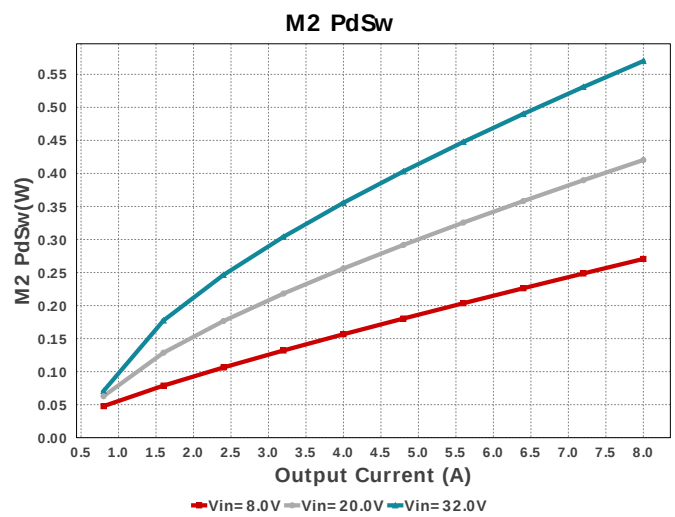
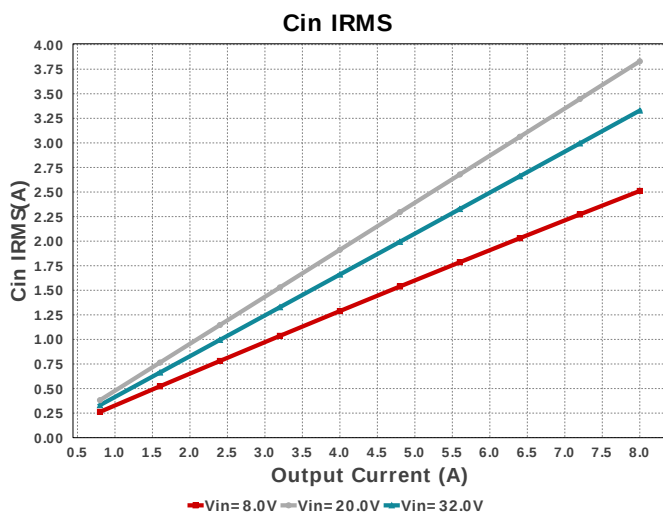
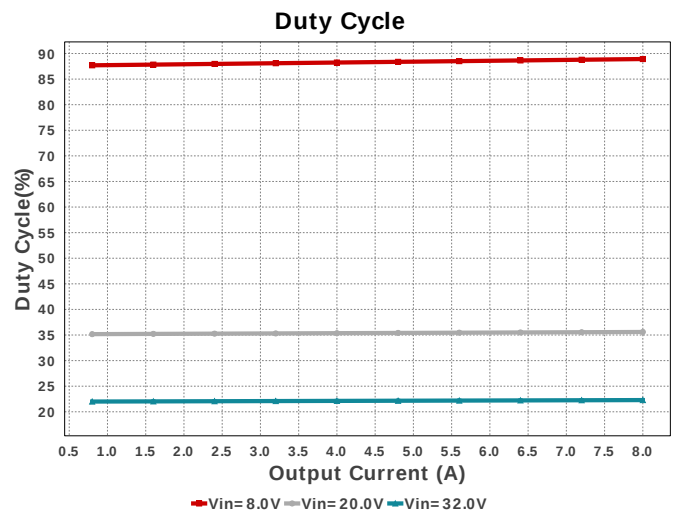
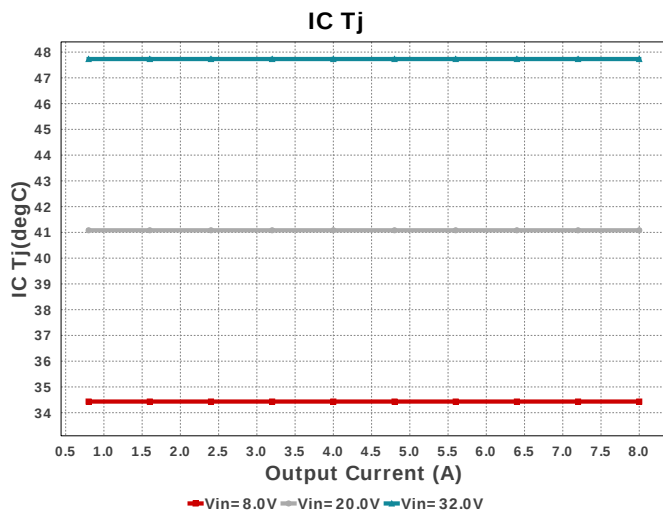
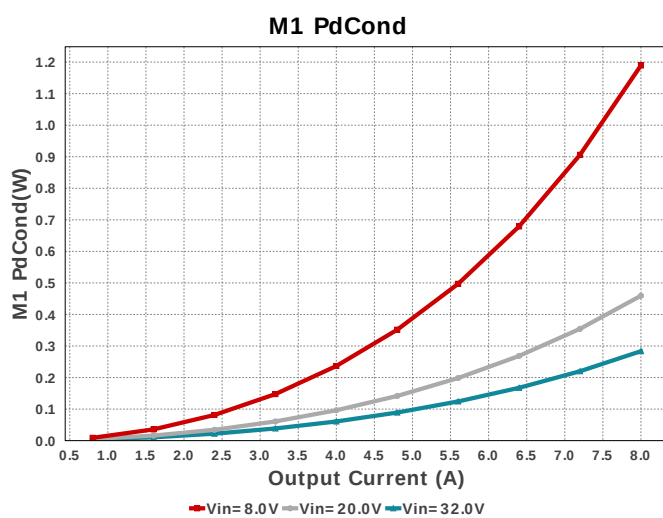
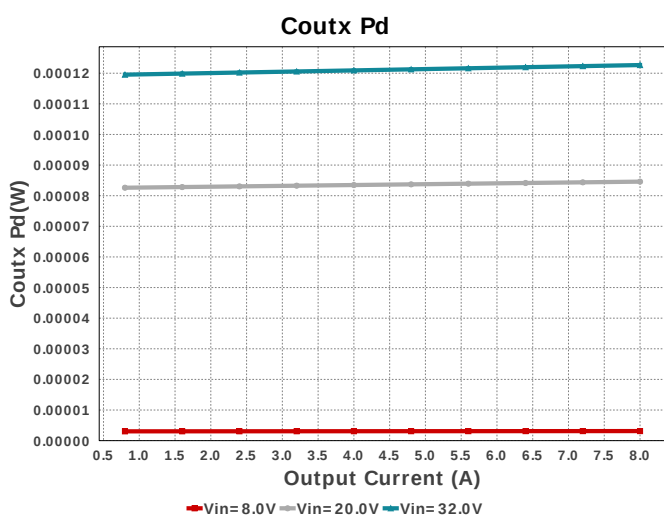
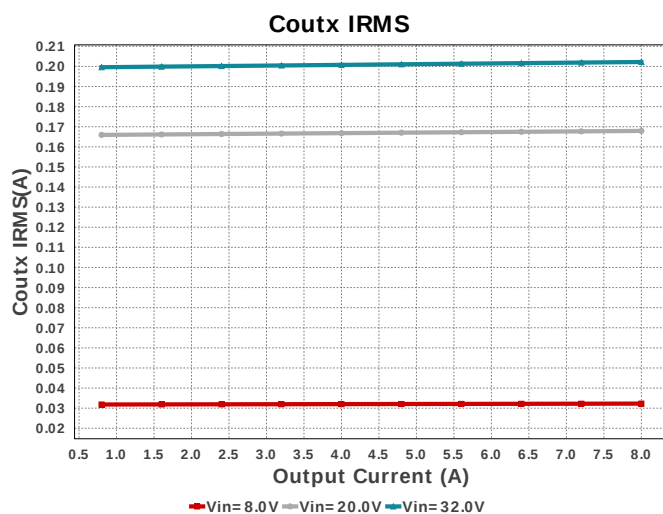
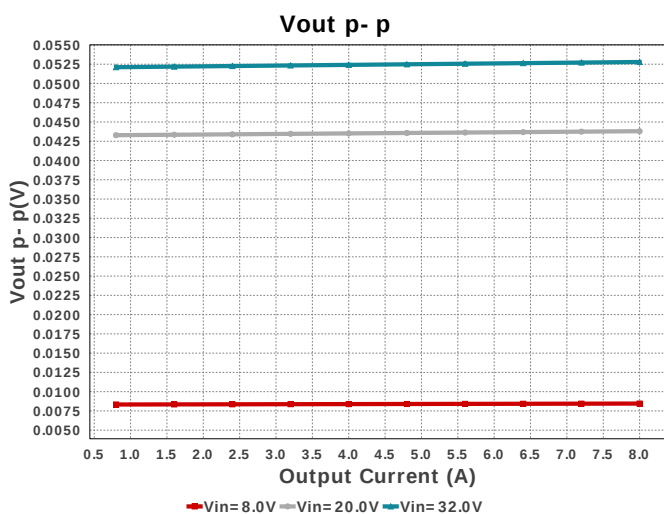
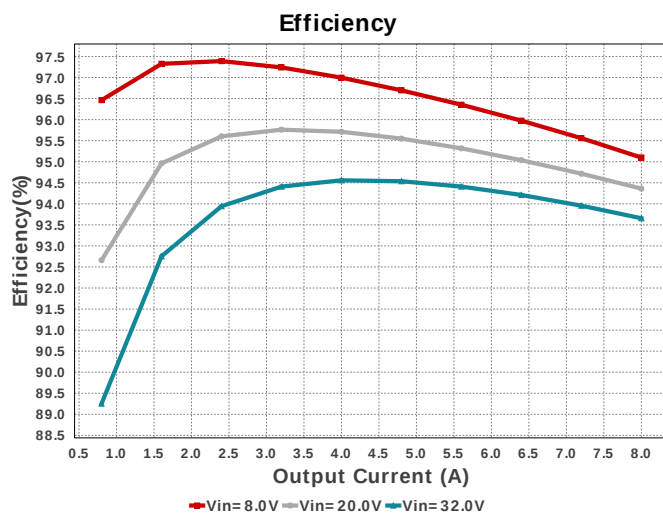
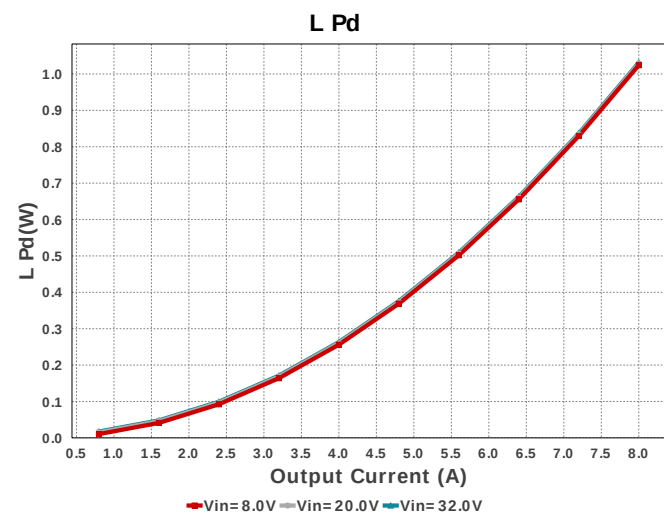


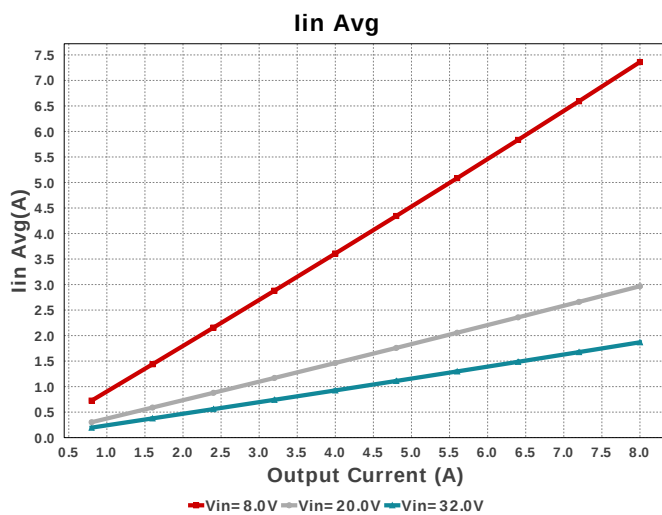
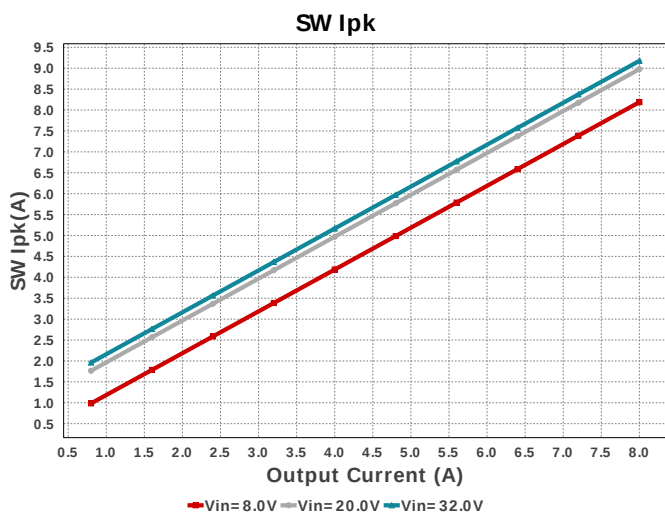
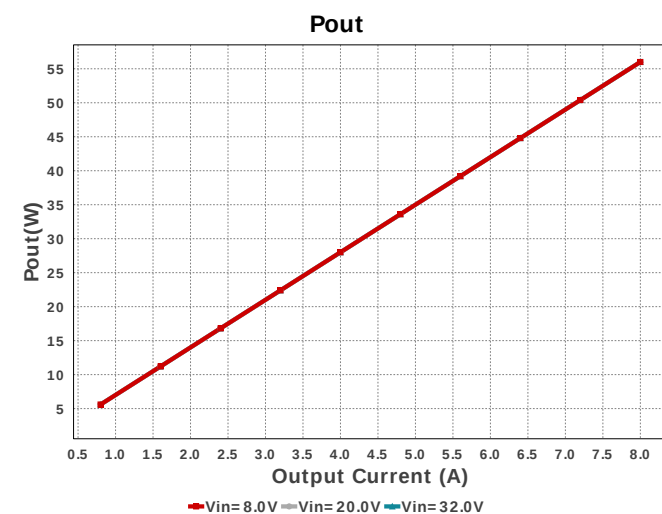
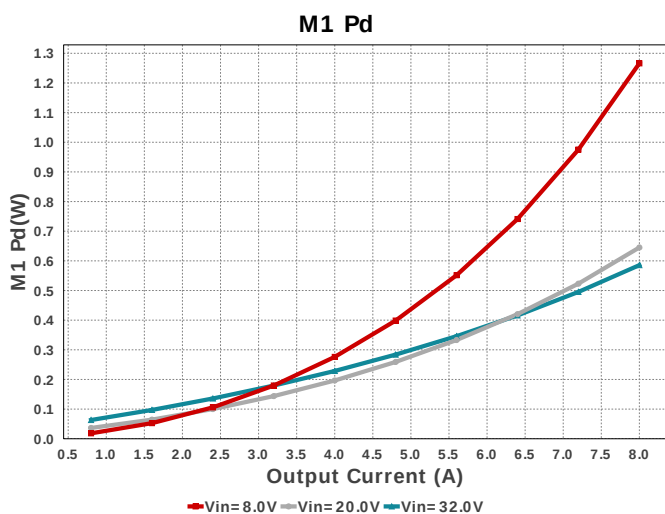
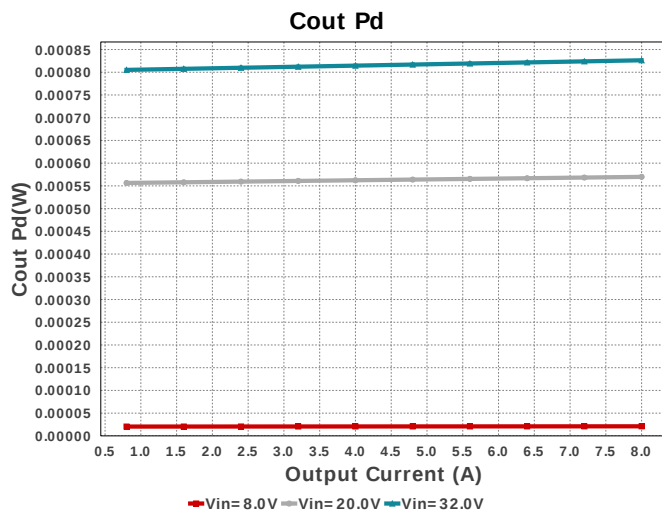
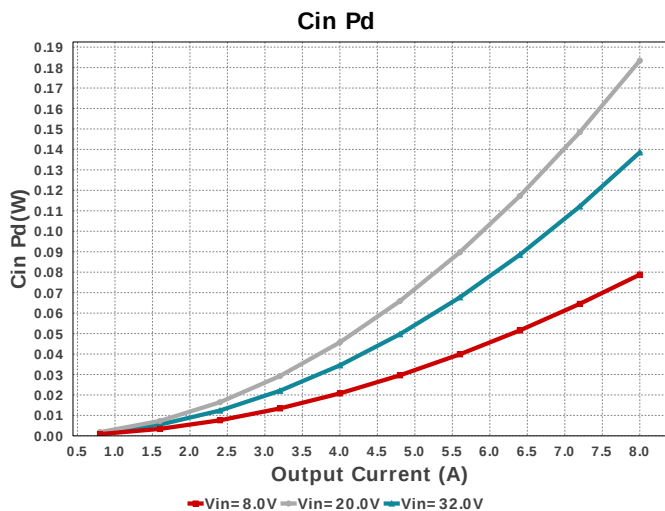
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Topology = Buck
