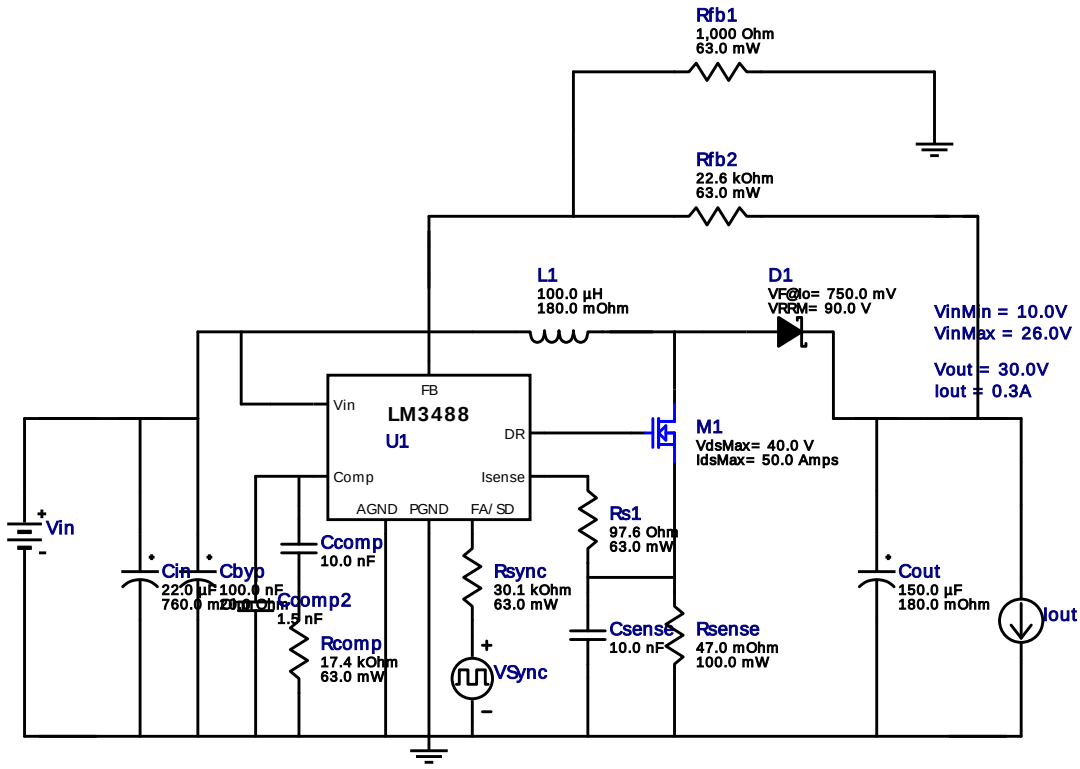
VinMin = 10.0V
VinMax = 26.0V
Vout = 30.0V
Iout = 0.3A

Device = LM3488MM/NOPB
Topology = Boost
Created = 1/22/14 12:35:39 PM
BOM Cost = $2.50
Total Pd = 0.72W
Footprint = 596.0mm2
BOM Count = 16

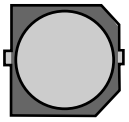
WEBENCH® Design Report

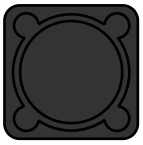
Design : 3955328/5 LM3488MM/NOPB
LM3488MM/NOPB 10.0V-26.0V to 30.0V @ 0.3A

