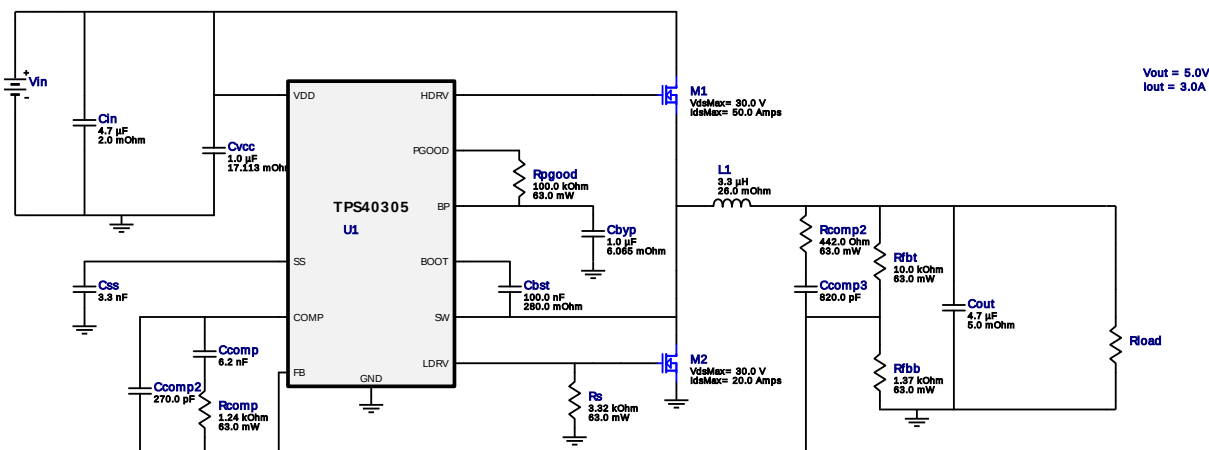
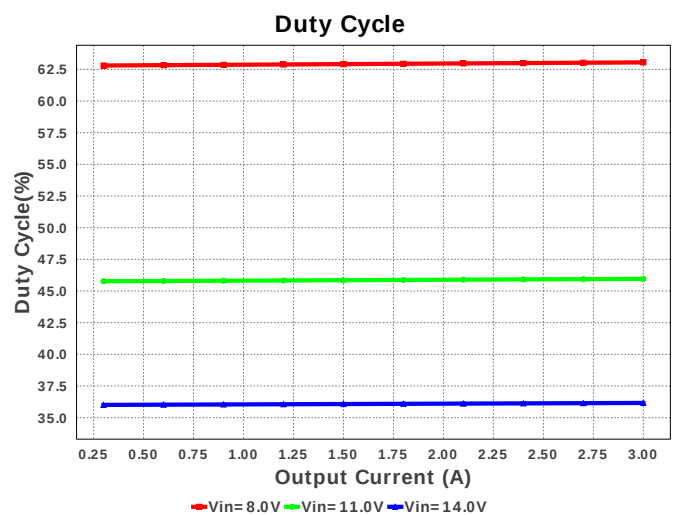
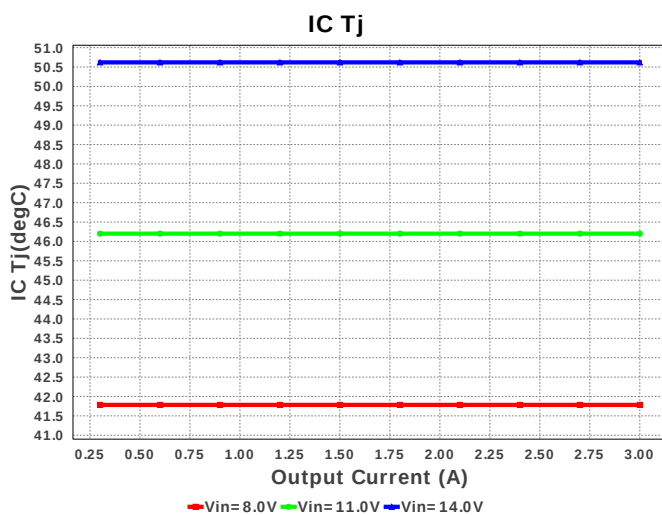