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BOM 비용 = \$5.72
BOM 부품수 = 29
Total Pd = 3.78W

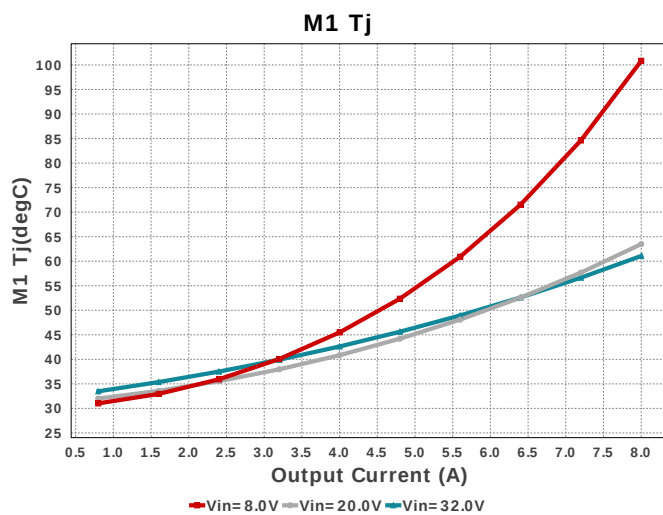
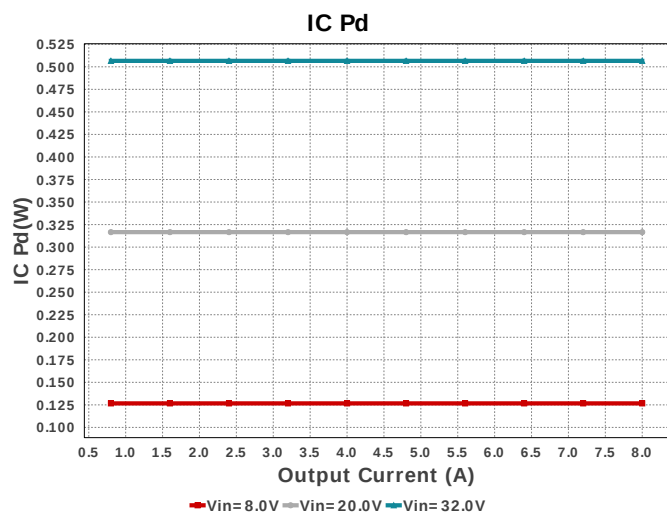
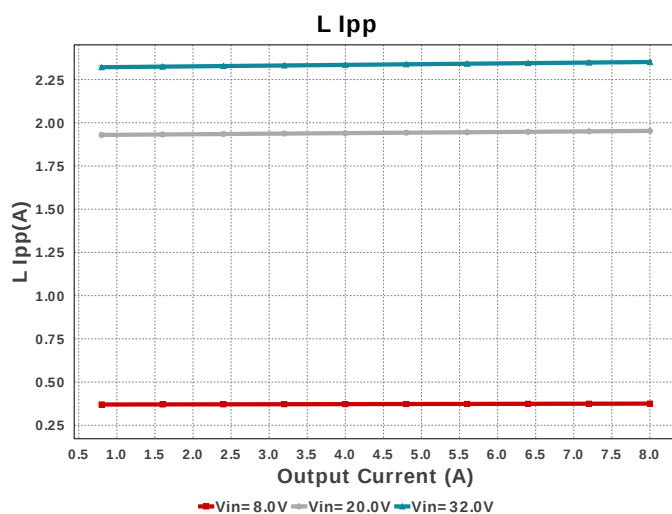
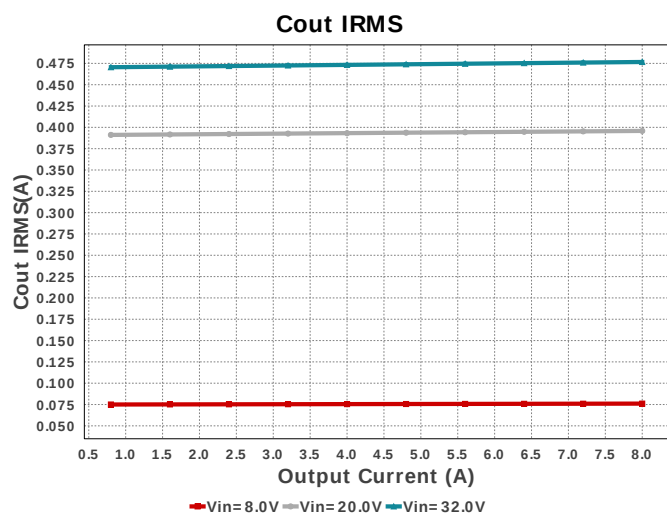
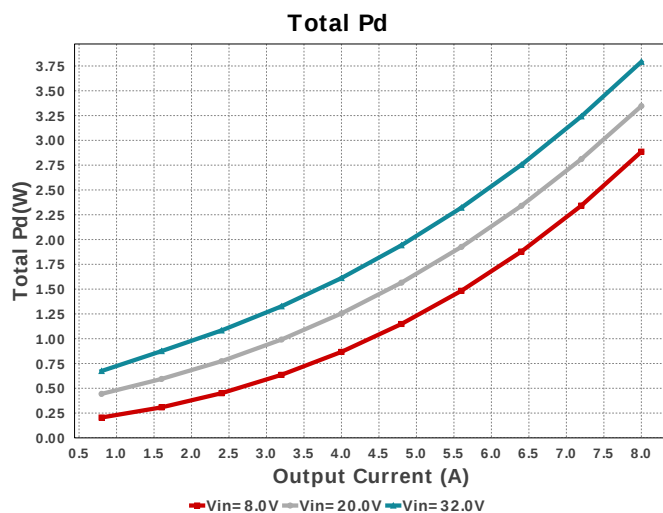
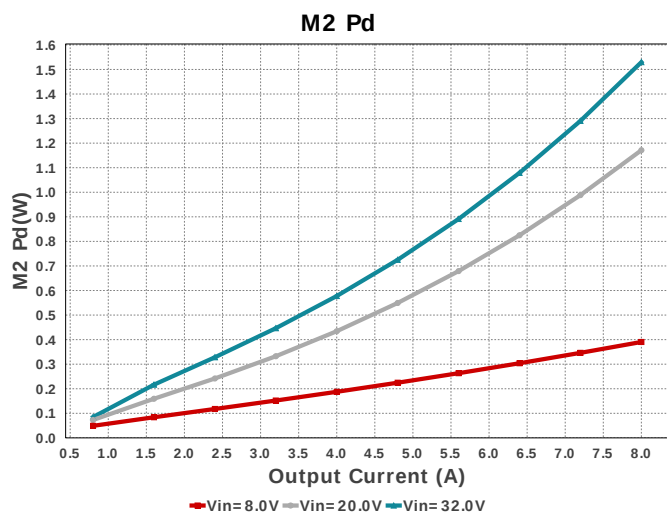
#	명칭	생산업체	부품번호	특성	Qty	Price	점유면적
9.	Cout	MuRata	GRM31CR61A226KE19L Series= X5R	Cap= 22.0 uF ESR= 3.637 mOhm VDC= 10.0 V IRMS= 3.56456 A	1	\$0.08	 1206_190 11 mm ²
10.	Coutx	Kemet	C0805C106K8PACTU Series= X5R	Cap= 10.0 uF ESR= 3.0 mOhm VDC= 10.0 V IRMS= 11.43 A	1	\$0.02	 0805 7 mm ²