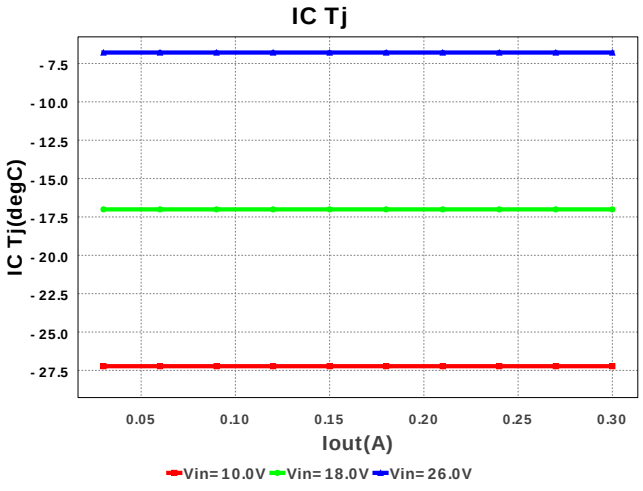


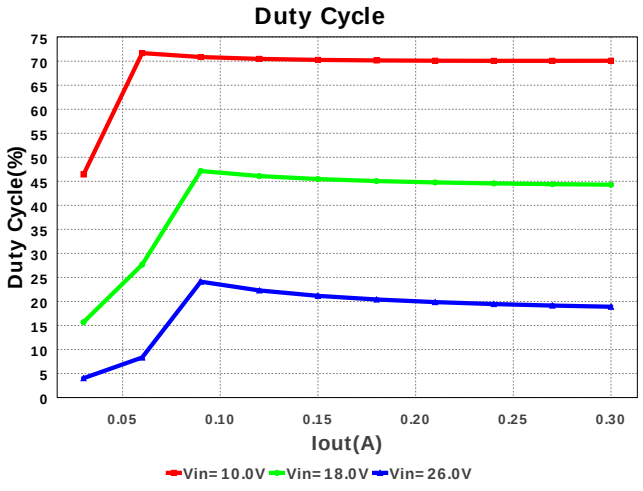
1. With the low turn of voltage of the LM34x8 your power supply may current limit before you reach your working input voltage. If this happens, or to preempt this from happening, you can include a low pass RC filter from input voltage to Vin on the IC. Make sure the rise time on the RC network is slower than your supply's rise time. If you are not using the syncronization feature of the part use the LM3478.

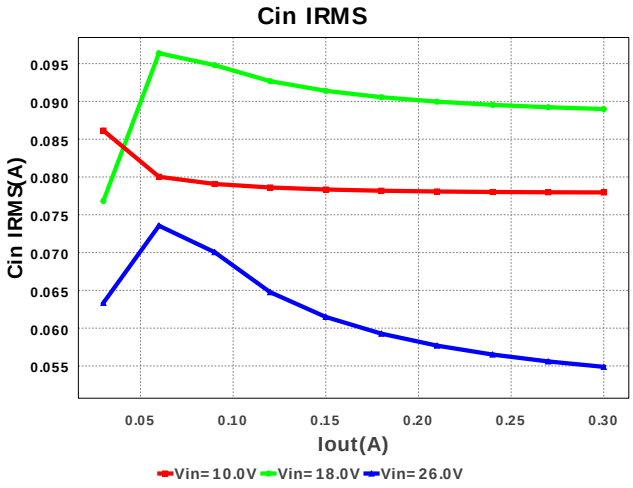
Electrical BOM

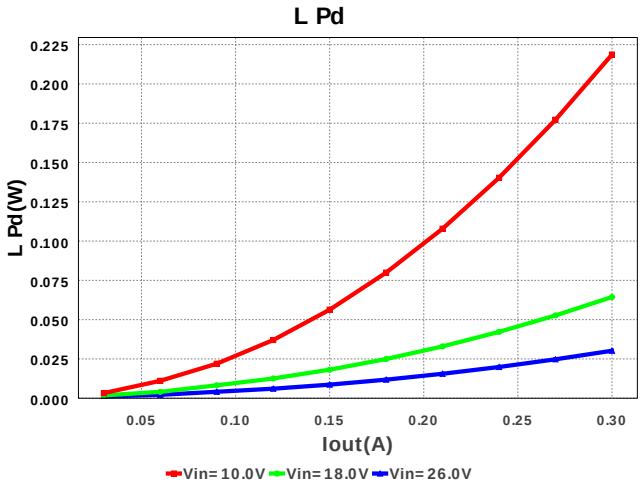
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cbyp	Vishay-Sprague	293D104X9035A2TE3 Series= 293D	Cap= 100.0 nF ESR= 20.0 Ohm VDC= 35.0 V IRMS= 60.0 mA	1	$0.12	 3216-18 11mm2
2.	Ccomp	MuRata	GRM216R71H103KA01D Series= X7R	Cap= 10.0 nF VDC= 50.0 V IRMS= 0.0 A	1	$0.01	 0805 7mm2
3.	Ccomp2	Yageo America	CC0805KRX7R9BB152 Series= X7R	Cap= 1.5 nF VDC= 50.0 V IRMS= 0.0 A	1	$0.01	 0805 7mm2
4.	Cin	Nichicon	UUD1V220MCL1GS Series= uD	Cap= 22.0 µF ESR= 760.0 mOhm VDC= 35.0 V IRMS= 150.0 mA	1	$0.10	 SM_RADIAL_5MM 58mm2
5.	Cout	Nichicon	UUD1H151MNL1GS Series= uD	Cap= 150.0 µF ESR= 180.0 mOhm VDC= 50.0 V IRMS= 670.0 mA	1	$0.26	 SM_RADIAL_10BMM 160mm2
6.	Csense	MuRata	GRM216R71H103KA01D Series= X7R	Cap= 10.0 nF VDC= 50.0 V IRMS= 0.0 A	1	$0.01	 0805 7mm2