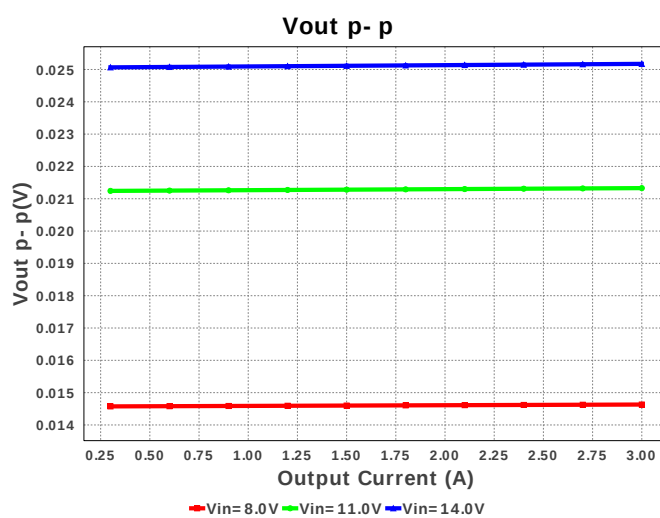
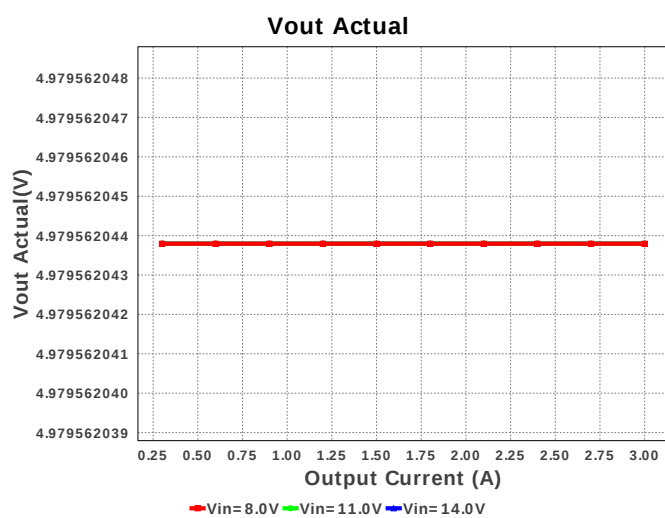
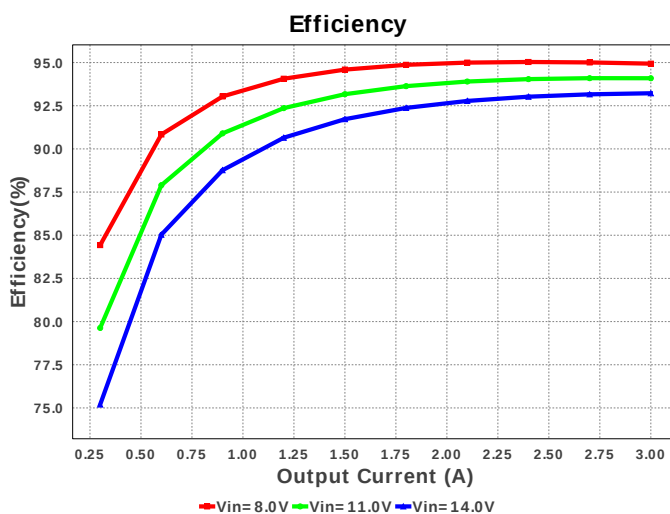
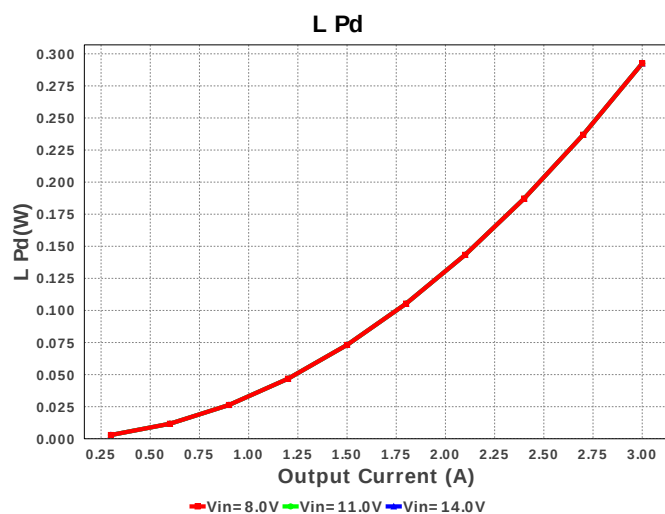
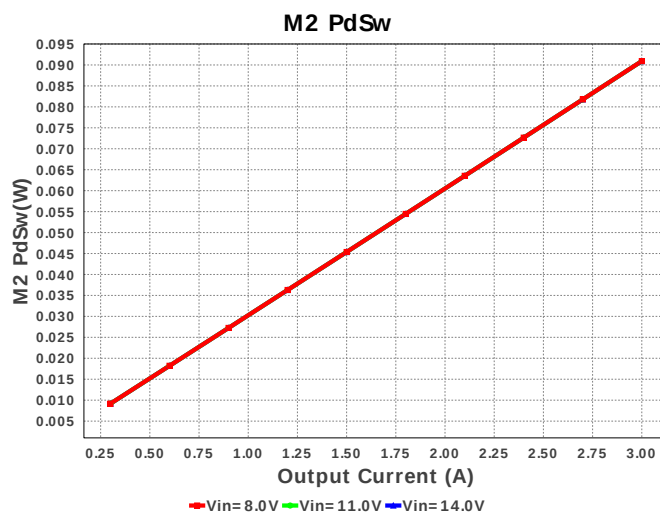
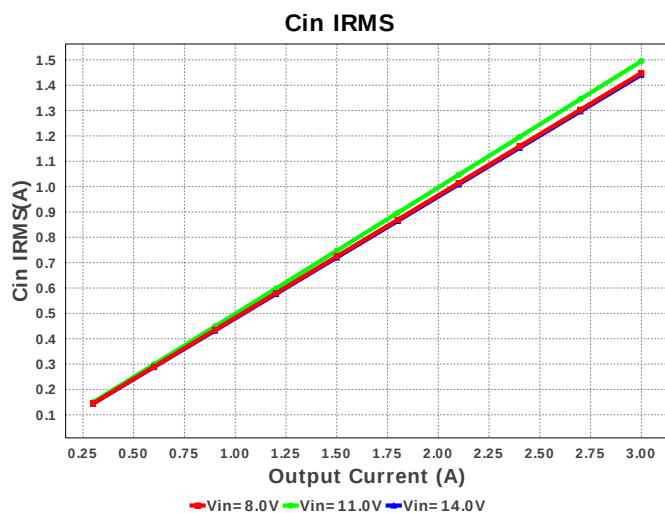


