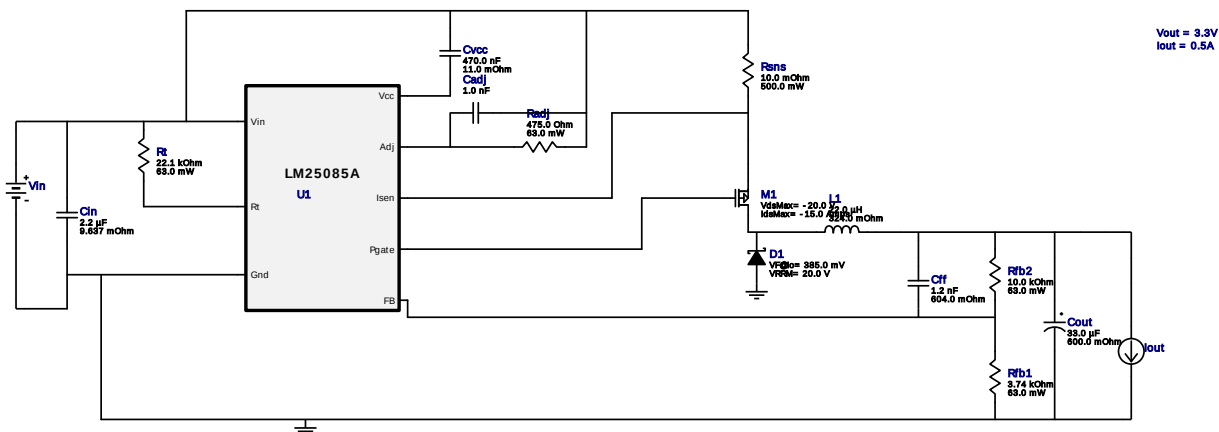


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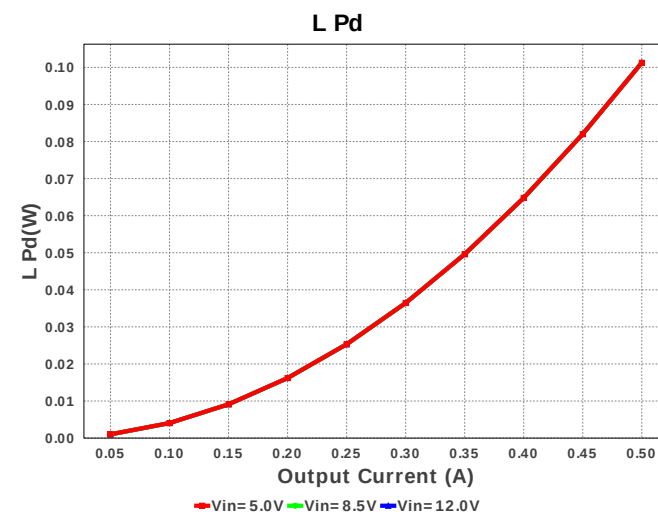
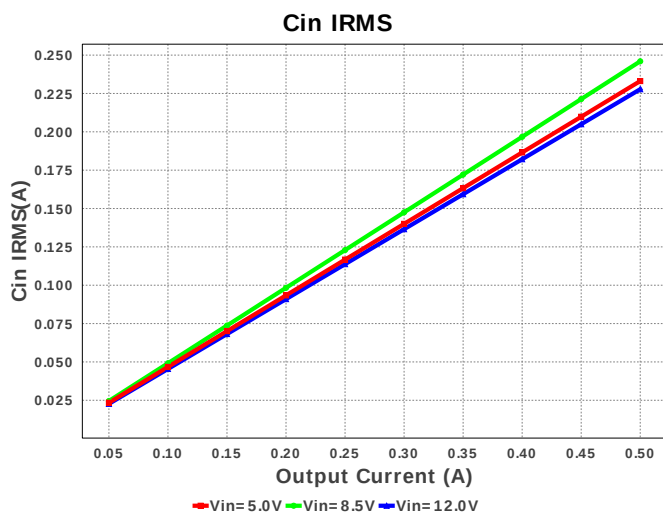
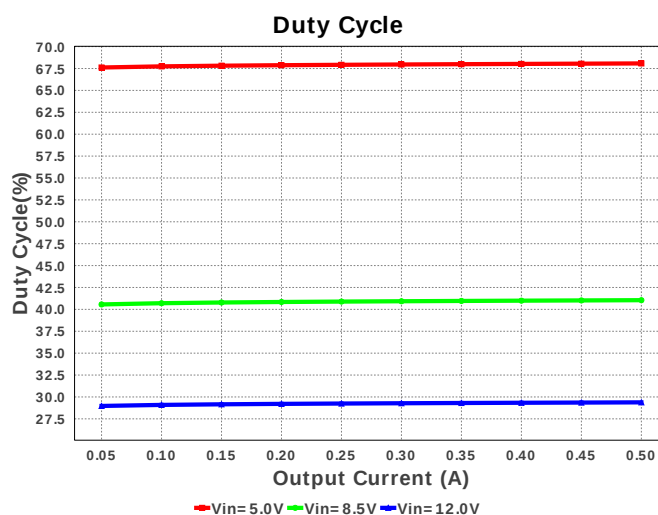
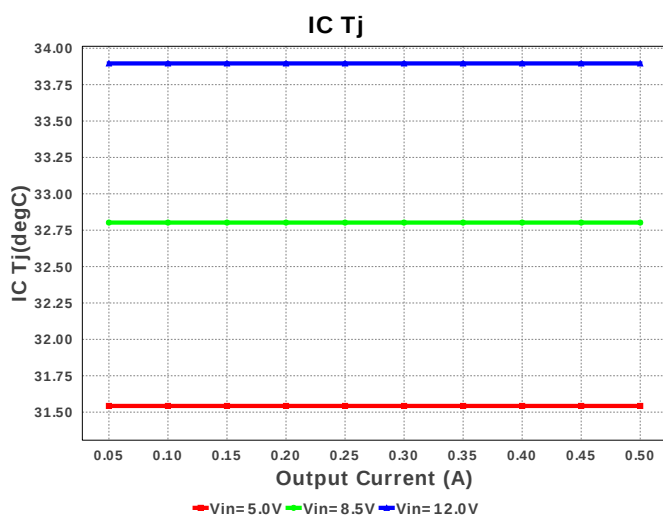
Design : 4372614/38 LM25085AMY/NOPB
LM25085AMY/NOPB 5.0V-12.0V to 3.30V @ 0.5A

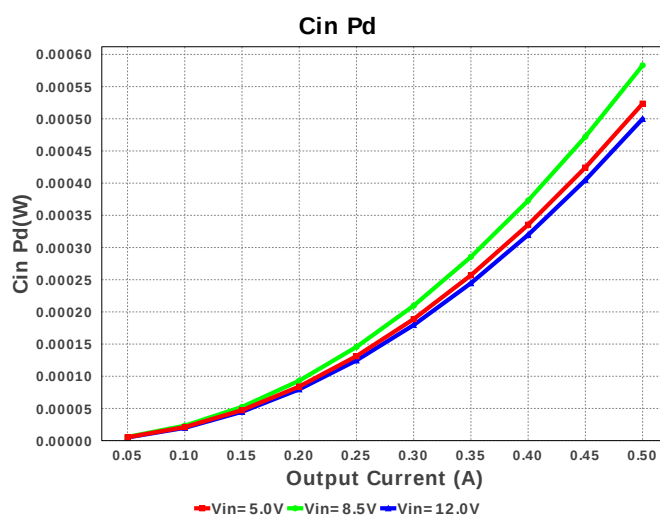
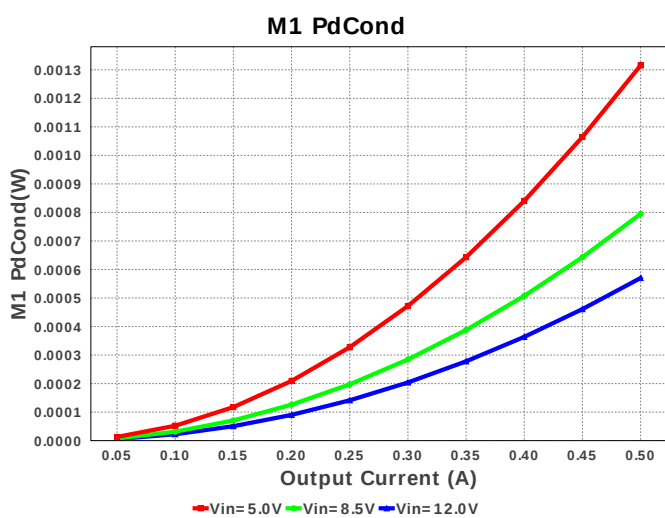
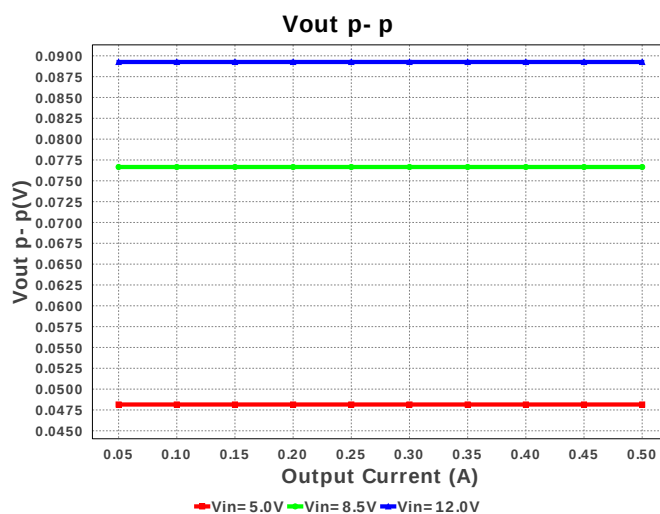
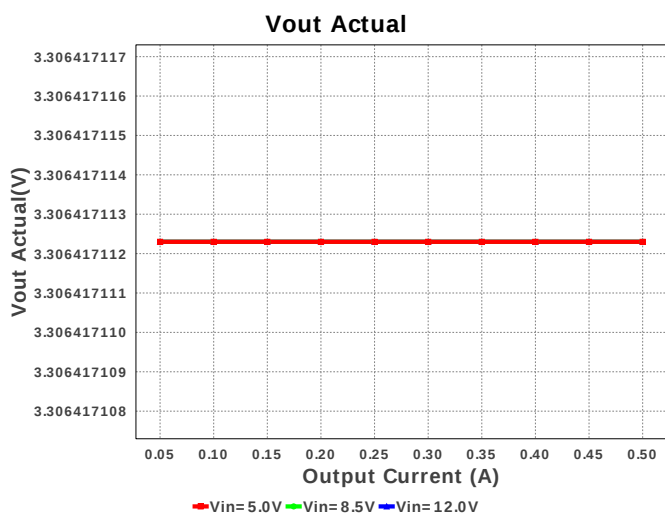
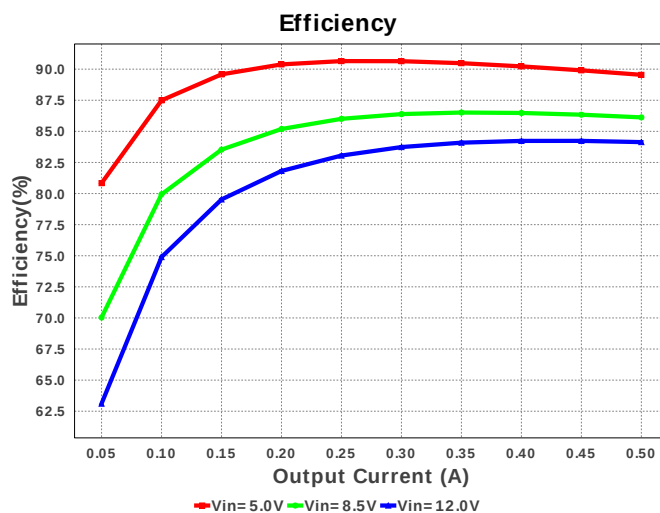
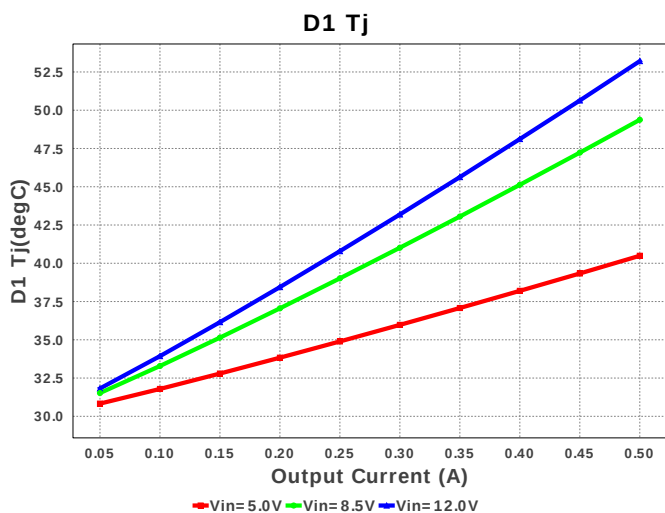


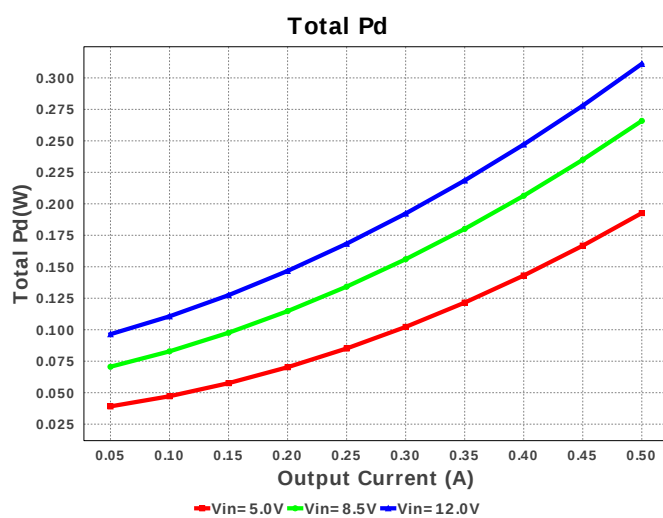
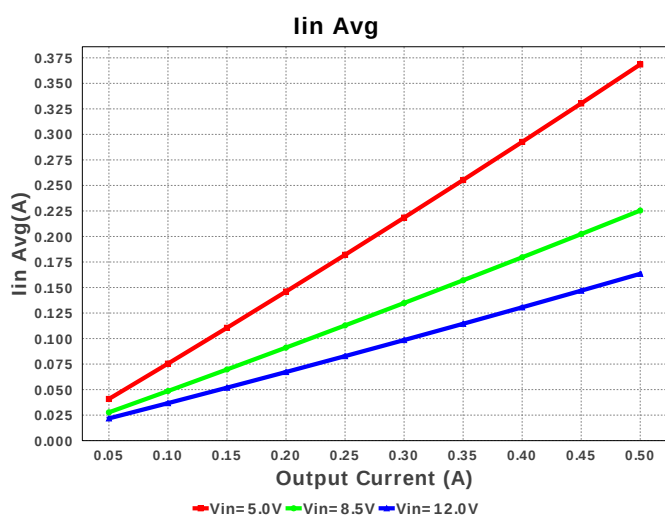
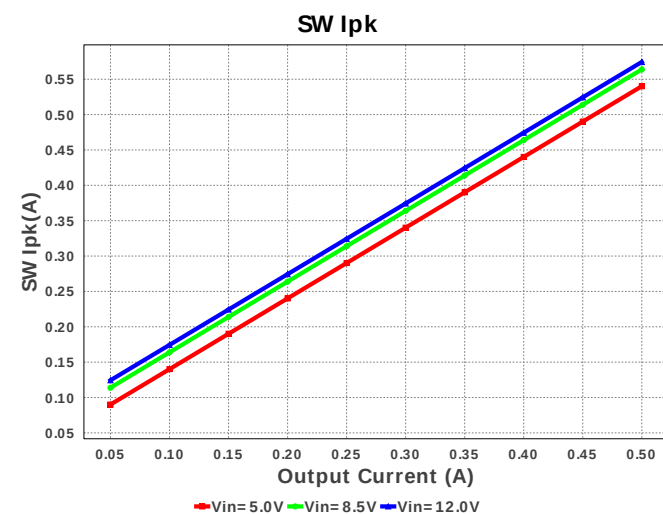
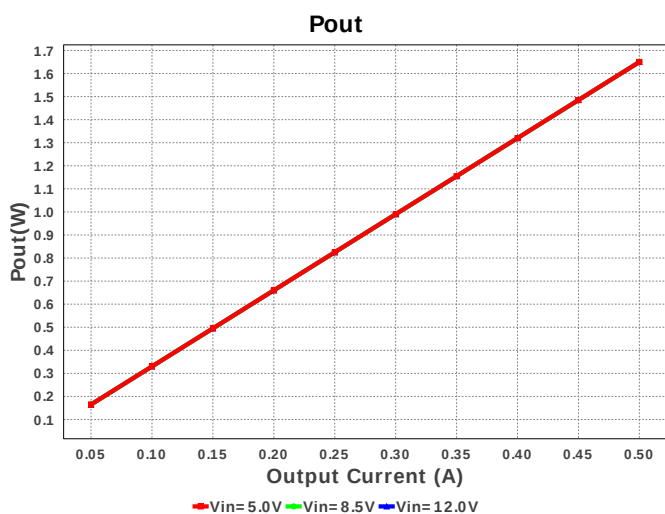
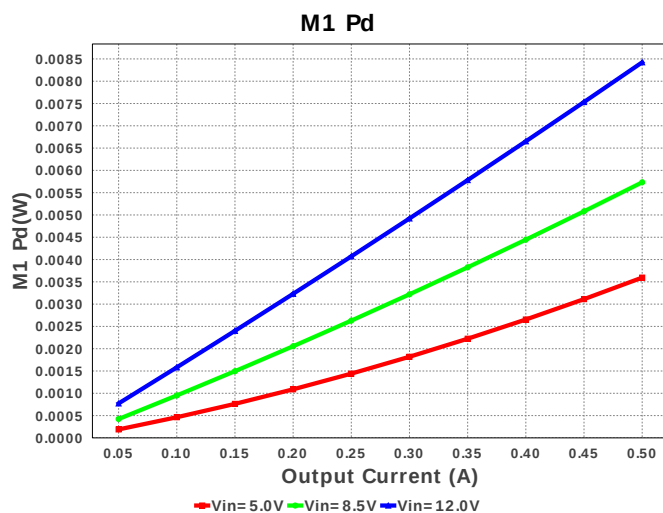
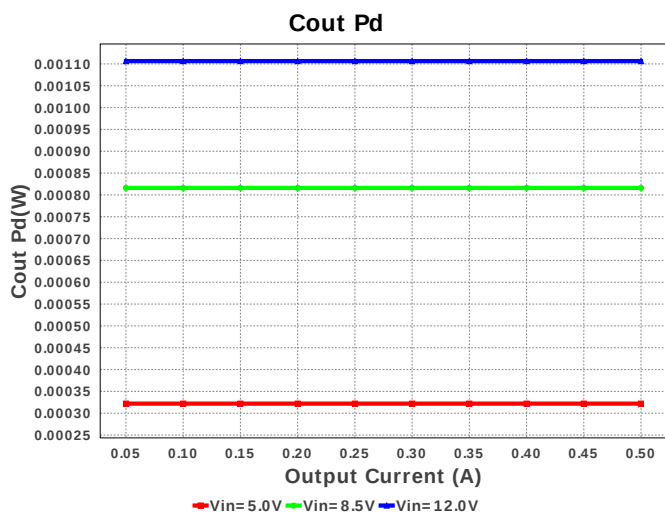
Electrical BOM