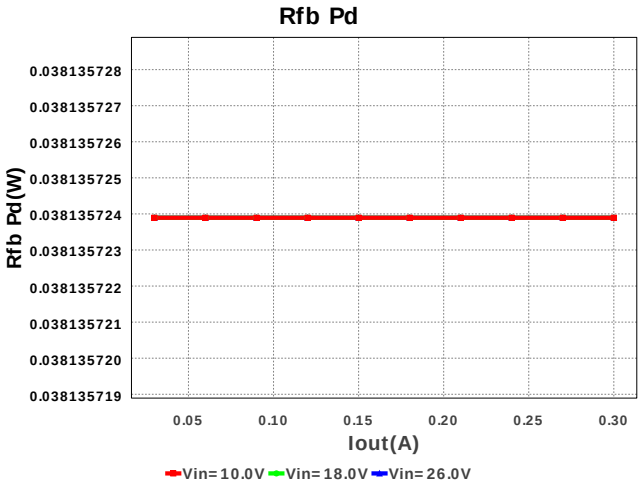
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
7.	D1	Vishay-Semiconductor	BYS12-90-E3/TR	VF@Io= 750.0 mV VRRM= 90.0 V	1	$0.08	 SMA 37mm2
8.	L1	Bourns	SRR1260-101M	L= 100.0 µH DCR= 180.0 mOhm	1	$0.41	 SRR1260 210mm2
9.	M1	Texas Instruments	CSD18504Q5A	VdsMax= 40.0 V IdsMax= 50.0 Amps	1	$0.56	 TRANS_NexFET_Q5A 55mm2
10.	Rcomp	Vishay-Dale	CRCW040217K4FKED Series= CRCW..e3	Res= 17.4 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	 0402 3mm2
11.	Rfb1	Vishay-Dale	CRCW04021K00FKED Series= CRCW..e3	Res= 1,000 Ohm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	 0402 3mm2
12.	Rfb2	Vishay-Dale	CRCW040222K6FKED Series= CRCW..e3	Res= 22.6 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	 0402 3mm2
13.	Rs1	Vishay-Dale	CRCW040297R6FKED Series= CRCW..e3	Res= 97.6 Ohm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	 0402 3mm2
14.	Rsense	Panasonic	ERJ-L03KF47MV Series= 231	Res= 47.0 mOhm Power= 100.0 mW Tolerance= 1.0%	1	$0.09	 0603 5mm2
15.	Rsync	Vishay-Dale	CRCW040230K1FKED Series= CRCW..e3	Res= 30.1 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	 0402 3mm2
16.	U1	Texas Instruments	LM3488MM/NOPB	Switcher	1	$0.80	 MUA08A 24mm2