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Topology = Buck
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BOM Cost = \$2.23
BOM Count = 19
Total Pd = 1.09W

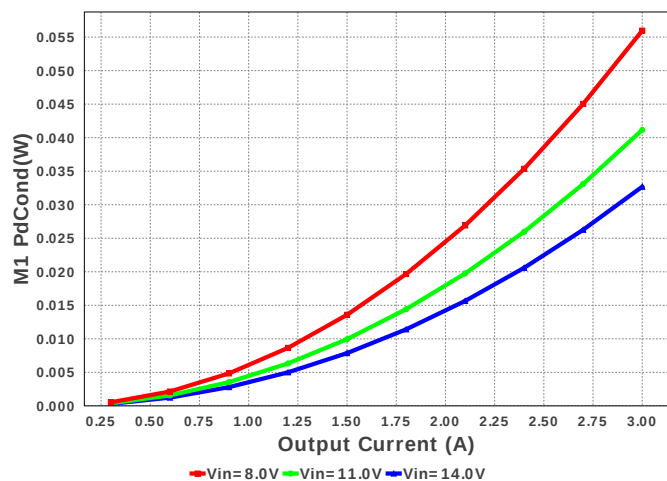


#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
11. M1		Texas Instruments	CSD17308Q3	VdsMax= 30.0 V IdsMax= 50.0 Amps	1	\$0.28	 TRANS_NexFET_Q3 18 mm²
12. M2		Texas Instruments	CSD17579Q3A	VdsMax= 30.0 V IdsMax= 20.0 Amps	1	\$0.19	 TRANS_NexFET_Q3A 18 mm²
13. Rcomp		Vishay-Dale	CRCW04021K24FKED Series= CRCW..e3	Res= 1.24 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm²
14. Rcomp2		Vishay-Dale	CRCW0402442RFKED Series= CRCW..e3	Res= 442.0 Ohm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm²
15. Rfbb		Vishay-Dale	CRCW04021K37FKED Series= CRCW..e3	Res= 1.37 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm²
16. Rfbt		Vishay-Dale	CRCW040210K0FKED Series= CRCW..e3	Res= 10.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm²
17. Rpgood		Vishay-Dale	CRCW0402100KFKED Series= CRCW..e3	Res= 100.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm²
18. Rs		Vishay-Dale	CRCW04023K32FKED Series= CRCW..e3	Res= 3.32 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm²
19. U1		Texas Instruments	TPS40305DRCR	Switcher	1	\$0.85	 S-PVSON-N10 17 mm²