11.	Css	MuRata	GRM033R70J222KA01D Series= X7R	Cap= 2.2 nF ESR= 1.0 mOhm VDC= 6.3 V IRMS= 0.0 A	1	\$0.01	 0201 2 mm ²
12.	Cvdd	Taiyo Yuden	EMK107B7105KA-T Series= X7R	Cap= 1.0 uF ESR= 1.0 mOhm VDC= 16.0 V IRMS= 0.0 A	1	\$0.01	 0603 5 mm ²
13.	Cvin	AVX	08055C105KAT2A Series= X7R	Cap= 1.0 uF ESR= 1.0 mOhm VDC= 50.0 V IRMS= 0.0 A	1	\$0.06	 0805 7 mm ²
14.	L1	Bourns	SRP1250-6R8M	L= 6.8 uH DCR= 16.0 mOhm	1	\$0.65	 SRP1250 253 mm ²
15.	M1	Texas Instruments	CSD18543Q3A	VdsMax= 60.0 V IdsMax= 35.0 Amps	1	\$0.27	 DNH0008A 18 mm ²
16.	M2	Texas Instruments	CSD19537Q3	VdsMax= 100.0 V IdsMax= 50.0 Amps	1	\$0.41	 DQG0008A 18 mm ²
17.	Rcomp	Vishay-Dale	CRCW0402634RFKED Series= CRCW..e3	Res= 634.0 Ohm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