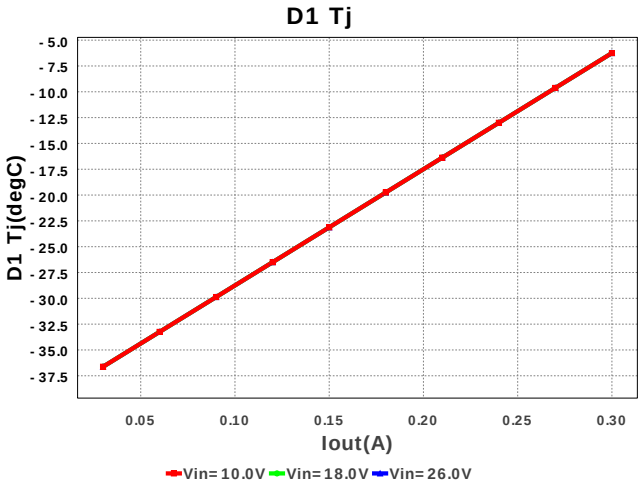


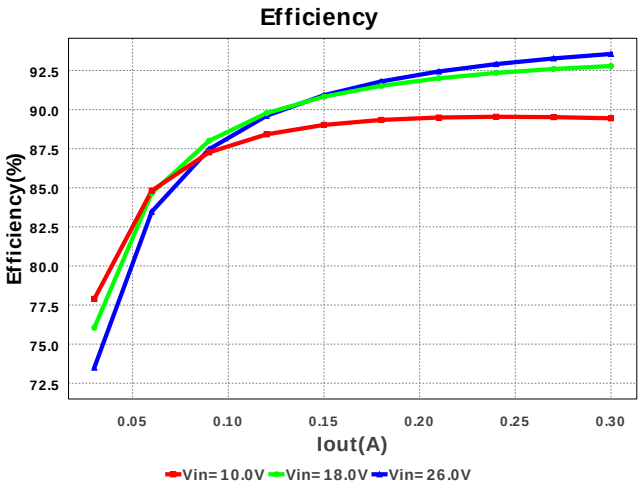


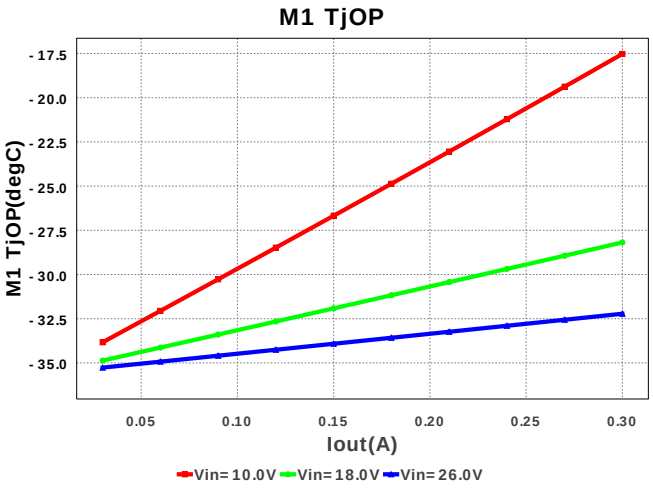


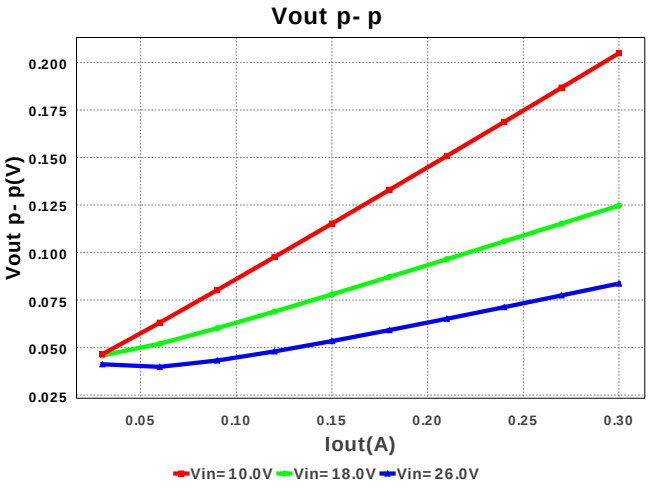


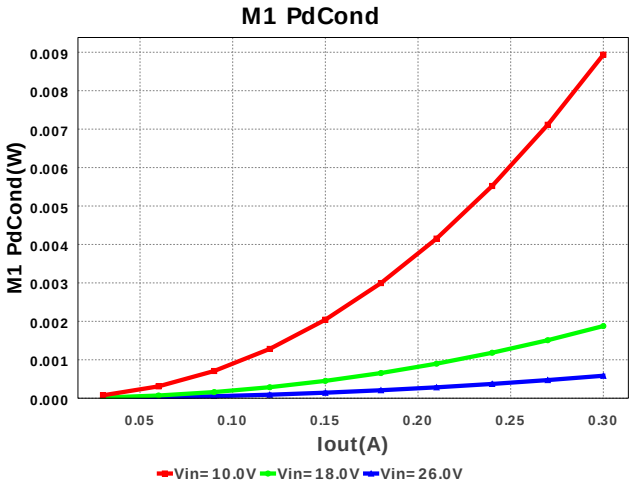


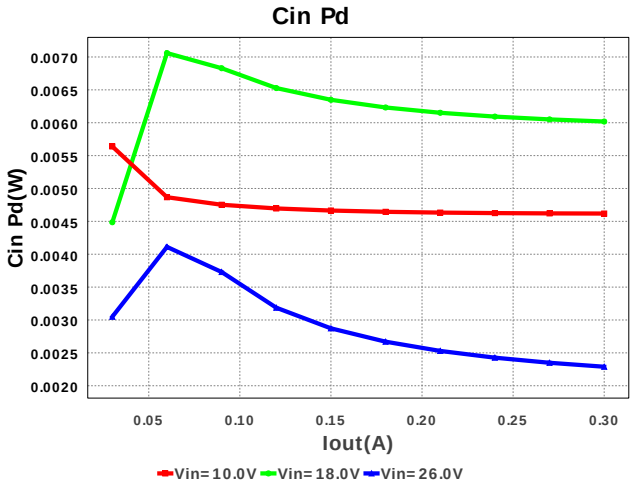


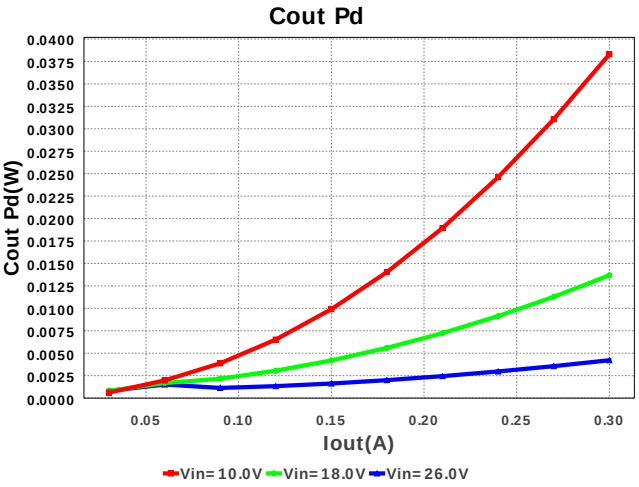


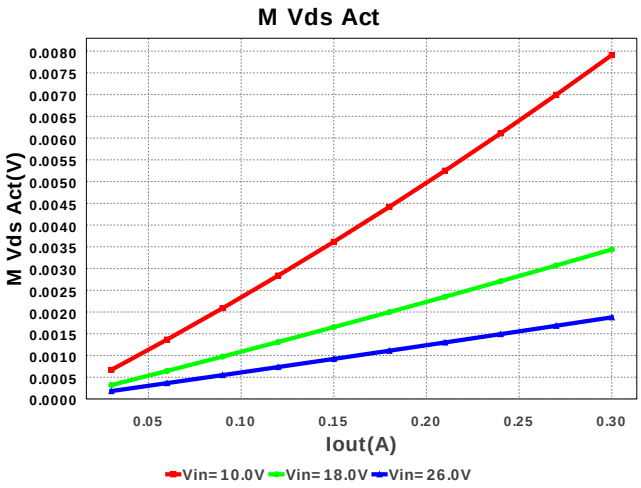


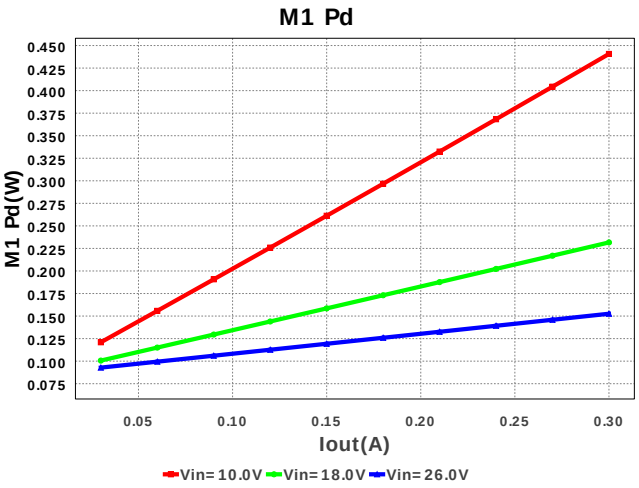


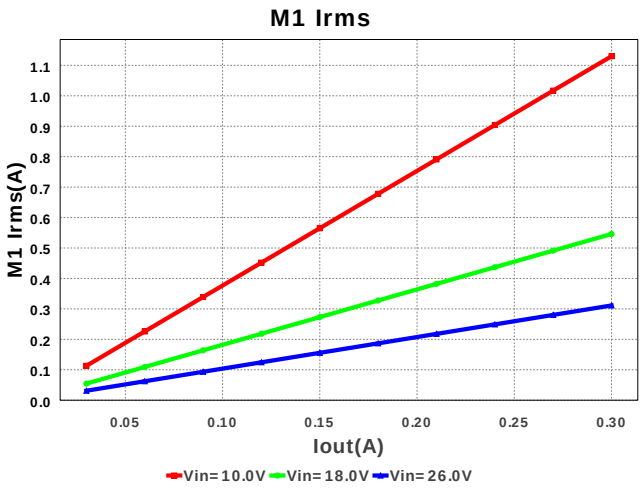


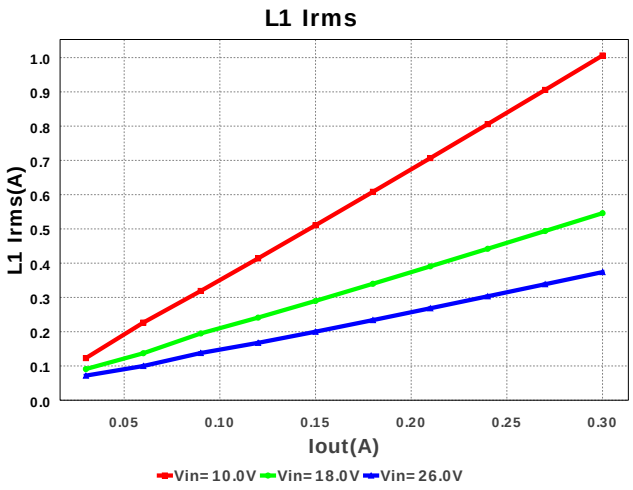


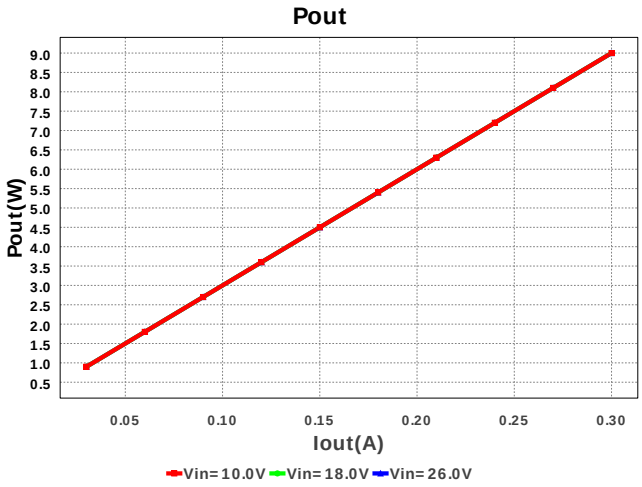


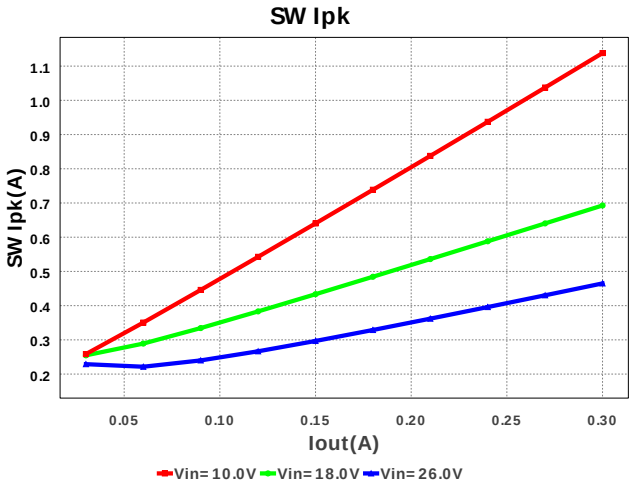


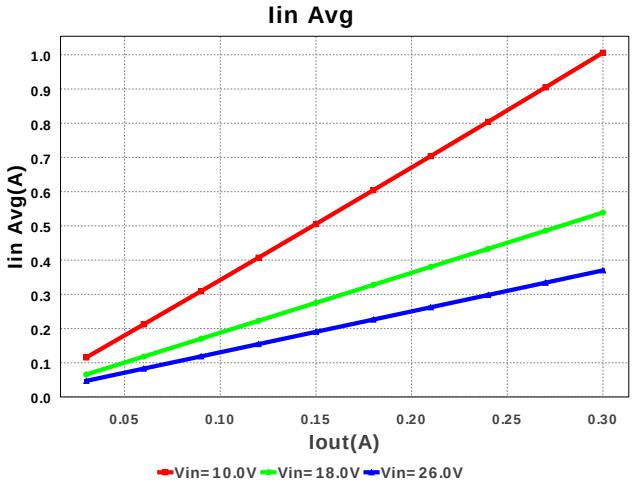


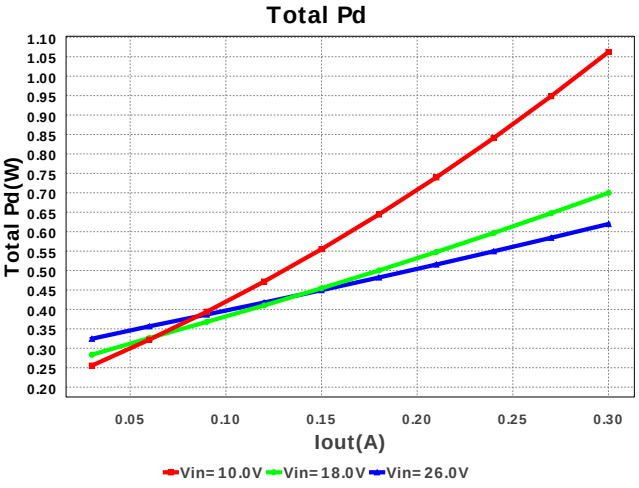


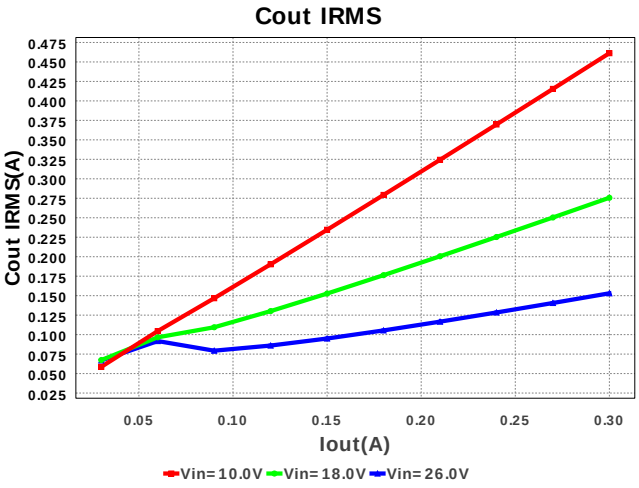


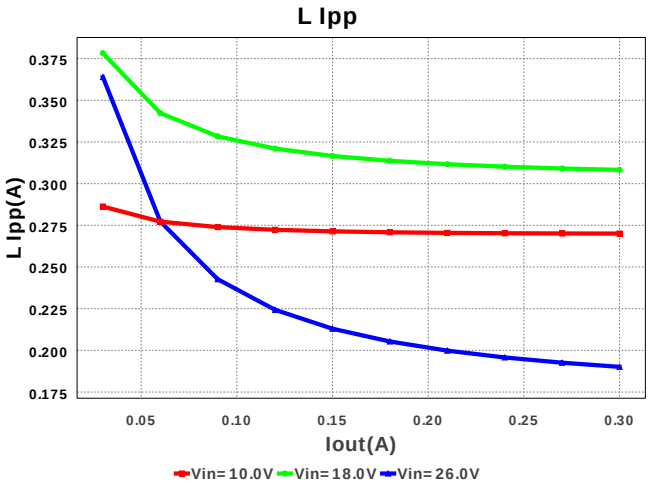