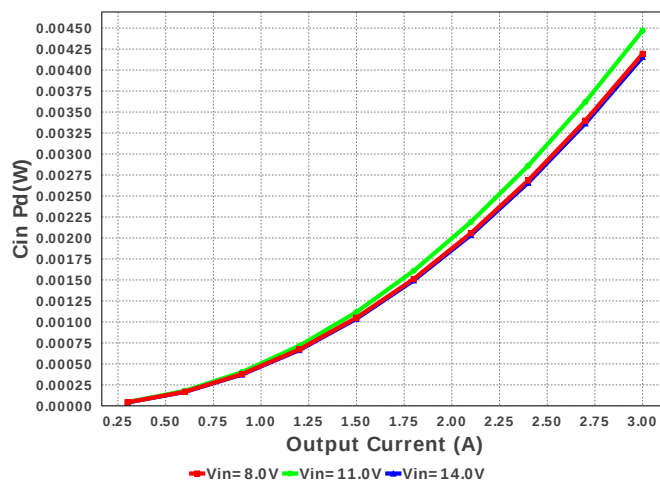




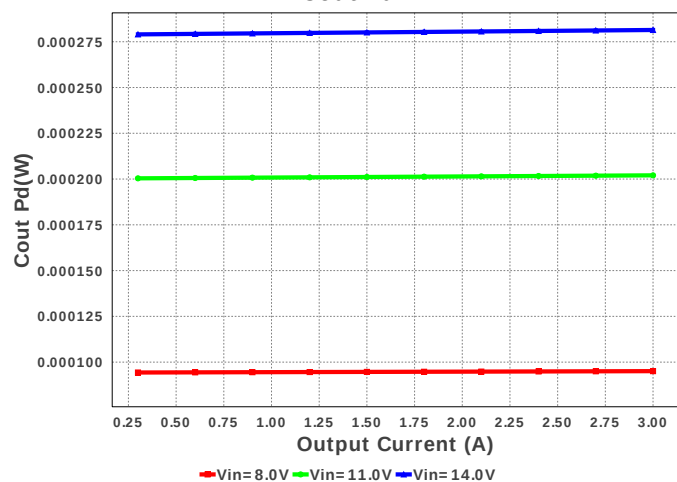
M1 PdCond



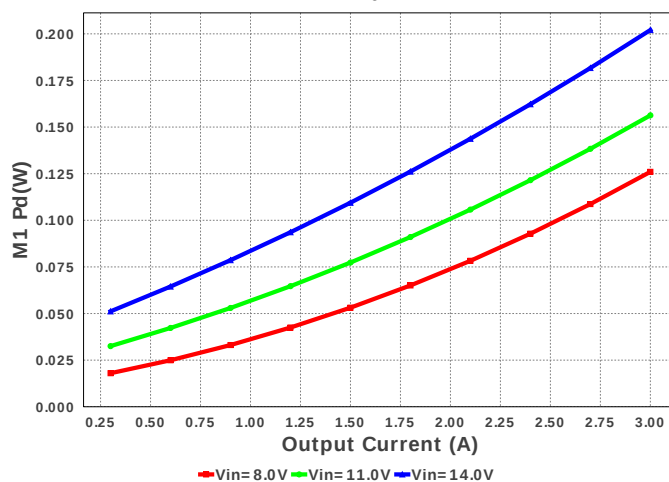
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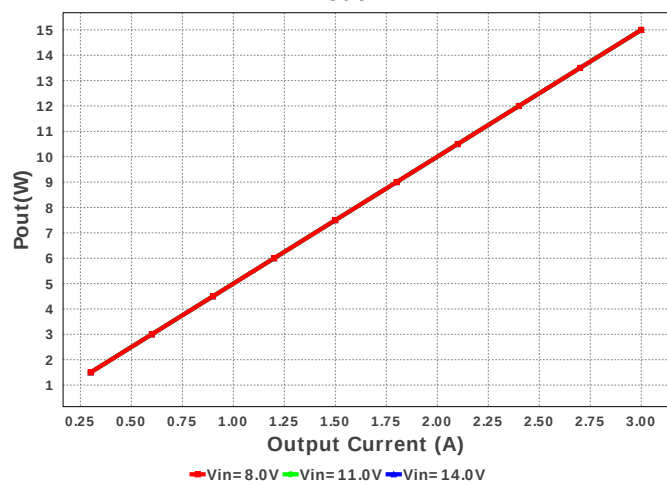
Cout Pd