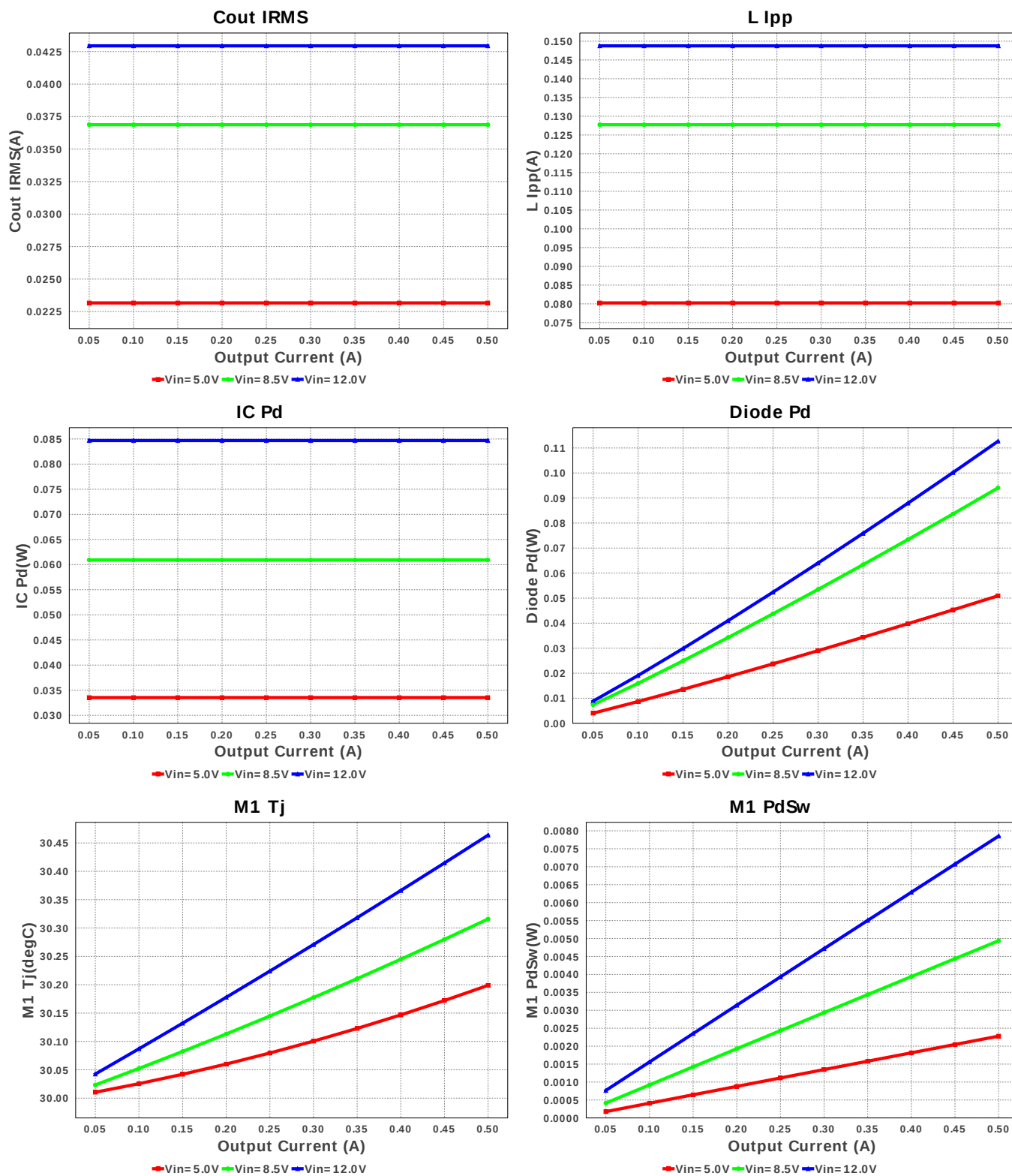
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cadj	Samsung Electro-Mechanics	CL21C102JBCNFNC Series= C0G/NP0	Cap= 1.0 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	0805 7 mm ²
2.	Cff	Kemet	C1206C122K5RACTU Series= X7R	Cap= 1.2 nF ESR= 604.0 mOhm VDC= 50.0 V IRMS= 164.0 mA	1	\$0.06	1206 11 mm ²
3.	Cin	MuRata	GRM188R61C225KE15D Series= X5R	Cap= 2.2 uF ESR= 9.637 mOhm VDC= 16.0 V IRMS= 1.20373 A	1	\$0.02	0603 5 mm ²
4.	Cout	AVX	TPSA336K006R0600 Series= TPS	Cap= 33.0 uF ESR= 600.0 mOhm VDC= 6.3 V IRMS= 318.0 mA	1	\$0.13	3216-18 11 mm ²
5.	Cvcc	AVX	0805YC474KAT2A Series= X7R	Cap= 470.0 nF ESR= 11.0 mOhm VDC= 16.0 V IRMS= 0.0 A	1	\$0.02	0805 7 mm ²
6.	D1	ON Semiconductor	MBR0520LT1G	VF@Io= 385.0 mV VRRM= 20.0 V	1	\$0.06	SOD-123 13 mm ²
7.	L1	Coilcraft	LPS4018-223MRB	L= 22.0 uH DCR= 324.0 mOhm	1	\$0.35	LPS4018 24 mm ²