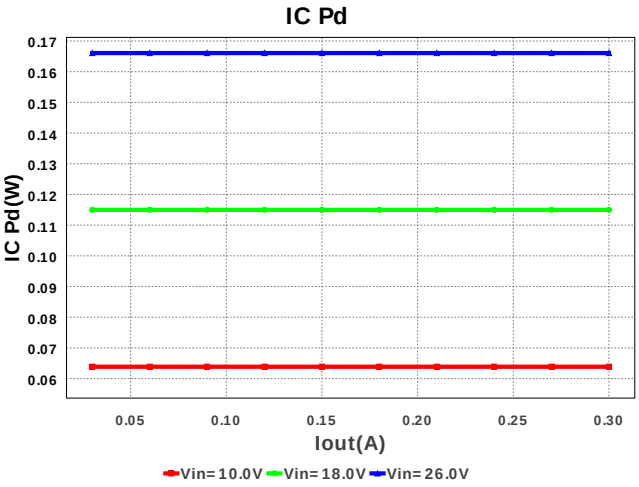


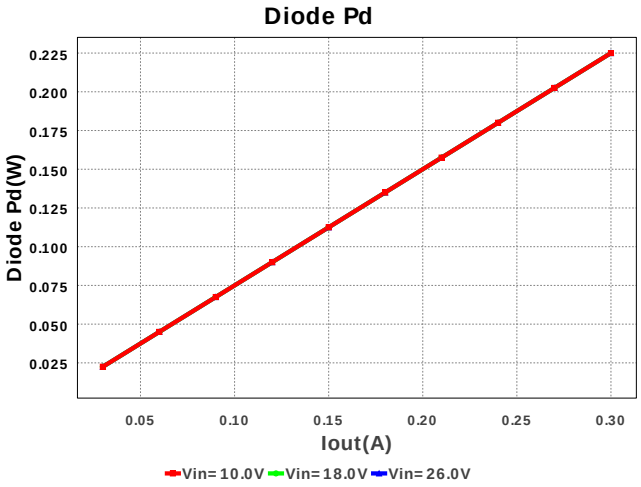


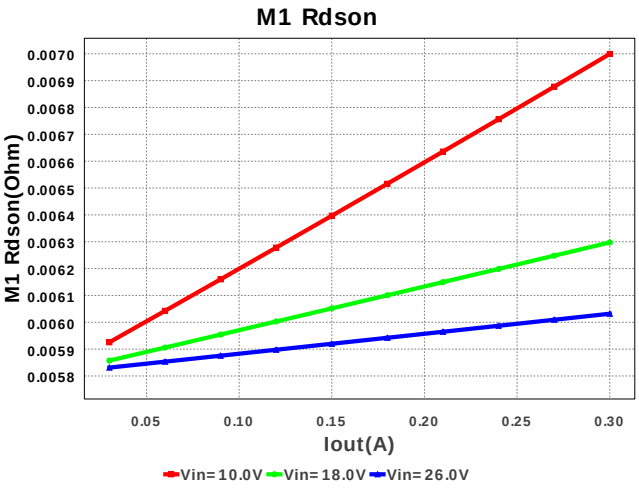


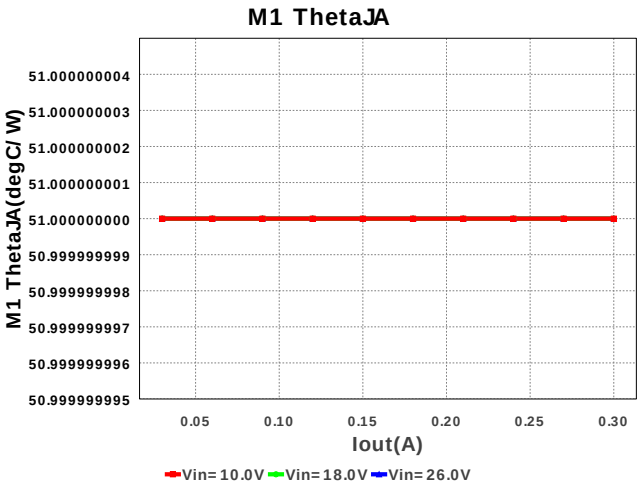


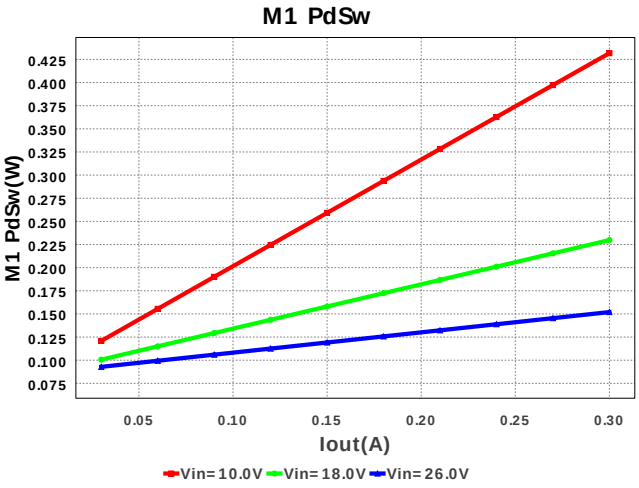












Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	76.871 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	450.724 mA	Current	Output capacitor RMS ripple current
3.	Iin Avg	972.39 mA	Current	Average input current
4.	L Ipp	266.289 mA	Current	Peak-to-peak inductor ripple current
5.	L1 Irms	974.127 mA	Current	Inductor ripple current
6.	M1 Irms	1.128 A	Current	M1 MOSFET Irms
7.	SW Ipk	1.104 A	Current	Peak switch current
8.	BOM Count	16	General	Total Design BOM count