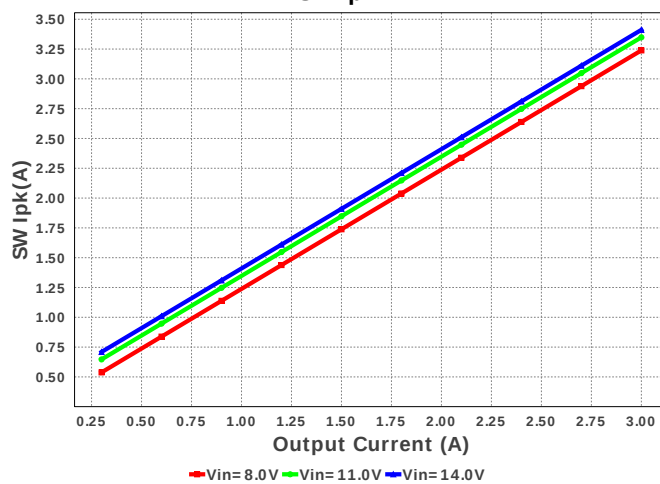
M1 Pd

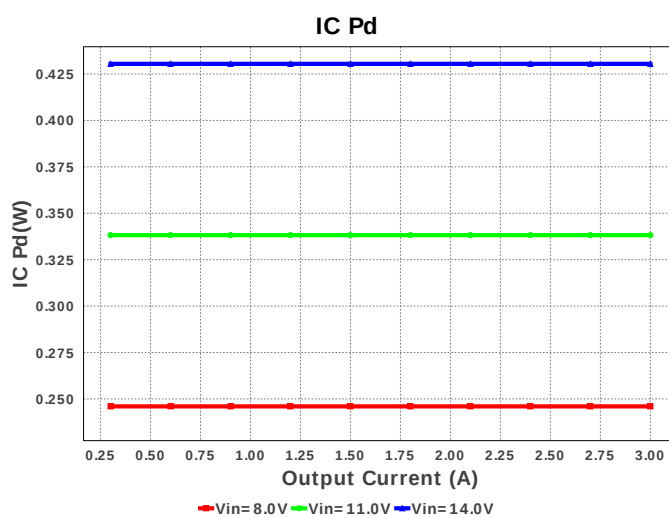
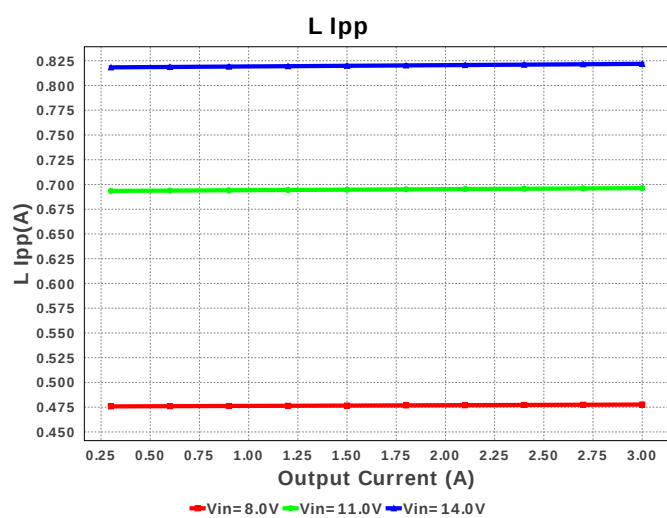
