	Res= 30.1 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7mm2
16.	U1	Texas Instruments	LM3488MM/NOPB	Switcher	1	\$0.80	 MUA08A 24mm2











Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	14.711 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	100.734 mA	Current	Output capacitor RMS ripple current
3.	Iin Avg	390.58 mA	Current	Average input current
4.	L Ipp	50.96 mA	Current	Peak-to-peak inductor ripple current
5.	L1 Irms	390.129 mA	Current	Inductor ripple current
6.	M1 Irms	453.204 mA	Current	M1 MOSFET Irms
7.	SW Ipk	415.332 mA	Current	Peak switch current
8.	BOM Count	16	General	Total Design BOM count
9.	FootPrint	770.0 mm2	General	Total Foot Print Area of BOM components
10.	Frequency	217.857 kHz	General	Switching frequency
11.	IC Tolerance	15.3 mV	General	IC Feedback Tolerance
12.	M Vds Act	125.716 mV	General	M Vds
13.	M1 Rdson	277.394 mOhm	General	Drain-Source On-resistance
14.	M1 ThetaJA	68.0 degC/W	General	MOSFET junction-to-ambient thermal resistance
15.	Pout	3.92 W	General	Total output power
16.	Total BOM	\$2.67	General	Total BOM Cost
17.	D1 Tj	33.142 degC	Op_Point	D1 junction temperature
18.	Vout OP	140.0 V	Op_Point	Operational Output Voltage
19.	Cross Freq	131.008 Hz	Op_point	Bode plot crossover frequency
20.	Duty Cycle	92.818 %	Op_point	Duty cycle
21.	Efficiency	83.635 %	Op_point	Steady state efficiency
22.	IC Tj	47.129 degC	Op_point	IC junction temperature
23.	ICThetaJA	200.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
24.	IOUT_OP	28.0 mA	Op_point	Iout operating point
25.	M1 TjOP	51.744 degC	Op_point	M1 MOSFET junction temperature
26.	Phase Marg	83.095 deg	Op_point	Bode Plot Phase Margin
27.	VIN_OP	12.0 V	Op_point	Vin operating point
28.	Vout p-p	67.479 mV	Op_point	Peak-to-peak output ripple voltage
29.	Cin Pd	389.535 μW	Power	Input capacitor power dissipation
30.	Cout Pd	1.649 mW	Power	Output capacitor power dissipation
31.	Diode Pd	23.8 mW	Power	Diode power dissipation
32.	IC Pd	85.646 mW	Power	IC power dissipation
33.	L Pd	310.49 mW	Power	Inductor power dissipation
34.	M1 Pd	319.762 mW	Power	M1 MOSFET total power dissipation
35.	M1 PdCond	56.975 mW	Power	M1 MOSFET conduction losses
36.	M1 PdSw	262.787 mW	Power	M1 MOSFET switching losses
37.	Rfb Pd	11.163 mW	Power	Rfb Power Dissipation
38.	Total Pd	767.021 mW	Power	Total Power Dissipation

Design Inputs

#	Name	Value	Description
1.	Iout	28.0 mA	Maximum Output Current
2.	Iout1	28.0 mAmps	Output Current #1
3.	VinMax	12.0 V	Maximum input voltage
4.	VinMin	12.0 V	Minimum input voltage
5.	Vout	140.0 V	Output Voltage
6.	Vout1	140.0 Volt	Output Voltage #1
7.	base_pn	LM3488	Base Product Number
8.	source	DC	Input Source Type
9.	Ta	30.0 degC	Ambient temperature
10.	UserFsw	217.857 kHz	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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