9.	FootPrint	596.0 mm2	General	Total Foot Print Area of BOM components
10.	Frequency	258.333 kHz	General	Switching frequency
11.	IC Tolerance	15.3 mV	General	IC Feedback Tolerance
12.	M Vds Act	6.679 mV	General	M Vds
13.	M1 Rdson	5.923 mOhm	General	Drain-Source On-resistance
14.	M1 ThetaJA	51.0 degC/W	General	MOSFET junction-to-ambient thermal resistance
15.	Pout	9.0 W	General	Total output power
16.	Total BOM	$2.5	General	Total BOM Cost
17.	D1 Tj	-6.25 degC	Op_Point	D1 junction temperature
18.	Vout OP	30.0 V	Op_Point	Operational Output Voltage
19.	Cross Freq	1.713 kHz	Op_point	Bode plot crossover frequency
20.	Duty Cycle	69.107 %	Op_point	Duty cycle
21.	Efficiency	92.555 %	Op_point	Steady state efficiency
22.	IC Tj	-27.226 degC	Op_point	IC junction temperature
23.	ICThetaJA	200.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
24.	IOUT_OP	300.0 mA	Op_point	Iout operating point
25.	M1 TjOP	-33.866 degC	Op_point	M1 MOSFET junction temperature
26.	Phase Marg	60.91 deg	Op_point	Bode Plot Phase Margin
27.	VIN_OP	10.0 V	Op_point	Vin operating point
28.	Vout p-p	198.762 mV	Op_point	Peak-to-peak output ripple voltage
29.	Cin Pd	4.491 mW	Power	Input capacitor power dissipation
30.	Cout Pd	36.567 mW	Power	Output capacitor power dissipation
31.	Diode Pd	225.0 mW	Power	Diode power dissipation
32.	IC Pd	63.87 mW	Power	IC power dissipation
33.	L Pd	204.968 mW	Power	Inductor power dissipation
34.	M1 Pd	120.276 mW	Power	M1 MOSFET total power dissipation
35.	M1 PdCond	7.532 mW	Power	M1 MOSFET conduction losses
36.	M1 PdSw	112.744 mW	Power	M1 MOSFET switching losses
37.	Rfb Pd	38.136 mW	Power	Rfb Power Dissipation
38.	Total Pd	723.944 mW	Power	Total Power Dissipation

Design Inputs

#	Name	Value	Description
1.	Iout	300.0 mA	Maximum Output Current
2.	Iout1	300.0 mAmps	Output Current #1
3.	VinMax	26.0 V	Maximum input voltage
4.	VinMin	10.0 V	Minimum input voltage
5.	Vout	30.0 V	Output Voltage
6.	Vout1	30.0 Volt	Output Voltage #1
7.	base_pn	LM3488	Base Product Number
8.	source	DC	Input Source Type
9.	Ta	-40.0 degC	Ambient temperature
10.	UserFsw	258.333 kHz	Customer Selected Frequency

Design Assistance

1. **LM3488** Product Folder : http://www.ti.com/product/lm3488 : contains the data sheet and other resources.