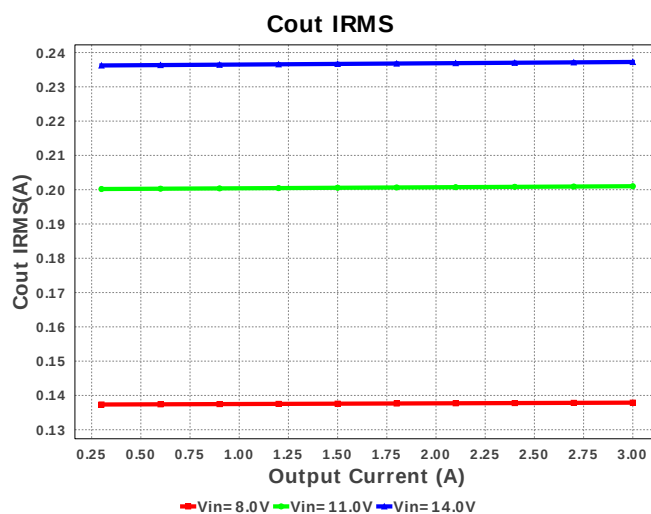
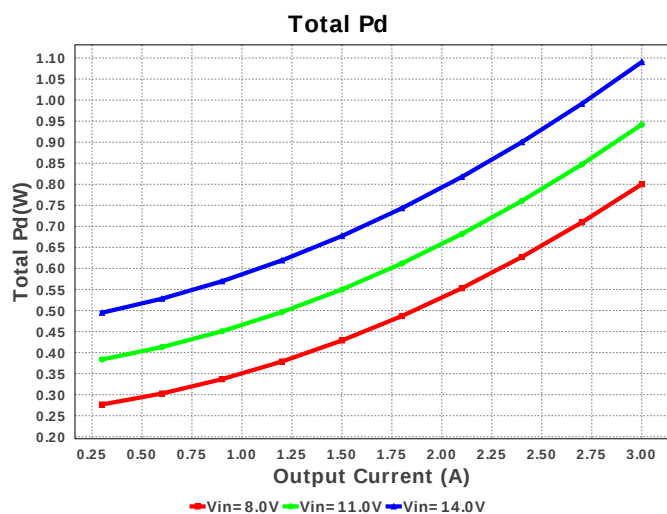
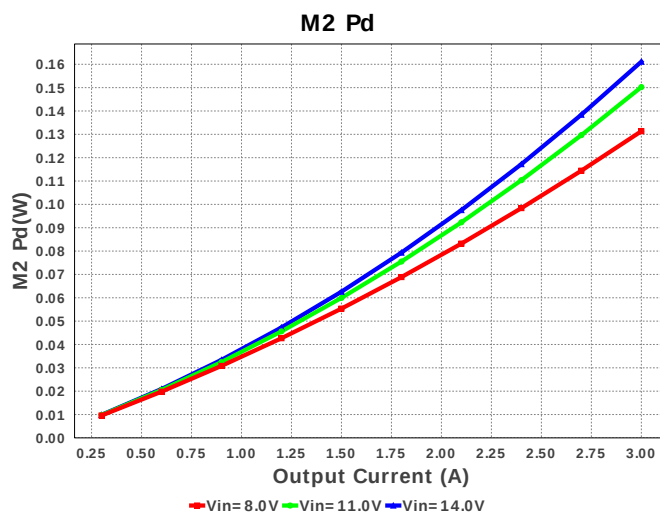
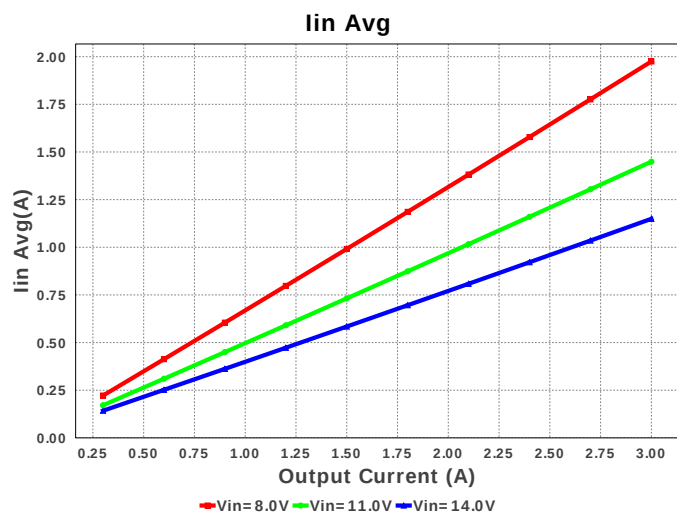