8.	M1	Texas Instruments	CSD25402Q3A	VdsMax= -20.0 V IdsMax= -15.0 Amps	1	\$0.34	TRANS_NexFET_Q3A 18 mm ²
9.	Radj	Vishay-Dale	CRCW0402475RFKED Series= CRCW..e3	Res= 475.0 Ohm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
10.	Rfb1	Vishay-Dale	CRCW04023K74FKED Series= CRCW..e3	Res= 3.74 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
11.	Rfb2	Vishay-Dale	CRCW040210K0FKED Series= CRCW..e3	Res= 10.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm²
12.	Rsns	Stackpole Electronics Inc	CSR1206FK10L0 Series= ?	Res= 10.0 mOhm Power= 500.0 mW Tolerance= 1.0%	1	\$0.11	 1206 11 mm²
13.	Rt	Vishay-Dale	CRCW040222K1FKED Series= CRCW..e3	Res= 22.1 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm²
14.	U1	Texas Instruments	LM25085AMY/NOPB	Switcher	1	\$0.75	 MUY08A 24 mm²









Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	227.757 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	42.943 mA	Current	Output capacitor RMS ripple current
3.	Iin Avg	163.43 mA	Current	Average input current
4.	L Ipp	148.76 mA	Current	Peak-to-peak inductor ripple current
5.	SW Ipk	574.379 mA	Current	Peak switch current
6.	BOM Count	14	General	Total Design BOM count
7.	FootPrint	142.0 mm ²	General	Total Foot Print Area of BOM components
8.	Frequency	645.281 kHz	General	Switching frequency
9.	IC Tolerance	18.0 mV	General	IC Feedback Tolerance
10.	Pout	1.65 W	General	Total output power
11.	Total BOM	\$1.89	General	Total BOM Cost

#	Name	Value	Category	Description
12.	D1 Tj	53.21 degC	Op_Point	D1 junction temperature
13.	Vout Actual	3.306 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
14.	Vout OP	3.3 V	Op_Point	Operational Output Voltage