18.	Rcomp2	Vishay-Dale	CRCW0402487RFKED Series= CRCW..e3	Res= 487.0 Ohm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
19.	Rcs	Vishay-Dale	CRCW040234K0FKED Series= CRCW..e3	Res= 34.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
20.	Renb	Vishay-Dale	CRCW040210K2FKED Series= CRCW..e3	Res= 10.2 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
21.	Rent	Vishay-Dale	CRCW040230K9FKED Series= CRCW..e3	Res= 30.9 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
22.	Rfbb	Vishay-Dale	CRCW0402931RFKED Series= CRCW..e3	Res= 931.0 Ohm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
23.	Rfbb	Susumu Co Ltd	RR1220P-103-D Series= RR12	Res= 10.0 kOhm Power= 100.0 mW Tolerance= 0.5%	1	\$0.01	 0805 7 mm ²
24.	Rpgood	Vishay-Dale	CRCW0402100KFKED Series= CRCW..e3	Res= 100.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
25.	Rscp	Vishay-Dale	CRCW04029K76FKED Series= CRCW..e3	Res= 9.76 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
26.	Rt	Vishay-Dale	CRCW040226K7FKED Series= CRCW..e3	Res= 26.7 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²

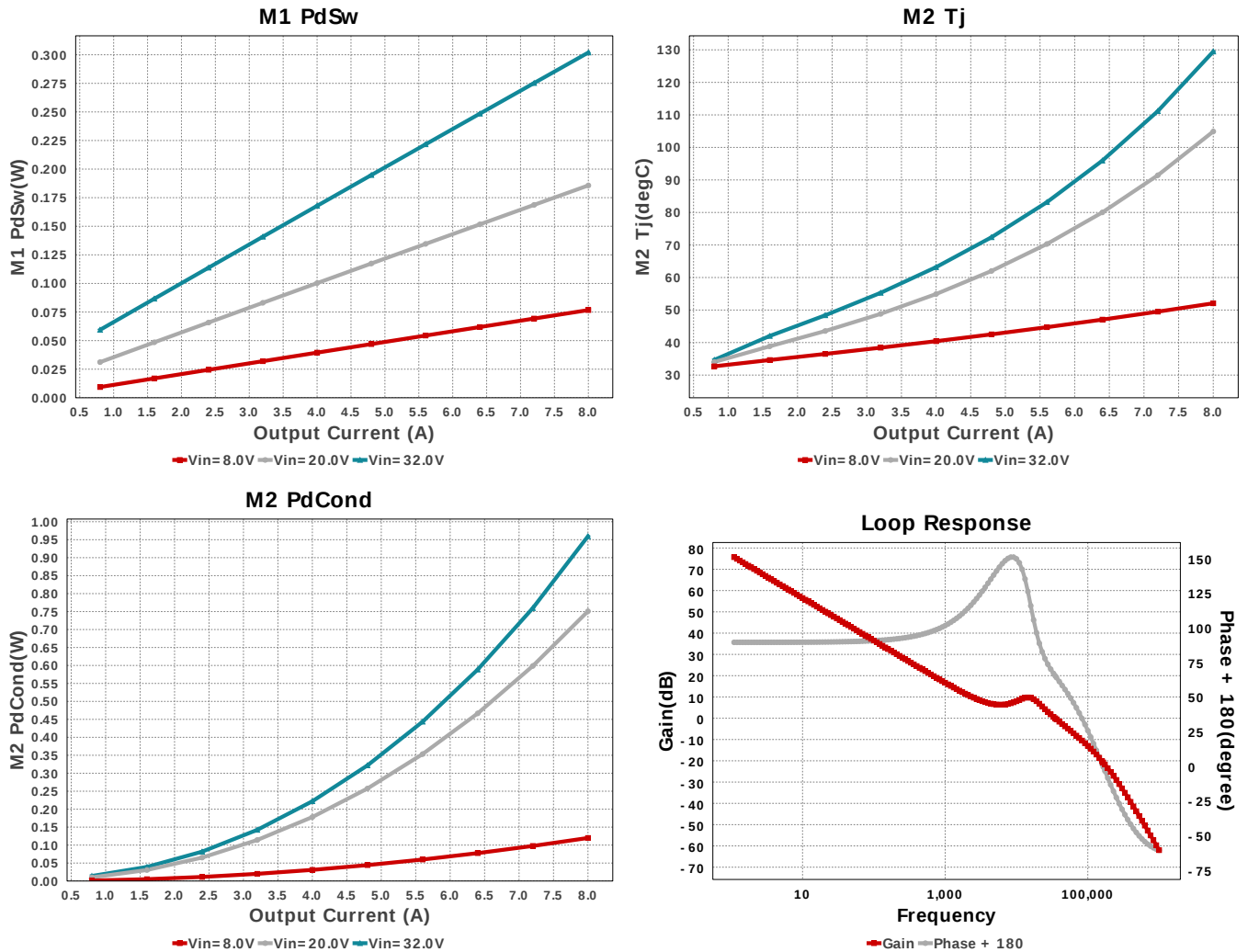
#	명칭	생산업체	부품번호	특성	Qty	Price	점유면적
27.	Rtrk	Vishay-Dale	CRCW04029K76FKED Series= CRCW..e3	Res= 9.76 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
28.	U1	Texas Instruments	TPS40170RGYR	Switcher	1	\$2.40	RGY0020A 25 mm ²











작동 값