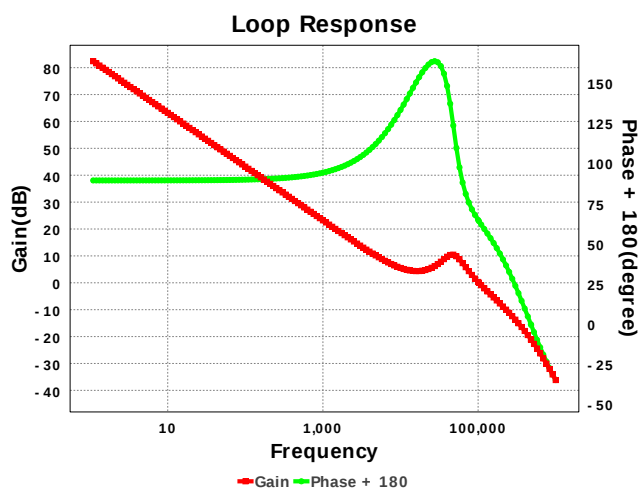
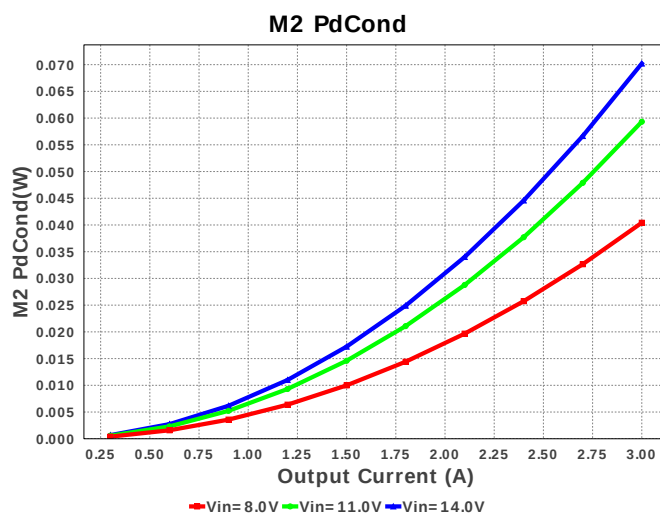
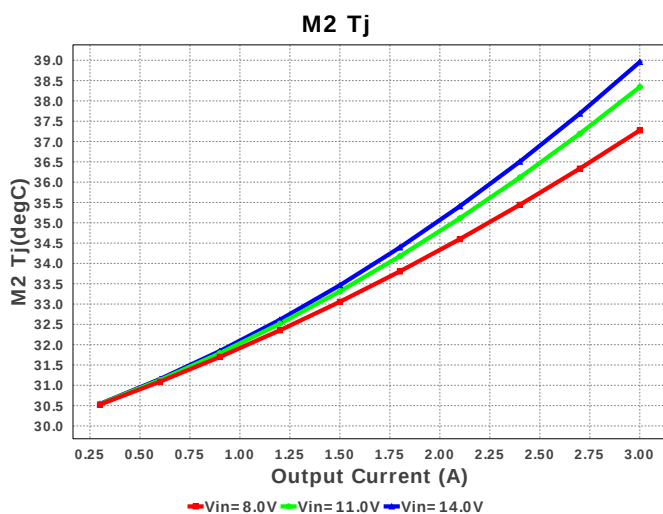
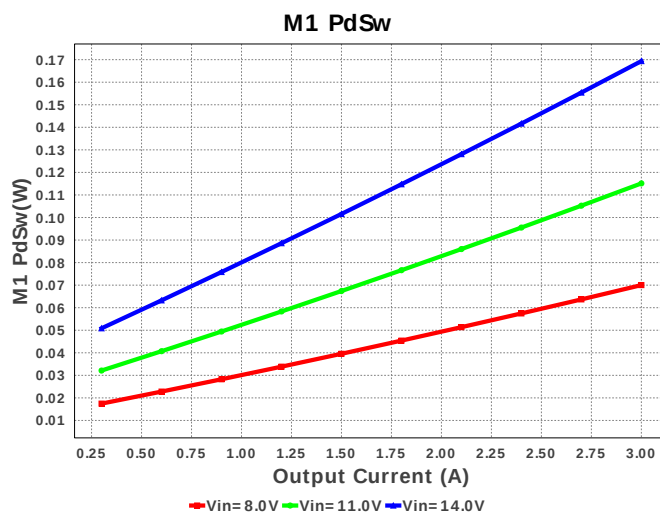
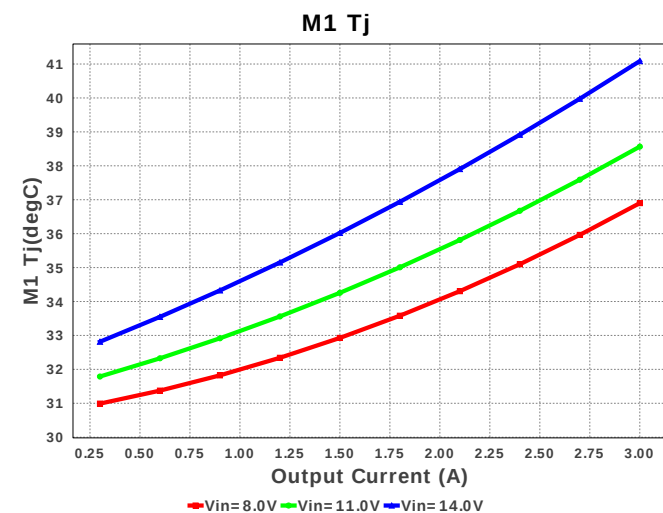
Pout