15.	Duty Cycle	29.383 %	Op_point	Duty cycle
16.	Efficiency	84.135 %	Op_point	Steady state efficiency
17.	IC Tj	33.896 degC	Op_point	IC junction temperature
18.	ICThetaJA	46.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
19.	IOUT_OP	500.0 mA	Op_point	Iout operating point
20.	M1 Tj	30.464 degC	Op_point	M1 MOSFET junction temperature
21.	VIN_OP	12.0 V	Op_point	Vin operating point
22.	Vout p-p	89.259 mV	Op_point	Peak-to-peak output ripple voltage
23.	Cin Pd	499.904 μW	Power	Input capacitor power dissipation
24.	Cout Pd	1.106 mW	Power	Output capacitor power dissipation
25.	Diode Pd	112.669 mW	Power	Diode power dissipation
26.	IC Pd	84.69 mW	Power	IC power dissipation
27.	L Pd	101.25 mW	Power	Inductor power dissipation
28.	M1 Pd	8.423 mW	Power	M1 MOSFET total power dissipation
29.	M1 PdCond	569.464 μW	Power	M1 MOSFET conduction losses
30.	M1 PdSw	7.853 mW	Power	M1 MOSFET switching losses
31.	Total Pd	311.138 mW	Power	Total Power Dissipation
32.	Vout Tolerance	3.5 %		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	12.0	Maximum input voltage
3.	VinMin	5.0	Minimum input voltage
4.	Vout	3.3	Output Voltage
5.	base_pn	LM25085A	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	30.0	Ambient temperature

Design Assistance

1. For a Constant On Time device to be stable, we need to provide a ripple at the feedback comparator. There are various methods to implement the ripple. Depending on the circuit complexity vs. the allowable ripple, we have three options to choose from. The simplest option, 'Low Complexity', would require only a high ESR cap at the output. This means that the BOM count will be small, but the output voltage ripple will be quite large. The 'optimal solution' would require a feed-forward cap in parallel with the upper feedback resistor to AC couple the ripple to the feedback node. This increases the BOM count slightly, but now we have more control over the output voltage ripple. If the output voltage requirement is very tight, then the best option is to go for the 'Low Output Ripple' solution. In this option we can go with very low ESR output caps and have very good control over the output voltage ripple

2. **LM25085A Product Folder** : <http://www.ti.com/product/LM25085A> : contains the data sheet and other resources.

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You should completely validate and test your design implementation to confirm the system functionality for your application prior to production.

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