#	명칭	값	구분	설명
1.	Cin IRMS	3.329 A	Current	입력 캐패시터 RMS 리플 전류
2.	Cout IRMS	476.647 mA	Current	출력 캐패시터 RMS 리플 전류
3.	Coutx IRMS	202.211 mA	Current	Output capacitor_x RMS ripple current
4.	Iin 평균	1.868 A	Current	평균 입력 전류
5.	L Ipp	2.352 A	Current	피크-투-피크 인덕터 리플 전류
6.	SW Ipk	9.176 A	Current	피크 스위치 전류
7.	BOM 부품수	29	General	Total Design BOM count
8.	점유면적	640.0 mm ²	General	BOM 부품들의 총 점유면적
9.	주파수	348.432 kHz	General	스위칭 주파수
10.	IC Tolerance	6.0 μ V	General	IC Feedback Tolerance
11.	모드	CCM	General	전도 모드
12.	Pout	56.0 W	General	총 출력 전력
13.	총 BOM	\$5.72	General	Total BOM Cost
14.	Low Freq Gain	75.694 dB	Op_Point	Gain at 1Hz
15.	Vout Actual	7.045 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
16.	크로스 주파수	34.874 kHz	Op_point	Bode 플랏 크로스 오버 주파수
17.	듀티 사이클	22.287 %	Op_point	듀티 사이클
18.	효율	93.677 %	Op_point	스테디 스테이트 효율
19.	이득 여유	-20.792 dB	Op_point	Bode 플랏 이득 여유
20.	IC Tj	47.731 degC	Op_point	IC 접합부 온도
21.	IOUT_OP	8.0 A	Op_point	Iout 동작점
22.	M1 Tj	61.067 degC	Op_point	M1 MOSFET 접합부 온도
23.	M2 Tj	128.52 degC	Op_point	M2 MOSFET 접합부 온도
24.	위상 여유	65.817 deg	Op_point	Bode 플랏 위상 여유
25.	VIN_OP	32.0 V	Op_point	Vin 동작점
26.	Vout p-p	52.789 mV	Op_point	피크-투-피크 출력 리플 전압
27.	Cin Pd	138.56 mW	Power	입력 캐패시터 전력소산
28.	Cout Pd	826.297 μ W	Power	출력 캐패시터 전력소산
29.	Coutx Pd	122.668 μ W	Power	Output capacitor_x power loss
30.	IC Pd	506.592 mW	Power	IC 전력소산
31.	L Pd	1.031 W	Power	인덕터 전력소산

#	명칭	값	구분	설명
32.	M1 Pd	585.585 mW	Power	M1 MOSFET 총 전력소산
33.	M1 PdCond	283.645 mW	Power	M1 MOSFET 전도 손실
34.	M1 PdSw	301.94 mW	Power	M1 MOSFET 스위칭 손실
35.	M2 Pd	1.517 W	Power	M2 MOSFET 총 전력소산
36.	M2 PdCond	959.798 mW	Power	M2 MOSFET 전도 손실
37.	M2 PdSw	556.717 mW	Power	M2 MOSFET 스위칭 손실
38.	총 Pd	3.78 W	Power	총 전력소산
39.	Vout Tolerance	1.387 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

설계 입력

#	명칭	값	설명
1.	Iout	8.0	최대 출력 전류
2.	Vin 최대	32.0	최대 입력전압
3.	Vin 최소	8.0	최소 입력전압
4.	Vout	7.0	출력전압
5.	base_pn	TPS40170	내셔널사 기준의 부품번호
6.	소스	DC	입력 소스 타입
7.	주위 온도	30.0	주위 온도

설계 지원

1. TPS40170 Product Folder : <http://www.ti.com/product/TPS40170> : contains the data sheet and other resources.

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