SW Ipk







Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	1.441 A	Current	Input capacitor RMS ripple current
2.	Cout IRMS	237.243 mA	Current	Output capacitor RMS ripple current
3.	Iin Avg	1.149 A	Current	Average input current
4.	L Ipp	821.83 mA	Current	Peak-to-peak inductor ripple current
5.	SW Ipk	3.411 A	Current	Peak switch current
6.	BOM Count	19	General	Total Design BOM count
7.	FootPrint	147.0 mm ²	General	Total Foot Print Area of BOM components
8.	Frequency	1.2 MHz	General	Switching frequency
9.	IC Tolerance	10.0 mV	General	IC Feedback Tolerance
10.	Mode	CCM	General	Conduction Mode
11.	Pout	15.0 W	General	Total output power

#	Name	Value	Category	Description
12.	Total BOM	\$2.23	General	Total BOM Cost
13.	Low Freq Gain	82.447 dB	Op_Point	Gain at 10Hz
14.	Vout Actual	4.98 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
15.	Cross Freq	102.548 kHz	Op_point	Bode plot crossover frequency
16.	Duty Cycle	36.161 %	Op_point	Duty cycle
17.	Efficiency	93.22 %	Op_point	Steady state efficiency
18.	Gain Marg	-21.162 dB	Op_point	Bode Plot Gain Margin
19.	IC Tj	50.62 degC	Op_point	IC junction temperature
20.	IOUT_OP	3.0 A	Op_point	Iout operating point
21.	M1 Tj	41.086 degC	Op_point	M1 MOSFET junction temperature
22.	M2 Tj	38.958 degC	Op_point	M2 MOSFET junction temperature
23.	Phase Marg	64.292 deg	Op_point	Bode Plot Phase Margin
24.	VIN_OP	14.0 V	Op_point	Vin operating point
25.	Vout p-p	25.174 mV	Op_point	Peak-to-peak output ripple voltage
26.	Cin Pd	4.155 mW	Power	Input capacitor power dissipation
27.	Cout Pd	281.421 μ W	Power	Output capacitor power dissipation
28.	IC Pd	430.472 mW	Power	IC power dissipation
29.	L Pd	292.5 mW	Power	Inductor power dissipation
30.	M1 Pd	202.127 mW	Power	M1 MOSFET total power dissipation
31.	M1 PdCond	32.765 mW	Power	M1 MOSFET conduction losses
32.	M1 PdSw	169.361 mW	Power	M1 MOSFET switching losses
33.	M2 Pd	161.449 mW	Power	M2 MOSFET total power dissipation
34.	M2 PdCond	70.537 mW	Power	M2 MOSFET conduction losses
35.	M2 PdSw	90.912 mW	Power	M2 MOSFET switching losses
36.	Total Pd	1.091 W	Power	Total Power Dissipation
37.	Vout Tolerance	3.473 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	3.0	Maximum Output Current
2.	VinMax	14.0	Maximum input voltage
3.	VinMin	8.0	Minimum input voltage
4.	Vout	5.0	Output Voltage
5.	base_pn	TPS40305	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	30.0	Ambient temperature

Design Assistance

1. **TPS40305** Product Folder : <http://www.ti.com/product/TPS40305> : contains the data sheet and other resources.

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